

DIGITRON SEMICONDUCTORS

BTC05-()A SERIES BTC05-()B SERIES

SILICON BIDIRECTIONAL THYRISTORS

Available Non-RoHS (standard) or RoHS compliant (add PBF suffix).

Available as "HR" (high reliability) screened per MIL-PRF-19500, JANTX level. Add "HR" suffix to base part number.

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Peak repetitive off-state voltage ⁽¹⁾ ($T_J = 110^\circ\text{C}$) BTC05-50A,B BTC05-100A,B BTC05-200A,B BTC05-400A,B BTC05-600A,B	V_{DRM}	50 100 200 400 600	Volts
RMS on-state current ($T_C = 80^\circ\text{C}$)	$I_{\text{T(RMS)}}$	5	Amps
Peak non-repetitive surge current (1 cycle, 60 Hz, $T_J = -40$ to 110°C)	I_{TSM}	30	Amps
Circuit fusing considerations ($T_J = -40$ to 110°C , $t = 10\text{ms}$)	I^2t	4.5	A^2s
Peak gate power	P_{GM}	10	Watts
Average gate power	$P_{\text{G(AV)}}$	0.5	Watts
Peak gate voltage	V_{GM}	5.0	Volts
Operating junction temperature range	T_J	-40 to +110	$^\circ\text{C}$
Storage temperature range	T_{stg}	-40 to +150	$^\circ\text{C}$

Note 1: Ratings apply for open gate conditions. Thyristor devices shall not be tested with a constant current source for blocking capability such that the voltage applied exceeds the rated blocking voltage.

Note 2: Soldering temperatures shall not exceed $+200^\circ\text{C}$ for 10 seconds.

THERMAL CHARACTERISTICS

Characteristic	Symbol	Maximum	Unit
Thermal resistance, junction to case	$R_{\theta\text{JC}}$	3	$^\circ\text{C}/\text{W}$
Thermal resistance, junction to ambient	$R_{\theta\text{JA}}$	60	$^\circ\text{C}/\text{W}$

ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Typ.	Max	Unit
Peak blocking current (either direction) (Rated V_{DRM} @ $T_J = 110^\circ\text{C}$, gate open)	I_{DRM}	-	-	2.0	mA
Peak on-state voltage (either direction) ($I_{\text{TM}} = 5.0\text{A}$ peak)	V_{TM}	-	-	1.8	Volts
Peak gate trigger voltage (main terminal voltage = 12V, $R_L = 100\Omega$) MT2(+), G(+); MT2(+), G(-); MT2(-), G(-) MT2(-), G(+) (main terminal voltage = rated V_{DRM} , $R_L = 10\text{k}\Omega$, $T_J = 110^\circ\text{C}$) All quadrants	V_{GTM}	- - 0.2	- - -	2.2 2.5 -	Volts
Holding current (either direction) (main terminal voltage = 12V, gate open, initiating current = 1.0A, $T_J = 25^\circ\text{C}$) BTC05-()A SERIES BTC05-()B SERIES	I_{H}	- -	- -	10 5.0	mA
Turn on time (either direction) ($I_{\text{TM}} = 14\text{A}$, $I_{\text{GT}} = 100\text{mA}$)	t_{on}	-	1.5	-	μs
Blocking voltage application rate at commutation (@ V_{DRM} , gate open)	dv/dt	-	50	-	$\text{V}/\mu\text{s}$

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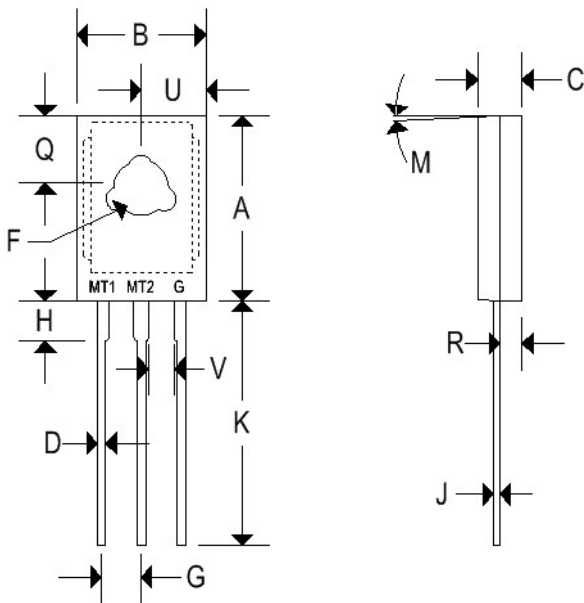
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Characteristic	Symbol	QUADRANT			
		I mA	II mA	III mA	IV mA
Peak trigger current (main terminal voltage = 12V, $R_L = 100\Omega$) BTC05-()A, $T_J = 25^\circ\text{C}$ BTC05-()A, $T_J = -40^\circ\text{C}$ BTC05-()B, $T_J = 25^\circ\text{C}$ BTC05-()B, $T_J = -40^\circ\text{C}$	I_{GTM}	10 25 5.0 15	10 25 5.0 15	10 25 5.0 15	15 40 10 25

MECHANICAL CHARACTERISTIC

Case	TO-220AB
Marking	Body painted, alpha-numeric
Pin out	See below



	TO-220AB			
	Inches		Millimeters	
	Min	Max	Min	Max
A	0.575	0.620	14.600	15.750
B	0.380	0.405	9.650	10.290
C	0.160	0.190	4.060	4.820
D	0.025	0.035	0.640	0.890
F	0.142	0.147	3.610	3.730
G	0.095	0.105	2.410	2.670
H	0.110	0.155	2.790	3.930
J	0.014	0.022	0.360	0.560
K	0.500	0.562	12.700	14.270
L	0.045	0.055	1.140	1.390
N	0.190	0.210	4.830	5.330
Q	0.100	0.120	2.540	3.040
R	0.080	0.110	2.040	2.790
S	0.045	0.055	1.140	1.390
T	0.235	0.255	5.970	6.480
U	-	0.050	-	1.270
V	0.045	-	1.140	-
Z	-	0.080	-	2.030

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FIGURE 1 – RMS CURRENT DERATING (f = 50 Hz)

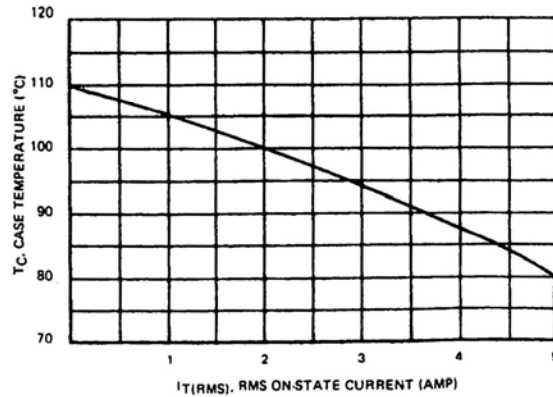


FIGURE 2 – MAXIMUM ON-STATE CHARACTERISTICS

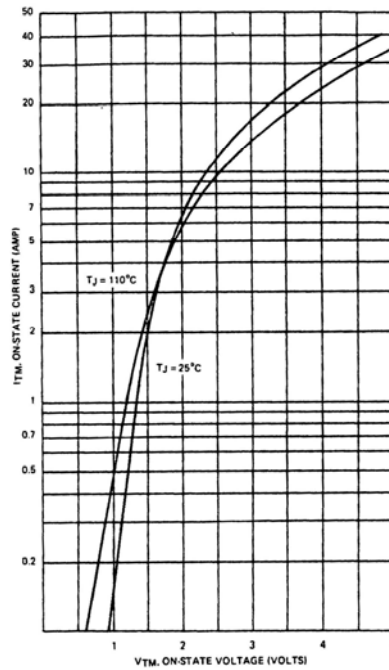
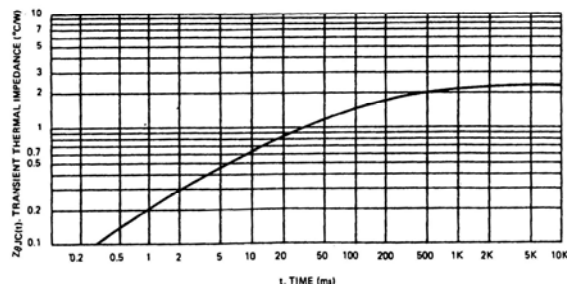


FIGURE 3 – THERMAL RESPONSE



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FIGURE 4 – TYPICAL HOLDING CURRENT

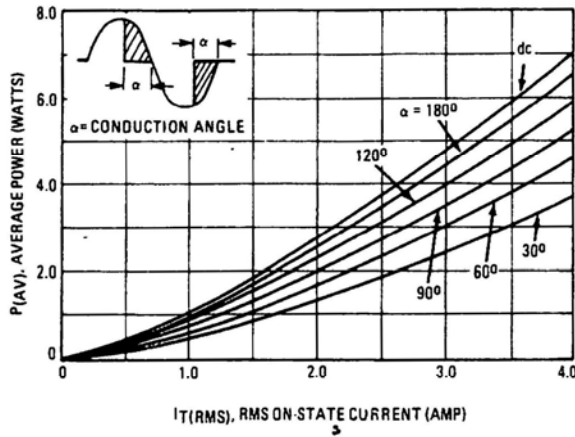


FIGURE 5 – TYPICAL GATE-TRIGGER CURRENT

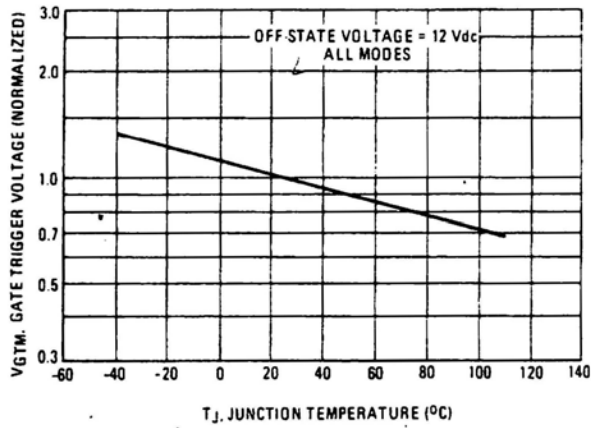


FIGURE 6 – TYPICAL GATE-TRIGGER VOLTAGE

