M52357SP/VP

FM EQUALIZER

DESCRIPTION

The M52357 has an FM signal equalizer for playback, low-pass and high-pass filter for recording, and recording level adjuster.

FEATURES

Playback system

- The cosine type equalizer has an almost flat delay characteristic.
- The equalizer peak frequency is preset in four modes by built-in IC. (Two for the high band and the other two for the low band)
- The equalizer "Q" characteristic is preset in 4 modes by built-in IC.
- The equalizer lower range is preset in 5 modes.
- These characteristics (peak frequency, "Q" characteristic and lower range) can be changed by controlling DC.
- All equalizer filters are built in.
- Delay can be corrected by adding L, C and R because both positive and negative outputs are provided.

Recording system

- Has a built-in normal VHS low-pass and high-pass filter.
- The Y and C recording levels are adjustable.

General

- The built-in filter is automatically adjusted with Fsc input. (Compatible with both NTSC and PAL.)
- Compatible with two types of traps.

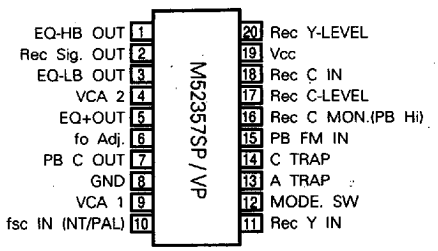
APPLICATION

VCR

RECOMMENDED OPERATING CONDITION

Operating supply voltage 4.7V-5.3V
Recommended supply voltage 5.0V

PIN CONFIGURATION (TOP VIEW)



Outline 20P4B (SP)
20P2E-A (VP)

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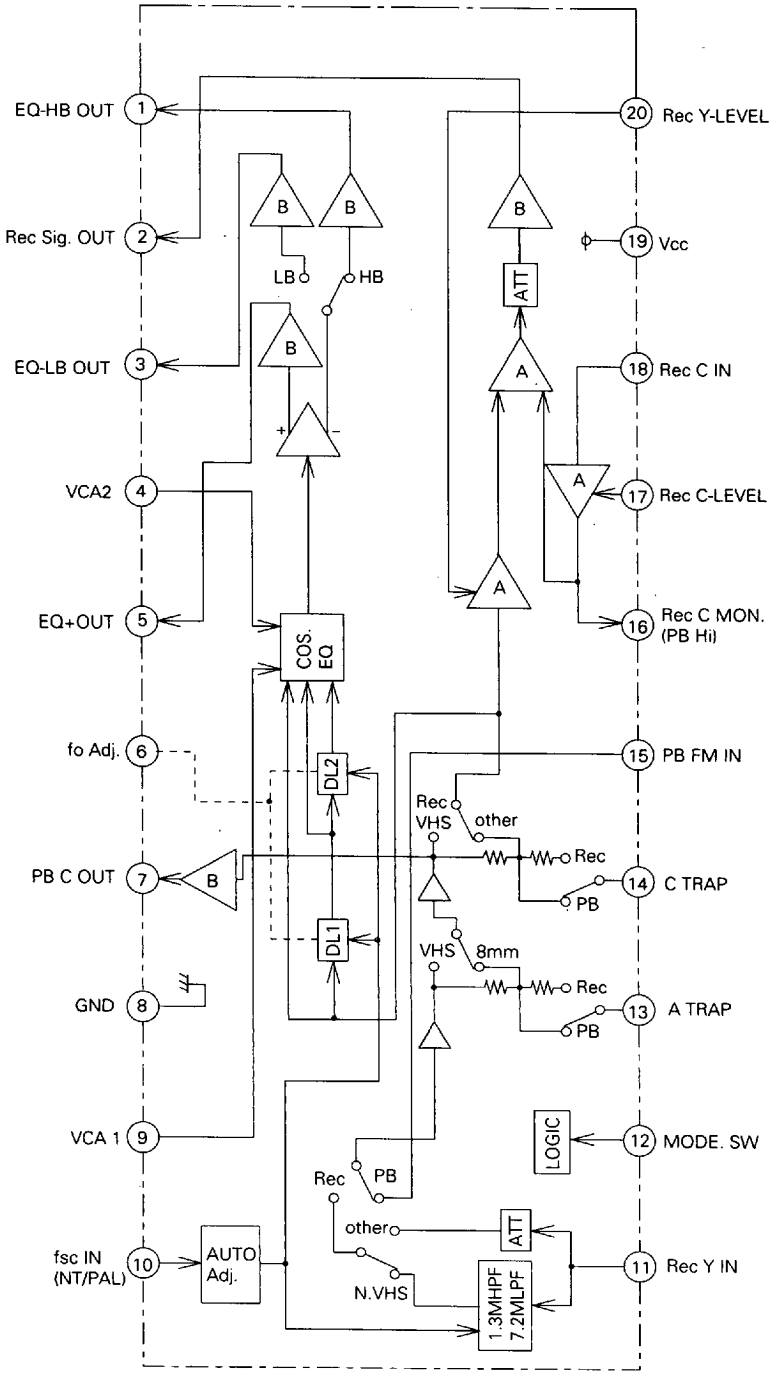
BLOCK DIAGRAM



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ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Ratings	Unit
Vcc	Supply voltage	6	V
Pd	Power dissipation	660 (SP) 520 (VP) (*)	mW
Topr	Operating temperature	−20~75	°C
Tstg	Storage temperature	−40~125	°C
Kθ	Thermal derating	6.6 (SP) 5.2 (VP) (*)	mW/°C

ELECTRICAL CHARACTERISTICS (Ta=25°C, Vcc=5.0V, unless otherwise noted)

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
IPV	Current dissipation PB VHS	PB, VHS, LB & HB, NTSC & PAL mode Icc read	25.0	32.0	39.0	mA
IP8	Current dissipation PB 8mm	PB, 8mm, LB & HM & HB, NTSC & PAL mode Icc read	25.0	32.0	39.0	mA
IRV	Current dissipation Rec VHS	Rec, VHS, LB & HB, NTSC & PAL mode Icc read	16.0	21.0	26.0	mA
IR8	Current dissipation Rec 8mm	Rec, 8mm, LB & HM & HB, NTSC & PAL Icc read	10.0	13.0	16.0	mA
ATP	Pin 13 output impedance (Audio TRAP) PB	8mm mode IN 13 1.5MHz 0.2VP-P CW Based on TP13 amplitude generated when SW13-1 is turned ON/OFF: ON/(OFF − ON) × 1000	180	210	240	Ω
ATR	Pin 13 output impedance (Audio TRAP) Rec	8mm mode IN 13 1.5MHz 0.2VP-P CW Based on TP13 amplitude generated when SW13-1 is turned ON/OFF: ON/(OFF − ON) × 1000	750	880	1010	Ω
CTP	Pin 14 output impedance (chroma TRAP) PB	8mm & VHS IN 14 600KHz 0.2VP-P CW Based on TP14 amplitude generated when SW14-1 is set to ON/OFF: ON/(OFF − ON) × 1000	650	765	880	Ω
CTR	Pin 14 output impedance (chroma TRAP) Rec	8mm & VHS IN 14 600KHz 0.2VP-P CW Based on TP14 amplitude generated when SW 14-1 is set to ON/OFF: ON/(OFF − ON) × 1000	750	880	1010	Ω
PE VLfN	PB EQ characteristic VHS LB peak fo NT	PB, VHS, LB, NTSC mode IN14 0.4VP-P 4~6MHz Sweep, gain MAXf TP3 & TP5 measurement SW14-1, SW14-3=ON	4.00	4.45	4.90	MHz
PE VLM	PB EQ characteristic VHS LB peak gain	Value f input/output gain calculated with PEVLf SW14-1, SW14-3=ON	3.0	4.0	5.0	dB
PE VLM1	PB EQ characteristic VHS LB peak 1/2 fo relative gain	Input of half of value f calculated in PEVLf; 0.4 VP-P Input/output gain A (dB) A - PEVLM SW14-1, SW14-3=ON	−7.2	−6.4	−5.6	dB
PE VHfN	PB EQ characteristic VHS HB peak fo NT	PB, VHS, HB, NTSC mode IN14 0.4VP-P 4~10MHz Sweep, gain MAXf TP1 & TP5 measurement SW14-1, SW14-3=ON	6.20	6.90	7.60	MHz
PE VHM	PB EQ characteristic VHS HB peak gain	Input/output gain of value f calculated in PEVHf SW14-1, SW14-3=ON	2.5	3.5	4.5	dB
PE VHM1	PB EQ characteristic VHS HB peak 1/2 fo relative gain	Input of half of value f calculated in PEVHf Input/output gain A (dB) A - PEVHM SW14-1, SW14-3=ON	−7.4	−6.4	−5.4	dB
PE 8LfN	PB EQ characteristic 8mm LB peak fo NT	PB, 8mm, LB, NTSC mode IN14 0.4VP-P 4~6MHz Sweep, gain MAXf TP5 measurement SW14-1, SW14-3=ON	5.20	5.70	6.20	MHz

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ELECTRICAL CHARACTERISTICS (cont.)

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
PE_{8LM}	PB EQ characteristic 8mm LB peak gain	Input/output gain of value f calculated in PE_{8LF} SW14-1, SW14-3=ON	1.9	2.9	3.9	dB
PE_{8LM1}	PB EQ characteristic 8mm LB peak 1/2 fo relative gain	Input of half of value f calculated in PE_{8LF}; 0.4 V_{P-P} Input/output gain A (dB) A - PE_{8LM} SW14-1, SW14-3=ON	−3.9	−3.4	−2.9	dB
PE_{8MfN}	PB EQ characteristic 8mm HM peak fo NT	PB, 8mm, HM, NTSC mode IN14 0.4V_{P-P} 4~12MHz Sweep, gain MAX f TP5 measurement SW14-1, SW14-3=ON	8.50	9.20	9.90	MHz
PE_{8HfN}	PB EQ characteristic 8mm HB peak fo	PB, 8mm, HB, NTSC mode IN14 0.4V_{P-P} 4~12MHz Sweep, gain MAX f TP5 measurement SW14-1, SW14-3=ON	8.50	9.20	9.90	MHz
PE_{8HM}	PB EQ characteristic 8mm HB peak gain	Input/output gain of value f calculated in PE_{8HF} SW14-1, SW14-3=ON	2.6	3.6	4.6	dB
PE_{8HM1}	PB EQ characteristic 8mm HB peak 1/2 fo relative gain	Input of half of value f calculated in PE_{8Hf}; 0.4 V_{P-P} Input/output gain A (dB) A - PE_{8HM} SW14-1, SW14-3=ON	−6.2	−5.7	−5.2	dB
PE_{VLfP}	PB EQ characteristic VHS LB peak fo PAL	PB, VHS, LB, PAL mode IN14 0.4V_{P-P} 4~6MHz Sweep, gain MAX f TP5 measurement SW14-1, SW14-3=ON	4.00	4.45	4.90	MHz
PE_{VHfP}	PB EQ characteristic VHS HB peak fo PAL	PB, VHS, HB, PAL mode IN14 0.4V_{P-P} 4~10MHz Sweep, gain MAX f TP5 measurement SW14-1, SW14-3=ON	6.20	6.90	7.60	MHz
PE_{8LfP}	PB EQ characteristic 8mm LB peak fo PAL	PB, 8mm, LB, PAL mode IN14 0.4V_{P-P} 4~6MHz Sweep, gain MAX f TP5 measurement SW14-1, SW14.3=ON	5.20	5.70	6.20	MHz
PE_{8MfP}	PB EQ characteristic 8mm HM peak fo PAL	PB, 8mm, HM, PAL mode IN14 0.4V_{P-P} 4~12MHz Sweep, gain MAX f TP5 measurement SW14-1, SW14-3=ON	8.50	9.20	9.90	MHz
PE_{8HfP}	PB EQ characteristic 8mm HB peak fo PAL	PB, 8mm, HB, PAL mode IN14 0.4V_{P-P} 4~12MHz Sweep, gain MAX f TP5 measurement SW14-1, SW14-3=ON	8.50	9.20	9.90	MHz
Δfo_{VL}	NT/PAL fo difference VHS LB	PE_{VLfN} – PE_{VLfP} SW14-1, SW14-3=ON	−200	0	200	KHz
Δfo_{VH}	NT/PAL fo difference VHS HB	PE_{VHfN} – PE_{VHfP} SW14-1, SW14-3=ON	−300	0	300	KHz
Δfo_{8L}	NT/PAL fo difference 8mm LB	PE_{8LfN} – PE_{8LfP} SW14-1, SW14-3=ON	−200	0	200	KHz
Δfo_{8M}	NT/PAL fo difference 8mm HM	PE_{8MfN} – PE_{8MfP} SW14-1, SW14-3=ON	−300	0	300	KHz
Δfo_{8H}	NT/PAL fo difference 8mm HB	PE_{8HfN} – PE_{8HfP} SW14-1, SW14-3=ON	−300	0	300	KHz
$VCAL_{MAX}$	PB EQ lower range addition amplifier MAX	PB, VHS, LB, NTSC mode Gain difference at TP5 under the conditions of IN14 = 1.0 MHz, 0.4 V_{P-P}, DC4 open and 5 V. SW14-1, SW14-3=ON	4.6	5.3	6.0	dB
$VCAL_{MIN}$	PB EQ lower range addition amplifier MIN	PB, VHS, LB, NTSC mode Gain difference at TP5 under the conditions of IN14 = 1.0 MHz, 0.4 V_{P-P}, DC4 open and 0 V. SW14-1, SW14-3=ON	−14.0	−12.5	−11.0	dB

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ELECTRICAL CHARACTERISTICS (cont.)

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
Q_{MAX} VL	PB EQ Q value MAX VHS LB	PB, VHS, LB, NTSC mode Gain difference at TP5 with DC9 open, 0 V. SW14-1, SW14-3=ON	2.8	3.8	4.8	dB
Q_{MIN} VL	PB EQ Q value MIN VHS LB	PB, VHS, LB, NTSC mode Gain difference at TP5 with DC9 open, 5 V. SW14-1, SW14-3=ON	−3.8	−2.8	−1.8	dB
f_{MAX} VL	PB EQ fo Adjustment MAX VHS LB	PB, VHS, LB, NTSC mode, DC6=5V IN14 0.4V_{P-P} 4~7MHz Sweep MAX (Gain value f check at TP5) SW14-1, SW14-3=ON Difference from PE_{VLf}	1.0	1.5	2.0	MHz
f_{MIN} VL	PB EQ fo Adjustment MIN VHS LB	PB, VHS, LB, NTSC mode, DC6=0V IN14 0.4V_{P-P} 3~6MHz Sweep MAX (Gain value f check at TP5) SW14-1, SW14-3=ON Difference from PE_{VLf}	−1.4	−1.1	−0.7	MHz
f_{MAX} VH	PB EQ fo Adjustment MAX VHS HB	PB, VHS, HB, NTSC mode, DC6=5V IN14 0.4V_{P-P} 5~12MHz Sweep MAX (Gain value f check at TP5) SW14-1, SW14-3=ON Difference from PE_{VHf}	0.8	1.3	2.0	MHz
f_{MIN} VH	PB EQ fo Adjustment MIN VHS HB	PB, VHS, HB, NTSC mode, DC6=0V IN14 0.4V_{P-P} 4~10MHz Sweep MAX (Gain value f check at TP5) SW14-1, SW14-3=ON Difference from PE_{VHf}	−1.8	−1.3	−0.8	MHz
f_{MAX} 8L	PB EQ fo Adjustment MAX 8mm LB	PB, 8mm, LB, NTSC mode, DC6=5V IN14 0.4V_{P-P} 3~8MHz Sweep MAX (Gain value f check at TP5) SW14-1, SW14-3=ON Difference from PE_{8Lf}	1.0	1.5	2.0	MHz
f_{MIN} 8L	PB EQ fo Adjustment MIN 8mm LB	PB, 8mm, LB, NTSC mode, DC6=0V IN14 0.4V_{P-P} 2~6MHz Sweep MAX (Gain value f check at TP5) SW14-1, SW14-3=ON Difference from PE_{8Lf}	−1.5	−1.2	−0.9	MHz
f_{MAX} 8M	PB EQ fo Adjustment MAX 8mm HM	PB, 8mm, HM, NTSC mode, DC6=5V IN14 0.4V_{P-P} 5~12MHz Sweep MAX (Gain value f check at TP5) SW14-1, SW14-3=ON Difference from PE_{8Hf}	0.3	1.0	1.7	MHz
f_{MIN} 8M	PB EQ fo Adjustment MIN 8mm HM	PB, 8mm, HM, NTSC mode, DC6=0V IN14 0.4V_{P-P} 4~10MHz Sweep MAX (Gain value f check at TP5) SW14-1, SW14-3=ON Difference from PE_{8Lf}	−1.5	−0.9	−0.3	MHz
PD VL	PB EQ distortion VHS LB	PB, VHS, LB, NTSC mode IN15 0.4V_{P-P} 4MHz TP3 & TP5 secondary distortion DC4, 6, 9 = open	−	−	−40	dB
PD VH	PB EQ distortion VHS HB	PB, VHS, HB, NTSC mode IN15 0.4V_{P-P} 6.4MHz TP1 & TP5 secondary distortion DC4, 6, 9 = open	−	−	−40	dB
PD 8L	PB EQ distortion 8mm LB	PB, 8mm, LB, NTSC mode IN15 0.4V_{P-P} 5MHz TP3 & TP5 secondary distortion DC4, 6, 9 = open	−	−	−40	dB

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ELECTRICAL CHARACTERISTICS (cont.)

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
PD 8M	PB EQ distortion 8mm HM	PB, 8mm, HM, NTSC mode IN15 0.4Vp-p 7MHz TP1 & TP5 secondary distortion DC4, 6, 9 = open	–	–	–40	dB
PD 8H	PB EQ distortion 8mm HB	PB, 8mm, HB, NTSC mode IN15 0.4Vp-p 7MHz TP1 & TP5 secondary distortion DC4, 6, 9 = open	–	–	–40	dB
PBC G	PB C output gain	PB, VHS & 8mm IN15 0.3Vp-p 700KHz input/output gain IN15→TP7	–1.0	–0.5	0.0	dB
PBC D	PB C output distortion	PB, 8mm IN15 0.3Vp-p 700KHz TP7 secondary and tertiary distortion	–	–	–50	dB
PBC f	PB C output frequency characteristic	PB, 8mm IN15 0.3Vp-p 5MHz input/output gain A (dB) A-PBCG	–3	–	–	dB
VRF 4N	VHS REC filter characteristic 4MHz gain NT	Rec, VHS, LB, NTSC mode IN11 4MHz 0.3Vp-p IN11→TP2 gain SW20 = 1	–1.6	–0.9	–0.2	dB
VRF 0.6N	VHS REC filter characteristic 600KHz 4M relative value NT	Rec, VHS, LB, NTSC mode IN11 0.6MHz 0.3Vp-p IN11→TP2 difference between gain and VRF4: SW20 = 1	–22.0	–20.5	–19.0	dB
VRF 1.3N	VHS REC filter characteristic 1.3MHz 4M relative value NT	Rec, VHS, LB, NTSC mode IN11 1.3MHz 0.3Vp-p IN11→TP2 difference between gain and VRF4: SW20 = 1	–4.7	–3.7	–2.7	dB
VRF 7.2N	VHS REC filter characteristic 7.2MHz 4M relative value NT	Rec, VHS, LB, NTSC mode IN11 7.2MHz 0.3Vp-p IN11→TP2 difference between gain and VRF4: SW20 = 1	–2.9	–1.9	–1.1	dB
VRF DN	VHS REC filter distortion NT	Rec, VHS, LB, NTSC mode IN11 3MHz 0.3Vp-p TR2 secondary and tertiary distortion	–	–	–43	dB
VRF 0.6P	VHS REC filter characteristic 600KHz 4M relative value PAL	Rec, VHS, LB PAL mode Refer to VRF0.6N.	–22.0	–20.5	–19.0	dB
VRF 1.3P	VHS REC filter characteristic 1.3MHz 4M relative value PAL	Rec, VHS, LB PAL mode Refer to VRF1.3N.	–4.7	–3.7	–2.7	dB
VRF 7.2P	VHS REC filter characteristic 7.2MHz 4M relative value PAL	Rec, VHS, LB PAL mode Refer to VRF7.2N.	–2.9	–1.9	–1.1	dB
RG VH	Rec gain VHS HB	Rec, VHS, HB IN11 5MHz 0.3Vp-p IN11→TP2 gain SW20 = 1	–1.4	–0.9	–0.4	dB
RD VH	Rec distortion VHS HB	Rec, VHS, HB IN11 5MHz 0.3Vp-p TP2 secondary and tertiary distortion SW20 = 1	–	–	–43	dB
Rf VH	Rec f characteristic VHS HB	Rec, VHS, HB IN11 10MHz 0.3Vp-p Input/output gain A (dB) A-RG8H SW20 = 1	–1.5	–0.5	0.5	dB
RG 8H	Rec gain 8mm HB	Rec, 8mm, HB IN11 5MHz 0.6Vp-p IN11→TP2 gain SW20 = 1	–9.0	–8.0	–7.0	dB
RD 8H	Rec distortion 8mm HB	Rec, 8mm, HB IN11 5MHz 0.6Vp-p TP2 secondary and tertiary distortion SW20 = 1	–	–	–40	dB
Rf 8H	Rec f characteristic 8mm HB	Rec, 8mm, HB IN11 10MHz 0.6Vp-p Input/output gain A (dB) A-RG8H SW20 = 1	–2	–	–	dB
RG 8M	Rec gain 8mm HM	Rec, 8mm, HM mode, IN11 5MHz 0.6Vp-p IN11→TP2 gain SW20 = 1	–9.6	–8.6	–7.6	dB
Rf 8M	Rec f characteristic 8mm HM	Rec, 8mm, HM mode, IN11 10MHz 0.8Vp-p Input/output gain A (dB) A-RG8M	–2	–	–	dB
ΔG MH	Rec 8mm HM-HB gain difference	RG8H – RG8M	0.6	0.8	1.0	dB

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ELECTRICAL CHARACTERISTICS (cont.)

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
RCG_{16}	Rec C gain pin 16	Rec mode IN18 0.3V_{P-P} 0.7MHz IN18→TP16 gain SW17 = 1	4.9	5.2	5.5	dB
RCD_{16}	Rec C distortion pin 16	Rec mode IN18 0.3V_{P-P} 0.7MHz TP16 secondary and tertiary distortion SW17 = 1	–	–	–50	dB
RCG_{2H}	Rec C gain pin 2 HB	Rec, HB mode IN18 0.3V_{P-P} 0.7MHz IN18→TP2 gain SW17 = 1	–5.2	–4.5	–3.8	dB
RCD_{2H}	Rec C distortion pin 2 HB	Rec, HB mode IN18 0.3V_{P-P} 0.7MHz TP2 secondary and tertiary distortion SW17 = 1	–	–	–50	dB
RCf_{2H}	Rec C f characteristic pin 2 HB	Rec, HB mode IN18 0.3V_{P-P} 5MHz Input/output gain A (dB) A-RCG_{2H} SW17 = 1	–2	–	–	dB
$RYA_{\Delta G}$	Rec Y Amplifier gain variable width	Rec, VHS, HB mode IN11 0.3V_{P-P} 5M Measure the difference in gain between when SW20 is 1 and when it is 2.	5.8	7.8	9.8	dB
$RCA_{\Delta G}$	Rec C Amplifier gain variable width	Rec, mode IN18 0.3V_{P-P} 0.7MHz Measure the difference in gain between when SW17 is 1 and when it is 2.	9.4	11.4	13.4	dB
$V_{M/L}$	Pin 12 HiMP/LB Switch voltage	PB, 8mm mode IN15 0.4V_{P-P} 1~10MHz Increase DC12 voltage from 0 V. TP5 Measure DC voltage at which EQ peak f comes out of PE_{8Lf} to PE_{8Mf}.	0.9	1.1	1.3	V
$V_{H/M}$	Pin 12 HB/HiMP Switch voltage	PB, 8mm mode IN15 0.4V_{P-P} 1~10MHz Increase DC12 voltage from 2 V. TP5 Measure DC voltage at which EQ peak f comes out of PE_{8Mf} to PE_{8Hf}.	3.0	3.2	3.4	V
$V_{P/R}$	Pin 16 PB/Rec Switch voltage	8mm, LB mode IN11 0.6V_{P-P} 3MHz SW16=ON Increase DC16 voltage from OPEN. Measure DC16 voltage at which there is no output at TP2.	2.8	3.0	3.2	V
$V_{V/8}$	Pin 13 VHS/8mm Switch voltage	REC, LB mode IN11 0.3V_{P-P} 1~10MHz SW13-3=ON Increase DC13 voltage from OPEN. Measure DC voltage at which the "zone flat" turns to 1.3 MHP and 7.2 MLP at TP2.	3.3	3.5	3.7	V
$V_{N/P}$	Pin 10 NTSC/PAL Switch voltage	PB, VHS, HB mode IN15 0.4V_{P-P} 1~10M IN10=4.433618MHz Decrease DC10 from 4 V. Measure DC10 voltage which satisfies PE_{VHf} at TP5.	2.8	3.0	3.2	V
$8R_{CT}$	8mm Rec C-TRAP	Rec, 8mm, LB & HM & HB IN11 0.6V_{P-P} 0.1~5MHz Sweep SW13-2, 14-2=2 TP2	Check that there is a trap near 1.5 M.			
VR_{T}	VHS Rec No trap	Rec, VHS, LB & HB IN11 0.3V_{P-P} 0.1~5MHz Sweep SW13-2, 14-2=2 TP2	Check that no trap occurs.			
$8P_{ACT}$	8mm PB A, C-TRAP	PB, 8mm, LB & HM & HB IN15 0.4V_{P-P} 0.1~5MHz Sweep SW13-2, 14-2=2 TP5	Check that there is a trap near 0.7 M and 1.5 M.			
VP_{CT}	VHS PB C-TRAP	PB, VHS, LB & HB IN15 0.4V_{P-P} 0.1~5MHz Sweep SW13-2, 14-2=2 TP5	Check that there is a trap near 0.7 M.			
I_{28}	Pin 2 output current 8mm	Rec, 8mm, LB & HM & HB no signal Ammeter between pin 2 and Vcc	0.45	0.55	0.70	mA
I_{2V}	Pin 2 output current VHS	Rec, VHS, LB & HB no signal Ammeter between pin 2 and Vcc	1.3	1.5	1.9	mA
$PE_{C/N}$	PB EQ C/N	PB, VHS, HB, NTSC mode IN15 7MHz 0.4V_{P-P} 6MHz/7MHz VBW 100Hz RBW 10KHz	–	–72	–	dB

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ELECTRICAL CHARACTERISTICS (cont.)

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
V_{RF} C/N	VHS REC filter C/N	Rec, VHS, LB, NTSC mode IN11 4MHz 0.3V_{P-P} 3MHz/4MHz VBW 100Hz RBW 10KHz	–	–74	–	dB
Fsc IL	Fsc input range	PB, VHS, HB NTSC mode IN10 level variable; operation should be normal.	200	400	600	mV_{P-P}
V_{CC} OP	Operating supply voltage range	Operation should be normal.	4.7	5.0	5.3	V

CONDITIONS FOR SWITCHES IN EACH MODE

Mode \ Condition	DC12
HB	5V
HiMP	2V
LB	0V

Mode \ Condition	SW13-3	DC13
8mm	OFF	–
VHS	ON	5V

Mode \ Condition	SW16	DC16
Rec	OFF	–
PB	ON	5V

Mode \ Condition	DC10	IN10
NTSC	4.3V	3.579545MHz, 0.4Vp-p CW
PAL	2.0V	4.433619MHz, 0.4Vp-p CW

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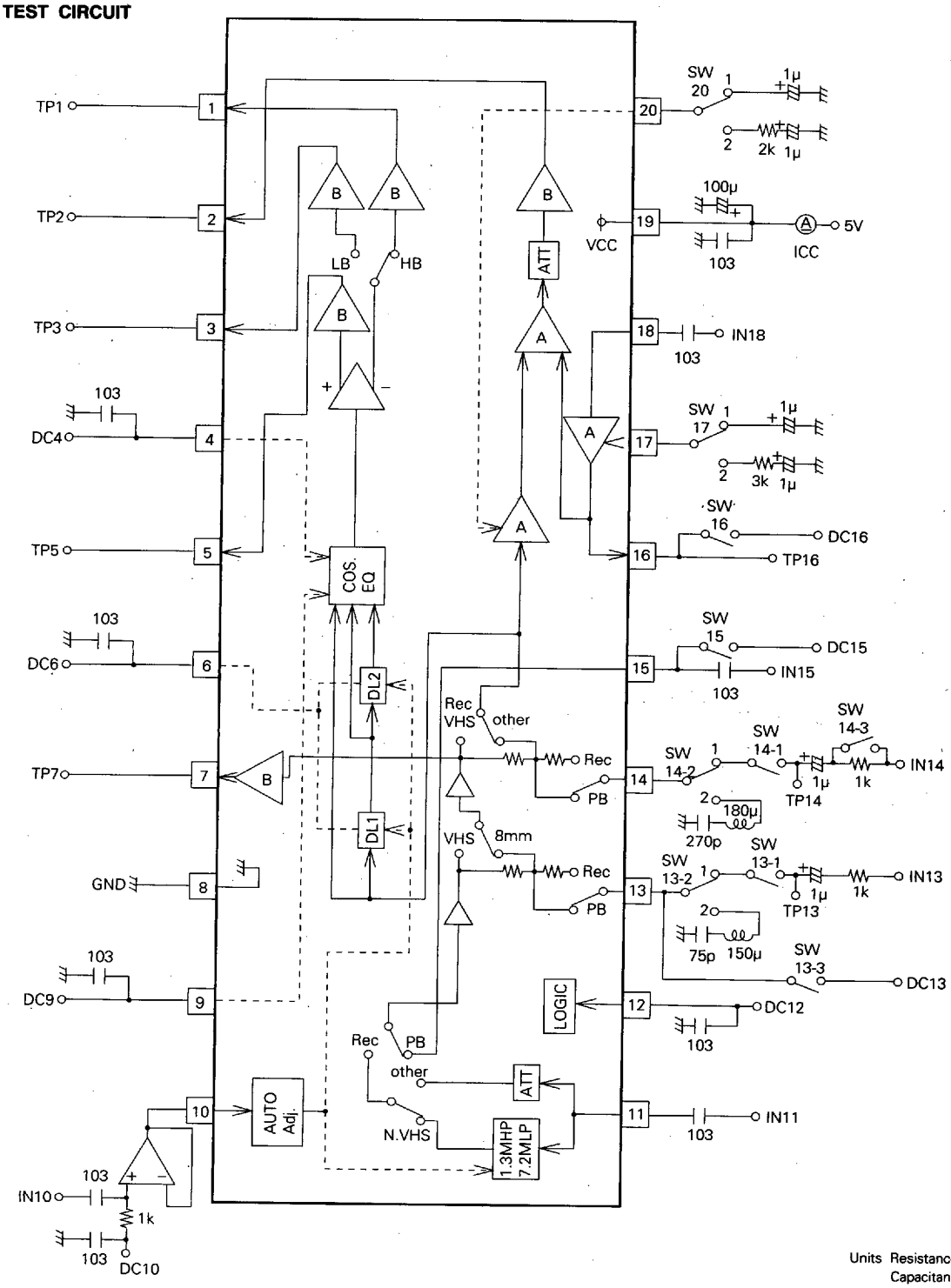
TEST CIRCUIT



Units Resistance:Ω
Capacitance:F

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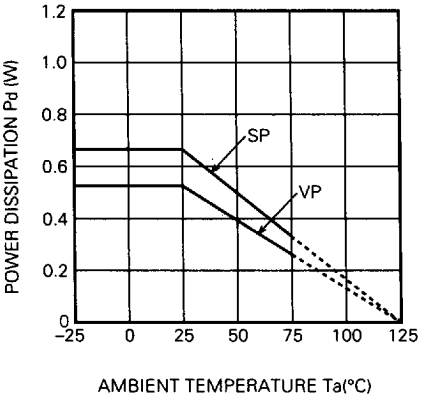
TYPICAL CHARACTERISTICS

THERMAL DERATING (MAXIMUM RATING)



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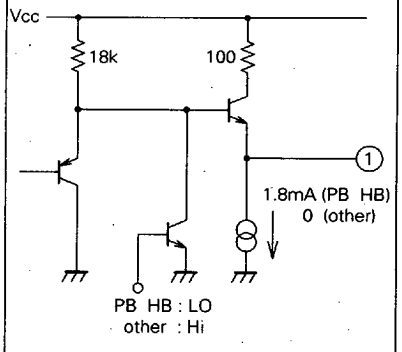
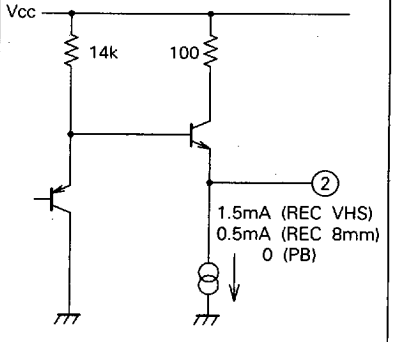
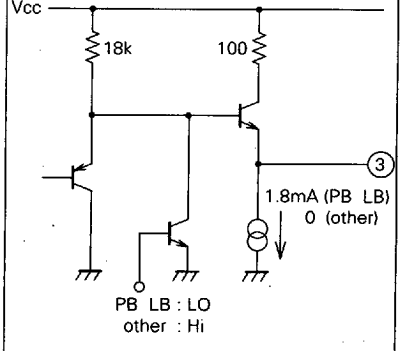
DESCRIPTION OF PIN

Pin No.	Name	Peripheral circuit of pins	Description of function
①	PB EQ Negative output (HB)		PB EQ high band negative output Output DC Approx. 2.1V Output amplitude Approx. 400mVp-p @ Standard output Note: Incidental capacitance should be kept at a minimum.
②	Rec Sig. OUT		Rec Y_{FM} + Low chroma output Output DC Approx. 2.6V Output amplitude 8mm 200mVp-p S-VHS 250mVp-p VHS 200mVp-p @ Standard input
③	PB EQ negative output (LB)		PB EQ low-band negative output Output DC Approx. 2.1V Output amplitude Approx. 400mVp-p @ Standard input Note: Incidental capacitance should be kept at a minimum.

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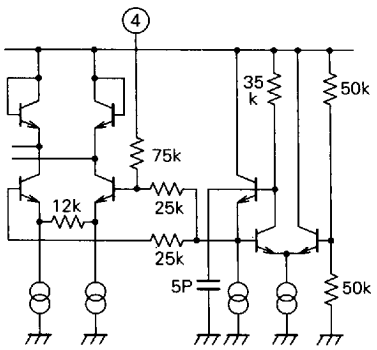
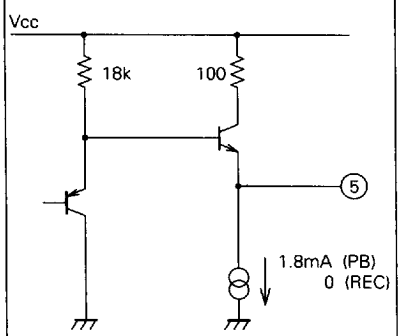
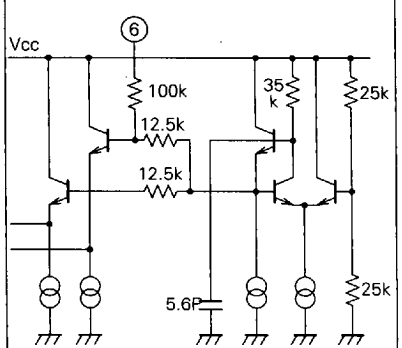
DESCRIPTION OF PIN (cont.)

Pin No.	Name	Peripheral circuit of pins	Description of function
④	VCA2		Adjusts PB EQ lower range addition amount slightly. DC = 2.5V @ open 0V ~ 5V adjustable The lower range adding amount is adjusted as it is set for each mode in the circuit when the voltage is OPEN.
⑤	PB EQ Positive output		PB EQ positive output Output DC Approx. 2.1V Output amplitude Approx. 400mVp-p @ Standard input
⑥	fo ADj.		Adjusts PB EQ peak frequency slightly. DC = 2.5V @ open 0V ~ 5V variable The peak frequency is adjusted as it is set for each mode in the circuit when the voltage is OPEN.

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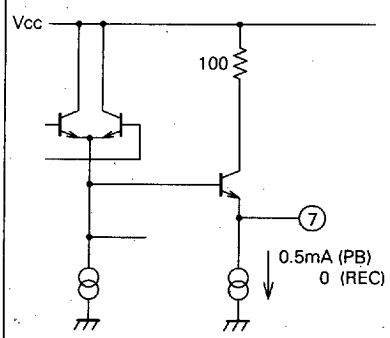
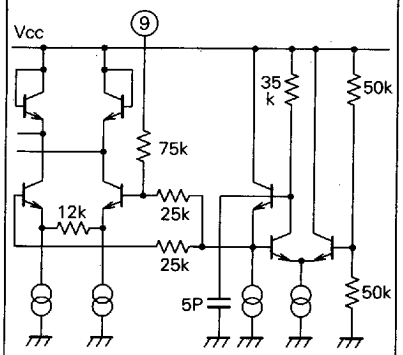
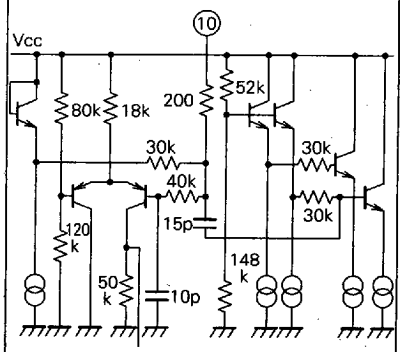
DESCRIPTION OF PIN (cont.)

Pin No.	Name	Peripheral circuit of pins	Description of function
⑦	PB C OUT		Takes PB low chroma. Output DC Approx. 1.6V Output amplitude Low chroma + YFM Approx. 800mVp-p
⑧	GND	——	——
⑨	VCA 1		Adjusts PB EQ Q slightly. DC = 2.5V @ open 0V ~ 5V variable Adjusts Q as it is set for each mode in the IC when the voltage is OPEN.
⑩	fsc IN (NTSC/PAL)		Inputs reference signals to adjust the internal filter automatically. DC = 4.2V @ open Pulls down at external R to below DC 3V. PAL mode NTSC: 3.5795MHz PAL: 4.4336MHz Input level 0.2Vp-p to 0.6Vp-p Standard 0.4Vp-p (Note: Do not decrease DC under 1V in the PAL mode.)

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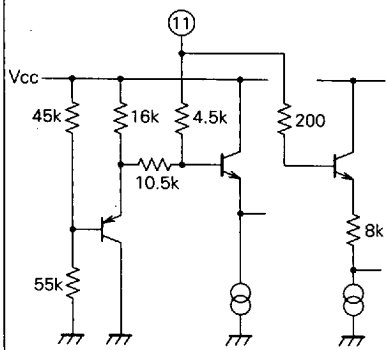
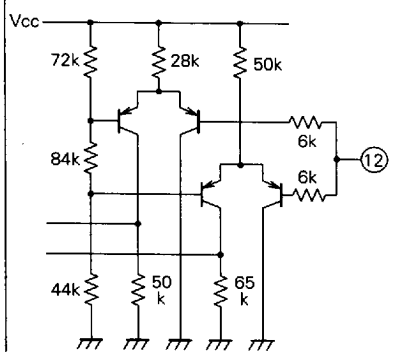
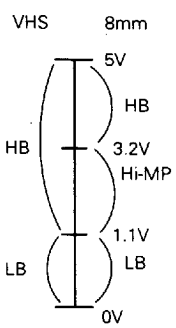
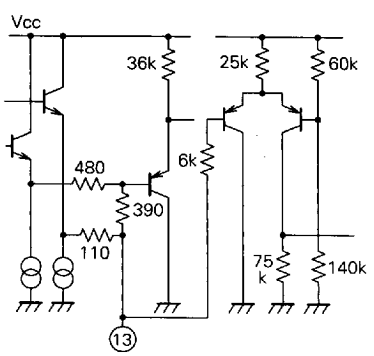
DESCRIPTION OF PIN (cont.)

Pin No.	Name	Peripheral circuit of pins	Description of function
⑪	Rec Y IN		Rec Y-FM signal input DC Approx. 3.5V 8mm: 800mVp-p S-VHS: 320mVp-p VHS: 260mVp-p
⑫	MODE SW		Low band/high band selector switch 
⑬	Audio TRAP (VHS/8mm)		Connects LC externally and traps audio FM (1.5MHz). (8mm only) VHS mode is set when voltage at this pin is set 3.5V or over.

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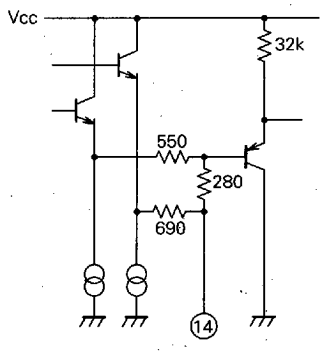
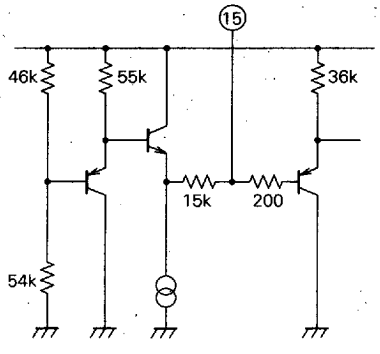
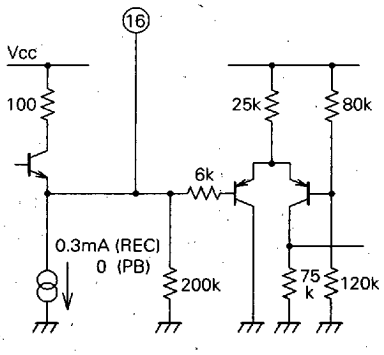
DESCRIPTION OF PIN (cont.)

Pin No.	Name	Peripheral circuit of pins	Description of function
⑭	Chroma TRAP		Connects LC to external equipment and traps "Low chroma".
⑮	PB FM IN		PB FM signal input Standard 400mVp-p DC = 2.7V
⑯	Rec C MON. (PB/Rec)		Monitors the "Rec Low chroma" amplitude. Output DC Approx. 1.7V PB mode is set when voltage at this pin is set to 3.0V or over.

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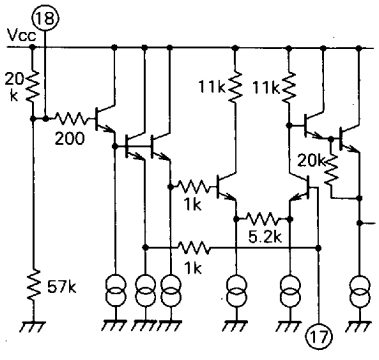
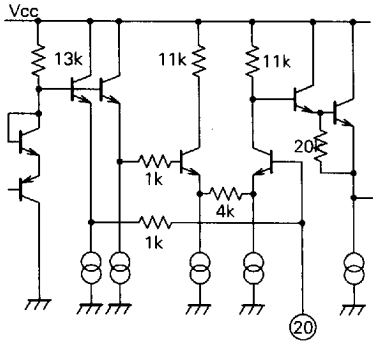
DESCRIPTION OF PIN (cont.)

Pin No.	Name	Peripheral circuit of pins	Description of function
⑰	Rec C LEVEL		Adjusts the "Rec Low chroma" recording level. DC Approx. 2.3V
⑱	Rec C IN		Inputs "Rec Low chroma." Standard: 290mVp-p (100% chroma)
⑲	Vcc	——	Recommended voltage 5.0V Supply voltage 4.7V~5.3V
⑳	Rec Y LEVEL		Adjusts the "Rec Y-FM" recording level. DC Approx. 3.0V

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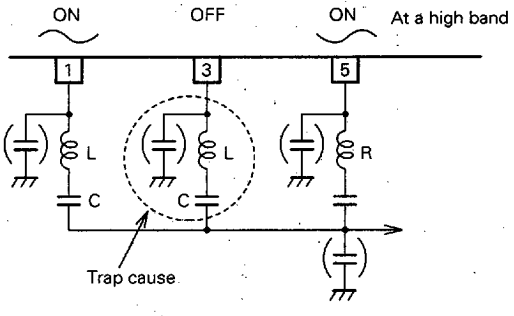
PRECAUTIONS FOR APPLICATION

1. Incidental capacitance on the board at pins 13 and 14 should be kept at a minimum to prevent deterioration of frequency characteristics at a high band in the PB EQ and REC modes.

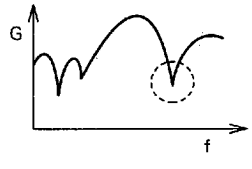
2. Incidental capacitance on the board at pins 17 and 20 should be kept at a minimum, as amplitude upheaves in the higher frequency range when a gain is reduced by inserting a resister.

3. Incidental capacitance on the board at pins 1 and 3 should be kept at a minimum, to prevent trapping at a high band when a phase equalizer is formed by adding coils and capacitance.



( ) Incidental capacitance

e.g. Pin 3 output is off at a high band,so that trap occurs due to incidental capacity, L and C at pin 3.



4. Because adjustments are made automatically, prevent input Fsc from crossing with other wires. The power coupling capacitance should be provided near the power source and grounding pin, to prevent Fsc leak to PB and REC output.

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