

## Phase Control Thyristor

## ISOPLUS220™

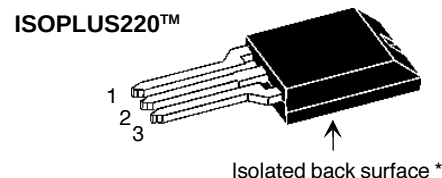
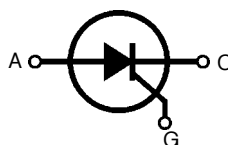
## Electrically Isolated Back Surface

$$V_{RRM} = 800 - 1200 \text{ V}$$

$$I_{T(RMS)} = 35 \text{ A}$$

$$I_{T(AV)M} = 23 \text{ A}$$

| $V_{RSM}$<br>$V_{DSM}$<br>$V$ | $V_{RRM}$<br>$V_{DRM}$<br>$V$ | Type         |
|-------------------------------|-------------------------------|--------------|
| 800                           | 800                           | CS 29-08io1C |
| 1200                          | 1200                          | CS 29-12io1C |



\* Patent pending

| Symbol         | Test Conditions                                                    | Maximum Ratings    |                  |
|----------------|--------------------------------------------------------------------|--------------------|------------------|
| $I_{T(RMS)}$   | $T_{VJ} = T_{VJM}$                                                 | 35                 | A                |
| $I_{T(AV)M}$   | $T_C = 95^\circ\text{C}$ ; 180° sine ( $I_{T(RMS)}$ current limit) | 23                 | A                |
| $I_{TSM}$      | $T_{VJ} = 45^\circ\text{C}$ ; $t = 10 \text{ ms}$ (50 Hz), sine    | 200                | A                |
|                | $V_R = 0 \text{ V}$ ; $t = 8.3 \text{ ms}$ (60 Hz), sine           | 215                | A                |
|                | $T_{VJ} = T_{VJM}$ ; $t = 10 \text{ ms}$ (50 Hz), sine             | 175                | A                |
|                | $V_R = 0 \text{ V}$ ; $t = 8.3 \text{ ms}$ (60 Hz), sine           | 185                | A                |
| $I^2t$         | $T_{VJ} = 45^\circ\text{C}$ ; $t = 10 \text{ ms}$ (50 Hz), sine    | 200                | A <sup>2</sup> s |
|                | $V_R = 0 \text{ V}$ ; $t = 8.3 \text{ ms}$ (60 Hz), sine           | 195                | A <sup>2</sup> s |
|                | $T_{VJ} = T_{VJM}$ ; $t = 10 \text{ ms}$ (50 Hz), sine             | 155                | A <sup>2</sup> s |
|                | $V_R = 0 \text{ V}$ ; $t = 8.3 \text{ ms}$ (60 Hz), sine           | 145                | A <sup>2</sup> s |
| $(di/dt)_{cr}$ | $T_{VJ} = T_{VJM}$ repetitive, $I_T = 40 \text{ A}$                | 150                | A/ $\mu\text{s}$ |
|                | $f = 50 \text{ Hz}$ , $t_p = 200 \mu\text{s}$                      |                    |                  |
|                | $V_D = 2/3 V_{DRM}$                                                |                    |                  |
|                | $I_G = 0.2 \text{ A}$ non repetitive, $I_T = I_{T(AV)M}$           | 500                | A/ $\mu\text{s}$ |
| $(dv/dt)_{cr}$ | $T_{VJ} = T_{VJM}$ ; $V_{DR} = 2/3 V_{DRM}$                        | 1000               | V/ $\mu\text{s}$ |
|                | $R_{GK} = \infty$ ; method 1 (linear voltage rise)                 |                    |                  |
| $P_{GM}$       | $T_{VJ} = T_{VJM}$ ; $t_p = 30 \mu\text{s}$                        | 5                  | W                |
|                | $I_T = I_{T(AV)M}$ ; $t_p = 300 \mu\text{s}$                       | 2.5                | W                |
| $P_{GAV}$      |                                                                    | 0.5                | W                |
| $V_{RGM}$      |                                                                    | 10                 | V                |
| $T_{VJ}$       |                                                                    | -40...+150         | °C               |
| $T_{VJM}$      |                                                                    | 150                | °C               |
| $T_{stg}$      |                                                                    | -40...+150         | °C               |
| $V_{ISOL}$     | 50/60 Hz RMS; $I_{ISOL} \leq 1 \text{ mA}$                         | 2500               | V~               |
| $T_L$          | 1.6mm from case; 10s                                               | 260                | °C               |
| $F_C$          | Mounting force                                                     | 11...65 / 2.4...11 | N / lb           |
| Weight         |                                                                    | 2                  | g                |

## Features

## Features

- Silicon chip on Direct-Copper-Bond substrate
- High power dissipation
- Isolated mounting surface
- 2500V electrical isolation
- Low cathode-to-tab capacitance (15pF typical)
- Planar passivated chips
- Epoxy meets UL 94V-0
- High performance glass passivated chip
- Long-term stability of leakage current and blocking voltage

## Applications

- Motor control
- Power converter
- AC power controller
- Light and temperature control
- SCR for inrush current limiting in power supplies or AC drive

## Advantages

- Space and weight savings
- Simple mounting

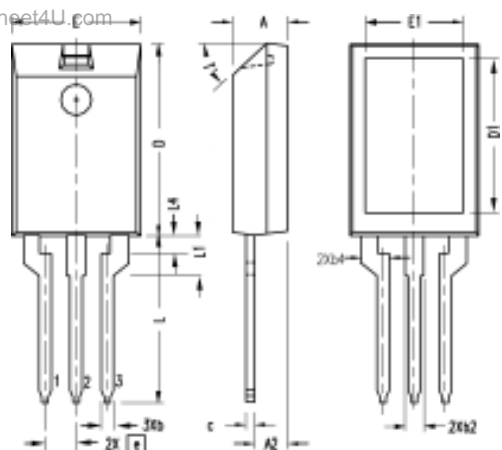
See CS 29..io1 data sheet for electrical characteristic curves.

IXYS reserves the right to change limits, conditions and dimensions.

98839 (5/01)

| Symbol     | Test Conditions                                                                                              | Characteristic Values |                  |
|------------|--------------------------------------------------------------------------------------------------------------|-----------------------|------------------|
| $I_R, I_D$ | $T_{VJ} = T_{VJM}; V_R = V_{RRM}; V_D = V_{DRM}$                                                             | $\leq$                | 2 mA             |
| $V_T$      | $I_T = 45 \text{ A}; T_{VJ} = 25^\circ\text{C}$                                                              | $\leq$                | 1.5 V            |
| $V_{T0}$   | For power-loss calculations only ( $T_{VJ} = 125^\circ\text{C}$ )                                            | 0.82                  | V                |
| $r_T$      |                                                                                                              | 16.5                  | m $\Omega$       |
| $V_{GT}$   | $V_D = 6 \text{ V}; T_{VJ} = 25^\circ\text{C}$                                                               | $\leq$                | 1.0 V            |
|            | $T_{VJ} = -40^\circ\text{C}$                                                                                 | $\leq$                | 1.2 V            |
| $I_{GT}$   | $V_D = 6 \text{ V}; T_{VJ} = 25^\circ\text{C}$                                                               | $\leq$                | 65 mA            |
|            | $T_{VJ} = -40^\circ\text{C}$                                                                                 | $\leq$                | 80 mA            |
| $V_{GD}$   | $T_{VJ} = T_{VJM}; V_D = 2/3 V_{DRM}$                                                                        | $\leq$                | 0.2 V            |
| $I_{GD}$   |                                                                                                              | $\leq$                | 5 mA             |
| $I_L$      | $T_{VJ} = 25^\circ\text{C}; t_p = 10 \mu\text{s}$<br>$I_G = 0.2; di_G/dt = 0.2 \text{ A}/\mu\text{s}$        | $\leq$                | 150 mA           |
| $I_H$      | $T_{VJ} = 25^\circ\text{C}; V_D = 6 \text{ V}; R_{GK} = \infty$                                              | $\leq$                | 50 mA            |
| $t_{gd}$   | $T_{VJ} = 25^\circ\text{C}; V_D = 1/2 V_{DRM}$<br>$I_G = 0.2 \text{ A}; di_G/dt = 0.2 \text{ A}/\mu\text{s}$ | $\leq$                | 2 $\mu\text{s}$  |
| $R_{thJC}$ | DC current                                                                                                   | 1.2                   | K/W              |
| $R_{thCK}$ | DC current                                                                                                   | typical 0.6           | K/W              |
| <b>a</b>   | Max. acceleration, 50 Hz                                                                                     | 50                    | m/s <sup>2</sup> |

## ISOPLUS220 OUTLINE



| SYM | INCHES     |      | MILLIMETERS |       |
|-----|------------|------|-------------|-------|
|     | MIN        | MAX  | MIN         | MAX   |
| A   | .157       | .197 | 4.00        | 5.00  |
| A2  | .098       | .118 | 2.50        | 3.00  |
| b   | .035       | .051 | 0.90        | 1.30  |
| b2  | .049       | .065 | 1.25        | 1.65  |
| b4  | .093       | .100 | 2.35        | 2.55  |
| c   | .028       | .039 | 0.70        | 1.00  |
| D   | .591       | .630 | 15.00       | 16.00 |
| D1  | .472       | .512 | 12.00       | 13.00 |
| E   | .394       | .433 | 10.00       | 11.00 |
| E1  | .295       | .335 | 7.50        | 8.50  |
| e   | .100 BASIC |      | 2.55 BASIC  |       |
| L   | .512       | .571 | 13.00       | 14.50 |
| L1  | .118       | .138 | 3.00        | 3.50  |
| L4  | .039       | .059 | 1.00        | 1.50  |
| T*  |            |      | 42.5*       | 47.5* |

Note: All terminals are solder plated.

- 1 - Cathode
- 2 - Anode
- 3 - Gate