

GT900SD120T2ZH

IGBT Module

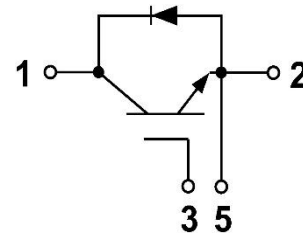
Features:

- $V_{CES}=1200V$ $I_C=900A$ 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:

- Servo Drives
- Motor Drives
- UPS Systems
- Wind Turbines

Circuit Diagram



Type	Package	Marking
GT900SD120T2ZH	T2Z	GT900SD120T2ZH

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}	$T_C=90^{\circ}C$	900	A
		$T_C=25^{\circ}C$	1800	A
I_{CM}	Peak Collector Current Repetitive	T_p limited by T_{Jmax}	1800	A
P_D	Maximum Power Dissipation (IGBT)	$T_C=25^{\circ}C$, $T_{Jmax}=175^{\circ}C$	5700	W

GT900SD120T2ZH

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	$I_C=32\text{mA}$, $V_{CE}=V_{GE}$	5.2	5.9	6.6	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=900\text{A}$, $V_{GE}=15\text{V}$	$T_J=25^{\circ}\text{C}$	2.01	2.40	V
			$T_J=125^{\circ}\text{C}$	2.42		V
			$T_J=175^{\circ}\text{C}$	2.60		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	$V_{GE}=20\text{V}$, $V_{CE}=0\text{V}$, $T_J=25^{\circ}\text{C}$			400	nA
C_{ies}	Input Capacitance	$V_{CE}=25\text{V}$, $V_{GE}=0\text{V}$, $f=100\text{kHz}$		96.45		nF
C_{oes}	Output Capacitance			4.68		nF
C_{res}	Reverse Transfer Capacitance			0.89		nF

Switching Characteristics

$t_{d(on)}$	Turn-on Delay Time	$V_{CC}=600V, I_C=900A,$ $R_{Gon}=1\Omega, V_{GE}=\pm 15V,$ Inductive Load	$T_J=25^{\circ}C$		259		ns
			$T_J=125^{\circ}C$		285		
			$T_J=175^{\circ}C$		288		
t_r	Rise Time		$T_J=25^{\circ}C$		129		ns
			$T_J=125^{\circ}C$		159		
			$T_J=175^{\circ}C$		164		
$t_{d(off)}$	Turn-off Delay Time		$T_J=25^{\circ}C$		408		ns
			$T_J=125^{\circ}C$		461		
			$T_J=175^{\circ}C$		470		
t_f	Fall Time	$T_J=25^{\circ}C$		237		ns	
		$T_J=125^{\circ}C$		369			
		$T_J=175^{\circ}C$		388			
E_{on}	Turn-on Switching Loss	$V_{CC}=600V, I_C=900A,$ $R_{Gon}=1\Omega, V_{GE}=\pm 15V,$ $di/dt=4300A/\mu s(T_J=175^{\circ}C)$ Inductive Load	$T_J=25^{\circ}C$		140		mJ
		$T_J=125^{\circ}C$		207			
		$T_J=175^{\circ}C$		216			

GT900SD120T2ZH

IGBT Module Datasheet



E _{off}	Turn-off Switching Loss	V _{CC} =600V, I _C =900A, R _{Goff} =1Ω, V _{GE} =±15V, du/dt=3600V/μs(T _J =175°C) Inductive Load	T _J =25°C		98		mJ
			T _J =125°C		129		
			T _J =175°C		135		
Q _g	Total Gate Charge	V _{GE} =+15V...-15V	T _J =25°C		5.67		uC
R _{G (int)}	Internal Gate Resistance		T _J =25°C		3.0		Ω
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)					0.026	°C/W
R _{θCS}	IGBT Thermal Resistance: Case-to-Sink (per IGBT) (per IGBT, λ _{grease} = 1 W/(m · K))				0.021		°C/W

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

Diode, Inverter

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		900	A
I _{FM}	Diode Maximum Forward Current	tp=1ms	1800	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 =900A	T _J =25°C		2.10	2.50	V
			T _J =125°C		2.28		
			T _J =175°C		2.22		
t _{rr}	Reverse Recovery Time	I _F =900A, -diF/dt=3250A/μs(T _J =175°C), V _R =600V, V _{GE} =-15V	T _J =25°C		448		ns
			T _J =125°C		590		
			T _J =175°C		632		
I _{rr}	Peak Reverse Recovery Current		T _J =25°C		225		A
			T _J =125°C		260		
			T _J =175°C		260		
Q _{rr}	Reverse Recovery Charge		T _J =25°C		50		μC
			T _J =125°C		102		
			T _J =175°C		116		



GT900SD120T2ZH

IGBT Module Datasheet

E _{rec}	Reverse Recovery Energy	I _F =900A, -diF/dt=3250A/μs(T _J =175°C), V _R =600V, V _{GE} =-15V	T _J =25°C		14.3		mJ
			T _J =125°C		31.5		
			T _J =175°C		36.6		
R _{θJC}	Diode Thermal Resistance: Junction-to-Case (per Diode)					0.063	°C/W
R _{θCS}	Diode Thermal Resistance: Case-to-Sink (per Diode, λ _{grease} = 1 W/(m • K))				0.052		°C/W

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	$^\circ C$
T_{JOP}	Maximum Operating Junction Temperature Range ^{note2}		-40		150	$^\circ C$
T_{stg}	Storage Temperature		-40		125	$^\circ C$
CTI	Comparative Tracking Index		200			
T	Signal Terminals Screw:M4		1.1		2	N·m
T	Power Terminals Screw:M6		2.5		5	N·m
T	Mounting Screw:M6		3		6	N·m
G	Weight			320		g

note2: $T_{JOP} > 150^\circ C$ is only allowed for operation at overload conditions.

Ordering Information Table

Device code	G	T	900	SD	120	T2Z	H
	①	②	③	④	⑤	⑥	⑦

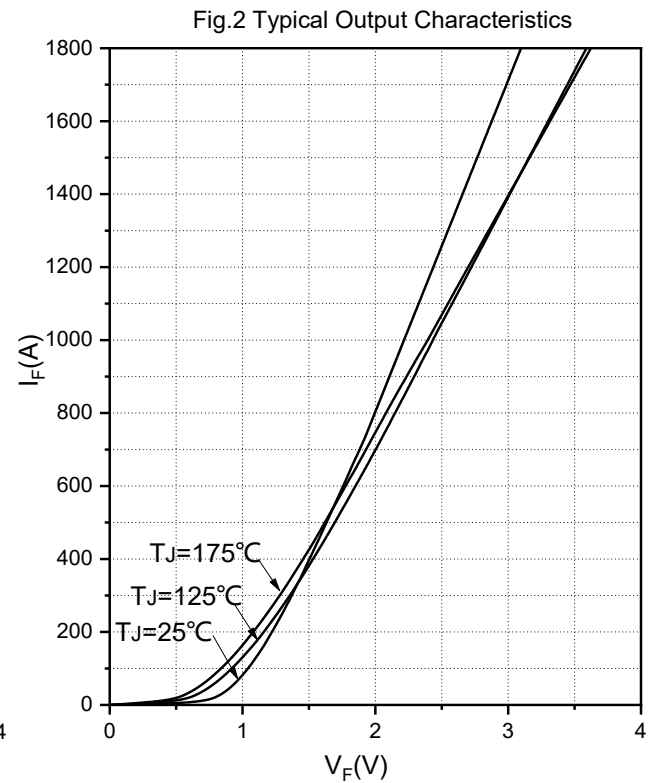
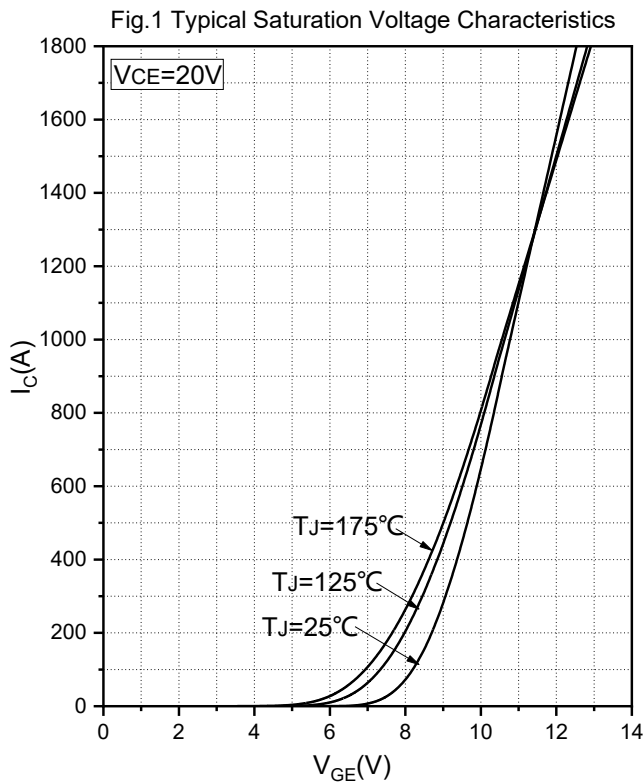
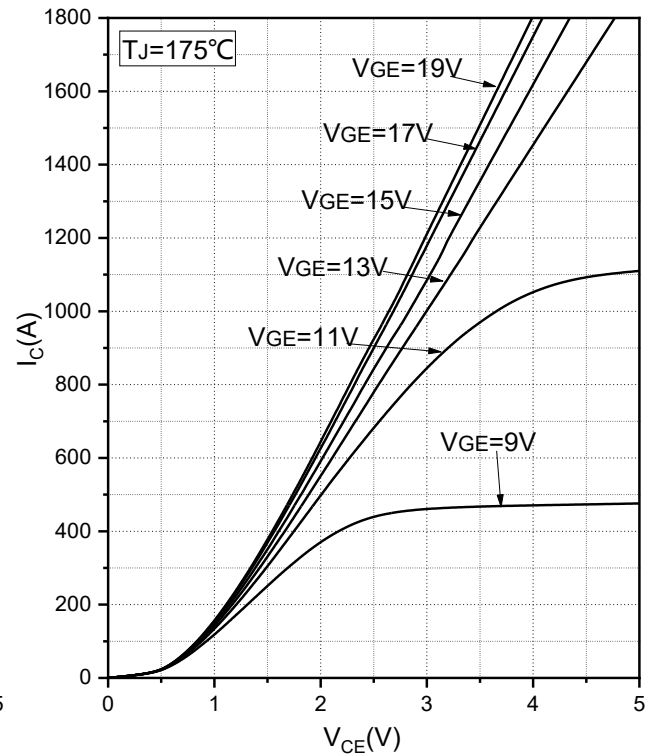
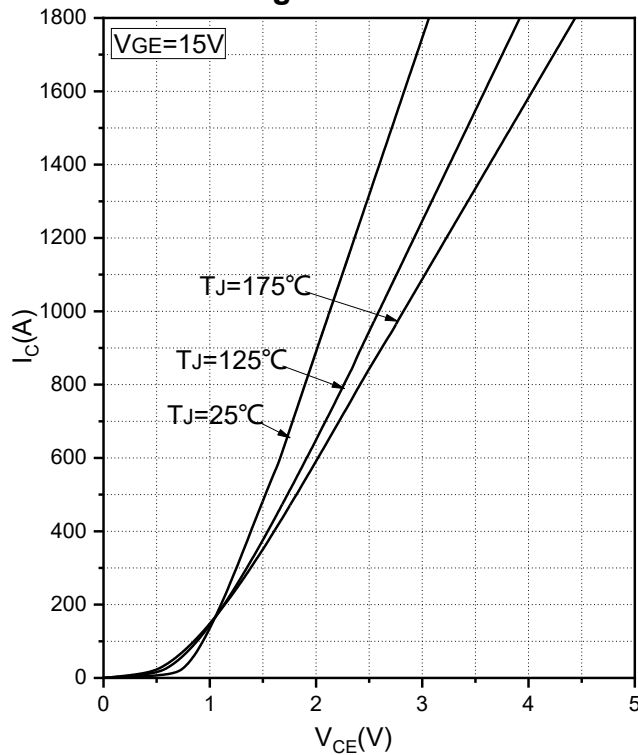
- ① - IGBT Module
- ② - Field Stop Trench Gate IGBT
- ③ - Rated Current (900=900A)
- ④ - Circuit Configuration:SD (Single)
- ⑤ - Rated Voltage (120=1200V)
- ⑥ - Package Type
- ⑦ - Test Level (Pass the Important Reliability Test-Industrial Grade)

GT900SD120T2ZH

IGBT Module Datasheet



Characteristic diagram



GT900SD120T2ZH

IGBT Module Datasheet

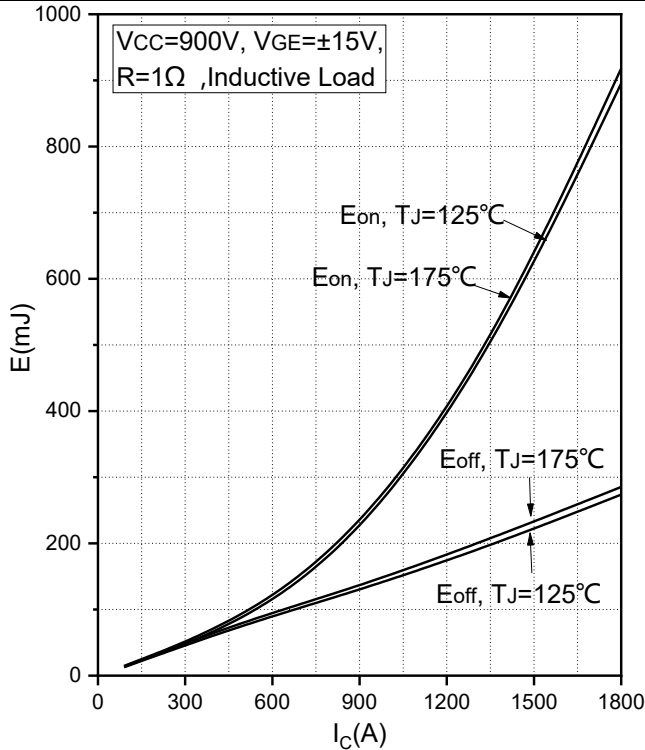


Fig.5 Typical Switching Loss vs. Collector Current

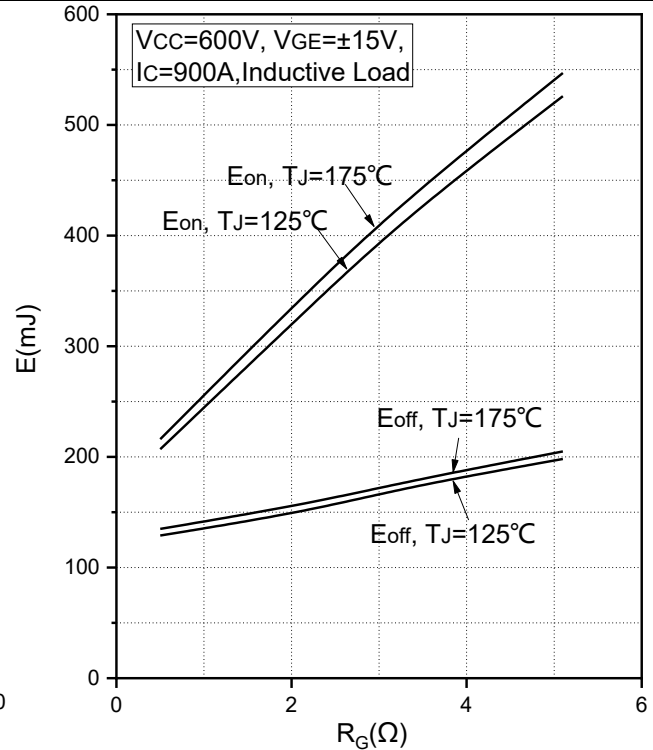


Fig.6 Typical Switching Loss vs. Gate Resistance

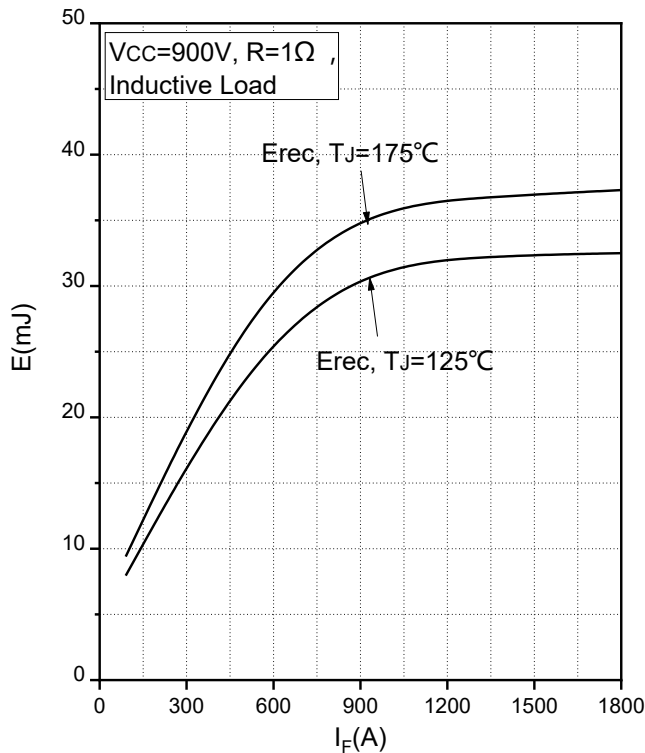


Fig.7 Typical Switching Loss vs. Forward Current

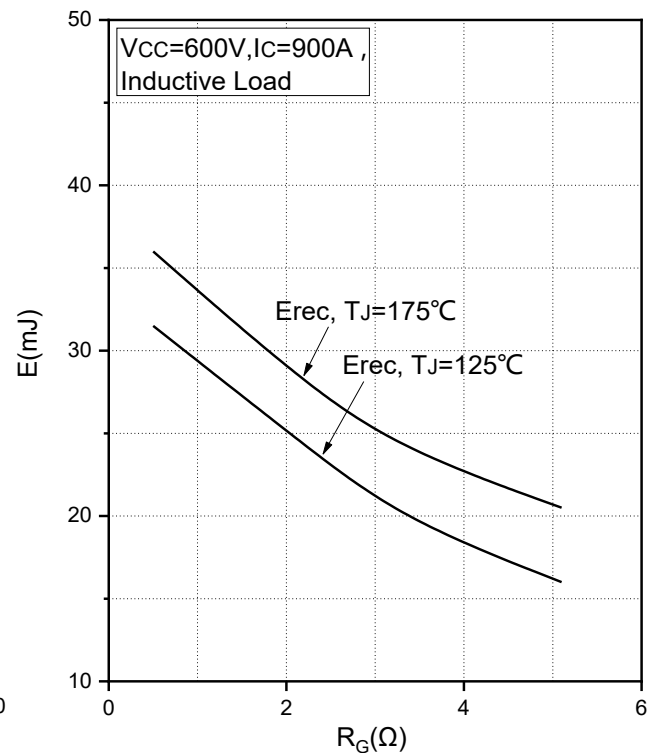


Fig.8 Typical Switching Loss vs. Gate Resistance

GT900SD120T2ZH

IGBT Module Datasheet

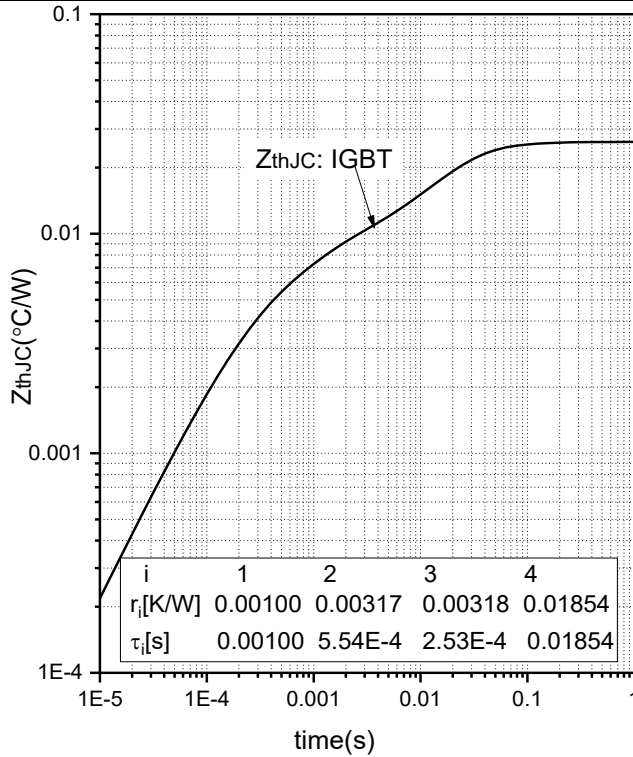


Fig.9 Transient Thermal Impedance (IGBT)

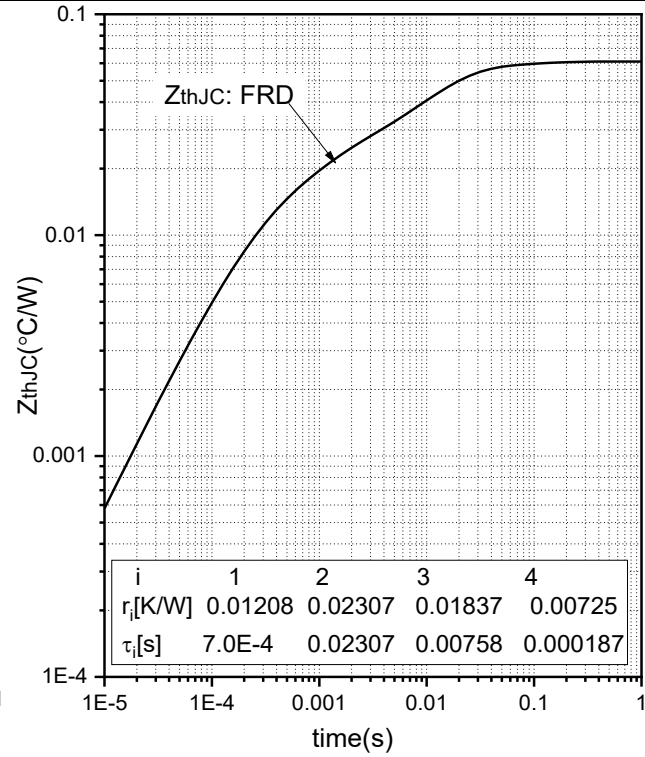


Fig.10 Transient Thermal Impedance (Diode)

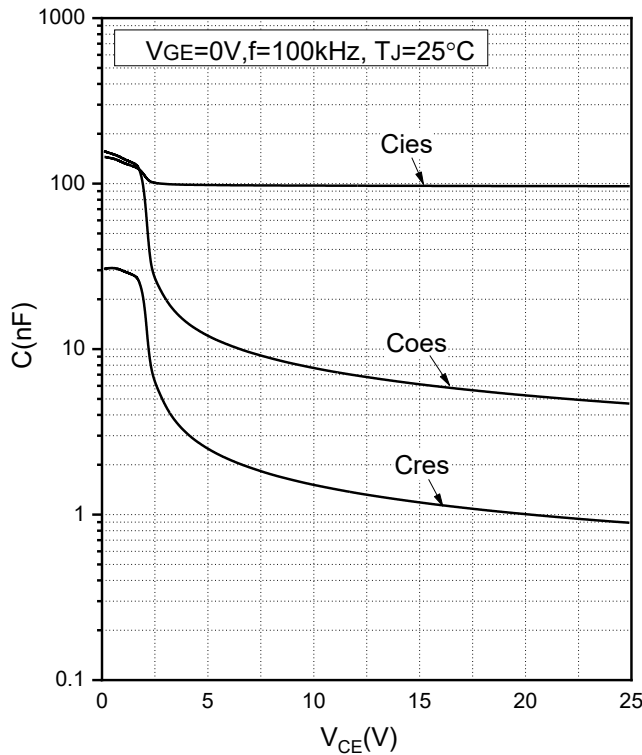


Fig.11 Capacitance Characteristics

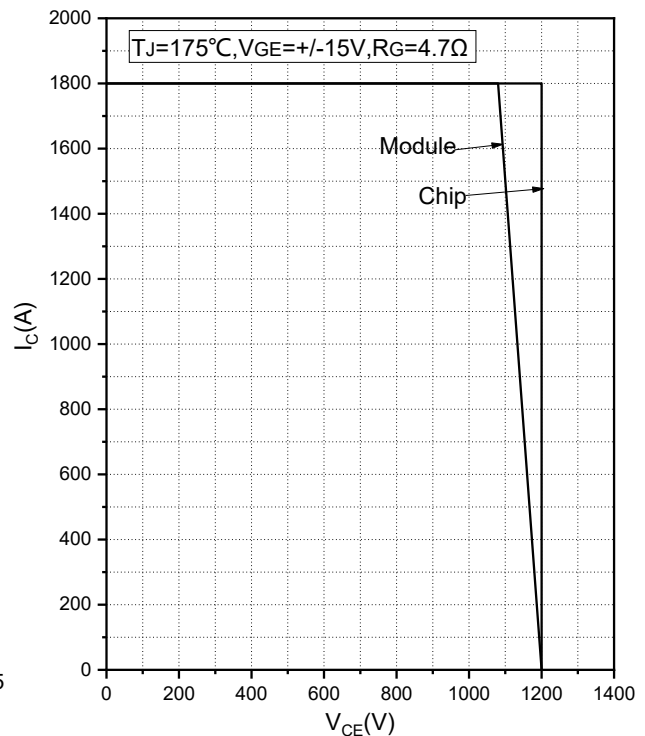


Fig.12 Reverse Bias Safe Operation Area (RBSOA)

GT900SD120T2ZH

IGBT Module Datasheet

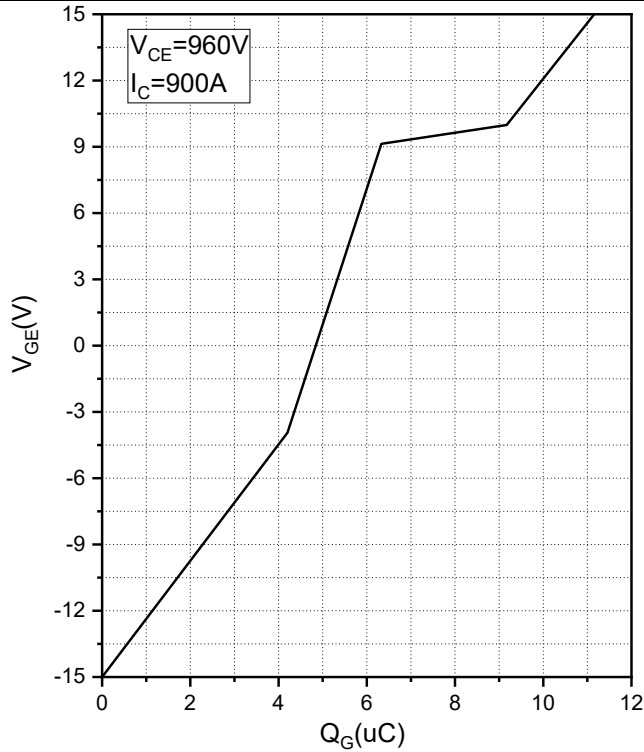


Fig.13 Gate Charge Characteristics

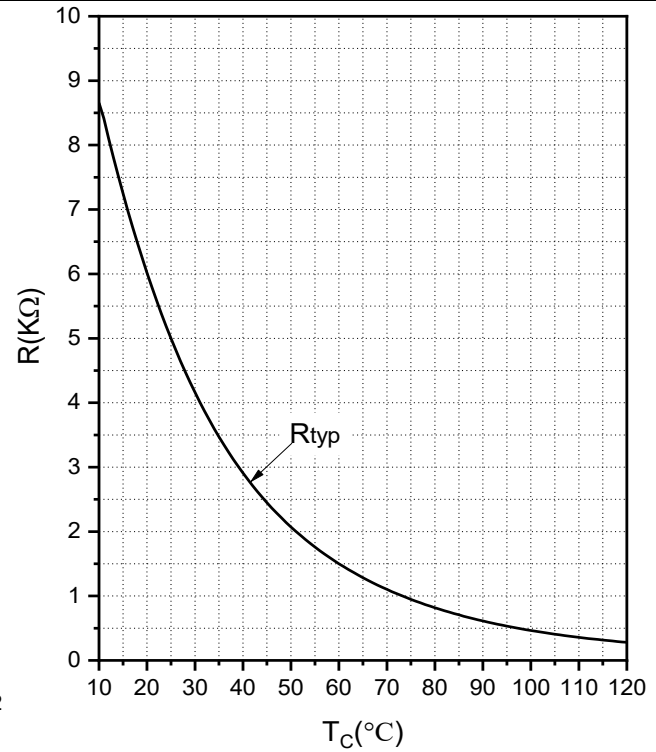


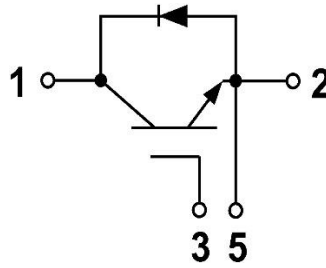
Fig.14 NTC Temperature Characteristics

GT900SD120T2ZH

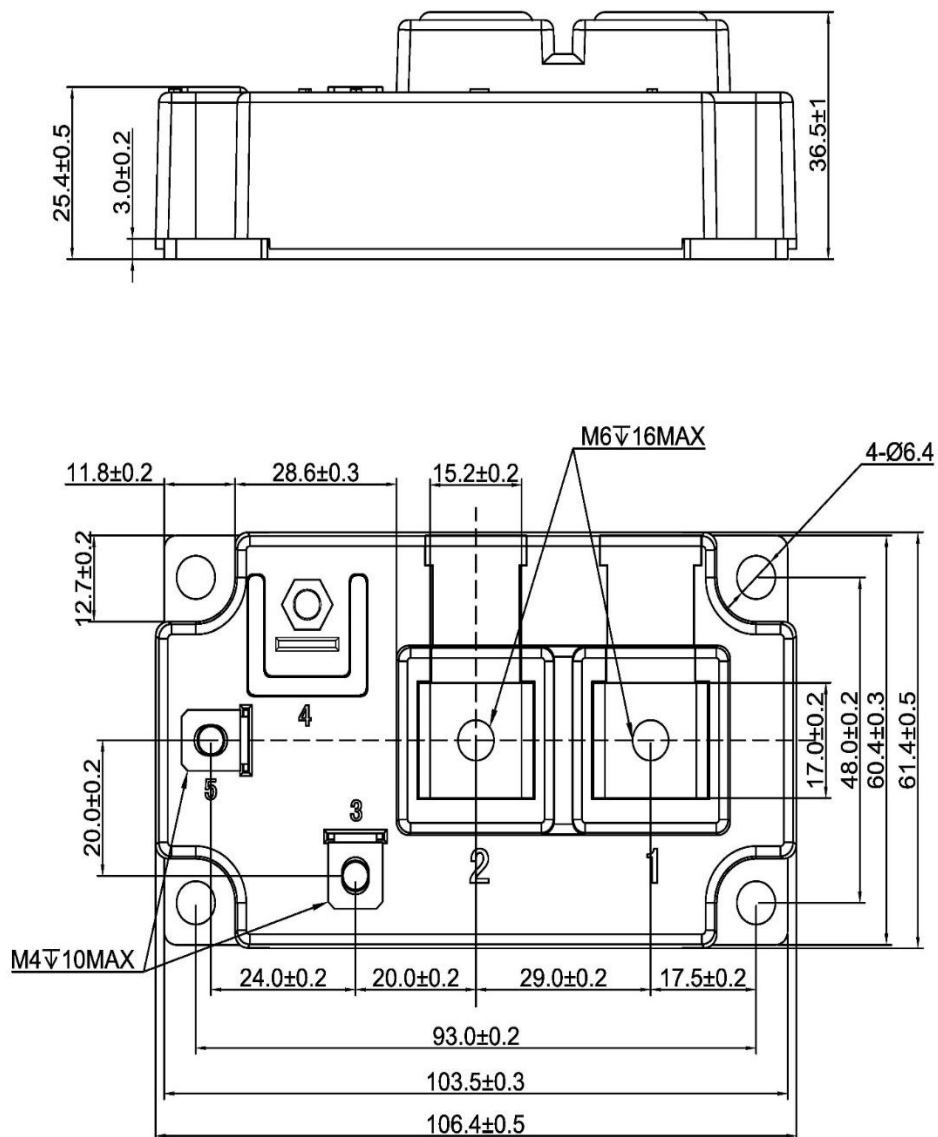
IGBT Module Datasheet



Internal Circuit:



Package Outline (Unit: mm):





Revision	Notes
02	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”.