

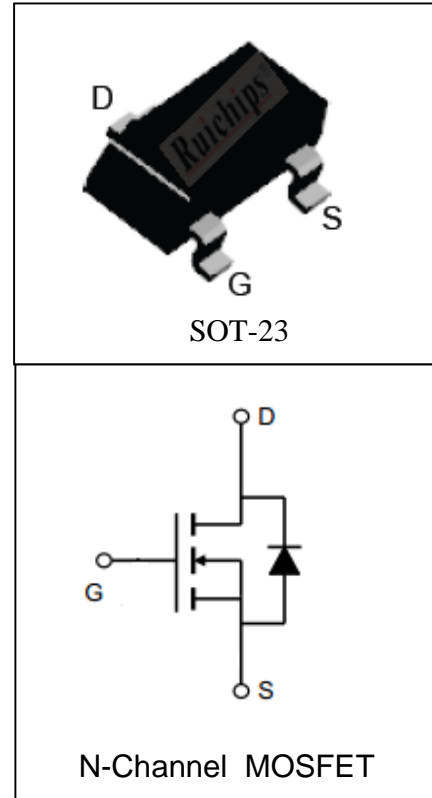
## Features

- 20V/5A,  
 $R_{DS(ON)} = 30m\Omega$  (Typ.) @  $V_{GS} = 4.5V$   
 $R_{DS(ON)} = 38m\Omega$  (Typ.) @  $V_{GS} = 2.5V$
- Low  $R_{DS(ON)}$
- Super High Dense Cell Design
- Reliable and Rugged
- Lead Free and Green Available

## Applications

- Load Switch
- PWM Applications

## Pin Description



## Absolute Maximum Ratings

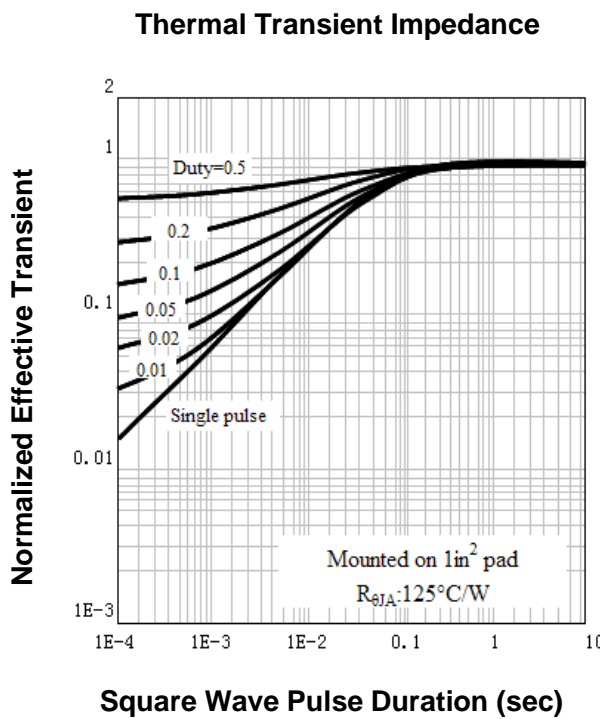
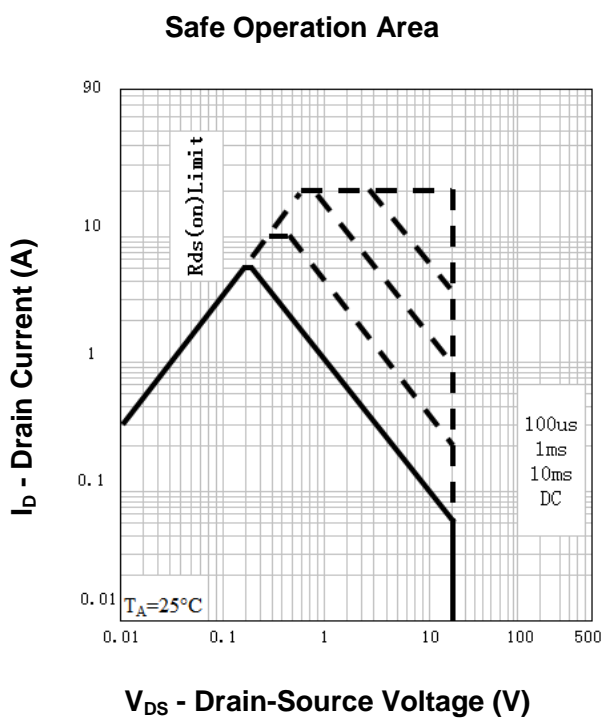
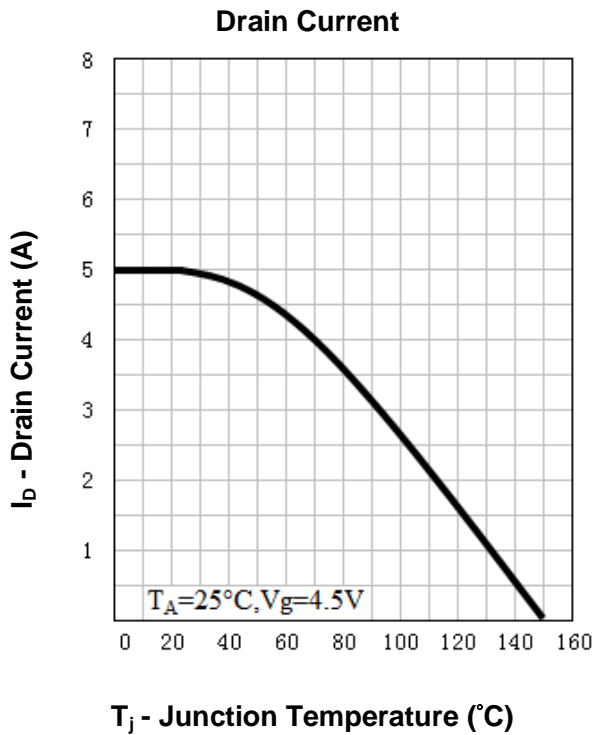
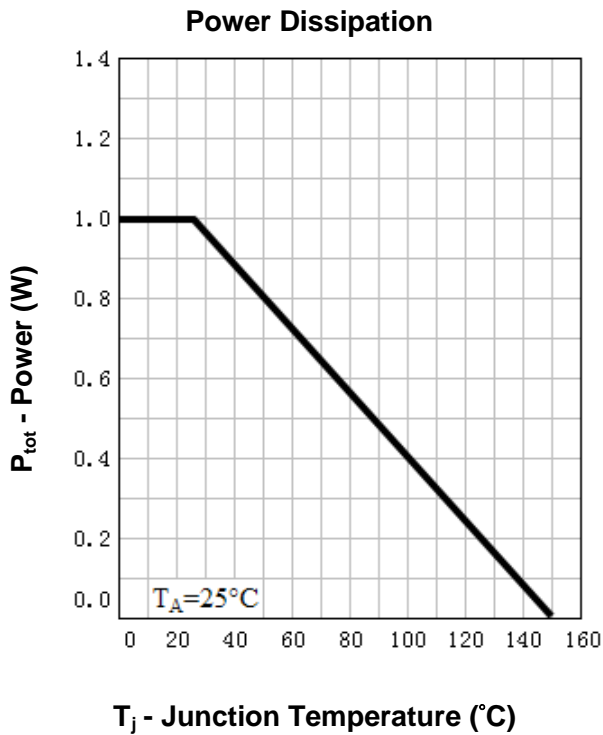
Symbol	Parameter	Rating	Unit
<b>Common Ratings</b> ( $T_A = 25^\circ C$ Unless Otherwise Noted)			
$V_{DSS}$	Drain-Source Voltage	20	V
$V_{GSS}$	Gate-Source Voltage	$\pm 12$	
$T_J$	Maximum Junction Temperature	150	$^\circ C$
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ C$
$I_S$	Diode Continuous Forward Current	$T_A = 25^\circ C$ 1.25	A
<b>Mounted on Large Heat Sink</b>			
$I_{DP}$	300 $\mu s$ Pulse Drain Current Tested	$T_A = 25^\circ C$ 20 <sup>①</sup>	A
$I_D$	Continuous Drain Current ( $V_{GS} = 4.5V$ )	$T_A = 25^\circ C$ 5	A
		$T_A = 70^\circ C$ 4	
$P_D$	Maximum Power Dissipation	$T_A = 25^\circ C$ 1	W
		$T_A = 70^\circ C$ 0.64	
$R_{\theta JA}$ <sup>②</sup>	Thermal Resistance-Junction to Ambient	125	$^\circ C/W$

**Electrical Characteristics** (T<sub>A</sub>=25°C Unless Otherwise Noted)

Symbol	Parameter	Test Condition	RU205B			Unit
			Min.	Typ.	Max.	
<b>Static Characteristics</b>						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>DS</sub> =250μA	20			V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V T <sub>J</sub> =85°C			1	μA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>DS</sub> =250μA	0.5	-	1.5	V
I <sub>GSS</sub>	Gate Leakage Current	V <sub>GS</sub> =±12V, V <sub>DS</sub> =0V			±100	nA
R <sub>DS(ON)</sub> <sup>③</sup>	Drain-Source On-state Resistance	V <sub>GS</sub> =4.5V, I <sub>DS</sub> =5A		30	36	mΩ
		V <sub>GS</sub> =2.5V, I <sub>DS</sub> =3A		38	55	mΩ
<b>Diode Characteristics</b>						
V <sub>SD</sub> <sup>③</sup>	Diode Forward Voltage	I <sub>SD</sub> =1A, V <sub>GS</sub> =0V			1.0	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>SD</sub> =1A, dI <sub>SD</sub> /dt=100A/μs		13		ns
Q <sub>rr</sub>	Reverse Recovery Charge			4		nC
<b>Dynamic Characteristics</b> <sup>④</sup>						
R <sub>G</sub>	Gate Resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, F=1MHz		0.8		Ω
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> =10V, Frequency=1.0MHz		208		pF
C <sub>oss</sub>	Output Capacitance			30		
C <sub>rss</sub>	Reverse Transfer Capacitance			18		
t <sub>d(ON)</sub>	Turn-on Delay Time	V <sub>DD</sub> =10V, R <sub>L</sub> =10Ω, I <sub>DS</sub> =1A, V <sub>GEN</sub> =4.5V, R <sub>G</sub> =1Ω		6		ns
t <sub>r</sub>	Turn-on Rise Time			10		
t <sub>d(OFF)</sub>	Turn-off Delay Time			14		
t <sub>f</sub>	Turn-off Fall Time			7		
<b>Gate Charge Characteristics</b> <sup>④</sup>						
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =16V, V <sub>GS</sub> =4.5V, I <sub>DS</sub> =1A		4		nC
Q <sub>gs</sub>	Gate-Source Charge			0.5		
Q <sub>gd</sub>	Gate-Drain Charge			1.2		

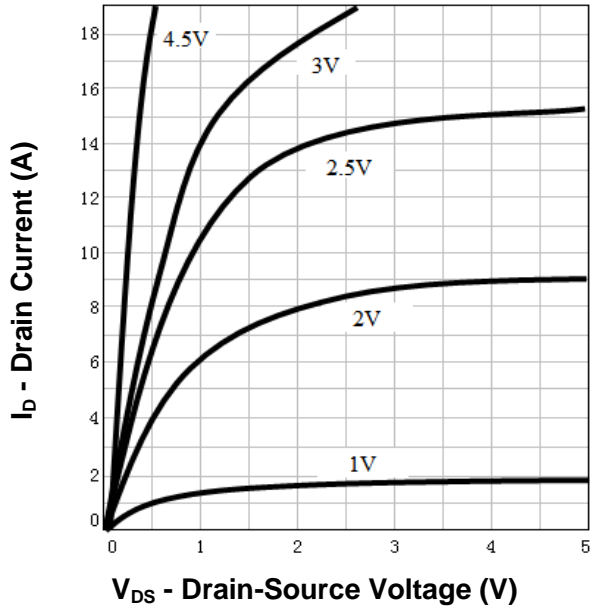
- Notes: ① Pulse width limited by safe operating area.  
 ② When mounted on 1 inch square copper board, t ≤ 10sec. The value in any given application depends on the user's specific board design.  
 ③ Pulse test ; Pulse width ≤ 300μs, duty cycle ≤ 2%.  
 ④ Guaranteed by design, not subject to production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

**Typical Characteristics**

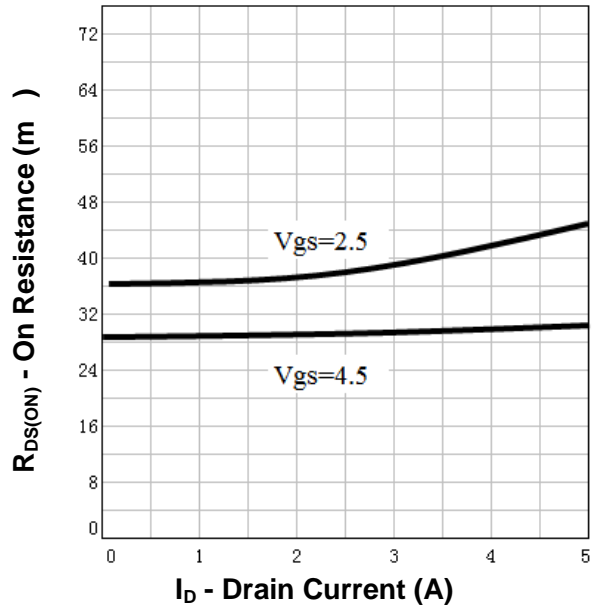


**Typical Characteristics**

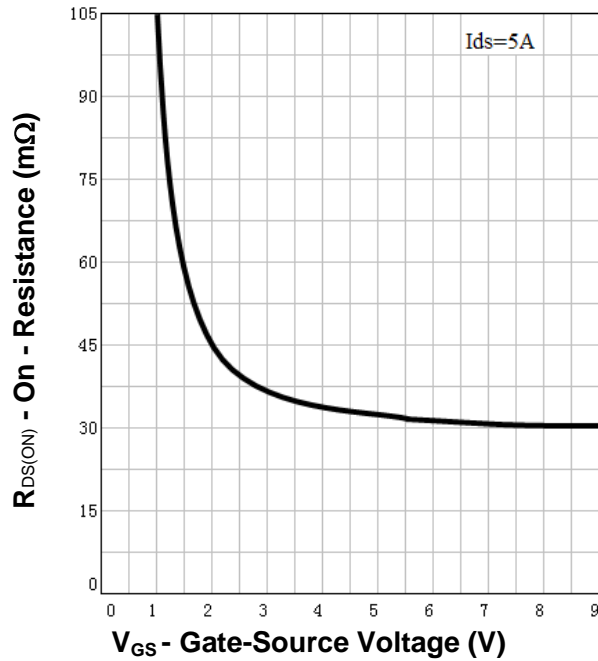
**Output Characteristics**



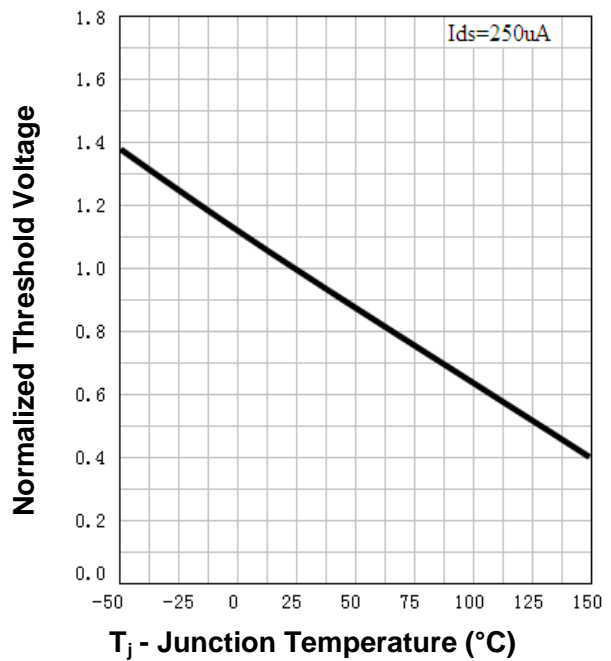
**Drain-Source On Resistance**



**Drain-Source On Resistance**

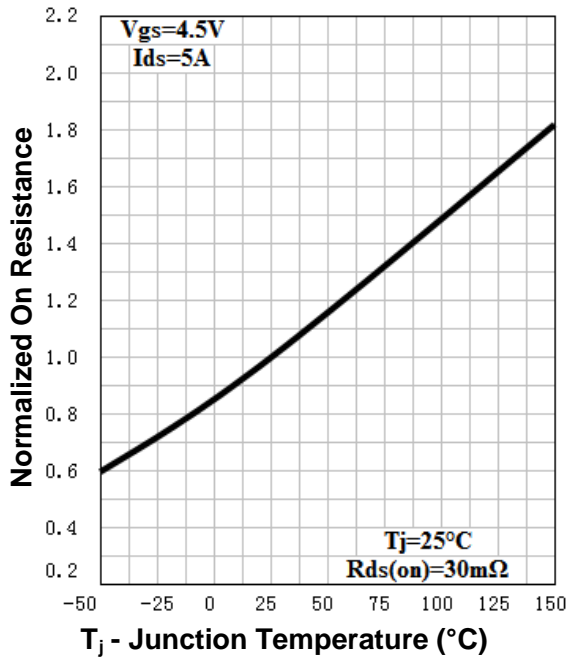


**Gate Threshold Voltage**

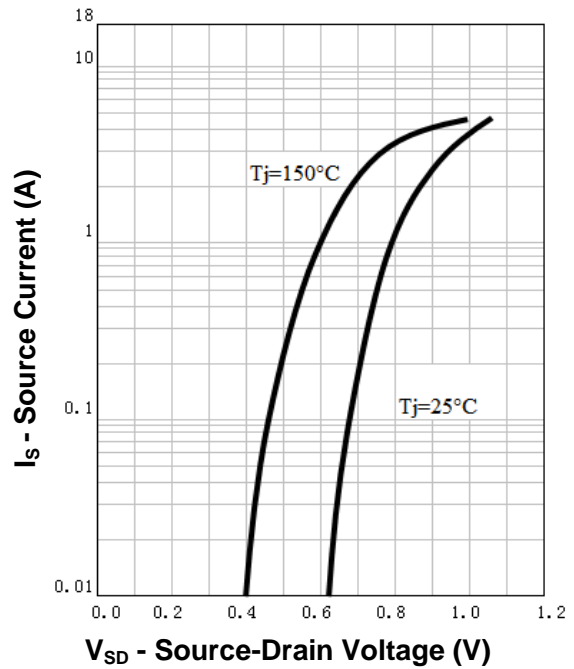


**Typical Characteristics**

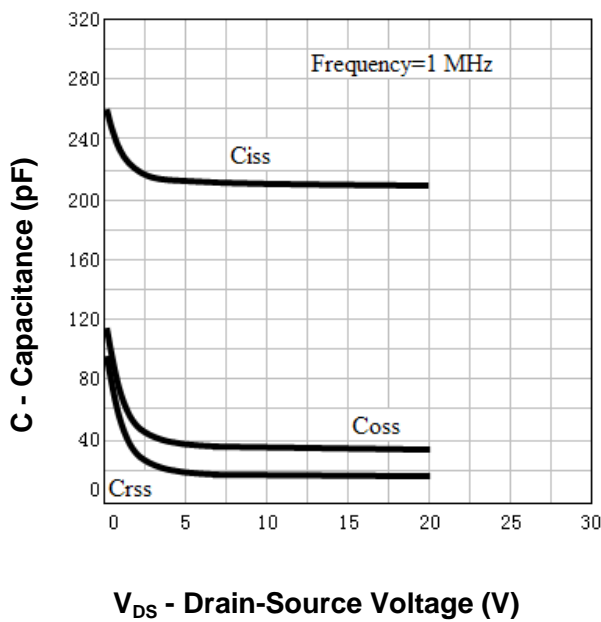
**Drain-Source On Resistance**



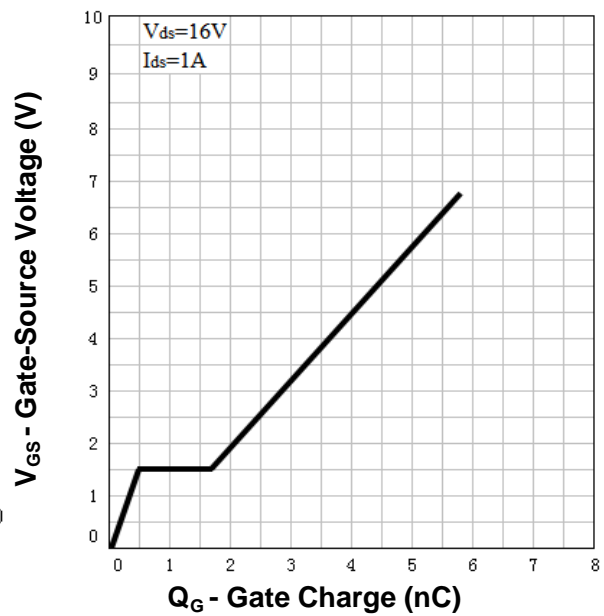
**Source-Drain Diode Forward**



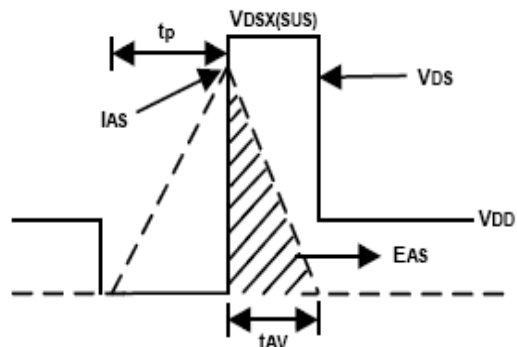
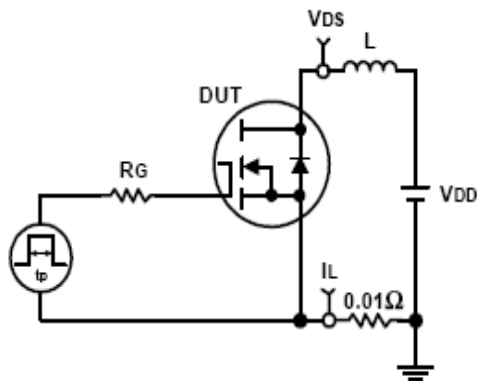
**Capacitance**



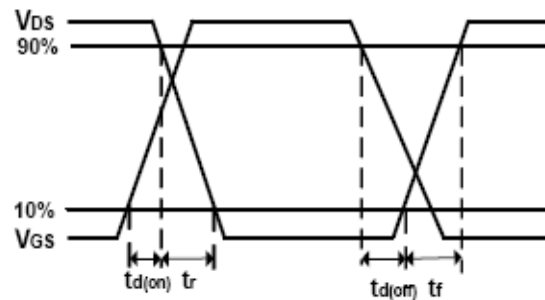
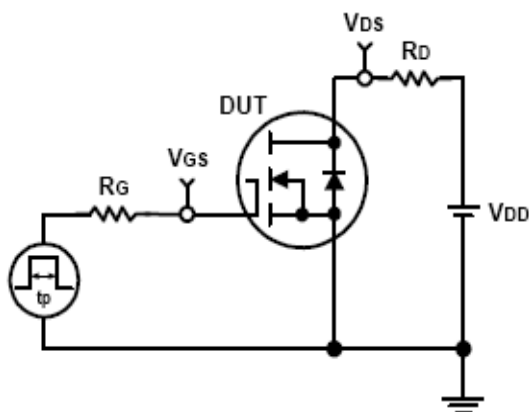
**Gate Charge**



**Avalanche Test Circuit and Waveforms**



**Switching Time Test Circuit and Waveforms**



**Ordering and Marking Information**

<b>Device</b>	<b>Marking<sup>①</sup></b>	<b>Package</b>	<b>Packaging</b>	<b>Quantity</b>	<b>Reel Size</b>	<b>Tape width</b>
RU205B	5XYWW	SOT-23	Tape&Reel	3000	7''	8mm

① The following characters could be different and means:

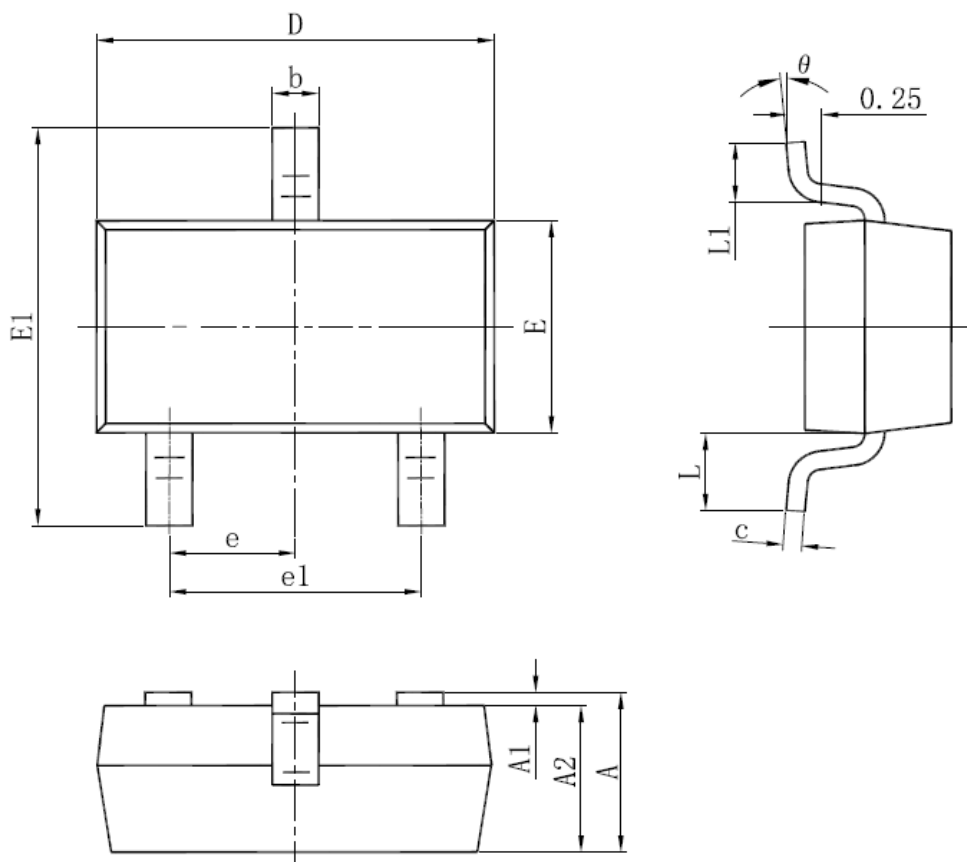
X =Assembly site code

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	$\theta$	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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