National Semiconductor

LM675
Power Operational Amplifier

General Description

The LM675 is a monolithic power operational amplifier featuring wide bandwidth and low input offset voltage, making it equally suitable for AC and DC applications.

The LM675 is capable of delivering output currents in excess of 3 amps, operating at supply voltages of up to 60V. The device overload protection consists of both internal current limiting and thermal shutdown. The amplifier is also internally compensated for gains of 10 or greater.

Features

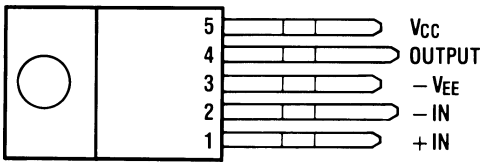
- 3A current capability
- A_{VO} typically 90 dB
- 5.5 MHz gain bandwidth product
- 8 V/µs slew rate
- Wide power bandwidth 70 kHz
- 1 mV typical offset voltage
- Short circuit protection
- Thermal protection with parole circuit (100% tested)
- 16V–60V supply range
- Wide common mode range
- Internal output protection diodes
- 90 dB ripple rejection
- Plastic power package TO-220

Applications

- High performance power op amp
- Bridge amplifiers
- Motor speed controls
- Servo amplifiers
- Instrument systems

Connection Diagram

TO-220 Power Package (T)



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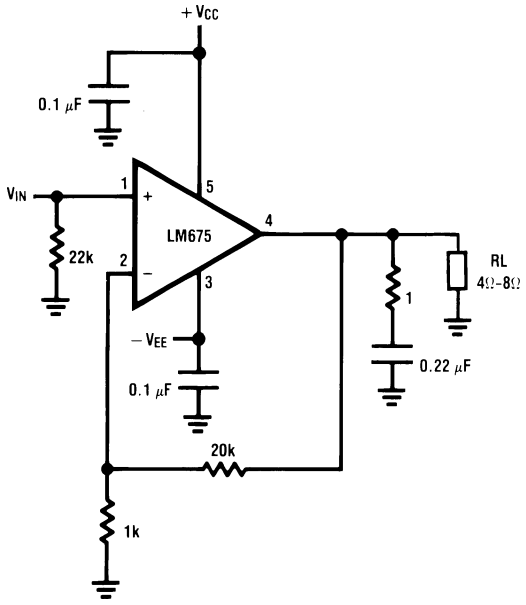
*The tab is internally connected to pin 3 ($-V_{EE}$)

Front View
Order Number LM675T
See NS Package T05D

Typical Applications

Non-Inverting Amplifier



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Absolute Maximum Ratings (Note 1)

If Military/Aerospace specified devices are required, please contact the National Semiconductor Sales Office/ Distributors for availability and specifications.

Supply Voltage	±30V
Input Voltage	$-V_{EE}$ to V_{CC}
Operating Temperature	0˚C to +70˚C
Storage Temperature	−65˚C to +150˚C
Junction Temperature	150˚C
Power Dissipation (Note 2)	30W
Lead Temperature (Soldering, 10 seconds)	260˚C

ESD rating to be determined.

Electrical Characteristics

V_S=±25V, T_A=25˚C unless otherwise specified.

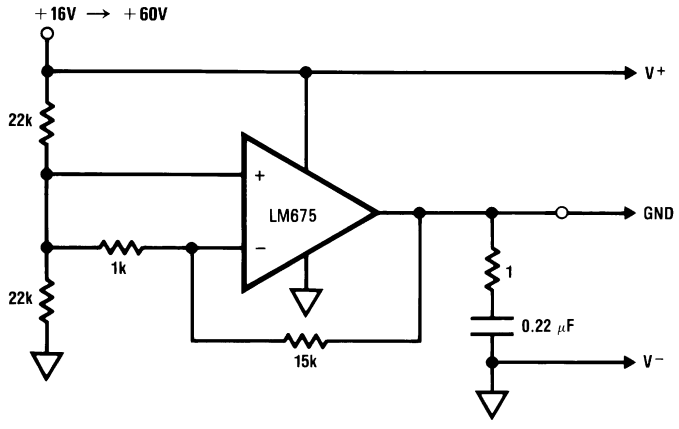
Parameter	Conditions	Typical	Tested Limit	Units
Supply Current	P_{OUT} = 0W	18	50 (max)	mA
Input Offset Voltage	V_{CM} = 0V	1	10 (max)	mV
Input Bias Current	V_{CM} = 0V	0.2	2 (max)	µA
Input Offset Current	V_{CM} = 0V	50	500 (max)	nA
Open Loop Gain	R_L = ∞Ω	90	70 (min)	dB
PSRR	ΔV_S = ±5V	90	70 (min)	dB
CMRR	V_{IN} = ±20V	90	70 (min)	dB
Output Voltage Swing	R_L = 8Ω	±21	±18 (min)	V
Offset Voltage Drift Versus Temperature	R_S < 100 kΩ	25		µV/˚C
Offset Voltage Drift Versus Output Power		25		µV/W
Output Power	THD = 1%, f_O = 1 kHz, R_L = 8Ω	25	20	W
Gain Bandwidth Product	f_O = 20 kHz, A_{VCL} = 1000	5.5		MHz
Max Slew Rate		8		V/µs
Input Common Mode Range		±22	±20 (min)	V

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. Electrical Characteristics state DC and AC electrical specifications under particular test conditions which guarantee specific performance limits. This assumes that the device is within the Operating Ratings. Specifications are not guaranteed for parameters where no limit is given, however, the typical value is a good indication of device performance.

Note 2: Assumes T_A equal to 70˚C. For operation at higher tab temperatures, the LM675 must be derated based on a maximum junction temperature of 150˚C.

Typical Applications

Generating a Split Supply From a Single Supply



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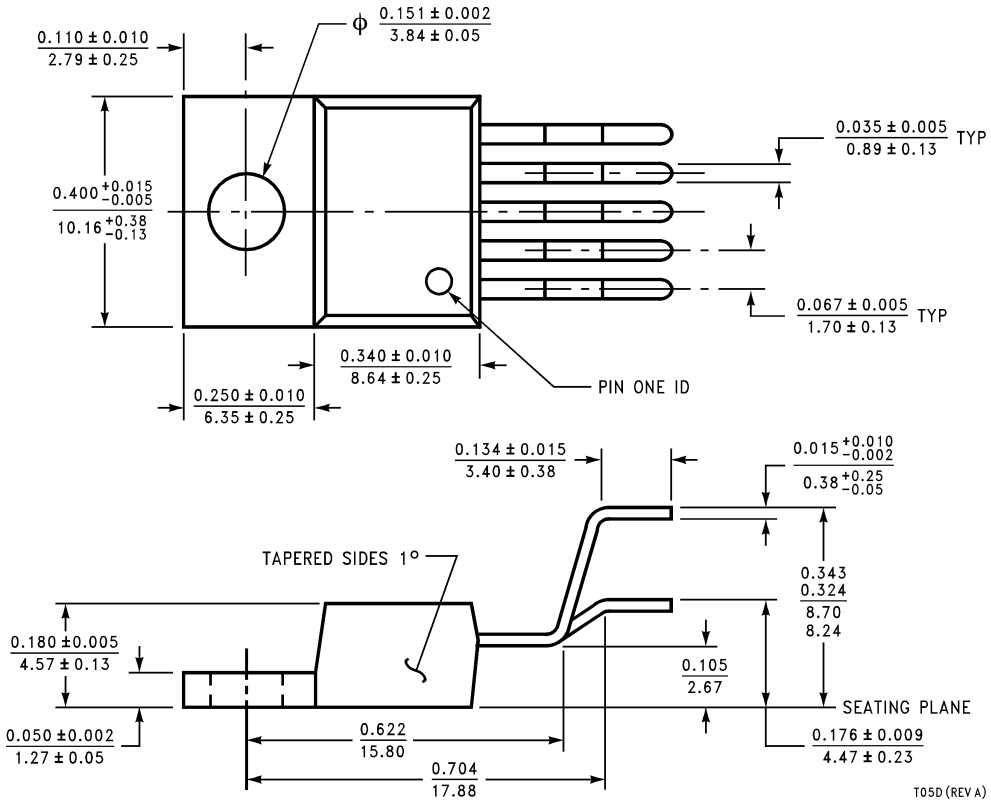
V_S = ±8V → ±30V

Physical Dimensions inches (millimeters) unless otherwise noted



TO-220 Power Package (T)
Order Number LM675T
NS Package T05D