

# THYRISTOR MODULE

20A / 300V to 800V

PBH203 PBH206 PBH208

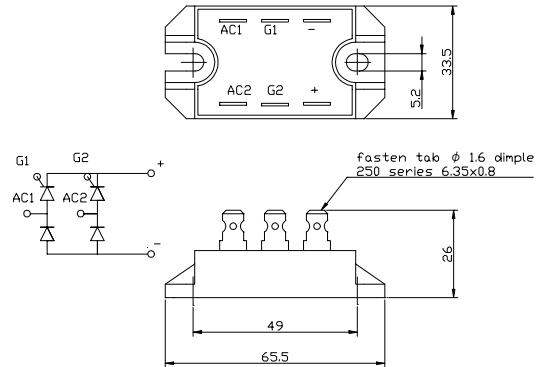
## FEATURES

- \* 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>$T_c=60^{\circ}C$                                                 | 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             | A <sup>2</sup> s |
| Critical Rate of Turned-On Current  | di/dt         | $V_D=2/3V_{DRM}$ , $I_{TM}=2 \cdot I_O$ , $T_j=125^{\circ}C$<br>$I_G=100mA$ , $di_G/dt=0.2A/\mu s$ | 100             | A/ $\mu s$       |
| 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 JunctionTemperature Range | $T_{jw}$      |                                                                                                    | -40 to +125     | $^{\circ}C$      |
| Storage Temperature Range           | $T_{stg}$     |                                                                                                    | -40 to +125     | $^{\circ}C$      |
| Isoration Voltage                   | $V_{iso}$     | Base Plate to Terminals, AC1min                                                                    | 2000            | V                |
| Mounting torque                     | Case mounting | Ftor                                                                                               | M5 Screw        | 2.4 to 2.8       |
|                                     | Terminals     |                                                                                                    |                 |                  |
|                                     |               |                                                                                                    | -               | -                |

Value per 1 Arm

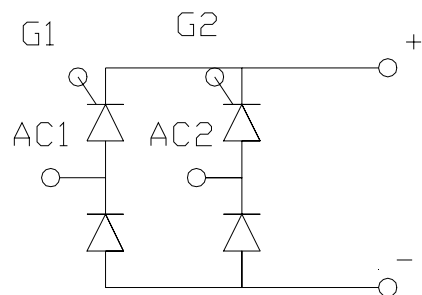
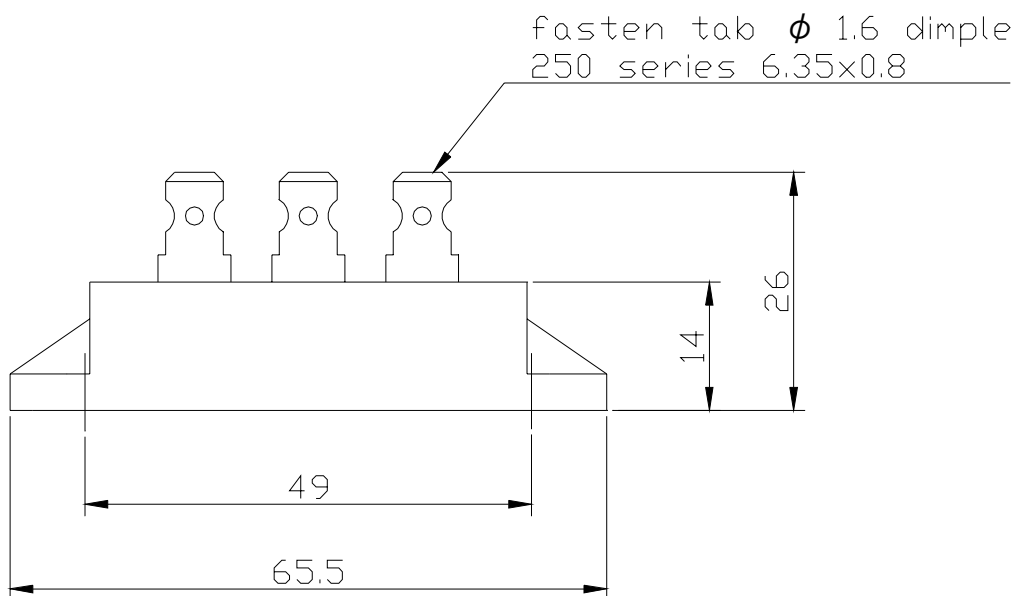
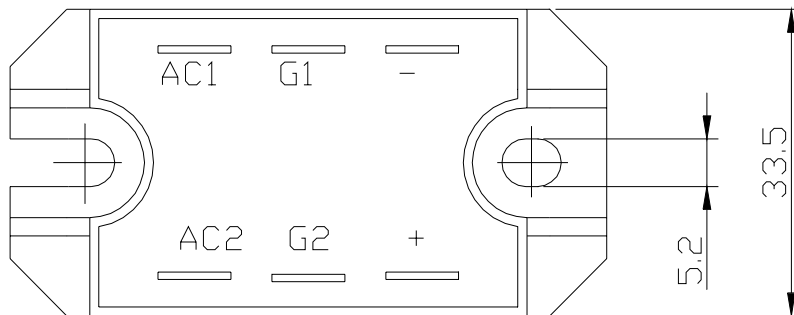
# Electrical • Thermal Characteristics

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

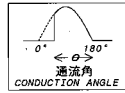
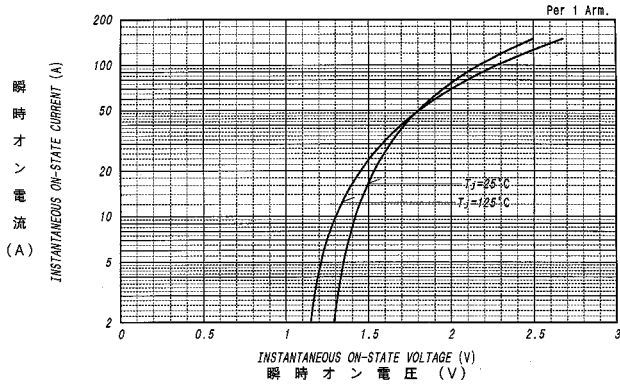
Value Per 1Arm

\*1: Value Per Module

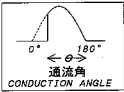
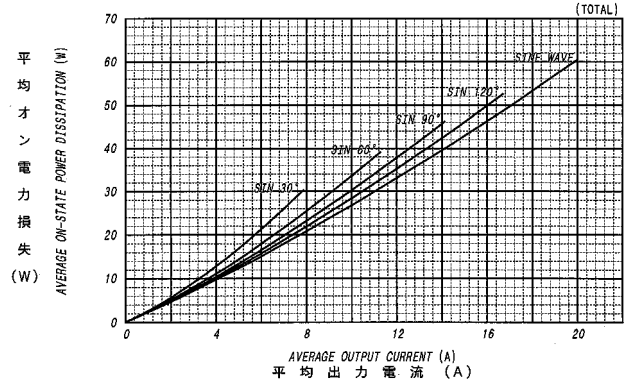
PBH20x OUTLINE DRAWING (Dimensions in mm)



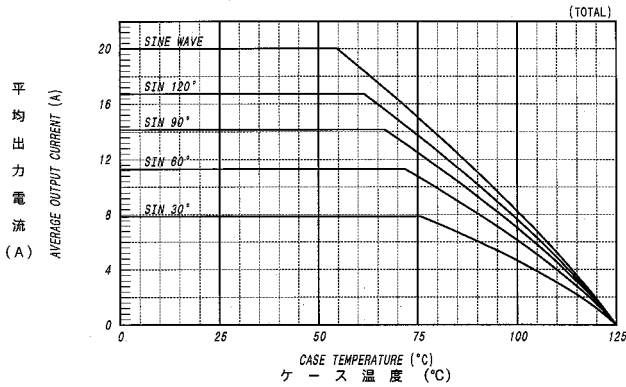
オン電圧特性  
ON-STATE CURRENT VS. VOLTAGE



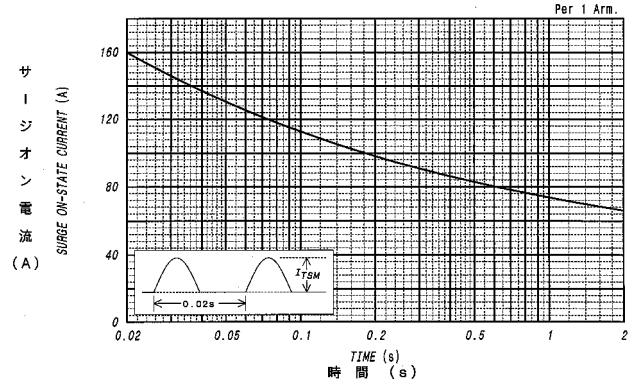
平均オン電力損失特性  
AVERAGE ON-STATE POWER DISSIPATION



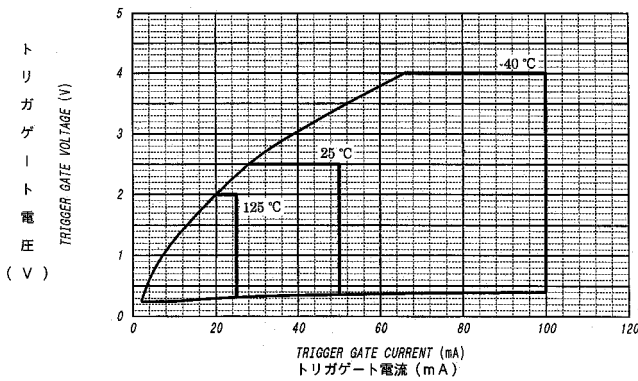
平均出力電流 - ケース温度定格  
AVERAGE OUTPUT CURRENT VS. CASE TEMPERATURE



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

