

# THYRISTOR MODULE

20A / 300V to 800V

**PBH203 PBH206 PBH208**

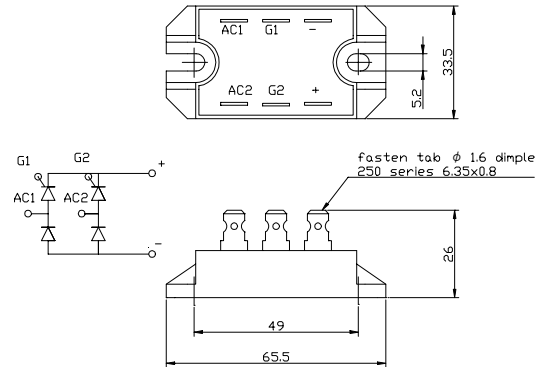
## FEATURES

- \* Isolated Base
- \* Thyristors and Diodes  
H-Bridge Circuit
- \* High Surge Capability
- \* UL Recognized, File No. E187184

## TYPICAL APPLICATIONS

- \* Rectified For General Use

## OUTLINE DRAWING



## Maximum Ratings

Approx Net Weight:70g

| Parameter                             | Symbol    | Grade  |        |        | Unit |
|---------------------------------------|-----------|--------|--------|--------|------|
|                                       |           | PBH203 | PBH206 | PBH208 |      |
| Repetitive Peak Off-State Voltage     | $V_{DRM}$ | 300    | 600    | 800    | V    |
| Non Repetitive Peak Off-State Voltage | $V_{DSM}$ | 400    | 700    | 960    |      |
| Repetitive Peak Reverse Voltage       | $V_{RRM}$ | 300    | 600    | 800    | V    |
| Non Repetitive Peak Reverse Voltage   | $V_{RSM}$ | 400    | 700    | 960    |      |

| Parameter                            |               | Conditions  | Max Rated Value | Unit                   |     |
|--------------------------------------|---------------|---|-----------------|------------------------|-----|
| Average Rectified Output Current     | $I_{O(AV)}$   | 50Hz Half Sine Wave condition<br>$T_c=60^\circ\text{C}$   | 20              | A                      |     |
| Surge On-State Current               | $I_{TSM}$     | 50 Hz Half Sine Wave, 1Pulse,<br>Non-Repetitive   | 160             | A                      |     |
| I Squared t                          | $I^2t$        | 2msec to 10msec   | 128             | $\text{A}^2\text{s}$   |     |
| Critical Rate of Turned-On Current   | $di/dt$       | $V_D=2/3V_{DRM}$ , $I_{TM}=2 \cdot I_O$ , $T_j=125^\circ\text{C}$<br>$I_G=100\text{mA}$ , $di_G/dt=0.2\text{A}/\mu\text{s}$ | 100             | $\text{A}/\mu\text{s}$ |     |
| Peak Gate Power                      | $P_{GM}$      |   | 5               | W                      |     |
| Average Gate Power                   | $P_{G(AV)}$   |   | 0.5             | W                      |     |
| Peak Gate Current                    | $I_{GM}$      |   | 2               | A                      |     |
| Peak Gate Voltage                    | $V_{GM}$      |   | 10              | V                      |     |
| Peak Gate Reverse Voltage            | $V_{RGM}$     |   | 5               | V                      |     |
| Operating Junction Temperature Range | $T_{jw}$      |   | -40 to +125     | $^\circ\text{C}$       |     |
| Storage Temperature Range            | $T_{stg}$     |   | -40 to +125     | $^\circ\text{C}$       |     |
| Isolation Voltage                    | Viso          | Base Plate to Terminals, AC1min   | 2000            | V                      |     |
| Mounting torque                      | Case mounting | Ftor  | M5 Screw        | 2.4 to 2.8             | N.m |
|                                      | Terminals     |   | -               | -                      |     |

Value per 1 Arm

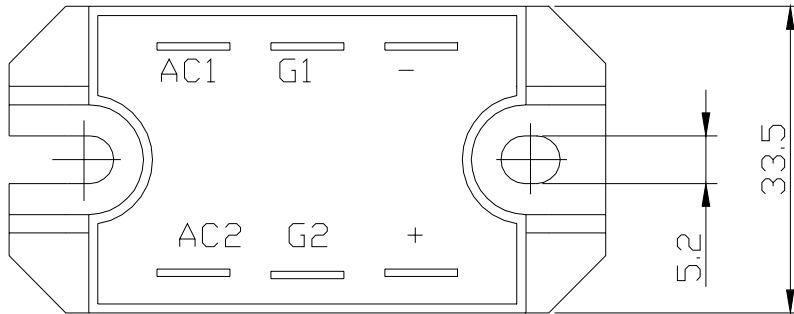
**Electrical • Thermal Characteristics**

| Characteristics                            | Symbol   | Test Conditions   | Maximum Value.            |      |      | Unit                      |
|--|----------|---|---------------------------|------|------|---------------------------|
|  |          |   | Min.                      | Typ. | Max. |                           |
| Peak Off-State Current                     | $I_{DM}$ | $V_{DM} = V_{DRM}, T_j = 125^\circ\text{C}$   |                           |      | 5    | mA                        |
| Peak Reverse Current                       | $I_{RM}$ | $V_{RM} = V_{RRM}, T_j = 125^\circ\text{C}$   |                           |      | 5    | mA                        |
| Peak Forward Voltage                       | $V_{TM}$ | $I_{TM} = 30\text{A}, T_j = 25^\circ\text{C}$   |                           |      | 1.63 | V                         |
| Gate Current to Trigger                    | $I_{GT}$ | $V_D = 6\text{V}, I_T = 1\text{A}$  | $T_j = -40^\circ\text{C}$ |      | 100  | mA                        |
|  |          |   | $T_j = 25^\circ\text{C}$  |      | 50   |                           |
|  |          |   | $T_j = 125^\circ\text{C}$ |      | 25   |                           |
| Gate Voltage to Trigger                    | $V_{GT}$ | $V_D = 6\text{V}, I_T = 1\text{A}$  | $T_j = -40^\circ\text{C}$ |      | 4    | V                         |
|  |          |   | $T_j = 25^\circ\text{C}$  |      | 2.5  |                           |
|  |          |   | $T_j = 125^\circ\text{C}$ |      | 2    |                           |
| Gate Non-Trigger Voltage                   | $V_{GD}$ | $V_D = 2/3V_{DRM}, T_j = 125^\circ\text{C}$   | 0.25                      |      |      | V                         |
| Critical Rate of Rise of Off-State Voltage | dv/dt    | $V_D = 2/3V_{DRM}, T_j = 125^\circ\text{C}$   | 100                       |      |      | V/ $\mu\text{s}$          |
| Turn-Off Time                              | tq       | $I_{TM} = I_O, V_D = 2/3V_{DRM}$<br>$dv/dt = 20\text{V}/\mu\text{s}, V_R = 100\text{V}$<br>$-di/dt = 20\text{A}/\mu\text{s}, T_j = 125^\circ\text{C}$ |                           | 80   |      | $\mu\text{s}$             |
| Turn-On Time                               | tgt      | $V_D = 2/3V_{DRM}, T_j = 125^\circ\text{C}$<br>$I_G = 100\text{mA}, di_G/dt = 0.2\text{A}/\mu\text{s}$  |                           | 6    |      | $\mu\text{s}$             |
| Delay Time                                 | td       |   |                           | 2    |      | $\mu\text{s}$             |
| Rise Time                                  | tr       |   |                           | 4    |      | $\mu\text{s}$             |
| Latching Current                           | $I_L$    | $T_j = 25^\circ\text{C}$  |                           | 70   |      | mA                        |
| Holding Current                            | $I_H$    | $T_j = 25^\circ\text{C}$  |                           | 50   |      |                           |
| Thermal Resistance *1                      | Rth(j-c) | Junction to Case  |                           |      | 1.01 | $^\circ\text{C}/\text{W}$ |
|  | Rth(c-f) | Base Plate to Heat Sink with Thermal Compound   |                           |      | 0.1  |                           |

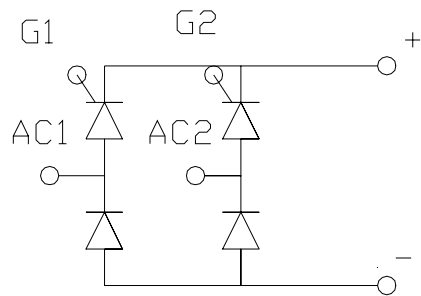
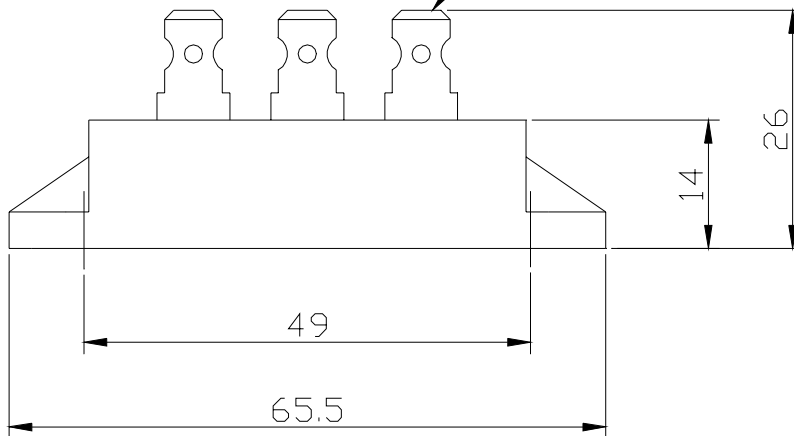
Value Per 1Arm

\*1:Value Per Module

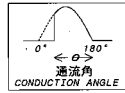
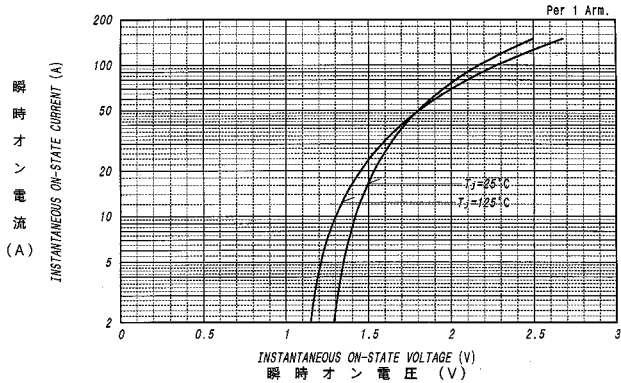
PBH20x OUTLINE DRAWING (Dimensions in mm)



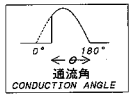
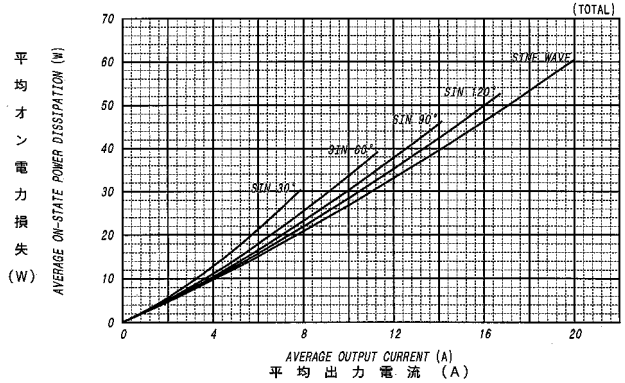
fasten tab  $\phi$  1.6 dimple  
250 series 6.35x0.8



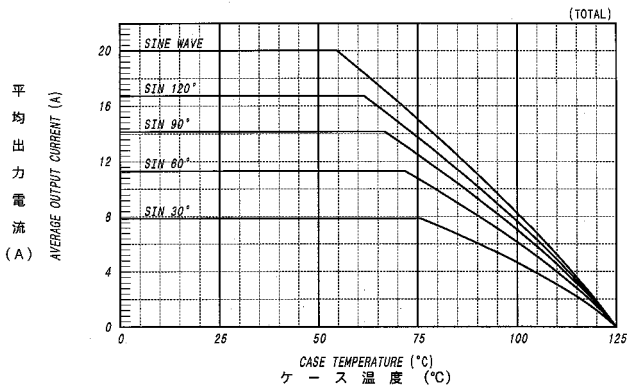
オン電圧特性  
ON-STATE CURRENT VS. VOLTAGE



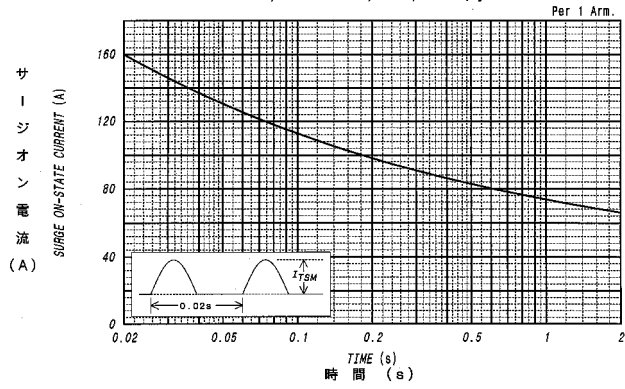
平均オン電力損失特性  
AVERAGE ON-STATE POWER DISSIPATION



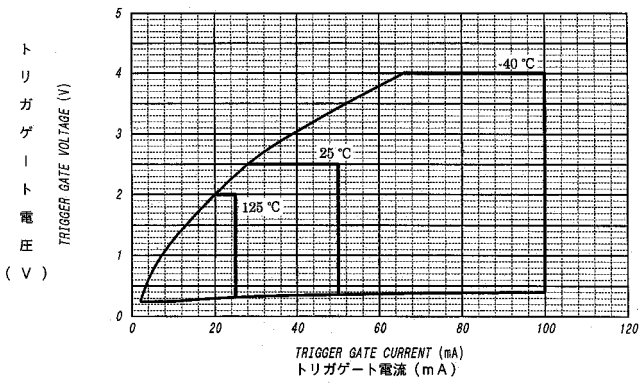
平均出力電流 - ケース温度定格  
AVERAGE OUTPUT CURRENT VS. CASE TEMPERATURE



サージオン電流定格  
SURGE CURRENT RATINGS  
f=50Hz, Half Sine Wave, Non-Repetitive, Tj=125°C



ゲート特性  
GATE CHARACTERISTICS



ゲート定格  
GATE RATINGS

