

DATA SHEET

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

Product specification

September 2018

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.

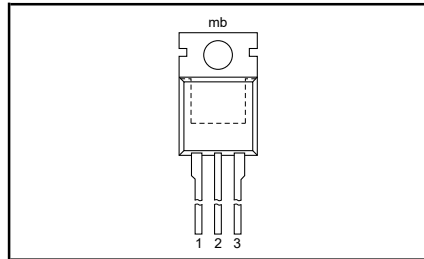
QUICK REFERENCE DATA

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

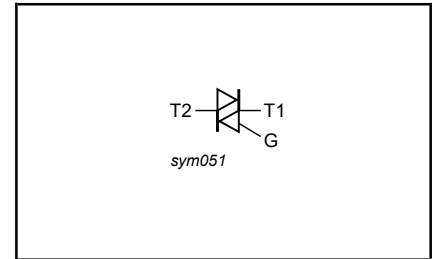
PINNING - TO220AB

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

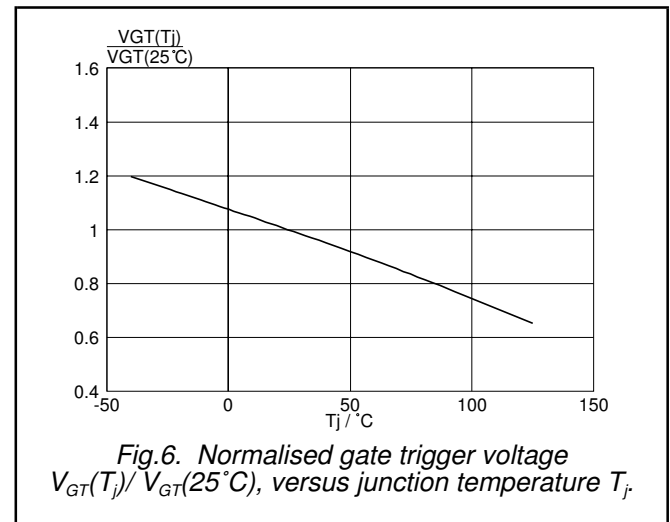
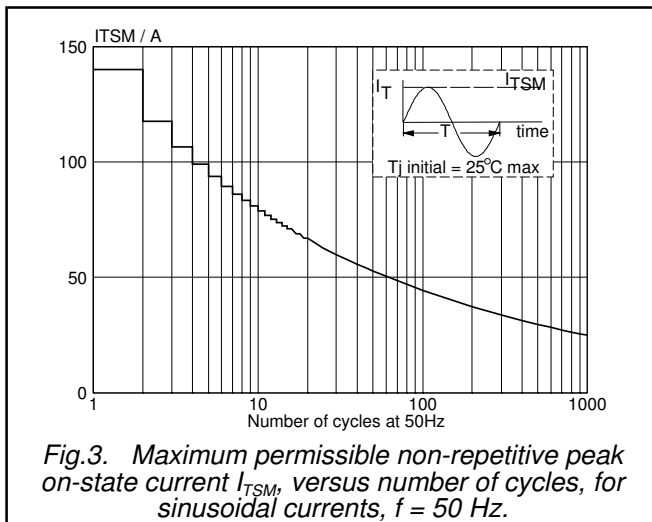
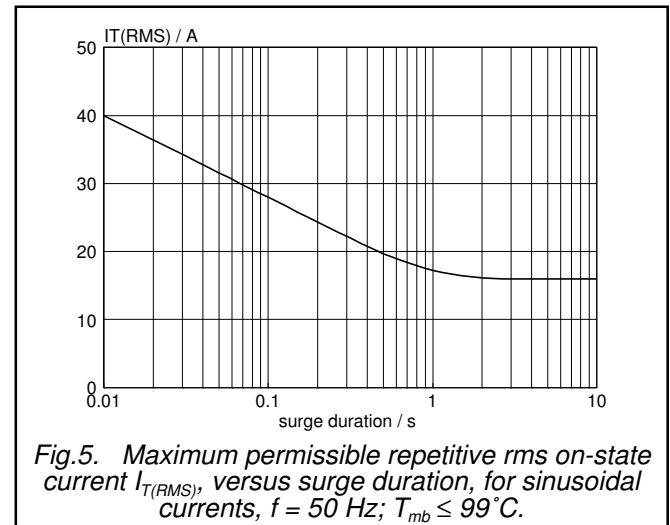
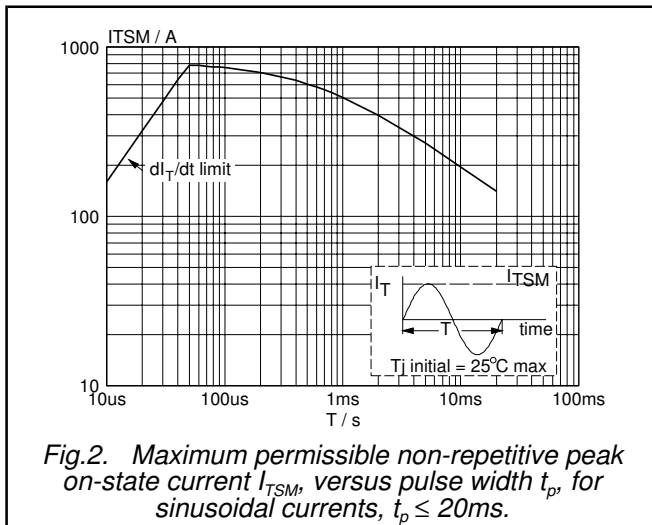
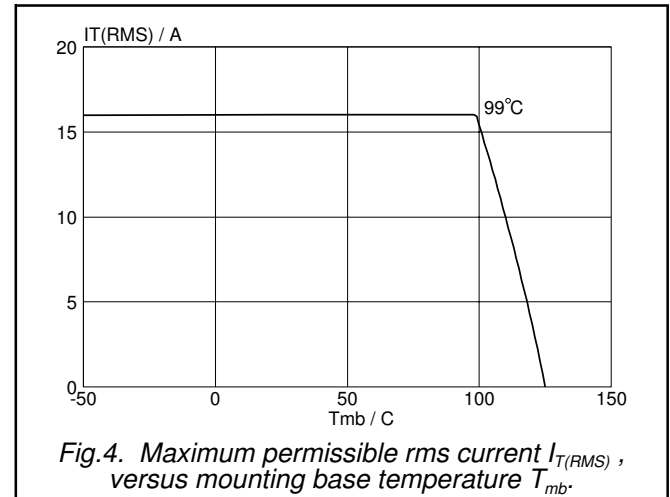
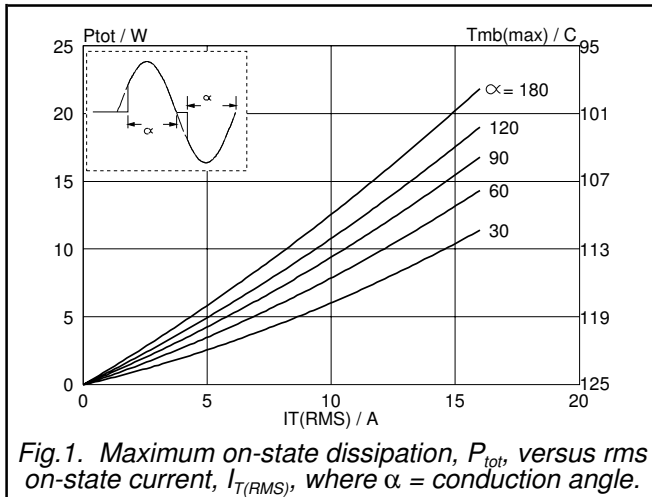
$T_j = 25\ ^\circ\text{C}$ unless otherwise stated

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.

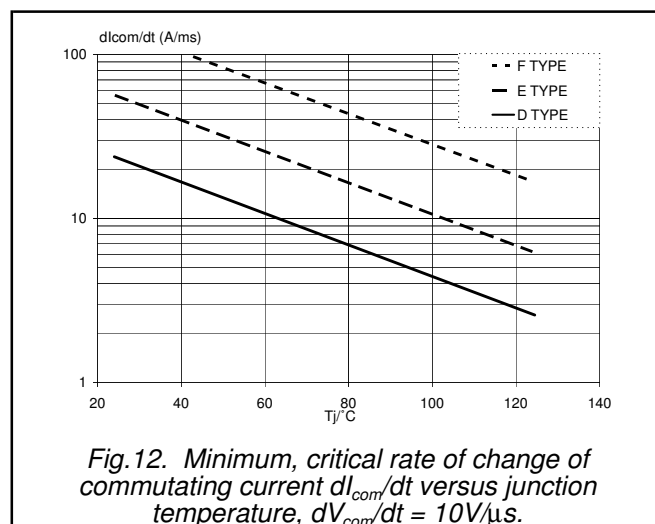
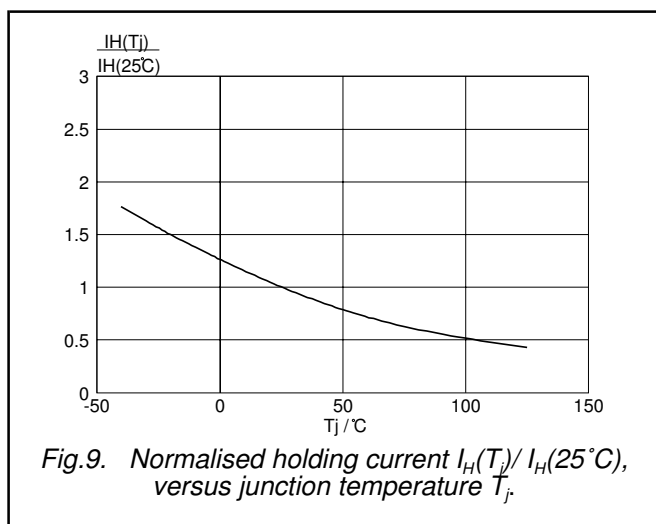
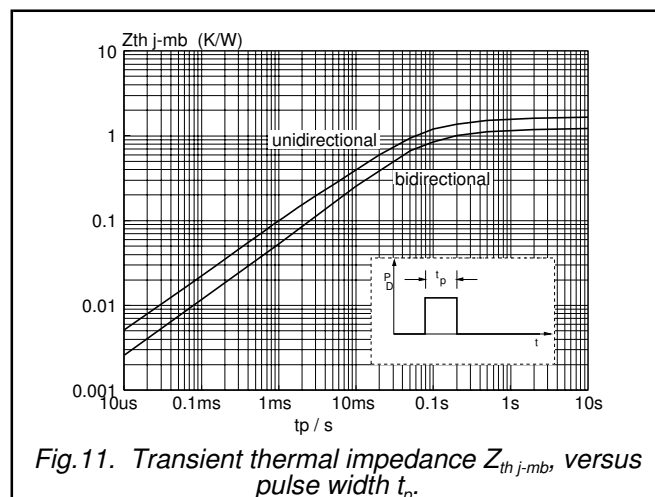
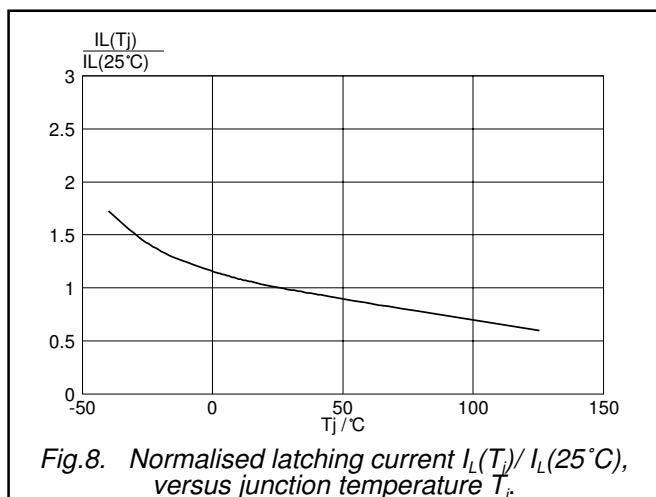
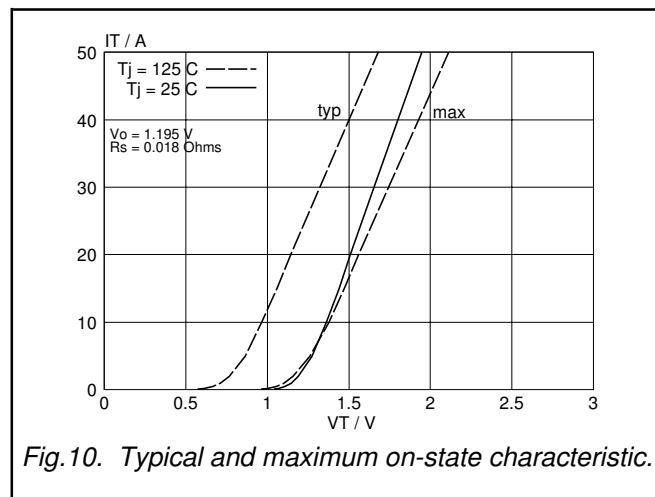
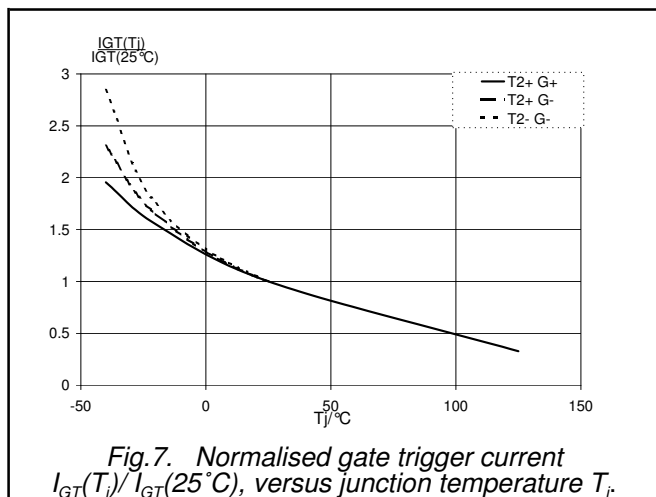
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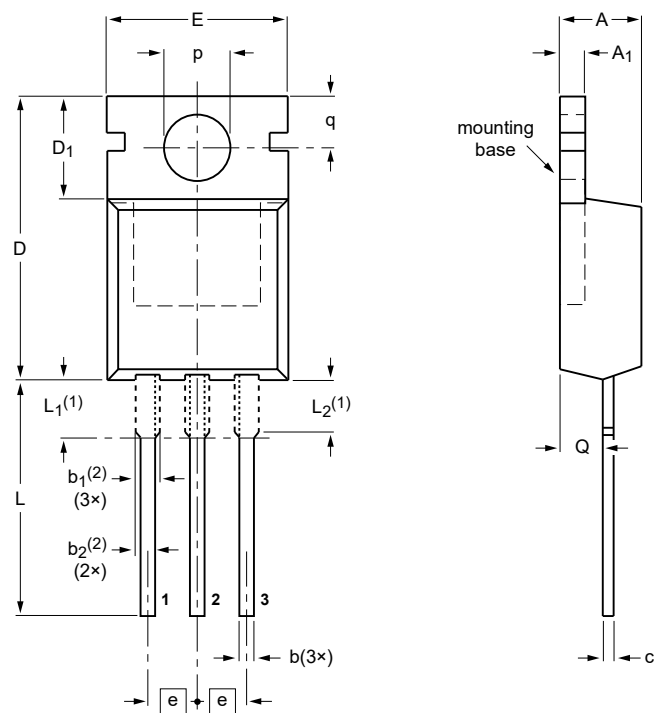
Three quadrant triacs
guaranteed commutation

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MECHANICAL DATA

Plastic single-ended package; heatsink mounted; 1 mounting hole; 3-lead TO-220AB

SOT78



DIMENSIONS (mm are the original dimensions)

UNIT	A	A ₁	b	b ₁ (2)	b ₂ (2)	c	D	D ₁	E	e	L	L ₁ (1)	L ₂ (1) max.	p	q	Q
mm	4.7 4.1	1.40 1.25	0.9 0.6	1.6 1.0	1.3 1.0	0.7 0.4	16.0 15.2	6.6 5.9	10.3 9.7	2.54	15.0 12.8	3.30 2.79	3.0	3.8 3.5	3.0 2.7	2.6 2.2

- Notes
- 1. Lead shoulder designs may vary.
 - 2. Dimension includes excess dambar.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT78		3-lead TO-220AB	SC-46			08-04-23 08-06-13

Legal information

Data sheet status

Document status [1][2]	Product status [3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

- [1] Please consult the most recently issued document before initiating or completing a design.
- [2] The term 'short data sheet' is explained in section "Definitions".
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