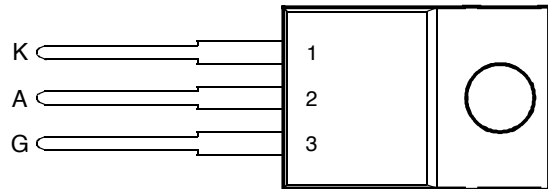


- 5 A Continuous On-State Current
- 20 A Surge-Current
- Glass Passivated Wafer
- 400 V to 800 V Off-State Voltage
- Max I_{GT} of 1 mA

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This series is obsolete and not recommended for new designs.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 (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 | μA |
| 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/ μs |

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**

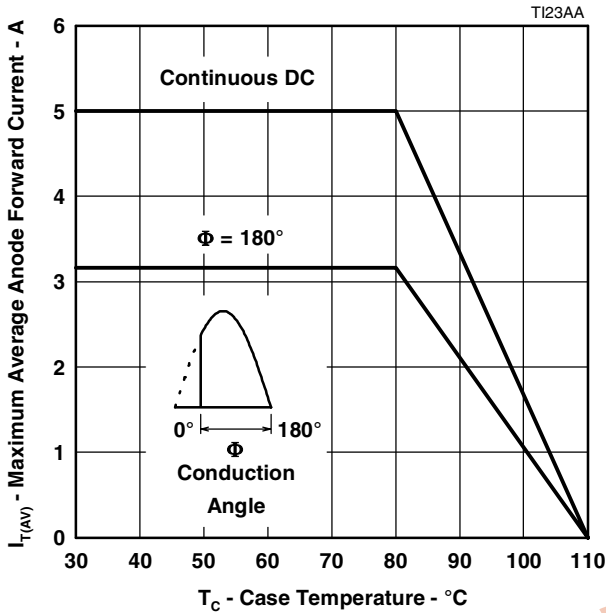


Figure 1.

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

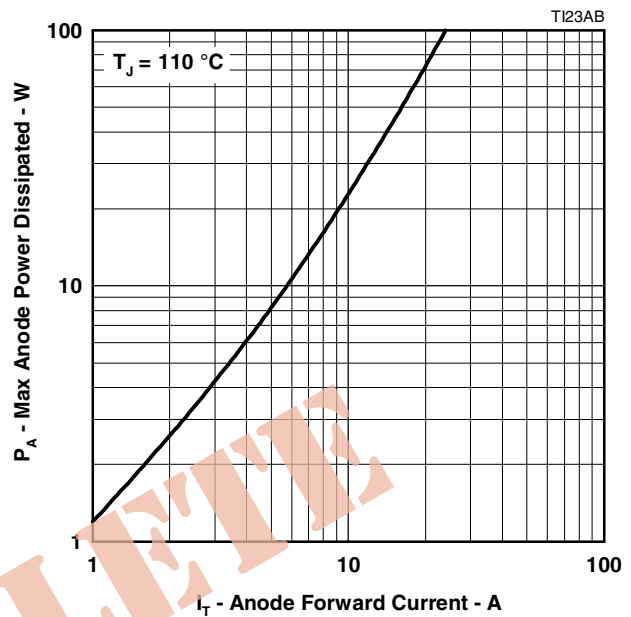


Figure 2.

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

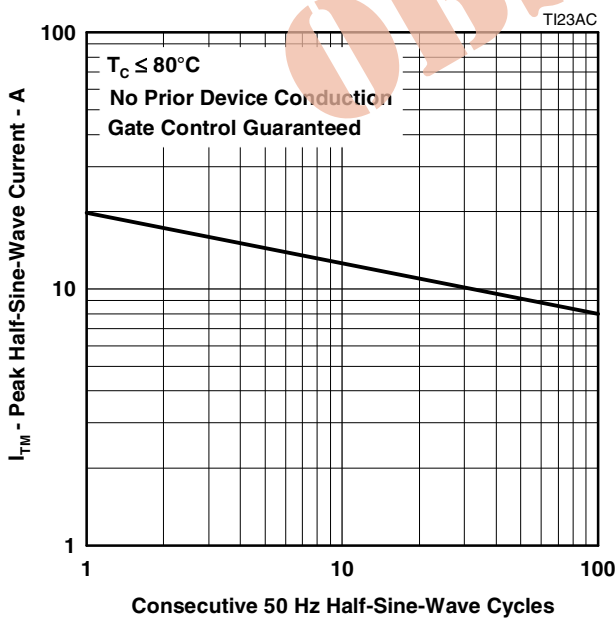


Figure 3.

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

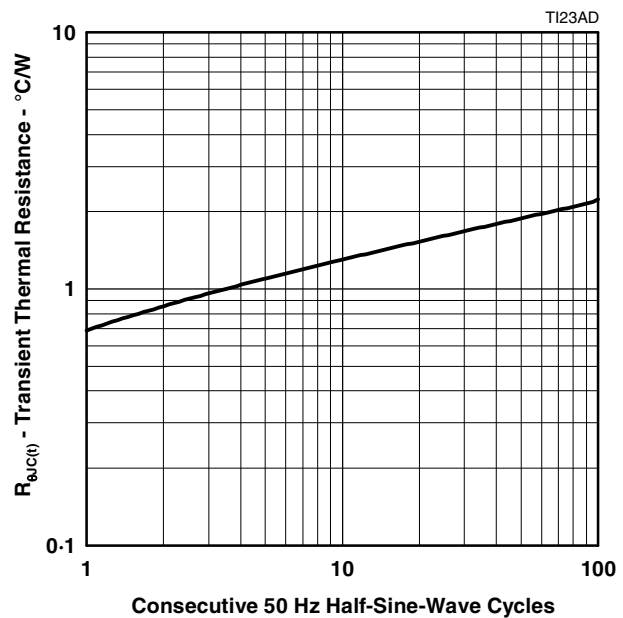


Figure 4.

PRODUCT INFORMATION

TYPICAL CHARACTERISTICS

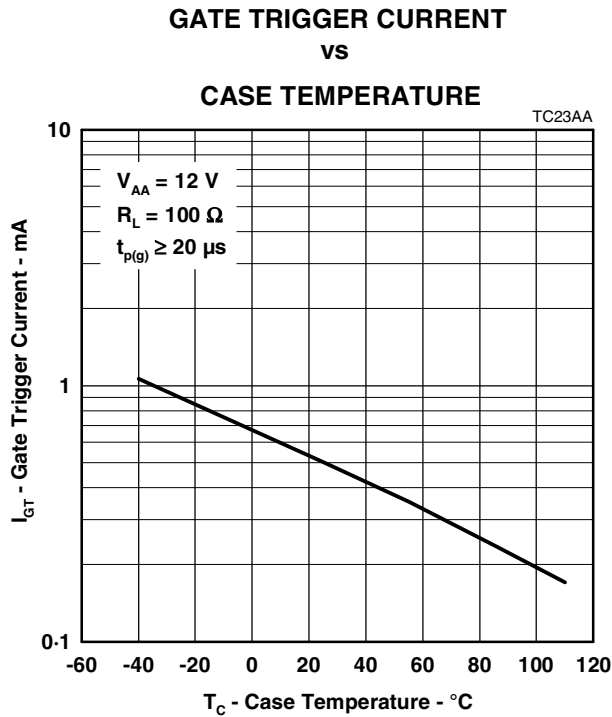


Figure 5.

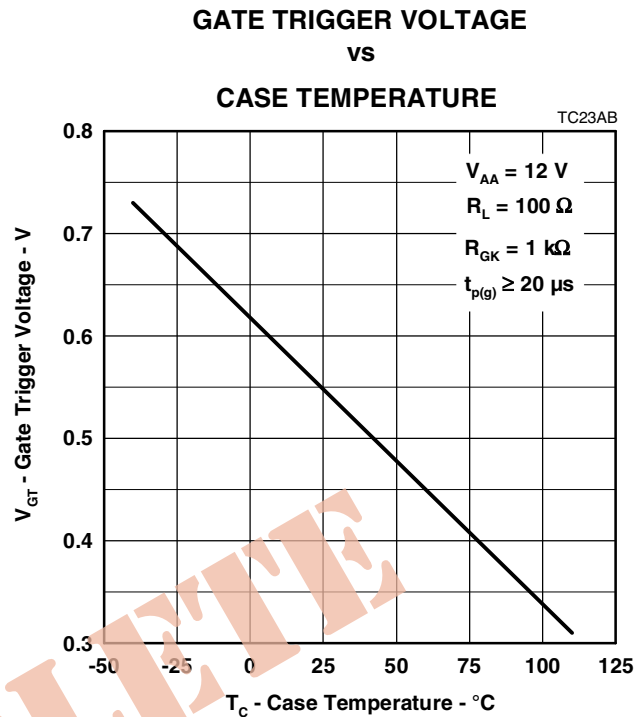


Figure 6.

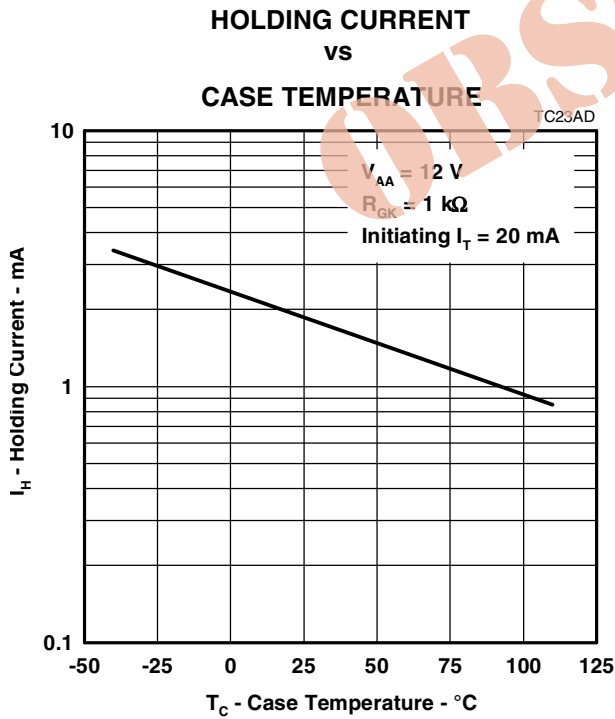


Figure 7.

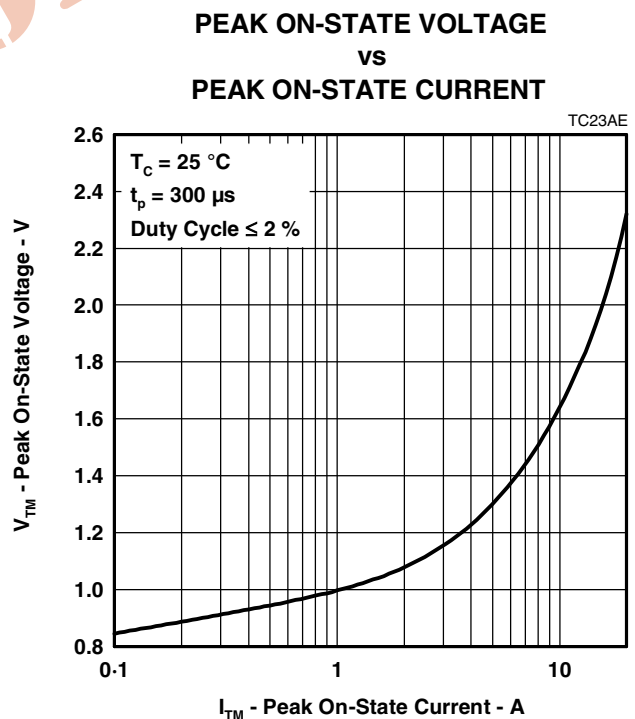


Figure 8.

PRODUCT INFORMATION