



# Frontier Electronics Corp.

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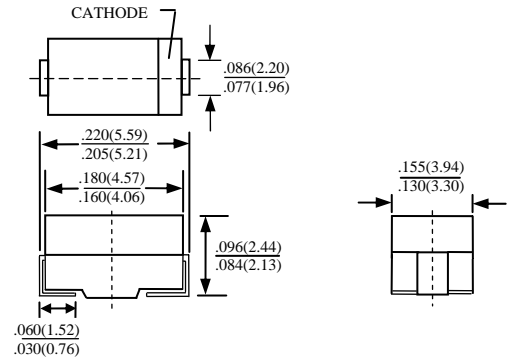
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## 600W SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR P6SMBJ5.0-LFR THRU P6SMBJ188A-LFR

### FEATURES

- OPTIMIZED FOR LAN PROTECTION APPLICATION
- IDEAL FOR ESD PROTECTION OF DATA LINES IN ACCORDANCE WITH IEC 1000-4-2(IEC801-2)
- IDEAL FOR EFT PROTECTION OF DATA LINE IN ACCORDANCE WITH IEC 1000-4-4(IEC801-4)
- EXCELLENT CLAMPING CAPABILITY
- LOW INCREMENTAL SURGE RESISTANCE
- FAST RESPONSE TIME: TYPICALLY LESS THAN 1.0 ps FROM 0 VOLTS TO V(BR) MIN
- 600 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 TERMINAL
- ROHS



### MECHANICAL DATA

- CASE: MOLDED PLASTIC, DO-214AA(SMB), DIMENSIONS IN INCHES AND (MILLIMETERS)
- TERMINALS: SOLDER PLATED
- POLARITY: INDICATED BY CATHODE BAND
- WEIGHT: 0.093 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 600	WATTS
PEAK PULSE CURRENT OF 0N 10/1000 $\mu$ S WAVEFORM (NOTE 1,FIG. 3)	$I_{PPM}$	SEE TABLE 1	A
STEADY STATE POWER DISSIPATION AT $T_L=75^\circ\text{C}$ (NOTE 2)	$P_{M(AV)}$	1.0	WATTS
PEAK FORWARD SURGE CURRENT, 8.3ms SINGLE HALF SINE-WAVE SUPERIMPOSED ON RATED LOAD, UNIDIRECTIONAL ONLY(NOTE 2)	$I_{FSM}$	100	A
MAXIMUM INSTANTANEOUS FORWARD VOLTAGE AT 25.0A 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 5mm<sup>2</sup> 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<sub>F</sub>=3.5V ON P6SMBJ5.0 THRU P6SMBJ90A DEVICES AND V<sub>F</sub>=5.0V ON P6SMBJ100 THRU P6SMBJ188A

DEVICE	DEVICE MARKING CODE		WORKING PEAK REVERSE VOLTAGE $V_{RWM}$ (VOLTS) @IT (mA)	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				
P6SMBJ5.0-LFR	KD	AD	5.0	6.40	7.82	10	9.6	62.5	800
P6SMBJ5.0A-LFR	KE	AE	5.0	6.40	7.07	10	9.2	65.2	800
P6SMBJ6.0-LFR	KF	AF	6.0	6.67	8.15	10	11.4	52.6	800
P6SMBJ6.0A-LFR	KG	AG	6.0	6.67	7.37	10	10.3	58.3	800
P6SMBJ6.5-LFR	KH	AH	6.5	7.22	8.82	10	12.3	48.8	500
P6SMBJ6.5A-LFR	KK	AK	6.5	7.22	7.98	10	11.2	53.6	500
P6SMBJ7.0-LFR	KL	AL	7.0	7.78	9.51	10	13.3	45.1	200
P6SMBJ7.0A-LFR	KM	AM	7.0	7.78	8.60	10	12.0	50.0	200
P6SMBJ7.5-LFR	KN	AN	7.5	8.33	10.2	1.0	14.3	42.0	100
P6SMBJ7.5A-LFR	KP	AP	7.5	8.33	9.21	1.0	12.9	46.5	100
P6SMBJ8.0-LFR	KQ	AQ	8.0	8.89	10.9	1.0	15.0	40.0	50.0
P6SMBJ8.0A-LFR	KR	AR	8.0	8.89	9.83	1.0	13.6	44.1	50.0
P6SMBJ8.5-LFR	KS	AS	8.5	9.44	11.5	1.0	15.9	37.7	10.0
P6SMBJ8.5A-LFR	KT	AT	8.5	9.44	10.4	1.0	14.4	41.7	10.0
P6SMBJ9.0-LFR	KU	AU	9.0	10.0	12.2	1.0	16.9	35.5	5.0
P6SMBJ9.0A-LFR	KV	AV	9.0	10.0	11.1	1.0	15.4	39.0	5.0
P6SMBJ10-LFR	KW	AW	10.0	11.1	13.6	1.0	18.8	31.9	5.0
P6SMBJ10A-LFR	KX	AX	10.0	11.1	12.3	1.0	17.0	35.3	5.0
P6SMBJ11-LFR	KY	AY	11.0	12.2	14.9	1.0	20.1	29.9	5.0
P6SMBJ11A-LFR	KZ	AZ	11.0	12.2	13.5	1.0	18.2	33.0	5.0
P6SMBJ12-LFR	LD	BD	12.0	13.3	16.3	1.0	22.0	27.3	5.0
P6SMBJ12A-LFR	LE	BE	12.0	13.3	14.7	1.0	19.9	30.2	5.0
P6SMBJ13-LFR	LF	BF	13.0	14.4	17.6	1.0	23.8	25.2	5.0
P6SMBJ13A-LFR	LG	BG	13.0	14.4	15.9	1.0	21.5	27.9	5.0
P6SMBJ14-LFR	LH	BH	14.0	15.6	19.1	1.0	25.8	23.3	5.0
P6SMBJ14A-LFR	LK	BK	14.0	15.6	17.2	1.0	23.2	25.9	5.0
P6SMBJ15-LFR	LL	BL	15.0	16.7	20.4	1.0	26.9	22.3	5.0
P6SMBJ15A-LFR	LM	BM	15.0	16.7	18.5	1.0	24.4	24.6	5.0
P6SMBJ16-LFR	LN	BN	16.0	17.8	21.8	1.0	28.8	20.8	5.0
P6SMBJ16A-LFR	LP	BP	16.0	17.8	19.7	1.0	26.0	23.1	5.0
P6SMBJ17-LFR	LQ	BQ	17.0	18.9	23.1	1.0	30.5	19.7	5.0
P6SMBJ17A-LFR	LR	BR	17.0	18.9	20.9	1.0	27.6	21.7	5.0
P6SMBJ18-LFR	LS	BS	18.0	20.0	24.4	1.0	32.2	18.6	5.0
P6SMBJ18A-LFR	LT	BT	18.0	20.0	22.1	1.0	29.2	20.5	5.0
P6SMBJ20-LFR	LU	BU	20.0	22.2	27.1	1.0	35.8	16.8	5.0
P6SMBJ20A-LFR	LV	BV	20.0	22.2	24.5	1.0	32.4	18.5	5.0
P6SMBJ22-LFR	LW	BW	22.0	24.4	29.8	1.0	39.4	15.2	5.0
P6SMBJ22A-LFR	LX	BX	22.0	24.4	26.9	1.0	35.5	16.9	5.0
P6SMBJ24-LFR	LY	BY	24.0	26.7	32.6	1.0	43.0	14.0	5.0
P6SMBJ24A-LFR	LZ	BZ	24.0	26.7	29.5	1.0	38.9	15.4	5.0
P6SMBJ26-LFR	MD	CD	26.0	28.9	35.3	1.0	46.6	12.9	5.0
P6SMBJ26A-LFR	ME	CE	26.0	28.9	31.9	1.0	42.1	14.3	5.0
P6SMBJ28-LFR	MF	CF	28.0	31.1	38.0	1.0	50.0	12.0	5.0
P6SMBJ28A-LFR	MG	CG	28.0	31.1	34.4	1.0	45.4	13.2	5.0
P6SMBJ30-LFR	MH	CH	30.0	33.3	40.7	1.0	53.5	11.2	5.0
P6SMBJ30A-LFR	MK	CK	30.0	33.3	36.8	1.0	48.4	12.4	5.0
P6SMBJ33-LFR	ML	CL	33.0	36.7	44.9	1.0	59.0	10.2	5.0
P6SMBJ33A-LFR	MM	CM	33.0	36.7	40.6	1.0	53.3	11.3	5.0
P6SMBJ36-LFR	MN	CN	36.0	40.0	48.9	1.0	64.3	9.3	5.0
P6SMBJ36A-LFR	MP	CP	36.0	40.0	44.2	1.0	58.1	10.3	5.0
P6SMBJ40-LFR	MQ	CQ	40.0	44.4	54.3	1.0	71.4	8.4	5.0
P6SMBJ40A-LFR	MR	CR	40.0	44.4	49.1	1.0	64.5	9.3	5.0
P6SMBJ43-LFR	MS	CS	43.0	47.8	58.4	1.0	76.7	7.8	5.0
P6SMBJ43A-LFR	MT	CT	43.0	47.8	52.8	1.0	69.4	8.6	5.0
P6SMBJ45-LFR	MU	CU	45.0	50.0	61.1	1.0	80.3	7.5	5.0
P6SMBJ45A-LFR	MV	CV	45	50.0	55.3	1.0	72.7	8.3	5.0
P6SMBJ48-LFR	MW	CW	48	53.3	65.1	1.0	85.5	7.0	5.0
P6SMBJ48A-LFR	MX	CX	48	53.3	58.9	1.0	77.4	7.8	5.0

DEVICE	DEVICE MARKING CODE		WORKING PEAK REVERSE VOLTAGE V <sub>RWM</sub> (VOLTS) @IT (mA)	BREAKDOWN VOLTAGE V <sub>(BR)</sub> (VOLTS) at I <sub>T</sub>		TEST CURRENT I <sub>T</sub> (mA)	MAXIMUM Clamping VOLTAGE AT I <sub>PPM</sub> VC(Volts) (Note 5)	MAX PEAK PULSE SURGE CURRENT I <sub>PPM</sub> (NOTE 5) (Amps)	MAXIMUM REVERSE LEAKAGE AT V <sub>WM</sub> I <sub>D</sub> (μA)
	UNI	BI		MIN	MAX				
P6SMBJ5-LFR	MY	CY	51	56.7	69.3	1.0	91.1	6.6	5.0
P6SMBJ51A-LFR	MZ	CZ	51	56.7	62.7	1.0	82.4	7.3	5.0
P6SMBJ54-LFR	ND	DD	54	60.0	73.3	1.0	96.3	6.2	5.0
P6SMBJ54A-LFR	NE	DE	54	60.0	66.3	1.0	87.1	6.9	5.0
P6SMBJ58-LFR	NF	DF	58	64.4	78.7	1.0	103.0	5.8	5.0
P6SMBJ58A-LFR	NG	DG	58	64.4	71.2	1.0	93.6	6.4	5.0
P6SMBJ60-LFR	NH	DH	60	66.7	81.5	1.0	107.0	5.6	5.0
P6SMBJ60A-LFR	NK	DK	60	66.7	73.7	1.0	96.8	6.2	5.0
P6SMBJ64-LFR	NL	DL	64	71.1	86.9	1.0	114.0	5.3	5.0
P6SMBJ64A-LFR	NM	DM	64	71.1	78.6	1.0	103.0	5.8	5.0
P6SMBJ70-LFR	NN	DN	70	77.8	95.1	1.0	125.0	4.8	5.0
P6SMBJ70A-LFR	NP	DP	70	77.8	86.0	1.0	113.0	5.3	5.0
P6SMBJ75-LFR	NQ	DQ	75	83.3	102.0	1.0	134.0	4.5	5.0
P6SMBJ75A-LFR	NR	DR	75	83.3	92.1	1.0	121.0	5.0	5.0
P6SMBJ78-LFR	NS	DS	78	86.7	106.0	1.0	139.0	4.3	5.0
P6SMBJ78A-LFR	NT	DT	78	86.7	95.8	1.0	126.0	4.8	5.0
P6SMBJ85-LFR	NU	DU	85	94.4	115.0	1.0	151.0	4.0	5.0
P6SMBJ85A-LFR	NV	DV	85	94.4	104.0	1.0	137.0	4.4	5.0
P6SMBJ90-LFR	NW	DW	90	100	122.0	1.0	160.0	3.8	5.0
P6SMBJ90A-LFR	NX	DX	90	100	111.0	1.0	146.0	4.1	5.0
P6SMBJ100-LFR	NY	DY	100	111	136.0	1.0	179.0	3.4	5.0
P6SMBJ100A-LFR	NZ	DZ	100	111	123.0	1.0	162.0	3.7	5.0
P6SMBJ110-LFR	PD	ED	110	122	149.0	1.0	196.0	3.1	5.0
P6SMBJ110A-LFR	PE	EE	110	122	135.0	1.0	177.0	3.4	5.0
P6SMBJ120-LFR	PF	EF	120	133	163.0	1.0	214.0	2.8	5.0
P6SMBJ120A-LFR	PG	EG	120	133	147.0	1.0	193.0	3.1	5.0
P6SMBJ130-LFR	PH	EH	130	144	176.0	1.0	231.0	2.6	5.0
P6SMBJ130A-LFR	PK	EK	130	144	159.0	1.0	209.0	2.9	5.0
P6SMBJ150-LFR	PL	EL	150	167	204.0	1.0	268.0	2.2	5.0
P6SMBJ150A-LFR	PM	EM	150	167	185.0	1.0	243.0	2.5	5.0
P6SMBJ160-LFR	PN	EN	160	178	218.0	1.0	287.0	2.1	5.0
P6SMBJ160A-LFR	PP	EP	160	178	197.0	1.0	259.0	2.3	5.0
P6SMBJ170-LFR	PQ	EQ	170	189	231.0	1.0	304.0	2.0	5.0
P6SMBJ170A-LFR	PR	ER	170	189	209.0	1.0	275.0	2.2	5.0
P6SMBJ188-LFR	PT	ET	188	209	255.0	1.0	344.0	1.7	5.0
P6SMBJ188A-LFR	PS	ES	188	209	231.0	1.0	328.0	2.0	5.0

- NOTE:
1. VF=3.5V on P6SMBJ5.0 thru 90A devices and VF=5.0V on P6SMBJ100 thru 188A devices at IF=25A on ½ Square or Equivalent Sine Wave. PW = 8.3ms , Duty Cycle = 4 Pulses per Minute Maximum
  2. For Bipolar types with VR of 10 volts and under , the IR limit is doubled
  3. Mounted on 5.0mm<sup>2</sup> copper pads to each terminal.
  4. For Bidirectional use C suffix for 10% tolerance , CA suffix for 5% tolerance

# RATINGS AND CHARACTERISTIC CURVES P6SMBJ5.0-LFR THRU P6SMBJ188A-LFR

FIG. 1 - PEAK PULSE POWER RATING CURVE

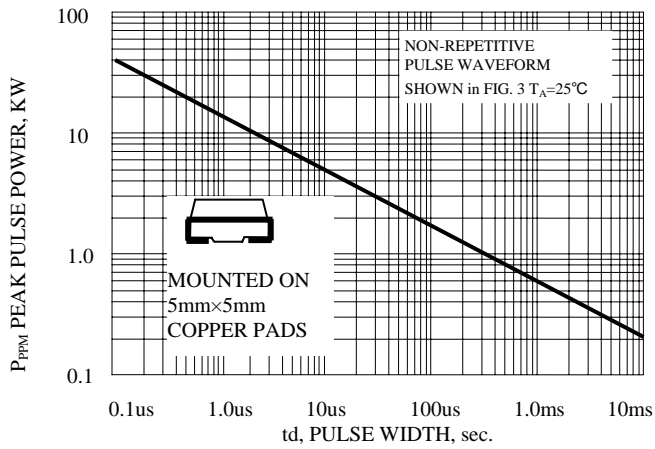


FIG. 2 - PULSE DERATING CURVE

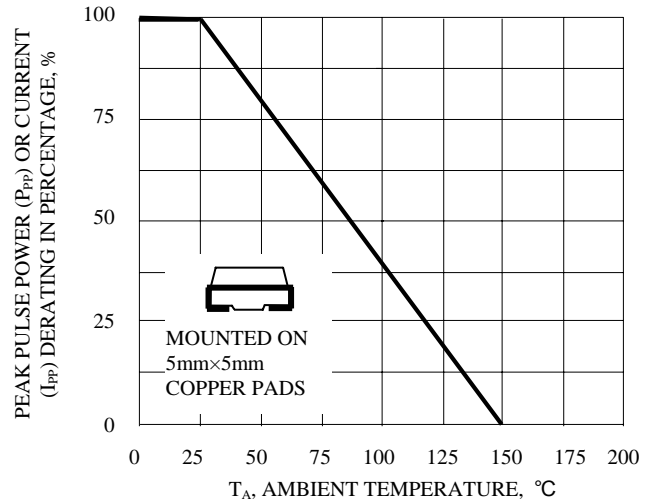


FIG. 3 - PULSE WAVEFORM

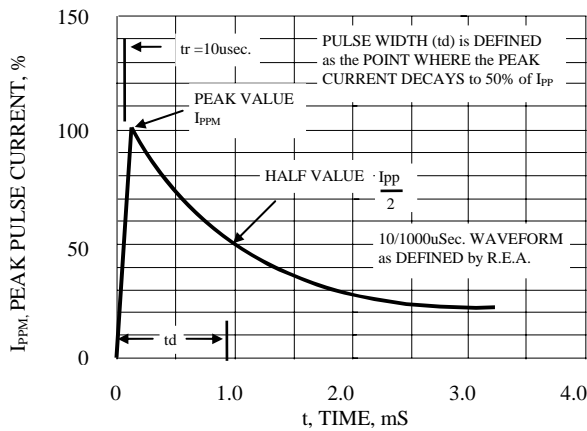


FIG. 4 - TYPICAL JUNCTION CAPACITANCE UNIDIRECTIONAL

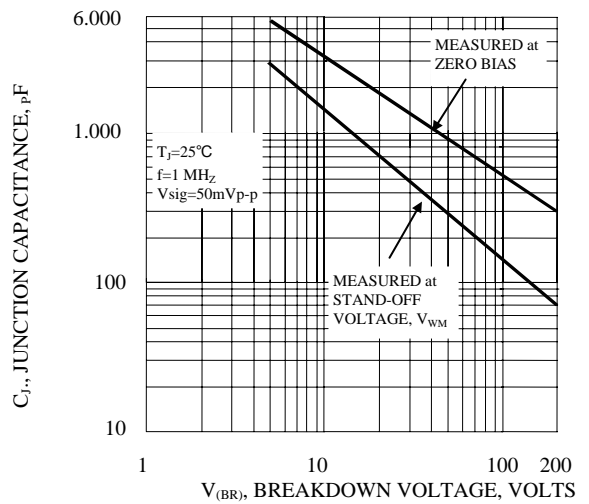


FIG. 5 - TYPICAL JUNCTION CAPACITANCE BIDIRECTIONAL

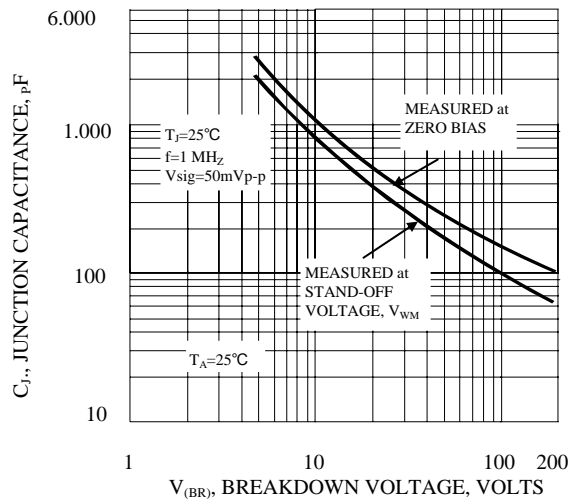


FIG. 6 - MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT UNIDIRECTIONAL

