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PRODUCT DATASHEET

Electro-Static Discharge

JES712 ESD

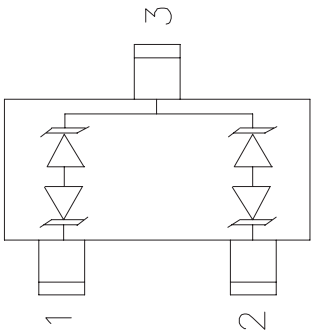
Features

- Package: SOT-23
- 325W peak pulse power (8/20μs)
- Ultra low leakage: nA level
- Operating voltage: 7V or 12V
- Low clamping voltage
- Complies with following standards:
- – IEC 61000-4-2 (ESD) immunity test
  Air discharge: ±30kV
  Contact discharge: ±30kV
  – IEC61000-4-5 (Lightning) 13A (8/20μs)
- RoHS Compliant

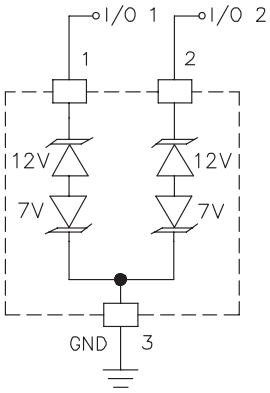
Applications

- Wireless System
- Networks
- Portable Instrumentation
- RS485 Ports

Pin Description



Schematic Diagram



Limiting Values(T_A = 25 °C, unless otherwise specified)

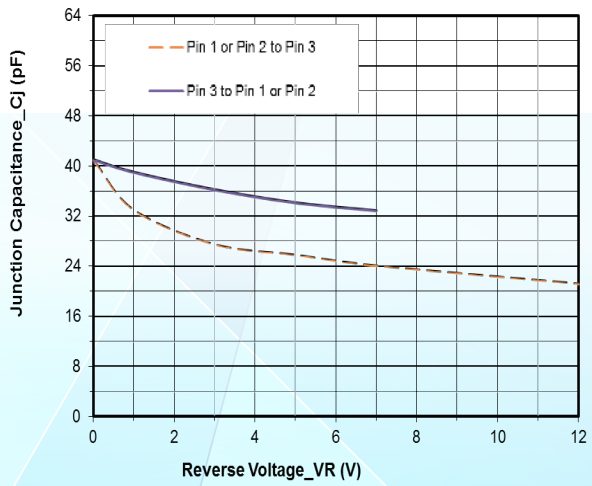
Symbol	Parameter	Conditions	Value	Unit
V_{ESD}	Electrostatic Discharge Voltage	IEC 61000-4-2;Contact Discharge	±30	kV
		IEC 61000-4-2;Air Discharge	±30	kV
P_{PP}	Peak Pulse Power	t_P=8/20μs	325	W
I_{PP}	Peak Pulse Current	t_P=8/20μs	13	A
T_J	Operating Temperature Range	-	-55 to +125	°C
T_{stg}	Storage Temperature Range	-	-55 to +150	°C

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

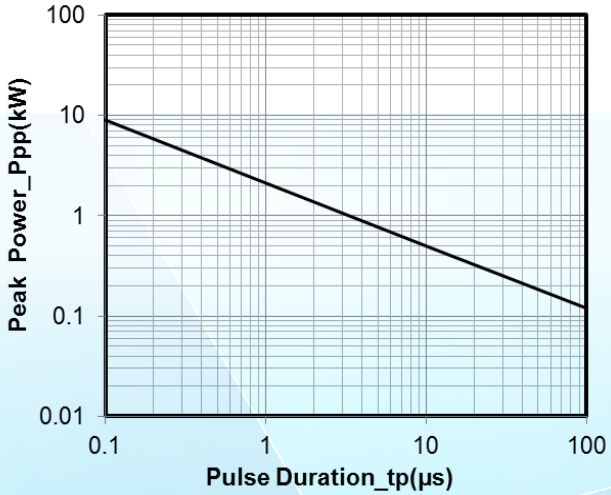
Symbol	Parameter	Conditions(7V TVS) (Pin 3 to 1 and 3 to 2)	Min	Typ.	Max	Unit
V_{RWM}	Reverse Working Voltage	T_A=25°C	-	-	7	V
V_{BR}	Breakdown Voltage	I_T=1mA;T_A=25°C	7.5	-	-	V
I_R	Reverse Leakage Current	V_R=V_{RWM};T_A=25°C	-	-	0.5	μA
V_C	Clamping Voltage	I_{PP}=5A,t_P=8/20μs	-	-	14	V
V_C	Clamping Voltage	I_{PP}=13A,t_P=8/20μs	-	-	16	V
C_J	Junction Capacitance	V_R=0V,f=1 MHZ	-	40	-	pF
C_J	Junction Capacitance	V_R=V_{RWM},f=1 MHZ	-	30	-	pF

Symbol	Parameter	Conditions(12V TVS) (Pin 1 to 3 and 2 to 3)	Min	Typ.	Max	Unit
V_{RWM}	Reverse Working Voltage	T_A=25°C	-	-	12	V
V_{BR}	Breakdown Voltage	I_T=1mA;T_A=25°C	13.3	-	-	V
I_R	Reverse Leakage Current	V_R=V_{RWM};T_A=25°C	-	-	0.5	μA
V_C	Clamping Voltage	I_{PP}=5A,t_P=8/20μs	-	-	20	V
V_C	Clamping Voltage	I_{PP}=13A,t_P=8/20μs	-	-	25	V
C_J	Junction Capacitance	V_R=0V,f=1 MHZ	-	40	-	pF
C_J	Junction Capacitance	V_R=V_{RWM},f=1 MHZ	-	20	-	pF

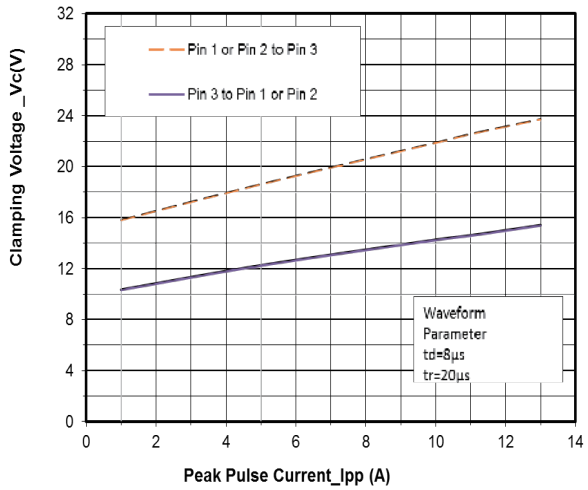
Typical Characteristics



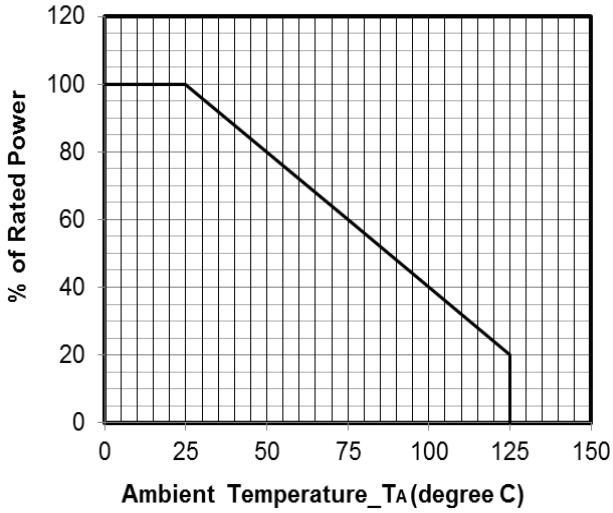
Junction Capacitance vs. Reverse Voltage



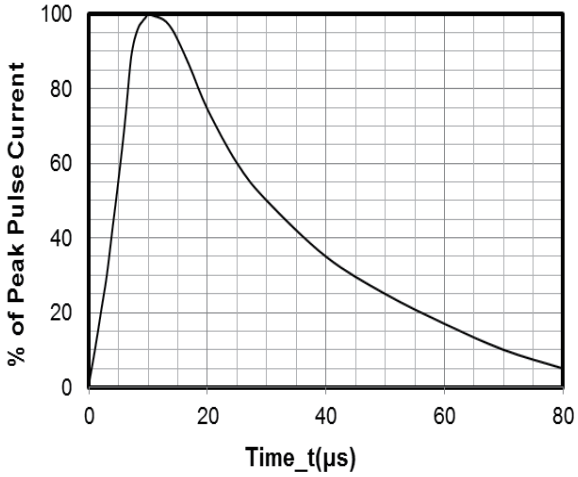
Peak Pulse Power vs. Pulse Time



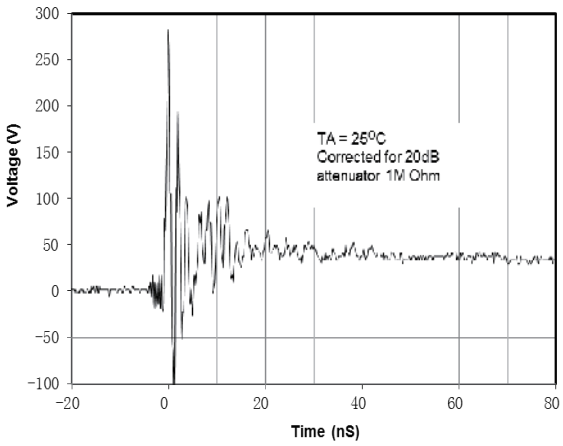
Clamping Voltage vs. Peak Pulse Current (tp = 8/20 μ s)



Power Derating Curve



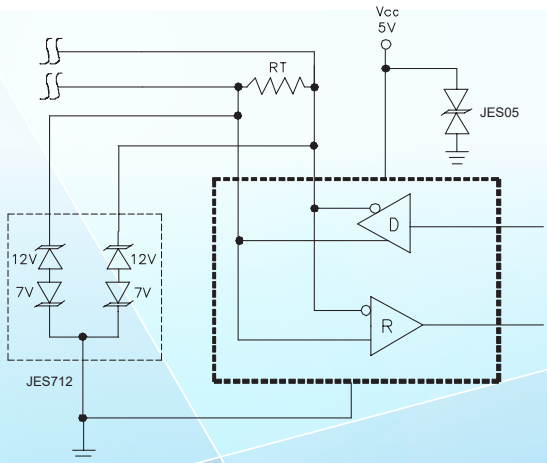
8 X 20 μ s Pulse Waveform



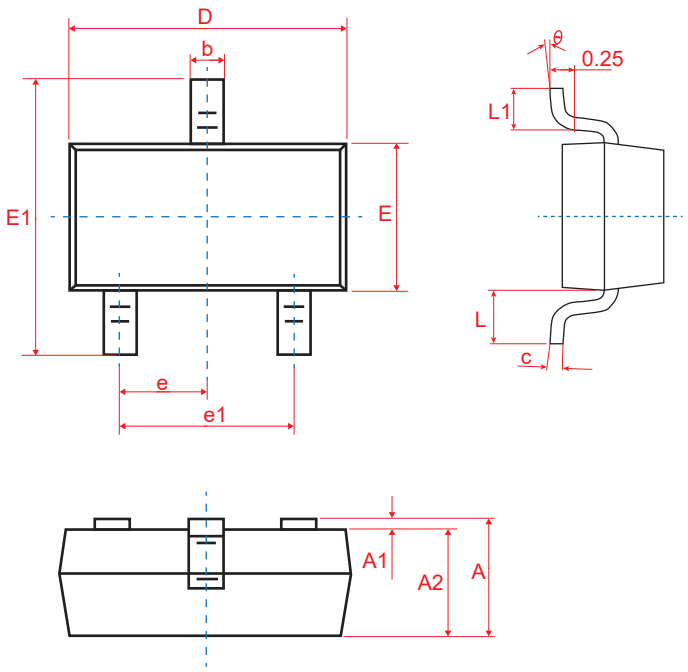
ESD Clamping Voltage
8 kV Contact per IEC61000-4-2

Application

EIA RS-485 specifies a ±7V ground difference between devices on the bus. This permits the bus voltage to range from +12V (5V + 7V) to -7V (0 - 7V). The JES712 is designed to protect two RS-485 data lines in extended common mode applications. The JES712 may be used to protect devices from transient voltages resulting from ESD, EFT, and light ning. The device is designed with asymmetrical operating voltages for optimum protection. The TVS diodes at pins 1 and 2 have a working voltage of 12volts. These pins are connected to the differential data line pairs. The TVS diodes at pin 3 have a working voltage of 7volts. Pin 3 is connected to ground. The internal TVS diodes of the ASM712 will protect the transceiver input from positive transient voltage spikes greater than 12V and negative spikes greater than 7V.

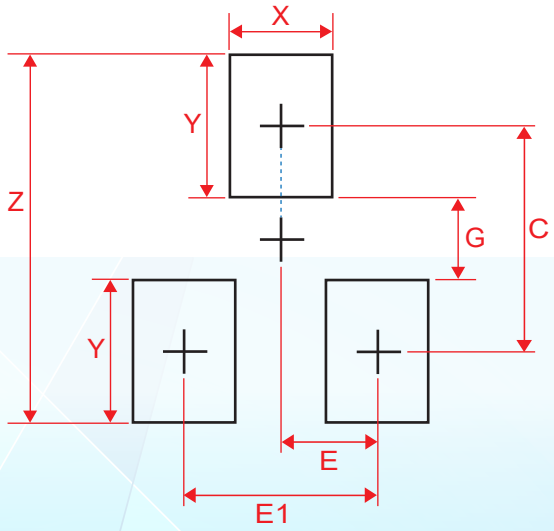


Physical Dimensions(mm.)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.90	1.15	0.035	0.045
A1	0.00	0.10	0.000	0.004
A2	0.90	1.05	0.035	0.041
b	0.30	0.50	0.012	0.020
c	0.08	0.15	0.003	0.006
D	2.80	3.00	0.110	0.118
E	1.20	1.40	0.047	0.055
E1	2.25	2.55	0.089	0.100
e	0.95 TYP		0.037 TYP	
e1	1.80	2.00	0.071	0.079
L	0.55 REF		0.022 REF	
L1	0.30	0.50	0.012	0.020
θ	0°	8°	0°	8°

Suggested Land Pattern

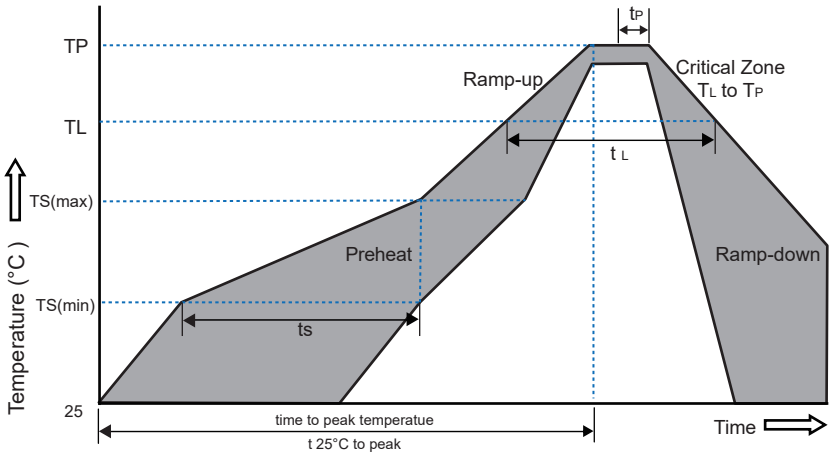


Symbol	Dimensions	
	Inches	Millimeters
C	0.087	2.20
E	0.037	0.95
E1	0.075	1.90
G	0.031	0.80
X	0.039	1.00
Y	0.055	1.40
Z	0.141	3.60

Packaging Quantity

Part Number	Delivery Form	Delivery Quantity
JES712	7"T&R	3,000

Soldering Parameters



Reflow Condition		Pb-Free Assembly
Pre-heat	-Temperature Min($T_{s(min)}$)	+150°C
	-Temperature Max($T_{s(max)}$)	+200°C
	-Time(Min to Max)(ts)	60~180 secs.
Average ramp up rate (Liquid us Temp(T_L) to peak)		3°C/sec. Max
Ts(max) to T_L - Ramp-up Rate		3°C/sec. Max
Reflow	-Temperature(T_L)(Liquid us)	+217°C
	-Temperature (t_L)	60~150 secs.
Peak Temp (T_p)		+260(+0/-5)°C
Time within 5°C of actual Peak Temp (t_p)		30 secs. Max
Ramp-down Rate		6°C/sec. Max
xTime 25°C to Peak Temp (TP)		8 min. Max
Do not exceed		+260°C

Part Number System

JE S712

- 712
- JDT ESD