

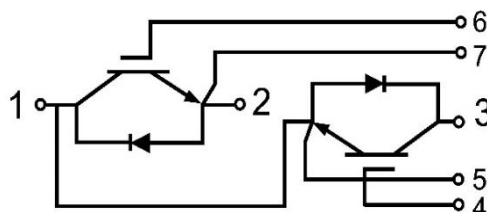
GT100HF120T1VH

Circuit Diagram

IGBT Module

Features:

- $V_{CES}=1200V$ $I_C=100A$ Trench & Field Stop IGBT Module
- Short Circuit Capability
- Low Switching Loss
- 100% RBSOA Tested($2 \times I_C$)
- Low Stray Inductance
- Lead Free, Compliant with RoHS Requirement



Applications:

- Welding
- UPS
- Induction Heating

Type	Package	Marking
GT100HF120T1VH	T1V	GT100HF120T1VH

IGBT, Inverter

Maximum Rated Values ($T_C=25^{\circ}C$ unless otherwise specified)

V_{CES}	Collector-Emitter Blocking Voltage		1200	V
V_{GES}	Gate-Emitter Voltage		± 20	V
I_C	Continuous Collector Current Limited by T_{Jmax}	$T_C=90^{\circ}C$	100	A
		$T_C=25^{\circ}C$	200	A
I_{CM}	Peak Collector Current Repetitive	T_p limited by T_{Jmax}	200	A
P_D	Maximum Power Dissipation (IGBT)	$T_C=25^{\circ}C$, $T_{Jmax}=175^{\circ}C$	700	W

GT100HF120T1VH

IGBT Module Datasheet



Electrical Characteristics of IGBT ($T_C=25^{\circ}\text{C}$ unless otherwise specified)

Static Characteristics

Symbol	Description	Conditions	Min.	Typ.	Max.	Units
$V_{GE(th)}$	Gate-Emitter Threshold Voltage	$I_C=4\text{mA}$, $V_{CE}=V_{GE}$	5.0	5.8	6.6	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=100\text{A}$, $V_{GE}=15\text{V}$	$T_J=25^{\circ}\text{C}$	2.20	2.65	V
			$T_J=125^{\circ}\text{C}$	2.90		V
			$T_J=175^{\circ}\text{C}$	3.20		V
I_{CES}	Collector-Emitter Leakage Current	$V_{GE}=0\text{V}$, $V_{CE}=1200\text{V}$, $T_J=25^{\circ}\text{C}$			1	mA
I_{GES}	Gate-Emitter Leakage Current	$V_{GE}=20\text{V}$, $V_{CE}=0\text{V}$, $T_J=25^{\circ}\text{C}$			200	nA
C_{ies}	Input Capacitance	$V_{CE}=25\text{V}$, $V_{GE}=0\text{V}$, $f=100\text{kHz}$		11.38		nF
C_{oes}	Output Capacitance			4.18		nF
C_{res}	Reverse Transfer Capacitance			0.99		nF

Switching Characteristics

$t_{d(on)}$	Turn-on Delay Time	$V_{CC}=600V, I_C=100A,$ $R_{Gon}=4.7\Omega, V_{GE}=\pm 15V,$ Inductive Load	$T_J=25^{\circ}C$		174		ns
			$T_J=125^{\circ}C$		186		
			$T_J=175^{\circ}C$		190		
t_r	Rise Time		$T_J=25^{\circ}C$		53		ns
			$T_J=125^{\circ}C$		60		
			$T_J=175^{\circ}C$		64		
$t_{d(off)}$	Turn-off Delay Time		$T_J=25^{\circ}C$		178		ns
			$T_J=125^{\circ}C$		209		
			$T_J=175^{\circ}C$		226		
t_f	Fall Time	$T_J=25^{\circ}C$		86		ns	
		$T_J=125^{\circ}C$		106			
		$T_J=175^{\circ}C$		123			
E_{on}	Turn-on Switching Loss	$V_{CC}=600V, I_C=100A,$ $R_{Gon}=4.7\Omega, V_{GE}=\pm 15V,$ $di/dt=1250A/\mu s(T_J=175^{\circ}C)$ Inductive Load	$T_J=25^{\circ}C$		5.0		mJ
		$T_J=125^{\circ}C$		6.3			
		$T_J=175^{\circ}C$		6.9			



GT100HF120T1VH

IGBT Module Datasheet

E _{off}	Turn-off Switching Loss	V _{CC} =600V, I _C =100A, R _{Goff} =4.7Ω, V _{GE} =±15V, du/dt=7900V/μs(T _J =175°C) Inductive Load	T _J =25°C		3.1		mJ
			T _J =125°C		4.2		
			T _J =175°C		4.8		
Q _g	Total Gate Charge	V _{GE} =+15V...-15V	T _J =25°C		663		nC
T _{SC}	V _{CC} =600V, V _{GE} =±15V, T _J =175°C ^{note1}					10	us
R _{θJC}	IGBT Thermal Resistance: Junction-to-Case (per IGBT)					0.215	°C/W
R _{θCS}	IGBT Thermal Resistance: Case-to-Sink (per IGBT) (per IGBT, λ _{grease} = 1 W/(m • K))				0.072		°C/W

note1: Short circuit withstand time cannot exceed 10us under specified condition

Diode (SiC SBD)

Maximum Rated Values of Diode (T_C=25°C unless otherwise specified)

V _{RRM}	Repetitive Peak Reverse Voltage	T _J =25°C	1200	V
I _F	Diode Continuous Forward Current		100	A
I _{FM}	Diode Maximum Forward Current	t _p =1ms	200	A

Electrical Characteristics of Diode (T_C=25°C unless otherwise specified)

Symbol	Description	Conditions		Min.	Typ.	Max.	Units
V _{FM}	Forward Voltage	I _F =100A	T _J =25°C		2.35	2.80	V
			T _J =125°C		3.11		
			T _J =175°C		3.65		
R _{θJC}	Diode Thermal Resistance: Junction-to-Case (per Diode)					1.050	°C/W
R _{θCS}	Diode Thermal Resistance: Case-to-Sink (per Diode, λ _{grease} = 1 W/(m • K))				0.351		°C/W

GT100HF120T1VH

IGBT Module Datasheet



Module

Symbol	Description	Min.	Typ.	Max.	Units
V _{iso}	Isolation Voltage (All Terminals Shorted)	RMS, f=50Hz, 60s 2500			V
T _J	Maximum Junction Temperature	-40		175	°C
T _{JOP}	Maximum Operating Junction Temperature Range ^{note3}	-40		150	°C
T _{stg}	Storage Temperature	-40		125	°C
CTI	Comparative Tracking Index	200			
T	Power Terminals Screw:M5	3		5	
T	Mounting Screw:M5	4		6	N·m
G	Weight		165		g

note3: T_{JOP}> 150°C is only allowed for operation at overload conditions.

Ordering Information Table

Device code

G	T	100	HF	120	T1V	H
①	②	③	④	⑤	⑥	⑦

- ① - IGBT Module
- ② - Trench, Low Switching Losses IGBT
- ③ - Rated Current (100=100A)
- ④ - Circuit Configuration: HF (Half Bridge)
- ⑤ - Rated Voltage (120=1200V)
- ⑥ - Package Type
- ⑦ - Test Level (Pass the Important Reliability Test-Industrial Grade)

GT100HF120T1VH

IGBT Module Datasheet



Characteristic diagram

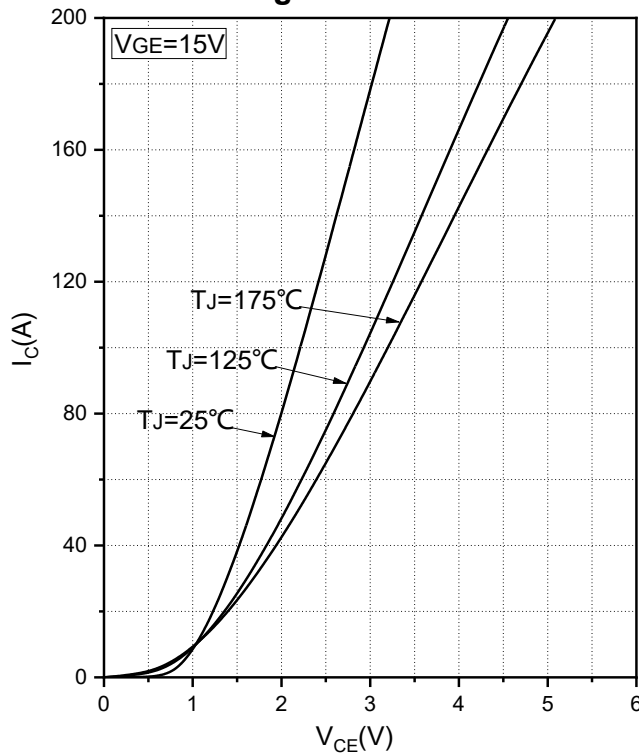


Fig.1 Typical Saturation Voltage Characteristics

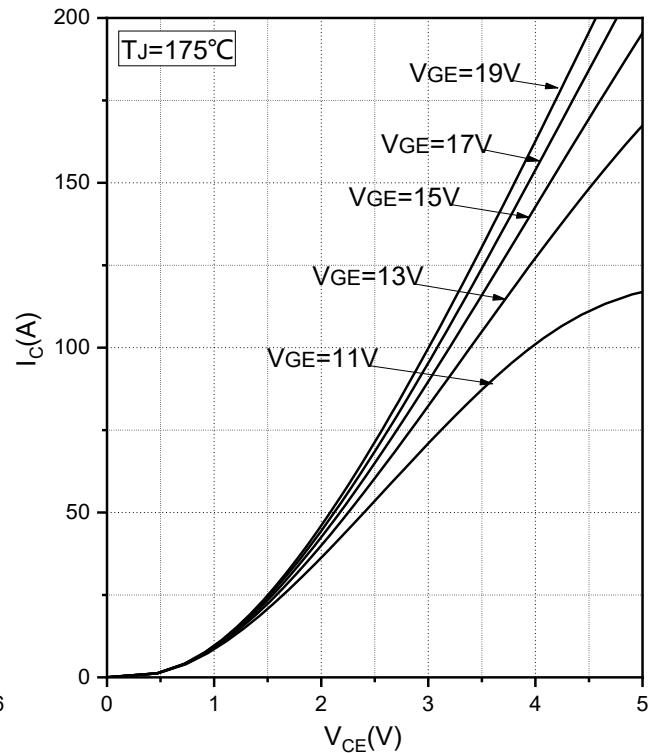


Fig.2 Typical Output Characteristics

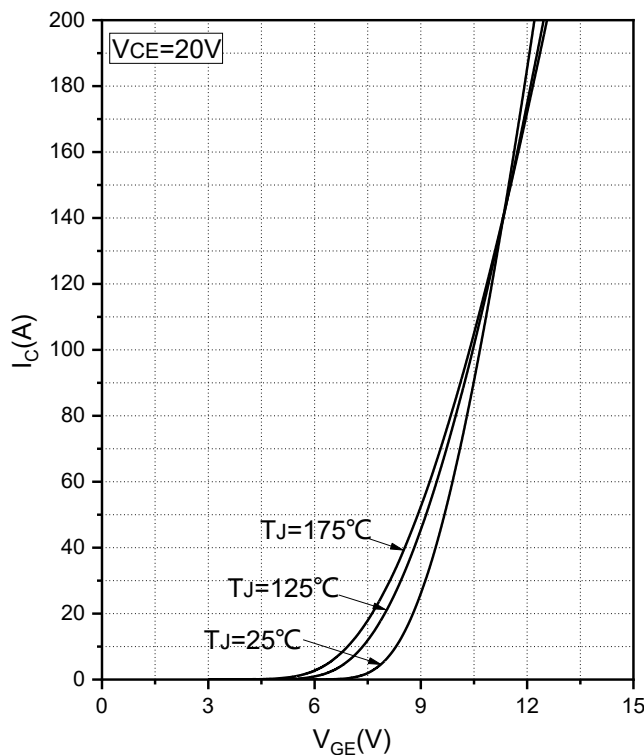


Fig.3 Transfer Characteristic

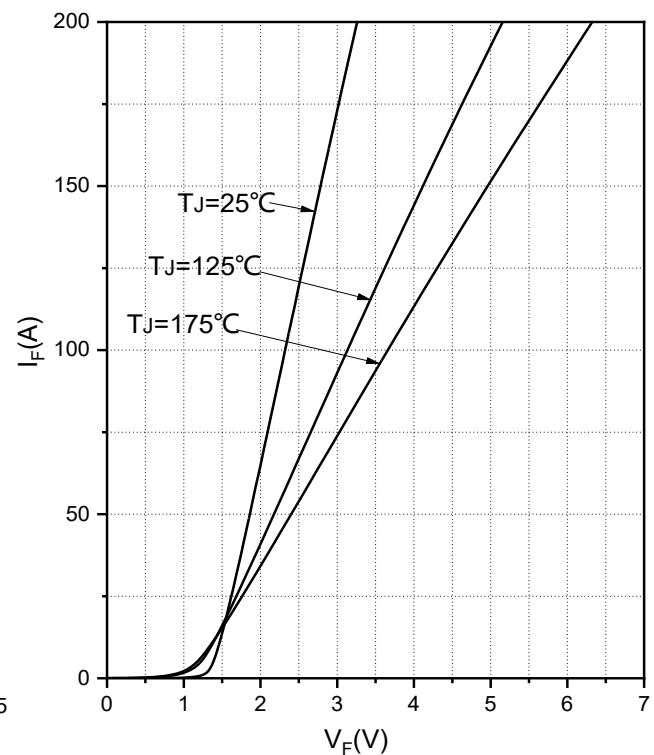


Fig.4 Forward Characteristics of SiC SBD

GT100HF120T1VH

IGBT Module Datasheet

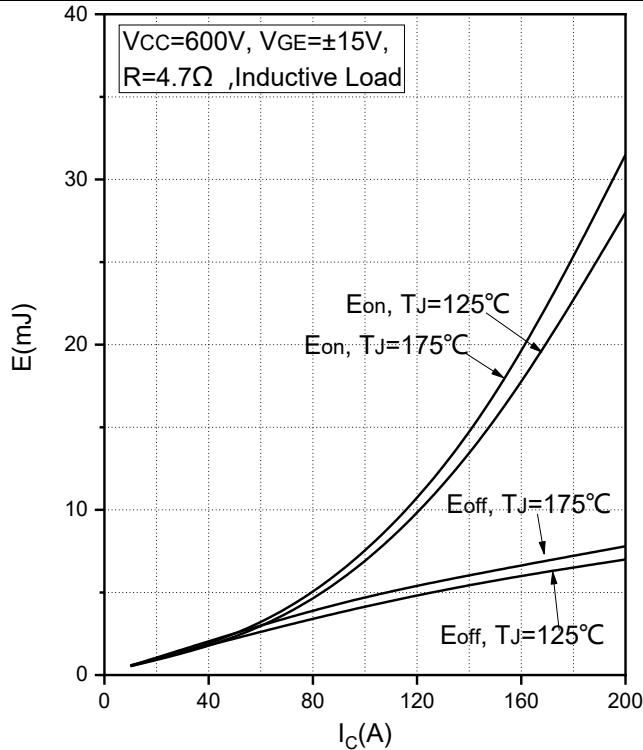


Fig.5 Typical Switching Loss vs. Collector Current

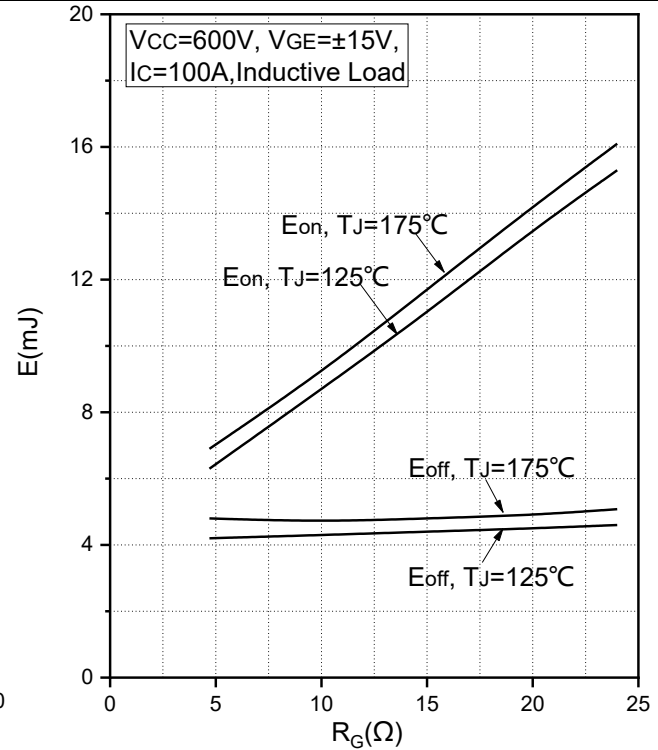


Fig.6 Typical Switching Loss vs. Gate Resistance

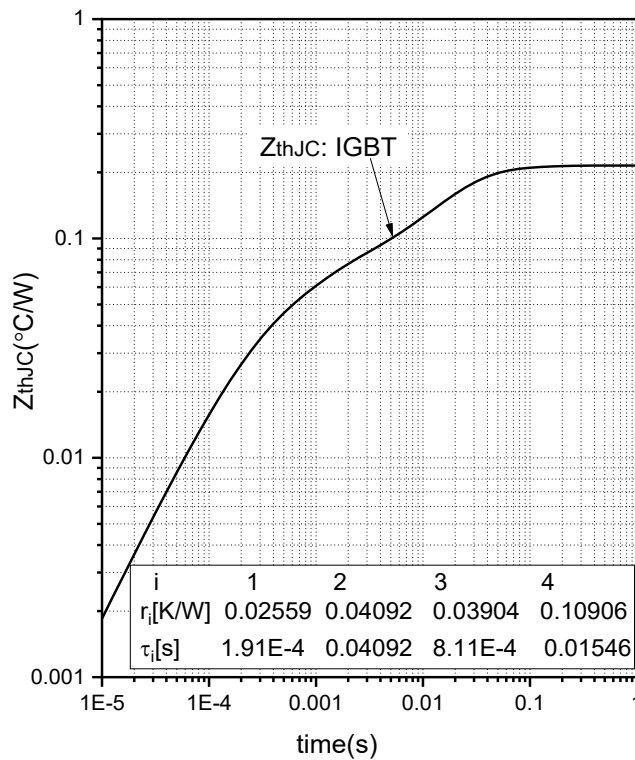


Fig.7 Transient Thermal Impedance (IGBT)

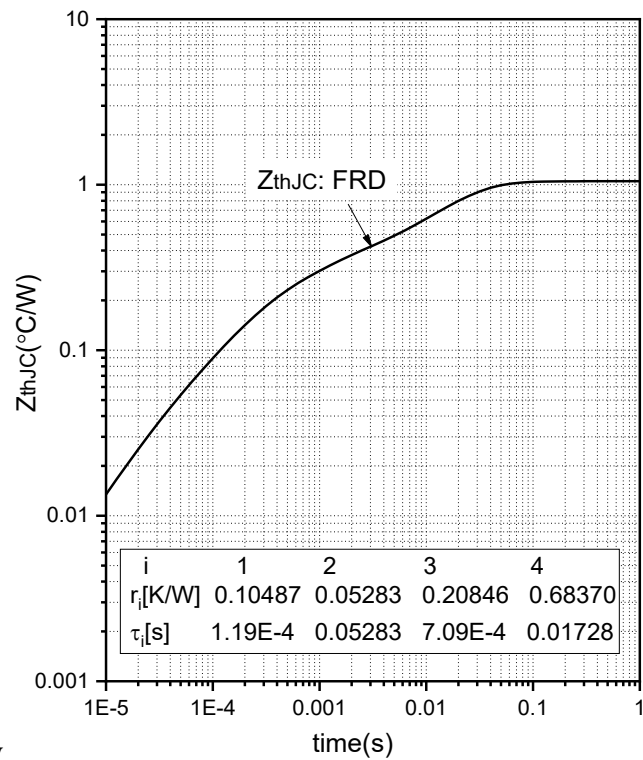


Fig.8 Transient Thermal Impedance (SiC SBD)

GT100HF120T1VH

IGBT Module Datasheet

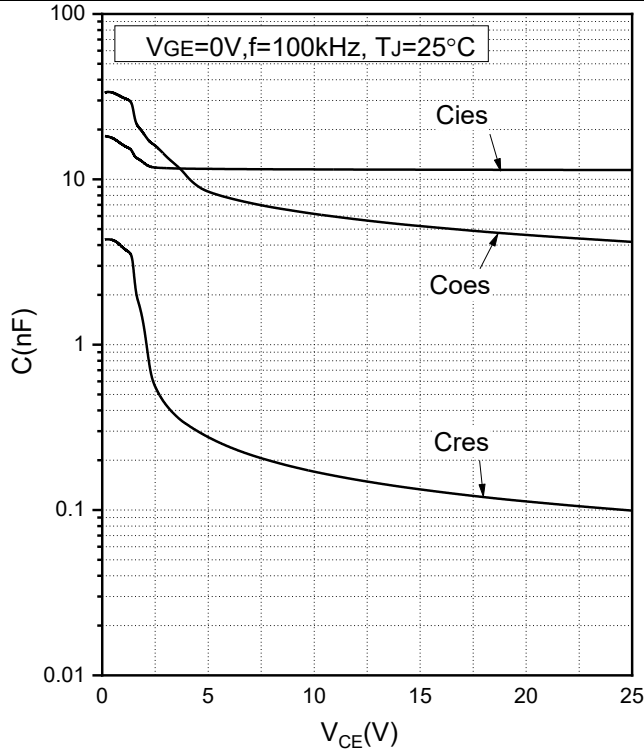


Fig.9 Capacitance Characteristics

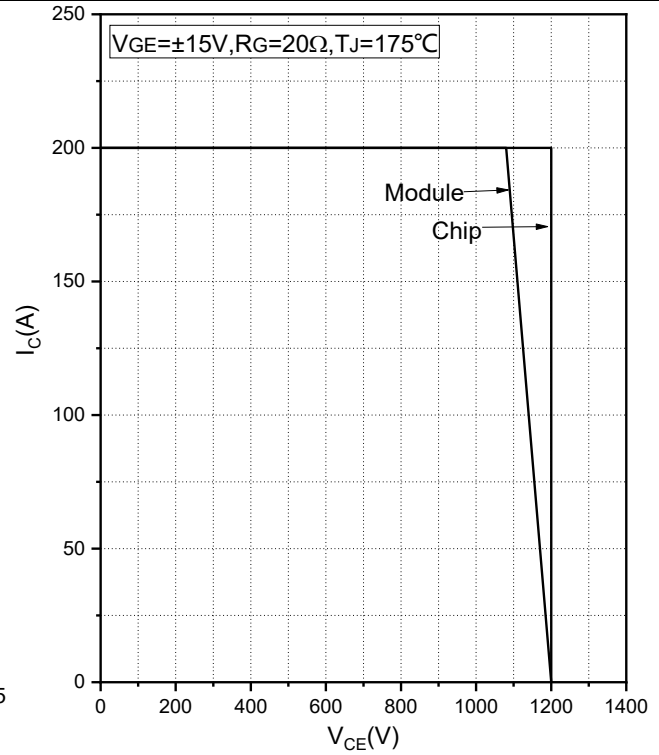


Fig.10 Reverse Bias Safe Operation Area (RBSOA)

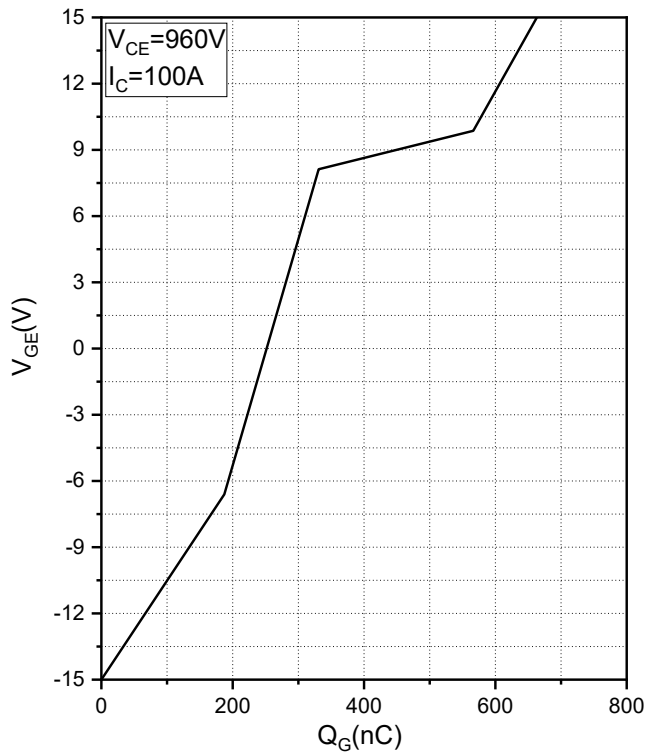
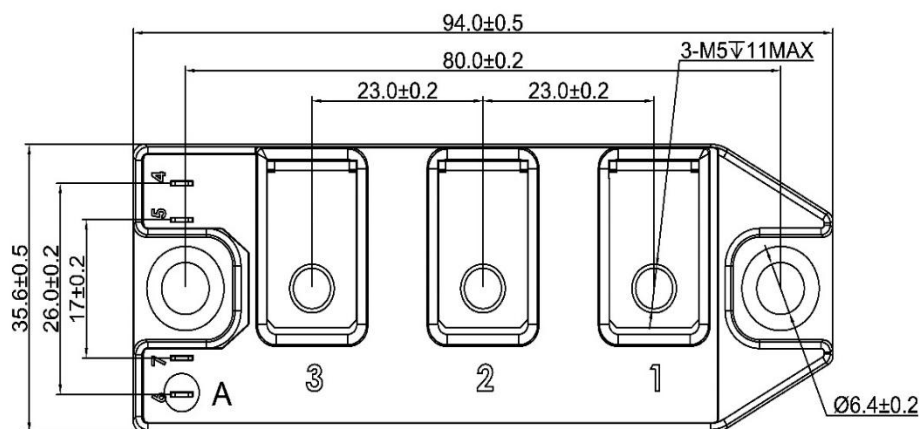


Fig.11 Gate Charge Characteristics

Technical drawing of a part with dimensions 2.80 ± 0.05 and 0.5 ± 0.05 .



GT100HF120T1VH

IGBT Module Datasheet



Revision	Notes
03	Engineering Sample Datasheet

Announcement

Information in this document is believed to be accurate and reliable. However, NJSME does not give any representations or warranties, expressed or implied, as to the accuracy or completeness of such information and shall have no liability for the consequences of use of such information.

Right to Make Changes

NJSME reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.

The datasheet with “REV.” + “Arabic numerals” is based on engineering data for initial reference purpose only.

The released datasheet would be issued with “REV.” + “alphabet characters”.