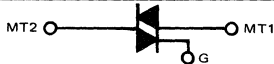


2N5571 thru 2N5574 (SILICON)

2N6145 thru 2N6147

MAC40797, MAC40798



### SILICON BIDIRECTIONAL THYRISTORS

... designed primarily for industrial and military applications for the control of ac loads in applications such as light dimmers, power supplies, heating controls, motor controls, welding equipment and power switching systems; or wherever full-wave, silicon gate controlled solid-state devices are needed.

- All Diffused and Passivated Junctions for Greater Stability
- Pressfit, Stud and Isolated Stud Packages
- Gate Triggering Guaranteed In All 4 Quadrants

### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
*Repetitive Peak Off-State Voltage (1) ( $T_J = -65$ to $+125^\circ\text{C}$ ) 1/2 Sine Wave 50 to 60 Hz, Gate Open  2N5571, 2N5573, 2N6145 2N5572, 2N5574, 2N6146 MAC40797, MAC40798, 2N6147	$V_{DRM}$ and $V_{RRM}$	200 400 600	Volts
*Peak Gate Voltage	$V_{GM}$	10	Volts
*On-State Current RMS ( $T_C = -65$ to $+80^\circ\text{C}$ ) ( $T_C = +85^\circ\text{C}$ )	$I_T(\text{RMS})$	15 10	Amp
*Peak Surge Current (One Full cycle of surge current at 60 Hz, preceded and followed by 15 A current, $T_C = +80^\circ\text{C}$ )	$I_{TSM}$	100	Amp
Circuit Fusing Considerations ( $T_C = -65$ to $+80^\circ\text{C}$ , $t = 1.0$ to $8.3$ ms)	$I^2t$	40	$\text{A}^2\text{s}$
*Peak Gate Power (2) ( $T_C = +80^\circ\text{C}$ , Pulse Width = $2.0$ $\mu\text{s}$ )	$P_{GM}$	20	Watts
*Average Gate Power ( $T_C = +80^\circ\text{C}$ , Pulse Width = $8.3$ ms)	$P_G(\text{AV})$	0.5	Watt
*Peak Gate Current	$I_{GM}$	2.0	Amp
*Operating Junction Temperature Range	$T_J$	$-65$ to $+100$	$^\circ\text{C}$
*Storage Temperature Range	$T_{stg}$	$-65$ to $+150$	$^\circ\text{C}$
*Stud Torque 2N5573, 2N5574 2N6145, 2N6146, 2N6147	—	30	in.lb.

### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
*Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.0	$^\circ\text{C}/\text{W}$

\*Indicates JEDEC Registered Data.

(1) Ratings apply for open gate conditions. Thyristor devices shall not be tested with a constant current source for blocking capability such that the voltage applied exceeds the rated blocking voltage.

(2) 2N5571 thru 2N5574,  $P_{GM}$  Rating = 16 Watts.

### TRIACS (THYRISTORS)

15 AMPERES RMS  
200-600 VOLTS



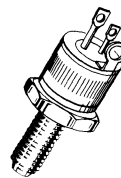
2N5571  
2N5572  
MAC40798

CASE 174  
TO-203



2N5573  
2N5574  
MAC40798

CASE 175



2N6145  
2N6146  
2N6147

CASE 235

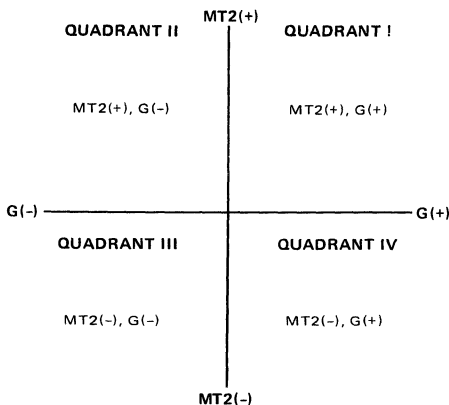
**ELECTRICAL CHARACTERISTICS** ( $T_C = 25^{\circ}\text{C}$  unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
*Peak Blocking Current (Either Direction) Rated $V_{\text{DRM}}$ @ $T_C = 100^{\circ}\text{C}$	$I_{\text{DRM}}$	—	—	2.0	mA
*On-State Voltage (Either Direction) $I_{\text{TM}} = 21$ A Peak, Pulse Width = 1.0 to 2.0 ms, Duty Cycle $\leq 2.0\%$	$V_{\text{TM}}$	—	1.3	1.8	Volts
Gate Trigger Current, Continuous dc (1) Main Terminal Voltage = 12 Vdc, $R_L = 30$ ohms MT2 (+), G(+); MT2(-), G(-) MT2 (+), G(-); MT2(-), G(+) *MT2 (+), G(+); MT2(-), G(-) $T_C = -65^{\circ}\text{C}$ *MT2 (+), G(-); MT2(-), G(+), $T_C = -65^{\circ}\text{C}$	$I_{\text{GT}}$	—	—	50 80 150 200	mA
Gate Trigger Voltage, Continuous dc (All Quadrants) Main Terminal Voltage = 12 Vdc, $R_L = 30$ ohms $T_C = 25^{\circ}\text{C}$ * $T_C = -65^{\circ}\text{C}$ *Main Terminal Voltage = Rated $V_{\text{DRM}}$ , $R_L = 10$ k ohms, $T_C = +100^{\circ}\text{C}$	$V_{\text{GT}}$	— — 0.2	— — —	2.5 4.0 —	Volts
Holding Current Main Terminal Voltage = 12 Vdc, Gate Open Initiating Current = 500 mA $T_C = 25^{\circ}\text{C}$ * $T_C = -65^{\circ}\text{C}$	$I_{\text{H}}$	— —	— —	75 300	mA
*Turn-On Time Rated $V_{\text{DRM}}$ , $I_{\text{TM}} = 21$ A Peak, $I_{\text{GT}} = 160$ mA, Rise Time = 0.1 $\mu\text{s}$ , Pulse Width = 2.0 $\mu\text{s}$	$t_{\text{gt}}$	—	1.0	2.0	$\mu\text{s}$
*Critical Rate-of-Rise of Commutation Voltage Rated $V_{\text{DRM}}$ , $I_{\text{TM}} = 21$ A Peak, Commutating $di/dt = 8$ A/ms, gate unenergized $T_C = 80^{\circ}\text{C}$ 2N5571 thru 2N5574, MAC40797, MAC40798 $T_C = 75^{\circ}\text{C}$ 2N6145 thru 2N6147	$dv/dt$	2.0 2.0	10 10	— —	V/ $\mu\text{s}$
*Critical Rate-of-Rise of Off-State Voltage Rated $V_{\text{DRM}}$ , Exponential Voltage Rise, Gate Open, $T_C = 100^{\circ}\text{C}$ : 2N5571, 2N5573, 2N6145 2N5572, 2N5574, 2N6146 MAC40797, MAC40798, 2N6147	$dv/dt$	30 20 10	150 100 75	— — —	V/ $\mu\text{s}$

\*Indicates JEDEC Registered Data.

(1) All Voltage polarity reference to main terminal 1.

**QUADRANT DEFINITIONS**



Trigger devices are recommended for gating on Triacs. They provide:

1. Consistent predictable turn-on points.
2. Simplified circuitry.
3. Fast turn-on time for cooler, more efficient and reliable operation.

**ELECTRICAL CHARACTERISTICS of RECOMMENDED BIDIRECTIONAL SWITCHES**

USAGE	General		Lamp Dimmer
PART NUMBER	MBS4991	MBS4992	MBS100
$V_S$	6.0 – 10 V	7.5 – 9.0 V	3.0 – 5.0 V
$I_S$	350 $\mu\text{A}$ Max	120 $\mu\text{A}$ Max	100 – 400 $\mu\text{A}$
$V_{S1} - V_{S2}$	0.5 V Max	0.2 V Max	0.35 V Max
Temperature Coefficient = 0.02%/ $^{\circ}\text{C}$ Typ			

See AN-526 for Theory and Characteristics of Silicon Bidirectional Switches.

FIGURE 1 - AVERAGE CURRENT DERATING

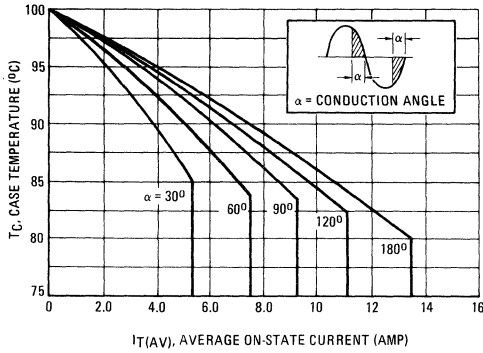


FIGURE 2 - RMS CURRENT DERATING

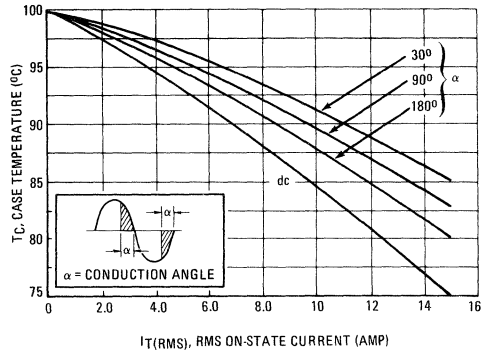


FIGURE 3 - ON-STATE POWER DISSIPATION

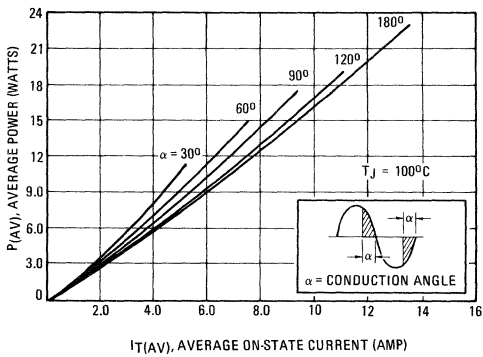


FIGURE 4 - ON-STATE POWER DISSIPATION

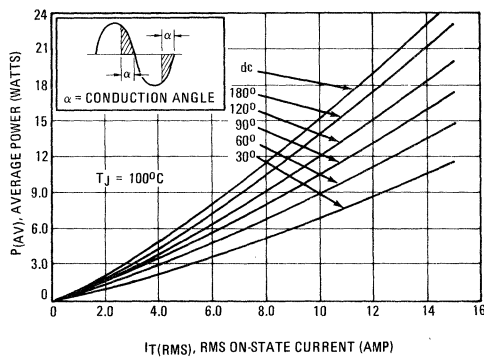


FIGURE 5 - TYPICAL GATE TRIGGER VOLTAGE

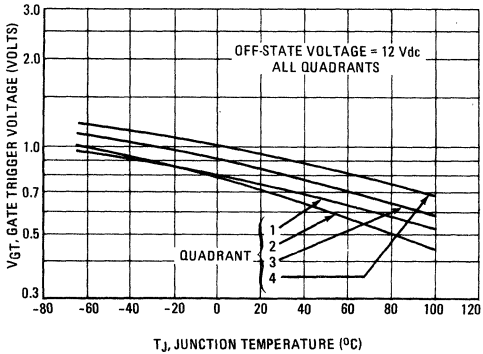


FIGURE 6 - TYPICAL GATE TRIGGER CURRENT

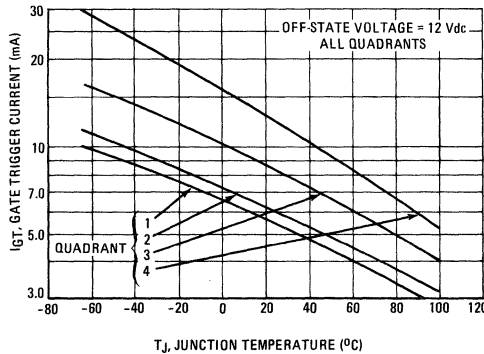


FIGURE 7 – MAXIMUM ON-STATE CHARACTERISTICS

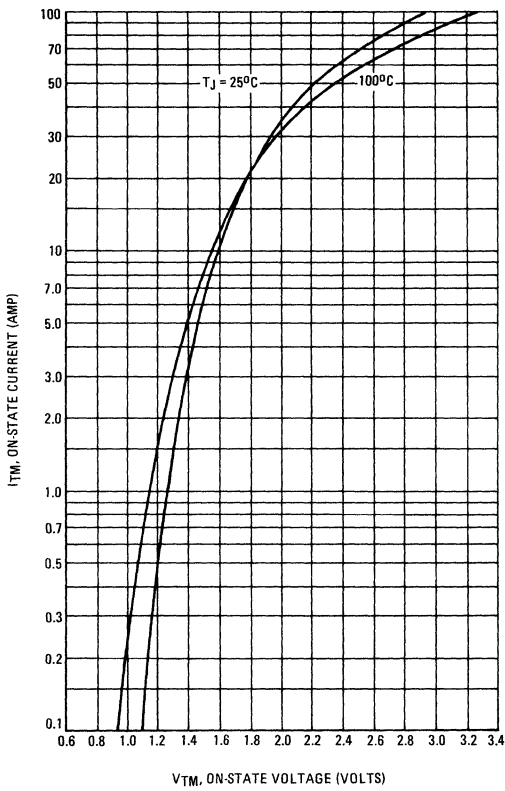


FIGURE 8 – TYPICAL HOLDING CURRENT

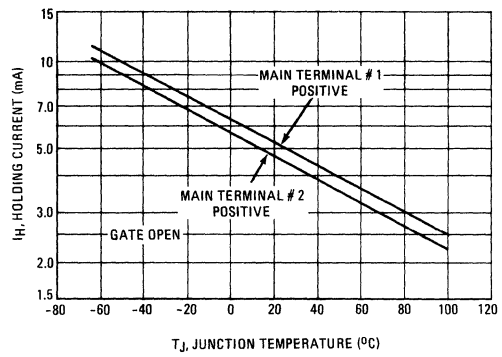


FIGURE 9 – MAXIMUM ALLOWABLE SURGE CURRENT

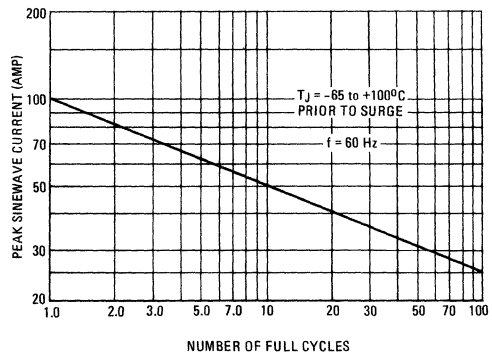
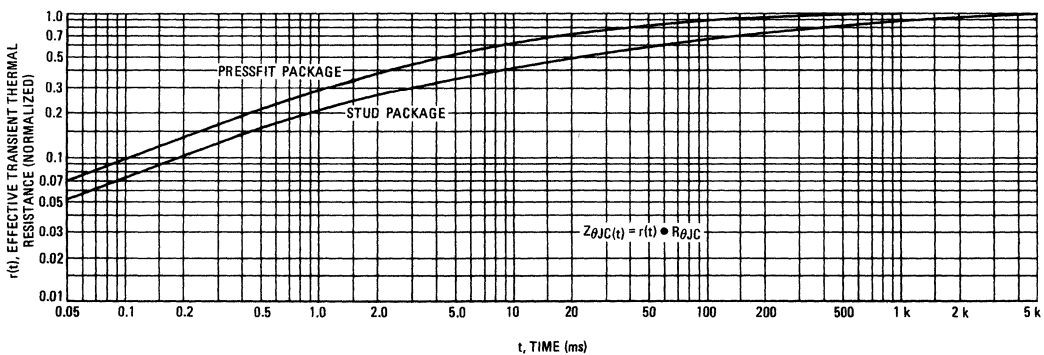
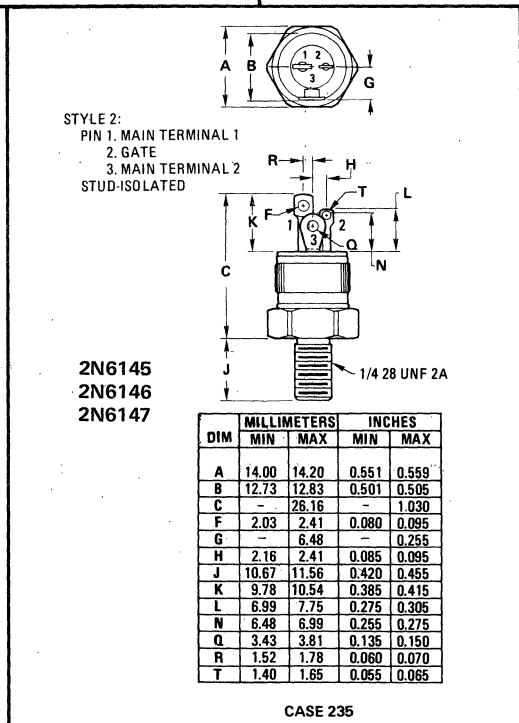
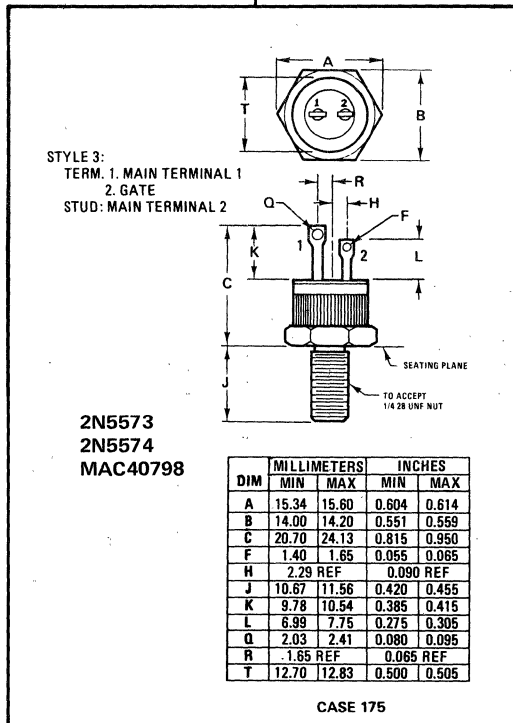
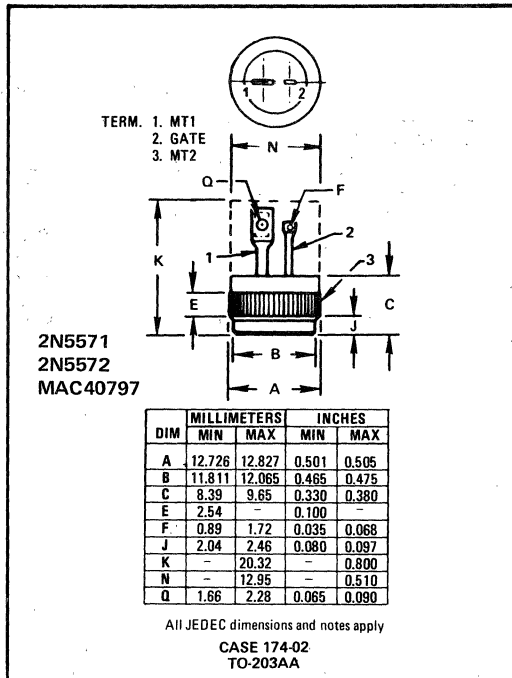


FIGURE 10 – TYPICAL THERMAL RESPONSE





# 2N 5581, 2N 5582 (SILICON)

For Specifications, See 2N2218S,AS Data, Volume I.