



## Thyristor Module

### Features

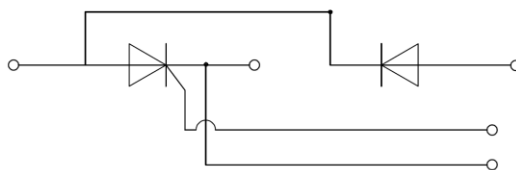
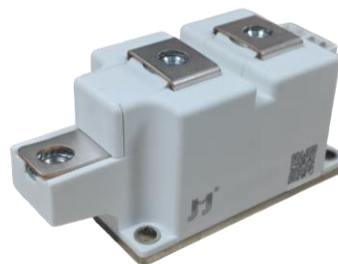
- Half-bridge SCR configuration integrated in a single package
- With high thermal conductivity DBC as the Insulation
- Welding by vacuum welding technology, which provide high reliability

### Product Summary

| Parameter                        | Value | Unit |
|----------------------------------|-------|------|
| $V_{RRM}$                        | 1600  | V    |
| $I_{T(AV)}(@ T_C = 85^{\circ}C)$ | 280   | A    |
| $I_{TSM}(@ t_p = 10ms)$          | 9000  | A    |
| $V_T(Max)$                       | 1.8   | V    |

### Applications

- Temperature control
- Light control system
- DC motor



### Absolute Maximum Ratings (@ $T_C = 25^{\circ}C$ unless otherwise specified)

| Parameter                                 | Conditions                                           | Symbol      | Values     | Unit             |
|-------------------------------------------|------------------------------------------------------|-------------|------------|------------------|
| Repetitive peak off-state voltage         | $T_{vj} = 25^{\circ}C$                               | $V_{DRM}$   | 1600       | V                |
| Repetitive peak reverse voltage           | $T_{vj} = 25^{\circ}C$                               | $V_{RRM}$   | 1600       | V                |
| Non-repetitive peak off-state voltage     | $T_{vj} = 25^{\circ}C$                               | $V_{DSM}$   | 1700       | V                |
| Non-repetitive peak reverse voltage       | $T_{vj} = 25^{\circ}C$                               | $V_{RSM}$   | 1700       | V                |
| Average forward current                   | $T_C = 85^{\circ}C$                                  | $I_{T(AV)}$ | 280        | A                |
| Forward surge current                     | 1/2 cycle, Sine wave, 50Hz<br>$T_{vj} = 25^{\circ}C$ | $I_{TSM}$   | 9000       | A                |
| $I^2t$ value for fusing                   |                                                      | $I^2t$      | 405000     | A <sup>2</sup> s |
| Critical rate of rise of on-state current | $I_G = 2 \times I_{GT}$                              | $di/dt$     | 150        | A/ $\mu$ s       |
| RMS isolation voltage                     | A.C 50Hz(1s/1min)                                    | $V_{ISO}$   | 3600/3000  | V                |
| Junction temperature range                |                                                      | $T_J$       | -40 ~ +125 | $^{\circ}C$      |
| Storage temperature range                 |                                                      | $T_{stg}$   | -40 ~ +125 | $^{\circ}C$      |

**Electrical Characteristics (@  $T_C = 25^\circ\text{C}$  unless otherwise specified)**

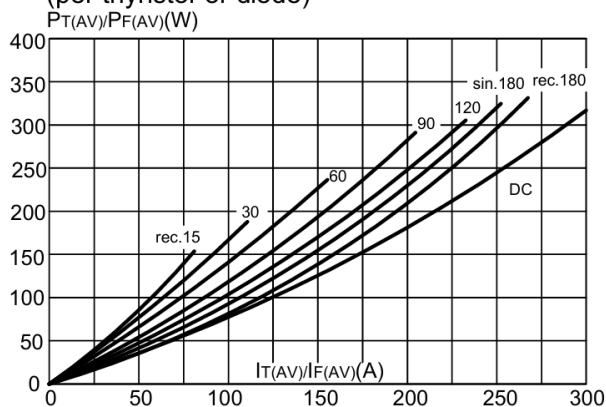
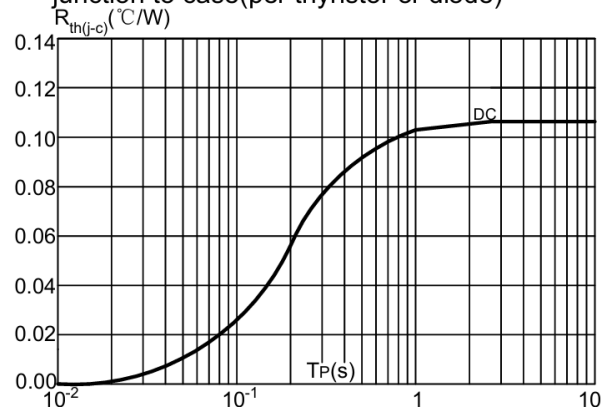
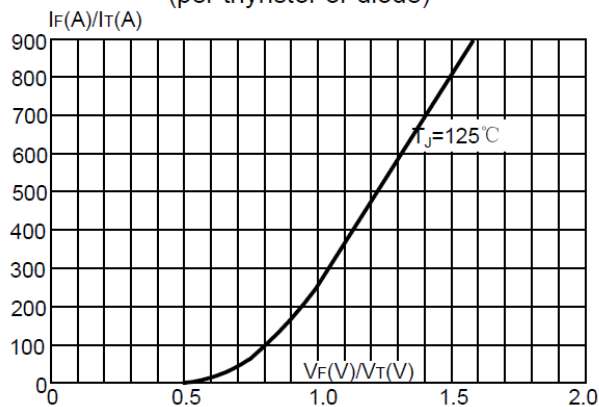
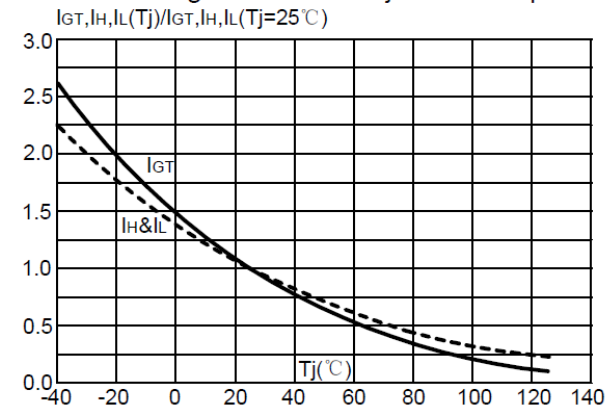
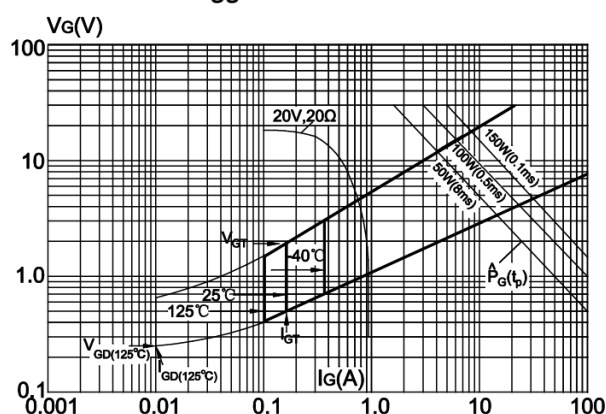
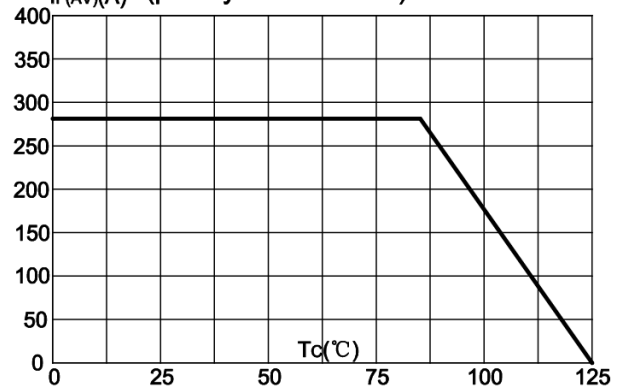
| Parameter                         | Conditions                                                   | Symbol           | Values |      |      | Unit             |
|-----------------------------------|--------------------------------------------------------------|------------------|--------|------|------|------------------|
|                                   |                                                              |                  | Min.   | Typ. | Max. |                  |
| Peak forward voltage              | $I_T=840\text{A}$ , $t_P=380\mu\text{s}$                     | $V_T$            |        |      | 1.80 | V                |
| Repetitive peak off-state current | $V_D = V_{\text{DRM}}$ , $T_{vj} = 25^\circ\text{C}$         | $I_{\text{DRM}}$ |        |      | 100  | $\mu\text{A}$    |
|                                   | $V_D = V_{\text{DRM}}$ , $T_{vj} = 125^\circ\text{C}$        |                  |        |      | 100  | mA               |
| Reverse leakage current           | $V_R = V_{\text{RRM}}$ , $T_{vj} = 25^\circ\text{C}$         | $I_{\text{RRM}}$ |        |      | 100  | $\mu\text{A}$    |
|                                   | $V_R = V_{\text{RRM}}$ , $T_{vj} = 125^\circ\text{C}$        |                  |        |      | 100  | mA               |
| Threshold voltage                 | For power loss calculation only $T_{vj} = 125^\circ\text{C}$ | $V_{\text{TO}}$  |        |      | 0.8  | V                |
| Dynamic resistance                | $T_{vj} = 125^\circ\text{C}$                                 | $r_T$            |        |      | 0.8  | $\text{m}\Omega$ |
| Triggering gate current           | $V_D=12\text{V}$ $R_L=30\Omega$                              | $I_{\text{GT}}$  | 20     |      | 150  | mA               |
| Holding current                   | $I_T=1\text{A}$                                              | $I_H$            |        |      | 300  | mA               |
| Latching current                  | $I_G=1.2 I_{\text{GT}}$                                      | $I_L$            |        |      | 400  | mA               |
| Triggering gate voltage           | $V_D=12\text{V}$ $R_L=30\Omega$                              | $V_{\text{GT}}$  |        |      | 1.8  | V                |
| Non triggering gate voltage       | $V_D=0.5V_{\text{DRM}}$ $T_{vj}=125^\circ\text{C}$           | $V_{\text{GD}}$  |        |      | 0.25 | V                |

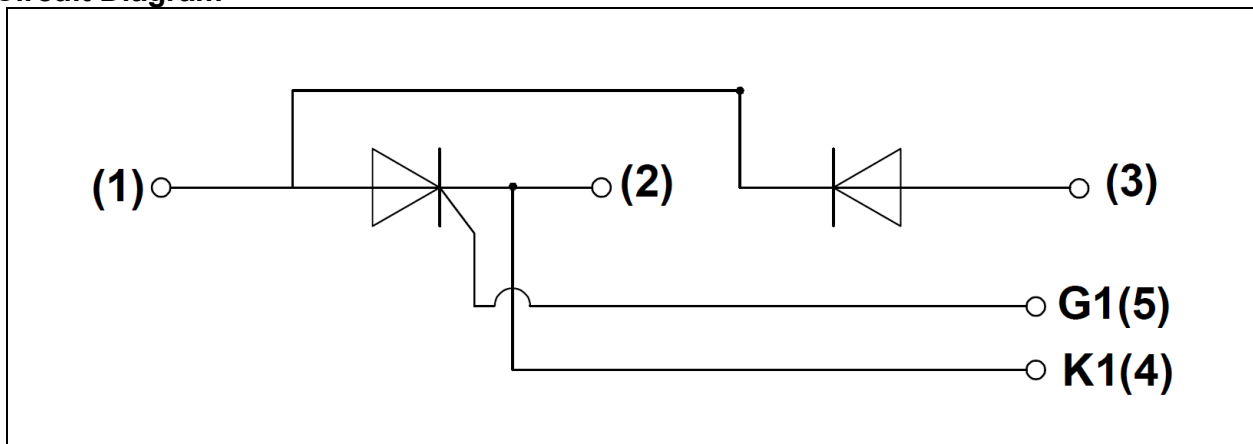
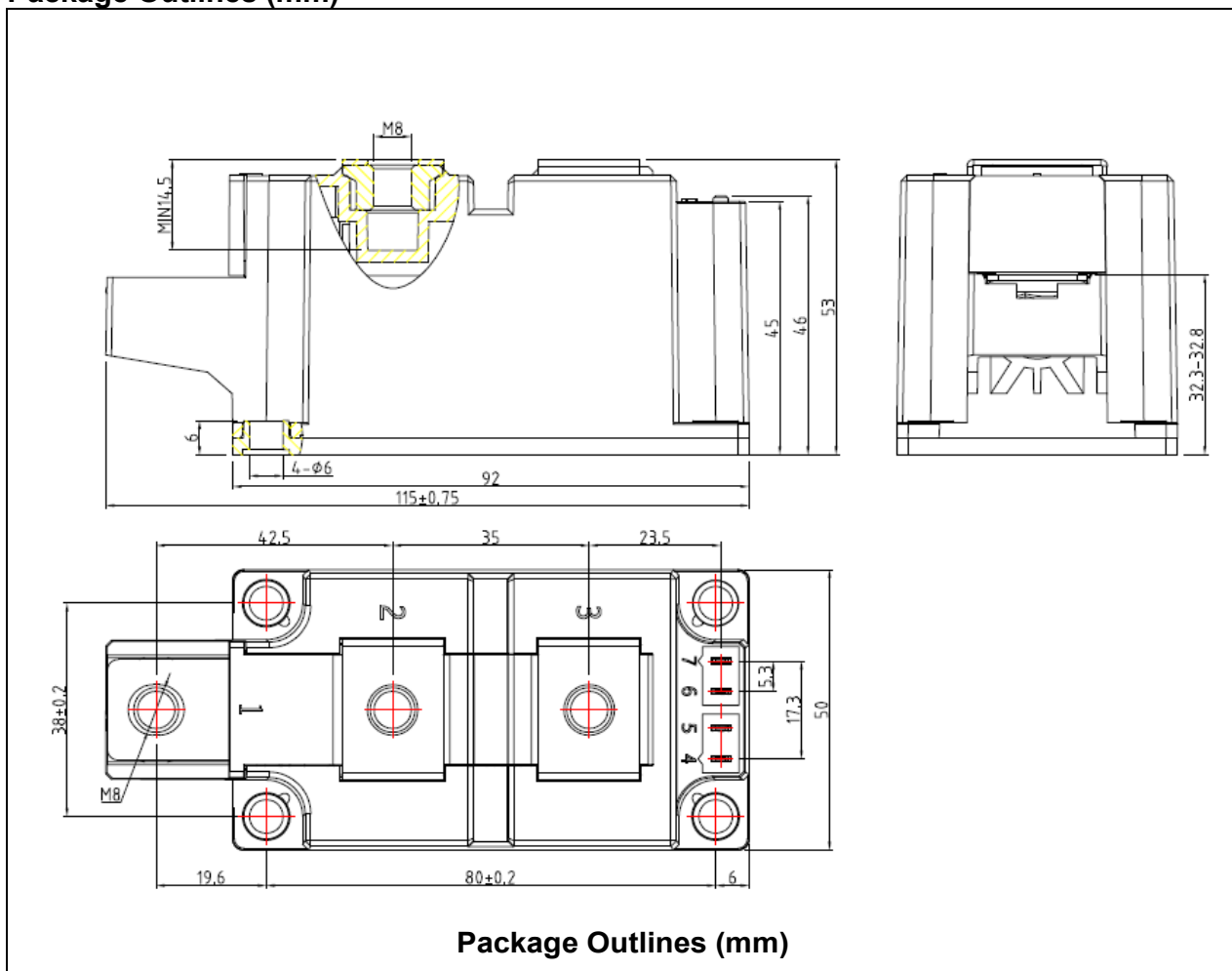
**Thermal Characteristics (@  $T_C = 25^\circ\text{C}$  unless otherwise specified)**

| Parameter                            | Conditions                          | Symbol               | Values |       |       | Unit                    |
|--------------------------------------|-------------------------------------|----------------------|--------|-------|-------|-------------------------|
|                                      |                                     |                      | Min.   | Typ.  | Max.  |                         |
| Thermal resistance, junction to case | per chip                            | $R_{\text{th(j-c)}}$ |        | 0.105 |       | $^\circ\text{C/W}$      |
| Thermal resistance, case to heatsink | per chip                            | $R_{\text{th(c-s)}}$ |        | 0.05  |       | $^\circ\text{C/W}$      |
| Mounting torque                      | Module and heatsink fixed torque M5 | M                    | 4.25   |       | 5.75  | $\text{N}\cdot\text{m}$ |
|                                      | Electrode connection torque M8      |                      | 7.65   |       | 10.34 | $\text{N}\cdot\text{m}$ |

**Ordering Information**

| Device       | Marking      | Package | Weight      | Inner Box | Per Carton |
|--------------|--------------|---------|-------------|-----------|------------|
| JMT280KH16T3 | JMT280KH16T3 | T3      | 355±10g/PCS | 3 PCS     | 27 PCS     |

**Typical Electrical & Thermal Characteristics****FIG.1:**Power dissipation vs. on-state current  
(per thyristor or diode)**FIG.2:** Maximum transient thermal impedance  
junction to case(per thyristor or diode)**FIG.3:**Forward characteristics  
(per thyristor or diode)**FIG.4:** Relative variations of gate trigger current, holding current and latching current versus junction temperature**FIG.5** Gate trigger characteristics**FIG.6:** Forward current vs. case temperature

**Circuit Diagram**

**Package Outlines (mm)**

**Package Outlines (mm)**



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