

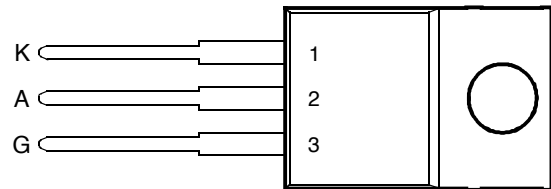


# THE DATASHEET OF TIC116M-S



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

TO-220 PACKAGE  
(TOP VIEW)



Pin 2 is in electrical contact with the mounting base.

MDC1ACA



This series is obsolete and not recommended for new designs.

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

RATING		SYMBOL	VALUE	UNIT
Repetitive peak off-state voltage	TIC116D	$V_{DRM}$	400	V
	TIC116M		600	
	TIC116S		700	
	TIC116N		800	
Repetitive peak reverse voltage	TIC116D	$V_{RRM}$	400	V
	TIC116M		600	
	TIC116S		700	
	TIC116N		800	
Continuous on-state current at (or below) 70°C case temperature (see Note 1)		$I_{T(RMS)}$	8	A
Average on-state current (180° conduction angle) at (or below) 70°C case temperature (see Note 2)		$I_{T(AV)}$	5	A
Surge on-state current at (or below) 25°C case temperature (see Note 3)		$I_{TM}$	80	A
Peak positive gate current (pulse width $\leq 300 \mu s$ )		$I_{GM}$	3	A
Peak gate power dissipation (pulse width $\leq 300 \mu s$ )		$P_{GM}$	5	W
Average gate power dissipation (see Note 4)		$P_{G(AV)}$	1	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 for continuous dc operation with resistive load. Above 70°C derate linearly to zero at 110°C.  
 2. This value may be applied continuously under single phase 50 Hz half-sine-wave operation with resistive load. Above 70°C derate linearly to zero at 110°C.  
 3. 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.  
 4. This value applies for a maximum averaging time of 20 ms.

**PRODUCT INFORMATION**

APRIL 1971 - REVISED SEPTEMBER 2002  
 Specifications are subject to change without notice.

# TIC116 SERIES SILICON CONTROLLED RECTIFIERS

**BOURNS®**

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

PARAMETER		TEST CONDITIONS			MIN	TYP	MAX	UNIT
$I_{DRM}$	Repetitive peak off-state current	$V_D = \text{rated } V_{DRM}$		$T_C = 110^\circ\text{C}$			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	$V_{AA} = 12\text{ V}$	$R_L = 100\ \Omega$	$t_{p(g)} \geq 20\ \mu\text{s}$		8	20	mA
$V_{GT}$	Gate trigger voltage	$V_{AA} = 12\text{ V}$	$R_L = 100\ \Omega$	$T_C = -40^\circ\text{C}$			2.5	V
		$V_{AA} = 12\text{ V}$	$R_L = 100\ \Omega$			0.8	1.5	
		$V_{AA} = 12\text{ V}$	$R_L = 100\ \Omega$	$T_C = 110^\circ\text{C}$	0.2			
$I_H$	Holding current	$V_{AA} = 12\text{ V}$		$T_C = -40^\circ\text{C}$			100	mA
		$V_{AA} = 12\text{ V}$					40	
$V_T$	On-state voltage	$I_T = 8\text{ A}$	(see Note 5)				1.7	V
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/ $\mu\text{s}$

NOTE 5: This parameter must be measured using pulse techniques,  $t_p = 300\ \mu\text{s}$ , duty cycle  $\leq 2\%$ . 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	$^\circ\text{C/W}$
$R_{\theta JA}$	Junction to free air thermal resistance			62.5	$^\circ\text{C/W}$

## PRODUCT INFORMATION

**THERMAL INFORMATION**

**AVERAGE ON-STATE CURRENT  
DERATING CURVE**

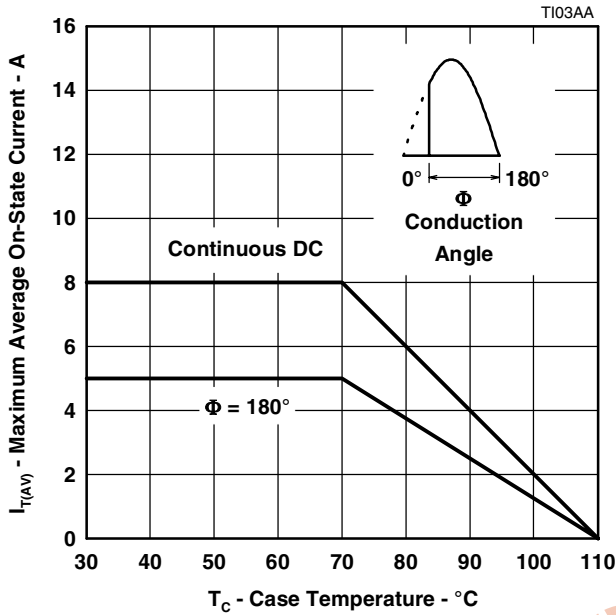


Figure 1.

**MAX ANODE POWER LOSS  
VS  
ON-STATE CURRENT**

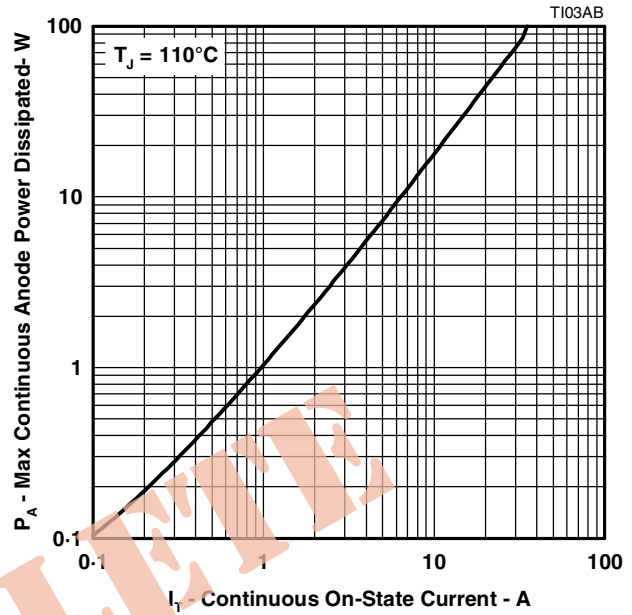


Figure 2.

**SURGE ON-STATE CURRENT  
VS  
CYCLES OF CURRENT DURATION**

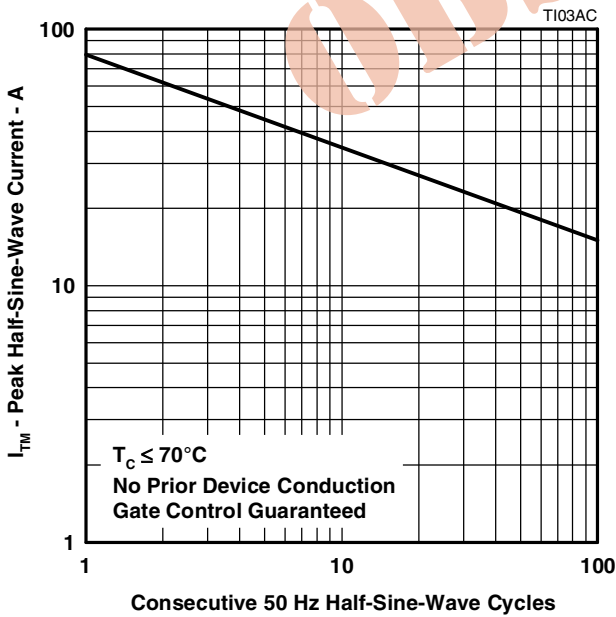


Figure 3.

**TRANSIENT THERMAL RESISTANCE  
VS  
CYCLES OF CURRENT DURATION**

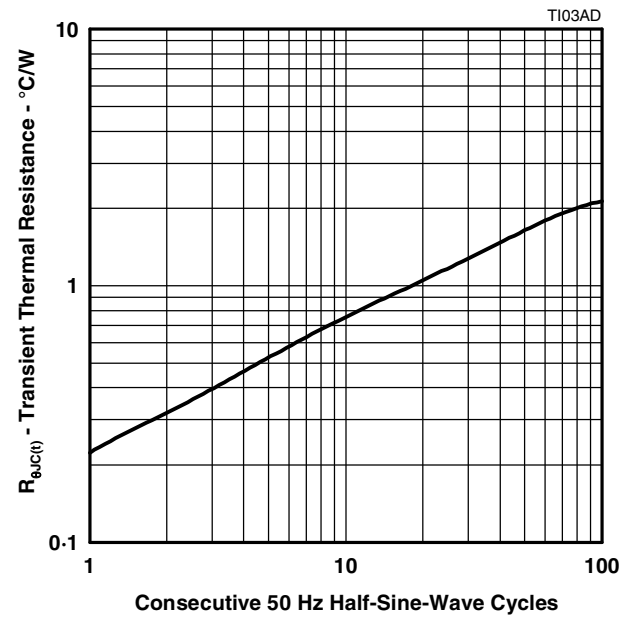


Figure 4.

**PRODUCT INFORMATION**

TYPICAL CHARACTERISTICS

GATE TRIGGER CURRENT  
vs  
CASE TEMPERATURE

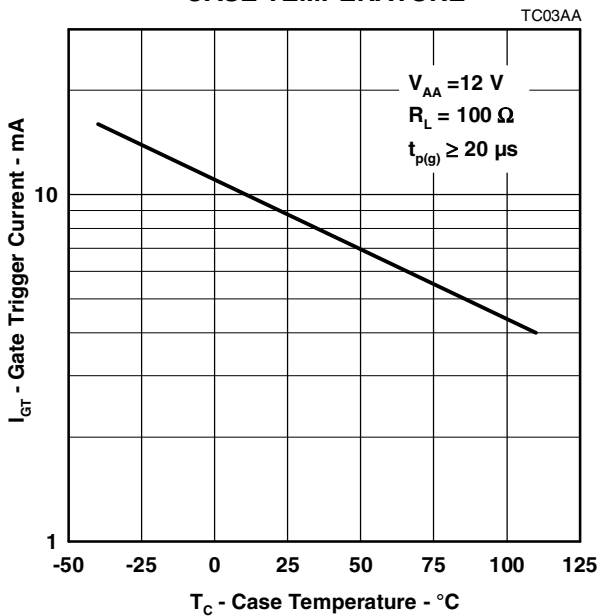


Figure 5.

GATE TRIGGER VOLTAGE  
vs  
CASE TEMPERATURE

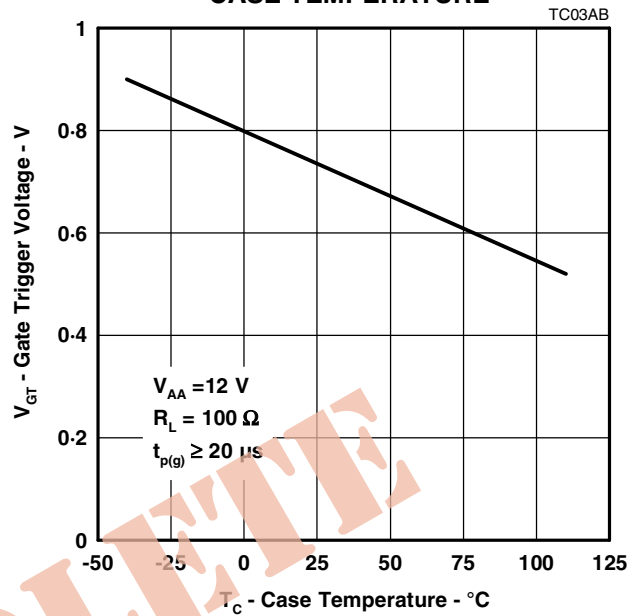


Figure 6.

HOLDING CURRENT  
vs  
CASE TEMPERATURE

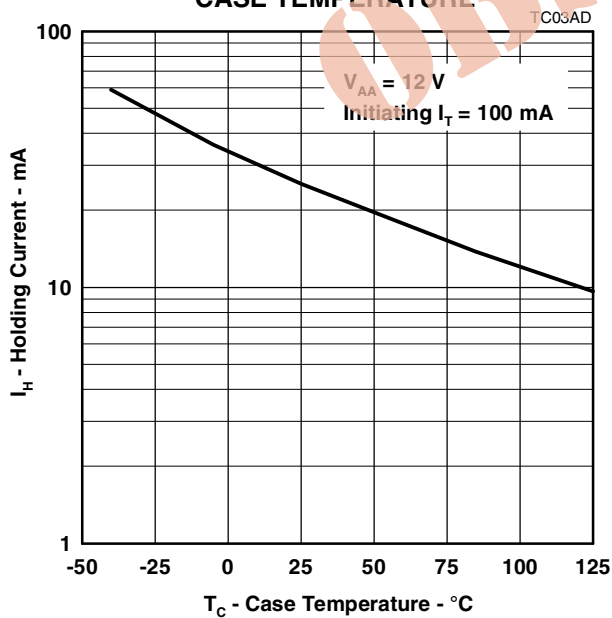


Figure 7.

PEAK ON-STATE VOLTAGE  
vs  
PEAK ON-STATE CURRENT

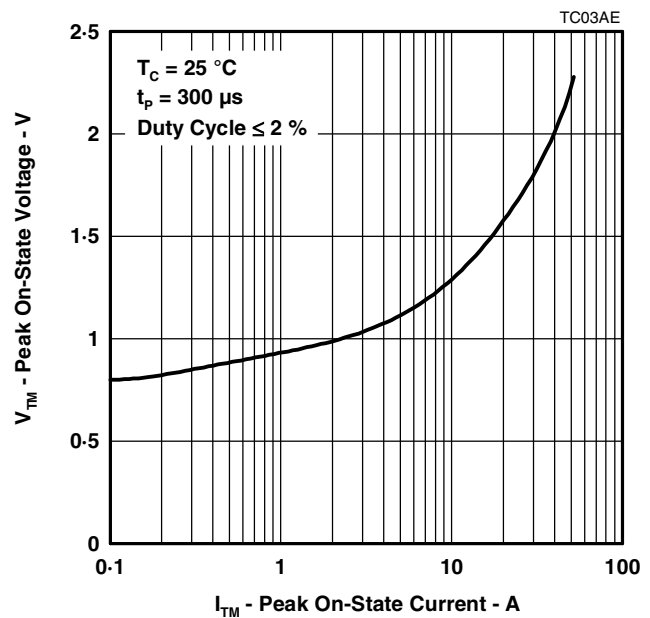




Figure 8.

**PRODUCT INFORMATION**

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