

ESD Protection Diode : TEUD25A5R0R4U

DFN2510 package ultra-low capacitance type



■ Features

1. RoHS compliant and halogen-free
2. Working voltage: 5.5V
3. Ultra-low capacitance: 0.45pF
4. Low clamping voltage
5. Low leakage current
6. IEC 61000-4-2 (ESD) ±20KV (air), ±20KV (contact)



■ Recommended Applications

1. PCI Express
2. High Definition Multi-Media Interface(HDMI)
3. Serial ATA
4. USB 1.1/2.0/3.0/3.1/OTG

■ Mechanical Data

1. Case: DFN2510, molded plastic meets UL flammability rating 94V-0
2. Terminals: Au plated, solderable per MIL-STD-750, method 2026
3. Meets MSL level 1, per J-STD-020

■ Part Number Code

T	E	U	D	2	5	A	5	R	0	R	4	U
1	2	3	4	5	6	7	8	9	10	11	12	13

Product Series		Type code		Package		Reverse Stand off Voltage(V_{RWM})		Junction Capacitance(C_j)		Type Code	
TE	THINKING ESD Transient Voltage Suppression Diodes	D	Standard Capacitance >10pF	SD32	SOD-323, 2pins	5R		0R4	0.45pF	U	Uni-directional
		L	Low Capacitance >1pF, ≤10pF	D102	DFN1006, 2pins			030	3.0pF	B	Bi-directional,
		U	Ultra-low Capacitance ≤1pF	D25A	DFN2510, 10pins			03D	3.3pF		
								100	10pF		

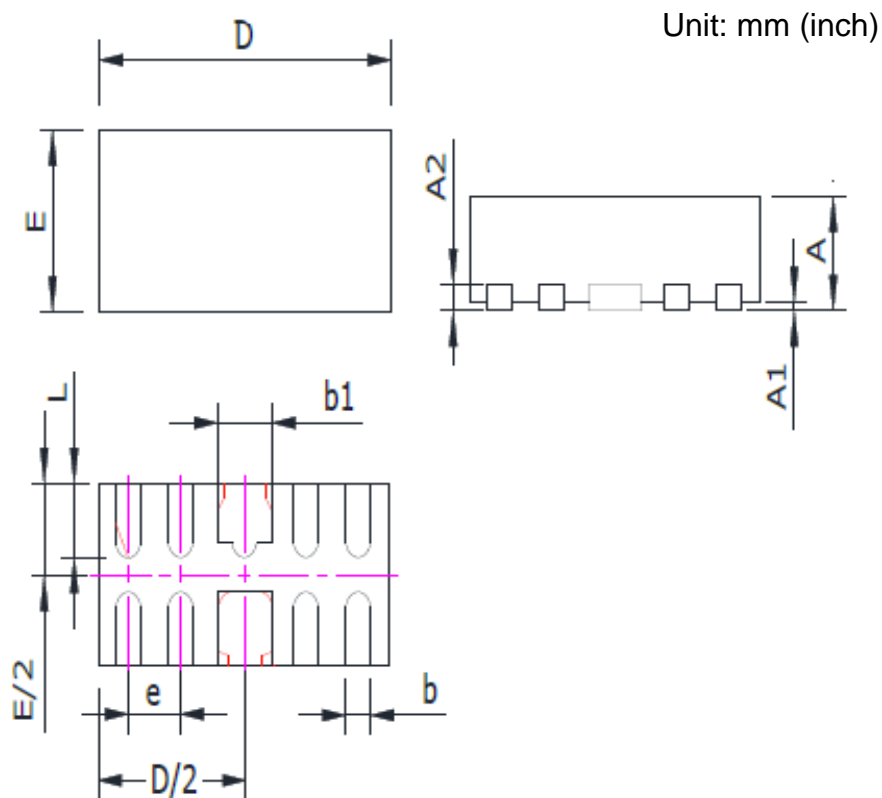
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Structures and Dimensions

DFN2510



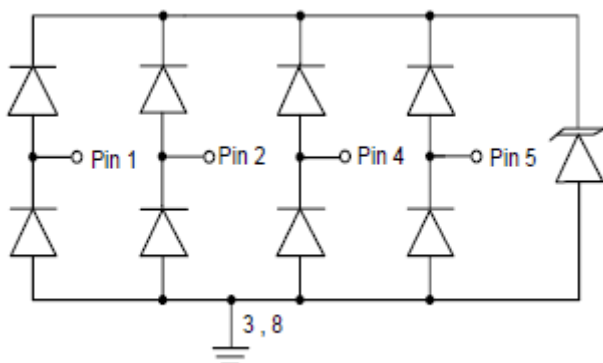
Code	Unit: mm		Unit: inch	
	Min.	Max.	Min.	Max.
A	0.45	0.65	0.017	0.026
A1	0.05 REF		0.002 REF	
A2	0.15 REF		0.006	
b	0.150	0.250	0.006	0.010
b1	0.300	0.500	0.012	0.020
D	2.424	2.576	0.095	0.101
E	0.924	1.076	0.036	0.042
e	0.500 BSC		0.020 BSC	
L	0.300	0.450	0.012	0.018

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■ Schematic & PIN Configuration



■ Maximum Rating (Rating at 25°C ambient temperature unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak pulse power (tp= 8/20μs waveform)	P _{PPM}	45	W
ESD per IEC61000-4-2 (Air) ESD per IEC61000-4-2 (Contact)	V _{ESD}	±20 ±20	KV
Operating junction temperature	T _J	-55~+125	°C
Storage temperature range	T _{STG}	-55~+150	°C

■ Electrical Characteristics (T_A=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse Stand-off Voltage	V _{RWM}	-			5.5	V
Breakdown Voltage	V _{BR}	I _R =1mA	6			V
Reverse Leakage Current	I _R	V _{RWM} =5V			0.5	μA
Clamping Voltage	V _C	I _{pp} =1A, tp= 8/20μs		8.6	9.8	V
		I _{pp} =3A, tp= 8/20μs		11.4	15	
Junction Capacitance	C _j	Between I/O pins V _R =0V, f=1MHz		0.15	0.25	pF
		Any I/O Pin to GND V _R =0V, f=1MHz		0.45	0.65	

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■ Rate and Characteristic Curve ($T_A=25^\circ\text{C}$ unless otherwise noted)

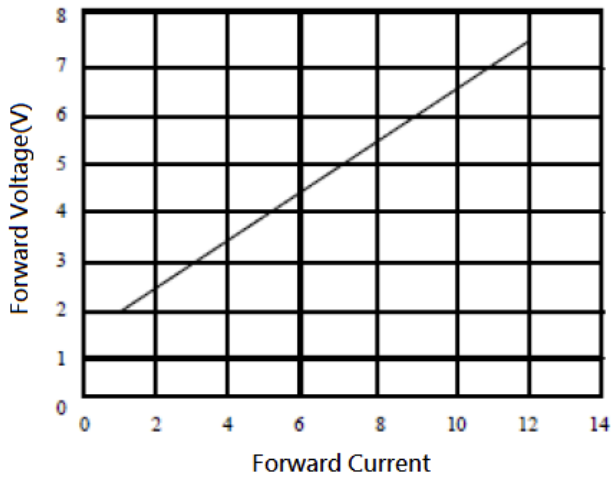


Fig.1 Forward Voltage vs. Forward Peak Pulse Current
($t_{\text{period}}=100\text{ns}$, $t_r=1\text{ns}$)

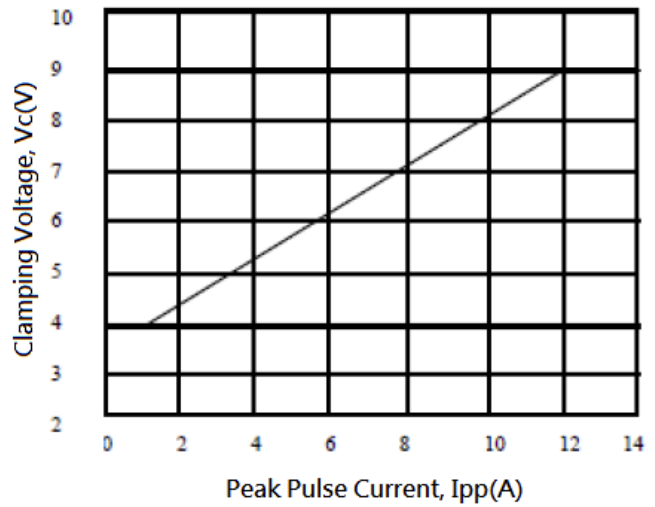


Fig.2 Clamping Voltage vs. Peak pulse Current.

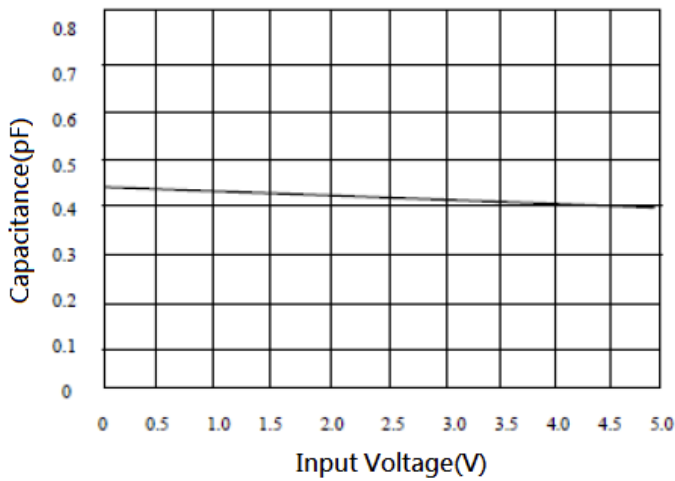


Fig.3 Typical Variation of C_{IN} vs. V_{IN}

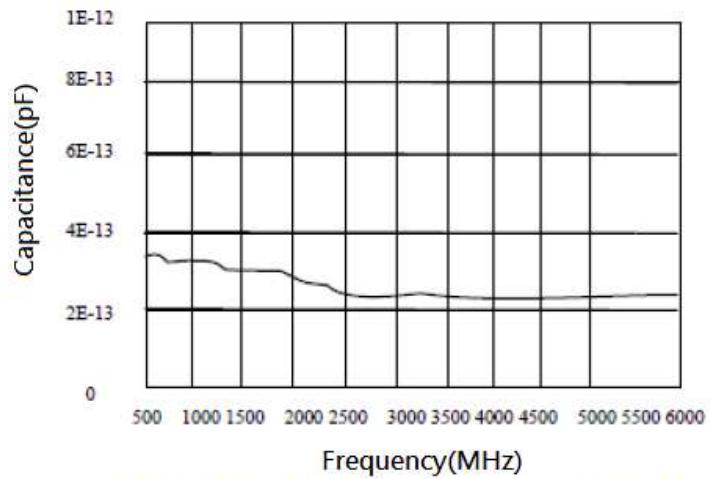


Fig.4 Capacitance vs. Frequency (IO to GND)

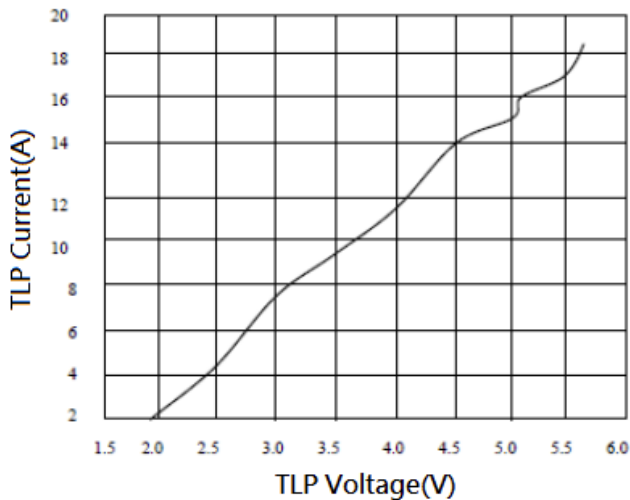


Fig.5 Transmission Line Pulsing (TLP) Measure

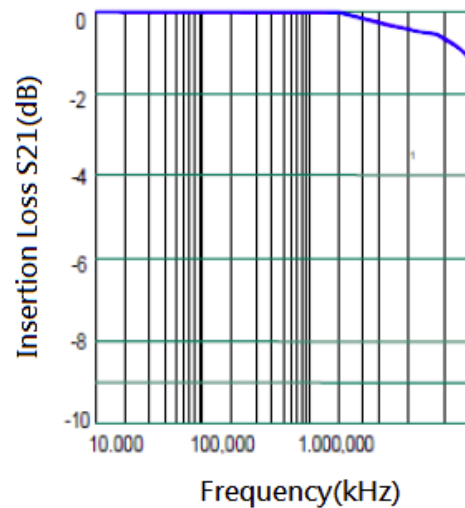


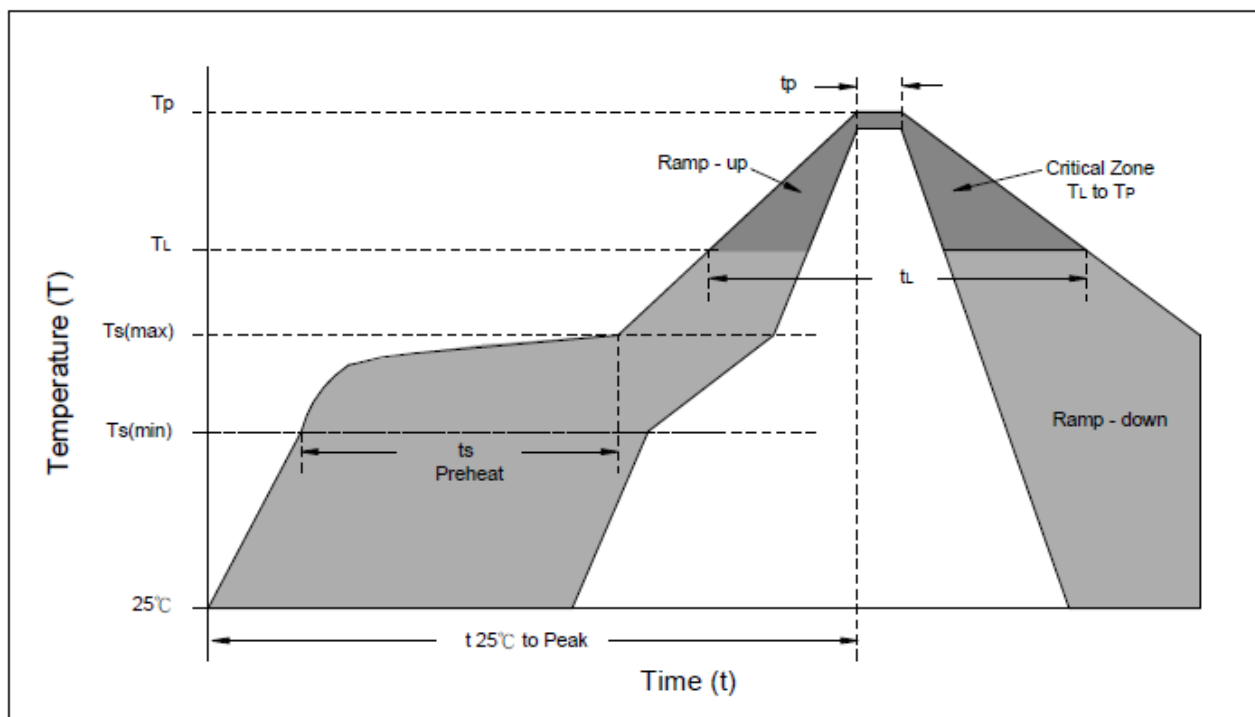
Fig.6 Insertion Loss vs. Frequency (IO to GND)

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■ Soldering Recommendation



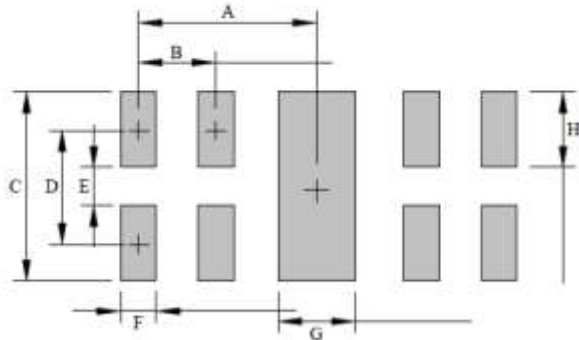
Reflow Condition	Lead-free assembly
Preheat -Temperature Min(Ts min) -Temperature Min(Ts max) -Time (min to max) (ts)	150°C 200°C 60 – 180 seconds
Average ramp up rate -Temperature Liquidus (TL) to peak	3°C/second max
Ts(max) to TL -Ramp-up Rate	3°C/second max.
Reflow -Temperature Liquidus (TL) -Time (tL)	217°C 60 – 150 seconds
Peak Temperature (TP)	260°C
Time within 5°C of actual peak Temperature(tp)	20 – 40 seconds
Ramp-down Rate	6°C/second max.
Time 25°C to peak Temperature(TP)	8 minutes max.
Do not exceed	260°C

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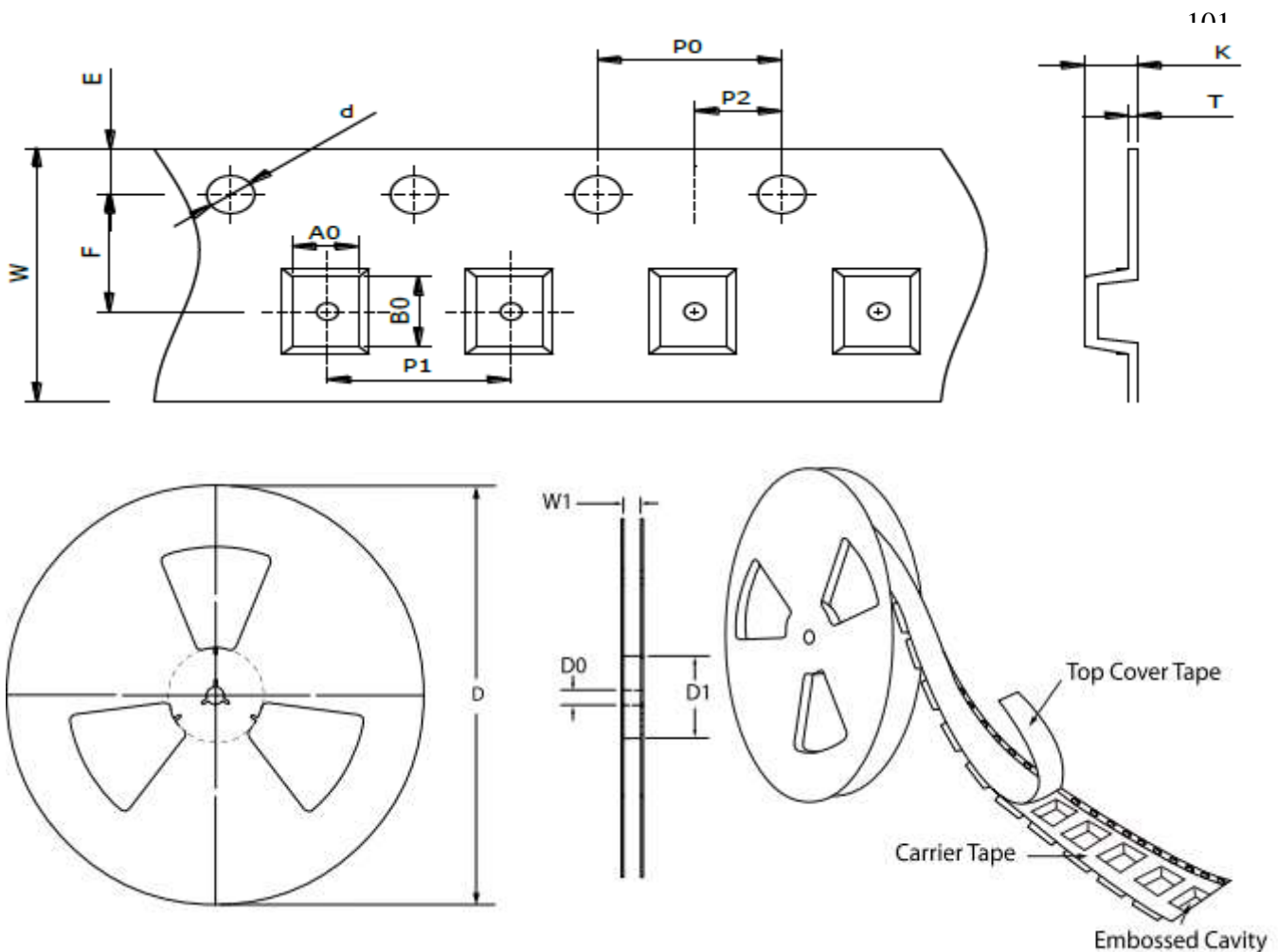


Recommended Soldering Pad Dimensions



Symbol	Unit:mm
A	1.00
B	0.50
C	1.55
D	0.88
E	0.20
F	0.20
F	0.40
H	0.68

Packaging



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Item	Symbol	DFN2510 (Unit: mm)
Carrier width	A0	1.20 ± 0.10
Carrier length	B0	2.70 ± 0.10
Carrier length	K	0.65± 0.10
Sprocket hole	d	1.50 ± 0.10
Reel outside diameter	D	178.00 ± 2.00
Feed hole width	D0	13.00 ± 0.20
Reel inner diameter	D1	MIN. 54.00
Sprocke hole position	E	1.75 ± 0.10
Punch hole position	F	3.50 ± 0.10
Sprocke hole pitch	P0	4.00 ± 0.10
Punch hole pitch	P1	4.00 ± 0.10
Embossment center	P2	2.00 ± 0.10
Overall tape thickness	T	0.20 ± 0.05
Tape width	W	8.00 ± 0.20
Reel width	W1	MAX. 13.50

■ Quantity

Package Type	Marking Code	Reel Size (inch)	Reel (Kpcs)
DFN2510	0524P	7"	3

■ Warehouse Storage Conditions of product

- Storage condition:
 - 1.Storage Temperature: -10℃~+40℃
 - 2.Relative Humidity: ≤75%RH
 - 3.Keep away from corrosive atmosphere and sunlight.
- Period of Storage: 1 year.