

LM383/LM383A 7W Audio Power Amplifier

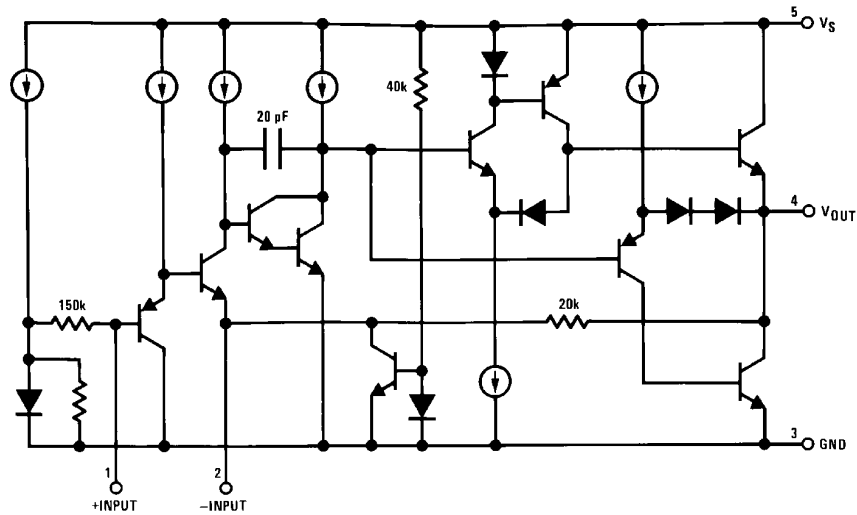
General Description

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

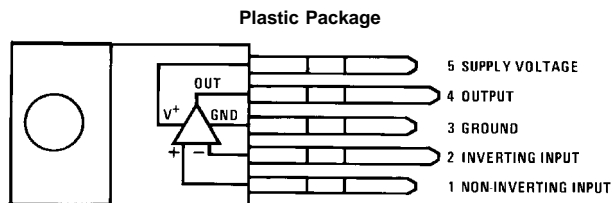
- High peak current capability (3.5A)
- Large output voltage swing
- Externally programmable gain
- Wide supply voltage range (5V–20V)
- Few external parts required
- Low distortion
- High input impedance
- No turn-on transients
- High voltage protection available (LM383A)
- Low noise
- AC short circuit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

Equivalent Schematic



DS007145-1

Connection Diagram



DS007145-2

Order Number LM383T or LM383AT
See NS Package Number T05D

Absolute Maximum Ratings (Note *NO TARGET FOR FNxref NS0064*),

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 Ω , 15 kHz Bandwidth		40		pA

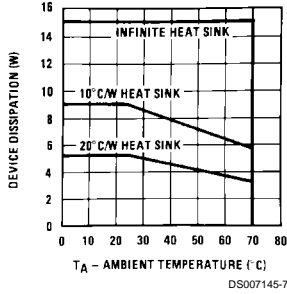
Note 1: A 0.2 μF capacitor in series with a 1 Ω resistor should be placed as close as possible to pins 3 and 4 for stability.

Note 2: The LM383 shuts down above 25V.

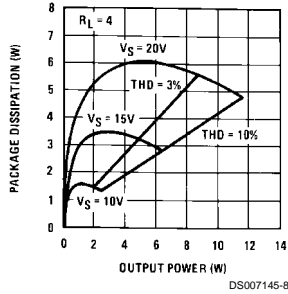
Note 3: For operating at elevated temperatures, the device must be derated based on a 150°C maximum junction temperature and a thermal resistance of 4°C/W junction to case.

Typical Performance Characteristics

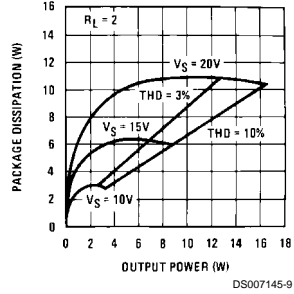
Device Dissipation vs Ambient Temperature



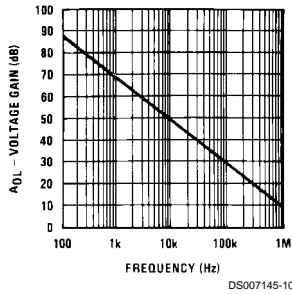
Power Dissipation vs Output Power



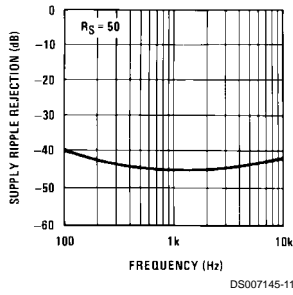
Power Dissipation vs Output Power



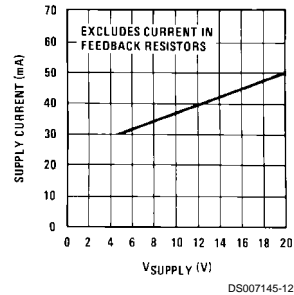
Open Loop Gain vs Frequency



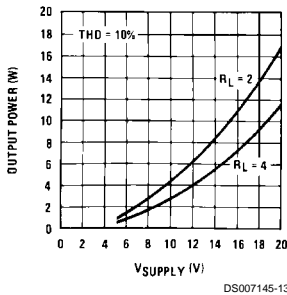
Supply Ripple Rejection vs Frequency



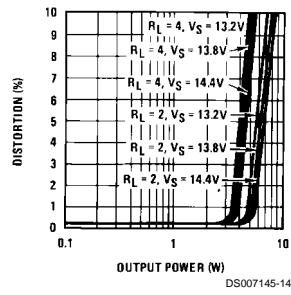
Supply Current vs Supply Voltage



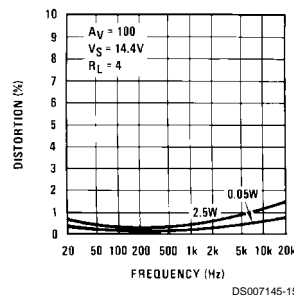
Output Power vs Supply Voltage



Distortion vs Output Power

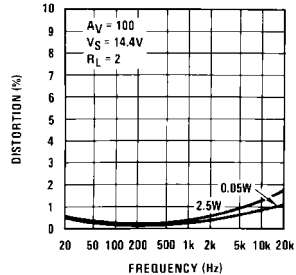


Distortion vs Frequency



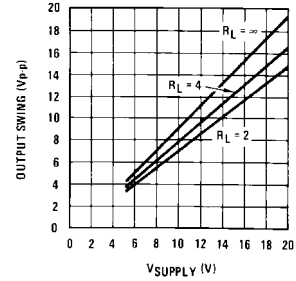
Typical Performance Characteristics (Continued)

Distortion vs Frequency



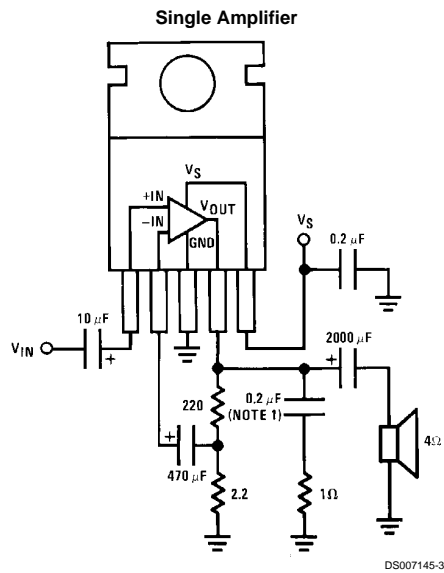
DS007145-16

Output Swing vs Supply Voltage



DS007145-17

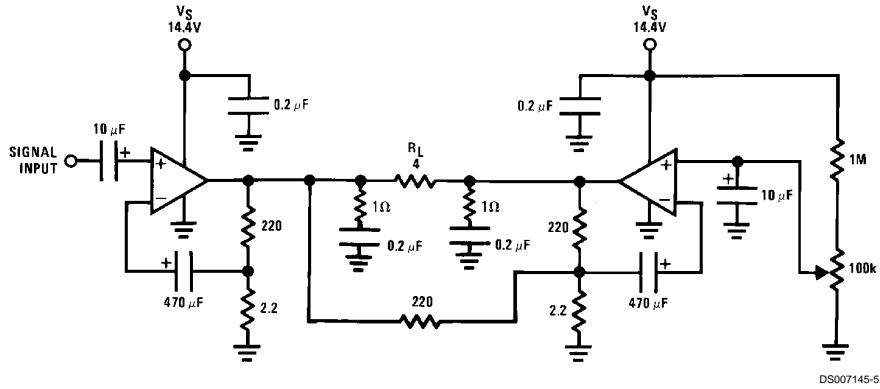
Typical Applications



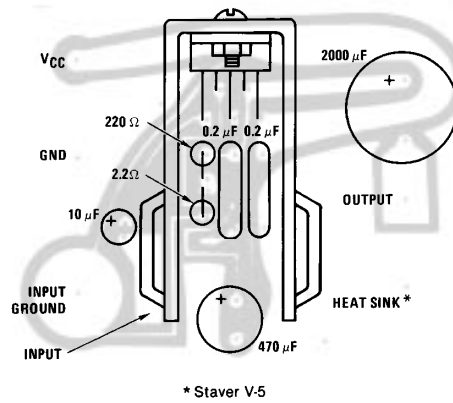
DS007145-3

Typical Applications (Continued)

16W Bridge Amplifier

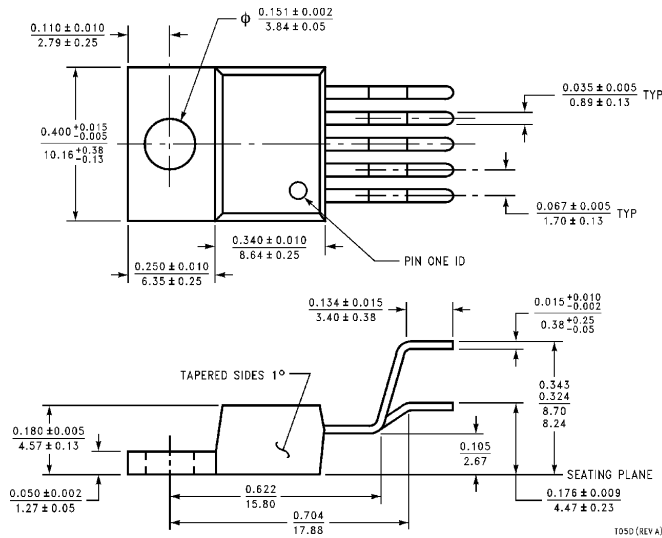


Component Layout



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

Physical Dimensions inches (millimeters)



Order Number LM383T or LM383AT
NS Package Number T05D

LIFE SUPPORT POLICY

NATIONAL'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE PRESIDENT OF NATIONAL SEMICONDUCTOR CORPORATION. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.
2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

<p>National Semiconductor Corporation 1111 West Bardin Road Arlington, TX 76017 Tel: (800) 272-9959 Fax: (800) 737-7018 http://www.national.com</p>	<p>National Semiconductor Europe Fax: (+49) 0-180-530 85 86 Email: cnjwge@tevm2.nsc.com Deutsch Tel: (+49) 0-180-530 85 85 English Tel: (+49) 0-180-532 78 32 Français Tel: (+49) 0-180-532 93 58 Italiano Tel: (+49) 0-180-534 16 80</p>	<p>National Semiconductor Hong Kong Ltd. 13th Floor, Straight Block, Ocean Centre, 5 Canton Rd. Tsimshatsui, Kowloon Hong Kong Tel: (852) 2737-1600 Fax: (852) 2736-9960</p>	<p>National Semiconductor Japan Ltd. Tel: 81-043-299-2308 Fax: 81-043-299-2408</p>
--	--	---	---

National does not assume any responsibility for use of any circuitry described, no circuit patent licenses are implied and National reserves the right at any time without notice to change said circuitry and specifications.