

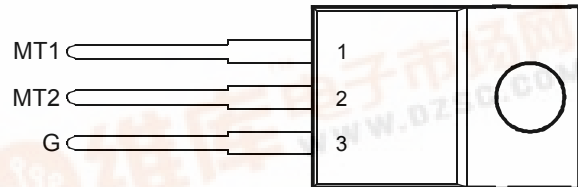
TIC236 SERIES SILICON TRIACS

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DECEMBER 1971 - REVISED JUNE 2000

- High Current Triacs
- 12 A RMS
- Glass Passivated Wafer
- 400 V to 800 V Off-State Voltage
- Max I_{GT} of 50 mA (Quadrants 1 - 3)

TO-220 PACKAGE
(TOP VIEW)



Pin 2 is in electrical contact with the mounting base.

MDC2ACA

absolute maximum ratings over operating case temperature (unless otherwise noted)

RATING		SYMBOL	VALUE	UNIT
Repetitive peak off-state voltage (see Note 1)	TIC236D	V_{DRM}	400	V
	TIC236M		600	
	TIC236S		700	
	TIC236N		800	
Full-cycle RMS on-state current at (or below) 70°C case temperature (see Note 2)		$I_{T(RMS)}$	12	A
Peak on-state surge current full-sine-wave at (or below) 25°C case temperature (see Note 3)		I_{TSM}	100	A
Peak gate current		I_{GM}	±1	A
Operating case temperature range		T_C	-40 to +110	°C
Storage temperature range		T_{stg}	-40 to +125	°C
Lead temperature 1.6 mm from case for 10 seconds		T_L	230	°C

- NOTES: 1. These values apply bidirectionally for any value of resistance between the gate and Main Terminal 1.
 2. This value applies for 50-Hz full-sine-wave operation with resistive load. Above 70°C derate linearly to 110°C case temperature at the rate of 300 mA/°C.
 3. This value applies for one 50-Hz full-sine-wave when the device is operating at (or below) the rated value of peak reverse voltage and on-state current. Surge may be repeated after the device has returned to original thermal equilibrium.

electrical characteristics at 25°C case temperature (unless otherwise noted)

PARAMETER	TEST CONDITIONS			MIN	TYP	MAX	UNIT
I_{DRM} Repetitive peak off-state current	$V_D = \text{Rated } V_{DRM}$	$I_G = 0$	$T_C = 110^\circ\text{C}$			±2	mA
I_{GT} Gate trigger current	$V_{supply} = +12\text{ V}^\dagger$	$R_L = 10\ \Omega$	$t_{p(g)} > 20\ \mu\text{s}$		12	50	mA
	$V_{supply} = +12\text{ V}^\dagger$	$R_L = 10\ \Omega$	$t_{p(g)} > 20\ \mu\text{s}$		-19	-50	
	$V_{supply} = -12\text{ V}^\dagger$	$R_L = 10\ \Omega$	$t_{p(g)} > 20\ \mu\text{s}$		-16	-50	
	$V_{supply} = -12\text{ V}^\dagger$	$R_L = 10\ \Omega$	$t_{p(g)} > 20\ \mu\text{s}$		34		
V_{GT} Gate trigger voltage	$V_{supply} = +12\text{ V}^\dagger$	$R_L = 10\ \Omega$	$t_{p(g)} > 20\ \mu\text{s}$		0.8	2	V
	$V_{supply} = +12\text{ V}^\dagger$	$R_L = 10\ \Omega$	$t_{p(g)} > 20\ \mu\text{s}$		-0.8	-2	
	$V_{supply} = -12\text{ V}^\dagger$	$R_L = 10\ \Omega$	$t_{p(g)} > 20\ \mu\text{s}$		-0.8	-2	
	$V_{supply} = -12\text{ V}^\dagger$	$R_L = 10\ \Omega$	$t_{p(g)} > 20\ \mu\text{s}$		0.9	2	
V_T On-state voltage	$I_{TM} = \pm 17\text{ A}$	$I_G = 50\text{ mA}$	(see Note 4)		±1.4	±2.1	V
I_H Holding current	$V_{supply} = +12\text{ V}^\dagger$	$I_G = 0$	Init' $I_{TM} = 100\text{ mA}$		22	40	mA
	$V_{supply} = -12\text{ V}^\dagger$	$I_G = 0$	Init' $I_{TM} = -100\text{ mA}$		-12	-40	

† All voltages are with respect to Main Terminal 1.

NOTE 4: This parameter must be measured using pulse techniques, $t_p \leq 1\text{ ms}$, duty cycle $\leq 2\%$. Voltage-sensing contacts separate from the current carrying contacts are located within 3.2 mm from the device body.



PRODUCT INFORMATION
Information is current as of publication date. Products conform to specifications in accordance with the terms of Power Innovations standard warranty. Production processing does not necessarily include testing of all parameters.



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electrical characteristics at 25°C case temperature (unless otherwise noted) (continued)

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
I_L Latching current	$V_{supply} = +12\text{ V}^\dagger$ $V_{supply} = -12\text{ V}^\dagger$ (see Note 5)			80 -80	mA
dv/dt Critical rate of rise of off-state voltage	$V_D = \text{Rated } V_D$ $I_G = 0$ $T_C = 110^\circ\text{C}$		± 400		V/ μs
$dv/dt_{(c)}$ Critical rise of commutation voltage	$V_D = \text{Rated } V_D$ $di/dt = 0.5 I_{T(RMS)}/\text{ms}$ $T_C = 80^\circ\text{C}$ $I_T = 1.4 I_{T(RMS)}$	± 1.2	± 9		V/ μs
di/dt Critical rate of rise of on-state current	$V_D = \text{Rated } V_D$ $di_G/dt = 50\text{ mA}/\mu\text{s}$ $I_{GT} = 50\text{ mA}$ $T_C = 110^\circ\text{C}$		± 100		A/ μs

† All voltages are with respect to Main Terminal 1.

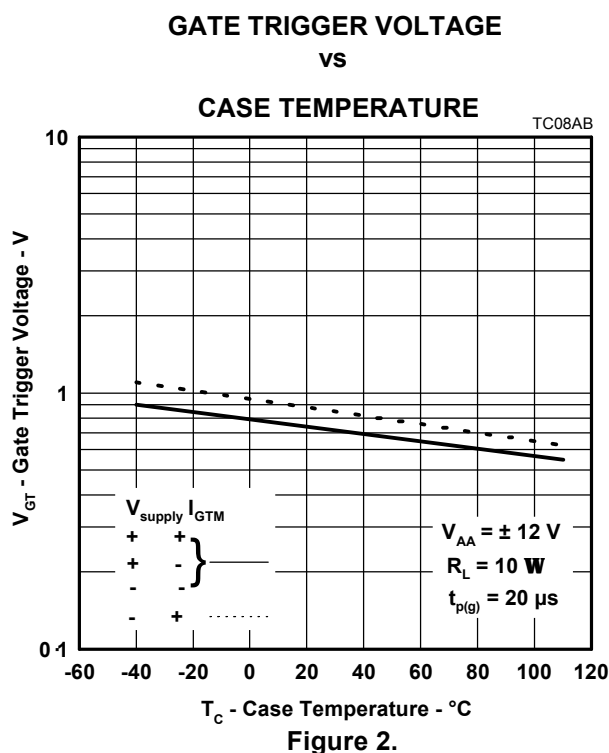
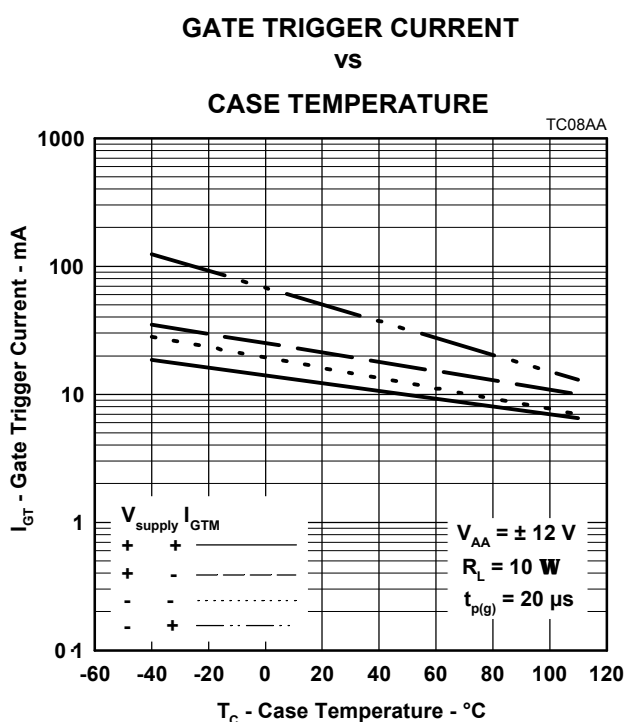
NOTE 5: The triacs are triggered by a 15-V (open-circuit amplitude) pulse supplied by a generator with the following characteristics:

$R_G = 100\ \Omega$, $t_{p(g)} = 20\ \mu\text{s}$, $t_r \leq 15\text{ ns}$, $f = 1\text{ kHz}$.

thermal characteristics

PARAMETER	MIN	TYP	MAX	UNIT
$R_{\theta JC}$ Junction to case thermal resistance			2	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$ Junction to free air thermal resistance			62.5	$^\circ\text{C}/\text{W}$

TYPICAL CHARACTERISTICS



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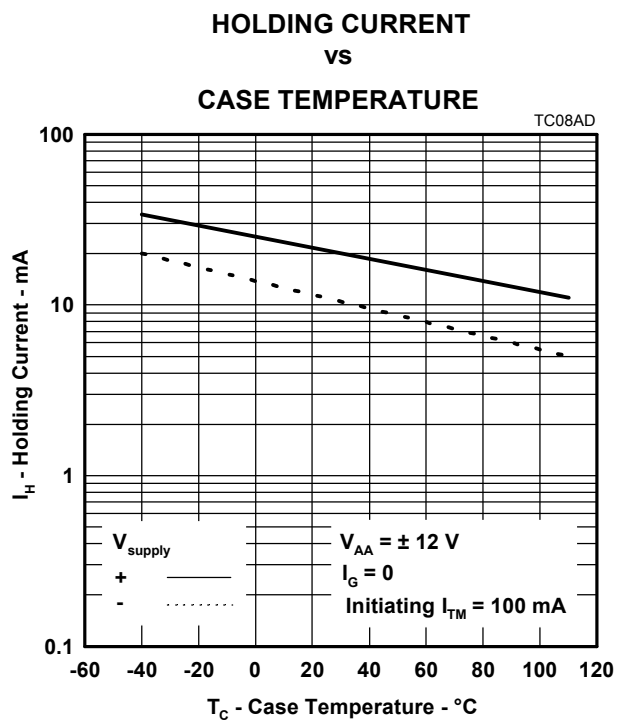


Figure 3.

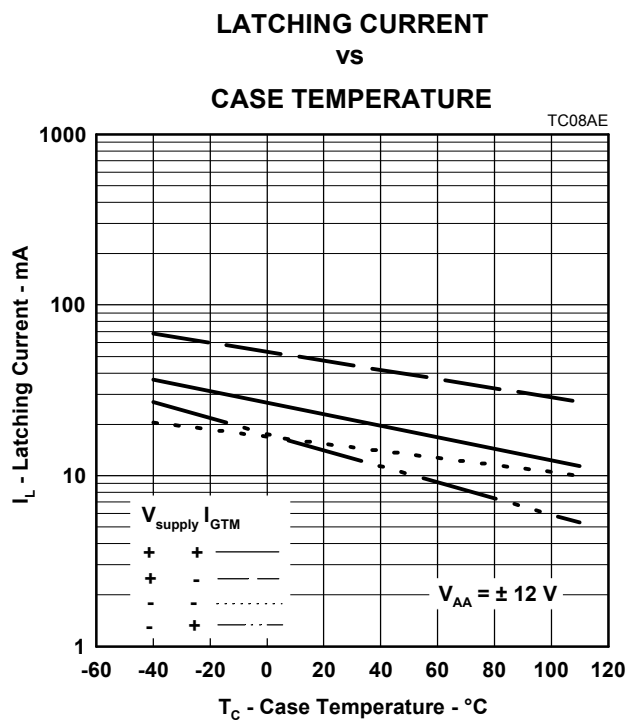


Figure 4.

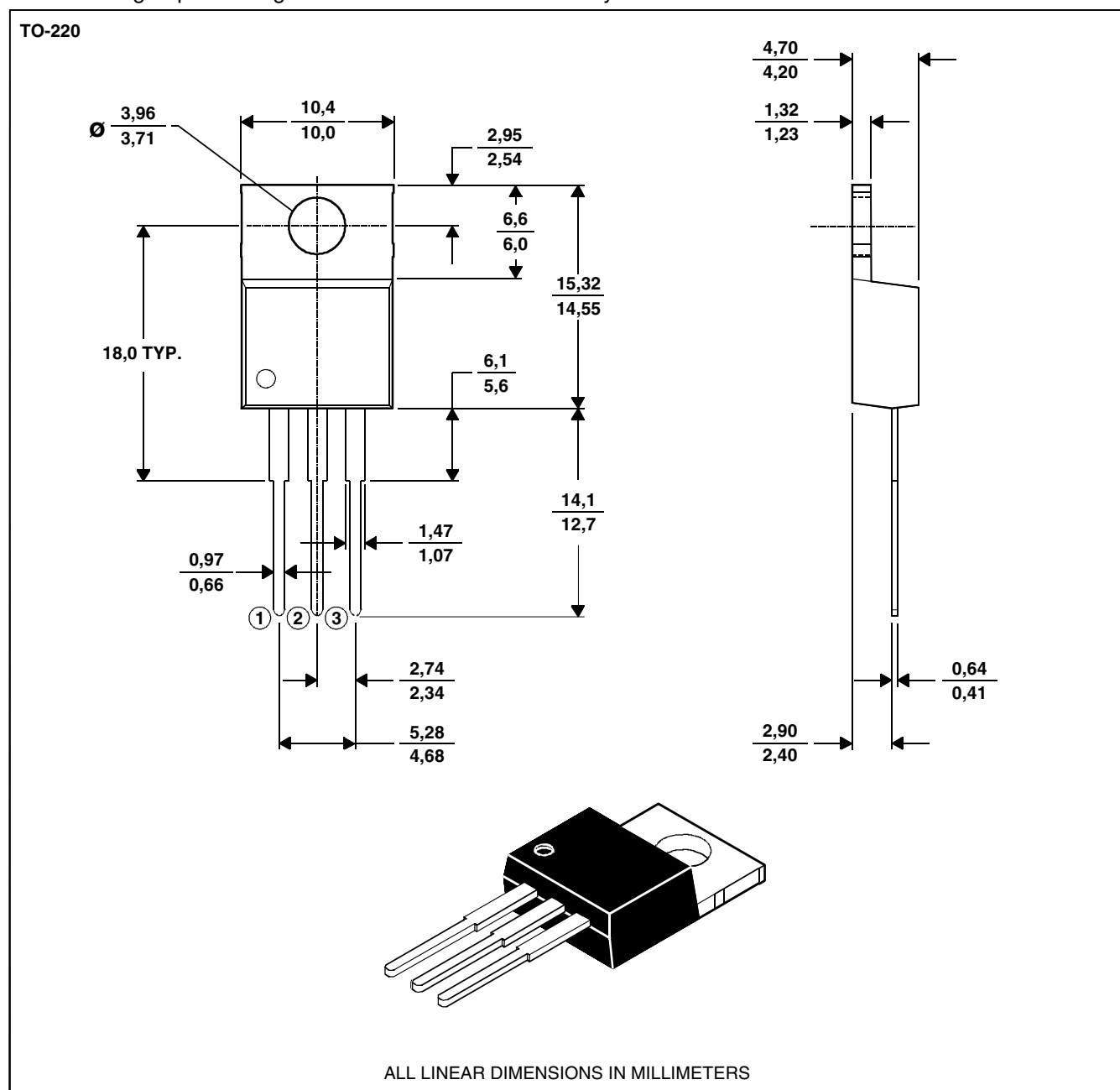
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MECHANICAL DATA

TO-220

3-pin plastic flange-mount package

This single-in-line package consists of a circuit mounted on a lead frame and encapsulated within a plastic compound. The compound will withstand soldering temperature with no deformation, and circuit performance characteristics will remain stable when operated in high humidity conditions. Leads require no additional cleaning or processing when used in soldered assembly.



NOTE A: The centre pin is in electrical contact with the mounting tab.

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