Nihon Inter Electronics Corporation

# THYRISTOR MODULE

**30A / 1200 to 1600V**

**PDT3012 PDT3016**

**PDH3012 PDH3016**

## FEATURES

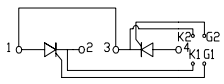
* Isolated Base
* Dual Thyristors or Thyristor and Diode Cascaded Circuit
* High Surge Capability
* UL Recognized, File No. E187184

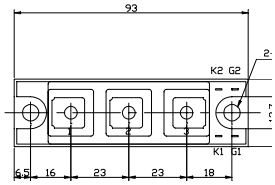
## TYPICAL APPLICATIONS

* Rectified For General Use

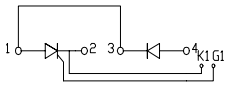
OUTLINE DRAWING

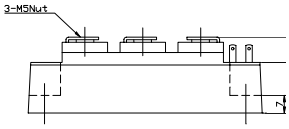
PDT




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 | |
| 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 Tc=96℃ | 30 | A |
| RMS On-State Current | | $I_{T(RMS)}$ | | 47 | A |
| Surge On-State Current | | $I_{TSM}$ | 50 Hz Half Sine Wave,1Pulse Non-Repetitive | 600 | A |
| I Squared t | | $I^2t$ | 2msec to 10msec | 1800 | $A^2s$ |
| Critical Rate of Turned-On Current | | di/dt | $V_D$=2/3$V_{DRM}$, $I_{TM}$=2·$I_O$, Tj=125℃ $I_G$=200mA, $di_G/dt$=0.2A/μs | 100 | A/μs |
| 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 | | Tjw | | -40 to +125 | ℃ |
| Storage Temperature Range | | Tstg | | -40 to +125 | ℃ |
| Isoration Voltage | | Viso | Base Plate to Terminals, AC1min | 2500 | V |
| Mounting torque | Case mounting | Ftor | M6 Screw | 2.4 to 3.5 | N•m |
| | Terminals | | M5 Screw | 2.4 to 2.8 | |

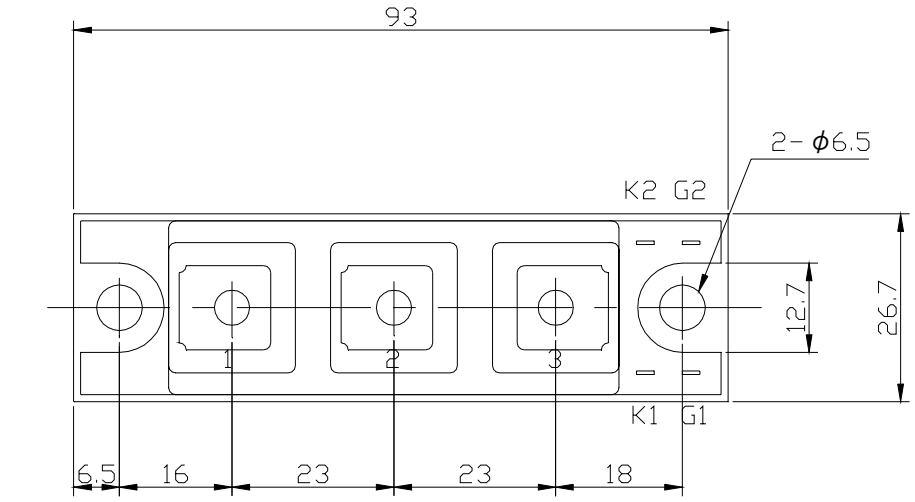
Value per 1 Arm

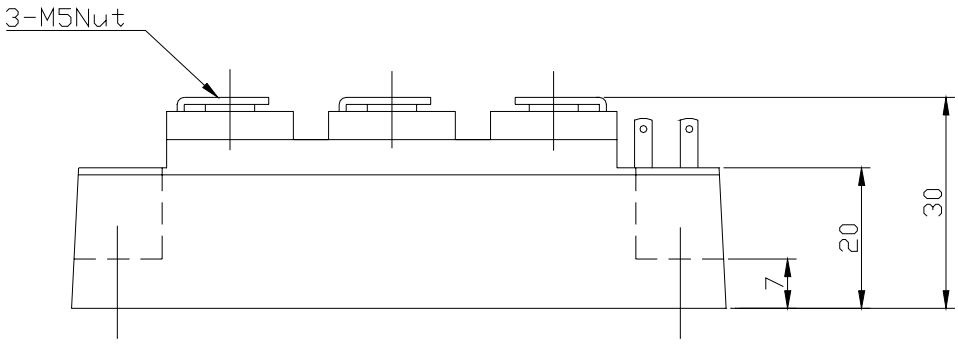
## Electrical • Thermal Characteristics

| Characteristics | Symbol | Test Conditions | | Maximum Value. | | | Unit |
|---|---|---|---|---|---|---|---|
| | | | | Min. | Typ. | Max. | |
| Peak Off-State Current | $I_{DM}$ | $V_{DM}$= $V_{DRM}$, Tj= 125℃ | | | | 10 | mA |
| Peak Reverse Current | $I_{RM}$ | $V_{RM}$= $V_{RRM}$, Tj= 125℃ | | | | 10 | mA |
| Peak Forward Voltage | $V_{TM}$ | $I_{TM}$= 90A, Tj=25℃ | | | | 1.50 | V |
| Gate Current to Trigger | $I_{GT}$ | $V_D$=6V,$I_T$=1A | Tj=-40℃ | | | 200 | mA |
| | | | Tj=25℃ | | | 100 | |
| | | | Tj=125℃ | | | 50 | |
| Gate Voltage to Trigger | $V_{GT}$ | $V_D$=6V,$I_T$=1A | Tj=-40℃ | | | 4 | V |
| | | | Tj=25℃ | | | 2.5 | |
| | | | Tj=125℃ | | | 2 | |
| Gate Non-Trigger Voltage | $V_{GD}$ | $V_D$=2/3$V_{DRM}$ Tj=125℃ | | 0.25 | | | V |
| Critical Rate of Rise of Off-State Voltage | dv/dt | $V_D$=2/3$V_{DRM}$ Tj=125℃ | | 500 | | | V/μs |
| Turn-Off Time | tq | $I_{TM}$=$I_O$,$V_D$=2/3$V_{DRM}$ dv/dt=20V/μs, $V_R$=100V -di/dt=20A/μs, Tj=125℃ | | | 100 | | μs |
| Turn-On Time | tgt | $V_D$=2/3$V_{DRM}$ Tj=125℃ $I_G$=200mA, $di_G$/dt=0.2A/μs | | | 6 | | μs |
| Delay Time | td | | | | 2 | | μs |
| Rise Time | tr | | | | 4 | | μs |
| Latching Current | $I_L$ | Tj=25℃ | | | 100 | | mA |
| Holding Current | $I_H$ | Tj=25℃ | | | 50 | | |
| Thermal Resistance | Rth(j-c) | Junction to Case | | | | 0.7 | ℃/W |
| | Rth(c-f) | Base Plate to Heat Sink with Thermal Compound | | | | 0.2 | |

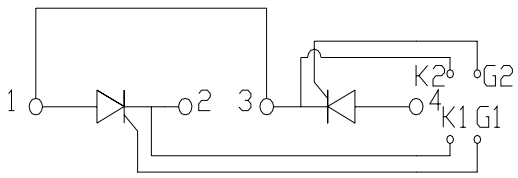
Value Per 1Arm

# PDT/PDH301x OUTLINE DRAWING (Dimensions in mm)

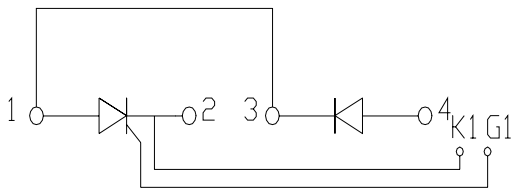


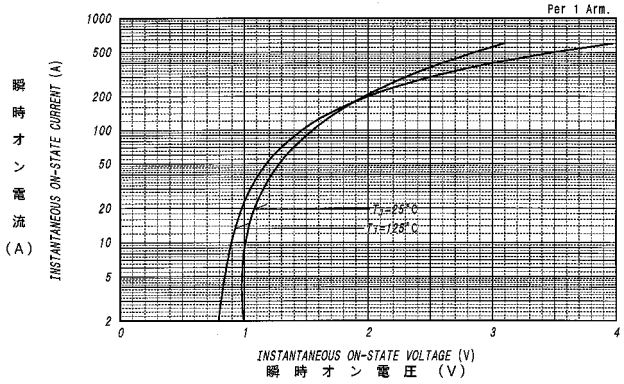

PDT

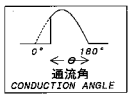



PDH

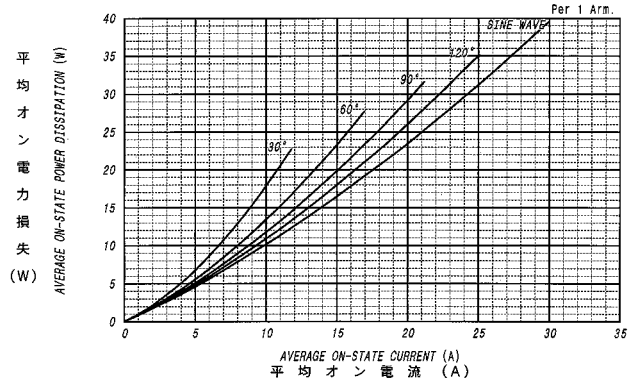


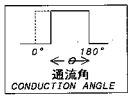
## オン電圧特性
## ON-STATE CURRENT VS. VOLTAGE



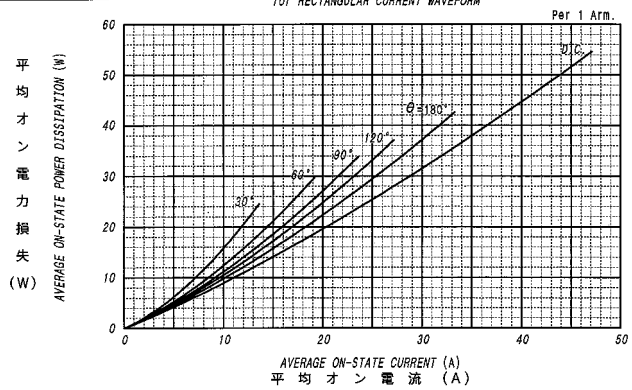



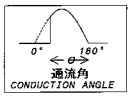

## 平均オン電力損失特性
## AVERAGE ON-STATE POWER DISSIPATION
### for SINUSOIDAL CURRENT WAVEFORM



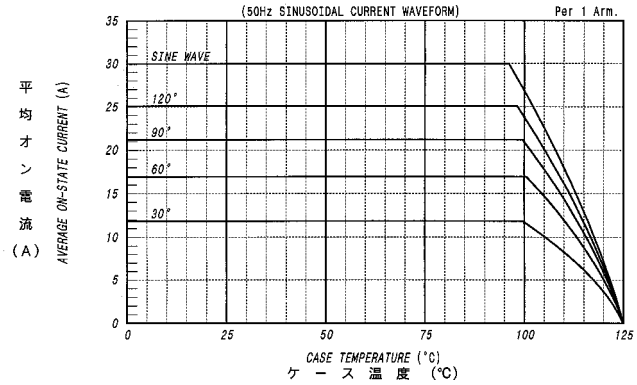



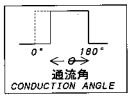

## 平均オン電力損失特性
## AVERAGE ON-STATE POWER DISSIPATION
### for RECTANGULAR CURRENT WAVEFORM




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

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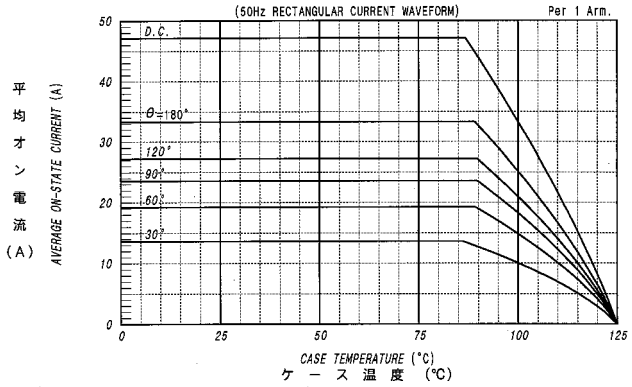
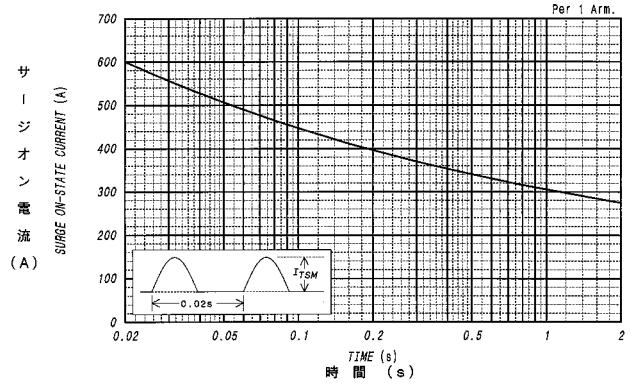
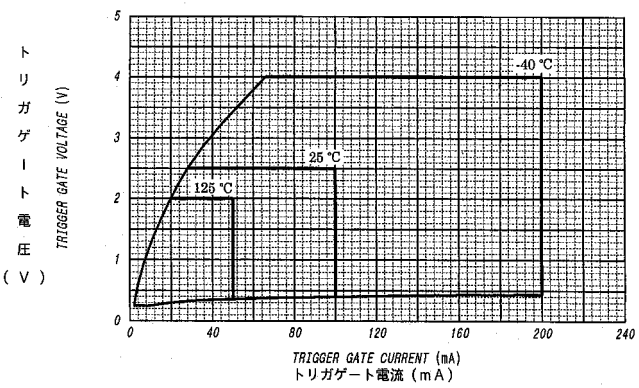
## AVERAGE ON-STATE CURRENT VS. CASE TEMPERATURE




## 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 CHARACTERISTCS

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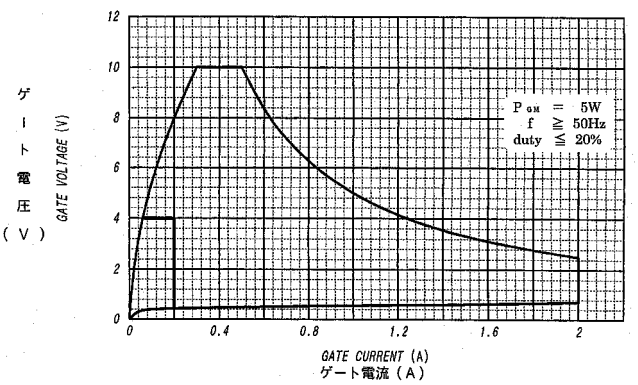
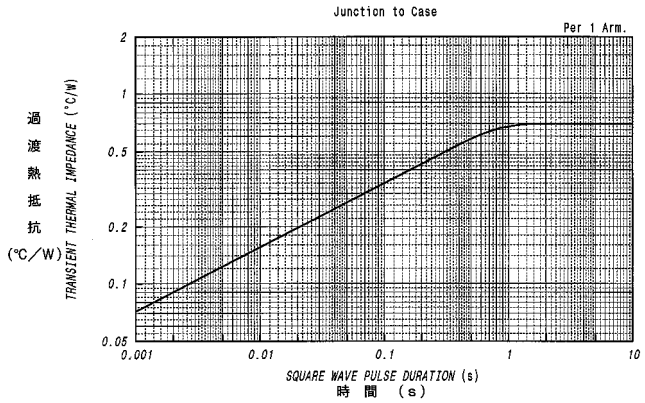
## GATE RATINGS



過渡熱抵抗特性
MAXIMUM TRANSIENT THERMAL IMPEDANCE