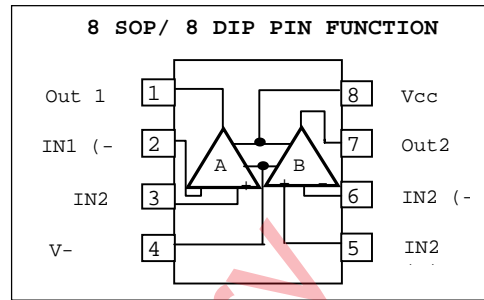


FEATURES

- Internally frequency compensated for unity gain
- Large DC voltage gain : 100dB
- Wide power supply range : 3V~32V(or±1.5V~16V)
- Input common-mode voltage range includes ground
- Large output voltage swing : 0V DC to $V_{CC}-1.5V$ DC
- Power drain suitable for battery operation



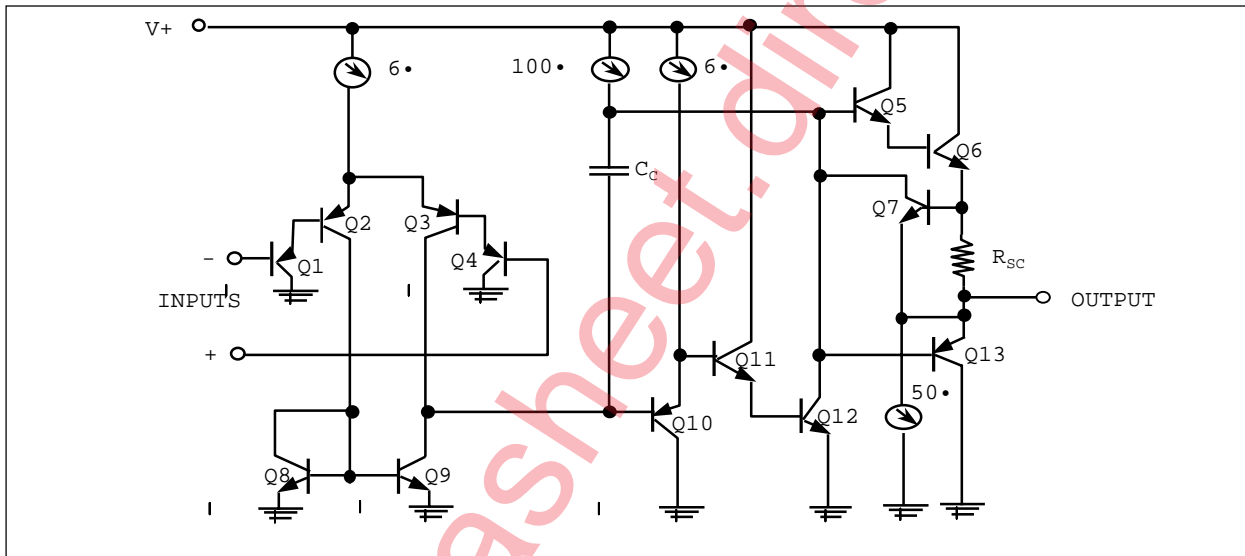
ORDERING INFORMATION

Device	Package
LM358D	8 SOP
LM358N	8 DIP

DUAL OPERATIONAL AMPLIFIERS

LM358 consists of four independent, high gain, internally frequency compensated operational amplifiers which were designed specifically to operate from a single power supply over a wide range of voltage. Operation from split power supplies is also possible and the low power supply current drain is independent of the magnitude of the power supply voltage. Application areas include transducer amplifier, DC gain blocks and all the conventional OP amp circuits which now can be easily implemented in single power supply systems.

EQUIVALENT CIRCUIT



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ABSOLUTE MAXIMUM RATINGS

CHARACTERISTIC	SYMBOL	VALUE	UNIT
Supply Voltage	V_{CC}	±16 or 32	V
Differential Input Voltage	$V_{I(DIFF)}$	±32	V
Input Voltage	V_I	-0.3 to +32	V

Output Short Circuit to GND $V_{CC} \cdot V_{T_A} = 25 \cdot$ (One Amp) Operating Temperature Range Storage Temperature Range	T_{OPR} T_{STG}	Continuous 0 to +70 -65 to +150	• •
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Electrical characteristics at specified free-air temperature, $V_{CC}=5V$ (unless otherwise noted)

PARAMETER	TEST CONDITIONS*	LM358			UNIT
		MIN	TYP	MAX	
V_{IO} Input Offset Voltage	$V_{CC}=5V$ to MAX, $V_{IC}=V_{ICR}$ MIN, $V_O=1.4V$	25• Full Range	3 7	7 9	•
V_{IO} Average Temperature Coefficient of Input Offset Voltage		Full Range	7		•/•
I_{IO} Input Offset Current	$V_O=1.4V$	25• Full Range	2	50 150	•
I_{IO} Average Temperature Coefficient of Input Offset Current		Full Range	10		•/•
I_{IB} Input Bias Current	$V_O=1.4V$	25• Full Range	-20	-250 -500	•
V_{ICR} Common-Mode Input Voltage Range	$V_{CC}=5V$ to MAX	25• Full Range	0 to $V_{CC}-1.5$ 0 to $V_{CC}-2$		V
V_{OH} High-Level Output Voltage	$R_L \cdot 2 \cdot$ $V_{CC}=MAX, R_L=2 \cdot$ $V_{CC}=MAX,$ $R_L \cdot 10 \cdot$	25• Full Range Full Range	$V_{CC}-1.5$ 26	28	V
V_{OL} Low-Level Output Voltage	$R_L \cdot 10 \cdot$	Full Range	5	20	•
A_{VD} Large-Signal Differential Voltage Amplification	$V_{CC}=15V,$ $V_O=1V$ to 11V, $R_L \cdot 2 \cdot$	25• Full Range	25	100	V/•
CMRR Common-Mode Rejection Ratio	$V_{CC}=5V$ to MAX, $V_{IC}=V_{ICR}$ MIN	25•	65	80	•
K_{SVR} Supply Voltage Rejection Ratio(V_{CC}/ V_{IO})	$V_{CC}=5V$ to MAX	25•	65	100	•
V_{D1}/V_{D2} Crosstalk Attenuation	$f=1$ kHz to 20kHz	25•		120	•
I_O Output Current	$V_{CC}=15V,$ $V_{ID}=1V, V_O=0$	25• Full Range	-20	-30	•
	$V_{CC}=15V,$ $V_{ID}=-1V, V_O=15V$	25• Full Range	-10	20	
	$V_{ID}=-1V,$ $V_O=200 \cdot$	25•	5	30	
I_{OS} Short-Circuit Output Current	V_{CC} at 5V, GND at -5V, $V_O=0$	25•	±40	±60	•
I_{CC} Supply Current (Two Amplifiers)	$V_O=2.5V,$ No Load	Full Range	0.7	1.2	•
	$V_{CC}=MAX,$ $V_O=0.5V_{CC},$ No Load	Full Range	1	2	

* All characteristics are measured under open-loop conditions with zero common-mode input voltage unless otherwise specified <<MAX>> V_{CC} for testing purpose is 30V. Full range is 0• to 70•.

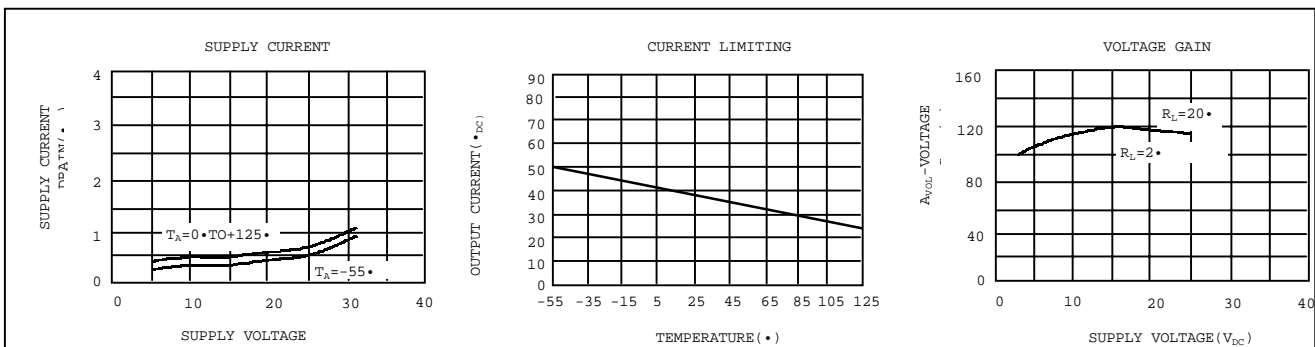
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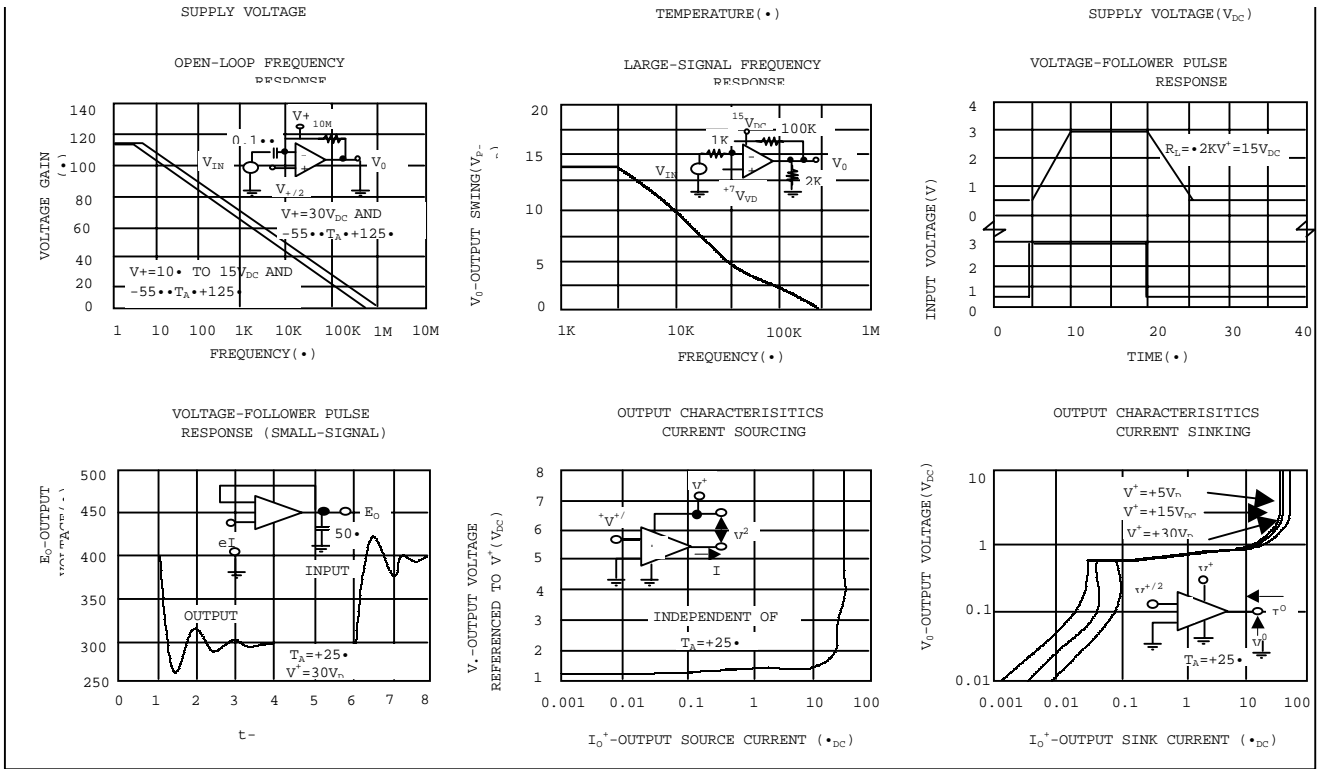
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LOW POWER DUAL OPERATIONAL AMPLIFIERS

LM358

TYPICAL PERFORMANCE CHARACTERISTICS





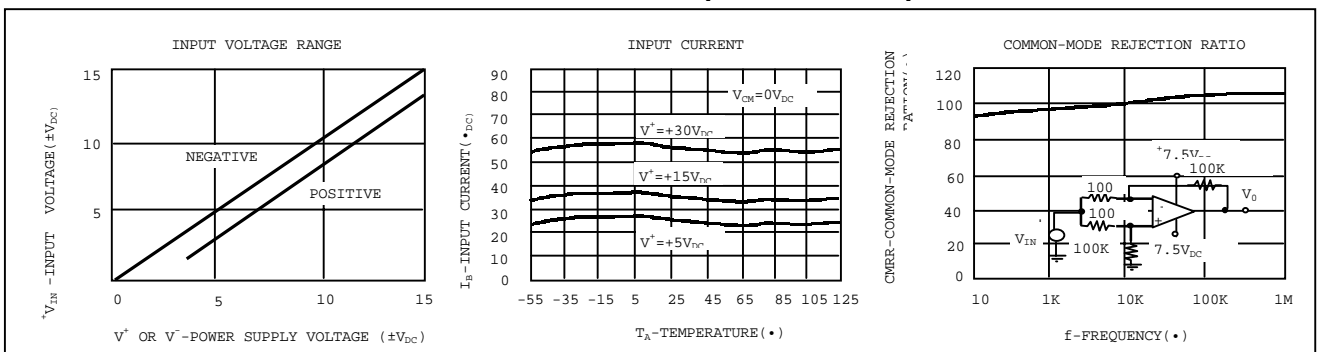
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LOW POWER DUAL OPERATIONAL AMPLIFIERS

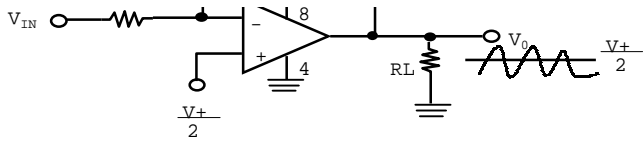
LM358

TYPICAL PERFORMANCE CHARACTERISTICS (CONTINUED)

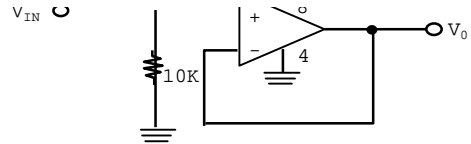


TYPICAL APPLICATIONS

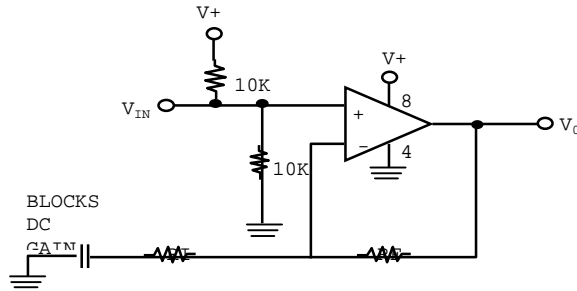




SINGLE SUPPLY INVERTING AMPLIFIER



INPUT BIASING VOLTAGE FOLLOWER



NON-INVERTING AMPLIFIER

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