

D-PAK Sensitive Triacs

(4 - 8 Amps)

General Description

Teccor's new line of sensitive gate D-PAK and V-PAK triacs include surface mount devices with current capabilities 4 through 8 amperes. Voltage ranges are available from 200 to 600 volts.

Teccor's D-PAK and V-PAK triacs are available in a choice of two packages as shown above, surface mount (SMT) TO-252AA and through hole TO-251AA.

These sensitive gated triacs from Teccor Electronics are part of a broad line of bidirectional semiconductors.

This new line of devices is designed for high volume, low cost AC power applications such as controllers for motor loads, lights, temperature, and general line voltage switching.

The triac may be gate triggered from a blocking to conduction state for either polarity of applied voltage and is designed for AC switching and phase control applications such as speed and temperature modulation controls, lighting controls and static switching relays. The triggering signal is normally applied between the gate and MT1 with all four operating modes guaranteed.

All Teccor triacs have glass-passivated junctions to ensure long term device reliability and permanent stability. Teccor's glass offers a rugged, reliable barrier against junction contamination.


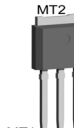
Variations of devices covered in this data sheet are available for custom design applications. Please consult factory for more information.

Tape-and-reel capability is available for through hole TO-251AA. The TO-252AA is furnished in pocket / embossed tape on reels.

Features

- Surface mount package TO-252AA and through hole TO-251AA
- Sensitive gate input
- Glass-passivated junctions ensure long device reliability and parameter stability
- Voltage capability — up to 600 Volts
- Surge capability — up to 80 Amps

Electrical Specifications

$I_T(\text{RMS})$	Part No.		V_{DRM}	I_{GT}				I_{DRM}		V_{TM}	V_{GT}	
	Surface Mount	Through Hole		mAmps				mAmps			Volts	
RMS On-State Current Conduction Angle of 360°	 TO-252AA D-PAK	 TO-251AA V-PAK	Repetitive Peak Blocking Voltage (1) Volts	DC Gate Trigger Current in Specific Operating Quadrants $V_D = 12\text{VDC}$ $R_L = 60\Omega$ (3)				Peak Off-State Current Gate Open $V_{\text{DRM}} = \text{Max Rated Value}$ (1) (7)		Peak On-State Voltage at Max Rated RMS Current $T_C = 25^\circ\text{C}$ (1)	DC Gate Trigger Voltage $V_D = 12\text{VDC}$ $R_L = 60\Omega$ (2)	
MAX	Non Isolated	Non Isolated	MIN	MAX				$T_C = 25^\circ\text{C}$	$T_C = 110^\circ\text{C}$	Volts	$T_C = 110^\circ\text{C}$	$T_C = 25^\circ\text{C}$
4A	L2004D3	L2004V3	200	3.0	3.0	3.0	3.0	0.01	0.2	1.6	0.2	2.0
	L4004D3	L4004V3	400	3.0	3.0	3.0	3.0	0.01	0.2	1.6	0.2	2.0
	L6004D3	L6004V3	600	3.0	3.0	3.0	3.0	0.01	0.2	1.6	0.2	2.0
	L2004D5	L2004V5	200	5.0	5.0	5.0	5.0	0.01	0.2	1.6	0.2	2.0
	L4004D5	L4004V5	400	5.0	5.0	5.0	5.0	0.01	0.2	1.6	0.2	2.0
	L6004D5	L6004V5	600	5.0	5.0	5.0	5.0	0.01	0.2	1.6	0.2	2.0
	L2004D6	L2004V6	200	5.0	5.0	5.0	10	0.01	0.2	1.6	0.2	2.0
	L4004D6	L4004V6	400	5.0	5.0	5.0	10	0.01	0.2	1.6	0.2	2.0
	L6004D6	L6004V6	600	5.0	5.0	5.0	10	0.01	0.2	1.6	0.2	2.0
	L2004D8	L2004V8	200	10	10	10	20	0.01	0.2	1.6	0.2	2.0
6A	L2006D5	L2006V5	200	5.0	5.0	5.0	5.0	0.02	0.5	1.6	0.2	2.0
	L4006D5	L4006V5	400	5.0	5.0	5.0	5.0	0.02	0.5	1.6	0.2	2.0
	L6006D5	L6006V5	600	5.0	5.0	5.0	5.0	0.02	0.5	1.6	0.2	2.0
	L2006D6	L2006V6	200	5.0	5.0	5.0	10	0.02	0.5	1.6	0.2	2.0
	L4006D6	L4006V6	400	5.0	5.0	5.0	10	0.02	0.5	1.6	0.2	2.0
	L6006D6	L6006V6	600	5.0	5.0	5.0	10	0.02	0.5	1.6	0.2	2.0
	L2006D8	L2006V8	200	10	10	10	20	0.02	0.5	1.6	0.2	2.0
	L4006D8	L4006V8	400	10	10	10	20	0.02	0.5	1.6	0.2	2.0
8A	L2008D6	L2008V6	200	5.0	5.0	5.0	10	0.02	0.5	1.6	0.2	2.0
	L4008D6	L4008V6	400	5.0	5.0	5.0	10	0.02	0.5	1.6	0.2	2.0
	L6008D6	L6008V6	600	5.0	5.0	5.0	10	0.02	0.5	1.6	0.2	2.0
	L2008D8	L2008V8	200	10	10	10	20	0.02	0.5	1.6	0.2	2.0
	L4008D8	L4008V8	400	10	10	10	20	0.02	0.5	1.6	0.2	2.0
	L6008D8	L6008V8	600	10	10	10	20	0.02	0.5	1.6	0.2	2.0

General Notes

- All measurements are made with 60Hz resistive load and at an ambient temperature of +25°C unless otherwise specified.
- Operating temperature range (T_J) is -40°C to +110°C.
- Storage temperature range (T_S) is -40°C to +150°C.
- Lead solder temperature is a maximum of 230°C for 10 seconds maximum at a minimum of 1/16" (1.59mm) from case.
- The case temperature (T_C) is measured as shown on dimensional outline drawings. See mechanical specifications on page - 4 of this data sheet.

Gate Characteristics

Teccor triacs may be turned on between gate and MT1 terminals in the following ways:

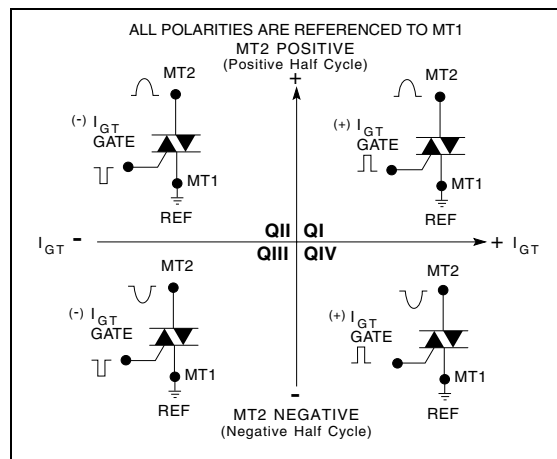
- With in-phase signals (using standard AC line) Quadrants I and III are used.
- By applying unipolar pulses (gate always positive or negative) with negative gate pulses Quadrants II and III are used and with positive gate pulses Quadrants I and IV are used.

When maximum surge capability is required, pulses should be a minimum of one magnitude above I_{GT} rating with a steep rising waveform ($\leq 1\mu\text{sec}$ rise time).

I_H	I_{GTM}	P_{GM}	$P_{G(AV)}$	I_{TSM}		$dv/dt(c)$	dv/dt	t_{gt}	I^2t	di/dt
				Amps						
Holding Current Gate Open Initial On-State Current = 200mA DC (1)	Peak Gate Trigger Current (6)	Peak Gate Power Dissipation $I_{GT} \leq I_{GTM}$ (6)	Average Gate Power Dissipation	Peak One Cycle Surge (4) (5)		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)	Critical Rate-of-Rise of Off-State Voltage at Rated V_{DRM} Gate Open (1) Volts/ μ Sec	Gate Controlled Turn-On Time $I_{GT} = 50mA$ 0.1 μ s Rise Time	RMS Surge (Non-Repetitive) On-State Current for Period of 8.3ms for Fusing	Maximum Rate-of-Change of On-State Current $I_{GT} = 50mA$ With 0.1 μ s Rise Time
mAmps	Amps	Watts	Watts	60Hz	50Hz	Volts/ μ Sec	$T_C = 100^\circ C$	μ Sec	Amps ² Sec	Amps/ μ Sec
MAX						TYP	TYP	TYP		
5.0	1.2	15	0.3	40	33	0.5	25	2.8	6.6	50
5.0	1.2	15	0.3	40	33	0.5	25	2.8	6.6	50
5.0	1.2	15	0.3	40	33	0.5	15	2.8	6.6	50
10	1.2	15	0.3	40	33	1.0	25	3.0	6.6	50
10	1.2	15	0.3	40	33	1.0	25	3.0	6.6	50
10	1.2	15	0.3	40	33	1.0	10	3.0	6.6	50
10	1.2	15	0.3	40	33	1.0	30	3.0	6.6	50
10	1.2	15	0.3	40	33	1.0	30	3.0	6.6	50
10	1.2	15	0.3	40	33	1.0	20	3.0	6.6	50
15	1.2	15	0.3	40	33	2.0	35	3.2	6.6	50
15	1.2	15	0.3	40	33	2.0	35	3.2	6.6	50
15	1.2	15	0.3	40	33	2.0	25	3.2	6.6	50
10	1.6	18	0.4	60	50	1.0	40	3.0	15.0	70
10	1.6	18	0.4	60	50	1.0	30	3.0	15.0	70
10	1.6	18	0.4	60	50	1.0	20	3.0	15.0	70
10	1.6	18	0.4	60	50	2.0	40	3.0	15.0	70
10	1.6	18	0.4	60	50	2.0	30	3.0	15.0	70
10	1.6	18	0.4	60	50	2.0	25	3.0	15.0	70
20	1.6	18	0.4	60	50	2.0	45	3.2	15.0	70
20	1.6	18	0.4	60	50	2.0	40	3.2	15.0	70
20	1.6	18	0.4	60	50	2.0	30	3.2	15.0	70
10	1.6	18	0.4	80	65	2.0	40	3.0	26.5	70
10	1.6	18	0.4	80	65	2.0	30	3.0	26.5	70
10	1.6	18	0.4	80	65	2.0	20	3.0	26.5	70
20	1.6	18	0.4	80	65	2.0	45	3.2	26.5	70
20	1.6	18	0.4	80	65	2.0	40	3.2	26.5	70
20	1.6	18	0.4	80	65	2.0	30	3.2	26.5	70

Electrical Specification Notes

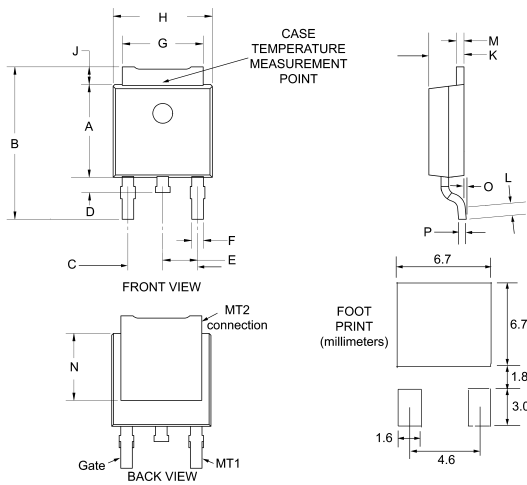
- (1) For either polarity of MT2 with reference to MT1 terminal.
- (2) For either polarity of gate voltage V_{GT} with reference to MT1 terminal.
- (3) See definition of quadrants and gate characteristics.
- (4) See Figure 1.2 for surge rating and specific duration.
- (5) See Figure 1.1 for maximum allowable case temperature at maximum rated current.
- (6) Pulse width $\leq 10\mu s$.
- (7) $T_C = T_J$ for test conditions in off-state.



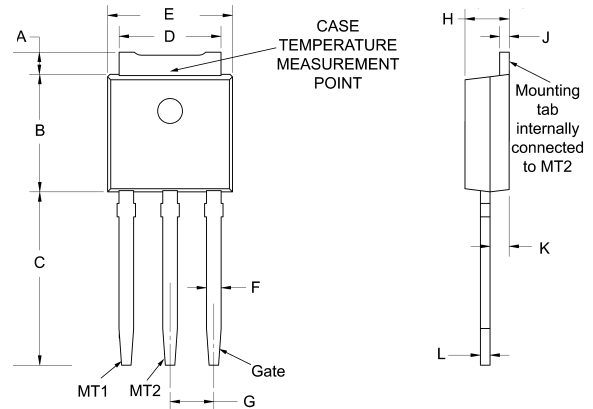
Definition of Quadrants

Mechanical Specifications

TO-252AA D-PAK Surface Mount



TO-251AA V-PAK Through Hole



DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.236	.244	6.00	6.20
B	.379	.409	9.63	10.39
C	.176	.184	4.47	4.67
D	.035	.050	0.89	1.27
E	.087	.093	2.21	2.36
F	.027	.033	0.69	0.84
G	.205	.213	5.21	5.41
H	.251	.261	6.38	6.63
J	.040	.050	1.02	1.27
K	.086	.094	2.18	2.39
L	.026	.036	0.66	0.91
M	.018	.023	0.46	0.58
N	.170	.180	4.32	4.57
O	.002	.010	0.05	0.25
P	.018	.023	0.46	0.58

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.040	.050	1.02	1.27
B	.236	.244	6.00	6.20
C	.350	.375	8.89	9.53
D	.205	.213	5.21	5.41
E	.251	.261	6.38	6.63
F	.027	.033	0.69	0.84
G	.087	.093	2.21	2.36
H	.086	.094	2.18	2.39
J	.018	.023	0.46	0.58
K	.036	.042	0.91	1.07
L	.018	.023	0.46	0.58

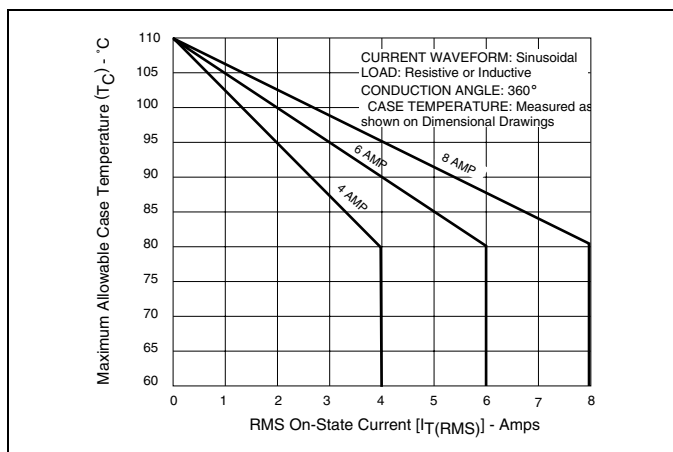


Figure 1.1 Maximum Allowable Case Temperature vs On-State Current

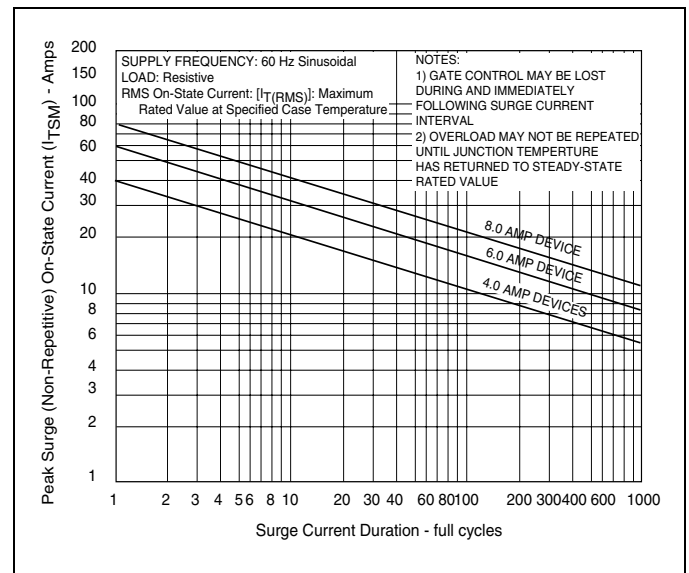


Figure 1.2 Peak Surge Current vs Surge Current Duration