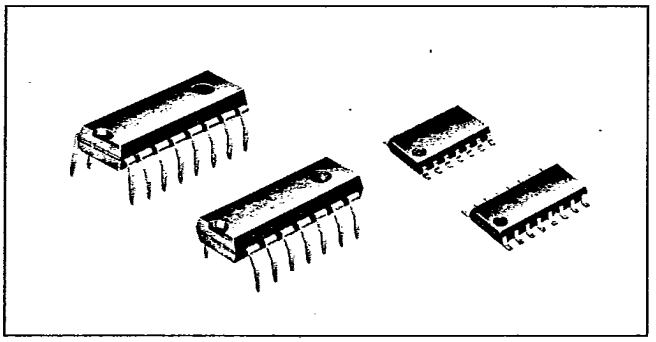
CMOS Logic ICs

BU4000B Series

T-51-11
T-43-21
T-51-21
T-46-07-05
T-46-07-07
T-46-09-05
T-67-11-51
T-51-19
T-45-23-09



The BU4000B is a series of CMOS ICs characterized by low voltage and low power consumption. In addition to a wide supply range, the BU4000B is compatible with the general-purpose 4000B series. Another feature of the series is that it can drive LS-TTL ICs directly. The BU4000B is available in standard DIP and mini-flat (MF) packages.

Features

1. Low power consumption.
2. Wide supply voltage range.
3. High input impedance.
4. High fan-out.
5. Capable of directly driving LS-TTL1 and LS-TTL2.

BU4000B Series Product Summary

☆Under development

Category	Type	Function	Block diagram	Package	
				Configuration	No. of pins
Analog switches/multiplexers	BU4016B	Quad bilateral switch	Fig. 16	DIP/MF	14
	BU4066B	Quad bilateral switch	Fig. 17	DIP/MF	14
	BU4051B	8-channel analog multiplexer/demultiplexer	Fig. 18	DIP/MF	16
	BU4052B	Dual 4-channel analog multiplexer/demultiplexer	Fig. 19	DIP/MF	16
	BU4053B	Triple 2-channel analog multiplexer/demultiplexer	Fig. 20	DIP/MF	16
	BU4551B	Quad 2-channel analog multiplexer/demultiplexer	Fig. 21	DIP/MF	16
Gates	BU4001B	Quad 2-input NOR gate	Fig. 22	DIP/MF	14
	BU4011B	Quad 2-input NAND gate	Fig. 23	DIP/MF	14
	BU4030B	Quad exclusive-OR gate	Fig. 24	DIP/MF	14
	BU4070B	Quad exclusive-OR gate	Fig. 25	DIP/MF	14
	BU4081B	Quad 2-input AND gate	Fig. 26	DIP/MF	14
	BU4093B	Quad 2-input NAND Schmitt trigger	Fig. 27	DIP/MF	14
	☆BU4049UB	Hex inverting buffer/converter	Fig. 28	DIP/MF	16
	BU4069UB	Hex inverter	Fig. 29	DIP/MF	14
	☆BU4503B	Hex tristate buffer	Fig. 30	DIP/MF	16
	BU4584B	Hex Schmitt trigger	Fig. 31	DIP/MF	14
Flip-flops	BU4013B	Dual D-type flip-flop	Fig. 32	DIP/MF	14
	☆BU4027B	Dual J-K master-slave flip-flop	Fig. 33	DIP/MF	16
Shift registers/counters	BU4015B	Dual 4-bit static shift register	Fig. 34	DIP/MF	16
	☆BU4021B	8-stage static shift register	Fig. 35	DIP/MF	16
	☆BU4516B	Binary up/down counter	Fig. 36	DIP/MF	16
Monostable multivibrator	BU4538B	Dual precision monostable multivibrator	Fig. 37	DIP/MF	16
Decoder	BU4028B	BCD to decimal decoder	Fig. 38	DIP/MF	16
Latch	BU4042B	Quad D-latch	Fig. 39	DIP/MF	16
Others	☆BU4007UB	Dual complementary pair plus inverter	Fig. 40	DIP/MF	14

T-51-11

ROHM

T-43-21
T-51-21
T-46-07-05
T-46-07-07
T-46-09-05
T-67-11-51
T-51-19
T-45-23-09

Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Supply voltage	V_{DD}	−0.3~16	V
Input voltage	V_{IN}	−0.3~V_{DD}+0.3	V
Power dissipation	Pd	550(for both DIP and MF)	mW
Storage temperature	Tstg	−55~150	°C

Recommended Operating Conditions

Parameter	Symbol	Limits	Unit	Conditions
Supply voltage	V_{DD}	3~16	V	—
Input voltage	V_{IN}	0~V_{DD}	V	—
Operating temperature	Topr	−40~85*	°C	—

*For an extended operating temperature range, consult your local ROHM representative.

Electrical Characteristics/DC Characteristics (Ta=25°C, V_{SS}=0V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions V_{DD}(V)	Conditions V_{IN} (V)	Conditions
Input high voltage (Type B)	V_{IH}	3.5	2.75	—	V	5	—	—
		7.0	5.50	—		10		
		11.0	8.25	—		15		
Input high voltage (Type UB)		4.0	2.75	—		5	—	—
		8.0	5.50	—		10		
		12.5	8.25	—		15		
Input low voltage (Type B)	V_{IL}	—	2.25	1.5	V	5	—	—
		—	4.50	3.0		10		
		—	6.75	4.0		15		
Input low voltage (Type UB)		—	2.25	1.0		5	—	—
		—	4.50	2.0		10		
		—	6.75	2.5		15		
Output high voltage	V_{OH}	4.95	5.00	—	V	5	0, V_{DD}	I_O=0mA
		9.95	10.00	—		10		
		14.95	15.00	—		15		
Output low voltage	V_{OL}	—	0.00	0.05	V	5	0, V_{DD}	I_O=0mA
		—	0.00	0.05		10		
		—	0.00	0.05		15		
Output high current	I_{OH}	−0.16	—	—	mA	5	0, V_{DD}	V_{OH}=4.6V
		−0.4	—	—		10		V_{OH}=9.5V
		−1.2	—	—		15		V_{OH}=13.5V
Output low current	I_{OL}	0.44	—	—	mA	5	0, V_{DD}	V_{OL}=0.4V
		1.1	—	—		10		V_{OL}=0.5V
		3.0	—	—		15		V_{OL}=1.5V
Input current	I_{IN}	—	—	±0.3	μA	5	0, V_{DD}	—
Power consumption (Gates)	I_{DD}	—	—	1.0	μA	5	0, V_{DD}	—
		—	—	2.0		10		
		—	—	4.0		15		
Power consumption (Flip-fops, buffers)		—	—	4.0		5		
		—	—	8.0		10		
		—	—	16.0		15		
Power consumption (MSI)		—	—	20		5		
		—	—	40		10		
		—	—	80		15		

T-51-11
T-46-09-05 T-43-21
T-67-11-51 T-51-21
T-51-19 T-46-07-05
J-45-23-09 T-46-07-07

Electrical Characteristics/Switching Characteristics (Ta=25°C, V_{SS}=0V)

Prameter	Symbol	Min.	Typ.	Max.	Unit	Conditions V_{DD}	Conditions
Output rise time	Tr	—	180	400	ns	5	C_L=50pF
		—	90	200		10	
		—	65	160		15	
Output fall time	Tf	—	100	200	ns	5	C_L=50pF
		—	50	100		10	
		—	40	80		15	
Maximum clock frequency	fφmax.	—	2.0	—	MHz	5	C_L=50pF
		—	6.0	—		10	
		—	7.5	—		15	

Dimensions (Unit: mm)

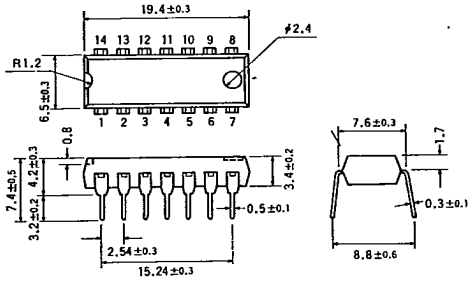


Fig. 1 14-pin DIP

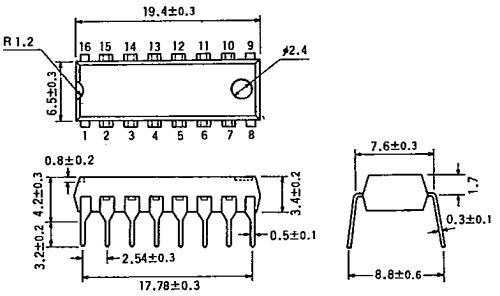


Fig. 2 16-pin DIP

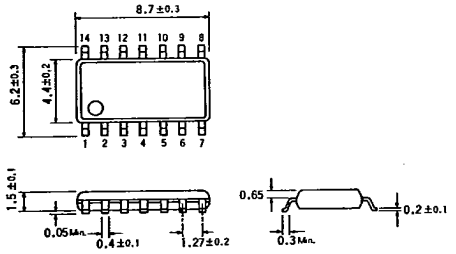


Fig. 3 14-pin MF

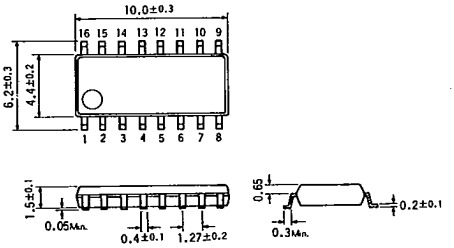


Fig. 4 16-pin MF

Electrical Characteristic Curves

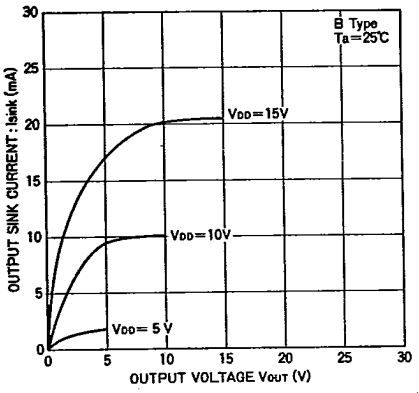


Fig. 5 Output sink current vs. output voltage

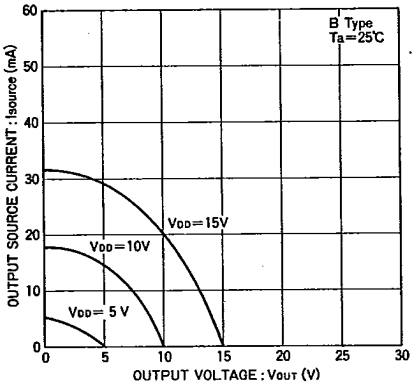


Fig. 6 Output source current vs. output voltage

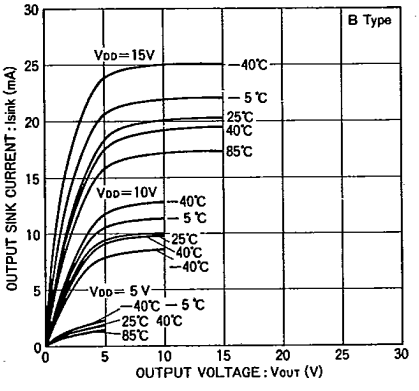


Fig. 7 Output sink current vs. output voltage

Electrical Characteristic Curves

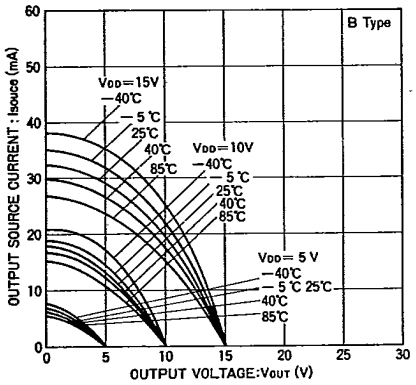


Fig. 8 Output source current vs. output voltage

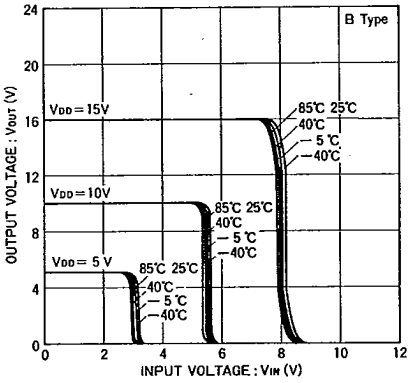


Fig. 9 Output voltage vs. input voltage

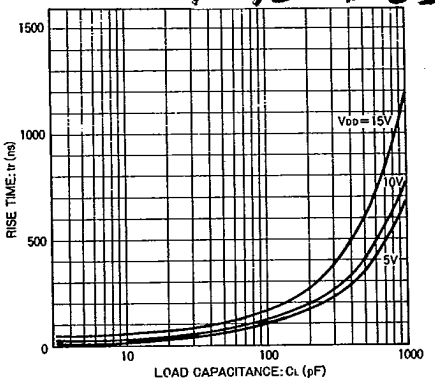


Fig. 10 Rise time vs. load capacitance

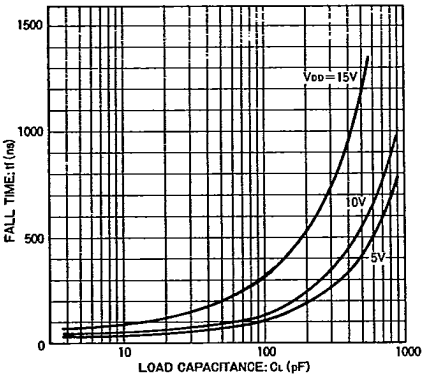


Fig. 11 Fall time vs. load capacitance

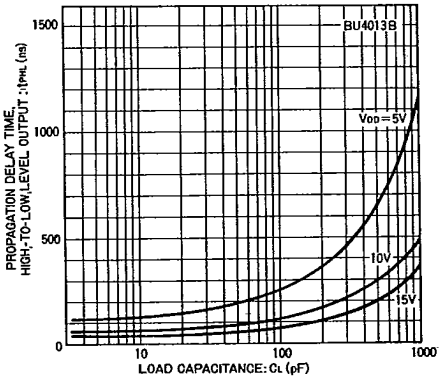


Fig. 12 Propagation delay time, high-to-low output vs. load capacitance

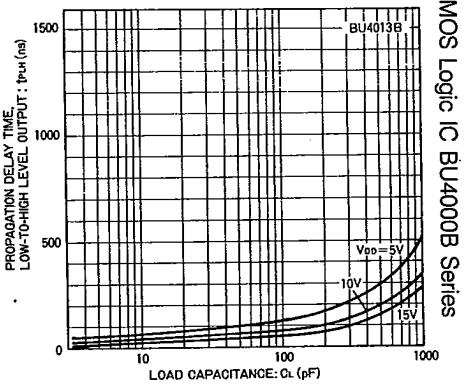


Fig. 13 Propagation delay time, low-to-high output vs. load capacitance

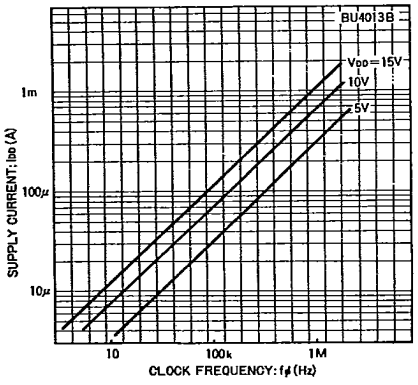


Fig. 14 Supply current vs. clock frequency

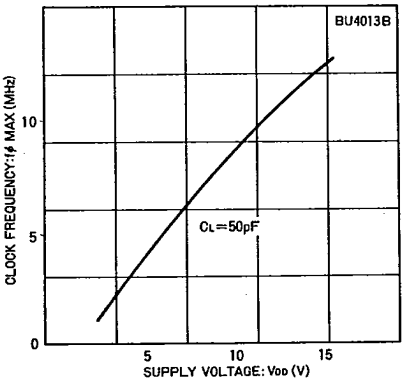


Fig. 15 Clock frequency vs. supply voltage

T-51-11
T-67-11-51
T-43-21
T-51-19
T 51-21
T-45-23-09
T-46-07-05
T-46-07-07
T-46-09-05

Block Diagrams

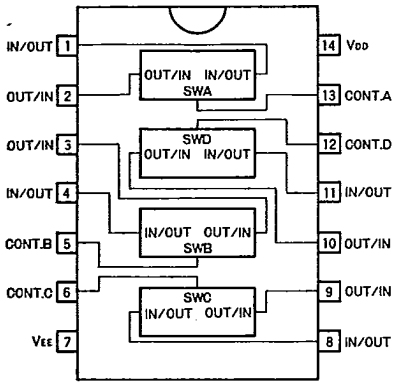


Fig. 16 BU4016B

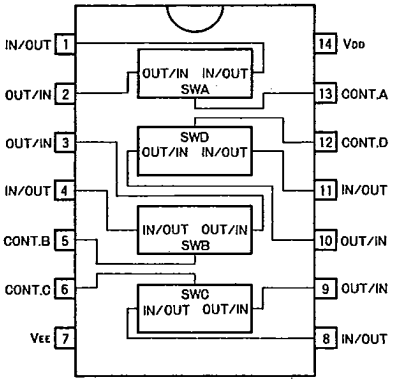


Fig. 17 BU4066B

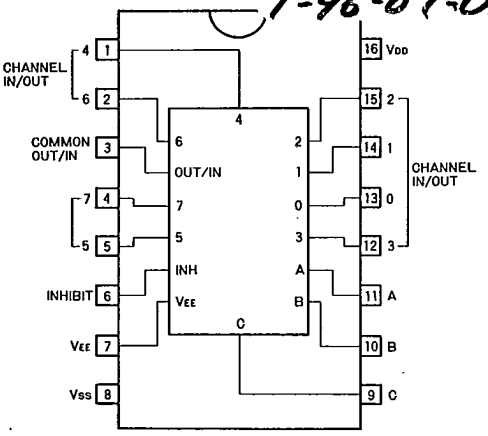


Fig. 18 BU4051B

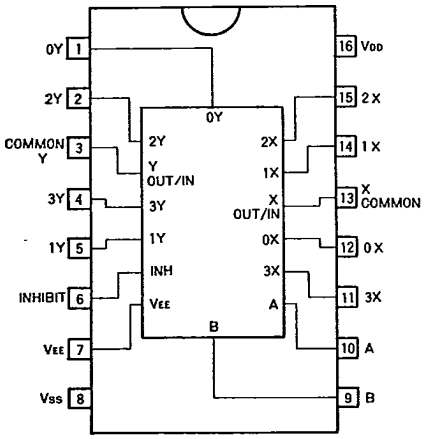


Fig. 19 BU4052B

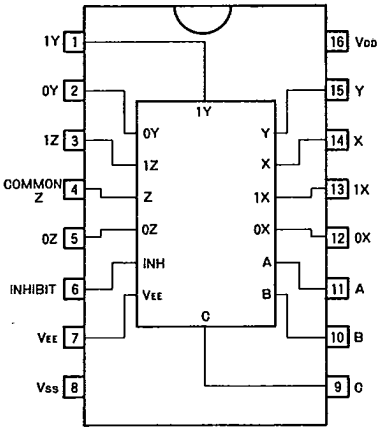


Fig. 20 BU4053B

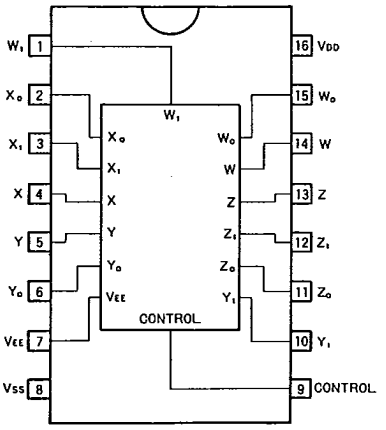


Fig. 21 BU4551B

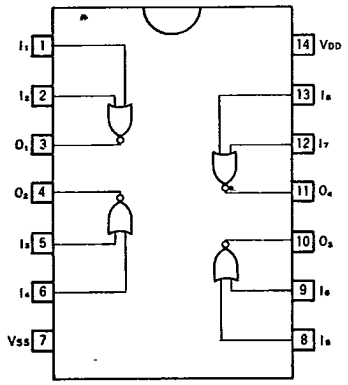


Fig. 22 BU4001B

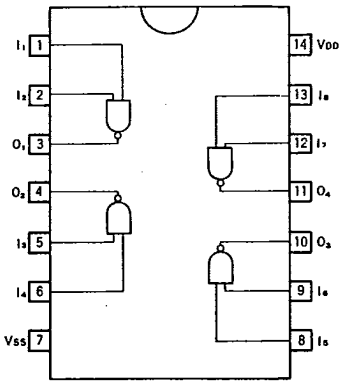


Fig. 23 BU4011B

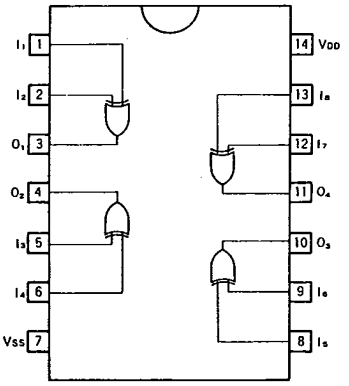


Fig. 24 BU4030B

T-51-11
ROHM
T-46-07-07
T-46-09-05
T-67-11-51
T-51-19
T-45-23-09
T-43-21
T-51-21
T-46-07-05

Block Diagrams

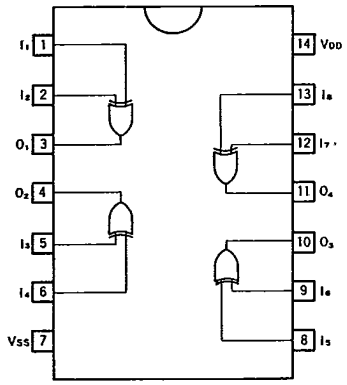


Fig. 25 BU4070B

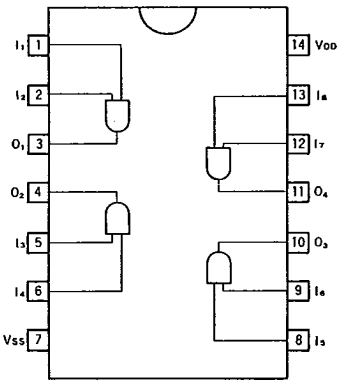


Fig. 26 BU4081B

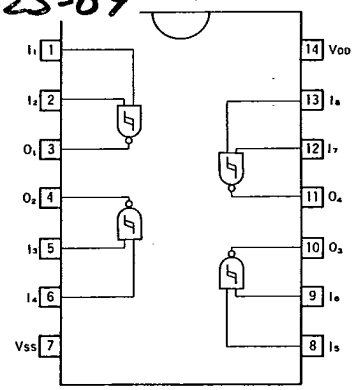


Fig. 27 BU4093B

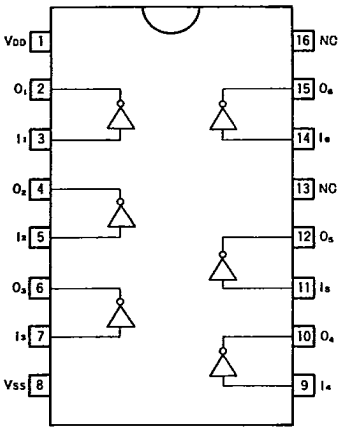


Fig. 28 BU4049UB

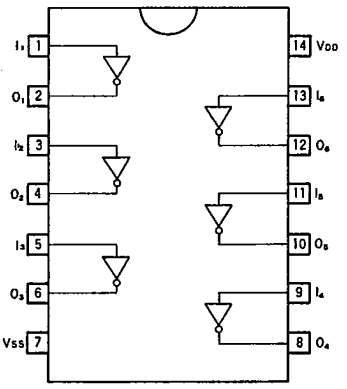


Fig. 29 BU4069UB

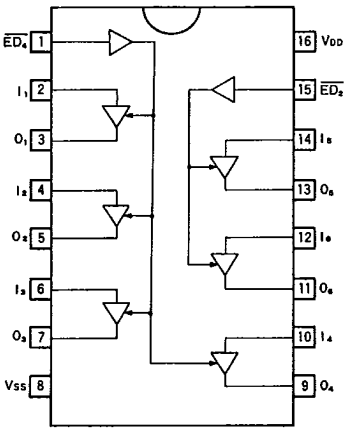


Fig. 30 BU4503B

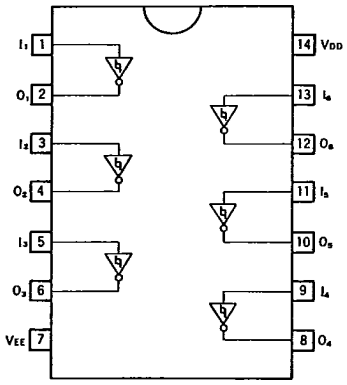


Fig. 31 BU4584B

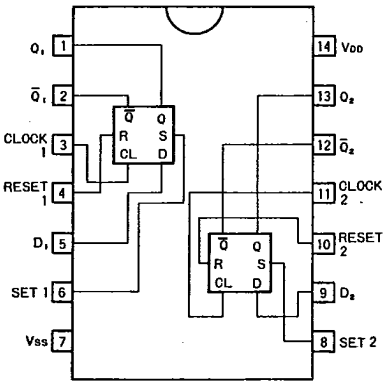


Fig. 32 BU4013B

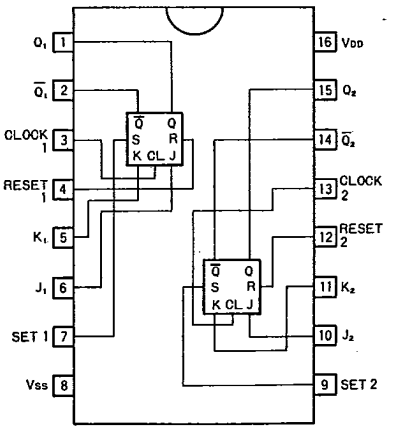


Fig. 33 BU4027B

T-51-11
T-43-21
T-51-21
T-46-07-05
T-46-07-07
T-46-09-05
T-67-11-51
T-51-19
T-45-23-09

Block Diagrams

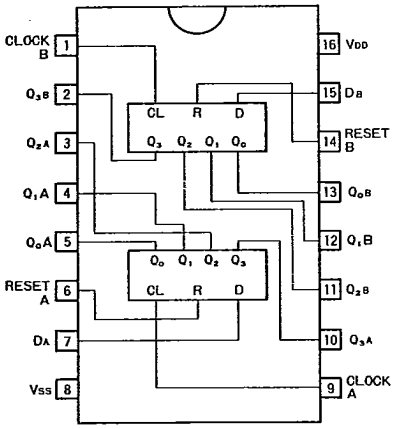


Fig. 34 BU4015B

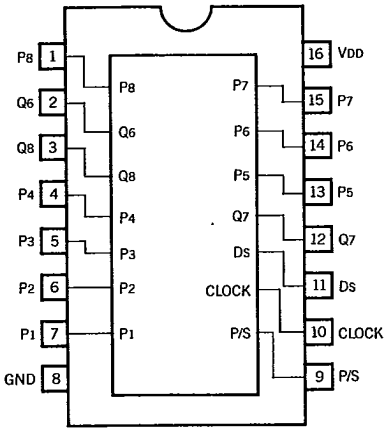


Fig. 35 BU4021B

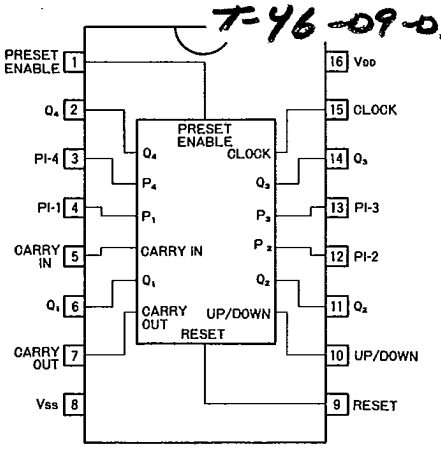


Fig. 36 BU4516B

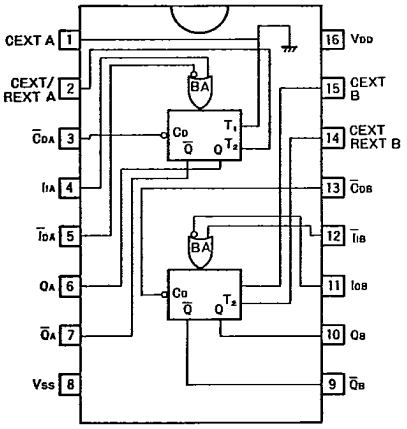


Fig. 37 BU4538B

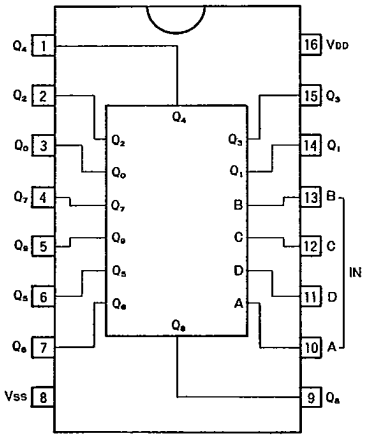


Fig. 38 BU4028B

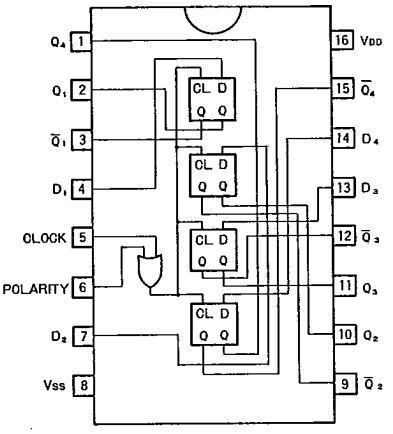


Fig. 39 BU4042B

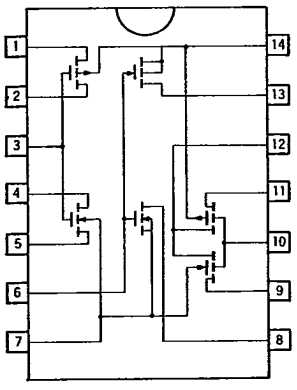


Fig. 40 BU4007UB