



## Features

Low power loss,high efficiency.

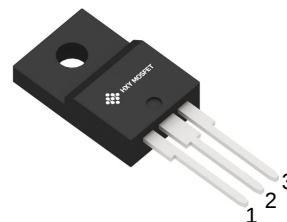
High surge capacity

For use in low voltage,high frequency inverters,  
free wheeling,and polarity protection applications.

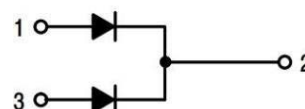
Metal silicon junction,majority carrier conduction.

High current Capability,low forward voltage drop.

Guard ring for over voltage protection.



**TO-220F**  
**PIN CONNECTIONS**



## Absolute Maximum Ratings (T<sub>c</sub>=25°C)

| Parameter                                                                                        |                       | Symbol             | MBRF<br>2040<br>CTR | MHBRF<br>2045<br>CTR | MHBRF<br>2050<br>CTR | MHBRF<br>2060<br>CTR | MHBRF<br>2080<br>CTR | MHBRF<br>2090<br>CTR | MHBRF<br>20100<br>CTR | MHBRF<br>20150<br>CTR | MHBRF<br>20200<br>CTR | Unit |
|--------------------------------------------------------------------------------------------------|-----------------------|--------------------|---------------------|----------------------|----------------------|----------------------|----------------------|----------------------|-----------------------|-----------------------|-----------------------|------|
| Maximum Recurrent Peak Reverse Voltage                                                           |                       | V <sub>RRM</sub>   | 40                  | 45                   | 50                   | 60                   | 80                   | 90                   | 100                   | 150                   | 200                   | V    |
| Maximum RMS Voltage                                                                              |                       | V <sub>RMS</sub>   | 28                  | 31.5                 | 35                   | 42                   | 56                   | 63                   | 70                    | 105                   | 140                   | V    |
| Maximum DC Blocking Voltage                                                                      |                       | V <sub>R(DC)</sub> | 40                  | 45                   | 50                   | 60                   | 80                   | 90                   | 100                   | 150                   | 200                   | V    |
| Maximum Average Forward Current                                                                  |                       | I <sub>F(AV)</sub> | 20                  |                      |                      |                      |                      |                      |                       |                       |                       | A    |
| Peak Forward Surge Current:8.3ms single half sine-wave superimposed on rated load (JEDEC method) |                       | I <sub>FSM</sub>   | 175                 |                      |                      |                      |                      |                      |                       |                       |                       | A    |
| Maximum Forward Voltage at 10A per leg                                                           |                       | V <sub>F</sub>     | 0.65                |                      | 0.72                 |                      | 0.85                 |                      | 0.95                  |                       | V                     |      |
| Maximum DC Reverse Current at Rated DC Blocking Voltage                                          | T <sub>j</sub> =25°C  | I <sub>R</sub>     | 0.1                 |                      |                      |                      |                      |                      |                       |                       |                       | mA   |
|                                                                                                  | T <sub>j</sub> =125°C |                    | 20                  |                      |                      |                      |                      |                      |                       |                       |                       | mA   |
| Maximum Operating Junction Temperature                                                           |                       | T <sub>j</sub>     | 150                 |                      |                      |                      | 175                  |                      |                       |                       | °C                    |      |
| Storage Temperature                                                                              |                       | T <sub>stg</sub>   | -55~+ 150           |                      |                      |                      | -65~+175             |                      |                       |                       | °C                    |      |
| Typical Thermal Resistance                                                                       |                       | R <sub>θJC</sub>   | 1.4                 |                      |                      |                      |                      |                      |                       |                       |                       | °C/W |



## Typical Characteristics

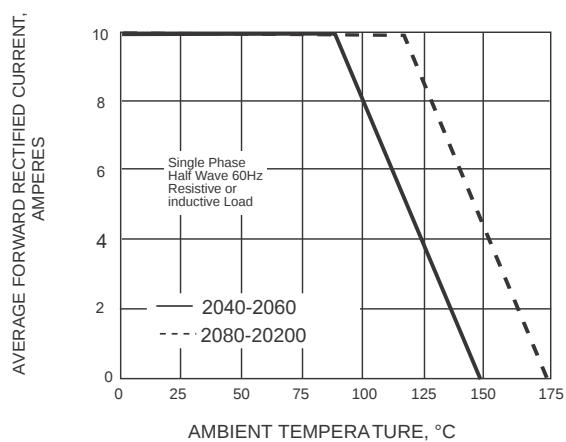


Fig.1 FORWARD CURRENT ERATING CURVE

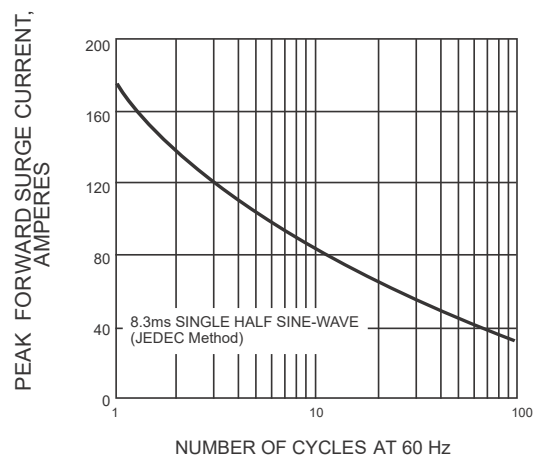


Fig.2 MAXIMUM NON-REPETITIVE SURGE CURRENT

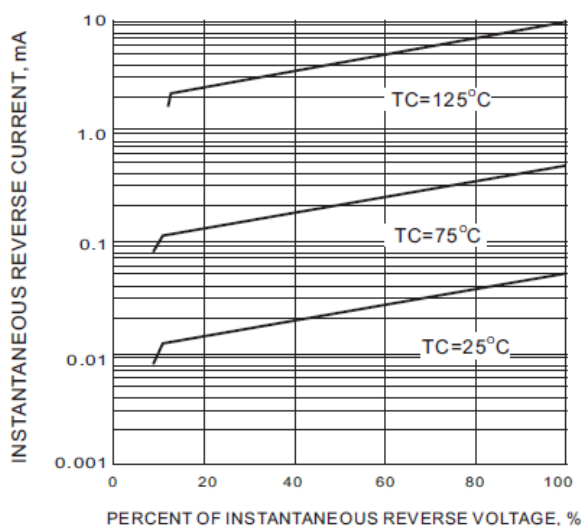


Fig.3 TYPICALREVERSE CHARACTERISTIC

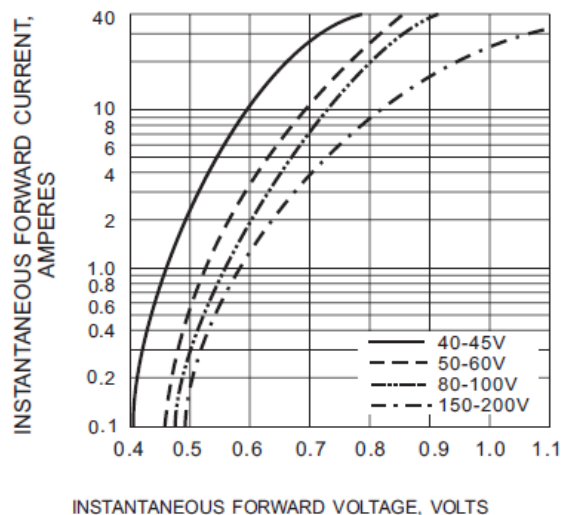
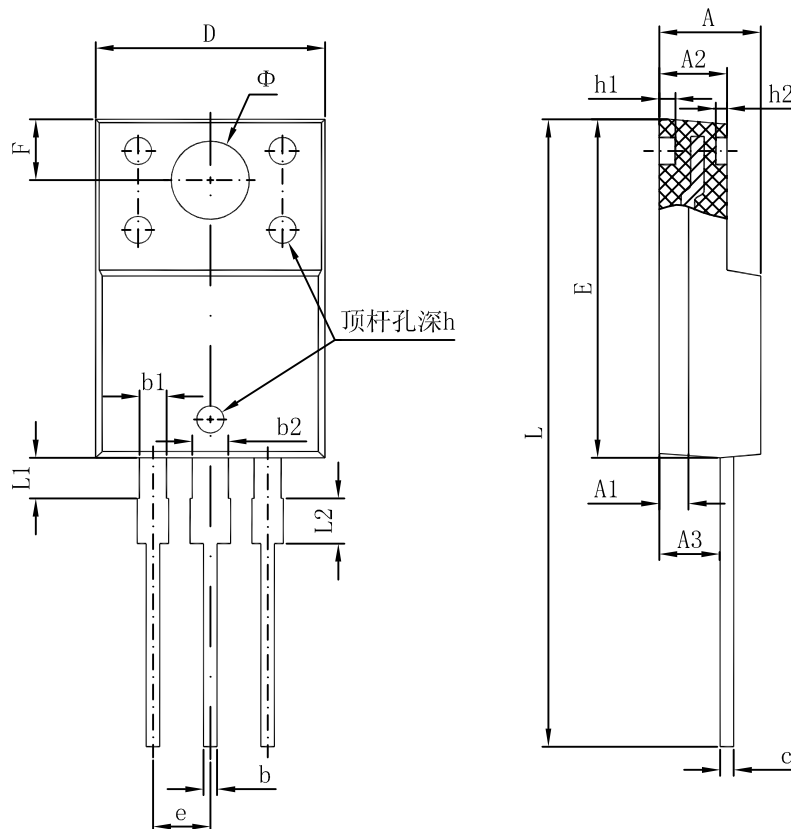


Fig.4 TYPICAL INSTANTANEOUS FORWARD CHARACTERISTIC



## TO-220F Package Information



| Symbol | Dimensions In Millimeters |        | Dimensions In Inches |       |
|--------|---------------------------|--------|----------------------|-------|
|        | Min.                      | Max.   | Min.                 | Max.  |
| A      | 4.300                     | 4.700  | 0.169                | 0.185 |
| A1     | 1.300 REF.                |        | 0.051 REF.           |       |
| A2     | 2.800                     | 3.200  | 0.110                | 0.126 |
| A3     | 2.500                     | 2.900  | 0.098                | 0.114 |
| b      | 0.500                     | 0.750  | 0.020                | 0.030 |
| b1     | 1.100                     | 1.350  | 0.043                | 0.053 |
| b2     | 1.500                     | 1.750  | 0.059                | 0.069 |
| c      | 0.500                     | 0.750  | 0.020                | 0.030 |
| D      | 9.960                     | 10.360 | 0.392                | 0.408 |
| E      | 14.800                    | 15.200 | 0.583                | 0.598 |
| e      | 2.540 TYP.                |        | 0.100 TYP.           |       |
| F      | 2.700 REF.                |        | 0.106 REF.           |       |
| Φ      | 3.500 REF.                |        | 0.138 REF.           |       |
| h      | 0.000                     | 0.300  | 0.000                | 0.012 |
| h1     | 0.800 REF.                |        | 0.031 REF.           |       |
| h2     | 0.500 REF.                |        | 0.020 REF.           |       |
| L      | 28.000                    | 28.400 | 1.102                | 1.118 |
| L1     | 1.700                     | 1.900  | 0.067                | 0.075 |
| L2     | 1.900                     | 2.100  | 0.075                | 0.083 |



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