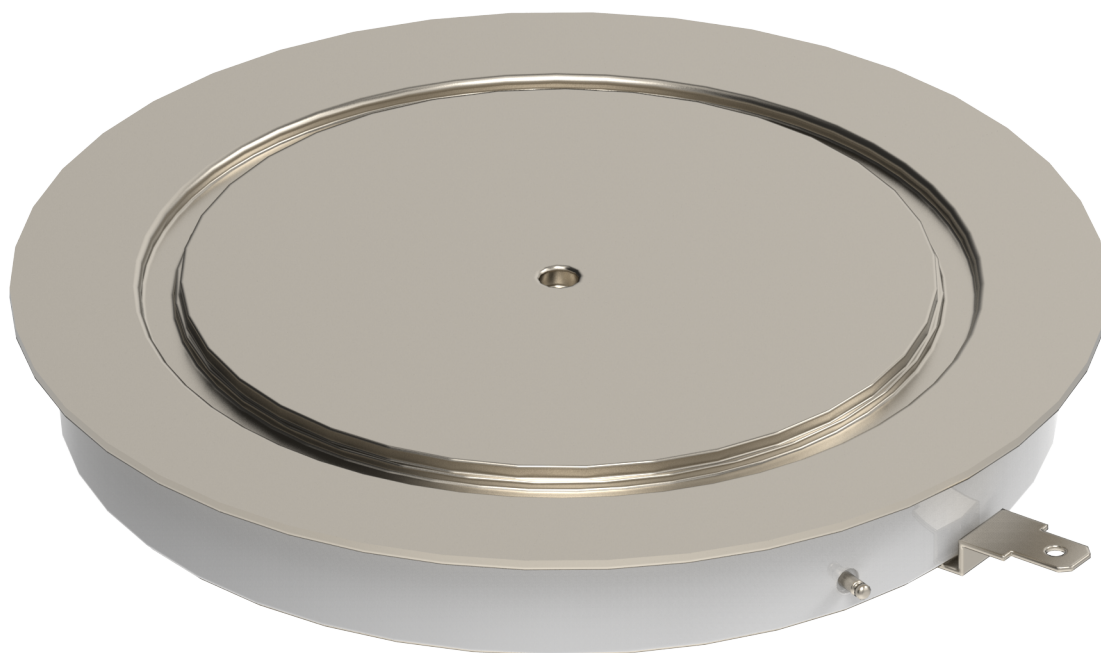


Phase Control Thyristor Type SA20UX3904A0

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Date: November, 2020
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SA	20	UX	3904	A	0	
-	Voltage Code	Outline Code	Current code	Type code	Special code	Optional code

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Absolute Maximum Ratings

VOLTAGE RATINGS		MAXIMUM LIMITS	UNITS
V_{DRM}	Repetitive peak off-state voltage, (note 1)	2000	V
V_{DSM}	Non-repetitive peak off-state voltage, (note 1)	2000	V
V_{DDC}	Maximum DC of-state voltage, (note 1)	1250	V
V_{RRM}	Repetitive peak reverse voltage, (note 1)	2000	V
V_{RSM}	Non-repetitive peak reverse voltage, (note 1)	2100	V
V_{RDC}	Maximum DC revrese voltage, (note 1)	1250	V
note 1)	De-rating factor of 0.13%/°C is applicable for T_j below 25°C		

OTHER RATINGS		MAXIMUM LIMITS	UNITS
$I_{T(AV)M}$	Maximum average on-state current, $T_{sink} = 55^{\circ}C$, (note 1)	3904	A
$I_{T(AV)M}$	Maximum average on-state current, $T_{sink} = 85^{\circ}C$, (note 1)	2682	A
$I_{T(AV)M}$	Maximum average on-state current, $T_{sink} = 85^{\circ}C$, (note 2)	1506	A
$I_{T(RMS)M}$	Nominal RMS on-state current, $T_{sink} = 25^{\circ}C$ (note 1)	7703	A
$I_{T(d.c.)}$	D.C. on-state current, $T_{sink} = 25^{\circ}C$, (note 3)	6685	A
I_{TSM}	Peak non-repetitive surge current $t_p = 10ms$, $V_{RM} = 60\%V_{RRM}$, (note 4)	50.9	kA
I_{TSM2}	Peak non-repetitive surge current $t_p = 10ms$, $V_{RM} \leq 10V$, (note 4)	56.0	kA
I^2t	I^2t capacity for fusing $t_p = 10ms$, $V_{RM} = 60\%V_{RRM}$, (note 4)	$12.95 \cdot 10^6$	A ² s
I^2t	I^2t capacity for fusing $t_p = 10ms$, $V_{RM} \leq 10V$, (note 4)	$15.68 \cdot 10^6$	A ² s
$(di/dt)_{cr}$	Critical rate of rise of on-state current (continuous, 50Hz), (note 5)	100	A/ μ s
	Critical rate of rise of on-state current (repetitive, 50Hz, 60s), (note 5)	200	A/ μ s
	Critical rate of rise of on-state current (non repetitive), (note 5)	400	A/ μ s
V_{RGM}	Peak reverse gate voltage	5	V
$P_{G(AV)}$	Mean forward gate power	5	W
P_{GM}	Peak forward gate power	30	W
T_{jop}	Operating temperature range	-40 to +125	°C
T_{stg}	Storage temperature range	-40 to +150	°C
note 1)	Double-side cooled, single phase, 50Hz, 180° half-sinewave.		
note 2)	Single-side cooled, single phase, 50Hz, 180° half-sinewave.		
note 3)	Double-side cooled		
note 4)	Half-sinewave, 125°C T_j initial		
note 5)	$V_D = 67\%V_{DRM}$, $I_{TM} = 2000A$, $I_{FG} = 2A$, $t_R \leq 0.5\mu s$, $T_{case} = 125^{\circ}C$		

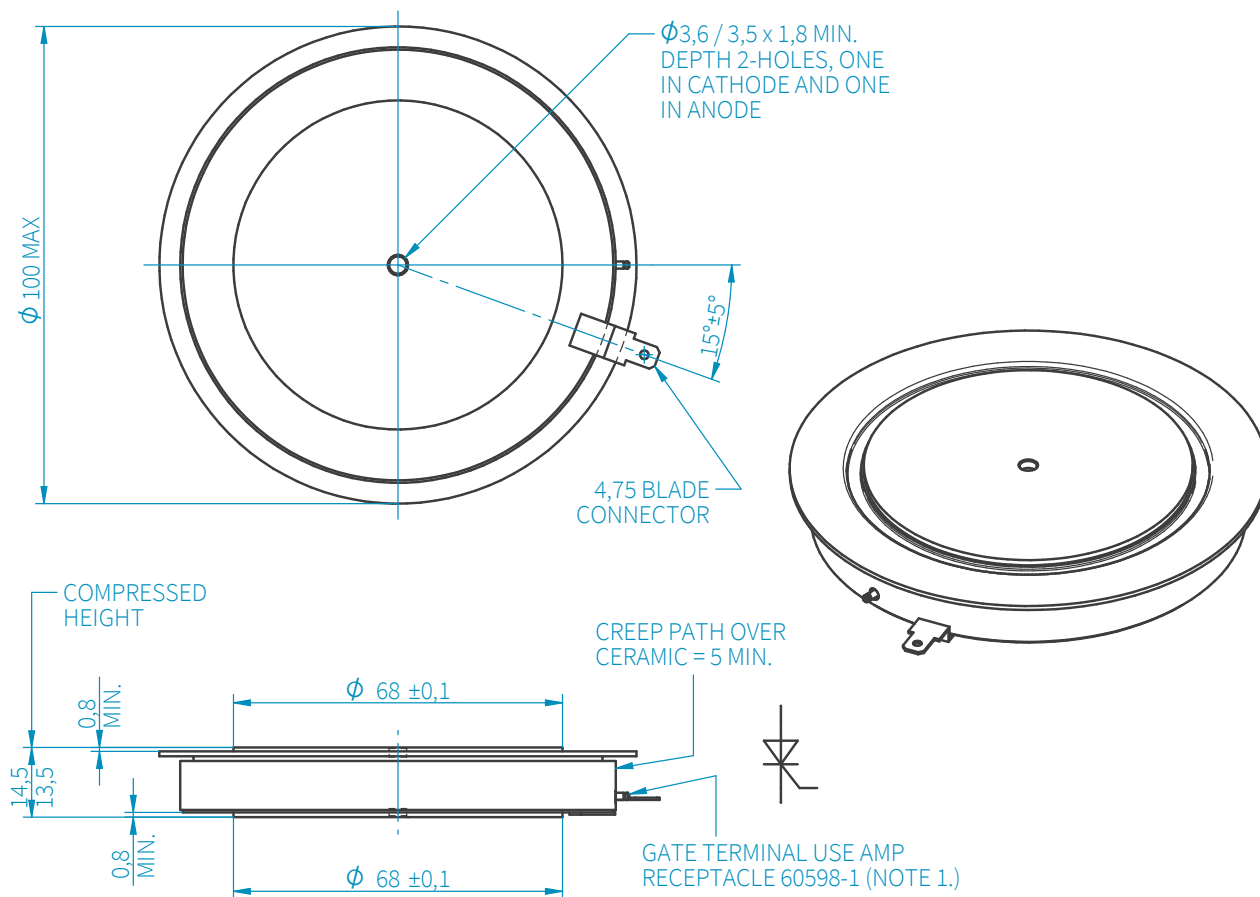
Characteristics

	PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNITS
V _{TM}	Maximum peak on-state voltage	I _{TM} = 3000A	-	-	1.25	V
		I _{TM} = 11700A	-	-	2.06	V
V _{T0}	Threshold voltage	Valid from 2000A to 7000A	-	-	0.920	V
r _T	Slope resistance		-	-	0.111	mΩ
(dv/dt) _{CR}	Critical rate of rise of off-state voltage	V _D = 80%V _{DRM} , Linear ramp, gate o/c	1000	-	-	V/μs
I _{DRM}	Peak off-state current	Rated V _{DRM}	-	-	150	mA
I _{RRM}	Peak reverse current	Rated V _{RRM}	-	-	150	mA
V _{GT}	Gate trigger voltage	T _j = 25°C, V _D = 10V, I _T = 3A	-	-	3.0	V
I _{GT}	Gate trigger current		-	-	300	mA
V _{GD}	Gate non-trigger voltage	Rated V _{DRM}	-	-	0.25	V
I _H	Holding current	T _j = 25°C	-	-	1000	mA
t _{GD}	Gate controlled turn-on delay time	V _D = 67%V _{DRM} , I _{TM} = 2000A, di/dt = 10A/μs, I _{FG} = 2A, t _r = 0.5μs, T _j = 25°C	-	1.0	2.0	μs
t _{GT}	Turn-on time		-	2.0	3.0	μs
Q _{RR}	Recovered charge		-	4700	5500	μC
Q _{RA}	Recovered charge, 50% Chord	I _{TM} = 2000A, t _p = 2000μs, di/dt = 10A/μs, V _R = 100V	-	3200	-	μC
I _{RR}	Reverse recovery current		-	175	-	A
t _{RR}	Reverse recovery time, 50% Chord		-	37	-	μs
t _{GQ}	Turn-off time	I _{TM} = 2000A, t _p = 2000μs, di/dt = 10A/μs, V _R = 100V, V _{DR} = 80%V _{DRM} , dV _{DR} /dt = 20V/μs	-	250	-	μs
		I _{TM} = 2000A, t _p = 2000μs, di/dt = 10A/μs, V _R = 100V, V _{DR} = 80%V _{DRM} , dV _{DR} /dt = 200V/μs	-	450	-	μs
R _{thJK}	Thermal resistance, junction to sink	Double-side cooled	-	-	9.0	K/kW
		Anode-side cooled	-	-	16.7	K/kW
		Cathode-side cooled	-	-	19.9	K/kW
F	Mounting force	(note 2)	36	-	44	kN
W _t	Weight		-	550	-	g
note 1)	Unless otherwise indicated T _j = 125°C					
note 2)	For other clamp forces, please consult factory					

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