

SPECIFICATION SHEET NO.	S0414- ESD3Z5V0BUS5BU	
ORIGINAL MFG/PART NO.	MDD Diodes/ESD3Z5V0BU	
NEXTGEN PART CODE	ESD3Z5V0BUS5BU	Indicate This Code For RFQ /Order
DATE	Apr. 14, 2025	
REVISION	A3	Updated With Most Recent Data
DESCRIPTION AND MAIN PARAMETRICS	SMD Plastic-Encapsulate ESD Protection Diodes, ESD3Z Series Case SOD-323, 2 Pads, Ultra -Low Capacitance, Bi-Directional Type Reverse Working Voltage : 5.0V, Clamping Voltage 13VC Max.@1.0A Operating Junction Temp. Range -55°C ~+125°C Package in Tape/Reel, 3000pcs/Reel RoHS/RoHS III compliant, RoHS Annex III lead Exemption (Exempt per RoHS EU 2015/863) and Halogen Free (HF)	
CUSTOMER		
CUSTOMER PART NUMBER		
CROSS REF. PART NUMBER		
MEMO		

VENDOR APPROVE
Issued/Checked/Approved   
Effective Date: Apr. 14, 2025

CUSTOMER APPROVE
Date:

DESCRIPTION

ESD3Z5V0BU is an ultra low-capacitance Transient Voltage Suppressor (TVS) designed to provide electrostatic discharge (ESD) protection for high-speed data interfaces. With typical capacitance of 0.25pF, ESD3Z5V0BU is designed to protect parasitic-sensitive systems against over-voltage and overcurrent transient events. It complies with IEC 61000-4-2 (ESD), Level 4 ($\pm 15\text{kV}$ air, $\pm 8\text{kV}$ contact discharge), IEC 61000-4-4 (electrical fast transient - EFT) (40A, 5/50 ns), very fast charged device model (CDM) ESD and cable discharge event (CDE), etc. ESD3Z5V0BU uses ultra-small SOD-323 package. Each device can protect one high-speed data line. It offers system designers flexibility to protect single data line where space is a premium concern. The combined features of low capacitance, ultra-small size and high ESD robustness make ESD3Z5V0BU ideal for high-speed data port and high-frequency line applications, such as cellular phones and HD visual devices.



Image shown is a representation only. Exact specifications should be obtained from the product dimension.



MAIN FEATURE

- Peak Power Dissipation 100W (8/20 μs)
- Transient Protection For High-Speed Data Lines
- IEC61000-4-2 (ESD) $\pm 15\text{kV}$ (Air), $\pm 8\text{kV}$ (Contact)
- IEC61000-4-4 (EFT) 40A (5/50ns) Cable Discharge Event (CDE)
- Ultra-small package, Case SOD 323
- Protects One Data, Control Line
- Low Clamping Voltage/Low Leakage Current
- Low Capacitance 0.25pf (Typical)
- Meet MSL 1 Requirement
- Cross Competitors Parts and More.
- RoHS/RoHS III compliant, RoHS Annex III lead Exemption (Exempt per RoHS EU 2015/863) and Halogen Free (HF)

APPLICATION

- 10/100M Ethernet Ports
- WAN/LAN Equipment
- Notebooks, Desktops, And Servers Cellular
- Switching System
- Cellular Phones
- Audio /Video Input

ELECTRICAL CHARACTERISTICS

- See Page 5 ~Page 6.
- All Parameters are Subject To NextGen Components' Final Confirmation

HOW TO ORDER

- Please Follow Up Part Code Guide And Indicate NextGen Part Code ESD3Z5V0BUS5BU For RFQ and Order.

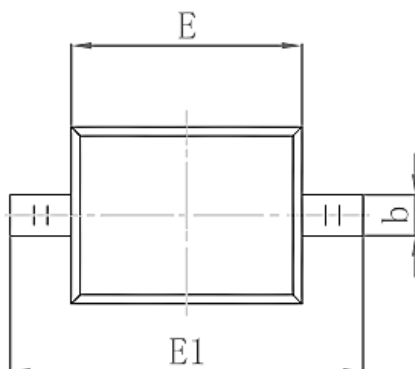
PART CODE GUIDE

RFQ
[Request For Quotation](#)

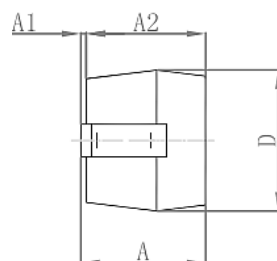
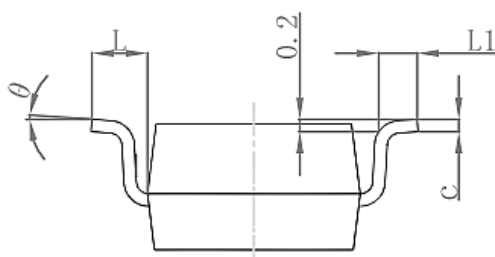
CODE	NAME	KEY SPECIFICATION OPTION
ESD3Z	Product Series Code	SMD Plastic-Encapsulate ESD Protection Diodes, Case SOD-323, 2 pads, Ultra -Low Capacitance, Bi-Directional Type
5V0	Reverse Working Voltage Code	5V0: Reverse Working Voltage 5.0V 3V3: Reverse Working Voltage 3.3V
BUS	Internal Control Code	Letter or Digits (A~Z, a~z or 1~9)
5BU	Marking Code	Marking "5BU"
XX	Special/Custom Parameters Code	Letter or Digits (A~Z, a~z or 1~9) for Special Parametric; Blank: N/A

DIMENSION- Unit: mm, Case SOD-323 Outline

Top View



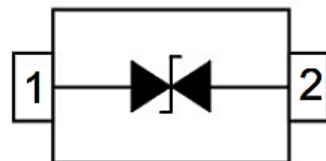
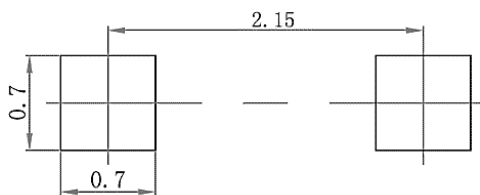
Side View



SYMBOL	DIMENSION (MM)		DIMENSION (INCH)	
	MIN.	MAX.	MIN.	MAX.
A	-	1.000	-	0.039
A1	-	0.1000	0.000	0.004
A2	0.800	0.900	0.031	0.035
b	0.250	0.350	0.010	0.014
c	0.080	0.150	0.003	0.006
D	1.200	1.400	0.047	0.055
E	1.600	1.800	0.063	0.071
E1	2.550	2.750	0.100	0.108
L	0.475 REF.		0.019 REF.	
L1	0.250	0.400	0.010	0.016
θ	0	8 °	0 °	8 °

Recommend Pad Layout (unit : mm)

Circuit Diagram



MECHANICAL CHARACTERISTICS

CASE	FLAMMABILITY RATING	HIGH TEMPERATURE SOLDERING GUARANTEED:	MARKING
JEDEC SOD-323 molded plastic body	UL 94V-0	260°C/ 10s	5BU

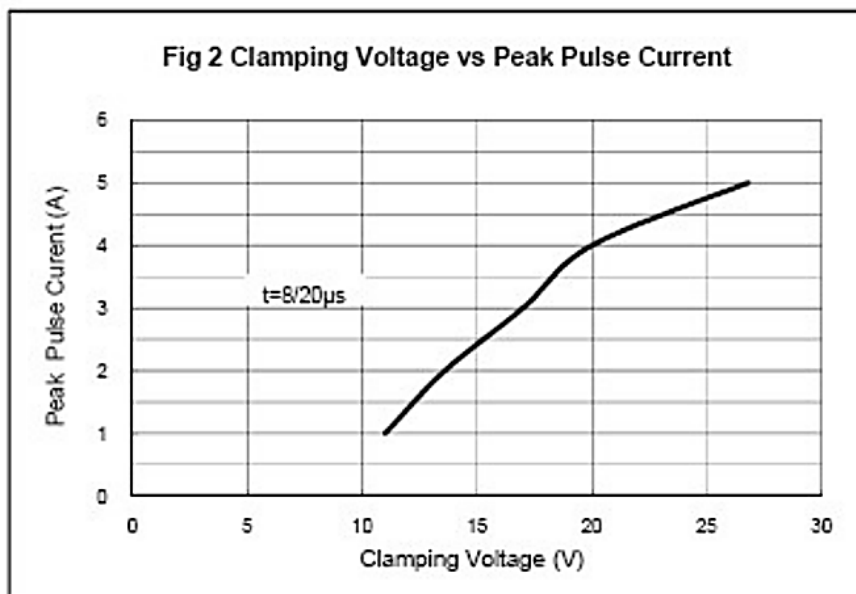
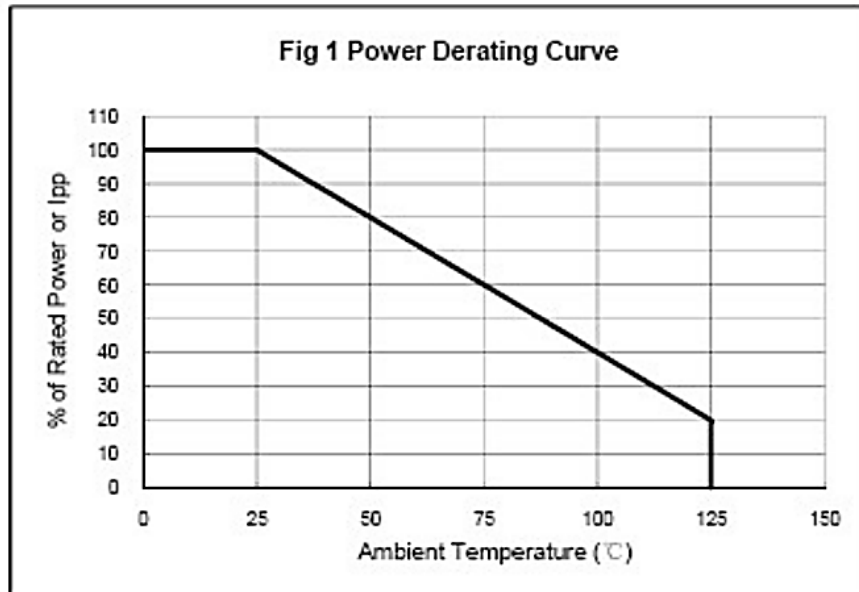
ABSOLUTE MAX. RATING & CHARACTERISTICS - TA=25°C unless otherwise specified, For Reference Only

PARAMETER	SYMBOLS	VALUE	UNITS
ESD per IEC 61000-4-2 (Air)	VESD	±20	KV
ESD per IEC 61000-4-2 (Contact)	VESD	±20	KV
Peak Pulse Power @8/20μs	PPP	100	W
Operating Temperature Range	TOPT	-55 ~+ 125	°C
Storage Temperature Range	TSTG	-55 ~ +150	°C
Lead Solder Temperature- Max. (10 s Duration)	TL	260 /10s	°C

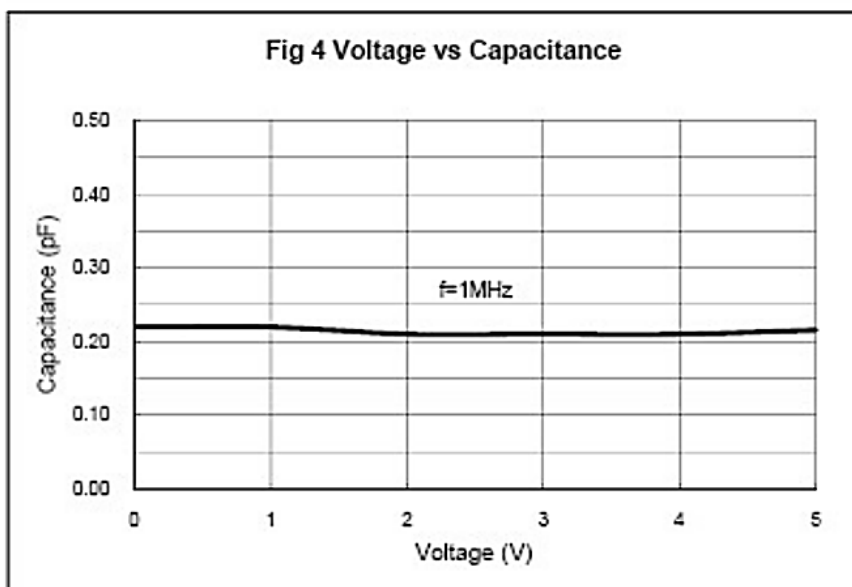
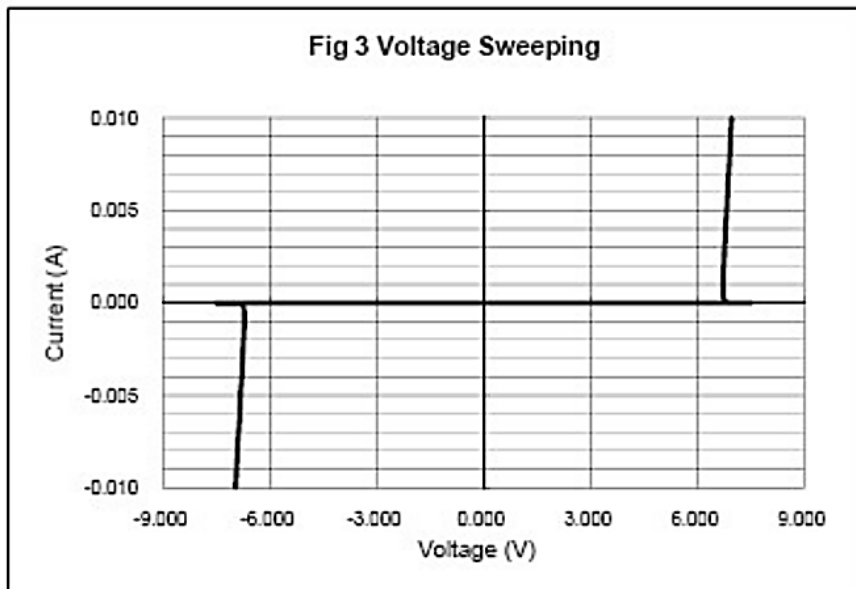
ELECTRICAL CHARACTERISTICS - TA=25°C unless otherwise specified, For Reference Only

PARAMETER	TEST CONDITION	SYMBOLS	VALUE			UNITS
			MIN.	TYP.	MAX.	
Reverse Working Voltage		VRWM			5.0	V
Reverse Breakdown Voltage	IT = 1.0mA	VBR	6.0			V
Reverse Leakage Current	VRWM = 5.0V	IR			100	nA
Clamping Voltage	IPP = 1A, tp = 8/20μs	VC			13	V
	IPP = 4A, tp = 8/20μs				25	V
Junction Capacitance	VR = 0V, f = 1MHz	Cj		0.25	0.4	pF

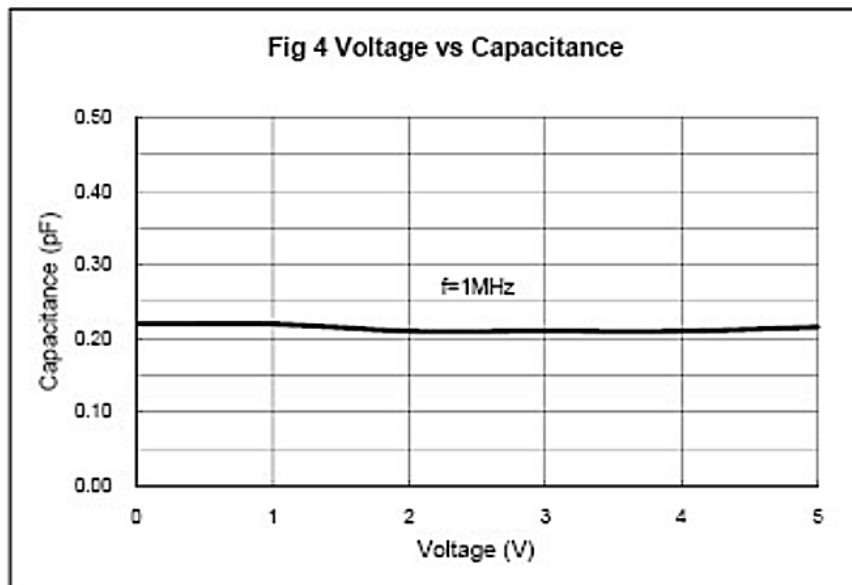
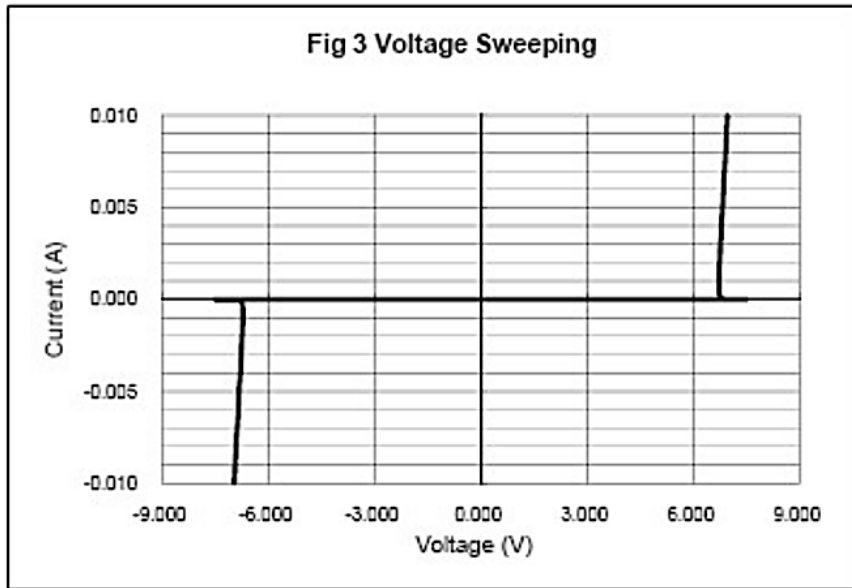
RATINGS AND CHARACTERISTICS CURVES- For Reference Only, Ta=25°C Unless Otherwise Specified.



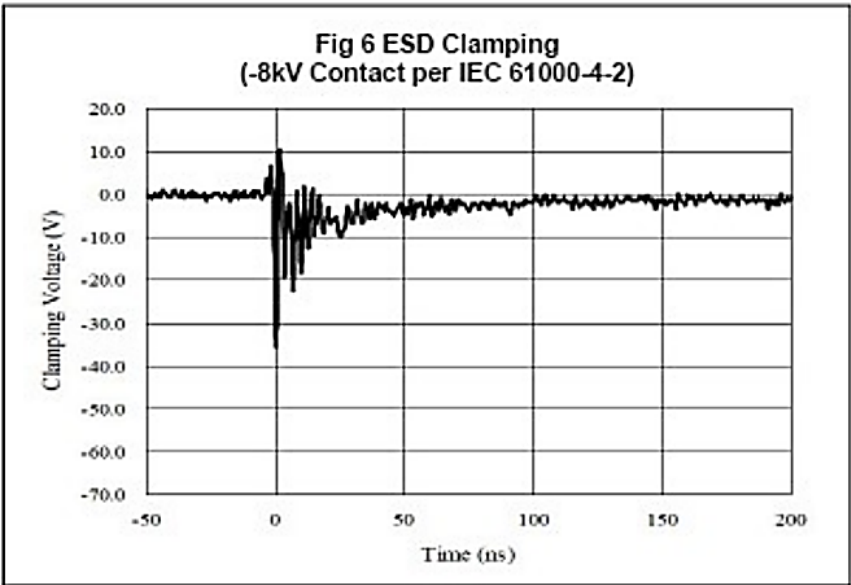
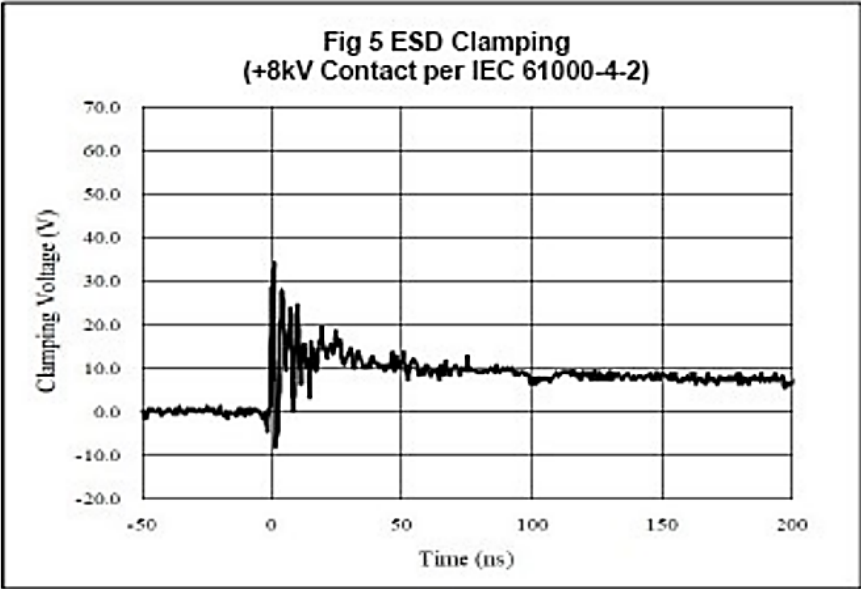
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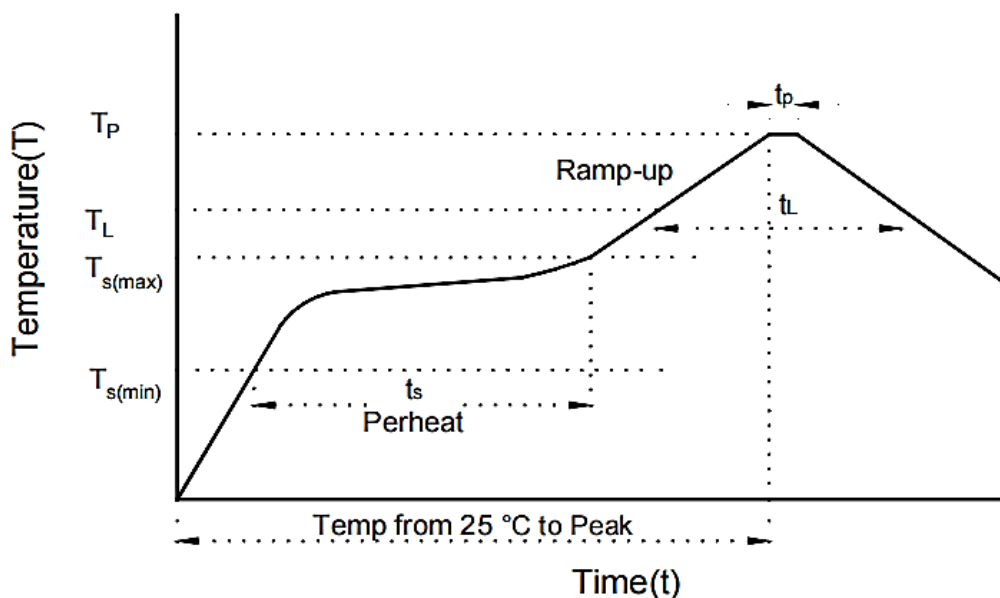
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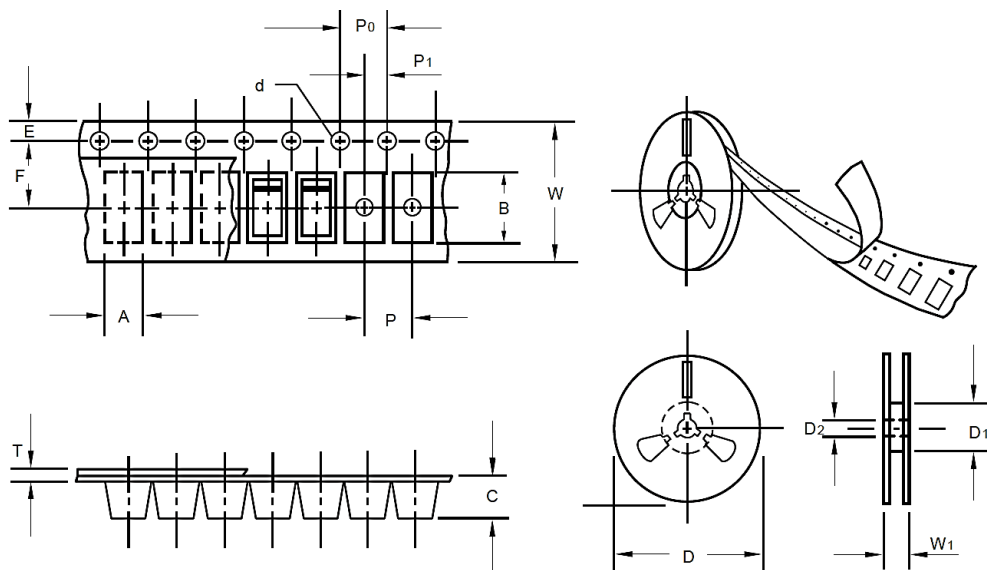


RECOMMENDED SOLDERING PARAMETERS – FOR REFERENCE ONLY



PROFILE FEATURE		PB-FREE ASSEMBLY
Average Ramp-up Rate (T_L Max to T_p)		3°C/second Max
Preheat	Temperature Min (T_s Min.)	150°C
	Temperature Max (T_s Max.)	200°C
	Time (t_s Min. to t_s Max.)	60 ~ 180 seconds
Time maintained above	Temperature (T_L)	217°C
	Time (t_L)	60 ~ 150 seconds
Peak/Classification Temperature (T_p)		260 °C
Time within 5°C of actual Peak Temperature (t_p)		10 seconds Max.
Ramp-down Rate		6 °C /Second Max.
Time 25 °C to Peak Temperature		8 Minutes Max.
Suggest reflow times		3 Times Max.

TAPE/REEL - Unit: mm, All Devices are packed in accordance with EIA standard RS-481-A and specifications



ITEM	SYMBOL	TOLERANCE	SOD-323
Carrier width	A	0.1	1.46
Carrier Length	B	0.1	2.9
Carrier Depth	C	0.1	1.25
Sprocket hole	d	0.05	1.55
7"Reel outside diameter	D	2	178
7"Reel inner diameter	D1	Min.	50
Feed hole diameter	D2	0.5	13
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	3.5
Punch hole pitch	P	0.1	4
Sprocket hole pitch	P0	0.1	4
Embossment center	P1	0.1	2
Overall tape thickness	T	0.1	0.06
Tape width	W	0.3	8
Reel width	W1	1	12.3
Qty. Per Reel (pcs)	3000		

IMPORTANT NOTES AND DISCLAIMER

1. **ROHS COMPLIANCE:** The levels of RoHS restricted materials in this product are below the maximum concentration values (also referred to as the threshold limits) permitted for such substances, or are used in an exempted application, in accordance with EU RoHS Directive (EU) 2015/863 EC (RoHS3). RoHS Test Report for this product can be obtained at Download Center.
2. **REACH COMPLIANCE:** REACH substances of high concern (SVHCs) information is available for this product. Since the European Chemical Agency (ECHA) has published notice of their intent to frequently revise the SVHC listing for the foreseeable future, REACH Test Report for this product can be obtained at Download Center.
3. All Product parametric performance is indicated in the Electrical Characteristics for the listed herein test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.
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