Anode Shorted Gate Turn-Off Thyristor Type SA45GS3000T0PNN

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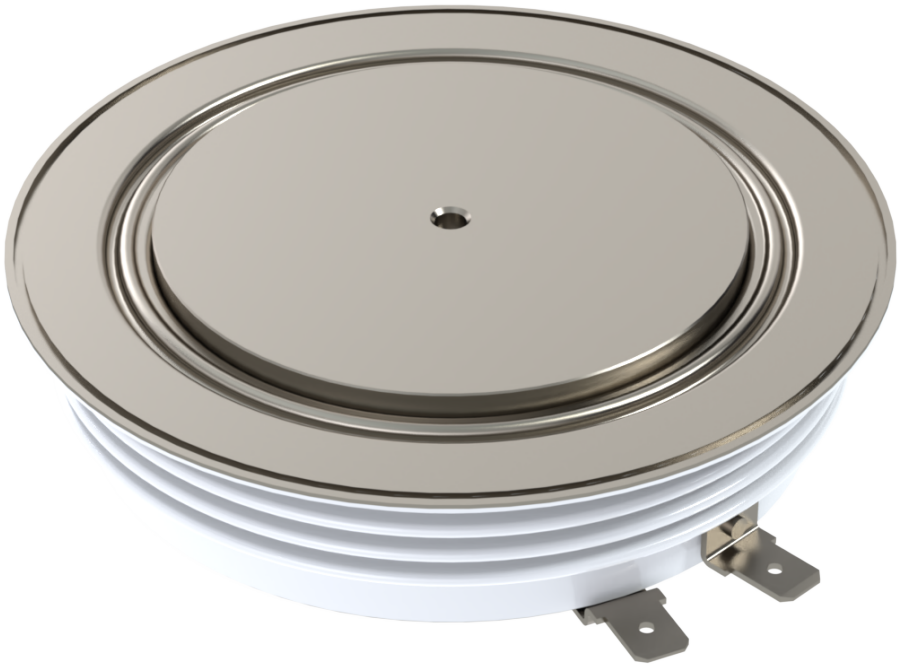

ORDERING INFORMATION				(Please quote 12 to 15 digit code as below)		
SA	45	GS	3000	T	0	PNN
-	Voltage Code	Outline Code	Current code	Type code	Special code	Optional code

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Absolute Maximum Ratings

	VOLTAGE RATINGS	MAXIMUM LIMITS	UNITS
V_{DRM}	Repetitive peak off-state voltage, (note 1)	4500	V
V_{RSM}	Non-repetitive peak off-state voltage, (note 1)	4500	V
V_{RRM}	Repetitive peak reverse voltage	18	V
V_{RSM}	Non-repetitive peak reverse voltage	18	V
$V_{DC-link}$	Maximum continuos DC-link voltage	2800	V
note 1)	V_{GK} = –2V		

	OTHER RATINGS	MAXIMUM LIMITS	UNITS
I_{TGQ}	Peak turn-off current (note 1)	3000	A
L_S	Snubber loop impedance, $I_{TM} = I_{TGQ}$ (note 1)	200	nH
$I_{T(AV)M}$	Mean on-state current, T_{sink} = 55°C, (note 2)	1381	A
$I_{T(RMS)}$	Nominal RMS on-state current, T_{sink} = 25°C (note 2)	2770	A
I_{TSM}	Peak non-repetitive surge current t_p = 10ms (note 3)	24	kA
I_{TSM2}	Peak non-repetitive surge current t_p = 2ms (note 3)	32	kA
I^2t	I^2t capacity for fusing t_p = 10ms	$2.88 \cdot 10^6$	A^2s
$(di/dt)_{cr}$	Critical rate of rise of on-state current, (note 4)	500	A/µs
P_{FGM}	Peak forward gate power	200	W
P_{RGM}	Peark reverse gate power	21	kW
I_{FGM}	Peak forward gate current	100	A
V_{RGM}	Peak reverse gate voltage (note 5)	18	V
T_{jop}	Operating temperature range	-40 to +125	°C
T_{stg}	Storage temperature range	-40 to +125	°C
note 1)	T_j = 125°C, V_D = 2800V, $V_{DM} \leq$ 4500V, di_{GQ}/dt = 40A/µs, I_{TGQ} = 3000A and C_S = 6µF		
note 2)	Double-side cooled, single phase, 50Hz, 180° half-sinewave.		
note 3)	$T_{j(initial)}$ = 125°C, single phase, 50Hz, 180° sinewave, re-applied voltage $V_D = V_R \leq$ 10V		
note 4)	I_T = 3000A repetitive, I_{GM} = 25A, di_{GM}/dt = 20A/µs. For di/dt > 500A/µs please consult factory.		
note 5)	May exceed this value during turn-off avalanche period.		

Characteristics

	PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNITS
V_{TM}	Maximum peak on-state voltage	I_G = 8A, I_T = 3000A	-	3.75	4.0	V
I_L	Latching current	T_j = 25°C	-	40	-	A
I_H	Holding current	T_j = 25°C	-	40	-	A
$(dv/dt)_{cr}$	Critical rate of rise of off-state voltage	V_D = 3000V, V_{GR} = –2V	1000	-	-	V/µs
I_{DRM}	Peak off-state current	Rated V_{DRM}, V_{GR} = –2V	-	-	60	mA
I_{RRM}	Peak reverse current	V_{RR} = 18V	-	-	20	mA
V_{GF}	Forward gate voltage	I_{GF} = 10mA, T_j = 25°C	320	-	520	mV
$V_{GR(AV)}$	Gate avanlanche voltage	I_{GR} = 10mA, T_j = 25°C	22	-	26	V
I_{GKM}	Peak negative gate leakage current	V_{GR} = –18V, T_j = 25°C	-	-	1	mA
		V_{GR} = –18V	-	-	20	mA
V_{GT}	Gate trigger voltage	T_j = –40°C, V_D = 25V, R_L = 25mΩ	-	1.0	-	V
		T_j = 25°C, V_D = 25V, R_L = 25mΩ	-	0.8	1.0	V
		T_j = 125°C, V_D = 25V, R_L = 25mΩ	-	0.6	-	V
I_{GT}	Gate trigger current	T_j = –40°C, V_D = 25V, R_L = 25mΩ	-	-	8	A
		T_j = 25°C, V_D = 25V, R_L = 25mΩ	-	-	3	A
		T_j = 125°C, V_D = 25V, R_L = 25mΩ	0.05	-	1	A
t_d	Delay time	V_D = 2250V, I_{TGQ} = 3000A, di_T/dt = 300A/µs, I_{GM} = 30A, di_G/dt = 20A/µs, C_S = 6µF, R_S = 5Ω	-	-	3	µs
t_{gt}	Turn-on time		-	4	10	µs
E_{on}	Turn-on energy		-	1	-	J
t_f	Fall time	V_{DM} = 3200V, I_{TGQ} = 3000A, di_{GQ}/dt = 50A/µs, V_{GR} = –16V, C_S = 6µF	-	2	-	µs
t_s	Storage time		-	-	25	µs
t_{gq}	Turn-off time		-	-	30	µs
I_{CQM}	Peak turn-off gate current		-	850	-	A
Q_{GQ}	Turn-off gate charge		-	9	-	mC
t_{tail}	Tail time		-	20	-	µs
E_{off}	Turn-off energy		-	7	-	J
$E_{on} + E_{off}$		(note 2)	-	-	9	J
R_{thJK}	Thermal resistance, junction to sink	Double side cooled	-	12	-	K/kW
		Cathode side cooled	-	26	-	K/kW
		Anode side cooled	-	22	-	K/kW
F	Mounting force	(note 3)	30	-	44	kN
W_t	Weight		-	1240	-	g

note 1) Unless otherwise indicated T_j = 125°C

note 2) V_{DM} = 3200V, V_D = 2250V, I_{TGQ} = 3000A, di_T/dt = 300A/µs, I_{GM} = 30A, di_G/dt = 20A/µs, di_{GQ}/dt = 50A/µs, V_{GR} = –16V, C_S = 6µF, R_S = 5Ω

note 3) For other clamping forces, consult factory.

Test Area Specifications

	PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNITS
V_{TM}	Maximum peak on-state voltage	I_G = 8A, I_T = 3000A	-	-	4.0	V
I_{DRM}	Peak off state current	Rated V_{DRM}, V_{GR} = –2V	-	-	60	mA
		Rated V_{DRM}, V_{GR} = –2V, T_j = 25°C	-	-	10	mA
I_{RRM}	Peak reverse current	V_{RR} = 18V	-	-	20	mA
		V_{RR} = 18V, T_j = 25°C	-	-	20	mA
V_{GF}	Forward gate voltage	I_{GF} = 10mA, T_j = 25°C	320	-	520	mV
$V_{GR(AV)}$	Gate avalanche Voltage	I_{GR} = 10mA, T_j = 25°C	22	-	26	V
I_{GKM}	Peak negative gate leakage current	V_{GR} = –18V, T_j = 25°C	-	-	1	mA
		V_{GR} = –18V	-	-	20	mA
V_{GT}	Gate trigger voltage	T_j = 25°C, V_D = 25V, R_L = 25mΩ	-	-	1	V
		T_j = 125°C, V_D = 25V, R_L = 25mΩ	-	-	1	V
I_{GT}	Gate trigger current	T_j = –40°C, V_D = 25V, R_L = 25mΩ	-	-	8	A
		T_j = 25°C, V_D = 25V, R_L = 25mΩ	-	-	3	A
		T_j = 125°C, V_D = 25V, R_L = 25mΩ	5	-	-	mA
t_d	Delay time	V_D = 2250V, I_{TGQ} = 3000A, di_T/dt = 300A/µs, I_{GM} = 30A, di_G/dt = 20A/µs, R_S = 5Ω	-	-	3	µs
t_{gt}	Turn-on time		-	-	10	µs
E_{ON}	Turn-on energy		-	-	Note 2	J
E_{OFF}	Turn-off energy	V_D = 2250V, V_{DM} = 3200V, I_{TGQ} = 3000A, di_{GQ}/dt = 50A/µs, V_{GR} = –16V, C_S = 6µF	-	-	Note 2	J
t_{gq}	Turn-off time		-	-	25	µs
t_s	Storage time		-	-	22	µs
F	Mounting force		30	-	44	kN
note 1)	Unless otherwise indicated T_j = 125°C					
note 2)	Max energy: $(E_{on} + E_{off}) \leq 9J$					

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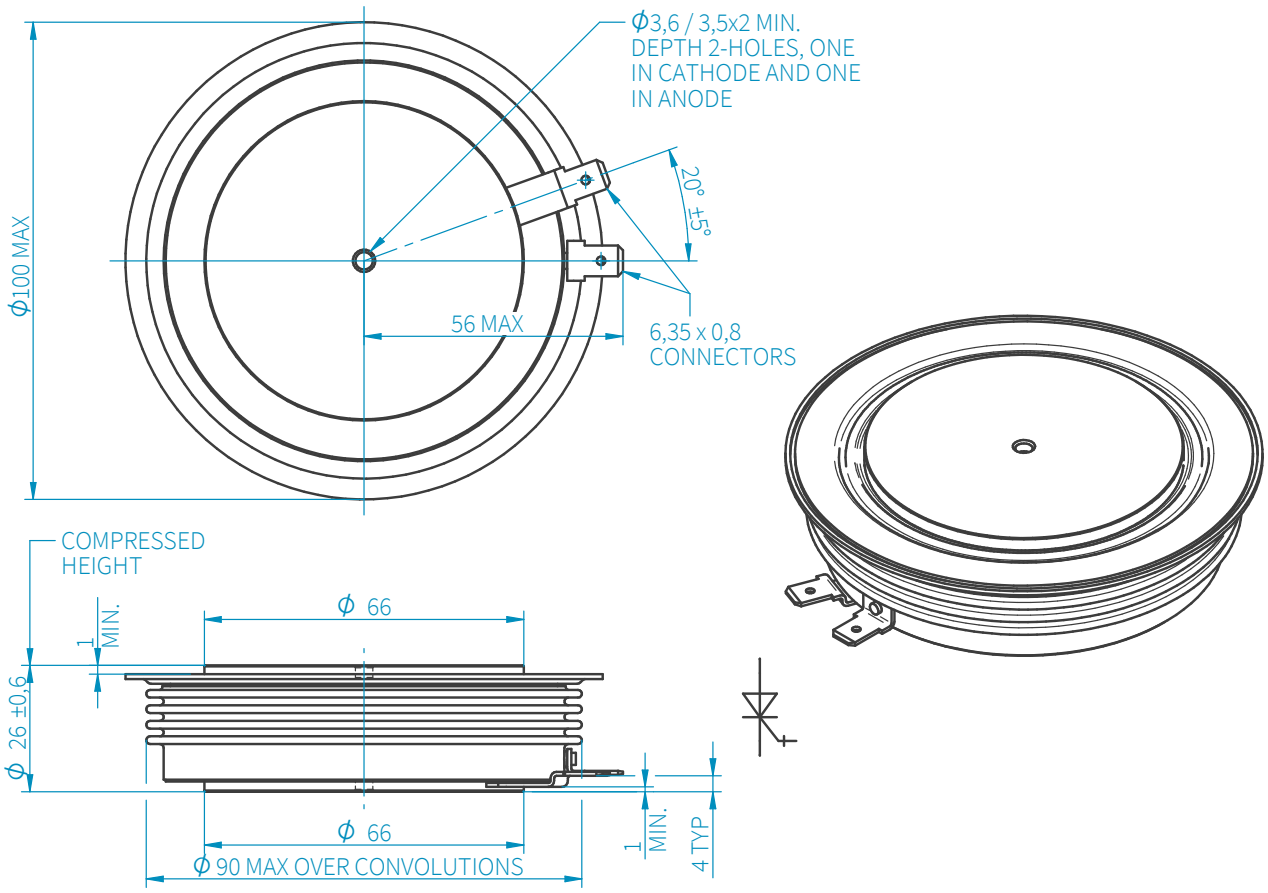
Outline Drawing



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