

# MDE Semiconductor, Inc.

78-150 Calle Tampico, Unit 210, La Quinta, CA. U.S.A. 92253 Tel: 760-564-8656 • Fax: 760-564-2414

## P4KE SERIES

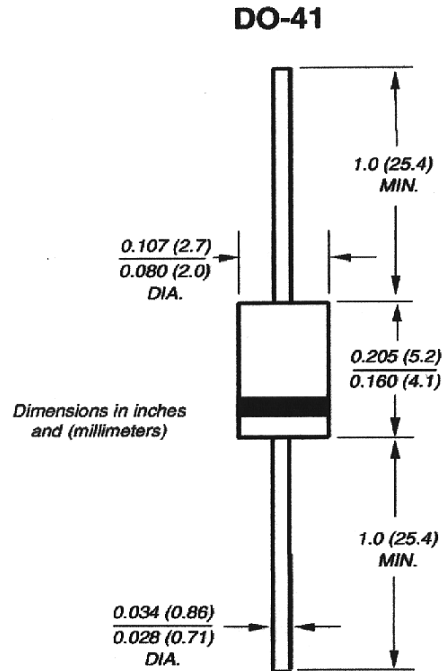
### GLASS PASSIVATED JUNCTION TRANSIENT VOLTAGE SUPPRESSOR VOLTAGE-6.8 TO 440 Volts 400 Watt Peak Pulse Power

#### FEATURES

- Plastic package has Underwriters Laboratory Flammability Classification 94 V-O
- Glass passivated chip junction in DO-41 package
- 400W surge capability at 1ms
- Excellent clamping capability
- Low zener impedance
- Low incremental surge resistance
- Excellent clamping capability
- Fast response time: typically less than 1.0 ps from 0 volts to BV min
- Typical IR less than 1μA above 10V
- High temperature soldering guaranteed: 300°C/10 seconds/ .375", (9.5mm) lead length, 5lbs., (2.3kg) tension

#### MECHANICAL DATA

Case: JEDEC DO-41 Molded plastic  
 Terminals: Axial leads, solderable per MIL-STD-750, Method 2026  
 Polarity: Color band denoted positive end (cathode) except Bipolar  
 Mounting Position: Any  
 Weight: 0.012 ounces, 0.3 grams



#### DEVICES FOR BIPOLAR APPLICATIONS

For Bidirectional use C or CA Suffix for types P4KE6.80 thru types P4KE440 (e.g. P4KE6.8C, P4KE440CA)  
 Electrical characteristics apply in both directions.

#### MAXIMUM RATINGS AND CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

Single phase, half wave, 60Hz, resistive or inductive load.

For Capacitive load, derate current by 20%

RATING	SYMBOL	VALUE	UNITS
Peak Pulse Power Dissipation at TA = 25 °C, TP = 1ms (NOTE 1)	P <sub>ppm</sub>	Minimum 400	Watts
Peak Pulse Current of on 10/1000 μs waveform (Note 1)	I <sub>ppm</sub>	SEE TABLE 1	Amps
Steady State Power Dissipation at TL = 75°C Lead lengths .375", 9.5mm (Note 2)	P <sub>m(AV)</sub>	1.0	Watts
Peak Forward Surge Current, 8.3ms Single Half Sine-wave Superimposed on Rated Load, (JEDEC Method)(Note 3)	I <sub>FSM</sub>	40	Amps
Operatings and Storage Temperature Range	T <sub>j</sub> , T <sub>stg</sub>	-55 +175	°C

**NOTES:**

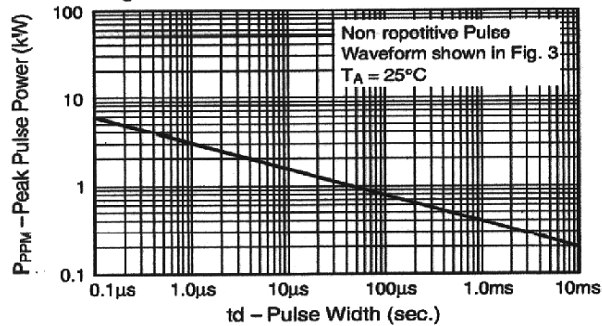
1. Non-repetitive current pulse, per Fig.3 and derated above Ta=25 °C per Fig.2.
2. Mounted on Copper Pad area of 1.6x1.6" (40x40mm) per Fig.5.
3. 8.3ms single half sine-wave, or equivalent square wave, Duty cycle=4 pulses per minutes maximum.

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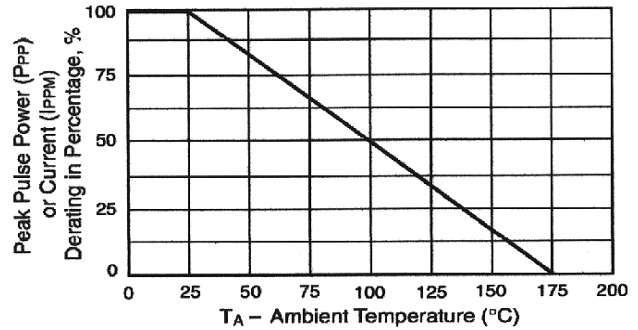
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## RATING AND CHARACTERISTIC CURVES P4KE SERIES

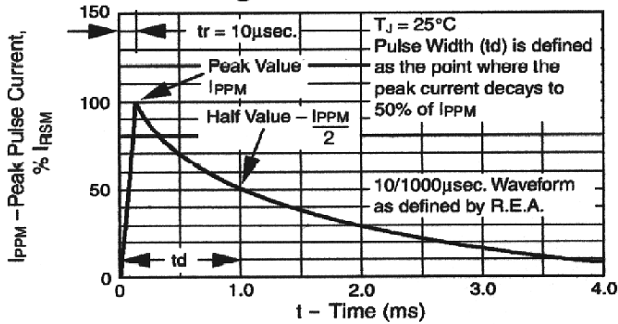
**Fig. 1 – Peak Pulse Power Rating Curve**



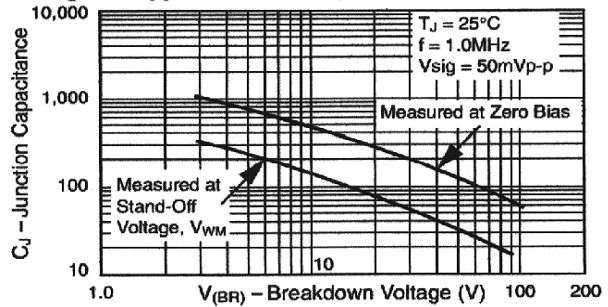
**Fig. 2 – Pulse Derating Curve**



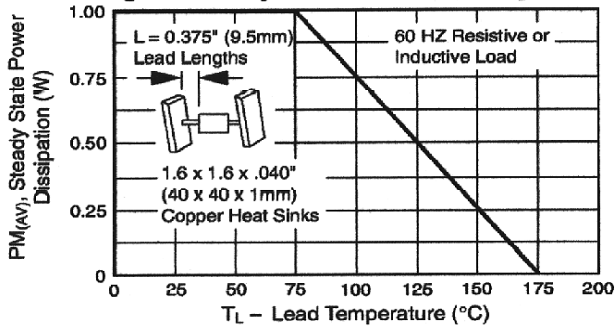
**Fig. 3 – Pulse Waveform**



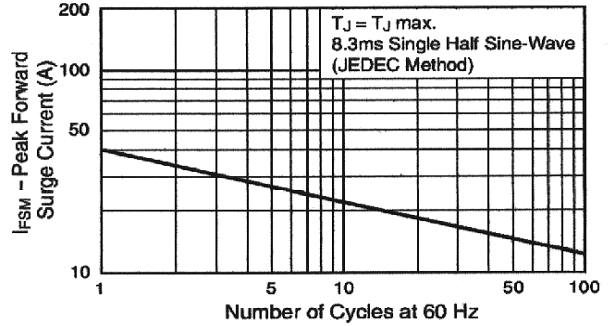
**Fig. 4 – Typ. Junction Capacitance Uni-Directional**



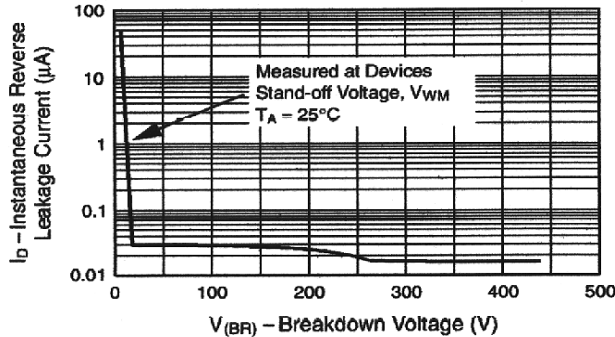
**Fig. 5 – Steady State Power Derating Curve**



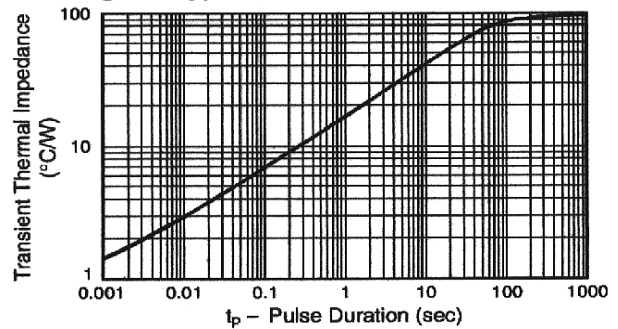
**Fig. 6 - Max. Non-Repetitive Forward Surge Current Uni-Directional Only**



**Fig. 7 – Typical Reverse Leakage Characteristics**



**Fig. 8 – Typ. Transient Thermal Impedance**



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## 400 Watt TVS

UNI-DIRECTIONAL PART NUMBER	REVERSE STANDOFF VOLTAGE VRWM (V)	BREAKDOWN VOLTAGE VBR (V)		TEST CURRENT (It) mA	MAXIMUM CLAMPING VOLTAGE @Ipp Vc (V)	PEAK PULSE CURRENT Ipp (A)	REVERSE LEAKAGE @ VRWM IR (µA)
		MIN. @ IT	VOLTAGE VBR (V) MAX. @ IT				
P4KE6.8	5.50	6.12	7.48	10	10.8	38.0	1000
P4KE6.8.0A	5.80	6.45	7.14	10	10.5	39.0	1000
P4KE7.5	6.05	6.75	8.25	10	11.7	35.0	500
P4KE7.5A	6.40	7.13	7.88	10	11.3	36.3	500
P4KE8.2	6.63	7.38	9.02	10	12.5	32.8	200
P4KE8.2A	7.02	7.79	8.61	10	12.1	33.9	200
P4KE9.1	7.37	8.19	10.00	10	13.8	29.7	50
P4KE9.1A	7.78	8.65	9.55	10	13.4	30.6	50
P4KE10	8.10	9.00	11.00	1	15.0	27.3	10
P4KE10A	8.55	9.50	10.50	1	14.5	28.3	10
P4KE11	8.92	9.90	12.10	1	16.2	25.3	5
P4KE11A	9.40	10.50	11.60	1	15.6	26.3	5
P4KE12	9.72	10.80	13.20	1	17.3	23.7	1
P4KE12A	10.20	11.40	12.60	1	16.7	24.6	1
P4KE13	10.50	11.70	14.30	1	19.0	21.6	1
P4KE13A	11.10	12.40	13.70	1	18.2	22.5	1
P4KE15	12.10	13.50	16.50	1	22.0	18.6	1
P4KE15A	10.00	14.30	15.80	1	21.2	19.3	1
P4KE16	12.80	14.40	17.60	1	23.5	17.4	1
P4KE16A	12.90	15.20	16.80	1	22.5	18.2	1
P4KE18	13.60	16.20	19.80	1	26.5	15.5	1
P4KE18A	14.50	17.10	18.90	1	25.2	16.1	1
P4KE20	15.30	18.00	22.00	1	29.1	14.1	1
P4KE20A	17.10	19.00	21.00	1	27.7	14.8	1
P4KE22	17.80	19.80	24.20	1	31.9	12.9	1
P4KE22A	18.80	20.90	23.10	1	30.6	13.4	1
P4KE24	19.40	21.60	26.40	1	34.7	11.8	1
P4KE24A	20.50	22.80	25.20	1	33.2	12.3	1
P4KE27	21.80	24.30	29.70	1	39.1	10.5	1
P4KE27A	23.10	25.70	28.40	1	37.5	10.9	1
P4KE30	24.30	27.00	33.00	1	43.5	9.4	1
P4KE30A	25.60	28.50	31.50	1	41.4	9.9	1
P4KE33	26.80	29.70	36.30	1	47.7	8.6	1
P4KE33A	28.20	31.40	34.70	1	45.7	9.0	1
P4KE36	29.10	32.40	39.60	1	52.0	7.9	1
P4KE36A	30.80	34.20	37.80	1	49.9	8.2	1
P4KE39	31.60	35.10	42.90	1	56.4	7.3	1
P4KE39A	33.30	37.10	41.00	1	53.9	7.6	1
P4KE43	34.80	38.70	47.30	1	61.9	6.6	1
P4KE43A	36.80	40.90	45.20	1	59.3	6.9	1
P4KE47	38.10	42.30	51.70	1	67.8	6.0	1
P4KE47A	40.20	44.70	49.40	1	64.8	6.3	1
P4KE51	41.30	45.90	56.10	1	73.5	5.6	1
P4KE51A	43.60	48.50	53.60	1	70.1	5.8	1
P4KE56	45.40	50.40	61.60	1	80.5	5.1	1
P4KE56A	47.80	53.20	58.80	1	77.0	5.3	1
P4KE62	50.20	55.80	68.20	1	89.0	4.6	1
P4KE62A	53.00	58.90	65.10	1	85.0	4.8	1
P4KE68	55.10	61.20	74.80	1	98.0	4.2	1
P4KE68A	58.10	64.60	71.40	1	92.0	4.5	1

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		(V) MIN. @ IT	(V) MAX. @ IT				
P4KE75	60.70	67.50	82.50	1	108.0	3.8	5
P4KE75A	64.10	71.30	78.80	1	103.0	4.0	5
P4KE82	66.40	73.80	90.20	1	118.0	3.5	5
P4KE82A	70.10	77.90	86.10	1	113.0	3.6	5
P4KE91	73.70	81.90	100.00	1	131.0	3.10	5
P4KE91A	77.80	86.50	95.50	1	125.0	3.3	5
P4KE100	81.00	90.00	110.00	1	144.0	2.8	5
P4KE100A	85.50	95.00	105.00	1	137.0	3.0	5
P4KE110	89.20	99.00	121.00	1	158.0	2.6	5
P4KE110A	94.00	105.00	116.00	1	152.0	2.7	5
P4KE120	97.20	108.00	132.00	1	173.0	2.4	5
P4KE120A	102.00	114.00	126.00	1	165.0	2.5	5
P4KE130A	105.00	117.00	143.00	1	187.0	2.2	5
P4KE130A	111.00	124.00	137.00	1	179.0	2.3	5
P4KE150	121.00	135.00	165.00	1	215.0	1.9	5
P4KE150A	128.00	143.00	158.00	1	207.0	2.0	5
P4KE160	130.00	144.00	176.00	1	230.0	1.8	5
P4KE160A	136.00	152.00	168.00	1	219.0	1.9	5
P4KE170	138.00	153.00	187.00	1	244.0	1.7	5
P4KE170A	145.00	162.00	179.00	1	234.0	1.8	5
P4KE180	146.00	162.00	198.00	1	258.0	1.6	5
P4KE180A	154.00	171.00	189.00	1	246.0	1.7	5
P4KE200	162.00	180.00	220.00	1	287.0	1.4	5
P4KE200A	171.00	190.00	210.00	1	274.0	1.5	5
P4KE220	175.00	198.00	242.00	1	344.0	1.2	5
P4KE220A	185.00	209.00	231.00	1	328.0	1.3	5
P4KE250	202.00	225.00	275.00	1	360.0	1.1	5
P4KE250A	214.00	237.00	263.00	1	344.0	1.2	5
P4KE300	243.00	270.00	330.00	1	430.0	0.97	5
P4KE300A	256.00	285.00	315.00	1	414.0	1.0	5
P4KE350	284.00	315.00	385.00	1	504.0	0.82	5
P4KE350A	300.00	333.00	368.00	1	482.0	0.85	5
P4KE400	324.00	360.00	440.00	1	574.0	0.72	5
P4KE400A	342.00	380.00	420.00	1	548.0	0.75	5
P4KE440	356.00	396.00	484.00	1	631.0	0.65	5
P4KE440A	376.00	418.00	462.00	1	602.0	0.68	5

For Bidirectional type having Vrwm of 10volts and less, the IR limit is double.