

**MBR40L300PT**

Low Vf Schottky Barrier Rectifiers



**Voltage:** 300 Volts

**Current:** 40 A

**Package:** TO-247

**Features**

- NH'S Low Vf Schottky Barrier Chip Technology
- Super Low Forward Voltage Drop For High Efficiency
- Low Power Loss For High Reliability
- High Frequency Switching Speed

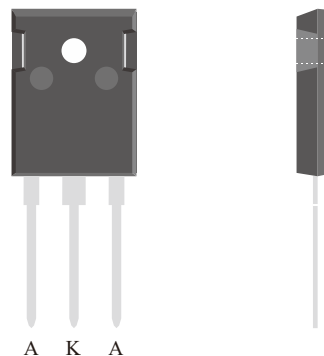
**Mechanical Data**

- **Case:** Molded With UL-94 ClassV-0 Recognized, RoHS-Compliant
- **Polarity:** Look At The Diagram And Polarity On The Right
- **Terminals:** Tin Plated Leads,Solderable Per J-STD-002 And JESD22-B102

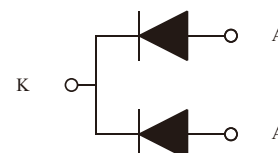
**Typical Applications**

- Switch Mode Power Supplies (SMPS)
- Fast Chargers
- LED Driver And Monitor Lighting
- Automotive Electronics And Charging Posts

**Diagram:**



**Polarity:**



Single Phase,Half Wave,60Hz,Resistive Or Inductive Load.For Capacitive Load,Derate Current By 20%

**Maximum Ratings (Ta=25°C Unless Otherwise Specified)**

| Parameter                                 | Test Conditions                                          | Symbol      | Ratings  | Unit               |
|-------------------------------------------|----------------------------------------------------------|-------------|----------|--------------------|
| Maximum Repetitive Peak Reverse Voltage   |                                                          | $V_{RRM}$   | 300      | V                  |
| Maximum RMS Voltag                        |                                                          | $V_{RMS}$   | 210      | V                  |
| Maximum DC Blocking Voltage               |                                                          | $V_{DC}$    | 300      | V                  |
| Maximum Average Forward Rectified Current | Per Diode<br>Total device                                | $I_{F(AV)}$ | 20<br>40 | A                  |
| Peak Forward Surge Current Per Diode      | 8.3ms Single Half Sine-wave<br>Superimposed On Rate Load | $I_{FSM}$   | 250      | A                  |
| Current Squared Time Per Diode            | $t < 8.3ms$                                              | $I^2t$      | 259.4    | A <sup>2</sup> sec |

**Electrical Characteristics (Ta=25°C Unless Otherwise Specified )**

| Parameter                                               | Test Conditions                                         | Symbol    | Ratings  |             |           | Unit     |
|---------------------------------------------------------|---------------------------------------------------------|-----------|----------|-------------|-----------|----------|
|                                                         |                                                         |           | Min.     | Typ.        | Max.      |          |
| Instaneous Forward Voltage Per Diode                    | Ta=25°C<br>Ta=100°C<br>If= 20.0 A                       | $V_F$     | --<br>-- | 0.94<br>0.9 | 1.05<br>1 | V        |
| Maximum DC Reverse Current at Rated DC Blocking Voltage | Ta=25°C , $V_R=V_{RRM}$<br>Ta=90°C , $V_R=V_{RRM}*80\%$ | $I_{RRM}$ | --<br>-- | 0.1<br>1    | 5<br>5    | uA<br>mA |
| Typical Junction Capacitance Per Diode                  | 4 V,1MHz                                                | $C_J$     | --       | 300         | --        | pF       |

**Thermal Characteristics (Ta=25°C Unless Otherwise Specified )**

| Parameter                                                   | Test Conditions                                     | Symbol          | Ratings    | Unit |
|-------------------------------------------------------------|-----------------------------------------------------|-----------------|------------|------|
| Operating Junction Temperature Range                        |                                                     | $T_J$           | -55 to 150 | °C   |
| Storage Temperature Range                                   |                                                     | $T_{STD}$       | -55 to 150 |      |
| Thermal Resistance Junction To Ambient<br>With Steady-State | Still Air Environment<br>With Ta=25°C               | $R_{\theta JA}$ | 40.0       | °C/W |
| Thermal Resistance Junction-Case<br>With Steady-State       | Device Mounted On<br>75mm x 45mm x 2.5mm Alu. Heat. | $R_{\theta JC}$ | 1.0        |      |

Notes: 1.Pulse Test: 300 Us Pulse Width,1% Duty Cycle

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Typical Characteristics Curves

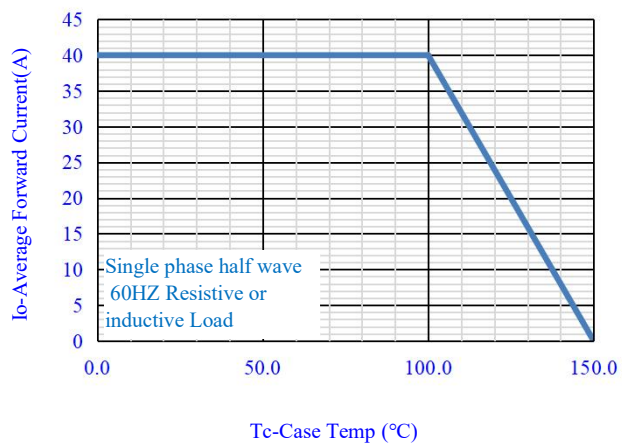


Fig.1-Forward Current Derating Curve

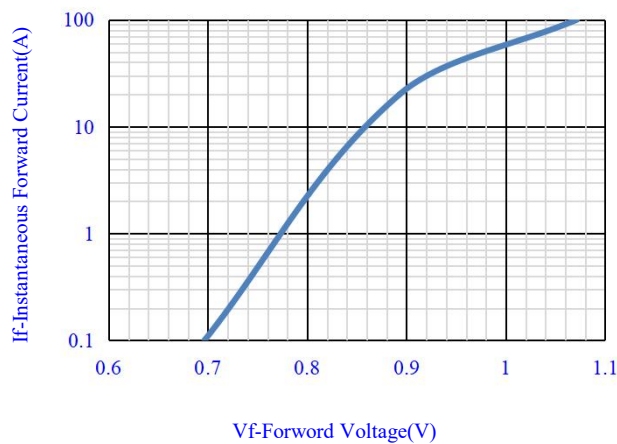


Fig.2-Typical Instantaneous Forward

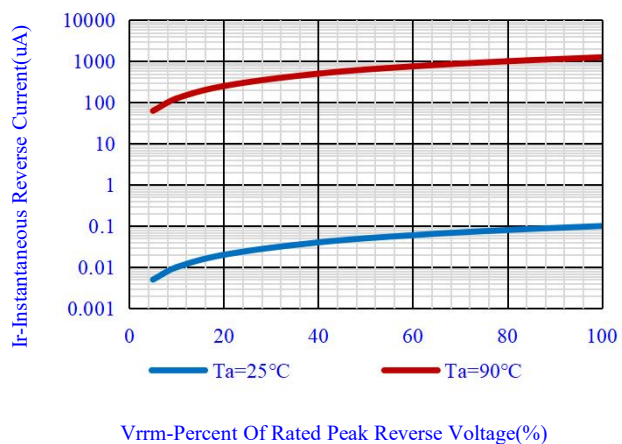


Fig.3-Typical Reverse Characteristics

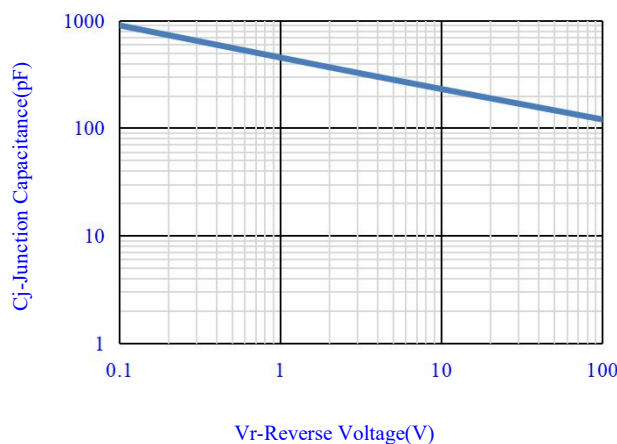


Fig.4-Typical Junction Capacitance

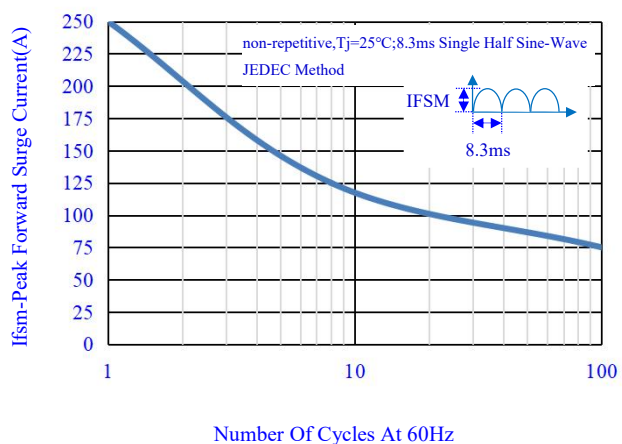


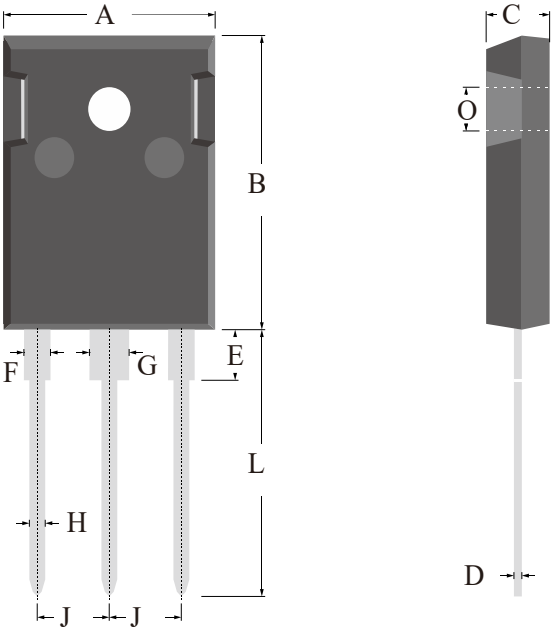
Fig.5-Max. Non-Repetitive Surge Current

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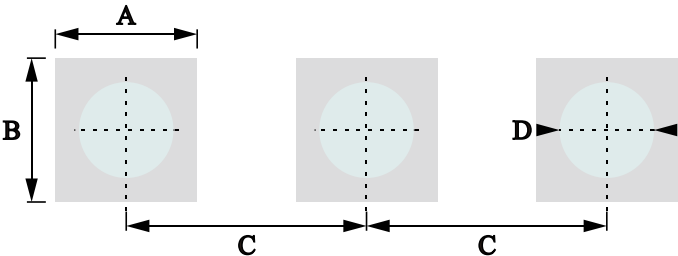
OUTLINE DRAWINGS



TO-247

| OUTLINE DIMENSIONS |            |      |       |        |      |        |
|--------------------|------------|------|-------|--------|------|--------|
| Dim.               | Milimeters |      |       | Inches |      |        |
|                    | Min.       | Typ. | Max.  | Min.   | Typ. | Max.   |
| A                  | 15.25      | -    | 16.75 | 0.6004 | -    | 0.6594 |
| B                  | 20.50      | -    | 22.50 | 0.8071 | -    | 0.8858 |
| C                  | 4.50       | -    | 5.10  | 0.1772 | -    | 0.2008 |
| D                  | 0.40       | -    | 0.80  | 0.0157 | -    | 0.0315 |
| E                  | 3.40       | -    | 4.00  | 0.1339 | -    | 0.1575 |
| F                  | 1.80       | -    | 2.20  | 0.0709 | -    | 0.0866 |
| G                  | 2.70       | -    | 3.30  | 0.1063 | -    | 0.1299 |
| H                  | 1.00       | -    | 1.40  | 0.0394 | -    | 0.0551 |
| J                  | 5.15       | -    | 5.75  | 0.2028 | -    | 0.2264 |
| L                  | 18.50      | -    | 20.50 | 0.7283 | -    | 0.8071 |
| O                  | 2.85       | -    | 3.15  | 0.1122 | -    | 0.1240 |

RECOMMEDND LAYOUT DRAWINGS



TO-247

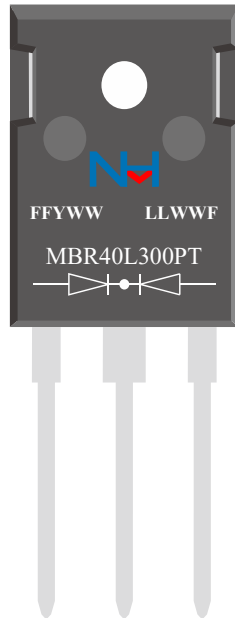
| OUTLINE DIMENSIONS |            |      |      |        |        |      |
|--------------------|------------|------|------|--------|--------|------|
| Dim.               | Milimeters |      |      | Inches |        |      |
|                    | Min.       | Typ. | Max. | Min.   | Typ.   | Max. |
| A                  | -          | 2.00 | -    | -      | 0.0787 | -    |
| B                  | -          | 2.00 | -    | -      | 0.0787 | -    |
| C                  | -          | 5.50 | -    | -      | 0.2165 | -    |
| D                  | -          | 1.40 | -    | -      | 0.0551 | -    |

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MARKING



MARKING INSTRUCTION

NH=Niuhan Trademark  
FF=Product Line Code,According To Actual Changes  
YWW=Date Code,According To Actual Changes  
LLWWF=Inernal Code,According To Actual Changes  
MBR40L300PT=Model

PACKING INFORMATION

| Package Type | Package Code | Product Weight Approx(g/Pcs) | Package Method | Quantity (Pcs/Min. Pack.) | Quantity (Pcs/Inner Box) | Quantity (Pcs/Carton) |
|--------------|--------------|------------------------------|----------------|---------------------------|--------------------------|-----------------------|
| TO-247       | P1           | 5.778                        | Tube           | 30                        | 450                      | 2250                  |

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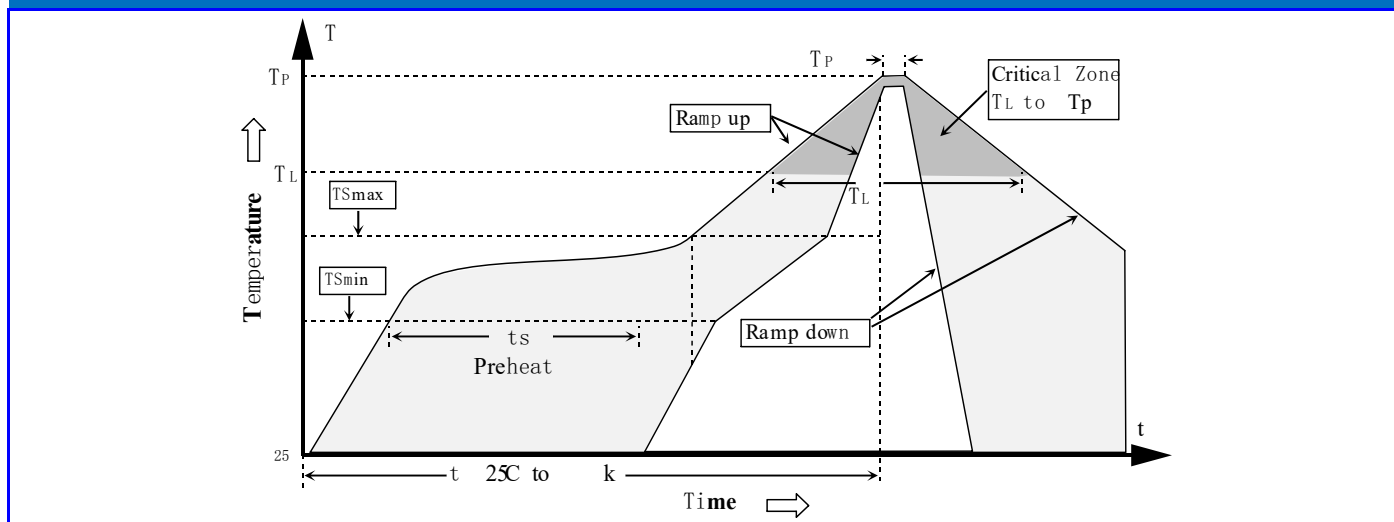
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**Recommended wave soldering condition**

| Product         | Peak Temperature | Soldering Time  |
|-----------------|------------------|-----------------|
| Pb-free devices | 260 +0/-5 °C     | 5 +1/-1 seconds |

**Recommended temperature profile for IR reflow**



| Profile feature                                                                            | Sn-Pb eutectic Assembly          | Pb-free Assembly                 |
|--------------------------------------------------------------------------------------------|----------------------------------|----------------------------------|
| Average ramp-up rate<br>(T <sub>smax</sub> to T <sub>p</sub> )                             | 3°C/second max.                  | 3°C/second max.                  |
| Preheat<br>-Temperature Min(TS min)<br>-Temperature Max(TS max)<br>-Time(ts min to ts max) | 100°C<br>150°C<br>60-120 seconds | 150°C<br>200°C<br>60-180 seconds |
| Time maintained above:<br>-Temperature (TL)<br>- Time (tL)                                 | 183°C<br>60-150 seconds          | 217°C<br>60-150 seconds          |
| Peak Temperature(TP)                                                                       | 240 +0/-5 °C                     | 260 +0/-5 °C                     |
| Time within 5°C of actual peak<br>temperature(tp)                                          | 10-30 seconds                    | 20-40 seconds                    |
| Ramp down rate                                                                             | 6°C/second max.                  | 6°C/second max.                  |
| Time 25 °C to peak temperature                                                             | 6 minutes max.                   | 8 minutes max.                   |

Note : All temperatures refer to topside of the package, measured on the package body surface.

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