



## CR03AM-16 1.25A Sensitive SCR

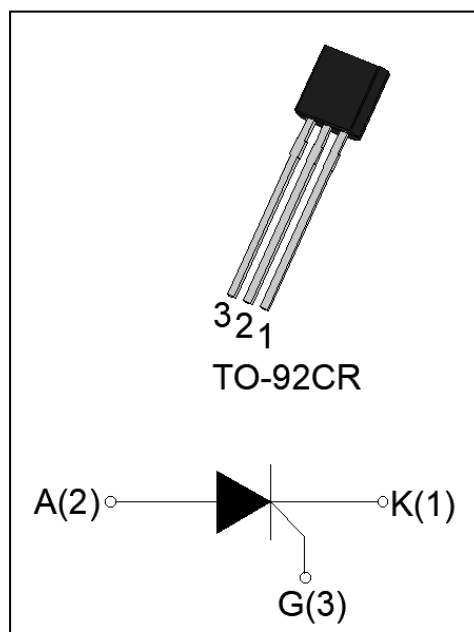
Rev.A.2.2

### DESCRIPTION:

The CR03AM-16 SCR provides high  $dV/dt$  rate with strong resistance to electromagnetic interface. It is especially recommended for use on residual current circuit breaker, straight hair, igniter etc. Package TO-92CR is RoHS compliant.

### MAIN FEATURES

| Symbol            | Value      | Unit    |
|-------------------|------------|---------|
| $I_{T(RMS)}$      | 1.25       | A       |
| $V_{DRM}/V_{RRM}$ | 1250       | 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                                                                 | $T_j$        | -40-110 | $^{\circ}C$ |
| Repetitive peak off-state voltage ( $T_j=25^{\circ}C$ )                                              | $V_{DRM}$    | 1250    | V           |
| Repetitive peak reverse voltage ( $T_j=25^{\circ}C$ )                                                | $V_{RRM}$    | 1250    | V           |
| Average on-state current ( $T_c \leq 42^{\circ}C$ )                                                  | $I_{T(AV)}$  | 0.8     | A           |
| RMS on-state current ( $T_c \leq 42^{\circ}C$ )                                                      | $I_{T(RMS)}$ | 1.25    | A           |
| Non repetitive surge peak on-state current ( $t_p=10ms$ , $T_j=25^{\circ}C$ )                        | $I_{TSM}$    | 25      | A           |
| Non repetitive surge peak on-state current ( $t_p=8.3ms$ , $T_j=25^{\circ}C$ )                       |              | 28      |             |
| $I^2t$ value for fusing ( $t_p=10ms$ , $T_j=25^{\circ}C$ )                                           | $I^2t$       | 3.1     | $A^2s$      |
| Critical rate of rise of on-state current ( $I_G=2 \times I_{GT}$ , $f=100Hz$ , $T_j=110^{\circ}C$ ) | $di/dt$      | 100     | $A/\mu s$   |
| Peak gate current ( $t_p=20\mu s$ , $T_j=110^{\circ}C$ )                                             | $I_{GM}$     | 1.2     | A           |
| Average gate power dissipation ( $T_j=110^{\circ}C$ )                                                | $P_{G(AV)}$  | 0.2     | W           |

|                                                                                      |          |   |    |
|--------------------------------------------------------------------------------------|----------|---|----|
| Peak gate power                                                                      | $P_{GM}$ | 2 | W  |
| Peak pulse voltage<br>( $T_j=25^{\circ}\text{C}$ ; non-repetitive, off-state; FIG.7) | $V_{pp}$ | 1 | kV |

**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                |
| $V_{GD}$  | $V_D=V_{DRM}$ $T_j=110^{\circ}\text{C}$                                          | 0.2   | -    | -    | V                |
| $I_L$     | $I_G=1.2 I_{GT}$                                                                 | -     | -    | 5    | mA               |
| $I_H$     | $I_T=0.05\text{A}$                                                               | -     | -    | 4    | mA               |
| dV/dt     | $V_D=800\text{V}$ $T_j=110^{\circ}\text{C}$ $R_{GK}=1\text{k}\Omega$             | 200   | -    | -    | V/ $\mu\text{s}$ |
|           | $V_D=800\text{V}$ $T_j=110^{\circ}\text{C}$ $R_{GK}=220\Omega$                   | 1000  | -    | -    |                  |
| $t_{on}$  | $I_G=10\text{mA}$ $I_A=20\text{mA}$ $I_R=2\text{mA}$<br>$T_j=25^{\circ}\text{C}$ | -     | 2    | -    | $\mu\text{s}$    |
| $t_{off}$ |                                                                                  | -     | 50   | -    | $\mu\text{s}$    |

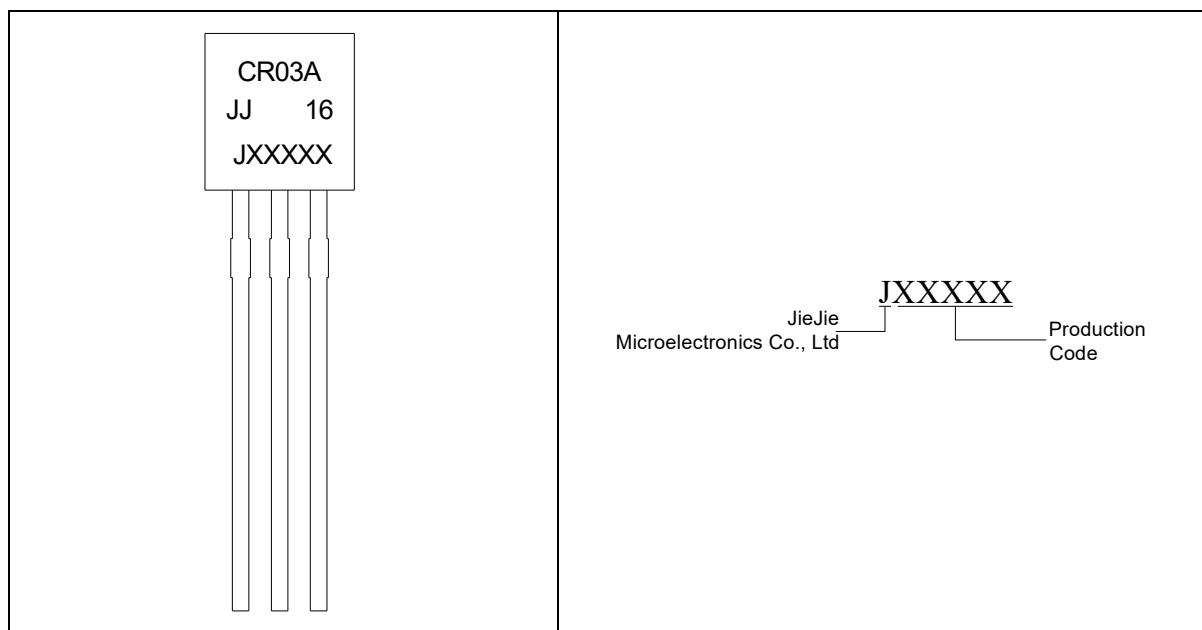
**STATIC CHARACTERISTICS**

| Symbol    | Parameter                            |                           | Value(MAX.) | Unit          |
|-----------|--------------------------------------|---------------------------|-------------|---------------|
| $V_{TM}$  | $I_T=2\text{A}$ $t_p=380\mu\text{s}$ | $T_j=25^{\circ}\text{C}$  | 1.3         | V             |
| $V_{TO}$  | Threshold voltage                    | $T_j=110^{\circ}\text{C}$ | 0.8         | V             |
| $R_D$     | Dynamic Resistance                   | $T_j=110^{\circ}\text{C}$ | 0.2         | $\Omega$      |
| $I_{DRM}$ | $V_D=V_{DRM}$ $V_R=V_{RRM}$          | $T_j=25^{\circ}\text{C}$  | 5           | $\mu\text{A}$ |
| $I_{RRM}$ |                                      | $T_j=110^{\circ}\text{C}$ | 0.3         | mA            |

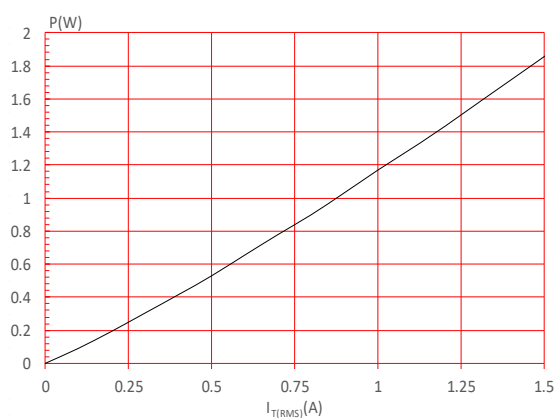
**THERMAL RESISTANCES**

| Symbol        | Parameter                | Value | Unit                 |
|---------------|--------------------------|-------|----------------------|
| $R_{th(j-c)}$ | junction to case (DC)    | 50    | $^{\circ}\text{C/W}$ |
| $R_{th(j-a)}$ | junction to ambient (DC) | 130   | $^{\circ}\text{C/W}$ |

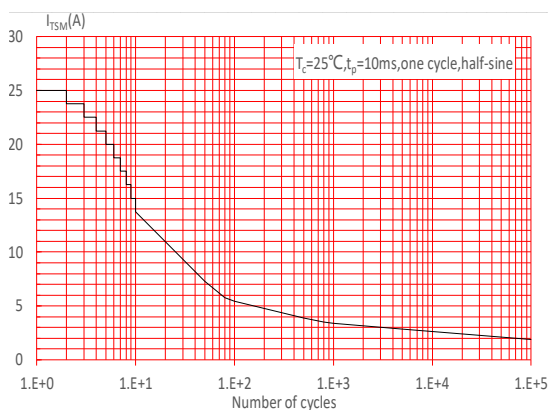
## MARKING



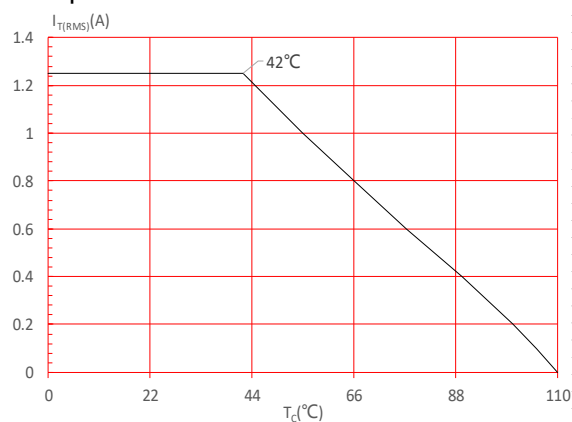
**FIG.1:** Maximum power dissipation versus RMS on-state current



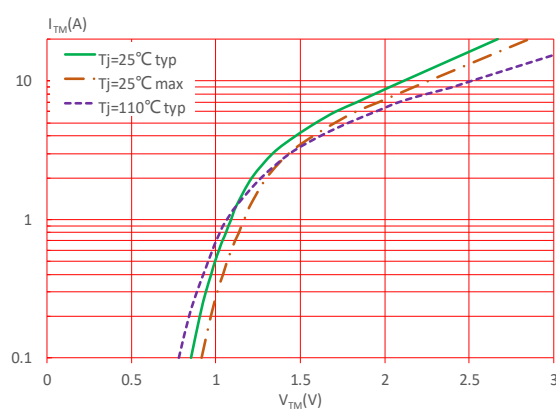
**FIG.3:** Surge peak on-state current versus number of cycles



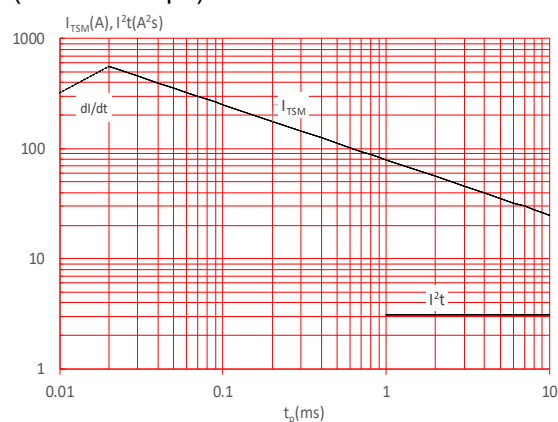
**FIG.2:** RMS on-state current versus case temperature



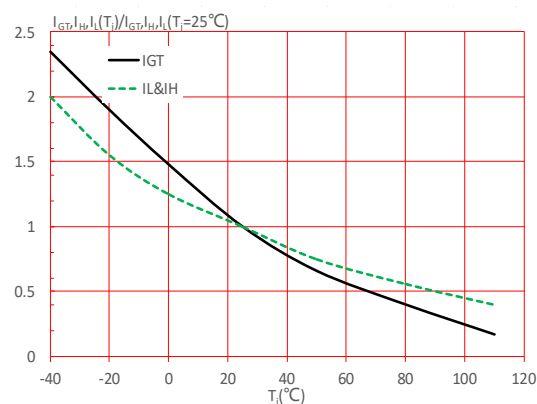
**FIG.4:** On-state characteristics



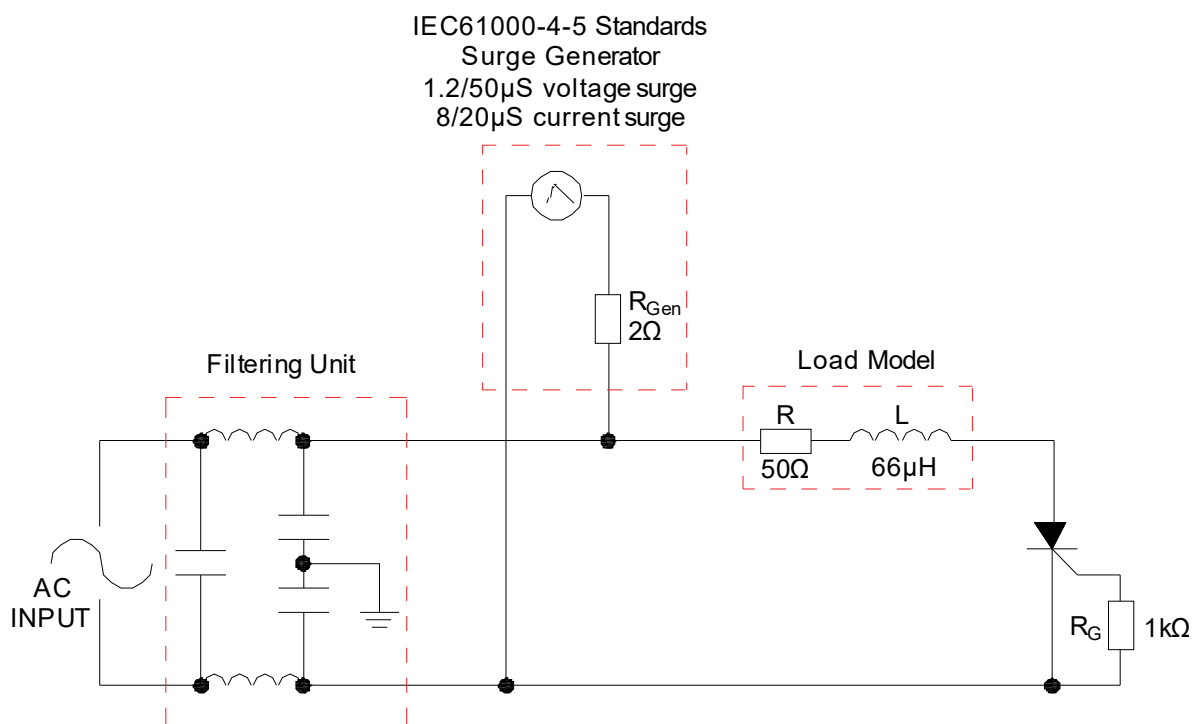
**FIG.5:** Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 10\text{ms}$ , and corresponding value of  $I^2t$  ( $di/dt < 100\text{A}/\mu\text{s}$ )



**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

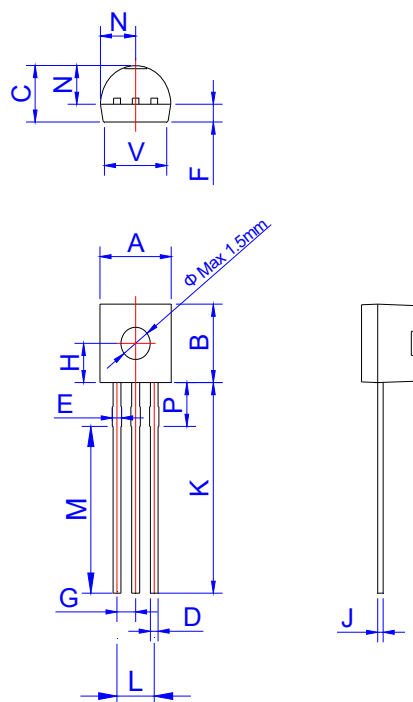
**ORDERING INFORMATION**

| Order code   | Voltage<br>V <sub>DRM</sub> /V <sub>RRM</sub> (V) | IGT(μA) | Package | Base qty.<br>(pcs) | Delivery<br>mode |
|--------------|---------------------------------------------------|---------|---------|--------------------|------------------|
| CR03AM-16    | 1250                                              | ≤200    | TO-92CR | 1,000              | Bulk Pack        |
| CR03AM-16-TR |                                                   |         |         | 2,000              | Tape & Reel      |

**Document Revision History**

| Date          | Revision | Changes                        |
|---------------|----------|--------------------------------|
| Apr.12, 2023  | A.1.0    | Last update                    |
| Mar.27, 2025  | A.2.0    | Revise PACKAGE MECHANICAL DATA |
| Sept.3, 2025  | A.2.1    | Revise dV/dt                   |
| Sept.28, 2025 | A.2.2    | Revise PACKAGE MECHANICAL DATA |

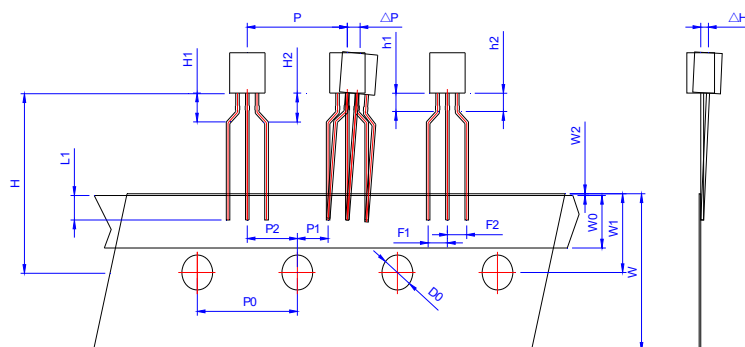
## PACKAGE MECHANICAL DATA



| Ref. | Dimensions  |      |       |        |      |       |
|------|-------------|------|-------|--------|------|-------|
|      | Millimeters |      |       | Inches |      |       |
|      | Min.        | Typ. | Max.  | Min.   | Typ. | Max.  |
| A    | 4.45        |      | 5.20  | 0.175  |      | 0.205 |
| B    | 4.32        |      | 5.33  | 0.170  |      | 0.210 |
| C    | 3.18        |      | 4.19  | 0.125  |      | 0.165 |
| D    | 0.407       |      | 0.533 | 0.016  |      | 0.021 |
| E    | 0.50        |      | 0.70  | 0.020  |      | 0.028 |
| F    | 1.00        |      | 1.20  | 0.039  |      | 0.047 |
| G    | 1.10        |      | 1.40  | 0.043  |      | 0.055 |
| H    | 2.30        |      | 2.60  | 0.091  |      | 0.102 |
| J    | 0.36        |      | 0.50  | 0.014  |      | 0.020 |
| K    | 12.70       |      | 15.0  | 0.500  |      | 0.591 |
| L    | 2.44        |      | 2.64  | 0.096  |      | 0.104 |
| M    | 11.64       |      | 12.04 | 0.458  |      | 0.474 |
| N    | 2.04        |      | 2.66  | 0.080  |      | 0.105 |
| P    | 1.86        |      | 2.06  | 0.073  |      | 0.081 |
| V    | 4.40        |      | 5.00  | 0.173  |      | 0.197 |

## DELIVERY MODE

| PACKAGE | OUTLINE   | BAG (PCS) | INNER BOX (PCS) | CARTON BOX (PCS) |
|---------|-----------|-----------|-----------------|------------------|
| TO-92CR | Bulk Pack | 1,000     | 10,000          | 50,000           |



| Ref.   | Dimensions  |       |       |        |       |       |
|--------|-------------|-------|-------|--------|-------|-------|
|        | Millimeters |       |       | Inches |       |       |
|        | Min.        | Typ.  | Max.  | Min.   | Typ.  | Max.  |
| P      | 12.40       | 12.70 | 13.00 | 0.488  | 0.500 | 0.512 |
| P0     | 12.40       | 12.70 | 13.00 | 0.488  | 0.500 | 0.512 |
| P1     | 3.55        | 3.85  | 4.15  | 0.140  | 0.152 | 0.163 |
| P2     | 6.05        | 6.35  | 6.65  | 0.238  | 0.250 | 0.262 |
| ΔP     | -1.00       | 0     | 1.00  | -0.039 | 0     | 0.039 |
| F1, F2 | 2.20        | 2.50  | 2.80  | 0.087  | 0.098 | 0.110 |
| F1-F2  | -0.30       | 0     | 0.30  | -0.012 | 0     | 0.012 |
| W      | 17.50       | 18.00 | 19.00 | 0.689  | 0.709 | 0.748 |
| W0     | 5.50        | 6.00  | 6.50  | 0.217  | 0.236 | 0.256 |
| W1     | 8.50        | 9.00  | 9.50  | 0.335  | 0.354 | 0.374 |
| W2     |             |       | 1.00  |        |       | 0.039 |
| D0     | 3.80        | 4.00  | 4.20  | 0.150  | 0.157 | 0.165 |
| ΔH     | -1.00       | 0     | 1.00  | -0.039 | 0     | 0.039 |
| L1     | 2.50        |       |       | 0.098  |       |       |
| H      | 18.00       | 19.00 | 20.00 | 0.709  | 0.748 | 0.787 |
| H1, H2 |             |       | 3.00  |        |       | 0.119 |
| H1-H2  | -0.50       |       | 0.50  | -0.020 |       | 0.020 |
| h1, h2 |             |       | 1.00  |        |       | 0.040 |
| h1-h2  | -0.20       |       | 0.20  | -0.008 |       | 0.008 |

| PACKAGE | OUTLINE     | REEL (PCS) | INNER BOX (PCS) | CARTON BOX (PCS) |
|---------|-------------|------------|-----------------|------------------|
| TO-92CR | Tape & Reel | /          | 2,000           | 20,000           |

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