

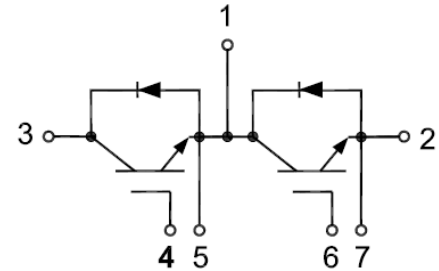


# GT75HF120T1VH

## IGBT Module

### Features:

- Field Stop Trench Gate IGBT
- Short Circuit Rated > 10 $\mu$ s
- Low Saturation Voltage
- Low Switching Loss
- 100% RBSOA Tested (2xI<sub>c</sub>)
- 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

V <sub>CES</sub>	Collector-Emitter Blocking Voltage	T <sub>J</sub> =25°C	1200	V
V <sub>GES</sub>	Gate-Emitter Voltage		±20	V
I <sub>c</sub>	Continuous Collector Current	T <sub>C</sub> =100°C	75	A
		T <sub>C</sub> =25°C	150	A
I <sub>CM</sub>	Repetitive Peak Collector Current	t <sub>p</sub> =1ms	150	A
t <sub>sc</sub>	Short Circuit Withstand Time		>10	μs
P <sub>D</sub>	Maximum Power Dissipation per IGBT	T <sub>C</sub> =25°C T <sub>Jmax</sub> =175°C	540	W



## Electrical Characteristics of IGBT

### Static Characteristics

Symbol	Description	Conditions	Min	Typ	Max	Unit
$V_{GE(th)}$	Gate-Emitter Threshold Voltage	$I_C=2.6mA, V_{CE}=V_{GE}, T_J=25^\circ C$	5.0	5.5	6.6	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=75A, V_{GE}=15V$	$T_J=25^\circ C$	1.60	1.90	V
			$T_J=125^\circ C$	1.80		V
$I_{CES}$	Collector-Emitter Leakage Current	$V_{GE}=0V, V_{CE}=V_{CES}, T_J=25^\circ C$			1	mA
$I_{GES}$	Gate-Emitter Leakage Current	$V_{GE}=\pm 20V, V_{CE}=0V, T_J=25^\circ C$			200	nA
$C_{ies}$	Input Capacitance	$V_{CE}=25V, V_{GE}=0V, f=1MHz$		5.62		nF
$C_{oes}$	Output Capacitance			0.49		nF
$C_{res}$	Reverse Transfer Capacitance			0.38		nF

### Switching Characteristics

$t_{d(on)}$	Turn-on Delay Time	$V_{CC}=600V, I_C=75A, R_{Gon}=2\Omega, V_{GE}=\pm 15V, \text{Inductive Load}$	$T_J=25^\circ C$		158		ns
			$T_J=125^\circ C$		163		
$t_r$	Rise Time		$T_J=25^\circ C$		49		ns
			$T_J=125^\circ C$		53		
$t_{d(off)}$	Turn-off Delay Time	$V_{CC}=600V, I_C=75A, R_{Goff}=2\Omega, V_{GE}=\pm 15V, \text{Inductive Load}$	$T_J=25^\circ C$		193		ns
			$T_J=125^\circ C$		211		
$t_f$	Fall Time		$T_J=25^\circ C$		203		ns
			$T_J=125^\circ C$		370		
$E_{on}$	Turn-on Switching Loss	$V_{CC}=600V, I_C=75A, R_{Gon}=2\Omega, V_{GE}=\pm 15V, di/dt=1203A/\mu s(T_J=125^\circ C), \text{Inductive Load}$	$T_J=25^\circ C$		3.22		mJ
			$T_J=125^\circ C$		4.35		
$E_{off}$	Turn-off Switching Loss		$T_J=25^\circ C$		3.40		mJ
			$T_J=125^\circ C$		5.91		
$Q_g$	Total Gate Charge	$V_{GE}=+15V \dots -15V$	$T_J=25^\circ C$		374		nC
$R_{gint}$	Internal Gate Resistor		$T_J=25^\circ C$		10		$\Omega$
RBSOA	Reverse Bias Safe Operation Area	$I_C=150A, V_{CC}=1050V, V_p=1200V, R_{Goff}=2\Omega, V_{GE}=+15V \text{ to } 0V, T_J=150^\circ C$	Trapezoid				
SC Data	$V_{CC}=800V, t_p=10\mu s, V_{ge}=\pm 15V, R_{Gon}=10\Omega, R_{Goff}=10\Omega, T_J=25^\circ C$				469		A
$R_{\theta JC}$	IGBT Thermal Resistance: Junction-To-Case					0.277	$^\circ C/W$



## Maximum Rated Values of Diode

$V_{RRM}$	Repetitive Peak Reverse Voltage	$T_J=25^{\circ}\text{C}$	1200	V
$I_F$	Diode Continuous Forward Current		75	A
$I_{FM}$	Diode Maximum Forward Current	$t_p=1\text{ms}$	150	A

## Electrical Characteristics of Diode

Symbol	Description	Conditions	Min	Typ	Max	Unit	
$V_{FM}$	Forward Voltage	$I_F=75\text{A}$	$T_J=25^{\circ}\text{C}$	2.10		V	
			$T_J=125^{\circ}\text{C}$	2.20			
$t_{rr}$	Reverse Recovery Time	$I_F=75\text{A},$ $-di_F/dt=1738\text{A}/\mu\text{s}(T_J=125^{\circ}\text{C}),$ $V_R=600\text{V},$ $V_{GE}=-15\text{V}$	$T_J=25^{\circ}\text{C}$	204		ns	
			$T_J=125^{\circ}\text{C}$	388			
$I_{rr}$	Peak Reverse Recovery Current		$T_J=25^{\circ}\text{C}$	47		A	
			$T_J=125^{\circ}\text{C}$	64			
$Q_{rr}$	Reverse Recovery Charge		$T_J=25^{\circ}\text{C}$	4.56		$\mu\text{C}$	
			$T_J=125^{\circ}\text{C}$	9.42			
$E_{rec}$	Reverse Recovery Energy		$T_J=25^{\circ}\text{C}$	1.67		mJ	
			$T_J=125^{\circ}\text{C}$	3.60			
$R_{\theta JC}$	Diode Thermal Resistance: Junction-To-Case					0.425	$^{\circ}\text{C}/\text{W}$



## Module

Symbol	Description		Min	Typ	Max	Unit
V <sub>iso</sub>	Isolation Voltage (All Terminals Shorted)	RMS, f = 50Hz, 1minute	2500			V
T <sub>J</sub>	Maximum Junction Temperature				175	°C
T <sub>JOP</sub>	Maximum Operating Junction Temperature Range		-40		+150	°C
T <sub>stg</sub>	Storage Temperature		-40		+125	°C
CTI	Comparative Tracking Index		200			V
R <sub>ecs</sub>	Case-To-Sink Thermally (Conductive Grease Applied)				0.1	°C/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

## Ordering Information Table

Device code	G	T	75	HF	120	T1V	H
	①	②	③	④	⑤	⑥	⑦

- ① - IGBT Module
- ② - Field Stop Trench Gate IGBT
- ③ - Rated Current (75=75A)
- ④ - Circuit Configuration (HF=Half Bridge)
- ⑤ - Rated Voltage (120=1200V)
- ⑥ - Package Type
- ⑦ - Test Level (Pass the Important Reliability Test-Industrial Grade)

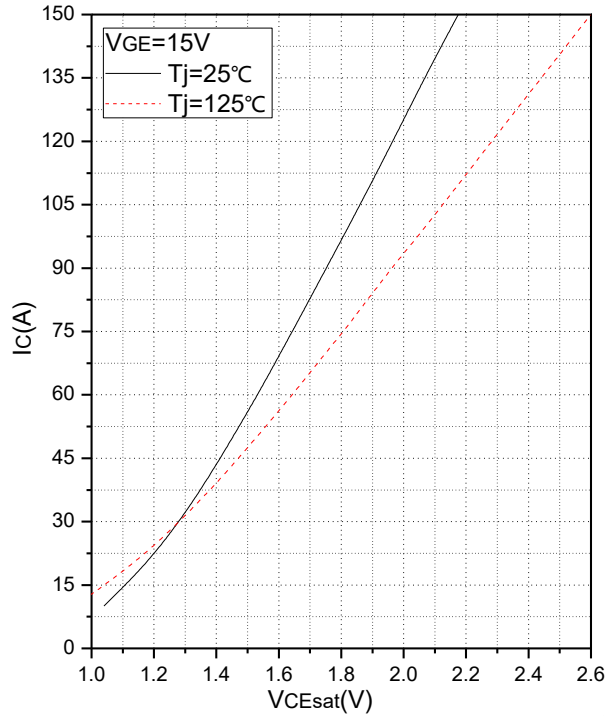


Fig.1 Typical Saturation Voltage Characteristics

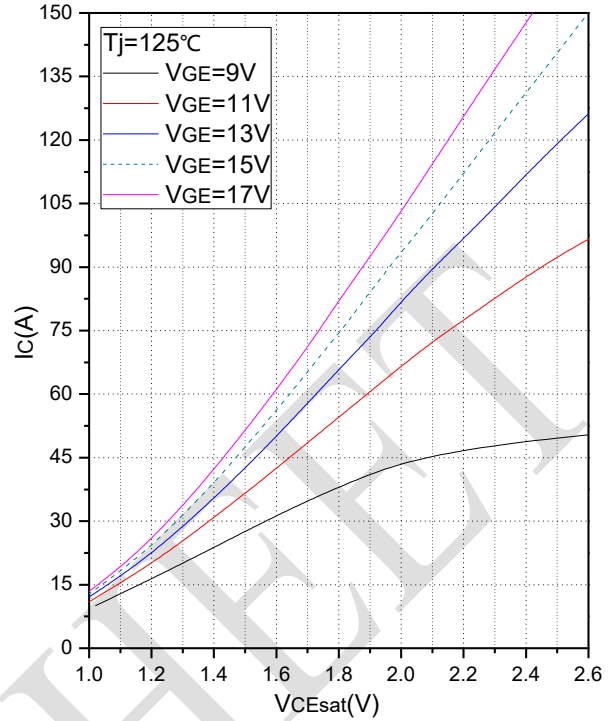


Fig.2 Typical Output Characteristics

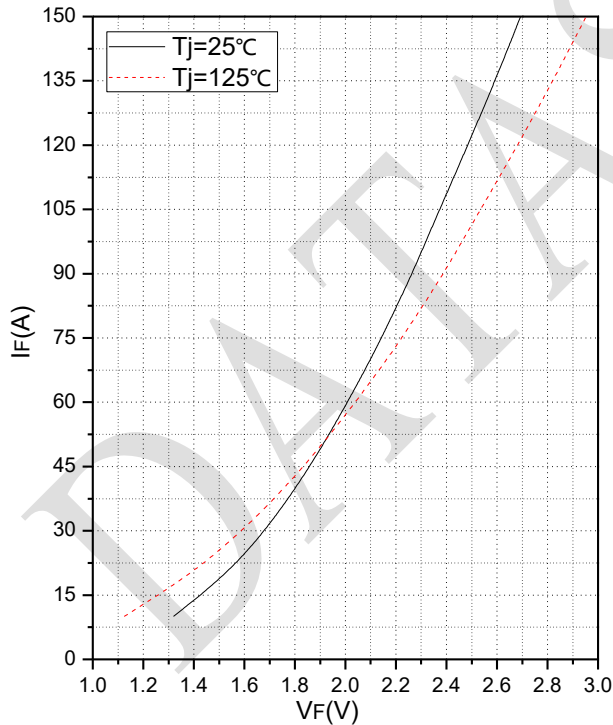


Fig.3 Forward Characteristics of Diode

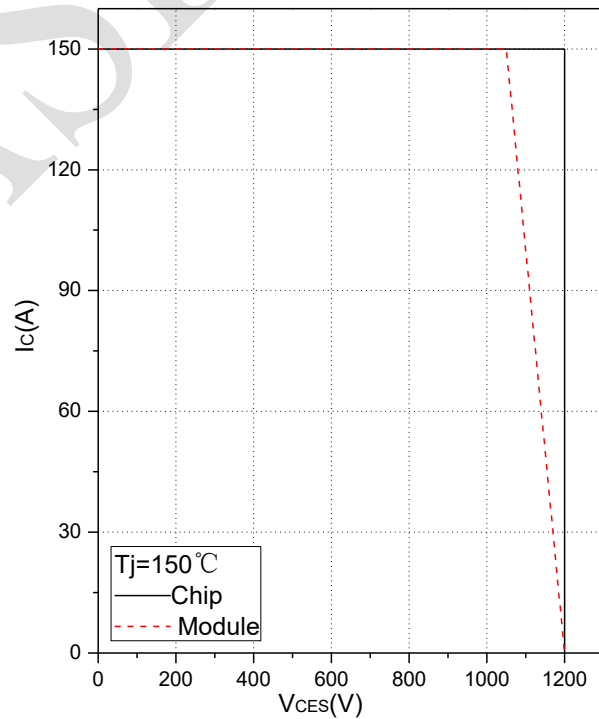


Fig.4 Reverse Bias Safe Operation Area (RBSOA)

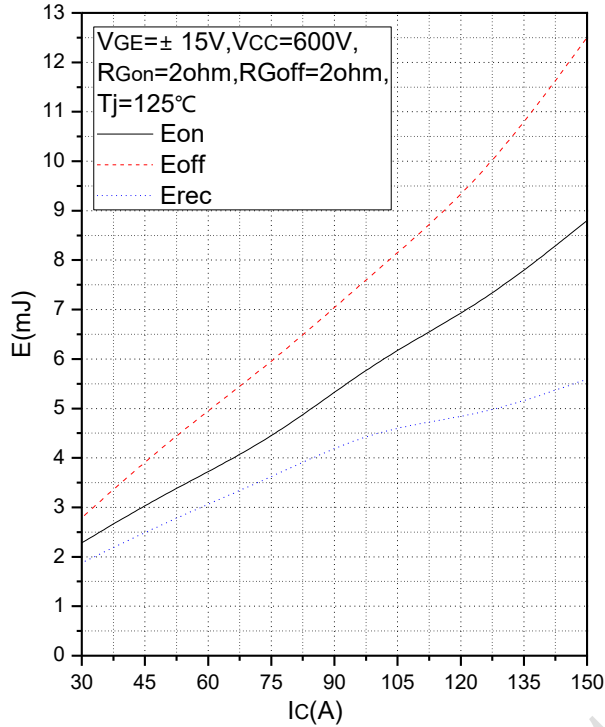


Fig.5 Typical Switching Loss vs. Collector Current

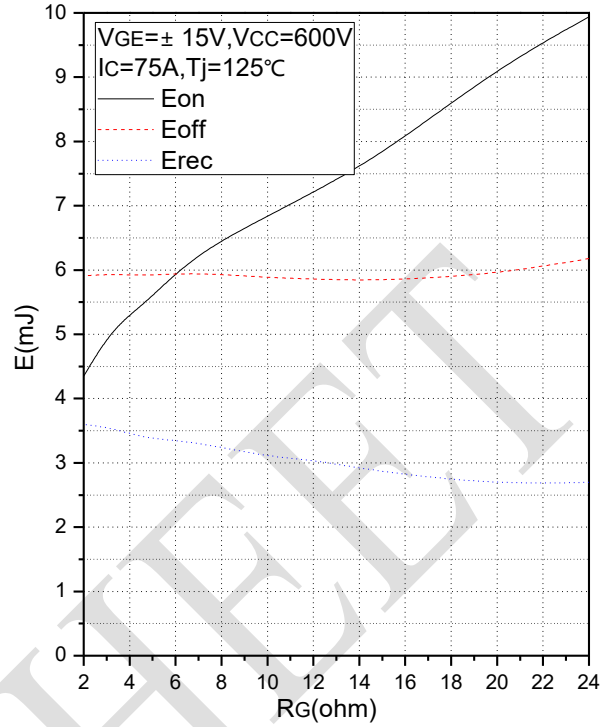


Fig.6 Typical Switching Loss vs. Gate Resistance

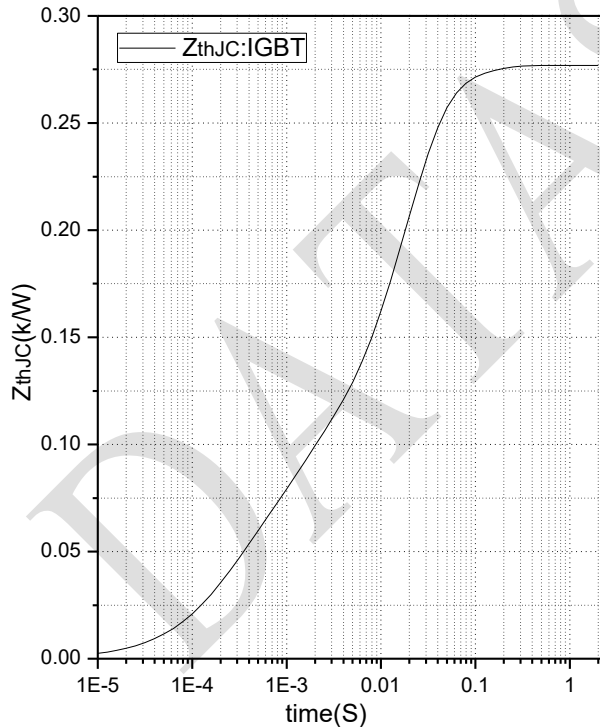


Fig.7 Transient Thermal Impedance (IGBT)

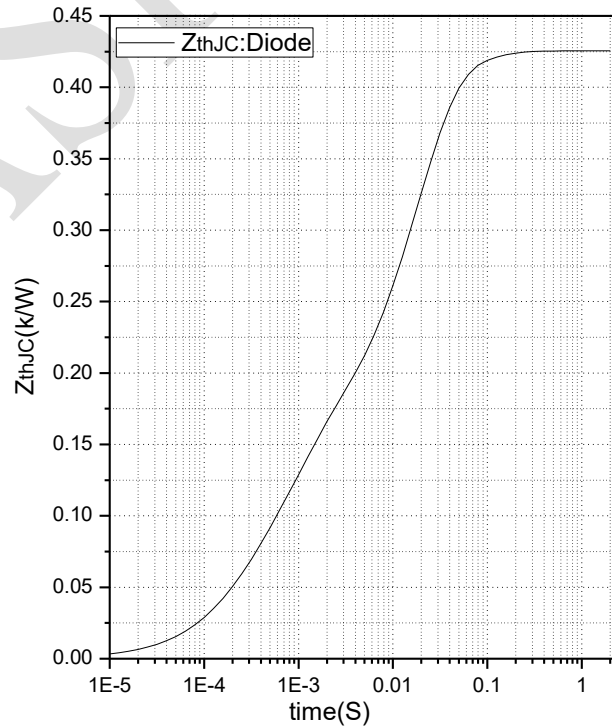


Fig.8 Transient Thermal Impedance (Diode)

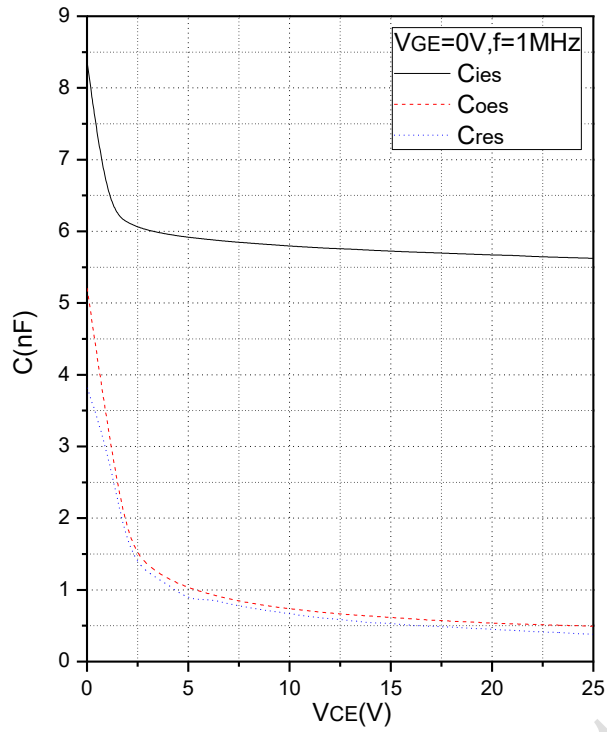


Fig.9 Capacitance Characteristics

DATA SHEET







Date	Revision	Notes
04/10/2018	A	Final Version

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

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