

## 5KP\_A

VRM : 5.0 - 180 Volts

PPK : 5000 Watts

### Features

- 5000W Peak Pulse Power
- Excellent clamping capability
- Low incremental surge resistance
- Fast response time : typically less then 1.0 ps from 0

volt to  $V_{BR(min)}$

- Typical IR less then 1 $\mu$ A above 10V
- RoHS compliant package

### Mechanical Data

- Case : Void-free molded plastic body
- Epoxy : UL94V-0 rate flame retardant
- Lead : Axial lead solderable per MIL-STD-202,

Method 208 guaranteed

- Polarity : Color band denotes cathode end
- Mounting position : Any
- Weight : 2.1 gram

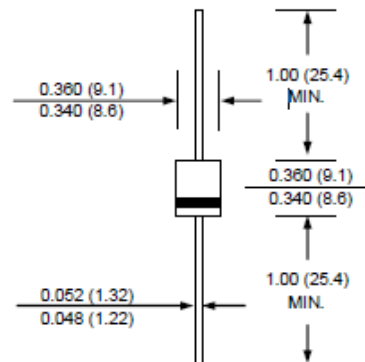
### Packing & Order Information

500/T

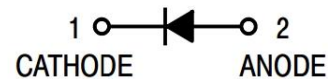


**RoHS**  
COMPLIANT

R6



Graphic symbol



## MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Rating at 25 °C ambient temperature unless otherwise specified.

| Symbol         | Parameter   | Value         | Unit             |
|----------------|---|---------------|------------------|
| $P_{PK}$       | Peak Pulse Power Dissipation at $t_p=1$ ms (Note 1, Fig. 4)   | Minimum 500   | W                |
| $P_D$          | Steady State Power Dissipation at $T_L=75^\circ\text{C}$<br>Lead Lengths 0.375", (9.5mm) (Fig. 2)                 | 8.0           | W                |
| $I_{FSM}$      | Peak Forward Surge Current, 8.3 ms single half<br>Sine-Wave Superimposed on Rated Load<br>(JEDEC Method) (Note 3) | 400           | A                |
| $T_J, T_{stg}$ | Operating Junction and Storage Temperature Range  | - 55 to + 150 | $^\circ\text{C}$ |

Notes :

- (1) Non-repetitive Current pulse, per Fig. 5 and derated above  $T_a = 25^\circ\text{C}$  per Fig. 1
- (2) Mounted on Copper Leaf of 0.79 in<sup>2</sup> (20mm<sup>2</sup>)
- (3) Measured on 8.3 ms , single half sine-wave or equivalent square wave, duty cycle=4 pulses per minutes maximum.

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| Type    | Breakdown Voltage @ IT<br>(Note 1) |      | Reverse<br>Stand off<br>Voltage | Maximum<br>Reverse<br>Leakage @<br>VRM | Maximum<br>Peak Pulse<br>Current<br>(Note2) | Maximum<br>Clamping<br>Voltage @<br>IPPM | Maximum<br>Temperature<br>Coefficient<br>of VBR<br>(%/°C) |            |
|---------|------------------------------------|------|---------------------------------|--|---|--|---|------------|
|         | VBR(V)                             |      |                                 |  |   |  |   | IT<br>(mA) |
|         | Min                                | Max  |                                 |  |   |  |   |            |
| 5KP5.0  | 6.40                               | 7.30 | 50                              | 5.0                                    | 5000  | 520                                      | 9.60  | 0.057      |
| 5KP5.0A | 6.40                               | 7.00 | 50                              | 5.0                                    | 5000  | 543                                      | 9.20  | 0.057      |
| 5KP6.0  | 6.67                               | 8.15 | 50                              | 6.0                                    | 5000  | 439                                      | 11.4  | 0.061      |
| 5KP6.0A | 6.67                               | 7.37 | 50                              | 6.0                                    | 5000  | 485                                      | 10.3  | 0.061      |
| 5KP6.5  | 7.22                               | 8.82 | 50                              | 6.5                                    | 2000  | 407                                      | 12.3  | 0.065      |
| 5KP6.5A | 7.22                               | 7.98 | 50                              | 6.5                                    | 2000  | 447                                      | 11.2  | 0.065      |
| 5KP7.0  | 7.78                               | 9.51 | 50                              | 7.0                                    | 1000  | 378                                      | 13.3  | 0.068      |
| 5KP7.0A | 7.78                               | 8.60 | 50                              | 7.0                                    | 1000  | 417                                      | 12.0  | 0.068      |
| 5KP7.5  | 8.33                               | 10.2 | 5.0                             | 7.5                                    | 250   | 350                                      | 14.3  | 0.073      |
| 5KP7.5A | 8.33                               | 9.21 | 5.0                             | 7.5                                    | 250   | 388                                      | 12.9  | 0.073      |
| 5KP8.0  | 8.89                               | 10.9 | 5.0                             | 8.0                                    | 150   | 333                                      | 15.0  | 0.075      |
| 5KP8.0A | 8.89                               | 9.83 | 5.0                             | 8.0                                    | 150   | 367                                      | 13.6  | 0.075      |
| 5KP8.5  | 9.44                               | 11.5 | 5.0                             | 8.5                                    | 50  | 314                                      | 15.9  | 0.078      |
| 5KP8.5A | 9.44                               | 10.4 | 5.0                             | 8.5                                    | 50  | 347                                      | 14.4  | 0.078      |
| 5KP9.0  | 10.0                               | 12.2 | 5.0                             | 9.0                                    | 20  | 295                                      | 16.9  | 0.081      |
| 5KP9.0A | 10.0                               | 11.1 | 5.0                             | 9.0                                    | 20  | 325                                      | 15.4  | 0.081      |
| 5KP10   | 11.1                               | 13.6 | 5.0                             | 10                                     | 15  | 266                                      | 18.8  | 0.084      |
| 5KP10A  | 11.1                               | 12.3 | 5.0                             | 10                                     | 15  | 294                                      | 17.0  | 0.084      |
| 5KP11   | 12.2                               | 14.9 | 5.0                             | 11                                     | 10  | 249                                      | 20.1  | 0.086      |
| 5KP11A  | 12.2                               | 13.5 | 5.0                             | 11                                     | 10  | 274                                      | 18.2  | 0.086      |
| 5KP12   | 13.3                               | 16.3 | 5.0                             | 12                                     | 10  | 227                                      | 22.0  | 0.088      |
| 5KP12A  | 13.3                               | 14.7 | 5.0                             | 12                                     | 10  | 251                                      | 19.9  | 0.088      |
| 5KP13   | 14.4                               | 17.6 | 5.0                             | 13                                     | 10  | 210                                      | 23.8  | 0.090      |
| 5KP13A  | 14.4                               | 15.9 | 5.0                             | 13                                     | 10  | 232                                      | 21.5  | 0.090      |
| 5KP14   | 15.6                               | 19.1 | 5.0                             | 14                                     | 10  | 194                                      | 25.8  | 0.092      |
| 5KP14A  | 15.6                               | 17.2 | 5.0                             | 14                                     | 10  | 215                                      | 23.2  | 0.092      |
| 5KP15   | 16.7                               | 20.4 | 5.0                             | 15                                     | 10  | 188                                      | 26.9  | 0.094      |
| 5KP15   | 16.7                               | 18.5 | 5.0                             | 15                                     | 10  | 206                                      | 24.4  | 0.094      |
| 5KP16   | 17.8                               | 21.8 | 5.0                             | 16                                     | 10  | 176                                      | 28.8  | 0.096      |

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| Type   | Breakdown Voltage @ IT<br>(Note 1) |      | Reverse<br>Stand off<br>Voltage | Maximum<br>Reverse<br>Leakage @<br>VRM | Maximum<br>Peak Pulse<br>Current<br>(Note2) | Maximum<br>Clamping<br>Voltage @<br>IPPM | Maximum<br>Temperature<br>Coefficient<br>of VBR<br>(%/°C) |            |
|--------|------------------------------------|------|---------------------------------|--|---|--|---|------------|
|        | VBR(V)                             |      |                                 |  |   |  |   | IT<br>(mA) |
|        | Min                                | Max  |                                 |  |   |  |   |            |
| 5KP16A | 17.8                               | 19.7 | 5.0                             | 16                                     | 10  | 192                                      | 26.0  | 0.096      |
| 5KP17  | 18.9                               | 23.1 | 5.0                             | 17                                     | 10  | 164                                      | 30.5  | 0.097      |
| 5KP17A | 18.9                               | 20.9 | 5.0                             | 17                                     | 10  | 181                                      | 27.6  | 0.097      |
| 5KP18  | 20.0                               | 24.4 | 5.0                             | 18                                     | 10  | 155                                      | 32.2  | 0.098      |
| 5KP18A | 20.0                               | 22.1 | 5.0                             | 18                                     | 10  | 172                                      | 29.2  | 0.098      |
| 5KP20  | 22.2                               | 27.1 | 5.0                             | 20                                     | 10  | 139                                      | 35.8  | 0.099      |
| 5KP20A | 22.2                               | 24.5 | 5.0                             | 20                                     | 10  | 154                                      | 32.4  | 0.099      |
| 5KP22  | 24.4                               | 29.8 | 5.0                             | 22                                     | 10  | 127                                      | 39.4  | 0.100      |
| 5KP22A | 24.4                               | 26.9 | 5.0                             | 22                                     | 10  | 141                                      | 35.5  | 0.100      |
| 5KP24  | 26.7                               | 32.6 | 5.0                             | 24                                     | 10  | 116                                      | 43.0  | 0.101      |
| 5KP24A | 26.7                               | 29.5 | 5.0                             | 24                                     | 10  | 128                                      | 38.9  | 0.101      |
| 5KP26  | 28.9                               | 35.3 | 5.0                             | 26                                     | 10  | 107                                      | 46.6  | 0.101      |
| 5KP26A | 28.9                               | 31.9 | 5.0                             | 26                                     | 10  | 119                                      | 42.1  | 0.101      |
| 5KP28  | 31.1                               | 38.0 | 5.0                             | 28                                     | 10  | 99                                       | 50.1  | 0.102      |
| 5KP28A | 31.1                               | 34.4 | 5.0                             | 28                                     | 10  | 110                                      | 45.4  | 0.102      |
| 5KP30  | 33.3                               | 40.7 | 5.0                             | 30                                     | 10  | 93                                       | 53.5  | 0.103      |
| 5KP30A | 33.3                               | 36.8 | 5.0                             | 30                                     | 10  | 103                                      | 48.4  | 0.103      |
| 5KP33  | 36.7                               | 44.9 | 5.0                             | 33                                     | 10  | 85                                       | 59.0  | 0.104      |
| 5KP33A | 36.7                               | 40.6 | 5.0                             | 33                                     | 10  | 94                                       | 53.3  | 0.104      |
| 5KP36  | 40.0                               | 48.9 | 5.0                             | 36                                     | 10  | 78                                       | 64.3  | 0.104      |
| 5KP36A | 40.0                               | 44.2 | 5.0                             | 36                                     | 10  | 86                                       | 58.1  | 0.104      |
| 5KP40  | 44.4                               | 54.3 | 5.0                             | 40                                     | 10  | 70                                       | 71.4  | 0.105      |
| 5KP40A | 44.4                               | 49.1 | 5.0                             | 40                                     | 10  | 78                                       | 64.5  | 0.105      |
| 5KP43  | 47.8                               | 58.4 | 5.0                             | 43                                     | 10  | 65                                       | 76.7  | 0.105      |
| 5KP43A | 47.8                               | 52.8 | 5.0                             | 43                                     | 10  | 72                                       | 69.4  | 0.105      |
| 5KP45  | 50.0                               | 61.1 | 5.0                             | 45                                     | 10  | 62                                       | 80.3  | 0.106      |
| 5KP45A | 50.0                               | 55.3 | 5.0                             | 45                                     | 10  | 69                                       | 72.7  | 0.106      |
| 5KP48  | 53.3                               | 65.2 | 5.0                             | 48                                     | 10  | 58                                       | 85.5  | 0.106      |
| 5KP48A | 53.3                               | 58.9 | 5.0                             | 48                                     | 10  | 65                                       | 77.4  | 0.106      |

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| Type    | Breakdown Voltage @ IT<br>(Note 1) |      | Reverse<br>Stand off<br>Voltage | Maximum<br>Reverse<br>Leakage @<br>VRM | Maximum<br>Peak Pulse<br>Current<br>(Note2) | Maximum<br>Clamping<br>Voltage @<br>IPPM | Maximum<br>Temperature<br>Coefficient<br>of VBR<br>(%/°C) |            |
|---------|------------------------------------|------|---------------------------------|--|---|--|---|------------|
|         | VBR(V)                             |      |                                 |  |   |  |   | IT<br>(mA) |
|         | Min                                | Max  |                                 |  |   |  |   |            |
| 5KP51   | 56.7                               | 69.3 | 5.0                             | 51                                     | 10  | 55                                       | 91.1  | 0.107      |
| 5KP51A  | 56.7                               | 62.7 | 5.0                             | 51                                     | 10  | 61                                       | 82.4  | 0.107      |
| 5KP54   | 60.0                               | 73.3 | 5.0                             | 54                                     | 10  | 52                                       | 96.3  | 0.107      |
| 5KP54A  | 60.0                               | 66.3 | 5.0                             | 54                                     | 10  | 57                                       | 87.1  | 0.107      |
| 5KP56   | 62.2                               | 76.1 | 5.0                             | 56                                     | 10  | 50                                       | 100   | 0.107      |
| 5KP56A  | 62.2                               | 68.8 | 5.0                             | 56                                     | 10  | 55                                       | 91  | 0.107      |
| 5KP58   | 64.4                               | 78.7 | 5.0                             | 58                                     | 10  | 49                                       | 103   | 0.107      |
| 5KP58A  | 64.4                               | 71.2 | 5.0                             | 58                                     | 10  | 53                                       | 94  | 0.107      |
| 5KP60   | 66.7                               | 81.5 | 5.0                             | 60                                     | 10  | 47                                       | 107   | 0.108      |
| 5KP60A  | 66.7                               | 73.7 | 5.0                             | 60                                     | 10  | 52                                       | 97  | 0.108      |
| 5KP64   | 71.1                               | 96.9 | 5.0                             | 64                                     | 10  | 44                                       | 114   | 0.108      |
| 5KP64A  | 71.1                               | 78.6 | 5.0                             | 64                                     | 10  | 49                                       | 103   | 0.108      |
| 5KP70   | 77.6                               | 95.1 | 5.0                             | 70                                     | 10  | 40                                       | 125   | 0.108      |
| 5KP70A  | 77.6                               | 86.0 | 5.0                             | 70                                     | 10  | 44                                       | 113   | 0.108      |
| 5KP75   | 83.3                               | 102  | 5.0                             | 75                                     | 10  | 37                                       | 134   | 0.108      |
| 5KP75A  | 83.3                               | 92.1 | 5.0                             | 75                                     | 10  | 41                                       | 121   | 0.108      |
| 5KP78   | 86.7                               | 106  | 5.0                             | 78                                     | 10  | 36                                       | 139   | 0.108      |
| 5KP78A  | 86.7                               | 95.8 | 5.0                             | 78                                     | 10  | 40                                       | 126   | 0.108      |
| 5KP85   | 94.4                               | 115  | 5.0                             | 85                                     | 10  | 33                                       | 151   | 0.108      |
| 5KP85A  | 94.4                               | 104  | 5.0                             | 85                                     | 10  | 36                                       | 137   | 0.110      |
| 5KP90   | 100                                | 122  | 5.0                             | 90                                     | 10  | 31                                       | 160   | 0.110      |
| 5KP90A  | 100                                | 111  | 5.0                             | 90                                     | 10  | 34                                       | 146   | 0.110      |
| 5KP100  | 111                                | 136  | 5.0                             | 100                                    | 10  | 28                                       | 179   | 0.110      |
| 5KP100A | 111                                | 123  | 5.0                             | 100                                    | 10  | 31                                       | 162   | 0.110      |
| 5KP110  | 122                                | 149  | 5.0                             | 110                                    | 10  | 26                                       | 196   | 0.112      |
| 5KP110A | 122                                | 135  | 5.0                             | 110                                    | 10  | 28                                       | 177   | 0.112      |
| 5KP120  | 133                                | 163  | 5.0                             | 120                                    | 10  | 24                                       | 211   | 0.112      |
| 5KP120A | 133                                | 147  | 5.0                             | 120                                    | 10  | 26                                       | 194   | 0.112      |
| 5KP150  | 167                                | 204  | 5.0                             | 150                                    | 10  | 19                                       | 263   | 0.112      |

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| Type    | Breakdown Voltage @ IT<br>(Note 1) |     | Reverse<br>Stand off<br>Voltage | Maximum<br>Reverse<br>Leakage @<br>VRM | Maximum<br>Peak Pulse<br>Current<br>(Note2) | Maximum<br>Clamping<br>Voltage @<br>IPPM | Maximum<br>Temperature<br>Coefficient<br>of VBR<br>(%/°C) |       |
|---------|------------------------------------|-----|---------------------------------|--|---|--|---|-------|
|         | VBR(V)                             |     |                                 |  |   |  |   | IT    |
|         | Min                                | Max | (mA)                            | (V)                                    | ( $\mu$ A)                                  | (A)                                      |   | (V)   |
| 5KP150A | 167                                | 184 | 5.0                             | 160                                    | 10  | 21                                       | 242   | 0.112 |
| 5KP160  | 178                                | 217 | 5.0                             | 160                                    | 10  | 18                                       | 281   | 0.114 |
| 5KP160A | 178                                | 196 | 5.0                             | 160                                    | 10  | 19                                       | 258   | 0.114 |
| 5KP170  | 189                                | 231 | 5.0                             | 170                                    | 10  | 17                                       | 298   | 0.114 |
| 5KP170A | 189                                | 209 | 5.0                             | 170                                    | 10  | 18                                       | 274   | 0.114 |
| 5KP180  | 200                                | 244 | 5.0                             | 180                                    | 10  | 16                                       | 316   | 0.114 |
| 5KP180A | 200                                | 221 | 5.0                             | 180                                    | 10  | 17                                       | 290   | 0.114 |

Note :

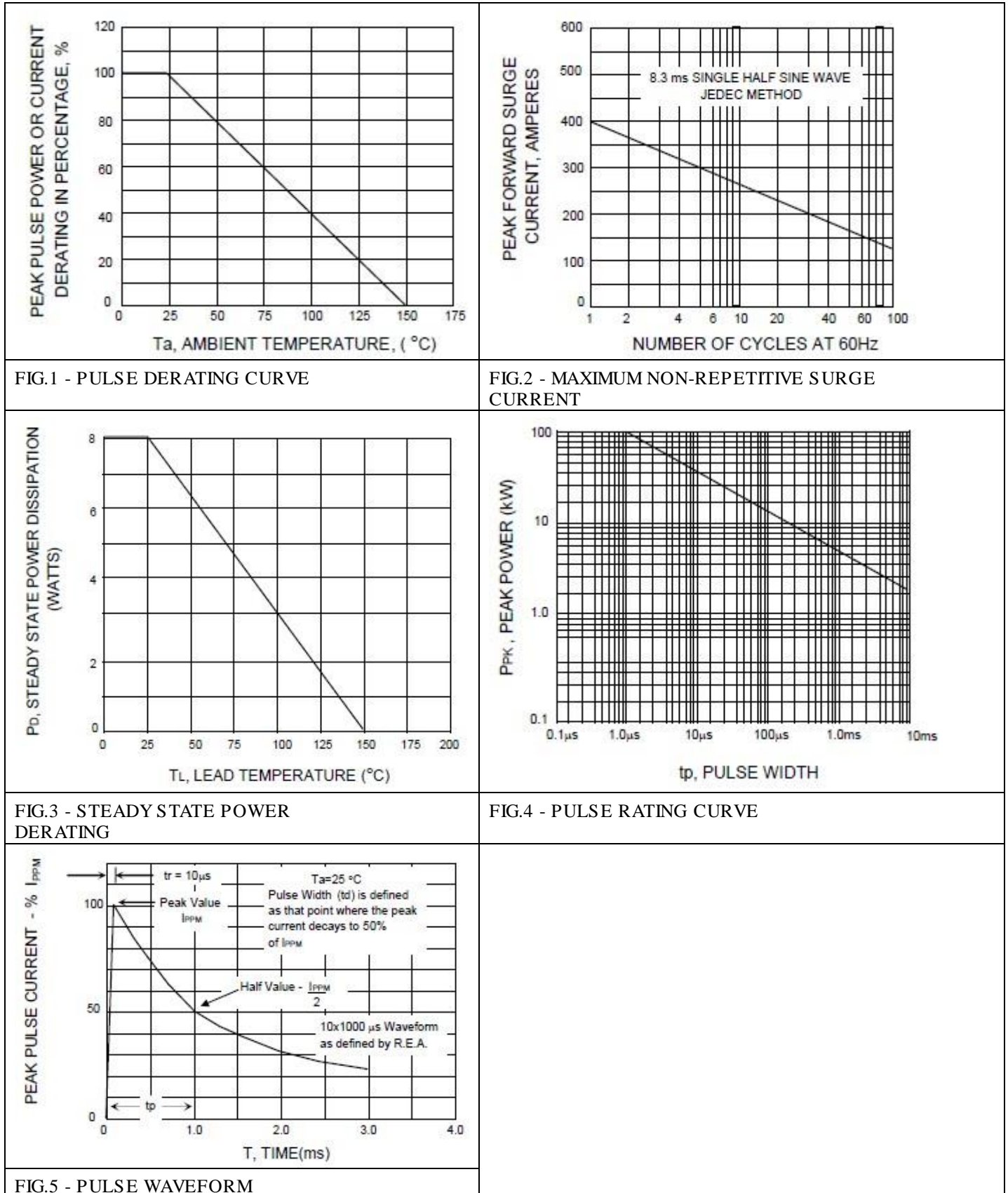
- (1) VBR measured after IT applied for 300 $\mu$ s, IT= square wave pulse or equivalen.
- (2) Surge Current waveform per Fig.3 and Derate per Fig.2
- (3) VF=3.5 Volts max. for devices of VR<100 V , and VF=5 Volts max. for devices of VR>100 V
- (4) For Bi-directional devices having VR of 10 Volts and under the IR limit is doubled.

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### ■ RATING AND CHARACTERISTIC CURVES ( 5KP SERIES )



## 5KP\_A

VRM : 5.0 - 180 Volts

PPK : 5000 Watts

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