Low-Power rail-to-rail Operational Amplifier

Description

LMV358 (dual channel) is a rail-to-rail input, output voltage feedback, low power consumption operational amplifier. It has wide input common mode voltage and output swing. The minimum working voltage can be up to 2.1V, and the maximum working voltage is recommended to be 5.5V. Used as power amplifier in all kinds of pocket or portable stereo radio recorders.

LMV358 has the following characteristics:Can provide 1MHz gain bandwidth product. It has an extremely low input bias current (about 10pA level) and can be used for integration, photo diode amplifiers and piezoelectric sensors. The Rail to Rail input and output buffers are also used for specific IC designs in single power systems. Applications of this series of amplifiers include safety monitoring, portable devices, batteries and power supplies, supply control, signal processing and interfaces in low power sensor systems.

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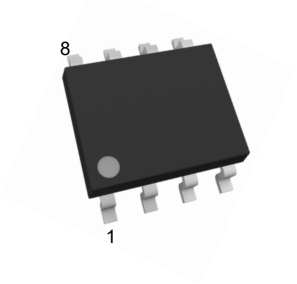
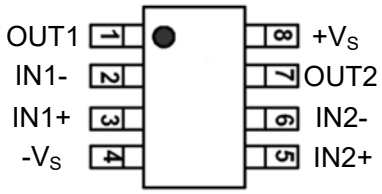


Pin Assignment



Features

- Low power dissipation
- Rail to rail input and output, typical 0.8mv Vos
- Stable unit gain
- Gain bandwidth product 1.1MHz
- Low input bias current: 10pA Level, <1nA
- Low Power consumption
- 2.1V ~ 5.5V working voltage
- Low operating current: 45uA each channel

Pin Function

Pin No.	Symbol	Function	Pin No.	Symbol	Function
1	OUT1	The output of the first operational amplifier	5	IN2+	The non-inverting intput of the second operational amplifier
2	IN1-	The inverting intput of the first operational amplifier	6	IN2-	The inverting intput of the second operational amplifier
3	IN1+	The non-inverting intput of the first operational amplifier	7	OUT2	The output of the second operational amplifier
4	-Vs	Negative power input	8	+Vs	Positive power input

Absolute Maximum Ratings (at T_A = 25°C) Note1

Parameter	Symbol	Value	Unit
Supply Voltage(+V_S→-V_S)	V_{CC}	7.5	V
Common-mode Input Voltage	V_{ICR}	-V_S-0.5~+V_S+0.5	V
Junction Temperature	T_J	150	°C
Operating Temperature Range	T_{OPR}	-40~85	°C
Storage Temperature Range	T_{STG}	-50~150	°C
Lead Temperature (Soldering, 10 sec)	T_L	260	°C

Note1: Exceeding the above limits may damage to the chip. The reliability of the device will also be affected if the device works under the limit conditions. Electrostatic discharge can also cause damage to chips, so it is suggested to take some preventive measures for integrated circuits. Failure to follow proper handling and installation can also cause damage. Precision LMV358 and other devices are more vulnerable to damage than ordinary devices in the case of tiny electrostatic, and small parameter changes may make the whole circuit performance substandard.

Electrical Characteristics

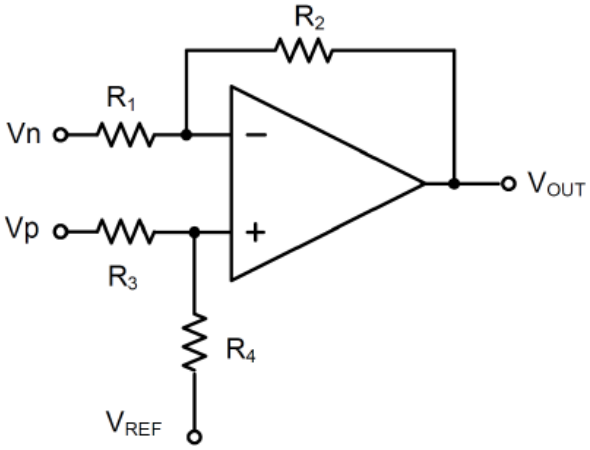
R_L=100KΩ Connected to V_S/2 and V_{OUT}=V_S/2, T_A=25℃, unless otherwise noted

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Input offset voltage	V_{OS}		--	±0.8	±5	mV
Input offset current	I_{OS}		--	10	--	pA
Low input bias current	I_B		--	10	--	pA
Common-mode input voltage rang	V_{CM}	V_S=5.5V	--	-0.1-5.6	--	V
Input offset voltage drift	△V_{OS}/△T		--	2.7	--	μV/°C
Open-loop gain	A_{OL}	V_O=0.1V~4.9 V, R_L=5 kΩ	70	80	--	dB
		V_O=0.035V~4.96V, R_L=100 kΩ	80	84	--	dB
Common mode rejection	CMRR	V_S=5.5,V_{CM}=0.1~4V	62	70	--	dB
		V_S=5.5,V_{CM}=0.1~5.6V	56	68	--	dB
Power supply rejection	PSRR	V_S=2.5V~5.5V,V_{CM}=(-V_S)+0.5V	60	80	--	dB
Working voltage range	V_W		2.1	--	5.5	V
Quiescent current	I_Q	I_{OUT}=0	--	45	75	μA
Gain bandwidth product	GBP	C_L=100pF	--	1.1	--	MHz
Slew rate	SR	G=1, 2V Output Step	--	0.5	--	V/μs
Equivalent input noise Voltage	en	f=1KHz	--	27	--	$nV/\sqrt{Hz}$
		f=10KHz	--	20	--	
Output current	I_{OUT}		18	30	--	mA
Output voltage swing	V_{OH}	R_L=100KΩ	--	0.008	--	V
	V_{OL}	R_L=10KΩ	--	0.08	--	V

Typical Application Circuit

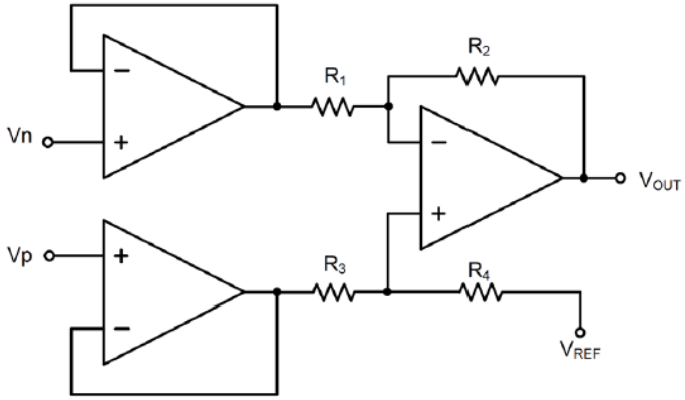
1.differential amplifier

As shown in the figure, if the resistance is equal, (R4 / R3 = R2 / R1), then the output VOUT = (Vp - Vn) × R2 / R1 + VREF



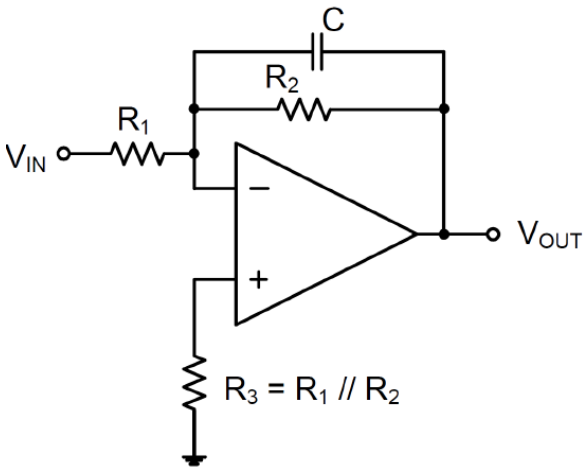
2.instrumentation amplifier

The circuit in the figure above performs the same function, but the input is high impedance.

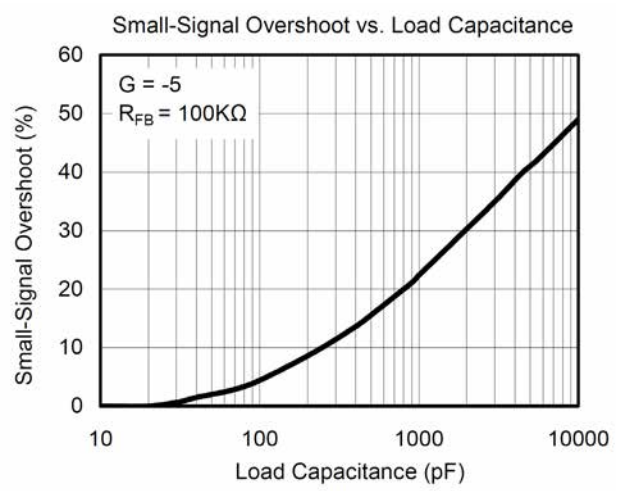


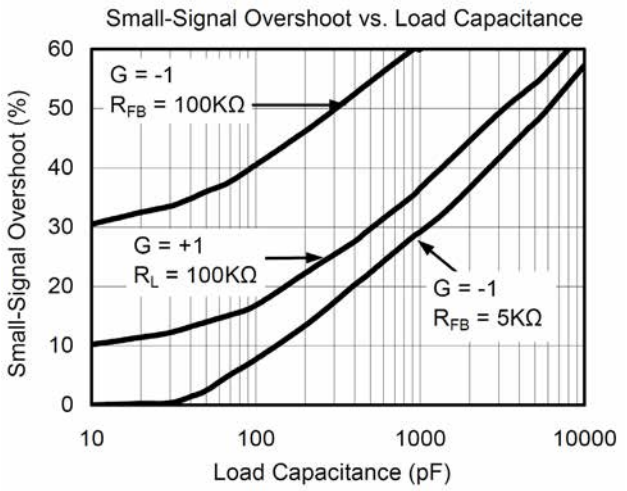
3.Low pass active filtering

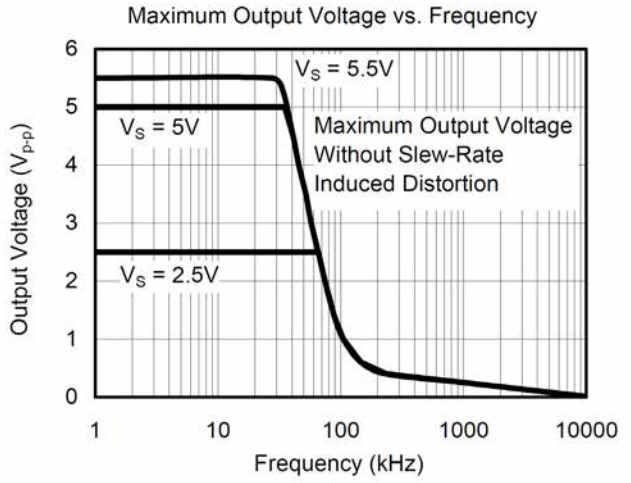
The low-pass filter circuit shown here has a (-R2 / R1) DC gain and -3db at a frequency of 1/2 π R2C corner. Make sure the filter is within the amplifier's bandwidth. Large feedback resistors are easily accompanied by parasitic capacitance at high speed, resulting in adverse effects such as oscillation. Keep the resistance value as low as possible and consider the appropriate output load.

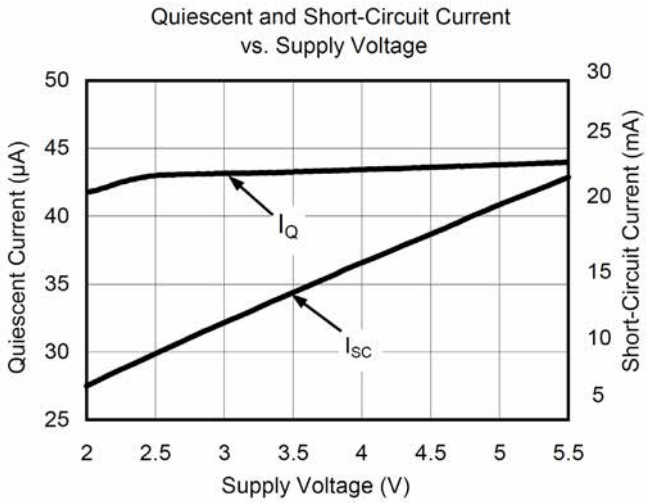


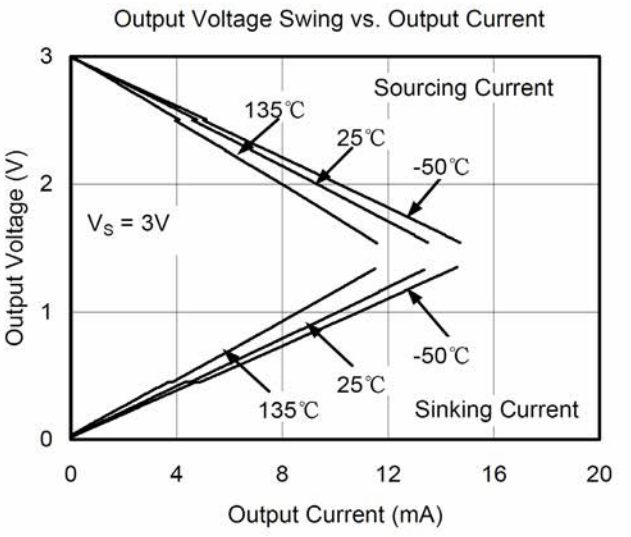
Typical characteristic curve

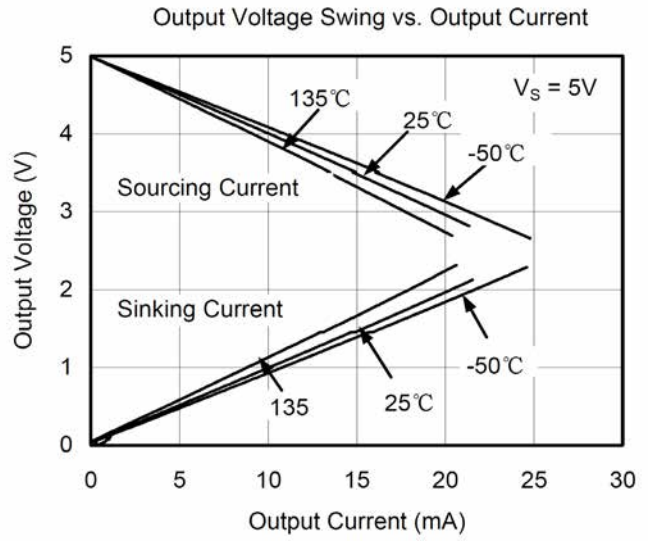


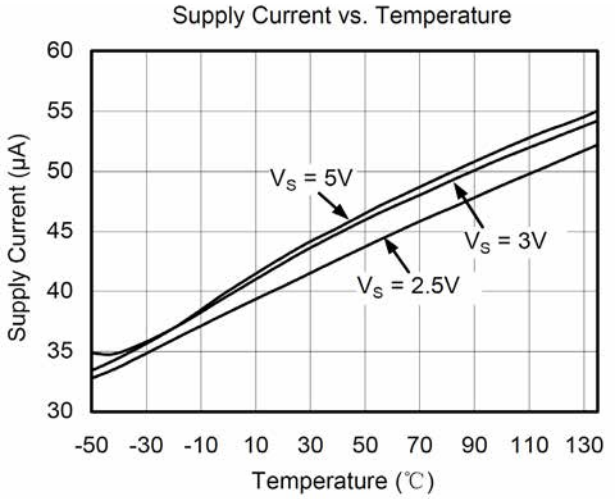


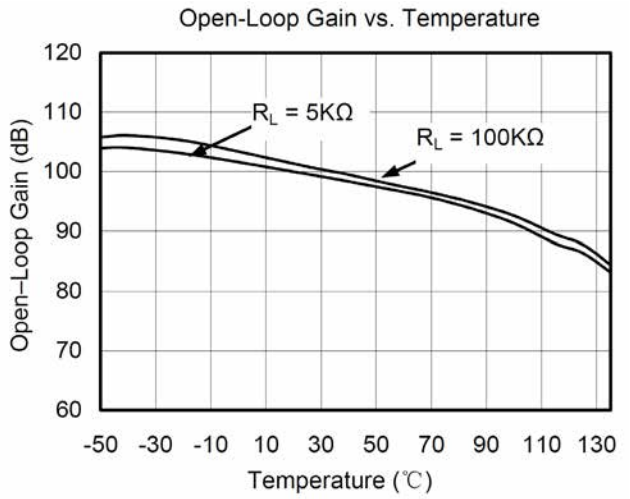


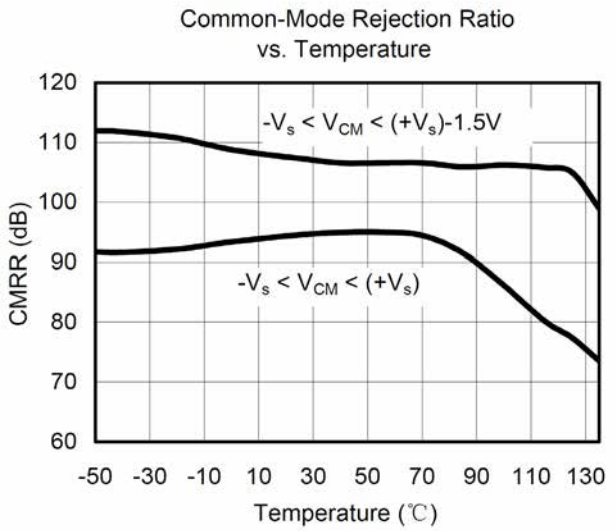


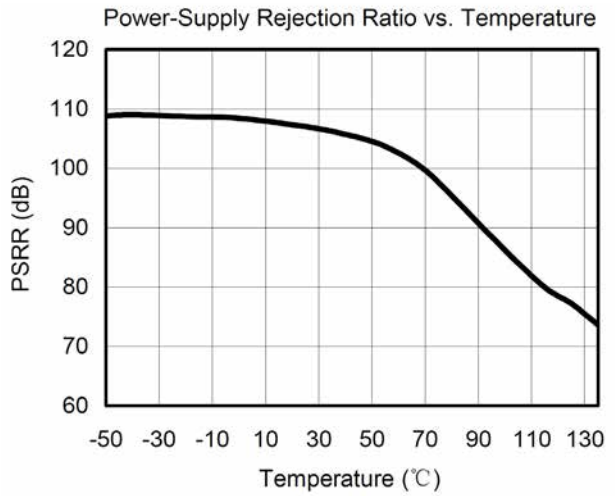












Package Outline

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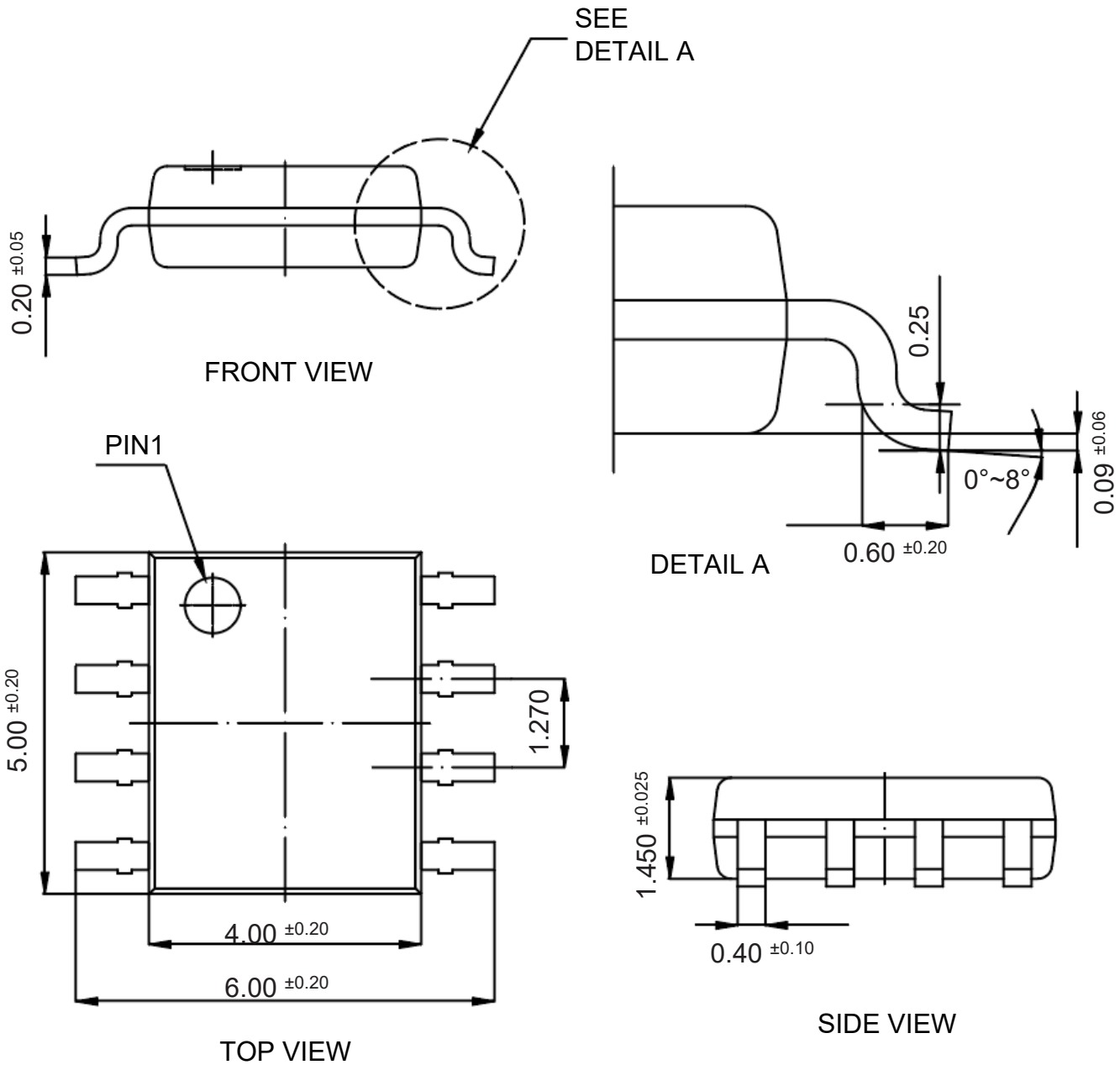
Dimensions in mm



Ordering Information

Device	Package	Shipping
LMV358	SOP-8	4,000PCS/Reel&13inches

Contact Information

TANI website: **http://www.tanisemi.com** Email:tani@tanisemi.com

For additional information, please contact your local Sales Representative.

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