

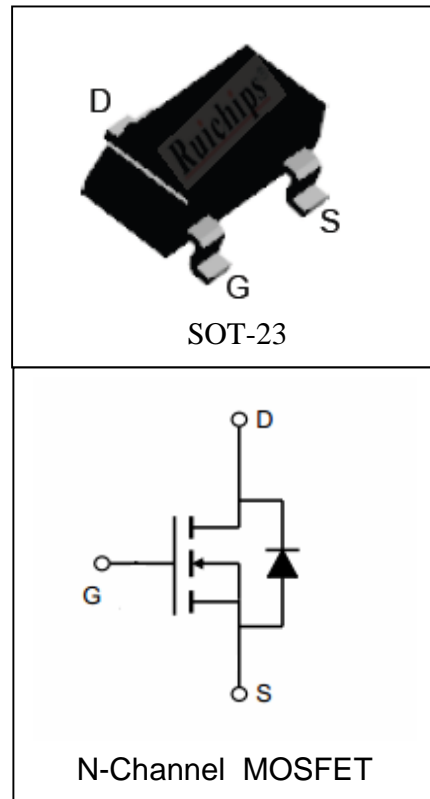
### Features

- 60V/1.5A,  
R<sub>DS (ON)</sub> = 220mΩ (Typ.) @ V<sub>GS</sub> = 10V
- Low R<sub>DS (ON)</sub>
- Super High Dense Cell Design
- Reliable and Rugged
- Lead Free and Green Available

### Applications

- DC/DC Converter
- Battery Switch

### Pin Description



### Absolute Maximum Ratings

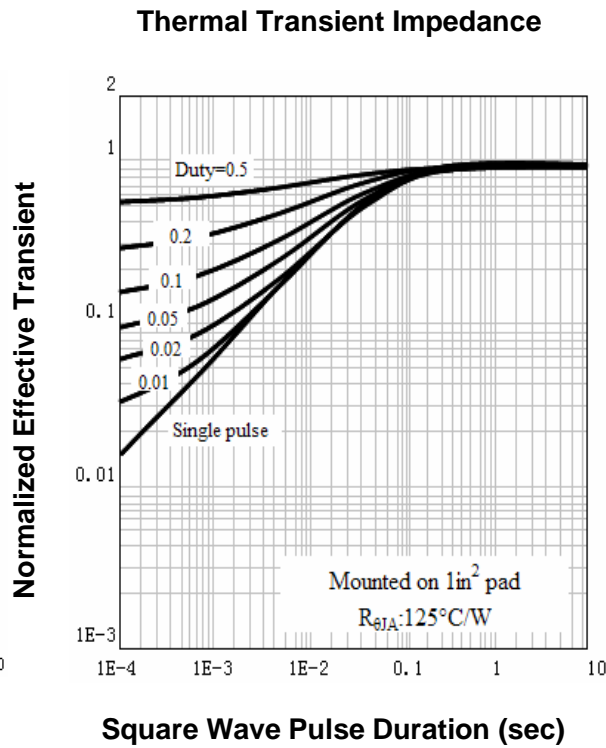
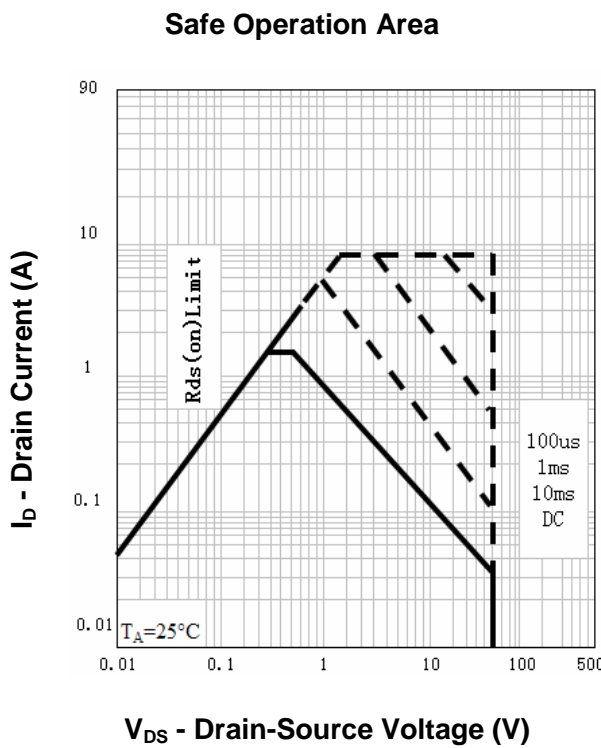
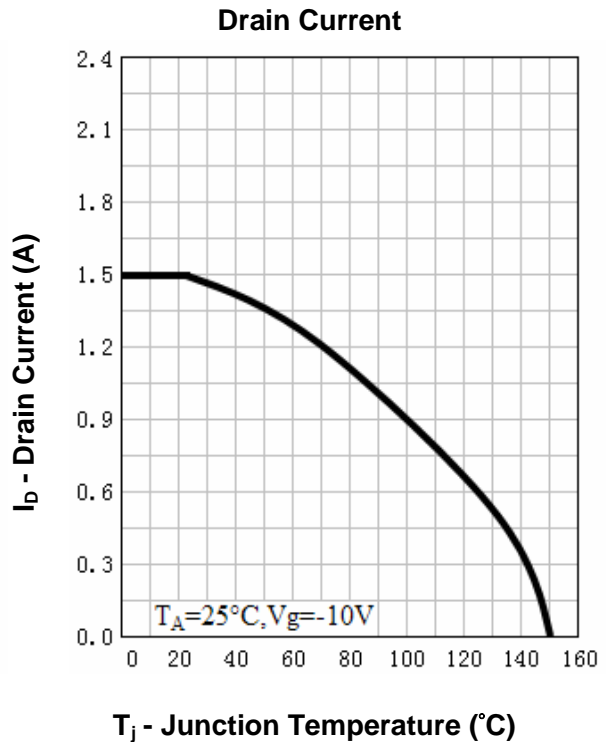
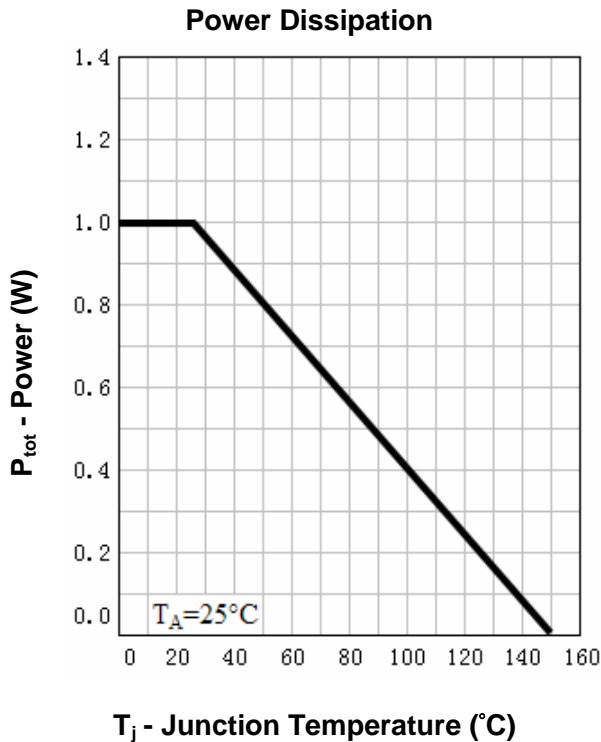
Symbol	Parameter	Rating	Unit
<b>Common Ratings</b> (T <sub>A</sub> = 25°C Unless Otherwise Noted)			
V <sub>DSS</sub>	Drain-Source Voltage	60	V
V <sub>GSS</sub>	Gate-Source Voltage	±25	
T <sub>J</sub>	Maximum Junction Temperature	150	°C
T <sub>STG</sub>	Storage Temperature Range	-55 to 150	°C
I <sub>S</sub>	Diode Continuous Forward Current	T <sub>A</sub> = 25°C 1.1	A
<b>Mounted on Large Heat Sink</b>			
I <sub>DP</sub>	300µs Pulse Drain Current Tested	T <sub>A</sub> = 25°C 6 <sup>①</sup>	A
I <sub>D</sub>	Continuous Drain Current (V <sub>GS</sub> = 10V)	T <sub>A</sub> = 25°C 1.5	A
		T <sub>A</sub> = 70°C 1.2	
P <sub>D</sub>	Maximum Power Dissipation	T <sub>A</sub> = 25°C 1	W
		T <sub>A</sub> = 70°C 0.64	
R <sub>θJA</sub> <sup>②</sup>	Thermal Resistance-Junction to Ambient	125	°C/W

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

Symbol	Parameter	Test Condition	RU602B			Unit
			Min.	Typ.	Max.	
<b>Static Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	60			V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=60V, V_{GS}=0V$ $T_J=85^\circ\text{C}$			1	$\mu A$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	2	3	4	V
$I_{GSS}$	Gate Leakage Current	$V_{GS}=\pm 25V, V_{DS}=0V$			$\pm 100$	nA
$R_{DS(ON)}^{(3)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_{DS}=1A$		220	250	$m\Omega$
<b>Diode Characteristics</b>						
$V_{SD}^{(3)}$	Diode Forward Voltage	$I_{SD}=1A, V_{GS}=0V$			1.2	V
$t_{rr}$	Reverse Recovery Time	$I_{SD}=1A, dI_{SD}/dt=100A/\mu s$		23		ns
$Q_{rr}$	Reverse Recovery Charge			17		nC
<b>Dvnamic Characteristics</b> <sup>(4)</sup>						
$R_G$	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$		1.5		$\Omega$
$C_{iss}$	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=30V,$ Frequency=1.0MHz		195		pF
$C_{oss}$	Output Capacitance			26		
$C_{rss}$	Reverse Transfer Capacitance			14		
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=30V, R_L=30\Omega,$ $I_{DS}=1A, V_{GEN}=10V,$ $R_G=1\Omega$		8		ns
$t_r$	Turn-on Rise Time			11		
$t_{d(OFF)}$	Turn-off Delay Time			18		
$t_f$	Turn-off Fall Time			7		
<b>Gate Charge Characteristics</b> <sup>(4)</sup>						
$Q_g$	Total Gate Charge	$V_{DS}=48V, V_{GS}=10V,$ $I_{DS}=1A$		6.5		nC
$Q_{gs}$	Gate-Source Charge			1.3		
$Q_{gd}$	Gate-Drain Charge			2.3		

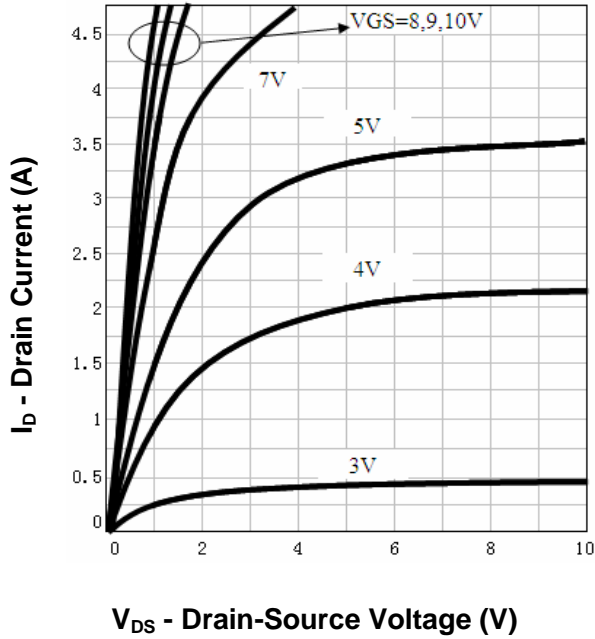
- Notes: ① Pulse width limited by safe operating area.  
 ② When mounted on 1 inch square copper board,  $t \leq 10\text{sec}$ . The value in any given application depends on the user's specific board design.  
 ③ Pulse test ; Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .  
 ④ Guaranteed by design, not subject to production testing.

**Typical Characteristics**

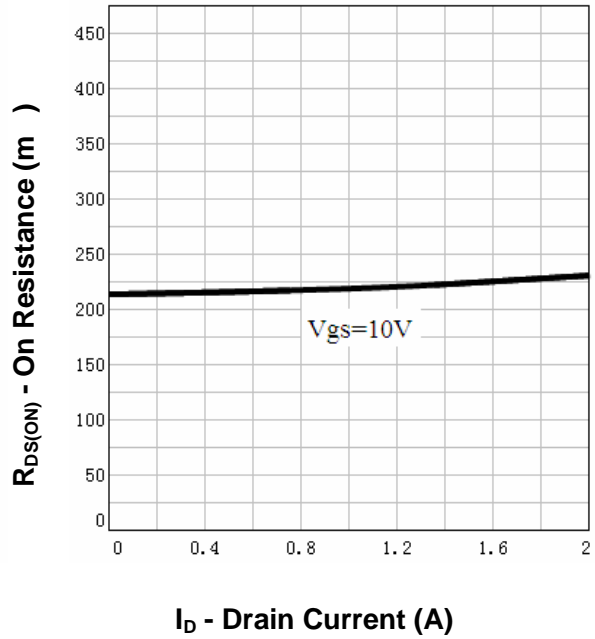


**Typical Characteristics**

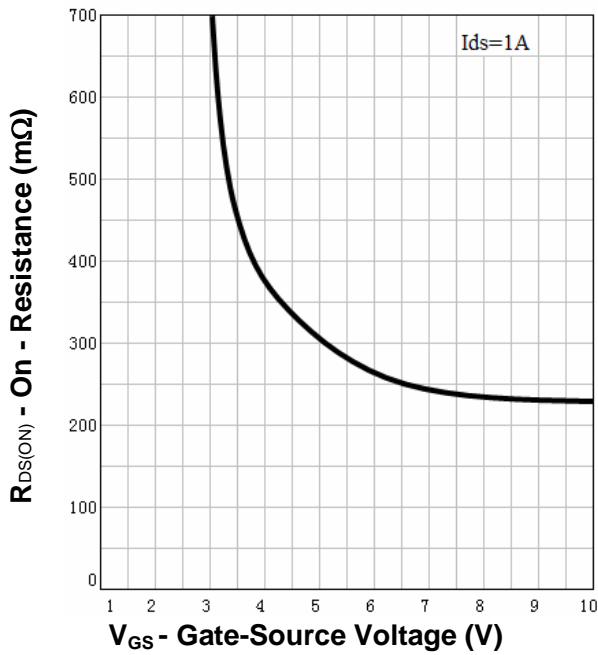
**Output Characteristics**



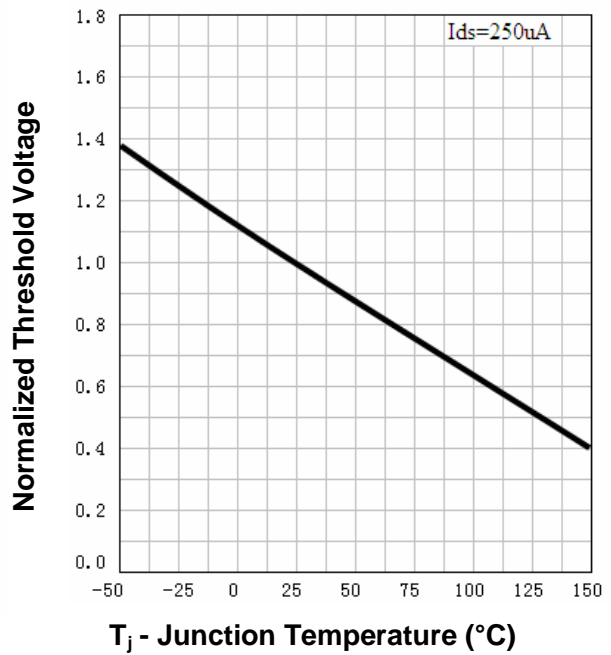
**Drain-Source On Resistance**



**Drain-Source On Resistance**

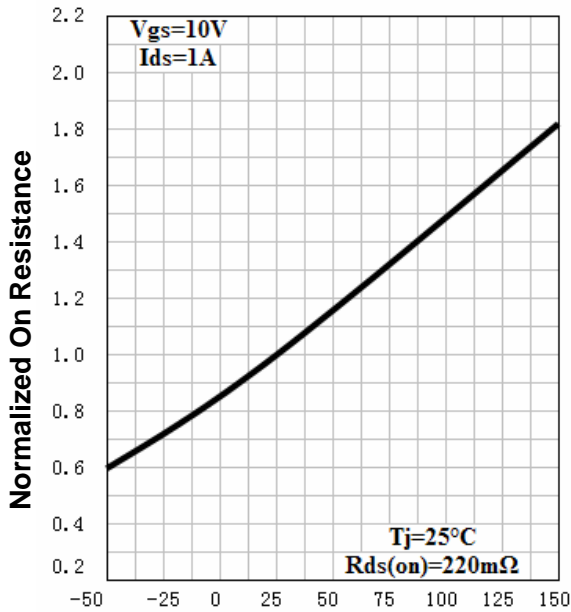


**Gate Threshold Voltage**



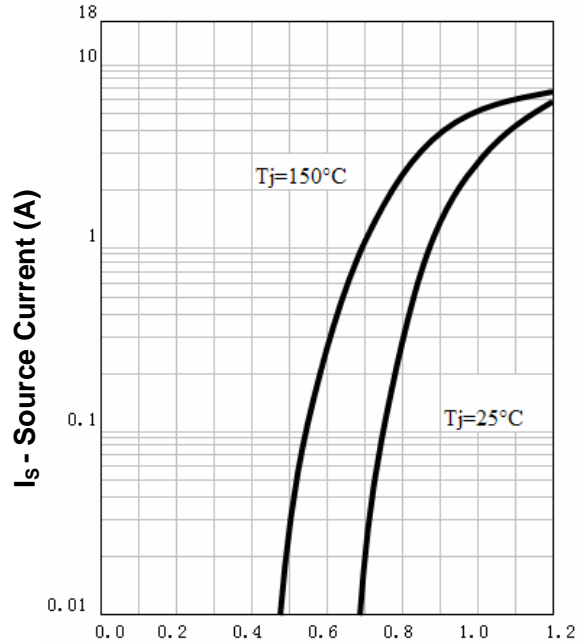
**Typical Characteristics**

**Drain-Source On Resistance**



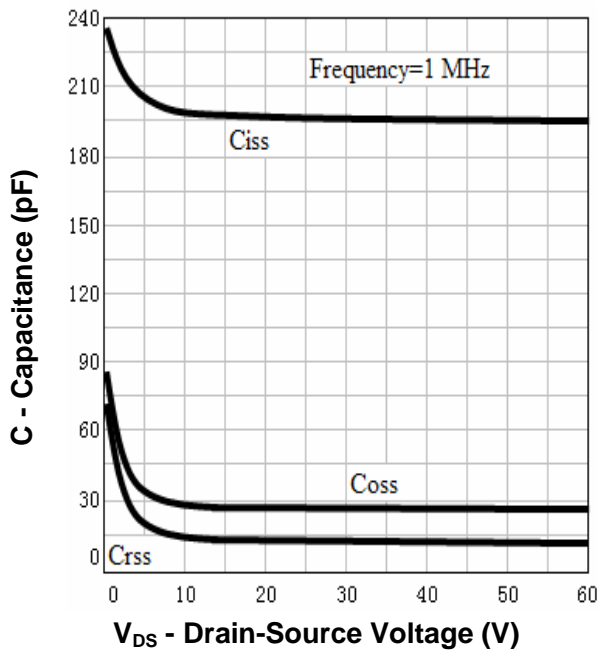
**T<sub>j</sub> - Junction Temperature (°C)**

**Source-Drain Diode Forward**



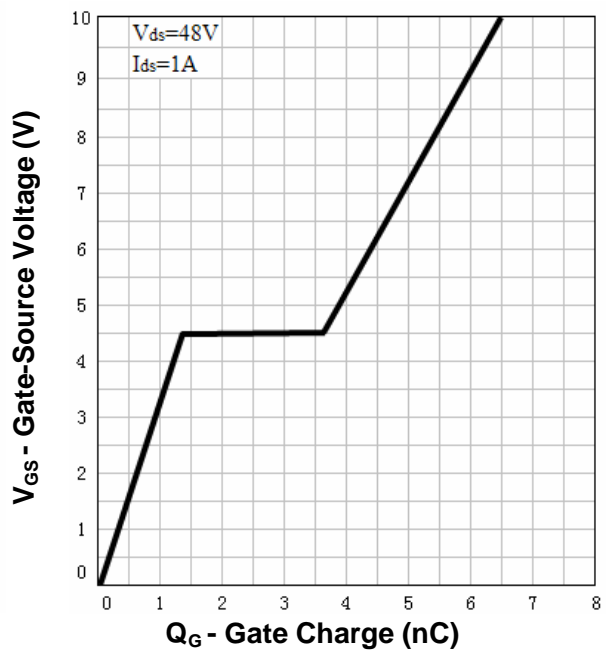
**V<sub>SD</sub> - Source-Drain Voltage (V)**

**Capacitance**



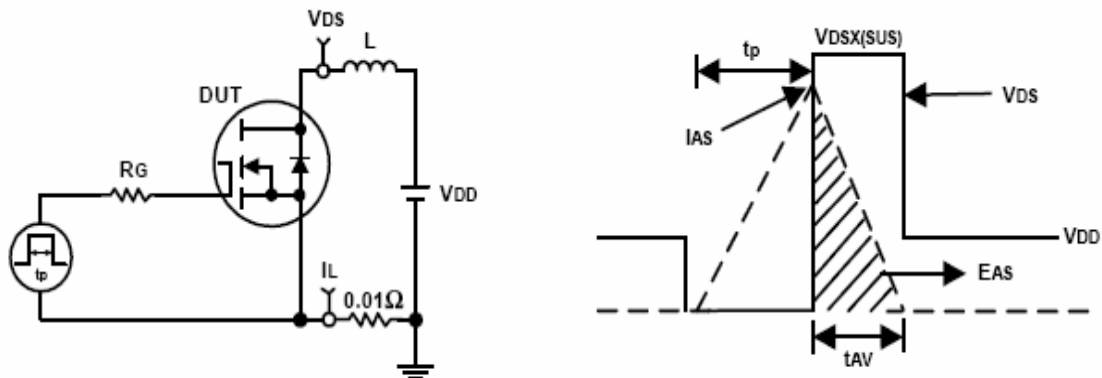
**V<sub>DS</sub> - Drain-Source Voltage (V)**

**Gate Charge**

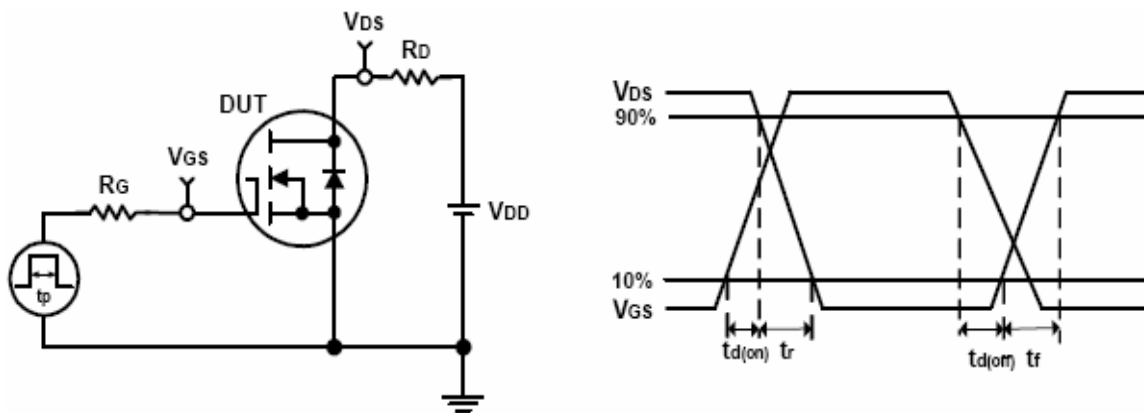


**Q<sub>G</sub> - Gate Charge (nC)**

**Avalanche Test Circuit and Waveforms**



**Switching Time Test Circuit and Waveforms**



## Ordering and Marking Information

Device	Marking <sup>①</sup>	Package	Packaging	Quantity	Reel Size	Tape width
RU602B	3XYWW	SOT-23	Tape&Reel	3000	7''	8mm

① The following characters could be different and means:

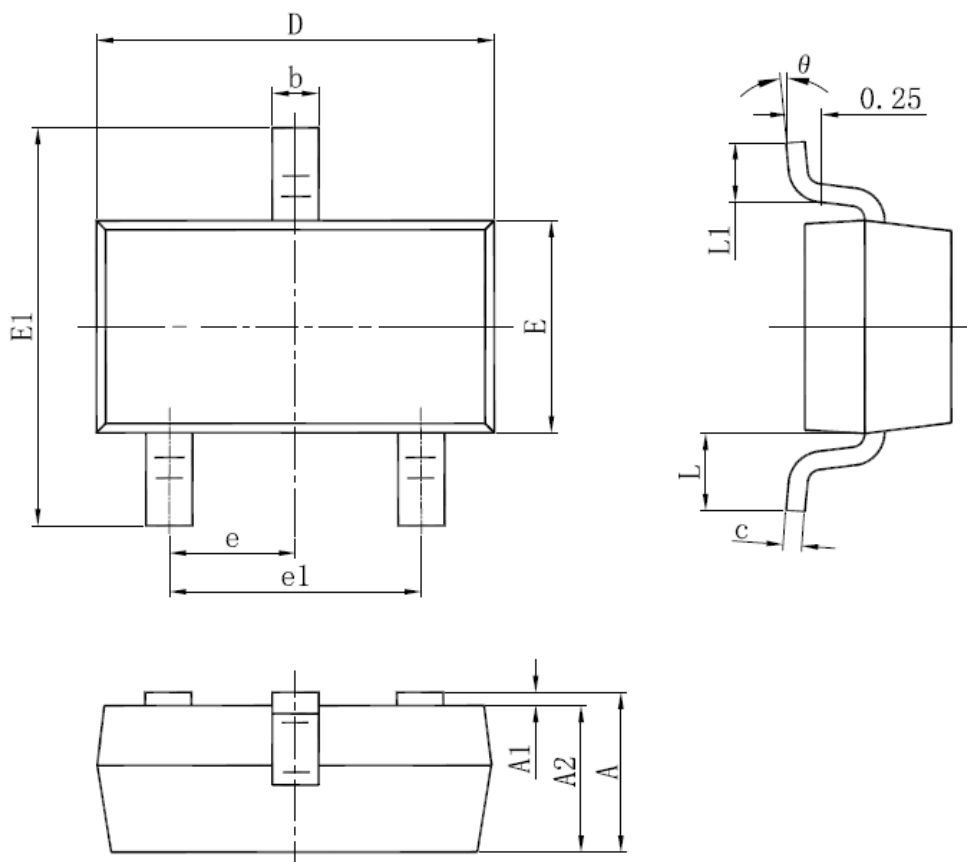
X =Assembly site code

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



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