(Graphics Liquid Crystal Display Controller/Driver Supporting JIS Level-1 and Level-2 Kanji ROM)

# **HITACHI**

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#### **Description**

The HD66732 is a dot-matrix liquid crystal display (LCD) controller and driver LSI that displays 11-by-12 dot Japanese characters consisting of kanji and hiragana according to the Japanese Industrial Standard (JIS) Level-1 and Level-2 Kanji Set. The HD66732 incorporates the following five functions on a single chip: (1) display control function for the dot matrix LCD, (2) a display RAM to store character codes, (3) ROM fonts to support level-1 and level-2 kanji, (4) an LCD driver, and (5) a booster to drive the LCD. A 4-line 10-character kanji display can be easily achieved by receiving character codes (2 bytes/character) from the microcomputer. The software processing loads on the microcomputer for kanji-font display development can be greatly reduced, and an external kanji character generator or key scan circuit is not needed. The character font includes font ROMs of 6,353 kanji from the JIS Level-1 and Level-2 Kanji Set, 285 JIS non-kanji characters, and 256 half-size alphanumeric characters and symbols. Full-size fonts such as Japanese kanji and half-size fonts such as alphanumeric characters can be displayed together. In addition, the HD66732 supports a 120-by-52 dot graphics display function that can display not only characters such as kanji but also graphics such as drawings or maps.

The HD66732 has various functions to reduce the power consumption of an LCD system, such as low-voltage operation at 2.4 V, a low-power LCD drive operating amplifier, and a booster to switch the boosting rate. Combining these hardware functions with software functions such as standby and sleep modes allows precise power control. The HD66732 is suitable for any battery-driven product requiring long-term driving capabilities such as cellular phones, pagers, or portable devices.

#### **Features**

- Dot-matrix liquid crystal display controller/driver supporting the display of kanji from the JIS Level-1 and Level-2 Kanji Set
- Kanji display and high-speed font development processing enabled by data transfer of two bytes/character
- 4-line 10-character kanji and 120-by-52-dot graphics display
- Mark display using 200 monochrome segments (marks) or 40 grayscale segments
- Control up to a 4 x 8 (32 key) matrix key scan (at a serial interface)

- Large character generator ROM for full-size display: corresponds to 8,128 full-size fonts
  - Kanji according to JIS Level-1 Kanji (11 x 12 dots): 2,965-character font
  - Kanji according to JIS Level-2 Kanji (11 x 12 dots): 3,388-character font
  - JIS non-kanji (11 x 12 dots): 285-character font
- Character generator ROM for half-size display: corresponds to 256 half-size fonts
  - Alphanumeric characters (6 x 12 dots): 128 fonts x 2 banks (256 fonts)
- 120-by-52-dot bit-map graphics display
- Combined display of 11 x 12 dots for full-size fonts consisting of kanji and kana, 6 x 12 dots for halfsize fonts of alphanumeric characters and symbols
- Low-power operation support:
  - Vcc = 2.4 to 5.5 V (low voltage)
  - Single, double, triple, or quadruple booster for liquid crystal drive voltage
  - Operational amplifier for low-power LCD drive supply and bleeder-resistors incorporated
  - Strong power-save functions such as the standby mode and sleep mode supported
  - Wake-up function using key scan interrupt
  - Programmable LCD-drive duty ratios and bias values
- Various display control functions:
  - Combined display (super-imposed display) of kanji characters and bit map graphics
  - Vertical smooth scroll (dot unit)
  - Black-white reversed display of full screen
  - Display-line-unit black-white reversed/underline/blinking display
  - Black-white reversed/blinking/black-white reversed blinking character display
- Display data RAM: 80 bytes (stores 40-character code in full size)
- Character generator RAM: 780 bytes (stores 120-by-52-dot bit map areas) (30 full-size user fonts can be displayed)
- Segment RAM: 60 bytes (200 segments can be displayed)
- Three-line clock synchronous serial bus, 4-/8-bit bus interface
- · No wait cycle for instruction execution and RAM access
- 120-segment x 54-common LCD driver
- Three general output ports built-in
- External R-C oscillator
- LCD drive voltage: 4.5 V to 13.0 V
- External dimensions: Tape carrier package (TCP) and slim chip with Au-bumps

Table 1 Programmable Display Sizes and Duty Ratios

Duty Ratio	Optimum Drive Bias	Number of Full-size Kanji Display Characters	Graphics Display Area	Segment Display	Scanned Keys	General Ports		
1/2	1/2	Unavailable	Unavailable	200	32 (4 x 8)	3		
1/15	1/5	1 line x 10 characters	120 x 13 dots	Grayscale				
1/28	1/6	2 lines x 10 characters	120 x 26 dots	segments:				
1/41	1/7	3 lines x 10 characters	120 x 39 dots	40)				
1/54	1/8	4 lines x 10 characters	120 x 52 dots	_				

### Type Name

Type Name	External Dimensions	Display Lines (Graphics Display)	Built-in Full-size Font	Built-in Half-size Font
HD66732A00TB0L	Bending TCP	4-line x 10-character (120 x 52 dots)	JIS Level-1 and Level-2 Kanji Set + non-kanji characters	Alphanumeric characters
HD66732A00BP	Au-bumped chip (slim chip)	4-line x 10-character (120 x 52 dots)	JIS Level-1 and Level-2 Kanji Set + non-kanji characters	Alphanumeric characters

## **Example of Liquid Crystal Display**



Figure 1 Combined Display of 4-line x 10-character Kanji and Graphics

## LCD Specification Comparison for Kanji Display

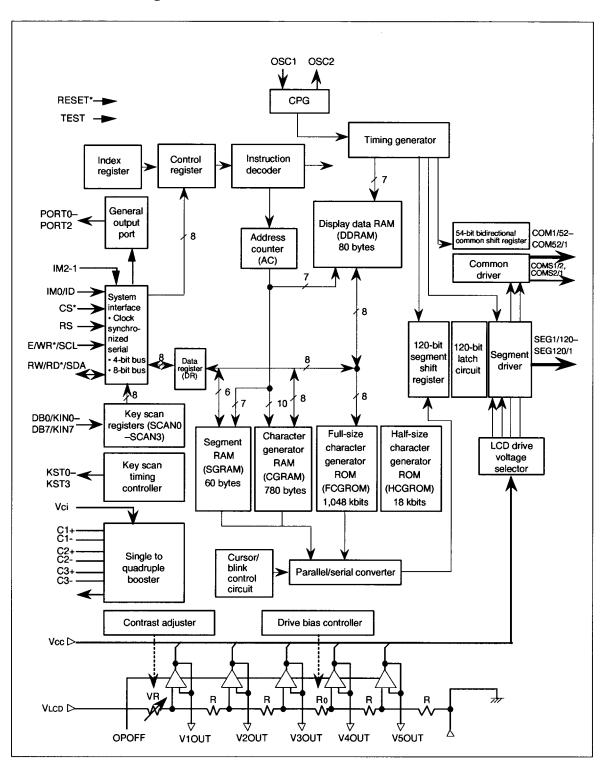
	External Kanji ROM Type		
Items	HD66724	HD66725	HD66726
Kanji display area	72 x 24 dots	96 x 24 dots	96 x 40 dots
Kanji character display		_	_
Half-size alphanumeric character display	12 characters x 3 lines	16 characters x 3 lines	16 characters x 5 lines
Graphics display sizes	72 x 26 dots	96 x 26 dots	96 x 42 dots
Multiplexing icons	144	192	192
Key scan control	8 x 4	8 x 4	8 x 4
General output port	3	3	3
Operating power voltages	1.8 V to 5.5 V	1.8 V to 5.5 V	1.8 V to 5.5 V
Liquid crystal drive voltages	3 V to 6 V	3 V to 6 V	4.5 V to 11 V
Serial bus	Clock-synchronized serial	Clock-synchronized serial	Clock-synchronized serial
Parallel bus	4 bits, 8 bits	4 bits, 8 bits	4 bits, 8 bits
Expansion driver control	Impossible	Impossible	Impossible
Liquid crystal drive duty ratios	1/2, 10, 18, 26	1/2, 10, 18, 26	1/2, 10, 18, 26, 34, 42
Liquid crystal drive biases	1/4 to 1/6.5	1/4 to 1/6.5	1/2 to 1/8
Liquid crystal drive waveforms	В	В	В
Liquid crystal voltage booster	Single, double or triple	Single, double, or triple	Single, double, triple, or quadruple
Bleeder-resistor for liquid crystal drive	Incorporated (external)	Incorporated (external)	Incorporated (external)
Liquid crystal drive operational amplifier	Incorporated	Incorporated	Incorporated
Contrast adjuster	Incorporated	Incorporated	Incorporated
Horizontal smooth scroll	3-dot unit	3-dot unit	Impossible
Vertical smooth scroll	Raster-row unit	Raster-row unit	Raster-row unit
Double-height display	Yes	Yes	Yes
DDRAM	80 x 8	80 x 8	80 x 8
CGROM	21 k	21 k	21 k
Incorporated font	Alphanumeric character +	Alphanumeric character +	Alphanumeric character +
	kana	kana	kana
CGRAM	384 x 8	384 x 8	480 x 8
SEGRAM	72 x 8	96 x 8	96 x 8
Number of CGROM fonts	432	432	432
Number of CGRAM fonts	64	64	64
Font sizes	6 x 8	6 x 8	6 x 8
R-C oscillation resistor/	External resistor,	External resistor,	External resistor (50 kHz)
oscillation frequency	incorporated (32 kHz)	incorporated (32 kHz)	
Reset function	External	External	External
Low power control	Partial display off	Partial display off	Partial display off
	Display off	Display off	Display off
	Oscillation off	Oscillation off	Oscillation off
	Liquid crystal power off Key wake-up interrupt	Liquid crystal power off Key wake-up interrupt	Liquid crystal power off Key wake-up interrupt
SEG/COM direction switching	SEG, COM	SEG, COM	SEG, COM
QFP package	old, com	SEG, COIVI	SEG, COM
	TCP	TCP	TCP
TCP package  Bare chip (without bumps)	107	IUP	105
	Yes	Yes	Yes
Bumped chip	146	170	185
Number of pins			
Chip sizes	10.34 x 2.51	10.97 x 2.51	13.13 x 2.51
Pad (bump) intervals	80 μm	80 μm	100 μm

## LCD Specification Comparison for Kanji Display (cont)

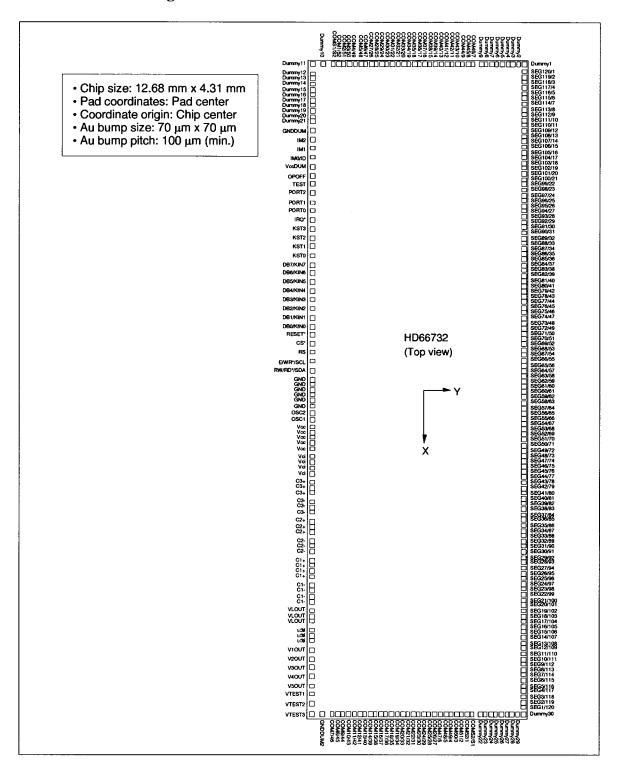
Internal Kanji ROM Type

	Internal Kanji ROM Type		
Items	HD66730	HD66731	HD66732
Kanji display area	71 x 25 dots	119 x 51 dots	120 x 52 dots
Kanji character display	6 characters x 2 lines	10 characters x 4 lines	10 characters x 4 lines
Half-size alphanumeric character display	12 characters x 2 lines	20 characters x 4 lines	20 characters x 4 lines
Graphics display sizes	(48 x 26 dots)	(48 x 26 dots)	120 x 52 dots
Multiplexing icons	71	120	200
Key scan control	_	_	8 x 4
General output port	_	_	3
Operating power voltages	2.4 V to 5.5 V	2.4 V to 5.5 V	2.4 V to 5.5 V
Liquid crystal drive voltages	3 V to 15 V	3 V to 15 V	4.5 V to 13 V
Serial bus	Clock-synchronized serial	Clock-synchronized serial	Clock-synchronized serial
Parallel bus	8 bits	8 bits	4 bits, 8 bits
Expansion driver control	Possible	Impossible	Impossible
Liquid crystal drive duty ratios	1/14, 27, 40, 53	1/14, 27, 40, 53	1/2, 15, 28, 41, 54
Liquid crystal drive biases	1/4 to 1/8.3	1/4 to 1/8.3	1/2 to 1/8
Liquid crystal drive waveforms	В	В	B+C
Liquid crystal voltage booster	Double or triple	Double or triple	Single, double, triple, or quadruple
Bleeder-resistor for liquid crystal drive	External	External	External
Liquid crystal drive operational amplifier	_	_	Incorporated
Contrast adjuster	_	_	Incorporated
Horizontal smooth scroll	Display unit	Display unit	Impossible
Vertical smooth scroll	Raster-row unit	Raster-row unit	Raster-row unit
Double-height display	<del></del>	_	_
DDRAM	80 x 8	80 x 8	80 x 8
CGROM	507 k + 9 k	507 k + 9 k	1,048 k + 18 k
Incorporated font	JIS Level-1 Kanji Set,	JIS Level-1 Kanji Set,	JIS Level-1 and Level-2
	Hungle	Hungle	Kanji Set
CGRAM	208 x 8	208 x 8	780 x 8
SEGRAM	16 x 8	16 x 8	60 x 8
Number of CGROM fonts	3840 + 128 (half size)	3840 + 128 (half size)	8128 + 256 (half size)
Number of CGRAM fonts	8	8	30
Font sizes	11 x 12	11 x 12	11 x 12
R-C oscillation resistor/	External resistor (150 kHz)	External resistor (150 kHz)	External resistor
oscillation frequency			(45 to 76 kHz)
Reset function	External	External	External
Low power control	Booster off Internal division function	Booster off Internal division function	Partial display off Display off Oscillation off Liquid crystal power off Key wake-up interrupt
SEG/COM direction switching	-	_	SEG, COM
QFP package	QFP-1420	_	
TCP package		TCP	TCP
Bare chip (without bumps)	Yes	_	<del></del>
Bumped chip	<del></del>	Yes	Yes
Number of pins	128	206	221
Chip sizes	7.48 x 6.46	7.48 x 6.46	12.68 x 4.31
Pad (bump) intervals	180 μm	80 μm	100 μm
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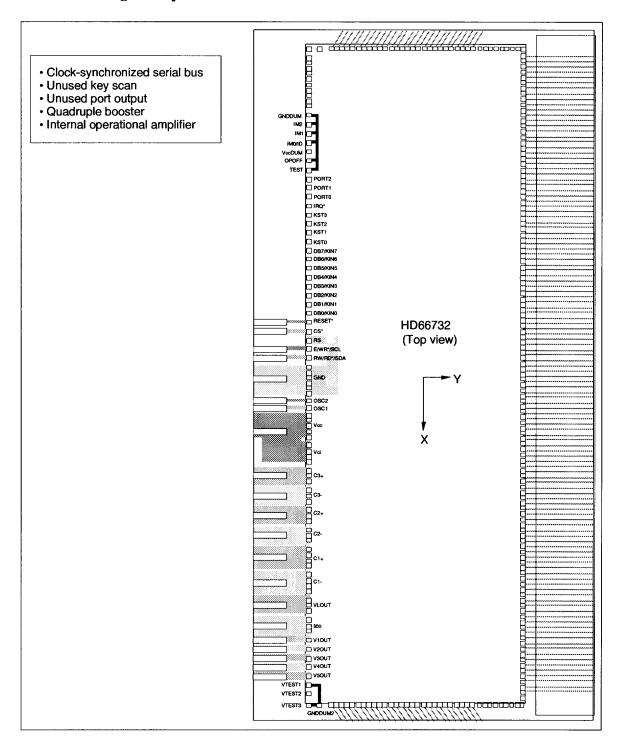
### **HD66732 Block Diagram**



### **HD66732 Pad Arrangement**



## **COG Routing Example**

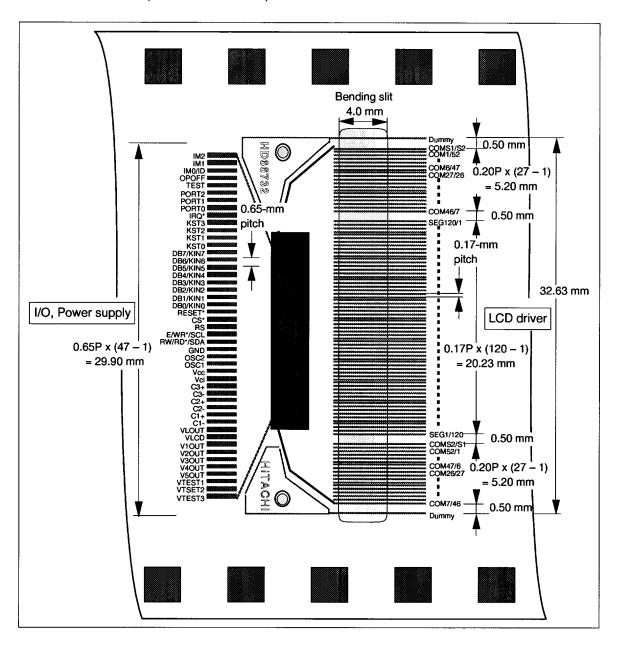


## **HD66732 Pad Coordinates**

Pin		Coordi	nate	Pin		Coordi	nate	Pin		Coordi	nate	
No.	Pad Name	X	Υ		Pad Name	X	Υ	No.	Pad Name	x	γ	
	Dummy1	-6165	1929	7	TEST	-4027	-1989	61	C1+	3917	-1929	
	Dummy2	-6165	1829	- 8	PORT2	-3843	-1989	62	C1-	4047	-1929	
	Dummy3	-6165	1729	9	PORT1	-3659	-1989	63	C1-	4147	-1929	
	Dummy4	-6165	1629	10	PORT0	-3475	-1989	64		4247	-1929	
_	Dummy5	-6165	1529	11	IRQ*	-3291	-1989	65	C1-	4347	-1929	
	Dummy6	-6165	1428	12	KST3	-3107	-1989	66	VLOUT	4478	-1929	
	Dummy7	-6165	1328	13	KST2	-2923	-1989	67	VLOUT	4578	-1929	
_	Dummy8	-6165	1228	14	KST1	-2739	-1989	68		4678	-1929	
_	Dummy9	-6165	1128	15	KST0	-2555	-1989	69	VLCD	4808	-1929	
228	COM46/7	-6114	972	16	DB7/KIN7	-2371	-1989	70	VLCD	4908	-1929	
229	COM45/8	-6114	872	17	DB6/KIN6	-2187	-1989	71	VLCD	5008	-1929	
230	COM44/9	-6114	772	18	DB5/KIN5	-2003	-1989	72	V1OUT	5188	-1940	
231	COM43/10	-6114	671	19	DB4/KIN4	-1819	-1989	73	V2OUT	5318	-1940	
232	COM42/11	-6114	571	20	DB3/KIN3	-1635	-1989	74	V3OUT	5448	-1940	
233	COM41/12	-6114	471	21	DB2/KIN2	-1451	-1989	75	V4OUT	5578	-1940	
	COM40/13	-6114	371	22	DB1/KIN1	-1267	_1989_	76	V5OUT	5709	-1940	
	COM39/14	-6114	271	23	DB0/KIN0	-1083	-1989	77	VTEST1	5839	-1940	
	COM38/15	-6114	171	24	RESET*	-899	-1989	78		5969	-1940	
237	COM37/16	-6114	71	25	CS*	<del>-715</del>	-1989		VTEST3	6114	-1940	
238	COM36/17	-6114	29_	26	RS	-531	-1989	80	GNDDUM2	6114	<del>-1765</del>	
239	COM35/18	-6114	-129	27	E/WR*/SCL	-368	-1989	81		6114	-1630	
	COM34/19	-6114	-229	28	RW/RD*/SDA	-238	-1989		COM8/45	6114	-1530	
241	COM33/20	-6114	-329	29	GND	<u>–53</u>	-1989	83		6114	_1430	
	COM32/21	<u>–6114</u>	<del>-429</del>	30	GND	77	<del>-1989</del>		COM10/43	6114	-1330	
	COM31/22	-6114	-529	31	GND	208	<u>-1989</u>		COM11/42	6114	-1230	
244	COM30/23	<u>-6114</u>	-630	32	GND	338	-1989	86		6114	-1130	
	COM29/24	-6114	-730	33	GND	468	-1989	87	COM13/40	6114	-1030	
	COM28/25	<u>-6114</u>	<u>-830</u>	34_	GND	598	-1989	88		6114	<u>-930</u>	
247	COM27/26	<u>-6114</u>	<u>-930</u>	35	OSC2	784	_1989		COM15/38	6114	_830_	
248	COM6/47	-6114	-1030	36	OSC1	968	-1989		COM16/37	6114	_730	
249	COM5/48	-6114	-1130	37	V <sub>cc</sub>	1148	-1932	91		6114	-630	
250	COM4/49	<u>-6114</u>	-1230	38	V <sub>cc</sub>	1278	-1932		COM18/35	6114	-529	
251	COM3/50	<u>-6114</u>	-1330	39	V <sub>cc</sub>	1408	-1932		COM19/34	6114	-429	
	COM2/51	<u>-6114</u>	<u>-1430</u>	40	V <sub>cc</sub>	1538	-1932	94		6114	-329	
	COM1/52	<u>-6114</u>	<u>-1530</u>	41	V <sub>CC</sub>	1668	-1932		COM21/32	6114	-229	
254	COMS1/S2	<u>-6114</u> -6114	-1630 -1810	42	Vci Vci	1965	<u>-1929</u> -1929	96		6114	-129	
	Dummy10			43	Vci	1865		97 98		6114	<u>–29</u> 71	
	Dummy11	<u>-6114</u>	_1989 _1989		Vci	2065	-1929	99	COM24/29	6114		
	Dummy12 Dummy13	_5914 _5814	-1989	<u>45</u> 46	C3+	2165 2296	<u>-1929</u> -1929		COM25/28 COM26/27	6114 6114	<u>171</u> 271	
	Dummy14		-1989	47	C3+	2396	-1929 -1929	101	COM26/27 COM47/6	6114	371	
	Dummy15	-5613	-1989	48	C3+	2496	-1929 -1929	102	COM48/5	6114	471	
	Dummy16	<u>-5513</u>	-1989	49	C3-	2626	-1929	103		6114	571	
	0 17	-5413			C3-	2726	-1929		COM50/3	6114	671	
	Dummy18	-5313		51	C3-	2826	-1929 -1929		COM50/3	6114	772	
	Dummy19	-5213		52	C2+	2956	-1929		COM51/2	6114	872	
	Dummy20	-5113		53	C2+	3056	-1929		COMS2/S1	6114	972	
	Dummy21	_5013		54	C2+	3156	-1929		Dummy22	6165	1128	
		<del>-3013</del> <del>-4863</del>		55	C2-	3256	-1929		Dummy23	6165	1228	
	IM2	<del>-4762</del>		56	C2-	3387	-1929		Dummy24	6165	1328	
$\frac{2}{3}$	IM1	<del>-4762</del> <del>-4578</del>		57	C2-	3487	-1929 -1929	_	Dummy25	6165	1428	
$\frac{3}{4}$	IM0/ID	<del>-4578</del> <del>-4403</del>		58	C1+	3617	-1929 -1929	=	Dummy26	6165	1529	
	V <sub>CC</sub> DUM	<del>-4403</del> <del>-4303</del>	-1989	59	C1+	3717	-1929			6165	1629	
	OPOFF	<del>-4</del> 303			C1+	3817	-1929		Dummy28	6165	1729	
	OF OF I	-4202	-1303		UIT	3017	-1323		Dullilly20	0100	1129	

Pin		Coordi	nate	Pin		Coordi	nate	D:		Coordi	nate
No.	Pad Name	<u>x</u>	Υ	No.	Pad Name	${x}$	Y	Pin No.	Pad Name	X	Y
	Dummy29	6165	1829	147	SEG40/81	2052	1929	188	SEG81/40	-2052	1929
_	Dummy30	6165	1929	148	SEG41/80	1952	1929	189	SEG82/39	-2152	1929
108	SEG1/120	5955	1929	149	SEG42/79	1851	1929	190	SEG83/38	-2252	1929
109	SEG2/119	5855	1929	150	SEG43/78	1751	1929	191	SEG84/37	-2352	1929
110	SEG3/118	5755	1929	151	SEG44/77	1651	1929	192	SEG85/36	-2452	1929
111	SEG4/117	5655	1929	152	SEG45/76	1551	1929	193	SEG86/35	-2552	1929
112	SEG5/116	5554	1929	153	SEG46/75	1451	1929	194	SEG87/34	-2652	1929
113	SEG6/115	5454	1929	154	SEG47/74	1351	1929	195	SEG88/33	-2752	1929
114	SEG7/114	5354	1929	155	SEG48/73	1251	1929	196	SEG89/32	-2852	1929
115	SEG8/113	5254	1929	156	SEG49/72	1151	1929	197	SEG90/31	-2952	1929
116	SEG9/112	5154	1929	157	SEG50/71	1051	1929	198	SEG91/30	-3052	1929
117	SEG10/111	5054	1929	158	SEG51/70	951	1929	199	SEG92/29	-3153	1929
118	SEG11/110	4954	1929	159	SEG52/69	851	1929	200	SEG93/28	-3253	1929
119	SEG12/109	4854	1929	160	SEG53/68	751	1929	201	SEG94/27	-3353	1929
120	SEG13/108	4754	1929	161	SEG54/67	651	1929	202	SEG95/26	-3453	1929
121	SEG14/107	4654	1929	162	SEG55/66	550	1929	203	SEG96/25	-3553	1929
122	SEG15/106	4554	1929	163	SEG56/65	450	1929	204	SEG97/24	-3653	1929
123	SEG16/105	4454	1929	164	SEG57/64	350	1929	205	SEG98/23	-3753	1929
124	SEG17/104	4353	1929	165	SEG58/63	250	1929	206	SEG99/22	-3853	1929
125	SEG18/103	4253	1929	166	SEG59/62	150	1929	207	SEG100/21	-3953	1929
126	SEG19/102	4153	1929	167	SEG60/61	50	1929	208	SEG101/20	<del>-4</del> 053	1929
127	SEG20/101	4053	1929	168	SEG61/60	-50	1929	209	SEG102/19	-4153	1929
128	SEG21/100	3953	1929	169	SEG62/59	-150	1929	210	SEG103/18	<b>-4253</b>	1929
129	SEG22/99	3853	1929	170	SEG63/58	-250	1929	211	SEG104/17	<del>-4353</del>	1929
130	SEG23/98	3753	1929	171	SEG64/57	-350	1929	212	SEG105/16	<del>-4454</del>	1929
131	SEG24/97	3653	1929	172	SEG65/56	-450	1929	213	SEG106/15	<del>-4554</del>	1929
132	SEG25/96	3553	1929	173	SEG66/55	-550	1929	214	SEG107/14	-4654	1929
133	SEG26/95	3453	1929	174	SEG67/54	-651	1929	215	SEG108/13	-4754	1929
134	SEG27/94	3353	1929	175	SEG68/53	<b>-751</b>	1929	216	SEG109/12	-4854	1929
135	SEG28/93	3253	1929		SEG69/52	-851	1929	217	SEG110/11	-4954	1929
136	SEG29/92	3153	1929	177	SEG70/51	-951	1929	218	SEG111/10	-5054	1929
137	SEG30/91	3052	1929	178	SEG71/50	-1051	1929	219	SEG112/9	-5154	1929
138	SEG31/90	2952	1929	179	SEG72/49	-1151	1929	220	SEG113/8	-5254	1929
139	SEG32/89	2852	1929	180	SEG73/48	-1251	1929	221	SEG114/7	-5354	1929
140	SEG33/88	2752	1929	181	SEG74/47	-1351	1929	222	SEG115/6	-5454	1929
141	SEG34/87	2652	1929	182	SEG75/46	-1451	1929	223	SEG116/5	-5554	1929
142	SEG35/86	2552	1929	193	SEG76/45	-1551	1929	224	SEG117/4	-5655	1929
143	SEG36/85	2452	1929		SEG77/44	-1651	1929	225	SEG118/3	-5755	1929
144	SEG37/84	2352	1929	185	SEG78/43	-1751	1929	226	SEG119/2	-5855	1929
145	SEG38/83	2252	1929	186	SEG79/42	-1851	1929		SEG120/1	-5955	1929
146	SEG39/82	2152	1929		SEG80/41	-1952	1929				

### TCP Dimensions (HD66732xxxTB0)



## **Pin Functions**

 Table 2
 Pin Functional Description

Signals	Number of Pins	1/0	Connected to	Functions							
IM2, IM1	2	ı	V <sub>∞</sub> or GND	Selects t	he MPU i	nterface mode:					
				IM2	IM1	MPU interface mode					
				"GND"	"GND"	Clock-synchronized serial interface					
				"GND"	"Vcc"	68-system parallel bus interface					
				"Vcc"	"GND"	Setting inhibited					
				"Vcc"	"Vcc"	80-system parallel bus interface					
IM0/ID	1	1	V <sub>cc</sub> or GND	Inputs the ID of the device ID code for a serial bus interface. Selects the transfer bus length for a parallel bus interface.  GND: 8-bit bus, Vcc: 4-bit bus							
CS*	1	1	MPU	Selects the HD66732: Low: HD66732 is selected and can be accessed High: HD66732 is not selected and cannot be accessed Must be fixed at GND level when not in use.							
RS	1	I	MPU	Selects the register for a parallel bus interface.  Low: Instruction High: RAM access  Selects the key scan interrupt method in the standby period for a serial interface. Monitors a total of eight keys connected to KST0 at the GND level and monitors all keys at the Vcc level to generate an interrupt.							
E/WR*/SCL	1	ı	MPU	Inputs the Fetches For a 68- enable si For an 80	e serial tr data at th system p gnal to a 3-system	ransfer clock for a serial interface. The rising edge of a clock. The rising edge of a					
RW/RD*/ SDA	1	l or I/O	MPU	Serves a serial into For a 68- signal to For an 80	s the bidierface. Seystem pelect da D-system pelect da	rectional serial transfer data for a sends/Receives data. carallel bus interface, serves as a sta read/write operation. parallel bus interface, serves as a l and reads data at the low level.					
IRQ*	1	0	MPU			y scan interrupt signal.					
KST0- KST3	4	0	Key matrix	from the	key matri	signals for latching scanned data ix at specific time intervals.					
DB0/KIN0— DB7/KIN7	8	l or I/O	Key matrix or MPU	Available for a serial interface only.  Samples key state from key matrix synchronously with strobe signals for a serial interface.  Serves as a bidirectional data bus for a parallel bus interface.  For a 4-bit bus, data transfer uses KIN7/DB7-KIN4/DB4; leave KIN3/DB3-KIN0/DB0 disconnected.							

 Table 2
 Pin Functional Description (cont)

Signals	Number of Pins	I/O	Connected to	Functions
PORT0- PORT2	3	0	General output	General output ports. These ports cannot drive current such as for LEDs or backlighting control. Boost the current using an external transistor.
COMS1/2, COMS2/1	2	0	LCD	Common output signals for segment-icon display.
COM1/52- COM52/1	52	0	LCD	Common output signals for character/graphics display: COM1 to COM13 for the first line, COM14 to COM26 for the second line, COM27 to COM39 for the third line, and COM40 to COM52 for the fourth line. All the unused pins output unselected waveforms. In the sleep mode (SLP = 1) or standby mode (STB = 1), all pins output GND level. The CMS bit can change the shift direction of the common signal. For example, if CMS = 0, COM1/52 is COM1. If CMS = 1, COM1/52 is COM52.
SEG1/120- SEG120/1	120	0	LCD	Segment output signals for segment-icon display and character/graphics display. In the sleep mode (SLP = 1) or standby mode (STB = 1), all pins output GND level.  The SGS bit can change the shift direction of the segment signal. For example, if SGS = 0, SEG1/120 is SEG1. If SGS = 1, SEG1/120 is SEG120.
V1OUT- V5OUT	10	I or O	Open or external bleeder-resistor	Used for output from the internal operational amplifiers when they are used (OPOFF = GND); attach a capacitor to stabilize the output. When the amplifiers are not used (OPOFF = V <sub>cc</sub> ), V1 to V5 voltages can be supplied to these pins externally.
V <sub>LCD</sub>	3	_	Power supply	Power supply for LCD drive. $V_{LCD} - GND = 13 \text{ V max}$ .
V <sub>cc</sub> , GND	7	_	Power supply	V <sub>cc</sub> : +2.4 V to +5.5 V; GND (logic): 0 V
OSC1, OSC2	2	I or O	Oscillation- resistor or clock	For R-C oscillation using an external resistor, connect an external resistor. For external clock supply, input clock pulses to OSC1.
Vci	3	I	Power supply	Inputs a reference voltage and supplies power to the booster; generates the liquid crystal display drive voltage from the operating voltage.  Must be left disconnected when the booster is not used.
VLOUT	3	0	V <sub>LCD</sub> pin/booster capacitance	Potential difference between Vci and GND is single- to quadruple-boosted and then output. Magnitude of boost is selected by instruction.
C1+, C1-	8		Booster capacitance	External capacitance should be connected here when using the double, triple, or quadruple booster.
C2+, C2-	8	_	Booster capacitance	External capacitance should be connected here when using the triple or quadruple booster.
C3+, C3–	8	_	Booster capacitance	External capacitance should be connected here when using the quadruple booster.

 Table 2
 Pin Functional Description (cont)

Signals	Number of Pins	I/O	Connected to	Functions
RESET*	1	1	MPU or external R-C circuit	Reset pin. Initializes the LSI when low. Must be reset after power-on.
OPOFF	1	ı	V <sub>cc</sub> or GND	Turns the internal operational amplifier off when OPOFF = $V_{cc}$ , and turns it on when OPOFF = GND. If the amplifier is turned off (OPOFF = $V_{cc}$ ), V1 to V5 must be supplied to the V1OUT to V5OUT pins.
VccDUM	1	0	Input pins	Outputs the internal $V_{cc}$ level; shorting this pin sets the adjacent input pin to the $V_{cc}$ level.
GNDDUM	1	0	Input pins	Outputs the internal GND level; shorting this pin sets the adjacent input pin to the GND level.
TEST	1	l	GND	Test pin. Must be fixed at GND level.
VTEST1	1	I	Vcc or GND	Adjust the driving ability of the internal LCD operational amplifier. Normal drive mode in the GND side, and high-power drive mode in the Vcc side. Use the high-power drive mode when the display quality is insufficient although current consumption increases.
VTEST2	1	_	_	Test pin. Must be open.
VTEST3	1	I	Vcc or GND	Adjust the driving ability of the internal LCD operational amplifier.  Normal drive mode or high-power drive mode in the GND side, and low-power drive mode in the Vcc side.

#### **Block Function Description**

#### **System Interface**

The HD66732 has five types of system interfaces, and a clock-synchronized serial interface, a 68-system 4-bit/8-bit bus, and a 80-system 4-bit/8-bit bus. The interface mode is selected by the IM2-0 pins. The key scan of the HD66732 is not available for the 4-bit/8-bit bus interface. Instead, use the clock-synchronized serial interface.

The HD66732 has five 8-bit registers: an index register (IR), a status register (SR), control registers, a RAM address register, and a RAM data register.

The IR specifies the index address of the register to be accessed. The SR reads the key scan data in the serial interface mode, and the internal states in the bus interface mode. Control registers (CNRs) set instructions such as clear display or display control. The RAM address register and RAM data register store the addresses or data of the display data RAM (DDRAM), character generator RAM (CGRAM), or segment RAM (SEGRAM).

Data written into the RAM data register from the MPU is automatically written into the DDRAM, CGRAM, or SEGRAM by internal operation. Data is read and temporarily latched in the RAM data register when reading from the RAM, and the first read data is invalid and the second data is normal. After reading, data in the DDRAM, CGRAM, or SEGRAM at the next address is sent to the RAM data register for the next reading from the MPU.

Execution time for instructions, excluding clear display, is 0 clock cycles and instructions can be written in succession.

Table 3 Register Selection by RS and R/W Bits

R/W Bits	RS Bits	Operations
0	0	Writes to the index register (IR)
1	0	Reads the status register (SR)
0	1	Writes to the control register, RAM address register, and RAM data register
1	1	Reads the RAM data register

#### **Key Scan Registers (SCAN0 to SCAN3)**

The key matrix scanner senses and holds the key states at each rising edge of the key strobe signals that are output by the HD66732. The key strobe signals are output as time-multiplexed signals from KST0 to KST3. After passing through the key matrix, these strobe signals are used to sample the key status on eight inputs from KIN0 to KIN7, enabling up to 32 keys to be scanned.

The states of inputs KIN0 to KIN7 are sampled by key strobe signal KST0 and latched into register SCAN0. Similarly, the data sampled by strobe signals KST1 to KST3 is latched into registers SCAN1 to SCAN3, respectively.

#### **General Output Ports (PORT0 to PORT 2)**

The HD66732 has three general output ports. These ports control drive current such as that for LEDs or backlighting by using the current boosted by an external transistor.

#### Address Counter (AC)

The address counter (AC) assigns addresses to the DDRAM, CGRAM, or SEGRAM. When an address is written into the RAM address register, the address information is sent to the AC. Selection of the DDRAM, CGRAM, and SEGRAM is also determined concurrently by the RAM select bit (RM1/0).

After writing data into DDRAM, CGRAM, or SEGRAM, the AC is automatically incremented by 1 (or decremented by 1). After reading the data, the AC is automatically updated or not updated by the RDM bit. The cursor display position is determined by the address counter value.

#### Display Data RAM (DDRAM)

Display data RAM (DDRAM) stores display data represented in 8-bit character codes in the character display mode. Its capacity is 80 x 8 bits, or 80 characters, which is equivalent to an area of 10 characters x 4 lines. Any number of display lines (LCD drive duty ratio) from 1 to 4 can be selected by software. Here, assignment of DDRAM addresses is the same for all display modes. The line to be displayed at the top of the display (display-start line) can also be selected by register settings. The graphics display mode does not use data in the DDRAM.

#### Full-size Character Generator ROM (FCGROM)

Full-size character generator ROM (FCGROM) generates 11 x 12-dot character patterns from 13-bit character codes. It is equipped with 8,128 full-size font patterns such as the JIS Level-1 and Level-2 Kanji Set or non-Kanji Set. For the relationships between JIS codes and character codes to be set in the DDRAM, see the Combined Display of Full-size and Half-size Characters section.

#### Half-size Character Generator ROM (HCGROM)

Half-size character generator ROM (HCGROM) generates 6 x 12-dot character patterns from 7-bit character codes. It is equipped with two banks of 128 half-size font patterns, and 256 half-size fonts in total. For details, see the Combined Display of Full-size and Half-size Characters section and the Display Attribute Designation section.

#### **Character Generator RAM (CGRAM)**

Character generator RAM (CGRAM) allows the user to redefine the character patterns in the character display mode. Up to 40 character patterns of 12 x 13-dot characters can be simultaneously displayed. DRAM-specified character code can be selected to display one of these user font patterns.

The CGRAM serves as a RAM to store 120 x 52-dot bit pattern data in the graphics display mode. Here, display patterns are directly written into CGRAM. Character codes set in the DDRAM are not used. For details, see the Character Display Functions and Graphics Display Functions section.

#### **Segment RAM (SEGRAM)**

The segment RAM (SEGRAM) is used to enable control of segments such as icons and marks through the user program. Segments and characters are driven by a multiplexing drive method.

The SEGRAM has a capacity of 120 x 4 bits, and can control a display of up to 200 icon segments. Since 40 segments can be controlled by grayscale, they are used for reflective color icons. While COMS1 and COMS2 outputs are being selected, 120 segments are driven. The 40 grayscale-controlled segments output the same display data in both the COMS1 drive and COMS2 drive modes.

Bits in the SEGRAM corresponding to segments to be displayed are set directly by the MPU, regardless of the contents of the DDRAM and CGRAM.

#### **Timing Generator**

The timing generator generates timing signals for the operation of internal circuits such as DDRAM, CGROM, CGRAM, and SEGRAM. The RAM read timing for display and internal operation timing by MPU access are generated separately to avoid interference with one another. This prevents flickering in areas other than the display area when writing data to DDRAM, for example.

#### Cursor/Blink Controller

The cursor/blink (or black-white reversed) control is used to create a cursor or a flashing area on the display in a position corresponding to the location stored in the address counter (AC).

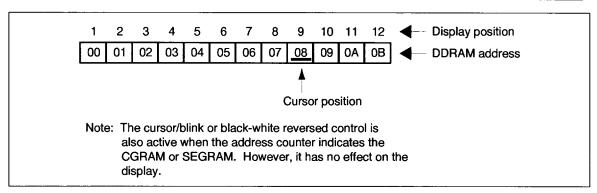


Figure 2 Cursor Position and DDRAM Address

#### **Oscillation Circuit (OSC)**

The HD66732 can provide R-C oscillation simply through the addition of an external oscillation-resistor between the OSC1 and OSC2 pins. The appropriate oscillation frequency for operating voltage, display size, and frame frequency can be obtained by adjusting the external-resistor value. Clock pulses can also be supplied externally. Since R-C oscillation stops during the standby mode, current consumption can be reduced. For details, see the Oscillation circuit section.

#### **Liquid Crystal Display Driver Circuit**

The liquid crystal display driver circuit consists of 54 common signal drivers (COM1 to COM52, COMS1, and COMS2) and 120 segment signal drivers (SEG1 to SEG120). When the number of lines are selected by a program, the required common signal drivers automatically output drive waveforms, while the other common signal drivers continue to output unselected waveforms.

Character pattern data is sent serially through a 120-bit shift register and latched when all needed data has arrived. The latched data then enables the segment signal drivers to generate drive waveform outputs.

The shift direction of 120-bit data can be changed by the SGS bit. The shift direction for the common driver can also be changed by the CMS bit by selecting an appropriate direction for the device mounting configuration.

When multiplexing drive is not used, or during the standby or sleep mode, all the above common and segment signal drivers output the GND level, halting the display.

#### **Booster (DC-DC Converter)**

The booster doubles, triples, or quadruples a voltage input to the Vci pin. With this, both the internal logic units and LCD drivers can be controlled with a single power supply. Boost output level from single to quadruple boost can be selected by software. For details, see the Power Supply for Liquid Crystal Display Drive section.

#### V-pin Voltage Follower

A voltage follower for each voltage level (V1 to V5) reduces current consumption by the LCD drive power supply circuit. No external resistors are required because of the internal bleeder-resistor, which generates different levels of LCD drive voltage. This internal bleeder-resistor can be software-specified from 1/2 bias to 1/8 bias, according to the liquid crystal display drive duty value. The voltage followers can be turned off while multiplexing drive is not being used. For details, see the Power Supply for Liquid Crystal Display Drive section.

#### **Contrast Adjuster**

The contrast adjuster can be used to adjust LCD contrast in 32 steps by varying the LCD drive voltage by software. This can be used to select an appropriate LCD brightness or to compensate for temperature.

## **DDRAM Address Map**

Table 4 DDRAM Addresses and Display Positions

Display		Display Character (Half Size)																		
Line	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1st	"00"	"01"	"02"	"03"	"04"	"05"	"06"	"07"	"08"	"09"	"0A"	"0B"	"0C"	"0D"	"0E"	"0F"	"10"	"11"	"12"	"13"
2nd	"20"	"21"	"22"	"23"	"24"	"25"	"26"	"27"	"28"	"29"	"2A"	"2B"	"2Ç"	"2D"	"2E"	"2F"	"30"	"31"	"32"	"33"
3rd	"40"	"41"	"42"	"43"	"44"	"45"	"46"	"47"	"48"	"49"	"4A"	"4B"	"4C"	"4D"	"4E"	"4F"	"50"	"51"	"52"	"53"
4th	"60"	"61"	' "62"	"63"	"64"	"65"	"66"	"67"	"68"	"69"	"6A"	"6B"	"6C"	"6D"	"6E"	"6F"	"70"	"71"	"72"	"73"

Note: When SGS = 0, SEG1/120 to SEG6/115 appear at the first character at the extreme left of the screen. When SGS = 1, SEG120/1 to SEG115/6 appear at the first character at the extreme left of the screen.

Table 5 Display-line Modes, Display-start Line, and DDRAM Addresses

Di	ien	los		tort		ines
U	SD	Ιέτν	- 5	lari	_	mes

					_	
Display- line Mode	Duty Ratio	Common Pins	1st Line (SN = 00)	2nd Line (SN = 01)	3rd Line (SN = 10)	4th Line (SN = 11)
1-line (NL = 001)	1/15	COM1- COM13	00H-13H	20H-33H	40H–53H	60H-73H
2-line (NL = 010)	1/28	COM1- COM13	00H-13H	20H-33H	40H-53H	60H-73H
		COM14- COM26	20H-33H	40H-53H	60H-73H	00H-13H
3-line (NL = 011)	1/41	COM1- COM13	00H-13H	20H-33H	40H–53H	60H-73H
		COM14- COM26	20H-33H	40H–53H	60H-73H	00H-13H
		COM27- COM39	40H–53H	60H-73H	00H–13H	20H-33H
4-line (NL = 100)	1/54	COM1- COM13	00H-13H	20H-33H	40H–53H	60H-73H
		COM14- COM26	20H-33H	40H–53H	60H-73H	00H-13H
		COM27- COM39	40H-53H	60H-73H	00H-13H	20H-33H
		COM40- COM52	60H-73H	00H-13H	20H-33H	40H-53H

### **CGRAM Address Map**

Table 6 Relationship between Character Code in Character Display Mode (GR = SPR = 0) and **CGRAM Address** 

,											
Character		"0000"	"0001"	"0002"	"0003"	"0004"	"0005"	"0006"	"0007"	"8000"	"0009"
CGRAM Address	080 083 083 083 084 085 085	000–00B	00C-017	018–023	024 <b>–</b> 02F	030-03B	03C-047	048–053	054-05F	060-06B	06C-077
	DB0 DB1 DB2 DB3 DB4	100–10B	10C-117	118–123	124–12F	130-13B	13C-147	148–153	154–15F	160–16B	16C-177
Character		"0010"	"0011"	"0012"	"0013"	"0014"	"0015"	"0016"	"0017"	"0018"	"0019"
	DB5 DB6 DB7	100-10B	10C-117	118–123	124–12F	130-13B	13C-147	148–153	154-15F	160-16B	16C-177
CGRAM Address	DB0 DB1 DB2 DB3 DB4 DB5 DB6 DB7	200–20B	20C-217	218–223	224-22F	230–23B	23C-247	248–253	254–25F	260-26B	26C-277
	DB0 DB1	300-30B	30C-317	318–323	324-32F	330-33B	33C-347	348–353	354-35F	360-36B	36C-377
Character		"1000"	"1001"	"1002"	"1003"	"1004"	"1005"	"1006"	"1007"	"1008"	"1009"
CGRAM	DB2 DB3 DB4 DB5 DB5 DB6 DB7	300-30B	30C-317	318–323	324-32F	330-33B	33C-347	348–353	354-35F	360-36B	36C-377
Address	DB0 DB1 DB2 DB3 DB4 DB5 DB6	400–40B	40C-417	418–423	424–42F	430–43B	43C-447	448–453	454–45F	460–46B	46C-477
Character	Code	"1010"	"1011"	"1012"	"1013"	"1014"	"1015"	"1016"	"1017"	"1018"	"1019"
	DB7	400–40B	40C-417	418–423	424–42F	430-43B	43C-447	448-453	454–45F	460–46B	46C-477
CGRAM Address	DB0 DB1 DB2 DB3 DB4 DB5 DB5	500-50B	50C-517	518–523	524–52F	530-53B	53C-547	548–553	554–55F	560-56B	56C-577
	DB0 DB1 DB2 DB3	600–60B	60C-617	618–623	624–62F	630-63B	63C-647	648–653	654–65F	660-66B	66C-677

Notes: 1. In the character display mode (GR = SPR = 0), RM1/0 = 10 is set and CGRAM is used.

<sup>2.</sup> In the character display mode (GR = SPR = 0), the CGRAM font pattern is displayed using character codes set to the DDRAM as per the above table. In the graphics display mode (GR = 1 and SPR = 0) or super-imposed mode (SPR = 1), the CGRAM data is displayed irrespective of the DDRAM set data (character code).

<sup>(</sup>character code).

3. The least significant bit (LSB) of the write data is displayed on the first line.

4. The 13th raster-row is the cursor position and its display is formed by a logical OR with the cursor.

5. A set bit in CGRAM data 1 corresponds to display selection (lit) and 0 to non-selection (unlit).

Table 7 Relationship between Display Position and CGRAM Address in Graphics Display Mode (GR = 1, SPR = 0) and Super-imposed Display Mode (SPR = 1)

			1							_	_													_	/
	egment river	SEG1/120	SEG2/119	SEG3/118	SEG4/117	SEG5/116	SEG6/115	SEG7/114	SEG8/113	SEG9/112	SEG10/111	SEG11/110	SEG12/109	SEG13/108	SEG14/107	SEG15/106	SEG16/105	EG17/104	111	SEG116/5	SEG117/4	SEG118/3	SEG119/2	SEG120/1	Segment
g	000 0	000		002		<u> </u>		006	-	-	-	00A		000				<u>0</u>	111	_	-				2 0011111011
Address	SGS=0	UUL	100	002	003	004	000	000	007	UUG	UUS	1004	000	000	UUL	UUE	יטטר	010	""	073	074	0/5	076	077	(HEX)
Ad	SGS=1	077	076	075	074	073	072	071	070	06F	06E	06E	060	06E	06A	069	068	067	•••	004	003	002	001	000	
L	DB0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	111	0	0	1	0	0	COM1
l	DB1	0	1	1				1	7	1	7	1	1	1	1			0	111	0	П	1	0	0	COM2
	DB2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	111	0	0	П	0	0	СОМЗ
	DB3	0	0	0	1	1	1	1	1	1	1	1	1	1		0	0	0	111	0	0		0	0	COM4
	DB4	0	0	0	1	0	0	0	0		0	0	0	0	1	0	0	0	111	0	0	T	0	0	COM5
	DB5	0	0	0	1	0	0	0	0		0	0	0	0	1	0	0	0	111	0	0	T	0	0	СОМ6
	DB6	0	0	0	1	1		1	1	1	1	7	1	1	1	0	0	0	111	0	П	•	1	0	COM7
	DB7	0	0	0	1	0	0	0	0	1	0	0	0	0	7	0	0	0	111	0	0	0	0	0	COM8
ess	SGS=0	100	101	102	103	104	105	106	107	108	109	10A	10E	100	100	10E	10F	110	111	173	174	175	176	177	
Address	SGS=1	177	176					-	_	16F		160		16B		_				104	103	102	101	100	(HEX)
1																									
1	DB0-																								COM9-
	DB7																						====		COM16
Address	SGS=0	200	201	202	203	204	205	206	207	208	209	20A	20B	200	20C	20E	20F	210	111	273	274	275	276	277	
B	SGS=1	277	276	275	274	273	272	271	270	26F	26E	26E	260	26B	26A	269	268	267	111	204	203	202	201	200	(HEX)
	DD0	:																							COM17-
	DB0- DB7		}																						COM17-
92																									
Address	SGS=0	300	301	302	303	304		306			309	30A	30E	30C	300	30E	30F	310	111	3/3	374	375	37€	377	(HEX)
Ağ	SGS=1	377	376	375	374	373	372	371	370	36F	36E	36E	36C	36E	36A	369	368	367	111	304	303	302	301	300	(1.2.1)
	DB0-																								COM25-
	DB7																								COM32
SS	SGS=0	400	401	400	402	404	406	406	407	400	400	404	400	400	400	405	405	410	101	473	474	475	476	477	
Address		_	$\vdash$			_		Н				$\vdash$							171						(HEX)
δ	SGS=1	477	476	4/5	474	473	472	471	4/0	46H	46L	46L	46C	46 <b>E</b>	46A	469	468	467	111	404	403	402	401	400	
	DB0-																								COM33-
	DB7								===														====		COM40
SS	SGS=0	500	501	502	503	504	505	506	507	508	509	50A	50B	50C	500	50E	50F	510		573	574	575	576	577	
Address	SGS=1	577	576					$\vdash$				$\vdash$			$\overline{}$							$\vdash$	501		(HEX)
ă			374	573	3,	3,4	572	57			JUL	302	300			303	300	307		307	300	302			
	DB0-																								COM41-
L.	DB7	====	===									====													COM48
ddress	SGS=0	600	601	602	603	604	605	606	607	608	609	60A	60E	60C	60D	60E	60F	610	•••	673	674	675	676	677	41510
ddr	SGS=1	677	676	675	674	673	672	671	670	66F	66E	66E	660	66E	66A	669	668	667	=	604	603	602	601	600	(HEX)
_a_	DB0	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	111	0/1	0/1	0/1	0/1	0/1	COM49
ļ	DB1	0/1									0/1	<u> </u>			0/1				111	0/1					COM50
	DB2	0/1				0/1													111	0/1	0/1				COM51
·	DB3		0/1					+				h							111				0/1		COM52
ш	550	U/ 1	. 0/11	U) 11	U/ 11	U/ /I	J/ 11	U/ //	J/ 11		U/ 1	. 3/ 1	U/ 11	U/ 11	U/ 10	U) 11	- O7 11	U/ 11		. 0/ 10	. U/ II	. 0/ 1	. 0/ 1	U/ 1	30,4102

Notes: 1. When the RM1/0 bit is set to "10", the CGRAM can be selected.
2. In the graphics display mode (GR = 1 and SPR = 0) and super-imposed display mode (SPR = 1), the CGRAM data is displayed irrespective of the DDRAM set data.
3. Writing to the upper four bits (DB4–DB7) in CGRAM addresses 600H–677H is invalid.
4. A set bit in CGRAM 1 corresponds to display selection (lit) and 0 to non-selection (unlit).

### **SEGRAM Address Map**

Table 8 Relationship between SEGRAM Address and Screen Display Position

1	egment iver	SEG1/120	SEG2/119	SEG3/118	SEG4/117	SEG5/116	SEG6/115	SEG7/114	SEG8/113	SEG9/112	SEG10/111	SEG11/110	SEG12/109	SEG13/108	SEG14/107	SEG15/106	SEG16/105	SEG17/104	 SEG116/5	SEG117/4	SEG118/3	SEG119/2	SEG120/1	Segment
Address	SGS=0	000	001	002	003	004	005	006	007	008	009	00A	00B	00C	00D	00E	00F	010	 073	074	075	076	077	a IEV
Add	SGS=1	077	076	075	074	073	072	071	070	06F	06E	06D	06C	06E	06A	069	068	067	 004	003	002	001	000	(HEX)
	DB0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	 *	*	*	*	*	
	DB1	*	*	*	*	*	*	*	*	/le	) / O	امنا	are	20)	*	*	*	*	 *	*	*	*	*	
	DB2	*	*	*	*	*	*	*	*	(11	IVa	ıııu	an	<del>z</del> a,	*	*	*	*	 *	*	*	*	*	
	DB3	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	 *	*	*	*	*	
	DB4	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	 0/1	0/1	0/1	0/1	0/1	COMS1
Ĺ	DB5	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	 0/1	0/1	0/1	0/1	0/1	COMST
	DB6	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	 0/1	0/1	0/1	0/1	0/1	COMEO
	DB7	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	 0/1	0/1	0/1	0/1	0/1	COMS2

Notes: 1. When the RM1/0 bit is set to "11", the SEGRAM can be selected.

2. Writing to the lower four bits (DB0–DB3) in the SEGRAM is invalid.

3. The segment output that can be controlled by grayscale is enabled for only the 40 segments (table 9).

These grayscale-controlled segments are driven by the same grayscale data at COMS1 and COMS2 selection.

4. Other outputs than the grayscale-controlled segment outputs can control segment on/off and blinking. The COMS1 and COMS2 outputs are independently controlled.

Table 9 Relationship between Segment Driver Output Pin and Segment Display Function

When SGS = 0	When SGS = 1	Remarks
SEG1/120, SEG4/117, SEG7/114, SEG10/111, SEG13/108, SEG10/111, SEG13/108, SEG16/105, SEG19/102, SEG22/99, SEG25/96, SEG28/93, SEG31/90, SEG34/87, SEG37/84, SEG40/81, SEG43/78, SEG46/75, SEG49/72, SEG52/69, SEG55/66, SEG58/63, SEG61/60, SEG64/57, SEG67/54, SEG70/51, SEG73/48, SEG76/45, SEG79/42, SEG82/39, SEG85/36, SEG88/33, SEG91/30, SEG94/27, SEG97/24, SEG100/21, SEG103/18, SEG106/15, SEG109/12, SEG112/9, SEG115/6, SEG118/3	SEG120/1, SEG117/4, SEG114/7, SEG111/10, SEG108/13, SEG105/16, SEG102/19, SEG99/22, SEG96/25, SEG93/28, SEG90/31, SEG87/34, SEG84/37, SEG81/40, SEG78/43, SEG75/46, SEG72/49, SEG69/52, SEG66/55, SEG63/58, SEG60/61, SEG57/64, SEG51/70, SEG42/79, SEG33/88, SEG30/91, SEG37/94, SEG33/88, SEG30/91, SEG27/94, SEG24/97, SEG21/100, SEG18/103, SEG15/106, SEG12/109, SEG9/112, SEG6/115, SEG3/118	The COMS1 and COMS2 outputs are controlled by the same grayscale.  Total: 40 segments
Output pins other than above	Output pins other than above	The COMS1 and COMS2 outputs are independently controlled.
		Total: 80 x 2 = 160 segments

Table 10 Relationship between SEGRAM Data and Grayscale-Controlled Segment Display

#### **SEGRAM Data**

DB7	DB6	DB5	DB4	Effective Applied Voltage for COMS1 and COMS2 Output
0	0	0	0	0 (Always unlit)
0	0	0	1	1 (Always lit)
0	0	1	0	0.34 (Grayscale display)
0	0	1	1	0.38 (Grayscale display)
0	1	0	0	0.41 (Grayscale display)
0	1	0	1	0.44 (Grayscale display)
0	1	1	0	0.47 (Grayscale display)
0	1	1	1	0.50 (Grayscale display)
1	0	0	0	(Blink display)*
1	0	0	1	0.53 (Grayscale display)
1	0	1	0	0.56 (Grayscale display)
1	0	1	1	0.59 (Grayscale display)
1	1	0	0	0.63 (Grayscale display)
1	1	0	1	0.66 (Grayscale display)
1	1	1	0	0.69 (Grayscale display)
1	1	1	1	0.72 (Grayscale display)

Notes: 1. For details, see the Reflective Color Mark/Blink Mark Display section.

Table 11 Relationship between SEGRAM Data and Blinking Segment Display (1)

#### **SEGRAM Data**

DB5	DB4	LCD Display Control for COMS1 Segment	
0	0	Always unlit	_
0	1	Always lit	
1	0	Blinking display (32-frame unit)	_
1	1	Double-speed blinking display (16-frame unit)	_

<sup>2.</sup> Blinking is provided by repeatedly turning on the segment for 32 frames and turning it off for the next 32 frames.

Table 12 Relationship between SEGRAM Data and Blinking Segment Display (2)

### **SEGRAM Data**

DB7	DB6	LCD Display Control for COMS2 Segment	
0	0	Always unlit	_
0	1	Always lit	
1	0	Blinking display (32-frame unit)	_
1	1	Double-speed blinking display (16-frame unit)	

Table 13 HD66732 Full-size Character Codes and JIS Codes (Level-1, Non-kanji)

Character																	
Code	JIS Code	0	1	2	3	4	5	6	7	8	9	Α	_	С	D	E	F
000	(300)				CGRA									99			M
001	[301]		707	_	CGRA				145	- AA	`**	/// 葵	////	<u> </u>	////	握	777
002	302	÷Ω	亜	<b>唖</b> 岩	蛙鰺	阿梓	<b>京</b> 圧	愛斡	挨扱	始宛	逢姐	虻	飴	穐絢	悪綾	鮨	遅或
003	303 304	規 粟	葦袷	安	庵	按	暗	案	闇	鞍	杏	以	伊	位	依	偉	囲
005	305	夷	委	威	尉	惟	意	慰	易	椅	為	畏	異	移	維	- 緯	胃
006	306	娄	衣	謂	違	遺	医	非	亥	域	育	郝	磯		壱	溢	逸
007	307	稲	茨	芋	鰯	允	印	咽	Î	因	- 姻	· 引	飲	淫	胤	蔭	~=
- 007	- 00.	0	1	2	3	4	5	6	7	8	9	A	В	C	D	E	F
008	[310]				3	•	-		<u>'</u>								
009	[311]										-						
00A	312		院	陰	隠	韻	时	右	宇	烏	羽	迁	兩	4h	鷨	窥	IŁ
00B	313	碓	Ð	渦	嘘	唄	欝	蔚	鰻	姥	厩	浦	瓜	開	嗾	云	運
00C	314	雲	荏	餌	叡	営	嫳	影	映	曳	栄	永	泳	洩	瑛	盈	穎
0 0 D	315	顈	英	南	詠	鋭	液	疫	益	駅	悦	謁	越	閲	榎	厭	円
00E	316	園	堰	奄	宴	延	怨	掩	援	俗	演	炎	焔	煙	燕	猿	緑
00F	317	薨	苑	薗	遠	鉛	駕	壇	於	汚	甥	ाम	央	奥	往	IŪ.	
		0	1	2	3	4	5	6	7	8	9	Α	В	С	D	Е	F
010	[320]	ļ					ļ			<b></b>		<b> </b>		μ			
011	[321]										يند	P.	- 344	<u></u>	>-		
012	322		押峪	HE.	横	欧	段	王	翁知	襖	鴬	鸥	黄立	岡下	沖ル	荻	(億)
013	323 324	屋	値	脆	植加	牡可	乙嘉	<b>俺</b>	卸嫁	恩家	温寒	科	音暇	平果	化架	仮歌	何河
014	324	<b>伽</b>	珂	佳	禾	稼	簡		一节	-	一一一一一	華	菓	蝦	課	哔	貨
016	325	迦	過	霞	蚊	俄	(戦	-15	牙	画	队	芽	蝦	賀	雅	餓	駕
017	327	介	会	解	回	塊	壊	廻	快	怪	悔	恢	懐	戒	拐	改	-,***
	<u> </u>	0	1	2	3	4	5	6	7	8	9		В	C	D	E	F
018	(330)	Ü		-		-		Ň		Ŭ		É		Ŭ.	Ň	<u> </u>	
019	[331]		•	-				-								•	
01A	332	00000000	魁	晦	械	海	灰	界	皆	絵	芥	蟹	開	階	貝	凱	劾
0 1 B	333	外	咳	害	崖	慨	概	涯	碍	垄	街	該	鎧	骸	浬	馨	蛙
01C	334	垣	杮	蛎	鈎	劃	嚇	各	鄭	拡	撹	格	核	殼	獲	確	穫
01 D	335	覚	角	赫	較	郭	閣	隔	革	学	岳	楽	額	顎	掛	笠	樫
01E	336	櫃	梶	鳅	潟	割	喝	. 恰	括	活	渇	滑	葛	褐	輪	且	鰹
01F	337	叶	椛	樺	鞄	株	兜	竃	浦	釜	鎌	噛	鴨	栢	茅	査	
N1000000000000000000000000000000000000	***************************************	0	1	2	3	4	5	6	7	8	9	A	В	С	D	E	F
020	[340]											<b>!</b>		ļ	٠	<b>!</b>	
021	[341] 342		粥	세	苅	瓦	乾	侃	冠	寒	刊	勘	勧	巻	唤	堪	姦
022	343	完	官	寛	干	幹	患	感	慣	憾	換	敢	柑	植	棺	- 款	歓
024	344	汗	英	一潤	潅	環	甘	18.	看	竿	管	簡	緩	宙	翰	肝	艦
025	345	莞	観	諫	貫	還	鑑	間	開	関	Fia	韓	館	舘	丸	含	岸
026	346	厳	玩	癌	眼	岩	翫	贋	雁	頑	願	願	企	伎	危	喜	器
027	347	基	奇	嬉	寄	岐	希	幾	忌	揮	机	旗	既	期	棋	棄	
		0	1	2	3	4	5	6	7	8	9	Α	В	С	D	E	F
028	[350]																
029	[351]																
0 2 A	352	ļ	機	帰	毅	気	汽	畿	祈	季	稀	紀	徽	規	記	貴	起
02B	353	軌	輝	飢	騎	鬼	龟	偽	後数	妓士	宜	戯	技	擬	欺	<b>様</b>	疑
02C	354	祇	義却	蟻客	加加	議虐	掬逆	新丘	鞠	古仇	<u>吃</u>	型及	桔吸	橋宮	詰弓	<u>砧</u> 急	- 杵- 救
02 D 02 E	355 356	参	求	汲	泣	灸	球	究	育	笈	級	糾	給	B	牛	去	居
02E	357	旨	拒	拠	学	楽	虚	許	距	鋸	漁	禦	魚	亨	享	京	
<u> </u>	<del>  ```</del>	0	115	2	3	4	5	6	7	8	: 9	A	В	C	D	E	F
030	[360]	ľ	-	É	,	4	, ,		<u>'</u>	Ů	,		Ь	<u> </u>	<u> </u>	<u> </u>	,
031	[361]	<b>!</b>	•	•	•	<b>!</b>	•	t	<b>†</b>	†	<b>†</b>	<b>†</b>	<b></b>	<b> </b>			<b>***</b>
032	362	t	供	侠	僑	兇	競	共	凶	協	E	舞	매	喬	境	峡	強
	363	暹	怯	恐	恭	挟	教	橋	況	Æ.	狭	緍	胸	翰	興	蕎	緷
033		鏡	響	饗	鷙	仰	凝	尭	晩	業	局	曲	極	玉	桐	粁	僅
033	364		₩.	巾	錦	斤	欣	欽	琴	禁	鶬	筋	緊	芹	南	衿	襟
034 035	365	勤	均		吟	銀	九	俱	句	. <u> </u>	狗	玖	矩	苦	躯	駆	. 駈
034 035 036	365 366	勤謹	近	金	+			偶	裏	選	隅	串	櫛	釧	一層	屈	
034 035	365	勤謹駒	近具	愚	虞	喰	空	+		_		1			-	+	
034 035 036 037	365 366 367	勤謹	近	-	+	喰 4	空 5	6	7	8	9	Α	В	С	D	E	F
034 035 036 037	365 366 367	勤謹駒	近具	愚	虞	+	+	+		8	9	Α	В	С	-	+	F
034 035 036 037	365 366 367 [370] [371]	勤謹駒	近 具 1	思 2	3	4	5	6	7						D	E	
034 035 036 037 038 039	365 366 367 [370] [371] 372	勤謹駒 0	近 具 1	愚 2 箱	· 異 3 音	4 #1t	5	6 建	7	限	条	栗	繰	桑	D 鍬	E 勲	君
034 035 036 037 038 039 03A 03B	365 366 367 [370] [371] 372 373	勤 謹 駒 0	近具 1 掘割	思 2 箱群	<b>虞</b> 3	4 靴 郡	5 轡	6 建 架	1 熊祁	限係	桑傾	栗刑	繰兄	桑啓	D	敷珠	君型
034 035 036 037 038 039 03A 03B 03C	365 366 367 [376] [371] 372 373 374	勤謹駒 0 薫契	近具 1 掘割形	思 2 箱 群 径	<b>冀</b> 3	4 靴 郡 慶	5 <b>曹</b> 卦 慧	全 架 憩	1 熊 祁 掲	<b>限係携</b>	条傾敬	栗刑景	繰兄桂	桑啓渓	D 数 重	E 勲珪稽	君型系
034 035 036 037 038 039 03A 03B 03C 03D	365 366 367 [370] [371] 372 373 374 375	勤謹駒 0 薫契経	近具 1 掘割形継	思 2 箱群径繁	g 3 香軍惠	4 靴 郡 <u>聚</u> 茎	5 替卦慧荊	6 建製憩蛍	7 熊 祁 掲 計	<b>限係携詣</b>	条傾敬警	栗刑景軽	繰兄桂頚	桑啓渓鶏	D	E 勲珪稽迎	君型系鯨
034 035 036 037 038 039 03A 03B 03C	365 366 367 [376] [371] 372 373 374	勤謹駒 0 薫契	近具 1 掘割形	思 2 箱 群 径	<b>冀</b> 3	4 靴 郡 慶	5 <b>曹</b> 卦 慧	全 架 憩	1 熊 祁 掲	<b>限係携</b>	条傾敬	栗刑景	繰兄桂	桑啓渓	D 数 重	E 勲珪稽	君型系

No CGROMs (Cannot be used as CGROMs.) No CGROMs

\* [XXX]: Not allocated to JIS codes. (Do not correspond to JIS codes.) Can be used as CGROMs.

\* The following JIS codes cannot be used: (They overlap with the character codes for non-kanji JIS codes 2120–287F.)

Unavailable JIS codes (non-kanji: 2920-2F7F):

- 2920–297F
- 2A20-2A7F
- 2B20-2B7F 2C20-2C7F
- 2D20–2D7F
- 2E20-2E7F
- 2F20–2F7F

Character	<u> </u>	Γ									••••						
Code	JIS Code	0	1	2	3	4	5	6	7	8	9	A	В	С	D	E	F
040	282	H	Ė	Ť	F	<u> </u>	Ľ	L	Ė	Ť	Ť	+ +	Ť	Ť	Ť	F	<u> </u>
041	283	7	L	F	T	1	ㅗ	+	F	-	Ŧ	工	İ÷	<b> </b>	T	≒ं	亡主
042	382		検	権	牽	犬	献	研	砚	制	県	肩	見	謙	賢	軒	造
043	383	鍵	険	顕	験	鹸	元	原	厳	幻	弦	減	源	玄	現	核	舷
044	384	言	諺	限	F	個	占	呼	固	姑	孤	己	庫	弧	Fi	故	枯
045	385	湖	狐	楜	袴	股	胡	菰	虎	誇	跨	鈷	雇	顧	鼓	五	Э.
046	386	伍	午	呉	吾	娯	後	御	悟	梧	檎	瑚	基	新	誤	護	풺
047	387	乞	鯉	交	校	侯	候	倖	光	公	功	効	勾	厚		向	(199)
<u> </u>							_			_				_		<del></del>	_
040	040	0		2	3	4	5	6	7	. 8	9	A	<u>B</u>	c	Ď	E	F
048	212	_	-	-	<u> </u>	**	-	٠.	-	;-	?	!			ļ		۰,
049	213	_			<b>⊢</b> `				· *	<u>소</u>	A.	1			<del>-</del>	-	4
04A	392		后	喉	坑	垢	好	- FL	孝	宏	工	巧	巷	幸	広	庚	康
04B	393	弘	恒	慌	抗	拘	控	攻	昂	晃	更	杭	校	. 梗	_構_	江	洪
04C	394	浩	港	溝	甲	皇	硬	稿	糠	紅	粒	紋	網	耕	考	肯	肱
04D	395	腔	膏	航	荒	行	衡	講	貢	購	郊	酵	鉱	砿	. 鋼	閣	降
04E	396	項	香	高	鴻	剛	劫	붕	合	壕	拷	濠	豪	轟	麹	克	刻
04F	397	告	国	榖	酷	鵠	黒	獄	漣	腰	紙	忽	惚	骨	狮	- 込	
		0	1	2	3	4	5	6	7	8	9	Α	В	С	D	Е	F
050	222		•			Δ	•	$\nabla$	•	*	₹	-	-	1	Ţ	=	
051	223				-	!	<del></del>	t	:	-		€	∍	Ė	ì	_	5
052	3A2		此	頃	今	困	坤	墾	婚	恨	懇	昏	昆	根	梱	混	痕
053	3A3	紺	艮	魂	些	佐	叉	唆	嵯	左	差	査	沙	瑳	砂	詐	鎖
054	3A4	裟	坐	座	挫	債	催	再	最	裁	塞	妻	宰	彩	1	採	栽
055	3A5	歳	済	災	- 采	犀	· 辞	呰	祭	斎	細	菜	裁	載	際	剤	在
056	3A6	材	罪	財	- <del>X</del>	坂	阪	堺	榊	看	咲	崎	埼	碕	賞	作	削
057	3A7	昨	搾	昨	朔	榾	窄	兼	索	錯	桜	鮭	笹	匙	HH	161	na
H	O/II						<u> </u>		_			_					_
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058	232																
059	233	0	_1_	2	3	4	5	6	7	8	9						
05A	3B2	L	察	拶	撮	擦	札	殺	薩	雑	皐	鯖	捌	錆	蛟	Ш	H/G
05B	3B3	Ξ	<b>傘</b>	参	山	惨	撤	散	栈	燦	珊	産	算	纂	蚕	讃	贅
05C	3B4	酸	餐	斬	暫	残	仕	fF	伺	使	刺	司	史		四	士	始
05D	3B5	姉	姿	子	屍	市	師	志	思	指	支	孜	斯	施	. 旨	枝	止
05E	3B6	死	氏	獅	祉	私	糸	紙	紫	肢	脂	至	視	詞	詩	試	誌
05F	3B7	諸	資	賜	雌	飼	歯	事	似	侍	児	字	寺	慈	<u>持</u>	時	
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060	242		ð	あ	Į,	4,	'n	う	ż	え	ħ	お	か	が	ð	ð.	<
061	243	<b>(*</b>	17	17	2	2	*	<u>خ</u>	L	じ	す	ず	반	ぜ	そ	ぞ	た
062	3C2		次	襚	冶	爾	里	痔	磁	示	而	耳	自	蒔	辞	汐	鹿
063	3C3	式	識	鳴	<b>*</b>	軸	失	华	七	叱	執	失	嫉	室	悉	湿	漆
064	3C4	疾	質	実	蔀	篠	偲	柴	芝	屡	蕊	縞	舎	写	射	捨	赦
065	3C5	斜	煮	社	紗	者	謝	車	遮	蛇	邪	借	勺	尺	杓	灼	爵
066	3C6	17)	釈	錫	若	寂	弱	惹	主	取	守	手	朱	殊	狩	珠	種
067	3C7	腫	趣	酒	首	儒	受	呪	寿	授	樹	綬	雷	囚	収	周	
		0	1	2	3	4	. 5	6	7	8	9	A	В	С	D	E	F
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069	252	4	7	*	- 1	7	+	#	シ	ッ	*		セ	ガゼ	7	ナソ	ク タ
06A	3D2	⊢ <u>~</u>	宗	就	- <del></del>	修	愁	拾	洲		ス 秋	終				_	
06B	3D2 3D3	衆	乗	響	蹴	輯	週	首		秀			繍	習	臭	舟	蒐
		_	滑		_				E37	集	放金	什 iba	住	充	+	従	火
06C	3D4	柔出	術	法	獣後	縦峻	垂春	銃	叔	夙	宿略	淑	视	縮	粛	塾	熟
06D	3D5 3D6	単		述			遊		竣	舜処	駿	准	循	旬	楯	殉	淳
06E			凋	盾	純	巡		醇	順		初	所如	暑	曙	渚	庶	緒
06F	3D7	署	青	薯	請	諸	助	叙	女		徐	恕	鋤	除	傷	償	
		0	1	2	3	4	5	6	7	8	9	Α	В	С	D	E	F
070	262		A	В	Г	Δ	E	Z	H.	Θ	1	К	Λ	М	N	Ξ	0
071	263	П	P	Σ	Т	Τ	Φ	Х	Ψ	Ω		]					
072	3E2		勝	丘	升	召	哨	商	唱	甞	奨	妾	娼	宵	将	小	少
073	3E3	尚	庄	床	廠	彰	承	抄	招	掌	捷	昇	昌	昭	晶	松	梢
074	3E4	樟	樵	沼	消	涉	湘	焼	焦	照	症	省	硝	礁	祥	称	章
	3E5	笑	粧	絽	肖	菖	蒋	蕉	衝	裳	訟	ãЕ	詔	詳	象	賞	醬
075		錘	鑂	鐘	障	鞘	E	丈	丞	乗	冗	剰	城	場	壌	嬢	常
	3E6	<b>78.</b>		条	杖	浄	状	豊	穣	蒸	譲	酸	錠	嘱	埴	飾	
075		情	擾	*				_			9					_	F
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Character Code	JIS Code	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
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080	284	Ť			Ť	<u> </u>		_			Ť			-	_	_	÷
081	285		İ														
082	402	L	意.	摺	寸	世	瀬	畝	是	凄	制	勢	姓	征	性	成	政
083	403	整	星	晴	棲	栖	Œ	清	推	生	盛	精	聖	声	製	西	誠
084	404	誓	請	逝	醒	青	静	. 斉	税	. 颱	隻	席	借	威	斥	昔	析
085 086	405 406	石窃	静	籍説	續雪	<b>脊</b>	責	- 赤_	跡仙	. <u></u> 費	碩工	切上	出 宣	接專	摂尖	折用	設
087	407	扇扇	撰	栓	梅		一造	. 一姓	染	<u>先</u>	手煎	<u>-</u> 占	旋	穿	新	線	戦
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089	215	1	1	<del>"</del>	>	~	>	├ <u>┌</u>	J	Г	i	Ì	Í	+		±	×
08A	412		繊	羨	腺	舛	船	薦	詮	賎	践	選	遷	銭	銑	閃	鲜
08B	413	前	善	漸	然	全	禅	繕	膳	糎	噌	塑	岨	措	曾	曾	楚
08C	414	狙	妓	疎	磫	祖	租	粗	素	組	蘇	訴	爼	遡	鼠	僧	創
08D	415	双	叢	倉	喪	壮	奏	爽	宋	層	匝	惣	想	捜	掃	挿	掻
08E	416 417	操草	早 荘	曹	巣	槍藻	槽装	漕	燥	争	痩	相	窓	糟	総	粽	聡
001	417	_				-		走	送	遭	鎗	霜	験	像	増	憎	_
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090	225	$\exists$	- '			-				_			· ·		→	⇔.	∀
092	422	H	験	蔵	贈	造	促	倒	則	即	息	捉	東	測		速	俗
093	423	属	賊	族	続	卒	袖	其	揃	存	孫	尊	損	村	遥	他	多
094	424	太	汰	詑	崜	堕	妥	惰	打	柁	舵	楕	陀	駄	騨	体	堆
095	425	対	耐	岱	帯	待	怠	態	戴	替	泰	滞	胎	腿	苔	袋	貸
096	426	退	逮	隊	黛	劉	代	台	大	第	醍	題	鷹	滝	徹	卓	啄
097	427	宅	托	_択	拓	沢	濯	琢	託	鐸	濁	諾	茸	胍	蛸	只	
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098	234	-	A	В	С	D	E	F	G	H	I	J	K	L	M	N	0
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09A	432	丹	単	嘆	達坦	- 長 - 担	<u>奪</u>	脱旦	数	淡	湛	棚炭	短	狸	鳕	梅	雅
09C	434	胆	蛋	誕	鍛	団	壇	弾	断	暖	檀	段.	男	談	値	知	地
09D	435	弛	恥	智	池	痴	稚	置	致	蜘	遅	馳	築	畜	竹	筑	蓄
09E	436	vz:	-74														
	700	逐	<b>* 秩</b>	窒	茶	嫡	着	中	仲	宙	忠	抽	昼	柱	注	虫	衷
09F	437	註	科	多	駐	嫡樗	希	中猪	仲	宙著	忠	抽丁	<b>昼</b>	相	建喋	鬼	农
09F		註 0	酎	鋳 2				猪		$\rightarrow$	貯 9		兆 B		· — -		表 F
0 A 0	437 <b>244</b>	註 0 だ	耐 1 ち	鋳 2 ち	駐 3 っ	樗 4	務 5 づ	猪 6 て	学 7 で	著 8 と	貯 9 ど	丁 A	兆 B に	凋 C ぬ	喋 D	離 E の	Fは
0 A 0 0 A 1	244 245	註 0	耐 1 ち ぱ	鋳 2 ぢ ひ	駐 3 っ び	樗 4 つび	務 5 づふ	猪 6 て ぶ	学 7 で ぶ	著 8 と へ	貯 9 どべ	丁 A な	兆 B に ほ	凋 C ぬ ほ	喋 D ねぱ	離 E の ま	F は み
0 A 0 0 A 1 0 A 2	244 245 442	註 0 だ ば	耐 1 ち ば 帖	鋳 2 ぢ ひ 帳	駐 3 っ び 庁	樗 4 つ ぴ 弔	<b>務</b> 5 づ ふ 張	猪 6 て ぶ 彫	学 7 で お 数	著8とへ数	貯 9 どべ挑	丁 A なべ暢	兆 B にほ朝	周 C ぬ ほ 潮	喋 D ね ほ 様	離 E の ま 町	F はみ 眺
0 A 0 0 A 1 0 A 2 0 A 3	244 245 442 443	註のだば、聴	耐 1 ちば 帖 脹	鋳2ぢひ帳腸	駐3っぴ庁蝶	樗 4 つ ぴ 弔 調	務 5 づふ張課	猪のなが影超	学 7 で お 数 跳	著 8 とへ 懲続	貯 9 どべ挑長	丁 A なべ暢頂	兆 B に ほ 朝 鳥	周にぬける刺動	喋Dねぽ牒捗	離しのま町直	Fはみ眺朕
0 A 0 0 A 1 0 A 2 0 A 3 0 A 4	244 245 442 443 444	註のだば聴沈	酎 1 ちば帖脹珍	鋳2ぢひ帳腸賃	駐3っぴ庁蝶鎮	樗4つび弔調陳	豨 5 づふ張課津	猪6てぶ彫超墜	学 7 で ぶ 数 跳 椎	著8とへ懲嫌槌	貯9どべ挑長追	丁Aなべ暢頂鎚	兆 Bにほ朝鳥痛	周 C ぬぼ潮勅通	喋Dねば牒捗塚	離Eのま町直栂	Fはみ眺影掴
0 A 0 0 A 1 0 A 2 0 A 3	244 245 442 443	註のだば、聴	耐 1 ちば 帖 脹	鋳2ぢひ帳腸	駐3っぴ庁蝶	樗 4 つ ぴ 弔 調	務 5 づふ張課	猪のなが影超	学 7 で お 数 跳	著 8 とへ 懲続	貯 9 どべ挑長	丁 A なべ暢頂	兆 B に ほ 朝 鳥	周にぬける刺動	喋Dねぽ牒捗	離しのま町直	Fはみ眺朕
0 A 0 0 A 1 0 A 2 0 A 3 0 A 4 0 A 5	244 245 442 443 444 445	註のだば聴沈槻	酎 1 ちば帖脹珍佃	鋳2ぢひ帳腸賃漬	駐3っぴ庁蝶鎮柘	樗 4 つび 弔調 陳 辻	瀦 5 づふ張課津蔦	猪 6 てぶ 彫 超 墜 級	学 7 でぶ 散跳 椎鍔	著8とへ懲続槌椿	貯9どべ挑長追潰	丁Aなべ暢頂鎚坪	兆 Bにほ朝鳥痛壷	周 C ぬぼ潮勅通嬌	喋Dねば牒捗塚紬	龍Eのま町直栂爪	Fはみ眺联掴吊
0 A 0 0 A 1 0 A 2 0 A 3 0 A 4 0 A 5 0 A 6	244 245 442 443 444 445 446	註のだば、聴沈槻釣	酎 1 ちば帖脹珍価鶴	鋳2ぢひ帳腸賃潰亭	駐3っぴ庁蝶鎮柘低	樗4つび弔調陳辻停	瀦 5 づふ張課津蔦偵	猪 6 てぶ 彫 超 墜 級 剃	学 7 でぶ 散跳 椎 鍔 貞	著8とへ懲銭槌椿呈	貯 9 どべ挑長追潰堤	丁Aなべ暢頂鎚坪定	兆 Bにほ朝鳥痛壷帝	凋Cぬは潮勅通嬬底	喋Dねぽ牒捗塚紬庭	離Eのま町直梅爪廷	Fはみ眺联掴吊
0 A 0 0 A 1 0 A 2 0 A 3 0 A 4 0 A 5 0 A 6 0 A 7	244 245 442 443 444 445 446	註のだば、聴沈槻釣俤	酎 1 ちば帖脹珍価鶴抵 1 チ	鋳2ぢひ帳腸賃漬亭挺	駐3つび庁蝶鎮柘低提3ッ	樗 4つび弔調陳辻停梯 4ッ	務 5 づふ張課津蔦偵汀	猪 6 てぶ 彫超墜級剃碇 6 テ	学 7 で ぶ 散跳 椎 鍔 貞 禎	著8とへ懲就槌椿呈程8ト	野 9 どべ挑長追潰堤締 9 ド	丁Aなべ暢頂鏡坪定艇	兆 Bにほ朝鳥痛壷帝訂	凋 Cぬぼ潮勅通嬬底諦 Cヌ	喋Dねば牒捗塚紬庭蹄	龍Eのま町直梅爪廷逓	Fはみ眺联掴吊弟
0 A 0 0 A 1 0 A 2 0 A 3 0 A 4 0 A 5 0 A 6 0 A 7	244 245 442 443 444 445 446 447	註のだば聴沈槻釣悌の	酎 1 ちば帖脹珍価鶴抵 1 チバ	鋳 2 ぢひ帳腸賃渍亭挺 2 ヂヒ	駐3つび庁蝶鎮柘低提3ッピ	樗 4 つび 弔調 陳辻 停梯 4 ッピ	務 5 づふ張課津蔦偵汀 5 ツァ	猪 6 てぶ 彫 超墜級 剃碇 6 テブ	学 7でぶ 散跳推舞貞禎 7デブ	著8とへ懲銭槌椿呈程8トへ	野 9 どべ挑長追潰堤締 9 ドベ	丁Aなべ暢頂鏡坪定艇 Aナベ	兆 Bにほ朝鳥痛壷帝訂 Bニホ	凋 C ぬぼ潮勅通嬌底諦 C ヌボ	喋 Dねば 牒捗塚紬庭路 Dネボ	龍Eのま町直栂爪廷逓Eノマ	Fはみ眺联掴吊弟 Fハミ
0 A 0 0 A 1 0 A 2 0 A 3 0 A 4 0 A 5 0 A 6 0 A 7	244 245 442 443 444 445 446 447 254 255	註のだば、聴沈機釣俤のダバ	酎 1ちば帖脹珍価鶴抵 1チバ郎	鋳 2 ぢひ帳腸賃渍亭挺 2 ヂヒ鄭	駐3つび庁蝶鎮柘低提3ッピ釘	樗 4つび弔調陳辻停梯 4ッビ鼎	発 5 づふ張課津蔦偵汀 5 ツァ泥	猪 6 てぶ彫超墜綴剃碇 6 テブ摘	学 7でぶ 散跳推鍔貞禎 7 デブ擢	著8とへ懲銭槌椿呈程8トへ敵	貯9どべ挑長追潰堤締9ドベ滴	丁 A なべ暢頂鏡坪定艇 A ナベ的	兆 Bにほ朝鳥痛壷帝訂 Bニホ笛	凋 C ぬぼ潮勅通嬌底諦 C ヌボ適	喋 Dねば 際捗塚紬庭路 Dネボ鏑	龍Eのま町直栂爪廷逓Eノマ湯	Fはみ眺朕掴吊弟 Fハミ哲
0 A 0 0 A 1 0 A 2 0 A 3 0 A 4 0 A 5 0 A 6 0 A 7	244 245 442 443 444 445 446 447 254 255 452	註のだば、聴沈槻釣俤のダバー徹	酎1ちば帖脹珍価銭抵1チバ邸撤	鋳 2 5 ひ帳腸賃漬亭挺 2 デヒ鄭轍	駐3つび庁蝶鎮柘低提3ッピ釘迭	樗 4つび弔調陳辻停梯 4ッビ鼎鉄	務 5 づふ張霖津蔦偵汀 5 ツフ泥典	猪6てぶ彫超墜級剃碇6テブ摘填	学 7 でぶ 散跳椎 鍔貞禎 7 デブ擢天	著8とへ懲嫌槌椿呈程8トへ敵展	貯9どべ挑長追潰堤締9ドベ滴店	丁Aなべ暢頂雞坪定艇Aナベ的添	兆 Bにほ朝鳥痛壷帝訂 Bニホ笛纏	凋 C ぬは 潮勅通嬌底 諦 C ヌボ 適甜	喋 Dねば朦捗塚紬庭路 Dネポ鏑貼	龍Eのま町直梅爪廷逓Eノマ湯転	Fはみ眺联掴吊弟 Fハミ哲顔
0 A 0 0 A 1 0 A 2 0 A 3 0 A 4 0 A 5 0 A 6 0 A 7	244 245 442 443 444 445 446 447 255 452 453 454	註のだば聴沈槻釣悌のダバー徹点	財15ば帖脹珍価鶴抵1チバ邪撤伝	鋳25ひ帳腸賃漬亭挺2デヒ鄭轍殿	駐3つび庁蝶鎮柘低提3ッピ釘迭澱	樗4つび弔調陳辻停梯4ッビ鼎鉄田	務 5 つふ張霖津蔦偵汀 5 ツァ泥典電	猪6てぶ彫超墜級剃碇6テブ摘填兎	学 7 でぶ 散跳 椎 鍔 貞禎 7 デブ 擢 天 吐	著8とへ懲銭槌椿呈程8トへ敵	貯9どべ挑長追潰堤締9ドベ滴店塗	丁Aなべ暢頂鏡坪定艇Aナベ的添妬	兆 Bにほ朝鳥痛壷帝訂 Bニホ笛纏屠	凋 C ぬぼ潮勅通嬌底諦 C ヌボ適甜徒	喋 Dねば 牒抄 塚紬庭路 Dネポ鏑貼斗	龍田のま町直梅爪廷港田ノマ湯転社	Fはみ眺朕掴吊弟 Fハミ哲顔渡
0 A 0 0 A 1 0 A 2 0 A 3 0 A 4 0 A 5 0 A 6 0 A 7	244 245 442 443 444 445 446 447 254 255 452	註のだば、聴沈槻釣俤のダバー徹	酎1ちば帖脹珍価銭抵1チバ邸撤	鋳 2 5 ひ帳腸賃漬亭挺 2 デヒ鄭轍	駐3つび庁蝶鎮柘低提3ッピ釘迭	樗 4つび弔調陳辻停梯 4ッビ鼎鉄	務 5 づふ張霖津蔦偵汀 5 ツフ泥典	猪6てぶ彫超墜級剃碇6テブ摘填	学 7 でぶ 散跳椎 鍔貞禎 7 デブ擢天	著8とへ懲続槌椿呈程8トへ敵展堵	貯9どべ挑長追潰堤締9ドベ滴店	丁Aなべ暢頂雞坪定艇Aナベ的添	兆 Bにほ朝鳥痛壷帝訂 Bニホ笛纏	凋 C ぬは 潮勅通嬌底 諦 C ヌボ 適甜	喋 Dねば朦捗塚紬庭路 Dネポ鏑貼	龍Eのま町直梅爪廷逓Eノマ湯転	Fはみ眺联掴吊弟 Fハミ哲顔
0 A 0 0 A 1 0 A 2 0 A 3 0 A 4 0 A 5 0 A 6 0 A 7	244 245 442 443 444 445 446 447 254 255 452 453 454 455	註 0 だば 聴沈槻釣俤 0 ダバ 徹点登	財15ば帖脹珍価鶴抵1チバ邸撤伝莬	鋳2ちひ帳腸賃液亭挺2ヂヒ鄭轍殿賭	駐3つび庁蝶鎮柘低提3ッピ釘迭殿途	樗4つび弔調陳辻停梯4ッビ鼎鉄田都	瀦 5 づふ張課津蔦偵汀 5 ツフ泥典電鍍	猪 6 てぶ 彫超墜級 剃碇 6 テブ摘填兎砥	学 7 でぶ 散跳椎 鍔貞禎 7 デブ 擢天 吐 砺	著8とへ聚鉄槌椿呈程8トへ敵展堵努	貯りどべ挑長追潰堤締りドベ滴店除度	丁Aなべ暢頂鏡坪定艇Aナベ的添妬土	兆 Bにほ朝鳥痛壷帝訂 Bニホ笛纏屠奴	凋 C ぬぼ潮勅通孀底諦 C ヌボ適甜徒怒	喋 Dねば 牒 捗 塚 釉 庭 蹄 D ネ ボ 鏑 貼 斗 倒	龍 Eのま町直梅爪廷逓 Eノマ溺転杜党	Fはみ眺朕掴吊弟 Fハミ竹頭渡冬
0 A 0 0 A 1 0 A 2 0 A 3 0 A 4 0 A 5 0 A 6 0 A 7 0 A 8 0 A 9 0 A A 0 A B 0 A C 0 A D	244 245 442 443 444 445 446 447 254 255 452 453 454 455 456	註のだば聴沈槻釣悌のダバー徹点登凍	酎 1 ちば 帖脹珍価鶴抵 1 チパ 耶撒伝 菟刀	鋳 2 ちひ帳腸賃漬亭挺 2 デヒ鄭轍殿賭唐	駐3つび庁蝶鎮柘低提3ッピ釘迭殿途塔	樗4つび弔調陳辻停梯4ッビ鼎鉄田都塘	瀦 5 づふ張霖津嶌偵汀 5 ソフ泥典電鍍套	猪 6 てぶ彫超墜級剃碇 6 テブ摘填兎砥宕	学 7でぶ 後跳椎鍔貞禎 7 アブ擢天吐砺島	著8とへ懲練槌椿呈程8トへ敵展堵努嶋	貯 9 どべ挑長追潰堤締 9 ドベ滴店塗度惇	TAなべ暢頂鏡坪定艇 Aナベ的添妬土投	兆 Bにほ朝鳥痛壷帝訂 Bニホ笛纏屠奴搭	凋 Cぬは潮勅通孀底諦 Cヌボ適甜徒怒東	喋 Dねば朦拶塚紬庭路 Dネポ鏑貼斗倒桃	離Eのま町直梅爪廷遜 Eノマ溺転杜党梼	Fはみ眺朕掴吊弟 Fハミ竹頭渡冬
0 A 0 0 A 1 0 A 2 0 A 3 0 A 4 0 A 5 0 A 6 0 A 7 0 A 8 0 A 9 0 A A 0 A B 0 A C 0 A D 0 A F	244 245 442 443 444 445 446 447 254 255 452 453 454 455 456 457	註のだば聴沈機釣悌のダバ 徹点登凍盗	酎 1 ちば帖脹珍価鶴抵 1 チバ邸撤伝莵刀海	鋳2ちひ帳腸賃漬亭挺2ヂヒ鄭轍殿賭唐湯	駐3つび庁蝶鎮柘低提3ッピ釘迭殿途塔涛	樗4つび弔調陳辻停梯4ッビ鼎鉄田都塘灯	務 5 づふ張課津嶌偵汀 5 ツフ泥典電鍍套燈	猪6てぶ彫超墜級剃碇6テブ摘填兎砥宕当	学 7 でぶ 散跳椎 鍔貞禎 7 デブ擢天吐 砺島痘	著8とへ懲続槌椿呈程8トへ敵展堵努嶋祷	貯9どべ挑長追潰堤締9ドベ滴店除度悼等	TAなべ暢頂鏡坪定艇 Aナベ的添妬土投答	兆 Bにほ朝鳥痛霊帝訂 Bニホ笛纏屠奴搭筒	凋 Cぬは潮勅通嬌底諦 Cヌボ適甜徒怒東糖	喋 Dねば 農捗 塚紬 庭路 Dネポ 鏑貼斗倒桃統	離 Eのま町直梅爪廷逓 Eノマ湯転杜党棒到	Fはみ眺 展 III A III
0 A 0 0 A 1 0 A 2 0 A 3 0 A 4 0 A 5 0 A 6 0 A 7 0 A 8 0 A 9 0 A A 0 0 A B 0 A C 0 A D 0 A E 0 A F	244 245 442 443 444 445 446 447 254 255 452 453 454 455 456 457	註のだば聴沈機釣悌のダバ 徹点登凍盗	耐 1 ちば帖脹珍価鶴抵 1 チバ邸撤伝蒐刀淘 1 a e	鋳 2 5 ひ帳腸賃漬亭挺 2 ヂヒ鄭轍殿賭唐湯 2 β σ	駐3つび庁蝶鎮柘低提3ッピ釘法殿途塔涛3ヶヶ	<ul><li>樗4つび弔調陳辻停梯4ッビ鼎鉄田都塘灯4 â。</li></ul>	第5づふ張霖津蔦偵汀 5ツフ泥典電鍍套燈 5 € €	猪 6 てぶ 彫超墜級剃碇 6 テブ摘填兎砥宕当 6 な と	学 7 でぶ 酸跳椎 鍔貞禎 7 デブ擢天吐 砺島痘 7 7 %	著8とへ懲続槌椿呈程8トへ敵展堵努嶋祷8のω	貯 9 どべ挑長追潰堤締 9 ドベ滴店檢度悼等 9 、	丁Aなべ暢頂雞坪定艇Aナベ的添妬土投答A。	兆 Bにほ朝烏痛壷帝訂 Bニホ笛纏屠奴搭筒 B A	周 C ぬぼ潮動通嬌底諦 C ヌボ適甜徒怒東糖 C μ	喋 Dねば 農捗 塚紬 庭路 Dネポ 鏑貼斗倒桃統 D ×	離 Eのま町直梅爪延逓 Eノマ湯転杜党梼到 E ξ	Fはみ眺联掴吊弟 Fハミ哲顔渡冬棟 F。
0 A 0 0 A 1 0 A 2 0 A 3 0 A 4 0 A 5 0 A 6 0 A 7 0 A 8 0 A 9 0 A A 0 0 A B 0 A C 0 A D 0 A E 0 B 0 0 B 1 0 B 2	244 245 442 443 444 445 446 447 255 452 453 454 455 456 457 264 265 462	註のだば聴沈槻釣俤のダバー徹点登凍盗の	耐 1 ちば帖脹珍価鶴抵 1 チバ邸撤伝苑刀淘 1 α ℓ董	鋳 2 ちひ帳腸賃漬亭挺 2 ヂヒ鄭轍殿賭唐湯 2 β π 蕎	駐3つび庁蝶鎮柘低提3ッピ釘法殿途塔涛3ヶで藤	<ul><li>樗4つび弔調陳辻停梯4ッビ鼎鉄田都塘灯46ッ計</li></ul>	務 5 つふ張澤津蔦偵汀 5 ツフ泥典電鍍套燈 5 c 4 謄	猪 6 てぶ 彫超墜級 剃碇 6 テブ 摘填 兎 砥 宕 当 6 な 又豆	学 7でぶ 飯跳椎鍔貞禎 7 デブ擢天吐砺鳥痘 7 カダ路	著8とへ懲続槌椿呈程8トへ敵展堵努嶋祷8の必逃	貯 9 どべ挑長追潰堤締 9 ドベ滴店兼度悼等 9 、 透	丁 A なべ暢頂雞坪定艇 A ナベ的添妬土投答 A と 鐙	兆 Bにほ朝鳥痛壷帝訂 Bニホ笛纏屠奴搭筒 B A 陶	周 C ぬほ潮勅通嬌底諦 C ヌボ適甜徒怒東糖 C μ 頭	喋 Dねば 環帯 塚紬 庭路 Dネポ 鏑貼斗倒桃統 D× 騰	離 目のま町直梅爪廷遜 目ノマ湯転杜党棒到 目 ミ 闘	Fはみ眺联掴吊弟 Fハミ哲顔渡冬棟 F。 働
0 A 0 0 A 1 0 A 2 0 A 3 0 A 4 0 A 5 0 A 6 0 A 7 0 A 8 0 A 9 0 A A 0 A B 0 A C 0 A D 0 A E 0 A F	244 245 442 443 444 445 447 254 452 453 454 455 456 457 264 265 463	註のだば、聴沈機動像のダバー徹点登凍盗の	財 1 ちば帖脹珍価銭抵 1 チバ邸撤伝莬刀海 1 α c 薫同	鋳 2 ちひ帳腸賃漬亭挺 2 ヂヒ鄭轍殿賭唐湯 2 β α 蕩堂	駐3つび庁蝶鎮柘低提3ッピ釘迭殿途塔涛3アで藤導	<ul><li>樗4つび弔調陳辻停梯4ッビ鼎鉄田都塘灯460討憧</li></ul>	第5つふ張澤津蔦偵汀 5ツフ泥典電鍍套燈 5 。	猪 6 てぶ 彫超墜級剃碇 6 テブ摘填兎砥宕当 6 で 2 豆屑	学 7でぶ 飯跳椎鍔貞禎 7 デブ擢天吐 砺鳥痘 7 り 必踏瞳	著8とへ懲鈍槌椿呈程8トへ敵展堵努嶋椿80m逃童	貯 9 どべ挑長追潰堤締 9 ドベ滴店塗度悼等 9 ィ 透胴	丁Aなべ暢頂鎚坪定艇 Aナベ的添妬土投答A を	兆 Bにほ朝鳥痛霊帝訂 Bニホ笛纏屠奴搭筒 B λ 陶道	周 C ぬぼ 潮勅通孀底諦 C スポ適甜徒怒東糖 C 〃 頭銅	喋 Dねば 牒 捗 塚紬庭路 Dネポ鏑貼斗倒桃統 D × 臍峠	龍 目のま町直梅爪廷基 目ノマ湯転杜党権到 目を 闘鴇	Fはみ眺联掴吊弟 Fハミ哲頭渡冬棟 F。 働匿
0 A 0 0 A 1 0 A 2 0 A 3 0 A 4 0 A 5 0 A 6 0 A 7 0 A 8 0 A 9 0 A A 0 A B 0 A C 0 A D 0 A F 0 B 0 0 B 1 0 B 3 0 B 3	244 245 442 443 444 445 446 447 254 453 454 455 456 457 264 265 463 464	註のだば聴沈機動像のダバー機点登凍盗の 動得	附 1 ちば帖脹珍価鶴抵 1 チバ邸撤伝莵刀海 1 α c 董同徳	鋳 2 ちひ帳腸賃漬亭挺 2 デヒ鄭轍殿賭唐湯 2 β α 蕩堂涜	駐3つび庁蝶鎮柘低提3ッピ釘迭殿途塔涛3ヶで藤尊特	<ul><li>樗4つび弔調陳辻停梯4ッビ鼎鉄田都塘灯4 â。計憧督</li></ul>	務 5 づふ張霖津蔦偵汀 5 ツフ泥典電鍍套燈 5 ・4 謄朣禿	猪 6 てぶ 彫超墜級剃碇 6 テブ摘填兎砥宕当 6 と 2 豆屑篤	学 7でぶ 酸跳椎鍔貞禎 7 デフ擢天吐砺島痘 7 リシ路瞳毒	著8とへ懲続槌椿呈程8トへ敵展堵努嶋祷8の必逃童独	貯 9 どべ挑長追濱堤締 9 ドベ滴店塗度悼等 9 ィ 透胴読	丁Aなべ暢頂雞坪定艇 Aナベ的添妬土投答A κ 鐘萄栃	兆 Bにほ朝鳥痛霊帝訂 Bニホ笛纏屠奴搭筒 B A 陶道橡	周 C ぬぼ 潮勅通嬌底諦 C ヌボ適甜徒怒東糖 C 〃 頭銅凸	喋 Dねば 牒 捗 塚 釉 庭路 Dネポ 鏑貼斗 倒桃 統 D × 騰 峠 突	離 Eのま町直梅爪廷選 Eノマ湯転杜党棒到 E々 闘鴇椴	Fはみ眺联掴吊弟 Fハミ哲頭渡冬棟 F。 働匿届
0 A 0 0 A 1 0 A 2 0 A 3 0 A 4 0 A 5 0 A 6 0 A 7 0 A 8 0 A 9 0 A A 0 A B 0 A C 0 A D 0 A E 0 A F	244 245 442 443 444 445 447 254 452 453 454 455 456 457 264 265 463	註 0 だば 聴沈槻釣俤 0 ダバ 徹点登凍盗 0 の動得意	財 1 ちば帖脹珍価銭抵 1 チバ邸撤伝莬刀海 1 α c 薫同	鋳 2 ちひ帳腸賃漬亭挺 2 ヂヒ鄭轍殿賭唐湯 2 β α 蕩堂	駐 3つび庁蝶鎮柘低提 3ッピ釘迭殿途塔涛 3ァェ藤尊特酉	<ul><li>樗4つび弔調陳辻停梯4ッビ鼎鉄田都塘灯460討憧</li></ul>	第5つふ張澤津蔦偵汀 5ツフ泥典電鍍套燈 5 。	猪 6 てぶ彫超墜級剃碇 6 テブ摘填兎砥宕当 6 な 2 豆洞篤屯	学 7でぶ 酸跳椎鍔貞禎 7 デブ擢天吐砺島痘 7 7 少路瞳毒惇	著8とへ懲鈍槌格呈程8トへ敵展堵穷嶋梅8のの逃童独敦	貯 9 どべ挑長追潰堤締 9 ドベ滴店塗度悼等 9 ィ 透胴	丁Aなべ暢頂雞坪定艇 Aナベ的添妬土投答 Ac 鐘萄栃豚	兆 Bにほ朝烏痛壷帝訂 Bニホ笛纏屠奴搭筒 B A 陶道橡透	周 C ぬば潮勅通嬌底諦 C ヌボ適甜徒怒東糖 C μ 頭銅凸頓	喋 Dねば 牒 捗 塚紬庭路 Dネポ鏑貼斗倒桃統 D × 臍峠	離 Eのま町直梅爪廷選 Eノマ湯転杜党棒到 E ε 闘鴇椴曇	Fはみ眺 展 掴 吊弟 Fハミ哲 顔渡冬棟 F。 働 匿 届 鈍
0 A 0 0 A 1 0 A 2 0 A 3 0 A 4 0 A 5 0 A 6 0 A 7 0 A 8 0 A 9 0 A A 0 0 A B 0 A C 0 A D 0 A E 0 A F 0 B 0 0 B 1 0 B 2 0 B 3 0 B 4 0 B 5	244 245 442 443 444 445 446 447 254 255 452 453 454 455 456 457 264 265 462 463 464 465	註のだば聴沈機動像のダバー機点登凍盗の 動得	財 1 ちば帖脹珍価銭抵 1 チバ邸撤伝莬刀淘 1 α c 薫同徳苫	鋳 2 ちひ帳腸賃漬亭挺 2 戸ヒ鄭轍殿賭唐湯 2 β π 蕭堂売寅	駐3つび庁蝶鎮柘低提3ッピ釘迭殿途塔涛3ヶで藤尊特	<ul><li>樗4つび弔調陳辻停梯4ッビ鼎鉄田都塘灯40,計憧督瀞</li></ul>	務 5 づふ張霖津嶌偵汀 5 ツフ泥典電鍍套燈 5 c 4 階 撞禿順	猪 6 てぶ 彫超墜級剃碇 6 テブ摘填兎砥宕当 6 と 2 豆屑篤	学 7でぶ 酸跳椎鍔貞禎 7 デフ擢天吐砺島痘 7 リシ路瞳毒	著8とへ懲続槌椿呈程8トへ敵展堵努嶋祷8の必逃童独	貯 9 どべ挑長追潰堤締 9 ドベ滴店塗度悼等 9 ・ 透胴読沌	丁Aなべ暢頂雞坪定艇 Aナベ的添妬土投答A κ 鐘萄栃	兆 Bにほ朝鳥痛霊帝訂 Bニホ笛纏屠奴搭筒 B A 陶道橡	周 C ぬぼ 潮勅通嬌底諦 C ヌボ適甜徒怒東糖 C 〃 頭銅凸	喋 Dねば 摩渉塚紬 庭路 Dネボ鏑貼斗倒桃統 Dュ 膳峠突吞	離 Eのま町直梅爪廷選 Eノマ湯転杜党棒到 E々 闘鴇椴	Fはみ眺联掴吊弟 Fハミ哲頭渡冬棟 F。 働匿届
0 A 0 0 A 1 0 A 2 0 A 3 0 A 4 0 A 5 0 A 6 0 A 7 0 A 8 0 A 9 0 A A 0 0 A D 0 A C 0 A D 0 A E 0 B 1 0 B 2 0 B 3 0 B 4 0 B 5 0 B 6	244 245 442 443 444 445 446 447 255 452 453 454 455 456 457 264 265 462 463 464 465 466	註 0 だば 聴沈機釣俤 0 ダバ 徹点登凍盗 0 エ 動得應奈	計 1 ちば帖脹珍価鶴抵 1 チバ邸撤伝莬刀淘 1 α e 薫同徳苫那	鋳 2 ぢひ帳腸賃漬亭挺 2 ヂヒ鄭轍殿賭唐湯 2 βα 萬堂浣寅内	駐 3つび庁蝶鎮柘低提 3ッピ釘迭殿途塔涛 3ァェ藤尊特酉	樗 4つび弔調陳辻停梯 4ッビ鼎鉄田都塘灯 4 6 0 討憧督瀞凪	務 5 づふ張霖津嶌偵汀 5 ツフ泥典電鏡套燈 5 。 4 謄撞禿順薙	猪 6 てぶ 彫 超 墜 級 剃 碇 6 テブ 摘 填 兎 砥 宕 当 6 ζ 又 豆 洞 篤 屯 謎	学 7 でぶ 散跳椎鍔貞禎 7 デブ擢天吐砺島痘 7 9 必路職毒惇灘	著8とへ懲鈍槌棒呈程8トへ敵展堵努嶋祷8の3逃童独敦捺	貯 9 どべ挑長追潰堤締 9 ドベ滴店徐度慎等 9 ・ 透胴読池鍋	丁Aなべ暢頂錐坪定艇Aナベ的添妬土投答A を 鐙菊栃豚楢	兆 Bにほ朝烏痛壷帝訂 Bニホ笛纏屠奴搭筒 B A 陶道橡道馴	周 C & は 潮動通嬌底諦 C ヌ ボ 適甜徒怒 東糖 C 〃 頭鍋凸頓縄	喋 Dねば 際抄塚袖庭路 Dネポ鏑貼斗倒桃統 D z 勝峠突吞啜	龍 Eのま町直栂爪廷逓 Eノマ湯転杜党棒到 Eミ 闘鴇椴曇南	Fはみ眺 展 掴 吊弟 Fハミ哲 顔渡冬棟 F。 働 匿 届 鈍
0 A 0 0 A 1 0 A 2 0 A 3 0 A 4 0 A 5 0 A 6 0 A 7 0 A 8 0 A 9 0 A A 0 0 A D 0 A C 0 A D 0 A E 0 B 1 0 B 2 0 B 3 0 B 4 0 B 5 0 B 6	244 245 442 443 444 445 446 447 255 452 453 454 455 456 457 264 265 462 463 464 465 466	註 0 だば 聴沈槻釣悌 0 ダバ 徹点登凍盗 0 * 動得應奈秋	酎 1 ちば帖脹珍価鶴抵 1 チバ邸撤伝莬刀淘 1 g ℓ 薫同徳苫那難	鋳 2 ぢひ帳腸賃漬亭挺 2 ヂヒ鄭轍殿賭唐湯 2 βα	駐3つび庁繁鎮柘低提3ッピ釘迭殿途塔涛3ヶヶ藤等特酉乍二	樗 4つび弔調陳辻停棒 4ツビ鼎鉄田都塘灯 4 6 。討憧督瀞凪尼	第5つふ張霖津蔦偵汀5ツフ泥典電鍍套燈5。 e 謄鐘禿噸薙弐	猪 6 てぶ 彫 超 墜 級 剃 碇 6 テブ 摘 填 兎 砥 石 当 6 で え豆 洞 篤 屯 謎 迩	学 7 でぶ 散跳椎鍔貞禎 7 デブ擢天吐砺島痘 7 カダ路瞳毒惇灘匂	著8とへ懲鈍槌棒呈程8トへ敵展堵努嶋棒80m逃童独敦捺賑	貯 9 どべ挑長追潰堤締 9 ドベ滴店塗度悼等 9 、 透胴読花鍋肉	丁Aなべ暢頂鏡坪定艇 Aナベ的添妬土投答A κ 鐙菊栃豚楢虹	兆 Bにほ朝鳥痛壺帝訂 Bニホ笛纏屠奴搭筒 B A 陶道橡透馴廿	周 C & は 潮動通嬌底諦 C ヌ ボ 適甜徒怒 東糖 C 〃 頭銅凸頓縄日	喋 Dねば 康 抄 塚 釉 庭 路 D ネ ボ 鏑 貼 斗 倒 桃 統 D × 騰 峠 突 吞 暖 乳	龍 Eのま町直栂爪廷逓 Eノマ湯転杜党棒到 Eミ 闘鴇椴曇南入	Fはみ眺联掴吊弟 Fハミ哲頭渡冬棟 F。 働匿届鈍楠
0 A 0 0 A 1 0 A 2 0 A 3 0 A 4 0 A 5 0 A 6 0 A 7 0 A 8 0 A 9 0 A A 0 A B 0 A C 0 A D 0 A E 0 A F 0 B 0 0 B 1 0 B 2 0 B 3 0 B 4 0 B 5 0 B 6 0 B 7	244 245 442 443 444 445 446 447 255 452 453 454 455 456 457 264 265 462 463 464 465 466 467	註 0 だば 聴沈機釣俤 0 ダバ 徹点登凍盗 0 エ 動得意奈軟 0	計   1   5   は 帖 脹珍 価 鶴 抵   1 + パ 郎 撤 伝 莬 刀 海   1   * e 薫 同 徳 苫 那 難   1   9   a	鋳 2 50 0 帳腸賃漬亭挺 2 デヒ鄭轍殿賭唐湯 2 β n 萬堂売寅内次 2 6	駐3つび庁蝶鎮柘低提3ッピ釘法殿途塔涛3アで腰導特酉乍二3	樗 4つび弔調陳辻停梯 4ツビ鼎鉄田都塘灯 4 6 の討憧督瀞凪尼 4 г	第5づふ張霖津鳥偵汀 5ツフ泥典電鍍套燈 5。 4階 撞禿順薙弐 5	猪 6 てぶ 彫超墜級 剃碇 6 テフ 摘填 兎 砥 宕 当 6 で 又豆 洞 篤 屯 謎 迩 6 e	学 7 でぶ 酸跳椎鍔貞禎 7 デブ擢天吐 砺鳥痘 7 7 少路瞳毒惇灘匂 7	著8とへ懲続槌椿呈程8トへ敵展堵努嶋祷8の3逃童独敦捺賑8 *	貯 9 どべ挑長追潰堤締 9 ドベ滴店塗度障等 9 ・ 透胴読池鍋肉 9 。	丁Aなべ暢頂雞坪定艇Aナベ的添妬土投答A を 鐙菊栃豚楢虹A …	兆 Bにほ朝烏痛壷帝訂 Bニホ笛纏屠奴搭筒 B A 陶道橡透馴廿 B n	周 C ぬぼ潮勅通孀底諦 C スポ適甜徒怒東糖 C 〃 頭銅凸順縄日 C ĸ	喋 Dねば 康 抄 塚 釉 庭 路 D ネ ボ 鏑 貼 斗 倒 桃 統 D × 騰 峠 突 吞 暖 乳	龍 Eのま町直栂爪廷逓 Eノマ湯転杜党棒到 Eミ 闘鴇椴曇南入	Fはみ眺 展 相 日
0 A 0 0 A 1 0 A 2 0 A 3 0 A 4 0 A 5 0 A 6 0 A 7 0 A 8 0 A 9 0 A A 0 0 A D 0 A C 0 A D 0 A E 0 A F 0 B 0 0 B 1 0 B 2 0 B 3 0 B 4 0 B 5 0 B 6 0 B 7	244 245 442 443 444 445 446 447 255 452 453 454 455 456 457 264 265 462 463 464 465 465 466 467 274 275 472	註 0 だば 聴沈機的俤 0 ダバ 徹点登凍盗 0 エ 動得意奈敷 0 円	耐 1 ちば帖脹珍価額抵 1 チパ郎撤伝苑刀淘 1 α ℓ 産同徳苫那難 1 Я a 如	鋳 2 5 ひ 帳腸賃 漬亭挺 2 チヒ鄭 轍殿 賭唐湯 2 β α 蕎堂浣寅内次 2 6 尿	駐 3 つび庁蝶鎮柘低提 3 ッピ釘法設途塔涛 3 ソ で藤尊特酉年二 3 B韮	樗 4つび 中調陳辻 停梯 4 ツビ 鼎鉄田 都 増灯 4 8 0 計 憧 督 瀞 凪 尼 4 任	第5つふ張霖津嶌偵汀 5ツフ泥典電鍍套燈 5 € ∮騰撞禿噸華弐 5 4妊	猪 6 てぶ 彫超墜級 剃碇 6 テブ 摘填 兎 砥 宕 当 6 で え豆 洞篤 屯 謎 迩 6 ・ 忍	学 7でぶ 酸跳椎鍔貞禎 7 デブ擢天吐砺島痘 7 7 夕踏職毒惇羅匂 7 ・ さ認	著8とへ懲続槌椿呈程8トへ敵展堵努暢待8の3逃童独敦捺賑8 米満	貯 9 どべ挑長追潰堤締 9 ドベ滴店塗度悼等 9 、 透胴読池鍋肉 9 3 禰	丁 A なべ暢頂雞坪定艇 A ナベ的添妬土投答 A ε 鐙菊栃豚楢虹 A ニ袮	兆 Bにほ朝鳥痛壷帝訂 Bニホ笛纏屠奴搭筒 B A 陶道橡透馴廿 B 市家	周 C ぬぼ潮勅通孀底締 C x ボ適甜徒怒東糖 C μ 頭銅凸頓縄目 C κ 葱	喋 D ねぼ 歴 抄 塚 釉 庭 路 D ネ ボ 鏑 貼 斗 倒 桃 統 D レ 勝 峠 突 吞 暖 乳 D ヵ 猫	離 Eのま町直栂爪延逓 Eノマ湯転社党権到 E钅 闘鴇撥曇南入 E M熱	Fはみ眺 展 日
0A0 0A1 0A2 0A3 0A4 0A5 0A6 0A7 0A8 0A9 0AA 0AB 0AC 0AD 0AE 0AF 0B0 0B1 0B2 0B3 0B4 0B5 0B6 0B7	244 245 442 443 444 445 446 447 254 452 453 454 455 456 457 264 265 463 464 465 467 274 275 473	註 0 だば 聴沈槻釣俤 0 ダバ 徹点登凍盗 0 * 動得意奈軒 0 Ю	时 1 ちば帖脹珍価鶴抵 1 チバ邸撤伝莬刀淘 1 α ℓ 薫同徳苫那難 1 Я а 如捻	鋳 2 5 ひ帳腸賃漬亭挺 2 ギヒ鄭轍殿賭唐湯 2 β π 萬堂売寅内汝 2 6 尿燃	駐3つび庁蝶鎮柘低提3ッピ釘迭殿途塔涛3ヶヶ藤導特酉乍二3 B 並然	樗 4つび弔調陳辻停梯 4ッピ鼎鉄田都塘灯 4 8 0 討憧督瀞風尼 4 「任粘	第5づふ張霖津嶌偵汀5ツフ泥典電鍍套燈5、4階撞禿噸薙弐5 ユ妊乃	猪 6 てぶ 彫超 墜級 刺碇 6 テブ摘填 兎砥 宕当 6 と 2 豆 洞篤 屯 謎 迩 6 。 忍 廼	学 7 でぶ 散跳椎鍔貞禎 7 デブ擢天吐砺鳥痘 7 カル路瞳毒惇灘句 7 と認之	著8とへ懲縄槌格呈程8トへ敵展堵努嶋梅8の3逃童独敦捺賑8 米満埜	貯 9 どべ挑長追潰堤締 9 ドベ滴店徐度悼等 9 ・ 透胴読池鍋肉 9 ・3 禰嚢	丁 A なべ暢頂鏡坪定艇 A ナベ的添妬土投答 A を 鐙菊栃豚楢虹 A ニ袮悩	兆 Bにほ朝鳥痛壺帝訂 Bニホ笛纏屠奴搭筒 B A 胸道橡透馴廿 B n 家 湊	凋 C ぬぼ潮動通孀底諦 C ヌボ適甜徒怒東糖 C μ 頭銅凸頓縄日 C κ葱納	喋 D ねば 摩 歩 塚 釉 庭 路 D ネ ボ 鏑 貼 斗 倒 桃 統 D レ 勝 峠 突 吞 暖 乳 D の 猫 能	離 Eのま町直梅爪延遜 Eノマ溺転杜党棒到 E钅 闘鴇椴曇南入 E M熱脳	Fはみ眺联掴吊弟 Fハミ哲・頻波冬棟 F。 働医届鈍楠 F H年膿
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OEC	4D4	誉	輿	預	储	幼	妖	容	庸	揚	揺	摊	曜	楊	様	洋	溶
0ED	4D5	熔	角	38	羊	耀	葉	蓉	要	謡	踊	遙	陽	養	絃	抑	欲
OEE	4D6	沃	浴	32	翼	淀	羅	螺	裸	来	莱	頼	雷	洛	絡	落	酪
0EF	4D7	乱	卵	嵐	欄	<u>*</u>	藍	蘭	覧	利	更	履	李	梨	理	璃	
		0	1	2	3	4	5	6	7	8	9	· A	В	c	D	E	F
0F0	266	<u> </u>			-		Ť	Ť	Ė	اتا	-			<u> </u>		_	
	267	—·												-			
0 F 1		-:	痢	裏	裡	里	離	陸	律	率	立	葎	掠	略	劉	流	溜
0F1 0F2	4E2			硫	粒	隆	竜	龍	侶	慮	旅	虜	了	亮	僚	阿	凌
0 F 2		拼	THE I		涼	猟	療	瞭	稜	糧	良	諒	遼	量	陵	領	一方
	4E2 4E3 4E4	琉寮	留料	梁			燐	琳	12	輪	<b>P</b>	鳞	麟	增	显	涙	累
0F2 0F3	4E3	寮	料	楽厘	林	淋				玲	礼	苓			_		麗
0F2 0F3 0F4	4E3 4E4		料偷			淋冷	励	嶺	1166				₹17	44	25	99	
0F2 0F3 0F4 0F5 0F6	4E3 4E4 4E5	寮緑類	料倫令	厘伶	林例	冷	Fish	嶺裂	廉	_	_		<b>鈴</b>	練	零練	霊聯	BE
0F2 0F3 0F4 0F5	4E3 4E4 4E5 4E6	寮緑類齢	料倫令曆	厘份歷	林例	冷劣	励烈	裂	廉	恋	憐	漣	煉	簾	練	聯	
0F2 0F3 0F4 0F5 0F6 0F7	4E3 4E4 4E5 4E6 4E7	寮緑類齢の	料倫令曆1	厘 伶 歷 2	林 例 列 3	冷 劣 4	励 烈 5	裂 6	廉 7	恋 8	<b>憐</b> 9	漣 A	煉 B	簾 C	練 D	聯 E	F
0F2 0F3 0F4 0F5 0F6 0F7	4E3 4E4 4E5 4E6 4E7	寮 緑 類 齢 0 o	料 倫 令 暦 1	厘份歷	林例	冷劣	励烈	裂	廉	恋	憐	漣	煉	簾	練	聯	
0F2 0F3 0F4 0F5 0F6 0F7	4E3 4E4 4E5 4E6 4E7 276 277	寮緑類齢の	料 倫 令 暦 1 π	厘 伶 歷 2 p	林 例 列 3	冷 劣 4	励 烈 5 y	裂 6 中	康 7 x	恋 8 u	<b>憐</b> 9	連 A ···	煉 B III	廉 C b	練 D	聯 E b	F 9
0F2 0F3 0F4 0F5 0F6 0F7 0F8 0F9 0FA	4E3 4E4 4E5 4E6 4E7 276 277 4F2	寮 緑 類 齢 0 0	料倫令暦 1 π я 連	厘 伶 歴 2 p	林 例 3 c 鍊	冷 劣 4 T 呂	励 烈 5 y	裂 6 Φ 槽	廉 7 x 炸i	恋 8 u 略	憐 9 4 路	連 A III	煉 B III	廉 C b	練 D B	聯 E b	F 9
0F2 0F3 0F4 0F5 0F6 0F7	4E3 4E4 4E5 4E6 4E7 276 277 4F2 4F3	寮線類 齢 0 0 枚	料倫令暦 1 π я 連 概	厘 倫 歴 2 り 連浪	林 例 3 c 鍊漏	帝 <b>4</b> <sup>1</sup> 日 车	励 烈 5 y 鲁 狼	裂 6 Φ 槽 篭	廉 7 x fi 老	恋 8 u 路	憐 9 9 以 路 蝋	連 A III 露 郎	煉 B 以 労	廉 С ъ 妻	練 D B 麻 禄	聯 E 弄 肋	F 9 朗録
0F2 0F3 0F4 0F5 0F6 0F7 0F8 0F9 0FA 0FB	4E3 4E4 4E5 4E6 4E7 276 277 4F2 4F3 4F4	寮線類齡 0 0 核論	科倫令暦 1 п я 運搬倭	厘 伶 歷 2 p 連 浪和	林例到3 年練漏話	冷 劣 4 T 呂	励 烈 5 y	裂 6 Φ 槽	廉 7 x 炸i	恋 8 u 略	憐 9 4 路	連 A III	煉 B III	廉 C b	練 D B	聯 E b	F 9
0F2 0F3 0F4 0F5 0F6 0F7 0F8 0F9 0FA 0FB	4E3 4E4 4E5 4E6 4E7 276 277 4F2 4F3	寮線類 齢 0 0 枚	料倫令暦 1 π g 連榔	厘 倫 歴 2 り 連浪	林 例 3 c 鍊漏	帝 <b>4</b> <sup>1</sup> 日 车	励 烈 5 y 鲁 狼	裂 6 Φ 槽 篭	廉 7 x fi 老	恋 8 u 路	憐 9 9 以 路 蝋	連 A III 露 郎	煉 B 以 労	廉 С ъ 妻	練 D B 麻 禄	聯 E 弄 肋	F 9 朗録

### **HITACHI**

Table 14 HD66732 Full-size Character Codes and JIS Codes (Level-2)

	I										_						
Character							1	1	1				ı		_ 1	1	_
Code	JIS Code	0	1	2	3	4	5	6	7	8	9	Α	В	С	D	É	F
100	[500]		_ :				00-10						(dise	1419	<i>\$779</i>	W	WA.
101	[501]	:		For (	CGRA	M (10	10–10	19)					$\underline{m}$	22	<i>111</i> 1	1111	224
102	502		弌丁	丐	丕	个	弛	`	井	ノ	又	乖	乗	亂	1	豫	爭
103	503	舒	走	Ŧ	亞	亟	-1-	亢	亰	亳	宜	从	05	仄	11	仂	仗
104	504	例	仭	ff !	价	伉	佚	估	佛	侚	佗	佇	佶	侈	侏	侘	佻
105	505	佩	佰	侑	佯	來	侖	儘	俔	俟	俎	俘	俛	俑	俚	俐	俤
106	506	俥	倚	倨	倔	倪	倥	倅	伜	俶	倡	倩	倬	俾	俯	們	俪
107	507	偃	假	曾	借	偐	(R)	做	偖	他	偸	愧	傚	傅	偃	傲	
<del></del>	<del></del>		-	2	3	4	5	6	7	8	9	Α	В	С	D	E	F
		0	1	2	<u></u>	4										_	
108	[510]																
109	[511]			ANE	M	A85		MS.	48	ANE.	偖	僮	價	僵	儉	儁	優
10A	512		棄	僊	傅	僂	僖	僞	饒	借		-			兔	兢	餕
1 0 B	513	儖	儕	篇	儚	<b>#</b>	離	儷	儼	黛	儿	兀	兒	兌		_	冢
10C	514	兩	兪	兮	冀	П	囘	册	冉	冏	胄	善	是		冤	虺	_
10D	515	冩	幕	7	决	冱	坤	冰	况	例	凅	凉	凛	几	處	凩	凭
10E	516	凰	Щ	鯏	双	刋	刔	刎	刼	刪	刮	剣	刹	椒	剄	剋	刺
10F	517	剞	剔	剪	剴	剰	剳	剿	剽	劍	劍	劒	剱	劈	劑	辨	
		0	1	2	3	4	5	6	7	8	9	A	В	C	D	E	F
110	[520]																
111	[521]																
112	522		瓣	劬	劭	劼	劵	勁	勍	勗	勞	勸	勒力	飭	勠	勳	剛
113	523	動	勺 -	匆	匈	甸	匍	淘	匏	七	Ë.	匣	匯	匱	蜃		H
113	523	~	<b>#</b>	世	卉	卍	地	- <del>'''</del>	11	卮	夘	ä	卷	广	厖	厠	厦
115	525	厥	斯	嚴	4	零	1	雙	曳	曼	(at	III.	叨	叭	叺	吁	件
	526	呀	听	吭	吼	吮	啉	吩	吝	俞	咏	(SO)	谷	眩	呱	pp	呰
116	527	咒	呻	咀	呶	咄	附	咆	哇	咢	咸	咥	咬	哄	哈	杏	$\vdash$
117	521	-	_			_						1	В	C	D	E	F
		0	1	2	3	4	5	6	7	8	9	Α	В		. ∪ *******	E	-
118	[530]	<b>!</b>			ш.	<b></b>	<b></b>	<b></b>	<b></b>			1		₩	<del> </del>		
119	[531]						ļļ.	<b>.</b>		<b></b>	ı.			p-tot	, po	gade (	
11A	532	L.,	咫	哂	眸	咾	局	哘	哥	哦	唏	唔	哽	哮	- 哭	哺	哢
11B	533	軟	啀	鲫	啌	售	啜	晫	啖	哨	唸	- 唳	啝	喙	喀	咯	贼
11C	534	喟	一啻	啾	喘	唧	單	啼	喃	崳	喇	喨	鳴	嗅	嗟	嗄	嗜
11D	535	嗤	嘆	16	嗷	噴	験	、戦	嘛	嗹	曀	器	營	嘶	嘶	嘲	嘸
11E	536	疃	噤	囄	・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・	燥	「「「「「「」	嚀	嚊	喇	嚔	嚔	、嚥	嚮	嚶	嚴	二萬
11F	537	嚼	兓	囃	畴	験	喘	屬	囓		阻	一圈	圀	囿	圕	圉	$\vdash$
		0	1	2	3	4	5	6	7	8	<sub> </sub> 9	Α	В	С	. D	Ε	F
120	[540]																
121	[541]	•	•		+	†	+	1	•	•	•	1					
122	542	******	198	國	園	<b>B</b>		- B	嗇	1	圦	邽	圸	坎	圻	址	坏
123	543	坩	<b>1</b>	垈	坡	坩	垉	垓	垠	坿	垤	垪	垰	埃	- 埆	埔	埒
124	544	埓	堊	埖	埣	堋	堙	場	場	堡	塢	-	逢	毀	蝣	堽	塹
125	545	墅	燗	堪	蟑	墺	壞	墻	墸	堕	壅	壓	壑	造	壙	疉	堰
126	546	墁	壤	鏧	壯	壺	壹	壻	畫	壽	文	文	敻	夛	梦	黟	夬
127	547	灵	本	夸	火火	一竒	奕	奂	奎	奚	奘		奠	奥	獎	•	
127	347	1					_	_		8	9	A	В	C	D	E	F
		0	1	2	3	4	5	6	7	8	9	*****		1		3	•
128	[550]	ļ	ļ		<b></b>	ļ	4	<b>.</b>		ļ	•	<b></b>	<b></b>	<b>-</b>	<b>.</b>		<del> </del>
129	[551]		١,,,,,	<b></b> ,		<b></b>	<b></b>	<b>1</b>		1	120	<b></b>	Ler	]	- 144 144	娥	娟
12A	552	<b>.</b>	_ 奸	妁	. 数	佞	侫	妣	妲	- 姆	姨		妍	姙	姚		
12B	553	娑	娜	娉	娚	啊	丝	婉	娵	娶	婢		媚	媼	媾	- 娲	嫂
12C	554	媽	媽	繼	嫦	教	嫌	婤	網	嬌	婵		嬲	嫩	嬪		嫌
12D	555	欀	孅	蟎	孑	孕	乎	李	孥	核	執		噼		李	孺	+
12E	556	它	臣	宸	寃	寇	寉	寔	寐	寤	實		寞		寫	寰	寶
12F	557	實	尅	將	專	對	尓	脚	l t	尨	尸	尹	屁	居	屎	屓	
	1	0	1	2	3	4	5	· 6	7	. 8	9	A	В	С	D	E	F
130	15601																
131	[561]	1	1			1	1	100									
132	562	1	展	屛	孱	屬	ሥ	#L	岃	屹	岌	岑	盆	妛	触	岻	<b>M</b>
133	563	岼	岷	峅	帖	-	峙	殺	一峽	峺	前	_	峪		崕	崗	寄
134	564	崟	- 幅	崑	崔		峻	崙	倫	嵌	+		帽		嵳	幅	幅
135	565	嶄	藤	嶢	一嶝	_	- •	遊	楼	嶷	-+	-	<b>33</b>		100	巖	///
	566	巫	분	卮	「桥	-		帑	帛	帯	輔	-	韓		幎	幗	幔
136		_		-	. +	-	- +		麼	17.		<del></del>	廂		廐	廏	<u> </u>
137	567		+ —	幣	┤幇			+	+	+	-		•		•	+	-
	1	0	1	2	3	4	5	6	7	8	9	A	В	С	D	E	F
138	[570]					1	4	4	1	1	4	4		4	4	4	4
139	[571]																
13A	572	T	廖	廣	凘	廚	廮	廢	廡	廨			摩	<del></del>		廴	廸
13B	573	开	弃	弉		葬	ナ	弑	5.	黟	亞	引	週	彈	_	彎	弯
13C	574	彑		彗			彭	+ -	彷	徃	Æ	L 彿	便	【很	徑	徇	從
13D	575	一徙	$\rightarrow$	徠	-	_	徼	Ħ	析	忤	任	t tt	乔	息	忿	怡	恠
13E	576	怙	-	怩	-			-	佛	<del></del>			-+				恟
13F	577	協	-	恍	•	+ :-	_		恬		_		_			悚	1
135	3//	L LED	l ter	· ·	,,,	1 13	1,000	1.7	1,114		,		· · ·				

No CGROMs

: Not allocated to JIS codes.
(Do not correspond to JIS codes.)
Can be used as CGROMs.

Cardes																		
140   702   快	Character																	
142   583   作	Code	JIS Code	0	1	2	3	4	5	6	7	8	9	Α	В	С	D	E	F
142	140	702		陜	陟	陦	陲	阪	隍	堂	隕	隗	険	隧	隠	隲	隰	麚
144	141	703	隶	隸	隹	雎	雋	雉	雍	襍	雜	霍	雕	雹	霄	蓬	霈	霓
1445	142	582		悄	悛	侼	悗	悒	悧	悋	悪	悸	惠	憉	悴	忰	悽	惆
146	143	583	悵	惘	慍	愕	Ð.	惶	憃	愀	惴	惺	愃	惚	惻	焰	愍	愎
146	144	584	慇	愾	慸	愧	慊	愿	愼	想	愴	愽	慂	慄	慳	慷	慘	慙
147	145	585	讏	慫	慴	慯	慥	僔	働	慝	慓	慵	憙	憖	憇	憬	僬	惲
148   712	146	586	憊	憑	憫	憮	懌	懊	應	懐	懈	懃	幧	憐	懋	罹	懍	儒
148 712	147	587	摦	懶	懺	馘	懿	惟	懼	憐	戀	戈	戉	戍	戊	戔	夏	
148 712			0	1	2	3	4	5	6	7	8	9	Α	В	С	D	Е	F
1449 713	148	712		顱		顳	Ĭ.	飆	颱	颶	飄	廳		飩		餃	劕	餒
14A 592			鯆	餘	餡	-	餞	餤	餅	餬	雑	蝕	ਿ	縕	饉	漫		
14B	1 4 A										扁			扣				
14C 594 劫 拜 拌 排 檢 扔 換 位 格 括 班 排 桂 坚 拯 矫 所 14E 596 预 接 搭 操 理 粉 所 接 腔 粉 排 接 腔 粉 形 縣 縣 排 接 腔 粉 形 接 粉 形 縣 縣 接 下 縣 接 所 旅 縣 粉 鄉 縣 接 下 縣 接 下 縣 接 下 縣 接 下 縣 接 下 縣 接 下 縣 接 下 縣 接 下 縣 接 下 縣 接 下 縣 接 下 縣 图 下 8 9 A B C D E F F S 5 5 5 K 下 形 形 斯 斯 縣 縣 旁 所 旅 藏 屬 所 元 東 모 모 모 모 모 모 모 모 모 모 모 모 모 모 모 모 모 모			扭			_				抃								
14E	14C	594	拈	拜	拌	拊	拂	拇	拋	拉	挌	拮	拱	挧	挂	挈	拯	拵
14E   596   振   接   接   接   接   接   接   接   接   接	1 4 D	595		挟	捍	搜		掖	掎	掀	掫		掣	掏	掉	掟	掵	捫
150   722   6   5   6   7   8   9   A   B   C   D   E   F   F   F   F   F   F   F   F   F	14E				揩				揉	插	揮		搖	搴	搆	搓		
150   722   一	14F	597	攝	搗	搨	搏	摧	攀	搏	摎	攪	撕	撓	撥	撩	撈	撼	
150   722				1	_	_		5	ß.							n		F
151   723   他 整 數 數 數 數 數 數 數 數 數 數 數 數 數 數 数 数 数 数 数	150	722	۲					_				-						
152			rjeli														_	
153			''78															
154			梅							_		-			_		_	
155												_		_				_
156																		
157   5A7   級					-													
158   732			_	_				-	_						_			/155,
158		U/ 1.1																
159	1 5 0	722	٠			-			_									
15 A   5B2			<b>56</b> 0								_							
15 B			399					-										
15 C 5B4			Had:														_	
15D 5B5 作 标 抵 柮 枪 桁 拉 抵 搚 聚 框 栩 榮 挎 栲 桎 15E 5B6 依 作 样 档 椅 桿 整 格 校 範 條 椰 框 醬 醛 杯 栓 15F 5B7 焚 枪 椌 枪 棉 桦 및 格 树 林 柳 桥 柳 椌 腿 15F 5B7 焚 枪 椌 枪 棉 桦 및 橡 楠 柳 柳 校 본 棍 揭 16B 1743 16B 1743 16B 16B 5C3 秧 倒 榆 楹 椭 松 楸 橙 楔 校 榕 棉 橡 椰 椰 椰 16B 16B 5C6 树 聚 榧 胶 框 槭 椰 椰 椰 楼 橙 橙 橙 橙 橙 橙 橙 橙 橙 橙 橙 橙 橙 橙 橙 橙																		
15E   5B6   校 将 件 档 构 桿 泉 桔 核 栀 栎 椰 梃 轉 栎 桴										_			_		_			
15F   587   姓 松 梺 松 松 桃 桦 桦 柳 楝 柳 楼 桃 松 和 梅 柳 楼 桃 松 和 梅 柳 楼 桃 松 和 梅 柳 楼 桃 松 和 梅 柳 楼 桃 松 和 梅 柳 楼 桃 松 和 梅 柳 楼 桃 柳 溪 松 柳 桃 柳 楼 柳 楼 柳 楼 柳 楼 柳 楼 柳 楼 柳 楼 柳 楼 柳 楼									_				_		_			
To   To   To   To   To   To   To   To								-	_									11
160   742   完 核	137	307			-	-											_	
162   5C2			0							7	8	9	Α	В	С	D	E	
162 SC2			0000000	発	僕	渔	塔	<b></b>	<b>PK</b>								<b>5</b> 7700000	
163 5C3 換 個 倫 盤 楷 棚 楸 桃 楔 椋 楮 椹 禘 椽 縣 椰 164 5C4 愉 榜 棒 權 標 標 機 機 機 橋 橋 橋 橋 橋 橋 橋 橋 橋 橋 橋 橋 橋 橋 橋				115	14	44.5	115	44:0	+tz	***	++		+4:		-V-	est.		488
164								_						_		गार	TW.	
165 5C5 樹 聚 棵 楔 桲 楔 榕 榕 榕 榕 榕 燦 檬 槿 槿 ৄ 檢 檀		J 503				437										45.	121	
166 5C6 例 聚 權 粮 櫃 棟 樓 轉 整 椿 楼 樓 檄 槓 텪 167 5C7		ECA	_	_														
167 5C7 操 幅 幅 輛 橙 幢 輳 售 樒 榁 築 燉 檢 檔			楡	楞	棟	榁	楪	榲	榮	槐	榿	槁	槓	榾	槎	寨	槊	槝
168		5C5	楡樹	楞槃	椎	榁梗	楪榑	榲榠	<b>榮</b>	槐榕	橙榴	植	榎	榾樂	槎	秦槿	槊權	梅槹
168	166	5C5 5C6	楡樹	<b>楞</b> 繁 槧	様機	榁梗	模模	榲椒	<b>榮</b>	槐榕梅	橙榴	梅権	植幣	榾 樂 様	槎樓	秦槿椒	型 権 横	梅槹
16.9   15D1	166	5C5 5C6	楡樹樹	楞繁編	<b>棟 椎 椎 椎</b>	榁梗橑	楪 榑 樞 橙	<b>榲</b> 棋 権	<b>荣榜</b> 模	槐榕槫樸	<b>橙榴类</b>	槁槞樒檐	植棚機機	榾 様 築	槎樓檄	泰槿嫩檢	槊 權 樌 槒	梅棹棺
16A 5D2	166 167	5C5 5C6 5C7	楡樹樹	楞繁編	<b>棟 椎 椎 椎</b>	榁梗橑	楪 榑 樞 橙	<b>榲</b> 棋 権	<b>荣榜</b> 模	槐榕槫樸	<b>橙榴类</b>	槁槞樒檐	植棚機機	榾 様 築	槎樓檄	泰槿嫩檢	槊 權 樌 槒	梅棹棺
16B 5D3 欅 集 檔 樂 覆 鬱 楓 软 数 盎 软 飲 歇 數 數 數 16C 5D4 飲 數 飲 數 數 屬 罗 歿 殀 殄 殃 殍 殘 需 租 租 16F 5D5 殓 殫 預 %	166 167	5C5 5C6 5C7 [5D0]	楡樹樹	楞繁編	<b>棟</b> 椎 椎	榁梗橑	楪 榑 樞 橙	<b>榲</b> 棋 権	<b>荣榜</b> 模	槐榕槫樸	<b>橙榴类</b>	槁槞樒檐	植棚機機	榾 様 築	槎樓檄	泰槿嫩檢	槊 權 樌 槒	梅棹棺
16C 5D4 飲飲飲飲飲飲飲飲飲飲	166 167 168 169	5C5 5C6 5C7 [5D0] [5D1]	楡樹樹	楞繁 編 1	棟 棚 樅 橇 2	程 標 療 3	様 樽 櫃 位 4	<b>榲</b> 模板	<b>荣榜</b> 模	槐榕轉撲 7	橙榴 樊 搗	稿 権 権 9	植 r r r r r r r r r r r r r r r r r r r	榾樂様檠 B	槎 樓 檄 C	寒 植 橄 板 D	類 權 植 格 E	梅 棹 椿 F
16D     5D5     檢 鄉 殯 殯 娥 娥 殳 殷 毅 殿 毋 號 卷 毬 毫 總 卷       16E     5D6     應 氈 氓 气 氣 氣 氣 油 注 汪 沂 冱 並 沁 沛       16F     5D7     分 汨 汳 沒 沐 濯 决 品 洁 溷 冽 泝 沮 ĉ 沾 沛       16F     5D7     分 汨 汳 沒 沐 濯 决 品 洁 溷 冽 泝 沮 ĉ 沾 沛       170     [5B0]       171     [5B1]       172     5E2     溫 泛 泯 泙 沮 浅 衍 洶 瀘 洽 洗 洙 洵 湎 酒       173     5E3     洌 清 清 浓 浚 浹 淅 涎 海 淺 涼 淡 澄 淪 淮 潤       175     5E5     湮 清 涣 爰 湿 渾 流 湫 漾 涼 溜 濟 濟 瀬 瀬 瀬 瀬 瀬 瀬 瀬 瀬 瀬 瀬 瀬 瀬 瀬 瀬 瀬 瀬 瀬	166 167 168 169	5C5 5C6 5C7 [5D0] [5D1] 5D2	橡樹 假 0	楞 製 編 1 · · · · · · · · · · · · · · · · · ·	棟 機 機 2 乗	権 模 務 3	<b>楪</b> 梅 櫃 橙 4	程 模 域 を 5	<b>茶榜模</b> 6	槐榕檸樸 7	橙榴 樊 搗 8	槁檍樒檐9	植物核橙 A 編	榾樂様檠 B	槎 樓 檄 C 檪	寒 槿 嫩 檢 D 桐	規權 植橋 E 機	梅 桿 格 F
16E 5D6 應 帐 氓 气 氛 氣 氣 末 油 注 汪 沂 冱 注 沁 沛 16F 5D7 分 汨 汳 沒 沐 泄 决 弘 沽 泗 汎 泝 沮 沱 沾 18F0 15B0 1 172 5E2 溫 済 茂 溪 瀬 瀬 溪 遠 遠 混 瀬 滾 澤 瀬 渝 濱 茂 濱 瀬 瀬 濱 濱 下 八 万 万 万 万 万 万 万 万 万 万 万 万 万 万 万 万 万 万	166 167 168 169 16A 16B	5C5 5C6 5C7 [5D0] [5D1] 5D2 5D3	橋 樹 樹 〇	楞繁 編 1	様 機 2 桑 櫺	権 模 権 3 名	様 杉 植 位 4	程 模 域 権 5	茶榜機機 6 棒機	槐榕檸樸 7 模数	橙榴獎 梅 8 橡 数	槁檍郴檐 9	植槨核橙 A 編献	榾樂樣樂 B 櫟飲	槎 樓 檄 C 檪 歇	寒槿嫩檢 D 桐鉱	型權 植 E	梅棹榕 F
16F 5D7 汾 汨 波 沒 沐 准 決 弘 沽 泗 泅 泝 沮 沱 沾  170 [SE0] 171 [SE1] 172 SE2 게 泛 沢 泙 汨 洟 衍 椈 瀘 冷 洗 沖 洵 湎 语 173 SE3 冽 浣 涓 汯 浚 浃 折 涎 涕 藻 湿 液 润 渊 瀬 淇 淇 ガ 椈 瀘 冷 浣 沖 瀬 瀬 瀬 淇 頂 茨 浹 連 侖 准 別 175 SE5 湮 清 涣 爰 湿 渾 液 浓 潔 深 溜 溶 爽 滴 滴 瘦 脂 滴 滴 源 河 深 藻 藻 滴 藻 藻 滴 藻 源 滴 滚 源 河 流 滚 溪 溪 溪 溜 溶 藻 藻 滴 液 液 滴 滴 逐 溪 溪 溪 溪 溪 溪 溪 溪 溪 溪 溪 溪 溪 溪 溪 溪 溪	166 167 168 169 16A 16B 16C	5C5 5C6 5C7 [SD0] [SD1] 5D2 5D3 5D4	榆樹 樹 の 欅 飲	楞槃 類 編 1 · · · · · · · · · · · · · · · · · ·	棟 概 機 2 · · · · · · · · · · · · · · · · · ·	控 模	株 神 樞 橙 4	盤模 板 5 を と を	<b>茶榜模</b> 6 <b>檸櫻</b> 夕	槐榕檸樸 7 模紋歿	橙榴类	槁槞郴檐 9 棒监殄	植槨楼橙 A 編針殃	榾樂樣築 B 櫟飲穿	槎 樓 檄 C 檪 歇 殘	塞槿嫩檢 D 桐歃殆	型權 槓 格 E 機 數 殞	楊棹植 F 櫻歐殤
TO   SEO    166 167 168 169 16A 16B 16C 16D	5C5 5C6 5C7 [5D0] [5D1] 5D2 5D3 5D4 5D5	榆樹樹 の 欅飲殖	楞繁 編 1 檗	棒 概 機 2 · · · · · · · · · · · · · · · · · ·	<b>控</b> 模	樣 神 樞 检 4 權 卷 数 殲	<b>榲</b> 模 城 権 5 権 鬱 聯 父	業務機機 6 棒欄 夕殷	槐榕轉樸 7 模紋歿殼	<b>档相类</b> 4 8 ★ 数	槁槞郴檐 9	植槨核橙 A 編針殃鍼	榾樂樣築 B 櫟飲殍毟	槎樱樓 C 檪歇殘毽	聚植嫩檢 D 桐歃殆亳	槊權槓槒 E 機數殞器	楊槹棺 F 櫻歌鴉毯	
170	166 167 168 169 16A 16B 16C 16D	5C5 5C6 5C7 [5D0] [5D1] 5D2 5D3 5D4 5D5 5D6	榆樹 樹 田 中 飲 養 慶	楞繁製櫑 1 檗藤獻殢氈	棒機機 2 薬儒飲殯氓	<b>控模榜略 3                                   </b>	樣 博 框 卷 4	<b>榲榠城幢</b> 5 權鬱歸殳氤	荣榜模模 6 檸檬歹殷氣	槐榕轉撲 7 模数歿殼汞	橙榴獎搗 8 橡紮殀殿汕	槁欖棉塘 9 攀监殄毋辻	植槨楼橙 A 編針殃號汪	榾樂樣檠 B 櫟飲殍毟沂	槎響樓懒 C 檪歇殘毬冱	寨植橄檢 D 桐 献 殆 毫 汕	架權槓椿 E 機數殞器心	楊槹棺 F 櫻歌鴉毯
171   ISBI	166 167 168 169 16A 16B 16C 16D	5C5 5C6 5C7 [5D0] [5D1] 5D2 5D3 5D4 5D5 5D6	<ul><li>楡樹椒</li><li>椒椒</li><li>0</li><li>欅軟殪魔汾</li></ul>	楞槃繁櫑 1	棒櫃樅橇 2 葉櫺飲殯氓返	<b>植</b> 梗榱橢 3 <b>檻樂败殘</b> 气沒	樣神樞橙 4 權權數 殲氛 沐	程模城権 5 權鬱聯父鼠泄	業務機機 6 檸檬罗殷氣決	槐榕檸樸 7 横紋歿殼汞弘	橙榴獎  8	稿 機	槓槨楼檍 A 編欹殃驗汪泅	精樂樣樂 B 操飲穿笔沂泝	槎響樓 像 C	秦槿橄檢 D 桐    桐	架權槓橋 E 機數項器沁沾	梅槹榕 F 樱歐鴉毯沛
172	166 167 168 169 16A 16B 16C 16D 16E	5C5 5C6 5C7 [5D0] [5D1] 5D2 5D3 5D4 5D5 5D6 5D7	<ul><li>楡樹椒</li><li>椒椒</li><li>0</li><li>欅軟殪魔汾</li></ul>	楞槃繁櫑 1	棒櫃樅橇 2 葉櫺飲殯氓返	<b>植</b> 梗榱橢 3 <b>檻樂败殘</b> 气沒	樣神樞橙 4 權權數 殲氛 沐	程模城権 5 權鬱聯父鼠泄	業務機機 6 檸檬罗殷氣決	槐榕檸樸 7 横紋歿殼汞弘	橙榴獎  8	稿 機	槓槨楼檍 A 編欹殃驗汪泅	精樂樣樂 B 操飲穿笔沂泝	槎響樓 像 C	秦槿橄檢 D 桐    桐	架權槓橋 E 機數項器沁沾	梅槹榕 F 樱歐鴉毯沛
173 5E3 冽 浣 涓 浓 浚 浃 浙 涎 沸 滹 涅 淹 渕 渊 涵 洪 174 5E4 诠 涸 済 淬 松 滴 淨 漆 淅 淺 淙 淤 逵 淪 准 潤 175 5E5 湮 清 淚 沒 湟 渾 流 湫 溪 淚 濁 淬 海 滴 滴 滴 沥 河 河 河 河 河 河 河 河 河 河 河 河 河 河 河 河	166 167 168 169 16A 16B 16C 16D 16E 16F	5C5 5C6 5C7 [5D0] [5D1] 5D2 5D3 5D4 5D5 5D6 5D7	<ul><li>楡樹椒</li><li>椒椒</li><li>0</li><li>欅軟殪魔汾</li></ul>	楞槃繁櫑 1	棒櫃樅橇 2 葉櫺飲殯氓返	<b>植</b> 梗榱橢 3 <b>檻樂败殘</b> 气沒	樣神樞橙 4 權權數 殲氛 沐	程模城権 5 權鬱聯父鼠泄	業務機機 6 檸檬罗殷氣決	槐榕檸樸 7 横紋歿殼汞弘	橙榴獎  8	稿 機	槓槨楼檍 A 編欹殃驗汪泅	精樂樣樂 B 操飲好笔沂泝	槎響樓 像 C	秦槿橄檢 D 桐    桐	架權槓橋 E 機數項器沁沾	梅槹榕 F 樱歐鴉毯沛
174	166 167 168 169 16A 16B 16C 16D 16E 16F	5C5 5C6 5C7 [5D0] [5D1] 5D2 5D3 5D4 5D5 5D6 5D7	<ul><li>楡樹椒</li><li>椒椒</li><li>0</li><li>欅軟殪魔汾</li></ul>	楞繁槧櫑 1	棒櫃樅橇 2 葉櫺飲殯氓波 2	権 模 榜 格 3 8 8 8 8 8 9 8 9 8 9 8 9 8 9 8 9 8 9 8	株神樞橙 4	榲榠槭橦 5 權鬱聯殳氤泄 5	業務機機 6 棒欄 夕殷 氣 決 6	槐榕檸樸 7 模数效殼汞弘 7	橙榴类梅 8 橡软灰酸油沾 8	稿 機 格	植槨楼橙 A 編 M M M E E N A	桁樂樣築 B 操飲穿笔沂泝 B	槎標 中 を を を を を を を を を を を を を	塞槿嫩檢 D 桐猷殕毫沚沱 D	型権機 権 E 機 数 規 る 心 沾 る	楊槹槍 F 標歌鴉毯市 F
175	166 167 168 169 16A 16B 16C 16D 16E 16F	5C5 5C6 5C7 [5D0] [5D1] 5D2 5D3 5D4 5D5 5D6 5D7	榆相樹 O 棒軟 殖 磨 分 O	楞繁槧櫑 1	棒櫃樅橇 2 樂檔欽殯氓版 2	権 模 権 務 3 艦 業 験 強 气 没 る る 、 ス ス ス ス ス ス ス ス ス ス ス ス ス ス ス ス ス	株神樞橙 4	程 模 板 権 5 権 を い 者 り し り し り し り り り り り り り り り り り り り	<b>茶榜棵僥 6</b>	槐榕檸樸 7 模数歿殼汞弘 7	<b>栏榴樊档</b> 8 橡软灰酸油沾 8 胸	稿 機 格	植槨楼橙A編欹殃毓汪泅A	桁樂樣築 B 操飲穿毟沂泝 B 洸	槎標	塞槿嫩檢 D 桐酞赔毫沚沱 D 洵	樂權 槓	楊槹棺 F 標歌瘍毯沛 F
176     5E6     滿 渝 游 瀬 溪 溢 混 潮 溪 渣 混 潮 溶 漆 潮 渝 瓊 滔 廢 蔣 清 777       177     5E7     溥 滂 戻 穎 漑 凍 湿 湿 滞 滾 聚 溶 漱 滯 混 滌       0 1 2 3 4 5 6 7 8 9 A B C D E F       178     [5F0]       179     [5F3]       17 A 5F2     濛 滴 凍 滚 澳 澣 深 潭 濱 濱 滘 濟 混 溶 瀬 澤 濱 濱 澤 濱 濱 濱 濱 濱 濱 濱 濱 濱 濱 濱 濱 濱 濱 濱	166 167 168 169 16A 16B 16C 16D 16E 16F	5C5 5C6 5C7 [5D0] [5D1] 5D2 5D3 5D4 5D5 5D6 5D7 [5E0] [5E0] [5E1] 5E2 5E3	榆相樹假 O 棒軟燈磨汾 O	楞緊 編 1	棒櫃樅橇 2 泰檔欽殯氓版 2 泛涓	権機 療輸 3	株神樞橙 4	個模版権 5 權數聯 Q 氣泄 5 泪浹	<b>茶榜棵僥 6</b>	槐榕檸樸 7 模数效殼汞弘 7 衍選	<b>橙榴獎搗 8 橡紮殀殿汕沽 8 淘涕</b>	稿 権 権 9 維 益 珍 母 辻 泗 9 進 濟	植槨楼檍 A 編欹殃毓汪泅 A 治涅	桁樂樣築 B 楝飲穿毟沂泝 B 洸淹	槎標 像 C 探歇 殘毬 冱沮 C 未測	塞槿嫩檢 D 桐    桐    桐	樂權 槓 榰 E 機 軟 殞 鍋 沁 沾 E 加 涵 涵	楊槹棺 F 樱歐鴉毯沛 F 洒淇
177     5E7     溥 滂 戻 穎 漑 瀧 滬 潔 滸 滾 聚 溶 潔 滯 磁 滌       178     [5F0]       179     [5F3]       17A     5F2       17B     5F3       17C     5F4       17B     5F3       17B     5F3       17C     5F4       17B     5F5       17C     5F5       17B     5B       17B     5F5       17B     5B       18B     1B       18B     1B	166 167 168 169 16A 16B 16C 16D 16E 16F 170 171 172 173 174	5C5 5C6 5C7 [5D0] [5D1] 5D2 5D3 5D4 5D5 5D6 5D7 [5E0] [SE1] 5E2 5E3 5E4	榆相槲假 O 棒軟殪應汾 O 洌淦	楞槃槧櫑 1	棒櫃樅橇 2 麋艦飲殯氓版 2 泛涓渝	<b>権機械輸</b> 3 <b>艦樂數殲气沒</b> 3 泯汯淬	株神樞橙 4	個模板権 5 權鬱歸 Q 氤泄 5 泪浃淌	<b>、                                    </b>	槐榕檸樸 7 模数殁殼汞弘 7 行涎凄	<b>档 榴 樊 梅 8</b> 橡	稿 権 権 9 維 登 珍 母 辻 泗 9 進 壽 浅	植鄉楼樓 A 編象映號汪泅 A 治涅淙	楊樂樣築 B 株飲殍毟沂泝 B 洗淹淤	槎標 像 C	塞槿嫩檢 D 桐酞殆毫沚沱 D 泃渊淪	樂權 槓 e	梅桿槽 F 標歐鴉毯市 F 酒淇潤
TAB   SFO   TAB   166 167 168 169 16A 16B 16C 16D 16E 16F	5C5 5C6 5C7 [6D0] [5D1] 5D2 5D3 5D4 5D5 5D6 5D7 [SEI] 5E2 5E2 5E3 5E4 5E5	榆相樹懶 O 欅軟殖魔労 O 別途湮	楞槃槧櫑 1	棒 概 機 2	権機	株棒樞橙 4 權權數 殲氛沐 4 严资 凇 湟	個模城権 5 權數聯 Q 氫 泄 5 泪浹淌渾	<b>、                                    </b>	槐榕轉樣 7 植飲歿殼汞弘 7 行逐凄湫	<b>档 榴 樊 楊 8                                </b>	稿 植 格	植鄉楼槍 A 編象映輸汪泅 A 治涅淙湍	楊樂樣築 B 棟飲殍毟沂泝 B 洸淹淤渟	槎標	塞權轍檢 D 桐	樂權槓橋 E 機數項器沁沾 E 加油准油	梅桿楠 F 標散瘍毯市 F 酒淇潤渤	
178 [5F0] 179 [5F1] 17A 5F2	166 167 168 169 16A 16B 16C 16D 16E 16F 170 173 174 175 176	5C5 5C6 5C7 [5D0] [5D1] 5D2 5D3 5D4 5D5 5D6 5D7 [5E0] [5E3] 5E2 5E3 5E3 5E4 5E5 5E5	榆栩樹版 O 欅飲殖竈汾 O 別途湮滿	楞槃槧櫑 1	棒 概 機 2 業 橋 欽 殯 氓 返 2 泛 涓 淆 涣 游	権機 権 機	株/博樞橙 4 撒欖教 殲気 沐 4 严凌 凇 湟 溪	監督 監督 監督 監督 監督 監督 定<	<b>、                                    </b>	槐榕轉模 7 模数效殼汞弘 7 衍逐凄湫溷	<sup>1</sup> <sup>1</sup> <sup>1</sup> <sup>1</sup> <sup>1</sup> <sup>1</sup> <sup>1</sup> <sup>1</sup> <sup>1</sup> <sup>1</sup>	稿 植 格	植鄉楼槍 A 編欹殃毓汪泅 A 治涅淙湍溯	情樂樣樂 B 操飲穿毟沂泝 B 洗淹淤渟滄	槎標 像 C 操	塞槿嫩檢 D 桐歃殆毫沚沱 D 洵渊淪渺滔	樂權 槓 fe	梅桿楠 F 標散瘍毯市 F 酒淇潤渤
179 [5F1] 17A 5F2	166 167 168 169 16A 16B 16C 16D 16E 16F 170 173 174 175 176	5C5 5C6 5C7 [5D0] [5D1] 5D2 5D3 5D4 5D5 5D6 5D7 [5E0] [5E3] 5E2 5E3 5E3 5E4 5E5 5E5	榆樹樹 O 欅 飲 殖 壓 分 O 別 企 湮 滿 溥	楞繁製櫑 1 柴 葉 軟 赤 氈 汨 1 沺 浣 洇 清 渝 滂	棟機機 2 乗檔飲殯氓版 2 泛涓淆渙游溟	<b>植機 敷 職 气 沒 3</b>	株 博 框 检 4	監督 提供 据 を が を を を を を を を を を を を を を を と を と	<b>荣榜機僥 6</b>	槐榕轉換 7 模数效数汞弘 7 行選湊湫溷滸	<b>恺榴獎</b> 8 橡紮殀殿汕沽 8 胸涕淅渫滓滾	稿 植	植鄉核檍 A 編象殊號汪泅 A 冶涅淙湍溯渗	情樂樣築 B 棟飲好笔沂泝 B 洸淹淤渟滄嶽	槎標櫢 C 探歇殘毬冱沮 C 洙測達湃復滯	塞槿嫩檢 D 桐酥殕毫沚沱 D 洵渊淪渺滔張	槊權槓槽 E 機飲殞器沁沾 E 洳涵准襺滕滌	梅槹楠 F 標散瘍毯沛 F 洒淇潤渤溏
17A 5F2 淺滴滴。淺潺潸溢。澀漭潛潭潋滴滴 17B 5F3 澎滴水液类溶液溶液溶液溶液溶液溶 17C 5F4 濱濮濛瀉溶酸湯淡溶滴溶液溢滴溶 17D 5F5 瀰瀾激液覆潛炙炒炒奶烟炬炸奶炮烟炸 17E 5F6 烙焉烙焜焙煨焙煨熙熙、乾燥烧炼 魚 燻熄	166 167 168 169 16A 16B 16C 16D 16E 170 171 172 173 174 175 176	5C5 5C6 5C7 [6D0] [5D1] 5D2 5D3 5D4 5D5 5D6 5D7 [5E0] [5E1] 5E2 5E3 5E4 5E5 5E6 5E7	榆樹樹 O 欅 飲 殖 壓 分 O 別 企 湮 滿 溥	楞繁製櫑 1	棟機機 2 乗檔飲殯氓版 2 泛涓淆渙游溟	<b>植機 敷 職 气 沒 3</b>	株 博 框 检 4	監督 提供 据 を が を を を を を を を を を を を を を を と を と	<b>荣榜機僥 6</b>	槐榕轉換 7 模数效数汞弘 7 行選湊湫溷滸	<b>恺榴獎</b> 8 橡紮殀殿汕沽 8 胸涕淅渫滓滾	稿 植	植鄉核檍 A 編象殊號汪泅 A 冶涅淙湍溯渗	情樂樣築 B 棟飲好笔沂泝 B 洸淹淤渟滄嶽	槎標櫢 C 探歇殘毬冱沮 C 洙測達湃復滯	塞槿嫩檢 D 桐酥殕毫沚沱 D 洵渊淪渺滔張	槊權槓槽 E 機飲殞器沁沾 E 洳涵准襺滕滌	梅槹楠 F 標散瘍毯沛 F 洒淇潤渤溏
17B 5F3 澎 潘 濂 潦 澳 澣 渌 澤 澹 濱 澪 溽 濕 溶 瀾 濘 17C 5F4 濱 濮 濠 瀉 瀋 醆 瀑 漾 瀏 濾 瀛 瀚 粥 遻 濾 瀟 17D 5F5 瀰 瀾 澈 灑 灣 炙 炒 炯 烱 炬 炸 炳 炮 烟 休 烝 17E 5F6 烙 焉 锋 焜 焙 煥 熙 熙 煦 煢 煌 媛 煬 熏 燻 熄	166 167 168 169 16A 16B 16C 16D 16E 16F 170 171 172 173 174 175 176	5C5 5C6 5C7 [5D0] [5D1] 5D2 5D3 5D4 5D5 5D6 5D7 [5B0] [5B1] 5E2 5E3 5E4 5E5 5E6 5E7	榆樹樹 O 欅 飲 殖 壓 分 O 別 企 湮 滿 溥	楞繁製櫑 1	棟機機 2 乗檔飲殯氓版 2 泛涓淆渙游溟	<b>植機 敷 職 气 沒 3</b>	株 博 框 检 4	監督 提供 据 を が を を を を を を を を を を を を を を と を と	<b>荣榜機僥 6</b>	槐榕轉換 7 模数效数汞弘 7 行選淒湫溷滸	<b>恺榴獎</b> 8 橡紮殀殿汕沽 8 胸涕淅渫滓滾	稿 植	植鄉核檍 A 編象殊號汪泅 A 冶涅淙湍溯渗	情樂樣築 B 棟飲好笔沂泝 B 洸淹淤渟滄嶽	槎標櫢 C 探歇殘毬冱沮 C 洙測達湃復滯	塞槿嫩檢 D 桐酥殕毫沚沱 D 洵渊淪渺滔張	槊權槓槽 E 機飲殞器沁沾 E 洳涵准襺滕滌	梅槹楠 F 標散瘍毯沛 F 洒淇潤渤溏
17 C 5F4 濱 濮 濛 瀉 瀋 護 瀑 漾 濶 遠 瀛 瀚 潴 遻 遠 瀟 17 D 5F5 瀰 瀾 澈 灑 灣 炙 炒 娟 烱 炬 炸 炳 炮 烟 秌 烝 17 E 5F6 烙 焉 烽 焜 焙 煥 熈 熈 煦 煢 煌 媛 煬 熏 燻 熄	166 167 168 169 16A 16B 16C 16D 16E 170 171 172 173 174 175 176 177	5C5 5C6 5C7 [6D0] [5D1] 5D2 5D3 5D4 5D5 5D6 5D7 [SEI] 5E2 5E3 5E4 5E5 5E6 5E7	榆樹樹 O 欅 飲 殖 壓 分 O 別 企 湮 滿 溥	楞槃繁櫑 1 聚葉軟彈氈汨 1 沺浣涸荷渝涝 1	棟 概 機 位 集 標 飲 殯 氓 版 2 泛 涓 淆 涣 游 展 2	<b>植機械輸</b> 3 <b>框樂敷殲气沒</b> 3	株 博 框 检 4	監督 監督 監督 監督 監督 監督 定<	<b>荣榜機僥 6</b> 棒欄歹殷氣決 6 洟淅淨渣滉渥 6	槐榕檸樸 7 植软殁榖汞弘 7 衍涎凄湫溷滸 7	<b>愷榴獎</b>	稿 機	植鄉接億 A 編欹殃毓汪泅 A 洽涅淙湍溯渗 A	情樂樣樂 B 棟飲殍毟沂泝 B 洸淹淤洿滄澈 B	槎標機像 C 探歇殘毬冱沮 C	塞權數檢 D 桐献殕毫沚沱 D 洵渊淪渺滔漲 D	型權 槓 fe E 極 軟 項 器 心 沾 E 加 涵 准 湔 膝 滌 E	梅掉槽 F 樱歐鴉毯市 F 洒淇渭渤源 F
17D 5F5 瀰 瀾 澈 灑 灣 炙 炒 鳩 燗 炬 炸 炳 炮 烟 秌 烝 17E 5F6 烙 焉 烽 焜 焙 煥 熙 熙 煦 煢 煌 媛 煬 熏 燻 熄	166 167 168 169 16A 16B 16C 16D 16E 16F 170 173 174 175 176 177	5C5 5C6 5C7 [5D0] [5D1] 5D2 5D3 5D4 5D5 5D6 5D7 [5E0] [5E1] 5E2 5E3 5E4 5E5 5E6 5E7	檢欄樹板 0 欅軟蒄應分 0 列淦湮滿溥 0	楞繁槧櫑 1	棟 概 機 2 乗 艦 飲 殯 氓 版 2 泛 涓 淆 渙 游 漠 2 漓	<b>植</b> 模模	株 博 樞 检 4	<ul><li>機模板権 5</li><li>権鬱贈殳氤卍 5</li><li>泪浃淌渾渣灌 5</li><li>潺</li></ul>	業榜機機 6 檸檬 夕殷氣決 6 澳浙淨液混溷 6 潜	槐榕檸樸 7 植软殁殼汞弘 7 行選湊湫溷滸 7 澁	世榴獎 <b>槝</b> 8 橡軟灰殿汕沽 8	橋	植鄉楼 在	情樂樣樂 B 棟飲穿毟沂泝 B 洗淹淤洿滄澈 B	槎標機像 C 探歇殘毬冱沮 C	塞權嫩檢 D 桐献殕亳沚沱 D 洵渊淪渺滔薇 D	樂權	梅掉槽 F 樱歐鴉毯市 F 洒淇潤渤溏 F
17E 5F6 烙 焉 烁 焜 焙 煥 熙 熙 煦 瑩 煌 媛 煬 熏 燻 熄	166 167 168 169 16A 16B 16C 16D 16E 170 171 172 173 174 175 176 177	5C5 5C6 5C7 [5D0] [5D1] 5D2 5D3 5D4 5D5 5D6 5D7 [5E0] [5E3] 5E2 5E3 5E4 5E5 5E6 5E7	檢欄欄機 0 欅數殪應労 0 別途湮滿溥 0 澎	楞繁槧櫑 1	棟 概 機 2 乗 艦 飲 噴 氓 扳 2 泛 涓 淆 渙 游 漠 2 鴻 濂	<b>植機敷強气沒 3</b> 泯汯淬泼涮穎 3 滷潦	探神樞橙 4	艦棋城権 5 權鬱聯受鼠泄 5 泪浃淌渾渣灌 5 潺澣	<b>業榜機機 6</b> 棒欄 夕殷氣 决 6 浅淅淨 渣 滉 2 6 滑 溁	槐榕轉換 7 模数效殼汞弘 7 衍進淒湫溷滸 7 澁澤	世榴獎 <b>傳</b> 8 橡紮殀殿汕沽 8 胸涕淅溱滓滾 8 躍澹	稿	植鄉楼橙 A 編鉱殃毓汪泅 A 治涅淙湍溯渗 A 着落	情樂樣聚 B 操飲穿毟沂泝 B 洗淹淤渟滄澈 B 潜濟	槎標	塞 僅 轍 檢 D 桐 献 殆 毫 汕 沱 D 洵 渊 渝 渺 滔 禐 D 激 溶	樂權 槓 · · · · · · · · · · · · · · · · · ·	梅樟楠 F 標歐鴉毯市 F 洒淇潤渤溏 F 潘濘
	166 167 168 169 16A 16B 16C 16D 16E 170 171 172 173 174 175 176 177	5C5 5C6 5C7 [5D0] [5D1] 5D2 5D3 5D4 5D5 5D6 5D7 [5E0] [SE3] 5E2 5E3 5E4 5E5 5E6 5E7 [5F0] [5F1] 5F2 5F3 5F4	檢樹樹 0 欅 飲 殖 應 分 0 別 途 湮 滿 溥 0 澎 濱	楞繁繁檔 1 聚藥數彈氈泪 1 温浣潤清渝滂 1 漾潘濮	棒機從橇 2 樂檔欽殯氓版 2 泛涓淆渙游展 2 鴻濂濛	<b>植</b> 梗模	探神樞橙 4	艦权城権 5 權鬱聯受鼠泄 5 泪浹淌渾渣襬 5 潺潺飕飕	<b>菜榜機機 6</b> 棒棚歹殷氣决 6 澳浙淨液滉滬 6 清澡瀑	槐榕轉模 7 模数效殼汞弘 7 行選淒湫溷滸 7 澁澤養	世榴獎 <b>傷</b> 8 橡紮殀殿汕沽 8	稿 権 権 9 維 監 珍 母 辻 泗 9 連 講 淺 湶 澤 寮 9 澤 濱 濾	植鄉楼橙 A 楊欹殃毓汪泅 A 冷涅淙湍溯渗 A 潜荡瀛	情樂樣聚 B 棟飲好笔沂泝 B 洗淹淤渟泊澈 B 潜濟瀚	槎標橡樹 C 操歌殘毬冱沮 C 未測達湃溲滯 C 潭濕瀦	塞 僅 椒 檢 D 桐 献 ନ 毫 汕 沱 D 洵 渊 淪 渺 滔 푾 D 数 溶 瀝	樂權	梅律楠 F 標歌鳴毯市 F 洒淇潤渤溏 F 潘濘瀟
I/F   OF/   現 型 然 期 意   戦 院   取   箱   煤   膜   液   隆   隆	166 167 168 169 16A 16B 16C 16D 16E 170 171 172 173 174 175 176 177	5C5 5C6 5C7 [5D0] [5D1] 5D2 5D3 5D4 5D5 5D6 5D7 [SEI] 5E2 5E3 5E4 5E5 5E6 5E7 [SF0] [SF1] 5F2 5F3 5F4 5F5	檢欄樹 Q 欅 軟 檢 應 汾 Q 別 途 湮 滿 溥 Q 澎 濱 瀰	楞繁槧櫑 1	棒概從橇 2 樂播飲殯氓版 2 泛涓淆渙游溟 2 鴻濂濛潋	<b>植</b> 梗模	標轉幅橙 4	艦榠城幢 5 ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~	業榜機機 6 棒觀 7 殷氣決 6 澳浙淨渣 滉遐 6 潜渌瀑炒	槐榕轉輳 7 模数歿殼汞弘 7 行選淒湫溷滸 7 澁澤淺娟	世榴獎	稿 権 権 9 維 益 参 母 辻 泗 9 進 壽 淺 湶 澤 聚 9 澤 濱 遠 炬	植鄉核槍 A 編弘 癸 輸 汪 泅 A 治 涅 淙 湍 溯 渗 A 潜 溚 瀛 炸	情樂樣築 B 棟飲好笔沂泝 B 洗淹淤渟滄澈 B 潜濟鷸炳	槎樗樓 做 C	塞植橄檢 D 桐献殆毫沚沱 D 洵渊淪渺滔張 D 激潜瀝炽	樂權 槓 榰 E 機 軟 殞 霧 沁 沾 E 洳 瀬 淮 祻 藤 絳 E 潼 濔 滷 休	梅樟楠 F 樱歐鴉毯市 F 洒淇潤渤溏 F 潘澤瀟烝
	166 167 168 169 16A 16B 16C 16D 16E 16F 170 171 172 173 174 175 176 177 178 178 179 17A 17B 17C	5C5 5C6 5C7 [6D0] [5D1] 5D2 5D3 5D4 5D5 5D6 5D7 [5E0] [SE1] 5E2 5E3 5E4 5E5 5E6 5E7 [5F0] [5F1] 5F2 5F3 5F4 5F5 5F6	檢欄橱機 0 欅飲燈雕分 0 洌淦湮滿溥 0 澎濱彌烙	楞繁聚櫑 1   檗蘗數彈氈汨 1   沺浣涸清渝滂 1   漾濡濮瀾焉	棒機模 2 獎檔飲獲氓版 2 泛涓淆渙游展 2 鴻濂濛澈烽	<b>柱模模橢 3</b>	楪棒樞橙 4	艦模城権 5 權數贈 受 ( ) ( ( ) ( ( ) ) ( ) ) ( ) ) ( ) ) ) ( ) ) ) ( ) ) ) ( )	業榜機 6 棒 欄 夕 殷 氣 決 街 淨 渣 滉 遐 6 清 溁 瀑 炒 熙	槐榕轉模 7 横数效殼汞弘 7 行逐凄湫溷滸 7 澁澤濱炯熙	担相要 4 8 ■ 機 数 殀 殿 汕 沽 8 ■ 海 涕 淅 漾 滓 滾 8 ■ 麗 澹 瀏 燭 煦	稿権権権 9 嫌盜殄毋辻泗 9 瀘濤浅泉澤漿 9	植鄉核檢 A 楊敬殃・・ 編弘 映 ・	情樂樣聚 B 操飲穿毟沂泝 B 洗淹淤渟滄澈 B 潜濟鷸炳媛	槎樓樓做 C	塞槿嫩檢 D 桐歃殆毫沚沱 D 洵渊淪渺滔禐 D 数潜瀝烟熏	樂權 槓 榰 E 機 軟 殞 鍋 沁 沾 E 加 涵 淮 湎 膝 綠 E 潼 瀾 滷 沐 燻	梅樟楠 F 樱歐鴉毯市 F 洒淇潤渤溏 F 潘澤瀟烝

Character																	
Code	JIS Code	0	1	2	3	4	5	6	7	8	_	A	В	C	D	E	F
180	704	委	落	乘	霖	奏	杏	蹇	霰	薛	霽	畫	靄	鍵	靈	鏖	靉
181	705	靜	靠	. 靤	靦	靨	勒	製	報	鞆	鞅	靼	鞁	. 靺	鞆	鞋	鞏
182	602	Eb	燹	燿	爍	進	爛	藝	爭	爬	爱		_ 爻	<u> 21</u>	#	林	牆
183	603 604	段 狎	強	抵	<b>牾</b>	犂	犁	犇	箱	挙	檀	横	犹	- 豺	狃	神	狄
185	605	猥	滑	<b>络</b>	狭	狡默	狭猴	狷	<u> </u>	<b>猗</b>	親	猜	組 献	猝	雅珈	端玳	- 猩
186	606	玻	珀	珥	珮	珞	珊	現	瑯	琥	珸	- 排	琺	瑕	琿	瑟	- 斑
187	607	瑁	瑜	<b>坐</b>	瑰	瑣	瑪	瑶	- 瑾	璋	璞	監	瓊	職	瓔	珱	
		0	1	2	3	4	5	6	7	8	9	_	B	C	D	E	F
188	714	饑	饒	僕	雙	植	馘	馥	馭	馮	敷	A Mar	駛	駝	駘	麗	駭
189	715	較	駱	駲	駻	騣	騁	騏	騅	- 騈	騙	賽	騒	驅	験	驀	票
18A	612		瓠	霽	赴	瓩	瓮	瓲	瓰	瓱	通	~	敷	<b>髪</b>	題	順	甎
18B	613	娄	蹇	壁	甞	甦	一角	更	畄	腑	畊	畉	黔	畆	备	恢	時
18C	614	畧	畫	除	畸	當	蠹	疇	畴	疉	髪	疂	拧	疚	- 疝	疥	疣
18D	615	痂	疳	痃	疵	疽	疸	疼	疱	痍	痊	痒	痙	痣	痞	痾	痿
18E	616	痼	瘁	緂	痺	穰	痳	瘦	瘍	榆	瘟	継	将	瘡	瘢	瘤	瘴
18F	617	擦	瘻	艄	癈	癆	癜	瘓	凝	癢	墙	織	癥	癴	癬	權	
		0	1	2	3	4	5	6	7	8	9	Α	В	С	D	Е	F
190	724	鮴	鯀	滅	鮹	鯆	鯏	鯑	鯆	鯣	鯢	鲲	鯔	鯡	鰺	鯲	鯱
191	725	鯰	鰕	鯎	鰉	鰓	鯔	蜂	鰈	鰒	鰊	鯎	鰮	鰮	鳏	鰤	鰡
192	622		獺	9%	癸	發	- 皀	兒	飯	皋	皎	皖	皓	哲	皚	皰	皴
193	623	鞍	皹	籔	盂	畫	盖	盒	盏	盡	盥	盧	盪	<u> </u>	肹	眈	. 些
194	624 625	野寒	眩睹	瞎	真	<b>哲</b>	雎	麻繭	<b>作</b>	眸	膵	框	睨瞼	. 睫	睛	睥	- 容
196	626	*	嘴	矜	矣	矮	紅	砌	砒	礦	祖	催	硅	<u>瞽</u> 碎	蟾	<b>曚</b> 碆	- 選
197	627	錇	硃	碣	碵	磋	磁	磑	磆	産	礫	報	碼	磅	磊	磬	1478)
	<u> </u>	0	1	2	3	4	5	6	7								_
198	734	靐	<b>1</b> 33	鶯	鹵	誠	鹽	麁	廮	聚	9	A 麒	B 機	C	D 辭	麥	麩
199	735	麸	麪	麭	離	黄	黎	黏	鰗	黔	鸚		黝	點	黥	黨	點
19A	632	743	碵	碑	磽	磴	碘	礒	礑	礙	整	. 礫	祀	嗣	祇	- 二	離
19B	633	嬔	祓	祺	祿	禊	禝	14	**	禪	禮	禳	禹	禺	秉	秕	秧
19C	634	柜	秡	秣	稈	稍	稘	稙	稠	稟	禀	稱	稻	棄	稷	榕	穗
19D	635	穉	穑	穢	穩	稚	穣	穹	穽	窈	Bi	窕	窘	窖	窩	il.	*
19E	636	窶	竅	黛	窿	邃	簽	箱	竍	竏	鈖	竓	站	竚	玅	莂	竢
19F							_	100		. *1	>,,,	24	24.1	-1	24.	-11	
137	637	竦	齃	竰	笂	笏	笊	色	笳	答	笙	笞	范	笨	美	筐	
137	637	竦	揭	2	<b>筑</b> 3		-		_								F
1 A O	[744]					笏	笊	色	笳	笘	笙	各	范	笨	笶	筐	
1 A O 1 A 1	[744] [745]		1	2	3	笏 4	<b>欠</b> 5	<b>色</b>	笳 7	告 8	至 9	各 A	范 B	笨 C	笑 D	宦 E	F
1 A 0 1 A 1 1 A 2	[744] [745] 642	0	1	2 笄	3	<b>笏</b> 4	<b></b>	色 6 筅	新 7	答 8	至 9 美	咨 A 筧	范 B	笨 C 筱	笑 D 筬	筐 E	F
1 A 0 1 A 1 1 A 2 1 A 3	[744] [745] 642 643	0	1 <b>锭</b> <b>覧</b>	2 笄 稚	3 筍 箜	<b>第</b> 第	<b>第</b>	色 6 第	笳 7 <b>差</b>	答 8 答	至 9 英 箙	各 A	范 B 作 篁	安 C 筱	<b>英</b> D	筐 E 凝 凝	F 箝
1 A 0 1 A 1 1 A 2 1 A 3 1 A 4	[744] [745] 642 643 644	10 第	1 <b>筐</b> <b>篦</b>	2 笄 箍 賽	3 筍 <b>箜</b> 簑	<b>第</b> 4	<b>第 5 ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~</b>	色 6 筅 幕 籠	新 7 <b>差</b> 等 實	答 8 <b>宫</b> 等簇	至 9	各 A 复 策 筆	范 B 作 篁篷	安 C 後奏	笑 D 筬嵌簍	筐 E	F 箱篆
1 A O 1 A 1 1 A 2 1 A 3 1 A 4 1 A 5	[744] [745] 642 643 644 645	0 簡 簧	1 筐篦飾	2 笄稚賽	3 筍 羹 簑 簷	<b>第</b> 第 <b>第 第</b>	<b>第 5                                   </b>	色 6 第 第	新 7 <b>建等實</b>	<ul><li>答</li><li>8</li><li>答</li><li>等</li><li>簽</li></ul>	至 9 英 腋 族	各	范 B 作 篁 篷 籐	笨 C 筱篌樂樂	笑 D 筬嵌筆籟	筐 E	F 箱篆簧籤
1 A Q 1 A 1 1 A 2 1 A 3 1 A 4 1 A 5 1 A 6	[744] [745] 642 643 644 645 646	0 第 第	1 筐篦飾簪籬	2 笄 箍 簑 撃 料	3 筍 箜 簑 簷 批	第 4 等 簡 筆 編 护		色 6	新 7 選等實鑑楽	答 8 答 等 簇 <b>藝</b> 楠	至 9 茨腹膨瀕桐	答 A 覧簽纂箱	范 B 作皇篷籐梗	笨 C 筱篌樂樂	笑 D 筬嵌筆籟梁	筐 E	F 箱篆
1 A O 1 A 1 1 A 2 1 A 3 1 A 4 1 A 5	[744] [745] 642 643 644 645	0 簡著 簽 編 粽	1 (電質篩賽簾椛	2 笄箍賽簟籵糅	3 筍箜簑簷批糕	第 4 等 簡 無 和 稼		色 6	新 7 <b>差等實監</b> 來模	答 8 答 等 8 额 看 器	至 9 茨腹膨脹桐橋	答 A 复簽纂籀相欄	范 B 作篁篷籐梗糴	笨 C 筱篌樂樂架	笑 D	筐 E	F 箱篆簧畿粹
1 A 0 1 A 1 1 A 2 1 A 3 1 A 4 1 A 5 1 A 6 1 A 7	[744] [745] 642 643 644 645 646 647	0 第 第	1 筐篦飾簪籬	2 笄 箍 簑 撃 料	3 筍 箜 簑 簷 批	第 4 等 簡 筆 編 护		色 6	新 7 選等實鑑楽	答 8 答 等 簇 <b>藝</b> 楠	至 9 茨腹膨緩桐	答 A 覧簽纂箱	范 B 作皇篷籐梗	笨 C 筱篌樂樂	笑 D 筬嵌筆籟梁	筐 E	F 箱篆簧籤
1 A Q 1 A 1 1 A 2 1 A 3 1 A 4 1 A 5 1 A 6	[744] [745] 642 643 644 645 646	0 簡著 簽 編 粽	1 (電質篩賽簾椛	2 笄箍賽簟籵糅	3 筍箜簑簷批糕	第 4 等 簡 無 和 稼		色 6	新 7 <b>差等實監</b> 來模	答 8 答 等 8 额 看 器	至 9 茨腹膨脹桐橋	答 A 复簽纂籀相欄	范 B 作篁篷籐梗糴	笨 C 筱篌樂樂架	笑 D	筐 E	F 箱篆簧畿粹
1 A 0 1 A 1 1 A 2 1 A 3 1 A 4 1 A 5 1 A 6 1 A 7	[744] [745] 642 643 644 645 646 647	0 簡著 簽 編 粽	1 (電質篩賽簾椛	2 笄箍賽簟籵糅	3 筍箜簑簷批糕	第 4 等 簡 無 和 稼		色 6	新 7 <b>差等實監</b> 來模	答 8 答 等 8 额 看 器	至 9	答 A 复簽纂籀相欄	范 B 作篁篷籐梗糴	笨 C 筱篌樂樂架	笑 D	筐 E	F 箱篆簧畿粹
1 A Q 1 A 1 1 A 2 1 A 3 1 A 4 1 A 5 1 A 6 1 A 7	[744] [745] 642 643 644 645 646 647 [650] [651] 652 653	0 簡等	1 筐篦篩簪簾椛 1	2 笄箍賽簟料糅 2 紅機	3 管警賽簷批糕 3 批絣	第 4 等 3 第 編 柜 稼 4 条 經	<ul><li>第 签 等 等 等 等 等 等 等 等 等 等 等 等 等 等 等 等 等 等</li></ul>	色 6 笼幕籠籌粭廠 6 絋條	新 7 建筆實監楽模 7 紫 桜	<ul><li>答</li><li>8</li><li>答</li><li>等</li><li>(数</li><li>有</li><li>器</li><li>器</li><li>組</li><li>組</li></ul>	至 9	答 A 复簽睾瘤相欄 A 紵綺	范B 作篁篷籐梗羅B 絆緊	宋 C 筱篌楽籐祭糶 C 絳卷	笑 D	筐 E	F 箝篆簧籔枠 F
1A0 1A1 1A2 1A3 1A4 1A5 1A6 1A7	[744] [745] 642 643 644 645 646 647 [650] [651] 652 653 654	0 菌養養 輸粽 0 級緩	1 锭筐飾簪簾椛 1 対絮總	2 笄獾簑簟籵株 2	3 筍箜簑簷粃楳 3 批絣梅	第 4 第 3 第 4 第 2 系 經 縣	第 第 第 第 第 第 第 第 第 8 第 8 第 8 8 8 8 8 8 8	色 6 笼幕籠籌粭麜 6 絋條綟	新 7 選筆寶藍來模 7 紮 彩 報 棺	答 8 答 8 答 8 答 8 繼 8 繼 8	至 9 英	A 筧簽睾瘤相欄 A 紵綺緤	范 B 作 篁 篷 籐 梗 羅 B 絆 緊 緞	笨 C 筱篌樂樂祭糧 C 絳卷数	笑 D	筐 E	F
1A0 1A1 1A2 1A3 1A4 1A5 1A6 1A7	[744] [746] 642 643 644 645 646 647 [650] [651] 652 653 654 655	0 簡菁菁篇 粽 0 絨毯粒	1 鐘箟篩簪簾椛 1 対絮總縣	字	3 管警養批糕 3 批絣編縒	第 4 等 消 2		色 6	新 7 <b>建</b> 筆實監來模 7 ** ** * * * * * * * * * * * * * * *	答 8 答 8 答 8 题 4 組 4 組 4 展 数 有 器 8	至 9 英 服 影 猴 桐 橘 9 給 総 絹 縁	各 A 复簽單籀粨欄 A 籽綺碟器	范 B 作 篁 篷 籐 梗 糴 B 絆 緊 緞 糜	笨 C 筱篌楽廳祭曜 C	笑 D 筬篏簍籟梁糺 D 絖綵緲縹	筐 E	F
1A0 1A1 1A2 1A3 1A4 1A5 1A6 1A7	[744] [745] 642 643 644 645 646 647 [650] [651] 652 653 654 655 656	0 簡菁菁篇标 0 絨毯粒裸	1	字 籍 賽 章 十 林 2 紅 秋 組 経 概	3 管警察警批權 3 批絣網縒欄	第 4 等 河 篦 簫 和 稼 4 案 經 縣 縱 歡	笊 5 笠 3 築 3 等 8 場 4 5 網 5 網 6 網 6 網 7 の 7 の 8 の 8 の 8 の 8 の 8 の 8 の 8 の 8 の 8 の 8 の 8 の 8 の 8 の 8 の 9 <	色 6	新 7 差等實監 ※ 模 7 紮 彩 紹 組 線	答 8 答 8 答 8 卷 4 組 4 根 4 表 4 表 4 表 4 表 4 表 4 表 4 表 5 表 6 表 7	至 9	各 A 复	范 B 作 篁 篷 縣 梗 羅 B 絆 緊 緞 糜 繼	宋 C 筱篌楽籐祭曜 C	笑 D	筐 E	F
1A0 1A1 1A2 1A3 1A4 1A5 1A6 1A7	[744] [746] 642 643 644 645 646 647 [650] [651] 652 653 654 655	0 簡菁菁篇粽 0 絨毯 繼縲鐴	1	字	3	第 4 等 3 萬 5 年 4 素 經 縣 縱 撒 機	笊 5 笠 美 筆 簽 專 精 5 網 移 給 縟 繞 機	色 6 先帶龍籌拾廠 6 絋條綟糣繙纐	新 7 建等實監來模 7 紮 沒 棺 縋 橑 糭	答 8	至 9	各 A 莧蕨篳獅稻糲 A	范 B 作 算 篷 籐 梗 羅 B 料 緊 緞 糜 繼 纛	宋 C 核模築 縣 祭 糶 C 経 義 教 授 編 機	笑 D	筐 E	F 稍篆簧籔粋 F 絲綽槭縷檳
1A0 1A1 1A2 1A3 1A4 1A5 1A6 1A7	[744] [746] 642 643 644 645 646 647 [650] [651] 653 654 655 656 657	0 簡菁菁篇标 0 絨毯粒裸	1	字 籍 賽 章 十 林 2 紅 秋 組 経 概	3 管警察警批權 3 批絣網縒欄	第 4 等 河 篦 簫 和 稼 4 案 經 縣 縱 歡	笊 5 笠 3 築 3 等 8 場 4 5 網 5 網 6 網 6 網 7 の 7 の 8 の 8 の 8 の 8 の 8 の 8 の 8 の 8 の 8 の 8 の 8 の 8 の 8 の 8 の 9 <	色 6	新 7 差等實監 ※ 模 7 紮 彩 紹 組 線	答 8 答 8 答 8 卷 4 組 4 根 4 表 4 表 4 表 4 表 4 表 4 表 4 表 5 表 6 表 7	至 9	各 A 复	范 B 作 篁 篷 縣 梗 羅 B 絆 緊 緞 糜 繼	宋 C 筱篌楽籐祭曜 C	笑 D	筐 E	F
1A0 1A1 1A2 1A3 1A4 1A5 1A6 1A7 1A8 1A9 1AA 1AB 1AB	[744] [746] 642 643 644 645 646 647 [650] [661] 652 653 654 655 656 656	0 簡菁菁篇粽 0 絨毯 繼縲鐴	1	字	3	第 4 等 3 萬 5 年 4 素 經 縣 縱 撒 機	笊 5 笠 等 策 專 精 5 網 移 輪 網 機	色 6 先帶龍籌拾廠 6 絋條綟糣繙纐	新 7 建等實監來模 7 紮 沒 棺 縋 橑 糭	答 8	至 9	各 A 莧蕨篳獅稻糲 A	范 B 作 算 篷 籐 梗 羅 B 料 緊 緞 糜 繼 纛	宋 C 核模築 縣 祭 糶 C 経 義 教 授 編 機	笑 D	筐 E	F 稍篆簧籔粋 F 絲綽槭縷檳
1A0 1A1 1A2 1A3 1A4 1A5 1A6 1A7 1A8 1A8 1A9 1AA 1AB 1AC 1AD 1AE 1AF	[744] [745] 642 643 644 645 646 647 [650] [651] 652 653 654 655 656 657	0 簡菁菁篇粽 0 絨毯 繼縲鐴	1 電電節審算机 1 対架總縣鏈艦 1	字 籍 章 料 林 2 紅 機 網 祥 標 欄 2	3	第 4 等 3 距 編 和 稼 4 条 經 縣 縱 糤 緞 4		色 6	加 7 差等質監楽模 7	答 8	至 9	答 A	范 B 作篁篷籐梗羅 B 絆綮緞糜繼藏 B	完 C 夜後楽 繁榮曜 C 経総数機構機 C	笑 D	筐 E	F 指篆寶籔粹 F
1A0 1A1 1A2 1A3 1A4 1A5 1A6 1A7 1A8 1A8 1AA 1AB 1AC 1AD 1AE 1AF	[744] [745] 642 643 644 645 646 647 [650] [651] 652 653 654 655 656 657	0 簡菁黃篇粽 0 級綫 粒縲辮	1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	2 笄稚簑簟籵株 2 紅槐綱縡繧纈 2	3	第 4 等 3 距 編 和 稼 4 案 經 縣 縱 糤 積 4		色 6	加 7 差等實施來模 7 紮 沒 棺 縋 繚 稷 7	答 8 答 8 答 8 繼 組 報 機 釋 程 8 图	至 9	答 A 复	范 B 作篁篷籐梗羅 B 絆綮緞糜繼藏 B	完 C 核後築験祭糧 C 経総数機構機 C	笑 D	筐 E	F 指案資驗枠 F 絲綽槭縷橘 F
1A0 1A1 1A2 1A3 1A4 1A5 1A6 1A7 1A8 1A9 1AA 1AB 1AC 1AD 1AE 1AF	[744] [746] 642 643 644 645 646 647 [650] [651] 652 653 654 655 656 657	0 簡菁黃篇粽 0 総綫粒縲辮	1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	2	3	第 4 第 第 5 第 6 第 7 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	<ul><li>午 5</li><li></li></ul>	<ul><li>笠 6</li><li></li></ul>	加 7 <b>建筆實藍來模 7</b> 紫綏綰継繚纓 7 罕羞	答 8 答 8 答 8 繼 8 繼 8 器 8	至 9	答 A	范 B 作量篷籐梗羅 B 絆 緊緞 糜糟 B 昆羯	宋 C 筱後寮鱳粲糶 C 絳卷教縵纗纜 C 罨義	笑 D 総 嵌 額 梁 礼 D 総 統 郷 郷 橋 紅 D 単 糞	筐 E	F
1A0 1A1 1A2 1A3 1A4 1A5 1A6 1A7 1A8 1A8 1AA 1AB 1AC 1AD 1AE 1AF	[744] [745] 642 643 644 645 646 647 [650] [651] 652 653 654 655 656 657	0 簡菁黃篇粽 0 級綫 粒縲辮	1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	2 笄稚簑簟籵株 2 紅槐綱縡繧纈 2	3	第 4 等 3 距 編 和 稼 4 案 經 縣 縱 糤 積 4		色 6	加 7 差等實施來模 7 紮 沒 棺 縋 繚 稷 7	答 8 答 8 答 8 繼 組 報 機 釋 程 8 图	至 9	答 A 复	范 B 作篁篷籐梗羅 B 絆綮緞糜繼藏 B	完 C 核後築験祭糧 C 経総数機構機 C	笑 D	筐 E	F 指案資驗枠 F 絲綽槭縷橘 F
1A0 1A1 1A2 1A3 1A4 1A5 1A6 1A7 1A8 1A9 1AA 1AB 1AC 1AD 1AE 1AF	[744] [746] 642 643 644 645 646 647 [650] [661] 652 653 654 655 656 657 [660] [661] 662 663 664	0 簡菁養稀粽 0 絨綫粒縲辮 0	1 龍箟飾簪雕椛 1 対絮總縣鏈艦 1 罅羆羞	2	3	第 4 第 第 5 第 6 第 7 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8		笠 6	加 7 <b>建筝寶藍來模 7</b> 紫綏綰継繚纓 7 罕羞翡	答 8 答 8 答 8 差 8 維 組 組 級 操 釋 機 8 四 五 前	至 9	答 A	范 B 作 篁窪縣 梗羅 B 絆 緊 嚴 羅 B B B B B B	宋 C 筱後楽録祭曜 C 経総数機構機 C 電影線	笑 D	筐 E	F
1A0 1A1 1A2 1A3 1A4 1A5 1A6 1A7 1A8 1A9 1AA 1AB 1AC 1AD 1AE 1AF	[744] [746] 642 643 644 645 646 647 [650] [661] 652 653 654 655 656 657 [660] [661] 662 663 664 665	① 簡響簧籥棕 O 絨毯粒裸辫 O 羂贏来	1	2	3 6 空賽賽批准 3 批絣網縒網籍 3 唇欄翠相	第 4 等 3 節	笊 5 签箋築簽專精 5 網絡網絡網 新	笆 6 筅帶龍籌拾廠 6 絋條綟糣繙纐 6 网羔翔耿	新 7	答 8 答 8 答 8 差 8 維 2 等 8 維 2 第 8 維 2 新 4 器 8 2 2 3 4 8 9 8 9 <td>至 9</td> <td>答 A 复</td> <td>范 B 作 算 注</td> <td><ul><li>完 で で で で で で で で で で で で で で で で で で で</li></ul></td> <td>笑 D</td> <td>筐 E</td> <td>F 新篆竇巖粹 F 絲掉槭縷檳 F 討羶盞聠</td>	至 9	答 A 复	范 B 作 算 注	<ul><li>完 で で で で で で で で で で で で で で で で で で で</li></ul>	笑 D	筐 E	F 新篆竇巖粹 F 絲掉槭縷檳 F 討羶盞聠
1A0 1A1 1A2 1A3 1A4 1A5 1A6 1A7 1A8 1A8 1AA 1AB 1AC 1AD 1AE 1AF	[744] [745] 642 643 644 645 646 647 [650] [681] 652 653 654 655 656 (661) [661] 662 663 664 665 665	0 簡著黃篇粽 0 絨綫縫縹辮 0 羂贏未鋒	1	2	3 6 空賽簷批棋 3 批絣網縒網椅 3 唇耦翠耜聶	第 4 第 3 第 4 第 4 第 4 第 4 8 8 8 8 9 1 1 1 1 1 1 1 1 1	笊 5 签箋藥簽專精 5 網絡網絡網 新 新 新 新 新 表 新 表 新 表 新 表 新 表 表 新 表 、 </td <td>笆 6 筅帶龍籌給藥 6 紅條綟衛繙續 6 网羔翔耿聿</td> <td>加 7 <b>差筆寶鑑</b>來模 7 紫綏綰縋橑纓 7 罕羞弱耻肆</td> <td>答 8 答 8 答 8 题 4 組 4 器 8 题 4 器 8 题 4 器 8 器 8 题 4 器 8 器 8 题 5 器 9</td> <td>至 9</td> <td>答 A</td> <td>范 B 作篁藻籐梗羅 B 絆綮緞糜繼藏 B</td> <td>来 C                                    </td> <td>笑 D</td> <td>筐 E</td> <td>F 新篆竇巖粹 F 絲掉槭縷檳 F 討羶盞聠</td>	笆 6 筅帶龍籌給藥 6 紅條綟衛繙續 6 网羔翔耿聿	加 7 <b>差筆寶鑑</b> 來模 7 紫綏綰縋橑纓 7 罕羞弱耻肆	答 8 答 8 答 8 题 4 組 4 器 8 题 4 器 8 题 4 器 8 器 8 题 4 器 8 器 8 题 5 器 9	至 9	答 A	范 B 作篁藻籐梗羅 B 絆綮緞糜繼藏 B	来 C	笑 D	筐 E	F 新篆竇巖粹 F 絲掉槭縷檳 F 討羶盞聠
1A0 1A1 1A2 1A3 1A4 1A5 1A6 1A7 1A8 1A8 1AA 1AB 1AC 1AD 1AE 1AF	[744] [745] 642 643 644 645 646 647 [650] [681] 652 653 654 655 656 (661) [661] 662 663 664 665 665	0 歯養養 輸 に 0 絨毯 経縲鏘 0 羂贏未発胛	1 健箟飾簪離桃 1 対絮總縣縺鑑 1 罅脈叢耘聲胥	2	3	第 4 第 3 第 4 第 4 第 4 第 4 第 4 8 8 8 9 1 1 1 1 1 1 1 1 1	笊 5 笠箋簗簽粵糒 5 網務輪縟纏 5 罐芜肴褥聽胚	笠 6 粒條製着橋類 6 网 所 3 財 取 事 財	新 7	苦 8	至 9	答 A	范 B 作量藻籐梗羅 B 絆 紫緞糜繼藏 B	宋 C	笑 D	筐 E	F 指案资量枠 F 絲掉槭縷檳 F 尉羶盞胼肬
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1A0 1A1 1A2 1A3 1A4 1A5 1A6 1A7 1A8 1A8 1A9 1AA 1AB 1AC 1AD 1AE 1AF 1B0 1B1 1B2 1B3 1B4 1B5 1B6 1B7	[744] [745] 642 643 644 645 646 647 [650] [651] 652 653 654 655 656 657 [660] [661] 662 663 664 665 666 667	0 簡著黃篇棕 0 絨毯糍縲辮 0 料羸耒柴胛 0	1 食箟飾簪雕椛 1 対架總縣纏艦 1 罅脈蓋耘整胥 1 陏	2	3	第 4 等 3	<ul><li>午</li></ul>	芭 6	第 2 第 3 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	答 8	至 9	答 A	范 B 作臺藻縣模羅 B 絆緊緞際繼藏 B 昆羯翹聘肓脩 B 腴	宋 C	笑 D	筐 E	F
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Teo   [746]					-				_		-		•	-				- PH
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1 E 7     6C7     限 院 與 晚 晚 晚 號 健 課 題 獎 別 联 所 翰 颜 蹊       0 1 2 3 4 5 6 7 8 9 A B C D E F       1 E 8 [6D0]     [6D0]       1 E 9 [9D1]     1 E A 6D2     蹇 蹉 節 節 節 蹙 蹤 麗 歸 풹 獅 蹬 趺 疑 疑 疑 疑 疑 疑 疑 疑 疑 疑 疑 疑 疑 疑 疑 疑 疑 疑	1 F 5				_	豎	夏	豖	豢	豬	*	豺	貂	貉	貅	貊	貍	貎
TE9   GDQ    FEDQ     . ~ ~	6C4	貔	豼	貘	豎 戝	豊质	<b>豕</b>	豢 貽	豬賃	貧	豺貮	船貶	<b>貉</b> 賈	<b>貅</b>	貊 賤	狸賣	親費	
1 E 9	1 E 6	6C4 6C5	雞賽	<b>豼</b> 賺	<b>頻</b> 膊	<b>監</b> 敗 贄	豊质贅	<b>豕                                    </b>	拳 胎 質	猪賃贏	豸 武 贈	射貮	船艇	<b>新</b> 賈 贓	<b>新</b> 賁 賍	貊 賤 贔	狸賣	親費
1 E 9         [6D1]         寒 蹉 賄 脐 脐 蹙 嚴 麗 麗 脐 湃 蹶 郑 跷 跷 跷 目 E A GD2         寒 蹉 賄 脐 脐 屬 屬 屬 屬 關 關 關 屬 所 縣 縣 郑 郑 跷 跷 縣 和 程 较 報 图 图 图 图 图 图 图 图 图 图 图 图 图 图 图 图 图 图	1 E 6	6C4 6C5 6C6	雅賽	<b>豼</b> 賺	<b>頻</b> 膊	<b>監</b> 敗 贄	豊质贅趙	<b>豕                                    </b>	祭 胎 費 趾	豬賃贏趺	豸 武 贍 跏	豺 賞 職 獨	貂貶賣跖	<b>络賈臧跌</b>	<b>貅</b> 賁 脏 跛	<b>貊</b> 賤 最 跋	狸賣臉跪	親費
1 EA         6D2         蹇         遊         節         野         定         股         腕         脚 </td <td>1 E 6 1 E 7</td> <td>6C4 6C5 6C6 6C7</td> <td><b>変</b> 務 限</td> <td><b>豼</b> 康 <b>支</b> <b>跣</b></td> <td><b>集</b> 財 起 場</td> <td><b>豎</b> 戝 贄 趁 疎</td> <td>夏质贅趙踉</td> <td><b>豕食贊跂跿</b></td> <td>拳 胎 費 趾 踝</td> <td>豬貨贏趺踞</td> <td>豸 武 贈 跏 践</td> <td><b>射</b> 武 <b>睦 m m</b></td> <td>貂 貶 壽 跖 蹂</td> <td><b>络賈臧跌踵</b></td> <td><b>貅 賁 賍 跛 踚</b></td> <td><b>貊</b></td> <td>狸賣贖跪蹊</td> <td>親資報</td>	1 E 6 1 E 7	6C4 6C5 6C6 6C7	<b>変</b> 務 限	<b>豼</b> 康 <b>支</b> <b>跣</b>	<b>集</b> 財 起 場	<b>豎</b> 戝 贄 趁 疎	夏质贅趙踉	<b>豕食贊跂跿</b>	拳 胎 費 趾 踝	豬貨贏趺踞	豸 武 贈 跏 践	<b>射</b> 武 <b>睦 m m</b>	貂 貶 壽 跖 蹂	<b>络賈臧跌踵</b>	<b>貅 賁 賍 跛 踚</b>	<b>貊</b>	狸賣贖跪蹊	親資報
1 E B     6D3     珠 獨 壁 断 片 報 哪 團 團 團 圖 新 好 躰 體 躱 較 額 1 E C 6D4 軀 輛 輛 輛 輛 輛 較 較 較 較 輕 較 輕 輕 極 較 報 報 報 報 報 報 報 報 報 報 報 報 報 報 報 報 報 報	1 E 6 1 E 7	6C4 6C5 6C6 6C7	<b>変</b> 務 限	<b>豼</b> 康 <b>支</b> <b>跣</b>	<b>集</b> 財 起 場	<b>豎</b> 戝 贄 趁 疎	夏质贅趙踉	<b>豕食贊跂跿</b>	拳 胎 費 趾 踝	豬貨贏趺踞	豸 武 贈 跏 践	<b>射</b> 武 <b>睦 m m</b>	貂 貶 壽 跖 蹂	<b>络賈臧跌踵</b>	<b>貅 賁 賍 跛 踚</b>	<b>貊</b>	狸賣贖跪蹊	親資報
1 E C         6D4         糖         概         机         板         表         板         村         校         板<	1 E 6 1 E 7 1 E 8 1 E 9	6C4 6C5 6C6 6C7 [6D0]	<b>変</b> 務 限	<b>豼 賺</b> 赱 跣	<b>頻</b> <b>期</b> <b>2</b>	股 敗 散 趁 陳 3	豊质贅趙踉 4	<b>豕貨贊跂跿</b> 5	拳 胎 登 趾 ほ 6	豬賃贏趺踞 7	豸 貳 贈 跏 践 8	射 武	貂 貶 膏 跖 踩 A	絡 賈 職 跌 踵 B	新 責 賍 数 隆 C	貊 賤 最 跋 題 D	狸 賣	親 費 載 を F
1 E D     6D5     輟 輛 輌 鞏 輳 輛 轅 較 報 較 報 報 輕 轉 極 桶 帳 橋 幅 幅 幅 幅 图 图 图 图 图 图 图 图 图 图 图 图 图 图 图	1 E 6 1 E 7 1 E 8 1 E 9 1 E A	6C4 6C5 6C6 6C7 [6D0] [6D1] 6D2	雅 春 格 限 0	<b>豼賺赱跣</b> ↑	ります。 ります。 変験がある。 とは、 とは、 とは、 とは、 とは、 とは、 とは、 とは、	豎 敗 贄 趁 疎 3	豊质養趙踉 4	<b>豕貨贊跂踺</b> 5	泰 胎 費 趾 足 6	豬質贏趺踞 7	考 武 贈 別 践 8	射 武 脂 脂 別 9	貂 貶 膏 跖 踩 A	絡買職跌踵 B	新 責 脏 破 確 C	組 競 動 り り り	狸 賣	親資報 で ・ ・ ・ ・ ・ ・ ・ ・ ・ ・ ・ ・ ・
1 E E     6D6     標 照 幅 率 辟 辣 辭 辯 元 迚 迥 迢 进 选 選 達 进       1 E F     6D7     逅 涟 適 光 逕 逡 道 逞 逝 遍 遊 遙 達 进       0 1 2 3 4 5 6 7 8 9 A B C D E F       1 F Q     [6E0]       1 F 1 (5E1)     週 選 週 週 逾 逾 適 選 越 趣 歷 益 歷 盈 區 平       1 F 2 6E2     週 週 選 週 週 適 逾 逾 適 選	1 E 8 1 E 9 1 E A 1 E B	6C4 6C5 6C6 6C7 [6D0] [6D1] 6D2 6D3	<b>雅春赭限</b> 0	<b>豼 賺 赱 跣 ↑</b>	集 類 数 第 2 と と と と と と と と と と と と と と と と と と	豎	夏质贅趙踉 4	不負費 b 財政 ま 5 	泰 胎 野 趾 踝 6	豬賃贏跌踞 7	豸 武 贈 跏 践 8	射貮 <b>壁</b>	貂 貶 膏 跖 踩 A	格賈w 跌踵 B	新 責 賍 跋 踰 C 蹶 躰	組 競 動 り り り り り り り り り り り り り り り り り り	狸 賣	親 費 報 是 展 躾
1 E F     6D7     近 速 通 速 運 速 週 選 選 週 월 월 월 월 월 월 월 월 월 월 월 월 월 월 월 월	1 E 6 1 E 7 1 E 8 1 E 9 1 E A 1 E B 1 E C	6C4 6C5 6C6 6C7 [6D0] [6D1] 6D2 6D3 6D4	雅 養 精 服 0 賭 軅	<ul><li>批 赚 支 跌 1</li><li> 蹇 獨 轆</li></ul>	集 類 2 選 見 題 見 と と 見 れ	豎戝贄趁睞 3 蹌蹐軛	夏质養趙踉 4	<b>豕食贊跂跿 5</b> 蹈躓軼	泰 胎 野 趾 踝 6 慶 聯 啊	豬賃贏跌踞 7 從應軫	多武 贈 助 践 8 題 職	射武 <b>造</b>	貂貶賣跖蹂 A 蹣跚輅	格賈web B B B B B B B B B B B B B B B B B B B	貅 責 賍 跛 趾 C ■ 蹶 躰 輒	貊賤 最跋踴 D 蹲 體報	程	親實報 是 是 集 報
TFQ   [6E0]   TFQ   [6E1]   TFQ   [6E1]   TFQ   [6E1]   TFQ   GES   TFQ   T	1 E 6 1 E 7 1 E 8 1 E 9 1 E A 1 E B 1 E C 1 E D	6C4 6C5 6C6 6C7 [6D0] [6D1] 6D2 6D3 6D4 6D5	雅賽 赭限 O	批 赚 支 比 ↑ 多 四 整 輛	<b>須赙赳跼 2</b>	豎戝贄趁睞 3 蹌蹐軛輦	夏质質趙踉 4	不負費及鍵 5 蹈戰軟幅	<ul><li>衆胎資趾踝 6</li><li>蹙躑軻輹</li></ul>	猪賃贏趺踞 7 蹤邏軫轅	多	豺貮 <b>睦</b> 野 男	貂貶膏跖蹂 A 蹣鞴幣幣	格買喊跌踵 B 路躬輕轉	新 真 賍 跋 蹌 C 蹶 躰 輒 轋	領 野 最 数 関 D の の の の の の の の	程	親實報跫 F 躁躾輻轎
1 FQ     [6E0]       1 F1     [6E1]       1 F2     6E2     地 超 遠 通 道 道 道 道 道 遠 適 選 應 整 應 經 率       1 F3     6E3     建 連 邁 整 通 運 邮 邮 邱 平 郭 添 屆 平 事       1 F4     6E4     都 邮 耶 都 前 放 府 府 府 府 府 府 府 府 府 府 府 府 府 府 府 府 府 府	1E6 1E7 1E8 1E9 1EA 1EB 1EC 1ED	6C4 6C5 6C6 6C7 [6D0] [6D1] 6D2 6D3 6D4 6D5 6D6	<b>雅賽赭股 0                                   </b>	<b>豼賺支跣 ↑</b> 蹇躅魒輛		豎戝贄趁陳 3 蹌躓軛輦辜	皇质贅趙踉 4	不負費及疑 5 蹈躓帙輻辣	<ul><li>拳 監 整 轉 轉 幹</li></ul>	猪賃贏趺踞 7 從鹽軫轅辯	多	豺貮 <b>駿</b> 跚 9	貂貶膏跖蹂 A 聯聯幣轉週	格買職跌踵 B 野躬輕轉迢	(外貢賍波隆 C )	貊賤贔跋踴 D 蹲軆輙轎迯	程 賣 贖 跪 蹊 E	親實報跫 F 躁躾輻轎
1 F1     [6E1]       1 F2     6E2     选 照 違 適 適 逾 逾 減 減 減 減 減 整 適 陵 運       1 F3     6E3     避 適 遊 適 適 適 適 減 減 減 減 整 適 陵 運       1 F4     6E4     都 部 耶 都 前 成 成 前 縣 務 前 配 前 縣 額 1       1 F5     6E5     窗 儲 醇 離 體 額 職 費 和 釋 粒 切 釞 全 幼 銀 1       1 F6     6E6     致 绝 約 新 紗 鈬 針 級 銀 鉗 矩 섫 鉤 绽 頻 鋼       1 F7     6E7     鉋 約 新 紗 鈬 針 級 銀 鉗 矩 섫 鉤 绽 頻 鋼       1 F8     [8F0]       1 F9     [6F1]       1 FA     6F2     緬 錢 錚 級 錫 鄉 線 線 銀 銀 線 銀 線 銀 線 銀 銀 1       1 FB     6F3     鎔 銀 網 銀 線 銀 銀 銀 線 銀 線 銀 線 銀 銀 1       1 FD     6F5     油 銀 網 銀 銀 銀 銀 銀 銀 別 間 関 関 関 関 関 関 関 間 間 関 関 関 関 関 関 関 関 関	1E6 1E7 1E8 1E9 1EA 1EB 1EC 1ED	6C4 6C5 6C6 6C7 [6D0] [6D1] 6D2 6D3 6D4 6D5 6D6	<b>雅賽緒跟 0</b>	<b>豼賺赱跣 1</b> 蹇躅魒輛轣迹	<ul><li>集 を</li></ul>	豎戝贊趁睞 3 蹌躓軛輦辜逑	息质黄趙踉 4	系負費及疑 5  路置軼輻辣浚	<b>泰貽贇趾踝 6 蹙踯軻輹辭</b> 逍	猪貨贏跌踞 7	多	射貮 脂肪 胃別 9  	貂貶騫斯蹂 A 蹣鞴輅轉週逧	格買喊跌踵 B 選躬輕轉迢逶		貊賤贔跋踴 D 蹲軆輙轎迯逹	程 賣 贖 跪 蹊 E     蹼 躱 輓 轄 邇 迸	犯資報跫 F 躁躾輻幅洹
1 F 2     6E2     选 超 递 通 超 递 通 通 通 递 速 整 透 歷 流 隆 포       1 F 3     6E3     差 連 週 邀 透 通 運 邮 III 邱 邵 邓 祁 尼 邓 鄂       1 F 4     6E4     鄉 哪 耶 前 財 價 附 所 所 所 所 所 所 所 所 所 所 所 所 所 所 所 所 所 所	1E6 1E7 1E8 1E9 1EA 1EB 1EC 1ED	6C4 6C5 6C6 6C7 [6D1] 6D2 6D3 6D4 6D5 6D6 6D7	<b>雅賽緒跟 0</b>	<b>豼賺赱跣 1</b> 蹇躅魒輛轣迹	<ul><li>集 を</li></ul>	豎戝贊趁睞 3 蹌躓軛輦辜逑	息质黄趙踉 4	系負費及疑 5  路置軼輻辣浚	<b>泰貽贇趾踝 6 蹙踯軻輹辭</b> 逍	猪貨贏跌踞 7	多	射貮 脂肪 胃別 9  	貂貶騫斯蹂 A 蹣鞴輅轉週逧	格買喊跌踵 B 選躬輕轉迢逶		貊賤贔跋踴 D 蹲軆輙轎迯逹	程 賣 贖 跪 蹊 E     蹼 躱 輓 轄 邇 迸	犯資報跫 F 躁躾輻幅洹
1F3     6E3     選達     選適     遊邊     選帳     邮     邮     印     印     印     印     印     印     印     印     印     印     印     印     印     印     印     印     印     印     印     日	1E6 1E7 1E8 1E9 1EA 1EB 1EC 1ED 1EE 1EF	6C4 6C5 6C6 6C7 [6D0] [6D1] 6D2 6D3 6D4 6D5 6D6 6D7	<b>雅賽緒跟 0</b>	<b>豼賺赱跣 1</b> 蹇躅魒輛轣迹	<ul><li>集 を</li></ul>	豎戝贊趁睞 3 蹌躓軛輦辜逑	息质黄趙踉 4	系負費及疑 5  路置軼輻辣浚	<b>泰貽贇趾踝 6 蹙踯軻輹辭</b> 逍	猪貨贏跌踞 7	多	射貮 脂肪 胃別 9  	貂貶騫斯蹂 A 蹣鞴輅轉週逧	格買喊跌踵 B 選躬輕轉迢逶		貊賤贔跋踴 D 蹲軆輙轎迯逹	程 賣 贖 跪 蹊 E     蹼 躱 輓 轄 邇 迸	犯資報跫 F 躁躾輻幅洹
1 F 4     6E4     鄉 縣 縣 縣 縣 縣 縣 縣 縣 縣 縣 縣 縣 縣 縣 縣 縣 縣 縣 縣	1E6 1E7 1E8 1E9 1EA 1EB 1EC 1ED 1EE 1EF	6C4 6C5 6C6 6C7 [6D0] [6D1] 6D2 6D3 6D4 6D5 6D6 6D7	<b>雅賽緒跟 0</b>	批 账 支 比 1 蹇 獨 躽 輛 轣 述 1	集	豎戝贄趁陳 3 始臍軛輦辜迷 3	息质質趙踉 4	豕負贊跂跿 5 蹈躓軼輻辣逡 5	拳胎 整 整	猪質贏趺踞 7 羅邈軫轅辯逞 7	多武贈跏蹼 8 蹠調試設 2 8	射貮 <b>獨</b> 別 9	绍貶賣跖蹂 A 聯聯幣轉週逧 A	络賈臧跌踵 B 羅躬輕轉迢逶 B	外責班政論 C	貊賤 最跋踴 D 跨體 軟轎 迯達 D	狸 賣 贖 跪 蹼 E    蹼 躱 輓 轄 邇 迸 E	親査報 R
1 F 5     6E 5     ISB     IBB     IB	1 E 6 1 E 7 1 E 8 1 E 9 1 E A 1 E C 1 E D 1 E E 1 E F 1 F O 1 F 1 1 F 2	6C4 6C5 6C6 6C7 [6D0] [6D1] 6D2 6D3 6D4 6D5 6D6 6D7	<b>黎賽</b>	批	集	豎戝 實 趁 陳 3 站 跨 軛 輦 辜 迷 3 遑	豊质質趙踉 4	豕負贊跂跿 5 蹈躓軼輻辣逡 5	<b>拳胎</b> 野 野 野 野 野 野 野 野 野 野 野 前 道 6	猪質贏趺踞 7    從遊軫轅辯逞 7	多	豺貮 <b>睦跚</b> 9	绍貶賣跖蹂 A 鞴躡輅轉週逧 A	络買喊跌踵 B 選躬輕轉迢透 B	貅 賁賍跋蹌 C	貊賤 最跋踴 D 跨體 軟轎 迯達 D	狸 齊 贖 跪 蹼 E 蹼 躱 輓 轄 選 进 E 随	犯資報 是
1 F7     6E7     鏡 鎖 銜 鉢 銓 銘 錦 線 錄 錫 鋩 经 鏡 鏡 鋼       0 1 2 3 4 5 6 7 8 9 A B C D E F       1 F8 [6F0]     (6F1)       1 F9 [6F1]     編 錢 錚 缀 錫 姚 紋 銀 盤 紋 爺 鎌 縫 鐘 鋼 第       1 FA 6F2     編 錢 錚 缀 錫 姚 紱 錄 鐘 鐘 鍵 黛 鐘 線 鐘 百 級 第       1 FB 6F3     鎔 盤 鑒 壁 鉱 縮 綠 紱 鐘 響 鏈 線 鐘 鐘 線 鐘 鐘 線 鐘 1 景 銀 銀 銀 鐘 4 景 章 鐘 4 景 章 鐘 4 景 章 鐘 4 景 鐘 4 景 章 章 章 章 章 章 章 章 章 章 章 章 章 章 章 章 章 章	1E6 1E7 1E8 1E9 1EA 1EB 1EC 1ED 1EE 1EF	6C4 6C5 6C6 6C7 [6D0] [6D1] 6D2 6D3 6D4 6D5 6D6 6D7 [6E0] [6E0] 6E2 6E3	第一条 第一条 第一条 第一条 第一条 第一条 第一条 第一条	批 賺 支 跣 1 蹇 獨 魒 輛 轣 述 1 過 選	復赎赳跼 2	豎敗 實	豊质養趙踉 4	豕負贊跂裝 5 蹈戳軟輻辣逡 5 過過	拳 B Y B B B B B B B B B B B B B B B B B	猪質贏趺踞 7    從躔軫轅辯逞 7    逾邨	多	豺貮 <b>睦跚</b> 9	貂貶膏跖蹂 A 蹣躡格奪迴逧 A	络買喊跌踵 B 選躬輕轉迢逶 B 邀郢	貅 賁 賍 跋 蹌 C 蹶 躰 輒 轆 迪 逹 C 蹇 郤	領 ・ ・ ・ ・ ・ ・ ・ ・ ・ ・	狸賣贖跪蹊 E 蹼躱輓轞避进 E 隨郛	犯資報 是
TFB   GF0   TFB   GF4   TFB   GF6   TFB   1E6 1E7 1E8 1E9 1EA 1ED 1EC 1ED 1EE 1EF 1F0 1F1 1F2 1F3 1F4 1F5	6C4 6C5 6C6 6C7 [6D0] [6D1] 6D2 6D3 6D4 6D5 6D6 6D7 [6E0] [6E1] 6E2 6E3 6E4	第一条	批 赚 之 跌 1 蹇 獨 聽 輛 轣 述 1 過 選 鄙	復赎担跼 2	豎戝贊趁睞 3 蹌臍軛輦辜逑 3	息质黄趙踉 4 蹐踏喪輳辟逕 4 逍邊酊	豕負質跂毙 5 蹈躓軼輻辣逡 5 通過散	拳胎 整 整 影 制 複 解 調 を の の の の の の の の の の の の の	猪質贏趺踞 7      從應軫轅辯逞 7     逾邮酣	多	豺爪鹽獨別 9 踪躪輕緩迚逋 9 遊邱觡	貂貶膏跖蹂 A 蹣跚格轉迴逧 A	格買喊跌踵 B 羅躬輕轉迢逶 B 邀郢酲	貅 真 賍 跋 踰 C 蹶 躰 輒 轆 迪 逵 C 蹇 郤 醋	領 ・ ・ ・ ・ ・ ・ ・ ・ ・ ・	程	犯資報 <sup>2</sup> F 躁躾輻輻道 F 運那醢	
1 F 8 [6F0]       1 F 9 [6F1]       1 F A 6F2     編 錢 錚 缀 錺 挑 就 跟 親 鍼 爺 鎌 鎰 鎬 第       1 F B 6F3     鎔 鑒 歷 鏨 縮 緣 錄 鐸 鐸 總 鍊 鍊 鍵 繳 鈐       1 F C 6F4     豬 鐐 頌 鄉 織 錄 箱 發 響 鄉 練 鍵 繳 鈐       1 F D 6F5     瑜 雅 編 續 號 羅 鑒 寶 門 門 岡 関 関 開 間       1 F E 6F6     関 関 関 関 関 関 関 関 関 関 関 関 関 関 関 関 関 関 関	1E6 1E7 1E8 1E9 1EA 1EB 1EC 1ED 1EE 1EF 1F0 1F1 1F2 1F3 1F4 1F5 1F6	6C4 6C5 6C6 6C7 [6D0] [6D1] 6D2 6D3 6D4 6D5 6D6 6D7 [6E0] [6E1] 6E2 6E3 6E4 6E5 6E6	第一套	批 账 支 比 1 蹇 獨 魒 輛 饗 述 1 過 遅 鄙 醛 鉋	復 時 起 跼 2 と と と と と と と と と と と と と と と と と と	豎戝贄趁陳 3 蹌臍軛輦辜逑 3 遑邀都醾釿	息质質趙踉 4	豕負贊跂毙 5 蹈躓軼輻辣逡 5 過過酞醺	拳胎 養胎 養 上 大 上 大 大 大 大 大 大 大 大 大 大 大 大 大	猪貨贏跌踞 7 一、蹤聽軫轅辯逞 7 一 逾 邨 酣 雾	多	豺爪驢獨別 9 踪躪輕緩迚逋 9 遊邱觡釋	貂貶膏跖蹂 A 蹒跚格轉迴逧 A 遗谬酚釐鉅	格買喊跌踵 B 選躬輕轉迢透 B 邀郢酲釖	貅 真 賍 跋 踰 C 默 躰 輒 轆 迪 逵 C 整 祁 醋 釞	征 野 最 数 勝 D か り と き を を を を の の の の の の の の の の の の の	程 資 贈 跪 蹼 E 上 蹼 躱 輓 轄 選 迸 E 上 一 随 郛 醂 釛	犯資報是 F 躁躾輻轎道 F 運那醢釵
1F9     [6F1]       1FA     6F2     編 錢 錚 缀 錺 挑 鱿 銀 銀 錄 錄 維 塗 鍋 禦       1FB     6F3     鎔 鑒 蹇 鉱 錦 錦 錄 錄 鐸 踺 練 鍵 煙 鍛 鏡       1FC     6F4     錉 鐐 錦 織 鍛 錦 鐵 鄉 鐵 經 壁 錦 練 樂 總 銀 鐘 好       1FD     6F5     論 建 編 續 鐵 編 鐵 變 羅 鑒 門 門 関 関 関 開 間       1FE     6F6     図 関 関 関 関 関 関 関 関 関 関 関 関 関 関 関 関 関 関 関	1E6 1E7 1E8 1E9 1EA 1EB 1EC 1ED 1EE 1EF 1F0 1F1 1F2 1F3 1F4 1F5 1F6	6C4 6C5 6C6 6C7 [6D0] [6D1] 6D2 6D3 6D4 6D5 6D6 6D7 [6E0] [6E1] 6E2 6E3 6E4 6E5 6E6	第一套	批 账 支 比 1 蹇 獨 魒 輛 饗 述 1 過 遅 鄙 醛 鉋	復時起跼 2 蹉覽軋輛輸通 2 遐邁耶醇釣	豎戝贄趁陳 3 蹌臍軛輦辜逑 3 遑邀都醾釿	豊质養趙踉 4 	豕負贊跂毙 5 蹈躓軼輻辣逡 5 通過酞醺鈬	蒙胎質趾踝 6 蹙娜柯輹辭道 6 這遷般聽鈕	猪貨贏跌踞 7 一、蹤聽軫轅辯逞 7 一 逾邨酣雾飯	多	豺朮鹽쮐踟 9	貂貶膏跖蹂 A 蹒跚格轉迴逧 A 遗谬酚釐鉅	格買喊跌踵 B 選躬輕轉迢透 B 邀郢酲釖鈘	貅 真 賍 跋 瑜 C 默 林 靰 鞭 迪 逵 C 题 郤 醋 釞 鉤	征 野 最 数 勝 D か 線 を を を を の と の に の に の の に る に の に 。 に る 。 に る 。 に る 。 に 。 に 。 に 。 に 。 に 。 に 。 に 。 に 。 に 。 に 。 に 。	程	犯資報是 F 躁躾輻轎道 F 運那醢釵
1 FA     6F2     5     5     5     5     3     5     3     5     3     5     3     5     3     5     3     5     3     5     3     5     3 <t< td=""><td>1E6 1E7 1E8 1E9 1EA 1EB 1EC 1ED 1EE 1EF 1F0 1F1 1F2 1F3 1F4 1F5 1F6</td><td>6C4 6C5 6C6 6C7 [6D0] [6D1] 6D2 6D3 6D4 6D5 6D6 6D7 [6E0] [6E1] 6E2 6E3 6E4 6E5 6E6</td><td>第一次 整理 整理 整理 整理 整理 整理 整理 整理 整理 影型 影型 影型</td><td>批赚支跌 1 蹇獨轣輛輕述 1 岌遅鄙醯鲍鮖</td><td>復轉赳跼 2 遊覧机輔輸通 2 遐邁耶醇釣銜</td><td>豎戝贄趁陳 3 蹌踏輛輦事逑 3 遑邀鄰醾釿銖</td><td>豊质養趙踉 4</td><td>豕貨質跂健 5 蹈躓軼輻辣逡 5 酒遇耽鹽鈬銛</td><td>黎 胎 Y 趾 踝 6 壁 鄭 柯 複 辭 道 6 道 遷 殷 醸 鈕 鄉</td><td>猪質贏趺踞 7   緊聽軫較辯逞 7   逾邨酣釁鈒銕</td><td>多</td><td>豺武<b>&gt;&gt;                                     </b></td><td>貂貶齋跖蹂 A 蹒跚格轉迴逧 A 逃び酚釐鉅鋩</td><td>格賈臧跌踵 B 選躬輕轉迢逶 B 邀郢酲釖鉉錏</td><td>貅 真 賍 跋 瑜 C 默 林 輒 轆 迪 逵 C 恶 悉 郤 醋 釞 鉤 鋺</td><td><ul><li>イン・</li></ul></td><td>程實贖跪獎 E 蹼躱輓轗避迸 E 隨郛醂釛銕鐗</td><td>犯</td></t<>	1E6 1E7 1E8 1E9 1EA 1EB 1EC 1ED 1EE 1EF 1F0 1F1 1F2 1F3 1F4 1F5 1F6	6C4 6C5 6C6 6C7 [6D0] [6D1] 6D2 6D3 6D4 6D5 6D6 6D7 [6E0] [6E1] 6E2 6E3 6E4 6E5 6E6	第一次 整理 整理 整理 整理 整理 整理 整理 整理 整理 影型 影型 影型	批赚支跌 1 蹇獨轣輛輕述 1 岌遅鄙醯鲍鮖	復轉赳跼 2 遊覧机輔輸通 2 遐邁耶醇釣銜	豎戝贄趁陳 3 蹌踏輛輦事逑 3 遑邀鄰醾釿銖	豊质養趙踉 4	豕貨質跂健 5 蹈躓軼輻辣逡 5 酒遇耽鹽鈬銛	黎 胎 Y 趾 踝 6 壁 鄭 柯 複 辭 道 6 道 遷 殷 醸 鈕 鄉	猪質贏趺踞 7   緊聽軫較辯逞 7   逾邨酣釁鈒銕	多	豺武 <b>&gt;&gt;                                     </b>	貂貶齋跖蹂 A 蹒跚格轉迴逧 A 逃び酚釐鉅鋩	格賈臧跌踵 B 選躬輕轉迢逶 B 邀郢酲釖鉉錏	貅 真 賍 跋 瑜 C 默 林 輒 轆 迪 逵 C 恶 悉 郤 醋 釞 鉤 鋺	<ul><li>イン・</li></ul>	程實贖跪獎 E 蹼躱輓轗避迸 E 隨郛醂釛銕鐗	犯
1 FB     6F3     鎔     錠     整     套     銀     別 <t< td=""><td>1E6 1E7 1E8 1E9 1EA 1EB 1EC 1ED 1EE 1FF 1F0 1F1 1F2 1F3 1F4 1F5 1F6 1F7</td><td>6C4 6C5 6C6 6C7 [6D0] [6D1] 6D2 6D3 6D4 6D6 6D6 6D7 [6E0] [6E1] 6E2 6E3 6E4 6E5 6E6 6E7</td><td>第一次 整理 整理 整理 整理 整理 整理 整理 整理 整理 影型 影型 影型</td><td>批赚支跌 1 蹇獨轣輛輕述 1 岌遅鄙醯鲍鮖</td><td>復轉赳跼 2 遊覧机輔輸通 2 遐邁耶醇釣銜</td><td>豎戝贄趁陳 3 蹌踏輛輦事逑 3 遑邀鄰醾釿銖</td><td>豊质養趙踉 4</td><td>豕貨質跂健 5 蹈躓軼輻辣逡 5 酒遇耽鹽鈬銛</td><td>黎 胎 Y 趾 踝 6 壁 鄭 柯 複 辭 道 6 道 遷 殷 醸 鈕 鄉</td><td>猪質贏趺踞 7   緊聽軫較辯逞 7   逾邨酣釁鈒銕</td><td>多</td><td>豺武<b>&gt;&gt;                                     </b></td><td>貂貶齋跖蹂 A 蹒跚格轉迴逧 A 逃び酚釐鉅鋩</td><td>格賈臧跌踵 B 選躬輕轉迢逶 B 邀郢酲釖鉉錏</td><td>貅 真 賍 跋 瑜 C 默 林 輒 轆 迪 逵 C 恶 悉 郤 醋 釞 鉤 鋺</td><td><ul><li>イン・</li></ul></td><td>程實贖跪獎 E 蹼躱輓轗避迸 E 隨郛醂釛銕鐗</td><td>犯</td></t<>	1E6 1E7 1E8 1E9 1EA 1EB 1EC 1ED 1EE 1FF 1F0 1F1 1F2 1F3 1F4 1F5 1F6 1F7	6C4 6C5 6C6 6C7 [6D0] [6D1] 6D2 6D3 6D4 6D6 6D6 6D7 [6E0] [6E1] 6E2 6E3 6E4 6E5 6E6 6E7	第一次 整理 整理 整理 整理 整理 整理 整理 整理 整理 影型 影型 影型	批赚支跌 1 蹇獨轣輛輕述 1 岌遅鄙醯鲍鮖	復轉赳跼 2 遊覧机輔輸通 2 遐邁耶醇釣銜	豎戝贄趁陳 3 蹌踏輛輦事逑 3 遑邀鄰醾釿銖	豊质養趙踉 4	豕貨質跂健 5 蹈躓軼輻辣逡 5 酒遇耽鹽鈬銛	黎 胎 Y 趾 踝 6 壁 鄭 柯 複 辭 道 6 道 遷 殷 醸 鈕 鄉	猪質贏趺踞 7   緊聽軫較辯逞 7   逾邨酣釁鈒銕	多	豺武 <b>&gt;&gt;                                     </b>	貂貶齋跖蹂 A 蹒跚格轉迴逧 A 逃び酚釐鉅鋩	格賈臧跌踵 B 選躬輕轉迢逶 B 邀郢酲釖鉉錏	貅 真 賍 跋 瑜 C 默 林 輒 轆 迪 逵 C 恶 悉 郤 醋 釞 鉤 鋺	<ul><li>イン・</li></ul>	程實贖跪獎 E 蹼躱輓轗避迸 E 隨郛醂釛銕鐗	犯
1 FC 6F4 5番 5年 5乗 5乗 5乗 5乗 5乗 5乗 5乗 5乗 5乗 5乗 5乗 5乗 5乗	1E6 1E7 1E8 1E9 1EA 1EB 1EC 1ED 1EE 1EF 1F0 1F1 1F2 1F3 1F4 1F5 1F6 1F7	6C4 6C5 6C6 6C7 [6D0] [6D1] 6D2 6D3 6D4 6D5 6D6 6D7 [6E0] [6E1] 6E2 6E3 6E4 6E5 6E6 6E7	第一次 整理 整理 整理 整理 整理 整理 整理 整理 整理 影型 影型 影型	批赚支跌 1 蹇獨轣輛輕述 1 岌遅鄙醯鲍鮖	復轉赳跼 2 遊覧机輔輸通 2 遐邁耶醇釣銜	豎戝贄趁陳 3 蹌踏輛輦事逑 3 遑邀鄰醾釿銖	豊质養趙踉 4	豕貨質跂健 5 蹈躓軼輻辣逡 5 酒遇耽鹽鈬銛	黎 胎 Y 趾 踝 6 壁 鄭 柯 複 辭 道 6 道 遷 殷 醸 鈕 鄉	猪質贏趺踞 7   緊聽軫較辯逞 7   逾邨酣釁鈒銕	多	射武 <b>&gt;                                     </b>	貂貶齋跖蹂 A 蹒跚格轉迴逧 A 逃び酚釐鉅鋩	格賈臧跌踵 B 選躬輕轉迢逶 B 邀郢酲釖鉉錏	貅 真 賍 跋 瑜 C 默 林 輒 轆 迪 逵 C 恶 悉 郤 醋 釞 鉤 鋺	<ul><li>イン・</li></ul>	程實贖跪獎 E 蹼躱輓轗避迸 E 隨郛醂釛銕鐗	犯
1 FD 6F5 鏡 鐵 縣 鏡 鏡 鏡 鑑 鑒 經 經 點 門 門 悶 閔 閔 閉 嗣 1 FE 6F6 閏 閏 閏 閏 閏 閏 閏 閏 閏 日 日 日 日 日 日 日 日 日 日	1E6 1E7 1E8 1E9 1EA 1EB 1EC 1ED 1EE 1EF 1F0 1F1 1F2 1F3 1F4 1F5 1F6 1F7	6C4 6C5 6C6 6C7 [6D0] [6D1] 6D2 6D3 6D4 6D5 6D6 6D7 [6E0] [6E1] 6E2 6E3 6E4 6E5 6E6 6E7	<ul><li>・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・</li></ul>	批赚之院 1 選出 選出 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	復時起跼 2 遊覧礼糊輸通 2 遐邁耶醪釣銜 2	豎敗贄趁陳 3 追邀都職新 3 選邀都職新 4 3	豐质養趙取 4	豕貨費改裝 5 蹈躍軟輻辣滋 5 通過肚臘鈬銛 5 錺	黎貽賢趾踝 6 整鄰柯輹辭道 6 逍邁殷釀鈕鄉 6	猪貨贏趺踞 7   嚴纏軫轅辯逞 7   逾邨酣釁鈑鋏 7	多武蟾跏踆 8 遊鷹軾 設 2 返 適比酥和绒绣 8	射武 <b>隨</b>	貂貶齋跖蹂 A 端獨格釋迴逧 A 遊び酚釐鉅鋩 A	絡買喊跌踵 B 選躬輕轉迢透 B 邀郢酲釖鉸錏 B	<ul><li>株育賍炭論 C</li><li></li></ul>	領 野 最 散 関 D か 適 を を 変 原 D の あ る る の の の の の の の の の の の の の	程 · 」 · 」 · 」 · 」 · · · · · · · · · · ·	犯資報是 F
1 F E 6 F 6 B B B B B B B B B B B B B B B B B	1E6 1E7 1E8 1E9 1EA 1EB 1EC 1ED 1EE 1EF 1F0 1F1 1F2 1F3 1F4 1F5 1F6 1F7	6C4 6C5 6C6 6C7 [6D0] [6D1] 6D2 6D3 6D4 6D5 6D6 6D7 [6E0] [6E1] 6E2 6E3 6E4 6E5 6E6 6E7 [6F0] [6F1] 6F2 6F3	<ul><li>・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・</li></ul>	批 赚 之 洗 1 差 獨 聽 輛 輕 述 1 過 達 鄙 薩 绝 鉱 1	<ul><li>り、</li></ul>	豎敗贄趁陳 3 追邀都職新銖 3 錚鏗	豐质費趙段 4	豕貨費改裝 5 蹈躍軟輻辣逡 5 通過配鹽鈬銛 5 錺縮	黎 胎 質 趾 踝 6	猪質贏趺踞 7    跺蹬軫轅辯逞 7    逾邨酣釁鈑鋏 7    鍼鏃	多武廟加獎 8 遊願試設 2 逃 逃 断 動 1 動 1 動 1 動 1 動 1 動 1 動 1 動 1 動 1 動	射朮腫珊踟 9	貂貶齊跖蹂 A 蹒跚格轄迴逧 A 滅び酷益鉅鋩 A 鍼鍵	絡買喊跌踵 B 學躬輕轉迢透 B 邀郢酲釖鉉錏 B 输建	貅 貢 賍 跋 踰 C 默 林 輒 轆 迪 遠 C 影 都 醋 釞 鉤 鋺 C 鍵 鐚	領 野 最 数 勝 D か か か か か か か か か の の の の の の の の の の	程 · 實際 · 跨 · 與 · 幹 · 快 · · · · · · · · · · · · · · · ·	犯資報是 F 躁躾輻輻道 F 運邪醢釵鈿 F 鎖鏡
	1E6 1E7 1E8 1E9 1EA 1EB 1EC 1ED 1EE 1FF 1F0 1F1 1F2 1F3 1F4 1F5 1F6 1F7	6C4 6C5 6C6 6C7 [6D0] [6D1] 6D2 6D3 6D4 6D5 6D6 6D7 [6E1] 6E2 6E3 6E4 6E5 6E6 6E7 [6F1] 6F1 6F1 6F2 6F3 6F4	・ ・ ・ ・ ・ ・ ・ ・ ・ ・ ・ ・ ・ ・ ・ ・ ・ ・ ・	批 順 支 院 1 麦 獨 糖 輛 輕 述 1 過 進 部 隆 绝 釦 1	<ul><li>・ クラック</li></ul>	豎敗贄趁陳 3 路衛轭輦亭迷 3 追邀都職新森 3 錚鏗鐫	豐质養趙段 4	豕貨質及健 5 陷置軟輻辣邊 5 通過肽醺釈話 5 錺縮鐵	蒙胎質趾踝 6 整路柯頓辭逍 6 追邏殷釀鈕卿 6 維鑄鑰	豬質贏趺踞 7 一、從應軫轅辯逞 7 一 逾邨酣霽鈑鋏 7 三 鉱鏃鏝	多武蟾跏趺 8 避關杖殺 上 3 逃 逃 1 地 1 和 4 数 5 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	射貮陸羅 9 跨騰輕緩迚逋 9 遊邱略釋鉗銷 9 望鐸鑄	貂貶膏跖蹂 A 滿陽格轉迴逧 A 美邵蘭釐鉅鋩 A 鍼鏈鑛	格買喊跌踵 B	貅 貢 賍 跋 踰 C	領 野 最 数 勝 D か 路 を を の か 路 を の の の の の の の の の の	程 · 實際 · 医 · 医 · 医 · 医 · 医 · 医 · 医 · 医 · 医 ·	犯資報是 F 躁躾輻輻道 F 運邪醢釵細 F 鐵鏡釘
IFF   OF/   瞬	1E6 1E7 1E8 1E9 1EA 1EB 1EC 1ED 1EE 1EF 1F0 1F1 1F2 1F3 1F4 1F5 1F6 1F7 1F8 1F9 1FA 1FB	6C4 6C5 6C6 6C7 [6D0] [6D1] 6D2 6D3 6D4 6D5 6D6 6D7 [6E0] [6E1] 6E2 6E3 6E4 6E5 6E6 6E7 [6F0] [6F1] 6F2 6F3 6F4 6F5	・	批 順 之 院 1 差 四 標 報 整 述 1 過 達 部 醛 绝 鉱 1	<b>黎 陳 担 跼 2                                </b>	豎敗贄趁陳 3 追避都離新珠 3 錚鏗鐫費	豐质養趙踉 4 游路喪輳辟逕 4 逍邊町體鈔銓 4 錣鏨鐵鑽	不負責及疑 5 蹈躍軟幅辣泡 5 通過肚鹽鈬新 5 錺錦鐵鑼	蒙胎質趾踝 6 號鄉柯輹辭逍 6 逍邁殷釀鈕鄉 6 錐鑄鑰鑒	猪質贏趺踞 7 一 從應軫較辯逞 7 一 逾邨酣霽鈑鋏 7 一 鉱鏃變鐔	多武蟾跏趺 8 遊園試設 B 通邯酥釉绒绣 8 銀鏝鑒磐	射武 <b>廣</b>	貂 貶 旁 断 踩 A 跳 路 縣 縣 縣 縣 灣 通	絡買喊跌踵 B 選躬輕轉迢逶 B 邀郢酲釖鉉錏 B 输鍊樂開	貅 責 賍 跋 強 C	新	程 · 實際 · 」 · 」 · 」 · · · · · · · · · · · · ·	犯資報 跫 F 炭 軽 幅 幅 酒 F 産 雰 種 奴 細 F (
	1E6 1E7 1E8 1E9 1EA 1EB 1EC 1ED 1EE 1EF 1F0 1F1 1F2 1F3 1F4 1F5 1F6 1F7 1F8 1F9 1FA 1FB 1FB 1FD	6C4 6C5 6C6 6C7 [6D0] [6D1] 6D2 6D3 6D4 6D6 6D6 6D7 [6E0] [6E1] 6E2 6E3 6E4 6E5 6E6 6E7 [6F1] 6F2 6F3 6F4 6F5 6F6	<ul><li>・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・</li></ul>	批 順 之 比 1 差 獨 糖 輛 輕 述 1 過 递 鄙 醛 绝 紅 1	<ul><li>・ クラック</li></ul>	豎敗登趁陳 3 追邀都職新 3 舒鏗鐫鑽 四	息质黄趙珠 4	不負質皮健 5 蹈躍軟輻辣逡 5 通過肚腫釈託 5 錺縮鐵鑼間	蒙胎質趾踝 6 變鄰柯複辭道 6 追灑酸酸鈕狮 6 維鑄盒鑒閱	豬質贏趺踞 7 一 從應軫轅辯逞 7	多武蟾跏趺 8 遊瀾軾殺辷逖 8 適比酥釉绒绣 8 銀鏝鑒點閱	射武 <b>體                                   </b>	貂貶騫斯默 A	絡買職跌踵 B 選躬輕轉迢透 B 邀郢酲釖鉉錏 B 输建继周闍	貅 貢 賍 跋 踰 C	領壁 最跋 B D	程 · 實際 · 學 · 學 · 學 · 學 · 學 · 學 · 學 · 學 · 學 ·	犯資報 跫 F 炭 軽 幅 幅 酒 F 産 雰 種 奴 細 F (

Table 15 A00 Standard Half-size Font Pattern (ROM Bank 0 (ROM = 0)

	Lower	0	1	2	3	4	5	6	7	8	9	Α	В	C	D	Е	F
ROM	Upper																
0	0	0	1	2	3	4	5	6	7	8	9	,	0	:	;	(	
0	1	45	Ø	۲.	ヤ	1	т	ア	4	ゥ	н	オ	٦		*	#	/
0	2	space	あ	い	う	え	ħ	か	衪	<b>~</b>	け	١J	ゃ	し	す	せ	そ
0	3	2	た	ち	ŋ	7	۲	な	i,	ぬ	ね	0	は	v	ぶ	^	ほ
0	4	\$	み	ΰ	B	ŧ	や	Ю	لد لا	5	ij	る	ħ	ろ	ゎ	を	h
0	5		ア	1	ゥ	I	オ	カ	+	ク	ケ	П	サ	シ	ス	セ	ソ
0	6	ッ	タ	チ	ッ	テ	4	ナ	=	ヌ	ネ	1	ハ	۲	フ	^	ホ
0	7	マ	3	4	Х	Ŧ	ヤ	ュ	3	Ð	リ	ル	レ		ワ	ヲ	ン

Table 16 A00 Standard Half-size Font Pattern (ROM Bank 1 (ROM = 1)

	Lower	0	1	2	3	4	5	6	7	8	9	Α	В	С	D	Е	F
ROM	Upper																
0	0	0	1	2	3_	4	5	6	7	8_	9	^			;	,	•
0	1	_	ア	1	ゥ	エ	オ	カ	+	ク	ケ	П	ħ	۵	ス	セ	ゝ
0	2	space	タ	チ	ッ	テ	۲	ナ	II	ヌ	ネ	7	<	ע	フ	<	ホ
0	3	マ	<i>'''</i>	4	У	Ŧ	ヤ	ı	п	ラ	IJ	ル	٧		ワ	ヲ	λ
0	4	*	Α	В	С	D	Е	F	G	Н	1	J	Κ	لــ	М	N	0
0	5	Р	œ	R	S	Т	U	٧	W	Х	Υ	Z	ッ	+	ı	m	
0	6	#	а	b	С	d	е	f	g	h	i	j	k	1	m	n	0
0	7	р	a	r	s	t	u	v	w	х	у	z	٠	٥	@	!	?

#### **HD66732 CGROM Character Pattern Write**

#### 1. When Using Two 1-M EPROMs (for Full Size) + One 32-k EPROM (for Half Size)

#### 1.1 Full-size Character (Level-1 Kanji Set, Non-Kanji) (FCGROM-1)

- 11 x 12 dots, up to 4064 types (not including 32 types of CGRAM (character code: 0000 to 001F))
- EPROM: HN27C101G/AG x one
- Divide the character pattern into six left-half dots (A16 = 0) and five right-half dots (A16 = 1)
- EPROM addresses A16 to A 0 designate the "left/right distinction bit + full-size character code (C11 to C0) + line position" (Not using C12 of a full-size character code)
- Write "0" into I/0s 7 and 6 of the left-half character pattern (A16 = 0)
- Write "0" into I/0s 7, 6 and 5 of the right-half character pattern (A16 = 1)
- When A3, A2, A1, or A0 = C to F (1100 to 1111), write "0" into I/Os 7 to 0
- Write "0" into \$0 to \$1FF and \$10000 to \$101FF (corresponding to the CGRAM character codes 0000 to 001F) (The data of \$0 to \$1FF, and \$10000 to \$101FF are ignored)

Table 17 FCGROM-1 Write (1)

		FCGROM-1 EPROM Address																		A1	6 =	0 (	(left	)	Α1	16 =	<u>= 1</u>	(rig	ht)	
		EPROM Address																					Da	ata						
	A15 A14 A13 A12 A11 A10 A9 A8 A7 A6 A5 A4 A3 A2 A1 A0																I/O 5	I/O 4	I/O 3	1/0	1/0	1/0	1/O 4	I/O 3	I/O 2	1/0	1/0			
+	$\rightarrow$					1													$\vdash$	<del></del> _			0	ö	_		÷	Ť	'n	_0
	C	1	C10	C9	CE	3	C7	C6	C5	C4	C3	C2	C1	C0		0	0	0				9000000		300000	wiw					
1	1					1			, T						0	0	0	ı		0	0	<b></b>	_				, <b>,</b>			***
1	- !					-			+						0	0	1	0	l	0	U	0	0		0		0		0	( ****
i						1			+						0	0	1	1			·	0	0							
i	ĺ					-			ļ						0	1	0	0		1 .	<b>M</b>	· -	0		0	0		0	www.	
1	- }					1			1						0	1	0	1		0	0	0	0		W.				******	W
i						ı			<b>+</b>						0	1	1	0	ŀ	0	0		0			0		0		
i	i					1			<b>↓</b>						0	1	1	1		0	0		0							
;	- 1								1						1	0	0	0		0		<b></b>	0	0	0	0		0		(
i						1			1						1	0	0	1		0		0	0							***
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‡	_ ــ	_			- —	4	- —		_ ⊥ .						∟1_	<u> </u>	_1_	. <u>1</u> .	$\vdash$ $-$		_0_	_0_	0			0	_0_	_0_		▩
į									1						1	1	0	0		0	0	0	0	0	0	0	0	0	0	(
į	- 1								1						1	1	0	1		0	0	0	0	0	0	0	0	0	0	(
ŀ	- 1								Ţ						1	1	1	0		0	0	0	0	0	0	0	0	0	0	(
1	!_								<b>1</b>						1	1	1	_1_		0	0	0	0	0	0	0	0	0	0	(
	\													_/	\_			_/	•	\_										_
				Cha	irac	cte	er c	ode	(C1	1 to	C0	1			Line	e po	sitic	n				(	Cha	ırac	ter	pat	teri	n		

Note: For character codes (C12 to C0), 0000 to 001F are used as CGRAM codes, and EPROM addresses \$0 to \$1FF and the data of \$10000 to \$101FF are ignored.

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#### 1.2 Full-size Character (Level-2 Kanji Set) (FCGROM-2)

[the same as a Full-size Character (Level-1 Kanji Set, Non-Kanji) (FCGROM-1)]

- 11 x 12 dots, up to 4064 types (not including 32 types of CGRAM (character code: 1000 to 101F))
- EPROM: HN27C101G/AG x one
- Divide the character pattern into six left-half dots (A16 = 0) and five right-half dots (A16 = 1)
- EPROM addresses A16 to A 0 designate the "left/right distinction bit + full-size character code (C11 to C0) + line position" (Not using C12 of a full-size character code)
- Write "0" into I/0s 7 and 6 of the left-half character pattern (A16 = 0)
- Write "0" into I/0s 7, 6 and 5 of the right-half character pattern (A16 = 1)
- When A3, A2, A1, or A0 = C to F (1100 to 1111), write "0" into I/Os 7 to 0
- Write "0" into \$0 to \$1FF and \$10000 to \$101FF (corresponding to the CGRAM character codes 1000 to 101F) (The data of \$0 to \$1FF, and \$10000 to \$101FF are ignored)

Table 18 FCGROM-2 Write (1)

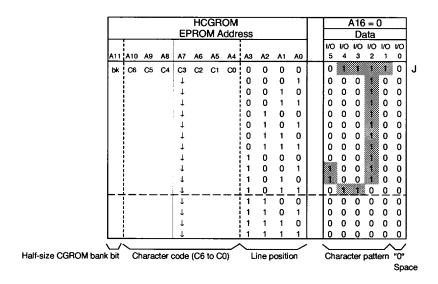
								FCC	aRC	M-1										<b>A</b> 1	6 =	0 (	left)	)	A1	6 =	: 1 (	(rig	ht)	
							EF	PRO	M A	ddre	ess													Da	ata					
	:	! !																	1/0	1/0	1/0	1/0	1/0	ΙO	1/0	1/0	VO.	1/0	I/O	
	!	A15	A14	A13	A12	A11	A10	A9	A8	A7	A6	A5	A4	A3	A2	A1	A0		5	4	3	2	1	0	4	3	2	1	0	
		C11	C10	C9	C8	Ç7	C6	C5	C4	СЗ	C2	C1	C0	0	0	0	0		0	0	0	0	0	1	0	0		0	0	≡t
	1							1						0	0	0	1		0	0	0	0	0			0	0		0	
	:	:						1						0	0	1	0		0	0	0		0			0		0	0	
	į	į						1						0	0	1	1									1			0	
	!	!						1						0	1	0	0		0	0	0	0	0	0		0	0	0	0	
		į						Ţ						0	1	0	1		0		.0		.0	0	0	1	0	0	0	
	į	į						1		i				0	1	1	0		0					0	0	1	0	0	0	
	!	!				ŀ		1						0	1	1	1		0	0	0	0	0	0	0		0	0	0	
	i	į						1						1	0	0	0		0	0	0		0	0	0	0	*	0	0	
	1	;						1						1	0	0	1		0		0				0	0		0	0	
	!	!						1						1	0	1	0					0	0	0	0	0		0		
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	!	!						1						1	1	0	0		0	0	0	0	0	0	0	0	0	0	0	
		:						Ţ						1	1	0	1		0	0	0	0	0	0	0	0	0	0	0	
	į	ĺ						1						1	1	1	0		0	0	0	0	0	0	0	0	0	0	0	
L	<u> </u>	! !						<u></u>		L				1	1	1	1		0	0	0	0	0	0	0	0	0	0	0	
		\_											_/	\_			_/	•	\_										_/	
				Cha	ırac	ter o	code	(C1	1 to	C0)	)			Lin	e po	sitic	n				(	Cha	rac	ter	pat	terr	า			

Note: For character codes (C12 to C0), 1000 to 101F are used as CGRAM codes, and EPROM addresses \$0 to \$1FF and the data of \$10000 to \$101FF are ignored.

## 1.3 Half-size Character (HCGROM)

- 6 x 12 dots, up to 256 types (128 types x 2 banks)
- EPROM: an EPROM with 512 bytes or more capacity, such as the HN27C256AG
- EPROM addresses A11 to A0 designate the "half-size CGROM bank bit (bk) + half-size character code (C6 to C0) + line position"
- Write "0" into the rightmost bit as a character space (I/O 0 = 0)
- Write "0" into I/Os 7 and 6
- When A3, A2, A1, or A0 = C to F (1100 to 1111), write "0" into I/Os 7 to 0

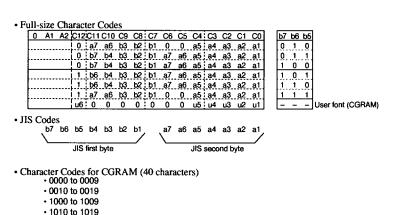
#### **Table 19 HCGROM Write**



## \* Relationship between HD66732 Full-size Character Codes and JIS Codes

(Codes for 24 remaining characters are reserved.)

Table 20 Full-size Character Codes and JIS Codes



## 2. When Using One 4-M EPROM

## 2.1 Full-size Character (Level-1 Kanji Set, Non-Kanji) (FCGROM-1)

- 11 x 12 dots, up to 4064 types (not including 32 types of CGRAM (character code: 0000 to 001F))
- EPROM: HN27C4001G x one (address: \$0 to \$1FFFF)
- Divide character pattern into six left-half dots (A16 = 0) and five right-half dots (A16 = 1)
- EPROM addresses A18 to A 0 designate the "0 + full-size character code (C12) + left/right distinction bit + full-size character code (C11 to C0) + line position" (C12 of the full-size character code is used as an EPROM address A17)
- Write "0" into I/0s 7 and 6 of the left-half character pattern (A16 = 0)
- Write "0" into I/0s 7, 6 and 5 of the right-half character pattern (A16 = 1)
- Write "0" into \$0 to \$1FF, and \$10000 to \$101FF (corresponding to the CGRAM character codes 0000 to 001F) (The data of \$0 to \$1FF, and \$10000 to \$101FF are ignored)

Table 21 FCGROM-1 Write (2)

									FCC	arc	M-1								Г	Τ	(*) A	16 :	= 0 (	(left)		(*) <i>F</i>	116	= 1	(rig	ht)	
								EF	PRO	M A	ddr	ess									`			,	Da						
															:					1/0	1/0	1/0	1/0	1/0	S	1/0	1/0	1/0	1/0	1/0	
A18	A17	A16	A15	A14	A13	A12	A11	A10	A9	A8	A7	A6	A5	A4	A3	A2	A1	A0		5	4	3	2	1	0	4	3	2	1	0	
0	C12	O	C11	C10	C9	C8	C7	C6	C5	C4	СЗ	C2	C1	C0	0	0	0	0		0		0	0	0	0	•	0	1	0	0	Ä
		!	!						Ţ						0	0	0	1		0	0		0	*		1	4	1	1		
	i	į	i						Ţ						0	0	1	0		0	0 ٍ	0	0	0	0	▓.	0		0	0	
	1	!	!						1		ŀ				0	0	1	1			0	0	0								
		•							1		ļ				0	1	0	0		0	***	0	0	•	0	0			0		
	}	1							1						0	1	0	1		0	0	0	0				1	*****	300	<b>     </b>	
	:								1						0	1	1	0		0	0		0		0	0		0	0		
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	1	!	•						1						1	0	0	0		0			0		0	0			0		
	•								1						1	0	0	1		0		0	0					*			
	1	Ì	ĺ						1		İ				1	0	1	0		0		0	0	0	0		0 }			0	
⊢-	<u> </u>	<u>-</u>	<u> </u>				⊢-		ุ\		<b>-</b> -				1.	0_	. <u>1</u> .	_1_	<u> </u>		0	_0_	_0_			_0_	<u>0</u> .	0	<b></b>		
	i	į							1						1	1	0	0		0	0	0	0	0	0	0	0	0	0	0	
	1	1							1						¦ 1	1	0	1		0	0	0	0	0	0	0	0	0	0	0	
	1						l		<b>1</b>						1	1	1	0		0	0	0	0	0	0	0	0	0	0	0	
$ldsymbol{\sqcup}$	<u>i                                      </u>	<u>i                                      </u>	<u> </u>						<u> </u>						<u>i 1</u>	1	1	_1_		0	0	0	0	0	0	0_	0	0	0	0_	
			\_											_/	\_			_/		\										_/	
				1	Cha	ıract	er c	ode	(C1	1 to	C0	)			Lir	ie po	ositi	on					Cha	ract	ter	patt	ern	1			

Note: For character codes (C12 to C0), 0000 to 001F are used as CGRAM codes, and EPROM addresses \$0 to \$1FF and the data of \$10000 to \$101FF are ignored.

## 2.2 Full-size Character (Level-2 Kanji Set) (FCGROM-2)

- 11 x 12 dots, up to 4064 types (not including 32 types of CGRAM (character code: 1000 to 101F))
- EPROM: HN27C4001G x one (address: \$20000 to \$3FFFF)
- Divide character pattern into six left-half dots (A16 = 0) and five right-half dots (A16 = 1)
- EPROM addresses A18 to A 0 designate the "0 + full-size character code (C12) + left/right distinction bit + full-size character code (C11 to C0) + line position" (C12 of the full-size character code is used as EPROM address A17)
- Write "0" into I/0s 7 and 6 of the left-half character pattern (A16 = 0)
- Write "0" into I/0s 7, 6 and 5 of the right-half character pattern (A16 = 1)
- When A3, A2, A1, or A0 = C to F (1100 to 1111), write "0" into I/Os 7 to 0
- Write "0" into \$0 to \$1FF, and \$10000 to \$101FF (corresponding to the CGRAM character codes 1000 to 101F) (The data of \$0 to \$1FF, and \$10000 to \$101FF are ignored)

Table 22 FCGROM-2 Write (2)

										F	CG	RC	M-2	:									*) A	16 =	= O (I	left)		(*) /	<b>416</b>	= 1	(rig	ht)	
									E	EPI	ROI	<u> </u>	ddre	ess													Da						
110	A17			16	A14	A12	A 14		٠ ٨٠	10	40	۸٥	A7	۸e	۸E	A4	42	A2	A1	A0		1/0	1/0		1/0	1/0	_			1/0	1/0		
		_						C7							C1			0	0	0	$\vdash$	0	<u> </u>	<u>3</u>	<u>2</u>	0	0	0	0	2	1	0	
٠		! '	1	•	0.0	00	•	١	·	,,	1	٠,	- 55	OŁ.	٠.	00	0	n	0	1		ŏ	0	0	n	٠,		ŏ	0		Ĭ	٠ı	
		i	i								ļ						ō	ō	1	0		ŏ	Ŏ	Ŏ	Ŏ	0	0	Ň	0	0	0	ŏ	
		ŀ	!								1						0	0	1	1						Ŵ		1		×	×	0	
		į	į								$\downarrow$						0	1	0	0		0	0	0	0	0	0		0	0	0	0	
											Ţ						0	1	0	1		0	0	0	0	0	0	0		0	0	0	
į		į	1								$\downarrow$						0	1	1	0		0					0	0		0	0	0	
		:									1						0	1	1	1		0	0	0	0	0	0	0		0	0	0	
		1	į								1						1	0	0	0		0	0	0	0	0		0	0	1	0	0	
		i	i					l			1						1	0	0	1		0	w.	U				0	0		0		
		!	!					l			1						! !	0	1	0		0	<b>***</b> ***	<b>***</b> ***	Ü	U	0	0	_		×××		
	-	┾-	-;-					┝᠂			-*-						<u> </u>		<del>-</del>			<del>լ</del> բ	∽.	_,_	-~	0.	∹╂	-ç_	<u>0</u>	_0_1			
		į .	!					l			T.						1	1	0	1		١ň	n	n	n	n	ដ	n	n	٥	0	0	
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			1								1						1	1	1	1		o	ō	ō	Ö	0	ŏ	Õ	ŏ	Ö	Ö	ŏ	
			$\overline{\ }$														$\subseteq$			$\overline{}$		$\overline{}$										二	
act	er co	de (C	(12			Cha	ırac	acter code (C11 to C0)									Line	е ро	sitic	n				(	Chai	rac	ter	pati	terr	1			

Note: For character codes (C12 to C0), 1000 to 101F are used as CGRAM codes, and EPROM addresses \$20000 to \$201FF and the data of \$30000 to \$301FF are ignored.

# 2.3 Half-size Character (HCGROM)

- 6 x 12 dots, up to 256 types (128 types x 2 banks)
- EPROM: HN27C4001G x one (address: \$40000 to \$40FFF)
- EPROM addresses A18 to A0 designate the "\$40 + half-size CGROM bank bit (bk) + half-size character code (C6 to C0) + line position"
- Write "0" into the rightmost bit as a character space (I/O 0 = 0)
- Write "0" into I/Os 7 and 6
- When A3, A2, A1, or A0 = C to F (1100 to 1111), write "0" into I/Os 7 to 0

Table 23 HCGROM Write (2)

							EF	HC		OM ddr										/		= ( ata	)	
					440														1/0		1/0	1/0	1/0	
118	A17	A16	A15	A14	A13	A12	A11	A10	A9	A8	A7	A6	A5	A4	A3	A2	A1	_A0	 5	4	3	2	1	0
1	0	0	0	0	0	0	bk	C6	C5	C4	СЗ	C2	Ç1	C0	0	0	0	0	0			١	1	0
			ĺ								1				0	0	0	1	0	0	0	•	0	0
			l					l			1				0	0	1	0	0	0	0	٠	0	0
ĺ		1	ĺ					1			1				0	0	1	1	0	0	0	•	0	0
- 1											↓				0	1	0	0	0	0	0		0	0
											1				0	1	0	1	0	0	0	1	0	0
į											1				0	1	1	0	0	0	0	¥	0	0
į											1				0	1	1	1	0	0	0	1	0	0
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į			İ					İ			1				1	0	0	1		0	0		0	0
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			}					-			l ↓				1	1	0	1	l٥	0	0	0	0	0
i											l ↓				1	1	1	0	lo	0	0	0	0	0
								1			↓				1	1	1	1	0	0	0	0	0	0
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	r	Tall-	size	Cur	VIVI	Dani	K DIT	CI	ıara	cier	code	(CD	io C	U)	LII	ne po	osmo	)[ }	Una	arac	ier	patte	ern	Spa

Table 24 4-M EPROM Address

		т —																		_	
									4-M	EPR	OM	Add	ress								
		A18	A17	A16	A15	A14	A13	A12	A11	A10	A9	A8	A7	A6	A5	A4	A3	A2	A1	ΑD	hex.
Level 1	(left)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kanji	1																		Ι.		
Set +		0	0	0	1	1	1_	1	1	1	1	1	1	1	1	1	1	1	1	t	FFFF
non-	(right)	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10000
Kanji	!		П								Т				Т				$\top$		
	<u> </u>	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1FFFF
	(left)	0	_1_	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20000
Level 2	•		1				ı														
Kanji	į	0	1	0	1	1	1	1	1	1	1	1	. 1	1	1	1	1	1	1	1	2FFFF
Set	(right)	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30000
	<u> </u>	0	1	1	1	1	1	1	1	1	1	1	1_	1	1	1	1	1	1	1	3FFFF
	bk = 0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40000
Half-	(bank 0)																				
size	į	1	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	407FF
Font	bk = 1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40800
	(bank 1)						1.								1		,		L.		
	!	1	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	40FFF

# **Instruction Registers**

## Outline

The HD66732 consists of the following five types of register:

- Index register (IR): Selects control registers, RAM addresses, or data registers
- Status register (SR): Reads the internal state or key scan data
- Control registers (R0-RC): Set the display control or key scan control
- RAM address registers (RD and RE): Select RAMs and set RAM addresses
- RAM data register (RF): Receives the write and read data for the RAM

Normally, instructions that transfer display data are used the most. However, auto-incrementation by 1 (or auto-decrementation by 1) of internal HD66732 RAM addresses after each data write can reduce the MPU program load.

Because instructions other than the clear-display instruction are executed in 0 cycles, instructions can be written in succession.

While the clear-display instruction is being executed for internal operation, or during reset, no instruction other than the SR read instruction can be executed.

## **Instruction Descriptions**

## Index Register (IR)

The index register designates control registers (R0 to RC), RAM address registers (RD and RE), and RAM data register (RF). The register index value must be set between addresses 0000 to 1110.

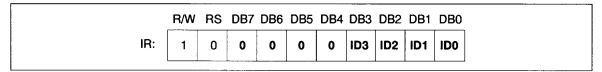


Figure 3 Index Register Instruction

## Status Register (SR)

The status register reads the busy flag (BF), LCD-driven display lines (NF1/0), and display raster-rows (LF3 to LF0).

In a serial interface, the SR reads the key scan data in key scan registers SCAN0 to SCAN3. After the start byte has been transferred, the SR starts reading from SCAN0, then SCAN1, SCAN2, and SCAN3. After SCAN3 has been read, SCAN0 is read again. For details, see the Key Scan Control section.

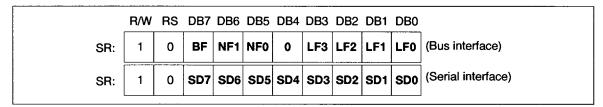


Figure 4 Status Register Instruction

**Table 25 Display Line Position** 

NF1	NF0	Display Line Position
0	0	Displaying the 1st line
0	1	Displaying the 2nd line
1	0	Displaying the 3rd line
1	1	Displaying the 4th line

Table 26 Display Raster-row Position

LF3	LF2	LF1	LF0	Display Raster-row Position	
0	0	0	0	Displaying the 1st raster-row	
0	0	0	1	Displaying the 2nd raster-row	
0	0	1	0	Displaying the 3ed raster-row	
0	0	1	1	Displaying the 4th raster-row	
0	1	0	0	Displaying the 5th raster-row	
0	1	0	1	Displaying the 6th raster-row	
	•			•	
	•			•	
	•			•	
1	0	1	1	Displaying the 12th raster-row	
1	1	0	0	Displaying the 13th raster-row	

## Clear Display (R0)

The clear display instruction writes half-size space code A0H (half-size HCROM for character code A0H must be a blank pattern) into all DDRAM addresses. It then sets DDRAM address 0 into the address counter (AC). It also sets I/D to 1 (increment mode) in the entry mode set instruction. Since the execution time of this instruction needs 85 clock cycles, do not transfer the next instruction during this time.

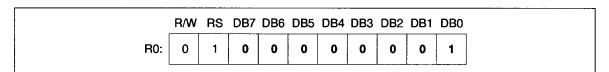


Figure 5 Clear Display Instruction

#### Start Oscillation (R1)

The start oscillation instruction restarts the oscillator from the halt state in the standby mode. After issuing this instruction, wait at least 10 ms for oscillation to stabilize before issuing the next instruction. (See the Standby Mode section.)

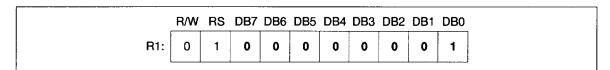


Figure 6 Start Oscillation Instruction

## **Driver Output Control (R2)**

**NL2-0:** Specify the display lines. Display lines change the liquid crystal display drive duty ratio. DDRAM address mapping does not depend on the number of display lines.

CEN: Switches the COM1 output start position. When CEN = 1, it shifts COM1 by one line (13 rasterrows) and outputs COM1 from the center of the screen (the second line). For details, see the Partial-display-on Function section.

CMS: Selects the output shift direction of a common driver. When CMS = "0", COM1/52 shifts to COM1, and COM52/1 to COM52. When CMS = "1", COM1/52 shifts to COM52, and COM52/1 to COM1. Output position of a common driver shifts depending on the CEN bit setting. For details, see the Display On/Off Control section.

SGS: Selects the output shift direction of a segment driver. When SGS = "0", SEG1/120 shifts to SEG1, and SEG120/1 to SEG120. When SGS = "1", SEG1/120 shifts SEG120, and SEG120/1 to SEG1.

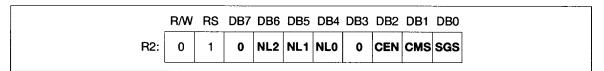


Figure 7 Driver Output Control Instruction

Table 27 NL Bits and Display Lines

NL2	NL1	NL0	Display Lines	Liquid Crystal Display Drive Duty Ratio	Common Driver Used
0	0	0	Segment display	1/2 Duty	COMS1, COMS2
0	0	1	One character line + segment display	1/15 Duty	COM1-13, COMS1, COMS2
0	1	0	Two character lines + segment display	1/28 Duty	COM1-26, COMS1, COMS2
0	1	1	Three character lines + segment display	1/41 Duty	COM1-39, COMS1, COMS2
1	0	0	Four character lines + segment display	1/54 Duty	COM1-52, COMS1, COMS2

## LCD Driving Wave (R3)

**B/C:** Specifies the LCD alternating method. When B/C = "0", a B-pattern waveform is generated and alternates in every frame. When B/C = "1", a C-pattern waveform is generated and alternates (n-raster-row reversed AC drive) in each raster-row specified by NW4–NW0. For details, see the n-raster-row Reversed AC Drive section.

**EOR:** When the C-pattern waveform is set and EOR = "1", the odd/even frame-select signals and the n-raster-row reversed signals are EORed for alternating drive. EOR is used when the LCD is not alternated by combining the set values of the LCD drive duty ratio and n raster-row.

**NW4–0:** Specify the number of raster-rows n that will alternate at the C-pattern waveform setting. NW4–NW0 alternate in every n + 1 raster-row, and the first to the 32nd raster-row can be selected.

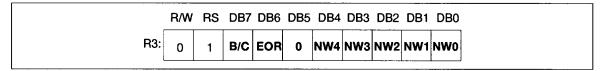


Figure 8 LCD Driving Wave Instruction

## LCD Driving Control (R4)

**BS2-0:** Set the LCD drive bias values in the range of 1/2 to 1/8 bias. The LCD drive bias value can be selected according to the LCD drive duty and LCD drive voltage. For details, see the LCD Drive Bias Selector section.

CT4-CT0: Control the LCD drive voltage (potential difference between V1 and GND) to adjust contrast. A 32-step adjustment is possible. For details, see the Contrast Adjuster section.

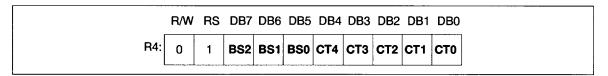


Figure 9 LCD Driving Control Instruction

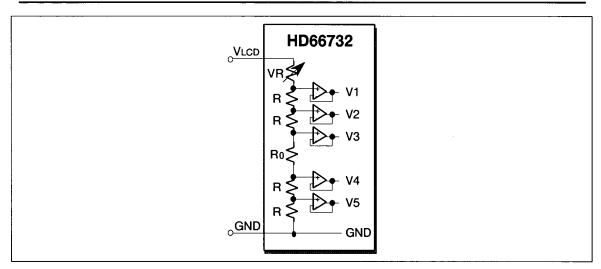


Figure 10 Contrast Adjuster

Table 28 BS Bits and LCD Drive Bias Value

BS2	BS1	BS0	Liquid Crystal Display Drive Bias Value	
0	0	0	1/8 bias drive	
0	0	1	1/7 bias drive	
0	1	0	1/6 bias drive	
0	1	1	1/5.5 bias drive	
1	0	0	1/5 bias drive	
1	0	1	1/4.5 bias drive	
1	1	0	1/4 bias drive	
1	1	1	1/2 bias drive	

Table 29 CT Bits and Variable Resistor Value of Contrast Adjuster

CT S	et Valı	ue			_ Variable	CT S	et Val	ue			Variable
CT4	СТЗ	CT2	CT1	СТО	Resistor (VR)	CT4	СТЗ	CT2	CT1	СТО	Resistor (VR)
0	0	0	0	0	3.2 x R	1	0	0	0	0	1.6 x R
0	0	0	0	1	3.1 x R	1	0	0	0	1	1.5 x R
0	0	0	1	0	3.0 x R	1	0	0	1	0	1.4 x R
0	0	0	1	1	2.9 x R	1	0	0	1	1	1.3 x R
0	0	1	0	0	2.8 x R	1	0	1	0	0	1.2 x R
0	0	1	0	1	2.7 x R	1	0	1	0	1	1.1 x R
0	0	1	1	0	2.6 x R	1	0	1	1	0	1.0 x R
0	0	1	1	1	2.5 x R	1	0	1	1	1	0.9 x R
0	1	0	0	0	2.4 x R	1	1	0	0	0	0.8 x R
0	1	0	0	1	2.3 x R	1	1	0	0	1	0.7 x R
0	1	0	1	0	2.2 x R	1	1	0	1	0	0.6 x R
0	1	0	1	1	2.1 x R	1	1	0	1	1	0.5 x R
0	1	1	0	0	2.0 x R	1	1	1	0	0	0.4 x R
0	1	1	0	1	1.9 x R	1	1	1	0	1	0.3 x R
0	1	1	1	0	1.8 x R	1	1	1	1	0	0.2 x R
0	1	1	1	1	1.7 x R	1	1	1	1	1	0.1 x R

### Power Control (R5)

AMP: When AMP = 1, each voltage follower for V1 to V5 pins and the booster are turned on. When AMP = 0, current consumption can be reduced while the display is not being used.

**BT1-0:** Switch the output of V5OUT between single, double, triple, and quadruple boost. The LCD drive voltage level can be selected according to its drive duty ratio and bias. A lower amplification of the booster consumes less current. When BT1/0 = "00", a single boost is output. When BT1/0 = "01", a double boost is output. When BT1/0 = "10", a triple boost is output.

SLP: When SLP = 1, the HD66732 enters the sleep mode, where the internal operations are halted except for the key scan function and the R-C oscillator, thus reducing current consumption. For details, see the Sleep Mode section. Only the following instructions can be executed during the sleep mode.

- a. Key scan data read
- b. Key scan control (IRE, KF1/0 bit)
- c. Power control (AMP, SLP, and STB bits)
- d. Port control (PT2-0 bits)

During the sleep mode, the other RAM data and instructions cannot be updated although they are retained.

STB: When STB = 1, the HD66732 enters the standby mode, where display operation and key scan completely stops, halting all the internal operations including the internal R-C oscillator. Further, no external clock pulses are supplied. This setting can be used as the system wake-up, because an interrupt is generated when a specific key is pressed. For details, see the Standby Mode section.

Only the following instructions can be executed during the standby mode.

- a. Standby mode cancel (STB = 0)
- b. Voltage follower circuit on/off (AMP = 1/0)
- c. Start oscillation
- d. Key scan interrupt generation enabled/disabled (IRE = 1/0)
- e. Port control (PT2-0 bits)

During the standby mode, the other RAM data and instructions may be lost. To prevent this, they must be set again after the standby mode is canceled.

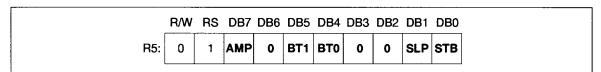


Figure 11 Power Control Instruction

#### **Key Scan Control (R6)**

**PT2-0:** Control the output level of a port output pin (PORT2-PORT0). When PT0 = 0, the PORT0 pin outputs the GND level, and when PT0 = 1, it outputs the VCC level. Similarly, PT1 and PT2 bits control PORT1 and PORT2 output levels respectively.

KSB: When KSB = "1", the mode enters key standby and the key scan is stopped. In this case, key scan interrupts can be generated as well as in the standby mode. When KSB = "0", the keys are scanned normally.

**IRE:** When IRE = 1, it permits interrupts when a key is pressed. This causes interrupts to occur in the standby period when the oscillator clock is halted, as well as key scan interrupts during normal operation, allowing system wake-up.

**KF1-0:** Set the key scan cycle. The following table shows the key scan pulse width and key scan cycle used when the oscillation frequency (fosc) is 60 kHz, which depend on the oscillation frequency. For details, see the Key Scan Control section.

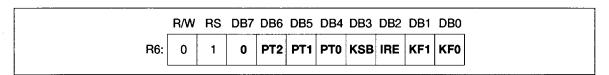


Figure 12 Key Scan Control Instruction

Table 30 KF Bits and Key Scan Cycle

KF1	KF0	Key Scan Pulse Width	Key Scan Cycle
0	0	0.25 ms	1.1 ms (64 clock cycles)
0	1	0.5 ms	2.1 ms (128 clock cycles)
1	0	1.1 ms	4.3 ms (256 clock cycles)
1	1	2.1 ms	8.5 ms (512 clock cycles)

Note: The data is a value obtained when the oscillation frequency (fosc) is 60 kHz. The value depends on the oscillation frequency.

#### Entry Mode (R7)

**REV:** When REV = "1", the REV displays all character and graphics display sections except for the segment display section with black-white reversal. For details, see the Reversed Display Function section.

**SPR:** When SPR = "1", the SPR displays combined character and graphics display screens (the superimposed display mode). In this case, user fonts using the CGRAM in the character display mode cannot be displayed. For details, see the Super-imposed Display Function section.

**GR:** Activates the character mode when GR = "0". Displays the font pattern on the CGROM or CGRAM according to the character code written in the DDRAM. Activates the graphics mode when GR = 1. Displays a given pattern according to the bit map data written in the CGRAM. In this case, data in the DDRAM is not used for display. Segment pattern display set to the SEGRAM is enabled both in the character mode and graphics mode. For details, see the Character Display Functions and Graphics Display Functions section.

**RDM:** When RDM = "0", the RDM increments or decrements the address counter value according to the I/D bit setting after reading the data from the DDRAM/CGRAM/SEGRAM. When RDM = "1", the address counter is not updated after the data has been read from the RAM. The address counter is used when the RAM data is read, modified, and written. Since the first read data is invalid, the read must be done twice. After writing to the RAM, the address counter value must be incremented or decremented.

**I/D:** Increments (I/D = 1) or decrements (I/D = 0) the DDRAM address by 1 when a character code is written into or read from DDRAM. The cursor or blinking moves to the right when incremented by 1 and to the left when decremented by 1. The same applies to the writing and reading of CGRAM and SEGRAM.

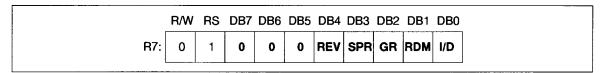


Figure 13 Entry Mode Set Instruction

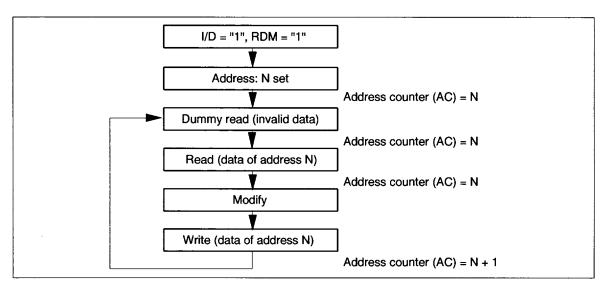


Figure 14 Read, Modify, and Write Sequences in Bus Interface Mode

#### **Cursor Control (R8)**

CH: Executes the cursor home instruction and sets DDRAM address 0 into the address counter (AC). The DDRAM contents do not change. The cursor or blinking goes to the top left of the display.

LC: When LC = 1, a cursor attribute is assigned to the line that contains the address counter (AC) value. Cursor mode can be selected with the B/W, C, and B bits. For details, see the Line-cursor Display section.

**B/W**: When B/W = 1 and LC = 1, the character at the cursor position is cyclically (every 32 frames) blink-displayed with black-white reversal.

When B/W = 1 and LC = 1, all characters including the cursor on the display line appear with black-white reversal. The characters do not blink. For details, see the Line-cursor Display section.

C: The cursor is displayed on the 13th raster-row when C = 1. The 13-dot cursor is ORed with the character pattern and displayed on the 13th raster-row.

B: The character indicated by the cursor blinks when B = 1. The blinking is displayed as switching between all black dots and displayed characters every 32 frames. The cursor and blinking can be set to display simultaneously. When LC =1, setting B = 1 alternately displays all white dots and character pattern in a line unit.

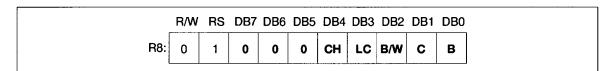


Figure 15 Cursor Control Instruction

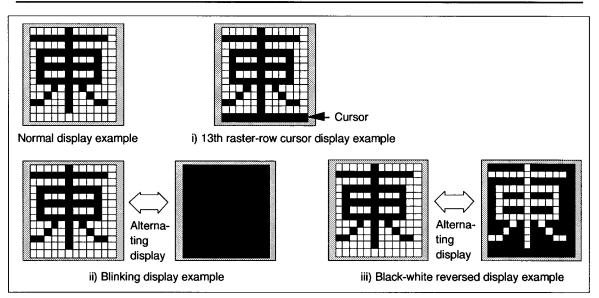


Figure 16 Cursor Control Examples

## Display Control (R9)

**DC:** Character/graphics display is on when DC = 1 and off when DC = 0. When off, the display data remains in the DDRAM and CGRAM, and can be displayed instantly by setting D = 1.

**DS:** Icon mark segments are on when DS = 1 and off when DS = 0. When off, the display data remains in the SEGRAM, and can be displayed again instantly by setting DS = 1. When DC = DS = 0 and all displays are off, all LCD driver outputs are set to the GND level and the display is off. Because of this, the HD66732 can control charging current for the LCD with AC driving.

NC1-0: Sets the number of display characters per line.

	R/W	RS	DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
R9:	0	1	0	0	DC	DS	0	0	NC1	NC0

Figure 17 Display Control Instruction

**Table 31 NC Bits and Display Characters** 

NC1	NC0	Number of Display Characters	Segment Driver Used
0	0	6	SEG1-SEG72
0	1	8	SEG1-SEG96
1	0	10	SEG1-SEG120
1	1	Inhibited	_

## Scroll Control (RA)

**SN1-0:** Specify the display start line output from COM1. The data is displayed sequentially from the first line to the fourth line then repeated from the first line.

**SL3-0:** Select the top raster-row to be displayed (display-start raster-row) in the display-start lines specified by SN1 to SN0. Any raster-row from the first to fourth can be selected. This function is used to achieve raster-row-unit vertical smooth scrolling together with SN1 to SN0. For details, see the Vertical Smooth Scroll section.

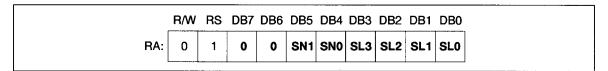


Figure 18 Scroll Control Instruction

Table 32 SN Bits and Display-start Lines

SN1	SN0	Display-start Line
0	0	1st line
0	1	2nd line
1	0	3rd line
1	1	4th line

Table 33 SL Bits and Display-start Raster-row

SL3	SL2	SL1	SL0	Display-start Raster-row
0	0	0	0	1st raster-row
0	0	0	1	2nd raster-row
0	0	1	0	3rd raster-row
0	0	1	1	4th raster-row
0	1	0	0	5th raster-row
		•		•
		•		•
		•		•
1	1	0	0	13th raster-row

## Half-size ROM (HCGROM) Select (RB)

**RL4-1:** Switch the memory bank of the half-size HCGROM for the specified display line. Bank 0 and bank 2 of the HCGROM each incorporate 128 fonts, and display 256 fonts in total. The RL1-RL4 bits select HCGROM bank 0/1 for the display-line unit. When RL1 = "0", the first line selects bank 0. When RL1 = "1", the first line selects bank 1. The RL2, RL3, and RL4 bits select the second- to fourth-line memory banks, respectively. For details, see the HCGROM Bank Switching Function section.

	R/W	RS	DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
RB:	0	1	0	0	0	0	RL4	RL3	RL2	RL1

Figure 19 HCGROM Select Instruction

# Half-size ROM (HCGROM) Display Attribute (RC)

A11/10: Designate the display attributes of all half-size HCGROM fonts displayed in the first line.

A21/20: Designate the display attributes of all half-size HCGROM fonts displayed in the second line.

A31/30: Designate the display attributes of all half-size HCGROM fonts displayed in the third line.

A41/40: Designate the display attributes of all half-size HCGROM fonts displayed in the fourth line.

For details, see the Display Attribute Designation section. The full-size fonts are specified with the two-bit attribute codes in each character code.

	R/W	RS	DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
RC:	0	1	A41	A40	A31	A30	A21	A20	A11	A10

Figure 20 HCGROM Display Attribute Instruction

Table 34 Attributes and Half-size Display State

A41	A40	A31	A30	A21	A20	A11	A10	Half-size Display State
0	0	0	0	0	0	0	0	Normal display
0	1	0	1	0	1	0	1	Black-white reversed display
1	0	1	0	1	0	1	0	Blinking display
1	1	1	1	1	1	1	1	Black-white reversed blinking display

## RAM Address (RD/RE)

RM1-0: Select DDRAM, CGRAM, and SEGRAM. The selected RAM is accessed with this setting.

AD10-0: Initially set RAM addresses to the address counter (AC). Once the RAM data is written, the AC is automatically updated according to the I/D bit. This allows consecutive writing without resetting addresses. Once the RAM data is read, the AC is automatically updated when RDM = "0", but is not updated when RDM = "1". When the read, modify, and write are executed for every one-byte data, set RDM = "1". RAM address setting is not allowed in the sleep mode or standby mode.

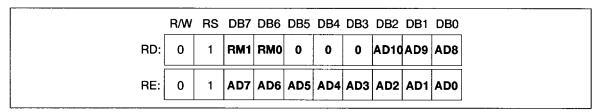


Figure 21 RAM Address Instruction

Table 35 RM Bits and RAM Selection

RM1	RM0	RAM Selection	
0	0	DDRAM	_
0	1	Inhibited	
1	0	CGRAM	
1	1	SEGRAM	

Table 36 AD Bits and DDRAM Setting

RM1/0	AD1-AD0	DDRAM Setting	
00	"000"H-"013"H	Character code on the 1st line	
00	"020"H-"033"H	Character code on the 2nd line	
00	"040"H-"053"H	Character code on the 3rd line	
00	"060"H-"073"H	Character code on the 4th line	

Table 37 AD Bits and CGRAM Setting (GR = 0)

RM1/0	AD9-AD0	CGRAM (1) Setting in the Character Mode (GR = 0)
10	"000"H–"077"H	Upper font pattern of CGRAM characters (1) to (10)
10	"100"H–"177"H	Lower font pattern of CGRAM characters (1) to (10)
10	"200"H–"277"H	Upper font pattern of CGRAM characters (11) to (20)
10	"300"H–"377"H	Lower font pattern of CGRAM characters (11) to (20)
10	"400"H–"477"H	Upper font pattern of CGRAM characters (21) to (30)
10	"500"H–"577"H	Lower font pattern of CGRAM characters (21) to (30)

Table 38 AD Bits and CGRAM Setting (GR = 1)

RM1/0	AD10-AD0	CGRAM Setting in the Graphics Mode (GR = 1)
10	"000"H-"077"H	Bit map data for COM1 to COM8
10	"100"H-"177"H	Bit map data for COM9 to COM16
10	"200"H-"277"H	Bit map data for COM17 to COM24
10	"300"H-"377"H	Bit map data for COM25 to COM32
10	"400"H-"477"H	Bit map data for COM33 to COM40
10	"500"H"577"H	Bit map data for COM41 to COM48
10	"600"H–"677"H	Bit map data for COM49 to COM52

Table 39 AD Bits and SEGRAM Setting

RM1/0	AD10-AD0	SEGRAM Setting
11	"000"H-"077"H	SEGRAM display data

#### RAM Data (RF)

WD7-0: Write 8-bit data to the DDRAM and CGRAM, and lower 2-bit data to the SEGRAM. The DDRAM/CGRAM/SEGRAM is selected by the previous specification of the RM 1/0 bit. After a write, the address is automatically incremented or decremented by 1 according to the I/D bit setting in the entry mode set instruction. During the sleep and standby modes, the DDRAM, CGRAM, or SEGRAM cannot be accessed.

**RD7-0:** Read 8-bit data from the DDRAM, CGRAM or SEGRAM. The DDRAM, CGRAM, or SEGRAM is selected by the previous specification of the RM 1/0 bit. In the parallel bus interface mode, the first-byte data read will be invalid immediately after the RAM address set, and the consecutive second-byte data will be read normally. In the serial interface mode, two bytes will be invalid immediately after the start byte, and the consecutive third-byte data will be read normally. For details, see the Serial Data Transfer section.

After a RAM read, the address is automatically incremented or decremented by 1 according to the entry mode set instruction. When RDM = "1", the address is not updated.

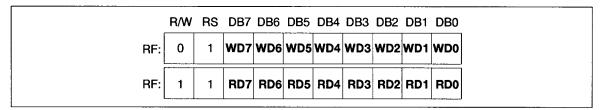


Figure 22 RAM Data Instruction

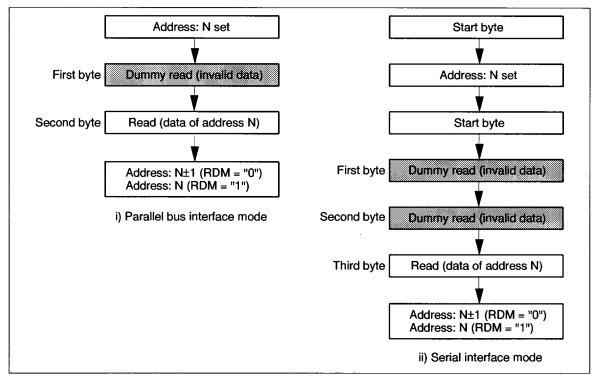


Figure 23 RAM Read Sequence

Table 40 Instruction Register List

	Index	Register					C	ode						Execu- tion
No.	(Hex)	Name	R/W	RS	DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0	Description	Cycle
IR	_	Index	0	0		_	_	_	ID3	ID2	ID1	ID0	Sets the register number of the instruction register to be accessed. ID = 0000: R0– 1111: RF	0
SR	_	Status	1	0	BF	NF1	NF0	_	LF3	LF2	LF1	LF0	Reads the busy flag (BF), display line position (NF1/0), and display raster- row position (NL3– NL0) in the bus interface mode.	0
			1	0				K	SD				Reads the key scan data (KSD) in the serial interface mode.	0
R0	0	Clear display	0	1	0	0	0	0	0	0	0	1	Clears display and sets address 0 into the address counter.	85*
R1	1	Start oscillation	0	1	0	0	0	0	0	0	0	1	Starts oscillation during the standby mode.	_
R2	2	Driver output control	0	1	0	NL2	NL1	NLO	0	CEN	CMS	SGS	Sets the number of display lines (NL2–0), centering (CEN), common driver shift direction (CMS), and segment driver shift direction (SGS).	0
R3	3	LCD drive waveform	0	1	B/C	EOR	0	NW4	NW3	NW2	NW1	NW0	Selects the LCD drive waveform (B/C), specifies the EOR output (EOR), and the number of n raster-rows (NW4– 0).	0
R4	4	LCD drive control	0	1	BS2	BS1	BS0	CT4	СТЗ	CT2	CT1	СТ0	Sets the LCD drive bias (BS2–0) and contrast adjustment (CT4–0).	0
R5	5	Power control	0	1	АМР	0	BT1	ВТ0	0	0	SLP	STB	Turns on the LCD power supply (AMP), and sets the boosting output ratio (BT1/0), sleep mode (SLP), and standby mode (STB).	0

Table 40 Instruction Register List (cont)

	Index	Register					C	ode						Execu- tion
No.	(Hex)	Name	R/W	RS	DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0	Description	Cycle
R6	6	Key scan control	0	1	0	PT2	PT1	PT0	KSB	IRE	KF1	KF0	Sets the port output control (PT2–0), key standby mode (KSB), key scan interrupt (IRE), and key scan cycle (KF1/0).	0
R7	7	Entry mode	0	1	0	0	0	REV	SPR	GR	RDM	I/D	Sets the black- white reversal (REV), super- imposed display (SPR), graphics mode (GR), read/modify/write (RDM), and address counter update direction after RAM access (I/D).	0
R8	8	Cursor control	0	1	0	0	0	СН	LC	B/W	С	В	Sets cursor home (CH), raster-row cursor (LC), black-white reversed cursor (B/W), 13th raster-row cursor (C), and blinking cursor (B).	0
R9	9	Display control	0	1	0	0	DC	DS	0	0	NC1	NC0	Sets display on (DC), segment display on (DS), and the number of display characters (NC1/0).	0
RA	A	Scroll control	0	1	0	0	SN1	SN0	SL3	SL2	SL1	SL0	Sets the display start line (SN1/0) and start raster-row (SL3-0).	0
RB	В	Half-size ROM select	0	1	0	0	0	0	RL4	RL3	RL2	RL1	Sets the half-size CGROM bank switch (RL1-4) every display line.	0
RC	С	Half-size display attribute	0	1	A41	A40	A31	A30	A21	A20	A11	A10		0
RD	D	RAM address set (upper)	0	1	RM1	RMO	0	0	0	AD10	)—8 (up	oper)	Initially sets the RAM select (RM1/0) and upper three bits of the RAM address (AD10–8).	0

Table 40 Instruction Register List (cont)

	Index	Register			Code	_	Execu- tion
No.		Name	R/W	RS	DB7 DB6 DB5 DB4 DB3 DB2 DB1 DB6	Description	Cycle
RE	E	RAM address set (lower)	0	1	AD7–0 (lower)	Initially sets the lower eight bits of the RAM address (AD7-0).	0
RF	F	RAM data	0	1	Write data	Writes or reads the data to or from the	0
			1	1	Read data	DDRAM, CGRAM, or SEGRAM.	

Note: The execution time depends on the supplied clock frequency or the internal oscillation frequency.

Bit definition:

BF = 1: Internal processing

NF1/0: Display read line positions

LF3-0: Display read raster-row positions

NL2–0: Display line setting (000: Segment only, 001: One line, 010: Two lines, 011: Three lines, 100: Four lines)

CEN = 1: Display position shift to the center of the screen

CMS = 0: COM1/52 => COM1

SGS = 0: SEG1/120 => SEG1

B/C = 0: B-pattern waveform drive

B/C = 1: C-pattern waveform drive

EOR = 1: EOR alternating drive at C-pattern waveform

NW4-0: Reversed number of n raster-rows at C-pattern waveform drive (alternating with the set value + one raster-row)

BS2-0: LCD drive bias select

CT4-0: Contrast adjustment

AMP = 1: Operating amplifier/booster on

BT1/0: Boost output ratio (00: Single, 01: Double, 10: Triple, 11: Quadruple)

SLP = 1: Sleep mode

STB = 1: Standby mode

PT2-0: Port output control (PT2 = 1: PORT2 = Vcc, PT1 = 1: PORT1 = Vcc, PT0 = 1: PORT0 = Vcc)

KSB = 1: Key standby mode (key scan stop)

IRE = 1: Key scan interrupt generation enabled

KF1/0: Key scan cycle set

REV = 1: Black-white reversed display, but excluding the segment display

SPR = 1: Super-imposed display of the character and graphics

GR = 0: Character display mode

GR = 1: Graphics display mode

RDM = 0: Automatically update the address counter after reading

RDM = 1: Do not automatically update the address counter after reading

I/D = 1: Address counter increment

I/D = 0: Address counter decrement

CH = 1: Cursor home

LC = 1: Raster-row cursor

B/W = 1: Black-white reversed cursor

C = 1: 13th raster-row cursor

B = 1: Blinking cursor

DC = 1: Character/graphics display on

DS = 1: Segment display on

NC1/0: Number of display characters (00: six, 01: eight, 10: 10)

SN1/0: Display-start line specifications (00: 1st line, 01: 2nd line, 10: 3rd line, 11: 4th line)

SL3-0: Scroll-start raster-row specifications (0000: 1st raster-row, 0100: 5th raster-row, 1000: 9th raster-row, 1100: 13th raster row)

RL1-4: Half-size CGROM memory bank selection (RL1: 1st line, RL2: 2nd line, RL3: 3rd line, RL4: 4th line)

A11/10: 1st-line half-size display attribute (00: normal, 01: black-white reversal, 10: blinking, 11: black-white reversed blinking)

A21/20: 2nd-line half-size display attribute A31/30: 3rd-line half-size display attribute A41/40: 4th-line half-size display attribute

RM1/0: RAM selection (00/01: DDRAM, 10: CGRAM, 11: SEGRAM)

AD10-0: RAM address

#### **Reset Function**

The HD66732 is internally initialized by RESET input. During initialization, the system executes a clear display instruction after reset is canceled. The system executes the other instructions during the reset period. Because the busy flag (BF) indicates a busy state (BF = 1) during the reset period and the clear display instruction is executed following reset cancellation, no instruction or RAM data access from the MPU is accepted. The reset input must be held for at least 1 ms. Any initializing instruction must wait for 200 clock cycles after the reset is canceled so that execution of the clear display instruction can be completed.

#### **Instruction Set Initialization:**

- 1. Clear display executed (writes half-size space code A0H to DDRAM)
- 2. Start oscillation executed
- 3. Driver output control (NL2-0 = 100: 1/54 duty drive, CEN = 0, SGS = 0, CMS = 0, CEN = 0)
- 4. LCD waveform control (B/C = 0: B-pattern waveform, EOR = 0, NW4-0 = 0000)
- 5. LCD drive control (BS2-0 = 000: 1/8 bias drive, CT4-0 = 00000: Weak contrast)
- 6. Power control (AMP = 0: LCD power off, BT1/0 = 00: Single boost, SLP = 0: Sleep mode off, STB = 0: Standby mode off)
- 7. Key scan control (KSB = 0: Key scan, IRE = 0: Key scan interrupt (IRQ) generation disabled, KF1/0 = 00: Key scan set to 64 cycles)
- 8. Port control (PT2/1/0 = 000: PORT2/1/0 output = GND level)
- 9. Entry mode set (REV = 0, SPR = 0, GR = 0: Character display mode, RDM = 0, I/D = 1: Increment by
- 10. Cursor control (CH = 0: Cursor home, LC = 0, B/W = 0, C = 0, B = 0)
- 11. Display control (DC/DS = 00: Display off, NC1/0 = 00: six-character display)
- 12. Scroll control (SN1/0 = 00, SL3/2/1/0 = 0000: First raster-row displayed at the top of the first line)
- 13. Half-size ROM control (RL4/3/2/1 = 0000; Bank 0 selection)
- 14. Half-size display attribute (A41/40 = 00, A31/30 = 00, A21/20 = 00, A11/10 = 00): Normal half-size display)
- 15. RAM address (RM1/0 = 00: DDRAM selection, AD10-0 = 000H)

#### **RAM Data Initialization:**

#### 1. DDRAM

All addresses are initialized to A0H by the clear-display instruction after the reset is canceled.

#### 2. CGRAM/SEGRAM

This is not automatically initialized by the reset input but must be initialized by software while the display is off (D = 0).

# **Output Pin Initialization:**

- 1. LCD driver output pins (SEG/COM): Outputs GND level
- 2. Booster output pins (VLOUT): Outputs GND level
- 3. Oscillator output pin (OSC2): Outputs oscillation signal
- 4. Key strobe pins (KST0 to KST3): Output strobe signals at specified time intervals
- 5. Key scan interrupt pin (IRQ\*): Outputs  $V_{CC}$  level
- 6. General output ports (PORT0-PORT2): Output GND level

#### Serial Data Transfer

Setting the IM1 and IM2 pins (interface mode pins) to the GND level allows standard clock-synchronized serial data transfer, using the chip select line (CS\*), serial data line (SDA), and serial transfer clock line (SCL). For a serial interface, the IM0/ID pin function uses an ID pin.

The HD66732 initiates serial data transfer by transferring the start byte at the falling edge of CS\* input. It ends serial data transfer at the rising edge of CS\* input.

The HD66732 is selected when the 6-bit chip address in the start byte transferred from the transmitting device matches the 6-bit device identification code assigned to the HD66732. The HD66732, when selected, receives the subsequent data string. The least significant bit of the identification code can be determined by the ID pin. The five upper bits must be 01110. Two different chip addresses must be assigned to a single HD66732 because the seventh bit of the start byte is used as a register select bit (RS): that is, when RS = 0, an instruction can be issued or key scan data can be read, and when RS = 1, data can be written to or read from RAM. Read or write is selected according to the eighth bit of the start byte (R/W bit) as shown in table 41.

After receiving the start byte, the HD66732 receives or transmits the subsequent data byte-by-byte. The data is transferred with the MSB first. To transfer data consecutively, note that only the clear-display instruction requires 85 clock cycles. Wait after issuing the clear-display instruction.

Two bytes of RAM read data after the start byte are invalid. The HD66732 starts to read correct RAM data from the third byte.

**Table 41** Start Byte Format

Transfer Bit	S	1	2	3	4	5	6	7	8
Start byte format	Transfer start	Device ID code					RS	R/W	
		0	1	1	1	0	ID	_	

Note: ID bit is selected by the IM0/ID pin.

Table 42 RS and R/W Bit Function

RS	R/W	Function
0	0	Sets index address
0	1	Reads status register
1	0	Writes control register, RAM address, or RAM data
1	1	Reads RAM data

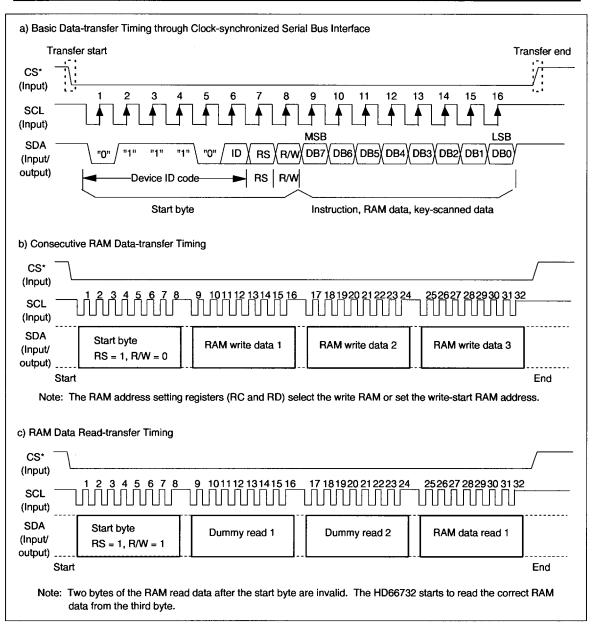


Figure 24 Clock-synchronized Serial Interface Timing Sequence

## **Key Scan Control**

The key matrix scanner senses and holds the key states at each rising edge of key strobe signals (KST) that are output by the HD66732. The key strobe signals are output as time-multiplexed signals from KST0 to KST3. After passing through the key matrix, these strobe signals are used to sample the key state of eight inputs KIN0 to KIN7, enabling up to 32 keys to be scanned.

The states of inputs KIN0 to KIN7 are sampled by key strobe signal KST0 and latched into the SCAN0 register. Similarly, the data sampled by strobe signals KST1 to KST3 is latched into the SCAN1 to SCAN3 registers, respectively. Key pressing is stored as 1 in these registers.

The generation cycle and pulse width of the key strobe signals depend on the operating frequency (oscillation frequency) of the HD66732 and the key scan cycle determined by the KF0 and KF1 bits. For example, when the operating frequency is 60 kHz and KF0 and KF1 are both 10, the generation cycle is 4.3 ms and the pulse width is 1.1 ms. When the operating frequency (oscillation frequency) is changed, the above generation cycle and the pulse width are changed in inverse proportion.

In order to compensate for the mechanical features of the keys, such as chattering and noise and for the key-strobe generation cycle and the pulse width of the HD66732, software should read the scanned data two to three times in succession to obtain valid data. Multiple keypress combinations should also be processed in the software.

Up to three keys can be pressed simultaneously. Note, however, that if the third key is pressed on the intersection between the rows and columns of the first two keys pressed, incorrect data will be sampled. For three-key input, the third key must be on a separate column or row.

Additionally, the HD66732 supports the key standby mode in which only the key scan circuit enters the standby state. When 1 is set to the key standby mode setting bit (KSB), only key scanning is stopped. In this case, as well as in the normal standby mode, the key scan interrupt function can be used. For example, this function is used when only key scanning is stopped to improve the sensitivity of the wave received by a radio system during calling.

The input pins KIN0 to KIN7 are pulled up to  $V_{CC}$  with internal MOS transistors (see the Electrical Characteristics section). External resistors may also be required to further pull the voltages up when the internal pull-ups are insufficient for the desired noise margins or for a large key matrix.

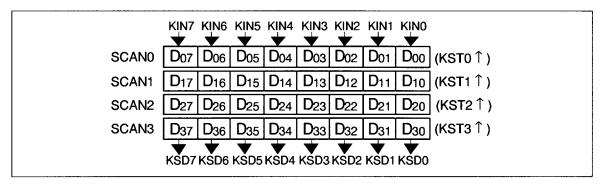


Figure 25 Key Scan Register Configuration

Table 43 Key Scan Cycles for Each Operating Frequency

KF1	KF0	Key Scan Pulse Width	Key Scan Cycle
0	0	0.26 ms	1.1 ms (64 clock cycles)
0	1	0.5 ms	2.1 ms (128 clock cycles)
1	0	1.1 ms	4.3 ms (256 clock cycles)
1	1	2.1 ms	8.5 ms (512 clock cycles)

Note: The data is a value obtained when the oscillation frequency (fosc) is 60 kHz. The value depends on the oscillation frequency.

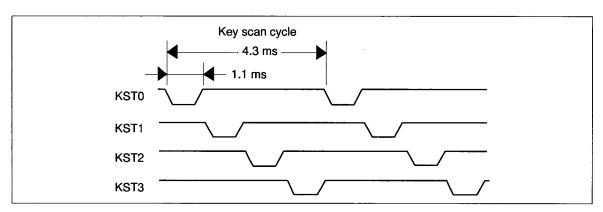


Figure 26 Key Strobe Output Timing (KF1/0 = 10, fcp/fosc = 60 kHz)

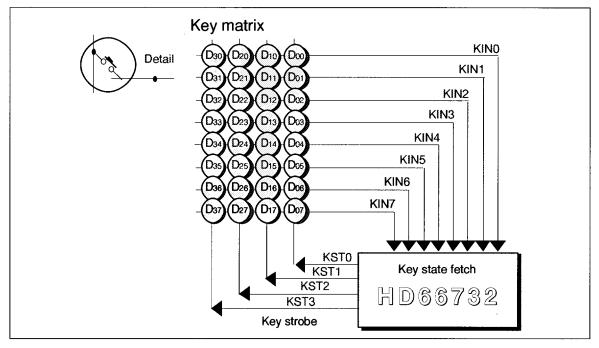


Figure 27 Key Scan Configuration

The key-scanned data can be read by an MPU via a serial interface. First, a start byte should be transferred. After the HD66732 has received the start byte, the MPU reads scan data KSD7 to KSD0 from the SCAN0 register starting from the MSB. Similarly, the MPU reads data from SCAN1, SCAN2 and SCAN3 in that order. After reading SCAN3, the MPU starts at SCAN0 again.

The HD66732 may be read out while it is latching scan data and is thus unstable. Consequently, it should also be reconfirmed with software if required.

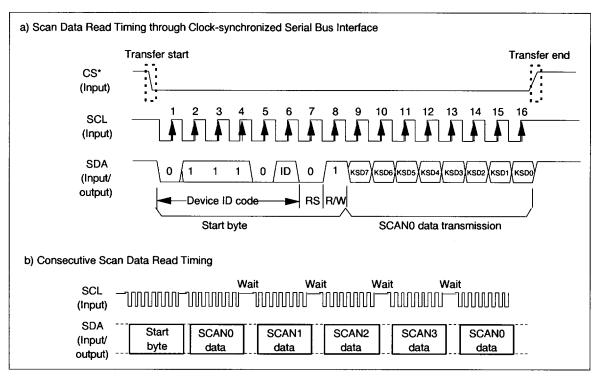


Figure 28 Scan Data Serial Transfer Timing

## **Key Scan Interrupt (Wake-up Function)**

If the interrupt enable bit (IRE) is set to 1, the HD66732 sends an interrupt signal to the MPU on detecting that a key has been pressed in the key scan circuit by setting the IRQ\* output pin to a low level. An interrupt signal can be generated by pressing any key in a 32-key matrix. The interrupt level continues to be output during the key scan cycle while the key is being pressed.

Normal key scanning is performed and interrupts can occur in the HD66732 sleep mode (SLP = 1). Accordingly, power consumption can be minimized in the sleep mode, by triggering the MPU to read key states via the interrupt which is generated only when the HD66732 detects a key input. For details, see the Sleep Mode section.

On the other hand, normal key scanning stops in the standby mode (STB = 1) or in the key standby mode (KSB = 1). During this period, the KST0 output is kept low, so the HD66732 can always monitor eight key inputs (KIN0-KIN7) connected to KST0 when RS = GND. Therefore, if any of the eight keys is pressed, an interrupt occurs. When RS = Vcc, all outputs KST0 to KST3 are kept low, so the HD66732 can always monitor 32 key inputs. If any of the 32 keys is pressed, an interrupt occurs. Accordingly, power consumption or noise generation can be further minimized in the standby mode, where the whole system is inactive, by triggering the MPU via the interrupt which is generated only when the HD66732 detects a key input from the above keys. For details, see the Standby Mode section.

The IRQ\* output pin is pulled up to the  $V_{\rm CC}$  with an internal MOS resistor of approximately 50 k $\Omega$ . Additional external resistors may be required to obtain stronger pull-ups. Interrupts may occur if noise occurs in KINO-KIN7 input during key scanning. Interrupts must be inhibited if not needed by setting the interrupt enable bit (IRE) to 0.

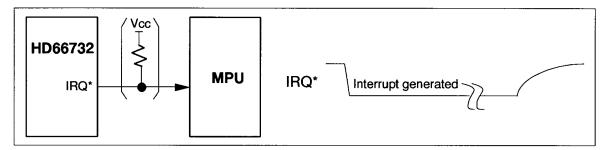


Figure 29 Interrupt Generator

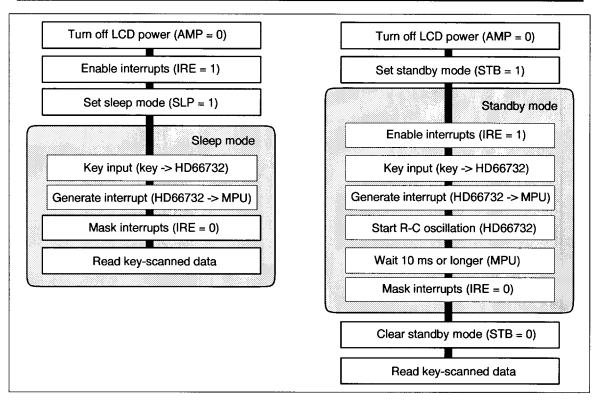


Figure 30 Key Scan Interrupt Processing Flow in Sleep and Standby Modes

#### **Parallel Data Transfer**

#### 8-bit Interface

Setting the IM2/1/0 (interface mode) to the GND/Vcc/GND level allows E-clock-synchronized 8-bit parallel data transfer. Setting the IM2/1/0 (interface mode) to the Vcc/Vcc/GND level allows 80-system 8-bit parallel data transfer. When the number of buses or the mounting area is limited, use a 4-bit bus interface or serial data transfer.

Using a parallel bus interface disables the key scan function. To prevent this, use a clock-synchronized serial interface.

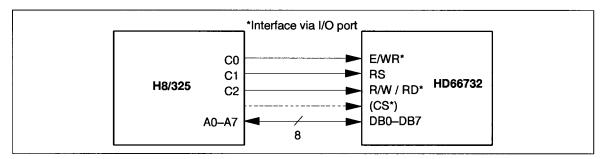


Figure 31 Interface to 8-bit Microcomputer

#### 4-bit Interface

Setting the IM2/1/0 (interface mode) to the GND/Vcc/Vcc level allows E-clock-synchronized 4-bit parallel data transfer using pins DB7/KIN7-DB4/KIN4. Setting the IM2/1/0 (interface mode) to the Vcc/Vcc/Vcc level allows 80-system 4-bit parallel data transfer. 8-bit instructions and RAM data are divided into four upper/lower bits and the transfer starts from the upper four bits.

Using a parallel bus interface disables the key scan function. To prevent this, use a clock-synchronized serial interface.

Note: Transfer synchronization function for a 4-bit bus interface

The HD66732 supports the transfer synchronization function which resets the upper/lower counter to count upper/lower 4-bit data transfer in the 4-bit bus interface. Noise causing transfer mismatch between the four upper and lower bits can be corrected by a reset triggered by consecutively writing a 0000 instruction four times. The next transfer starts from the upper four bits. Executing synchronization function periodically can recover any runaway in the display system.

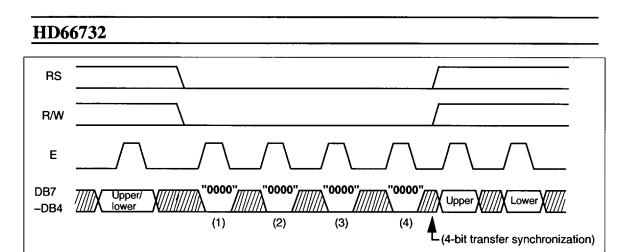


Figure 32 4-bit Transfer Synchronization

#### **Oscillation Circuit**

The HD66732 can either be supplied with operating pulses externally (external clock mode), oscillate using an internal R-C oscillator with an external oscillator-resistor. External oscillator-resistors (Rf) can adjust the oscillating frequency. When the power-supply voltage is minimized, the frequency is lowered. See the Electrical Characteristics Notes section for the relationships between the Rf resistance value and oscillating frequency.

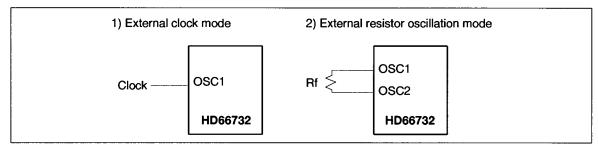


Figure 33 Oscillation Circuits

Table 44 Relationship between Drive Duty Ratio and Frame Frequency

	Number of Display Cl	haracters	
	6-character display (NC = 00)	8-character display (NC = 01)	10-character display (NC = 10)
	Recommended R-C C	Scillating Frequency	
Frame Frequency	45 kHz	60 kHz	76 kHz
Segment display (NL = 001)	70 Hz	70 Hz	70 Hz
1-line display (NL = 001)	73 Hz	71 Hz	70 Hz
2-line display (NL = 010)	73 Hz	71 Hz	71 Hz
3-line display (NL = 011)	69 Hz	73 Hz	71 Hz
4-line display (NL = 100)	70 Hz	70 Hz	70 Hz

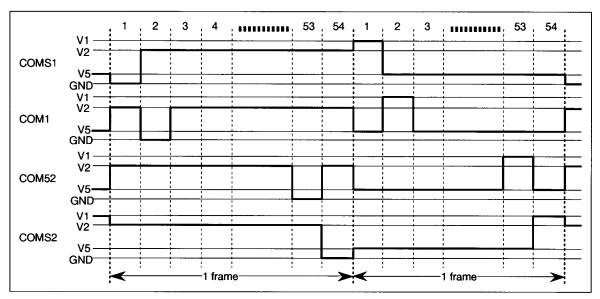


Figure 34 LCD Drive Output Waveform (4-line Display with 1/54 Multiplexing Duty Ratio)

#### n-raster-row Reversed AC Drive

The HD66732 supports not only the LCD reversed AC drive in a one-frame unit (B-pattern waveform) but also the n-raster-row reversed AC drive which alternates in an n-raster-row unit from one to 32 raster-rows (C-pattern waveform). When a problem affecting display quality occurs, such as crosstalk at high-duty driving of more than three lines (1/42 duty), the n-raster-row reversed AC drive (C-pattern waveform) can improve the quality. Determine the number of raster-rows n for alternating after confirmation of the display quality with the actual LCD panel. However, if the number of AC raster-rows is reduced, the LCD alternating frequency becomes high. Because of this, the charge or discharge current is increased in the LCD cells.

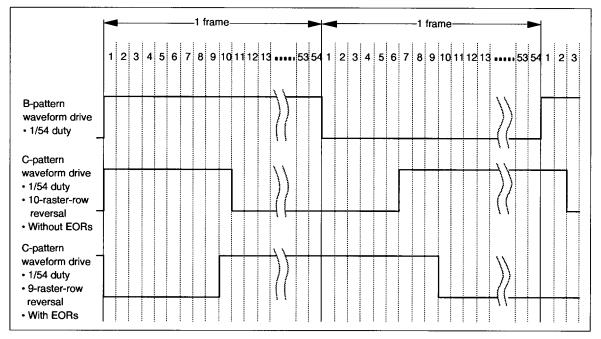


Figure 35 Example of an AC Signal under n-raster-row Reversed AC Drive

### Liquid Crystal Display Voltage Generator

#### When External Power Supply and Internal Operational Amplifiers are Used

To supply LCD drive voltage directly from the external power supply without using the internal booster, circuits should be connected as shown in figure 36. Here, contrast can be adjusted by software through the CT bits of the contrast adjustment register.

The HD66732 incorporates a voltage-follower operational amplifier for each V1 to V5 to reduce current flowing through the internal bleeder-resistors, which generate different levels of liquid-crystal drive voltages. Thus, the potential difference between  $V_{LCD}$  and V1 must be 0.1 V or higher, and ones between V4 and GND between V2 and GND must be 1.4 V or higher. Note that the OPOFF pin must be grounded when using the operational amplifiers. Place a capacitor of about 0.1  $\mu$ F to 0.5  $\mu$ F between each internal operational amplifier V10UT to V50UT output and GND and stabilize the output level of the operational amplifier.

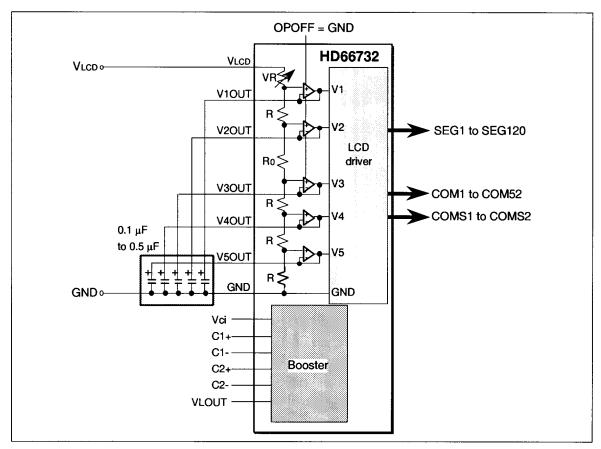


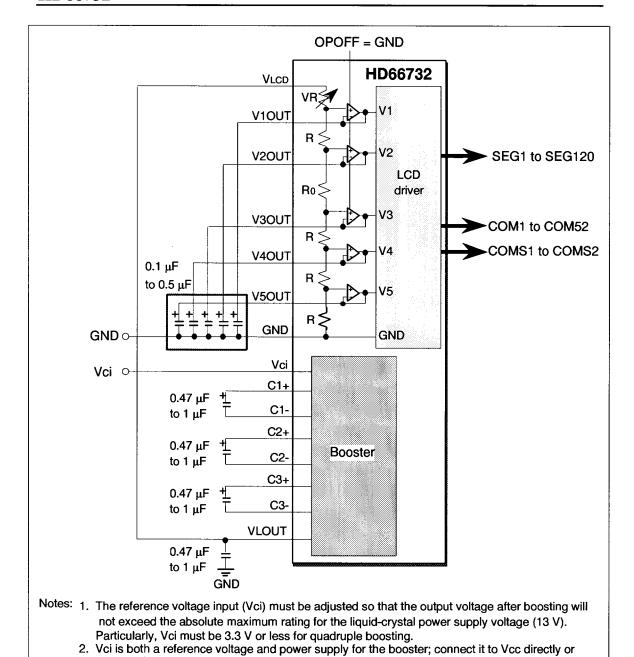
Figure 36 External Power Supply Circuit for LCD Drive Voltage Generation

#### When an Internal Booster and Internal Operational Amplifiers are Used

To supply LCD drive voltage using the internal booster, circuits should be connected as shown in figure 37. Here, contrast can be adjusted through the CT bits of the contrast control instruction. Temperature can be compensated either through the CT bits or by controlling the reference voltage for the booster (Vci pin) using a thermistor.

Note that Vci is both a reference voltage and power supply for the booster. The reference voltage must therefore be adjusted using an emitter-follower or a similar element so that sufficient current can be supplied. In this case, Vci must be equal to or smaller than the  $V_{\rm CC}$  level.

The HD66732 incorporates a voltage-follower operational amplifier for each of V1 to V5 to reduce current flowing through the internal bleeder-resistors, which generate different liquid-crystal drive voltages. Thus, the potential difference between  $V_{LCD}$  and V1 must be 0.1 V or higher, and ones between V4 and GND and between V2 and GND must be 1.4 V or higher. Note that the OPOFF pin must be grounded when using the operational amplifiers. Place a capacitor of about 0.1  $\mu$ F to 0.5  $\mu$ F between each internal operational amplifier V1OUT to V5OUT output and GND and stabilize the output level of the operational amplifier.



- combine it with a transistor so that sufficient current can be obtained. 3. Vci must be smaller than Vcc.
- 4. Polarized capacitors must be connected correctly.
- 5. Circuits for temperature compensation should be based on the sample circuit in figure 38.

Figure 37 Internal Booster for LCD Drive Voltage Generation

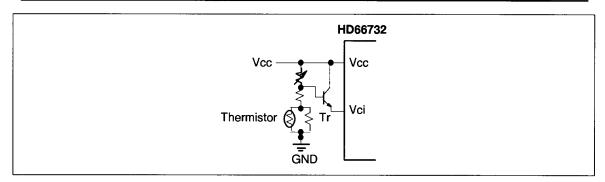


Figure 38 Temperature Compensation Circuit

Instruction bits (BT1/0) can optionally select the boosting multiplying factor of the internal booster. According to the display status, power consumption can be reduced by changing the LCD drive duty and the LCD drive bias, and by controlling the boosting multiplying factor for the minimum requirements. For details, see the Partial-display-on Function section.

Due to the maximum boosting multiplying factor, the following external capacitor needs to be connected. For example, when the maximum boosting is tripled, the capacitors between C3+ and C3- for quadruple boosting are not needed, so these pins must be open.

**Table 45 VLOUT Output Status** 

BT1	вто	VLOUT Output Status
0	0	Single output (The potential difference between Vci and GND is output to the VLOUT.)
0	1	Double boosting output
1	0	Triple boosting output
1	1	Quadruple boosting output

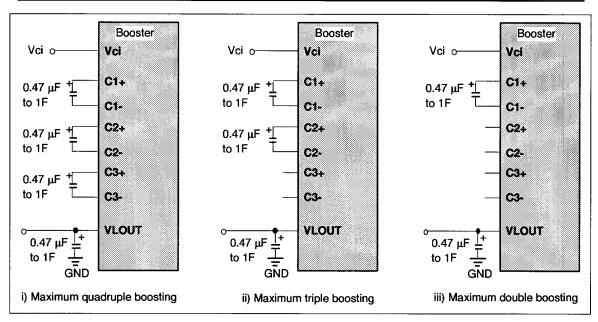


Figure 39 Booster Output Multiplying Factor Switching

### **Contrast Adjuster**

Software can adjust contrast for an LCD by varying the liquid-crystal drive voltage (potential difference between  $V_{LCD}$  and V1) through the CT bits of the contrast adjustment register (electron volume function). The value of a variable resistor (VR) can be adjusted within a range from 0.1 x R through 3.2 x R, where R is a reference resistance obtained by dividing the total resistance between  $V_{LCD}$  and V1.

The HD66732 incorporates a voltage-follower operational amplifier for each of V1 to V5 to reduce current flowing through the internal bleeder resistors, which generate different liquid-crystal drive voltages. Thus, CT4-0 bits must be adjusted so that the potential difference between  $V_{LCD}$  and V1 is 0.1 V or higher, and ones between V4 and GND and between V2 and GND are 1.4 V or higher when liquid-crystal drives.

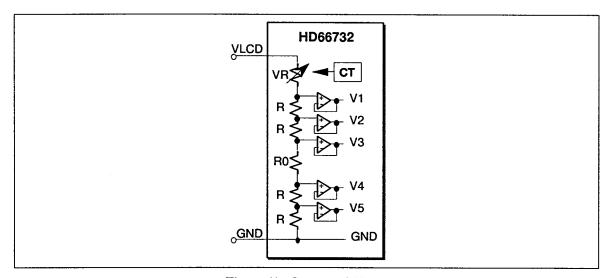


Figure 40 Contrast Adjuster

Table 46 Contrast Adjustment Bits (CT) and Variable Resistor Values

	CT Set Value		ie	Variable Resistor Value	1	Display Color	
CT4	CT4 CT3 CT2 CT1 CT0			СТО	(VR)	between V1 and GND	Display Coloi
0	0	0	0	0	3.2 x R	(Small)	(Light)
0	0	0	0	1	3.1 x R	<b>1</b>	A
0	0	0	1	0	3.0 x R	<b>A</b>	<b>•</b>
0	0	0	1	1	2.9 x R		
0	0	1	0	0	2.8 x R		
0	0	1	0	1	2.7 x R		
0	0	1	1	0	2.6 x R		
0	0	1	1	1	2.5 x R		
0	1	0	0	0	2.4 x R		
0	1	0	0	1	2.3 x R		
0	1	0	1	0	2.2 x R		
0	1	0	1	1	2.1 x R		
0	1	1	0	0	2.0 x R		
0	1	1	0	1	1.9 x R		
0	1	1	1	0	1.8 x R		
0	1	1	1	1	1.7 x R		
1	0	0	0	0	1.6 x R		į
1	0	0	0	1	1.5 x R		
1	0	0	1	0	1.4 x R		
1	0	0	1	1	1.3 x R		
1	0	1	0	0	1.2 x R		
1	0	1	0	1	1.1 x R		
1	0	1	1	0	1.0 x R		
1	0	1	1	1	0.9 x R		
1	1	0	0	0	0.8 x R		
1	1	0	0	1	0.7 x R		; !
1	1	0	1	0	0.6 x R		
1	1	0	1	1	0.5 x R		
1	1	1	0	0	0.4 x R		
1	1	1	0	1	0.3 x R		Ť
1	1	1	1	0	0.2 x R	<b>∀</b>	<b>V</b>
1	1	1	1	1	0.1 x R	(Large)	(Deep)

Table 47 Contrast Adjustment per Bias Drive Voltage

Bias	LCD drive voltage: VDR	Contrast adjustment range
	200 dirio vollago. VDII	- LCD drive voltage adjustment range : 0.714 x (VLCD-GND) ≤ VDR ≤ 0.988 x (VLCD-GND)
1/8 bias	8 x R 8 x R + VR x (VLCD - GND)	- Limit of potential difference between V4 and GND: $\frac{2 \times R}{8 \times R + VR} \times (VLCD-GND) \ge 1.4 [V]$
drive		- Limit if potential difference between VLCD and V1:      VR   X (VLCD-GND) ≥ 0.1 [V]
1/7		- LCD drive voltage adjustment range : 0.686 x (VLCD-GND) ≤ VDR ≤ 0.986 x (VLCD-GND)
bias drive	$\frac{7 \times R}{7 \times R + VR} \times (VLCD - GND)$	- Limit of potential difference between V4 and GND : $\frac{2 \times R}{7 \times R + VR} \times (VLCD\text{-GND}) \ge 1.4 \text{ [V]}$
unve		- Limit if potential difference between VLCD and V1: $\frac{VR}{7 \times R + VR} \times (VLCD-GND) \ge 0.1 [V]$
1/6		- LCD drive voltage adjustment range : 0.652 x (VLCD-GND) ≤ VDR ≤ 0.984 x (VLCD-GND)
bias drive	6 x R 6 x R + VR x (VLCD - GND)	- Limit of potential difference between V4 and GND : $\frac{2 \times R}{6 \times R + VR} \times (VLCD-GND) \ge 1.4 [V]$
unve		- Limit if potential difference between VLCD and V1 :
1/5.5		- LCD drive voltage adjustment range : 0.632 x (VLCD-GND) ≤ VDR ≤ 0.982 x (VLCD-GND)
bias drive	5.5 x R 5.5 x R + VR x (VLCD - GND)	- Limit of potential difference between V4 and GND : $\frac{2 \times R}{5.5 \times R + VR} \times (VLCD-GND) ≥ 1.4 [V]$
G		- Limit if potential difference between VLCD and V1 : √R (VLCD-GND) ≥ 0.1 [V]
1/5		- LCD drive voltage adjustment range : 0.610 x (VLCD-GND) ≤ VDR ≤ 0.980 x (VLCD-GND)
bias drive	5 x R + VR x (VLCD - GND)	- Limit of potential difference between V4 and GND : $\frac{2 \times R}{5 \times R + VR} \times (VLCD-GND) ≥ 1.4 [V]$
L		- Limit if potential difference between VLCD and V1 :    VR  5 x R + VR x (VLCD-GND ) ≥ 0.1 [V]
1/4.5	45 v D	- LCD drive voltage adjustment range :0.556 x (VLCD-GND) ≤ VDR ≤ 0.978 x (VLCD-GND)
bias drive	$\frac{4.5 \times R}{4.5 \times R + VR} \times (VLCD - GND)$	- Limit of potential difference between V4 and GND : $\frac{2 \times R}{4.5 \times R + VR} \times (VLCD-GND) ≥ 1.4 [V]$
unve		- Limit if potential difference between VLCD and V1: $\frac{VR}{4.5 \times R + VR} \times (VLCD-GND) \ge 0.1 [V]$
1/4	4B	- LCD drive voltage : 0.556 x (VLcD-GND) ≤ VDR ≤ 0.976 x (VLcD-GND)
bias drive	4 x R + VR x (VLCD - GND)	- Limit of potential difference between V4 and GND:   - Limit of potential 4 x R + VR x (VLCD-GND) ≥ 1.4 [V]
		- Limit if potential difference between VLCD and V1:   VR / 4 x R + VR x (VLCD-GND) ≥ 0.1 [V]
4 10		- LCD drive voltage adjustment range :0.385 x (VLCD-GND) ≤ VDR ≤ 0.952 x (VLCD-GND)
1/2 bias	2 x R 2 x R + VR x (VLCD - GND)	- Limit of potential difference between V2 and GND : $\frac{2 \times R}{2 \times R + VR} \times (VLCD\text{-GND}) \ge 1.4 \text{ [V]}$
drive		- Limit if potential difference between VLCD and V1:   VR 2 x R + VR x (VLCD-GND) ≥ 0.1 [V]

### **LCD Drive Bias Selector**

An optimum liquid crystal display bias value can be selected using BS2-0 bits, according to the liquid crystal drive duty ratio setting (NL2-0 bits). Liquid crystal display drive duty ratio and bias value can be displayed while switching software applications to match the LCD panel display status. The optimum bias value calculated using the following expression is an ideal value where the optimum contrast is obtained. Driving by using a lower value than the optimum bias value provides lower contrast and lower liquid crystal display voltage (potential difference between V1 and GND). When the liquid crystal display voltage is insufficient even if a quadruple booster is used or output voltage is lowered because the battery life has been reached, the display can be made easier to see by lowering the liquid crystal bias.

The liquid crystal display can be adjusted by using the contrast adjustment register (CT4-0 bits) and selecting the booster output level (BT1/0 bits).

Optimum bias value for 1/N duty ratio drive voltage = 
$$\frac{1}{\sqrt{N} + 1}$$

**Table 48** Optimum Drive Bias Values

LCD drive duty ratio (NL2-0 set value)	1/54 duty ratio (NL2-0 = 100)	1/41 duty ratio (NL2-0 = 011)	1/28 duty ratio (NL2-0 = 010)	1/15 duty ratio (NL2-0 = 001)	1/2 duty ratio (NL2-0 = 000)
Optimum drive bias value (BS2-0 set value)	1/8 bias (BS2-0 = 000)	1/7 bias (BS2-0 = 001)	1/6 bias (BS2-0 = 010)	1/4.5 bias (BS2-0 = 101)	1/2 bias (BS2-0 = 111)

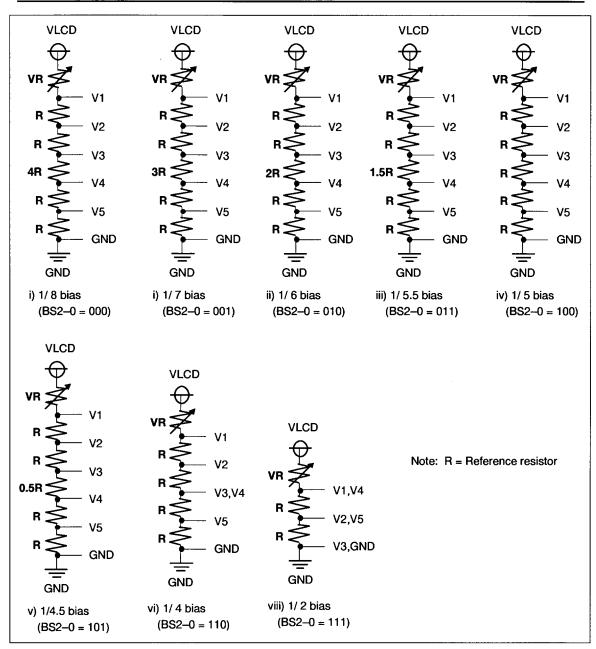


Figure 41 Liquid Crystal Display Drive Bias Circuit

#### **LCD Panel Interface**

The HD66732 has a function for changing the common driver/segment driver output shift direction using the CMS bit and SGS bit to meet the chip mounting positions of the HD66732. This is to facilitate the interface wiring to the LCD panel with COG or TCP installed.

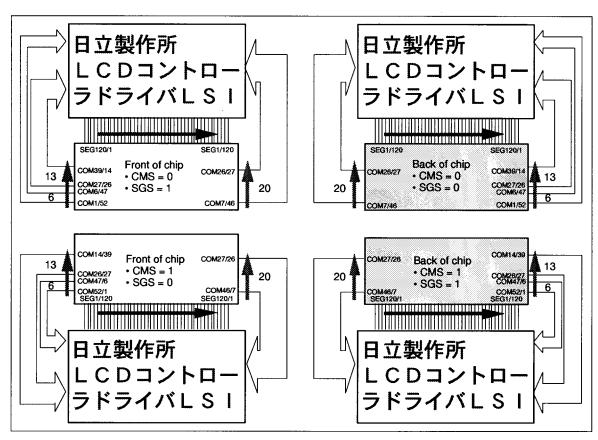


Figure 42 3-line Display Pattern Wiring

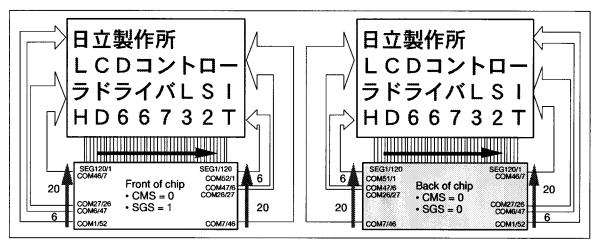


Figure 43 4-line Display Pattern Wiring

## Combined Display of Full-size and Half-size Characters

The HD66732 creates a display from the left edge of the display area combining 12-dot full-size (font size: 11 x 12 dots) and 6-dot half-size characters (font size: 5 x 12 dots). There will be a one-dot space between these fonts.

The most significant bit in the data (8 bits) in the DDRAM is allocated to the designation bit indicating a full-size or half-size character. When this MSB is 0, the full-size character is selected, and when 1, the half-size character is selected.

When the full-size character is selected, two bytes of DDRAM are linked and used as a 16-bit code. In this case, the lower byte is written into the smaller DDRAM address. 13 bits of this 16-bit code are used as character codes. Since up to 8,192 character codes can be specified, symbols can be used as well as the JIS Level-1 and Level-2 Kanji Sets. In addition, two of the remaining bits can be allocated to a display-attribute code and can designate a black-white reversed display for individual characters. For details, refer to the Display Attribute Designation section.

Table 50 shows the relationship between the 16-bit designated JIS code and the HD66732 13-bit character code. The 8-bit data designating half-size characters are used as an 8-bit code. Specifically, 7 bits of the 8-bit half-size characters become the character codes, so that a total of 128 characters can be displayed (alphanumeric characters and symbols can be displayed as half-size characters). These 128 CGROMs (HCGROMs) for half-size fonts have two memory banks and incorporate a total of 256 half-size fonts. These memory banks are switched in a display-line unit by bits RL1-RL4 in the half-size ROM select register (RA). For details, refer to the HCGROM Bank Switching Function section. A half-size font display attribute is designated by the half-size display attribute register (RB) in a display-line unit. Note that the same display attribute in a character unit such as the full-size font cannot be specified.

User fonts can be displayed using the CGRAM. Special symbols not included in the internal CGROM can be displayed as needed. Since the display font size of the CGRAM is 12 x 13 dots, CGRAM fonts can be displayed to the right, left, top, or bottom, in order to be used to display double-size characters. In the super-imposed display mode, which displays the combined character display mode and graphics display mode, this CGRAM becomes the bit map memory for the graphics display and cannot be used as the user font for characters.

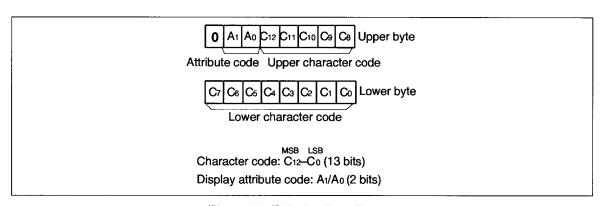


Figure 44 Full-size Code Format

**Table 49 Attribute Code and Display Contents** 

A1	Α0	Display Contents
0	0	Normal display
0	1	Black-white reversed display
1	0	Blinking display
1	1	Black-white reversed blinking display

Table 50 JIS Code and HD66732 Character Code

- JIS Level-1 byte code: b7-b1 (7 bits)
- JIS Level-2 byte code: a7-a1 (7 bits)
- CGRAM code for user fonts: u6-u1 (6 bits)

IIC Codo							HD	667	'32	Cha	arac	ter	Cod	le		
JIS Code	b7	b6	b5	C12	C11	C10	Co	Св	С7	C <sub>6</sub>	C₅	C4	Сз	C <sub>2</sub>	C <sub>1</sub>	Co
Non-kanji	0	1	0	0	a7	а6	b3	b2	b1	0	0	a5	a4	а3	a2	a1
Level-1 Kanji	0	1	1	0	b7	b4	b3	b2	b1	a7	<b>a</b> 6	a5	a4	аЗ	a2	a1
	1	0	0	0	b7	b4	b3	b2	b1	а7	a6	<b>a</b> 5	a4	а3	a2	a1
Level-2 Kanji	1	0	1	1	b6	b4	b3	b2	b1	a7	<b>a</b> 6	a5	a4	а3	a2	a1
	1	1	0	1	b6	b4	b3	b2	b1	a7	a6	а5	a4	аЗ	<b>a</b> 2	<b>a</b> 1
	1	1	1	1	а7	а6	b3	b2	b1	0	0	<b>a</b> 5	a4	а3	a2	<b>a</b> 1
User Font	_	_	_	u6	0	0	0	0	0	0	0	u5	u4	u3	u2	u1
Upper byte						Lo	we	r by	te		7					

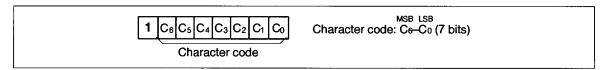


Figure 45 Half-size Code Format

An example of how to display full-size and half-size characters together is explained here.

The full-size character display conforms to the JIS code (16 bits). According to the relationship between the 13-bit JIS code, the code is converted from 16 bits to 13 bits, and the data of two bytes/character is written to the DDRAM. Write the lower byte to the smaller DDRAM address (table 51). When displaying a half-size character, refer to the HD66732 half-size font list (table 52) and write the one byte/character data to the DDRAM.

Figure 46 shows how to set data to the DDRAM when performing a 3-line 6-character display and figure 47 shows the resulting LCD display example.

Table 51 Example of Full-size Character Code Conversion

Displayed Character	JIS Code (first/second byte)	Character Code (C11–C0)			
東	45/6C (Hex)	AEC (Hex)			
京	35/7E (Hex)	2FE (Hex)			
都	45/54 (Hex)	AD4 (Hex)			
小	3E/2E (Hex)	72E (Hex)			
平	4A/3F (Hex)	D3F (Hex)			
市	3B/54 (Hex)	5D4 (Hex)			
本	4B/5C (Hex)	DDC (Hex)			
町	44/2E (Hex)	A2C (Hex)			
の	24/4E (Hex)	A0E (Hex)			

Table 52 Example of Half-size Character Code

Display Character	Character Code (C6–C0)	Display Character	Character Code (C6–C0)
1	31 (Hex)	0	30 (Hex)
2	32 (Hex)	4	34 (Hex)
0	30 (Hex)	2	32 (Hex)
,	2C (Hex)	3	33 (Hex)
М	4D (Hex)	5	35 (Hex)
С	43 (Hex)	1	31 (Hex)

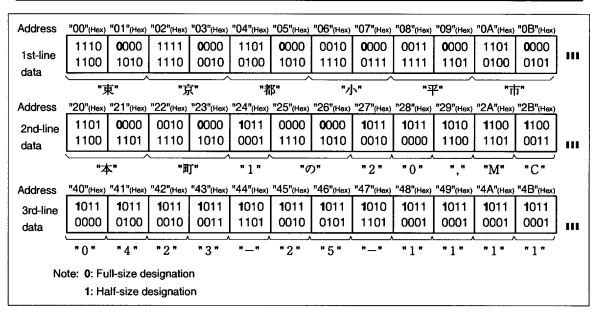


Figure 46 Example of Character Code Setting to DDRAM (3-line Mode, 1/41 Duty)

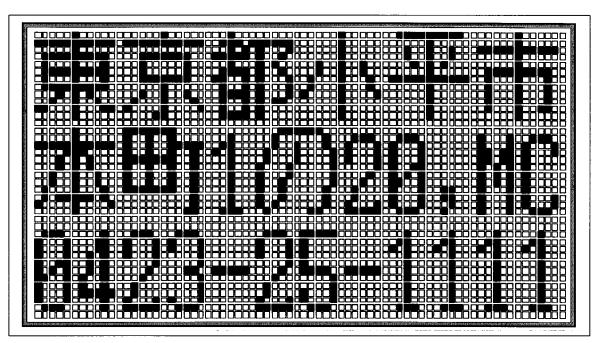


Figure 47 Example of Liquid Crystal Display (3-line 6-character Display)

#### Display Attribute Designation

The HD66732 allocates 12 bits of the full-size 16-bit code character to an abbreviated character code and 2 bits to a display-attribute code. A black-white reversed display, blinking display, and black-white reversed blinking display can be designated for each full-size character. Display attribute control is performed for a 12 x 13 dot matrix unit that includes a 11 x 12 dot full-size character and a column of dots to the right and a row of dots at the bottom. The blinking cycle for the blinking display and black-white reversed blinking display is 64 frames. The blinking display is provided by changing the display pattern every 32 frames.

The display attribute can be designated by the half-size display attribute register (RC) in each display-line unit although the display attribute cannot be designated by the 8-bit half-size character code. The half-size fonts in the same display line have the same display attributes.

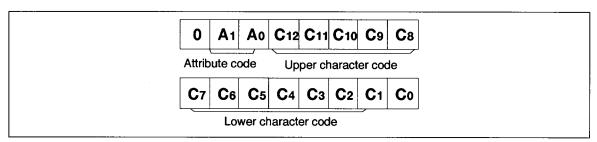


Figure 48 Full-size Code Format

Table 53 Full-size Display Attribute Designation

A1	<b>A</b> 0	Display State
0	0	Normal display
0	1	Black-white reversed display
1	0	Blinking display
1	1	Black-white blinking display

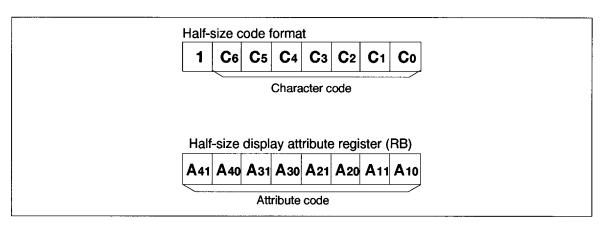


Figure 49 Half-size Code Format and RB

Table 54 Half-size Display Attribute Designation

A11	A10	Display State
0	0	Normal display of all half-size characters in the 1st line
0	1	Black-white reversed display of all half-size characters in the 1st line
1	0	Blinking display of all half-size characters in the 1st line
1	1	Black-white blinking display of all half-size characters in the 1st line
A21	A20	Display State
0	0	Normal display of all half-size characters in the 2nd line
0	1	Black-white reversed display of all half-size characters in the 2nd line
1	0	Blinking display of all half-size characters in the 2nd line
1	1	Black-white blinking display of all half-size characters in the 2nd line
A31	A30	Display State
0	0	Normal display of all half-size characters in the 3rd line
0	1	Black-white reversed display of all half-size characters in the 3rd line
1	1 0	Black-white reversed display of all half-size characters in the 3rd line Blinking display of all half-size characters in the 3rd line
	·	
1	0	Blinking display of all half-size characters in the 3rd line
1	0	Blinking display of all half-size characters in the 3rd line
1	0 1	Blinking display of all half-size characters in the 3rd line  Black-white blinking display of all half-size characters in the 3rd line
1 1 A41	0 1 A40	Blinking display of all half-size characters in the 3rd line  Black-white blinking display of all half-size characters in the 3rd line  Display State
1 1 <b>A41</b> 0	0 1 <b>A40</b> 0	Blinking display of all half-size characters in the 3rd line  Black-white blinking display of all half-size characters in the 3rd line  Display State  Normal display of all half-size characters in the 4th line

## **Setting Codes in the DDRAM and Display Examples**

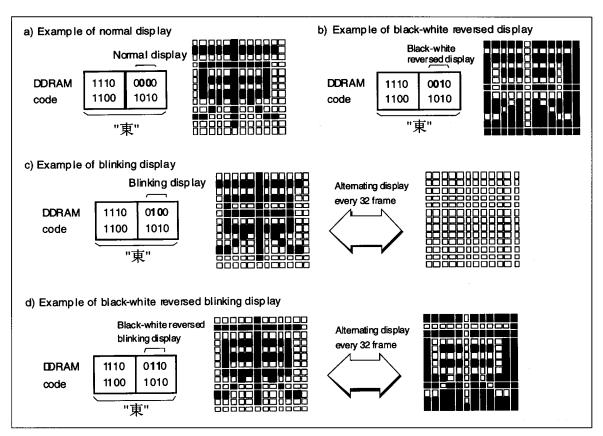


Figure 50 Example of Full-size Character Display at Display Attribute Designation



Figure 51 Example of Black-white Reversed Character Display

### **Character Display Functions and Graphics Display Functions**

The HD66732 has a character display mode (GR = 0) where the CGRAM or CGROM is used to display font patterns, a graphics display mode (GR = 1) where the bit pattern data is set to the CGRAM to display given patterns, and a super-imposed display mode (SPR = 1) which displays both display modes combined. In the character display mode, kanji characters can easily be provided by sending two-byte-per-character character codes to the DDRAM. For example, when an LCD panel which displays 4-line 10-character kanji is rewritten, the LCD display can be easily provided simply by transferring 80-byte character codes. This reduces the microcomputer software processing needed to develop kanji fonts. In addition, since the 30 user fonts can be registered by using the CGRAM, kanji characters other than JIS Level-1 or Level-2, symbols, or marks which are not included in the CGROM can be displayed.

In the graphics display mode, all bit pattern data to be displayed need to be sent. However, up to a 120 x 52-dot display is possible using the CGRAM. The GR bit can switch these modes not only when characters such as kanji are displayed but also when graphics such as maps or games are used.



Figure 52 Example of Kanji Display in the Character Display Mode (GR = 0)

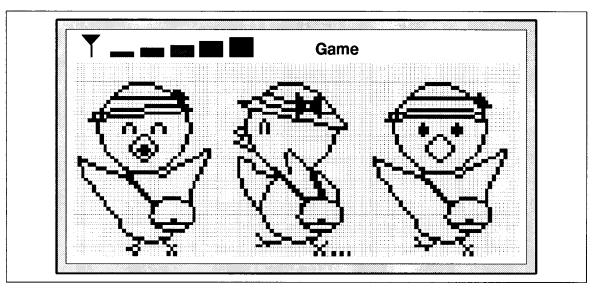


Figure 53 Example of Graphics Display in the Graphics Display Mode (GR = 1)

### **Super-imposed Display Function**

The HD66732 has a super-imposed display mode (SPR = 1) which displays two modes combined: the character display mode where the full-size and half-size CGROM is used to display font patterns, and the graphics display mode where the bit pattern data is set to the CGRAM to display given patterns. The super-imposed mode can be supplied with an easy character display mode and various graphics display modes, enabling a flexible high-quality display. For example, this mode is available to insert graphics such as maps or to create facial images in an address book which otherwise only uses characters.

When characters are displayed in this mode, user fonts cannot be displayed by using the CGRAM. The CGRAM is used as the RAM for the graphics display.

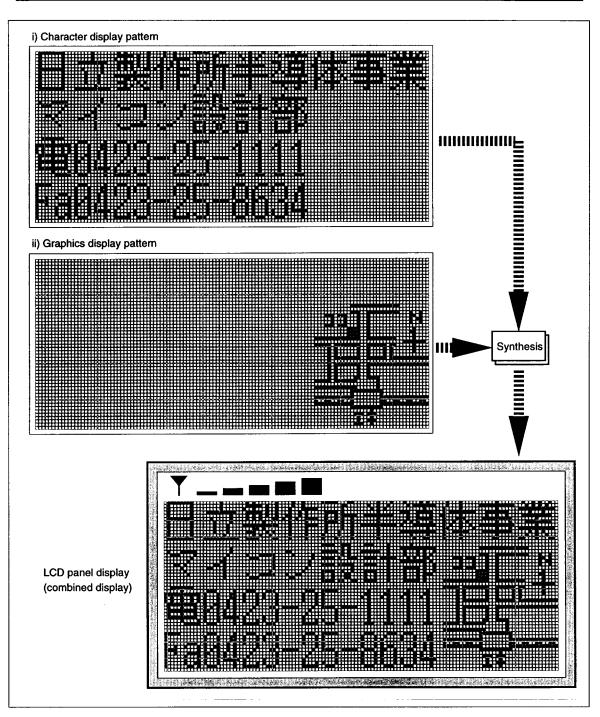


Figure 54 Example of Super-imposed Display

#### **Vertical Smooth Scroll**

The HD66732 can scroll vertically in units of one dot. Vertical smooth scrolling is enabled for the character display, graphics display, and super-imposed display modes. In vertical scrolling, the display start position is controlled in one-raster-row units by incrementing or decrementing the display start line (SN1/0) and display-start raster-row (SL3/2/1/0). However, segment icons (marks) displayed by using the SEGRAM are not scrolled.

If the response speed of the liquid crystal is slow and cannot keep up with one-raster-row scrolling, scroll multiple raster-row units together. Moreover, if vertical smooth scrolling is performed with a four-line display (1/54 duty), the display raster-row that has scrolled out of the display will appear again from the bottom (or the top) (this function is called lap-around). In this case, confirm the display line position (NF1/0) and display raster-row position (LF3-0) flags in the status register, and update the display data in the DDRAM or CGRAM while LCD driving is not performed.

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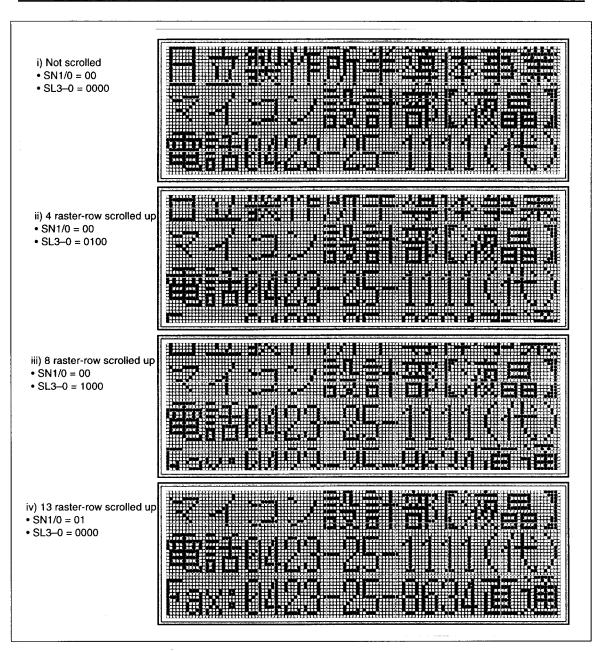
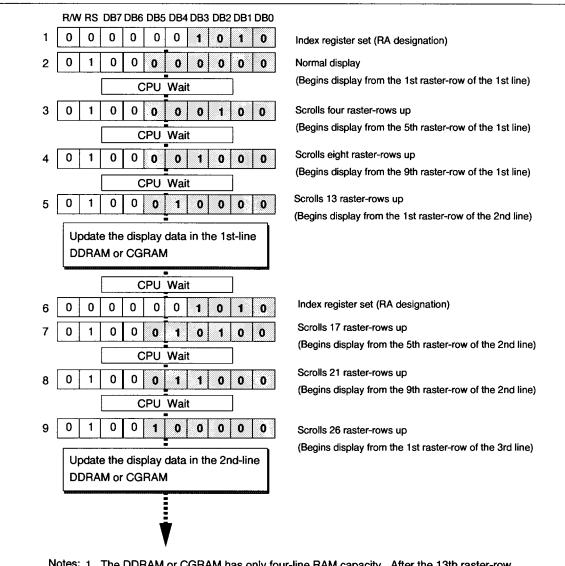


Figure 55 Example of Vertical Smooth Scroll Display

### Vertical Smooth Scroll at 3-line Display (NL2–0 = 011)



Notes: 1. The DDRAM or CGRAM has only four-line RAM capacity. After the 13th raster-row in the fourth line is displayed, the first raster-row in the first line is lap-around displayed again.

2. In four-line display (NL2–0 = 100), all areas of the DDRAM and CGRAM are used and displayed. Therefore, update the contents of the DDRAM or CGRAM after checking the flags of the display line position (NF1/0) and display raster-row position (LF3–0) in the status register while the LCD driving is not performed. LCD driving is performed by time sharing from the first raster-row in the first line. For example, when the display data in the first line is updated, start driving when the LCD driving line enters the second line by the status register, and complete by the beginning of the 13th raster-row driving in the fourth line.

Figure 56 Vertical Scroll Control

## **Reversed Display Function**

The HD66732 can display character/graphics display sections by black-white reversal except for the segment/icon display sections. Black-white reversal can be easily displayed without rewriting the data in the RAM when REV is set to 1. The segment and icon sections are not black-white reversed and do not depend on the REV bit setting.

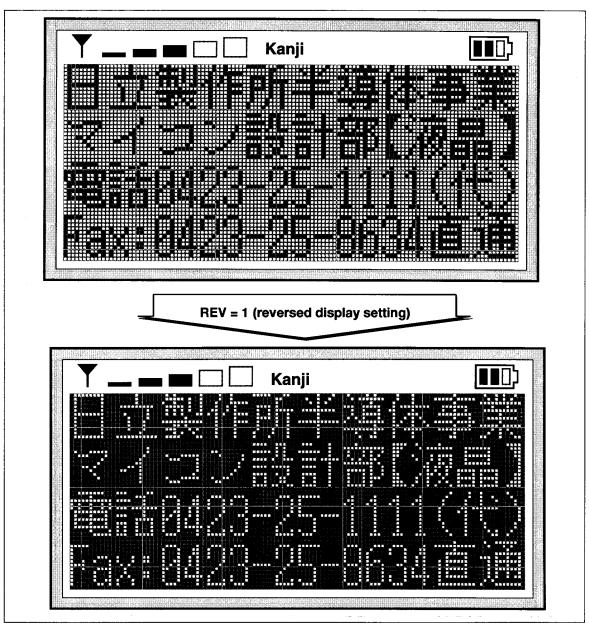


Figure 57 Example of Reversed Display

## Reflective Color Mark/Blink Mark Display

The HD66732 has a grayscale display and blink display based on 200 individual segments (marks). Forty of these are for grayscale display and the remainder are for blink display.

These 40 segments can also control reflective color LCDs, providing simple colors on specific pictograms or marks. For example, the battery-low alarm uses this display. The above display uses a curtailed frame grayscale system, and flicker may result in quick-response liquid crystal materials. Table 57 shows the relationship between set data in the SEGRAM and the effective applied voltage during the frame curtailing operation. These grayscale control segments are driven with the same grayscale data when COMS1 and COMS2 are selected.

The remaining 160 segments are responsible for normal blinking and double-speed blinking. Normal blinking (black and white) is achieved by repeatedly turning on each segment for 32 frames and turning it off for the next 32 frames. Double-speed blinking (black and white) is achieved by repeatedly turning each segment on and off every 16 frames. These blinking control segments are driven by the independent blinking data when COMS1 and COMS2 are selected.

Table 55 Relationship between Segment Driver Output Pin and Segment Display Function

When SGS = 0	When SGS = 1	Remarks
SEG1/120, SEG4/117, SEG7/114, SEG10/111, SEG13/108, SEG16/105, SEG19/102, SEG22/99, SEG25/96, SEG28/93, SEG31/90, SEG34/87, SEG37/84, SEG40/81, SEG43/78, SEG46/75, SEG49/72, SEG52/69, SEG55/66, SEG58/63, SEG61/60, SEG64/57, SEG67/54, SEG70/51, SEG73/48, SEG76/45, SEG79/42, SEG82/39, SEG85/36, SEG88/33, SEG91/30, SEG94/27, SEG97/24, SEG100/21, SEG103/18, SEG106/15, SEG109/12, SEG112/9, SEG115/6, SEG118/3	SEG120/1, SEG117/4, SEG114/7, SEG111/10, SEG108/13, SEG105/16, SEG102/19, SEG99/22, SEG96/25, SEG93/28, SEG90/31, SEG87/34, SEG84/37, SEG81/40, SEG78/43, SEG75/46, SEG72/49, SEG69/52, SEG66/55, SEG63/58, SEG60/61, SEG57/64, SEG54/67, SEG51/70, SEG48/73, SEG45/76, SEG42/79, SEG39/82, SEG36/85, SEG33/88, SEG30/91, SEG27/94, SEG24/97, SEG21/100, SEG18/103, SEG15/106, SEG12/109, SEG9/112, SEG6/115, SEG3/118	The COMS1 and COMS2 outputs are controlled by the same grayscale.  Total: 40 segments
Output pins other than above	Output pins other than above	The COMS1 and COMS2 outputs are independently controlled.
		Total: 80 x 2 = 160 segments

Table 56 Relationship between SEGRAM Data and Blinking Segment

SEGRAM Data Setting		_LCD Display Control for		RAM ing	LCD Display Control for
DB5	DB4	COMS1 Segment	DB7	DB6	COMS2 Segment
0	0	Always unlit	0	0	Always unlit
0	1	Always lit	0	1	Always lit
1	0	Normal blinking (32-frame unit)	1	0	Normal blinking (32-frame unit)
1	1	Double-speed blinking (16-frame unit)	1	1	Double-speed blinking (16-frame unit)

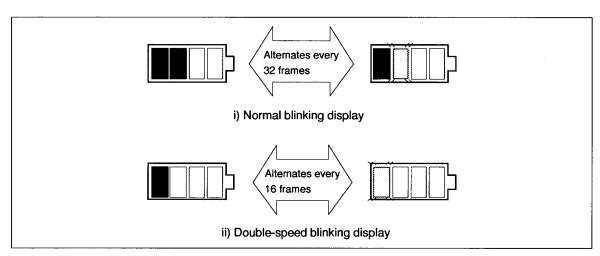


Figure 58 Blinking Segment Display

Table 57 Relationship between SEGRAM Data and Grayscale Segment Display

# **SEGRAM Data Setting**

DB7	DB6	DB5	DB4	Effective Applied Voltage for COMS1 and COMS2 Outputs
0	0	0	0	0 (Always unlit)
0	0	0	1	1 (Always lit)
0	0	1	0	0.34 (Grayscale display)
0 -	0	1	1	0.38 (Grayscale display)
0	1	0	0	0.41 (Grayscale display)
0	1	0	1	0.44 (Grayscale display)
0	1	1	0	0.47 (Grayscale display)
0	1	1	1	0.50 (Grayscale display)
1	0	0	0	(Blink display) *
1	0	0	1	0.53 (Grayscale display)
1	0	1	0	0.56 (Grayscale display)
1	0	1	1	0.59 (Grayscale display)
1	1	0	0	0.63 (Grayscale display)
1	1	0	1	0.66 (Grayscale display)
1.	1	1	0	0.69 (Grayscale display)
1	1	1	1	0.72 (Grayscale display)

Note: Turn on the segment for 32 frames and turn it off for the next 32 frames.

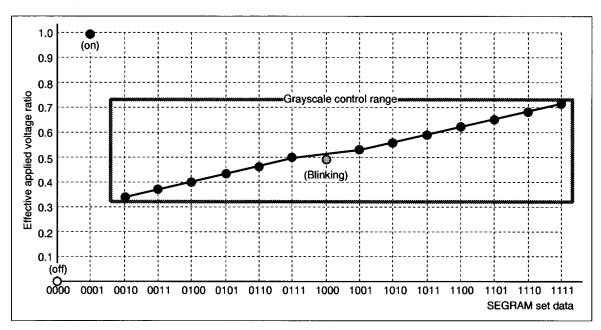


Figure 59 Relationship between SEGRAM Set Data and Effective Applied Voltage

## **Line-cursor Display**

The HD66732 can assign a cursor attribute to an entire line corresponding to the address counter value by setting the LC bit to 1. One of three line-cursor modes can be selected: a black-white reversed cursor (B/W = 1), an underline cursor (C = 1), and a blink cursor (B = 1). The cycle for a blink cursor is 32 frames. These line-cursors are suitable for highlighting an index and/or marker, or for indicating an item in a menu with a cursor or an underline.

However, the black-white reversed display described above does not perform black-white blinking.

**Table 58 Address Counter Value and Line Cursor** 

Address Counter Value (AC)	Selected Line for Line Cursor	
00H to 13H	Entire 1st line (10 characters)	
20H to 33H	Entire 2nd line (10 characters)	
40H to 53H	Entire 3rd line (10 characters)	
60H to 73H	Entire 4th line (10 characters)	

Black-white Reserved Display (LC = 1, R/W = 1)

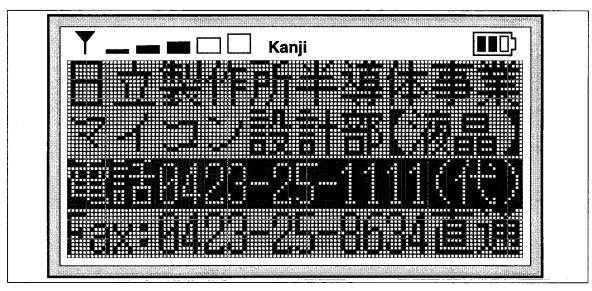


Figure 60 Black-white Reversed Cursor

Underline Cursor (LC = 1, C = 1)

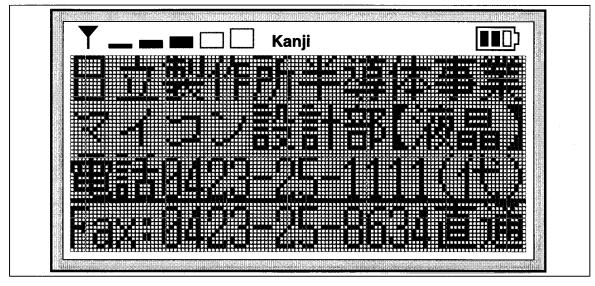


Figure 61 Underline Cursor

# Blinking Display (LC = 1, B = 1)

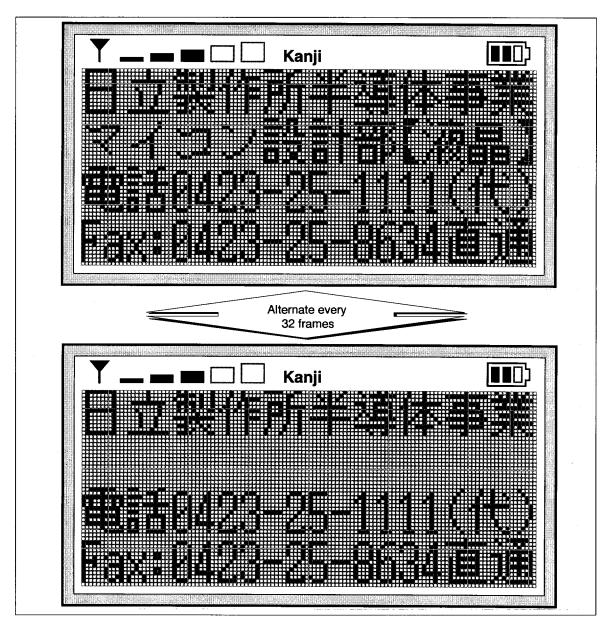


Figure 62 Blinking Display

### **Partial-display-on Function**

The HD66732 can program the liquid crystal display drive duty ratio setting (NL2-0 bits), liquid crystal display drive bias value selection (BS2-0 bits), boost output level selection (BT1/0 bit) and contrast adjustment (CT4-0 bits). For example, in the four-line display mode (1/54 duty ratio), the HD66732 can drive only two lines in the center of the screen by combining these register functions and the centering display (CEN bit) function with the 1/28 duty ratio. This is called partial-display-on. Lowering the liquid crystal display drive duty ratio as required saves the liquid crystal display drive voltage, thus reducing internal current consumption. This is suitable for calendar or time display, which needs to be continuous in the system standby state with minimal current consumption. Here, the non-displayed lines are constantly driven by the unselected level voltage, thus turning off the LCD for the lines.

In general, lowering the liquid crystal display drive duty ratio decreases the optimum liquid crystal display drive voltage and liquid crystal display drive bias value.

**Table 59 Partial-display-on Function (4-line Display)** 

Item	Normal 4-line Display	Partial-on Display	
Character/graphics display	4th line displayed	Only one line in the center of the screen	Only two lines in the center of the screen
LCD drive duty ratio	1/54 (NL2/1/0 = 100)	1/15 (NL2/1/0 = 001)	1/28 (NL2/1/0 = 010)
LCD drive bias value (optimum)	1/8 (BS2-0 = 000)	1/5 (BS2-0 = 100)	1/6 (BS2-0 = 010)
LCD drive voltage	Adjustable using BT1/0 and CT4-0	Adjustable using BT1/0 and CT4-0	Adjustable using BT1/0 and CT4-0
Frame frequency (fosc = 76 kHz)	70 Hz	71 Hz	70 Hz

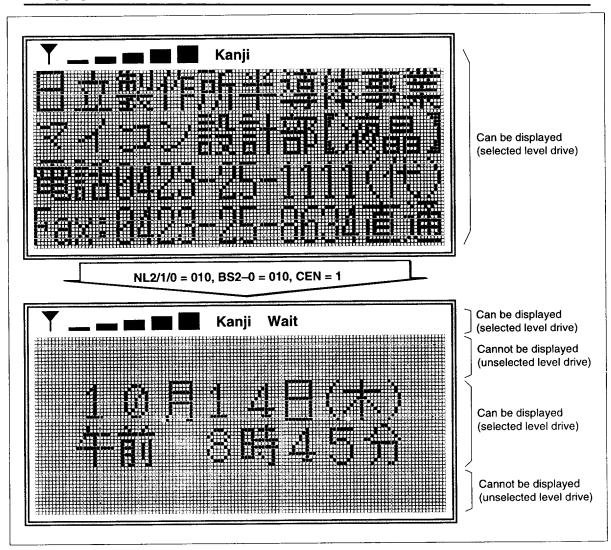


Figure 63 Partial-on Display (Date and Time Indicated)

## Sleep Mode

Setting the sleep mode bit (SLP) to 1 puts the HD66732 in the sleep mode, where the device stops all internal display operations except for key scan operations, thus reducing current consumption. Specifically, LCD drive is completely halted. Here, all the SEG (SEG1 to SEG120) and COM (COM1 to COM52, COMS1/2) pins output the GND level, resulting in no display. If the AMP bit is set to 0 in the sleep mode, the LCD drive power supply can be turned off, reducing the total current consumption of the LCD module.

The key scan circuit operates normally in the sleep mode, thus allowing normal key scan and key scan interrupt generation. For details, see the Key Scan Control section and Key Scan Interrupt (Wake-up Function) section.

Table 60 Comparison of Sleep Mode and Standby Mode

Function	Sleep Mode (SLP = 1)	Standby Mode (STB = 1)	Key Standby Mode (KSB = 1)			
Character display	Turned off	Turned off	Normally turned on			
Segment display	Turned off	Turned off	Normally turned on			
R-C oscillation circuit	Operates normally	Halted	Operates normally			
Key scan circuit	Can operate normally	Halted but IRQ* can be generated				

### **Standby Mode**

Setting the standby mode bit (STB) to 1 puts the HD66732 in the standby mode, where the device stops completely, halting all internal operations including the R-C oscillation circuit, thus further reducing current consumption compared to that in the sleep mode. Specifically, character and segment displays, which are controlled by the multiplexing drive method, are completely halted. Here, all the SEG (SEG1 to SEG120) and COM (COM1 to COM52, COMS1/2) pins output the GND level, resulting in no display. If the AMP bit is set to 0 in the standby mode, the LCD drive power supply can be turned off.

During the standby mode, no instructions can be accepted other than those for the start-oscillation instruction and the key scan interrupt generation enable instruction. To cancel the standby mode, issue the start-oscillation instruction to stabilize R-C oscillation before setting the STB bit to 0.

Although key scan is halted in the standby mode, the HD66732 can detect key inputs, thus generating key scan interrupt (IRQ\*). This means, the system can be activated from a completely inactive state. For details, see the Key Scan Interrupt (Wake-up Function) section.

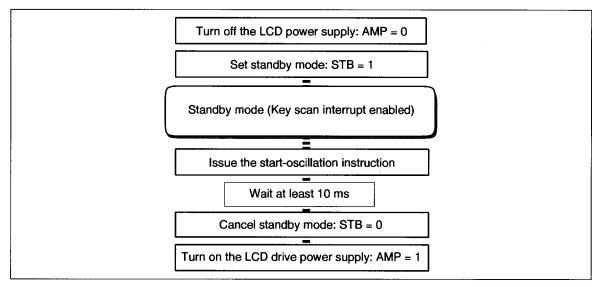


Figure 64 Procedure for Setting and Canceling Standby Mode

## **Key Standby Mode**

When the key standby mode (KSB bit = "1") is set, only key-scan operations are selectively stopped. In this case, however, the display operation, including the internal CR oscillation circuit operation, continues as usual. Since noise generation can be suppressed by stopping unnecessary key-scan operations, the receiving sensitivity for such a wireless system can be improved.

In this case, although key-scan operations are stopped during standby mode, a key scan interrupt (IRQ\*) can be generated by detecting the key being depressed, as can be done during the standby mode described above. For details, refer to the Key Scan Interrupt (Wake-up Function) section.

# **Absolute Maximum Ratings \***

Item	Symbol	Unit	Value	Notes*
Power supply voltage (1)	V <sub>cc</sub>	٧	-0.3 to +7.0	1
Power supply voltage (2)	V <sub>LCD</sub> – GND	٧	-0.3 to +15.0	1, 2
Input voltage	Vt	٧	$-0.3$ to $V_{cc} + 0.3$	1
Operating temperature	Topr	°C	-40 to +85	3
Storage temperature	Tstg	°C	-55 to +110	4

Note: If the LSI is used above these absolute maximum ratings, it may become permanently damaged.

Using the LSI within the following electrical characteristics limits is strongly recommended for normal operation. If these electrical characteristic conditions are also exceeded, the LSI will malfunction and cause poor reliability.

# DC Characteristics ( $V_{CC}$ = 2.4 to 5.5 V, Ta = -40 to +85°C\*<sup>3</sup>)

Item	Symbol	Min	Тур	Max	Unit	Test Condition	Notes
Input high voltage	V <sub>IH</sub>	0.7 V <sub>cc</sub>	_	V <sub>cc</sub>	٧		5, 6
Input low voltage	V <sub>IL</sub>	-0.3	_	0.15 V <sub>cc</sub>	٧	V <sub>cc</sub> = 2.4 to 2.7 V	5, 6
Input low voltage	V <sub>IL</sub>	-0.3	_	0.15 V <sub>cc</sub>	٧	V <sub>cc</sub> = 2.7 to 5.5 V	5, 6
Output high voltage (1) (SDA, DB0-7 pins)	V <sub>OH1</sub>	0.75 V <sub>cc</sub>			٧	I <sub>OH</sub> = -0.1 mA	5, 7
Output low voltage (1) (SDA, DB0-7 pins)	V <sub>OL1</sub>	_		0.2 V <sub>cc</sub>	٧	$V_{cc} = 2.4 \text{ to } 2.7 \text{ V},$ $I_{oL} = 0.1 \text{ mA}$	5
Output low voltage (1) (SDA, DB0-7 pins)	V <sub>OL1</sub>	_	_	0.15 V <sub>cc</sub>	V	$V_{cc} = 2.7 \text{ to } 5.5 \text{ V},$ $I_{oL} = 0.1 \text{ mA}$	5
Output high voltage (2) (KST0-7, IRQ* pins)	V <sub>OH2</sub>	0.7 V <sub>cc</sub>	_	_	٧	$-I_{OH} = 0.5 \mu A,$ $V_{CC} = 3 V$	5
Output low voltage (2) (KST0-7, IRQ* pins)	V <sub>OL2</sub>	_	_	0.2 V <sub>cc</sub>	٧	I <sub>OL</sub> = 0.1 mA	5
Output high voltage (3) (PORT0-2 pins)	V <sub>ОНЗ</sub>	0.75 V <sub>cc</sub>	_	_	٧	-I <sub>OH</sub> = 0.1mA	5
Output low voltage (3) (PORT0-2 pins)	V <sub>OL3</sub>	_	_	0.2 V <sub>cc</sub>	٧	1 <sub>oL</sub> = 0.1mA	5
Driver ON resistance (COM pins)	R <sub>COM</sub>	_	3	20	kΩ	$\pm Id = 0.05 \text{ mA},$ V <sub>LCD</sub> = 6 V	8
Driver ON resistance (SEG pins)	R <sub>SEG</sub>		3	30	kΩ	$\pm Id = 0.05 \text{ mA},$ $V_{LCD} = 6 \text{ V}$	8
I/O leakage current	l <sub>u</sub>	<b>–</b> 1	_	1	μА	Vin = 0 to V <sub>cc</sub>	9
Pull-up MOS current (KIN0-7, DB0-7, SDA pins)	-I <sub>p</sub>	1	10	40	μА	V <sub>cc</sub> = 3 V, Vin = 0 V	5
Current consumption during normal operation (V <sub>cc</sub> –GND)	I <sub>OP</sub>	_	30	55	μА	R-C oscillation, $V_{cc} = 3 \text{ V}, f_{osc} = 60 \text{ kHz}$ (1/41 duty)	10, 11
Current consumption during sleep mode (V <sub>cc</sub> –GND)	I <sub>SL</sub>	_	13	_	μА	R-C oscillation, V <sub>cc</sub> = 3 V, f <sub>osc</sub> = 60 kHz (1/41 duty)	10, 11
Current consumption during standby mode (V <sub>cc</sub> –GND)	I <sub>ST</sub>	_	0.1	5	μА	No R-C oscillation, V <sub>cc</sub> = 3 V, Ta = 25°C	10, 11
LCD drive power supply current (V <sub>LCD</sub> -GND)	1 <sub>EE</sub>	_	15	30	μА	$V_{LCD}$ – GND = 8 V, $f_{OSC}$ = 60 kHz, 1/7 bias, VTEST3 = " $V_{CC}$ "	11
LCD drive voltage (V <sub>LCD</sub> – GND)	V <sub>LCD</sub>	4.5	_	13.0	٧		12

Note: For the numbered notes, refer to the Electrical Characteristics Notes section following these tables.

## **Booster Characteristics**

Item	Symbol	Min	Тур	Max	Unit	Test Condition	Notes
Double-boost output voltage (VLOUT pin)	$V_{UP2}$	5.5	5.9	6.0	V	$V_{cc}$ = Vci = 3.0 V, $I_{o}$ = 0.03 mA, C = 1 $\mu$ F, $f_{osc}$ = 60 kHz, Ta = 25°C	15
Triple-boost output voltage (VLOUT pin)	V <sub>UP3</sub>	8.5	8.9	9.0	V	$V_{cc} = Vci = 3.0 \text{ V},$ $I_{o} = 0.03 \text{ mA}, C = 1 \mu\text{F},$ $f_{osc} = 60 \text{ kHz}, Ta = 25^{\circ}\text{C}$	15
Quadruple- boost output voltage (VLOUT pin)	V <sub>UP4</sub>	11.5	11.8	12.0	V	$V_{cc} = Vci = 3.0 \text{ V}, \\ I_o = 0.03 \text{ mA, C} = 1 \mu\text{F}, \\ f_{osc} = 60 \text{ kHz, Ta} = 25^{\circ}\text{C}$	15
Booster output voltage range	V <sub>UP</sub>	V <sub>cc</sub>	_	13.0	٧	Vci ≤ V <sub>cc</sub>	15, 16

Note: For the numbered notes, refer to the Electrical Characteristics Notes section following these tables.

# AC Characteristics ( $V_{CC}$ = 2.4 to 5.5 V, Ta = -40 to +85°C\*<sup>3</sup>)

# Clock Characteristics ( $V_{CC} = 2.4 \text{ to } 5.5 \text{ V}$ )

Item	Symbol	Min	Тур	Max	Unit	<b>Test Condition</b>	Notes
External clock frequency	fcp	15	60	100	kHz		13
External clock duty ratio	Duty	45	50	55	%		13
External clock rise time	trcp	_		0.2	μs		13
External clock fall time	tfcp	_	_	0.2	μs		13
Internal Rf oscillation frequency	tosc	45	60	75	kHz	Rf = 300 kΩ, $V_{cc}$ = 3 V	14

Note: For the numbered notes, refer to the Electrical Characteristics Notes section following these tables.

# **68-system Bus Interface Timing Characteristics**

(Vcc = 2.4 to 2.7 V)

ltem		Symbol	Min	Тур	Max	Unit	<b>Test Condition</b>
Enable cycle time	Write	t <sub>CYCE</sub>	800	_	_	ns	Figure 71
	Read		1200	_	_		
Enable high-level pulse width	Write	PW <sub>EH</sub>	150		_	ns	Figure 71
	Read		450	_	_	-	
Enable low-level pulse width	Write	PW <sub>EL</sub>	300	_	_	ns	Figure 71
	Read		450	_	_	-	
Enable rise/fall time		t <sub>Er</sub> , t <sub>Ef</sub>	_	_	25	ns	Figure 71
Setup time (RS, R/W to E, CS*)		t <sub>ASE</sub>	50	_	_	ns	Figure 71
Address hold time		t <sub>AHE</sub>	20	_	_	ns	Figure 71
Write data setup time		t <sub>DSWE</sub>	60			ns	Figure 71
Write data hold time	•	t <sub>HE</sub>	20	_	_	ns	Figure 71
Read data delay time		t <sub>DDRE</sub>	_	_	400	ns	Figure 71
Read data hold time		t <sub>DHRE</sub>	5	_	_	ns	Figure 71

# (Vcc = 2.7 to 5.5 V)

Item		Symbol	Min	Тур	Max	Unit	Test Condition
Enable cycle time	Write	t <sub>cyce</sub>	500	_	_	ns	Figure 71
	Read	•	700	-			
Enable high-level pulse width	Write	PW <sub>EH</sub>	80	_	_	ns	Figure 71
	Read	•	300			•	
Enable low-level pulse width	Write	PW <sub>EL</sub>	250			ns	Figure 71
	Read	•	320			•	
Enable rise/fall time		t <sub>Er</sub> , t <sub>Ef</sub>	_	_	25	ns	Figure 71
Setup time (RS, R/W to E, CS*)		t <sub>ASE</sub>	50	_		ns	Figure 71
Address hold time		t <sub>AHE</sub>	20	_		ns	Figure 71
Write data setup time		t <sub>DSWE</sub>	60	_	_	ns	Figure 71
Write data hold time		t <sub>HE</sub>	20	_	_	ns	Figure 71
Read data delay time		t <sub>DDRE</sub>	_	_	250	ns	Figure 71
Read data hold time		t <sub>DHRE</sub>	5	_	_	ns	Figure 71

# **80-system Bus Interface Timing Characteristics**

(Vcc = 2.4 to 2.7 V)

Item		Symbol	Min	Тур	Max	Unit	<b>Test Condition</b>
Bus cycle time	Write	t <sub>cycw</sub>	800	_	_	ns	Figure 72
	Read	t <sub>cycr</sub>	1200	_	_	ns	Figure 72
Write low-level pulse width		$PW_{Lw}$	150	_	_	ns	Figure 72
Read low-level pulse width		PW <sub>LR</sub>	450		_	ns	Figure 72
Write high-level pulse width		PW <sub>HW</sub>	300	_	_	ns	Figure 72
Read high-level pulse width		PW <sub>HR</sub>	450		_	ns	Figure 72
Write/Read rise/fall time		t <sub>wRr</sub> , wRf	_	_	25	ns	Figure 72
Setup time (RS to CS*, WR*, RD*)		t <sub>AS</sub>	50	_	_	ns	Figure 72
Address hold time		t <sub>AH</sub>	20	_	_	ns	Figure 72
Write data setup time		t <sub>DSW</sub>	60	_	_	ns	Figure 72
Write data hold time		t <sub>H</sub>	20	_	_	ns	Figure 72
Read data delay time		t <sub>DDR</sub>	_	_	400	ns	Figure 72
Read data hold time		t <sub>DHR</sub>	5	_	_	ns	Figure 72

(Vcc = 2.7 to 5.5 V)

Item		Symbol	Min	Тур	Max	Unit	<b>Test Condition</b>
Bus cycle time	Write	t <sub>cycw</sub>	500	_	_	ns	Figure 72
	Read	t <sub>cycr</sub>	700	_	_	ns	Figure 72
Write low-level pulse width		PW <sub>Lw</sub>	80	_	_	ns	Figure 72
Read low-level pulse width		PW <sub>LR</sub>	300	_	_	ns	Figure 72
Write high-level pulse width		PW <sub>HW</sub>	250	_	_	ns	Figure 72
Read high-level pulse width		PW <sub>HR</sub>	300	-	_	ns	Figure 72
Write/Read rise/fall time		t <sub>war, wat</sub>	_	_	25	ns	Figure 72
Setup time (RS to CS*, WR*, RD*)		t <sub>AS</sub>	50			ns	Figure 72
Address hold time		t <sub>AH</sub>	20	_		ns	Figure 72
Write data setup time		t <sub>DSW</sub>	60	_	_	ns	Figure 72
Write data hold time		t <sub>H</sub>	20	_	_	ns	Figure 72
Read data delay time		t <sub>DDR</sub>	_	_	250	ns	Figure 72
Read data hold time		t <sub>DHR</sub>	5	_	_	ns	Figure 72

# Clock-synchronized Serial Interface Timing Characteristics (2.4 V) (V $_{\text{CC}}$ = 2.4 to 2.7 V)

Item		Symbol	Min	Тур	Max	Unit	<b>Test Condition</b>
Serial clock cycle time	Write	t <sub>scyc</sub>	0.5	_	20	μs	Figure 73
	Read	t <sub>scyc</sub>	1	_	20	μs	Figure 73
Serial clock high-level width	Write	t <sub>sch</sub>	230	_	_	ns	Figure 73
	Read	t <sub>scн</sub>	480	_	_	ns	Figure 73
Serial clock low-level width	Write	t <sub>scL</sub>	230	_	_	ns	Figure 73
	Read	t <sub>scL</sub>	480	_	_	ns	Figure 73
Serial clock rise/fall time		t <sub>scf</sub> , t <sub>scr</sub>	_	_	20	ns	Figure 73
Chip select setup time		t <sub>csu</sub>	60	_	_	ns	Figure 73
Chip select hold time		t <sub>cH</sub>	200	_		ns	Figure 73
Serial input data setup time		t <sub>sisu</sub>	100	_	_	ns	Figure 73
Serial input data hold time		t <sub>SIH</sub>	100	_	_	ns	Figure 73
Serial output data delay time		t <sub>sop</sub>	_		400	ns	Figure 73
Serial output data hold time		t <sub>soн</sub>	5	_	_	ns	Figure 73

# $(V_{CC} = 2.7 \text{ to } 5.5 \text{ V})$

Item		Symbol	Min	Тур	Max	Unit	<b>Test Condition</b>
Serial clock cycle time	Write	t <sub>scyc</sub>	0.2		20	μs	Figure 73
	Read	t <sub>scyc</sub>	0.5	_	20	μs	Figure 73
Serial clock high-level width	Write	t <sub>scн</sub>	80	_	_	ns	Figure 73
	Read	t <sub>sch</sub>	230	_	_	ns	Figure 73
Serial clock low-level width	Write	t <sub>scL</sub>	80		_	ns	Figure 73
	Read	t <sub>scl</sub>	230	_		ns	Figure 73
Serial clock rise/fall time		t <sub>scf</sub> , t <sub>scr</sub>	_	_	20	ns	Figure 73
Chip select setup time		t <sub>csu</sub>	60		_	ns	Figure 73
Chip select hold time		t <sub>ch</sub>	200	_	_	ns	Figure 73
Serial input data setup time		t <sub>sisu</sub>	40	_	_	ns	Figure 73
Serial input data hold time		t <sub>SIH</sub>	40	_	_	ns	Figure 73
Serial output data delay time		t <sub>sop</sub>	_	_	200	ns	Figure 73
Serial output data hold time		t <sub>soн</sub>	5	_	_	ns	Figure 73

Reset Timing Characteristics ( $V_{CC}$  = 2.4 to 5.5 V)

Item	Symbol	Min	Тур	Max	Unit	Test Condition
Reset low-level width	t <sub>RES</sub>	1	_	_	ms	Figure 74

#### **Electrical Characteristics Notes**

- 1. All voltage values are referred to GND = 0 V. If the LSI is used above the absolute maximum ratings, it may become permanently damaged. Using the LSI within the given electrical characteristic is strongly recommended to ensure normal operation. If these electrical characteristics are exceeded, the LSI may malfunction or exhibit poor reliability.
- 2. VLCD > GND must be maintained.
- 3. For bare die products, specified up to 85°C.
- 4. For bare die products, specified by the common die shipment specification.
- 5. The following three circuits are I/O pin configurations (figure 65).

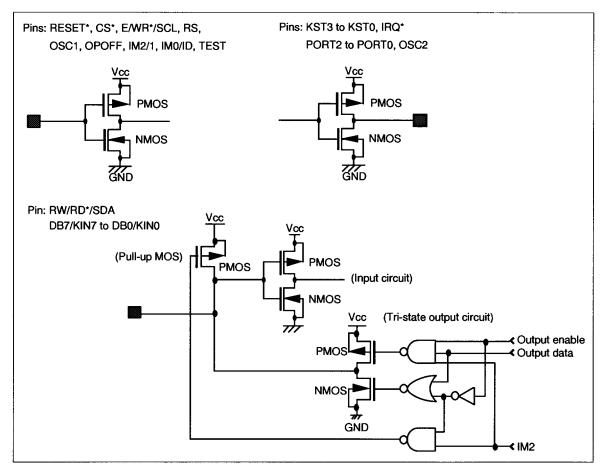


Figure 65 I/O Pin Configuration

- 6. The TEST pin must be grounded and the IM2/1, IM0/ID, and OPOFF pins must be grounded or connected to Vcc.
- 7. Corresponds to the high output for clock-synchronized serial interface.
- 8. Applies to the resistor value (RCOM) between power supply pins V1OUT, V2OUT, V5OUT, GND and common signal pins (COM1 to COM52, COMS1 and COMS2), and resistor value (RSEG) between power supply pins V1OUT, V3OUT, V4OUT, GND and segment signal pins (SEG1 to SEG120), when current Id is flown through all driver output pins.
- 9. This excludes the current flowing through pull-up MOSs and output drive MOSs.
- 10. This excludes the current flowing through the input/output units. The input level must be fixed high or low because through current increases if the CMOS input is left floating.
- 11. The following shows the relationship between the operation frequency (fosc) and current consumption (Icc) (figure 66).

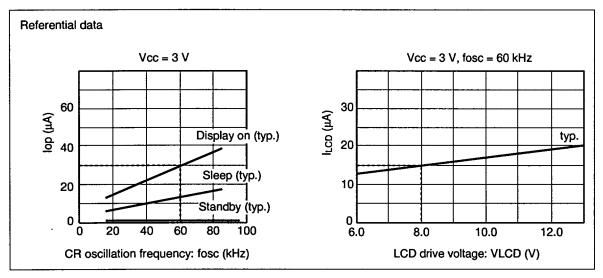


Figure 66 Relationship between the Operation Frequency and Current Consumption

- 12. Each COM and SEG output voltage is within ±0.15 V of the LCD voltage (Vcc, V1, V2, V3, V4, V5) when there is no load.
- 13. Applies to the external clock input (figure 67).

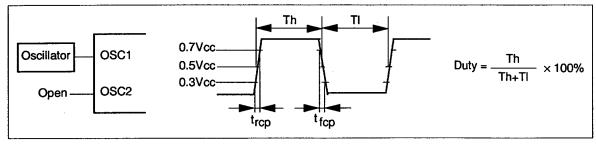


Figure 67 External Clock Supply

14. Applies to the internal oscillator operations using oscillation resistor Rf (figure 68).

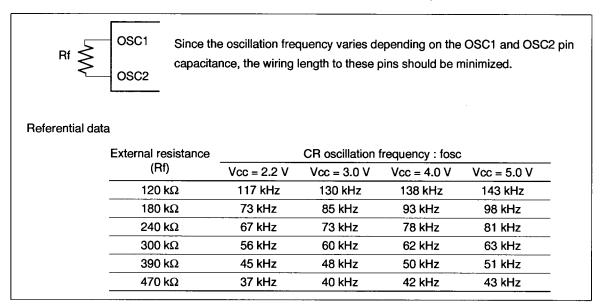


Figure 68 Internal Oscillation

15. Booster characteristics test circuits are shown in figure 69.

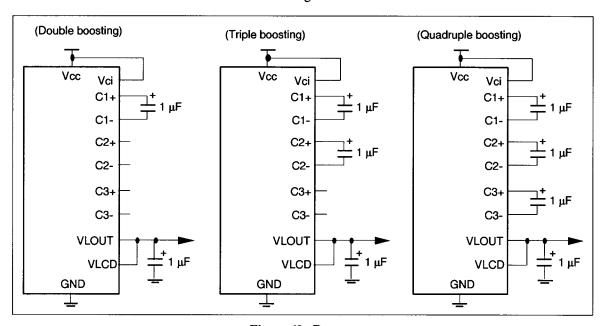


Figure 69 Booster

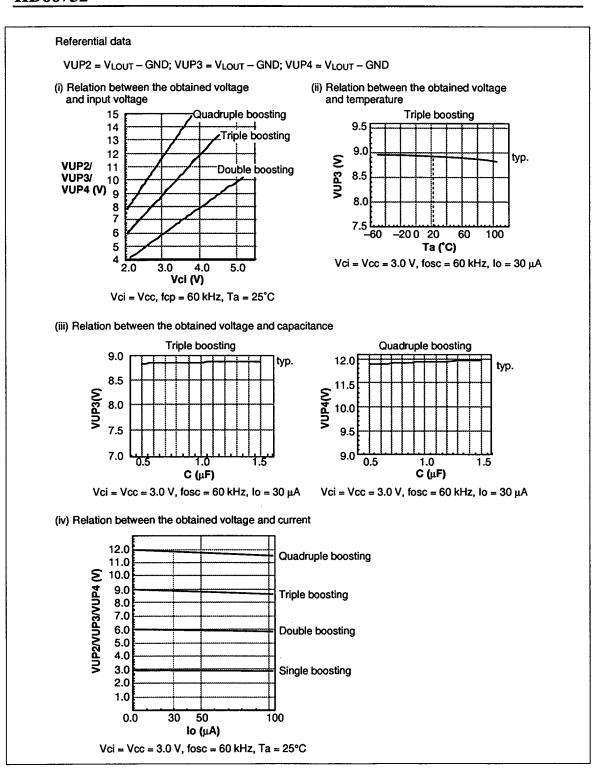


Figure 69 Booster (cont)

16. Vcc ≥ Vci must be maintained.

## **Load Circuits**

### **AC Characteristics Test Load Circuits**

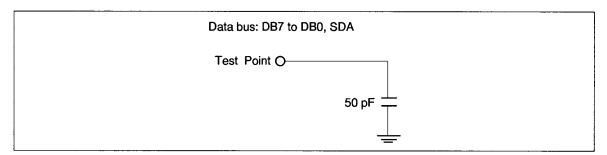


Figure 70 Load Circuit

# **Timing Characteristics**

## **68-system Bus Operation**

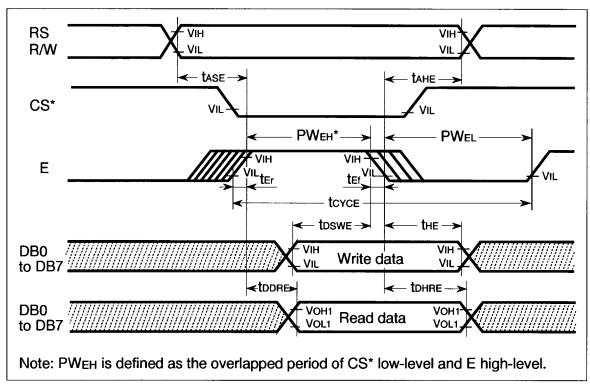


Figure 71 68-system Bus Timing

### 80-system Bus Operation

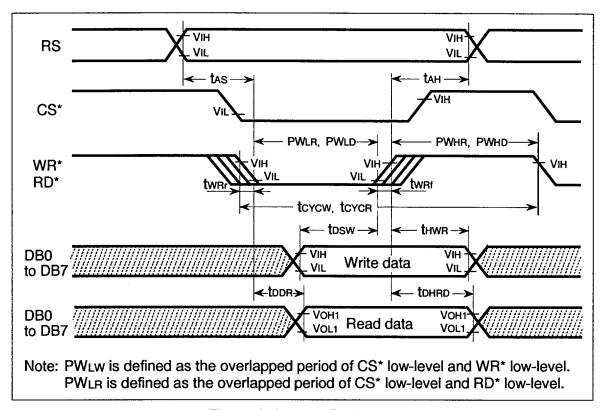


Figure 72 80-system Bus Timing

## **Clock-synchronized Serial Operation**

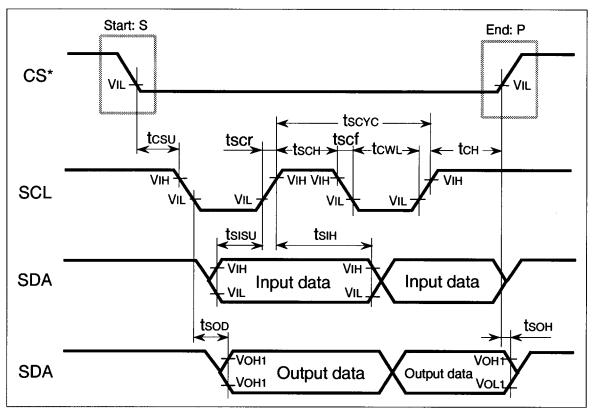


Figure 73 Clock-synchronized Serial Interface Timing

## **Reset Operation**

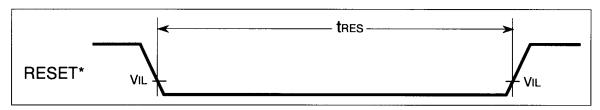


Figure 74 Reset Timing