

# THYRISTOR MODULE

30A / 1200 to 1600V

P D T 3 0 1 2    P D T 3 0 1 6

P D H 3 0 1 2    P D H 3 0 1 6

## FEATURES

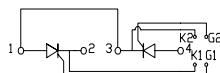
- \* Isolated Base
- \* Dual Thyristors or Thyristor and Diode Cascaded Circuit
- \* High Surge Capability
- \* UL Recognized, File No. E187184

## TYPICAL APPLICATIONS

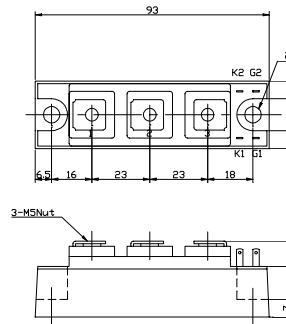
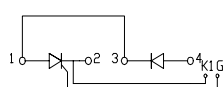
- \* Rectified For General Use

## OUTLINE DRAWING

PDT



PDH



## Maximum Ratings

Approx Net Weight:155g

| Parameter                             | Symbol    | Grade       |             | Unit |
|---------------------------------------|-----------|-------------|-------------|------|
|                                       |           | PDT/PDH3012 | PDT/PDH3016 |      |
| Repetitive Peak Off-State Voltage     | $V_{DRM}$ | 1200        | 1600        | V    |
| Non Repetitive Peak Off-State Voltage | $V_{DSM}$ | 1300        | 1700        | V    |
| Repetitive Peak Reverse Voltage       | $V_{RRM}$ | 1200        | 1600        | V    |
| Non Repetitive Peak Reverse Voltage   | $V_{RSM}$ | 1300        | 1700        | V    |

| Parameter                           |               | Conditions                                                                                         | Max Rated Value | Unit             |
|-------------------------------------|---------------|----------------------------------------------------------------------------------------------------|-----------------|------------------|
| Average Rectified Output Current    | $I_{O(AV)}$   | 50Hz Half Sine Wave condition<br>$T_c=96^{\circ}C$                                                 | 30              | A                |
| RMS On-State Current                | $I_{T(RMS)}$  |                                                                                                    | 47              | A                |
| Surge On-State Current              | $I_{TSM}$     | 50 Hz Half Sine Wave,1Pulse<br>Non-Repetitive                                                      | 600             | A                |
| I Squared t                         | $I^2t$        | 2msec to 10msec                                                                                    | 1800            | 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>$I_G=200mA$ , $di_G/dt=0.2A/\mu s$ | 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 JunctionTemperature Range | $T_{jw}$      |                                                                                                    | -40 to +125     | $^{\circ}C$      |
| Storage Temperature Range           | $T_{stg}$     |                                                                                                    | -40 to +125     | $^{\circ}C$      |
| Isoration 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       |

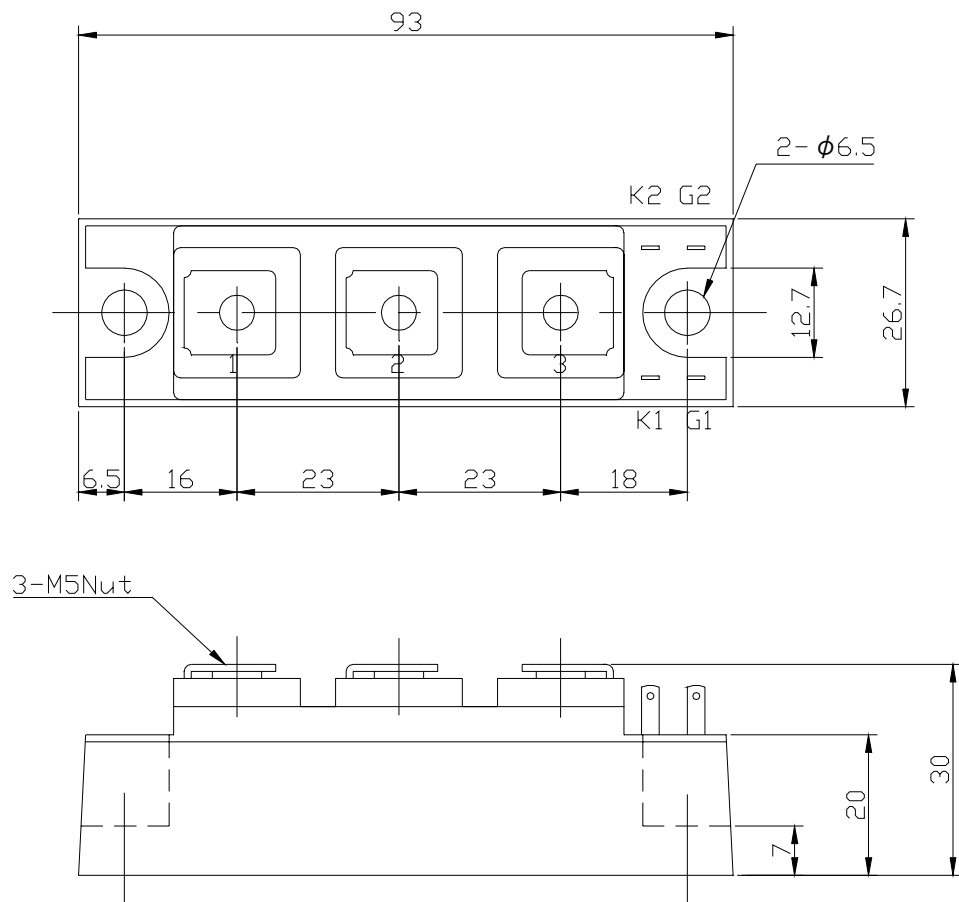
Value per 1 Arm

# Electrical • Thermal Characteristics

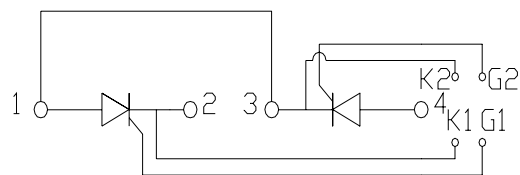
| Characteristics                            | Symbol        | Test Conditions                                                                                                 | Maximum Value.       |      |      | Unit          |
|--------------------------------------------|---------------|-----------------------------------------------------------------------------------------------------------------|----------------------|------|------|---------------|
|                                            |               |                                                                                                                 | Min.                 | Typ. | Max. |               |
| Peak Off-State Current                     | $I_{DM}$      | $V_{DM} = V_{DRM}, T_j = 125^{\circ}C$                                                                          |                      |      | 10   | mA            |
| Peak Reverse Current                       | $I_{RM}$      | $V_{RM} = V_{RRM}, T_j = 125^{\circ}C$                                                                          |                      |      | 10   | mA            |
| Peak Forward Voltage                       | $V_{TM}$      | $I_{TM} = 90A, T_j = 25^{\circ}C$                                                                               |                      |      | 1.50 | V             |
| Gate Current to Trigger                    | $I_{GT}$      | $V_D = 6V, I_T = 1A$                                                                                            | $T_j = -40^{\circ}C$ |      | 200  | mA            |
|                                            |               |                                                                                                                 | $T_j = 25^{\circ}C$  |      | 100  |               |
|                                            |               |                                                                                                                 | $T_j = 125^{\circ}C$ |      | 50   |               |
| 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 | $dv/dt$       | $V_D = 2/3V_{DRM}, T_j = 125^{\circ}C$                                                                          | 500                  |      |      | 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>$-di/dt = 20A/\mu s, T_j = 125^{\circ}C$ |                      | 100  |      | $\mu s$       |
| Turn-On Time                               | $t_{gt}$      | $V_D = 2/3V_{DRM}, T_j = 125^{\circ}C$<br>$I_G = 200mA, di_G/dt = 0.2A/\mu s$                                   |                      | 6    |      | $\mu s$       |
| Delay Time                                 | $t_d$         |                                                                                                                 |                      | 2    |      | $\mu s$       |
| Rise Time                                  | $t_r$         |                                                                                                                 |                      | 4    |      | $\mu s$       |
| Latching Current                           | $I_L$         | $T_j = 25^{\circ}C$                                                                                             |                      | 100  |      | mA            |
| Holding Current                            | $I_H$         | $T_j = 25^{\circ}C$                                                                                             |                      | 50   |      |               |
| Thermal Resistance                         | $R_{th(j-c)}$ | Junction to Case                                                                                                |                      |      | 0.7  | $^{\circ}C/W$ |
|                                            | $R_{th(c-f)}$ | Base Plate to Heat Sink with Thermal Compound                                                                   |                      |      | 0.2  |               |

Value Per 1Arm

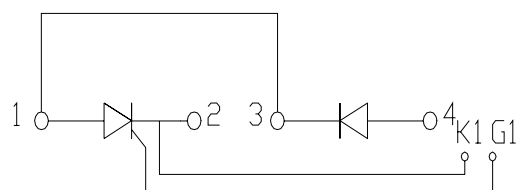
PDT/PDH301x OUTLINE DRAWING (Dimensions in mm)



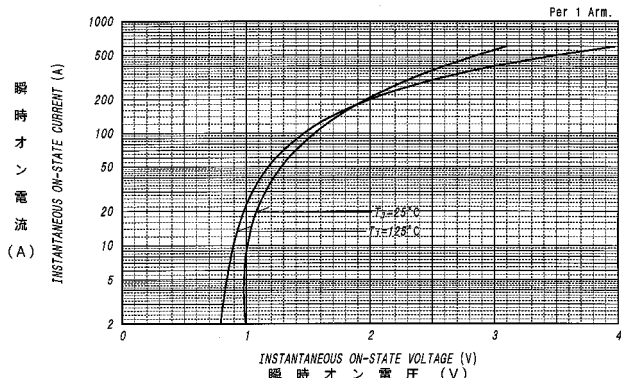
PDT



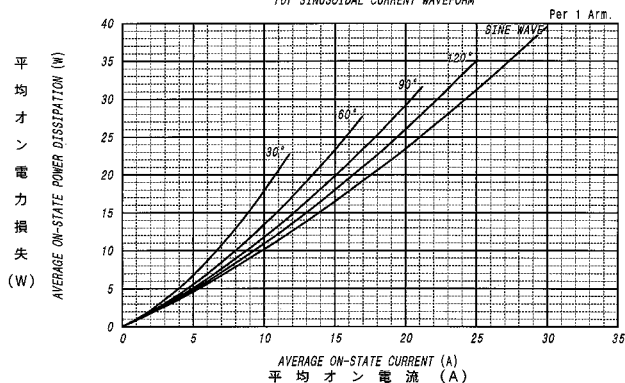
PDH



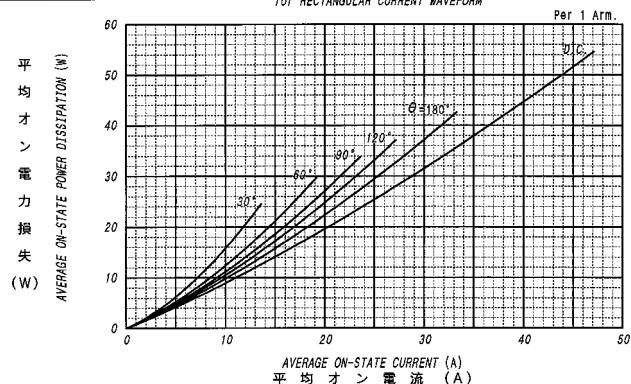
オン電圧特性  
ON-STATE CURRENT VS. VOLTAGE



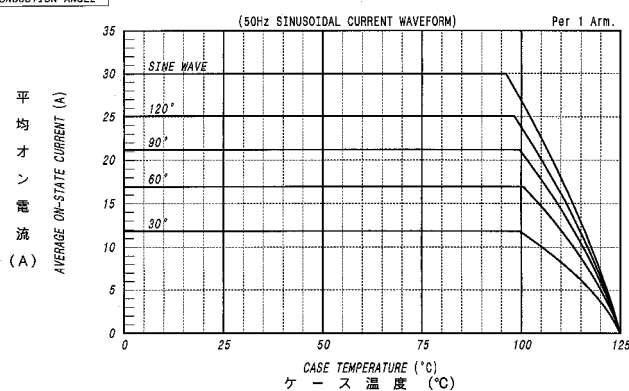
平均オン電力損失特性  
AVERAGE ON-STATE POWER DISSIPATION  
for SINUSOIDAL CURRENT WAVEFORM



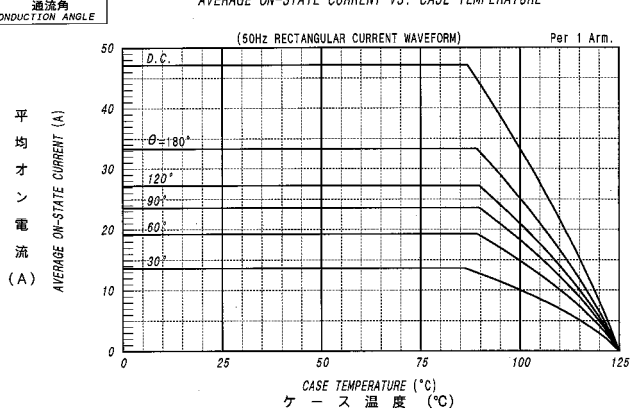
平均オン電力損失特性  
AVERAGE ON-STATE POWER DISSIPATION  
for RECTANGULAR CURRENT WAVEFORM



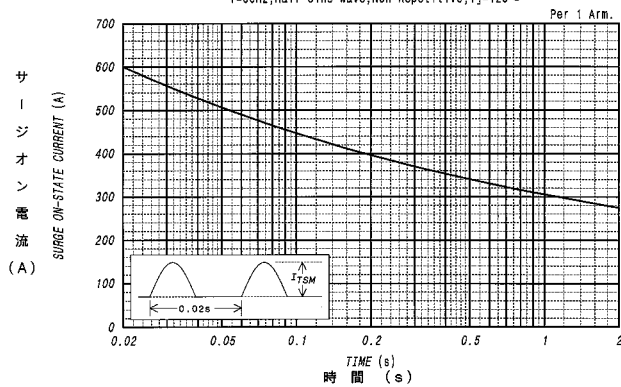
平均オン電流－ケース温度定格  
AVERAGE ON-STATE CURRENT VS. CASE TEMPERATURE



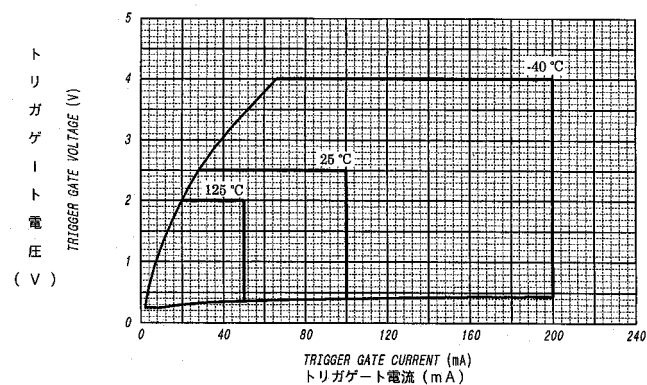
平均オン電流－ケース温度定格  
AVERAGE ON-STATE CURRENT VS. CASE TEMPERATURE



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

