

# THYRISTOR MODULE

66A / 1200 to 1600V

PAT3012 PAT3016

PAH3012 PAH3016

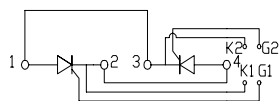
## FEATURES

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

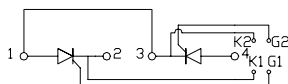
## TYPICAL APPLICATIONS

- \* AC phase control
- \* AC switch

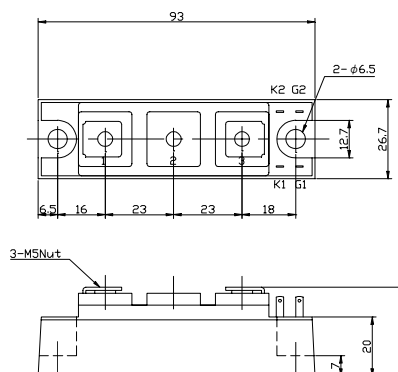
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## OUTLINE DRAWING



## Maximum Ratings

Approx Net Weight:155g

| Parameter                             | Symbol    | Grade       |             | Unit |
|---------------------------------------|-----------|-------------|-------------|------|
|                                       |           | PAT/PAH3012 | PAT/PAH3016 |      |
| Repetitive Peak Off-State Voltage     | $V_{DRM}$ | 1200        | 1600        | V    |
| Non Repetitive Peak Off-State Voltage | $V_{DSM}$ | 1300        | 1700        |      |

| Parameter                            |               | Conditions                                                                                         | Max Rated Value | Unit             |
|--------------------------------------|---------------|----------------------------------------------------------------------------------------------------|-----------------|------------------|
| RMS On-State Current                 | $I_{T(RMS)}$  | 50Hz Half Sine Wave condition<br>$T_C=96^{\circ}C$                                                 | 66              | A                |
| Surge On-State Current               | $I_{FSM}$     | 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 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

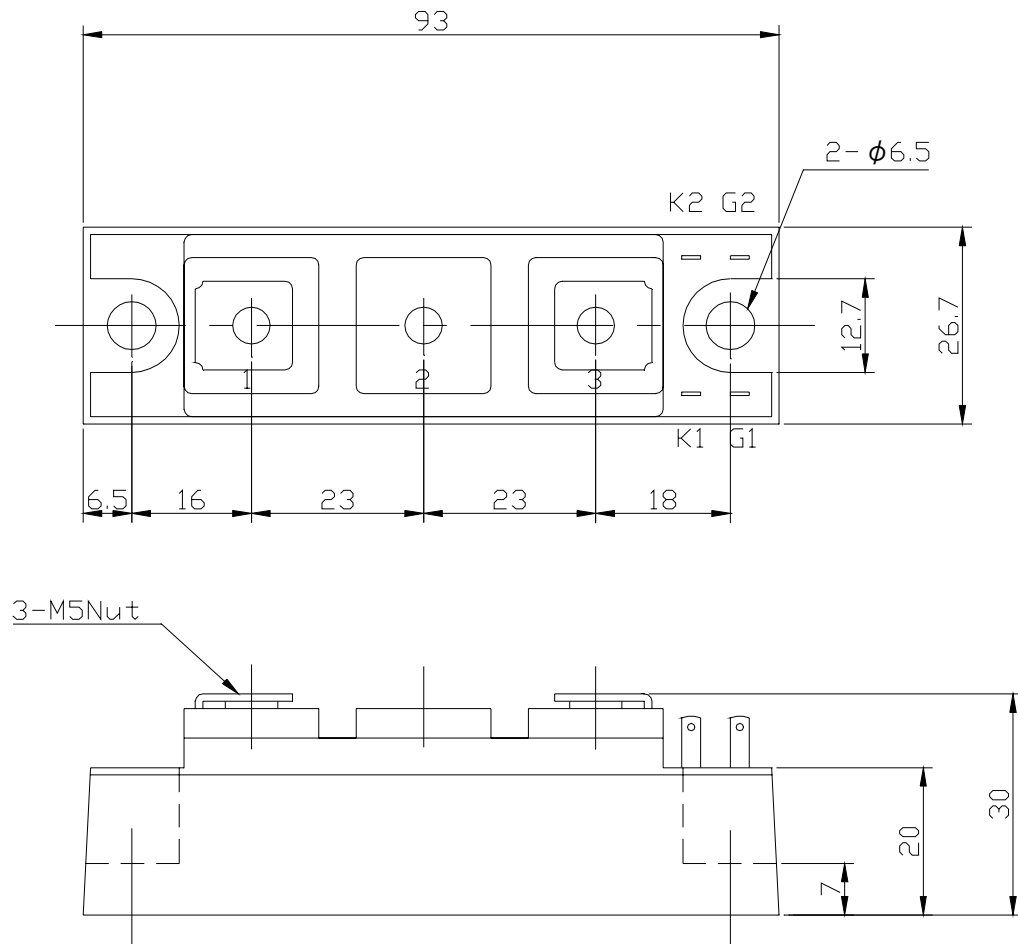
# Electrical • Thermal Characteristics

| Characteristics                            | Symbol        | Test Conditions                                                                                                       | Maximum Value.       |      |      | Unit          |
|--------------------------------------------|---------------|-----------------------------------------------------------------------------------------------------------------------|----------------------|------|------|---------------|
|                                            |               |                                                                                                                       | Min.                 | Typ. | Max. |               |
| Peak Off-State Current                     | $I_{DM}$      | $V_{DM} = V_{DRM}$ , $T_j = 125^{\circ}C$                                                                             |                      |      | 20   | mA            |
| Peak On-State 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                               | $t_{gt}$      | $T_j = 25^{\circ}C$ , $I_{TM} = I_{T(RMS)}$                                                                           |                      | 6    |      | $\mu s$       |
| Delay Time                                 | $t_d$         | $V_D = 100V$ , $I_G = 200mA$                                                                                          |                      | 2    |      | $\mu s$       |
| Rise Time                                  | $t_r$         | $di_G/dt = 0.2A/\mu s$                                                                                                |                      | 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 *1                      | $R_{th(j-c)}$ | Junction to Case                                                                                                      |                      |      | 0.35 | $^{\circ}C/W$ |
|                                            | $R_{th(c-f)}$ | Base Plate to Heat Sink with Thermal Compound                                                                         |                      |      | 0.1  |               |

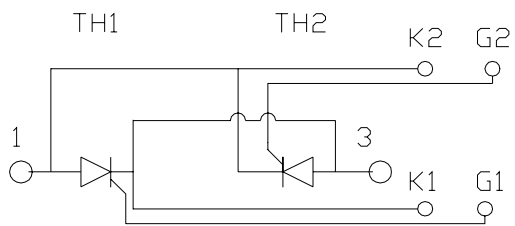
Value Per 1Arm

\*1: Value Per Module

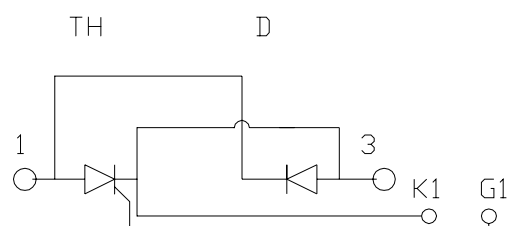
PAT/PAH301x OUTLINE DRAWING (Dimensions in mm)



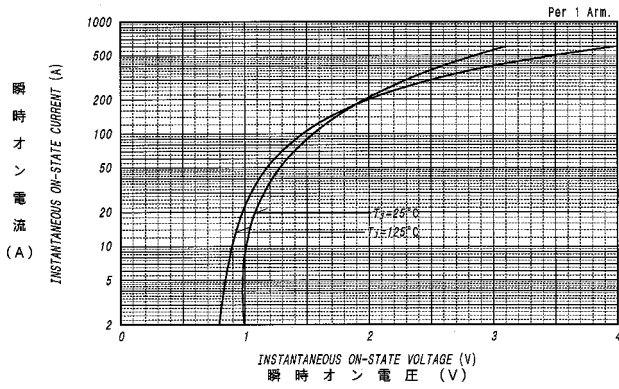
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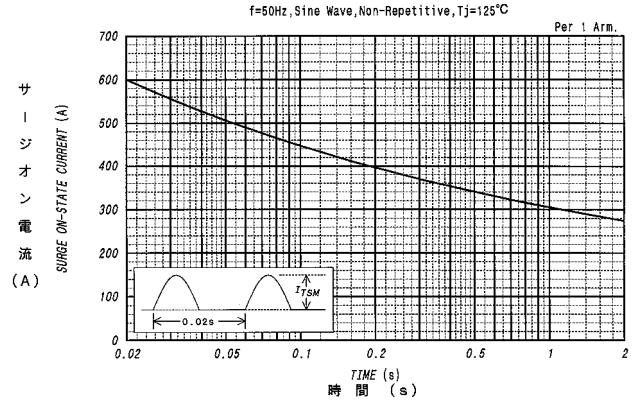
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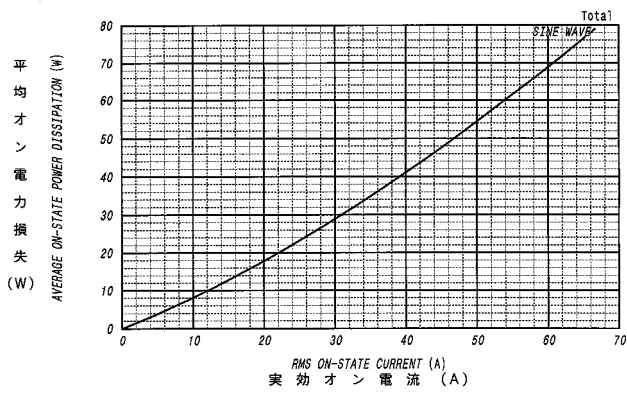
オン電圧特性  
ON-STATE CURRENT VS. VOLTAGE



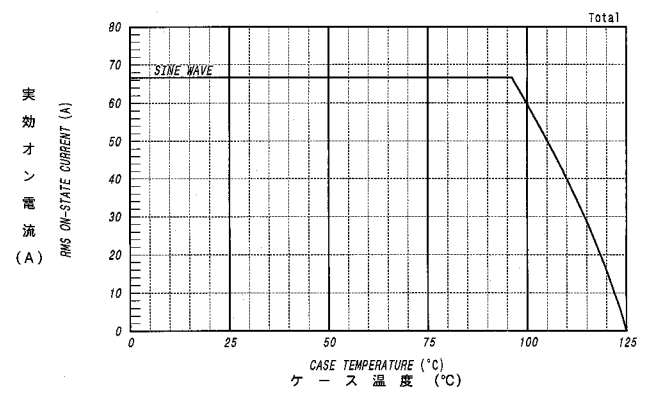
サージオン電流定格  
SURGE CURRENT RATINGS



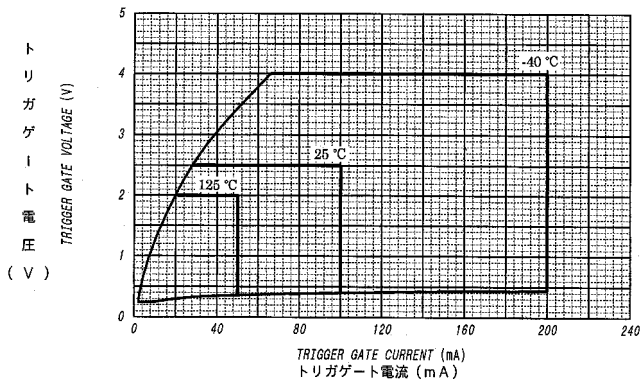
平均オン電力損失特性  
AVERAGE ON-STATE POWER DISSIPATION



実効オン電流ーケース温度定格  
RMS ON-STATE CURRENT VS. CASE TEMPERATURE



ゲート特性  
GATE CHARACTERISTICS



ゲート定格  
GATE RATINGS

