

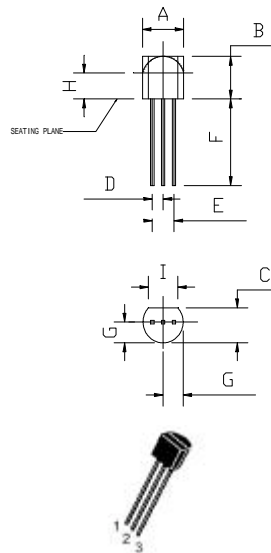
**Sensitive Gate Triacs  
Silicon Bidirectional Thyristors**

**TRIACs  
1.0 AMPERES RMS  
400 thru 600 VOLTS**

**FEATURES**

- One-Piece, Injection-Molded Package
- Blocking Voltage to 600 Volts
- Sensitive Gate Triggering in Four Trigger Modes (Quadrants) for all possible Combinations of Trigger Sources, and especially for Circuits that Source Gate Drives
- All Diffused and Glassivated Junctions for Maximum Uniformity of Parameters and Reliability
- Improved Noise Immunity (dv/dt Minimum of 20 V/msec at 110 )
- Commutating di/dt of 1.6 Amps/msec at 110
- High Surge Current of 12 Amps
- Pb-Free Package

**TO-92 (TO-226AA)**



TO-92		
DIM.	MIN.	MAX.
A	4.45	4.70
B	4.32	5.33
C	3.18	4.19
D	1.15	1.39
E	2.42	2.66
F	12.7	-----
G	2.04	2.66
H	2.93	-----
I	3.43	-----

All Dimensions in millimeter

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

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

Rating	Symbol	Value	Unit
Peak Repetitive Off- State Voltage (T <sub>J</sub> = -40 to 110 , Sine Wave, 50 to 60 Hz; Gate Open)	V <sub>DRM</sub> , V <sub>RRM</sub>	400 600	Volts
On-State RMS Current Full Cycle Sine Wave 50 to 60 Hz (T <sub>c</sub> = 50 )	I <sub>T(RMS)</sub>	1.0	Amp
Peak Non-Repetitive Surge Current Full Cycle Sine Wave 60 Hz (T <sub>J</sub> =25 )	I <sub>TSM</sub>	12.0	Amps
Circuit Fusing Consideration (t = 8.3 ms)	I <sup>2</sup> t	0.60	A <sup>2</sup> s
Peak Gate Power ( t = 2.0us ,T <sub>c</sub> = 80 )	P <sub>GM</sub>	5.0	Watt
Average Gate Power (T <sub>c</sub> = 80 , t = 8.3 ms )	P <sub>G(AV)</sub>	0.1	Watt
Peak Gate Current ( t = 2.0us ,T <sub>c</sub> = 80 )	I <sub>GM</sub>	1.0	Amp
Peak Gate Voltage ( t = 2.0us ,T <sub>c</sub> = 80 )	V <sub>GM</sub>	5.0	Volts
Operating Junction Temperature Range	T <sub>J</sub>	-40 to +110	
Storage Temperature Range	T <sub>stg</sub>	-40 to +150	

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. 2, Jun-2005, KTXD11

**THERMAL CHARACTERISTICS**

Characteristic	Symbol	Value	Unit
Thermal Resistance - Junction to Lead - Junction to Case - Junction to Ambient	RthJL RthJC RthJA	60 75 150	/W
Maximum Lead Temperature for Soldering Purposes 1/8" from Case for 10 Seconds	TL	260	

**ELECTRICAL CHARACTERISTICS (T<sub>c</sub>=25 °C unless otherwise noted)**

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

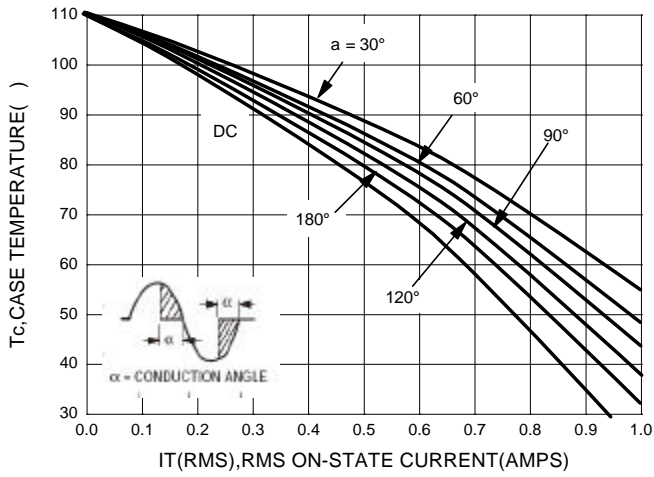
Peak Repetitive Forward or Reverse Blocking Current (V <sub>D</sub> =Rated V <sub>DRM</sub> and V <sub>RRM</sub> ; Gate OPen)	I <sub>DRM</sub> I <sub>RRM</sub>	---	---	10 100	uA uA
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**ON CHARACTERISTICS**

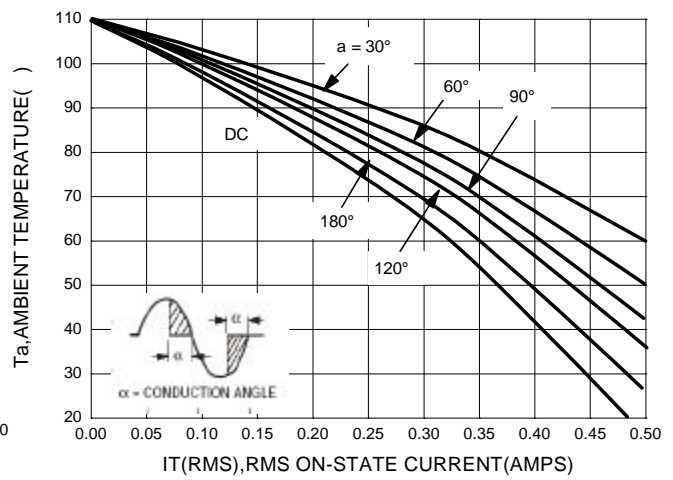
Peak Forward On-State Voltage (I <sub>TM</sub> =± 1A Peak @T <sub>p</sub> 2.0 ms, Duty Cycle 2%)	V <sub>TM</sub>	---	---	1.9	Volts
Gate Trigger Current (Continuous dc) (V <sub>D</sub> = 12 Vdc; R <sub>L</sub> = 100 Ohms)	I <sub>GT1</sub> I <sub>GT2</sub> I <sub>GT3</sub> I <sub>GT4</sub>	---	---	5.0 5.0 5.0 7.0	mA
Holding Current (V <sub>D</sub> = 12 V, Initiating Current = ± 200 mA, Gate Open)	I <sub>H</sub>	---	1.5	10	mA
Turn-On Time (V <sub>D</sub> = Rated V <sub>DRM</sub> , I <sub>TM</sub> = 1.0 A pk, I <sub>G</sub> = 25 mA)	t <sub>gt</sub>	---	2	---	us
Gate Trigger Voltage (Continuous dc) (V <sub>D</sub> = 12 Vdc; R <sub>L</sub> =100 Ohms)	V <sub>GT1</sub> V <sub>GT2</sub> V <sub>GT3</sub> V <sub>GT4</sub>	---	0.66 0.77 0.84 0.88	2.0 2.0 2.0 2.5	Volts
Latching Current (V <sub>D</sub> =12V,I <sub>G</sub> = 10 mA)	I <sub>L1</sub> I <sub>L2</sub> I <sub>L3</sub> I <sub>L4</sub>	---	1.6 10.5 1.5 2.5	15 20 15 15	mA
Gate Non-Trigger Voltage (V <sub>D</sub> = 12V, R <sub>L</sub> = 100 Ohms , T <sub>J</sub> =110 °C)	V <sub>GD</sub>	0.1	---	---	Volts

**DYNAMIC CHARACTERISTICS**

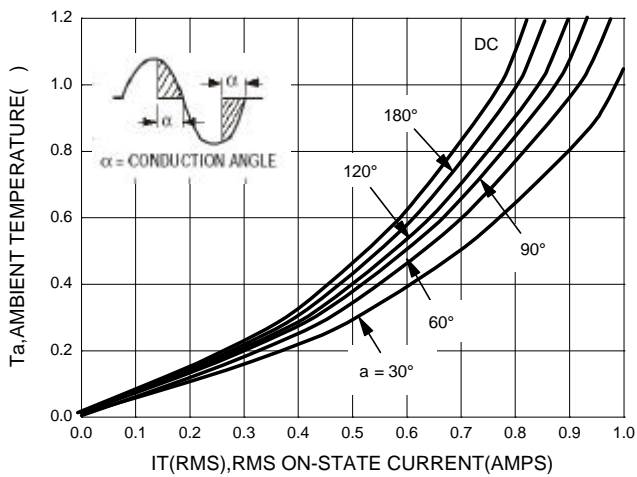
Critical Rate of Rise of Off-State Voltage (V <sub>D</sub> =Rated V <sub>DRM</sub> ,Exponential Waveform, Gate Open, T <sub>J</sub> =110 °C)	dv/dt	20	60	---	V/us
Repetitive Critical Rate of Rise of On-State Current Pulse Width = 20 us, I <sub>PKmax</sub> = 15 A, di <sub>G</sub> /dt = 1 A/us, f = 60 Hz	di/dt	---	---	10	A/us
Rate of Change of Commutating Current (V <sub>D</sub> = 400 V, I <sub>TM</sub> = .84 A, Commutating dv/dt = 1.5 V/us, Gate Open, T <sub>J</sub> = 110° C, f = 250 Hz, with Snubber)	di/dt(c)	1.6	---	---	A/ms



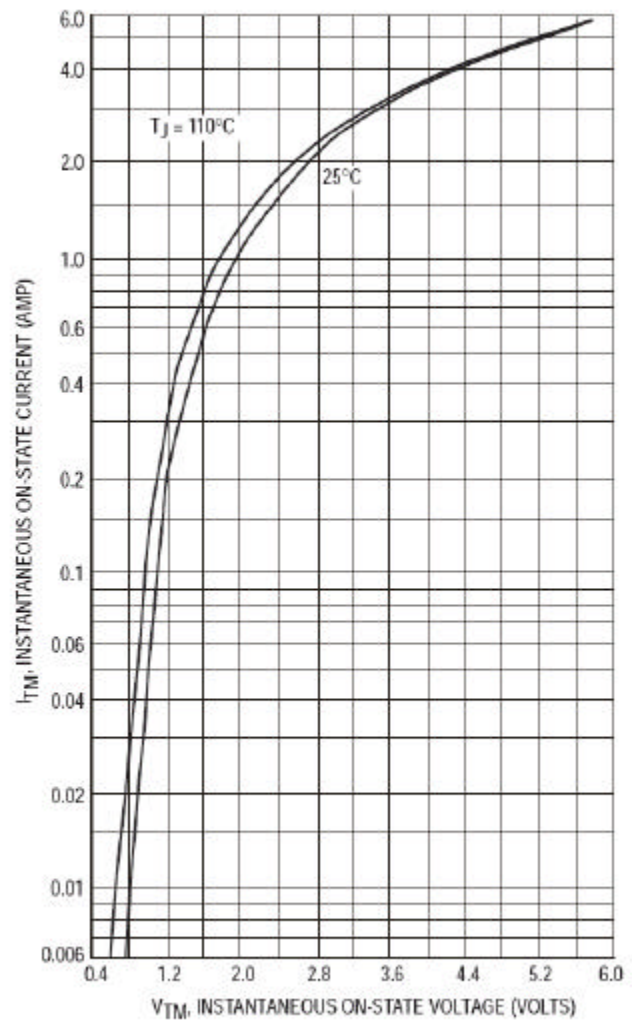
**Figure 1. RMS Current Derating**



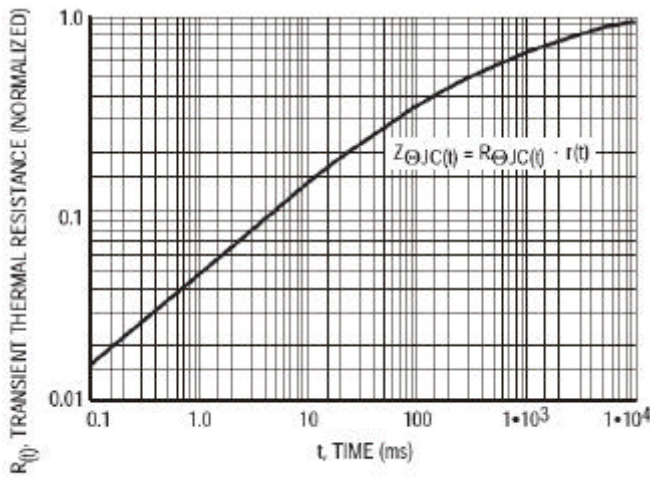
**Figure 2. RMS Current Derating**



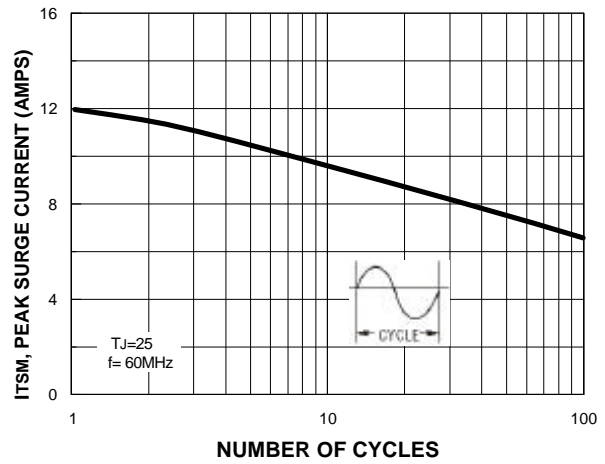
**Figure 3. Power Dissipation**



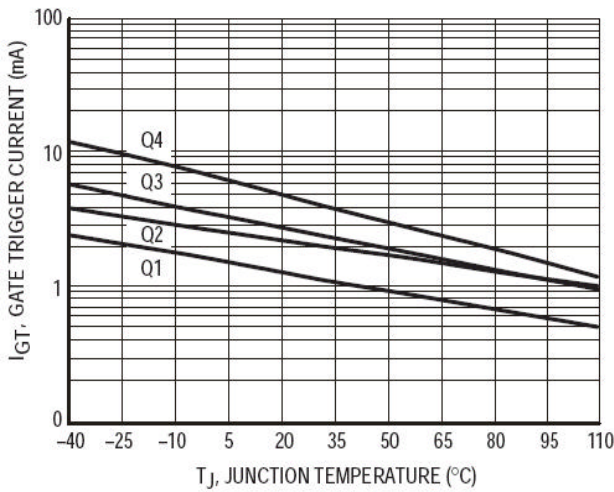
**Figure 4. On-State Characteristics**



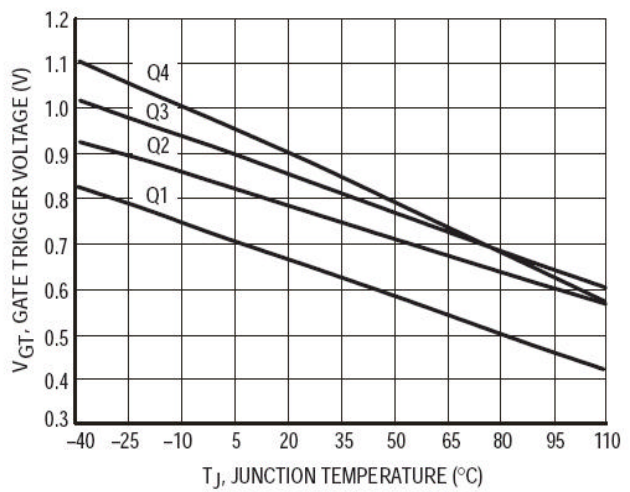
**Figure 5. Transient Thermal Response**



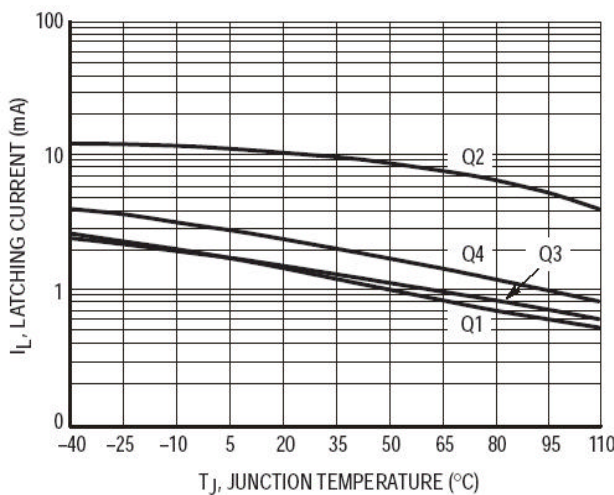
**Figure 6. Maximum Allowable Surge Current**



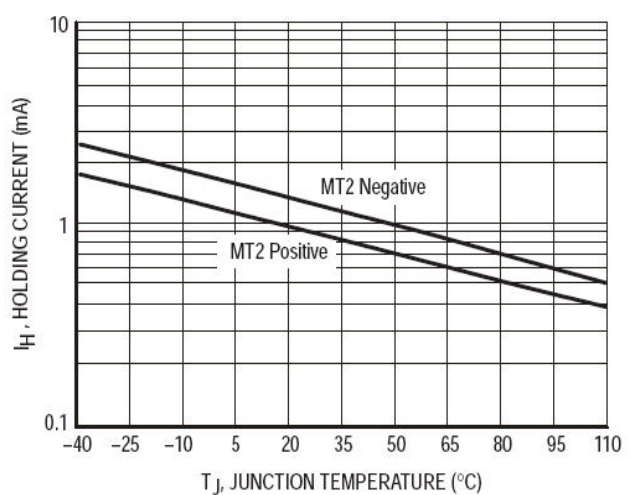
**Figure 7. Typical Gate Trigger Current versus Junction Temperature**



**Figure 8. Typical Gate Trigger Voltage versus Junction Temperature**



**Figure 9. Typical Latching Current versus Junction Temperature**



**Figure 10. Typical Holding Current versus Junction Temperature**