

Description

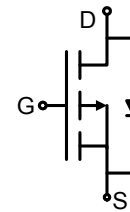
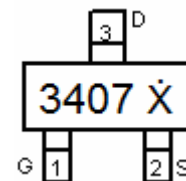
The RST3407 uses advanced trench technology to provide excellent $R_{DS(ON)}$. This device is suitable for use as a load switch or in PWM applications.

General Features

- $V_{DS} = -30V, I_D = -4.6A$
 $R_{DS(ON)} < 95m\Omega @ V_{GS} = -4.5V$
 $R_{DS(ON)} < 65m\Omega @ V_{GS} = -10V$
- 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

SOT-23 top view
Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
3407 X	RST3407	SOT-23	Ø180mm	8 mm	3000 units

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous	I_D	-4.6	A
Drain Current-Pulsed ^(Note 1)	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	$^\circ\text{C}$

Thermal Characteristic

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

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
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	μA

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±20V,V _{DS} =0V	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} ,I _D =-250μA	-1.1	-1.5	-2.1	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =-10V, I _D =-4.6A	-	48	65	mΩ
		V _{GS} =-4.5V, I _D =-4A	-	60	95	mΩ
Forward Transconductance	g _{FS}	V _{DS} =-5V,I _D =-4.6A	-	10	-	S
Dynamic Characteristics (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
Switching Characteristics (Note 4)						
Turn-on Delay Time	t _{d(on)}	V _{DD} =-15V,R _L =3.6Ω V _{GS} =-10V,R _{GEN} =3Ω	-	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
Drain-Source Diode Characteristics						
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

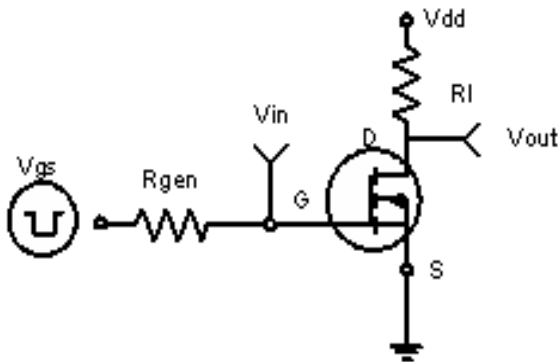


Figure 1: Switching Test Circuit

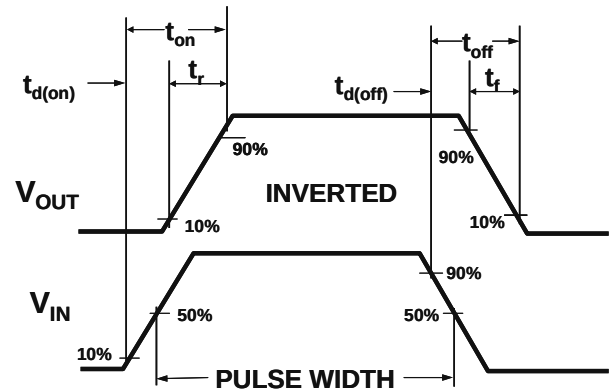


Figure 2: Switching Waveforms

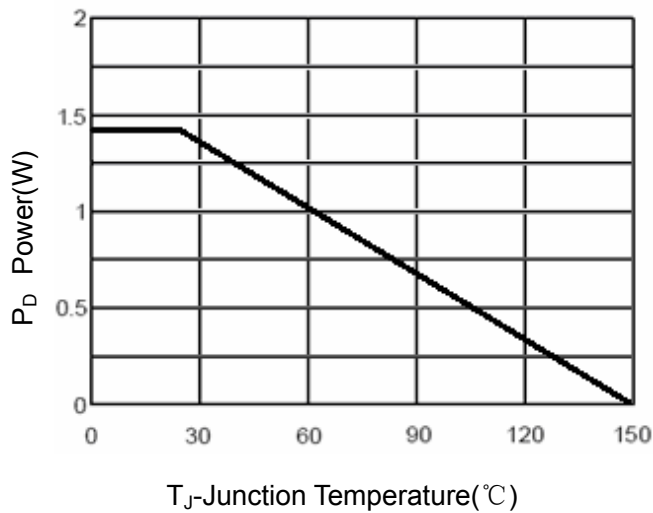


Figure 3 Power Dissipation

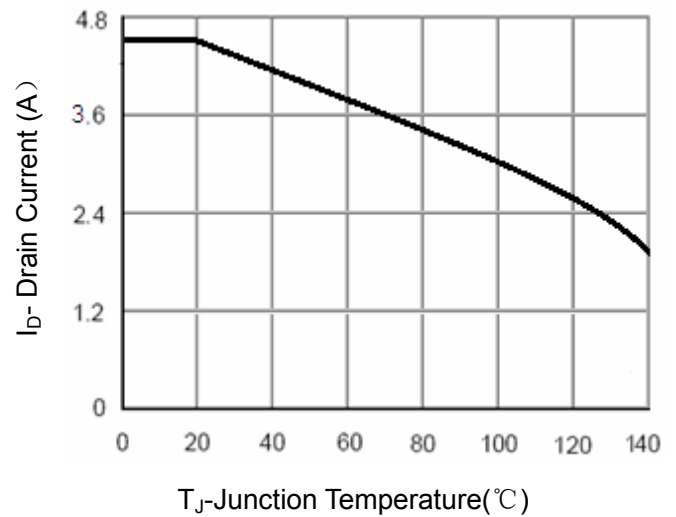


Figure 4 Drain Current

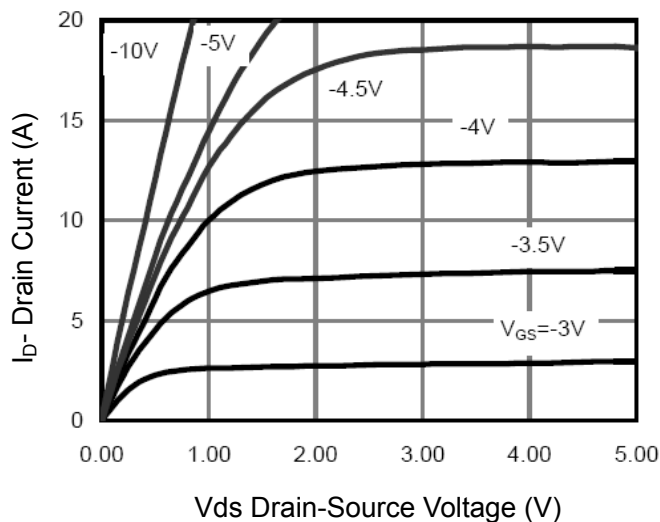


Figure 5 Output Characteristics

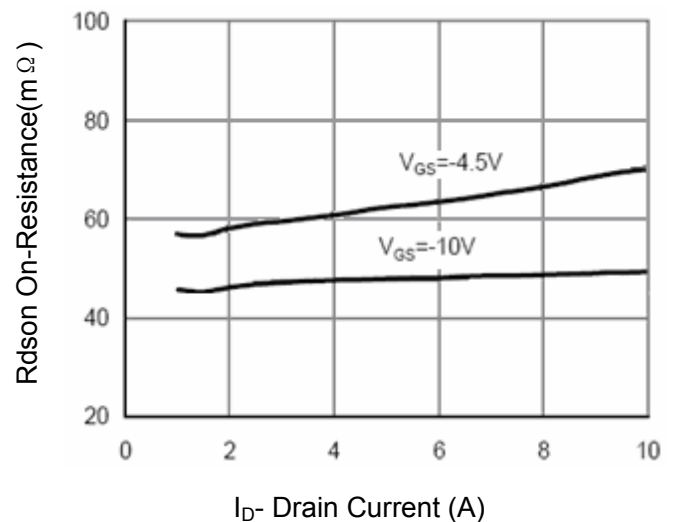
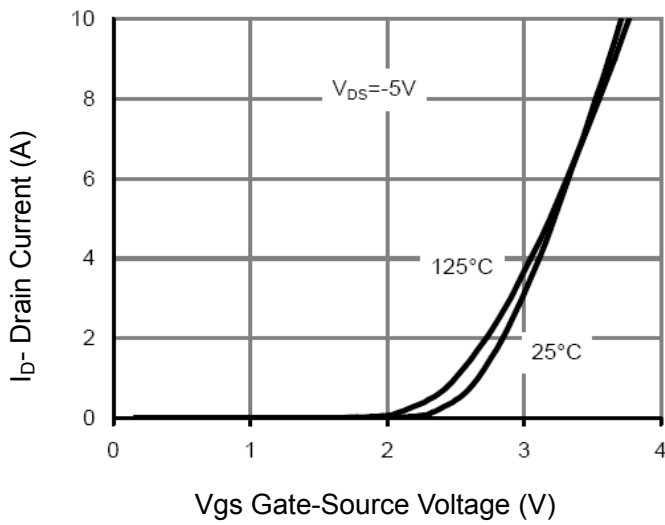
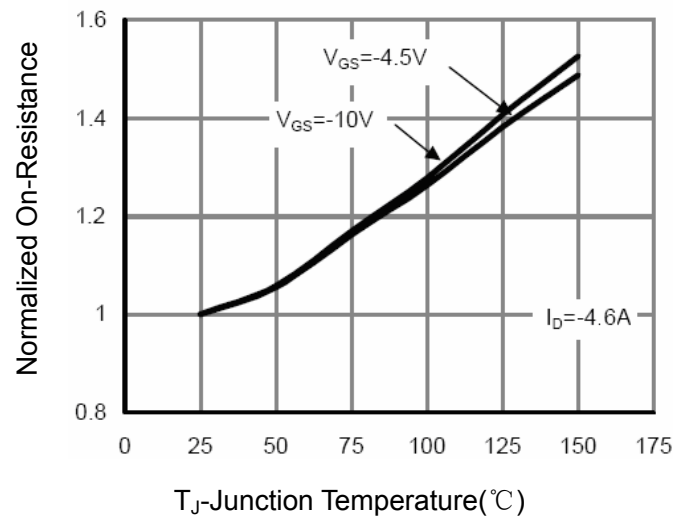
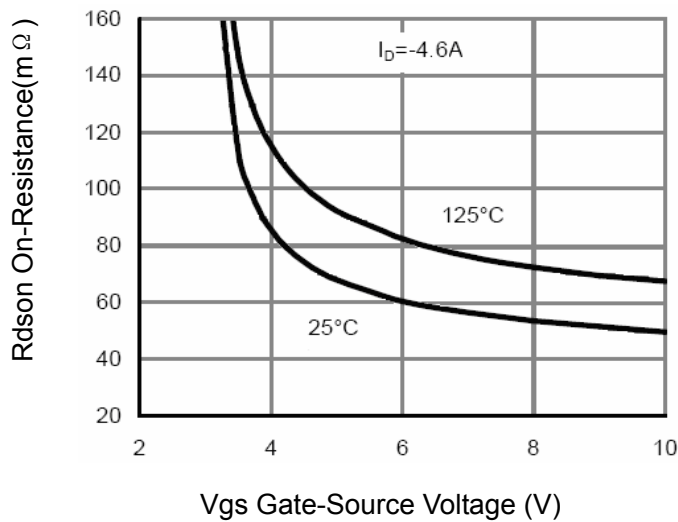
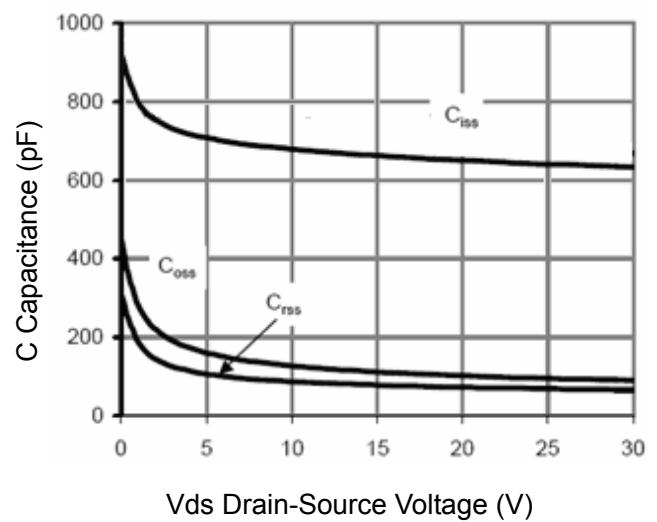
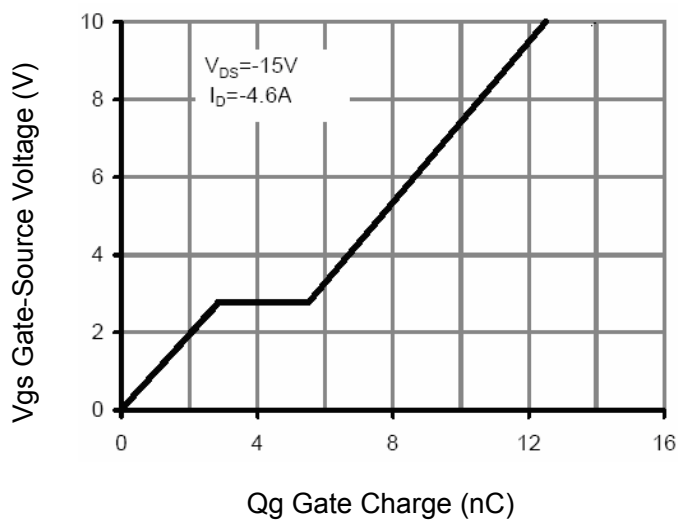
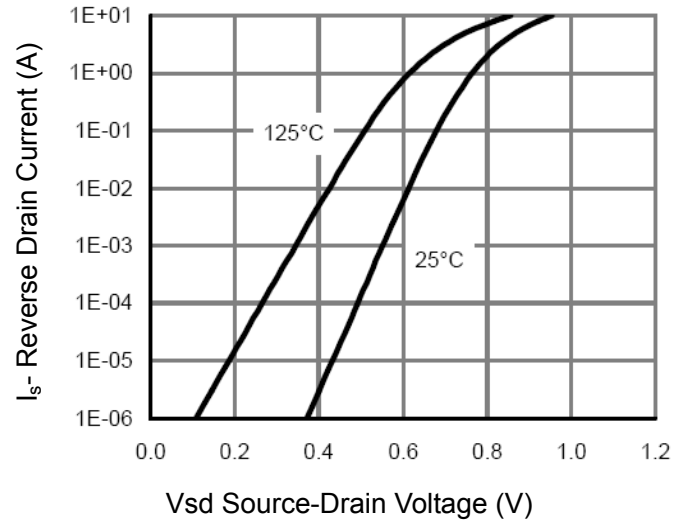


Figure 6 Drain-Source On-Resistance


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

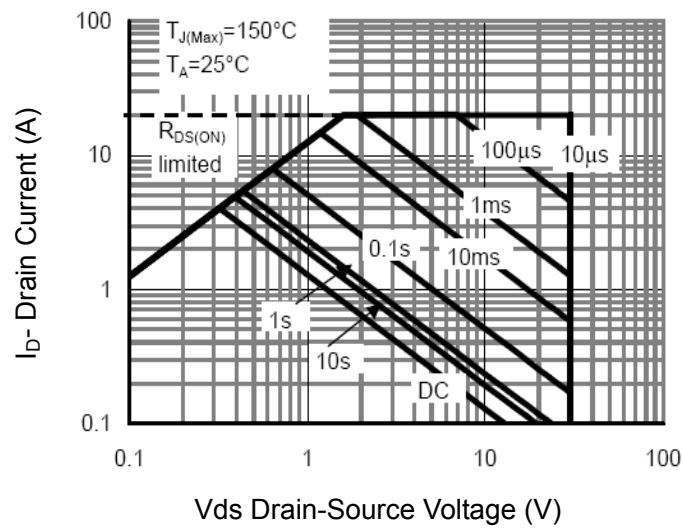


Figure 13 Safe Operation Area

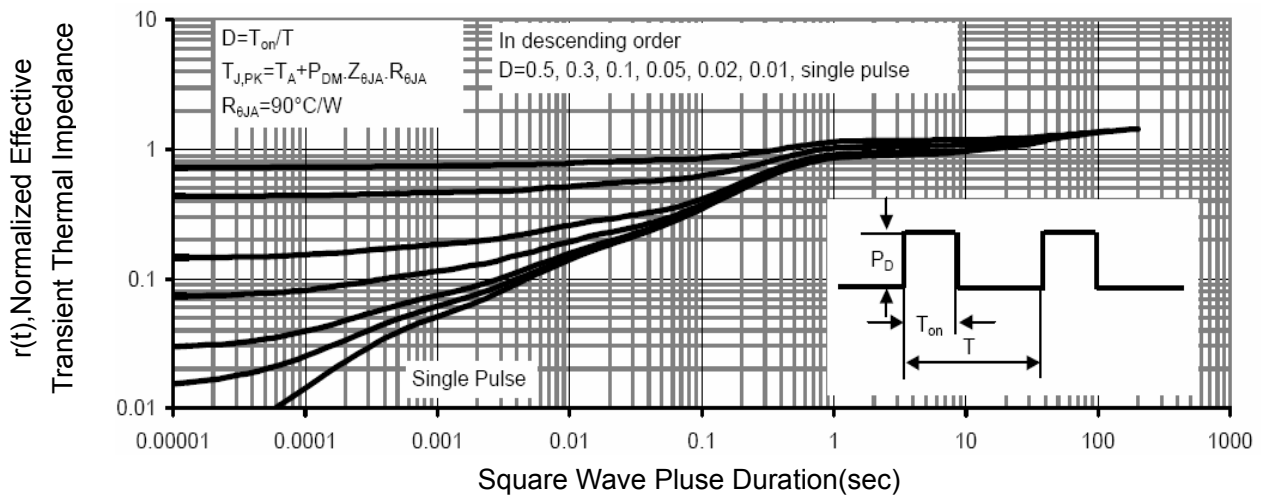
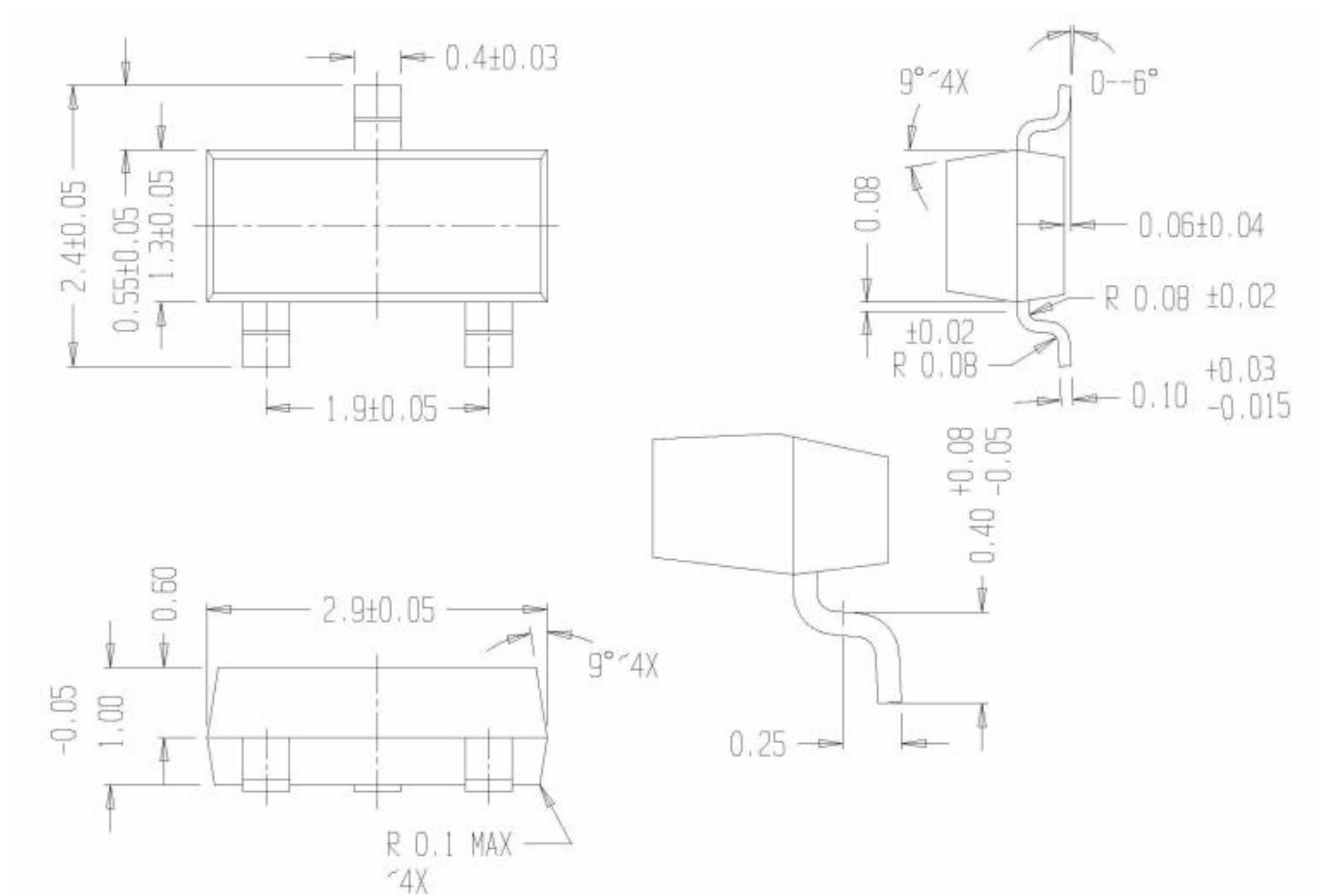
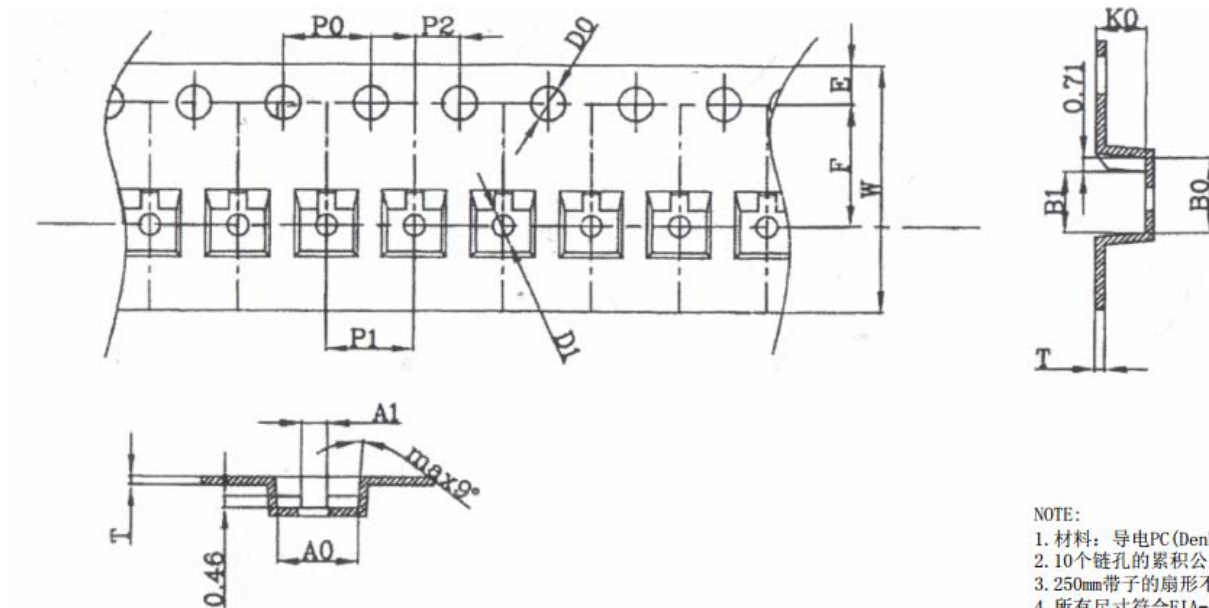


Figure 14 Normalized Maximum Transient Thermal Impedance

SOT-23 Package Information




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 ^{+0.1} ₀	1.0 ^{+0.25} ₀	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