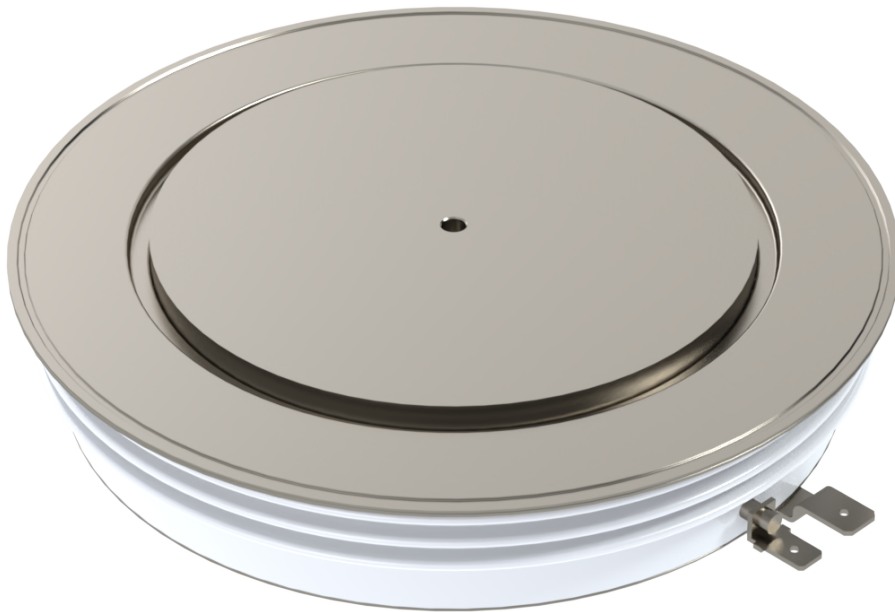


**Anode Shorted Gate
Turn-Off Thyristor
Type SA45RP4000T0**

Contact us!

Date: April, 2020
Data Sheet Issue: 1



ORDERING INFORMATION

(Please quote 12 to 15 digit code as below)

| | | | | | | |
|----|--------------|--------------|--------------|-----------|--------------|---------------|
| SA | 45 | RP | 4000 | T | 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) | 4500 | V |
| V_{RSM} | Non-repetitive peak off-state voltage, (note 1) | 4500 | V |
| V_{RRM} | Repetitive peak reverse voltage | 18 | V |
| $V_{DC-link}$ | Maximum continuous DC-link voltage | 2800 | V |
| note 1) | $V_{GK} = -2V$ | | |

| OTHER RATINGS | | MAXIMUM LIMITS | UNITS |
|----------------|--|-------------------|-------------|
| I_{TGQ} | Peak turn-off current (note 1) | 4000 | A |
| L_S | Snubber loop impedance, $I_{TM} = I_{TGQ}$ (note 1) | 300 | nH |
| $I_{T(AV)M}$ | Mean on-state current, $T_{sink} = 55^{\circ}C$, (note 2) | 1270 | A |
| $I_{T(RMS)}$ | Nominal RMS on-state current, $T_{sink} = 25^{\circ}C$ (note 2) | 2540 | A |
| I_{TSM} | Peak non-repetitive surge current $t_p = 10ms$ (note 3) | 25 | kA |
| I_{TSM2} | Peak non-repetitive surge current $t_p = 2ms$ (note 3) | 32 | kA |
| I^2t | I^2t capacity for fusing $t_p = 10ms$ | $3.13 \cdot 10^6$ | A^2s |
| $(di/dt)_{cr}$ | Critical rate of rise of on-state current, (note 4) | 500 | A/ μs |
| V_{RGM} | Peak reverse gate voltage (note 5) | 18 | V |
| T_{jop} | Operating temperature range | -40 to +125 | $^{\circ}C$ |
| T_{stg} | Storage temperature range | -40 to +125 | $^{\circ}C$ |
| note 1) | $T_j = 125^{\circ}C$, $V_D = 0.67V_{DM}$, $V_{DM} \leq V_{DRM}$, $di_{GQ}/dt = 40A/\mu s$, $C_S = 6\mu F$ | | |
| note 2) | Double-side cooled, single phase, 50Hz, 180° half-sinewave. | | |
| note 3) | $T_{j(initial)} = 125^{\circ}C$, single phase, 50Hz, 180° sinewave, re-applied voltage $V_D = V_R \leq 10V$ | | |
| note 4) | $I_T = 4000A$ repetitive, $I_{GM} = 50A$, $di_{GM}/dt = 40A/\mu s$. For higher di/dt please consult factory. | | |
| note 5) | May exceed this value during turn-off avalanche period. | | |

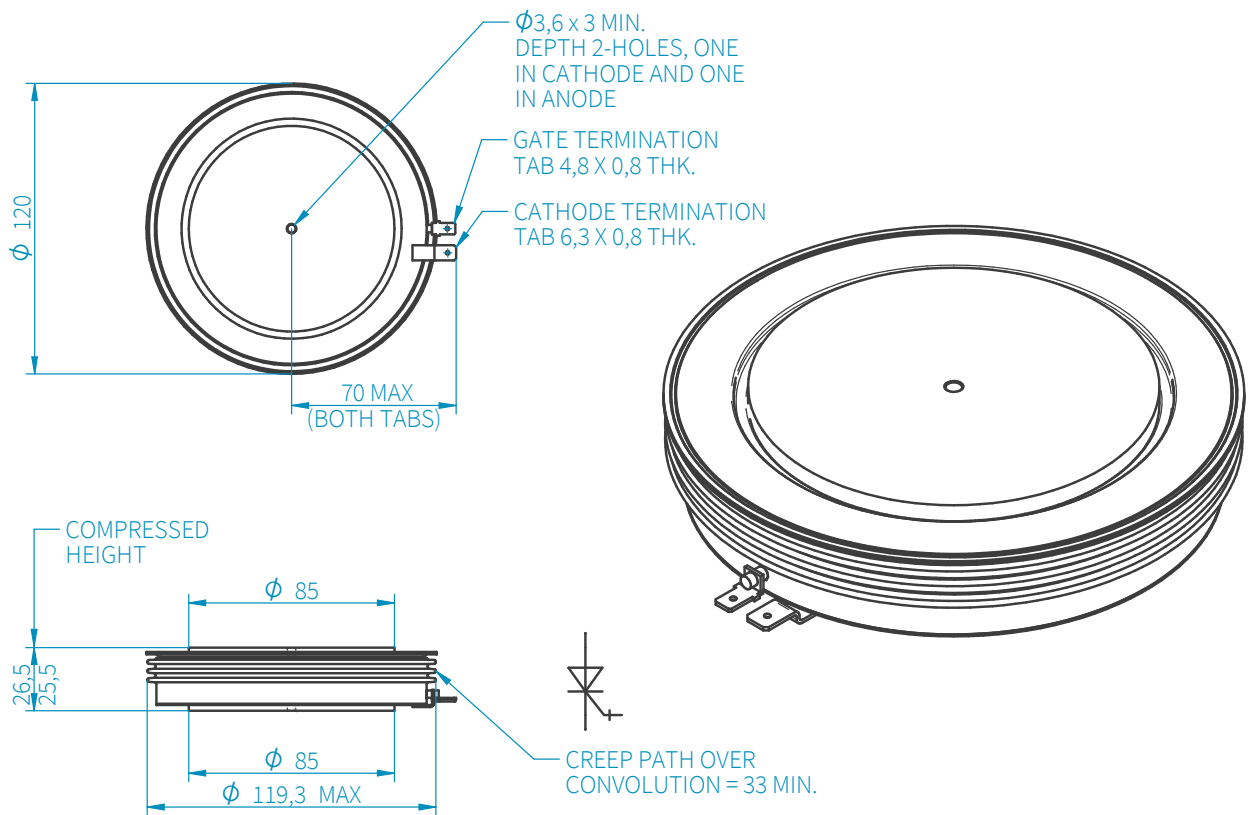
Characteristics

| | PARAMETER | TEST CONDITIONS | MIN | TYP | MAX | UNITS |
|-----------------------|---|---|------|------|-------|-------|
| V _{TM} | Maximum peak on-state voltage | I _T = 4000A | - | - | 4.40 | V |
| I _L | Latching current | T _J = 25°C | - | - | 100 | A |
| I _H | Holding current | T _J = 25°C | - | - | 100 | A |
| (dv/dt) _{cr} | Critical rate of rise of off-state voltage | V _D = 3000V, V _G = 0V, R _G = 0Ω | 1000 | - | - | V/μs |
| I _{DRM} | Peak off-state current | Rated V _{DRM} , V _{GR} ≤ -2V | - | - | 100 | mA |
| I _{RRM} | Peak reverse current | Rated V _{RR} , R _{GK} = ∞ | - | - | 50 | mA |
| I _{GKM} | Peak negative gate leakage current | V _{GR} = -16V | - | - | 50 | mA |
| V _{GT} | Gate trigger voltage | T _J = 25°C, V _D = 24V, R _L = 0.1Ω | - | - | 1.2 | V |
| I _{GT} | Gate trigger current | T _J = 25°C, V _D = 24V, R _L = 0.1Ω | - | - | 4.0 | A |
| t _d | Delay time | | - | 2.5 | - | μs |
| t _r | Rise time | V _D = 0.5V _{DRM} , I _{TGQ} = 4000A, di _T /dt = 300A/μs, I _{GM} = 50A, | - | 5.0 | - | μs |
| t _{gt} | Turn-on time | di _G /dt = 40A/μs, C _S = 6μF | - | 7.5 | - | μs |
| E _{on} | Turn-on energy | | - | 3.3 | - | J |
| t _s | Storage time | | - | 25 | - | μs |
| t _f | Fall time | | - | 3.0 | - | μs |
| t _{gq} | Turn-off time | V _D = 0.5V _{DRM} , V _{DM} = V _{DRM} , I _{TGQ} = I _{TGQM} , | - | 28 | - | μs |
| E _{off} | Turn-off energy | di _{GQ} /dt = 40A/μs, C _S = 6μF, L _S = 300nH | - | 10 | - | J |
| I _{CQM} | Peak turn-off gate current | | - | - | 1000 | A |
| Q _{GQ} | Turn-off gate charge | | - | 18 | - | μC |
| R _{thJK} | Thermal resistance, junction to sink | Double side cooled | - | - | 0.015 | K/W |
| | | Anode side cooled | - | - | 0.026 | K/W |
| | | Cathode side cooled | - | - | 0.031 | K/W |
| F | Mounting force | (note 2) | 36 | - | 44 | kN |
| W _t | Weight | | - | 1500 | - | g |
| note 1) | Unless otherwise indicated T _J = 125°C | | | | | |
| note 2) | For other clamping forces, consult factory. | | | | | |

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