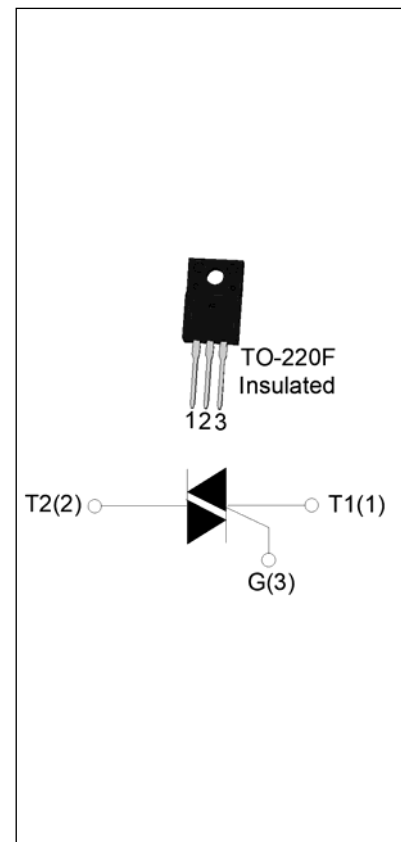


## T1650H-8F 16A TRIAC

Rev.A.1.1

### DESCRIPTION:

The T1650H-8F triac is suitable for general purpose AC switching. It can be used as an ON/OFF function in applications such as heating regulation, induction motor starting circuits, for phase control operation in light dimmers, motor speed controllers. Compared to traditional triacs, T1650H-8F provides a very high switching capability up to junction temperatures of 150°C. By using an external plastic package, T1650H-8F provides a rated insulation voltage of 2000 VRMS, complying with UL standards (File ref: E252906). Package TO-220F is RoHS compliant.



### MAIN FEATURES

| Symbol             | Value    | Unit |
|--------------------|----------|------|
| $I_{T(RMS)}$       | 16       | A    |
| $V_{DRM}/V_{RRM}$  | 800      | V    |
| $I_{GT\ I/II/III}$ | 50/50/50 | mA   |

### ABSOLUTE MAXIMUM RATINGS

| Parameter                                                                                                        | Symbol       | Value   | Unit                   |
|------------------------------------------------------------------------------------------------------------------|--------------|---------|------------------------|
| Storage junction temperature range                                                                               | $T_{stg}$    | -40-150 | °C                     |
| Operating junction temperature range                                                                             | $T_j$        | -40-150 | °C                     |
| Repetitive peak off-state voltage ( $T_j=25^\circ\text{C}$ )                                                     | $V_{DRM}$    | 800     | V                      |
| Repetitive peak reverse voltage ( $T_j=25^\circ\text{C}$ )                                                       | $V_{RRM}$    | 800     | V                      |
| RMS on-state current ( $T_c \leq 100^\circ\text{C}$ )                                                            | $I_{T(RMS)}$ | 16      | A                      |
| Non repetitive surge peak on-state current (full cycle , $t_p=20\text{ms}$ , $T_j=25^\circ\text{C}$ )            | $I_{TSM}$    | 160     | A                      |
| Non repetitive surge peak on-state current (full cycle , $t_p=16.6\text{ms}$ , $T_j=25^\circ\text{C}$ )          |              | 176     |                        |
| $I^2t$ value for fusing ( $t_p=10\text{ms}$ , $T_j=25^\circ\text{C}$ )                                           | $I^2t$       | 128     | $\text{A}^2\text{s}$   |
| Critical rate of rise of on-state current ( $I_G=2 \times I_{GT}$ , $f=100\text{Hz}$ , $T_j=150^\circ\text{C}$ ) | $di/dt$      | 100     | $\text{A}/\mu\text{s}$ |
| Peak gate current ( $t_p=20\mu\text{s}$ , $T_j=150^\circ\text{C}$ )                                              | $I_{GM}$     | 4       | A                      |

|                                                                                      |             |    |    |
|--------------------------------------------------------------------------------------|-------------|----|----|
| Average gate power dissipation ( $T_j=150^{\circ}\text{C}$ )                         | $P_{G(AV)}$ | 1  | W  |
| Peak gate power                                                                      | $P_{GM}$    | 10 | W  |
| Peak pulse voltage<br>( $T_j=25^{\circ}\text{C}$ ; non-repetitive, off-state; FIG.7) | $V_{pp}$    | 4  | kV |

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

| Symbol      | Test Condition                                                                     | Quadrant    | Value |      | Unit             |
|-------------|------------------------------------------------------------------------------------|-------------|-------|------|------------------|
| $I_{GT}$    | $V_D=12\text{V}$ $R_L=33\Omega$                                                    | I - II -III | MAX.  | 50   | mA               |
| $V_{GT}$    |                                                                                    | I - II -III | MAX.  | 1    | V                |
| $V_{GD}$    | $V_D=V_{DRM}$ $T_j=150^{\circ}\text{C}$<br>$R_L=3.3\text{k}\Omega$                 | I - II -III | MIN.  | 0.2  | V                |
| $I_L$       | $I_G=1.2I_{GT}$                                                                    | I -III      | MAX.  | 80   | mA               |
|             |                                                                                    | II          |       | 100  |                  |
| $I_H$       | $I_T=500\text{mA}$                                                                 |             | MAX.  | 60   | mA               |
| $dV/dt$     | $V_D=540\text{V}$ Gate Open $T_j=150^{\circ}\text{C}$                              |             | MIN.  | 1800 | V/ $\mu\text{s}$ |
| $(dI/dt)_c$ | $(dV/dt)_c=20\text{V}/\mu\text{s}$ , $T_j=150^{\circ}\text{C}$                     |             | MIN.  | 25   | A/ms             |
| $t_{on}$    | $I_G=80\text{mA}$ $I_A=400\text{mA}$ $I_R=40\text{mA}$<br>$T_j=25^{\circ}\text{C}$ |             | TYP.  | 12   | $\mu\text{s}$    |
| $t_{off}$   |                                                                                    |             |       | 80   |                  |

**STATIC CHARACTERISTICS**

| Symbol    | Parameter                                  |                           | Value(MAX.) | Unit             |
|-----------|--------------------------------------------|---------------------------|-------------|------------------|
| $V_{TM}$  | $I_{TM}=22.5\text{A}$ $t_p=380\mu\text{s}$ | $T_j=25^{\circ}\text{C}$  | 1.4         | V                |
| $V_{TO}$  | Threshold voltage                          | $T_j=150^{\circ}\text{C}$ | 0.75        | V                |
| $R_D$     | Dynamic resistance                         | $T_j=150^{\circ}\text{C}$ | 27          | $\text{m}\Omega$ |
| $I_{DRM}$ | $V_D=V_{DRM}$ $V_R=V_{RRM}$                | $T_j=25^{\circ}\text{C}$  | 5           | $\mu\text{A}$    |
| $I_{RRM}$ |                                            | $T_j=150^{\circ}\text{C}$ | 2           | mA               |

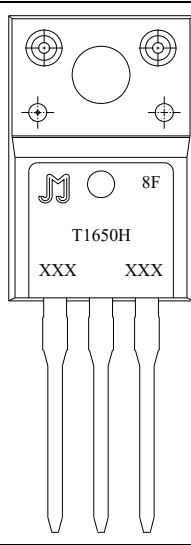
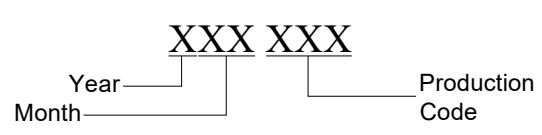
**THERMAL RESISTANCES**

| Symbol        | Parameter                | Value | Unit                        |
|---------------|--------------------------|-------|-----------------------------|
| $R_{th(j-c)}$ | junction to case (AC)    | 2.4   | $^{\circ}\text{C}/\text{W}$ |
| $R_{th(j-a)}$ | junction to ambient (AC) | 60    | $^{\circ}\text{C}/\text{W}$ |

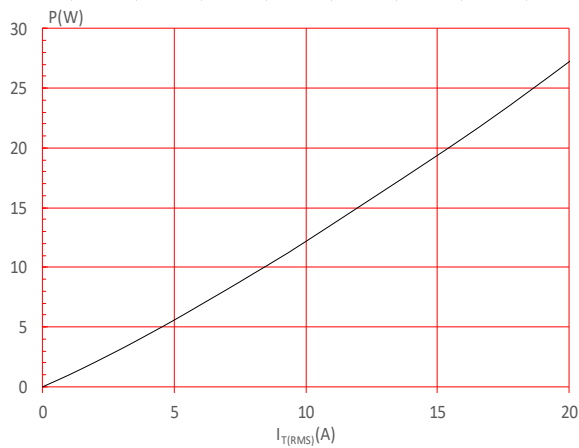
ORDERING INFORMATION

|        |                          |    |                           |                                 |                |
|--------|--------------------------|----|---------------------------|---------------------------------|----------------|
| T      | 16                       | 50 | H                         | -8                              | F              |
| Triacs | $I_T(RMS):16A$           |    |                           |                                 | F:TO-220F(Ins) |
|        | $50:I_{GT1-3} \leq 50mA$ |    |                           | $8:V_{DRM} / V_{RRM} \geq 800V$ |                |
|        |                          |    | High junction temperature |                                 |                |

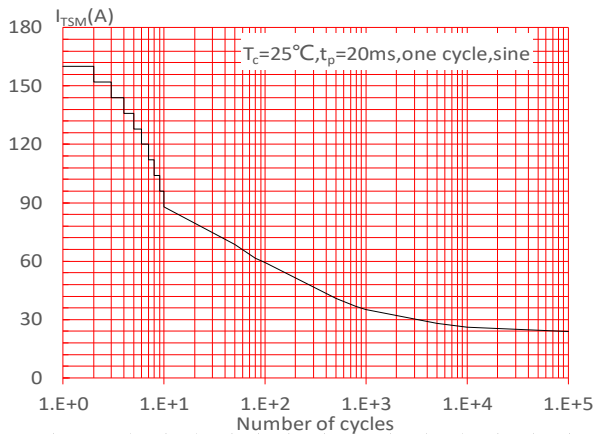
MARKING

|                                                                                     |                                                                                      |
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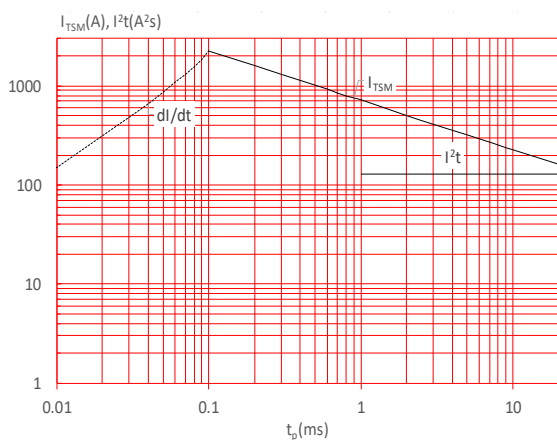
**FIG.1:** Maximum power dissipation versus RMS on-state current



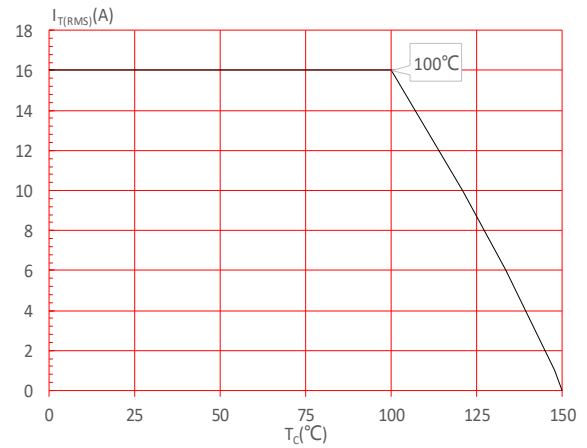
**FIG.3:** Surge peak on-state current versus number of cycles



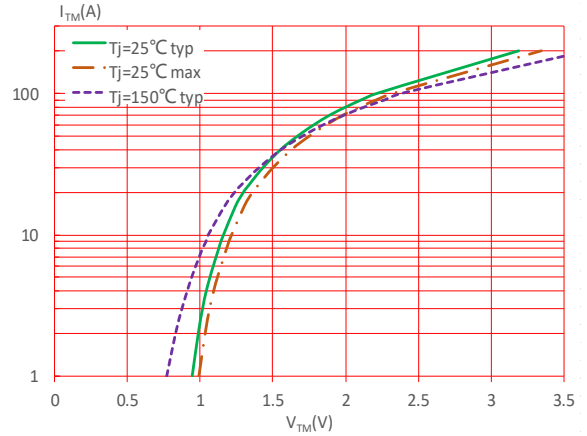
**FIG.5:** Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 20\text{ms}$ , and corresponding value of  $I^2t$  ( $dI/dt < 100\text{A}/\mu\text{s}$ )



**FIG.2:** RMS on-state current versus case temperature



**FIG.4:** On-state characteristics



**FIG.6:** Relative variations of gate trigger current, holding current and latching current versus junction temperature

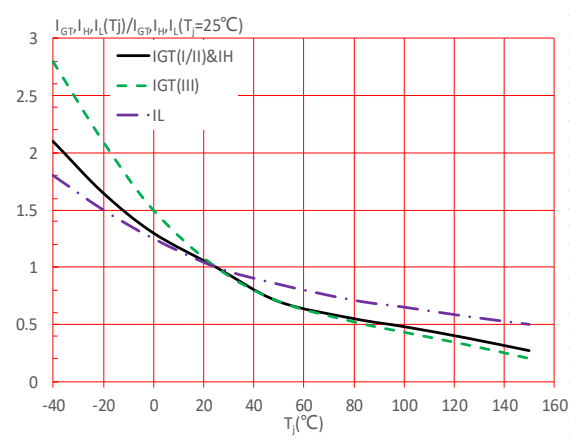
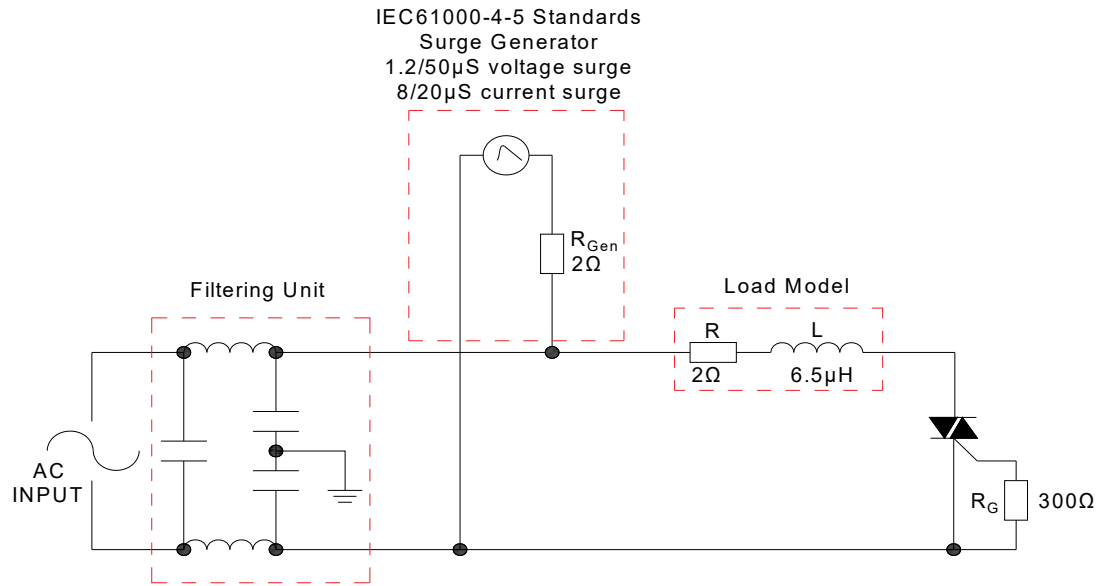


FIG.7: Test circuit for inductive and resistive loads to IEC-61000-4-5 standards



## LEAD FORMING AND SOLDERING

Refer to the application note “Assembly Instructions for Thyristors in Through-hole Package” released by JieJie Microelectronics.

## ORDERING INFORMATION

| Order code | Voltage<br>$V_{\text{DRM}}/V_{\text{RRM}}$ (V) | IGT(mA)      | Package      | Base qty.<br>(pcs) | Delivery<br>mode |
|------------|------------------------------------------------|--------------|--------------|--------------------|------------------|
|            |                                                | I - II - III |              |                    |                  |
| T1650H-8F  | 800                                            | 50           | TO-220F(Ins) | 50                 | Tube             |

## Document Revision History

| Date         | Revision | Changes                        |
|--------------|----------|--------------------------------|
| Apr.11, 2023 | A.1.0    | Last updated                   |
| Oct.10, 2025 | A.1.1    | Revise PACKAGE MECHANICAL DATA |



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