

# PK(PD,PE)200HB

TOP



UL:E76102(M)

Power Thyristor/Diode Module **PK200HB** series are designed for various rectifier circuits and power controls. For your circuit application, following internal connections and wide voltage ratings up to 1,600V are available.

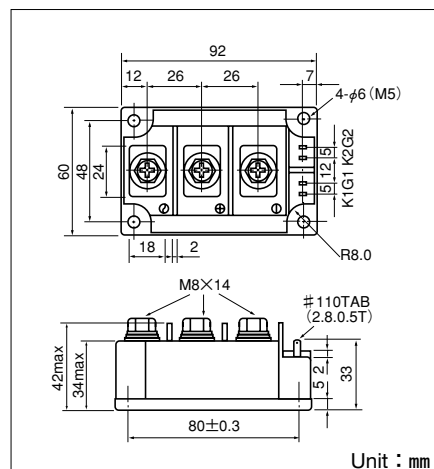
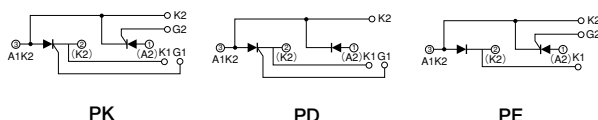
Isolated mounting base

- $I_{T(AV)}$  200A,  $I_{T(RMS)}$  310A,  $I_{TSM}$  5500A
- $di/dt$  200 A/ $\mu$ s
- $dv/dt$  500V/ $\mu$ s

(Applications)

- Various rectifiers
- AC/DC motor drives
- Heater controls
- Light dimmers
- Static switches

## Internal Configurations



### ■ Maximum Ratings

| Symbol           | Item                                  | Ratings                  |                                        | Unit |
|------------------|---------------------------------------|--------------------------|----------------------------------------|------|
|                  |                                       | PK200HB120<br>PE200HB120 | PD200HB120<br>PK200HB160<br>PD200HB160 |      |
| V <sub>RRM</sub> | * Repetitive Peak Reverse Voltage     | 1200                     | 1600                                   | V    |
| V <sub>RSM</sub> | * Non-Repetitive Peak Reverse Voltage | 1300                     | 1700                                   | V    |
| V <sub>DRM</sub> | Repetitive Peak Off-State Voltage     | 1200                     | 1600                                   | V    |

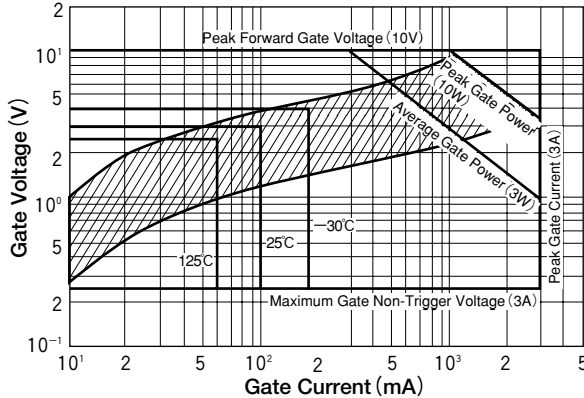
| Symbol  | Item                                      |               | Conditions                                          | Ratings     | Unit            |
|---------|-------------------------------------------|---------------|-----------------------------------------------------|-------------|-----------------|
| IT(AV)  | * Average On-State Current                |               | Single phase, half wave, 180° conduction, Tc : 74°C | 200         | A               |
| IT(RMS) | * R.M.S. On-State Current                 |               | Single phase, half wave, 180° conduction, Tc : 74°C | 310         | A               |
| ITSM    | * Surge On-State Current                  |               | 1/2 cycle, 50Hz/60Hz, peak Value, non-repetitive    | 5000/5500   | A               |
| I²t     | * I²t                                     |               | Value for one cycle of surge current                | 125000      | A²S             |
| PGM     | Peak Gate Power Dissipation               |               |                                                     | 10          | W               |
| PG(AV)  | Average Gate Power Dissipation            |               |                                                     | 3           | W               |
| IFGM    | Peak Gate Current                         |               |                                                     | 3           | A               |
| VFGM    | Peak Gate Voltage (Forward)               |               |                                                     | 10          | V               |
| VRGM    | Peak Gate Voltage (Reverse)               |               |                                                     | 5           | V               |
| di/dt   | Critical Rate of Rise of On-State Current |               | IG=100mA, Tj=25°C, VD=1/2VDRM, dIG/dt=0.1A/μs       | 200         | A/μs            |
| VISO    | * Isolation Breakdown Voltage (R.M.S.)    |               | A.C. 1 minute                                       | 2500        | V               |
| Tj      | * Operating Junction Temperature          |               |                                                     | −40 to +125 | °C              |
| Tstg    | * Storage Temperature                     |               |                                                     | −40 to +125 | °C              |
|         | Mounting Torque                           | Mounting (M5) | Recommended Value 1.5-2.5 (15-25)                   | 2.7 (28)    | N·m<br>(kgf·cm) |
|         |                                           | Terminal (M8) | Recommended Value 8.8-10 (90-105)                   | 11 (115)    |                 |
|         | Mass                                      |               | Typical Value                                       | 510         | g               |

## ■Electrical Characteristics

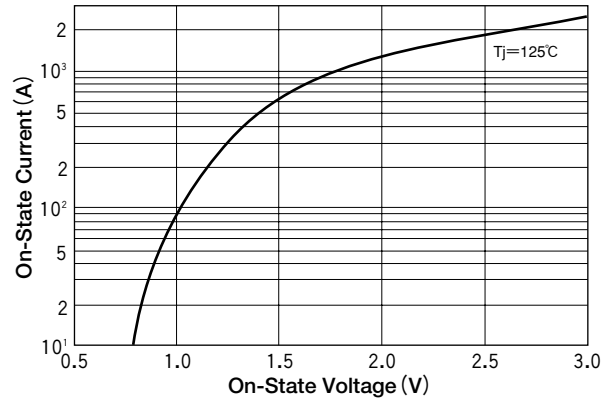
| Symbol                           | Item                                             | Conditions                                                                                                                         | Ratings | Unit |
|----------------------------------|--------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|---------|------|
| I <sub>DRM</sub>                 | Repetitive Peak Off-State Current, max.          | at V <sub>DRM</sub> , Single phase, half wave, T <sub>j</sub> =125°C                                                               | 50      | mA   |
| I <sub>RRM</sub>                 | * Repetitive Peak Reverse Current, max.          | at V <sub>DRM</sub> , Single phase, half wave, T <sub>j</sub> =125°C                                                               | 50      | mA   |
| V <sub>TM</sub>                  | * Peak On-State Voltage, max.                    | On-State Current 750A, T <sub>j</sub> =125°C Inst. measurement                                                                     | 1.50    | V    |
| I <sub>GT</sub> /V <sub>GT</sub> | Gate Trigger Current/Voltage, max.               | T <sub>j</sub> =25°C, I <sub>T</sub> =1A, V <sub>D</sub> =6V                                                                       | 100/3   | mA/V |
| V <sub>GD</sub>                  | Non-Trigger Gate, Voltage. min.                  | T <sub>j</sub> =125°C, V <sub>D</sub> =½V <sub>DRM</sub>                                                                           | 0.25    | V    |
| t <sub>gt</sub>                  | Turn On Time, max.                               | I <sub>T</sub> =250A, I <sub>G</sub> =100mA, T <sub>j</sub> =25°C, V <sub>D</sub> =½V <sub>DRM</sub> , dI <sub>G</sub> /dt=0.1A/μs | 10      | μs   |
| dv/dt                            | Critical Rate of Rise of Off-State Voltage, min. | T <sub>j</sub> =125°C, V <sub>D</sub> =⅔V <sub>DRM</sub> , Exponential wave.                                                       | 500     | V/μs |
| I <sub>H</sub>                   | Holding Current, typ.                            | T <sub>j</sub> =25°C                                                                                                               | 50      | mA   |
| I <sub>L</sub>                   | Lutching Current, typ.                           | T <sub>j</sub> =25°C                                                                                                               | 100     | mA   |
| R <sub>th</sub> (j-c)            | * Thermal Impedance, max.                        | Junction to case                                                                                                                   | 0.18    | °C/W |

\* mark : Thyristor and Diode part. No mark : Thyristor part

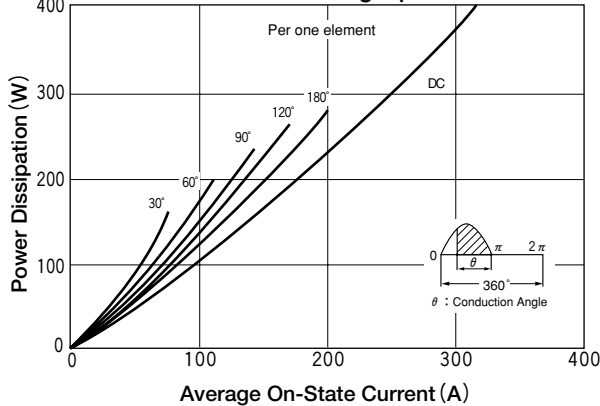
### Gate Characteristics



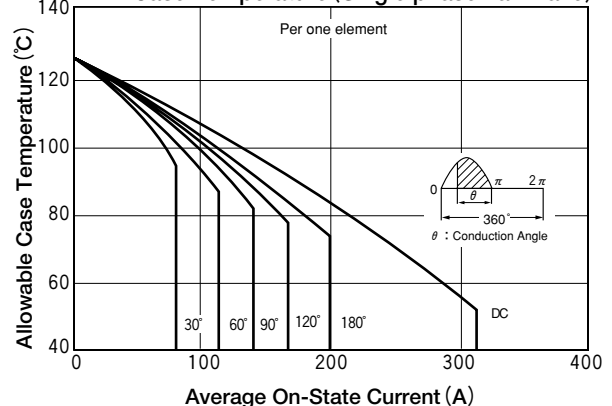
### On-State Characteristics



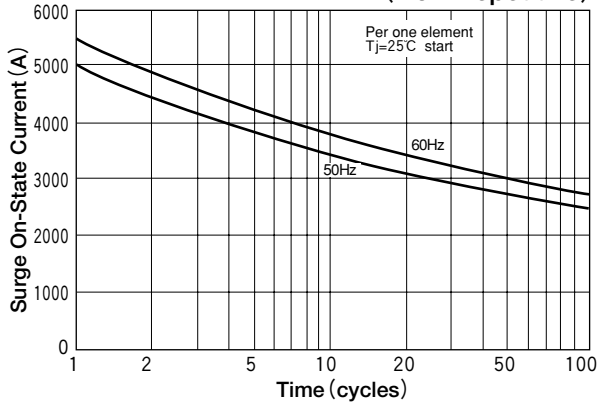
### Average On-State Current Vs Power Dissipation (Single phase half wave)



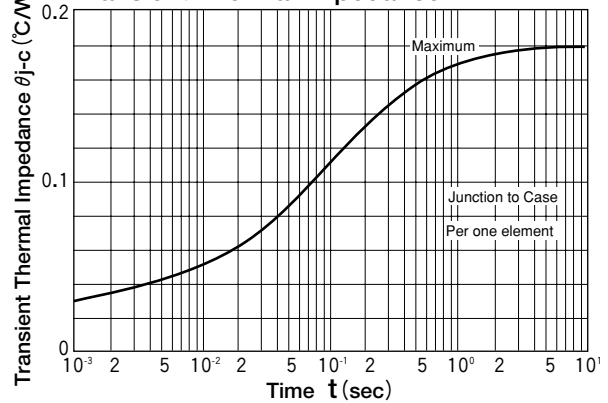
### Average On-State Current Vs Maximum Allowable Case Temperature (Single phase half wave)



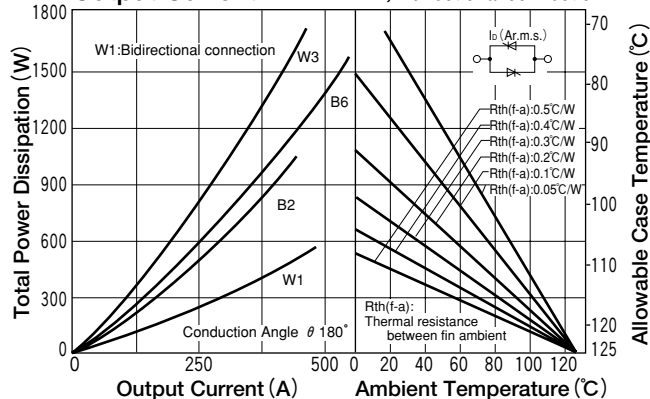
### Surge On-State Current Rating (Non-Repetitive)



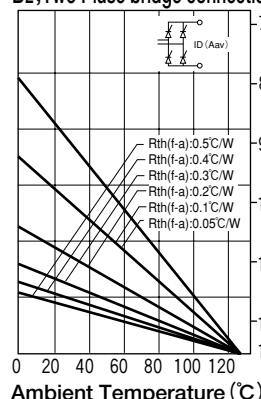
### Transient Thermal Impedance



### Output Current



### B2: Two Pulse bridge connection



### B6: Six pulse bridge connection W3: Three phase bidirectional connection

