Triacs

Silicon Bidirectional Thyristors

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 Amperes RMS at 25°C
- Uniform Gate Trigger Currents in Three Quadrants
- High Immunity to dV/dt 2000 V/\u00fcs minimum at 125°C
- Minimizes Snubber Networks for Protection
- Industry Standard TO-220AB Package
- High Commutating dI/dt 4 A/ms minimum at 125°C
- These are Pb-Free Devices

MAXIMUM RATINGS (T_J = 25°C unless otherwise noted)

Rating	Symbol	Value	Unit
Peak Repetitive Off-State Voltage (Note 1) (T _J = -40 to 125°C, Sine Wave, 50 to 60 Hz, Gate Open)	V _{DRM,} V _{RRM}		V
BTB08-600BW3G BTB08-800BW3G		600 800	
On-State RMS Current (Full Cycle Sine Wave, 60 Hz, T _C = 80°C)	I _{T(RMS)}	8.0	Α
Peak Non-Repetitive Surge Current (One Full Cycle Sine Wave, 60 Hz, T _C = 25°C)	I _{TSM}	90	Α
Circuit Fusing Consideration (t = 10 ms)	I ² t	36	A ² sec
Non-Repetitive Surge Peak Off-State Voltage (T _J = 25°C, t = 10ms)	$V_{DSM/} \ V_{RSM}$	V _{DSM/} V _{RSM} +100	V
Peak Gate Current (T _J = 125°C, t = 20ms)	I_{GM}	4.0	Α
Peak Gate Power (Pulse Width \leq 1.0 μ s, T _C = 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

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.

 V_{DRM} and V_{RRM} for all types can be applied on a continuous basis. Blocking voltages shall not be tested with a constant current source such that the voltage ratings of the devices are exceeded.

1



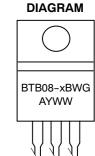
ON Semiconductor®

http://onsemi.com

TRIACS 8 AMPERES RMS 600 thru 800 VOLTS







MARKING

= 6 or 8
 = Assemble

A = Assembly Location

Y = Year WW = Work Week G = Pb-Free Package

PIN ASSIGNMENT			
1	Main Terminal 1		
2	Main Terminal 2		
3	Gate		
4	Main Terminal 2		

ORDERING INFORMATION

Device	Package	Shipping
BTB08-600BW3G	TO-220AB (Pb-Free)	50 Units / Rail
BTB08-800BW3G	TO-220AB (Pb-Free)	50 Units / Rail

^{*}For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

THERMAL CHARACTERISTICS

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case Junction-to-Ambient	$R_{ hetaJC} \ R_{ hetaJA}$	2.5 60	°C/W
Maximum Lead Temperature for Soldering Purposes 1/8" from Case for 10 seconds	TL	260	°C

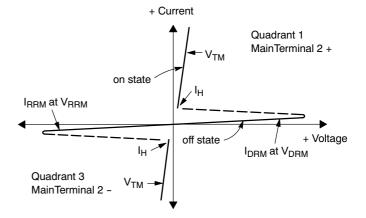
ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise noted; Electricals apply in both directions)

Characteristic	Symbol	Min	Тур	Max	Unit
OFF CHARACTERISTICS	1		1	1	1
Peak Repetitive Blocking Current $(V_D = \text{Rated V}_{DRM}, V_{RRM}; \text{Gate Open}) \\ T_J = 25^{\circ}\text{C} \\ T_J = 125^{\circ}\text{C}$	I _{DRM} / I _{RRM}		- -	0.005 1.0	mA
ON CHARACTERISTICS	•				
Peak On-State Voltage (Note 2) (I _{TM} = ±11 A Peak)	V _{TM}	-	-	1.55	٧
Gate Trigger Current (Continuous dc) (V_D = 12 V, R_L = 30 Ω) MT2(+), G(+) MT2(+), G(-) MT2(-), G(-)	I _{GT}	2.5 2.5 2.5	- - -	50 50 50	mA
Holding Current $(V_D = 12 \text{ V}, \text{ Gate Open, Initiating Current} = \pm 100 \text{ mA})$	I _H	-	-	50	mA
Latching Current (V_D = 24 V, I_G = 60 mA) MT2(+), G(+) MT2(+), G(-) MT2(-), G(-)	IL	- - -	- - -	70 90 70	mA
Gate Trigger Voltage (V_D = 12 V, R_L = 30 Ω) MT2(+), G(+) MT2(+), G(-) MT2(-), G(-)	V _{GT}	0.5 0.5 0.5	- - -	1.7 1.1 1.1	V
Gate Non-Trigger Voltage (T _J = 125°C) MT2(+), G(+) MT2(+), G(-) MT2(-), G(-)	V _{GD}	0.2 0.2 0.2	- - -	- - -	V
DYNAMIC CHARACTERISTICS					
Rate of Change of Commutating Current, See Figure 10. (Gate Open, T _J = 125°C, No Snubber)	(dl/dt) _c	4.0	-	-	A/ms
Critical Rate of Rise of On–State Current $(T_J = 125^{\circ}C, f = 120 \text{ Hz}, I_G = 2 \times I_{GT}, \text{ tr} \le 100 \text{ ns})$	dI/dt	-	-	50	A/μs
Critical Rate of Rise of Off-State Voltage $(V_D = 0.66 \text{ x } V_{DRM}, \text{ Exponential Waveform, Gate Open, } T_J = 125^{\circ}\text{C})$	dV/dt	2000	_	-	V/µs

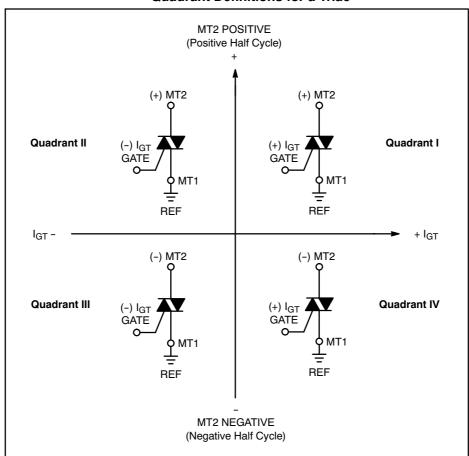
^{2.} Indicates Pulse Test: Pulse Width \leq 2.0 ms, Duty Cycle \leq 2%.

Voltage Current Characteristic of Triacs (Bidirectional Device)

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



Quadrant Definitions for a Triac



All polarities are referenced to MT1.

With in-phase signals (using standard AC lines) quadrants I and III are used.

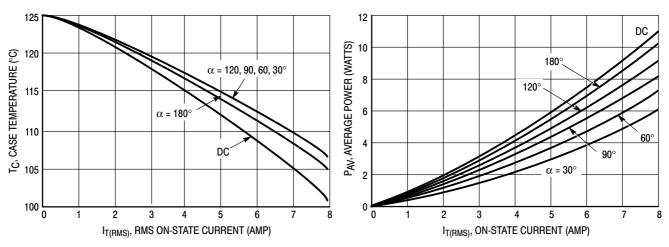


Figure 1. RMS Current Derating

Figure 2. On-State Power Dissipation

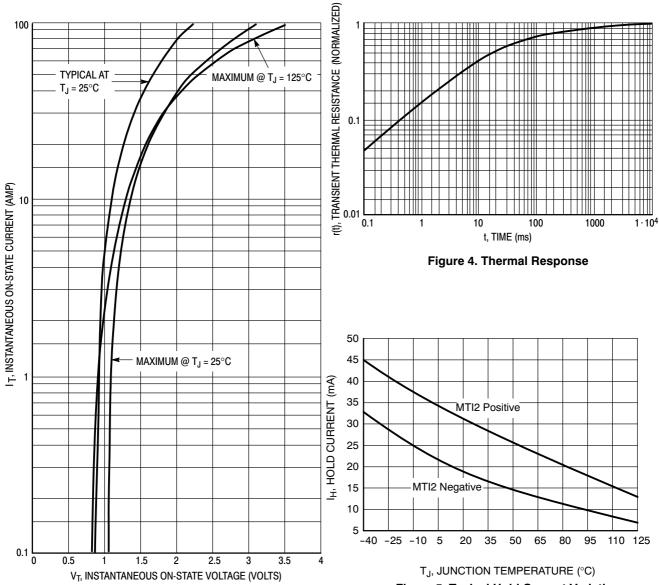


Figure 3. On-State Characteristics

Figure 5. Typical Hold Current Variation

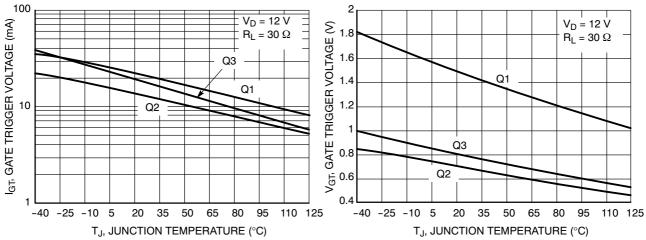


Figure 6. Typical Gate Trigger Current Variation

Figure 7. Typical Gate Trigger Voltage Variation

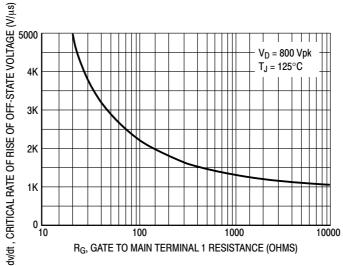
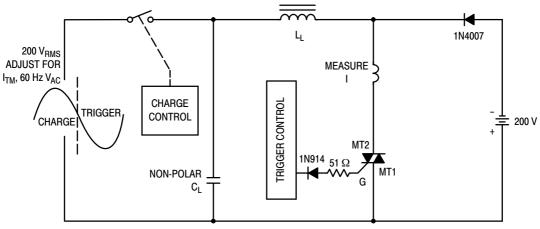


Figure 8. Critical Rate of Rise of Off-State Voltage (Exponential Waveform)

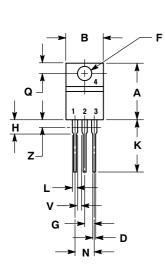


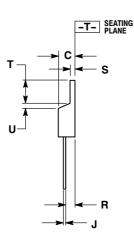
Note: Component values are for verification of rated $(di/dt)_c$. See AN1048 for additional information.

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

PACKAGE DIMENSIONS

TO-220 CASE 221A-07 **ISSUE AA**





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

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
Α	0.570	0.620	14.48	15.75
В	0.380	0.405	9.66	10.28
С	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
Н	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
Т	0.235	0.255	5.97	6.47
U	0.000	0.050	0.00	1.27
٧	0.045		1.15	
Z		0.080		2.04

STYLE 4:

- PIN 1 MAIN TERMINAL 1
 - MAIN TERMINAL 2 2.
 - 3. GATE
 - MAIN TERMINAL 2 4.

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