

LM1575/LM2575/LM2575HV SIMPLE SWITCHER® 1A Step-Down Voltage Regulator

General Description

The LM2575 series of regulators are monolithic integrated circuits that provide all the active functions for a step-down (buck) switching regulator, capable of driving a 1A load with excellent line and load regulation. These devices are available in fixed output voltages of 3.3V, 5V, 12V, 15V, and an adjustable output version.

Requiring a minimum number of external components, these regulators are simple to use and include internal frequency compensation and a fixed-frequency oscillator.

The LM2575 series offers a high-efficiency replacement for popular three-terminal linear regulators. It substantially reduces the size of the heat sink, and in many cases no heat sink is required.

A standard series of inductors optimized for use with the LM2575 are available from several different manufacturers. This feature greatly simplifies the design of switch-mode power supplies.

Other features include a guaranteed $\pm 4\%$ tolerance on output voltage within specified input voltages and output load conditions, and $\pm 10\%$ on the oscillator frequency. External shutdown is included, featuring 50 μA (typical) standby current. The output switch includes cycle-by-cycle current limiting, as well as thermal shutdown for full protection under fault conditions.

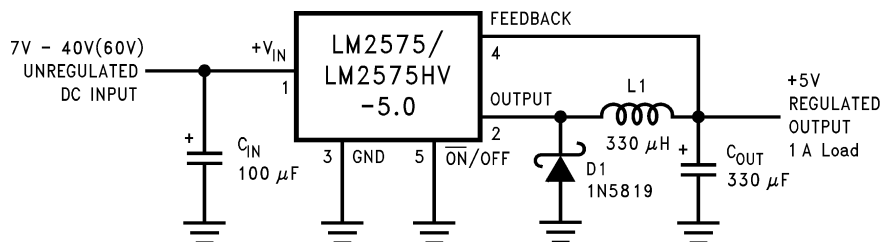
Features

- 3.3V, 5V, 12V, 15V, and adjustable output versions
- Adjustable version output voltage range, 1.23V to 37V (57V for HV version) $\pm 4\%$ max over line and load conditions
- Guaranteed 1A output current
- Wide input voltage range, 40V up to 60V for HV version
- Requires only 4 external components
- 52 kHz fixed frequency internal oscillator
- TTL shutdown capability, low power standby mode
- High efficiency
- Uses readily available standard inductors
- Thermal shutdown and current limit protection
- P+ Product Enhancement tested

Applications

- Simple high-efficiency step-down (buck) regulator
- Efficient pre-regulator for linear regulators
- On-card switching regulators
- Positive to negative converter (Buck-Boost)

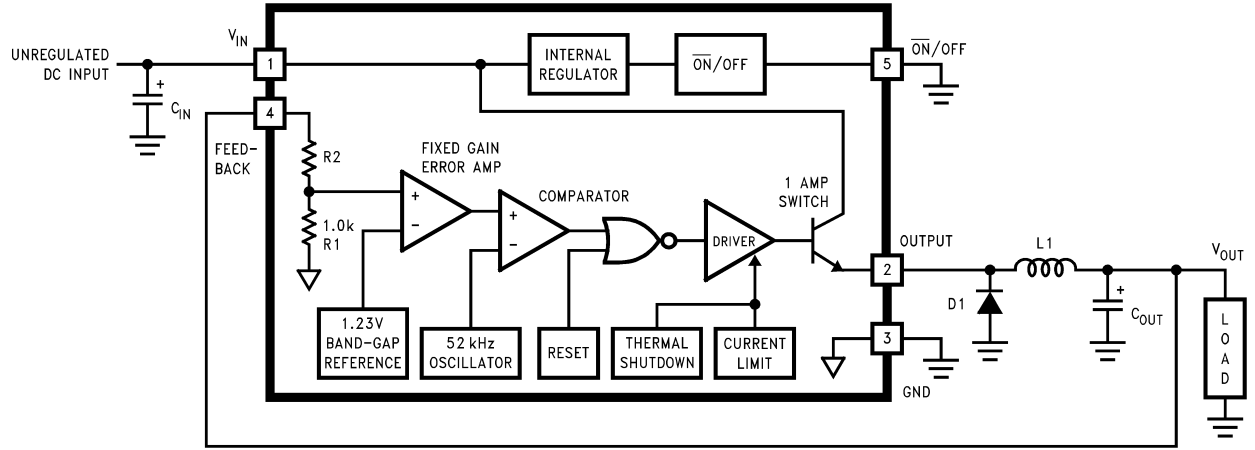
Typical Application (Fixed Output Voltage Versions)



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Note: Pin numbers are for the TO-220 package.

Block Diagram and Typical Application



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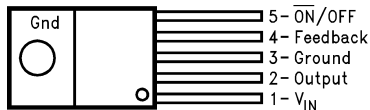
3.3V, R2 = 1.7k
 5V, R2 = 3.1k
 12V, R2 = 8.84k
 15V, R2 = 11.3k
 For ADJ. Version
 R1 = Open, R2 = 0Ω

Note: Pin numbers are for the TO-220 package.

FIGURE 1.

Connection Diagrams (XX indicates output voltage option. See Ordering Information table for complete part number.)

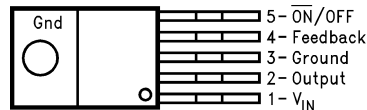
Straight Leads 5-Lead TO-220 (T)



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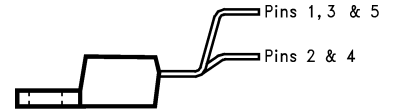
Top View
 LM2575T-XX or LM2575HVT-XX
 See NS Package Number T05A

Bent, Staggered Leads 5-Lead TO-220 (T)



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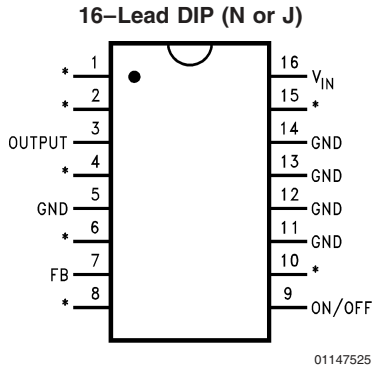
Top View



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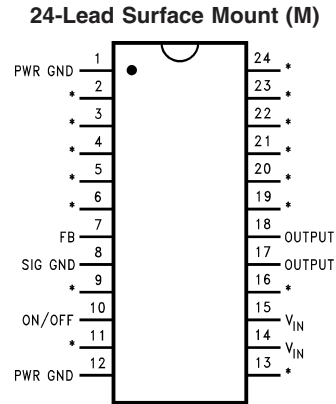
Side View
 LM2575T-XX Flow LB03 or
 LM2575HVT-XX Flow LB03
 See NS Package Number T05D

Connection Diagrams (XX indicates output voltage option. See Ordering Information table for complete part number.) (Continued)



*No Internal Connection

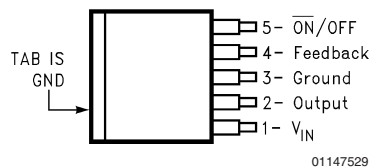
Top View
LM2575N-XX or LM2575HVN-XX
 See NS Package Number N16A
LM1575J-XX-QML
 See NS Package Number J16A



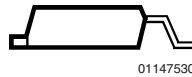
*No Internal Connection

Top View
LM2575M-XX or LM2575HVM-XX
 See NS Package Number M24B

TO-263(S)
5-Lead Surface-Mount Package



Top View



Side View
LM2575S-XX or LM2575HVS-XX
 See NS Package Number TS5B

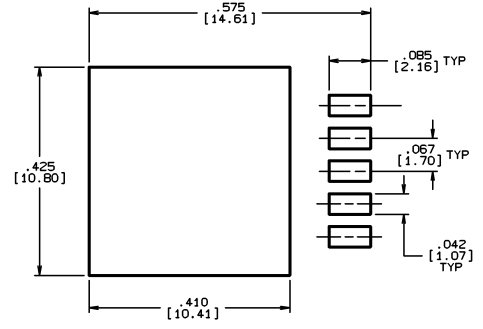
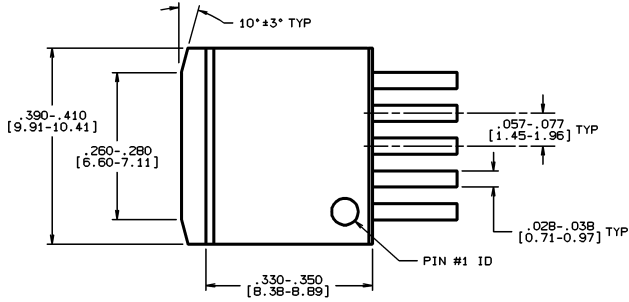
Ordering Information

Package Type	NSC Package Number	Standard Voltage Rating (40V)	High Voltage Rating (60V)	Temperature Range
5-Lead TO-220 Straight Leads	T05A	LM2575T-3.3 LM2575T-5.0 LM2575T-12 LM2575T-15 LM2575T-ADJ	LM2575HVT-3.3 LM2575HVT-5.0 LM2575HVT-12 LM2575HVT-15 LM2575HVT-ADJ	
5-Lead TO-220 Bent and Staggered Leads	T05D	LM2575T-3.3 Flow LB03 LM2575T-5.0 Flow LB03 LM2575T-12 Flow LB03 LM2575T-15 Flow LB03 LM2575T-ADJ Flow LB03	LM2575HVT-3.3 Flow LB03 LM2575HVT-5.0 Flow LB03 LM2575HVT-12 Flow LB03 LM2575HVT-15 Flow LB03 LM2575HVT-ADJ Flow LB03	

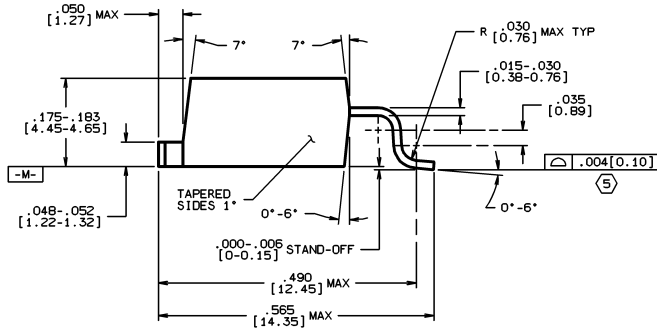
Ordering Information (Continued)

Package Type	NSC Package Number	Standard Voltage Rating (40V)	High Voltage Rating (60V)	Temperature Range
16-Pin Molded DIP	N16A	LM2575N-5.0 LM2575N-12 LM2575N-15 LM2575N-ADJ	LM2575HVN-5.0 LM2575HVN-12 LM2575HVN-15 LM2575HVN-ADJ	-40°C ≤ T _J ≤ +125°C
24-Pin Surface Mount	M24B	LM2575M-5.0 LM2575M-12 LM2575M-15 LM2575M-ADJ	LM2575HVM-5.0 LM2575HVM-12 LM2575HVM-15 LM2575HVM-ADJ	
5-Lead TO-263 Surface Mount	TS5B	LM2575S-3.3 LM2575S-5.0 LM2575S-12 LM2575S-15 LM2575S-ADJ	LM2575HVS-3.3 LM2575HVS-5.0 LM2575HVS-12 LM2575HVS-15 LM2575HVS-ADJ	
16-Pin Ceramic DIP	J16A	LM1575J-3.3-QML LM1575J-5.0-QML LM1575J-12-QML LM1575J-15-QML LM1575J-ADJ-QML		-55°C ≤ T _J ≤ +150°C

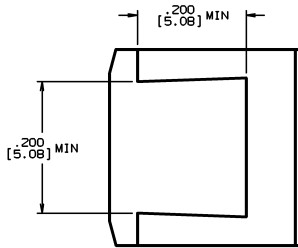
Physical Dimensions inches (millimeters) unless otherwise noted (Continued)



LEAD POSITION OVERLAY



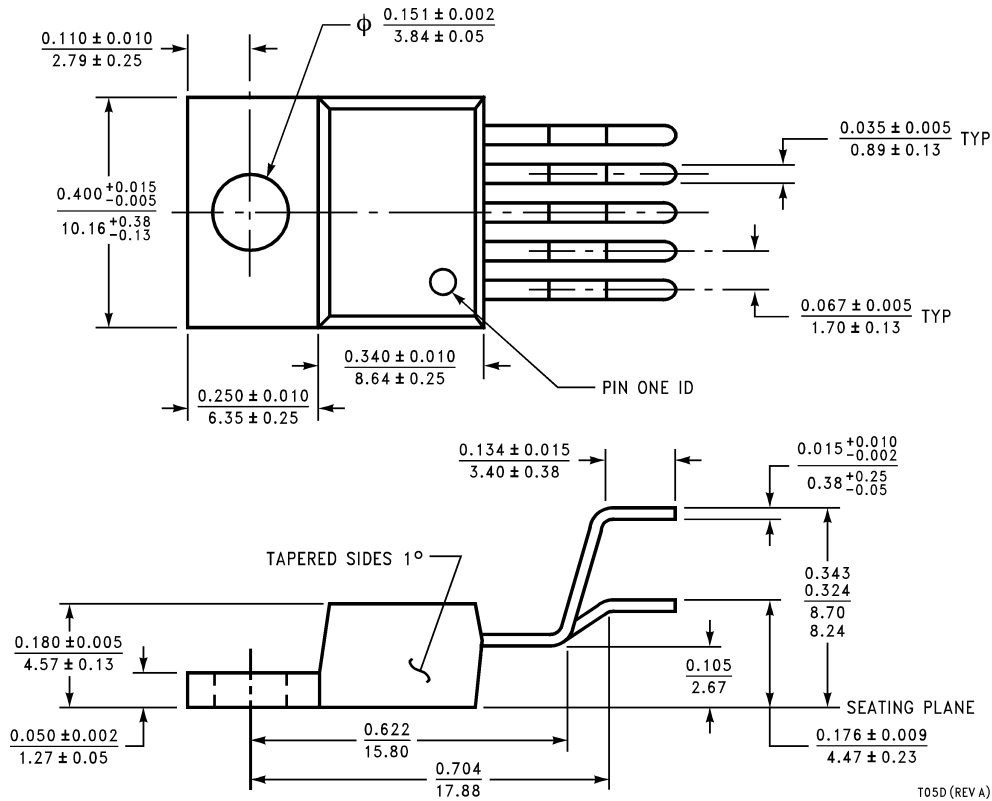
CONTROLLING DIMENSION: INCH



TS5B (Rev C)

TO-263, Molded, 5-Lead Surface Mount
Order Number LM2575S-3.3, LM2575HVS-3.3, LM2575S-5.0, LM2575HVS-5.0, LM2575S-12,
LM2575HVS-12, LM2575S-15, LM2575HVS-15, LM2575S-ADJ or LM2575HVS-ADJ
NS Package Number TS5B

Physical Dimensions inches (millimeters) unless otherwise noted (Continued)



Bent, Staggered 5-Lead TO-220 (T)
Order Number LM2575T-3.3 Flow LB03, LM2575HVT-3.3 Flow LB03,
LM2575T-5.0 Flow LB03, LM2575HVT-5.0 Flow LB03,
LM2575T-12 Flow LB03, LM2575HVT-12 Flow LB03,
LM2575T-15 Flow LB03, LM2575HVT-15 Flow LB03,
LM2575T-ADJ Flow LB03 or LM2575HVT-ADJ Flow LB03
NS Package Number T05D

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