



### CTA/CTB12

12Amp - 400/600/800/1000V - TRIAC

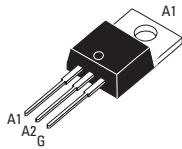
#### Applications

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

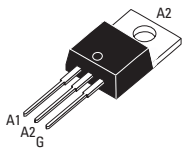
- > Suitable for General Purpose AC Switching
- > Alternistor/No Snubber Versions for Inductive Loads
- > Logic Level Available for use with Microcontrollers and Low Level Devices
- > IGT Range 5-50 mA (Q1)
- > V<sub>DRM</sub>/V<sub>RMM</sub> 400, 600, 800, 1000V

#### Absolute Maximum Ratings

	CONDITIONS	SYMBOL	RATING
RMS On-State Current (full sine wave)	T <sub>c</sub> = 105°C T <sub>c</sub> = 90°C	T0-220AB T0-220AB Iso	I <sub>T(RMS)</sub> 12A
Non Repetitive Surge Peak On-State Current (Full Cycle, T <sub>j</sub> Initial = 25°C)	F = 50 Hz F = 60 Hz	I <sub>TSM</sub>	120A 126A
I <sup>2</sup> t Value for fusing	tp = 10 ms	I <sup>2</sup> t	78A <sup>2</sup> s
Critical rate of rise of on-state current I <sub>G</sub> = 2 x I <sub>GT</sub> , tr < 100ns, 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>



TO-220AB Isolated (CTA12)



TO-220AB Non-Isolated (CTB12)



#### 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	
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		3.5A/ms	5.4A/ms		
(di/dt) <sub>c</sub> MIN @ (dv/dt) <sub>c</sub> = 10 V/ms NOTE 2	T <sub>j</sub> = 125°C		1A/ms	2.9A/ms		
(di/dt) <sub>c</sub> MIN without Snubber NOTE 2	T <sub>j</sub> = 125°C				6.5A/ms	12A/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-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			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

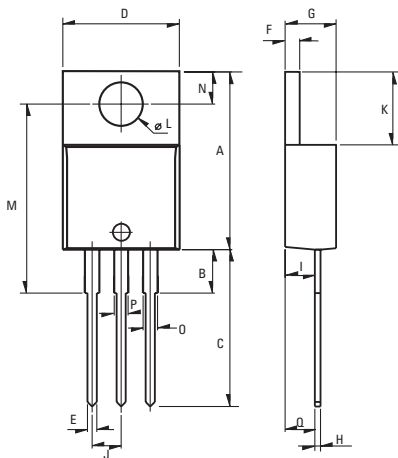
1. Minimum IGT is guaranteed at 5% of IGT max.
2. For both polarities of A2 referenced to A1
3. All parameters at 25 degrees C unless otherwise specified.

## Static Characteristics

$V_T$ MAX @ $I_{TM} = 17$ 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	$T_j = 125^\circ C$	35m $\Omega$
$I_{ORM}$ MAX @ $V_{DRM} = V_{RRM}$	$T_j = 25^\circ C$	5 $\mu A$
$I_{RRM}$ MAX @ $V_{DRM} = V_{RRM}$	$T_j = 125^\circ C$	1mA

## Thermal Resistances

	SYMBOL	RATING
Junction to Case (AC)	TO-220AB	$R_{th(j-c)}$ 1.4°C/W
Junction to Case (AC)	TO-220AB Isolated	$R_{th(j-c)}$ 2.3°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]	$I_{GT}$ [mA]	Type	Package
CTA/CTB12-xxxB	400, 600, 800, 1000	50mA	Standard	TO-220AB
CTA/CTB12-xxxBW	400, 600, 800, 1000	50mA	Alternistor/No Snubber	TO-220AB
CTA/CTB12-xxxC	400, 600, 800, 1000	25mA	Standard	TO-220AB
CTA/CTB12-xxxCW	400, 600, 800, 1000	35mA	Alternistor/No Snubber	TO-220AB
CTA/CTB12-xxxSW	400, 600, 800, 1000	10mA	Logic Level	TO-220AB
CTA/CTB12-xxxTW	400, 600, 800, 1000	5mA	Logic Level	TO-220AB

## Part Number Designation

**CT** SERIES  
**B** Isolation Type  
**12** Rated Current 12: 12 Amp  
**800** Maximum Blocking Voltage  
**CW** Type  
**PT** Packaging

**A:** Isolated  
**B:** Non-Isolated

**400:** 400Vpk  
**600:** 600Vpk  
**800:** 800Vpk  
**1000:** 1000Vpk

**B:** Standard ( $I_{GT}=50$ mA)  
**BW:** Alternistor/No Snubber ( $I_{GT}=50$ mA)  
**C:** Standard ( $I_{GT}=25$ mA)  
**CW:** Alternistor/No Snubber ( $I_{GT}=35$ mA)  
**SW:** Logic Level ( $I_{GT}=10$ mA)  
**TW:** Logic Level ( $I_{GT}=5$ mA)

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

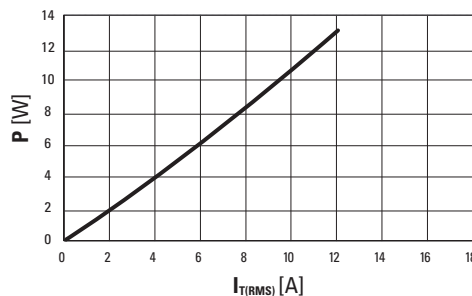


Fig. 1: Power dissipation versus RMS on-state current (full cycle).

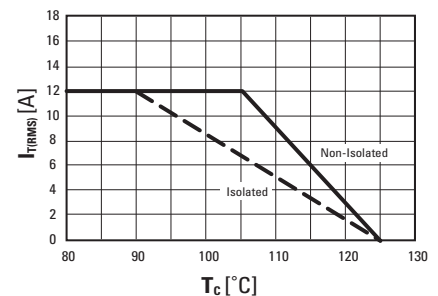


Fig. 2: RMS on-state current versus case temperature (full cycle)

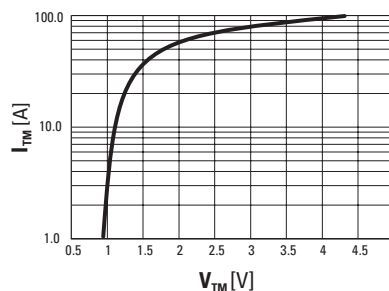


Fig. 3: On-state current versus on-state voltage (instantaneous values)

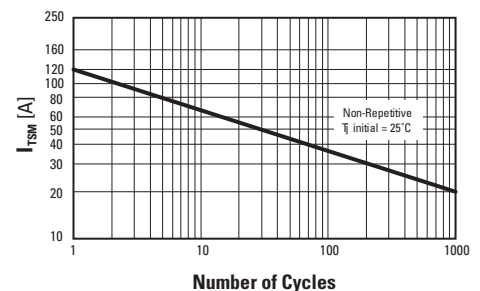


Fig. 4: Non-repetitive surge peak on-state current versus number of cycles.

## ISO9001 Certified

## Approvals

UL - E72445

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