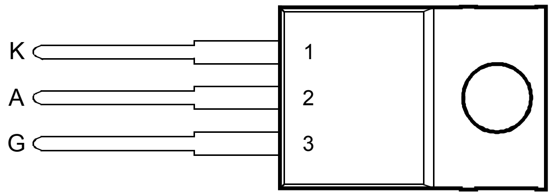
TIC106 SERIES
SILICON CONTROLLED RECTIFIERS

 APRIL 1971 - REVISED JULY 2000

- **5 A Continuous On-State Current**
- **30 A Surge-Current**
- **Glass Passivated Wafer**
- **400 V to 800 V Off-State Voltage**
- **Max I_{GT} of 200 µA**

TO-220 PACKAGE
(TOP VIEW)



Pin 2 is in electrical contact with the mounting base.

MDC1ACA

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

RATING		SYMBOL	VALUE	UNIT
Repetitive peak off-state voltage (see Note 1)	TIC106D	V_{DRM}	400	V
	TIC106M		600	
	TIC106S		700	
	TIC106N		800	
Repetitive peak reverse voltage	TIC106D	V_{RRM}	400	V
	TIC106M		600	
	TIC106S		700	
	TIC106N		800	
Continuous on-state current at (or below) 80°C case temperature (see Note 2)		$I_{T(RMS)}$	5	A
Average on-state current (180° conduction angle) at (or below) 80°C case temperature (see Note 3)		$I_{T(AV)}$	3.2	A
Surge on-state current at (or below) 25°C (see Note 4)		I_{TSM}	30	A
Peak positive gate current (pulse width ≤ 300 µs)		I_{GM}	0.2	A
Peak gate power dissipation (pulse width ≤ 300 µs)		P_{GM}	1.3	W
Average gate power dissipation (see Note 5)		$P_{G(AV)}$	0.3	W
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 when the gate-cathode resistance R_{GK} = 1 kΩ.
2. These values apply for continuous dc operation with resistive load. Above 80°C derate linearly to zero at 110°C.
3. This value may be applied continuously under single phase 50 Hz half-sine-wave operation with resistive load. Above 80°C derate linearly to zero at 110°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.

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 = 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} = 12 V	R_L = 100 Ω	$t_{p(g)} \geq$ 20 µs		5	200	µA
V_{GT}	Gate trigger voltage	V_{AA} = 12 V $t_{p(g)} \geq$ 20 µs	R_L = 100 Ω R_{GK} = 1 kΩ	T_C = - 40°C			1.2	V
		V_{AA} = 12 V $t_{p(g)} \geq$ 20 µs	R_L = 100 Ω R_{GK} = 1 kΩ		0.4	0.6	1	
		V_{AA} = 12 V $t_{p(g)} \geq$ 20 µs	R_L = 100 Ω R_{GK} = 1 kΩ	T_C = 110°C	0.2			
I_H	Holding current	V_{AA} = 12 V Initiating I_T = 10 mA	R_{GK} = 1 kΩ	T_C = - 40°C			8	mA
		V_{AA} = 12 V Initiating I_T = 10 mA	R_{GK} = 1 kΩ				5	
V_T	Peak on-state voltage	I_T = 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

NOTE 6: This parameter must be measured using pulse techniques, t_p = 300 µs, duty cycle ≤ 2 %. Voltage sensing-contacts, separate from the current carrying contacts, are located within 3.2 mm from the device body.

thermal characteristics

PARAMETER		MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Junction to case thermal resistance			3.5	°C/W
$R_{\theta JA}$	Junction to free air thermal resistance			62.5	°C/W

THERMAL INFORMATION

AVERAGE ANODE ON-STATE CURRENT DERATING CURVE

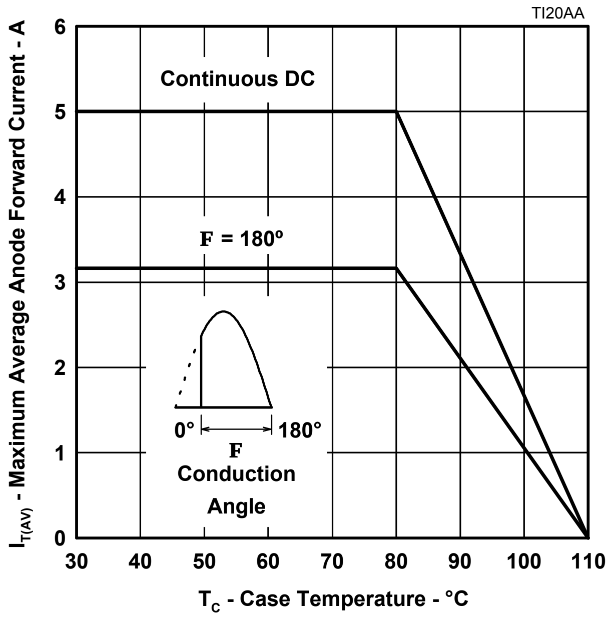


Figure 1.

ANODE POWER DISSIPATED vs ON-STATE CURRENT

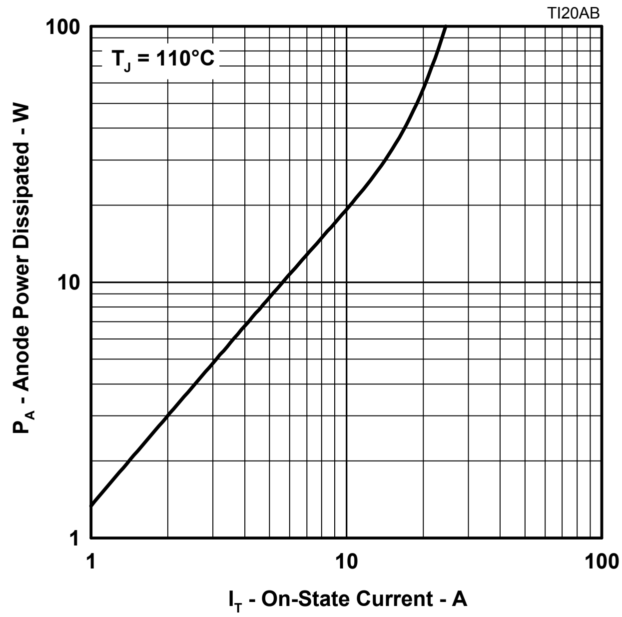


Figure 2.

SURGE ON-STATE CURRENT vs CYCLES OF CURRENT DURATION

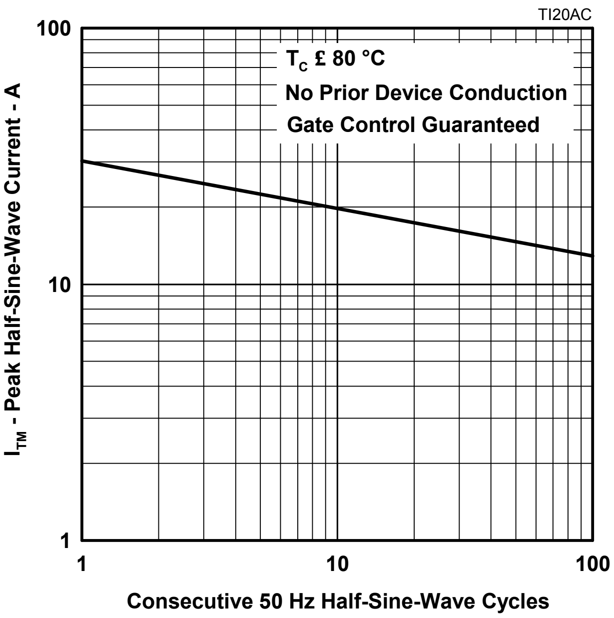


Figure 3.

TRANSIENT THERMAL RESISTANCE vs CYCLES OF CURRENT DURATION

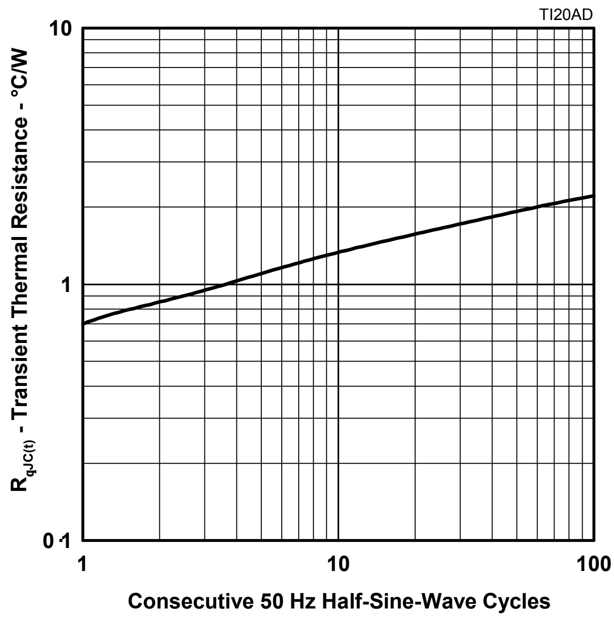


Figure 4.

TYPICAL CHARACTERISTICS

GATE TRIGGER VOLTAGE vs CASE TEMPERATURE

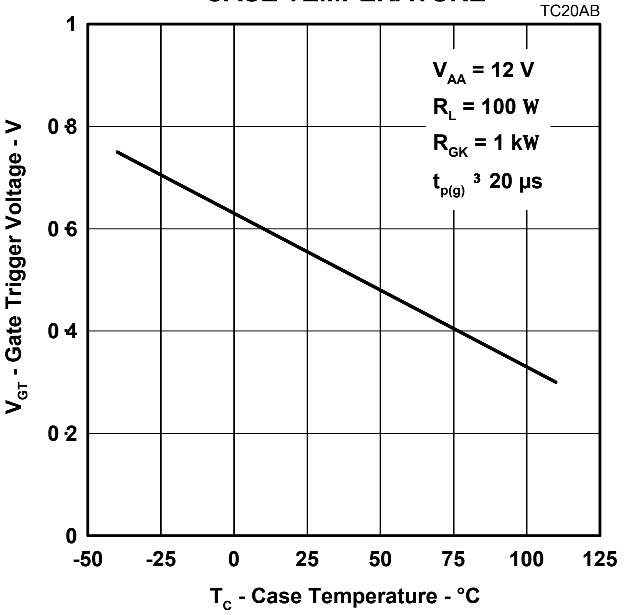


Figure 5.

HOLDING CURRENT vs CASE TEMPERATURE

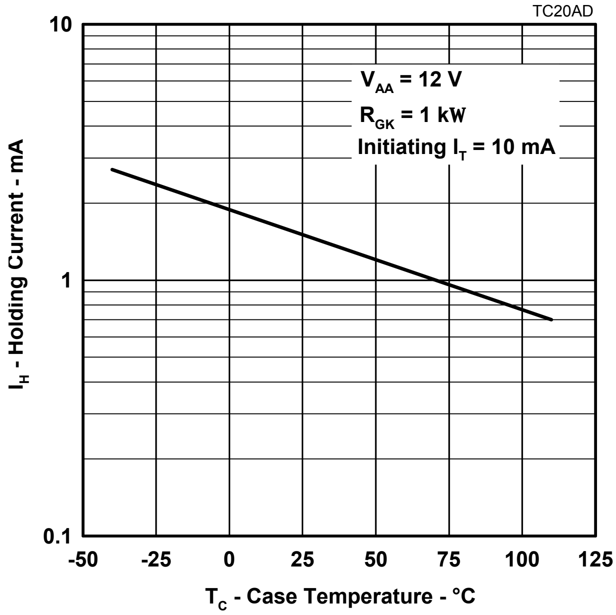


Figure 6.

PEAK ON-STATE VOLTAGE vs PEAK ON-STATE CURRENT

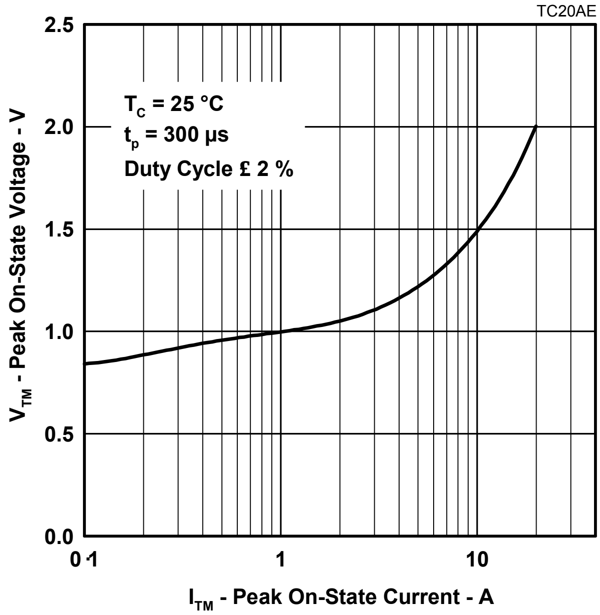


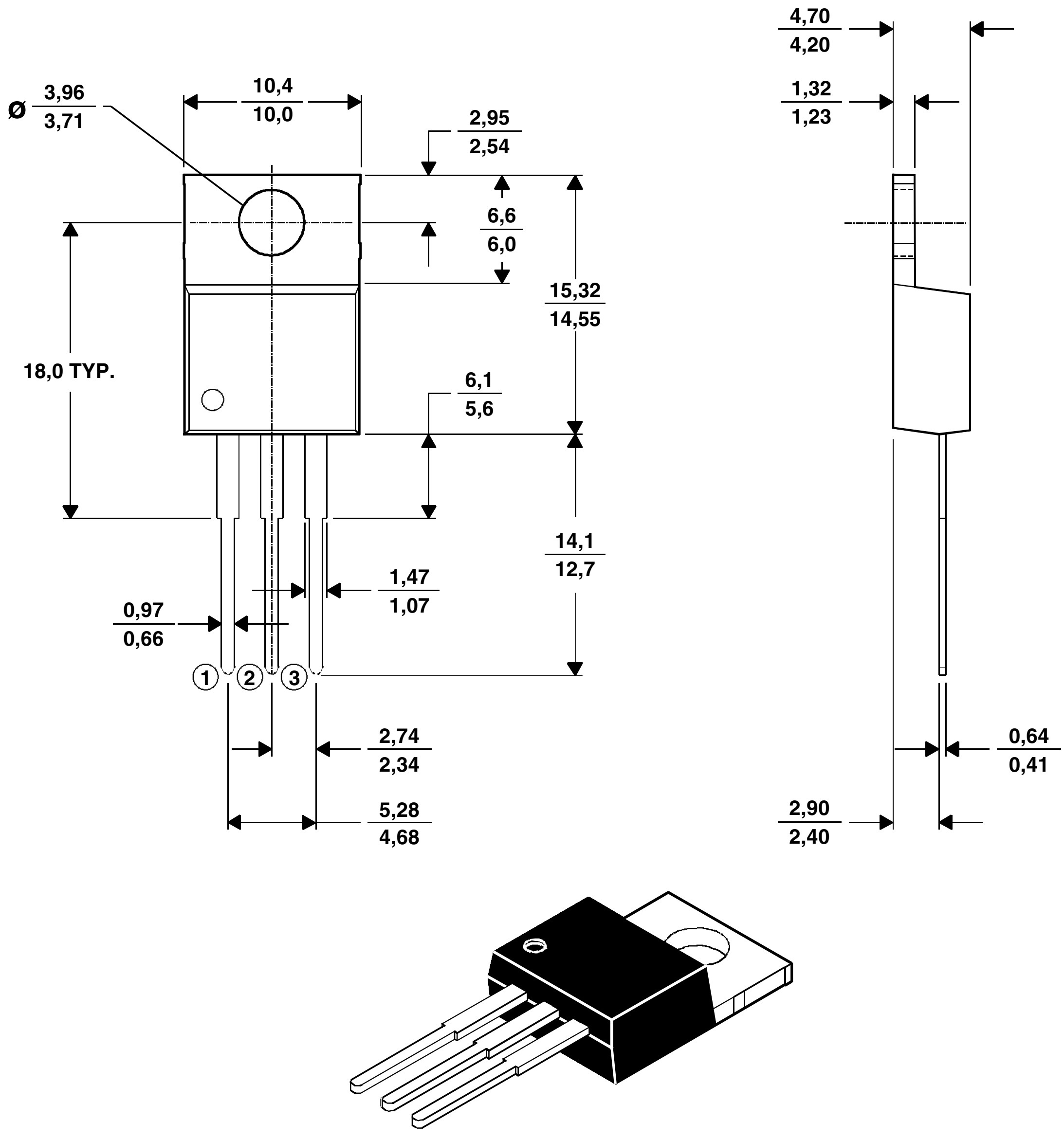
Figure 7.

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.

TO-220



ALL LINEAR DIMENSIONS IN MILLIMETERS

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

IMPORTANT NOTICE