Selected Packages*
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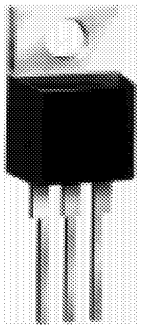
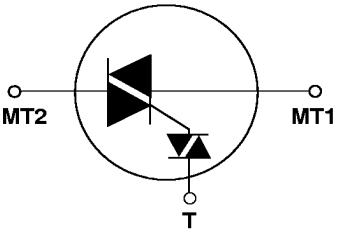


THERMOTAB
TO-220AB
(Isolated)



QUADRACs

Internally Triggered Triacs (4 – 15 Amps)

General Description

Teccor's QUADRAC is a triac that includes a diac trigger mounted inside the same package. This device, developed by Teccor, saves the user the expense and assembly time of buying a discrete diac and assembling in conjunction with a gated triac.

The QUADRAC is a bidirectional AC switch and is gate controlled for either polarity of main terminal voltage. Its primary purpose is for AC switching and phase control applications such as speed controls, temperature modulation controls, and lighting controls.

Triac current capacities range from 4 to 15 Amperes with voltage ranges from 200-600 Volts. QUADRACs are available in the TO-220AB package as shown above.

The Thermotab package is electrically isolated to 2,500 V (RMS) from the leads to mounting surface. 4,000 V (RMS) available on special order. This means that no external isolation is required, thus eliminating the need for separate insulators and insulator-mounting steps ... saving dollars over "hot tab" devices.

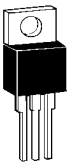
All Teccor triac and diac chips have glass-passivated junctions to ensure long term device reliability and parameter stability.

Variations of devices in this data sheet are available for custom design applications. Please consult the factory for more information.

Features

- **Glass-passivated junctions**
- **Electrically-isolated package**
- **Internal trigger diac**
- **High surge capability — up to 200 Amps**
- **High voltage capability — 200 up to 600 Volts**

Electrical Specifications

$I_{T(RMS)}$	Part No.	V_{DRM}	I_{DRM}			V_{TM}	Trigger Diac Specifications (T–MT1)					
	Isolated						ΔV_{BO}	V_{BO}		[$\Delta V\pm$]	I_{BO}	C_T
RMS On-State Current Conduction Angle of 360° (5)	 THERMOTAB TO-220AB	Repetitive Peak Blocking Voltage (1)	Peak Off-State Current Gate Open V_{DRM} = Max Rated Value (1) (10) mAmps			Peak On-State Voltage at Max Rated RMS Current T_C = 25°C (1) (3)	Breakover Voltage Symmetry (7)	Breakover Voltage (Forward & Reverse) (6)		Dynamic Breakback Voltage (Forward & Reverse) (6)	Peak Break-over Current	Trigger Firing Capaci-tance (11)
		Volts	T_C = 25°C	T_C = 100°C	T_C = 125°C	Volts	Volts	Volts		Volts	µAmps	µFarads
See "Package Dimensions" section for variations.		MIN	MAX			MAX	MAX	MIN	MAX	MIN	MAX	MAX
4.0 Amps	Q2004LT	200	.05	0.5	2.0	1.6	3	33	43	5	25	0.1
	Q4004LT	400	.05	0.5	2.0	1.6	3	33	43	5	25	0.1
	Q5004LT	500	.05	0.5	2.0	1.6	3	33	43	5	25	0.1
	Q6004LT	600	.05	0.5	2.0	1.6	3	33	43	5	25	0.1
6.0 Amps	Q2006LT	200	.05	0.5	2.0	1.6	3	33	43	5	25	0.1
	Q4006LT	400	.05	0.5	2.0	1.6	3	33	43	5	25	0.1
	Q5006LT	500	.05	0.5	2.0	1.6	3	33	43	5	25	0.1
	Q6006LT	600	.05	0.5	2.0	1.6	3	33	43	5	25	0.1
8.0 Amps	Q2008LT	200	.05	0.5	2.0	1.6	3	33	43	5	25	0.1
	Q4008LT	400	.05	0.5	2.0	1.6	3	33	43	5	25	0.1
	Q5008LT	500	.05	0.5	2.0	1.6	3	33	43	5	25	0.1
	Q6008LT	600	.05	0.5	2.0	1.6	3	33	43	5	25	0.1
10.0 Amps	Q2010LT	200	.05	0.5	2.0	1.6	3	33	43	5	25	0.1
	Q4010LT	400	.05	0.5	2.0	1.6	3	33	43	5	25	0.1
	Q5010LT	500	.05	0.5	2.0	1.6	3	33	43	5	25	0.1
	Q6010LT	600	.05	0.5	2.0	1.6	3	33	43	5	25	0.1
15.0 Amps	Q2015LT	200	.05	0.5	2.0	1.6	3	33	43	5	25	0.1
	Q4015LT	400	.05	0.5	2.0	1.6	3	33	43	5	25	0.1
	Q5015LT	500	.05	0.5	2.0	1.6	3	33	43	5	25	0.1
	Q6015LT	600	.05	0.5	2.0	1.6	3	33	43	5	25	0.1

General Notes

- All measurements are made at 60Hz with resistive load at an ambient temperature of +25°C unless otherwise specified.
- Operating temperature range (T_J) is -40°C to +125°C.
- Storage temperature range (T_S) is -40°C to +125°C.
- Lead solder temperature is a maximum of +230°C for 10 seconds maximum; ≥ 1/16" (1.59mm) from case.
- The case temperature (T_C) is measured as shown on dimensional outline drawings. See "Package Dimensions" section of this catalog.

Electrical Specification Notes

(1) For either polarity of MT2 with reference to MT1.
(2) See Figure 3.1 for I_H vs T_C.
(3) See Figures 3.4 and 3.5 for i_T vs v_T.
(4) See Figure 3.9 for surge ratings with specific durations.
(5) See Figures 3.6, 3.7, and 3.8 for current rating at specific operating temperature.
(6) See Figures 3.2 and 3.3 for test circuit.
(7) ΔV_{BO} = [+ V_{BO}] - [- V_{BO}]
(8) See Figures 3.7 and 3.8 for maximum allowable case temperature at maximum rated current.
(9) Trigger firing capacitance = 0.1µF with 0.1µs rise time.
(10) T_C = T_J for test conditions in off-state.
(11) Maximum required value to ensure sufficient gate current.

THERMAL RESISTANCE (STEADY STATE) $R_{\theta JC}$ [$R_{\theta JA(TYP)}$] °C/WATT	
TYPE	ISOLATED TO-220AB
4.0 Amps	3.6 [50]
6.0 Amps	3.3
8.0 Amps	2.8
10.0 Amps	2.6
15.0 Amps	2.1

Electrical Isolation

All Teccor isolated QUADRAC packages will withstand a minimum high potential test of 2500VAC (RMS) from leads to mounting tab over the operating temperature range of the device. See isolation table for standard and optional isolation ratings.

ELECTRICAL ISOLATION FROM LEADS TO MOUNTING TAB **	
VAC(RMS)	TYPE
2500	Standard
4000	Optional*

* For 4000 V isolation use "V" suffix.
** U.L. Recognized File #E71639

I_H	I_{TSM}		dv/dt(c)	dv/dt		t_{gt}	I^2t	I_{GTM}	di/dt
Holding Current Gate Open (1) (2)	Peak One Cycle Surge (4) (8)		Critical Rate-of-Rise of Commutation Voltage at Rated V_{DRM} and $I_{T(RMS)}$ Commutating di/dt = 0.54 Rated $I_{T(RMS)}$/ms Gate Unenergized (1) (5) (8)	Critical Rate-of-Rise of Off-State Voltage at Rated V_{DRM} Gate Open (1) Volts/µSec		Gate Controlled Turn-On Time (6) (9)	RMS Surge (Non-Repetitive) On-State Current for period of 8.3ms for Fusing	Peak Gate Trigger Current (10µs Max)	Maximum Rate-of-Change of On-State Current (9)
				T_C = 100°C	T_C = 125°C				
mAmps	Amps		Volts/µSec			µSec	$Amps^2Sec$	Amps	Amps/µSec
MAX	60Hz	50Hz	MIN	MIN		TYP			
40	55	46	3	75	50	3	12.5	1.2	50
40	55	46	3	75	50	3	12.5	1.2	50
40	55	46	3	50	50	3	12.5	1.2	50
40	55	46	3	50	50	3	12.5	1.2	50
50	80	65	4	150	100	3	26.5	1.5	70
50	80	65	4	150	100	3	26.5	1.5	70
50	80	65	4	125	85	3	26.5	1.5	70
50	80	65	4	125	85	3	26.5	1.5	70
60	100	83	4	175	120	3	41	1.5	70
60	100	83	4	175	120	3	41	1.5	70
60	100	83	4	150	100	3	41	1.5	70
60	100	83	4	150	100	3	41	1.5	70
60	120	100	4	200	150	3	60	1.5	70
60	120	100	4	200	150	3	60	1.5	70
60	120	100	4	175	120	3	60	1.5	70
60	120	100	4	175	120	3	60	1.5	70
70	200	167	4	300	200	3	166	1.5	100
70	200	167	4	300	200	3	166	1.5	100
70	200	167	4	200	150	3	166	1.5	100
70	200	167	4	200	150	3	166	1.5	100

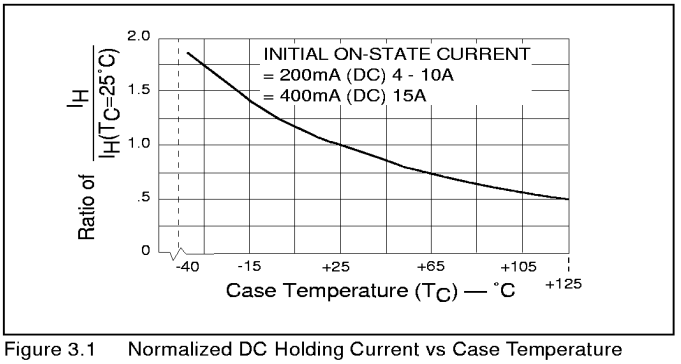


Figure 3.1 Normalized DC Holding Current vs Case Temperature

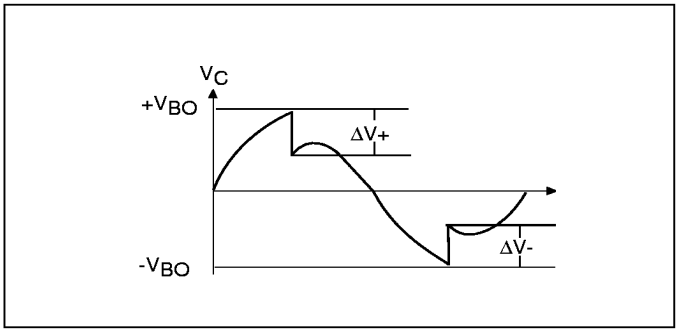


Figure 3.3 Test Circuit Waveforms

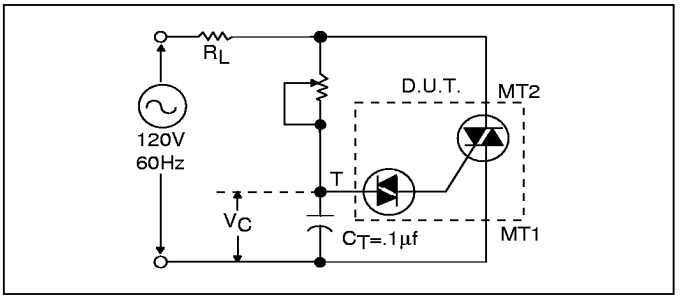


Figure 3.2 Test Circuit

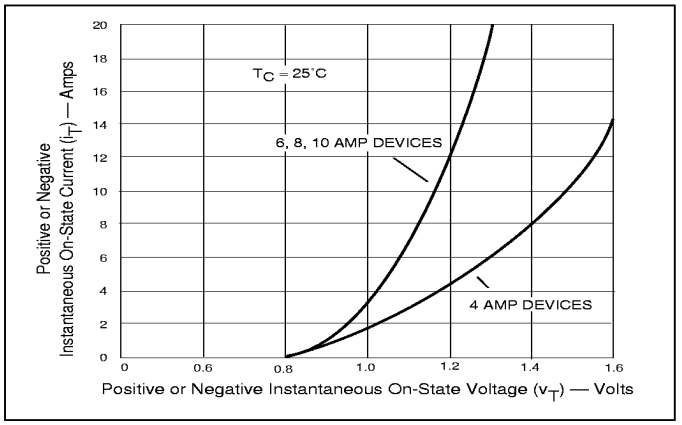


Figure 3.4 On-State Current vs On-State Voltage (Typical) (4-10 Amp)

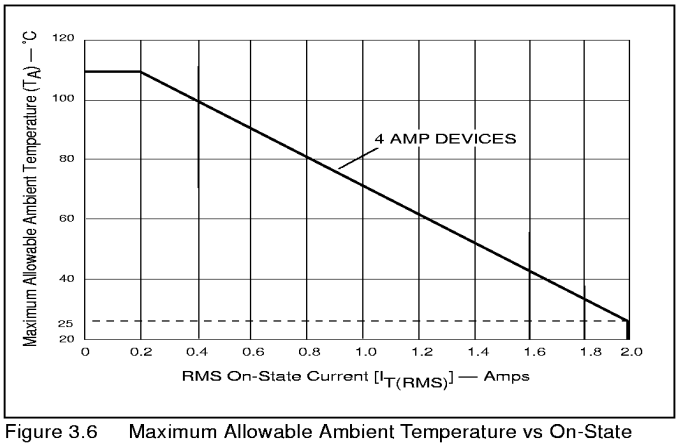


Figure 3.6 Maximum Allowable Ambient Temperature vs On-State Current

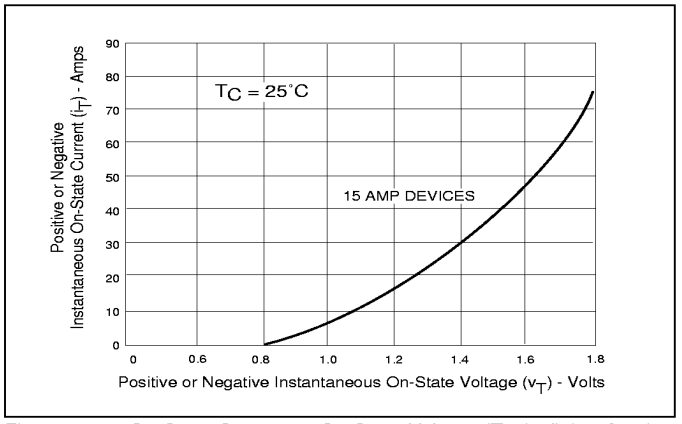


Figure 3.5 On-State Current vs On-State Voltage (Typical) (15 Amp)

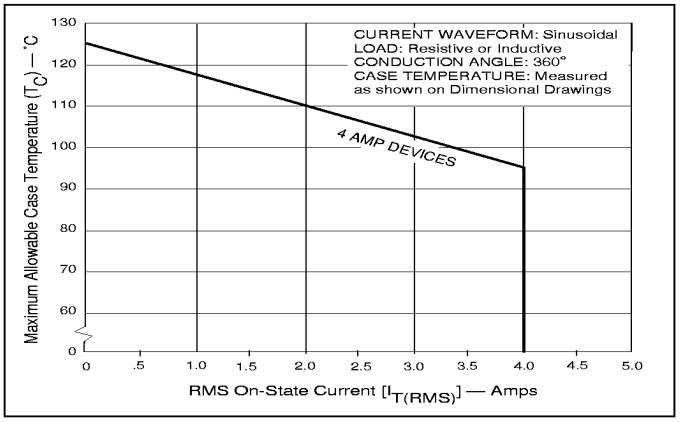


Figure 3.7 Maximum Allowable Case Temperature vs On-State Current (4 Amp)

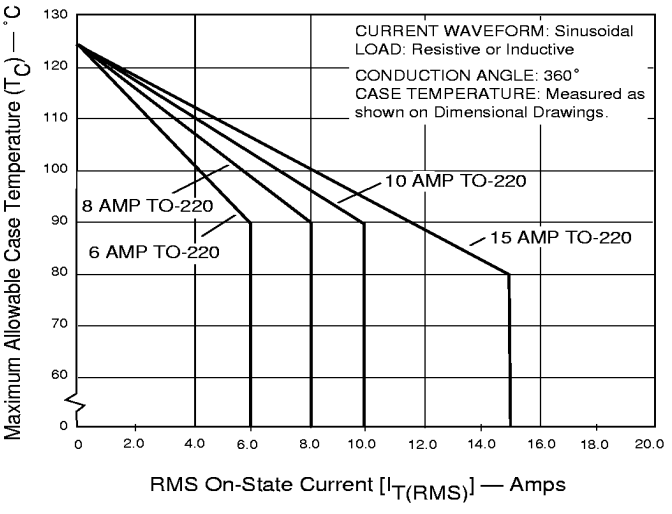


Figure 3.8 Maximum Allowable Case Temperature vs On-State Current (6-15 Amp)

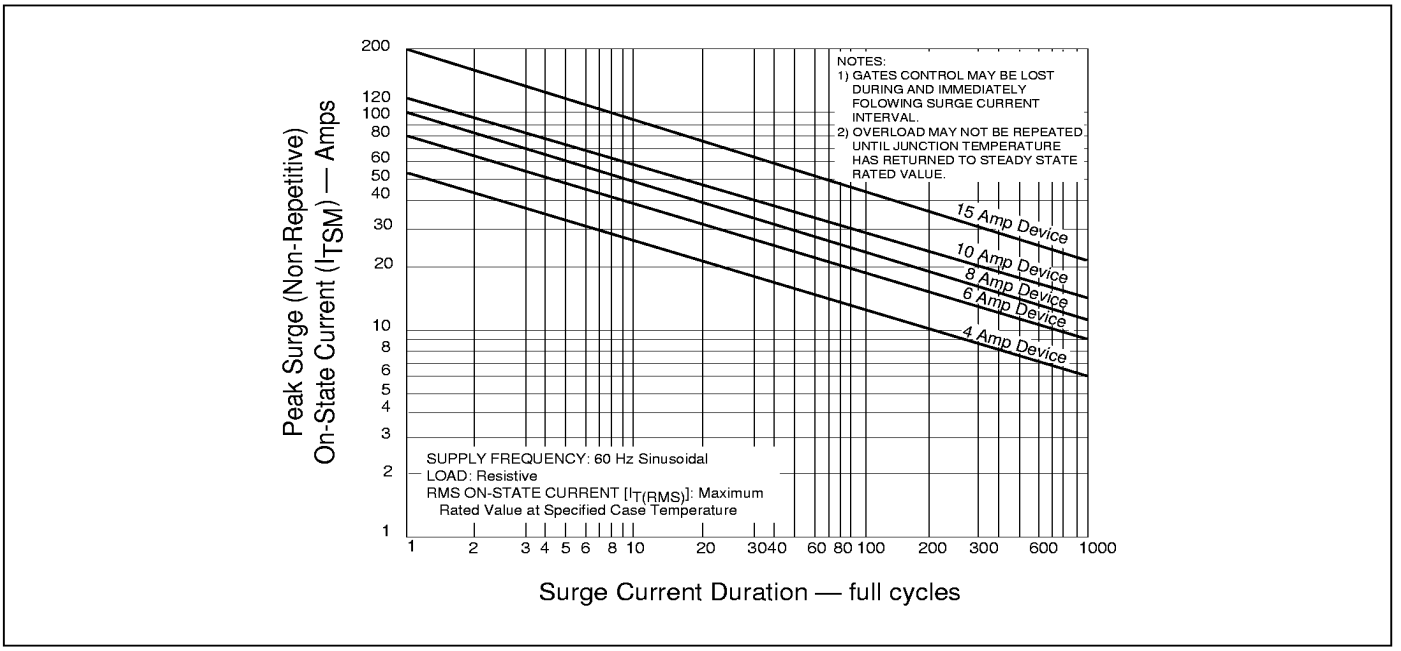


Figure 3.9 Peak Surge Current vs Surge Current Duration

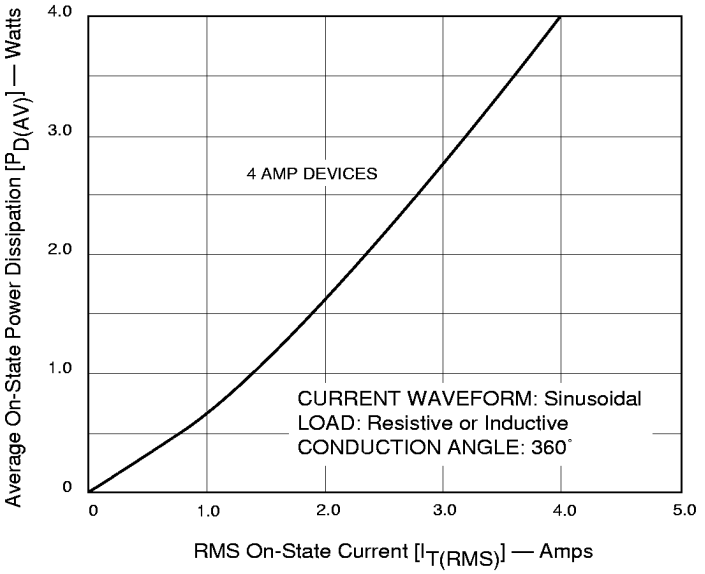


Figure 3.10 Power Dissipation (Typical) vs. On-State Current (4 Amp)

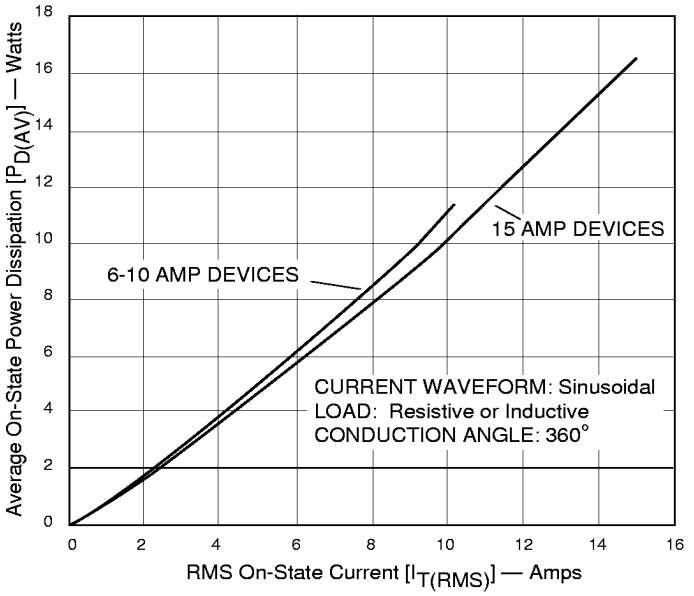


Figure 3.11 Power Dissipation (Typical) vs. On-State Current (6-10 and 15 Amp)