M51567P

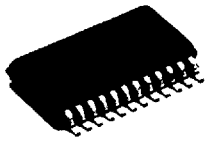
PREAMPLIFIER FOR OPTICAL PICKUP

DESCRIPTION

The M51567P is an optical pickup preamplifier for CD players. It has a built-in I-V amplifiers that convert current signals gained by photodetectors into voltage signals and HF (high frequency), FE (focus error), and TE (tracking error) amplifiers, as well as HFOK, MR, and EFM waveform shaping circuits that output in logic level.

FEATURES

- For 3 laser system
- Combination with M51564P (pickup servo control) offers capability of forming optical pickup servo system operating on 5V single power supply
- Built-in LPF for TE and FE amplifiers to remove unwanted high-frequency components
- E-F balance control pin (pin ⑲)
- Built-in hold capacitor for mirror detection
- External components : 2 chemical capacitors, 2 ceramic capacitors, 1 volume control, and 2 resistors (excluding HF com. section)
- Built-in microminiature 24-pin flat package (0.8mm lead pitch)



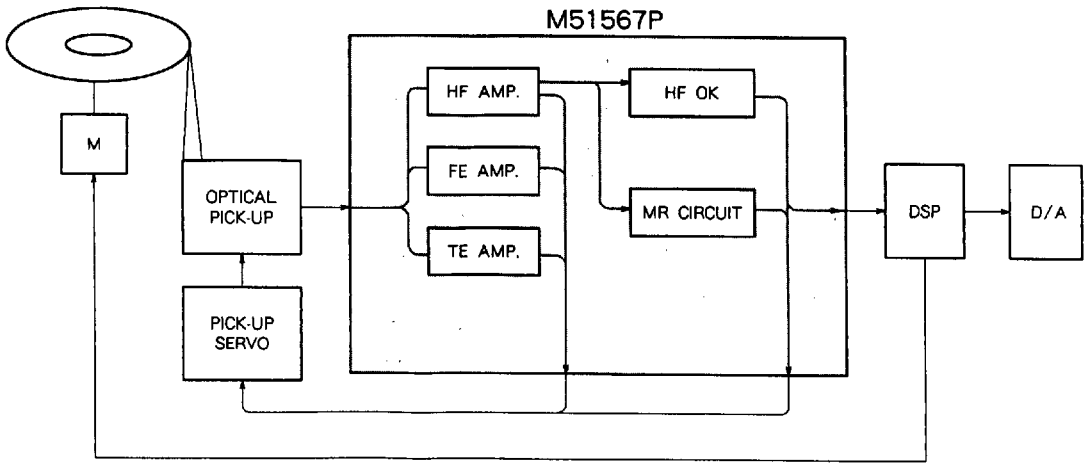
Outline 24P2Q-A

0.8mm pitch 300mil SSOP
(5.3mm × 10.1mm × 1.8mm)

RECOMMENDED OPERATING CONDITIONS

Supply voltage range ..... Vcc = 4.75 to 5.25V
Rated supply voltage ..... Vcc = 5V
Rated power dissipation 80mW

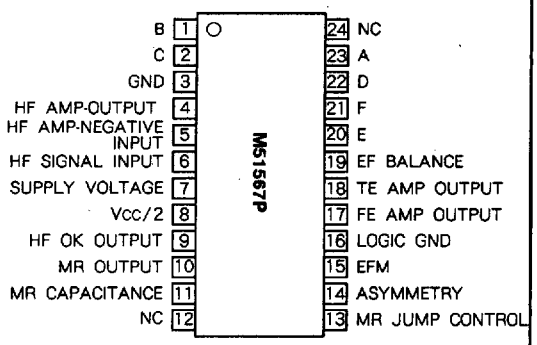
SYSTEM CONFIGURATION



M51567P

PREAMPLIFIER FOR OPTICAL PICKUP

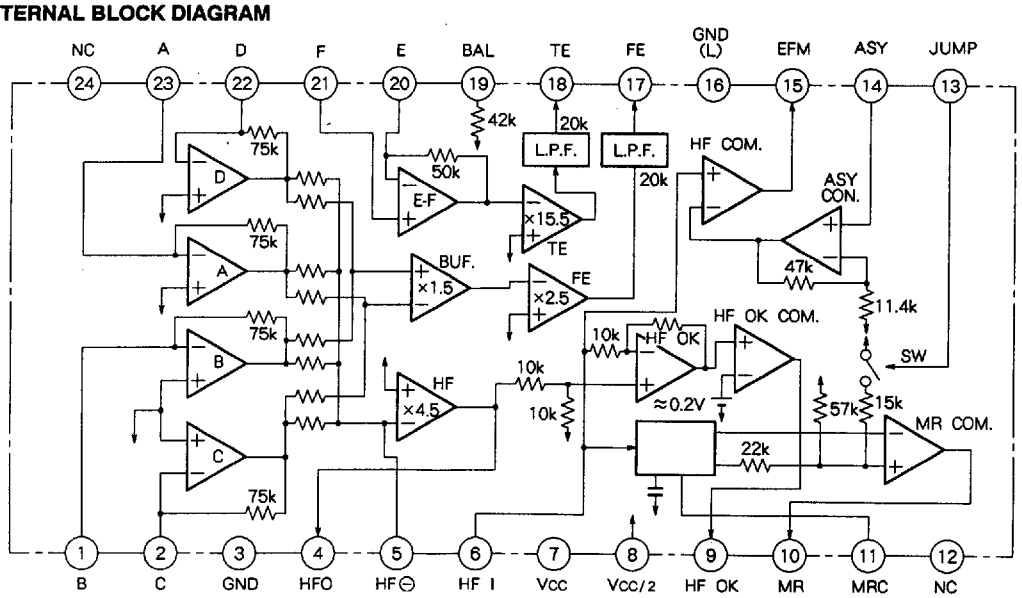
PIN CONFIGURATION (TOP VIEW)



Outline 24P2Q-A

NC : NO CONNECTION

IC INTERNAL BLOCK DIAGRAM



Units Resistance : Ω
Capacitance : F

ABSOLUTE MAXIMUM RATINGS (Ta = 25℃, unless otherwise noted)

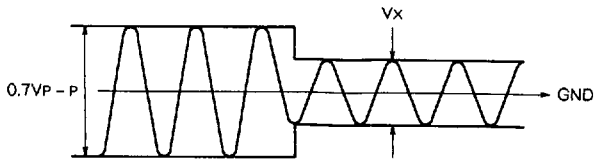
Symbol	Parameter	Ratings	Unit
V_{CC}	Supply voltage	10	V
I_{CC}	Circuit current	40	mA
V_I	Input voltage	0 to V_{CC}	V
V_O	Output voltage	0 to V_{CC}	V
P_d	Power dissipation	540	mW
T_{opr}	Operating temperature	− 20 to + 75	℃
T_{stg}	Storage temperature	− 40 to + 125	℃

ELECTRICAL CHARACTERISTICS (Ta = 25℃, V_{CC} = 5V)

Symbol	Block	Parameter	Test conditions	Limits			Unit
				Min	Typ	Max	
G_{VHF}	HF	HF output voltage	Input f=1kHz, A, B, C, D input I_i = 2μ A_{P-P}	−	0.7	−	V_{P-P}
f_{HF}	HF	HF frequency	V_i = 50mVrms input, − 3dB frequency	−	3	−	MHz
V_{OLA}	HF	HF Low output voltage		−	0.5	1.2	V
V_{OHA}	HF	HF High output voltage		3.2	3.8	−	V
V_{OHF}	HF	Output offset voltage		− 40	0	40	mV
G_{VFE}	FE	FE output voltage	f=1kHz, A, C input I_i=2μ A_{P-P}	−	0.55	−	V_{P-P}
f_{FE}	FE	FE frequency		−	20	−	kHz
V_{LAC}	FE	FE Low output voltage	R_L = 10k Ω	−	0.5	1.2	V
V_{HAC}	FE	FE High output voltage	R_L = 10k Ω	3.6	4	−	V
V_{OFE}	FE	Output offset voltage		− 50	0	50	mV
G_{VTE1}	TE	TE output voltage	f=1kHz, E input, I_i=2μ A_{P-P}	−	1.55	−	V_{P-P}
f_{TE1}	TE	TE frequency		−	20	−	kHz
V_{LE}	TE	TE Low output voltage	R_L = 10k Ω	−	0.5	1.2	V
V_{HE}	TE	TE High output voltage	R_L = 10k Ω	3.6	4	−	V
V_{OTE}	TE	Output offset voltage		−110	0	110	mV
f_{OK}	HFOK	HFOK frequency	pin⑥ input : 200mVrms Voffset = − 0.2V	45	−	−	kHz
V_{HHFOK}	HFOK	High output voltage		3.5	4	−	V
V_{LHFOK}	HFOK	Low output voltage		−	0	0.4	V
V_{THHFOK}	HFOK	Threshold voltage	note 1	−	0.2	−	V
V_{HMR}	MR	High output voltage		3.5	4	−	V
V_{LMR}	MR	Low output voltage		−	0	0.4	V
V_{THMR}	MR	Output level ratio	note 2	−	0.4	−	V
V_{THMJ}	MR (JUMP)	Output level ratio	V⑬ = 2.5V Same to V_{THMR}	−	0.7	−	V
V_{HEFM}	EFM	High output voltage		3.5	4	−	V
V_{LEFM}	EFM	Low output voltage		−	0.2	0.4	V

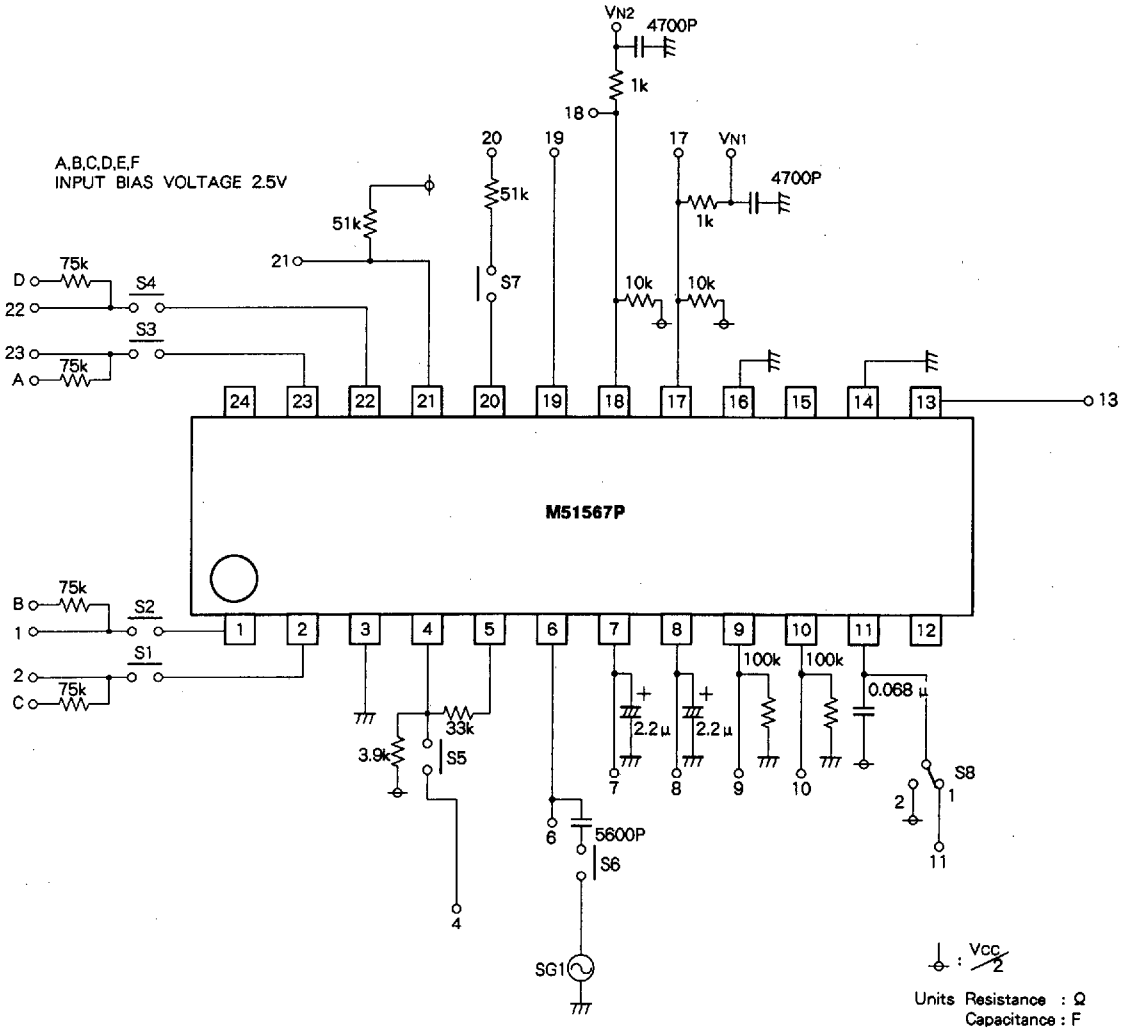
Note 1. DC voltage is input to A. Threshold voltage is the pin④ voltage when pin⑨ voltage changes from low to high.

2. Following signal is input to pin⑥. Measure Vx (V_{PP}) when pin⑩ voltage becomes high.



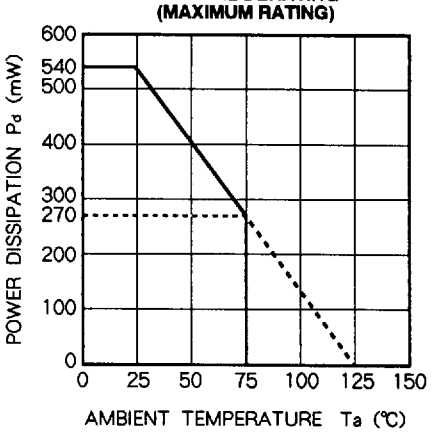
$$\text{Output level ratio} = \frac{Vx}{0.7\ (V_{P\text{-}P})}$$

TEST CIRCUIT

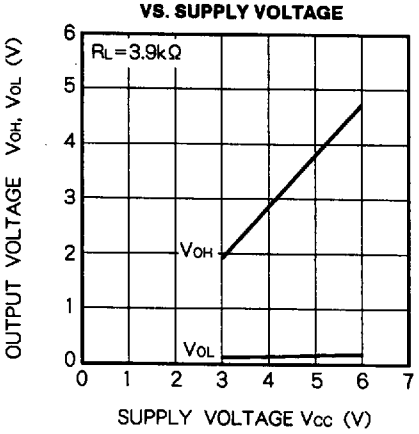


TYPICAL CHARACTERISTICS

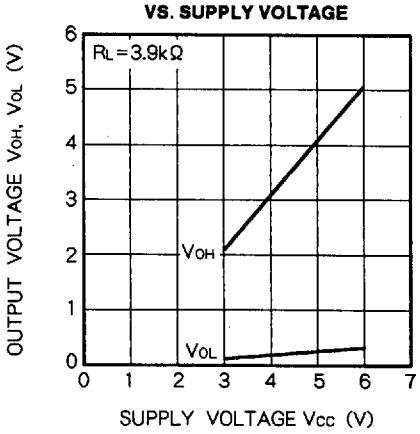
THERMAL DERATING (MAXIMUM RATING)



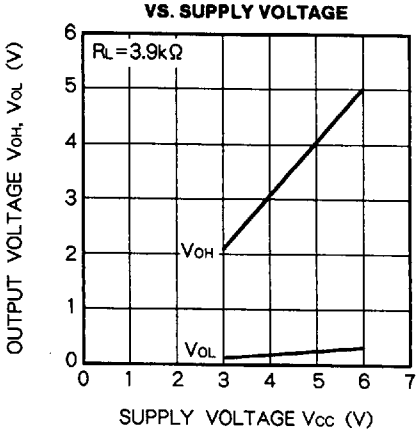
HF AMPLIFIER HIGH/LOW OUTPUT VOLTAGE VS. SUPPLY VOLTAGE



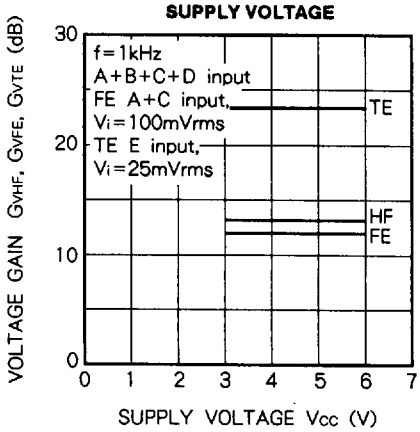
FE AMPLIFIER HIGH/LOW OUTPUT VOLTAGE VS. SUPPLY VOLTAGE



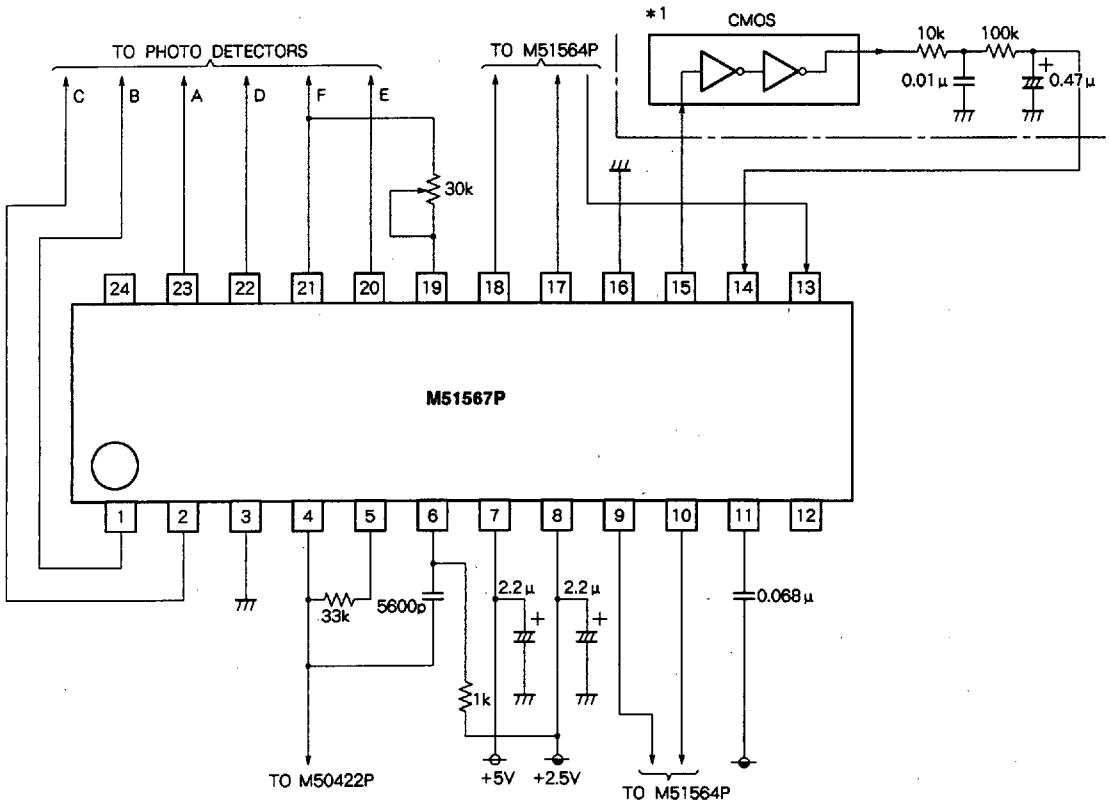
TE AMPLIFIER HIGH/LOW OUTPUT VOLTAGE VS. SUPPLY VOLTAGE



HF, FE, TE VOLTAGE GAIN VS. SUPPLY VOLTAGE



APPLICAION EXAMPLE



Units Resistance : Ω
Capacitance : F

*1 Not used in combination with M50422P (C-MOS digital signal processor). Pin 14 is grounded.