

LINEAR INTEGRATED CIRCUITS

DESCRIPTION

The 5558 consists of a pair of high performance monolithic operational amplifiers constructed on a single chip. It features internal compensation and is intended for use in a variety of analog applications. High common mode voltage range and immunity to latch-up makes the 5558 ideal for use as a voltage follower. The high gain and wide range of operating voltage achieves superior performance in integrator, summing amplifier, and general feedback applications. The device is short-circuit protected. For single amplifier performance see the 5741 data sheet. The 5558 is a pin-for-pin replacement for the MC1558G.

ABSOLUTE MAXIMUM RATINGS

Power Supply Voltages

S5558 $\pm 22V$

N5558 $\pm 18V$

Differential Input Voltage $\pm 30V$

Common-mode Input Swing $\pm 15V$

Output Short Circuit Duration Continuous

Power Dissipation (Note 1)

T Package — (MO-002-AG) 680mW

V Package 625mW

Operating Temperature Range

S5558 $-55^{\circ}C$ to $+125^{\circ}C$

N5558 $0^{\circ}C$ to $+75^{\circ}C$

Storage Temperature Range $-65^{\circ}C$ to $+150^{\circ}C$

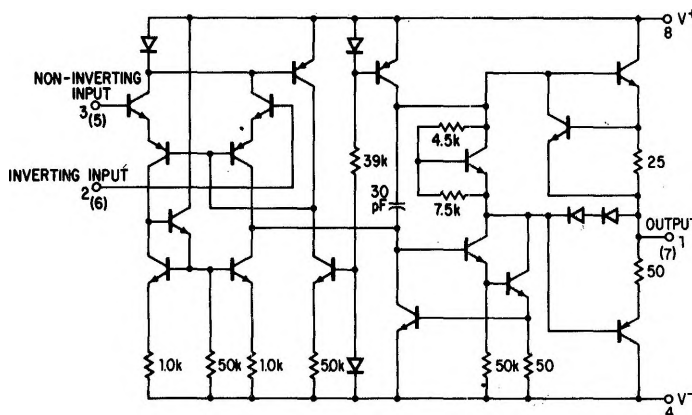
Lead Temperature (Soldering, 60 sec) $300^{\circ}C$

NOTE:

1. Derate T package linearly at 4.6 mW/ $^{\circ}C$ for ambient temperatures above $+25^{\circ}C$

2. Derate V package at 5mW/ $^{\circ}C$ above $25^{\circ}C$

EQUIVALENT SCHEMATIC

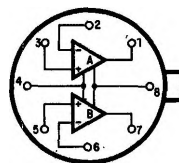


The numbers without parenthesis represent the pin numbers for 1/2 of the dual circuit. The numbers in parenthesis represent the pin numbers for the other half.

PIN CONFIGURATIONS

T-PACKAGE

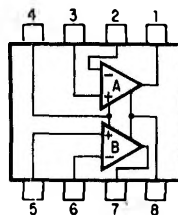
(Top View)



1. Output A
2. Inverting Input A
3. Noninverting Input A
4. V^-
5. Noninverting Input B
6. Inverting Input B
7. Output B
8. V^+

ORDER PART NOS. S5558T/N5558T

V-PACKAGE



1. Output A
2. Inverting Input A
3. Noninverting Input A
4. V^-
5. Noninverting Input B
6. Inverting Input B
7. Output B
8. V^+

ORDER PART NO. N5558V

FEATURES:

- 2 "OP AMPS" IN SPACE OF ONE 741 V PACKAGE
- NO FREQUENCY COMPENSATION REQUIRED
- SHORT CIRCUIT PROTECTION
- LOW POWER CONSUMPTION
- LARGE COMMON MODE AND DIFFERENTIAL VOLTAGE RANGES
- NO LATCH-UP

LINEAR INTEGRATED CIRCUITS ■ 5558

1. ELECTRICAL CHARACTERISTICS ($V^+ = +15\text{ Vdc}$, $V^- = -15\text{ Vdc}$, $T_A = +25^\circ\text{C}$ unless otherwise noted)

CHARACTERISTICS	SYMBOL	MIN		TYP		MAX		UNIT
		S5558	N5558	S5558	N5558	S5558	N5558	
Input Bias Current $T_A = +25^\circ\text{C}$ $T_A = T_{\text{low}}$ to T_{high} (See Note 1)	I_b			0.2	0.2	0.5	0.5	μAdc
						1.5	0.8	
Input Offset Current $T_A = +25^\circ\text{C}$ $T_A = T_{\text{low}}$ to T_{high}	$ I_{io} $			0.03	0.03	0.2	0.2	μAdc
						0.5	0.3	
Input Offset Voltage ($R_S \leq 10\text{ k}\Omega$) $T_A = +25^\circ\text{C}$ $T_A = T_{\text{low}}$ to T_{high}	$ V_{io} $			1.0	2.0	5.0	6.0	mVdc
						6.0	7.5	
Differential Input Impedance (Open-Loop, $f = 20\text{ Hz}$)								
Parallel Input Resistance	R_p	0.3	0.3	1.0	1.0			Megohm
Parallel Input Capacitance	C_p			6.0	6.0			pF
Common-Mode Input Impedance ($f = 20\text{ Hz}$)	$Z_{(in)}$			200	200			Megohms
Common-Mode Input Voltage Swing	CMV_{in}	± 12	± 12	± 13	± 13			V_{pk}
Equivalent Input Noise Voltage ($A_V = 100$, $R_S = \text{k}\Omega$, $f = 1.0\text{ kHz}$, $BW = 1.0\text{ Hz}$)	e_n			45	45			$\text{nV}(\text{Hz})^{1/2}$
Common-Mode Rejection Ratio ($f = 100\text{ Hz}$)	CM_{rej}	70	70	90	90			dB
Open-Loop Voltage Gain, ($V_{out} = \pm 10\text{V}$, $R_L = 2.0\text{ k}\Omega$) $T_A = +25^\circ\text{C}$ $T_A = T_{\text{low}}$ to T_{high}	$AVOL$	50,000	20,000	200,000	100,000			V/V
		25,000	15,000					
Power Bandwidth ($A_V = 1$, $R_L = 2.0\text{ k}\Omega$, $THD \leq 5\%$, $V_{out} = 20\text{Vp-p}$)	PBW			14	14			kHz
Unity Gain Crossover Frequency (open-loop)				1.1	1.1			MHz
Phase Margin (open-loop, unity gain)				65	65			degrees
Gain Margin				11	11			dB
Slew Rate (Unity Gain)	dV_{out}/dt			0.8	0.8			V/ μs
Output Impedance ($f = 20\text{ Hz}$)	Z_{out}			300	300			ohms
Short-Circuit Output Current	I_{SC}			20	20			mAdc
Output Voltage Swing ($R_L = 10\text{ k}\Omega$) $R_L = 2\text{ k}\Omega$ ($T_A = T_{\text{low}}$ to T_{high})	V_{out}	± 12	± 12	± 14	± 14			V_{pk}
		± 10	± 10	± 13	± 13			
Power Supply Sensitivity $V^- = \text{constant}$, $R_S \leq 10\text{ k}\Omega$ $V^+ = \text{constant}$, $R_S \leq 10\text{ k}\Omega$	S^+ S^-			30	30	150	150	$\mu\text{V/V}$
				30	30	150	150	
Power Supply Current	I_{D^+} I_{D^-}			2.3	2.3	5.0	5.6	mAdc
				2.3	2.3	5.0	5.6	
DC Quiescent Power Dissipation ($V_{out} = 0$)	P_D			70	70	150	170	mW
Channel Separation	e_{01}/e_{02}			120	120			dB

Note 1: T_{low} : 0°C for N5558, -55°C for S5558; T_{high} : $+75^\circ\text{C}$ for N5558, $+125^\circ\text{C}$ for S5558

TYPICAL CHARACTERISTIC CURVES

