

GA060TH65

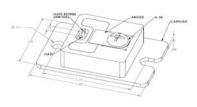
Silicon Carbide Thyristor

V_{FBM} 6500 V $\mathbf{I}_{\mathrm{T(AVM)}}$ 60 A \mathbf{Q}_{rr} 2.95 µC

Features

- 6500 V Asymmetric SiC NPNP Thyristor
- 150 °C operating temperature
- Robust compact fully soldered package
- SOT-227 (ISOTOP) base plate form factor
- Fast turn on characteristics
- Lowest in class Q_{rr}/I_{T(AVM)}

- Applications
 Grid Tied Solar Inverters
- Wind Power Inverters
- HVDC Power Conversion
- Utility Scale Power Conversion
- Trigger Circuits/Ignition Circuits



Package



Maximum Ratings

| Parameter | Symbol | Conditions | Values | Unit |
|--------------------------------------|-----------------------------------|--|------------|------|
| Repetitive peak forward voltage | V_{FBM} | T _j = 25 °C | 6500 | V |
| Repetitive peak reverse voltage | V_{RBM} | T _j = 25 °C | 50 | V |
| Maximum average on-state current | I _{T(AVM)} | T _c ≤ 120 °C | 60 | Α |
| RMS on-state current | I _{T(RMS)} | T _c ≤ 120 °C | 104 | Α |
| Non-repetitive peak on-state current | I _{T.max} | $T_{\rm C}$ = 25 °C, $t_{\rm p}$ = 2 us, D = 0.1 | tbd | Α |
| Power dissipation | P _{tot} | T _C = 25 °C | 919 | W |
| Operating and storage temperature | T _i , T _{sta} | | -55 to 150 | °C |

Electrical Characteristics

| Parameter | Cumbal | Conditions | Values | | Heit | |
|----------------------------------|----------------------|--|--------|------------|------|------|
| | Symbol | | min. | typ. | max. | Unit |
| Maximum neak an atata valtana | V | I _K = -60 A, T _j = 25 °C | | -3.90 | | |
| Maximum peak on state voltage | $V_{KA(ON)}$ | $I_{\kappa} = -60 \text{ A}, T_{j} = 150 ^{\circ}\text{C}$ | | -3.70 | | V |
| Anode-cathode threshold voltage | $V_{KA(TO)}$ | T _j = 25 °C (150 °C) | | -3.1(-2.8) | | V |
| Anode-cathode slope resistance | R _{AK} | T_{j} = 25 °C (150 °C), I_{K} = -60 A | | 9.4(9.5) | | mΩ |
| Lookaga gurrant | ı | V _{KA} = -6500 V, V _{GA} = 0 V, T _j = 25 °C | | 20 | | |
| Leakage current | ' <u>L</u> | $V_{KA} = -6500 \text{ V}, V_{GA} = 0 \text{ V}, T_{j} = 150 ^{\circ}\text{C}$ | | 50 | | μΑ |
| Gate trigger current | I _{GT} | $T_{_{\rm J}}$ = 25 °C, $t_{_{\rm P}}$ = 10 μs | | -100 | | mA |
| Holding current | I _H | T _j = 25 °C | | tbd | | mA |
| Rise time | t _R | I _G = -3 A, V _{KA} = -2200 V | | 170 | | ns |
| Delay time | $t_{_{\mathrm{D}}}$ | $I_{K} = -60 \text{ A}, T_{j} = 25 ^{\circ}\text{C}$ | | 45 | | ns |
| Reverse recovery charge | $Q_{_{\mathrm{ff}}}$ | | | 2.95 | | μC |
| Recovered charge, 50% chord | Q_{ra} | $dI/dt = 360 \text{ A/us}, I_{K} = -60 \text{ A}, V_{KA} = 20 \text{ V}$ | | 1.6 | | μC |
| Reverse recovery current | I _{rm} | $dV/dt(re-app) = -362 V/us, T_j = 25 °C$ | | 15 | | Α |
| Circuit commutated turn-off time | t _q | | | 6.7 | | μs |

Thermal Characteristics

| Thermal resistance, junction - case | R_{thJC} | | 0.136 | °C/W |
|-------------------------------------|----------------|--|-------|------|
| | | | | |
| Mechanical Properties | | | | |
| Mounting torque for base | M _b | Heat sink surface must be optically flat | 1.5 | Nm |
| Mounting torque for top | M _t | | 1.3 | Nm |

W,

1. Considering worst case Z_{th} conditions

Weight

30



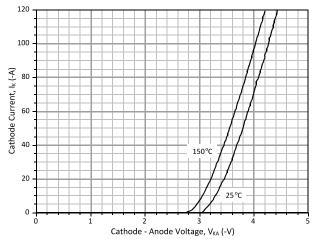


Figure 1: Typical On State Characteristics

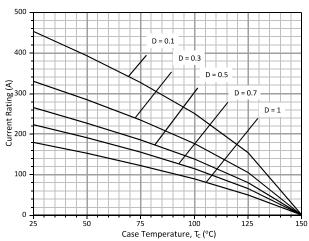


Figure 3: Typical Current Derating Curves (D = t_p/T , t_p = 400 μ s¹)

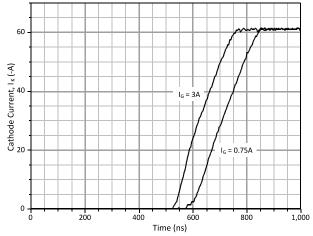


Figure 5: Typical Turn On Characteristics at 25 °C

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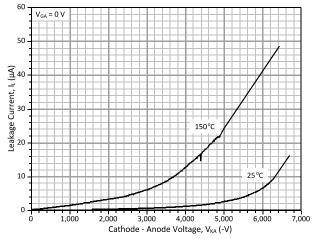


Figure 2: Typical Forward Blocking Characteristics

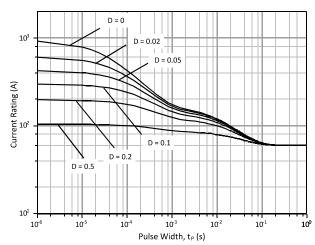


Figure 4: Typical Current Rating versus Pulse Duration Curves at $T_{\rm c}$ = 120 $^{\rm o}$ C

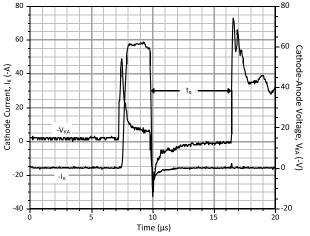
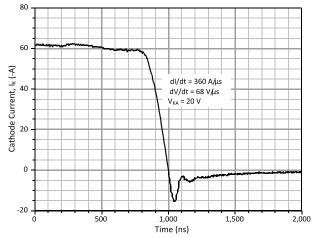


Figure 6: Typical Turn Off Characteristics at 25 °C





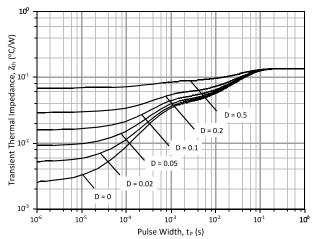


Figure 8: Typical Transient Thermal Impedance

| Revision History | | | | |
|------------------|----------|--------------------------|------------|--|
| Date | Revision | Comments | Supersedes | |
| 2010/11/10 | 1 | First generation release | | |
| | | | | |

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