

LM1875

20W Audio Power Amplifier

General Description

The LM1875 is a monolithic power amplifier offering very low distortion and high quality performance for consumer audio applications.

The LM1875 delivers 20 watts into a 4Ω or 8Ω load on ±25V supplies. Using an 8Ω load and ±30V supplies, over 30 watts of power may be delivered. The amplifier is designed to operate with a minimum of external components. Device overload protection consists of both internal current limit and thermal shutdown.

The LM1875 design takes advantage of advanced circuit techniques and processing to achieve extremely low distortion levels even at high output power levels. Other outstanding features include high gain, fast slew rate and a wide power bandwidth, large output voltage swing, high current capability, and a very wide supply range. The amplifier is internally compensated and stable for gains of 10 or greater.

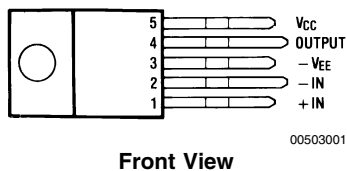
Features

- Up to 30 watts output power
- A_{VO} typically 90 dB
- Low distortion: 0.015%, 1 kHz, 20 W
- Wide power bandwidth: 70 kHz
- Protection for AC and DC short circuits to ground
- Thermal protection with parole circuit
- High current capability: 4A
- Wide supply range 16V-60V
- Internal output protection diodes
- 94 dB ripple rejection
- Plastic power package TO-220

Applications

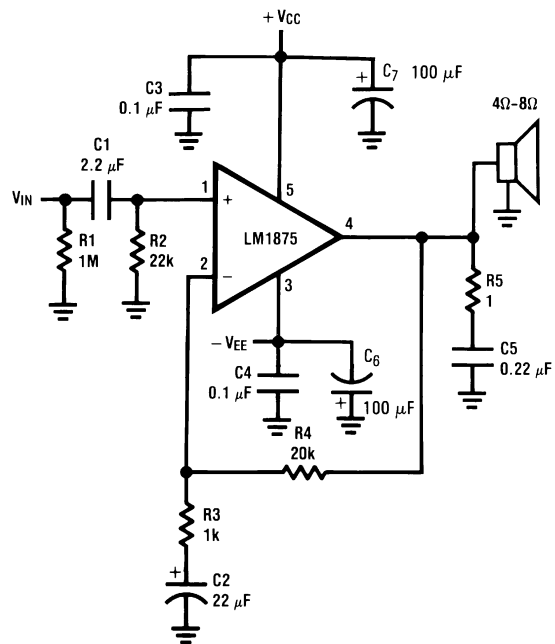
- High performance audio systems
- Bridge amplifiers
- Stereo phonographs
- Servo amplifiers
- Instrument systems

Connection Diagram



Package	Ordering Info	NSC Package Number
For Straight Leads	LM1875T SL108949	T05A
For Stagger Bend	LM1875T LB03	T05D
For 90° Stagger Bend	LM1875T LB05	T05E
For 90° Stagger Bend	LM1875T LB02	TA05B

Typical Applications



Absolute Maximum Ratings (Note 1)

Supply Voltage	60V
Input Voltage	$-V_{EE}$ to V_{CC}
Storage Temperature	-65°C to $+150^{\circ}\text{C}$
Junction Temperature	150°C

Lead Temperature

(Soldering, 10 seconds)

 θ_{JC} θ_{JA} 260°C 3°C 73°C

Electrical Characteristics

$V_{CC}=+25\text{V}$, $-V_{EE}=-25\text{V}$, $T_{\text{AMBIENT}}=25^{\circ}\text{C}$, $R_L=8\Omega$, $A_V=20$ (26 dB), $f_o=1\text{ kHz}$, unless otherwise specified.

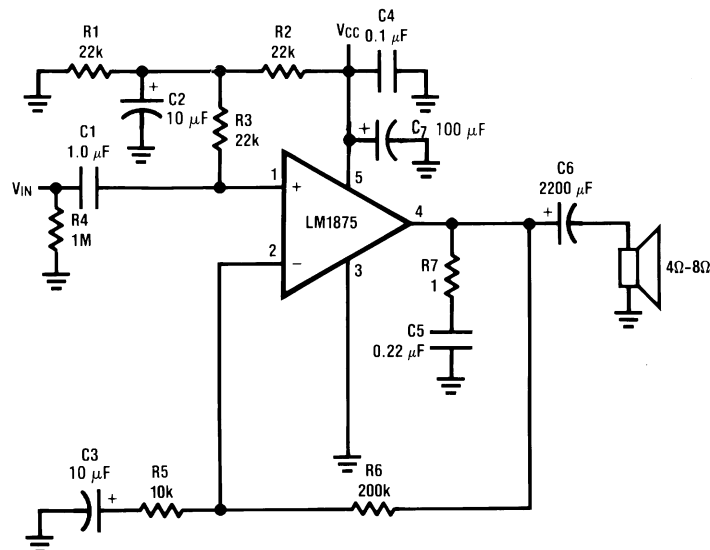
Parameter	Conditions	Typical	Tested Limits	Units
Supply Current	$P_{\text{OUT}}=0\text{W}$	70	100	mA
Output Power (Note 2)	THD=1%	25		W
THD (Note 2)	$P_{\text{OUT}}=20\text{W}$, $f_o=1\text{ kHz}$	0.015		%
	$P_{\text{OUT}}=20\text{W}$, $f_o=20\text{ kHz}$	0.05	0.4	%
	$P_{\text{OUT}}=20\text{W}$, $R_L=4\Omega$, $f_o=1\text{ kHz}$	0.022		%
	$P_{\text{OUT}}=20\text{W}$, $R_L=4\Omega$, $f_o=20\text{ kHz}$	0.07	0.6	%
Offset Voltage		± 1	± 15	mV
Input Bias Current		± 0.2	± 2	μA
Input Offset Current		0	± 0.5	μA
Gain-Bandwidth Product	$f_o=20\text{ kHz}$	5.5		MHz
Open Loop Gain	DC	90		dB
PSRR	V_{CC} , 1 kHz, 1 Vrms	95	52	dB
	V_{EE} , 1 kHz, 1 Vrms	83	52	dB
Max Slew Rate	20W, 8Ω , 70 kHz BW	8		V/ μs
Current Limit	$V_{\text{OUT}} = V_{\text{SUPPLY}} - 10\text{V}$	4	3	A
Equivalent Input Noise Voltage	$R_S=600\Omega$, CCIR	3		μVrms

Note 1: "Absolute Maximum Ratings" indicate limits beyond which damage to the device may occur. Operating Ratings indicate conditions for which the device is functional, but do not guarantee specific performance limits.

Note 2: Assumes the use of a heat sink having a thermal resistance of $1^{\circ}\text{C}/\text{W}$ and no insulator with an ambient temperature of 25°C . Because the output limiting circuitry has a negative temperature coefficient, the maximum output power delivered to a 4Ω load may be slightly reduced when the tab temperature exceeds 55°C .

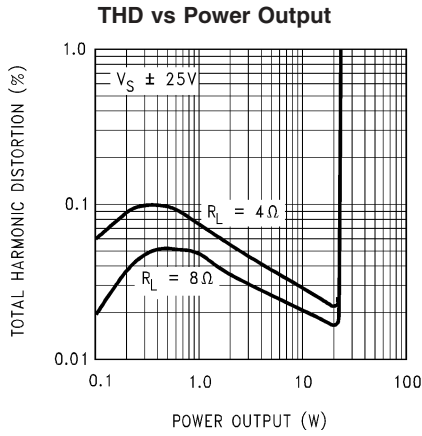
Typical Applications

Typical Single Supply Operation

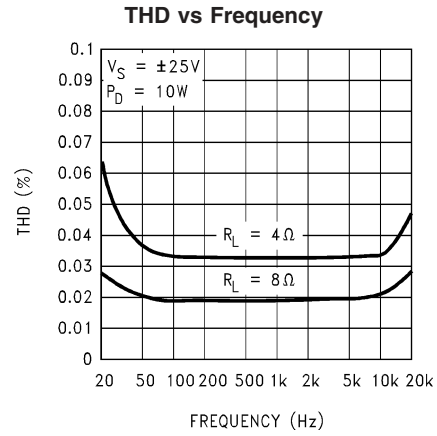


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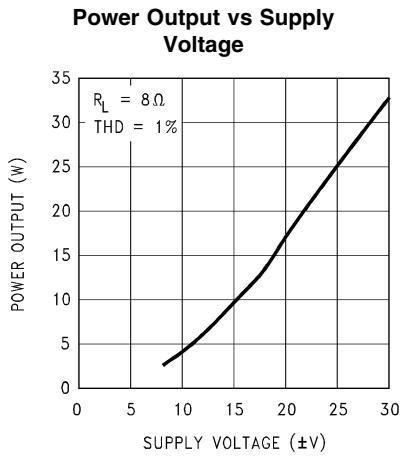
Typical Performance Characteristics



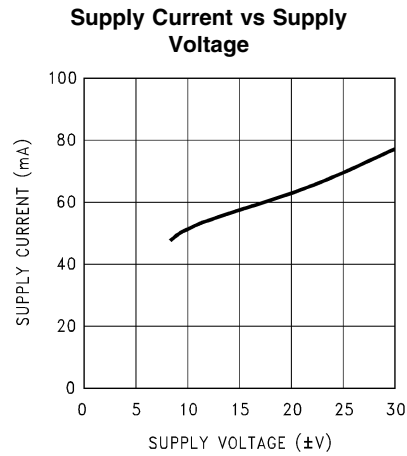
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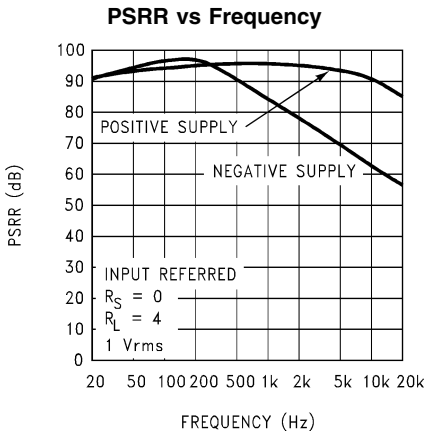
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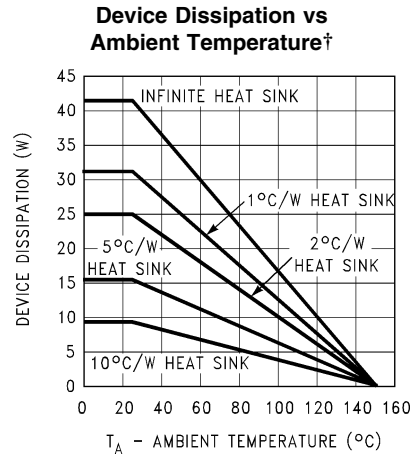
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† $\phi_{INTERFACE} = 1^\circ C/W$.

See Application Hints.