Ruttonsha International Rectifier Ltd.

SILICON CONTROLLED RECTIFIERS

High Power Thyristor
Hockey Puk Version
S-PUK Series 3700PS

Types : 3700 PS 500

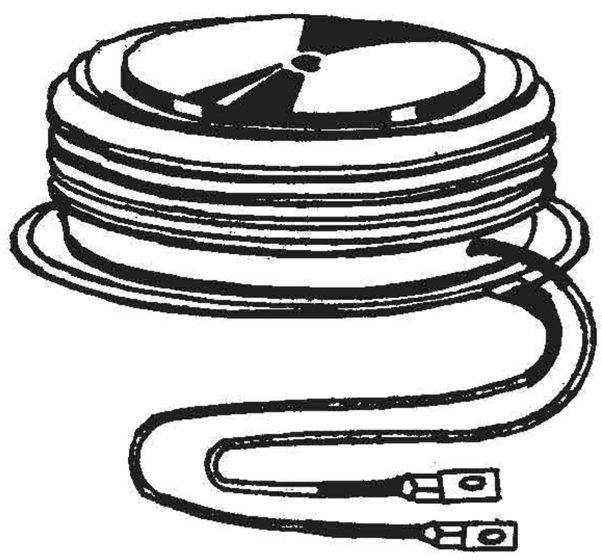
FEATURES

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

TYPICAL APPLICATIONS

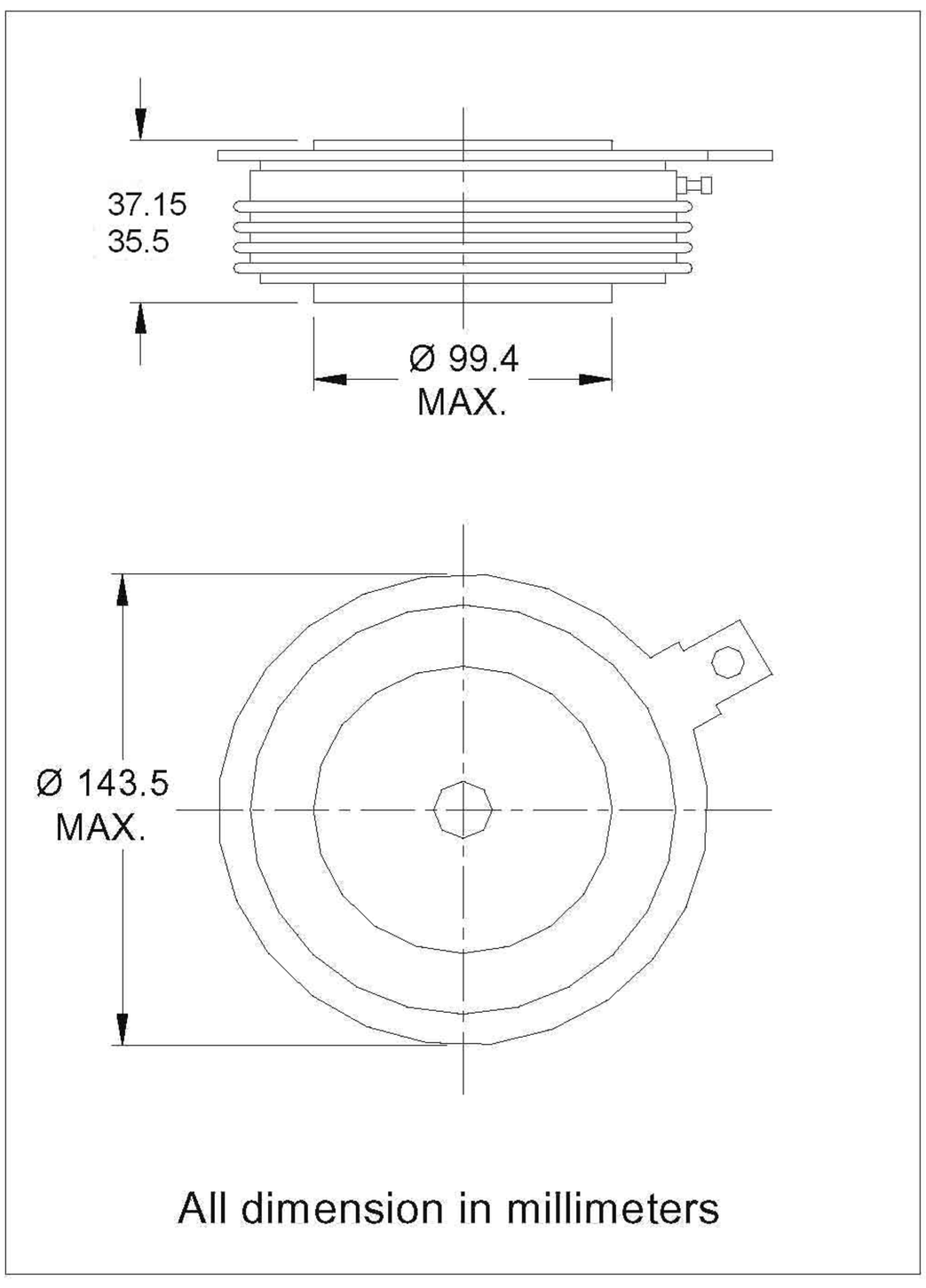
- *DC motor control (e.g. for machine tools).*
- *Controlled rectifiers (e.g. for battery charging, Uninterrupted Power Supply).*
- *AC controllers (e.g. for temperature control, lights control).*

3700 PS (S - PUK)



Major Ratings and Characteristics

Parameter		3700 PS	Units
$I_{T(AV)}$		3700	A
	@ T_{hs}	55	℃
$I_{T(RMS)}$		5809	A
	@ T_{hs}	55	℃
I_{TSM}	@ 50 Hz	50	KA
I^2t	@ 50 Hz	12500	KA^2s
V_{DRM}/V_{RRM}		5000	V
t_q	typical	500	µs
T_J		125	℃



All dimension in millimeters

ELECTRICAL SPECIFICATIONS

3700 PS 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
3700 PS	450	4500 / 4500	4600	500
	460	4600/4600	4700	
	470	4700/4700	4800	
	480	4800/4800	4900	
	490	4900/4900	5000	
	500	5000/5000	5100	

On - state Conduction

	Parameter	3700 PS	Units	Conditions		
$I_{T(AV)}$	Max. average on-state current	3700	A	180° conduction, half sine wave		
	@ Heatsink temperature	55	°C	double side cooled		
$I_{T(RMS)}$	Max RMS on-state current	5809	A	Double side cooled		
I_{TSM}	Max. peak, one-cycle non-repetitive surge current	50	KA	t = 10 ms	No voltage reapplied	Sinusoidal half wave, Initial $T_J=T_J$ max.
I^2t	Maximum I^2t for fusing	12500	KA^2s	t = 10 ms		
V_{TO}	Threshold voltage	1.0	V	$T_J=T_J$ max		
r_t	On-state slope resistance	0.19	mΩ	$T_J=T_J$ max.		
V_{TM}	Max. on state voltage	2.0	V	I_{PK} = 4000A,$T_J=T_J$ max, t_P = 10 ms sine pulse		
I_H	Maximum holding current	400	mA	T_J = 25°C , anode supply 12 V resistive load		
I_L	Typical latching current	1000	mA	T_J = 25°C , anode supply 12 V resistive load		

3700 PS Series

Switching

	Parameter	3700 PS	Units	Conditions
di/dt	Max. non-repetitive rate of rise of turned-on current	100	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	500	µs	I_{TM} =1000A, $T_J=T_J$ max. di/dt = 40A/µs ,V_R = 75V dv/dt = 50V/µs, 0.5 V_{DRM} Reapplied , t_p = 500µs

Blocking

	Parameter	3700 PS	Units	Conditions
dv/dt	Maximum critical rate of rise of off-state voltage	500	V/µs	$T_J = T_J$ max. linear to 80% rated V_{DRM}
I_{RRM} I_{DRM}	Max. peak reverse and off-state leakage current	500	mA	$T_J = T_J$ max. rated V_{DRM} /V_{RRM} applied

Triggering

	Parameter	3700 PS	Units	Conditions
P_{GM}	Maximum peak gate power	150	W	$T_J = T_J$ max., $t_p \leq 5$ ms
$P_{G(AV)}$	Maximum average gate power	10		$T_J = T_J$ max., f = 50Hz, d% = 50
I_{GM}	Max. peak positive gate current	30	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		
I_{GT}	DC gate current required to trigger	500	mA	T_J = 25°C
V_{GT}	DC gate voltage required to trigger	3.5	V	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

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		

Thermal and Mechanical Specifications

	Parameter	3700 PS	Units	Conditions
T_J	Max.operating temperature range	125	°C	
T_{stg}	Max.storage temperature range	125		
R_{thJ-hs}	Max. thermal resistance, junction to heatsink	0.007	K/W	DC operation double side cooled
F	Mounting force, ± 10% ,	65	KN	
wt.	Approximate weight	3000	g	
	Case style	S-PUK		See Outline Table