

# THYRISTOR MODULE

**50A / 800V**

**P G H 5 0 8 A M**

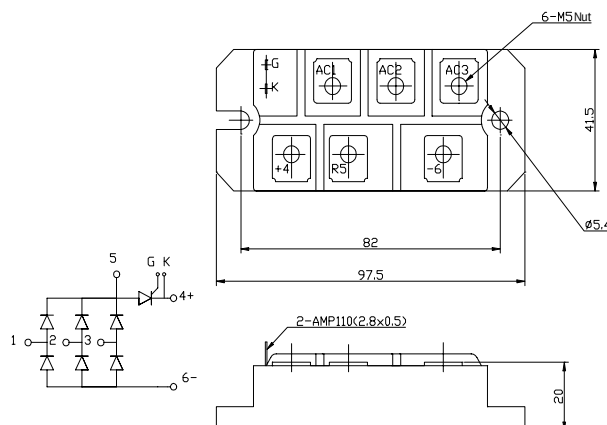
OUTLINE DRAWING

## FEATURES

- \* Isolated Base
- \* 3 Phase Converter with Rush-Current Controllable Thyristor
- \* High Surge Capability
- \* UL Recognized, File No. E187184

## TYPICAL APPLICATIONS

- \* Converter For UPS , VVVF and Servo Motor Drive Amplifier



Approx Net Weight:200g

## Pert of Diode Bridge and Thyristor

### Maximum Ratings

| Parameter                           |               | Conditions                  |                                            | Max Rated Value | Unit |
|-------------------------------------|---------------|-----------------------------|--------------------------------------------|-----------------|------|
| Average Rectified Output Current    |               | 3 Phase Full Wave Rectified | Tc=110°C(Non-Bias)<br>Tc=85°C(Biased)      | 50              | A    |
| Operating JunctionTemperature Range |               | Tjw                         | Tj>125°C, Can not be Biased for Thyristor. | -40 to +150     | °C   |
| Storage Temperature Range           |               | Tstg                        |                                            | -40 to +125     | °C   |
| Isoration Voltage                   |               | Viso                        | Base Plate to Terminals, AC1min.           | 2000            | V    |
| Mounting torque                     | Case mounting | Ftor                        | Greased                                    | 2.4 to 2.8      | N.m  |
|                                     | Terminals     |                             | M5 Screw<br>M5 Screw                       | 2.4 to 2.8      |      |

### Thermal Characteristics

| Characteristics    | Symbol   | Test Conditions           | Maximum Value. | Unit |
|--------------------|----------|---------------------------|----------------|------|
| Thermal Resistance | Rth(c-f) | Case to Fin,Total,Greased | 0.06           | °C/W |

## Part of Diode Bridge (6 dies)

### Maximum Ratings

| Parameter                              | Symbol | Grade    | Unit |
|----------------------------------------|--------|----------|------|
|                                        |        | PGH508AM |      |
| Repetitive Peak Reverse Voltage *1     | VRRM   | 800      | V    |
| Non Repetitive Peak Reverse Voltage *1 | VRSM   | 900      |      |

| Parameter                     | Symbol           | Conditions                                  | Max Rated Value | Unit             |
|-------------------------------|------------------|---------------------------------------------|-----------------|------------------|
| Surge Forward Current *1      | IFSM             | 50 Hz Half Sine Wave,1Pulse, Non-Repetitive | 600             | A                |
| I Squared t *1                | I <sup>2</sup> t | 2msec to 10msec                             | 1800            | A <sup>2</sup> s |
| Allowable Operating Frequency | f                |                                             | 400             | Hz               |

\*1 Value Per 1 Arm

## Electrical • Thermal Characteristics

| Characteristics         | Symbol        | Test Conditions                                  | Maximum Value. |  |      | Unit               |
|-------------------------|---------------|--------------------------------------------------|----------------|--|------|--------------------|
| Peak Reverse Current *1 | $I_{RM}$      | $V_{RM} = V_{RRM}$ , $T_j = 125^\circ\text{C}$   |                |  | 10   | mA                 |
| Peak Forward Voltage *1 | $V_{FM}$      | $I_{FM} = 50\text{A}$ , $T_j = 25^\circ\text{C}$ |                |  | 1.15 | V                  |
| Thermal Resistance      | $R_{th(j-c)}$ | Junction to Case (Total)                         |                |  | 0.27 | $^\circ\text{C/W}$ |

\*1 Value Per 1 Arm

## Part of Thyristor (1 die)

### Maximum Ratings

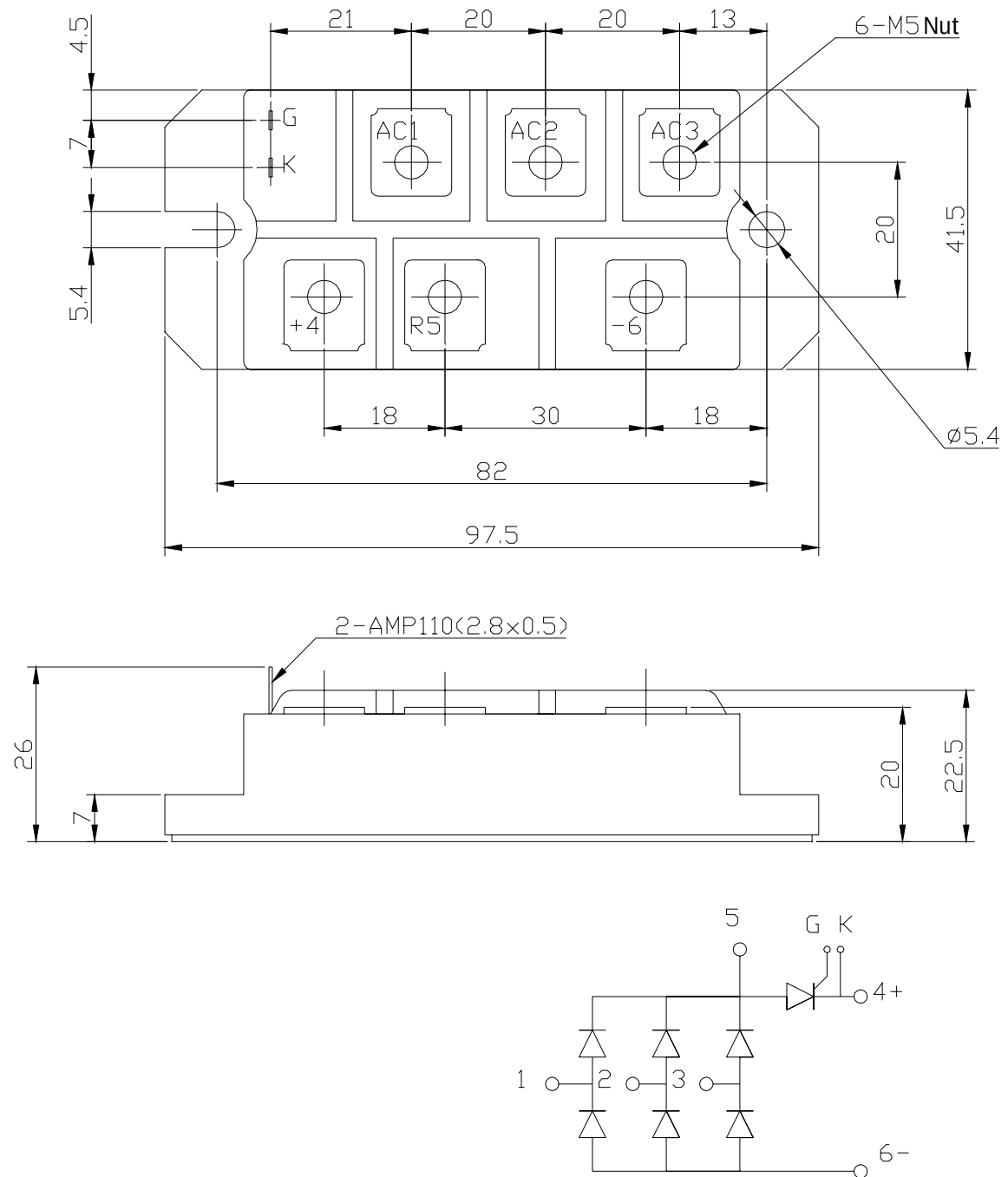
| Parameter                             | Symbol    | Grade    | Unit |
|---------------------------------------|-----------|----------|------|
|                                       |           | PGH508AM |      |
| Repetitive Peak Off-State Voltage     | $V_{DRM}$ | 800      | V    |
| Non Repetitive Peak Off-State Voltage | $V_{DSM}$ | 900      |      |
| Repetitive Peak Reverse Voltage       | $V_{RRM}$ | 800      | V    |
| Non Repetitive Peak Reverse Voltage   | $V_{RSM}$ | 900      |      |

| Parameter                          |             | Conditions                                                                                                                     | Max Rated Value | Unit                   |
|------------------------------------|-------------|--------------------------------------------------------------------------------------------------------------------------------|-----------------|------------------------|
| Surge On-State Current             | $I_{TSM}$   | 50 Hz Half Sine Wave, 1 Pulse<br>Non-Repetitive                                                                                | 600             | A                      |
| I Squared t                        | $I^2t$      | 2msec to 10msec                                                                                                                | 1800            | $\text{A}^2\text{s}$   |
| Critical Rate of Turned-On Current | $di/dt$     | $V_D = 2/3V_{DRM}$ , $I_{TM} = 2I_O$ , $T_j = 125^\circ\text{C}$<br>$I_G = 200\text{mA}$ , $di_G/dt = 0.2\text{A}/\mu\text{s}$ | 100             | $\text{A}/\mu\text{s}$ |
| Peak Gate Power                    | $P_{GM}$    |                                                                                                                                | 5               | W                      |
| Average Gate Power                 | $P_{G(AV)}$ |                                                                                                                                | 1               | W                      |
| Peak Gate Current                  | $I_{GM}$    |                                                                                                                                | 2               | A                      |
| Peak Gate Voltage                  | $V_{GM}$    |                                                                                                                                | 10              | V                      |
| Peak Gate Reverse Voltage          | $V_{RGM}$   |                                                                                                                                | 5               | V                      |

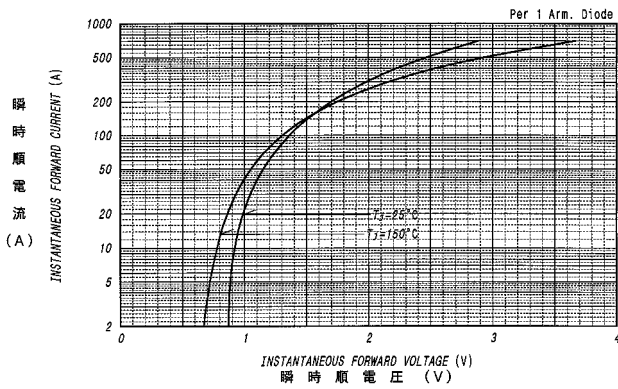
## Electrical • Thermal Characteristics

| Characteristics                            | Symbol        | Test Conditions                                                                                                                                                | Maximum Value. |      |      | Unit                   |
|--------------------------------------------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|------|------|------------------------|
|                                            |               |                                                                                                                                                                | Min.           | Typ. | Max. |                        |
| Peak Off-State Current                     | $I_{DM}$      | $V_{DM} = V_{DRM}$ , $T_j = 125^\circ\text{C}$                                                                                                                 |                |      | 15   | mA                     |
| Peak Reverse Current                       | $I_{RM}$      | $V_{RM} = V_{RRM}$ , $T_j = 125^\circ\text{C}$                                                                                                                 |                |      | 15   | mA                     |
| Peak On-State Voltage                      | $V_{TM}$      | $I_{TM} = 50\text{A}$ , $T_j = 25^\circ\text{C}$                                                                                                               |                |      | 1.10 | V                      |
| Gate Current to Trigger                    | $I_{GT}$      | $V_D = 6\text{V}$ , $I_T = 1\text{A}$                                                                                                                          |                |      | 200  | mA                     |
|                                            |               |                                                                                                                                                                |                |      | 100  |                        |
|                                            |               |                                                                                                                                                                |                |      | 50   |                        |
| Gate Voltage to Trigger                    | $V_{GT}$      | $V_D = 6\text{V}$ , $I_T = 1\text{A}$                                                                                                                          |                |      | 4    | V                      |
|                                            |               |                                                                                                                                                                |                |      | 2.5  |                        |
|                                            |               |                                                                                                                                                                |                |      | 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 | $dv/dt$       | $V_D = 2/3V_{DRM}$ , $T_j = 125^\circ\text{C}$                                                                                                                 | 500            |      |      | $\text{V}/\mu\text{s}$ |
| Turn-Off Time                              | $t_q$         | $I_{TM} = I_O$ , $V_D = 2/3V_{DRM}$<br>$dv/dt = 20\text{V}/\mu\text{s}$ , $V_R = 100\text{V}$<br>$-di/dt = 20\text{A}/\mu\text{s}$ , $T_j = 125^\circ\text{C}$ |                | 150  |      | $\mu\text{s}$          |
| Turn-On Time                               | $t_{gt}$      | $V_D = 2/3V_{DRM}$ , $T_j = 125^\circ\text{C}$<br>$I_G = 200\text{mA}$ , $di_G/dt = 0.2\text{A}/\mu\text{s}$                                                   |                | 6    |      | $\mu\text{s}$          |
| Delay Time                                 | $t_d$         |                                                                                                                                                                |                | 2    |      | $\mu\text{s}$          |
| Rise Time                                  | $t_r$         |                                                                                                                                                                |                | 4    |      | $\mu\text{s}$          |
| Latching Current                           | $I_L$         | $T_j = 25^\circ\text{C}$                                                                                                                                       |                | 100  |      | mA                     |
| Holding Current                            | $I_H$         | $T_j = 25^\circ\text{C}$                                                                                                                                       |                | 80   |      |                        |
| Thermal Resistance                         | $R_{th(j-c)}$ | Junction to Case                                                                                                                                               |                |      | 0.8  | $^\circ\text{C/W}$     |

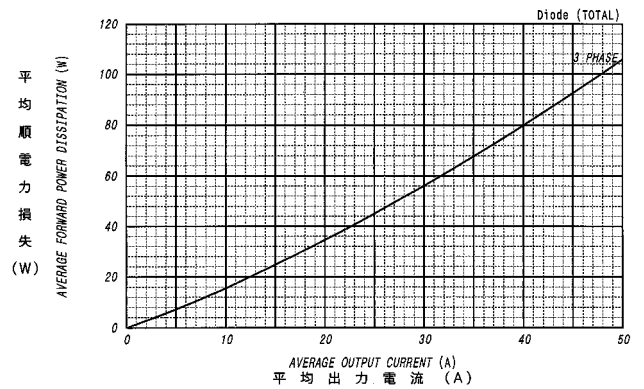
PGH508AM OUTLINE DRAWING (Dimensions in mm)



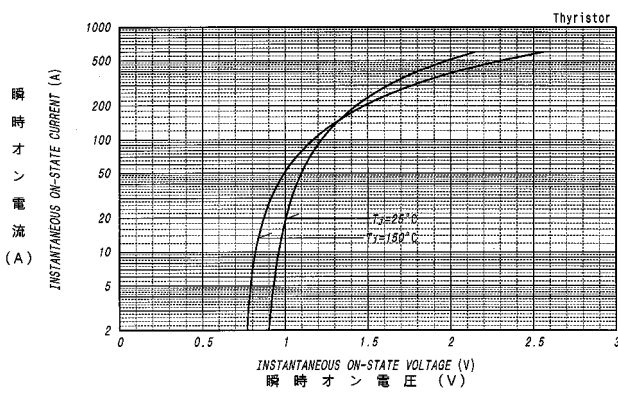
順電圧特性  
FORWARD CURRENT VS. VOLTAGE



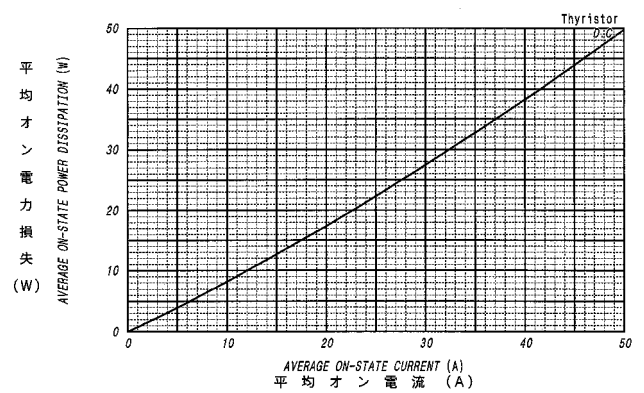
平均順電力損失特性  
AVERAGE FORWARD POWER DISSIPATION



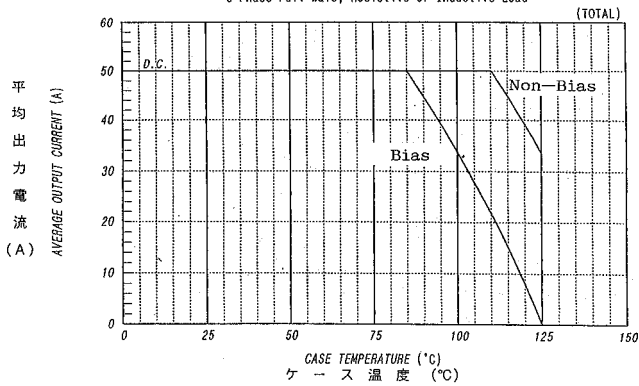
オン電圧特性  
ON-STATE CURRENT VS. VOLTAGE



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

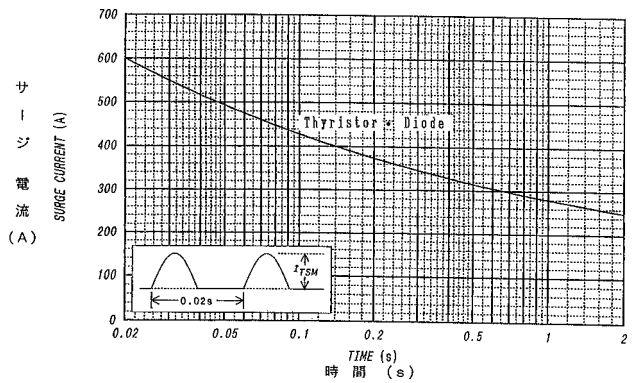


平均出力電流 - ケース温度定格  
AVERAGE OUTPUT CURRENT VS. CASE TEMPERATURE  
3-Phase Full Wave, Resistive or Inductive Load

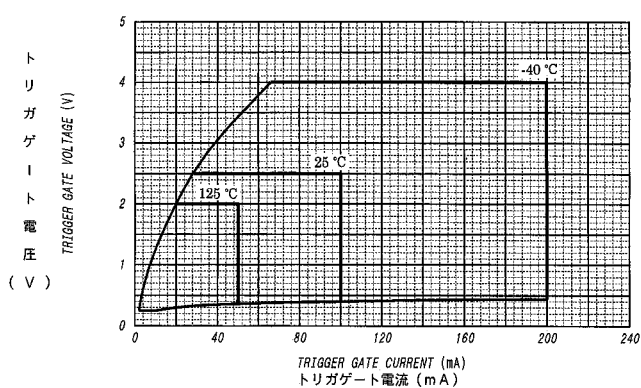


サージ電流定格  
SURGE CURRENT RATINGS

$f=50\text{Hz}$ , Half Sine Wave, Non-Repetitive, On Load



ゲート特性  
GATE CHARACTERISTICS



ゲート定格  
GATE RATINGS

