

**Phase Control Thyristors (SCRs)**

| $I_T(AV)$<br>$T_c=65^\circ C$<br>50% Duty<br>Cycle,<br>Half Sine<br>(Amps) | $I_{TSM}$<br>(Amps) |     | $I_{DRM}/I_{RRM}$<br>@ Rated<br>$V_{DRM}/V_{RRM}$<br>and $T_{J(Max)}$<br>(mA) | $I^2t$<br>for<br>Fusing<br>@ 8.3 ms<br>(A <sup>2</sup> sec) | $V_{DRM}/V_{RRM}$<br>Range<br>(Volts) | $V_{TM}$<br>@ $I_{TM}$<br>and $T_c=25^\circ C$<br>$I_{TM}$ (Amps) | $V_{TM}$<br>(Volts) | Chip<br>Size<br>(mm) | Junction<br>Temp.<br>Range<br>( $^\circ C$ ) | $R_{\theta JC}$<br>( $^\circ C/W$ ) | Typical<br>$t_q$<br>@ $T_{J(Max)}$<br>( $\mu sec$ ) |
|----------------------------------------------------------------------------|---------------------|-----|-------------------------------------------------------------------------------|-------------------------------------------------------------|---------------------------------------|-------------------------------------------------------------------|---------------------|----------------------|----------------------------------------------|-------------------------------------|-----------------------------------------------------|
| 6<br>@ $101^\circ C$                                                       | 170                 | 200 | 2                                                                             | 166                                                         | 400                                   | 20                                                                | 1.4                 | —                    | -40 to 125                                   | 1.8                                 | —                                                   |
| 6<br>@ $85^\circ C$                                                        | 78                  | 90  | 2                                                                             | 33.6                                                        | 400-600                               | 20                                                                | 1.7                 | —                    | -40 to 125                                   | 3                                   | —                                                   |
| 6.4                                                                        | 82                  | 90  | .5                                                                            | 33.6                                                        | 25-600                                | 20                                                                | 1.95                | —                    | -40 to 100                                   | 2 to 3                              | —                                                   |
| 6.4                                                                        | 82                  | 90  | .5                                                                            | 33.6                                                        | 25-600                                | 20                                                                | 1.95                | —                    | -40 to 100                                   | 2                                   | —                                                   |
| 6.5                                                                        | 113                 | 125 | 3 to 22.5                                                                     | 65                                                          | 25-500                                | 10                                                                | 1.6                 | —                    | -40 to 100                                   | 1.3                                 | 50                                                  |
| 6.5                                                                        | 113                 | 125 | 6                                                                             | 65                                                          | 500-700                               | 50                                                                | 2.9                 | —                    | -40 to 125                                   | 2.5                                 | 50                                                  |
| 8<br>@ $88^\circ C$                                                        | 104                 | 120 | 2                                                                             | 60                                                          | 400-600                               | 20                                                                | 1.4*                | —                    | -40 to 125                                   | 3                                   | —                                                   |
| 10                                                                         | 113                 | 125 | 4 to 13                                                                       | 65                                                          | 25-800                                | 30                                                                | 2.25                | —                    | -40 to 105                                   | 1.5                                 | —                                                   |
| 10<br>@ $92^\circ C$                                                       | 113                 | 125 | 3 to 22.5                                                                     | 65                                                          | 25-500                                | 10                                                                | 1.6                 | —                    | -40 to 125                                   | 1.3                                 | 50                                                  |
| 11                                                                         | 136                 | 150 | 1.5 to 6.5                                                                    | 93.4                                                        | 50-1200                               | 31.4                                                              | 2.3                 | —                    | -40 to 125                                   | 1.5                                 | 75                                                  |
| 13                                                                         | 218                 | 240 | 5                                                                             | 239                                                         | 50-600                                | 239                                                               | 1.7                 | —                    | -40 to 100                                   | 1.6                                 | —                                                   |
| 14.5                                                                       | 226                 | 250 | 1.5 to 6.5                                                                    | 259                                                         | 50-1200                               | 50                                                                | 2.3                 | —                    | -40 to 125                                   | 1.5                                 | 75                                                  |
| 16                                                                         | 226                 | 250 | 1                                                                             | 259                                                         | 25-600                                | 100                                                               | 1.9                 | —                    | -40 to 100                                   | 1.0                                 | —                                                   |
| 16                                                                         | 226                 | 250 | 1                                                                             | 259                                                         | 25-600                                | 100                                                               | 1.9                 | —                    | -40 to 100                                   | 1.0                                 | —                                                   |
| 16                                                                         | 226                 | 250 | 1                                                                             | 259                                                         | 25-600                                | 100                                                               | 1.9                 | —                    | -40 to 100                                   | 1.0                                 | —                                                   |
| 16                                                                         | 226                 | 250 | 1                                                                             | 259                                                         | 25-600                                | 100                                                               | 1.9                 | —                    | -40 to 100                                   | 1.0                                 | —                                                   |
| 16                                                                         | 136                 | 150 | 4 to 13                                                                       | 93.4                                                        | 25-800                                | 50                                                                | 2                   | —                    | -65 to 125                                   | 1.7                                 | —                                                   |
| 16                                                                         | 205                 | 225 | 4.5 to 13                                                                     | 210                                                         | 25-700                                | 50                                                                | 2                   | —                    | -65 to 150                                   | 1.7                                 | 75                                                  |
| 18                                                                         | 327                 | 360 | 1.5 to 6.5                                                                    | 538                                                         | 50-1200                               | 69                                                                | 2.3                 | —                    | -40 to 125                                   | 1.5                                 | 75                                                  |
| 21                                                                         | 226                 | 250 | 1                                                                             | 259                                                         | 100-600                               | 69                                                                | 1.85                | —                    | -40 to 100                                   | 1.0                                 | —                                                   |
| 21                                                                         | 226                 | 250 | 1                                                                             | 259                                                         | 100-600                               | 69                                                                | 1.85                | —                    | -40 to 100                                   | 1.0                                 | —                                                   |

\* = Typical Value

° = Other Packages Available, Contact Factory

x = Rating @  $T_{J(Max)}$

| Typical<br>ton<br>( $\mu$ sec) | Min<br>di/dt<br>@ $T_J(\text{Max})$<br>Repetitive<br>on-state<br>(A/ $\mu$ sec) | Min<br>dv/dt<br>@ $T_J(\text{Max})$<br>(V/ $\mu$ sec) | Max<br>V <sub>GT</sub><br>(V) | Max<br>I <sub>GT</sub><br>(mA) | PACKAGE INFORMATION                         |                      |         |               |
|--------------------------------|---------------------------------------------------------------------------------|-------------------------------------------------------|-------------------------------|--------------------------------|---------------------------------------------|----------------------|---------|---------------|
|                                |                                                                                 |                                                       |                               |                                | Max<br>Mounting<br>Force or<br>Torque       | STYLE                | Outline | TYPE NO.      |
| —                              | —                                                                               | —                                                     | 1.5                           | 30                             | —                                           | Flat<br>Pak          | TO-220  | CR6AM         |
| —                              | —                                                                               | —                                                     | 1.3                           | 20                             | —                                           | Flat<br>Pak          | TO-220  | CR6CM         |
| —                              | 50-100                                                                          | 50*                                                   | 2                             | 40                             | $\frac{25 \text{ lb-in}}{29 \text{ kg-cm}}$ | Non-Isolated<br>Stud | —       | °C220         |
| —                              | 50-100                                                                          | 50*                                                   | 2                             | 40                             | $\frac{800 \text{ lb}}{3.6 \text{ KN}}$     | Press<br>Fit         | —       | C222          |
| —                              | 10                                                                              | —                                                     | 3.5                           | 150                            | $\frac{30 \text{ lb-in}}{35 \text{ kg-cm}}$ | ¼-28<br>Stud         | TO-48   | C36           |
| —                              | —                                                                               | —                                                     | 1.75                          | 30                             | —                                           | Flat<br>Pak          | TO-220  | CR8AM         |
| —                              | 20                                                                              | —                                                     | 3.5                           | 150                            | $\frac{30 \text{ lb-in}}{35 \text{ kg-cm}}$ | ¼-28<br>Stud         | TO-48   | C37           |
| 3                              | 25                                                                              | 50*                                                   | 3.5                           | 80<br>@25°C                    | $\frac{30 \text{ lb-in}}{35 \text{ kg-cm}}$ | ¼-28<br>Stud         | TO-48   | 2N1842-1850   |
| 3                              | 25                                                                              | 100                                                   | 3.5                           | 80<br>@25°C                    | $\frac{30 \text{ lb-in}}{35 \text{ kg-cm}}$ | ¼-28<br>Stud         | TO-48   | 2N1842A-1850A |
| —                              | 150                                                                             | 50                                                    | 3                             | 40-80                          | $\frac{30 \text{ lb-in}}{35 \text{ kg-cm}}$ | ¼-28<br>Stud         | TO-48   | T400__ 10     |
| —                              | 40-60                                                                           | 200                                                   | 2.5                           | 75                             | $\frac{800 \text{ lb}}{3.6 \text{ KN}}$     | Press<br>Fit/Stud    | —       | 2N5164-5171   |
| —                              | 100                                                                             | 100                                                   | 3                             | 40-80                          | $\frac{30 \text{ lb-in}}{35 \text{ kg-cm}}$ | ¼-28<br>Stud         | TO-48   | T400__ 16     |
| —                              | 40-100                                                                          | 200*                                                  | 2                             | 40                             | $\frac{25 \text{ lb-in}}{29 \text{ kg-cm}}$ | Non-Isolated<br>Stud | —       | °C230         |
| —                              | 40-100                                                                          | 200*                                                  | 2                             | 40                             | $\frac{800 \text{ lb}}{3.6 \text{ KN}}$     | Press<br>Fit         | —       | C232          |
| —                              | 40-100                                                                          | 200*                                                  | 2                             | 20                             | $\frac{25 \text{ lb-in}}{29 \text{ kg-cm}}$ | Non-Isolated<br>Stud | —       | °C231         |
| —                              | 40-100                                                                          | 200*                                                  | 2                             | 20                             | $\frac{800 \text{ lb}}{3.6 \text{ KN}}$     | Press<br>Fit         | —       | C233          |
| —                              | 10                                                                              | 50*                                                   | 3                             | 80                             | $\frac{30 \text{ lb-in}}{35 \text{ kg-cm}}$ | Non-Isolated<br>Stud | —       | 2N681-692     |
| —                              | 150                                                                             | 50                                                    | 3                             | 40-80                          | $\frac{30 \text{ lb-in}}{35 \text{ kg-cm}}$ | ¼-28<br>Stud         | TO-48   | T400__ 22     |
| —                              | 15-100                                                                          | 10-25                                                 | 3                             | 80                             | $\frac{30 \text{ lb-in}}{35 \text{ kg-cm}}$ | ¼-28<br>Stud         | TO-48   | C35           |
| —                              | 150                                                                             | 50                                                    | 3                             | 80                             | $\frac{800 \text{ lb}}{3.6 \text{ KN}}$     | Press<br>Fit         | —       | 2N3870-3873   |
| —                              | 150                                                                             | 50                                                    | 3                             | 80                             | $\frac{25 \text{ lb-in}}{29 \text{ kg-cm}}$ | Non-Isolated<br>Stud | —       | 2N3896-3899   |



Modified TO-65



JEDEC TO-83



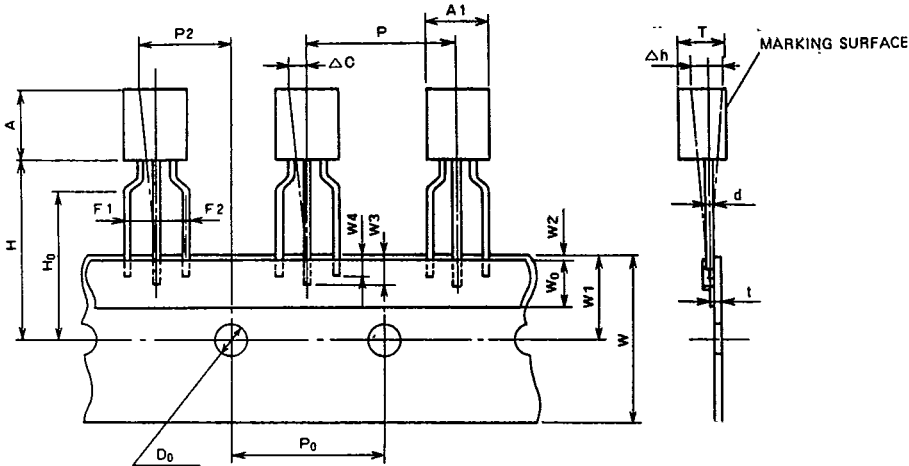
Powerex, Inc., Hillis Street, Youngwood, Pennsylvania 15697 (412) 925-7272  
Powerex Europe, S.A., 428 Avenue G. Durand, BP107, 72003 Le Mans, France (43) 41.14.14

Taping

STANDARD SPECIFICATIONS  
FOR TAPING OF MOLDED  
PACKAGE THYRISTORS AND  
TRIACS

TO-92 Package

Thyristor  
CR02AM, CR03AM, CR04AM  
Triac  
BCR1AM



Taping dimensions

| Description of symbol              | Symbol | Dimensions (Unit:mm) | Remark                                              |
|------------------------------------|--------|----------------------|-----------------------------------------------------|
| Product width                      | A1     | 5.0 MAX              |                                                     |
| Product height                     | A      | 5.0 MAX              |                                                     |
| Product thickness                  | T      | 3.7 MAX              |                                                     |
| Lead wire diameter                 | d      | 0.6 MAX              |                                                     |
| Sticker lead wire length (1)       | W3     | 2.5 MIN              |                                                     |
| Sticker lead wire length (2)       | W4     | 2.0 MIN              |                                                     |
| Pitch between products             | P      | 12.7 ± 1.0           |                                                     |
| Feed hole pitch                    | P0     | 12.7 ± 0.3           | The cumulative pitch error is ± 1mm per 20 pitches. |
| Feed hole deviation (1)            | P2     | 6.35 ± 1.3           |                                                     |
| Distance between lead wires        | F1, F2 | 2.5 ± 0.4            |                                                     |
| Defective product (1)              | Δh     | 0 ± 2.0              |                                                     |
| Tape width                         | W      | 18.0 ± 1.0<br>0.5    |                                                     |
| Sticker tape width                 | W0     | 6.0 ± 0.5            |                                                     |
| Feed hole deviation (2)            | W1     | 9.0 ± 0.5            |                                                     |
| Sticker tape deviation             | W2     | 0.5 MAX              |                                                     |
| Position of product bottom surface | H      | 17.5 MIN             |                                                     |
| Lynch height of lead wire          | H0     | 16.0 ± 0.5           |                                                     |
| Feed hole diameter                 | D0     | 4.0 ± 0.2            |                                                     |
| Tape thickness                     | t      | 0.7 ± 0.2            |                                                     |
| Defective product (2)              | ΔC     | 0 ± 1.0              |                                                     |

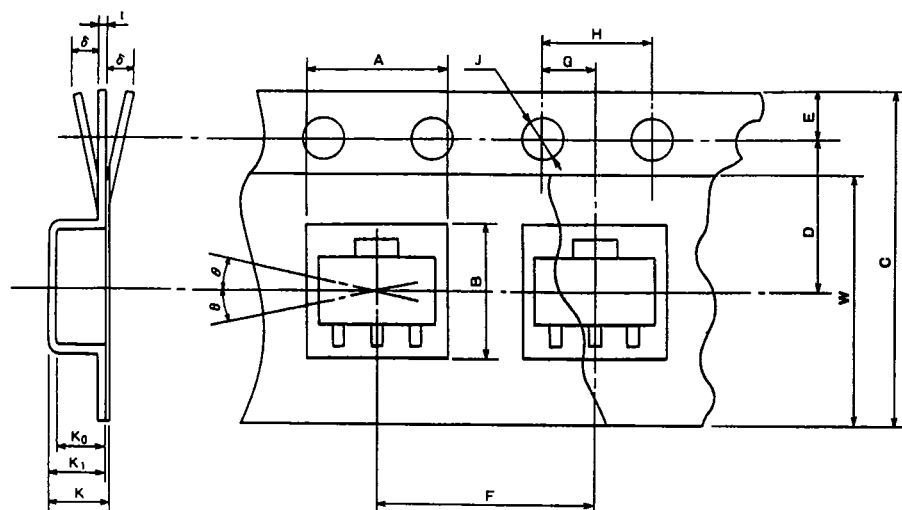


Powerex, Inc., Hillis Street, Youngwood, Pennsylvania 15697 (412) 925-7272

Powerex Europe, S.A., 428 Avenue G. Durand, BP107, 72003 Le Mans, France (43) 41.14.14

Powerex Semiconductor Data Book

Taping



SOT-89 Package

Thyristor  
CR08AS

Taping dimensions

| Description of symbol         |                    | Symbol         | Dimensions/angles<br>Unit:mm | Remark                                                    |
|-------------------------------|--------------------|----------------|------------------------------|-----------------------------------------------------------|
| Parts Insertion               | Height             | A              | $5.0 \pm 0.1$                | Cross-section of the surface 0.5mm above the inner bottom |
|                               | Width              | B              | $4.6 \pm 0.1$                | Cross-section of the surface 0.5mm above the inner bottom |
| Concave square hole           | Depth              | K <sub>0</sub> | $1.8 \pm 0.1$                | Inner space                                               |
|                               | Pitch              | F              | $8.0 \pm 0.1$                | Cumulative error +0.1/-0.3 MAX/10 pitches                 |
| Round feed hole               | Diameter           | J              | $\phi 1.5 \pm 0.05$          |                                                           |
|                               | Pitch              | H              | $4.0 \pm 0.1$                | Cumulative error +0.1/-0.3 MAX/10 pitches                 |
|                               | Position           | E              | $1.5 \pm 0.1$                | Distance between the tape edge and the hole center        |
| Distance between center lines | Vertical           | G              | $2.0 \pm 0.5$                | Center line of concave square hole and round feed hole    |
|                               | Horizontal         | D              | $5.65 \pm 0.05$              | Center line of concave square hole and round feed hole    |
| Cover tape                    | Width              | W              | $9.5 + 0.3/-0$               | Thickness: 0.1 MAX                                        |
| Carrier tape                  | Width              | C              | $12 \pm 0.2$                 | Warp $\pm 0.3$ MAX                                        |
|                               | Thickness          | t              | $0.3 \pm 0.05$               |                                                           |
|                               | Package hole depth | K <sub>1</sub> | $2.1 \pm 0.1$                |                                                           |
| Device                        | Package dimensions | —              | —                            | As shown in (e)                                           |
|                               | Inclination        | $\theta$       | 30° MAX.                     |                                                           |
| Total Thickness               |                    | K              | $2.3 \pm 0.1$                | Total thickness including cover and carrier tapes         |