

## Ordering Information

Part Number		Temperature Range	Package
Standard	Pb-Free / RoHS Compliant		
LM2575BN*	Contact Factory	–40° to +85°C	16-Pin Plastic DIP
LM2575-3.3BN	Contact Factory	–40° to +85°C	16-Pin Plastic DIP
LM2575-5.0BN	LM2575-5.0YN	–40° to +85°C	16-Pin Plastic DIP
LM2575-12BN	LM2575-12YN	–40° to +85°C	16-Pin Plastic DIP
LM2575BWM*	LM2575YWM*	–40° to +85°C	24-Pin Wide SOIC
LM2575-3.3BWM	LM2575-3.3YWM	–40° to +85°C	24-Pin Wide SOIC
LM2575-5.0BWM	LM2575-5.0YWM	–40° to +85°C	24-Pin Wide SOIC
LM2575-12BWM	LM2575-12YWM	–40° to +85°C	24-Pin Wide SOIC
LM2575BT*†	LM2575WT*/**	–40° to +85°C	5-Pin TO-220
LM2575-3.3BT†	LM2575-3.3WT**	–40° to +85°C	5-Pin TO-220
LM2575-5.0BT†	LM2575-5.0WT**	–40° to +85°C	5-Pin TO-220
LM2575-12BT†	LM2575-12WT**	–40° to +85°C	5-Pin TO-220
LM2575BU*	LM2575WU*/**	–40° to +85°C	5-Pin TO-263
LM2575-3.3BU	LM2575-3.3WU**	–40° to +85°C	5-Pin TO-263
LM2575-5.0BU	LM2575-5.0WU**	–40° to +85°C	5-Pin TO-263
LM2575-12BU	LM2575-12WU**	–40° to +85°C	5-Pin TO-263

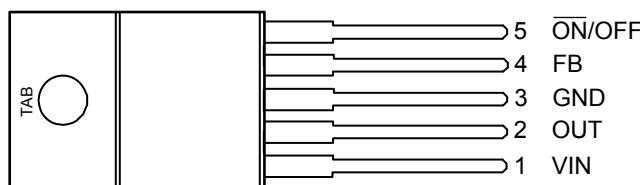
**Notes:**

\* Adjustable output regulators.

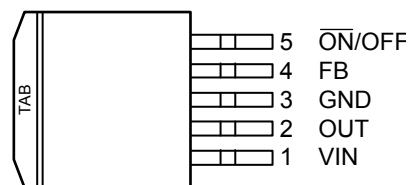
\*\* RoHS compliant with "high-melting solder" exemption.

† Contact factory for bent or staggered leads option.

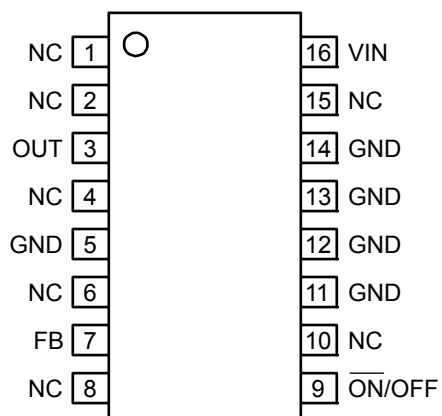
## Pin Configuration



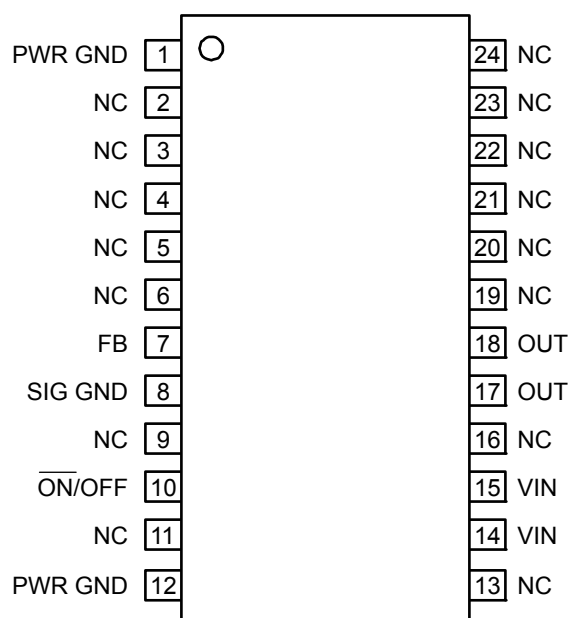
5-Pin TO-220 (T)



5-Pin TO-263 (U)



16-Pin Plastic DIP (N)



24-Pin Wide SOIC (WM)

**Absolute Maximum Ratings<sup>(1)</sup>**

Maximum Supply Voltage ( $V_{IN}$ )	45V
ON/OFF Pin Input Voltage	$-0.3V \leq V \leq +40V$
Output Voltage to Ground (Steady State)	-1V
Power Dissipation	Internally Limited
Maximum Junction Temperature	150°C
Lead Temperature (soldering, 10 sec.)	260°C
Storage Temperature ( $T_s$ )	-65°C to +150°C
Minimum ESD Rating	
C = 100pF, R = 1.5k $\Omega$	2kV
FB Pin	1kV

**Operating Ratings**

Supply Voltage ( $V_{IN}$ )	40V
Junction Temperature Range ( $T_J$ )	-40°C $\leq T_J \leq$ +125°C

**Electrical Characteristics**

Specifications with standard typeface are for  $T_J = 25^\circ\text{C}$ , and those with **boldface type** apply over full Operating Temperature Range. Unless otherwise specified,  $V_{IN} = 12V$ , and  $I_{LOAD} = 200\text{mA}$ .

Symbol	Parameter	Condition	Typ	LM2575 Limit (Note 2)	Units (Limits)
<b>SYSTEM PARAMETERS, ADJUSTABLE REGULATORS (Note 3) Test Circuit Figure 1</b>					
$V_{OUT}$	Feedback Voltage	$V_{IN} = 12V$ , $I_{LOAD} = 0.2A$ $V_{OUT} = 5V$	1.230	1.217 1.243	V V(min) V(max)
	Feedback Voltage LM2575	$0.2A \leq I_{LOAD} \leq 1A$ , $8V \leq V_{IN} \leq 40V$ $V_{OUT} = 5V$	1.230	1.193/ <b>1.180</b> 1.267/ <b>1.280</b>	V V(min) V(max)
$\eta$	Efficiency	$V_{IN} = 12V$ , $I_{LOAD} = 1A$ , $V_{OUT} = 5V$	82		%
<b>SYSTEM PARAMETERS, 3.3V REGULATORS (Note 3) Test Circuit Figure 1</b>					
$V_{OUT}$	Output Voltage	$V_{IN} = 12V$ , $I_{LOAD} = 0.2A$ $V_{OUT} = 3.3V$	3.3	3.234 3.366	V V(min) V(max)
	Output Voltage LM2575-3.3	$0.2A \leq I_{LOAD} \leq 1A$ , $8V \leq V_{IN} \leq 40V$ $V_{OUT} = 3.3V$	3.3	3.168/ <b>3.135</b> 3.432/ <b>3.465</b>	V V(min) V(max)
$\eta$	Efficiency	$V_{IN} = 12V$ , $I_{LOAD} = 1A$	75		%
<b>SYSTEM PARAMETERS, 5V REGULATORS (Note 3) Test Circuit Figure 1</b>					
$V_{OUT}$	Output Voltage	$V_{IN} = 12V$ , $I_{LOAD} = 0.2A$ $V_{OUT} = 5V$	5.0	4.900 5.100	V V(min) V(max)
	Output Voltage LM2575-5.0	$0.2A \leq I_{LOAD} \leq 1A$ , $8V \leq V_{IN} \leq 40V$ $V_{OUT} = 5V$	5.0	4.800/ <b>4.750</b> 5.200/ <b>5.250</b>	V V(min) V(max)
$\eta$	Efficiency	$V_{IN} = 12V$ , $I_{LOAD} = 1A$	82		%
<b>SYSTEM PARAMETERS, 12V REGULATORS (Note 3) Test Circuit Figure 1</b>					
$V_{OUT}$	Output Voltage	$V_{IN} = 25V$ , $I_{LOAD} = 0.2A$ $V_{OUT} = 12V$	12	11.760 12.240	V V(min) V(max)
	Output Voltage LM2575-12	$0.2A \leq I_{LOAD} \leq 1A$ , $15V \leq V_{IN} \leq 40V$ $V_{OUT} = 12V$	12	11.520/ <b>11.400</b> 12.480/ <b>12.600</b>	V V(min) V(max)
$\eta$	Efficiency	$V_{IN} = 25V$ , $I_{LOAD} = 1A$	88		%

Symbol	Parameter	Condition	Typ	LM2575 Limit (Note 2)	Units (Limits)
DEVICE PARAMETERS, ADJUSTABLE REGULATOR					
I <sub>B</sub>	Feedback Bias Current	V <sub>OUT</sub> = 5V	50	100/500	nA
DEVICE PARAMETERS, FIXED and ADJUSTABLE REGULATORS					
f <sub>O</sub>	Oscillator Frequency		52	47/42 58/63	kHz kHz(min) kHz(max)
V <sub>SAT</sub>	Saturation Voltage	I <sub>OUT</sub> = 1A (Note 4)	0.9	1.2/1.4	V V(max)
DC	Max Duty Cycle (ON)	(Note 5)	98	93	% %(max)
I <sub>CL</sub>	Current Limit	Peak Current, t <sub>ON</sub> ≤ 3μs (Note 4)	2.2	1.7/1.3 3.0/3.2	A A(min) A(max)
I <sub>L</sub>	Output Leakage Current	V <sub>IN</sub> = 40V, (Note 6), Output = 0V Output = −1V (Note 6)	75	2 30	mA(max) mA mA(max)
I <sub>Q</sub>	Quiescent Current	(Note 6)	5	10	mA mA(max)
I <sub>STBY</sub>	Standby Quiescent Current	ON/OFF Pin = 5V (OFF)	50	200	μA μA(max)
θ <sub>JA</sub>	Thermal Resistance	T Package, Junction to Ambient (Note 7)	65		°C/W
θ <sub>JA</sub>		T Package, Junction to Ambient (Note 8)	45		
θ <sub>JC</sub>		T Package, Junction to Case	2		
θ <sub>JA</sub>		N Package, Junction to Ambient (Note 9)	85		
θ <sub>JA</sub>		WM Package, Junction to Ambient (Note 9)	100		
ON/OFF CONTROL, FIXED and ADJUSTABLE REGULATORS Test Circuit Figure 1					
V <sub>IH</sub> V <sub>IL</sub>	ON/OFF Pin Logic Input Level	V <sub>OUT</sub> = 0V V <sub>OUT</sub> = 5V	1.4 1.2	2.2/2.4 1.0/0.8	V(min) V(max)
I <sub>IH</sub>	ON/OFF Pin Logic Current	ON /OFF Pin = 5V (OFF)	4	30	μA μA(max)
I <sub>IL</sub>		ON /OFF Pin = 0V (ON)	0.01	10	μA μA(max)

**Notes:**

1. Absolute Maximum Rating indicate limits beyond which damage to the device may occur. Operating Ratings indicate conditions for which the device is intended to be functional, but do not guarantee specific performance limits. For guaranteed specifications and test conditions, see the Electrical Characteristics.
2. All limits guaranteed at room temperature (standard type face) and at **temperature extremes (bold type face)**. All room temperature limits are 100% production tested. All limits at **temperature extreme** are guaranteed via testing.
3. External components such as the catch diode, inductor, input and output capacitors can affect switching regulator system performance. When the LM2575/LM1575 is used as shown in Figure 1 test circuit, system performance will be shown in system parameters section of Electrical Characteristics.
4. Output (pin 2) sourcing current. No diode, inductor or capacitor connected to output.
5. Feedback (pin 4) removed from output and connected to 0V.
6. Feedback (pin 4) removed from output and connected to 12V to force the output transistor OFF.
7. Junction to ambient thermal resistance (no external heat sink) for the 5-pin TO-220 package mounted vertically, with 1/2" leads in a socket, or on PC board with minimum copper area.
8. Junction to ambient thermal resistance (no external heat sink) for the 5-pin TO-220 package mounted vertically, with 1/4" leads soldered to PC board containing approximately 4 square inches of copper area surrounding the leads.
9. Junction to ambient thermal resistance with approximately 1 square inch of pc board copper surrounding the leads. Additional copper will lower thermal resistance further.

## Test Circuits and Layout Guidelines

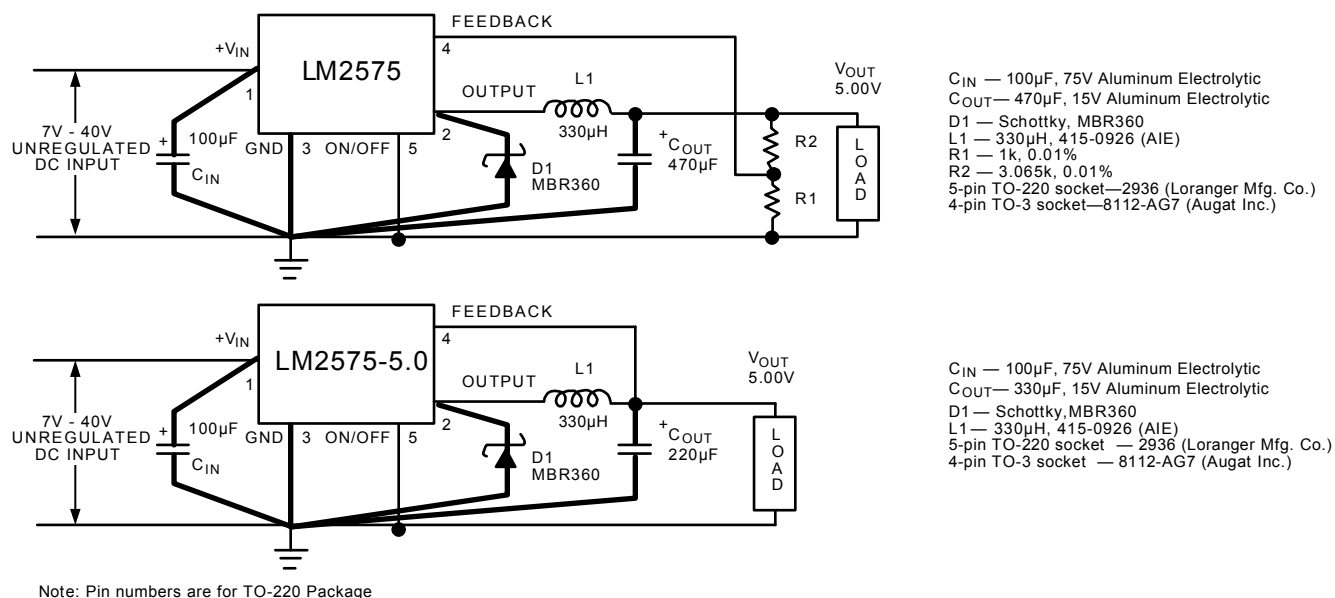
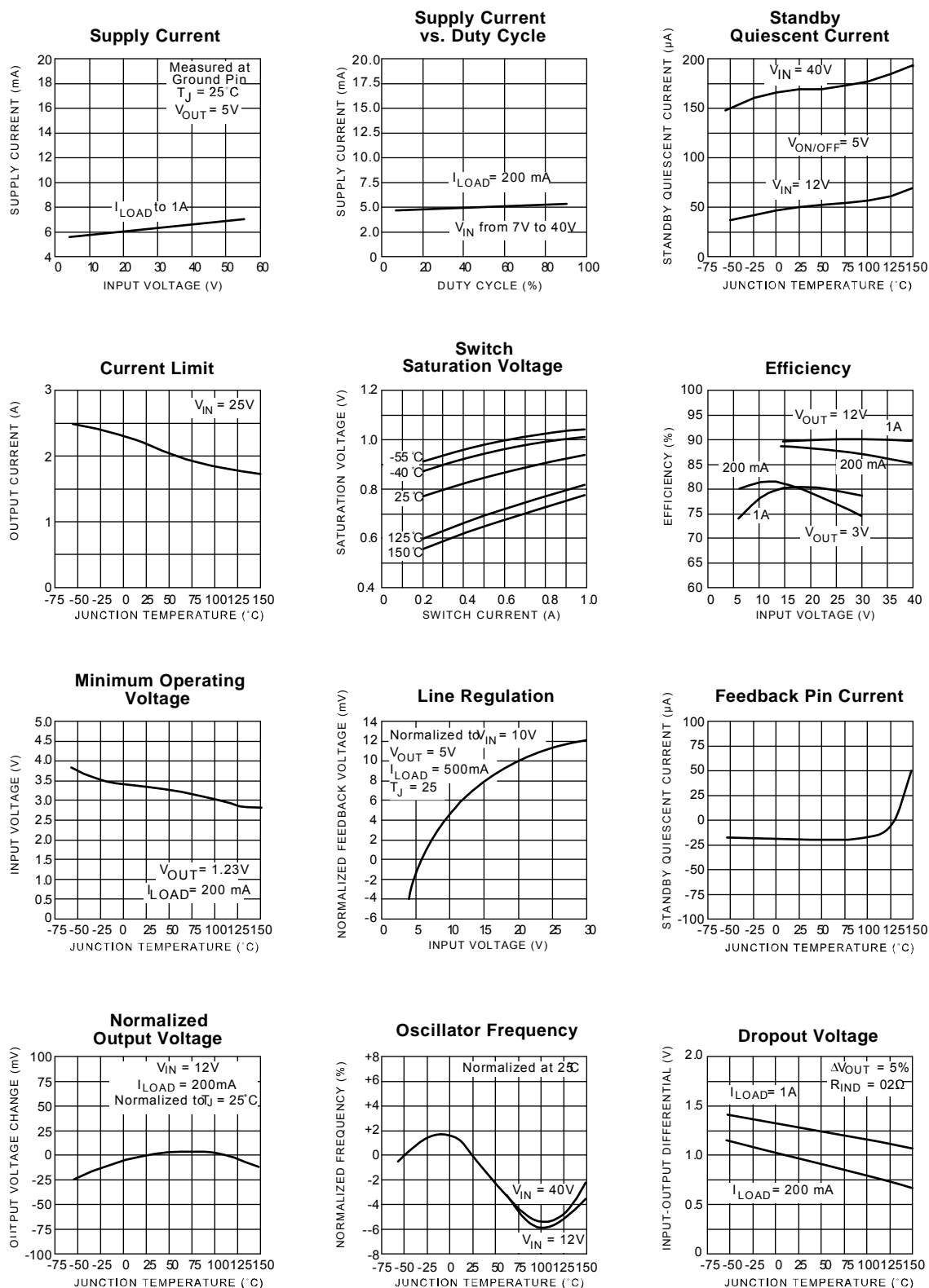


Figure 1.

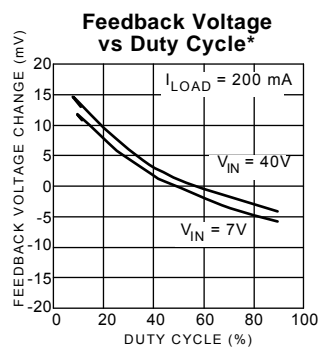
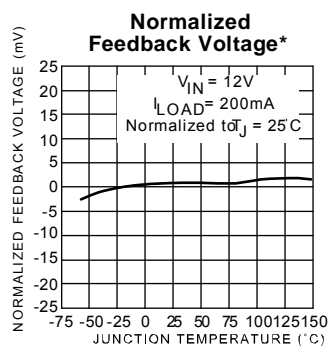
As in any switching regulator, layout is very important. Rapidly switching currents associated with wiring inductance generate voltage transient which can cause problems. For minimal stray inductance and ground

loops, the length of the leads indicated by heavy lines should be kept as short as possible. Single-point grounding (as indicated) or ground plane construction should be used for best results.

## Typical Characteristics (circuit of Figure 1)

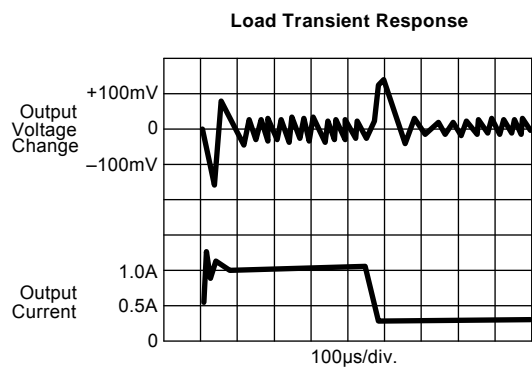


## Typical Characteristics (continued)

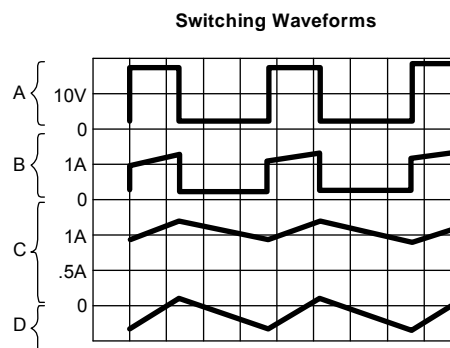


\* Adjustable version only

## Functional Characteristics (circuit of Figure 1)



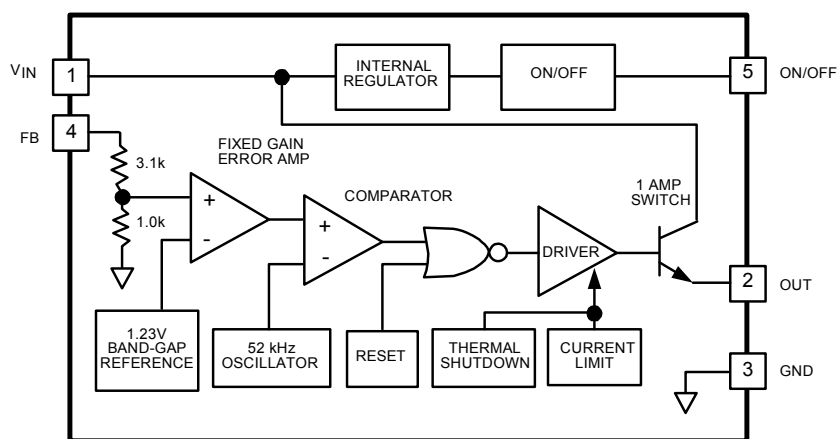
$V_{OUT} = 5V$



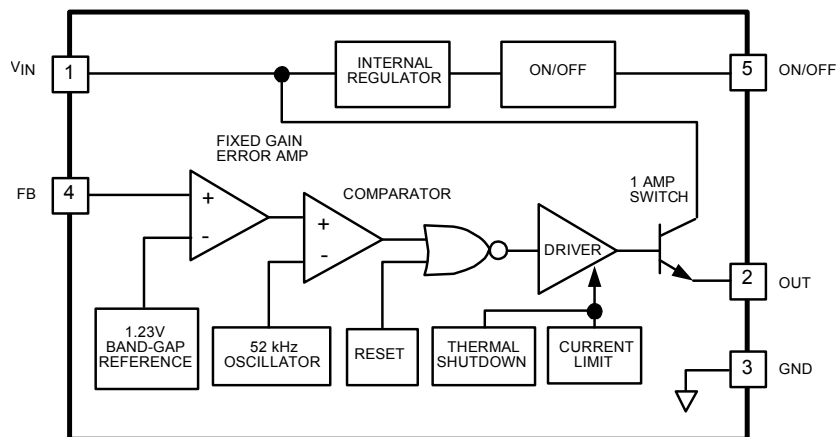
$V_{OUT} = 5V$   $V_{IN} = 20V$

A: Output pin voltage 10V/div  
 B: Output pin current 1A/div  
 C: Inductor current 0.5A/div  
 D: Output ripple voltage 20 mV/div. AC coupled  
 Horizontal Time Base: 5µs/div

## Functional Diagrams



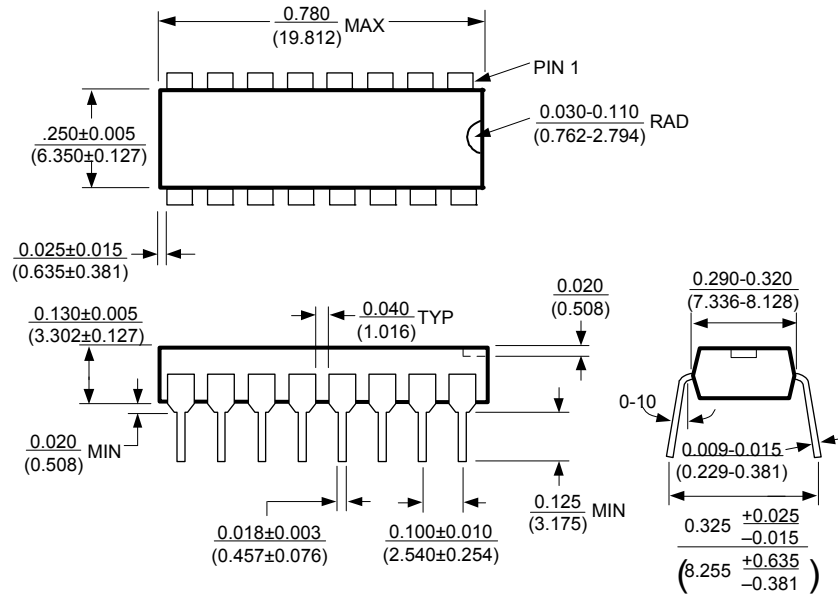
**Fixed Regulator**



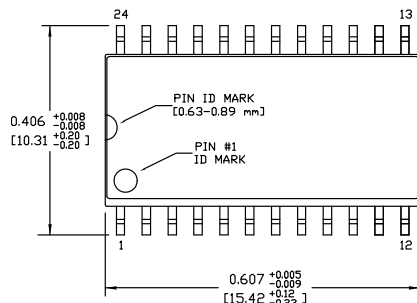
**Adjustable Regulator**



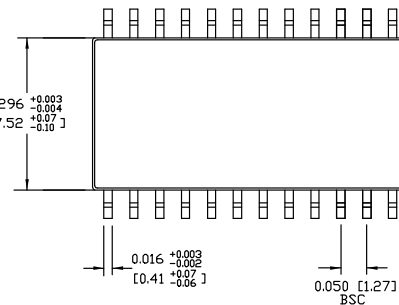
## Package Information



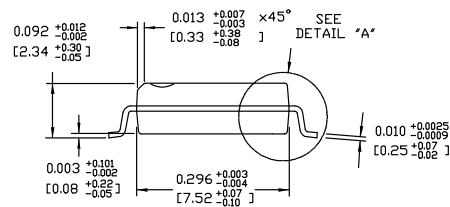
16-Pin Plastic DIP (N)



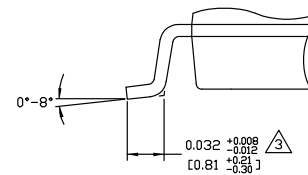
TOP VIEW



BOTTOM VIEW



END VIEW

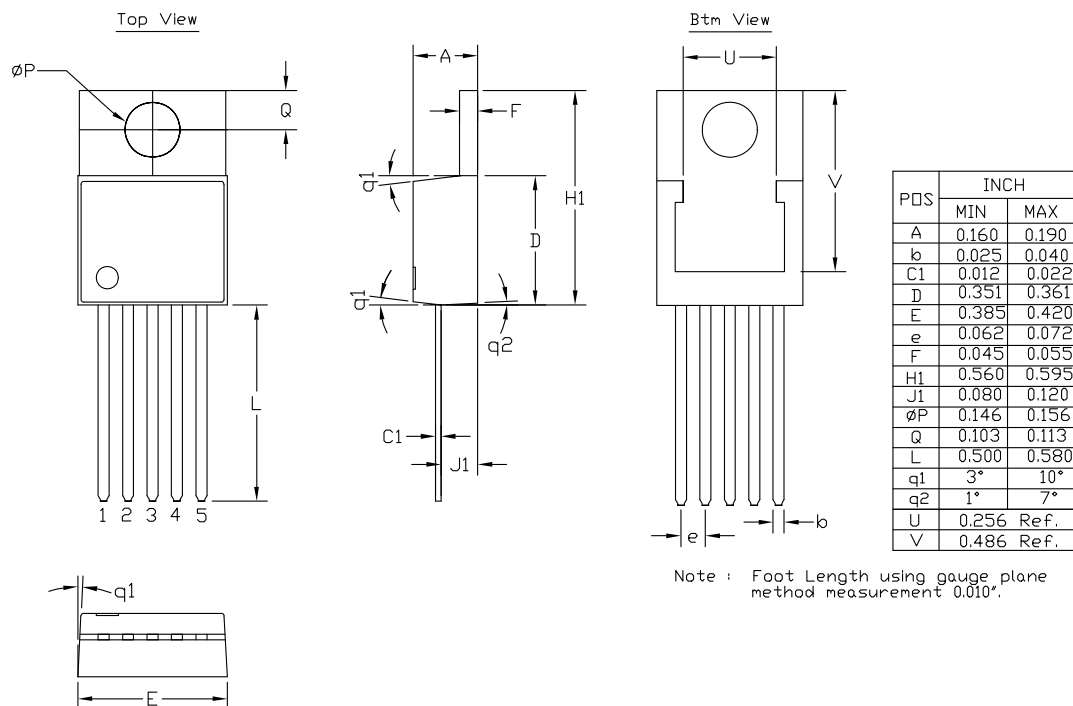


DETAIL "A"

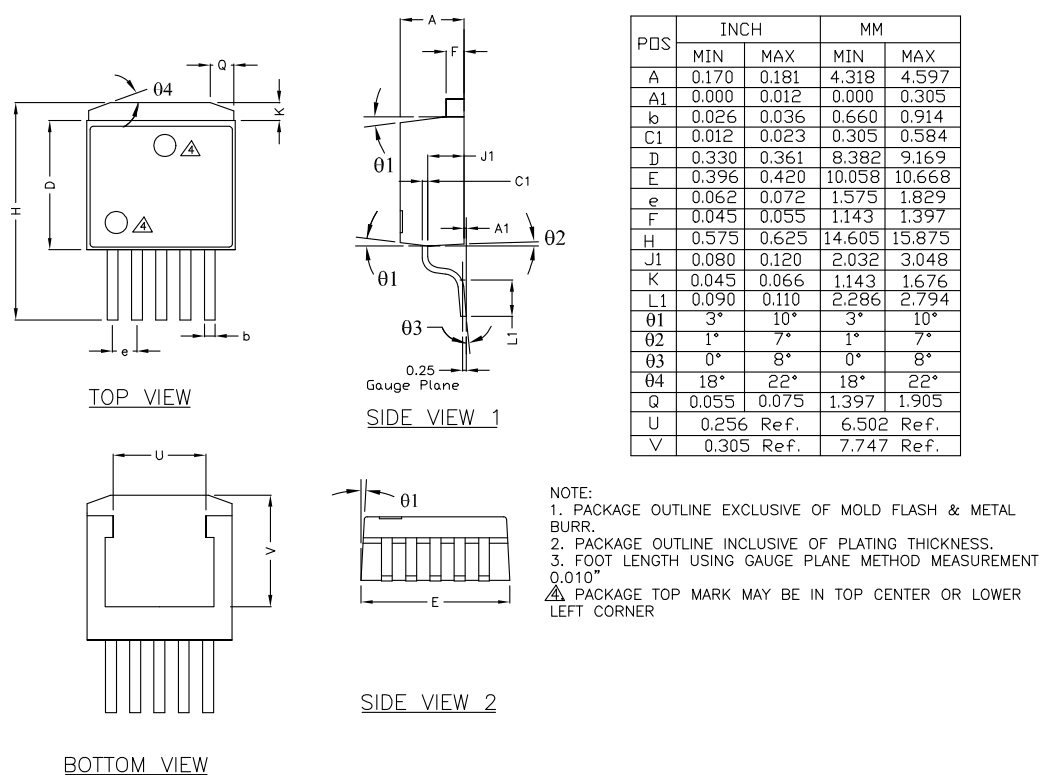
### NOTES:

1. DIMENSIONS ARE IN INCHES[MM].
2. CONTROLLING DIMENSION: INCHES.
3. DIMENSION DOES NOT INCLUDE MOLD FLASH OR PROTRUSIONS, EITHER OF WHICH SHALL NOT EXCEED 0.006[0.15] PER SIDE.

24-Pin Wide SOIC (WM)



5-Pin TO-220 (T)



5-Pin TO-263 (T)

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