



Continental Device India Pvt. Limited

An IATF 16949, ISO9001 and ISO 14001 Certified Company



ASYMMETRICAL TVS DIODE

(FOR EXTENDED COMMON - MODE RS-485)

SM712

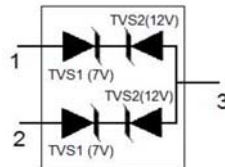
SOT 23

Surface Mount Package

RoHS compliant



SOT-23



Marking : 712

FEATURES:

1. Small SOT-23 Package
2. Protects two +12V to -7V lines
3. Peak power dissipation of 400W under 8/20 s waveform
4. Low Leakage
5. Fast Response Time < 5 ns
6. Protects One Power or I/O Port
7. ESD Rating of Class 3 (>16KV) per Human Body Model
8. ESD Protection to IEC 61000-4-2 Level 4
9. ESD Protection to IEC 61000-4-2 Level 4
10. RoHS Compliant in Lead-Free Version
11. This device is available in AEC-Q101 compliant also.
12. For AECQ compliant device, Please add suffix -AQ in the part number while ordering.

APPLICATIONS:

1. SM712 transient voltage suppressor(TVS) diode is designed for asymmetrical (12V to-7V) protection in muti-point data transmission standard RS-485 applications
2. Communication Systems & Cellular Phones
3. Security Systems, Automatic Teller Machine
4. HFC Systems
5. Networks

ABSOLUTE MAXIMUM RATINGS (Ta = 25 °C Unless otherwise specified)

PARAMETER		SYMBOL	VALUE	UNITS
Peak Power Dissipation (Note 1.) @T _L = 25°C		P _{PK}	400	W
IEC 61000-4-2 (ESD)	AIR		15	KV
	CONTACT		8	KV
ESD Voltage	Per Human Body Model		16	KV
	Per Machine Model		400	V
Storage Temperature Range		T _{STG}	-55 to 150	°C
Operating Junction Temperature Range		T _J	-55 to 150	°C

NOTE:

1. 8X20 μS, Non repetitive

SM712

Rev2_09022021ESW

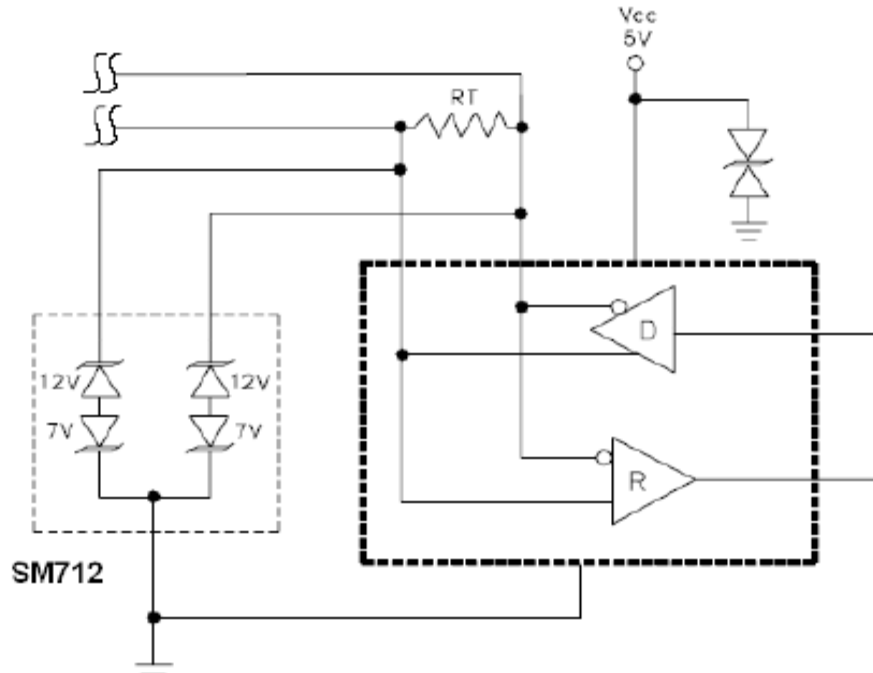


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TYPICAL APPLICATION BLOCK DIAGRAM:



ELECTRICAL CHARACTERISTICS (Ta = 25 °C Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	Pins 1 to 3 and 2 to 1 (12V TVS)			Pins 3 to 1 and 3 to 2 (7V TVS)			UNITS
			MIN	TYP	MAX	MIN	TYP	MAX	
Reverse Stand-Off Voltage	V_{RWM}	Pin 3 to 1 or Pin 2 to 1	--	--	12	--	--	7	V
Reverse Breakdown Voltage	V_{BR}	$I_{PT} = 1 \text{ mA}$	13.3	--	--	7.5	--	--	V
Reverse Leakage Current	I_R	$V_R = V_{RWM}$	--	--	1.0	--	--	20	μA
Clamping Voltage	V_C	$I_{PP} = 5 \text{ A}$, $t_P = 8/20 \mu\text{S}$	--	--	20	--	--	10	V
Clamping Voltage	V_C	$I_{PP} = 17 \text{ A}$, $t_P = 8/20 \mu\text{S}$	--	--	26	--	--	12	V
Junction Capacitance	C_J	$V_R = 0 \text{ V}$, $f = 1 \text{ MHz}$	--	--	75	--	--	75	pF
		$V_R = V_{RWM}$, $f = 1 \text{ MHz}$	--	45	--	--	45	--	pF



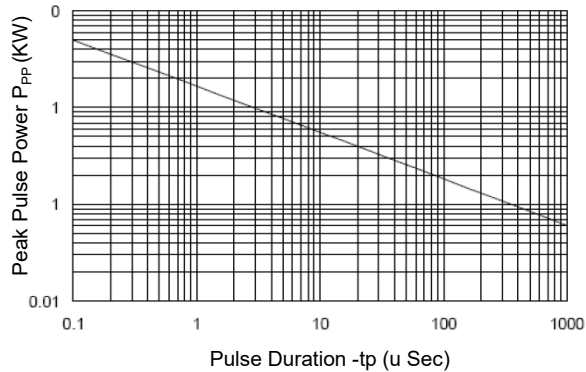
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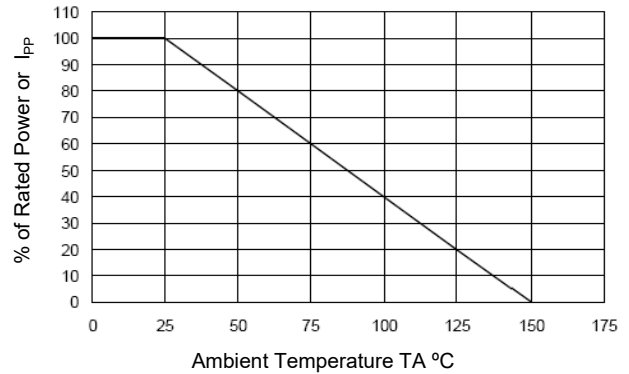


TYPICAL CHARACTERISTICS CURVE

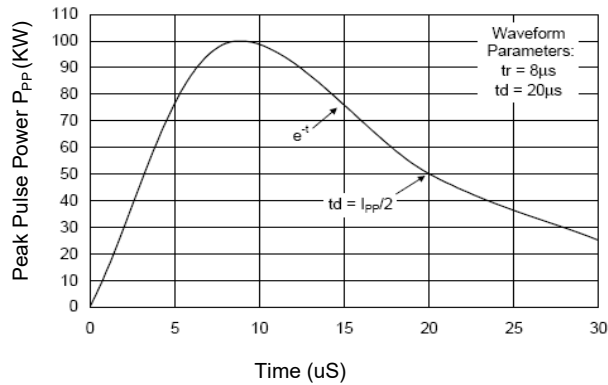
Non-Repetitive Peak Pulse Power v/s Pulse Duration



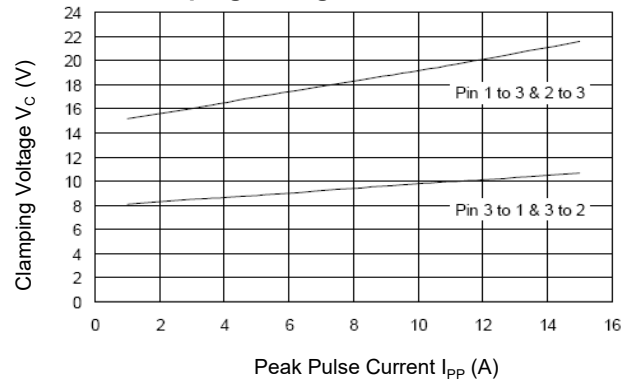
Power Derating Curve



Pulse Waveform



Clamping Voltage vs Peak Pulse Current





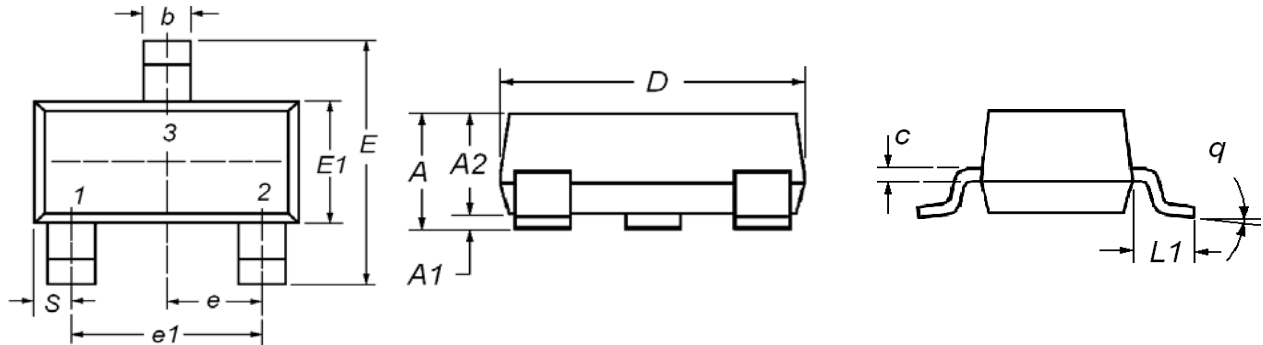
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PACKAGE DETAILS

SOT-23 MECHANICAL DATA



Dimensions	Millimeter		
	Min	Typ	Max
A	1.00	--	1.40
A1	0.00	--	0.10
A2	1.00	--	1.30
b	0.35	--	0.50
c	0.10	--	0.20
D	2.70	2.9	3.10
E	2.40	--	2.80
E1	1.40	--	1.60
e	0.85	--	1.15
e1	--	1.9	--
L1	0.40	--	--
q	0°	--	10°
S	0.45	--	0.55



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Recommended Product Storage Environment for Discrete Semiconductor Devices

This storage environment assumes that the Diodes and transistors are packed properly inside the original packing supplied by CDIL.

- Temperature 5 °C to 30 °C
- Humidity between 40 to 70 %RH
- Air should be clean.
- Avoid harmful gas or dust.
- Avoid outdoor exposure or storage in areas subject to rain or water spraying .
- Avoid storage in areas subject to corrosive gas or dust. Product shall not be stored in areas exposed to direct sunlight.
- Avoid rapid change of temperature.
- Avoid condensation.
- Mechanical stress such as vibration and impact shall be avoided.
- The product shall not be placed directly on the floor.
- The product shall be stored on a plane area. They should not be turned upside down. They should not be placed against the wall.

Shelf Life of CDIL Products

The shelf life of products is the period from product manufacture to shipment to customers. The product can be unconditionally shipped within this period. The period is defined as 2 years.

If products are stored longer than the shelf life of 2 years the products shall be subjected to quality check as per CDIL quality procedure.

The products are further warranted for another one year after the date of shipment subject to the above conditions in CDIL original packing.

Floor Life of CDIL Products and MSL Level

When the products are opened from the original packing, the floor life will start.

For this, the following JEDEC table may be referred:

JEDEC MSL Level		
Level	Time	Condition
1	Unlimited	≤30 °C / 85% RH
2	1 Year	≤30 °C / 60% RH
2a	4 Weeks	≤30 °C / 60% RH
3	168 Hours	≤30 °C / 60% RH
4	72 Hours	≤30 °C / 60% RH
5	48 Hours	≤30 °C / 60% RH
5a	24 Hours	≤30 °C / 60% RH
6	Time on Label(TOL)	≤30 °C / 60% RH



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CUSTOMER NOTES

Component Disposal Instructions

1. CDIL Semiconductor Devices are RoHS compliant, customers are requested to please dispose as per prevailing Environmental Legislation of their Country.
2. In Europe, please dispose as per EU Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE).

Disclaimer

The product information and the selection guides facilitate selection of the CDIL's Semiconductor Device(s) best suited for application in your product(s) as per your requirement. It is recommended that you completely review our Data Sheet(s) so as to confirm that the Device(s) meet functionality parameters for your application. The information furnished in the Data Sheet and on the CDIL Web Site/CD are believed to be accurate and reliable. CDIL however, does not assume responsibility for inaccuracies or incomplete information. Furthermore, CDIL does not assume liability whatsoever, arising out of the application or use of any CDIL product; neither does it convey any license under its patent rights nor rights of others. These products are not designed for use in life saving/support appliances or systems. CDIL customers selling these products (either as individual Semiconductor Devices or incorporated in their end products), in any life saving/support appliances or systems or applications do so at their own risk and CDIL will not be responsible for any damages resulting from such sale(s).

CDIL strives for continuous improvement and reserves the right to change the specifications of its products without prior notice.



CDIL is a registered trademark of
Continental Device India Pvt. Limited

C-120 Naraina Industrial Area, New Delhi 110 028, India.

Telephone +91-11-2579 6150, 4141 1112 Fax +91-11-2579 5290, 4141 1119

email@cdil.com www.cdil.com

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