

**HBR3040YD THRU HBR30200YD**
**Schottky Barrier Rectifiers**

**Voltage:** 40~200 Volts

**Current:** 30 Amperes

**Package:** TO-263

**Features**

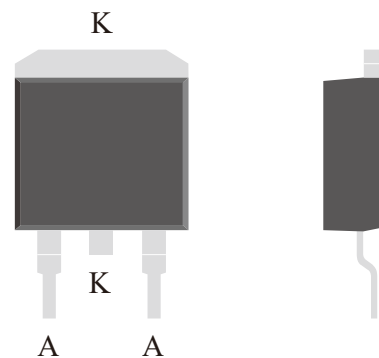
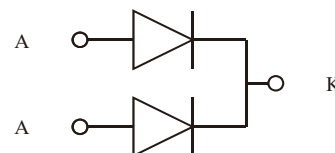
- NH'S Plane Schottky Barrier Chip Technology
- Low Forward Voltage Drop For High Efficiency
- Low Power Loss For High Reliability
- High Frequency Switching Speed

**Mechanical Data**

- **Case:** Molded With UL-94 Class V-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      | HBR30<br>40YD | HBR30<br>45YD | HBR30<br>60YD | HBR30<br>80YD | HBR30<br>100YD | HBR30<br>150YD | HBR30<br>200YD | Unit               |
|-------------------------------------------|----------------------------------------------------------|-------------|---------------|---------------|---------------|---------------|----------------|----------------|----------------|--------------------|
| Maximum Repetitive Peak Reverse Voltage   |                                                          | $V_{RRM}$   | 40            | 45            | 60            | 80            | 100            | 150            | 200            | V                  |
| Maximum RMS Voltage                       |                                                          | $V_{RMS}$   | 28            | 32            | 42            | 56            | 70             | 105            | 140            | V                  |
| Maximum DC Blocking Voltage               |                                                          | $V_{DC}$    | 40            | 45            | 60            | 80            | 100            | 150            | 200            | V                  |
| Maximum Average Forward Rectified Current | Per Diode<br>Total device                                | $I_{F(AV)}$ | 15<br>30      |               |               |               |                |                |                | A                  |
| Peak Forward Surge Current Per Diode      | 8.3ms Single Half Sine-wave<br>Superimposed On Rate Load | $I_{FSM}$   | 200           |               |               |               |                |                |                | A                  |
| Current Squared Time Per Diode            | $t < 8.3ms$                                              | $I^2t$      | 166.0         |               |               |               |                |                |                | A <sup>2</sup> sec |

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

| Parameter                                               | Test Conditions                                              | Symbol    | HBR30<br>40YD | HBR30<br>45YD | HBR30<br>60YD | HBR30<br>80YD | HBR30<br>100YD | HBR30<br>150YD | HBR30<br>200YD | Unit     |
|---------------------------------------------------------|--------------------------------------------------------------|-----------|---------------|---------------|---------------|---------------|----------------|----------------|----------------|----------|
| Instantaneous Forward Voltage Per Diode                 | $I_F = 15.0 A$                                               | $V_F$     | 0.55          | 0.70          | 0.85          | 0.90          |                |                |                | V        |
| Maximum DC Reverse Current at Rated DC Blocking Voltage | Ta=25°C, $V_R = V_{RRM}$<br>Ta=110°C, $V_R = V_{RRM} * 80\%$ | $I_{RRM}$ | 100<br>10     | 80<br>8       | 50<br>5       | 10<br>3       |                |                |                | uA<br>mA |
| Typical Junction Capacitance Per Diode                  | 4 V, 1MHz                                                    | $C_J$     | 750           | 580           | 290           | 240           |                |                |                | pF       |

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

| Parameter                                                   | Test Conditions                                        | Symbol           | HBR30<br>40YD | HBR30<br>45YD | HBR30<br>60YD | HBR30<br>80YD | HBR30<br>100YD | HBR30<br>150YD | HBR30<br>200YD | Unit |
|-------------------------------------------------------------|--------------------------------------------------------|------------------|---------------|---------------|---------------|---------------|----------------|----------------|----------------|------|
| Operating Junction Temperature Range                        |                                                        | T <sub>J</sub>   | -55~125       |               |               | -55~150       |                | -55~175        |                | ℃    |
| Storage Temperature Range                                   |                                                        | T <sub>STD</sub> | -55~125       |               |               | -55~150       |                | -55~175        |                |      |
| Thermal Resistance Junction To Ambient<br>With Steady-State | Still Air Environment<br>With Ta=25℃                   | R <sub>θJA</sub> | 55.0          |               |               |               |                |                |                | ℃/W  |
| Thermal Resistance Junction-Case<br>With Steady-State       | Device Mounted On<br>1 in2 FR-4 Board With 2oz. Copper | R <sub>θJC</sub> | 2.0           |               |               |               |                |                |                |      |

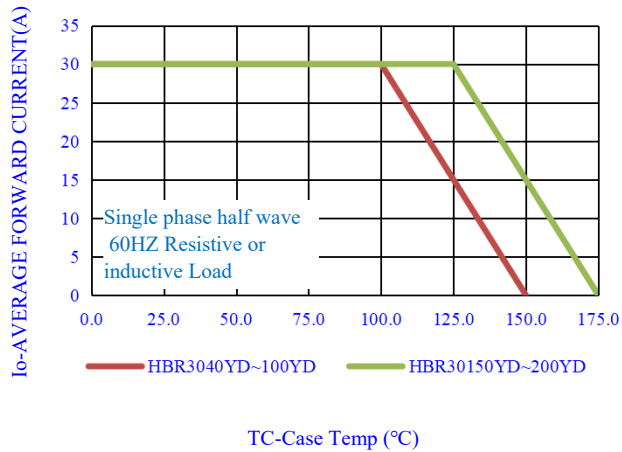
Notes: 1. Pulse Test: 300 Us Pulse Width, 1% Duty Cycle

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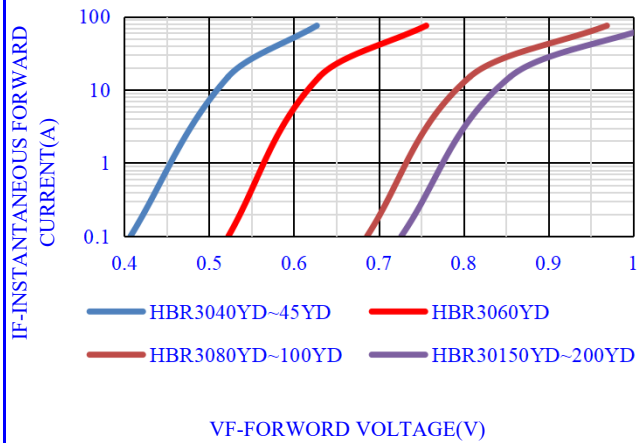
**Schottky Barrier Rectifiers**



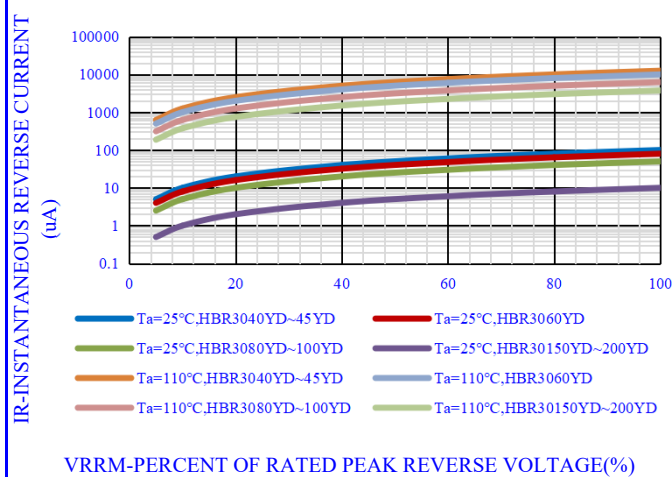
**Typical Characteristics Curves**



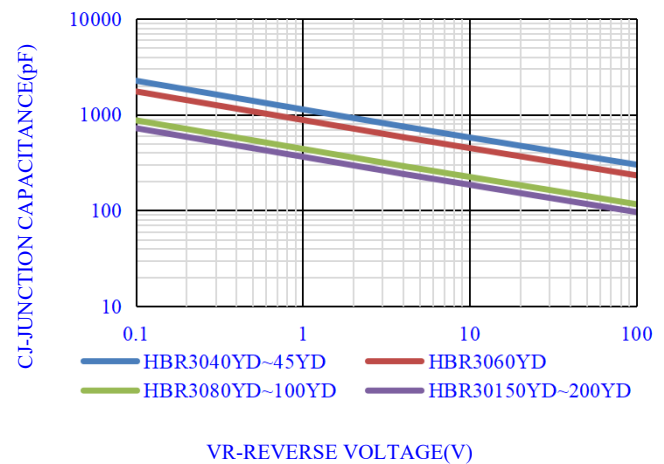
**Fig.1-FORWARD CURRENT DERATING CURVE**



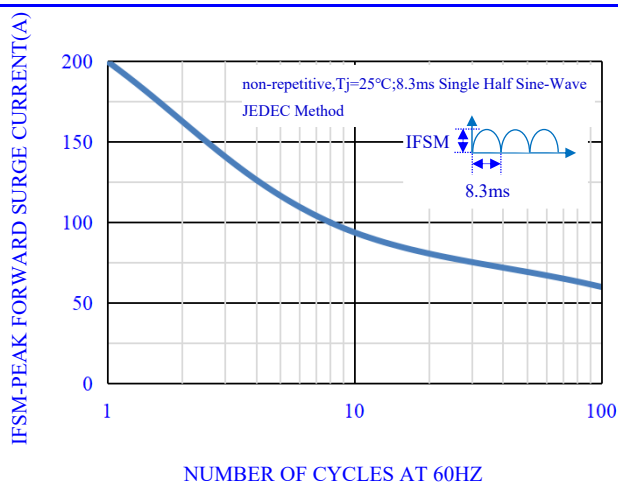
**Fig.2- TYPICAL INSTANTANEOUS FORWARD**



**Fig.3- TYPICAL REVERSE CHARACTERISTICS**



**Fig.4- TYPICAL JUNCTION CAPACITANCE**



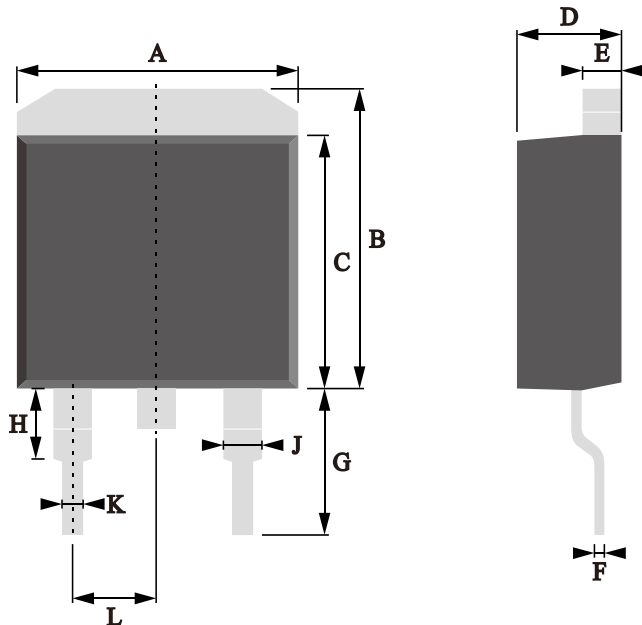
**Fig.5-MAX. NON-REPETITIVE SURGE CURRENT**

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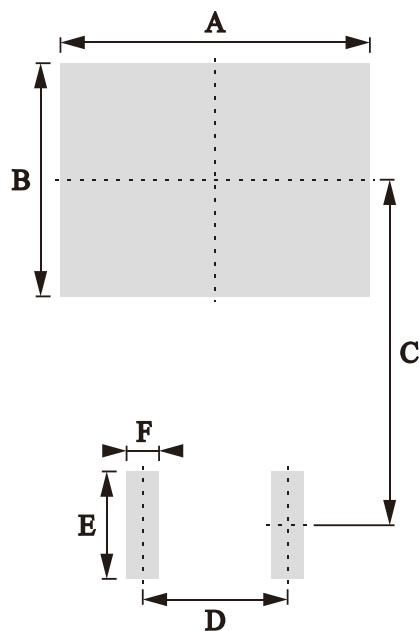
**OUTLINE DRAWINGS**



**TO-263**

| OUTLINE DIMENSIONS |            |      |       |        |      |        |
|--------------------|------------|------|-------|--------|------|--------|
| Dim.               | Milimeters |      |       | Inches |      |        |
|                    | Min.       | Typ. | Max.  | Min.   | Typ. | Max.   |
| A                  | 9.30       | -    | 10.50 | 0.3661 | -    | 0.4134 |
| B                  | 9.60       | -    | 11.60 | 0.3780 | -    | 0.4567 |
| C                  | 8.20       | -    | 9.50  | 0.3228 | -    | 0.3740 |
| D                  | 4.00       | -    | 5.00  | 0.1575 | -    | 0.1969 |
| E                  | 1.00       | -    | 1.70  | 0.0394 | -    | 0.0669 |
| F                  | 0.20       | -    | 0.70  | 0.0079 | -    | 0.0276 |
| G                  | 4.45       | -    | 5.25  | 0.1752 | -    | 0.2067 |
| H                  | 1.25       | -    | 1.85  | 0.0492 | -    | 0.0728 |
| J                  | 1.00       | -    | 1.60  | 0.0394 | -    | 0.0630 |
| K                  | 0.60       | -    | 1.00  | 0.0236 | -    | 0.0394 |
| L                  | 2.25       | -    | 2.80  | 0.0886 | -    | 0.1102 |

**RECOMMEDNED LAYOUT DRAWINGS**



**TO-263**

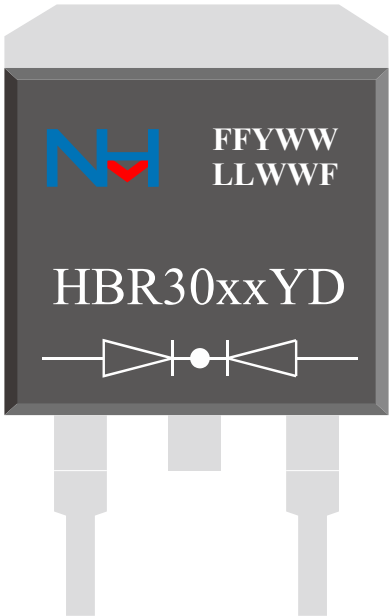
| OUTLINE DIMENSIONS |            |       |      |        |        |      |
|--------------------|------------|-------|------|--------|--------|------|
| Dim.               | Milimeters |       |      | Inches |        |      |
|                    | Min.       | Typ.  | Max. | Min.   | Typ.   | Max. |
| A                  | -          | 10.86 | -    | -      | 0.4276 | -    |
| B                  | -          | 7.86  | -    | -      | 0.3094 | -    |
| C                  | -          | 11.64 | -    | -      | 0.4583 | -    |
| D                  | -          | 5.08  | -    | -      | 0.2000 | -    |
| E                  | -          | 3.62  | -    | -      | 0.1090 | -    |
| F                  | -          | 1.14  | -    | -      | 0.0560 | -    |

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MARKING



MARKING INSTRUCTION

NH=Niuhang Trademark  
FF=Product Line Code,According To Actual Changes  
YWW=Date Code,According To Actual Changes  
LLWWF=Inernal Code,According To Actual Changes  
HBR30xxYD=Model,xx=40,45,60,80,100,150,200  
White band denotes cathode

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-263       | P1           | 1.4331                          | 13" Reel       | 800                          | 800                         | 4000                     |
| TO-263       | P2           | 1.4331                          | 13" Reel       | 800                          | 800                         | 6400                     |

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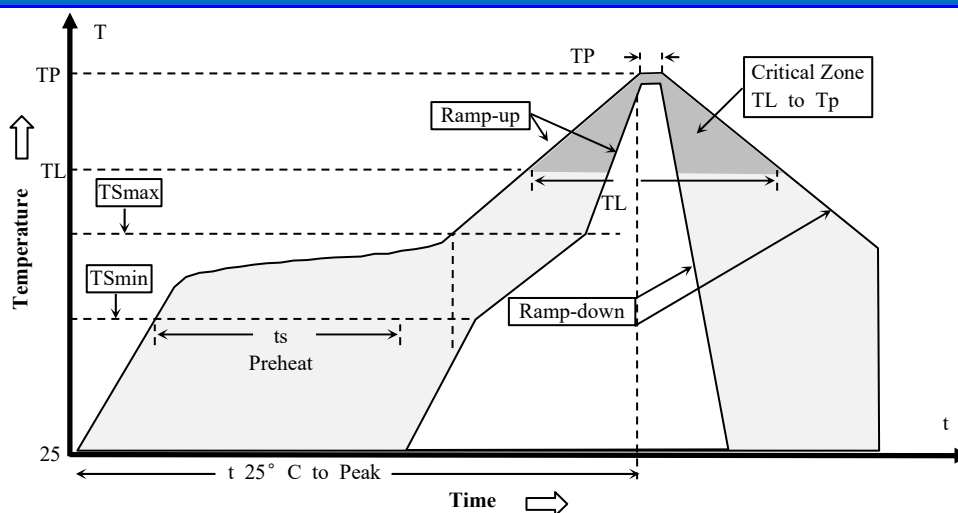
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**Recommended wave soldering condition**

| 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(T <sub>s</sub> min)<br>-Temperature Max(T <sub>s</sub> max)<br>-Time(t <sub>s</sub> min to t <sub>s</sub> max) | 100°C<br>150°C<br>60-120 seconds | 150°C<br>200°C<br>60-180 seconds |
| Time maintained above:<br>-Temperature (T <sub>L</sub> )<br>- Time (t <sub>L</sub> )                                                       | 183°C<br>60-150 seconds          | 217°C<br>60-150 seconds          |
| Peak Temperature(T <sub>p</sub> )                                                                                                          | 240 +0/-5 °C                     | 260 +0/-5 °C                     |
| Time within 5°C of actual peak 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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