HA13119

Dual 5.5 W Audio Power Amplifier

HITACHI

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
  (Po = 0.5 W, f = 100 Hz to 10 kHz)
  THD = 1% typ
  (Po = 3 W, f = 70 Hz to 40 kHz)
- Internal each protection circuits
  - ¾ Surge protection circuit (more than 50 V)
  - ¾ Thermal shut-down circuit
  - ¾ Ground fault protection circuit
  - ¾ 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_{CC}	18	V	
DC supply voltage	V_{CC} (DC)	26	V	1
Peak supply voltage	V_{CC} (peak)	50	V	2
Output current	Io (peak)	4	A	3
Power dissipation	P_T	15	W	4
Thermal resistance	θj – c	3.5	°C/W	
Junction temperature	Tj	150	°C	
Operating temperature	Topr	–30 to +80	°C	
Storage temperature	Tstg	–55 to +125	°C	

Notes: 1. Value at t = 30 sec.
2. Value at width tw = 200 ms and rise time tr = 1 ms.
3. Per channel
4. Per package

Electrical Characteristics (V_{CC} = 13.2 V, f = 1 kHz, R_L = 4 Ω, Ta = 25°C)

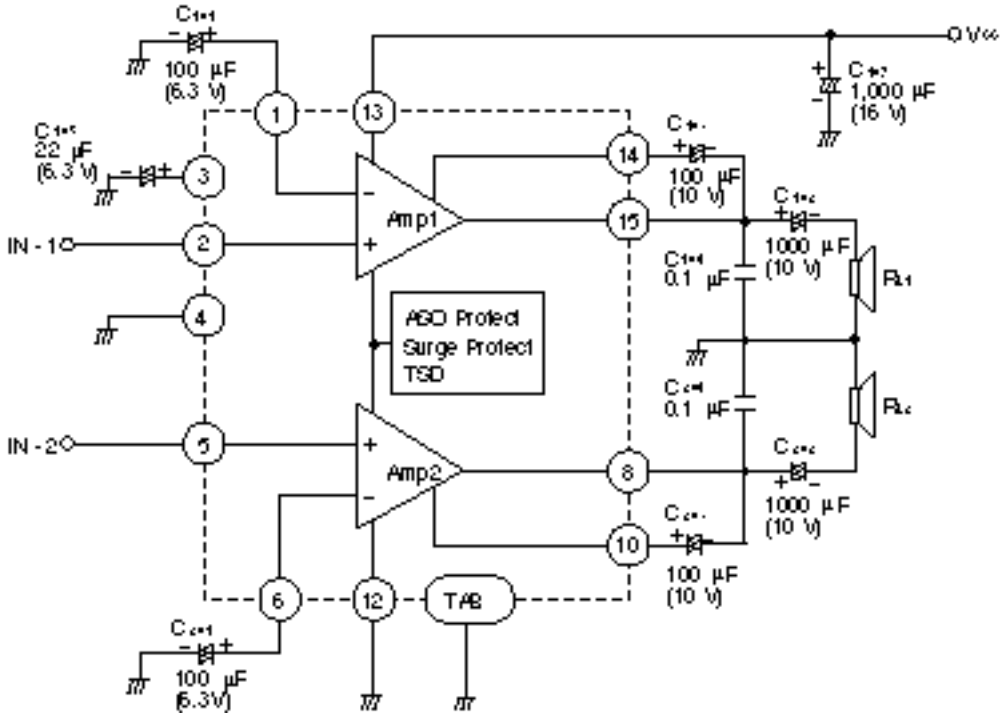
1 channel operation

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Quiescent current	I_Q	—	80	160	mA	Vin = 0 V
Input bias voltage	V_B	—	—	10	mV	Vin = 0 V, Rg = 10 kΩ
Voltage gain	G_V	48	50	52	dB	Vin = –50 dBm
Voltage gain difference	ΔG_V	—	—	+1.5	dB	Vin = –50 dBm
Output power	Pout	5.0	5.5	—	W	R_L = 4 Ω V_{CC}=13.2 V
		—	6.5	—		THD = 10 % V_{CC}=14.4 V
Total harmonic distortion	THD	—	0.05	0.5	%	Pout = 1.5 W
Wide band noise	WBN	—	0.6	1.2	mV	Rg = 10 kΩ, BW = 20 Hz to 20 kHz
Supply voltage rejection ratio	SVR	35	50	—	dB	Rg = 600 Ω, f = 500 Hz
Input impedance	Rin	—	33	—	kΩ	f = 1 kHz, Vin = –50 dBm
Roll off frequency	f_L	—	55	—	Hz	ΔG_V = –3 dB Low
	f_H	—	50	—	kHz	from f = 1 kHz Ref High
Cross-talk	C.T	40	55	—	dB	Rg = 600 Ω, Vin = –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



Note: C_{104}, C_{204} must be non secondary resonance type (non inductive) polyester film capacitor for keeping stability.

Figure 1 Typical Application Circuit

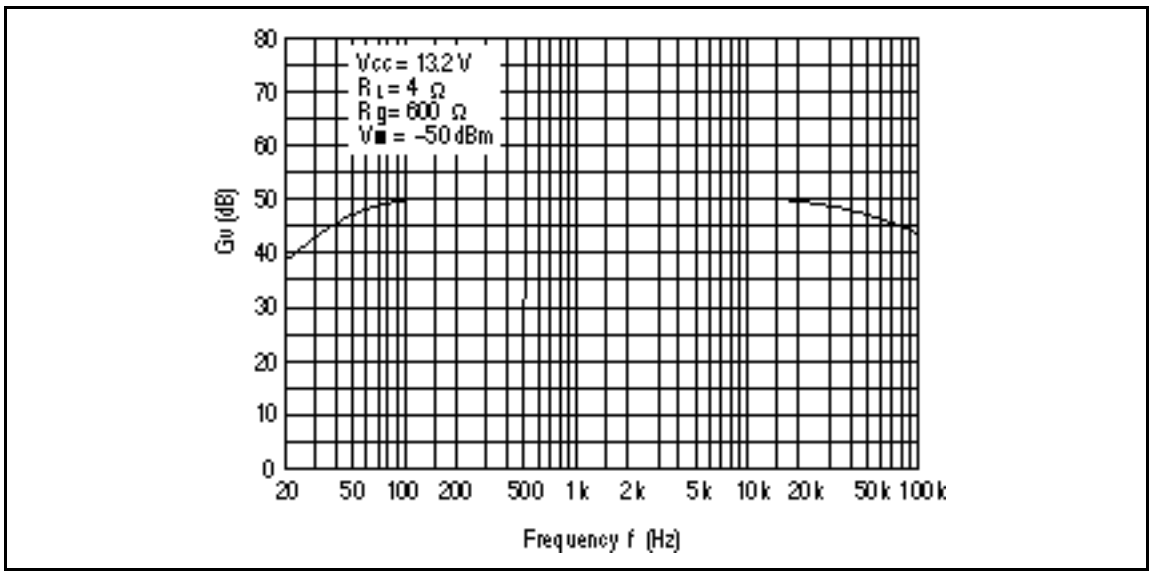


Figure 2 Voltage Gain vs. Frequency

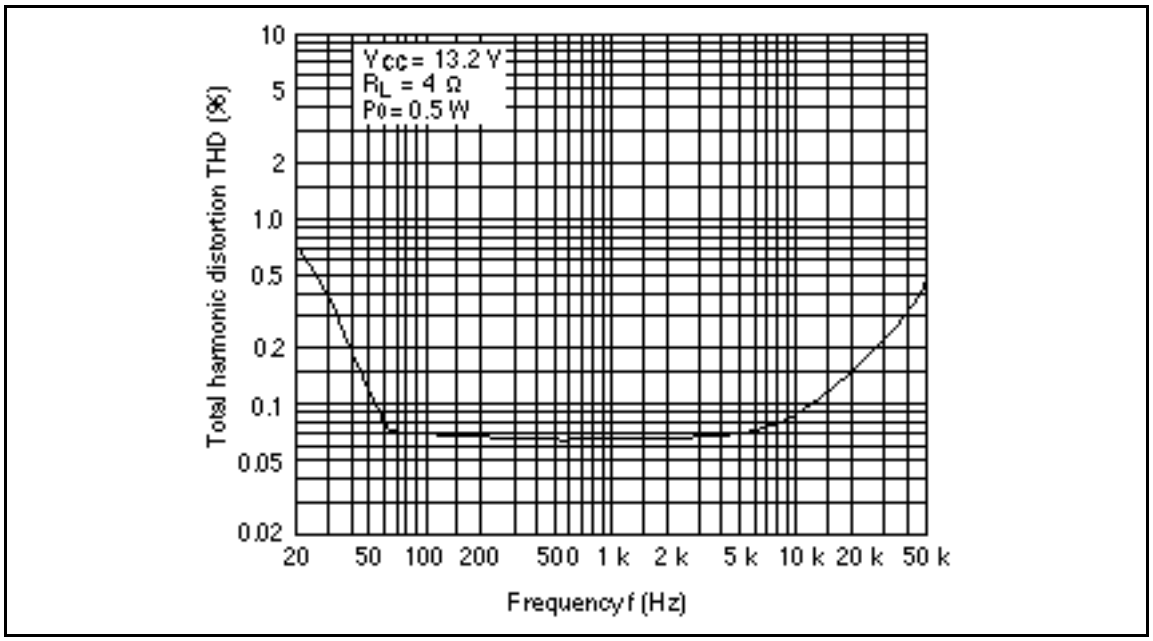


Figure 3 Total Harmonic Distortion vs. Frequency

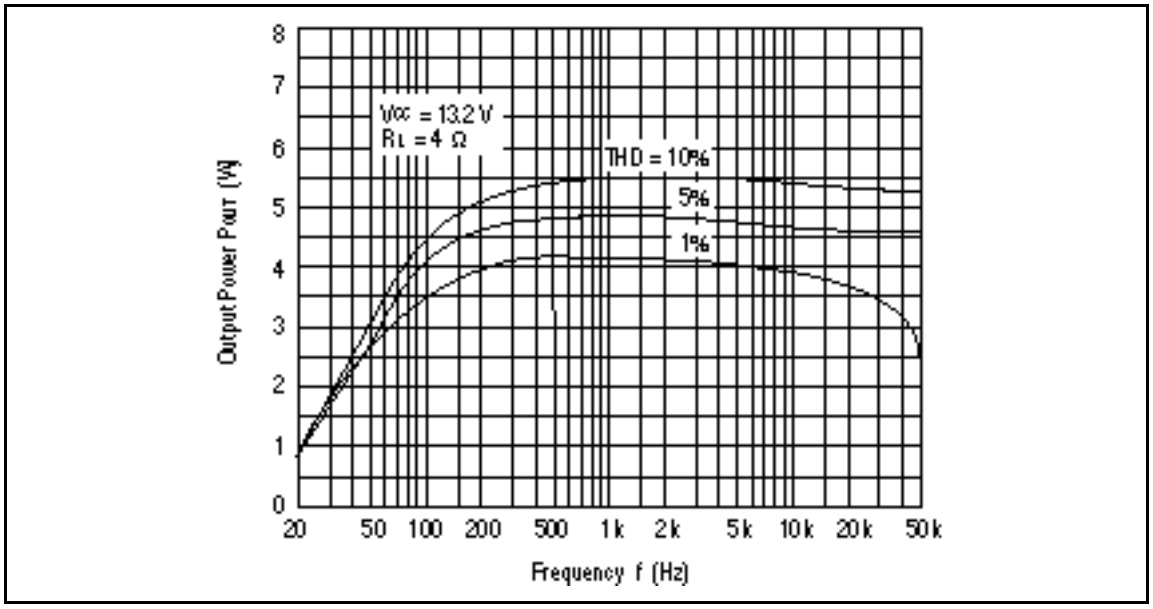


Figure 4 Output Power vs. Frequency

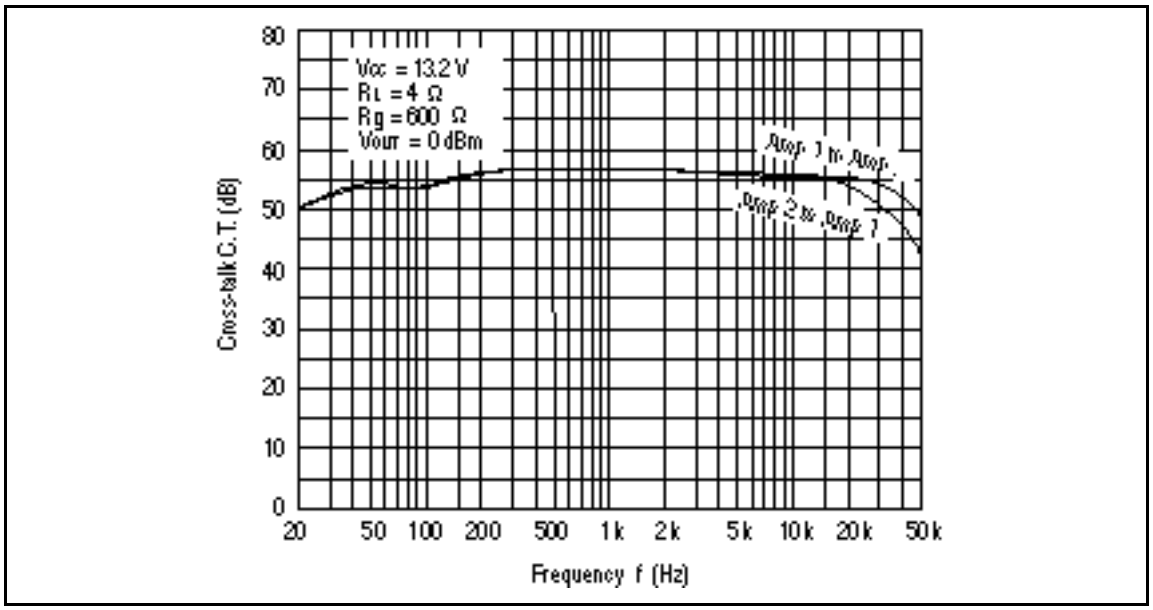


Figure 5 Cross-talk vs. Frequency

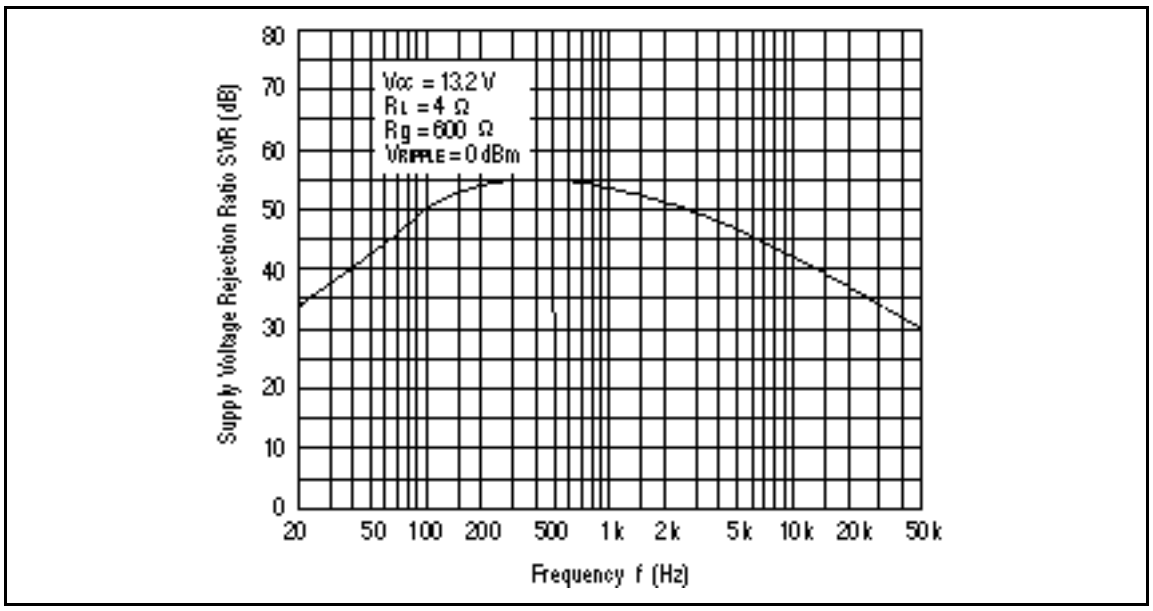


Figure 6 Supply Voltage Rejection Ratio vs. Frequency

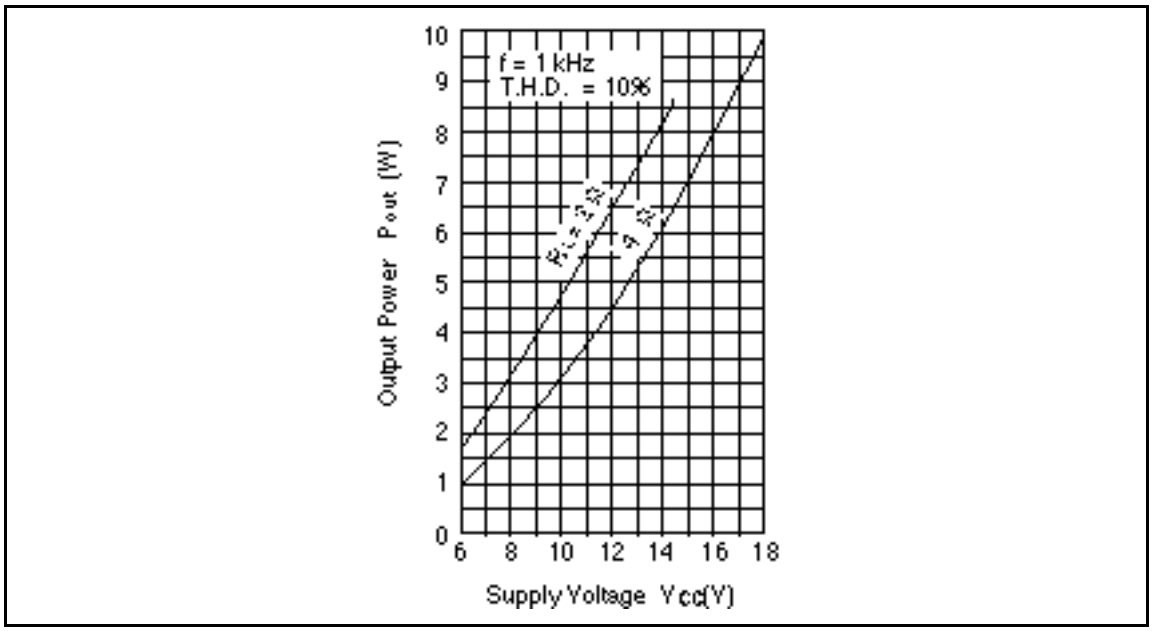


Figure 7 Output Power vs. Supply Voltage

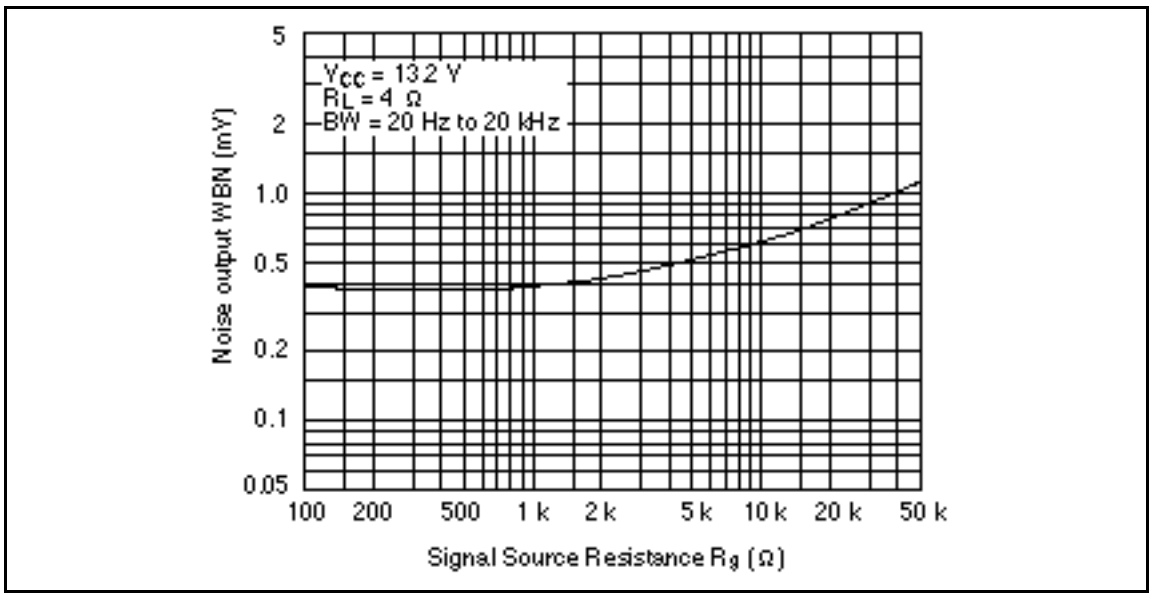


Figure 8 Noise Output vs. Signal Source Resistance

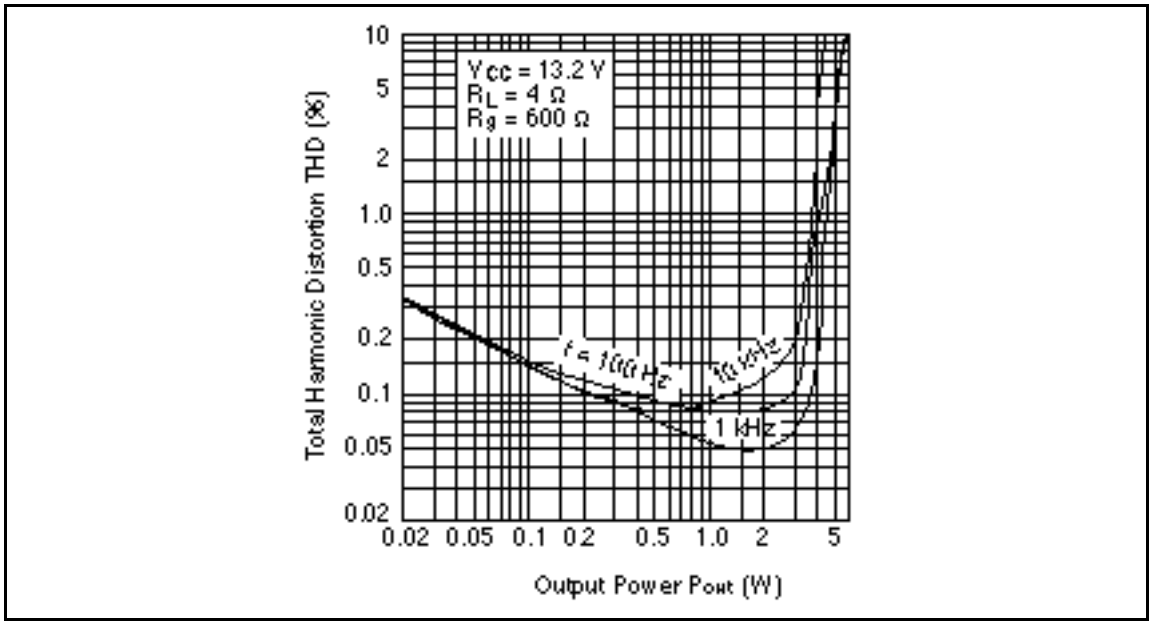


Figure 9 Total Harmonic Distortion vs. Output Power

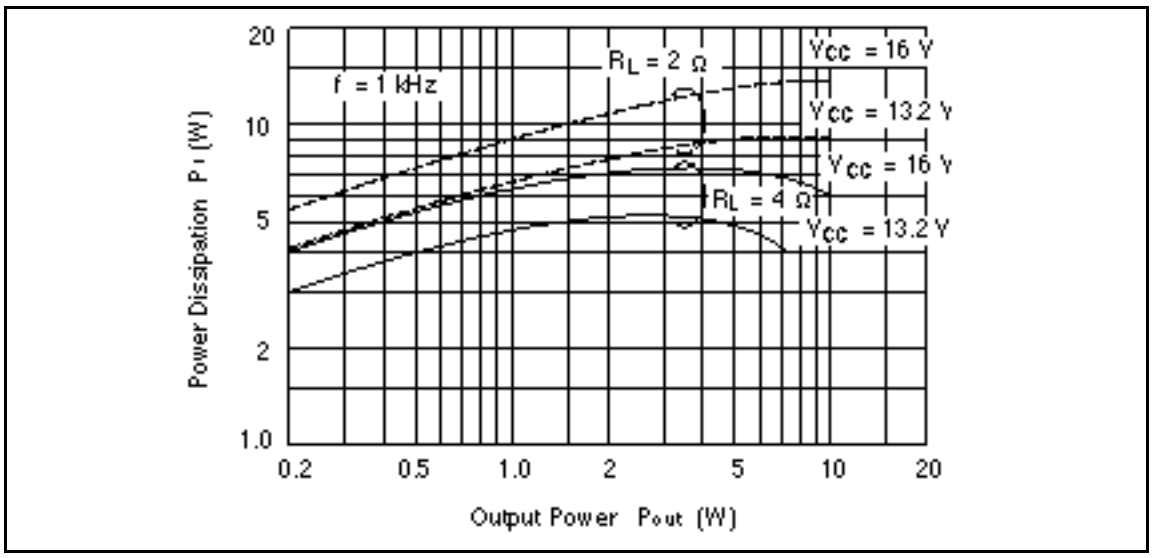


Figure 10 Power Dissipation vs. Output Power

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