

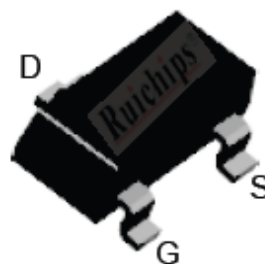
Features

- -20V/-4A,
 $R_{DS(ON)} = 40m\Omega$ (Typ.) @ $V_{GS} = -4.5V$
 $R_{DS(ON)} = 55m\Omega$ (Typ.) @ $V_{GS} = -2.5V$
- LOW $R_{DS(ON)}$
- Super High Dense Cell Design
- Reliable and Rugged
- Lead Free and Green Available

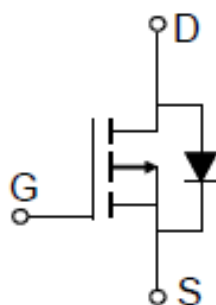
Applications

- Power Management
- Load Switch

Pin Description



SOT-23-3



P-Channel MOSFET

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		±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	-1.5	A
Mounted on Large Heat Sink				
I _{DP}	300μs Pulse Drain Current Tested	T _A =25°C	-16 ^①	A
I _D	Continuous Drain Current	T _A =25°C	-4	A
		T _A =70°C	-3.2	
P _D	Maximum Power Dissipation	T _A =25°C	1.3	W
		T _A =70°C	0.8	
R _{θJA} ^②	Thermal Resistance-Junction to Ambient		100	°C/W

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

Symbol	Parameter	Test Condition	RU20P4C			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 =85°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)} ③	Drain-Source On-state Resistance	V _{GS} =-4.5V, I _{DS} =-4A		40	60	mΩ
		V _{GS} =-2.5V, I _{DS} =-3A		55	100	mΩ
Diode Characteristics						
V _{SD} ③	Diode Forward Voltage	I _{SD} =-1A, V _{GS} =0V			-1	V
t _{rr}	Reverse Recovery Time	I _{SD} =-4A, dI _{SD} /dt=100A/μs		15		ns
Q _{rr}	Reverse Recovery Charge			8		nC
Dynamic Characteristics ④						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz		7.5		Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =-10V, Frequency=1.0MHz		585		pF
C _{oss}	Output Capacitance			95		
C _{rss}	Reverse Transfer Capacitance			50		
t _{d(ON)}	Turn-on Delay Time	V _{DD} =-10V, R _L =2.5Ω, I _{DS} =-4A, V _{GEN} =-4.5V, R _G =6Ω		8		ns
t _r	Turn-on Rise Time			11		
t _{d(OFF)}	Turn-off Delay Time			30		
t _f	Turn-off Fall Time			10		
Gate Charge Characteristics ④						
Q _g	Total Gate Charge	V _{DS} =-16V, V _{GS} =-4.5V, I _{DS} =-4A		9	13	nC
Q _{gs}	Gate-Source Charge			1.8		
Q _{gd}	Gate-Drain Charge			2.9		

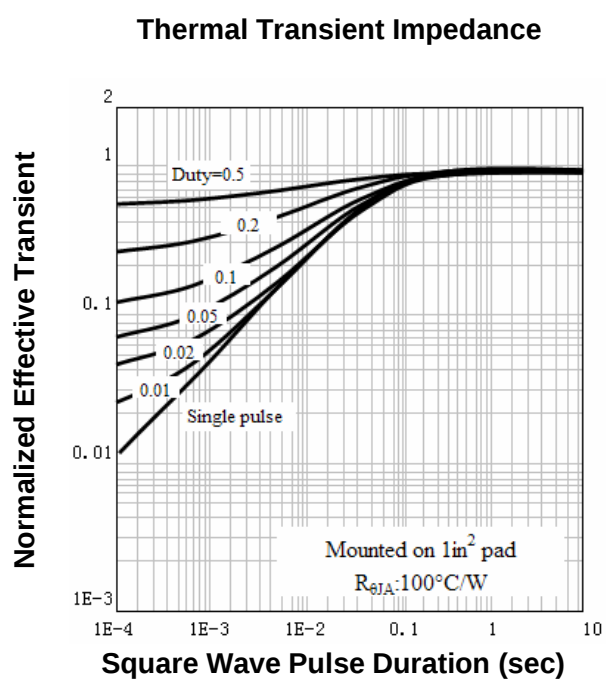
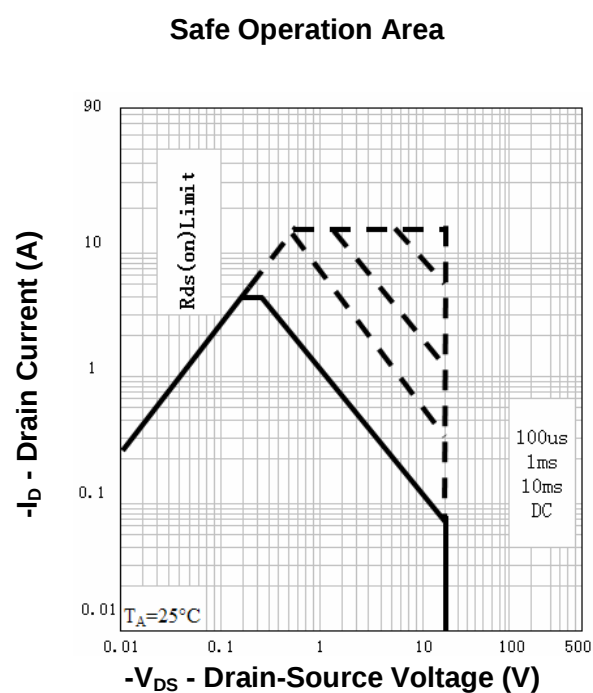
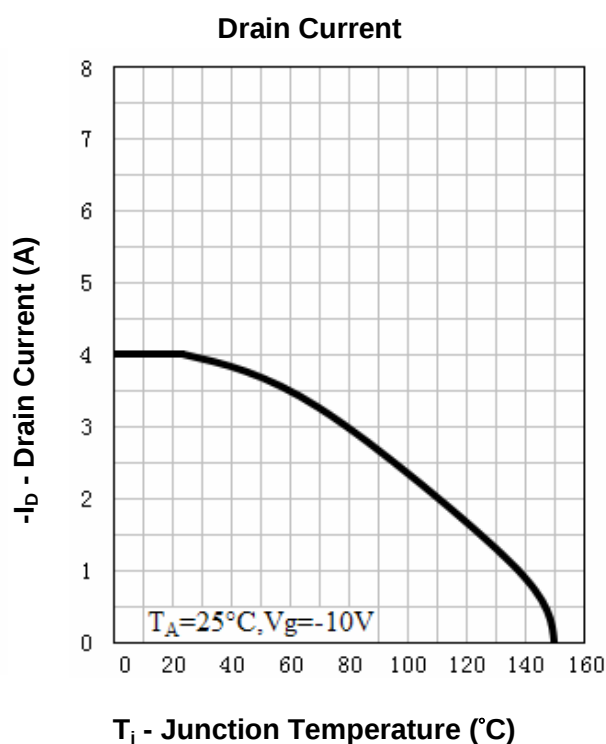
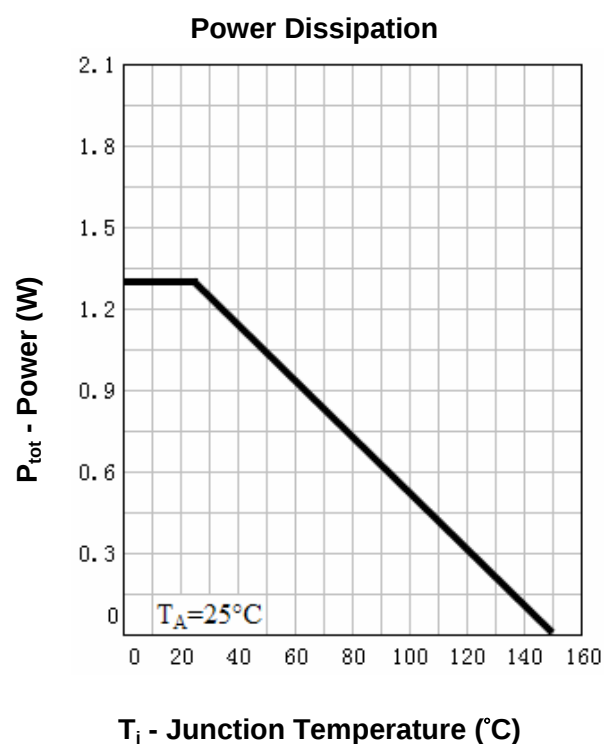
Notes: ① Pulse width limited by safe operating area.

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 $\leq 2\%$.

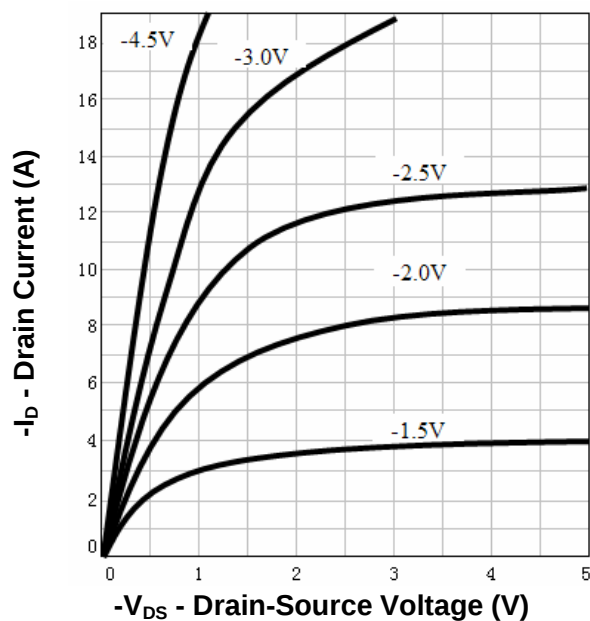
④ Guaranteed by design, not subject to production testing.

Typical Characteristics

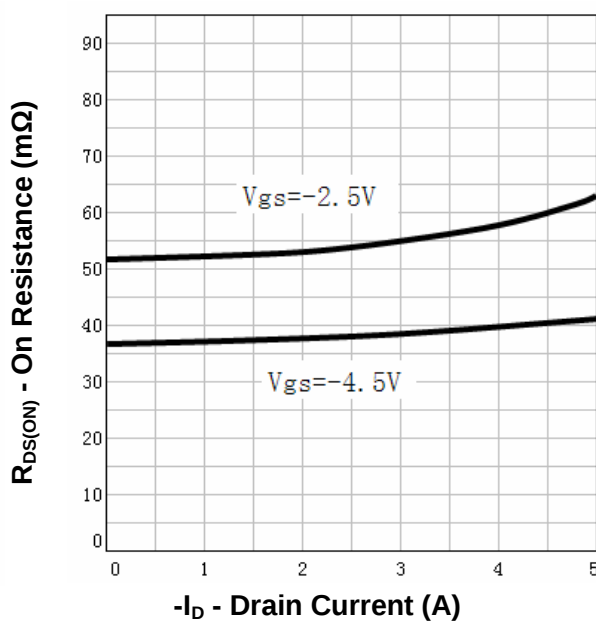


Typical Characteristics

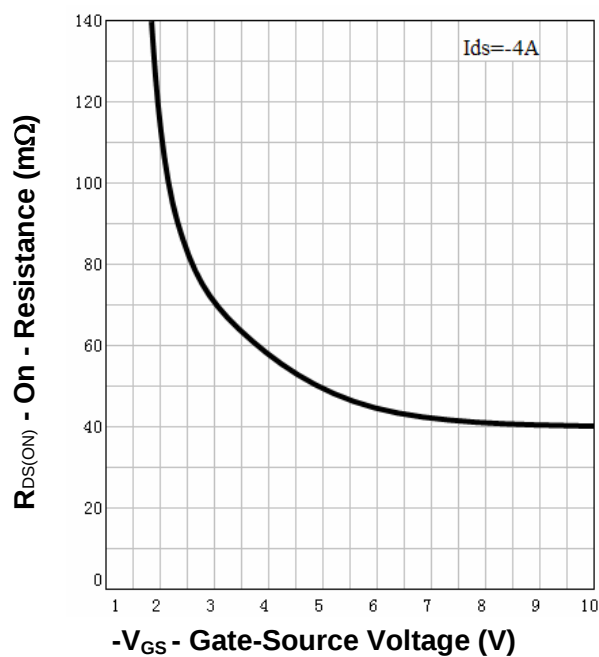
Output Characteristics



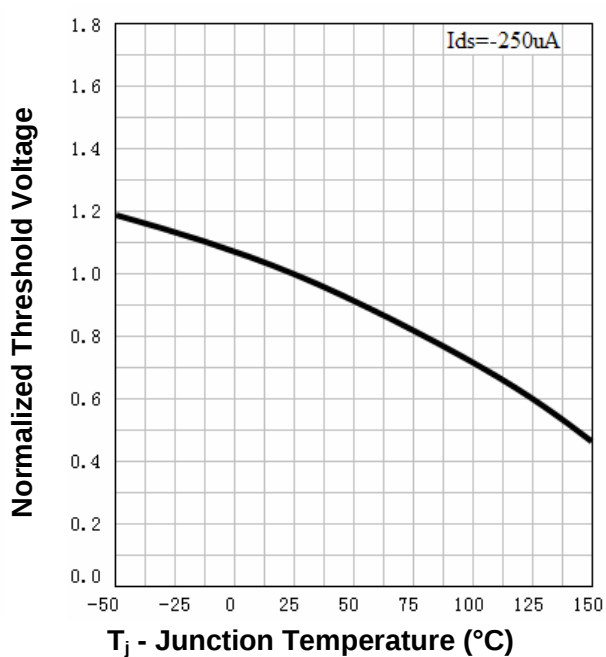
Drain-Source On Resistance



Drain-Source On Resistance

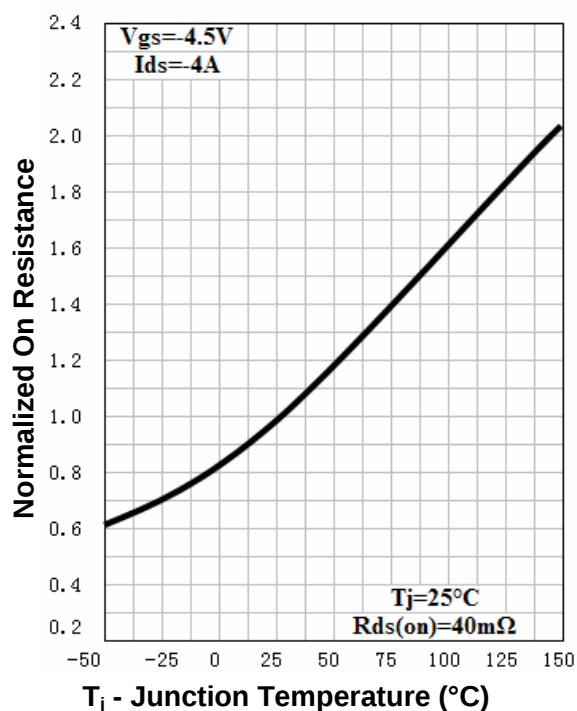


Gate Threshold Voltage

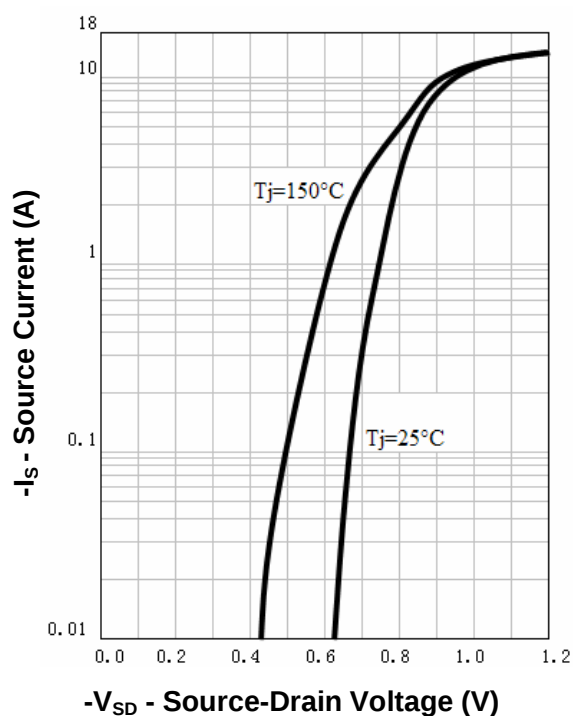


Typical Characteristics

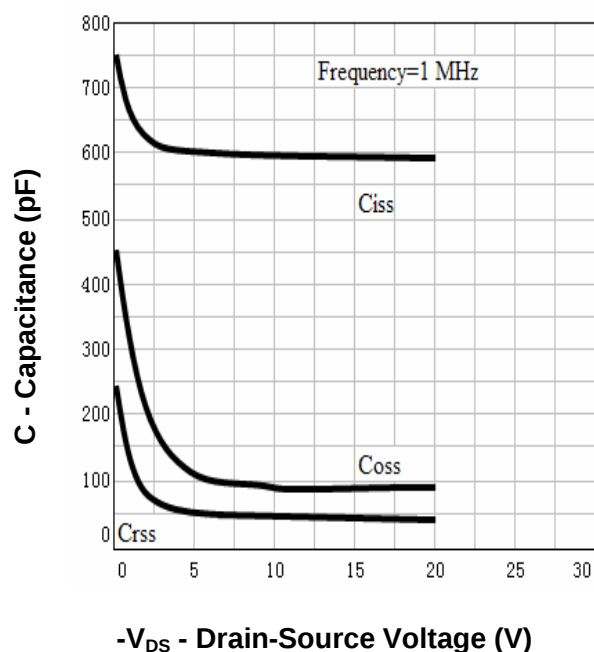
Drain-Source On Resistance



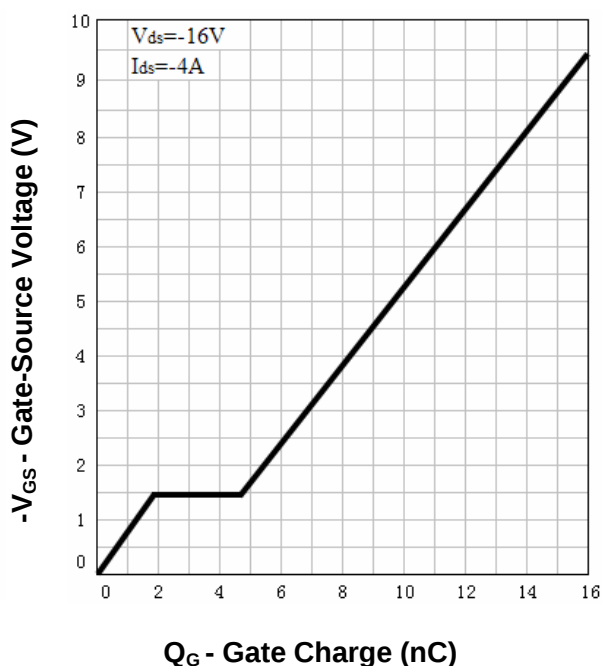
Source-Drain Diode Forward



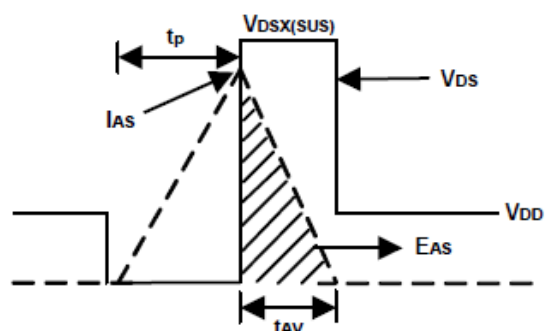
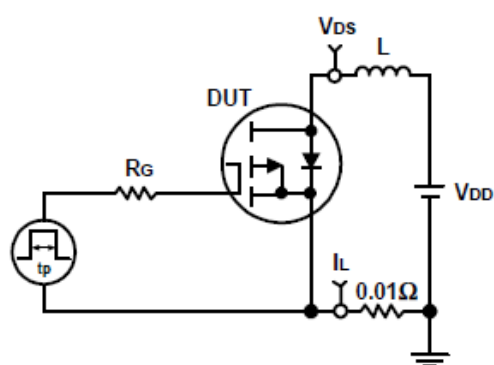
Capacitance



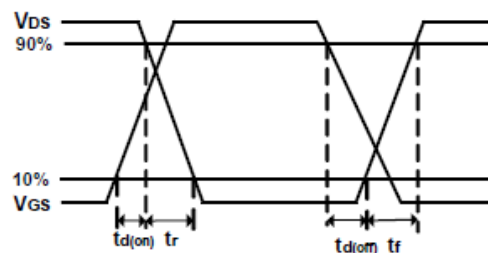
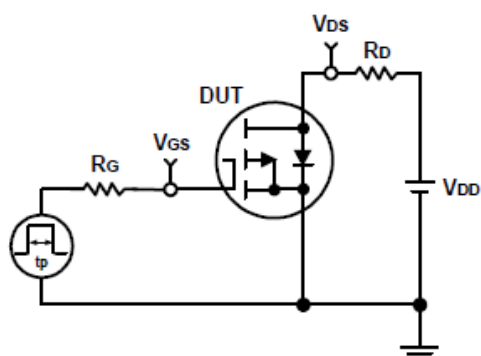
Gate Charge



Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms



Ordering and Marking Information

RU20P4

Package (Available)

C : SOT-23-3

Operating Temperature Range

C : -55 to 150 °C

Assembly Material

G : Green & Lead Free

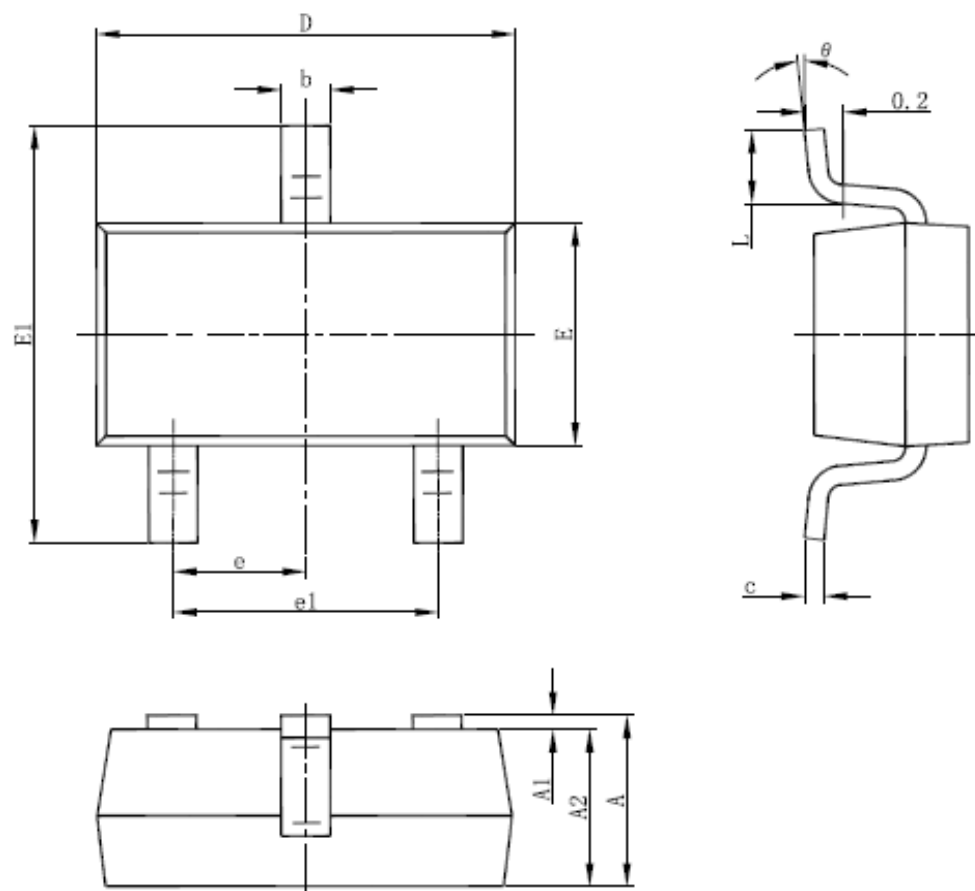
Packaging

T : TUBE

TR : Tape & Reel

Package Information

SOT-23-3



SYMBOL	MM		INCH		SYMBOL	MM		INCH	
	MIN	MAX	MIN	MAX		MIN	MAX	MIN	MAX
A	1.050	1.250	0.041	0.049	E	1.500	1.700	0.059	0.067
A1	0.0000	0.100	0.000	0.004	E1	2.650	2.950	0.104	0.116
A2	1.050	1.150	0.041	0.045	e	0.950(BSC)		0.037(BSC)	
b	0.300	0.500	0.012	0.020	e1	1.800	2.000	0.071	0.079
c	0.100	0.200	0.004	0.008	L	0.300	0.600	0.012	0.024
D	2.820	3.020	0.111	0.119	θ	0°	8°	0°	8°

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

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