SOLID STATE INC.
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2N1842 thru 2N1850 SILICON

TO-208AA
(TO-48)

Industrial-type, silicon controlled rectifiers in a stud package with current handling capability to 16 amperes at junction temperatures to 100°C.

MAXIMUM RATINGS (T_J = 100°C unless otherwise noted)

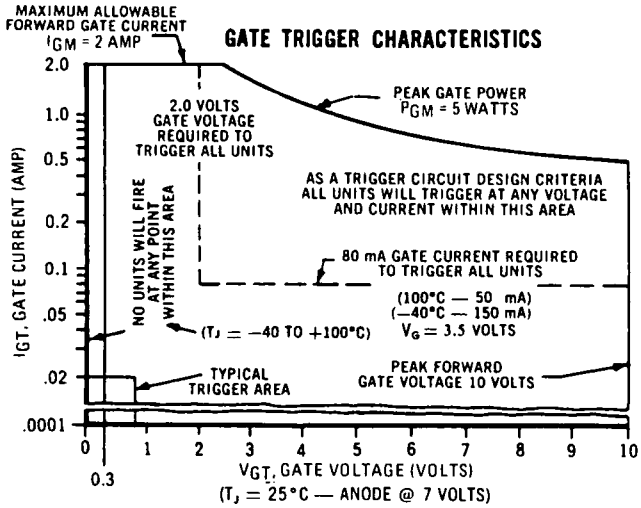
Rating	Symbol	Value	Unit
Peak Reverse Blocking Voltage*	$V_{RSM(rep)}$*		Volts
2N1842		25	
2N1843		50	
2N1844		100	
2N1845		150	
2N1846		200	
2N1847		250	
2N1848		300	
2N1849		400	
2N1850		500	
Peak Reverse Blocking Voltage (Transient) (Non-Recurrent 5 ms max.)	$V_{RSM(non-rep)}$		Volts
2N1842		35	
2N1843		75	
2N1844		150	
2N1845		225	
2N1846		300	
2N1847		350	
2N1848		400	
2N1849		500	
2N1850		600	
Forward Current RMS (All Conduction Angles)	$I_{T(RMS)}$	16	Amp
Circuit Fusing Considerations (T_J = -40 to +100°C, t ≤ 8.3 ms)	I^2t	60	A^2s
Peak Forward Surge Current (One Cycle, 60 Hz, T_J = -40 to +100°C)	I_{TSM}	125	Amp
Peak Gate Power -	P_{GM}	5.0	Watts
Average Gate Power	$P_{G(AV)}$	0.5	Watt
Peak Gate Current -	I_{GM}	2.0	Amp
Peak Gate Voltage - Forward	V_{GFM}	10	Volts
Reverse	V_{GRM}	5.0	
Operating Junction Temperature Range	T_J	-40 to +100	°C
Storage Temperature Range	T_{stg}	-40 to +125	°C
Stud Torque	—	30	in. lb.

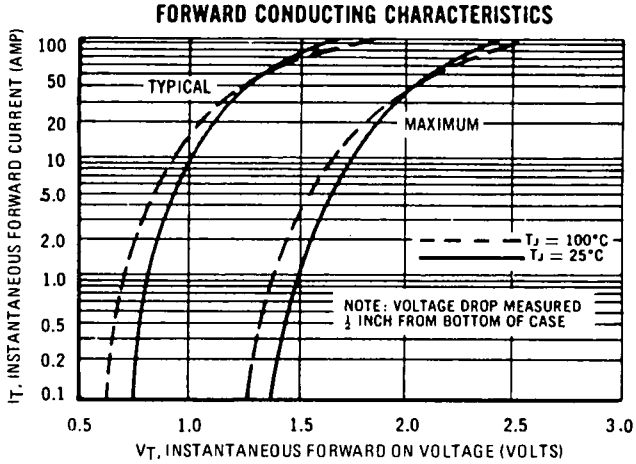
*$V_{RSM(rep)}$ for all types can be applied on a continuous dc basis without incurring damage. Ratings apply for zero or negative gate voltage.

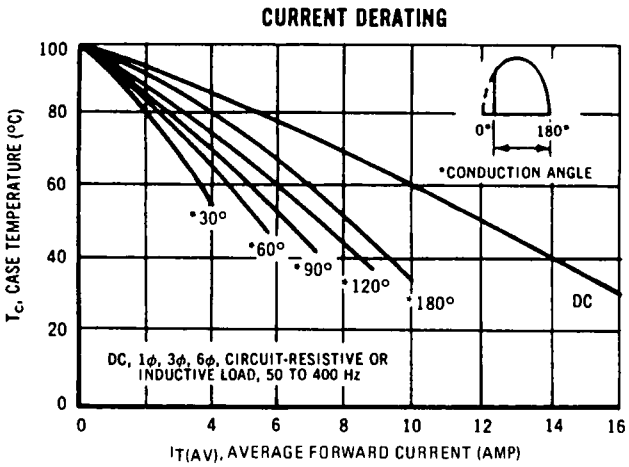
ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

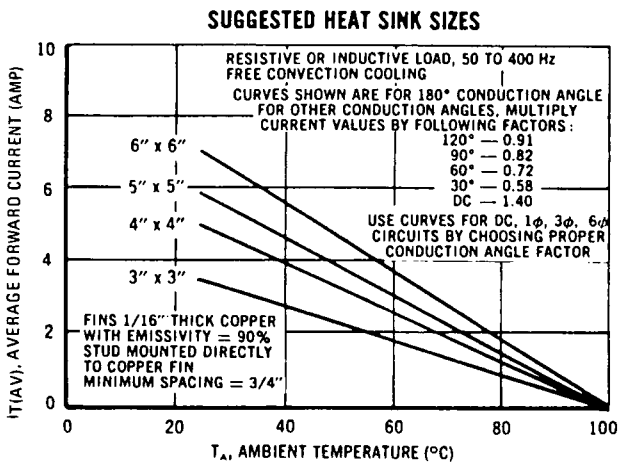
Characteristic		Symbol	Min	Typ	Max	Units
Peak Forward Blocking Voltage* (T_J = 100°C)		V_{DRM}*				Volts
	2N1842		25	—	—	
	2N1843		50	—	—	
	2N1844		100	—	—	
	2N1845		150	—	—	
	2N1846		200	—	—	
	2N1847		250	—	—	
	2N1848		300	—	—	
	2N1849		400	—	—	
	2N1850		500	—	—	
Peak Forward or Reverse Blocking Current (Rated V_{FOM} or V_{ROM} gate open, T_J = 100°C)		I_{DRM} I_{RRM}	—	—	6.0	mA
Gate Trigger Current (Continuous dc) (Anode Voltage = 7 Vdc, R_L = 50 Ω)		I_{GT}	—	15	80	mA
Gate Trigger Voltage (Continuous dc) (Anode Voltage = 7 Vdc, R_L = 50 Ω)		V_{GT}	—	0.8	2.0	Volts
(V_{DRM} = Rated V, R_L = 50 Ω, T_J = 100°C)		V_{GNT}	0.3	—	—	
Holding Current (Anode Voltage = 7 Vdc, Gate Open)		I_H	—	20	—	mA
Forward On Voltage (I_F = 16 Adc)		V_{TM}	—	1.1	1.8	Volts
Turn-On Time (t_d + t_r) (I_G = 50 mA, I_F = 10 A)		t_{gt}	—	1.0	—	μs
Turn-Off Time (I_F = 10 A, I_R = 10 A; dv/dt = 20 V/μs, T_J = 100°C) (V_{DRM} = rated voltage)		t_q	—	25	—	μs
Forward Voltage Application Rate (Gate open, T_J = 100°C)		dv/dt	—	30	—	V/μs
Thermal Resistance (Junction to Case)		θ_{JC}	—	1.0	2.0	°C/W

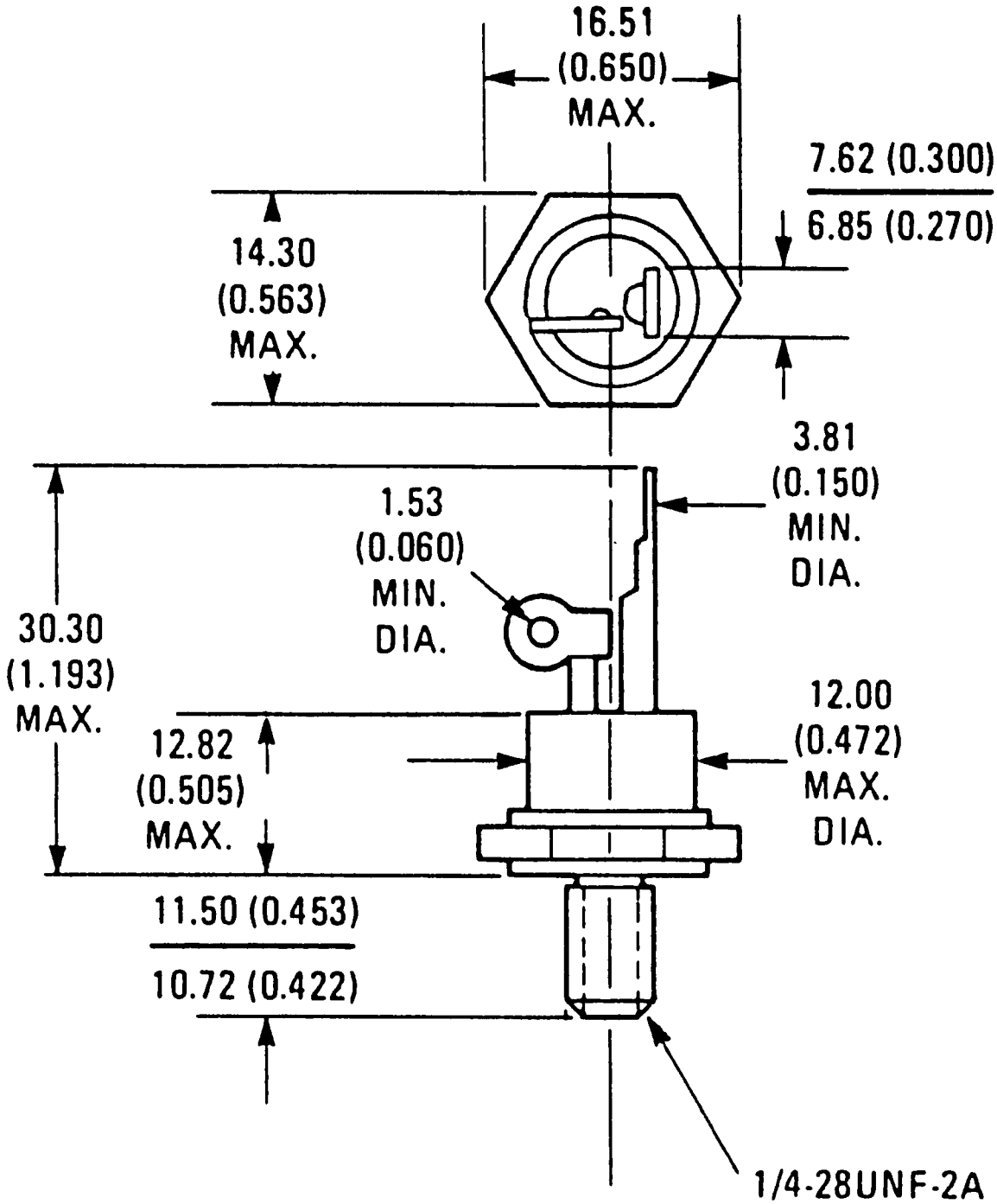
*V_{DRM} for all types can be applied on a continuous dc basis without incurring damage.
Ratings apply for zero or negative voltage.


GATE TRIGGER CHARACTERISTICS
MAXIMUM ALLOWABLE FORWARD GATE CURRENT
IGM = 2 AMP
PEAK GATE POWER
PGM = 5 WATTS
2.0 VOLTS GATE VOLTAGE REQUIRED TO TRIGGER ALL UNITS
AS A TRIGGER CIRCUIT DESIGN CRITERIA ALL UNITS WILL TRIGGER AT ANY VOLTAGE AND CURRENT WITHIN THIS AREA
NO UNITS WILL FIRE AT ANY POINT WITHIN THIS AREA
80 mA GATE CURRENT REQUIRED TO TRIGGER ALL UNITS
(100°C — 50 mA)
(—40°C — 150 mA)
(TJ = —40 TO +100°C)
VG = 3.5 VOLTS
TYPICAL TRIGGER AREA
PEAK FORWARD GATE VOLTAGE 10 VOLTS
IGT, GATE CURRENT (AMP)
VGT, GATE VOLTAGE (VOLTS)
(TJ = 25°C — ANODE @ 7 VOLTS)


FORWARD CONDUCTING CHARACTERISTICS
TYPICAL
MAXIMUM
TJ = 100°C
TJ = 25°C
NOTE: VOLTAGE DROP MEASURED ½ INCH FROM BOTTOM OF CASE
IT, INSTANTANEOUS FORWARD CURRENT (AMP)
VT, INSTANTANEOUS FORWARD ON VOLTAGE (VOLTS)


CURRENT DERATING
0°
180°
*CONDUCTION ANGLE
*30°
*60°
*90°
*120°
*180°
DC
DC, 1φ, 3φ, 6φ, CIRCUIT-RESISTIVE OR INDUCTIVE LOAD, 50 TO 400 Hz
TC, CASE TEMPERATURE (°C)
IT(AV), AVERAGE FORWARD CURRENT (AMP)


SUGGESTED HEAT SINK SIZES
RESISTIVE OR INDUCTIVE LOAD, 50 TO 400 Hz
FREE CONVECTION COOLING
CURVES SHOWN ARE FOR 180° CONDUCTION ANGLE
FOR OTHER CONDUCTION ANGLES, MULTIPLY CURRENT VALUES BY FOLLOWING FACTORS:
120° — 0.91
90° — 0.82
60° — 0.72
30° — 0.58
DC — 1.40
6" x 6"
5" x 5"
4" x 4"
3" x 3"
USE CURVES FOR DC, 1φ, 3φ, 6φ CIRCUITS BY CHOOSING PROPER CONDUCTION ANGLE FACTOR
FINS 1/16" THICK COPPER WITH EMISSIVITY = 90% STUD MOUNTED DIRECTLY TO COPPER FIN
MINIMUM SPACING = 3/4"
IT(AV), AVERAGE FORWARD CURRENT (AMP)
TA, AMBIENT TEMPERATURE (°C)



Conforms to JEDEC OUTLINE TO-208AA (TO-48)

Dimensions in Millimeters and (Inches)