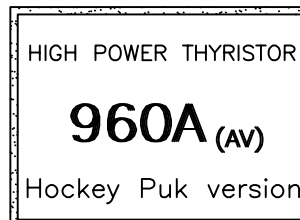


### Features

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

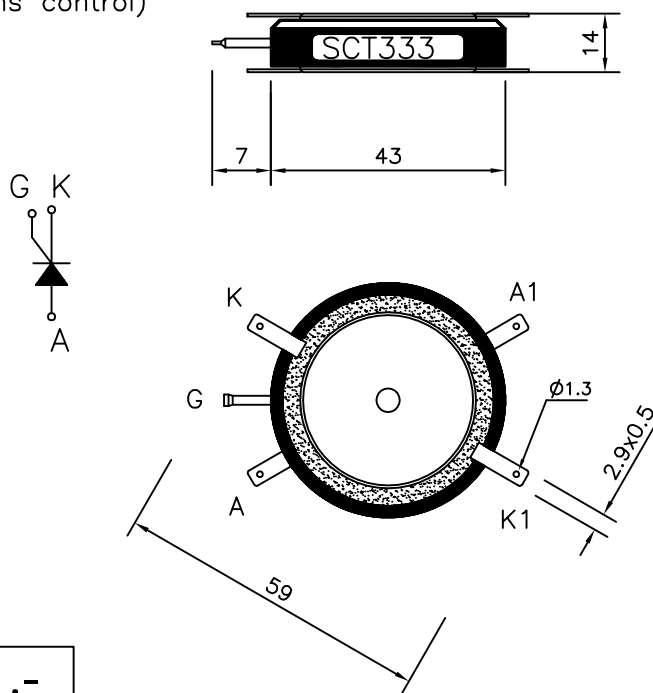
### Typical Applications

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



### Ratings and Characteristics

Parameters	SCT333	Units
$I_{T(AV)}$	960	A
	@ $T_{hs}$	55 °C
$I_{T(RMS)}$	220	A
	@ $T_{hs}$	25 °C
$I_{TSM}$	@ 50Hz	12.500 A
	@ 60Hz	13.000 A
$I^2t$	@ 50Hz	782 $KA^2s$
	@ 60Hz	713 $KA^2s$
$V_{DRM}/V_{RRM}$	200 to 600	V
$t_q$	typical	100 $\mu s$
$T_j$		-40 to 125 °C



SCT333 .-- .-- .-

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	SCT333	Units	Conditions	
$I_{T(AV)}$ Max. average on-state current @ Heatsink temperature	960(440)	A	180° conduction, half sine wave	
	80(110)	°C	double side (single side) cooled	
$I_{T(RMS)}$ Max. RMS on-state current	2220	A	@ 25°C heatsink temperature (double side cooled)	
$I_{TSM}$ Max. peak, one-cycle non-repetitive surge current	12.500		t=10ms	No voltage reappplied
	13.000		t=8.3ms	reappplied
	10.500		t=10ms	100% $V_{RRM}$
	11.000		t=8.3ms	reappplied
$I^2 t$ Maximum $I^2 t$ for fusing	782	KA <sup>2</sup> s	t=10ms	No voltage reappplied
	713		t=8.3ms	reappplied
	553		t=10ms	100% $V_{RRM}$
	505		t=8.3ms	reappplied
$I^2 \sqrt{t}$ Maximum $I^2 \sqrt{t}$ for fusing	7820	KA <sup>2</sup> √s	t=0.1 to 10ms, no voltage reappplied	
$V_{T(TO)1}$ Low level value of threshold voltage	0.85	V	$(16.7\% \times I_{F(AV)} < I < I_{F(AV)})$ , $T_J = T_J \text{ max.}$	
$V_{T(TO)2}$ High level value of threshold voltage	0.88		$(I_{F(AV)} < I < 20 \times I_{F(AV)})$ , $T_J = T_J \text{ max.}$	
$r_{t1}$ Low level value of on-state slope resistance	0.25	mΩ	$(16.7\% \times I_{F(AV)} < I < I_{F(AV)})$ , $T_J = T_J \text{ max.}$	
$r_{t2}$ High level value of on-state slope resistance	0.24		$(I_{F(AV)} < I < 20 \times I_{F(AV)})$ , $T_J = T_J \text{ max.}$	
$V_{TM}$ Max. on-state voltage	1.58	V	$I_{pk} = 2900A$ , $T_J = 150^\circ C$ , $t_p = 10ms$ sine pulse	
$I_H$ Maximum holding current	600	mA	$T_J = 25^\circ C$ , anode supply 12V resistive load	
$I_L$ Latching current	1000			

### ⊕ Switching

Parameter	SCT333	Units	Conditions
$di/dt$ Max. non repetitive rate of rise of turned-on current	1000	A/μs	Gate drive 20V, 20Ω $t_r \leq 1 \mu s$ $T_J = 150^\circ C$ , anode voltage $\leq 80\% V_{DRM}$
$t_d$ Typical delay time	1.0	μs	Gate current 1A, $di_g/dt = 1A/\mu s$ $V_d = 0.67\% V_{DRM}$ , $T_J = 25^\circ C$
$t_q$ Typical turn-off time	100		$I_{TM} = 550A$ , $T_J = 150^\circ C$ , $di/dt = 40A/\mu s$ , $V_R = 50V$ $dv/dt = 20V/\mu s$ , Gate 0V 100Ω, $t_p = 500 \mu s$

### ⊕ Blocking

Parameter	SCT333	Units	Conditions
$dv/dt$ Maximum critical rate of rise of off-state voltage	400	V/ $\mu$ s	$T_J = 150^\circ\text{C}$ linear to 80% rated $V_{DRM}$
$I_{RRM}$ $I_{DRM}$ Max. peak reverse and off-state leakage current	100	mA	$T_J = 150^\circ\text{C}$ , rated $V_{DRM}/V_{RRM}$ applied

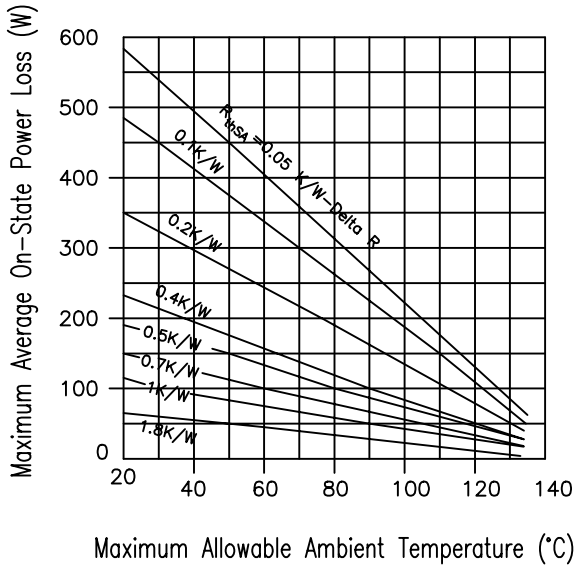
### ⊕ Triggering

Parameter	SCT333	Units	Conditions
$P_{GM}$ Maximum peak gate power	10.0	W	$T_J = 150^\circ\text{C}$ , $t_p \leq 5\text{ms}$
$P_{G(AV)}$ Maximum average gate power	2.0		$T_J = 150^\circ\text{C}$ , $f = 50\text{HZ}$ , $d\% = 50$
$I_{GM}$ Max. peak positive gate current	3.0	A	$T_J = 150^\circ\text{C}$ , $t_p \leq 5\text{ms}$
$+V_{GM}$ Maximum peak positive gate voltage	20	V	$T_J = 150^\circ\text{C}$ , $t_p \leq 5\text{ms}$
$-V_{GM}$ Maximum peak negative gate voltage	5.0		
$I_{GT}$ DC gate current required to trigger	TYP.	MAX.	$T_J = -40^\circ\text{C}$ $T_J = 25^\circ\text{C}$ $T_J = 150^\circ\text{C}$ Max. required gate trigger/current/voltage are the lowest value which will trigger all units 12V anode-to-cathode applied
	200	-	
	100	200	
$V_{GT}$ DC gate current required to trigger	2.5	-	$T_J = -40^\circ\text{C}$ $T_J = 25^\circ\text{C}$ $T_J = 150^\circ\text{C}$
	1.8	3.0	
	1.0	-	
$I_{GD}$ DC gate current not to trigger	10	mA	$T_J = 150^\circ\text{C}$ 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	

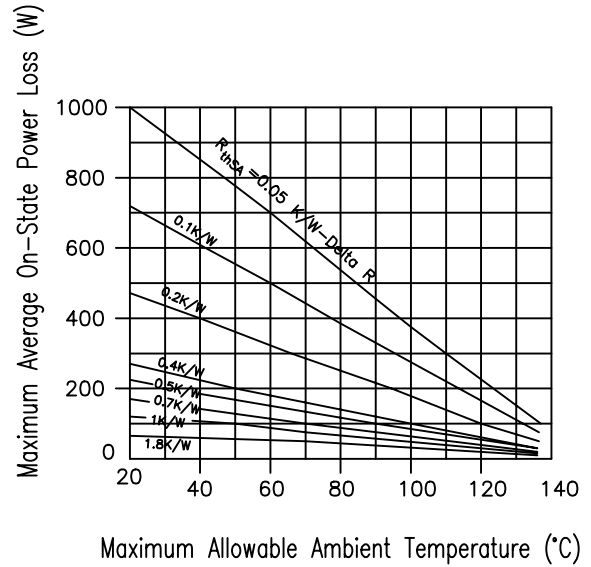
### ⊕ Thermal and Mechanical Specification

Parameter	SCT333	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	0.11 0.06	K/W	DC operation single side cooled DC operation double side cooled
F Mounting force, $\pm 10\%$	4900 (500)	N (Kg)	
wt Approximate weight	83	g	
Case style	TO-200AB (E-PUK)		See Outline Table

SCT380: Power Loss Versus Ambient Temperature;  
 $T_j \text{ max.} = 150^\circ\text{C}$ ,  $R_{thJ-hs} = 0.18 \text{ K/W}$  (Single Side Cooled)



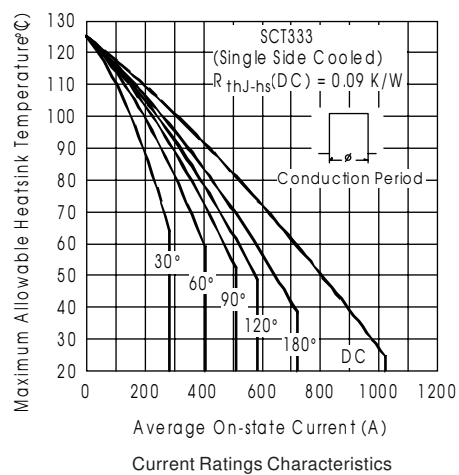
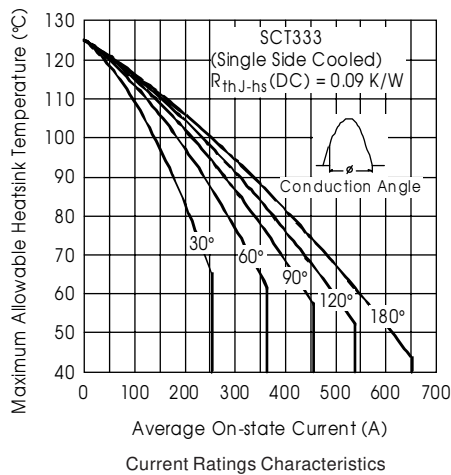
SCT380: Power Loss Versus Ambient Temperature;  
 $T_j \text{ max.} = 150^\circ\text{C}$ ,  $R_{thJ-hs} = 0.09 \text{ K/W}$  (Double Side Cooled)

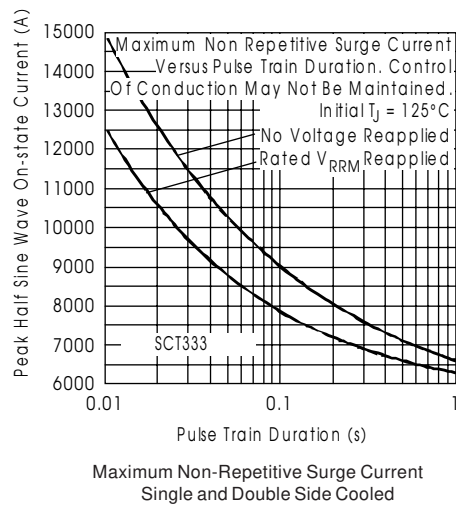
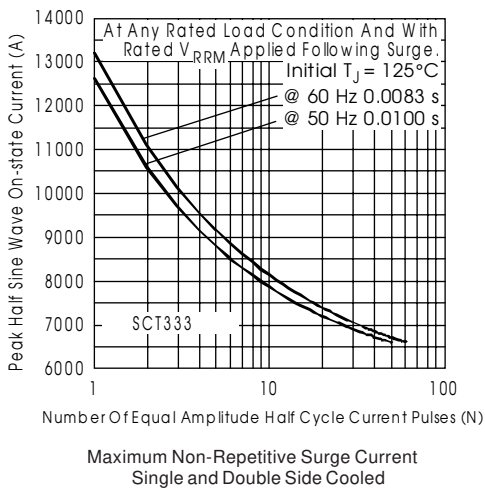
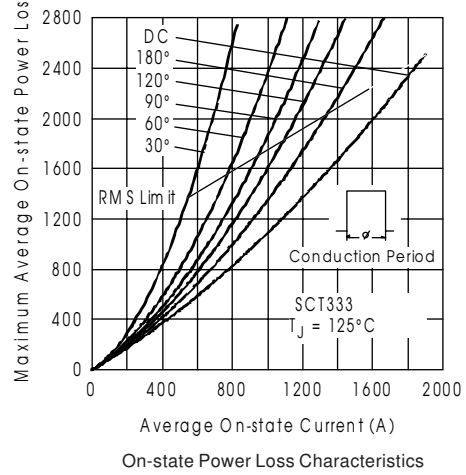
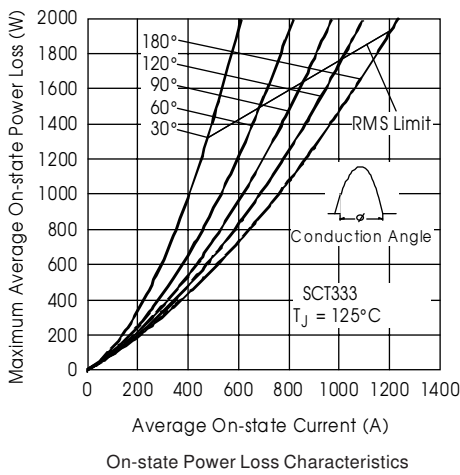
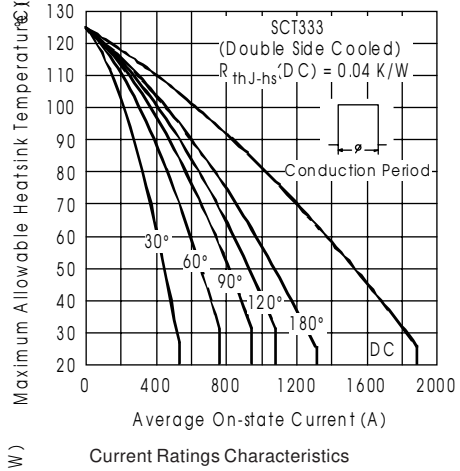
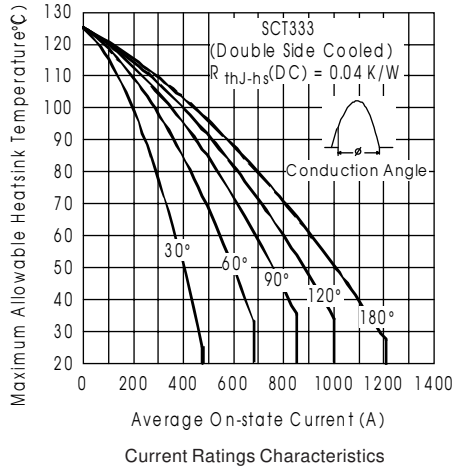


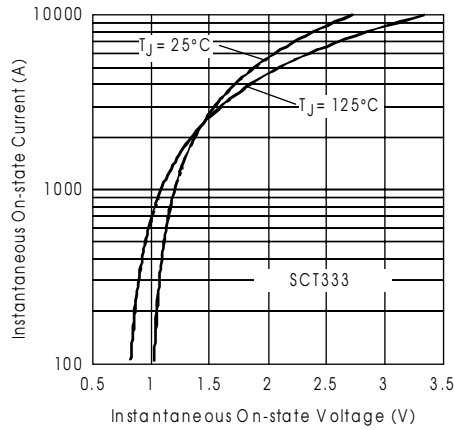
$\Delta R_{thJ-hs}$  Conduction

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

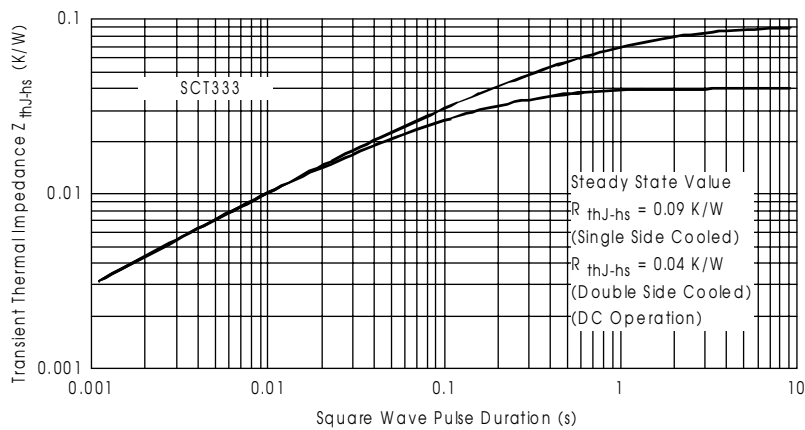
Conduction angle	Sinusoidal conduction		Rectangular conduction		Units	Conditions
	Single Side	Double Side	Single Side	Double Side		
180°	0.010	0.011	0.007	0.007	K/W	$T_J = T_J \text{ max.}$
120°	0.012	0.012	0.012	0.013		
90°	0.015	0.015	0.016	0.017		
60°	0.022	0.022	0.023	0.023		
30°	0.036	0.036	0.036	0.037		



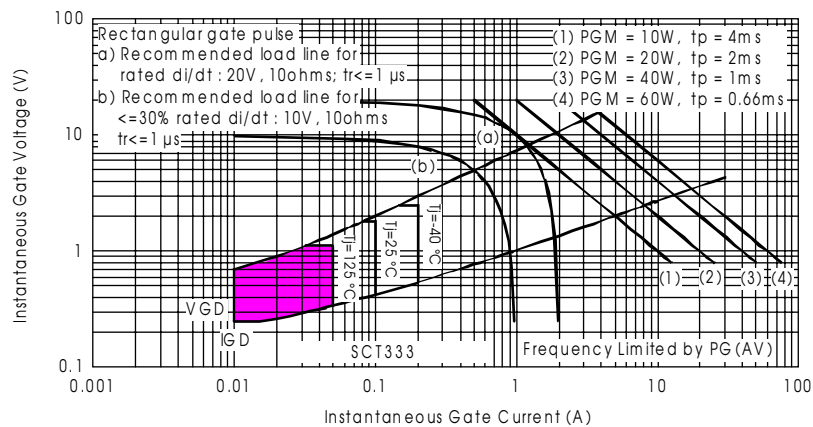




On-state Voltage Drop Characteristics



Thermal Impedance  $Z_{thJ-hs}$  Characteristics



Gate Characteristics