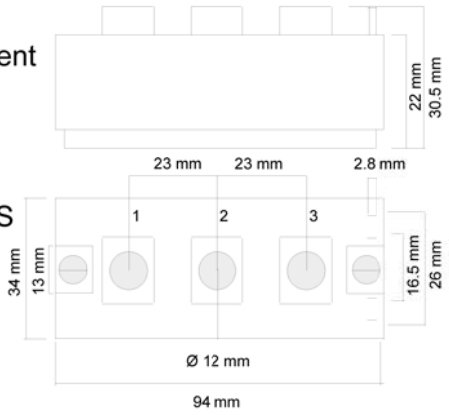
IGBT

Phase Leg Module

V_{CES} = 1200 V
I_{CM} = 100 A
$V_{CE(SAT)}$ = 2 V

Features

- SPT chip (soft-punch-through)
- MOS input control
- Low $V_{CE(SAT)}$
- Positive temperature coefficient for easy paralleling
- High short-circuit current capability
- Low switching losses
- Isolation voltage 2500 V RMS

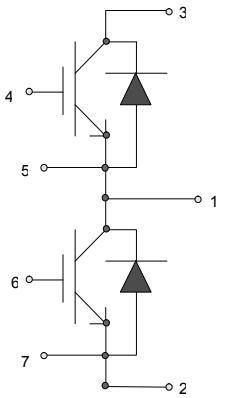


Applications

- AC and DC motor control
- AC servo and robot devices
- Power supplies
- Welding inverters

Maximum Ratings

Parameter	Symbol	Conditions		Values	Units
IGBT					
Collector-Emitter Voltage	V_{CES}			1200	V
DC-Collector Current	I_{CM}	T_c=25ºC (85ºC)		150 (100)	A
Gate Emitter Peak Voltage	V_{GES}			±20	V
Operating Temperature	T_{vj}			-40 to +125	ºC
Storage Temperature	T_{stg}			-40 to +125	ºC
Insulation Test Voltage	V_{ISOL}	RMS, 1min, 50 Hz		2500	V
Free-wheeling diode					
DC-Forward Current	I_F	T_c=25ºC (85ºC)		150 (100)	A
Repetitive Peak Forward Current	I_{FM}		t_P= 1ms	300 (190)	A
Forward Surge Current	I_{FSM}	t_P= 10ms, Sin, T_j = 150ºC		1000	A
Thermal Properties					
Th. Resistance Junction to Case	R_{thJC}			0.17	K/W
Th. Resistance Case to Heat Sink	R_{thCS}			0.25	K/W



Mechanical Properties		Values			
		Min	Typ	Max	
Mounting Torque	M_d	3		5	Nm
Terminal Connection Torque		2.5		5	Nm
Weight			176		g
Case Color			White		
Dimensions			94x34x30.5		mm

Characteristic Values

Parameter	Symbol	Conditions	Values Min	Typ	Max	Unit
IGBT						
Gate Threshold Voltage	$V_{GE(th)}$	V_{GE}= V_{CE}, I_C= 2mA, T_j= 25ºC		6.5		V
Collector-Emitter Cut-Off Current	$I_{CES,25}$	V_{GE}= 0V, V_{CE} = V_{CES}, T_j= 25ºC		0.05		mA
	$I_{CES,125}$	V_{GE}= 0V, V_{CE} = V_{CES}, T_j= 125ºC		0.1		mA
Gate-Leakage Current	I_{GES}	V_{GE}= 0V, V_{CE} = 20V, T_j= 25ºC	-200		200	nA
Collector-Emitter Threshold Voltage	$V_{CE(TO)}$	T_j= 25ºC		1		V
Collector-Emitter Slope Resistance	$R_{CE,25}$	V_{GE}= 15V, T_j= 25ºC		9		mΩ
	$R_{CE,125}$	V_{GE}= 15V, T_j= 125ºC		11		mΩ
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	I_C= 100A, V_{GE} = 15V		2		V
Input Capacitance	C_{ies}	V_{GE}= 0V, V_{CE} = 25V, f = 1MHz		9		nF
Output Capacitance	C_{oes}			1		nF
Reverse Transfer Capacitance	C_{res}			1		nF
Stray Inductance Module	L_σ			25		nH
Module Lead Resistance	R_{mod}	T_c= 25 (125) ºC		0.75(1)		mΩ
Short Circuit Current	I_{sc}	T_c= 125ºC, t_{psc}<10s, V_{CC}=900 V, V_{GE}=15V		470		A
Rise Time	t_R	V_{CC}= 600V, I_C = 100A, T_j= 125ºC R_{gon} = R_{goff} = 12Ω, V_{GE}= ±18V		120		nS
Fall Time	t_F			130		nS
Turn-On Energy Loss Per Pulse	E_{on}			3.45		mJ
Turn-Off Energy Loss Per Pulse	E_{off}			12.28		mJ
Free-wheeling diode						
Forward Voltage	V_F	I_F= 100A, V_{GE} = 0V, T_j= 25ºC		2.45		V
Threshold Voltage at Diode	$V_{D(TO)}$	T_j= 25ºC		0.7		V
Peak Reverse Recovery Current	I_{RRM}	I_F=100A, V_{GE}=0V, -dI/dt=125 A/µs		15		A
Reverse Recovery Time	t_{RR}			1100		nS

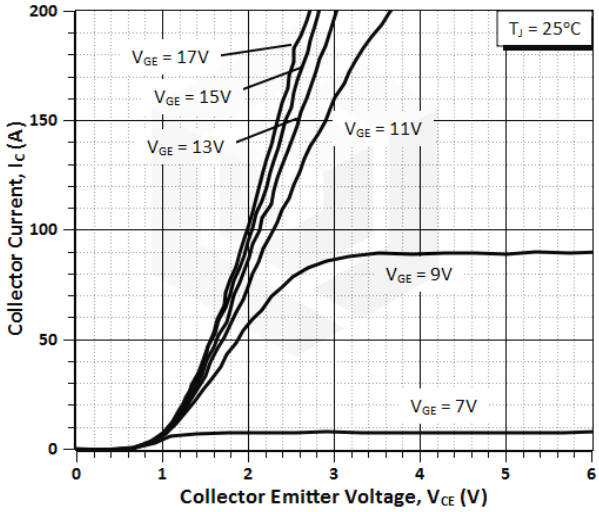


Figure 1: Typical Output Characteristics at 25 ºC

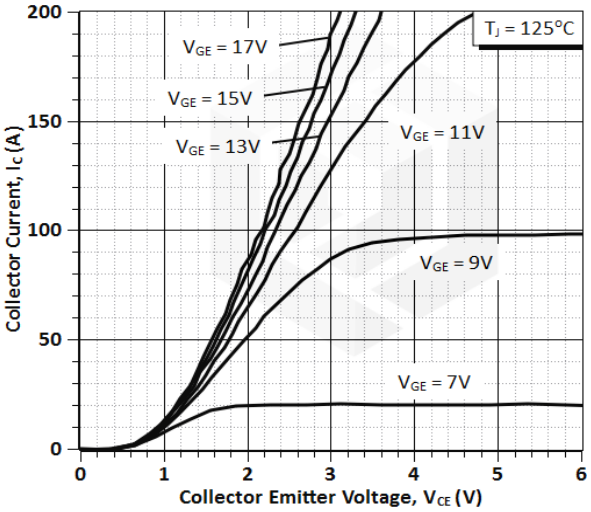


Figure 2: Typical Output Characteristics at 125 ºC

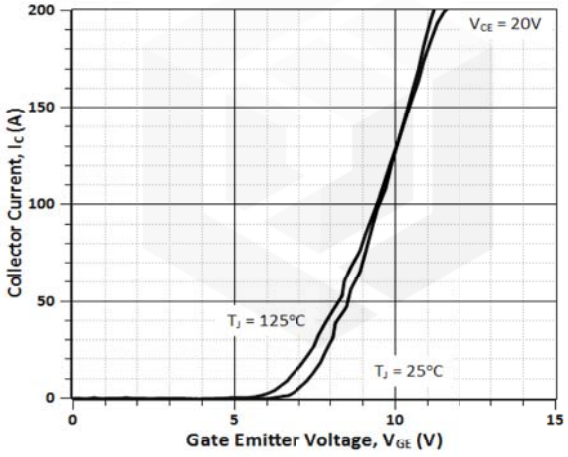


Figure 3: Typical Transfer Characteristics

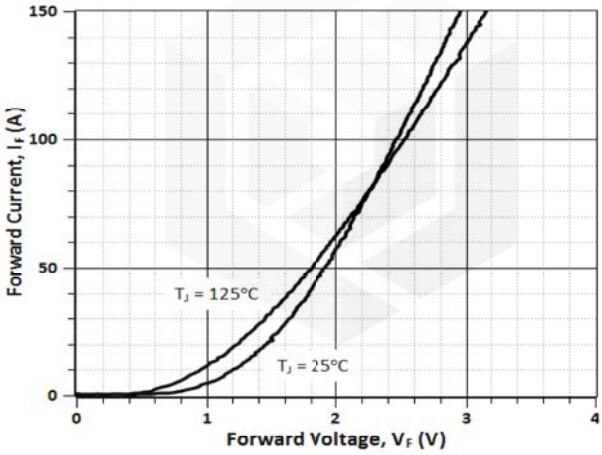


Figure 4: Typical FWD Forward Characteristics

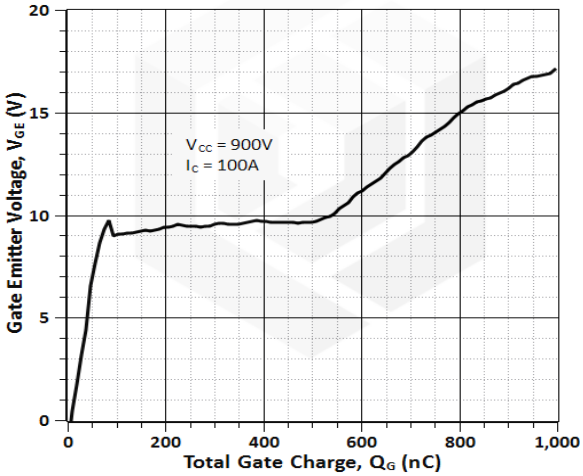


Figure 5: Typical Turn On Gate Charge

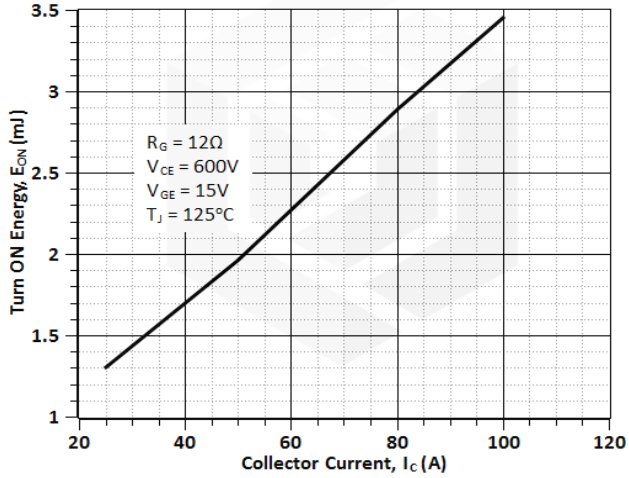


Figure 6: Typical Turn On Energy vs Collector Current

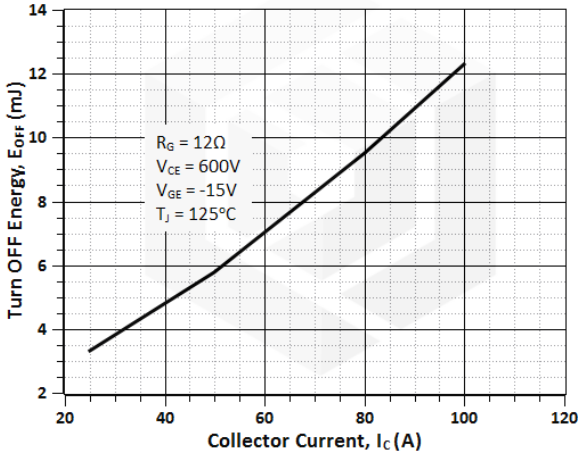


Figure 7: Typical Turn Off Energy vs Collector Current

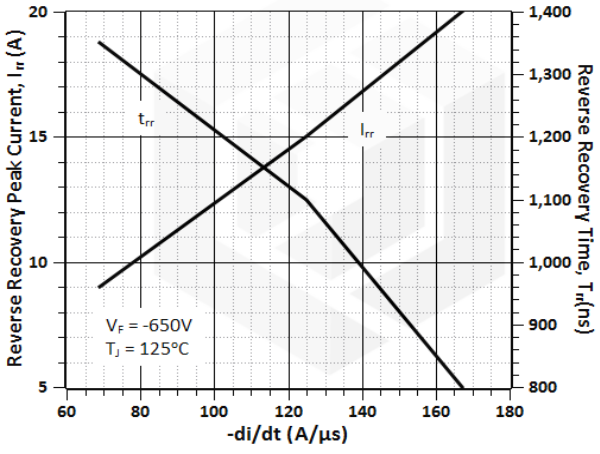


Figure 8: Typical FWD Turn Off Characteristics

Revision History		
Date	**Rev.**	**Notes**
2010-10-08	0	Created

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