AN6474NFBQ

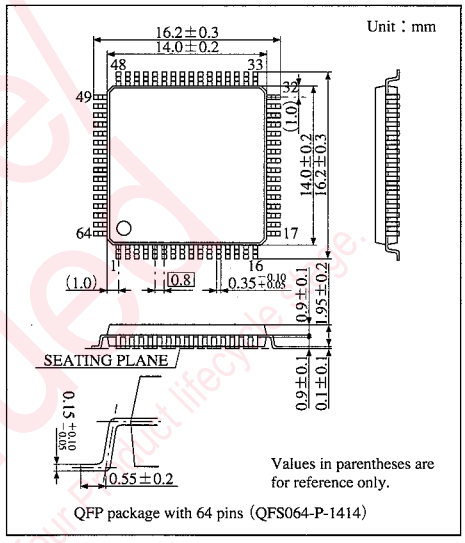
Cordless Telephone Speech Network IC Incorporating Cross-Point Switch

■ Overview

The AN6474NFBQ is a speech network IC most suitable for basic-type cordless telephones. It incorporates a cross-point switch controlled by serial input. It allows speech path switching and mixing, and provides for three- or four-person communication and other sophisticated functions. It also incorporates REC/PLAY amplifiers with VOX circuits.

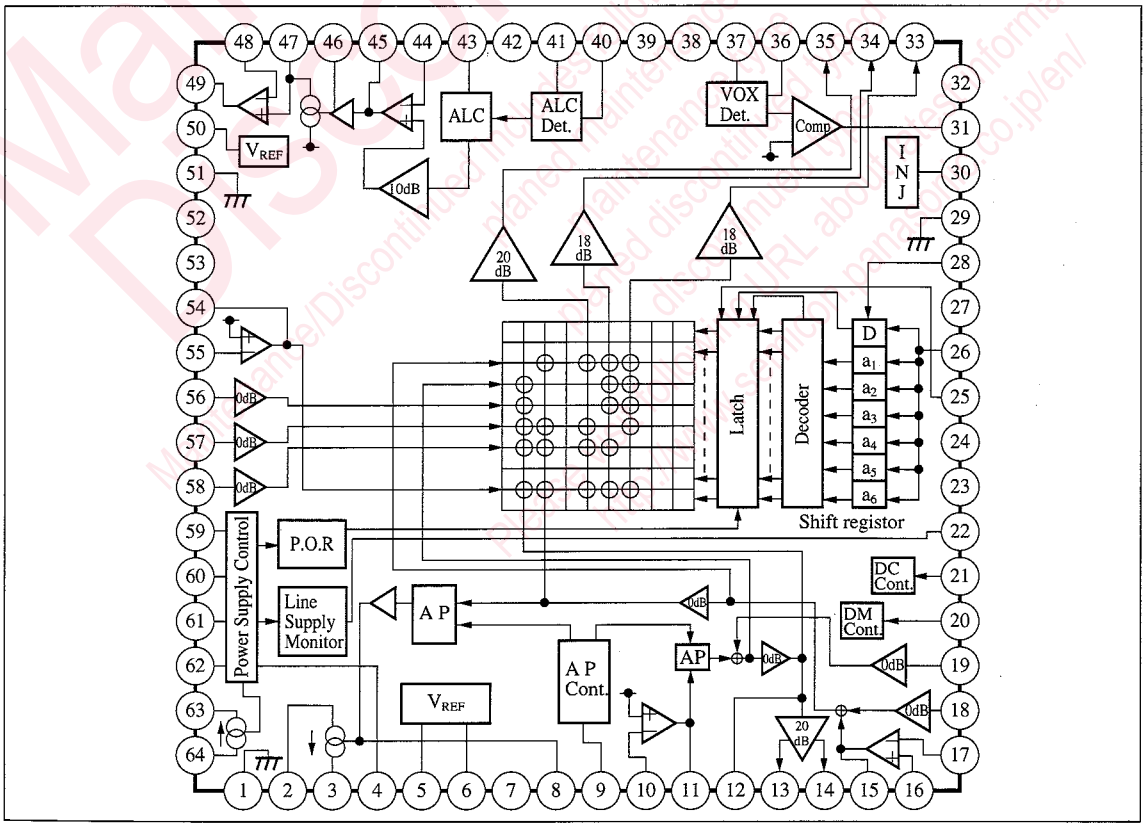
■ Features

- The speech block can operate on line voltage, with no external power supply, and is operational even during a commercial power failure.
- Incorporates auto. PAD, dial mute, DC voltage regulation, and other basic speech functions.
- The cross-point switch can be operated independently.
- Each output of the cross-point switch can correspond to multiple inputs, allowing three- or four-person communication.
- The REC/PLAY amplifiers incorporate ALC and VOX circuits.
- Receiver volume can be increased by 6 dB or 9 dB.



QFP package with 64 pins (QFS064-P-1414)

■ Block Diagram



■ Pin Descriptions

Pin No.	Description	Pin No.	Description
1	Ground	33	RF2 link output
2	Line power (+) input	34	RF1 link output
3	Side-tone adjustment	35	Intercom link output
4	Line voltage control (1)	36	VOX detection control
5	Int. ref. voltage output (1)	37	VOX amp. input
6	Int. ref. voltage output (2)	38	No connection
7	No connection	39	No connection
8	Trans. preamp. output	40	ALC input
9	Auto. PAD control	41	ALC detection control
10	Rec. preamp. input	42	Loudspeaker link input
11	Rec. preamp. output	43	Recording input
12	Rec. amp. input	44	Recording inverse input
13	Rec. amp. output (1)	45	Recording preamp. output
14	Rec. amp. output (2)	46	Recording bias current control
15	MIC preamp. output	47	To recording head
16	MIC preamp. input (1)	48	EQ amp. inverse input
17	MIC preamp. input (2)	49	EQ amp. output
18	DTMF signal input	50	REC/PLAY int. ref. voltage output
19	BT signal input	51	Ground
20	Dial mute control	52	No connection
21	Line voltage control	53	No connection
22	Line interruption detector output	54	AUX preamp. output
23	No connection	55	AUX link input
24	No connection	56	Intercom link input
25	Strobe signal input	57	RF1 link input
26	Clock signal input	58	RF2 link input
27	No connection	59	Power-ON reset control
28	Data input	60	External supply voltage input
29	Ground	61	Internal supply voltage output
30	Logic power supply input	62	Circuit voltage control (2)
31	VOX detector output	63	Line current bypass (2)
32	No connection	64	Line current bypass (1)

■ Absolute Maximum Ratings (Ta=25℃)

Parameter	Symbol	Rating	Unit
Supply voltage (1)	V_{CC}	7.0	V
Supply current (1)	I_{CC}	50	mA
Supply voltage (2)	V_L	12.0	V
Supply current (2)	I_L	135	mA
Power dissipation Note)	P_D	645	mW
Operating ambient temperature	T_{opr}	−20 to +75	℃
Storage temperature	T_{stg}	−55 to +150	℃

Note) In a free-air condition with Ta=75℃.

■ Supply Voltage Range (Ta=25℃)

Parameter	Symbol	Range
Operating supply voltage range (1)	V_{CC}	4.5V to 5.5V
Operating supply voltage range (2)	V_L	3.0V to 11.0V

■ Recommended Operating Conditions (Ta = −20℃ ~ +75℃)

Parameter		Symbol	Condition	min.	typ.	max.	Unit
Supply voltage		V_{CC}	—	4.5	5	5.5	V
Clock frequency		f_{CLK}	Input Duty 40% to 50%	—	—	250	kHz
Input pulse width	CLK (LOW)	$t_{WL(CLK)}$		1.6	—	2.0	μs
	CLK (HIGH)	$t_{WH(CLK)}$		2.0	—	2.4	μs
	STB	$t_{W(STB)}$		1.2	—	—	μs
Setup time	DATA	$t_{SU(DATA)}$		1.6	—	—	μs
	STB	$t_{SU(STB)}$		0.8	—	—	μs
Hold time	DATA	$t_{h(DATA)}$		1.6	—	—	μs
	STB	$t_{h(STB)}$		1.2	—	—	μs
Clock pulse rise time		$t_{r(CLK)}$		—	—	20	μs
Clock pulse fall time		$t_{f(CLK)}$		—	—	20	μs
Input voltage		V_i		0	—	V_{CC}	V

■ Electrical Characteristics (Ta = 25 ± 2℃)

Parameter	Symbol	Condition	min.	typ.	max.	Unit
Power supply characteristics during power failure						
Line DC voltage (I−1)	V_{L-I1}	V−DCC=HIGH, I_L=20mA, V_{CC}=0V	3.3	3.6	3.9	V
Line DC voltage (I−2)	V_{L-I2}	V−DCC=HIGH, I_L=60mA, V_{CC}=0V	4.8	5.1	5.5	V
Line DC voltage (I−3)	V_{L-I3}	V−DCC=HIGH, I_L=120mA, V_{CC}=0V	7.0	7.4	7.9	V
Line DC voltage H (I−1)	V_{LH-I1}	V−DCC=LOW, I_L=30mA, V_{CC}=0V	5.25	5.75	6.25	V
Line DC voltage H (I−2)	V_{LH-I2}	V−DCC=LOW, I_L=60mA, V_{CC}=0V	6.55	7.05	7.55	V
Line DC voltage H (I−3)	V_{LH-I3}	V−DCC=LOW, I_L=120mA, V_{CC}=0V	8.9	9.6	10.3	V
Internal supply voltage (I)	V_{reg-I}	V−DCC=HIGH, I_L=20mA, V_{CC}=0V	1.8	2.0	2.2	V
Internal ref. supply voltage (I)	V_{ref-I}	V−DCC=HIGH, I_L=20mA, V_{CC}=0V	0.9	1.0	1.1	V
Normal power supply characteristics						
Line DC voltage (E−1)	V_{L-E1}	V−DCC=HIGH, I_L=20mA, V_{CC}=5V	3.2	3.5	3.9	V
Line DC voltage (E−2)	V_{L-E2}	V−DCC=HIGH, I_L=60mA, V_{CC}=5V	4.5	4.9	5.3	V
Line DC voltage (E−3)	V_{L-E3}	V−DCC=HIGH, I_L=120mA, V_{CC}=5V	6.5	7.0	7.5	V
Line DC voltage H (E−1)	V_{LH-E1}	V−DCC=LOW, I_L=30mA, V_{CC}=5V	4.8	5.35	5.9	V
Line DC voltage H (E−2)	V_{LH-E2}	V−DCC=LOW, I_L=60mA, V_{CC}=5V	5.9	6.55	7.2	V
Line DC voltage H (E−3)	V_{LH-E3}	V−DCC=LOW, I_L=120mA, V_{CC}=5V	8.1	8.8	9.5	V
Internal supply voltage (E)	V_{reg-E}	V−DCC=HIGH, I_L=20mA, V_{CC}=5V	4.6	4.85	5.0	V
Internal ref. supply voltage (E)	V_{ref-E}	V−DCC=HIGH, I_L=20mA, V_{CC}=5V	2.25	2.5	2.7	V
Total circuit current	I_{total}	V−DCC=HIGH, I_L=20mA, V_{CC}=5V	12	22	30	mA
Power interruption detection (1)	V−HIT1	V_L=2.7V, V_{CC}=5V	0	0.1	0.6	V
Power interruption detection (2)	V−HIT2	V_L=1.5V, V_{CC}=5V	4.4	4.95	5	V

■ Electrical Characteristics (cont.) (Ta=25±2℃)

Parameter	Symbol	Condition	min.	typ.	max.	Unit
Receiver during power failure						
Rec. gain (I−1)	Gv−IR1	I_L=30mA, V_{CC}=0V, V_{in}=−42dBm	30.5	32.5	34.5	dB
Rec. gain (I−2)	Gv−IR2	I_L=80mA, V_{CC}=0V, V_{in}=−42dBm	27	29	31	dB
Rec. auto. PAD width (I) Note 1)	AP−IR	I_L=30mA−80mA, V_{CC}=0V, V_{in}=−42dBm	2.3	3.3	4.8	dB
Rec. max. output (I)	Vo−IR	With I_L=30mA, V_{CC}=0V, and THD=5%	0	4	—	dBm
BT amp. gain (I)	Gv−IBT	I_L=30mA, V_{CC}=0V, V−DMC=LOW, V_{in}=−30dBm	19	21	23	dB
Receiver on external power supply						
Rec. gain (E−1)	Gv−ER1	I_L=30mA, V_{CC}=5V, V_{in}=−42dBm	30.5	32.5	34.5	dB
Rec. gain (E−2)	Gv−ER2	I_L=80mA, V_{CC}=5V, V_{in}=−42dBm	26.8	28.8	30.8	dB
Rec. auto. PAD width (E) Note 1)	AP−ER	I_L=30mA−80mA, V_{CC}=5V, V_{in}=−42dBm	2.3	3.5	4.8	dB
Rec. max. output (E)	Vo−ER	With I_L=30mA, V_{CC}=5V, and THD=5%	4	12	—	dBm
Rec. digital volume (1) Note 2)	Gv−DV1	I_L=30mA, V_{CC}=5V, V_{in}=−42dBm, DV−1 ON	5	6	7	dB
Rec. digital volume (2) Note 2)	Gv−DV2	I_L=30mA, V_{CC}=5V, V_{in}=−42dBm, DV−1&2 ON	7.5	9	10.5	dB
BT amp. gain (E)	Gv−EBT	I_L=30mA, V_{CC}=5V, V−DMC=LOW, V_{in}=−30dBm	19.5	21.5	23.5	dB
Rec. gain difference	ΔG−R	For V_{CC}=0V and V_{CC}=5V (between Gv−IR1 and Gv−ER1)	−1.2	−0.1	1.2	dB
Transmitter amp. during power failure						
Trans. gain (I−1)	Gv−IM1	R=27Ω (Pin③), I_L=30mA, V_{CC}=0V, V_{in}=−38dBm	26.9	28.9	30.9	dB
Trans. gain (I−2)	Gv−IM2	I_L=80mA, V_{CC}=0V, V_{in}=−38dBm	23.9	25.9	27.9	dB
Trans. auto. PAD width (I) Note 1)	AP−IM	I_L=30mA−80mA, V_{CC}=0V, V_{in}=−38dBm	1.7	3.0	4.2	dB
Trans. max. output (I−1)	Vo−IM1	With I_L=30mA, V_{CC}=0V, and THD=5%	0	3.5	—	dBm
Trans. max. output (I−2)	Vo−IM2	I_L=30mA, V_{CC}=0V, THD=5%, V−DCC=LOW	0	3.5	—	dBm
DTMF gain (I−1)	Gv−ID1	I_L=30mA, V_{CC}=0V, V−DMC=LOW, V_{in}=−30dBm	16.3	18.3	20.3	dB
DTMF gain (I−2)	Gv−ID2	I_L=80mA, V_{CC}=0V, V−DMC=LOW, V_{in}=−30dBm	13.1	15.1	17.1	dB
DTMF auto. PAD width (I) Note 1)	AP−IDT	I_L=30mA−80mA, V_{CC}=0V, V−DMC=LOW, V_{in}=−30dBm	1.9	3.2	4.4	dB
DTMF max. output (I−1)	Vo−ID1	I_L=30mA, V_{CC}=0V, V−DMC=LOW, THD=5%	0	3.8	—	dBm
DTMF max. output (I−2)	Vo−ID2	I_L=30mA, V_{CC}=0V, THD=5%, V−DMC=LOW, V−DCC=LOW	0	3.5	—	dBm

Note) Unless otherwise specified, input signal Fin = 1 kHz, control voltage V-DOC = high, and control voltage V-DMC = high.
Note 1) Gain decrease when line current (I_L) is changed from 30 to 80 mA.
Note 2) Gain increase from receiver gain (E−1).

■ Electrical Characteristics (cont.) (Ta=25±2℃)

Parameter	Symbol	Condition	min.	typ.	max.	Unit
Transmitter amp. on external power supply						
Trans. gain (E−1)	Gv−EM1	I_L=30mA, V_{CC}=5V, V_{in}=−38dBm	27.1	29.1	31.1	dB
Trans. gain (E−2)	G_{v-EM2}	I_L=80mA, V_{CC}=5V, V_{in}=−38dBm	23.4	25.4	27.4	dB
Trans. auto. PAD width (E) Note 1)	A_{P-EM}	I_L=30mA−80mA, V_{CC}=5V, V_{in}=−38dBm	2.4	3.7	4.9	dB
Trans. max. output (E−1)	V_{o-EM1}	With I_L=30mA, V_{CC}=5V, and THD=5%	2	6	—	dBm
Trans. max. output (E−2)	V_{o-EM2}	I_L=30mA, V_{CC}=5V, THD=5%, V−DCC=LOW	2	6	—	dBm
DTMF gain (E−1)	G_{v-ED1}	I_L=30mA, V_{CC}=5V, DM=ON, V_{in}=−30dBm	16.5	18.5	20.5	dB
DTMF gain (E−2)	G_{v-ED2}	I_L=80mA, V_{CC}=5V, V−DMC=LOW, V_{in}=−30dBm	12.6	14.6	16.6	dB
DTMF auto. PAD width (E) Note 1)	A_{P-EDT}	I_L=30mA−80mA, V_{CC}=5V, V−DMC=LOW, V_{in}=−30dBm	2.6	3.9	5.1	dB
DTMF max. output (E−1)	V_{o-ED1}	I_L=30mA, V_{CC}=5V, V−DMC=LOW, THD=5%	2	6	—	dBm
DTMF max. output (E−2)	V_{o-ED2}	I_L=30mA, V_{CC}=5V, DM=ON, V−DMC=LOW, THD=5%	2	6	—	dBm
Trans. gain difference (1)	ΔG−M1	For V_{CC}=0V and V_{CC}=5V (between Gv−IM1 and Gv−EM1)	−1.3	−0.2	0.9	dB
Trans. gain difference (2)	ΔG−M2	For V_{CC}=0V and V_{CC}=5V (between Gv−IM2 and Gv−EM2)	−0.6	0.5	1.6	dB
DTMF gain difference (1)	ΔG−MF1	For V_{CC}=0V and V_{CC}=5V (between Gv−ID1 and Gv−ED1)	−1.3	−0.2	0.9	dB
DTMF gain difference (2)	ΔG−MF2	For V_{CC}=0V and V_{CC}=5V (between Gv−ID2 and Gv−ED2)	−0.6	0.5	1.6	dB

Note) Unless otherwise specified, input signal Fin = 1 kHz, control voltage V−DOC = high, and control voltage V−DMC = high.
Note 1) Gain decrease when line current (I_L) is changed from 30 to 80 mA.

■ Electrical Characteristics (cont.) (Ta=25±2℃)

Parameter	Symbol	Condition	min.	typ.	max.	Unit
Recording preamplifiers						
Rec. preamp. gain	G_{v-Rp}	V_{in}=−60dBm, R_{in}=0Ω	43	45	47	dB
Rec. preamp. output	V_{o-RP}	V_{in}=−45dBm, R_{in}=10Ω	−13.4	−11.4	−9.4	dBm
Rec. preamp. output noise voltage	V_{no-RP}	DIN/AUDIO, Rg=10kΩ	—	0.8	2.5	dBrms
Recording amplifier						
Head bias current	I−REC	L−SW (h07) =ON	145	180	215	μA
Head output	G_{v-REC}	L−SW (h07) =ON, V_{in}=−15dBm, R_L=1kΩ	40.0	50.0	63.0	mVrms
Playing EQ amplifier						
EQ amp. gain	G_{v-EQ}	L−SW (h07) =ON, V_{in}=−40dBm	27.8	29.8	31.8	dB
EQ amp. output noise voltage	V_{no-EQ}	L−SW (h07) =ON, DIN/AUDIO, R_{in}=1kΩ	—	0.45	1.2	mVrms
VOX detector						
VOX sensitivity (1)	VS1	I−VOX=12.5μA	3.5	4.8	—	V
VOX sensitivity (2)	VS2	I−VOX=24.5μA	—	0.025	0.5	V

Note) Unless otherwise specified, external supply voltage V_{CC}=5V, line current I_L=0mA, input signal frequency = 1 kHz, control voltage V-DOC = high, and control voltage V-DMC = high.

■ Electrical Characteristics (cont.) (Ta=25±2℃)

Parameter	Symbol	Condition	min.	typ.	max.	Unit
Link SW input amplifier						
AUX amp. gain	G_{v-AUX}	V_{in}=−36dBm	5	6	7	dB
Link SW output amplifier						
Intercom output gain Note 1)	G_{v-DHO}	Input AUX IN, V_{in}=−36dBm, L−SW (h3B) =ON	18.5	20	21.5	dB
RF1 output gain Note 1)	G_{v-RF1O}	Input AUX IN, V_{in}=−36dBm, L−SW (h3C) =ON	16.5	18	19.5	dB
RF2 output gain Note 1)	G_{v-RF2O}	Input AUX IN, V_{in}=−36dBm, L−SW (h3D) =ON	16.5	18	19.5	dB
Receiver output gain Note 1)	G_{v-RO}	Input AUX IN, V_{in}=−36dBm, L−SW (h38) =ON	19.9	21.4	22.9	dB
Line output gain Note 1)	G_{v-TO}	Input AUX IN, V_{in}=−36dBm, L−SW (h39) =ON	17.7	19.2	20.7	dB

Note) Unless otherwise specified, external supply voltage V_{CC}=5V, line current I_L=0mA, input signal frequency = 1 kHz, control voltage V−DCC = high, and control voltage V−DMC = high.
Note 1) Each amp. gain is measured from AUX OUT (Pin ㊹) to its output (The AUX preamp. gain is not included in the calculation).

■ Electrical Characteristics (cont.) (Ta=25±2℃)

Parameter	Symbol	Condition	min.	typ.	max.	Unit
Link SW input						
MIC input gain Note 1)	G_{v-MI}	V_{in}=−38dBm, L−SW (h0C) =ON	−1	0	1	dB
Rec. input gain Note 1)	G_{v-RI}	V_{in}=−42dBm, L−SW (h14) =ON	−1	0	1	dB
Intercom input gain	G_{v-DHI}	V_{in}=−30dBm, L−SW (h1C) =ON	5	6	7	dB
RF1 input gain	G_{v-RF1I}	V_{in}=−30dBm, L−SW (h25) =ON	−1	0	1	dB
RF2 input gain	G_{v-RF2I}	V_{in}=−30dBm, L−SW (h2C) =ON	−1	0	1	dB
Link maximum output						
DH OUT max. output	V_{o-DH}	Input RF1 IN, THD=5% L−SW (h23) =ON	0	4	—	dBm
RF1 OUT max. output	V_{o-RF1}	Input RF2 IN, THD=5% L−SW (h2C) =ON	0	4	—	dBm
RF2 OUT max. output	V_{o-RF2}	Input RF1 IN, THD=5% L−SW (h25) =ON	0	4	—	dBm

Note) Unless otherwise specified, external supply voltage V_{CC}=5V, line current I_L=0mA, input signal frequency = 1 kHz, control voltage V−DOC = high, and control voltage V−DMC = high.
Note 1) Each amp. gain is measured from MIC OUT (Pin⑮) or R PRE OUT (Pin⑪) to its output.

■ Electrical Characteristics (cont.) (Ta=25±2℃)

Parameter	Symbol	Condition	min.	typ.	max.	Unit
Controls						
Dial mute high level voltage	V_{DMC-H}		2	—	V_{CC} +0.2	V
Dial mute high level control current	I_{DMC-H}	V−DMC=5V	15	38	80	μA
Dial mute low level voltage	V_{DMC-L}		−0.2	—	0.3	V
Dial mute low level control current	I_{DMC-L}	V−DMC=0V	−40	−20	−10	μA
DC voltage control high level voltage	V_{DCC-H}		2	—	V_{CC} +0.2	V

Note) Unless otherwise specified, V_{CC}=5V, and I_L=20mA.

■ Electrical Characteristics (cont.) (Ta=25±2℃)

Parameter	Symbol	Condition	min.	typ.	max.	Unit
DC voltage control high level control current	I_{DCC-H}	V−DCC=5V	10	25	50	μA
DC voltage control low level voltage	V_{DCC-L}		−0.2	—	0.4	V
DC voltage control low level control current	I_{DCC-L}	V−DCC=0V	−2	−0.1	—	μA
Data input high level voltage	V_{DIN-H}		2	—	V_{CC} +0.2	V
Data input high level control current	I_{DIN-H}	V−DIN=5V	70	160	250	μA
Data input low level voltage	V_{DIN-L}		−0.2	—	0.3	V
Data input low level control current	I_{DIN-L}	V−DIN=0V	−1	−0.1	—	μA
Power supply block						
AC impedance (I)	Z_{AC-I}	I_L=80mA, V_{CC}=0V, V_{in}=200mVrms, Fin=1kHz	450	570	750	Ω
AC impedance (E)	Z_{AC-E}	I_L=80mA, V_{CC}=5V, V_{in}=200mVrms, Fin=1kHz	450	580	750	Ω
Input impedance						
DTMF amp. input impedance	Z_{in-MF}	Pin⑱ Input	8.5	9.5	10.5	kΩ
BT amp. input impedance	Z_{in-BT}	Pin⑲ Input	8.7	9.7	10.7	kΩ
ALC amp. input impedance	Z_{in-ALC}	Pin⑳ Input	8.5	9.5	10.5	kΩ
Intercom preamp. input impedance	Z_{in-DH}	Pin㊻ Input	8.5	9.5	10.5	kΩ
RF1 preamp. input impedance	Z_{in-RF1}	Pin㊼ Input	8.5	9.5	10.5	kΩ
RF2 preamp. input impedance	Z_{in-RF2}	Pin㊽ Input	8.5	9.5	10.5	kΩ

Note) Unless otherwise specified, V_{CC}=5V, and I_L=20mA.

■ Electrical Characteristics (Design Values for Reference) (cont.) (Ta=25±2℃)

Parameter	Symbol	Condition	min.	typ.	max.	Unit
Speech block						
Rec. output noise voltage (1)	V_{n-IR}	I_L=30mA, V_{CC}=0V, DIN/AUDIO	—	0.3	—	mVrms
Rec. output noise voltage (E)	V_{n-ER}	I_L=30mA, V_{CC}=5V, DIN/AUDIO	—	0.3	—	mVrms
Trans. output noise voltage (1)	V_{n-IT}	I_L=30mA, V_{CC}=0V, DIN/AUDIO	—	0.3	—	mVrms
Trans. output noise voltage (E)	V_{n-ET}	I_L=30mA, V_{CC}=5V, DIN/AUDIO	—	0.3	—	mVrms
Dial mute trans. amp. Mute attenuation	M−T	I_L=30mA, V_{CC}=5V, V_{in}=−30dBm, V−DBM=H/L	—	75	—	dB
Rec. output mute attenuation	M−RO	I_L=30mA, V_{in}=−30dBm, V_{CC}=5V, Lsw (h27) =OFF/ON	—	50	—	dB
Rec. preamp. input impedance	Z_{in-R}	Pin⑩ Input	—	500	—	kΩ
MIC preamp. input impedance	Z_{in-M}	Pin⑯, ⑰ Input	—	500	—	kΩ
REC/PLAY block						
ALC amp. ALC width	W−ALC	I_L=0mA, V_{CC}=5V, and ALC output distortion≦2%	—	40	—	dB
ALC amp. ALC effect	ΔALC	I_L=0mA, V_{CC}=5V, V_{in}=−45dBm→−20dBm	—	1	—	dB
Rec. amp. mute attenuation	M−REC	V_{CC}=5V, V_{in}=−10dBm I_L=0mA, LSW (h07) =ON/OFF	—	80	—	dB

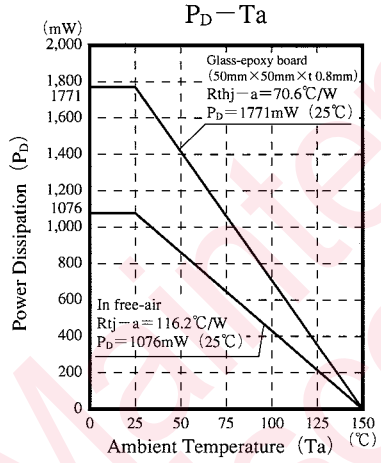
Note) The above design values are for reference only, and not guaranteed values.

■ Electrical Characteristics (Design Values for Reference) (cont.) (Ta=25±2℃)

Parameter	Symbol	Condition	min.	typ.	max.	Unit
EQ amp. mute attenuation	M−EQ	V_{CC}=5V, V_{in}=−30dBm I_L=0mA, LSW (h0F) =ON/OFF	—	80	—	dB
Recording preamp. input impedance	Z_{in-REC}	Pin㊸ Input	—	10	—	kΩ
EQ amp. input impedance	Z_{in-EQ}	Pin㊼, ㊽ Input	—	500	—	kΩ
VOX amp. input impedance	Z_{in-VOX}	Pin㊲ Input	—	500	—	Ω
Link switch						
Link SW mute attenuation	M−LS	V_{CC}=5V, I_L=30mA, AC output measured at link ON/OFF	—	75	—	dB
AUX preamp. input impedance	Z_{in-AUX}	Pin㊺ Input	—	500	—	kΩ

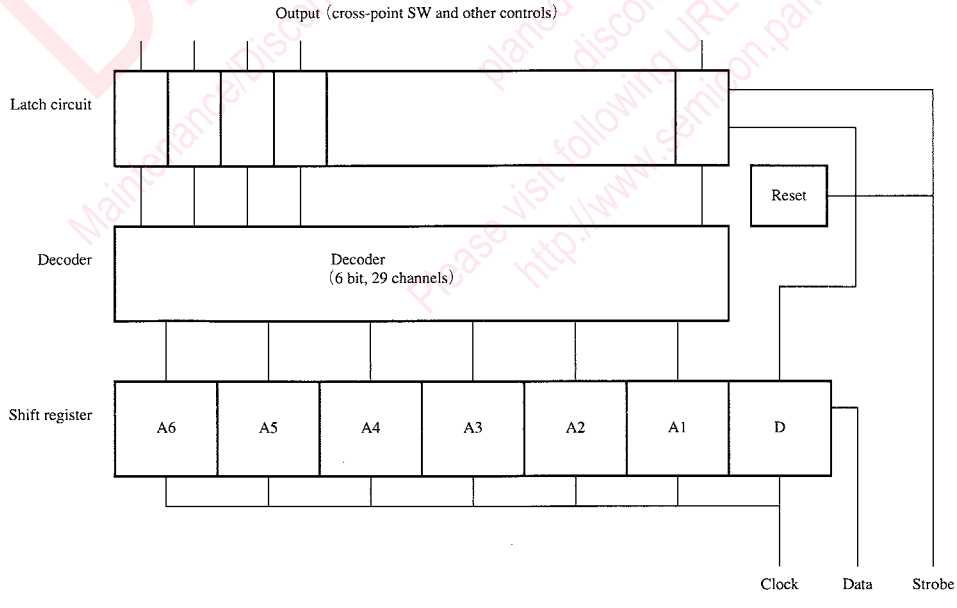
Note) The above design values are for reference only, and not guaranteed values.

■ Characteristics Curve

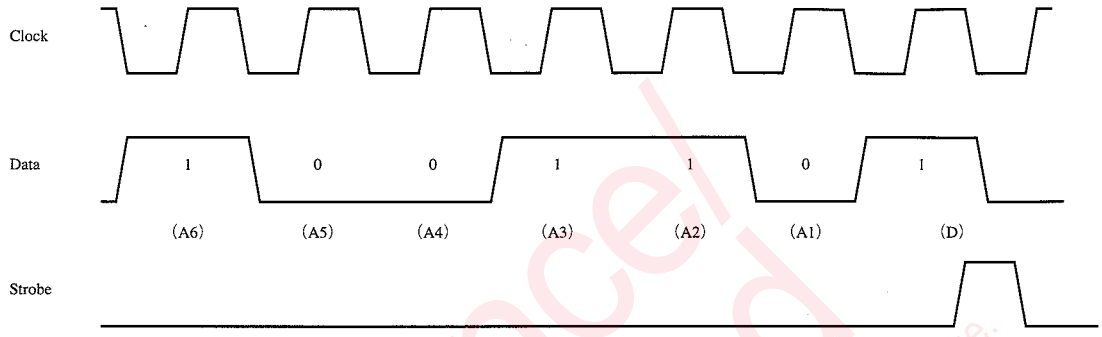


■Logic Specifications

• Basic block diagrams



• Time Charts (assuming the address h26 latch is to be set)



1. Data is read into the shift register in synchronization with a rising edge of the clock, with the higher data being shifted sequentially on a first-come highest-bit basis.
2. When the strobe is low, data is shifted sequentially on the sift register in synchronization with the clock. Data on the latch circuit will not change.
3. When the strobe goes high, the latched data whose address is represented by the highest six bits of the shift register is updated. Latched data is set when the least significant bit is 1, and reset when the bit is 0.
4. Referring to 3 above, if the address is h00 (the highest six bits of the shift register are all 0s), the latch circuit is cleared (all reset) regardless of the data content.
5. At power-on (V_{CC} ON), the latch circuit is cleared (by power-ON reset).

• Logic Circuits Address Specifications

1. Cross-point switch

Input \ Output	Handset rec.	Line output	Intercom	RF1	RF2
Microphone		09	0B	0C	0D
Receiver	10			14	15
Intercom	18			1C	1D
RF1	20	21	23		25
RF2	28	29	2B	2C	—
AUX	38	39	3B	3C	3D

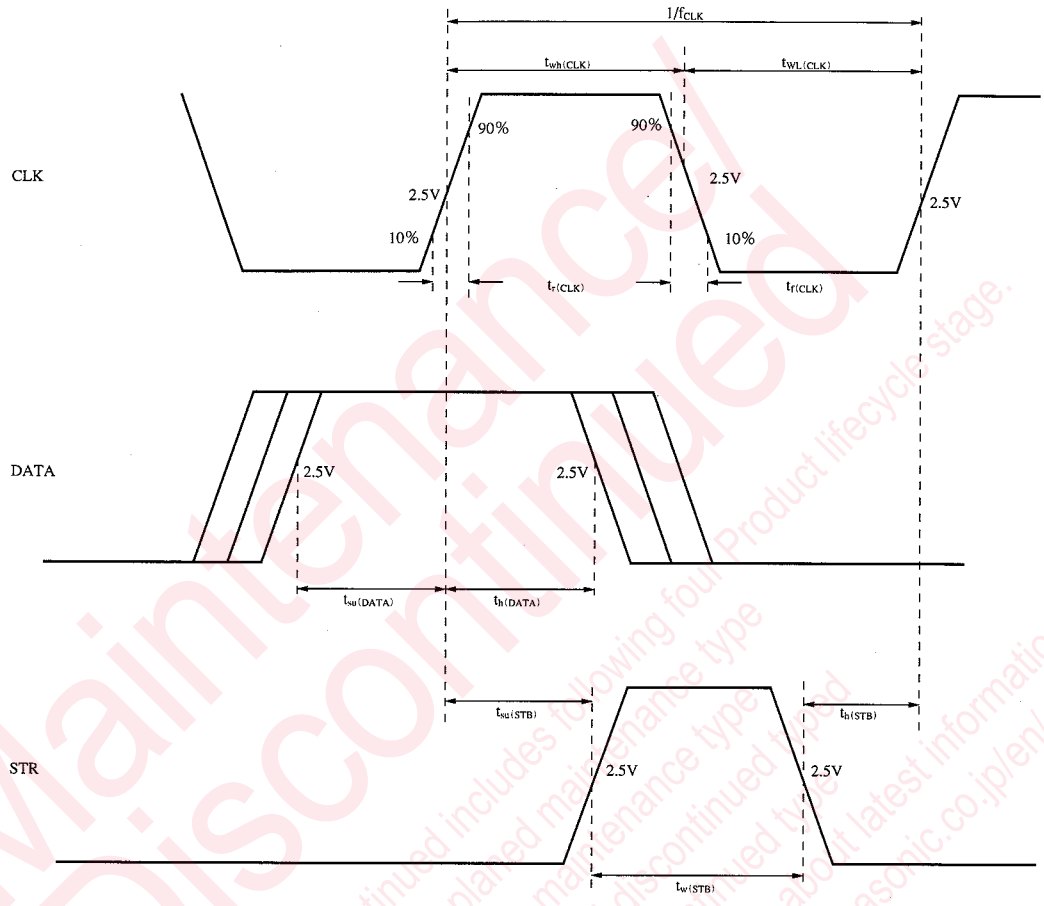
Note) Empty space means "not applicable." Address is in hexadecimal.

2. Other control switches

Address	Description
00	Cross-point SW all reset
07	Recording amp. ON
0F	Playing amp. ON
17	Receiver volume 6dB up
1F	Receiver volume 9dB up (when address 17 is ON)
27	Handset receiver amp. mute

Note) Address is in hexadecimal.

■ Timing Charts



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