# THYRISTOR MODULE

# PK(PD,PE,KK)90HB

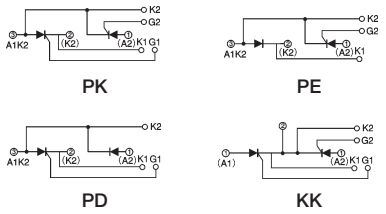
UL;E76102 (M)

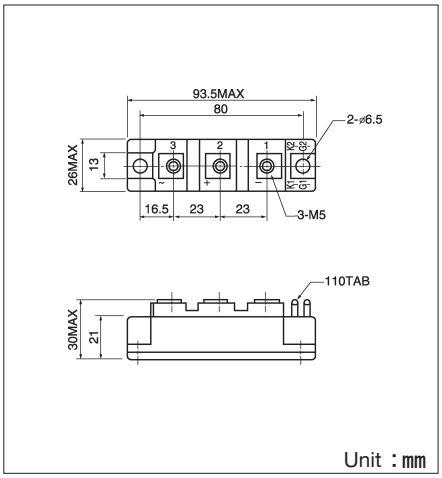
Power Thyristor/Diode Module **PK90HB** series are designed for various rectifier circuits and power controls. For your circuit application. following internal connections and wide voltage ratings up to 1,600V are available. and electrically isolated mounting base make your mechanical design easy.

- $I_{T(AV)}$ 90A, $I_{T(RMS)}$ 140A, $I_{TSM}$ 1800A
- 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 |
|---|---|---|---|---|
| | | **PK90GB40 PD90GB40 KK90GB40 PE90GB40** | **PK90GB80 PD90GB80 KK90GB80 PE90GB80** | |
| $V_{RRM}$ | ＊Repetitive Peak Reverse Voltage | 1200 | 1600 | V |
| $V_{RSM}$ | ＊Non-Repetitive Peak Reverse Voltage | 1350 | 1700 | V |
| $V_{DRM}$ | Repetitive Peak Off-State Voltage | 1200 | 1600 | V |

| Symbol | Item | | Conditions | Ratings | Unit |
|---|---|---|---|---|---|
| $I_{T(AV)}$ | ＊Average On-State Current | | Single phase, half wave, 180° conduction, Tc：88℃ | 90 | A |
| $I_{T(RMS)}$ | ＊R.M.S. On-State Current | | Single phase, half wave, 180° conduction, Tc：88℃ | 140 | A |
| $I_{TSM}$ | ＊Surge On-State Current | | ½cycle, 50Hz/60Hz, peak Value, non-repetitive | 1650/1800 | A |
| $I^2t$ | ＊$I^2t$ | | Value for one cycle of surge current | 15000 | $A^2S$ |
| $P_{GM}$ | Peak Gate Power Dissipation | | | 10 | W |
| $P_{G(AV)}$ | Average Gate Power Dissipation | | | 3 | 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 | | $I_G$=100mA, Tj=25℃, $V_D$=½$V_{DRM}$, $dI_G/dt$=0.1A/$\mu$s | 200 | A/$\mu$s |
| $V_{ISO}$ | ＊Isolation Breakdown Voltage (R.M.S.) | | A.C.1minute | 2500 | V |
| Tj | ＊Operating Junction Temperature | | | −40～+125 | ℃ |
| Tstg | ＊Storage Temperature | | | −40～+125 | ℃ |
| | Mounting Torque | Mounting (M6) | Recommended Value 2.5～3.9 (25～40) | 4.7 (48) | N・m (kgf・cm) |
| | | Terminal (M5) | Recommended Value 1.5～2.5 (15～25) | 2.7 (28) | |
| | Mass | | | 170 | g |

## ■Electrical Characteristics

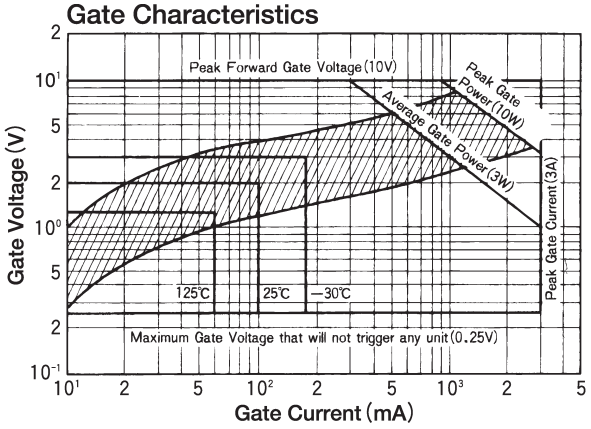
| Symbol | Item | Conditions | Ratings | Unit |
|---|---|---|---|---|
| $I_{DRM}$ | Repetitive Peak Off-State Current, max. | at $V_{DRM}$, single phase, half wave, Tj=125℃ | 15 | mA |
| $I_{RRM}$ | ＊Repetitive Peak Reverse Current, max. | at $V_{DRM}$, single phase, half wave, Tj=125℃ | 15 | mA |
| $V_{TM}$ | ＊Peak On-State Voltage, max. | On-State Current 270A, Tj=125℃ Inst. measurement | 1.40 | V |
| $I_{GT}$／$V_{GT}$ | Gate Trigger Current/Voltage, max. | Tj=25℃, $I_T$=1A, $V_D$=6V | 100/2 | mA/V |
| $V_{GD}$ | Non-Trigger Gate, Voltage. min. | Tj=125℃, $V_D$=½$V_{DRM}$ | 0.25 | V |
| tgt | Turn On Time, max. | $I_T$=90A, $I_G$=100mA, Tj=25℃, $V_D$=½$V_{DRM}$, $dI_G/dt$=0.1A/$\mu$s | 10 | $\mu$s |
| dv／dt | Critical Rate of Rise of Off-State Voltage, min. | Tj=125℃, $V_D$=⅔$V_{DRM}$, Exponential wave. | 500 | V/$\mu$s |
| $I_H$ | Holding Current, typ. | Tj=25℃ | 50 | mA |
| $I_L$ | Lutching Current, typ. | Tj=25℃ | 100 | mA |
| Rth(j-c) | ＊Thermal Impedance, max. | Junction to case | 0.30 | ℃/W |

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

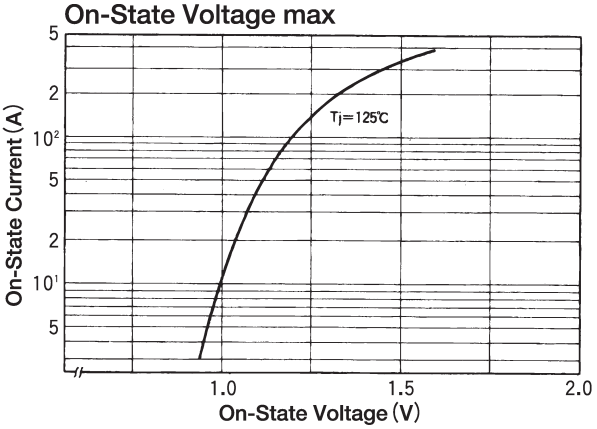


SanRex

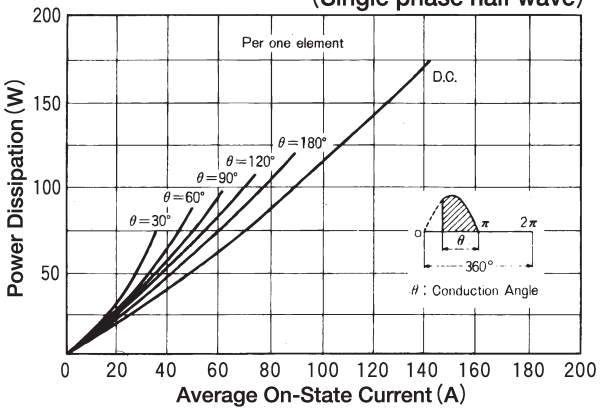
## Gate Characteristics



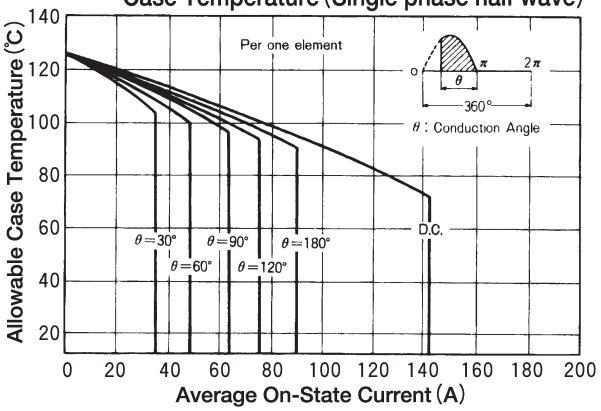

## On-State Voltage max



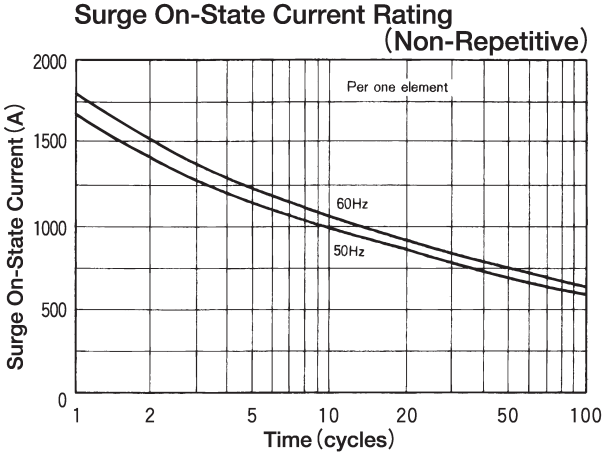

## Average On-State Current Vs Power Dissipation (Single phase half wave)



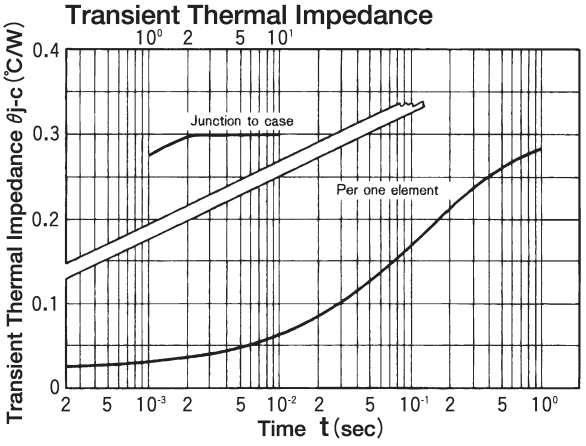

## Average On-State Current Vs Maximum Allowable Case Temperature (Single phase half wave)




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




## Transient Thermal Impedance




## Output Current