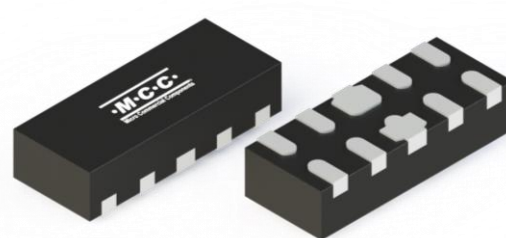


4-Line Uni-directional Ultra Low Capacitance ESD

Features

- Transient protection :
 - IEC 61000-4-2 (ESD) $\pm 30\text{kV}$ (Air), $\pm 30\text{kV}$ (Contact)
 - IEC 61000-4-5 (Lightning) 5A (8/20 μs)
- Uni-directional ESD protection of four lines
- Reverse working voltage, V_{RWM} : 3.3V
- Low capacitance: 0.2pF (I/O to GND)
- Low clamping voltage: 10V
- Low reverse leakage current: 100nA max at $V_R = 3.3\text{V}$
- Solid-state silicon-avalanche



DFN2510-10



Applications

- USB 2.0 , USB 3.0 , USB 3.1 and USB type-C
- HDMI 1.3, HDMI 1.4 and HDMI 2.0
- Portable Electronics and Notebooks
- Ethernet port: 10/100/1000 Mb/s

Mechanical Data

- Package: DFN2510-10
- Moisture Sensitivity Level 1, per J-STD-020
- Halogen Free. "Green" Device (Note1)
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

Body Marking and Pin Layout

Marking Code	Simplified Outline	Internal Structure
	<p>Transparent top view</p>	

Ordering Information

Product Name	Packing info
ESDSBULC3304P5-TP	3K pcs/reel

For packaging details, visit our website at <https://www.mccsemi.com/Package/List>

4-Line Uni-directional Ultra Low Capacitance ESD

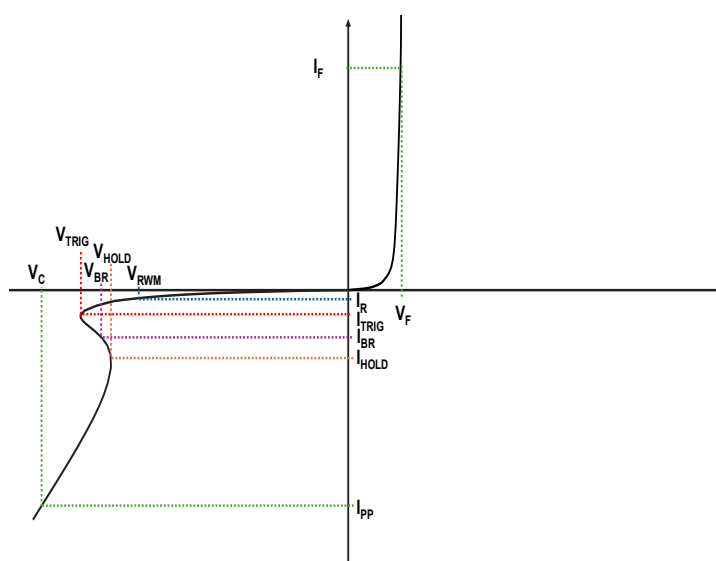
Maximum Ratings (T_A=25°C unless otherwise specified)

Parameter	Symbol	Rating	Unit	
IEC61000-4-2(ESD)	Air	V _{ESD}	±30	kV
	Contact	V _{ESD}	±30	kV
Peak Pulse Current (8/20μs) (Note 2)	I _{PP}	5	A	
Peak Pulse Power (8/20μs) (Note 2)	P _{PK}	50	W	
Operating Temperature Range	T _J	-44 to +125	°C	
Storage Temperature Range	T _{STG}	-55 to +150	°C	

- Note:
- Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and 1000ppm antimony compounds.
 - Non-repetitive current pulse 8/20μs exponential decay waveform according to IEC61000-4-5.

Parameter Definition

Symbol	Parameter
V _{RWM}	Peak Reverse Working Voltage
I _R	Reverse Leakage Current @ V _{RWM}
V _{BR}	Breakdown Voltage @ I _T
I _T	Test Current
I _{PP}	Maximum Reverse Peak Pulse Current
V _C	Clamping Voltage @ I _{PP}
V _{TRIG}	Reverse Trigger Voltage
I _{TRIG}	Reverse Trigger Current
V _{HOLD}	Reverse Holding Voltage
I _{HOLD}	Reverse Holding Current
C _J	Junction Capacitance
P _{PK}	Peak Pulse Power
I _F	Forward Current
V _F	Forward Voltage @ I _F



Electrical Characteristics (T_A=25°C unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Reverse Working Voltage	V _{RWM}				3.3	V
Reverse Breakdown Voltage	V _{BR}	I _T = 1mA	5		8.5	V
Reverse Leakage Current	I _R	V _{RWM} = 3.3V			0.1	μA
Forward Voltage	V _F	I _F = 15mA			1.2	V
Clamping Voltage (Note3)	V _C	I _{PP} = 1A, t _p = 8/20μs			6.5	V
		I _{PP} = 5A, t _p = 8/20μs			10	
Clamping Voltage (Note4)	V _C	I _{PP} = 4A(TLP)		5.9		V
		I _{PP} = 16A(TLP)		9		
ESD Trigger Voltage	V _{TRIG}	t _p = 100ns, T _A = 25°C		7.5		V
Reverse Holding Voltage	V _{HOLD}			5		V
Junction Capacitance	C _J	V _R = 0V, f = 1MHz		0.2	0.3	pF
Dynamic Resistance (Note4)	R _{DYN}	TLP, t _p = 100ns		0.3		Ω

- Note:
- Non-repetitive current pulse 8/20μs exponential decay waveform according to IEC61000-4-5.
 - TLP parameter: Z₀ = 50Ω, t_p = 100ns, t_r = 2ns, averaging window from 60ns to 80ns. R_{DYN} is calculated from 4A to 16A.

4-Line Uni-directional Ultra Low Capacitance ESD

Curve Characteristics

Fig. 1 - 8 X 20µs Pulse Waveform

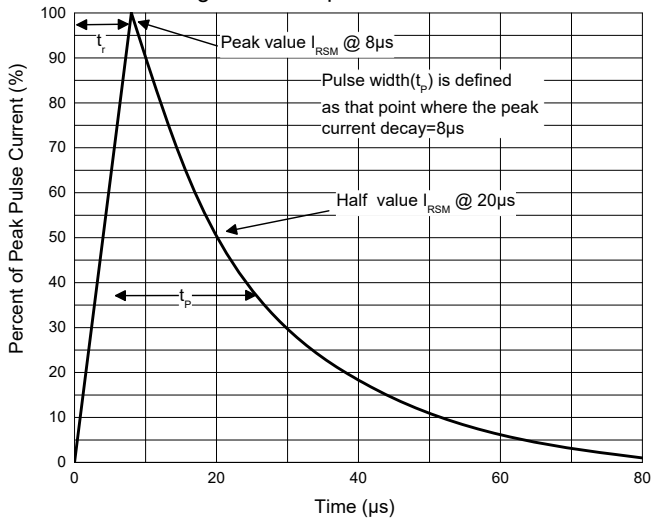


Fig. 2 - Non-Repetitive Peak Pulse Power

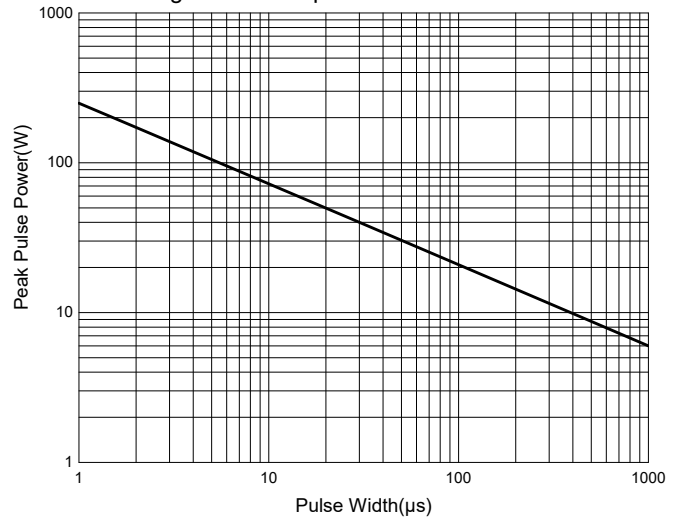


Fig. 3 - Capacitance Characteristics

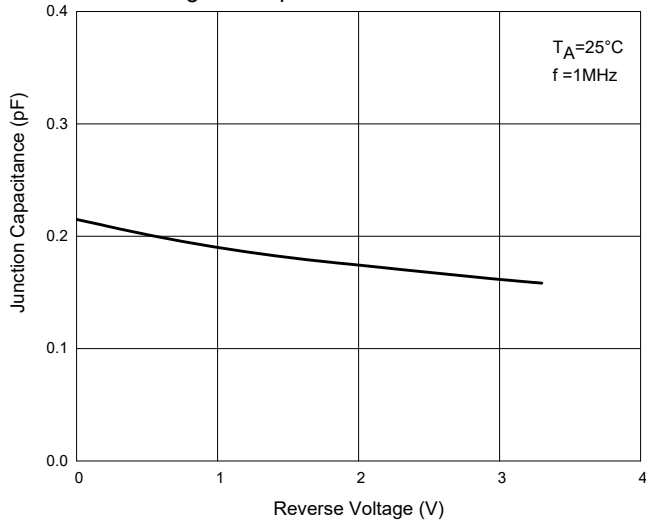


Fig. 4 - Clamping Voltage Characteristics

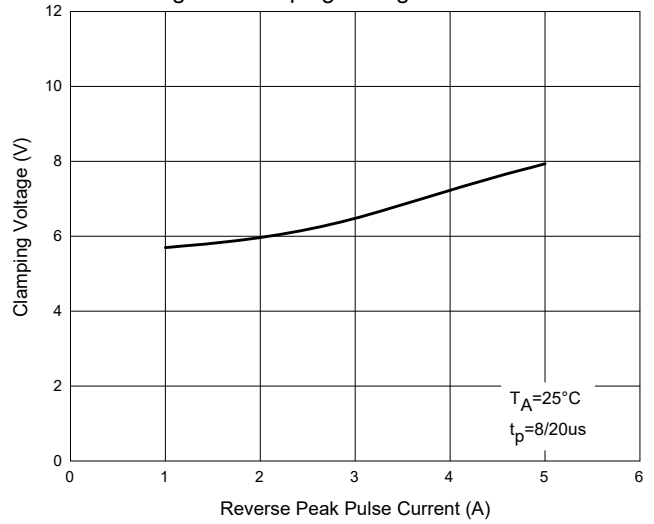


Fig. 5 - TLP Curve

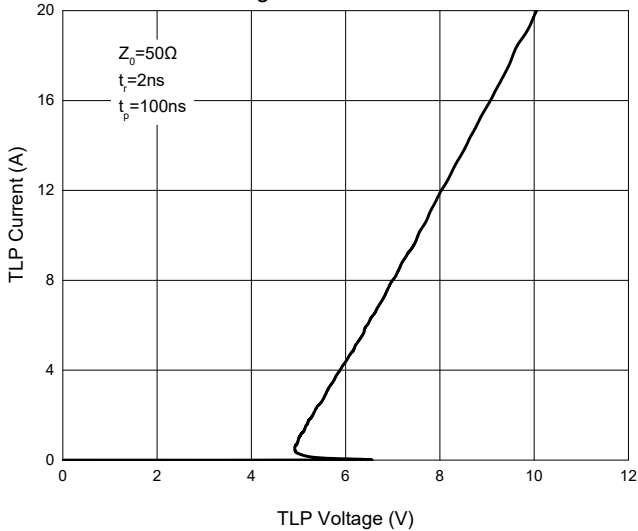
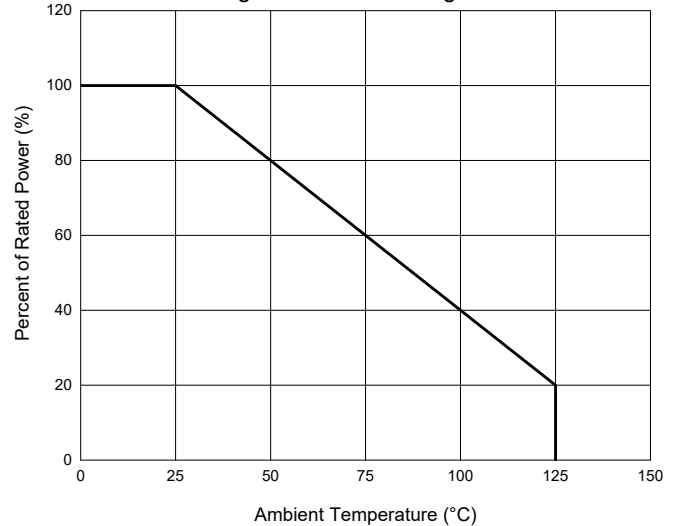
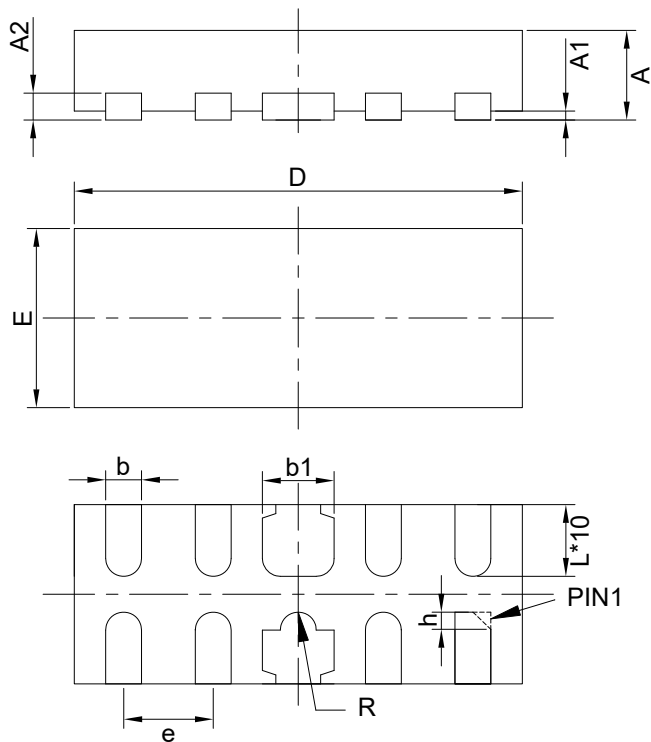


Fig. 6 - Pulse Derating Curve

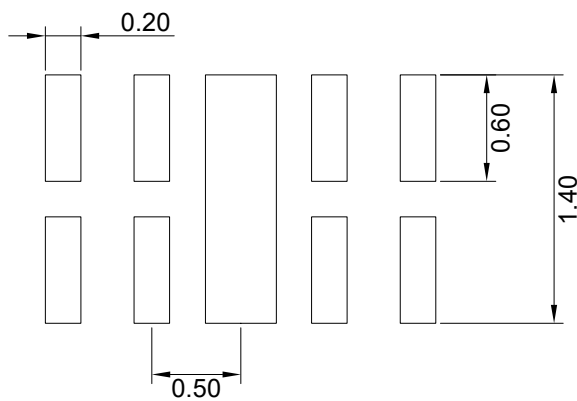


Package Outline



DIM	INCH		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.018	0.026	0.45	0.65	
A1	0.000	0.002	0.00	0.05	
A2	0.006		0.15		TYP
b	0.005	0.010	0.13	0.25	
b1	0.012	0.020	0.30	0.50	
D	0.094	0.102	2.40	2.60	
e	0.020		0.50		TYP
E	0.035	0.043	0.90	1.10	
L	0.011	0.020	0.28	0.50	
h	0.004		0.10		TYP
R	0.004		0.10		TYP

Suggested Pad Layout (Unit:mm)



Notes:

1. The suggested land pattern dimensions have been provided for reference only.
2. For further information, please refer to document IPC-7351A.

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