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With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



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PHASE CONTROL THYRISTORS

Hockey Puk Version

Features

- Double side cooling
- High surge capability
- High mean current
- Fatigue free

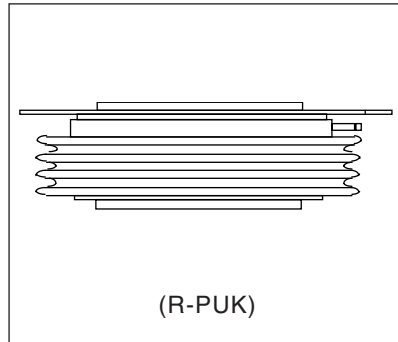
Typical Applications

- DC motor controls
- Controlled DC power supplies
- AC controllers

Major Ratings and Characteristics

Parameters	ST2100C..R	Units
$I_{T(AV)}$	1770	A
	@ T_C	80 °C
$I_{T(AV)}$	2090	A
	@ T_{hs}	55 °C
$I_{T(RMS)}$	3850	A
	@ T_{hs}	25 °C
I_{TSM}	@ 50Hz	36250 A
	@ 60Hz	38000 A
I^2t	@ 50Hz	6570 KA ² s
	@ 60Hz	5990 KA ² s
V_{DRM}/V_{RRM}	3000 to 4200	V
t_q	typical	500 μ s
T_J	max.	125 °C

2090A



ST2100C..R Series

Bulletin I25198 rev. B 02/00

International
 Rectifier

ELECTRICAL SPECIFICATIONS

Voltage Ratings

Type number	Voltage Code	V_{DRM}/V_{RRM} , max. repetitive peak and off-state voltage V	V_{RSM} , maximum non-repetitive peak voltage V	I_{DRM}/I_{RRM} max. @ $T_C = 125^\circ\text{C}$ mA
ST2100C..R	30	3000	3100	250
	32	3200	3300	
	34	3400	3500	
	36	3600	3700	
	38	3800	3900	
	40	4000	4100	
	42	4200	4300	

On-state Conduction

Parameter	ST2100C..R	Units	Conditions
$I_{T(AV)}$ Max. average on-state current @ Case temperature	1770 (1150)	A	180° conduction, half sine wave double side (single side [anode side]) cooled
	80	°C	
$I_{T(AV)}$ Max. average on-state current @ Heatsink temperature	2090 (940)	A	
	55 (85)	°C	
$I_{T(RMS)}$ Max. RMS on-state current	3850	A	DC @ 25°C heatsink temperature double side cooled
I_{TSM} Max. peak, one-cycle non-repetitive surge current	36250	A	t = 10ms No voltage
	38000		t = 8.3ms reapplied
	29000		t = 10ms 50% V_{RRM}
	30350		t = 8.3ms reapplied
I^2t Maximum I^2t for fusing	6570	KA ² S	t = 10ms No voltage
	5990		t = 8.3ms reapplied
	4205		t = 10ms 50% V_{RRM}
	3820		t = 8.3ms reapplied
$V_{T(TO)}$ Max. value of threshold voltage	1.03	V	$T_J = T_J$ max.
r_t Max. value of on-state slope resistance	0.32	mΩ	$T_J = T_J$ max.
V_{TM} Max. on-state voltage	1.875	V	$I_{pk} = 2900\text{A}$, $T_C = 25^\circ\text{C}$
I_L Typical latching current	300	mA	$T_J = 25^\circ\text{C}$, $V_D = 5\text{V}$

Switching

Parameter	ST2100C..R	Units	Conditions
di/dt Max. repetitive 50Hz (no repetitive) rate of rise of turned-on current	150 (300)	A/μs	From 67% V_{DRM} to 1000A gate drive 20V, 10Ω, $t_r = 0.5\mu\text{s}$ $T_J = T_J$ max.
t_d Maximum delay time	2.5	μs	Gate drive 30V, 15Ω, $V_d = 67\% V_{DRM}$, $T_J = 25^\circ\text{C}$ Rise time 0.5μs
t_q Typical turn-off time	500		$I_T = 1000\text{A}$, $t_p = 1\text{ms}$, $T_J = T_J$ max, $V_{RM} = 50\text{V}$, $dI_{RR}/dt = 2\text{A}/\mu\text{s}$, $V_{DR} = 67\% V_{DRM}$, $dV_{DR}/dt = 8\text{V}/\mu\text{s}$ linear

Blocking

Parameter	ST2100C..R	Units	Conditions
dv/dt Maximum linear rate of rise of off-state voltage	500	V/ μ s	$T_J = T_J$ max. to 67% rated V_{DRM}
I_{RRM} I_{DRM} Max. peak reverse and off-state leakage current	250	mA	$T_J = 125^\circ\text{C}$ rated V_{DRM}/V_{RRM} applied

Triggering

Parameter	ST2100C..R	Units	Conditions
P_{GM} Maximum peak gate power	150	W	$t_p = 100\mu\text{s}$
$P_{G(AV)}$ Maximum average gate power	10		
I_{GM} Max. peak positive gate current	30	A	Anode positive with respect to cathode
V_{GM} Max. peak positive gate voltage	30	V	Anode positive with respect to cathode
$-V_{GM}$ Max. peak negative gate voltage	0.25	V	Anode positive with respect to cathode
I_{GT} Maximum DC gate current required to trigger	400	mA	$T_C = 25^\circ\text{C}$, $V_{DRM} = 5\text{V}$
V_{GT} Maximum gate voltage required to trigger	4	V	$T_C = 25^\circ\text{C}$, $V_{DRM} = 5\text{V}$
V_{GD} DC gate voltage not to trigger	0.25	V	$T_C = 125^\circ\text{C}$ Max. gate current/voltage not to trigger is the max. value which will not trigger any unit with rated V_{DRM} anode-to-cathode applied

Thermal and Mechanical Specification

Parameter	ST2100C..R	Units	Conditions	
T_J max. Max. operating temperature	125	$^\circ\text{C}$	On-state (conducting)	
T_{stg} Max. storage temperature range	-55 to 125			
R_{thJ-C} Thermal resistance, junction to case	0.019 0.0095	K/W	DC operation single side cooled DC operation double side cooled	
$R_{th(C-h)}$ Thermal resistance, case to heatsink	0.004 0.002	K/W	Single side cooled Double side cooled	Clamping force 43KN with mounting compound
F Mounting force $\pm 10\%$	43000 (4400)	N (Kg)		
wt Approximate weight	1600	g		
Case style	(R-PUK)		See Outline Table	

ΔR_{thJ-C} Conduction

(The following table shows the increment of thermal resistance R_{thJ-C} when devices operate at different conduction angles than DC)

Conduction angle	Single side	Double side	Units	Conditions
180 $^\circ$	0.0010	0.0010	K/W	$T_J = T_J$ max.
120 $^\circ$	0.0017	0.0017		
60 $^\circ$	0.0044	0.0044		

ST2100C..R Series

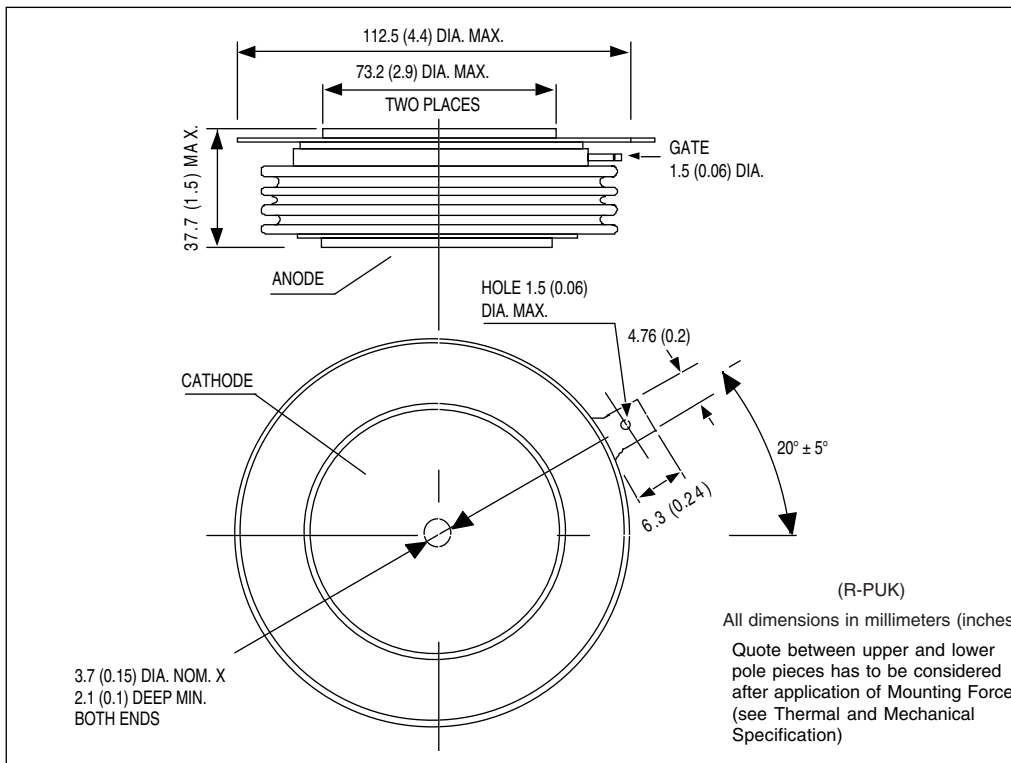
Bulletin I25198 rev. B 02/00

International
IR Rectifier

Ordering Information Table

Device Code							
ST	210	0	C	42	R	1	
①	②	③	④	⑤	⑥	⑦	⑧
1	- Thyristor						
2	- Essential part number						
3	- 0 = Converter grade						
4	- C = Ceramic Puk						
5	- Voltage code: Code x 100 = V_{RRM} (See Voltage Rating Table)						
6	- R = Puk Case						
7	- 0 = Eyelet terminals (Gate and Auxiliary Cathode Unsoldered Leads)						
	- 1 = Fast-on terminals (Gate and Auxiliary Cathode Unsoldered Leads)						
	- 2 = Eyelet terminals (Gate and Auxiliary Cathode Soldered Leads)						
	- 3 = Fast-on terminals (Gate and Auxiliary Cathode Soldered Leads)						
8	- Critical dv/dt: None = 500V/ μ sec (Standard selection)						
	- L = 1000V/ μ sec (Special selection)						

Outline Table



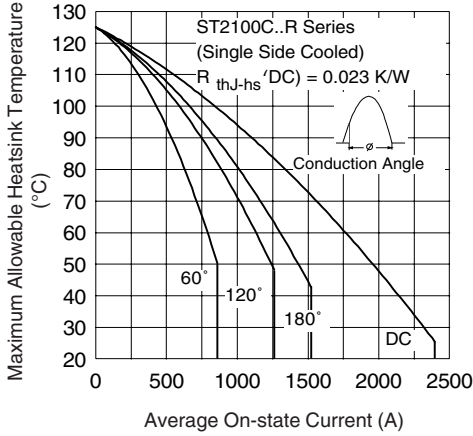


Fig. 1 - Current Ratings Characteristics

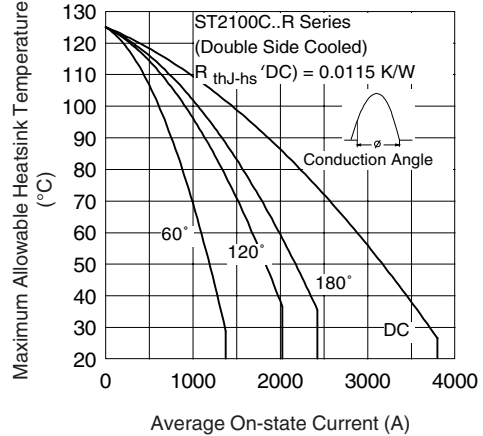


Fig. 2 - Current Ratings Characteristics

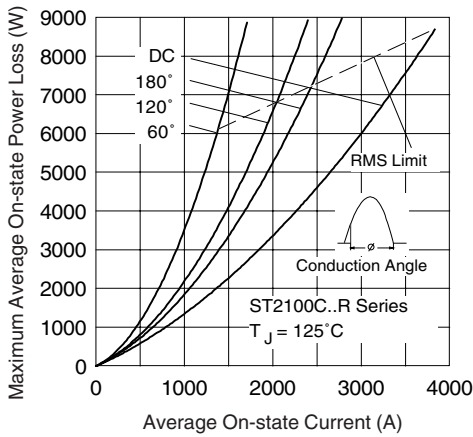


Fig. 3 - On-state Power Loss Characteristics

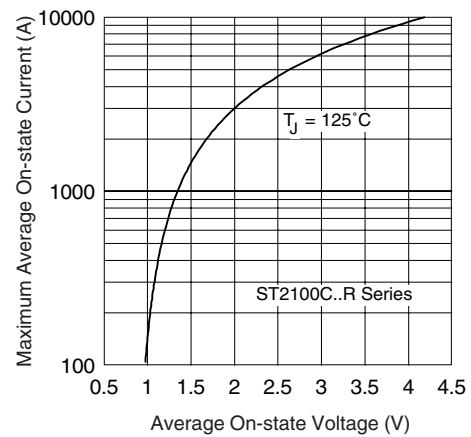


Fig. 4 - On-state Voltage Drop Characteristics

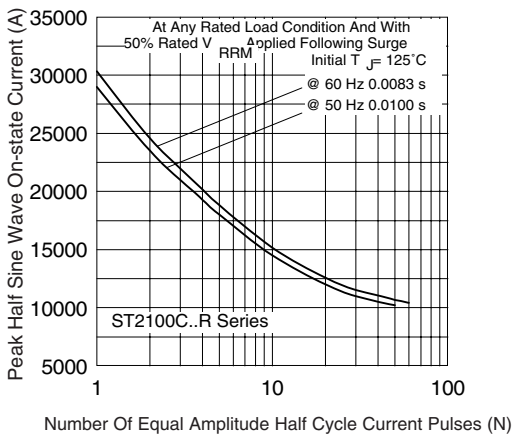


Fig. 5 - Maximum Non-Repetitive Surge Current
Single and Double Side Cooled

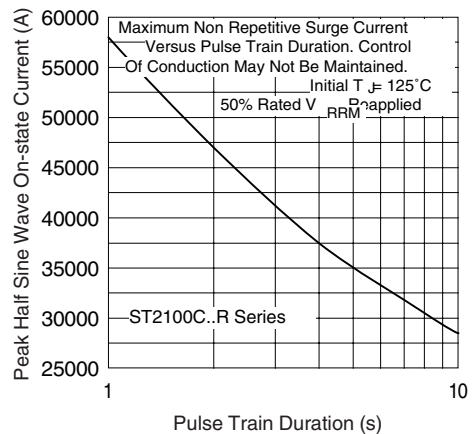


Fig. 6 - Maximum Non-Repetitive Surge Current
Single and Double Side Cooled

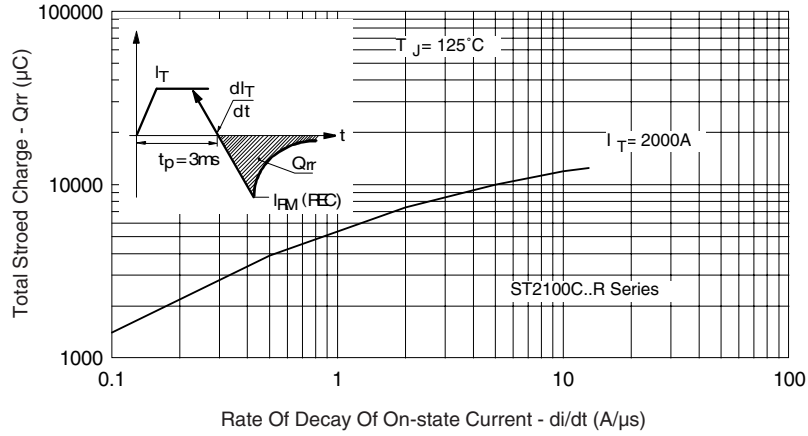


Fig. 7 - Stored Charged

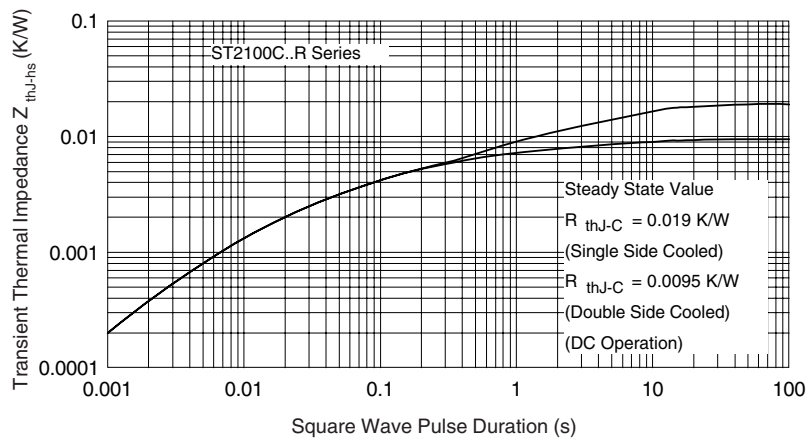


Fig. 10 - Thermal Impedance Z_{thJ-hs} Characteristics

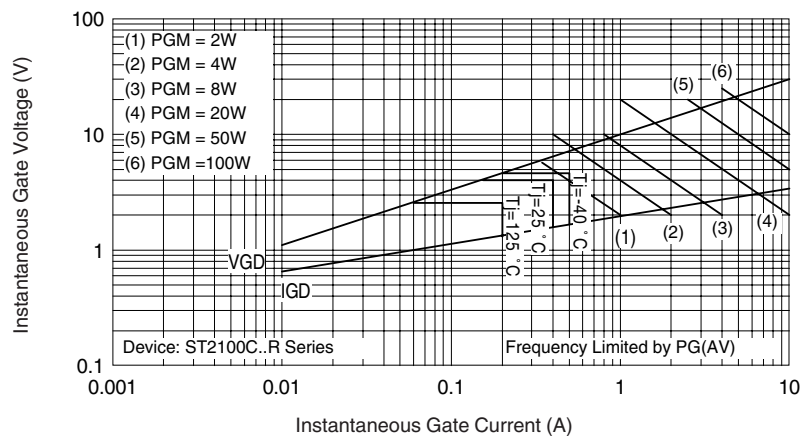


Fig. 11 - Gate Characteristics