M51599FP

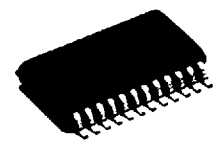
PREAMPLIFIER FOR OPTICAL PICKUP

DESCRIPTION

The M51599FP 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 and MR circuits that output in logic level.

FEATURES

- For 3 laser system
- High speed pickup access
  Frequency of mirror circuit : 100kHz typ
- Built-in finger-print circuit
  Variable level of mirror detector
- Built-in LPF for TE and FE amplifiers (fc = 70kHz)
- E-F balance control pin (pin ③)
- Built-in focus error balance control pin (pin ⑩)
- External components : 2 chemical capacitors, 4 ceramic capacitors, 2 volume controls, and 1 resistor
- Built-in microminiature 24-pin flat package (0.8mm lead pitch)



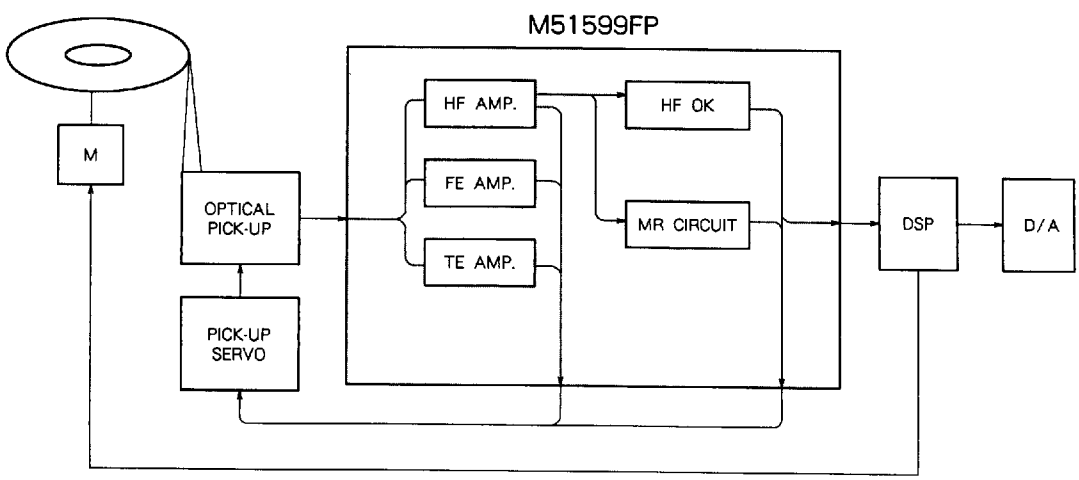
Outline 24P2Q-A

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

RECOMMENDED OPERATING CONDITIONS

Supply voltage range ····· V_{CC}, V_{EE} = ± 4.75 ~ ± 5.25V
Rated supply voltage ····· V_{CC}, V_{EE} = ± 5V
Rated power dissipation ····· 85mW

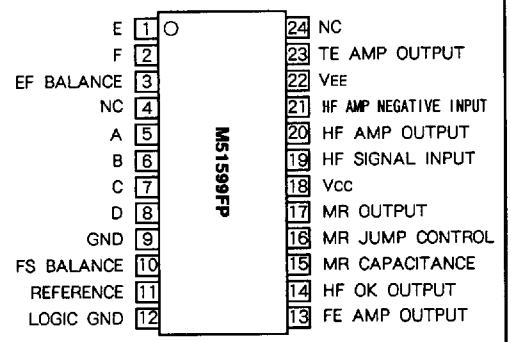
SYSTEM CONFIGURATION



M51599FP

PREAMPLIFIER FOR OPTICAL PICKUP

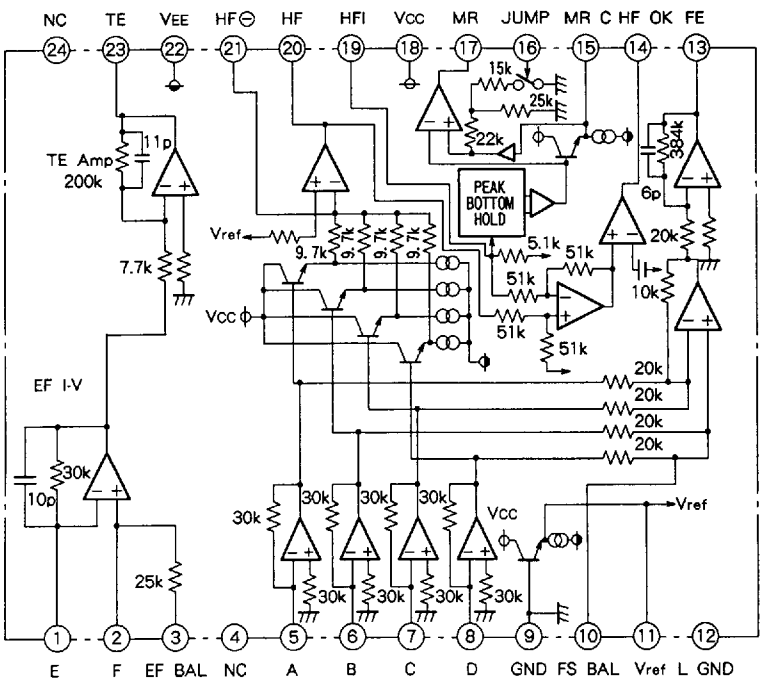
PIN CONFIGURATION



Outline 24P2Q-A

NC : NO CONNECTION

IC INTERNAL BLOCK DIAGRAM



Units Resistance : Ω
Capacitance : F

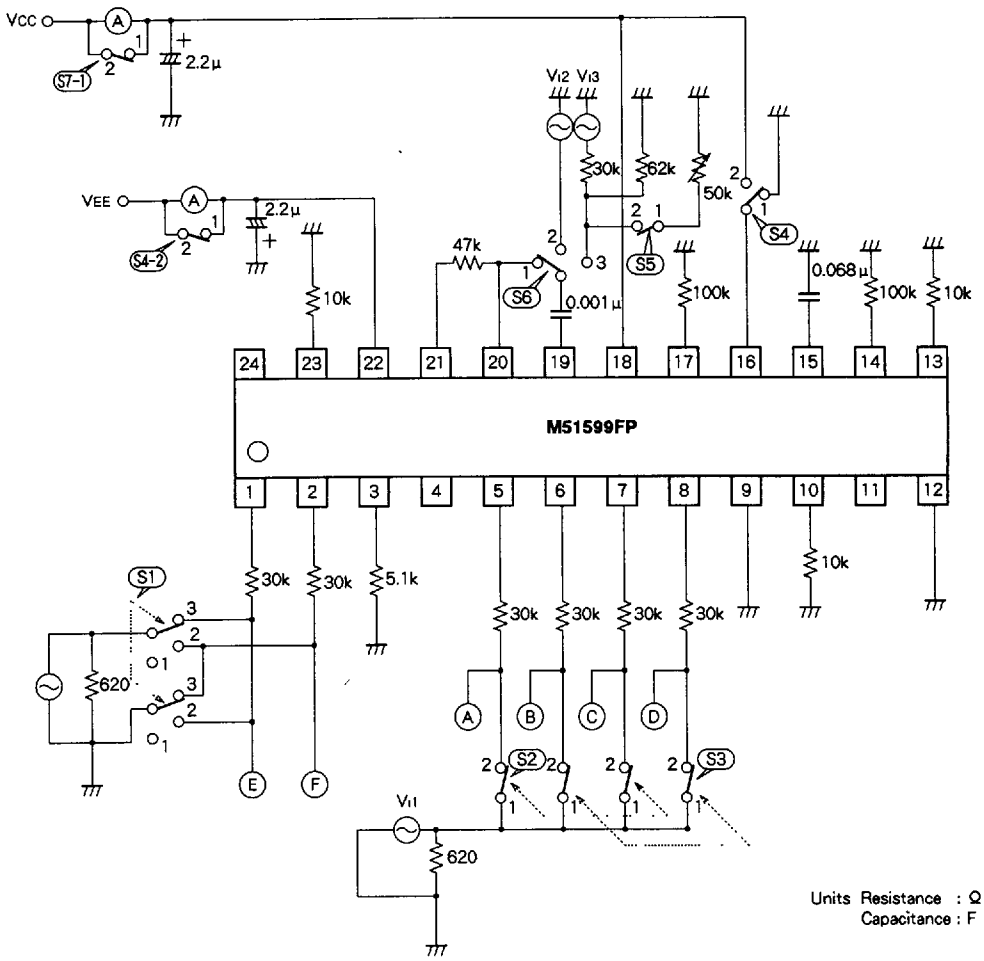
ABSOLUTE MAXIMUM RATINGS (Ta = 25℃, unless otherwise noted)

Symbol	Parameter	Ratings	Unit
V_{CC}	Supply voltage	13	V
I_{CC}	Circuit current	± 40	mA
V_I	Input voltage	V_{EE} − 0.3~V_{CC} + 0.3	V
V_O	Output voltage	V_{EE} − 0.3~V_{CC} + 0.3	V
P_d	Power dissipation	540	mW
T_{opr}	Operating temperature	−20~+75	℃
T_{stg}	Storage temperature	−40~+125	℃

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

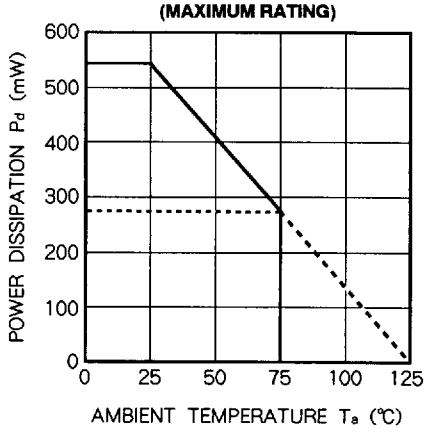
Symbol	Block	Parameter	Test conditions	Limits			Unit
				Min	Typ	Max	
I_{CC}		Circuit current	No signal	−	17	34	mA
I_{EE}				− 34	− 17	−	
G_{VHF}	HF	HF output voltage	A~D input f=500kHz, V_I = 78mV$_{P-P}$	1.35	1.5	1.65	V_{P-P}
f_{HF}	HF	HF frequency	A~D input f=2MHz, V_I=65mV$_{P-P}$	− 8	− 5	−	dB
V_{OHA}	HF	HF High output voltage		3.5	4.2	−	V
V_{OHF}	HF	HF output noise voltage	Input open	− 140	50	+ 190	mV
G_{VFE}	FE	FE output voltage	A, C input f=500kHz, V_I=78mV$_{P-P}$	2.1	3.0	3.9	V_{P-P}
V_{HAC}	FE	HF High output voltage	R_L = 10kΩ	3.2	4.0	−	V
V_{LAC}	FE	HF Low output voltage	R_L = 10kΩ	−	− 4.5	− 3.2	V
V_{OFE}	FE	Output offset voltage	Input open	− 195	0	+ 195	mV
G_{VTE}	TE	TE output voltage	E input f=1kHz V_I=38.4mV$_{P-P}$	0.7	1.0	1.3	V_{P-P}
V_{HE}	TE	TE High output voltage	R_L=10kΩ	3.2	4.0	−	V
V_{LE}	TE	TE Low output voltage	R_L=10kΩ	−	− 4.5	− 3.2	V
V_{OTE}	TE	Output offset voltage	Input open	− 160	0	+ 160	mV
V_{HOK}	HFOK	HFOK High output voltage		3.5	4.1	−	V
VLOK	HFOK	HFOK Low output voltage	No signal	−	0	0.4	V
V_{THK}	HFOK	Threshold voltage		0.26	0.37	0.48	V
V_{THOK}	MR	MR High output voltage	No signal	3.5	4.1	−	V
V_{LMR}	MR	MR Low output voltage		−	0	0.4	V
V_{THN}	MR	Envelope ratio (normal)	f = 500kHz (carrier)	0.26	0.36	0.46	−
V_{THJ}	MR	Envelope ratio (jump)	f = 500kHz (carrier)	0.5	0.6	0.7	−
f_{MRf}	MR	MR frequency	f = 500kHz (carrier), AM mod=55%	47	60	−	kHz

TEST CIRCUIT

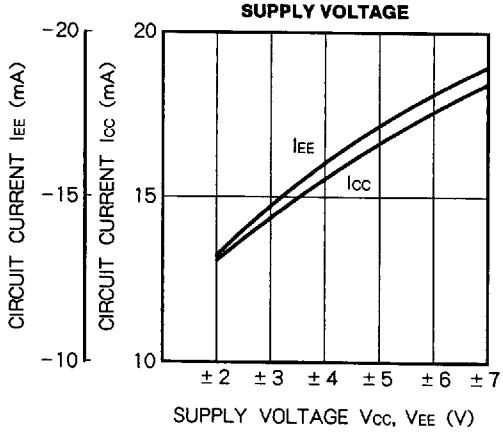


TYPICAL CHARACTERISTICS

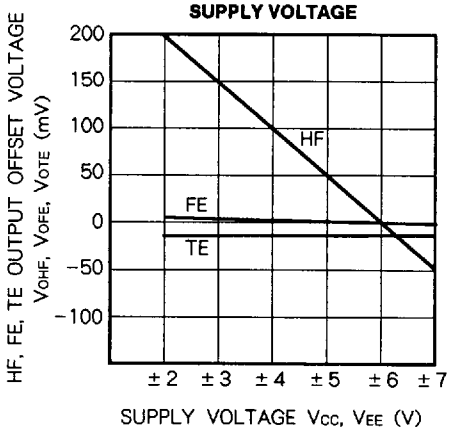
THERMAL DERATING (MAXIMUM RATING)



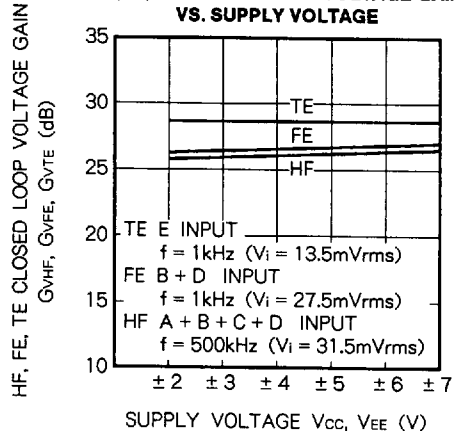
CIRCUIT CURRENT VS. SUPPLY VOLTAGE



HF, FE, TE OUTPUT OFFSET VOLTAGE VS. SUPPLY VOLTAGE



HF,FE, TE CLOSED LOOP VOLTAGE GAIN VS. SUPPLY VOLTAGE



HFOK OUTPUT VOLTAGE "H" "L" VS. SUPPLY VOLTAGE