



## LM1875

## LINEAR INTEGRATED CIRCUIT

### 20W AUDIO POWER AMPLIFIER

#### DESCRIPTION

The UTC LM1875 is a monolithic power amplifier offering very low distortion and high quality performance for consumer audio applications. It delivers 20W into a 4Ω or 8Ω load on ±25V supplies. Using an 8Ω load and ±30V supplies, over 30W 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 UTC LM1875 design utilizes 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 30W output power
- \*Avo typically 90 dB
- \*Low distortion: 0.015%, 1kHz, 20W
- \*Wide power bandwidth: 70kHz
- \*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

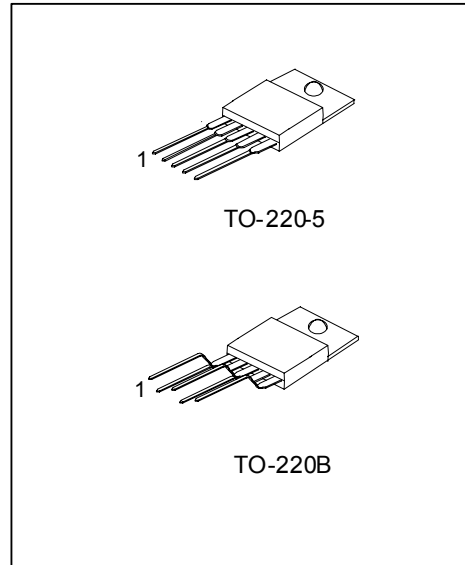
#### APPLICATIONS

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

#### ORDERING INFORMATION

Order Number		Package	Pin Assignment					Packing
Normal	Lead Free Plating		1	2	3	4	5	
LM1875-TA5-T	LM1875L-TA5-T	TO-220-5	+IN	-IN	-V <sub>EE</sub>	OUT	V <sub>CC</sub>	Tube
LM1875-TB5-T	LM1875L-TB5-T	TO-220B	+IN	-IN	-V <sub>EE</sub>	OUT	V <sub>CC</sub>	Tube

<p>LM1875L-TA5-T</p> <p>(1) Packing Type (2) Package Type (3) Lead Plating</p>	<p>(1) T: Tube (2) TA5: TO-220-5, TB5: TO-220B (3) L: Lead Free Plating Blank: Pb/Sn</p>
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\*Pb-free plating product number: LM1875L

### ■ ABSOLUTE MAXIMUM RATINGS (Ta=25 °C)

PARAMETER	SYMBOL	RATING	UNIT
Supply Voltage	V <sub>CC</sub>	60	V
Input Voltage	V <sub>IN</sub>	-V <sub>EE</sub> ~ V <sub>CC</sub>	V
Junction Temperature	T <sub>J</sub>	+150	
Storage Temperature	T <sub>STG</sub>	-40 ~ +150	

Note Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

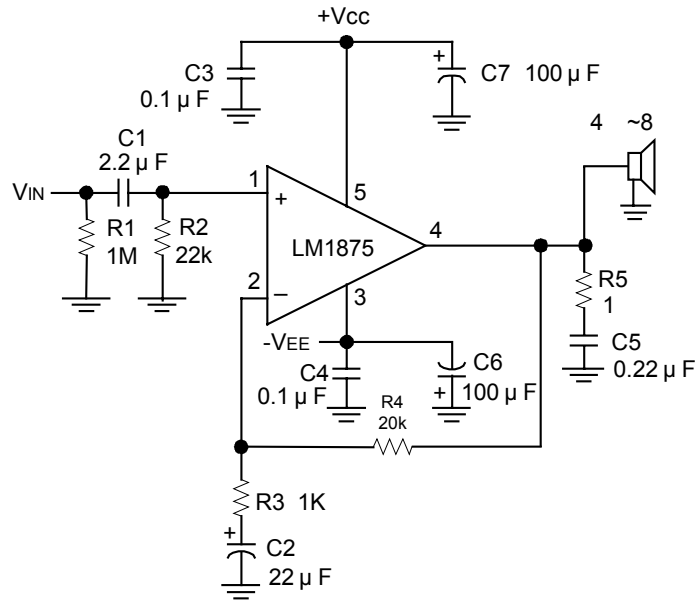
### ■ ELECTRICAL CHARACTERISTICS

(V<sub>CC</sub>=+25V, -V<sub>EE</sub>=-25V, Ta=25 °C, R<sub>L</sub>=8 Ω, Av=20(26dB), fo=1kHz, unless otherwise specified.)

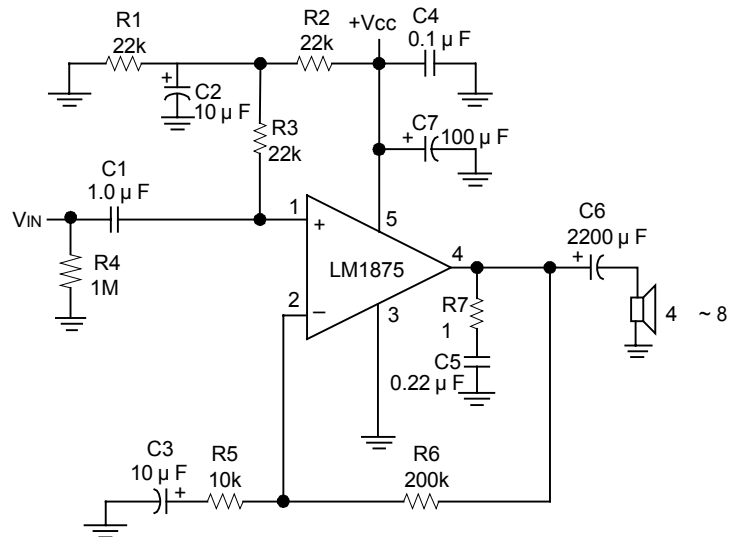
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Current	I <sub>CC</sub>	P <sub>OUT</sub> =0W		70	100	mA
Output Power(Note)	P <sub>OUT</sub>	THD=1%		25		W
Total Harmonic Distortion (Note)	THD	P <sub>OUT</sub> =20W, fo=1kHz		0.015		%
		P <sub>OUT</sub> =20W, fo =20kHz		0.05	0.4	
		P <sub>OUT</sub> =20W, R <sub>L</sub> =4Ω, fo=1kHz		0.022		
		P <sub>OUT</sub> =20W, R <sub>L</sub> =4Ω, fo=20kHz		0.07	0.6	
Offset Voltage	V <sub>O(OFF)</sub>			±1	±15	mV
Input Bias Current	I <sub>I(BIAS)</sub>			±0.2	±2	μA
Input Offset Current	I <sub>I(OFF)</sub>			0	±0.5	μA
Gain-Bandwidth Product	GB <sub>W</sub>	Fo=20kHz		5.5		MHz
Open Loop Gain	G <sub>V</sub>	DC		90		dB
Power Supply Rejection Ratio	RR	V <sub>CC</sub> , 1kHz, 1 Vrms	52	95		dB
		V <sub>EE</sub> , 1kHz, 1 Vrms	52	83		
Max Slew Rate	SR	20W, 8Ω, 70kHz BW		8		V/μs
Current Limit	I <sub>LIMIT</sub>	V <sub>OUT</sub> =V <sub>SUPPLY</sub> -10V	3	4		A
Equivalent Input Noise Voltage	e <sub>N</sub>	Rs=600Ω, CCIR		3		μVrms

Note: Assumes the use of a heat sink having a thermal resistance of 1 °C/W and no insulator with an Ta=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.

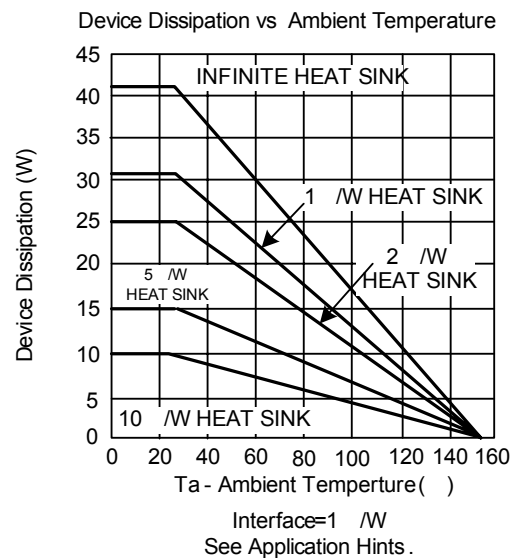
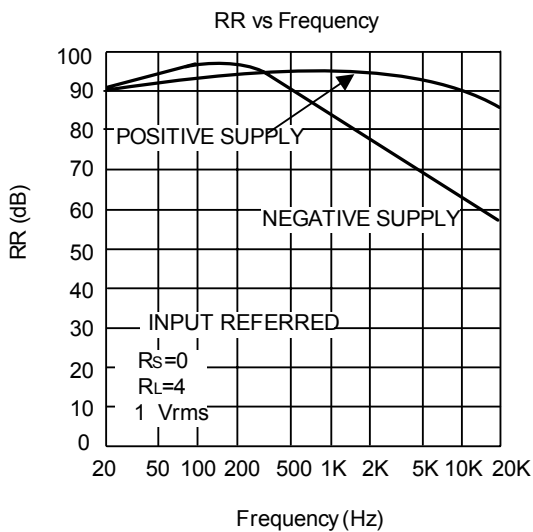
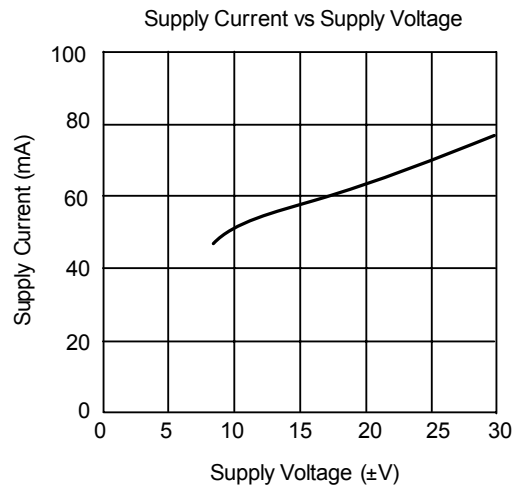
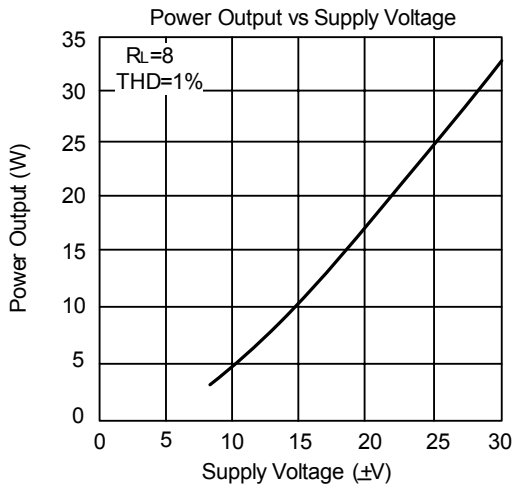
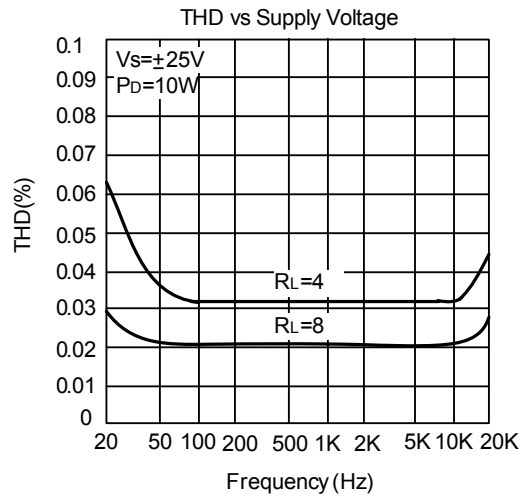
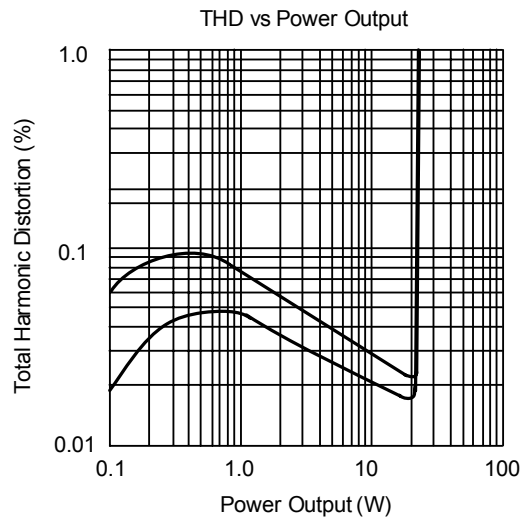
### ■ TYPICAL APPLICATION CIRCUIT



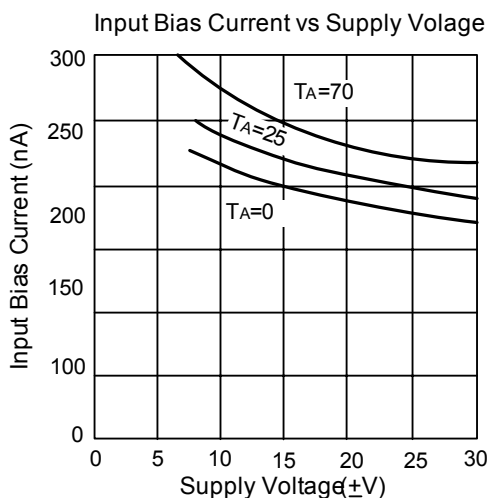
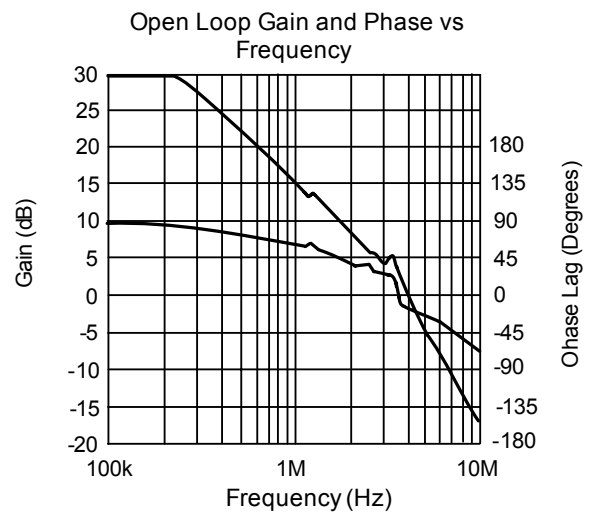
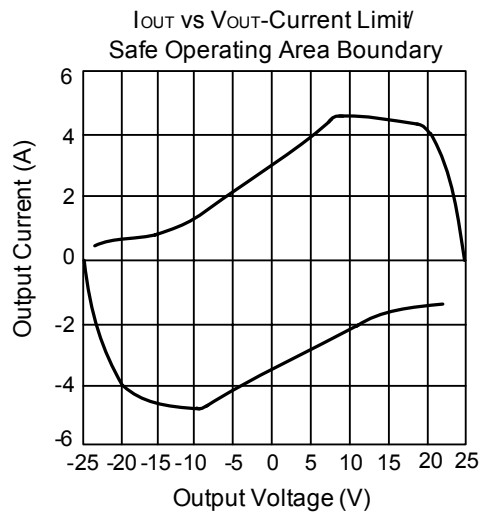
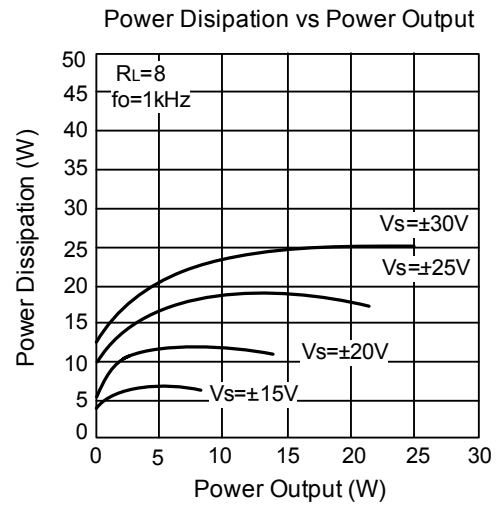
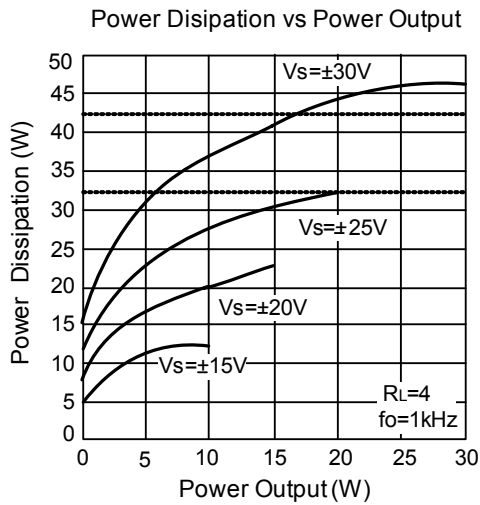
### ■ TYPICAL SINGLE SUPPLY OPERATION



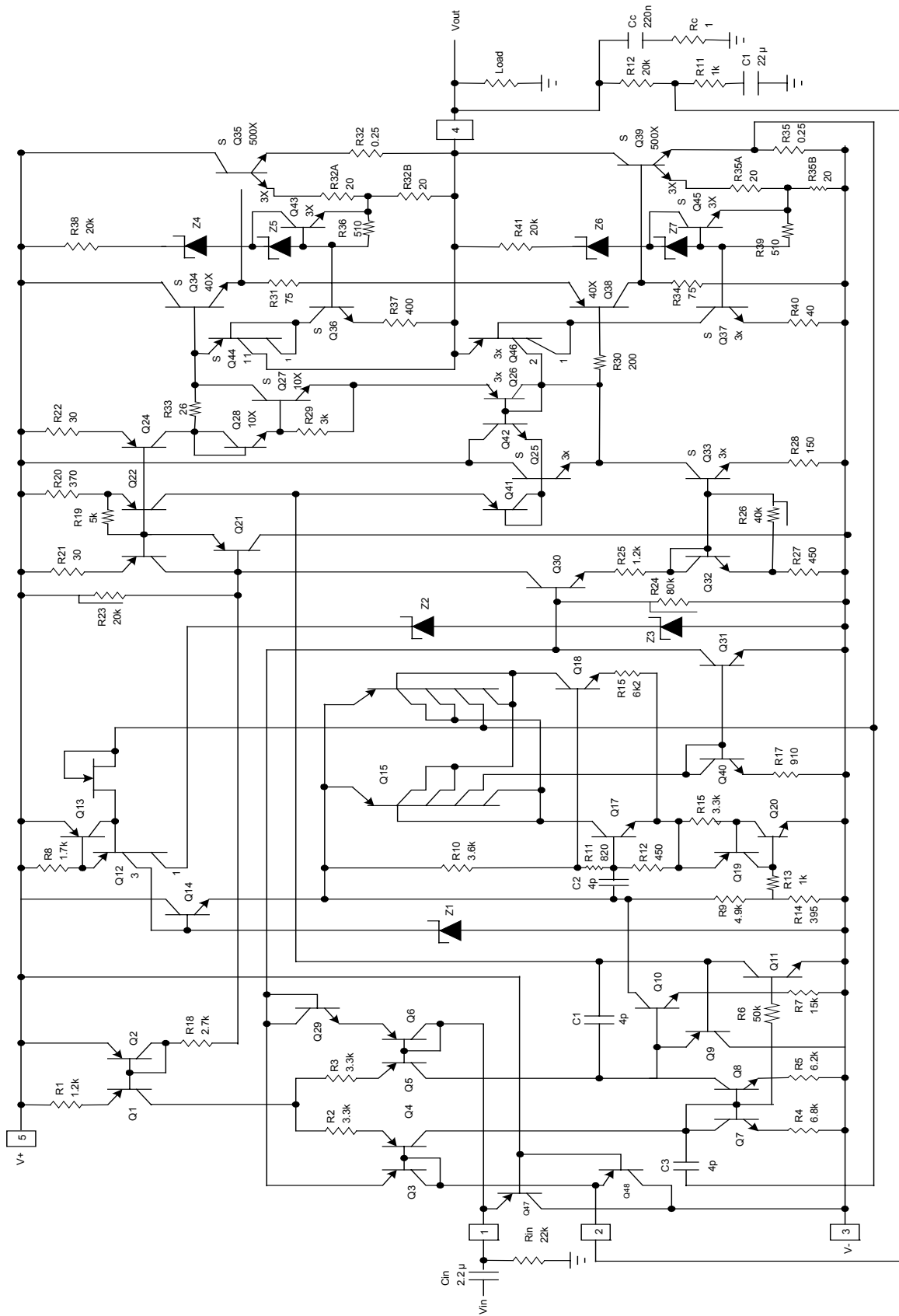
## TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



\* Thermal shutdown with infinite heat sink  
 \*\* Thermal shutdown with 1 /W heat sink



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