THE DATASHEET OF

ST2600C26R0

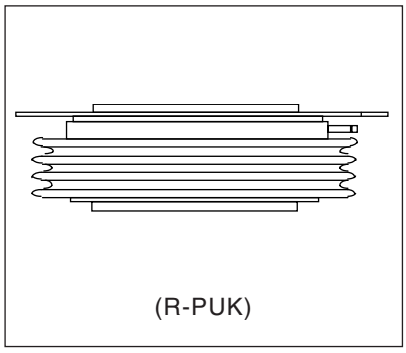
Bulletin I25199 rev. B 02/00

International
IOR Rectifier

ST2600C..R SERIES

PHASE CONTROL THYRISTORS **Hockey Puk Version**

2630A



(R-PUK)

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		ST2600C..R	Units
$I_{T(AV)}$		2220	A
	@ T_C	80	°C
$I_{T(AV)}$		2630	A
	@ T_{hs}	55	°C
$I_{T(RMS)}$		4800	A
	@ T_{hs}	25	°C
I_{TSM}	@ 50Hz	46000	A
	@ 60Hz	48200	A
I^2t	@ 50Hz	10580	KA^2s
	@ 60Hz	9640	KA^2s
V_{DRM}/V_{RRM}		2000 to 3000	V
t_q	typical	400	µs
T_J	max.	125	°C

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°C mA
ST2600C..R	20	2000	2100	250
	22	2200	2300	
	24	2400	2500	
	26	2600	2700	
	28	2800	2900	
	30	3000	3100	

On-state Conduction

	Parameter	ST2600C..R	Units	Conditions		
$I_{T(AV)}$	Max. average on-state current	2220 (1440)	A	180° conduction, half sine wave double side (single side [anode side]) cooled		
	@ Case temperature	80	°C			
$I_{T(AV)}$	Max. average on-state current	2630 (1160)	A			
	@ Heatsink temperature	55 (85)	°C			
$I_{T(RMS)}$	Max. RMS on-state current	4800	A	DC @ 25°C heatsink temperature double side cooled		
I_{TSM}	Max. peak, one-cycle non-repetitive surge current	46000	A	t = 10ms	No voltage reapplied	Sinusoidal half wave, Initial T_C = 125°C
		48200		t = 8.3ms		
		36800		t = 10ms	50% V_{RRM} reapplied	
		38500		t = 8.3ms		
I^2t	Maximum I^2t for fusing	10580	KA^2s	t = 10ms	No voltage reapplied	
		9640		t = 8.3ms		
		6770		t = 10ms	50% V_{RRM} reapplied	
		6150		t = 8.3ms		
$V_{T(TO)}$	Max. value of threshold voltage	0.89	V	$T_J = T_J$ max.		
r_t	Max. value of on-state slope resistance	0.19	mΩ	$T_J = T_J$ max.		
V_{TM}	Max. on-state voltage	1.45	V	I_{pk} = 2900A, T_C = 25°C		
I_L	Max. (typical) latching current	300 (100)	mA	T_J = 25°C, V_D = 5V		

Switching

	Parameter	ST2600C..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} gate drive 20V, 20Ω, t_r = 1µs $T_J = T_J$ max.
t_d	Maximum delay time	2.0	µs	Gate drive 30V, 15Ω, V_d = 67% V_{DRM}, T_J = 25°C Rise time 0.5µs
t_q	Typical turn-off time	400		I_T = 800A, t_p = 1ms, $T_J = T_J$ max, V_{RM} = 50V, dI_{RR}/dt = 20A/µs, V_{DR} = 67% V_{DRM}, dV/dt = 20V/µs linear

Blocking

	Parameter	ST2600C..R	Units	Conditions
dv/dt	Maximum linear rate of rise of off-state voltage	500	V/µs	$T_J = T_J$ max. to 67% rated V_{DRM}
I_{RRM} I_{DRM}	Max. peak reverse and off-state leakage current	250	mA	T_J = 125°C rated V_{DRM}/V_{RRM} applied

Triggering

	Parameter	ST2600C..R	Units	Conditions
P_{GM}	Maximum peak gate power	150	W	t_p = 100µs
$P_{G(AV)}$	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 negative with respect to cathode
I_{GT}	Maximum DC gate current required to trigger	400	mA	T_C = 25°C, V_{DRM} = 5V
V_{GT}	Maximum gate voltage required to trigger	4	V	T_C = 25°C, V_{DRM} = 5V
V_{GD}	DC gate voltage not to trigger	0.25	V	T_C = 125°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	ST2600C..R	Units	Conditions	
T_J max.	Max. operating temperature	125	°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 ± 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 resistence R_{thJ-C} when devices operate at different conduction angles than DC)

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

Ordering Information Table

Device Code

ST	260	0	C	30	R	1	
1	2	3	4	5	6	7	8

1 - Thyristor

2 - Essential part number

3 - 0 = Converter grade

4 - C = Ceramic Puk

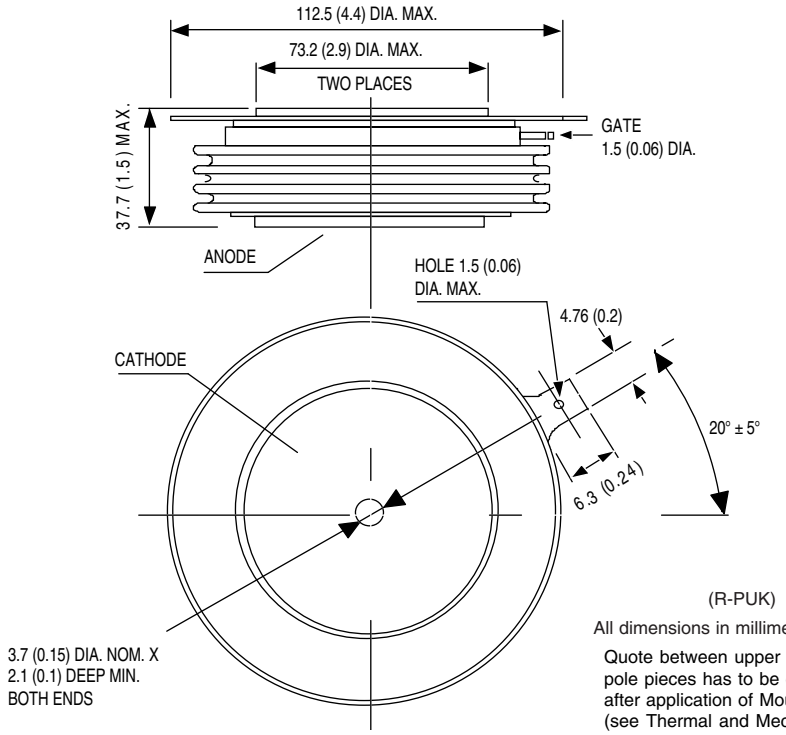
5 - Voltage code: Code x 100 = V_{RRM} (See Voltage Rating Table)

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/µsec (Standard selection)
L = 1000V/µsec (Special selection)

Outline Table



(R-PUK)

All dimensions in millimeters (inches)

Quote between upper and lower pole pieces has to be considered after application of Mounting Force (see Thermal and Mechanical Specification)

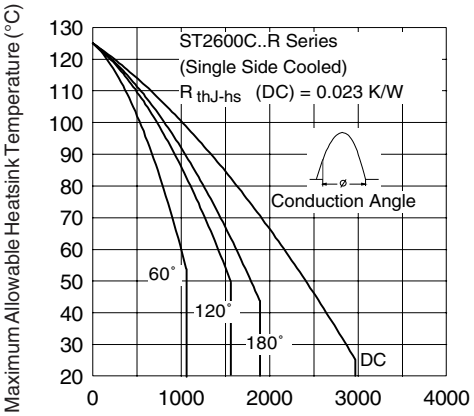


Fig. 1 - Current Ratings Characteristics

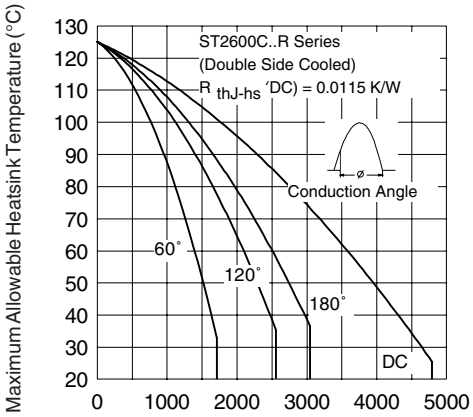


Fig. 2 - Current Ratings Characteristics

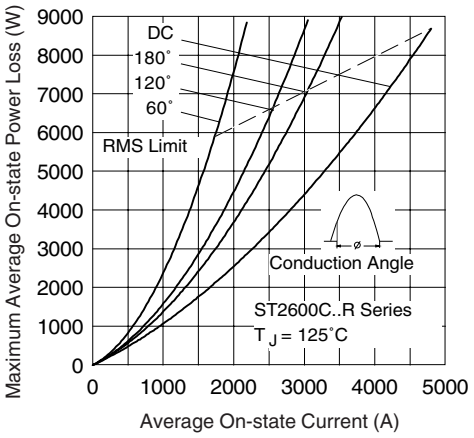


Fig. 3- On-state Power Loss Characteristics

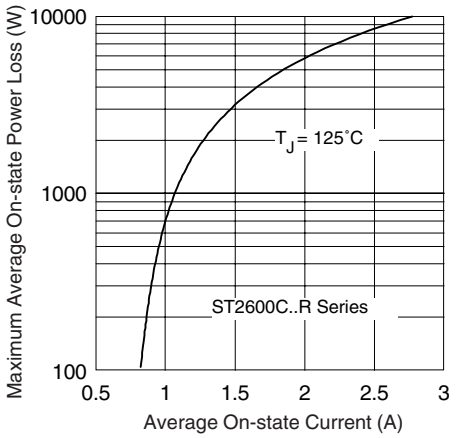


Fig. 4- On-state Power Loss Characteristics

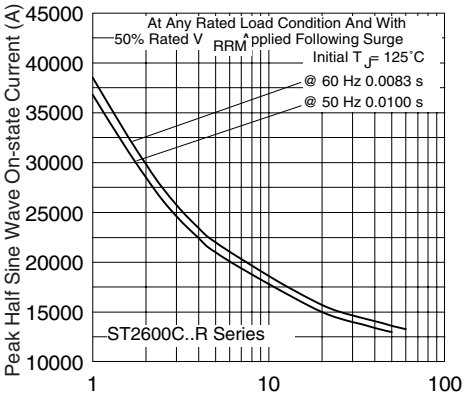


Fig.5 - Maximum Non-Repetitive Surge Current
Single and Double Side Cooled

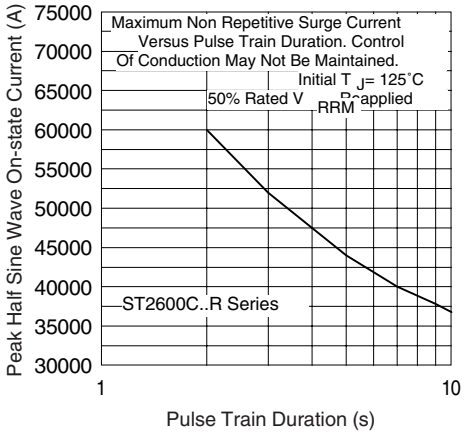


Fig. 6 - Maximum Non-Repetitive Surge Current
Single and Double Side Cooled

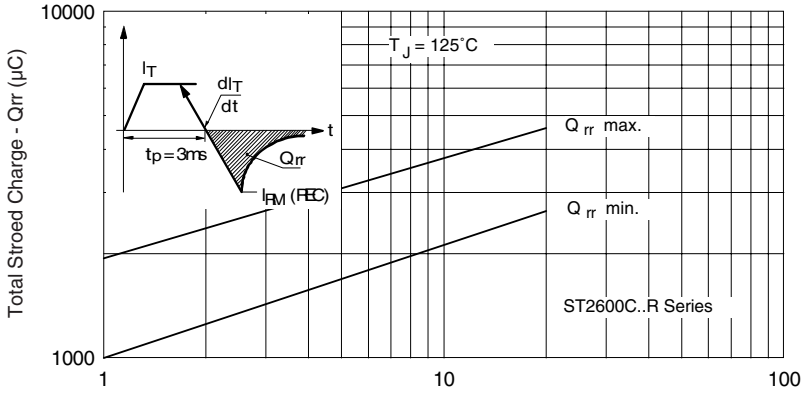


Fig. 7 - Stored Charged

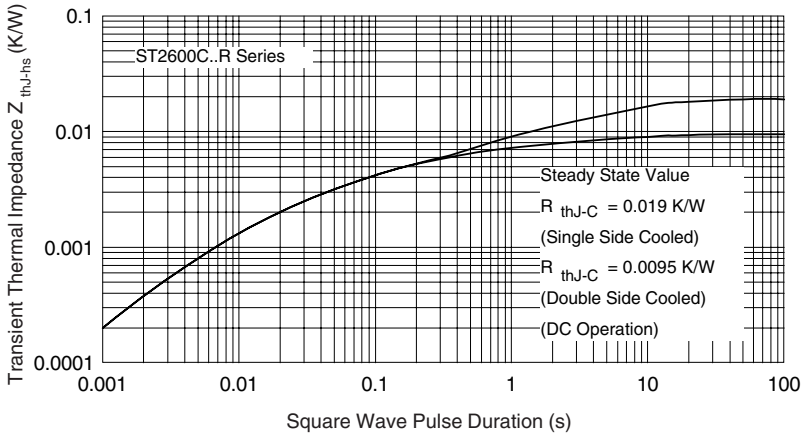


Fig. 10 - Thermal Impedance Z_{thJ-hs} Characteristics

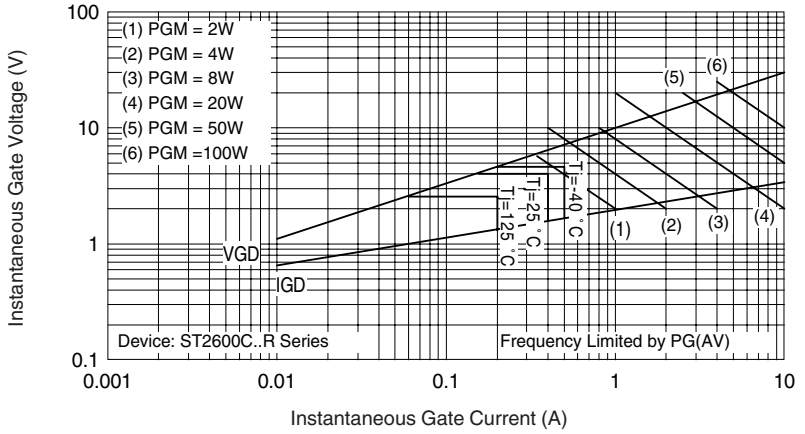


Fig. 11 - Gate Characteristics

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