Ordering number : EN4090E

LA4450

Monolithic Linear IC

2-Channel, 26V, Power Amplifier for Bus and Track in Car Stereo

ON Semiconductor®

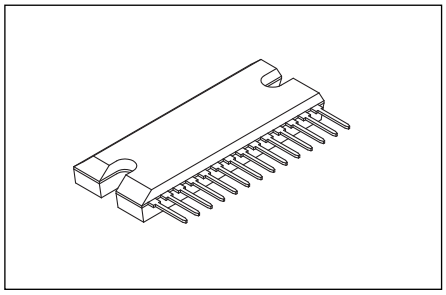
http://onsemi.com

Overview

The LA4450 is a single package 2-channel power Amplifier that supports an operating voltage of 26V. It is particularly well suited for use as the bus and track power IC in car stereo applications. Additionally, since the LA4450 can drive 4Ω loads, it can be used effectively in high-power high-end products. Furthermore, since it supports a high operating voltage and has low distortion, it is also optimal for use in TV and home audio products.

Features

- Two channels in a single package
- P_O = 12W×2 (V_{CC} = 26.4V, R_L = 8Ω, THD = 10%)
- P_O = 20W×2 (V_{CC} = 26.4V, R_L = 4Ω, THD = 10%)
- Can drive 4Ω speakers
- Built-in standby switch
- Minimizes impulse noises



SIP14 36.8x13.8 / SIP14H

Functions

- Standby switch (active on high (+5V) input)
- On-chip impulse noise protection circuit
- On-chip thermal protection circuit
- On-chip overvoltage and surge protection circuits

Specifications

Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V_{CC} max	Rg = 0 (no signal)	37	V
Maximum output current	I_O peak		4	A
Allowable power dissipation	Pd max	Infinite heat sink*	25	W
Operating temperature	Topr		–35 to +80	°C
Storage temperature	Tstg		–40 to +150	°C

Note : * Set V_{CC} and R_L within ranges that do not cause Pd max to exceed 25W.

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

Operating Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V_{CC}		26.4	V
Recommended load resistance	R_L		8	Ω
Operating supply voltage range	V_{CC} op		10 to 30	V

Functional operation above the stresses listed in the Recommended Operating Ranges is not implied. Extended exposure to stresses beyond the Recommended Operating Ranges limits may affect device reliability.

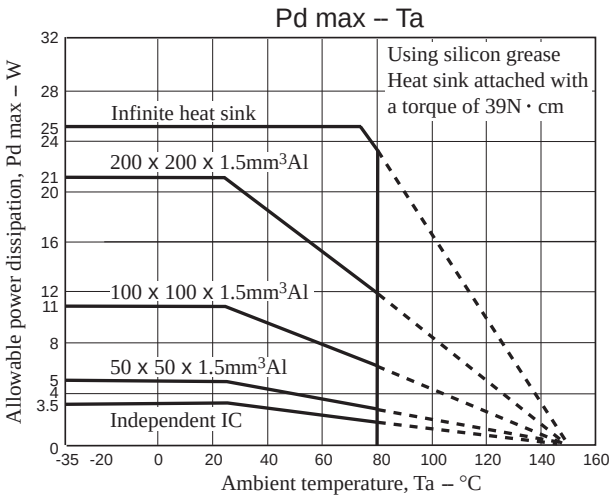
ORDERING INFORMATION

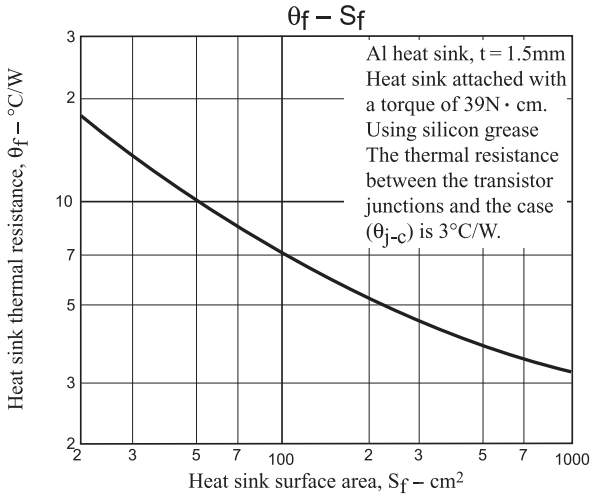
See detailed ordering and shipping information on page 8 of this data sheet.

Electrical Characteristics at Ta = 25°C, V_{CC} = 26.4V, R_L = 8Ω, f = 1kHz, Rg = 600Ω

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Standby current	Ist	Standby switch off		1	30	μA
Quiescent current	I_{CCO}	Rg = 0	50	80	140	mA
Output power	P_{O1}	THD = 10%	10	12		W
	P_{O2}	THD = 10%, R_L = 4Ω		20		W
Voltage gain	VG	V_O = 0dBm	49	51	53	dB
Total harmonic distortion	THD	P_O = 1W		0.07	0.4	%
Output noise voltage	V_{NO}	Rg = 0, BPF-BW = 20Hz to 20kHz		0.4	1.0	mV
Ripple exclusion ratio	SVRR	Rg = 0, f_R = 100Hz, V_R = 0dBm	45	55		dB
Channel separation	CHsep	V_O = 0dBm, Rg = 10kΩ	45	55		dB
Standby control voltage	Vst	With a 10kΩ resistor connected at pin 12	2.5		V_{CC}	V

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

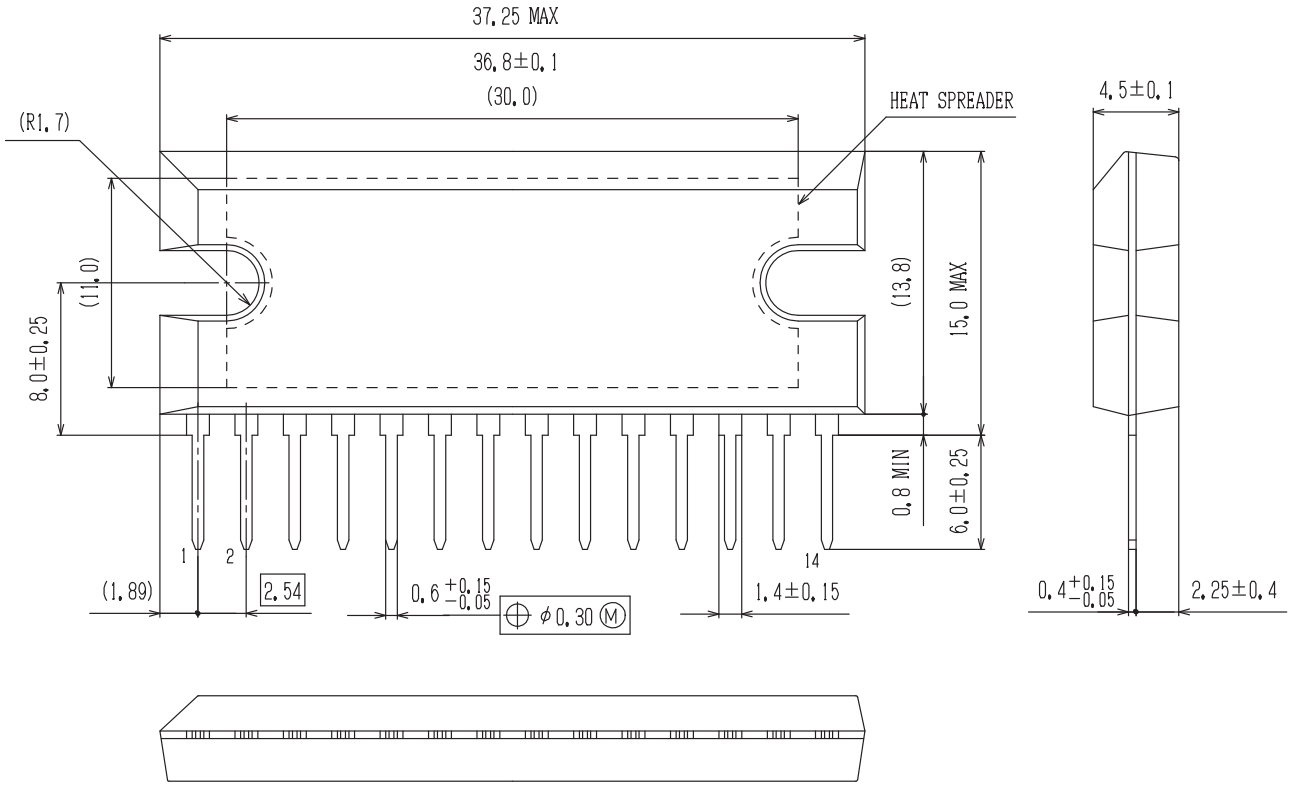




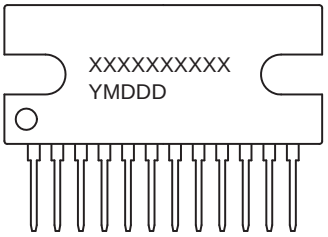
Package Dimensions

unit : mm

SIP14 36.8x13.8 / SIP14H
CASE 127AQ
ISSUE A



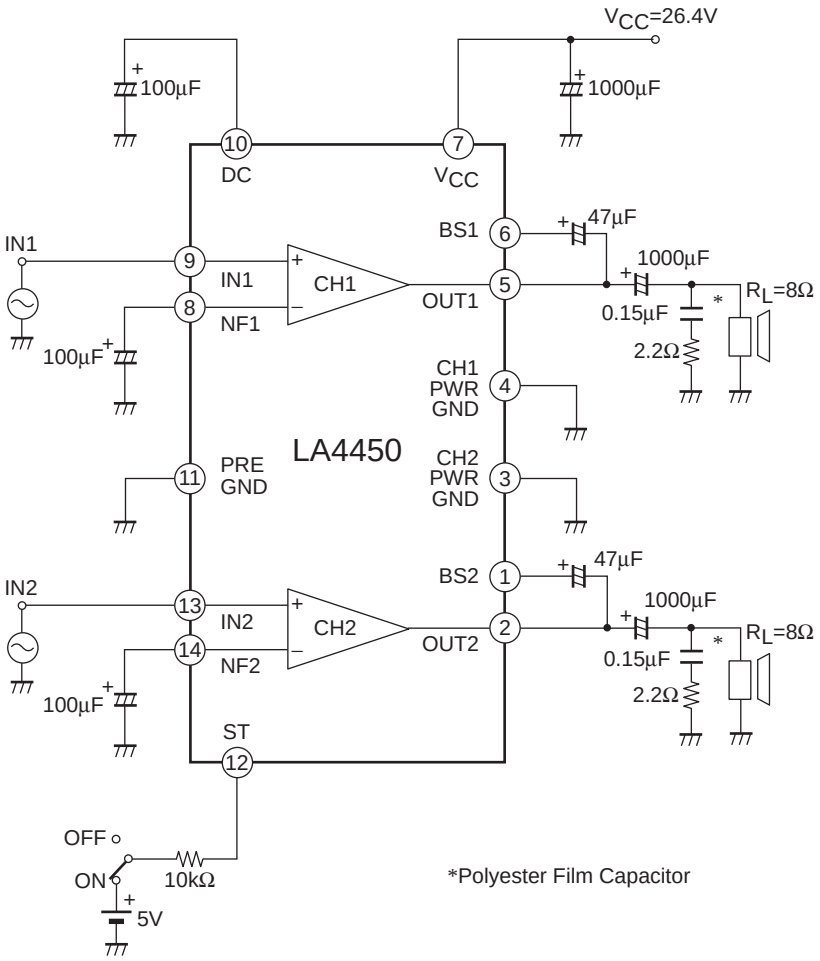
GENERIC
MARKING DIAGRAM*



XXXXX = Specific Device Code
Y = Year
M = Month
DDD = Additional Traceability Data

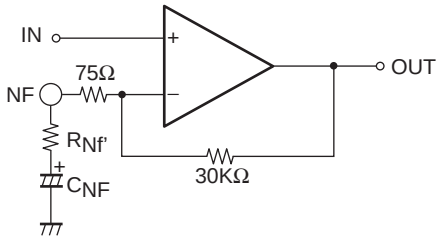
*This information is generic. Please refer to device data sheet for actual part marking. Pb−Free indicator, “G” or microdot “▪”, may or may not be present.

Test Circuit



1. Features and Usage Notes

- Pin 12 is the standby pin. The IC operates when a voltage of 2V or higher is applied through the external resistor R1. Note that the maximum influx current to pin 12 is 500µA.
- Changing the voltage gain



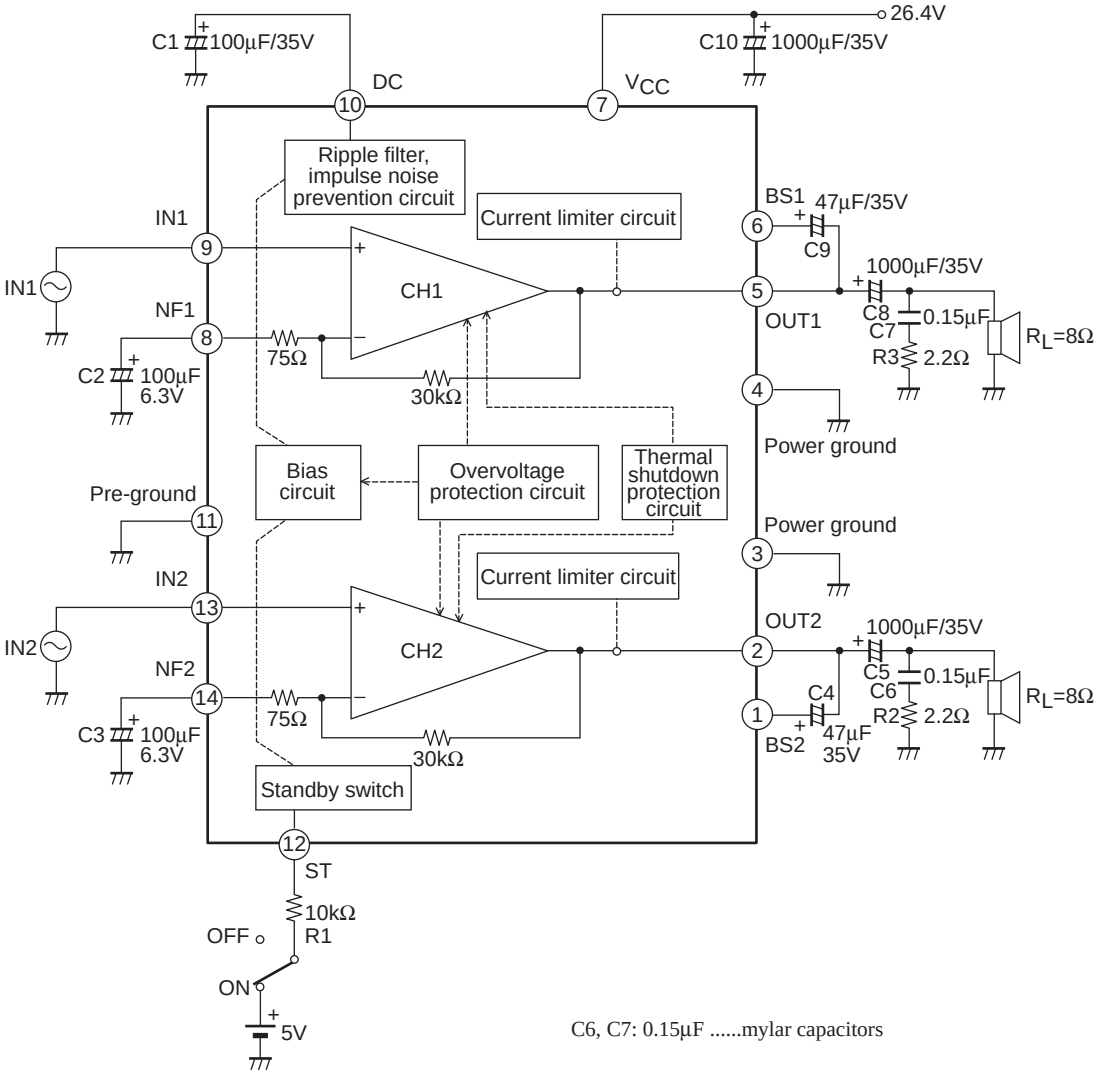
The voltage gain VG can be lowered by connecting an external resistor in series between the NF pin (pins 8 and 14) and C_{NF}.

$$VG = 20\log \frac{30k\Omega}{75+R_{Nf}},$$

However, since the IC may oscillate if VG is 30dB or lower, use a VG of 36dB or higher.

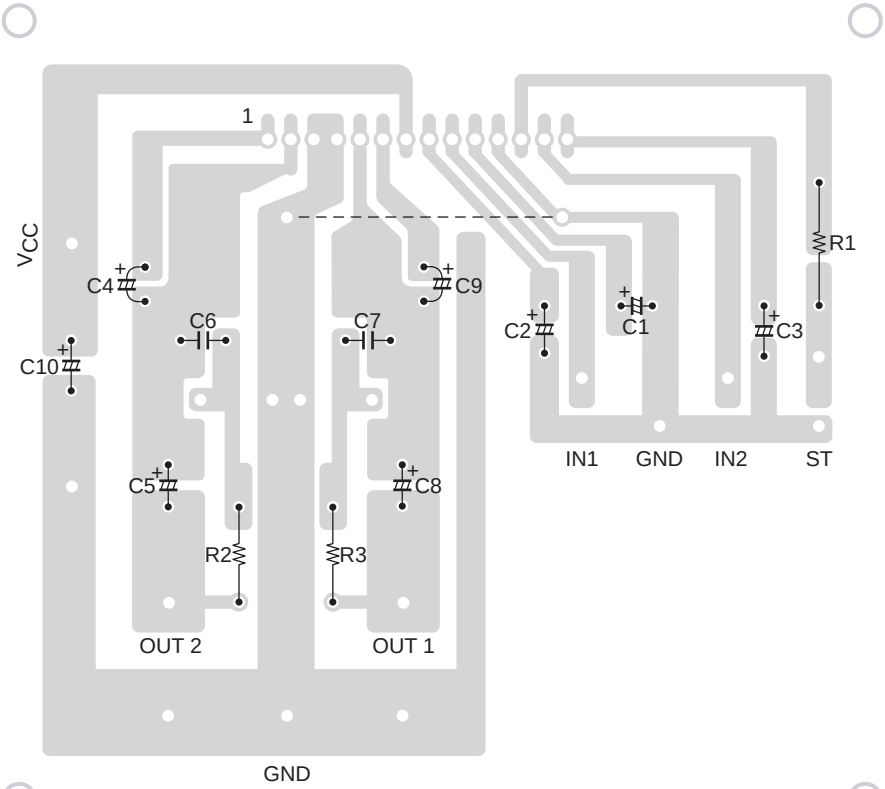
- The LA4450 includes a thermal protection circuit to prevent damage to or destruction of the IC due to abnormal overheating. As a result, the output may be attenuated or cut off if the application heat sinking is inadequate.
- The LA4450 includes an overvoltage protection circuit to protect the IC against power supply surges and abnormal voltages. This circuit has hysteresis characteristics : it operates at between 39 and 40V, and recovers at around 34V.
- Although the LA4450 includes a current limiter circuit to prevent damage due to abnormal currents, care must still be exercised to prevent load shorts and other excessive current conditions.

Application Circuit Example

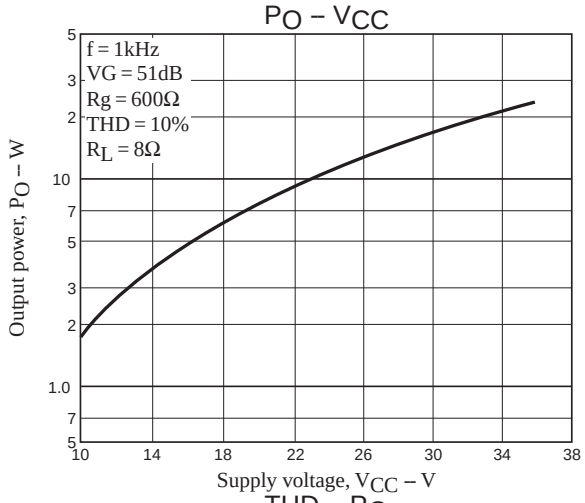


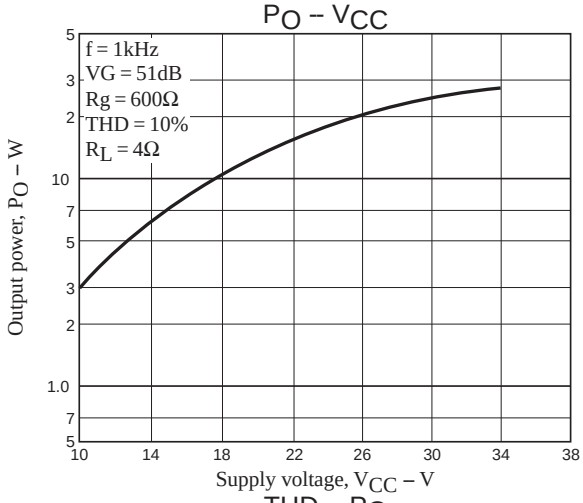
C6, C7: 0.15µF .....mylar capacitors

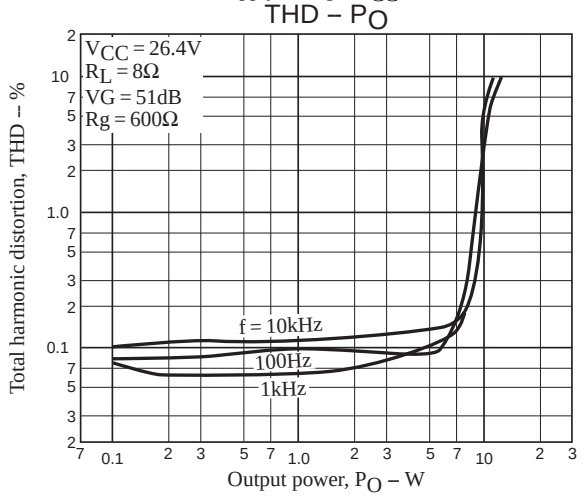
Printed Circuit Board Pattern Example

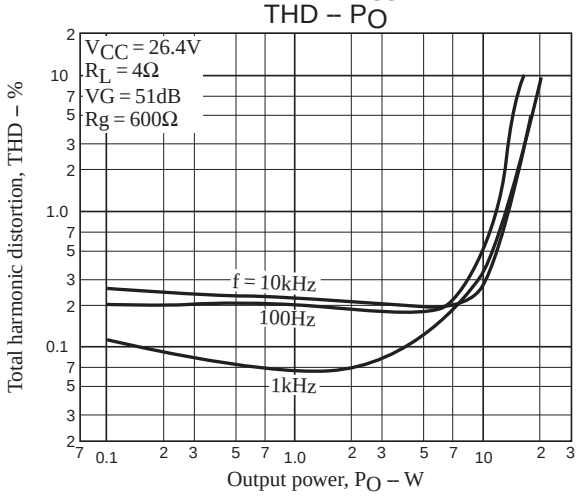


Copper foiled side 90×100mm²

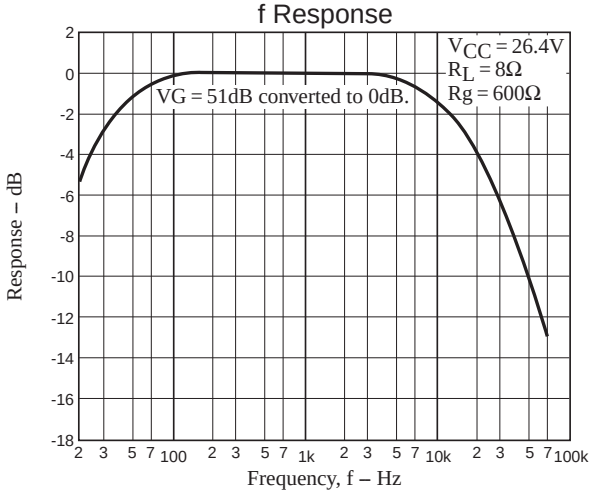




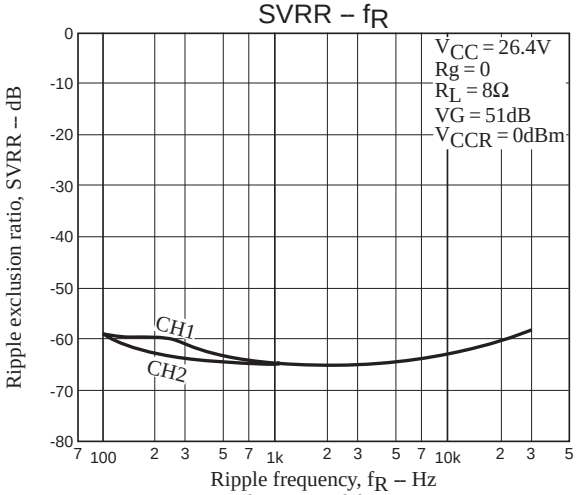




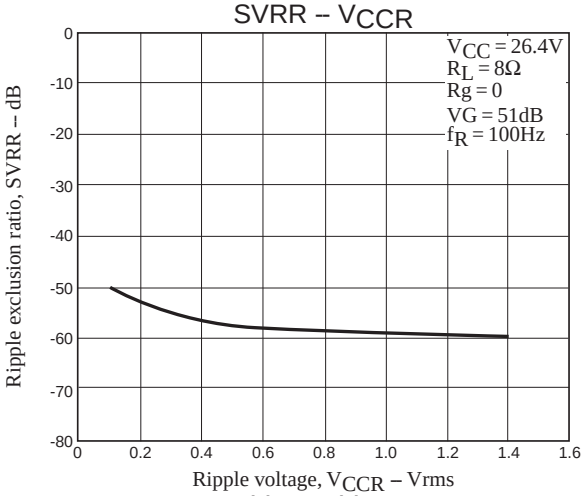
f Response



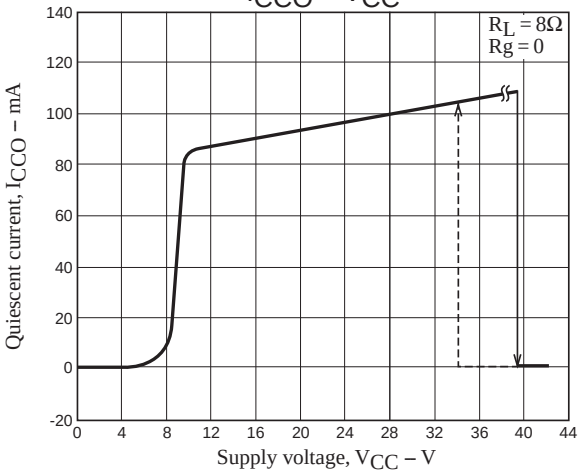
SVRR – f_R



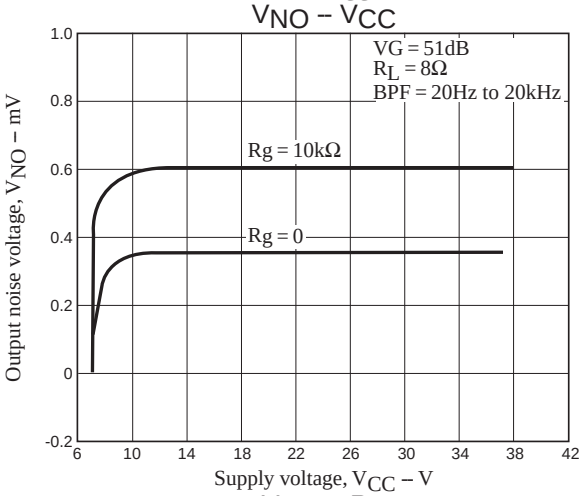
SVRR – V_{CCR}



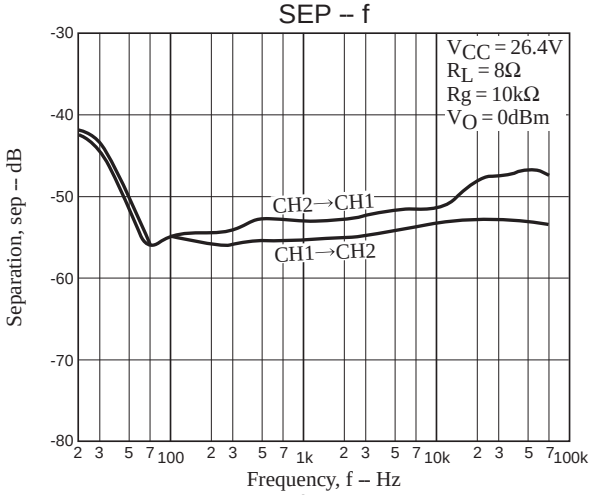
I_{CCO} – V_{CC}



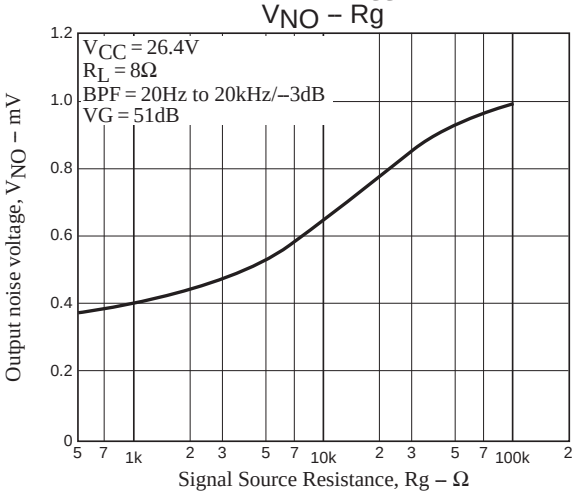
V_{NO} – V_{CC}



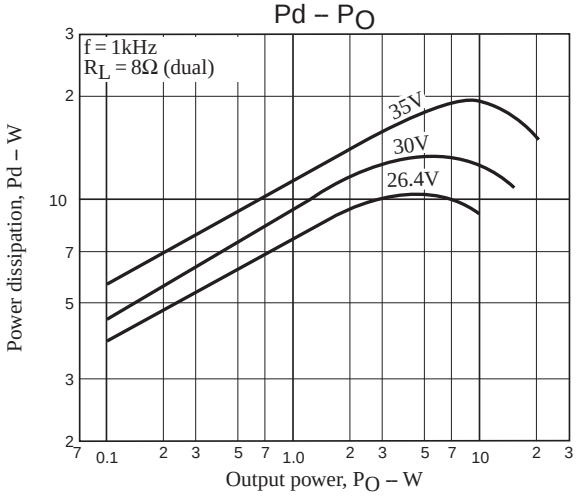
SEP – f

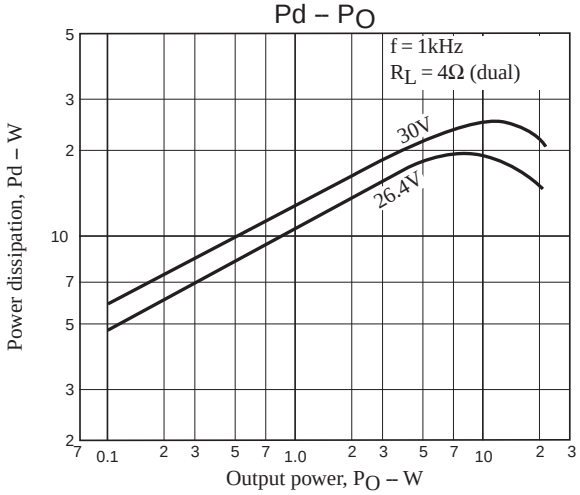


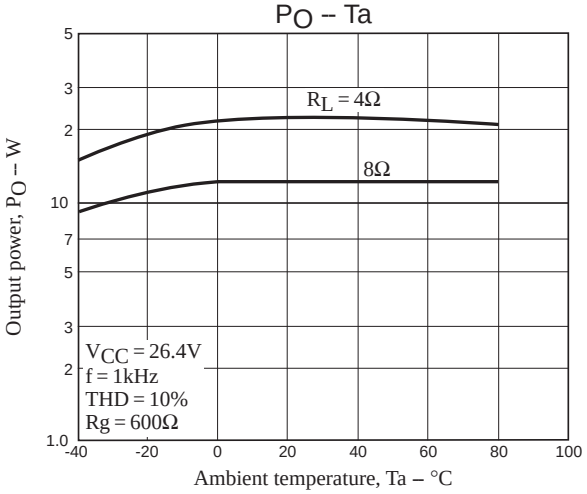
V_{NO} – Rg

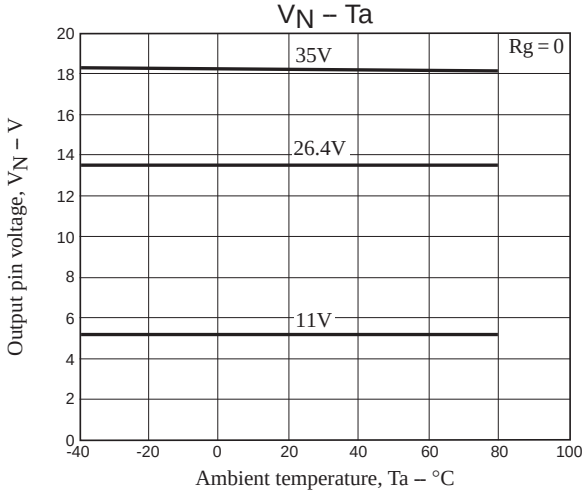


Pd – P_O









ORDERING INFORMATION

Device	Package	Shipping (Qty / Packing)
LA4450-E	SIP14 36.8x13.8 / SIP14H (Pb-Free)	15 / Fan-Fold
LA4450F-E	SIP14 36.8x13.8 / SIP14H (Pb-Free)	14 / Fan-Fold
LA4450L-E	SIP14 36.8x13.8 / SIP14H (Pb-Free)	15 / Fan-Fold