

# MDE Semiconductor, Inc.

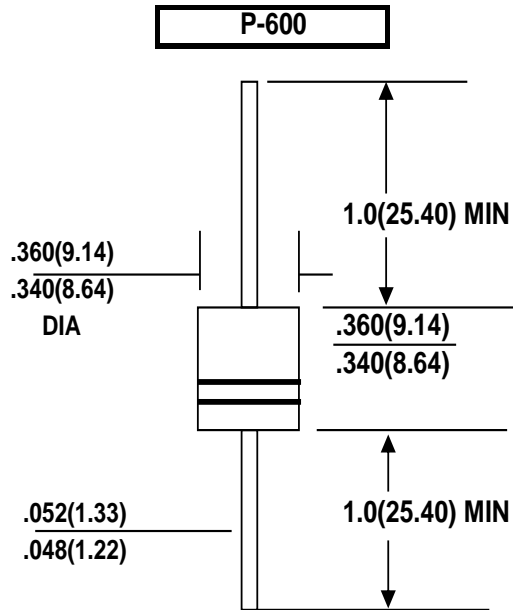
201 Shipyard Way, Unit C, Newport Beach, CA., USA 92663 Tel : 760-564-8656 • Fax : 760-564-2414  
1-800-831-4881 Email: sales@mdesemiconductor.com Web: www.mdesemiconductor.com

## MRT100KP SERIES

### GLASS PASSIVATED JUNCTION TRANSIENT VOLTAGE SUPPRESSOR VOLTAGE-28.0 TO 400 Volts 100000 Watt Peak Pulse Power

#### FEATURES

- Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- Glass passivated junction
- 100000W Peak Pulse Power capability on 6.4/6.9µs waveform
- Excellent clamping capability
- Repetition rate (duty cycle):0.05%
- Low incremental surge resistance
- Fast response time: typically less than 1.0 ps from 0 volts to BV
- High temperature soldering guaranteed: 265°C/10 seconds/.375", (9.5mm) lead length, 5lbs., (2.3kg) tension
- 100KW Transient Voltage Suppressor (TVS) are designed for aircraft applications requiring high power transient protection. This includes various treats such as "Waveform 4" at 6.4/69 µs per RTCA/DO-160E Section 22



Dimensions in inches (millimeters)

#### MECHANICAL DATA

Case: Molded plastic over glass passivated junction  
 Terminals: Matte Tin Plated Axial leads, solderable per MIL-STD-750, Method 2026  
 Polarity: Color band denoted positive end (cathode) except Bipolar  
 Mounting Position: Any  
 Weight: 0.07 ounce, 2.5 gram

#### DEVICES FOR BIPOLAR APPLICATIONS

For Bidirectional use C or CA Suffix for types MRT100KP28 thru types MRT1000KP400  
 Electrical characteristics apply in both directions.

#### MAXIMUM RATINGS AND CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

RATING	SYMBOL	VALUE	UNITS
Peak Pulse Power Dissipation on 6.4/6.9µs waveform	P <sub>PPM</sub>	Minimum 100000	Watts
Peak Pulse Current of on 6.4/69µs waveform	I <sub>PPM</sub>	SEE TABLE 1	Amps
Steady State Power Dissipation at Tl=75 °C Lead Lengths.375", (9.5mm)	P <sub>M(AV)</sub>	8.0	Watts
Peak Forward Surge Current, 8.3ms Sine-Wave Superimposed on Rated Load, (JEDEC Method)	I <sub>FSM</sub>	400.0	Amps
Operatings and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +175	°C

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## 100000 Watt TVS

UNI-POLAR	BI-POLAR	REVERSE STANDOFF VOLTAGE $V_{RWM}$ (V)	BREAKDOWN VOLTAGE $V_{BR}$ (V) MIN. @ $I_T$	TEST CURRENT ( $I_T$ ) mA	MAXIMUM CLAMPING VOLTAGE @ $I_{PP}$ $V_c$ (V)	PEAK PULSE CURRENT $I_{PP}$ (A)	REVERSE LEAKAGE @ $V_{RWM}$ $I_R$ ( $\mu$ A)
MRT100KP28A	MRT100KP28CA	28.00	31.28	50	58.0	1715.0	5000
MRT100KP30A	MRT100KP30CA	30.00	33.51	50	64.0	1553.0	5000
MRT100KP33A	MRT100KP33CA	33.00	36.9	50	67.8	1463.0	5000
MRT100KP36A	MRT100KP36CA	36.00	40.2	50	71.7	1387.0	5000
MRT100KP39A	MRT100KP39CA	39.00	43.6	20	77.7	1275.0	2000
MRT100KP42A	MRT100KP42CA	42.00	46.9	10	83.5	1190.0	1000
MRT100KP43A	MRT100KP43CA	43.00	48.0	10	84.5	1184.0	1000
MRT100KP45A	MRT100KP45CA	45.00	50.3	5	88.5	1130.0	250
MRT100KP48A	MRT100KP48CA	48.00	53.6	5	94.3	1061.0	150
MRT100KP51A	MRT100KP51CA	51.00	57.0	5	101.0	990.0	50
MRT100KP54A	MRT100KP54CA	54.00	60.3	5	106.0	943.0	20
MRT100KP58A	MRT100KP58CA	58.00	64.8	5	114.0	878.0	20
MRT100KP60A	MRT100KP60CA	60.00	67.0	5	118.0	848.0	15
MRT100KP64A	MRT100KP64CA	64.00	71.5	5	126.0	795.0	10
MRT100KP66A	MRT100KP66CA	66.00	73.7	5	128.4	776.0	10
MRT100KP70A	MRT100KP70CA	70.00	78.2	5	138.0	725.0	10
MRT100KP71A	MRT100KP71CA	71.00	79.3	5	133.0	723.0	10
MRT100KP72A	MRT100KP72CA	72.00	80.4	5	136.8	708.0	10
MRT100KP75A	MRT100KP75CA	75.00	83.8	5	147.0	680.0	10
MRT100KP78A	MRT100KP78CA	78.00	87.1	5	153.0	655.0	10
MRT100KP84A	MRT100KP84CA	84.00	93.8	5	167.0	579.0	10
MRT100KP90A	MRT100KP90CA	90.00	100.5	5	178.0	563.0	10
MRT100KP96A	MRT100KP96CA	96.00	107.2	5	187.0	516.0	10
MRT100KP102A	MRT100KP102CA	102.00	113.9	5	198.0	487.0	10
MRT100KP108A	MRT100KP108CA	108.00	120.6	5	210.0	460.0	10
MRT100KP120A	MRT100KP120CA	120.00	134.0	5	235.0	426.0	10
MRT100KP132A	MRT100KP132CA	132.00	147.4	5	256.0	378.0	10
MRT100KP144A	MRT100KP144CA	144.00	160.8	5	267.0	361.0	10
MRT100KP150A	MRT100KP150CA	150.00	167.6	5	296.0	338.0	10
MRT100KP156A	MRT100KP156CA	156.00	174.3	5	306.0	328.0	10
MRT100KP160A	MRT100KP160CA	160.00	178.7	5	315.0	318.0	10
MRT100KP168A	MRT100KP168CA	168.00	187.7	5	326.0	314.0	10
MRT100KP170A	MRT100KP170CA	170.00	189.9	5	334.0	300.0	10
MRT100KP180A	MRT100KP180CA	180.00	201.1	5	354.0	283.0	10
MRT100KP198A	MRT100KP198CA	198.00	221.2	5	382.0	267.0	10
MRT100KP216A	MRT100KP216CA	216.00	241.3	5	417.0	245.0	10
MRT100KP240A	MRT100KP240CA	240.00	268.1	5	460.0	221.0	10
MRT100KP258A	MRT100KP258CA	258.00	288.2	5	510.0	198.0	10
MRT100KP260A	MRT100KP260CA	260.00	290.4	5	512.0	196.0	10
MRT100KP270A	MRT100KP270CA	270.00	301.6	5	523.0	184.0	10
MRT100KP280A	MRT100KP280CA	280.00	312.8	5	552.0	181.0	10
MRT100KP288A	MRT100KP288CA	288.00	321.7	5	563.0	177.0	10
MRT100KP300A	MRT100KP300CA	300.00	333.0	5	590.0	170.0	10
MRT100KP350A	MRT100KP350CA	350.00	389.0	5	690.0	145.0	10
MRT100KP400A	MRT100KP400CA	400.00	444.0	5	787.0	127.0	10

For bidirectional type having  $V_{RWM}$  of 40 volts and less, the  $I_R$  limit is double.

For parts without A , the  $V_{BR}$  is  $\pm 10\%$

Certified RoHS Compliant

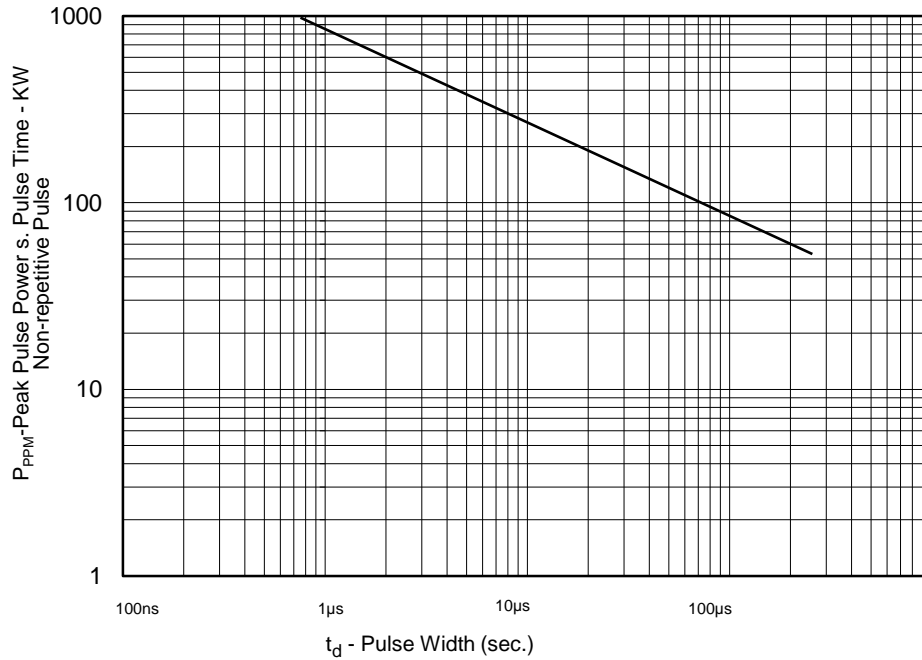
8/11/2020

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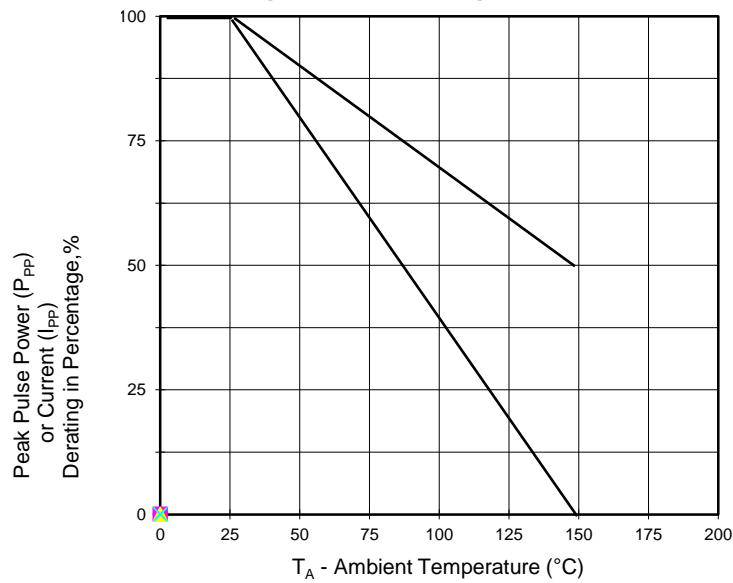
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## **MRT100KP Series Rating and Characteristic Curves**

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



**Fig.2 - Pulse Derating Curve**



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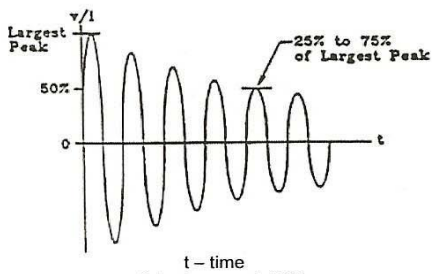


FIGURE 7 – Waveform 3

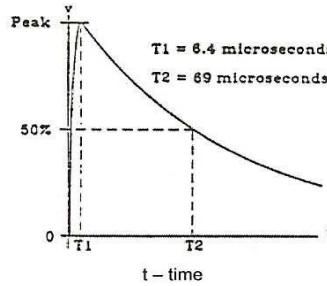


FIGURE 8 – Waveform 4

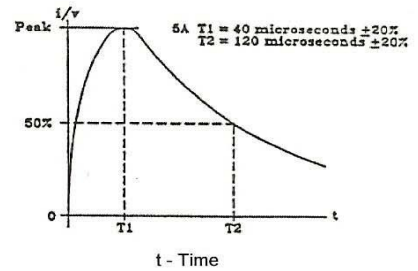


FIGURE 9 – Waveform 5A

**Note: The 1 Mhz damped oscillatory waveform (3) has an effective oulse width of 4  $\mu$ s. Equivalent peak pulse power at each of the pulse widths represented in the RTCA/DO-160E for waveforms 3, 4 and 5A (above) has been determined referencing Figure 1.**

WAVEFORM NUMBER	PULSE WIDTH $\mu$ s	PEAK PULSE POWER kW	Peak Pulse Current Conversion Factor * from Rated $I_{pp}$ at 6.4/69 $\mu$ s
3	4	340	3.40x
4	6.4/69	100	1.00x
5A	40/120	70	0.70x

\* Multiply by the conversion factor shown with reference to the maximum rated  $I_{pp}$  in the Electrical Characteristics Table.

## UPSCREENING

The specific screening flow for MRT100KP upscreening includes the following process steps on the finished product.

- |                         |   |
|-------------------------|---|
| Temperature Cycling:    | 10 cycles, -55 to +150 deg C                |
| 100% surge testing:     | 3 times(each direction for bidirectional)   |
| High Temp Reverse Bias: | 24 hours (each direction for bidirectional) |