

Silicon Carbide Thyristor

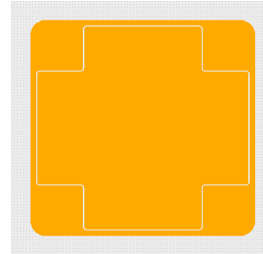
V_{FBM}	=	6500 V
$I_{T(AVM)}$	=	80 A
Q_{rr}	=	4.2 μ C

Features

- 6500 V Asymmetric SiC NPNP Thyristor
- 210 °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}	$T_j = 25\text{ }^\circ\text{C}$	6500	V
Repetitive peak reverse voltage	V_{RBM}	$T_j = 25\text{ }^\circ\text{C}$	50	V
Maximum average on-state current	$I_{T(AVM)}$	$T_c \leq 125\text{ }^\circ\text{C}$	80	A
RMS on-state current	$I_{T(RMS)}$	$T_c \leq 125\text{ }^\circ\text{C}$	139	A
Operating and storage temperature	T_j, T_{stg}		-55 to 210	$^\circ\text{C}$

Electrical Characteristics

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Maximum peak on state voltage	$V_{KA(ON)}$	$I_K = -80\text{ A}, T_j = 25\text{ }^\circ\text{C}$ $I_K = -80\text{ A}, T_j = 150\text{ }^\circ\text{C}$		-3.70 -3.45		V
Anode-cathode threshold voltage	$V_{KA(TO)}$	$T_j = 25\text{ }^\circ\text{C} (150\text{ }^\circ\text{C})$		-3.0(-2.7)		V
Anode-cathode slope resistance	R_{AK}	$T_j = 25\text{ }^\circ\text{C} (150\text{ }^\circ\text{C}), I_K = -80\text{ A}$		6.0(6.3)		m Ω
Leakage current	I_L	$V_{KA} = -6500\text{ V}, V_{GA} = 0\text{ V}, T_j = 25\text{ }^\circ\text{C}$ $V_{KA} = -6500\text{ V}, V_{GA} = 0\text{ V}, T_j = 150\text{ }^\circ\text{C}$		15 50		μ A
Gate trigger current	I_{GT}	$T_j = 25\text{ }^\circ\text{C}, t_p = 10\text{ }\mu\text{s}$		-100		mA
Holding current	I_H	$T_j = 25\text{ }^\circ\text{C}$		tbd		mA
Rise time	t_R	$I_G = -3\text{ A}, V_{KA} = -2200\text{ V}$		190		ns
Delay time	t_D	$I_K = -80\text{ A}, T_j = 25\text{ }^\circ\text{C}$		50		ns
Reverse recovery charge	Q_{rr}			4.2		μ C
Recovered charge, 50% chord	Q_{ra}	$di/dt = 430\text{ A/us}, I_K = -70\text{ A}, V_{KA} = 20\text{ V}$		2.3		μ C
Reverse recovery current	I_{rm}	$dV/dt(\text{re-app}) = -460\text{ V/us}, T_j = 25\text{ }^\circ\text{C}$		20		A
Circuit commutated turn-off time	t_q			10.1		μ s

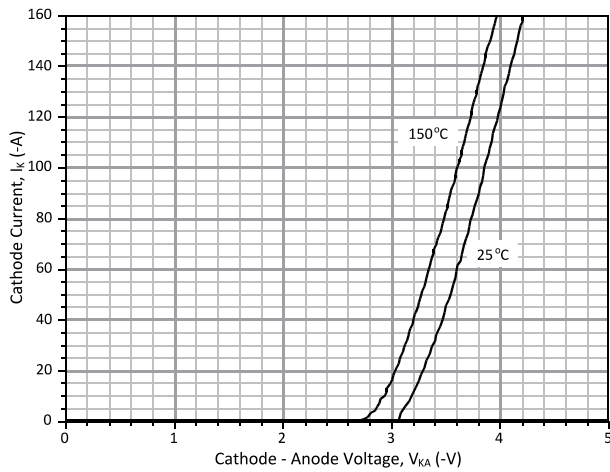


Figure 1: Typical On State Characteristics

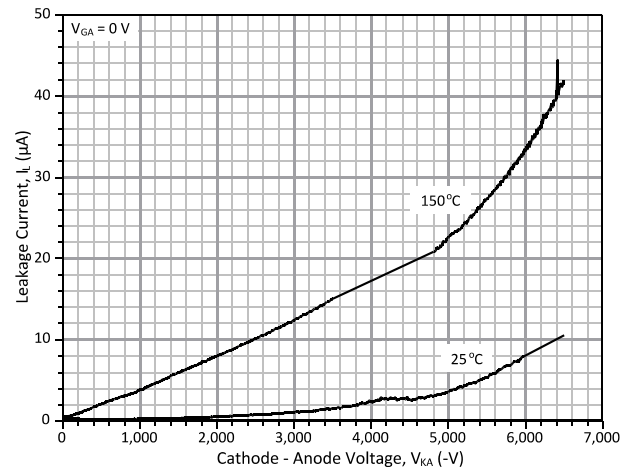


Figure 2: Typical Forward Blocking Characteristics

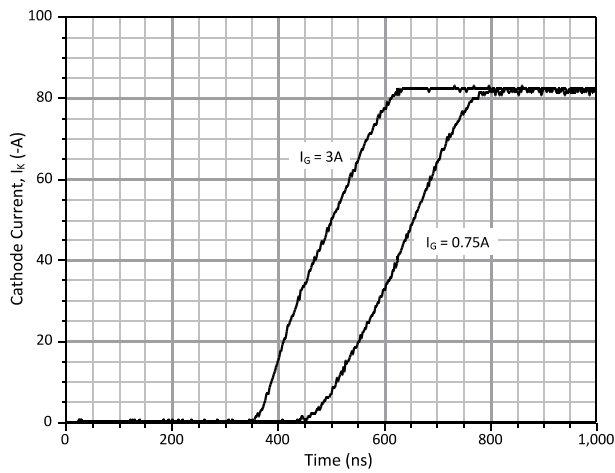


Figure 5: Typical Turn On Characteristics at 25 °C

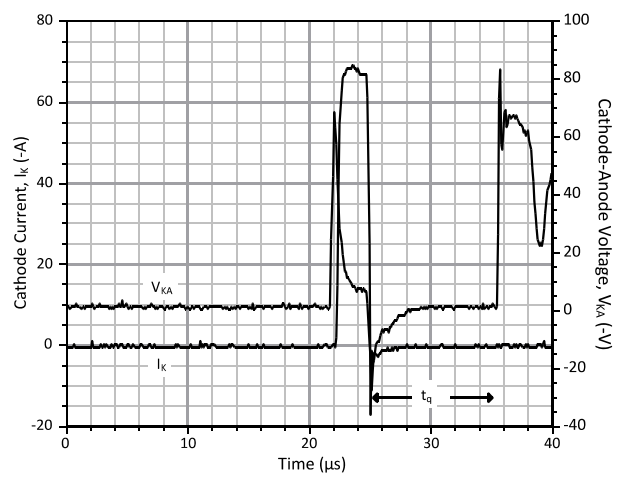


Figure 6: Typical Turn Off Characteristics at 25 °C

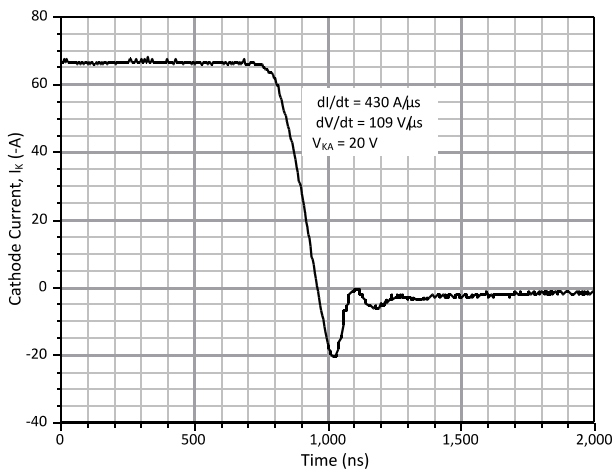


Figure 7: Typical Reverse Recovery Characteristics at 25 °C

Revision History			
Date	Revision	Comments	Supersedes
2013/11/07	1	First generation release	

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