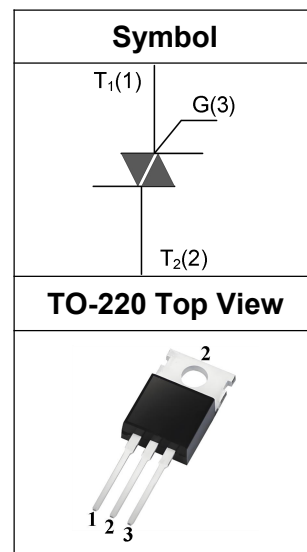


### Features

- ◆ Five-layer NPNPN-Structured Silicon Bidirectional Device
- ◆ Single-Side Trenching Technology and Mesa Glass Passivation Process
- ◆ Backside Multilayer Metallized Electrode
- ◆ High Blocking Voltage and Superior Temperature Stability

### Application

- ◆ Solid State Relay
- ◆ Heating Controller (Temperature Adjustment)
- ◆ Motor Speed Controllers for Vacuum Cleaners, Power Tools, and Similar Applications



### Product Summary

| Symbol       | Value | Unit |
|--------------|-------|------|
| $I_{T(RMS)}$ | 8.0   | A    |
| $V_{DRM}$    | 800   | V    |
| $V_{RRM}$    | 800   |      |

### ■ Absolute Maximum Ratings

| Symbol       | Parameter                                  | Test Condition                                 | Value      | Unit                   |
|--------------|--------------------------------------------|------------------------------------------------|------------|------------------------|
| $I_{T(RMS)}$ | RMS On-State Current                       | $T_C = 90^\circ\text{C}$                       | 8.0        | A                      |
| $I_{TSM}$    | Non-Repetitive Surge Peak On-State Current | $F = 50\text{Hz}, t = 20\text{ms}$             | 80         |                        |
| $I^2t$       | $I^2t$ Value for Fusing                    | $t_p = 10\text{ms}$                            | 64         | $\text{A}^2\text{s}$   |
| $d_i/d_t$    | Critical Rate of Rise of On-State Current  | $T_J = 125^\circ\text{C}$                      | 50         | $\text{A}/\mu\text{s}$ |
| $V_{DRM}$    | Repetitive Peak Off-State Voltage          | $T_J = 25^\circ\text{C}$                       | 800        | V                      |
| $V_{RRM}$    | Repetitive Peak Reverse Voltage            | $T_J = 25^\circ\text{C}$                       | 800        |                        |
| $I_{GM}$     | Peak Gate Current                          | $t_p = 20\mu\text{s}, T_J = 125^\circ\text{C}$ | 4.0        | A                      |
| $P_{G(AV)}$  | Average Gate Power Dissipation             | $T_J = 125^\circ\text{C}$                      | 1.0        | W                      |
| $T_{stg}$    | Storage Junction Temperature Range         | -                                              | -40 to 150 | $^\circ\text{C}$       |
| $T_J$        | Operating Junction Temperature Range       | -                                              | -40 to 125 |                        |



# BT08C80X(W)

## 8A Bidirectional Thyristor

### Thermal Characteristics

| Symbol               | Parameter             | Test Condition | Value(Max) | Unit |
|----------------------|-----------------------|----------------|------------|------|
| R <sub>th(j-c)</sub> | Junction to Case (AC) | Insulated      | 2.05       | °C/W |
|                      |                       | Non-Insulated  | 1.25       |      |

### Electrical Characteristics (3 Quadrants)

| Symbol                                         | Parameter                                    | Test Condition                                                | Quadrant | Value |     | Unit |
|------------------------------------------------|----------------------------------------------|---------------------------------------------------------------|----------|-------|-----|------|
| I <sub>GT</sub>                                | Gate Trigger Current                         | V <sub>D</sub> = 12V,<br>R <sub>L</sub> = 100Ω                | I-II-III | Max   | 50  | mA   |
| V <sub>GT</sub>                                | Gate Trigger Voltage                         |                                                               |          |       | 1.5 |      |
| V <sub>GD</sub>                                | Gate Non-Trigger Voltage                     | T <sub>J</sub> = 125°C                                        |          | Min   | 0.2 | V    |
| I <sub>H</sub>                                 | Holding Current                              | I <sub>T</sub> = 0.5A                                         |          | Max   | 60  | mA   |
| I <sub>L</sub>                                 | Latching Current                             | I <sub>G</sub> = 1.2I <sub>GT</sub>                           | I-III    |       | 60  |      |
|                                                |                                              |                                                               | II       |       | 100 |      |
| d <sub>V</sub> /d <sub>t</sub>                 | Critical Rate-of-Rise of Off-Stage Voltage   | V <sub>D</sub> = 2/3V <sub>DRM</sub> , T <sub>J</sub> = 125°C |          | Min   | 500 | V/μs |
| (d <sub>V</sub> /d <sub>t</sub> ) <sub>c</sub> | Critical Rate-of-Rise of Commutation Voltage | T <sub>J</sub> = 125°C                                        |          |       | 10  |      |

### Electrical Characteristics (4 Quadrants)

| Symbol                                         | Parameter                                    | Test Condition                                                | Quadrant               | Value |             | Unit |
|------------------------------------------------|----------------------------------------------|---------------------------------------------------------------|------------------------|-------|-------------|------|
| I <sub>GT</sub>                                | Gate Trigger Current                         | V <sub>D</sub> = 12V,<br>R <sub>L</sub> = 100Ω                | I-II-III               | Max   | 50          | mA   |
|                                                |                                              |                                                               | IV                     |       | 120         |      |
| V <sub>GT</sub>                                | Gate Trigger Voltage                         |                                                               | T <sub>J</sub> = 125°C |       | I-II-III-IV | Min  |
| V <sub>GD</sub>                                | Gate Non-Trigger Voltage                     | 0.2                                                           |                        |       |             |      |
| I <sub>H</sub>                                 | Holding Current                              | I <sub>T</sub> = 0.5A                                         |                        | Max   | 60          | mA   |
| I <sub>L</sub>                                 | Latching Current                             | I <sub>G</sub> = 1.2I <sub>GT</sub>                           | I-III-IV               |       | 60          |      |
|                                                |                                              |                                                               | II                     |       | 100         |      |
| d <sub>V</sub> /d <sub>t</sub>                 | Critical Rate-of-Rise of Off-Stage Voltage   | V <sub>D</sub> = 2/3V <sub>DRM</sub> , T <sub>J</sub> = 125°C |                        | Min   | 500         | V/μs |
| (d <sub>V</sub> /d <sub>t</sub> ) <sub>c</sub> | Critical Rate-of-Rise of Commutation Voltage | T <sub>J</sub> = 125°C                                        |                        |       | 10          |      |

### Static Characteristics

| Symbol            | Parameter                         | Test Condition                                                                                    | Value(Max) | Unit |
|-------------------|-----------------------------------|---------------------------------------------------------------------------------------------------|------------|------|
| V <sub>TM</sub>   | Peak ON-State Voltage             | I <sub>TM</sub> = 12A, T <sub>J</sub> = 25°C                                                      | 1.5        | V    |
| V <sub>TO</sub>   | Threshold Voltage                 | T <sub>J</sub> = 125°C                                                                            | 0.84       |      |
| R <sub>D</sub>    | Dynamic Resistance                | T <sub>J</sub> = 125°C                                                                            | 22.5       | mΩ   |
| I <sub>DRM</sub>  | Repetitive Peak Off-State Current | V <sub>D</sub> = V <sub>DRM</sub> , V <sub>R</sub> = V <sub>R</sub> RM,<br>T <sub>J</sub> = 25°C  | 5.0        | μA   |
| I <sub>R</sub> RM | Repetitive Peak Reverse Current   | V <sub>D</sub> = V <sub>DRM</sub> , V <sub>R</sub> = V <sub>R</sub> RM,<br>T <sub>J</sub> = 125°C | 1.0        | mA   |

### ■ Characteristic Curve

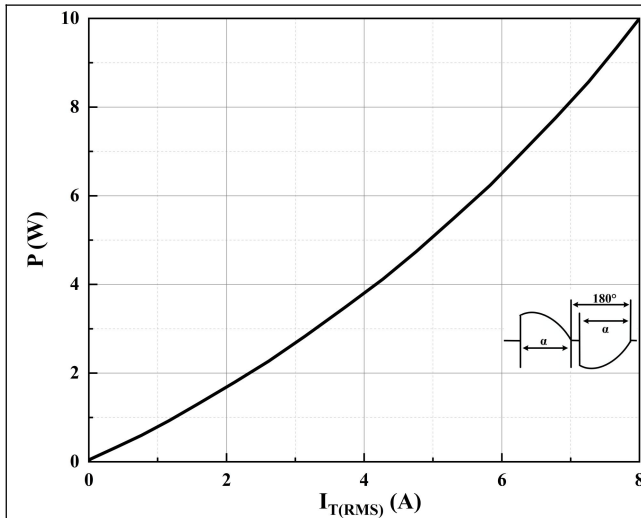


Figure 1. Power Dissipation vs. RMS On-State Current

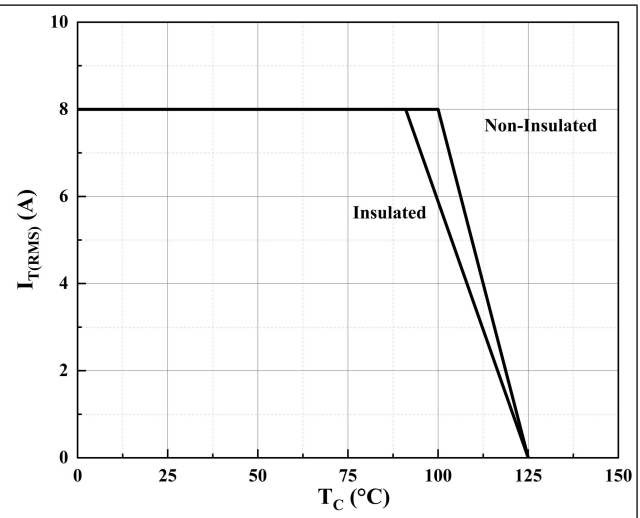


Figure 2. RMS On-State Current vs. Case Temperature

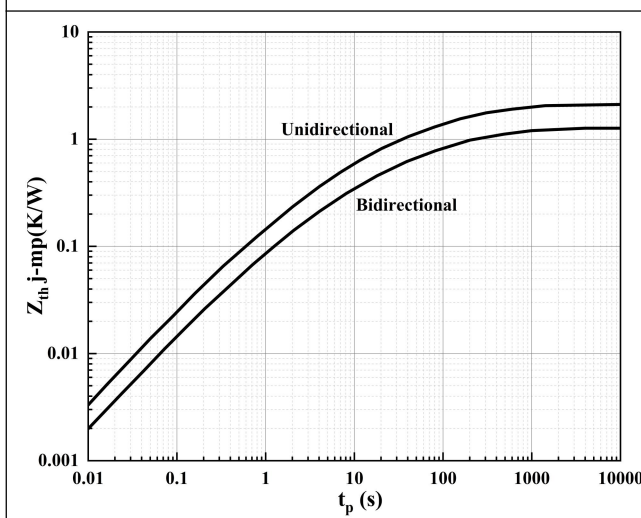


Figure 3. Relative Variation of Thermal Impedance Junction to Case vs. Pulse Duration

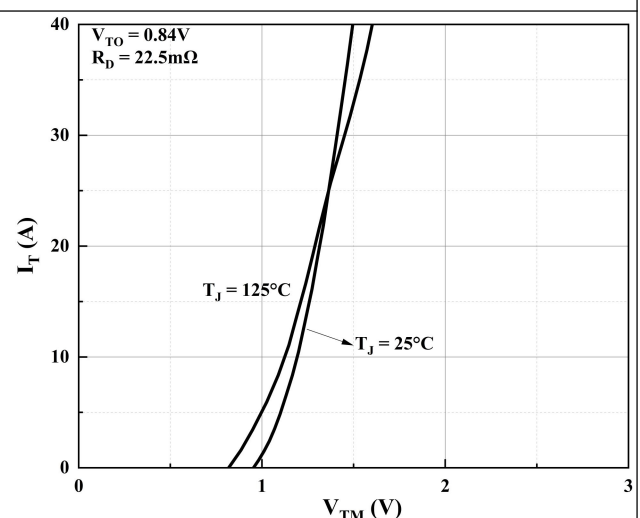


Figure 4. On-State Current vs. Peak ON-State Voltage

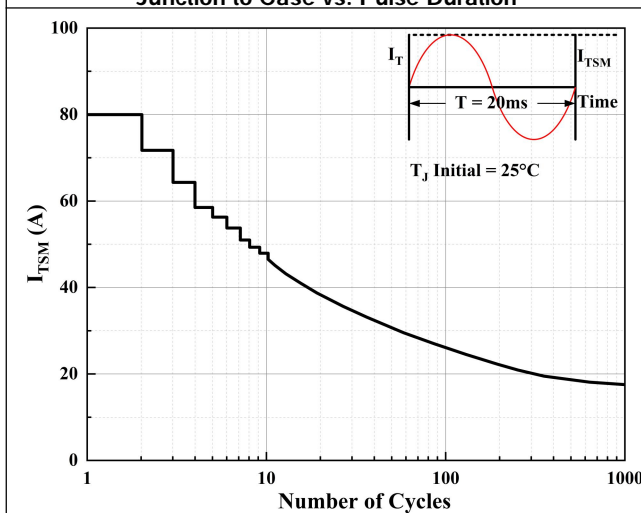


Figure 5. Surge Peak On-State Current vs. Number of Cycles

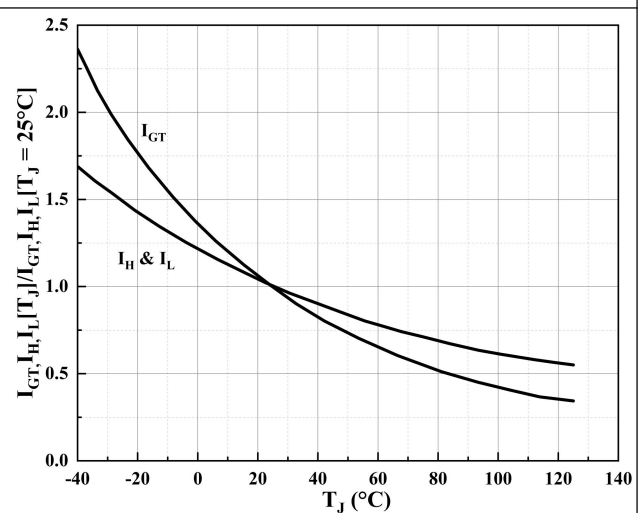


Figure 6. Gate Trigger Current, Holding Current and Latching Current vs. Junction Temperature

### ■ Characteristic Curve

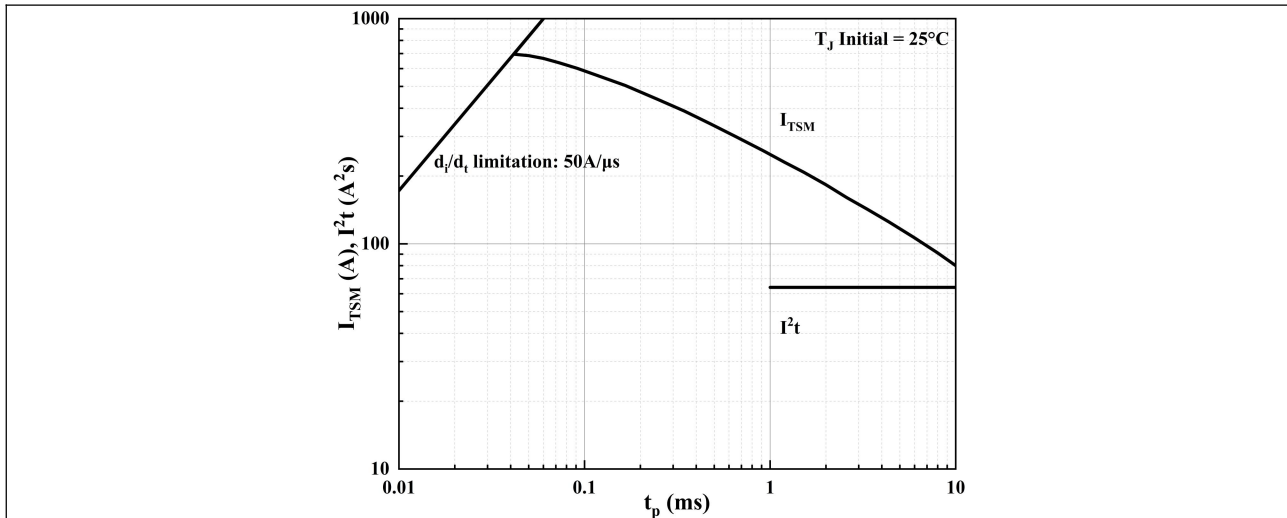


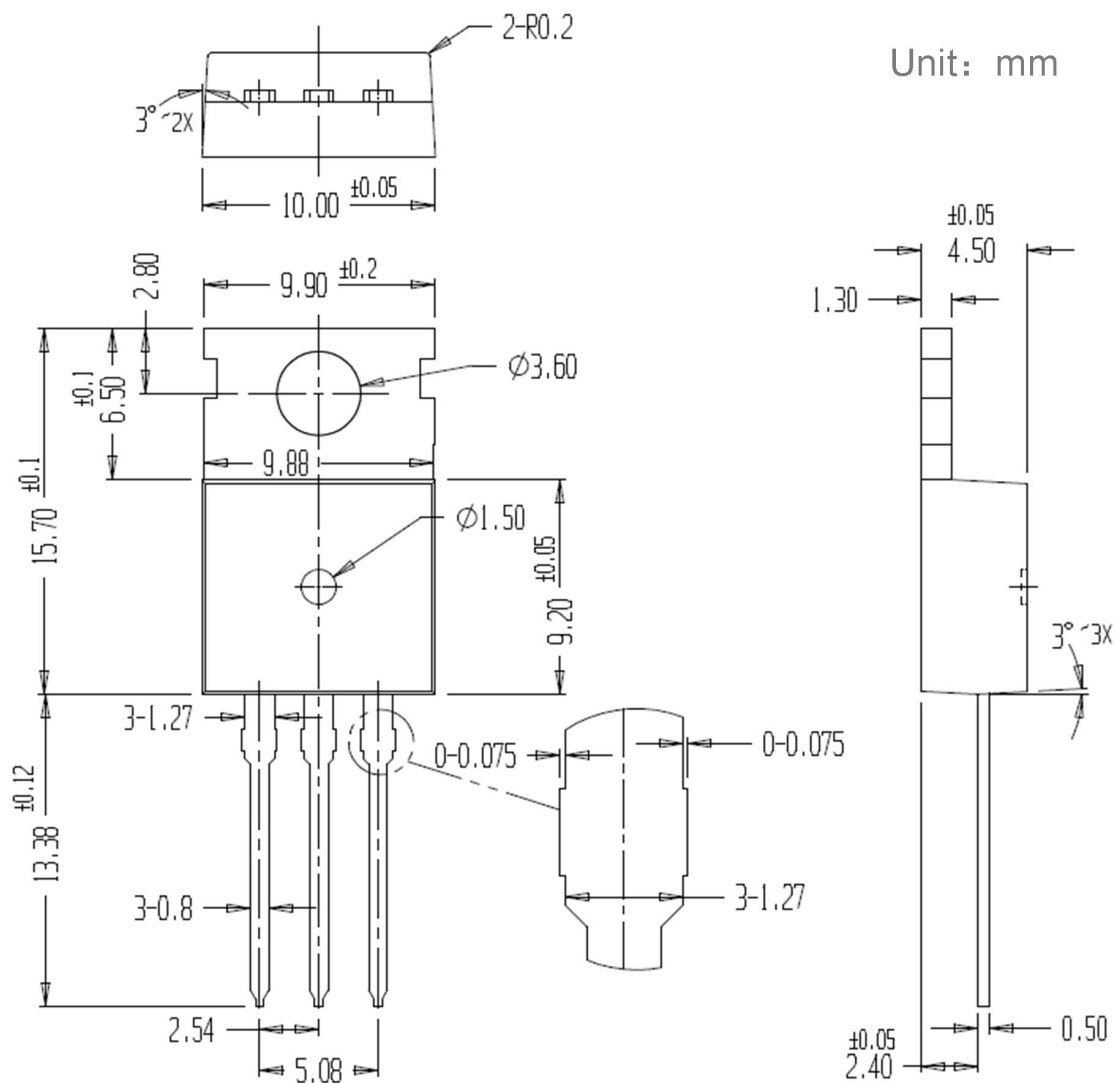
Figure 7. Non-Repetitive Surge Peak On-State Current for a Sinusoidal Pulse with Width  $t_p < 10\text{ms}$  and Corresponding Value of  $I^2t$  ( $d_i/d_t < 50\text{A}/\mu\text{s}$ )

### ■ Ordering Information

|           |                                     |                         |          |                                                          |          |                                                                                                                                                                                                     |                                                                 |
|-----------|-------------------------------------|-------------------------|----------|----------------------------------------------------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|
| <b>BT</b> | <b>(A)</b>                          | <b>08</b>               | <b>C</b> | <b>80</b>                                                | <b>X</b> | <b>(W)</b>                                                                                                                                                                                          | <b>(H)</b>                                                      |
| Triacs    | A: Insulated<br>None: Non-insulated | $I_{T(RMS)}: 8\text{A}$ | TO-220   | $V_{DRM} \geq 800\text{V}$<br>$V_{RRM} \geq 800\text{V}$ |          | C: $I_{GT1-3} \leq 25\text{mA}$<br>B: $I_{GT1-3} \leq 50\text{mA}$<br>C: $I_{GT1-3} \leq 25\text{mA}$ , $I_{GT4} \leq 50\text{mA}$<br>B: $I_{GT1-3} \leq 50\text{mA}$ , $I_{GT4} \leq 120\text{mA}$ | None: $T_J = 125^\circ\text{C}$<br>H: $T_J = 150^\circ\text{C}$ |
|           |                                     |                         |          |                                                          |          | W: 3 Quadrants<br>None: 4 Quadrants                                                                                                                                                                 |                                                                 |

### Package Information

#### TO-220



### Revision History

| Version | Date       | Subjects (major changes since last revision) |
|---------|------------|----------------------------------------------|
| 1.0     | 2025-05-08 | Datasheet Complete                           |
| 1.1     | 2026-09-16 | Add Ordering Information                     |