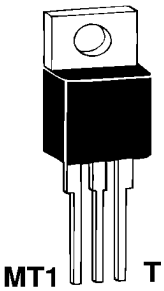
TECCOR ELECTRONICS

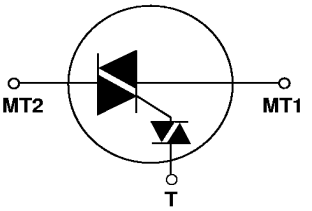
Selected Packages* U.L. RECOGNIZED File #E71639



THERMOTAB
TO-220AB (Isolated)

Alternistor Quadrac®

Internally Triggered Triacs (6 - 15 Amps)



Product Description

Teccor's Alternistor QUADRAC is a triac that includes a diac trigger mounted inside the same package. This device, developed by Teccor, saves the user the expense of buying a discrete diac and assembling in conjunction with a gated triac. Also, the Alternistor triac eliminates the need for a snubber network.

The Alternistor 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 where noise immunity is required.

Alternistor QUADRAC current capacities range from 6 to 15 Amperes with voltage ranges from 400-600 Volts and 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. A 4,000 V (RMS) rating is 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.

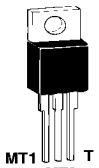
All Teccor dice have glass-passivated junctions to ensure long term reliability and parametric stability. Variations of devices in this data sheet are available for custom design applications. Please consult the factory for more information.

Features

- **Glass-passivated junctions**
- **Electrically-isolated package**
- **Internal trigger diac**
- **High surge capability — up to 200 Amps**
- **High voltage capability — 400 up to 600 Volts**

ISO 9001 TECCOR ELECTRONICS, INC.

Electrical Specifications

$I_{T(RMS)}$	Part No.	V_{DRM}	I_{DRM}			V_{TM}	Trigger Diac Specifications (T–MT1)					
	Isolated						ΔV_{BO}	V_{BO}		[ΔV±]	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)
			T_C = 25°C	T_C = 100°C	T_C = 125°C							
		Volts				Volts	Volts	Volts		Volts	µAmps	µFarads
		MIN	MAX			MAX	MAX	MIN	MAX	MIN	MAX	MAX
6.0 Amps	Q4006LTH	400	.05	0.5	2.0	1.6	3	33	43	5	25	0.1
	Q5006LTH	500	.05	0.5	2.0	1.6	3	33	43	5	25	0.1
	Q6006LTH	600	.05	0.5	2.0	1.6	3	33	43	5	25	0.1
8.0 Amps	Q4008LTH	400	.05	0.5	2.0	1.6	3	33	43	5	25	0.1
	Q5008LTH	500	.05	0.5	2.0	1.6	3	33	43	5	25	0.1
	Q6008LTH	600	.05	0.5	2.0	1.6	3	33	43	5	25	0.1
10.0 Amps	Q4010LTH	400	.05	0.5	2.0	1.6	3	33	43	5	25	0.1
	Q5010LTH	500	.05	0.5	2.0	1.6	3	33	43	5	25	0.1
	Q6010LTH	600	.05	0.5	2.0	1.6	3	33	43	5	25	0.1
15.0 Amps	Q4015LTH	400	.05	0.5	2.0	1.6	3	33	43	5	25	0.1
	Q5015LTH	500	.05	0.5	2.0	1.6	3	33	43	5	25	0.1
	Q6015LTH	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.

Electrical Specification Notes

(1) For either polarity of MT2 with reference to MT1.
(2) See Figure 1.1 for I_H vs. T_C.
(3) See Figures 1.4 and 1.5 for i_T vs. v_T.
(4) See Figure 1.9 for surge ratings with specific durations.
(5) See Figures 1.6 and 1.7 for current rating at specific operating temperature.
(6) See Figures 1.2 and 1.3 for test circuit.
(7) $\Delta V_{BO} = [+ V_{BO}] - [- V_{BO}]$
(8) See Figure 1.7 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
6.0 Amps	3.3 [50]
8.0 Amps	2.8
10.0 Amps	2.6
15.0 Amps	2.1

Electrical Isolation

- All Teccor isolated TO-220AB 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)		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
	60Hz	50Hz	MIN	MIN		TYP			
50	**80**	**65**	**25**	**575**	**450**	**3**	**26.5**	**1.5**	**70**
50	**80**	**65**	**25**	**500**	**400**	**3**	**26.5**	**1.5**	**70**
50	**80**	**65**	**25**	**425**	**350**	**3**	**26.5**	**1.5**	**70**
50	**100**	**83**	**25**	**575**	**450**	**3**	**41**	**1.5**	**70**
50	**100**	**83**	**25**	**500**	**400**	**3**	**41**	**1.5**	**70**
50	**100**	**83**	**25**	**425**	**350**	**3**	**41**	**1.5**	**70**
60	**120**	**100**	**30**	**925**	**700**	**3**	**60**	**1.5**	**70**
60	**120**	**100**	**30**	**850**	**650**	**3**	**60**	**1.5**	**70**
60	**120**	**100**	**30**	**775**	**600**	**3**	**60**	**1.5**	**70**
70	**200**	**167**	**30**	**925**	**700**	**3**	**166**	**1.5**	**100**
70	**200**	**167**	**30**	**850**	**650**	**3**	**166**	**1.5**	**100**
70	**200**	**167**	**30**	**775**	**600**	**3**	**166**	**1.5**	**100**

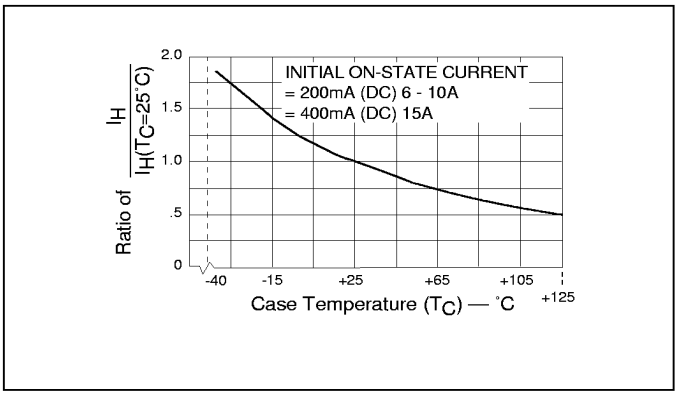


Figure 1.1 Normalized DC Holding Current vs. Case Temperature

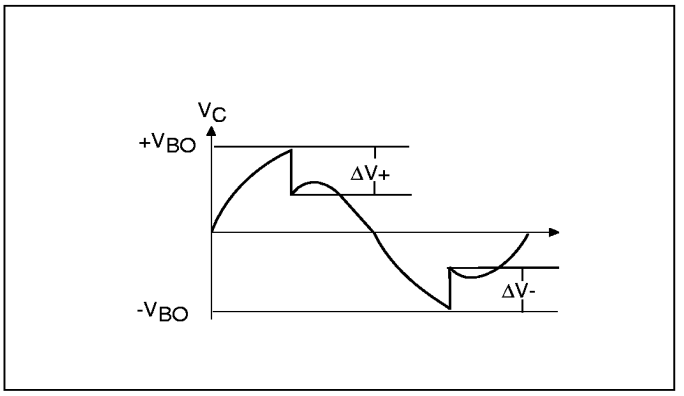


Figure 1.3 Test Circuit Waveforms

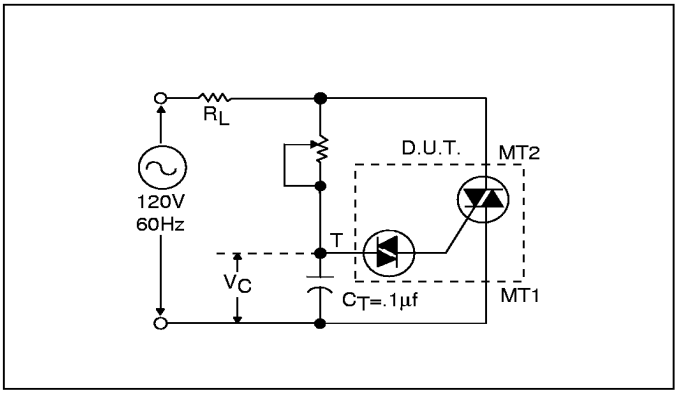


Figure 1.2 Test Circuit

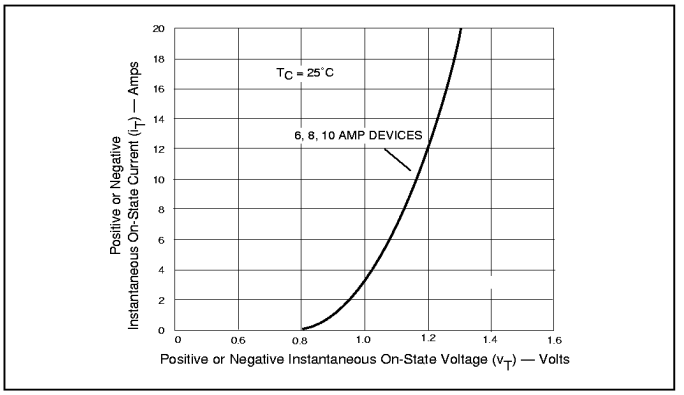


Figure 1.4 On-State Current vs. On-State Voltage (Typical) (6-10 Amp)

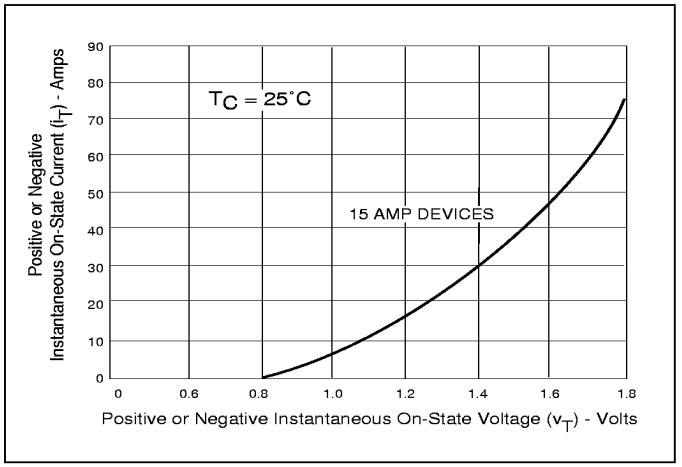


Figure 1.5 On-State Current vs. On-State Voltage (Typical) (15 Amp)

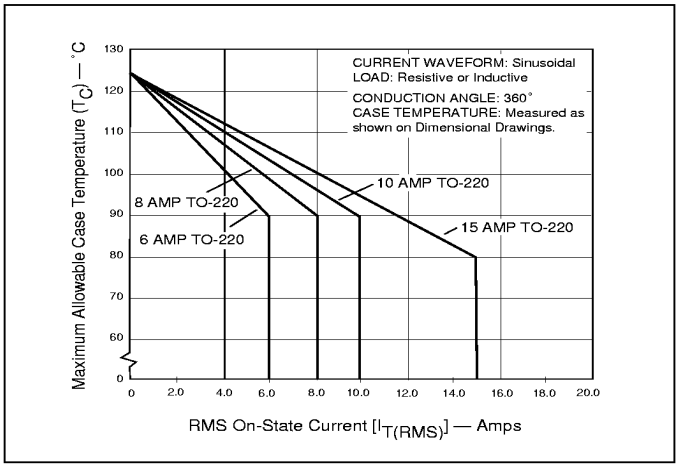


Figure 1.7 Maximum Allowable Case Temperature vs. On-State Current (6-15 Amp)

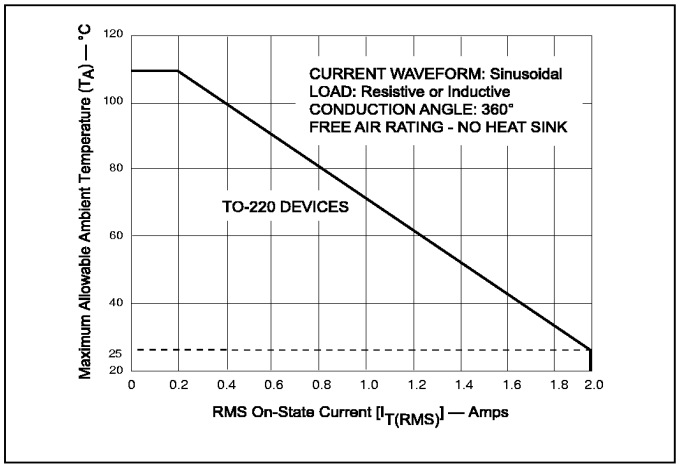


Figure 1.6 Maximum Allowable Ambient Temperature vs. On-State Current

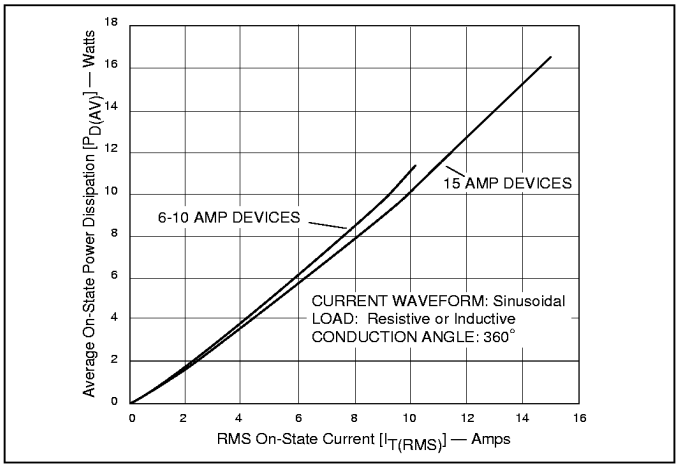


Figure 1.8 Power Dissipation (Typical) vs. On-State Current (6-10 and 15 Amp)

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Data Sheet: AltQuadrac-1098

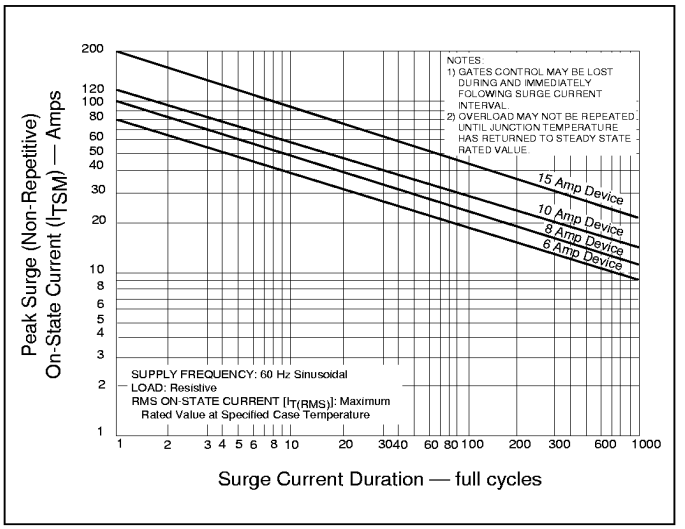

Figure 1.9 Peak Surge Current vs. Surge Current Duration

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