

**Sensitive Gate Triacs  
Silicon Bidirectional Thyristors**

**TRIACS  
4 AMPERES RMS  
600 VOLTS**

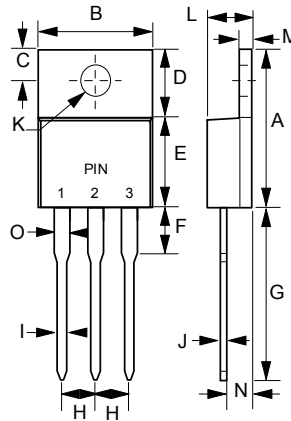
**FEATURES**

- Blocking Voltage to 600 Volts
- On-State Current Rating of 4.0 Amperes RMS at 100°C
- Uniform Gate Trigger Currents in Three Modes
- High Immunity to dv/dt - 500 V/ms minimum at 125°C
- Minimizes Snubber Networks for Protection
- High Surge Current Capability - 40 Amperes
- Industry Standard TO-220AB Package
- High Commutating di/dt - 6.0 A/ms minimum at 125°C
- Operational in Three Quadrants: Q1, Q2, and Q3
- Pb-Free Package

**MECHANICAL DATA**

- Case: Molded plastic
- Weight: 0.07 ounces, 2.0 grams

**TO-220AB**



TO-220AB		
DIM.	MIN.	MAX.
A	14.22	15.88
B	9.65	10.67
C	2.54	3.43
D	5.84	6.86
E	8.26	9.28
F	-	6.35
G	12.70	14.73
H	2.29	2.79
I	0.51	1.14
J	0.40	0.67
K	3.53 $\varnothing$	4.09 $\varnothing$
L	3.56	4.83
M	1.14	1.40
N	2.03	2.92
O	1.17	1.37

All Dimensions in millimeter

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

**MAXIMUM RATINGS** (T<sub>J</sub>= 25°C unless otherwise noticed)

Rating	Symbol	Value	Unit
Peak Repetitive Off- State Voltage (1) (T <sub>J</sub> = -40 to 125°C, Sine Wave, 50 to 60 Hz; Gate Open)	V <sub>DRM</sub> , V <sub>RRM</sub>	600	Volts
On-State RMS Current (Full Cycle Sine Wave 50 to 60 Hz, T <sub>c</sub> =100°C)	I <sub>T(RMS)</sub>	4.0	Amp
Peak Non-Repetitive Surge Current (One Full Cycle Sine Wave, 60 Hz, T <sub>J</sub> = 25°C)	I <sub>TSM</sub>	40	Amps
Circuit Fusing Consideration (t = 8.3 ms)	I <sup>2</sup> t	6.6	A <sup>2</sup> s
Peak Gate Power (T <sub>c</sub> = 100°C, T <sub>p</sub> ≤1.0 us)	P <sub>GM</sub>	0.5	Watt
Average Gate Power (T <sub>c</sub> = 100°C, t=8.3 ms)	P <sub>G(AV)</sub>	0.1	Watt
Operating Junction Temperature Range	T <sub>J</sub>	-40 to +125	°C
Storage Temperature Range	T <sub>stg</sub>	-40 to +150	°C

Notice: (1) V<sub>DRM</sub> and V<sub>RRM</sub> 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.

REV. 6 Oct-2010, KTXC06

**THERMAL CHARACTERISTICS**

Characteristic	Symbol	Value	Unit
Thermal Resistance - Junction to Case - Junction to Ambient	RthJC RthJA	2.2 62.5	°C/W
Maximum Lead Temperature for Soldering Purposes 1/8" from Case for 10 Seconds	TL	260	°C

**ELECTRICAL CHARACTERISTICS (T<sub>J</sub>=25°C unless otherwise noted; Electrical apply in both directions)**

Characteristics	Symbol	Min	Typ	Max	Unit
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**OFF CHARACTERISTICS**

Peak Repetitive Forward or Reverse Blocking Current (V <sub>D</sub> =Rated V <sub>DRM</sub> , V <sub>RRM</sub> ; Gate Open)	T <sub>J</sub> =25°C	I <sub>DRM</sub>	----	----	10	µA
	T <sub>J</sub> =125°C	I <sub>RRM</sub>	----	----	2.0	mA

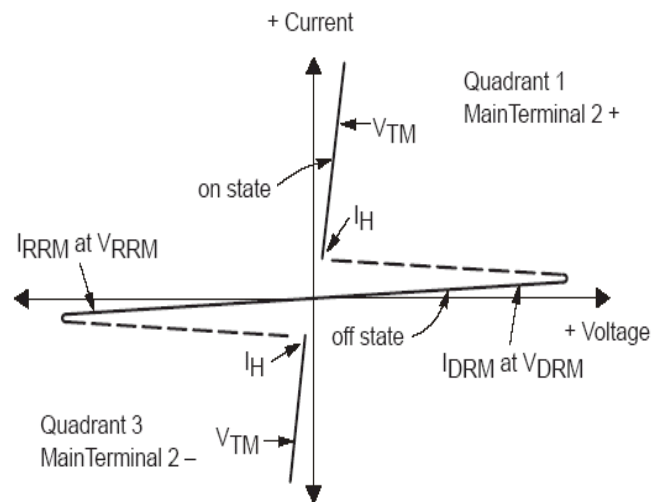
**ON CHARACTERISTICS**

Peak On-State Voltage (I <sub>TM</sub> =± 6A Peak @T <sub>p</sub> ≤2.0 ms, Duty Cycle ≤ 2%)	V <sub>TM</sub>	----	1.3	1.6	Volts
Gate Trigger Current (V <sub>D</sub> = 12V; R <sub>L</sub> = 100 Ohms)	I <sub>GT1</sub>	8.0	12	35	mA
	I <sub>GT2</sub>	8.0	16	35	
	I <sub>GT3</sub>	8.0	21	35	
Gate Trigger Voltage (V <sub>D</sub> = 12 V; R <sub>L</sub> =100 Ohms)	V <sub>GT1</sub>	0.5	0.8	1.3	Volts
	V <sub>GT2</sub>	0.5	0.8	1.3	
	V <sub>GT3</sub>	0.5	0.8	1.3	
Latching Current (V <sub>D</sub> = 12 V, I <sub>G</sub> = 35 mA)	I <sub>L1</sub>	----	25	60	mA
	I <sub>L2</sub>	----	40	80	
	I <sub>L3</sub>	----	20	60	
Holding Current (V <sub>D</sub> = 12 V, Initiating Current = ± 200 mA, Gate Open)	I <sub>H</sub>	6	20	35	mA

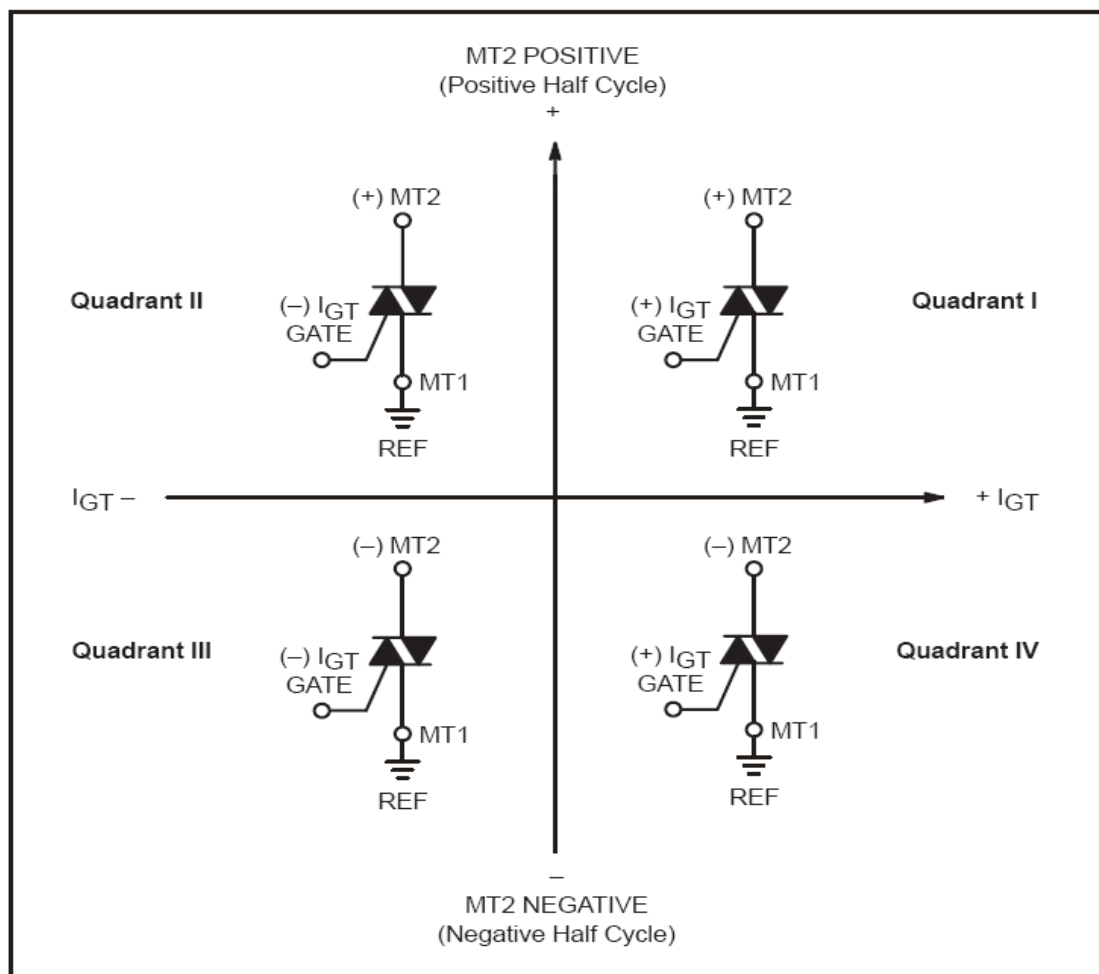
**DYNAMIC CHARACTERISTICS**

Critical Rate of Rise of Off-State Voltage (V <sub>D</sub> =0.67 x Rated V <sub>DRM</sub> , Exponential Waveform, Gate Open, T <sub>J</sub> =125°C)	dv/dt	500	1500	----	V/us
Repetitive Critical Rate of Rise of On-State Current I <sub>PK</sub> = 50 A; PW = 40 usec; di <sub>G</sub> /dt = 200 mA/usec; f = 60 Hz	di/dt	----	----	10	A/us
Rate of Change of Commutating Current (V <sub>D</sub> = 400 V, I <sub>TM</sub> = 4A, Commutating dv/dt = 18 V/us, Gate Open, T <sub>J</sub> = 125°C, f = 250 Hz, C <sub>L</sub> = 5.0 µF, L <sub>L</sub> = 20 mH, No Snubber)	(di/dt) <sub>c</sub>	6.0	8.4	----	A/ms

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

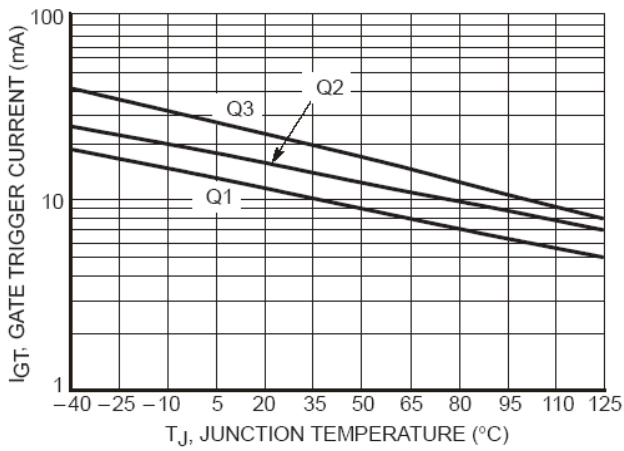


### Quadrant Definitions

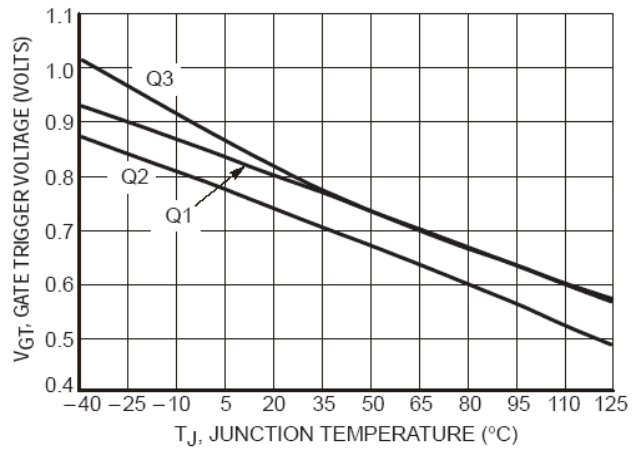


All polarities are referenced to MT1

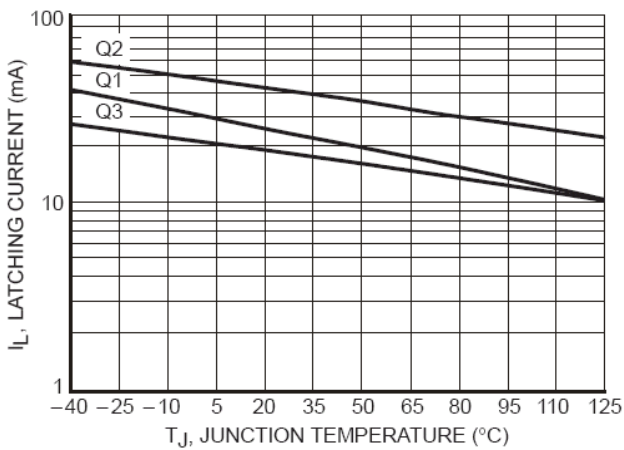
Whith in -phase signal (using standard AC lines) quadrants I and III are used



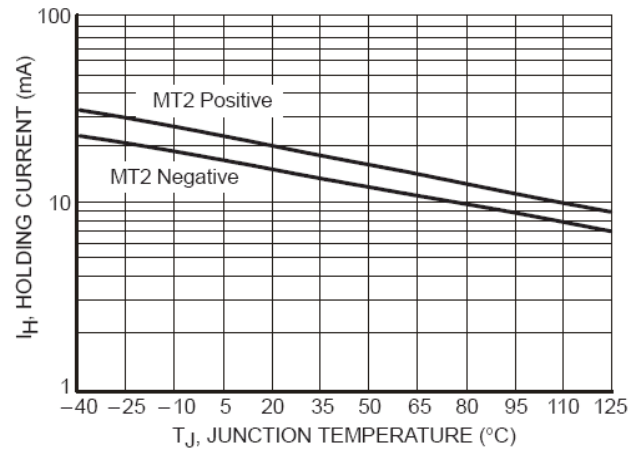
**Figure 1. Typical Gate Trigger Current versus Junction Temperature**



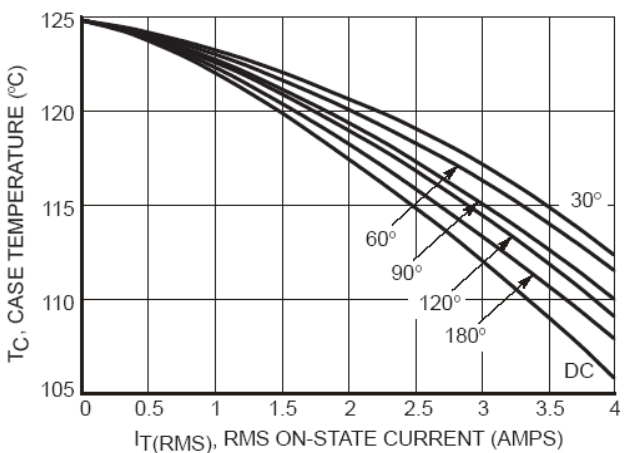
**Figure 2. Typical Gate Trigger Voltage versus Junction Temperature**



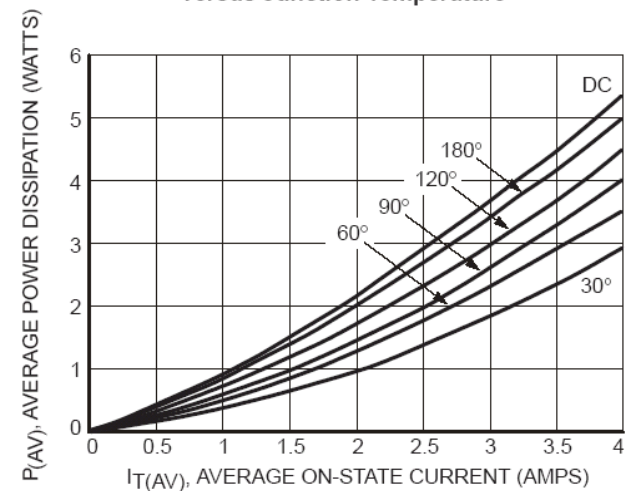
**Figure 3. Typical Latching Current versus Junction Temperature**



**Figure 4. Typical Holding Current versus Junction Temperature**



**Figure 5. Typical RMS Current Derating**



**Figure 6. On-State Power Dissipation**

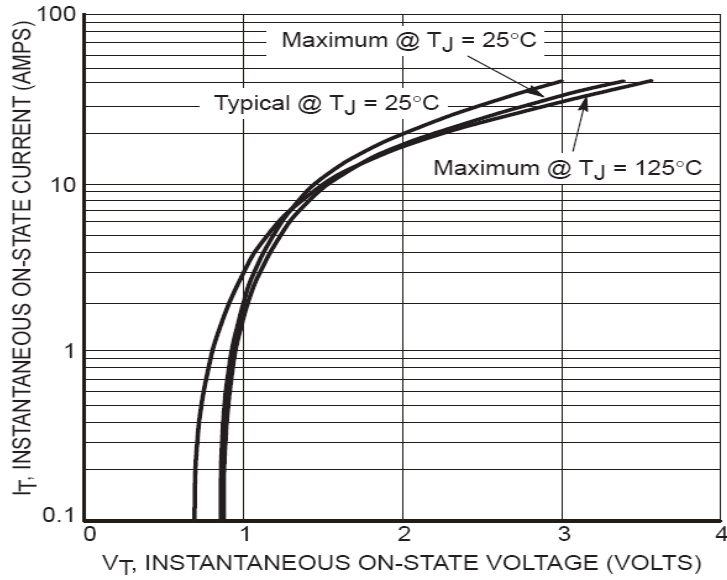


Figure 7. Typical On-State Characteristics

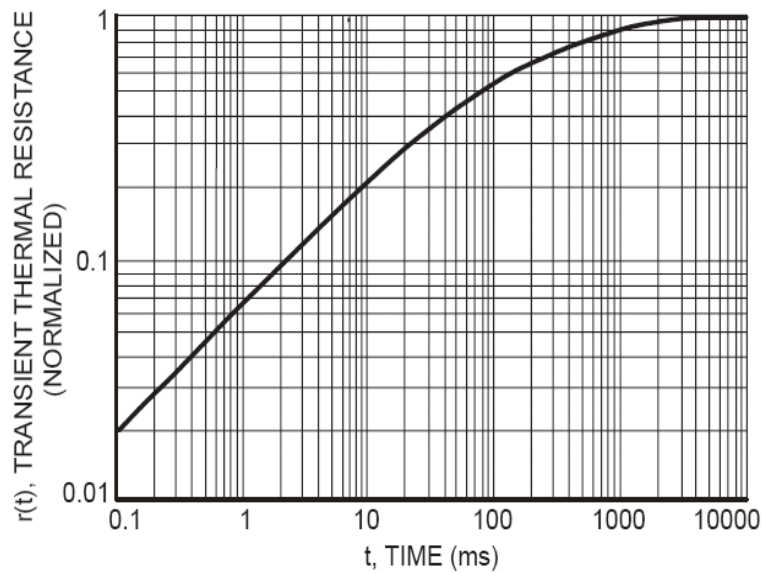


Figure 8. Typical Thermal Response

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