Reverse Blocking Triode Thyristors

. . . designed for industrial and consumer applications such as power supplies; battery chargers; temperature, motor, light and welder controls.

- Economical for a Wide Range of Uses
- High Surge Current — I_{TSM} = 350 Amp
- Practical Level Triggering and Holding Characteristics — 4 and 5.2 mA (Typ) @ T_C = 25°C
- Rugged Construction in Either Pressfit, Stud or Isolated Stud Package

MAXIMUM RATINGS (T_C = 100°C unless otherwise noted.)

Rating	Symbol	Value	Unit
*Peak Repetitive Forward or Reverse Blocking Voltage, Note 1 (T_J = −40 to +100°C, 1/2 Sine Wave, 50 to 400 Hz, Gate Open)	V_{RRM} or V_{DRM}		Volts
2N3870, 2N3896, 2N6171		100	
2N3871, 2N3897, 2N6172		200	
2N3872, 2N3898, 2N6173		400	
2N3873, 2N3899, 2N6174		600	
*Peak Non-Repetitive Forward or Reverse Blocking Voltage (t ≤ 5 ms)	V_{RSM} or V_{DSM}		Volts
2N3870, 2N3896, 2N6171		150	
2N3871, 2N3897, 2N6172		330	
2N3872, 2N3898, 2N6173		660	
2N3873, 2N3899, 2N6174		700	
*Average On-State Current, Note 2 (T_C = −40 to +65°C)	$I_{T(AV)}$	22	Amps
(T_C = +85°C)		11	
*Peak Non-Repetitive Surge Current (One cycle, 60 Hz) (T_C = +65°C)	I_{TSM}	350	Amps
Circuit Fusing (T_C = −40 to +100°C) (t = 1 to 8.30 ms)	I^2t	510	A^2s

* Indicates JEDEC Registered Data.

Notes: 1. Ratings apply for zero or negative gate voltage. Devices shall not have a positive bias applied to the gate concurrently with a negative potential on the anode. Devices should not be tested with constant current source for forward or reverse blocking capability such that the voltage applied exceeds the rated blocking voltage.

2. Isolated stud devices must be derated an additional 10 percent.

Peak Gate Voltage	V_{GM}	10
*Operating Junction Temperature Range	T_J	−40 to +100
*Storage Temperature Range	T_{stg}	−40 to +150
Stud Torque	—	30

*Indicates JEDEC Registered Data.

*THERMAL CHARACTERISTICS

Characteristic	Symbol	Max
Thermal Resistance, Junction to Case 2N3870 thru 2N3873, 2N3896 thru 2N3899 2N6171 thru 2N6174	$R_{\theta JC}$	 0.9 1

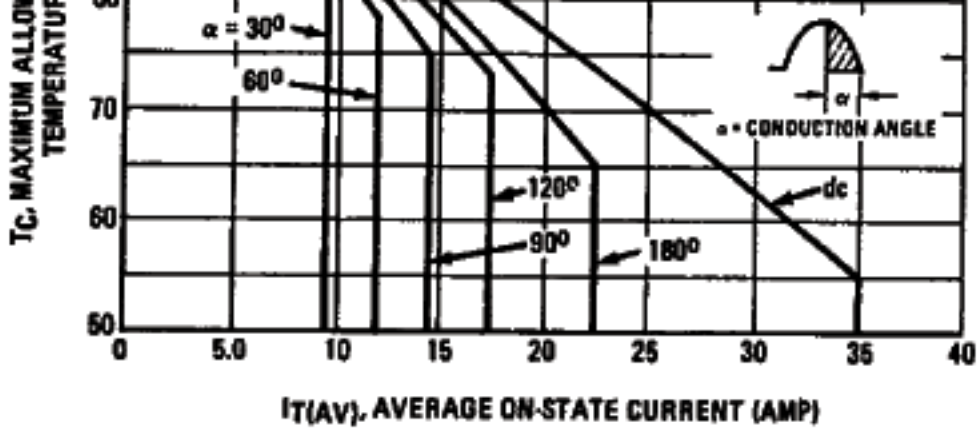
* Indicates JEDEC Registered Data.

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted.)

Characteristic		Symbo
*Peak Forward or Reverse Blocking Current (Rated V_{DRM} or V_{RRM}, gate open, T_J = 100°C) 2N3870, 2N3896, 2N6171 2N3871, 2N3897, 2N6172 2N3872, 2N3898, 2N6173 2N3873, 2N3899, 2N6174 (Rated V_{DRM} or V_{RRM}, gate open, T_J = 25°C) All Devices		I_{DRM}, I_{RR}
*Peak On-State Voltage (I_{TM} = 69 A Peak)		V_{TM}
*Gate Trigger Current (Continuous dc) (V_D = 12 V, R_L = 24 ohms)	*T_C = −40°C T_C = 25°C	I_{GT}
*Gate Trigger Voltage (Continuous dc) (V_D = q2 V, R_L = 24 ohms)	*T_C = −40°C T_C = 25°C	V_{GT}
*Holding Current (Gate Open) (V_D = 12 V, I_{TM} = 200 mA)	*T_C = −40°C T_C = 25°C	I_H
*Gate Controlled Turn-On Time (t_d + t_r) (I_{TM} = 41 Adc, V_D = rated V_{DRM}, I_{GT} = 40 mAdc, Rise Time ≤ 0.05 μs, Pulse Width = 10 μs)		t_{gt}
Circuit Commutated Turn-Off Time (I_{TM} = 10 A, I_R = 10 A) (I_{TM} = 10 A, I_R = 10 A, T_C = 100°C)		t_q
Forward Voltage Application Rate (T_C = 100°C, V_D = Rated V_{DRM})		dv/dt

*Indicates JEDEC Registered Data.

3



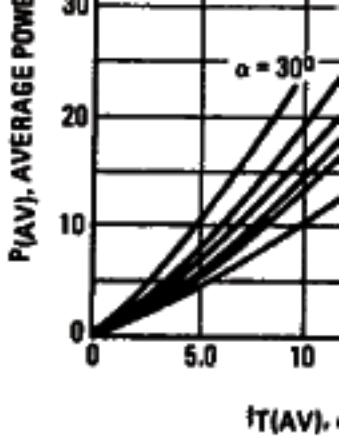
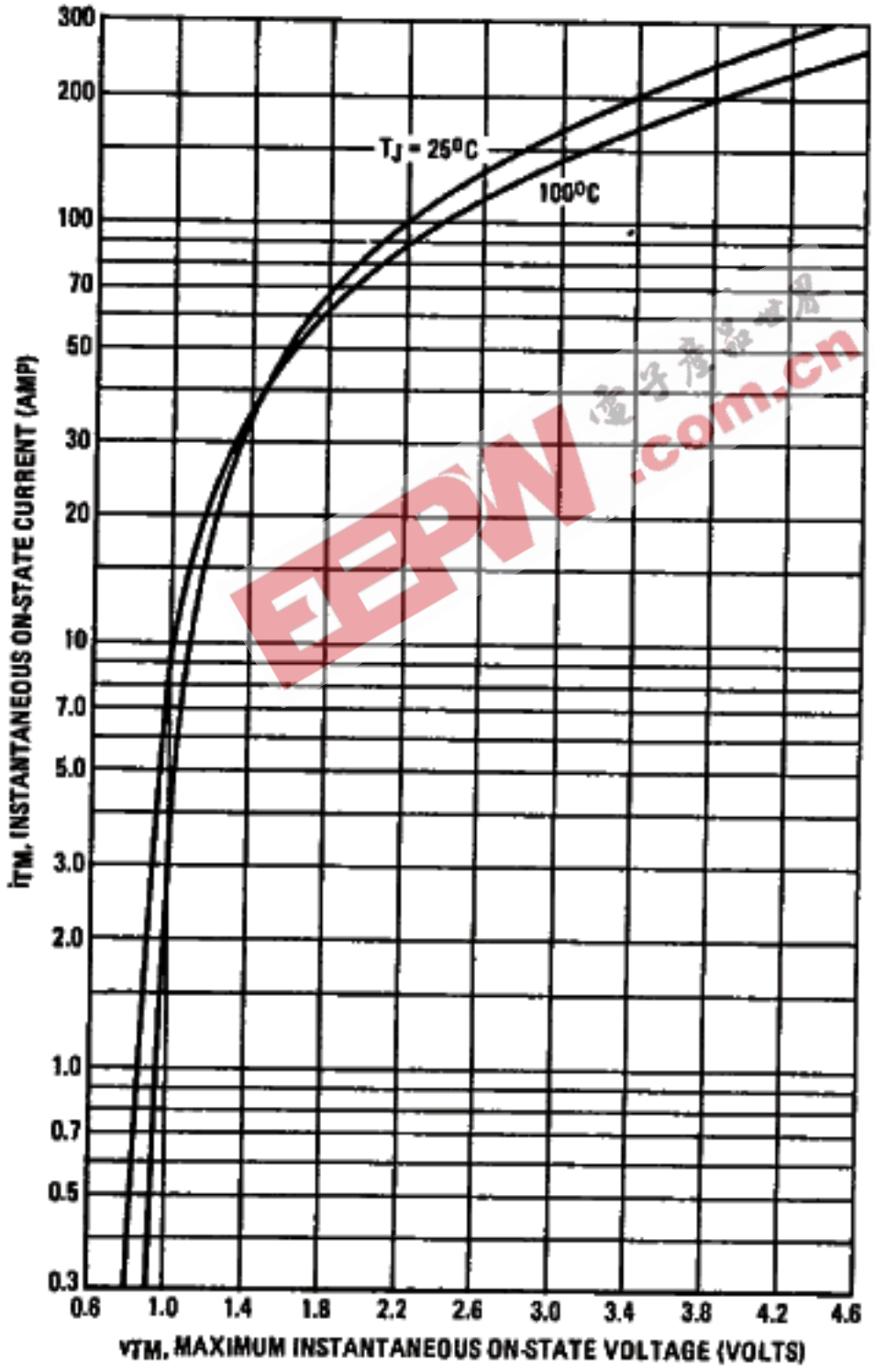
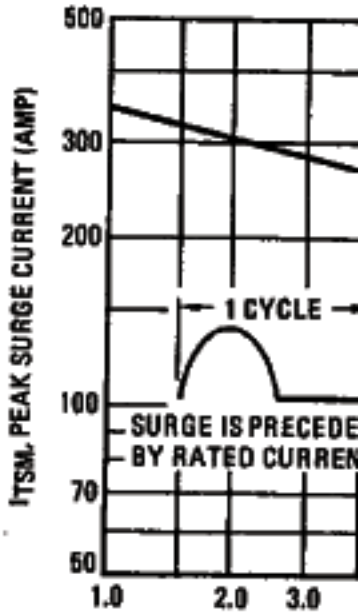


FIGURE 3 – ON-STATE CHARACTERISTICS



FIGURE



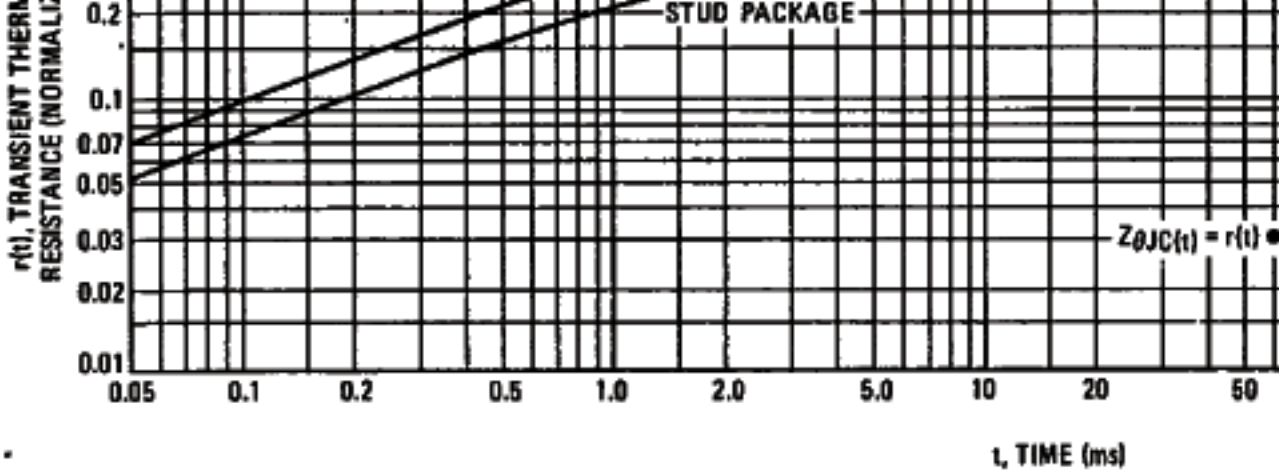
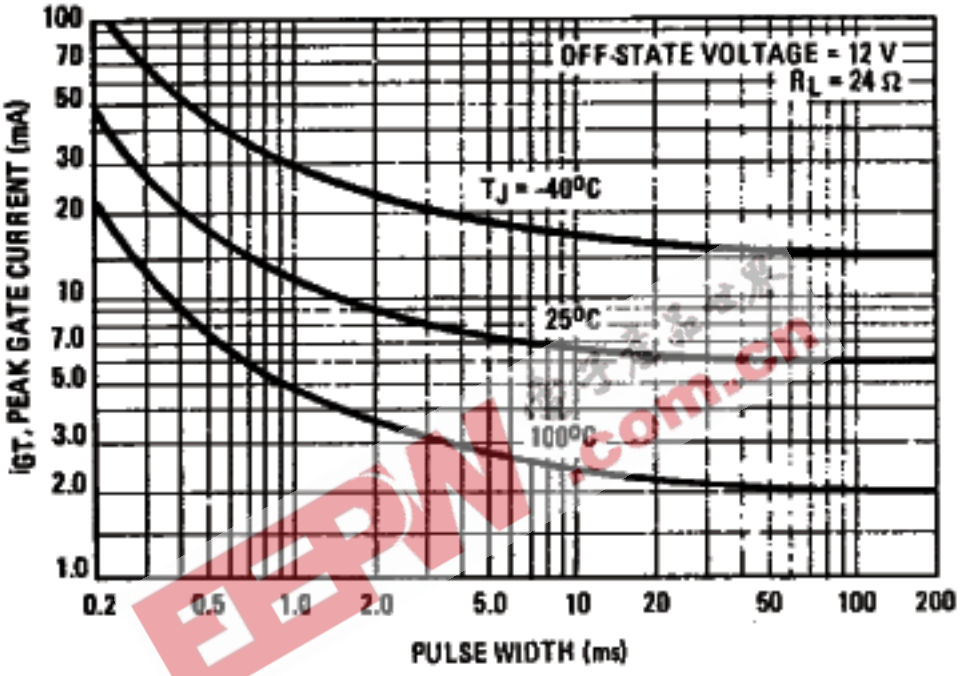


FIGURE 6 — PULSE TRIGGER CURRENT



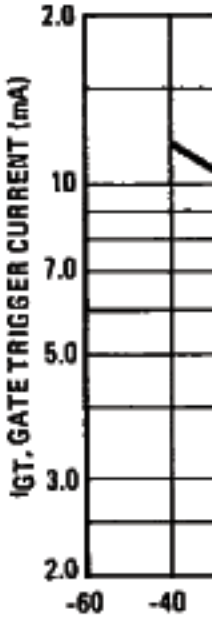


FIGURE 8 — GATE TRIGGER VOLTAGE