

DATA SHEET

BTA216 series D, E and F Three quadrant triacs guaranteed commutation

Product specification

April 2002



Three quadrant triacs guaranteed commutation

BTA216 series D, E and F

GENERAL DESCRIPTION

Passivated guaranteed commutation triacs in a plastic envelope intended for use in motor control circuits or with other highly inductive loads. These devices balance the requirements of commutation performance and gate sensitivity. The "sensitive gate" E series and "logic level" D series are intended for interfacing with low power drivers, including micro controllers.

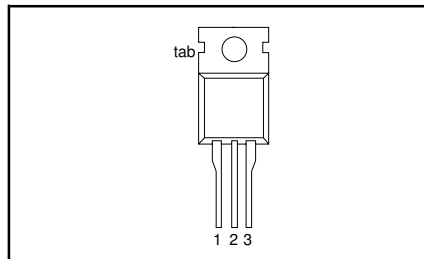
QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	UNIT
V_{DRM}	Repetitive peak off-state voltages	BTA216-600D BTA216-600E BTA216-600F 600	V
$I_{\text{T(RMS)}}$	RMS on-state current	16	A
I_{TSM}	Non-repetitive peak on-state current	140	A

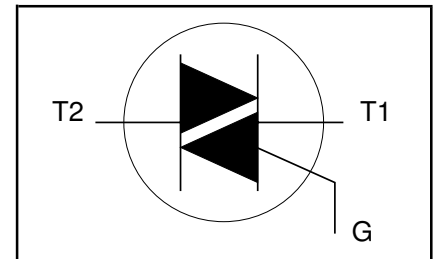
PINNING - TO220AB

PIN	DESCRIPTION
1	main terminal 1
2	main terminal 2
3	gate
tab	main terminal 2

PIN CONFIGURATION



SYMBOL



LIMITING VALUES

Limiting values in accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{DRM}	Repetitive peak off-state voltages		-	600 ¹	V
$I_{\text{T(RMS)}}$	RMS on-state current	full sine wave; $T_{\text{mb}} \leq 99^\circ\text{C}$	-	16	A
I_{TSM}	Non-repetitive peak on-state current	full sine wave; $T_j = 25^\circ\text{C}$ prior to surge $t = 20\text{ ms}$	-	140	A
I^2t	I^2t for fusing	$t = 16.7\text{ ms}$	-	150	A ² s
di_{T}/dt	Repetitive rate of rise of on-state current after triggering	$t = 10\text{ ms}$ $I_{\text{TM}} = 20\text{ A}; I_{\text{G}} = 0.2\text{ A};$ $di_{\text{G}}/dt = 0.2\text{ A}/\mu\text{s}$	-	98	A/ μs
I_{GM}	Peak gate current		-	2	A
P_{GM}	Peak gate power		-	5	W
$P_{\text{G(AV)}}$	Average gate power	over any 20 ms period	-	0.5	W
T_{stg}	Storage temperature		-40	150	$^\circ\text{C}$
T_j	Operating junction temperature		-	125	$^\circ\text{C}$

¹ Although not recommended, off-state voltages up to 800V may be applied without damage, but the triac may switch to the on-state. The rate of rise of current should not exceed 15 A/ μs .

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THERMAL RESISTANCES

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$R_{th\ j-mb}$	Thermal resistance junction to mounting base	full cycle	-	-	1.2	K/W
$R_{th\ j-a}$	Thermal resistance junction to ambient	half cycle in free air	-	-	1.7	K/W
			-	60	-	K/W

STATIC CHARACTERISTICS

$T_j = 25\ ^\circ\text{C}$ unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.			UNIT
		BTA216-		...D	...E	...F	
I_{GT}	Gate trigger current ²	$V_D = 12\ \text{V}; I_T = 0.1\ \text{A}$ T2+ G+ T2+ G- T2- G-	-	5	10	25	mA
			-	5	10	25	mA
			-	5	10	25	mA
I_L	Latching current	$V_D = 12\ \text{V}; I_{GT} = 0.1\ \text{A}$ T2+ G+ T2+ G- T2- G-	-	15	25	30	mA
			-	25	30	40	mA
			-	25	30	40	mA
I_H	Holding current	$V_D = 12\ \text{V}; I_{GT} = 0.1\ \text{A}$	-	15	25	30	mA
			...D, E, F				
V_T	On-state voltage	$I_T = 20\ \text{A}$	-	1.5			V
V_{GT}	Gate trigger voltage	$V_D = 12\ \text{V}; I_T = 0.1\ \text{A}$ $V_D = 400\ \text{V}; I_T = 0.1\ \text{A};$ $T_j = 125\ ^\circ\text{C}$	-	1.5			V
			0.25	-			V
I_D	Off-state leakage current	$V_D = V_{DRM(max)}; T_j = 125\ ^\circ\text{C}$	-	0.5			mA

DYNAMIC CHARACTERISTICS

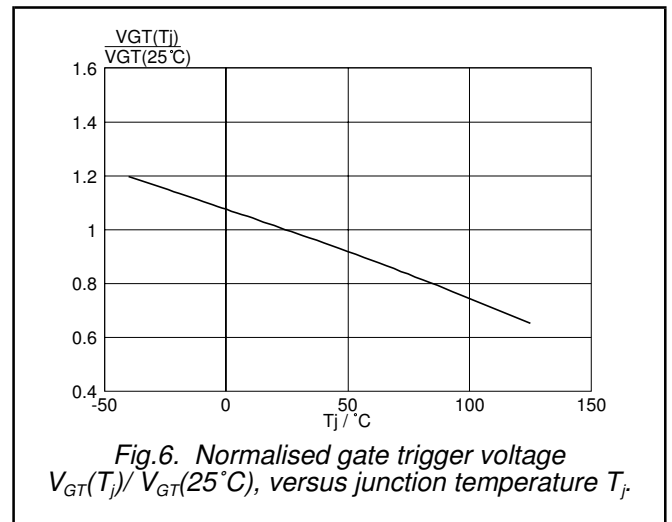
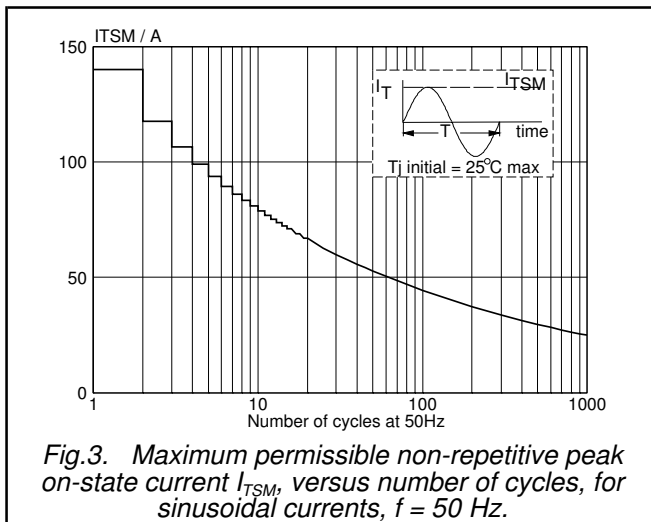
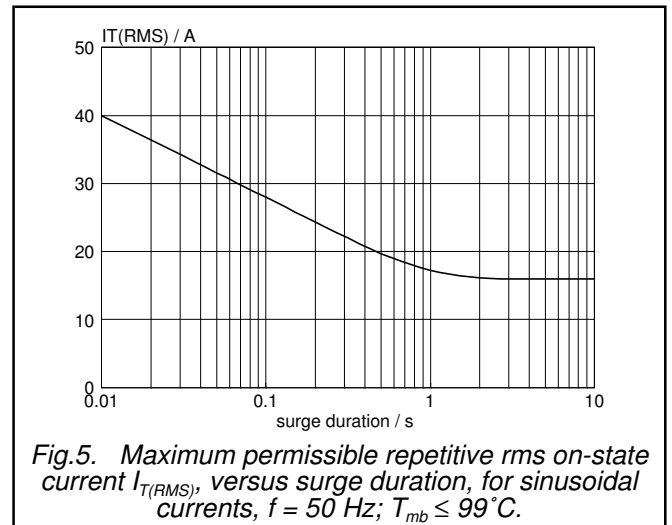
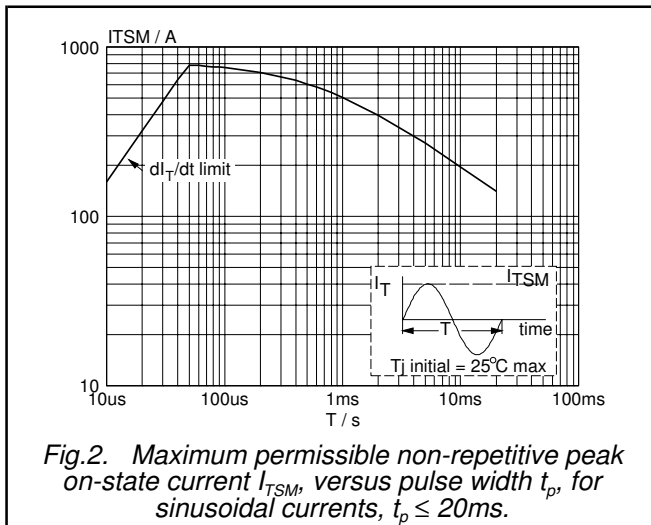
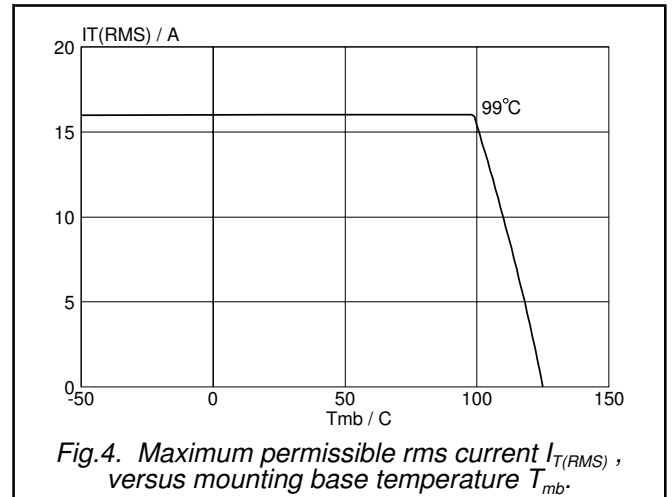
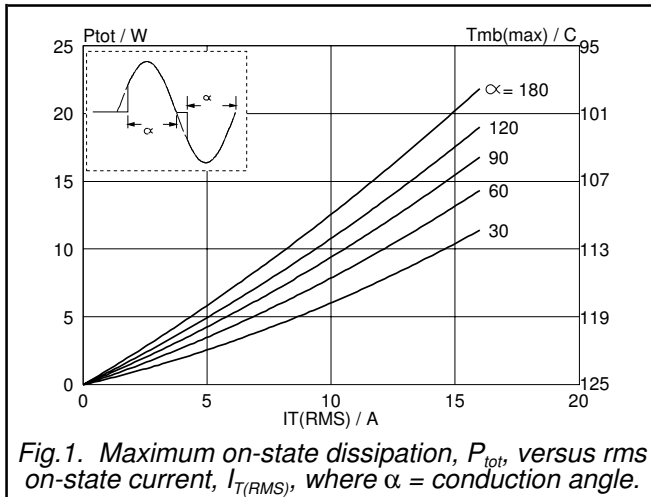
$T_j = 25\ ^\circ\text{C}$ unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN.			MAX.	UNIT
		BTA216-	...D	...E	...F		
dV_D/dt	Critical rate of rise of off-state voltage	$V_{DM} = 67\% V_{DRM(max)};$ $T_j = 110\ ^\circ\text{C};$ exponential waveform; gate open circuit	30	60	70	-	V/ μs
dI_{com}/dt	Critical rate of change of commutating current	$V_{DM} = 400\ \text{V}; T_j = 125\ ^\circ\text{C};$ $I_{T(RMS)} = 16\ \text{A};$ $dV_{com}/dt = 10\ \text{V}/\mu\text{s};$ gate open circuit	2.5	6.2	18	-	A/ms
dI_{com}/dt	Critical rate of change of commutating current	$V_{DM} = 400\ \text{V}; T_j = 125\ ^\circ\text{C};$ $I_{T(RMS)} = 16\ \text{A};$ $dV_{com}/dt = 0.1\ \text{V}/\mu\text{s};$ gate open circuit	12	20	50	-	A/ms

² Device does not trigger in the T2-, G+ quadrant.

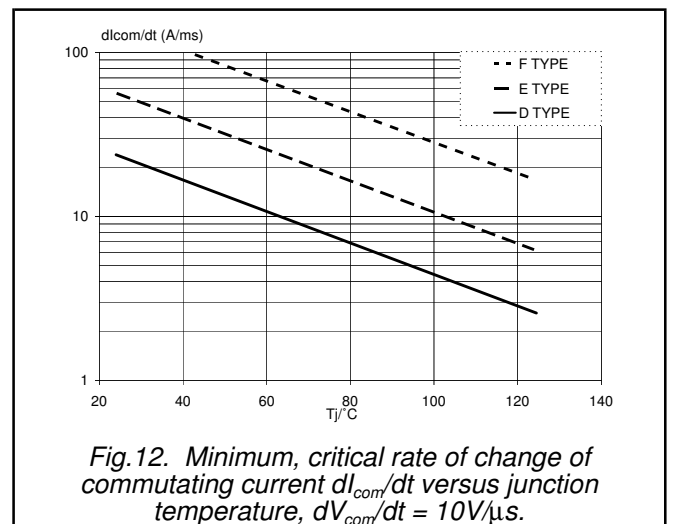
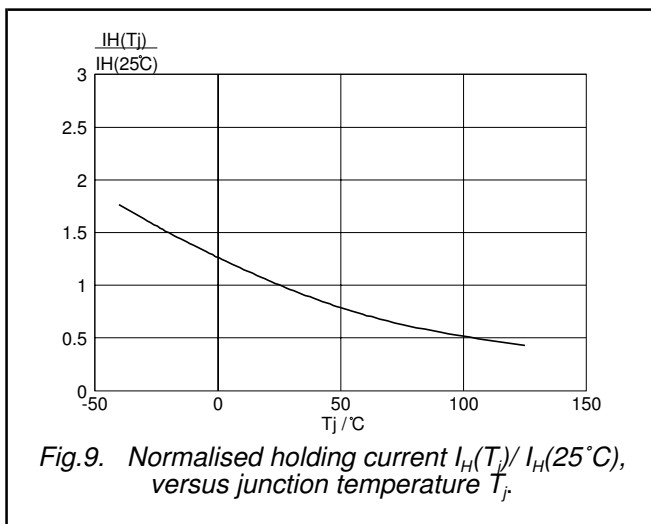
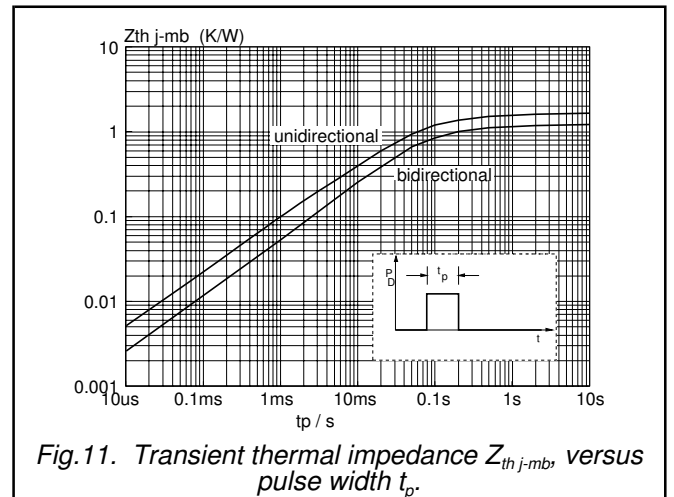
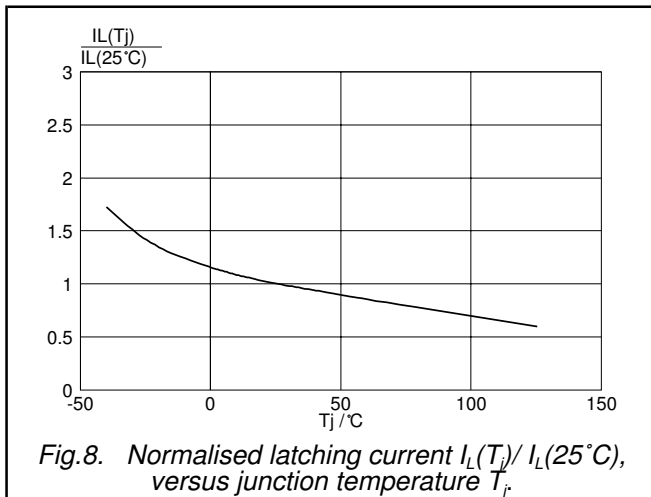
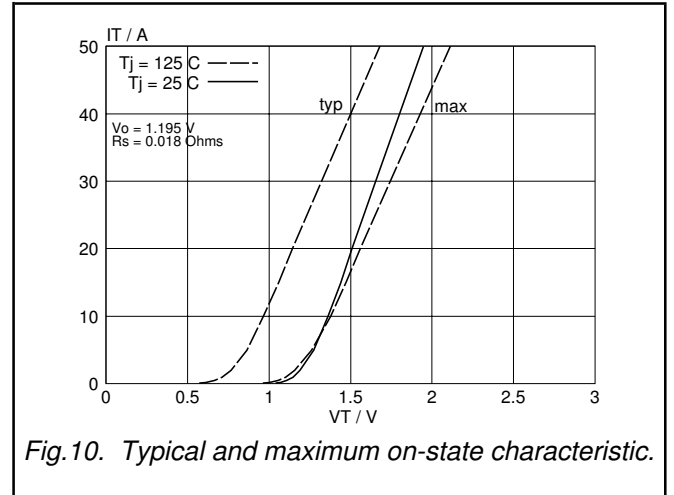
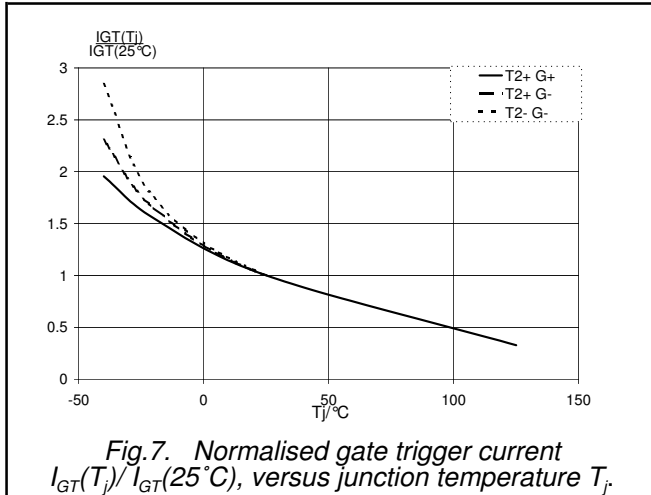
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MECHANICAL DATA

Dimensions in mm

Net Mass: 2 g

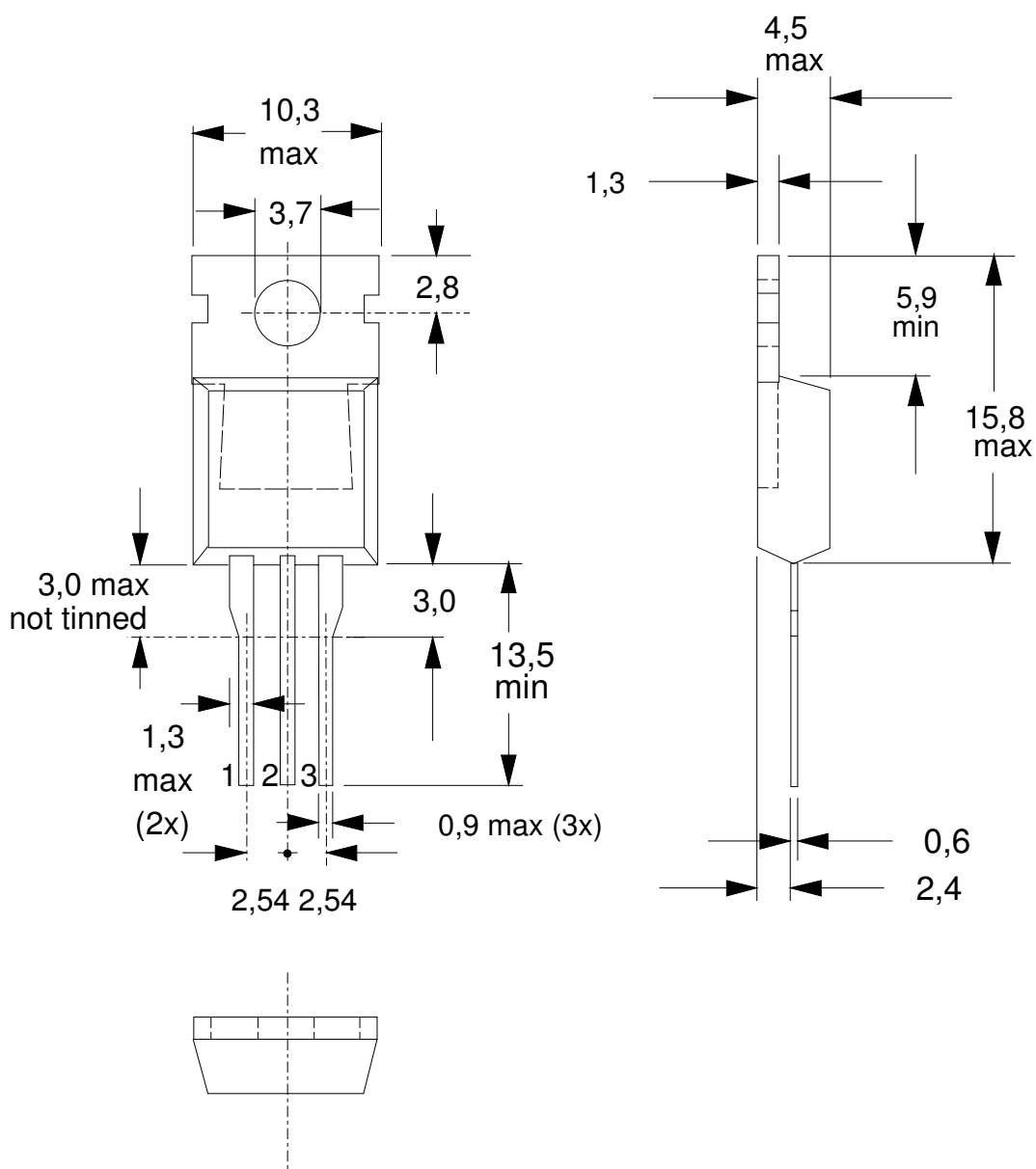


Fig.13. SOT78 (TO220AB). pin 2 connected to mounting base.

Notes

1. Refer to mounting instructions for SOT78 (TO220) envelopes.
2. Epoxy meets UL94 V0 at 1/8".

Legal information

DATA SHEET STATUS

DOCUMENT STATUS ⁽¹⁾	PRODUCT STATUS ⁽²⁾	DEFINITION
Objective data sheet	Development	This document contains data from the objective specification for product development.
Preliminary data sheet	Qualification	This document contains data from the preliminary specification.
Product data sheet	Production	This document contains the product specification.

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