

## Applications

- Freewheeling, Snubber, Clamp
- Inversion Welder
- PFC
- Plating Power Supply
- Ultrasonic Cleaner and Welder
- Converter & Chopper
- UPS

## Features

- Ultrafast Recovery Time
- Soft Recovery Characteristics
- Low Recovery Loss
- Low Forward Voltage
- High Surge Current Capability
- Low Leakage Current

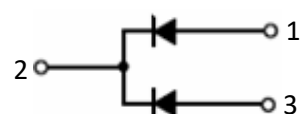
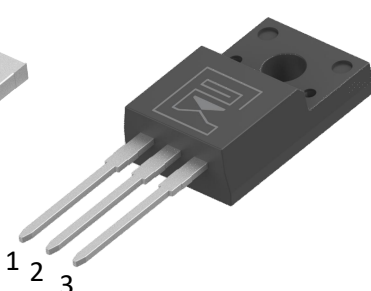
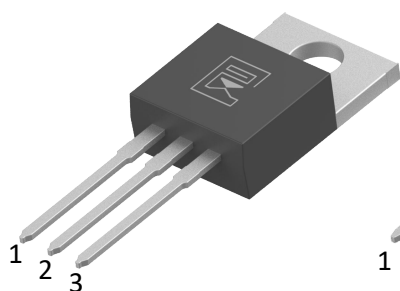
## Product Summary

|                                         |       |    |
|-----------------------------------------|-------|----|
| $V_{RRM}$                               | 200   | V  |
| $I_F@T_c=110^{\circ}\text{C}$           | 10x 2 | A  |
| $V_{F,TYP}@10A,T_c=25^{\circ}\text{C}$  | 0.93  | V  |
| $V_{F,TYP}@10A,T_c=125^{\circ}\text{C}$ | 0.88  | V  |
| $I_{R,MAX}@T_c=25^{\circ}\text{C}$      | 5     | uA |



TO-220

TO-220F



1、ANODE

2、CATHODE

3、ANODE

## Package Marking and Ordering Information

| Ordering code | Marking  | Package | Packaging | Min. package quantity |
|---------------|----------|---------|-----------|-----------------------|
| MC-M20F20CT   | M20F20CT | TO-220  | Tube      | 1000                  |
| MF-M20F20CT   | M20F20CT | TO-220F | Tube      | 1000                  |

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

| Parameter                         | Test Conditions                  | Symbol                       | Ratings     | Unit |
|-----------------------------------|----------------------------------|------------------------------|-------------|------|
| D.C. Reverse Voltage              |                                  | V <sub>R</sub>               | 200         | V    |
| Repetitive Reverse Voltage        |                                  | V <sub>RRM</sub>             | 200         | V    |
| Average Forward Current           | T <sub>C</sub> =110°C, Per Diode | I <sub>F(AV)</sub> (per leg) | 10          | A    |
|                                   |                                  | I <sub>F(AV)</sub> (Total)   | 20          |      |
| Peak Repetitive Forward Current   | T <sub>C</sub> =110°C, Per Diode | I <sub>FM</sub>              | 20          | A    |
| Non-Repetitive Peak Surge Current | T=10ms, Sine                     | I <sub>FSM</sub>             | 100         | A    |
| Junction Temperature              |                                  | T <sub>J</sub>               | -55 to +150 | °C   |
| Storage Temperature               |                                  | T <sub>stg</sub>             | -55-150     | °C   |

## » Thermal Characteristics

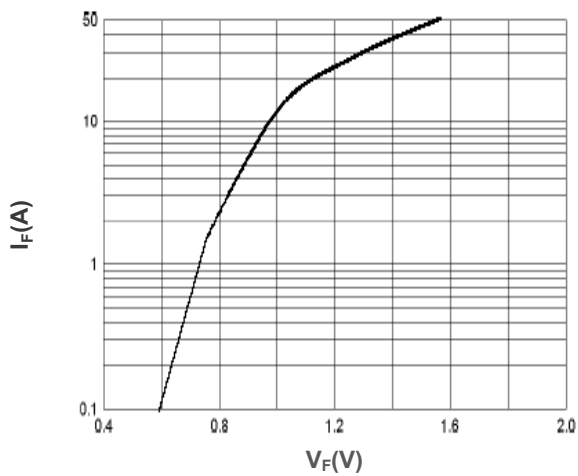
| Parameter                  | Symbol           | Package | Max | Unit |
|----------------------------|------------------|---------|-----|------|
| Maximum Thermal Resistance | R <sub>θJC</sub> | TO-220  | 2.5 | °C/W |
|                            | R <sub>θJC</sub> | TO-220F | 4   | °C/W |

## » Electrical Characteristics (Per Leg) (T<sub>c</sub>=25°C unless otherwise noted)

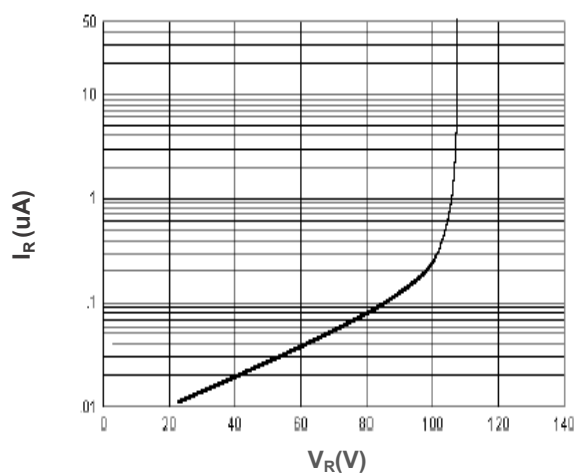
| Parameter                     | Symbol           | Test Condition                                                 |                       | Min | Typ  | Max | Unit |
|-------------------------------|------------------|----------------------------------------------------------------|-----------------------|-----|------|-----|------|
| Forward Voltage               | V <sub>F</sub>   | I <sub>F</sub> =10A, T <sub>J</sub> =25°C                      |                       | -   | 0.93 | 1.2 | V    |
|                               |                  | I <sub>F</sub> =10A, T <sub>J</sub> =125°C                     |                       | -   | 0.88 | -   | V    |
| Reverse Leakage Current       | I <sub>RM</sub>  | V <sub>R</sub> =200V, T <sub>J</sub> =25°C                     |                       | -   | -    | 5   | uA   |
|                               |                  | V <sub>R</sub> =200V, T <sub>J</sub> =125°C                    |                       | -   | -    | 100 | uA   |
| Reverse Recovery Time         | t <sub>rr</sub>  | I <sub>F</sub> =1A, V <sub>R</sub> =30V,<br>diF/dt=-200A/μs    |                       | 30  | 35   | 40  | ns   |
| Max. Reverse Recovery Current | t <sub>rr</sub>  | I <sub>F</sub> =10A<br>V <sub>R</sub> =100V<br>diF/dt=-200A/μs | T <sub>J</sub> =25°C  | -   | 45   | -   | ns   |
|                               | t <sub>rr</sub>  |                                                                | T <sub>J</sub> =125°C | -   | 58   | -   | ns   |
|                               | I <sub>RRM</sub> |                                                                | T <sub>J</sub> =125°C | -   | 6    | -   | A    |



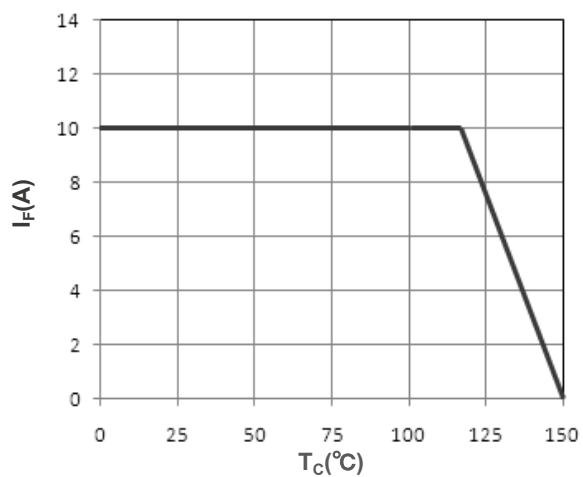
## >> Characteristics Curves



Forward Characteristics Per Diode



Reverse Characteristics Per Diode



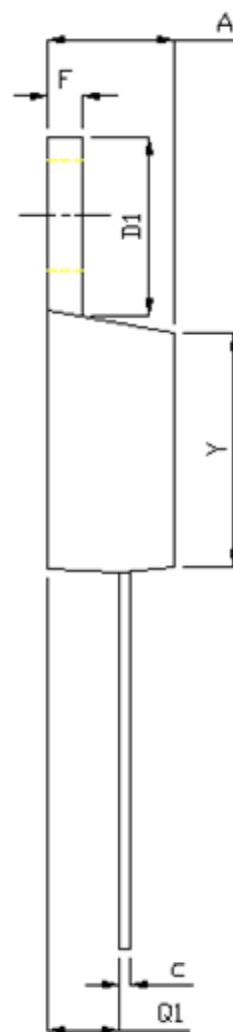
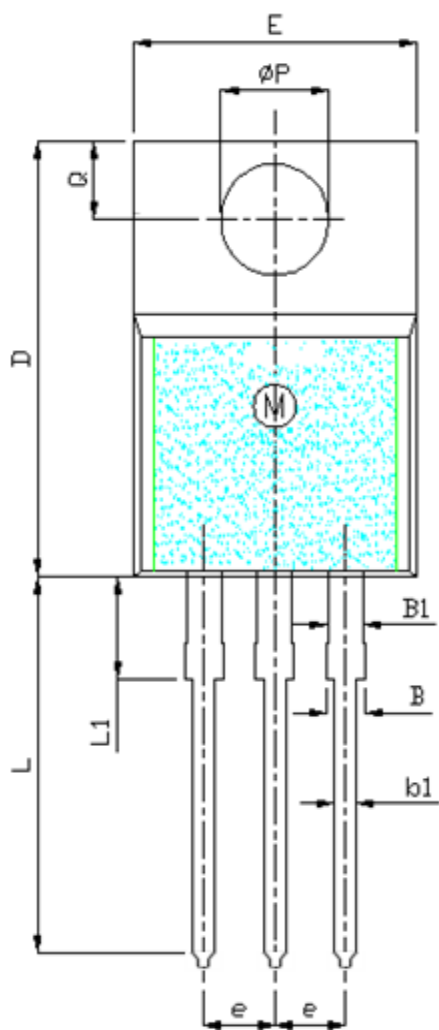
Current Derating Per Diode



## TO-220 Package Dimensions

Unit: mm

| Symbol | Min   | Nom | Max   | Symbol | Min   | Nom  | Max   |
|--------|-------|-----|-------|--------|-------|------|-------|
| A      | 4.00  |     | 4.80  | e      | 2.44  | 2.54 | 2.64  |
| B      | 1.20  |     | 1.40  | F      | 1.10  |      | 1.40  |
| B1     | 1.00  |     | 1.40  | L      | 12.50 |      | 14.50 |
| b1     | 0.75  |     | 0.95  | L1     | 3.00  | 3.50 | 4.00  |
| c      | 0.40  |     | 0.55  | ΦP     | 3.70  | 3.80 | 3.90  |
| D      | 15.00 |     | 16.50 | Q      | 2.50  |      | 3.00  |
| D1     | 5.90  |     | 6.90  | Q1     | 2.00  |      | 2.90  |
| E      | 9.90  |     | 10.70 | Y      | 8.02  | 8.12 | 8.22  |





TO-220F Package Dimensions

Unit: mm

| Symbol | Min  | Nom | Max  | Symbol | Min  | Nom  | Max   |
|--------|------|-----|------|--------|------|------|-------|
| A      | 4.5  |     | 4.9  | E1     | 6.5  | 7    | 7.5   |
| A1     | 2.3  |     | 2.9  | e      | 2.44 | 2.54 | 2.64  |
| b      | 0.65 |     | 0.9  | L      | 12.5 |      | 14.3  |
| b1     | 1.1  |     | 1.7  | L1     | 9.45 |      | 10.05 |
| b2     | 1.2  |     | 1.4  | L2     | 15   |      | 16    |
| c      | 0.35 |     | 0.65 | L3     | 3.2  |      | 4.4   |
| D      | 14.5 |     | 16.5 | ΦP     | 3    |      | 3.3   |
| D1     | 6.1  |     | 6.9  | Q      | 2.5  |      | 2.9   |
| E      | 9.6  |     | 10.3 |        |      |      |       |

