signetics DUAL OPERATIONAL AMPLIFIERS 5558

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.

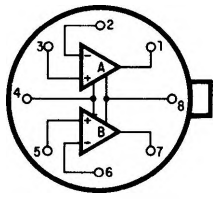
ABSOLUTE MAXIMUM RATINGS

Power Supply Voltages	
S5558	±22V
N5558	±18V
Differential Input Voltage	±30V
Common-mode Input Swing	±15V
Output Short Circuit Duration	Continuous
Power Dissipation (Note 1)	
T Package – (MO-002-AG)	680mW
Operating Temperature Range	
S5558	–55°C to +125°C
N5558	0°C to +75°C
Storage Temperature Range	–65°C to +150°C
Lead Temperature (Soldering, 60 sec)	300°C

Note 1. Derate linearly at 4.6 mW/°C for ambient temperatures above +25°C

PIN CONFIGURATIONS

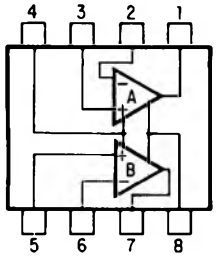
T-PACKAGE
(Top View)



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



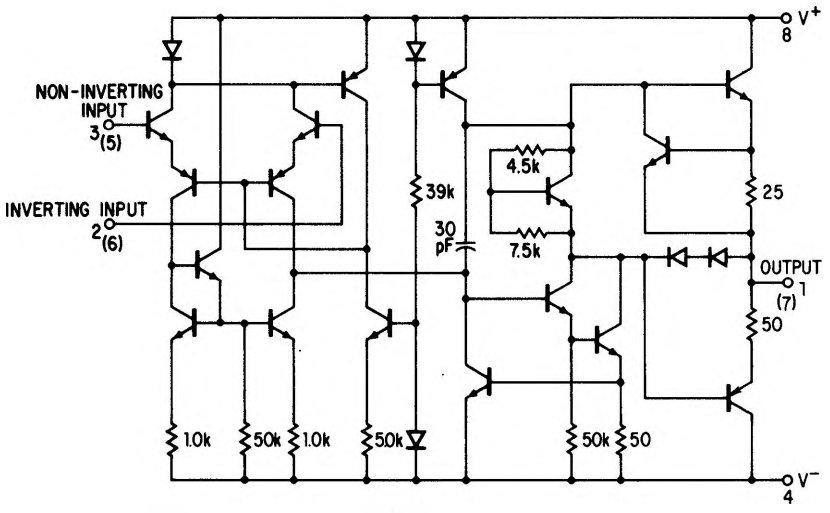
1. Output A
2. Inverting Input A
3. Noninverting Input A
4. V^-
5. Noninverting Input B
6. Inverting Input B
7. Output B
8. V^+

ORDER PART NO. N5558V

FEATURES:

- "OP AMPS" IN SPACE OF ONE 5741A ('V' PACKAGE)
- NO FREQUENCY COMPENSATION REQUIRED
- SHORT CIRCUIT PROTECTION
- LOW POWER CONSUMPTION
- LARGE COMMON MODE AND DIFFERENTIAL VOLTAGE RANGES
- NO LATCH-UP

EQUIVALENT SCHEMATIC



The numbers without parenthesis represent the pin numbers for ½ of the dual circuit. The numbers in parenthesis represent the pin numbers for the other half.

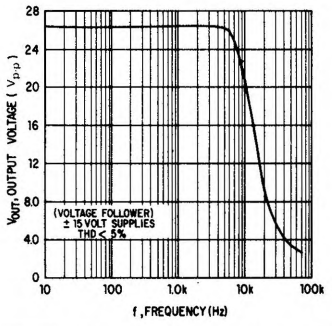
ELECTRICAL CHARACTERISTICS (V^+ = +15 Vdc, V^- = −15 Vdc, T_A = +25°C unless otherwise noted)

CHARACTERISTICS	SYMBOL	MIN		TYP		MAX		UNIT
		S5558	N5558	S5558	N5558	S5558	N5558	
Input Bias Current	I_b							μAdc
T_A = +25°C				0.2	0.2	0.5	0.5	
T_A = T_{low} to T_{high} (See Note 1)						1.5	0.8	
Input Offset Current	$\|I_{io}\|$							μAdc
T_A = +25°C				0.03	0.03	0.2	0.2	
T_A = T_{low} to T_{high}						0.5	0.3	
Input Offset Voltage ($R_S \leq 10k\Omega$)	$\|V_{io}\|$							mVdc
T_A = +25°C				1.0	2.0	5.0	6.0	
T_A = T_{low} to T_{high}						6.0	7.5	
Differential Input Impedance (Open-Loop, f = 20 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 Hz)	$Z_{(in)}$			200	200			Megohms
Common-Mode Input Voltage Swing	CMV_{in}	±12	±12	±13	±13			V_{pk}
Equivalent Input Noise Voltage	e_n							nV(Hz)½
(A_V = 100, R_S = kΩ,								
f = 1.0 kHz, BW = 1.0 Hz)				45	45			
Common-Mode Rejection Ratio (f = 100 Hz)	CM_{rej}	70	70	90	90			dB
Open-Loop Voltage Gain,	A_{VOL}							V/V
(V_{out} = ±10V, R_L = 2.0kΩ)								
T_A = +25°C		50,000	20,000	200,000	100,000			
T_A = T_{low} to T_{high}		25,000	15,000					
Power Bandwidth	P_{BW}			14	14			kHz
(A_V = 1, R_L = 2.0kΩ, THD≤5%, V_{out} = 20V_{p-p})								
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 Hz)	Z_{out}			300	300			ohms
Short-Circuit Output Current	I_{SC}			20	20			mAdc
Output Voltage Swing	V_{out}							V_{pk}
(R_L = 10kΩ)		±12	±12	±14	±14			
R_L = 2kΩ (T_A = T_{low} to T_{high})		±10	±10	±13	±13			
Power Supply Sensitivity								μV/V
V^- = constant, $R_S \leq 10k\Omega$	S^+			30	30	150	150	
V^+ = constant, $R_S \leq 10k\Omega$	S^-			30	30	150	150	
Power Supply Current	I_D^+			2.3	2.3	5.0	5.6	mAdc
	I_D^-			2.3	2.3	5.0	5.6	
DC Quiescent Power Dissipation	P_D							mW
(V_{out} = 0)				70	70	150	170	
Channel Separation	e_{o1}/e_{o2}			120	120			dB

Note 1: T_{low}: 0°C for N5558, −55°C for S5558; T_{high}: +75°C for N5558, +125°C for S5558

TYPICAL CHARACTERISTIC CURVES

POWER BANDWIDTH (Large Signal Swing versus Frequency)



OPEN LOOP FREQUENCY RESPONSE