1-Line Uni-directional Ultra Low Capacitance ESD

Features

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

DFN1006-2

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:DFN1006-2
- 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
A3U	1 2 Transparent top view	

Ordering Information

Product Name	Packing info
ESDUSBULC3V3L-TP	10K pcs/reel

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

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

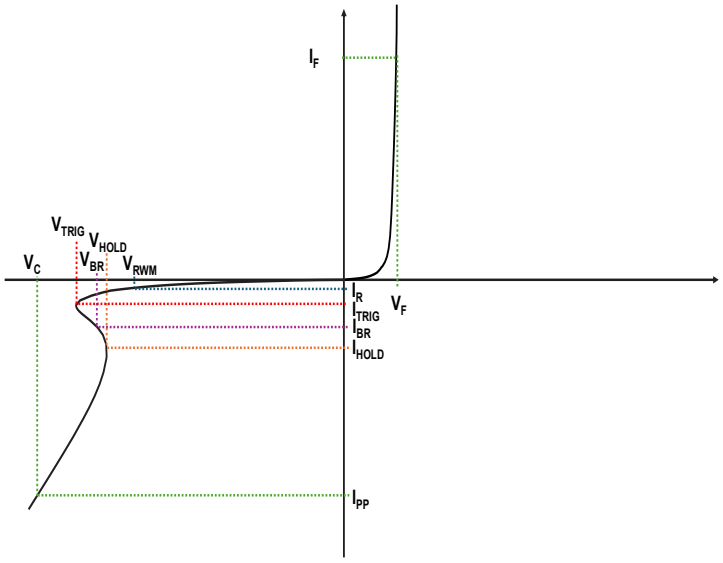
Parameter		Symbol	Rating	Unit
IEC61000-4-2(ESD)	Air	V_{ESD}	±30	kV
	Contact	V_{ESD}	±30	kV
Peak Pulse Current (8/20μs) (Note 2)		I_{PP}	5	A
Peak Pulse Power (8/20μs) (Note 2)		P_{PK}	50	W
Operating Temperature Range		T_J	-40 to +125	°C
Storage Temperature Range		T_{STG}	-55 to +150	°C

Note:

1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and 1000ppm antimony compounds.
2. 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 @ IF



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=10mA			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℃		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:

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

Curve Characteristics

Fig. 1 - 8 X 20μs Pulse Waveform

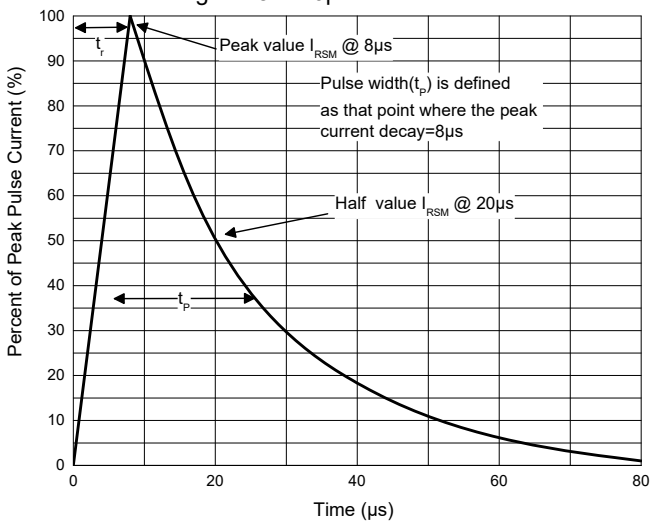


Fig. 2 - Non-Repetitive Peak Pulse Power

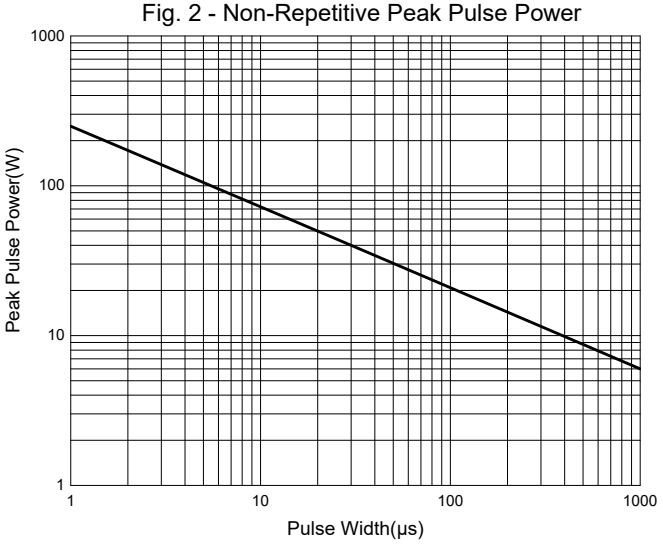


Fig. 3 - Capacitance Characteristics

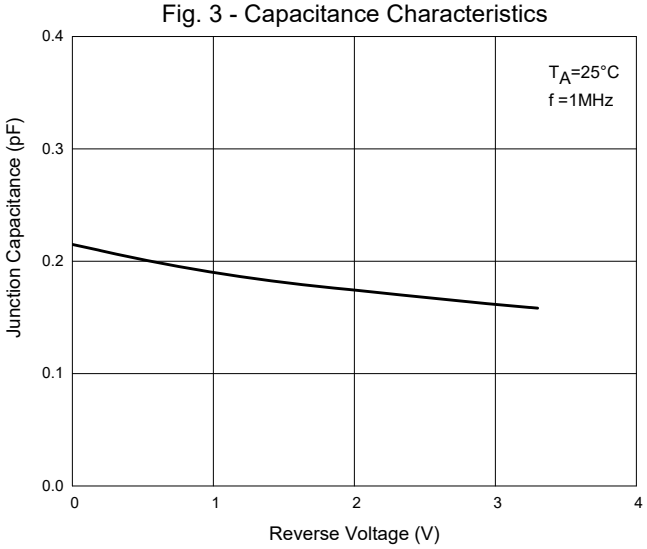


Fig. 4 - Clamping Voltage Characteristics

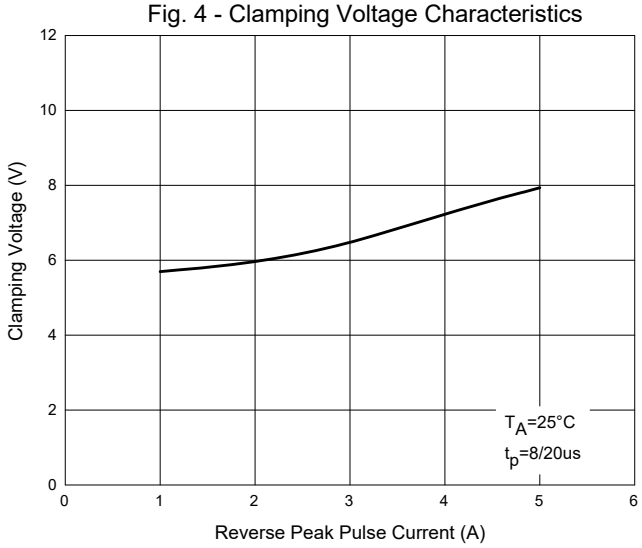


Fig. 5 - TLP Curve

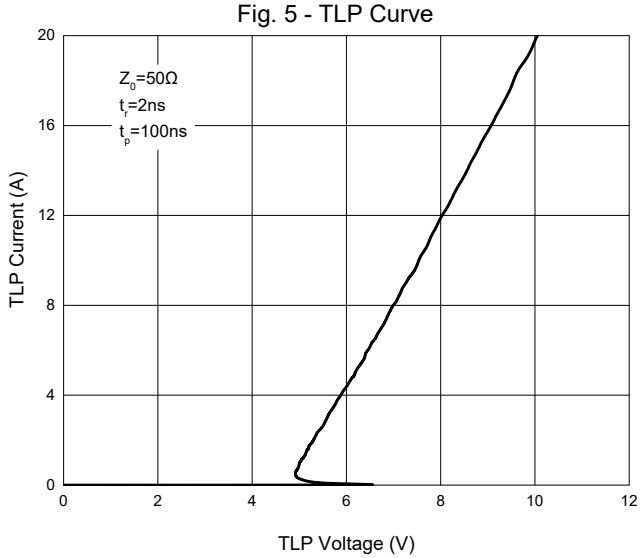
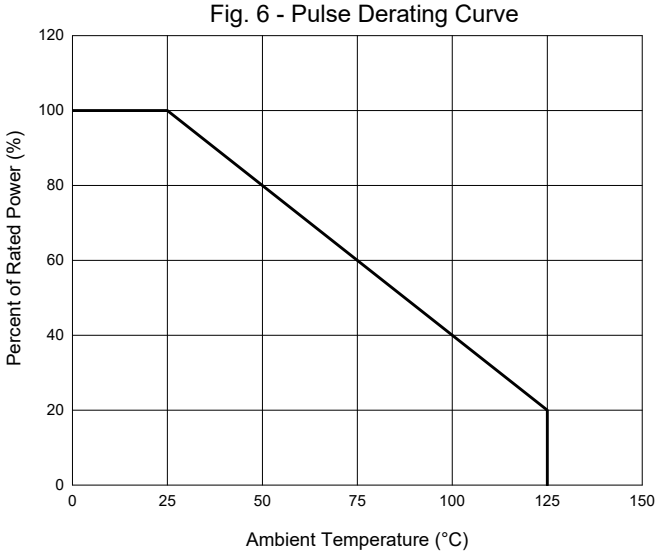
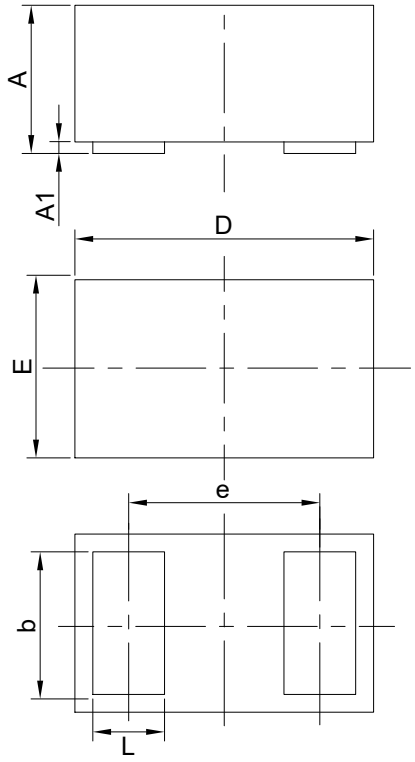


Fig. 6 - Pulse Derating Curve

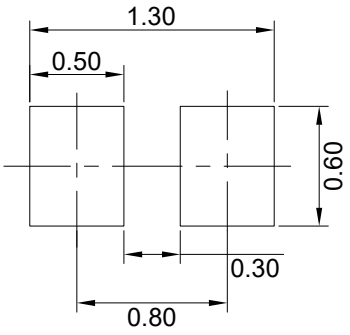


Package Outline



DIM	INCH		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.013	0.022	0.34	0.55	
A1	0.000	0.002	0.00	0.05	
b	0.016	0.022	0.40	0.55	
D	0.037	0.042	0.95	1.08	
E	0.022	0.027	0.55	0.68	
e	0.026		0.65		TYP
L	0.008	0.012	0.20	0.30	

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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