



Ruttonsha International Rectifier Ltd.

PHASE CONTROL THYRISTORS

HOCKEY PUCK VERSION

Type : 550 PK 700

Features

- Center amplifying gate
- Metal case with ceramic insulator
- International standard case (K-PUK)
- High profile hockey-puk

Typical Applications

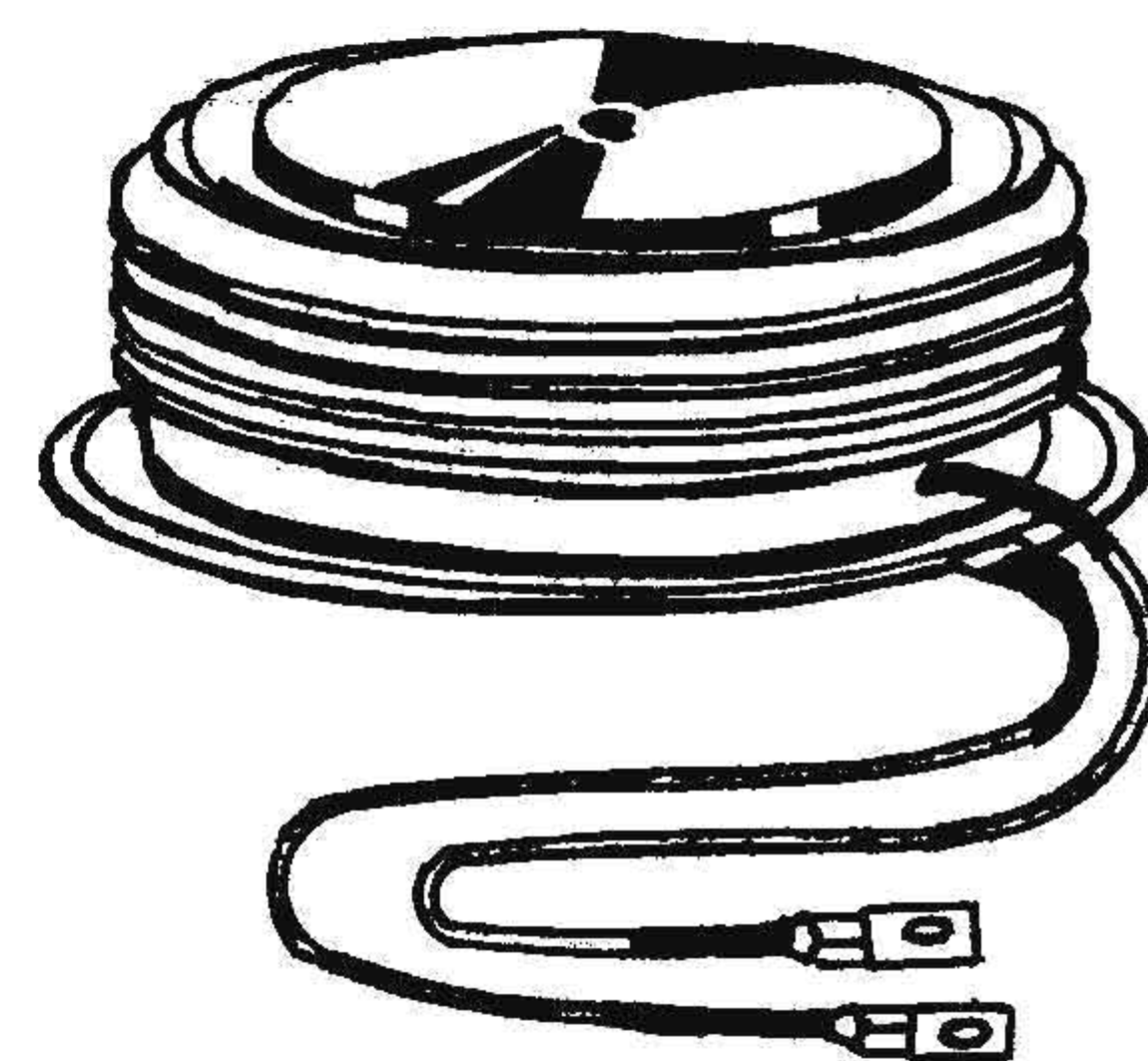
- D C motor controls
- Controlled D C power supplies
- A C controllers

Major Ratings and Characteristics :-

PARAMETERS	550 PK	UNITS
$I_{T(AV)}$	550	A
$@T_{hs}$	70	°C
$I_{T(RMS)}$	863	A
$@T_{hs}$	70	°C
$I_{TSM} @50Hz$	5.5	KA
$I^2t @50Hz$	151	KA ² s
V_{DRM} / V_{RRM}	5500 to 7000	V
T_q typical	650	μs
T_J	- 40 to 120	°C

550A

550 PK (K - PUK)



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ELECTRICAL SPECIFICATIONS

550 PK Series

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. @ $T_J = T_J$ max. mA
550PK	550	5500	5600	200
	600	6000	6100	
	650	6500	6600	
	700	7000	7100	

On - state Conduction

Parameter	550 PK	Units	Conditions
$I_{T(AV)}$ Max. average on-state current @ Heatsink temperature	550	A	180° conduction, half sine wave
	70	°C	double side cooled
$I_{T(RMS)}$ Max RMS on-state current	863	A	DC@ 70°C heatsink temperature double side cooled
I_{TSM} Max. peak, one-cycle non-repetitive surge current	5.5	KA	t = 10 ms
I^2t Maximum I^2t for fusing	151	KA ² s	t = 10 ms
V_T Threshold voltage	1.3	V	$T_J = T_J$ max.
r_t On-state slope resistance	2.0	mΩ	$T_J = T_J$ max.
V_{TM} Max. on state voltage drop	2.0	V	$I_{PK} = 500A$, $T_J = T_J$ max, $t_P = 10$ ms sine pulse
I_H Maximum holding current	400	mA	$T_J = 25^\circ C$, anode supply 12 V resistive load
I_L Maximum latching current	1000		

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Switching550 PK Series

Parameter		550 PK	Units	Conditions
di/dt	Max. non-repetitive rate of rise of turned-on current	100	A/μs	Gate drive 20V, 20 Ω , t _r ≤ 1μs T _J =T _J max. anode voltage ≤ 80%
t _d	Typical delay time	5	μs	V _d = 1000V , T _J = 25° C
t _q	Typical turn-off time	650	A/μs	I _{TM} = 550A, T _J =T _J max. di/dt = 10A/μs ,V _R =100V dv/dt=20V/μs, Gate OV 100Ω,t _p =500μs V _{DM} =0.67 V _{DRM}

Blocking

Parameter		550 PK	Units	Conditions
dv/dt	Maximum critical rate of rise of off-state voltage	500	V/μs	T _J = T _J max. linear to 60% rated V _{DRM}
I _{RRM} I _{DRM}	Max. peak reverse and off-state leakage current	200	μs	T _J = T _J max. rated V _{DRM} /V _{RRM} applied

* Higher dv/dt is available on request.

Triggering

Parameter		550 PK		Units	Conditions
I _{GT}	DC gate voltage required to trigger	TYP.	MAX.	mA	T _J = 25°C Max.required gate trigger/ current/voltage are the lowest value which will trigger all units 12 V anode-to-cathode applied
		100	200		
V _{GT}	DC gate voltage required to trigger	1.1	3.0	V	T _J = 25°C

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550 PK Series

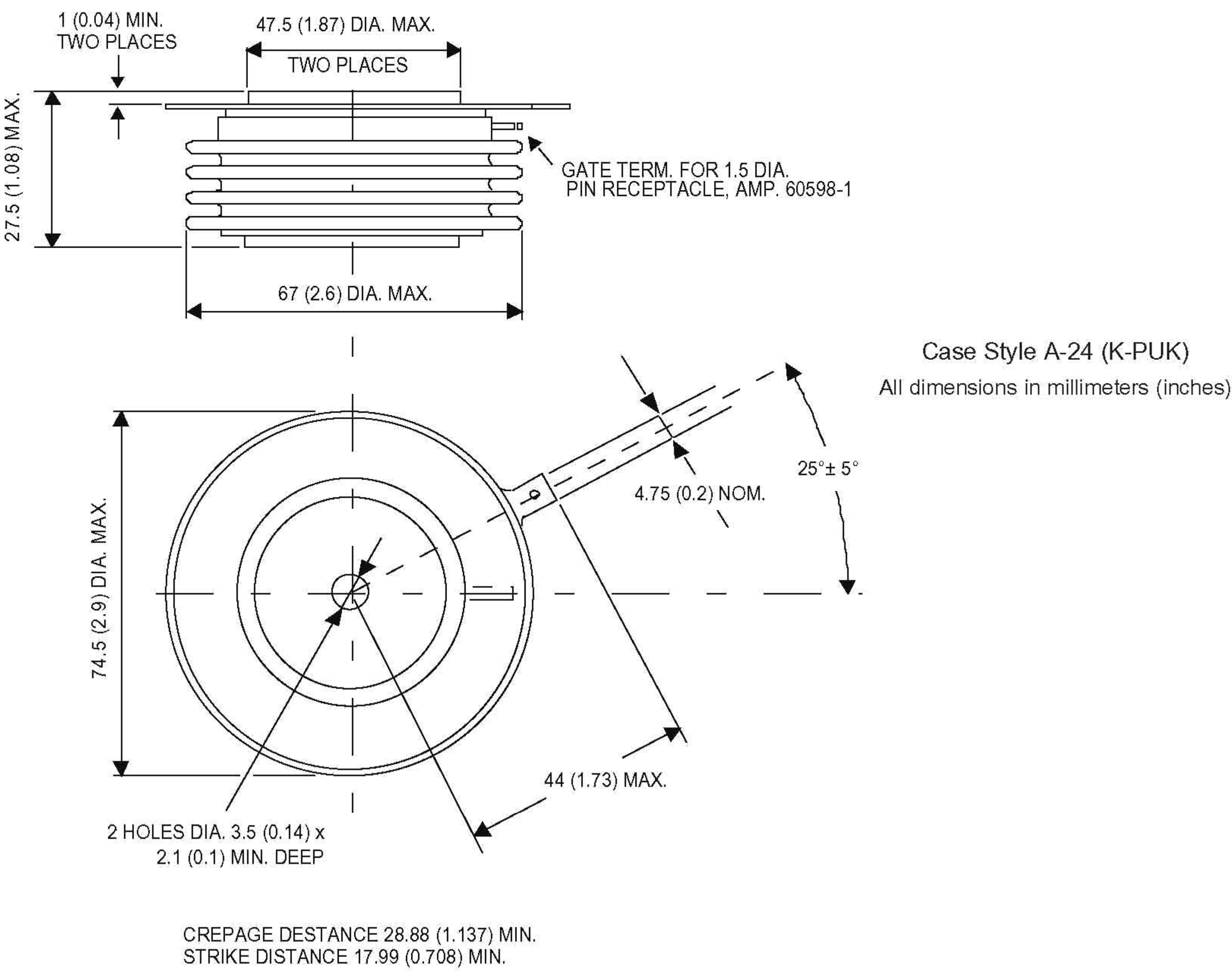
Thermal and Mechanical Specifications

Parameter		550 PK	Units	Conditions
T _J	Max.operating temperature range	- 40 to 120	°C	
T _{stg}	Max.storage temperature range	- 40 to 150		
R _{thJ-hs}	Max. thermal resistance, junction to case	0.025	K/W	DC operation double side cooled
F	Mounting force, ± 10%	24500 (2500)	N (Kg.)	
wt	Approximate weight	425	g	
Case style		A-24(K-PUK)		See Outline Table

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550 PK Series

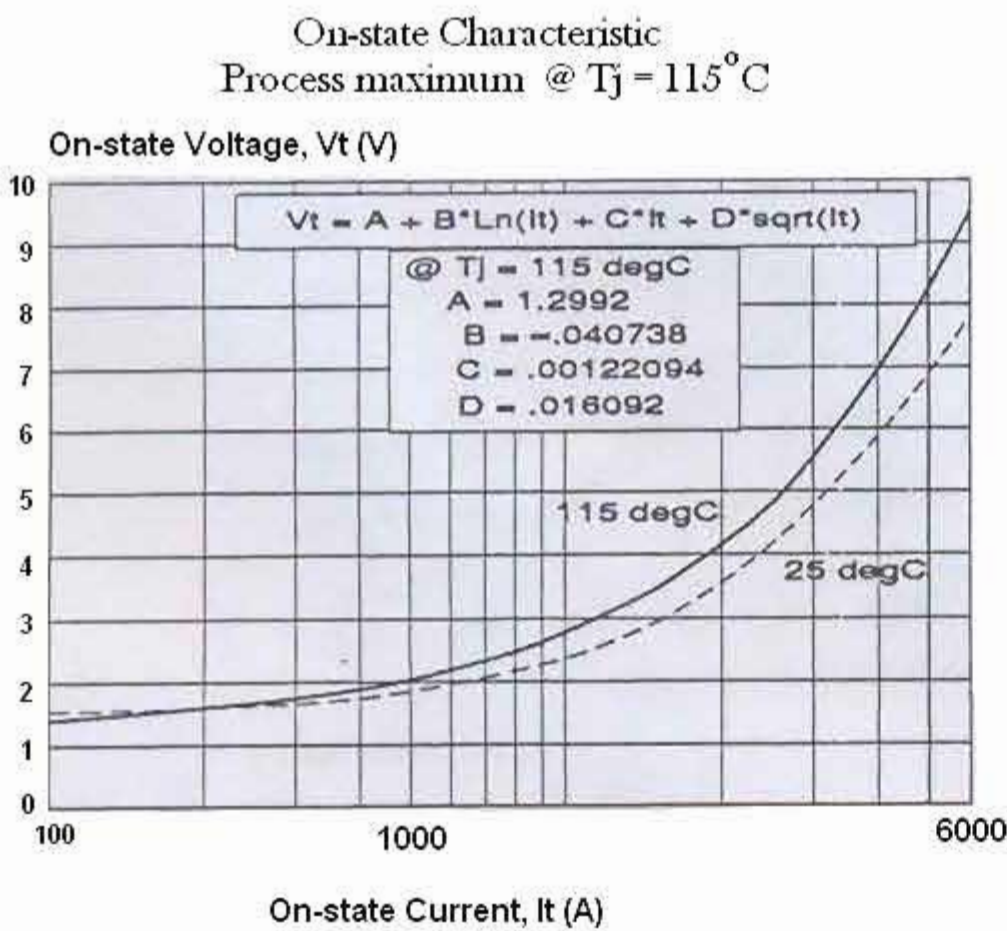
Outline Table



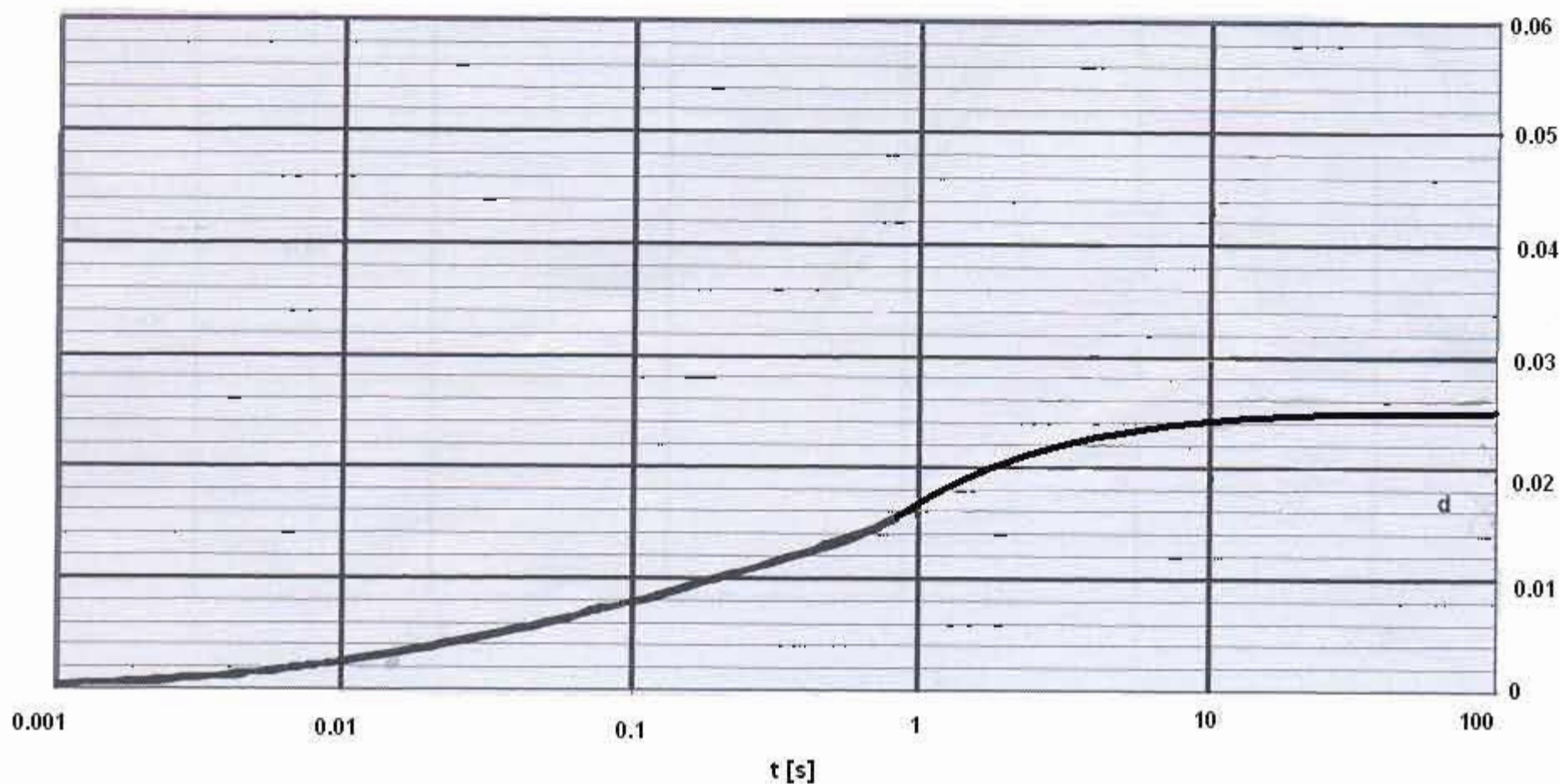
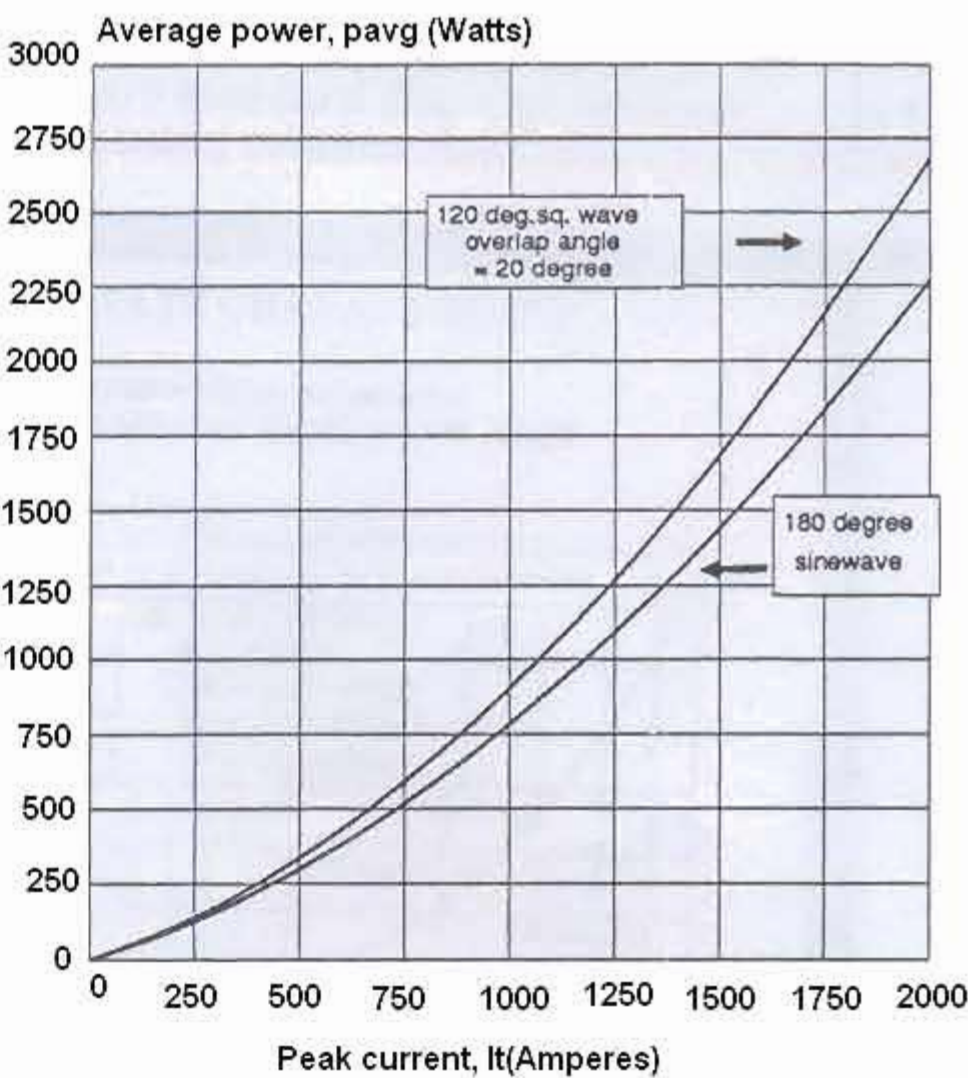
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ON-STATE CHARACTERISTIC



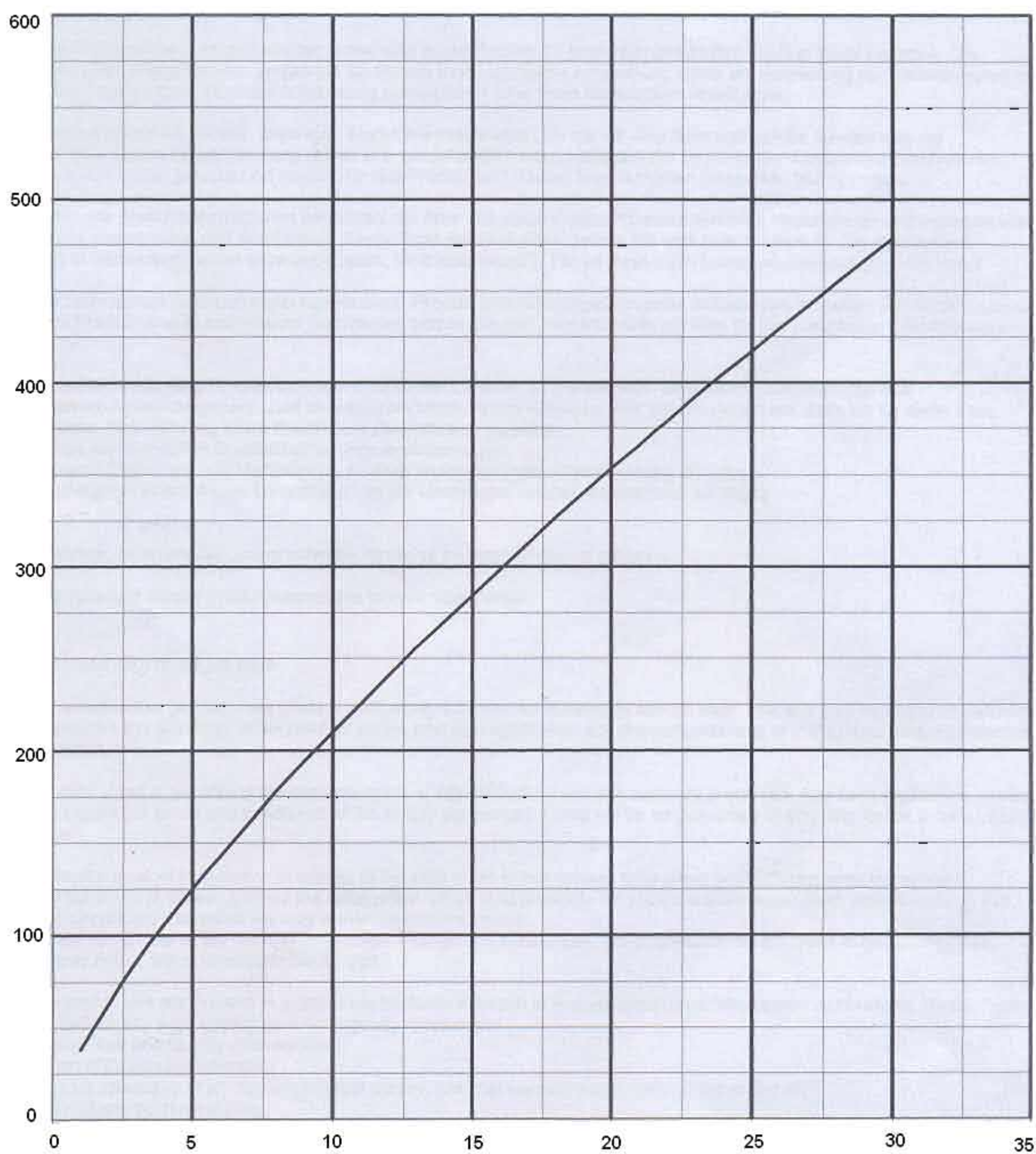
FULL CYCLE AVERAGE POWER LOSS versus PEAK CURRENT at 50/60 Hz (plasma spreading and conduction loss)



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$-di/dt$ [A/μs]

Peak reverse recovery current $I_{RM} = f(-di/dt)$

$T_{vj} = T_{vjmax}$, $VR = 0.5 V_{RRM}$, $V_{VRM} = 0.8 V_{VRM}$