



## A3L:210TT.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 $125^\circ\text{C}$	$T_J = -40$ to $0^\circ\text{C}$	$T_J = 25$ to $125^\circ\text{C}$
	A3L:210TT.02H	200	200
A3L:210TT.04H	400	400	500
A3L:210TT.06H	600	600	700
A3L:210TT.08H	800	800	900
A3L:210TT.10H	1000	1000	1100
A3L:210TT.12H	1200	1200	1300
A3L:210TT.14H	1400	1330	1500
A3L:210TT.16H	1600	1520	1700

### 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. $T_C$	210	A	180° half sine wave
	85	$^\circ\text{C}$	
$I_{F(RMS)}$ Nom. RMS current	466	A	-
$I_{FSM}$ Max. Peak non-rep. surge current	6.32	kA	50 Hz half cycle sine wave Initial $T_J = 125^\circ\text{C}$ , rated $V_{RRM}$ applied after surge.
	6.89		60 Hz half cycle sine wave
	7.2		50 Hz half cycle sine wave Initial $T_J = 125^\circ\text{C}$ , no voltage applied after surge.
	7.85		60 Hz half cycle sine wave
$I^2t$ Max. $I^2t$ capability	206	$\text{kA}^2\text{s}$	$t = 10\text{ms}$ Initial $T_J = 125^\circ\text{C}$ , rated $V_{RRM}$ applied after surge.
	225		$t = 8.3\text{ms}$
	235		$t = 10\text{ms}$ Initial $T_J = 125^\circ\text{C}$ , no voltage applied after surge.
	256		$t = 8.3\text{ms}$
$I^2t^{1/2}$ Max. $I^2t^{1/2}$ capability	2810	$\text{kA}^2\text{s}^{1/2}$	Initial $T_J = 125^\circ\text{C}$ , no voltage applied after surge. $I^2t$ for time $t_x = I^2t^{1/2} * t_x^{1/2}$ . ( $0.1 < t_x < 10\text{ms}$ ).
di/dt Max. Non-repetitive rate-of- rise current	500	A/ $\mu\text{s}$	$T_J = 125^\circ\text{C}$ , $V_D = V_{DRM}$ , $I_{TM} = 1600\text{A}$ . Gate pulse: 20V, 20 $\Omega$ , 10 $\mu\text{s}$ , 0.5 $\mu\text{s}$ rise time, Max. repetitive di/dt is approximately 40% of non-repetitive value.
$P_{GM}$ Max. Peak gate power	10	W	$t_p < 5\text{ms}$
$P_{G(AV)}$ Max. Av. gate power	3	W	-
$+I_{GM}$ Max. Peak gate current	150	mA	$t_p < 5\text{ms}$
$-V_{GM}$ Max. Peak negative gate voltage	2	V	-
F Mounting Force	3(5)	N.m	Upper connectors(Heatsink)



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## CHARACTERISTICS

PARAMETER	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
$V_{TM}$ peak on-state voltage	---	---	1.47	V	Initial $T_J = 25^\circ\text{C}$ , 50-60Hz half sine, $I_{peak} = 659\text{A}$ .
$V_{T(TO)}$ Threshold voltage	---	---	0.91	V	$T_J = 125^\circ\text{C}$ Av. power = $V_{T(TO)} * I_{T(AV)} + r_T * [I_{T(RMS)}]^2$ , 180 Half Sine.
$r_T$ Slope resistance	---	---	0.82	m $\Omega$	Use low values for $I_{TM} < \pi$ rated $I_{T(AV)}$
$I_L$ Latching current	---	---	200	mA	$T_C = 125^\circ\text{C}$ , 12V anode. Gate pulse: 10V, 20 $\Omega$ , 100 $\mu\text{s}$ .
$I_H$ Holding current	---	---	500	mA	$T_C = 25^\circ\text{C}$ , 12V anode. Initial $I_T = 15\text{A}$ .
$t_d$ Delay time	---	0.7	1.5	$\mu\text{s}$	$T_C = 25^\circ\text{C}$ , $V_D = V_{DRM}$ , 50A resistive load. Gate pulse: 10V, 20 $\Omega$ , 10 $\mu\text{s}$ , 1 $\mu\text{s}$ rise time.
$t_q$ Turn-off time	---	125	200	$\mu\text{s}$	$T_J = 125^\circ\text{C}$ , $I_{TM} = 500\text{A}$ , $di/dt = 25\text{A}/\mu\text{s}$ , $V_R = 50\text{V}$ . $dv/dt = 20\text{V}/\mu\text{s}$ lin. to rated $V_{DRM}$ . Gate: 0V, 100 $\Omega$ .
$dv/dt$ Critical rate-of-rise of off-state voltage	80	140	---	V/ $\mu\text{s}$	$T_J = 125^\circ\text{C}$ . Exp. to 100% or lin. Higher $dv/dt$ values To 80% $V_{DRM}$ , gate open. available. $T_J = 125^\circ\text{C}$ , Exp. To 67% $V_{DRM}$ , gate open.
$I_{RM}$ , $I_{DM}$ Peak reverse and off-state current	---	10	50	mA	$T_J = 125^\circ\text{C}$ , Rated $V_{RRM}$ and $V_{DRM}$ , gate open.
$I_{GT}$ DC gate current to trigger	---	---	300	mA	$T_C = -40^\circ\text{C}$ $T_C = 25^\circ\text{C}$ $T_C = -40^\circ\text{C}$ $T_C = 25^\circ\text{C}$ +12V anode-to-cathode. For recommended gate drive see "Gate Characteristics" figure.
$V_{GT}$ DC gate voltage to trigger	4	---	---	V	
$V_{GD}$ DC gate voltage not to trigger	---	---	0.3	V	$T_C = 25^\circ\text{C}$ , Max. Value which will not trigger with rated $V_{DRM}$ anode.
$R_{thJC}$ Thermal resistance, junction-to-case	---	---	0.076	$^\circ\text{C}/\text{W}$	DC operation, single side cooled.
	---	---	0.08	$^\circ\text{C}/\text{W}$	180 sine wave, single side cooled.
	---	---	0.084	$^\circ\text{C}/\text{W}$	120 rectangular wave, single side cooled.
$R_{thCS}$ Thermal resistance, case-to-sink	---	---	0.02	$^\circ\text{C}/\text{W}$	Mtg. Surface smooth, flat and greased. Single side cooled.
wt Weight	---	500(18)	---	g(oz.)	---

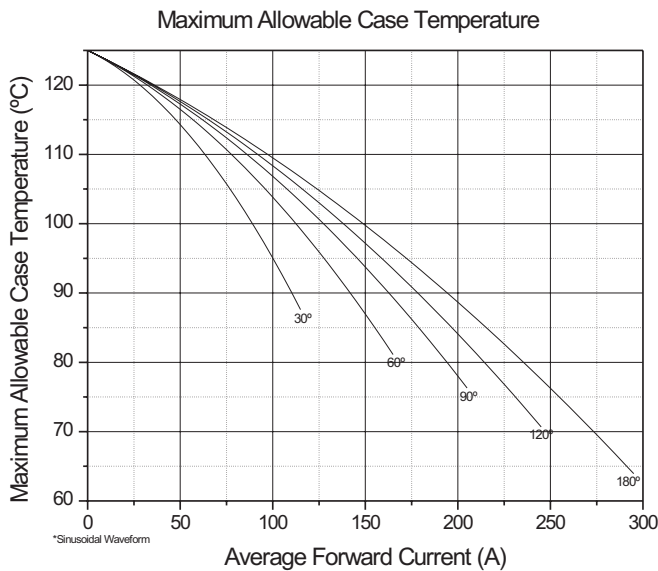


Fig. 1 - Current Ratings Characteristics

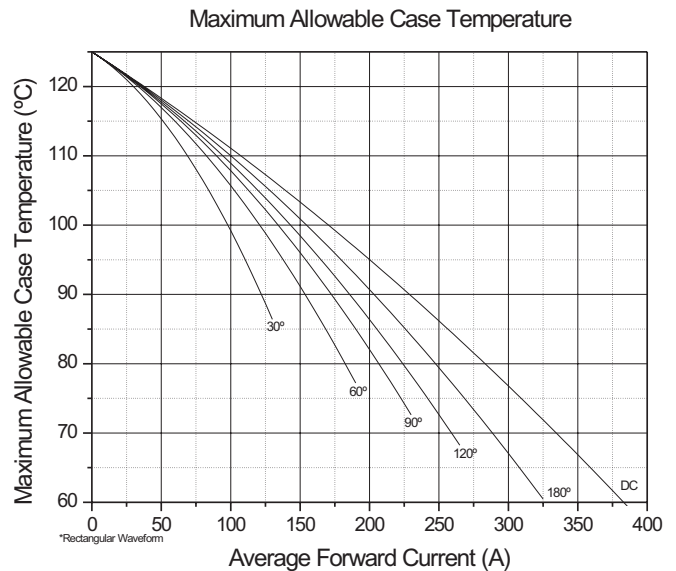


Fig. 2 - Current Ratings Characteristics



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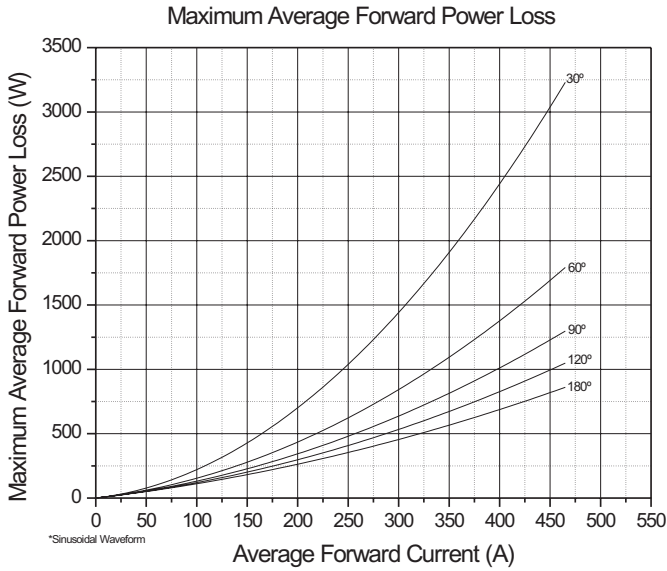


Fig.3 -Forward Power Loss Characteristics

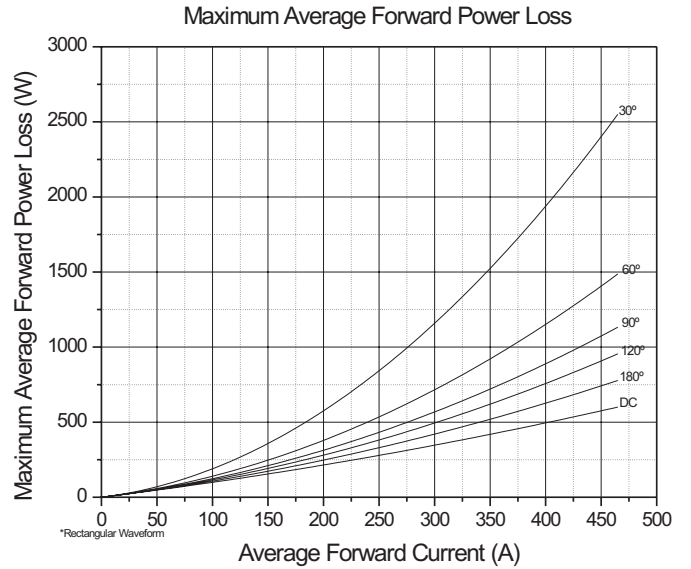


Fig. 4 - Forward Power Loss Characteristics

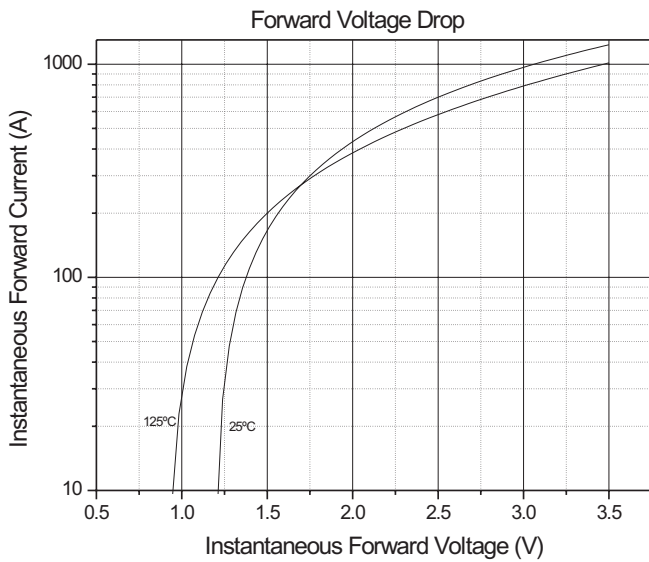


Fig. 5 - Forward Voltage Drop Characteristics

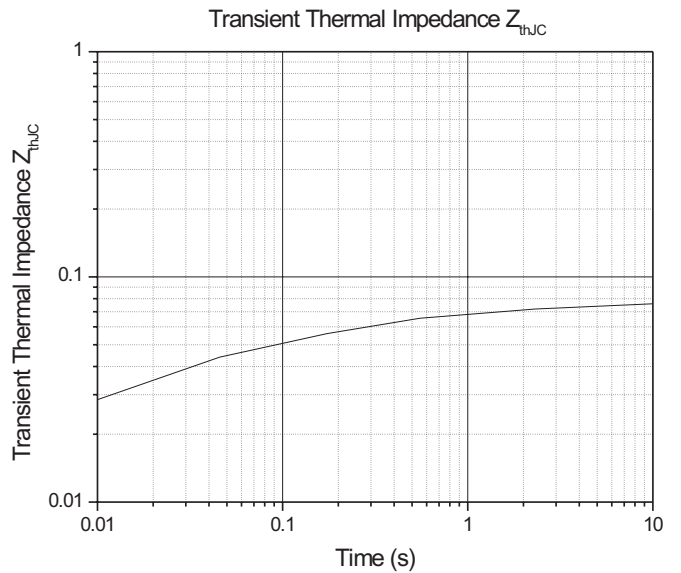
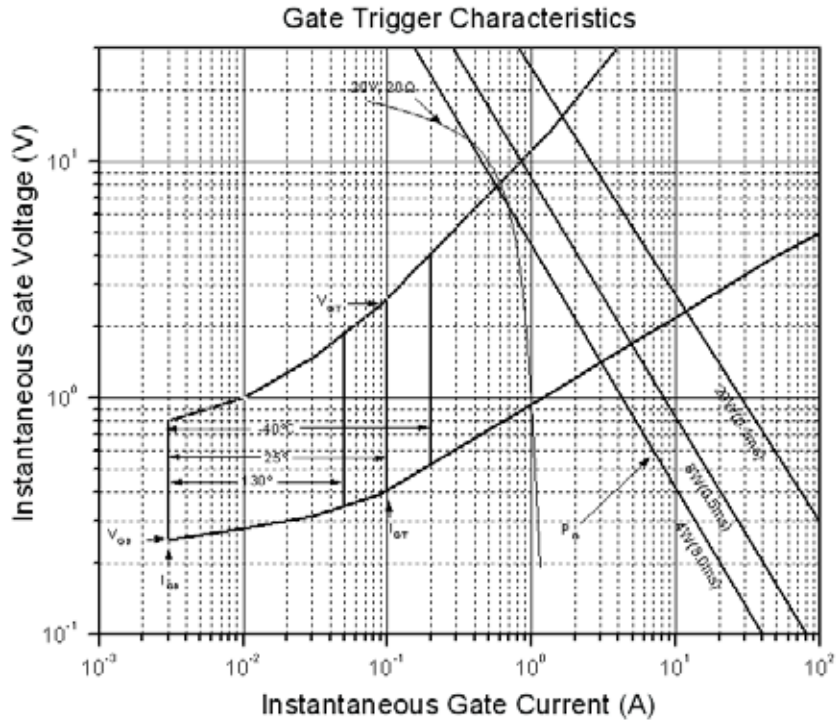


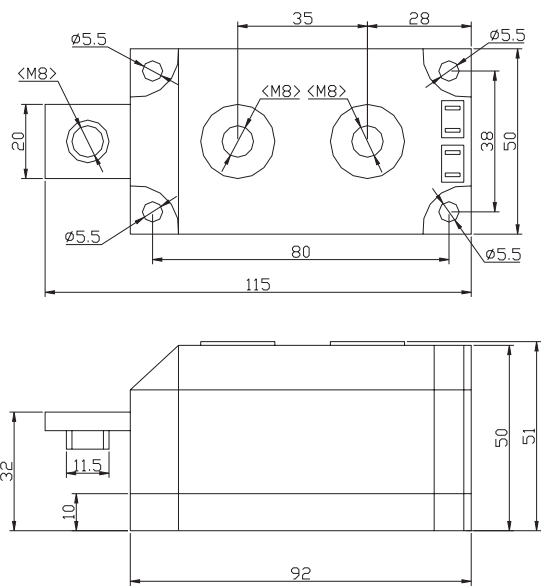
Fig. 6 - Transient Thermal Impedance



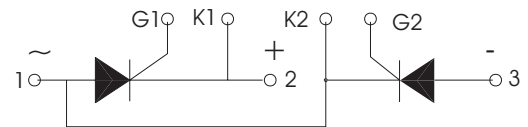
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**Fig. 7 - Gate Trigger Characteristics**



**Fig. 8 - Outline Characteristics**



**Fig. 9 - Circuit Layout**