

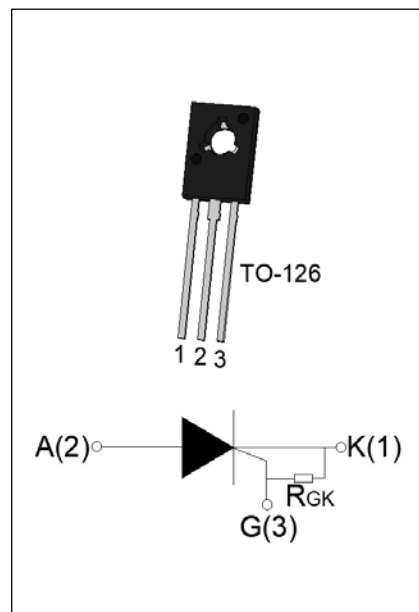


### DESCRIPTION:

The JR0405Q SCR with the parallel resistor between Gate and Cathode,  $R_{GK}=10\sim80k\Omega$ , is especially recommended for use on straight hair, igniter, anion generator, etc. Package TO-126 is RoHS compliant.

### MAIN FEATURES

| Symbol            | Value      | Unit    |
|-------------------|------------|---------|
| $I_{T(RMS)}$      | 4          | A       |
| $V_{DRM}/V_{RRM}$ | 600        | V       |
| $I_{GT}$          | $\leq 200$ | $\mu A$ |



### ABSOLUTE MAXIMUM RATINGS

| Parameter                                                                                            | Symbol       | Value                | Unit        |
|------------------------------------------------------------------------------------------------------|--------------|----------------------|-------------|
| Storage junction temperature range                                                                   | $T_{stg}$    | -40-150              | $^{\circ}C$ |
| Operating junction temperature range                                                                 | $T_j$        | -40-125 <sup>①</sup> | $^{\circ}C$ |
| Repetitive peak off-state voltage ( $T_j=25^{\circ}C$ )                                              | $V_{DRM}$    | 600                  | V           |
| Repetitive peak reverse voltage ( $T_j=25^{\circ}C$ )                                                | $V_{RRM}$    | 600                  | V           |
| Average on-state current ( $T_c \leq 85^{\circ}C$ )                                                  | $I_{T(AV)}$  | 2.5                  | A           |
| RMS on-state current ( $T_c \leq 85^{\circ}C$ )                                                      | $I_{T(RMS)}$ | 4                    | A           |
| Non repetitive surge peak on-state current ( $t_p=10ms$ , $T_j=25^{\circ}C$ )                        | $I_{TSM}$    | 40                   | A           |
| Non repetitive surge peak on-state current ( $t_p=8.3ms$ , $T_j=25^{\circ}C$ )                       |              | 44                   |             |
| $I^2t$ value for fusing ( $t_p=10ms$ , $T_j=25^{\circ}C$ )                                           | $I^2t$       | 8                    | $A^2s$      |
| Critical rate of rise of on-state current ( $I_G=2 \times I_{GT}$ , $f=100Hz$ , $T_j=125^{\circ}C$ ) | $di/dt$      | 50                   | $A/\mu s$   |
| Peak gate current ( $t_p=20\mu s$ , $T_j=125^{\circ}C$ )                                             | $I_{GM}$     | 2                    | A           |
| Average gate power dissipation ( $T_j=125^{\circ}C$ )                                                | $P_{G(AV)}$  | 0.5                  | W           |

|                                                                                      |          |     |    |
|--------------------------------------------------------------------------------------|----------|-----|----|
| Peak gate power                                                                      | $P_{GM}$ | 5   | W  |
| Peak pulse voltage<br>( $T_j=25^{\circ}\text{C}$ ; non-repetitive, off-state; FIG.7) | $V_{pp}$ | 0.5 | kV |

**NOTE 1:** Operating junction temperature  $T_j$  is up to  $125^{\circ}\text{C}$  when a resistor  $\leq 1\text{k}\Omega$  is connected between Gate and Cathode. Without this resistor, the  $T_j$  is up to  $110^{\circ}\text{C}$  only.

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

| Symbol    | Test Condition                                                                   | Value |      |      | Unit             |
|-----------|----------------------------------------------------------------------------------|-------|------|------|------------------|
|           |                                                                                  | MIN.  | TYP. | MAX. |                  |
| $I_{GT}$  | $V_D=12\text{V}$ $R_L=33\Omega$                                                  | -     | 50   | 200  | $\mu\text{A}$    |
| $V_{GT}$  |                                                                                  | -     | 0.6  | 0.8  | V                |
| $V_{GD}$  | $V_D=V_{DRM}$ $T_j=125^{\circ}\text{C}$                                          | 0.2   | -    | -    | V                |
| $I_L$     | $I_G=1.2 I_{GT}$                                                                 | -     | -    | 6    | mA               |
| $I_H$     | $I_T=0.1\text{A}$                                                                | -     | -    | 5    | mA               |
| dV/dt     | $V_D=400\text{V}$ $T_j=125^{\circ}\text{C}$ $R_{GK}=1\text{k}\Omega$             | 50    | -    | -    | V/ $\mu\text{s}$ |
|           | $V_D=400\text{V}$ $T_j=125^{\circ}\text{C}$ $R_{GK}=220\Omega$                   | 250   | -    | -    |                  |
| $t_{on}$  | $I_G=10\text{mA}$ $I_A=20\text{mA}$ $I_R=2\text{mA}$<br>$T_j=25^{\circ}\text{C}$ | -     | 2    | -    | $\mu\text{s}$    |
| $t_{off}$ |                                                                                  | -     | 50   | -    |                  |

### STATIC CHARACTERISTICS

| Symbol    | Parameter                               |                           | Value(MAX.) | Unit          |
|-----------|-----------------------------------------|---------------------------|-------------|---------------|
| $V_{TM}$  | $I_{TM}=8\text{A}$ $t_p=380\mu\text{s}$ | $T_j=25^{\circ}\text{C}$  | 1.6         | V             |
| $V_{TO}$  | Threshold voltage                       | $T_j=125^{\circ}\text{C}$ | 0.64        | V             |
| $R_D$     | Dynamic resistance                      | $T_j=125^{\circ}\text{C}$ | 0.08        | $\Omega$      |
| $I_{DRM}$ | $V_D=V_{DRM}$ $V_R=V_{RRM}$             | $T_j=25^{\circ}\text{C}$  | 5           | $\mu\text{A}$ |
| $I_{RRM}$ |                                         | $T_j=125^{\circ}\text{C}$ | 0.5         | mA            |

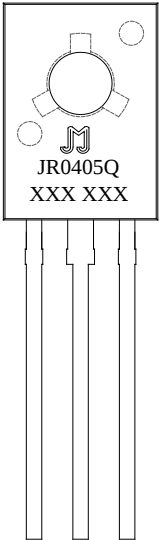
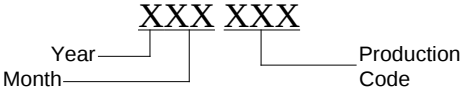
### THERMAL RESISTANCES

| Symbol        | Parameter                | Value | Unit                 |
|---------------|--------------------------|-------|----------------------|
| $R_{th(j-c)}$ | junction to case (DC)    | 7.5   | $^{\circ}\text{C/W}$ |
| $R_{th(j-a)}$ | junction to ambient (DC) | 120   | $^{\circ}\text{C/W}$ |

## ORDERING INFORMATION

|                                   |                     |                 |                            |          |
|-----------------------------------|---------------------|-----------------|----------------------------|----------|
| J                                 | R                   | 04              | 05                         | Q        |
| JieJie Microelectronics Co., Ltd. | Sensitive gate SCRs | $I_{T(RMS)}:4A$ |                            | Q:TO-126 |
|                                   |                     |                 | 05: $I_{GT} \leq 200\mu A$ |          |

## MARKING

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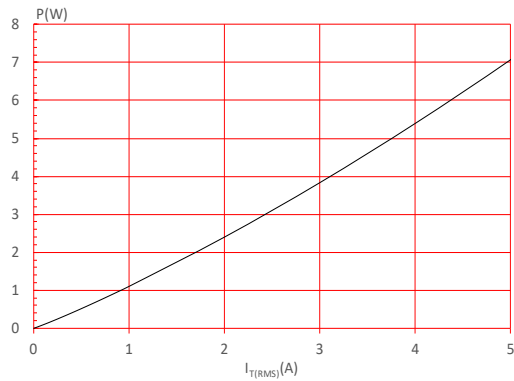
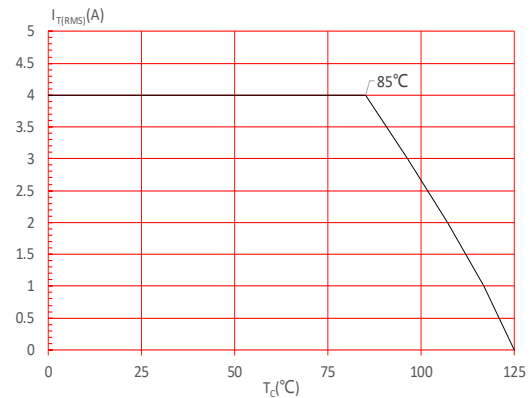
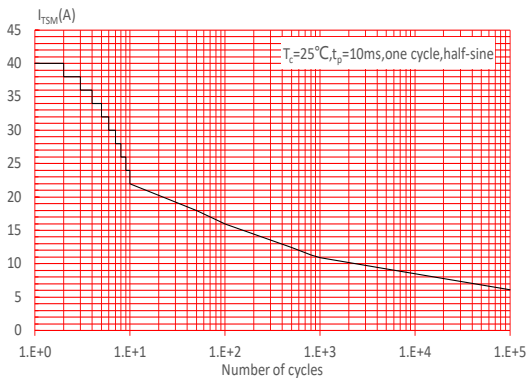
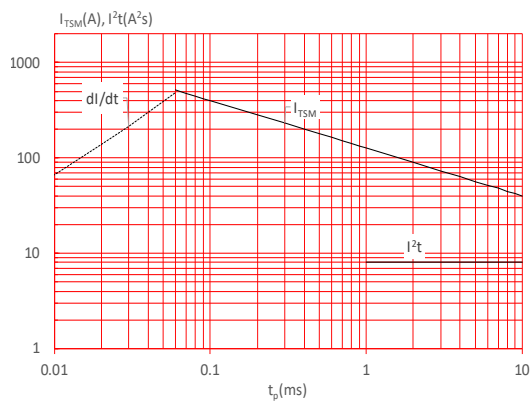
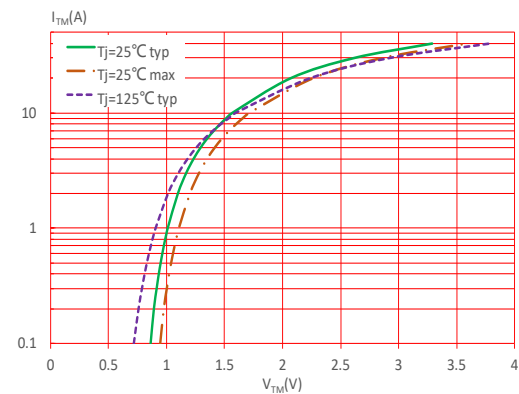
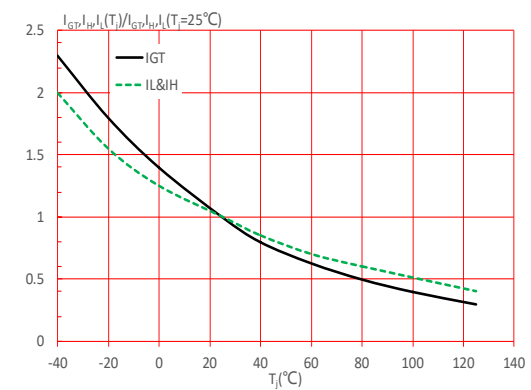
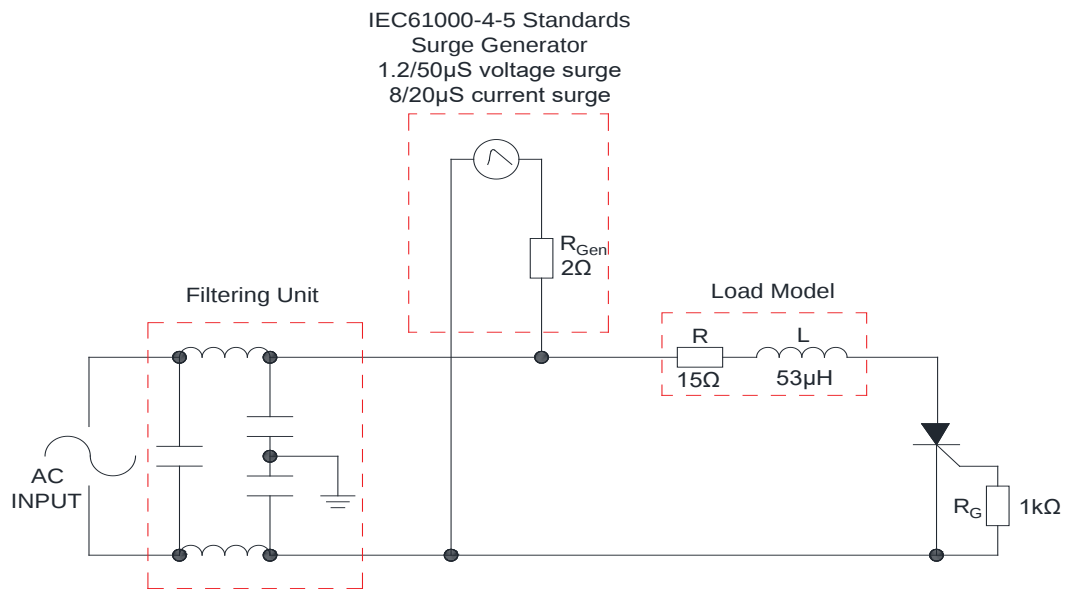
**FIG.1:** Maximum power dissipation versus RMS on-state current

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

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

**FIG.5:** Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 10ms$ , and corresponding value of  $I^2t$  ( $di/dt < 50A/\mu s$ )

**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

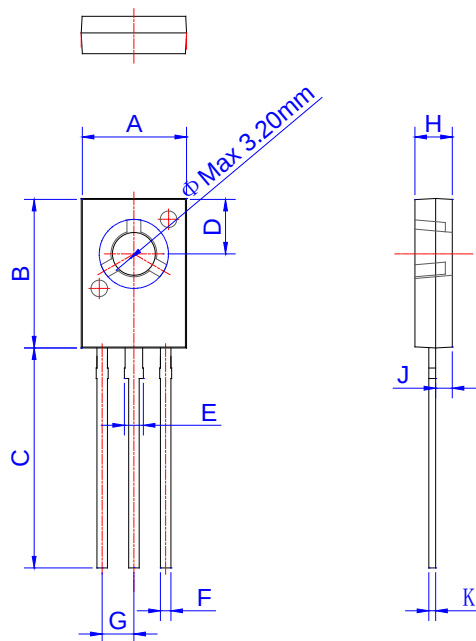
**ORDERING INFORMATION**

| Order code | Voltage<br>$V_{\text{DRM}}/V_{\text{RRM}}$ (V) | IGT( $\mu\text{A}$ ) | Package | Base qty.<br>(pcs) | Delivery<br>mode |
|------------|------------------------------------------------|----------------------|---------|--------------------|------------------|
| JR0405Q    | 600                                            | $\leq 200$           | TO-126  | 500                | Bulk Pack        |

**Document Revision History**

| Date         | Revision | Changes     |
|--------------|----------|-------------|
| Apr.10, 2023 | A.1.0    | Last update |

## PACKAGE MECHANICAL DATA



| Ref. | Dimensions  |      |      |        |      |       |
|------|-------------|------|------|--------|------|-------|
|      | Millimeters |      |      | Inches |      |       |
|      | Min.        | Typ. | Max. | Min.   | Typ. | Max.  |
| A    | 7.40        |      | 7.80 | 0.291  |      | 0.307 |
| B    | 10.6        |      | 11.2 | 0.417  |      | 0.441 |
| C    | 15.3        |      | 16.3 | 0.602  |      | 0.642 |
| D    | 3.90        |      | 4.10 | 0.154  |      | 0.161 |
| E    | 1.17        |      | 1.47 | 0.046  |      | 0.058 |
| F    | 0.66        |      | 0.86 | 0.026  |      | 0.034 |
| G    | 2.15        |      | 2.45 | 0.085  |      | 0.096 |
| H    | 2.50        |      | 2.90 | 0.098  |      | 0.114 |
| J    | 1.10        |      | 1.50 | 0.043  |      | 0.059 |
| K    | 0.45        |      | 0.60 | 0.018  |      | 0.024 |

## DELIVERY MODE

| PACKAGE | OUTLINE   | BAG (PCS) | INNER BOX (PCS) | CARTON BOX (PCS) |
|---------|-----------|-----------|-----------------|------------------|
| TO-126  | Bulk Pack | 500       | 2,000           | 10,000           |

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