



# Frontier Electronics Corp.

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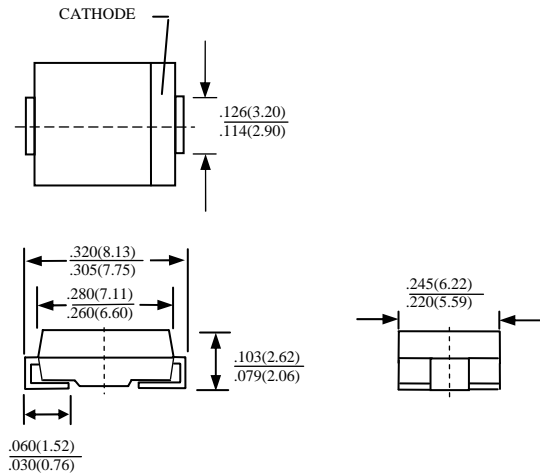
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## 1500W SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR

### 1.5SMCJ5.0 THRU 1.5SMCJ188A

#### FEATURES

- PLASTIC PACKAGE HAS UNDERWRITERS LABORATORY FLAMMABILITY CLASSIFICATION 94V-0
- GLASS PASSIVATED JUNCTION
- LOW PROFILE
- EXCELLENT CLAMPING CAPABILITY
- LOW INCREMENTAL SURGE RESISTANCE
- FAST RESPONSE TIME: TYPICALLY LESS THEN 1.0 pS FROM 0 VOLTS TO V (BR) MIN
- 1500 W PEAK PULSE POWER CAPABILITY WITH A 10/1000  $\mu$ S WAVEFORM, REPETITION RATE (DUTY CYCLE): 0.01%
- TYPICAL  $I_D$  LESS THAN 1 $\mu$ A ABOVE 10V
- HIGH TEMPERATURE SOLDERING GUARANTEED: 250°C /10 SECONDS AT TERMINALS



#### MECHANICAL DATA

- CASE: MOLDED PLASTIC, DO-214AB (SMC) DIMENSIONS IN INCHES AND (MILLIMETERS)
- TERMINALS: SOLDER PLATED
- POLARITY: INDICATED BY CATHODE BAND
- WEIGHT: 0.21 GRAMS

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS RATINGS AT 25°C AMBIENT TEMPERATURE UNLESS OTHERWISE SPECIFIED

RATINGS	SYMBOL	VALUE	UNITS
PEAK PULSE POWER DISSIPATION ON 10/1000 $\mu$ S WAVEFORM (NOTE 1, FIG. 1)	$P_{PPM}$	MINIMUM 1500	WATTS
PEAK PULSE CURRENT OF ON 10/1000 $\mu$ S WAVEFORM (NOTE 1, FIG. 3)	$I_{PPM}$	SEE TABLE 1	A
PEAK FORWARD SURGE CURRENT, 8.3ms SINGLE HALF SINE-WAVE SUPERIMPOSED ON RATED LOAD, UNIDIRECTIONAL ONLY (NOTE 2)	$I_{FSM}$	200	A
MAXIMUM INSTANTANEOUS FORWARD VOLTAGE AT 25A FOR UNIDIRECTIONAL ONLY (NOTE 3 & 4)	V <sub>F</sub>	SEE NOTE 4	V
OPERATING JUNCTION AND STORAGE TEMPERATURE RANGE	$T_J, T_{STG}$	- 55 TO + 150	°C

- NOTE: 1. NON-REPETITIVE CURRENT PULSE, PER FIG.3 AND DERATED ABOVE  $T_A=25^\circ\text{C}$  PER FIG 2.  
 2. MOUNTED ON 8.0x 8.0mm COPPER PADS TO EACH TERMINAL  
 3. MEASURED ON 8.3ms SINGLE HALF SINE-WAVE OR EQUIVALENT SQUARE WAVE, DUTY CYCLE = 4 PULSES PER MINUTE MAXIMUM  
 4.  $V_F=3.5V$  ON 1.5SMCJ5.0 THRU 1.5SMCJ90A DEVICES AND  $V_F=5.0V$  ON 1.5SMCJ100 THRU 1.5SMCJ188A

DEVICE	DEVICE MARKING CODE		WORKING PEAK REVERSE VOLTAGE $V_{WM}$ (VOLTS)	BREAKDOWN VOLTAGE $V_{(BR)}$ (VOLTS) at $I_T$		TEST CURRENT $I_T$ (mA)	MAXIMUM Clamping VOLTAGE AT $I_{PPM}$ VC(Volts) (Note 5)	MAX PEAK PULSE SURGE CURRENT $I_{PPM}$ (NOTE 5) (Amps)	MAXIMUM REVERSE LEAKAGE AT $V_{WM}$ $I_D$ ( $\mu$ A)
	UNI	BI		MIN	MAX				
1.5SMCJ5.0	GDD	BDD	5.0	6.40	7.82	10	9.6	156.3	800
1.5SMCJ5.0A	GDE	BDE	5.0	6.40	7.07	10	9.2	163.0	800
1.5SMCJ6.0	GDF	BDF	6.0	6.67	8.15	10	11.4	131.6	800
1.5SMCJ6.0A	GDG	BDG	6.0	6.67	7.37	10	10.3	145.6	800
1.5SMCJ6.5	GDH	BDH	6.5	7.22	8.82	10	12.3	122.0	500
1.5SMCJ6.5A	GDK	BDK	6.5	7.22	7.98	10	11.2	133.9	500
1.5SMCJ7.0	GDL	BDL	7.0	7.78	9.51	10	13.3	112.8	200
1.5SMCJ7.0A	GDM	BDM	7.0	7.78	8.60	10	12.0	125.0	200
1.5SMCJ7.5	GDN	BDN	7.5	8.33	10.2	1.0	14.3	104.9	100
1.5SMCJ7.5A	GDP	BDP	7.5	8.33	9.21	1.0	12.9	116.3	100
1.5SMCJ8.0	GDQ	BDQ	8.0	8.89	10.9	1.0	15.0	100.0	50.0
1.5SMCJ8.0A	GDR	BDR	8.0	8.89	9.83	1.0	13.6	110.3	50.0
1.5SMCJ8.5	GDS	BDS	8.5	9.44	11.5	1.0	15.9	94.3	10.0
1.5SMCJ8.5A	GDT	BDT	8.5	9.44	10.4	1.0	14.4	104.2	10.0
1.5SMCJ9.0	GDU	BDU	9.0	10.0	12.2	1.0	16.9	88.8	5.0
1.5SMCJ9.0A	GDV	BDV	9.0	10.0	11.1	1.0	15.4	97.4	5.0
1.5SMCJ10	GDW	BDW	10.0	11.1	13.6	1.0	18.8	79.8	5.0
1.5SMCJ10A	GDX	BDX	10.0	11.1	12.3	1.0	17.0	88.2	5.0
1.5SMCJ11	GDY	BDY	11.0	12.2	14.9	1.0	20.1	74.6	5.0
1.5SMCJ11A	GDZ	BDZ	11.0	12.2	13.5	1.0	18.2	82.4	5.0
1.5SMCJ12	GED	BED	12.0	13.3	16.3	1.0	22.0	68.2	5.0
1.5SMCJ12A	GEE	BEE	12.0	13.3	14.7	1.0	19.9	75.4	5.0
1.5SMCJ13	GEF	BEF	13.0	14.4	17.6	1.0	23.8	63.0	5.0
1.5SMCJ13A	GEG	BEG	13.0	14.4	15.9	1.0	21.5	69.8	5.0
1.5SMCJ14	GEH	BEH	14.0	15.6	19.1	1.0	25.8	58.1	5.0
1.5SMCJ14A	GEK	BEK	14.0	15.6	17.2	1.0	23.2	64.7	5.0
1.5SMCJ15	GEL	BEL	15.0	16.7	20.4	1.0	26.9	55.8	5.0
1.5SMCJ15A	GEM	BEM	15.0	16.7	18.5	1.0	24.4	61.5	5.0
1.5SMCJ16	GEN	BEN	16.0	17.8	21.8	1.0	28.8	52.1	5.0
1.5SMCJ16A	GEP	BEP	16.0	17.8	19.7	1.0	26.0	57.7	5.0
1.5SMCJ17	GEQ	BEQ	17.0	18.9	23.1	1.0	30.5	49.2	5.0
1.5SMCJ17A	GER	BER	17.0	18.9	20.9	1.0	27.6	54.3	5.0
1.5SMCJ18	GES	BES	18.0	20.0	24.4	1.0	32.2	46.6	5.0
1.5SMCJ18A	GET	BET	18.0	20.0	22.1	1.0	29.2	51.4	5.0
1.5SMCJ20	GEU	BEU	20.0	22.2	27.1	1.0	35.8	41.9	5.0
1.5SMCJ20A	GEV	BEV	20.0	22.2	24.5	1.0	32.4	46.3	5.0
1.5SMCJ22	GEW	BEW	22.0	24.4	29.8	1.0	39.4	38.1	5.0
1.5SMCJ22A	GEX	BEX	22.0	24.4	26.9	1.0	35.5	42.3	5.0
1.5SMCJ24	GEY	BEY	24.0	26.7	32.6	1.0	43.0	34.9	5.0
1.5SMCJ24A	GEZ	BEZ	24.0	26.7	29.5	1.0	38.9	38.6	5.0
1.5SMCJ26	GFD	BFD	26.0	28.9	35.3	1.0	46.6	32.2	5.0
1.5SMCJ26A	GFE	BFE	26.0	28.9	31.9	1.0	42.1	35.6	5.0
1.5SMCJ28	GFF	BFF	28.0	31.1	38.0	1.0	50.0	30.0	5.0
1.5SMCJ28A	GFG	BFG	28.0	31.1	34.4	1.0	45.4	33.0	5.0
1.5SMCJ30	GFH	BFH	30.0	33.3	40.7	1.0	53.5	28.0	5.0
1.5SMCJ30A	GFK	BFK	30.0	33.3	36.8	1.0	48.4	31.0	5.0
1.5SMCJ33	GFL	BFL	33.0	36.7	44.9	1.0	59.0	25.4	5.0
1.5SMCJ33A	GFM	BFM	33.0	36.7	40.6	1.0	53.3	28.1	5.0
1.5SMCJ36	GFN	BFN	36.0	40.0	48.9	1.0	64.3	23.3	5.0
1.5SMCJ36A	GFP	BFP	36.0	40.0	44.2	1.0	58.1	25.8	5.0
1.5SMCJ40	GFQ	BFQ	40.0	44.4	54.3	1.0	71.4	21.0	5.0
1.5SMCJ40A	GFR	BFR	40.0	44.4	49.1	1.0	64.5	23.3	5.0
1.5SMCJ43	GFS	BFS	43.0	47.8	58.4	1.0	76.7	19.6	5.0
1.5SMCJ43A	GFT	BFT	43.0	47.8	52.8	1.0	69.4	21.6	5.0
1.5SMCJ45	GFU	BFU	45.0	50.0	61.1	1.0	80.3	18.7	5.0
1.5SMCJ45A	GFV	BFV	45	50.0	55.3	1.0	72.7	20.6	5.0
1.5SMCJ48	GFW	BFW	48	53.3	65.1	1.0	85.5	17.5	5.0
1.5SMCJ48A	GFX	BFX	48	53.3	58.9	1.0	77.4	19.4	5.0

DEVICE	DEVICE MARKING CODE		WORKING PEAK REVERSE VOLTAGE $V_{WM}$ (VOLTS)	BREAKDOWN VOLTAGE $V_{(BR)}$ (VOLTS) at $I_T$		TEST CURRENT $I_T$ (mA)	MAXIMUM Clamping VOLTAGE AT $I_{PPM}$ VC(Volts) (Note 5)	MAX PEAK PULSE SURGE CURRENT $I_{PPM}$ (NOTE 5) (Amps)	MAXIMUM REVERSE LEAKAGE AT $V_{WM}$ $I_D$ ( $\mu$ A)
	UNI	BI		MIN	MAX				
1.5SMCJ51	GFY	BFY	51	56.7	69.3	1.0	91.1	16.5	5.0
1.5SMCJ51A	GFZ	BFZ	51	56.7	62.7	1.0	82.4	18.2	5.0
1.5SMCJ54	GGD	BGD	54	60.0	73.3	1.0	96.3	15.6	5.0
1.5SMCJ54A	GGE	BGE	54	60.0	66.3	1.0	87.1	17.2	5.0
1.5SMCJ58	GGF	BGF	58	64.4	78.7	1.0	103.0	14.6	5.0
1.5SMCJ58A	GGG	BGG	58	64.4	71.2	1.0	93.0	16.0	5.0
1.5SMCJ60	GGH	BGH	60	66.7	81.5	1.0	107.0	14.0	5.0
1.5SMCJ60A	GGK	BGK	60	66.7	73.7	1.0	96.0	15.5	5.0
1.5SMCJ64	GGL	BGL	64	71.1	86.9	1.0	114.0	13.2	5.0
1.5SMCJ64A	GGM	BGM	64	71.1	78.6	1.0	103.0	14.6	5.0
1.5SMCJ70	GGN	BGN	70	77.8	95.1	1.0	125.0	12.0	5.0
1.5SMCJ70A	GGP	BGP	70	77.8	86.0	1.0	113.0	13.3	5.0
1.5SMCJ75	GGQ	BGQ	75	83.3	102.0	1.0	134.0	11.2	5.0
1.5SMCJ75A	GGR	BGR	75	83.3	92.1	1.0	121.0	12.4	5.0
1.5SMCJ78	GGs	BGs	78	86.7	106.0	1.0	139.0	10.8	5.0
1.5SMCJ78A	GGT	BGT	78	86.7	95.8	1.0	126.0	11.9	5.0
1.5SMCJ85	GGU	BGU	85	94.4	115.0	1.0	151.0	9.9	5.0
1.5SMCJ85A	GGV	BGV	85	94.4	104.0	1.0	137.0	10.9	5.0
1.5SMCJ90	GGW	BGW	90	100	122.0	1.0	160.0	9.4	5.0
1.5SMCJ90A	GGX	BGX	90	100	111.0	1.0	146.0	10.3	5.0
1.5SMCJ100	GGY	BGY	100	111	136.0	1.0	179.0	8.4	5.0
1.5SMCJ100A	GGZ	BGZ	100	111	123.0	1.0	162.0	9.3	5.0
1.5SMCJ110	GHD	BHD	110	122	149.0	1.0	196.0	7.7	5.0
1.5SMCJ110A	GHE	BHE	110	122	135.0	1.0	177.0	8.5	5.0
1.5SMCJ120	GHF	BHF	120	133	163.0	1.0	214.0	7.0	5.0
1.5SMCJ120A	GHG	BHG	120	133	147.0	1.0	193.0	7.8	5.0
1.5SMCJ130	GHH	BHH	130	144	176.0	1.0	231.0	6.5	5.0
1.5SMCJ130A	GHK	BHK	130	144	159.0	1.0	209.0	7.2	5.0
1.5SMCJ150	GHL	BHL	150	167	204.0	1.0	268.0	5.6	5.0
1.5SMCJ150A	GHM	BHM	150	167	185.0	1.0	243.0	6.2	5.0
1.5SMCJ160	GHN	BHN	160	178	218.0	1.0	287.0	5.2	5.0
1.5SMCJ160A	GHP	BHP	160	178	197.0	1.0	259.0	5.8	5.0
1.5SMCJ170	GHQ	BHQ	170	189	231.0	1.0	304.0	4.9	5.0
1.5SMCJ170A	GHR	BHR	170	189	209.0	1.0	275.0	5.5	5.0
1.5SMCJ188	GHT	GHT	188	209	255.0	1.0	344.0	4.4	5.0
1.5SMCJ188A	GHS	GHS	188	209	231.0	1.0	328.0	4.6	5.0

NOTE:

1.  $V_F=3.5V$  on 1.5SMCJ5.0 thru 90A devices and  $V_F=5.0V$  on 1.5SMCJ100 thru 188A devices at  $I_F=25A$  on  $\frac{1}{2}$  Square or Equivalent Sine Wave.  $PW = 8.3ms$ , Duty Cycle = 4 Pulses per Minute Maximum.
2. For Bipolar types with  $V_R$  of 10 volts and under, the  $I_R$  limit is doubled.
3. Mounted on  $5.0mm^2$  copper pads to each terminal.
4. For Bidirectional use C suffix for 10% tolerance, CA suffix for 5% tolerance.

FIG. 1 - PEAK PULSE POWER RATING CURVE

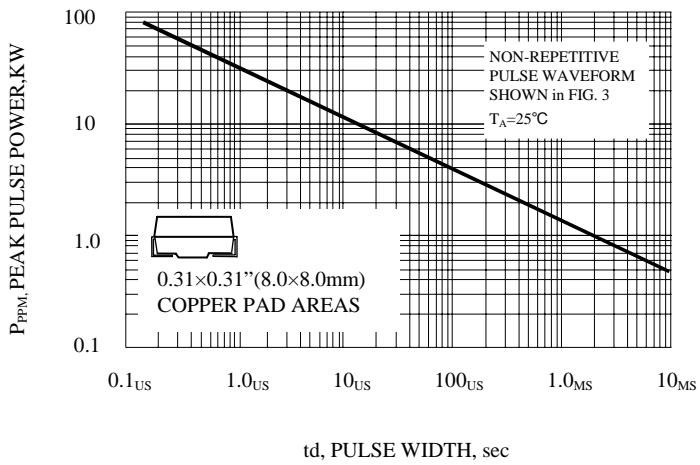


FIG. 2 - PULSE DERATING CURVE

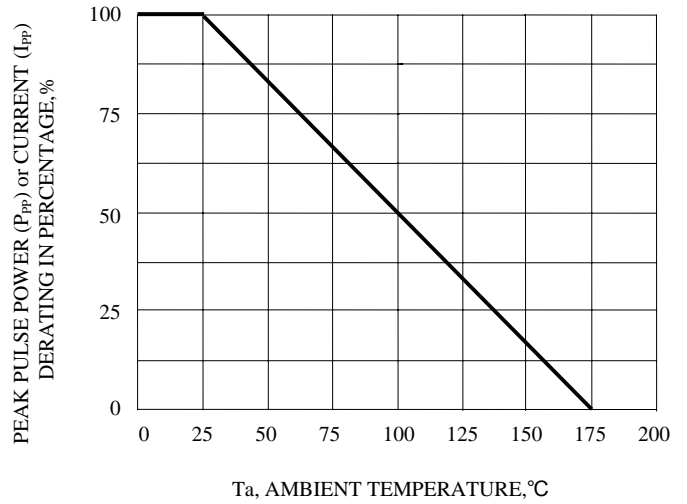


FIG. 3 - PULSE WAVEFORM

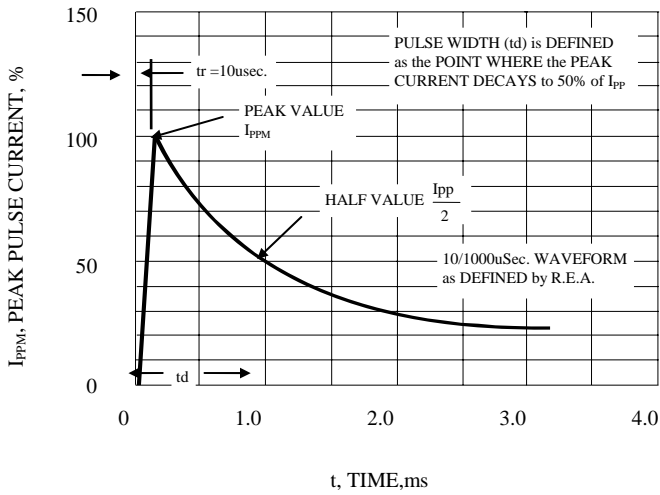


FIG. 4 - TYPICAL JUNCTION CAPACITANCE

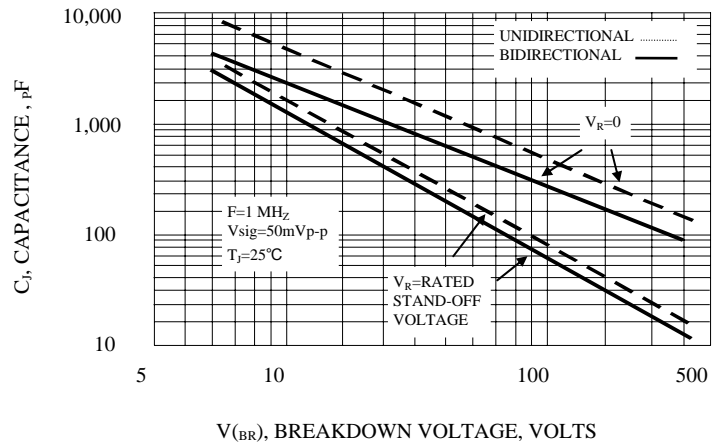


FIG. 5 - STEADY STATE POWER DERATING CURVE

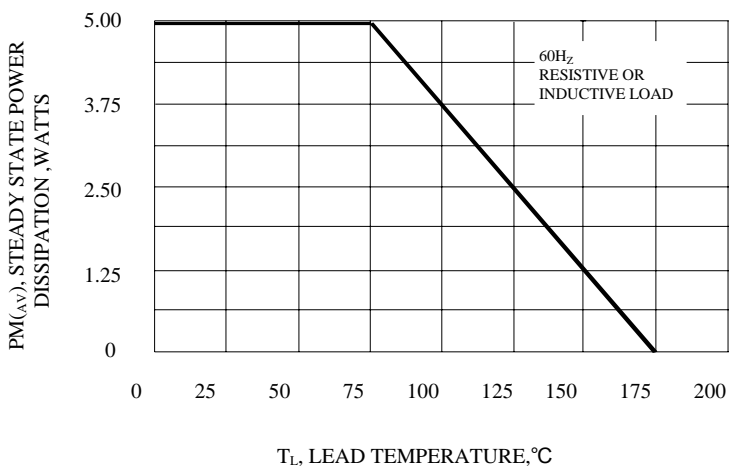


FIG. 6 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT UNIDIRECTIONAL ONLY

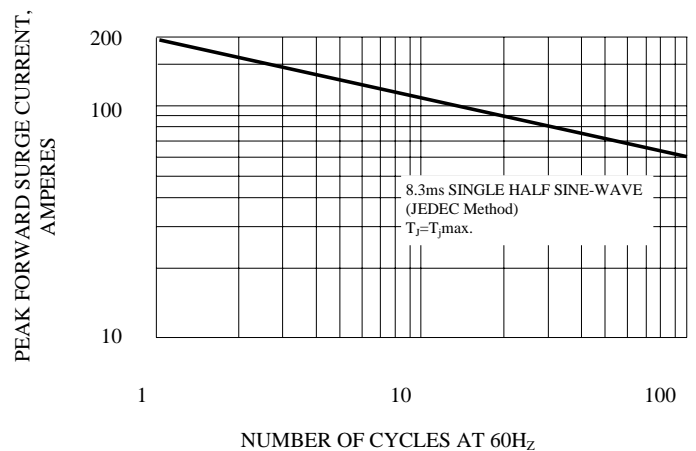


FIG. 7 - INCREMENTAL CLAMPING VOLTAGE CURVE UNIDIRECTIONAL

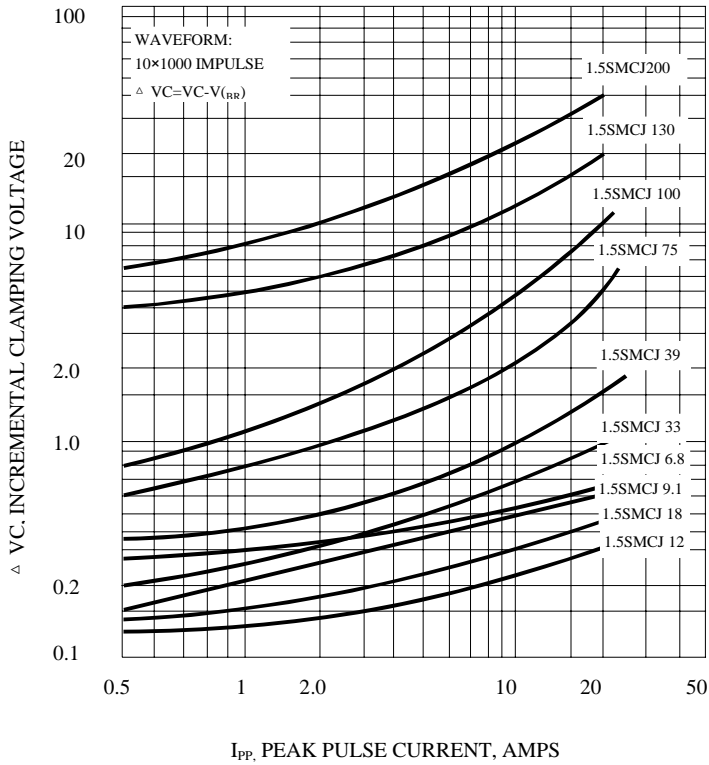


FIG. 8 - INCREMENTAL CLAMPING VOLTAGE CURVE UNIDIRECTIONAL

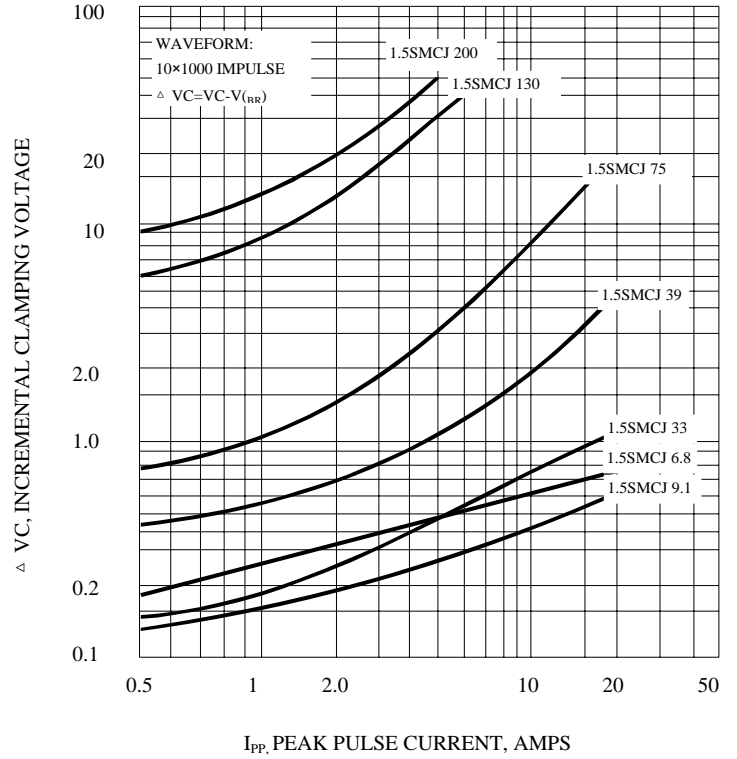


FIG. 9 - INCREMENTAL CLAMPING VOLTAGE CURVE BIDIRECTIONAL

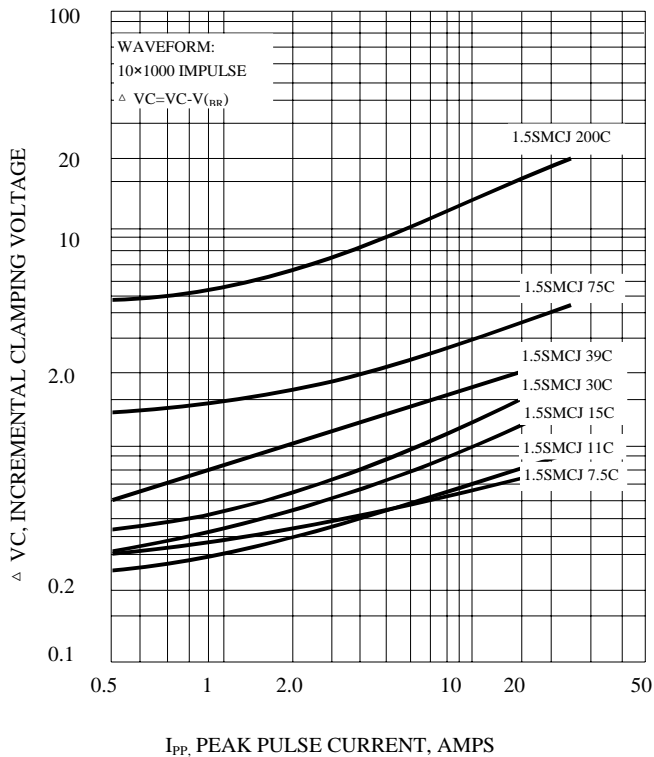


FIG. 10 - INCREMENTAL CLAMPING VOLTAGE CURVE BIDIRECTIONAL

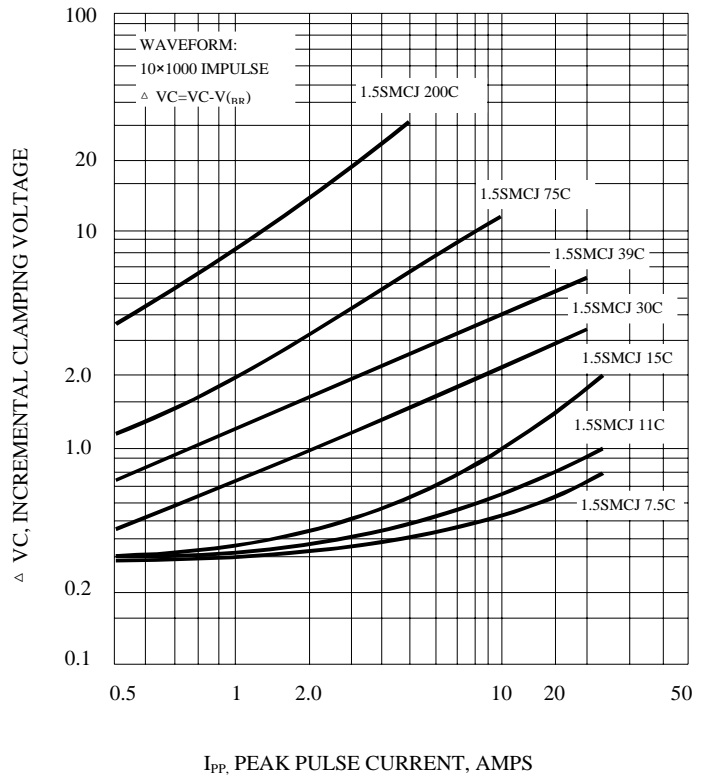
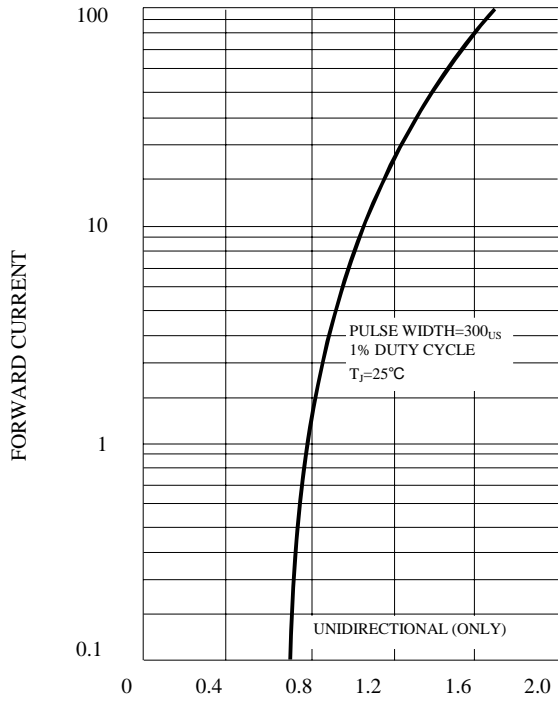


FIG. 11 - INSTANTANEOUS FORWARD VOLTAGE CHARACTERISTICS CURVE



INSTANTANEOUS FORWARD CURRENT, AMPERES

FIG. 12 - BREAKDOWN VOLTAGE TEMPERATURE COEFFICIENT CURVE

