

# THYRISTOR MODULE (NON-ISOLATED TYPE)

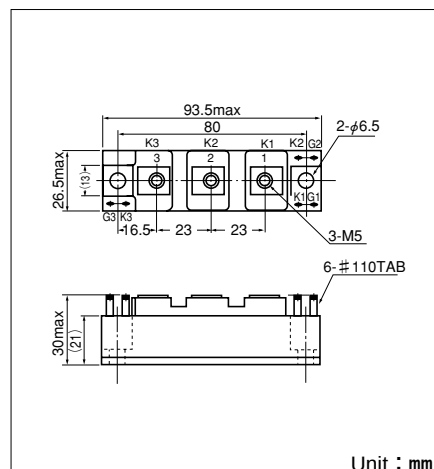
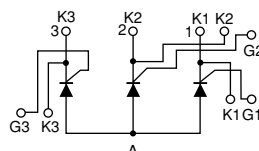
## PWB100A

PWB100A is a Thyristor module suitable for low voltage, 3 phase rectifier applications.

- $I_{T(AV)}$ 100A (each device)
- High Surge Current 3500 A (60Hz)
- Easy Construction
- Non-isolated. Mounting base as common Anode terminal

### (Applications)

Welding power Supply  
Various DC power Supply



Unit : mm

### Maximum Ratings

| Symbol | Item                                | Ratings   |           | Unit |
|--------|-------------------------------------|-----------|-----------|------|
|        |                                     | PWB100A30 | PWB100A40 |      |
| VRRM   | Repetitive Peak Reverse Voltage     | 300       | 400       | V    |
| VRSM   | Non-Repetitive Peak Reverse Voltage | 360       | 480       | V    |
| VDRM   | Repetitive Peak Off-State Voltage   | 300       | 400       | V    |

| Symbol       | Item                                      | Conditions                                                                                                 | Ratings                           | Unit               |
|--------------|-------------------------------------------|------------------------------------------------------------------------------------------------------------|-----------------------------------|--------------------|
| $I_{T(AV)}$  | Average On-State Current                  | Single phase, half wave, 180° conduction, $T_c : 114^{\circ}\text{C}$                                      | 100                               | A                  |
| $I_{T(RMS)}$ | R.M.S. On-State Current                   | Single phase, half wave, 180° conduction, $T_c : 114^{\circ}\text{C}$                                      | 157                               | A                  |
| $I_{TSM}$    | Surge On-State Current                    | $\frac{1}{2}$ cycle, 50Hz/60Hz, peak value, non-repetitive                                                 | 3200/3500                         | A                  |
| $I^2t$       | $I^2t$                                    |                                                                                                            | 51000                             | A <sup>2</sup> S   |
| $P_{GM}$     | Peak Gate Power Dissipation               |                                                                                                            | 10                                | W                  |
| $P_{G(AV)}$  | Average Gate Power Dissipation            |                                                                                                            | 1                                 | W                  |
| $I_{FGM}$    | Peak Gate Current                         |                                                                                                            | 3                                 | A                  |
| $V_{FGM}$    | Peak Gate Voltage (Forward)               |                                                                                                            | 10                                | V                  |
| $V_{RGM}$    | Peak Gate Voltage (Reverse)               |                                                                                                            | 5                                 | V                  |
| $di/dt$      | Critical Rate of Rise of On-State Current | $I_G=200\text{mA}$ , $T_j=25^{\circ}\text{C}$ , $V_D=\frac{1}{2}V_{DRM}$ , $dI_G/dt=1\text{A}/\mu\text{s}$ | 50                                | A/ $\mu\text{s}$   |
| $T_j$        | Operating Junction Temperature            |                                                                                                            | -30 to +150                       | $^{\circ}\text{C}$ |
| $T_{stg}$    | Storage Temperature                       |                                                                                                            | -30 to +125                       | $^{\circ}\text{C}$ |
|              | Mounting Torque                           | Mounting (M6)                                                                                              | Recommended Value 2.5-3.9 (25-40) | N·m<br>(kgf·cm)    |
|              |                                           | Terminal (M5)                                                                                              | Recommended Value 1.5-2.5 (15-25) |                    |
|              | Mass                                      |                                                                                                            | 170                               | g                  |

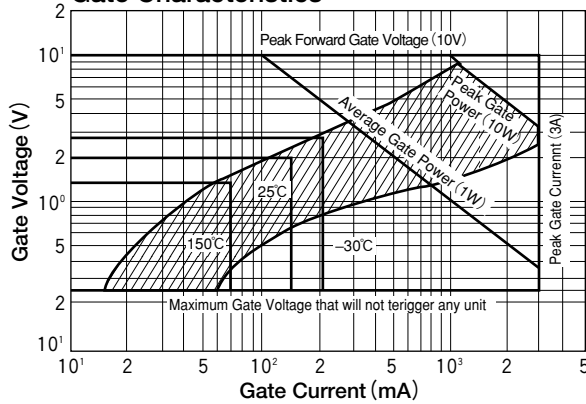
### Electrical Characteristics

| Symbol          | Item                                             | Conditions                                                                                                                     | Ratings | Unit                        |
|-----------------|--------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|---------|-----------------------------|
| $I_{DRM}$       | Repetitive Peak Off-State Current, max.          | at $V_{DRM}$ , single phase, half wave, $T_j=150^{\circ}\text{C}$                                                              | 15      | mA                          |
| $I_{RRM}$       | Repetitive Peak Reverse Current, max.            | at $V_{DRM}$ , single phase, half wave, $T_j=150^{\circ}\text{C}$                                                              | 15      | mA                          |
| $V_{TM}$        | Peak On-State Voltage, max.                      | On-State Current 310A, $T_j=25^{\circ}\text{C}$ Inst. measurement                                                              | 1.20    | V                           |
| $I_{GT}/V_{GT}$ | Gate Trigger Current/Voltage, max.               | $T_j=25^{\circ}\text{C}$ , $I_T=1\text{A}$ , $V_D=6\text{V}$                                                                   | 150/2   | mA/V                        |
| $V_{GD}$        | Non-Trigger Gate, Voltage. min.                  | $T_j=150^{\circ}\text{C}$ , $V_D=\frac{1}{2}V_{DRM}$                                                                           | 0.25    | V                           |
| $t_{gt}$        | Turn On Time, max.                               | $I_T=100\text{A}$ , $I_G=200\text{mA}$ , $T_j=25^{\circ}\text{C}$ , $V_D=\frac{1}{2}V_{DRM}$ , $dI_G/dt=1\text{A}/\mu\text{s}$ | 10      | $\mu\text{s}$               |
| $dv/dt$         | Critical Rate of Rise of Off-State Voltage, min. | $T_j=150^{\circ}\text{C}$ , $V_D=\frac{2}{3}V_{DRM}$ , Exponential wave.                                                       | 50      | V/ $\mu\text{s}$            |
| $I_H$           | Holding Current, typ.                            | $T_j=25^{\circ}\text{C}$                                                                                                       | 70      | mA                          |
| $R_{th(j-c)}$   | Thermal Impedance, max.                          | Junction to case ( $\frac{1}{3}$ Module)                                                                                       | 0.3     | $^{\circ}\text{C}/\text{W}$ |

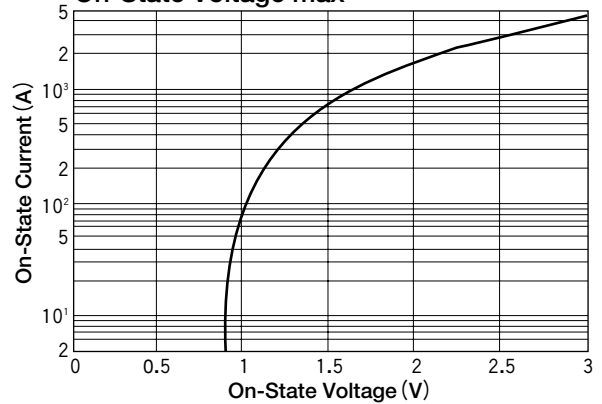
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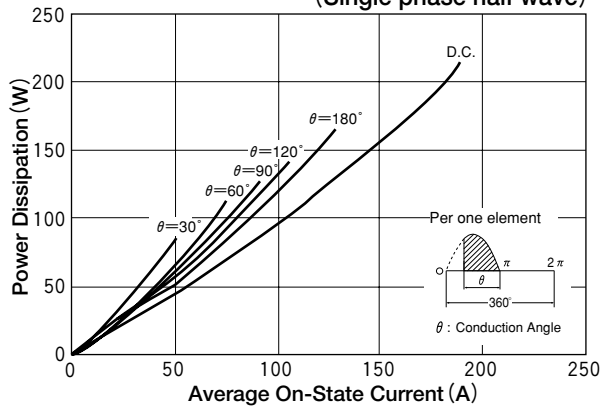
## Gate Characteristics



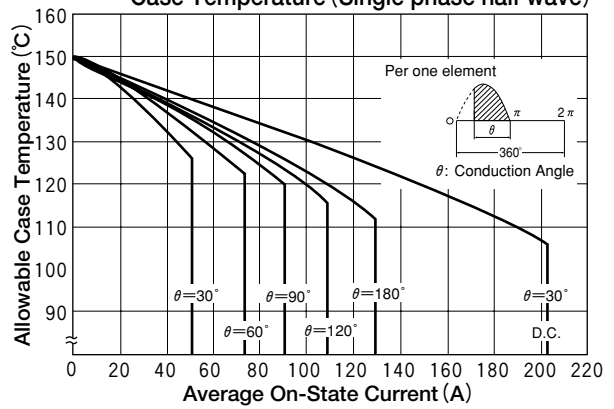
## On-State Voltage max



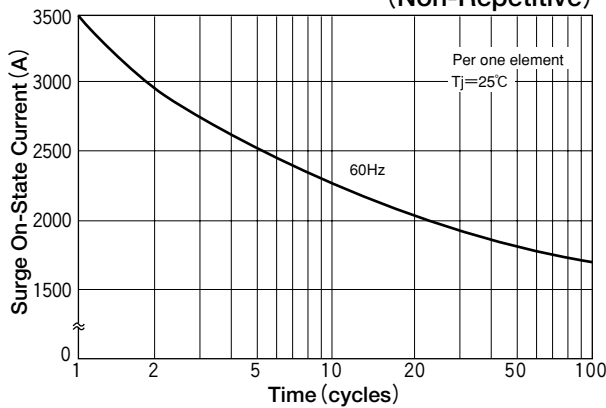
## Average On-State Current Vs Power Dissipation (Single phase half wave)



## Average On-State Current Vs Maximum Allowable Case Temperature (Single phase half wave)



## Surge On-State Current Rating (Non-Repetitive)



## Transient Thermal Impedance

