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• • • • • • P • R • E • L • I • M • I • N • A • R • Y • • • • • •

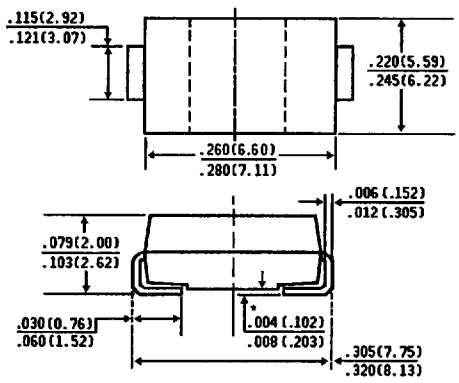
TSMC SERIES

SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR

***VOLTAGE** - 6.8 - 200 Volts*

FEATURES

SMC/DO-214AB



* TYPICAL RANGE

Dimensions in inches and (millimeters)

- For surface mounted applications
- Low profile package
- Built-in strain relief
- Glass passivated junction
- Excellent clamping capability
- Fast response time: typically less than 1.0ps from 0 volts to BV min.
- Typical I_R less than 1mA above 10V
- High temperature soldering: 250°C/10 seconds at terminals

MECHANICAL DATA

Case: Molded plastic

Terminals: Solder plated

Polarity: Indicated by cathode band

Standard Packaging: 16mm tape *(E1A STD RS-481)*

Weight: .007 ounces, 0.21 gram

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

	SYMBOLS	VALUE	UNITS
Peak Power Dissipation at T_A=25°C, Tp=1ms (NOTES 1,2)	Ppk	Minimum 1500	Watts
Peak forward Surge Current 8.3ms single half sine-wave superimposed on rated load (JEDEC Method)(NOTES 2,3)	I_{FSM}	200.0	Amps
Operating and Storage Temperature Range	T_J,T_{STG}	-65 to +175	°C

NOTES:
1. Non-repetitive current pulse, per Fig.3 and derated above T_A=25°C per Fig. 2.
2. Mounted on 8.0mm² copper pads to each terminal.
3. 8.3ms single half sine-wave duty cycle=4 pulses per minutes maximum.

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MAXIMUM RATINGS AND CHARACTERISTIC CURVES TSMC SERIES

FIG 1 - PULSE RATING CURVE

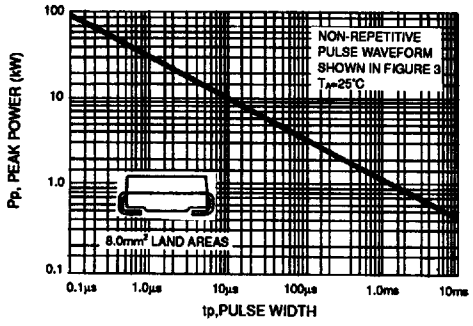


FIG 2 - PULSE DERATING CURVE

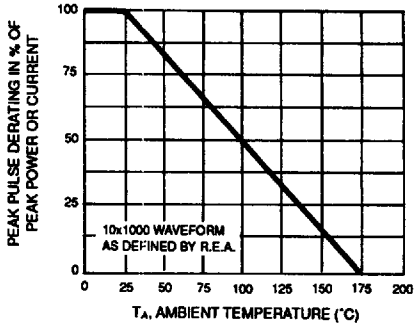


FIG 3 - PULSE WAVEFORM

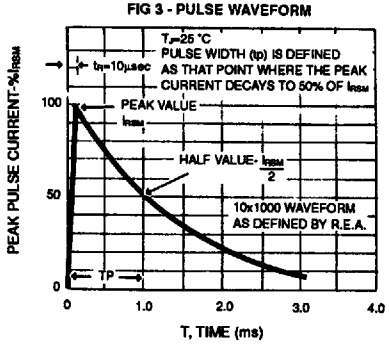


FIG 4 - TYPICAL JUNCTION CAPACITANCE

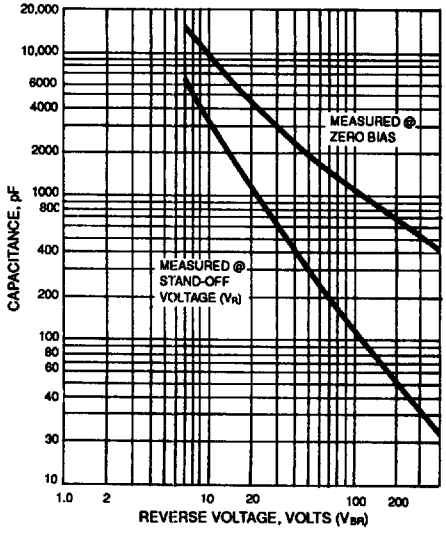
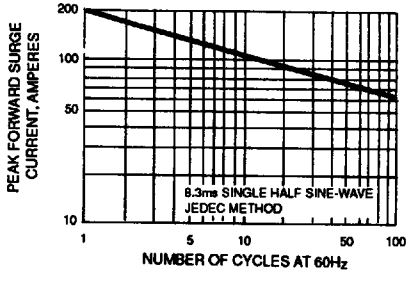


FIG 5 - MAXIMUM NON-REPETITIVE SURGE CURRENT



GENERAL INSTRUMENT

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ELECTRICAL CHARACTERISTICS @25°C

Device	Device Marking Code	Breakdown Voltage V_{BR} Volts (NOTE 1) Min.	Max.	@ IT mA	Working Peak Reverse Voltage V_{RWM} (Volts)	Maximum Reverse Leakage at V_{RWM} $I_{R(uA)}$	Maximum Reverse Surge Current I_{RSM} (NOTE 2) (Amps)	Maximum Reverse Voltage at I_{RSM} (Clamping Voltage) V_{RSM} (Volts)
TSMC6.8	DD	6.12	7.48	10	5.50	1000	139	10.8
TSMC6.8A	DE	6.45	7.14	10	5.80	1000	143	10.5
TSMC7.5	DF	6.75	8.25	10	6.05	500	128	11.7
TSMC7.5A	DG	7.13	7.88	10	6.40	500	132	11.3
TSMC8.2	DH	7.38	9.02	10	6.63	200	120	12.5
TSMC8.2A	DK	7.79	8.0	10	7.02	200	124	12.1
TSMC9.1	DL	8.19	10.0	1.0	7.37	50	109	13.8
TSMC9.1A	DM	8.65	9.55	1.0	7.78	50	112	13.4
TSMC10	DN	9.00	11.0	1.0	8.10	10	100	15.0
TSMC10A	DP	9.50	10.5	1.0	8.55	10	103	14.5
TSMC11	DQ	9.90	12.1	1.0	8.92	5.0	93.0	16.2
TSMC11A	DR	10.5	11.6	1.0	9.40	5.0	96.0	15.6
TSMC12	DS	10.8	13.2	1.0	9.72	5.0	87.0	17.3
TSMC12A	DT	11.4	12.6	1.0	10.2	5.0	90.0	16.7
TSMC13	DU	11.7	14.3	1.0	10.5	5.0	79.0	19.0
TSMC13A	DV	12.4	13.7	1.0	11.1	5.0	82.0	18.2
TSMC15	DW	13.5	16.5	1.0	12.1	5.0	68.0	22.0
TSMC15A	DX	14.3	15.8	1.0	12.8	5.0	71.0	21.2
TSMC16	DY	14.4	17.6	1.0	12.9	5.0	64.0	23.5
TSMC16A	DZ	15.2	16.8	1.0	13.6	5.0	67.0	22.5
TSMC18	ED	16.2	19.8	1.0	14.5	5.0	56.5	26.5
TSMC18A	EE	17.1	18.9	1.0	15.3	5.0	59.5	26.2
TSMC20	EF	18.0	22.0	1.0	16.2	5.0	51.5	29.1
TSMC20A	EG	19.0	21.0	1.0	17.1	5.0	54.0	27.7
TSMC22	EH	19.8	24.2	1.0	17.8	5.0	47.0	31.9
TSMC22A	EK	20.9	23.1	1.0	18.8	5.0	49.0	30.6
TSMC24	EL	21.6	26.4	1.0	19.4	5.0	43.0	34.7
TSMC24A	EM	22.8	25.2	1.0	20.5	5.0	45.0	33.2
TSMC27	EN	24.3	29.7	1.0	21.8	5.0	38.5	39.1
TSMC27A	EP	25.7	28.4	1.0	23.1	5.0	40.0	37.5
TSMC30	EQ	27.0	33.0	1.0	24.3	5.0	34.5	43.5
TSMC30A	ER	28.5	31.5	1.0	25.6	5.0	36.0	41.4
TSMC33	ES	29.7	36.3	1.0	26.8	5.0	31.5	47.7
TSMC33A	ET	31.4	34.7	1.0	28.2	5.0	33.0	45.7
TSMC36	EU	32.4	39.6	1.0	29.1	5.0	29.0	52.0
TSMC36A	EV	34.2	37.8	1.0	30.8	5.0	30.0	49.9
TSMC39	EW	35.1	42.9	1.0	31.6	5.0	26.5	56.4
TSMC39A	EX	37.1	41.0	1.0	33.3	5.0	28.0	53.9
TSMC43	EY	38.7	47.3	1.0	34.8	5.0	24.0	61.9
TSMC43A	EZ	40.9	45.2	1.0	36.8	5.0	25.3	59.3
TSMC47	FD	42.3	51.7	1.0	36.1	5.0	22.2	67.8
TSMC47A	FE	44.7	49.4	1.0	40.2	5.0	23.2	64.8
TSMC51	FF	45.9	56.1	1.0	41.3	5.0	20.4	73.5
TSMC51A	FG	48.5	53.6	1.0	43.6	5.0	21.4	70.1
TSMC56	FH	50.4	61.8	1.0	45.4	5.0	18.6	80.5
TSMC56A	FK	53.2	58.8	1.0	47.8	5.0	19.5	77.0
TSMC62	FL	55.8	68.2	1.0	50.2	5.0	16.9	89.0
TSMC62A	FM	58.9	65.1	1.0	53.0	5.0	17.7	85.0
TSMC68	FN	61.2	74.8	1.0	55.1	5.0	15.3	98.0
TSMC68A	FP	64.6	71.4	1.0	58.1	5.0	16.3	92.0
TSMC75	FQ	67.5	82.5	1.0	60.7	5.0	13.9	109
TSMC75A	FR	71.3	78.8	1.0	64.1	5.0	14.6	104
TSMC82	FS	73.8	90.2	1.0	66.4	5.0	12.7	118
TSMC82A	FT	77.9	86.1	1.0	70.1	5.0	13.3	113
TSMC91	FU	81.9	100.0	1.0	73.7	5.0	11.4	131
TSMC91A	FV	86.5	95.5	1.0	77.8	5.0	12.0	125
TSMC100	FW	90.0	110	1.0	81.0	5.0	10.4	144
TSMC100A	FX	95.0	105	1.0	85.5	5.0	11.0	137
TSMC110	FY	99.0	121	1.0	89.2	5.0	9.5	158
TSMC110A	FZ	106	116	1.0	94.0	5.0	9.9	152
TSMC120	GD	108	132	1.0	97.2	5.0	8.7	173
TSMC120A	GE	114	126	1.0	102	5.0	9.1	165

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TSMC130	GF	117	143	1.0	106	5.0	8.0	187
TSMC130A	GG	124	137	1.0	111	5.0	8.4	179
TSMC150	GH	136	165	1.0	121	5.0	7.0	215
TSMC150A	GK	143	158	1.0	128	5.0	7.2	207
TSMC160	GL	144	176	1.0	130	5.0	6.5	230
TSMC160A	GM	152	168	1.0	136	5.0	6.8	219
TSMC170	GN	153	167	1.0	138	5.0	6.2	244
TSMC170A	GP	162	179.	1.0	145	5.0	6.4	234
TSMC180	GQ	162	198	1.0	146	5.0	5.8	258
TSMC180A	GR	171	189	1.0	154	5.0	6.1	246
TSMC200	GS	180	220	1.0	162	5.0	5.2	287
TSMC200A	GT	190	210	1.0	171	5.0	5.5	274

NOTES:
1. V_{BR} measured after I_T applied for 300 us. I_T = Square Wave Pulse or equivalent.
2. Surge current Waveform per Figure 3 and Derate per Figure 2.
3. V_F - 3.5V max, I_F=100A (TSMC6.8 thru TSMC91A)
   V_F=5.0 V max., I_F=100A (TSMC100 thru TSMC400A) per 1/2 Square or equivalent Sine Wave.
   PW - 8.3mx, Duty Cycle - 4 Pulses per minute maximum.

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 placed at different points. All provide protection of the load.

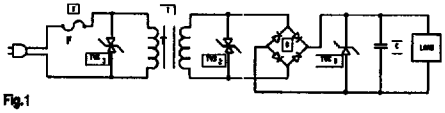

Fig.1

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.

Transient Voltage Suppressor 2 provides excellent 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 of the line fuse is further reduced. If only Transient Voltage Suppressor 3 is in use, then the bridge rectifier is unprotected and would require a higher voltage and current rating to prevent failure by transients.

Any combination of these three, or any one of these applications, will prevent damage to the load. This would require varying trade-offs in power supply protection versus maintenance (time changing the fuse).

An additional method is to utilize the Transient Voltage Suppressor units as a controlled avalanche bridge. This reduces the parts count and incorporates the protection within the bridge rectifier.

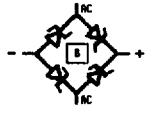

Fig.2

Lower wattage devices are available in the TSMA series of 400 W and TSMB series of 600 W surface mount suppressors.