

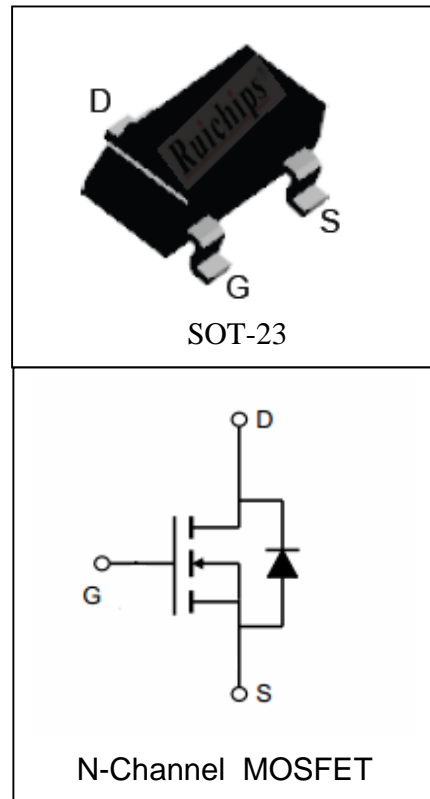
Features

- 30V/4A,
 $R_{DS(ON)} = 44m\Omega$ (Typ.) @ $V_{GS} = 4.5V$
 $R_{DS(ON)} = 53m\Omega$ (Typ.) @ $V_{GS} = 2.5V$
- Low $R_{DS(ON)}$
- Super High Dense Cell Design
- Reliable and Rugged
- Lead Free and Green Available

Applications

- Load/System Switch

Pin Description



Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
Common Ratings ($T_A = 25^\circ C$ Unless Otherwise Noted)			
V_{DSS}	Drain-Source Voltage	30	V
V_{GSS}	Gate-Source Voltage	± 12	
T_J	Maximum Junction Temperature	150	$^\circ C$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
I_S	Diode Continuous Forward Current	$T_A = 25^\circ C$ 1.1	A
Mounted on Large Heat Sink			
I_{DP}	300 μs Pulse Drain Current Tested	$T_A = 25^\circ C$ 15 ^①	A
I_D	Continuous Drain Current ($V_{GS} = 4.5V$)	$T_A = 25^\circ C$ 4	A
		$T_A = 70^\circ C$ 2.9	
P_D	Maximum Power Dissipation	$T_A = 25^\circ C$ 1	W
		$T_A = 70^\circ C$ 0.64	
$R_{\theta JA}$ ^②	Thermal Resistance-Junction to Ambient	125	$^\circ C/W$

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

Symbol	Parameter	Test Condition	RU304B			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	30			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=30V, V_{GS}=0V$ $T_J=85^\circ\text{C}$			1	μA
					30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	0.5	-	1.5	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$			± 100	nA
$R_{DS(ON)}^{(3)}$	Drain-Source On-state Resistance	$V_{GS}=4.5V, I_{DS}=4A$		44	60	$m\Omega$
		$V_{GS}=2.5V, I_{DS}=2A$		53	80	$m\Omega$
Diode Characteristics						
$V_{SD}^{(3)}$	Diode Forward Voltage	$I_{SD}=1A, V_{GS}=0V$			1	V
t_{rr}	Reverse Recovery Time	$I_{SD}=2A, di_{SD}/dt=100A/\mu s$		13		ns
Q_{rr}	Reverse Recovery Charge			4		nC
Dynamic Characteristics ⁽⁴⁾						
R_G	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$		0.8		Ω
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=15V,$ Frequency=1.0MHz		210		pF
C_{oss}	Output Capacitance			32		
C_{rss}	Reverse Transfer Capacitance			19		
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=15V, R_L=7.5\Omega,$ $I_{DS}=2A, V_{GEN}=4.5V,$ $R_G=1\Omega$		6		ns
t_r	Turn-on Rise Time			10		
$t_{d(OFF)}$	Turn-off Delay Time			15		
t_f	Turn-off Fall Time			7		
Gate Charge Characteristics ⁽⁴⁾						
Q_g	Total Gate Charge	$V_{DS}=24V, V_{GS}=4.5V,$ $I_{DS}=2A$		4		nC
Q_{gs}	Gate-Source Charge			0.5		
Q_{gd}	Gate-Drain Charge			1.2		

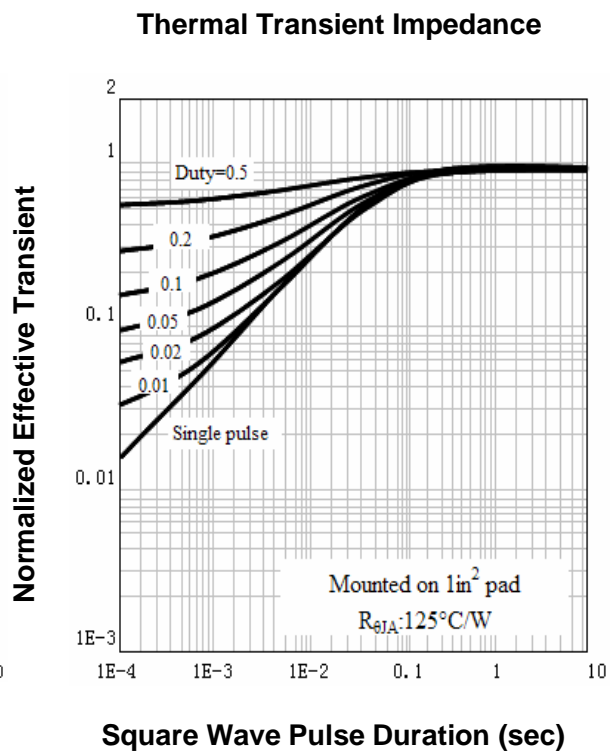
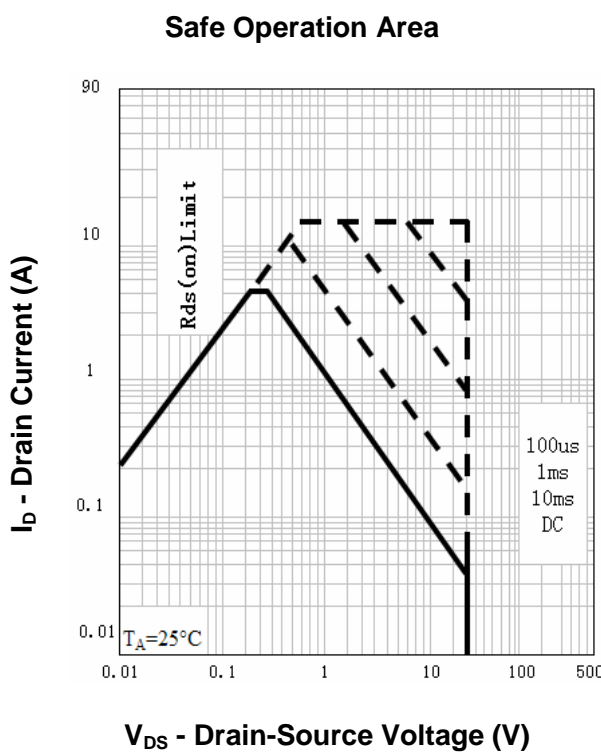
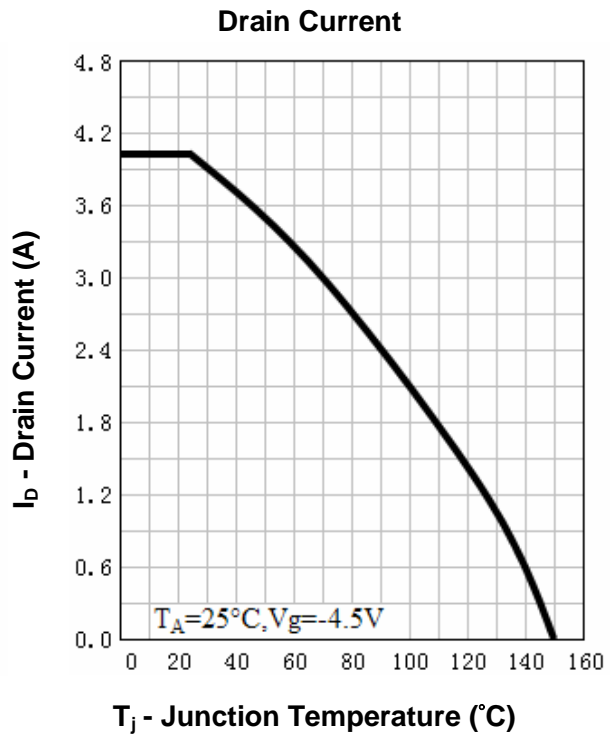
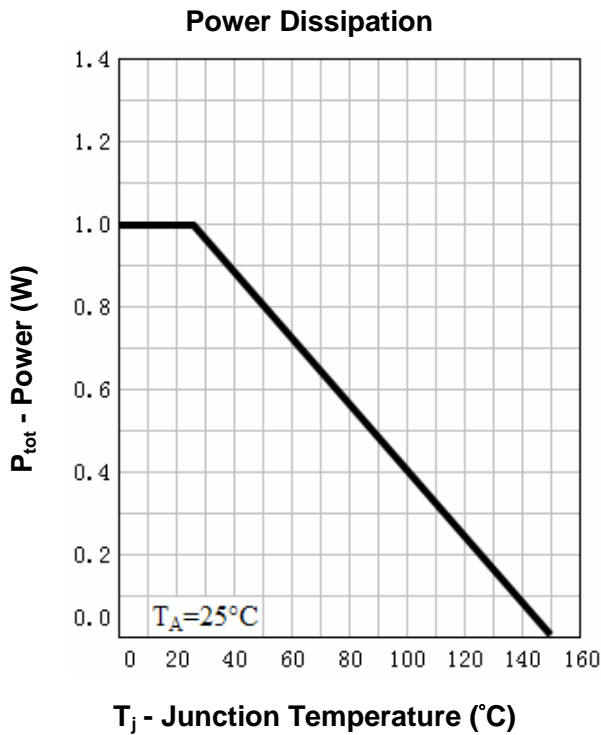
Notes: ① Pulse width limited by safe operating area.

② 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.

③ Pulse test ; Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

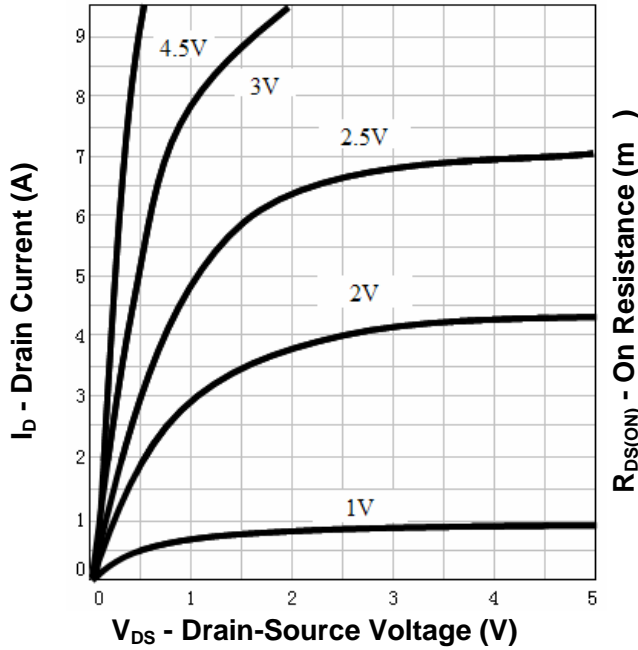
④ Guaranteed by design, not subject to production testing.

Typical Characteristics

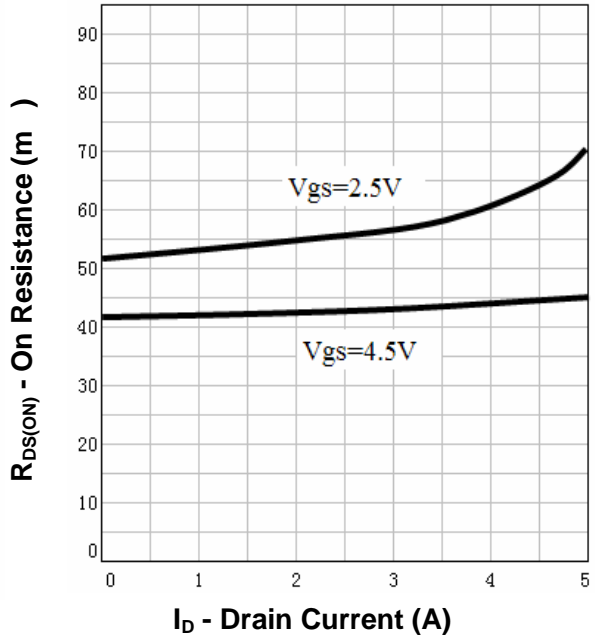


Typical Characteristics

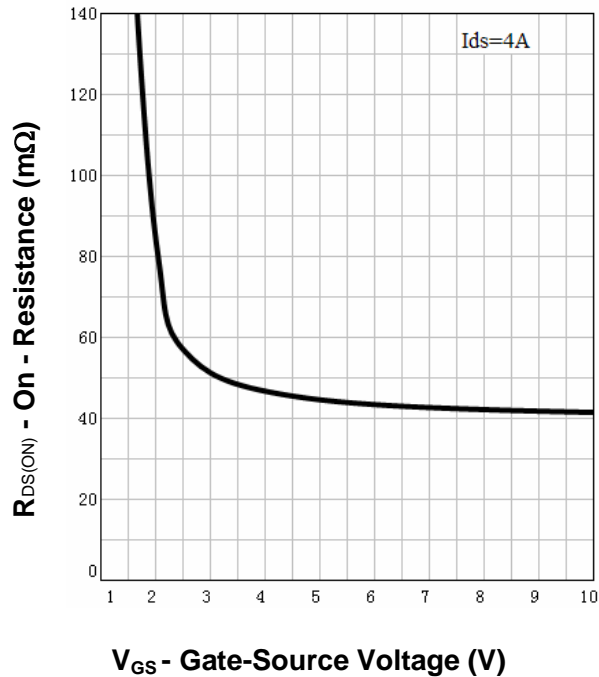
Output Characteristics



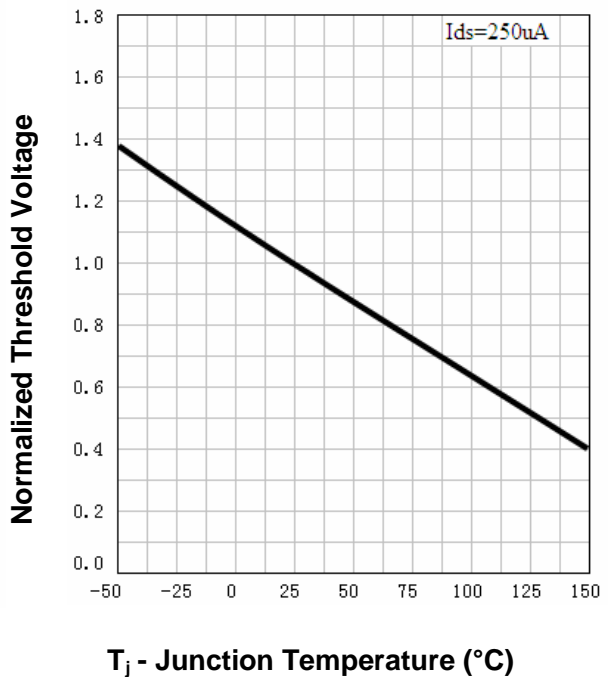
Drain-Source On Resistance



Drain-Source On Resistance

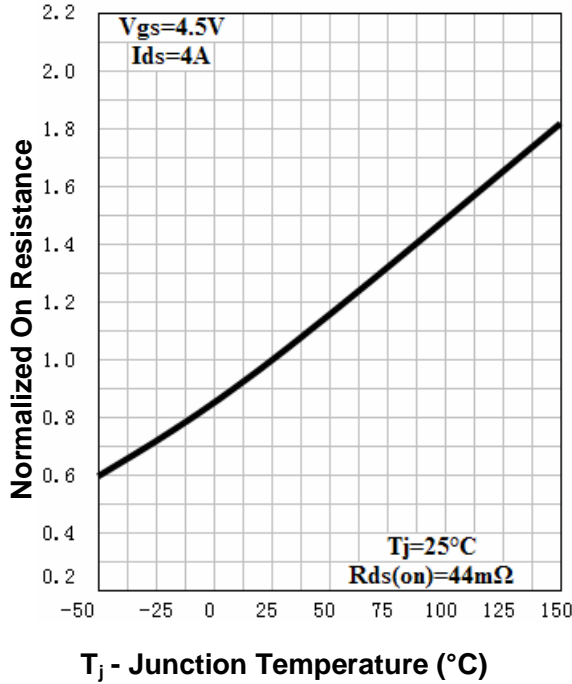


Gate Threshold Voltage

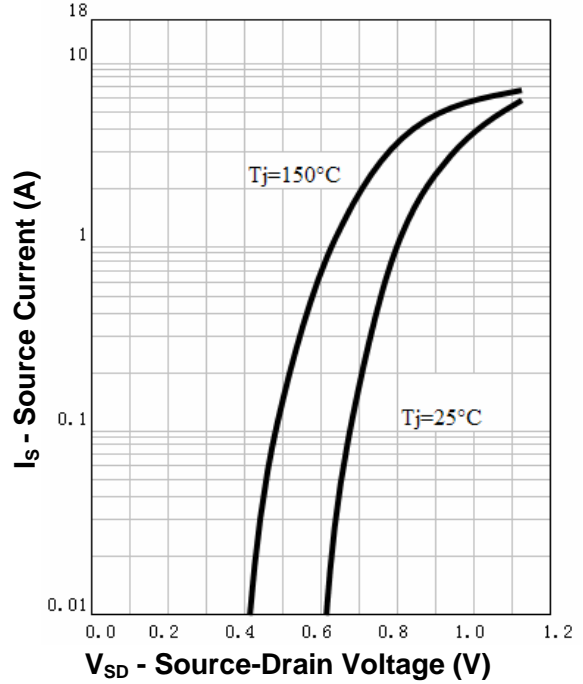


Typical Characteristics

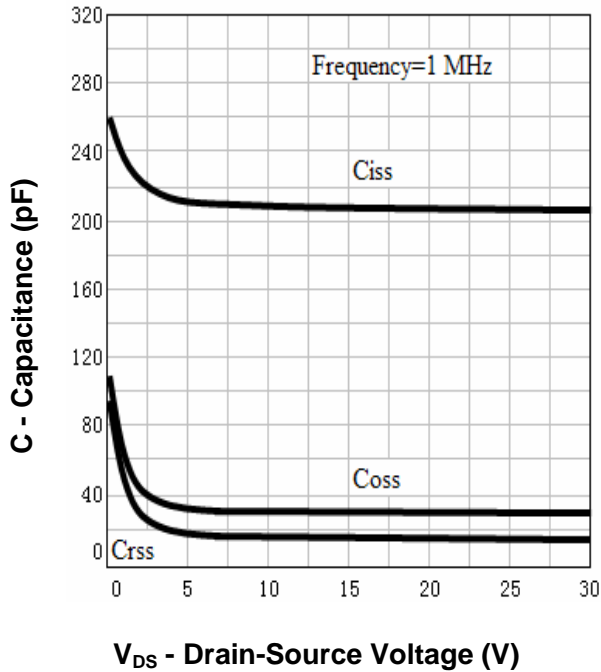
Drain-Source On Resistance



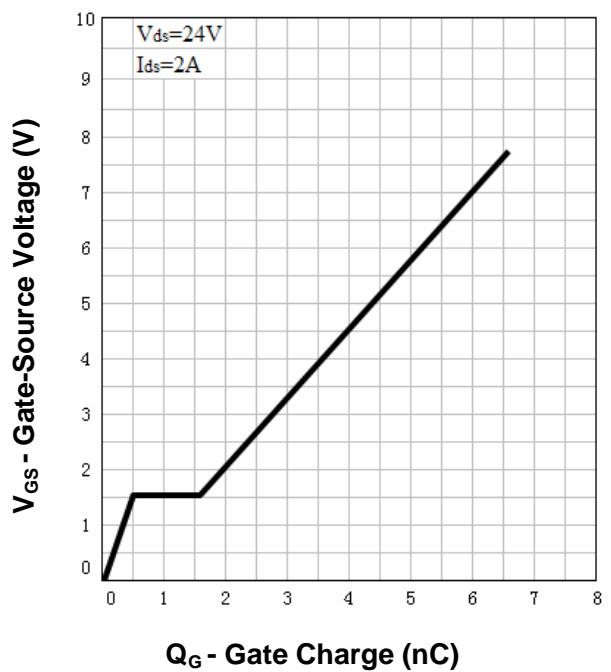
Source-Drain Diode Forward



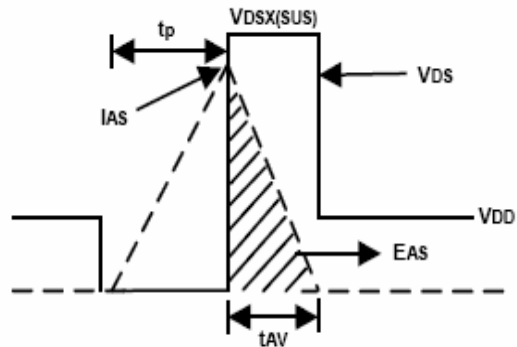
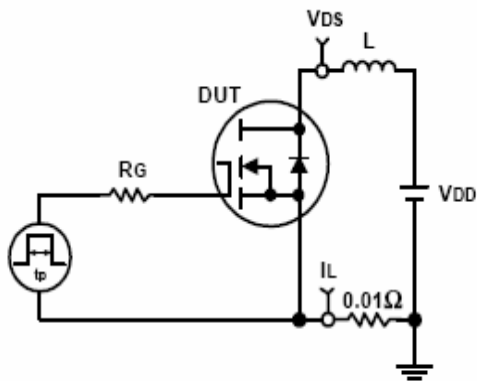
Capacitance



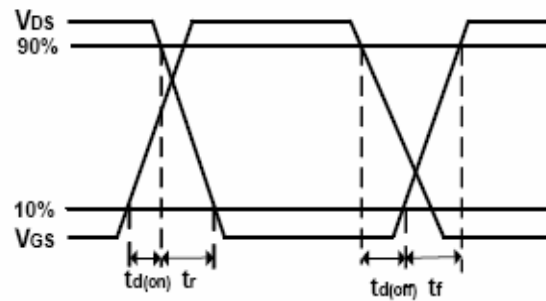
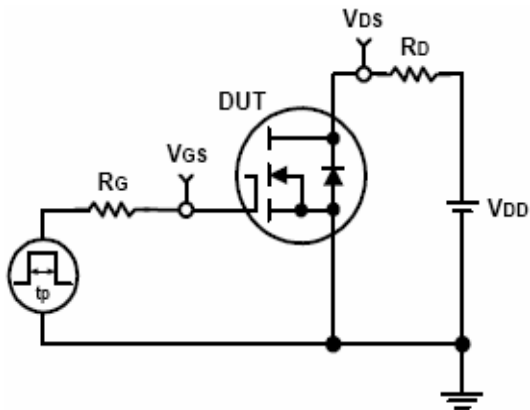
Gate Charge



Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms



Ordering and Marking Information

Device	Marking ^①	Package	Packaging	Quantity	Reel Size	Tape width
RU304B	6XYWW	SOT-23	Tape&Reel	3000	7''	8mm

① The following characters could be different and means:

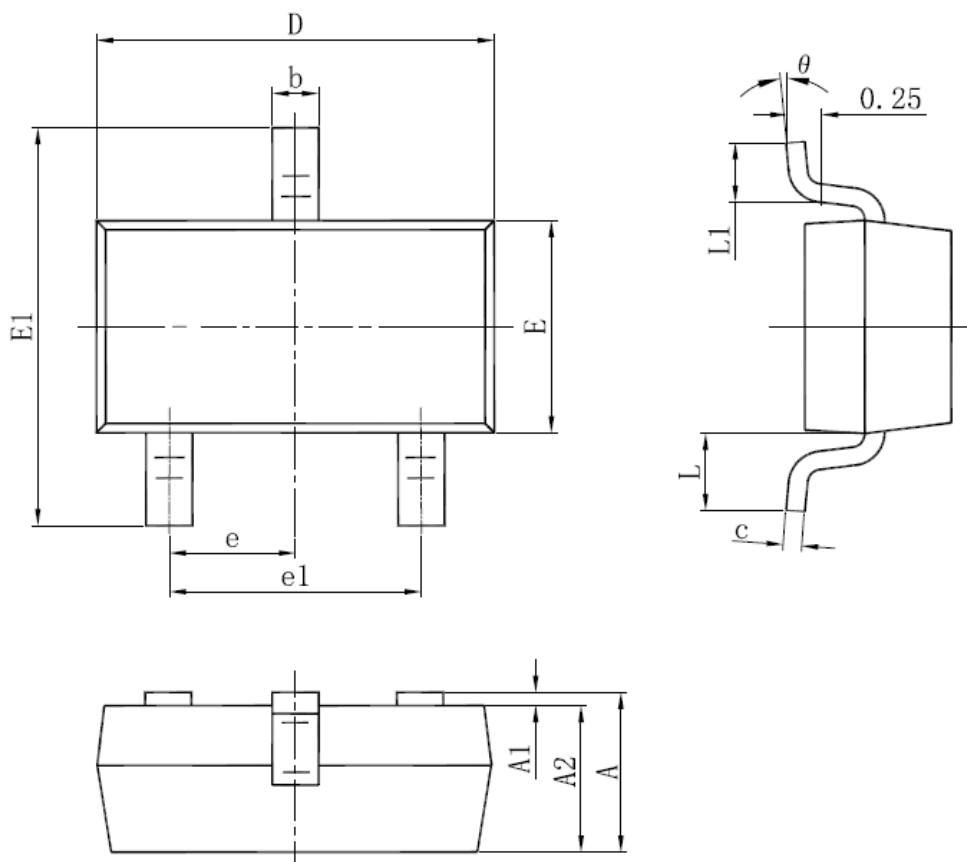
X =Assembly site code

Y =Year

WW =Work Week

Package Information

SOT-23



SYMBOL	MM		INCH		SYMBOL	MM		INCH	
	MIN	MAX	MIN	MAX		MIN	MAX	MIN	MAX
A	0.900	1.150	0.035	0.045	E1	2.250	2.550	0.089	0.100
A1	0.000	0.100	0.000	0.004	e	0.950 TYP.		0.037 TYP.	
A2	0.900	1.050	0.035	0.041	e1	1.800	2.000	0.071	0.079
b	0.300	0.500	0.012	0.020	L	0.550 REF.		0.022 REF.	
c	0.080	0.150	0.003	0.006	L1	0.300	0.500	0.012	0.020
D	2.800	3.000	0.110	0.118	θ	0°	8°	0°	8°
E	1.200	1.400	0.047	0.055					

ALL DIMENSIONS REFER TO JEDEC STANDARD
DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS

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.com

HR Contact:

HR@ruichips.com

Legal Contact:

Legal@ruichips.com

Shen Zhen RUICHIPS Semiconductor CO., LTD

Room 501, the 5floor An Tong Industrial Building,
NO.207 Mei Hua Road Fu Tian Area Shen Zhen City, CHINA

TEL: (86-755) 8311-5334

FAX: (86-755) 8311-4278

E-mail: Sales-SZ@ruichips.com