Three quadrant triacs guaranteed commutation

BTA212 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.	MAX.	UNIT
	BTA212-	600D	600D		
	BTA212-	600E	600E	800E	
	BTA212-	600F	600F	800F	
V_{DRM}	Repetitive peak off-state voltages		600	800	V
$I_{T(RMS)}$	RMS on-state current		12	12	A
I_{TSM}	Non-repetitive peak on-state current		95	95	A

PINNING - TO220AB

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

PIN CONFIGURATION

tab

1 2 3

SYMBOL

T2   T1

G
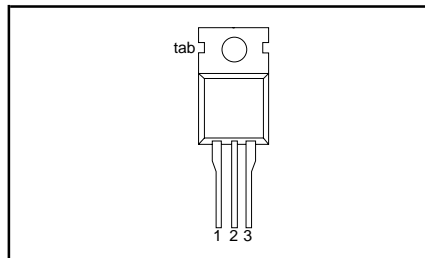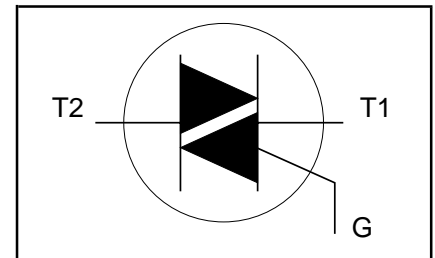
LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.		UNIT
				-600	**-800**	
V_{DRM}	Repetitive peak off-state voltages		-	600[1]	800	V
$I_{T(RMS)}$	RMS on-state current	full sine wave; $T_{mb} \leq 99\ ^{\circ}C$	-	12		A
I_{TSM}	Non-repetitive peak on-state current	full sine wave; $T_j = 25\ ^{\circ}C$ prior to surge				
		t = 20 ms	-	95		A
		t = 16.7 ms	-	105		A
I^2t	I^2t for fusing	t = 10 ms	-	45		A^2s
dI_T/dt	Repetitive rate of rise of on-state current after triggering	$I_{TM} = 20\ A$; $I_G = 0.2\ A$; $dI_G/dt = 0.2\ A/\mu s$		100		$A/\mu s$
I_{GM}	Peak gate current		-	2		A
V_{GM}	Peak gate voltage		-	5		V
P_{GM}	Peak gate power		-	5		W
$P_{G(AV)}$	Average gate power	over any 20 ms period	-	0.5		W
T_{stg}	Storage temperature		-40	150		$^{\circ}C$
T_j	Operating junction temperature		-	125		$^{\circ}C$

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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	-	-	1.5	K/W
		half cycle	-	-	2.0	K/W
$R_{th\ j-a}$	Thermal resistance junction to ambient	in free air	-	60	-	K/W

STATIC CHARACTERISTICS

$T_j = 25\ °C$ unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.			UNIT
		BTA212-			...D	...E	...F	
I_{GT}	Gate trigger current[2]	$V_D = 12\ V$; $I_T = 0.1\ A$						
		T2+ G+	-	-	5	10	25	mA
		T2+ G-	-	-	5	10	25	mA
		T2- G-	-	-	5	10	25	mA
I_L	Latching current	$V_D = 12\ V$; $I_{GT} = 0.1\ A$						
		T2+ G+	-	-	15	20	25	mA
		T2+ G-	-	-	25	30	40	mA
		T2- G-	-	-	25	30	40	mA
I_H	Holding current	$V_D = 12\ V$; $I_{GT} = 0.1\ A$	-	-	15	25	30	mA
V_T	On-state voltage	$I_T = 17\ A$	-	1.3	1.6			V
V_{GT}	Gate trigger voltage	$V_D = 12\ V$; $I_T = 0.1\ A$	-	0.7	1.5			V
		$V_D = 400\ V$; $I_T = 0.1\ A$; $T_j = 125\ °C$	0.25	0.4	-			V
I_D	Off-state leakage current	$V_D = V_{DRM(max)}$; $T_j = 125\ °C$	-	0.1	0.5			mA

DYNAMIC CHARACTERISTICS

$T_j = 25\ °C$ unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN.			TYP.	MAX.	UNIT
		BTA212-	...D	...E	...F			
dV_D/dt	Critical rate of rise of off-state voltage	$V_{DM} = 67\% V_{DRM(max)}$; $T_j = 110\ °C$; exponential waveform; gate open circuit	30	60	70	-	-	V/μs
dI_{com}/dt	Critical rate of change of commutating current	$V_{DM} = 400\ V$; $T_j = 110\ °C$; $I_{T(RMS)} = 12\ A$; $dV_{com}/dt = 20v/μs$; gate open circuit	1.8	3.5	4.5	-	-	A/ms
dI_{com}/dt	Critical rate of change of commutating current	$V_{DM} = 400\ V$; $T_j = 110\ °C$; $I_{T(RMS)} = 12\ A$; $dV_{com}/dt = 0.1v/μs$; gate open circuit	4.3	5.3	6.3	-	-	A/ms
t_{gt}	Gate controlled turn-on time	$I_{TM} = 12\ A$; $V_D = V_{DRM(max)}$; $I_G = 0.1\ A$; $dI_G/dt = 5\ A/μs$	-	-	-	2	-	μs

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

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MECHANICAL DATA

Dimensions in mm

Net Mass: 2 g

10,3 max

3,7

2,8

4,5 max

1,3

5,9 min

15,8 max

3,0 max not tinned

3,0

13,5 min

1,3 max (2x)

1 2 3

0,9 max (3x)

0,6

2,4

2,54 2,54

Fig.1. SOT78 (TO220AB). pin 2 connected to mounting base.
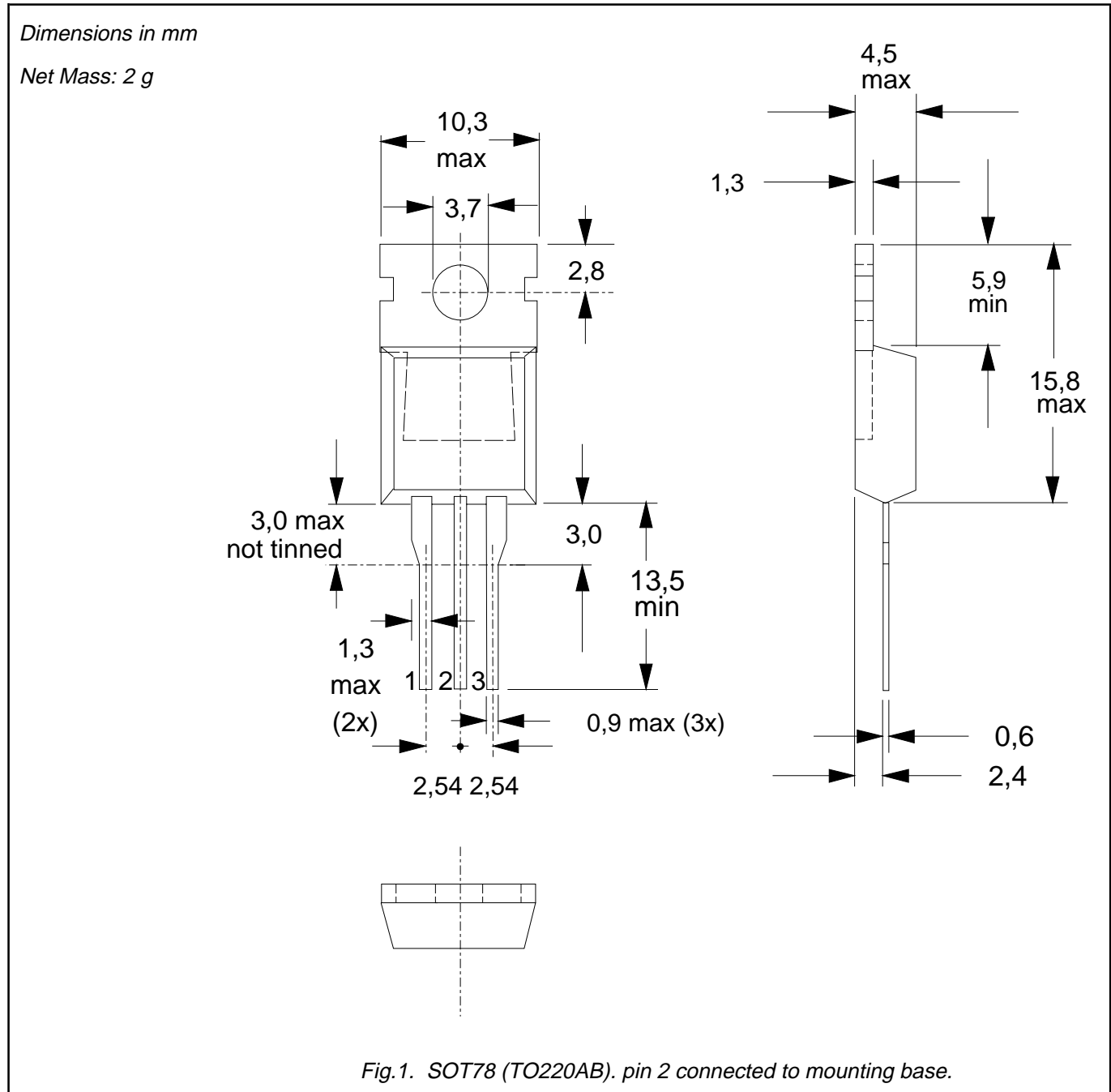
Notes
1. Refer to mounting instructions for SOT78 (TO220) envelopes.
2. Epoxy meets UL94 V0 at 1/8".

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DEFINITIONS

Data sheet status	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
Limiting values	
Limiting values are given in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of this specification is not implied. Exposure to limiting values for extended periods may affect device reliability.	
Application information	
Where application information is given, it is advisory and does not form part of the specification.	
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LIFE SUPPORT APPLICATIONS

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