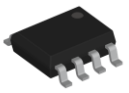
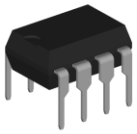
Dual Operational Amplifiers LM358

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 VCC-1.5V DC
- Power drain suitable for battery operation
- Moisture Sensitivity Level 3



SOP-8



DIP-8

ORDERING INFORMATION

Device	Package
LM358D	SOP-8
LM358N	DIP-8

DESCRIPTION

The LM358 consists of two independent, high gain, internally frequency compensated operational amplifiers which were designed specifically to operate from a single power supply over a wide range of voltages. 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 amplifiers, DC gain blocks and all the conventional op amp circuits.

Which now can be easily implemented in single power supply systems.

ABSOLUTE MAXIMUM RATING

CHARACTERISTIC	SYMBOL	VALUE	UNIT
Supply Voltage	V_{CC}	±16V or 32V	V
Differential Input Voltage	$V_{I(DIF)}$	±32V	V
Input Voltage	V_I	-0.3V to 32V	V
Output Short Circuit to GND		Continuous	
$V_{CC} \leq$ V T_A=25℃ (One Amp)			
Operating Temperature Range	T_{OPR}	0 to 70℃	℃
Storage Temperature Range	T_{STG}	-65℃ to 150℃	℃

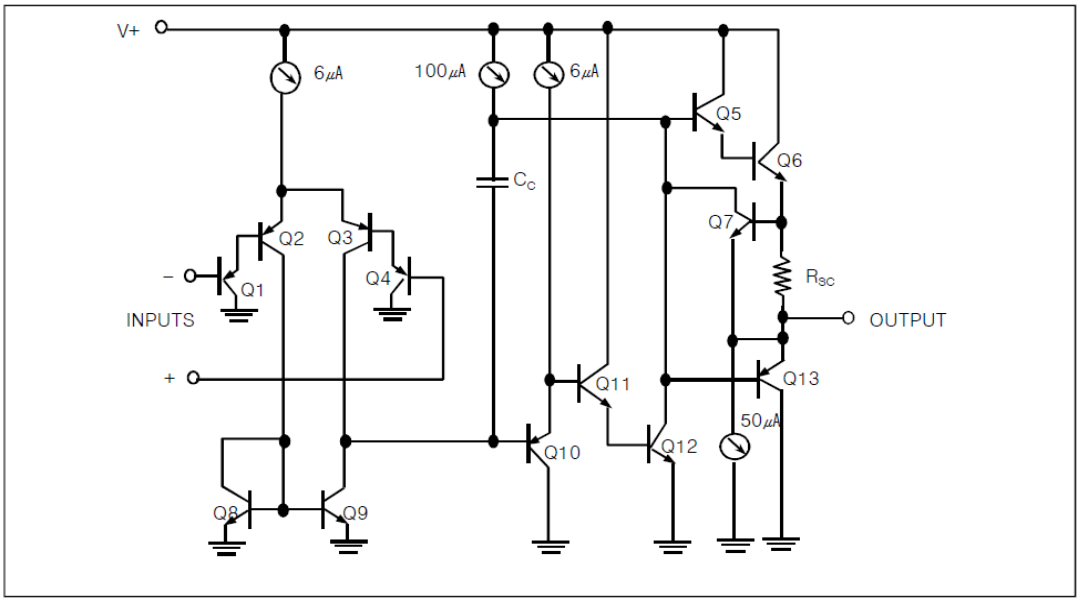
ELECTRICAL CHARACTERISTICS

Electrical characteristics at specified free-air temperature, VCC=5V(unless otherwise noted)

PARAMETER	TEST CONDITIONS*		MIN	TYP	MAX	UNIT
V_{IO} Input offset voltage	V_{CC}=5V to MAX, $V_{IC}=V_{ICR}$ min, V_O=1.4V	25℃		3	7	mV
		Full range			9	
αV_{IO} Average temperature coefficient of input offset voltage		Full range		7		μV/℃
I_{IO} Input offset current	V_O=1.4V	25℃		2	50	nA
		Full range			150	
αI_{IO} Average temperature coefficient of input offset current		Full range		10		pA/℃
I_{IB} Input bias current	V_O=1.4V	25℃		-20	-250	nA
		Full range			-500	
V_{ICR} Common-mode input voltage range	V_{CC}=5V to MAX	25℃	0		V_{CC}-1.5	V
		Full range	0		V_{CC}-2.0	
V_{OH} High-level output voltage	V_{CC}=MAX, R_L=2kΩ	Full range	26			V
	V_{CC}=MAX, R_L≥10kΩ	Full range	27	28		
V_{OL} Low-level output voltage	R_L≥10kΩ	Full range		5	20	mV
A_{VD} Large-signal differential voltage amplification	V_{CC}=15V V_O=1V to 11V R_L≥2kΩ	25℃	25	100		V/mV
		Full range	15			
THD Total harmonic distortion	F=1kHz, A_V=20dB, R_L=2KΩ, V_O=2V_{PP}, C_L=100pF	25℃		0.02		%
CMRR Common-mode rejection ratio	V_{CC} = 5 V to MAX, $V_{IC}=V_{ICR}$ min	25℃	65	80		dB
k_{SVR} Supply voltage rejection ratio ($\Delta V_{CC}/\Delta V_{IO}$)	V_{CC} = 5 V to MAX	25℃	65	100		dB
V_O1/V_O2 Crosstalk attenuation	f=1kHz to 20kHz	25℃		120		dB
I_O Output current	V_{CC}=15V, V_{ID}=1V, V_O=0V	25℃	-20	-30		mA
		Full range	-10			
	V_{CC}=15V, V_{ID}= -1V, V_O=15V	25℃	10	20		
		Full range	5			
	V_{ID}= -1 V, V_O= 200mV	25℃	12	30		μA
I_{OS} Short-circuit output current	V_{CC} at 5V, GND at -5V, V_O=0	25℃		±40	±60	mA
I_{CC} Supply current (Two amplifiers)	Vo=2.5 V, No load	Full range		0.7	1.2	mA
	V_{CC} = MAX, Vo = 0.5Vcc, No load	Full range		1	2	

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

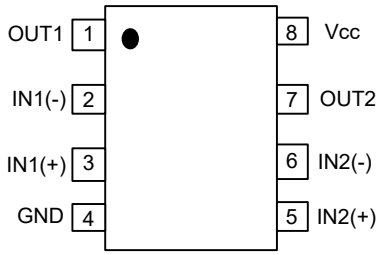
EQUIVALENT CIRCUIT



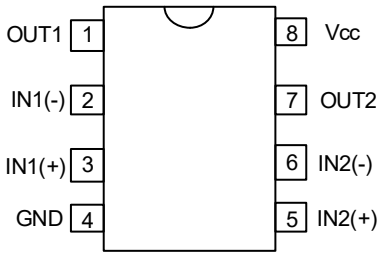
ORDERING INFORMATION

Package	Order No.	Description	Supply As	Status
SOP-8	LM358D	Dual Operational Amplifier, Pb-Free	Reel	Active
DIP-8	LM358N	Dual Operational Amplifier, Pb-Free	Reel	Active

PIN CONFIGULATION



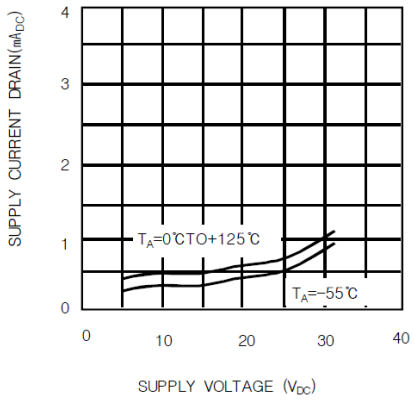
SOP-8



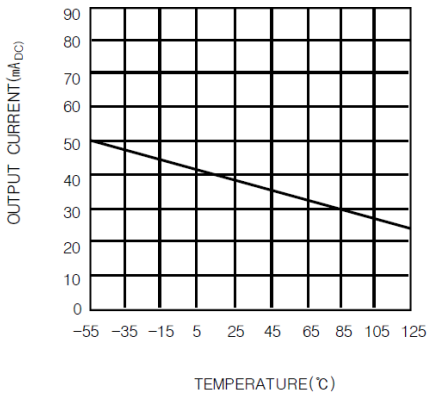
DIP-8

TYPICAL PERFORMANCE CHARACTERISTICS

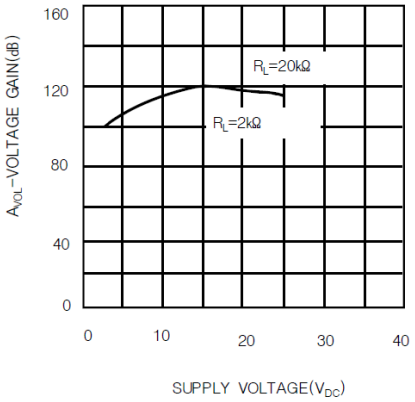
SUPPLY CURRENT



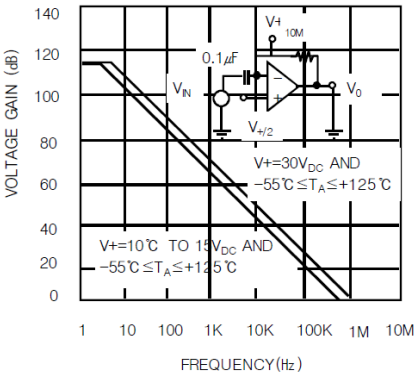
CURRENT LIMITING



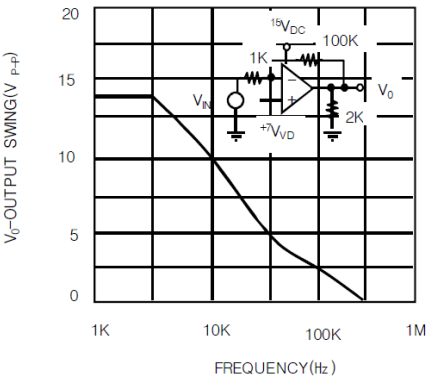
VOLTAGE GAIN



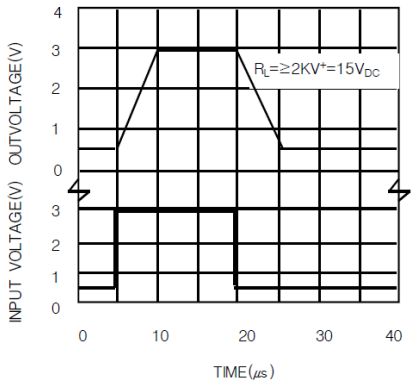
OPEN-LOOP FREQUENCY RESPONSE



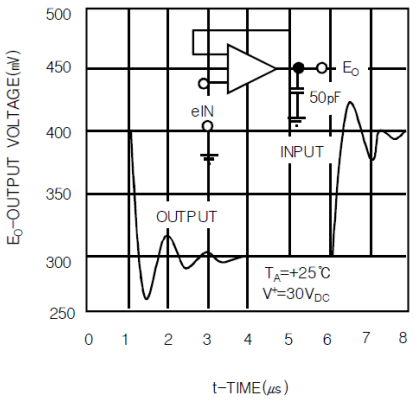
LARGE-SIGNAL FREQUENCY RESPONSE



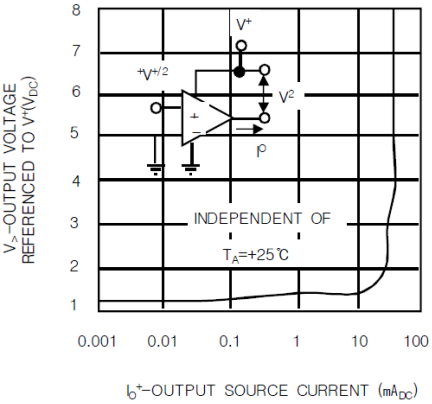
VOLTAGE-FOLLOWER PULSE RESPONSE



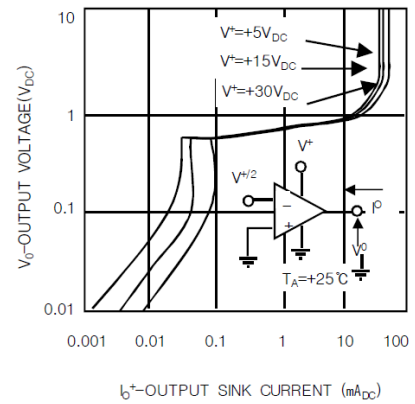
VOLTAGE-FOLLOWER PULSE RESPONSE (SMALL-SIGNAL)



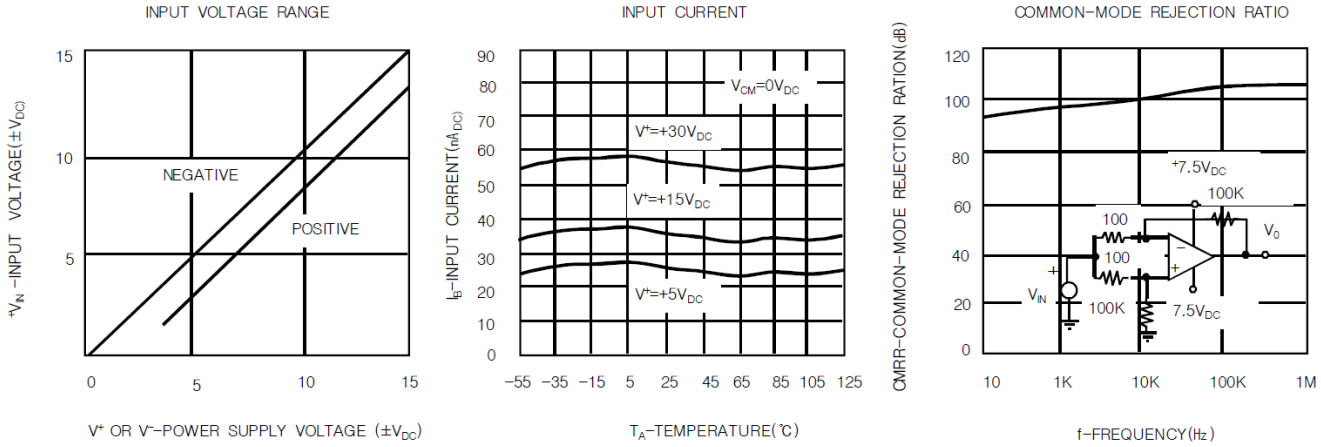
OUTPUT CHARACTERISITICS CURRENT SOURCING



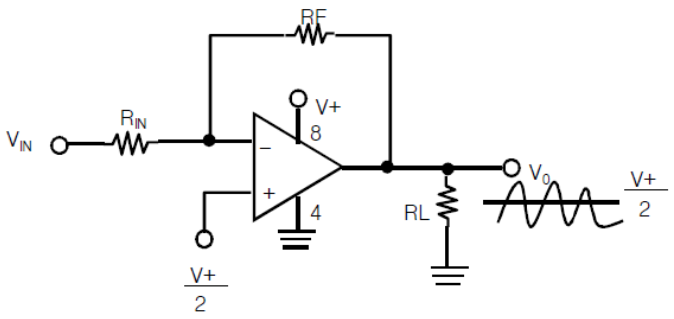
OUTPUT CHARACTERISITICS CURRENT SINKING



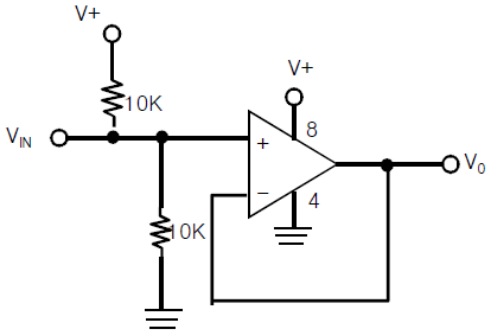
TYPICAL PERFORMANCE CHARACTERISTICS (CONTINUED)



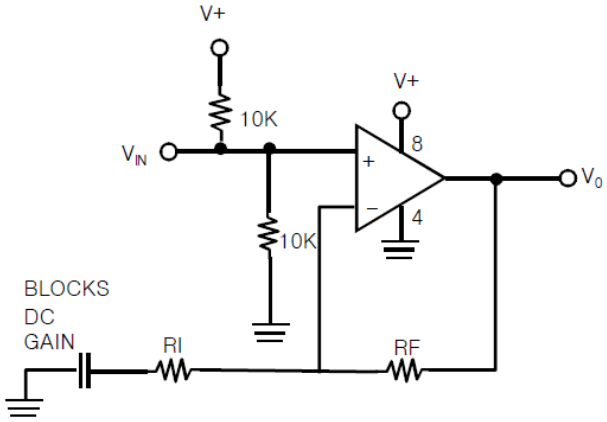
TYPICAL APPLICATIONS



SINGLE SUPPLY INVERTING AMPLIFIER



INPUT BIASING VOLTAGE POLLOWER



NON–INVERTING AMPLIFIER

REVISION NOTICE

The description in this datasheet can be revised without any notice to describe its electrical characteristics properly.