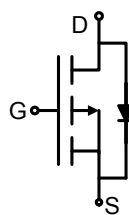
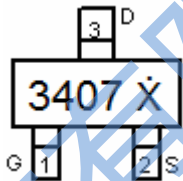



**NCE P-Channel Enhancement Mode Power MOSFET**

<p><b>Description</b> The NCE3407 uses advanced trench technology to provide excellent <math>R_{DS(ON)}</math>. This device is suitable for use as a load switch or in PWM applications.</p> <p><b>General Features</b></p> <ul style="list-style-type: none"> <li>● <math>V_{DS} = -30V, I_D = -4.6A</math>  <math>R_{DS(ON)} &lt; 95m\Omega @ V_{GS} = -4.5V</math>  <math>R_{DS(ON)} &lt; 65m\Omega @ V_{GS} = -10V</math></li> <li>● High power and current handling capability</li> <li>● Lead free product is acquired</li> <li>● Surface mount package</li> </ul> <p><b>Application</b></p> <ul style="list-style-type: none"> <li>● PWM applications</li> <li>● Load switch</li> <li>● Power management</li> </ul>	<div style="text-align: center;">  <p><b>Schematic diagram</b></p>  <p><b>Marking and pin assignment</b></p>  <p><b>SOT-23 top view</b></p> </div>
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**Package Marking and Ordering Information**

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
3407 X	NCE3407	SOT-23	Ø180mm	8 mm	3000 units

**Absolute Maximum Ratings ( $T_A = 25^\circ C$  unless otherwise noted)**

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	$V_{DS}$	-30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current-Continuous	$I_D$	-4.6	A
Drain Current-Pulsed <sup>(Note 1)</sup>	$I_{DM}$	-20	A
Maximum Power Dissipation	$P_D$	1.4	W
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 To 150	$^\circ C$

**Thermal Characteristic**

Thermal Resistance, Junction-to-Ambient <sup>(Note 2)</sup>	$R_{\theta JA}$	90	$^\circ C/W$
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**Electrical Characteristics ( $T_A = 25^\circ C$  unless otherwise noted)**

Parameter	Symbol	Condition	Min	Typ	Max	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-30	-33	-	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -24V, V_{GS} = 0V$	-	-	-1	$\mu A$

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 100$	nA
<b>On Characteristics</b> (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.1	-1.5	-2.2	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-4.6A$	-	48	65	m $\Omega$
		$V_{GS}=-4.5V, I_D=-4A$	-	60	95	m $\Omega$
Forward Transconductance	$g_{FS}$	$V_{DS}=-5V, I_D=-4.6A$	-	10	-	S
<b>Dynamic Characteristics</b> (Note4)						
Input Capacitance	$C_{iss}$	$V_{DS}=-15V, V_{GS}=0V,$ $F=1.0MHz$	-	650	-	PF
Output Capacitance	$C_{oss}$		-	105	-	PF
Reverse Transfer Capacitance	$C_{rss}$		-	65	-	PF
<b>Switching Characteristics</b> (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=-15V, R_L=3.6\Omega$ $V_{GS}=-10V, R_{GEN}=3\Omega$	-	8.5	-	nS
Turn-on Rise Time	$t_r$		-	4.5	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	26	-	nS
Turn-Off Fall Time	$t_f$		-	12.5	-	nS
Total Gate Charge	$Q_g$	$V_{DS}=-15V, I_D=-4.6A, V_{GS}=-10V$	-	12.5	-	nC
Gate-Source Charge	$Q_{gs}$		-	2.8	-	nC
Gate-Drain Charge	$Q_{gd}$		-	2.7	-	nC
<b>Drain-Source Diode Characteristics</b>						
Diode Forward Voltage (Note 3)	$V_{SD}$	$V_{GS}=0V, I_S=-4.6A$	-	-	-1.2	V

### Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board,  $t \leq 10$  sec.
3. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .
4. Guaranteed by design, not subject to production

Typical Electrical and Thermal Characteristics

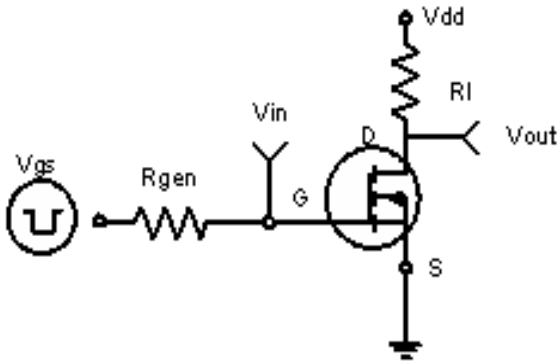


Figure 1: Switching Test Circuit

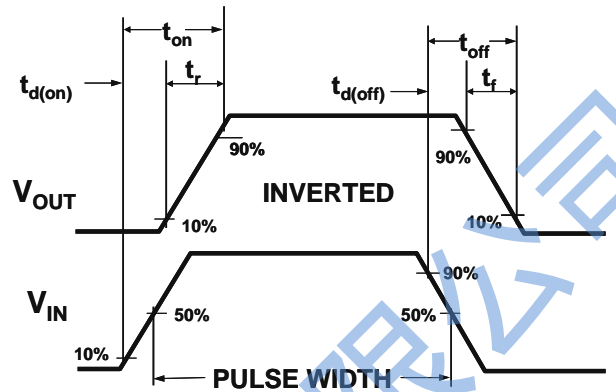


Figure 2: Switching Waveforms

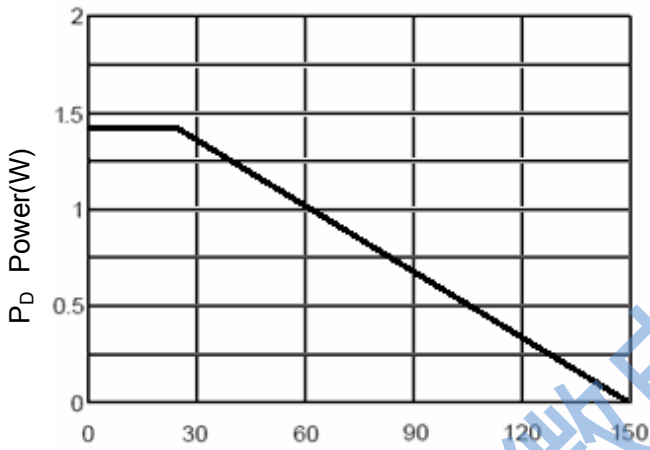


Figure 3 Power Dissipation

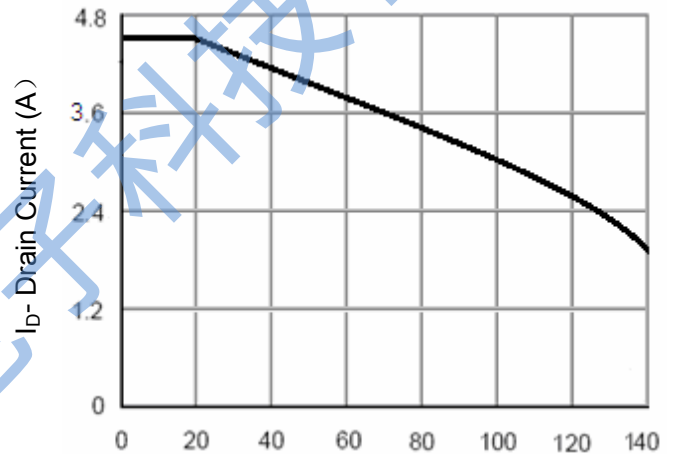


Figure 4 Drain Current

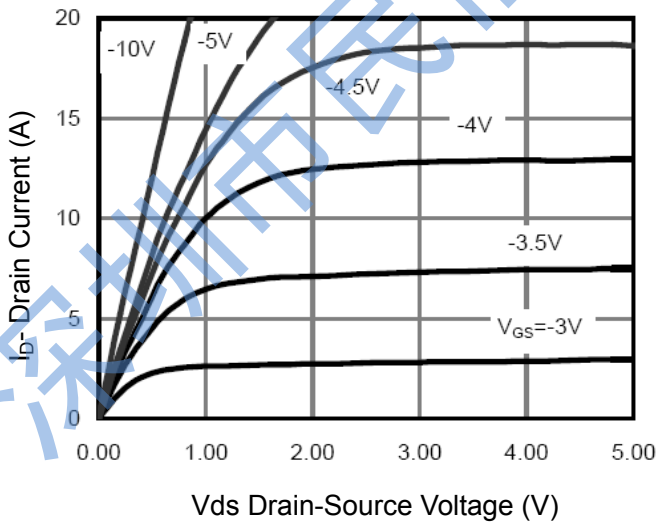


Figure 5 Output Characteristics

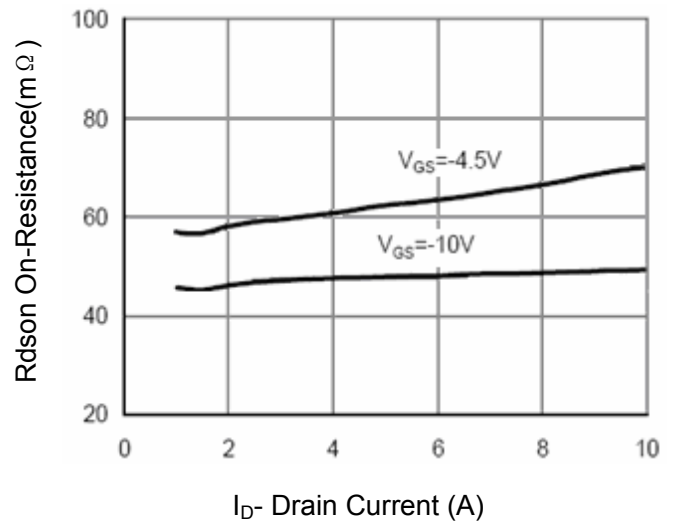


Figure 6 Drain-Source On-Resistance

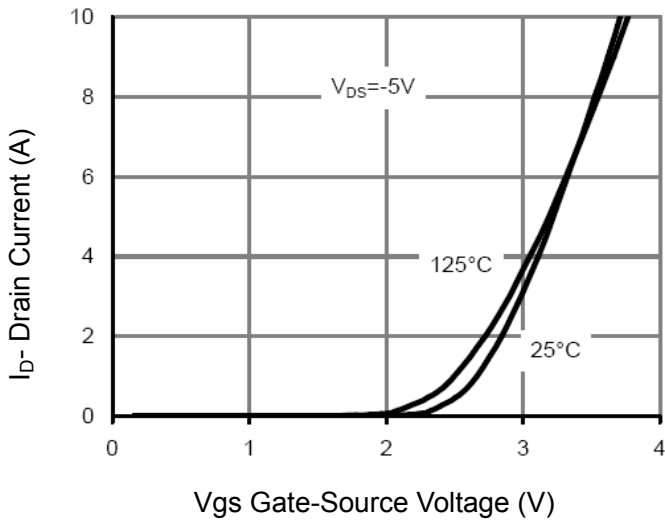


Figure 7 Transfer Characteristics

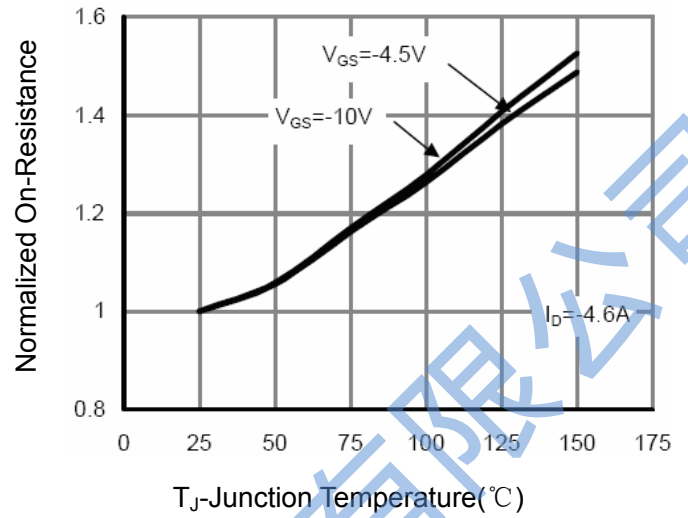


Figure 8 Drain-Source On-Resistance

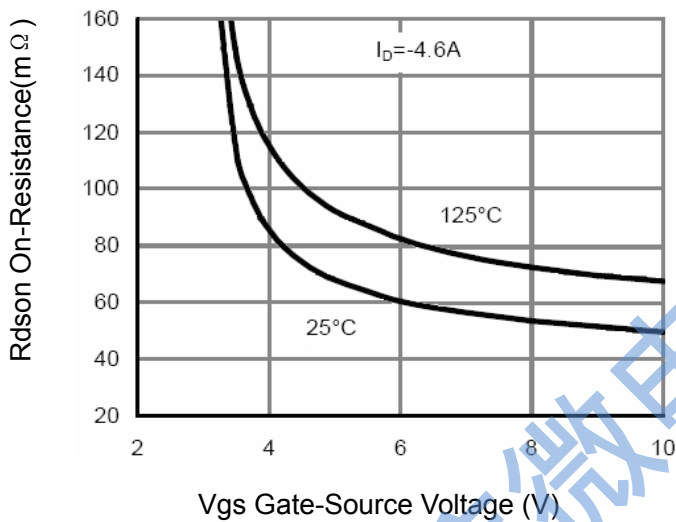


Figure 9 Rdson vs Vgs

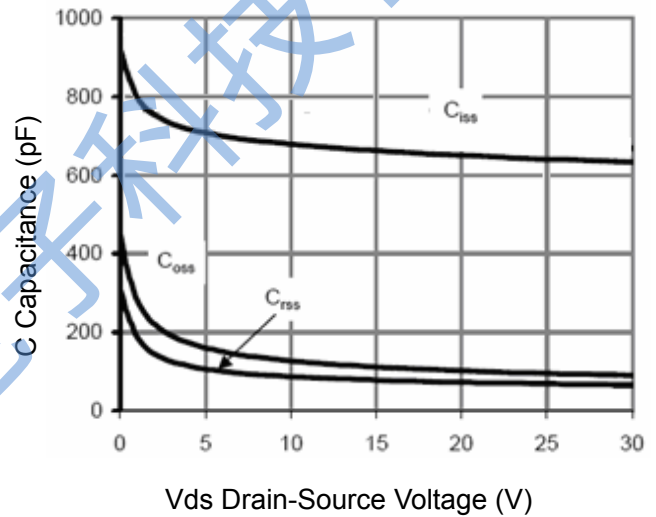


Figure 10 Capacitance vs Vds

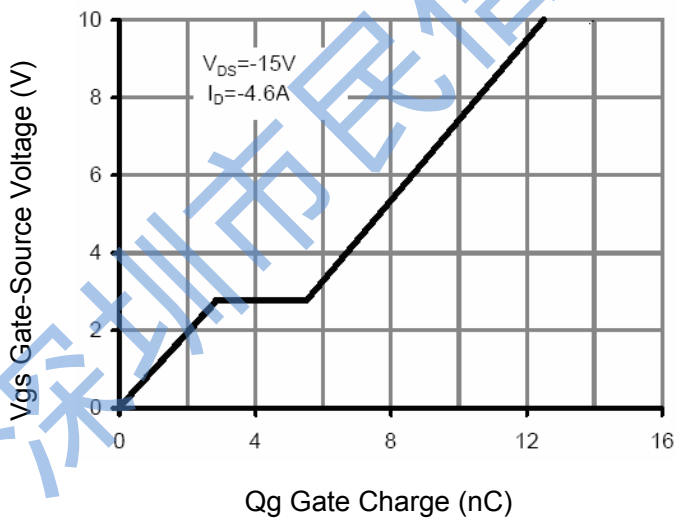


Figure 11 Gate Charge

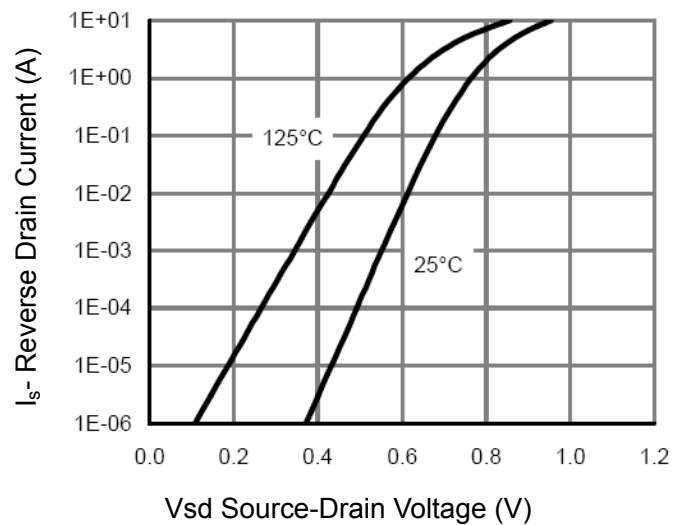


Figure 12 Source- Drain Diode Forward

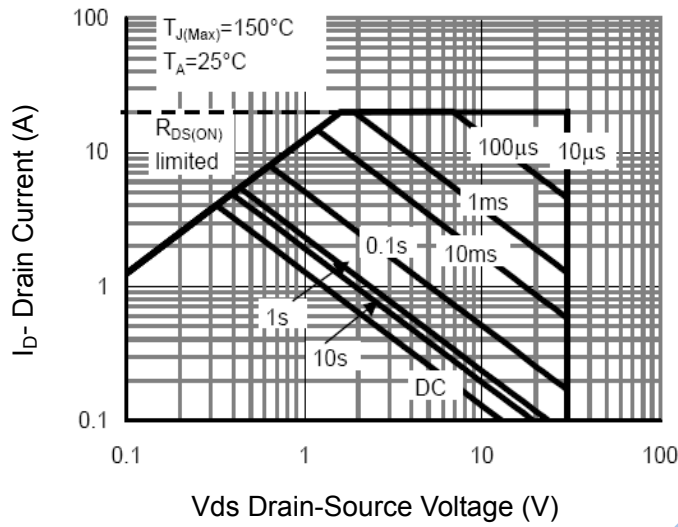


Figure 13 Safe Operation Area

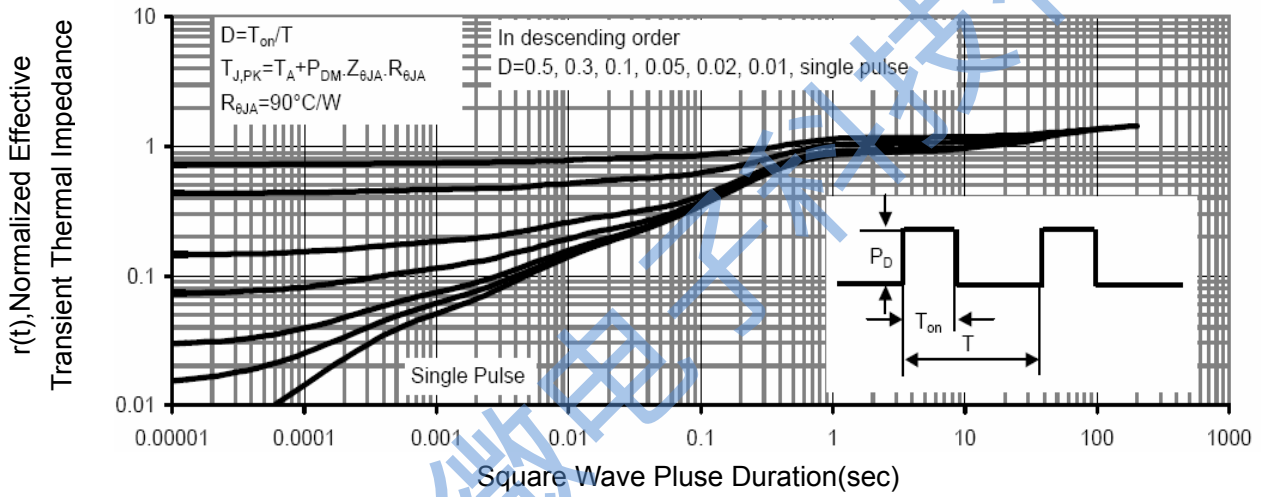
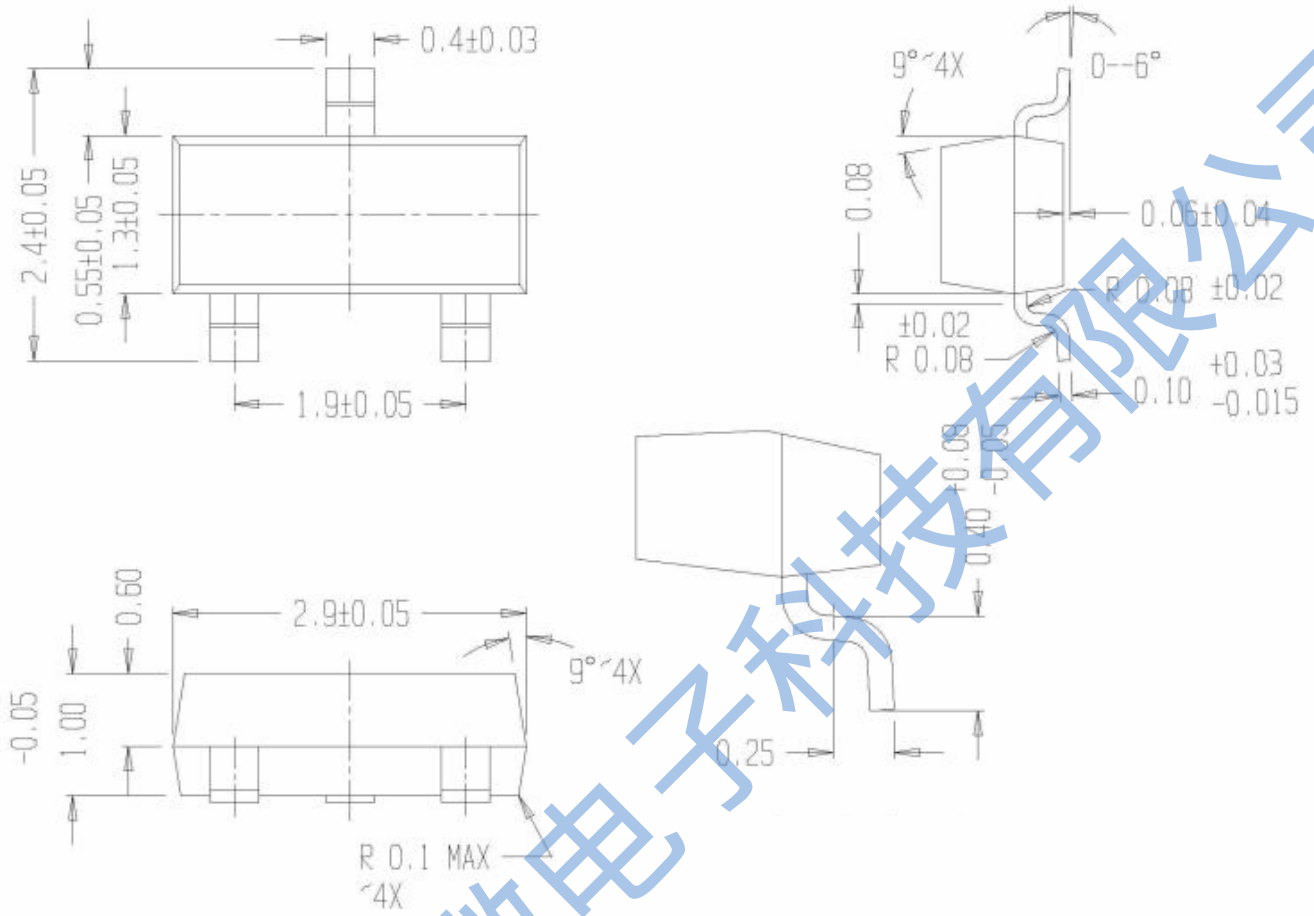
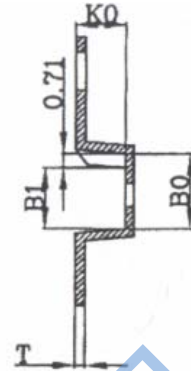
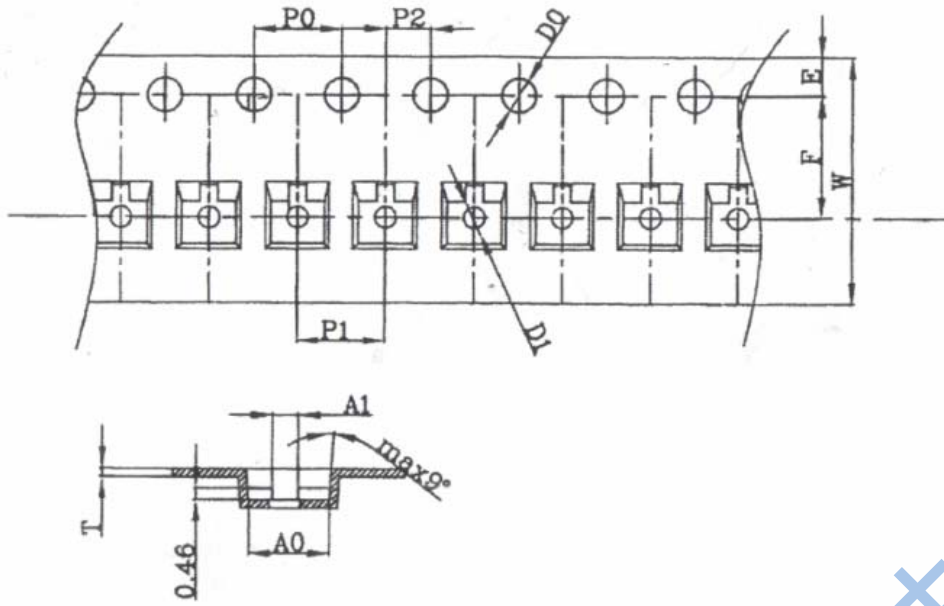


Figure 14 Normalized Maximum Transient Thermal Impedance

SOT-23 Package Information



深圳市民信微电子技术有限公司



NOTE:  
 1. 材料：导电PC (Denka ECM3K, 0.20T) ;  
 2. 10个链孔的累积公差不能超过0.2mm;  
 3. 250mm带子的扇形不得超过1mm;  
 4. 所有尺寸符合EIA-481-E的要求

SYMBOL	A0	A1	B0	B1	K0	P0	P1	P2
SPEC	3.15±0.10	0.99±0.2	2.77±0.10	2.06±0.10	1.22±0.10	4.00±0.10	4.00±0.10	2.00±0.05
SYMBOL	T	E	F	D0	D1	W		
SPEC	0.2±0.02	1.75±0.10	3.50±0.50	1.55 <sup>+0.1</sup> <sub>0</sub>	1.0 <sup>+0.25</sup> <sub>0</sub>	8.00±0.1		

Carrier Tape

PKG TYPE	Lead count	Tape Width	Reel Diameter	QTY/Reel	QTY/Outer Box	G.W.(kg)
SOT-23	3	8mm	7"	3000	180000	6.5

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