

■ General Description

The OCP78L05 is three terminal positive regulators designed for a wide variety of applications including local, on-card regulation. It integrates internal current limiting, thermal shutdown protection, and safe-area compensation which make them virtually immune from output overload. If adequate heat sinking are provided, these regulators can deliver output currents up to 100mA.

The device is a RoHs compliant SOT89-3L package.

■ Features

- Input Voltage up to: 30 V
- Output Voltage: 5 V
- Output Current: 100mA
- Output Voltage Accuracy of $\pm 5\%$ over the Full Temperature range
- Output Transistor Safe-area Protection
- Internal Thermal Overload Protection
- Internal Short-circuit Current Limit

■ Applications

- Consumer Electronics
- Microprocessor Power Supply

■ Pin Configuration

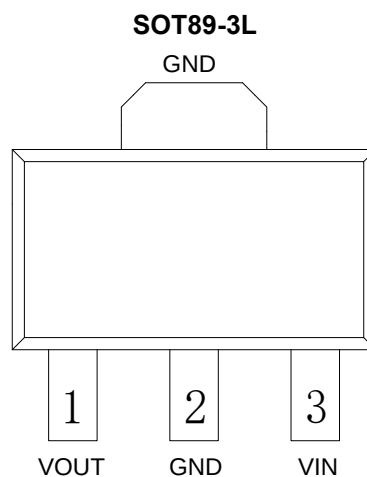


Figure 1, Pin Assignments of OCP78L05 (Top View)

Pin No.	Pin Name	Pin Function
1	VOUT	Regulator Output Pin. Bypass a 0.1 μ F capacitor to ground.
2	GND	Ground
3	VIN	Regulator Input Pin. 0.33 μ F decouple capacitor is needed.



■ Typical Application Circuit

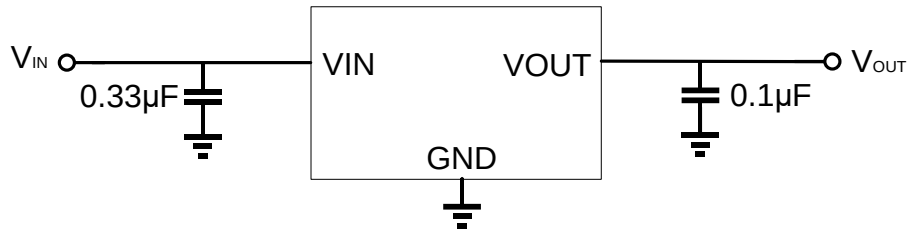


Figure 2, Typical Application Block diagram of OCP78L05

■ Block Diagram

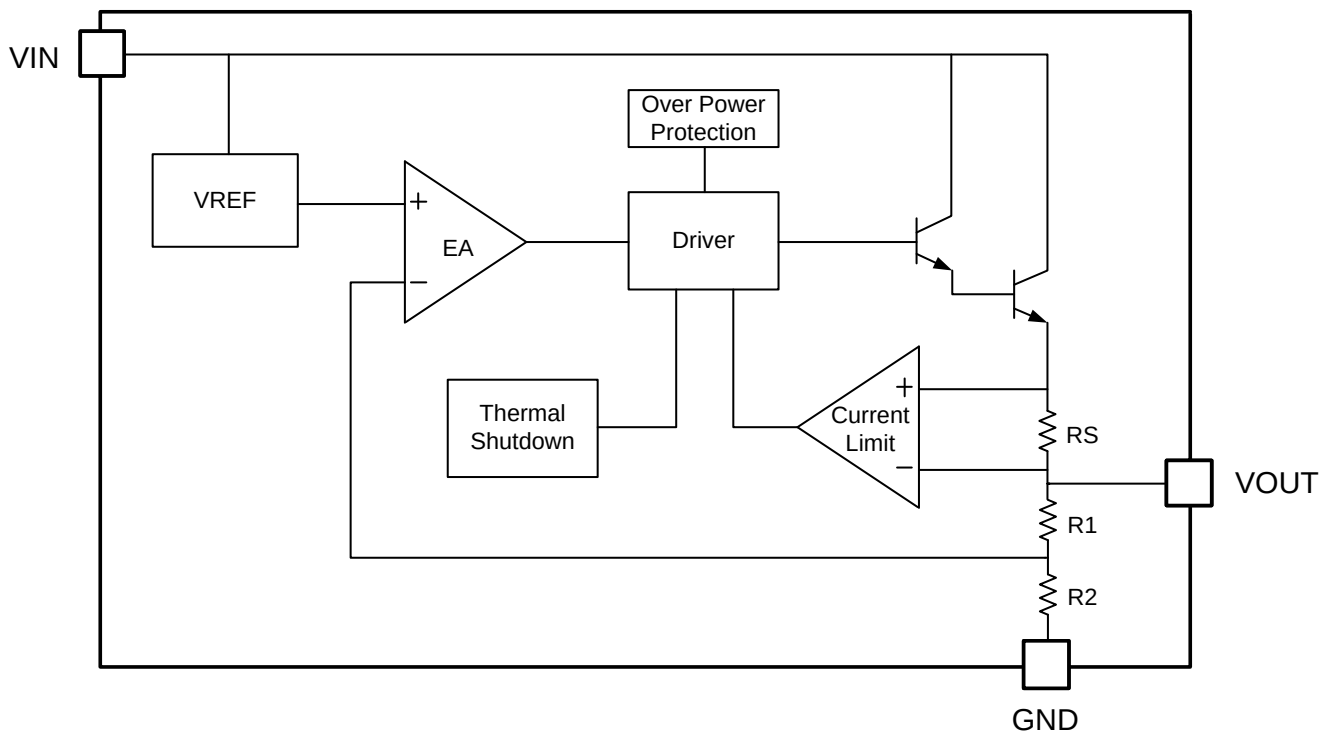


Figure 3, Block diagram of OCP78L05



■ Absolute Maximum Ratings¹ ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Rating	Unit
Input Voltage	V_{IN}	36	V
Human Body Model	HBM	4	kV
Charged Device Model	CDM	2	kV
Power Dissipation	P_D	750	mW
Storage Temperature Range	T_S	-55 to +150	$^{\circ}\text{C}$
Maximum Operating Junction Temperature Range	T_J	-40 to 125	$^{\circ}\text{C}$

Notes: 1) Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

■ Recommended Operating Conditions² ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Input Voltage	V_{IN}	30	V
Ambient Operating Temperature	T_A	-40 to 85	$^{\circ}\text{C}$
Thermal Resistance (SOT89-3L)	$R_{\theta JA}$	55	$^{\circ}\text{C}/\text{W}$

Notes: 2) The device is not guaranteed to function outside of its operating conditions

■ Electrical Characteristics

(Unless otherwise noted, typical values are at $T_A=25^{\circ}\text{C}$, $V_{IN}=10\text{V}$, $I_O=40\text{mA}$, $C_{IN}=0.33\mu\text{F}$, $C_{OUT}=0.1\mu\text{F}$)

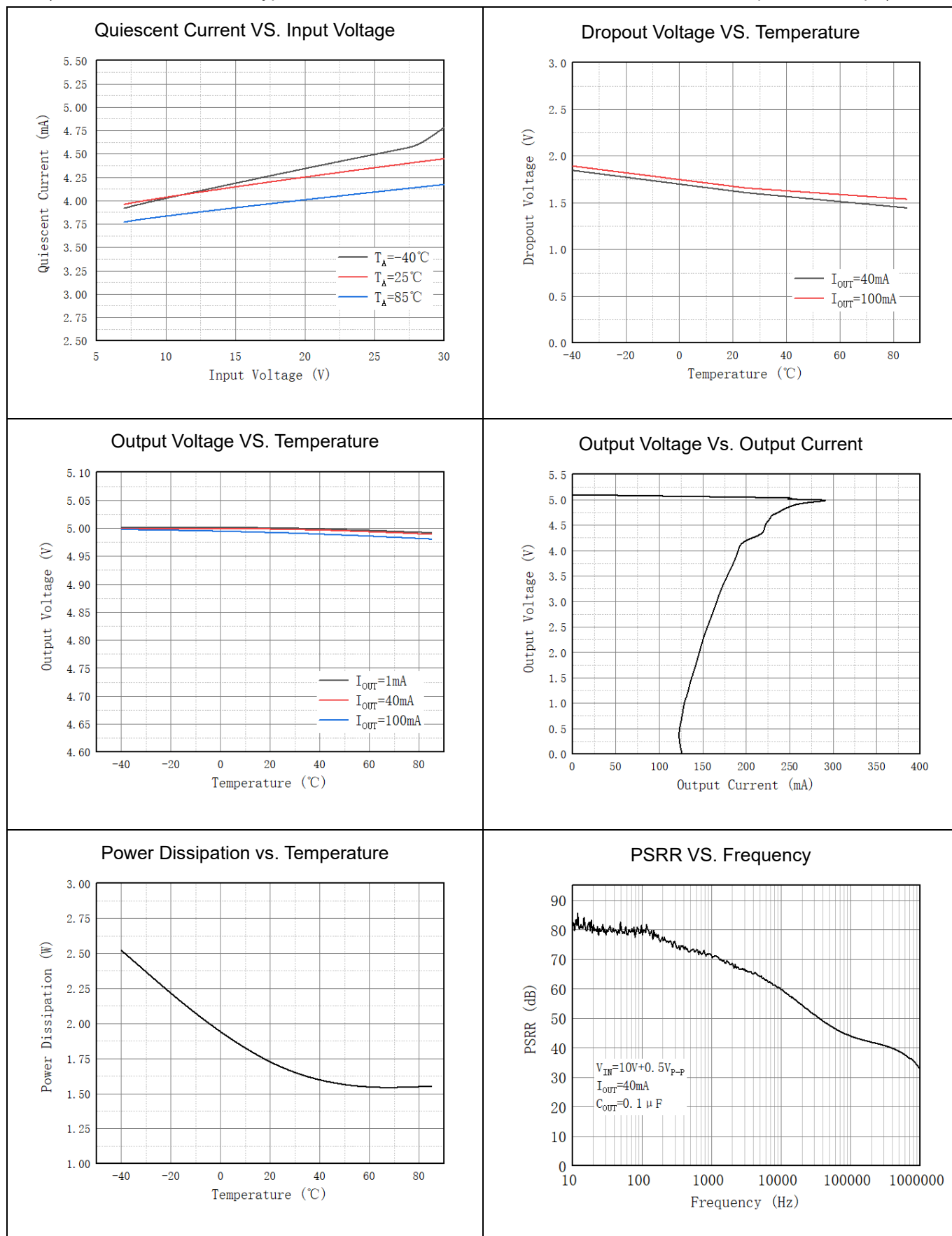
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{OUT}	Output Voltage	$T_A=25^{\circ}\text{C}$	4.8	5.0	5.2	V
		$7\text{V} \leq V_{IN} \leq 20\text{V}$, $1\text{mA} \leq I_{OUT} \leq 100\text{mA}$, $P_D \leq 0.75\text{W}$	4.75		5.25	V
I_Q	Quiescent Current			4.24	5.5	mA
ΔI_Q	Quiescent Current Change	$8\text{V} \leq V_{IN} \leq 20\text{V}$		0.27	1.0	mA
		$1\text{mA} \leq I_{OUT} \leq 100\text{mA}$		0.20	0.5	
Reg-LINE	Line Regulation	$V_{IN}=7\text{V to } 20\text{V}$		25	80	mV
		$V_{IN}=8\text{V to } 20\text{V}$		22	65	
Reg-LOAD	Load Regulation	$I_{OUT}=1 \sim 100\text{mA}$		7	35	mV
		$I_{OUT}=1 \sim 40\text{mA}$		2	20	
V_{DO}	Dropout Voltage	$I_{OUT} = 40\text{mA}$, V_{OUT} falls 5% below $V_{OUT}(\text{NOM})$		1.65	2.00	V
		$I_{OUT} = 100\text{mA}$, V_{OUT} falls 5% below $V_{OUT}(\text{NOM})$		1.70	2.20	
PSRR	Power Supply Rejection Ratio	$f=120\text{Hz}$		75		dB

En	Output Voltage Noise	f = 10 Hz to 100 kHz		45		μVRMS
IPK	Peak output current			200		mA
ΔVo/ΔT	Average coefficient output voltage temperature	Io = 5 mA		0.08		mV/°C



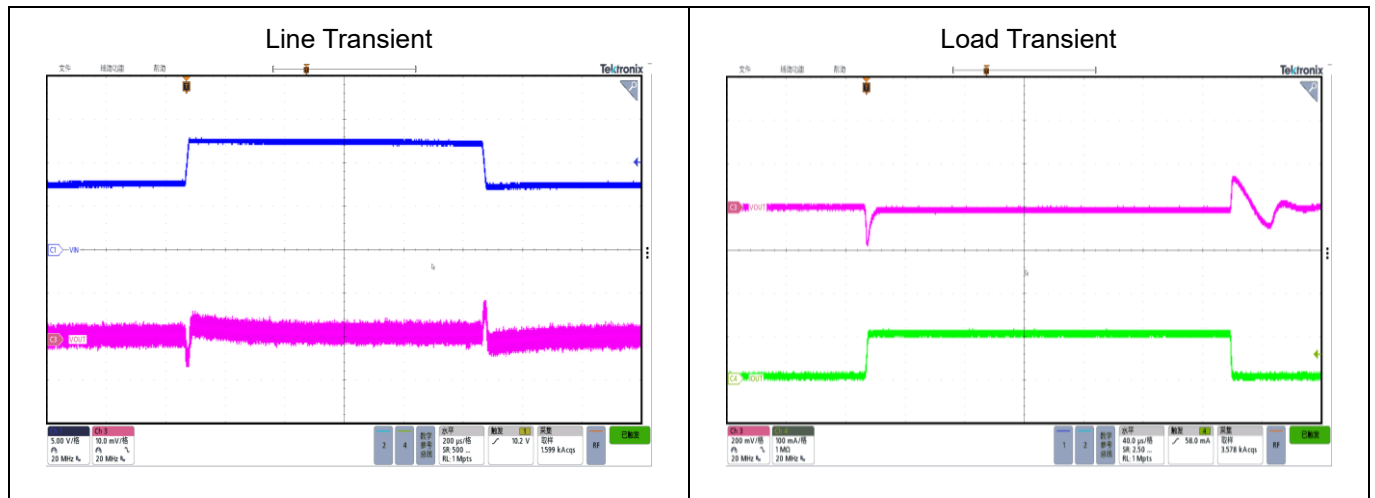
■ Typical characteristics

(Unless otherwise noted, typical values are at $T_A=25^{\circ}\text{C}$, $V_{IN}=10\text{V}$, $I_O=40\text{mA}$, $C_{IN}=0.33\mu\text{F}$, $C_{OUT}=0.1\mu\text{F}$)



■ Typical characteristics (Continued)

(Unless otherwise noted, typical values are at $T_A=25^{\circ}\text{C}$, $V_{IN}=10\text{V}$, $I_O=40\text{mA}$, $C_{IN}=0.33\mu\text{F}$, $C_{OUT}=0.1\mu\text{F}$)

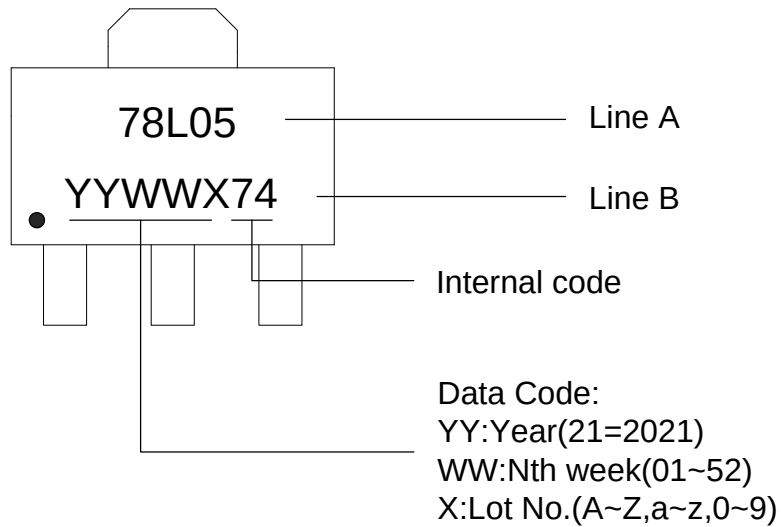


■ Ordering Information

Part Number	Package Type	Package Qty	Ambient Operating Temperature	Eco Plan	Lead
OCP78L05YAE	SOT89-3L	13-in reel 4000pcs/reel	-40℃~85℃	Green	Sn

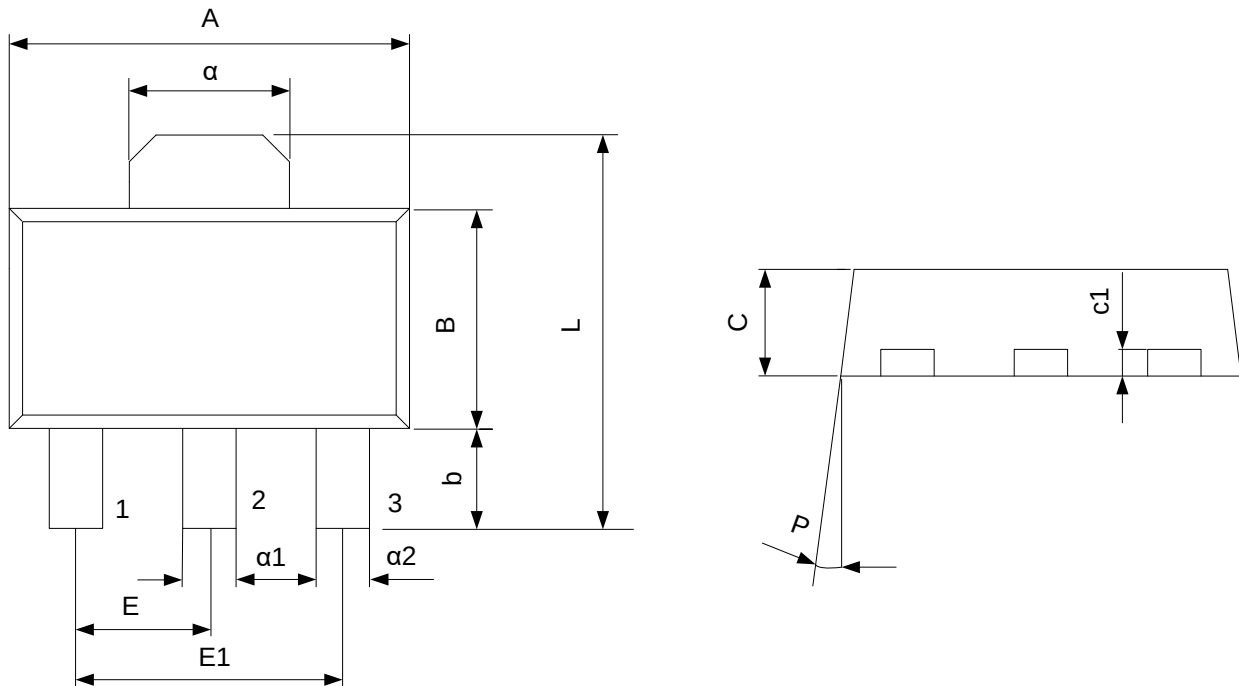
■ Marking Information

SOT89-3L



■ Package Information

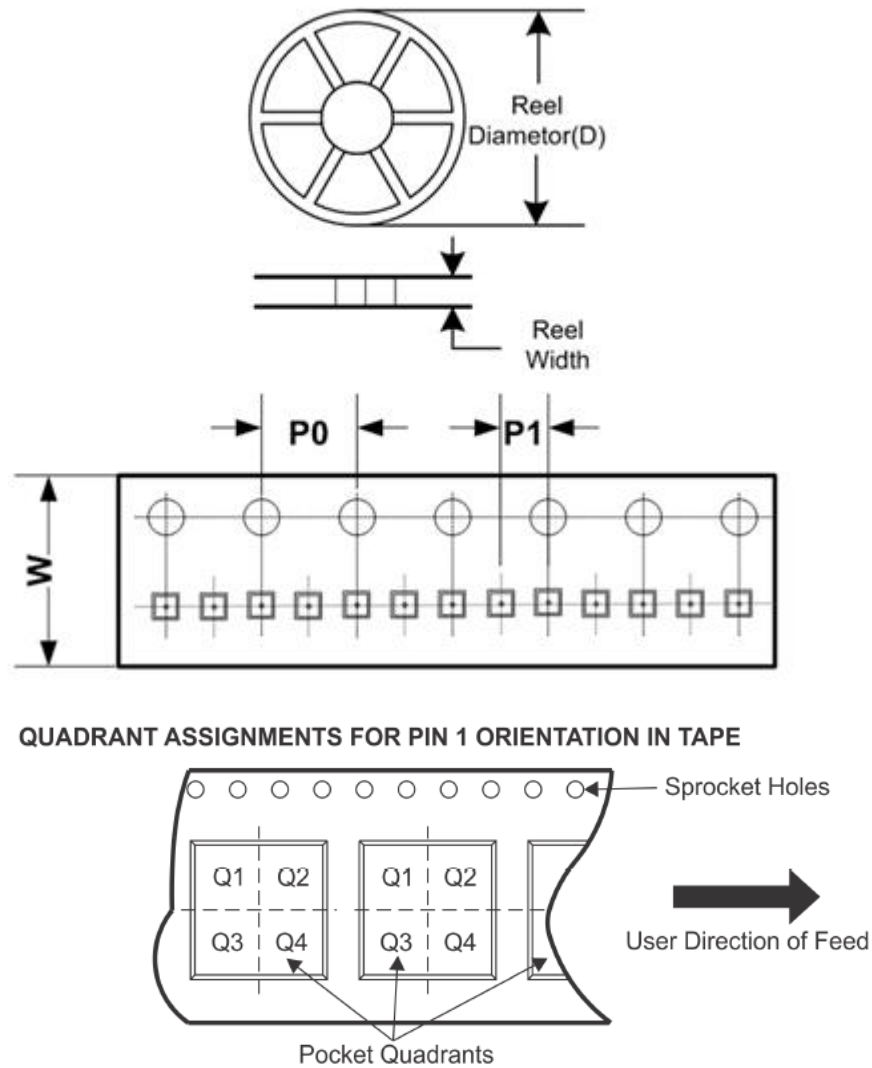
SOT89-3L



Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
A	4.4	4.7	α1	0.36	0.56
B	2.35	2.65	α2	0.30	0.50
L	3.878	4.478	C	1.40	1.70
α	1.45	1.65	c1	0.35	0.50
E	1.40	1.60	P	6°	
E1	2.80	3.20			
b	0.80	1.20			



■ Packing Information



Package Type	Carrier Width (W)	Pitch (P0)	Pitch (P1)	Reel Size(D)	Packing Minimum	PIN 1 Quadrant	MSL
SOT89-3L	12.0±0.1 mm	4.0±0.1 mm	8.0±0.1 mm	330±1 mm	4000pcs	Q3	Level-3-260℃

Note: Carrier Tape Dimension, Reel Size and Packing Minimum.



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