



### CTA/CTB24

24Amp - 400/600/800/1200V - TRIAC

#### Applications

- Phase Control
- Static Switching
- Light Dimming
- Motor Speed Control
- Kitchen Equipment
- Power Tools
- Solenoid Valve Controls:
  - Dishwashers
  - Washing Machines

- > **Suitable for General Purpose AC Switching**
- > **Alternistor/No Snubber Versions for Inductive Loads**
- > **Logic Level Available for use with Microcontrollers and Low Level Devices**
- > **IGT Range 35-50 mA (Q1)**
- > **V<sub>DRM</sub>/V<sub>RMM</sub> 400, 600, 800, 1200V**

#### Absolute Maximum Ratings

|                                                                                                                         | CONDITIONS                                      | SYMBOL                   | RATING                  |
|-------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|--------------------------|-------------------------|
| RMS On-State Current (full sine wave)                                                                                   | T <sub>c</sub> = 100°C<br>T <sub>c</sub> = 75°C | T0-220AB<br>T0-220AB Iso | I <sub>T(RMS)</sub> 24A |
| Non Repetitive Surge Peak On-State Current (Full Cycle, T <sub>j</sub> Initial = 25°C)                                  | F = 50 Hz<br>F = 60 Hz                          | I <sub>TSM</sub>         | 250A<br>260A            |
| I <sup>2</sup> t Value for fusing                                                                                       | tp = 10 ms                                      | I <sup>2</sup> t         | 340A <sup>2</sup> s     |
| Critical rate of rise of on-state current<br>I <sub>G</sub> = 2 x I <sub>GT</sub> , tr < 100 ns, T <sub>j</sub> = 125°C | F = 120 Hz                                      | di/dt                    | 50A/μs                  |
| Peak Gate Current @ T <sub>j</sub> = 125°C                                                                              | tp = 20 μs                                      | I <sub>GM</sub>          | 4A                      |
| Average Gate Power Dissipation @ T <sub>j</sub> = 125°C                                                                 |                                                 | P <sub>G(AV)</sub>       | 1W                      |
| Storage Temperature Range                                                                                               |                                                 | T <sub>stg</sub>         | -40 to +150°C           |
| Operating Junction Temperature Range                                                                                    |                                                 | T <sub>j</sub>           | -40 to +125°C           |
| Isolation Voltage (CTA Series only)                                                                                     |                                                 | V <sub>ISO</sub>         | 2500 V <sub>RMS</sub>   |

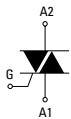
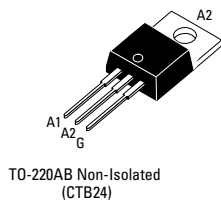
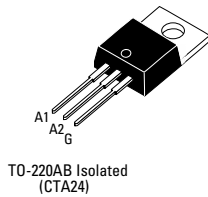
#### Electrical Characteristics

##### ALTERNISTOR/NO SNUBBER AND LOGIC LEVEL (3 Quadrants)

|                                                                                                         |           | CW      | BW       |
|---------------------------------------------------------------------------------------------------------|-----------|---------|----------|
| I <sub>GT</sub> MAX @ V <sub>D</sub> = 12 V, R <sub>L</sub> = 30Ω NOTE 1                                | QI-II-III | 35mA    | 50mA     |
| V <sub>GT</sub> MAX @ V <sub>D</sub> = 12 V, R <sub>L</sub> = 30Ω                                       | QI-II-III | 1.3V    | 1.3V     |
| V <sub>GD</sub> MIN @ V <sub>D</sub> = V <sub>DRM</sub> , R <sub>L</sub> = 3.3kΩ T <sub>j</sub> = 125°C | QI-II-III | 0.2V    | 0.2V     |
| I <sub>H</sub> MAX @ I <sub>T</sub> = 500 mA NOTE 2                                                     |           | 50mA    | 75mA     |
| I <sub>L</sub> MAX @ I <sub>G</sub> = 1.2 I <sub>GT</sub>                                               | QI-III    | 50mA    | 70mA     |
| I <sub>L</sub> MAX @ I <sub>G</sub> = 1.2 I <sub>GT</sub>                                               | Q-II      | 80mA    | 100mA    |
| dv/dt MIN @ V <sub>D</sub> = 67%V <sub>DRM</sub> (gate open) NOTE 2 T <sub>j</sub> = 125°C              |           | 500V/μs | 1000V/μs |
| (di/dt) <sub>c</sub> MIN without Snubber NOTE 2 T <sub>j</sub> = 125°C                                  |           | 13A/ms  | 22A/ms   |

##### STANDARD (4 Quadrants)

|                                                                                                         |           | B       |
|---------------------------------------------------------------------------------------------------------|-----------|---------|
| I <sub>GT</sub> MAX @ V <sub>D</sub> = 12 V, R <sub>L</sub> = 30Ω NOTE 1                                | QI-II-III | 50mA    |
| I <sub>GT</sub> MAX @ V <sub>D</sub> = 12 V, R <sub>L</sub> = 30Ω NOTE 1                                | QIV       | 100mA   |
| V <sub>GT</sub> MAX @ V <sub>D</sub> = 12 V, R <sub>L</sub> = 30Ω                                       | Q-All     | 1.3V    |
| V <sub>GD</sub> MIN @ V <sub>D</sub> = V <sub>DRM</sub> , R <sub>L</sub> = 3.3kΩ T <sub>j</sub> = 125°C | Q-All     | 0.2V    |
| I <sub>H</sub> MAX @ I <sub>T</sub> = 500 mA NOTE 2                                                     |           | 80mA    |
| I <sub>L</sub> MAX @ I <sub>G</sub> = 1.2 I <sub>GT</sub>                                               | QI-III-IV | 70mA    |
| I <sub>L</sub> MAX @ I <sub>G</sub> = 1.2 I <sub>GT</sub>                                               | Q-II      | 160mA   |
| dv/dt MIN @ V <sub>D</sub> = 67%V <sub>DRM</sub> (gate open) NOTE 2 T <sub>j</sub> = 125°C              |           | 500V/μs |
| (dv/dt) <sub>c</sub> MIN @ (di/dt) <sub>c</sub> = 13.3 A/ms NOTE 2 T <sub>j</sub> = 125°C               |           | 10V/μs  |



#### GENERAL NOTES

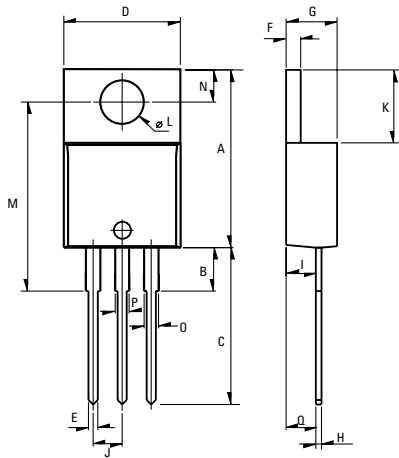
1. Minimum IGT is guaranteed at 5% of IGT max.
2. For both polarities of A2 referenced to A1
3. All parameters at 25 degrees C unless otherwise specified.

## Static Characteristics

|                                                      |                     |              |
|------------------------------------------------------|---------------------|--------------|
| $V_T$ MAX @ $I_{TM} = 35$ A, $t_p = 380\mu s$ NOTE 2 | $T_j = 25^\circ C$  | 1.55V        |
| $V_{TO}$ MAX @ Threshold Voltage NOTE 2              | $T_j = 125^\circ C$ | 0.85V        |
| $R_d$ MAX @ Dynamic Resistance NOTE 2                | $T_j = 125^\circ C$ | 16m $\Omega$ |
| $I_{ORM}$ MAX @ $V_{ORM} = V_{RRM}$                  | $T_j = 25^\circ C$  | 5 $\mu A$    |
| $I_{RRM}$ MAX @ $V_{ORM} = V_{RRM}$                  | $T_j = 125^\circ C$ | 3mA          |

## Thermal Resistances

|                       | SYMBOL            | RATING                |
|-----------------------|-------------------|-----------------------|
| Junction to Case (AC) | TO-220AB          | $R_{th(j-c)}$ 0.8°C/W |
| Junction to Case (AC) | TO-220AB Isolated | $R_{th(j-c)}$ 1.7°C/W |
| Junction to Ambient   | TO-220AB          | $R_{th(j-a)}$ 60°C/W  |
| Junction to Ambient   | TO-220AB Isolated | $R_{th(j-a)}$ 60°C/W  |



Weight: 2.3g (0.08 oz)

## Dimensions

| REF. | Millimeters |      | Inches | Typ.  | Max.  |
|------|-------------|------|--------|-------|-------|
|      | Min.        | Typ. |        |       |       |
| A    | 15.24       |      | 0.6    |       | 0.62  |
| B    |             | 3.23 |        | 0.127 |       |
| C    | 12.78       |      | 0.503  |       | 0.543 |
| D    | 9.96        |      | 0.392  |       | 0.408 |
| E    | 0.69        |      | 0.027  |       | 0.037 |
| F    | 1.22        |      | 0.048  |       | 0.052 |
| G    | 4.62        |      | 0.182  |       | 0.19  |
| H    | 0.46        |      | 0.018  |       | 0.024 |
| I    | 2.49        |      | 0.098  |       | 0.112 |
| J    | 2.39        |      | 0.094  |       | 0.106 |
| K    | 6.48        |      | 0.255  |       | 0.271 |
| L    | 3.78        |      | 0.149  |       | 0.153 |
| M    | 15.49       | 16   | 0.61   | 0.63  | 0.65  |
| N    | 2.59        |      | 0.102  |       | 0.114 |
| O    | 0.99        |      | 0.039  |       | 0.061 |
| P    | 0.99        |      | 0.039  |       | 0.061 |
| Q    |             | 2.67 |        | 0.105 |       |

## Part Number Selection

| Part Number     | Voltage [Vpk]       | $I_{GT}$ [mA] | Type                   | Package  |
|-----------------|---------------------|---------------|------------------------|----------|
| CTA/CTB24-xxxB  | 400, 600, 800, 1200 | 50mA          | Standard               | TO-220AB |
| CTA/CTB24-xxxBW | 400, 600, 800, 1200 | 50mA          | Alternistor/No Snubber | TO-220AB |
| CTA/CTB24-xxxCW | 400, 600, 800, 1200 | 35mA          | Alternistor/No Snubber | TO-220AB |

## Part Number Designation

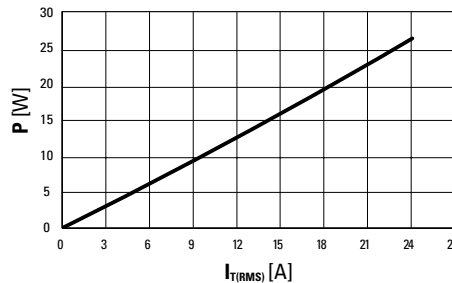
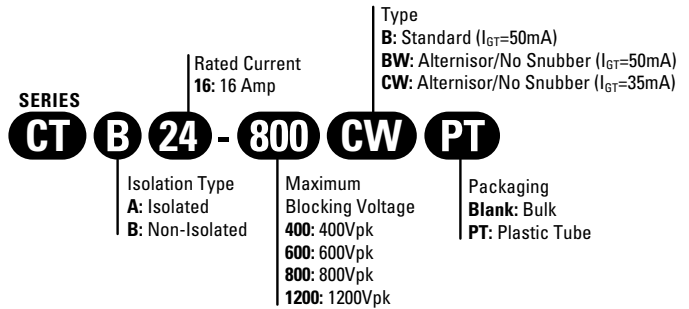


Fig. 1: Power dissipation versus RMS on-state current (full cycle).

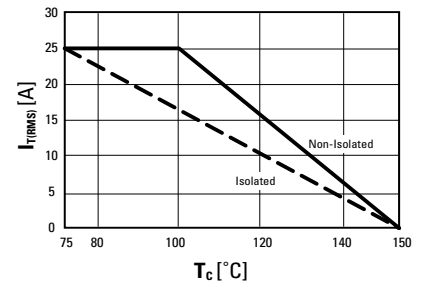


Fig. 2: RMS on-state current versus case temperature (full cycle)

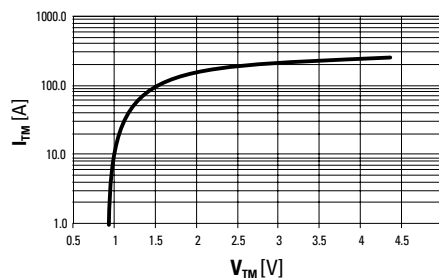


Fig. 3: On-state current versus on-state voltage (instantaneous values)

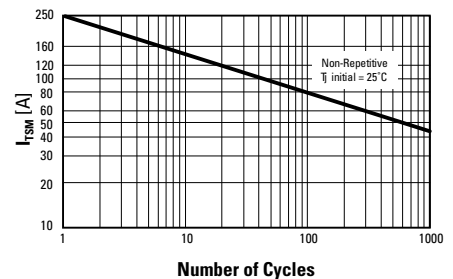


Fig. 4: Non-repetitive surge peak on-state current versus number of cycles.

## ISO9001 Certified

## Approvals

UL - Pending

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