




SPECIFICATION SHEET NO.	S0414- ESD0302L00S32L	
ORIGINAL MFG/PART NO.	MDD Diodes/ESD0302L/DFN10063L0S32L	
NEXTGEN PART CODE	ESD0302L00S32L	Indicate This Code For RFQ /Order
DATE	Apr. 14, 2025	
REVISION	A3	Updated With Most Recent Data
DESCRIPTION AND MAIN PARAMETRICS	<p>SMD Plastic-Encapsulate ESD Protection Diodes, ESD03 Series, 3 Pads</p> <p>Case DFN1006-3L, Ultra -Low Capacitance, Unidirectional Type</p> <p>Reverse Working Voltage: 3.3V,</p> <p>Clamping Voltage 10VC Max.@1.0A</p> <p>Operating Junction Temp. Range -55°C ~+125°C</p> <p>Package in Tape/Reel, 10,000pcs/Reel</p> <p>RoHS/RoHS III compliant, RoHS Annex III lead Exemption (Exempt per RoHS EU 2015/863) and Halogen Free (HF)</p>	
CUSTOMER		
CUSTOMER PART NUMBER		
CROSS REF. PART NUMBER		
MEMO		

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

CUSTOMER APPROVE
Date:

DESCRIPTION

ESD0302L 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 0.2pF (I/O to I/O) only, ESD0302L is designed to protect parasitic-sensitive systems against over-voltage and over-current 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. ESD0302L uses ultra-small DFN1006-3L package. Each ESD0302L device can protect two high-speed data lines. The combined features of low capacitance, small size and high ESD robustness make ESD0302L ideal for high-speed data port and high-frequency line applications, The low clamping voltage of the ESD0302L guarantees a minimum stress on the protected IC.

MAIN FEATURE

- Peak Power Dissipation 56W (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)
- Protects two Data Line
- Low Clamping Voltage
- Low Leakage Current
- Low Capacitance 0.2pF Typical (I/O - I/O)
- 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)

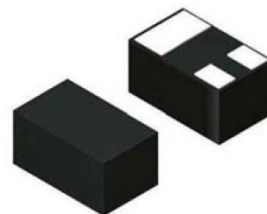


Image shown is a representation only. Exact specifications should be obtained from the product dimension.



APPLICATION

- Serial ATA
- Desktops, Servers and Notebooks
- Cellular Phone
- MDDI Ports / USB Data Line Protection
- Display Port
- Digital Visual Interfaces (DVI)

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 ESD0302L00S32L For RFQ and Order.

PART CODE GUIDE

RFQ
[Request For Quotation](#)

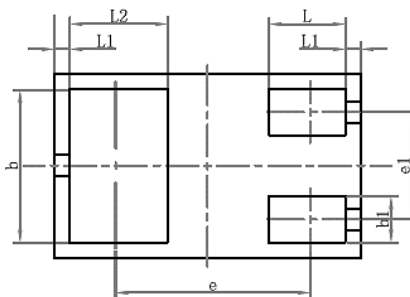
CODE	NAME	KEY SPECIFICATION OPTION
ESD03	Product Series Code	SMD Plastic-Encapsulate ESD Protection Diode, 3 Pads Case DFN1006-3L, Ultra Low Capacitance
02L	Parameters Code	Letter or Digits (A~Z, a~z or 1~9)
00S	Internal Control Code	Letter or Digits (A~Z, a~z or 1~9)
32L	Marking Code	Marking "32L"
XX	Special/Custom Parameters Code	Letter or Digits (A~Z, a~z or 1~9) for Special Parametric; Blank: N/A

DIMENSION- Unit: mm (Inch), Case DFN1006-3L Outline

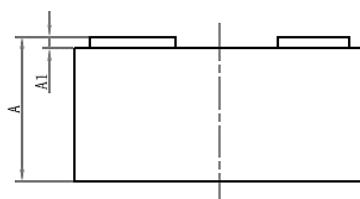
Top View



Bottom View

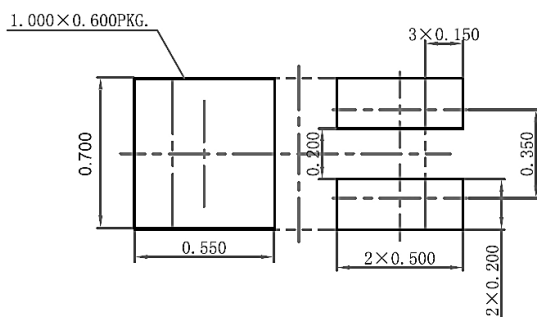


Side View

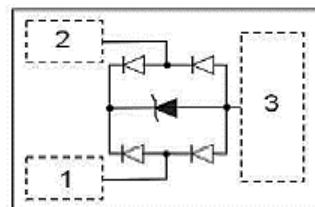


SYMBOL	DIMENSION (MM)		DIMENSION (INCH)	
	MIN.	MAX.	MIN.	MAX.
A	0.45	0.55	0.018	0.022
A1	0.01	0.1	0	0.004
D	0.95	1.05	0.037	0.041
E	0.55	0.65	0.022	0.026
b	0.45 Ref.		0.018 Ref	
b1	0.1	0.2	0.004	0.008
e	0.635 Ref.		0.025 Ref.	
e1	0.3	0.4	0.012	0.016
L	0.2	0.3	0.008	0.012
L1	0.05 Ref.		0.002 Ref.	
L2	0.2	0.3	0.008	0.012
A	0.45	0.55	0.018	0.022

Recommend Pad Layout (unit : mm)



Circuit Diagram



MECHANICAL CHARACTERISTICS

CASE	FLAMMABILITY RATING	TERMINALS	MARKING
JEDEC DFN1006-3L molded plastic body	UL 94V-0	Gold plated, solderable per MIL-STD-750, method 2026	32L

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	56	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	I/O to Ground	VRWM			3.3	V
Reverse Breakdown Voltage	IT = 1.0mA Between I/O and GND	VBR	4.2			V
Reverse Leakage Current	VRWM = 3.3V Between I/O and GND	IR			100	nA
Clamping Voltage	IPP = 1A, tp = 8/20μs Between I/O and GND	VC			10	V
	IPP = 4A, tp = 8/20μs Between I/O and GND				14	V
Forward Voltage	IT = 10mA, tp = 8/20μs Between I/O and GND	VF			1.2	V
Total Capacitance	VR = 0 V, f = 1.0MHz Between I/O and GND	CT		0.4	0.6	pF
	VR = 0 V, f = 1.0MHz Between I/O and I/O			0.2	0.3	

RATINGS AND CHARACTERISTICS CURVES- For Reference Only, $T_a=25^{\circ}\text{C}$ Unless Otherwise Specified.

Fig 1 Power Derating Curve

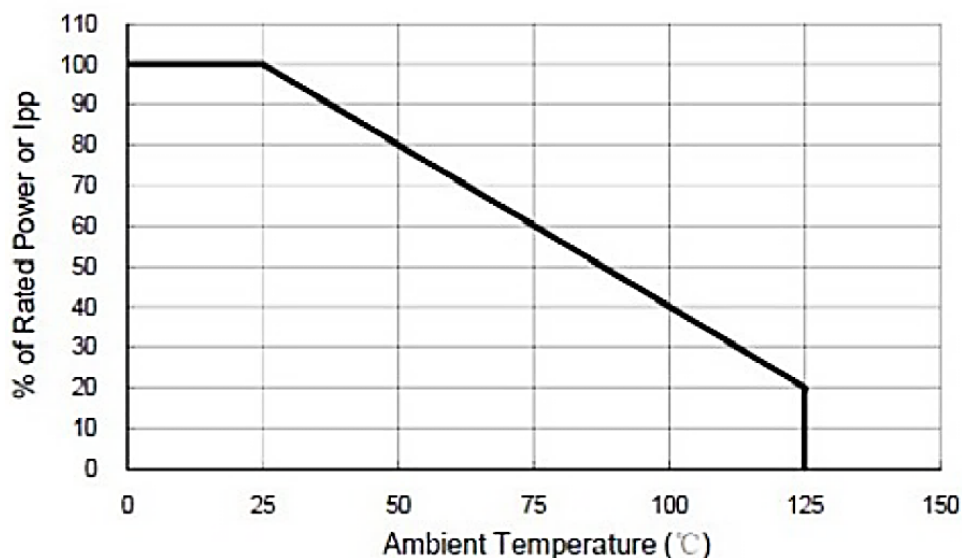
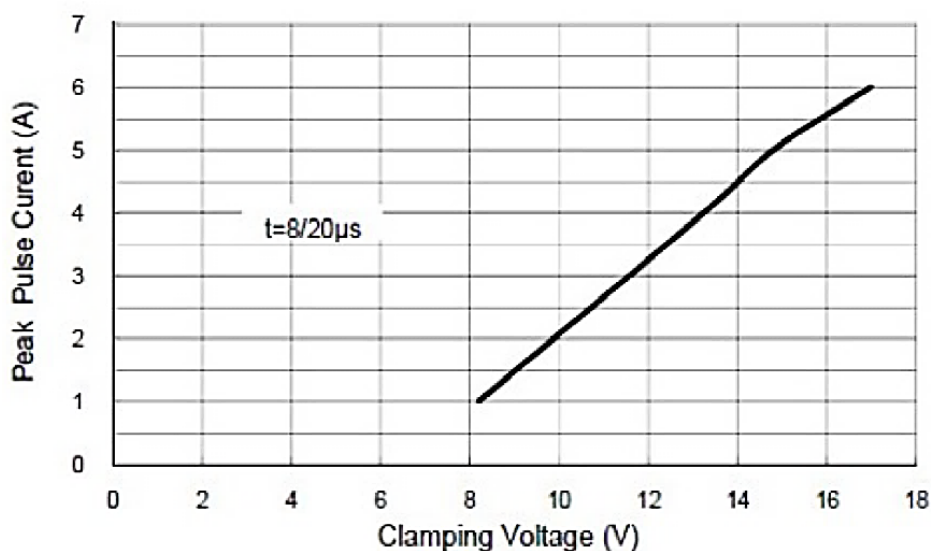


Fig 2 Clamping Voltage vs Peak Pulse Current



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

Fig 3 Voltage Sweeping

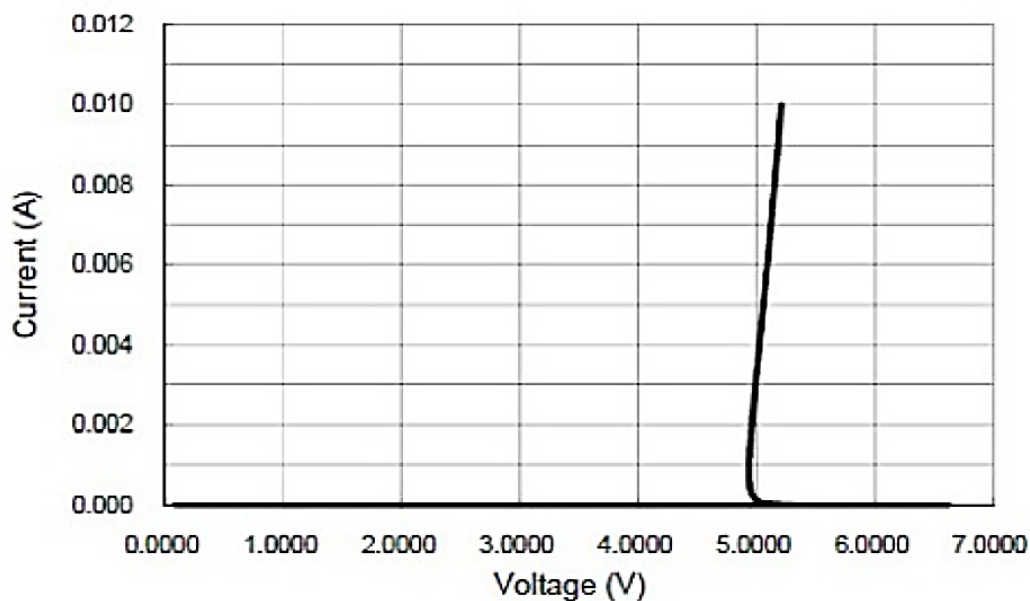
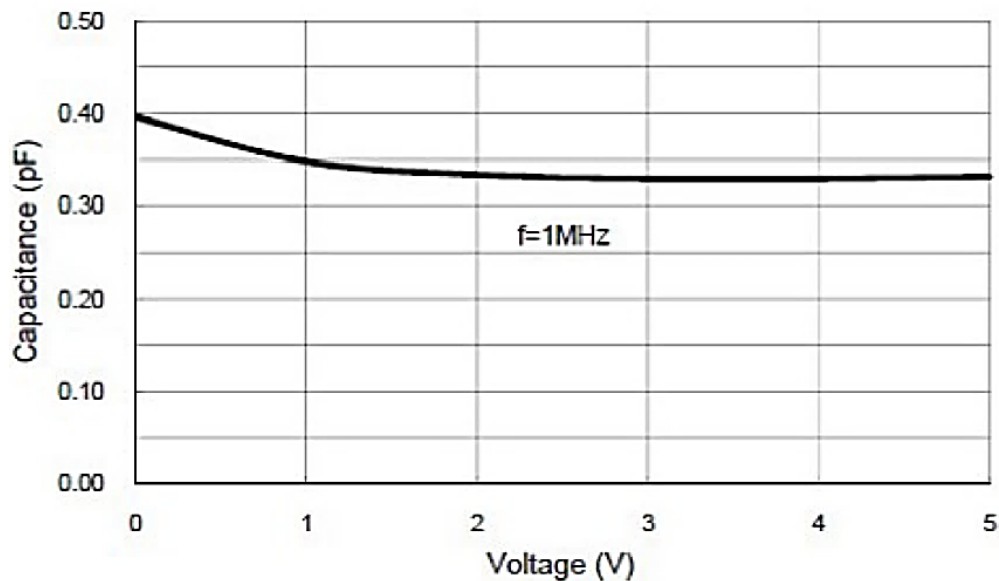


Fig 4 Voltage vs Capacitance



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

Fig 5 ESD Clamping
(+8kV Contact per IEC 61000-4-2)

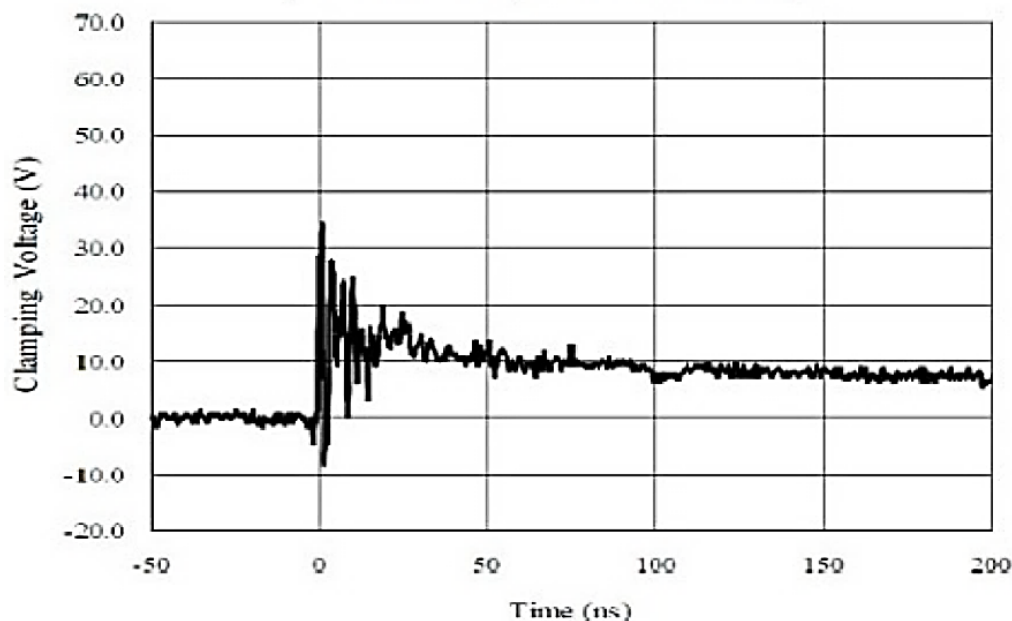
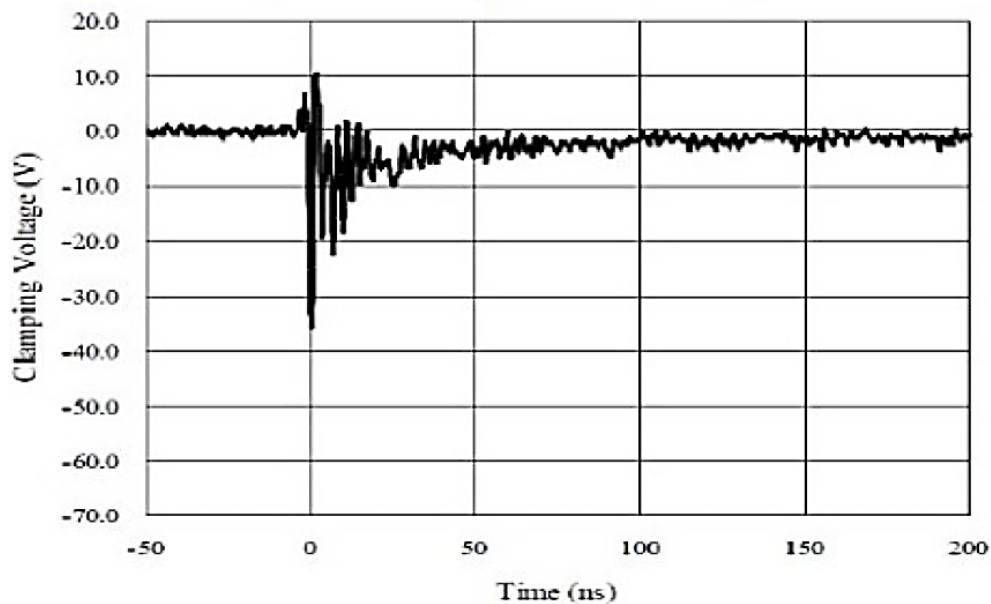
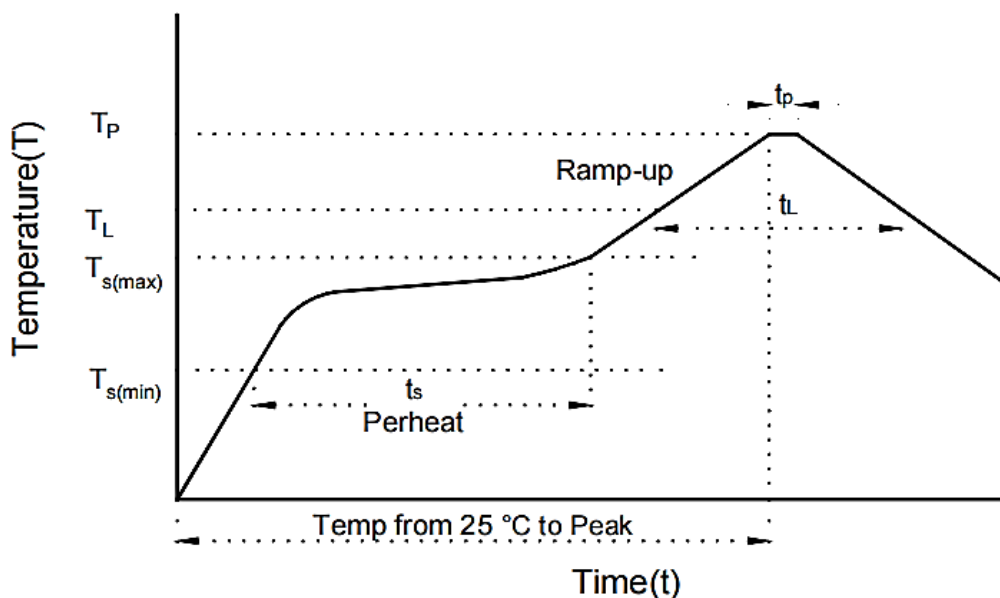


Fig 6 ESD Clamping
(-8kV Contact per IEC 61000-4-2)

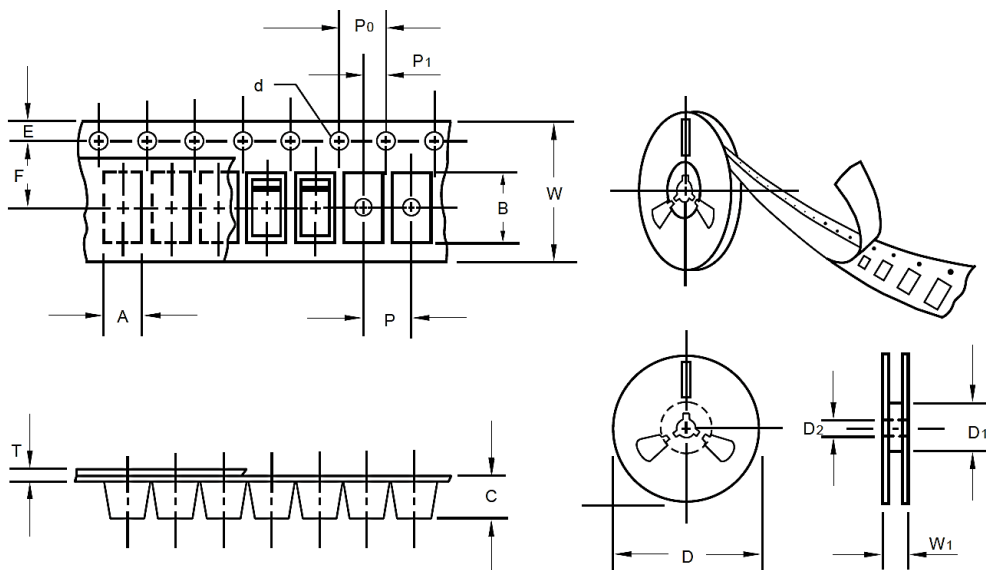


RECOMMENDED SOLDERING PARAMETERS – FOR REFERENCE ONLY



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	DFN1006
Carrier width	A	0.1	2.10
Carrier Length	B	0.1	4.00
Carrier Depth	C	0.1	1.60
Sprocket hole	d	0.05	1.55
7"Reel outside diameter	D	2	178.00
7"Reel inner diameter	D1	Min.	50.00
Feed hole diameter	D2	0.5	13.00
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	3.50
Punch hole pitch	P	0.1	4.00
Sprocket hole pitch	P0	0.1	4.00
Embossment center	P1	0.1	2.00
Overall tape thickness	T	0.1	0.25
Tape width	W	0.3	8.15
Reel width	W1	1	10.50
Qty. Per Reel (pcs)	10,000		

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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