

LM1558QML

Dual Operational Amplifier

General Description

The LM1558 is a general purpose dual operational amplifier. The two amplifiers share a common bias network and power supply leads. Otherwise, their operation is completely independent.

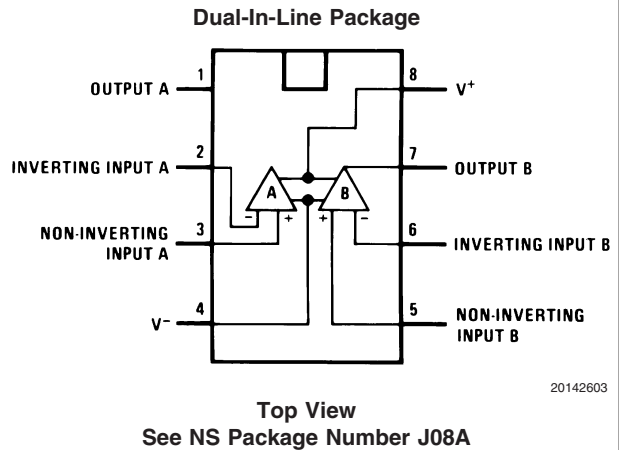
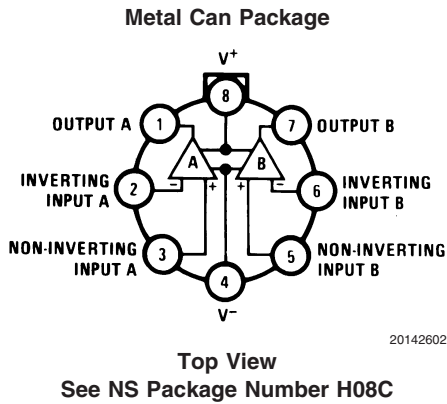
Features

- No frequency compensation required
- Short-circuit protection
- Wide common-mode and differential voltage ranges
- Low-power consumption
- 8-lead can and 8-lead mini DIP
- No latch up when input common mode range is exceeded

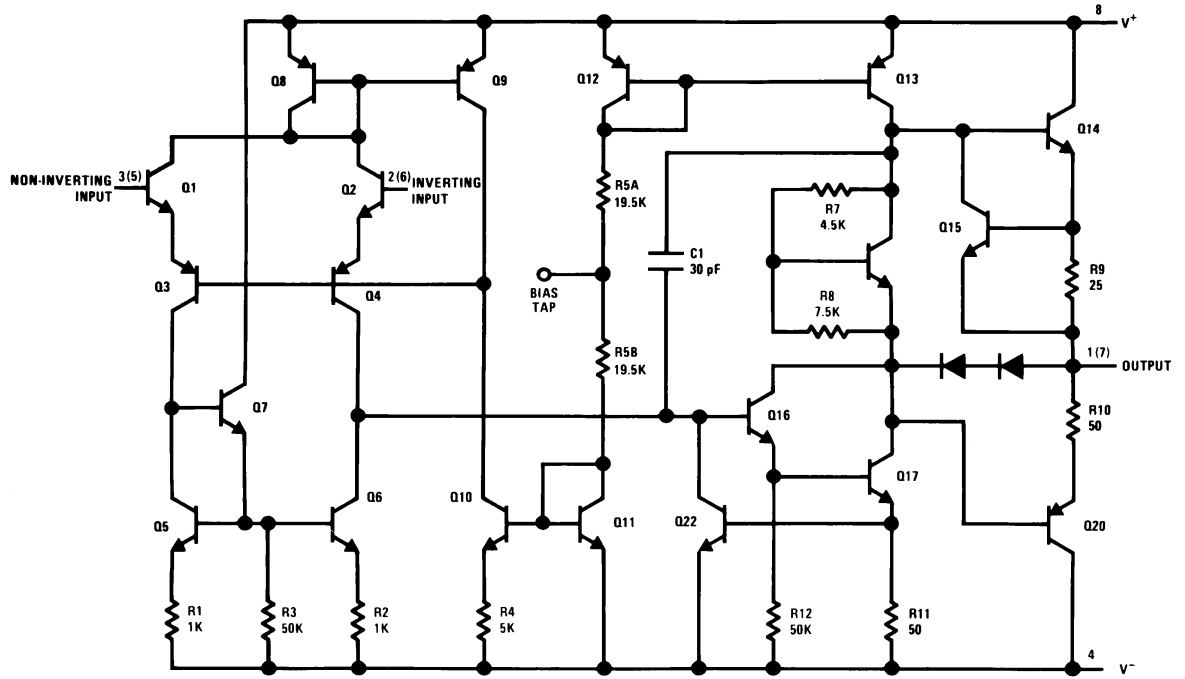
Ordering Information

NS PART NUMBER	SMD PART NUMBER	NS PACKAGE NUMBER	PACKAGE DISCRIPTION
LM1558H/883		H08C	8LD Metal Can
LM1558J/883		J08A	8LD Cerdip

Connection Diagrams



Schematic Diagram



Numbers in parentheses are pin numbers for amplifier B.

20142601

Absolute Maximum Ratings (Note 1)

Supply Voltage	±22V
Power Dissipation (Note 2)	
8LD Metal Can	500 mW
8LD CERDIP	TBD
Differential Input Voltage	±30V
Input Voltage (Note 3)	±15V
Output Short-Circuit Duration	Continuous
Operating Temperature Range	-55°C ≤ T _A ≤ +125°C
Maximum Junction Temperature	150°C
Storage Temperature Range	-65°C ≤ T _A ≤ +150°C
Lead Temperature (Soldering, 10 sec.)	260°C
Thermal Resistance	
θ _{JA}	
Metal Can 8LD	
Still Air	150°C/W
500LF/Min Air flow	85°C/W
CERDIP 8LD	
Still Air	125°C/W
500LF/Min Air flow	70°C/W
θ _{JC}	
Metal Can 8LD	30°C/W
CERDIP 8LD	22°C/W
ESD tolerance (Note 4)	300V

Quality Conformance Inspection

MIL-STD-883, Method 5005 - Group A

Subgroup	Description	Temp (C)
1	Static tests at	+25
2	Static tests at	+125
3	Static tests at	-55
4	Dynamic tests at	+25
5	Dynamic tests at	+125
6	Dynamic tests at	-55
7	Functional tests at	+25
8A	Functional tests at	+125
8B	Functional tests at	-55
9	Switching tests at	+25
10	Switching tests at	+125
11	Switching tests at	-55

LM1558 Electrical Characteristics

DC Parameters

The following conditions apply, unless otherwise specified. $V_{CC} = \pm 15V$, $V_{CM} = 0V$, $R_S = 10K\Omega$

Symbol	Parameter	Conditions	Note	Min	Max	Unit	Sub-group		
V_{IO}	Input Offset Voltage	$V_{CM} = -12V$		-5.0	5.0	mV	1		
				-6.0	6.0	mV	2, 3		
		$V_{CM} = +12V$		-5.0	5.0	mV	1		
				-6.0	6.0	mV	2, 3		
		$V_{CM} = 0V$		-5.0	5.0	mV	1		
				-6.0	6.0	mV	2, 3		
		$V_{CC} = 0V, R_S = 50\Omega$		-5.0	5.0	mV	1		
				-6.0	6.0	mV	2, 3		
		$V_{CC} = \pm 5V, V_{CM} = 0V$		-5.0	5.0	mV	1		
				-6.0	6.0	mV	2, 3		
I_{IO}	Input Offset Current	$V_{CM} = -12V$		-200	200	nA	1		
				-500	500	nA	2, 3		
		$V_{CM} = +12V$		-200	200	nA	1		
				-500	500	nA	2, 3		
		$V_{CM} = 0V$		-200	200	nA	1		
				-500	500	nA	2, 3		
		$V_{CC} = \pm 5V, V_{CM} = 0V$		-200	200	nA	1		
				-500	500	nA	2, 3		
		I_{IB}	Input Bias Current	$V_{CM} = -12V$			500	nA	1
							1500	nA	2, 3
$V_{CM} = +12V$					500	nA	1		
					1500	nA	2, 3		
$V_{CM} = 0V$					500	nA	1		
					1500	nA	2, 3		
$V_{CC} = \pm 5V, V_{CM} = 0V$					500	nA	1		
					1500	nA	2, 3		
PSRR	Power Supply Rejection Ratio			$\pm 5V \leq V_{CC} \leq \pm 15V$		77		dB	1, 2, 3
CMRR	Common Mode Rejection Ratio			$-12V \leq V_{CM} \leq 12V$		70		dB	1, 2, 3
I_{CC}	Power Supply Current	$R_S = 50\Omega$ (both amplifiers measured together)			5.0	mA	1, 2,		
					7.0	mA	3		
$+I_{OS}$	Short Circuit Current	$R_S = 50\Omega, V_O = 0V$		-45	-14	mA	1		
				-45	-9	mA	2		
				-50	-9	mA	3		
$-I_{OS}$	Short Circuit Current	$R_S = 50\Omega, V_O = 0V$		14	45	mA	1		
				9.0	45	mA	2		
				9.0	50	mA	3		
V_I	Input Voltage Range		(Note 5)	-12	12	V	1, 2, 3		
R_I	Input Resistance	$R_I = 5(KT/q I_{IB})$	(Note 6)	0.3		M Ω	1		
$+V_{OP}$	Output Voltage Swing	$R_S = 50\Omega, R_L = 10K\Omega, V_{CC} = \pm 20V$		16		V	4, 5, 6		
		$R_S = 50\Omega, R_L = 2K\Omega, V_{CC} = \pm 20V$		15		V	4, 5, 6		
		$R_S = 50\Omega, R_L = 10K\Omega$		12		V	4, 5, 6		
		$R_S = 50\Omega, R_L = 2K\Omega$		10		V	4, 5, 6		

LM1558 Electrical Characteristics (Continued)

DC Parameters (Continued)

The following conditions apply, unless otherwise specified. $V_{CC} = \pm 15V$, $V_{CM} = 0V$, $R_S = 10K\Omega$

Symbol	Parameter	Conditions	Note	Min	Max	Unit	Sub-group
$-V_{OP}$	Output Voltage Swing	$R_S = 50\Omega$, $R_L = 10K\Omega$, $V_{CC} = \pm 20V$			-16	V	4, 5, 6
		$R_S = 50\Omega$, $R_L = 2K\Omega$, $V_{CC} = \pm 20V$			-15	V	4, 5, 6
		$R_S = 50\Omega$, $R_L = 10K\Omega$			-12	V	4, 5, 6
		$R_S = 50\Omega$, $R_L = 2K\Omega$			-10	V	4, 5, 6
$+A_{VS}$	Large Signal Voltage Gain	$R_S = 50\Omega$, $R_L = 2K\Omega$, $V_O = 10V$		50		V/mV	4
				25		V/mV	5, 6
$-A_{VS}$	Large Signal Voltage Gain	$R_S = 50\Omega$, $R_L = 2K\Omega$, $V_O = -10V$		50		V/mV	4
				25		V/mV	5, 6

AC Parameters

The following conditions apply, unless otherwise specified. $V_{CC} = \pm 15V$, $V_{CM} = 0V$

Symbol	Parameter	Conditions	Note	Min	Max	Unit	Sub-group
+SR	Slew Rate	$V_I = -5$ to $5V$		0.2		V/ μ S	9
		$V_I = -5$ to $5V$, $R_L = 2K\Omega$, $C_L = 100pF$	(Note 6)	0.2		V/ μ S	9
-SR	Slew Rate	$V_I = 5$ to $-5V$		0.2		V/ μ S	9
		$V_I = 5$ to $-5V$, $R_L = 2K\Omega$, $C_L = 100pF$	(Note 6)	0.2		V/ μ S	9
GBW	Gain Bandwidth	$V_I = 50mV_{RMS}$, $f = 20KHz$, $R_S = 50\Omega$, $R_L = 2K\Omega$		250		KHz	9
t_R	Rise Time	$R_L = 2K\Omega$, $C_L = 100pF$	(Note 6)		1	μ S	9
OS	Overshoot	$R_L = 2K\Omega$, $C_L = 100pF$	(Note 6)		30	%	9

Note 1: "Absolute Maximum Ratings" indicate limits beyond which damage to the device may occur. Operating Ratings indicate conditions for which the device is intended to be functional, but do not guarantee specific performance limits. For guaranteed specifications and test conditions, see the Electrical Characteristics. The guaranteed specifications apply only for the test conditions listed.

Note 2: The maximum power dissipation must be derated at elevated temperatures and is dictated by T_{Jmax} (maximum junction temperature), θ_{JA} (package junction to ambient thermal resistance), and T_A (ambient temperature). The maximum allowable power dissipation at any temperature is $P_{Dmax} = (T_{Jmax} - T_A)/\theta_{JA}$ or the number given in the Absolute Maximum Ratings, whichever is lower.

Note 3: For supply Voltages less than $\pm 15V$, the absolute maximum input Voltage is equal to the supply Voltage.

Note 4: Human body model, 1.5 K Ω in series with 100 pF.

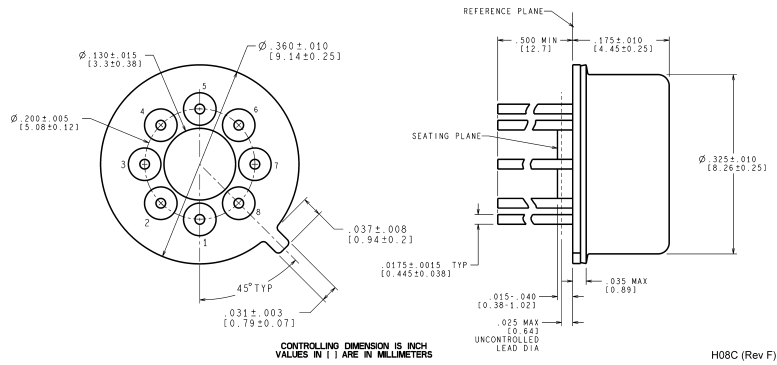
Note 5: Guaranteed by the CMRR test.

Note 6: Guaranteed parameter not tested.

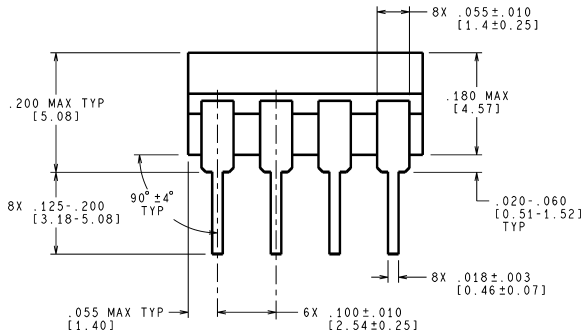
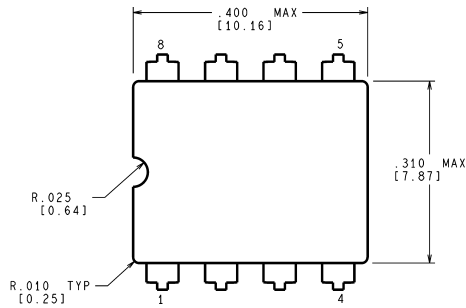
Revision History Section

Date Released	Revision	Section	Originator	Changes
05/24/05	A	New Released Corporate format. Electrical Section	R. Malone	1 MDS data sheet converted into one corp. data sheet format. MDS data MNLM1558-X, Rev. 0B0 will be achrived. Deleted Drift table from electrical section. Reason: Referenced products are 883 only.
08/04/05	B	Added Thermal Resistance limit in the Absolute Maximum Ratings Section	R. Malone	Added Thermal Resistance limit in the Absolute Maximum Ratings Section for all packages.

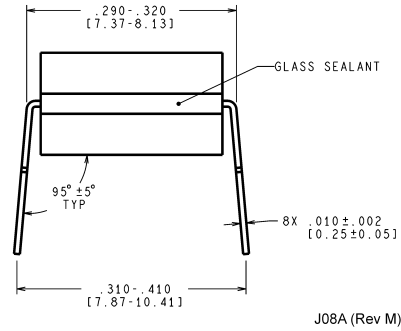
Physical Dimensions inches (millimeters) unless otherwise noted



Metal Can Package (H)
NS Package Number H08C



Ceramic Dual-In-Line Package (J)
NS Package Number J08A



Notes

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