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C3 Semiconductor, LLC

POWER COMPONENTS

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**
- > **400A Surge**
- > **IGT = 50 mA**
- > **V_{DRM}/V_{RMM} 400, 600, 800, 1000V**

CTA/CTB42

40Amp - 400/600/800/1000V - **TRIAC**

Absolute Maximum Ratings

	CONDITIONS	SYMBOL	RATING
RMS On-State Current (full sine wave)	T _c = 80°C T _c = 95°C	TO-247AD TO-247AD Iso I _{T(RMS)}	40A
Non Repetitive Surge Peak On-State Current (Full Cycle, T _j Initial = 25°C)	F = 50 Hz F = 60 Hz	I _{TSM}	400A 420A
I ² t Value for fusing	tp = 10 ms	I ² t	880A ² s
Critical rate of rise of on-state current I _G = 2 x I _{GT} , tr < 100 ns, T _j = 125°C		di/dt	100A/μs
Peak Gate Current @ T _j = 125°C	tp = 20 μs	I _{GM}	8A
Average Gate Power Dissipation @ T _j = 125°C		P _{G(AV)}	1W
Storage Temperature Range		T _{stg}	-40 to +150°C
Operating Junction Temperature Range		T _j	-40 to +125°C
Isolation Voltage (CTA Series only)		V _{ISO}	2500 V _{RMS}

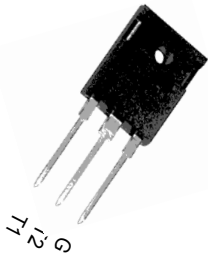
Electrical Characteristics

ALTERNISTOR/NO SNUBBER AND LOGIC LEVEL (3 Quadrants)

		BW
I _{GT} MAX @ V _D = 12 V, R _L = 30Ω NOTE 1	QI-II-III	50mA
V _{GT} MAX @ V _D = 12 V, R _L = 30Ω	QI-II-III	1.3V
V _{GD} MIN @ V _D = V _{DRM} , R _L = 3.3kΩ	T _j = 125°C QI-II-III	0.2V
I _H MAX @ I _T = 500 mA NOTE 2		75mA
I _L MAX @ I _G = 1.2 I _{GT}	QI-III	70mA
I _L MAX @ I _G = 1.2 I _{GT}	Q-II	160mA
dv/dt MIN @ V _D = 67%V _{DRM} (gate open) NOTE 2	T _j = 125°C	500V/μs
(di/dt) _c MIN without Snubber NOTE 2 & 4	T _j = 125°C	22A/ms

STANDARD (4 Quadrants)

		B
I _{GT} MAX @ V _D = 12 V, R _L = 30Ω NOTE 1	QI-II-III	50mA
I _{GT} MAX @ V _D = 12 V, R _L = 30Ω NOTE 1	QIV	100mA
V _{GT} MAX @ V _D = 12 V, R _L = 30Ω	Q-All	1.3V
V _{GD} MIN @ V _D = V _{DRM} , R _L = 3.3kΩ	T _j = 125°C Q-All	0.2V
I _H MAX @ I _T = 100 mA NOTE 2		75mA
I _L MAX @ I _G = 1.2 I _{GT}	QI-III-IV	75mA
I _L MAX @ I _G = 1.2 I _{GT}	Q-II	160mA
dv/dt MIN @ V _D = 67%V _{DRM} (gate open) NOTE 2	T _j = 125°C	500V/μs
(dv/dt) _c MIN @ (di/dt) _c = 13.3 A/ms NOTE 2	T _j = 125°C	10V/μs



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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.
4. Commutating dv/dt = 50V/μs, (exponential to 200 Vpk)

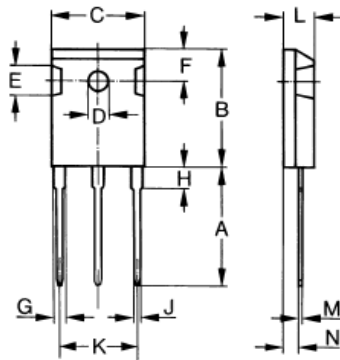
Static Characteristics

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	$T_j = 125^\circ C$	10m Ω
I_{DRM} MAX @ $V_{DRM} = V_{RRM}$	$T_j = 25^\circ C$	5 μ A
I_{RRM} MAX @ $V_{DRM} = V_{RRM}$	$T_j = 125^\circ C$	5mA

Thermal Resistances

		SYMBOL	RATING
Junction to Case (AC)	TO-247AD	Rth(j-c)	0.6°C/W
Junction to Case (AC)	TO-247AD Isolated	Rth(j-c)	1.1°C/W
Junction to Ambient	TO-247AD	Rth(j-a)	50°C/W
Junction to Ambient	TO-247AD Isolated	Rth(j-a)	50°C/W

Dimensions TO-247AD



Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	19.81	20.32	0.780	0.800
B	20.80	21.46	0.819	0.845
C	15.75	16.26	0.610	0.640
D	3.55	3.65	0.140	0.144
E	4.32	5.49	0.170	0.216
F	5.4	6.2	0.212	0.244
G	1.65	2.13	0.065	0.084
H	-	4.5	-	0.177
J	1.0	1.4	0.040	0.055
K	10.8	11.0	0.426	0.433
L	4.7	5.3	0.185	0.209
M	0.4	0.8	0.016	0.031
N	1.5	2.49	0.087	0.102

Part Number Selection

Part Number	Voltage [Vpk]	I_{GT} [mA]	Type	Package
CTA/CTB42-xxxB	400, 600, 800, 1000	50mA	Standard	TO-247AD
CTA/CTB42-xxxBW	400, 600, 800, 1000	50mA	Alternistor/No Snubber	TO-247AD

Part Number Designation

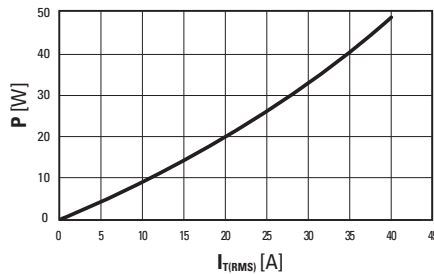
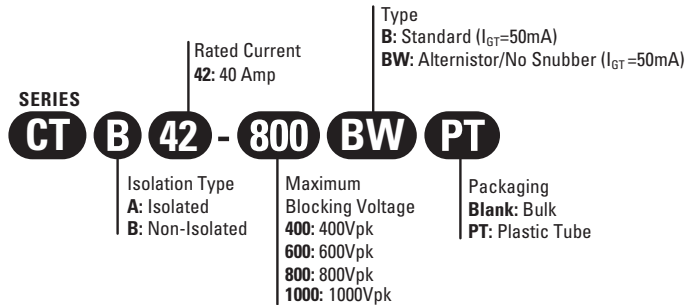


Fig. 1: Power dissipation versus RMS on-state current (full cycle).

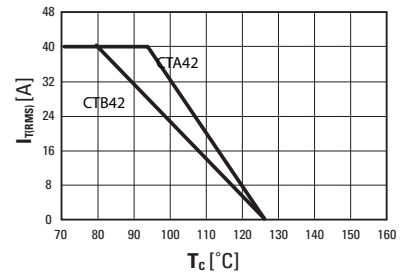


Fig. 2: RMS on-state current versus case temperature (full cycle)

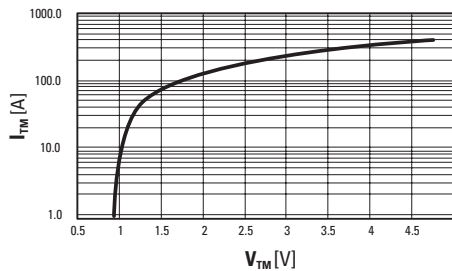


Fig. 3: On-state current versus on-state voltage (instantaneous values)

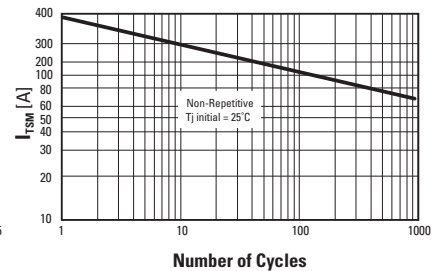


Fig. 4: Non-repetitive surge peak on-state current versus number of cycles.

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Approvals

UL - E72445

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