Ruttonsha International Rectifier Ltd.

SILICON CONTROLLED RECTIFIERS

High Power Thyristor
Hockey Puk Version
K-PUK Series 2000PK

Types : 2000 PK 180

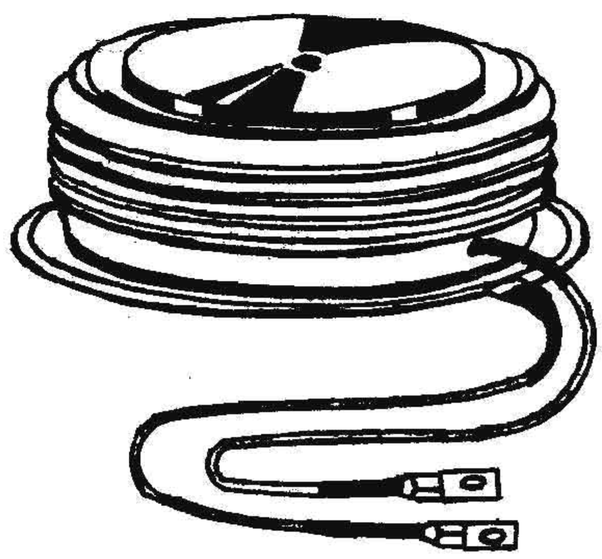
FEATURES

- *Center amplifying gate.*
- *Metal case with ceramic insulator*
- *High profile hockey - puk.*

TYPICAL APPLICATIONS

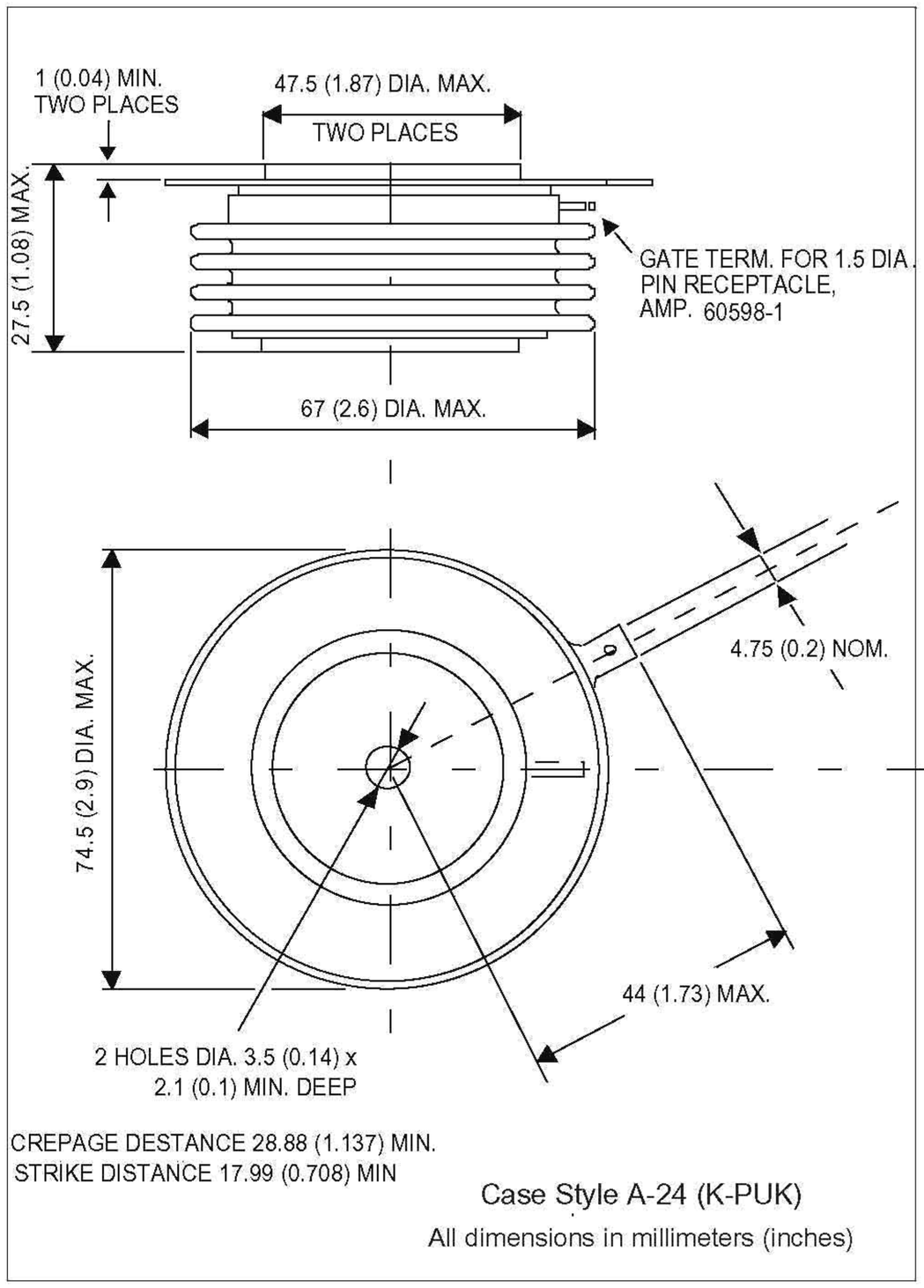
- *DC motor control (e.g. for machine tools).*
- *Controlled rectifiers (e.g. for battery charging, Uninterrupted Power Supply).*
- *AC controllers (e.g. for temperature control, lights control).*

2000 PK (K- PUK)



Major Ratings and Characteristics

Parameter		**2000PK**	Units
$I_{T(AV)}$		2000	A
	@ T_{hs}	58	℃
$I_{T(RMS)}$		3140	A
	@ T_{hs}	58	℃
I_{TSM}	@ 50 Hz	36	KA
I^2t	@ 50 Hz	6480	KA^2s
V_{DRM}/V_{RRM}		400 to 1800	V
t_q	typical	200	µs
T_J		125	℃



Case Style A-24 (K-PUK)

All dimensions in millimeters (inches)

ELECTRICAL SPECIFICATIONS — 2000 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
2000PK	040	400	500	100
	080	800	900	
	120	1200	1300	
	160	1600	1700	
	180	1800	1900	

On - state Conduction

	Parameter	2000PK	Units	Conditions	
$I_{T(AV)}$	Max. average on-state current	2000	A	180° conduction, half sine wave	
	@ Heatsink temperature	58	°C	double side cooled	
$I_{T(RMS)}$	Max RMS on-state current	3140	A	DC@ 58°C heatsink temperature double side cooled	
I_{TSM}	Max. peak, one-cycle non-repetitive surge current	36	KA	t = 10 ms	Sinusoidal half wave, Initial $T_J=T_J$ max.
I^2t	Maximum I^2t for fusing	6480	KA^2s	t = 10 ms	
$V_{T(TO)}$	Threshold voltage	0.82	V	$T_J=T_J$ max	
r_t	On-state slope resistance	0.127	mΩ	$T_J=T_J$ max.	
V_{TM}	Max. on state voltage	1.4	V	I_{PK} = 3000A,$T_J=T_J$ max, t_P = 10 ms sine pulse	
I_H	Maximum holding current	150	mA	T_J = 25°C , anode supply 12 V resistive load	
I_L	Typical latching current	500	mA	T_J = 25°C , anode supply 12 V resistive load	

2000 PK Series

Switching

	Parameter	2000PK	Units	Conditions
di/dt	Max. non-repetitive rate of rise of turned-on current	150	A/µs	Gate drive 20V, 20Ω , $t_r \leq 1\mu s$ $T_J=T_J$ max. anode voltage ≤ 80% V_{DRM}
t_q	Typical turn-off time	200	µs	

Blocking

	Parameter	2000PK	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	100	mA	$T_J = T_J$ max. rated V_{DRM} /V_{RRM} applied

Triggering

	Parameter	2000PK		Units	Conditions	
P_{GM}	Maximum peak gate power	16		W	$T_J = T_J$ max., $t_p \leq 5$ ms	
$P_{G(AV)}$	Maximum average gate power	3.0			$T_J = T_J$ max., f = 50Hz, d% = 50	
I_{GM}	Max. peak positive gate current	3.0		A	$T_J = T_J$ max., $t_p \leq 5$ ms	
$+V_{GM}$	Maximum peak positive gate voltage	20		V	$T_J = T_J$ max., $t_p \leq 5$ ms	
$-V_{GM}$	Maximum peak negative gate voltage	5.0				
		TYP.	MAX.			
I_{GT}	DC gate current required to trigger	100	200	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
V_{GT}	DC gate voltage required to trigger	1.1	3.0	V	$T_J = 25°C$	
I_{GD}	DC gate current not to trigger	10		mA	$T_J = T_J$ max.	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
V_{GD}	DC gate voltage not to trigger	0.25		V		

2000 PK Series

Thermal and Mechanical Specifications

	Parameter	2000PK	Units	Conditions
T_J	Max.operating temperature range	125	°C	
T_{stg}	Max.storage temperature range	150		
$R_{th\ (J-C)}$	Max. thermal resistance, junction to case	0.015	K/W	DC operation double side cooled
$R_{th\ (C-HK)}$	Max. thermal resistance, case to heatsink	0.005	K/W	
F	Mounting force, ± 10%	24.5	KN	
wt	Approximate weight	425	g	
	Case style	K-PUK		See Outline Table

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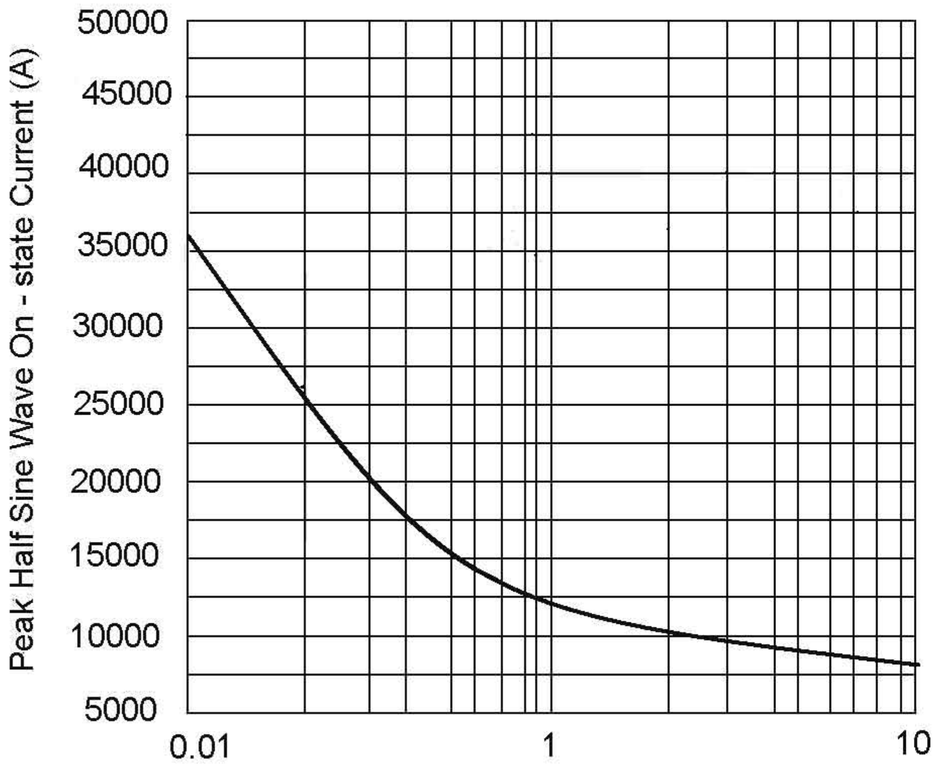

Fig. 1 - Maximum Non - Repetitive Surge Current

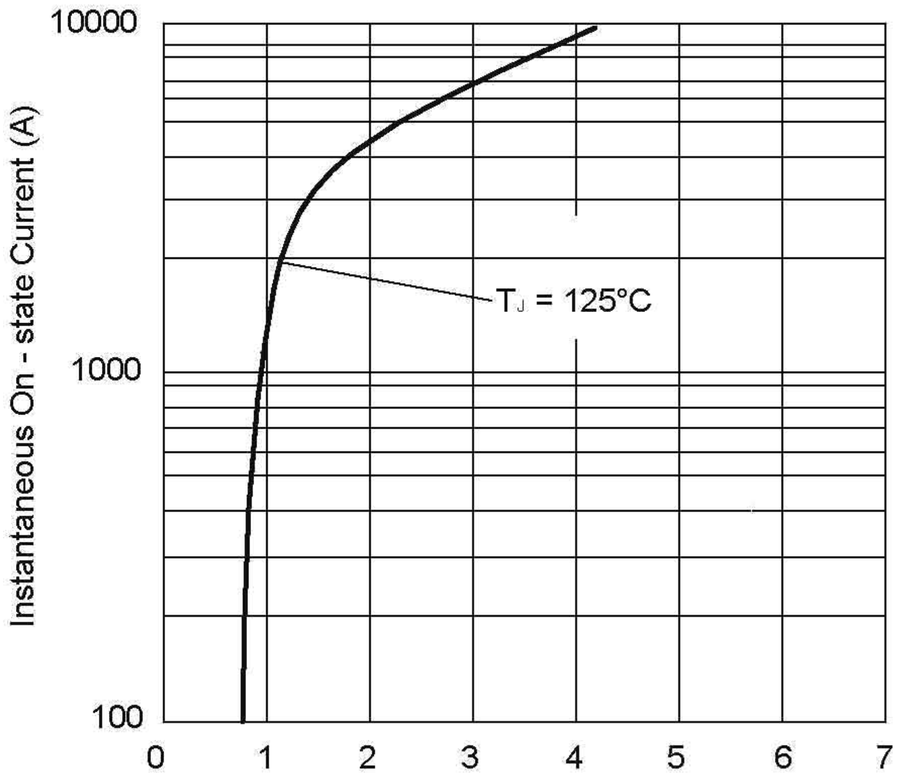

Fig. 2 - On - state Voltage Drop Characteristics

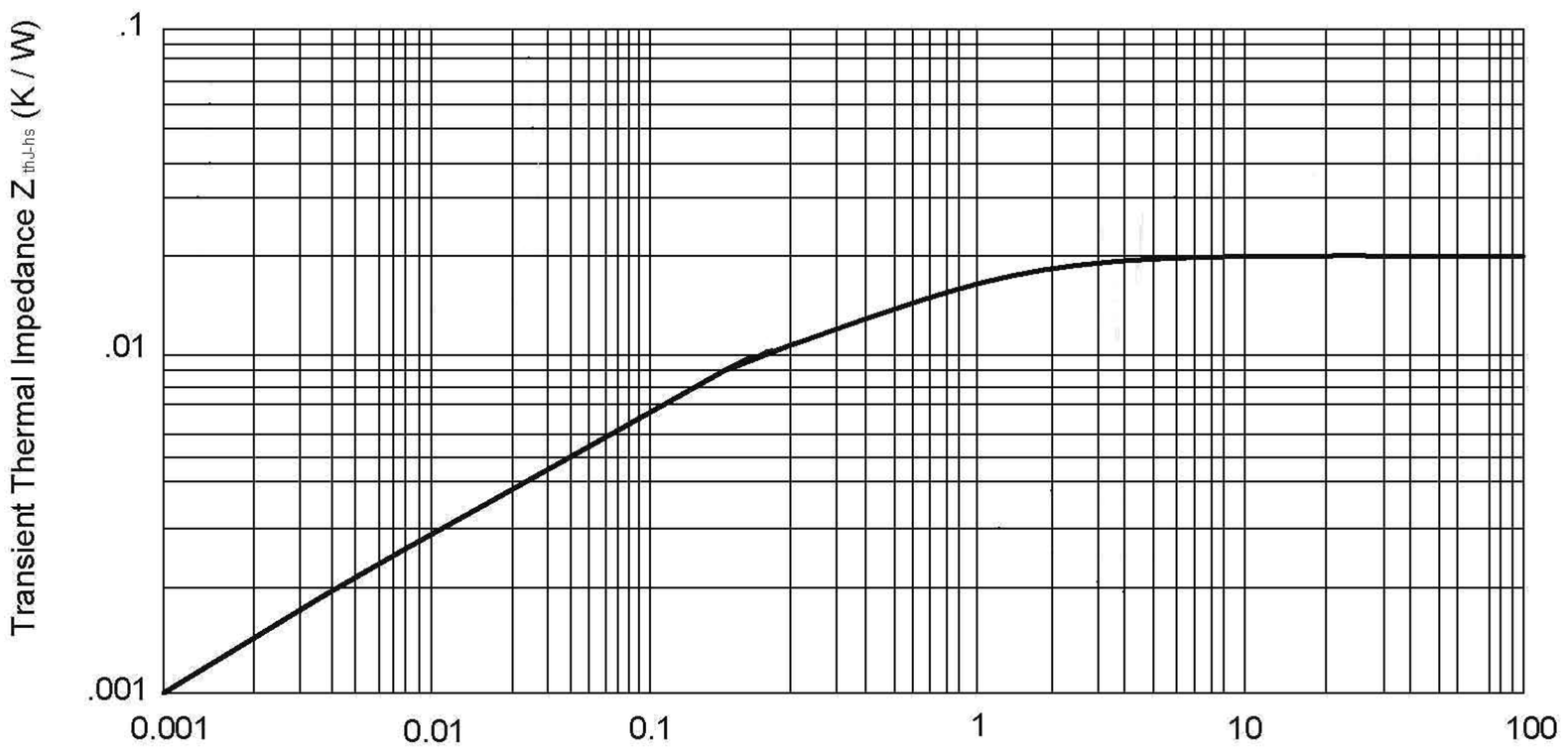

Fig. 3 - Thermal Impedance Z_{thJ-hs} Characteristics