

Features

- ❑ Transient protection for high-speed data lines
 - IEC 61000-4-2 (ESD) $\pm 30\text{kV}$ (Air)
 - $\pm 30\text{kV}$ (Contact)
 - IEC 61000-4-4 (EFT) 40A (5/50 ns)
 - Cable Discharge Event (CDE)
- ❑ Small package (2.9mm × 2.4mm × 1.4mm)
- ❑ ESD protects two +12V to -7V lines
- ❑ Low capacitance: 50pF Typical
- ❑ Low leakage current: 0.1 μA @ V_{RWM} (Typical)
- ❑ Low clamping voltage
- ❑ Each I/O pin can withstand over 1000 ESD strikes for $\pm 8\text{kV}$ contact discharge
- ❑ ROHS compliant
- ❑ Those with A meet the AEC-Q101 standard

Description

The SM712X 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 SM712X minimizes the stress on the protected transceivers.

The SM712X transient voltage suppressor (TVS) diode is designed for asymmetrical(12V to -7V) protection in multi-point data transmission standard RS-485 applications. The SM712X has been specifically designed to protect sensitive components which are connected to data and transmission lines from overvoltage caused by ESD(electrostatic discharge), CDE(Cable Discharge Events),and EFT(electrical fast transient).

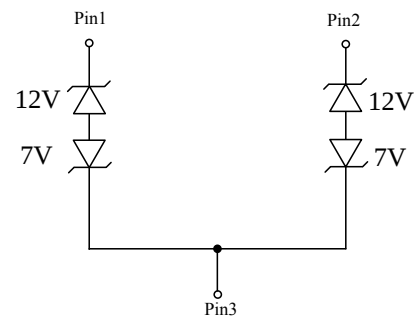
Applications

- ❑ Data Lines
- ❑ Industrial Controls
- ❑ Computers and peripherals
- ❑ Portable instrumentation
- ❑ Peripherals
- ❑ Security systems
- ❑ Automatic Teller Machines
- ❑ HFC systems
- ❑ Networks
- ❑ Protection of RS-485 transceivers with extended common-mode range

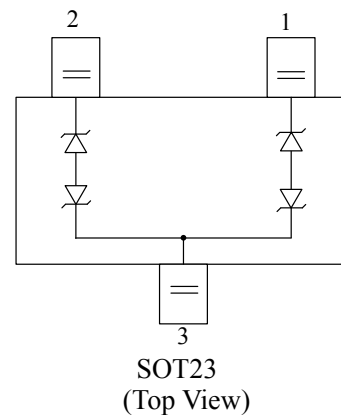
Mechanical Characteristics

- ❑ SOT23 package
- ❑ Flammability Rating: UL 94V-0
- ❑ Marking: Part number
- ❑ Packaging: Tape and Reel

Circuit Diagram



Pin Configuration



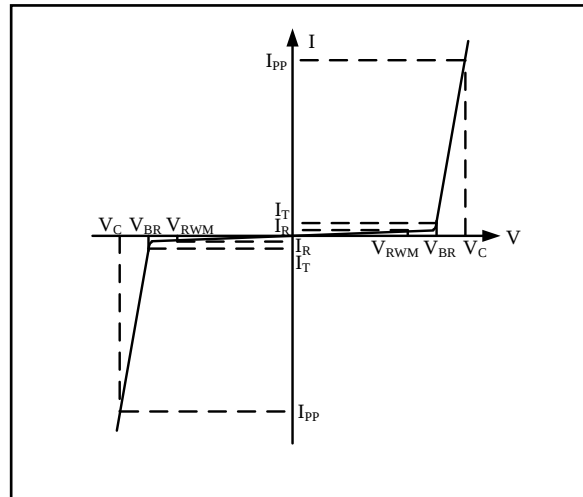


Absolute Maximum Rating

Symbol	Parameter	Value	Units
P_{PK}	Peak Pulse Power (8/20 μ s)	350	Watts
V_{ESD}	ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	± 30 ± 30	kV
T_{OPT}	Operating Temperature	-55 to +150	°C
T_{STG}	Storage Temperature	-55 to +150	°C
T_{LST}	Lead Soldering Temperature	260	°C

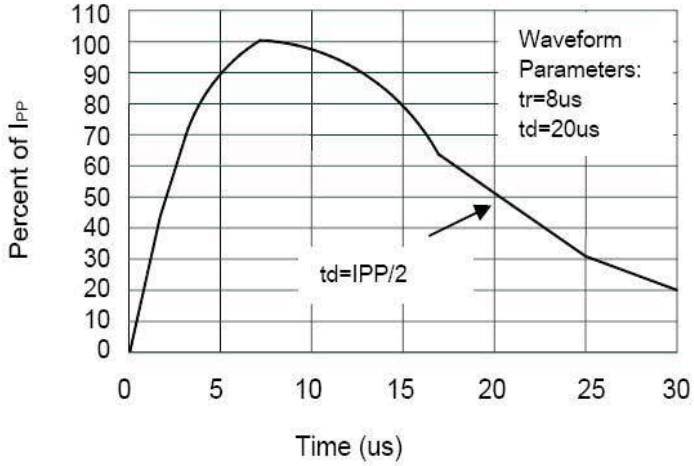
Electrical Characteristics (T = 25°C)

Symbol	Parameter
V_{RWM}	Nominal Reverse Working Voltage
I_R	Reverse Leakage Current @ V_{RWM}
V_{BR}	Reverse Breakdown Voltage @ I_T
I_T	Test Current for Reverse Breakdown
V_C	Clamping Voltage @ I_{PP}
I_{PP}	Maximum Peak Pulse Current
C_{ESD}	Parasitic Capacitance
V_R	Reverse Voltage
f	Small Signal Frequency

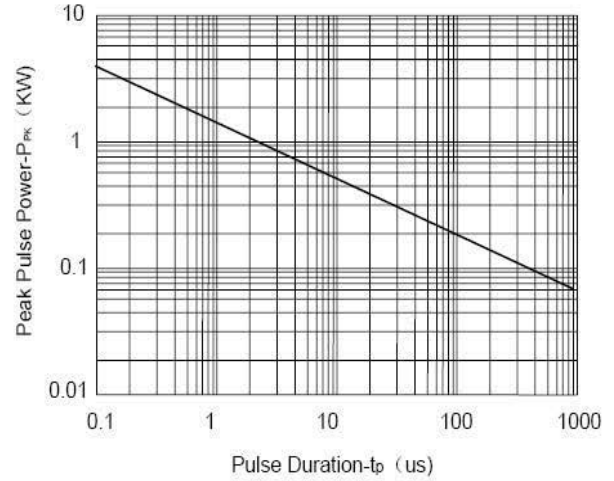


Symbol	Conditions	Pins 1 to 3 and 2 to 3 (12V)			Pins 3 to 1 and 3 to 2 (7V)			Units
		Min	Typ	Max	Min	Typ	Max	
V_{RWM}	Pin 3 to 1 or Pin 2 to 1			12			7	V
V_{BR}	$I_T = 1mA$,	13.3			7.5			V
I_R	$V_R = V_{RWM}$			1			20	μA
V_C	$I_{PP} = 1A$, $t_p = 8/20\mu s$			20			12	V
	$I_{PP} = 12A$, $t_p = 8/20\mu s$			30			16	V
C_{ESD}	$V_R = 0V$, $f = 1MHz$		50	60		50	60	pF

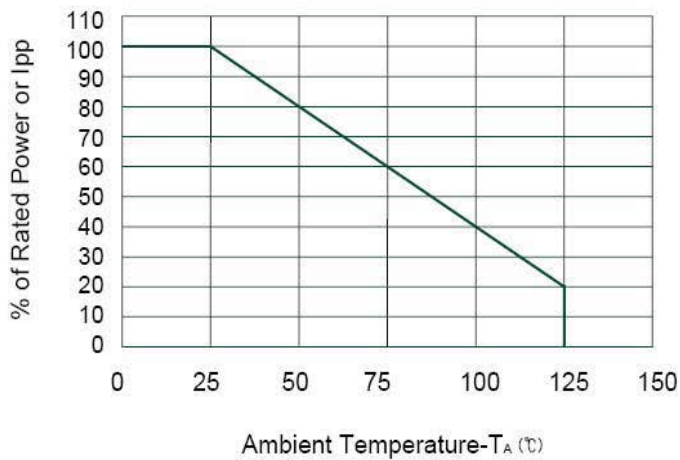
Electrical Characteristics Curve



Pulse Waveform



Non-Repetitive Peak Pulse Power vs. Pulse Time



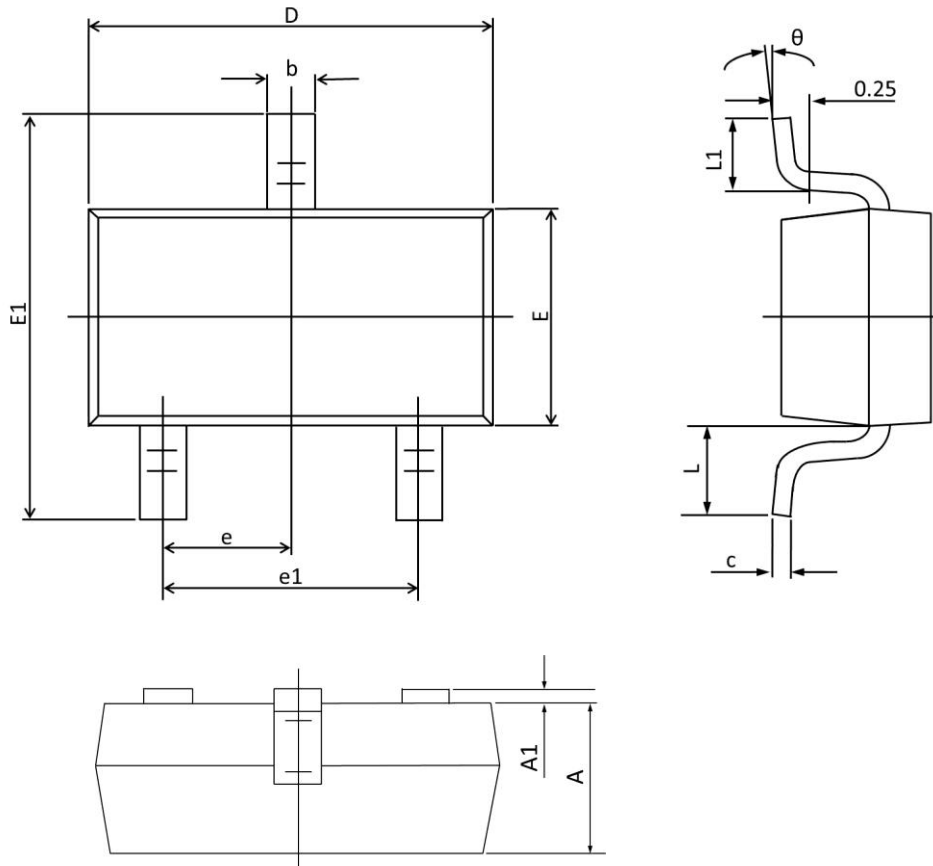
Power Derating Curve



Package Outline Demensions

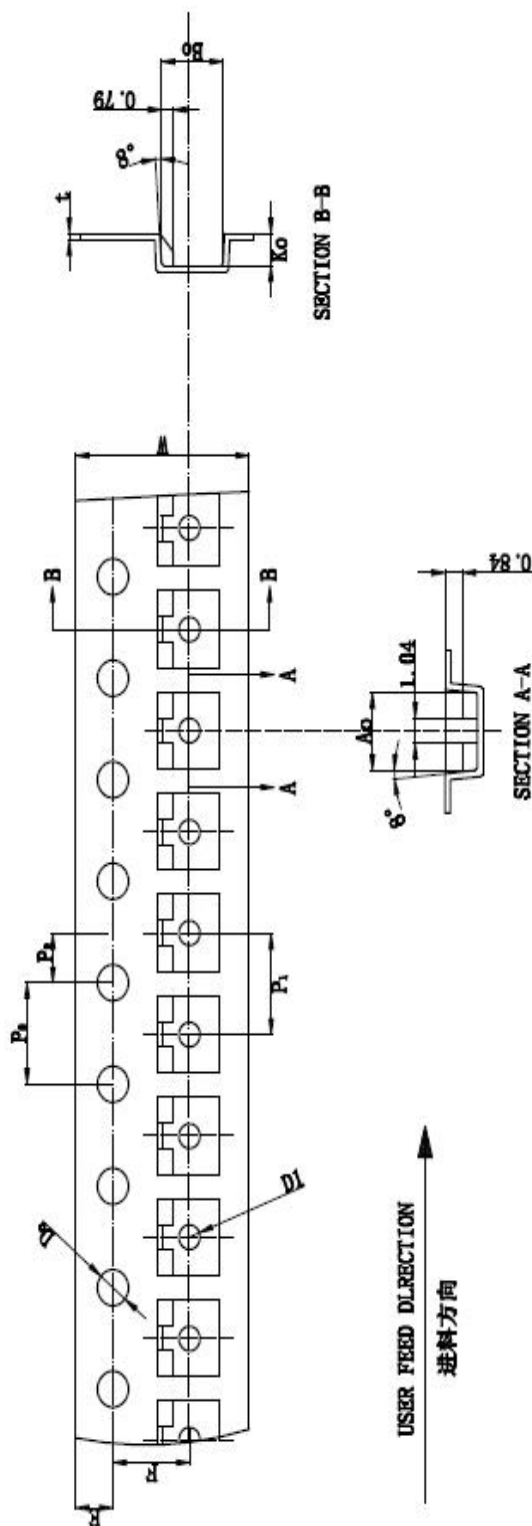
□ SOT23 package

□ MSL 3



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.000	0.035	0.039
A1	0.000	0.100	0.000	0.004
b	0.300	0.500	0.012	0.020
c	0.090	0.110	0.003	0.004
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
θ	1°	7°	1°	7°

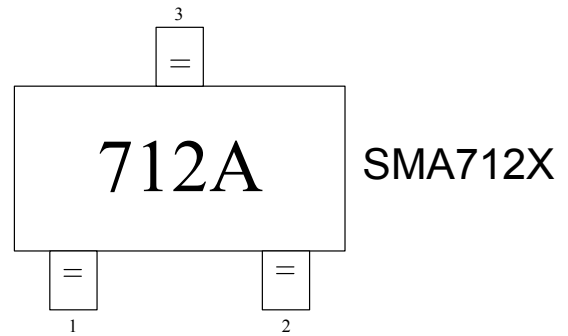
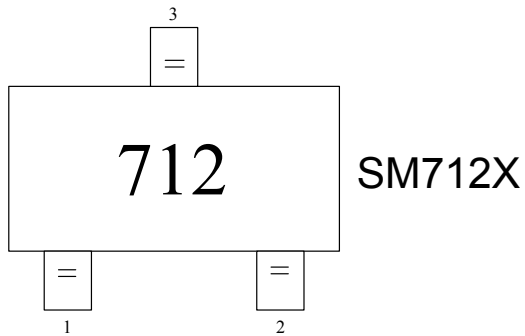
Tape and Reel Specification



W	P	E	F	D	D1	Po	Po10	P2	A0	B0	K0	T
8.00	4.00	1.75	3.50	1.50	1.00	4.00	40.00	2.00	3.15	2.77	1.22	0.20
+0.3/-0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.2	±0.05	±0.1	±0.1	±0.1	±0.02



Marking Codes



Note:

- (1) "712" is part number, fixed.
- (2) "A" is satisfy AEC-Q101.

Ordering Information

Part Number	Working Voltage	Quantity Per Reel	Reel Size
SM712X	7/12V	3,000	7 Inch
SMA712X	7/12V	3,000	7 Inch