

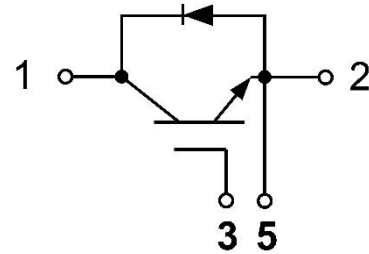


GF300SD120T2ZH

IGBT Module

Features:

- NPT Technology
- Short Circuit Rated $>10\mu\text{s}$
- Low Saturation Voltage
- Low Switching Loss
- 100% RBSOA Tested($2\times I_c$)
- Low Stray Inductance
- Lead Free, Compliant with RoHS Requirement



Applications:

- High Power Converters
- UPS Systems
- Motor Drives
- Wind Turbines

IGBT, Inverter

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

V_{CES}	Collector-Emitter Blocking Voltage		1200	V
V_{GES}	Gate-Emitter Voltage		± 20	V
I_c	Continuous Collector Current	$T_C=80^\circ\text{C}$	300	A
		$T_C=25^\circ\text{C}$	600	A
I_{CM}	Repetitive Pulse Collector Current	$t_p=1\text{ms}$	600	A
P_D	Maximum Power Dissipation per leg	$T_C=25^\circ\text{C}$ $T_{Jmax}=150^\circ\text{C}$	2942	W



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

Static Characteristics

Symbol	Description	Conditions	Min.	Typ.	Max.	Units
$V_{GE(th)}$	Gate-Emitter Threshold Voltage	$I_C=2\text{mA}$, $V_{CE}=V_{GE}$	5.0	5.5	6.5	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=300\text{A}$, $V_{GE}=15\text{V}$	$T_J=25^{\circ}\text{C}$	2.90	3.20	V
			$T_J=125^{\circ}\text{C}$	3.50		V
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	$V_{GE}=\pm 20\text{V}$, $V_{CE}=0\text{V}$, $T_J=25^{\circ}\text{C}$			± 400	nA
C_{ies}	Input Capacitance	$V_{CE}=25\text{V}$, $V_{GE}=0\text{V}$, $f=1\text{MHz}$		23.5		nF
C_{oes}	Output Capacitance			2.17		nF
C_{res}	Reverse Transfer Capacitance			1.10		nF

Switching Characteristics

$t_{d(on)}$	Turn-on Delay Time	$V_{CC}=600\text{V}$, $I_C=300\text{A}$, $R_{Gon}=5\Omega$, $V_{GE}=\pm 15\text{V}$, Inductive Load	$T_J=25^{\circ}\text{C}$		540		ns
			$T_J=125^{\circ}\text{C}$		560		
t_r	Rise Time		$T_J=25^{\circ}\text{C}$		115		ns
			$T_J=125^{\circ}\text{C}$		115		
$t_{d(off)}$	Turn-off Delay Time	$V_{CC}=600\text{V}$, $I_C=300\text{A}$, $R_{Goff}=5\Omega$, $V_{GE}=\pm 15\text{V}$, Inductive Load	$T_J=25^{\circ}\text{C}$		536		ns
			$T_J=125^{\circ}\text{C}$		580		
t_f	Fall Time		$T_J=25^{\circ}\text{C}$		195		ns
			$T_J=125^{\circ}\text{C}$		210		
E_{on}	Turn-on Switching Loss	$V_{CC}=600\text{V}$, $I_C=300\text{A}$, $R_{Gon}=5\Omega$, $V_{GE}=\pm 15\text{V}$, $di/dt=2310\text{A}/\mu\text{s}$ ($T_J=125^{\circ}\text{C}$) Inductive Load	$T_J=25^{\circ}\text{C}$		30.5		mJ
			$T_J=125^{\circ}\text{C}$		37.5		
E_{off}	Turn-off Switching Loss	$V_{CC}=600\text{V}$, $I_C=300\text{A}$, $R_{Goff}=5\Omega$, $V_{GE}=\pm 15\text{V}$, $du/dt=4248\text{V}/\mu\text{s}$ ($T_J=125^{\circ}\text{C}$) Inductive Load	$T_J=25^{\circ}\text{C}$		16.8		mJ
			$T_J=125^{\circ}\text{C}$		20.1		
Q_g	Total Gate Charge	$V_{GE}=+15\text{V} \dots -15\text{V}$	$T_J=25^{\circ}\text{C}$		3.30		μC
$R_{G(int)}$	Internal Gate Resistor				0.62		Ω
SCSOA	$V_{CC}=600\text{V}$, $V_{GE}=\pm 15\text{V}$, $T_J=150^{\circ}\text{C}$			10			μs
$R_{\theta JC}$	Thermal Resistance: Junction-to-Case (per IGBT)					0.042	$^{\circ}\text{C}/\text{W}$



Diode, Inverter

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

V_{RRM}	Repetitive Peak Reverse Voltage	$T_J=25^{\circ}\text{C}$	1200	V
I_F	Diode Continuous Forward Current	$T_C=80^{\circ}\text{C}$	300	A
I_{FM}	Diode Maximum Forward Current	$t_p=1\text{ms}$	600	A

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

Symbol	Description	Conditions		Min.	Typ.	Max.	Units	
V _{FM}	Forward Voltage	I _F =300A	T _J =25℃		2.65		V	
			T _J =125℃		2.80			
t _{rr}	Reverse Recovery Time	I _F =300A, di/dt=3158A/μs(T _J =125℃), V _{rr} =600V, V _{GE} =-15V	T _J =25℃		175		ns	
			T _J =125℃		365			
I _{rr}	Peak Reverse Recovery Current		T _J =25℃		108		A	
			T _J =125℃		136			
Q _{rr}	Reverse Recovery Charge		T _J =25℃		12.0		μC	
			T _J =125℃		24.0			
E _{rec}	Reverse Recovery Energy		T _J =25℃		4.10		mJ	
			T _J =125℃		8.50			
R _{θJC}	Thermal Resistance: Junction-to-Case (per Diode)					0.125	℃/W	



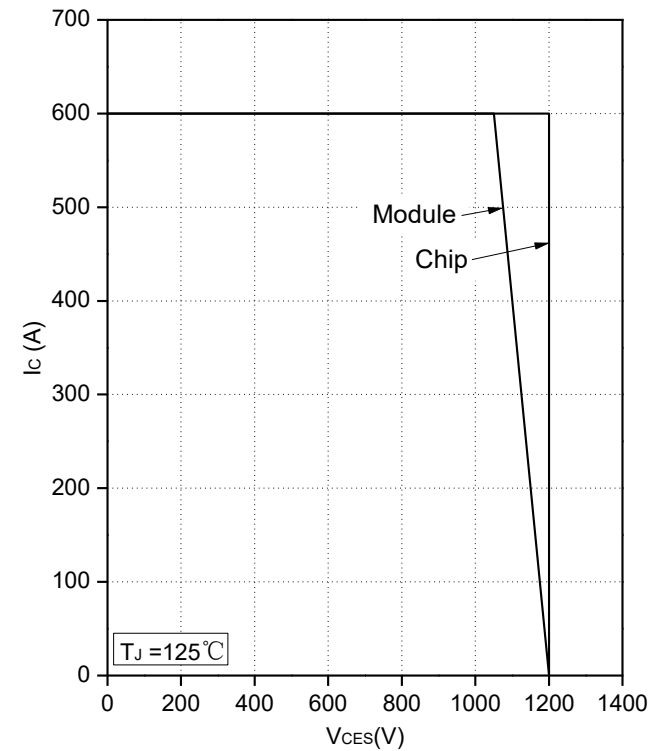
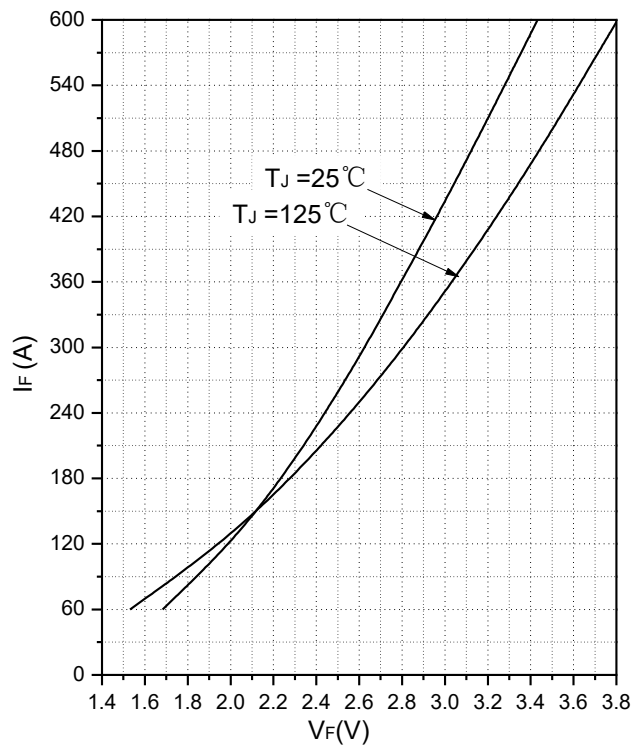
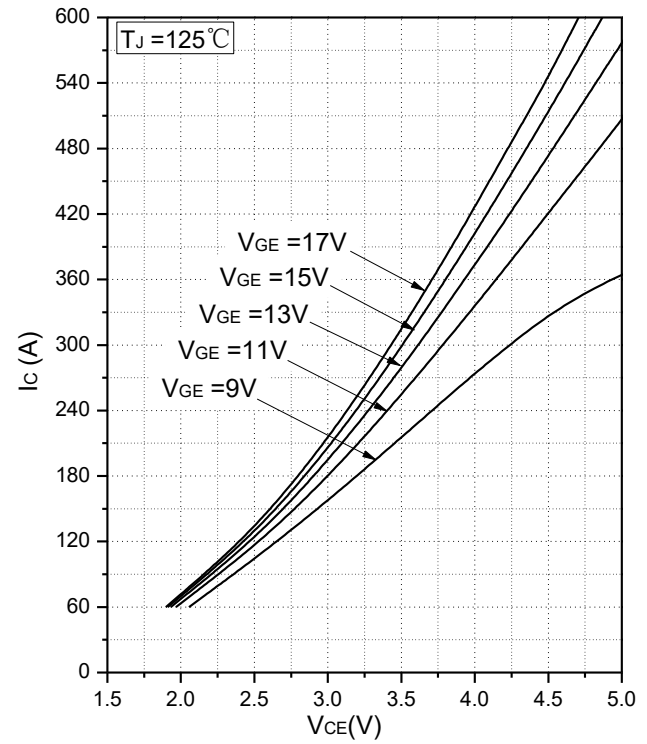
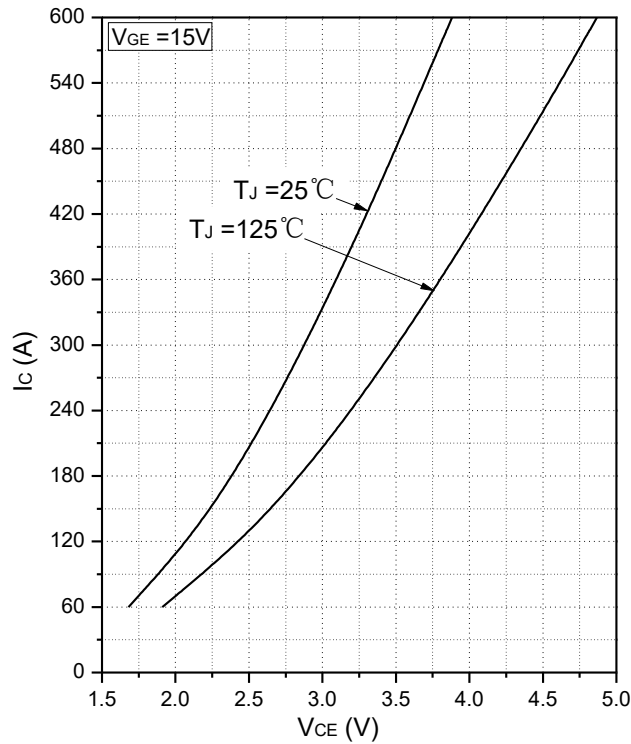
Module

Symbol	Description		Min.	Typ.	Max.	Units
V _{iso}	Isolation Voltage (All Terminals Shorted)	AC, f=50Hz, 1minute	2500			V
T _J	Maximum Junction Temperature				150	°C
T _{JOP}	Maximum Operating Junction Temperature Range		-40		+150	°C
T _{stg}	Storage Temperature		-40		+125	°C
CTI	Comparative Tracking Index		200			
R _{ecs}	Case-to-Sink Thermally (Conductive Grease Applied)				0.03	°C/W
T	Signal Terminals Screw:M4		1.1		2.0	N·m
T	Power Terminals Screw:M6		2.5		5.0	N·m
T	Mounting Screw:M6		3.0		6.0	N·m
G	Weight			320		g

Ordering Information Table

Device code	G	F	300	SD	120	T2Z	H
	①	②	③	④	⑤	⑥	⑦

- ① - IGBT Module
- ② - NPT, Fast IGBT
- ③ - Rated Current (300=300A)
- ④ - Circuit Configuration (Single Switch)
- ⑤ - Rated Voltage (120=1200V)
- ⑥ - Package Type
- ⑦ - Test Level (Pass the Important Reliability Test-Industrial Grade)



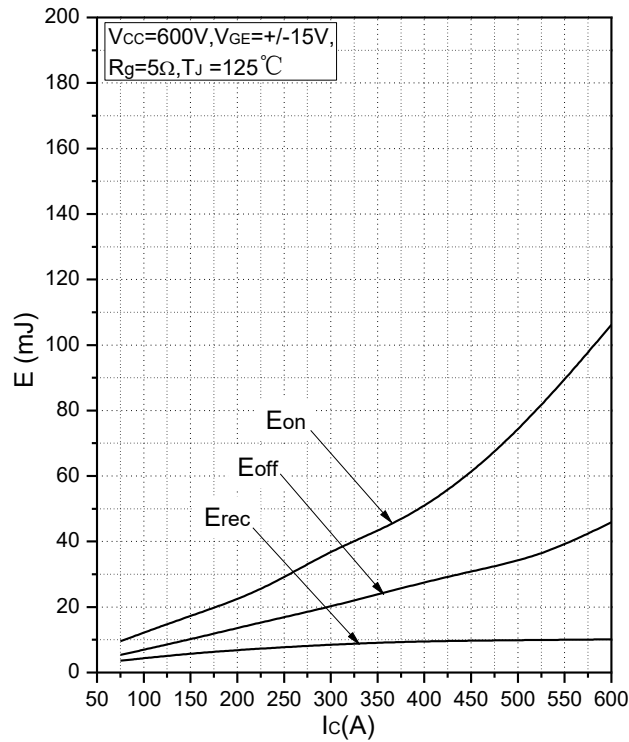


Fig.5 Typical Switching Loss vs. Collector Current

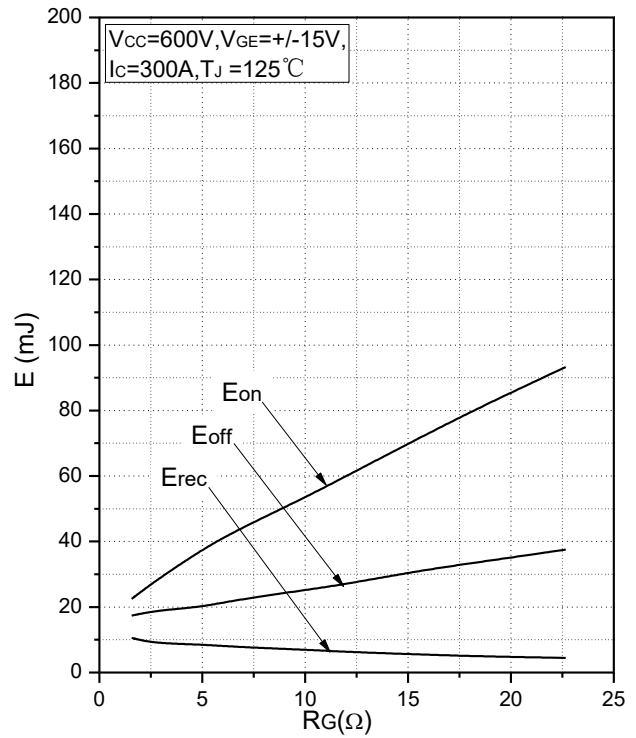


Fig.6 Typical Switching Loss vs. Gate Resistance

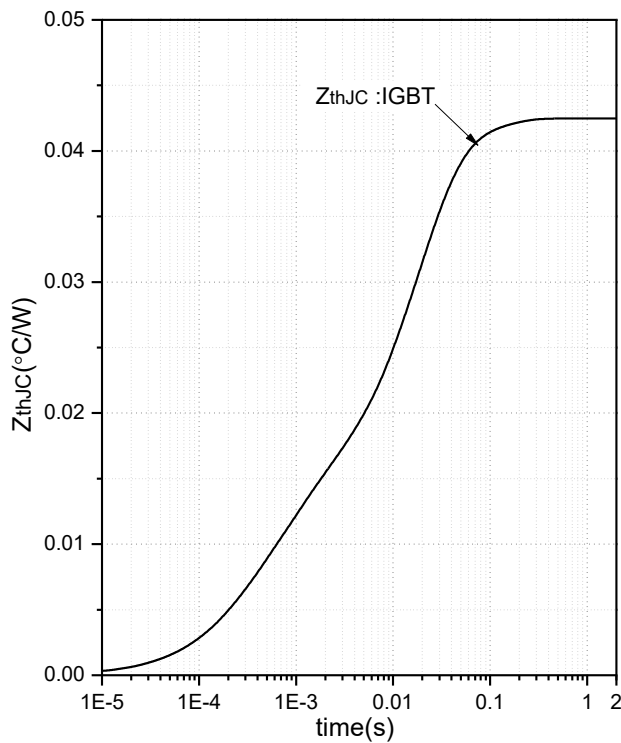


Fig.7 Transient Thermal Impedance (IGBT)

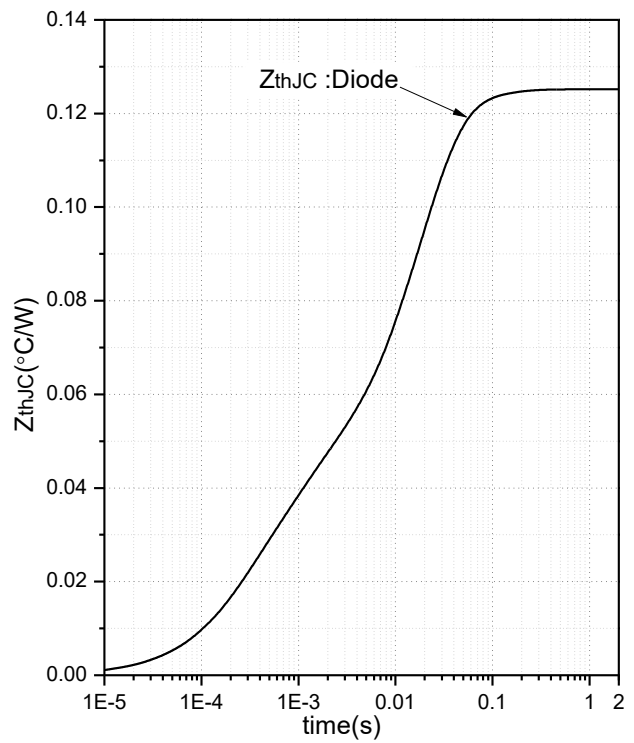


Fig.8 Transient Thermal Impedance (Diode)



Revision	Notes
01	Initial Release
02	Updated Electrical Characteristic Parameter Values

Announcement

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