



## JMT140KB16T1

### Thyristor Module

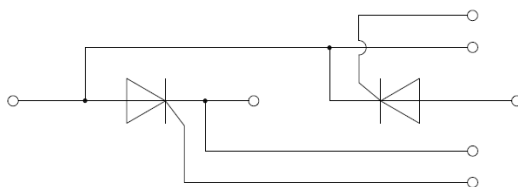
#### Features

- Half-bridge SCR configuration integrated  
In a single package
- High-thermal-conductivity DBC insulation for excellent  
heat dissipation
- Vacuum soldering technology for enhanced reliability

#### Applications

- Heating control
- Light control system
- DC motor

| Parameter                        | Value | Unit |
|----------------------------------|-------|------|
| $V_{RRM}$                        | 1600  | V    |
| $I_{T(AV)}(@ T_C = 85^{\circ}C)$ | 140   | A    |
| $I_{TSM}(@ t_p = 10ms)$          | 2800  | A    |
| $V_T(Max)$                       | 1.80  | V    |



#### 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                   | $T_C = 85^{\circ}C$                                | $I_{T(AV)}$ | 140        | A           |
| Forward surge current                     | 1/2 cycle, Sine wave, 50Hz<br>$T_vj = 25^{\circ}C$ | $I_{TSM}$   | 2800       | A           |
| $I^2t$ value for fusing                   |                                                    | $I^2t$      | 39200      | $A^2s$      |
| 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              | $I_T=420\text{A}$ , $t_P=380\mu\text{s}$                        | $V_T$            |        |      | 1.80 | V                      |
| Repetitive peak off-state current | $V_D = V_{\text{DRM}}$ , $T_{vj} = 25^\circ\text{C}$            | $I_{\text{DRM}}$ |        |      | 100  | $\mu\text{A}$          |
|                                   | $V_D = V_{\text{DRM}}$ , $T_{vj} = 125^\circ\text{C}$           |                  |        |      | 40   | mA                     |
| Reverse leakage current           | $V_R = V_{\text{RRM}}$ , $T_{vj} = 25^\circ\text{C}$            | $I_{\text{RRM}}$ |        |      | 100  | $\mu\text{A}$          |
|                                   | $V_R = V_{\text{RRM}}$ , $T_{vj} = 125^\circ\text{C}$           |                  |        |      | 40   | mA                     |
| Threshold voltage                 | For power loss calculation only $T_{vj} = 125^\circ\text{C}$ ,  | $V_{\text{TO}}$  |        |      | 0.89 | V                      |
| Dynamic resistance                | $T_{vj} = 125^\circ\text{C}$ ,                                  | $r_T$            |        |      | 2    | $\text{m}\Omega$       |
| Triggering gate current           | $V_D=12\text{V}$ $R_L=30\Omega$                                 | $I_{\text{GT}}$  | 20     |      | 120  | mA                     |
| Holding current                   | $I_T=1\text{A}$                                                 | $I_H$            |        |      | 250  | mA                     |
| Latching current                  | $I_G=1.2 I_{\text{GT}}$                                         | $I_L$            |        |      | 300  | mA                     |
| Critical rate of rise of voltage  | $V_D=2/3V_{\text{DRM}}$ $T_{vj}=125^\circ\text{C}$<br>Gate Open | $dv/dt$          | 1000   |      |      | $\text{V}/\mu\text{s}$ |
| 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 Thyristor                       | $R_{\text{th(j-c)}}$ |        | 0.181 |      | $^\circ\text{C}/\text{W}$ |
| Thermal resistance, case to heatsink | per Thyristor                       | $R_{\text{th(c-s)}}$ |        | 0.10  |      | $^\circ\text{C}/\text{W}$ |
| Mounting torque                      | Module and heatsink fixed torque M5 | M                    | 4.25   |       | 5.75 | $\text{N}\cdot\text{m}$   |
|                                      | Electrode connection torque M5      |                      | 2.55   |       | 3.45 | $\text{N}\cdot\text{m}$   |

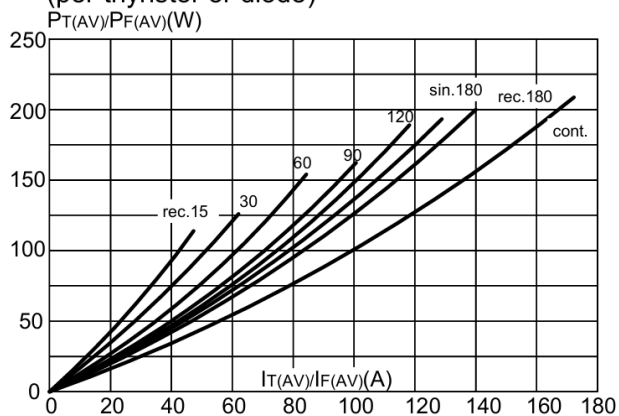


## Ordering Information

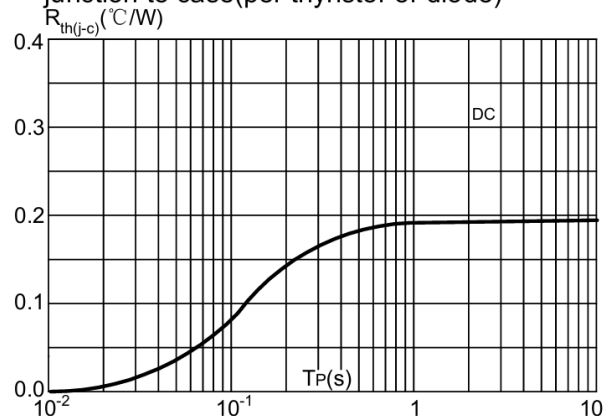
| Device       | Marking      | Package | Weight     | Inner Box | Per Carton |
|--------------|--------------|---------|------------|-----------|------------|
| JMT140KB16T1 | JMT140KB16T1 | T1      | 100±5g/PCS | 10 PCS    | 120 PCS    |

## Typical Electrical & Thermal Characteristics

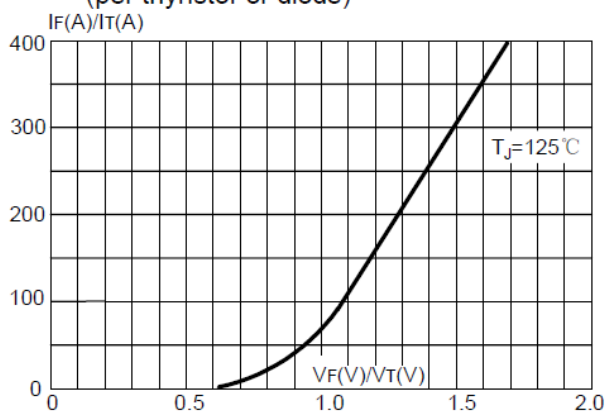
**FIG.1:**Power dissipation vs. on-state current  
(per thyristor or diode)



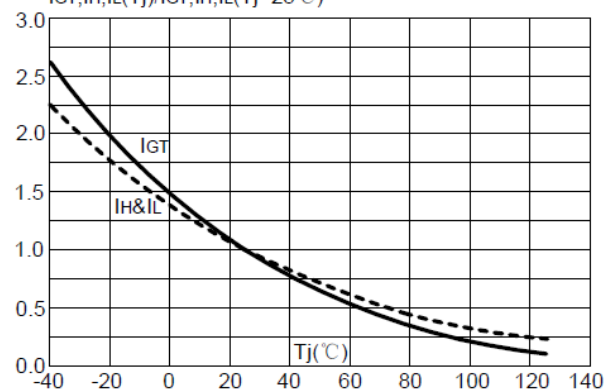
**FIG.2:** Maximum transient thermal impedance  
junction to case(per thyristor or diode)



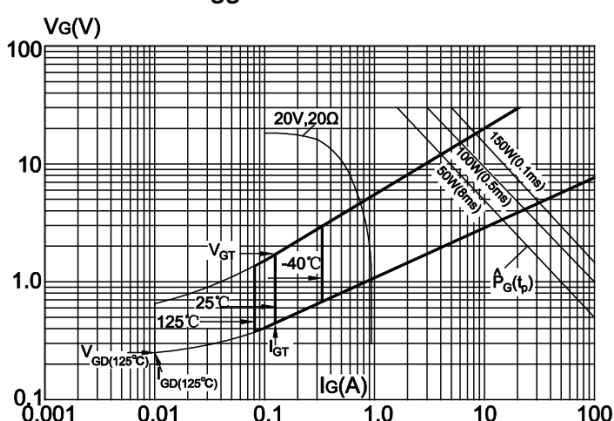
**FIG.3:**Forward characteristics  
(per thyristor or diode)



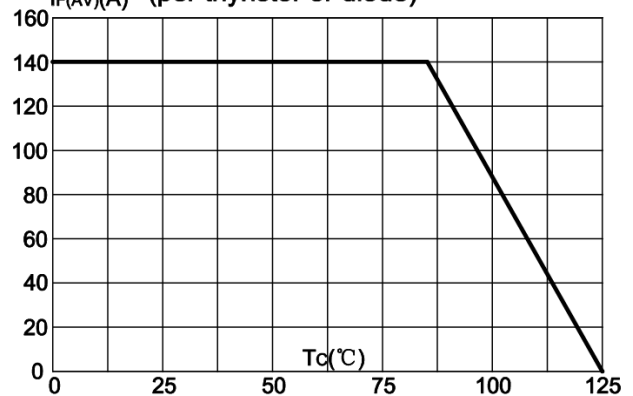
**FIG.4:** Relative variations of gate trigger current, holding current and latching current versus junction temperature  
 $I_{GT}, I_H, I_L(T_j)/I_{GT}, I_H, I_L(T_j=25^\circ\text{C})$

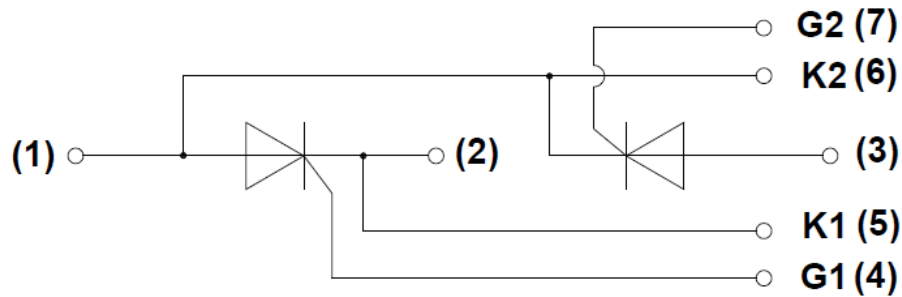
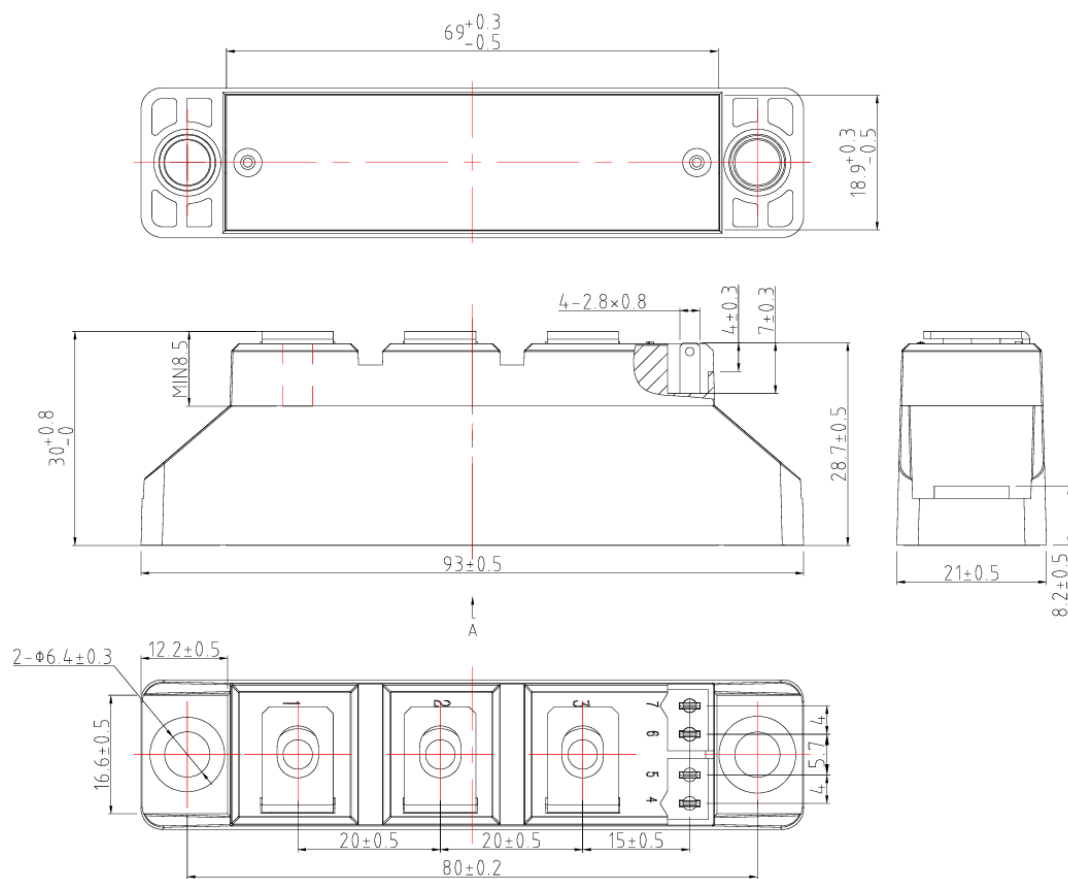


**FIG.5** Gate trigger characteristics



**FIG.6:** Forward current vs. case temperature  
 $I_{F(AV)}(A)$  (per thyristor or diode)



**Circuit Diagram**

**Package Outlines (mm)**


Unit of measurement: mm



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