



# Frontier Electronics Corp.

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## 3000W SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR

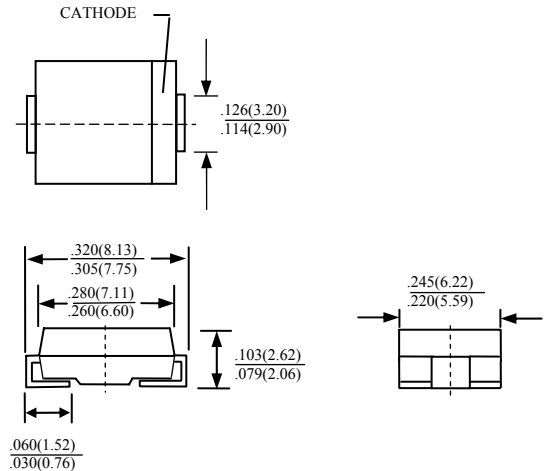
### 3.0SMCJ5.0 THRU 3.0SMCJ170A

#### 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 THAN 1.0 pS FROM 0 VOLTS TO V(BR) MIN
- 3000 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 :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 3000	WATTS
PEAK PULSE CURRENT OF 0N 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)	$I_{FSM}$	250	A
MAXIMUM INSTANTANEOUS FORWARD VOLTAGE AT 25A FOR UNIDIRECTIONAL ONLY (NOTE 3 & 4)	VF	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 8.0x8.0mm 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. VF=3.5V ON 3.0SMCJ5.0 THRU 3.0SMCJ90A DEVICES AND VF=5.0V ON 3.0SMCJ100 THRU 3.0SMCJ170A  
 5. PEAK PULSE POWER WAVE FORM IS 10/1000  $\mu$ S

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 2)	MAX PEAK PULSE SURGE CURRENT $I_{PPM}$ (NOTE 2) (Amps)	MAXIMUM REVERSE LEAKAGE AT $V_{WM}$ $I_b$ ( $\mu$ A)
	UNI	BI		MIN	MAX				
3.0SMCJ5.0	HDD	IDD	5.0	6.40	7.82	10	9.6	312.5	800
3.0SMCJ5.0A	HDE	IDE	5.0	6.40	7.07	10	9.2	326.0	800
3.0SMCJ6.0	HDF	IDF	6.0	6.67	8.15	10	11.4	263.2	800
3.0SMCJ6.0A	HDG	IDG	6.0	6.67	7.37	10	10.3	291.3	800
3.0SMCJ6.5	HDH	IDH	6.5	7.22	8.82	10	12.3	243.9	500
3.0SMCJ6.5A	HDK	IDK	6.5	7.22	7.98	10	11.2	267.9	500
3.0SMCJ7.0	HDL	IDL	7.0	7.78	9.51	10	13.3	225.6	200
3.0SMCJ7.0A	HDM	IDM	7.0	7.78	8.60	10	12.0	250.0	200
3.0SMCJ7.5	HDN	IDN	7.5	8.33	10.2	1.0	14.3	209.8	100
3.0SMCJ7.5A	HDP	IDP	7.5	8.33	9.21	1.0	12.9	232.6	100
3.0SMCJ8.0	HDQ	IDQ	8.0	8.89	10.9	1.0	15.0	200.0	50.0
3.0SMCJ8.0A	HDR	IDR	8.0	8.89	9.83	1.0	13.6	220.6	50.0
3.0SMCJ8.5	HDS	IDS	8.5	9.44	11.5	1.0	15.9	188.8	10.0
3.0SMCJ8.5A	HDT	IDT	8.5	9.44	10.4	1.0	14.4	208.4	10.0
3.0SMCJ9.0	HDU	IDU	9.0	10.0	12.2	1.0	16.9	177.4	5.0
3.0SMCJ9.0A	HDV	IDV	9.0	10.0	11.1	1.0	15.4	194.8	5.0
3.0SMCJ10	HDW	IDW	10.0	11.1	13.6	1.0	18.8	159.6	5.0
3.0SMCJ10A	HDX	IDX	10.0	11.1	12.3	1.0	17.0	176.4	5.0
3.0SMCJ11	HDY	IDY	11.0	12.2	14.9	1.0	20.1	149.2	5.0
3.0SMCJ11A	HDZ	IDZ	11.0	12.2	13.5	1.0	18.2	164.8	5.0
3.0SMCJ12	HED	IED	12.0	13.3	16.3	1.0	22.0	136.4	5.0
3.0SMCJ12A	HEE	IEE	12.0	13.3	14.7	1.0	19.9	150.6	5.0
3.0SMCJ13	HEF	IEF	13.0	14.4	17.6	1.0	23.8	126.0	5.0
3.0SMCJ13A	HEG	IEG	13.0	14.4	15.9	1.0	21.5	139.4	5.0
3.0SMCJ14	HEH	IEH	14.0	15.6	19.1	1.0	25.8	116.2	5.0
3.0SMCJ14A	HEK	IEK	14.0	15.6	17.2	1.0	23.2	129.4	5.0
3.0SMCJ15	HEL	IEL	15.0	16.7	20.4	1.0	26.9	111.6	5.0
3.0SMCJ15A	HEM	IEM	15.0	16.7	18.5	1.0	24.4	123.0	5.0
3.0SMCJ16	HEN	IEN	16.0	17.8	21.8	1.0	28.8	104.2	5.0
3.0SMCJ16A	HEP	IEP	16.0	17.8	19.7	1.0	26.0	115.4	5.0
3.0SMCJ17	HEQ	IEQ	17.0	18.9	23.1	1.0	30.5	98.4	5.0
3.0SMCJ17A	HER	IER	17.0	18.9	20.9	1.0	27.6	108.7	5.0
3.0SMCJ18	HES	IES	18.0	20.0	24.4	1.0	32.2	93.2	5.0
3.0SMCJ18A	HET	IET	18.0	20.0	22.1	1.0	29.2	102.8	5.0
3.0SMCJ20	HEU	IEU	20.0	22.2	27.1	1.0	35.8	83.8	5.0
3.0SMCJ20A	HEV	IEV	20.0	22.2	24.5	1.0	32.4	92.6	5.0
3.0SMCJ22	HEW	IEW	22.0	24.4	29.8	1.0	39.4	76.2	5.0
3.0SMCJ22A	HEX	IEX	22.0	24.4	26.9	1.0	35.5	84.4	5.0
3.0SMCJ24	HEY	IEY	24.0	26.7	32.6	1.0	43.0	69.8	5.0
3.0SMCJ24A	HEZ	IEZ	24.0	26.7	29.5	1.0	38.9	77.2	5.0
3.0SMCJ26	HFD	IFD	26.0	28.9	35.3	1.0	46.6	64.4	5.0
3.0SMCJ26A	HFE	IFE	26.0	28.9	31.9	1.0	42.1	71.2	5.0
3.0SMCJ28	HFF	IFF	28.0	31.1	38.0	1.0	50.0	60.0	5.0
3.0SMCJ28A	HFG	IFG	28.0	31.1	34.4	1.0	45.4	66.0	5.0
3.0SMCJ30	HFH	IFH	30.0	33.3	40.7	1.0	53.5	56.0	5.0
3.0SMCJ30A	HFK	IFK	30.0	33.3	36.8	1.0	48.4	62.0	5.0
3.0SMCJ33	HFL	IFL	33.0	36.7	44.9	1.0	59.0	50.4	5.0
3.0SMCJ33A	HFM	IFM	33.0	36.7	40.6	1.0	53.3	56.2	5.0
3.0SMCJ36	HFN	IFN	36.0	40.0	48.9	1.0	64.3	46.6	5.0
3.0SMCJ36A	HFP	IFP	36.0	40.0	44.2	1.0	58.1	51.6	5.0
3.0SMCJ40	HFQ	IFQ	40.0	44.4	54.3	1.0	71.4	42.0	5.0
3.0SMCJ40A	HFR	IFR	40.0	44.4	49.1	1.0	64.5	46.4	5.0
3.0SMCJ43	HFS	IFS	43.0	47.8	58.4	1.0	76.7	39.2	5.0
3.0SMCJ43A	HFT	IFT	43.0	47.8	52.8	1.0	69.4	43.2	5.0
3.0SMCJ45	HFU	IFU	45.0	50.0	61.1	1.0	80.3	37.4	5.0
3.0SMCJ45A	HFV	IFV	45	50.0	55.3	1.0	72.7	41.2	5.0
3.0SMCJ48	HFV	IFV	48	53.3	65.1	1.0	85.5	35.0	5.0
3.0SMCJ48A	HFX	IFX	48	53.3	58.9	1.0	77.4	38.8	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 2)	MAX PEAK PULSE SURGE CURRENT $I_{PPM}$ (NOTE 2) (Amps)	MAXIMUM REVERSE LEAKAGE AT $V_{WM}$ $I_D$ ( $\mu$ A)
	UNI	BI		MIN	MAX				
3.0SMCJ51	HFY	IFY	51	56.7	69.3	1.0	91.1	37.0	5.0
3.0SMCJ51A	HFZ	IFZ	51	56.7	62.7	1.0	82.4	36.4	5.0
3.0SMCJ54	HGD	IGD	54	60.0	73.3	1.0	96.3	31.2	5.0
3.0SMCJ54A	HGE	IGE	54	60.0	66.3	1.0	87.1	34.4	5.0
3.0SMCJ58	HGF	IGF	58	64.4	78.7	1.0	103.0	39.2	5.0
3.0SMCJ58A	HGG	IGG	58	64.4	71.2	1.0	93.0	32.0	5.0
3.0SMCJ60	HGH	IGH	60	66.7	81.5	1.0	107.0	28.0	5.0
3.0SMCJ60A	HGK	IGK	60	66.7	73.7	1.0	96.0	31.0	5.0
3.0SMCJ64	HGL	IGL	64	71.1	86.9	1.0	114.0	26.4	5.0
3.0SMCJ64A	HGM	IGM	64	71.1	78.6	1.0	103.0	29.2	5.0
3.0SMCJ70	HGN	IGN	70	77.8	95.1	1.0	125.0	24.0	5.0
3.0SMCJ70A	HGP	IGP	70	77.8	86.0	1.0	113.0	26.6	5.0
3.0SMCJ75	HGQ	IGQ	75	83.3	102.0	1.0	134.0	22.4	5.0
3.0SMCJ75A	HGR	IGR	75	83.3	92.1	1.0	121.0	24.8	5.0
3.0SMCJ78	HGS	IGS	78	86.7	106.0	1.0	139.0	21.6	5.0
3.0SMCJ78A	HGT	IGT	78	86.7	95.8	1.0	126.0	23.8	5.0
3.0SMCJ85	HGU	IGU	85	94.4	115.0	1.0	151.0	19.8	5.0
3.0SMCJ85A	HGV	IGV	85	94.4	104.0	1.0	137.0	21.9	5.0
3.0SMCJ90	HGW	IGW	90	100	122.0	1.0	160.0	18.8	5.0
3.0SMCJ90A	HGX	IGX	90	100	111.0	1.0	146.0	20.6	5.0
3.0SMCJ100	HGY	IGY	100	111	136.0	1.0	179.0	16.6	5.0
3.0SMCJ100A	HGZ	IGZ	100	111	123.0	1.0	162.0	18.6	5.0
3.0SMCJ110	HHD	IHD	110	122	149.0	1.0	196.0	15.4	5.0
3.0SMCJ110A	HHE	IHE	110	122	135.0	1.0	177.0	16.8	5.0
3.0SMCJ120	HHF	IHF	120	133	163.0	1.0	214.0	14.0	5.0
3.0SMCJ120A	HHG	IHG	120	133	147.0	1.0	193.0	15.6	5.0
3.0SMCJ130	HHH	IHH	130	144	176.0	1.0	231.0	13.0	5.0
3.0SMCJ130A	HHK	IHK	130	144	159.0	1.0	209.0	14.4	5.0
3.0SMCJ150	HHL	IHL	150	167	204.0	1.0	268.0	11.2	5.0
3.0SMCJ150A	HHM	IHM	150	167	185.0	1.0	243.0	12.4	5.0
3.0SMCJ160	HHN	IHN	160	178	218.0	1.0	287.0	10.4	5.0
3.0SMCJ160A	HHP	IHP	160	178	197.0	1.0	259.0	11.6	5.0
3.0SMCJ170	HHQ	IHQ	170	189	231.0	1.0	304.0	9.8	5.0
3.0SMCJ170A	HHR	IHR	170	189	209.0	1.0	275.0	11.0	5.0

- NOTE :
1.  $V_F=3.5V$  on 3.0SMCJ5.0 thru 90A devices and  $V_F=5.0V$  on 3.0SMCJ100 thru 170A 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 IR 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

# RATINGS AND CHARACTERISTIC CURVES 3.0SMCJ5.0 THRU 3.0SMCJ170A

FIG. 1 - PEAK PULSE POWER RATING CURVE

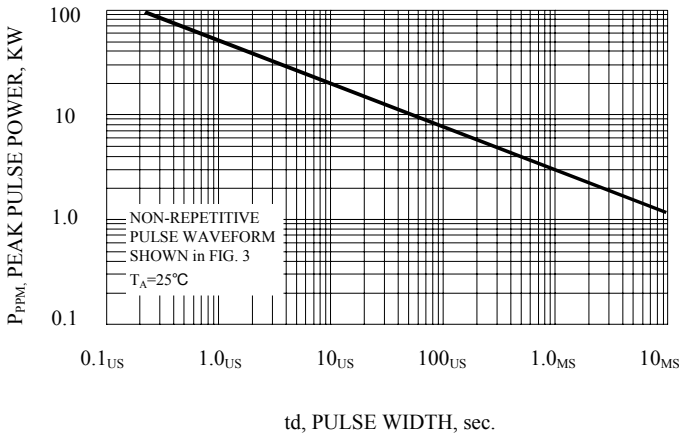


FIG. 2 - PULSE DERATING CURVE

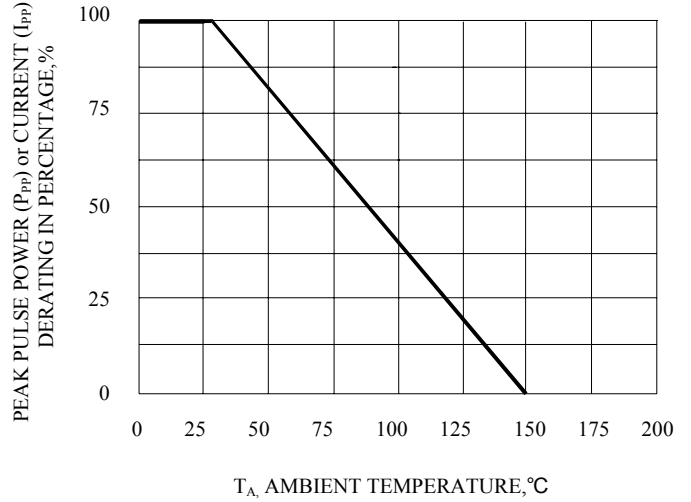


FIG. 3 - PULSE WAVEFORM  
10 / 1000  $\mu$  A

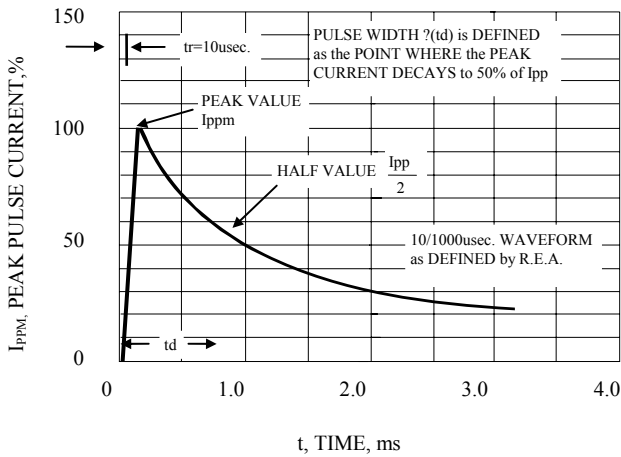


FIG. 4 - TYPICAL JUNCTION CAPACITANCE

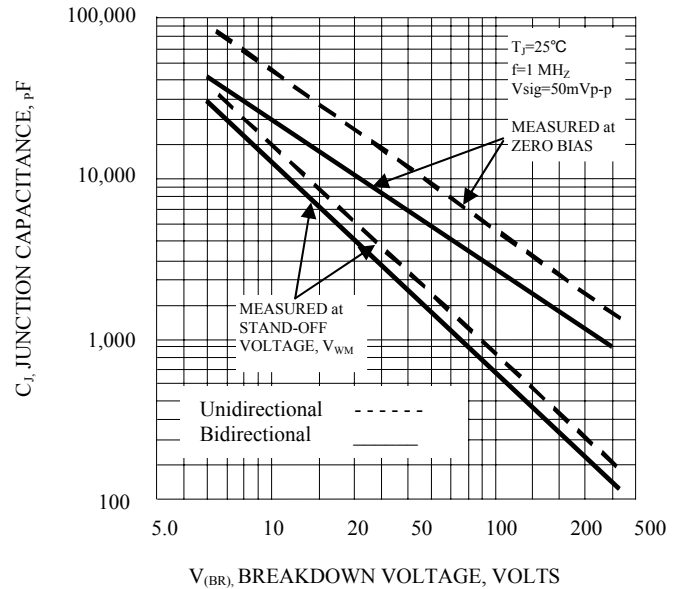


FIG. 5 - PULSE WAVEFORM  
8 / 20  $\mu$  s

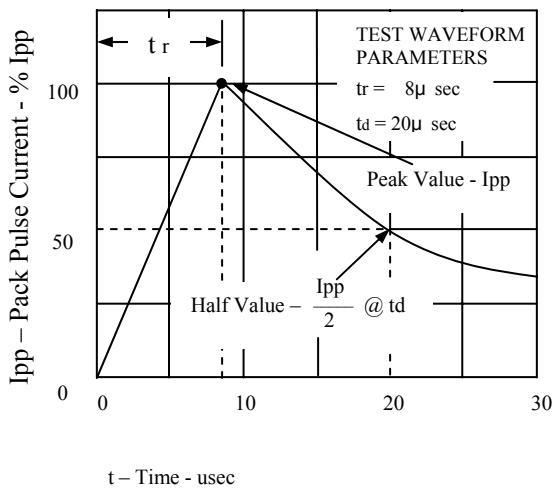


FIG. 6 - MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT

