TAIWAN SEMICONDUCTOR

The Smartest Choice

# MBR20L100CT - MBR20L120CT

20.0AMPS Low $V_F$ Schottky Barrier Rectifiers

**TO-220AB**

AEC-Q101 Qualified

Pb-Free

RoHS COMPLIANT

## Features

- ✧ Low power loss, high efficiency
- ✧ High current capability, low forward voltage drop
- ✧ Plastic material used carriers Underwriters Laboratory Classification 94V-0
- ✧ High surge current capability
- ✧ Guard-ring for overvoltage protection
- ✧ For use in low voltage - high frequency inverter, free wheeling, and polarity protection application
- ✧ High temperature soldering guaranteed: 260℃/10 seconds/.375", (9.5mm) lead lengths at 5 lbs.,(2.3kg) tension

## Mechanical Data

- ✧ Case: TO-220AB
- ✧ Terminals: Pure tin plated leads, solderable per MIL-STD-202, Method 208 guaranteed
- ✧ Polarity: As marked
- ✧ Mounting position:Any
- ✧ Mounting torque: 5 in- lbs, max
- ✧ Weight: 1.92 grams

## Ordering Information(example)

| Part No. | Package | Packing | Packing code | Green Compound Packing code |
|---|---|---|---|---|
| MBR20L100CT | TO-220AB | 50 / TUBE | D0 | D0G |

## Maximum Ratings and Electrical Characteristics

Rating at 25 ℃ ambient temperature unless otherwise specified.

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

For capacitive load, derate current by 20%

| Type Number | Symbol | MBR20L100CT | | MBR20L120CT | | Unit |
|---|---|---|---|---|---|---|
| Maximum Repetitive Peak Reverse Voltage | $V_{RRM}$ | 100 | | 120 | | V |
| Maximum RMS Voltage | $V_{RMS}$ | 70 | | 84 | | V |
| Maximum DC Blocking Voltage | $V_{DC}$ | 100 | | 120 | | V |
| Maximum Average Forward Rectified Current | $I_{F(AV)}$ | 20 | | | | A |
| Peak Repetitive Forward Current (Rated $V_R$, Square Wave, 20KHz) | $I_{FRM}$ | 20 | | | | A |
| Peak Forward Surge Current, 8.3 ms Single Half Sine-wave Superimposed on Rated Load | $I_{FSM}$ | 150 | | | | A |
| Peak Repetitive Reverse Surge Current (Note 1) | $I_{RRM}$ | 1 | | | | A |
| Maximum Instantaneous Forward Voltage (Note 2) | $V_F$ | TYP | MAX | TYP | MAX | V |
| IF=10A, $T_A$=25℃ | | 0.72 | 0.75 | 0.78 | 0.83 | |
| IF=10A, $T_A$=125℃ | | 0.58 | 0.68 | 0.63 | 0.72 | |
| IF=20A, $T_A$=25℃ | | 0.81 | 0.85 | 0.86 | 0.90 | |
| IF=20A, $T_A$=125℃ | | 0.67 | 0.75 | 0.73 | 0.80 | |
| Maximum Reverse Current @ Rated $V_R$ | $I_R$ | TYP | MAX | TYP | MAX | |
| $T_A$=25 ℃ | | 1.10 | 20 | 1.00 | 20 | uA |
| $T_A$=100 ℃ | | 1.20 | 15 | 1.40 | 10 | mA |
| Voltage Rate of Change,(Rated $V_R$) | dV/dt | 10000 | | | | V/us |
| Typical Junction Capacitance (Note 3) | Cj | 435 | | 270 | | pF |
| Typical Thermal Resistance | $R_{\theta JC}$ | 2.8 | | 3.0 | | $^{O}$C/W |
| Operating Temperature Range | $T_J$ | - 55 to + 150 | | | | $^{O}$C |
| Storage Temperature Range | $T_{STG}$ | - 55 to + 150 | | | | $^{O}$C |

Note 1: 2.0uS Pulse Width, f=1.0KHz

Note 2: Pulse Test : 300uS Pulse Width, 1% Duty Cycle

Note 3: Measure at 1 MHz and Applied Reverse Voltage of 4.0V D.C.

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# RATINGS AND CHARACTERISTIC CURVES (MBR20L100CT - MBR20L120CT)

FIG.1 FORWARD CURRENT DERATING CURVE

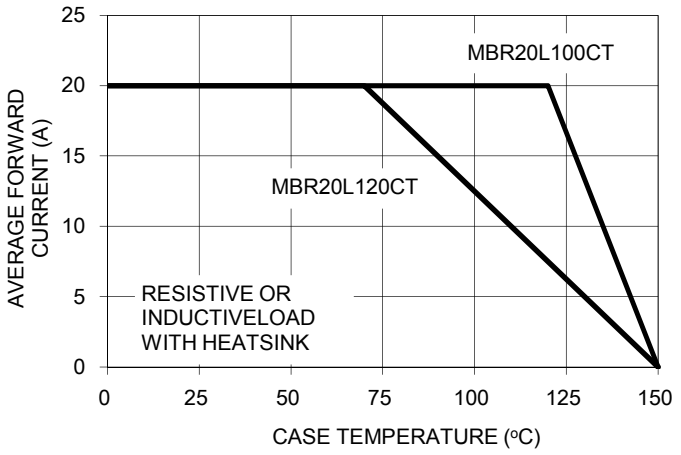



FIG. 2 MAXIMUM FORWARD SURGE CURRENT PER LEG

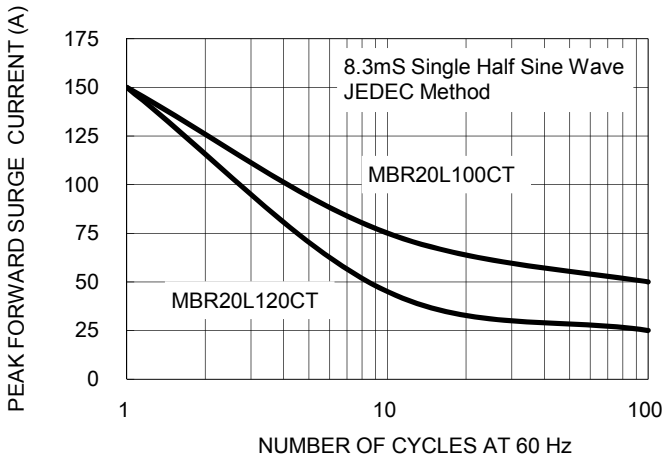



FIG. 3 TYPICAL FORWARD CHARACTERISTICS PER LEG

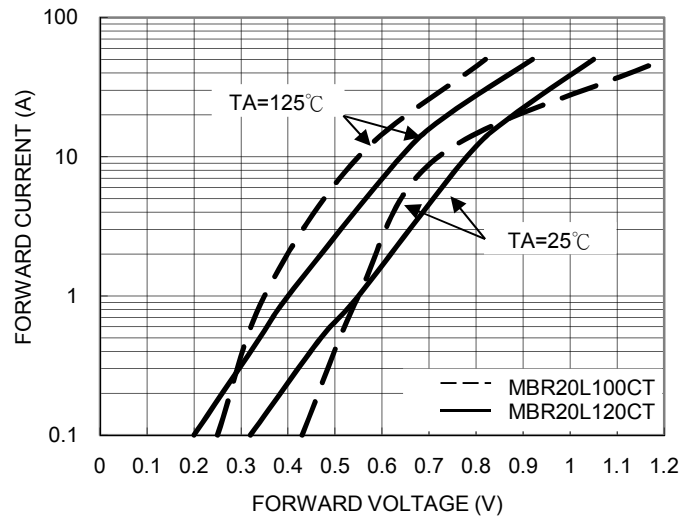



FIG. 4 TYPICAL REVERSE CHARACTERISTICS PER LEG

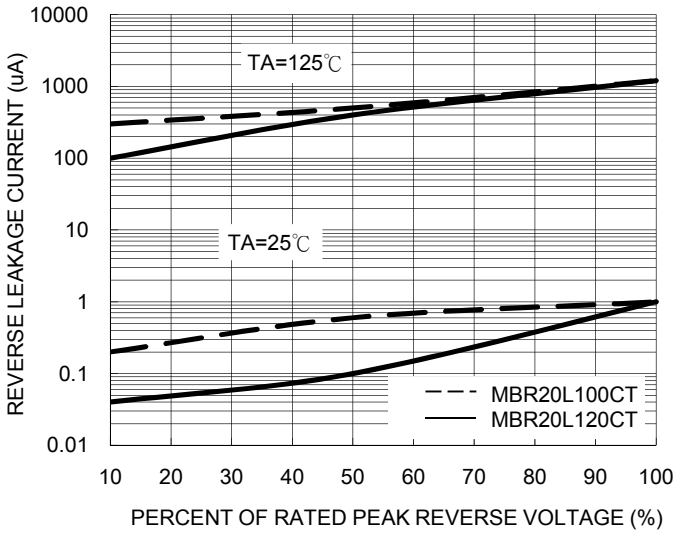



FIG. 5 TYPICAL JUNCTION CAPACITANCE PER LEG

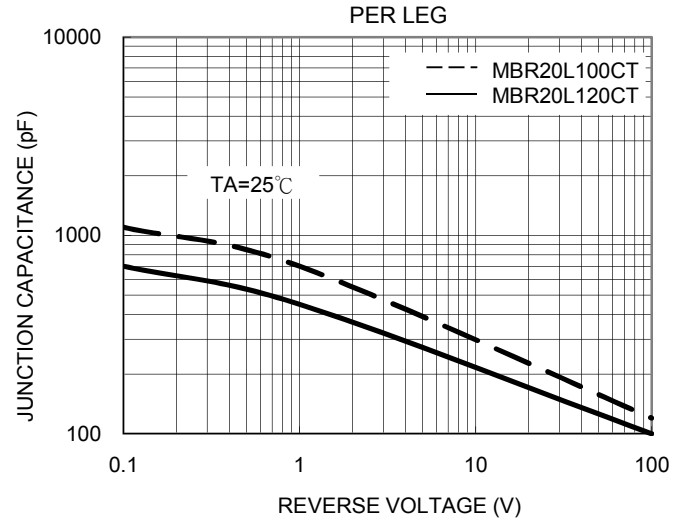
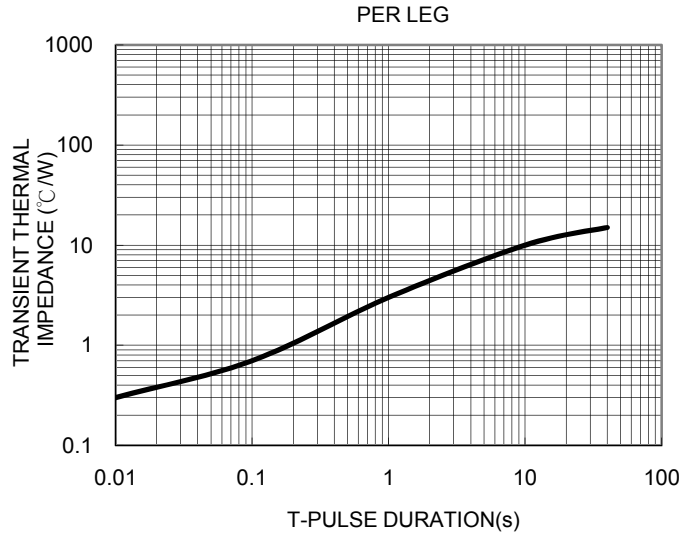



FIG. 6 TYPICAL TRANSIENT THERMAL IMPEDANCE PER LEG




Version:E12

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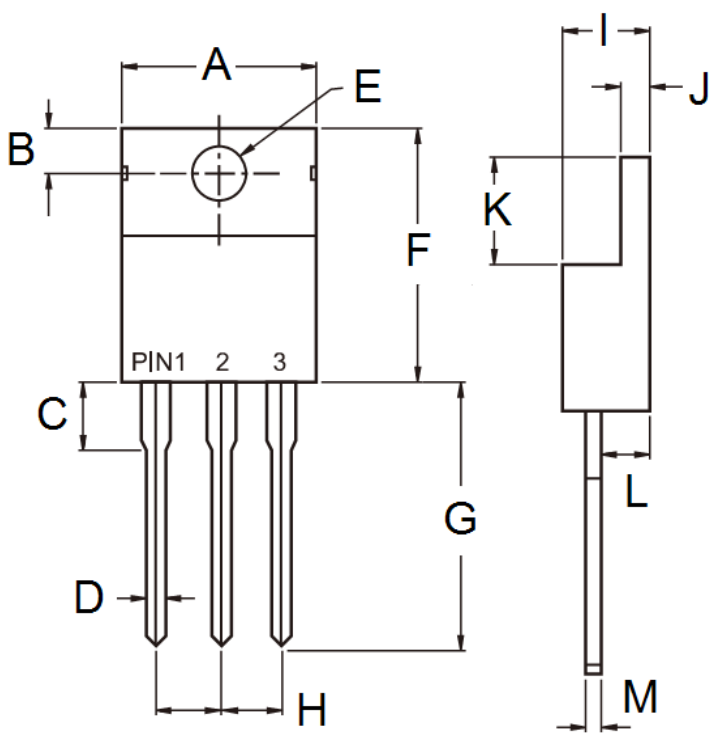
## Ordering information

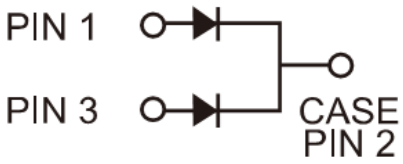
| Part No. | Package | BULK Packing | Packing code | Green Compound Packing code |
|---|---|---|---|---|
| MBR20LxxCT | TO-220AB | 50 / TUBE | C0 | C0G |
| | TO-220AB | 50 / TUBE | D0 | D0G |

Note: "xx" is Device Code from "100" thru "120".

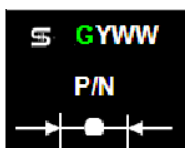
## Dimensions




| DIM. | Unit(mm) | | Unit(inch) | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | - | 10.50 | - | 0.413 |
| B | 2.62 | 3.44 | 0.103 | 0.135 |
| C | 2.80 | 4.20 | 0.110 | 0.165 |
| D | 0.68 | 0.94 | 0.027 | 0.037 |
| E | 3.54 | 4.00 | 0.139 | 0.157 |
| F | 14.60 | 16.00 | 0.575 | 0.630 |
| G | 13.19 | 14.79 | 0.519 | 0.582 |
| H | 2.41 | 2.67 | 0.095 | 0.105 |
| I | 4.42 | 4.76 | 0.174 | 0.187 |
| J | 1.14 | 1.40 | 0.045 | 0.055 |
| K | 5.84 | 6.86 | 0.230 | 0.270 |
| L | 2.20 | 2.80 | 0.087 | 0.110 |
| M | 0.35 | 0.64 | 0.014 | 0.025 |




## Marking Diagram




P/N = Specific Device Code
G = Green Compound
YWW = Date Code