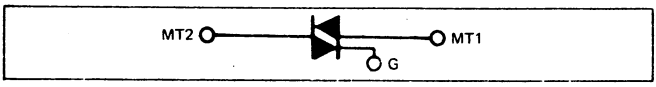
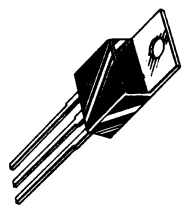
BT158-400
BT158-600



TRIACS
(THYRISTORS)
8 AMPERES RMS

400-600 VOLTS



SILICON BIDIRECTIONAL THYRISTORS

. . . designed primarily for consumer and industrial applications of power control using the zero voltage switching technique, such as heater controls, hot plate controls and static switches. These devices are characterized in the second and third quadrants (negative pulse triggering) and permit the design of most circuits entirely from the information presented.

- Low gate trigger current
- Low latching current
- All diffused and glass passivated junctions for greater parameter uniformity and stability
- Small, rugged, Thermowatt▲ construction for low thermal resistance, high heat dissipation and durability
- 12 Amp. Devices available as BT162-400, BT162-600.

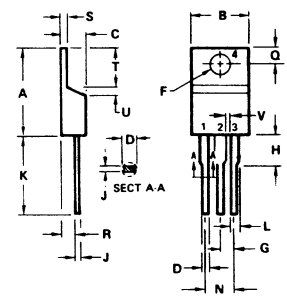
MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Repetitive Peak Off-State Voltage (T_J = −40 to +110 °C) Half Sine Wave 50 to 60 Hz, Gate Open BT158-400 BT158-600	V_{DRM}	400 600	Volts
Non Repetitive Peak Off-State Voltage[1] (T_J = −40 to +110 °C) t ≤ 10 ms, Gate Open BT158-400 BT158-600	V_{DSM}	500 700	Volts
On-State Current RMS (T_C = +90 °C) Full Cycle Sine Wave 50 to 60 Hz (T_C = +100 °C)	$I_{T(RMS)}$	8.0 4.0	Amp
Peak Surge Current (One Full Cycle, 60 Hz: T_C = 90 °) 50 Hz: preceded and followed by rated current	I_{TSM}	80 75	Amp
Rate of Rise of ON-State Current (Non Repetitive), Gate Open	$\frac{dI_T}{dt}$	10	Amp/μs
Circuit Fusing Considerations (T_J = −40 to +110 °C, t = 1.0 to 10 ms)	I^2t	30	A^2s
Peak Gate Voltage	V_{GM}	10	Volts
Peak Gate Current	I_{GM}	2.0	Amp
Peak Gate Power (T_C = +90 °C, Pulse Width = 2.0 μs)	P_{GM}	20	Watts
Average Gate Power (T_C = +90 °C, t = 10 ms)	$P_{G(AV)}$	0.5	Watt
Operating Junction Temperature Range	T_J	−40 to +110	°C
Storage Temperature Range	T_{stg}	−40 to +150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	2.2	°C/W

▲Trademark of Motorola Inc.



DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	15.11	15.75	0.595	0.620
B	9.65	10.29	0.380	0.405
C	4.06	4.82	0.160	0.190
D	0.64	0.89	0.025	0.035
F	3.61	3.73	0.142	0.147
G	2.41	2.67	0.095	0.105
H	2.79	3.30	0.110	0.130
J	0.36	0.56	0.014	0.022
K	12.70	14.27	0.500	0.562
L	1.14	1.27	0.045	0.050
N	4.83	5.33	0.190	0.210
Q	2.54	3.04	0.100	0.120
R	2.04	2.79	0.080	0.110
S	1.14	1.39	0.045	0.055
T	5.97	6.48	0.235	0.255
U	0.76	1.27	0.030	0.050
V	1.14	-	0.045	-

NOTE:
1. DIM. L & H APPLIES TO ALL LEADS.

STYLE 4:
PIN 1. MT1
2. MT2
3. GATE
4. MT2

CASE 221-A-02
TO-220AB

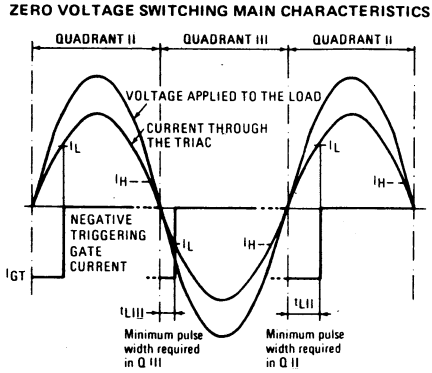
ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)

Characteristics	Symbol	Min	Typ.	Max.	Unit
Peak Blocking Current (Either Direction) Rated V_{DRM} @ T_j = 110 °C; Gate Open	I_{DRM}			2.0	mA
Peak On-State Voltage (Either Direction) I_{TM} = 11 A Peak; Pulse Width = 1 to 2 ms, Duty Cycle ≤ 2.0%	V_{TM}		1.3	1.55	Volts
Gate Trigger Current, Continuous dc Main Terminal Voltage = 12 Vdc, R_L = 100 Ohms Minimum Gate Pulse Width = 2.0 μs MT2 (+), G (−) MT2 (−), G (−) MT2 (+), G (−); MT2 (−), G (−), T_C = −40 °C	I_{GT}		 12 20	 40 40 60	mA
Gate Trigger Voltage, Continuous dc Main Terminal Voltage = 12 Vdc, R_L = 100 Ohms Minimum Gate Pulse Width = 2.0 μs MT2 (+), G (−) MT2 (−), G (−) MT2 (+), G (−); MT2 (−), G (−), T_C = −40 °C Main Terminal Voltage = Raged V_{DRM}, R_L = 10K, T_j = 110 °C MT2 (+), G (−); MT2 (−), G (−)	V_{GT}	 0.2	 0.9 1.1 	 1.5 1.5 2.0 	Volts
Holding Current (Either Direction) Main Terminal Voltage = 12 Vdc, Gate Open T_C = 25 °C Initiating Current = 200 mA T_C = −40 °C	I_H		6.0	30 50	mA
Latching Current Main Terminal Voltage = 12 Vdc; R_L = variable Gate Pulse Width = 20 μs, Duty Cycle ≤ 2% MT2 (+), G (−) MT2 (−), G (−) @ I_{GT} = 40 mA MT2 (+), G (−) MT2 (−), G (−) @ I_{GT} = 60 mA; T_C = −40 °C	I_L		 30 6.0	 50 30 75 50	mA
Critical Rate of Rise of Off-State Voltage Rated V_{DRM}, Exponential Voltage Rise, Gate Open T_C = 110 °C	dV/dt		100		V/μs

Note:

1. Off-State Voltage up to 800 V may be applied, but triac may switch into the On-State. In that case, the Rate of Rise of On-State current should not exceed its specified maximum rating.

ZERO VOLTAGE SWITCHING MAIN CHARACTERISTICS



RECOMMENDED ZERO VOLTAGE SWITCH INTEGRATED CIRCUITS

Part Nr.	Usage	Package
UAA1004	On-Off Applications, high volume	DIL 8 pin
UAA1016	Proportional Applications; variable duty cycle modulator	DIL 88 pin

See separate Data Sheets for complete information.

FIGURE 1 – RMS CURRENT DERATING

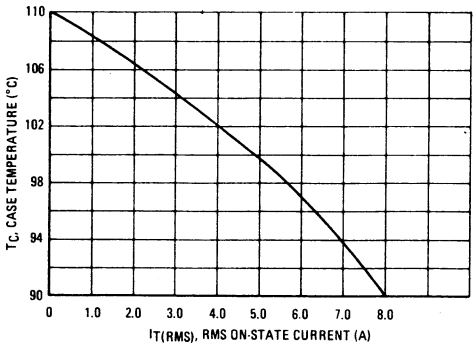


FIGURE 2 – ON-STATE POWER DISSIPATION

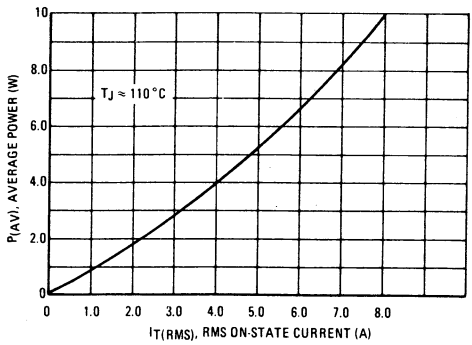


FIGURE 3 – TYPICAL GATE TRIGGER VOLTAGE

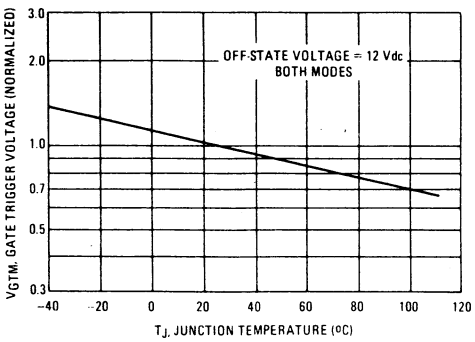


FIGURE 4 – TYPICAL GATE TRIGGER CURRENT

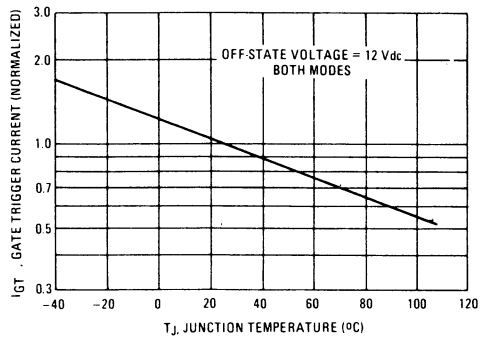


FIGURE 5 – TYPICAL HOLDING CURRENT

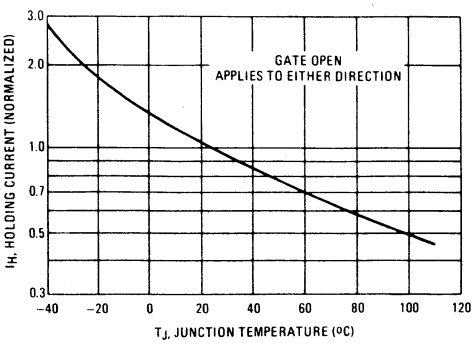


FIGURE 6 – TYPICAL LATCHING CURRENT

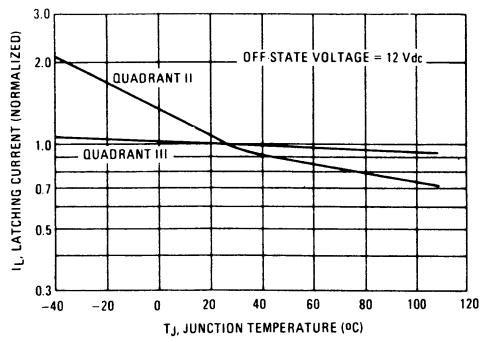


FIGURE 7 – MAXIMUM ON-STATE CHARACTERISTICS

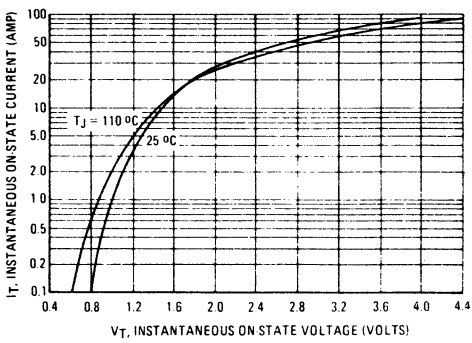


FIGURE 8 – MAXIMUM NON-REPETITIVE SURGE CURRENT

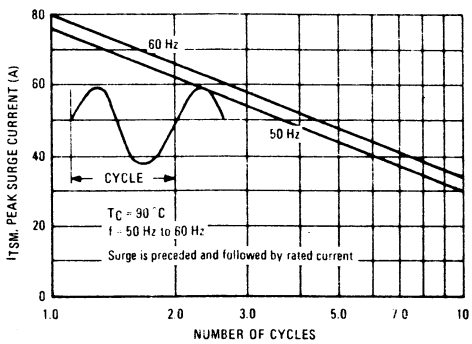
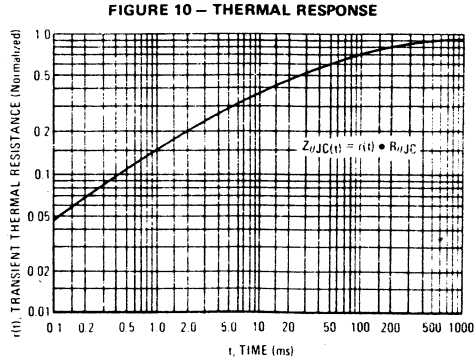


FIGURE 9 – TYPICAL THERMAL RESISTANCE FROM MOUNTING BASE TO HEATSINK

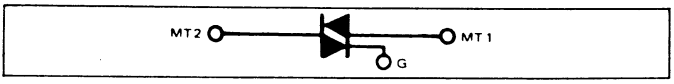
Metal to Metal:	Dry	0,9 °C/W
Metal to Metal:	Lubed	0,3 °C/W
With Insulator:	Dry	Not recommended
With Insulator:	Lubed	1,3 °C/W

These values are available when using the rectangular washer and mica insulator furnished for TO-220 Package. The recommended mounting torque is 0.68 Nm.

FIGURE 10 – THERMAL RESPONSE



BT162-400
BT162-600



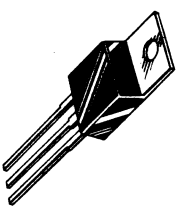
TRIACS (THYRISTORS) 12 AMPERES RMS

400-600 VOLTS

SILICON BIDIRECTIONAL THYRISTORS

. . . designed primarily for consumer and industrial applications of power control using the zero voltage switching technique, such as heater controls, hot plate controls and static switches. These devices are characterized in the second and third quadrants (negative pulse triggering) and permit the design of most circuits entirely from the information presented.

- Low gate trigger current
- Low latching current
- All diffused and glass passivated junctions for greater parameter uniformity and stability
- Small, rugged, Thermowatt▲ construction for low thermal resistance, high heat dissipation and durability
- 8 Amp. devices available as BT158-400, BT158-600.



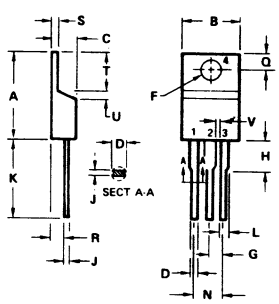
MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Repetitive Peak Off-State Voltage (T_J = −40 to +110 °C) Half Sine Wave 50 to 60 Hz, Gate Open BT162-400 BT162-600	V_{DRM}	400 600	Volts
Non Repetitive Peak Off-State Voltage[1] (T_J = −40 to +110 °C) t ≤ 10 ms, Gate Open BT162-400 BT162-600	V_{DSM}	500 700	Volts
On-State Current RMS (T_C = +80 °C) Full Cycle Sine Wave 50 to 60 Hz (T_C = +95 °C)	$I_{T(RMS)}$	12.0 6.0	Amp
Peak Surge Current (One Full Cycle, T_C = 80 °C) 60 Hz 50 Hz preceded and followed by rated current	I_{TSM}	120 110	Amp
Rate of Rise of ON-State Current (Non Repetitive), Gate Open	$\frac{dI_T}{dt}$	10	Amp/μs
Circuit Fusing Considerations (T_J = −40 to +110 °C, t = 1.0 to 10 ms)	I^2t	40	A^2s
Peak Gate Voltage	V_{GM}	10	Volts
Peak Gate Current	I_{GM}	2.0	Amp
Peak Gate Power (T_C = +80 °C, Pulse Width = 2,0 μs)	P_{GM}	20	Watts
Average Gate Power (T_C = +80 °C, t = 10 ms)	$P_{G(AV)}$	0 5	Watt
Operating Junction Temperature Range	T_J	−40 to +110	°C
Storage Temperature Range	T_{stg}	−40 to +150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R\theta JC$	2.0	°C/W

▲Trademark of Motorola Inc.



DIM	MILLIMETERS MIN	MAX	INCHES MIN	MAX
A	15.11	15.75	0.595	0.620
B	9.65	10.29	0.380	0.405
C	4.06	4.82	0.160	0.190
D	0.64	0.89	0.025	0.035
F	3.61	3.73	0.142	0.147
G	2.41	2.67	0.095	0.105
H	2.79	3.30	0.110	0.130
J	0.36	0.56	0.014	0.022
K	12.70	14.27	0.500	0.562
L	1.14	1.27	0.045	0.050
N	4.83	5.33	0.190	0.210
Q	2.54	3.04	0.100	0.120
R	2.04	2.79	0.080	0.110
S	1.14	1.39	0.045	0.055
T	5.97	6.48	0.235	0.255
U	0.76	1.27	0.030	0.050
V	1.14	-	0.045	-

NOTE:
1. DIM. L & H APPLIES TO ALL LEADS.

STYLE 4:
PIN 1. MT1
2. MT2
3. GATE
4. MT2

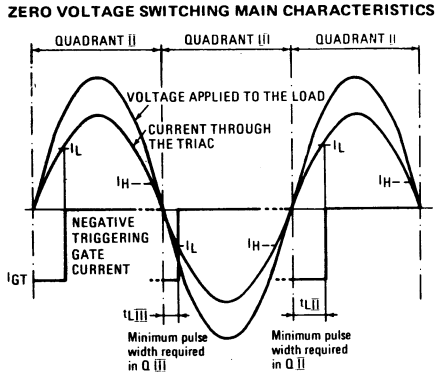
CASE 221-A-02
TO-220AB

ELECTRICAL CHARACTERISTICS (T_C = 25 ° unless otherwise noted)

Characteristics	Symbol	Min.	Typ.	Max.	Unit
Peak Blocking Current (Either Direction) Rated V_{DRM} @ T_J = 110°C; Gate Open	I_{DRM}			2.0	mA
Peak On-State Voltage (Either Direction) I_{TM} = 17 A Peak; Pulse Width = 1 to 2 ms, Duty Cycle ≤ 2.0 %	V_{TM}		1.3	1.75	Volts
Gate Trigger Current, Continuous dc Main Terminal Voltage = 12 Vdc, R_L = 100 Ohms Minimum Gate Pulse Width = 2.0 µs MT2 (+), G (–) MT2 (–), G (–) MT2 (+), G (–); MT2 (–), G (–), T_C = –40 °C	I_{GT}		 25 20	 40 40 75	mA
Gate Trigger Voltage, Continuous dc Main Terminal Voltage = 12 Vdc, R_L = 100 Ohms Minimum Gate Pulse Width = 2.0 µs MT2 (+), G (–) MT2 (–), G (–) MT2 (+), G (–); MT2 (–), G (–), T_C = –40 °C Main Terminal Voltage = Rated V_{DRM}, R_L = 10 K, T_J = 110 °C MT2 (+), G (–); MT2 (–), G (–)	V_{GT}	 0.2	 0.9 1.1	 1.5 1.5 2.0	Volts
Holding Current (Either Direction) Main Terminal Voltage = 12 Vdc, Gate Open } T_C = 25 °C Initiating Current = 200 mA } T_C = –40 °C	I_H		6.0	30 50	mA
Latching Current Main Terminal Voltage = 12 Vdc; R_L = variable Gate Pulse Width = 20 µs, Duty Cycle ≤ 2 % MT2 (+), G (–) } @ I_{GT} = 40 mA MT2 (–), G (–) } MT2 (+), G (–) } @ I_{GT} = 75 mA; T_C = –40 °C MT2 (–), G (–) }	I_L		 30 6.0	 60 40 100 60	mA
Critical Rate of Rise of Off-State Voltage Rated V_{DRM}, Exponential Voltage Rise, Gate Open T_C = 110 °C	dV/dt		100		V/µs

[1] Off-State Voltage up to 800 V may be applied, but triac may switch into the On-State. In that case, the Rate of Rise of On-State current should not exceed its specified maximum rating.

ZERO VOLTAGE SWITCHING MAIN CHARACTERISTICS



RECOMMENDED ZERO VOLTAGE SWITCH INTEGRATED CIRCUITS

Part Nr.	Usage	Package
UAA1004	On-Off Applications, high volume	DIL 8 pin
UAA1016	Proportional Applications; variable duty cycle modulator	DIL 88 pin

See separate Data Sheets for complete information.

FIGURE 1 – RMS CURRENT DERATING

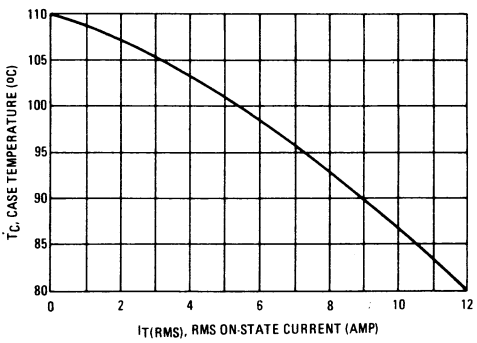


FIGURE 2 – ON-STATE POWER DISSIPATION

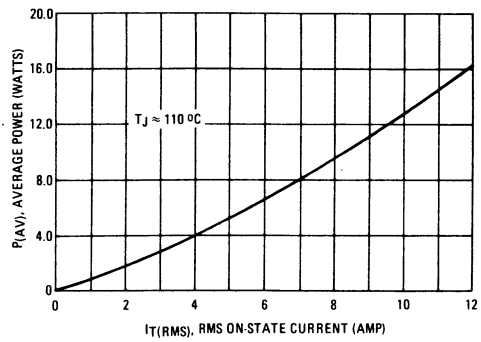


FIGURE 3 – TYPICAL GATE TRIGGER VOLTAGE

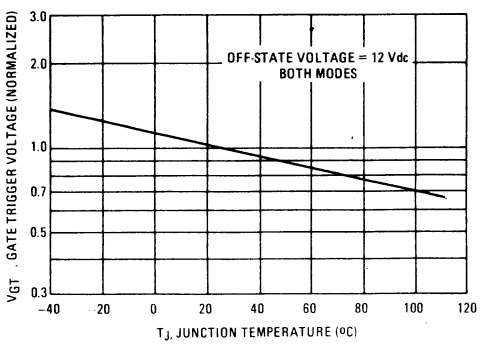


FIGURE 4 – TYPICAL GATE TRIGGER CURRENT

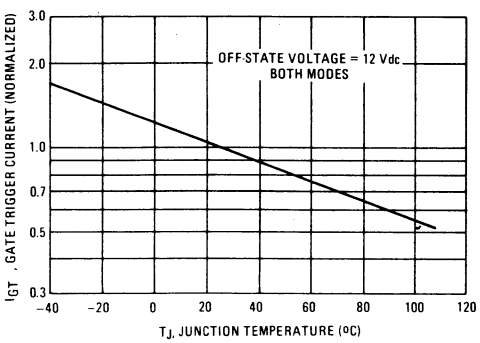


FIGURE 5 – TYPICAL HOLDING CURRENT

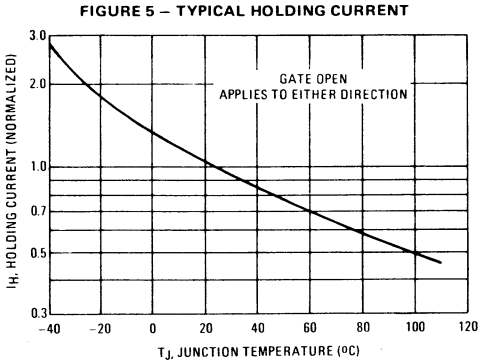


FIGURE 6 – TYPICAL LATCHING CURRENT

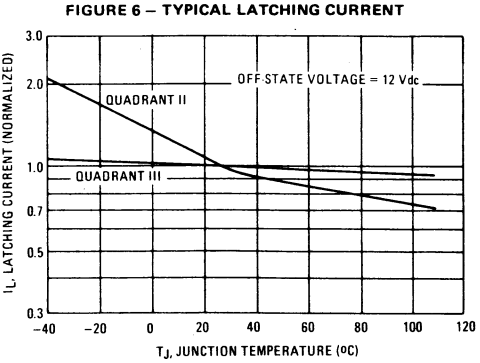


FIGURE 7 – MAXIMUM ON-STATE CHARACTERISTICS

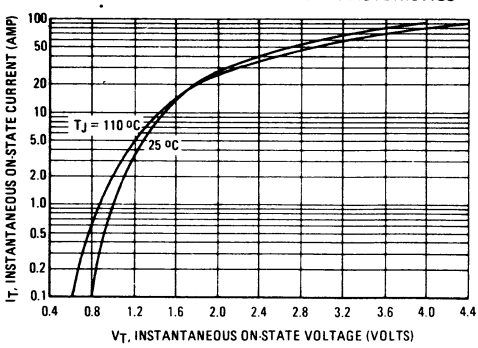


FIGURE 8 – MAXIMUM NON-REPETITIVE SURGE CURRENT

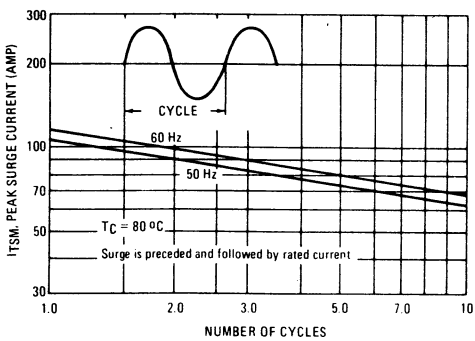


FIGURE 9 – TYPICAL THERMAL RESISTANCE FROM MOUNTING BASE TO HEATSINK

Metal to Metal:	Dry	0,9 °C/W
Metal to Metal:	Lubed	0,3 °C/W
With Insulator:	Dry	Not recommended
With Insulator:	Lubed	1,3 °C/W

These values are available when using the rectangular washer and mica insulator furnished for TO-220 Package. The recommended mounting torque is 0.68 Nm.

FIGURE 10 – THERMAL RESPONSE