



## JR0105 Series Sensitive gate SCRs

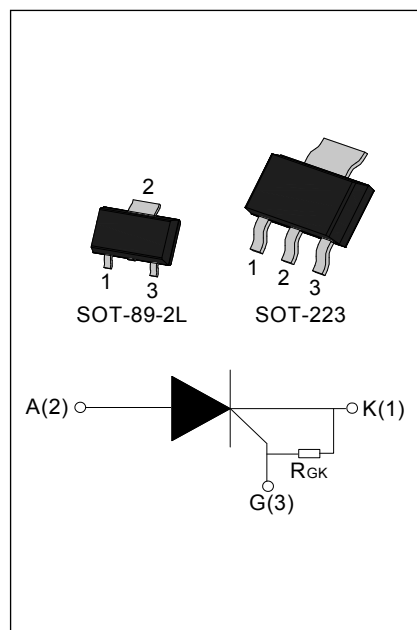
Rev.6.0

### DESCRIPTION:

The JR0105 SCR series with the parallel resistor between Gate and Cathode are especially recommended for use on straight hair, igniter, anion generator, etc. All the packages listed above are RoHS compliant.(2011/65/EU)

### MAIN FEATURES

| Symbol       | Value      | Unit    |
|--------------|------------|---------|
| $I_{T(RMS)}$ | 1          | A       |
| $I_{GT}$     | $\leq 200$ | $\mu A$ |
| $V_{TM}$     | $\leq 1.5$ | V       |



### 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                         | $V_{DRM}$                      | 600                  | V           |   |
| Repetitive peak reverse voltage                           | $V_{RRM}$                      | 600                  | V           |   |
| RMS on-state current                                      | SOT-223 ( $T_c=90^{\circ}C$ )  | $I_{T(RMS)}$         | 1           | A |
|   | SOT-89-2L( $T_c=85^{\circ}C$ ) |                      |             |   |
| Non repetitive surge peak on-state current ( $t_p=10ms$ ) | $I_{TSM}$                      | 10                   | A           |   |
| $I^2t$ value for fusing ( $t_p=10ms$ )                    | $I^2t$                         | 0.5                  | $A^2s$      |   |
| Critical rate of rise of on-state current                 | $di/dt$                        | 50                   | $A/\mu s$   |   |
| Peak gate current ( $t_p=20\mu s, T_j=125^{\circ}C$ )     | $I_{GM}$                       | 0.2                  | A           |   |
| Peak gate power ( $t_p=20\mu s, T_j=125^{\circ}C$ )       | $P_{GM}$                       | 0.5                  | W           |   |
| Average gate power dissipation( $T_j=125^{\circ}C$ )      | $P_{G(AV)}$                    | 0.1                  | W           |   |

**NOTE 1:** When we parallel connect a  $\leq 1K\Omega$  resistor between Gate and Cathode, the  $T_j$  can reach  $125^{\circ}C$ ; if without this resistor, the  $T_j$  only can reach  $110^{\circ}C$ .

**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                |
| $V_{GD}$ | $V_D=V_{DRM} T_j=125^\circ\text{C } R_L=3.3\text{K}\Omega$     | 0.2   | -    | -    | V                |
| $I_L$    | $I_G=1.2 I_{GT}$   | -     | -    | 3    | mA               |
| $I_H$    | $I_T=0.05\text{A}$   | -     | -    | 2    | mA               |
| dV/dt    | $V_D=2/3V_{DRM} T_j=125^\circ\text{C } R_{GK}=1\text{K}\Omega$ | 20    | -    | -    | V/ $\mu\text{s}$ |

**STATIC CHARACTERISTICS**

| Symbol    | Parameter                                | Value(MAX)                     | Unit          |
|-----------|--|--------------------------------|---------------|
| $V_{TM}$  | $I_{TM}=1.6\text{A } t_p=380\mu\text{s}$ | $T_j=25^\circ\text{C}$<br>1.5  | V             |
| $I_{DRM}$ | $V_D=V_{DRM} V_R=V_{RRM}$                | $T_j=25^\circ\text{C}$<br>5    | $\mu\text{A}$ |
| $I_{RRM}$ |  | $T_j=125^\circ\text{C}$<br>100 | $\mu\text{A}$ |

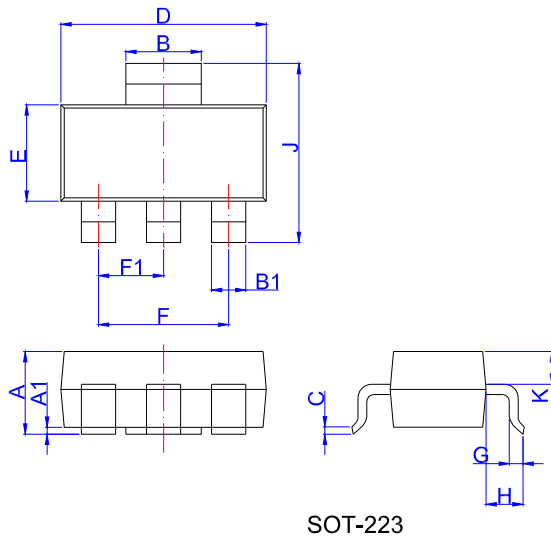
**THERMAL RESISTANCES**

| Symbol        | Parameter           | Value           | Unit               |
|---------------|---------------------|-----------------|--------------------|
| $R_{th(j-c)}$ | junction to case    | SOT-223<br>25   | $^\circ\text{C/W}$ |
|               |                     | SOT-89-2L<br>28 |                    |
| $R_{th(j-a)}$ | junction to ambient | SOT-223<br>60   | $^\circ\text{C/W}$ |
|               |                     | SOT-89-2L<br>90 |                    |

**ORDERING INFORMATION**

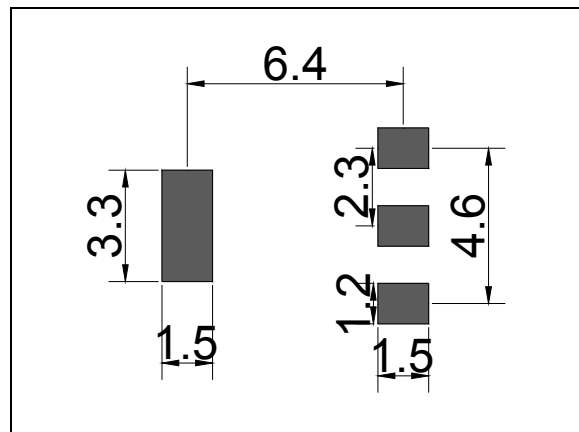
|   |
|---|
| <div style="display: flex; justify-content: space-around; font-size: 24px; font-weight: bold;"> <span>J</span> <span>R</span> <span>01</span> <span>05</span> <span>V</span> </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="text-align: center;"> <p><u>JieJie Microelectronics Co.,Ltd</u></p> <p><u>Sensitive gate SCRs</u></p> </div> <div style="text-align: center;"> <p><u><math>I_{T(RMS)}:1\text{A}</math></u></p> </div> <div style="text-align: center;"> <p><u>V:SOT-223</u><br/><u>N2:SOT-89-2L</u></p> <p><u>05: <math>I_{GT} \leq 200\mu\text{A}</math></u></p> </div> </div> |
|---|

**PACKAGE MECHANICAL DATA**

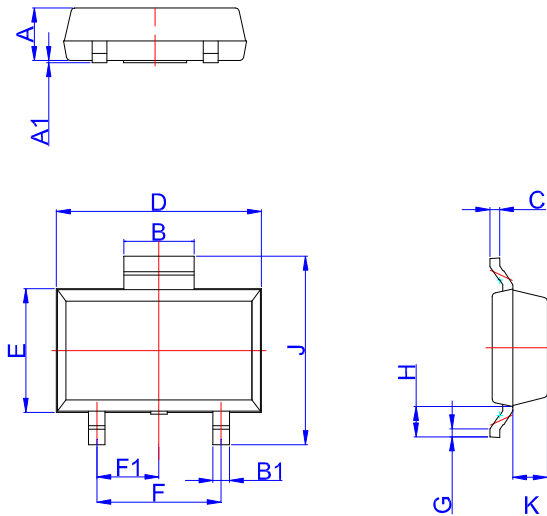


| Ref. | Dimensions  |      |      |        |       |       |
|------|-------------|------|------|--------|-------|-------|
|      | Millimeters |      |      | Inches |       |       |
|      | Min.        | Typ. | Max. | Min.   | Typ.  | Max.  |
| A    | 1.5         | 1.6  | 1.8  | 0.059  | 0.063 | 0.071 |
| A1   | 0.01        | 0.06 | 0.10 | 0.001  | 0.002 | 0.004 |
| B    | 2.9         | 3.0  | 3.1  | 0.114  | 0.118 | 0.122 |
| B1   | 0.6         | 0.7  | 0.8  | 0.024  | 0.028 | 0.031 |
| C    | 0.22        | 0.26 | 0.32 | 0.009  | 0.010 | 0.013 |
| D    | 6.3         | 6.5  | 6.7  | 0.248  | 0.256 | 0.264 |
| E    | 3.3         | 3.5  | 3.7  | 0.130  | 0.138 | 0.146 |
| F    |             | 4.6  |      |        | 0.181 |       |
| F1   |             | 2.3  |      |        | 0.091 |       |
| G    | 0.7         | 0.9  | 1.1  | 0.028  | 0.035 | 0.043 |
| H    | 1.5         | 1.75 | 2.0  | 0.059  | 0.069 | 0.079 |
| J    | 6.7         | 7.0  | 7.3  | 0.264  | 0.276 | 0.287 |
| K    | 0.8         | 0.9  | 1.0  | 0.031  | 0.035 | 0.039 |

**FOOTPRINT-SOT-223 (dimensions in mm)**



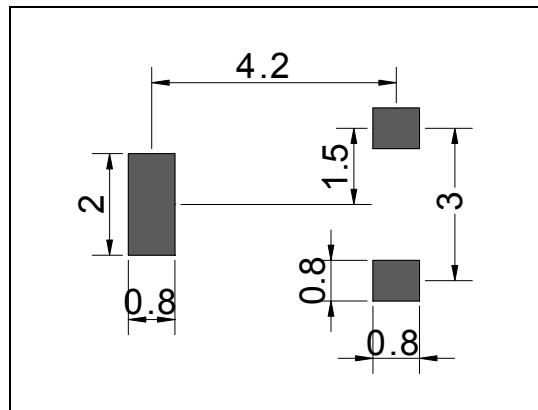
**PACKAGE MECHANICAL DATA**



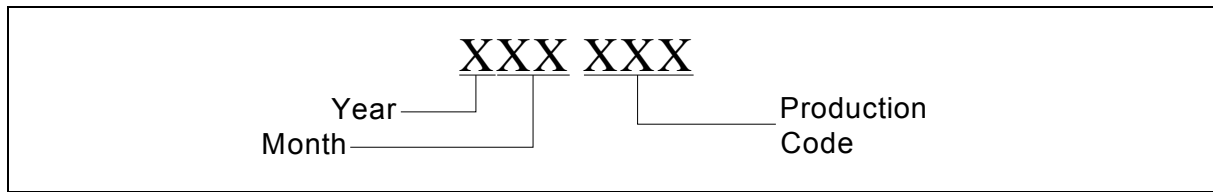
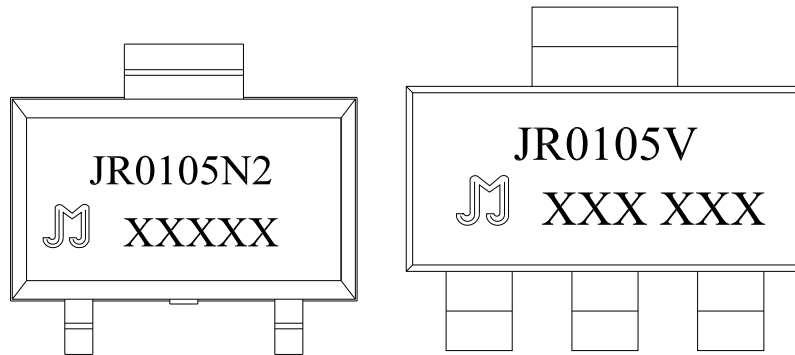
SOT-89-2L

| Ref. | Dimensions  |       |      |        |       |       |
|------|-------------|-------|------|--------|-------|-------|
|      | Millimeters |       |      | Inches |       |       |
|      | Min.        | Typ.  | Max. | Min.   | Typ.  | Max.  |
| A    | 1.3         | 1.4   | 1.5  | 0.051  | 0.055 | 0.059 |
| A1   | 0.01        | 0.06  | 0.10 | 0.001  | 0.002 | 0.004 |
| B    | 1.6         | 1.7   | 1.8  | 0.063  | 0.067 | 0.071 |
| B1   | 0.3         | 0.4   | 0.5  | 0.012  | 0.016 | 0.020 |
| C    | 0.22        | 0.254 | 0.32 | 0.009  | 0.010 | 0.013 |
| D    | 4.75        | 4.95  | 5.15 | 0.187  | 0.195 | 0.203 |
| E    | 2.75        | 2.95  | 3.15 | 0.108  | 0.116 | 0.124 |
| F    |             | 3.0   |      |        | 0.118 |       |
| F1   |             | 1.5   |      |        | 0.059 |       |
| G    | 0.2         | 0.3   | 0.4  | 0.008  | 0.012 | 0.016 |
| H    | 0.58        | 0.78  | 0.98 | 0.023  | 0.031 | 0.039 |
| J    | 4.3         | 4.5   | 4.7  | 0.169  | 0.177 | 0.185 |
| K    |             | 0.88  |      |        | 0.035 |       |

**FOOTPRINT-SOT-89-2L (dimensions in mm)**



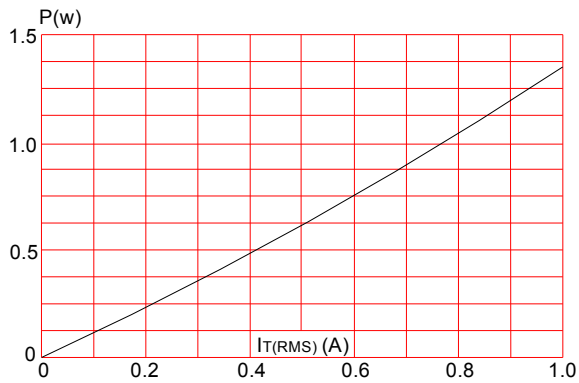
**MARKING**



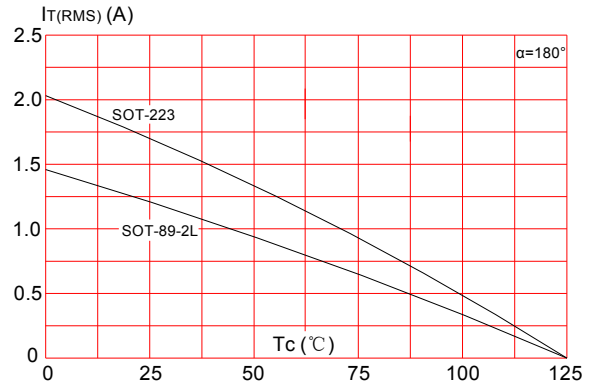
**PACKAGE INFORMATION**

| PACKAGE   | OUTLINE | REEL (PCS) | PER CARTON (PCS) | TAPE & REEL |
|-----------|---------|------------|------------------|-------------|
| SOT-89-2L | TAPING  | 4,000      | 40,000           | 13 inch     |
| SOT-223   | TAPING  | 4,000      | 40,000           | 13 inch     |

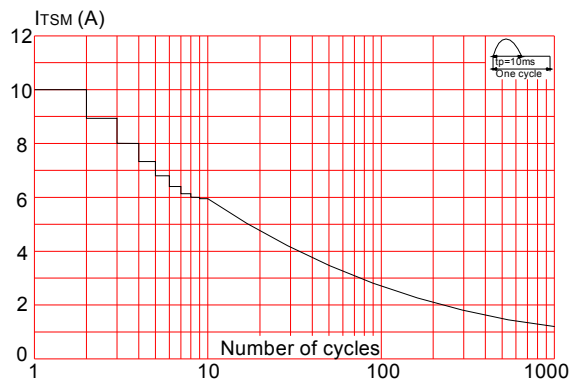
**FIG.1** Maximum power dissipation versus RMS on-state current



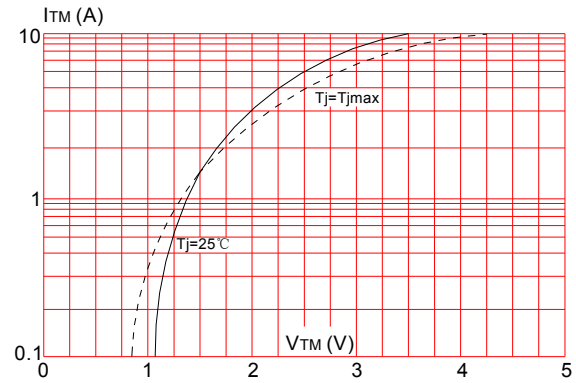
**FIG.2:** RMS on-state current versus ambient temperature (printed circuit board FR4, copper thickness: 35 $\mu$ m) (full cycle)



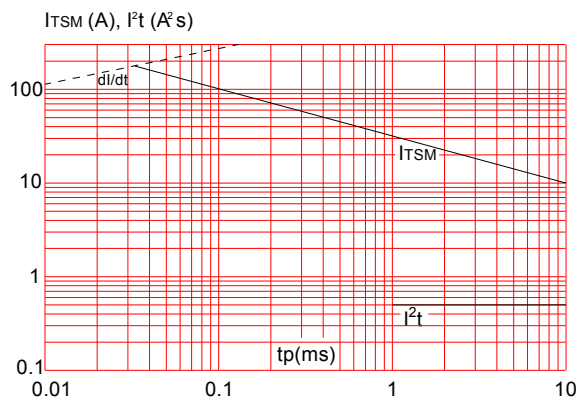
**FIG.3:** Surge peak on-state current versus number of cycles



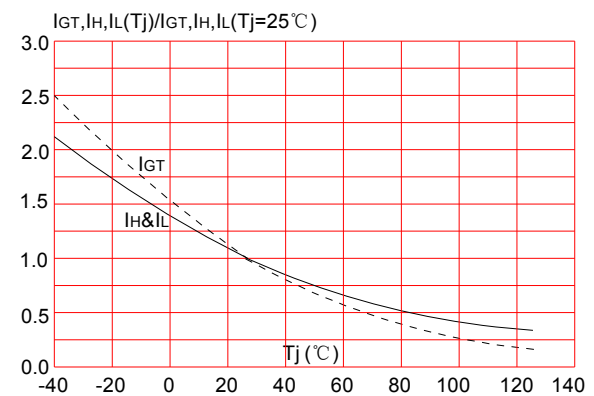
**FIG.4:** On-state characteristics (maximum values)



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

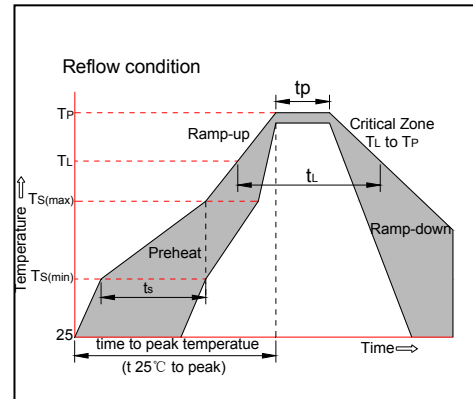


**FIG.6:** Relative variations of gate trigger current, holding current and latching current versus junction temperature




## SOLDERING PARAMETERS

|   |                                      |   |
|---|--------------------------------------|---|
| Reflow Condition  |                                      | Pb-Free assembly<br>(see figure at right) |
| Pre Heat  | -Temperature Min<br>( $T_{s(min)}$ ) | +150°C                                    |
|   | -Temperature<br>Max( $T_{s(max)}$ )  | +200°C                                    |
|   | -Time (Min to Max) (ts)              | 60-180 secs.                              |
| Average ramp up rate<br>(Liquidus Temp ( $T_L$ ) to peak) |                                      | 3°C/sec. Max                              |
| $T_{s(max)}$ to $T_L$ - Ramp-up Rate                      |                                      | 3°C/sec. Max                              |
| Reflow  | -Temperature( $T_L$ )<br>(Liquidus)  | +217°C                                    |
|   | -Temperature( $t_L$ )                | 60-150 secs.                              |
| Peak Temp ( $T_P$ )                                       |                                      | +260(+0/-5)°C                             |
| Time within 5°C of actual<br>Peak Temp ( $t_p$ )          |                                      | 20-40secs.                                |
| Ramp-down Rate  |                                      | 6°C/sec. Max                              |
| Time 25°C to Peak Temp ( $T_P$ )                          |                                      | 8 min. Max                                |
| Do not exceed   |                                      | +260°C                                    |



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