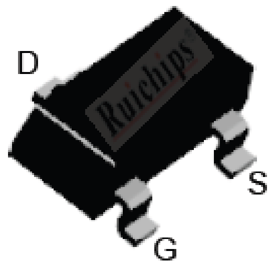
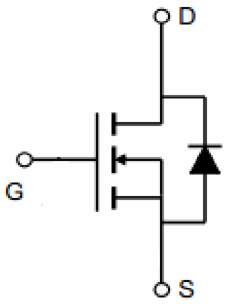
Features

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

Pin Description



SOT-23



N-Channel MOSFET

Applications

- Load/System Switch

Absolute Maximum Ratings

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

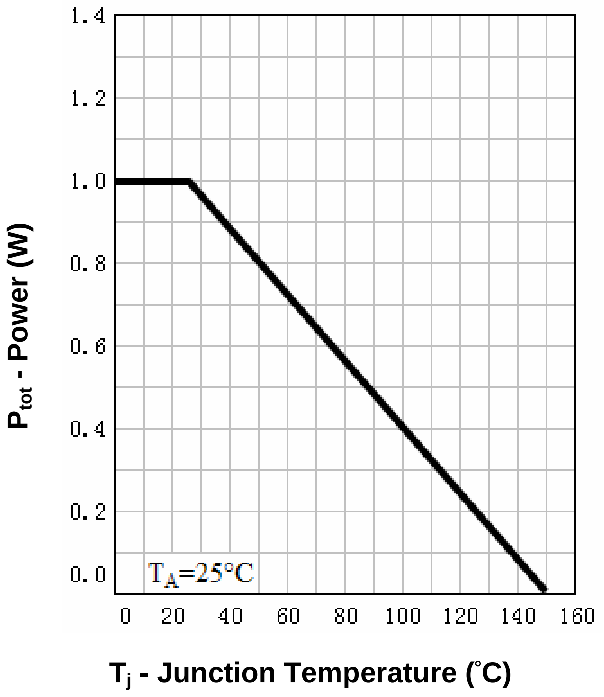
Electrical Characteristics (T_A=25°C Unless Otherwise Noted)

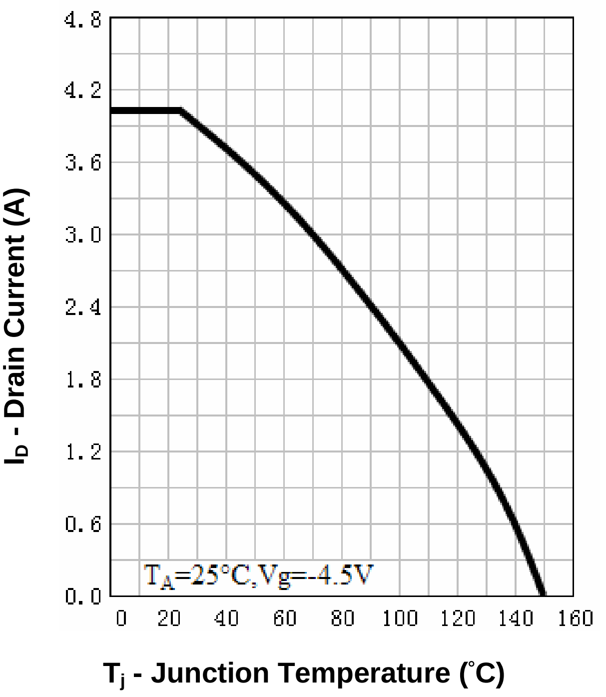
Symbol	**Parameter**	**Test Condition**	**RU304B**			**Unit**
			Min.	**Typ.**	**Max.**	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=250μA	30			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=30V, V_{GS}=0V			1	μA
		T_J=85°C			30	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=250μA	0.5	-	1.5	V
I_{GSS}	Gate Leakage Current	V_{GS}=±12V, V_{DS}=0V			±100	nA
$R_{DS(ON)}$ ③	Drain-Source On-state Resistance	V_{GS}=4.5V, I_{DS}=4A		44	60	mΩ
		V_{GS}=2.5V, I_{DS}=2A		53	80	mΩ

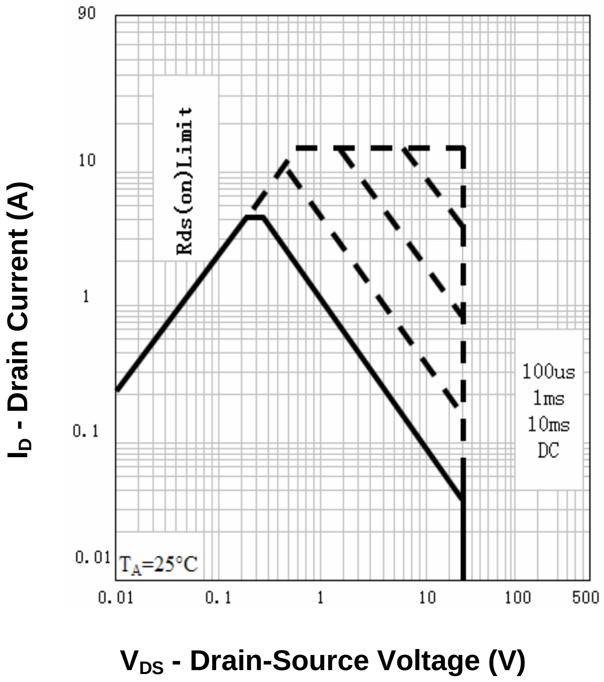
Symbol	**Parameter**	**Test Condition**	**Min.**	**Typ.**	**Max.**	**Unit**
Diode Characteristics						
V_{SD} ③	Diode Forward Voltage	I_{SD}=1A, V_{GS}=0V			1	V
t_{rr}	Reverse Recovery Time	I_{SD}=2A, dI_{SD}/dt=100A/μs		13		ns
Q_{rr}	Reverse Recovery Charge			4		nC
Dynamic Characteristics ④						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V,F=1MHz		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=7.5Ω, I_{DS}=2A, V_{GEN}=4.5V, R_G=1Ω		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		

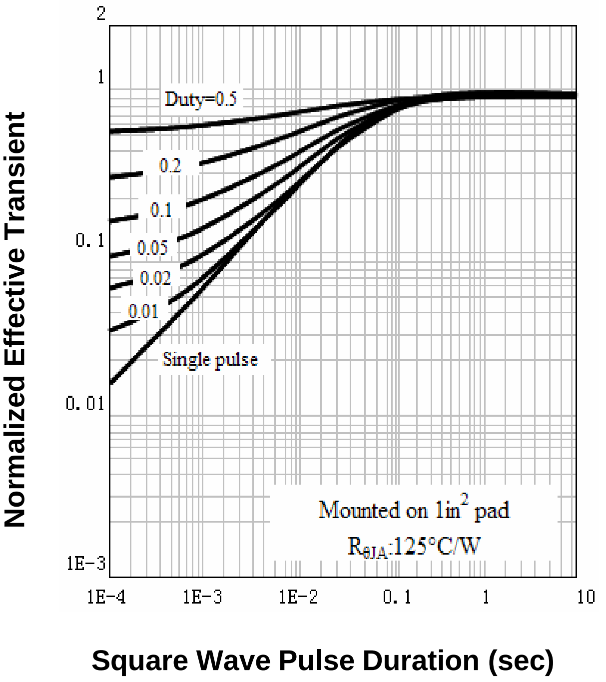
Notes: ①Pulse width limited by safe operating area.
②When mounted on 1 inch square copper board, t ≤10sec. The value in any given application depends on the user's specific board design.
③Pulse test ; Pulse width≤300μs, duty cycle≤2%.
④Guaranteed by design, not subject to production testing.

Typical Characteristics


Power Dissipation

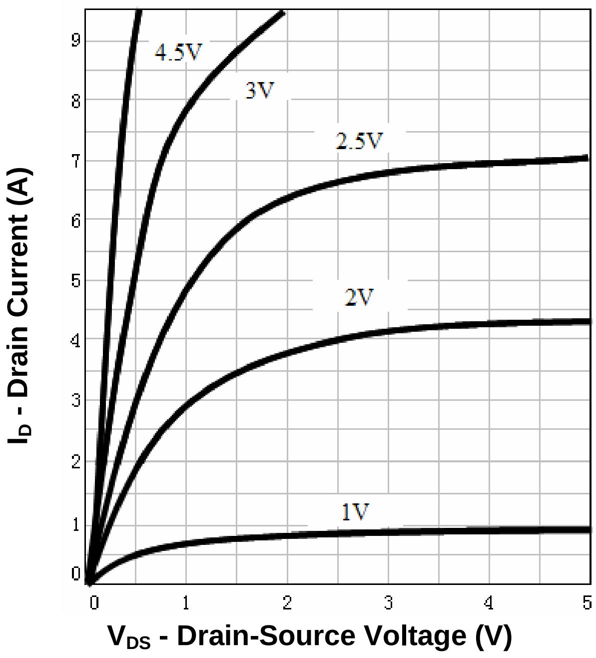

Drain Current


Safe Operation Area

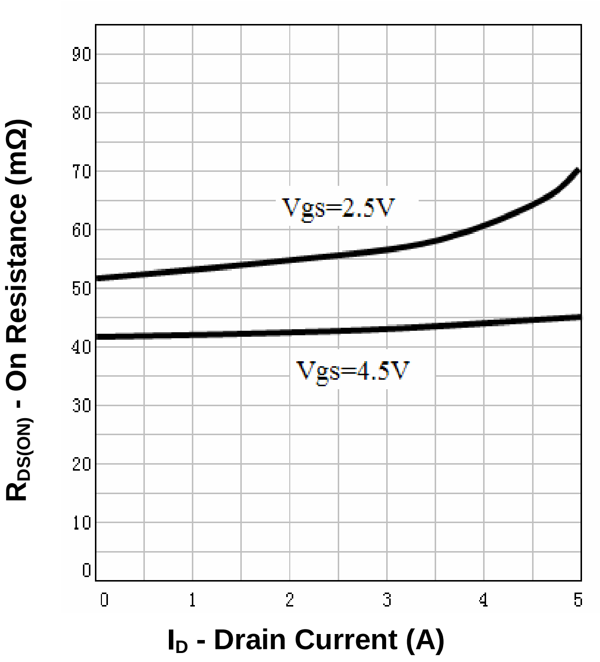

Thermal Transient Impedance

Typical Characteristics

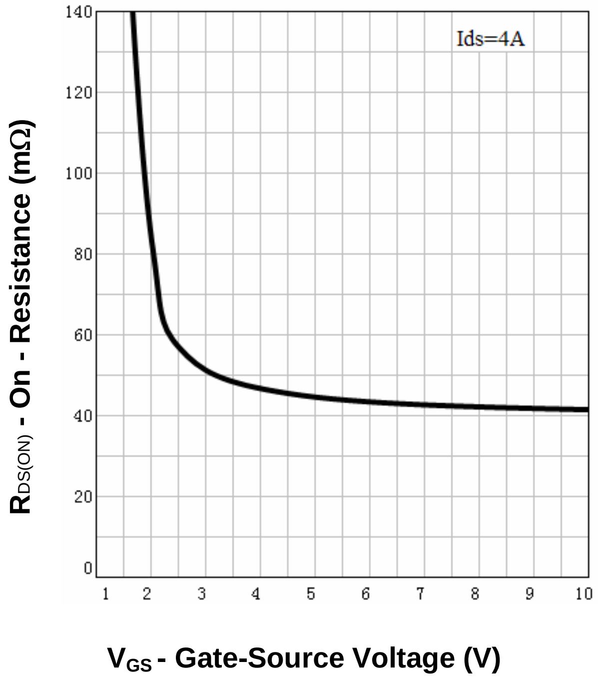
Output Characteristics



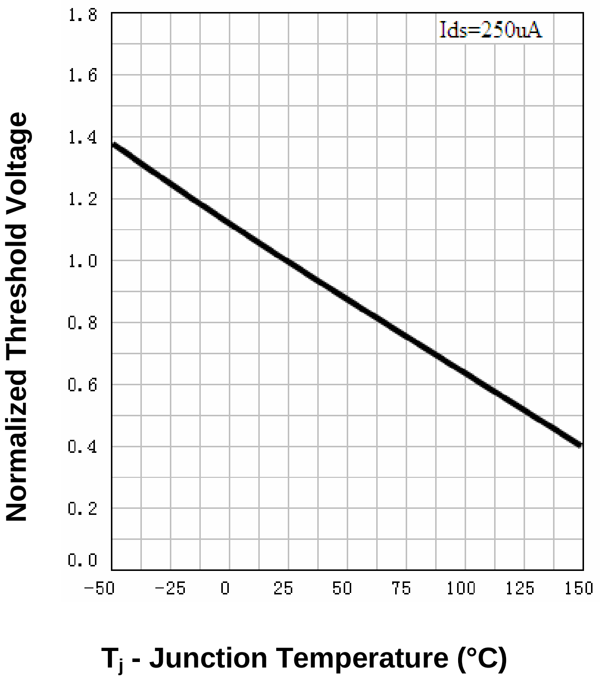
Drain-Source On Resistance



Drain-Source On Resistance

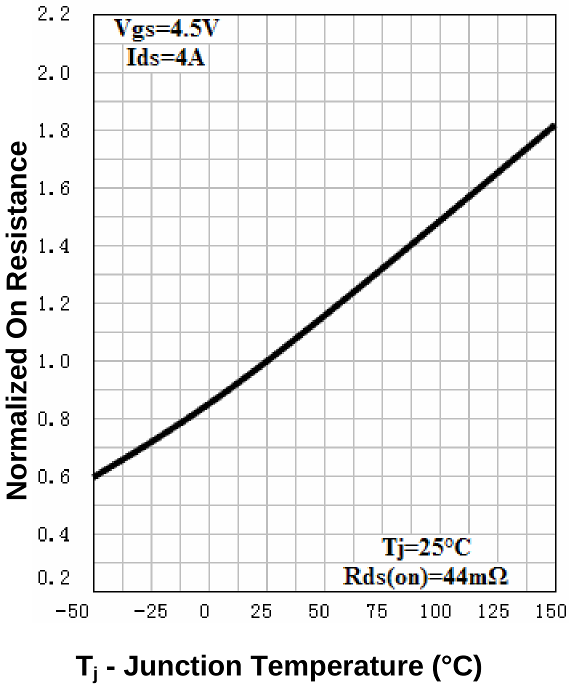


Gate Threshold Voltage

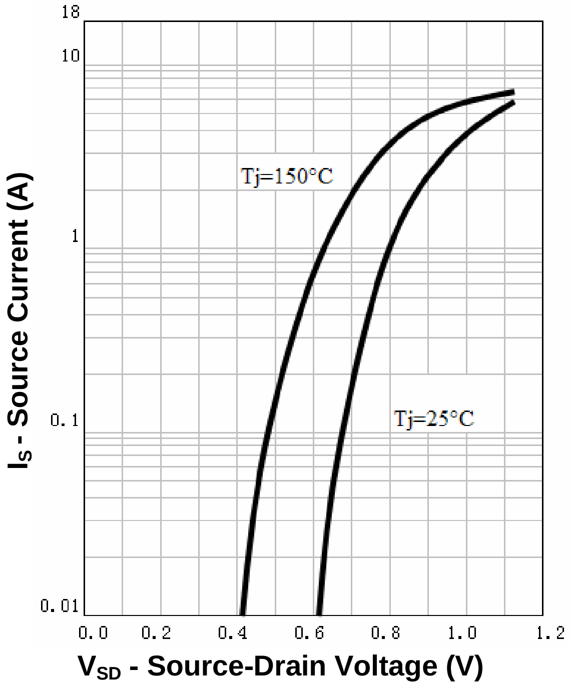


Typical Characteristics

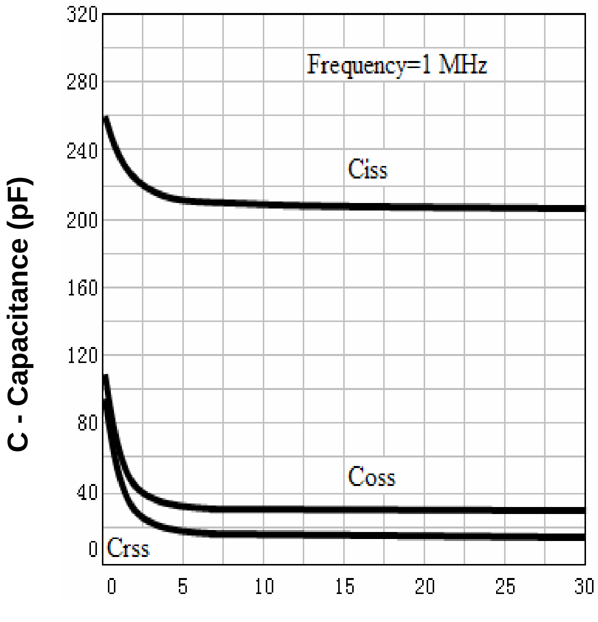
Drain-Source On Resistance



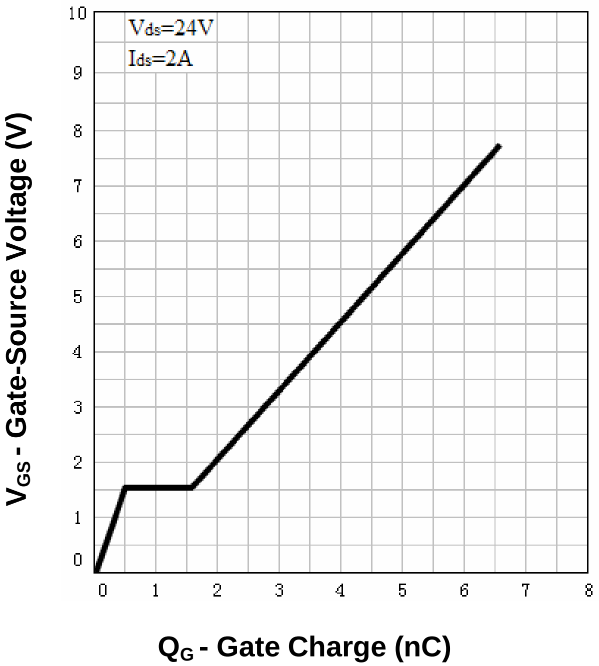
Source-Drain Diode Forward



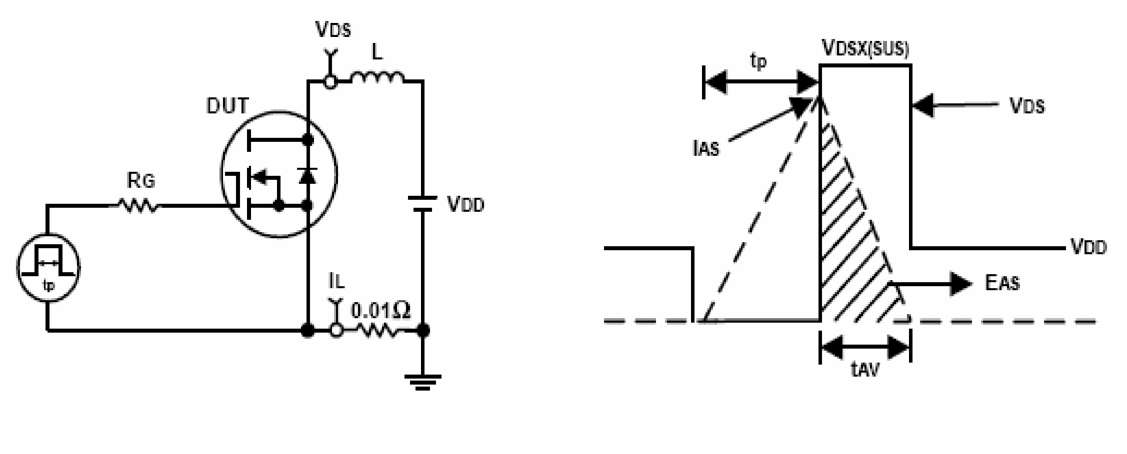
Capacitance



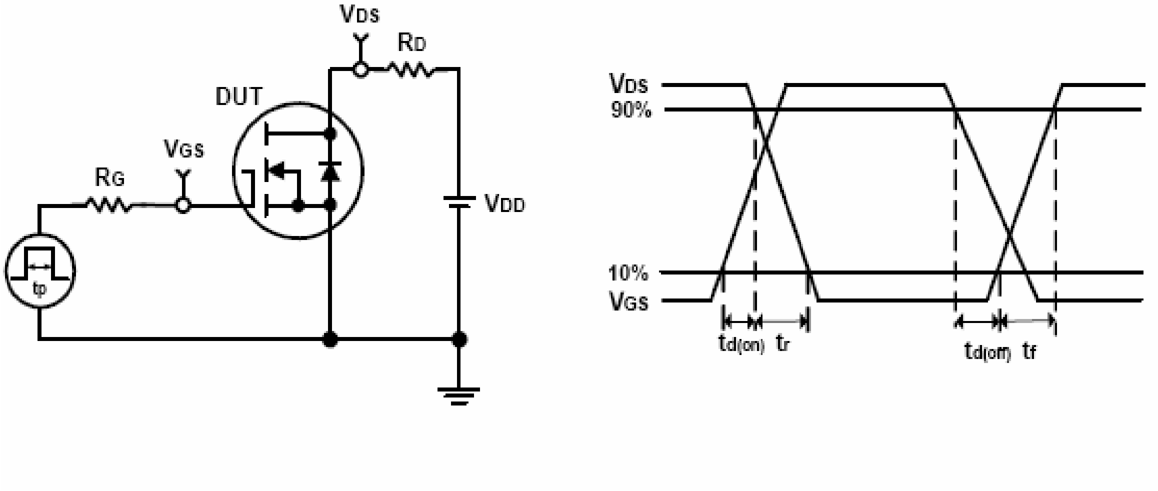
Gate Charge



Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms



Ordering and Marking Information

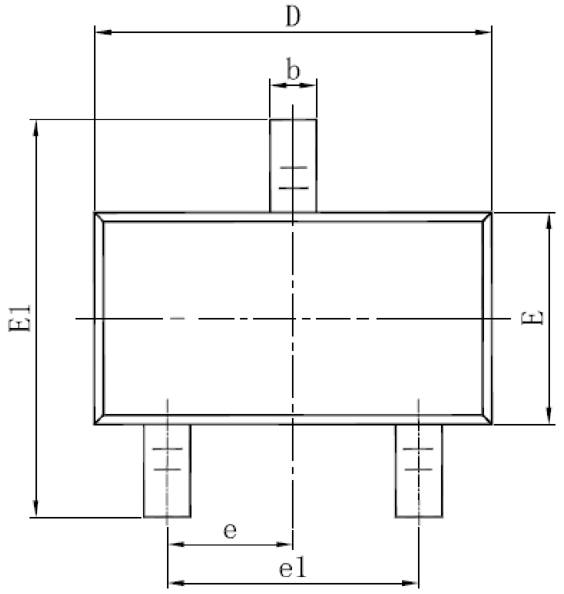
Device	Marking①	Package	Packaging	Quantity	Reel Size	Tape width
RU304B	6XYWW	SOT-23	Tape&Reel	3000	7’’	8mm

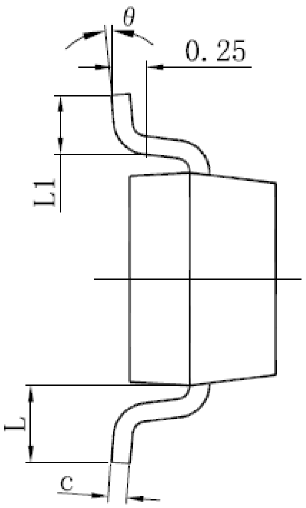
① The following characters could be different and means:

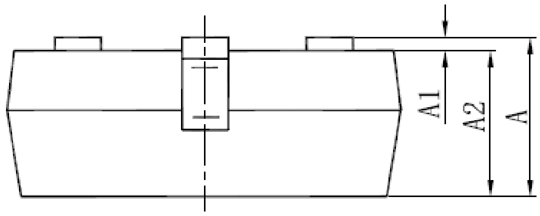
X =Assembly site code
Y =Year
WW =Work Week

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

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