Silicon Carbide Thyristor

V_{FBM}	=	6500 V
$I_{T(AVM)}$	=	60 A
Q_{rr}	=	2.95 µC

Features

- 6500 V Asymmetric SiC NPNP Thyristor
- 250 °C operating temperature
- 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

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	A
RMS on-state current	$I_{T(RMS)}$	T_C ≤ 120 °C	104	A
Operating and storage temperature	T_j, T_{stg}		-55 to 250	°C

Electrical Characteristics

Parameter	Symbol	Conditions	Values min.	Values typ.	Values max.	Unit
Maximum peak on state voltage	$V_{KA(ON)}$	I_K = -60 A, T_j = 25 °C		-3.90		V
		I_K = -60 A, T_j = 150 °C		-3.70		
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
Leakage current	I_L	V_{KA} = -6500 V, V_{GA} = 0 V, T_j = 25 °C		20		µA
		V_{KA} = -6500 V, V_{GA} = 0 V, T_j = 150 °C		50		
Gate trigger current	I_{GT}	T_j = 25 °C, t_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_D	I_K = -60 A, T_j = 25 °C		45		ns
Reverse recovery charge	Q_{rr}	dI/dt = 360 A/us, I_K = -60 A, V_{KA} = 20 V dV/dt(re-app) = -362 V/us, T_j = 25 °C		2.95		µC
Recovered charge, 50% chord	Q_{ra}			1.6		µC
Reverse recovery current	I_{rm}			15		A
Circuit commutated turn-off time	t_q			6.7		µs

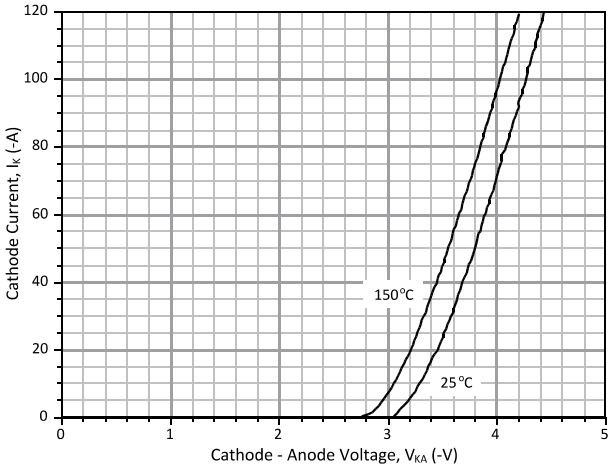

Figure 1: Typical On State Characteristics

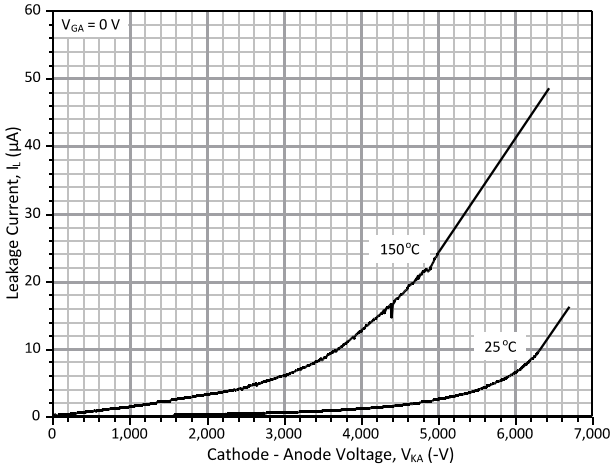

Figure 2: Typical Forward Blocking Characteristics

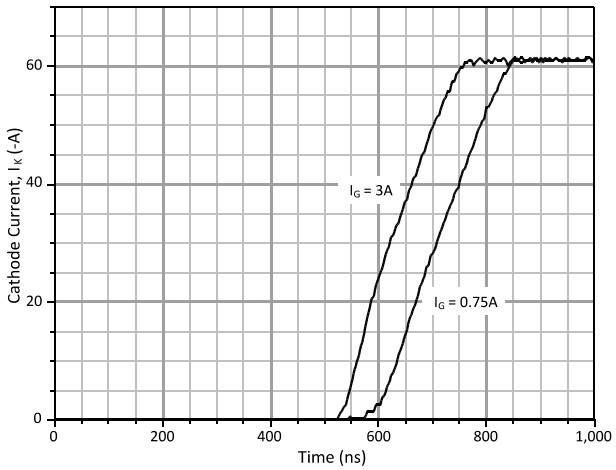

Figure 5: Typical Turn On Characteristics at 25 °C

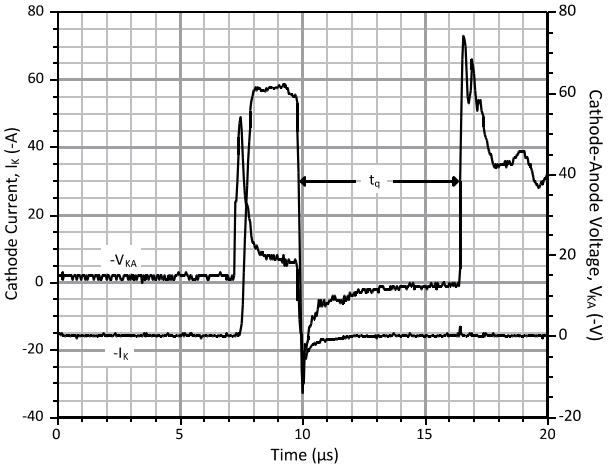

Figure 6: Typical Turn Off Characteristics at 25 °C

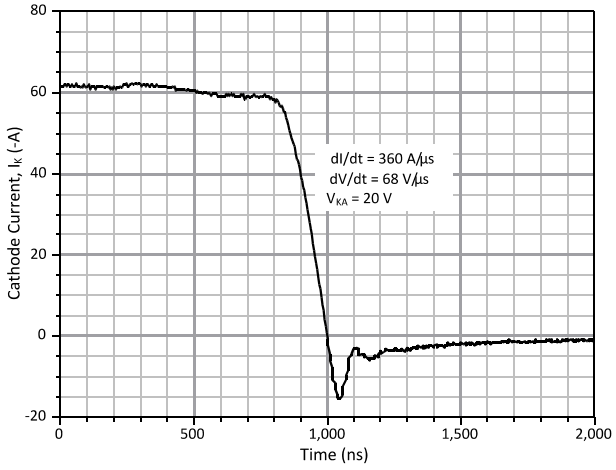

Figure 7: Typical Reverse Recovery Characteristics at 25 °C

Revision History			
Date	Revision	Comments	Supersedes
2010/11/07	1	First generation release	

Published by
GeneSiC Semiconductor, Inc.
43670 Trade Center Place Suite 155
Dulles, VA 20166

GeneSiC Semiconductor, Inc. reserves right to make changes to the product specifications and data in this document without notice.

GeneSiC disclaims all and any warranty and liability arising out of use or application of any product. No license, express or implied to any intellectual property rights is granted by this document.

Unless otherwise expressly indicated, GeneSiC products are not designed, tested or authorized for use in life-saving, medical, aircraft navigation, communication, air traffic control and weapons systems, nor in applications where their failure may result in death, personal injury and/or property damage.