



Ruttonsha International Rectifier Ltd.

HIGH POWER THYRISTOR

INVERTER GRADE THYRISTOR

Hockey Puk Version K-PUK SERIES 1050PK

Type : 1050 PK140 F To 1050 PK 200 F

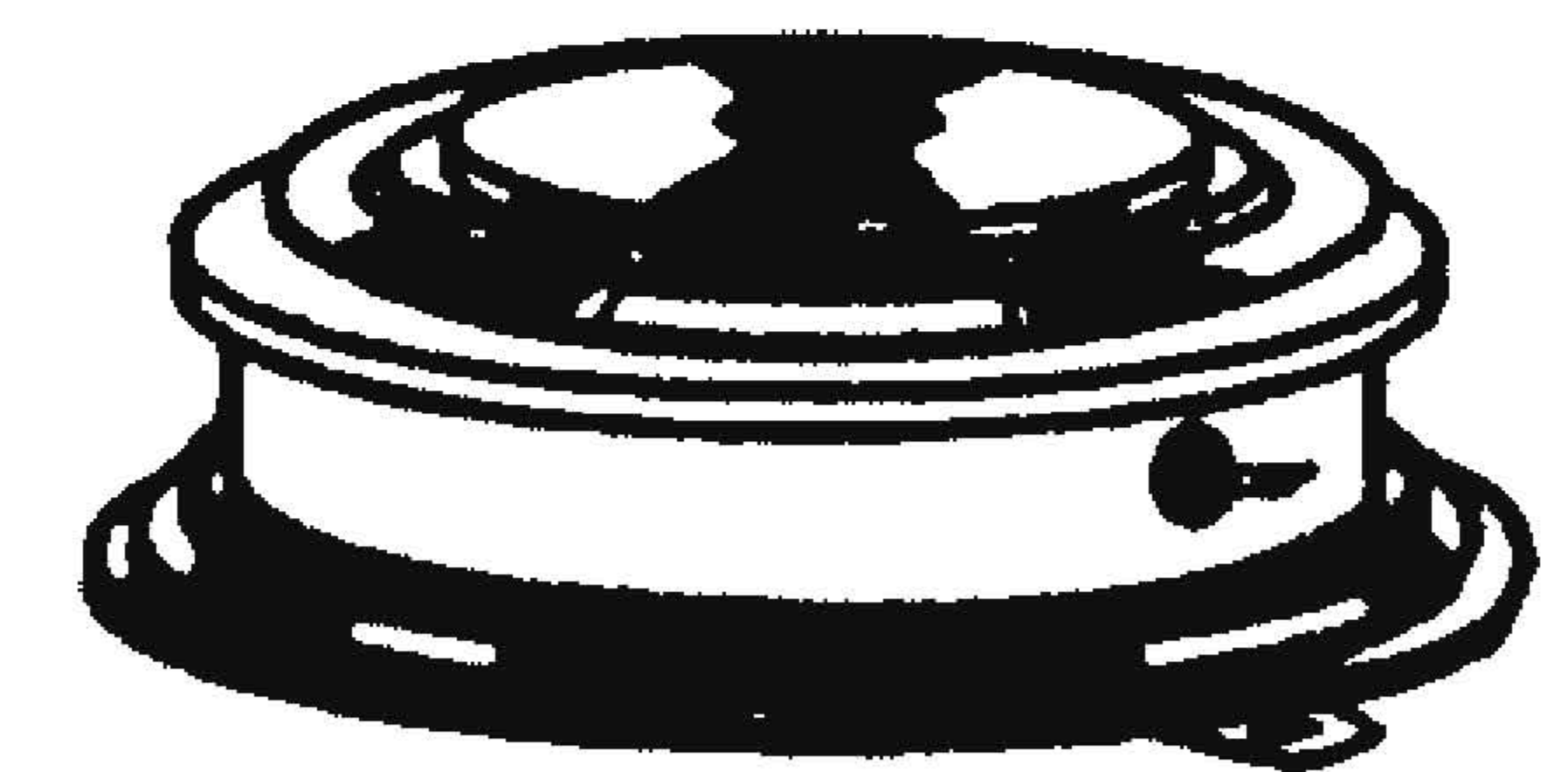
Features

- Low Switching loss at high frequency.
- 45 μ s maximum turn-off time with feedback diode.
- Involute, interdigitate gate

Typical Applications

- Inverters
- Choppers
- Induction heating
- All type of forced-Commutated converters

1050A



Case Style A- 24 (K-PUK)

Major Ratings and Characteristics :-

PARAMETERS	1050PK...F	UNITS
$I_{T(AV)}$	1050	A
@ T_{hs}	55	$^{\circ}$ C
$I_{T(RMS)}$	1648	A
@ T_{hs}	55	$^{\circ}$ C
I_{TSM}	12,000	A
@50Hz		
I^2t	720	KA^2s
V_{DRM} / V_{RRM}	1400 to 2000	V
T_q typical	40 to 45	μ s
T_J	125	$^{\circ}$ C

HIGH POWER THYRISTOR

Type : 1050 PK140 F To 1050 PK 200 F

Electrical Specifications

Voltage Ratings

Type Number	Voltage Code	V_{DRM}/V_{RRM} , max repetitive peak voltage V	V_{RSM} , maximum non-repetitive peak voltage V	I_{DRM}/I_{RRM} max. mA	
				25 ⁰ c	125 ⁰ c
	140	1400	1500	60	60
1050PK...F	160	1600	1700	60	60
	180	1800	1900	60	60
	200	2000	2100	60	60

On-state Conduction

	Parameter	1050PK...F	Units	Conditions
$I_{T(AV)}$	Max. average on-state current	1050	A	180° conduction, half sine wave
	@ Heatsink temperature	55	°C	double side cooled
$I_{T(RMS)}$	Max RMS on-state current	1648	A	DC @ 55°C heatsink temperature double side cooled
V_{TM}	Max. on-state voltage	2.10	V	$I_T=1000A$, $T_J=T_J$ max., Duty Cycle $\leq 0.01\%$

Switching

	Parameter	1050PK...F	Units	Conditions
di/dt	Max. Repetitive rate of rise of turned-on current	100	A/ μ s	$T_J=T_J$ max., $V_{DRM} = \text{rated } V_{DRM}$
t_d	Typical delay time	1.5	μ s	Switching from 140V, 20V, 10 ohm Gate 0.5 μ s rise time, $T_J = 25^\circ\text{C}$
t_q	Typical turn-off time	40 to 45	μ s	$T_J=T_J$ max., $I_T = 1000A$, $V_R = 50V$, di/dt=25A/us 80 % V_{DRM} Reapplied, dv/dt = 400 V / μ s, Gate bias = open During Turn-Off, Interval = 0V, 100 ohm, Duty Cycle $\leq 0.01\%$
V_o	Threshold Voltage	1.57	V	$T_J = T_J$ max.
r_T	Forward slop resistance	0.40		$T_J = T_J$ max.

Blocking

	Parameter	1050PK...F	Units	Conditions
dv/dt	Min. critical rate of rise of off-state voltage	500	V/ μ s	$T_J = T_J$ max. linear to 80% rated V_{DRM}
I_{RRM}	Max. peak reverse and off-state leakage current	60	mA	$T_J = T_J$ max., rated V_{DRM}/V_{RRM} applied

HIGH POWER THYRISTOR

Type : 1050 PK140 F To 1050 PK 200 F

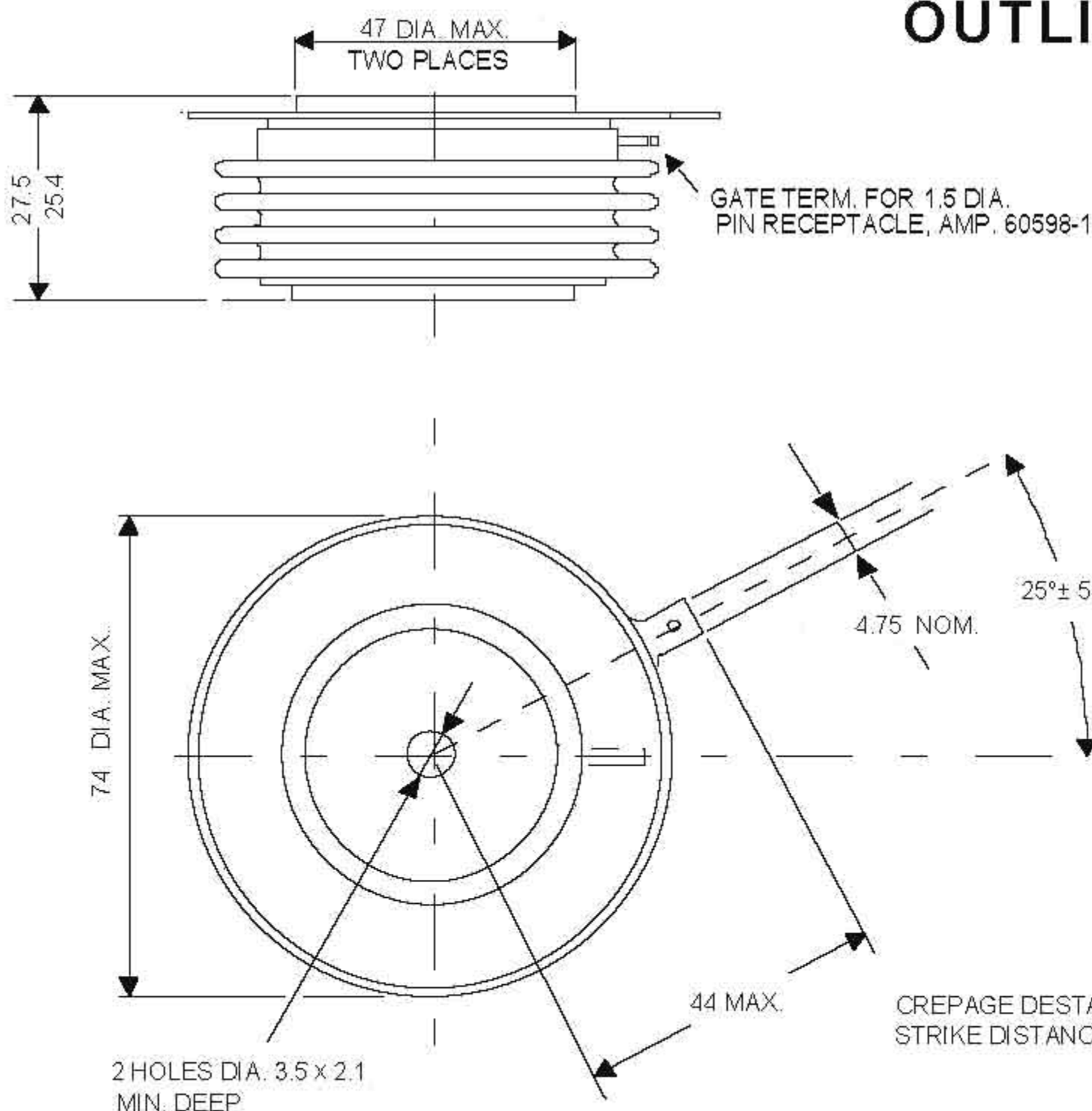
Triggering

Parameter	1050PK...F	Units	Conditions
P_{GM} Maximum peak gate power	100	W	$T_J = T_{Jmax.}$, $t_p \leq 5$ ms
$P_{G(AV)}$ Maximum average gate power	5	W	$T_J = T_{Jmax.}$, $f = 60$ Hz,
I_{GT} Max. DC gate current required to trigger	200	mA	$T_J = 25^\circ\text{C}$, $V_D = 10$ V dc $R_L = 3$ ohm
V_{GT} Max. DC gate voltage required to trigger	3.0	V	$T_J = 25^\circ\text{C}$, $V_D = 10$ V dc $R_L = 3$ ohm

Thermal and Mechanical Specifications

Parameter	1050PK...F	Units	Conditions
T_J Max. operating temperature range	125	$^\circ\text{C}$	
T_{stg} Max. storage temperature range	- 40 to +125	$^\circ\text{C}$	
R_{thJ-hs} Max. thermal resistance, junction to Heat sink	0.025	$^\circ\text{C/W}$	DC operation double side cooled
F Mounting force, $\pm 10\%$	24.5 (2500)	KN (Kg.)	
Case style	A-24 (K-PUK)		

OUTLINE DRAWING



SUGGESTED MOUNTING METHODS FOR PRESS-PAKS TO HEAT DISSIPATORS

To achieve a reliable and low thermal resistance interface when the press puk is assembled to a heat sink the following general instructions should be followed.

1. Check each mating surface for nicks, scratches, flatness and surface finish. The heat dissipator mating surfaces should be flat with .0005 inches and have a surface finish of 63 micro-inches.
2. It is recommended that the heat dissipator be plated with nickel or tin. Bare aluminum or copper surfaces will oxidize in time resulting in excessively high thermal resistance.
3. Sand each surface lightly with 600 grit paper just prior to assembly. Clean off and apply silicone grease (GE G623 or Dow Corning DC3, 4, 340 or 640). Clean off and apply again as a thin film. (A thick film will adversely affect the electrical and thermal resistances).
4. Assemble with the specified mounting force applied through a self-leveling, swivel connection. The force has to be evenly distributed over the full area. Center holes on both top and bottom of the press-puk are for locating purposes only.