

300mA Low Dropout Linear Regulator of Fixed 2.85V, 3.3V and 3.5V

Features

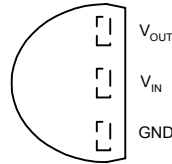
- Low Dropout Voltage of 1.2V at 300mA
- Output Voltage Accuracy $\pm 2.0\%$
- Line Regulation - 1mV (typ.)
- Load Regulation - 6mV (typ.)
- Input Voltage Range up to 9V
- Internal Current Limiting and Thermal Shutdown Protections
- Available Output Voltages - 2.85V, 3.3V and 3.5V
- Various SOT-89 and TO-92 Packages Available

General Description

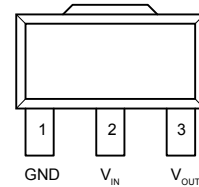
The APL5883 is a 3-pin low dropout linear regulator with 2.0% accuracy of output voltage over line, load and temperature variations. Dropout voltage at 300mA output current is less than 1.2V. Both output current limiting and thermal shutdown are built in to provide maximal protection to the APL5883 against fault conditions. The over current and thermal shutdown circuits become active when the current exceed 300mA, or the junction temperature reach 150°C. Normal operation is recovered when junction temperature drops below 130°C.

Applications

- Voltage Regulator for CD-ROM Drivers
- Voltage Regulator for LAN Cards
- Wireless Communication Systems
- Portable Instrument
- Portable Consumer Equipment
- Low Voltage Systems

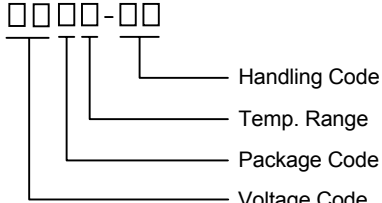


TO-92 (Top View)



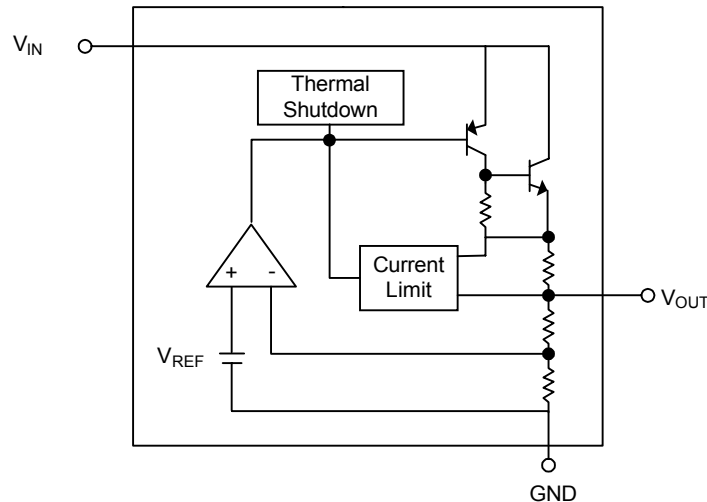
SOT-89 (Top View)

Ordering/ Marking Information

APL5883 □□□□-□□ 	Package Code D : SOT-89 E : TO-92 Temp. Range C : 0 to 70 °C Handling Code TB : Tape & Box TR : Tape & Reel PB : Plastic Bag Voltage Code : 28 : 2.85V 33 : 3.3V 35 : 3.5V
APL5883 - 28 : APL5883 XXXXX28 XXXXX - Date Code APL5883 - 35 : APL5883 XXXXX35 XXXXX - Date Code	APL5883 - 33 : APL5883 XXXXX33 XXXXX - Date Code

anpec reserves the right to make changes to improve reliability or manufacturability.

Block Diagram



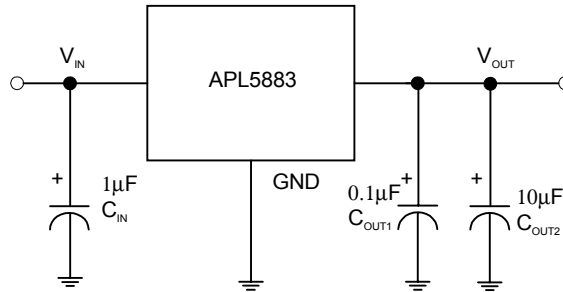
Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit	
V_{IN}	Input Voltage	9	V	
I_{OUT}	Output Current	450	mA	
T_A	Operating Ambient Temperature Range	0 to 70	°C	
T_J	Operating Junction Temperature Range	-40 to +150	°C	
T_{STG}	Storage Temperature Range	-65 to +150	°C	
P_D	Power Dissipation Package	SOT-89	550	mW
		TO-92	550	
θ_{JA}	Thermal Resistance	SOT-89	180	°C / W
		TO-92	180	

Electrical Characteristics ($T_A=25^\circ\text{C}$, unless otherwise noted)

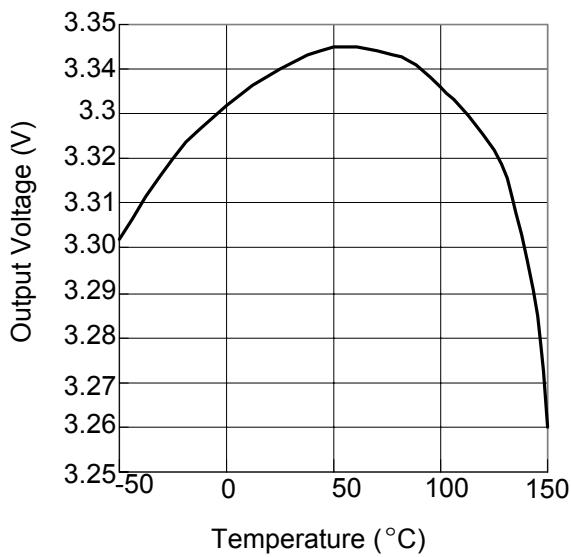
Symbol	Parameter	Test Conditions	APL5883			Unit
			Min.	Typ.	Max.	
V_{IN}	Input Voltage		$V_{OUT}+1.2\text{V}$		9	V
V_{OUT}	Output Voltage	$I_{OUT}=10\text{mA}$	$0.98 V_{OUT}$		$1.02 V_{OUT}$	V
I_{OUT}	Output Current Capability	$V_{OUT}=3.3\text{V}, \Delta V_{OUT}=2\%$	300	450		mA
I_{SC}	Short Circuit Current	$V_{OUT}<0.4\text{V}$		600		mA
I_Q	Quiescent Current	$V_{IN}=5\text{V}$, No Load		6	10	mA
REG_{LINE}	Line Regulation	$I_{OUT}=10\text{mA}$, $V_{IN}=5\text{V}$ to 8V		1	6	mV
REG_{LOAD}	Load Regulation	$I_{OUT}=1\text{mA}\sim 300\text{mA}$		6	12	mV
$V_{DROPOUT}$	Dropout Voltage	$I_{OUT}=300\text{mA}$, $\Delta V_{OUT}=1\%$		1200	1300	mV
PSRR	Power Supply Rejection Ratio	at 1kHz		55		dB
OTS	Over Temperature Shutdown			150		°C
E_N	Output Noise			100		μVrms
TC	Output Voltage Temperature Coefficient			100		ppm/°C

Application Schematic

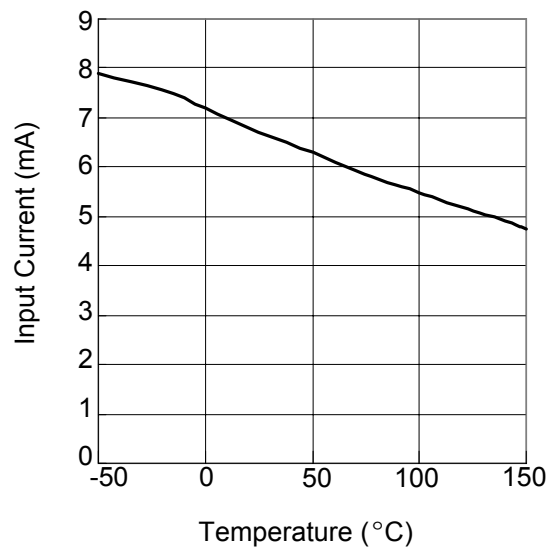


Typical Characteristics

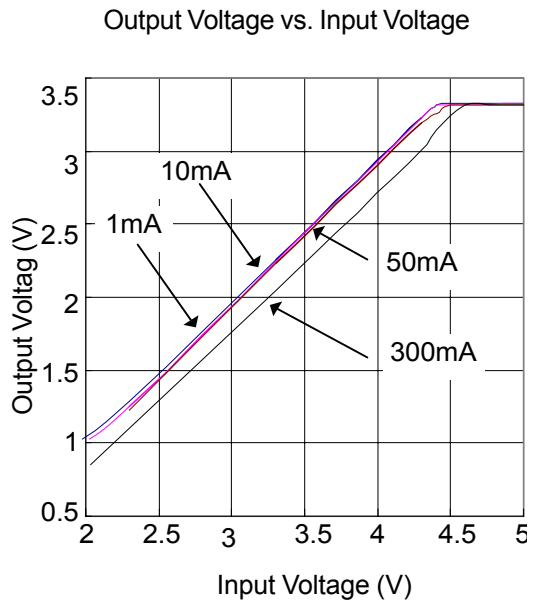
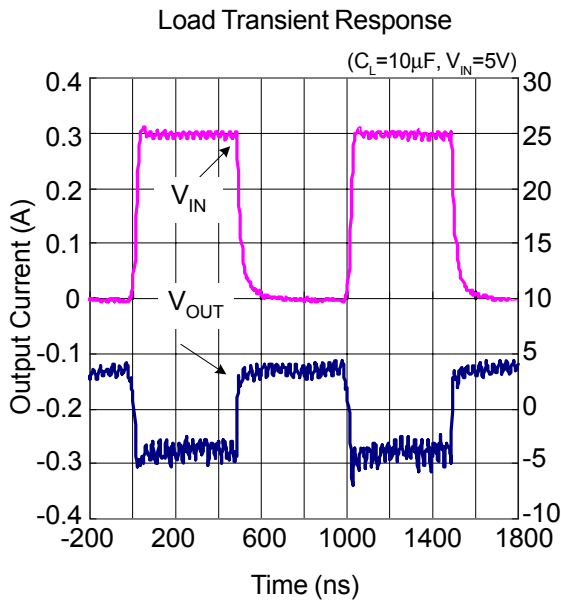
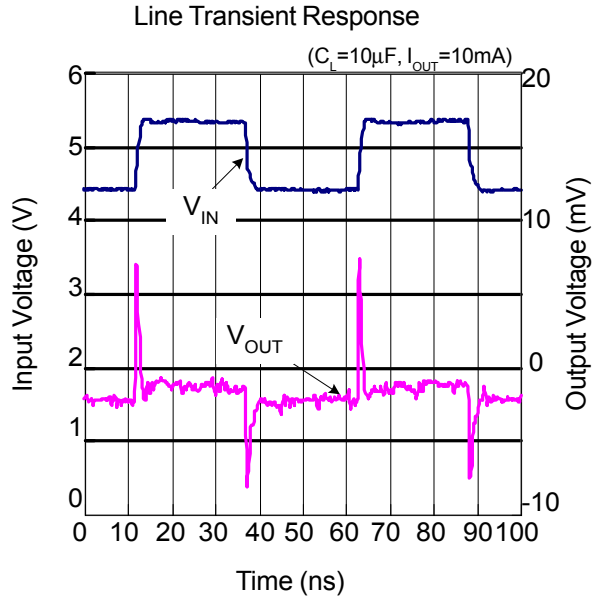
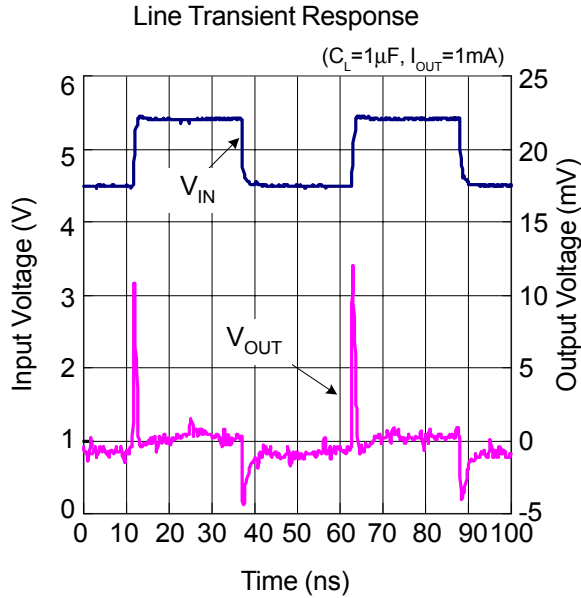
Output Voltage vs. Temperature



Input Current vs. Temperature

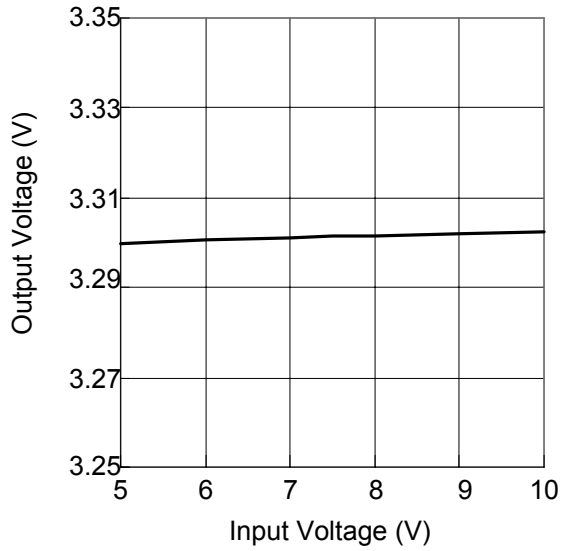


Typical Characteristics

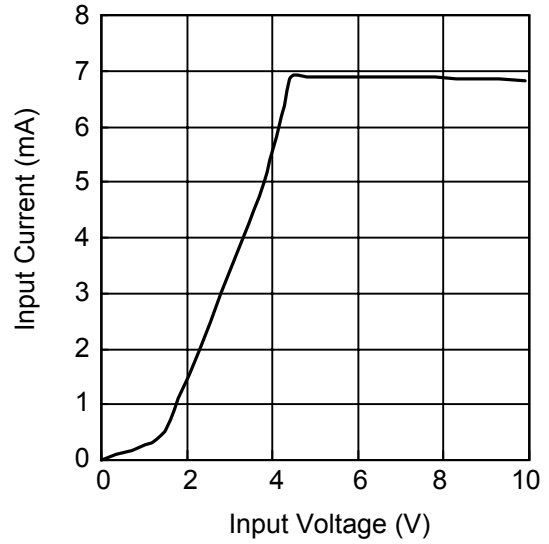


Typical Characteristics (Cont.)

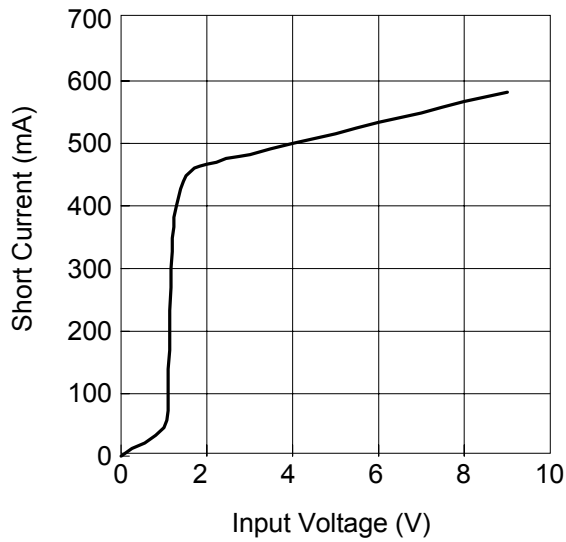
Output Voltage vs. Input Voltage



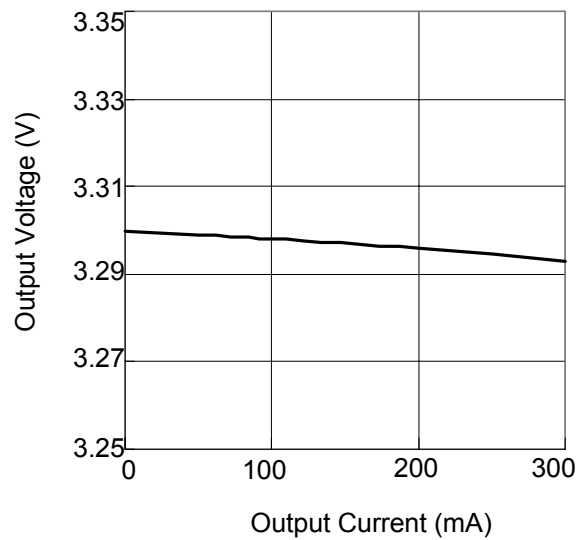
Input Current vs. Input Voltage



Short Current vs. Input Voltage

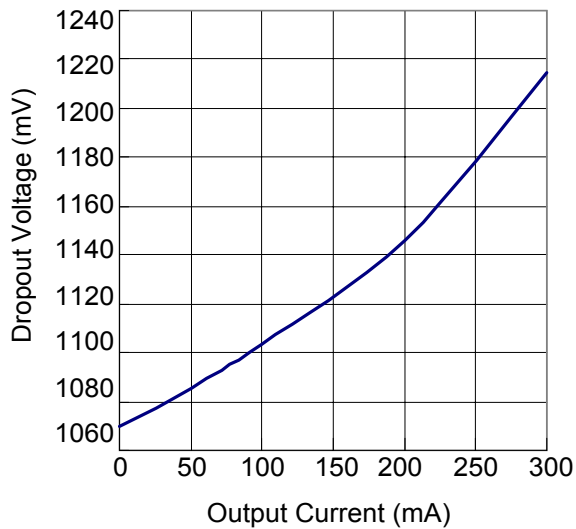


Output Voltage vs. Output Current

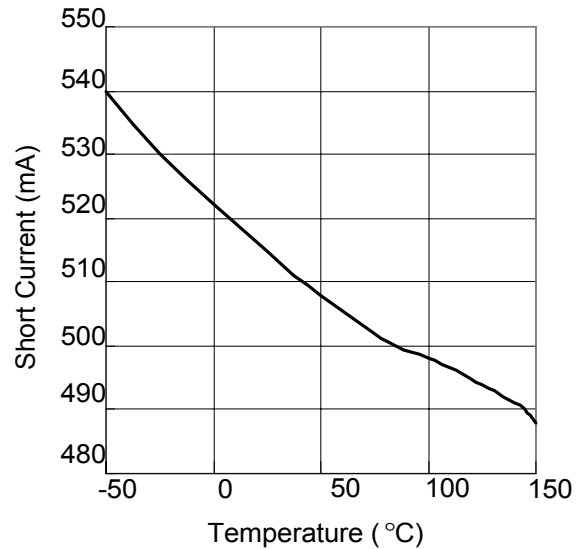


Typical Characteristics (Cont.)

Dropout Voltage vs. Output Current



Short Current vs. Temperature



Customer Service

Anpec Electronics Corp.

Head Office :

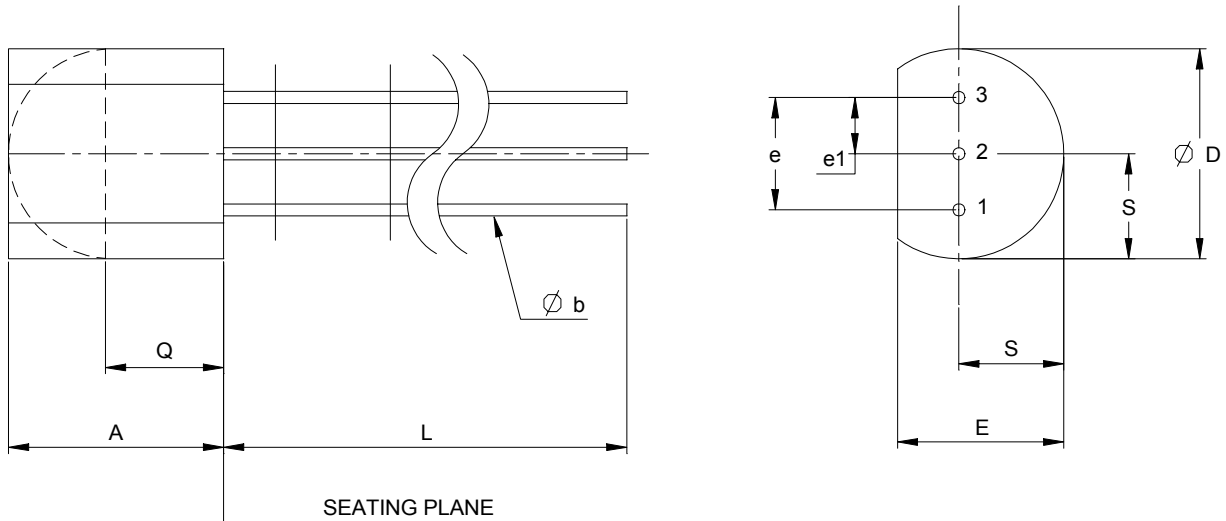
5F, No. 2 Li-Hsin Road, SBIP,
Hsin-Chu, Taiwan, R.O.C.
Tel : 886-3-5642000
Fax : 886-3-5642050

Taipei Branch :

7F, No. 137, Lane 235, Pac Chiao Rd.,
Hsin Tien City, Taipei Hsien, Taiwan, R. O. C.
Tel : 886-2-89191368
Fax : 886-2-89191369

Packaging Information

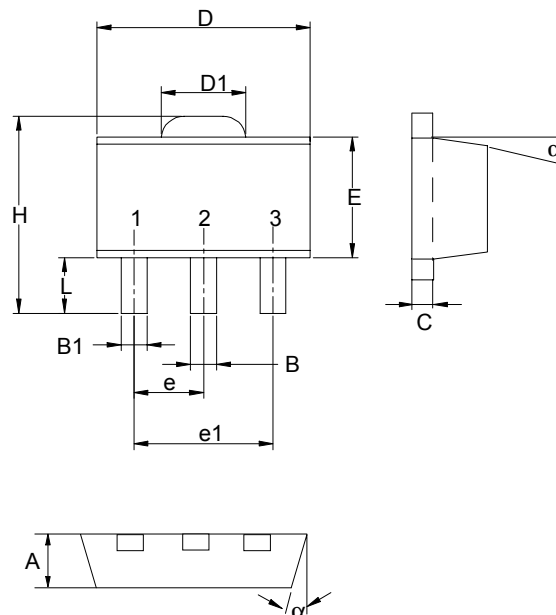
TO-92 (Reference JEDEC Registration TO-92)



Dim	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.318	5.33	0.170	0.210
ϕ b	0.356	0.53	0.014	0.021
ϕ D	4.45	5.21	0.175	0.205
E	3.175	4.19	0.125	0.165
e	2.41	2.67	0.095	0.105
e1	1.14	1.40	0.045	0.055
L	12.70		0.500	
Q	1.27		0.050	
S	2.03	2.66	0.080	0.105

Packaging Information

SOT-89 (Reference EIAJ ED-7500A Registration SC-62)



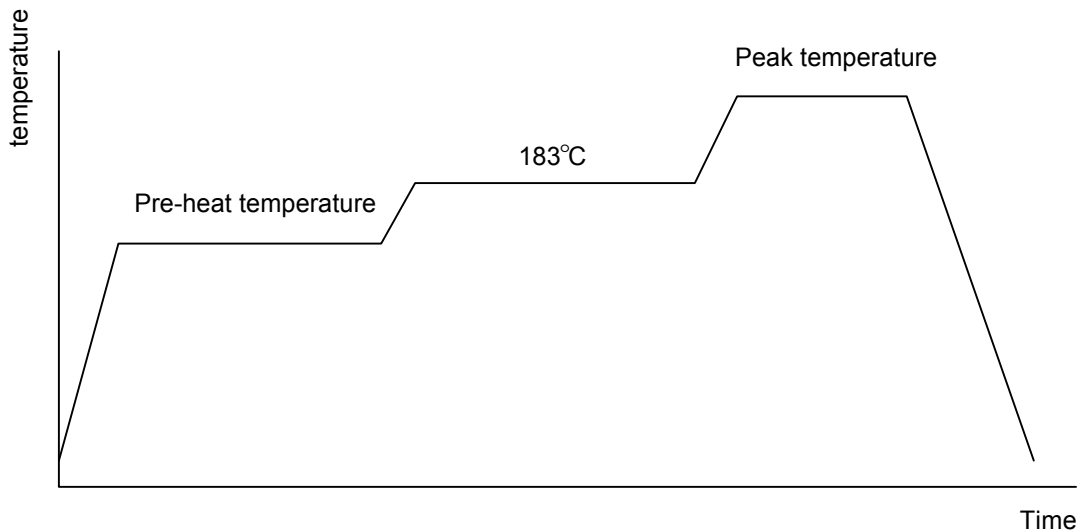
Dim	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	1.40	1.60	0.055	0.063
B	0.40	0.56	0.016	0.022
B1	0.35	0.48	0.014	0.019
C	0.35	0.44	0.014	0.017
D	4.40	4.60	0.173	0.181
D1	1.35	1.83	0.053	0.072
e	1.50 BSC		0.059 BSC	
e1	3.00 BSC		0.118 BSC	
E	2.29	2.60	0.090	0.102
H	3.75	4.25	0.148	0.167
L	0.80	1.20	0.031	0.047
α		10°		10°

Physical Specifications

Terminal Material	Solder-Plated Copper (Solder Material : 90/10 or 63/37 SnPb)
Lead Solderability	Meets EIA Specification RSI86-91, ANSI/J-STD-002 Category 3.
Packaging	1000 devices per reel

Reflow Condition (IR/Convection or VPR Reflow)

Reference JEDEC Standard J-STD-020A APRIL 1999



Classification Reflow Profiles

	Convection or IR/ Convection	VPR
Average ramp-up rate(183°C to Peak)	3°C/second max.	10 °C /second max.
Preheat temperature 125 ± 25°C)	120 seconds max.	
Temperature maintained above 183°C	60 ~ 150 seconds	
Time within 5°C of actual peak temperature	10 ~ 20 seconds	60 seconds
Peak temperature range	220 +5/-0°C or 235 +5/-0°C	215~ 219°C or 235 +5/-0°C
Ramp-down rate	6 °C /second max.	10 °C /second max.
Time 25°C to peak temperature	6 minutes max.	

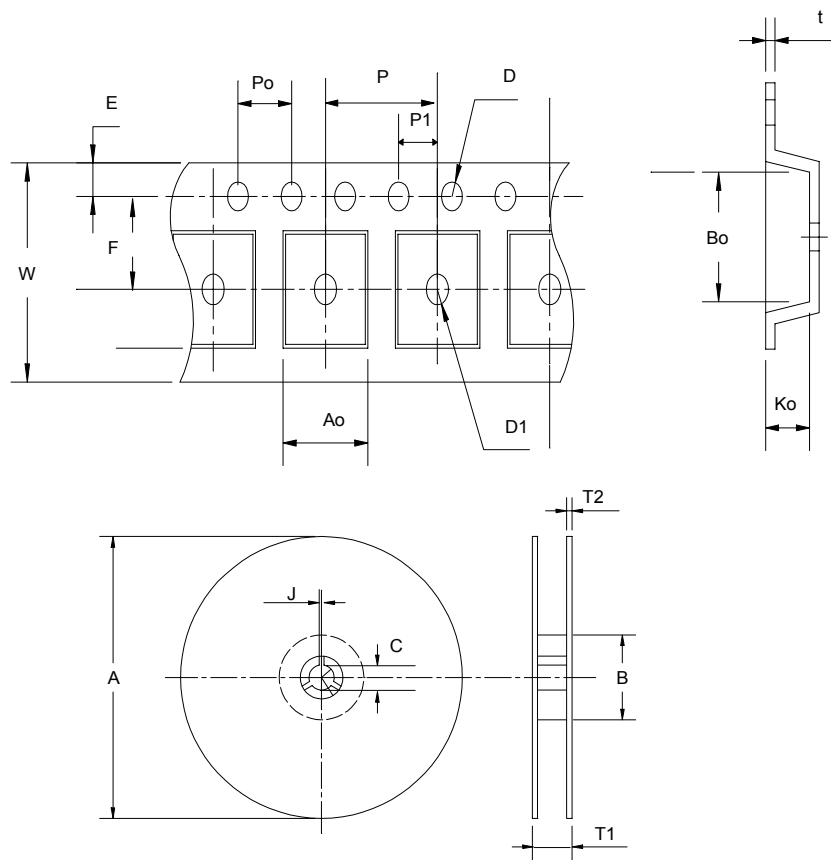
Package Reflow Conditions

pkg. thickness ≥ 2.5mm and all bags	pkg. thickness < 2.5mm and pkg. volume ≥ 350 mm ³	pkg. thickness < 2.5mm and pkg. volume < 350mm ³
Convection 220 +5/-0 °C		Convection 235 +5/-0 °C
VPR 215-219 °C		VPR 235 +5/-0 °C
IR/Convection 220 +5/-0 °C		IR/Convection 235 +5/-0 °C

Reliability test program

Test item	Method	Description
SOLDERABILITY	MIL-STD-883D-2003	245°C , 5 SEC
HOLT	MIL-STD-883D-1005.7	1000 Hrs Bias @ 125 °C
PCT	JESD-22-B, A102	168 Hrs, 100 % RH , 121°C
TST	MIL-STD-883D-1011.9	-65°C ~ 150°C, 200 Cycles
ESD	MIL-STD-883D-3015.7	VHBM > 2KV, VMM > 200V
Latch-Up	JESD 78	10ms , I _{tr} > 100mA

Carrier Tape & Reel Dimensions



Application	A	B	C	J	T1	T2	W	P	E
SOT-89	178 ±1	70 ± 2	13.5 ± 0.15	3 ± 0.15	14 ± 2	1.3 ± 0.3	12 + 0.3 12 - 0.1	8 ± 0.1	1.75 ± 0.1
Application	F	D	D1	Po	P1	Ao	Bo	Ko	t
SOT-89	5.5 ± 0.05	1.5 ± 0.1	1.5 ± 0.1	4.0 ± 0.1	2.0 ± 0.1	4.8 ± 0.1	4.5 ± 0.1	1.80 ± 0.1	0.3 ± 0.013

(mm)

Cover Tape Dimensions

Carrier Width	12
Cover Tape Width	9.3

(mm)