

Pin Configuration

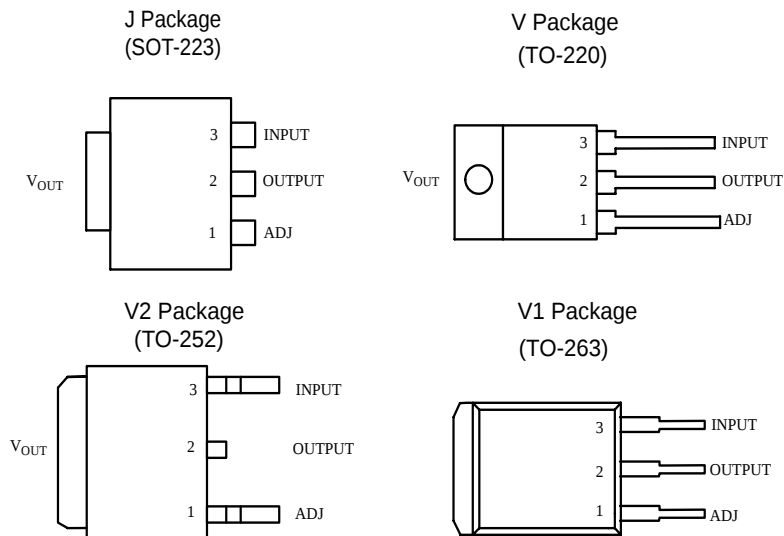


Figure 2. Pin Configuration of SP317 (Top View)

Functional Block Diagram

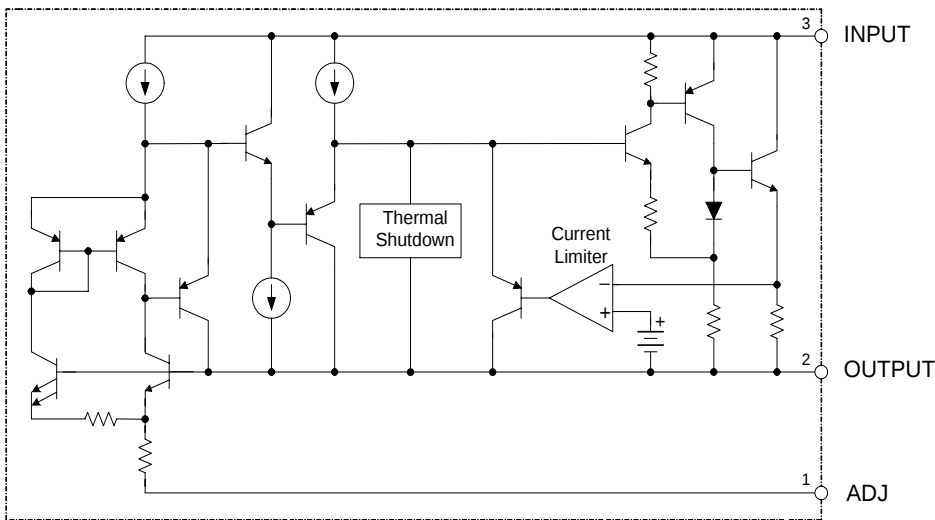


Figure 3. Functional Block Diagram of SP317

Absolute Maximum Ratings (Note 1)

Parameter	Symbol	Min	Max	Unit
Input Voltage	V_{IN}		20	V
Maximum Junction Temperature	T_J		150	°C
Storage Temperature	T_S	-65	150	°C
Lead Temperature (Soldering, 10sec)	T_{LEAD}		300	°C
ESD (Human Body Model)	ESD		4000	V

Note1: Stresses greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "Recommended Operating Conditions" is not implied. Exposure to "Absolute Maximum Ratings" for extended periods may affect device reliability.

Recommended Operating Conditions

Parameter	Symbol	Min	Max	Unit
Input Voltage	V_{IN}	$V_{OUT}+2$	15	V
Operating Junction Temperature Range	T_J	0	125	°C

Electrical Characteristics

(Typicals and limits apply for $T_J = 25^\circ\text{C}$, $P \leq$ Maximum Power Dissipation unless otherwise specified.)(Note 2)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reference Voltage	V_{REF}	$10\text{mA} \leq I_{OUT} \leq 1\text{A}$, $3\text{V} \leq (V_{IN} - V_{OUT}) \leq 10\text{V}$	1.20	1.25	1.30	V
Line Regulation	S_V	$I_{OUT} \leq 20\text{mA}$, $3\text{V} \leq V_{IN} - V_{OUT} \leq 10\text{V}$		0.01	0.04	%/V
Load Regulation	S_I	$V_{IN} - V_{OUT} = 2\text{V}$, $10\text{mA} \leq I_{OUT} \leq 1\text{A}$		0.2	0.4	%
Thermal Regulation		20ms Pulse		0.04	0.07	%/W
Dropout Voltage	ΔV	$I_{OUT} = 1\text{A}$		1.2	1.3	V
Current Limit	I_{LIMIT}	$(V_{IN} - V_{OUT}) = 2\text{V}$	1.2	1.5	1.8	A
Adjust Pin Current				50	100	μA
Adjust Pin Current Change		$1.4\text{V} \leq (V_{IN} - V_{OUT}) \leq 10\text{V}$, $10\text{mA} \leq I_{OUT} \leq 1\text{A}$		0.2	5	μA
Minimum Load Current		$3\text{V} \leq (V_{IN} - V_{OUT}) \leq 15\text{V}$		3.5	10	mA
Ripple Rejection		$f = 120\text{Hz}$, $C_{OUT} = 1\mu\text{F}$ Tantalum, $(V_{IN} - V_{OUT}) = 3\text{V}$, $I_{OUT} = 1\text{A}$	60	75		dB
Temperature Stability				1		%
Long -Term Stability		$T_A = 125^\circ\text{C}$, 1000hrs		0.3		%
RMS Output Noise (% of V_{OUT})		$T_A = 25^\circ\text{C}$, $10\text{Hz} \leq f \leq 10\text{kHz}$		0.003		%
Thermal Resistance, Junction to Case		SOT-223 TO-252 TO-220 TO-263		15 10 4.5 4		$^\circ\text{C/W}$
Thermal Shutdown		Junction Temperature		150		$^\circ\text{C}$
Thermal Shutdown Hysteresis				25		$^\circ\text{C}$

Note 2: Maximum Power Dissipation is Package Type and Case Temperature dependent. Please see Figure 12.

Typical Performance Characteristics

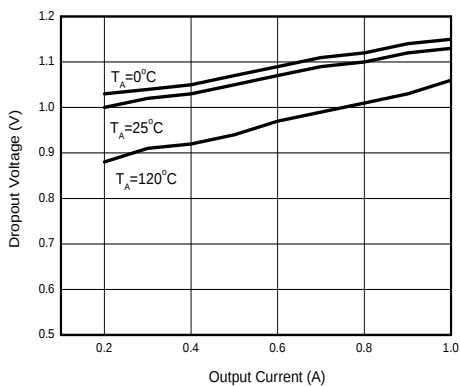


Figure 5. Dropout Voltage vs. Output Current

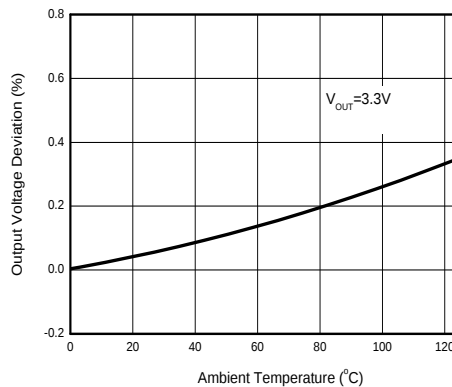


Figure 6. Load Regulation vs. Temperature

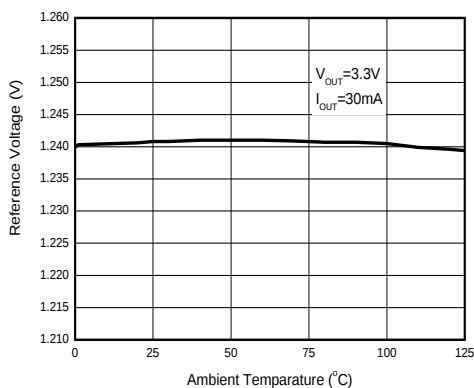


Figure 7. Reference Voltage vs. Temperature

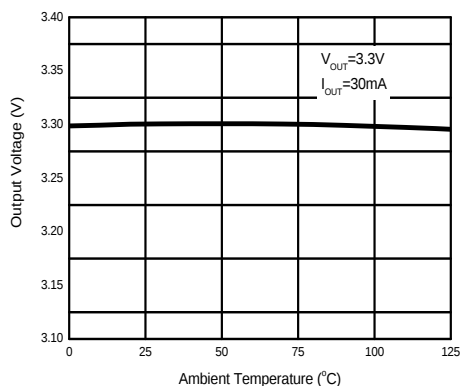


Figure 8. Output Voltage vs. Temperature

Typical Performance Characteristics (Continued)

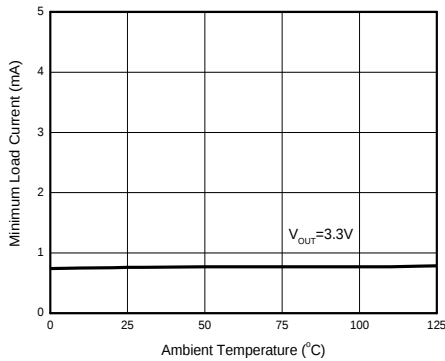


Figure 9. Minimum Load Current vs. Temperature

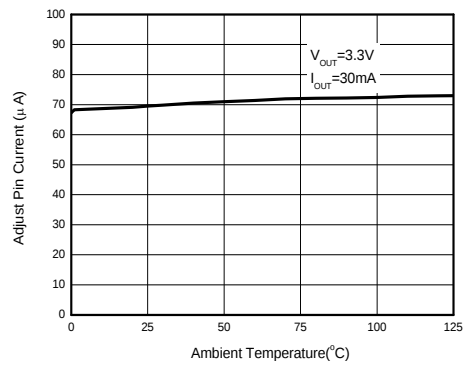


Figure 10. Adjust Pin Current vs. Temperature

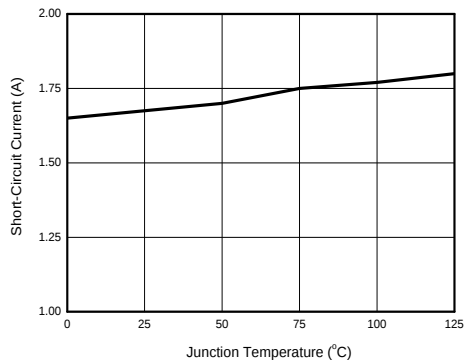


Figure 11. Short-Circuit Current vs. Temperature

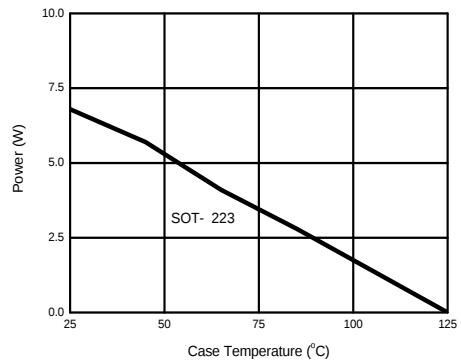


Figure 12. Maximum Power Dissipation

Typical Performance Characteristics (Continued)

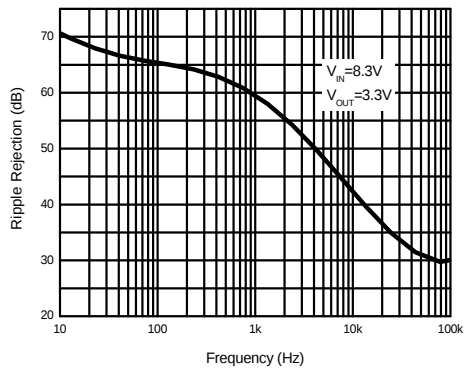


Figure 13. Ripple Rejection vs. Frequency

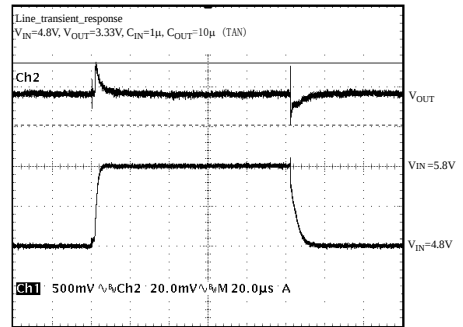


Figure 14. Line Transient Response

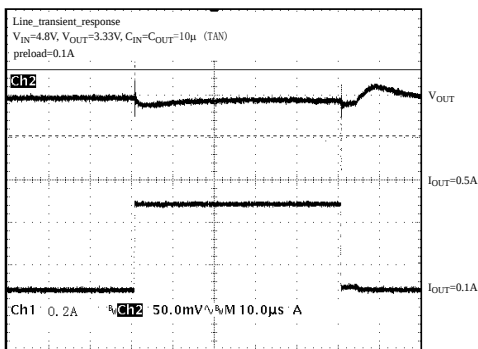


Figure 15. Load Transient Response

Typical Application

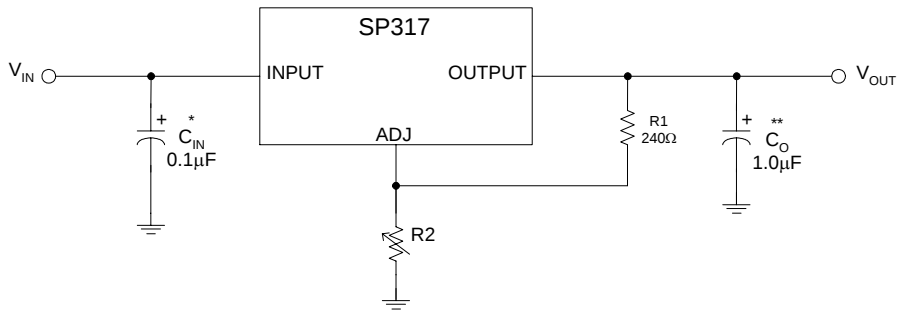


Figure 4. Typical Application of SP317

* = C_{IN} is required if the regulator is located near power supply filter.

**= C_O is needed for stability and it improves transient response.

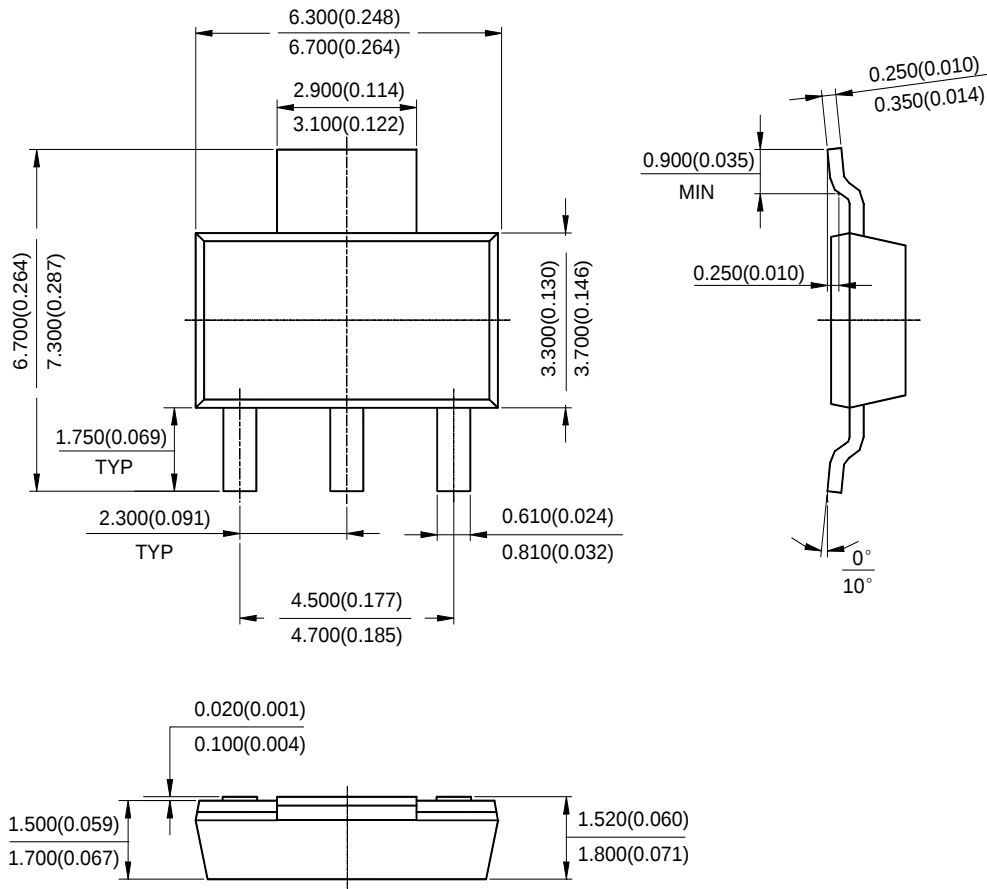
$$V_{OUT} = V_{REF} \times (1 + R2/R1) + I_{ADJ} \times R2$$

Since I_{ADJ} is controlled to less than 100µA, the error associated with this term is negligible in most applications.

Mechanical Dimensions

SOT-223

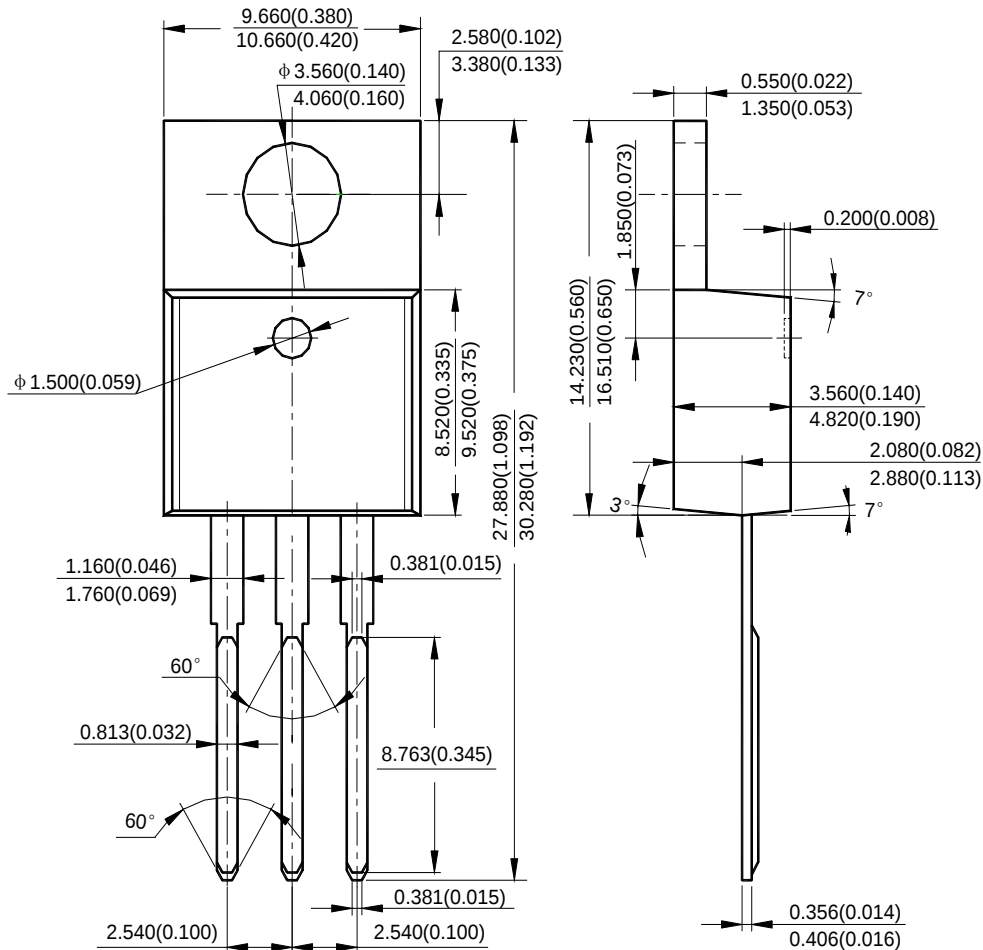
Unit: mm(inch)



Mechanical Dimensions (Continued)

TO-220

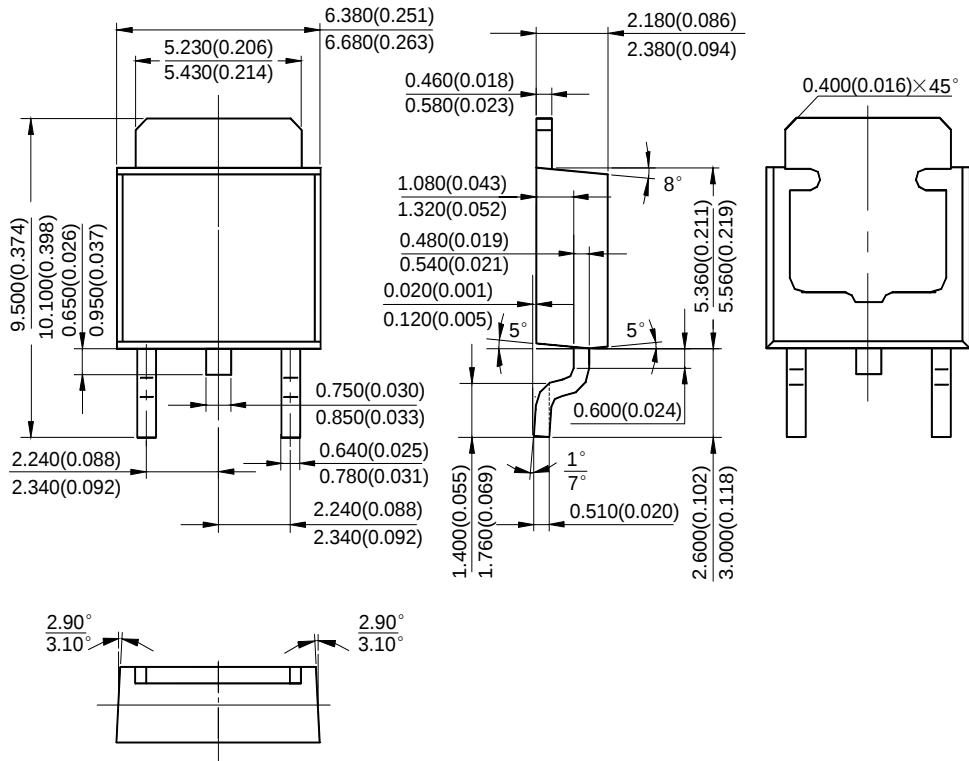
Unit: mm(inch)



Mechanical Dimensions (Continued)

TO-252

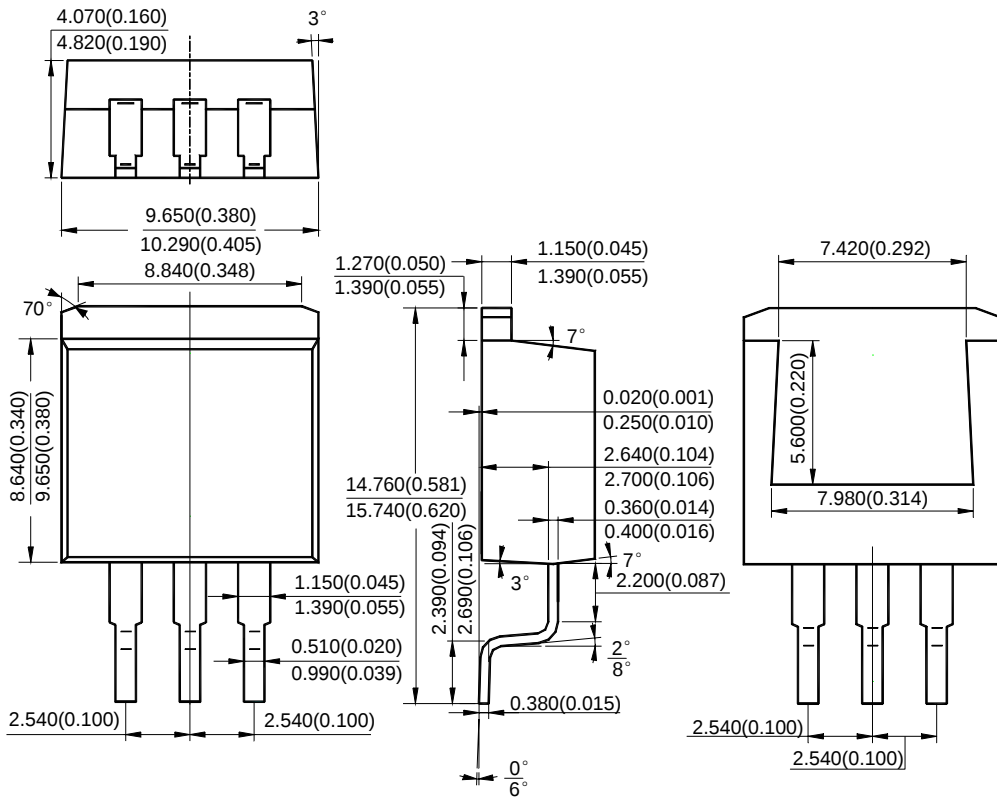
Unit: mm(inch)



Mechanical Dimensions (Continued)

TO-263

Unit: mm(inch)



SP317 ☐ ☐ ☐

Part Name _____ /TR: Tape and Reel
Blank: Tube

Package _____ -L: Lead Free and
RoHS Compliant

J: SOT-223
V: TO-220
V2: TO-252
V1: TO-263

Part Number	Temperature Range	Voltage Tolerance	Output Voltage	Package	Pin Count	Packing Type
SP317J-L/TR	0°C to +125°C	1.0%	Adj	SOT-223	3	2,500/TR
SP317V-L	0°C to +125°C	1.0%	Adj	TO-220	3	50/TUBE
SP317V2-L/TR	0°C to +125°C	1.0%	Adj	TO-252	3	2,500/TR
SP317V1-L/TR	0°C to +125°C	1.0%	Adj	TO-263	3	800/TR



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