JYELECTRONICS®

JY3407X

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,ID =-4.3A
  $R_{DS(ON)}$ < 50mΩ @ V_{GS} =-10V
  $R_{DS(ON)}$ < 100mΩ @ V_{GS} =-4.5V

- High Power and current handing capability
- Lead free product is acquired
- Surface Mount Package

Application

- PWM applications
- Load switch
- Power management
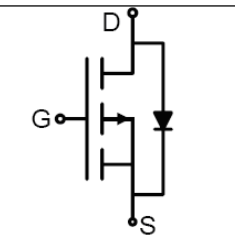
Schematic Diagram
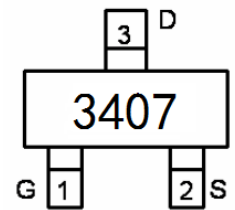
Marking and pin Assignment
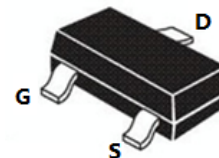
SOT23-3L top view

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℃)

Symbol	Parameter	Value	Unit
V_{DS}	Drain-Source Voltage (V_{GS}=0V）	-30	V
V_{GS}	Gate-Source Voltage (V_{DS}=0V)	±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	℃

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

Table 2. Thermal Characteristic

Symbol	Parameter	Value	Unit
$R_{θJA}$	Thermal Resistance, Junction-to-Ambient	85	℃/W

Table 3. Electrical Characteristics (T$_A$=25℃ unless otherwise noted)

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

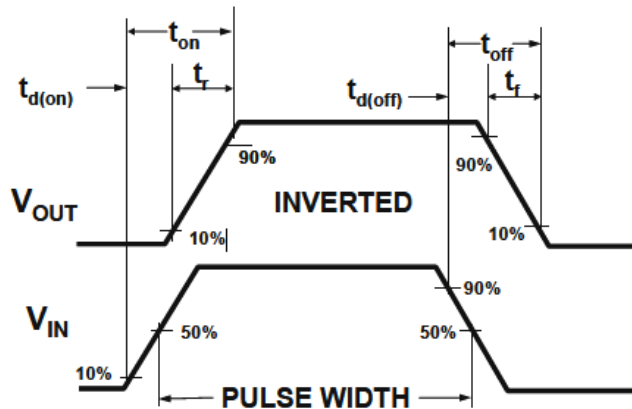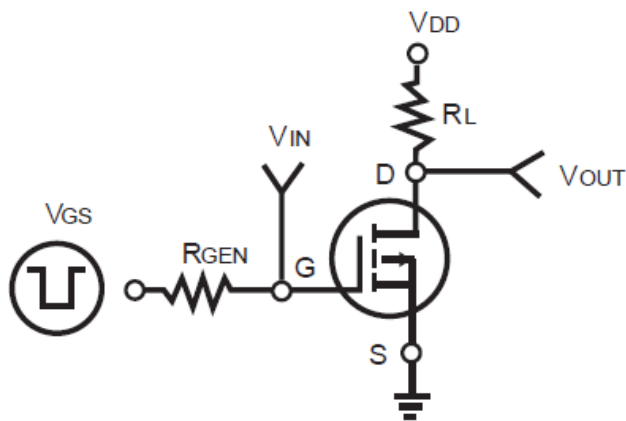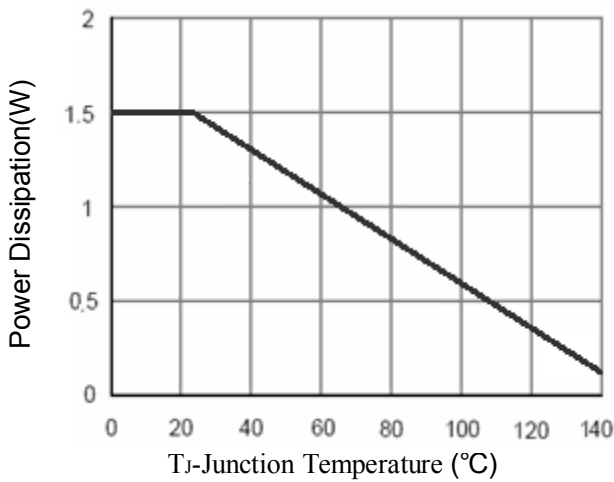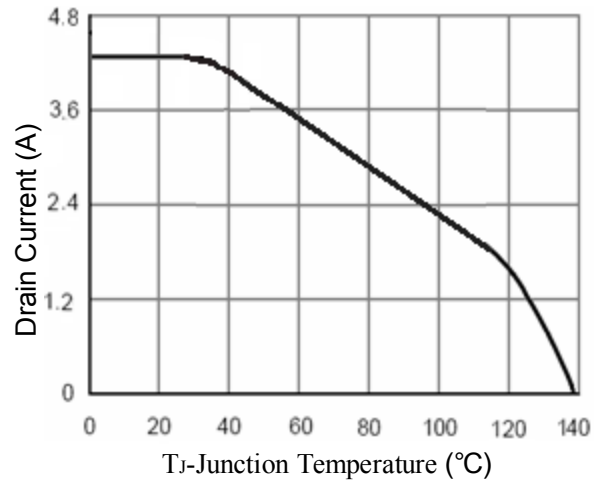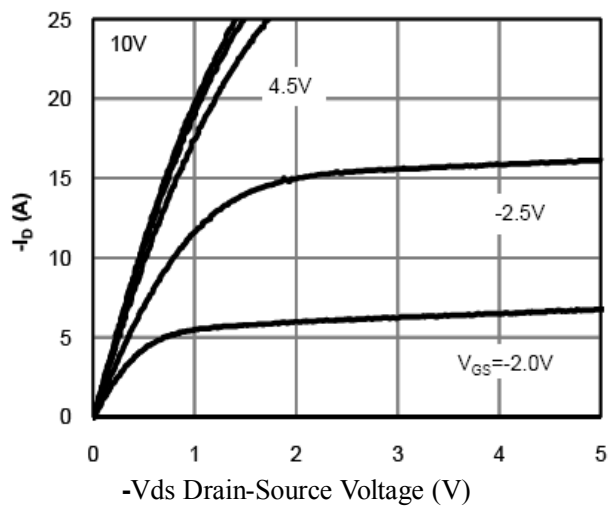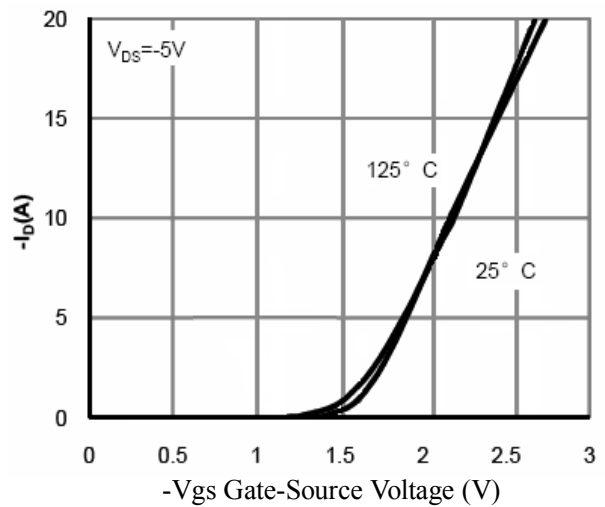Notes 1. Repetitive Rating: Pulse width limited by maximum junction temperature.

Switch Time Test Circuit and Switching Waveforms：

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS (Curves)

Figure1. Power Dissipation

Figure2. Drain Current

Figure3. Output Characteristics
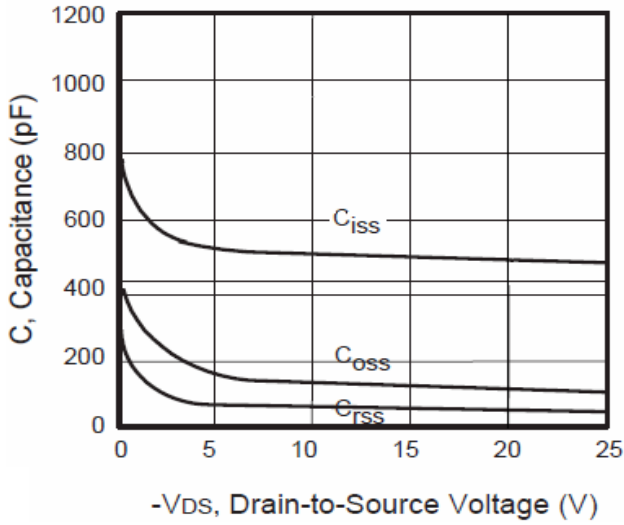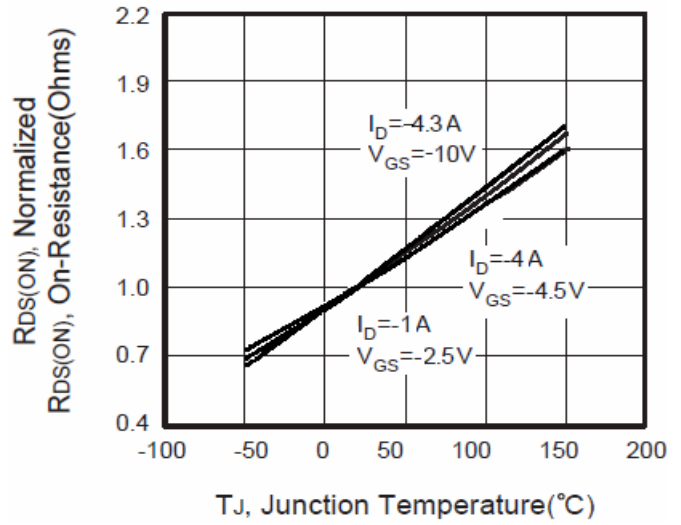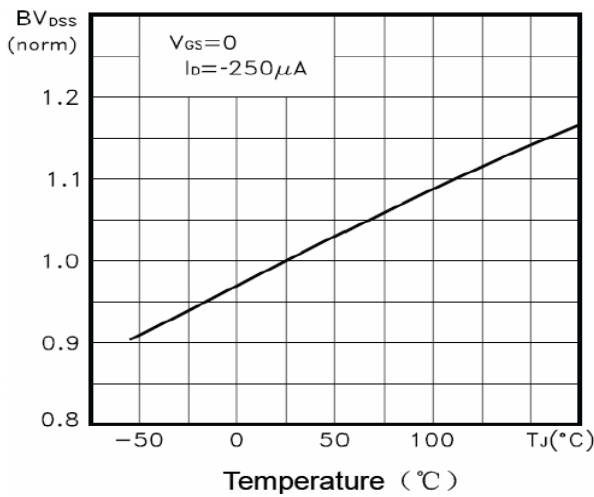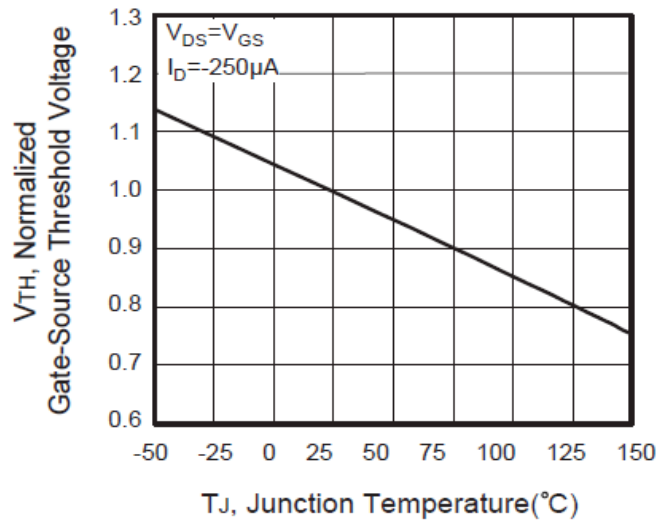

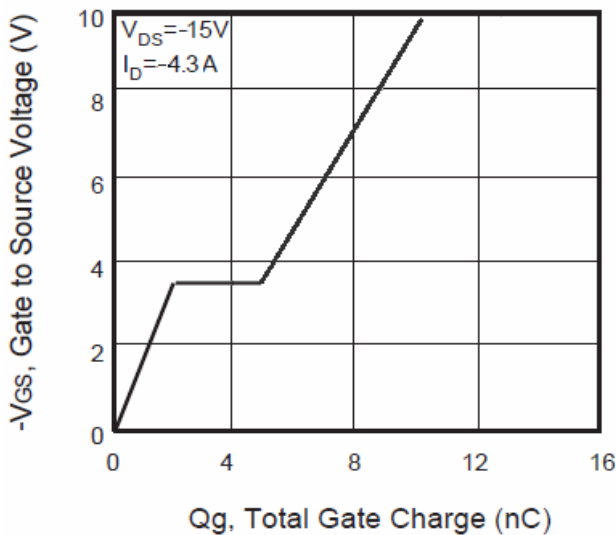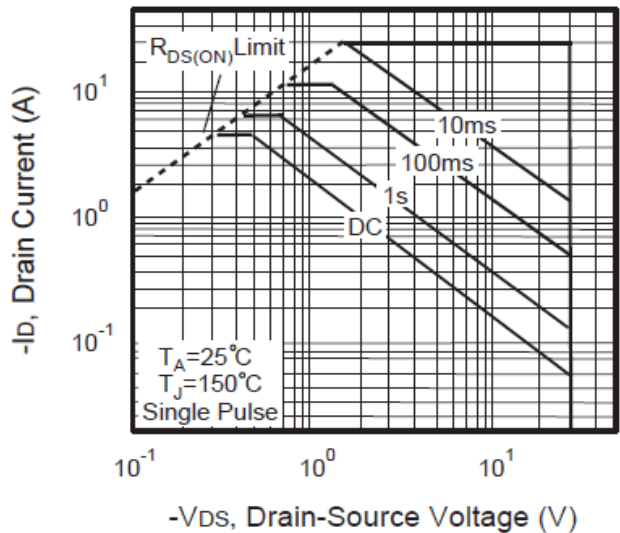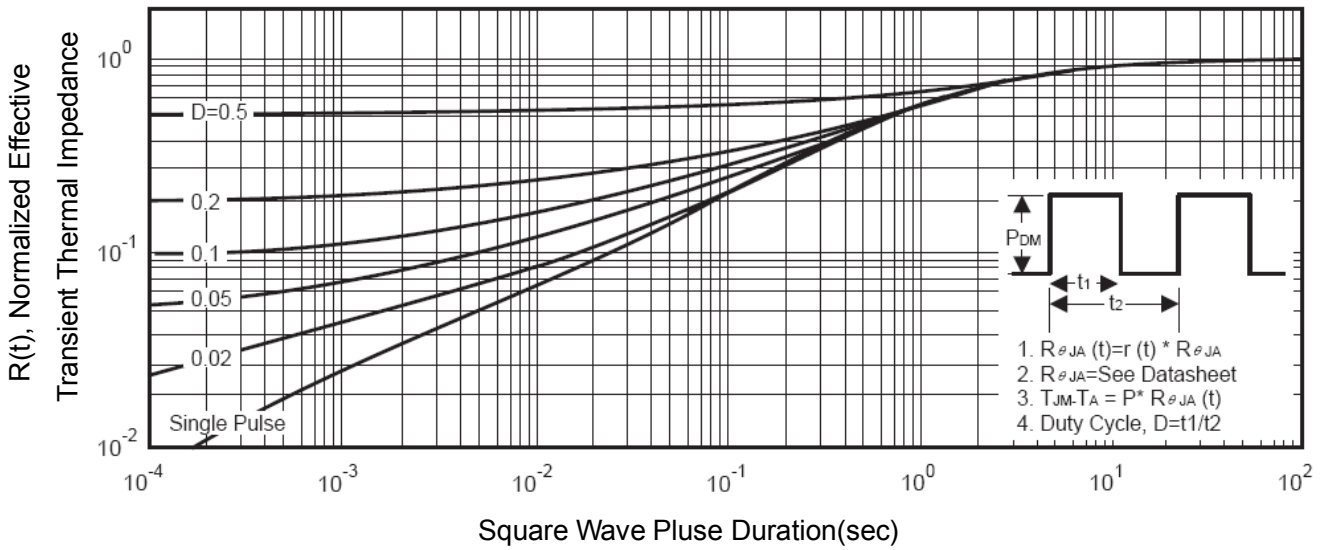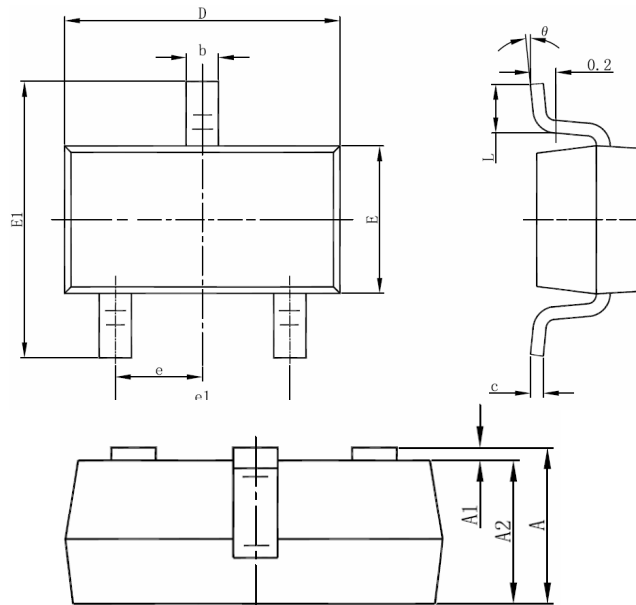**Figure4. Transfer Characteristics**

Figure5. Capacitance

Figure6. $R_{DS(ON)}$ vs Junction Temperature

Figure7. Max BV_{DSS} vs Junction Temperature

Figure8. $V_{GS(th)}$ vs Junction Temperature

Figure9. Gate Charge Waveforms

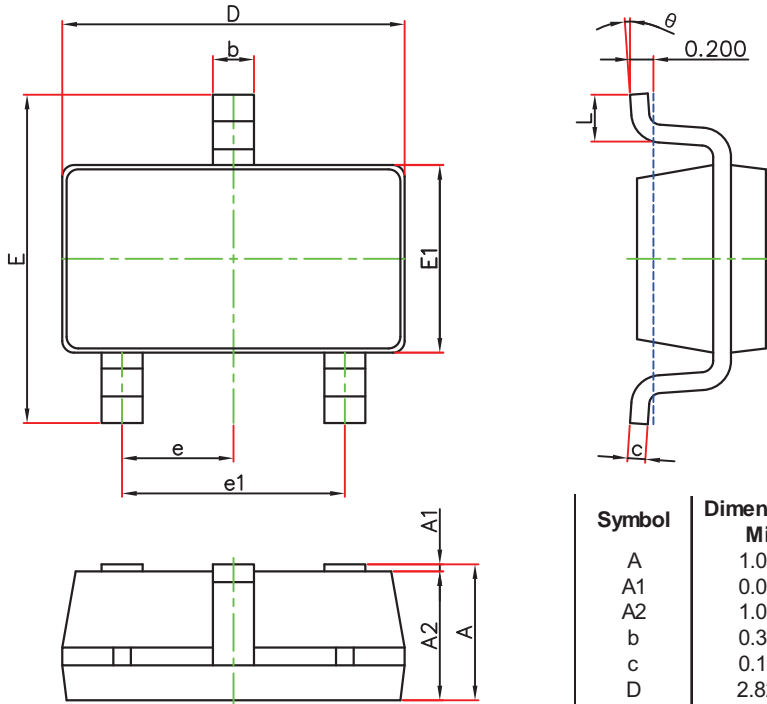**Figure10. Maximum Safe Operating Area**

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Figure11. Normalized Maximum Transient Thermal Impedance

1. $R_{\theta JA}(t) = r(t) * R_{\theta JA}$
2. $R_{\theta JA} = $ See Datasheet
3. $T_{JM} - T_A = P * R_{\theta JA}(t)$
4. Duty Cycle, $D = t1/t2$

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°

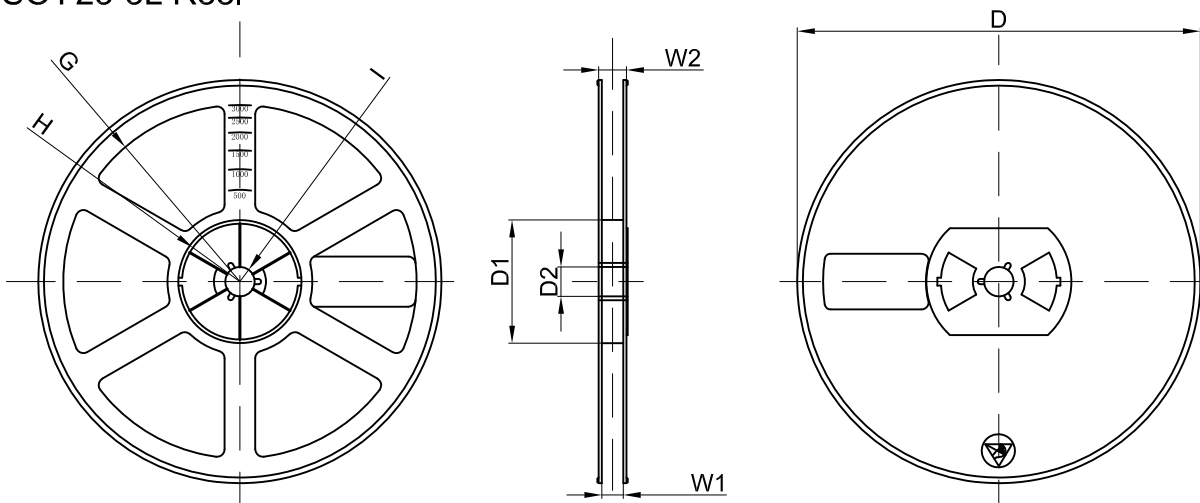## SOT23-3L Suggested Pad Layout
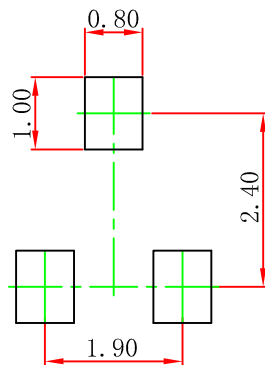
Note:
1.Controlling dimension:in millimeters.
2.General tolerance:± 0.05mm.
3.The pad layout is for reference purposes only.

![JYELECTRONICS logo]

JY3407X

SOT23-3L Tape and Reel

SOT23-3L Embossed Carrier Tape
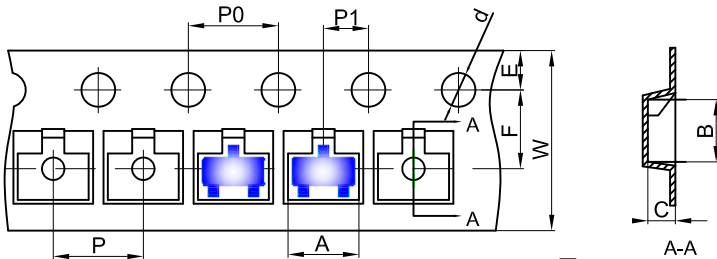
Packaging Description:
    SOT23-3L parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed 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

Trailer Tape — 100±2 Empty Pockets | Components | Leader Tape — 100±2 Empty Pockets
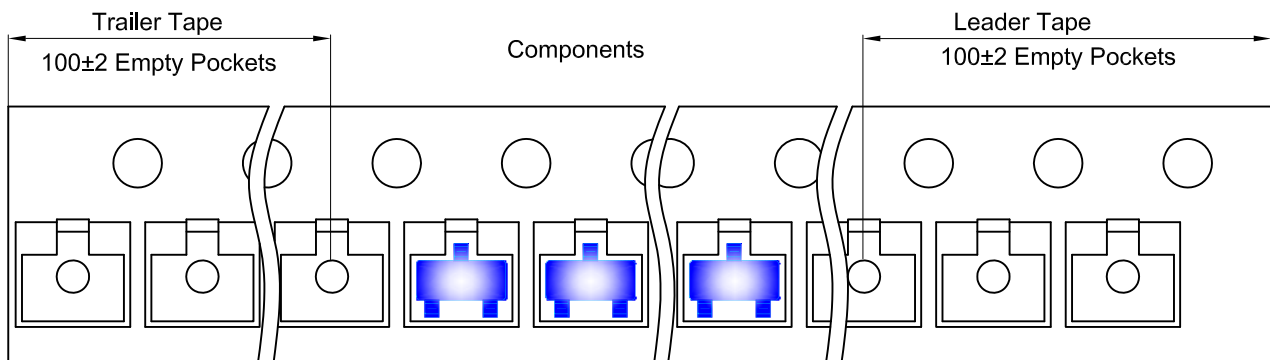
SOT23-3L Reel

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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