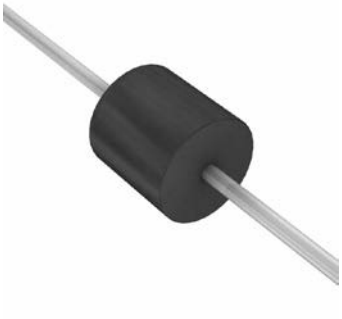
Power TVS in DO-15



Features

- 600Watts peak pulse power (10/1000μs)
- Class passivated junction
- High accuracy, 5% tolerance
- Uni and Bidirectional unit
- Low clamping voltage
- Low Leakage current
- Very fast response time

Mechanical Data

- **Case:** DO-15 (plastic package).
  Lead free; RoHS compliant
- **Molding Compound Flammability Rating:**
  UL 94 V-0
- **Terminals:** High temperature soldering guaranteed:
  260 °C/10 sec. at terminals

Applications

- Computers
- Telecom systems
- Industrial equipments
- Consumer electronic applications
- Other VCC bus and I/O interfaces

Absolute Maximum Ratings

Ratings at 25 °C, ambient temperature unless otherwise specified

Parameter	Symbols	Value	Unit
Peak power dissipation with a 10/1000us waveform (1) (Fig. 1)	P_{PPM}	600	W
Peak pulse current with a 10/1000us waveform (1)	I_{PPM}	See Next Table	A
Steady state power dissipation at T_L =75℃, lead lengths 0.375" (9.5mm)(2)	$P_{M(AV)}$	5.0	W
Peak forward surge current 8.3ms single half sine-wave (3)	I_{FSM}	100	A
Maximum instantaneous forward voltage @ 50A for unidirectional only(4)	V_F	3.5/5.0	V
Typical thermal resistance junction-to-lead	$R_{\theta JL}$	20	℃/W
Typical thermal resistance junction-to-ambient	$R_{\theta JA}$	75	℃/W
Operating junction and storage temperature range	T_J ,T_{STG}	-55 to +150	℃

Notes:1.Non-repetitive current pulse, per Fig.3 and derated above T_A=25℃ per Fig. 2

2. Mounted on copper pad area of 1.6 x 1.6” (40 x 40mm) per Fig. 5

3. Meas ed on 8.3ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum

4. $_F$=3.5 V for devices of $V_{(BR)}$ < 220V, and V_F=5.0 Volt max. for devices of $V_{(BR)}$>220V

Electrical Characteristics

(T_A=25℃, Unless otherwise specified.)

Part Number	Direction	Breakdown voltage $V_{(BR)}$ (Volts) (1)		Test current at I_T (mA)	Stand-off voltage V_{WM} (Volts)	Maximum reverse leakage at V_{WM} I_D (3) (uA)	Maximum peak pulse current I_{PPM} (2) (A)	Maximum clamping voltage at I_{PPM} V_C (Volts)	Maximum temperature coefficient of V_{BR} (% /℃)
		Min.	Max.						
P6KE6.8A	Uni-Dir	6.45	7.14	10	5.80	1000	57.1	10.5	0.057
P6KE6.8CA	Bi-Dir	6.45	7.14	10	5.80	1000	57.1	10.5	0.057
P6KE7.5A	Uni-Dir	7.13	7.88	10	6.40	500	53.1	11.3	0.061
P6KE7.5CA	Bi-Dir	7.13	7.88	10	6.40	500	53.1	11.3	0.061
P6KE8.2A	Uni-Dir	7.79	8.61	10	7.02	200	49.6	12.1	0.065
P6KE8.2CA	Bi-Dir	7.79	8.61	10	7.02	200	49.6	12.1	0.065
P6KE9.1A	Uni-Dir	8.65	9.55	1.0	7.78	50	44.8	13.4	0.068
P6KE9.1CA	Bi-Dir	8.65	9.55	1.0	7.78	50	44.8	13.4	0.068
P6KE10A	Uni-Dir	9.50	10.5	1.0	8.55	10	41.4	14.5	0.073
P6KE10CA	Bi-Dir	9.50	10.5	1.0	8.55	10	41.4	14.5	0.073
P6KE11A	Uni-Dir	10.5	11.6	1.0	9.40	5.0	38.5	15.6	0.075
P6KE11CA	Bi-Dir	10.5	11.6	1.0	9.40	5.0	38.5	15.6	0.075
P6KE12A	Uni-Dir	11.4	12.6	1.0	10.2	5.0	35.9	16.7	0.078
P6KE12CA	Bi-Dir	11.4	12.6	1.0	10.2	5.0	35.9	16.7	0.078
P6KE13A	Uni-Dir	12.4	13.7	1.0	11.1	5.0	33.0	18.2	0.081
P6KE13CA	Bi-Dir	12.4	13.7	1.0	11.1	5.0	33.0	18.2	0.081
P6KE15A	Uni-Dir	14.3	15.8	1.0	12.8	1.0	28.3	21.2	0.084
P6KE15CA	Bi-Dir	14.3	15.8	1.0	12.8	1.0	28.3	21.2	0.084
P6KE16A	Uni-Dir	15.2	16.8	1.0	13.6	1.0	26.7	22.5	0.086
P6KE16CA	Bi-Dir	15.2	16.8	1.0	13.6	1.0	26.7	22.5	0.086
P6KE18A	Uni-Dir	17.1	18.9	1.0	15.3	1.0	23.8	25.2	0.088
P6KE18CA	Bi-Dir	17.1	18.9	1.0	15.3	1.0	23.8	25.2	0.088
P6KE20A	Uni-Dir	19.0	21.0	1.0	17.1	1.0	21.7	27.7	0.090
P6KE20CA	Bi-Dir	19.0	21.0	1.0	17.1	1.0	21.7	27.7	0.090
P6KE22A	Uni-Dir	20.9	23.1	1.0	18.8	1.0	19.6	30.6	0.092
P6KE22CA	Bi-Dir	20.9	23.1	1.0	18.8	1.0	19.6	30.6	0.092
P6KE24A	Uni-Dir	22.8	25.2	1.0	20.5	1.0	18.1	33.2	0.094
P6KE24CA	Bi-Dir	22.8	25.2	1.0	20.5	1.0	18.1	33.2	0.094
P6KE27A	Uni-Dir	25.7	28.4	1.0	23.1	1.0	16.0	37.5	0.096
P6KE27CA	Bi-Dir	25.7	28.4	1.0	23.1	1.0	16.0	37.5	0.096
P6KE30A	Uni-Dir	28.5	31.5	1.0	25.6	1.0	14.5	41.4	0.097
P6KE30CA	Bi-Dir	28.5	31.5	1.0	25.6	1.0	14.5	41.4	0.097
P6KE33A	Uni-Dir	31.4	34.7	1.0	28.2	1.0	13.1	45.7	0.098
P6KE33CA	Bi-Dir	31.4	34.7	1.0	28.2	1.0	13.1	45.7	0.098
P6KE36A	Uni-Dir	34.2	37.8	1.0	30.8	1.0	12.0	49.9	0.099
P6KE36CA	Bi-Dir	34.2	37.8	1.0	30.8	1.0	12.0	49.9	0.099
P6KE39A	Uni-Dir	37.1	41.0	1.0	33.3	1.0	11.1	53.9	0.100
P6KE39CA	Bi-Dir	37.1	41.0	1.0	33.3	1.0	11.1	53.9	0.100
P6KE43A	Uni-Dir	40.9	45.2	1.0	36.8	1.0	10.1	59.3	0.101
P6KE43CA	Bi-Dir	40.9	45.2	1.0	36.8	1.0	10.1	59.3	0.101
P6KE47A	Uni-Dir	44.7	49.4	1.0	40.2	1.0	9.3	64.8	0.101

Part Number	Direction	Breakdown voltage $V_{(BR)}$ (Volts) [1]		Test current at I_T (mA)	Stand-off voltage V_{WM} (Volts)	Maximum reverse leakage at V_{WM} I_D [3] (uA)	Maximum peak pulse current I_{PPM} [2] (A)	Maximum clamping voltage at I_{PPM} V_C (Volts)	Maximum temperature coefficient of V_{BR} (% /℃)
		Min.	Max.						
P6KE47CA	Bi-Dir	44.7	49.4	1.0	40.2	1.0	9.3	64.8	0.101
P6KE51A	Uni-Dir	48.5	53.6	1.0	43.6	1.0	8.6	70.1	0.102
P6KE51CA	Bi-Dir	48.5	53.6	1.0	43.6	1.0	8.6	70.1	0.102
P6KE56A	Uni-Dir	53.2	58.8	1.0	47.8	1.0	7.8	77.0	0.103
P6KE56CA	Bi-Dir	53.2	58.8	1.0	47.8	1.0	7.8	77.0	0.103
P6KE62A	Uni-Dir	58.9	65.1	1.0	53.0	1.0	7.1	85.0	0.104
P6KE62CA	Bi-Dir	58.9	65.1	1.0	53.0	1.0	7.1	85.0	0.104
P6KE68A	Uni-Dir	64.6	71.4	1.0	58.1	1.0	6.5	92.0	0.104
P6KE68CA	Bi-Dir	64.6	71.4	1.0	58.1	1.0	6.5	92.0	0.104
P6KE75A	Uni-Dir	71.3	78.8	1.0	64.1	1.0	5.8	103	0.105
P6KE75CA	Bi-Dir	71.3	78.8	1.0	64.1	1.0	5.8	103	0.105
P6KE82A	Uni-Dir	77.9	86.1	1.0	70.1	1.0	5.3	113	0.105
P6KE82CA	Bi-Dir	77.9	86.1	1.0	70.1	1.0	5.3	113	0.105
P6KE91A	Uni-Dir	86.5	95.5	1.0	77.8	1.0	4.8	125	0.106
P6KE91CA	Bi-Dir	86.5	95.5	1.0	77.8	1.0	4.8	125	0.106
P6KE100A	Uni-Dir	95.0	105	1.0	85.5	1.0	4.4	137	0.106
P6KE100CA	Bi-Dir	95.0	105	1.0	85.5	1.0	4.4	137	0.106
P6KE110A	Uni-Dir	105	116	1.0	94.0	1.0	3.9	152	0.107
P6KE110CA	Bi-Dir	105	116	1.0	94.0	1.0	3.9	152	0.107
P6KE120A	Uni-Dir	114	126	1.0	102	1.0	3.6	165	0.107
P6KE120CA	Bi-Dir	114	126	1.0	102	1.0	3.6	165	0.107
P6KE130A	Uni-Dir	124	137	1.0	111	1.0	3.4	179	0.107
P6KE130CA	Bi-Dir	124	137	1.0	111	1.0	3.4	179	0.107
P6KE150A	Uni-Dir	143	158	1.0	128	1.0	2.9	207	0.108
P6KE150CA	Bi-Dir	143	158	1.0	128	1.0	2.9	207	0.108
P6KE160A	Uni-Dir	152	168	1.0	136	1.0	2.7	219	0.108
P6KE160CA	Bi-Dir	152	168	1.0	136	1.0	2.7	219	0.108
P6KE170A	Uni-Dir	162	179	1.0	145	1.0	2.6	234	0.108
P6KE170CA	Bi-Dir	162	179	1.0	145	1.0	2.6	234	0.108
P6KE180A	Uni-Dir	171	189	1.0	154	1.0	2.4	246	0.108
P6KE180CA	Bi-Dir	171	189	1.0	154	1.0	2.4	246	0.108
P6KE200A	Uni-Dir	190	210	1.0	171	1.0	2.2	274	0.108
P6KE200CA	Bi-Dir	190	210	1.0	171	1.0	2.2	274	0.108
P6KE220A	Uni-Dir	209	231	1.0	185	1.0	1.8	328	0.108
P6KE220CA	Bi-Dir	209	231	1.0	185	1.0	1.8	328	0.108
P6KE250A	Uni-Dir	237	263	1.0	214	1.0	1.7	344	0.110
P6KE250CA	Bi-Dir	237	263	1.0	214	1.0	1.7	344	0.110
P6KE300A	Uni-Dir	285	315	1.0	256	1.0	1.4	414	0.110
P6KE300CA	Bi-Dir	285	315	1.0	256	1.0	1.4	414	0.110
P6KE350A	Uni-Dir	333	368	1.0	300	1.0	1.2	482	0.110
P6KE350CA	Bi-Dir	333	368	1.0	300	1.0	1.2	482	0.110
P6KE400A	Uni-Dir	380	420	1.0	342	1.0	1.1	548	0.110
P6KE400CA	Bi-Dir	380	420	1.0	342	1.0	1.1	548	0.110
P6KE440A	Uni-Dir	418	462	1.0	376	1.0	1.0	602	0.110
P6KE440CA	Bi-Dir	418	462	1.0	376	1.0	1.0	602	0.110

Part Number	Direction	Breakdown voltage $V_{(BR)}$ (Volts) (1)		Test current at I_T (mA)	Stand-off voltage V_{WM} (Volts)	Maximum reverse leakage at V_{WM} I_D (3) (uA)	Maximum peak pulse current I_{PPM} (2) (A)	Maximum clamping voltage at I_{PPM} V_C (Volts)	Maximum temperature coefficient of V_{BR} (% /℃)
		Min.	Max.						
P6KE480A	Uni-Dir	456	504	1.0	408	1.0	0.9	658	0.110
P6KE480CA	Bi-Dir	456	504	1.0	408	1.0	0.9	658	0.110
P6KE510A	Uni-Dir	485	535	1.0	434	1.0	0.9	698	0.110
P6KE510CA	Bi-Dir	485	535	1.0	434	1.0	0.9	698	0.110
P6KE530A	Uni-Dir	503.5	556.5	1.0	450	1.0	0.8	725	0.110
P6KE530CA	Bi-Dir	503.5	556.5	1.0	450	1.0	0.8	725	0.110
P6KE540A	Uni-Dir	513	567	1.0	459	1.0	0.8	740	0.110
P6KE540CA	Bi-Dir	513	567	1.0	459	1.0	0.8	740	0.110
P6KE550A	Uni-Dir	522.5	577.5	1.0	467	1.0	0.8	760	0.110
P6KE550CA	Bi-Dir	522.5	577.5	1.0	467	1.0	0.8	760	0.110

Notes:1. $V_{(BR)}$ measured after I_T applied for 300us, I_T=square wave pulse or equivalent
2. Surge current waveform per Fig. 3 and derate per Fig. 2
3. For bidirectional types with V_{WM} of 10 volts and less, the I_D limit is doubled
4. All terms and symbols are consistent with ANSI/IEEE C62.35
5. For parts without A, the V_{BR} is±10%

Typical Characteristics (T_{amb} = 25 °C unless otherwise specified)

Fig.1 Peak Pulse Power Rating Curve

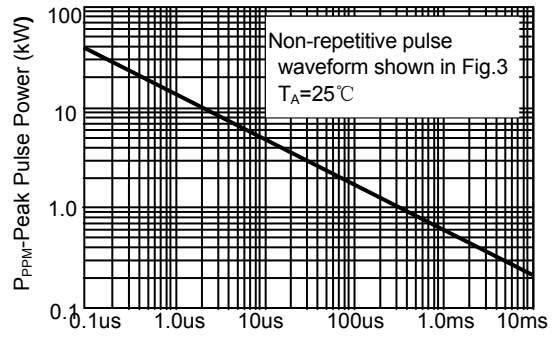


Fig.2 Maximum Non-Repetitive Surge Current

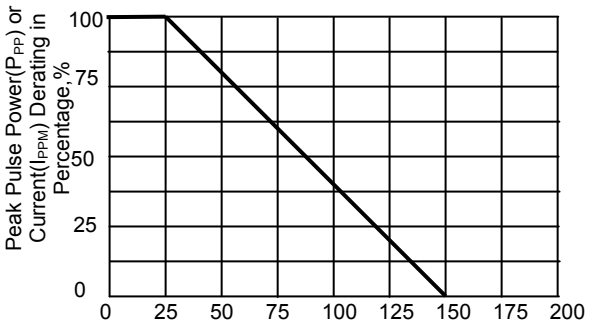


Fig.3 Typical Forward Characteristics

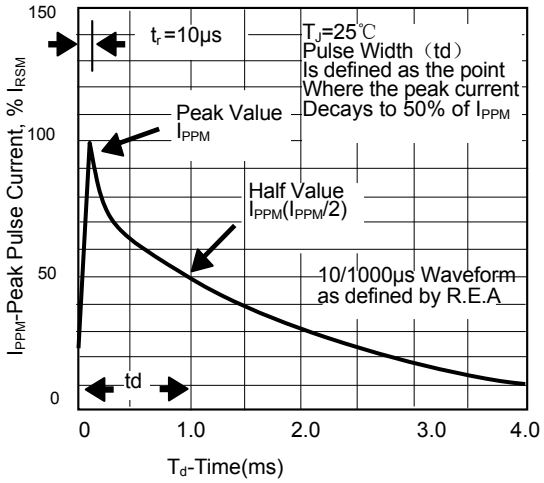


Fig.4 Typ. Junction Capacitance Uni-Directional

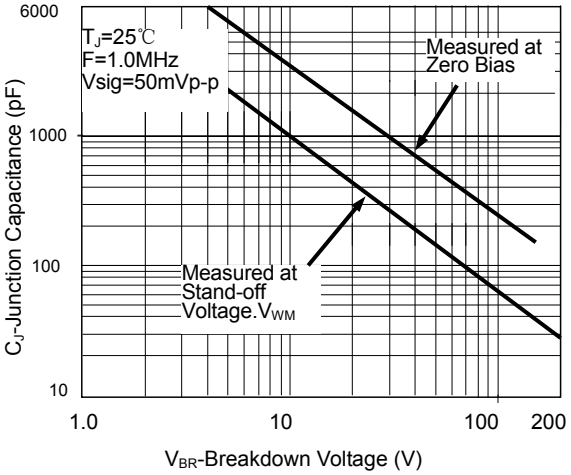


Fig.5 Steady State Power Derating Curve

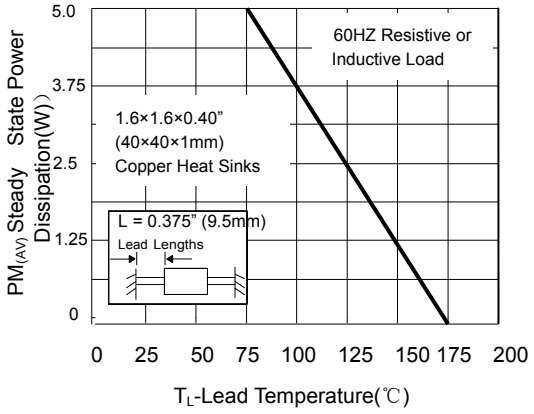


Fig.6 Max. Non-Repetitive Forward Surge Currer Uni-Directional Only

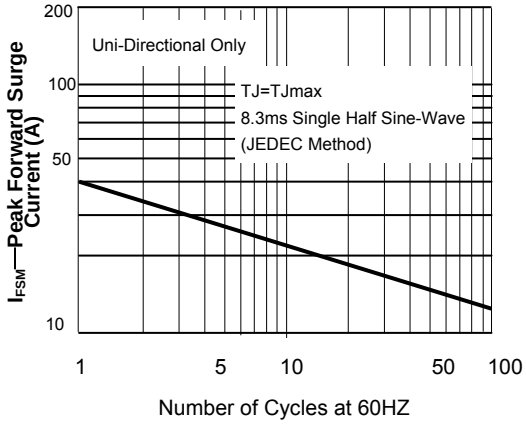


Fig.7 Typical Reverse Leakage Characteristics

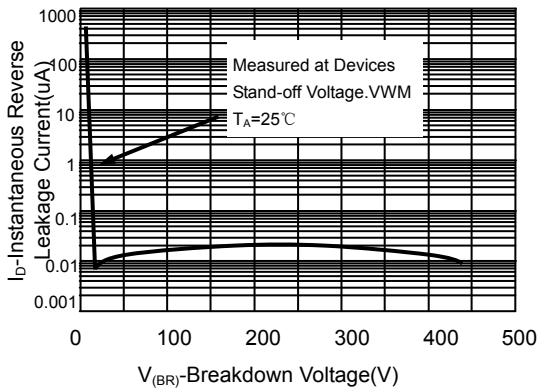
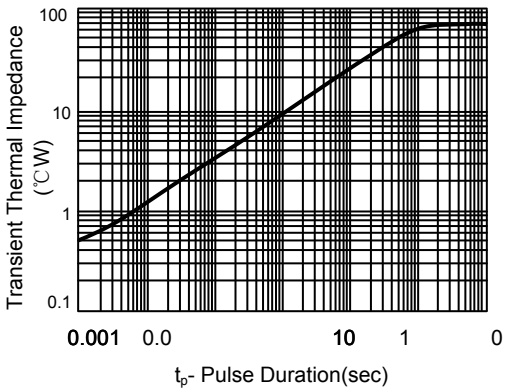
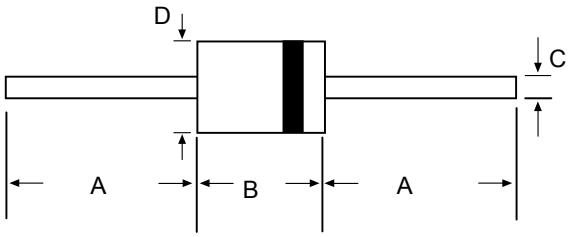


Fig.8 Typ. Transient Thermal Impedance

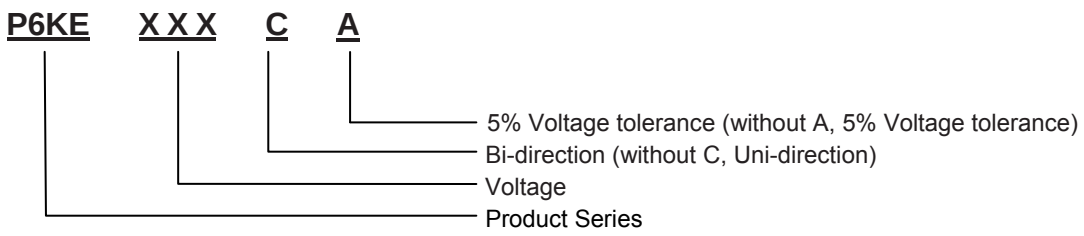


Package Dimensions



Dimensions	Milimeters	
	Min	Max
A	25.4	-
B	5.8	7.6
C	0.7	0.9
D	2.6	3.1

Part number system



Ordering inormation

Order code	Package	Packaging option	Base quantity	Packaging specification
P6KExxA(CA)	DO-15	Tape and BOX	3000pcs	EIA STD RS-481

Reision history

Date	Revision	Changes
23-May-2012	1.0	Initial release

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