

SCT 180...

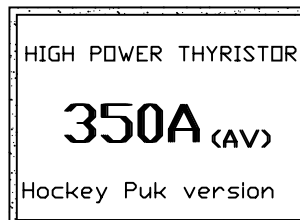
PLASTIC CASE

Features

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

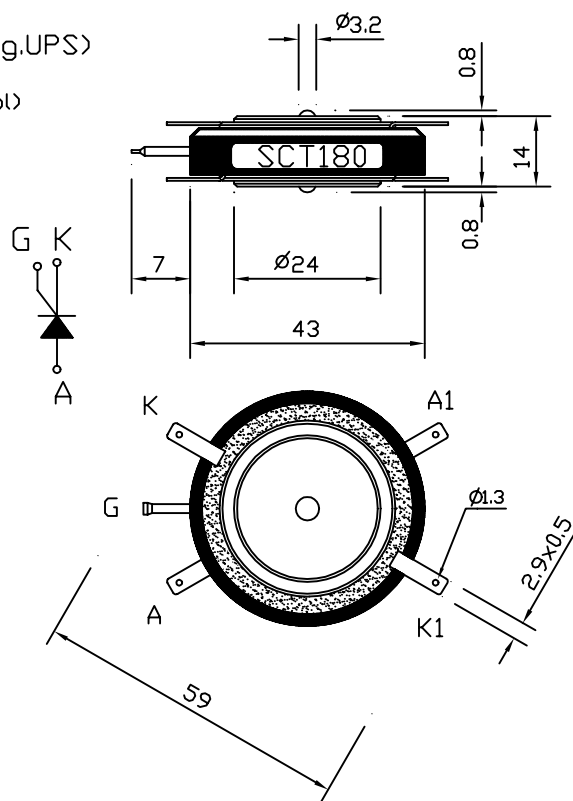
Typical Applications

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



Ratings and Characteristics

Parameters	SCT180	Units
$I_{T(AV)}$	350	A
	@ T_{hs} 55	°C
$I_{T(RMS)}$	650	A
	@ T_{hs} 25	°C
I_{TSM}	@ 50Hz 4950	A
	@ 60Hz 5200	A
	@ 50Hz 120	KA ² s
I^2t	@ 60Hz 110	KA ² s
	V_{DRM}/V_{RRM} 200 to 600	V
t_q typical	100	μs
T_J	-40 to 125	°C



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Voltage Code	V_{DRM}/V_{RRM} 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	SCT180	Units	Conditions	
$I_{T(AV)}$ Max. average on-state current @ Heatsink temperature	350(140)	A	180° conduction, half sine wave double side (single side) cooled	
	55(85)	°C		
$I_{T(RMS)}$ Max. RMS on-state current	650	A	@ 25°C heatsink temperature (double side cooled)	
I_{TSM} Max. peak, one-cycle non-repetitive surge current	4950		t=10ms	No voltage
	5200		t=8.3ms	reapplied
	4100		t=10ms	100% V_{RRM}
	4300		t=8.3ms	reapplied
$I^2 t$ Maximum $I^2 t$ for fusing	120	KA ² s	t=10ms	No voltage
	111		t=8.3ms	reapplied
	85		t=10ms	100% V_{RRM}
	80		t=8.3ms	reapplied
$I^2 \sqrt{t}$ Maximum $I^2 \sqrt{t}$ for fusing	1240	KA ² √s	t=0.1 to 10ms, no voltage reapplied	
$V_{T(TD)1}$ Low level value of threshold voltage	1.08	V	$(16.7\% \times I_{F(AV)} < I < 20 \times I_{F(AV)})$, $T_J = T_J \text{ max.}$	
$V_{T(TD)2}$ High level value of threshold voltage	1.14		$(I < 20 \times I_{F(AV)} < I_{F(AV)})$, $T_J = T_J \text{ max.}$	
r_{t1} Low level value of on-state slope resistance	1.18	mΩ	$(16.7\% \times I_{F(AV)} < I < 20 \times I_{F(AV)})$, $T_J = T_J \text{ max.}$	
r_{t2} High level value of on-state slope resistance	1.14		$(I < 20 \times I_{F(AV)} < I_{F(AV)})$, $T_J = T_J \text{ max.}$	
V_{TM} Max. on-state voltage	1.96	V	$I_{pk} = 750 \text{ A}$, $T_J = 125^\circ\text{C}$, $t_p = 10\text{ms}$ sine pulse	
I_H Maximum holding current	600	mA	$T_J = 25^\circ\text{C}$, anode supply 12V resistive load	
I_L Latching current	1000			

Switching

Parameter	SCT180	Units	Conditions
di/dt Max. non repetitive rate of rise of turned-on current	1000	A/μs	Gate drive 20V, 20Ω , $t_r \leq 1\mu\text{s}$ $T_J = 125^\circ\text{C}$, anode voltage $< 80\% V_{DRM}$
t_d Typical delay time	1.0	μs	Gate current 1A, $di/dt = 1\text{A}/\mu\text{s}$ $V_g = 0.67\% V_{DRM}$, $T_J = 25^\circ\text{C}$
t_q Typical turn-off time	100		$I_{TM} = 300\text{A}$, $T_J = 125^\circ\text{C}$, $di/dt = 20\text{A}/\mu\text{s}$, $V_R = 50\text{V}$ $dv/dt = 20\text{V}/\mu\text{s}$, Gate 0V 100Ω , $t_p = 500\mu\text{s}$

⊕ Blocking

Parameter	SCT180	Units	Conditions
dv/dt Maximum critical rate of rise of off-state voltage	500	V/ μ s	$T_J = 125^\circ\text{C}$ linear to 80% rated V_{DRM}
I_{RRM} / I_{DRM} Max. peak reverse and off-state leakage current	30	mA	$T_J = 125^\circ\text{C}$, rated V_{DRM} / V_{RRM} applied

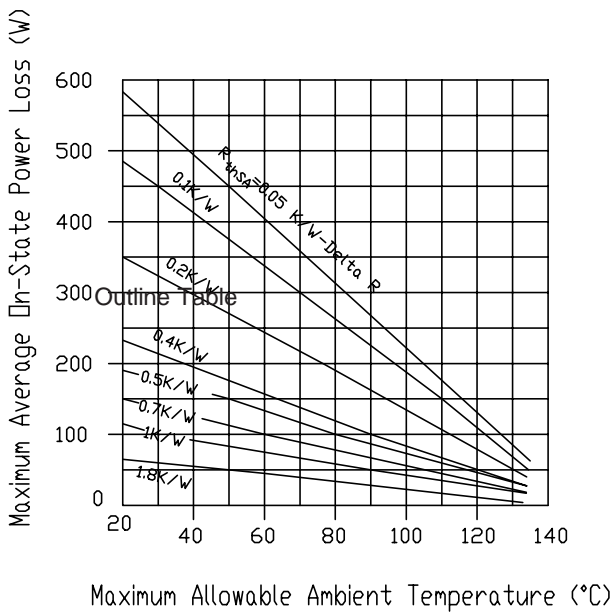
⊕ Triggering

Parameter	SCT180	Units	Conditions	
P_{GM} Maximum peak gate power	10.0	W	$T_J = 125^\circ\text{C}$, $t_p \leq 5\text{ms}$	
$P_{G(AV)}$ Maximum average gate power	2.0		$T_J = 125^\circ\text{C}$, $f = 50\text{Hz}$, $d\% = 50$	
I_{GM} Max. peak positive gate current	3.0	A	$T_J = 125^\circ\text{C}$, $t_p \leq 5\text{ms}$	
$+V_{GM}$ Maximum peak positive gate voltage	20	V	$T_J = 125^\circ\text{C}$, $t_p \leq 5\text{ms}$	
$-V_{GM}$ Maximum peak negative gate voltage	5.0			
I_{GT} DC gate current required to trigger	TYP.	MAX.	mA	$T_J = -40^\circ\text{C}$ $T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$ Max. required gate trigger/current/voltage are the lowest value which will trigger all units 12V anode-to-cathode applied
	180	-		
	90	150		
V_{GT} DC gate current required to trigger	2.9	-	V	$T_J = -40^\circ\text{C}$ $T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$
	1.8	3.0		
	1.2	-		
I_{GD} DC gate current not to trigger	10	mA	$T_J = 125^\circ\text{C}$	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	0.25	V		

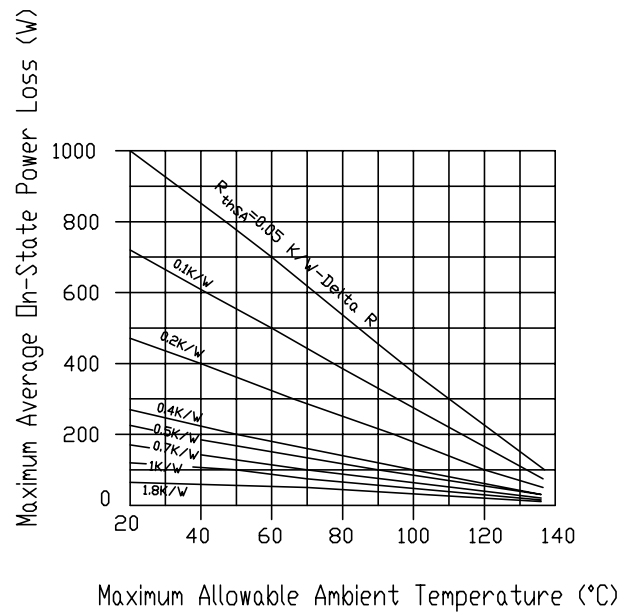
⊕ Thermal and Mechanical Specification

Parameter	SCT180	Units	Conditions
T_J Max. operating temperature range	-40 to 125	°C	
T_{stg} Max. storage temperature range	-40 to 125		
R_{thJ-HS} Max. thermal resistance, junction to heatsink	0.19 0.10	K/W	DC operation single side cooled DC operation double side cooled
F Mounting force, $\pm 10\%$ side cooled	4900 (500)	N (Kg)	

SCT180:Power Loss Versus Ambient Temperature;
T_J max.=150°C, R_{thJ-hs} = 0.18 K/W (Single Side Cooled)



SCT180:Power Loss Versus Ambient Temperature;
T_J max.=150°C, R_{thJ-hs} = 0.09 K/W (Double Side Cooled)



ΔR_{thJ-hs} Conduction

(The following table shows the increment of thermal resistance 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°	0.015	0.016	0.012	0.012	K/W	T _J = T _J max.
120°	0.019	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		

