

Triacs

Silicon Bidirectional Triode 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.

- Glass Passivated Junctions and Center Gate Fire
- Isolated Stud for Ease of Assembly
- Gate Triggering Guaranteed In All 4 Quadrants

**2N5444
thru
2N5446**

**TRIACs
40 AMPERES RMS
200 thru 600 VOLTS**



MAXIMUM RATINGS ($T_J = 25^\circ\text{C}$ unless otherwise noted.)

Rating	Symbol	Value	Unit
*Peak Repetitive Off-State Voltage ($T_J = -65$ to $+110^\circ\text{C}$) (Note 1) 1/2 Sine Wave 50 to 60 Hz, Gate Open	V_{DRM}		Volts
*Peak Principal Voltage			
2N5444		200	
2N5445		400	
2N5446		600	
*RMS On-State Current (T_C per Figure 2) ($T_C = +100^\circ\text{C}$) Full Sine Wave, 50 to 60 Hz	$I_T(\text{RMS})$	40 20	Amps
*Peak Non-Repetitive Surge Current (One Full Cycle of surge current at 60 Hz, preceded and followed by a 40 A RMS current, $T_C = 100^\circ\text{C}$)	I_{TSM}	300	Amps
*Peak Gate Power (Pulse Width = 10 μs Max)	P_{GM}	40	Watts
*Average Gate Power	$P_{G(AV)}$	0.75	Watt
*Peak Gate Current (10 μs Max)	I_{GM}	4	Amps
*Peak Gate Voltage	V_{GM}	30	Volts
*Operating Junction Temperature Range	T_J	-65 to +110	$^\circ\text{C}$
*Storage Temperature Range	T_{stg}	-65 to +150	$^\circ\text{C}$
*Stud Torque	—	30	in. lb.

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
*Thermal Resistance, Junction to Case 2N5444, 2N5445, 2N5446	$R_{\theta JC}$	0.9	$^\circ\text{C/W}$

*Indicates JEDEC Registered Data.

Note 1. V_{DRM} for all types can be applied on a continuous basis. Blocking voltages shall not be tested with a constant current source such that the voltage ratings of the devices are exceeded.



**CASE 263-04
STYLE 2
2N5444 thru 2N5446**

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2N5444 thru 2N5446

ELECTRICAL CHARACTERISTICS (T_C = 25°C, and either polarity of MT2 to MT1 voltage, unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
*Peak Blocking Current (Gate Open, V _D = Rated V _{DRM}) T _C = 25°C T _C = 100°C	I _{DRM}	— —	— 0.5	10 4	μA mA
*Peak On-State Voltage (I _{TM} = 56 A Peak, Pulse Width ≤ 1 ms, Duty Cycle ≤ 2%)	V _{TM}	—	1.65	1.85	Volts
Gate Trigger Current (Continuous dc), Note 1 (Main Terminal Voltage = 12 Vdc, R _L = 50 Ohms)	I _{GT}				mA
MT2(+), G(+)		—	—	70	
MT2(+), G(-)		—	—	70	
MT2(-), G(-)		—	—	70	
MT2(-), G(+)		—	—	100	
*MT2(+), G(+); MT2(-), G(-) T _C = -65°C		—	—	125	
*MT2(+), G(-); MT2(-), G(+)		—	—	240	
*Gate Trigger Voltage (Continuous dc) (Main Terminal Voltage = 12 Vdc, R _L = 50 Ohms)	V _{GT}				Volts
MT2(+), G(+)		—	—	2	
MT2(+), G(-)		—	—	2	
MT2(-), G(-)		—	—	2	
MT2(-), G(+)		—	—	2.5	
*All Quadrants, T _C = -65°C		—	—	3.4	
*Main Terminal Voltage = Rated V _{DRM} = R _L = 10 k ohms, T _C = 100°C		0.2	—	—	
*Holding Current (Main Terminal Voltage = 12 Vdc, Gate Open) (Initiating Current = 150 mA) T _C = 25°C *T _C = -65°C	I _H	— —	— —	70 100	mA
*Turn-On Time (Main Terminal Voltage = Rated V _{DRM} , I _{TM} = 56 A, Gate Source Voltage = 12 V, R _S = 12 Ohms, Rise Time = 0.1 μs, Pulse Width = 2 μs)	t _{gt}	—	1	2	μs
*Critical Rate-of-Rise of Commutation Voltage (Rated V _{DRM} , I _{TM} = 40 A, Commutating di/dt = 20 A/ms, gate unenergized) T _C = 65°C	dv/dt(c)	5	30	—	V/μs
Critical Rate-of-Rise of Off State Voltage (Rated V _{DRM} , Exponential Voltage Rise, Gate Open, T _C = 110°C)	dv/dt				V/μs
2N5444		50			
2N5445		30			
2N5446		20			

*Indicates JEDEC Registered Data for 2N5541 thru 2N5446.

Note 1. All voltage polarities referenced to main terminal 1.

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2N5444 thru 2N5446

FIGURE 1 – ON-STATE POWER DISSIPATION

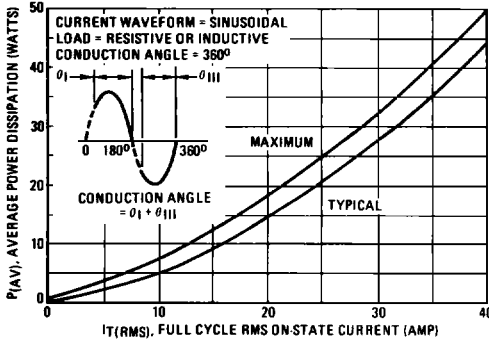


FIGURE 2 – RMS CURRENT DERATING

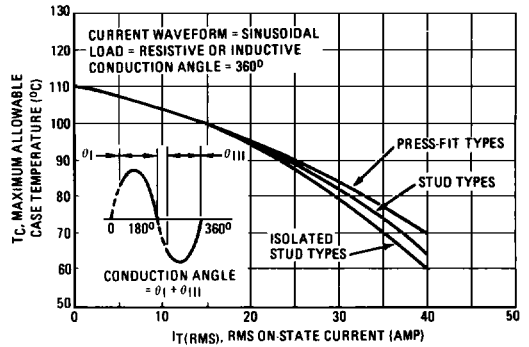


FIGURE 3 – TYPICAL GATE TRIGGER VOLTAGE

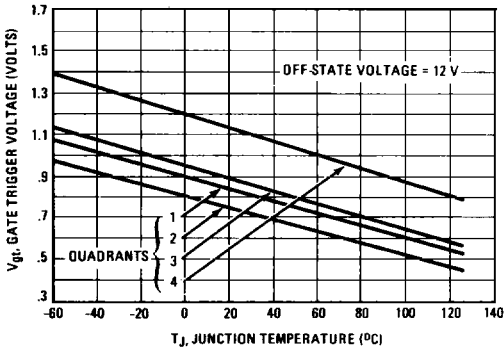


FIGURE 4 – TYPICAL GATE TRIGGER CURRENT

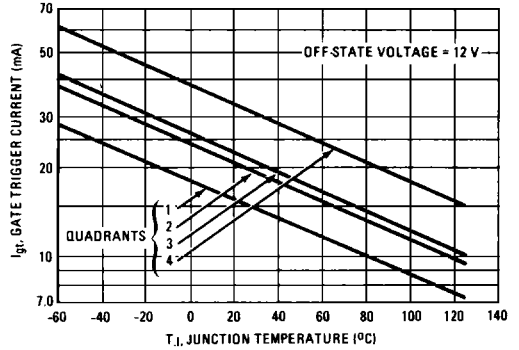
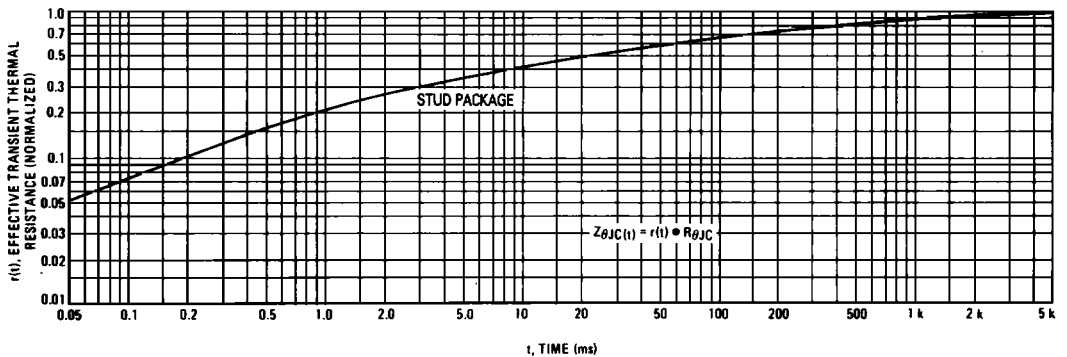


FIGURE 5 – TYPICAL THERMAL RESPONSE



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2N5444 thru 2N5446

FIGURE 6 - ON-STATE CHARACTERISTICS

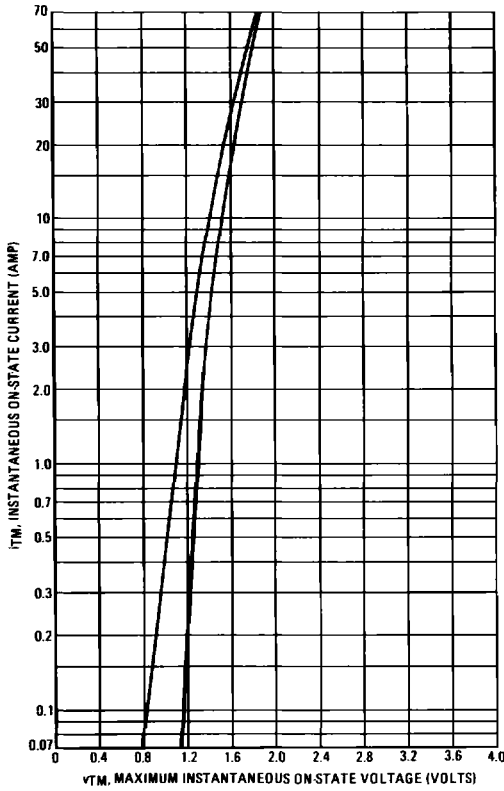


FIGURE 7 - TYPICAL HOLDING CURRENT

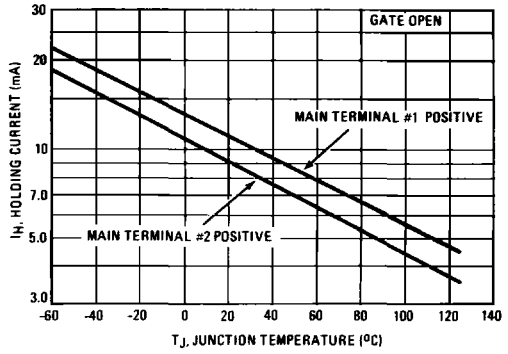
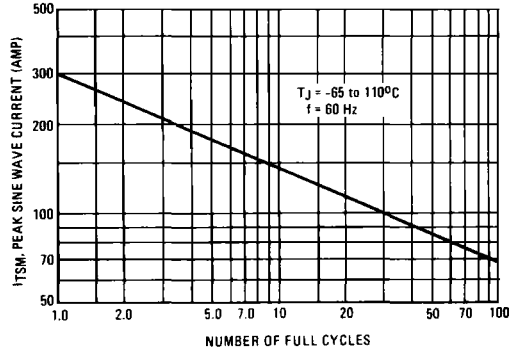


FIGURE 8 - MAXIMUM ALLOWABLE SURGE CURRENT



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