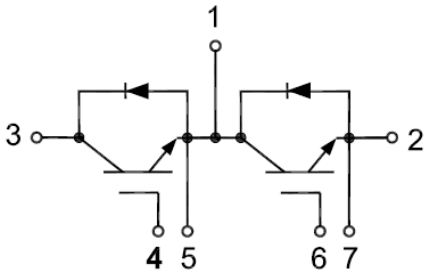
GT150HF120T1VH

IGBT Module

Features：

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



Applications：

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

Maximum Rated Values of IGBT (T_C=25℃ 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 = 100℃	150	A
		T_C = 25℃	300	A
I_{CM}	Repetitive Peak Collector Current	T_J = 175℃	300	A
t_{SC}	Short Circuit Withstand Time		>10	μs
P_D	Maximum Power Dissipation per IGBT	T_C = 25℃ T_{Jmax}=175℃	1085	W

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Electrical Characteristics of IGBT (T_C=25℃ unless otherwise specified)

Static Characteristics

Symbol	Description	Conditions		Min	Typ	Max	Unit
$V_{GE(th)}$	Gate-Emitter Threshold Voltage	I_C = 4mA, V_{CE} = V_{GE}		5.0	5.7	6.6	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C =150A, V_{GE} = 15V	T_J = 25℃		1.70	2.00	V
			T_J = 125℃		1.90		V
I_{CES}	Collector-Emitter Leakage Current	V_{GE} = 0V, V_{CE} = V_{CES}, T_J = 25℃				1	mA
I_{GES}	Gate-Emitter Leakage Current	V_{GE} = ±20V, V_{CE} = 0V, T_J = 25℃				400	nA
C_{ies}	Input Capacitance	V_{CE} = 25V, V_{GE} = 0V , f =1MHz			9.97		nF
C_{oes}	Output Capacitance				0.94		nF
C_{res}	Reverse Transfer Capacitance				0.64		nF

Switching Characteristics

$t_{d(on)}$	Turn-on Delay Time	V_{CC} = 600V,I_C =150A, R_{Gon} =3.3Ω,V_{GE} = ±15V, Inductive Load	T_J=25℃		245		ns
			T_J=125℃		234		
t_r	Rise Time		T_J=25℃		84		ns
			T_J=125℃		85		
$t_{d(off)}$	Turn-off Delay Time	V_{CC} = 600V,I_C =150A, R_{Goff} =3.3Ω,V_{GE} = ±15V, Inductive Load	T_J=25℃		263		ns
			T_J=125℃		271		
t_f	Fall Time		T_J=25℃		178		ns
			T_J=125℃		213		
E_{on}	Turn-on Switching Loss	V_{CC} = 600V,I_C =150A, R_{Gon} =3.3Ω,V_{GE} = ±15V, di/dt=1492A/μs(T_J=125℃), Inductive Load	T_J=25℃		10.1		mJ
			T_J=125℃		12.5		
E_{off}	Turn-off Switching Loss	V_{CC} = 600V,I_C =150A, R_{Goff} =3.3Ω,V_{GE} = ±15V, du/dt=4367V/μs(T_J=125℃), Inductive Load	T_J=25℃		8.4		mJ
			T_J=125℃		13.5		
Q_g	Total Gate Charge	V_{GE}=+15V…-15V	T_J=25℃		728		nC
$R_{g\ internal}$	Internal Gate Resistance		T_J=25℃		5		Ω
RBSOA	Reverse Bias Safe Operation Area	I_C=300A,V_{CC}=1050V,Vp=1200V, R_{Goff} = 3.3Ω, V_{GE}=+15V to 0V, T_J =150°C			Trapezoid		
SC Data	Vcc=600V, tp=10us, V_{GE}=+/-15V ,R_{Gon}=4.7ohm,R_{Goff}=4.7ohm,Tj=25℃				775		A
$R_{\theta JC}$	IGBT Thermal Resistance: Junction-To-Case				0.138		℃/W

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

V_{RRM}	Repetitive Peak Reverse Voltage	1200	V
I_F	Diode Continuous Forward Current	150	A
I_{FM}	Diode Maximum Forward Current	300	A

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

Symbol	Description	Conditions		Min	Typ	Max	Unit
V_{FM}	Forward Voltage	I_F =150A	T_J=25℃		1.75		V
			T_J=125℃		1.85		
t_{rr}	Reverse Recovery Time	I_F=150A, -diF/dt =1200A/μs(T_J=125℃), V_{rr} = 600V, V_{GE} = -15V	T_J=25℃		267		ns
			T_J=125℃		415		
I_{rr}	Peak Reverse Recovery Current		T_J=25℃		78		A
			T_J=125℃		98		
Q_{rr}	Reverse Recovery Charge		T_J=25℃		9.18		μC
			T_J=125℃		17.9		
E_{rec}	Reverse Recovery Energy		T_J=25℃		3.2		mJ
			T_J=125℃		6.4		
$R_{\theta JC}$	Diode Thermal Resistance: Junction-To-Case				0.212		℃/W

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Module

Symbol	Description		Min	Typ	Max	Unit
V_{iso}	Isolation Voltage (All Terminals Shorted)	f = 50Hz, 1minute	2500			V
T_J	Maximum Junction Temperature				175	℃
T_{JOP}	Maximum Operating Junction Temperature Range		-40		+150	℃
T_{stg}	Storage Temperature		-40		+125	℃
CTI	Comparative Tracking Index		200			
$R_{\theta CS}$	Case-To-Sink Thermally (Conductive Grease Applied)			0.1		℃/W
T	Power Terminals Screw:M5		3.0		5.0	N·m
T	Mounting Screw:M6		4.0		6.0	N·m
G	Weight			165		g

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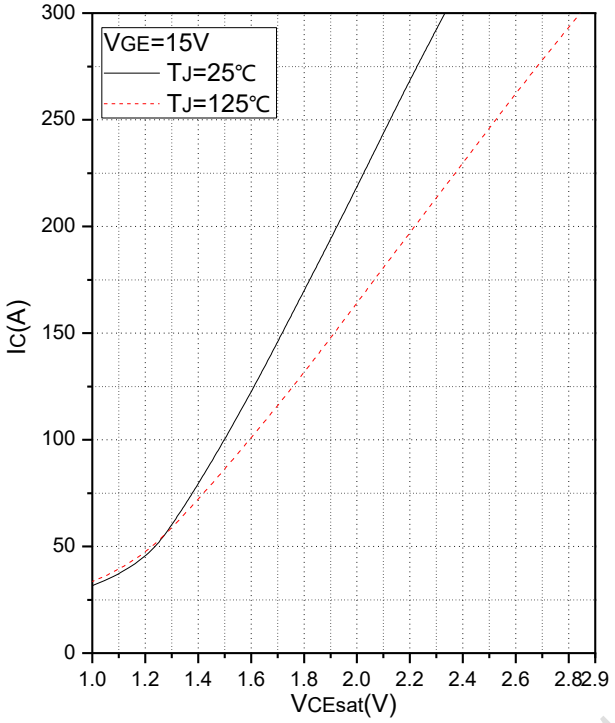

Fig.1 Typical Saturation Voltage Characteristics

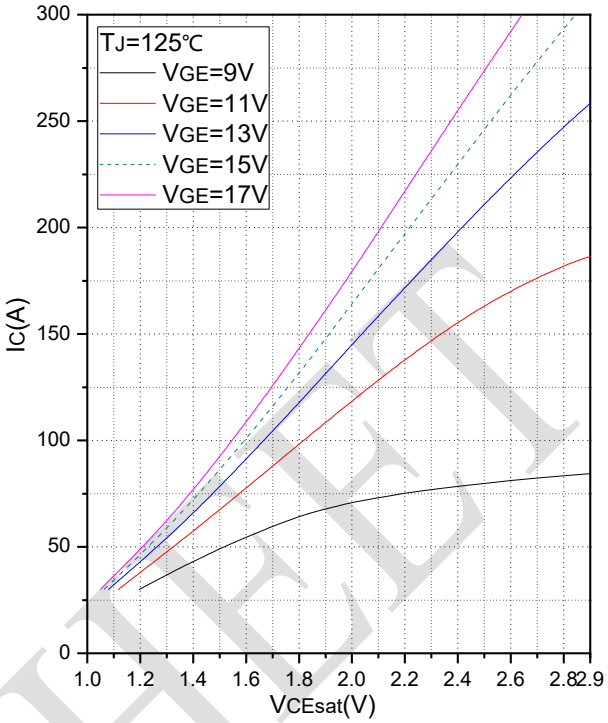

Fig.2 Typical Output Characteristics

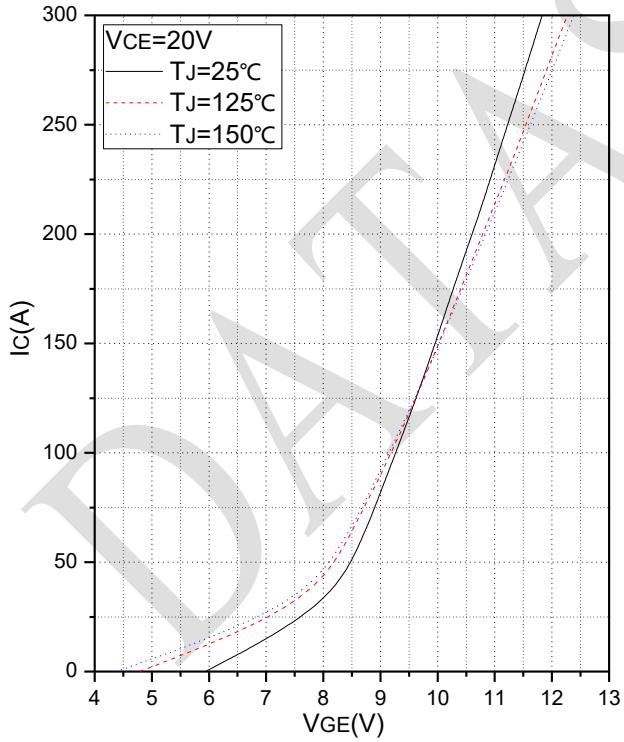

Fig.3 Transfer Characteristic

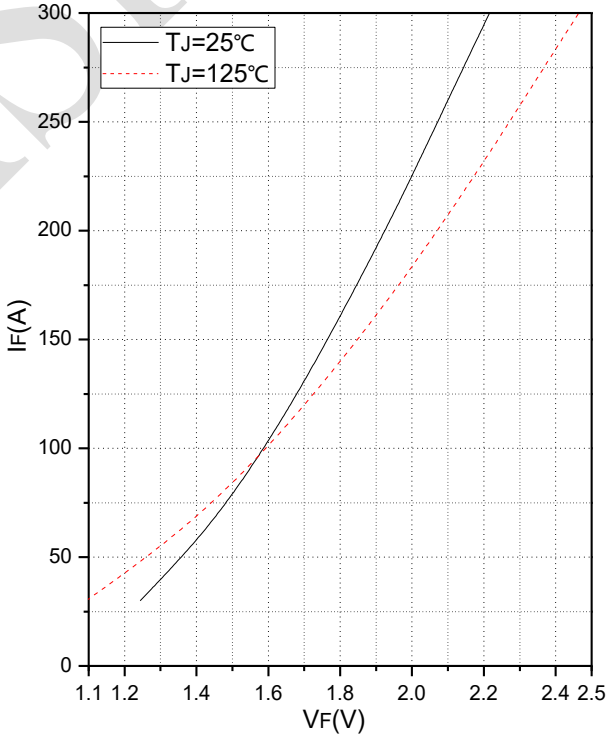

Fig.4 Forward Characteristics of Diode

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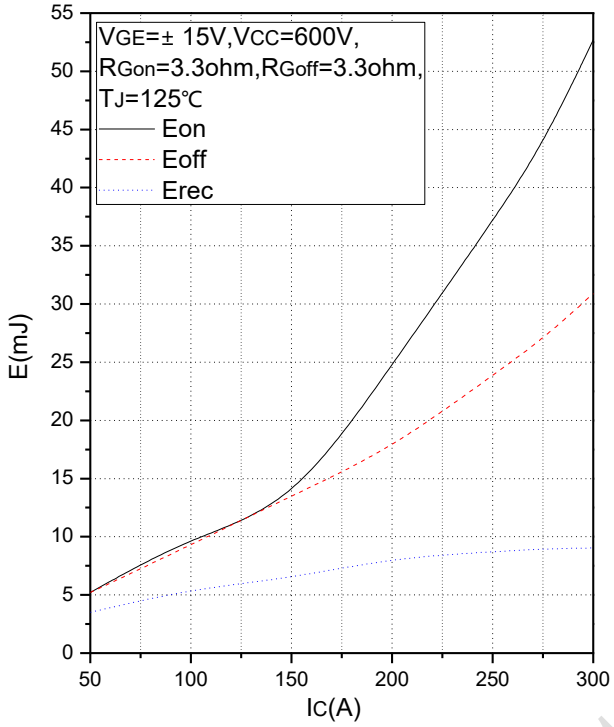

Fig.5 Typical Switching Loss vs. Collector Current

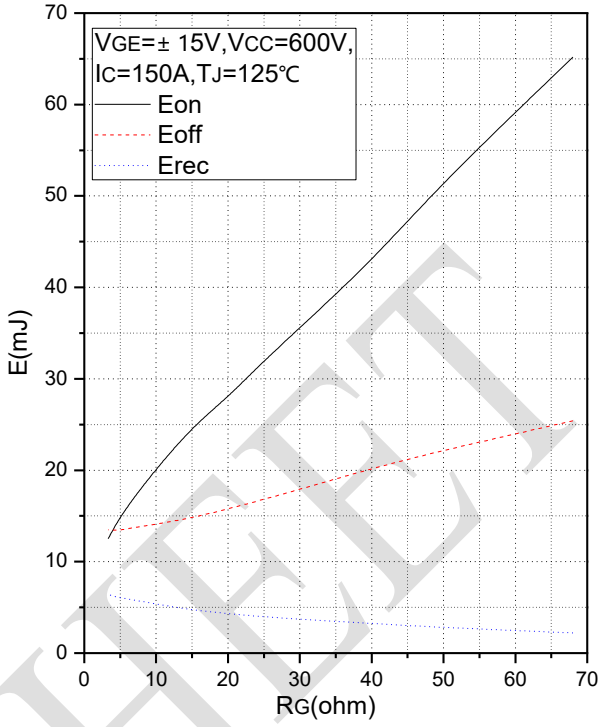

Fig.6 Typical Switching Loss vs. Gate Resistance

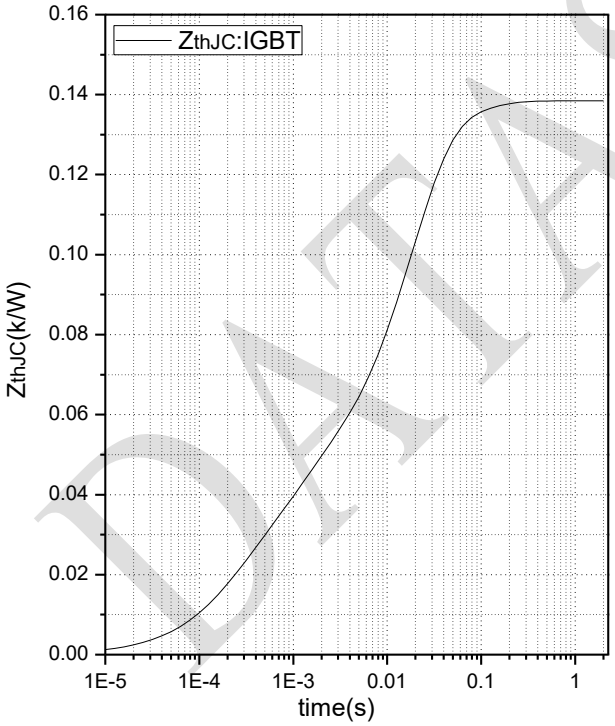

Fig.7 Transient Thermal Impedance (IGBT)

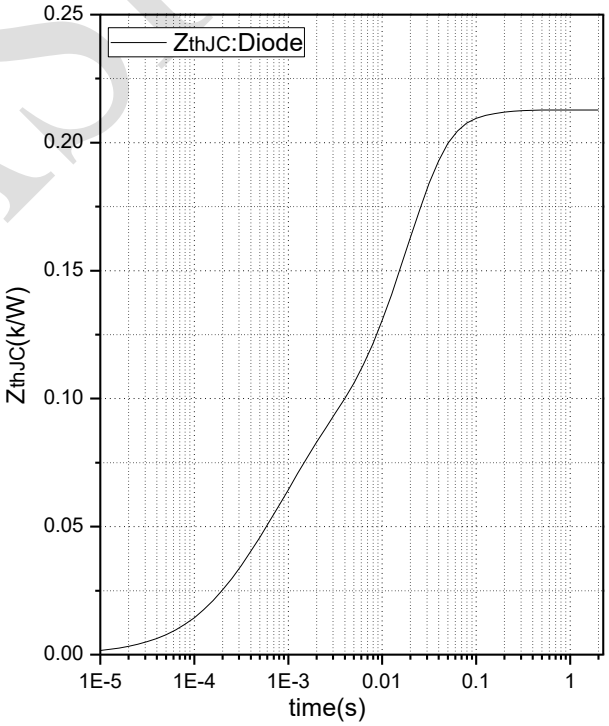

Fig.8 Transient Thermal Impedance (Diode)

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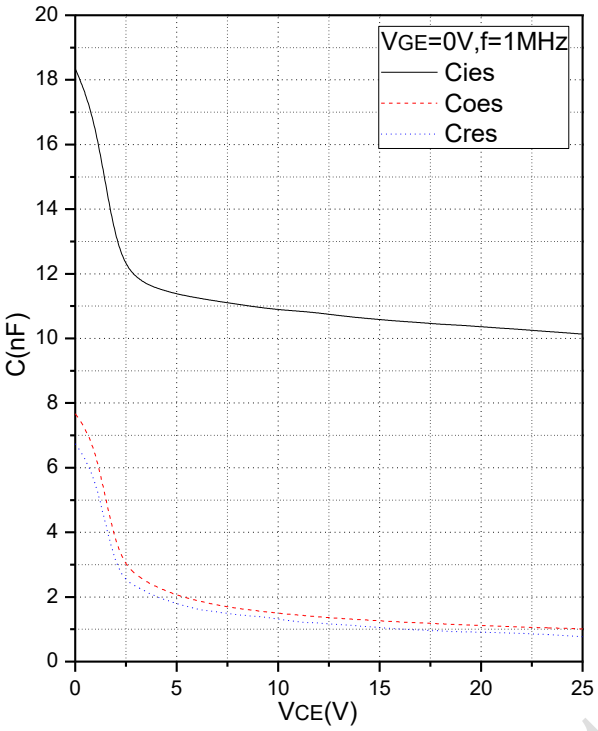

Fig.9 Capacitance Characteristics

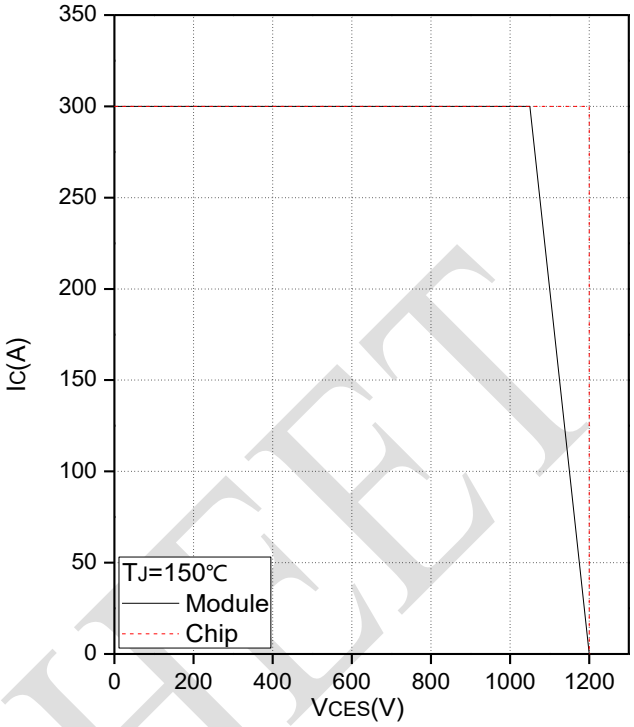

Fig.10 Reverse Bias Safe Operation Area (RBSOA)

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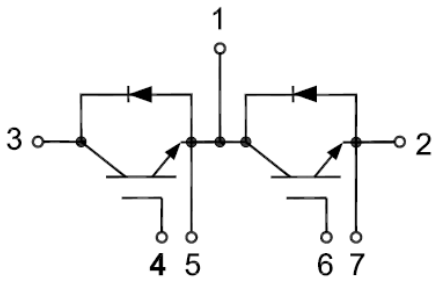
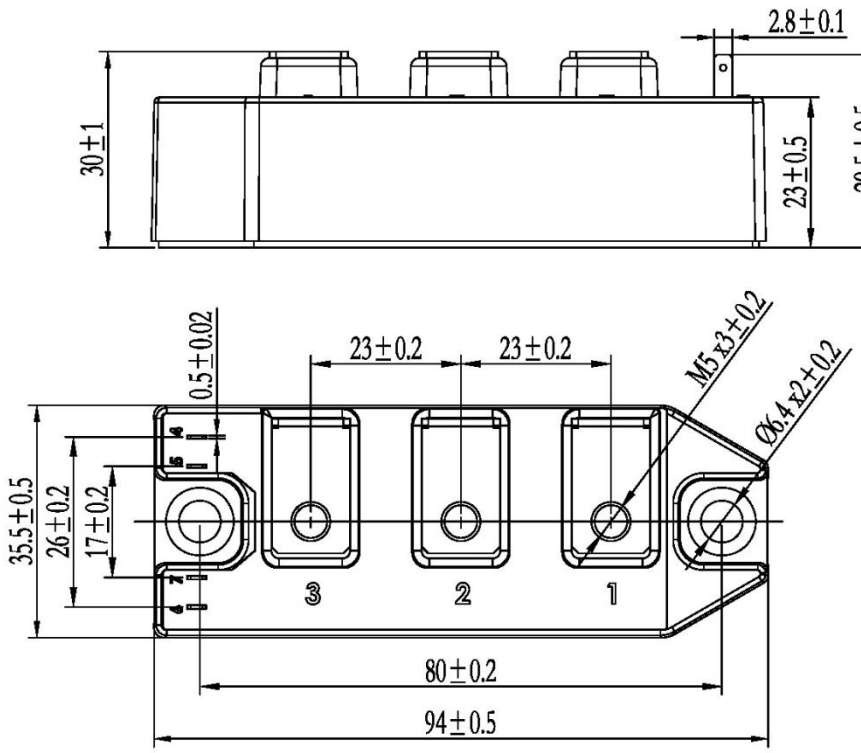
Internal Circuit



Package Outline (Unit: mm):



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Date	Revision	Notes
04/10/2018	01	Initial Release.
11/27/2018	A	Final Version.
09/11/2019	B	Add $R_{g\ internal.}$

Announcements

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