

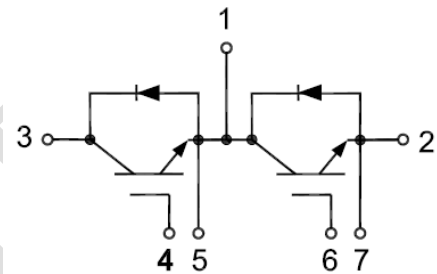


GT75HF65T1VH

IGBT Module

Features:

- Trench IGBT Technology
- 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



Applications:

- Welding Machine
- Cutting Machine
- Plating Power Supply
- Induction Heating

IGBT, Inverter

Maximum Rated Values (T_C=25°C unless otherwise specified)

V _{CES}	Collector-Emitter Blocking Voltage		650	V
V _{GES}	Gate-Emitter Voltage		±20	V
I _C	Continuous Collector Current	T _C =100°C	75	A
		T _C =25°C	95	A
I _{CM}	Peak Collector Current Repetitive	T _J =175°C	150	A
t _{sc}	Short Circuit Withstand Time		>10	μs
P _D	Maximum Power Dissipation (IGBT)	T _C =25°C T _{Jmax} =175°C	320	W



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

Static Characteristics

Symbol	Description	Conditions		Min	Typ	Max	Unit
V _{GE(th)}	Gate-Emitter Threshold Voltage	I _C = 1 mA, V _{CE} = V _{GE}		4.0	5.5	6.5	V
V _{CE(sat)}	Collector-Emitter Saturation Voltage	I _C = 75 A, V _{GE} = 15V	T _J = 25°C		1.90	2.10	V
			T _J = 125°C		2.10		V
I _{CES}	Collector-Emitter Leakage Current	V _{GE} = 0V, V _{CE} = V _{CES} , T _J = 25°C				1	mA
I _{GES}	Gate-Emitter Leakage Current	V _{GE} = ±20V, V _{CE} = 0V, T _J = 25°C				200	nA
C _{ies}	Input Capacitance	V _{CE} = 25V, V _{GE} = 0V , f = 1MHz			4.44		nF
C _{oes}	Output Capacitance				0.25		nF
C _{res}	Reverse Transfer Capacitance				0.13		nF

Switching Characteristics

t _{d(on)}	Turn-on Delay Time	V _{CC} = 300V, I _C = 75A, R _{Gon} = 15 Ω, V _{GE} = ±15V, Inductive Load	T _J = 25°C		149		ns
			T _J = 125°C		147		
t _r	Rise Time	Inductive Load	T _J = 25°C		89		ns
			T _J = 125°C		89		
t _{d(off)}	Turn-off Delay Time	V _{CC} = 300V, I _C = 75A, R _{Goff} = 15 Ω, V _{GE} = ±15V, Inductive Load	T _J = 25°C		110		ns
			T _J = 125°C		113		
t _f	Fall Time	Inductive Load	T _J = 25°C		76		ns
			T _J = 125°C		94		
E _{on}	Turn-on Switching Loss	V _{CC} = 300V, I _C = 75A, R _{Gon} = 15 Ω, V _{GE} = ±15V, di/dt = 675A/μs (T _J = 125°C) Inductive Load	T _J = 25°C		1.17		mJ
			T _J = 125°C		1.55		
E _{off}	Turn-off Switching Loss	V _{CC} = 300V, I _C = 75A, R _{Goff} = 15 Ω, V _{GE} = ±15V, du/dt = 6970V/μs (T _J = 125°C) Inductive Load	T _J = 25°C		0.52		mJ
			T _J = 125°C		0.88		
Q _g	Total Gate Charge	V _{GE} = -15V...+15V	T _J = 25°C		220		nC
RBSOA	Reverse Bias Safe Operation Area	I _C = 150A, V _{CC} = 600V, V _p = 650V, R _{Goff} = 15Ω, V _{GE} = +15V to 0V, T _J = 150°C	Trapezoid				
SCSOA	Short Circuit Safe Operation Area	V _{CC} = 300V, V _{GE} = 15V, T _J = 150°C	10				μs
R _{θJC}	IGBT Thermal Resistance: Junction-To-Case			0.466			°C/W



Diode, Inverter

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

V_{RRM}	Repetitive Peak Reverse Voltage	650	V
I_F	Diode Continuous Forward Current	75	A
I_{FM}	Peak FWD Current Repetitive	150	A

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

Symbol	Description	Conditions		Min	Typ	Max	Unit
V _{FM}	Forward Voltage	I _F = 75 A	T _J = 25°C		1.50		V
			T _J = 125°C		1.50		
trr	Reverse Recovery Time	I _F = 75A, -diF/dt =1015A/μs(T _J =125°C), V _{rr} = 300V, V _{GE} = -15V	T _J = 25°C		104		ns
			T _J = 125°C		133		
I _{rr}	Peak Reverse Recovery Current		T _J = 25°C	40		A	
			T _J = 125°C	48			
Q _{rr}	Reverse Recovery Charge		T _J = 25°C	2.55		μC	
			T _J = 125°C	3.86			
E _{rec}	Reverse Recovery Energy		T _J = 25°C	0.43		mJ	
			T _J = 125°C	0.64			
R _{θJC}	Diode Thermal Resistance: Junction-To-Case				0.612		°C/W



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	°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)			0.1		°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

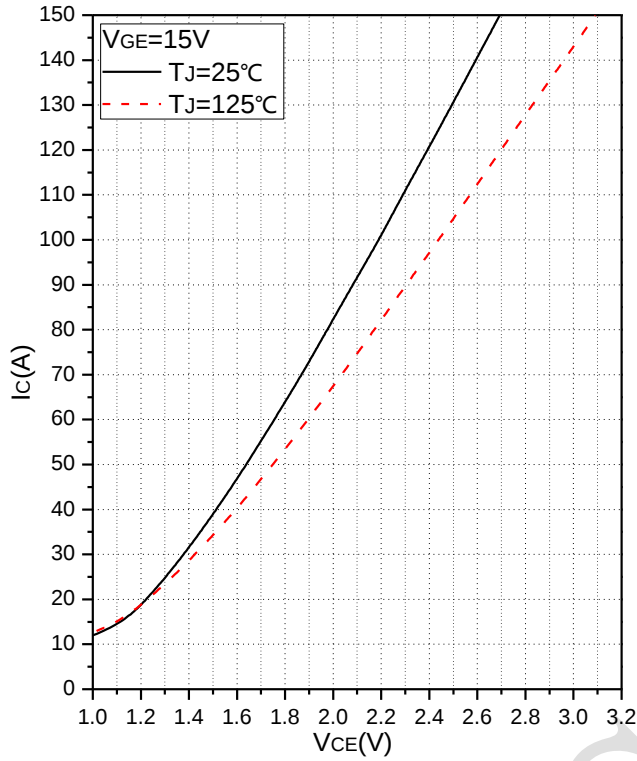


Fig.1 Typical Saturation Voltage Characteristics

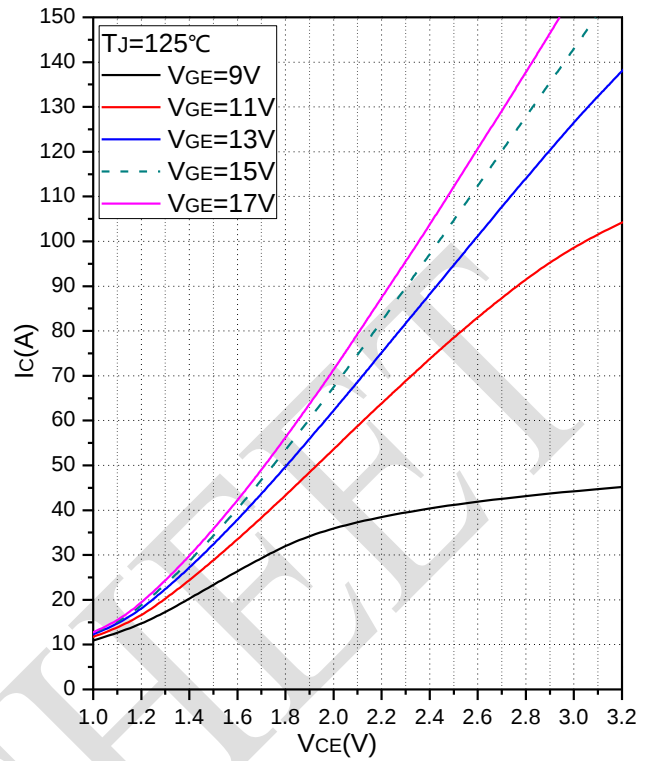


Fig.2 Typical Output Characteristics

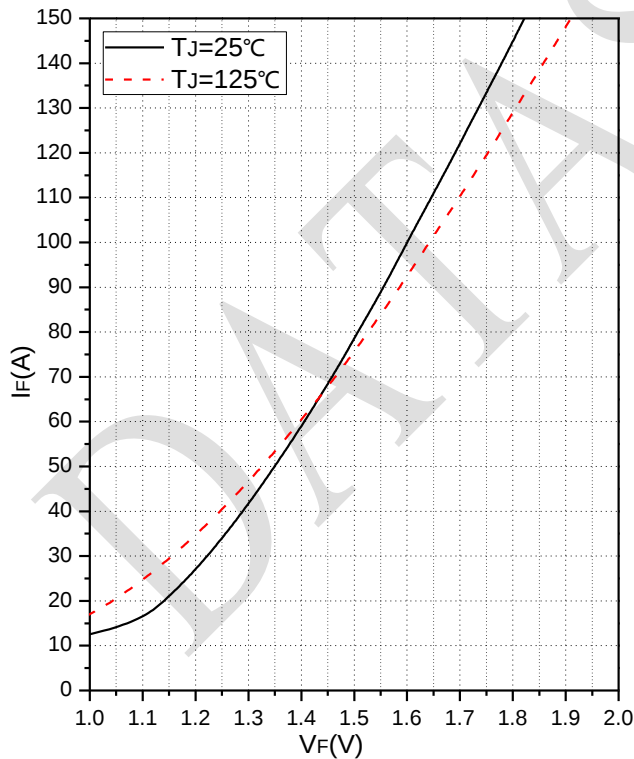


Fig.3 Forward Characteristics of FWD

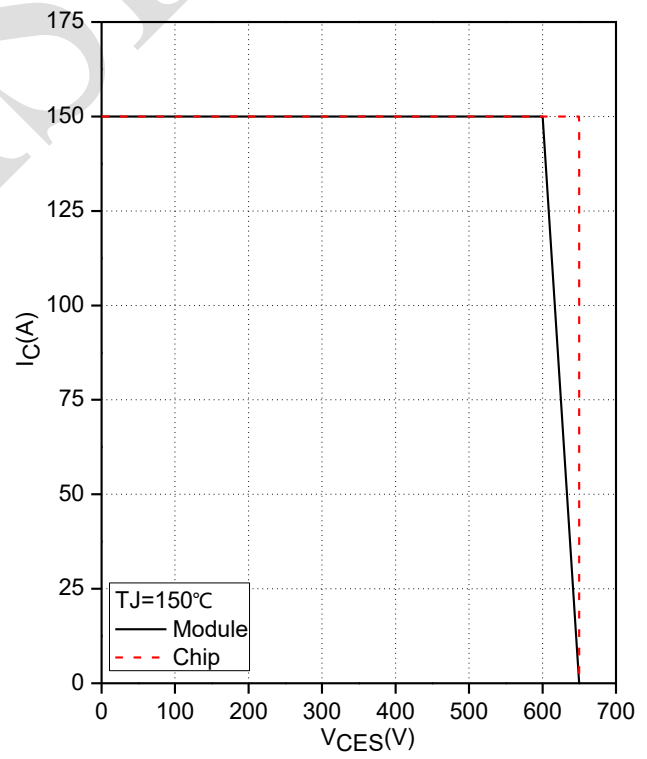


Fig.4 Reverse Bias Safe Operation Area (RBSOA)

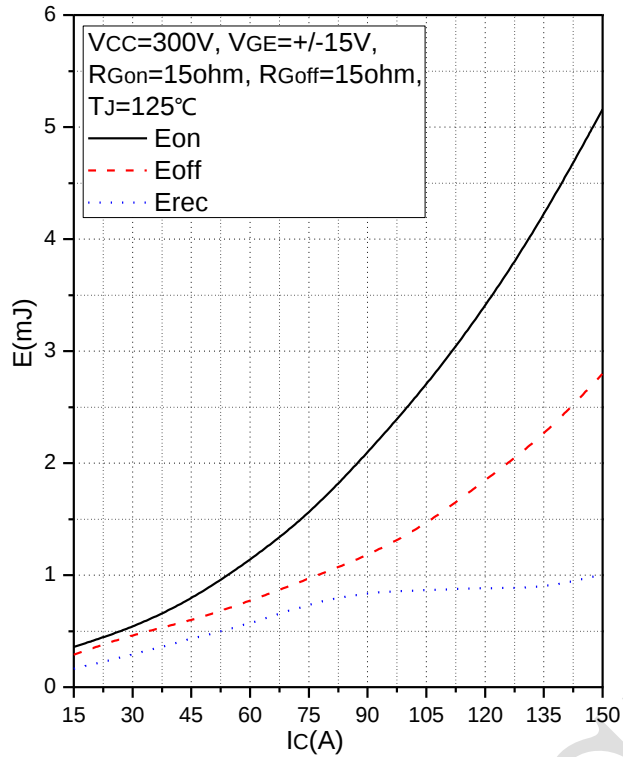


Fig.5 Typical Switching Losses vs. Collector Current

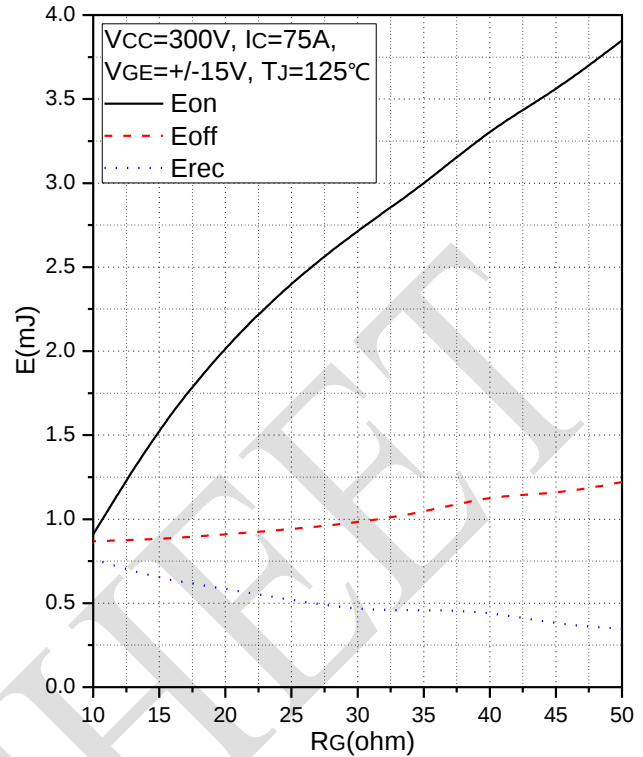


Fig.6 Typical Switching Loss vs. Gate Resistance

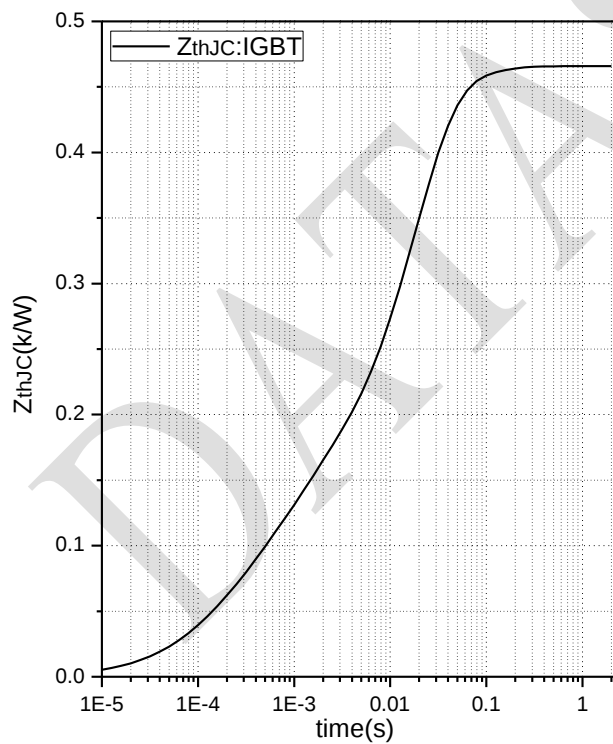


Fig.7 Transient Thermal Impedance (IGBT)

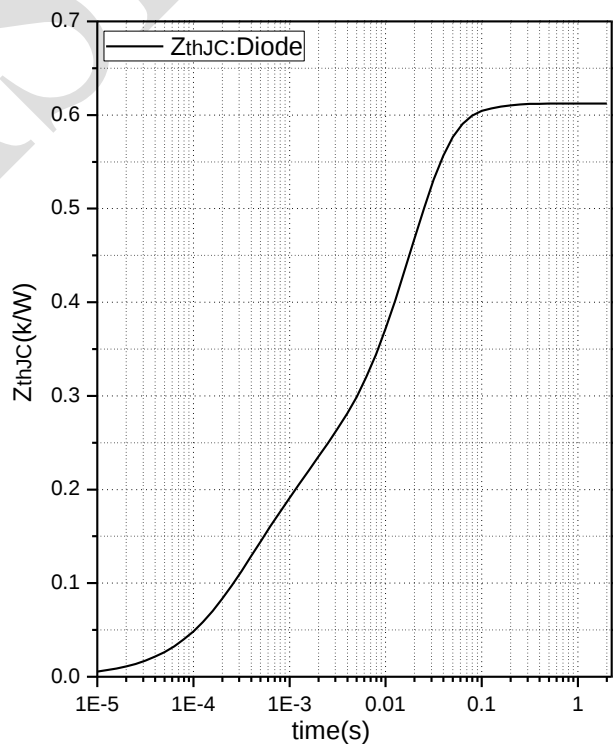
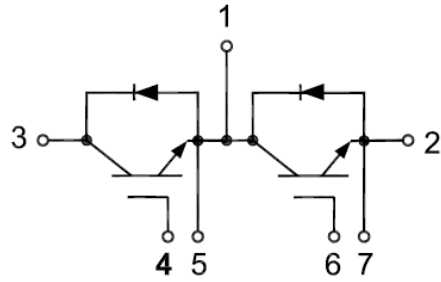


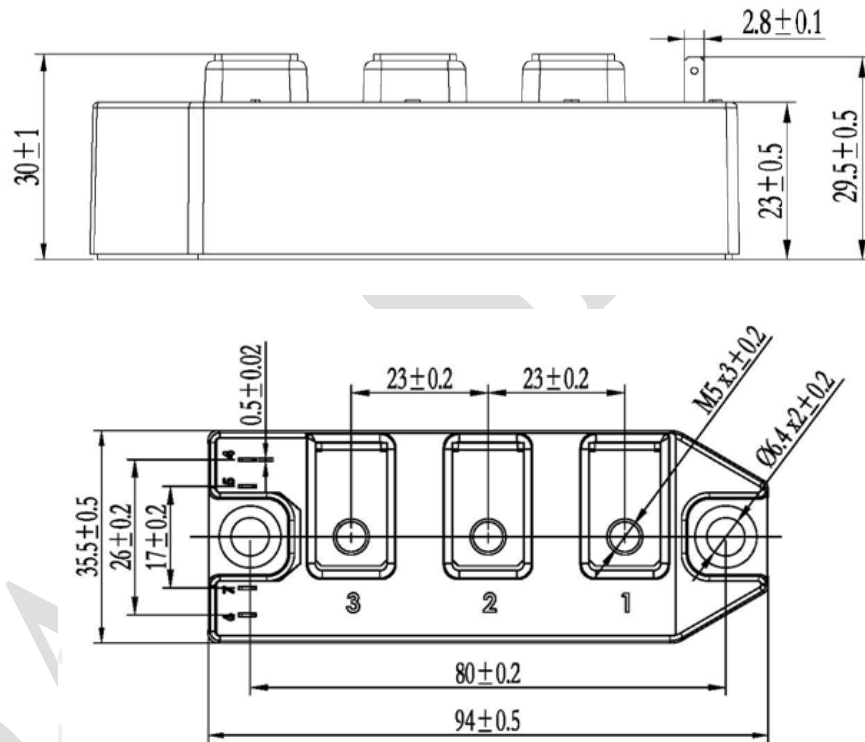
Fig.8 Transient Thermal Impedance (Diode)



Internal Circuit:



Package Outline (Unit: mm):





Date	Revision	Notes
05/27/2020	01	Initial Release
09/19/2020	02	Revised V_{CES} and V_{RRM} Value

Announcement

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