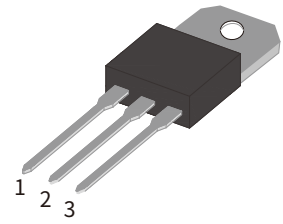


## FEATURES

- | High current 4 A RMS current Triac
- | Low thermal resistance
- | High commutation or very high commutation capability



TO-220A

## APPLICATIONS

- | General purpose motor control circuits
- | Phase control operations in light dimmers and motor speed controllers
- | Home appliances



Schematic Symbol

## APPROVALS

|             |                                    |
|-------------|------------------------------------|
| <b>RoHS</b> | Compliance with 2011/65/EU         |
| <b>HF</b>   | Compliance with IEC61249-2-21:2003 |

## THE MAIN PARAMETERS

| Symbol       | Parameter                         | Value | Unit |
|--------------|-----------------------------------|-------|------|
| $I_{T(RMS)}$ | RMS on-state current              | 4     | A    |
| $V_{DRM}$    | Off-state repetitive peak voltage | 800   | V    |
| $V_{TM}$     | On-state voltage                  | 1.5   | V    |

## ABSOLUTE MAXIMUM RATINGS

| Parameter                                                                 | Symbol              | Value           | Unit                   |
|---------------------------------------------------------------------------|---------------------|-----------------|------------------------|
| Repetitive peak off-state voltage ( $T_j=25^{\circ}\text{C}$ )            | $V_{\text{DRM}}$    | 800             | V                      |
| Repetitive peak reverse voltage ( $T_j=25^{\circ}\text{C}$ )              | $V_{\text{RRM}}$    | 800             |                        |
| RMS on-state current ( $T_c=100^{\circ}\text{C}$ )                        | $I_{\text{T(RMS)}}$ | 4               | A                      |
| Non repetitive surge peak on-state current (full cycle, $F=50\text{Hz}$ ) | $I_{\text{TSM}}$    | 40              |                        |
| $I^2t$ value for fusing ( $t_p=10\text{ms}$ )                             | $I^2t$              | 8               | $\text{A}^2\text{S}$   |
| Critical rate of rise of on-state current ( $I_G=2 \cdot I_{\text{GT}}$ ) | $di/dt$             | 50              | $\text{A}/\mu\text{s}$ |
| Peak gate current                                                         | $I_{\text{GM}}$     | 4               | A                      |
| Average gate power dissipation                                            | $P_{\text{G(AV)}}$  | 1               | W                      |
| Storage junction temperature range                                        | $T_{\text{STG}}$    | $-40 \sim +150$ | $^{\circ}\text{C}$     |
| Operating junction temperature range                                      | $T_j$               | $-40 \sim +125$ |                        |

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

| Symbol           | Test Condition                                                       | Quadrant                  | Value       |            |            |             | Unit                   |
|------------------|----------------------------------------------------------------------|---------------------------|-------------|------------|------------|-------------|------------------------|
|                  |                                                                      |                           | TW          | SW         | CW         | BW          |                        |
| $I_{\text{GT}}$  | $V_D=12\text{V}, R_L=33\Omega$                                       | I - II - III              | $\leq 5$    | $\leq 10$  | $\leq 35$  | $\leq 50$   | mA                     |
| $V_{\text{GT}}$  |                                                                      |                           | $\leq 1.5$  |            |            |             | V                      |
| $V_{\text{GD}}$  | $V_D=V_{\text{DRM}}, R_L=3.3\text{K}\Omega, T_j=125^{\circ}\text{C}$ |                           | $\geq 0.2$  |            |            |             | V                      |
| $I_{\text{H}}$   | $I_T=100\text{mA}$                                                   |                           | $\leq 10$   | $\leq 15$  | $\leq 35$  | $\leq 60$   | mA                     |
| $I_{\text{L}}$   | $I_G=1.2I_{\text{GT}}$                                               | I - III                   | $\leq 15$   | $\leq 35$  | $\leq 60$  | $\leq 80$   |                        |
|                  |                                                                      | II                        | $\leq 15$   | $\leq 15$  | $\leq 15$  | $\leq 15$   |                        |
| $dV_D/dt$        | $V_D=67\%V_{\text{DRM}}, T_j=125^{\circ}\text{C}$                    |                           | $\geq 50$   | $\geq 100$ | $\geq 400$ | $\geq 1000$ | $\text{V}/\mu\text{s}$ |
| $V_{\text{TM}}$  | $I_{\text{TM}}=5.5\text{A}, t_p=380\mu\text{s}$                      |                           | $\leq 1.5$  |            |            |             | V                      |
| $I_{\text{DRM}}$ | $V_D=V_{\text{DRM}}, V_R=V_{\text{RRM}}$                             | $T_j=25^{\circ}\text{C}$  | $\leq 10$   |            |            |             | $\mu\text{A}$          |
| $I_{\text{RRM}}$ |                                                                      | $T_j=125^{\circ}\text{C}$ | $\leq 0.75$ |            |            |             | mA                     |

## THERMAL RESISTANCES

| Symbol        | Parameter            | Value | Unit |
|---------------|----------------------|-------|------|
| $R_{th(j-c)}$ | Junction to case(AC) | 3.0   | °C/W |

## PARAMETER CHARACTERISTIC CURVE

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

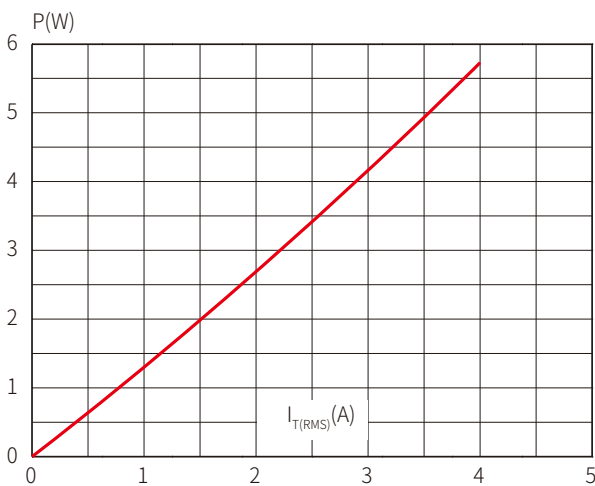


FIG.2: RMS on-state current versus case temperature

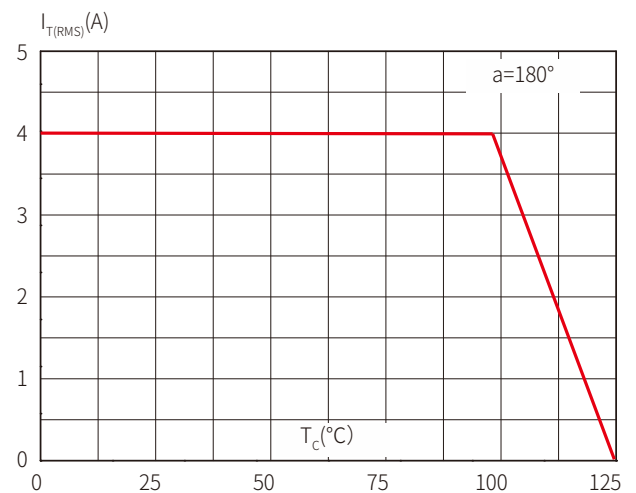


FIG.3: Surge peak on-state current versus number of cycles

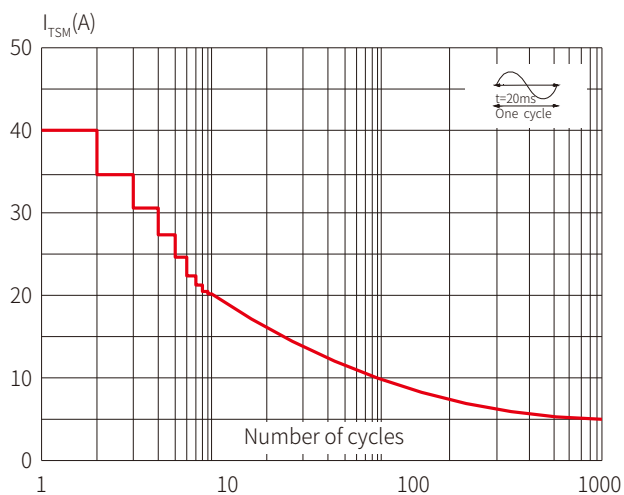
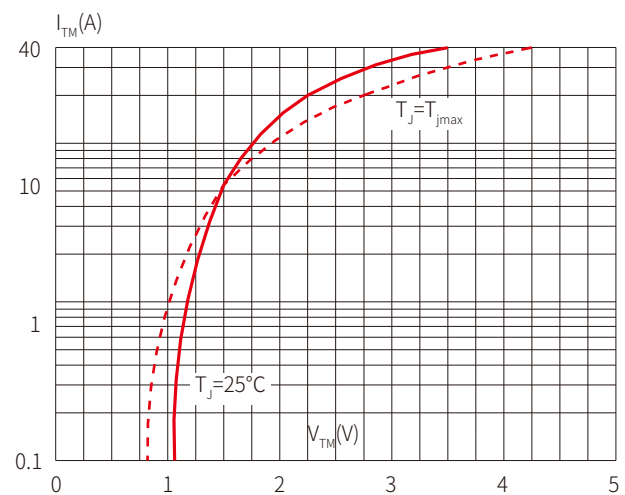
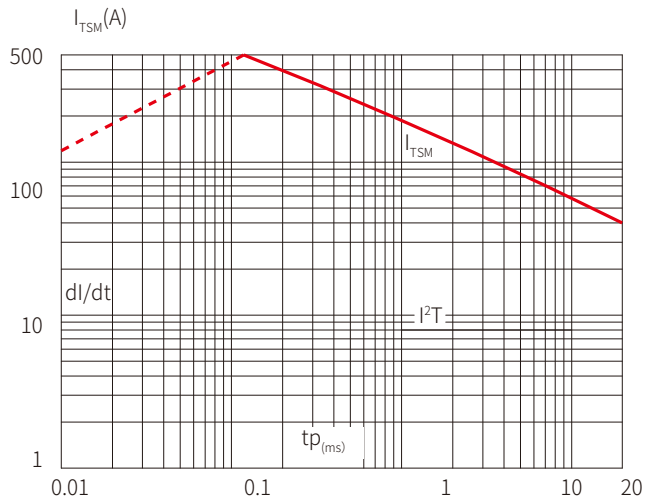


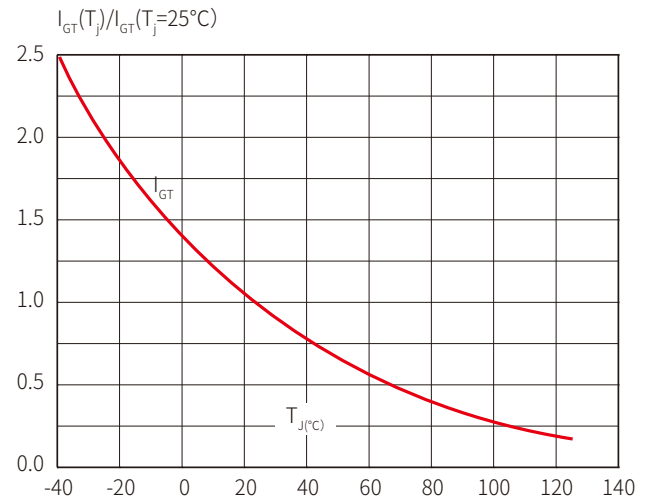
FIG.4 On-state characteristics (maximum values)



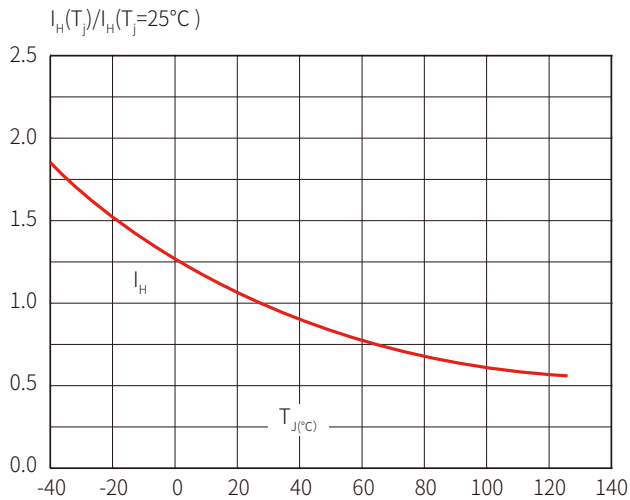
**FIG.5: Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 20\text{ms}$  and corresponding value of  $I^2t$  ( $dI/dt < 50\text{A}/\mu\text{s}$ )**



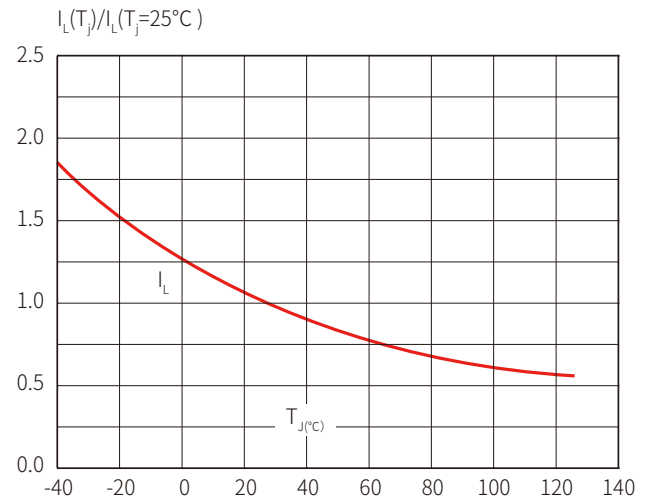
**FIG.6 Relative variations of gate trigger current versus junction temperature**



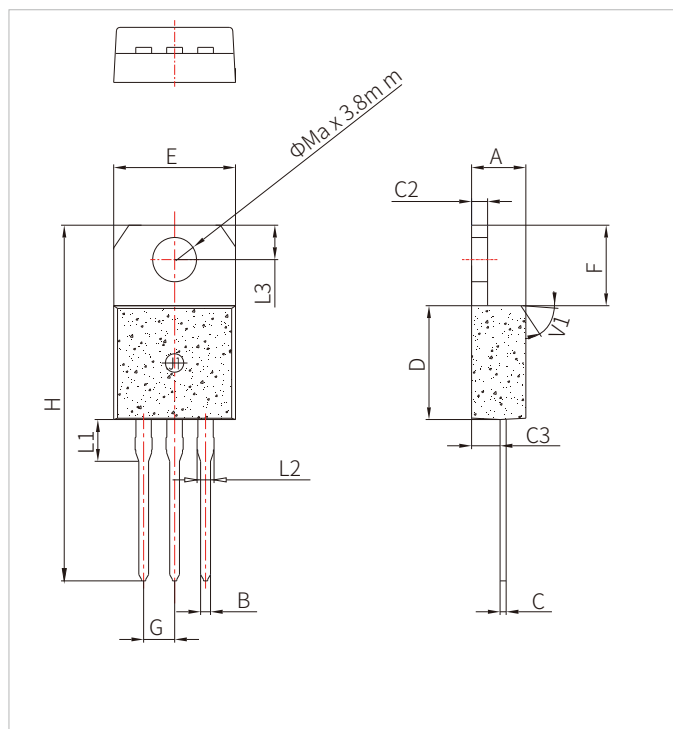
**FIG.7 Relative variations of holding current versus junction temperature**



**FIG.8 Relative variations of latching current versus junction temperature**



## TO-220A PACKAGE MECHANICAL DATA



| Ref. | Dimensions  |      |      |        |       |       |
|------|-------------|------|------|--------|-------|-------|
|      | Millimeters |      |      | Inches |       |       |
|      | Min.        | Typ. | Max. | Min.   | Typ.  | Max.  |
| A    | 4.30        |      | 4.70 | 0.169  |       | 0.185 |
| B    | 0.61        |      | 0.88 | 0.024  |       | 0.035 |
| C    | 0.46        |      | 0.70 | 0.018  |       | 0.028 |
| C2   | 1.21        |      | 1.32 | 0.048  |       | 0.052 |
| C3   | 2.40        |      | 2.72 | 0.094  |       | 0.107 |
| D    | 8.60        |      | 9.70 | 0.339  |       | 0.382 |
| E    | 9.60        |      | 10.4 | 0.378  |       | 0.409 |
| F    | 6.20        |      | 6.60 | 0.222  |       | 0.260 |
| G    |             | 2.54 |      |        | 0.1   |       |
| H    | 28.0        |      | 29.8 | 1.102  |       | 1.173 |
| L1   |             | 3.75 |      |        | 0.148 |       |
| L2   | 1.14        |      | 1.70 | 0.045  |       | 0.067 |
| L3   | 2.65        |      | 2.95 | 0.104  |       | 0.116 |
| V1   |             | 45°  |      |        | 45°   |       |

## ORDERING INFORMATION

| Part Number         | Package | Qty/pcs |           |        |
|---------------------|---------|---------|-----------|--------|
|                     |         | Tube    | Inner Box | Carton |
| STA4A80TW(SW/CW/BW) | TO-220A | 50      | 1000      | 5000   |

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