

**Features**

- For Sensitive ESD Protection
- Excellent Clamping Capability
- Low Leakage
- For Space Saving Application
- Fast Response, Response Time Less than 1ns
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free Available Upon Request By Adding Suffix "-HF"
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

**Maximum Ratings**

- Operating Junction Temperature Range: -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 625°C/W Junction to Ambient

MCC Part Number	Device Marking
ESD3V3D5	ZE
ESD5V0D5	ZF
ESD7V0D5	ZH
ESD12VD5	ZM

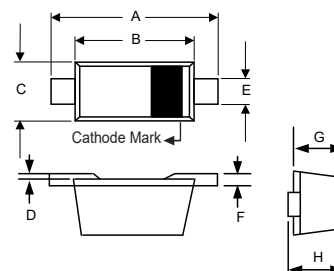
IEC61000-4-2(ESD)	Air Contact	±30KV ±30KV
JESD22-A114-B(ESD)	Machine Human Body	±0.4KV ±16KV

**Internal Structure**

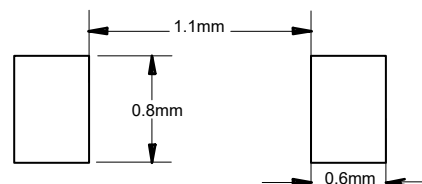


**ESD Protection Device**

**SOD-523**

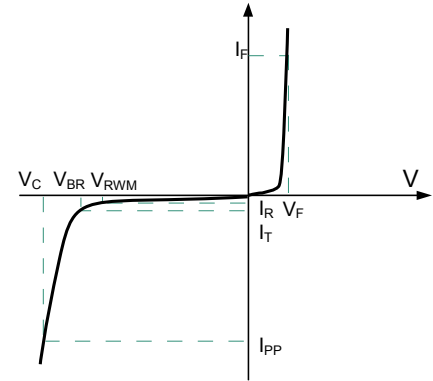


DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.059	0.067	1.50	1.70	
B	0.043	0.051	1.10	1.30	
C	0.030	0.033	0.75	0.85	
D	0.001	0.003	0.01	0.07	
E	0.010	0.014	0.25	0.35	
F	0.003	0.006	0.08	0.15	
G	0.020	0.028	0.50	0.70	
H	0.020	0.031	0.51	0.77	



**ELECTRICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

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 @ $I_{PP}$
$P_{PP}$	Peak Pulse Power
$C_J$	Junction Capacitance
$I_F$	Forward Current
$V_F$	Forward Voltage @ $I_F$



**Electrical Characteristics @ 25°C (Unless Otherwise Specified)**

**ESD3V3D5**

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Reverse Working Voltage	$V_{RWM}$				3.3	V
Reverse Breakdown Voltage	$V_{BR}$	$I_T = 1\text{mA}$	5			V
Reverse Leakage Current	$I_R$	$V_{RWM} = 3.3\text{V}$			0.08	$\mu\text{A}$
Forward Voltage	$V_F$	$I_F = 10\text{mA}$			0.9	V
Peak Pulse Current	$I_{PP}$	$t_p = 8/20\mu\text{s}$			16	A
Clamping Voltage	$V_C$	$I_{PP} = 5\text{A}, t_p = 8/20\mu\text{s}$			9.4	V
Clamping Voltage	$V_C$	$I_{PP} = 16\text{A}, t_p = 8/20\mu\text{s}$			13	V
Peak Pulse Power	$P_{PK}$	$t_p = 8/20\mu\text{s}$			220	W
Junction Capacitance	$C_J$	$V_R = 0\text{V}, f = 1\text{MHz}$		105		pF

**ESD5V0D5**

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Reverse Working Voltage	$V_{RWM}$				5	V
Reverse Breakdown Voltage	$V_{BR}$	$I_T = 1\text{mA}$	6.2			V
Reverse Leakage Current	$I_R$	$V_{RWM} = 5\text{V}$			0.08	$\mu\text{A}$
Forward Voltage	$V_F$	$I_F = 10\text{mA}$			0.9	V
Peak Pulse Current	$I_{PP}$	$t_p = 8/20\mu\text{s}$			9.4	A
Clamping Voltage	$V_C$	$I_{PP} = 5\text{A}, t_p = 8/20\mu\text{s}$			11.6	V
Clamping Voltage	$V_C$	$I_{PP} = 9.4\text{A}, t_p = 8/20\mu\text{s}$			18.6	V
Peak Pulse Power	$P_{PK}$	$t_p = 8/20\mu\text{s}$			174	W
Junction Capacitance	$C_J$	$V_R = 0\text{V}, f = 1\text{MHz}$		80		pF

Electrical Characteristics @ 25°C (Unless Otherwise Specified)

ESD7V0D5

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Reverse Working Voltage	$V_{RWM}$				7	V
Reverse Breakdown Voltage	$V_{BR}$	$I_T = 1mA$	7.5			V
Reverse Leakage Current	$I_R$	$V_{RWM} = 7V$			0.03	$\mu A$
Forward Voltage	$V_F$	$I_F = 10mA$			0.9	V
Peak Pulse Current	$I_{PP}$	$t_p = 8/20\mu s$			8.8	A
Clamping Voltage	$V_C$	$I_{PP} = 5A, t_p = 8/20\mu s$			13.5	V
Clamping Voltage	$V_C$	$I_{PP} = 8.8A, t_p = 8/20\mu s$			22.7	V
Peak Pulse Power	$P_{PK}$	$t_p = 8/20\mu s$			200	W
Junction Capacitance	$C_J$	$V_R = 0V, f = 1MHz$		65		pF

ESD12VD5

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Reverse Working Voltage	$V_{RWM}$				12	V
Reverse Breakdown Voltage	$V_{BR}$	$I_T = 1mA$	14.1			V
Reverse Leakage Current	$I_R$	$V_{RWM} = 12V$			0.02	$\mu A$
Forward Voltage	$V_F$	$I_F = 10mA$			0.9	V
Peak Pulse Current	$I_{PP}$	$t_p = 8/20\mu s$			9.6	A
Clamping Voltage	$V_C$	$I_{PP} = 5A, t_p = 8/20\mu s$			23	V
Clamping Voltage	$V_C$	$I_{PP} = 9.6A, t_p = 8/20\mu s$			25	V
Peak Pulse Power	$P_{PK}$	$t_p = 8/20\mu s$			240	W
Junction Capacitance	$C_J$	$V_R = 0V, f = 1MHz$		55		pF

## Curve Characteristics

Fig. 1 - 8 X 20 $\mu$ s Pulse Waveform

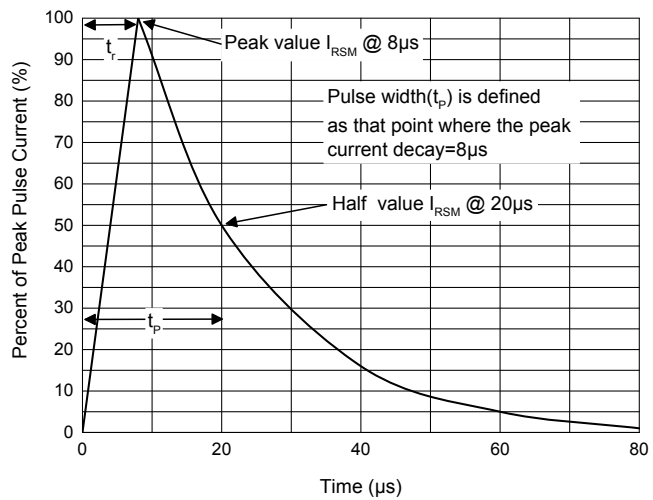
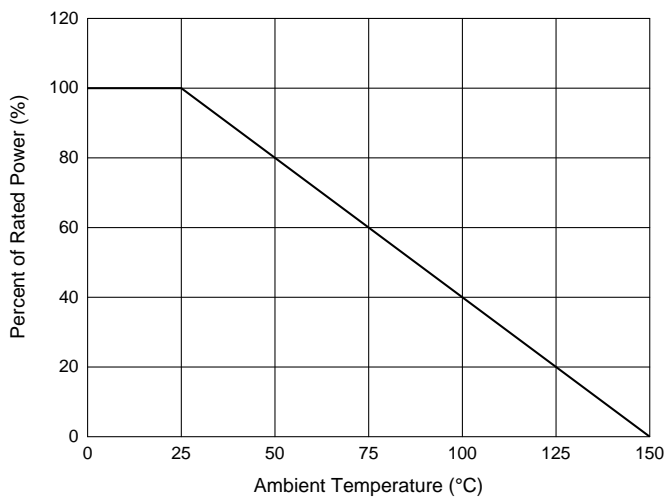


Fig. 2 - Pulse Derating Curve



## Ordering Information

Device	Packing
Part Number-TP	Tape&Reel: 8Kpcs/Reel

Note : Adding "-HF" Suffix for Halogen Free, eg. Part Number-TP-HF

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