LM380 - 2.5W Audio Power Amplifier

Features

- Wide supply voltage range: 10V-22V
- Low quiescent power drain: 0.13W (V_S= 18V)
- Voltage gain fixed at 50
- High peak current capability: 1.3A
- Input referenced to GND
- High input impedance: 150kΩ
- Low distortion
- Quiescent output voltage is at one-half of the supply voltage
- Standard dual-in-line package

General Description

The LM380 is a power audio amplifier for consumer applications. More...

Typical Application

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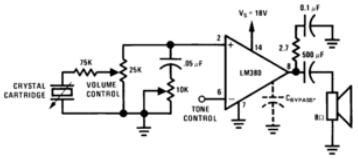
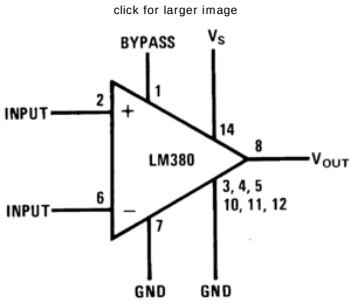


Parametric Table

Channels	1 Channels
Mono/Stereo	Mono
User Supply	18 Volt
Power@ 8Ohms, 1% THD	4 Watt
Power@ 8Ohms, 10% THD	6 Watt
Temperature Min	0 deg C
Temperature Max	70 deg C

Block Diagram

click for larger image



Typical Performance

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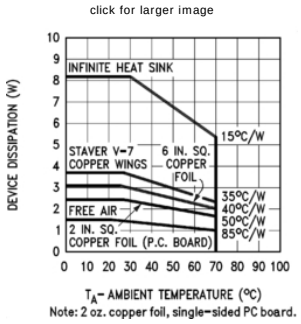

Datasheet

RoHS Compliance Information
LM380 2.5W Audio Power Amplifier
LM380 2.5W Audio Power Amplifier (**Japanese**) 本サイトの日本語版データシートは最新版ではない場合があります。ご検討 およびご採用に当たっては、最新の英語版データシートを必ずご確認ください。

Package Availability, Models, Samples & Pricing

Part Number	Package							Factory Lead Time		Models				Std Pack Size	Package Marking Format
	Type	Pins	Spec.	MSL Rating	Peak Reflow	RoHS Report	CAD Symbols	Weeks	Qty						
LM380N-8	MDIP	8	NOPB	1	NA	RoHS	N/A	Full production 6 weeks	5000	N/A				rail of 40	NSUZXYTT LM 380N-8
LM380N	MDIP	14	STD NOPB	1 1	NA NA	RoHS	N/A	Full production 6 weeks	2000	N/A				rail of 25	NSUZXYYTTE# LM380N

General Description

The LM380 is a power audio amplifier for consumer applications. In order to hold system cost to a minimum, gain is internally fixed at 34 dB. A unique input stage allows ground referenced input signals. The output automatically self-centers to one-half the supply voltage.

The output is short circuit proof with internal thermal limiting. The package outline is standard dual-in-line. The LM380N uses a copper lead frame. The center three pins on either side comprise a heat sink. This makes the device easy to use in standard PC layouts.

Uses include simple phonograph amplifiers, intercoms, line drivers, teaching machine outputs, alarms, ultrasonic drivers, TV sound systems, AM-FM radio, small servo drivers, power converters, etc.

A selected part for more power on higher supply voltages is available as the LM384. For more information see AN-69.

Reliability Metrics

Part Number	Process	EFR Reject	EFR Sample Size	PPM *	LTA Rejects	LTA Device Hours	FITS	MTTF (Hours)
LM380N	SLM	0	42786	0	0	3352500	2	951281028
LM380N-8	SLM	0	42786	0	0	3352500	2	951281028

Note: The Early Failure Rates were calculated as point estimates. The Long Term Failure Rates were calculated at 60% confidence using the Arrhenius equation at 0.7eV activation energy and derating the assumed stress temperature of 150°C to an application temperature of 55°C.

National Semiconductor

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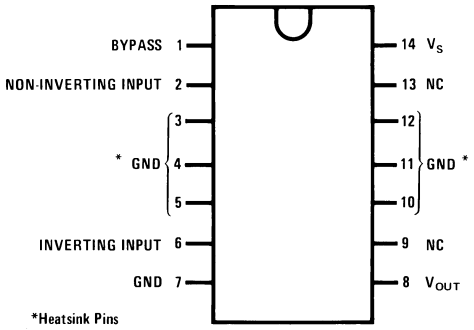
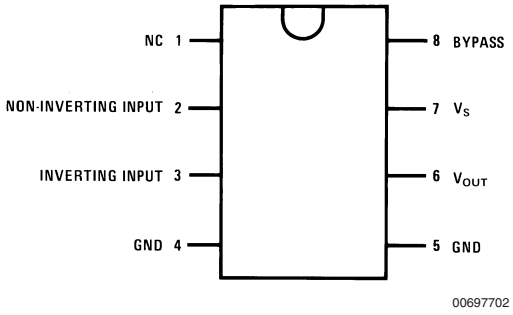
Connection Diagrams (Dual-In-Line Packages, Top View)



Order Number LM380N
See NS Package Number N14A



Order Number LM380N-8
See NS Package Number N08E

Absolute Maximum Ratings (Note 1)

If Military/Aerospace specified devices are required, please contact the National Semiconductor Sales Office/ Distributors for availability and specifications.

Supply Voltage	22V
Peak Current	1.3A
Package Dissipation 14-Pin DIP (Note 7)	8.3W
Package Dissipation 8-Pin DIP (Note 7)	1.67W
Input Voltage	±0.5V
Storage Temperature	−65˚C to +150˚C
Operating Temperature	0˚C to +70˚C
Junction Temperature	+150˚C
Lead Temperature (Soldering, 10 sec.)	+260˚C
ESD rating to be determined	
Thermal Resistance	
θ_{JC} (14-Pin DIP)	30˚C/W
θ_{JC} (8-Pin DIP)	37˚C/W
θ_{JA} (14-Pin DIP)	79˚C/W
θ_{JA} (8-Pin DIP)	107˚C/W

Electrical Characteristics (Note 2)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
$P_{OUT(RMS)}$	Output Power	R_L = 8Ω, THD = 3% (Notes 4, 5)	2.5			W
A_V	Gain		40	50	60	V/V
V_{OUT}	Output Voltage Swing	R_L = 8Ω		14		V_{p-p}
Z_{IN}	Input Resistance			150k		Ω
THD	Total Harmonic Distortion	(Notes 5, 6)		0.2		%
PSRR	Power Supply Rejection Ratio	(Note 3)		38		dB
V_S	Supply Voltage		10		22	V
BW	Bandwidth	P_{OUT} = 2W, R_L = 8Ω		100k		Hz
I_Q	Quiescent Supply Current			7	25	mA
V_{OUTQ}	Quiescent Output Voltage		8	9.0	10	V
I_{BIAS}	Bias Current	Inputs Floating		100		nA
I_{SC}	Short Circuit Current			1.3		A

Note 1: "Absolute Maximum Ratings" indicate limits beyond which damage to the device may occur. Operating Ratings indicate conditions for which the device is functional, but do not guarantee specific performance limits.

Note 2: V_S = 18V and T_A = 25˚C unless otherwise specified.

Note 3: Rejection ratio referred to the output with C_{BYPASS} = 5 µF.

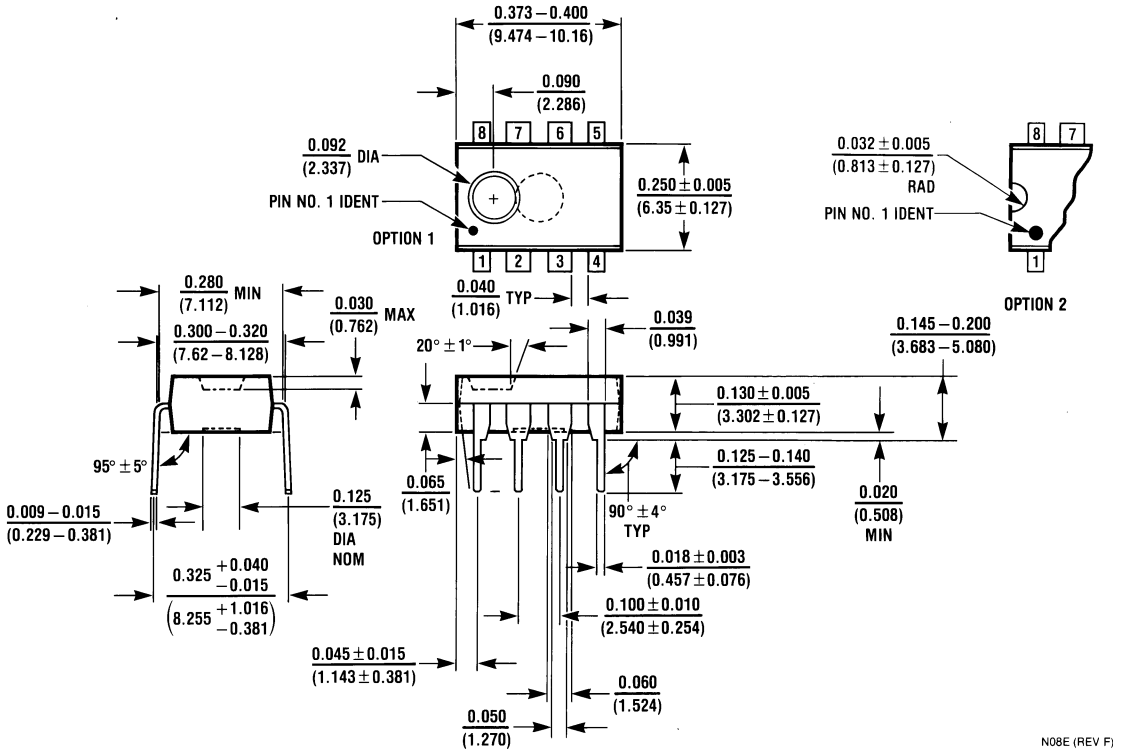
Note 4: With device Pins 3, 4, 5, 10, 11, 12 soldered into a 1/16" epoxy glass board with 2 ounce copper foil with a minimum surface of 6 square inches.

Note 5: C_{BYPASS} = 0.47 µfd on Pin 1.

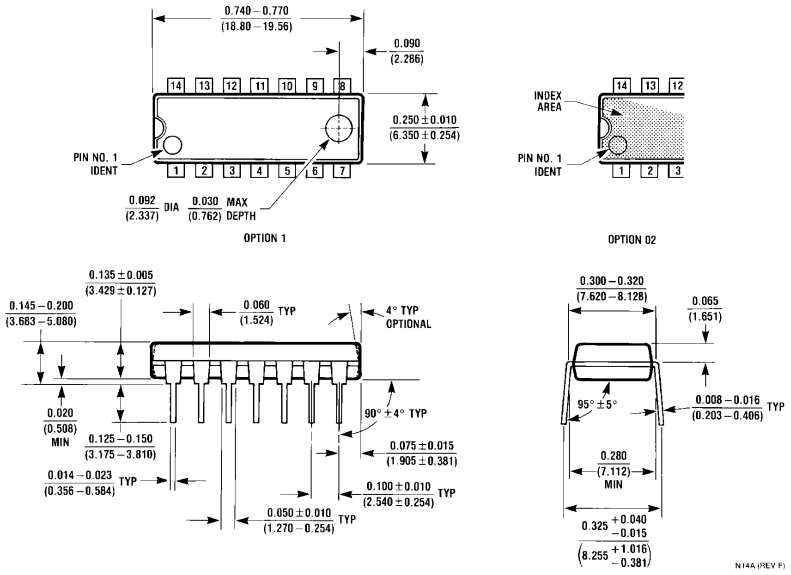
Note 6: The maximum junction temperature of the LM380 is 150˚C.

Note 7: The package is to be derated at 15˚C/W junction to heat sink pins for 14-pin pkg; 75˚C/W for 8-pin.

Physical Dimensions inches (millimeters) unless otherwise noted



Molded Dual-In-Line Package (N)
Order Number LM380N-8
NS Package Number N08E



Molded Dual-In-Line Package (N)
Order Number LM380N
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