

LM383/LM383A 7W Audio Power Amplifier

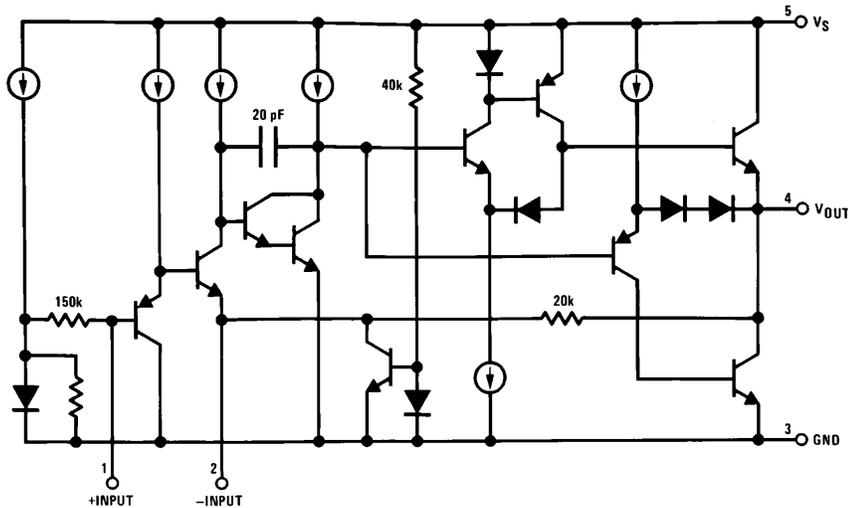
General Description

The LM383 is a cost effective, high power amplifier suited for automotive applications. High current capability (3.5A) enables the device to drive low impedance loads with low distortion. The LM383 is current limited and thermally protected. High voltage protection is available (LM383A) which enables the amplifier to withstand 40V transients on its supply. The LM383 comes in a 5-pin TO-220 package.

Features

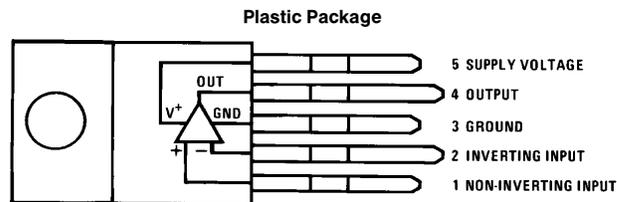
- High peak current capability (3.5A)
- Large output voltage swing
- Externally programmable gain
- Wide supply voltage range (5V–20V)
- Few external parts required
- Low distortion
- High input impedance
- No turn-on transients
- High voltage protection available (LM383A)
- Low noise
- AC short circuit protected

Equivalent Schematic



TL/H/7145-1

Connection Diagram



Order Number LM383T or LM383AT
See NS Package Number T05B

TL/H/7145-2

Absolute Maximum Ratings

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

Peak Supply Voltage (50 ms)	
LM383A (Note 2)	40V
LM383	25V
Operating Supply Voltage	20V
Output Current	
Repetitive	3.5A
Non-repetitive	4.5A

Input Voltage	±0.5V
Power Dissipation (Note 3)	15W
Operating Temperature	0°C to +70°C
Storage Temperature	-60°C to +150°C
Lead Temperature (Soldering, 10 sec.)	260°C

Electrical Characteristics $V_S = 14.4V, T_{TAB} = 25^\circ C, A_V = 100$ (40 dB), $R_L = 4\Omega$, unless otherwise specified

Parameter	Conditions	Min	Typ	Max	Units
DC Output Level		6.4	7.2	8	V
Quiescent Supply Current	Excludes Current in Feedback Resistors		45	80	mA
Supply Voltage Range		5		20	V
Input Resistance			150		k Ω
Bandwidth	Gain = 40 dB		30		kHz
Output Power	$V_S = 13.2V, f = 1$ kHz $R_L = 4\Omega, THD = 10\%$		4.7		W
	$R_L = 2\Omega, THD = 10\%$		7.2		W
	$V_S = 13.8V, f = 1$ kHz $R_L = 4\Omega, THD = 10\%$		5.1		W
	$R_L = 2\Omega, THD = 10\%$		7.8		W
	$V_S = 14.4V, f = 1$ kHz $R_L = 4\Omega, THD = 10\%$	4.8	5.5		W
	$R_L = 2\Omega, THD = 10\%$	7	8.6		W
	$R_L = 1.6\Omega, THD = 10\%$		9.3		W
	$V_S = 16V, f = 1$ kHz $R_L = 4\Omega, THD = 10\%$		7		W
	$R_L = 2\Omega, THD = 10\%$		10.5		W
	$R_L = 1.6\Omega, THD = 10\%$		11		W
THD	$P_O = 2W, R_L = 4\Omega, f = 1$ kHz		0.2		%
	$P_O = 4W, R_L = 2\Omega, f = 1$ kHz		0.2		%
Ripple Rejection	$R_S = 50\Omega, f = 100$ Hz	30	40		dB
	$R_S = 50\Omega, f = 1$ kHz		44		dB
Input Noise Voltage	$R_S = 0, 15$ kHz Bandwidth		2		μV
Input Noise Current	$R_S = 100$ k $\Omega, 15$ kHz Bandwidth		40		pA

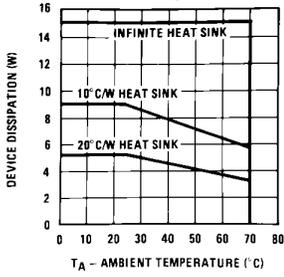
Note 1: A 0.2 μF capacitor in series with a 1 Ω resistor should be placed as close as possible to pins 3 and 4 for stability.

Note 2: The LM383 shuts down above 25V.

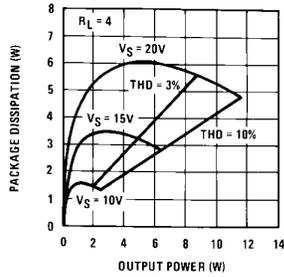
Note 3: For operating at elevated temperatures, the device must be derated based on a 150°C maximum junction temperature and a thermal resistance of 4°C/W junction to case.

Typical Performance Characteristics

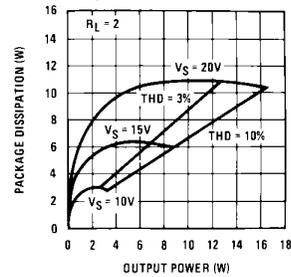
Device Dissipation vs Ambient Temperature



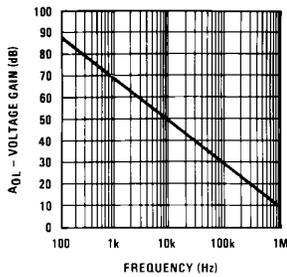
Power Dissipation vs Output Power



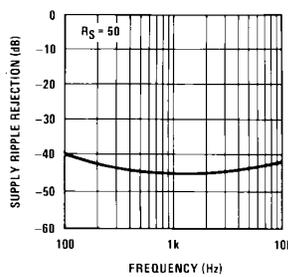
Power Dissipation vs Output Power



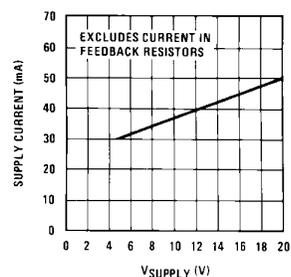
Open Loop Gain vs Frequency



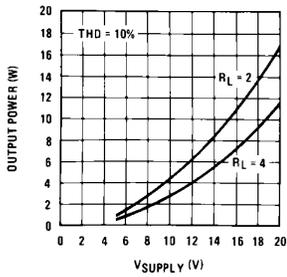
Supply Ripple Rejection vs Frequency



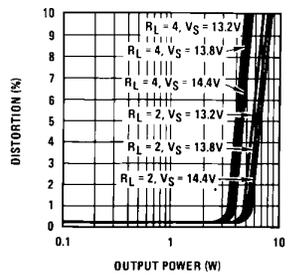
Supply Current vs Supply Voltage



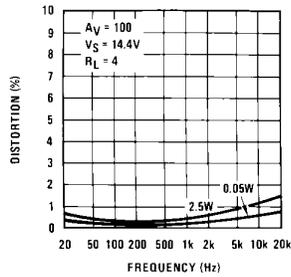
Output Power vs Supply Voltage



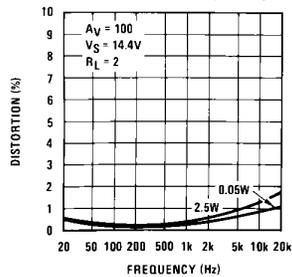
Distortion vs Output Power



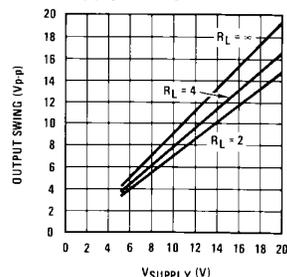
Distortion vs Frequency



Distortion vs Frequency

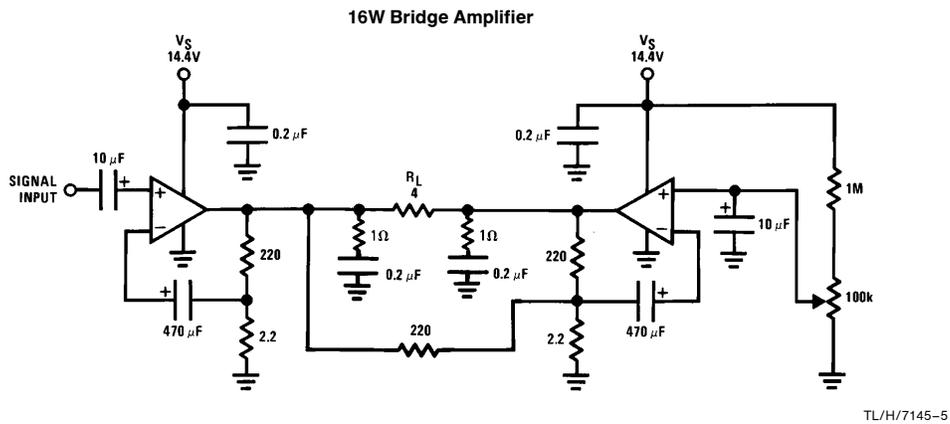
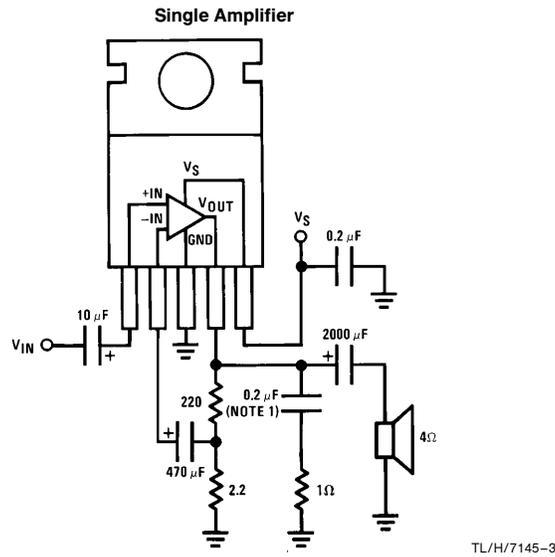


Output Swing vs Supply Voltage



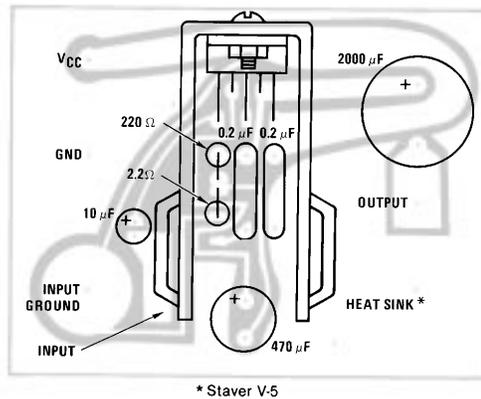
TL/H/7145-4

Typical Applications



Component Layout

Single Amplifier
 $V_S = 20V$
 $R_L = 4\Omega$



Heatsink from:
 Staver Company
 41 Saxon Ave.
 P.O. Drawer H
 Bay Shore, NY 11706
 Tel: (516) 666-8000

TL/H/7145-6