

# THYRISTOR MODULE

**60A / 1200 to 1600V**

**P D T 6 0 1 2    P D T 6 0 1 6**

**P D H 6 0 1 2    P D H 6 0 1 6**

## FEATURES

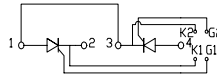
- \* Isolated Base
- \* Dual Thyristors or Thyristor and Diode Cascaded Circuit
- \* High Surge Capability
- \* UL Recognized, File No. E187184

OUTLINE DRAWING

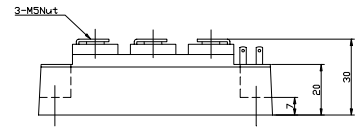
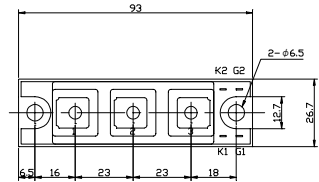
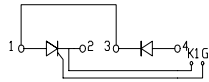
## TYPICAL APPLICATIONS

- \* Rectified For General Use

PDT



PDH



## Maximum Ratings

Approx Net Weight:155g

| Parameter                             | Symbol    | Grade       |             | Unit |
|---------------------------------------|-----------|-------------|-------------|------|
|                                       |           | PDT/PDH6012 | PDT/PDH6016 |      |
| Repetitive Peak Off-State Voltage     | $V_{DRM}$ | 1200        | 1600        | V    |
| Non Repetitive Peak Off-State Voltage | $V_{DSM}$ | 1300        | 1700        |      |
| Repetitive Peak Reverse Voltage       | $V_{RRM}$ | 1200        | 1600        | V    |
| Non Repetitive Peak Reverse Voltage   | $V_{RSM}$ | 1300        | 1700        |      |

| Parameter                            |               | Conditions                                                                                      | Max Rated Value | Unit       |
|--------------------------------------|---------------|-------------------------------------------------------------------------------------------------|-----------------|------------|
| Average Rectified Output Current     | $I_{O(AV)}$   | 50Hz Half Sine Wave condition<br>$T_c=82^\circ C$                                               | 60              | A          |
| RMS On-State Current                 | $I_{T(RMS)}$  |                                                                                                 | 94              | A          |
| Surge On-State Current               | $I_{TSM}$     | 50 Hz Half Sine Wave, 1Pulse<br>Non-Repetitive                                                  | 1200            | A          |
| I Squared t                          | $I^2t$        | 2msec to 10msec                                                                                 | 7200            | $A^2s$     |
| 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>$I_G=200mA$ , $di/dt=0.2A/\mu s$ | 100             | $A/\mu s$  |
| 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          |
| Operating Junction Temperature Range | $T_{jw}$      |                                                                                                 | -40 to +125     | $^\circ C$ |
| Storage Temperature Range            | $T_{stg}$     |                                                                                                 | -40 to +125     | $^\circ C$ |
| Isolation Voltage                    | Viso          | Base Plate to Terminals, AC1min                                                                 | 2500            | V          |
| Mounting torque                      | Case mounting | Ftor                                                                                            | M6 Screw        | 2.4 to 3.5 |
|                                      | Terminals     |                                                                                                 | M5 Screw        | 2.4 to 2.8 |

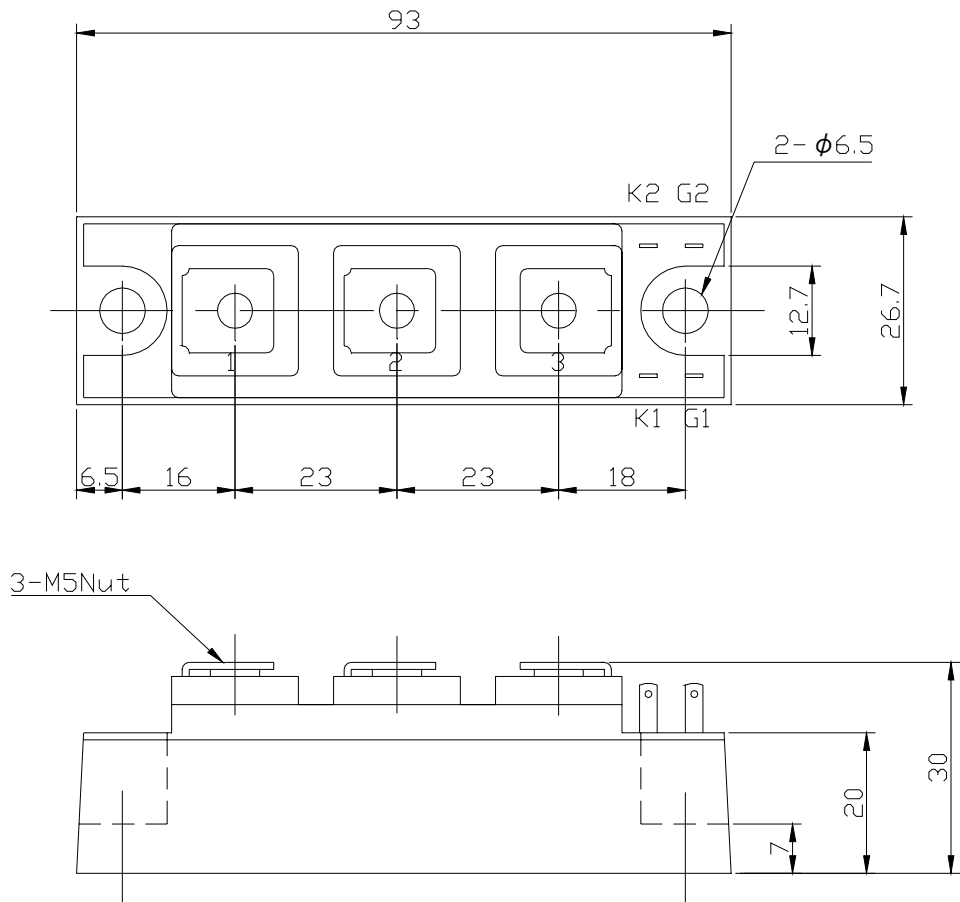
Value per 1 Arm

**Electrical • Thermal Characteristics**

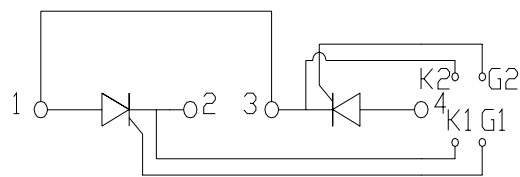
| Characteristics                            | Symbol   | Test Conditions                                                                                                                                       | Maximum Value.            |      |      | Unit                      |
|--------------------------------------------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|------|------|---------------------------|
|                                            |          |                                                                                                                                                       | Min.                      | Typ. | Max. |                           |
| Peak Off-State Current                     | $I_{DM}$ | $V_{DM} = V_{DRM}, T_j = 125^\circ\text{C}$                                                                                                           |                           |      | 15   | mA                        |
| Peak Reverse Current                       | $I_{RM}$ | $V_{RM} = V_{RRM}, T_j = 125^\circ\text{C}$                                                                                                           |                           |      | 15   | mA                        |
| Peak Forward Voltage                       | $V_{TM}$ | $I_{TM} = 180\text{A}, T_j = 25^\circ\text{C}$                                                                                                        |                           |      | 1.45 | V                         |
| Gate Current to Trigger                    | $I_{GT}$ | $V_D = 6\text{V}, I_T = 1\text{A}$                                                                                                                    | $T_j = -40^\circ\text{C}$ |      | 200  | mA                        |
|                                            |          |                                                                                                                                                       | $T_j = 25^\circ\text{C}$  |      | 100  |                           |
|                                            |          |                                                                                                                                                       | $T_j = 125^\circ\text{C}$ |      | 50   |                           |
| 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    | $V_D = 2/3V_{DRM}, T_j = 125^\circ\text{C}$                                                                                                           | 500                       |      |      | 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>$-di/dt = 20\text{A}/\mu\text{s}, T_j = 125^\circ\text{C}$ |                           | 100  |      | $\mu\text{s}$             |
| Turn-On Time                               | tgt      | $V_D = 2/3V_{DRM}, T_j = 125^\circ\text{C}$<br>$I_G = 200\text{mA}, di_G/dt = 0.2\text{A}/\mu\text{s}$                                                |                           | 6    |      | $\mu\text{s}$             |
| Delay Time                                 | td       |                                                                                                                                                       |                           | 2    |      | $\mu\text{s}$             |
| Rise Time                                  | tr       |                                                                                                                                                       |                           | 4    |      | $\mu\text{s}$             |
| Latching Current                           | $I_L$    | $T_j = 25^\circ\text{C}$                                                                                                                              |                           | 100  |      | mA                        |
| Holding Current                            | $I_H$    | $T_j = 25^\circ\text{C}$                                                                                                                              |                           | 50   |      |                           |
| Thermal Resistance                         | Rth(j-c) | Junction to Case                                                                                                                                      |                           |      | 0.5  | $^\circ\text{C}/\text{W}$ |
|                                            | Rth(c-f) | Base Plate to Heat Sink with Thermal Compound                                                                                                         |                           |      | 0.2  |                           |

Value Per 1Arm

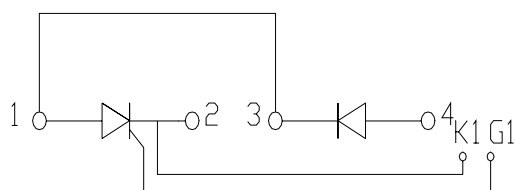
PDT/PDH601x OUTLINE DRAWING (Dimensions in mm)



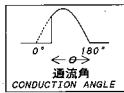
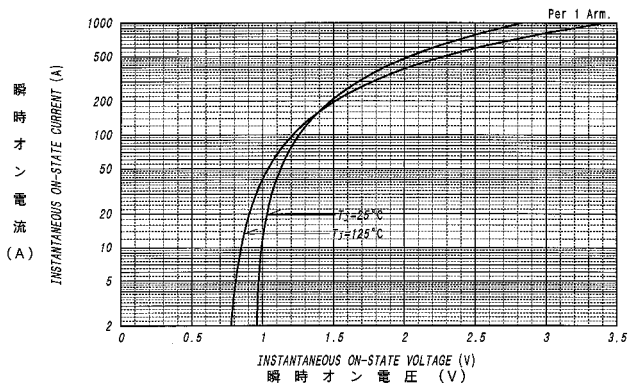
PDT



PDH

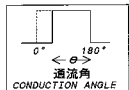
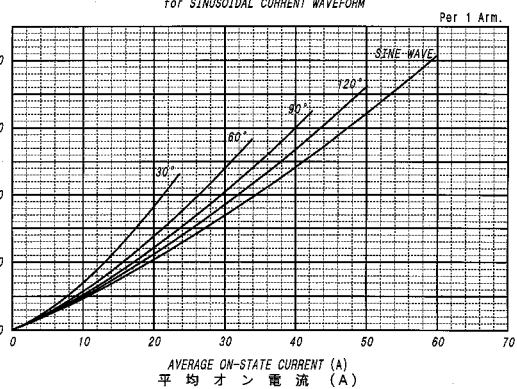


オン電圧特性  
ON-STATE CURRENT VS. VOLTAGE



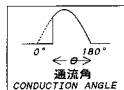
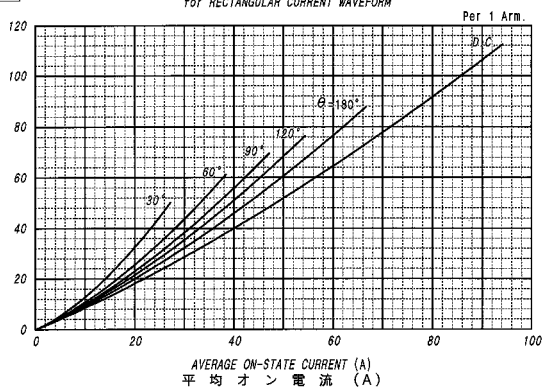
平均オン電力損失特性  
AVERAGE ON-STATE POWER DISSIPATION  
for SINUSOIDAL CURRENT WAVEFORM

平均オン電力損失 (W)



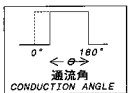
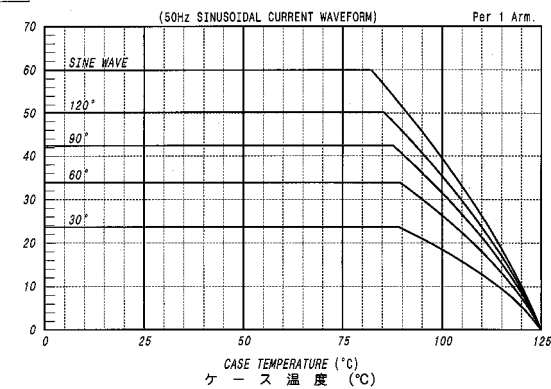
平均オン電力損失特性  
AVERAGE ON-STATE POWER DISSIPATION  
for RECTANGULAR CURRENT WAVEFORM

平均オン電力損失 (W)



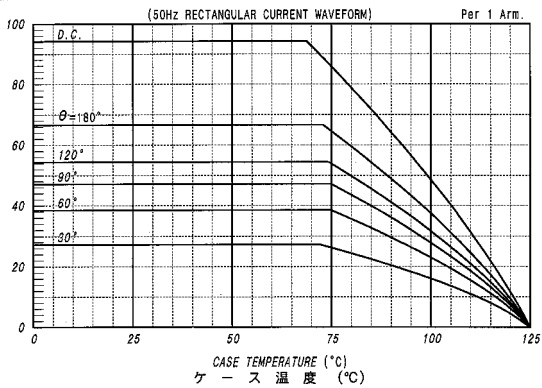
平均オン電流 - ケース温度定格  
AVERAGE ON-STATE CURRENT VS. CASE TEMPERATURE

平均オン電流 (A)



平均オン電流 - ケース温度定格  
AVERAGE ON-STATE CURRENT VS. CASE TEMPERATURE

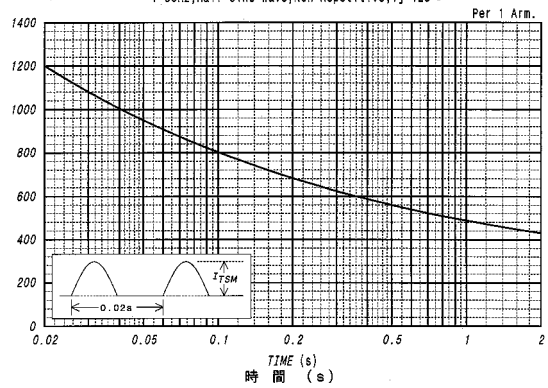
平均オン電流 (A)



サージオン電流定格  
SURGE CURRENT RATINGS

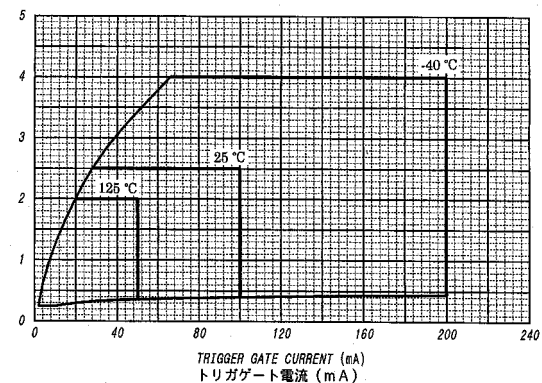
f=50Hz, Half Sine Wave, Non-Repetitive, Tj=125°C

サージオン電流 (A)



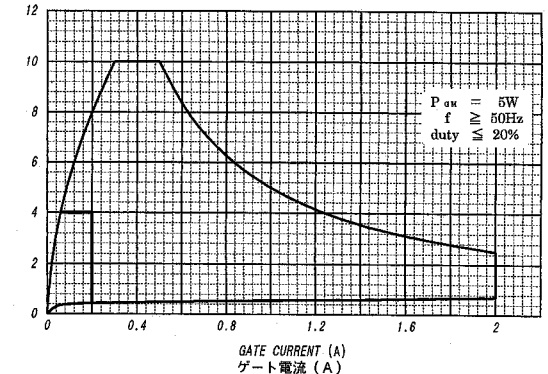
ゲート特性  
GATE CHARACTERISTICS

トリガゲート電圧 (V)



ゲート定格  
GATE RATINGS

ゲート電圧 (V)



$P_{as} = 5W$   
 $f = 50Hz$   
duty  $\leq 20\%$

過渡熱抵抗特性  
 MAXIMUM TRANSIENT THERMAL IMPEDANCE  
 Junction to Case

