

TVS Diode Arrays

FEATURES

- ✧ 400 watts peak pulse power per line ($t_P=8/20\mu s$)
- ✧ Protects two -7V~12V line
- ✧ Low clamping voltage
- ✧ Low capacitance
- ✧ RoHS compliant
- ✧ Solid-state silicon avalanche technology

MAIN APPLICATIONS

- ✧ Protection of RS-485 transceivers with extended common-mode range
- ✧ Security systems
- ✧ Automatic teller machines
- ✧ HFC systems
- ✧ Net works

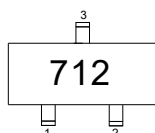
PROTECTION SOLUTION TO MEET

- ✧ IEC61000-4-2 (ESD) $\pm 30kV$ (air), $\pm 30kV$ (contact)
- ✧ IEC61000-4-4 (EFT) 40A (5/50ns)
- ✧ IEC61000-4-5 (Lightning) 17A (8/20 μs)

MECHANICAL CHARACTERISTICS

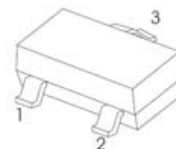
- ✧ SOT-23 package
- ✧ Molding compound flammability rating: UL 94V-0
- ✧ Weight 8 milligrams (approximate)
- ✧ Quantity per reel: 3,000pcs
- ✧ Lead finish: lead free

MARKING CODE

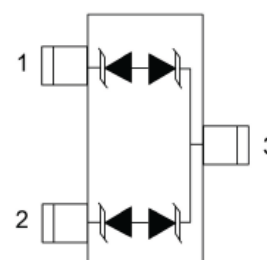


ORDERING INFORMATION

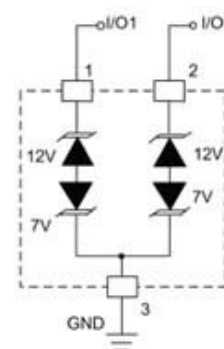
PART No.	PACKAGE TYPE	QUANTITY(PCS) REEL	DESCRIPTION
SM712-02HTG	SOT-23	3,000	7 inch reel pack



SOT-23



PIN Configuration



Circuit Diagram

ABSOLUTE MAXIMUM RATINGS ($T_A=25^{\circ}\text{C}$, RH=45%-75%, unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak pulse power dissipation on 8/20 μs waveform	P_{PP}	400	W
ESD per IEC 61000-4-2 (Air)	V_{ESD}	+/- 30	kV
ESD per IEC 61000-4-2 (Contact)		+/- 30	
Lead soldering temperature	T_L	260 (10 sec.)	$^{\circ}\text{C}$
Operating junction temperature range	T_J	-55 to +125	$^{\circ}\text{C}$
Storage temperature range	T_{STG}	-55 to +150	$^{\circ}\text{C}$

ELECTRICAL CHARACTERISTICS ($T_A=25^{\circ}\text{C}$)

SM712-02HTG									
			Pins 1、Pin2 to Pin 3 (12V TVS)			Pins 3 to Pin 1、Pin2 (7V TVS)			
Parameter	Symbol	Conditions	Min	Typ	Max	Min	Typ	Max	Unit
Reverse stand-off voltage	V_{RWM}				12			7	V
Reverse breakdown voltage	V_{BR}	$I_T=1\text{mA}$	13.3			7.5			V
Reverse leakage current	I_R	$V_R = V_{RWM}$			1			1	μA
Clamping voltage	V_C	$I_{PP}^{①}=12\text{A}$, $t_P = 8/20\mu\text{s}$		30	35				V
Clamping voltage	V_C	$I_{PP}^{①}=17\text{A}$, $t_P = 8/20\mu\text{s}$					18	22	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

① Surge waveform: 8/20 μs

RATINGS AND V-I CHARACTERISTICS CURVES ($T_A=25^\circ\text{C}$, unless otherwise noted)

FIG.1: V- I curve characteristics (Bi-directional)

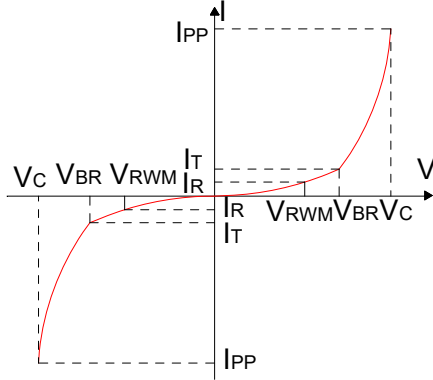


FIG.2: Pulse waveform (8/20 μs)

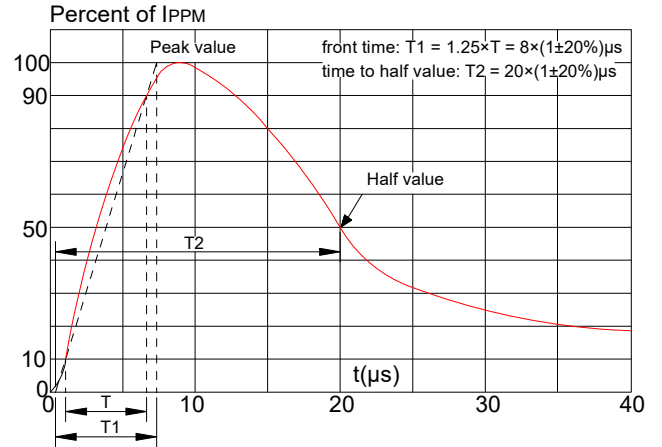


FIG.3: Pulse derating curve

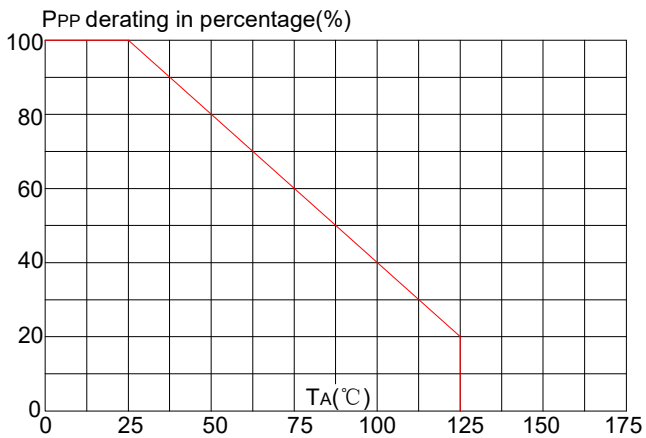
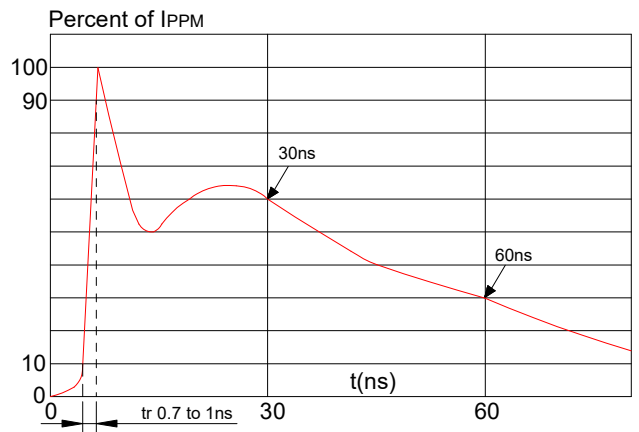
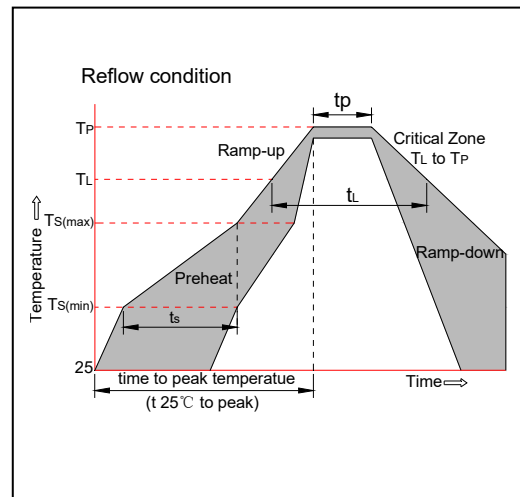


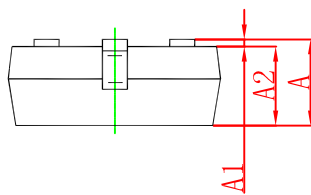
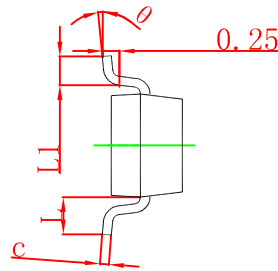
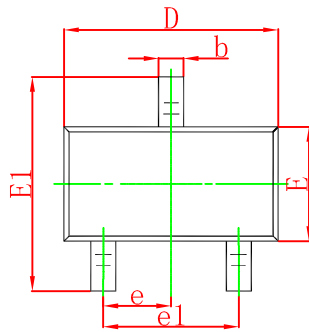
FIG.4: ESD clamping (30KV contact)



SOLDERING PARAMETERS

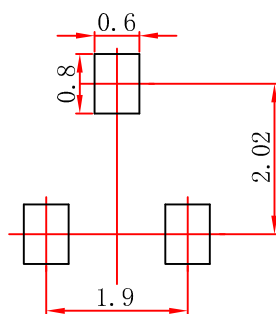
Reflow Condition		Pb-Free assembly (see figure at right)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150°C
	-Temperature Max($T_{s(max)}$)	+200°C
	-Time (Min to Max) (t_s)	60-180 secs.
Average ramp up rate (Liquidus Temp (T_L) to peak)		3°C/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3°C/sec. Max
Reflow	-Temperature(T_L)(Liquidus)	+217°C
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_P)		+260(+0/-5)°C
Time within 5°C of actual Peak Temp (t_p)		20-40secs.
Ramp-down Rate		6°C/sec. Max
Time 25°C to Peak Temp (T_P)		8 min. Max
Do not exceed		+260°C





Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	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	0.080	0.150	0.003	0.006
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	0°	8°	0°	8°

SOT-23 Suggested Pad Layout



Note:

1. Controlling dimension: in millimeters.
2. General tolerance: $\pm 0.05\text{mm}$.
3. The pad layout is for reference purposes only.