

8 mm VCR AFM Stereo Matrix

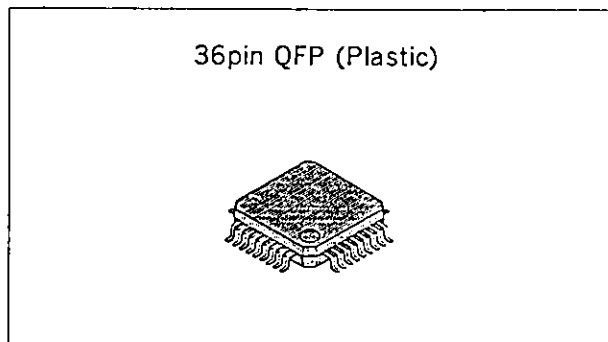
For the availability of this product, please contact the sales office.

Description

The CXA1536Q is an IC designed for 8 mm VCR stereo AFM matrix. In combination with a CXA1488R device it offers an effective implementation of an AFM audio stereo system.

Features

- Matrix select functions for stereo
- Monaural discriminating function
- Bilingual discriminating function
- Incorporates a pulse signal generator for inserting a bilingual pilot signal
- Low current consumption



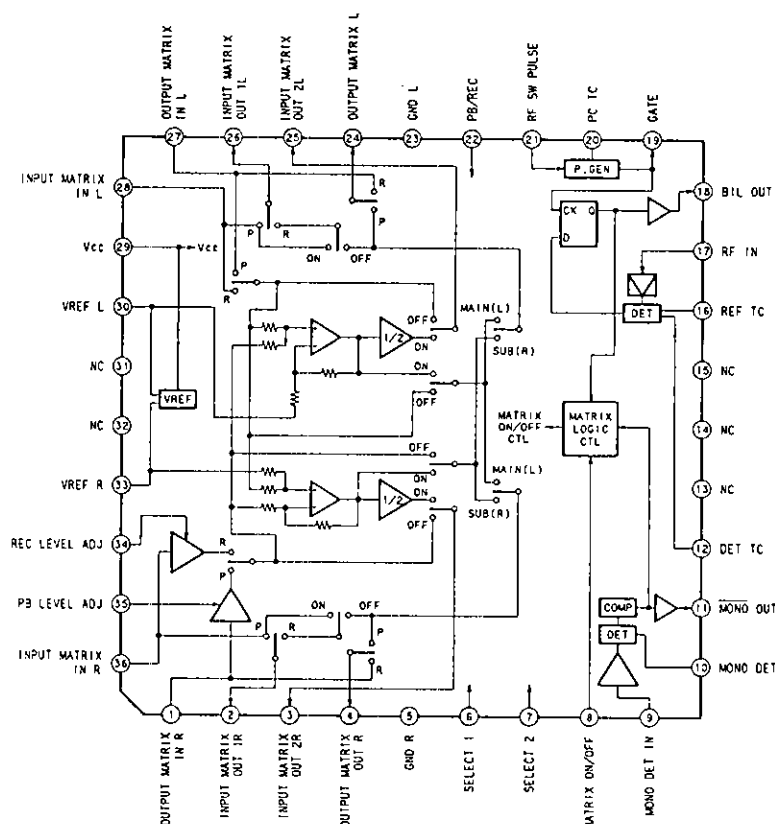
Application

8 mm VCR

Structure

Bipolar silicon monolithic IC

Block Diagram



Absolute Maximum Ratings (Ta = 25°C)

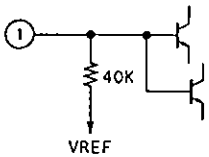
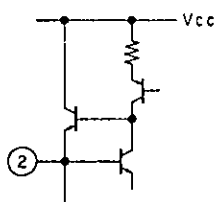
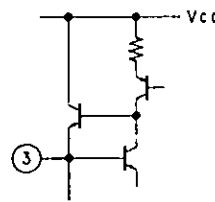
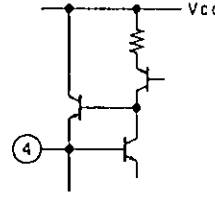
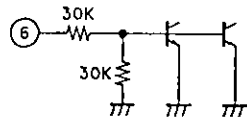
• Supply voltage	V_{CC}	7	V
• Operating temperature	T_{opr}	-20 to +75	°C
• Storage temperature	T_{stg}	-40 to +150	°C
• Allowable power dissipation	P_D	320	mW

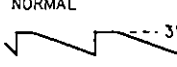
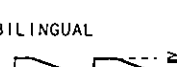
Operating Conditions

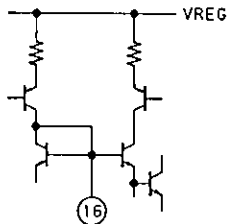
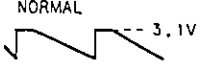
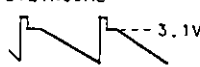
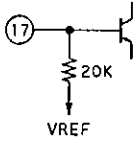
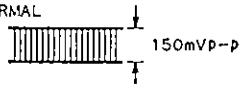
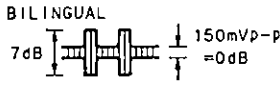
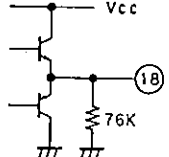
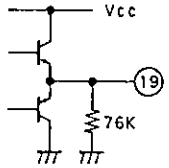
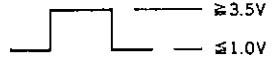
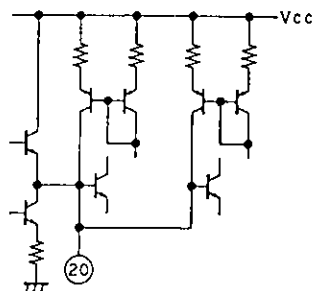
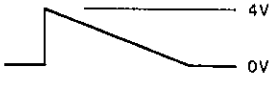
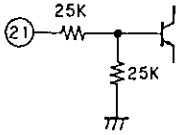
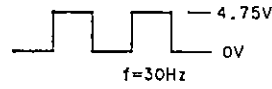
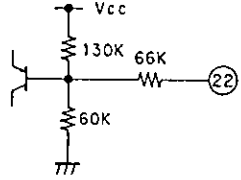
• Supply voltage	4.75 V	
• Supply voltage range	4.5 to 5.5	V

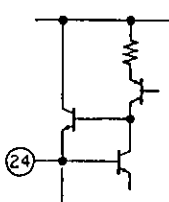
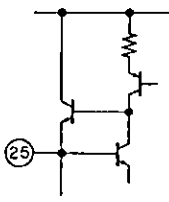
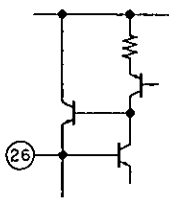
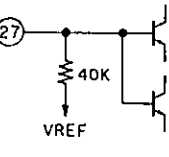
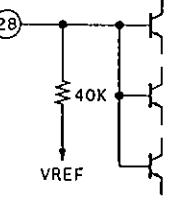
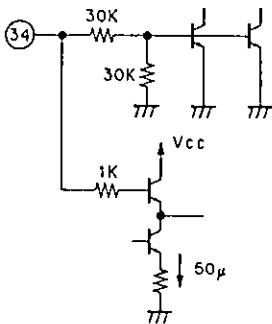
Pin Description

0 dBs = 2.191 Vp-p

No.	Symbol	DC voltage	AC voltage	Equivalent circuit	Remarks	
1	OUTPUT MATRIX IN R	2.375V	—		Reference input -15 dBs	
2	INPUT MATRIX OUT 1R	2.375V	-15dBs		With reference input	
3	INPUT MATRIX OUT 2R	2.375V	0V		With reference input	Recording stereo
			-15dBs			Other than recording stereo
4	OUTPUT MATRIX OUT R	2.375V	0V		With reference input	Playback Stereo
			-15dBs			Other than playback stereo
5	GND	—	—	—		
6	SELECT 1	—	—		High: right channel output Low: left channel output	

No.	Symbol	DC voltage	AC voltage	Equivalent circuit	Remarks	
7	SELECT 2	—	—		High: left channel output Low: right channel output	
8	MATRIX ON/OFF	2.5V	—		High: matrix on Open: automatic discrimination during playback Low: matrix off	
9	MONO DET IN	3V	—		Reference input	<p>MONO  $\geq 1.5V$</p> <p>STEREO  $-15dBs$</p>
10	MONO DET	$\geq 2.2V$	—		With reference input	Mono
		$\leq 1.8V$			With reference input	Stereo
11	$\overline{\text{MONO OUT}}$	$\leq 1V$	—		With reference input	Mono
		$\geq 3.5V$			With reference input	Stereo
12	DET TC	$\rightarrow$	—		With reference input	<p>NORMAL  $\sim 3V$</p> <p>BILINGUAL  $\geq 3.3V$</p>
13	NC					
14	NC					
15	NC					

No.	Symbol	DC voltage	AC voltage	Equivalent circuit	Remarks	
16	REF TC	→	—		With reference input	
						
17	RF IN	2.375V	—		Reference input	
						
18	BIL OUT	$\cong 1\text{ V}$	—		With reference input	Normal
		$\cong 3.5\text{V}$				Bilingual
19	GATE OUT	→	—			
20	PC TC	→	—			
21	RF SW PULSE	—	—		Reference input	
22	PB/REC	1.5V	—			High: playback Low/open: record
23	GND	—	—			

No.	Symbol	DC voltage	AC voltage	Equivalent circuit	Remarks	
24	OUTPUT MATRIX OUT L	2.375V	-9dBs		With reference input	Playback stereo
			-15dB9			Other than playback stereo
25	INPUT MATRIX OUT 2L	2.375V	-15dBs		With reference input	
26	INPUT MATRIX OUT 1L	2.375V	-15dBs		With reference input	
27	OUTPUT MATRIX IN L	2.375V	—		Reference input -15 dBs	
28	INPUT MATRIX IN L	2.375V	—		Reference nput -15 dBs	
29	V _{CC}	—	—			
30	VREF L	2.375V	—			
31	NC					
32	NC					
33	VREF R	2.375V	—			
34	REC LEVEL ADJ	—	—		Input voltage 1.8V-V _{CC} : ±3 dB variable ≧1 V: through	

No.	Symbol	DC voltage	AC voltage	Equivalent circuit	Remarks
35	PB LEVEL ADJ	—	—		Input voltage 1.8V–V _{CC} : ±3 dB variable ≤1 V: through
36	INPUT MATRIX IN R	2.375V	—		Reference input –15 dBs

Electrical Characteristics (Ta=25°C, V_{CC}=4.75V)

0 dBs=2.191 Vp-p

No.	Item	Symbol	Conditions		Min.	Typ.	Max.	Unit
			Input	Test point				
1	Current consumption recording	I _{CC R}		I _{CC}	4.8	6.1	7.4	mA
2	Current consumption playback	I _{CC P}		↓	6.0	7.6	9.2	mA
3	Reference voltage	VREF		TP11	2.300	2.375	2.450	V

REC MATRIX ON MODE (left channel)

4	Voltage gain 1	G _{RML1}	400Hz, –15dBs	TP9	–0.2	0	0.2	dB
5	Distortion factor 1	THD _{RML1}	400Hz, –5dBs	↓			0.1	%
6	Voltage gain 2	G _{RML2}	400Hz, –15dBs	TP8	–0.4	0	0.4	dB
7	Distortion factor 2	THD _{RML2}	400Hz, –5dBs	↓			0.1	%
8	Voltage gain 3	G _{RML3}	400Hz, –15dBs	TP7	–0.1	0	0.1	dB
9	Distortion factor 3	THD _{RML3}	400Hz, –5dBs	↓			0.1	%
10	Crosstalk	CT _{RML}	400Hz, –15dBs	TP1			–60	dB
11	Separation	SP _{RML}	400Hz, –15dBs, L/R left/right reverse phase inputs	TP8			–40	dB

REC MATRIX OFF MODE (left channel)

12	Voltage gain 1	G _{RL1}	400Hz, –15dBs	TP9, TP1	–0.5	0	0.5	dB
13	Distortion factor 1	THD _{RL1}	400Hz, –5dBs	↓			0.1	%
14	Voltage gain 2	G _{RL2}	400Hz, –15dBs	TP8	–0.2	0	0.2	dB
15	Distortion factor 2	THD _{RL2}	400Hz, –5dBs	↓			0.1	%
16	Crosstalk	CT _{RL}	400Hz, –15dBs	TP1			–60	dB

PB MATRIX ON MODE (left channel)

No.	Item	Symbol	Conditions		Min.	Typ.	Max.	Unit
			Input	Test point				
17	Voltage gain 1	G_{PML1}	400Hz, -15dBs	TP7	-0.5	0	0.5	dB
18	Distortion factor 1	THD_{PML1}	400Hz, -5dBs	↓			0.1	%
19	Voltage gain 2	G_{PML2}	400Hz, -15dBs	TP9	-0.1	0	0.1	dB
20	Distortion factor 2	THD_{PML2}	400Hz, -5dBs	↓			0.1	%
21	Crosstalk	CT_{PML}	400Hz, -15dBs	TP3			-60	dB
22	Separation	SP_{PML}	400Hz, -15dBs, left/right reverse phase inputs	TP7			-40	dB

PB MATRIX OFF MODE (left channel)

23	Voltage gain 1	G_{PL}	400Hz, -15dBs	TP7, TP3	-0.4	0	0.4	dB
24	Distortion factor 1	THD_{PL}	400Hz, -5dBs	↓			0.1	%
25	Crosstalk	CT_{PL}	400Hz, -15dBs	TP3			-60	dB

REC MATRIX ON MODE (right channel)

26	Voltage gain 1	G_{RMR}	400Hz, -15dBs	TP2	-0.5	0	0.5	dB
27	Distortion factor 1	THD_{RMR}	400Hz, -5dBs	↓			0.3	%
28	Crosstalk	CT_{RMR}	400Hz, -15dBs	TP9			-60	dB
29	Separation	SP_{RMR}	400Hz, -15dBs, left/right reverse phase inputs	TP2			-40	dB

REC MATRIX OFF MODE (right channel)

30	Voltage gain 1	G_{RR1}	400Hz, -15dBs	TP9, TP1	-0.5	0	0.5	dB
31	Distortion factor 1	THD_{RR1}	400Hz, -5dBs	↓			0.1	%
32	Voltage gain 2	G_{RR2}	400Hz, -15dBs	TP2	-0.3	0	0.3	dB
33	Distortion factor 2	THD_{RR2}	400Hz, -5dBs	↓			0.1	%
34	Crosstalk	CT_{RR}	400Hz, -15dBs	TP9			-60	dB

PR MATRIX ON MODE (right channel)

35	Voltage gain 1	G_{PMR}	400Hz, -15dBs	TP3	-0.5	0	0.5	dB
36	Distortion factor 1	THD_{PMR}	400Hz, -5dBs	↓			0.4	%
37	Crosstalk	CT_{PMR}	400Hz, -15dBs	TP9			-60	dB
38	Separation	SP_{PMR}	400Hz, -15dBs, left/right reverse phase inputs	TP3			-40	dB

PR MATRIX OFF MODE (right channel)

39	Voltage gain 1	G_{PR}	400Hz, -15dBs	TP3, TP7	-0.5	0	0.5	dB
40	Distortion factor 1	THD_{PR}	400Hz, -5dBs	↓			0.1	%
41	Crosstalk	CT_{PR}	400Hz, -15dBs	TP7			-60	dB

ADJUST LEVEL

No.	Item	Symbol	Conditions		Min.	Typ.	Max.	Unit
			Input	Test point				
42	REC LEVEL ADJUST range	$V_{ADJ J}$	400Hz, -15dBs, IN1 variable	TP2	1.8	3.0	V_{CC}	V
43	PB LEVEL ADJUST range	$V_{ADJ P}$	400Hz, -15dBs, IN2 variable	↓	1.8	3.0	V_{CC}	V

MONO DET

44	Discrimination level	V_{MON}	※ 1	TP4			1.5	Vp-p
45	Output level low	V_{MONL}	※ 1 V=0dBs	↓			1.0	V
46	Output level high	V_{MONH}	※ 1 V=-15dBs	↓	3.5			V

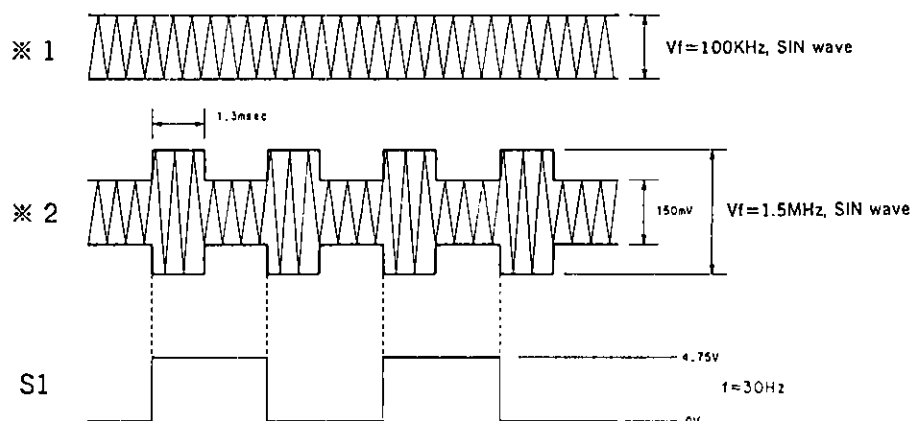
BILINGUAL DET

47	Discrimination level	V_3	※ 2	TP5	3.0	7.0		dB
48	Output level low	V_{3L}	※ 2 V=150mV	↓			1.0	V
49	Output level high	V_{3H}	※ 2 V=300mV	↓	3.5			V
50	Gate pulse width	T_P		TP6	1.2	1.3	1.4	msec
51	Gate pulse width output level low	V_{PL}		↓			1.0	V
52	Gate pulse width output level high	V_{PH}		↓	3.5			V

CONTROL LOGIC THRESHOLD

53	PB/REC L	$V_{P/RL}$	400Hz, -15dBs	TP9			1.0	V
54	PB/REC H	$V_{P/RH}$	400Hz, -15dBs	↓	3.5			V
55	MATRIX ON/OFF L	V_{MATL}	400Hz, -15dBs	↓			1.0	V
56	MATRIX ON/OFF H	V_{MATH}	400Hz, -15dBs	↓	4.2			V
57	SELECT 1 L	V_{S1L}	400Hz, -15dBs	TP7			1.0	V
58	SELECT 1 H	V_{S1H}	400Hz, -15dBs	↓	3.5			V
59	SELECT 2 L	V_{S2L}	400Hz, -15dBs	TP3			1.0	V
60	SELECT 2 H	V_{S2H}	400Hz, -15dBs	↓	3.5			V

Input Signal



Note: In this specification, when a signal level of 7 dB standard, minimum 3 dB, is input, it indicates a bilingual discrimination. If tested under the previous test conditions, then if the results are 3 dB or below the above specification will be met.

Switch Mode Table

MODE \ SW				PB/REC	MATRIX ON/OFF	SELECT1	SELECT2
REC	MONO			L	L	L	H
	STEREO			L	H	—	—
	BILINGUAL	MAIN/SUB		L	L	L	L
		MAIN/MAIN		L	L	L	H
		SUB/SUB		L	L	H	L
PB (AUTO)	MONO			H	OPEN	L	H
	STEREO			H	OPEN	L	L
	BILINGUAL	MAIN/SUB		H	OPEN	L	L
		MAIN/MAIN		H	OPEN	L	H
		SUB/SUB		H	OPEN	H	L
PB (MANUAL)	MONO			H	L	L	H
	STEREO			H	H	L	L
	BILINGUAL	MAIN/SUB		H	L	L	L
		MAIN/MAIN		H	L	L	H
		SUB/SUB		H	L	H	L

	PB/REC	MATRIX ON/OFF	SELECT1	SELECT2
H	PB	ON	Right channel output	Left channel output
L	REC	OFF	Left channel output	Right channel output

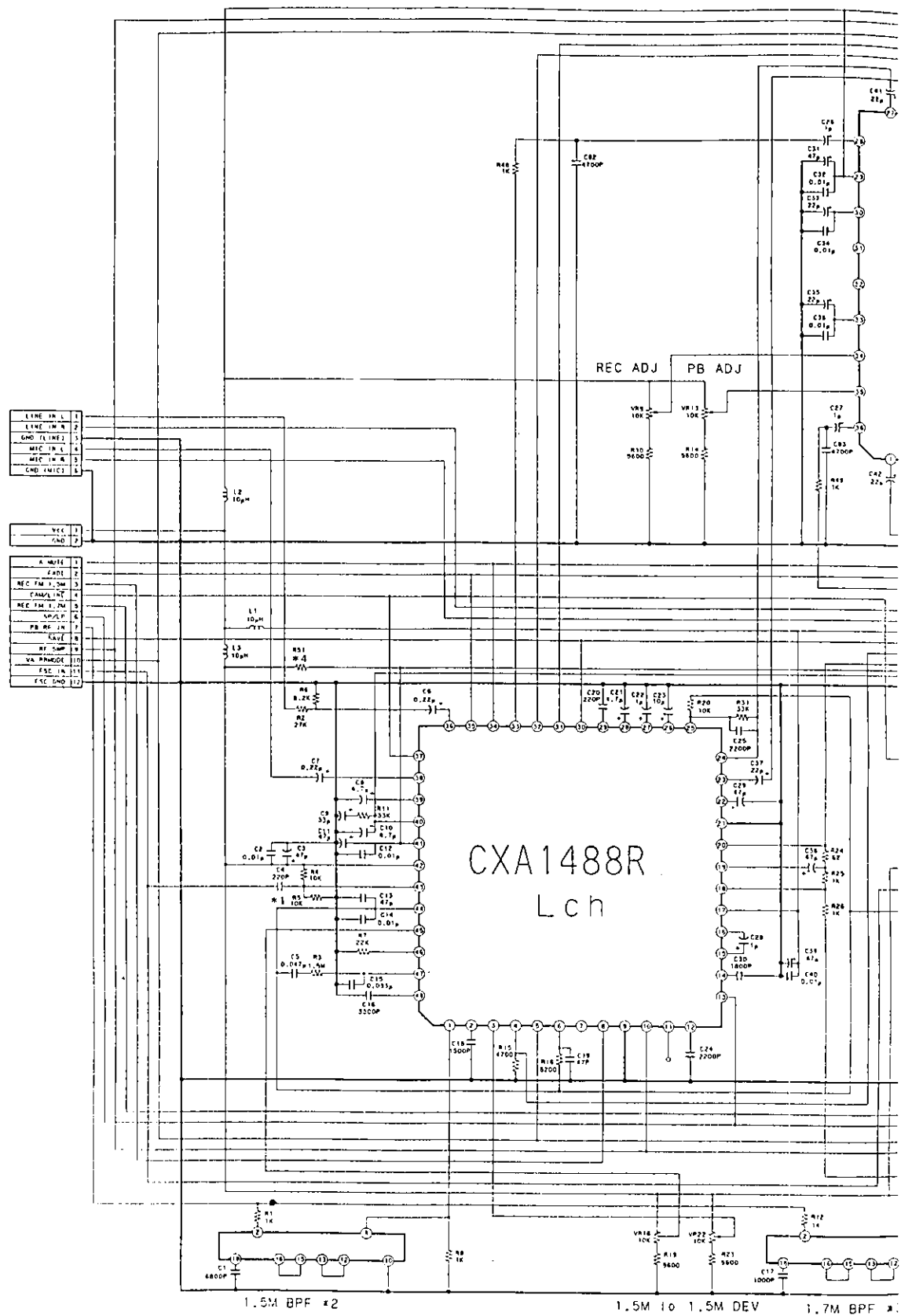
Test Program Table

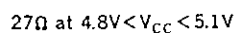
No.	Switch No.				Input point	Remarks
	SW1	SW2	SW3	SW4		
1	a	a	b	b		
2	↓	↓	↓	a		
3	↓	↓	↓	↓		
4	b	b	a	b	IN5	Common to left and right channels
5	↓	↓	↓	↓	↓	Common to left and right channels
6	↓	↓	↓	↓	↓	
7	↓	↓	↓	↓	↓	
8	↓	↓	↓	↓	IN4	REC MATRIX ON/OFF MODE and common to left and right channels
9	↓	↓	↓	↓	↓	REC MATRIX ON/OFF MODE and common to left and right channels
10	↓	↓	↓	↓	IN5	
11	↓	↓	↓	↓	IN5, 6	IN5 and IN6 are reverse phase inputs
12	↓	a	b	↓	IN5	
13	↓	↓	↓	↓	↓	
14	↓	b	↓	↓	↓	
15	↓	↓	↓	↓	↓	
16	↓	↓	↓	↓	↓	

No.	Switch No.				Input point	Remarks
	SW1	SW2	SW3	SW4		
17	b	b	a	a	IN4	
18	↓	↓	↓	↓	↓	
19	↓	↓	↓	↓	IN5	PB MATRIX ON/OFF MODE and common to left and right channels
20	↓	↓	↓	↓	↓	PB MATRIX ON/OFF MODE and common to left and right channels
21	↓	↓	↓	↓	IN5	
22	↓	↓	↓	↓	IN3, 4	IN3 and IN4 are reverse phase inputs
23	↓	a	b	↓	IN4	
24	↓	↓	↓	↓	↓	
25	↓	b	↓	↓	↓	
26	↓	↓	a	b	IN6	
27	↓	↓	↓	↓	↓	
28	↓	↓	↓	↓	↓	
29	↓	↓	↓	↓	IN5, 6	IN5 and IN6 are same phase inputs
30	a	↓	b	↓	IN6	
31	↓	↓	↓	↓	↓	
32	b	↓	↓	↓	↓	
33	↓	↓	↓	↓	↓	
34	↓	↓	↓	↓	↓	
35	↓	↓	a	a	IN3	
36	↓	↓	↓	↓	↓	
37	↓	↓	↓	↓	IN6	
38	↓	↓	↓	↓	IN3, 4	IN3 and IN4 are same phase inputs
39	a	↓	b	↓	IN3	
40	↓	↓	↓	↓	↓	
41	b	↓	↓	↓	↓	
42	↓	↓	↓	b	IN6	DC voltage applied to IN1 ; range of voltage on IN1 for TP2 output level to vary ± 3 dB.
43	↓	↓	↓	a	IN3	DC voltage applied to IN2 ; range of voltage on IN2 for TP2 output level to vary ± 3 dB.
44	↓	↓	↓	↓	IN8	Input level to IN8 for TP4 to go from high to low.
45	↓	↓	↓	↓	↓	
46	↓	↓	↓	↓	↓	
47	↓	↓	↓	↓	IN7	Voltage on IN7 increased ; voltage level for TP5 to go high at 150 mV.
48	↓	↓	↓	↓	↓	
49	↓	↓	↓	↓	↓	
50	↓	↓	↓	b		Pulse width output on TP6.
51	↓	↓	↓	↓		Low level output on TP6.
52	↓	↓	↓	↓		High level output on TP6.

No.	Switch No.				Input point	Remarks
	SW1	SW2	SW3	SW4		
53	a	b	b	c	IN5, IN9	Increase the voltage on IN9 from 0 V; voltage on IN9 for the IN5 signal to be output from TP9.
54	↓	↓	↓	↓	↓	
55	↓	↓	c	b	IN5, IN10	Increase the voltage on IN10 from 0 V; voltage on IN10 for the IN5 signal to be output from TP9.
56	↓	↓	↓	↓	↓	
57	c	↓	b	a	IN4, IN11	Increase the voltage on IN11 from 0 V; voltage on IN11 for the IN4 signal to be output from TP7.
58	↓	↓	↓	↓	↓	
59	b	c	↓	↓	IN4, IN12	Increase the voltage on IN12 from 0 V; voltage on IN12 for the IN4 signal to be output from TP3.
60	↓	↓	↓	↓	↓	

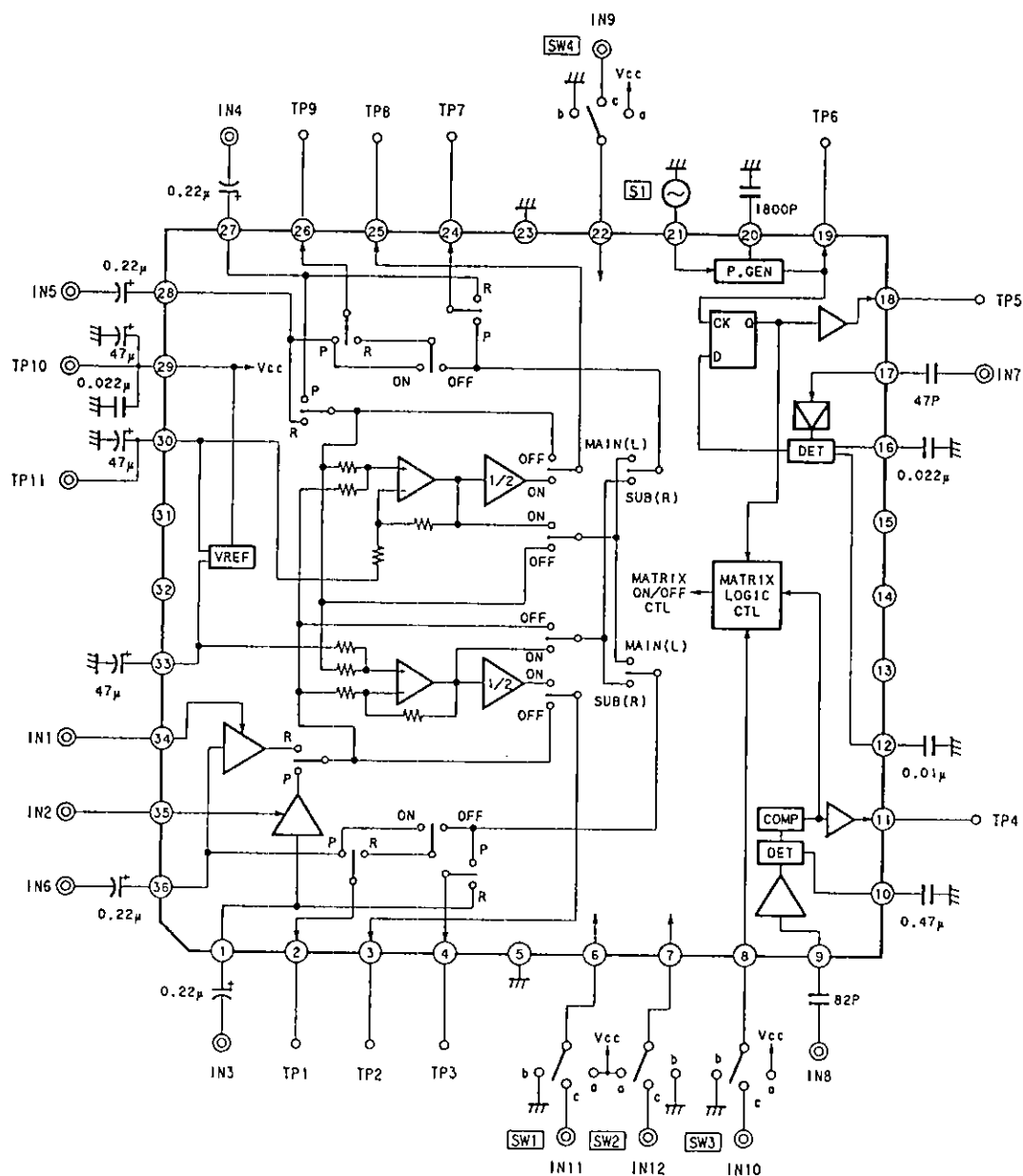
Stereo Application Circuit (8 mm VCR AFM)





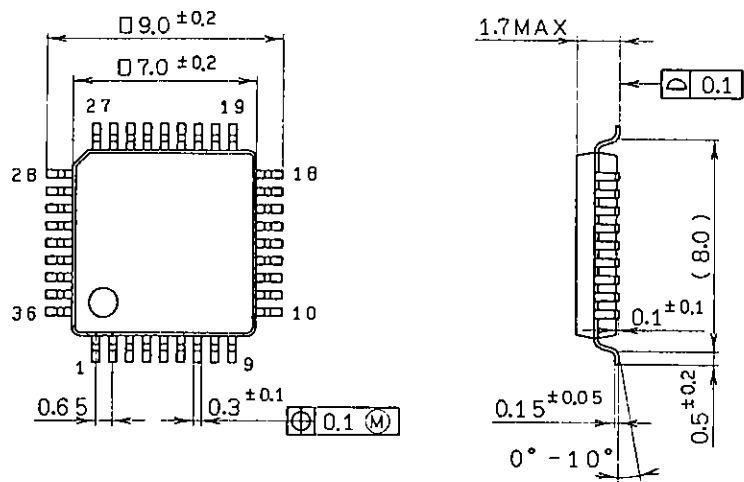
- 14 -

Test Circuit



Package Outline Unit: mm

36pin QFP (Plastic)



SONY NAME	QFP-36P-L061
EIAJ NAME	*QFP036-P-0707-BY
JEDEC CODE	—