



### CTA/CTB06

6Amp - 400/600/800/1000V - 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 5-50 mA (Q1)**
- > **V<sub>DRM</sub>/V<sub>RMM</sub> 400, 600, 800, 1000V**

#### Absolute Maximum Ratings

|                                                                                                                         | CONDITIONS                                       | SYMBOL                   | RATING                    |
|-------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|--------------------------|---------------------------|
| RMS On-State Current (full sine wave)                                                                                   | T <sub>c</sub> = 110°C<br>T <sub>c</sub> = 105°C | T0-220AB<br>T0-220AB Iso | I <sub>T(RMS)</sub><br>6A |
| 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>         | 60A<br>63A                |
| I <sup>2</sup> t Value for fusing                                                                                       | tp = 10 ms                                       | I <sup>2</sup> t         | 21A <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)

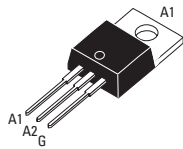
|                                                                                  |                                  | TW      | SW      | CW      | BW       |
|----------------------------------------------------------------------------------|----------------------------------|---------|---------|---------|----------|
| I <sub>GT</sub> MAX @ V <sub>D</sub> = 12 V, R <sub>L</sub> = 30Ω NOTE 1         | QI-II-III                        | 5mA     | 10mA    | 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    | 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    | 0.2V    | 0.2V     |
| I <sub>H</sub> MAX @ I <sub>T</sub> = 500 mA NOTE 2                              |                                  | 10mA    | 15mA    | 35mA    | 50mA     |
| I <sub>L</sub> MAX @ I <sub>G</sub> = 1.2 I <sub>GT</sub>                        | QI-III                           | 10mA    | 25mA    | 50mA    | 70mA     |
| I <sub>L</sub> MAX @ I <sub>G</sub> = 1.2 I <sub>GT</sub>                        | Q-II                             | 15mA    | 30mA    | 60mA    | 80mA     |
| dv/dt MIN @ V <sub>D</sub> = 67%V <sub>DRM</sub> (gate open) NOTE 2              | T <sub>j</sub> = 125°C           | 20V/μs  | 40V/μs  | 400V/μs | 1000V/μs |
| (di/dt) <sub>c</sub> MIN @ (dv/dt) <sub>c</sub> = 0.1 V/ms NOTE 2                | T <sub>j</sub> = 125°C           | 2.7A/ms | 3.5A/ms |         |          |
| (di/dt) <sub>c</sub> MIN @ (dv/dt) <sub>c</sub> = 10 V/ms NOTE 2                 | T <sub>j</sub> = 125°C           | 1.2A/ms | 2.4A/ms |         |          |
| (di/dt) <sub>c</sub> MIN without Snubber NOTE 2                                  | T <sub>j</sub> = 125°C           |         |         | 3.5A/ms | 5.3A/ms  |

##### STANDARD (4 Quadrants)

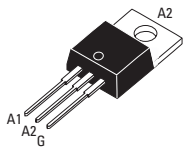
|                                                                                  |                              | C       | B       |
|----------------------------------------------------------------------------------|------------------------------|---------|---------|
| I <sub>GT</sub> MAX @ V <sub>D</sub> = 12 V, R <sub>L</sub> = 30Ω NOTE 1         | QI-II-III                    | 25mA    | 50mA    |
| I <sub>GT</sub> MAX @ V <sub>D</sub> = 12 V, R <sub>L</sub> = 30Ω NOTE 1         | QIV                          | 50mA    | 100mA   |
| V <sub>GT</sub> MAX @ V <sub>D</sub> = 12 V, R <sub>L</sub> = 30Ω                | Q-AII                        | 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-AII | 0.2V    |         |
| I <sub>H</sub> MAX @ I <sub>T</sub> = 500 mA NOTE 2                              |                              | 25mA    | 50mA    |
| I <sub>L</sub> MAX @ I <sub>G</sub> = 1.2 I <sub>GT</sub>                        | QI-III-IV                    | 40mA    | 50mA    |
| 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       | 200V/μs | 400V/μs |
| (dv/dt) <sub>c</sub> MIN @ (di/dt) <sub>c</sub> = 2.7 A/ms NOTE 2                | T <sub>j</sub> = 125°C       | 5V/μs   | 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.



TO-220AB Isolated  
(CTA06)



TO-220AB Non-Isolated  
(CTB06)

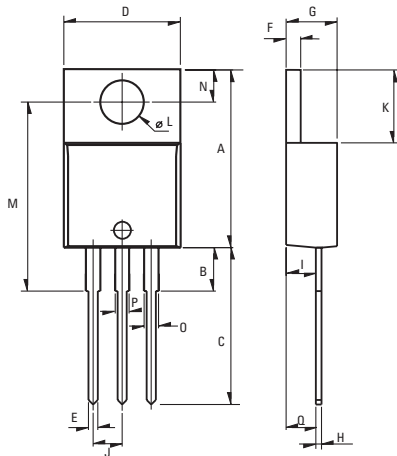


## Static Characteristics

|                                                                                           |                           |       |
|-------------------------------------------------------------------------------------------|---------------------------|-------|
| $V_T \text{ MAX @ } I_{TM} = 5.5 \text{ A, } t_p = 380 \mu\text{s}$ <small>NOTE 2</small> | $T_j = 25^\circ\text{C}$  | 1.55V |
| $V_{TO} \text{ MAX @ Threshold Voltage}$ <small>NOTE 2</small>                            | $T_j = 125^\circ\text{C}$ | 0.85V |
| $R_d \text{ MAX @ Dynamic Resistance}$ <small>NOTE 2</small>                              | $T_j = 125^\circ\text{C}$ | 60mΩ  |
| $I_{ORM} \text{ MAX @ } V_{ORM} = V_{RRM}$                                                | $T_j = 25^\circ\text{C}$  | 5μA   |
| $I_{RRM} \text{ MAX @ } V_{ORM} = V_{RRM}$                                                | $T_j = 125^\circ\text{C}$ | 1mA   |

## Thermal Resistances

|                       | SYMBOL            | RATING                |
|-----------------------|-------------------|-----------------------|
| Junction to Case (AC) | TO-220AB          | $R_{th(j-c)}$ 1.8°C/W |
| Junction to Case (AC) | TO-220AB Isolated | $R_{th(j-c)}$ 2.7°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 |       |       |
|------|-------------|------|-------|--------|-------|-------|
|      | Min.        | Typ. | Max.  | Min.   | Typ.  | Max.  |
| A    | 15.24       |      | 15.75 | 0.6    |       | 0.62  |
| B    |             | 3.23 |       |        | 0.127 |       |
| C    | 12.78       |      | 13.79 | 0.503  |       | 0.543 |
| D    | 9.96        |      | 10.36 | 0.392  |       | 0.408 |
| E    | 0.69        |      | 0.94  | 0.027  |       | 0.037 |
| F    | 1.22        |      | 1.32  | 0.048  |       | 0.052 |
| G    | 4.62        |      | 4.83  | 0.182  |       | 0.19  |
| H    | 0.46        |      | 0.61  | 0.018  |       | 0.024 |
| I    | 2.49        |      | 2.84  | 0.098  |       | 0.112 |
| J    | 2.39        |      | 2.69  | 0.094  |       | 0.106 |
| K    | 6.48        |      | 6.88  | 0.255  |       | 0.271 |
| L    | 3.78        |      | 3.89  | 0.149  |       | 0.153 |
| M    | 15.49       | 16   | 16.51 | 0.61   | 0.63  | 0.65  |
| N    | 2.59        |      | 2.9   | 0.102  |       | 0.114 |
| O    | 0.99        |      | 1.55  | 0.039  |       | 0.061 |
| P    | 0.99        |      | 1.55  | 0.039  |       | 0.061 |
| Q    |             | 2.67 |       |        | 0.105 |       |

## Part Number Selection

| Part Number     | Voltage [Vpk]       | I <sub>GT</sub> [mA] | Type                   | Package  |
|-----------------|---------------------|----------------------|------------------------|----------|
| CTA/CTB06-xxxB  | 400, 600, 800, 1000 | 50mA                 | Standard               | TO-220AB |
| CTA/CTB06-xxxBW | 400, 600, 800, 1000 | 50mA                 | Alternistor/No Snubber | TO-220AB |
| CTA/CTB06-xxxC  | 400, 600, 800, 1000 | 25mA                 | Standard               | TO-220AB |
| CTA/CTB06-xxxCW | 400, 600, 800, 1000 | 35mA                 | Alternistor/No Snubber | TO-220AB |
| CTA/CTB06-xxxSW | 400, 600, 800, 1000 | 10mA                 | Logic Level            | TO-220AB |
| CTA/CTB06-xxxTW | 400, 600, 800, 1000 | 5mA                  | Logic Level            | TO-220AB |

## Part Number Designation

**CT** SERIES  
**B** Isolation Type  
**06** Rated Current 06: 6 Amp  
**-**  
**800** Maximum Blocking Voltage  
**CW** Type  
**PT** Packaging

**A:** Isolated  
**B:** Non-Isolated  
**400:** 400Vpk  
**600:** 600Vpk  
**800:** 800Vpk  
**1000:** 1000Vpk

**B:** Standard (I<sub>GT</sub>=50mA)  
**BW:** Alternistor/No Snubber (I<sub>GT</sub>=50mA)  
**C:** Standard (I<sub>GT</sub>=25mA)  
**CW:** Alternistor/No Snubber (I<sub>GT</sub>=35mA)  
**SW:** Logic Level (I<sub>GT</sub>=10mA)  
**TW:** Logic Level (I<sub>GT</sub>=5mA)

**Blank:** Bulk  
**PT:** Plastic Tube

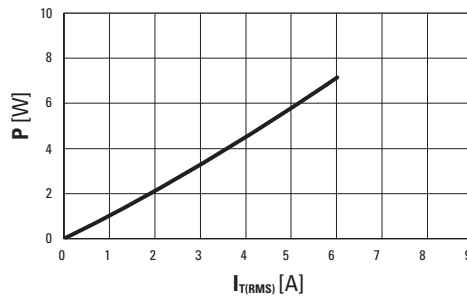


Fig. 1: Power dissipation versus RMS on-state current (full cycle).

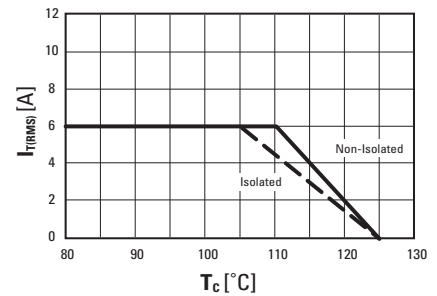


Fig. 2: RMS on-state current versus case temperature (full cycle)

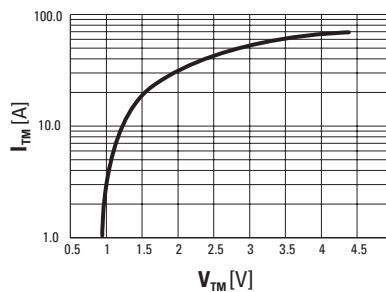


Fig. 3: On-state current versus on-state voltage (instantaneous values)

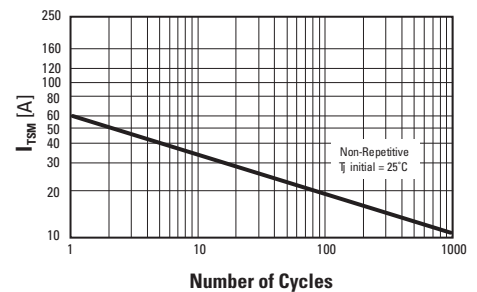


Fig. 4: Non-repetitive surge peak on-state current versus number of cycles.

## ISO9001 Certified

## Approvals

UL - E72445

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