Ruttonsha International Rectifier Ltd.

SILICON CONTROLLED RECTIFIERS

High Power Thyristor
Hockey Puk Version
S-PUK Series 3000PS

Types : 3000 PS 520

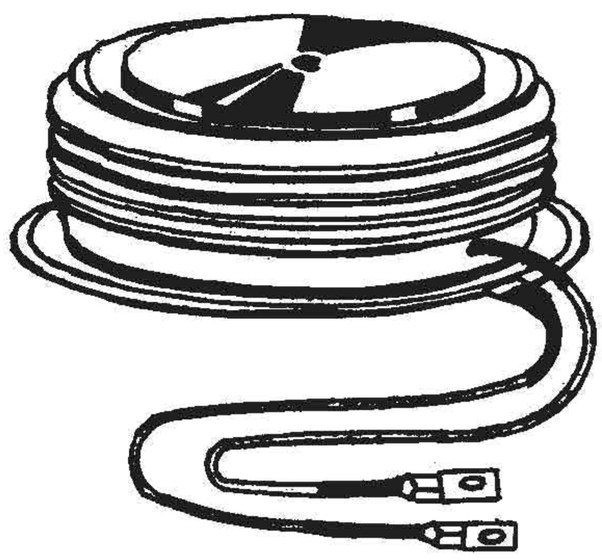
FEATURES

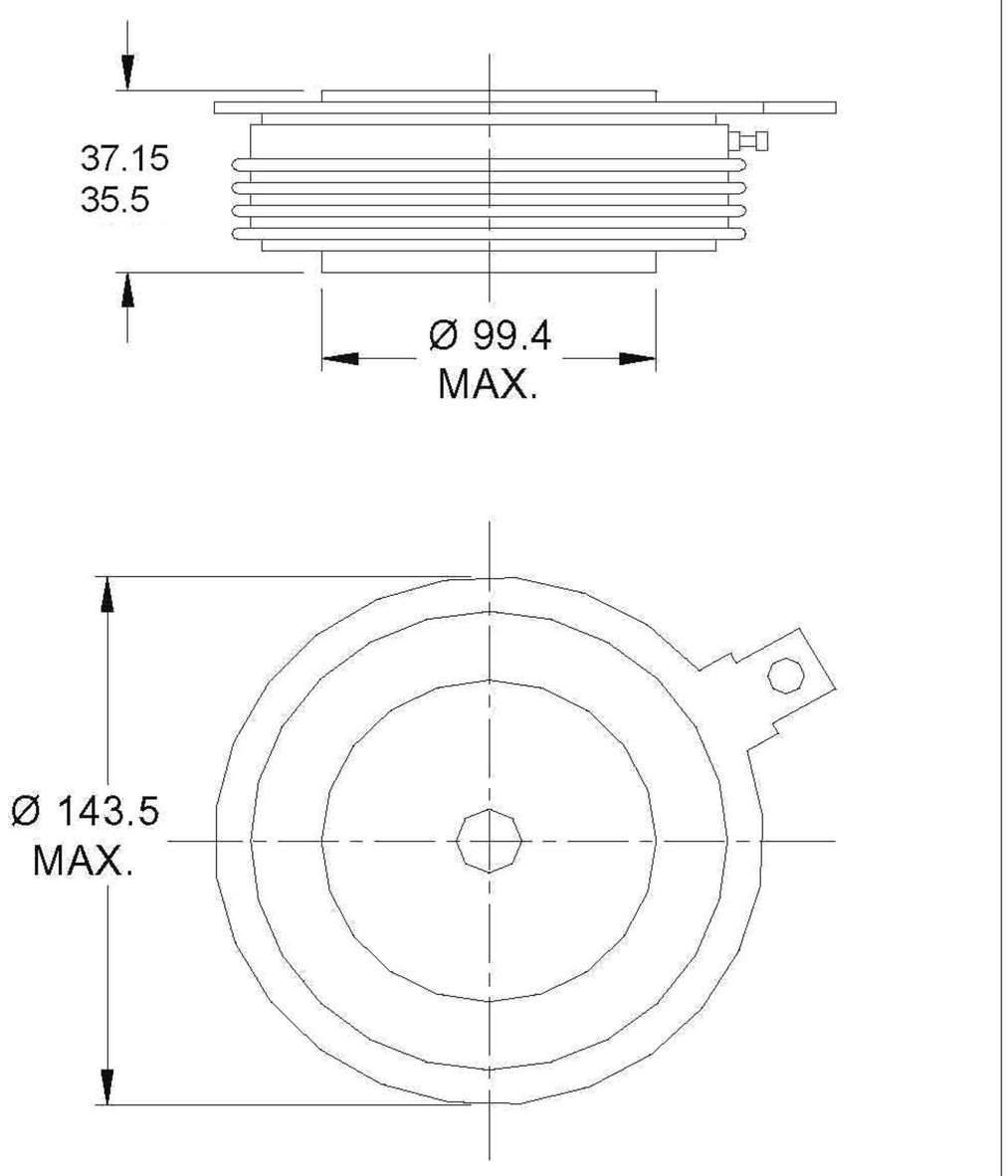
- *Center amplifying gate.*
- *Metal case with ceramic insulator*
- *High profile hockey - puk.*

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).*

3000 PS (S - PUK)





All dimension in millimeters

Major Ratings and Characteristics

Parameter		3000 PS	Units
$I_{T(AV)}$		3000	A
	@ T_{hs}	55	℃
$I_{T(RMS)}$		4710	A
	@ T_{hs}	55	℃
I_{TSM}	@ 50 Hz	54	KA
I^2t	@ 50 Hz	14580	KA^2s
V_{DRM}/V_{RRM}		5200	V
t_q	typical	500	µs
T_J		125	℃

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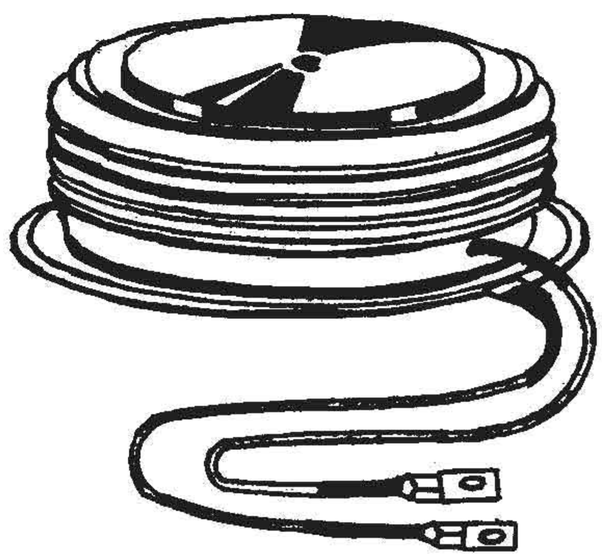

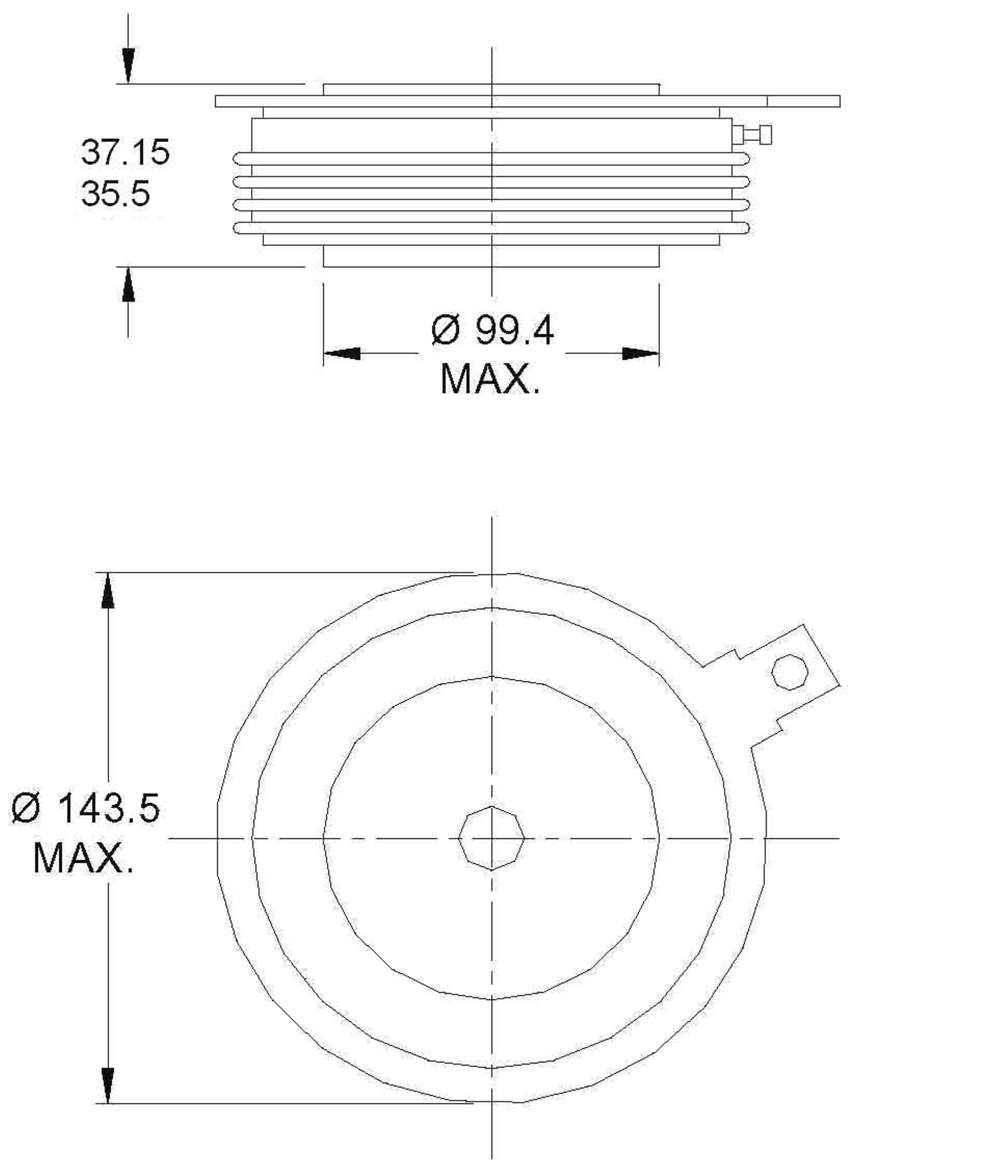

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ELECTRICAL SPECIFICATIONS

3000 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
3000PS	300	3000	3100	350
	360	3600	3700	
	420	4200	4300	
	480	4800	4900	
	520	5200	5300	

On - state Conduction

	Parameter	3000PS	Units	Conditions		
$I_{T(AV)}$	Max. average on-state current	3000	A	180° conduction, half sine wave		
	@ Heatsink temperature	55	°C	double side cooled		
$I_{T(RMS)}$	Max RMS on-state current	4710	A	DC@ 55°C heatsink temperature double side cooled		
I_{TSM}	Max. peak, one-cycle non-repetitive surge current	54	KA	t = 10 ms	No voltage reapplied	Sinusoidal half wave, Initial $T_J=T_J$ max.
I^2t	Maximum I^2t for fusing	14580	KA^2s	t = 10 ms	100% V_{RRM} reapplied	
$V_{T(TO)}$	Threshold voltage	0.81	V	$T_J=T_J$ max		
r_t	On-state slope resistance	0.341	mΩ	$T_J=T_J$ max.		
V_{TM}	Max. on state voltage	1.70	V	I_{PK} = 3000 A, $T_J=T_J$ 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		

3000 PS Series

Switching

	Parameter	3000PS	Units	Conditions
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
di/dt	Max. non-repetitive rate of rise of turned-on current	100	A/µs	IFG = 2A, t_r = 0.5µs, I_{TRM} = 4500A T_J=T_J max. anode voltage ≤ 67 % V_{DRM}

Blocking

	Parameter	3000PS	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	350	mA	T_J = T_J max. rated V_{DRM} /V_{RRM} applied

Triggering

	Parameter	3000PS	Units	Conditions
P_{GM}	Maximum peak gate power	50	W	T_J = T_J max., t_p ≤ 5 ms
$-V_{GM}$	Maximum peak negative gate voltage	5.0	V	T_J = T_J max., t_p ≤ 5 ms
I_{GT}	DC gate current required to trigger	300	mA	T_J = 25°C
V_{GT}	DC gate voltage required to trigger	3.0	V	T_J = 25°C
I_{GD}	DC gate current not to trigger	10	mA	T_J = T_J max.
V_{GD}	DC gate voltage not to trigger	0.4	V	T_J = T_J max.

Max.required gate trigger/ current/voltage are the lowest value which will trigger all units 12 V anode-to-cathode applied

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

Thermal and Mechanical Specifications

	Parameter	3000PS	Units	Conditions
T_J	Max.operating temperature range	125	°C	
T_{stg}	Max.storage temperature range	150		
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

3000 PS Series

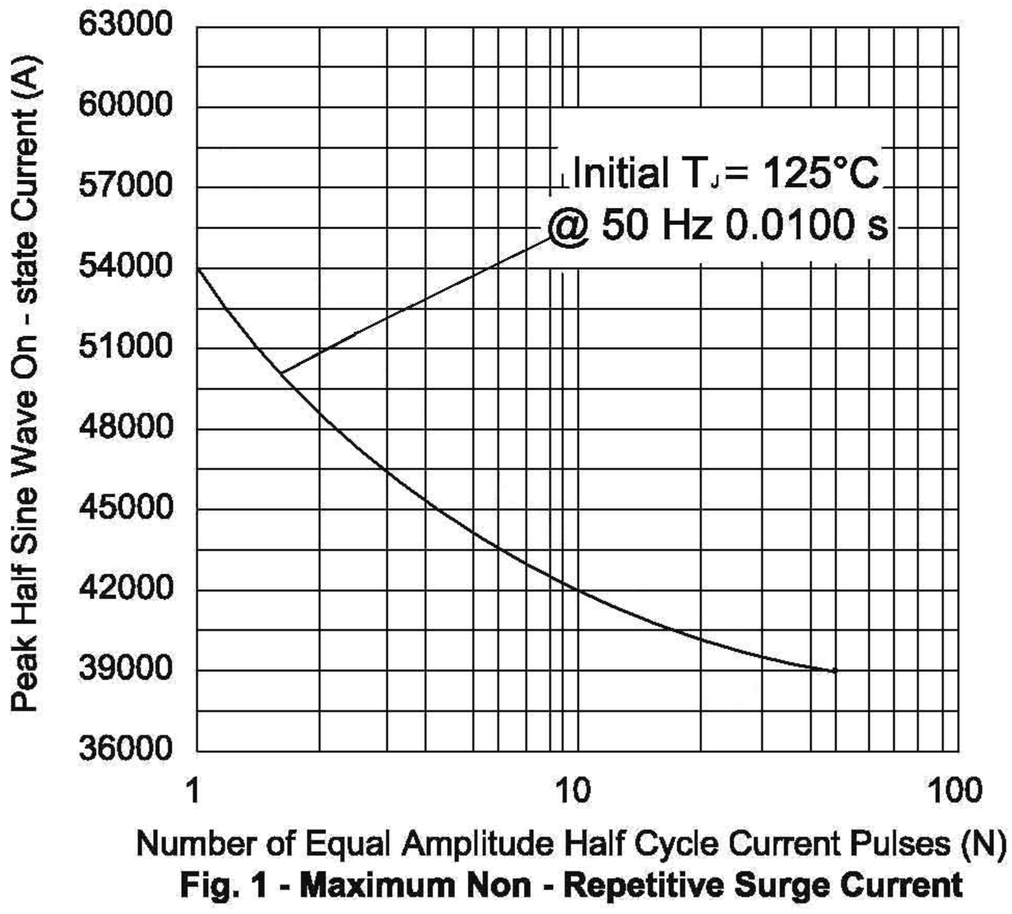

Fig. 1 - Maximum Non - Repetitive Surge Current

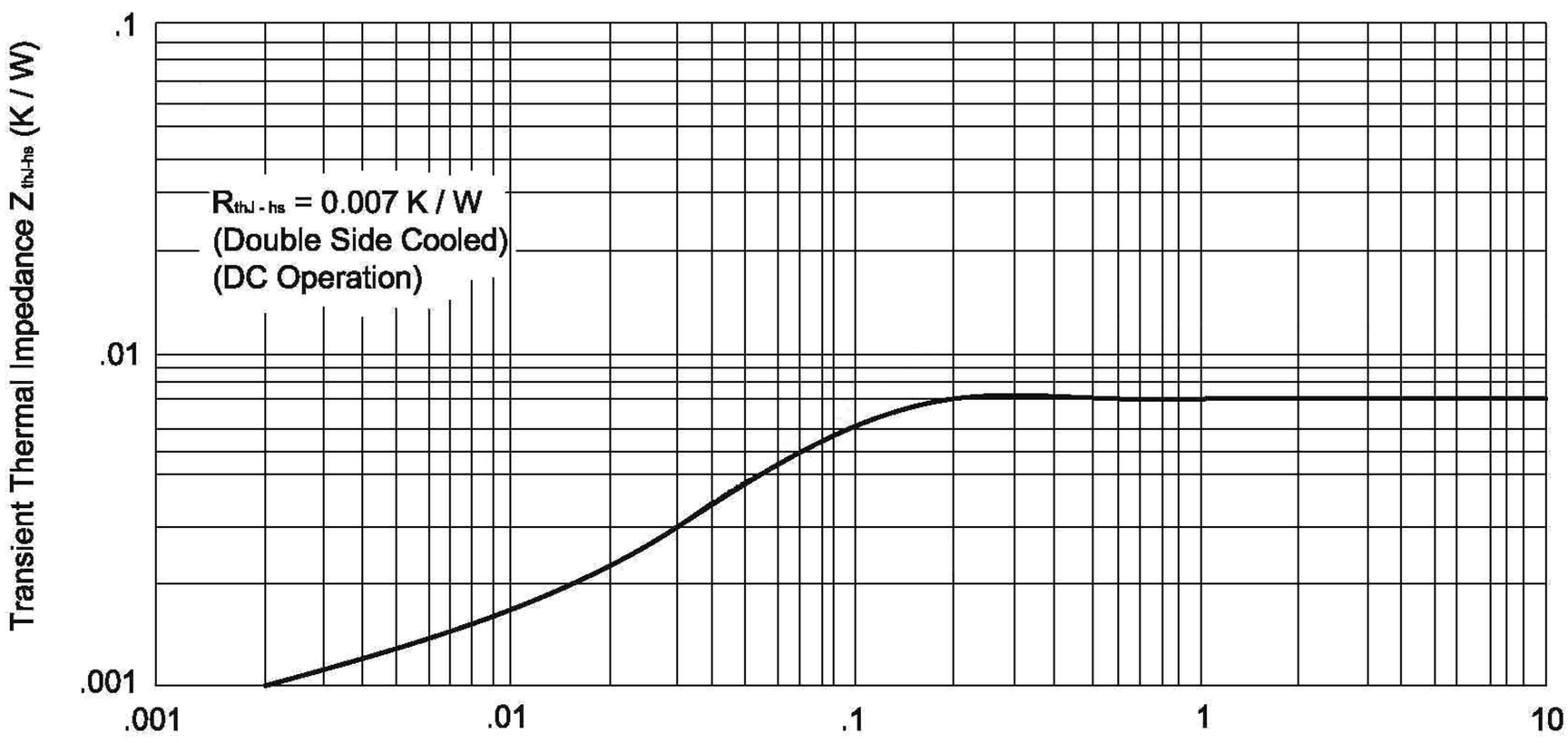

Fig. 2 - Thermal Impedance Z_{thJ-hs} Characteristics

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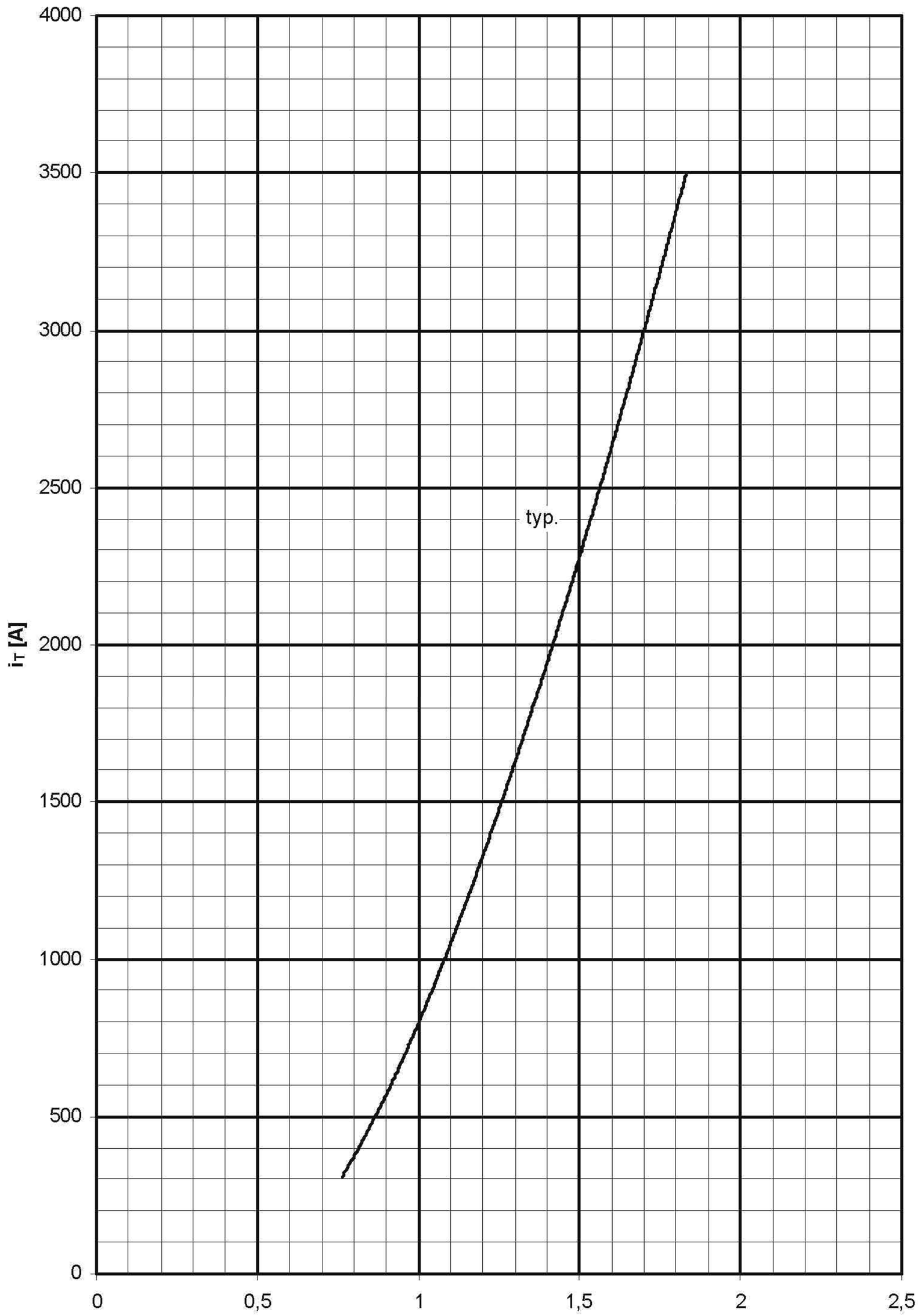

Limiting on-state characteristic $i_T = f(v_T)$

$T_{vj} = T_{vj\ max}$