

Features

- Uni-Directional ESD Protection of Two Line
- Low leakage current
- Low Clamping Voltage
- Moisture Sensitivity Level1
- Halogen Free. "Green" Device (Note 1)
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

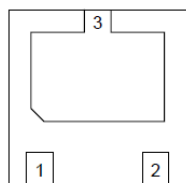
Maximum Ratings

IEC61000-4-2 (ESD)	Air	±30KV
	Contact	±30KV
Peak Pulse Power (8/20μs) ^(Note2)	P _{PK}	5000W
Operating Junction Temperature Range	T _J	-55°C to +125°C
Storage Temperature Range	T _{STG}	-55°C to +150°C

Note :

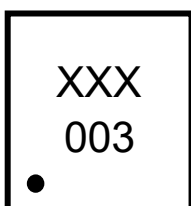
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. Non-repetitive current pulse 8/20 μs exponential decay waveform according to IEC61000-4-5.

Internal Structure



Transparent top view

Marking Code

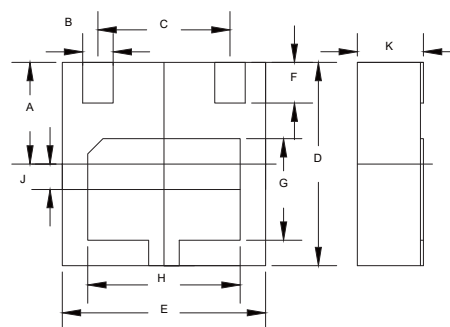


XXX:Device code

MCC Part No.	Device Code
ESDHC12VP4	T12
ESDHC15VP4	T15
ESDHC18VP4	T18
ESDHC24VP4	T24

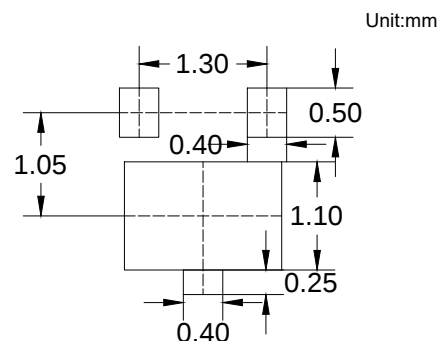
ESD Protection Device

DFN2020-3L

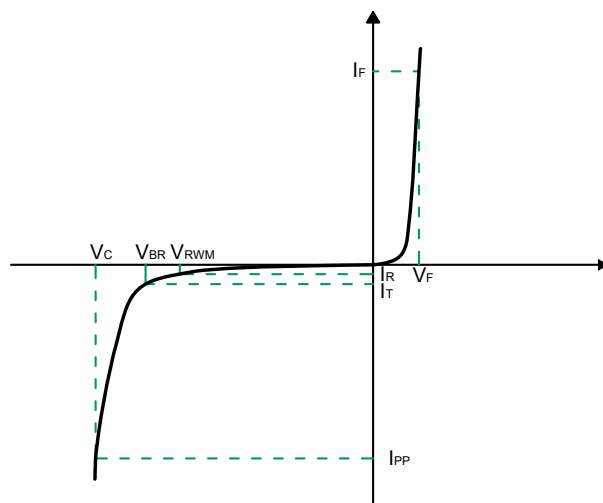


DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.037	0.041	0.950	1.050	
B	0.010	0.014	0.250	0.350	
C	0.051		1.30		TYP.
D	0.075	0.083	1.900	2.100	
E	0.075	0.083	1.900	2.100	
F	0.014	0.018	0.350	0.450	
G	0.035	0.043	0.900	1.100	
H	0.055	0.063	1.400	1.600	
J	0.008	0.012	0.200	0.300	
K	-	0.026	-	0.650	

SUGGESTED SOLDER PAD LAYOUT



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 @ 25°C (Unless Otherwise Specified)

ESDHC12VP4

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Reverse Working Voltage	V_{RWM}				12	V
Reverse Breakdown Voltage	V_{BR}	$I_T=1mA$	12.8		15	V
Reverse Leakage Current	I_R	$V_{RWM}=12V$			0.5	μA
Clamping Voltage ^{Note1}	V_C	$I_{PP}=50A, t_p=8/20\mu s$		16	20	V
Clamping Voltage ^{Note1}	V_C	$I_{PP}=100A, t_p=8/20\mu s$		18	22	V
Clamping Voltage ^{Note1}	V_C	$I_{PP}=200A, t_p=8/20\mu s$		20	24	V
Junction Capacitance	C_J	$V_R=0V, f=1MHz$		1080		pF
Dynamic Resistance ^{Note2}	R_{DYN}	TLP, $t_p=100ns$		0.09		Ω

ESDHC15VP4

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Reverse Working Voltage	V_{RWM}				15	V
Reverse Breakdown Voltage	V_{BR}	$I_T=1mA$	16		19	V
Reverse Leakage Current	I_R	$V_{RWM}=15V$			0.5	μA
Clamping Voltage ^{Note1}	V_C	$I_{PP}=50A, t_p=8/20\mu s$		20	24	V
Clamping Voltage ^{Note1}	V_C	$I_{PP}=100A, t_p=8/20\mu s$		24	27	V
Clamping Voltage ^{Note1}	V_C	$I_{PP}=170A, t_p=8/20\mu s$		30	35	V
Junction Capacitance	C_J	$V_R=0V, f=1MHz$		1050		pF
Dynamic Resistance ^{Note2}	R_{DYN}	TLP, $t_p=100ns$		0.035		Ω

ESDHC18VP4

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Reverse Working Voltage	V_{RWM}				18	V
Reverse Breakdown Voltage	V_{BR}	$I_T=1mA$	19		22	V
Reverse Leakage Current	I_R	$V_{RWM}=18V$			0.5	μA
Clamping Voltage ^{Note1}	V_C	$I_{PP}=50A, t_p=8/20\mu s$		23	27	V
Clamping Voltage ^{Note1}	V_C	$I_{PP}=100A, t_p=8/20\mu s$		28	33	V
Clamping Voltage ^{Note1}	V_C	$I_{PP}=150A, t_p=8/20\mu s$		32	38	V
Junction Capacitance	C_J	$V_R=0V, f=1MHz$		950		pF
Dynamic Resistance ^{Note2}	R_{DYN}	TLP, $t_p=100ns$		0.05		Ω

ESDHC24VP4

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Reverse Working Voltage	V_{RWM}				24	V
Reverse Breakdown Voltage	V_{BR}	$I_T=1mA$	25		30	V
Reverse Leakage Current	I_R	$V_{RWM}=24V$			0.5	μA
Clamping Voltage ^{Note1}	V_C	$I_{PP}=50A, t_p=8/20\mu s$		34	38	V
Clamping Voltage ^{Note1}	V_C	$I_{PP}=100A, t_p=8/20\mu s$		40	44	V
Clamping Voltage ^{Note1}	V_C	$I_{PP}=120A, t_p=8/20\mu s$		46	60	V
Junction Capacitance	C_J	$V_R=0V, f=1MHz$		800		pF
Dynamic Resistance ^{Note2}	R_{DYN}	TLP, $t_p=100ns$		0.05		Ω

Note :

1. Non-repetitive current pulse 8/20 μs exponential decay waveform according to IEC61000-4-5.

2. TLP parameter: $Z_0=50\Omega$, $t_p=100ns$, $t_r=2ns$, averaging window from 60ns to 80ns. R_{DYN} is calculated from 4A to 16A.

Curve Characteristics

Fig. 1 - 8 X 20 μ s Pulse Waveform

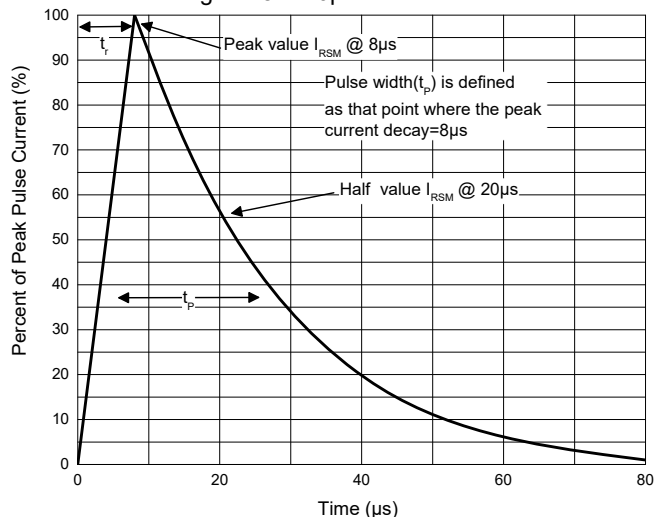


Fig. 2 - Non-Repetitive Peak Pulse Power

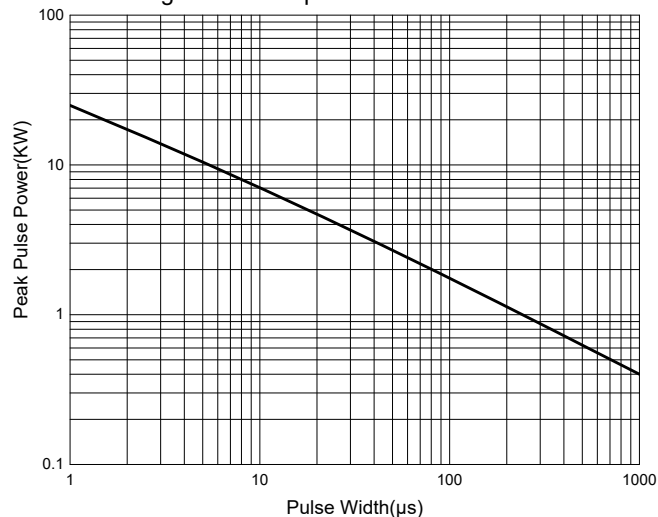


Fig. 3 - Capacitance Characteristics

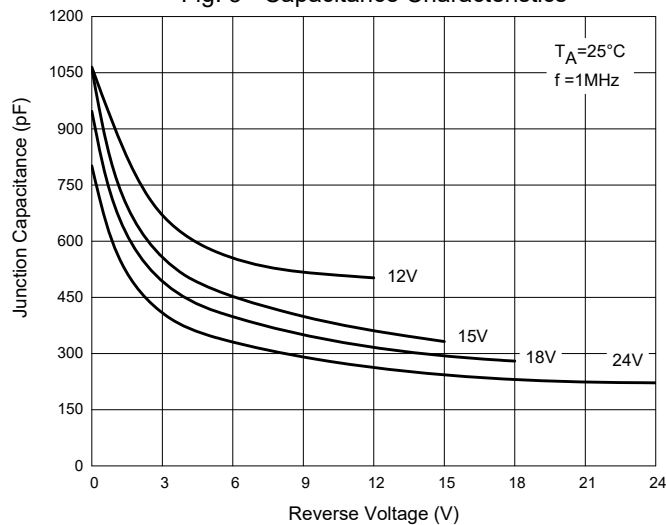


Fig. 4 - Clamping Voltage Characteristics

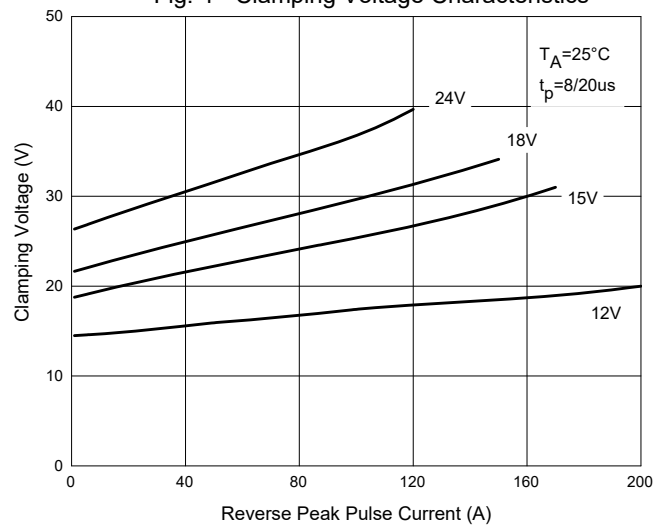


Fig. 5 - TLP Curve

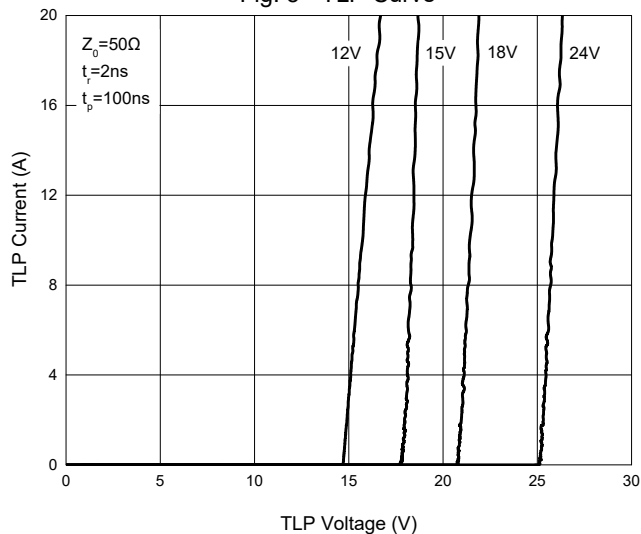
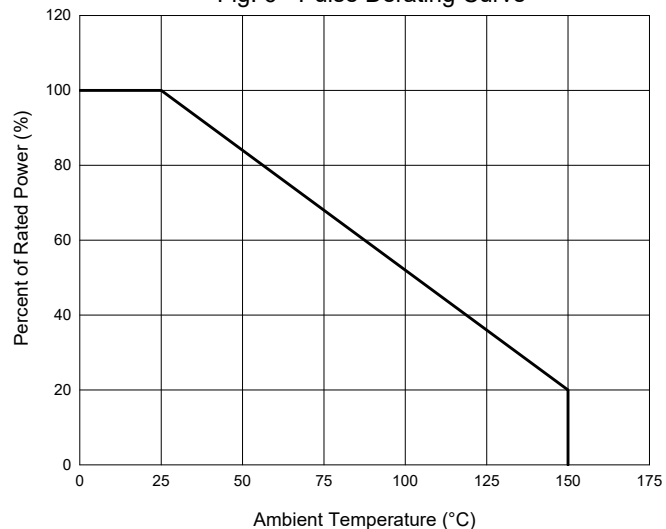


Fig. 6 - Pulse Derating Curve



Ordering Information

Device	Packing
Part Number-TP	Tape&Reel: 3Kpcs/Reel

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