S.C.O.M.E.S. S.R.L.
SOCIETA'COSTRUZIONE MATERIALI
ELETTRONICI E STRUMENTAZIONE

SCT 280...
PLASTIC CASE

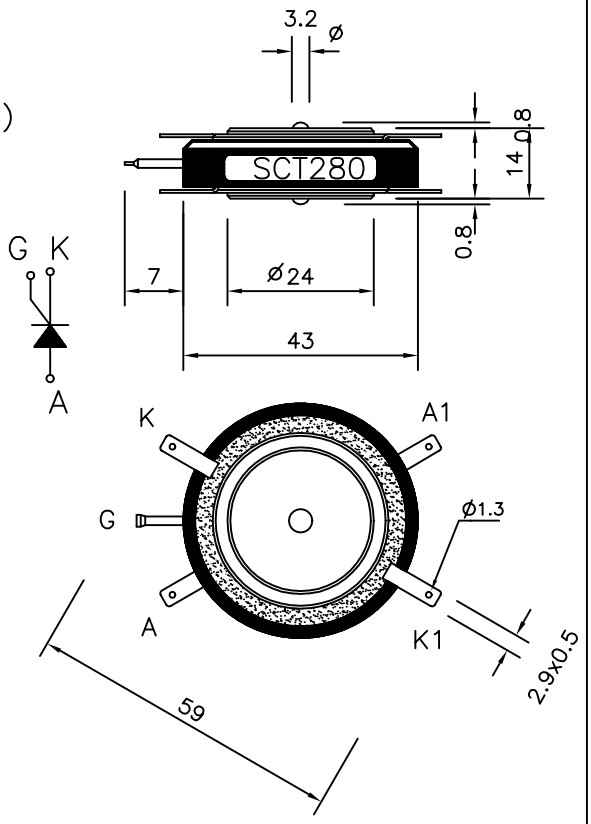
HIGH POWER THYRISTOR
500A (AV)
Hockey Puk version

Features

- Extended temperature range
- Center amplifying gate
- A . K – A1 . K1, AVAILABLE
- Pin of centering AVAILABLE.
- WEIGHT: 75 gr. (approxim.)

Typical Applications

- Welding
- DC motor control (e.g. for machine tools)
- Controlled rectifiers (e.g. for battery charging.UPS)
- AC controllers (e.g. for temperature control,ligths control)



Ratings and Characteristics

Parameters		SCT280	Units
$I_{T(AV)}$		500	A
	@ T_{hs}	85	°C
$I_{T(RMS)}$		950	A
	@ T_{hs}	22	°C
I_{TSM}	@ 50Hz	7800	A
	@ 60Hz	8200	A
I^2t	@ 50Hz	305	KA^2s
	@ 60Hz	280	KA^2s
V_{DRM}/V_{RRM}		200 to 600	V
t_q	typical	100	µs
T_j		–40 to 125	°C

SCT280 .-- .-- .-

Voltage Code	V_{DRM}/V_{DRM}, max.repetitive peak and off-state voltage	Current Code	I_{GT} Trigger current	Internal SCOMES Reference
02	200 V	04	40 mA	
04	400 V	06	60 mA	
06	600 V	08	80 mA	
––	–––––	10	100 mA	
––	–––––	12	120 mA	
––	–––––	14	140 mA	
––	–––––	16	160 mA	
––	–––––	18	180 mA	
––	–––––	20	200 mA	
––	–––––	22	220 mA	

ELECTRICAL SPECIFICATIONS

On-state Conduction

Parameter		SCT280	Units	Conditions		
$I_{T(AV)}$	Max. average on-state current @ Heatsink temperature	500(185)	A	180° conduction,half sine wave		
		50(85)	°C	double side (single side) cooled		
$I_{T(RMS)}$	Max. RMS on-state current	955	A	@ 25°C heatsink temperature (double side cooled)		
I_{TSM}	Max. peak,one-cycle non-repetitive surge current	7800	A	t=10ms	No voltage reapplied	Sinusoidal half wave, Initial $T_J = T_J$ max.
		8200		t=8.3ms		
		6550		t=10ms	100% V_{RRM} reapplied	
		6850		t=8.3ms		
I^2t	Maximum I^2t for fusing	305	KA^2s	t=10ms	No voltage reapplied	
		280		t=8.3ms		
		215		t=10ms	100% V_{RRM} reapplied	
		195		t=8.3ms		
$I^2\sqrt{t}$	Maximum $I^2\sqrt{t}$ for fusing	3070	$KA^2\sqrt{s}$	t=0.1 to 10ms, no voltage reapplied		
$V_{T(TO)1}$	Low level value of threshold voltage	0.84	V	$(16.7\%x\pi xI_{F(AV)} < I < \pi xI_{F(AV)})$, $T_J = T_J$ max.		
$V_{T(TO)2}$	High level value of threshold voltage	0.88		$(\pi xI_{F(AV)} < I < 20x\ \pi x\ I_{F(AV)})$, $T_J = T_J$ max.		
r_{t1}	Low level value of on-state slope resistance	0.50	mΩ	$(16.7\%x\pi xI_{F(AV)} < I < \pi xI_{F(AV)})$, $T_J = T_J$ max.		
r_{t2}	High level value of on-state slope resistance	0.47		$(\pi xI_{F(AV)} < I < 20x\ \pi x\ I_{F(AV)})$, $T_J = T_J$ max.		
V_{TM}	Max. on-state voltage	1.6	V	I_{pk} = 1050A, T_J = 150°C, t_p = 10ms sine pulse		
I_H	Maximum holding current	600	mA	T_J = 25°C,anode supply 12V resistive load		
I_L	Latching current	1000				

Switching

Parameter		SCT280	Units	Conditions
di/dt	Max.non repetitive rate of rise of turned-on current	1000	A/µs	Gate drive 20V,20Ω $t_r \leq$ 1 µs T_J =150°C,anode voltage $\leq$ 80% V_{DRM}
t_d	Typical delay time	1.0	µs	Gate current 1A,di_g/dt = 1A/µs V_d = 0.67% V_{DRM}, T_J = 25°C
t_q	Typical turn-off time	100		I_{TM}= 300A, T_J= 150°C,di/dt=20A/µs,V_R=50V dv/dt = 20V/µs,Gate 0V 100Ω,t_p= 500µs

Blocking

Parameter		SCT280	Units	Conditions
dv/dt	Maximum critical rate of rise of off-state voltage	500	V/µs	T_J = 150°C linear to 80% rated V_{DRM}
I_{RRM} I_{DRM}	Max. peak reverse and off-state leakage current	30	mA	T_J = 150°C, rated V_{DRM}/V_{RRM} applied

Triggering

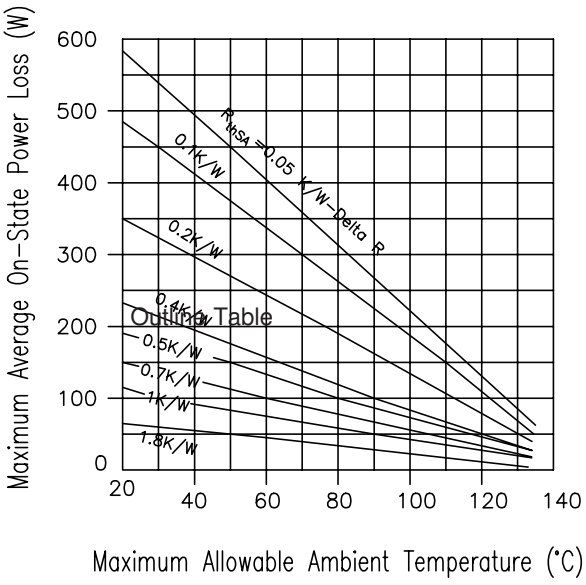
Parameter		SCT280		Units	Conditions	
P_{GM}	Maximum peak gate power	10.0		W	T_J = 150°C, $t_p \leq 5$ms	
$P_{G(AV)}$	Maximum average gate power	2.0		W	T_J = 150°C, f = 50HZ, d% =50	
I_{GM}	Max. peak positive gate current	3.0		A	T_J = 150°C, $t_p \leq 5$ms	
$+V_{GM}$	Maximum peak positive gate voltage	20		V	T_J = 150°C, $t_p \leq 5$ms	
$-V_{GM}$	Maximum peak negative gate voltage	5.0		V		
		TYP.	MAX.			
I_{GT}	DC gate current required to trigger	180	–	mA	T_J = −40°C	Max. required gate trigger/current/voltage are the lowest value which will trigger all units 12V anode-to-cathode applied
		90	150		T_J = 25°C	
		30	–		T_J = 150°C	
V_{GT}	DC gate current required to trigger	2.9	–	V	T_J = −40°C	
		1.8	3.0		T_J = 25°C	
		1.2	–		T_J = 150°C	
I_{GD}	DC gate current not to trigger	10		mA	T_J = 150°C	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	0.3		V		

Thermal and Mechanical Specification

Parameter		SCT280	Units	Conditions
T_J	Max.operating temperature range	−40 to 150	°C	
T_{stg}	Max.storage temperature range	−40 to 150		
R_{thJ-hs}	Max.thermal resistance, junction to heatsink	0.15 0.09	K/W	DC operation single side cooled DC operation double side cooled
F	Mounting force, ±10%	5000	N	

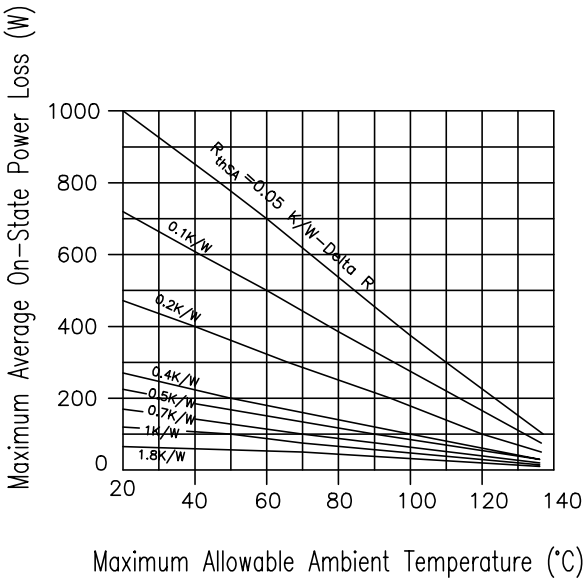
SCT280:Power Loss Versus Ambient Temperature;

Tj max.=150°C, RthJ-hs = 0.18 K/W (Single Side Cooled)



SCT280:Power Loss Versus Ambient Temperature;

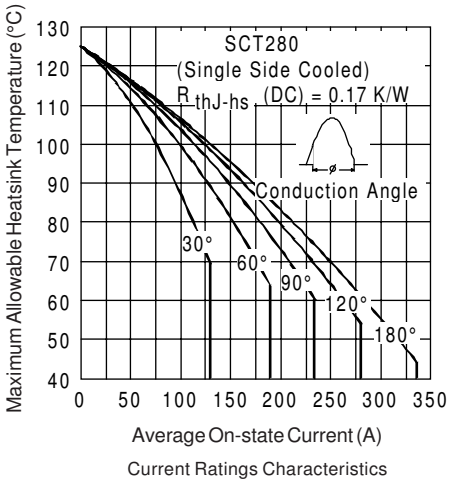
Tj max.=150°C, RthJ-hs = 0.09 K/W (Double Side Cooled)



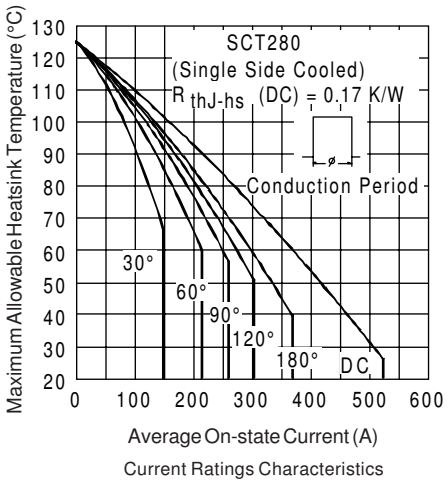
ΔR_{thJ-hs} Conduction

(The following table shows the increment of thermal resistence R_{thJ-hs} when devices operate at different conduction angles than DC)

Conduction angle	Sinusoidal conduction		Rectangular conduction		Units	Conditions
	Single Side	Double Side	Single Side	Double Side		
180°	0.017	0.018	0.012	0.012	K/W	$T_J = T_J$ max.
120°	0.020	0.020	0.020	0.020		
90°	0.025	0.025	0.027	0.027		
60°	0.037	0.037	0.038	0.039		
30°	0.063	0.063	0.063	0.064		



Current Ratings Characteristics



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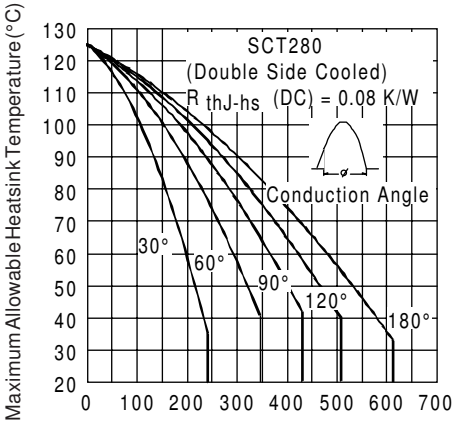

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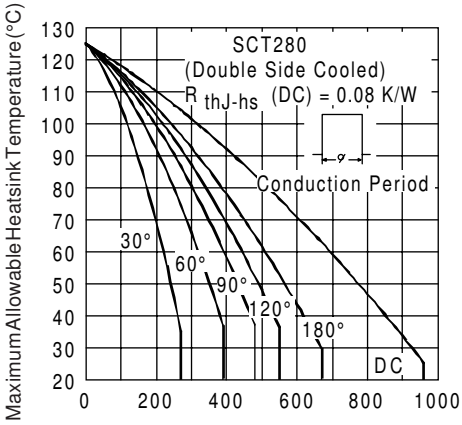

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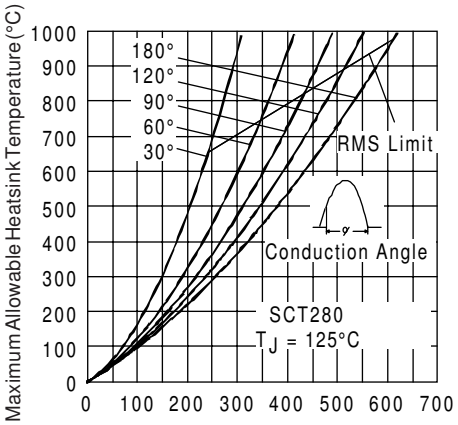
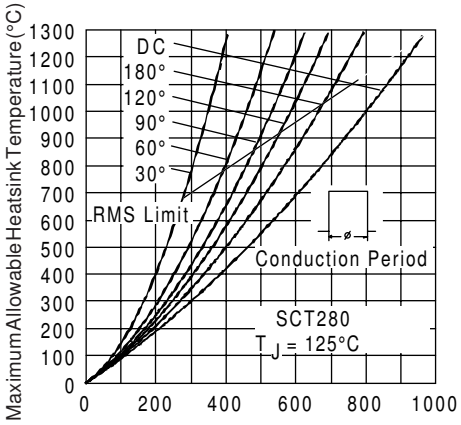


On-state Power Loss Characteristics



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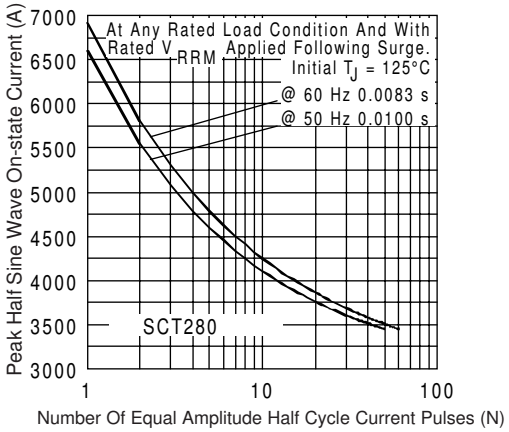
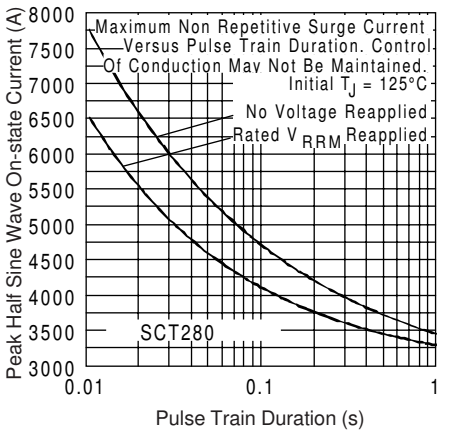


Maximum Non-Repetitive Surge Current
Single and Double Side Cooled



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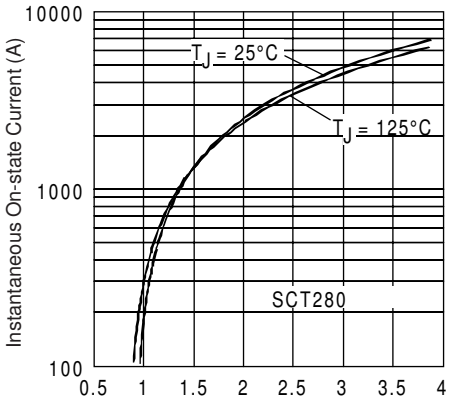
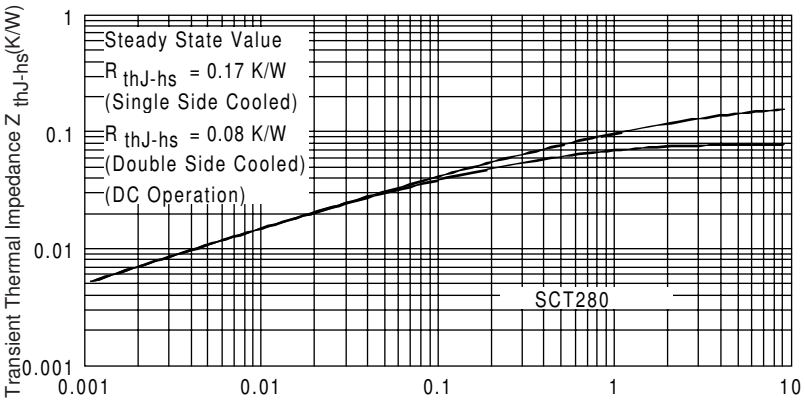
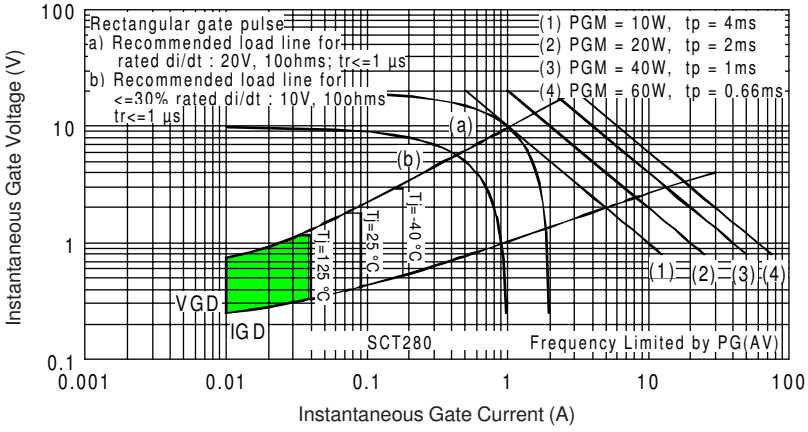
Single and Double Side Cooled



On-state Voltage Drop Characteristics



Thermal Impedance Z_{thJ-hs} Characteristics



Gate Characteristics