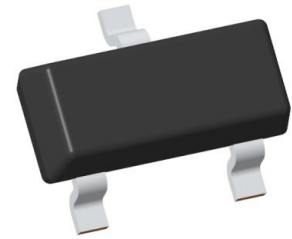


General Description

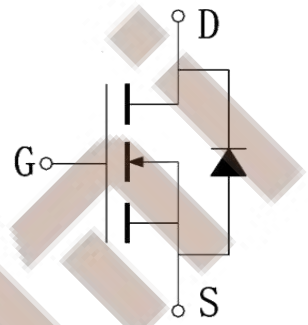


V_R	$R_{DS(on) MAX}$	I_D Max.
100V	285mΩ@10V	2A
	325mΩ@4.5V	



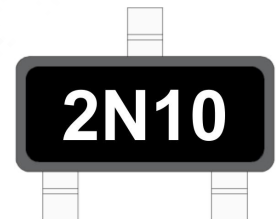
Features

- 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)
2N10	SOT-23	2N10	3000

Absolute Maximum Ratings (Ta=25°C unless otherwise noted)

Parameter	Symbols	Rating	Units
Drain-Source Voltage	VDS	100	V
Gate-Source Voltage	VGS	±20	V
Continuous Drain Current	ID	2.0	A
Pulsed Source Current	IDM	7.0	
Power Dissipation	PD	350	mW
Junction Temperature	Tj	150	°C
Storage Temperature	Tstg	-50-+150	°C
Thermal Resistance From Junction to Ambient	RθJA	357	°C/W

Electrical Characteristics (T_a=25°C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V(BR)DSS	VGS=0V, ID=250uA	100			V
Gate-Threshold voltage*	V GS (th)	VDS=VGS, ID=250uA	1.1	1.6	2.2	V
Gate-body Leakage	IGSS	VDS=0V, VGS=±20V			±100	nA
Zero Gate Voltage Drain current	IDSS	VDS=100V, VGS=0V			1	uA
Drain-Source On-Resistance (a)	RDS(ON)	VGS=10V, ID=1A		220	285	mΩ
		VGS=4.5V, ID=1A		240	325	
Forward trans conductance (a)	gfs	VDS=50V, ID=1.6A	5.7			S
Diode forward voltage	VSD	IS=1.1A, VGS=0V			1.3	V
Dynamic						
Input capacitance(b)	Ciss	VDS=25V, VGS=0V, f=1MHz		321		pF
Output capacitance(b)	Coss			21		
Reverse Transfer capacitance(b)	Crss			15		
Total gate charge	Qg	VDS=30V, VGS=0 to 10V,ID=2A		5.3		nC
Gate-source charge	Qgs			1.3		
Gate-drain charge	Qgd			1.7		
Switching (b)						
Turn-on Time	td(on)	VDD=30V, VGS=10V, ID=1A, RG=3Ω		14		ns
Rise time	tr			54		
Turn-off Time	td(off)			18		
Fall time	tf			11		

Notes :

a. Pulse Test: Pulse Width ≤300us, Duty Cycle≤2%.

b. These parameters have no way to verify.

Typical Performance Characteristics

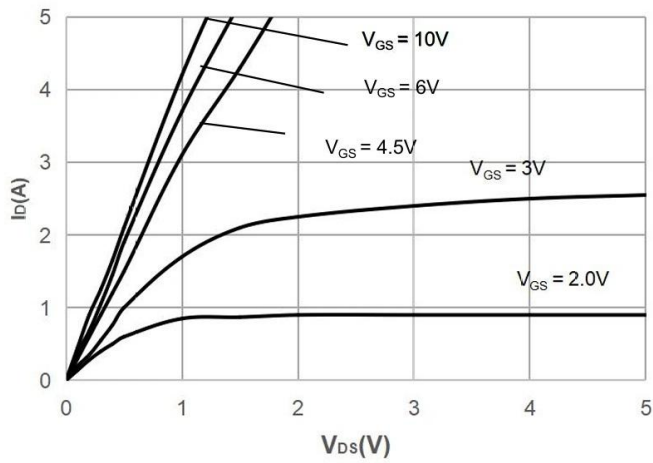
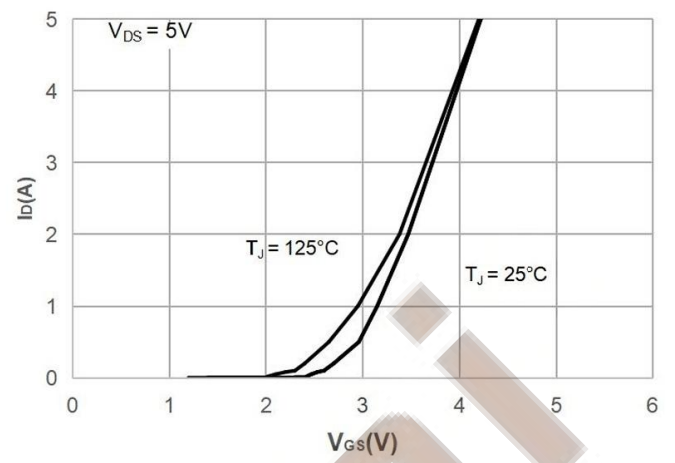
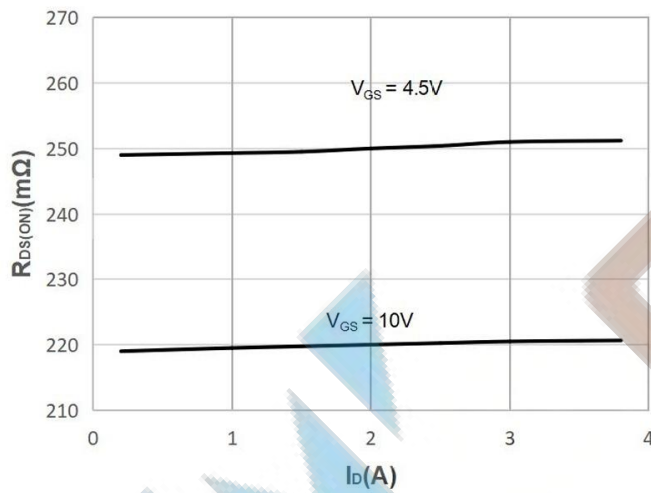
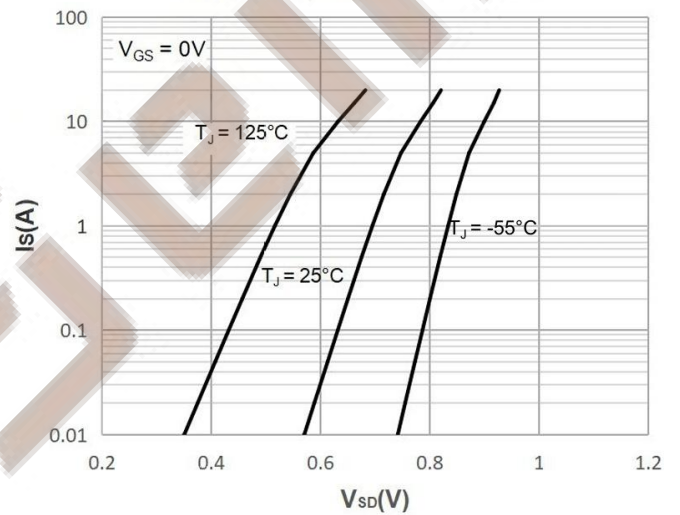
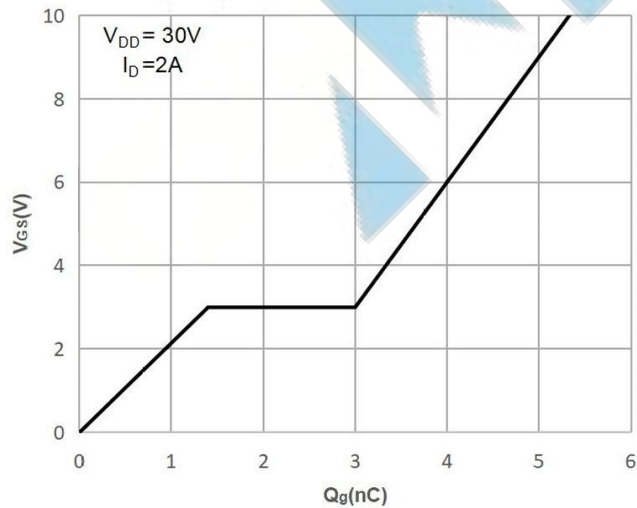
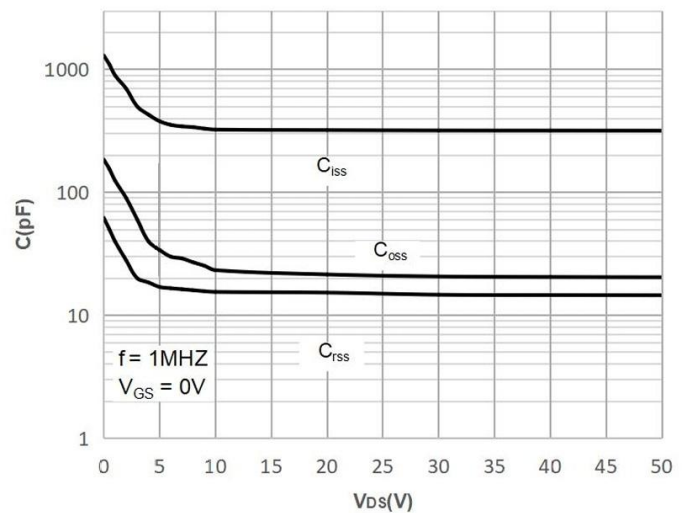
Figure 1: Output Characteristics

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

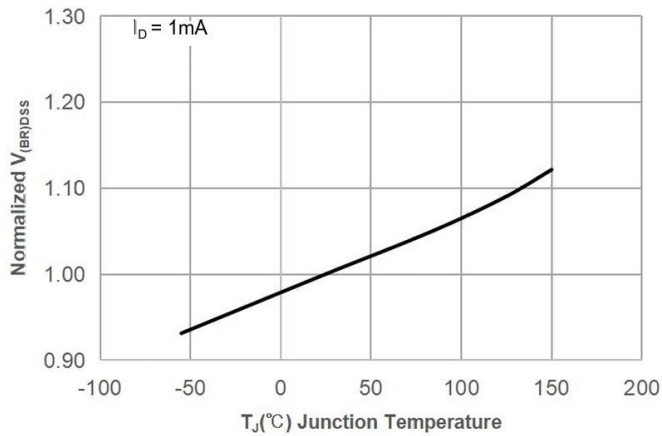


Figure 8: Normalized on Resistance vs. Junction Temperature

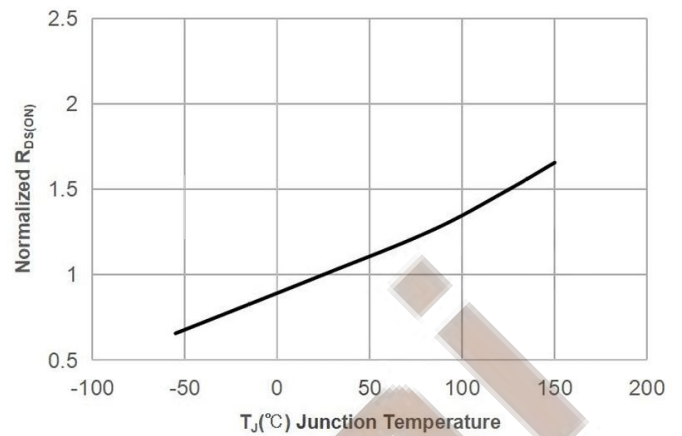


Figure 9: Maximum Safe Operating Area

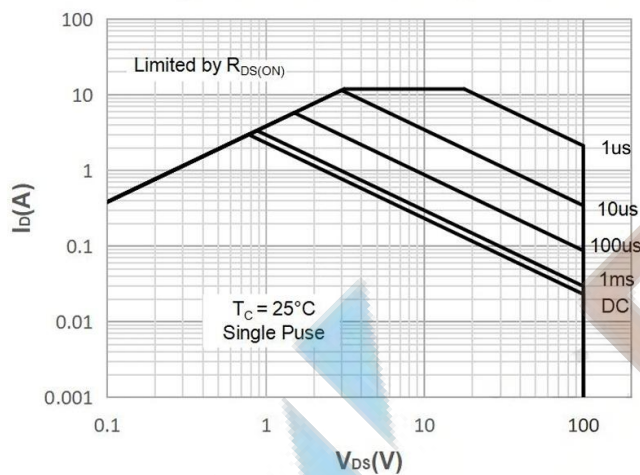


Figure 10: Maximum Continuous Drian Current vs. Case Temperature

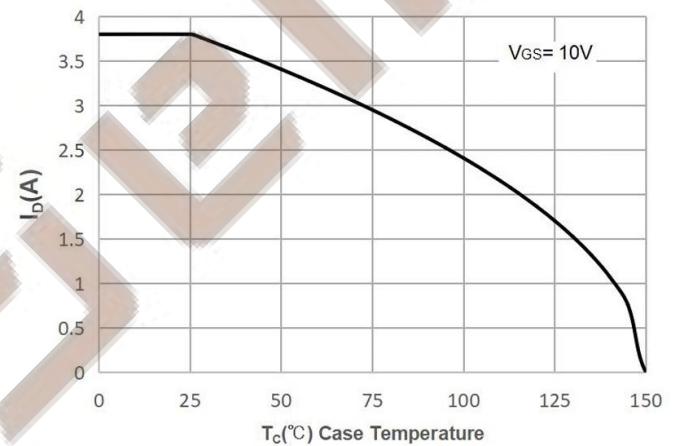


Figure 11: Normalized Maximum Transient Thermal Impedance

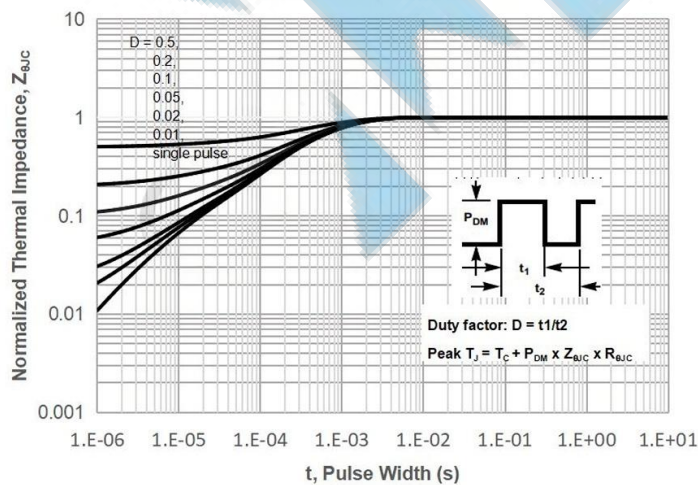
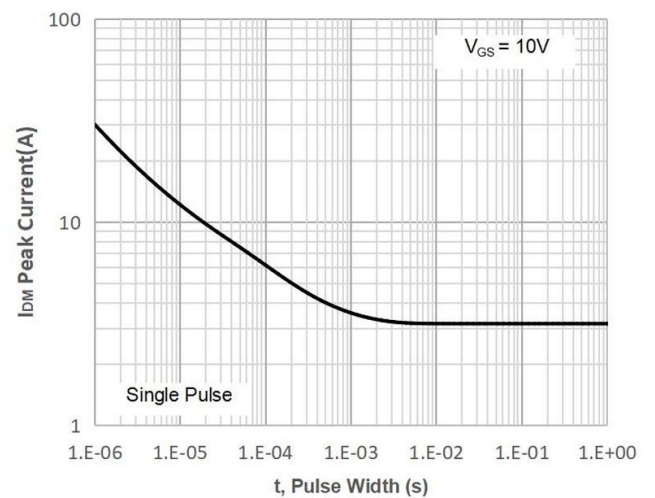
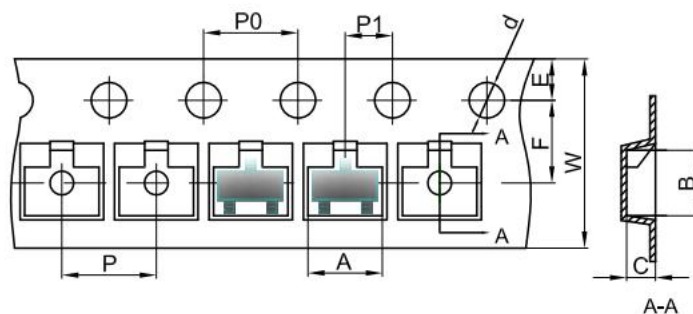


Figure 12: Peak Current Capacity



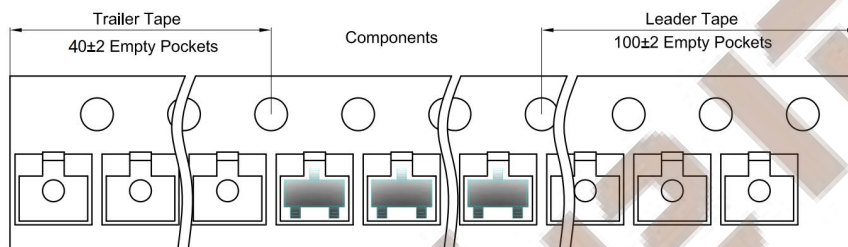
Package Information

Carrier Dimension(mm)

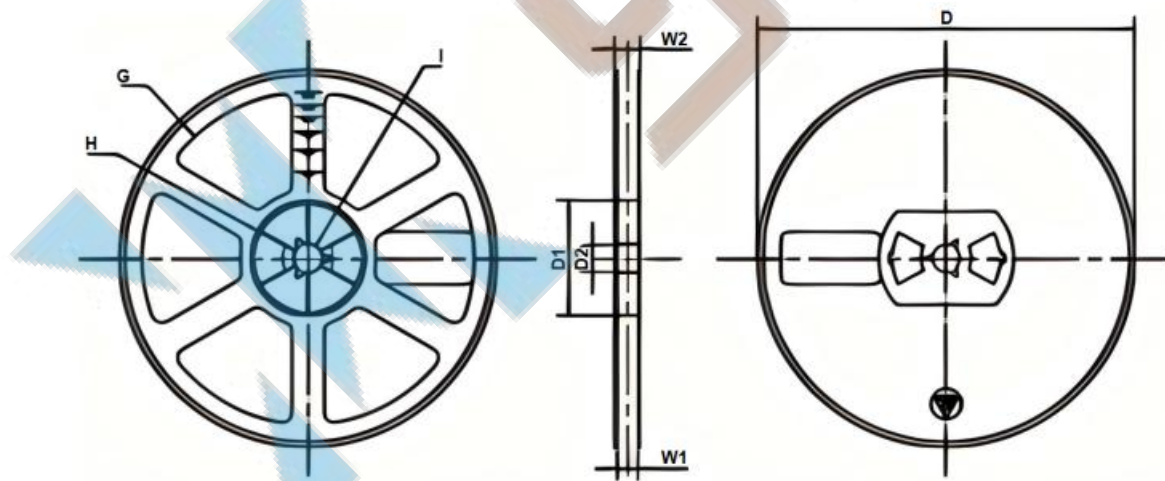


Dimensions are in millimeter

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)



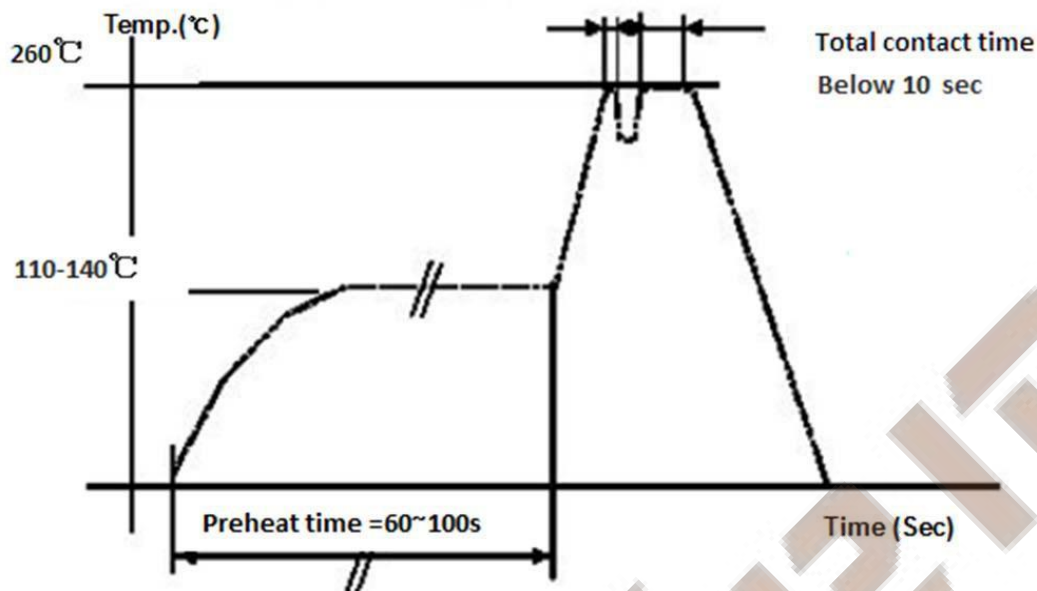
Reel Option	D	D1	D2	G	H	I	W1	W2
7"Dia	Φ178.00	54.40	13.00	R78.00	R25.60	R6.50	9.50	12.30
Tolerance	±2	±1	±1	±1	±1	±1	±1	±1

Package Specifications

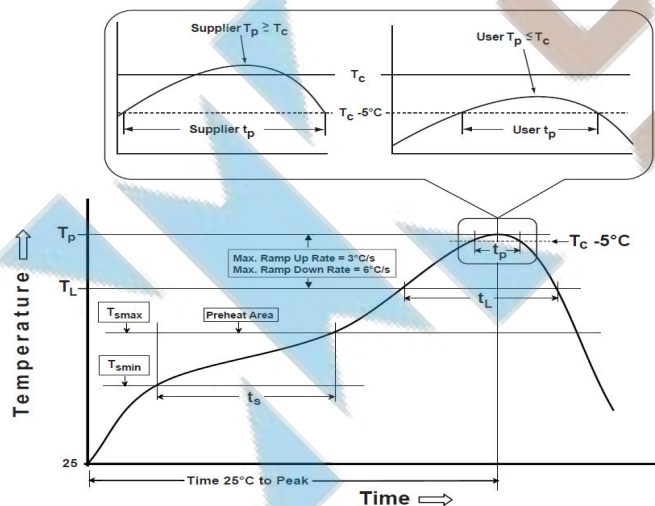
Package	Reel Size	Reel DIA. (mm)	Q'TY/Reel (Kpcs)	Box Size (mm)	QTY/Box (Kpcs)	Carton Size (mm)	Q'TY/Carton (Kpcs)
SOT23	7'	178	3	210*208*203	45	440*400*230	180

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

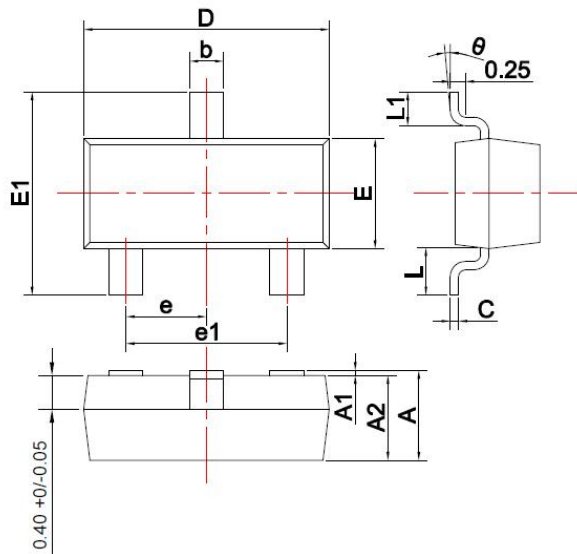


Preheat/Soak Temperature Min (T _{min}) Temperature Max (T _{max}) Time (ts) from (T _{min} to T _{max})	50 °C 200 °C 60-120 seconds
Melting Point of Solder (Sn Ag Cu)	217°C
Ramp-up Rate to 217°C(Melting Point of Solder)	3°C/sec
Time at Temp.>217°C (Melting Point of Solder)	60~150 Sec
Peak Temperature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

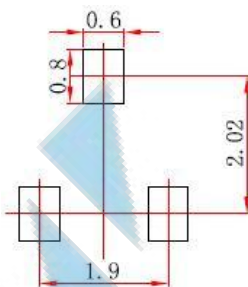
Package Mechanical Data



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: $\pm 0.05\text{mm}$.
3. The pad layout is for reference purposes only.

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