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# HA13119

## Dual 5.5 W Audio Power Amplifier

# HITACHI

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### Description

The HA13119 is power IC designed for car radio and car stereo amplifiers. At 13.2 V to 4 Ω load, this power IC provides output power of 5.5 W with 10 % distortion.

It is easy to design as this IC employs internal each protection circuit and the new small package.

### Features

- Low distortion  
THD = 0.1% typ  
( $P_o = 0.5\text{ W}$ ,  $f = 100\text{ Hz to }10\text{ kHz}$ )  
THD = 1% typ  
( $P_o = 3\text{ W}$ ,  $f = 70\text{ Hz to }40\text{ kHz}$ )
- Internal each protection circuits
  - Surge protection circuit (more than 50 V)
  - Thermal shut-down circuit
  - Ground fault protection circuit
  - Power supply fault protection circuit
- Low external components count

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## Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Rating	Unit	Note
Operating supply voltage	V <sub>CC</sub>	18	V	
DC supply voltage	V <sub>CC</sub> (DC)	26	V	1
Peak supply voltage	V <sub>CC</sub> (peak)	50	V	2
Output current	I <sub>o</sub> (peak)	4	A	3
Power dissipation	P <sub>T</sub>	15	W	4
Thermal resistance	j - c	3.5	°C/W	
Junction temperature	T <sub>j</sub>	150	°C	
Operating temperature	T <sub>opr</sub>	-30 to +80	°C	
Storage temperature	T <sub>stg</sub>	-55 to +125	°C	

Notes: 1. Value at t = 30 sec.

2. Value at width t<sub>w</sub> = 200 ms and rise time t<sub>r</sub> = 1 ms.

3. Per channel

4. Per package

## Electrical Characteristics (V<sub>CC</sub> = 13.2 V, f = 1 kHz, R<sub>L</sub> = 4 Ω, Ta = 25°C)

### 1 channel operation

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Quiescent current	I <sub>Q</sub>	—	80	160	mA	V <sub>in</sub> = 0 V
Input bias voltage	V <sub>B</sub>	—	—	10	mV	V <sub>in</sub> = 0 V, R <sub>g</sub> = 10 k
Voltage gain	G <sub>v</sub>	48	50	52	dB	V <sub>in</sub> = -50 dBm
Voltage gain difference	G <sub>v</sub>	—	—	+1.5	dB	V <sub>in</sub> = -50 dBm
Output power	P <sub>out</sub>	5.0	5.5	—	W	R <sub>L</sub> = 4 Ω, V <sub>CC</sub> = 13.2 V
		—	6.5	—		THD = 10 % V <sub>CC</sub> = 14.4 V
Total harmonic distortion	THD	—	0.05	0.5	%	P <sub>out</sub> = 1.5 W
Wide band noise	WBN	—	0.6	1.2	mV	R <sub>g</sub> = 10 k Ω, BW = 20 Hz to 20 kHz
Supply voltage rejection ratio	SVR	35	50	—	dB	R <sub>g</sub> = 600 Ω, f = 500 Hz
Input impedance	R <sub>in</sub>	—	33	—	k	f = 1 kHz, V <sub>in</sub> = -50 dBm
Roll off frequency	f <sub>L</sub>	—	55	—	Hz	G <sub>v</sub> = -3 dB Low
	f <sub>H</sub>	—	50	—	kHz	from f = 1 kHz Ref High
Cross-talk	C.T	40	55	—	dB	R <sub>g</sub> = 600 Ω, V <sub>in</sub> = -50 dBm

2 channel operation

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Output power	Pout	—	5.3	—	W	THD = 10 %
Total harmonic distortion	THD	—	0.10	—	%	Pout = 1.5 W

Block Diagram

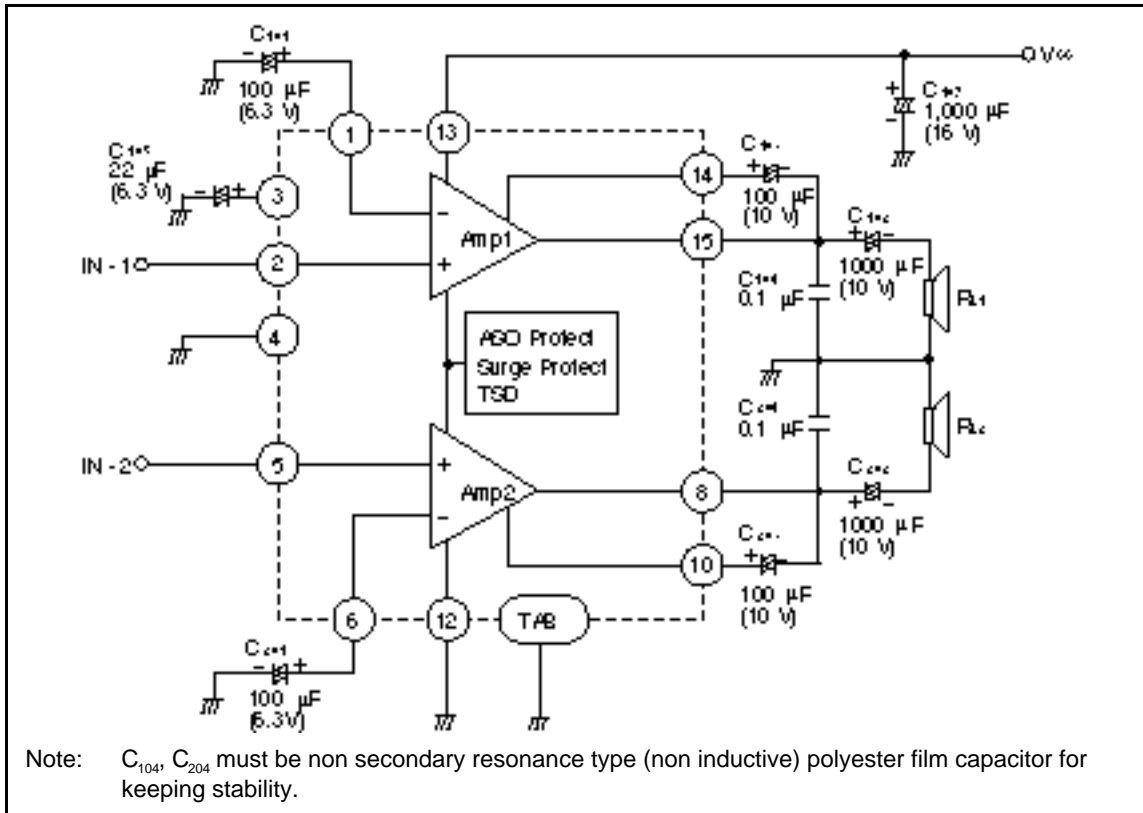


Figure 1 Typical Application Circuit

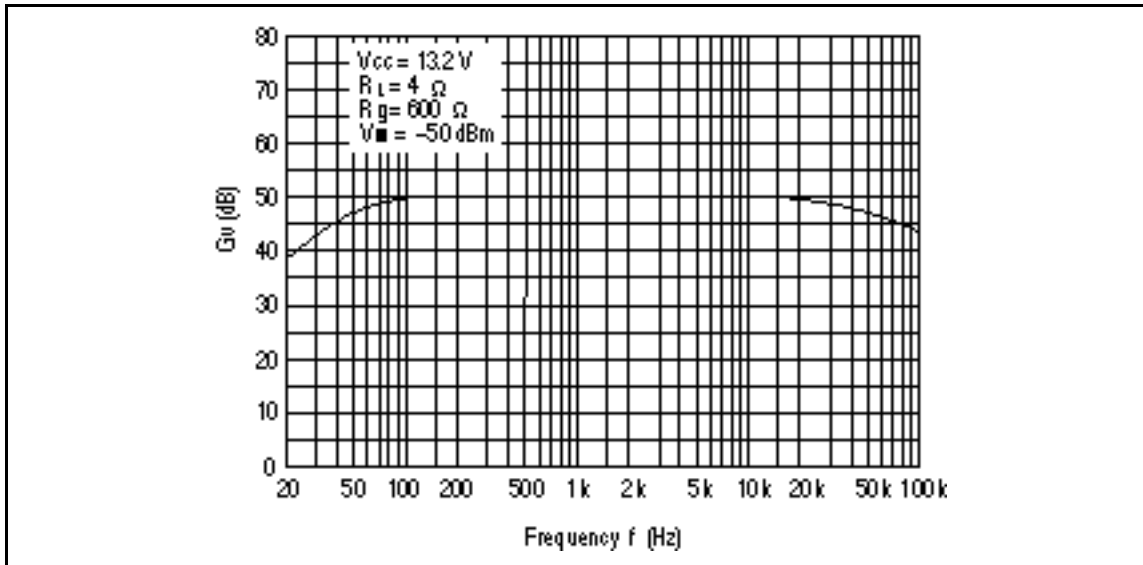


Figure 2 Voltage Gain vs. Frequency

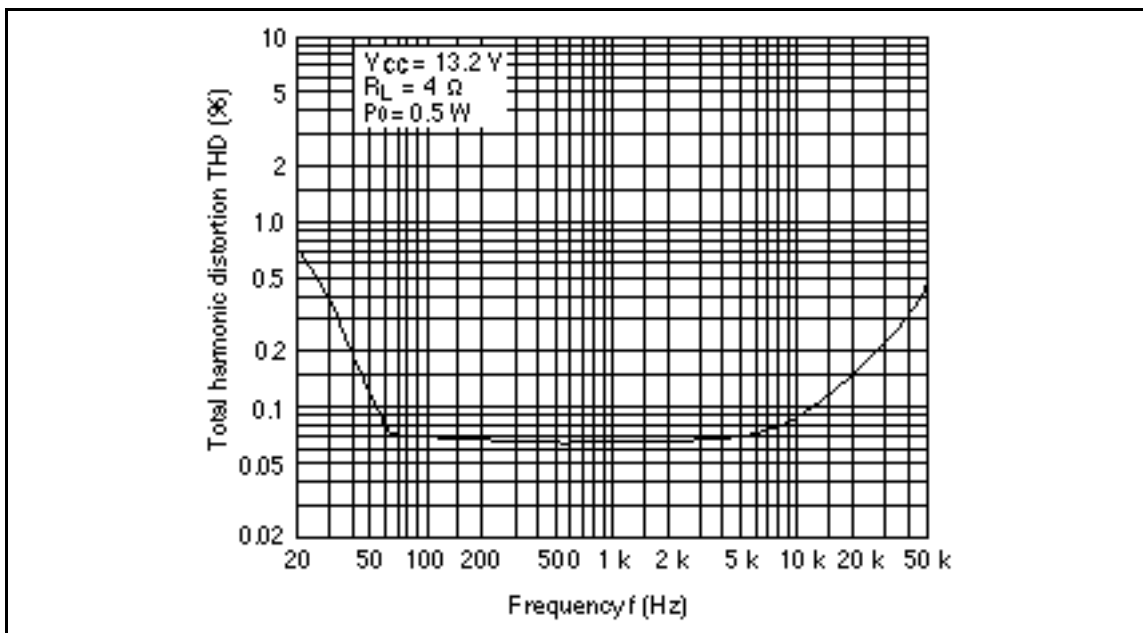


Figure 3 Total Harmonic Distortion vs. Frequency

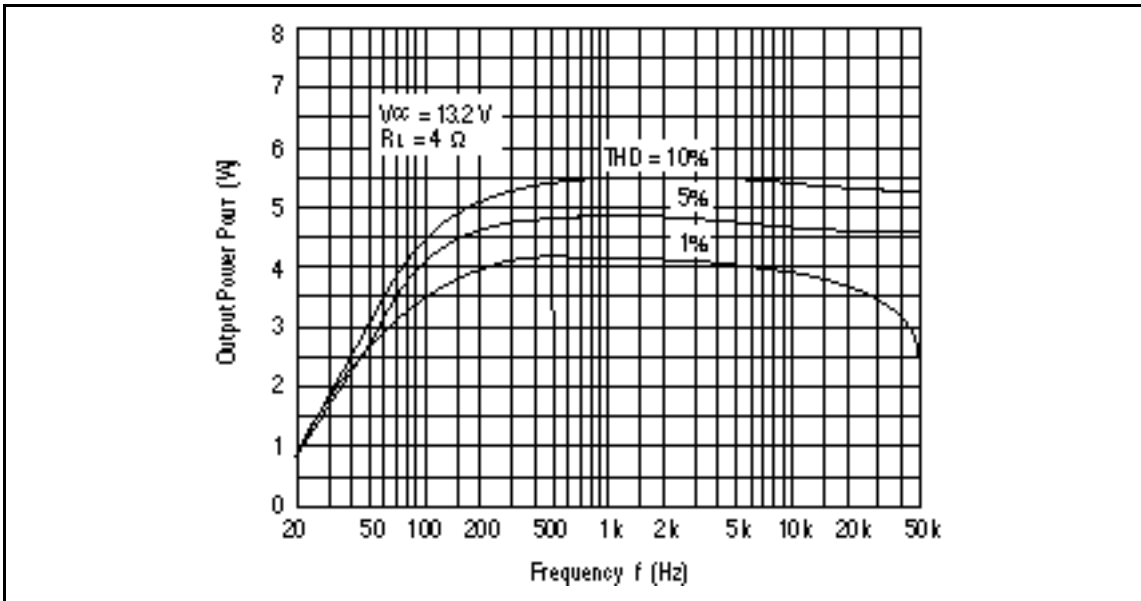


Figure 4 Output Power vs. Frequency

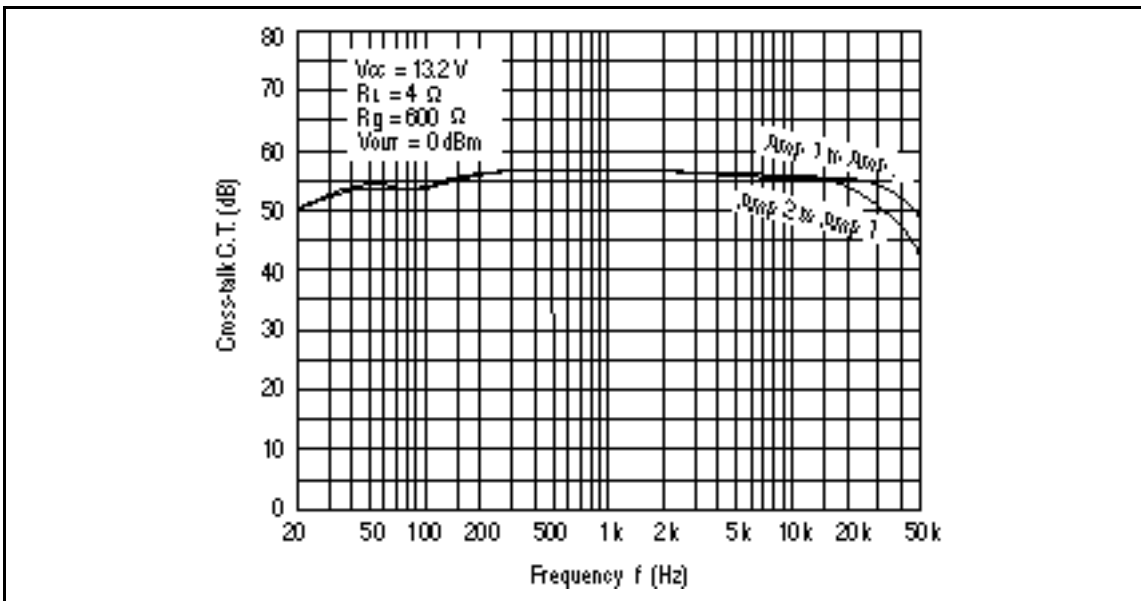


Figure 5 Cross-talk vs. Frequency

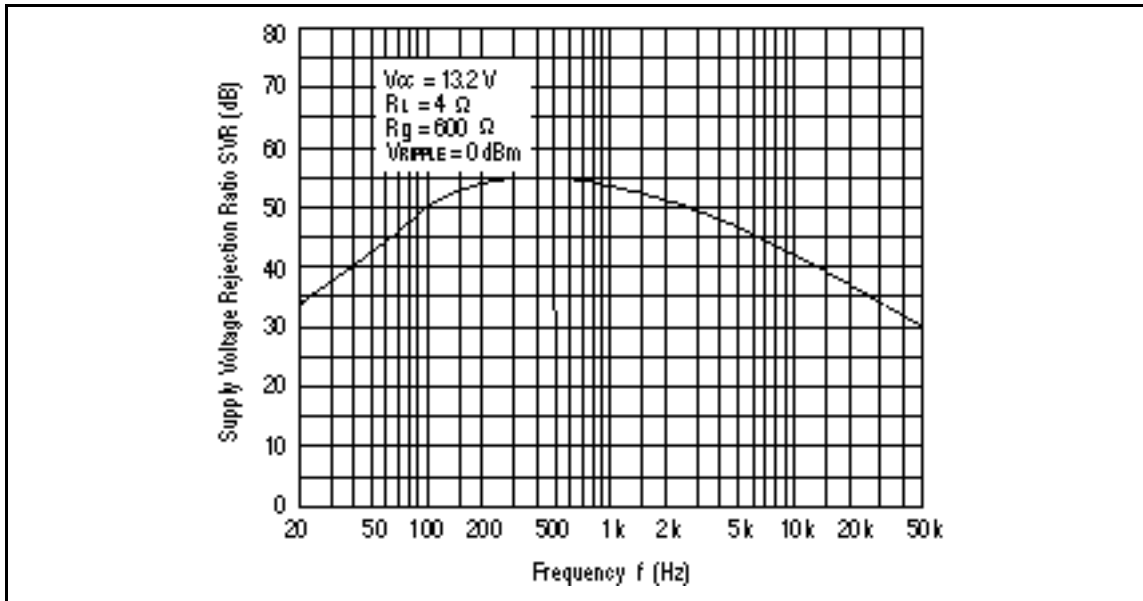


Figure 6 Supply Voltage Rejection Ratio vs. Frequency

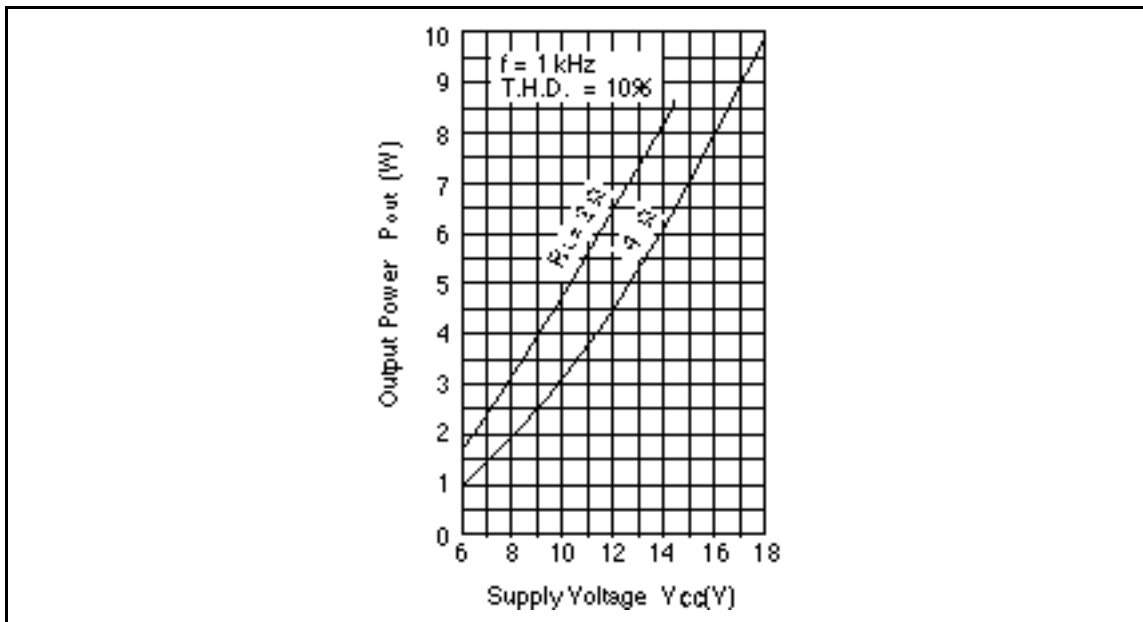


Figure 7 Output Power vs. Supply Voltage

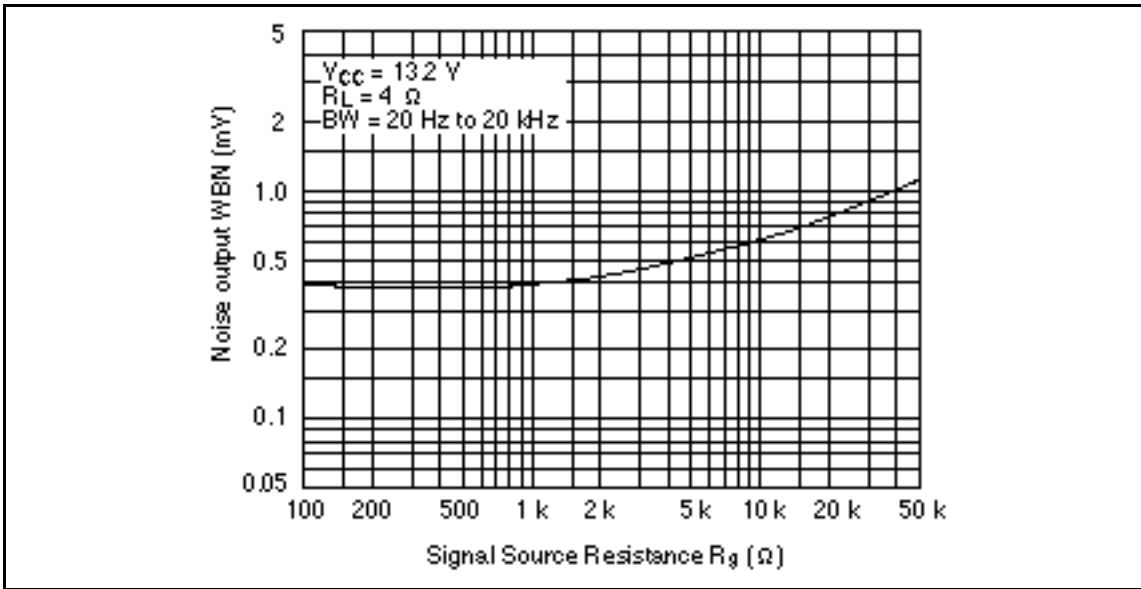


Figure 8 Noise Output vs. Signal Source Resistance

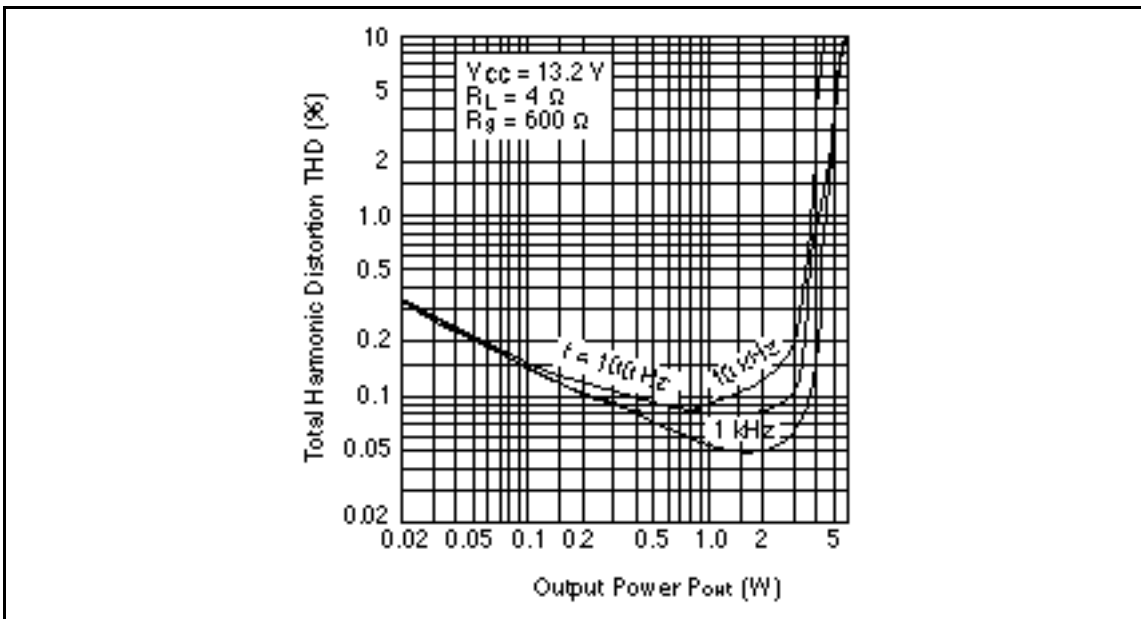


Figure 9 Total Harmonic Distortion vs. Output Power

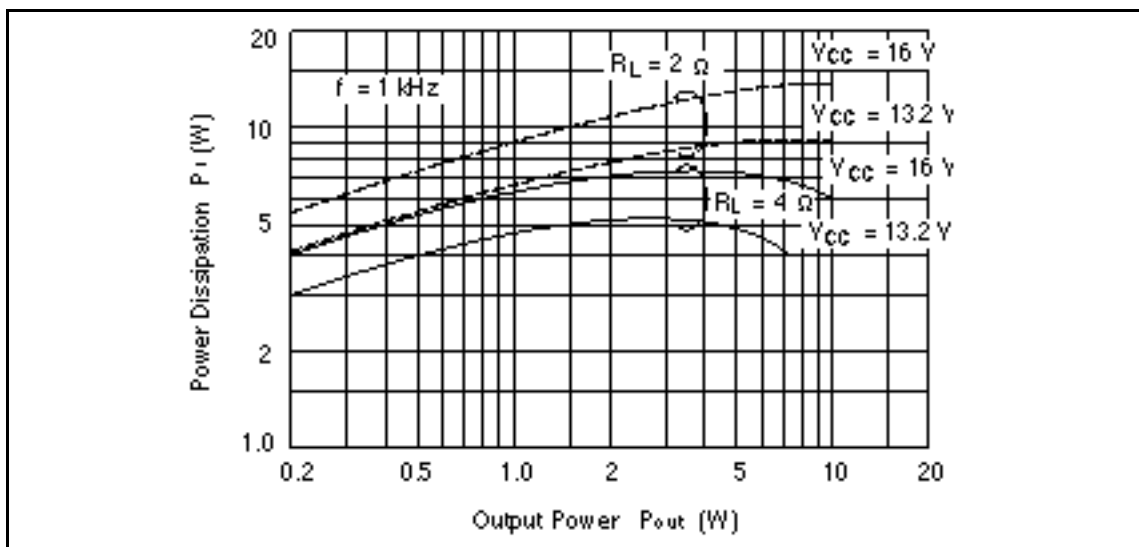


Figure 10 Power Dissipation vs. Output Power



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