

SERIES TIC106

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

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

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
I _{ORM} Repetitive Peak Off-State Current	V _D = Rated V _{DRM} , R _{GK} = 1 kΩ, T _C = 110°C		400		μA
I _{RRM} Repetitive Peak Reverse Current	V _R = Rated V _{RRM} , I _G = 0, T _C = 110°C		1		mA
I _{GT} Gate Trigger Current	V _{AA} = 6 V, R _L = 100 Ω, t _{p(g)} ≥ 20 μs	80	200		μA
V _{GT} Gate Trigger Voltage	V _{AA} = 6 V, R _L = 100 Ω, R _{GK} = 1 kΩ, t _{p(g)} ≥ 20 μs, T _C = -40°C		1.2		V
	V _{AA} = 6 V, R _L = 100 Ω, R _{GK} = 1 kΩ, t _{p(g)} ≥ 20 μs	0.4	0.6	1	
	V _{AA} = 6 V, R _L = 100 Ω, R _{GK} = 1 kΩ, t _{p(g)} ≥ 20 μs, T _C = 110°C	0.2			
I _H Holding Current	V _{AA} = 6 V, R _{GK} = 1 kΩ, Initiating I _T = 10 mA, T _C = -40°C		8		mA
	V _{AA} = 6 V, R _{GK} = 1 kΩ, Initiating I _T = 10 mA		5		
V _{TM} Peak On-State Voltage	I _{TM} = 5 A, See Note 6		1.7		V
dv/dt Critical Rate of Rise of Off-State Voltage	V _D = Rated V _D , R _{GK} = 1 kΩ, T _C = 110°C		10		V/μs

thermal characteristics

PARAMETER	MAX	UNIT
R _{θJC} Junction-to-Case Thermal Resistance	3.5	°C/W
R _{θJA} Junction-to-Free-Air Thermal Resistance	62.8	°C/W

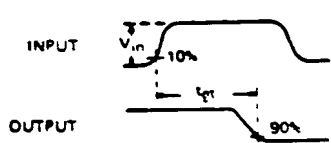
NOTE 6: This parameter must be measured using pulse techniques, t_w = 300 μs, duty cycle < 2%. Voltage-sensing contacts, separate from the current-carrying contacts, are located within 0.125 inch from the device body.

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

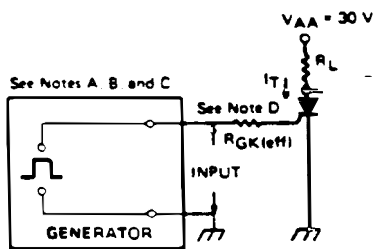
switching characteristics at 25°C case temperature

PARAMETER	TEST CONDITIONS	TYP	UNIT
t_{GT}	Gate-Controlled Turn-On Time $V_{AA} = 30\text{ V}$, $R_L = 6\ \Omega$, $R_{GK(\text{eff})} = 5\ \text{k}\Omega$, $V_{in} = 50\text{ V}$, See Figure 1	1.75	μs
t_C	Circuit-Commutated Turn-Off Time $V_{AA} = 30\text{ V}$, $R_L = 6\ \Omega$, $I_{RM} = 8\text{ A}$, See Figure 2	7.7	μs

PARAMETER MEASUREMENT INFORMATION

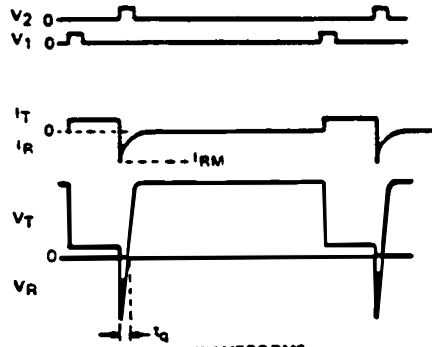


VOLTAGE WAVEFORMS

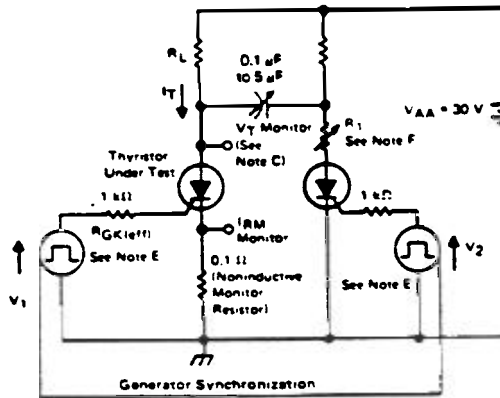


TEST CIRCUIT

FIGURE 1 - GATE-CONTROLLED TURN-ON TIME



WAVEFORMS



TEST CIRCUIT

FIGURE 2 - CIRCUIT-COMMUTATED TURN-OFF TIME

- NOTES
- V_{in} is measured with gate and cathode terminals open.
 - The input waveform of Figure 1 has the following characteristics: $t_r < 40\text{ ns}$, $t_w > 20\ \mu\text{s}$.
 - Waveforms are monitored on an oscilloscope with the following characteristics: $t_r < 14\text{ ns}$, $R_m > 10\ \text{M}\Omega$, $C_m < 12\ \text{pF}$.
 - $R_{GK(\text{eff})}$ includes the total resistance of the generator and the external resistor.
 - Pulse generators for V_1 and V_2 are synchronized to provide an anode current waveform with the following characteristics: $t_w = 50$ to $300\ \mu\text{s}$, duty cycle = 1%. The pulse widths of V_1 and V_2 are $> 10\ \mu\text{s}$.
 - Resistor R_1 is adjusted for $I_{RM} = 8\text{ A}$.

**SERIES 11C106
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THERMAL INFORMATION

AVERAGE ANODE FORWARD CURRENT DERATING CURVE

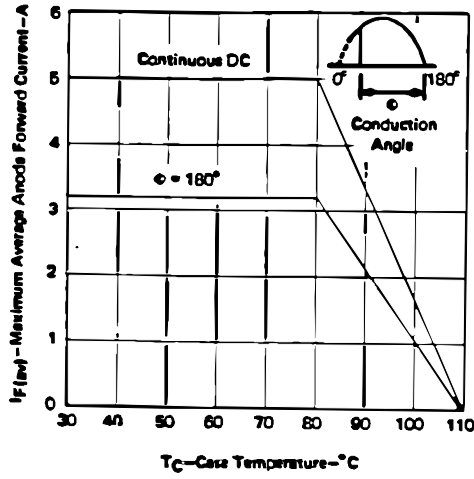


FIGURE 3

MAXIMUM CONTINUOUS ANODE POWER DISSIPAT. vs CONTINUOUS ANODE FORWARD CURRENT

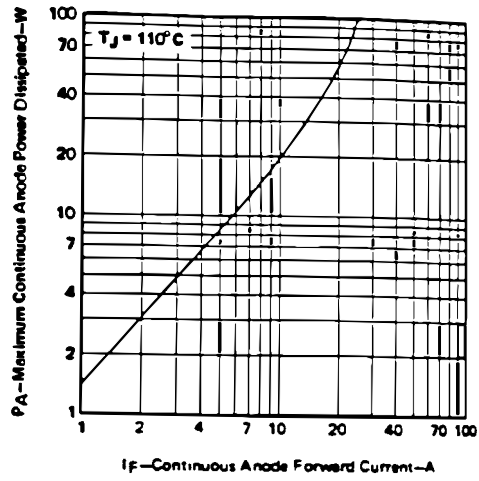


FIGURE 4

SURGE ON-STATE CURRENT vs CYCLES OF CURRENT DURATION

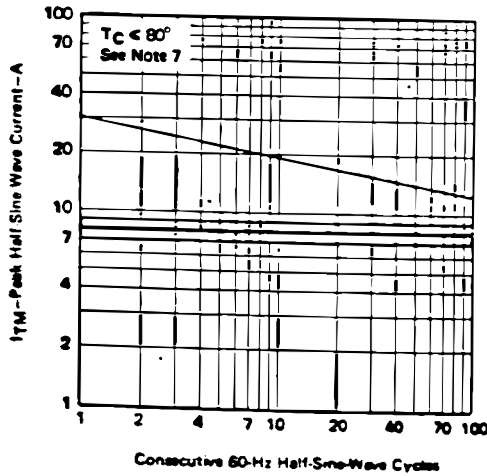
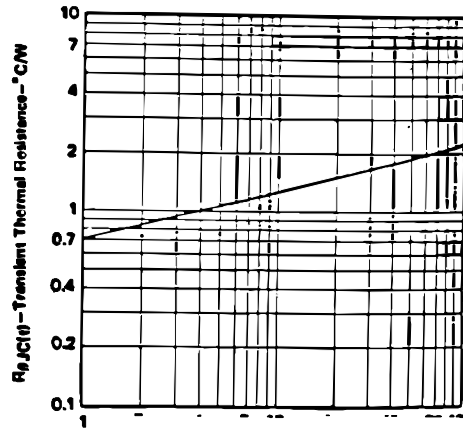


FIGURE 5

TRANSIENT THERMAL RESISTANCE vs CYCLES OF CURRENT DURATION



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TYPICAL CHARACTERISTICS

GATE TRIGGER CURRENT
vs
CASE TEMPERATURE

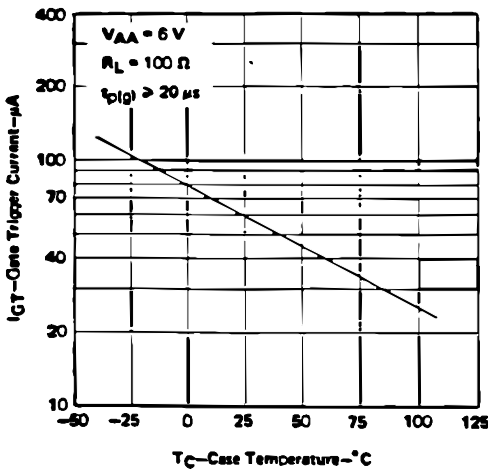


FIGURE 7

GATE TRIGGER VOLTAGE
vs
CASE TEMPERATURE

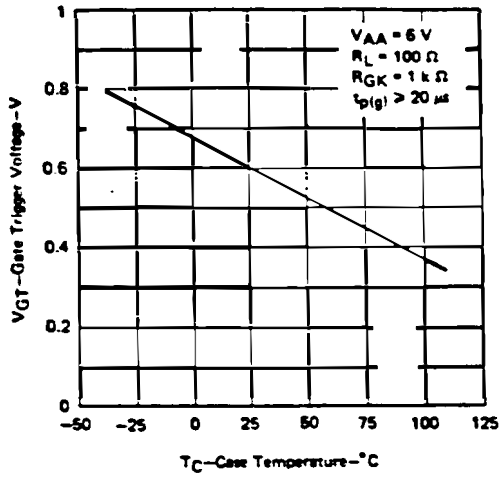


FIGURE 8

GATE FORWARD VOLTAGE
vs
GATE FORWARD CURRENT

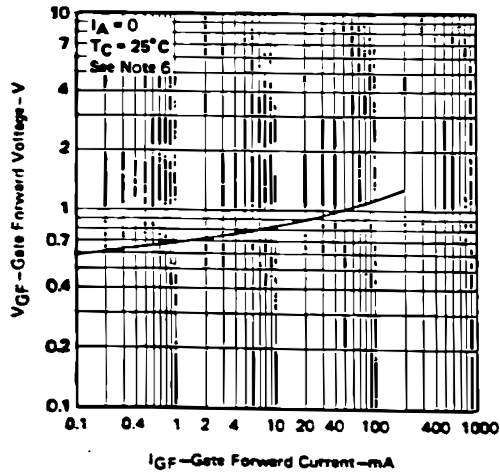


FIGURE 9

HOLDING CURRENT
vs
CASE TEMPERATURE

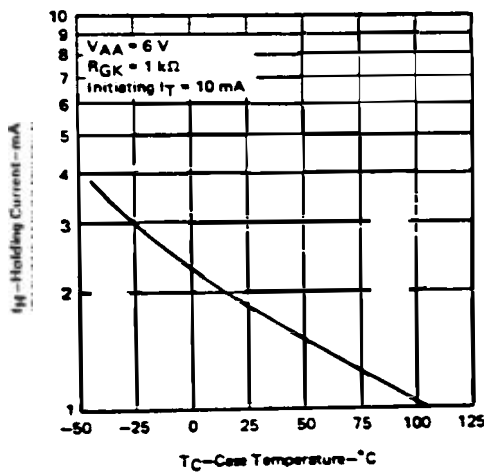


FIGURE 10

NOTE 6: This parameter must be measured using pulse techniques, $t_w = 300\mu s$, duty cycle $\leq 2\%$. Voltage-sensing contacts, separate from the current-carrying contacts, are located within 0.125 inch from the device body.

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

TYPICAL CHARACTERISTICS

PEAK ON-STATE VOLTAGE
vs
PEAK ON-STATE CURRENT

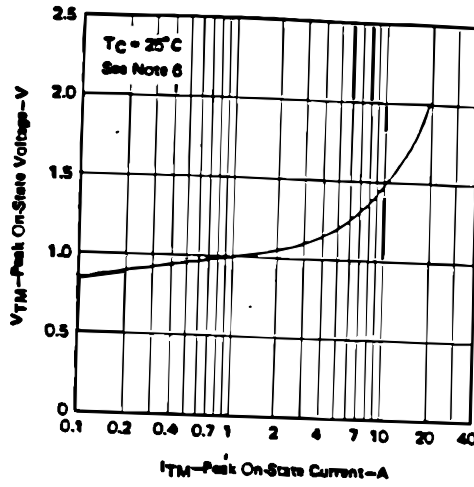


FIGURE 11

GATE-CONTROLLED TURN-ON TIME
vs
GATE CURRENT

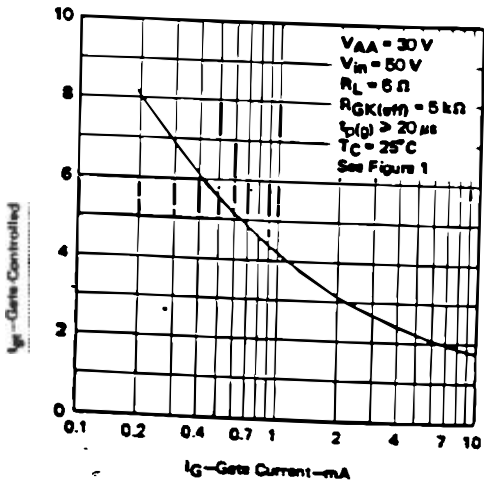


FIGURE 12

CIRCUIT-COMMUTATED TURN-OFF TIME
vs
CASE TEMPERATURE

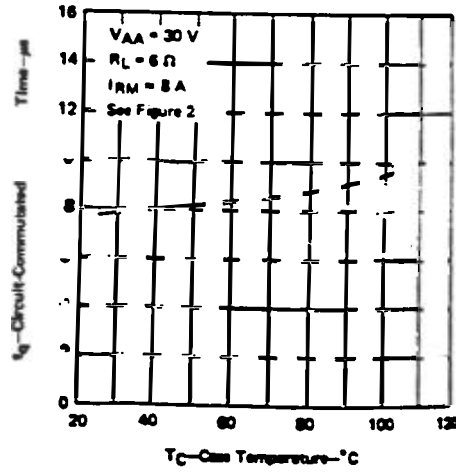


FIGURE 13

NOTE 6: This parameter 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 0.125 inch from the device body.

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