

## Low Capacitance ESD Protection -ESDSM712

### Description

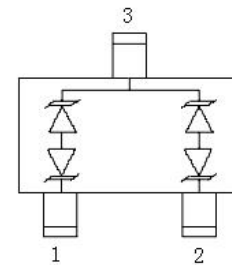
The ESDSM712 transient voltage suppressor (TVS) diode is designed for asymmetrical (12V to -7V ) protection in multi-point data transmission standard RS-485 applications. The SM712 features 400 Watts ( $t_p = 8/20 \mu s$ ) of power handling capability to accommodate the higher transient voltage levels which may be expected in extended common mode applications. This provides higher equipment reliability and eliminates the “guess work” required when using zener diodes that are not rated to handle such transient conditions. The SM712 replaces four discrete components by integrating two 12V and two 7V TVS diodes in a single package.

### Feature

- Case :JEDEC SOT-23 package
- Low clamping voltage
- Low leakage current
- Small packaging options saves board space
- Low capacitance
- Compatible with IEC 61000-4-2(ESD) :Air 15KV , Contact 8KV
- Compatible with IEC 61000-4-4(EFT) :40A ,5/50 nS
- Compatible with IEC 61000-4-5(Surge):24A

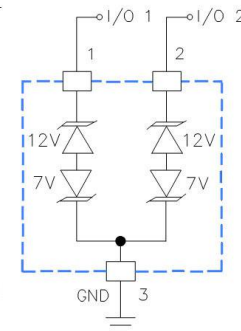
### Applications

- RS485 port protection
- Wireless systems
- Security systems
- Network protection
- Portable electronics

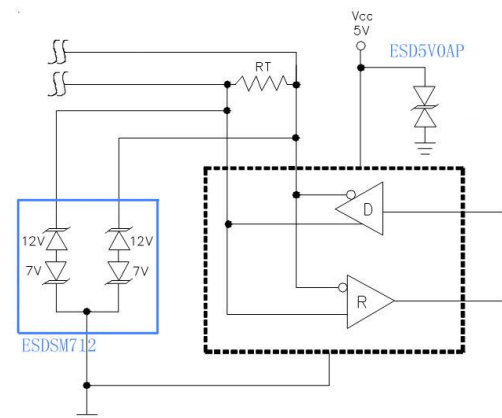


**SOT23 (Top View)**

### Circuit Diagram



### Schematic and PIN Configuration



**RS-485 Protection Circuit**

**Absolute Maximum Ratings**

Parameter	Symbol	Value	Units
Peak Current ( $t_p = 8/20 \mu s$ )	$P_{PK}$	400	W
Peak Current ( $t_p = 8/20 \mu s$ )	$I_{PP}$	17	A
IEC61000-4-2 (Contact)	$V_{ESD}$	8	KV
IEC61000-4-2 (Air)	$V_{ESD}$	15	KV
Lead Soldering Temperature	$T_L$	260 (10 sec)	$^{\circ} C$
Operating Temperature	$T_J$	-50 to 125	$^{\circ} C$
Storage Temperature Range	$T_{STG}$	-50 to 150	$^{\circ} C$

**Electrical Characteristics ( $T = 25^{\circ} C$ )**

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Reverse Stand-off Voltage	$V_{RWM}$	1 or 2 to 3			12	V
		3 to 1 or 2			7	
Reverse Breakdown Voltage	$V_{BR}$	$I_t = 1mA$	1 or 2 to 3	13.3		V
			3 to 1 or 2	7.5		
Reverse Leakage Current	$I_R$	$V_R = V_{RWM}$	1 or 2 to 3		1	$\mu A$
			3 to 1 or 2		20	
Clamping Voltage	$V_C$	$I_{PP} = 5A,$ $t_p = 8/20 \mu s$	1 or 2 to 3		20	V
			3 to 1 or 2		10	
Clamping Voltage	$V_C$	$I_{PP} = 17A,$ $t_p = 8/20 \mu s$	1 or 2 to 3		26	V
			3 to 1 or 2		12	
Junction Capacitance	$C_J$	$V_R = 0V,$ $f = 1MHz$	1 or 2 to 3	45	75	pF
			3 to 1 or 2	45	75	pF

Rating & Characteristic Curves

Figure 1- Power Derating Curve

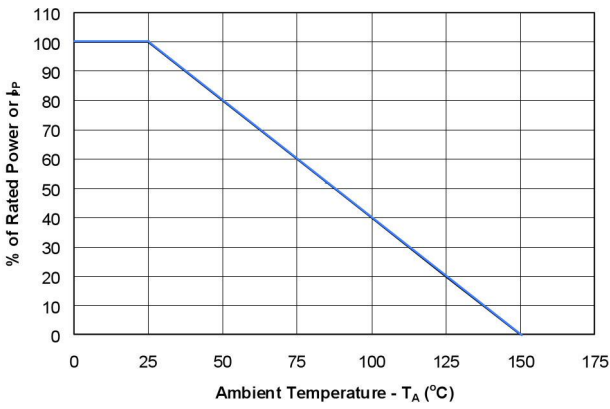


Figure 2- Clamping Voltage vs Current

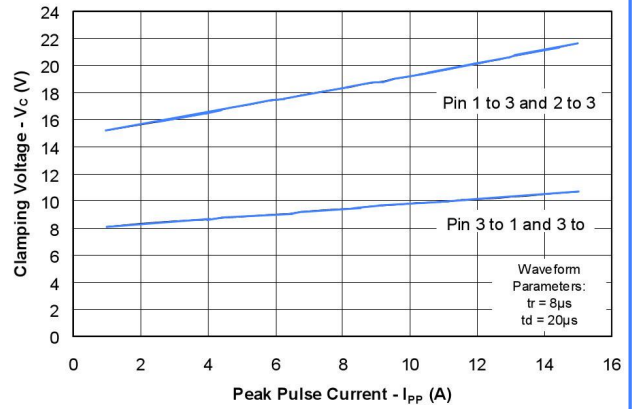


Figure 3- Typical Junction Capacitance

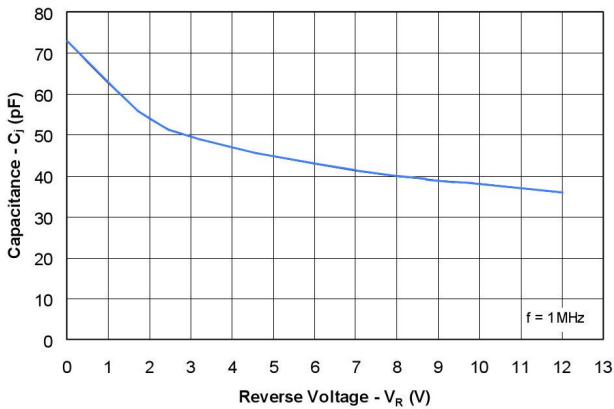


Figure 4- Pulse Waveform

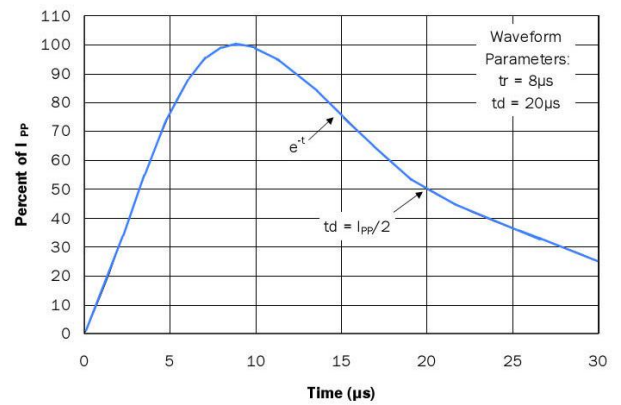
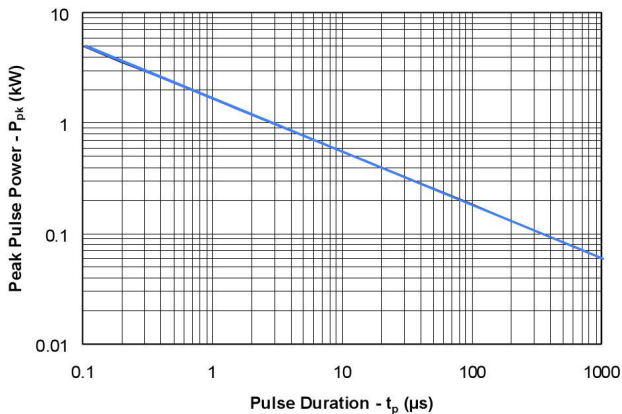
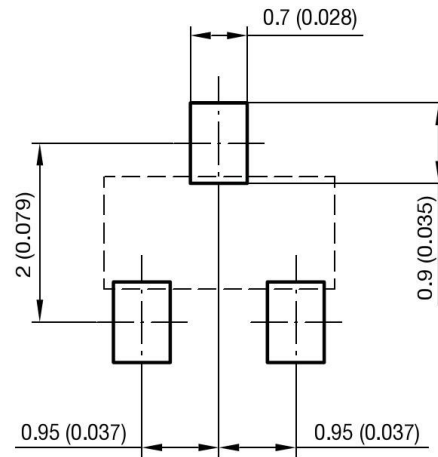
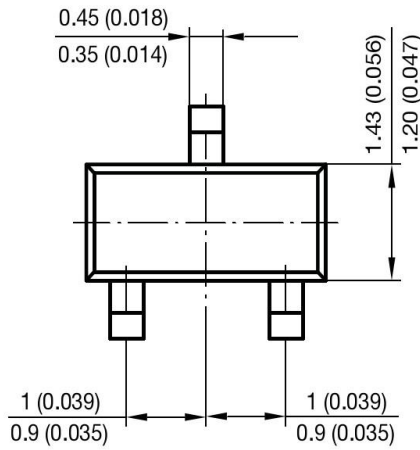
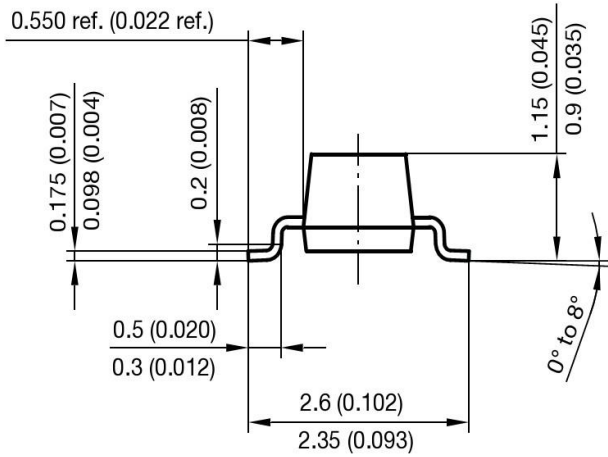
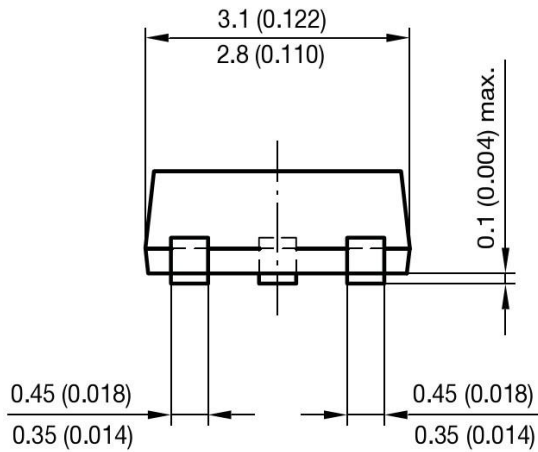


Figure 5- Peak Power Derating Curve





Mounting Pad Layout

**Disclaimer**

Specifications are subject to change without notice.

The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time.

Users should verify actual device performance in their specific applications.