M51802/M5F741P

OPERATIONAL AMPLIFIER

DESCRIPTION

The M51802L/M51802P is a semiconductor integrated circuit consisting of a differential amplifier and output circuit.
It is designed for a wide range of analog applications.

The high gain and wide range of operating voltage provides excellent performance in summing amplifer, integrator, and general feedback applications.

FEATURES

- No frequency compensation required
- Short-circuit protection
- No latch up
- Offset voltage null capability
- Large common mode and differential voltage ranges
- Low power dissipation

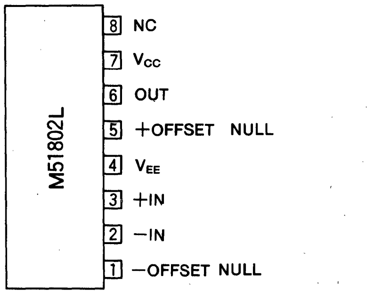
APPLICATION

General feedback applications

RECOMMENDED OPERATING CONDITIONS

Supply voltage range ················ $V_{CC}(+V)$, $V_{EE}(-V)$ 4~18V
Rated supply voltage ················ $V_{CC}(+V)$, $V_{EE}(-V)$ 15V

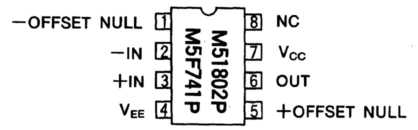
PIN CONFIGURATION (TOP VIEW)



Outline 8P5

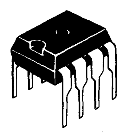
NC : NO CONNECTION

PIN CONFIGURATION (TOP VIEW)

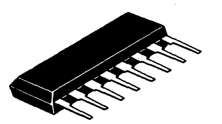


Outline 8P4

NC : NO CONNECTION

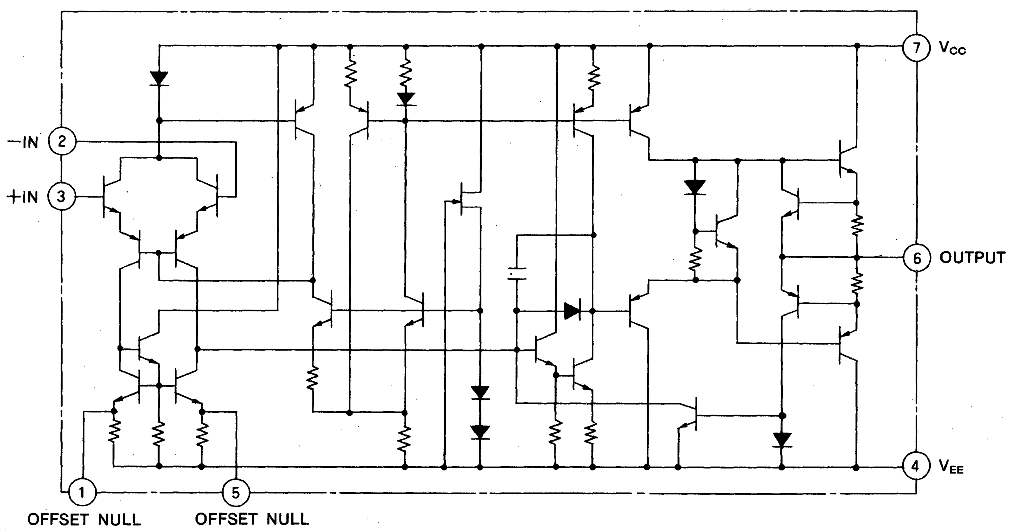


8-pin molded plastic DIL



8-pin molded plastic SIL

EQUIVALENT CIRCUIT



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

Symbol	Parameter	Conditions	Limits	Unit
V_{CC}	Supply voltage		18	V
V_{EE}			−18	V
V_{id}	Differential input voltage		±30	V
V_{ic}	Common mode input voltage	(Note 1)	±15	V
P_d	Power dissipation		360(SIL)	mW
			625(DIL)	
K_θ	Thermal derating	T_a≧25℃	3.6(SIL)	mW/℃
			6.25(DIL)	
T_{opr}	Operating temperature		−20～+75	℃
T_{stg}	Storage temperature		−40～+125	℃

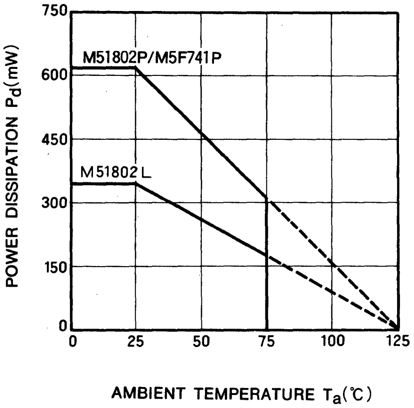
Note : 1. For supply voltages less than ±15V, the absolute maximum input voltage is equal to the supply voltage.

ELECTRICAL CHARACTERISTICS (T_a=25℃, V_{CC}=+15V, V_{EE}=−15V)

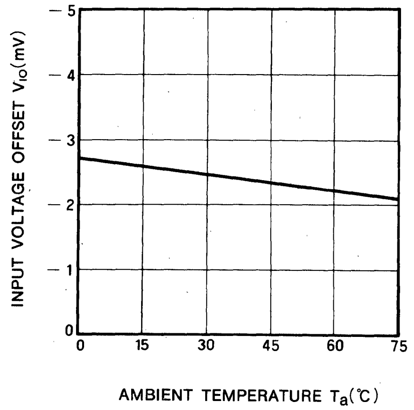
Symbol	Parameter		Test conditions	Limits			Unit
				Min	Typ	Max	
V_{IO}	Input offset voltage		R_g≦10kΩ		1.0	5.0	mV
I_{IB}	Input bias current				150	500	nA
I_{IO}	Input offset current				30	200	nA
R_{in}	Input resistance		Input frequency f=1kHz		1.0		MΩ
G_V	Voltage gain		R_L≧2kΩ, V_O=±10V	86	100		dB
V_{OPP}	Output voltage swing		R_g≧10kΩ	±12	±14		V
			R_g≧2kΩ	±10	±13		V
V_{IC}	Input voltage range			±12	±13		V
CMRR	Common mode rejection ratio		R_g≦10kΩ	70	90		dB
SVRR	Supply voltage rejection ratio		R_g≦10kΩ		80	150	μV/V
P_d	Power dissipation		R_L=∞		50	85	mW
t_r	Transient response	Rise time	V_{in}=20mV, R_L=2kΩ, C_L≦100pF		0.3		μs
K_{OV}		Over shoot			5.0		%
SR	Slew rate		R_L=2kΩ		0.5		V/μs

TYPICAL CHARACTERISTICS

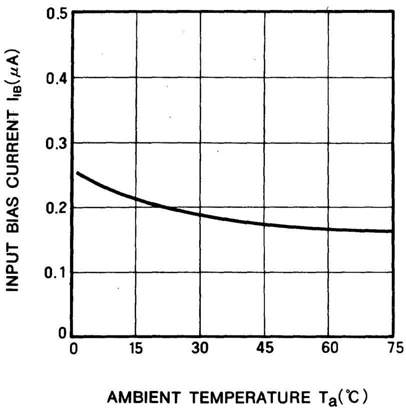
THERMAL DERATING
(MAXIMUM RATING)



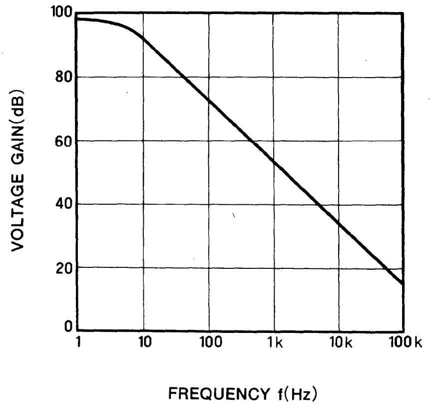
INPUT VOLTAGE OFFSET
VS AMBIENT TEMPERATURE



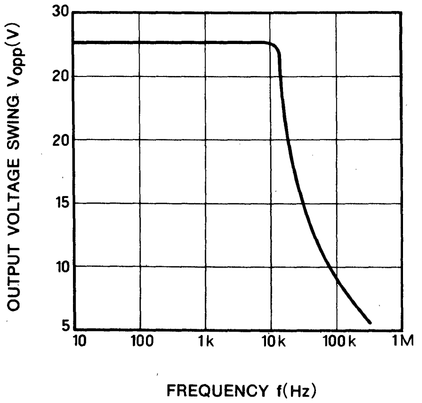
INPUT BIAS CURRENT VS
AMBIENT TEMPERATURE



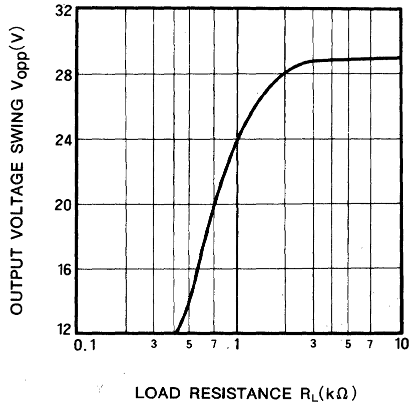
VOLTAGE GAIN VS
FREQUENCY



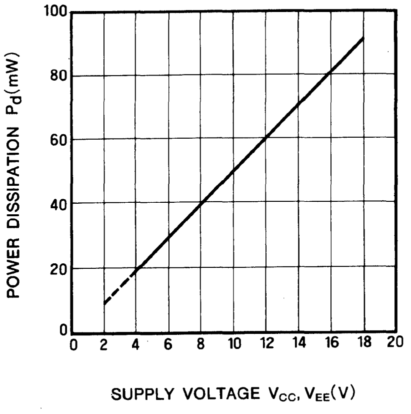
OUTPUT VOLTAGE SWING
VS FREQUENCY



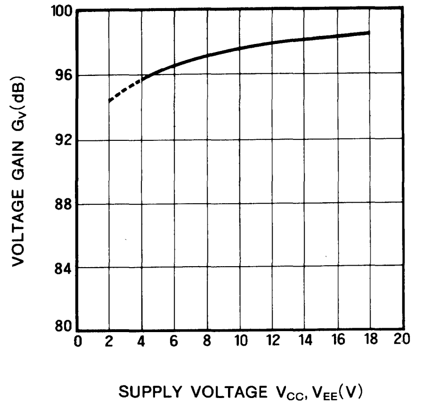
OUTPUT VOLTAGE SWING
VS LOAD RESISTANCE



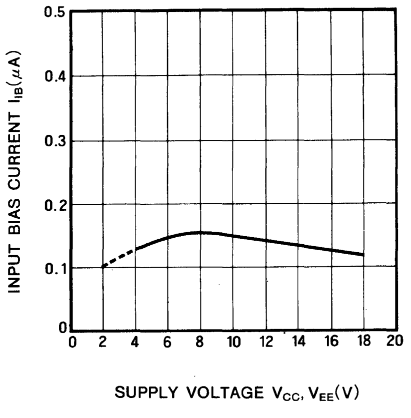
POWER DISSIPATION VS SUPPLY VOLTAGE



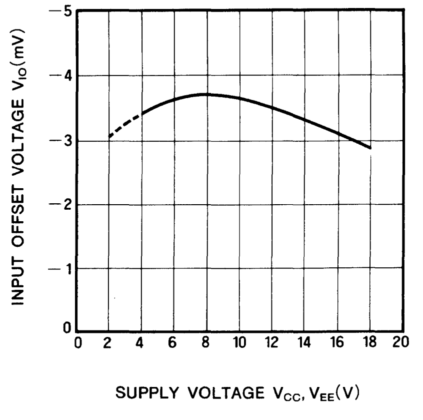
VOLTAGE GAIN VS SUPPLY VOLTAGE



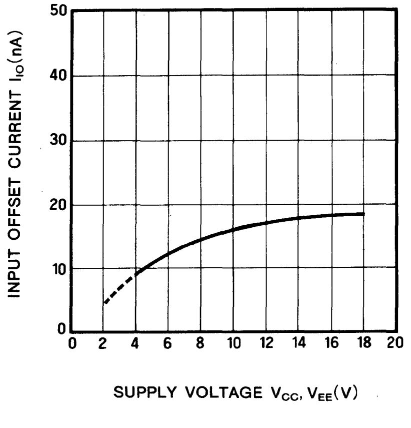
INPUT BIAS CURRENT VS SUPPLY VOLTAGE



INPUT OFFSET VOLTAGE VS SUPPLY VOLTAGE

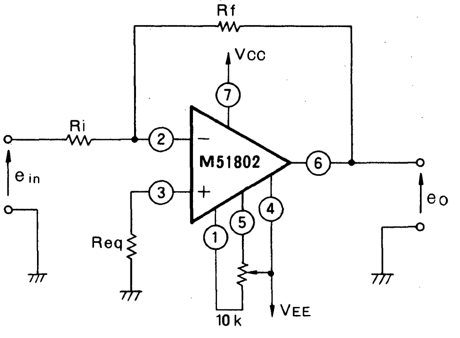


INPUT OFFSET CURRENT VS SUPPLY VOLTAGE



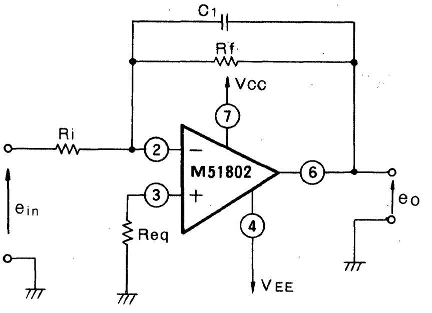
APPLICATION EXAMPLES

(1) INVERSE POLARITY AMP



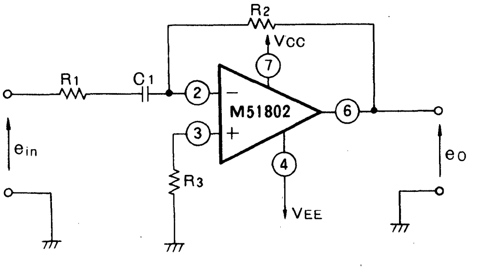
$R_{eq}=\frac{R_f \cdot R_i}{R_f+R_i}$ $A_{vo}=\frac{R_f}{R_i}$

(2) INTEGRATOR



$R_{eq}=\frac{R_f \cdot R_i}{R_f+R_i}$ $e_o=\frac{1}{R_iC_i}\int e_{in}dt$

(3) DIFFERENTIATOR



$e_o=R_2C_i\frac{de_{in}}{dt}$