

Hockey Puk Version A-PUK Series 330PA..F

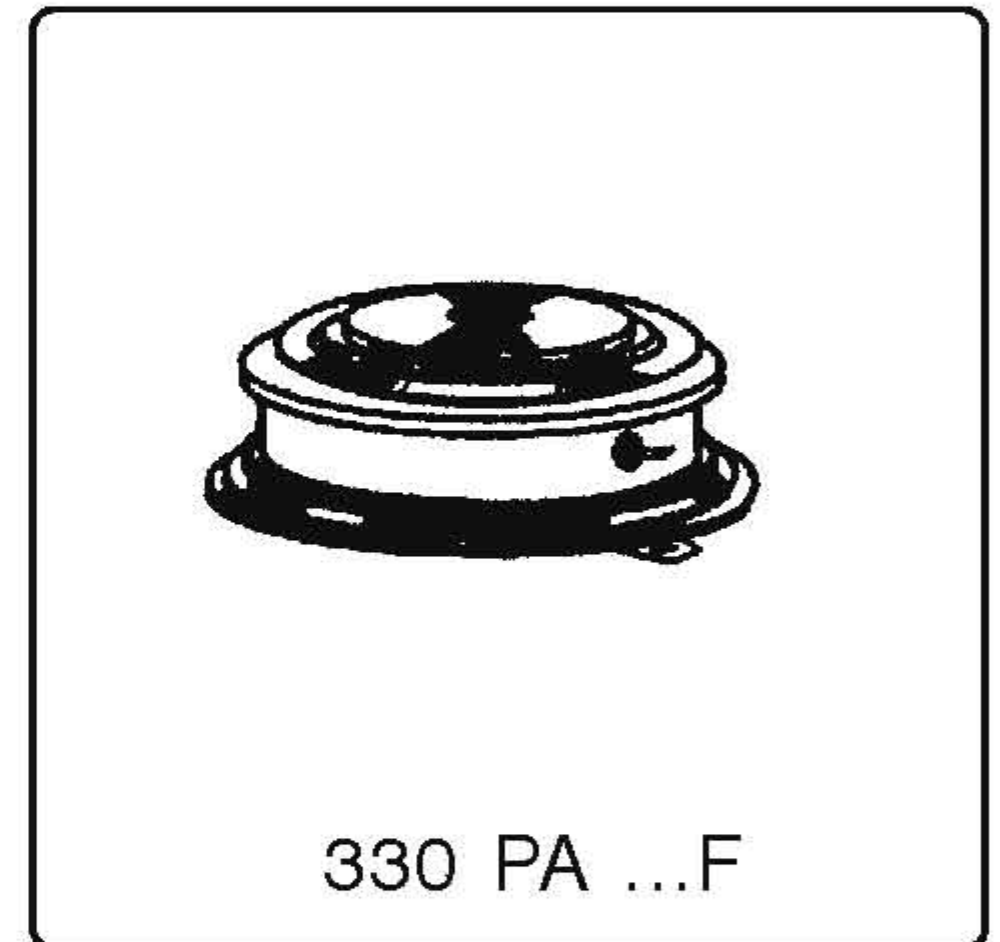
Types : 330PA 20F to 330PA 120F

FEATURES

- * Center amplifying gate.
- * Metal Case with ceramic insulator
- * International standard case TO-200AB (A-PUK)
- * Inverter Grade Thyristor

TYPICAL APPLICATIONS

- * Invertors
- * Choppers
- * Induction Heatings



MAJOR RATINGS & CHARACTERISTICS

Parameters	330PA..F	Units	
$I_{T(AV)}$	330	A	
@ T_{hs}	55	$^{\circ}C$	
$I_{T(RMS)}$	518	A	
@ T_{hs}	55	$^{\circ}C$	
I_{TSM}	@ 50 Hz	4680	A
I^2t	@ 50 Hz	110	KA ² s
V_{DRM}/V_{RRM}	200 to 1200	V	
t_q	range	15 to 30	μs
T_J	-40 to 125	$^{\circ}C$	

SILICON CONTROLLED RECTIFIERS

330PA..F Series

ELECTRICAL SPECIFICATION VOLTAGE RATINGS

Type Number	Voltage Code	V_{DRM} / V_{RRM} , maximum repetitive peak voltage V	V_{RSM} , maximum non-repetitive peak voltage V	I_{DRM} / I_{RRM} max. $T_J = T_J$ max. mA
330PA..F	02	200	300	40
	04	400	500	
	06	600	700	
	08	800	900	
	10	1000	1100	
	12	1200	1300	

ON-STATE CONDUCTION

	Parameter	330PA..F	Units	Conditions
$I_{T(AV)}$	Max. average on-state current @ heat sink temperature	330	A	180° conduction, half sine wave double side cooled
		55	°C	
$I_{T(RMS)}$	Max. RMS forward current	518	A	DC@55°C heat sink temperature (double side cooled)
I_{TSM}	Max. peak, one half cycle non-repetitive surge current	4680	A	t = 10ms Sinusoidal half wave, Initial $T_J = T_J$ max.,
I^2t	Maximum I^2t for fusing	110	KA ² s	
$I^2\sqrt{t}$	Maximum $I^2\sqrt{t}$ for fusing	1100	KA ² √s	t = 0.1 to 10ms. No voltage reapplied.
$V_{T(TO)}$	Threshold voltage	1.55	V	$T_J = T_J$ max.

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ON-STATE CONDUCTION

	Parameter	330PA..F	Units	Conduction
r_{t2}	Forward slope resistance	1.30	m Ω	$T_J = T_J \text{ max.}$
V_{TM}	Max. on state voltage	2.07	V	$I_{TM} = 600A, T_J = T_J \text{ max.}, t_p = 10\text{ms sine wave pulse}$
I_H	Maximum holding current	600	mA	$T_J = 25^\circ\text{C}, I_T > 30A$
I_L	Latching current	1000		$T_J = 25^\circ\text{C}, V_A = 12V, R_a = 6\Omega, I_G = 1A$

SWITCHING

	Parameter	330PA..F	Units	Conditions
di/dt	Max. non-repetitive rate of rise of turned-on current	100	A/ μs	$T_J = T_J \text{ max.}, V_{DRM} = \text{rated } V_{DRM}$ $I_{TM} = 2 \times di / dt$
t_d	Typical delay time	1.1	μs	$T_J = 25^\circ\text{C}, V_{DM} = \text{rated } V_{DRM}, I_{TM} = 50A \text{ DC}, t_p = 1\mu\text{s}$ resistive circuit. Gate pulse: 10V, 5 Ω source
t_q	Typical turn-off time	Min 15 Max. 30		$T_J = T_J \text{ max.}, I_{TM} = 300A, \text{commutating } di/dt = 20A/\mu\text{s},$ $VR = 50V. t_p = 500\mu\text{s}$

BLOCKING

	Parameter	330PA..F	Units	Conditions
dv/dt	Maximum critical rate of rise of off-state voltage	500	V/ μs	$T_J = T_J \text{ max.}, \text{linear to } 80\% \text{ rated } V_{DRM}, \text{ higher value available on request}$
I_{RRM} I_{DRM}	Max. peak reverse and off-state leakage current	40	mA	$T_J = T_J \text{ max.}, \text{rated } V_{DRM} / V_{RRM} \text{ applied}$

TRIGGERING

	Parameter	330PA..F	Units	Conditions
P_{GM}	Maximum peak gate power	60	W	$T_J = T_J \text{ max.}, f = 50\text{Hz}, d\% = 50$
$P_{G(AV)}$	Maximum average gate power	10		$T_J = T_J \text{ max.}, f = 50\text{Hz}, d\% = 50$
I_{GM}	Max. peak positive gate current	10	A	$T_J = T_J \text{ max.}, t_p \leq 5\text{ms}$
$+V_{GM}$	Max. peak positive gate voltage	20	V	$T_J = T_J \text{ max.}, t_p \leq 5\text{ms}$
$-V_{GM}$	Max. peak negative gate voltage	5		
I_{GT}	DC gate current required to trigger	150	mA	$T_J = 25^\circ\text{C}, t_p \leq 5\text{ms}$
V_{GT}	DC gate voltage required to trigger	3	V	
I_{GD}	DC gate current not to trigger	20	mA	$T_J = T_J \text{ max.}, \text{rated } V_{DRM} \text{ applied}$
V_{GD}	DC gate voltage not to trigger	0.25	V	

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THERMAL AND MECHANICAL SPECIFICATION

	Parameter	330PA..F	Units	Conditions
T_J	Max. junction operating temperature	-40 to 125	°C	
T_{stg}	Max. storage temperature range	-40 to 150		
R_{thJ-hs}	Max. thermal resistance, junction to heat sink	0.08	K/W	DC operation double side cooled
F	Mounting force, $\pm 10\%$	4900 (500)	N (kg)	
wt	Approximate weight	50	g	
	Case style	To - 200AB (A-PUK)		See outline

SILICON CONTROLLED RECTIFIERS

330PA..F Series

Outline Table

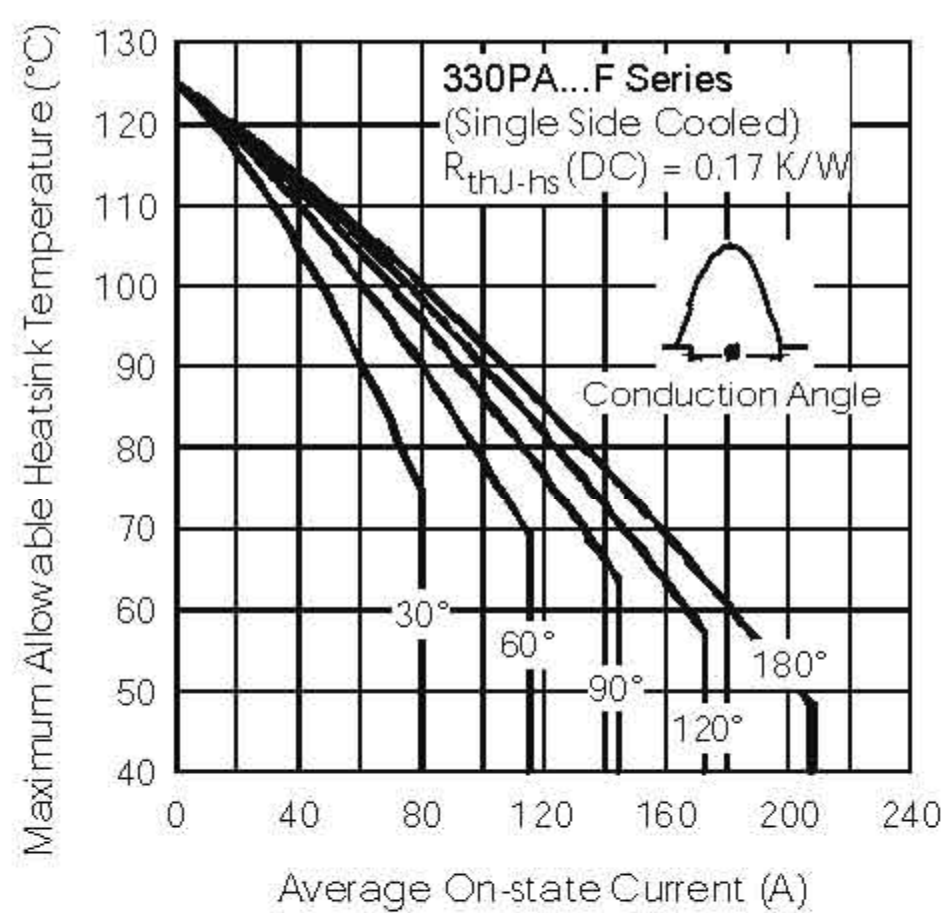
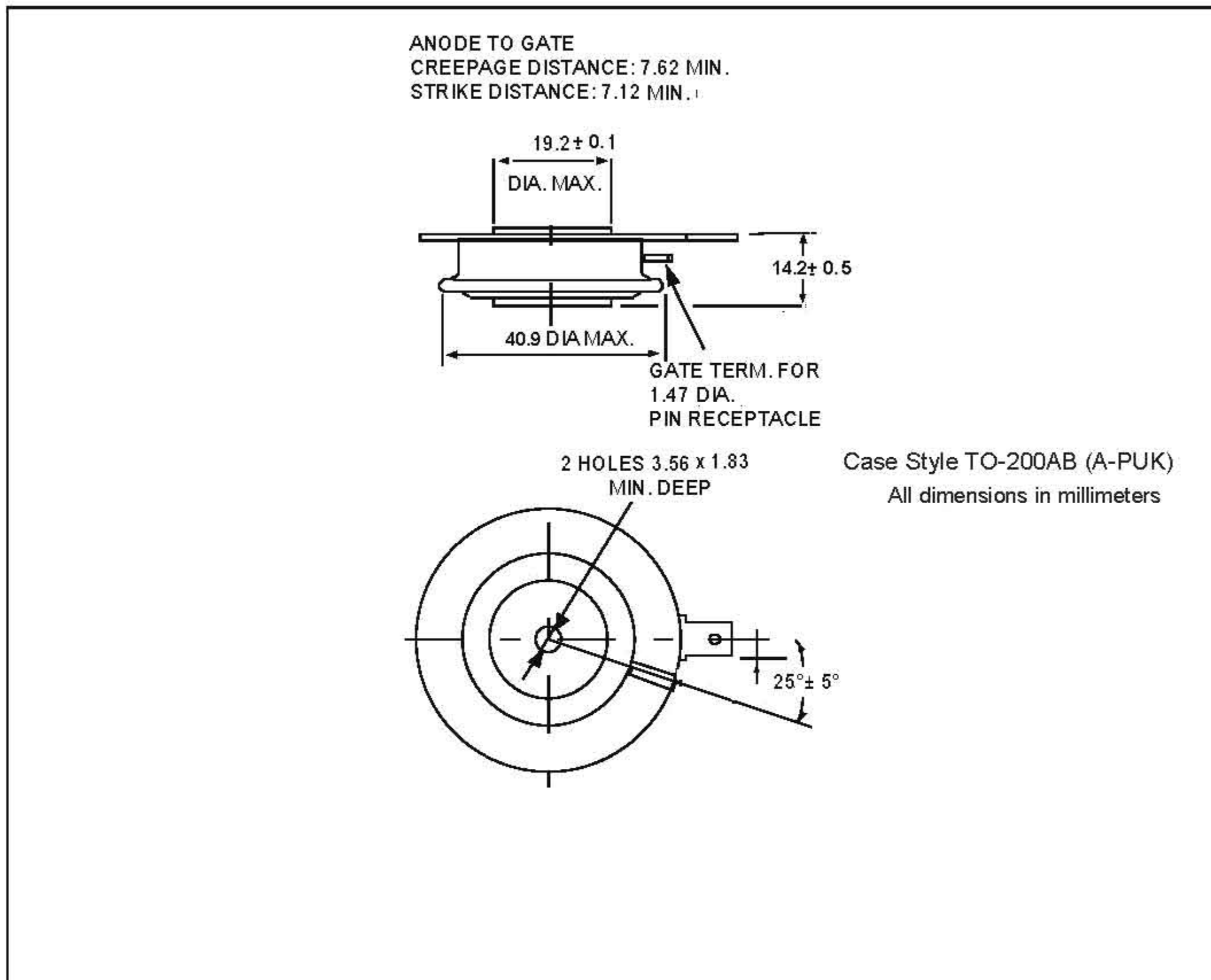


Fig. 1 - Current Ratings Characteristics

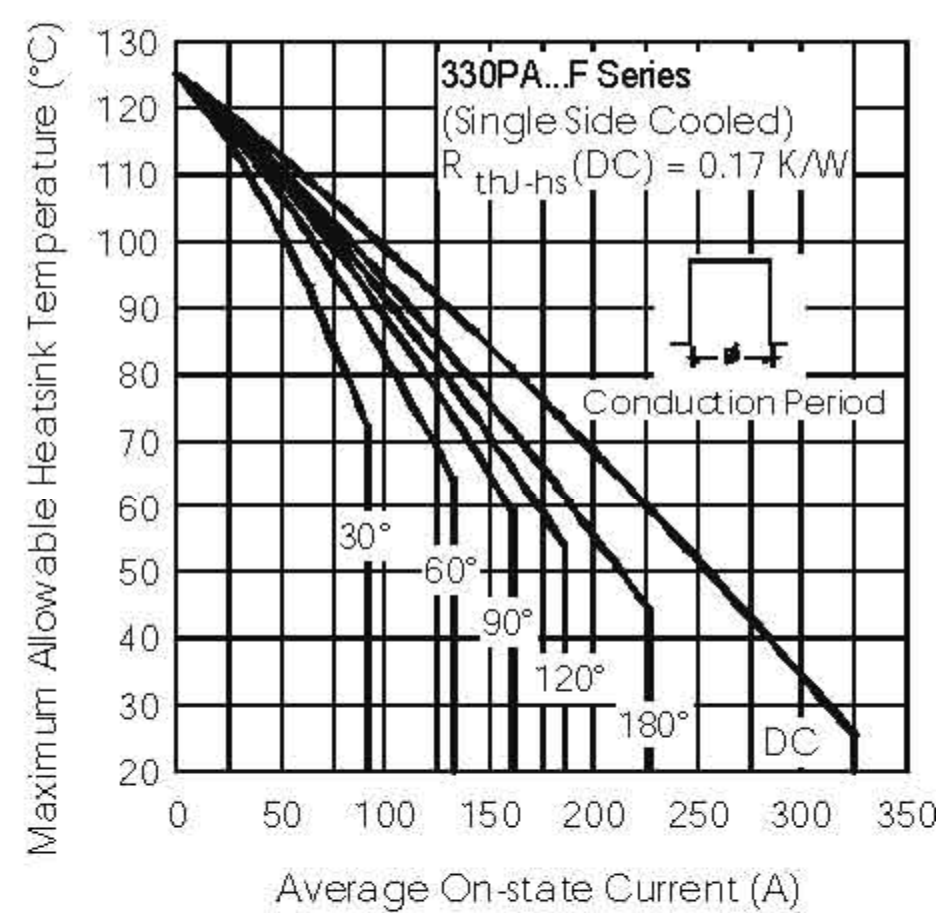


Fig. 2 - Current Ratings Characteristics

SILICON CONTROLLED RECTIFIERS

330PA..F Series

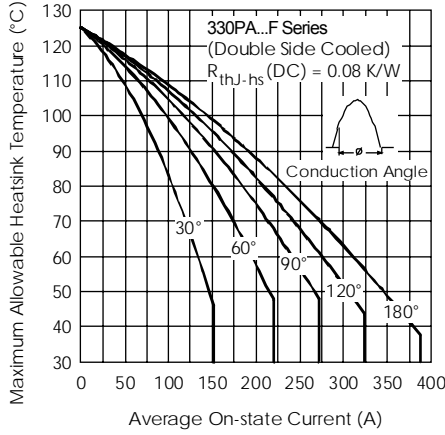


Fig. 3 - Current Ratings Characteristics

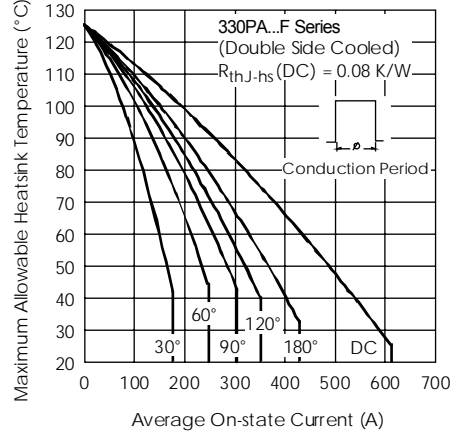


Fig. 4 - Current Ratings Characteristics

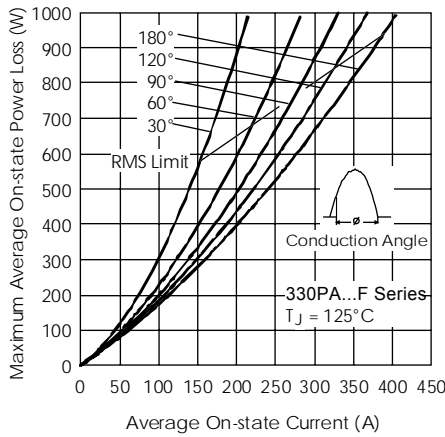


Fig. 5 - On-state Power Loss Characteristics

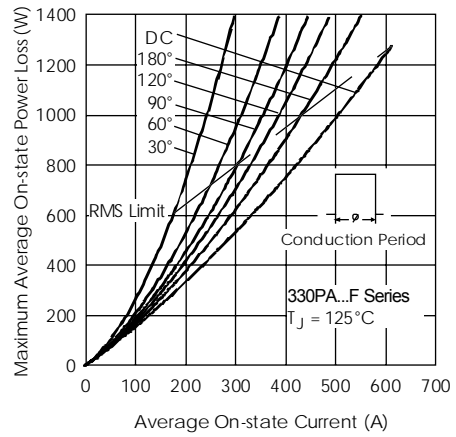


Fig. 6 - On-state Power Loss Characteristics

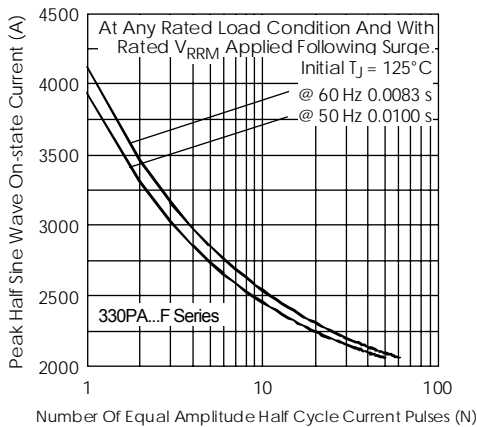


Fig. 7 - Maximum Non-repetitive Surge Current Single and Double Side Cooled

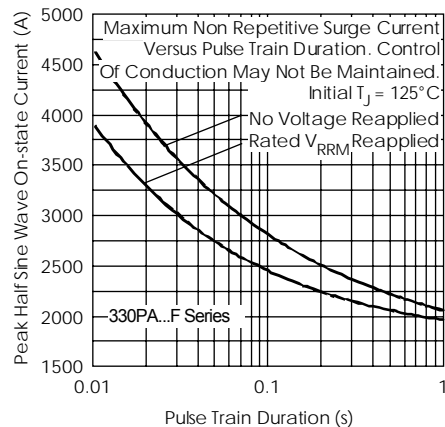


Fig. 8 - Maximum Non-repetitive Surge Current Single and Double Side Cooled

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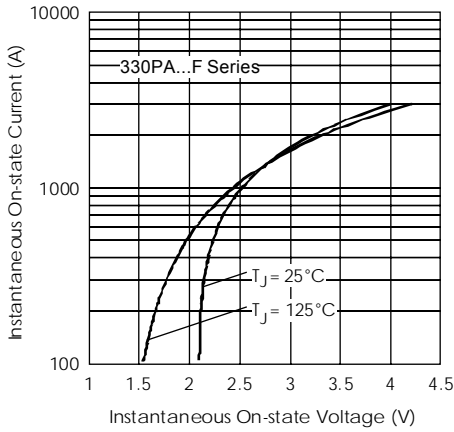


Fig. 9 - On-state Voltage Drop Characteristics

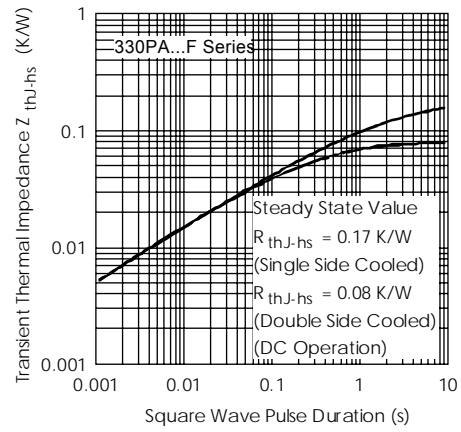


Fig. 10 - Thermal Impedance Z_{thJ-hs} Characteristics

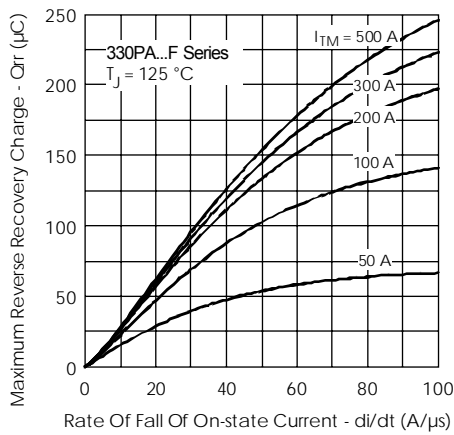


Fig. 11 - Reverse Recovered Charge Characteristics

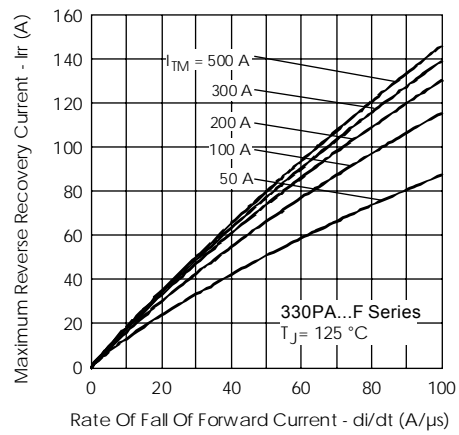


Fig. 12 - Reverse Recovery Current Characteristics

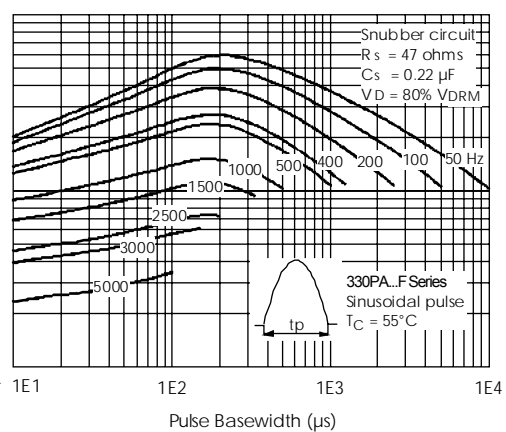
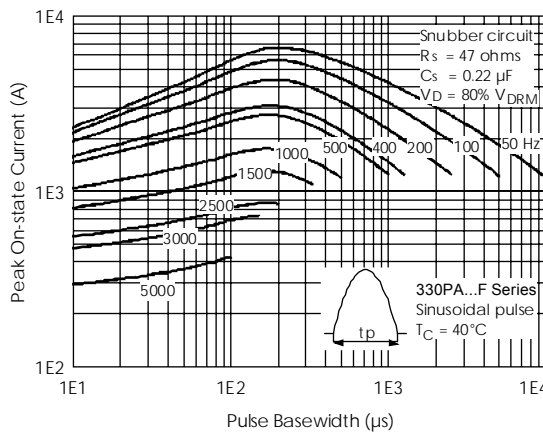


Fig. 13 - Frequency Characteristics

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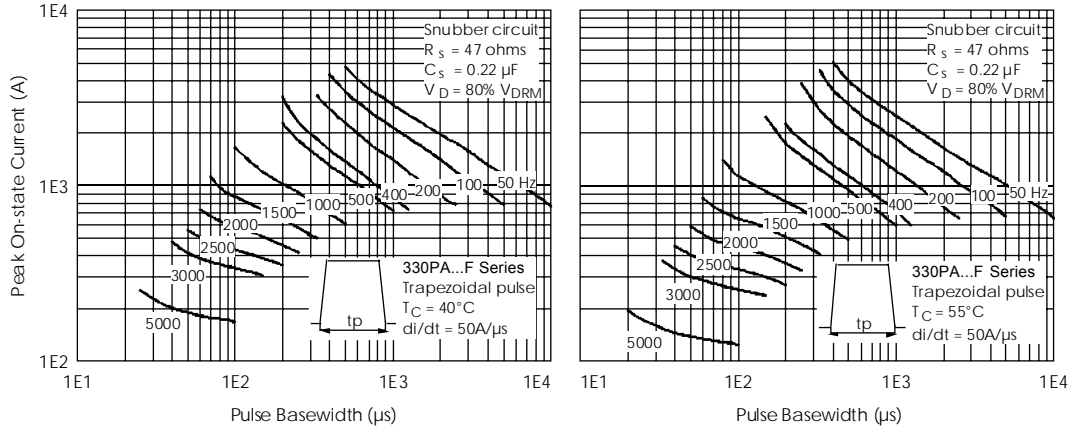


Fig. 14 - Frequency Characteristics

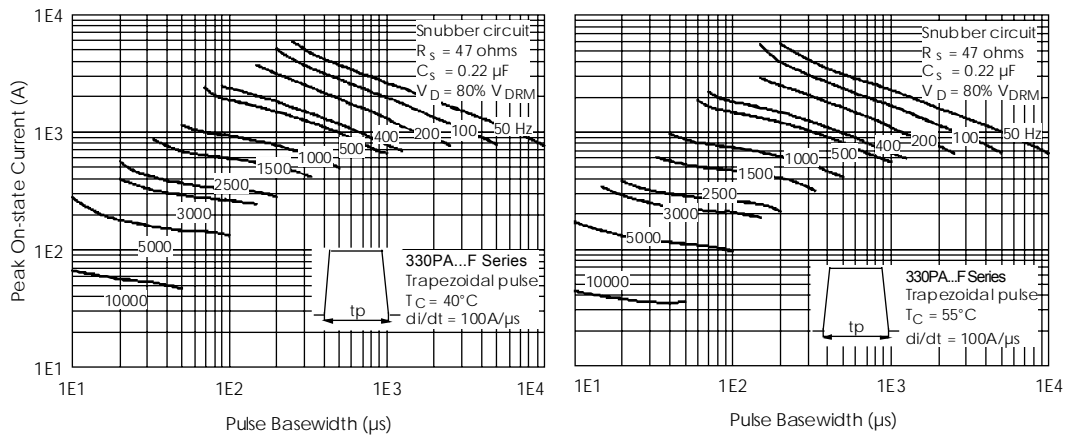


Fig. 15 - Frequency Characteristics

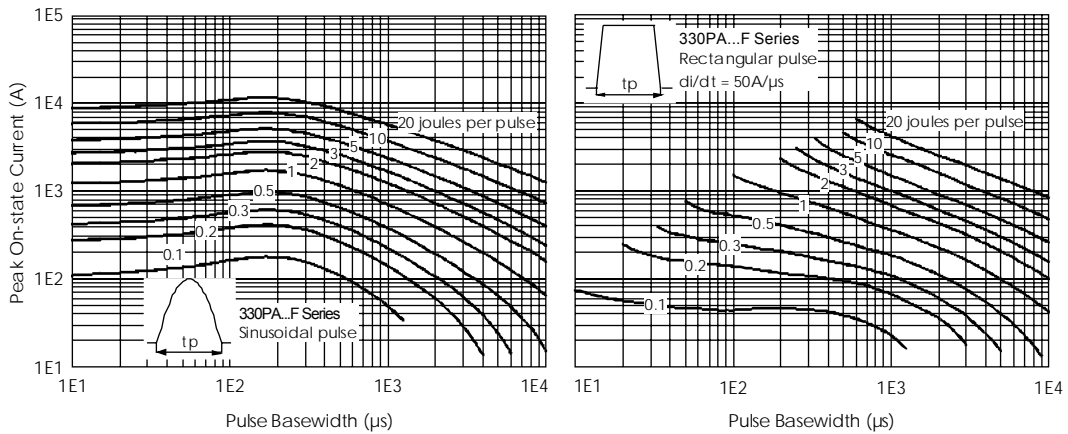


Fig. 16 - Maximum On-state Energy Power Loss Characteristics

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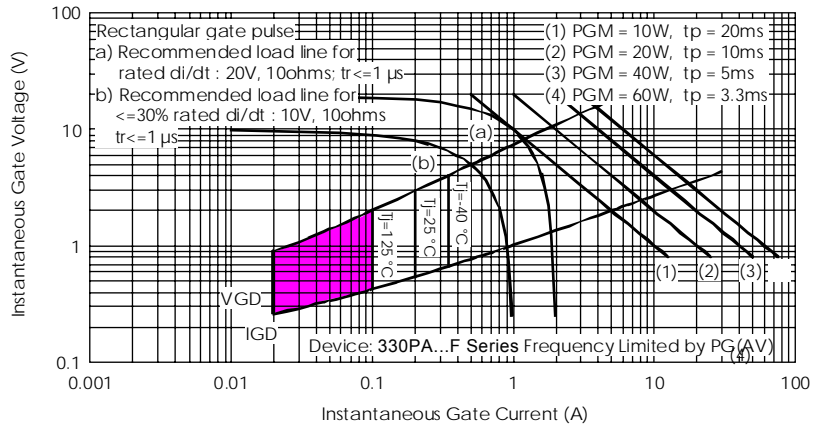


Fig. 17 - Gate Characteristics

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