

## TIC116A, TIC116B, TIC116C, TIC116D, TIC116E, TIC116M, TIC116N, TIC116S

### P-N-P-N SILICON REVERSE-BLOCKING TRIODE THYRISTORS

- 8 A Continuous On-State Current
- 80 A Surge-Current
- Glass Passivated Wafer
- 100 V to 800 V Off-State Voltage
- Max  $I_{GT}$  of 20 mA
- Compliance to ROHS

#### ABSOLUTE MAXIMUM RATINGS

Symbol	Ratings	Value								Unit
		A	B	C	D	E	M	S	N	
$V_{DRM}$	Repetitive peak off-state voltage (see Note1)	100	200	300	400	500	600	700	800	V
$V_{RRM}$	Repetitive peak reverse voltage	100	200	300	400	500	600	700	800	V
$I_{T(RMS)}$	Continuous on-state current at (or below) 70°C case temperature (see note2)	8								A
$I_{T(AV)}$	Average on-state current (180° conduction angle) at(or below) 70°C case temperature (see Note3)	5								A
$I_{TM}$	Surge on-state current (see Note4)	80								A
$I_{GM}$	Peak positive gate current (pulse width $\leq 300 \mu s$ )	3								A
$P_{GM}$	Peak power dissipation (pulse width $\leq 300 \mu s$ )	5								W
$P_{G(AV)}$	Average gate power dissipation (see Note5)	1								W
$T_C$	Operating case temperature range	-40 to +110								°C
$T_{stg}$	Storage temperature range	-40 to +125								°C
$T_L$	Lead temperature 1.6 mm from case for 10 seconds	230								°C

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### THERMAL CHARACTERISTICS

Symbol	Ratings		Value	Unit
$t_{gt}$	Gate-controlled Turn-on time	$V_{AA} = 30\text{ V}$ , $R_L = 6\ \Omega$ , $R_{GK(eff)} = 100\ \Omega$ , $V_{in} = 20\text{ V}$	0.8	$\mu\text{s}$
$t_q$	Circuit-communicated Turn-off time	$V_{AA} = 30\text{ V}$ , $R_L = 6\ \Omega$ , $I_{RM} \approx 10\text{ A}$	11	
$R_{\theta JC}$	Junction to case thermal resistance		$\leq 3$	$^{\circ}\text{C/W}$
$R_{\theta JA}$	Junction to free air thermal resistance		$\leq 62.5$	

### ELECTRICAL CHARACTERISTICS

TC=25°C unless otherwise noted

Symbol	Ratings	Test Condition(s)	Min	Typ	Max	Unit
$I_{DRM}$	Repetitive peak off-state current	$V_D = \text{Rated } V_{DRM}$ , $R_{GK} = 1\text{ k}\Omega$ $T_C = 110^{\circ}\text{C}$	-	-	2	mA
$I_{RRM}$	Repetitive peak reverse current	$V_R = \text{Rated } V_{RRM}$ , $I_G = 0$ $T_C = 110^{\circ}\text{C}$	-	-	2	mA
$I_{GT}$	Gate trigger current	$V_{AA} = 6\text{ V}$ , $R_L = 100\ \Omega$ $t_{p(g)} \geq 20\ \mu\text{s}$	-	5	20	mA
$V_{GT}$	Gate trigger voltage	$V_{AA} = 6\text{ V}$ , $R_L = 100\ \Omega$ $R_{GK} = 1\text{ k}\Omega$ , $t_{p(g)} \geq 20\ \mu\text{s}$ $T_C = -40^{\circ}\text{C}$	-	-	2.5	V
		$V_{AA} = 6\text{ V}$ , $R_L = 100\ \Omega$ $R_{GK} = 1\text{ k}\Omega$ , $t_{p(g)} \geq 20\ \mu\text{s}$	-	0.8	1.5	
		$V_{AA} = 6\text{ V}$ , $R_L = 100\ \Omega$ $R_{GK} = 1\text{ k}\Omega$ , $t_{p(g)} \geq 20\ \mu\text{s}$ $T_C = 110^{\circ}\text{C}$	0.2	-	-	
$I_H$	Holding current	$V_{AA} = 6\text{ V}$ , $R_{GK} = 1\text{ k}\Omega$ initiating $I_T = 100\text{ mA}$	-	-	40	mA
		$V_{AA} = 6\text{ V}$ , $R_{GK} = 1\text{ k}\Omega$ initiating $I_T = 100\text{ mA}$ $T_C = -40^{\circ}\text{C}$	-	-	70	
$V_{TM}$	Peak on-state voltage	$I_{TM} = 8\text{ A}$ (see Note6)	-	-	1.7	V
$dv/dt$	Critical rate of rise of off-state voltage	$V_D = \text{Rated } V_D$ $T_C = 110^{\circ}\text{C}$	-	100	-	V/ $\mu\text{s}$

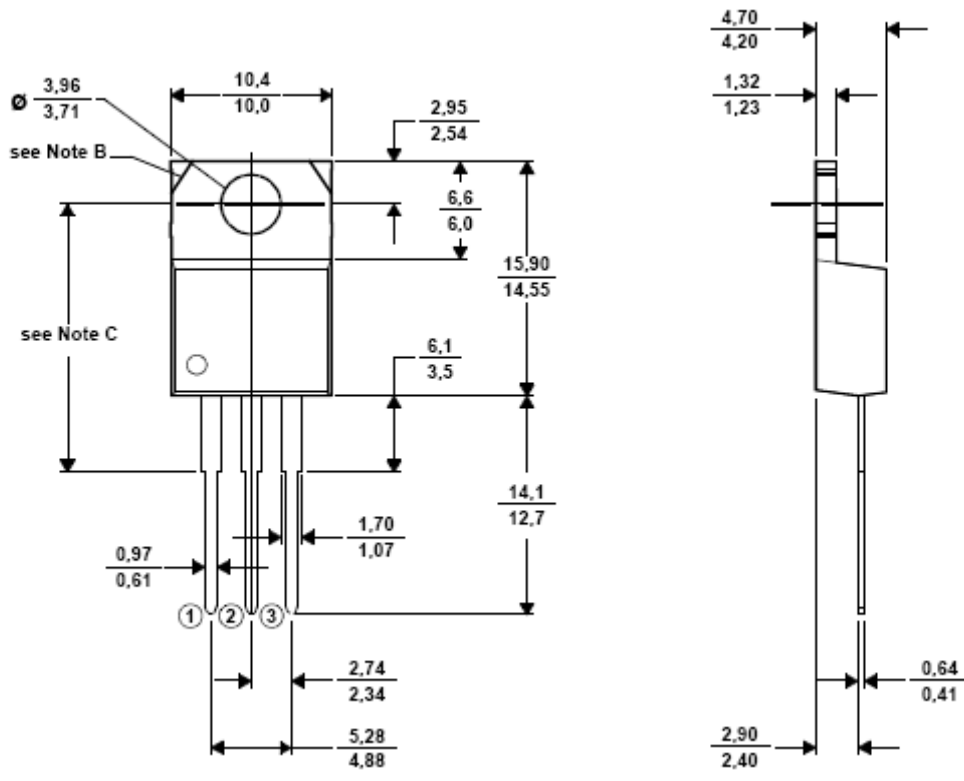
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Notes:

1. These values apply when the gate-cathode resistance  $R_{GK} = 1k\Omega$
2. These values apply for continuous dc operation with resistive load. Above  $70^{\circ}\text{C}$  derate linearly to zero at  $110^{\circ}\text{C}$ .
3. This value may be applied continuously under single phase 50 Hz half-sine-wave operation with resistive load. Above  $70^{\circ}\text{C}$  derate linearly to zero at  $110^{\circ}\text{C}$ .
4. This value applies for one 50 Hz half-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.
5. This value applies for a maximum averaging time of 20 ms.
6. This parameters must be measured using pulse techniques,  $t_w = 300\mu\text{s}$ , duty cycle  $\leq 2\%$ , voltage-sensing contacts, separate from the current-carrying contacts, are located within 3.2mm (1/8 inch) from de device body

### MECHANICAL DATA CASE TO-220

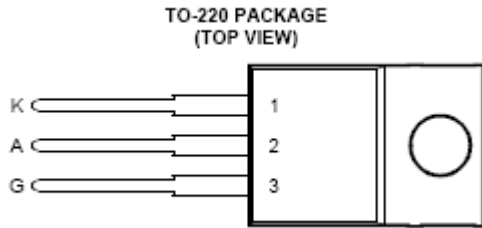
TO220





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TIC116N, TIC116S**

**PINNING**



Pin 1 :	kathode
Pin 2 :	Anode
Pin 3 :	Gate

Pin 2 is in electrical contact with the mounting base.

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