

**P-Channel Trench Power MOSFET**
**General Description**

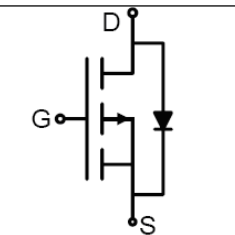
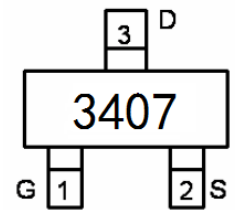
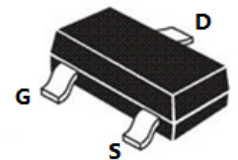
The JY3407X uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as  $-4.5V$ . This device is suitable for use as a load switch or in PWM applications.

**Features**

- $V_{DS} = -30V, I_D = -4.3A$   
 $R_{DS(ON)} < 50m\Omega @ V_{GS} = -10V$   
 $R_{DS(ON)} < 100m\Omega @ V_{GS} = -4.5V$
- High Power and current handling capability
- Lead free product is acquired
- Surface Mount Package

**Application**

- PWM applications
- Load switch
- Power management


**Schematic Diagram**

**Marking and pin Assignment**

**SOT23-3L top view**
**Package Marking and Ordering Information**

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
3407	JY3407X	SOT23-3L	Ø180mm	8mm	3000 units

**Table 1. Absolute Maximum Ratings ( $T_A=25^\circ C$ )**

Symbol	Parameter	Value	Unit
$V_{DS}$	Drain-Source Voltage ( $V_{GS}=0V$ )	-30	V
$V_{GS}$	Gate-Source Voltage ( $V_{DS}=0V$ )	$\pm 20$	V
$I_D$	Drain Current-Continuous	-4.3	A
$I_{DM (pluse)}$	Drain Current-Continuous@ Current-Pulsed (Note 1)	-30	A
$P_D$	Maximum Power Dissipation	1.5	W
$T_J, T_{STG}$	Operating Junction and Storage Temperature Range	-55 To 150	$^\circ C$

Notes 1.Repetitive Rating: Pulse width limited by maximum junction temperature

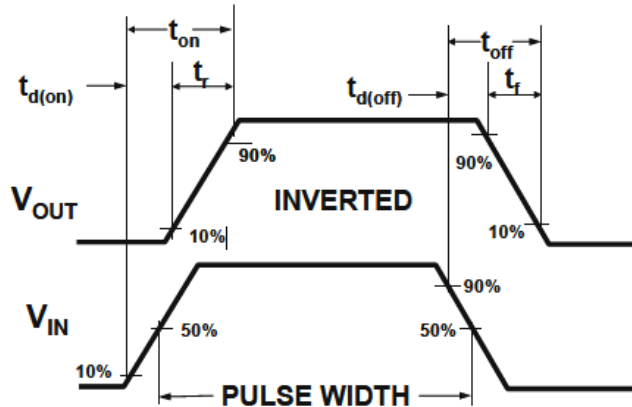
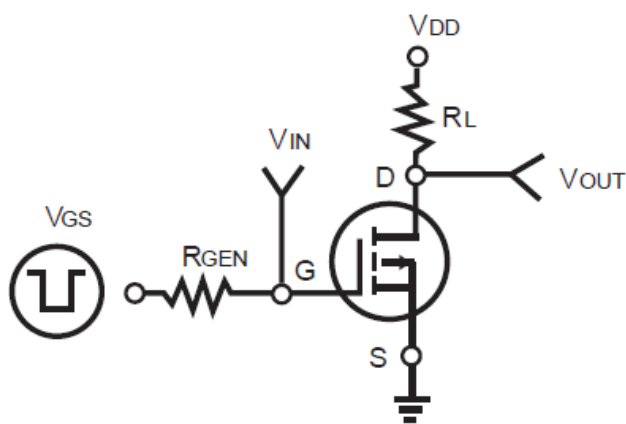
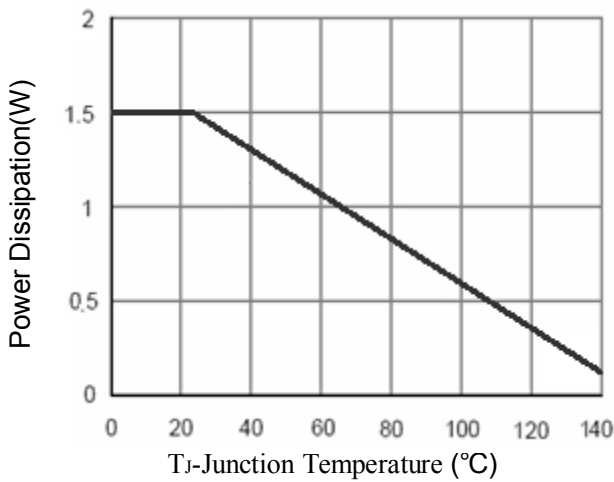
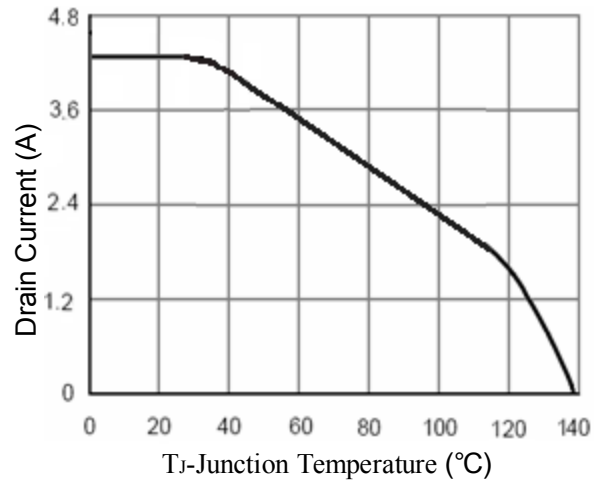
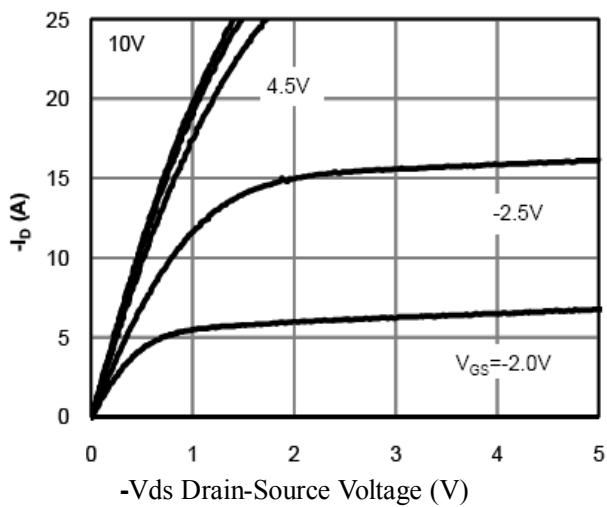
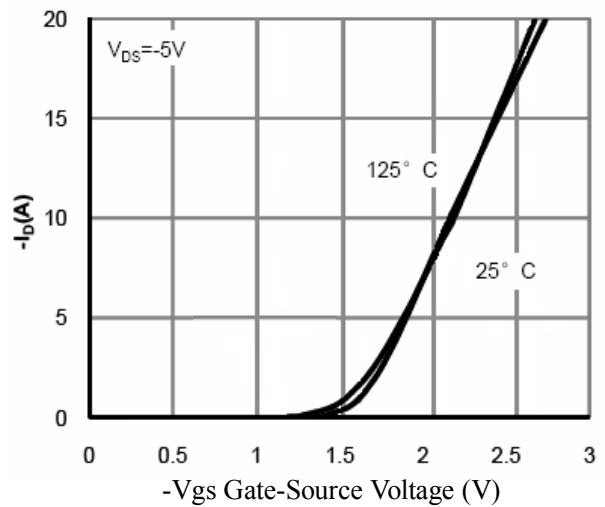
**Table 2. Thermal Characteristic**

Symbol	Parameter	Value	Unit
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	85	$^\circ C/W$

**Table 3. Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise noted)**

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>On/Off States</b>						
B <sub>V</sub> DSS	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =-250μA	-30	-34		V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =-24V, V <sub>GS</sub> =0V			1	μA
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V			±100	nA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250μA	-1.0	-1.6	-2.4	V
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =-5V, I <sub>D</sub> =-4.3A	4			S
R <sub>DS(on)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =-10V, I <sub>D</sub> =-4.3A		38	50	mΩ
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-4A		60	100	mΩ
<b>Dynamic Characteristics</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =-15V, V <sub>GS</sub> =0V, f=1.0MHz		580		pF
C <sub>oss</sub>	Output Capacitance			98		pF
C <sub>riss</sub>	Reverse Transfer Capacitance			74		pF
<b>Switching Times</b>						
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DD</sub> =-15V, I <sub>D</sub> =-1A, R <sub>L</sub> =15Ω V <sub>GS</sub> =-10V, R <sub>G</sub> =2.5Ω		5		nS
t <sub>r</sub>	Turn-on Rise Time			6		nS
t <sub>d(off)</sub>	Turn-Off Delay Time			28		nS
t <sub>f</sub>	Turn-Off Fall Time			7		nS
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =-15V, I <sub>D</sub> =-4.3A, V <sub>GS</sub> =-10V		10		nC
Q <sub>gs</sub>	Gate-Source Charge			2		nC
Q <sub>gd</sub>	Gate-Drain Charge			3		nC
<b>Source-Drain Diode Characteristics</b>						
I <sub>SD</sub>	Source-Drain Current(Body Diode)				-4.3	A
V <sub>SD</sub>	Forward on Voltage <sup>(Note 1)</sup>	V <sub>GS</sub> =0V, I <sub>S</sub> =-1A		-0.82	-1	V

Notes 1. Repetitive Rating: Pulse width limited by maximum junction temperature.

**Switch Time Test Circuit and Switching Waveforms:**

**TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS (Curves)**
**Figure1. Power Dissipation**

**Figure2. Drain Current**

**Figure3. Output Characteristics**

**Figure4. Transfer Characteristics**


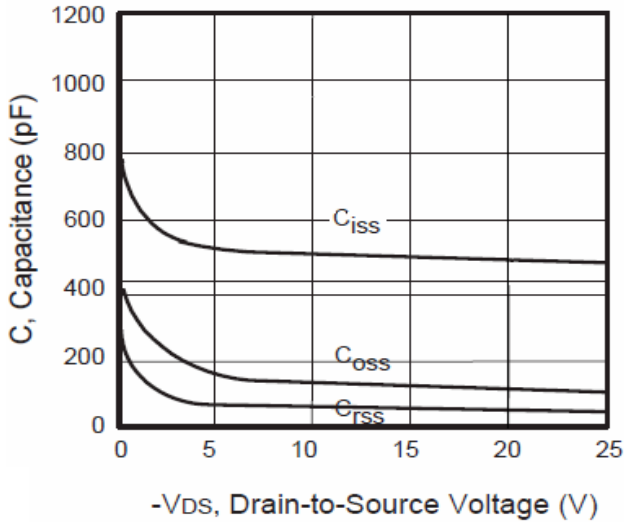
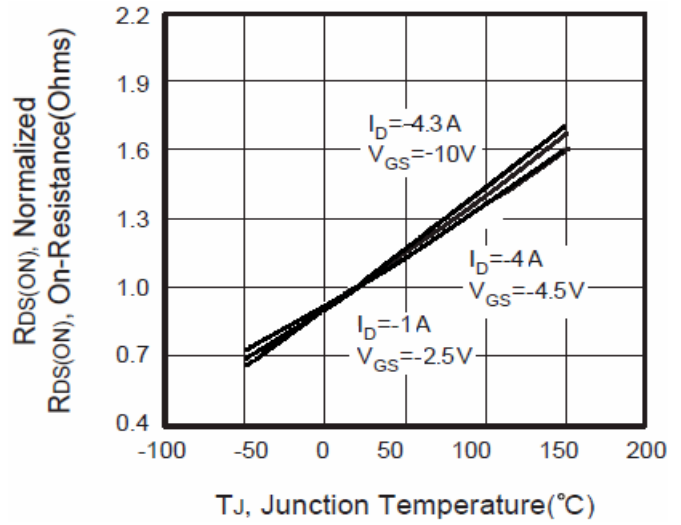
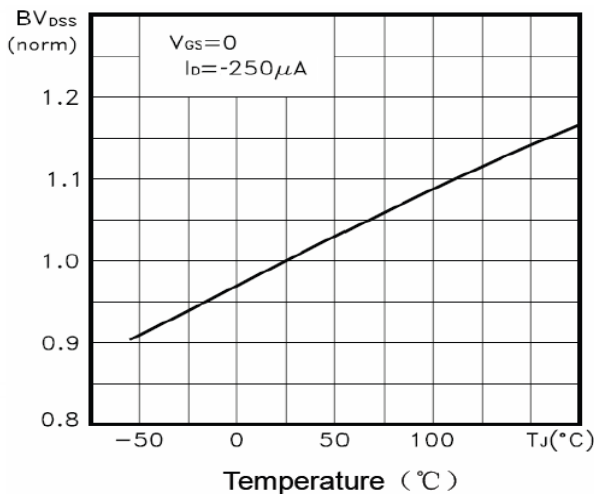
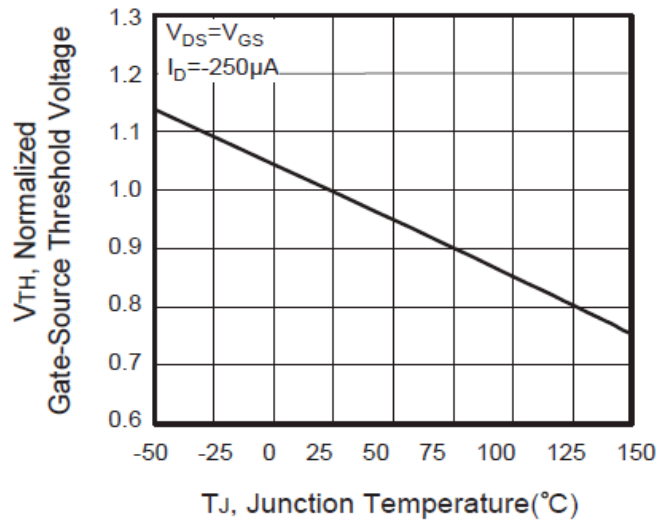
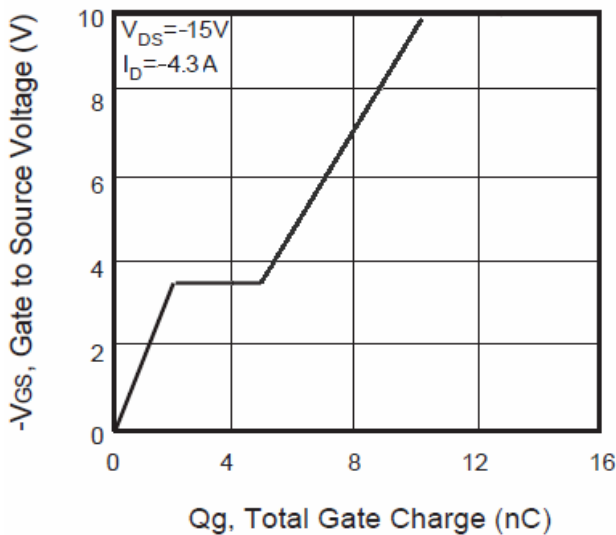
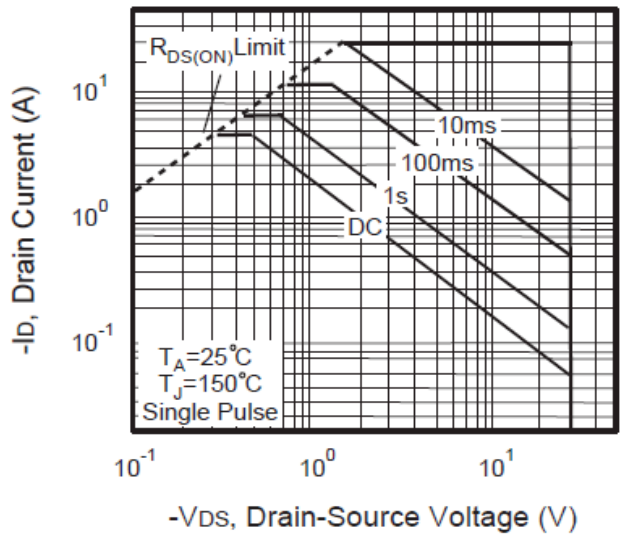
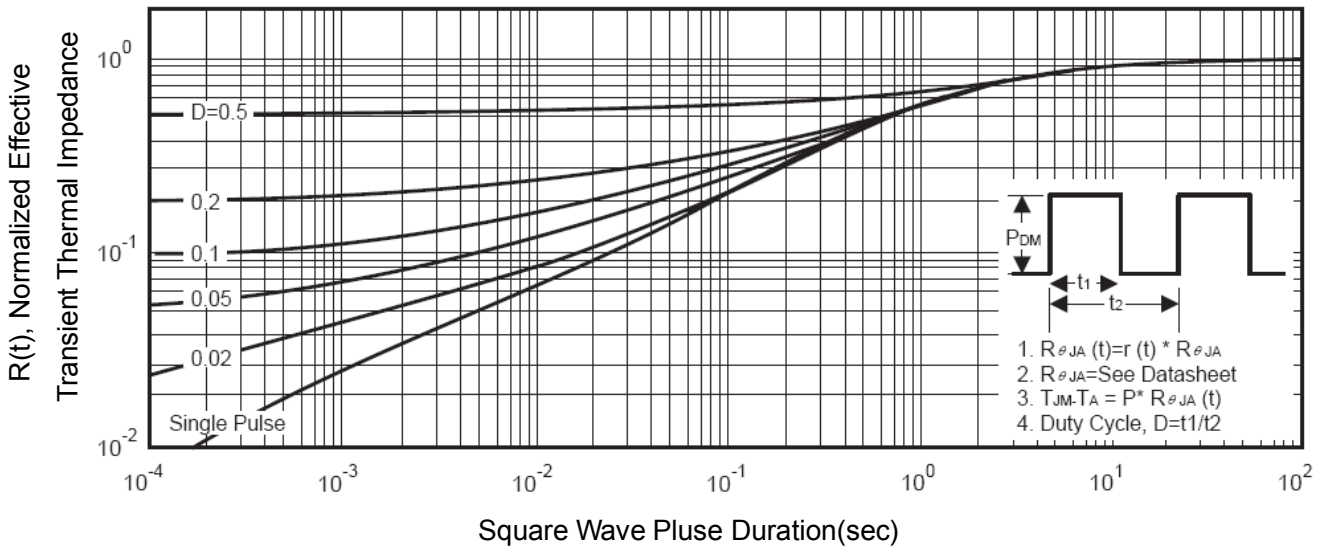
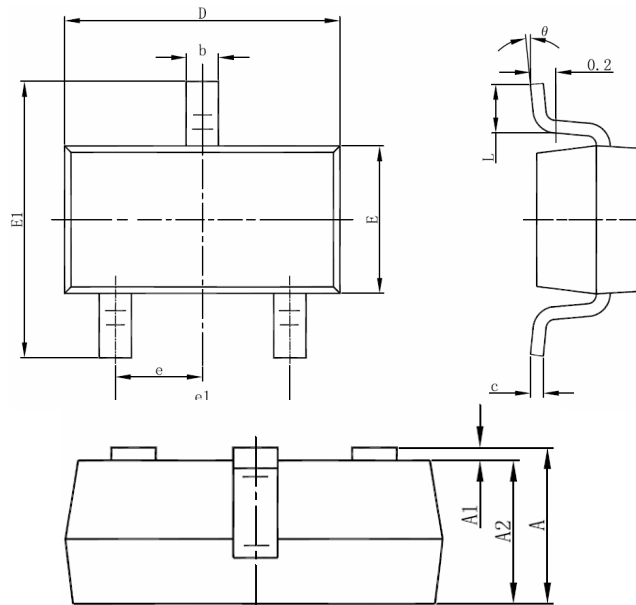
**Figure5. Capacitance**

**Figure6. R<sub>DS(ON)</sub> vs Junction Temperature**

**Figure7. Max BV<sub>DSS</sub> vs Junction Temperature**

**Figure8. V<sub>GS(th)</sub> vs Junction Temperature**

**Figure9. Gate Charge Waveforms**

**Figure10. Maximum Safe Operating Area**




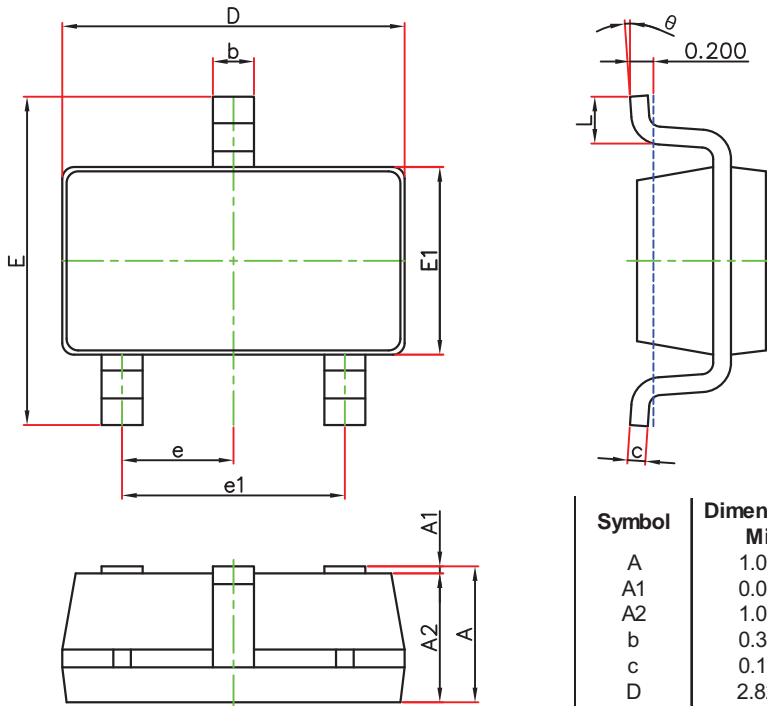
Figure11. Normalized Maximum Transient Thermal Impedance



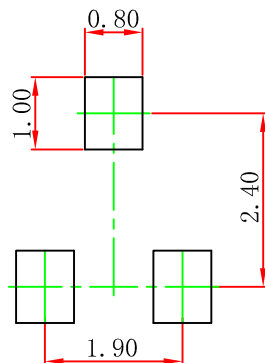
### SOT23-3L Package Information



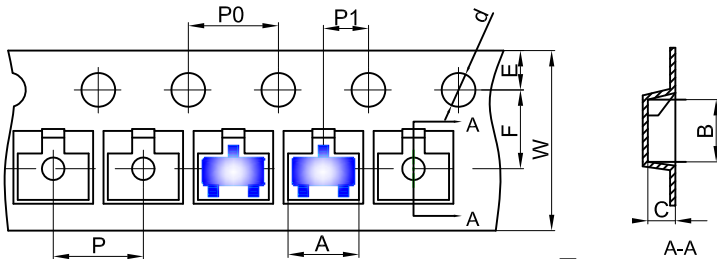
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

**SOT23-3L Package Outline Dimensions**


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E1	1.500	1.700	0.059	0.067
E	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

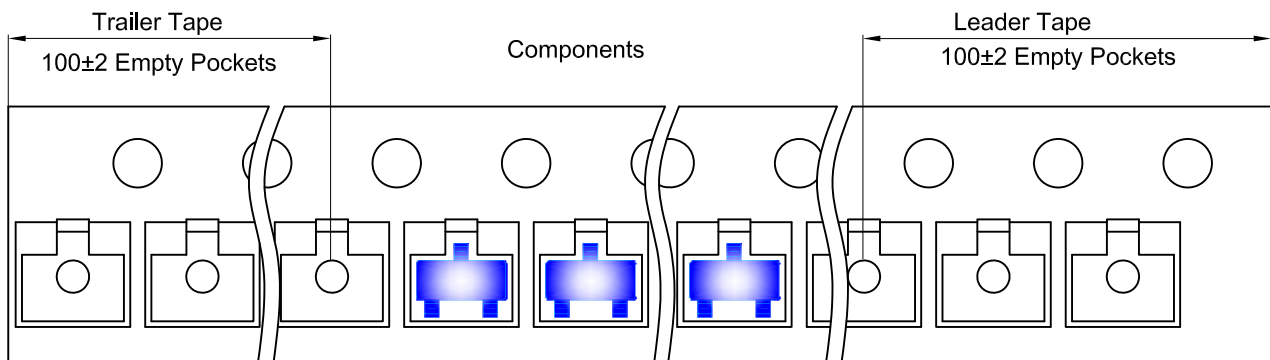
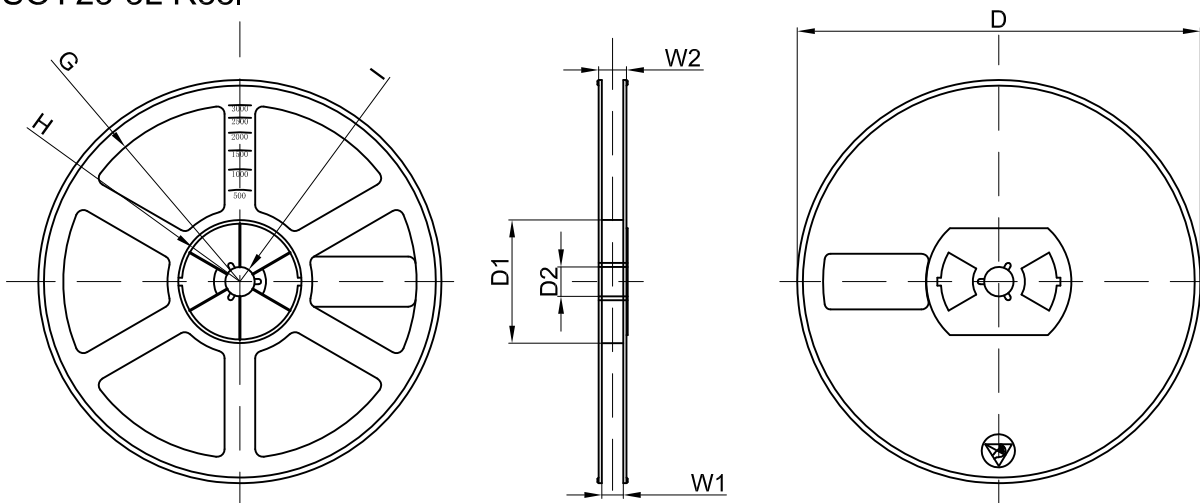
**SOT23-3L Suggested Pad Layout**


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

**SOT23-3L Tape and Reel**
**SOT23-3L Embossed Carrier Tape**

**Packaging Description:**

SOT23-3L 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 3,000 units per 7" or 18.0cm 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
SOT23-3L	3.18	3.28	1.32	Ø1.50	1.75	3.50	4.00	4.00	2.00	8.00

**SOT23-3L Tape Leader and Trailer**

**SOT23-3L Reel**


Dimensions are in millimeter								
Reel Option	D	D1	D2	G	H	I	W1	W2
7" Dia	Ø180.00	60.00	13.00	R78.00	R25.60	R6.50	9.50	13.10

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