

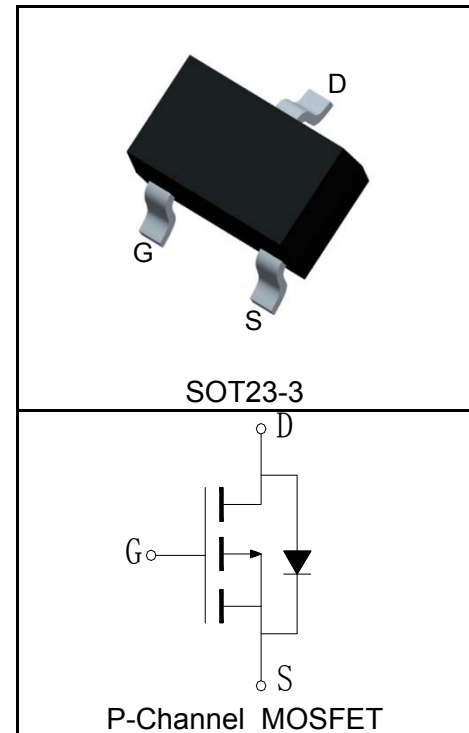
Features

- -20V/-5A,
 $R_{DS(ON)} = 20m\Omega(Typ.)@V_{GS} = -4.5V$
 $R_{DS(ON)} = 30m\Omega(Typ.)@V_{GS} = -2.5V$
- Low On-Resistance
- Super High Dense Cell Design
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)

Applications

- Load Switch
- Power Management
- Battery Protection

Pin Description



Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (T _A = 25°C Unless Otherwise Noted)				
V _{DSS}	Drain-Source Voltage		-20	V
V _{GSS}	Gate-Source Voltage		±10	
T _J	Maximum Junction Temperature		150	°C
T _{STG}	Storage Temperature Range		-55 to 150	°C
I _S	Diode Continuous Forward Current	T _A =25°C	-1	A
Mounted on Large Heat Sink				
I _{DP} ^①	300μs Pulse Drain Current Tested	T _A =25°C	-20	A
I _D ^②	Continuous Drain Current(V _{GS} =-10V)	T _A =25°C	-5	A
		T _A =70°C	-3.1	
P _D	Maximum Power Dissipation	T _A =25°C	1.3	W
		T _A =70°C	0.8	
R _{θJC}	Thermal Resistance-Junction to Case		-	°C/W
R _{θJA} ^③	Thermal Resistance-Junction to Ambient		100	°C/W
Drain-Source Avalanche Ratings				
E _{AS} ^④	Avalanche Energy, Single Pulsed		-	mJ

Electrical Characteristics ($T_A=25^{\circ}\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Test Condition	RU20P7C			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =-250μA	-20			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-20V, V _{GS} =0V			-1	μA
		T _J =125°C			-30	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =-250μA	-0.4	-0.7	-1.1	V
I _{GSS}	Gate Leakage Current	V _{GS} =±10V, V _{DS} =0V			±100	nA
R _{DS(ON)} ⑤	Drain-Source On-state Resistance	V _{GS} =-4.5V, I _{DS} =-5A		20	28	mΩ
		V _{GS} =-2.5V, I _{DS} =-4A		30	38	mΩ
Diode Characteristics						
V _{SD} ⑤	Diode Forward Voltage	I _{SD} =-1A, V _{GS} =0V			-1.2	V
t _{rr}	Reverse Recovery Time	I _{SD} =-5A, dI _{SD} /dt=100A/μs		17		ns
Q _{rr}	Reverse Recovery Charge			23		nC
Dynamic Characteristics ⑥						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz		0.9		Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =-10V, Frequency=1.0MHz		640		pF
C _{oss}	Output Capacitance			135		
C _{rss}	Reverse Transfer Capacitance			65		
t _{d(ON)}	Turn-on Delay Time	V _{DD} =-10V, R _L =3.8Ω, I _{DS} =-5A, V _{GEN} =-4.5V, R _G =6Ω		9		ns
t _r	Turn-on Rise Time			16		
t _{d(OFF)}	Turn-off Delay Time			45		
t _f	Turn-off Fall Time			21		
Gate Charge Characteristics ⑥						
Q _g	Total Gate Charge	V _{DS} =-16V, V _{GS} =-10V, I _{DS} =-5A		10		nC
Q _{gs}	Gate-Source Charge			2		
Q _{gd}	Gate-Drain Charge			3		

- Notes:
- ① Pulse width limited by safe operating area.
 - ② Calculated continuous current based on maximum allowable junction temperature.
 - ③ When mounted on 1 inch square copper board, $t \leq 10\text{sec}$. The value in any given application depends on the user's specific board design.
 - ④ Limited by T_{Jmax} . Starting $T_J = 25^{\circ}\text{C}$.
 - ⑤ Pulse test; Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
 - ⑥ Guaranteed by design, not subject to production testing.

Ordering and Marking Information

Device	Marking ^①	Package	Packaging	Quantity	Reel Size	Tape width
RU20P7C	QXYWW	SOT23-3	Tape&Reel	3000	7"	8mm

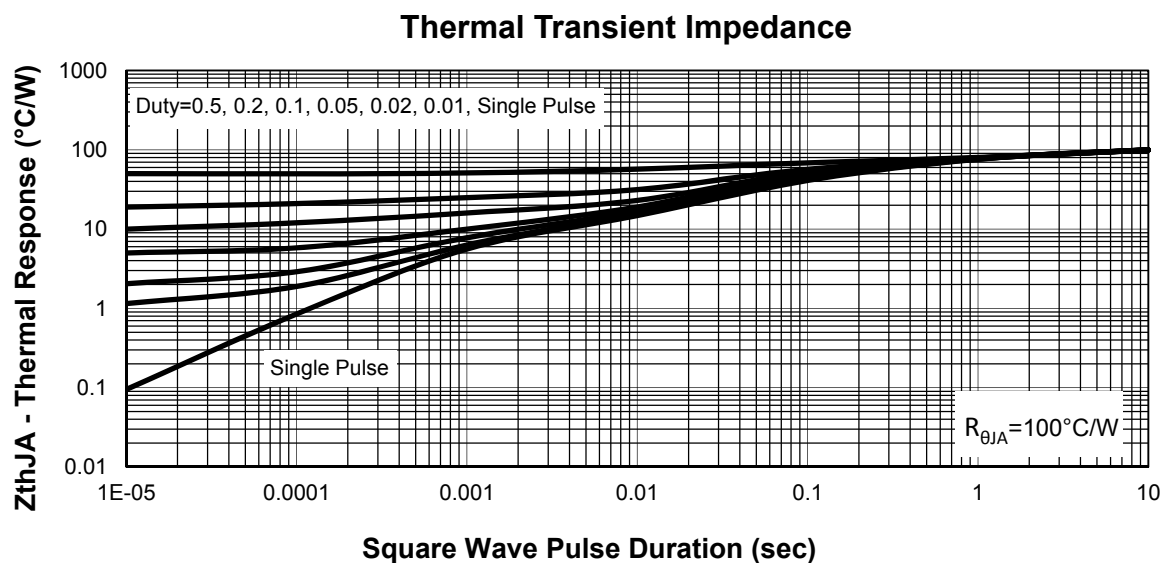
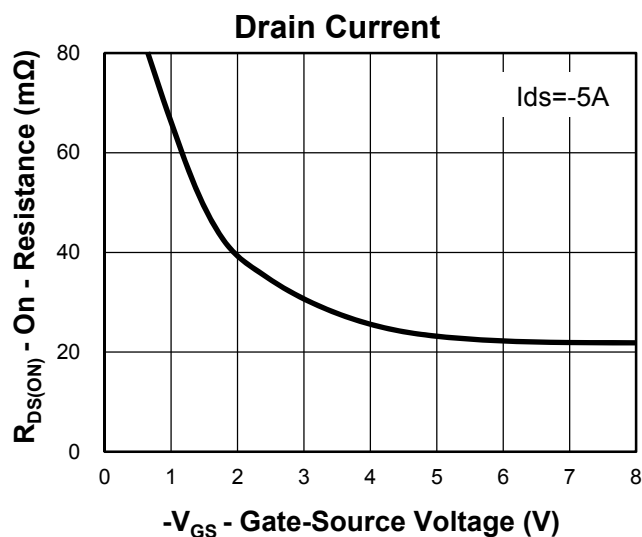
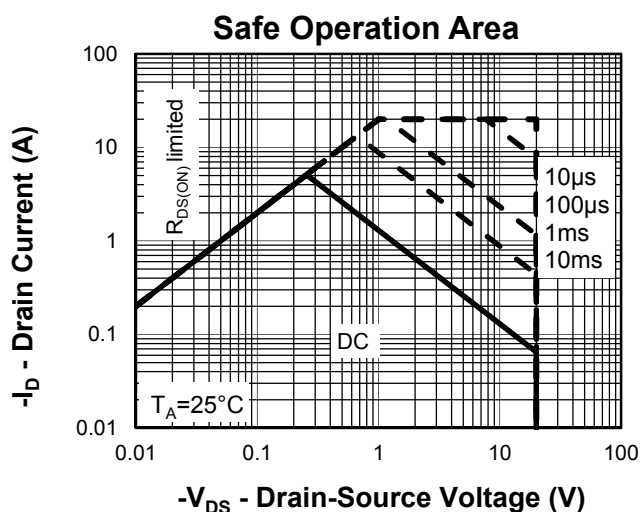
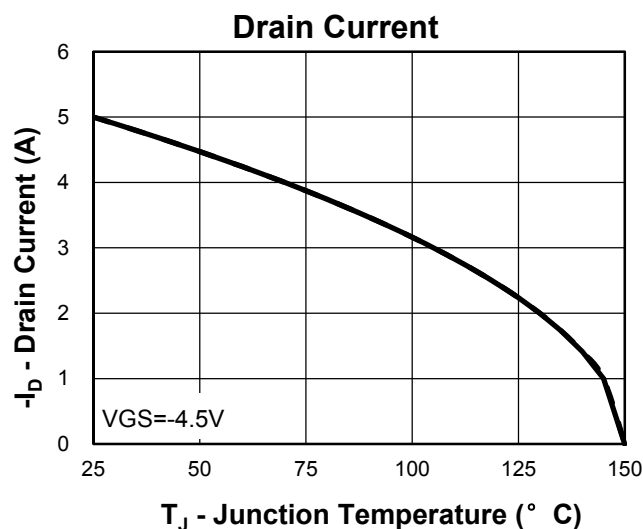
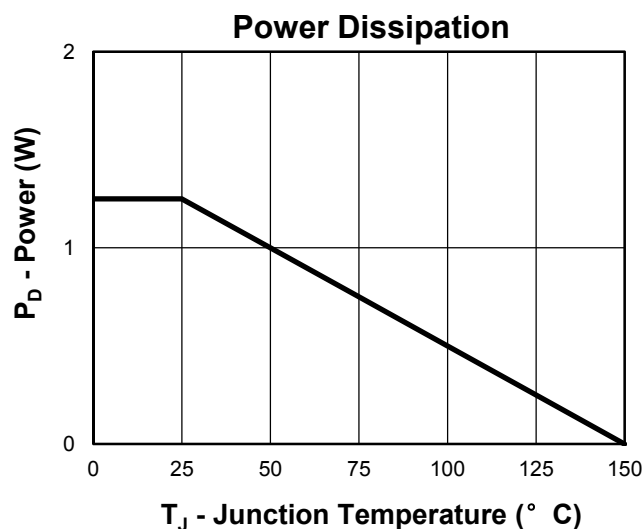
① The following characters could be different and means:

X =Assembly site code

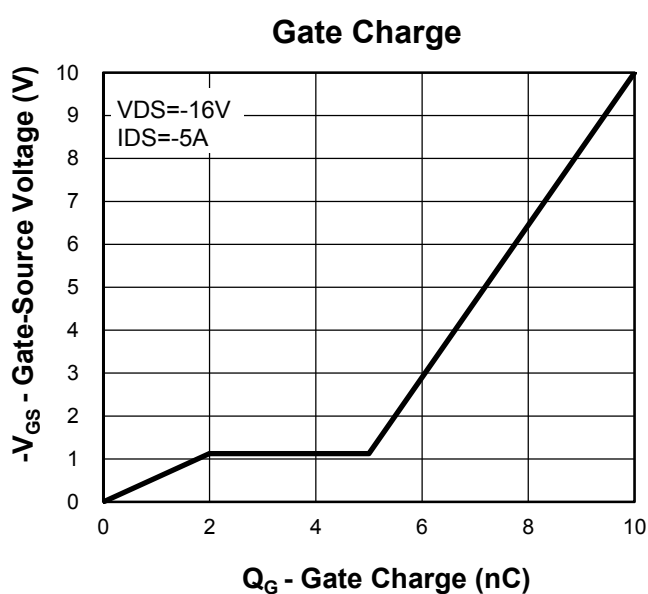
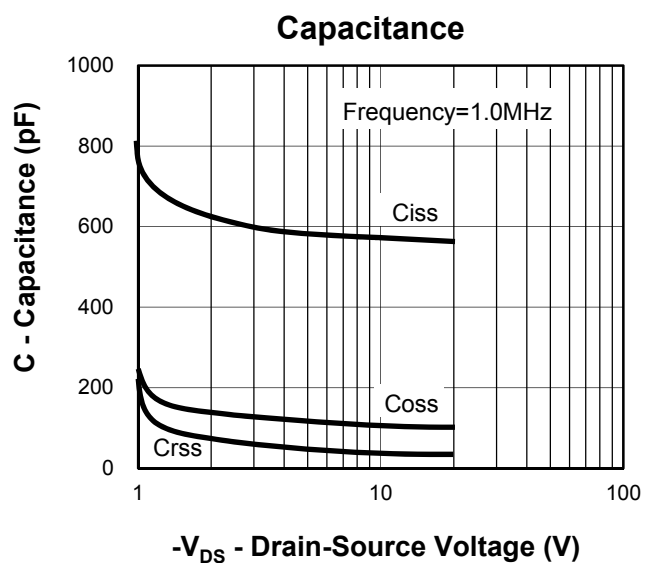
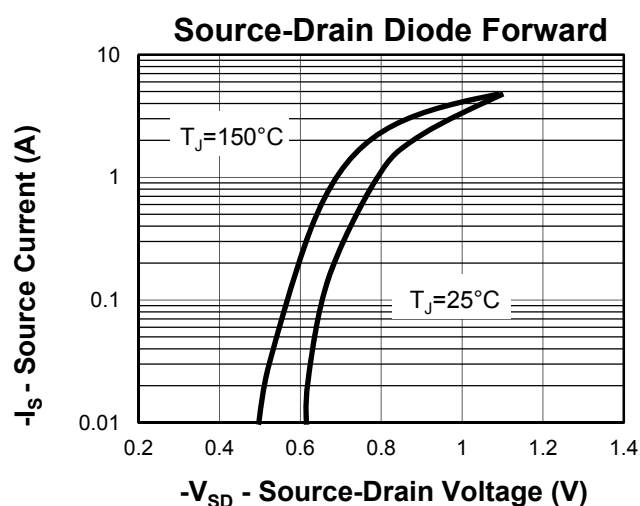
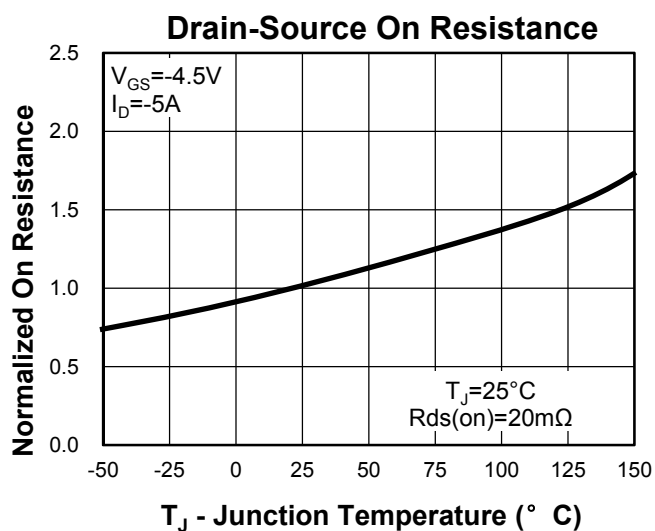
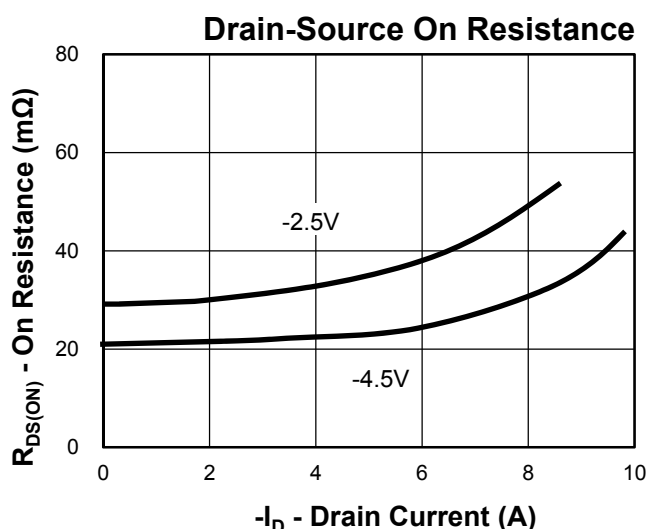
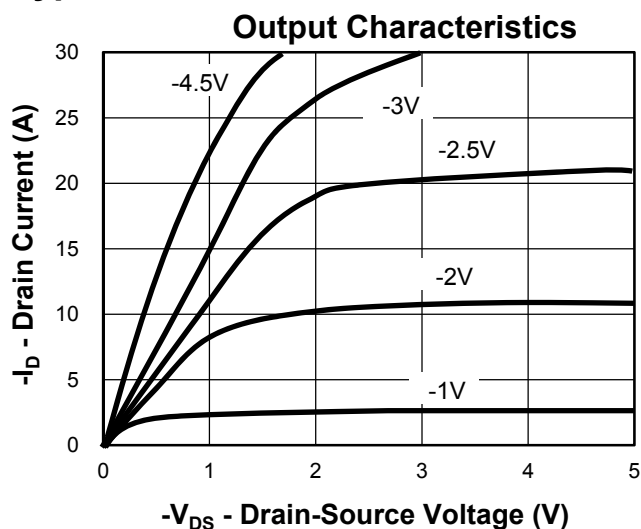
Y =Year

WW =Work Week

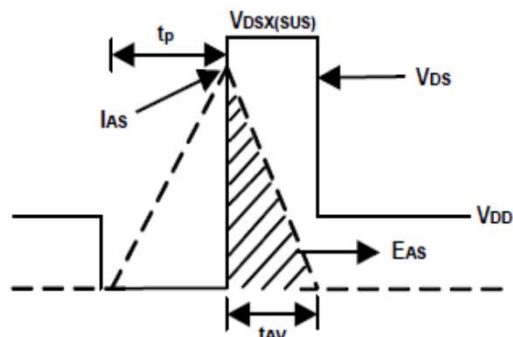
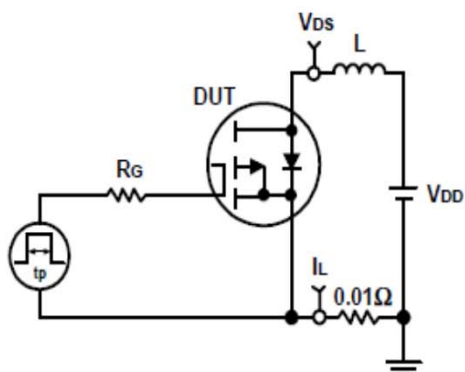
Typical Characteristics



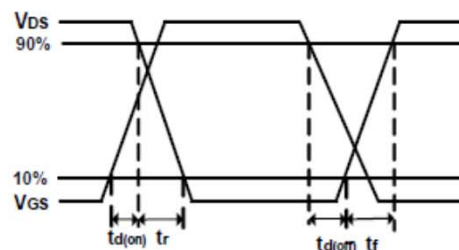
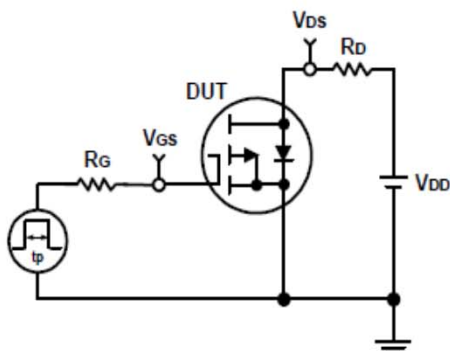
Typical Characteristics



Avalanche Test Circuit and Waveforms

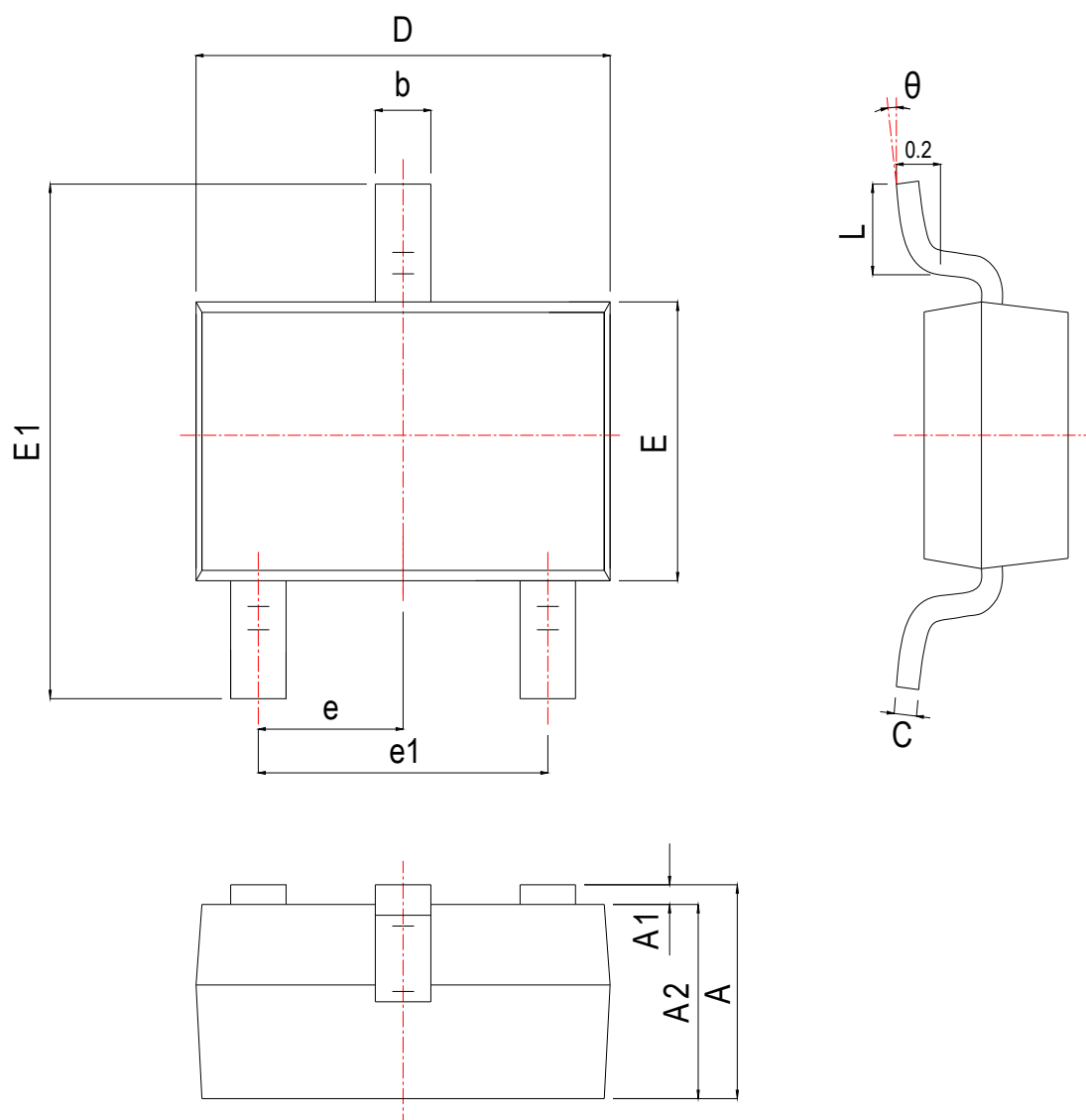


Switching Time Test Circuit and Waveforms



Package Information

SOT23-3



SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.050	1.150	1.250	0.041	0.045	0.049
A1	0.000	0.050	0.100	0.000	0.002	0.004
A2	1.050	1.100	1.150	0.041	0.043	0.045
b	0.300	0.400	0.500	0.012	0.016	0.020
c	0.100	0.150	0.200	0.004	0.006	0.008
D	2.820	2.920	3.020	0.111	0.115	0.119
E	1.500	1.600	1.700	0.059	0.063	0.067
E1	2.650	2.800	2.950	0.104	0.110	0.116
e	0.950 BSC			0.037 BSC		
e1	1.800	1.900	2.000	0.071	0.075	0.079
L	0.300	0.450	0.600	0.012	0.018	0.024
θ	0°	4°	8°	0°	4°	8°

Customer Service

Worldwide Sales and Service:

Sales@ruichips.com

Technical Support:

Technical@ruichips.com

Investor Relations Contacts:

Investor@ruichips.com

Marcom Contact:

Marcom@ruichips.com

Editorial Contact:

Editorial@ruichips.comm

HR Contact:

HR@ruichips.com

Legal Contact:

Legal@ruichips.com

Shen Zhen RUICHIPS Semiconductor CO., LTD

4th Floor, Block 8, Changyuan New Material Port, Keyuan Middle Road, Science & Industry Park,
Nanshan District, Shenzhen, CHINA

TEL: (86-755) 8311-5334

FAX: (86-755) 8311-4278

E-mail: Sales-SZ@ruichips.com