

Dual Operational Amplifier



Rev.1. Mar. 2011.



VSP MIKRON

LM358nd3

DESCRIPTION

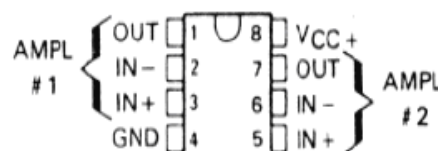
The LM358 consists of two independent, high gain, internally frequency compensated operational amplifiers which we designed specifically to operate from a single power supply over a wide range of voltages. Operation from split power supplies is also possible and the low power supply current drain is independent of the magnitude of the power supply voltage.

Application areas include transducer amplifiers, dc gain blocks and all the conventional op amp circuits.

FEATURES

- Wide range of supply voltages
- Low supply current drain independent of supply voltage
- Low input biasing current
- Low input offset voltage and offset current
- Input common-mode voltage range includes ground
- Differential input voltage range equal to the power supply voltage
- DC voltage gain 100 V/ mV Typ
- Internally frequency compensation

PACKAGE INFORMATION



ELECTRICAL CHARACTERISTICS

at specified free-air temperature, $V_{CC} = 5\text{ V}$ (unless otherwise noted)

PARAMETER	TEST CONDITIONS*	LM358nd3			UNIT	
		MIN	TYP	MAX		
V_{IO} Input offset voltage	$V_{CC} = 5\text{ V to MAX}$, $V_{IC} = V_{ICR\text{ min}}$, $V_O = 1.4\text{ V}$	25 °C	3	7	mV	
		Full range		9		
αV_{IO} Average temperature coefficient of input offset voltage		Full range	7		$\mu\text{V}/^\circ\text{C}$	
I_{IO} Input offset current	$V_O = 1.4\text{ V}$	25 °C	2	50	nA	
		Full range		150		
αI_{IO} Average temperature coefficient of input offset current		Full range	10		$\text{pA}/^\circ\text{C}$	
I_{IB} Input bias current	$V_O = 1.4\text{ V}$	25 °C	-20	-250	nA	
		Full range		-500		
V_{ICR} Common-mode input voltage range	$V_{CC} = 5\text{ V to MAX}$	25 °C	0 to $V_{CC} - 1.5$		V	
		Full range	0 to $V_{CC} - 2$			
V_{OH} High-level output voltage	$R_L \geq 2\text{ k}\Omega$	25 °C	$V_{CC} - 1.5$		V	
	$V_{CC} = \text{MAX}$, $R_L = 2\text{ k}\Omega$	Full range	26			
	$V_{CC} = \text{MAX}$, $R_L \geq 10\text{ k}\Omega$	Full range	27	28		
V_{OL} Low-level output voltage	$R_L \geq 10\text{ k}\Omega$	Full range		5	20	mV
A_{VD} Large-signal differential voltage amplification	$V_{CC} = 15\text{ V}$, $V_O = 1\text{ V to } 11\text{ V}$, $R_L \geq 2\text{ k}\Omega$	25 °C	25	100	V/mV	
		Full range	15			
CMRR Common-mode rejection ratio	$V_{CC} = 5\text{ V to MAX}$, $V_{IC} = V_{ICR\text{ min}}$	25 °C	65	80	dB	
k_{SVR} Supply voltage rejection ratio ($\Delta V_{CC}/\Delta V_{IO}$)	$V_{CC} = 5\text{ V to MAX}$	25 °C	65	100	dB	
V_{O1}/V_{O2} Crosstalk attenuation	$f = 1\text{ kHz to } 20\text{ kHz}$	25 °C		120	dB	
I_O Output current	$V_{CC} = 15\text{ V}$, $V_{ID} = 1\text{ V}$, $V_O = 0$	25 °C	-20	-30	mA	
		Full range	-10			
	$V_{CC} = 15\text{ V}$, $V_{ID} = -1\text{ V}$, $V_O = 15\text{ V}$	25 °C	10	20		
	$V_{ID} = -1\text{ V}$, $V_O = 200\text{ mV}$	25 °C	12	30		μA
I_{OS} Short-circuit output current	V_{CC} at 5 V, GND at -5 V, $V_O = 0$	25 °C		± 40	± 60	mA
I_{CC} Supply current (two amplifiers)	$V_O = 2.5\text{ V}$, No load	Full range		0.7	1.2	mA
	$V_{CC} = \text{MAX}$, $V_O = 0.5V_{CC}$, No load	Full range		1	2	

- All characteristics are measured under open-loop conditions with zero common-mode input voltage unless otherwise specified. "MAX" V_{CC} for testing purposes is 30 V. Full range is 0 °C to 70 °C.

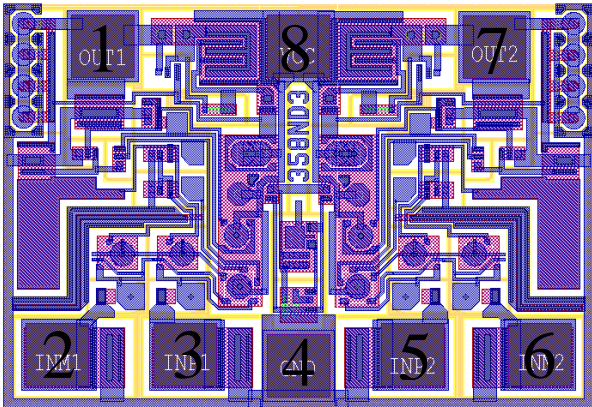
Dual Operational Amplifier



VSP MIKRON

LM358nd3

Pad Location



Wafer Thickness: 460±30µm (280±30µm)
 Top metal: AlSi
 Backside metal: - (or Ti-Ni (V)-Ag)
 Wafer size: 100 mm

Chip size: 0,93 x 0,67 mm

PAD LOCATION COORDINATES

Pad N	Pad Name	Pad size (µm x µm)	Coordinates, µm	
			X	Y
1	1 OUT	88 x 88	190	560
2	1 IN -	88 x 88	125	125
3	1 IN +	88 x 88	305	125
4	GND	88 x 88	465	100
5	2 IN +	88 x 88	625	125
6	2 IN -	88 x 88	805	125
7	2 OUT	88 x 88	740	560
8	V _{CC}	88 x 88	465	560