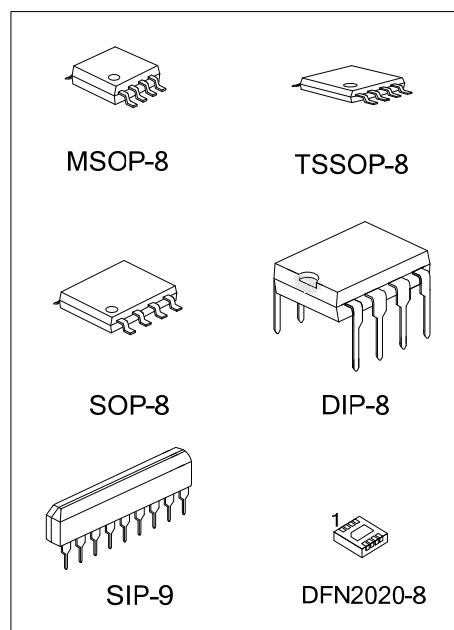


**LM358B****LINEAR INTEGRATED CIRCUIT****DUAL OPERATIONAL
AMPLIFIER****■ DESCRIPTION**

The UTC **LM358B** 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 - 32V.
- *Input common-mode voltage range include ground.
- *Large DC voltage gain.
- *High ESD (2kV, HBM)

**■ ORDERING INFORMATION**

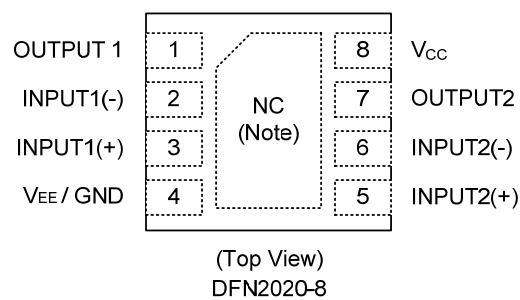
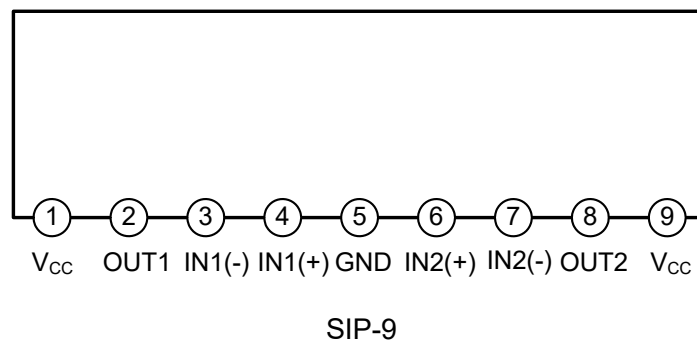
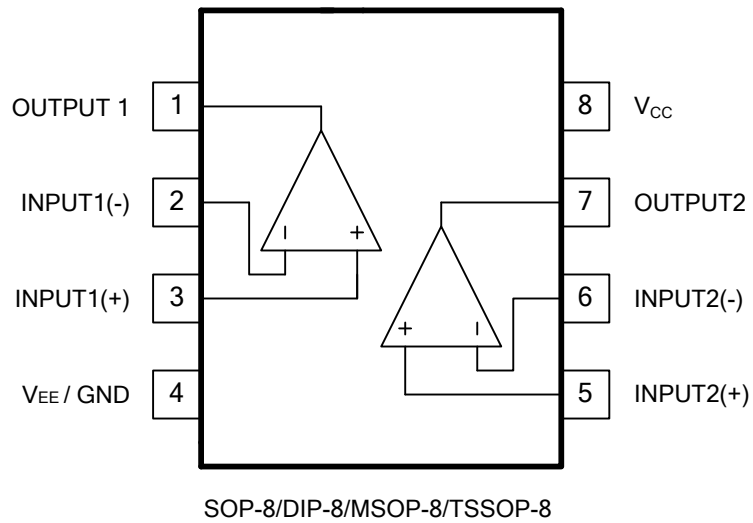
Ordering Number		Package	Packing
Lead Free	Halogen-Free		
LM358BL-D08-T	LM358BG-D08-T	DIP-8	Tube
LM358BL-L09-T	LM358BG-G09-T	SIP-9	Tube
LM358BL-P08-R	LM358BG-P08-R	TSSOP-8	Tape Reel
LM358BL-S08-R	LM358BG-S08-R	SOP-8	Tape Reel
LM358BL-SM1-R	LM358BG-SM1-R	MSOP-8	Tape Reel
LM358BL-K08-2020-R	LM358BG-K08-2020-R	DFN2020-8	Tape Reel

LM358BG-D08-T (1) Packing Type (2) Package Type (3) Green Package	(1) T: Tube, R: Tape Reel (2) D08: DIP-8, G09: SIP-9, S08: SOP-8, P08: TSSOP-8, SM1: MSOP-8, K08-2020: DFN2020-8 (3) G: Halogen Free and Lead Free, L: Lead Free
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■ MARKING

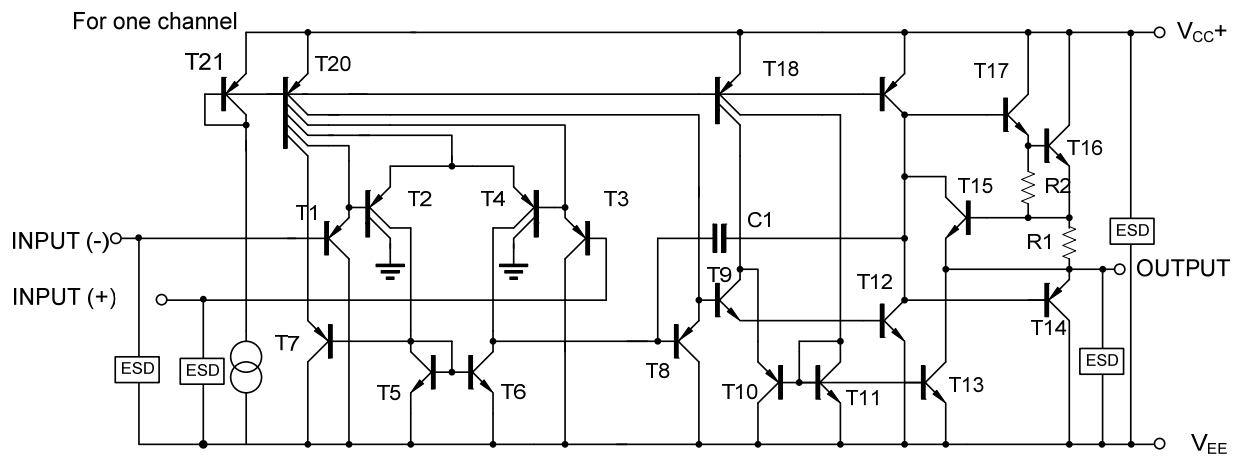
DIP-8	SOP-8/MSOP-8	TSSOP-8
UTC □□□□ → Date Code L: Lead Free G: Halogen Free □□ → Lot Code	UTC □□□□ → Date Code L: Lead Free G: Halogen Free □□ → Lot Code	UTC □□□□ → Date Code L: Lead Free G: Halogen Free □□ → Lot Code
SIP-9	DFN2020-8	
UTC □□□□ → Date Code L: Lead Free G: Halogen Free □□ → Lot Code	M58B □□□□ → Date Code	

■ PIN DESCRIPTION



Note: No connect.

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	RATINGS	UNIT
Supply Voltage		V_{CC}	± 16 or 32	V
Differential Input Voltage		$V_{I(DIFF)}$	± 32	V
Input Voltage		V_I	-0.3 ~ +32	V
Output Short to Ground			Continuous	
Power Dissipation	SIP-9	P_D	750	mW
	DIP-8		625	mW
	SOP-8		440	mW
	TSSOP-8		360	mW
	MSOP-8		300	mW
	DFN2020-8		830	mW
Electrostatic Discharge	Human-Body Model (HBM) Per JESD22-A114/115	$V_{(ESD)}$	2000	V
Junction Temperature		T_J	+150	°C
Operating Temperature (Note 2)		T_{OPR}	-20 ~ +85	°C
Storage Temperature		T_{STG}	-65 ~ +150	°C

Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

2. It is guarantee by design, not 100% be tested.

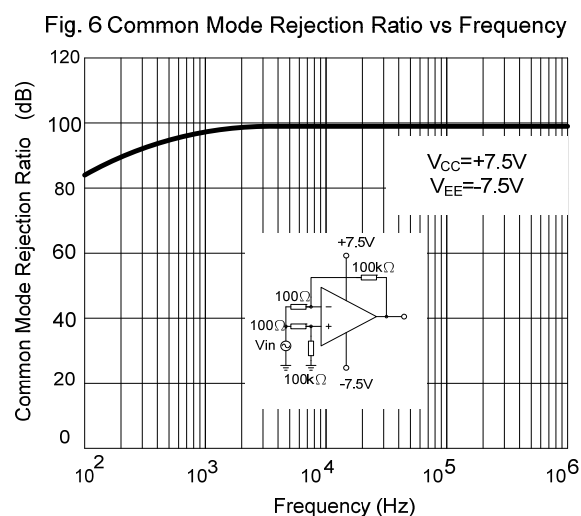
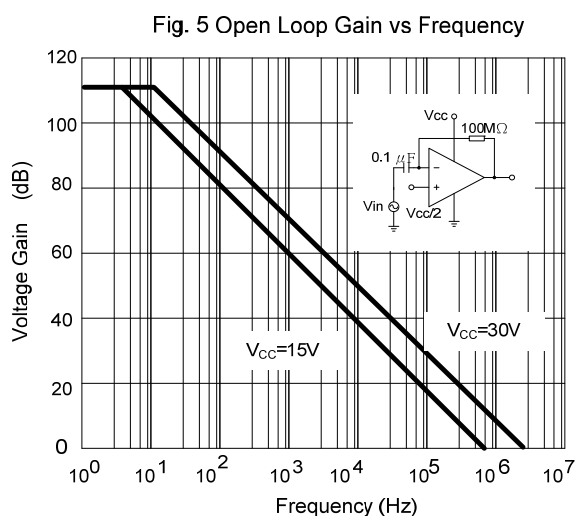
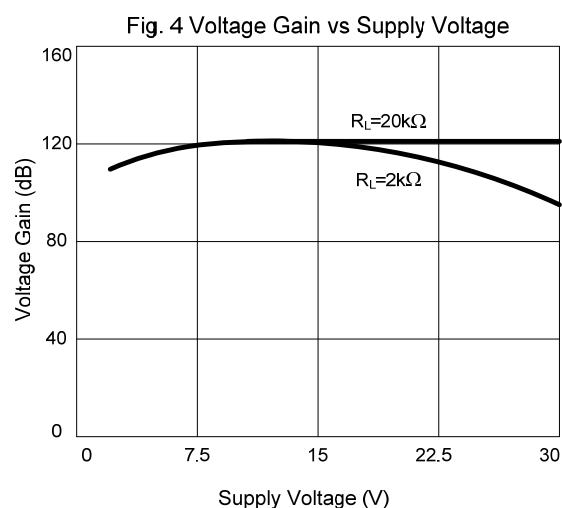
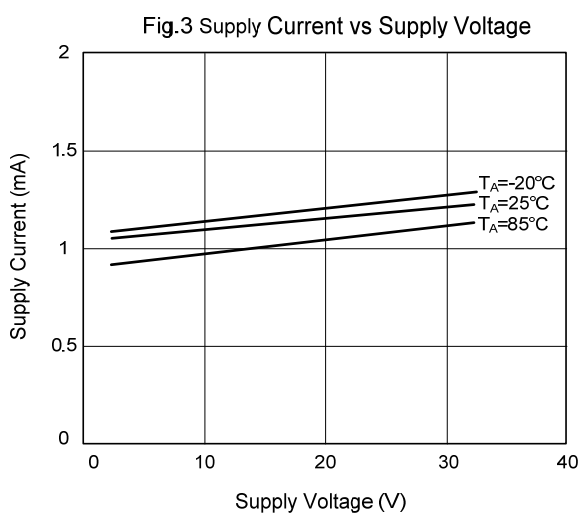
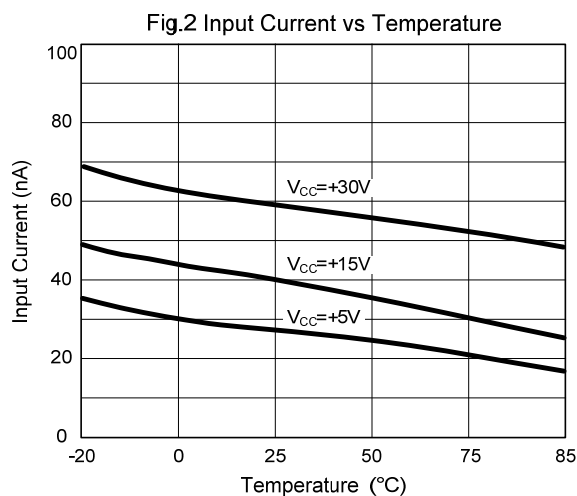
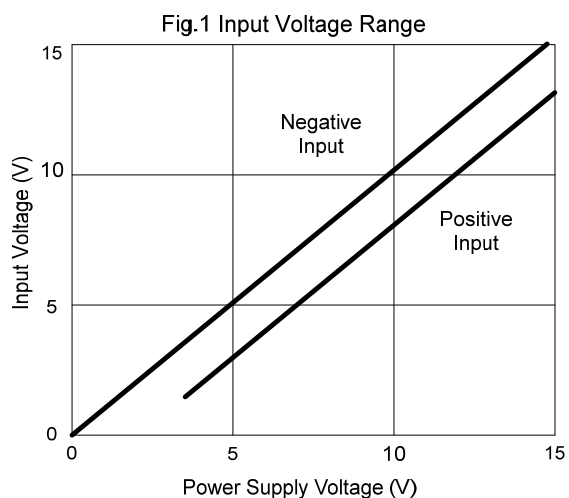
■ ELECTRICAL CHARACTERISTICS ($V_{CC}=5.0V$, $V_{EE}=GND$, $T_A=25^\circ C$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Offset Voltage	V_{OS}	$V_{CM}=0V$ to $V_{CC}-1.5V$ $V_{O(P)}=1.4V$, $R_S=0\Omega$		2.0	5.0	mV
		$T_{MIN}<T_A<T_{MAX}$			7.0	mV
Input Offset Voltage Drift	$\Delta V_{OS}/\Delta T$			14	30	$\mu V/^\circ C$
Input Common Mode Voltage	$V_{I(CM)}$	$V_{CC}=3V\sim 32V$	0		$V_{CC}-1.5$	V
Input Offset Current	I_{OS}			5	30	nA
		$T_{MIN}<T_A<T_{MAX}$			40	nA
Input Offset Current Drift	$\Delta I_{OS}/\Delta T$				300	$pA/^\circ C$
Input Bias Current	I_B			15	150	nA
		$T_{MIN}<T_A<T_{MAX}$			200	nA
Output Voltage Swing	V_{OH}	$V_{CC}=5V$, $R_L=2K\Omega$	$V_{CC}-1.7$			V
		$V_{CC}=30V$, $R_L=2K\Omega$	26			V
		$V_{CC}=30V$, $R_L=10K\Omega$	27	28		V
	V_{OL}	$V_{CC}=5V$, $R_L\geq 10K\Omega$		5	20	mV
Large Signal Voltage Gain	G_v	$V_{CC}=15V$, $R_L\geq 2K\Omega$ $V_{O(P)}=1V\sim 11V$	25	100		V/mV
		$T_{MIN}<T_A<T_{MAX}$	20	95		V/mV
Power Supply Current	I_{CC}	$R_L=\infty$, $V_{CC}=30V$		1.2	2.0	mA
		$R_L=\infty$, $V_{CC}=5V$ Full Temperature Range		0.5	1.2	mA
Short Circuit Current to Ground	I_{SC}			40	70	mA
Output Current	I_{SOURCE}	$V_I(+)=1V$, $V_I(-)=0V$ $V_{CC}=15V$, $V_{O(P)}=2V$	10	20		mA
	I_{SINK}	$V_I(+)=0V$, $V_I(-)=1V$ $V_{CC}=15V$, $V_{O(P)}=2V$	10	20		mA
		$V_I(+)=0V$, $V_I(-)=1V$ $V_{CC}=15V$, $V_{O(P)}=200mV$	12	100		μA

■ ELECTRICAL CHARACTERISTICS (Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Common Mode Rejection Ratio	CMRR		65	100		dB
		$T_{MIN} < T_A < T_{MAX}$	60			dB
Power Supply Rejection Ratio	PSRR		65	100		dB
		$T_{MIN} < T_A < T_{MAX}$	65			dB
Channel Separation	CS	$f=1\text{KHZ} \sim 20\text{KHZ}$		120		dB
Gain Bandwidth Product	GBW			1.1		MHz
Slew Rate	SR			0.6		V/ μ s

TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS (Cont.)

Fig. 7 Voltage Follower Pulse Response

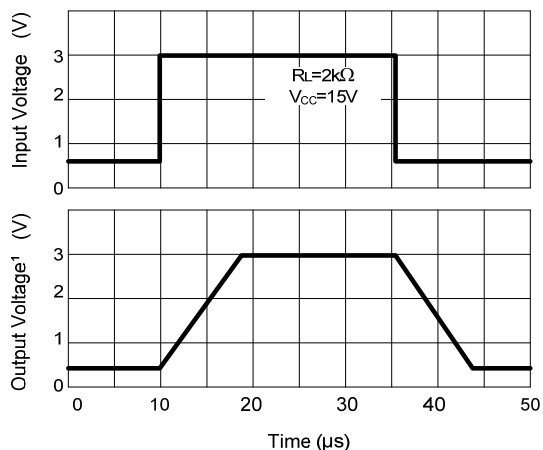


Fig. 8 Voltage Follower Response (Small Signal)

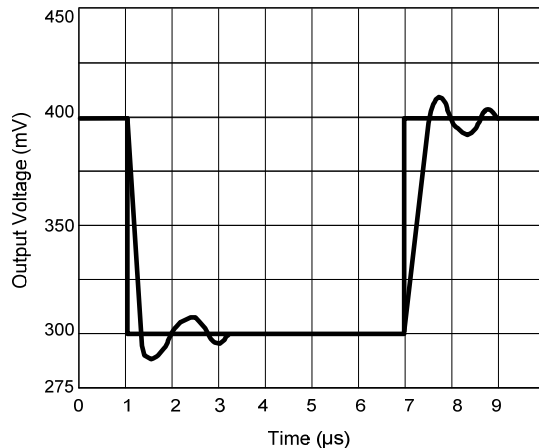


Fig. 9 Gain vs. Large Signal Frequency

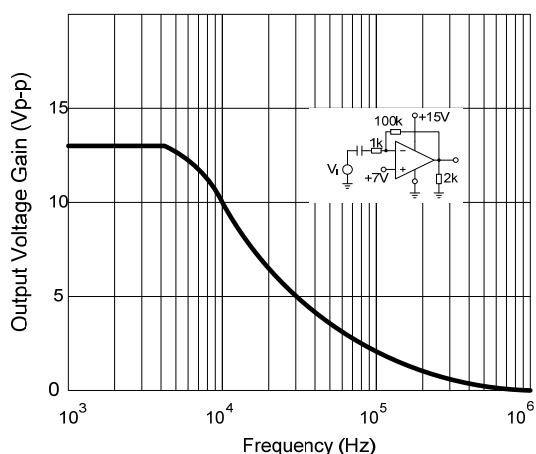


Fig. 10 Output Source Current vs Output Voltage

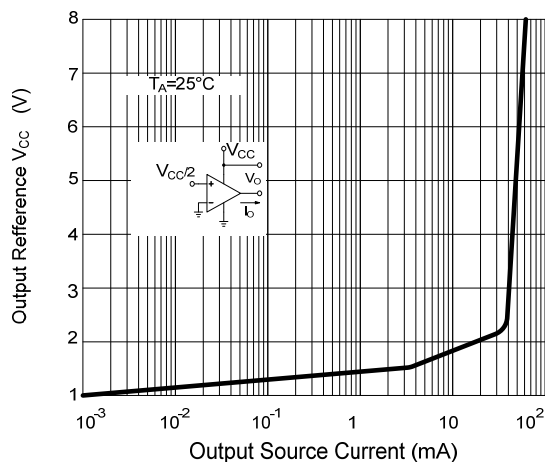


Fig. 11 Output Sink Current vs Output Voltage

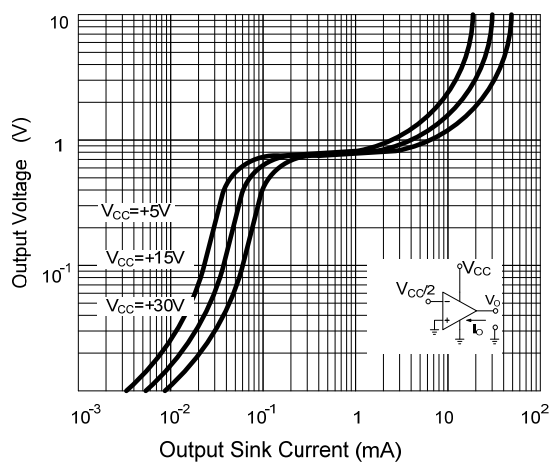
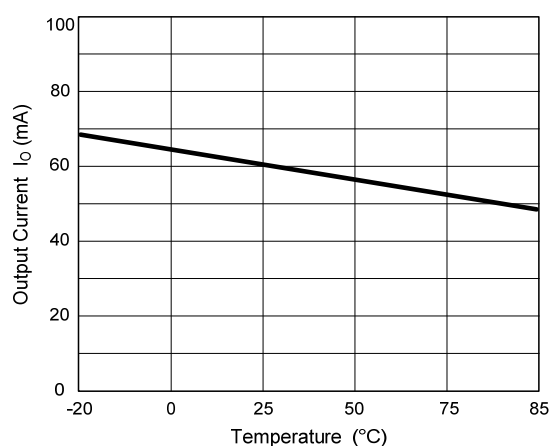


Fig. 12 Current Limiting vs Temperature



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