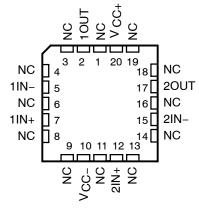
- Short-Circuit Protection
- Wide Common-Mode and Differential Voltage Ranges
- No Frequency Compensation Required
- Low Power Consumption
- No Latch-Up
- Designed to Be Interchangeable With Motorola MC1558/MC1458 and Signetics S5558/N5558

description/ordering information

The MC1458 and MC1558 are dual general-purpose operational amplifiers, with each half electrically similar to the μ A741, except that offset null capability is not provided.

The high-common-mode input voltage range and the absence of latch-up make these amplifiers ideal for voltage-follower applications. The devices are short-circuit protected and the internal frequency compensation ensures stability without external components.

MC1558 . . . FK PACKAGE (TOP VIEW)



NC - No internal connection

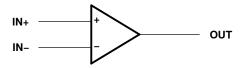
ORDERING INFORMATION

T _A	V _{IO} max AT 25°C	PACKA	GE [†]	ORDERABLE PART NUMBER	TOP-SIDE MARKING
		PDIP (P)	Tube	MC1458P	MC1458P
0°C to 70°C	2 1/	0010 (D)	Tube	MC1458D	MO1150
	6 mV	SOIC (D)	Tape and reel	MC1458DR	MC1458
		SOP (PS)	Tape and reel	MC1458PSR	M1458
		CDIP (JG)	Tube	MC1558JG	MC1558JG
-55°C to 125°C	5 mV	CDIP (JGB)	Tube	MC1558JGB	MC1558JGB
		LCCC (FK)	Tube	MC1558FK	MC1558FK

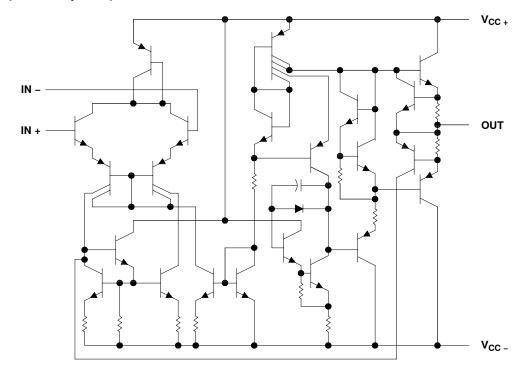
[†] Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at www.ti.com/sc/package.

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symbol (each amplifier)



schematic (each amplifier)



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absolute maximum ratings over operating free-air temperature range (unless otherwise noted)[†]

Supply voltage, V _{CC+} (see Note 1):	MC1458	
	MC1558	
Supply voltage, V _{CC} (see Note 1):	MC1458	
	MC1558	
Differential input voltage, V _{ID} (see No	ote 2)	
	otes ¹ and 3)	
	Note 4)	
	·e, T」 ´	
	ee Notes 5 and 6): D package	
5 1 , 5,11	P package	
	PS package	
Package thermal impedance, $\theta_{\rm JC}$ (se	ee Notes 7 and 8): FK package	
5 1 7 50 (JG package	
Case temperature for 60 seconds: F	K package	
•) from case for 10 seconds: JG package	
Lead temperature 1,6 mm (1/16 inch	rom case for 60 seconds: D, P, or PS package	је 260°С
Storage temperature range, T _{stq}	,	–65°C to 150°C

[†] Stresses beyond those listed under "absolute maximum ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "recommended operating conditions" is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

- NOTES: 1. All voltage values, unless otherwise noted, are with respect to the midpoint between V_{CC+} and V_{CC-}.
 - 2. Differential voltages are at IN+ with respect to IN-.
 - 3. The magnitude of the input voltage must never exceed the magnitude of the supply voltage or 15 V, whichever is less.
 - 4. The output can be shorted to ground or either power supply. For the MC1558 only, the unlimited duration of the short circuit applies at (or below) 125°C case temperature or 70°C free-air temperature.
 - 5. Maximum power dissipation is a function of $T_J(max)$, θ_{JA} , and T_A . The maximum allowable power dissipation at any allowable ambient temperature is $P_D = (T_J(max) T_A)/\theta_{JA}$. Operating at the absolute maximum T_J of 150°C can affect reliability.
 - 6. The package thermal impedance is calculated in accordance with JESD 51-7.
 - 7. Maximum power dissipation is a function of $T_J(max)$, θ_{JC} , and T_C . The maximum allowable power dissipation at any allowable case temperature is $P_D = (T_J(max) T_C)/\theta_{JC}$. Operating at the absolute maximum T_J of 150°C can affect reliability.
 - 8. The package thermal impedance is calculated in accordance with MIL-STD-883.

recommended operating conditions

			MIN	MAX	UNIT
V _{CC±}	Supply voltage		±5	±15	V
т.	Consideration from air boundaries areas		0	70	°C
1A	Operating free-air temperature range	MC1558	-55	125	

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electrical characteristics at specified free-air temperature, $V_{\text{CC}\pm}$ = $\pm 15~\text{V}$

	DADAMETED	TEC	T CONDITION:	N	/IC1458		ľ	MC1558		UNIT		
	PARAMETER	IES	I CONDITION:	51	MIN	TYP	MAX	MIN	TYP	MAX	UNII	
V_{IO}	Input offset voltage	V _O = 0		25°C		1	6		1	5	mV	
۷IO	input onset voltage	ΛΟ = 0		Full range			7.5			6	IIIV	
La	Input offset current	V _O = 0		25°C		20	200		20	200	nA	
I _{IO}	input onset current	ΛΟ = 0		Full range			300			500	ПА	
l	Input bias current	V _O = 0	V 0			80	500		80	500	nA	
I _{IB}	input bias current	ν0 = 0		Full range			800			1500	ПА	
V	Common-mode input			25°C	±12	±13		±12	±13		V	
V _{ICR}	voltage range			Full range	±12			±12			V	
		$R_L = 10 \text{ k}\Omega$		25°C	±12	±14		±12	±14			
V	Maximum peak output	$R_L \ge 10 \text{ k}\Omega$		Full range	±12			±11			V	
V_{OM}	voltage swing	$R_L = 2 k\Omega$		25°C	±10	±13		±10	±13		V	
		$R_L \ge 2 k\Omega$		Full range	±10			±10				
	Large-signal differential	D > 01:0		25°C	20	200		50	200		\	
A_{VD}	voltage amplification	$R_L \ge 2 k\Omega$,	$V_O = \pm 10 \text{ V}$	Full range	15			25			V/mV	
B _{OM}	Maximum-output-swing bandwidth (closed loop)	$R_L = 2 k\Omega,$ $A_{VD} = 1,$	$V_O \ge \pm 10 \text{ V},$ THD $\ge 5\%$	25°C		14			14		kHz	
B ₁	Unity-gain bandwidth			25°C		1			1		MHz	
фm	Phase margin	A _{VD} = 1		25°C		65			65		deg	
<u> </u>	Gain margin			25°C		11			11		dB	
r _i	Input resistance			25°C	0.3	2		0.3*	2		МΩ	
r _o	Output resistance	V _O = 0,	See Note 9	25°C		75			75		Ω	
C _i	Input capacitance			25°C		1.4			1.4		pF	
z _{ic}	Common-mode input impedance	f = 20 Hz		25°C		200			200		МΩ	
01400	Common-mode	V _{IC} = V _{ICR} m	in,	25°C	70	90		70	90			
CMRR	rejection ratio	V _O = 0		Full range	70			70			dB	
k _{SVS}	Supply-voltage sensitivity	V _{CC} = ±9 V to	o ±15 V,	25°C		30	150		30	150	μV/V	
1.373	$(\Delta V_{IO}/\Delta V_{CC})$	$V_O = 0$		Full range			150			150	μιγ	
V _n	Equivalent input noise voltage (closed loop)	A _{VD} = 100, f = 1 kHz,	R _S = 0, BW = 1 Hz	25°C		45			45		nV/√ Hz	
I _{OS}	Short-circuit output current			25°C		±25	±40		±25	±40	mA	
	Supply current	V 0 N:	la a d	25°C		3.4	5.6		3.4	5	^	
I _{CC}	(both amplifiers)	$V_O = 0$, No load		Full range			6.6			6.6	mA	
	Total power dissipation	V 0 11	اممط	25°C		100	170		100	150	\4/	
P_D	(both amplifiers)	$V_O = 0$, No	load	Full range			200			200	mW	
V _{O1} /V _{O2}	Crosstalk attenuation			25°C		120			120		dB	

^{*}On products compliant to MIL-PRF-38535, this parameter is not production tested.

NOTE 9: This typical value applies only at frequencies above a few hundred hertz because of the effect of drift and thermal feedback.



[†] All characteristics are specified under open-loop operating conditions with zero common-mode input voltage, unless otherwise specified. Full range for MC1458 is 0°C to 70°C and for MC1558 is –55°C to 125°C.

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operating characteristics, $V_{CC\pm}$ = ± 15 V, C_L = 100 pF, T_A = 25°C (see Figure 1)

PARAMETER		TEOT 001	UDITIONS	N	/IC1458		MC1558			
		TEST CO	MIN	TYP	MAX	MIN	TYP	MAX	UNIT	
T	Rise time	V _I = 20 mV,	$R_L = 2 k\Omega$,		0.3			0.3		μs
τ _r	Overshoot factor	V _I = 20 mV,	$R_L = 2 k\Omega$		5			5		%
SR	Slew rate at unity gain	V _I = 10 V,	$R_L = 2 k\Omega$		0.5			0.5		V/μs

PARAMETER MEASUREMENT INFORMATION

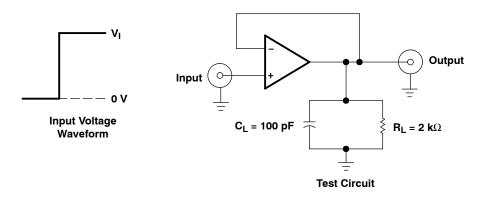


Figure 1. Rise-Time, Overshoot, and Slew-Rate Waveform and Test Circuit





10-Jun-2014

PACKAGING INFORMATION

Orderable Device	Status	Package Type	_	Pins	_	Eco Plan	Lead/Ball Finish	MSL Peak Temp	Op Temp (°C)	Device Marking	Samples
	(1)		Drawing		Qty	(2)	(6)	(3)		(4/5)	
5962-9760301Q2A	ACTIVE	LCCC	FK	20	1	TBD	POST-PLATE	N / A for Pkg Type	-55 to 125	5962- 9760301Q2A MC1558FKB	Samples
5962-9760301QPA	ACTIVE	CDIP	JG	8	1	TBD	A42	N / A for Pkg Type	-55 to 125	9760301QPA MC1558	Samples
MC1458D	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	MC1458	Samples
MC1458DE4	ACTIVE	SOIC	D	8	75	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	MC1458	Samples
MC1458DR	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	MC1458	Samples
MC1458DRE4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	MC1458	Samples
MC1458DRG4	ACTIVE	SOIC	D	8	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	MC1458	Samples
MC1458P	ACTIVE	PDIP	Р	8	50	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type	0 to 70	MC1458P	Samples
MC1458PE4	ACTIVE	PDIP	Р	8	50	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type	0 to 70	MC1458P	Samples
MC1458PSR	ACTIVE	so	PS	8	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	0 to 70	M1458	Samples
MC1558FKB	ACTIVE	LCCC	FK	20	1	TBD	POST-PLATE	N / A for Pkg Type	-55 to 125	5962- 9760301Q2A MC1558FKB	Samples
MC1558JG	ACTIVE	CDIP	JG	8	1	TBD	A42	N / A for Pkg Type	-55 to 125	MC1558JG	Samples
MC1558JGB	ACTIVE	CDIP	JG	8	1	TBD	A42	N / A for Pkg Type	-55 to 125	9760301QPA MC1558	Samples
MC1558P	OBSOLETE	PDIP	Р	8		TBD	Call TI	Call TI	-55 to 125		
SN98212P	OBSOLETE	E PDIP	Р	8		TBD	Call TI	Call TI			

⁽¹⁾ The marketing status values are defined as follows: **ACTIVE:** Product device recommended for new designs.

LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

PREVIEW: Device has been announced but is not in production. Samples may or may not be available.

PACKAGE OPTION ADDENDUM



10-Jun-2014

OBSOLETE: TI has discontinued the production of the device.

(2) Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check http://www.ti.com/productcontent for the latest availability information and additional product content details.

TBD: The Pb-Free/Green conversion plan has not been defined.

Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes. **Pb-Free** (RoHS Exempt): This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.

Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

- (3) MSL, Peak Temp. The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.
- (4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.
- (5) Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.
- (6) Lead/Ball Finish Orderable Devices may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead/Ball Finish values may wrap to two lines if the finish value exceeds the maximum column width.

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OTHER QUALIFIED VERSIONS OF MC1558, MC1558M:

Catalog: MC1558

Military: MC1558M

NOTE: Qualified Version Definitions:

Catalog - TI's standard catalog product





10-Jun-2014

• Military - QML certified for Military and Defense Applications

PACKAGE MATERIALS INFORMATION

www.ti.com 14-Jul-2012

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



A0	Dimension designed to accommodate the component width
В0	Dimension designed to accommodate the component length
K0	Dimension designed to accommodate the component thickness
W	Overall width of the carrier tape
P1	Pitch between successive cavity centers

TAPE AND REEL INFORMATION

*All dimensions are nominal

Device	Package Type	Package Drawing		SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
MC1458DR	SOIC	D	8	2500	330.0	12.4	6.4	5.2	2.1	8.0	12.0	Q1
MC1458DR	SOIC	D	8	2500	330.0	12.4	6.4	5.2	2.1	8.0	12.0	Q1
MC1458PSR	SO	PS	8	2000	330.0	16.4	8.2	6.6	2.5	12.0	16.0	Q1

PACKAGE MATERIALS INFORMATION

www.ti.com 14-Jul-2012



*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
MC1458DR	SOIC	D	8	2500	367.0	367.0	35.0
MC1458DR	SOIC	D	8	2500	340.5	338.1	20.6
MC1458PSR	SO	PS	8	2000	367.0	367.0	38.0

JG (R-GDIP-T8)

CERAMIC DUAL-IN-LINE



NOTES: A. All linear dimensions are in inches (millimeters).

- B. This drawing is subject to change without notice.
- C. This package can be hermetically sealed with a ceramic lid using glass frit.
- D. Index point is provided on cap for terminal identification.
- E. Falls within MIL STD 1835 GDIP1-T8

FK (S-CQCC-N**)

LEADLESS CERAMIC CHIP CARRIER

28 TERMINAL SHOWN



- A. All linear dimensions are in inches (millimeters).
- B. This drawing is subject to change without notice.
- C. This package can be hermetically sealed with a metal lid.
- D. Falls within JEDEC MS-004



P (R-PDIP-T8)

PLASTIC DUAL-IN-LINE PACKAGE



- A. All linear dimensions are in inches (millimeters).
- B. This drawing is subject to change without notice.
- C. Falls within JEDEC MS-001 variation BA.



D (R-PDSO-G8)

PLASTIC SMALL OUTLINE



- A. All linear dimensions are in inches (millimeters).
- B. This drawing is subject to change without notice.
- Body length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.006 (0,15) each side.
- Body width does not include interlead flash. Interlead flash shall not exceed 0.017 (0,43) each side.
- E. Reference JEDEC MS-012 variation AA.



D (R-PDSO-G8)

PLASTIC SMALL OUTLINE



- A. All linear dimensions are in millimeters.
- B. This drawing is subject to change without notice.
- C. Publication IPC-7351 is recommended for alternate designs.
- D. Laser cutting apertures with trapezoidal walls and also rounding corners will offer better paste release. Customers should contact their board assembly site for stencil design recommendations. Refer to IPC-7525 for other stencil recommendations.
- E. Customers should contact their board fabrication site for solder mask tolerances between and around signal pads.





NOTES: A. All linear dimensions are in millimeters.

B. This drawing is subject to change without notice.

C. Body dimensions do not include mold flash or protrusion, not to exceed 0,15.



PS (R-PDSO-G8)

PLASTIC SMALL OUTLINE



- A. All linear dimensions are in millimeters.
- B. This drawing is subject to change without notice.
- C. Publication IPC-7351 is recommended for alternate designs.
- D. Laser cutting apertures with trapezoidal walls and also rounding corners will offer better paste release. Customers should contact their board assembly site for stencil design recommendations. Refer to IPC-7525 for other stencil recommendations.
- E. Customers should contact their board fabrication site for solder mask tolerances between and around signal pads.



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Texas Instruments:

MC1458DR MC1458P MC1458D MC1458DE4 MC1458DRE4 MC1458PE4 MC1458PSR MC1458DRG4