

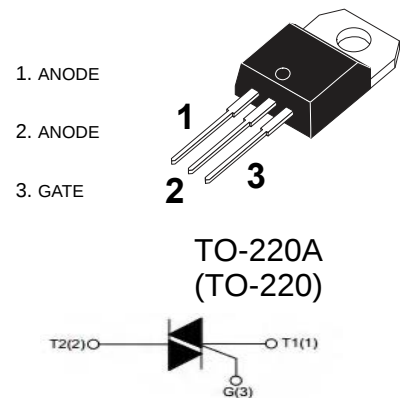


Description

The BTA16-600BRG Triac series are suitable for general purpose mains power AC switching. They can be used as ON/OFF function in applications such as static relays, heating regulation or induction motor starting circuit. They are also recommended for phase control operations in light dimmers and appliance motors speed controllers.

Main Fetures

Symbol	value	unit
$I_{T(RMS)}$	16	A
V_{DRM}/V_{RRM}	600	V
I_{TSM}	160	A



Absolute Maximum Ratings

Symbol	Parameters			Value	Unit
$I_{T(RMS)}$	RMS on-state current (full sine wave)		$T_c = 100\text{ }^{\circ}\text{C}$	16	A
I_{TSM}	Non repetitive surge peak on-state current (full cycle, T_j initial = $25\text{ }^{\circ}\text{C}$)	$F = 50\text{ Hz}$	$t_p = 20\text{ ms}$	160	A
		$F = 60\text{ Hz}$	$t_p = 16.7\text{ ms}$	168	
I^2t	I^2t value for fusing	$t_p = 10\text{ ms}$		144	A^2s
di/dt	Critical rate of rise of on-state current $I_G = 2 \times I_{GT}$, $t_r \leq 100\text{ ns}$	$F = 120\text{ Hz}$	$T_j = 125\text{ }^{\circ}\text{C}$	50	$\text{A}/\mu\text{s}$
V_{DSM}/V_{RSM}	Non repetitive surge peak off-state voltage	$t_p = 10\text{ ms}$	$T_j = 25\text{ }^{\circ}\text{C}$	$V_{DRM}/V_{RRM} + 100$	V
I_{GM}	Peak gate current	$t_p = 20\text{ }\mu\text{s}$	$T_j = 125\text{ }^{\circ}\text{C}$	4	A
$P_{G(AV)}$	Average gate power dissipation		$T_j = 125\text{ }^{\circ}\text{C}$	1	W
T_{stg}	Storage junction temperature range			-40 to +150	$^{\circ}\text{C}$
T_j	Operating junction temperature range			-40 to +125	$^{\circ}\text{C}$



Static Electrical Characteristics

Symbol	Test conditions	T_j		Value	Unit
$V_T^{(1)}$	$I_{TM} = 22.5 \text{ A}$, $t_p = 380 \mu\text{s}$	25 °C	Max.	1.55	V
$V_{TO}^{(1)}$	threshold on-state voltage	125 °C	Max.	0.85	V
$R_D^{(1)}$	Dynamic resistance	125 °C	Max.	25	mΩ
I_{DRM}/I_{RRM}	$V_{DRM} = V_{RRM}$	25 °C	Max.	5	μA
		125 °C		2	mA

1. For both polarities of A2 referenced to A1

Electrical Characteristics

($T_j = 25 \text{ °C}$, unless otherwise specified) - standard (4 quadrants)

Symbol	Parameters	Quadrant		BTA16	Unit
$I_{GT}^{(1)}$	$V_D = 12 \text{ V}$, $R_L = 33 \Omega$	I - II - III IV	Max.	25 50	mA
V_{GT}		All	Max.	1.3	V
V_{GD}	$V_D = V_{DRM}$, $R_L = 3.3 \text{ k}\Omega$, $T_j = 125 \text{ °C}$	All	Min.	0.2	V
$I_H^{(2)}$	$I_T = 500 \text{ mA}$		Max.	25	mA
I_L	$I_G = 1.2 I_{GT}$	I - III - IV	Max.	40	mA
		II	Max.	80	

Symbol	Parameters	Quadrant		BTA16	Unit
$dV/dt^{(2)}$	$V_D = 67 \% V_{DRM}$ gate open, $T_j = 125 \text{ °C}$		Min.	200	V/μs
$(dV/dt)_c^{(2)}$	$(dI/dt)_c = 7 \text{ A/ms}$, $T_j = 125 \text{ °C}$		Min.	5	V/μs

1. Minimum I_{GT} is guaranteed at 5 % of I_{GT} max.

2. For both polarities of A2 referenced to A1



Electrical Characteristics

($T_j = 25\text{ }^{\circ}\text{C}$, unless otherwise specified) - Snubberless and logic level (3quadrants)

Symbol	Parameters	Quadrant		BTA16	Unit
$I_{GT}^{(1)}$	$V_D = 12\text{ V}$, $R_L = 30\text{ }\Omega$	I - II - III	Max.	35	mA
V_{GT}			Max.	1.3	V
V_{GD}	$V_D = V_{DRM}$, $R_L = 3,3\text{ k}\Omega$, $T_j = 125\text{ }^{\circ}\text{C}$		Min.	0.2	V
$I_H^{(2)}$	$I_T = 500\text{ mA}$		Max.	35	mA
I_L	$I_G = 1.2\text{ }I_{GT}$	I - III	Max.	50	mA
		II	Max.	60	
$(dV/dt)^{(2)}$	$V_D = 67\text{ }\% V_{DRM}$ gate open, $T_j = 125\text{ }^{\circ}\text{C}$		Min.	500	V/ μs
$(dI/dt)^{(2)}$	$(dV/dt)_c = 0.1\text{ V}/\mu\text{s}$, $T_j = 125\text{ }^{\circ}\text{C}$	Min.		8.5	A/ms
	$(dV/dt)_c = 10\text{ V}/\mu\text{s}$, $T_j = 125\text{ }^{\circ}\text{C}$			3.0	
	Without snubber, $T_j = 125\text{ }^{\circ}\text{C}$			8.5	

1. Minimum I_{GT} is guaranteed at 5 % of I_{GT} max.
2. For both polarities of A2 referenced to A1

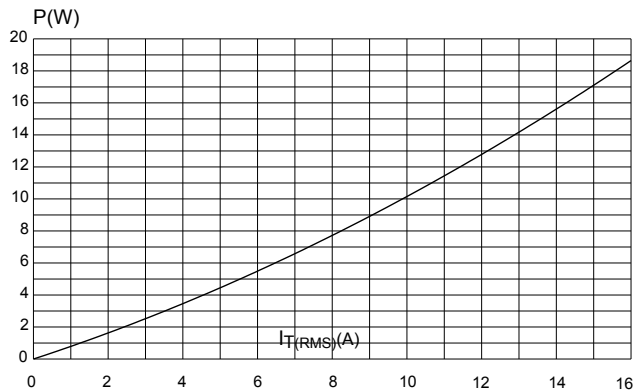
Thermal resistance

Symbol	Parameters	Value	Unit
$R_{th(j-c)}$	Max. junction to case (AC)	2.1	$^{\circ}\text{C}/\text{W}$
$R_{th(j-a)}$	Junction to ambient	60	

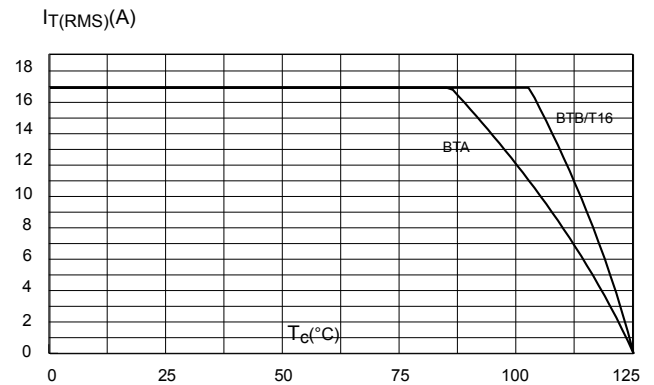


Characteristics (curves)

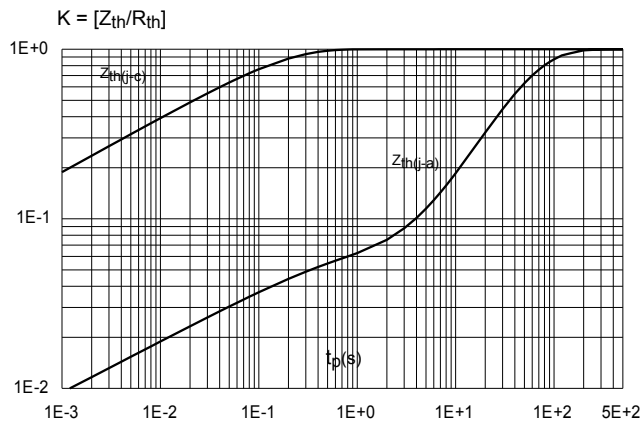
Maximum power dissipation versus on-state RMS current (full cycle)



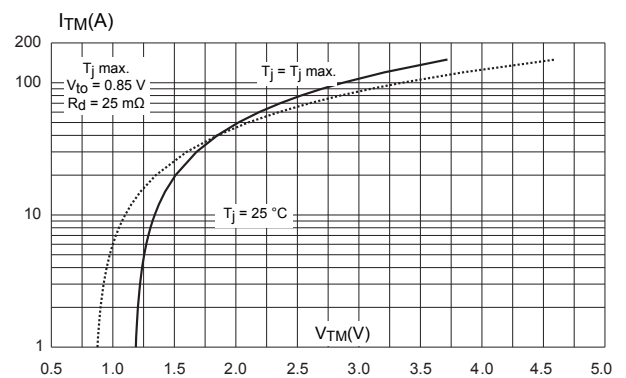
RMS on-state current versus case temperature (full cycle)



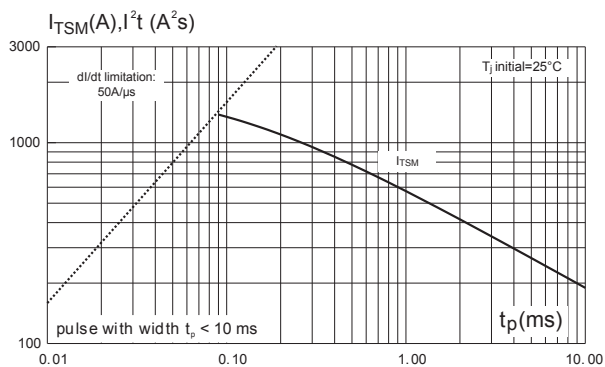
Relative variation of thermal impedance versus pulse duration



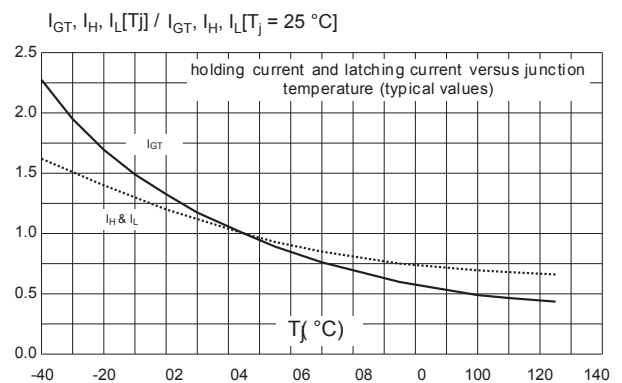
On-state characteristics (maximum values)



Non-repetitive surge peak on-state current for a sinusoidal

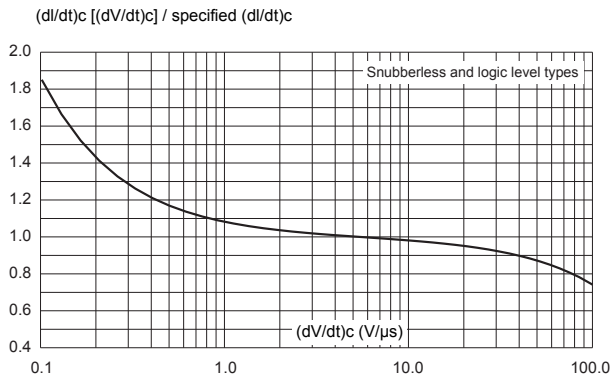


Relative variation of gate trigger current

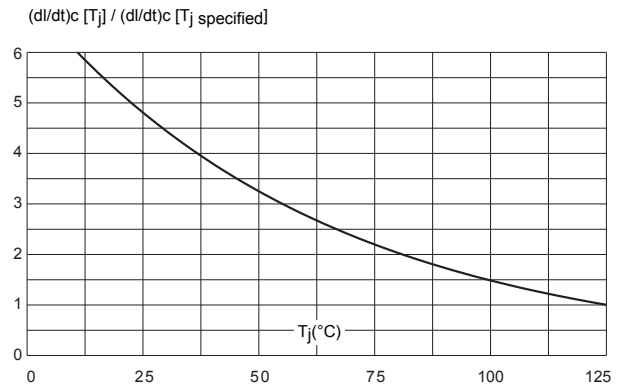




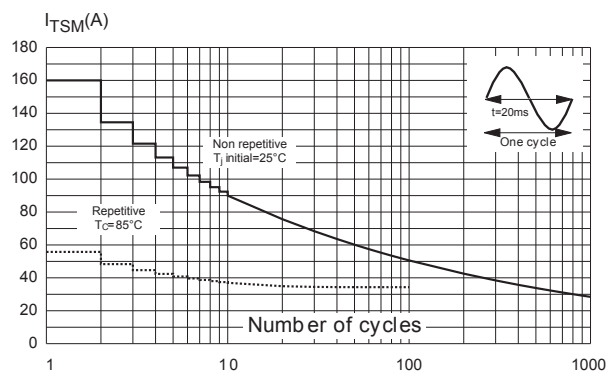
Relative variation of critical rate of decrease of
main current versus $(dV/dt)_c$ (typical values)



Relative variation of critical rate of decrease of
main current versus (junction temperature (typical values)

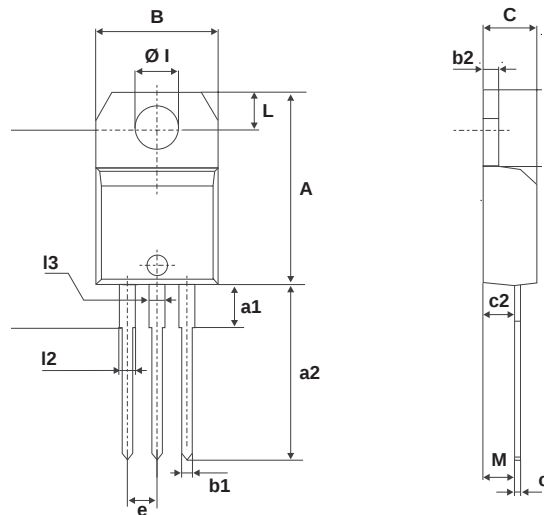


Surge peak on-state current versus number of
cycles





Package Information
TO-220A
(TO-220)



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	15.20		15.90	0.598		0.625
a1		3.75			0.147	
a2	13.00		14.00	0.511		0.551
B	10.00		10.40	0.393		0.409
b1	0.61		0.88	0.024		0.034
b2	1.23		1.32	0.048		0.051
C	4.40		4.60	0.173		0.181
c1	0.49		0.70	0.019		0.027
c2	2.40		2.72	0.094		0.107
e	2.40		2.70	0.094		0.106
F	6.20		6.60	0.244		0.259
ØI	3.75		3.85	0.147		0.151
I4	15.80	16.40	16.80	0.622	0.646	0.661
L	2.65		2.95	0.104		0.116
I2	1.14		1.70	0.044		0.066
I3	1.14		1.70	0.044		0.066
M		2.60			0.102	



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