



GT100SG120B5H

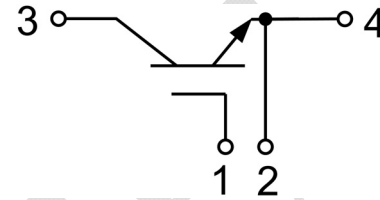
IGBT Module

Preliminary Data

Features:

- Field Stop Trench Gate IGBT
- Short Circuit Rated > 10 μ s
- Low Saturation Voltage
- Low Switching Loss
- 100% RBSOA Tested (2 \times I_c)
- Low Stray Inductance
- Lead Free, Compliant with RoHS Requirement

Circuit Diagram



Applications:

- Welding Machine, Cutting Machine
- Plating Power Supply, Induction Heating
- SMPS, UPS

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

V _{CES}	Collector-Emitter Blocking Voltage		1200	V
V _{GES}	Gate-Emitter Voltage		\pm 20	V
I _C	Continuous Collector Current	T _C =100 $^{\circ}$ C	100	A
		T _C =25 $^{\circ}$ C	200	
I _{CM}	Repetitive Peak Collector Current	T _J =175 $^{\circ}$ C	200	A
t _{SC}	Short Circuit Withstand Time		>10	μ s
P _D	Maximum Power Dissipation	T _C =25 $^{\circ}$ C T _{Jmax} =175 $^{\circ}$ C	714	W



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	$I_C=1\text{mA}$, $V_{CE}=V_{GE}$	5.0	5.5	6.6	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=100\text{A}$, $V_{GE}=15\text{V}$	$T_J=25^\circ\text{C}$	1.70	2.00	V
			$T_J=125^\circ\text{C}$	1.90		
			$T_J=150^\circ\text{C}$	1.90		
I_{CES}	Collector-Emitter Leakage Current	$V_{GE}=0\text{V}$, $V_{CE}=V_{CES}$, $T_J=25^\circ\text{C}$			1	mA
I_{GES}	Gate-Emitter Leakage Current	$V_{GE}=\pm 20\text{V}$, $V_{CE}=0\text{V}$, $T_J=25^\circ\text{C}$			200	nA
C_{ies}	Input Capacitance	$V_{CE}=25\text{V}$, $V_{GE}=0\text{V}$, $f=100\text{kHz}$		8.03		nF
C_{oes}	Output Capacitance			1.22		
C_{res}	Reverse Transfer Capacitance			0.59		

Switching Characteristics

Symbol	Description	Conditions	Min.	Typ.	Max.	Units
$t_{d(on)}$	Turn-on Delay Time	$V_{CC}=600\text{V}$, $I_C=100\text{A}$, $R_{Gon}=1\Omega$, $V_{GE}=\pm 15\text{V}$, Inductive Load	$T_J=25^\circ\text{C}$	228		ns
			$T_J=125^\circ\text{C}$	250		
			$T_J=150^\circ\text{C}$	254		
t_r	Rise Time	$V_{CC}=600\text{V}$, $I_C=100\text{A}$, $R_{Gon}=1\Omega$, $V_{GE}=\pm 15\text{V}$, Inductive Load	$T_J=25^\circ\text{C}$	63		ns
			$T_J=125^\circ\text{C}$	67		
			$T_J=150^\circ\text{C}$	69		
$t_{d(off)}$	Turn-off Delay Time	$V_{CC}=600\text{V}$, $I_C=100\text{A}$, $R_{Goff}=1\Omega$, $V_{GE}=\pm 15\text{V}$, Inductive Load	$T_J=25^\circ\text{C}$	269		ns
			$T_J=125^\circ\text{C}$	279		
			$T_J=150^\circ\text{C}$	284		
t_f	Fall Time	$V_{CC}=600\text{V}$, $I_C=100\text{A}$, $R_{Goff}=1\Omega$, $V_{GE}=\pm 15\text{V}$, Inductive Load	$T_J=25^\circ\text{C}$	184		ns
			$T_J=125^\circ\text{C}$	291		
			$T_J=150^\circ\text{C}$	317		
E_{on}	Turn-on Switching Loss	$V_{CC}=600\text{V}$, $I_C=100\text{A}$, $R_{Gon}=1\Omega$, $V_{GE}=\pm 15\text{V}$, $di/dt=1387\text{A}/\mu\text{s}$ ($T_J=150^\circ\text{C}$), Inductive Load	$T_J=25^\circ\text{C}$	3.1		mJ
			$T_J=125^\circ\text{C}$	4.3		
			$T_J=150^\circ\text{C}$	4.8		



E _{off}	Turn-off Switching Loss	V _{CC} =600V, I _C =100A, R _{Goff} =1Ω, V _{GE} =±15V, du/dt=4448V/μs(T _J =150°C), Inductive Load	T _J =25°C	5.28	mJ
			T _J =125°C	8.33	
			T _J =150°C	9.30	
Q _g	Total Gate Charge	V _{GE} =+15V...-15V	T _J =25°C	745	nC
R _{g internal}	Internal Gate Resistance		T _J =25°C	7.5	Ω
RBSOA	Reverse Bias Safe Operation Area	I _C =200A, V _{CC} =1050V, V _p =1200V, R _G =1Ω, V _{GE} =+15V to 0V, T _J =150°C	Trapezoid		
SC Data	V _{CC} =600V, t _p =10us, V _{GE} =±15V, R _{Gon} =1Ω, R _{Goff} =1Ω, T _J =25°C			575	A
R _{θJC}	IGBT Thermal Resistance: Junction-to-Case			0.21	°C/W

Module

Symbol	Description	Min.	Typ.	Max.	Units
V _{iso}	Isolation Voltage (All Terminals Shorted)	f=50Hz, 1minute	2500		V
Material of Module Base plate			Copper		
Internal Isolation			Al ₂ O ₃		
T _J	Maximum Junction Temperature			175	°C
T _{JOP}	Maximum Operating Junction Temperature Range		-40	+150	°C
T _{stg}	Storage Temperature		-40	+125	°C
CTI	Comparative Tracking Index		200		
R _{θCS}	Case-to-Sink Thermally (Conductive Grease Applied)			0.21	°C/W
T	Power Terminals Screw:M4		1.1	1.5	N·m
T	Mounting Screw:M4		1.1	1.5	N·m
G	Weight			30	g



Ordering Information Table

Device code	G	T	100	SG	120	B5	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 (Single Switch)
- ⑤ - Rated Voltage (120=1200V)
- ⑥ - Package Type
- ⑦ - Test Level (Pass the Important Reliability Test-Industrial Grade)

DATA SHEET

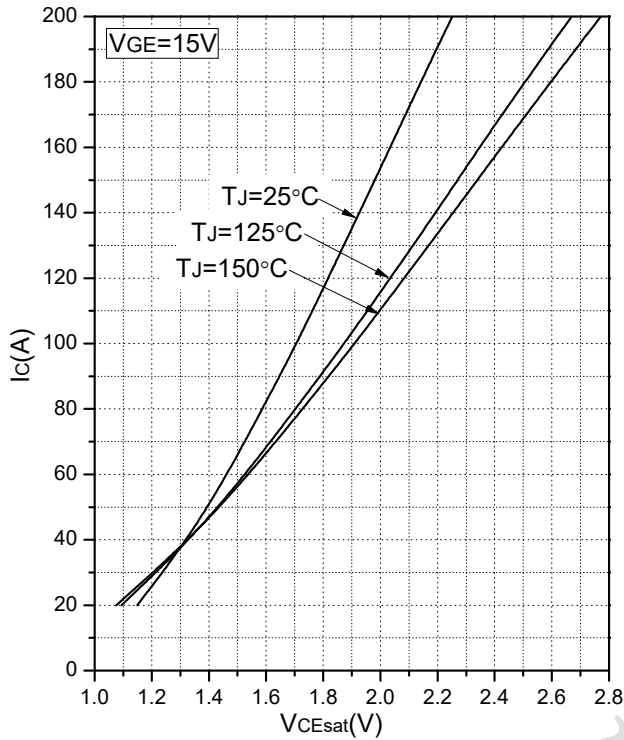


Fig.1 Typical Saturation Voltage Characteristics

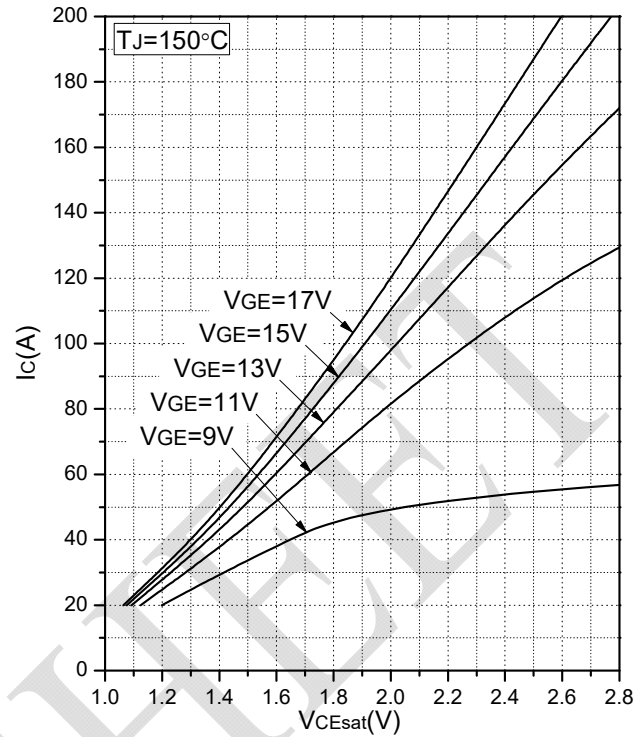


Fig.2 Typical Output Characteristics

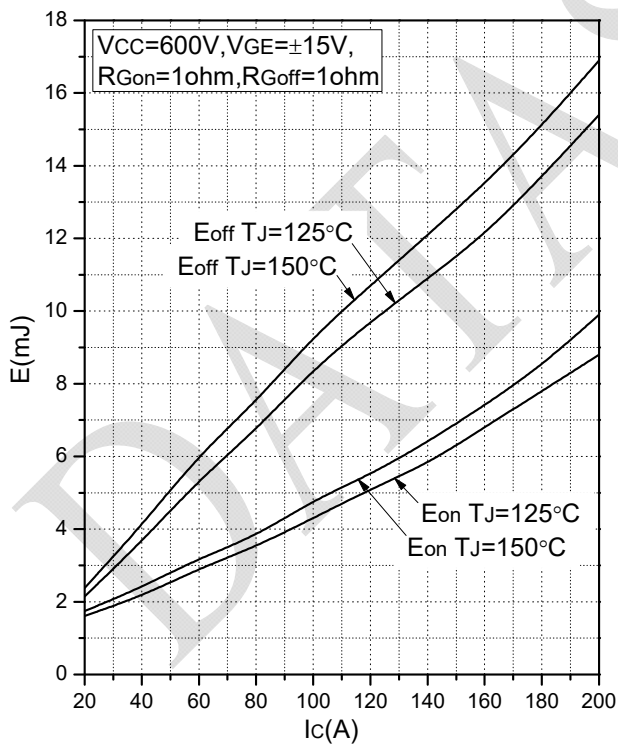


Fig.3 Typical Switching Loss vs. Collector Current

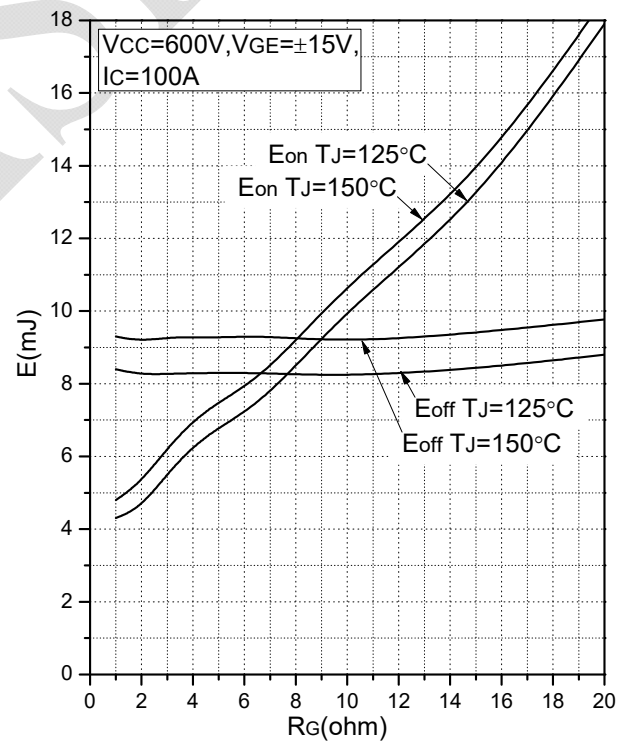
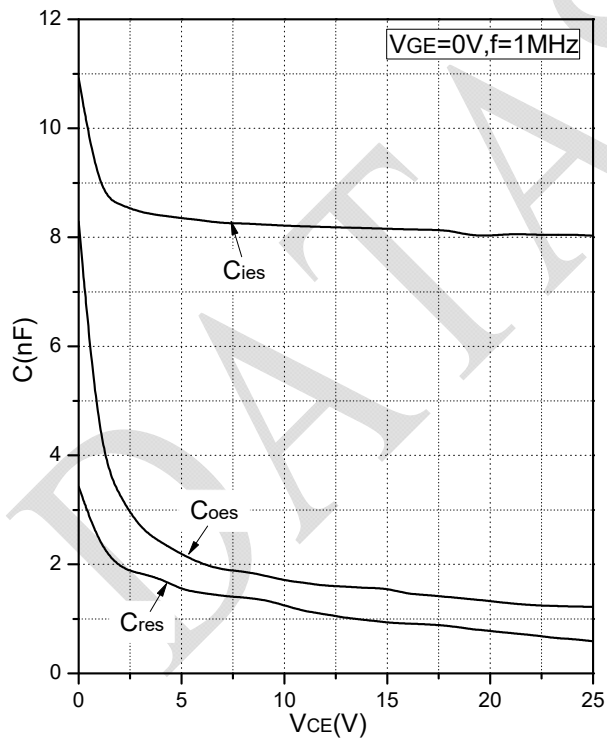
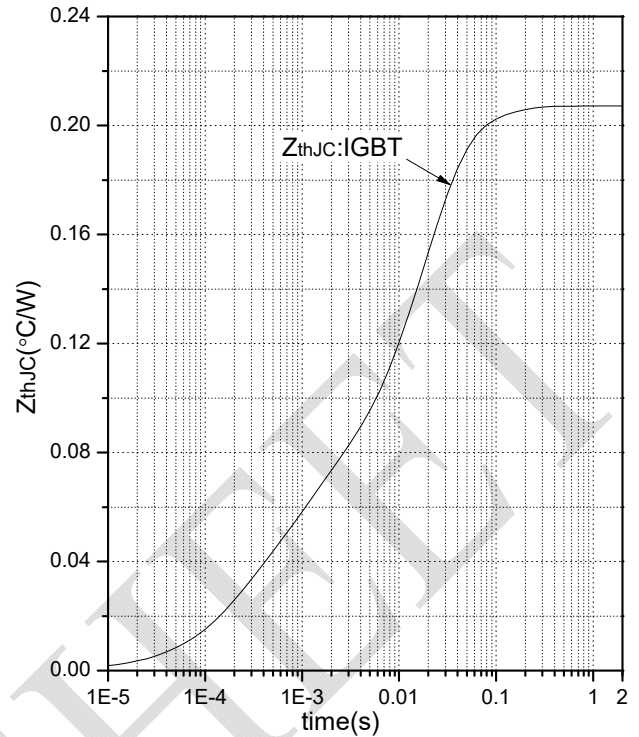
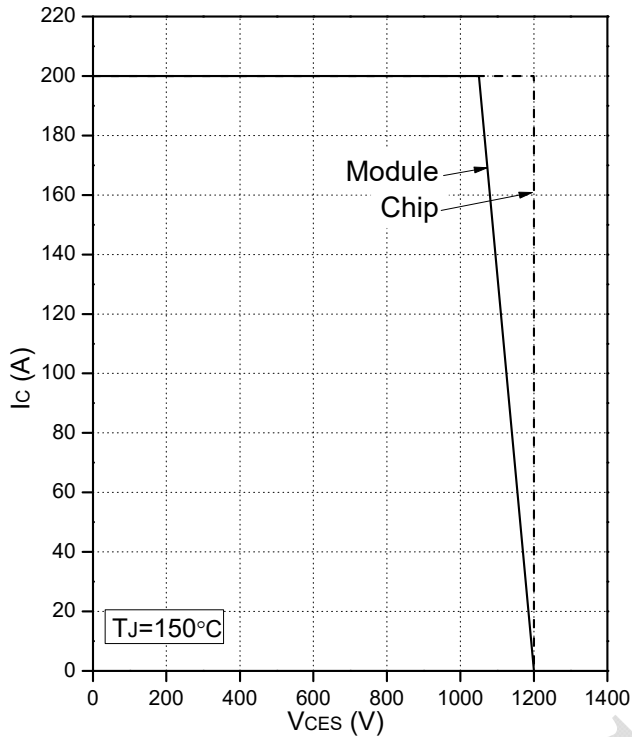
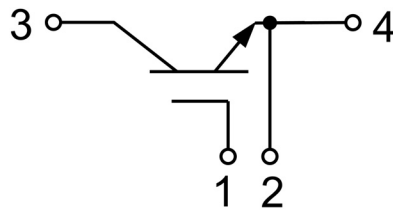


Fig.4 Typical Switching Loss vs. Gate Resistance

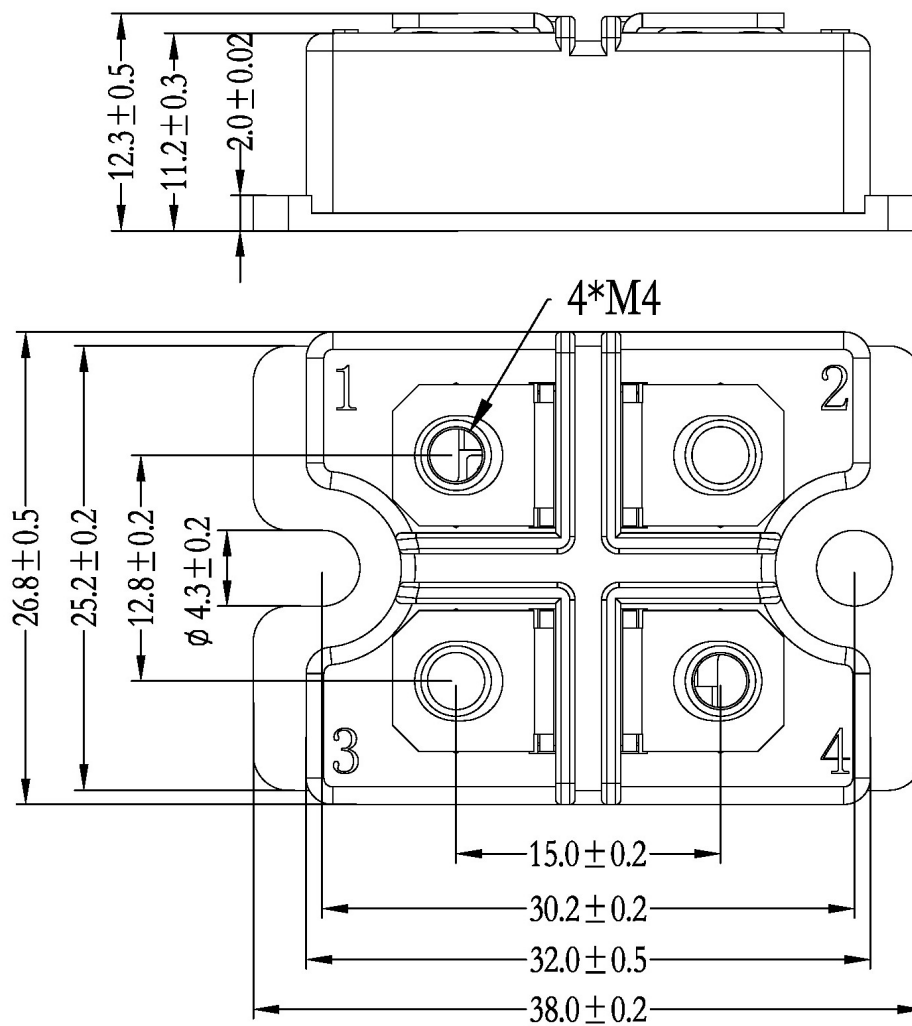




Internal Circuit



Package Outline (Unit: mm):





Date	Revision	Notes
10/30/2018	01	Initial Release
05/27/2022	02	Add Characteristic Curve 'Capacitance Characteristics'

Announcements

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