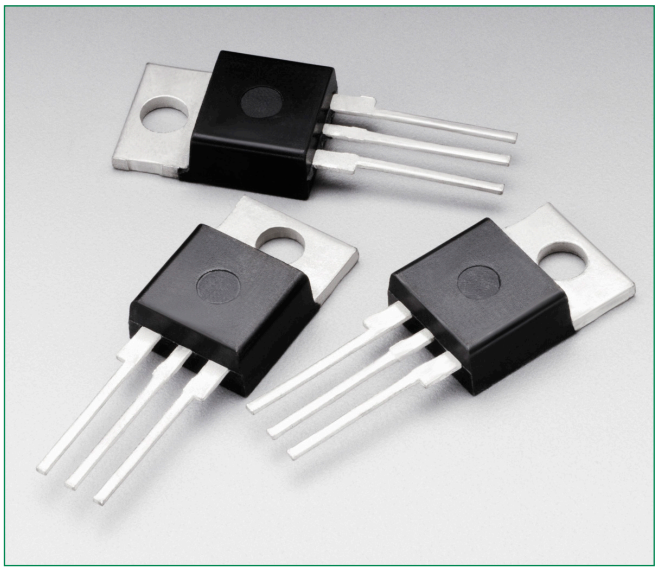
BTA08-600BW3G, BTA08-800BW3G



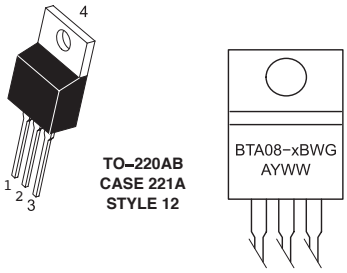
Description

Designed for high performance full-wave ac control applications where high noise immunity and high commutating di/dt are required.

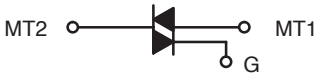
Features

- Blocking Voltage to 800 V
- On-State Current Rating of 8 A RMS at 80°C
- Uniform Gate Trigger Currents in Three Quadrants
- High Immunity to dV/dt – 2000 V/s minimum at 125°C
- Minimizes Snubber Networks for Protection
- Industry Standard TO-220AB Package
- High Commutating dI/dt – 1.5 A/ms minimum at 125°C
- Internally Isolated (2500 V_{RMS})
- These Devices are Pb–Free and are RoHS Compliant

Pin Out



Functional Diagram



Additional Information

Datasheet | Resources | Samples

Revised: 09/18/17

Maximum Ratings † (T_J = 25°C unless otherwise noted)

Rating	Part Number	Symbol	Value	Unit
Peak Repetitive Off-State Voltage (Note 1) (T_J = -40 to 125°C, Sine Wave, 50 to 60 Hz, Gate Open)	BTA08–600BW3G	V_{DRM}, V_{RRM}	600	V
	BTA08–800BW3G		800	
On-State RMS Current (180° Conduction Angles; T_C = 80°C)		$I_{T\ (RMS)}$	8.0	A
Peak Non–Repetitive Surge Current (1/2 Cycle, Sine Wave, 60 Hz, T_C = 80°C)		I_{TSM}	90	A
Circuit Fusing Considerations (t = 8.3 ms)		I^2t	36	A^2sec
Non–Repetitive Surge Peak Off–State Voltage (TJ = 25°C, t = 10ms)		V_{DSM}, V_{RSM}	V_{DRM}/V_{RRM} +100	V
Peak Gate Current (T_J = 125°C, t = 20ms)		I_{GM}	4.0	A
Peak Gate Power (Pulse Width ≤ 1.0 µs, TC = 80°C)		P_{GM}	20	W
Average Gate Power (T_J = 125°C)		$P_{G(AV)}$	1.0	W
Operating Junction Temperature Range		T_J	–40 to +125	°C
Storage Temperature Range		T_{stg}	–40 to +150	°C
RMS Isolation Voltage (t = 300 ms, R.H. ≤ 30%, TA = 25°C)		V_{iso}	2500	V

† Indicates JEDEC Registered Data

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

1. V_{DRM} and V_{RRM} for all types can be applied on a continuous basis. Ratings apply for zero or negative gate voltage; however, positive gate voltage shall not be applied concurrent with negative potential on the anode. Blocking voltages shall not be tested with a constant current source such that the voltage ratings of the devices are exceeded.

Maximum Ratings † (T_J = 25°C unless otherwise noted)

Rating	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case (AC)	$R_{\Theta JC}$	2.5	°C/W
Thermal Resistance, Junction-to-Ambient	$R_{\Theta JA}$	63	°C/W
Maximum Lead Temperature for Soldering Purposes, 1/8" from case for 10 seconds	T_L	260	°C

† Indicates JEDEC Registered Data

Revised: 09/18/17

Electrical Characteristics - OFF (T_C = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Typ	Max	Unit
Peak Repetitive Blocking Current ($V_{AK} = V_{DRM} = V_{RRM}$; Gate Open)	T_J = 25°C	I_{DRM}, I_{RRM}	-	-	0.005	mA
	T_J = 125°C		-	-	2.0	

Electrical Characteristics - ON

Characteristic		Symbol	Min	Typ	Max	Unit
Peak On-State Voltage (Note 2) (I_{TM} = ±11 A Peak)		V_{TM}	–	–	1.55	V
Gate Trigger Current (Continuous dc) (V_D = 12 V, R_L = 30 Ω)	MT2(+), G(+)	I_{GT}	2.5	–	50	mA
	MT2(+), G(–)		2.5	–	50	
	MT2(–), G(–)		2.5	–	50	
Holding Current (V_D = 12 V, Gate Open, Initiating Current = ±100 mA)		IH	–	–	60	mA
Latching Current (V_D = 24 V, I_G = 42 mA)	MT2(+), G(+)	IL	–	–	70	mA
	MT2(+), G(–)		–	–	90	
	MT2(–), G(–)		–	–	70	
Gate Trigger Voltage (V_D = 12 V, R_L = 30 Ω)	MT2(+), G(+)	V_{GT}	0.5	–	1.7	V
	MT2(+), G(–)		0.5	–	1.1	
	MT2(–), G(–)		0.5	–	1.1	
Gate Non–Trigger Voltage (T_J = 125°C)	MT2(+), G(+)	t_{gt}	0.2	–	–	V
	MT2(+), G(–)		0.2	–	–	
	MT2(–), G(–)		0.2	–	–	

Revised: 09/18/17

Dynamic Characteristics

Characteristic	Symbol	Min	Typ	Max	Unit
Rate of Change of Commutating Current, See Figure 10. (Gate Open, TJ = 125°C, No Snubber)	$(dI/dt)_C$	3.0	–	–	A/ms
Critical Rate of Rise of On-State Current (TJ = 125°C, f = 120 Hz, IG = 2 x IGT, tr ≤ 100 ns)	dI/dt	–	–	50	A/µs
Critical Rate–of–Rise of Off-State Voltage (V_D = 0.66 x V_{DRM}, Exponential Waveform, Gate Open, T_J = 125°C)	dv/dt(c)	1500	–	–	V/µs

Voltage Current Characteristic of SCR

Symbol	Parameter
V_{DRM}	Peak Repetitive Forward Off State Voltage
I_{DRM}	Peak Forward Blocking Current
V_{RRM}	Peak Repetitive Reverse Off State Voltage
I_{RRM}	Peak Reverse Blocking Current
V_{TM}	Maximum On State Voltage
I_H	Holding Current

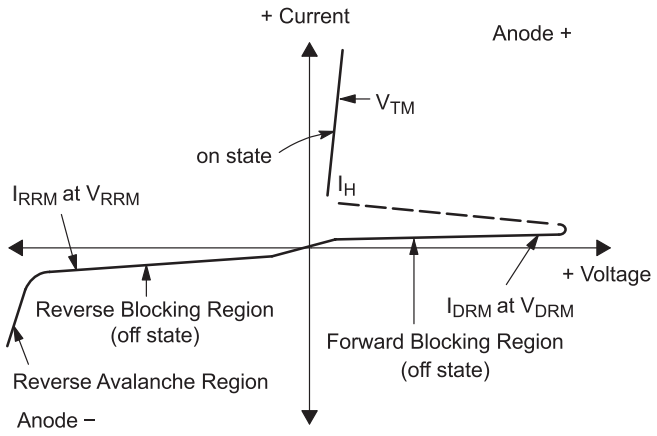


Figure 1. RMS Current Derating

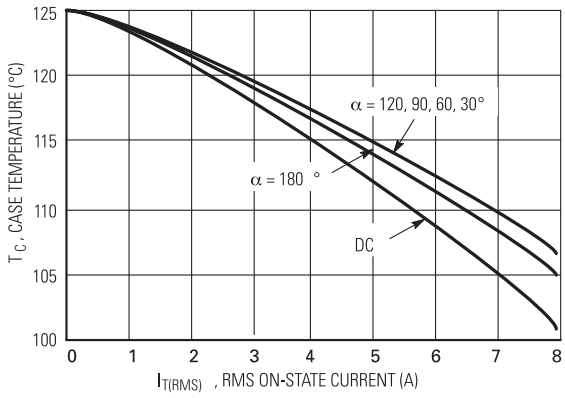


Figure 2. On-State Power Dissipation

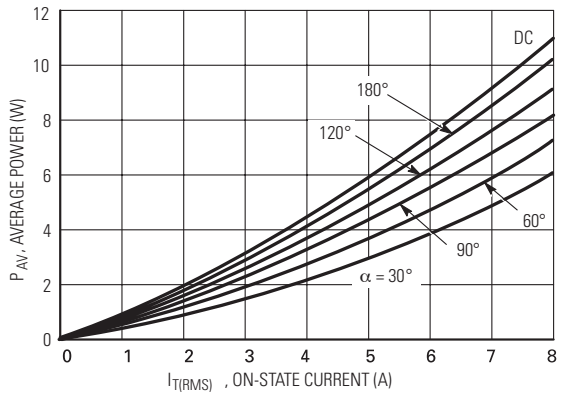


Figure 3. On–State Characteristics

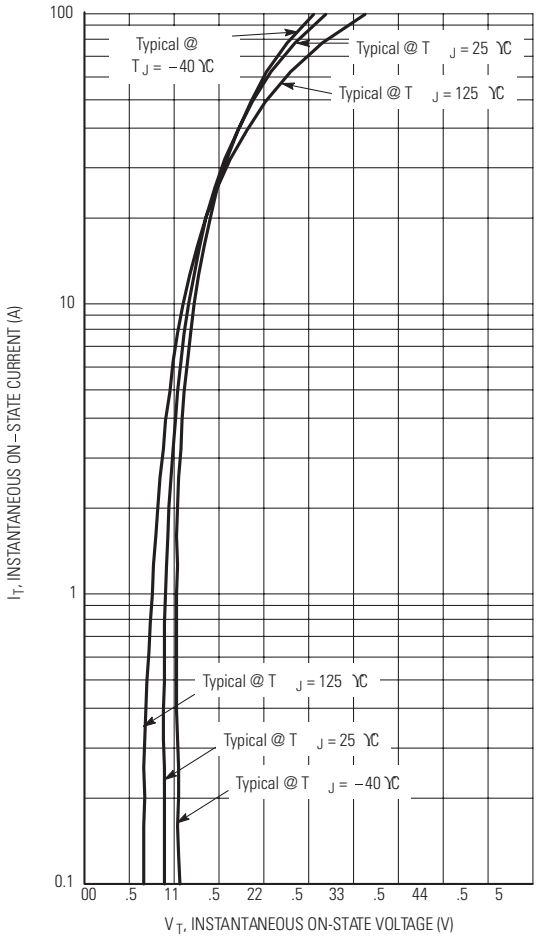


Figure 4. Thermal Response

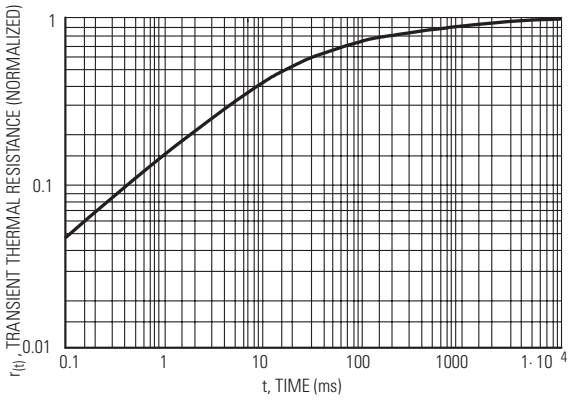
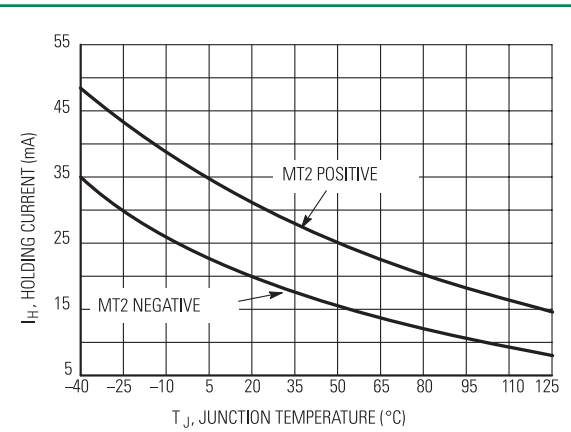


Figure 5. Holding Current Variation



Revised: 09/18/17

Typical Characteristics

Figure 6. Typical Gate Trigger Current vs. Pulse Width

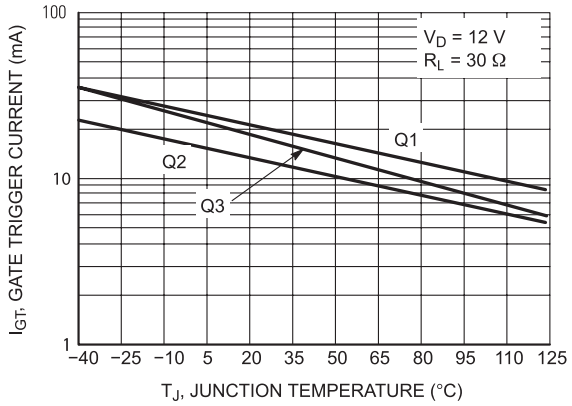


Figure 7. Typical Gate Trigger Current vs. Junction Temperature

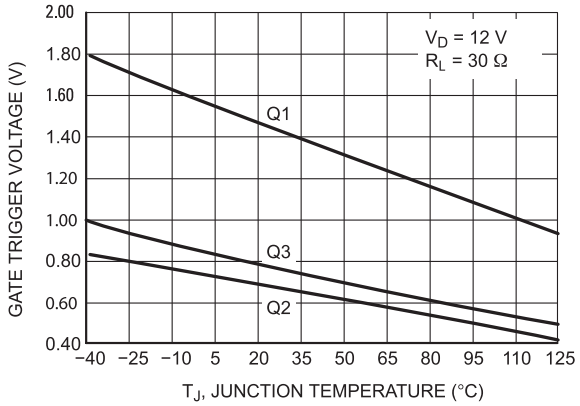


Figure 8. Typical Gate Trigger Voltage vs. Junction Temperature

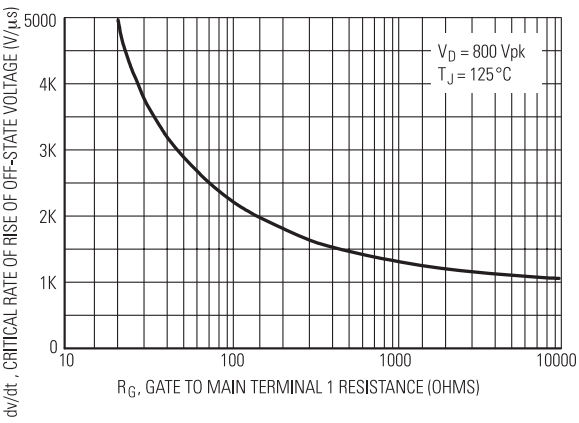


Figure 9. Typical Holding Current vs. Junction Temperature

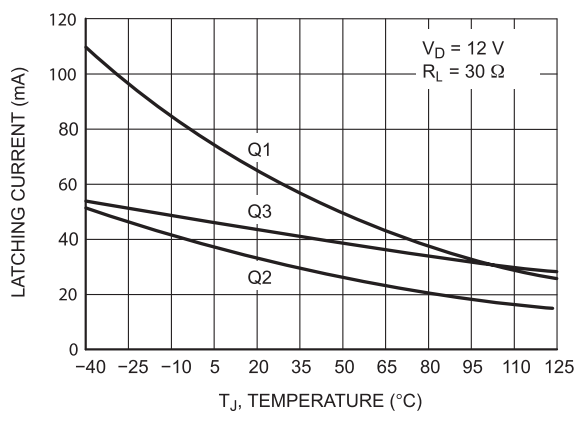
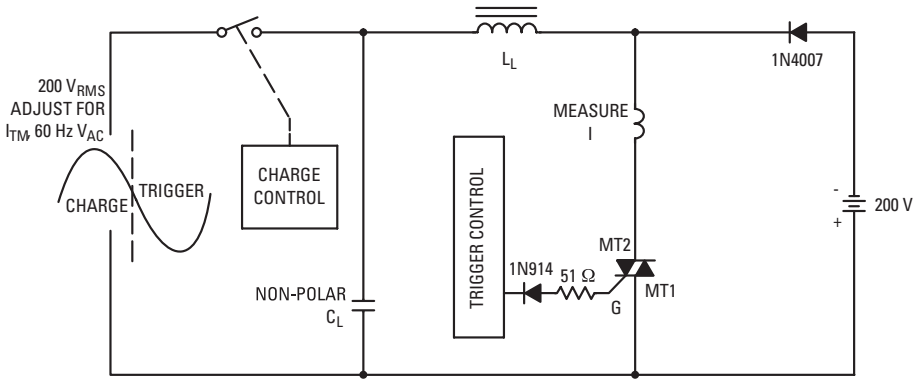


Figure 9. Simplified Test Circuit to Measure the Critical Rate of Rise of Commutating Current (di/dt)



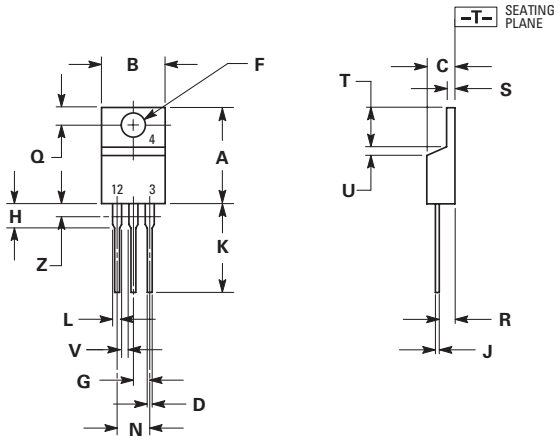
Note: Component values are for verification of rated $(di/dt)_c$. See AN1048 for additional information.

Note: Component values are for verification of rated (di/dt)c. See AN1048 for additional information

Thyristors

Surface Mount – 600 - 800V > BTA08-600BW3G, BTA08-800BW3G

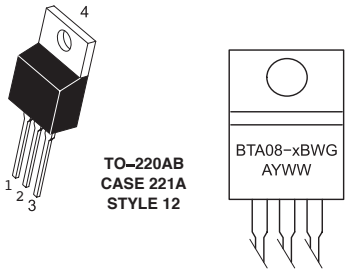
Dimensions



Dim	Inches		Millimeters	
	Min	Max	Min	Max
A	0.570	0.620	14.48	15.75
B	0.380	0.405	9.66	10.28
C	0.160	0.190	4.07	4.82
D	0.025	0.035	0.64	0.88
F	0.142	0.147	3.61	3.73
G	0.095	0.105	2.42	2.66
H	0.110	0.155	2.80	3.93
J	0.014	0.022	0.36	0.55
K	0.500	0.562	12.70	14.27
L	0.045	0.060	1.15	1.52
N	0.190	0.210	4.83	5.33
Q	0.100	0.120	2.54	3.04
R	0.080	0.110	2.04	2.79
S	0.045	0.055	1.15	1.39
T	0.235	0.255	5.97	6.47
U	0.000	0.050	0.00	1.27
V	0.045	---	1.15	---
Z	---	0.080	---	2.04

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

Part Marking System



x	= 6 or 8
A	= Assembly Location (Optional)*
Y	= Year
WW	= Work Week
G	= Pb–Free Package

* The Assembly Location code (A) is optional. In cases where the Assembly Location is stamped on the package the assembly code may be blank.

Pin Assignment

1	Main Terminal 1
2	Main Terminal 2
3	Gate
4	Main Terminal 2

Ordering Information

Device	Package	Shipping
BTA08-600BW3G	TO-220AB (Pb-Free)	50 Units / Retail
BTA08-800BW3G		