






**THE DATASHEET OF
ESD0524P**



SPECIFICATION SHEET

SPECIFICATION SHEET NO.	N0310- DFN25101S0524P
DATE	Mar. 10, 2021
REVISION	A0
DESCRIPTION	SMD Plastic-Encapsulate ESD Protection Diodes, DFN2510 series ESD0524P Type, Polarity: Unipolar, Ultra Low Capacitance ESD Protection Array, Reverse Working Voltage : 5.0V, Peak Pulse Power per: 60 Watts Operating Temp. Range -55°C ~+125°C, Package in Tape/Reel, 3000pcs/Reel RoHS/RoHS III compliant
CUSTOMER	
CUSTOMER PART NUMBER	
CROSS REF. PART NUMBER	
ORIGINAL PART NUMBER	MDD ESD0524P
PART CODE	DFN25101S0524P

VENDOR APPROVE			
Issued/Checked/Approved			
DATE: March 10, 2021			

CUSTOMER APPROVE	
DATE:	

SMD ESD PROTECTION DIODES (TUBE) DFN2510 SERIES

MAIN FEATURE

- 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)
- Low capacitance: 0.2pF (I/O to I/O)
- Protects four data lines
- Package optimized for high-speed lines
- Cable Discharge Event(CDE)
- Low clamping voltage
- Low leakage current
- Each I/O pin can withstand over 1000 ESD strikes for $\pm 8\text{KV}$ contact discharge



APPLICATION

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

PART CODE GUIDE

RFQ

[Request For Quotation](#)

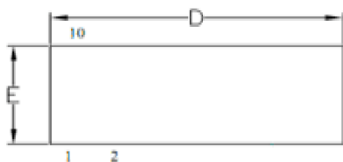
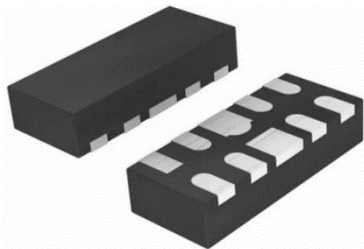
DFN2510	1	S	0524P
1	2	3	4

- 1) **DFN2510**: SMD Plastic-Encapsulate ESD Protection Diodes, DFN2510 series, 10 pads
- 2) **1**: Type code for original part number ESD0524P
- 3) **S**: Package code, Package in Tape/Reel, 3000pcs/Reel
- 4) **0524P**: Marking code "0524P" on the case surface, Different Marking for different specification.

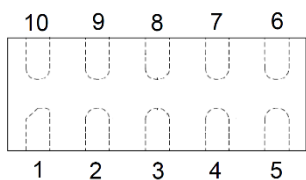
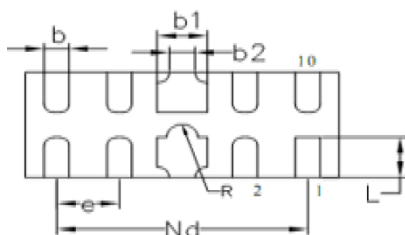
SMD ESD PROTECTION DIODES (TUBE) DFN2510 SERIES

DIMENSION (Unit: mm)

Image for reference



DFN2510

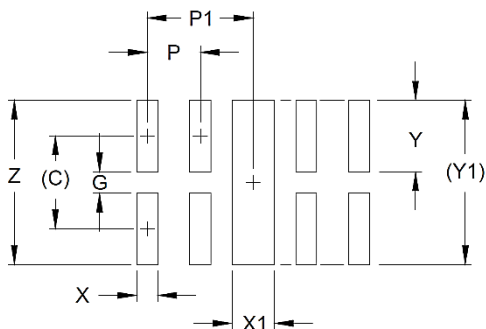


Marking: 0524P

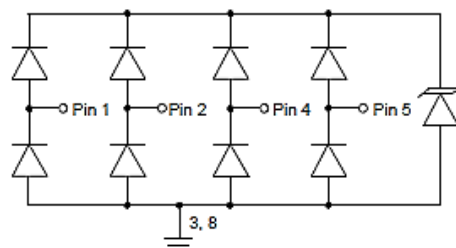
Symbol	Value (mm)		
	Min.	Typ.	Max.
A	0.45	0.50	0.550
A1	0.00	0.03	0.05
C	0.15		
b	0.15	0.20	0.250
b1	0.35	0.40	0.450
D	2.45	2.50	2.55
E	0.90	1.00	1.05
e	0.50		
L	0.30	0.38	0.43
Nd	2.0		
b2	0.20		
R	0.10	0.12	0.15

Pin	Identification
1,2,4,5	Input Lines
3,8	Ground
6,7,8,,9,	Output Lines No Internal Lines

Recommend Pad Layout



Circuit Diagram



Symbol	C	G	P	P1	X	X1	Y	Y1	Z
Value (mm)	(0.875)	0.2	0.50	1.00	0.2	0.40	0.675	(1.55)	1.55

SMD ESD PROTECTION DIODES (TUBE) DFN2510 SERIES
MECHANICAL DATA

Case	Terminals	High temperature soldering Guaranteed	Marking	Weight per piece
JEDEC DFN2510 molded plastic body	Matte tin plated	260°C/10s	0524P	0.00019 Ounce, 0.00591 grams

ABSOLUTE MAX. RATINGS AT Ta=25 °C (unless otherwise specified)

Parameter	SYMBOLS	VALUE	UNITS
		LIMIT	
ESD per IEC 61000-4-2 (Air)	V _{ESD}	+/-25	KV
ESD per IEC 61000-4-2 (Contact)	V _{ESD}	+/-20	KV
Peak Pulse Power(tp=8/20us waveform)	P _{PP}	60	W
Operating Temperature Range	T _{OPT}	-55 ~+ 125	°C
Storage Temperature Range	T _{STG}	-55 ~ +125	°C

ABSOLUTE MAX. RATINGS AT Ta=25 °C (unless otherwise specified)

Parameter	SYMBOLS	VALUE			UNITS
		Min.	Typical	Max.	
Reverse Working Voltage Any I/O pin to Ground	V _{RWM}			5.0	V
Reverse Breakdown Voltage @ I _T = 1.0mA Any I/O pin to Ground	V _{BR}	6.0		9.0	V
Reverse Leakage Current @V _{RWM} = 5.0V, Any I/O pin to Ground	I _R			1.0	µA
Clamping Voltage @ I _{PP} = 1A, t _p = 8/20µs Any I/O pin to Ground	V _C			10	V
Clamping Voltage @ I _{PP} = 4A, t _p = 8/20µs Any I/O pin to Ground	V _C			15	V
Capacitance VR = 0V, f = 1MHz Between I/O and GND	C _J		0.4	0.5	pF
Capacitance VR = 0V, f = 1MHz, Between I/O and GND	C _J		0.2	0.5	pF

Note:

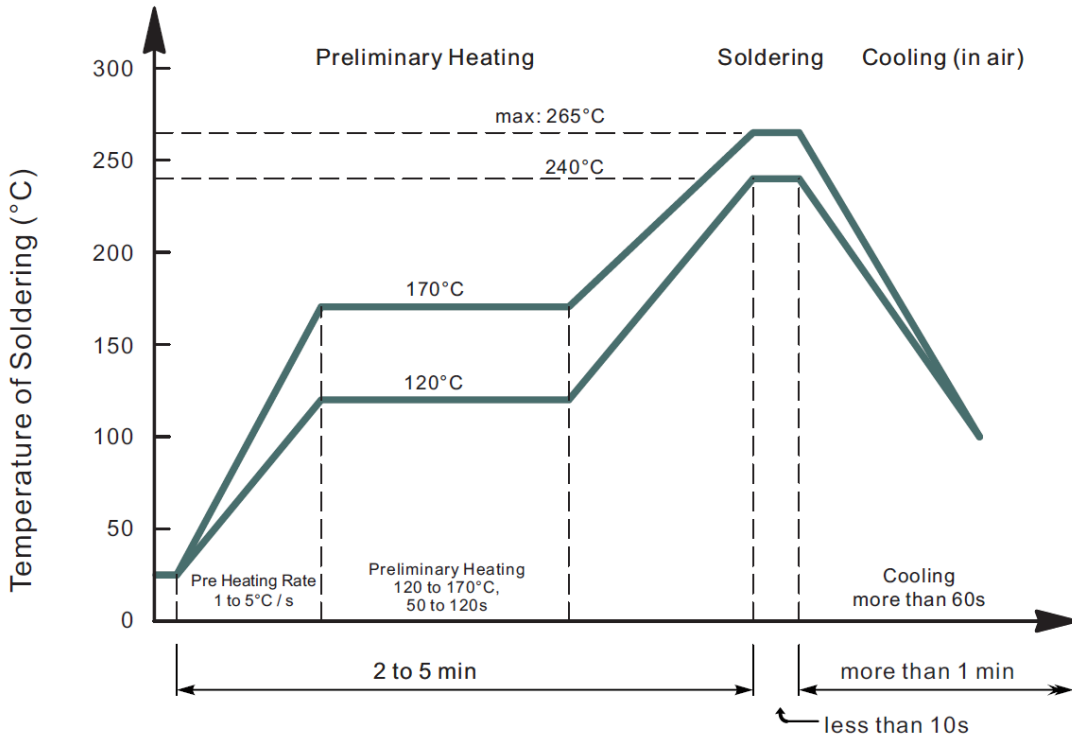
1) I/O pins are pin 1,2,4,5, GND pins are pin 3,8. 2) The above data are for reference only.

SMD ESD PROTECTION DIODES (TUBE) DFN2510 SERIES
RELIABILITY

Number	Experiment Items	Experiment Method And Conditions	Reference Documents
1	Solder Resistance Test	Test 260°C± 5°C for 10 ± 2 sec. Immerse body into solder 1/16" ± 1/32"	MIL-STD-750D METHOD-2031.2
2	Solderability Test	230°C ±5°C for 5 sec.	MIL-STD-750D METHOD-2026.1 0
3	Pull Test	1 kg in axial lead direction for 10 sec.	MIL-STD-750D METHOD-2036.4
4	Bend Test	0.5Kg Weight Applied To Each Lead, Bending Arcs 90 °C ± 5 °C For 3 Times	MIL-STD-750D METHOD-2036.4
5	High Temperature Reverse Bias Test	TA=100°C for 1000 Hours at VR=80% Rated VR	MIL-STD-750D METHOD-1038.4
6	Forward Operation Life Test	TA=25°C Rated Average Rectified Current	MIL-STD-750D METHOD-1027.3
7	Intermittent Operation Life Test	On state: 5 min with rated IRMS Power Off state: 5 min with Cool Forced Air. On and off for 1000 cycles.	MIL-STD-750D METHOD-1036.3
8	Pressure Cooker Test	15 PSIG, TA=121°C, 4 hours	MIL-S-19500 APPENOIXC
9	Temperature Cycling Test	-55°C~+125°C; 30 Minutes For Dwelled Time 5 minutes for transferred time. Total: 10 cycles.	MIL-STD-750D METHOD-1051.7
10	Thermal Shock Test	0°C for 5 minutes., 100°C for 5minutes, Total: 10 cycles	MIL-STD-750D METHOD-1056.7
11	Forward Surge Test	8.3ms Single Sale Sine-wave One Surge.	MIL-STD-750D METHOD-4066.4
12	Humidity Test	TA=65°C, RH=98% for 1000 hours.	MIL-STD-750D METHOD-1021.3
13	High Temperature Storage life Test	150°C for 1000 Hours	MIL-STD-750D METHOD-1031.5

SMD ESD PROTECTION DIODES (TUBE) DFN2510 SERIES

SUGGESTED REFLOW PROFILE (For Reference Only)



- Recommended peak temperature is over 245°C, If peak temperature is below 245 °C, you may adjust the following parameters; time length of peak temperature (longer), time length of soldering (longer), thickness of solder paste (thicker)
- Welding shall not exceed 2 times
- Remark: lead free solder paste (96.5 sn/3.0 Ag/0.5Cu)

SMD ESD PROTECTION DIODES (TUBE) DFN2510 SERIES

RATINGS AND CHARACTERISTIC CURVES (For Reference Only)

Fig 1 Power Derating Curve

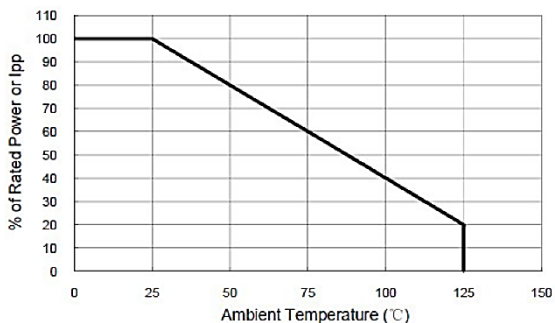


Fig 2 Clamping Voltage vs Peak Pulse Current

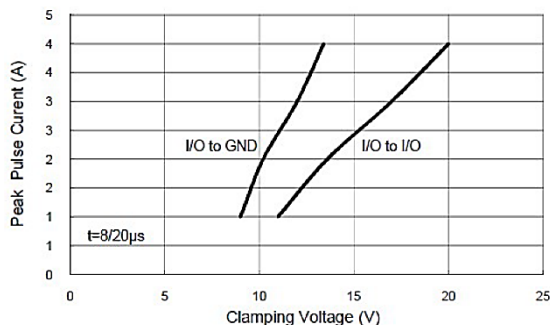


Fig 3 Voltage Sweeping of I/O to I/O

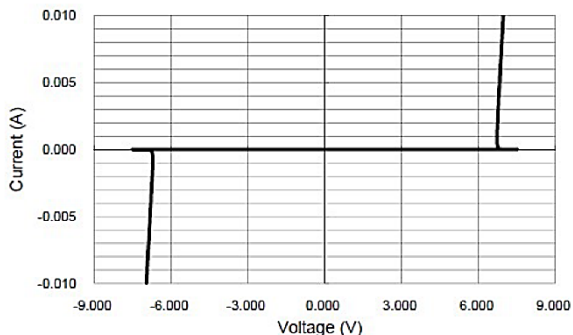


Fig 4 Voltage vs Capacitance

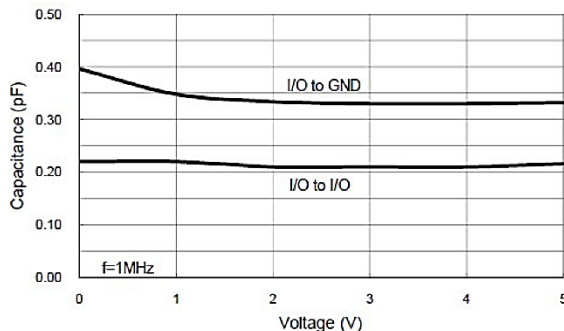


Fig 5 ESD Clamping of I/O to GND (+8kV Contact per IEC 61000-4-2)

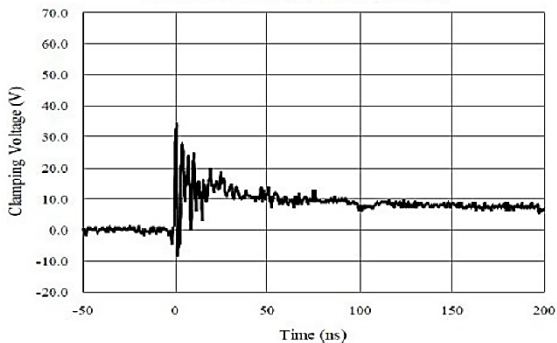
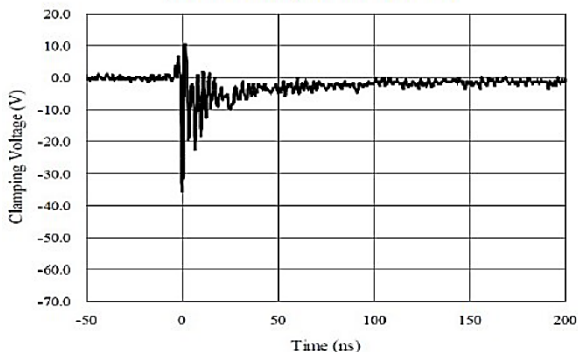


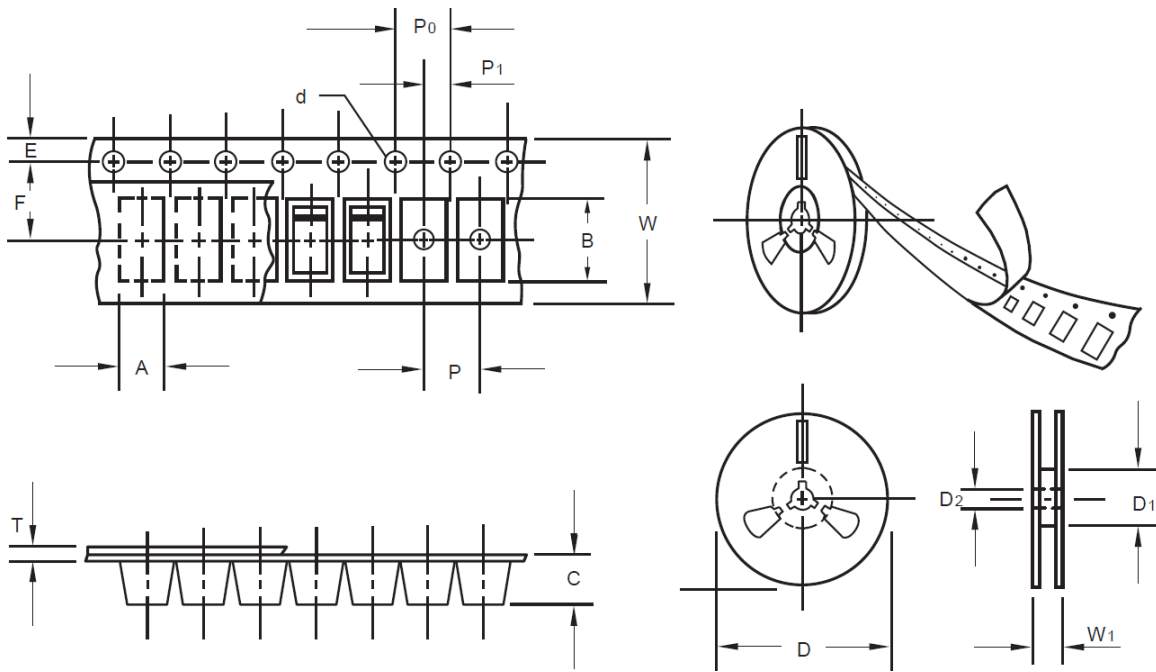
Fig 6 ESD Clamping of I/O to GND (-8kV Contact per IEC 61000-4-2)



SMD ESD PROTECTION DIODES (TUBE) DFN2510 SERIES

TAPE/REEL (Unit: mm)

All Devices are packed in accordance with EIA standard RS-481-A and specifications.

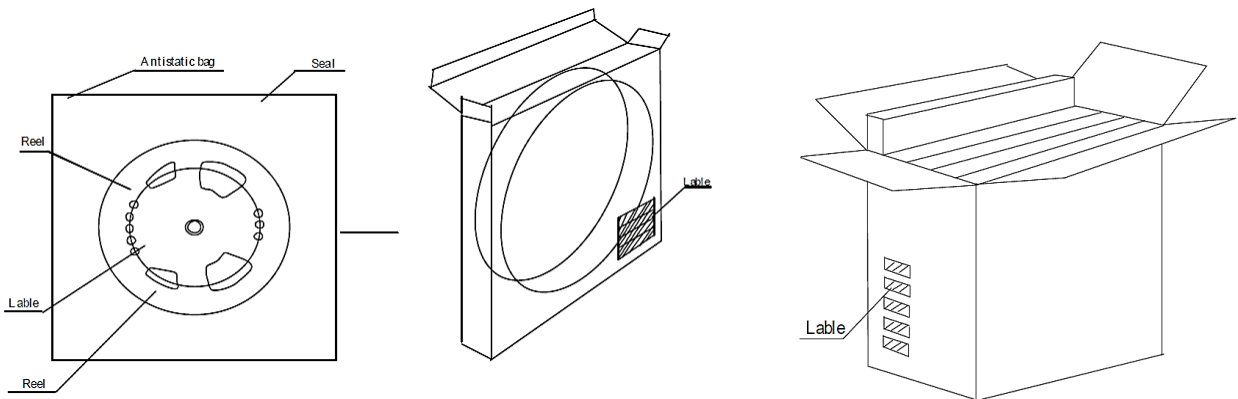


Item	Symbol	Tolerance	DFN2510
Carrier width	A	0.1	2.10
Carrier Length	B	0.1	4.00
Carrier Depth	C	0.1	1.60
Sprocket hole	d	0.05	1.55
13"Reel outside diameter	-	-	-
13"Reel inner diameter	-	-	-
7"Reel outside diameter	D	2.0	178.00
7"Reel inner diameter	D1	Min.	50.00
Feed hole diameter	D2	0.5	13.00
Sprocket 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	1.0	10.50

SMD ESD PROTECTION DIODES (TUBE) DFN2510 SERIES

PACKAGE

Case Code	Reel Size	MPQ (pcs)	Component Spacing (mm)	Qty. Per Box (pcs)	Inner Box L*W*H (mm)	Reel Size (mm)	Carton size L*W*H (mm)	Qty. Per Carton (pcs)	G. W (kg)
DFN2510	7"	3,000		30,000	203*203*195	178	438*438*220	120,000	6.5



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