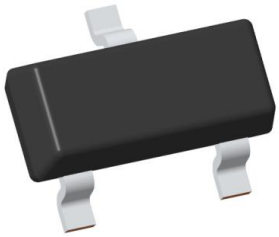
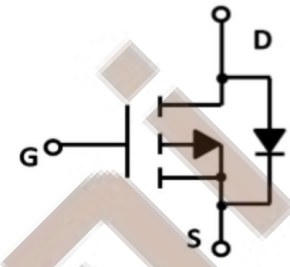
General Description

V_R	$R_{DSON\ MAX}$	I_D Max.
-20V	35.7mΩ@-4.5V	-5A
	46.2mΩ@-2.5V	



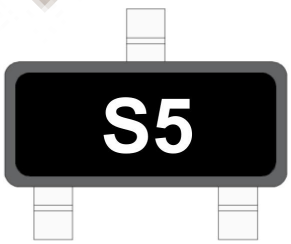
Features

- Trench FET Power MOSFET
- Load Switch for Portable Devices.
- DC/DC Converter.
- Moisture Sensitivity Level 3



Mechanical Data

- SOT-23 Small Outline Plastic Package.
- Epoxy UL: 94V-0.
- Mounting Position: Any.



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
2305B	SOT-23	S5	3000

Absolute Maximum Ratings (Ta=25℃ unless otherwise noted)

Parameter		Symbols	Rating	Units
Drain-Source Voltage		VDS	-20	V
Gate-Source Voltage		VGS	±12	V
Continuous Drain Current	TA=25℃	ID	-5	A
	TA=100℃		-3	
Pulsed Drain Current (Note1)		IDM	-20	
Power Dissipation		PD	1.25	W
Junction Temperature		Tj	150	℃
Storage Temperature		Tstg	-55-+150	℃
Thermal Resistance From Junction to Ambient (Note2)		RθJA	100	℃/W

Electrical Characteristics (Ta=25℃,unless otherwise noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V(BR)DSS	VGS=0V, ID=-250uA	-20			V
Gate-Threshold voltage	VGS (th)	VDS=VGS, ID=-250uA	-0.4	-0.65	-1	V
Gate-body Leakage	IGSS	VDS=0V, VGS=±12V			±100	nA
Zero Gate Voltage Drain current	IDSS	VDS=-20V, VGS=0V			-1	uA
Drain-Source On-Resistance (Note3)	RDS(ON)	VGS=-4.5V, ID=-3A		27.5	35.7	mΩ
		VGS=-2.5V, ID=-2A		35.5	46.2	
Drain to Source Diode Forward Voltage	VSD	IS=-3A, VGS=0V			-1.2	V
Dynamic						
Input capacitance	Ciss	VDS=-10V, VGS=0V, f=1MHz		597		pF
Output capacitance	Coss			97		
Reverse Transfer capacitance	Crss			83		
Total gate charge	Qg	VDS=-10V, VGS=0 to -4.5V, ID=-5A		15		nC
Gate-source charge	Qgs			1.8		
Gate-drain charge	Qgd			2.8		
Switching						
Turn-on Time	td(on)	VGS=-4.5V, VDD=-10V, ID=-5A, RGEN=6Ω		4.5		ns
Rise time	tr			9.2		
Turn-off Time	td(off)			18.7		
Fall time	tf			3.3		
Drain-source body diode characteristics						
Continuous source-drain diode current	IS				-5	A
Pulse diode forward current	ISM				-20	

Notes:

1. Repetitive Rating:Pulse Width Limited by Maximum Junction Temperature.
2. RθJA is measured with the device mounted on a 1inch^2 pad of 2oz copper FR4 PCB.
3. Pulse Test: Pulse Width ≤300us, Duty Cycle≤0.5%

Typical Characteristics

Figure 1: Output Characteristics

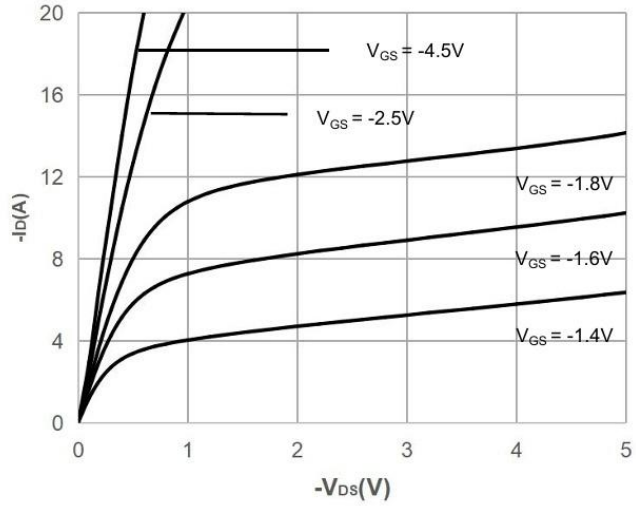


Figure 2: Typical Transfer Characteristics

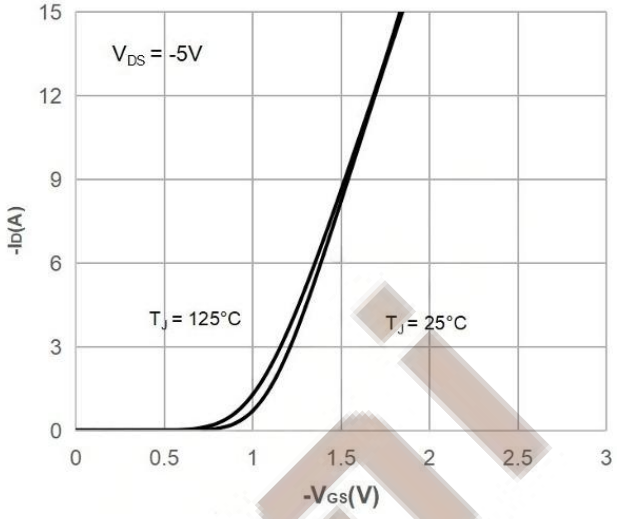


Figure 3: On-resistance vs. Drain Current

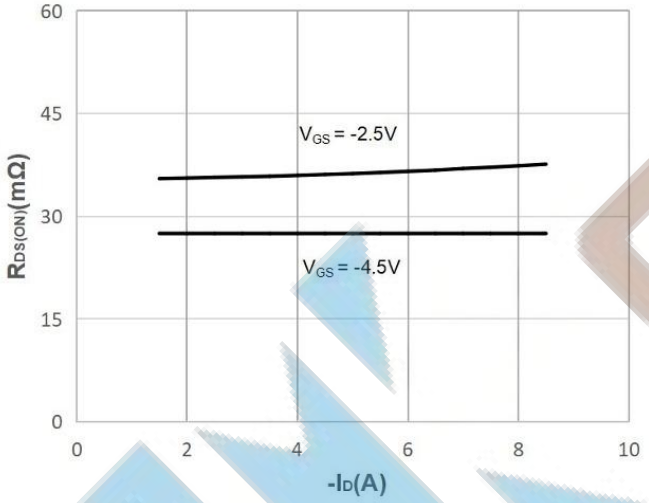


Figure 4: Body Diode Characteristics

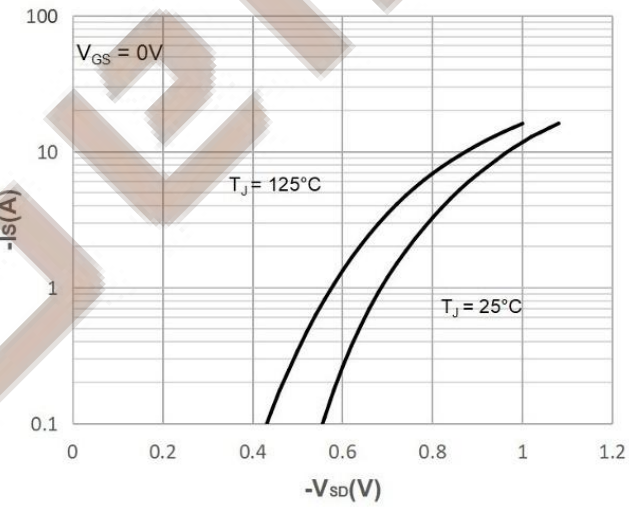


Figure 5: Gate Charge Characteristics

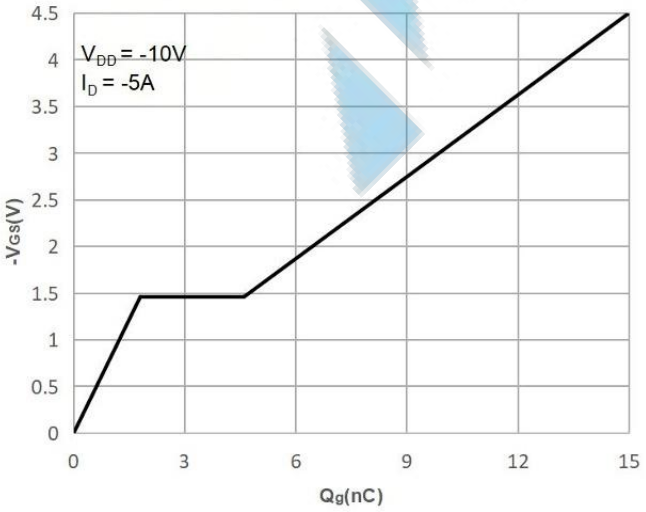


Figure 6: Capacitance Characteristics

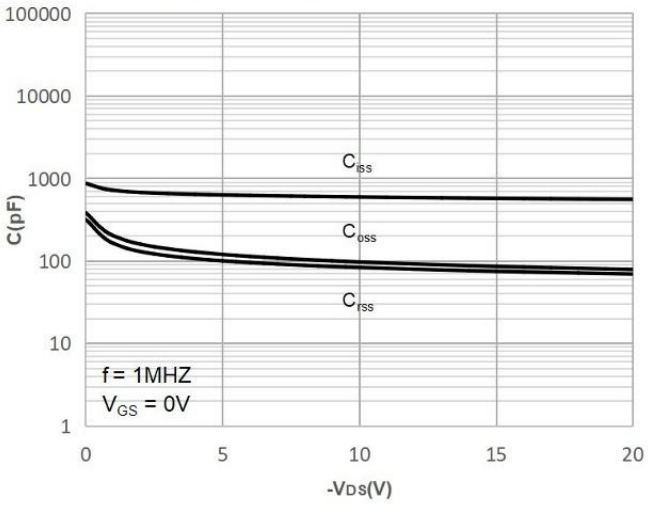


Figure 7: Normalized Breakdown voltage vs. Junction Temperature

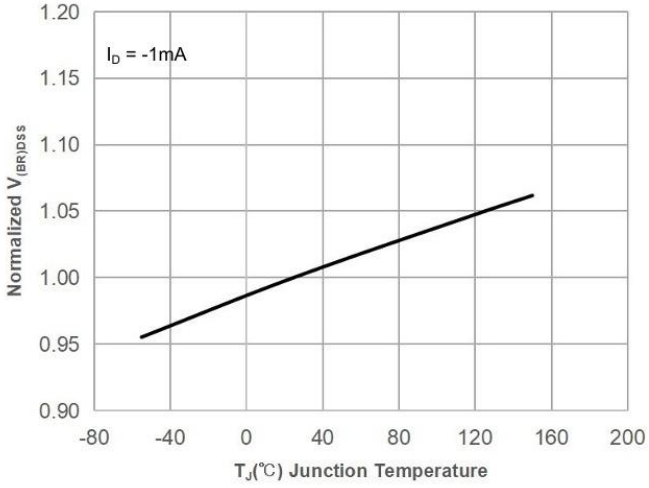


Figure 8: Normalized on Resistance vs. Junction Temperature

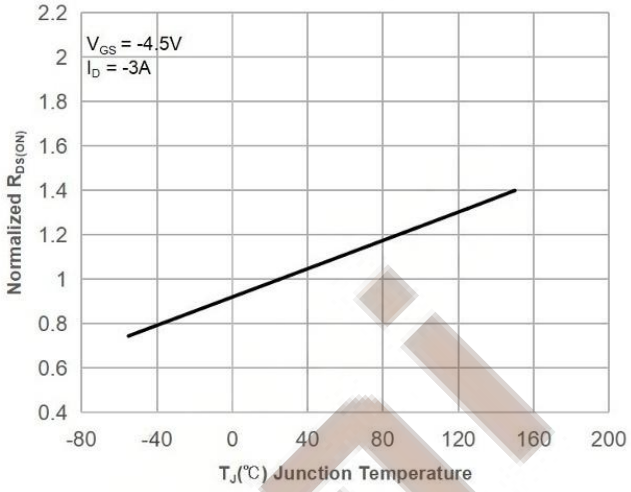


Figure 9: Maximum Safe Operating Area

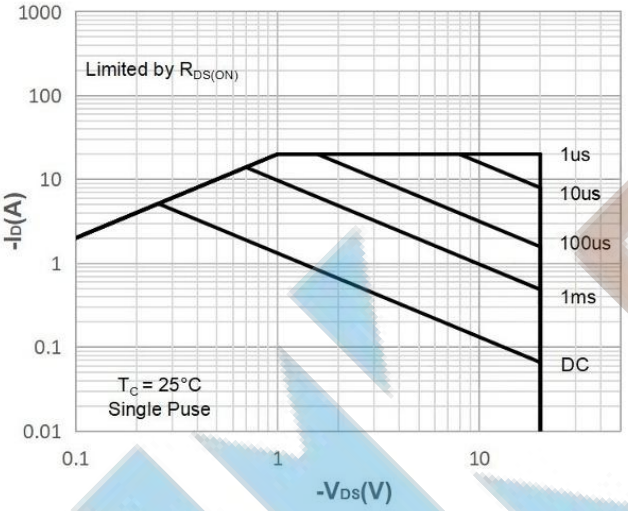


Figure 10: Maximum Continuous Drian Current vs. Case Temperature

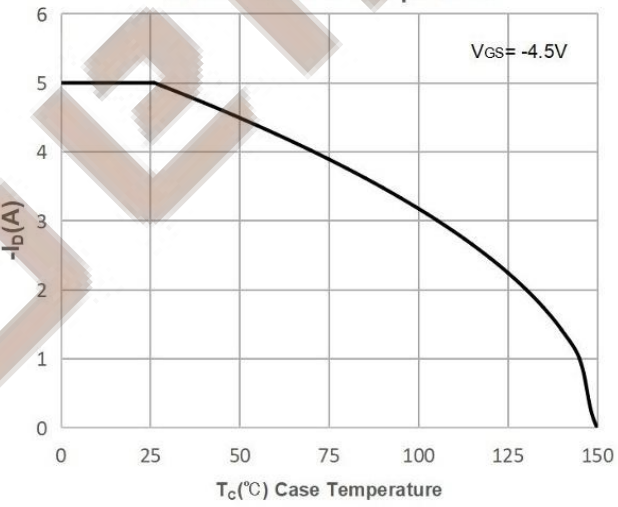


Figure 11: Normalized Maximum Transient Thermal Impedance

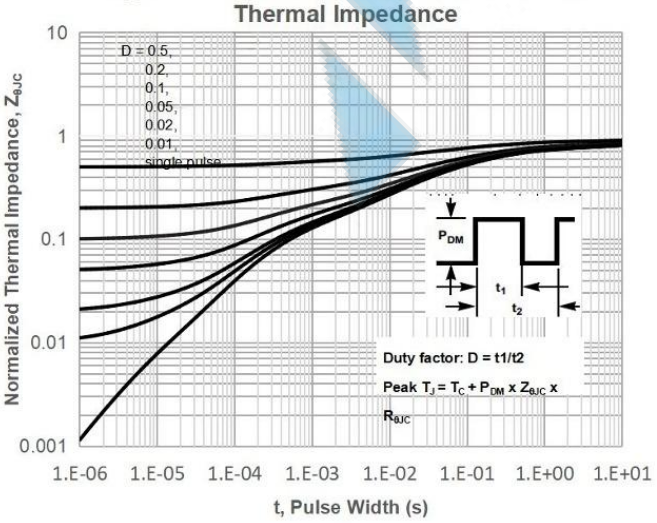
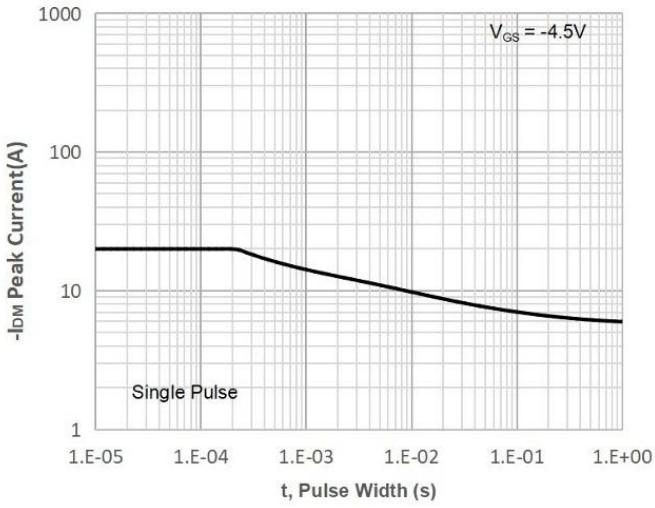
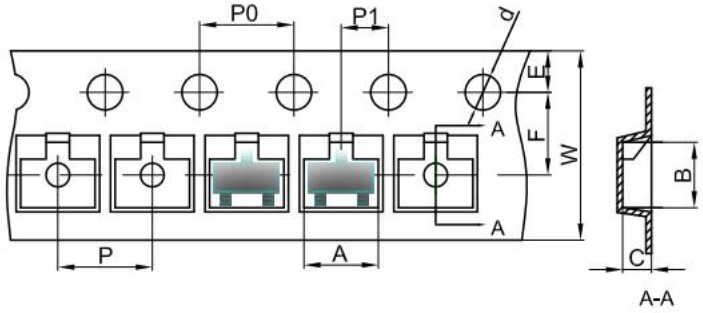


Figure 12: Peak Current Capacity

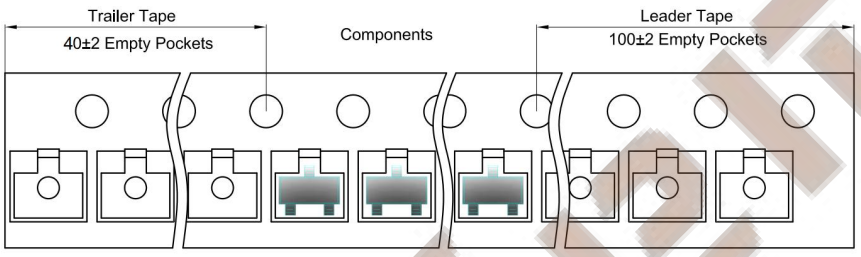


Package Information

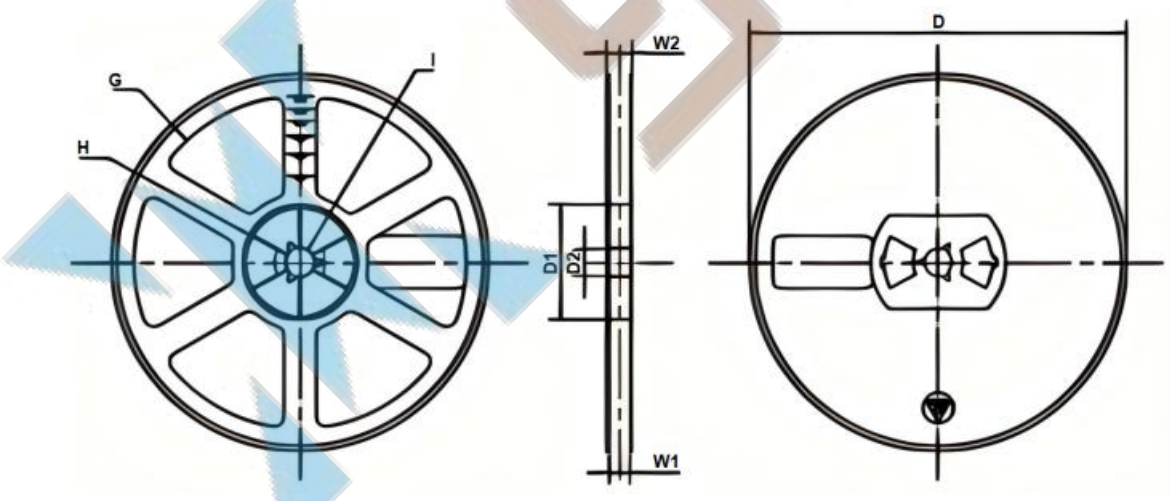
Carrier Dimension(mm)



Dimensions are in millimeter											
Pkg Type	A	B	C	d	E	F	P0	P	P1	10*P0	W
SOT-23	3.15	2.77	1.22	Ø1.50	1.75	3.50	4.00	4.00	2.00	40.00	8.00
(Tolerance)	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.2	±0.1



Reel Dimension(mm)



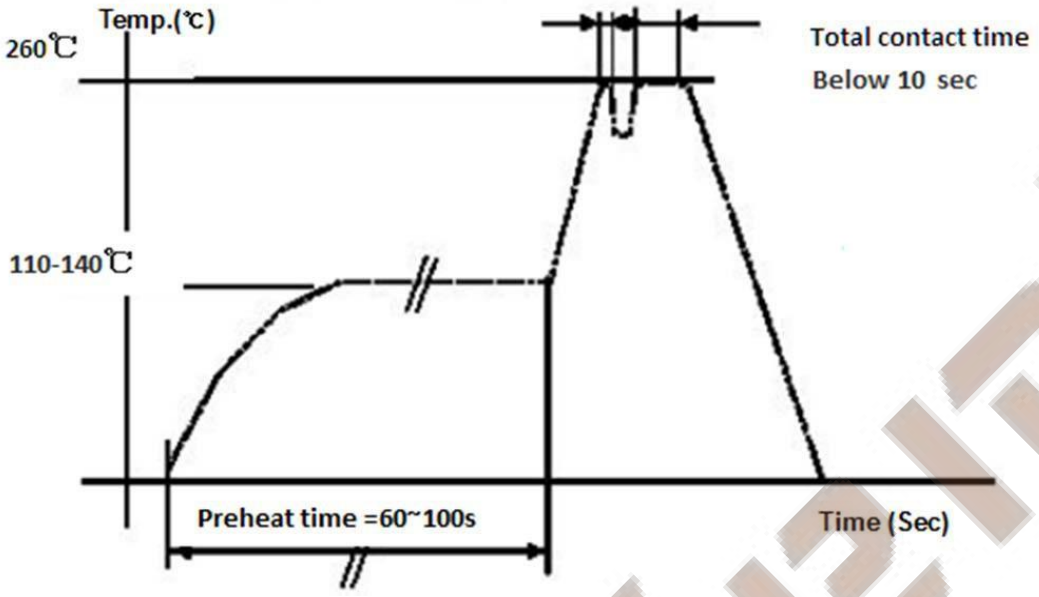
Reel Option	D	D1	D2	G	H	I	W1	W2
7"Dia	Φ178.00	54.40	13.00	R78.00	R25.60	R6.50	9.50	12.30
Tolerance	±2	±1	±1	±1	±1	±1	±1	±1

Package Specifications

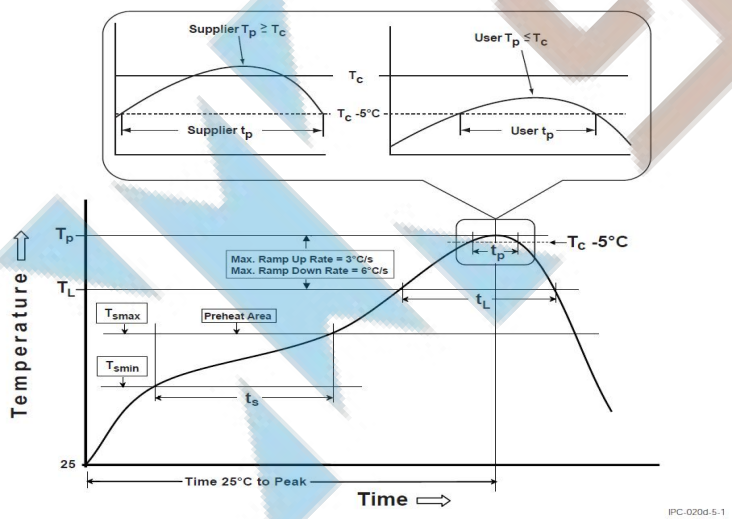
Package	Reel Size	Reel DIA. (mm)	Q'TY/Reel (Kpcs)	Box Size (mm)	QTY/Box (Kpcs)	Carton Size (mm)	Q'TY/Carton (Kpcs)
SOT23	7'	178	3	210*208*203	45	440*400*230	180

Recommended Soldering Profile for Rectifier Diodes (Pb Free)

a) Wave Soldering Profile



b) Reflow Soldering Profile (Pb Free Application), refer to IPC/JEDEC J-STD-020

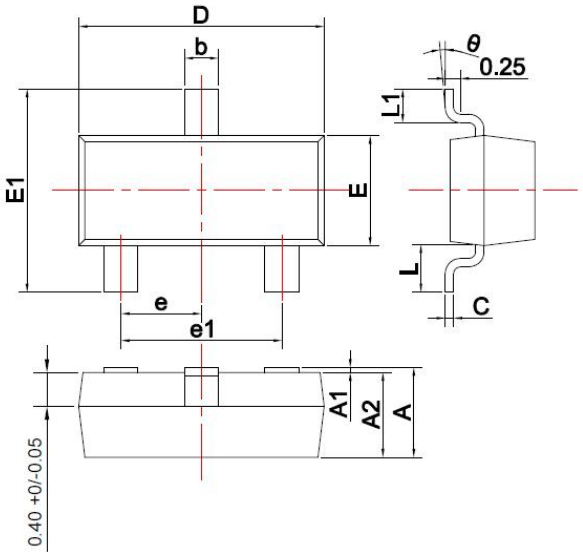


Preheat/Soak Temperature Min (Tsmin) Temperature Max (Tsmax) Time (ts) from (Tsmin to Tsmax)	50 °C 200 °C 60-120 seconds
Melting Point of Solder (Sn Ag Cu)	217℃
Ramp-up Rate to 217℃(Melting Point of Solder)	3℃/sec
Time at Temp.>217℃ (Melting Point of Solder)	60~150 Sec
Peak Temperature	255±5℃
Time within 5℃below Peak Temp.	20~40 Sec
Cooling Rate	6℃/sec (max)
Time from 25℃ to Peak Temp.	8min (max)

c) Manual Soldering

When using an electric soldering iron for manual soldering, it is recommended that the temperature does not exceed 300°C and the soldering time is less than 10 seconds.

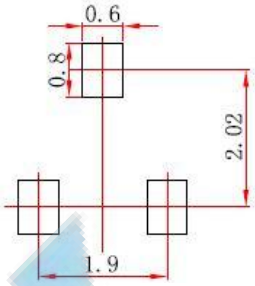
Package Mechanical Data



SYMBOL	DIMENSIONS	
	MIN.	MAX.
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.500
θ	0°	8°

Unit: mm

Suggested Pad Layout



Note:
1.Controlling dimension:In millimeters.
2.General tolerance:± 0.05mm.
3.The pad layout is for reference purposes only.

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