

# THYRISTOR MODULE

# PK(PD,PE)70FG

UL:E76102(M)

Power Thyristor/Diode Module PK70FG series are designed for various rectifier circuits and power controls. For your circuit application, following internal connections and wide voltage ratings up to 1600V are available. and electrically isolated mounting base make your mechanical design easy.

- $I_{T(AV)}$  70A,  $I_{T(RMS)}$  110A,  $I_{TSM}$  1600A
- $di/dt$  100A/ $\mu$ s
- $dv/dt$  1000V/ $\mu$ s

### (Applications)

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

Internal Configurations



Unit : mm

### Maximum Ratings

( $T_j=25^\circ\text{C}$  unless otherwise specified)

| Symbol    | Item                                  | Ratings                          |                                  |                                     |                                     | Unit |
|-----------|---------------------------------------|----------------------------------|----------------------------------|-------------------------------------|-------------------------------------|------|
|           |                                       | PK70FG40<br>PD70FG40<br>PE70FG40 | PK70FG80<br>PD70FG80<br>PE70FG80 | PK70FG120<br>PD70FG120<br>PE70FG120 | PK70FG160<br>PD70FG160<br>PE70FG160 |      |
| $V_{RRM}$ | * Repetitive Peak Reverse Voltage     | 400                              | 800                              | 1200                                | 1600                                | V    |
| $V_{RSM}$ | * Non-Repetitive Peak Reverse Voltage | 480                              | 960                              | 1300                                | 1700                                | V    |
| $V_{DRM}$ | * Repetitive Peak off-state Voltage   | 400                              | 800                              | 1200                                | 1600                                | V    |

| Symbol       | Item                                      | Conditions  | Ratings                           | Unit                   |   |
|--------------|---|---|-----------------------------------|------------------------|---|
| $I_{T(AV)}$  | * Average On-state Current                | Single phase, half wave, $180^\circ$ conduction, $T_c=84^\circ\text{C}$           | 70                                | A                      |   |
| $I_{T(RMS)}$ | * R.M.S. On-state Current                 | Single phase, half wave, $180^\circ$ conduction, $T_c=84^\circ\text{C}$           | 110                               | A                      |   |
| $I_{TSM}$    | * Surge On-state Current                  | $\frac{1}{2}$ Cycle, 50/60Hz, Peak Value, non-repetitive                          | 1460/1600                         | A                      |   |
| $I^2t$       | * $I^2t$                                  | Value for one cycle surge current   | 10660                             | $\text{A}^2\text{S}$   |   |
| $P_{GM}$     | 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 | $I_G=100\text{mA}$ , $V_D=\frac{1}{2}V_{DRM}$ , $di_G/dt=0.1\text{A}/\mu\text{s}$ | 100                               | $\text{A}/\mu\text{s}$ |   |
| $V_{ISO}$    | * Isolation Breakdown Voltage (R.M.S.)    | A.C. 1minute  | 2500                              | V                      |   |
| $T_j$        | * Operating Junction Temperature          |   | -40 to +125                       | $^\circ\text{C}$       |   |
| $T_{stg}$    | * Storage Temperature                     |   | -40 to +125                       | $^\circ\text{C}$       |   |
|              | Mounting Torque                           | Mounting (M5)   | Recommended Value 1.5-2.5 (15-25) | 2.7 (28)               | $\text{N}\cdot\text{m}$<br>( $\text{kgf}\cdot\text{cm}$ ) |
|              |   | Terminal (M5)   | Recommended Value 1.5-2.5 (15-25) | 2.7 (28)               |   |
|              | Mass                                      | Typical Value   |                                   | 170                    | g   |

### Electrical Characteristics

| Symbol        | Item   | Conditions   | Ratings | Unit                      |
|---------------|--|--|---------|---------------------------|
| $I_{DRM}$     | Repetitive Peak off-state Current,max          | $T_j=125^\circ\text{C}$ , $V_D=V_{DRM}$            | 20      | mA                        |
| $I_{RRM}$     | * Repetitive Peak Reverse Current,max          | $T_j=125^\circ\text{C}$ , $V_D=V_{DRM}$            | 20      | mA                        |
| $V_{TM}$      | * On-state Voltage,max                         | $I_T=210\text{A}$                                  | 1.6     | V                         |
| $I_{GT}$      | Gate Trigger Current,max                       | $V_D=6\text{V}$ , $I_T=1\text{A}$                  | 50      | mA                        |
| $V_{GT}$      | Gate Trigger Voltage,max                       | $V_D=6\text{V}$ , $I_T=1\text{A}$                  | 3       | V                         |
| $V_{GD}$      | Gate Non-Trigger Voltage,min                   | $T_j=125^\circ\text{C}$ , $V_D=\frac{1}{2}V_{DRM}$ | 0.25    | V                         |
| $dv/dt$       | Critical Rate of Rise of off-state Voltage,min | $T_j=125^\circ\text{C}$ , $V_D=\frac{2}{3}V_{DRM}$ | 1000    | $\text{V}/\mu\text{s}$    |
| $R_{th(j-c)}$ | * Thermal Impedance,max                        | Junction to case                                   | 0.37    | $^\circ\text{C}/\text{W}$ |

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

