



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

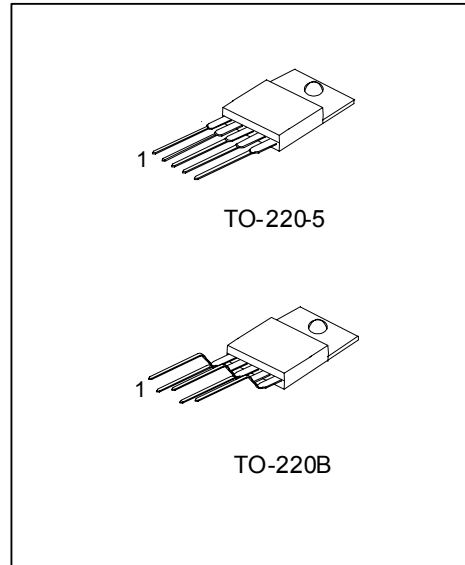
APPLICATIONS

- *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 _{EE} | OUT | V _{CC} | Tube |
| LM1875-TB5-T | LM1875L-TB5-T | TO-220B | +IN | -IN | -V _{EE} | OUT | V _{CC} | 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> |
|---|--|



*Pb-free plating product number: LM1875L

■ ABSOLUTE MAXIMUM RATINGS (Ta=25 °C)

| PARAMETER | SYMBOL | RATING | UNIT |
|----------------------|------------------|------------------------------------|------|
| Supply Voltage | V _{CC} | 60 | V |
| Input Voltage | V _{IN} | -V _{EE} ~ V _{CC} | V |
| Junction Temperature | T _J | +150 | |
| Storage Temperature | T _{STG} | -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.

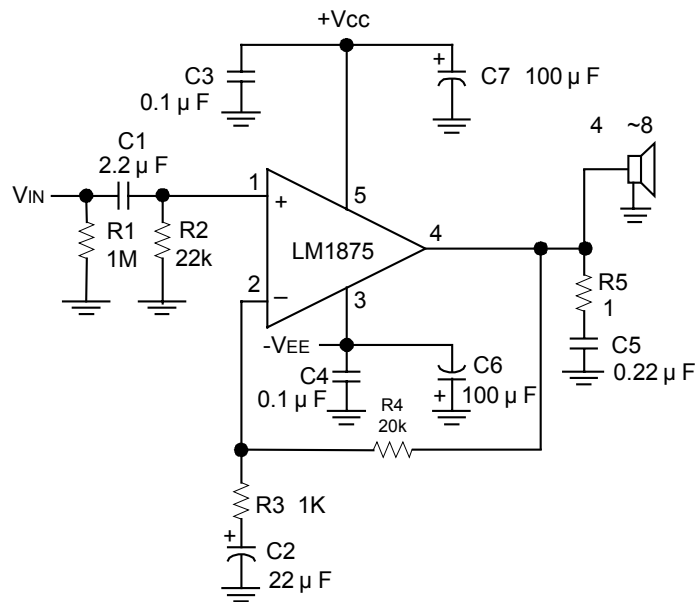
■ ELECTRICAL CHARACTERISTICS

(V_{CC}=+25V, -V_{EE}=-25V, Ta=25 °C, R_L=8 Ω, Av=20(26dB), fo=1kHz, unless otherwise specified.)

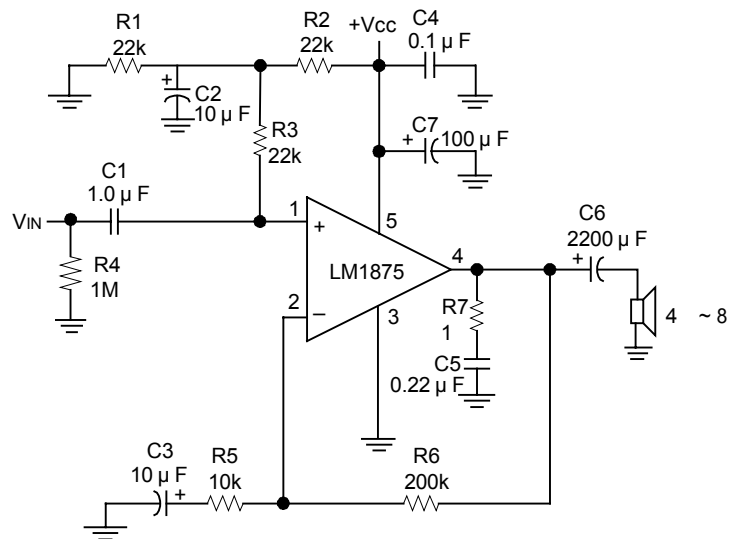
| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|----------------------------------|----------------------|---|-----|-------|------|-------|
| Supply Current | I _{CC} | P _{OUT} =0W | | 70 | 100 | mA |
| Output Power(Note) | P _{OUT} | THD=1% | | 25 | | W |
| Total Harmonic Distortion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

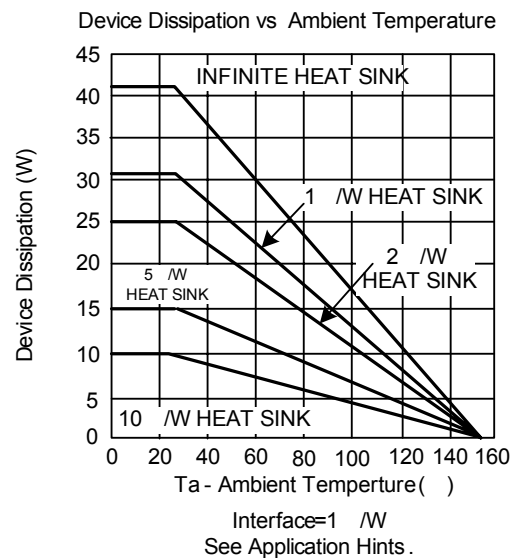
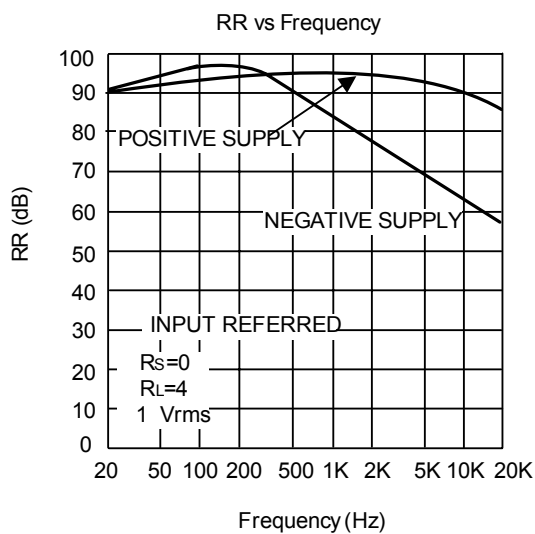
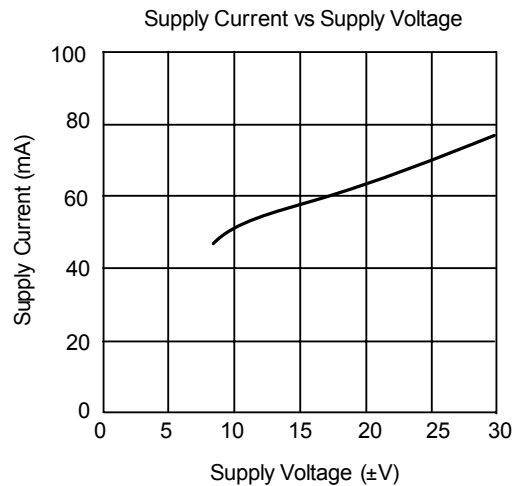
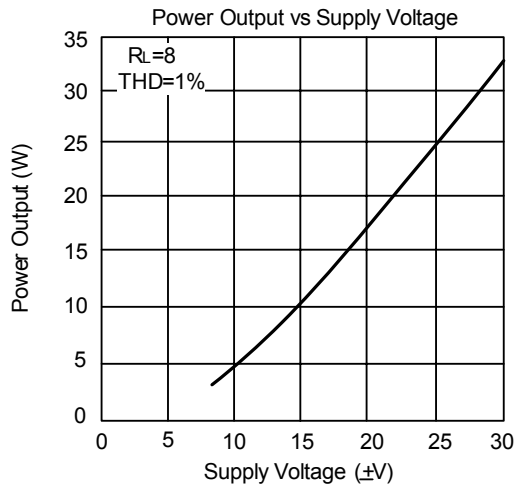
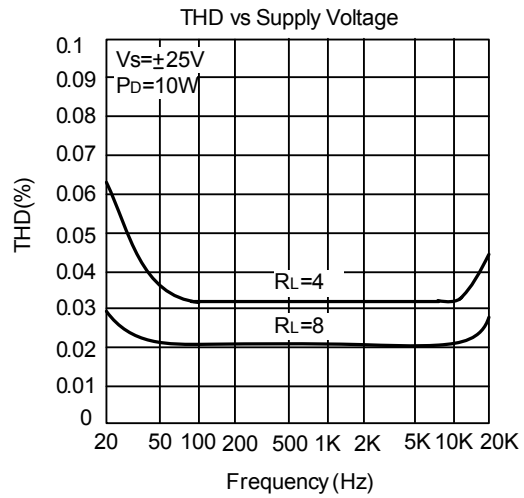
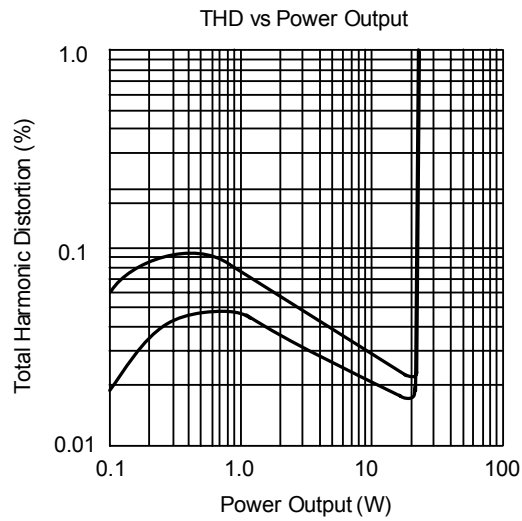
■ TYPICAL APPLICATION CIRCUIT



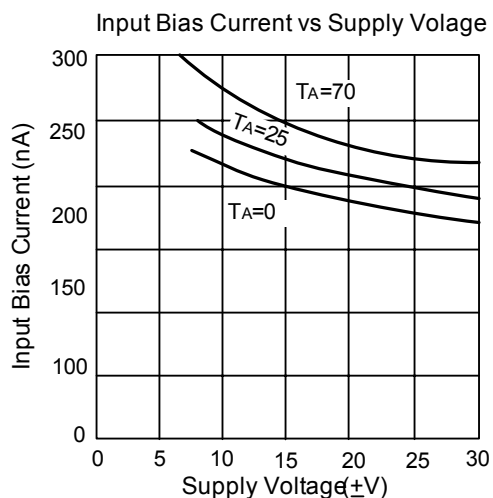
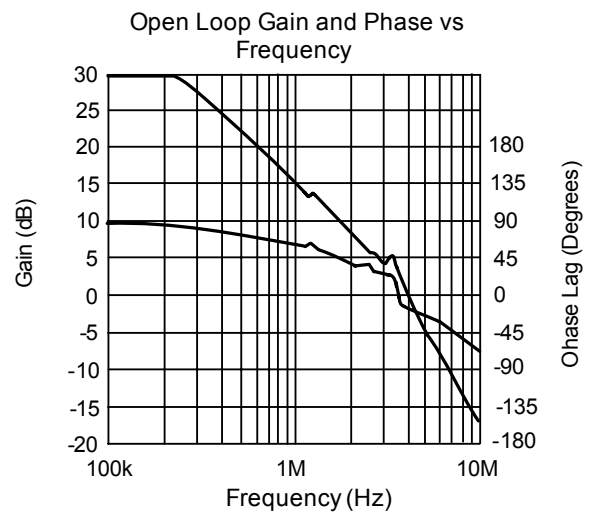
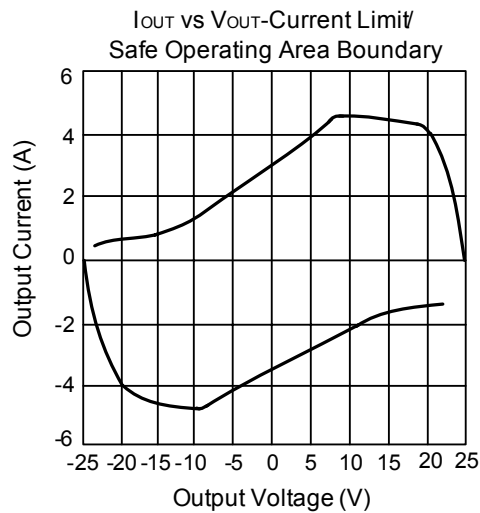
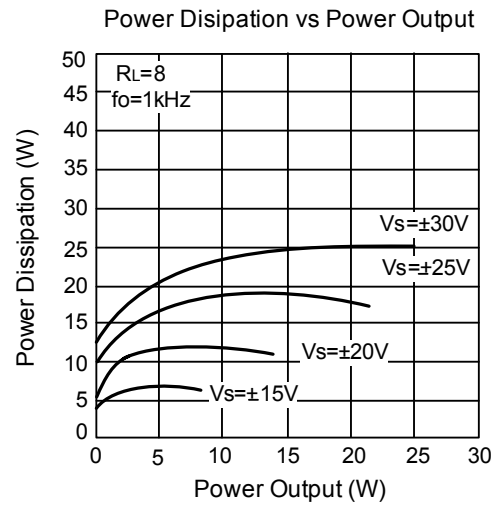
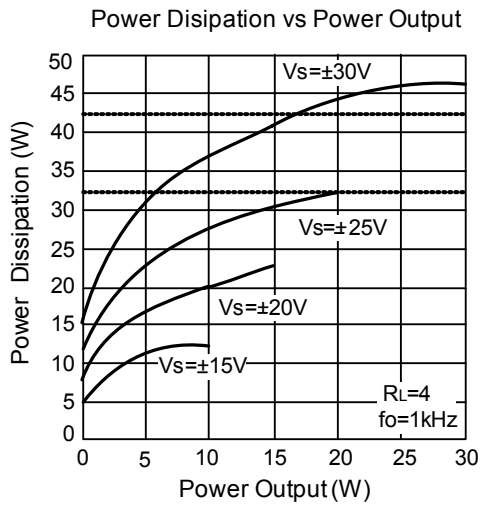
■ TYPICAL SINGLE SUPPLY OPERATION



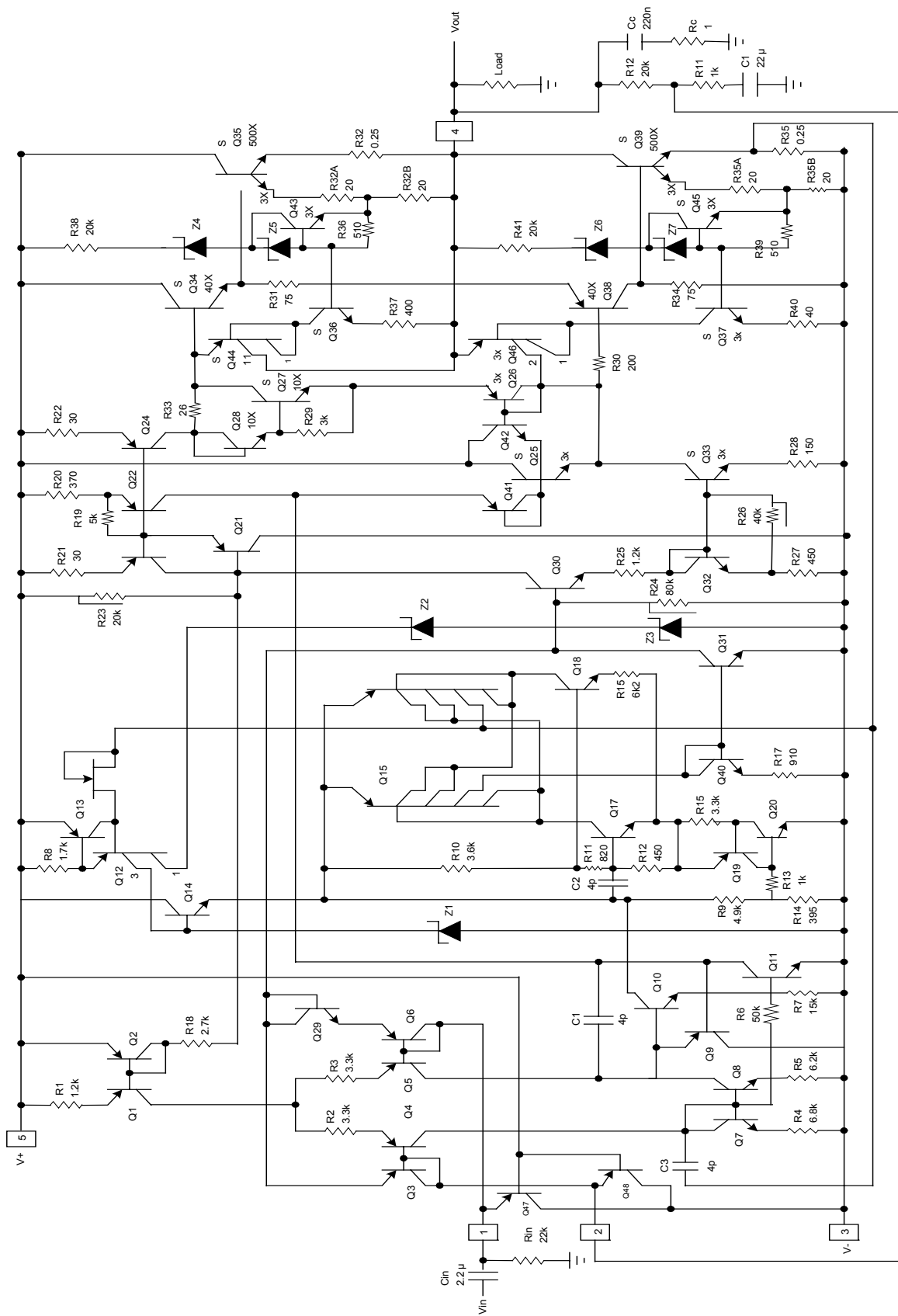
TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



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



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