

Description

The ASM712 is designed for asymmetrical (12V to -7V) protection in multi-point data transmission application. The ASM712 replace four discrete components by integrating two 12V and two 7V TVS diodes in a single package. The ASM712 complies with the IEC 61000-4-2 (ESD) with $\pm 30\text{kV}$ air and $\pm 30\text{kV}$ contact discharge. It is assembled into a lead-free SOT-23 package. It is designed to protect components which are connected to data and transmission lines from voltage surges.

Features

- 325W peak pulse power (8/20 μs)
- 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: $\pm 30\text{kV}$
 - Contact discharge: $\pm 30\text{kV}$
 - IEC61000-4-5 (Lightning) 13A (8/20 μs)
- RoHS Compliant

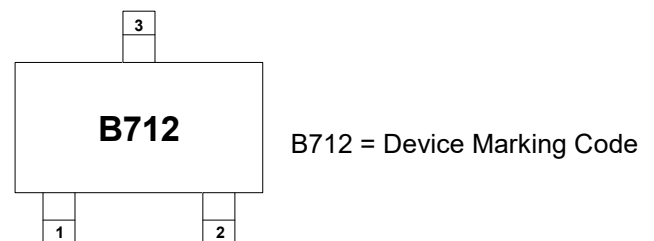
Mechanical Characteristics

- Package: SOT-23
- Lead Finish: Matte Tin
- Case Material: “Green” Molding Compound.
- Terminal Connections: See Diagram Below
- Marking Information: See Below

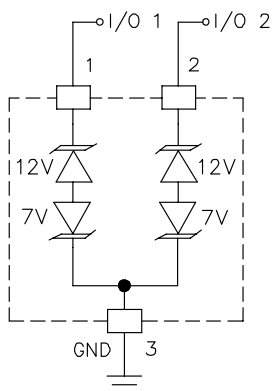
Applications

- Wireless System
- Networks
- Portable Instrumentation
- RS485 Ports

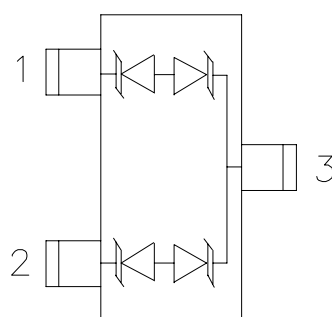
Marking Information



Dimensions and Pin Configuration



Circuit Schematic



Pin Schematic

Ordering Information

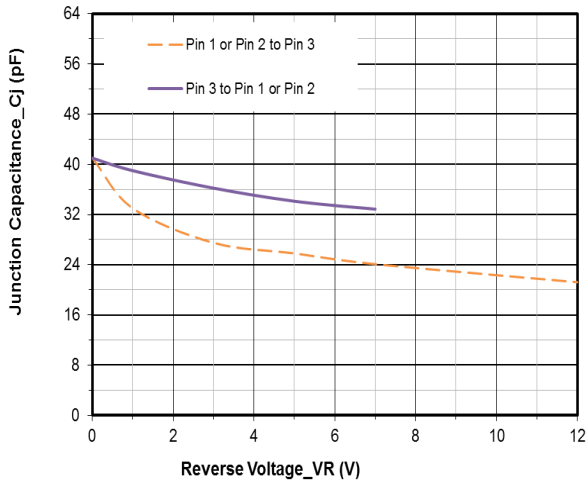
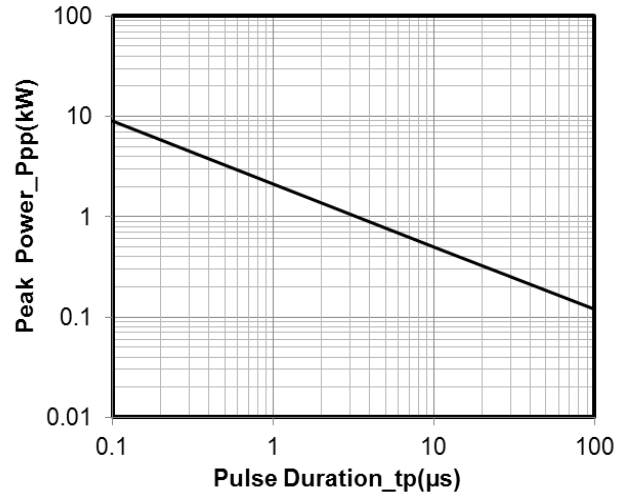
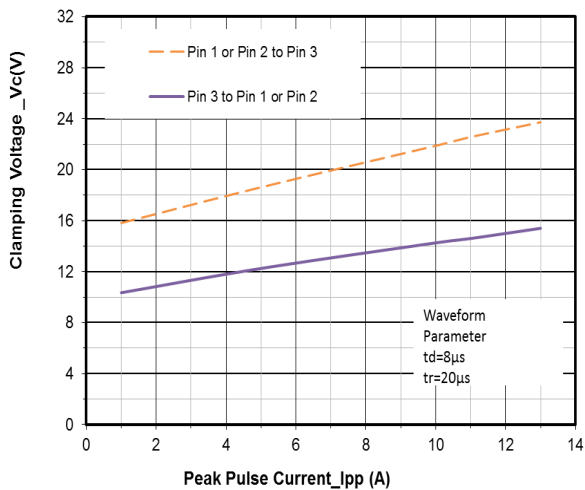
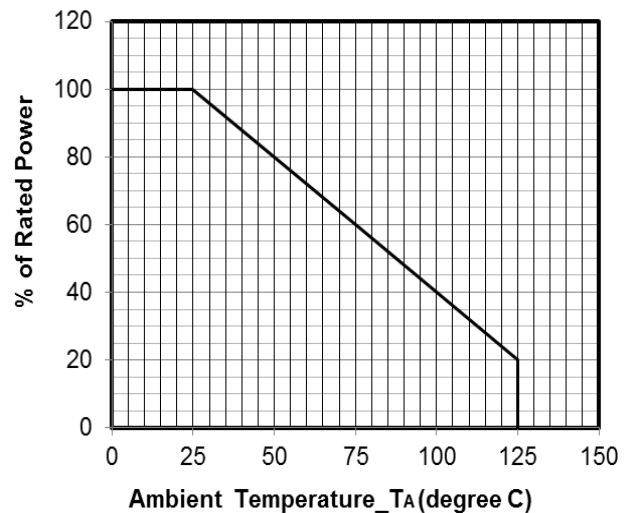
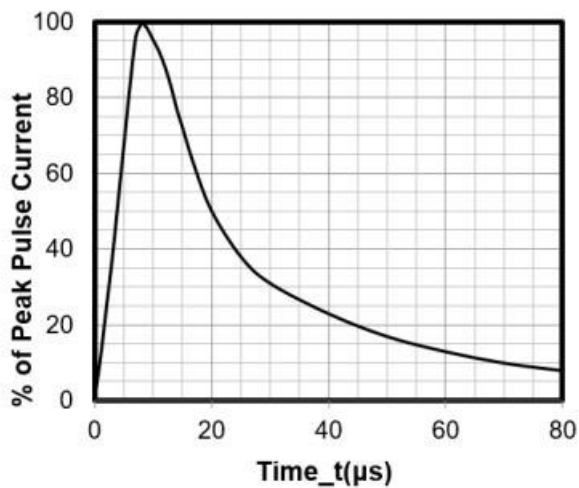
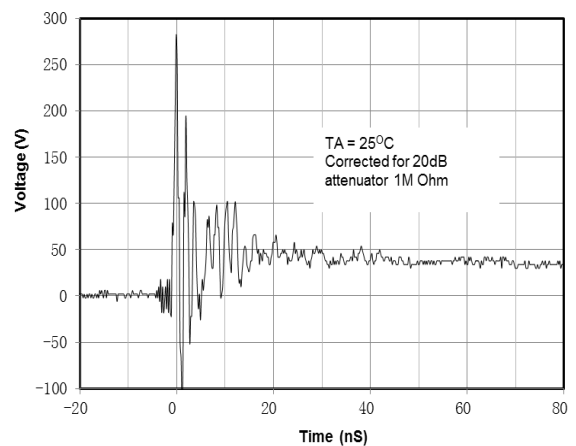
Part Number	Packaging	Reel Size
ASM712	3000/Tape & Reel	7 inch

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

Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20μs)	Ppk	325	W
Peak Pulse Current (8/20μs)	Ipp	13	A
ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	VESD	±30 ±30	kV
Operating Temperature Range	TJ	-55 to +125	°C
Storage Temperature Range	Tstg	-55 to +150	°C

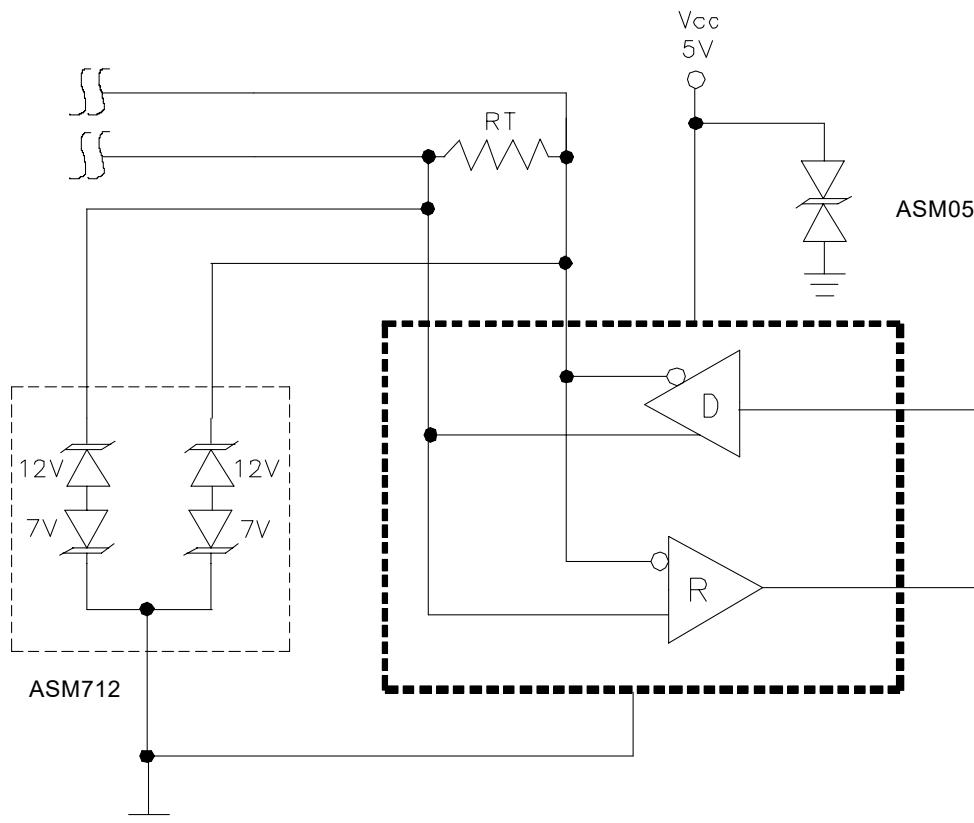
Electrical Characteristics (T_A=25°C unless otherwise specified)

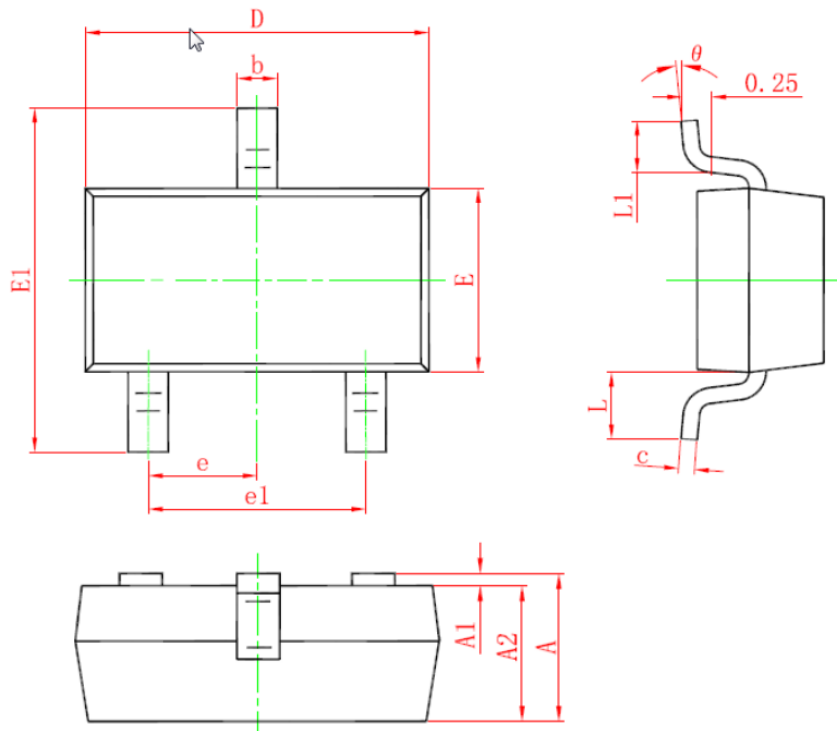
Parameter	Symbol	Pin 1 to 3 and 2 to 3			Pin 3 to 1 and 3 to 2			Unit	Test Condition
		Min	Typ	Max	Min	Typ	Max		
Reverse Working Voltage	VRWM			12			7	V	
Breakdown Voltage	VBR	13.3			7.5			V	IT = 1mA
Reverse Leakage Current	IR			0.5			0.5	μA	VR = VRWM
Clamping Voltage	VC			20			14	V	I _{PP} = 5A (8 x 20μs pulse)
Clamping Voltage	VC			25			16	V	I _{PP} = 13A (8 x 20μs pulse)
Junction Capacitance	CJ		40			40		pF	VR = 0V, f = 1MHz
Junction Capacitance	CJ		20			30		pF	VR = VRWM, f = 1MHz

Typical Performance Characteristics ($T_A=25^\circ\text{C}$ unless otherwise Specified)

Junction Capacitance vs. Reverse Voltage

Peak Pulse Power vs. Pulse Time

Clamping Voltage vs. Peak Pulse Current

Power Derating Curve

8 X 20 μs Pulse Waveform

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

ASM712 on RS-485 Data Lines Application

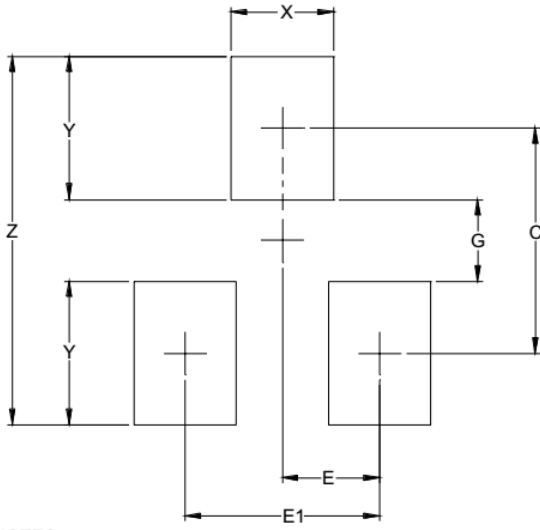
EIA RS-485 specifies a $\pm 7V$ ground difference between devices on the bus. This permits the bus voltage to range from +12V (5V + 7V) to -7V (0 - 7V). The ASM712 is designed to protect two RS-485 data lines in extended common mode applications. The ASM712 may be used to protect devices from transient voltages resulting from ESD, EFT, and lightning. 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.



SOT-23 Package Outline Drawing


SYM	DIMENSIONS					
	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	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	0.95TYP			0.037TYP		
e1	1.80	--	2.00	0.071	--	0.079
L	0.55REF			0.022REF		
L1	0.30	--	0.50	0.012	--	0.020
Θ	0°	--	8°	0°	--	8°

Suggested Land Pattern



SYM	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