

3A LOW-DROPOUT POSITIVE FIXED AND ADJUSTABLE VOLTAGE REGULATOR

A1085

Description

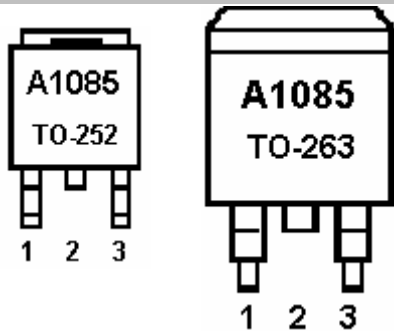
The A1085 is a series of low dropout three terminal regulators with a dropout of 1.3V at 3A load current.

Other than a fixed version ($V_{OUT}=1.8V, 2.5V, 3.3V, 5V$), A1085 has an adjustable version, which can set the output voltage with only two external resistors.

The A1085 offers thermal shut down and current limit functions, to assure the stability of chip and power system. And the A1085 uses trimming technique to guarantee output voltage accuracy within $\pm 2\%$

The A1085 is available in standard TO-252 and TO-263 package.

Pin Description



Top View

Ordering Information

Package Type	Part Number	Pin Assignment		
		1	2	3
TO-252	A1085D-xx	GND	V_{OUT}	V_{IN}
	A1085D-Adj	Adj	V_{OUT}	V_{IN}
TO-263	A1085S-xx	GND	V_{OUT}	V_{IN}
	A1085S-Adj	Adj	V_{OUT}	V_{IN}
Note	XX: Output Voltage, 3.3=3.3V, 5.0=5V			

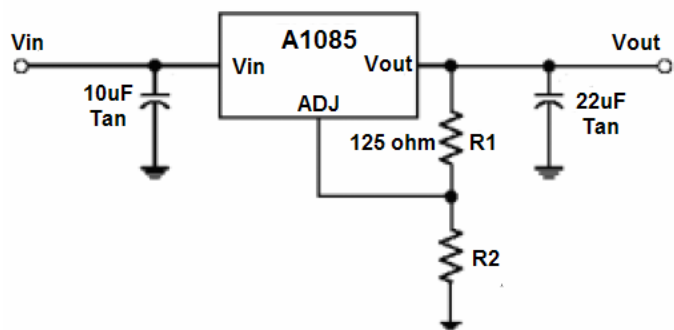
Features

- Provide Fixed Version and an Adjustable Version, Output Value can be customized on command.
- Maximum Output Current: 3A
- Output Voltage Accuracy within $\pm 2\%$
- Range of Operation Input Voltage: Max 18V
- Line Regulation: 0.2% (Typ.)
- Load Regulation: 0.4% (Typ.)
- Environment Temperature: $-50^{\circ}C \sim 140^{\circ}C$
- Standard package in TO-252 and TO-263

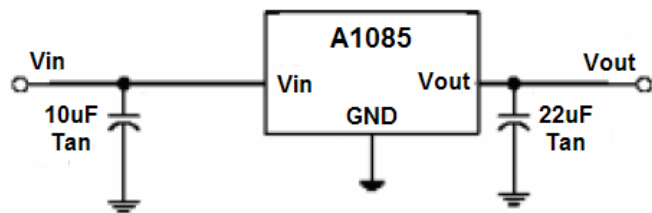
Application

- Power Management for Computer Mother board, Graphic Card
- LCD Monitor and LCD TV.
- Battery Charger
- DVD Record
- Post Regulators for Switching Supplies

Typical Application (Table 1)



Adjustable version. $V_{OUT}=V_{ref} \times (1+R2/R1) + I_{adj} \times R2$

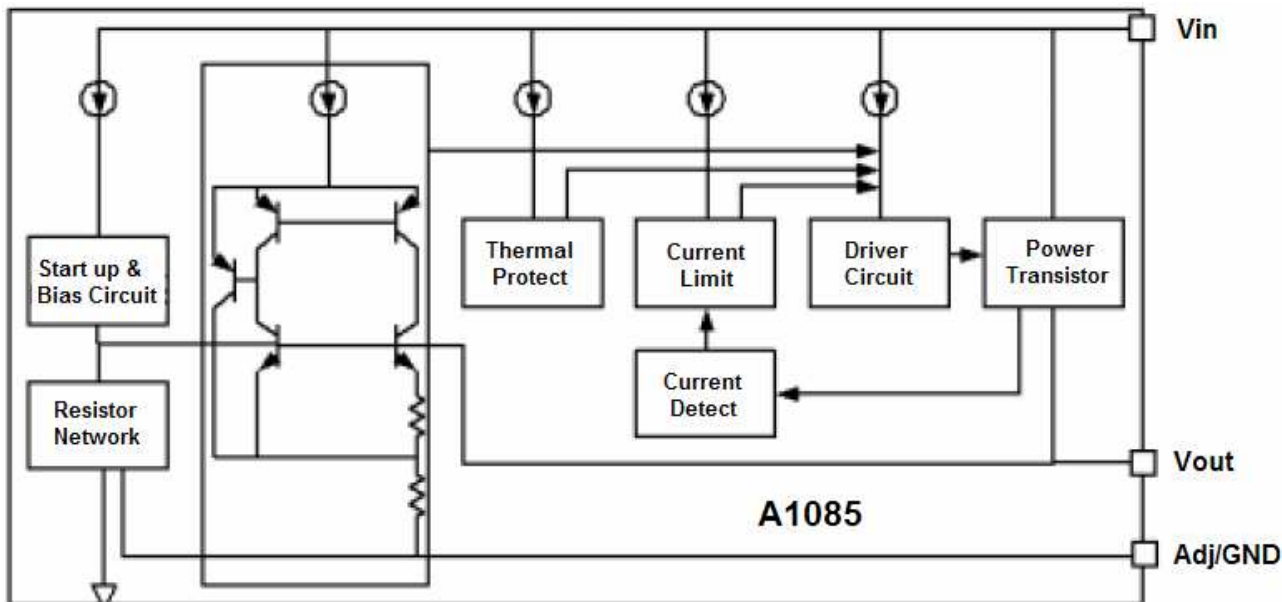


Fixed output version

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Block Diagram



Absolute Maximum Ratings

Max Input Voltage	18V
Junction Temperature(T_J)	150°C
Environment Temperature (T_A)	140°C
Storage Temperature (T_s)	-65°C~150°C
Lead Temperature and Time	260°C, 10S

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Electrical Characteristics

Test Conditions: Table 1, $C_{in}=10\mu F$, $C_{out}=2.2\mu F$, $T_A=25^\circ C$, unless otherwise noted.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Vref	Reference Voltage	$I_{OUT}=10mA, V_{IN}-V_{OUT}=3V$	1.238	1.25	1.262	V
		$10mA \leq I_{OUT} \leq 3A, 5V \leq V_{IN}-V_{OUT} \leq 5V$	1.225	1.25	1.275	
V _{OUT}	Output Voltage	A1085-1.8V				
		$I_{OUT}=0mA, V_{IN}=4.8V, T_J=25^\circ C$	1.782	1.80	1.818	V
		$10mA \leq I_{OUT} \leq 3A, 3.4V \leq V_{IN} \leq 7V$	1.764	1.80	1.836	
		A1085-2.5V				
		$I_{OUT}=0mA, V_{IN}=4.8V, T_J=25^\circ C$	2.475	2.50	2.525	V
		$10mA \leq I_{OUT} \leq 3A, 4.1V \leq V_{IN} \leq 7V$	2.450	2.50	2.550	
		A1085-3.3V				
		$I_{OUT}=0mA, V_{IN}=6.3V, T_J=25^\circ C$	3.267	3.3	3.333	V
$10mA \leq I_{OUT} \leq 3A, 4.9V \leq V_{IN} \leq 8V$	3.234	3.3	3.366			
ΔV_{OI}	Line Regulation (Note1)	A1085-Adj				
		$I_{OUT}=10mA, 2.85V \leq V_{IN} \leq 10V$		0.035	0.2	%
		A1085-1.8V				
		$I_{OUT}=10mA, 3.4V \leq V_{IN} \leq 10V$		1	5	mV
		A1085-2.5V				
		$I_{OUT}=10mA, 4.9V \leq V_{IN} \leq 10V$		1	5	mV
		A1085-5.0V				
		$I_{OUT}=10mA, 6.6V \leq V_{IN} \leq 10V$		1	5	mV

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Symbol	Parameter	Conditions	Min	Typ	Max	Unit
ΔV_{OL}	Load Regulation (Note1, 2)	A1085-Adj $V_{IN}-V_{OUT}=3V, 10mA \leq I_{OUT} \leq 3A$		0.2	0.4	%
		A1085-1.8V $V_{IN}-V_{OUT}=3V, 0 \leq I_{OUT} \leq 3A$		3	15	mV
		A1085-2.5V $V_{IN}-V_{OUT}=3V, 0 \leq I_{OUT} \leq 3A$		3	15	mV
		A1085-3.3V $V_{IN}-V_{OUT}=3V, 0 \leq I_{OUT} \leq 3A$		3	15	mV
		A1085-5.0V $V_{IN}-V_{OUT}=3V, 0 \leq I_{OUT} \leq 3A$		3	15	mV
$V_{IN}-V_{OUT}$	Dropout Voltage (Note3)	$\Delta V_{OUT}, \Delta V_{ref}=1\%, I_{OUT}=3A$		1.3	1.5	V
I_{Limit}	Current Limit	$V_{IN}-V_{OUT}=3V, T_J=25^\circ C$	3.2	4.5		A
Minimum Load Current (Note 4)		A1085-Adj		3	10	mA
I_q	Quiescent Current	$V_{IN}=10V$		4	10	mA
I_{ADJ}	Adjust Pin Current	$V_{IN}=4.25V, I_{OUT}=10mA$		45	110	μA
Ripple Rejection		$F=120Hz, C_{OUT}=25\mu F$ (Tan) $I_{OUT}=3A, V_{IN}-V_{OUT}=3V$	60			dB
I_{CHANGE}	Adjust Pin Current Change	$10mA \leq I_{OUT} \leq 3A, 1.5V \leq V_{IN} \leq 6V$		0.2	5	μA
Temperature Stability		$I_{OUT}=10mA, V_{IN}-V_{OUT}=1.5V$			0.5	%
θ_{JC}	Thermal Resistance	TO-252		12.5		$^\circ C/W$
	Junction to Case	TO-263		3		

Note1: The parameters of Line Regulation and Load Regulation in Table 1 are tested under constant junction temperature.

Note 2: When I_{OUT} varies between 0~3A, $V_{IN}-V_{OUT}$ varies between 1.5V~6V under constant junction temperature, the parameter is satisfied the criteria in table. If temperature varies between $-50^\circ C \leq T_A \leq 140^\circ C$, needs output current to be larger than 10mA to satisfy the criteria.

Note3: Dropout Voltage is specified over $I_{OUT}=3A$ and the following testing conditions: First step is to find out the V_{OUT} Value (V_{OUT1}), when $V_{IN1} = V_{OUT} + 1.5V$, Second step is to decrease V_{IN} (V_{IN2}) until V_{OUT} value is equal to $99\% \times V_{OUT1}$ (V_{OUT2}). $V_{DROPOUT} = V_{IN2} - V_{OUT2}$.

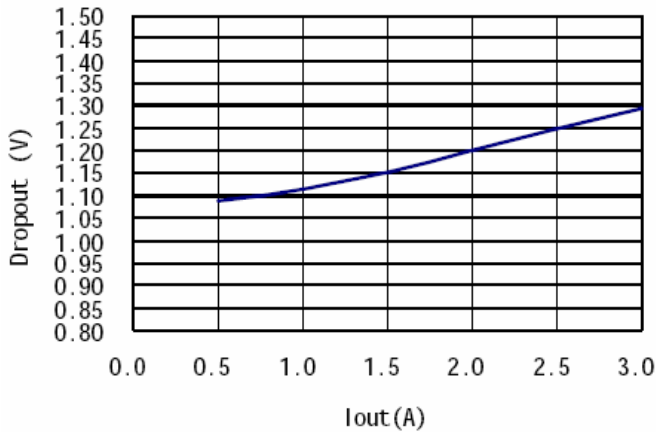
Note4: Minimum Load Current is defined as the minimum output current required to maintain regulation. When $1.5V \leq V_{IN}-V_{OUT} \leq 6V$, the device is guaranteed to regulate if the output current is greater than 10mA.

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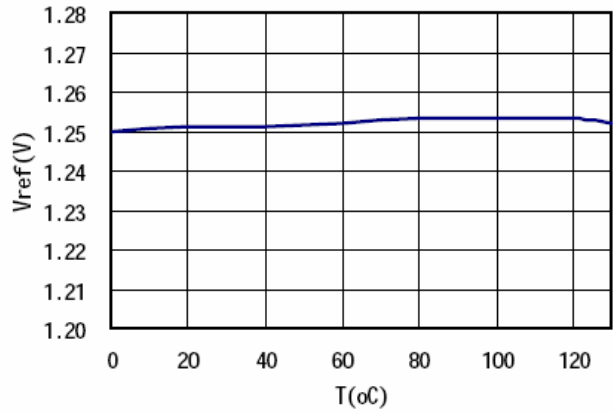
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Typical Characteristics

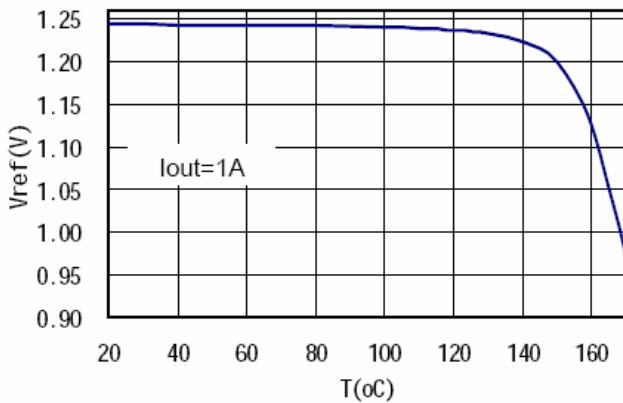
Dropout Voltage VS. Output Current



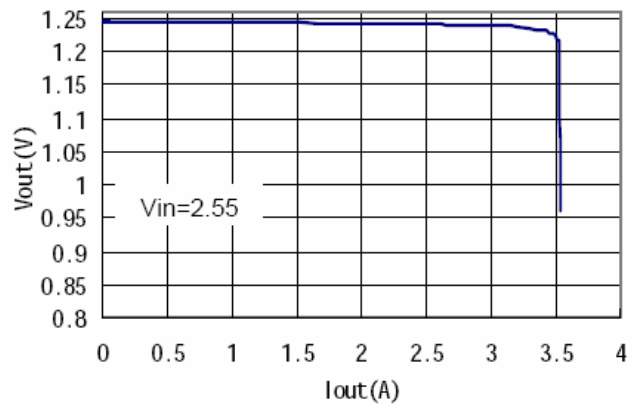
Reference Voltage VS. Temperature



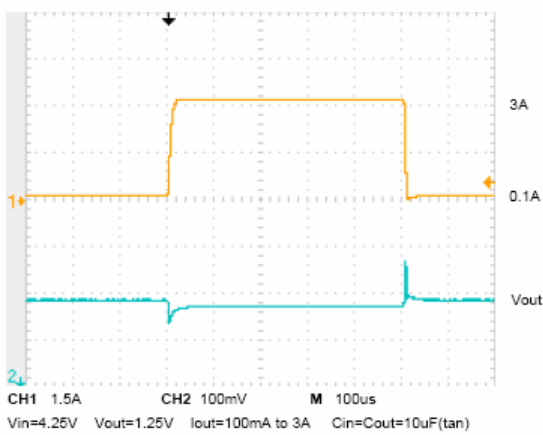
Reference Voltage VS. Thermal Protection



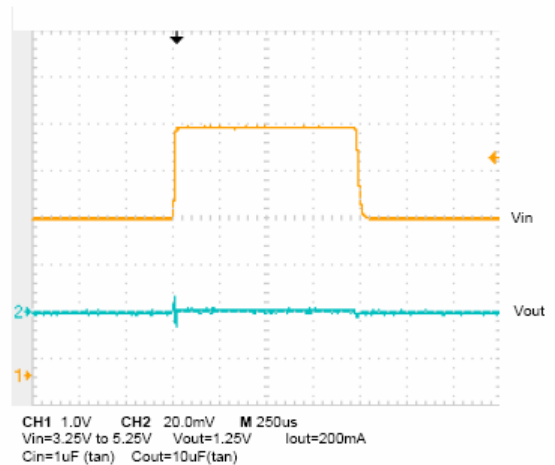
Output Voltage VS. Output Current



Load Transient Response



Line Transient Response

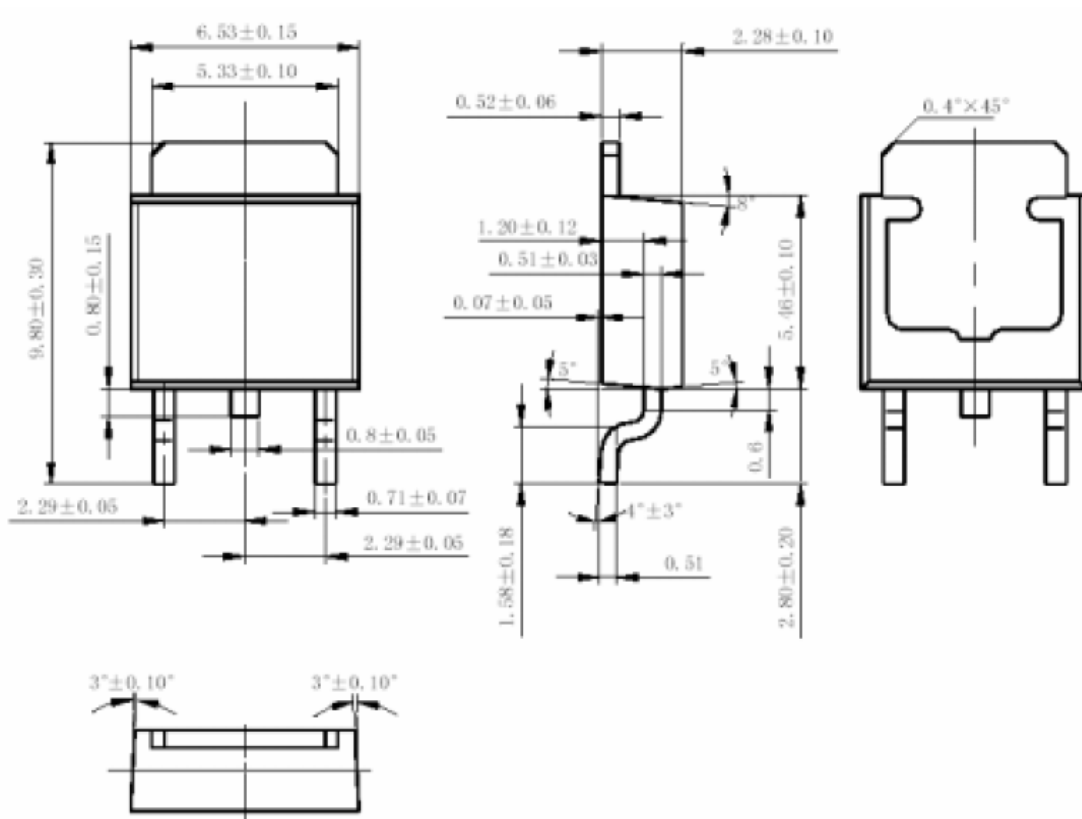


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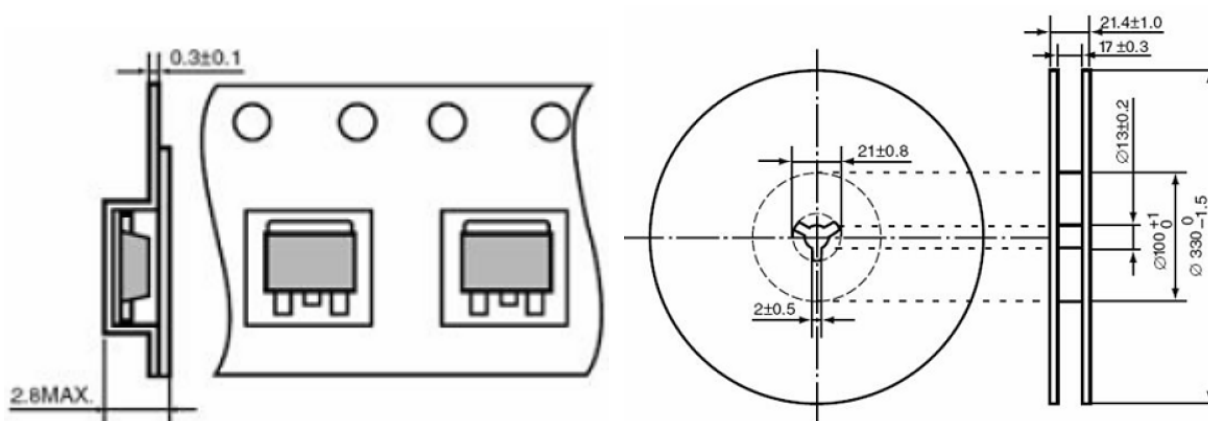
Package Information

Dimension in TO-252 (Unit: mm)



Tape Dimension

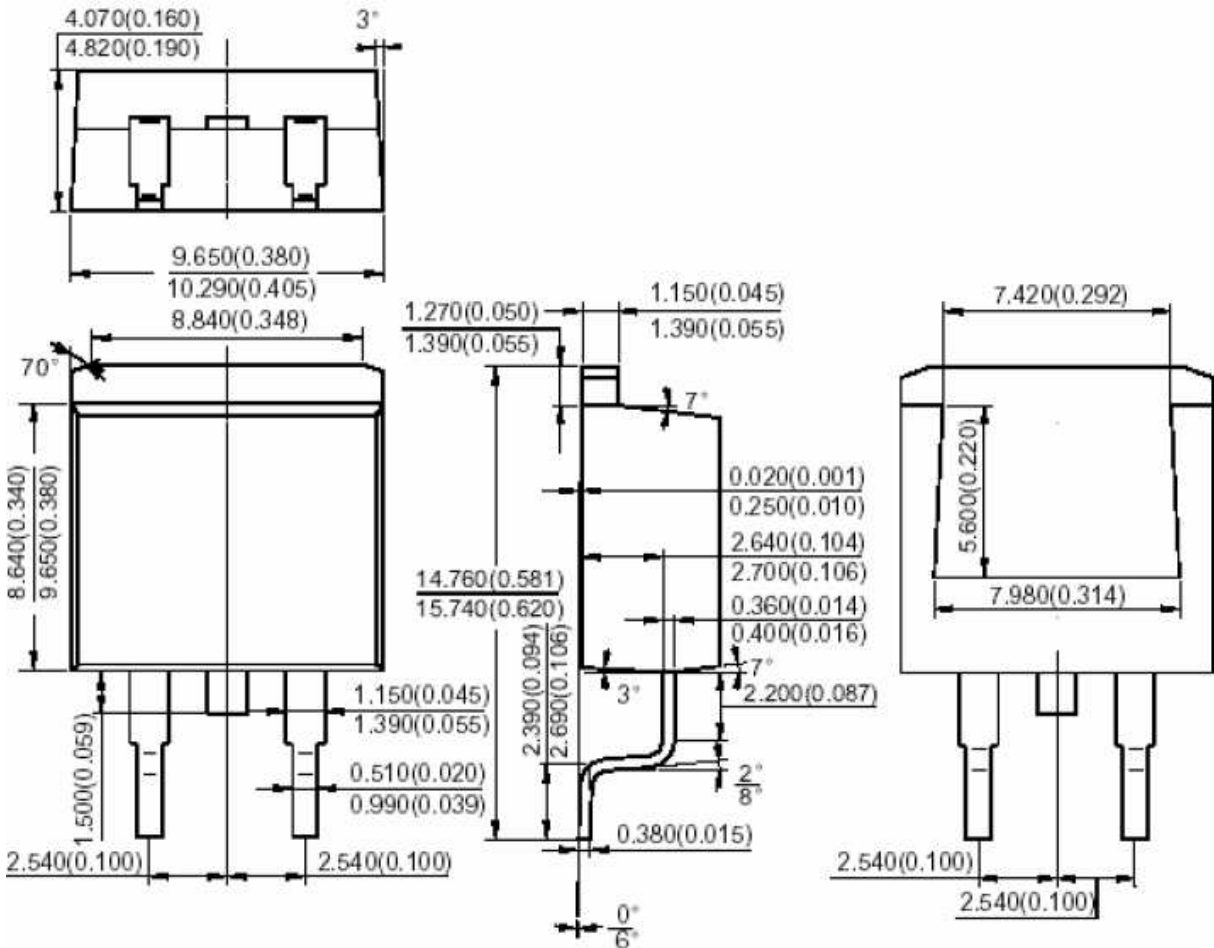
Tape & Reel Dimension



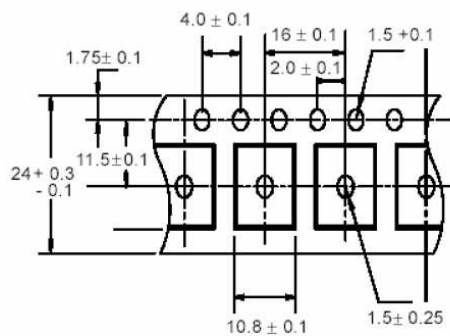
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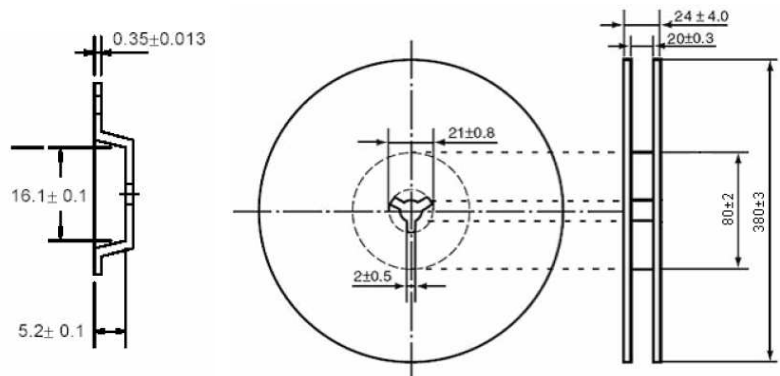
Dimension in TO-263 (Unit: mm)



Tape Dimension



Tape & Reel Dimension



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