

Description

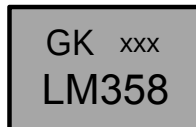
The LM358 consists of two independent high gain, internally frequency compensated operational amplifier. It can be operated from a single power supply and also split power supplies.

Features

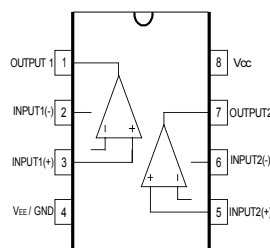
- * Internally frequency compensated for unity gain.
- * Wide power supply range 3V - 36V.
- * Input common-mode voltage range include ground.
- * Large DC voltage gain.

Applications

- * General purpose amplifier.
- * Transducer amplifier.



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PIN CONFIGURATIONS

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

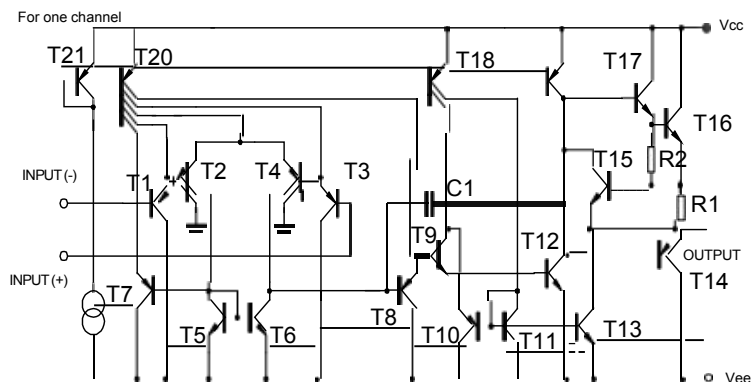
Absolute Maximum Ratings

PARAMETER	SYMBOL	VALUE	UNIT
Supply Voltage	V _{CC}	+ -18 or 36	V
Differential Input Voltage	V _I (DIFF)	36	V
Input Voltage	V _I	-0.3 ~ +36	V
Output Short to Ground		Continuous	V
Operating Temperature Range	TOPR	0 ~ +70	°C
Storage Temperature Range	TSTG	-65 ~ +150	°C

Electrical Characteristics ($T_J=25^{\circ}\text{C}$ unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Input Offset Voltage	VIO	VCM=0V to VCC- 1.5V VO(P)=1.4V, RS=0 Ω		2.9	7.0	mV
Input Offset Current	IIO			5	50	nA
Input Bias Current	IBIAS			45	250	nA
Input Common Mode Voltage	VI(R)	VCC=30V	0		VCC- 1.5	V
Power Supply Current	ICC	RL=记, VCC=30V		0.8	2.0	mA
		RL=记, Full Temperature Range		0.5	1.2	mA
Large Signal Voltage Gain	GV	VCC=15V, RL>=2K Ω VO(P)=1V to 11V	25	100		V/mV
Output Voltage Swing	VO(H)	VCC=30V, RL=2K Ω	26			V
		VCC=30V, RL=10K Ω	27	28		V
	VO(L)	VCC=5V, RL>=10K Ω		5	20	mV
Common Mode Rejection Ratio	CMRR		65	80		dB
Power Supply Rejection Ratio	PSRR		65	100		dB
Channel Separation	CS	f=1KHZ to 20KHZ		120		dB
Short Circuit Current to Ground	ISC			40	60	mA
Output Current	ISOURCE	VI(+)=1V, VI(-)=0V VCC=15V, VO(P)=2V	20	30		mA
	ISINK	VI(+)=0V, VI(-)=1V VCC=15V, VO(P)=2V	10	15		mA
		VI(+)=0V, VI(-)=1V VCC=15V, VO(P)=200mV	12	100		mA
Differential Input Voltage	VI(DIFF)				VCC	V

BLOCK DIAGRAM



RATING AND CHARACTERISTIC CURVES

Fig. 1 Input Voltage Range

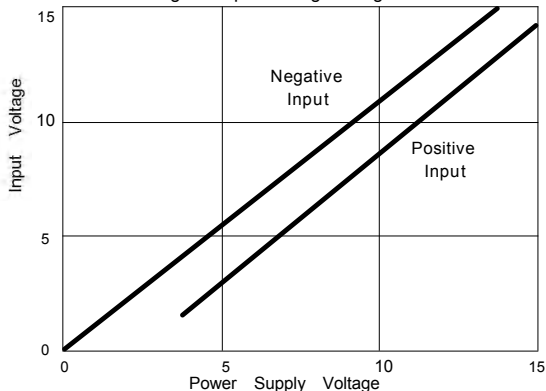


Fig. 2 Input Current vs Temperature

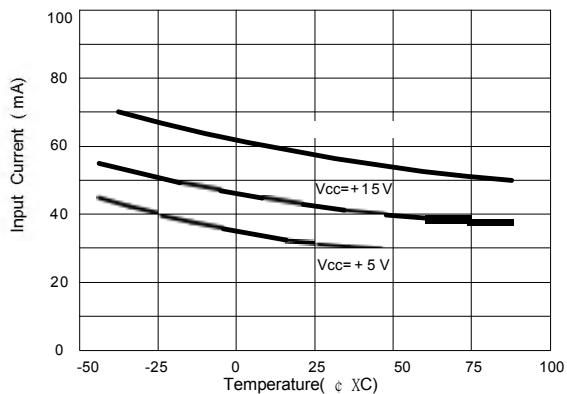


Fig. 3 Input Current vs Supply Voltage

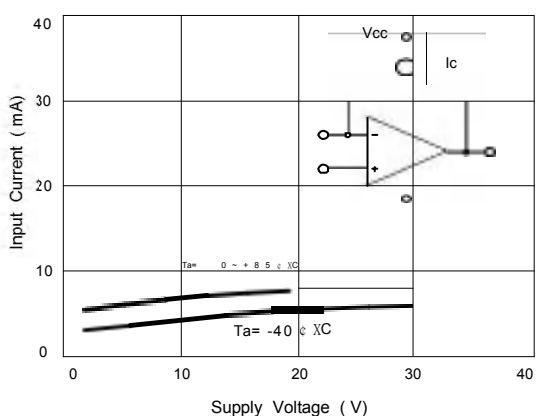


Fig. 4 Voltage Gain vs Supply Voltage

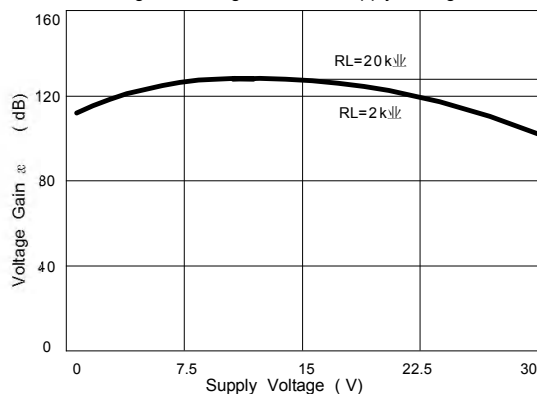


Fig. 5 Open Loop Gain vs Frequency

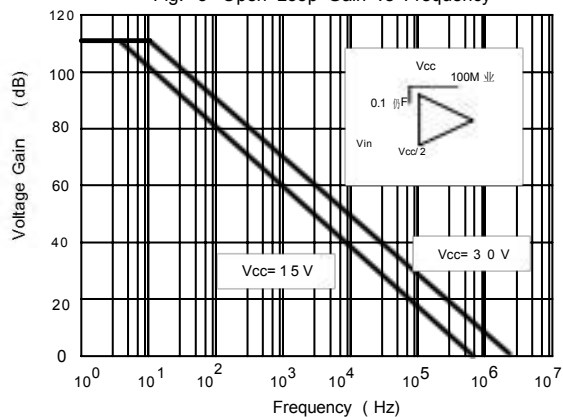
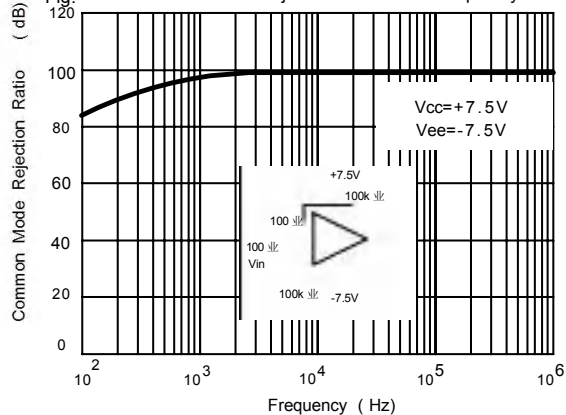


Fig. 6 Common Mode Rejection Ratio vs Frequency



RATING AND CHARACTERISTIC CURVES

Fig. 7 Voltage Follower Pulse Response

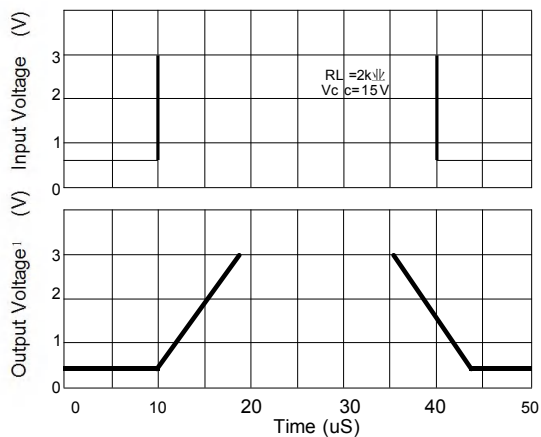


Fig. 8 Voltage Follower Response (Small Signal)

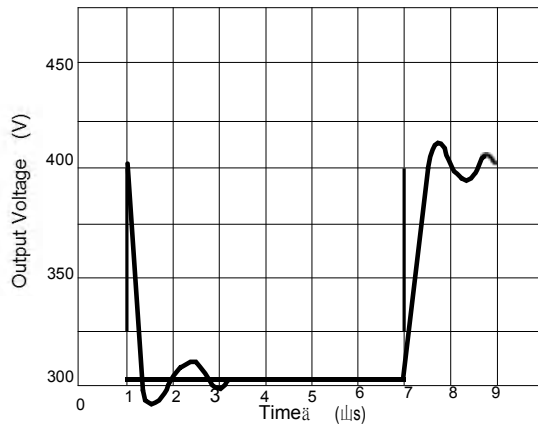


Fig. 9 Gain vs Large Signal Frequency

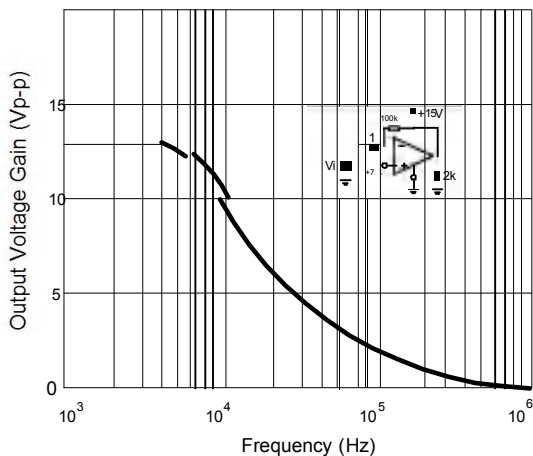


Fig. 10 Output Current Sinking vs Output Voltage

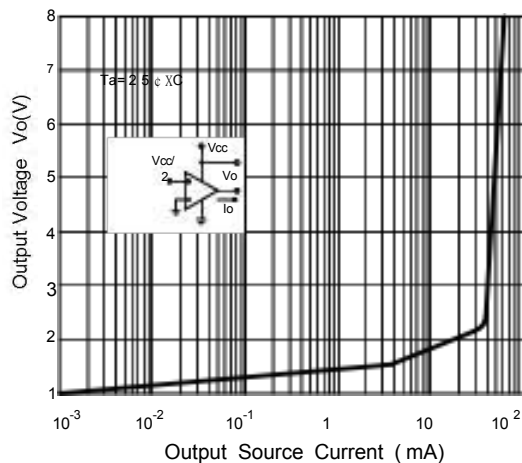


Fig. 11 Output Sink Current vs Output Voltage

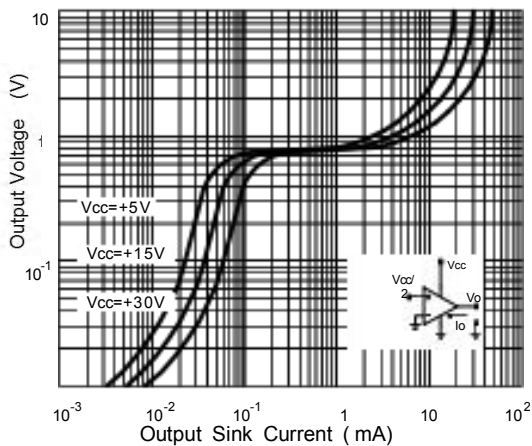
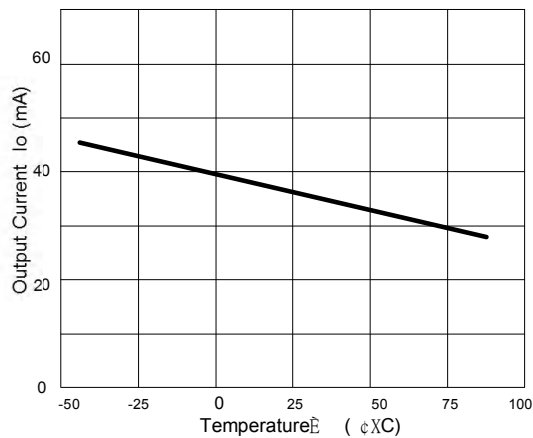
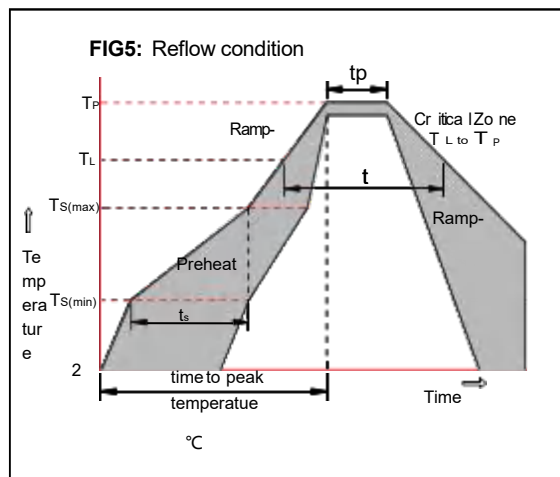


Fig. 12 Current Limiting vs Temperature



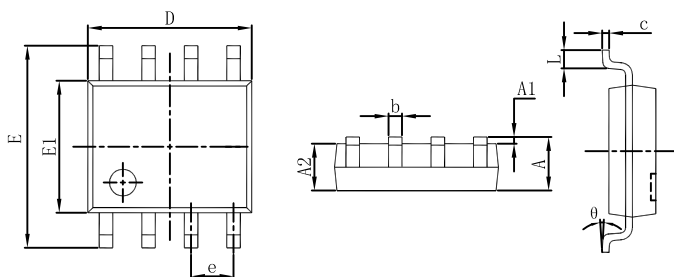
Soldering parameters

Reflow Condition		Pb-Free assembly (see as below)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150°C
	-Temperature Max($T_{s(max)}$)	+200°C
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3°C/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3°C/sec. Max
Reflow	-Temperature(T_L)(Liquid us)	+217°C
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_P)		+260(+0/-5)°C
Time within 5°C of actual Peak Temp (t_P)		30 secs. Max
Ramp-down Rate		6°C/sec. Max
Time 25°C to Peak Temp (T_P)		8 min. Max
Do not exceed		+260°C

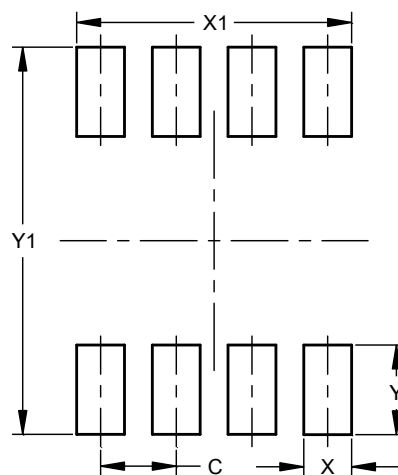


Package Dimensions & Suggested Pad Layout

SOP-8

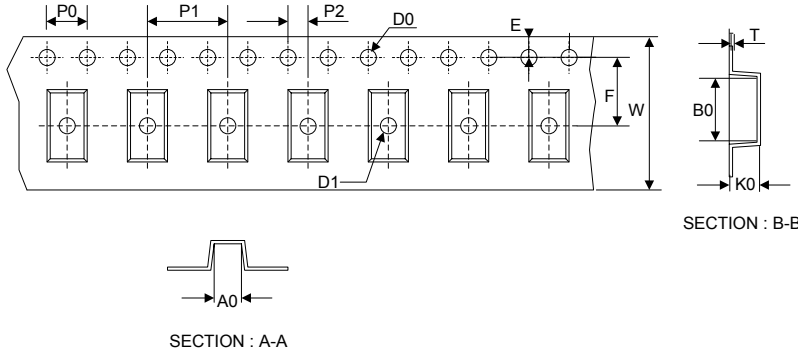
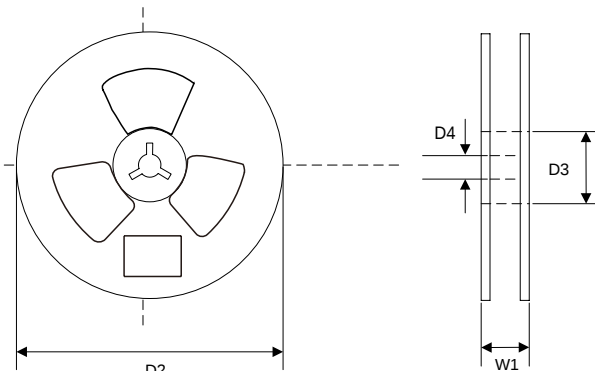
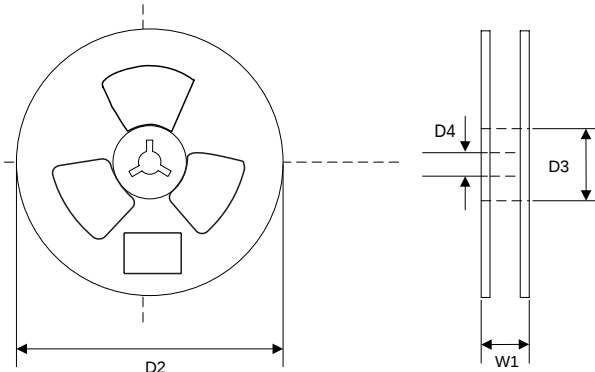


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.007	0.010
D	4.800	5.000	0.189	0.197
e	1.270 (BSC)		0.050 (BSC)	
E	5.800	6.200	0.228	0.244
E1	3.800	4.000	0.150	0.157
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°



Dimensions	Value (in mm)
C	1.27
X	0.70
X1	4.51
Y	2.00
Y1	7.00

Tape & reel specification

Tape		Symbol	Dimension (mm)
		P0	4.00±0.20
		P1	8.00±0.20
		P2	2.00±0.20
		D0	1.55±0.20
		D1	1.55±0.20
		E	1.75±0.15
		F	5.50±0.20
		W	12.00±0.20
		A0	7.00±0.20
		B0	5.70±0.20
		K0	1.35±0.20
		T	0.23±0.20
13" Reel		D2	330.0±5.0
		D3	73Min.
		D4	13.5±2.5
		W1	16.0±3.0
		Quantity: 3000PCS	
13" Reel		D2	330.0±5.0
		D3	73Min.
		D4	13.5±2.5
		W1	16.0±3.0
		Quantity: 4000PCS	