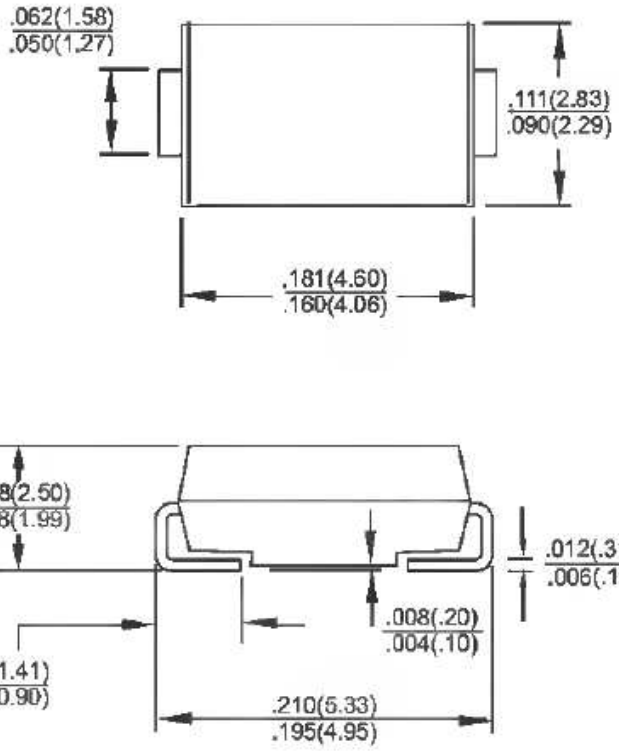
TAIWAN SEMICONDUCTOR

SMAJ HV SERIES

400 Watts Suface Mount Transient Voltage Suppressor

SMA/DO-214AC



Features

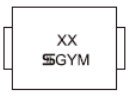
- For surface mounted application
- Low profile package
- Built-in strain relief
- Glass passivated junction
- Excellent clamping capability
- Fast response time: Typically less than 1.0ps from 0 volt to BV min
- Typical I_R less than 1uA above 10V
- High temperature soldering guaranteed: 260℃ / 10 seconds at terminals
- Plastic material used carried Underwriters Laboratory Flammability Classification 94V-0
- 400 watts peak pulse power capability with a 10 / 1000 us waveform (300W above 78V)
- Green compound with suffix "G" on packing code & prefix "G" on datecode

Mechanical Data

- Case: Molded plastic
- Terminals: Pure tin plated, lead free
- Polarity: Indicated by cathode band
- Packaging: 12mm tape per EIA Std RS-481
- Weight: 0.064 gram

Dimensions in inches and (millimeters)

Marking Diagram



XX = Specific Device Code
G = Green Compound
Y = Year
M = Work Month

Maximum Ratings and Electrical Characteristics

Rating at 25 ℃ ambient temperature unless otherwise specified.

Type Number	Symbol	Value	Unit
Peak Power Dissipation at T_A=25℃, Tp=1ms(Note 1)	P_{PK}	400	Watts
Steady State Power Dissipation	P_D	1	Watts
Peak Forward Surge Current, 8.3ms Single Half Sine-wave Superimposed on Rated Load (JEDEC method)	I_{FSM}	40	Amps
Maximum Instantaneous Forward Voltage at 25.0A for Unidirectional Only	V_F	3.5	Volts
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	℃

Note 1: Non-repetitive Current Pulse Per Fig. 3 and Derated above T_A=25℃ Per Fig. 2

RATINGS AND CHARACTERISTIC CURVES (SMAJ HV SERIES)

FIG. 1 PEAK PULSE POWER RATING CURVE

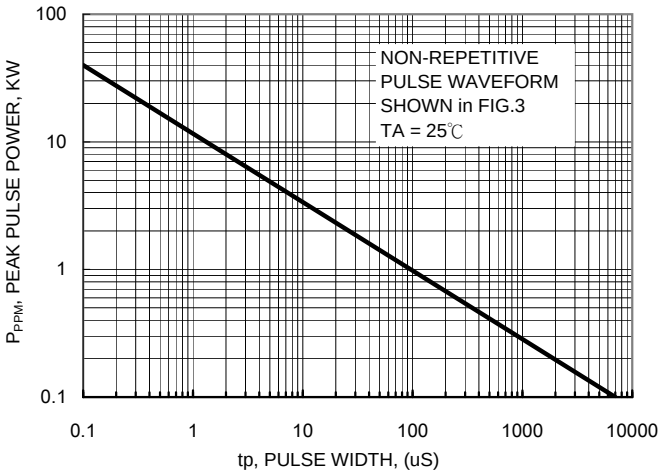


FIG.2 PULSE DERATING CURVE

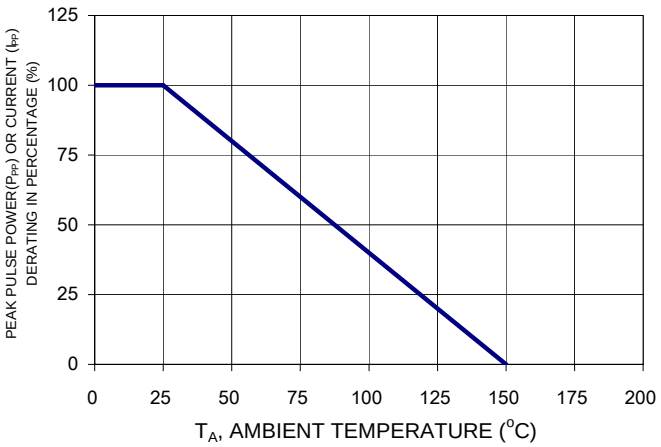


FIG. 3 CLAMPING POWER PULSE WAVEFORM

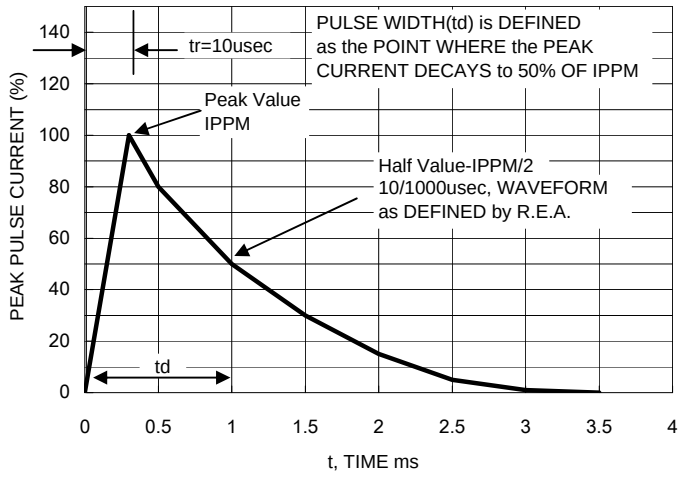


FIG. 4 MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT UNIDIRECTIONAL ONLY

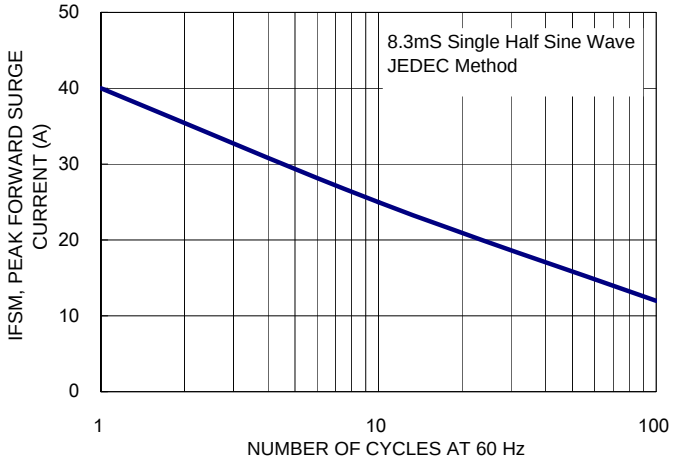
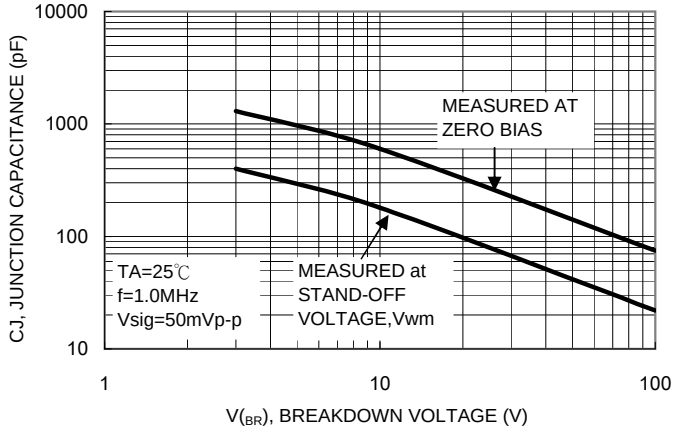


FIG. 5 TYPICAL JUNCTION CAPACITANCE



ELECTRICAL CHARACTERISTICS (TA=25℃ unless otherwise noted)

Device	Device Marking Code	Working Peak Reverse Voltage V_{WM}	Breakdown Voltage VBR (V) at I_T		Test Current IT (mA)	Maximum Clamping Voltage at IPPM Vc(V) (Note5)	Maximum Peak Pulse Surge Current I_{PPM} (A)(Note5)	Maximum Reverse Leakage @ V_{WM} ID (uA)
			Min	Max				
SMAJ200A	SV	200	224	247	1	324	1.2	1
SMAJ220A	SX	220	246	272	1	356	1.1	1
SMAJ250A	SZ	250	279	309	1	405	1.0	1
SMAJ300A	TE	300	335	371	1	486	0.8	1
SMAJ350A	TG	350	391	432	1	567	0.7	1
SMAJ400A	TK	400	447	494	1	648	0.6	1

Notes:

1. Non-repetitive current pulse, per Fig. 3 and derated above T_A=25℃ per Fig. 2
2. Measure on 8.3ms single half sine-wave duty cycle=4 pulses per minutes maximum
3. Peak pulse power waveform is 10/1000 us

TVS APPLICATION NOTES:

Transient Voltage Suppressors may be used at various points in a circuit to provide various degrees of protection. The following is a typical linear power supply with transient voltage suppressor units plaved at different points. All provide protection

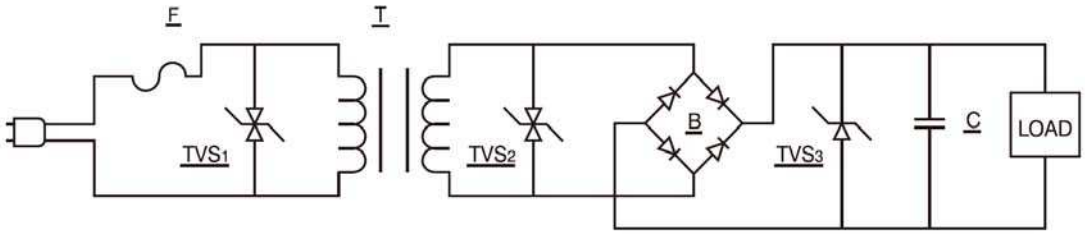


FIGURE 1

Transient Voltage Suppressor 1 provides maximum protection. However, the system will probably require replacement of the line fuse(F) since it provides a dominant portion of the series impedance when a surge is encountered.

Hower, we do not recommend to use the TVS diode here, unless we can know the electric circuit impedance and the magnitude of surge rushed into the circuit. Otherwise the TVS diode is easy to be destroyed by voltage surge.

Transient Voltage Suppressor 2 provides execllent protection of circuitry excluding the transformer(T). However, since the transformer is a large part of the series impedance, the chance of the line fuse opening during the surge condition is reduced.

Transient Voltage Suppressor 3 provides the load with complete protection. It uses a unidirectional Transient Voltage Suppressor, which is a cost advantage. The series impedance now includes the line fuse, transformer, and bridge rectifier(B) so failure

Any combination of this three, or any one of these applivations, will prevent damage to the load. This would require varying trade-offs in power supply protection versus maintenance(changing the time fuse).
An additional method is to utilize the Trans

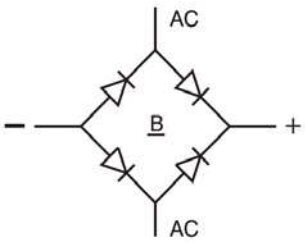
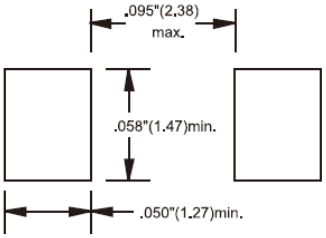


FIGURE 2

RECOMMENDED PAD SIZES

The pad dimensions should be 0.010"(0.25mm) longer than the contact size, in the lead axis. This allows a solder filler to form, see figure below. Contact factort for soldering methods.



Dimensions in inches and (millimeters)

Version : B12