



A5N:1400.XXH

VOLTAGE RATINGS

Part Number	V_{RRM}, V_R (V) Max. rep. peak reverse voltage		V_{RSM}, V_R (V) Max. non-rep. peak reverse voltage
	$T_J = 0$ to 125°C	$T_J = -40$ to 0°C	
A5N:1400.16	1600	1600	1700
A5N:1400.18	1800	1800	1900
A5N:1400.20	2000	2000	2100
A5N:1400.22	2200	2200	2300

MAXIMUM ALLOWABLE RATINGS

PARAMETER	VALUE	UNITS	NOTES
T_J Junction Temperature	-40 to 125	$^\circ\text{C}$	-
T_{stg} Storage Temperature	-40 to 150	$^\circ\text{C}$	-
$I_{F(AV)}$ Max. Av. current @ Max. T_C	1400	A	180° half sine wave
	70	$^\circ\text{C}$	
$I_{F(RMS)}$ Nom. RMS current	3080	A	-
I_{FSM} Max. Peak non-rep. surge current	25.7	KA	50 Hz half cycle sine wave Initial $T_J = 125^\circ\text{C}$, rated V_{RRM} applied after surge.
	26.9		60 Hz half cycle sine wave
	30.5		50 Hz half cycle sine wave Initial $T_J = 125^\circ\text{C}$, no voltage applied after surge.
	32		60 Hz half cycle sine wave
I^2t Max. I^2t capability	3300	kA^2s	$t = 10\text{ms}$ Initial $T_J = 125^\circ\text{C}$, rated V_{RRM} applied after surge.
	3000		$t = 8.3\text{ms}$
	4651		$t = 10\text{ms}$ Initial $T_J = 125^\circ\text{C}$, no voltage applied after surge.
	4250		$t = 8.3\text{ms}$
$I^2t^{1/2}$ Max. $I^2t^{1/2}$ capability	46510	$\text{kA}^2\text{s}^{1/2}$	Initial $T_J = 125^\circ\text{C}$, no voltage applied after surge. I^2t for time $t_x = I^2t^{1/2} * t_x^{1/2}$. (0.1 < t_x < 10ms).
di/dt Max. Non-repetitive rate-of-rise current	1000	A/ μs	$T_J = 125^\circ\text{C}$, $V_D = V_{DRM}$, $I_{TM} = 1600\text{A}$. Gate pulse: 20V, 20 Ω , 10 μs , 0.5 μs rise time, Max. repetitive di/dt is approximately 40% of non-repetitive value.
P_{GM} Max. Peak gate power	16	W	$t_p < 5\text{ms}$
$P_{G(AV)}$ Max. Av. gate power	3.0	W	-
$+I_{GM}$ Max. Peak gate current	3	A	$t_p < 5\text{ms}$
$-V_{GM}$ Max. Peak negative gate voltage	5	V	-
F Mounting Force	2500	N	Non lubricated threads



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CHARACTERISTICS

PARAMETER	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
V_{TM} peak on-state voltage	---	1.38	1.73	V	Initial $T_J = 25^\circ\text{C}$, 50-60Hz half sine, $I_{beak} = 4398\text{A}$.
$V_{T(TO)1}$ Low-level threshold	---	---	0.91	V	$T_J = 125^\circ\text{C}$ Av. power = $V_{T(TO)} * I_{T(AV)} + r_T * [I_{T(RMS)}]^2$
$V_{T(TO)2}$ High-level threshold	---	---	1.01		
r_{T1} Low-level resistance	---	---	0.21	m Ω	Use low values for $I_{TM} < \pi$ rated $I_{T(AV)}$
r_{T2} High-level resistance	---	---	0.19		
I_L Latching current	---	1000	---	mA	$T_C = 25^\circ\text{C}$, 12V anode. Gate pulse: 10V, 20 Ω , 100 μs .
I_H Holding current	---	100	600	mA	$T_C = 25^\circ\text{C}$, 12V anode. Initial $I_T = 10\text{A}$.
t_d Delay time	---	0.5	1.9	μs	$T_C = 25^\circ\text{C}$, $V_D = \text{rated } V_{DRM}$, 50A resistive load. Gate pulse: 10V, 20 Ω , 10 μs , 1 μs rise time.
t_q Turn-off time	---	---	200	μs	$T_J = 125^\circ\text{C}$, $I_{TM} = 500\text{A}$, $di/dt = 25\text{A}/\mu\text{s}$, $V_R = 50\text{V}$. $dv/dt = 200\text{V}/\mu\text{s}$ lin. To 80% rated V_{DRM} . Gate: 0V, 100 Ω .
dv/dt Critical rate-of-rise of off-state voltage	300	500	---	V/ μs	$T_J = 125^\circ\text{C}$. Exp. to 100% or lin. Higher dv/dt values available.
	600	---	---		$T_J = 125^\circ\text{C}$. Exp. To 67% V_{DRM} , gate open.
I_{RM} , I_{DM} Peak reverse and off-state current	---	40	100	mA	$T_J = 125^\circ\text{C}$, Rated V_{RRM} and V_{DRM} , gate open.
I_{GT} DC gate current to trigger	---	200	---	mA	$T_C = -40^\circ\text{C}$ $T_C = 25^\circ\text{C}$ +12V anode-to-cathode. For recommended gate drive see "Gate Characteristics" figure.
	75	100	200		
V_{GT} DC gate voltage to trigger	---	1.4	---	V	$T_C = -40^\circ\text{C}$ $T_C = 25^\circ\text{C}$
	---	1.1	3		
V_{GD} DC gate voltage not to trigger	---	---	0.25	V	$T_C = 25^\circ\text{C}$, Max. Value which will not trigger with rated V_{DRM} anode-to-cathode.
R_{thJC} Thermal resistance, junction-to-case	---	---	0.023	$^\circ\text{C}/\text{W}$	DC operation.
	---	---	0.025	$^\circ\text{C}/\text{W}$	180 $^\circ$ sine wave, double side coolde.
	---	---	0.025	$^\circ\text{C}/\text{W}$	120 $^\circ$ rectangular wave, double side cooled.
R_{thCS} Thermal resistance, case-to-sink	---	---	0.01	$^\circ\text{C}/\text{W}$	Mtg. Surface smooth, flat and greased.
wt Weight	---	425 (15)	---	g(oz.)	---
Case Style	TO-200AD			JEDEC	---



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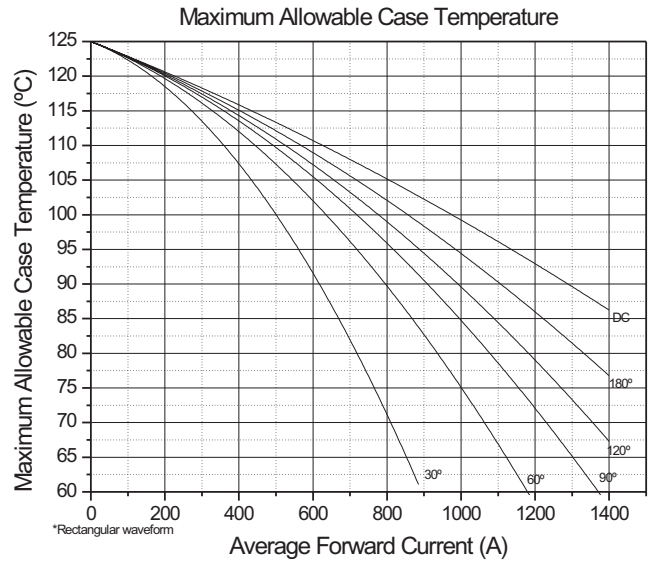
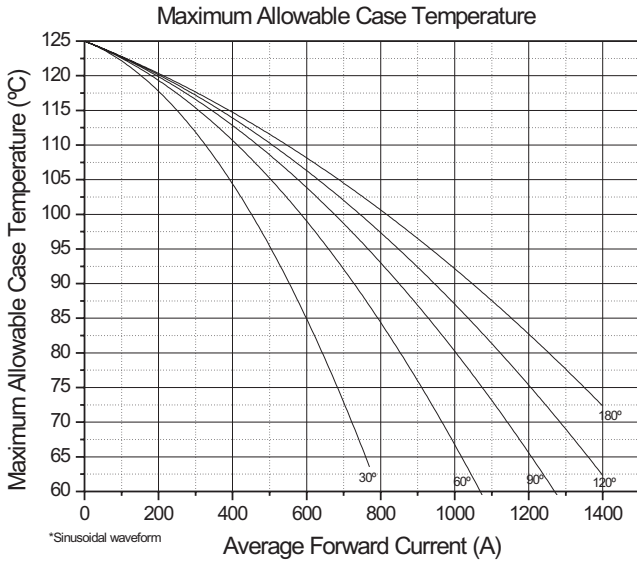


Fig. 1 - Current Ratings Characteristics

Fig. 2 - Current Ratings Characteristics

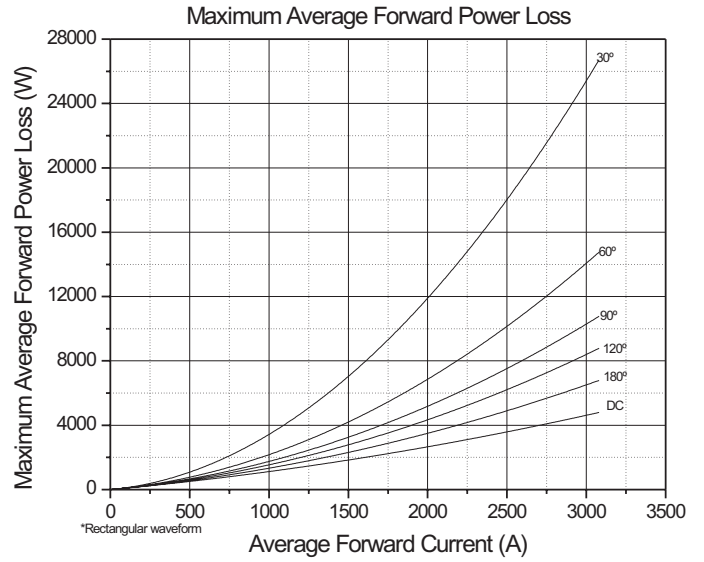
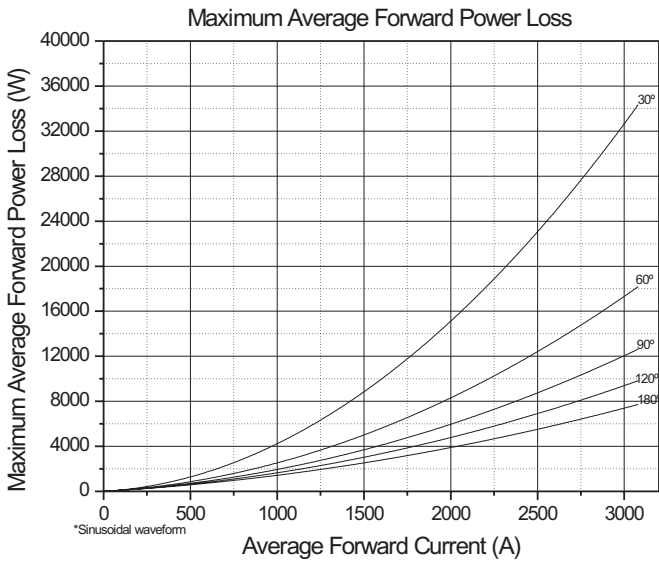


Fig. 3 - On-state Power Loss Characteristics

Fig. 4 - On-state Power Loss Characteristics



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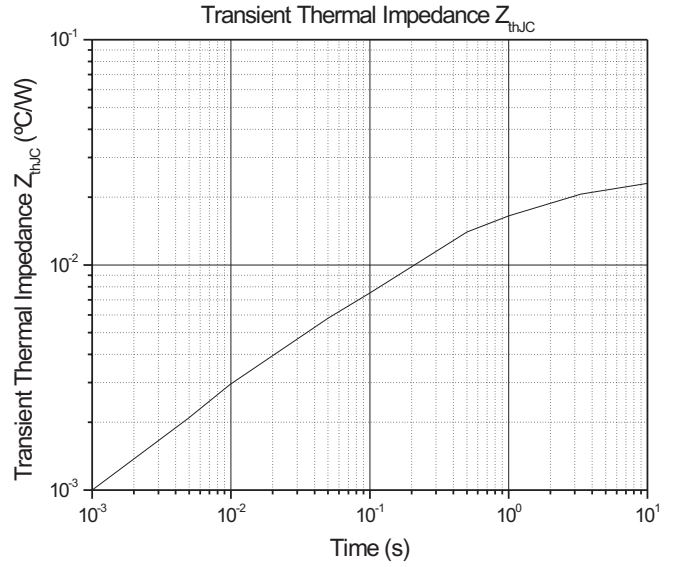
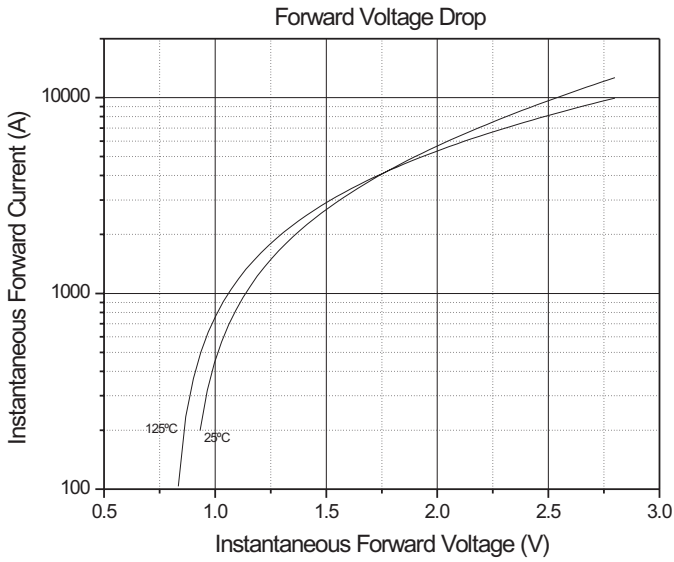


Fig. 5 - Forward Voltage Drop Characteristics

Fig. 6 - Transient Thermal Impedance Z_{thJC} Characteristics

TO-200AD

