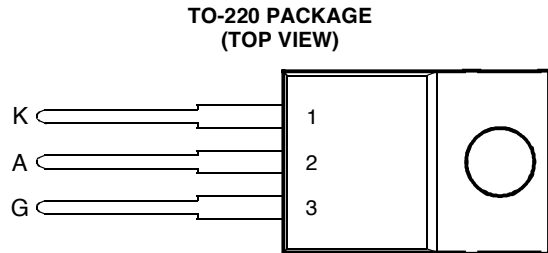


- 5 A Continuous On-State Current
- 20 A Surge-Current
- Glass Passivated Wafer
- 400 V to 800 V Off-State Voltage
- Max  $I_{GT}$  of 1 mA



This series is currently available, but not recommended for new designs.



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)	TIC108D	$V_{DRM}$	400	V
	TIC108M		600	
	TIC108S		700	
	TIC108N		800	
Repetitive peak reverse voltage	TIC108D	$V_{RRM}$	400	V
	TIC108M		600	
	TIC108S		700	
	TIC108N		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 (see Note 4)		$I_{TSM}$	20	A
Peak positive gate current (pulse width $\leq 300 \mu s$ )		$I_{GM}$	0.2	A
Peak gate power dissipation (pulse width $\leq 300 \mu s$ )		$P_{GM}$	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  $R_{GK} = 1 \text{ k}\Omega$ .
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.

**PRODUCT INFORMATION**

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

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

PARAMETER		TEST CONDITIONS			MIN	TYP	MAX	UNIT
$I_{DRM}$	Repetitive peak off-state current	$V_D = \text{rated } V_{DRM}$	$R_{GK} = 1 \text{ k}\Omega$	$T_C = 110^\circ\text{C}$			400	$\mu\text{A}$
$I_{RRM}$	Repetitive peak reverse current	$V_R = \text{rated } V_{RRM}$	$I_G = 0$	$T_C = 110^\circ\text{C}$			1	mA
$I_{GT}$	Gate trigger current	$V_{AA} = 12 \text{ V}$	$R_L = 100 \Omega$	$t_{p(g)} \geq 20 \mu\text{s}$	0.2	0.5	1	mA
$V_{GT}$	Gate trigger voltage	$V_{AA} = 12 \text{ V}$	$R_L = 100 \Omega$	$T_C = -40^\circ\text{C}$			1.2	V
		$t_{p(g)} \geq 20 \mu\text{s}$	$R_{GK} = 1 \text{ k}\Omega$					
		$V_{AA} = 12 \text{ V}$	$R_L = 100 \Omega$		0.4	0.6	1	
		$t_{p(g)} \geq 20 \mu\text{s}$	$R_{GK} = 1 \text{ k}\Omega$		0.2			
$I_H$	Holding current	$V_{AA} = 12 \text{ V}$	$R_{GK} = 1 \text{ k}\Omega$	$T_C = -40^\circ\text{C}$		3.5	15	mA
		Initiating $I_T = 20 \text{ mA}$				2	10	
		$V_{AA} = 12 \text{ V}$	$R_{GK} = 1 \text{ k}\Omega$					
		Initiating $I_T = 20 \text{ mA}$						
$V_T$	On-state voltage	$I_T = 5 \text{ A}$	(see Note 6)			1.3	1.7	V
dv/dt	Critical rate of rise of off-state voltage	$V_D = \text{rated } V_D$	$R_{GK} = 1 \text{ k}\Omega$	$T_C = 110^\circ\text{C}$		20		V/ $\mu\text{s}$

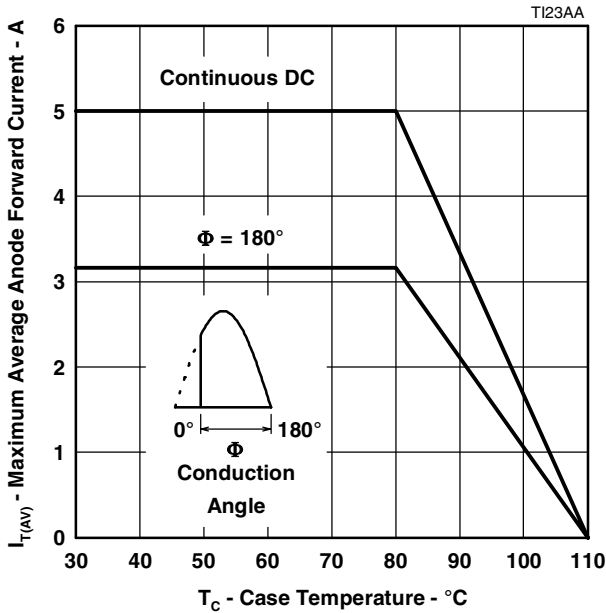
NOTE 6: This parameter must be measured using pulse techniques,  $t_p = 300 \mu\text{s}$ , duty cycle  $\leq 2\%$ . Voltage sensing-contacts, separate from the current carrying contacts, are located within 3.2 mm from the device body.

**thermal characteristics**

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

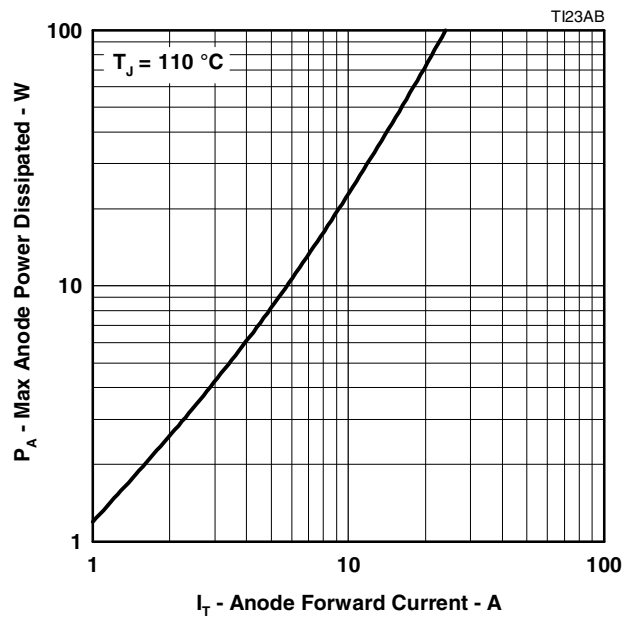
**THERMAL INFORMATION**

**AVERAGE ANODE ON-STATE CURRENT  
DERATING CURVE**



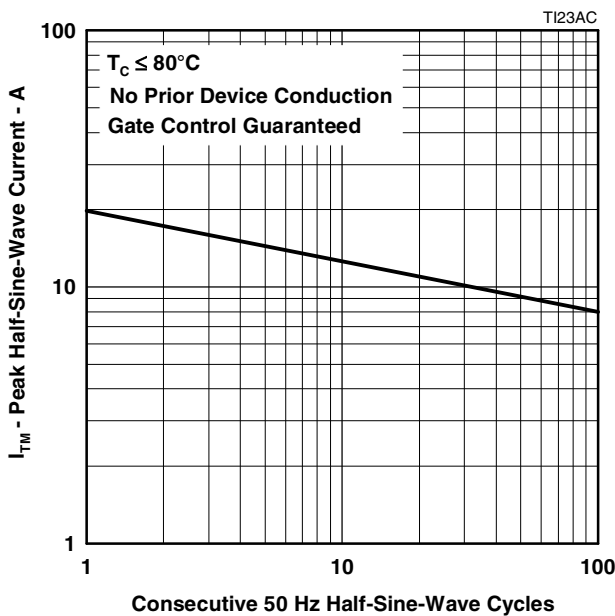
**Figure 1.**

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



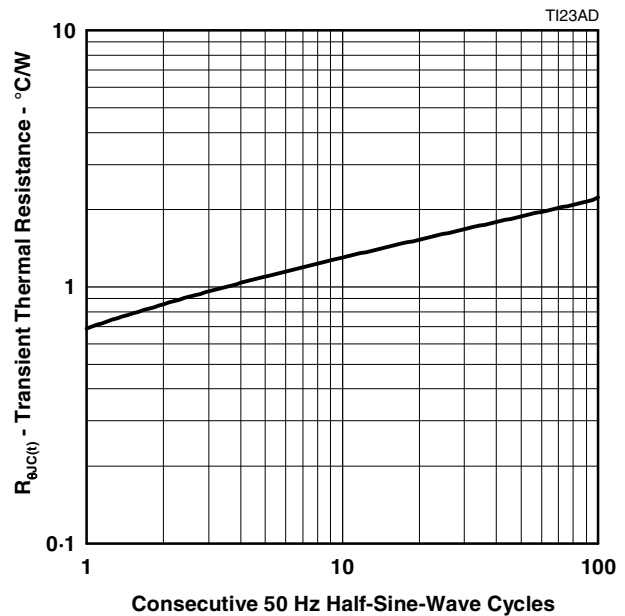
**Figure 2.**

**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

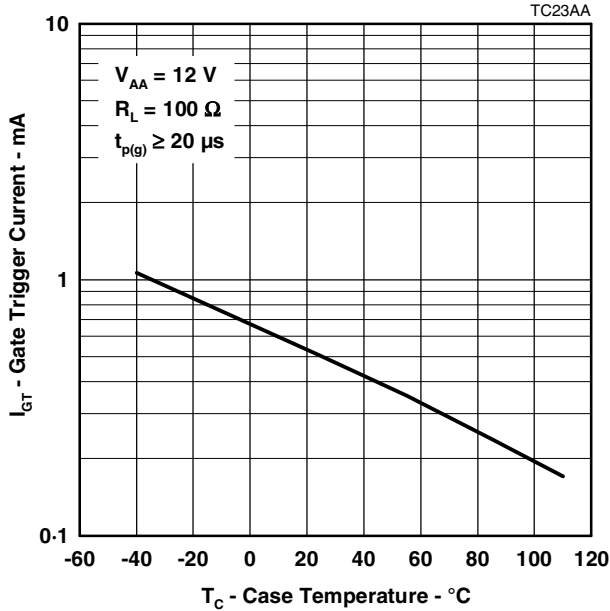


Figure 5.

GATE TRIGGER VOLTAGE  
vs

CASE TEMPERATURE

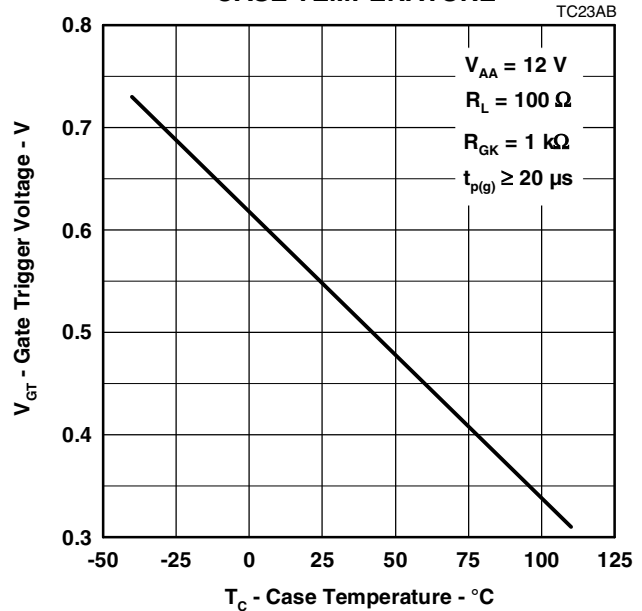


Figure 6.

HOLDING CURRENT  
vs

CASE TEMPERATURE

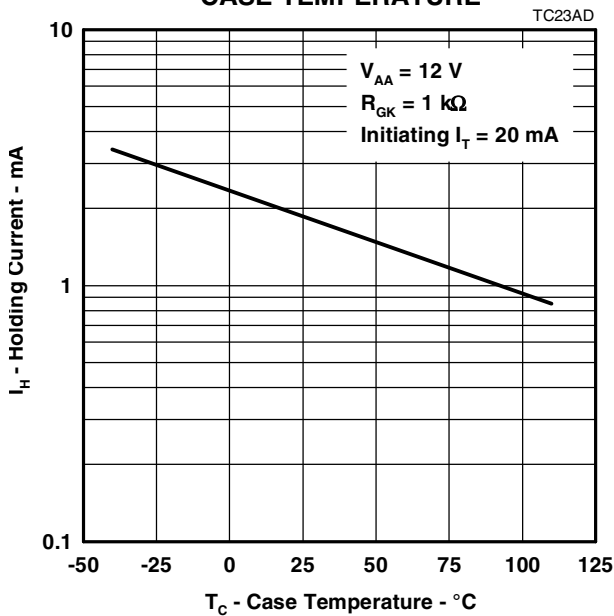


Figure 7.

PEAK ON-STATE VOLTAGE  
vs

PEAK ON-STATE CURRENT

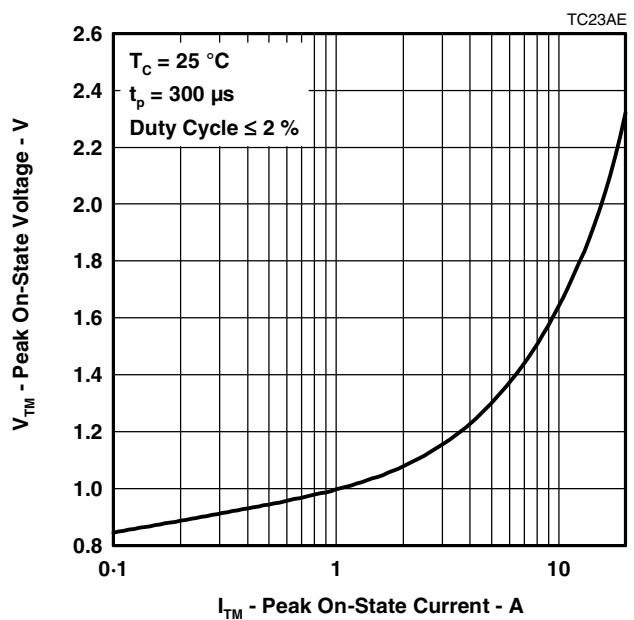


Figure 8.

**PRODUCT INFORMATION**