

### Hockey Puk Version E-PUK Series 620PE..F

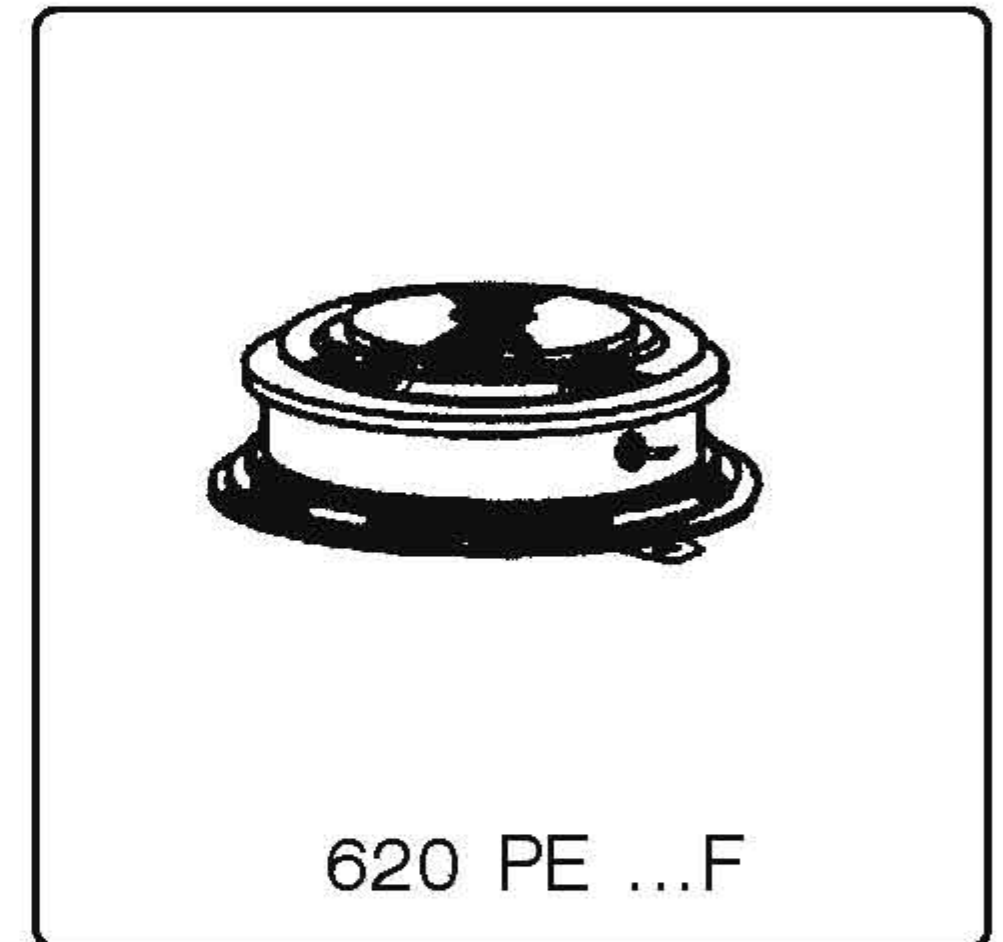
Types : 620PE 20F to 620PE 120F

#### FEATURES

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

#### TYPICAL APPLICATIONS

- \* Invertors
- \* Choppers
- \* Induction Heatings



#### MAJOR RATINGS & CHARACTERISTICS

Parameters	620PE..F	Units
$I_{T(AV)}$	620	A
@ $T_{hs}$	55	$^{\circ}C$
$I_{T(RMS)}$	973	A
@ $T_{hs}$	55	$^{\circ}C$
$I_{TSM}$ @ 50 Hz	7950	A
$I^2t$ @ 50 Hz	316	KA <sup>2</sup> s
$V_{DRM}/V_{RRM}$	200 to 1200	V
$t_q$ (*)	10 to 30	$\mu s$
$T_J$	-40 to 125	$^{\circ}C$

(\*)  $t_q = 10$  to  $20 \mu s$  for 400 to 800V device  
 $t_q = 20$  to  $30 \mu s$  for 800 to 1200V device

# SILICON CONTROLLED RECTIFIERS

620PE..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
620PE..F	02	200	300	50
	04	400	500	
	06	600	700	
	08	800	900	
	10	1000	1100	
	12	1200	1300	

## ON-STATE CONDUCTION

	Parameter	620PE..F	Units	Conditions
$I_{T(AV)}$	Max. average on-state current @ heat sink temperature	620	A	180° conduction, half sine wave double side cooled
		55	°C	
$I_{T(RMS)}$	Max. RMS forward current	973	A	DC@55°C heat sink temperature (double side cooled)
$I_{TSM}$	Max. peak, one half cycle non-repetitive surge current	7950	A	t = 10ms Sinusoidal half wave, Initial $T_J = T_J$ max.,
$I^2t$	Maximum $I^2t$ for fusing	316	KA <sup>2</sup> s	
$I^2\sqrt{t}$	Maximum $I^2\sqrt{t}$ for fusing	3160	KA <sup>2</sup> √s	t = 0.1 to 10ms. No voltage reapplied.
$V_{T(TO)}$	Threshold voltage	1.44	V	$T_J = T_J$ max.

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## ON-STATE CONDUCTION

	Parameter	620PE..F	Units	Conduction
$r_t$	Forward slope resistance	0.94	m $\Omega$	$T_J = T_{J \text{ max.}}$
$V_{TM}$	Max. on state voltage	2.16	V	$I_{TM} = 1255A, T_J = T_{J \text{ max.}}, t_p = 10ms$ sine wave pulse
$I_H$	Maximum holding current	600	mA	$T_J = 25^\circ C, I_T > 30A$
$I_L$	Latching current	1000		$T_J = 25^\circ C, V_A = 12V, R_a = 6\Omega, I_G = 1A$

## SWITCHING

	Parameter	620PE..F	Units	Conditions
$di/dt$	Max. non-repetitive rate of rise of turned-on current	100	A/ $\mu s$	$T_J = T_{J \text{ max.}}, V_{DRM} = \text{rated } V_{DRM}$ $I_{TM} = 2 \times di / dt$
$t_d$	Typical delay time	0.83	$\mu s$	$T_J = 25^\circ C, V_{DM} = \text{rated } V_{DRM}, I_{TM} = 50A$ DC, $t_p = 1\mu s$ resistive circuit. Gate pulse: 10V, 5 $\Omega$ source
$t_q$	Typical turn-off time	Min 10 Max. 30		$T_J = T_{J \text{ max.}}, I_{TM} = 300A, \text{commutating } di/dt = 20A/\mu s,$ $VR = 50V, t_p = 500\mu s$

## BLOCKING

	Parameter	620PE..F	Units	Conditions
$dv/dt$	Maximum critical rate of rise of off-state voltage	500	V/ $\mu s$	$T_J = T_{J \text{ max.}}, \text{linear to } 80\% \text{ rated } V_{DRM}, \text{ higher value available on request}$
$I_{RRM}$ $I_{DRM}$	Max. peak reverse and off-state leakage current	50	mA	$T_J = T_{J \text{ max.}}, \text{rated } V_{DRM} / V_{RRM} \text{ applied}$

## TRIGGERING

	Parameter	620PE..F	Units	Conditions
$P_{GM}$	Maximum peak gate power	60	W	$T_J = T_{J \text{ max.}}, f = 50Hz, d\% = 50$
$P_{G(AV)}$	Maximum average gate power	10		$T_J = T_{J \text{ max.}}, f = 50Hz, d\% = 50$
$I_{GM}$	Max. peak positive gate current	10	A	$T_J = T_{J \text{ max.}}, t_p \leq 5ms$
$+V_{GM}$	Max. peak positive gate voltage	20	V	$T_J = T_{J \text{ max.}}, t_p \leq 5ms$
$-V_{GM}$	Max. peak negative gate voltage	5		
$I_{GT}$	DC gate current required to trigger	150	mA	$T_J = 25^\circ C, t_p \leq 5ms$
$V_{GT}$	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	620PE..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	0.04	K/W	DC operation double side cooled
F	Mounting force, $\pm 10\%$	9800 (1000)	N (kg)	
wt	Approximate weight	83	g	
	Case style	To - 200AB (E-PUK)		See outline

# SILICON CONTROLLED RECTIFIERS

620PE..F Series

## Outline Table

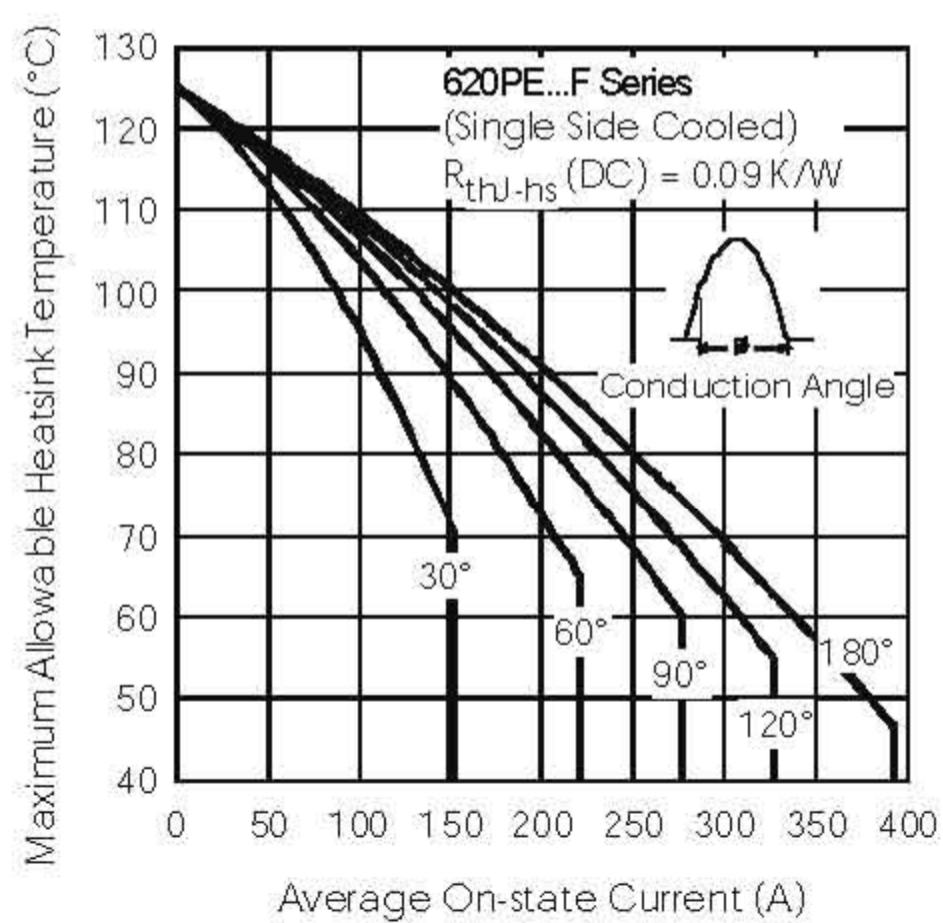
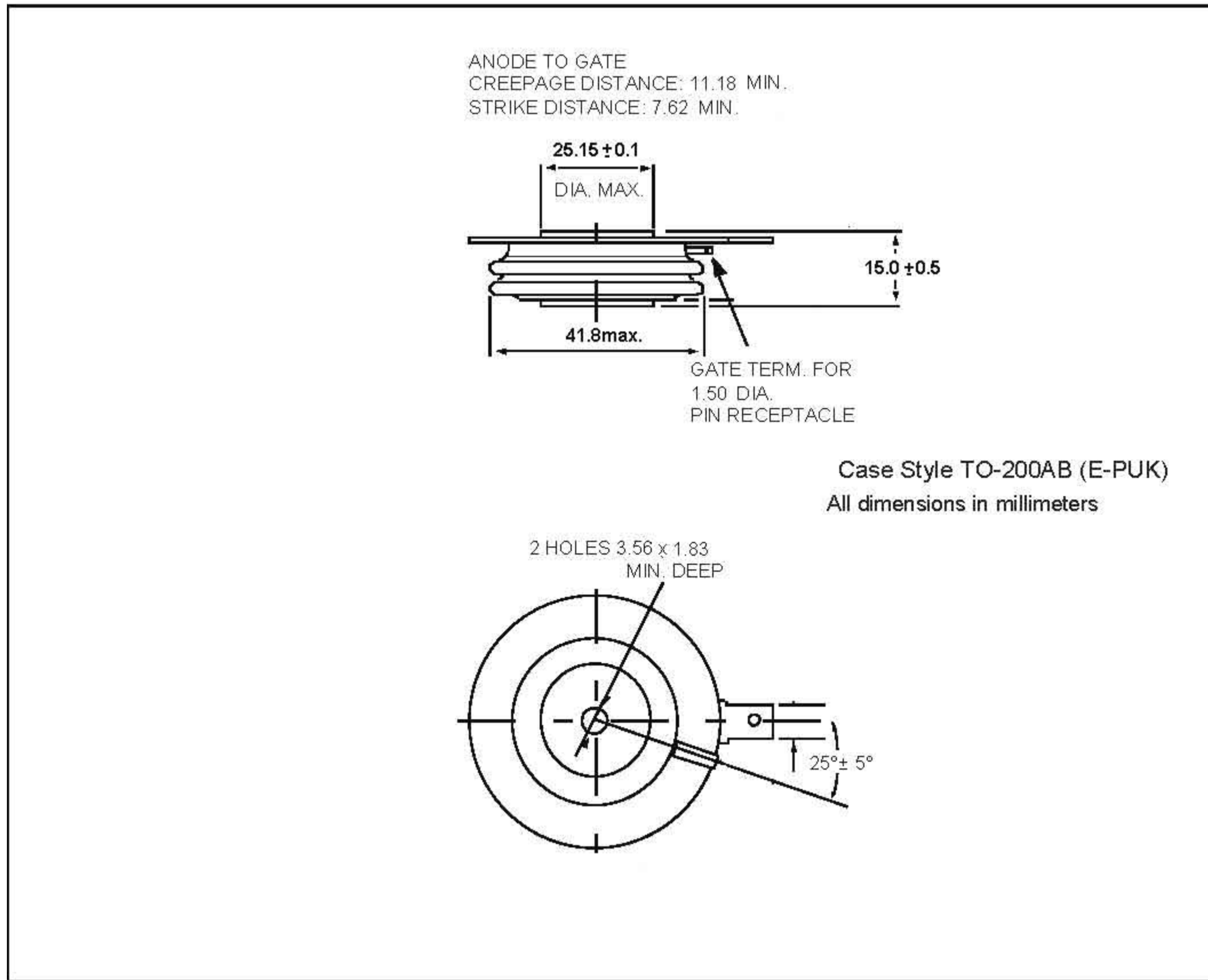


Fig. 1 - Current Ratings Characteristics

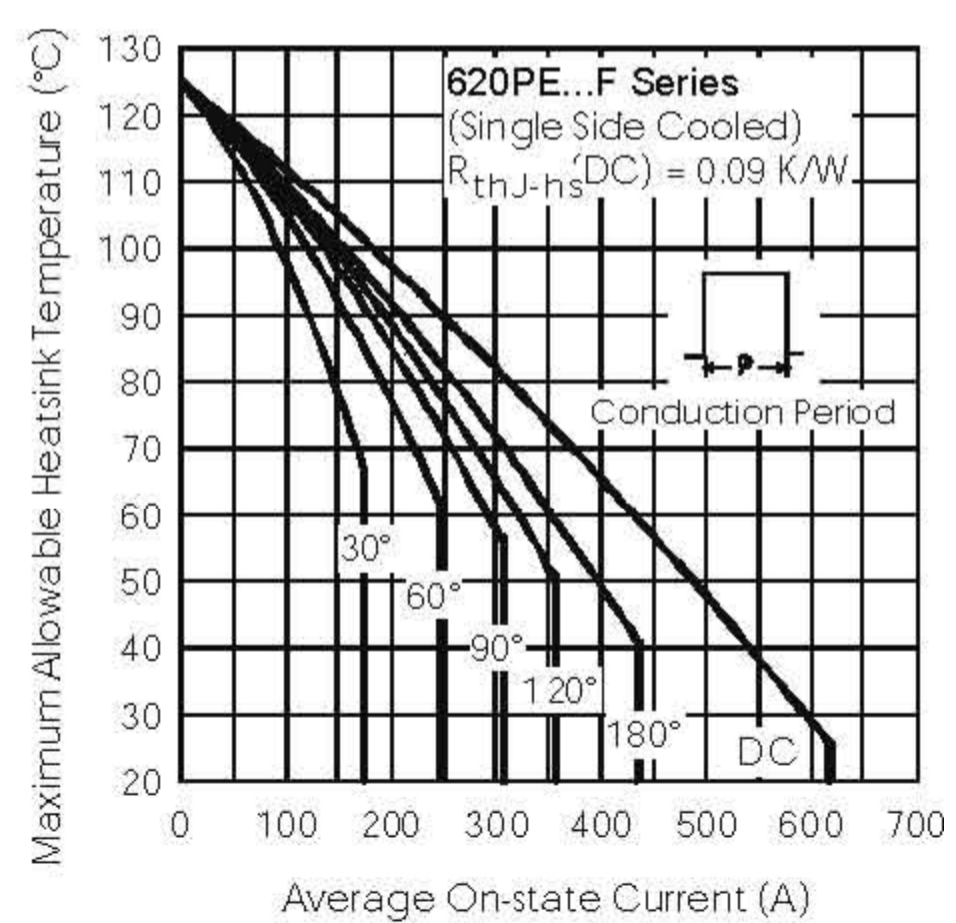


Fig. 2 - Current Ratings Characteristics

# SILICON CONTROLLED RECTIFIERS

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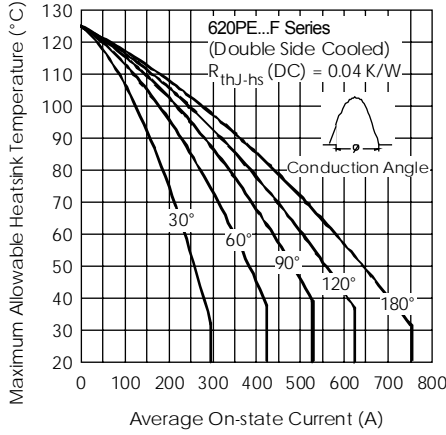


Fig. 3 - Current Ratings Characteristics

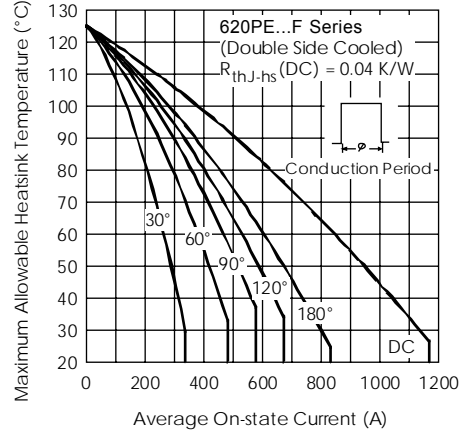


Fig. 4 - Current Ratings Characteristics

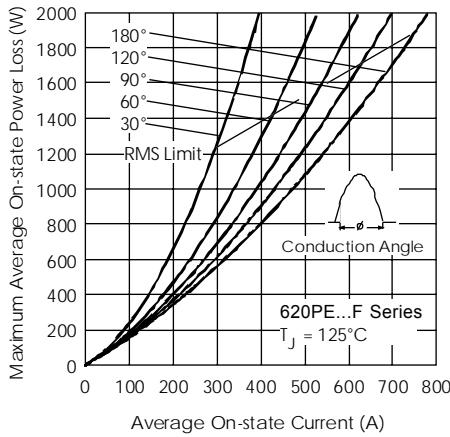


Fig. 5 - On-state Power Loss Characteristics

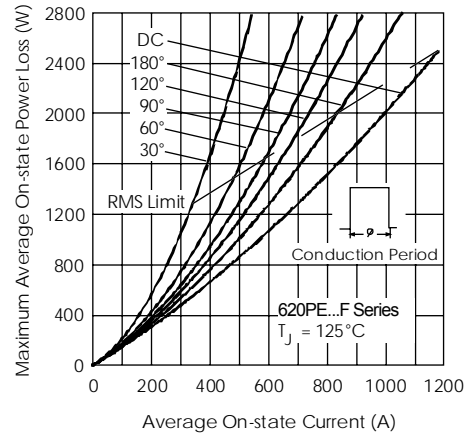


Fig. 6 - On-state Power Loss Characteristics

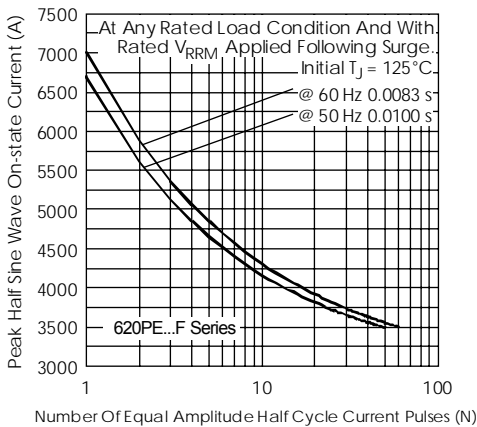


Fig. 7 - Maximum Non-repetitive Surge Current Single and Double Side Cooled

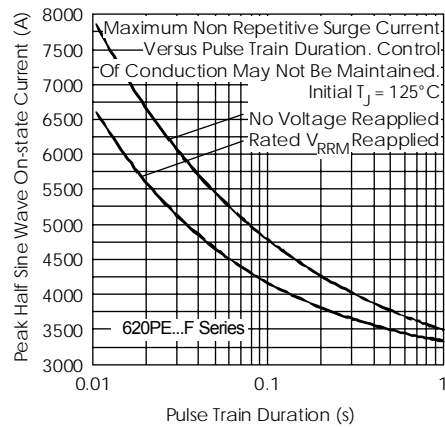


Fig. 8 - Maximum Non-repetitive Surge Current Single and Double Side Cooled

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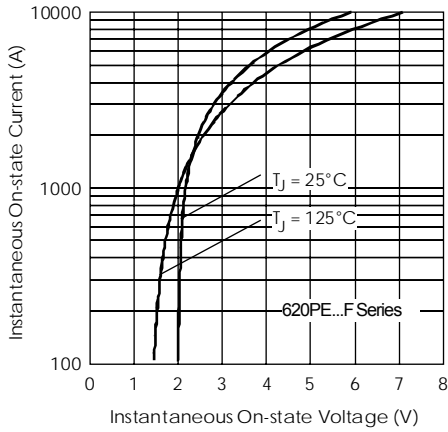


Fig. 9 - On-state Voltage Drop Characteristics

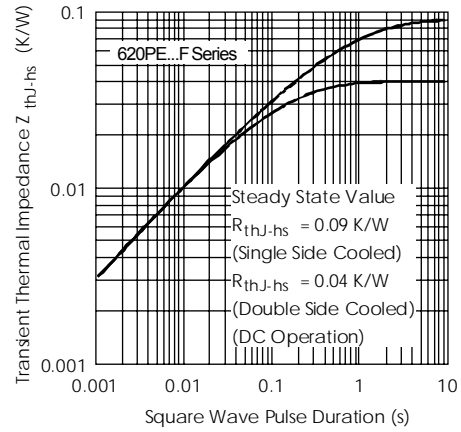


Fig. 10 - Thermal Impedance  $Z_{thJ-hs}$  Characteristics

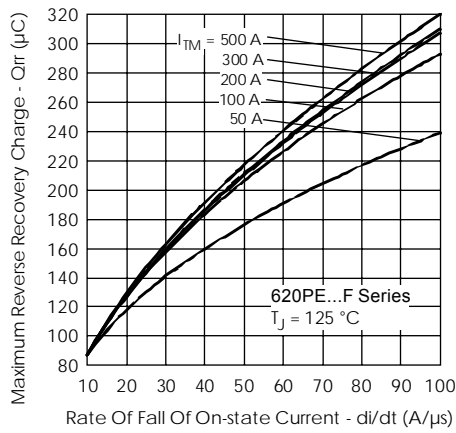


Fig. 11 - Reverse Recovered Charge Characteristics

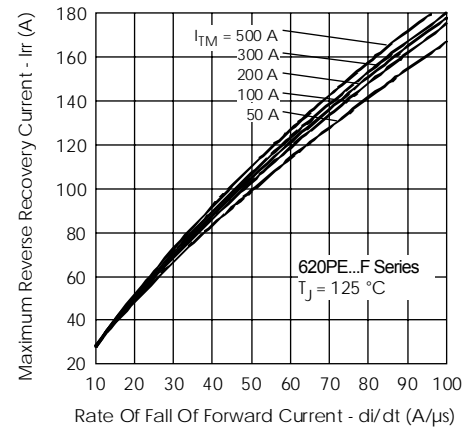


Fig. 12 - Reverse Recovery Current Characteristics

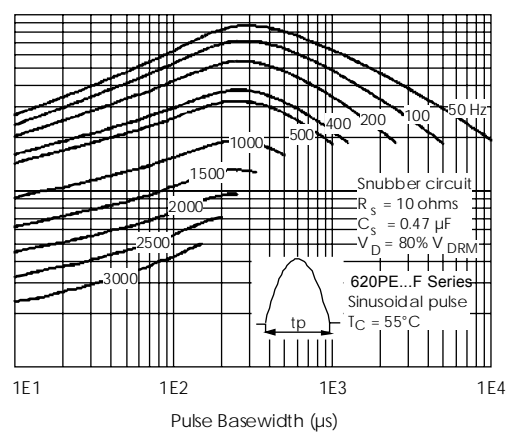
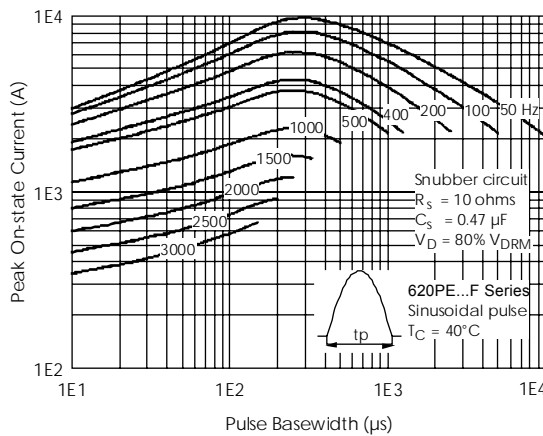


Fig. 13 - Frequency Characteristics

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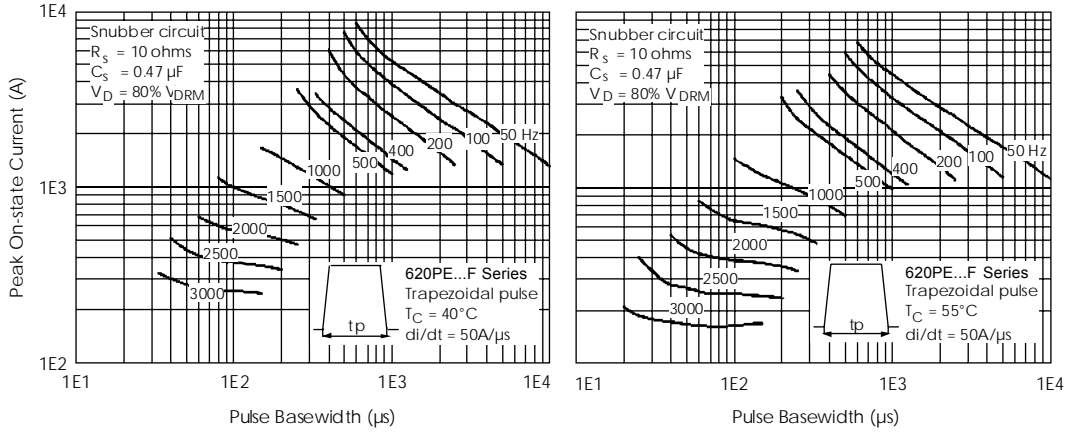


Fig. 14 - Frequency Characteristics

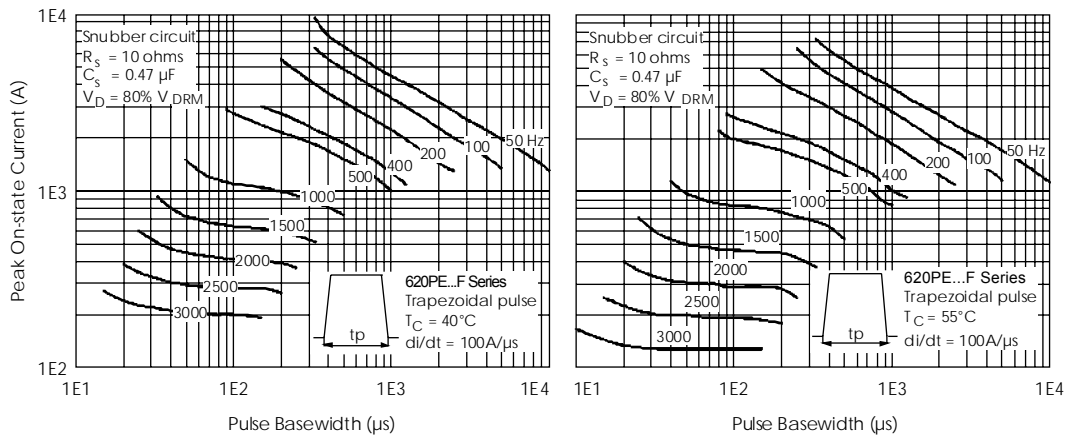


Fig. 15 - Frequency Characteristics

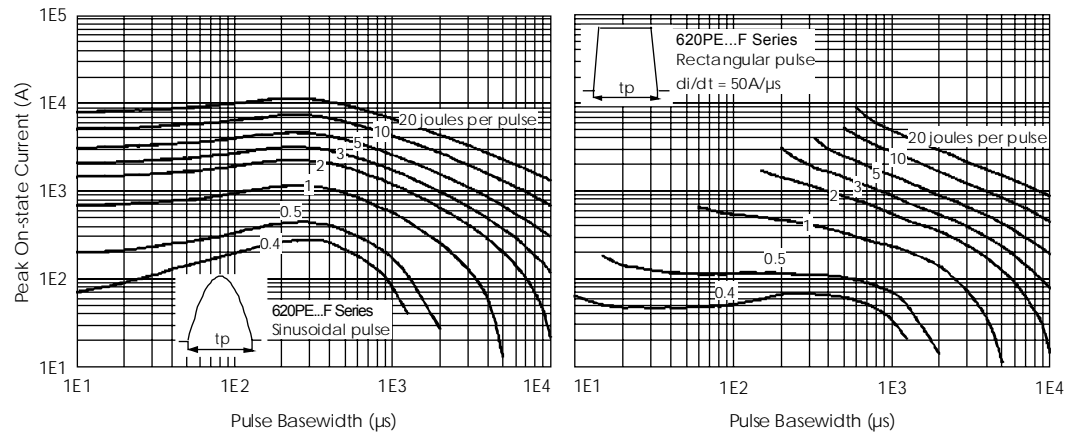


Fig. 16 - Maximum On-state Energy Power Loss Characteristics



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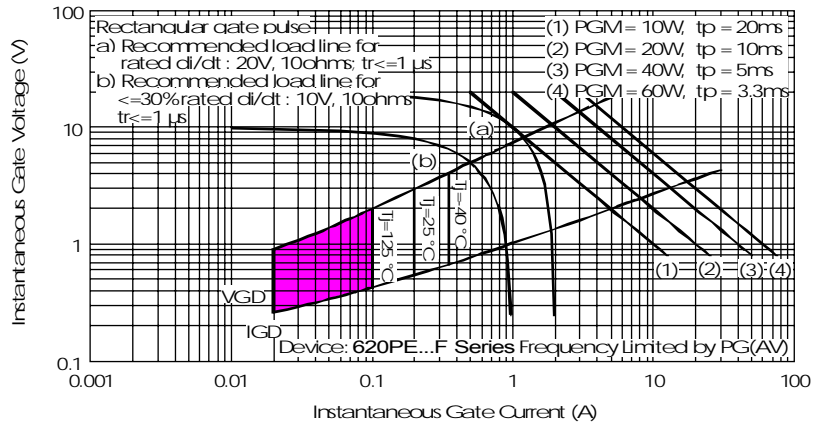


Fig. 17 - Gate Characteristics

Last Update : Mar. 2006