1-Line Uni-directional Standard ESD

Features

- Transient protection to:
  - IEC 61000-4-2 (ESD) ±30kV (Air), ±30kV (Contact)
  - IEC 61000-4-5 (Lightning) 25A~125A (8/20μs)
- Uni-directional ESD protection of one line
- Reverse working voltage, V_{RWM}: 5V~36V
- Low clamping voltage
- Low reverse leakage current
- Array of surge rated diodes with internal TVS diode
- Solid-state silicon-avalanche

DFN1610-2

Applications

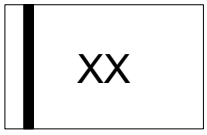
- Battery Protection
- USB VBus
- Power Line Protection
- Hand Held Portable Applications

Mechanical Data

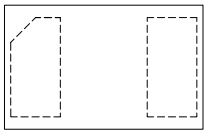
- Package: DFN1610-2
- Moisture Sensitivity Level 1, per J-STD-020
- Halogen Free. “Green” Device (Note1)
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

Body Marking and Pin Layout

Marking Code	Simplified Outline	Internal Structure



MCC Part No.	Device Marking
ESD0571P6	91
ESD0771P6	76
ESD1271P6	72
ESD2471P6	74
ESD3671P6	79



Transparent top view

Ordering Information

Product Name	Packing info
ESD0571P6-TP THRU ESD3671P6-TP	3K pcs/reel

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

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

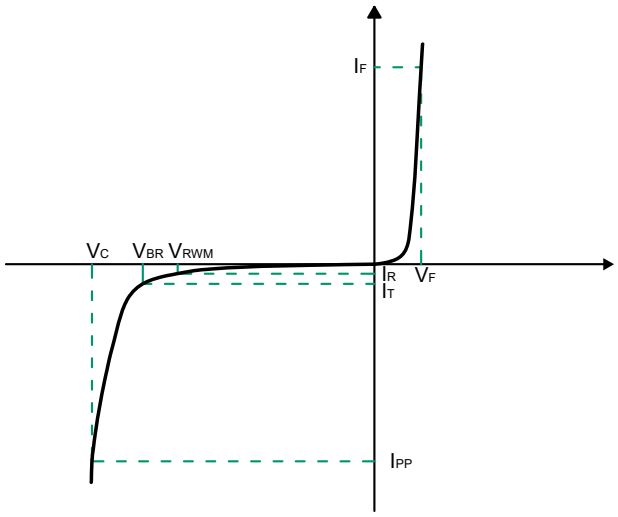
Parameter		Symbol	Rating	Unit
IEC61000-4-2(ESD)	Air	V_{ESD}	±30	kV
	Contact	V_{ESD}	±30	kV
Peak Pulse Power (8/20μs) (Note 2)		P_{PK}	1875	W
Operating Temperature Range		T_J	-55 to +125	°C
Storage Temperature Range		T_{STG}	-55 to +150	°C

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}
P_{PK}	Peak Pulse Power
C_J	Junction Capacitance
I_F	Forward Current
V_F	Forward Voltage @ I_F



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

ESD0571P6

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reverse Working Voltage	V_{RWM}				5	V
Reverse Breakdown Voltage	V_{BR}	I_T =1mA	6			V
Reverse Leakage Current	I_R	V_{RWM}=5V			1	μA
Forward Voltage	V_F	I_F=10mA			1.2	V
Clamping Voltage (Note3)	V_C	I_{PP}=10A, t_P=8/20μs			9	V
		I_{PP}=125A, t_P=8/20μs			15	
Junction Capacitance	C_J	V_R=0V, f=1MHz			960	pF

ESD0771P6

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reverse Working Voltage	V_{RWM}				7	V
Reverse Breakdown Voltage	V_{BR}	I_T =1mA	7.5			V
Reverse Leakage Current	I_R	V_{RWM}=7V			0.5	μA
Forward Voltage	V_F	I_F=10mA			1.2	V
Clamping Voltage (Note3)	V_C	I_{PP}=10A, t_P=8/20μs			12	V
		I_{PP}=115A, t_P=8/20μs			16.5	
Junction Capacitance	C_J	V_R=0V, f=1MHz			550	pF

ESD1271P6

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reverse Working Voltage	V_{RWM}				12	V
Reverse Breakdown Voltage	V_{BR}	I_T =1mA	12.6			V
Reverse Leakage Current	I_R	V_{RWM}=12V			0.1	μA
Forward Voltage	V_F	I_F=10mA			1.2	V
Clamping Voltage (Note3)	V_C	I_{PP}=10A, t_P=8/20μs			18	V
		I_{PP}=75A, t_P=8/20μs			25	
Junction Capacitance	C_J	V_R=0V, f=1MHz			500	pF

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

ESD2471P6

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reverse Working Voltage	V_{RWM}				24	V
Reverse Breakdown Voltage	V_{BR}	I_T =1mA	26.7			V
Reverse Leakage Current	I_R	V_{RWM}=24V			0.1	μA
Forward Voltage	V_F	I_F=10mA			1.2	V
Clamping Voltage (Note3)	V_C	I_{PP}=10A, t_P=8/20μs			42	V
		I_{PP}=35A, t_P=8/20μs			53.5	
Junction Capacitance	C_J	V_R=0V, f=1MHz			200	pF

ESD3671P6

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reverse Working Voltage	V_{RWM}				36	V
Reverse Breakdown Voltage	V_{BR}	I_T =1mA	37			V
Reverse Leakage Current	I_R	V_{RWM}=36V			0.5	μA
Forward Voltage	V_F	I_F=10mA			1.2	V
Clamping Voltage (Note3)	V_C	I_{PP}=10A, t_P=8/20μs			60	V
		I_{PP}=25A, t_P=8/20μs			75	
Junction Capacitance	C_J	V_R=0V, f=1MHz			150	pF

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

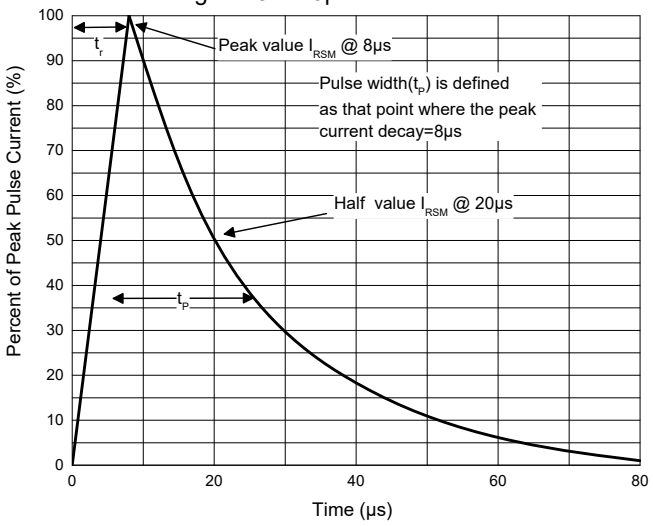


Fig. 2 - Non-Repetitive Peak Pulse Power

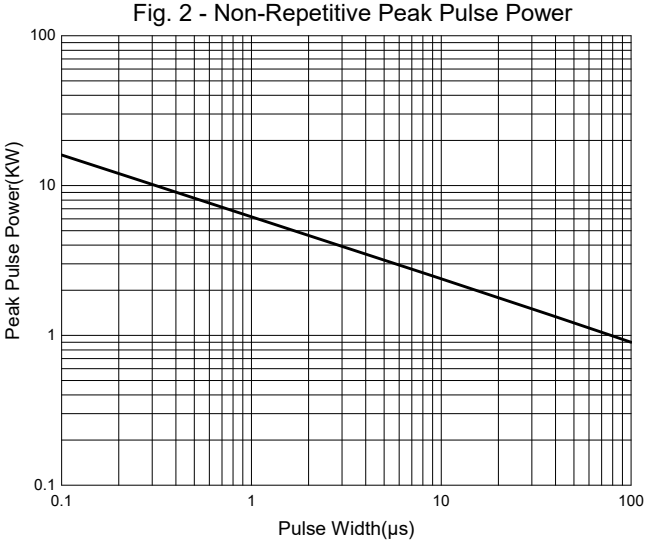


Fig. 3 - Clamping Voltage Characteristics

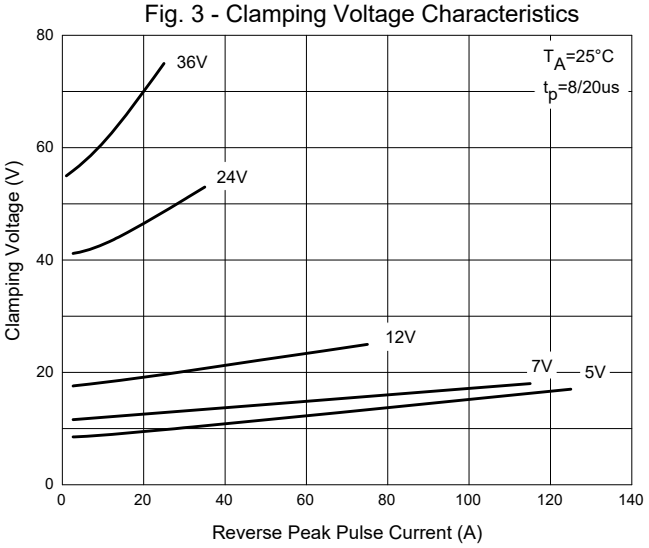
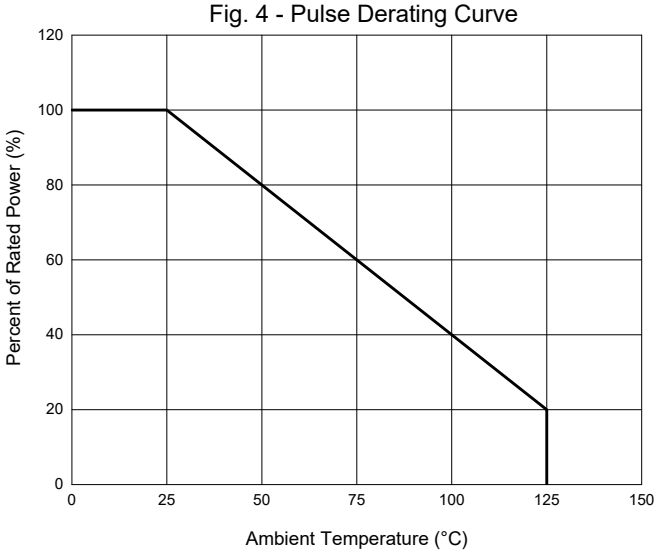
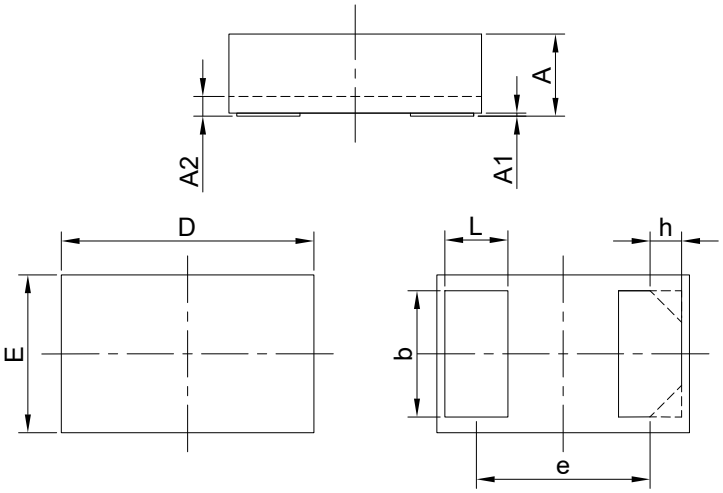


Fig. 4 - Pulse Derating Curve

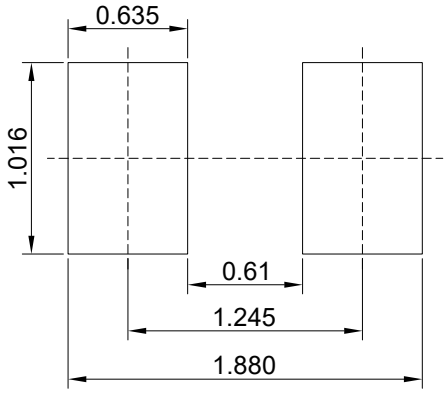


Package Outline



DIM	INCH		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.016	0.022	0.400	0.550	
A1	0.000	0.002	0.000	0.050	
A2	0.006		0.150		TYP
b	0.030	0.033	0.750	0.850	
D	0.061	0.065	1.550	1.650	
e	0.043		1.100		TYP
E	0.037	0.041	0.950	1.050	
L	0.014	0.018	0.350	0.450	
h	0.008		0.200		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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