

# Video/audio signal processor for VHS VCRs (single chip for Y/C/A)

Monolithic Linear IC

LA71521M

### Overview

The LA71521M is a video/audio signal processor IC for VHS VCRs. It handles recording and playback of PAL/GBI, MESECAM, and 4.43 NTSC signals. NTSC software tapes can be converted to PAL for monitoring. The IC requires no adjustments and minimizes the peripheral component count, making it possible to implement efficient signal handling at low cost.

### Package Dimensions

unit: mm **3174-QFP80E** 



### **Specifications**

#### Maximum Ratings at $Ta = 25^{\circ}C$

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V <sub>CC</sub> max		7	V
Allowable power dissipation	Pd max	Ta $\leq$ 65°C 114.3 x 76.1 mm <sup>2</sup> x 1.6 mm <sup>3</sup> with paper phenol substrate	1400	mW
Operating temperature	Topr		-10 to +65	°C
Storage temperature	Tstg		-40 to +150	°C

### Operating Conditions at $Ta = 25^{\circ}C$

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V <sub>CC</sub>		5	V
Recommended operating supply voltage range	V <sub>CC</sub> opg		4.8 to 5.2	V

- Any and all SANYO products described or contained herein do not have specifications that can handle applications that require extremely high levels of reliability, such as life-support systems, aircraft's control systems, or other applications whose failure can be reasonably expected to result in serious physical and/or material damage. Consult with your SANYO representative nearest you before using any SANYO products described or contained herein in such applications.
- SANYO assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all SANYO products described or contained herein.

SANYO Electric Co., Ltd. Semiconductor Business Headquarters TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

## Operating Characteristics at Ta = 25°C, $V_{CC}$ = 5V

Parameter	Symbol	Input	ut Output	Conditions		Ratings		Unit
	ey	mpar			min	typ	max	0
[REC mode Y]		-	-					
Current drain	I <sub>CCS</sub>			Influx current measured at pin 41 in power save mode	20	22	24	mA
(POWER SAVE MODE)								
Current drain	ICCR			Sum of influx current at pins 36, 41, 47, 76 measured;	130	145	160	mA
(REC)				5V: pins 36, 41, 47; 7V: pin 76				
EE output level 1	V <sub>EE</sub> 1	T28A	T38	T38 output level measured with V <sub>IN</sub> = 1.0 Vp-p video signal (PAL)	2.0	2.1	2.2	Vp-р
EE output level 2	V <sub>EE</sub> 2	T28A	T38	T38 output level measured with V <sub>IN</sub> = 1.0 Vp-p video signal (NTSC)	2.0	2.1	2.2	Vp-р
AGC characteristics 1	AGC1	T28A	T38	Ratio of V <sub>EE</sub> and T38 output level with V <sub>IN</sub> = 2.0 Vp-p video signal	0	0.6	1.2	dB
AGC characteristics 2	AGC2	T28A	T38	Ratio of V <sub>EE</sub> and T38 output level with V <sub>IN</sub> = 0.5 Vp-p video signal	-1.2	-0.2	0	dB
AGC characteristics 3	AGC3	T28A	T38	T38 SYNC level measured with V <sub>IN</sub> = 700 mVp-pLUMI, 600 mVp-p SYNC	550	650	750	mVp-p
AGC characteristics 4	AGC4	T28A	T38	T38 SYNC level measured with   V <sub>IN</sub> = 700 mVp-pLUMI, 150 mVp-p SYNC	370	420	470	mVp-p
Suna congration output loug	V	T28A	T37	T37 output pulse crest value measured with	4.0	4.2	A A	1/2 -
Sync separation output level	V <sub>SYR</sub>	128A	137	$V_{IN} = 1.0 V_{P}$ -p video signal	4.0	4.2	4.4	Vp-р
Sync separation output pulse width	PW <sub>SYR</sub>	T28A	T37	T37 output pulse width measured with V <sub>IN</sub> = 1.0 Vp-p video signal	4.2	4.5	4.8	μs
Sync separation output	$\Delta T_{SYR}$	T28A	T37	Delay of output SYNC vs. input SYNC measured with	0.6	0.8	1.0	μs
Pre-delay time	<sup>∆</sup> 'SYR	120/1		V <sub>IN</sub> = 1.0 Vp-p video signal	010	0.0		μο
Sync separation	TH <sub>SYR</sub>	T28A	T37	Input level gradually attenuated and measured when		-20	-15	dB
Threshold level				output pulse width becomes larger than $PW_{SYR}$ by 1 $\mu$ s				
Sync tip level	L <sub>VOR</sub>	T28A	T38	Potential measured with $V_{IN} = 1.0$ Vp-p video signal,	700	800	900	mV
Pedestal level	VUR	-		under following conditions.				
White level measurement				T38 sync tip level: L <sub>SYN</sub>				
				Pedestal level: L <sub>PED</sub>				
				White peak level: L <sub>WHT</sub>				
Simulated H insertion level	ΔHDR	T28A	T38	T38 DC level measured with 2.7V DC applied to T33. Using this as $L_{HDR}$ , differential to $L_{PED}$ (see above) is calculated.	-150	0	+150	mV
White insertion level	ΔWHR	T28A	T38	T38 DC level measured with 1.3V DC applied to T33.	-150	0	+150	mV
		120/1		Using this as $L_{WHR}$ , differential to $L_{WHT}$ (see above) is calculated.		Ŭ	1100	
REC YNR operation	R <sub>YNR</sub>	T28A	T25	T25 YNR characteristics measured with Serial				
I	· · YNK		-	$V_{IP} = 1$ Vp-p standard color bar signal 00 OFF	0	0	0	
				input 10 (weak)	1.7	2.7	3.7	dB
				01 (medium)	4.2	5.7	7.2	
				11 (strong)		/		
Y <sub>LPF</sub> frequency response characteristics 1	Y <sub>LPF</sub> 1	T28A	T25	1 MHz response of T25 vs. 500 kHz with V <sub>IN</sub> = 1 Vp-p standard multiburst signal	-0.3	+0.2	+0.7	dB
Y <sub>LPF</sub> frequency response characteristics 2	Y <sub>LPF</sub> 2	T28A	T25	2 MHz response of T25 vs. 500 kHz with V <sub>IN</sub> = 1 Vp-p standard multiburst signal	-1.4	-0.4	+0.6	dB
Y <sub>LPF</sub> frequency response characteristics 3	Y <sub>LPF</sub> 3	T28A	T25	3 MHz response of T25 vs. 500 kHz with V <sub>IN</sub> = 1 Vp-p standard multiburst signal	-4	-2	0	dB
Y <sub>LPF</sub> frequency response	Y <sub>LPF</sub> 4	T28A	T25	4.43 MHz response of T25 vs. 500 kHz with			-25	dB
characteristics 4	.,		T40	V <sub>IN</sub> = 1 Vp-p standard multiburst signal	001	0000	000	
REC-FM output level	V <sub>FM</sub>		T18	T18 output level measured in no-signal input condition	304	320	336	mVp-p
Carrier frequency 1 (PAL)	F <sub>FM</sub> 1		T18	T18 output frequency measured in no-signal input	3.725	3.8	3.875	MHz
Carrier frequency 2 (NTSC)	F <sub>FM</sub> 2			condition	3.325	3.4	3.475	MHz

Parameter	Symbol	Input	Output	Conditions		Ratings		Unit
					min	typ	max	
REC-FM output level	H <sub>MOD</sub>		T18	Secondary distortion measured in no-signal input condition		-40	-35	dB
Secondary distortion	DEV1	T00 A	T40	T18 doviation measured with $V_{\rm c}$ – white 100% 1 Vp p	0.05	1.00	1.05	N41 I-
Deviation 1 (PAL) Deviation 2 (NTSC)	DEV1	T28A T28A	T18 T18	T18 deviation measured with $V_{IN}$ = white 100% 1 Vp-p T18 deviation measured with $V_{IN}$ = white 100% 1 Vp-p	0.95 0.95	1.00 1.00	1.05 1.05	MHz
FM modulator linearity		T26A	T18	Output frequency set to f2.85 with 2.85V DC applied to	-2	0		1011 12 %
Fin modulator imeanty	LMOD	120	110	T26	-2	0	+2	70
1/2f <sub>H</sub> carrier shift	CS		T18	Output frequency shift	6.5	7.8	9.1	kHz
Emphasis gain	G <sub>EMP</sub> 24	T26A	T24	Level difference of T26A and T37 measured with	-0.75	-0.25	+0.25	dB
	G <sub>EMP</sub> 37		T37	V <sub>IN</sub> = 500 mVp-p, 10 kHz sine wave input				
Detail	G <sub>ENH</sub> 1	T26A	T24	Level difference of T26A and T37 measured with	0.1	0.6	1.1	dB
enhancer characteristics 1				V <sub>IN</sub> = 158 mVp-p, 2 MHz sine wave input Differential with G <sub>EMP</sub> 24				
Detail	G <sub>ENH</sub> 2	T26A	T24	Level difference of T26A and T24 measured with	1.3	2.3	3.3	dB
enhancer characteristics 2	LINIT	-		V <sub>IN</sub> = 50 mVp-p, 2 MHz sine wave input	_	_		
				Differential with $G_{EMP}^{24}$				
Detail	G <sub>ENH</sub> 3	T26A	T24	Level difference of T26A and T24 measured with	1.8	3.3	4.8	dB
enhancer characteristics 3				V <sub>IN</sub> = 15.8 mVp-p, 2 MHz sine wave input				
				Differential with G <sub>EMP</sub> 24				
Nonlinear	G <sub>NLEMP</sub> 1	T26A	T24	Level difference of T26A and T24 measured with	0.3	1.2	2.1	dB
emphasis characteristics 1				V <sub>IN</sub> = 500 mVp-p, 2 MHz sine wave input				
				Differential with G <sub>EMP</sub> 24				
Nonlinear	G <sub>NLEMP</sub> 2	T26A	T24	Level difference of T26A and T24 measured with	2.5	3.8	5.0	dB
emphasis characteristics 2				V <sub>IN</sub> = 158 mVp-p, 2 MHz sine wave input				
				Differential with G <sub>EMP</sub> 24				
Nonlinear	G <sub>NLEMP</sub> 3	T26A	T24	Level difference of T26A and T24 measured Serial 1	6.5	8.0	9.5	
emphasis characteristics 3				with $V_{IN} = 50 \text{ mVp-p}$ , 2 MHz sine wave input 2	4.5	6.0	7.5	dB
				Differential with G <sub>EMP</sub> 24 3	2.5	4.0	5.5	uВ
				4	0	0	0	
Main linear	G <sub>ME</sub> 1	T26A	T37	Level difference of T26A and T37 measured with	10.5	11.0	11.5	dB
emphasis characteristics 1				V <sub>IN</sub> = 50 mVp-p, 500 kHz sine wave input				
				Differential with G <sub>EMP</sub> 37				
Main linear	G <sub>ME</sub> 2	T26A	T37	Level difference of T26A and T37 measured with	12.5	13.0	13.5	dB
emphasis characteristics 2				V <sub>IN</sub> = 50 mVp-p, 2 MHz sine wave input Differential with G <sub>EMP</sub> 37				
White clip level	L <sub>WC</sub>	T28A	T37	White clip level at T37 measured with CTL 1	185	195	205	C/
				V <sub>IN</sub> = white 100% 1.0 Vp-p 2	176	185	194	%
Dark clip level	L <sub>DC</sub>	T28A	T37	Dark clip level at T37 measured with CTL 1	-57.5	-52.5	-47.5	0/
				V <sub>IN</sub> = white 100% 1.0 Vp-p 2	-52.0	-47.0	-42.0	%
Video output linearity	LINY	T28A	T38	T38 stair levels measured with video signal 1.0Vp-p	-0.5	0	+0.5	dB
				(linearity unit, 5 stairs) input. Stair linearity determined by				
				arithmetic processing.				<u>.</u>
[PB mode Y]								
Current drain PB	I <sub>CCP</sub>			5V: pins 36, 41, 47; 7V: pin 76	153	170	187	mA
				Sum of influx current at pins 36, 41, 47, 76 measured				
Dropout compensation time	T <sub>DOC</sub>	T15	T38	T20: 4 MHz, 300 mVp-p sine wave	10.5	12.5	14.5	Н
		T26A		T26A: revert time for T38 output from when 0.5 Vp-p video				
	-			signal T15 input is set to 0				
DOC characteristics	G <sub>DOC</sub>	T15	T38	T15: 4 MHz, 300 mVp-p sine wave	-1.5	0	+1.5	dB
		T26A		T26A: 0.5Vp-p video signal				
				Input/output response 5H after setting T15 input to 0				
PB Y level	V-Y <sub>OUT</sub>	T15	T38	Playback Y level with DEV = 1.0 MHz FM signal input	2.00	2.10	2.20	Vp-p
Self-recording/playback Y level	R/P- <sub>OUT</sub>		T38	Playback Y level for self-recording/playback	1.93	2.10	2.27	Vp-p

Parameter	Symbol	Input	Output	Conditions	min	Ratings typ	max	Unit
FM demodulator linearity	lacu	T15	T25		-3.5	0	+3.5	%
The demodulator intearity	LDEM	115	125	$L_{\text{DEM}} = \frac{V_{\text{DEM}}^4 - (V_{\text{DEM}}^2 + V_{\text{DEM}}^6)/2}{V_{\text{DEM}}^6 - V_{\text{DEM}}^2} \times 100$	-5.5	U	+3.5	70
Carrier leak	CL	T15	T25	V <sub>IN</sub> = 300 mVp-p f = 4 MHz Ratio of T25 4 MHz component and SDEM			-35	dB
Playback YNR characteristics	P <sub>YNR</sub>	T26A	T38	Ratio of 3 fH component and				
				32.5 fH component with Serial 00 OFF	0	0	0	
				$V_{IN}$ = white 50% + CW 10 (weak)	-3.7	-3.2	-2.7	dB
				(15.8 mVp-p) 01 (medium)	-9.2	-8.2	-7.2	
				11 (strong)	-13.3	-11.8	-10.3	
Nonlinear	G <sub>NLDE</sub> 1	T26A	T38	Input/output response measured with	-3.5	-2.5	-1.5	dB
deemphasis characteristics 1				V <sub>IN</sub> = white 50% video + sine wave f = 2 MHz 158 mVp-p				
Nonlinear	G <sub>NLDE</sub> 2	T26A	T38	f = 2 MHz, 50 mVp-p CTL 1	4.5	6.0	7.5	
deemphasis characteristics 2				2	2.5	4.0	5.5	
				3	0.5	2.0	3.5	dB
				4	0	0	0	
Double noise	G <sub>WNC</sub> 1	T26A	T38	f = 1.2 MHz, 158 mVp-p, pin 69 open	-3	-2	-1	dB
canceler characteristics 1	- WINC -			Gr2 bit 8/7 = "10", Gr5 bit 1 = "0"				
Double noise	G <sub>WNC</sub> 2	T26A	T38	f = 1.2 MHz, 50 mVp-p, pin 69 open	-7.5	-6.0	-4.5	dB
canceler characteristics 2	into			Gr2 bit 8/7 = "10", Gr5 bit 1 = "0"				
Double noise	G <sub>WNC</sub> 3	T26A	T38	f = 1.2 MHz, 15.8 mVp-p, pin 69 open	-14	-12	-10	dB
canceler characteristics 3	- WINC -			Gr2 bit 8/7 = "10", Gr5 bit 1 = "0"			-	
Double noise	G <sub>WNC</sub> 4	T26A	T38	f = 2.5 MHz, 15.8 mVp-p, pin 69 open	-6	-5	-4	dB
canceler characteristics 4	- WINC -			Gr2 bit 8/7 = "10", Gr5 bit 1 = "0"	Ũ	Ũ		u.D
Double noise	G <sub>WNC</sub> 5	T26A	T38	f = 2.5 MHz, 15.8 mVp-p, pin 69 open		-8.0	-6.5	dB
canceler characteristics 5	- WINC-	120/1	100	Gr2 bit 8/7 = "10", Gr5 bit 1 = "0"	-9.5	0.0	0.0	чъ
PIC-CTL hard response	G <sub>PH</sub> 1	T26A	T38	f = 1 MHz, 158 mVp-p, Gr5 bit 6/5/4 = "1/0/0"		3.5	4.5	dB
characteristics 1	OPHI	1207	130			5.5	4.5	uр
PIC-CTL hard response	G <sub>PH</sub> 2	T26A	T38	f = 2 MHz, 158 mVp-p, Gr5 bit 6/5/4 = "1/0/0"	6	7	8	dB
characteristics 2	Op <sub>H</sub> 2	1207	130	1 = 2  MHz, 136  HVp-p, G15  bit  6/3/4 = 1/0/0		'	0	uр
	62	T26A	T38	f = 1  MHz = 158  m/m  m  Cre bit  6/6/4 = 0/0/0"	-4.5	-3.5	-2.5	dB
PIC-CTL soft response characteristics 1	G <sub>PH</sub> 3	120A	130	f = 1 MHz, 158 mVp-p, Gr5 bit 6/5/4 = "0/0/0"	-4.5	-3.5	-2.5	uБ
	G 4	T26A	T38	f = 2 MHz, 158 mVp-p, Gr5 bit 6/5/4 = "0/0/0"	-8	-7	-6	dB
PIC-CTL soft response	G <sub>PH</sub> 4	120A	130	1 = 2  MHz, 138 1179-p, 015 bit 6/3/4 = 0/0/0	-0	-7	-0	uБ
characteristics 2	1	<b>T</b> 004	Too	T20 video output output $(l_{1})$ podeoto $(l_{1})$ vubito	700			
Sync tip level	LVOR	T26A	T38	T38 video output sync tip ( $L_{SYN}$ ), pedestal ( $L_{PED}$ ), white level ( $L_{WHT}$ ) potential measured with $V_{IN}$ = white 100%	700	800	900	mV
Pedestal level				0.5  Vp-p				
White level measurement								
Simulated V insertion level	ΔVDP	T26A	T38	DC voltage at T38 is measured when 5V is applied to	-50	0	+50	mV
				T33. Taking this as $L_{VDP}$ , differential with $L_{SYN}$ above is calculated.				
Simulated H insertion level	ΔHDP	T26A	T38	DC voltage at T38 is measured when 2.7V is applied to	-100	0	+100	mV
				T33. Taking this as $L_{HDP}$ , differential with $L_{PED}$ above is calculated.				
White insertion level	∆WHP	T26A	T38	DC voltage at T38 is measured when 1.3V is applied to	-100	0	+100	mV
				T33. Taking this as $L_{WHP}$ , differential with $L_{WHT}$ above is				
				calculated.				
Sync separation output level	V <sub>SYP</sub>	T26A	T37	Pin 37 output pulse crest value measured with	4.0	4.2	4.4	Vp-p
				V <sub>IN</sub> = 0.5 Vp-p video signal				
Sync separation output pulse	P <sub>WSYP</sub>	T26A	T37	Pin 37 output pulse width measured with	4.35	4.65	4.95	μs
width				V <sub>IN</sub> = 0.5 Vp-p video signal				
Sync separation output	$\Delta T_{SYP}$	T26A	T37	Delay of output SYNC vs. input SYNC measured with	0.7	0.9	1.10	μs
Pre-delay time				V <sub>IN</sub> = 0.5 Vp-p video signal				
4V regulator	V <sub>REG</sub>		T31	T31 DC level measured	3.8	4.0	4.2	V
FMAGC output level	VFAGC	T15	T17	Pin 17 signal amplitude measured with	325	350	375	mVp-p
				V <sub>IN</sub> = 150, 300, 600 mVp-p 4 MHz CW				

Parameter	Symbol	Input	Output	Conditions		Ratings		Unit
	-,				min	typ	max	
[REC mode chroma]			1		1			
REC chroma	V <sub>OR</sub> -14	T28A	T14A	T14A burst level measured with $V_{IN} = 1 V_{P-P}$ CTL 0	215	225	235	mVp-p
low-range converter output level				standard color bar signal 1	180	190	200	
REC chroma/FM ratio	C/FM	T28A	T14A	Down-converted chroma level/FM level ratio with 100%	-3.7	-3.0	-2.3	dB
			T18	chroma input				
				(R <sub>L</sub> : 5.1 kΩ)				
Burst emphasis amount	G <sub>BE</sub>	T28A	T14A	SP/EP and LP T14A burst level ratio with $V_{IN} = 1Vp-p$	5.5	6.0	6.5	dB
(NTSC mode)				standard color bar signal				
VXO oscillation level	V <sub>VXO-RP</sub>	T28A	T56	T56 output amplitude measured with FET probe at	300	500	700	mVp-p
(PAL mode)				V <sub>IN</sub> = 1 Vp-p standard color bar signal				
VXO oscillation level	V <sub>VXO-RN</sub>	T28A	T56	T56 output amplitude measured with FET probe at	300	500	700	mVp-p
(NTSC mode)				V <sub>IN</sub> = 1 Vp-p standard color bar signal				
REC ACC characteristics 1	ACC <sub>R</sub> 1	T28A	T14A	T14A burst level measured and compared to VOR-14		+0.2	+0.5	dB
				with $V_{IN}$ = 1 Vp-p standard color bar signal and chroma				
				signal only boosted by +6 dB				
REC ACC characteristics 2	ACC <sub>R</sub> 2	T28A	T14A	T14A burst level measured and compared to VOR-14	-0.5	-0.1		dB
				with $V_{IN}$ = 1 Vp-p standard color bar signal and chroma				
				signal only boosted by –6 dB				
REC ACC	V <sub>ACCK-ON</sub>	T28A	T14A	T14A input burst level measured when output goes off		-26		dB
Killer input level				and compared to standard input level, with $V_{IN}$ = 1 Vp-p				
				standard color bar signal and chroma signal being				
				gradually attenuated.				
REC ACC	VOACCK	T28A	T14A	T14A output level measured with spectrum analyzer and		-60	-50	dB
Killer output level				compared to VOR-14, in killer condition as described				
				above.				
REC ACC	V <sub>ACCK-OFF</sub>	T28A	T14A	From killer condition as described above, T14A input		-20		dB
Demodulator input level				burst level is measured when output goes on with input				
				chroma level being gradually increased. This is				
				compared to standard input level.				
REC APC	$\Delta f_{APC} 1$	T28A	T14A	Input signal: 50% white signal superimposed with	350			Hz
Pull-in range 1				4.4336 MHz 300 mVp-p CW. After checking that T14A				
				output is on, CW frequency is raised until T14A output				
				goes off. Frequency then is gradually reduced.				
				CW frequency when T14A output goes on: f1				
REC APC	$\Delta f_{APC}^2$	T28A	T14A	Same as above, CW frequency is lowered until T14A			-350	Hz
Pull-in range 2	AI U	-		output goes off. Then frequency is gradually raised.				
				CW frequency when T14A output goes on: f2				
REC AFC	$\Delta f_{AFC}$ 1	T28A	T51	300 mVp-p, 15.6 kHz pulse train with 5 μs pulse width	+1			kHz
Pull-in range 1	AIO			is input. Pulse train frequency is raised until T51 output				
				waveform is impaired. Then frequency is lowered.				
				Pulse train frequency when T51 waveform becomes				
REC AFC	∆f <sub>AFC</sub> 2	T28A	T51	normal: f1 Same as above, pulse train frequency is lowered until T51			-1	kHz
	<sup>⊥</sup> 'AFC <sup>∠</sup>	ı∠ŏA	101	Same as above, pulse train frequency is lowered until T51			-1	KHZ
Pull-in range 2				output waveform is impaired. Then frequency is raised.				
				Pulse train frequency when T51 waveform becomes				
		<b>T</b>	<b>T</b>	normal: f2				
BGP delay time	<sup>t</sup> D	T28	T37	T37 and T60 waveforms are observed with standard color	3.1	3.4	3.7	μs
			T60	bar input to T28A тзт				
BGP width	t <sub>W</sub>				4.7	4.9	5.1	μs
				A10276				

Parameter	Symbol	Input	Output	Conditions		Ratings		Unit
	-		Output		min	typ	max	onit
2 fsc output level	V2 <sub>fsc</sub>	T28A	T58	T58 level measured in no-signal input condition	360	400	440	mVp-p
2 fsc duty	D2 <sub>fsc</sub>	T28A	T58	T58 duty measured in no-signal input condition	40	50	60	%
[PB mode chroma chroma]			-					
PB chroma video	P <sub>Vop-38</sub>	T15A	T38	From T15A in PB and SP mode, a chroma signal	490	580	670	mVp-p
Output level		T26A		down-converted from the PAL chroma noise test signal				
(PAL mode)				(SP mode, burst 80 mVp-p) and mixed with a 4 MHz				
				300 mVp-p sine wave is input.				
				From T26A, a 50% white signal is input.				
				Burst level is measured at T38.				
PB chroma video	N <sub>Vop-38</sub>	T15A	T38	From T15A in PB and SP mode, a chroma signal	490	580	670	mVp-p
Output level		T26A		down-converted from the NTSC chroma noise test signal				
(NTSC mode)				(SP mode, burst 160 mVp-p) and mixed with a 4 MHz				
				300 mVp-p sine wave is input.				
				From T26A, a 50% white signal is input.				
				Burst level is measured at T38.				
PB chroma	Vop-46	T15A		Under same conditions as for P <sub>Vop-38</sub> , T46 burst level is	170	200	230	mVp-p
Pin 46 output level		T26A	T46	measured.				
PB ACC characteristics 1	ACC <sub>P</sub> 1	T15A		Under same conditions as for P <sub>Vop-38</sub> , input chroma		0.5	0.8	dB
		T26A	T46	level is raised by +6 dB. T46 burst level is measured				
				and compared to P <sub>Vop-38</sub> .				
PB ACC characteristics 2	ACC <sub>P</sub> 2	T15A	T46	Under same conditions as for P <sub>Vop-38</sub> , input chroma	-0.5	-0.2		dB
		T26A		level is raised by -6 dB. T46 burst level is measured				
				and compared to P <sub>Vop-38</sub> .				
PB killer input level	V <sub>ACK-P</sub>	T15A	T46	Under same conditions as for P <sub>Vop-38</sub> , input chroma			-25	dB
		T26A		level is attenuated and input burst level is measured				
				when chroma output at T46 goes off (compared to				
				standard input 80 mVp-p)				
Chroma output level in PPB killer	V <sub>OACK-P</sub>	T15A	T38	T38 measured with spectrum analyzer and compared to		-44	-40	dB
condition		T26A		P <sub>Vop-38</sub> in killer condition as described above.				
PB main converter carrier leak	C <sub>LP</sub>	T15A	T38	Under same conditions as for P <sub>Vop-38</sub> , T38 is measured		-40	-33	dB
		T26A		with spectrum analyzer and 4.43 MHz component is				%
				compared to 5.06 MHz component.				
Burst deemphasis	G <sub>BD</sub>	T15A	T46	629 kHz, 160 mVp-p CW is mixed with 4 MHz, 300 mVp-p	-5.75	-5.50	-5.25	dB
(PAL mode)		T26A		CW and input to T15A.				
				50% white signal is input from T26A.				
				Output level during T46 burst interval and during other				
				times is compared.				
PB XO output level	V <sub>XO-PP</sub>		T59	T59 output level measured with FET probe in PB mode	300	500	700	mVp-p
(NTSC mode)								
PB XO oscillator frequency	$\Delta f_{XOP}$		T59	T59 frequency measured in PB mode: f	-9	0	+9	Hz
deviation (PAL mode)	-							
NTSC -> PAL conversion	V <sub>BNAP</sub>	T15A		From T15A, down-converted chroma noise test signal	-1	0	+1	dB
V axis burst level		T26A	T38	mixed with 4 MHz, 300 mVp-p CW is input.				
				From T26A, 50% white signal is input.				
				-45° burst level at T38 is measured and compared to				
				P <sub>Vop-38</sub>				
NTSC -> PAL conversion	∆B-NAP	T15A		Under same conditions as above, +45° burst level is	-2	0	+2	dB

Parameter	Symbol	Input	Output	Conditions		Ratings		Unit
i didificici	Symbol	mput	Output	Conditions	min	typ	max	Onit
NTSC -> PAL conversion chroma	P-NAP	T15A		4 MHz, 300 mVp-p CW and 100% chroma signal phase	160	180	200	deg
phase		T26A	T38	shifted by $-90^{\circ}$ from burst are mixed and input to T15A.				
				50% white signal is input to T26A.				
				Chroma phase when pin 67 is 0V is measured and taken				
				as $\theta 1$ . Chroma phase when pin 67 is 5V is measured and				
				taken as $\theta 2$ . P-NAP = $\theta 1 - \theta 2$				
[REC mode/EQ]								
REC EQ characteristics 1	G <sub>REQ1</sub>	T23	T18	Input/output response measured with $V_{IN} = 500 \text{ mVp-p}$ , f = 4 MHz	-3	-2	-1	dB
REC EQ secondary distortion	H <sub>REQ</sub>	T23	T18	Under same conditions as above, secondary harmonics are measured.		-40	-35	dB
REC EQ characteristics 2	G <sub>REQ2</sub>	T23	T18	Input/output response measured with V <sub>IN</sub> = 500 mVp-p, f = 627 kHz			-20	dB
REC EQ characteristics 3	G <sub>REQ3</sub>	T23	T18	Input/output response measured with V <sub>IN</sub> = 500 mVp-p, f = 1.07 MHz			-20	dB
REC EQ characteristics 4	G <sub>REQ4</sub>	T23	T18	Input/output response measured with $V_{IN} = 500 \text{ mVp-p}$ , f = 4.5 MHz	-3.3	-2.3	-1.3	dB
REC EQ characteristics 5	G <sub>REQ5</sub>	T23	T18	Input/output response measured with $V_{IN} = 500 \text{ mVp-p}$ , f = 2.0 MHz	-1	0	+1	dB
[PB mode/EQ]					E	E		
PB EQ characteristics 1	G <sub>PEQ1</sub>	T15A	T17	Input/output response measured with $V_{IN} = 400 \text{ mVp-p}$ , f = 4 MHz	-2.5	-1.1	0.0	dB
PB EQ secondary distortion	H <sub>PEQ</sub>	T15A	T17	Under same conditions as above, secondary harmonics are measured.		-40	-30	dB
PB EQ characteristics 2	G <sub>PEQ2</sub>	T15A	T17	Input/output response measured with V <sub>IN</sub> = 400 mVp-p, f = 627 kHz			-30	dB
PB EQ characteristics 3	G <sub>PEQ3</sub>	T15A	T17	High-range trap frequency and gain measured with		7.8		MHz
	. 200			V <sub>IN</sub> = 400 mVp-p			-25	dB
PB EQ characteristics 4	G <sub>PEQ4</sub>	T15A	T17	Input/output response measured with $V_{IN}$ = 400 mVp-p, f = 1.07 MHz			-30	dB
PB EQ characteristics 5	G <sub>PEQ5</sub>	T15A	T17	Input/output response measured with $V_{IN}$ = 400 mVp-p, f = 4.5 MHz	-1	0	+1	dB
PB EQ characteristics 6	G <sub>PEQ6</sub>	T15A	T17	Input/output response measured with V <sub>IN</sub> = 400 mVp-p, f = 2.0 MHz	-11	-10	-9	dB

Parameter	Symbol	Input	Output	Conditions		Ratings		Unit
i didificici	Symbol	input	Output	Conditions	min	typ	max	Unit
[REC/PB mode]			-					
LINE AMP voltage gain (PB)	V <sub>GLP</sub>	T11	T77	$V_{IN} = -30 \text{ dBV}$	23.0	23.5	24.0	dB
LINE AMP voltage gain	V <sub>GLR</sub>	T71	T77	$V_{IN} = -30 \text{ dBV}$	23.0	23.5	24.0	dB
(A1, A2, A3)		T73						
		T75						
LINE AMP distortion (PB)	THDL	T11	T77	$V_{IN} = -30 \text{ dBV}$		0.1	0.4	%
LINE AMP	V <sub>NOL</sub>	—	T77	Rg = 1 k $\Omega$ , DIN audio filter		-74.0	-70.5	dBV
Output noise voltage (PB)								
LINE AMP	V <sub>OML</sub>	T11	T77	Output voltage for 1% THD	1.0	1.2		Vrms
Maximum output voltage (PB)								
Output voltage with	V <sub>OA</sub>	T73	T77	–28 dBV input to T73	-7	-6	-5	dBV
LINE AMP ALC								
LINE AMP ALC effect	ALC	T73	T77	T73 input level reduced from –28 dBV to –8 dBV	0	1	3	dB
LINE AMP ALC distortion	THDA	T73	T77	–28 dBV input to T73		0.1	0.5	%
MUTE attenuation	M <sub>PB</sub>	T11						
	M <sub>A</sub> 1	T71	T77		80	90		dB
	M <sub>A</sub> 2	T73	177		80	90		αв
	M <sub>A</sub> 3	T75						
EQ AMP open circuit voltage gain	VG <sub>OE</sub>	Τ7	T10	V <sub>IN</sub> =66 dBV	58	64		dB
EQ AMP input converted noise	V <sub>NIE</sub>	—	T10	Rg = 620Ω, DIN audio filter		1.0	1.8	μVrms
voltage								
REC AMP voltage gain	VG <sub>R</sub>	T79	T1	$V_{IN} = -20 \text{ dBV}$	14.0	14.5	15.0	dB
REC AMP distortion	THD <sub>R</sub>	T79	T1	$V_{IN} = -20 \text{ dBV}$		0.1	0.4	%
REC AMP	VOMR	T79	T1	Output voltage for 1% THD	1.0	1.2		Vrms
Maximum output voltage								
REC BIAS voltage	V <sub>BIAS</sub>	-	Т3	Head impedances must be in the middle of the range.	297	330	363	mVrms
REC BIAS control voltage	V <sub>CTL</sub>	—	T5	No-signal condition.	1.66	1.85	2.03	V

### **Pin Function**

Pin number	Pin name	Standard DC voltage	Signal waveform	Equivalent circuit
1	A-REC-OUT	2.3V	СW, 1.4 Vp-p	Power ON/OFF VCC
2	A-GND	0V		
3	A-AUTO-BIAS-IN	2.3V	REC MODE CW 1.4 Vp-p 70 kHz, 1.0 Vp-p PB MODE DC 2.3V	(3) → √ 500Ω 75pF ≤ 19kΩ
4	A-EQ-SW2	2.3V	REC MODE CW, 1.4 Vp-p 70 kHz, 1.1 Vp-p PB, EP MODE DC 2.3V PB, EP MODE CW 1.4 mVp-p	(4) REC LP/EP PB EP (A) A10430
5	A-AUTO-BIAS-IN	REC ADAPTIVE	DC (1.7 to 2.0V)	V <sub>CC</sub>
		PB VCC	DC 5V	27kΩ ₹ \$200Ω 3.6kΩ ₹ 500Ω 20pF
6	A-AUTO-BIAS-B	REC 0.7V	DC 0.7V	
Ū		PB 0V	DC 0V	7777 A10431
7	A-EQ-IN	2.3V	REC DC 2.3V	∧ <sup>V</sup> REF
,			PB CW, 1.4 mVp-p	
8	A-EQ-NFB	2.3V	REC DC 2.3V	
Ŭ			PB CW, 1 mVp-p	A10432

Pin number	Pin name	Standard DC voltage	Signal waveform	Equivalent circuit
9	A-EQ-SW1	2.3V	REC DC 2.3V	−−−− V <sub>CC</sub> ≶200Ω SL/LP ⊕
			РВ СW, 2.2 Vp-p	
10	A-EQ-OUT	2.3V	REC DC 2.3V	
			PB CW, 2.2 Vp-p	A10433
11	A-LINE-PB-IN	2.3V	REC HALF RECTIFICATION 70 kHz	120kΩ 120kΩ 500Ω 11 500Ω
			PB CW 95 mVp-p	
12	AGC-TC1	REC 2.3V	DC	$\begin{array}{c} \begin{array}{c} \begin{array}{c} \\ \\ \end{array} \\ \end{array} \\ \begin{array}{c} \\ \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \\ \end{array} \\ $
12	Carrier Leak Balancer	PB 2.3V	DC	Ω 1kΩ 1kΩ 500Ω 500Ω 1kΩ 500Ω 50 50 500 500 500 500 50 500 500 50 50 500 500 500 50
13	ACC-FILT	REC 1.8V	DC	13 2kΩ 1kΩ 2kΩ 1kΩ 1kΩ
		PB 1.8V		200μA Α11108
		REC 2.8V	200 mVp-p 627 kHz 200mVp-p 627kHz	200Ω (14)
14 REC-	REC-C-OUT	PB 0V	A11109	650µA(REC)

Pin number	Pin name	Standard DC voltage	Signal waveform	Equivalent circuit
15	PB Y-FM/C-IN	REC 4.2V		200Ω 200Ω 500Ω 10kΩ 7/7
	C-IN (FROM Pre)	PB 3.2V	A10436	100μA Δ10437
16	PM (R03)	REC 1.6V	DC	
	16 PM (R03)	PB 1.6V		$\begin{array}{c} & & \\ & & \\ & & \\ \hline \\ \hline \\ \hline \\ \hline \\ \hline \\ \hline$
17	17 PB-EQ-OUT	REC 2.6V	FM 730 mVp-p	
		PB 2.6V	PB Y-FM 340 mVp-p	180μA(PB) A10440
18	REC-Y FM-OUT	REC 1.9V	PEC Y-FM 730 mVp-p	₹200Ω ↓
10		PB 1.9V	A10441	(18) ₹30 kΩ 777 A10442
		REC 4.2V		
19	REC-H-OUT	REC PAUSE 2.5V	DC	
		EE or PB 0V		50kΩ 50kΩ 50kΩ 50kΩ 50kΩ 50kΩ 50kΩ 50kΩ 50kΩ 50kΩ 50kΩ 50kΩ 50kΩ 50kΩ 50kΩ

Pin number	Pin name	Standard DC voltage	Signal waveform	Equivalent circuit
		REC 4.7V	FM 700 mVp-p	
20	PB Y-FM-IN (FROM EQ)	PB 2.5V	PB-Y•FM 320 mVp-p	3.25V 100µA(PB) 3.000 5k0 5k0 5k0 5k0 5k0 5k0 5k0
21	TRICK-HOUT	TRICK MODE WITHOUT TRICK MODE	DC 4.5V OV	50kΩ 50kΩ 50kΩ 50kΩ 50kΩ 50kΩ 50kΩ 50kΩ
22	AGC-TC2	REC 1.6V	DC	
		PB 1.7V		(22) REC-ON
		REC 0V	DC	
23	PB-EMITTER -PEAKING	PB 2.6V	340 mVp-p	2.33kQ 23 (25) A10449
24	MAIN-EMPH FILTER	REC 2.2V	500 mVp-p	$\begin{array}{c} \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} $
		PB 0V	CC	μΑ(REC) 2.7kΩ (24) Α10451

Pin number	Pin name	Standard DC voltage	Signal waveform	Equivalent circuit
25	REC-Y	REC 1.6V	500mVp-p	
23	MAIN-DE-EMPH. OUT	PB 1.2V	500mVp-p	→→ 2.5kΩ 2.5kΩ 4.10454
26	CLAMP-IN	REC 2.9V	500mVp-p	\$30kΩ \$ \$15kΩ \$200Ω 15kΩ ↓ ↓
20		PB 2.8V	500mVp-p	20kΩ 26 500Ω A A 10457
27	Y-GND	0V		
28	VIDEO-IN1	REC VSYNC 1.7V	1.0Vp-p	
		PB 0V	DC	2.3V 22µA 24µA 24µA A10459
29	FBC-FILT (Feed Back Clamp)	REC 2.6V	DC	7.5kΩ 500Ω 200Ω 500Ω 500Ω 500Ω 500Ω
		PB 2.6V		₹20kΩ 130μA A10460
30	VIDEO-IN2	REC VSYNC 1.7V	1.0Vp-p	30 200Ω 50KΩ 10KΩ 2.3VT
30		PB 0V		2.3VT

Pin number	Pin name	Standard DC voltage	Signal waveform	Equivalent circuit
31	REG	REC 4.1V	DC	31 ξ23kΩ ξ10kΩ
		REC 4.1V		A10463
32	VIDEO-IN3	REC VSYNC 1.7V	1.0Vp-p	32 2000 50kΩ 10kΩ
		PB 0V		2.3VT 2.2µA 2.4µA A10465
33	QV/QH-INS CHARA-INS		0 to 0.8V : Through 1.0 to 2.2V : Character Ins. 2.5 to 3.2V : QV Ins. 3.8 to V <sub>CC</sub> V : QV Ins.	50μA 33 1kΩ 1kΩ 50μA 1kΩ 10kΩ 10kΩ 10kΩ 10kΩ 10kΩ 10kΩ 10kΩ 10kΩ 10kΩ 10kΩ 10kΩ 10kΩ
34	VPS-OUT	REC VSYNC 1.7V PB 0V	1.0Vp-p	₹200Ω 
				470μΑ
35	VIDEO-AGC-IN	REC 2.3V	1.0Vp-p	4V 35) 7.5kΩ 7.5kΩ 7.5kΩ
		PB 3.1V		17kΩ 740μA A10470
36	Y-V <sub>CC</sub>	5V	DC	

Pin number	Pin name	Standard DC voltage	Signal waveform	Equivalent circuit
37	SYNC-OUT		4.2V 0V	20kΩ 500Ω 20kΩ 500Ω 10pF 37 50kΩ 410472
38	VIDEO-OUT	VSYNC 0.8V	2.1Vp-p	1000 1000 1000 1000 1000 1000 15.5k0 15.5k0 15.5k0 11k0 38 26k0 1.8µA A10474
39	VCA-FILT	REC 3.1V PB 3.1V	DC	1K0 \$1K0 1K0 \$1K0 5000 9K0 9K0 200µA A10475
40	VCA-IN (CLAMP)	REC 2.8V PB 2.8V	350mVp-p 	1kΩ 15kΩ 200Ω 40 100μA 410478
41	VCC2	5V	DC	
42	Y-CCD-DRIVE	REC 1.8V	350mVp-p	₹350Ω
		PB 1.8V	370mVp-p	42 370μΑ Α10481

Pin number	Pin name	Standard DC voltage	Signal waveform	Equivalent circuit
43	NTSC-H OUT	NTSC MODE 4.2V WITHOUT NTSC MODE 0V	Σ	200Ω 4(3) 50kΩ 50kΩ 410482
44	PQ 2 (RO2)	REC 1.7V	DC	
		PB 1.8V		44 410483
45	PB CHROMA IN	REC 1.8V	210mVp-p ↓	₹4kΩ 1kΩ ₹65kΩ
		PB 1.9V	A10484	45 ₹35kΩ A10485
46	PB CHROMA OUT	REC 0V	210mVp-p ↓	
		PB 2.0V	A10486	46 400µA (PB) 410487
47	C-V <sub>CC</sub>	5V	DC	
48 C-CC	C-CCD-	REC 2.8V	150mVpp ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	
	DRIVE2	PB 2.8V	130mVpp ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	440µA (PB)

Pin number	Pin name	Standard DC voltage	Signal waveform	Equivalent circuit
49	SLD-FILT	REC 4.0V	DC	49 200Ω 200Ω
		PB 4.1V		22kQ\$ \$1kQ \$2kQ \$1kQ \$2kQ \$2kQ \$10491
50	C-CCD-DRIVE 1	REC 2.9V	150mVpp ↓	₹250Ω ▼
		PB 2.9V	130mVpp	50 6440µA #10494
51	AFC/APC-FILT	REC 4.0V	H → 10mVpp A10495	500kΩ≦ 49 200Ω 200Ω 49 49 49 49 49 49 49 49
		PB = 4.0V	Field A10496	22kΩ \$2kΩ \$1kΩ 51 A10497
52	C-CCD-IN	3.2V	140mVpp 	97µA (52) 10kΩ 410499
53	PA STOP-TR-SW	ΟV	DC	P.A.STOP (53) (5)) (5

Pin number	Pin name	Standard DC voltage	Signal waveform	Equivalent circuit
54	REC-APC-FILTER	2.1V	H A10501	$50k\Omega$ $50k\Omega$ $50k\Omega$ $5k\Omega$ $3rd \oplus$ $70k\Omega$ 54 410502
55	VXO/XO-IN	REC 4.0	600mVp-p	
		PB 3.9V	600mVp-p	62µA 90µA 650µA 340µA   (VXO) (VXO) (VXO)
56	VXO/XO-OUT	REC 2.5V	600mVp-p	100Ω \$200Ω \$900Ω \$900Ω \$2kΩ \$100Ω \$00Ω \$2kΩ
	VX0/X0-001	PB 2.5V	500mVp-p	56 900μA 100μA 500μA (XO) (XO) Α10508
57	C-GND	0V	DC	
58	2Fsc/PB-H	REC 1.5V	400mVp-p	5kΩ 5kΩ 200Ω
<sup>56</sup> OUT	OUT	PB 2.8V	400mVp-p	200Ω 58 500Ω 777 777 A10511
59 RL (RO4		REC 1.5V	DC	
		PB 1.5V	DC	59 ξ1kΩ δ1kΩ δ1kΩ δ1kΩ

Pin number	Pin name	Standard DC voltage	Signal waveform	Equivalent circuit	
60	BGP-OUT		SYNC+BGP SYNC 1.4V (TYP) BGP 4.0V or MORE	60 200Ω 50kΩ 5	
61	KILL-FILT	Color 2.0V	C		
		killer 3.0V		1kΩ 1.66kΩ 1.66kΩ 260Ω 225V 61 A10514	
62	ACK/SLD OUT	ACK-OUT MODE	KILLER MODE 4V or MORE COLOR MODE 0V		
		SLD-OUT MODE	200µА 0µА 0µА л1b515	62 Δ10516	
63	SERIAL- CLOCK-IN		3.0V 5V 3.0V 5V 1.6V 0V A10517	50μA 50μA 50μA 25kΩ 25kΩ 63 300Ω 63 300Ω 410518	
64	SERIAL- DATA-IN		3.0V 5V 3.0V 5V 0V A10519	50μA 3V 4 64 300Ω ACK 60kΩ 410520	

Pin number	Pin name	Standard DC voltage	Signal waveform	Equivalent circuit
65	PQ1 (RO1)	REC 1.6V PB 1.6V	ß	1kΩ 1kΩ REG   300Ω 1kΩ 1kΩ   65 1kΩ 1kΩ
66	C-ROTARY -PULSE-IN		0.8V 0	66 1kΩ 1kΩ 1kΩ 1kΩ 410523
67	CSC-PULSE-IN		0.8V 0	67 1kΩ 20kΩ A10525
68	PAL-PULSE	+45° 1V or MORE +45° 1V or LESS		
69	NC-CTL	REC 2.1V PB 2.1V	DC	40kΩ \$ 500Ω 40kΩ \$ 2.2kΩ \$ 500Ω 40kΩ \$ 2.2kΩ \$ 500Ω 23kΩ \$ \$ 7 0
70	A. MUTE- ON/OFF	ΟV	DC MUTE OFF : under 2.7V MUTE ON : over 3.3V	70 10kΩ 45kΩ 45kΩ 45kΩ 45kΩ 45kΩ 45kΩ 45kΩ 45

Pin number	Pin name	Standard DC voltage	Signal waveform	Equivalent circuit
71	A. LINE-IN1	2.3V	REC CW, 95 mVp-p	
		2.01	PB DC 2.3V	С Г Г Г Г Г Г Г Г Г Г Г Г Г Г Г Г Г Г Г
72	A-ALC-DET	OV	REC: ADAPTIVE	Vcc 200Ω≶ –
12	72 A-ALC-DET		PB DC 0V	1500 \$ 2k0 (72) 2k0 10k0 \$ 72 10k0 \$
73 A-LIN	A-LINE-IN2	NE-IN2 2.3V	REC CW, 95 mVp-p	
			PB DC 2.3V	100µA A10531
74	A-V <sub>REF-</sub> FILTER	2.3V	DC	$\begin{array}{c} & & & \\ & & & & \\ & & & \\ & & & \\ & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ &$
75	A. LINE-IN3	2.3V	REC CW, 95 mVp-p	VREF 120kΩ (75)
			PB DC 2.3V	777 100µА А10533
76	A-V <sub>CC</sub>	5V	DC	

Pin number	Pin name	Standard DC voltage	Signal waveform	Equivalent circuit
77	A-LINE-OUT	2.3V	СW, 1.4 Vp-p	Power ON/OFF H VCC (7) γ γ γ γ γ γ γ γ γ γ γ γ γ
78	A-ALC-DET-IN	0V	СW, 0.6 Vp-p	(78)
79	79 A-REC-IN	2.3V	REC CW, 283 mVp-p	VREF 120kΩ (79) 500Ω 100μΑ A10536
		2.07	PB DC 2.3V	
80	80 A-AUDIO- HEAD-SW-OUT	A-AUDIO-	REC DC 5V (SW/OFF)	
		PB 0V	PB DC 0V (SW/ON)	50kΩ → → → → → → → → → → → → → → → → → → →









- Specifications of any and all SANYO products described or contained herein stipulate the performance, characteristics, and functions of the described products in the independent state, and are not guarantees of the performance, characteristics, and functions of the described products as mounted in the customer's products or equipment. To verify symptoms and states that cannot be evaluated in an independent device, the customer should always evaluate and test devices mounted in the customer's products or equipment.
- SANYO Electric Co., Ltd. strives to supply high-quality high-reliability products. However, any and all semiconductor products fail with some probability. It is possible that these probabilistic failures could give rise to accidents or events that could endanger human lives, that could give rise to smoke or fire, or that could cause damage to other property. When designing equipment, adopt safety measures so that these kinds of accidents or events cannot occur. Such measures include but are not limited to protective circuits and error prevention circuits for safe design, redundant design, and structural design.
- In the event that any or all SANYO products(including technical data, services) described or contained herein are controlled under any of applicable local export control laws and regulations, such products must not be exported without obtaining the export license from the authorities concerned in accordance with the above law.
- No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or any information storage or retrieval system, or otherwise, without the prior written permission of SANYO Electric Co., Ltd.
- Any and all information described or contained herein are subject to change without notice due to product/technology improvement, etc. When designing equipment, refer to the "Delivery Specification" for the SANYO product that you intend to use.
- Information (including circuit diagrams and circuit parameters) herein is for example only ; it is not guaranteed for volume production. SANYO believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringements of intellectual property rights or other rights of third parties.

This catalog provides information as of January, 1999. Specifications and information herein are subject to change without notice.