

SPECIFICATION SHEET NO.	S0417- ESD0524PS0524P	
ORIGINAL MFG/PART NO.	MDD Diodes/ESD0524P/DFN2510524PS01	
NEXTGEN PART CODE	ESD0524PS0524P	Indicate This Code For RFQ /Order
DATE	Apr. 17, 2025	
REVISION	A3	Updated With Most Recent Data
DESCRIPTION AND MAIN PARAMETRICS	SMD Plastic-Encapsulate ESD Protection Array, ESD05 Series, 10 Pads Case DFN2510, Ultra -Low Capacitance, Unidirectional Type Reverse Working Voltage: 5.0V, Clamping Voltage 10VC Max.@1.0A Operating Junction Temp. Range -55°C ~+125°C Package in Tape/Reel, 3,000pcs/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. 17, 2025

CUSTOMER APPROVE
Date:

DESCRIPTION

ESD0524P is an ultra-low capacitance Transient Voltage Suppressor (TVS) designed to protection for high-speed data interfaces. With typical capacitance of 0.2pF (I/O to I/O) only, ESD0524P 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), IEC61000-4-4 (electrical fast transient-EFT) (40A, 5/50ns),very fast charged device model (CDM) ESD and cable discharge event(CDE), etc. ESD0524P uses ultra-small DFN2510 package. Each ESD0524P device can protect four high-speed data lines. The combined features of ultra-low capacitance, ultra-small size and high ESD robustness make ESD0524P ideal for high-speed data ports and high-frequency lines (e.g., HDMI & DVI) applications. The low clamping voltage of the ESD0524P guarantees a minimum stress on the protected IC.

MAIN FEATURE

- Peak Power Dissipation 60W (8/20 μs)
- Transient Protection For Asymmetrical Data Lines
- IEC61000-4-2 (ESD) $\pm 25\text{kV}$ (air), $\pm 20\text{kV}$ (contact)
- IEC61000-4-4 (EFT) 40A (5/50ns) Cable Discharge Event (CDE)
- Package Optimized For High-speed Lines
- Protects Four Data Line
- Low Capacitance: 0.20pF (I/O to I/O)
- Low Clamping Voltage And Low Leakage Current
- Each I/O pin can withstand over 1000 ESD strikes for $\pm 8\text{KV}$ contact discharge
- 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)

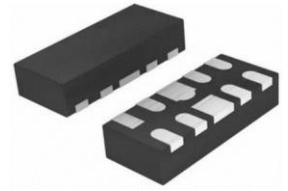


Image shown is a representation only. Exact specifications should be obtained from the product dimension.



APPLICATION

- Serial ATA
- High Definition Multi Interface (HDMI)
- Desktops, Servers and Notebooks
- USB 2.0/3.0 Power and Data Line Protection
- MDDI Ports, Display Port And PCI Express
- Digital Visual Interfaces (DVI)

ELECTRICAL CHARACTERISTICS

- See Page 6 ~Page 7.
- All Parameters are Subject To NextGen Components' Final Confirmation

HOW TO ORDER

- Please Follow Up Part Code Guide And Indicate NextGen Part Code ESD0524PS0524P For RFQ and Order.

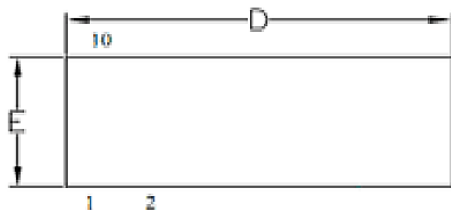
PART CODE GUIDE

RFQ
[Request For Quotation](#)

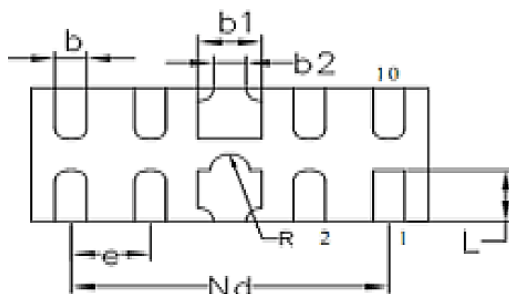
CODE	NAME	KEY SPECIFICATION OPTION
ESD05	Product Series Code	SMD Plastic-Encapsulate ESD Protection Array, ESD05 Series, 10 Pads Case DFN2510, Ultra -Low Capacitance,
24P	Parameters Code	Letter or Digits (A~Z, a~z or 0~9)
S	Internal Control Code	Letter or Digits (A~Z, a~z or 0~9)
0524P	Marking Code	Marking "0524P"
XX	Special/Custom Parameters Code	Letter or Digits (A~Z, a~z or 0~9) for Special Parametric; Blank: N/A

DIMENSION- Unit: mm, Case SOT-26 Outline

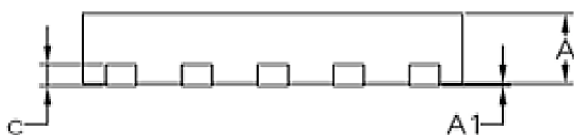
Top View



Bottom View

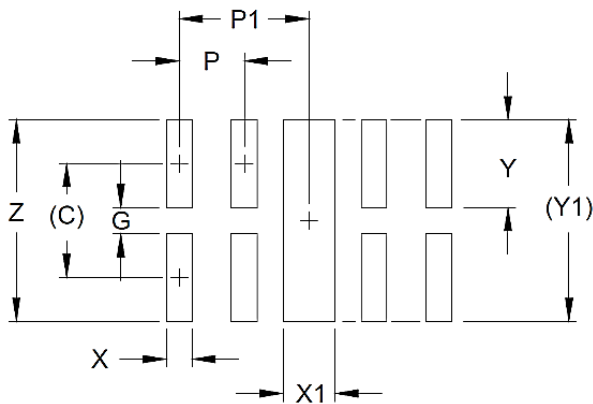


Side View



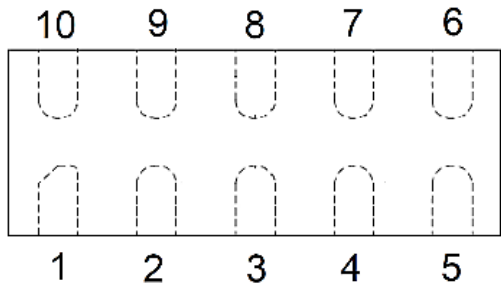
SYMBOL	DIMENSION (MM)			DIMENSION (INCH)		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.45	0.50	0.55	0.018	0.020	0.022
A1	0.000	0.03	0.05	0.000	0.001	0.002
C	0.15			0.005		
b	0.15	0.20	0.25	0.006	0.008	0.010
b1	0.35	0.40	0.45	0.014	0.016	0.018
D	2.45	2.50	2.55	0.096	0.098	0.100
E	0.90	1.0	1.05	0.035	0.039	0.041
e	0.50 Bas.			0.020 Bas.		
L	0.30	0.38	0.43	0.012	0.015	0.017
Nd	2.0 Bas.			0.079 Bas.		
b2	0.20 Ref.			0.008 Ref.		
R	0.10	0.125	0.15	0.004	0.005	0.06

Recommend Pad Layout (unit : Inch/mm)



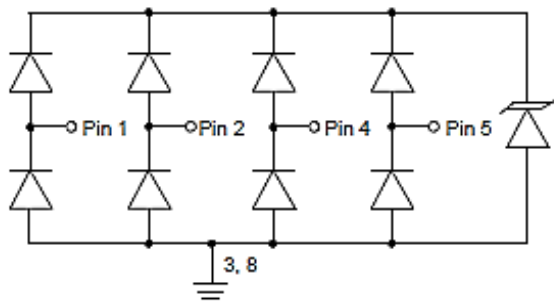
SYMBOL	DIMENSION	
	MM	INCH
C	0.875	0.034
G	0.20	0.008
P	0.50	0.020
P1	1.00	0.039
X	0.20	0.008
X1	0.40	0.016
Y	0.675	0.027
Y1	1.55	0.061
Z	1.55	0.061

Pin Configuration



PIN	IDENTIFICATION
1, 2, 4, 5	Input Lines
3, 8	Ground
6, 7, 8, 9, 10	Output Lines (No Internal Lines)

Circuit Diagram



MECHANICAL CHARACTERISTICS

CASE	FLAMMABILITY RATING	TERMINALS	MARKING
JEDEC DFN2410 molded plastic body	UL 94V-0	Matte tin plated, High temperature soldering guaranteed: 260°C/10s	0524P

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	±25	KV
ESD per IEC 61000-4-2 (Contact)	VESD	±20	KV
Peak Pulse Power @8/20μs	PPP	60	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	Any I/O pin to GND	VRWM			5.0	V
Reverse Breakdown Voltage	IT = 1.0mA Any I/O pin to GND	VBR	6.0		9.0	V
Reverse Leakage Current	VRWM = 5.0V Any I/O pin to GND	IR			1.0	μA
Clamping Voltage	IPP = 1A, tp = 8/20μs Any I/O pin to GND	VC			10	V
	IPP = 4A, tp = 8/20μs Any I/O pin to GND				15	V
Parasitic Capacitance	VR = 0 V, f = 1.0MHz Between I/O and I/O	CESD		0.40	0.50	pF
	VR = 0 V, f = 1.0MHz Between I/O and I/O			0.20	0.30	

Note: I/O pins are pin 1, 2, 4, 5, GND pins are pin 3, 8

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

Fig 1 Power Derating Curve

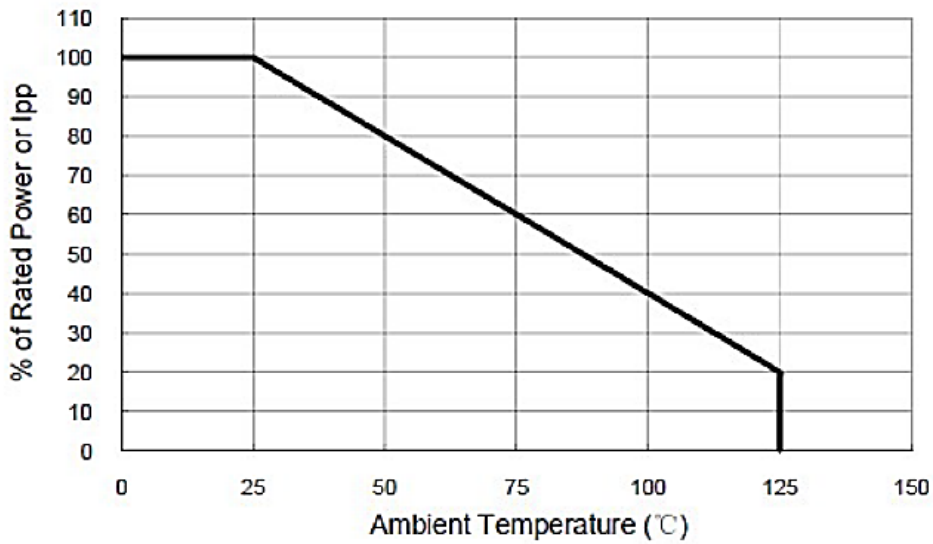
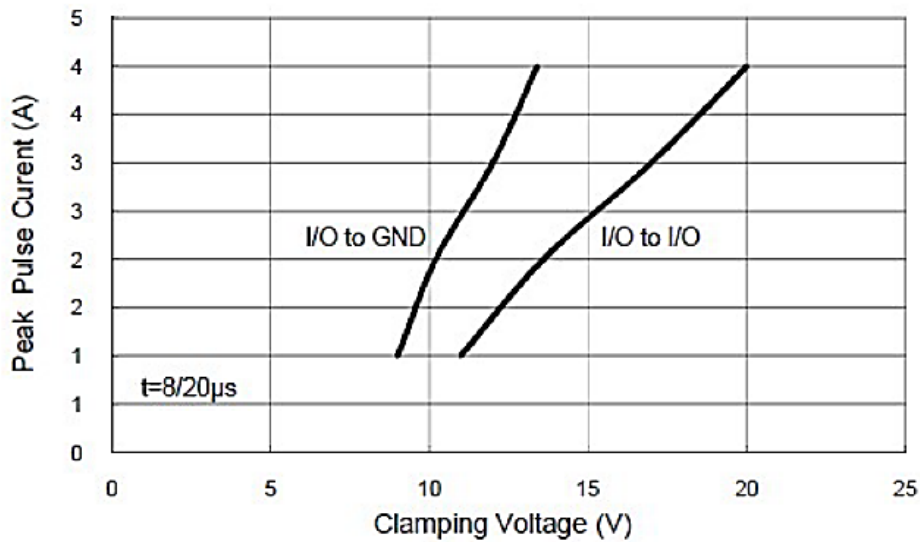


Fig 2 Clamping Voltage vs Peak Pulse Current



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

Fig 3 Voltage Sweeping of I/O to I/O

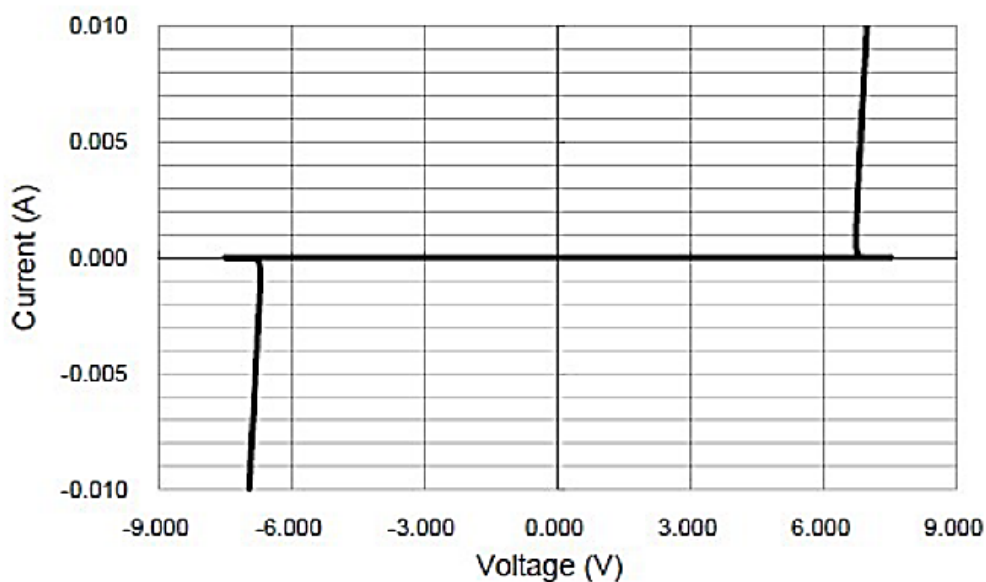
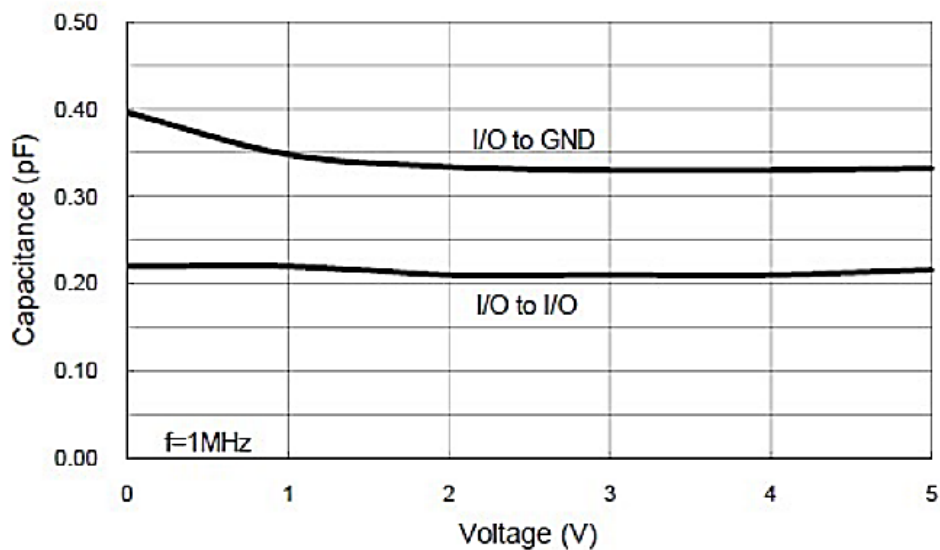
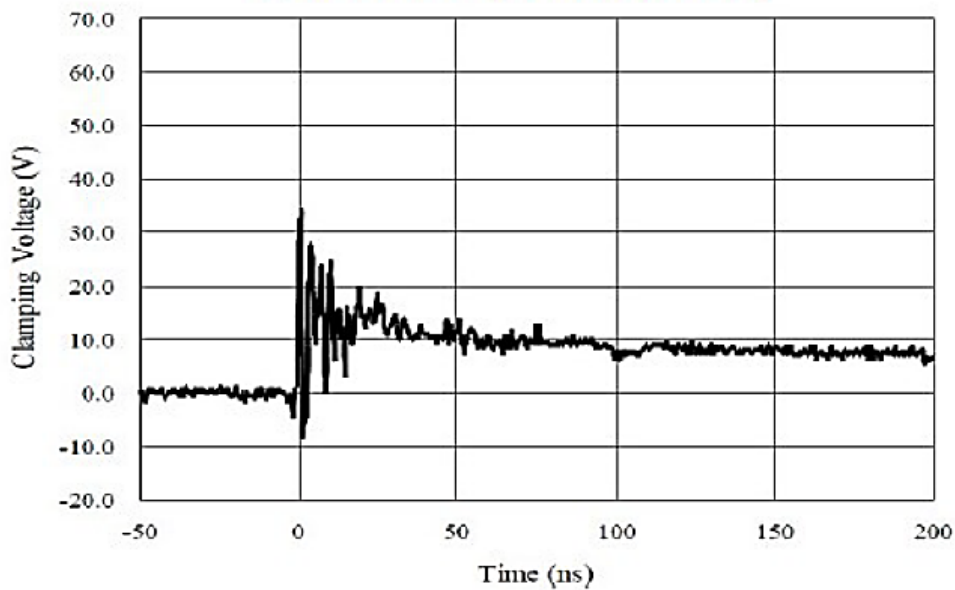


Fig 4 Voltage vs Capacitance

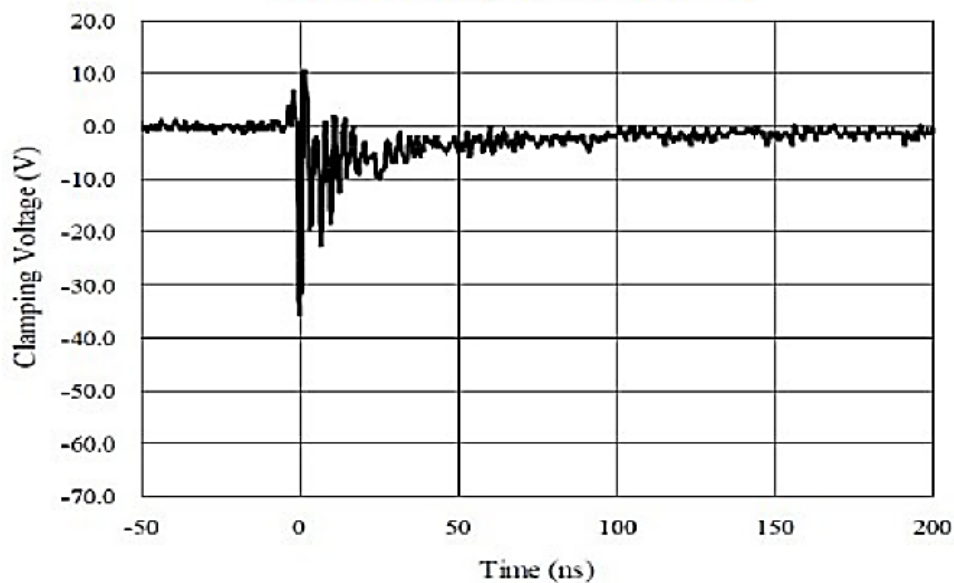


RATINGS AND CHARACTERISTICS CURVES- For Reference Only, Ta=25°C Unless Otherwise Specified.

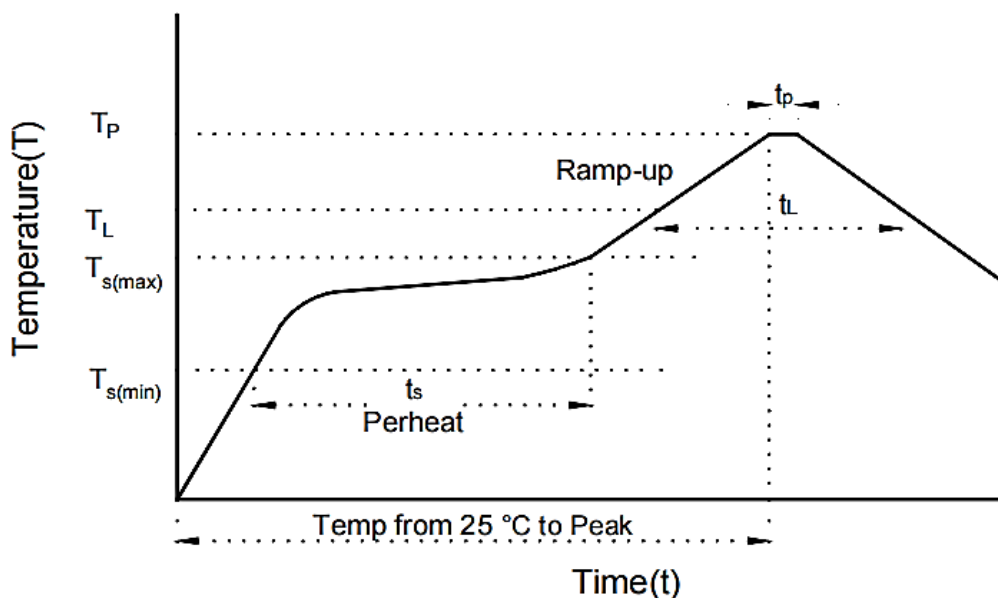
**Fig 5 ESD Clamping of I/O to GND
(+8kV Contact per IEC 61000-4-2)**



**Fig 6 ESD Clamping of I/O to GND
(-8kV Contact per IEC 61000-4-2)**

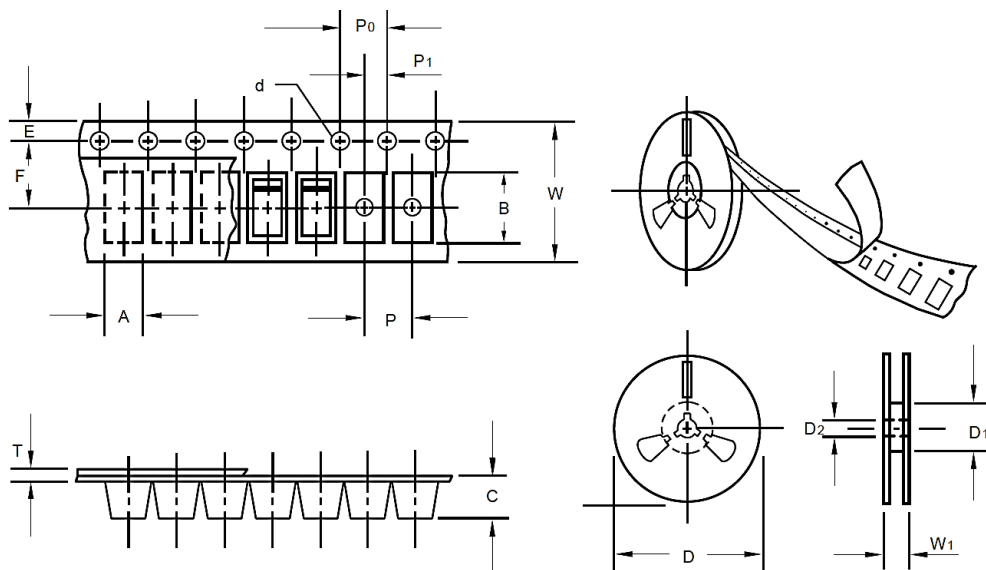


RECOMMENDED SOLDERING PARAMETERS – FOR REFERENCE ONLY



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	DFN2510
Carrier width	A	0.1	2.1
Carrier Length	B	0.1	4
Carrier Depth	C	0.1	1.6
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	0.25
Tape width	W	0.3	8.15
Reel width	W1	1	10.5
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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