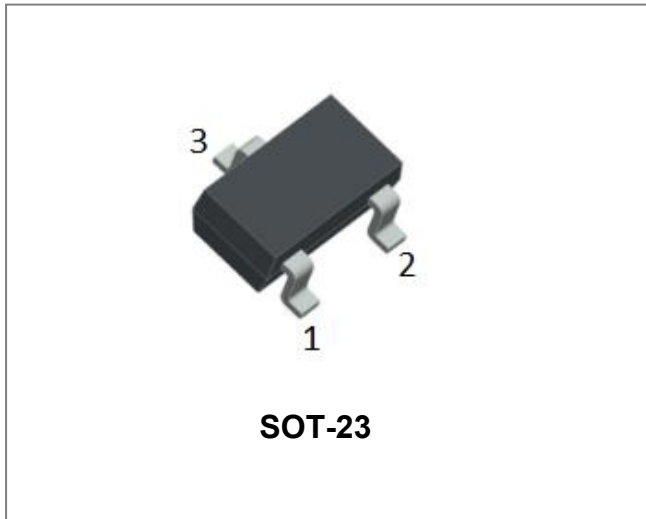




# THE DATASHEET OF SM712



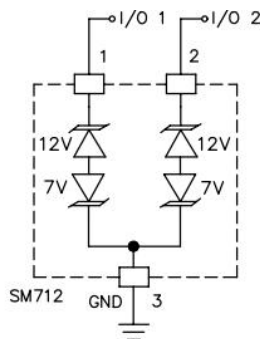
## SM712 TVS Diode



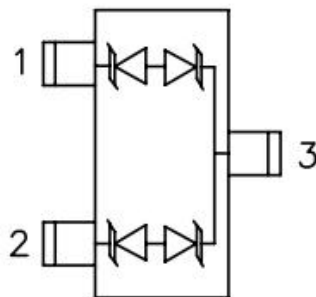
### Description

The SM712 transient voltage suppressor (TVS) diode is designed for asymmetrical (12V to -7V ) protection in multi-point data transmission standard RS-485 applications. The SM712 may be used to protect devices from transient voltages resulting from electrostatic discharge (ESD), electrical fast transients (EFT), and lightning. The SM712 replaces four discrete components by integrating two 12V and two 7V TVS diodes in a single package. The integrated design aids in reducing voltage over-shoot associated with trace inductance. The low clamping voltage of the SM712 minimizes the stress on the protected transceiver. The SOT23 package allows flexibility in the design of “crowded” circuit boards.

### Circuit Diagram



### Schematic and Pin Configuration



### Features

- Transient protection for high speed data lines  
IEC 61000-4-2(ESD)±15KV(air),±8KV(contact)  
IEC 61000-4-4(EFT) 40A (5/50ns)  
IEC 61000-4-5(Lightning) 12A (8/20us)
- Protects two +12V to -7V lines
- Low capacitance
- Low clamping voltage
- Solid-state silicon avalanche technology
- “-A” is an AEC-Q101 qualified device

### Mechanical Characteristics

- SOT-23 package
- Marking: 712
- Molding compound flammability rating: UL 94V-0

### Applications

- Protection of RS-485 transceivers with extended
- common-mode range
- Security systems
- Automatic Teller Machines
- HFC systems

**Maximum Ratings:**

Characteristics	Symbol	Max.	Units
Peak Pulse Current (tp=8/20us)	I <sub>PP</sub>	15	A
Lead Soldering Temperature	T <sub>L</sub>	260(10 seconds)	°C
Operating Temperature	T <sub>J</sub>	-55 to +125	°C
Storage Temperature	T <sub>STG</sub>	-55 to +150	°C

**Electrical Characteristics@T<sub>A</sub>=25°C unless otherwise specified**

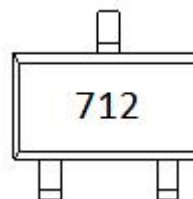
Characteristics	Symbol	Condition	Pins 1 to 3 and 2 to 3 (12V TVS)			Pins 3 to 1 and 3 to 2 (7V TVS)			Units
			Min.	Typ.	Max.	Min.	Typ.	Max.	
Reverse Stand-Off Voltage*	V <sub>RWM</sub>	-	-	-	12	-	-	7	V
Reverse Breakdown Voltage*	V <sub>BR</sub>	I <sub>PT</sub> =1mA	13.3	-	-	7.5	-	-	V
Reverse Leakage Current*	I <sub>R</sub>	V <sub>R</sub> =V <sub>RWM</sub>	-	-	1	-	-	20	uA
Clamping Voltage	V <sub>C</sub>	I <sub>PP</sub> =5A, tp=8/20us	-	-	20	-	-	10	V
Clamping Voltage	V <sub>C</sub>	I <sub>PP</sub> =15A, tp=8/20us	-	-	24	-	-	12	V
Junction Capacitance	C <sub>j</sub>	V <sub>R</sub> =0V, f=1MHz	-	-	75	-	-	75	pF

\* Pulse width < 300 μs, duty cycle < 2%

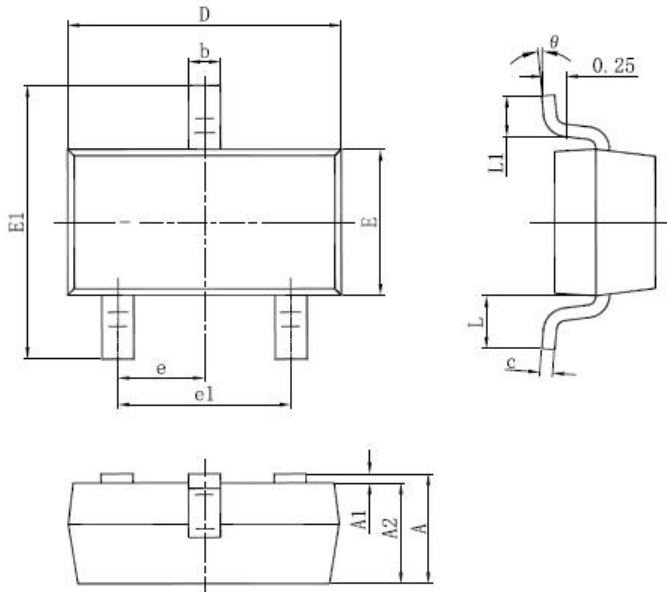
**Ordering Information**

Device	Package	Shipping
SM712	SOT-23 (Pb-Free)	3000pcs / reel
SM712TR	SOT-23 (Pb-Free)	3000pcs / reel

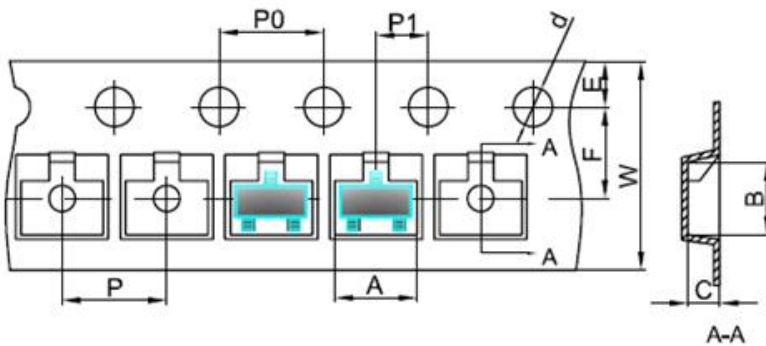
For information on tape and reel specifications, including part orientation and tape sizes, please refer to our tape and reel packaging specification.

**Marking Diagram**


712 = Device Code

**Mechanical Dimensions SOT-23**


SYMBOL	Millimeters		Inches	
	MIN.	MAX.	MIN.	MAX.
A	0.890	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.076	0.170	0.003	0.007
D	2.650	3.050	0.104	0.120
E	1.190	1.400	0.047	0.055
E1	2.100	2.550	0.083	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.780	2.050	0.070	0.081
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
$\theta$	0°	8°	0°	8°

**Carrier Tape Specification SOT-23**




SYMBOL	Millimeters	
	Min.	Max.
A	3.05	3.25
B	2.67	2.87
C	1.12	1.32
d	1.40	1.60
E	1.65	1.85
F	3.40	3.60
P	3.90	4.10
P0	3.90	4.10
P1	1.90	2.10
W	7.90	8.30

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