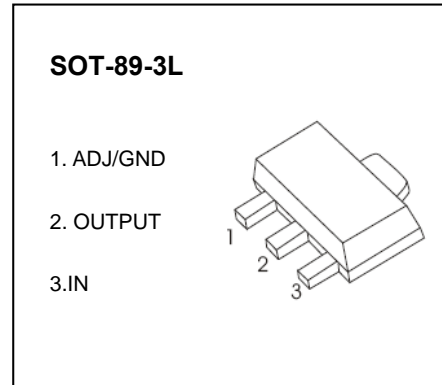


# 1A LOW DROPOUT LINEAR REGULATOR

## CJA1117B-XXX

### FEATURES

- Low Dropout Voltage: 1.15V at 1A Output Current
- Trimmed Current Limit
- On-Chip Thermal Shutdown
- Three-Terminal Adjustable or Fixed 1.8V, 2.5V, 3.3V, 5V
- Operation Junction Temperature: -40 °C to 125°C



### GENERAL DESCRIPTION

The CJA1117B-XXX is a series of low dropout three-terminal regulators with a dropout of 1.15V at 1A output current.

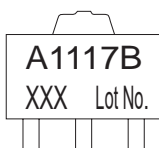
The CJA1117B-XXX series provides current limiting and thermal shutdown. Its circuit includes a trimmed bandgap reference to assure output voltage accuracy to be within 1.5%. Current limit is trimmed to ensure specified output current and controlled short-circuit current. On-chip thermal shutdown provides protection against any combination of overload and ambient temperature that would create excessive junction temperature.

The CJA1117B-XXX has an adjustable version, that can provide the output voltage from 1.25V to 5V with only 2 external resistors.

### APPLICATIONS

- PC Motherboard
- LCD Monitor
- Graphic Card
- DVD-Video Player
- NIC/Switch
- Telecom Modem
- ADSL Modem
- Printer and other peripheral Equipment

### Marking:



A1117B = Device code

XXX: output voltage

## ORDERING INFORMATION

Package	Operating Junction Temperature Range	Part NO.
SOT-89-3L	-40 to 125°C	CJA1117B-ADJ
		CJA1117B-1.8
		CJA1117B-2.5
		CJA1117B-3.3
		CJA1117B-5.0

## ABSOLUTE MAXIMUM RATINGS ( $T_a=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Input Voltage	$V_i$	20	V
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	250	$^\circ\text{C}/\text{W}$
Operating Ambient Temperature	$T_A$	-40~+85	$^\circ\text{C}$
Operating Junction Temperature	$T_j$	-40~+125	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-40~+125	$^\circ\text{C}$
Soldering Temperature & Time	$T_{solder}$	260°C, 10s	
ESD Voltage (Machine Model)	$V_{ESD}$	400	V

Note: Stresses greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional 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

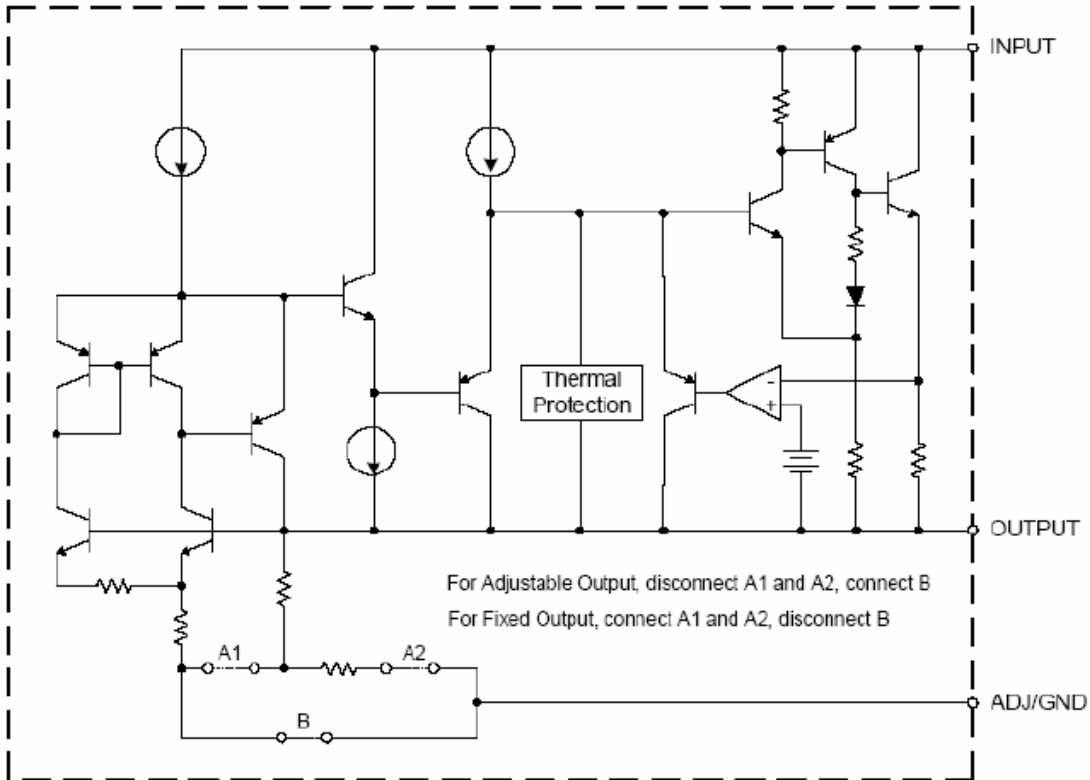
Parameter	Symbol	Value	Unit
Input Voltage	$V_i$	15	V
Operating Junction Temperature	$T_j$	-40~+125	$^\circ\text{C}$

**ELECTRICAL CHARACTERISTICS ( $V_{IN} \leq 10V$ ,  $T_J = 25^\circ C$  unless otherwise specified. )**

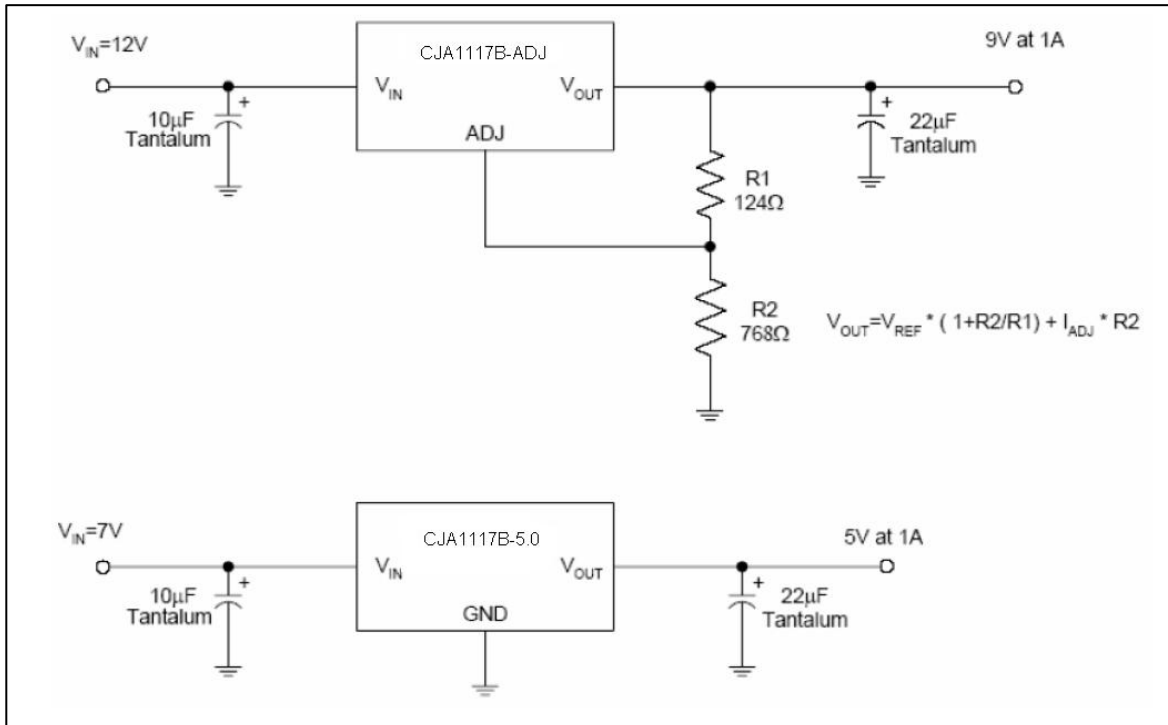
Parameter	Symbol	Part No.	Test Conditions	Min	Typ	Max	Unit		
Reference Voltage	$V_{IROC}$	CJA1117B-ADJ	$I_{OUT} = 10mA$ , $V_{IN} - V_{OUT} = 3.23$	1.231	1.250	1.269	V		
			$10mA \leq I_{OUT} \leq 1A$ , $2.75V \leq V_{IN} - V_{OUT} \leq 13.25V$	1.225	1.250	1.275			
Output Voltage	$V_O$	CJA1117B-1.8	$I_{OUT} = 10mA$ , $V_{IN} = 3.8V$	1.773	1.8	1.827	V		
			$10mA \leq I_{OUT} \leq 1A$ , $3.3V \leq V_{IN} \leq 12V$	1.764	1.8	1.836			
		CJA1117B-2.5	$I_{OUT} = 10mA$ , $V_{IN} = 4.5V$	2.463	2.5	2.538	V		
			$10mA \leq I_{OUT} \leq 1A$ , $4V \leq V_{IN} \leq 12V$	2.450	2.5	2.550			
		CJA1117B-3.3	$I_{OUT} = 10mA$ , $V_{IN} = 5.3V$	3.251	3.3	3.350	V		
			$10mA \leq I_{OUT} \leq 1A$ , $4.8V \leq V_{IN} \leq 12V$	3.234	3.3	3.366			
		CJA1117B-5.0	$I_{OUT} = 10mA$ , $V_{IN} = 7.0V$	4.925	5.0	5.075	V		
			$10mA \leq I_{OUT} \leq 1A$ , $6.5V \leq V_{IN} \leq 12V$	4.9	5.0	5.1			
		Line Regulation	LNR	CJA1117B-ADJ	$I_{OUT} = 10mA$ , $1.5V \leq V_{IN} - V_{OUT} \leq 12V$		0.035	0.2	mV
				CJA1117B-1.8	$I_{OUT} = 10mA$ , $1.5V \leq V_{IN} - V_{OUT} \leq 10.2V$		1	7	
CJA1117B-2.5	$I_{OUT} = 10mA$ , $1.5V \leq V_{IN} - V_{OUT} \leq 9.5V$				1	7			
CJA1117B-3.3	$I_{OUT} = 10mA$ , $1.5V \leq V_{IN} - V_{OUT} \leq 8.7V$				1	7			
CJA1117B-5.0	$I_{OUT} = 10mA$ , $1.5V \leq V_{IN} - V_{OUT} \leq 7V$				1	10			
Load Regulation	LDR	CJA1117B-ADJ	$V_{IN} - V_{OUT} = 1.5V$ , $10mA \leq I_{OUT} \leq 1A$		0.2	0.4	mV		
		CJA1117B-1.8				7.2			
		CJA1117B-2.5				10			
		CJA1117B-3.3				13.2			
		CJA1117B-5.0				20			
Dropout Voltage	$V_D$		$\Delta V_{REF} = 1\%$ , $I_{OUT} = 1.0A$			1.3	V		
Current Limit	$I_{limit}$		$V_{IN} - V_{OUT} = 2V$	1			A		
Adjust Pin Current					60	120	$\mu A$		
Minimum Load Current	$I_L$		$1.5V \leq V_{IN} - V_{OUT} \leq 12V$ (ADJ only)		1.7	5	$\mu A$		
Quiescent Current	$I_q$		$V_{IN} = V_{OUT} + 1.25V$ (ADJ except)		5	10	mA		
Ripple Rejection	RR		$f = 120Hz$ , $C_{OUT} = 22\mu F$ Tantalum, $V_{IN} - V_{OUT} = 3V$ , $I_{OUT} = 1A$	60	75		dB		
Temperature Stability					0.5		%		
Long-Term Stability			$T_A = 125^\circ C$ , 1000hrs		0.3		%		
RMS Output Noise (% of VOUT)			$T_A = 25^\circ C$ , $10Hz \leq f \leq 10kHz$		0.003		%		
Thermal Shutdown Hysteresis					25		$^\circ C$		

\* With package soldering to copper area over backside ground plane or internal power plane  $R_{\theta JA}$  can vary from  $46^\circ C/W$  to  $>90^\circ C/W$  depending on mounting technique and the size of the copper area

## FUNCTIONAL BLOCK DIAGRAM

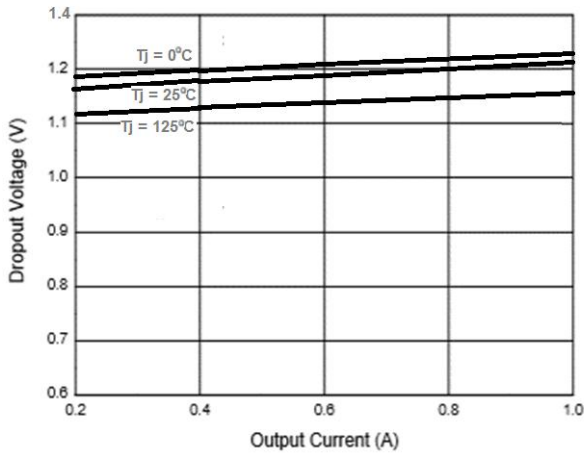


## TYPICAL APPLICATION CIRCUIT

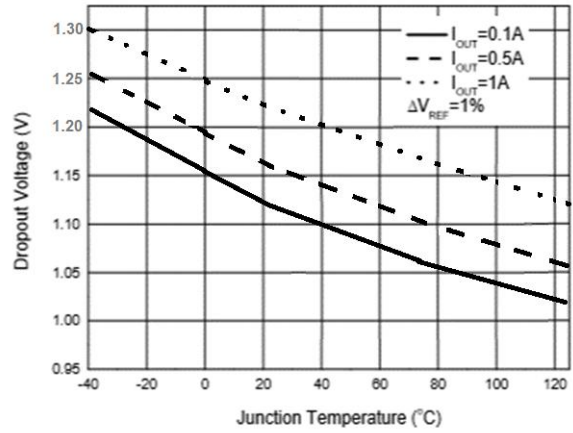


# Typical Characteristics

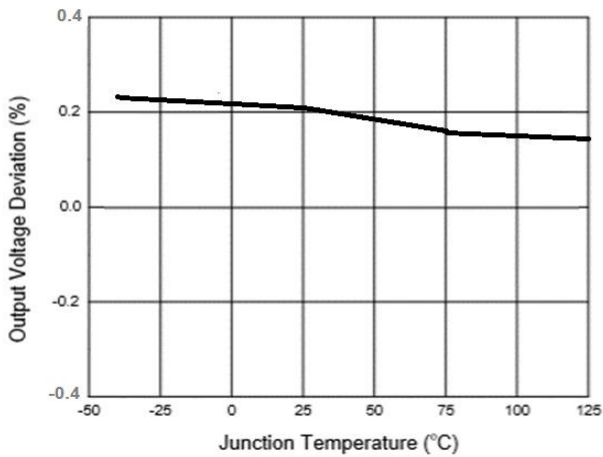
### Dropout Voltage vs. Output Current



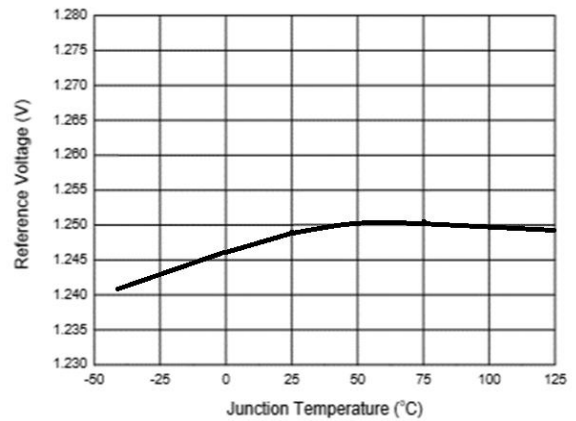
### Dropout Voltage vs. Junction Temperature



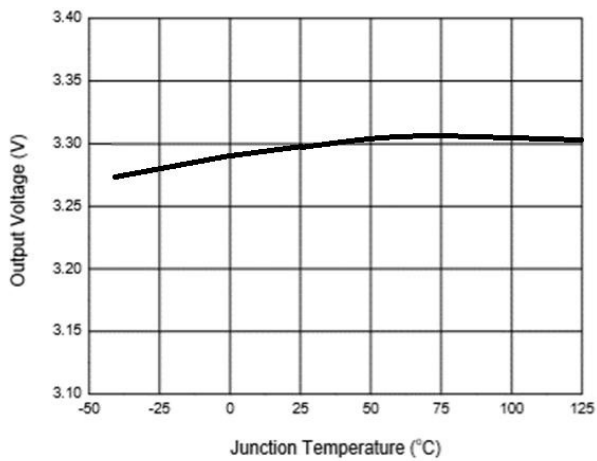
### Load Regulation vs. Junction Temperature



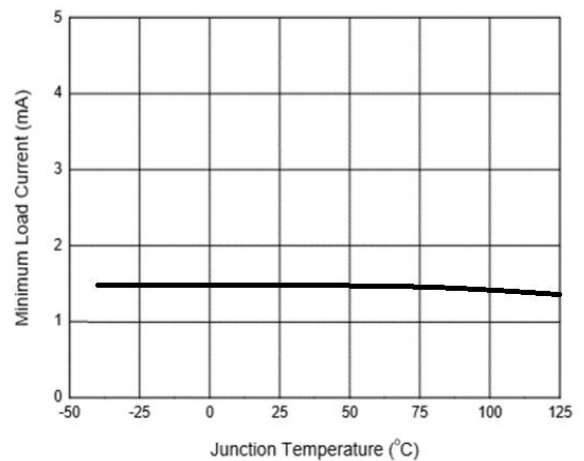
### Reference Voltage vs. Junction Temperature



### Output Voltage vs. Junction Temperature

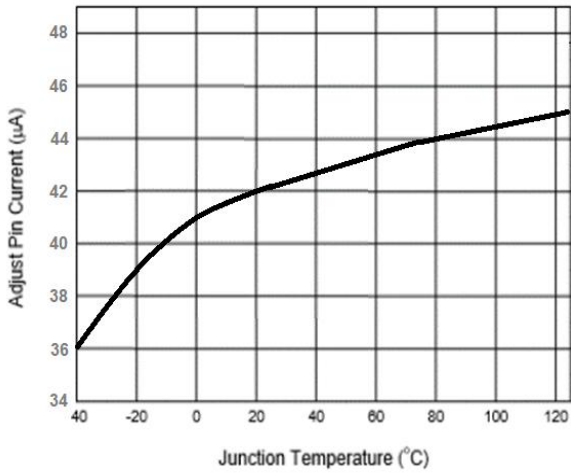


### Minimum Load Current vs. Junction Temperature

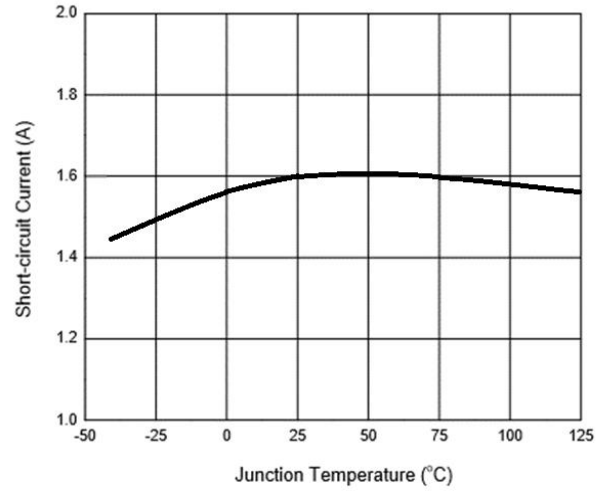


# Typical Characteristics

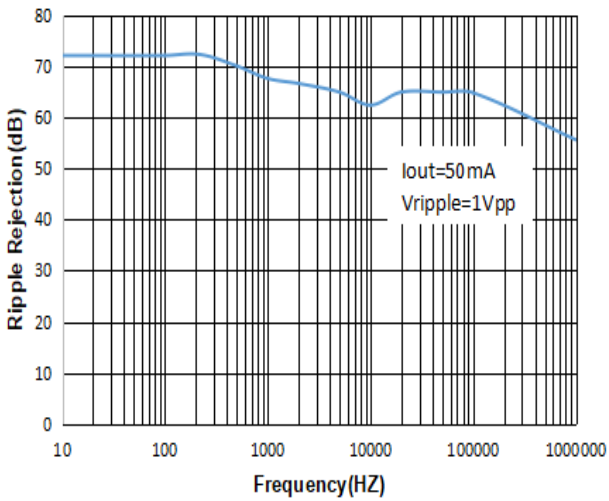
### Adjust Pin Current vs. Junction Temperature



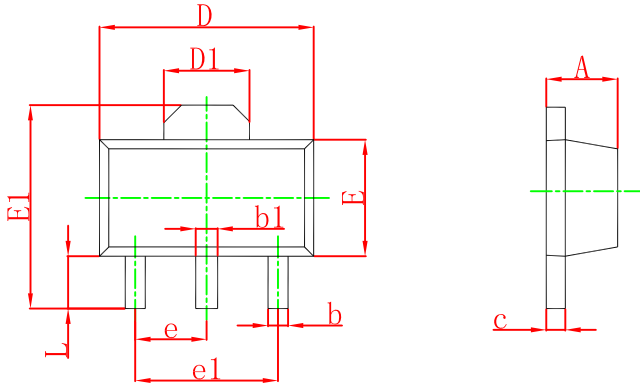
### Short-circuit Current vs. Junction Temperature



### PSRR Vs. Frequency

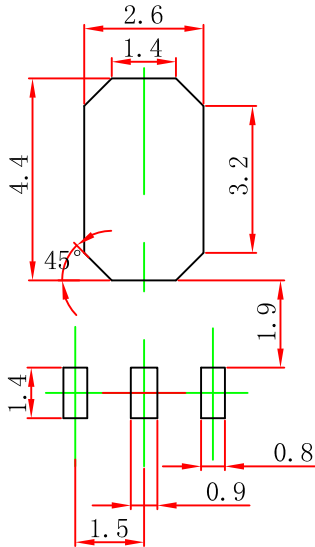


## SOT-89-3L Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF.		0.061 REF.	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP.		0.060 TYP.	
e1	3.000 TYP.		0.118 TYP.	
L	0.900	1.200	0.035	0.047

## SOT-89-3L Suggested Pad Layout



Note:

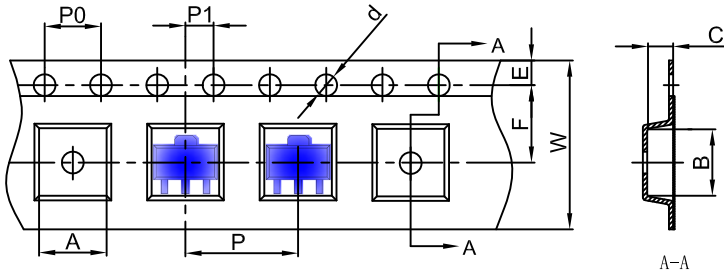
1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.05$  mm.
3. The pad layout is for reference purposes only.

### NOTICE

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# SOT-89-3L Tape and Reel

## SOT-89-3L Embossed Carrier Tape

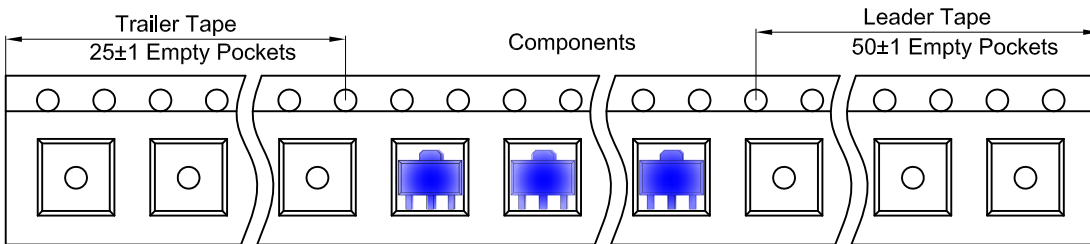


### Packaging Description:

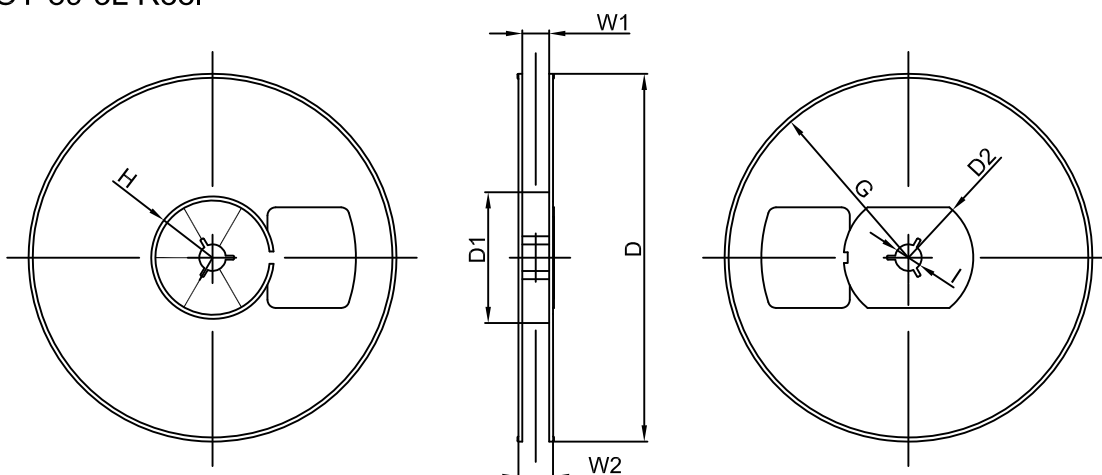
SOT-89-3L parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 1,000 units per 7" or 18.0 cm diameter reel. The reels are clear in color and is made of polystyrene plastic (anti-static coated).

Dimensions are in millimeter										
Pkg type	A	B	C	d	E	F	P0	P	P1	W
SOT-89-3L	4.85	4.45	1.85	Ø1.50	1.75	5.50	4.00	8.00	2.00	12.00

## SOT-89-3L Tape Leader and Trailer



## SOT-89-3L Reel



Dimensions are in millimeter								
Reel Option	D	D1	D2	G	H	I	W1	W2
7" Dia	Ø180.00	60.00	R32.00	R86.50	R30.00	Ø13.00	13.20	16.50

REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)	G.W.(kg)
1000 pcs	7 inch	10,000 pcs	203×203×195	40,000 pcs	438×438×220	