

February 1995

LM384 5W Audio Power Amplifier

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General Description

The LM384 is a power audio amplifier for consumer application. In order to hold system cost to a minimum, gain is internally fixed at 34 dB. A unique input stage allows inputs to be ground referenced. The output is automatically self-centering to one half the supply voltage.

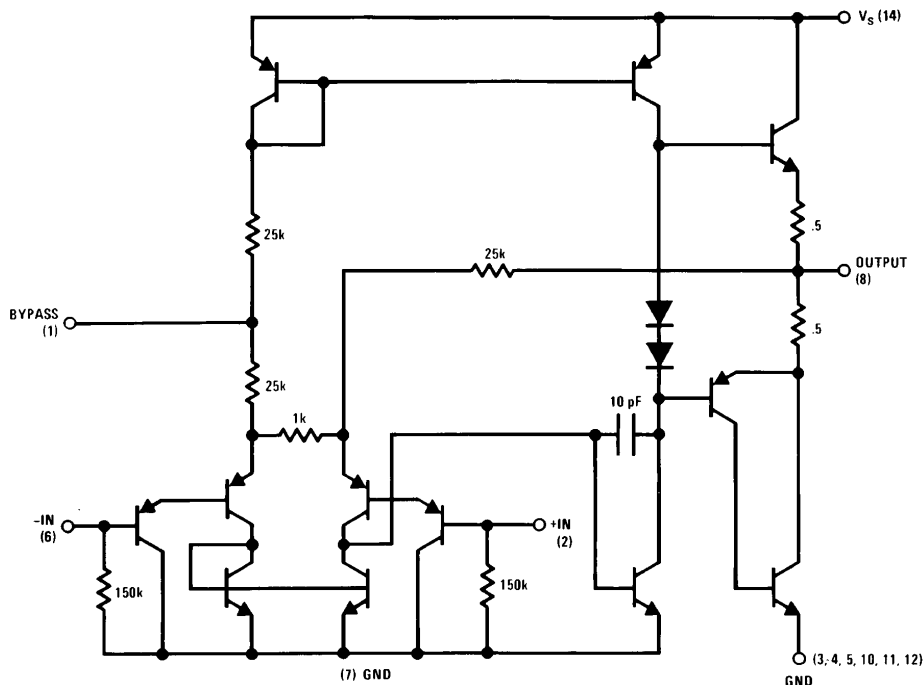
The output is short-circuit proof with internal thermal limiting. The package outline is standard dual-in-line. A copper lead frame is used with the center three pins on either side comprising a heat sink. This makes the device easy to use in standard p-c layout.

Uses include simple phonograph amplifiers, intercoms, line drivers, teaching machine outputs, alarms, ultrasonic drivers, TV sound systems, AM-FM radio, sound projector systems, etc. See AN-69 for circuit details.

Features

- Wide supply voltage range
- Low quiescent power drain
- Voltage gain fixed at 50
- High peak current capability
- Input referenced to GND
- High input impedance
- Low distortion
- Quiescent output voltage is at one half of the supply voltage
- Standard dual-in-line package

Schematic Diagram



TL/H/7843-3

Absolute Maximum Ratings

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

Supply Voltage	28V
Peak Current	1.3A
Power Dissipation (See Notes 3 and 4)	1.67W
Input Voltage	$\pm 0.5V$

Storage Temperature	-65°C to $+150^{\circ}\text{C}$
Operating Temperature	0°C to $+70^{\circ}\text{C}$
Lead Temperature (Soldering, 10 sec.)	260°C
Thermal Resistance	
θ_{JC}	30°C/W
θ_{JA}	79°C/W

Electrical Characteristics (Note 1)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Z_{IN}	Input Resistance			150		$k\Omega$
I_{BIAS}	Bias Current	Inputs Floating		100		nA
A_V	Gain		40	50	60	V/V
P_{OUT}	Output Power	THD = 10%, $R_L = 8\Omega$	5	5.5		W
I_Q	Quiescent Supply Current			8.5	25	mA
$V_{\text{OUT } Q}$	Quiescent Output Voltage			11		V
BW	Bandwidth	$P_{\text{OUT}} = 2W$, $R_L = 8\Omega$		450		kHz
V^+	Supply Voltage		12		26	V
I_{SC}	Short Circuit Current (Note 5)			1.3		A
PSRR_{RTO}	Power Supply Rejection Ratio (Note 2)			31		dB
THD	Total Harmonic Distortion	$P_{\text{OUT}} = 4W$, $R_L = 8\Omega$		0.25	1.0	%

Note 1: $V^+ = 22V$ and $T_A = 25^{\circ}\text{C}$ operating with a Staver V7 heat sink for 30 seconds.

Note 2: Rejection ratio referred to the output with $C_{\text{BYPASS}} = 5 \mu\text{F}$, freq = 120 Hz.

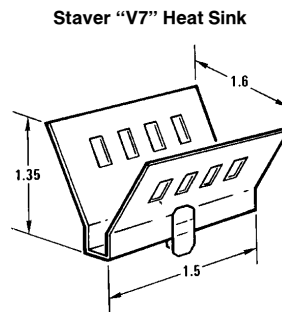
Note 3: The maximum junction temperature of the LM384 is 150°C .

Note 4: The package is to be derated at 15°C/W junction to heat sink pins.

Note 5: Output is fully protected against a shorted speaker condition at all voltages up to 22V.

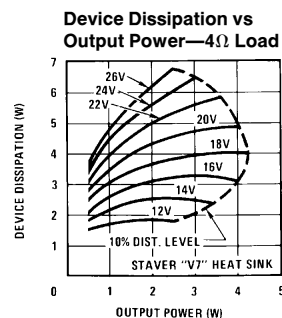
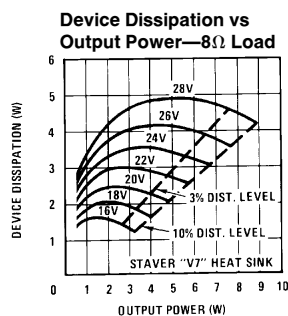
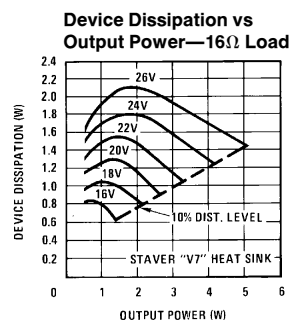
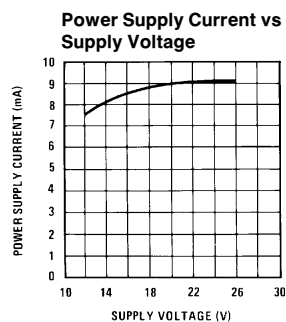
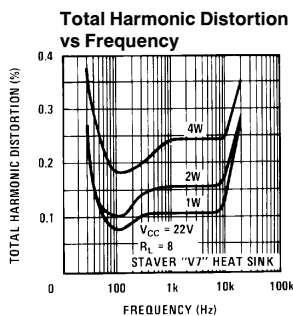
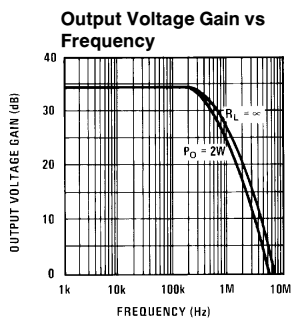
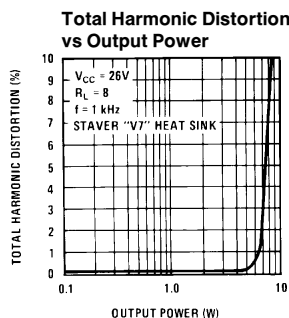
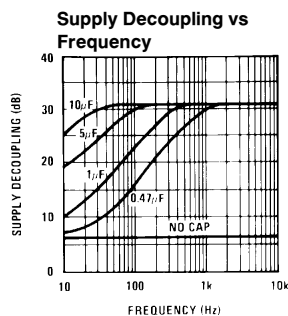
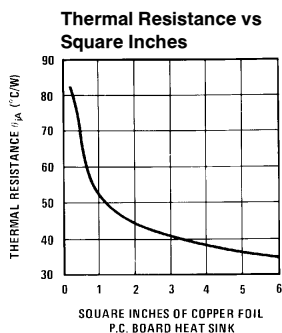
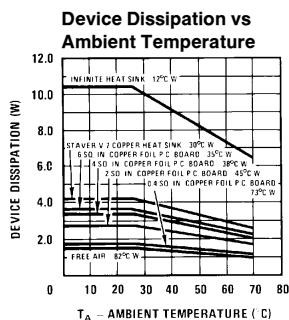
Heat Sink Dimensions

Staver Company
41 Saxon Ave.
P.O. Drawer H
Bay Shore, N.Y.
Tel: (516) 666-8000



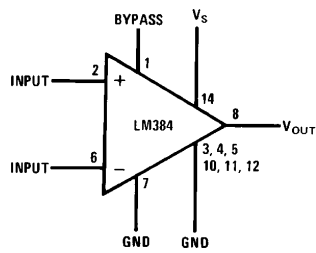
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Typical Performance Characteristics

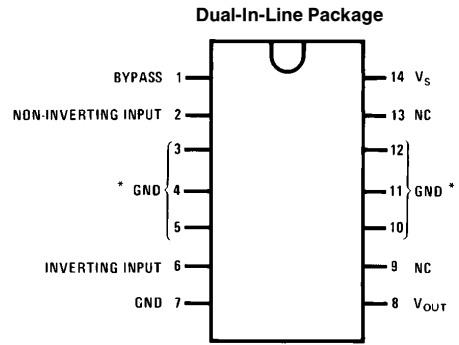


TL/H/7843-5

Block and Connection Diagrams



TL/H/7843-1



*Heatsink Pins

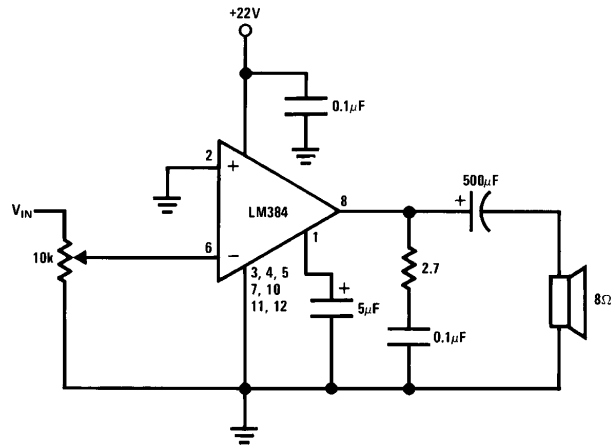
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Top View

Order Number LM384N
See NS Package Number N14A

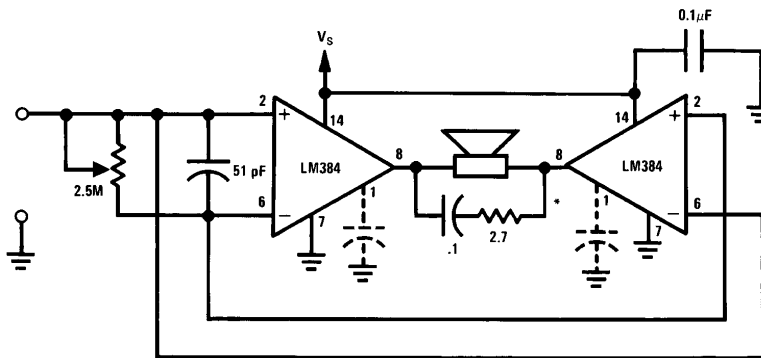
Typical Applications

Typical 5W Amplifier



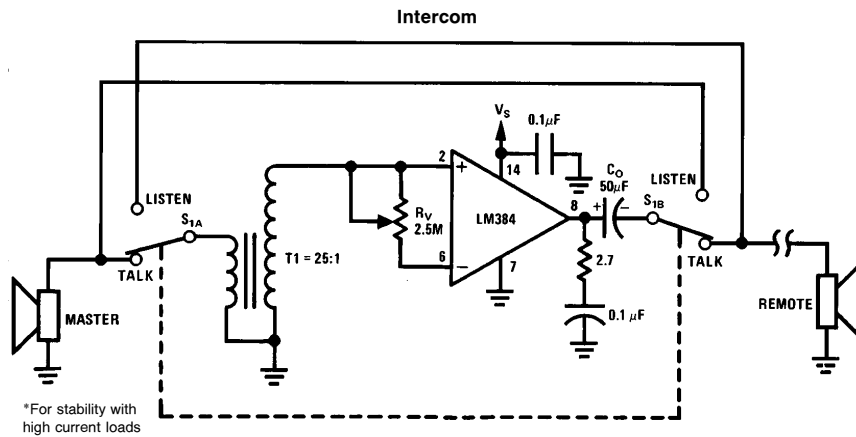
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Bridge Amplifier

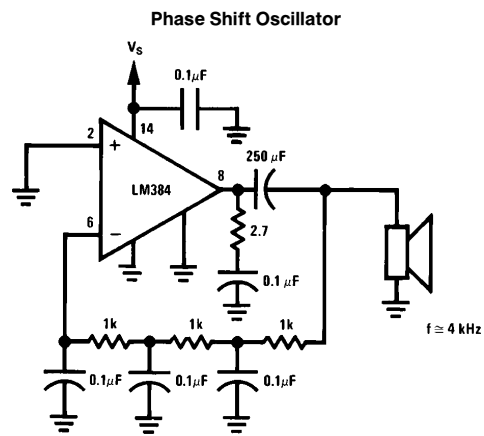


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Typical Applications (Continued)

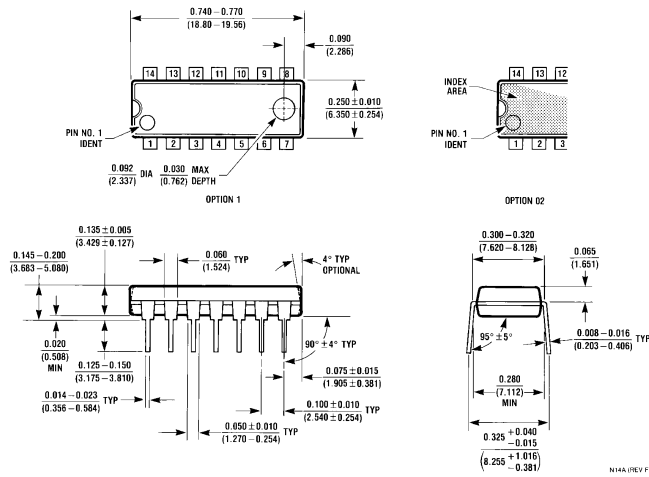


TL/H/7843-8



TL/H/7843-9

Physical Dimensions inches (millimeters)



Molded Dual-In-Line Package (N)
Order Number LM384N
NS Package Number N14A

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