Single Line TVS Diode
ESD5ZXX

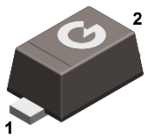
Features

- ESD / transient protection of high speed data lines
  - IEC 61000-4-2 (ESD): ±30kV (air), ±30 kV (contact)
- Low reverse stand−off voltage: 2.5V-12V
- Very low leakage current
- RoHS compliant with Halogen-free

HF

Mechanical Data

- Case: SOD-523
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte Tin-Plated Leads, Solderability-per MIL-STD-202, Method 208



SOD-523

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
ESD5Z2.5	SOD-523	3000pcs / Tape & Reel	ZD
ESD5Z3.3	SOD-523	3000pcs / Tape & Reel	ZE
ESD5Z5.0	SOD-523	3000pcs / Tape & Reel	ZF
ESD5Z6.0	SOD-523	3000pcs / Tape & Reel	ZG
ESD5Z7.0	SOD-523	3000pcs / Tape & Reel	ZH
ESD5Z12	SOD-523	3000pcs / Tape & Reel	ZM

Maximum Ratings (@ T_A = 25℃ unless otherwise specified)

Parameter	Symbol	Value	Unit
IEC 61000-4-2; ESD (Air)	V_{ESD-A}	±30	kV
IEC 61000-4-2; ESD (Contact)	V_{ESD-C}	±30	kV
JESD22-A114-B; ESD (Human Body)	V_{ESD-HB}	±16	kV
JESD22-A114-B; ESD (Machine)	V_{ESD-M}	±0.4	kV
Total Power Dissipation	P_D	0.15	W

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-to-Air	$R_{\theta JA}$	834	°C/W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	542	°C/W
Thermal Resistance Junction-to-Lead	$R_{\theta JL}$	515	°C/W
Junction Temperature	T_J	-55 ~ +150	°C
Storage Temperature Range	T_{STG}	-55 ~ +150	°C

Electrical Characteristics (@ T_A = 25℃ unless otherwise specified)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
ESD5Z2.5 TVS for 2.5V Lines						
Reverse Stand-off Voltage	V_{RWM}		-	-	2.5	V
Peak Pulse Power (t_p = 8/20μs)	P_{PP}		-	-	120	W
Reverse Breakdown Voltage	$V_{(BR)}$	I_T = 1mA	4	-	-	V
Reverse Leakage Current	I_R	V_{RWM} = 2.5V	-	-	6	μA
Clamping Voltage	V_C	I_{PP} = 5A, tp = 8/20μs	-	6.5	8	V
		I_{PP} = 11A, tp = 8/20μs	-	-	10.9	V
Junction Capacitance	C_J	V_R = 0V, f = 1MHZ	-	145	-	pF
ESD5Z3.3 TVS for 3.3V Lines						
Reverse Stand-off Voltage	V_{RWM}		-	-	3.3	V
Peak Pulse Power (t_p = 8/20μs)	P_{PP}		-	-	158	W
Reverse Breakdown Voltage	$V_{(BR)}$	I_T = 1mA	5	-	-	V
Reverse Leakage Current	I_R	V_{RWM} = 3.3V	-	-	1	μA
Clamping Voltage	V_C	I_{PP} = 5A, tp = 8/20μs	-	8.4	10	V
		I_{PP} = 11.2A, tp = 8/20μs	-	-	14.1	V
Junction Capacitance	C_J	V_R = 0V, f = 1MHZ	-	105	-	pF
ESD5Z5.0 TVS for 5.0V Lines						
Reverse Stand-off Voltage	V_{RWM}		-	-	5.0	V
Peak Pulse Power (t_p = 8/20μs)	P_{PP}		-	-	174	W
Reverse Breakdown Voltage	$V_{(BR)}$	I_T = 1mA	6.2	-	-	V
Reverse Leakage Current	I_R	V_{RWM} = 5V	-	-	0.05	μA
Clamping Voltage	V_C	I_{PP} = 5A, tp = 8/20μs	-	11.6	13	V
		I_{PP} = 9.4A, tp = 8/20μs	-	-	18.6	V
Junction Capacitance	C_J	V_R = 0V, f = 1MHZ	-	80	-	pF
ESD5Z6.0 TVS for 6.0V Lines						
Reverse Stand-off Voltage	V_{RWM}		-	-	6.0	V
Peak Pulse Power (t_p = 8/20μs)	P_{PP}		-	-	181	W
Reverse Breakdown Voltage	$V_{(BR)}$	I_T = 1mA	6.8	-	-	V
Reverse Leakage Current	I_R	V_{RWM} = 6V	-	-	0.01	μA
Clamping Voltage	V_C	I_{PP} = 5A, tp = 8/20μs	-	12.4	14	V
		I_{PP} = 8.8A, tp = 8/20μs	-	-	20.5	V
Junction Capacitance	C_J	V_R = 0V, f = 1MHZ	-	70	-	pF

ESD5Z7.0 TVS for 7.0V Lines						
Reverse Stand-off Voltage	V_{RWM}		-	-	7.0	V
Peak Pulse Power (t_p = 8/20μs)	P_{PP}		-	-	200	W
Reverse Breakdown Voltage	$V_{(BR)}$	I_T = 1mA	7.5	-	9	V
Reverse Leakage Current	I_R	V_{RWM} = 7V	-	-	0.01	μA
Clamping Voltage	V_C	I_{PP} = 5A, tp = 8/20μs	-	13.5	16	V
		I_{PP} = 8.8A, tp = 8/20μs	-	-	22.7	V
Junction Capacitance	C_J	V_R = 0V, f = 1MHZ	-	65	-	pF
ESD5Z12 TVS for 12V Lines						
Reverse Stand-off Voltage	V_{RWM}		-	-	12	V
Peak Pulse Power (t_p = 8/20μs)	P_{PP}		-	-	240	W
Reverse Breakdown Voltage	$V_{(BR)}$	I_T = 1mA	14.1	-	-	V
Reverse Leakage Current	I_R	V_{RWM} = 12V	-	-	0.01	μA
Clamping Voltage	V_C	I_{PP} = 5A, tp = 8/20μs	-	17	20	V
		I_{PP} = 9.6A, tp = 8/20μs	-	-	25	V
Junction Capacitance	C_J	V_R = 0V, f = 1MHZ	-	55	-	pF

Ratings and Characteristic Curves (@ T_A = 25°C unless otherwise specified)

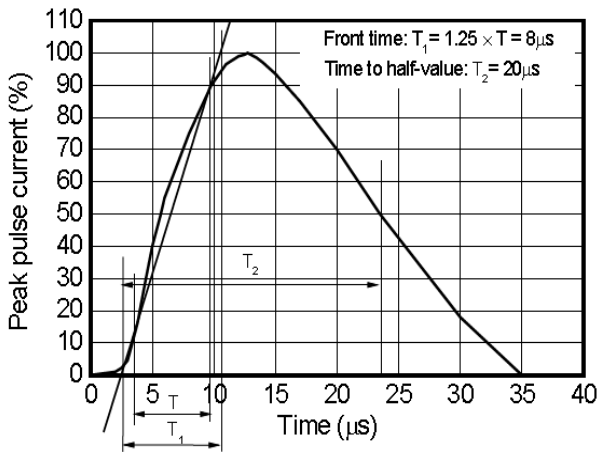


Fig 1 8/2 0μs waveform per IEC61000-4-5

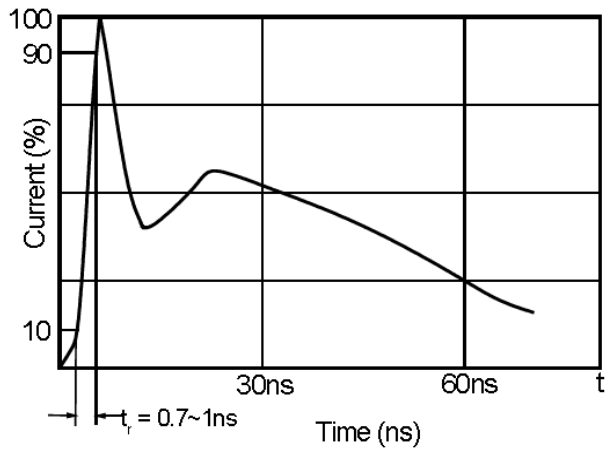


Fig 2 ESD pulse waveform according to IEC61000-4-2

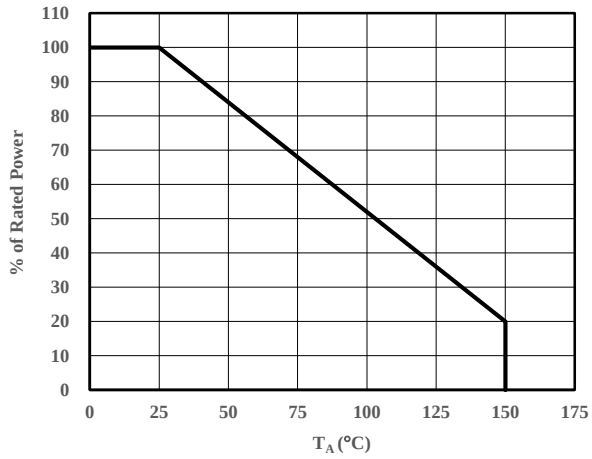


Fig 3 Power Derating Curve

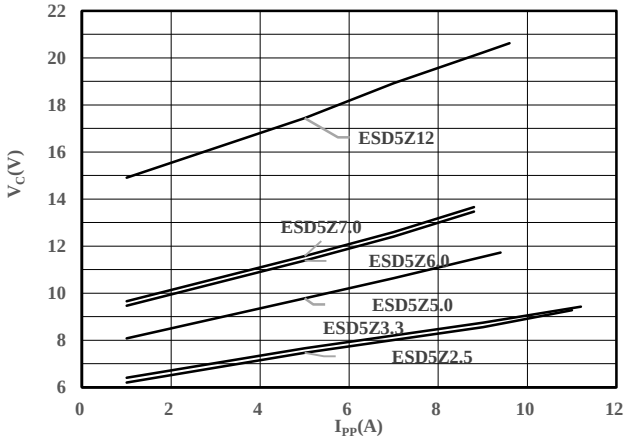
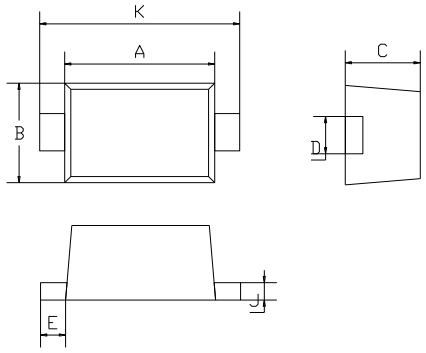


Fig 4 Clamping Voltage vs. Peak Pulse Current

Package Outline Dimensions (Unit: mm)



SOD-523		
Dimension	**Min.**	**Max.**
A	1.10	1.30
B	0.70	0.90
C	0.50	0.70
D	0.25	0.35
E	0.15	0.25
J	0.05	0.15
K	1.50	1.70

Package Outline Dimensions (Unit: mm)

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