

**MBR20L80CS**

Low Vf Schottky Barrier Rectifiers



**Voltage:** 80 Volts

**Current:** 20 Amperes

**Package:** TO-252

**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

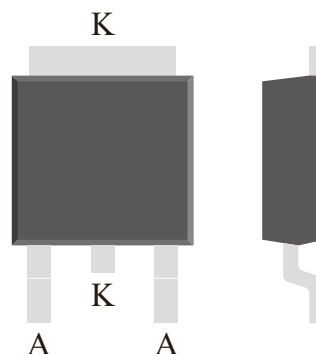
**Mechanical Data**

- **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

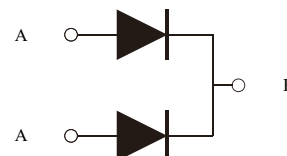
**Typical Applications**

- 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   |                                                          | $V_{RRM}$   | 80       | V                  |
| Maximum RMS Voltag                        |                                                          | $V_{RMS}$   | 56       | V                  |
| Maximum DC Blocking Voltage               |                                                          | $V_{DC}$    | 80       | V                  |
| Maximum Average Forward Rectified Current | Per Diode<br>Total device                                | $I_{F(AV)}$ | 10<br>20 | A                  |
| Peak Forward Surge Current Per Diode      | 8.3ms Single Half Sine-wave<br>Superimposed On Rate Load | $I_{FSM}$   | 150      | A                  |
| Current Squared Time Per Diode            | $t < 8.3ms$                                              | $I^2t$      | 93.4     | 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= 10.0 A                        | $V_F$     | --<br>-- | 0.57<br>0.53 | 0.65<br>0.6 | V        |
| Maximum DC Reverse Current at Rated DC Blocking Voltage | Ta=25°C , $V_R=V_{RRM}$<br>Ta=100°C , $V_R=V_{RRM}*80\%$ | $I_{RRM}$ | --<br>-- | 10<br>1      | 100<br>13   | uA<br>mA |
| Typical Junction Capacitance Per Diode                  | 4 V,1MHz                                                 | $C_J$     | --       | 720          | --          | 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                  | $R_{\theta JA}$ | 100.0      | °C/W |
| Thermal Resistance Junction-Case<br>With Steady-State       | Device Mounted On<br>1 in2 FR-4 Board With 2oz. Copper | $R_{\theta JC}$ | 2.5        |      |

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

**MBR20L80CS**

Low Vf Schottky Barrier Rectifiers



Typical Characteristics Curves

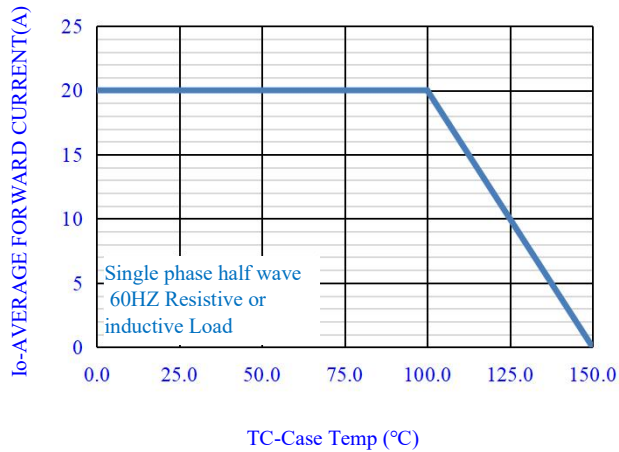


Fig.1-FORWARD CURRENT DERATING CURVE

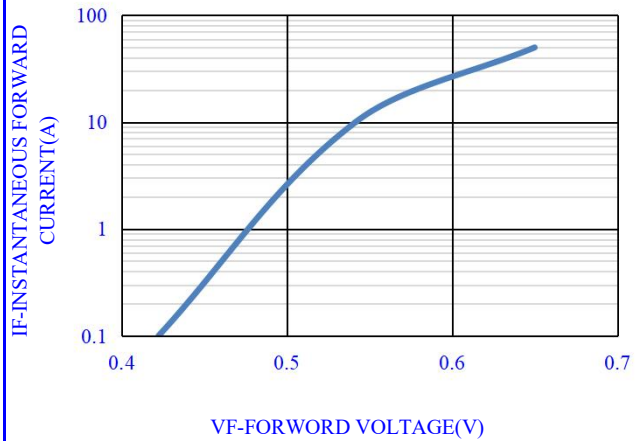


Fig.2- TYPICAL INSTANTANEOUS FORWARD

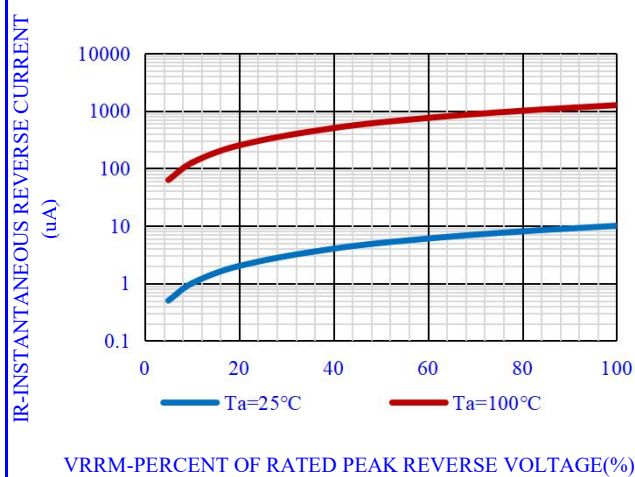


Fig.3- TYPICAL REVERSE CHARACTERISTICS

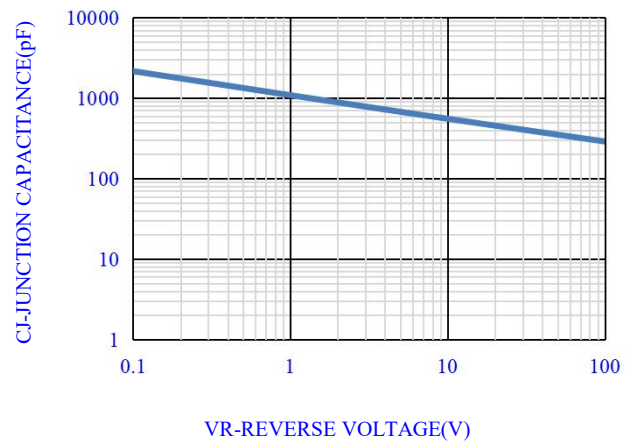


Fig.4- TYPICAL JUNCTION CAPACITANCE

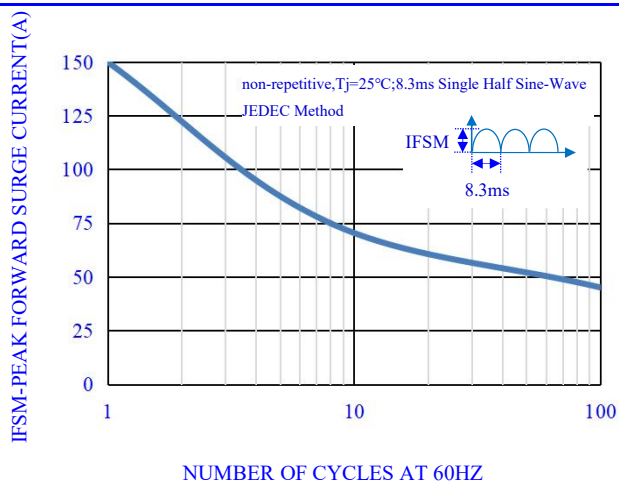


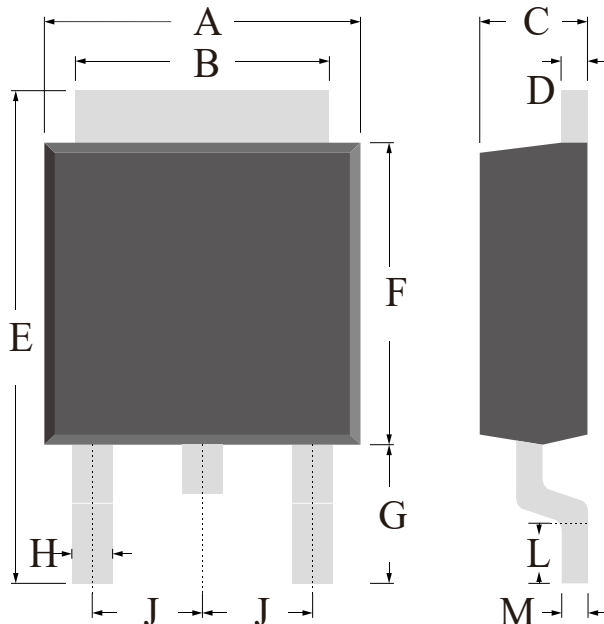
Fig.5-MAX. NON-REPETITIVE SURGE CURRENT

**MBR20L80CS**

Low Vf Schottky Barrier Rectifiers



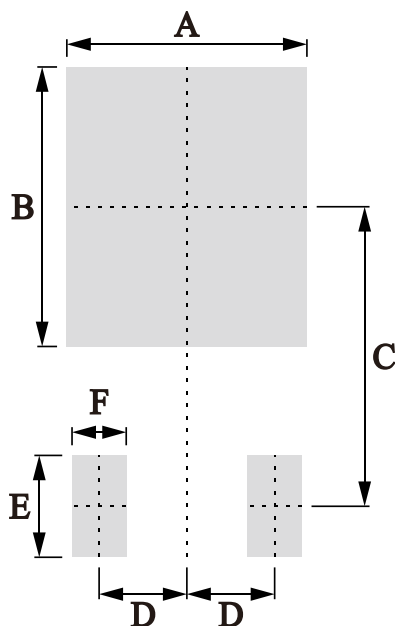
**OUTLINE DRAWINGS**



**TO-252**

| OUTLINE DIMENSIONS |            |      |       |        |      |        |
|--------------------|------------|------|-------|--------|------|--------|
| Dim.               | Milimeters |      |       | Inches |      |        |
|                    | Min.       | Typ. | Max.  | Min.   | Typ. | Max.   |
| A                  | 6.10       | -    | 7.10  | 0.2402 | -    | 0.2795 |
| B                  | 4.80       | -    | 5.80  | 0.1890 | -    | 0.2283 |
| C                  | 1.95       | -    | 2.55  | 0.0768 | -    | 0.1004 |
| D                  | 0.35       | -    | 0.75  | 0.0138 | -    | 0.0295 |
| E                  | 9.25       | -    | 10.75 | 0.3642 | -    | 0.4232 |
| F                  | 5.60       | -    | 6.60  | 0.2205 | -    | 0.2598 |
| G                  | 2.50       | -    | 3.10  | 0.0984 | -    | 0.1220 |
| H                  | 0.65       | -    | 1.05  | 0.0256 | -    | 0.0413 |
| J                  | 2.10       | -    | 2.50  | 0.0827 | -    | 0.0984 |
| L                  | 1.00       | -    | 1.40  | 0.0394 | -    | 0.0551 |
| M                  | 0.35       | -    | 0.75  | 0.0138 | -    | 0.0295 |

**RECOMMENDED LAYOUT DRAWINGS**



**TO-252**

| OUTLINE DIMENSIONS |            |      |      |        |        |      |
|--------------------|------------|------|------|--------|--------|------|
| Dim.               | Milimeters |      |      | Inches |        |      |
|                    | Min.       | Typ. | Max. | Min.   | Typ.   | Max. |
| A                  | -          | 6.09 | -    | -      | 0.2398 | -    |
| B                  | -          | 7.57 | -    | -      | 0.2980 | -    |
| C                  | -          | 6.64 | -    | -      | 0.2610 | -    |
| D                  | -          | 2.30 | -    | -      | 0.0910 | -    |
| E                  | -          | 2.76 | -    | -      | 0.1090 | -    |
| F                  | -          | 1.42 | -    | -      | 0.0560 | -    |

MBR20L80CS

Low Vf Schottky Barrier Rectifiers



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  
MBR20L80CS=Model

PACKING INFORMATION

| Package Type | Package Code | Product Weight<br>Approx(g/Pcs) | Package Method | Quantity<br>(Pcs/Min. Pack.) | Quantity<br>(Pcs/Inner Box) | Quantity<br>(Pcs/Carton) |
|--------------|--------------|---------------------------------|----------------|------------------------------|-----------------------------|--------------------------|
| TO-252       | P1           | 0.321                           | 13" Reel       | 2500                         | 5000                        | 30000                    |
| TO-252       | P2           | 0.321                           | 13" Reel       | 2500                         | 2500                        | 25000                    |

**MBR20L80CS**

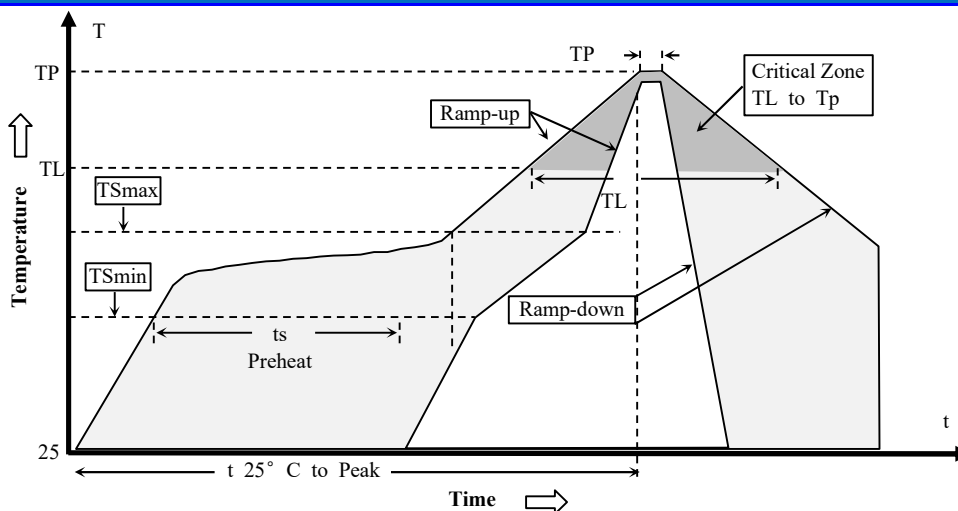
Low Vf Schottky Barrier Rectifiers



**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.

**MBR20L80CS**

Low Vf Schottky Barrier Rectifiers



**Disclaimer**

- Reproducing and modifying information of the document is prohibited without permission from Niuhan Electronics Technology Co., LTD
- Niuhan Electronics Technology Co., LTD. reserves the rights to make changes of the content herein the document anytime without notification.
- Niuhan Electronics Technology Co., LTD. disclaims any and all liability arising out of the application or use of any product including damages incidentally and consequentially occurred.
- Niuhan Electronics Technology Co., LTD. does not assume any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.
- Applications shown on the herein document are examples of standard use and operation. Customers are responsible in comprehending the suitable use in particular applications. Niuhan Electronics Technology Co., LTD. makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.
- The products shown herein are not designed and authorized for equipments requiring high level of reliability or relating to human life and for any applications concerning life-saving or life-sustaining, such as medical instruments, transportation equipment, aerospace machinery et cetera. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Niuhan Electronics Technology Co., LTD. for any damages resulting from such improper use or sale.
- When the appearance of the product and chip size does not change, in order to product the customer. quality, change the internal structure and the production process Niuhan can not notify