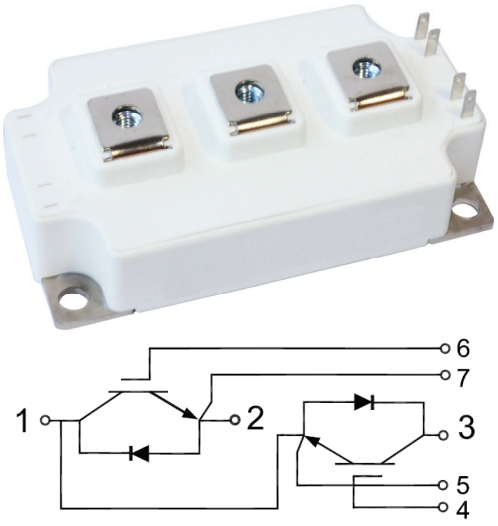
SYMT200HF170T2VH

IGBT Module Preliminary Data



Features：

- Short Circuit Rated ＞10μs
- Low Saturation Voltage: $V_{CE\ (sat)}$ = 2.30V @ I_C = 200A , T_C=25℃
- Low Switching Loss
- 100% RBSOA Tested（2×Ic）
- Low Stray Inductance
- Lead Free, Compliant with RoHS Requirement

Applications：

- Industrial Inverters
- Motor Drives
- UPS Systems

IGBT,Inverter

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

V_{CES}	Collector-Emitter Blocking Voltage		1700	V
V_{GES}	Gate-Emitter Voltage		±20	V
I_C	Continuous Collector Current	T_C = 80℃	200	A
		T_C = 25℃	310	A
I_{CM}	Peak Collector Current Repetitive	T_J = 150℃	400	A
t_{SC}	Short Circuit Withstand Time		>10	μs
P_D	Maximum Power Dissipation (IGBT)	T_C = 25℃ T_{Jmax}=150℃	1490	W

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 = 1 mA, V_{CE} = V_{GE}		5.5	6.0	6.5	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C = 200A, V_{GE} = 15V	T_J = 25℃		2.30	2.50	V
			T_J = 125℃		2.70		V
I_{CES}	Collector-Emitter Leakage Current	V_{GE} = 0V, V_{CE} = V_{CES}, T_J = 25℃				2	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			13.2		nF
C_{oes}	Output Capacitance				0.70		nF

Switching Characteristics

$t_{d(on)}$	Turn-on Delay Time	V_{CC} = 900V,I_C = 200A, R_G = 10Ω,V_{GE} = ±15V, Inductive Load	T_J = 25℃		560		ns
			T_J = 125℃		570		
t_r	Rise Time		T_J = 25℃		205		ns
			T_J = 125℃		205		
$t_{d(off)}$	Turn-off Delay Time		T_J = 25℃		530		ns
			T_J = 125℃		580		
t_f	Fall Time		T_J = 25℃		250		ns
			T_J = 125℃		370		
E_{on}	Turn-on Switching Loss		T_J = 25℃		43.5		mJ
			T_J = 125℃		58.5		
E_{off}	Turn-off Switching Loss		T_J = 25℃		28.4		mJ
			T_J = 125℃		48.4		
Q_g	Total Gate Charge		T_J = 25℃		1200		nC
RBSOA	RBSOA	I_C=400A,V_{CC}=1650V,Vp=1700V, Rg = 10Ω, V_{GE}=+15V to 0V, T_J =150°C		Trapezoid			
SCSOA	SCSOA	V_{CC} = 900V, V_{GE} = 15V, T_J = 150℃		10			μs
$R_{\theta JC}$	IGBT Thermal Resistance: Junction-To-Case				0.084		℃/W

Diode, Inverter

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

V_{RRM}	Repetitive Peak Reverse Voltage	1700	V
I_F	Diode Continuous Forward Current	200	A
I_{FM}	Peak FWD Current Repetitive	400	A

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

Symbol	Description	Conditions		Min	Typ	Max	Unit
V_{FM}	Forward Voltage	I_F = 200A , V_{GE} = 0V	T_J = 25℃		1.70		V
			T_J = 125℃		1.90		
I_{rr}	Peak Reverse Recovery Current	I_F = 200A, di/dt =1800A/μs, V_{rr} = 900V, V_{GE} = -15V	T_J = 25℃		100		A
			T_J = 125℃		150		
Q_{rr}	Reverse Recovery Charge		T_J = 25℃		27.2		μC
			T_J = 125℃		51.2		
E_{rec}	Reverse Recovery Energy		T_J = 25℃		16.2		mJ
			T_J = 125℃		33.2		
$R_{\theta JC}$	Diode Thermal Resistance: Junction-To-Case				0.154		℃/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				150	℃
T_{JOP}	Maximum Operating Junction Temperature Range		-40 +150			℃
T_{stg}	Storage Temperature		-40 +125			℃
$R_{\theta CS}$	Case-To-Sink Thermally (Conductive Grease Applied)			0.03		℃/W
M	Power Terminals Screw:M6		3.0		5.0	N·m
M	Mounting Screw:M6		4.0		6.0	N·m
G	Weight			300		g

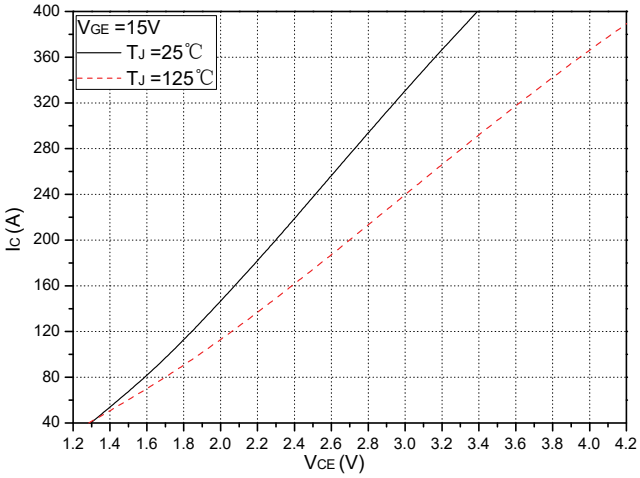


Fig.1 Typical Saturation Voltage Characteristics

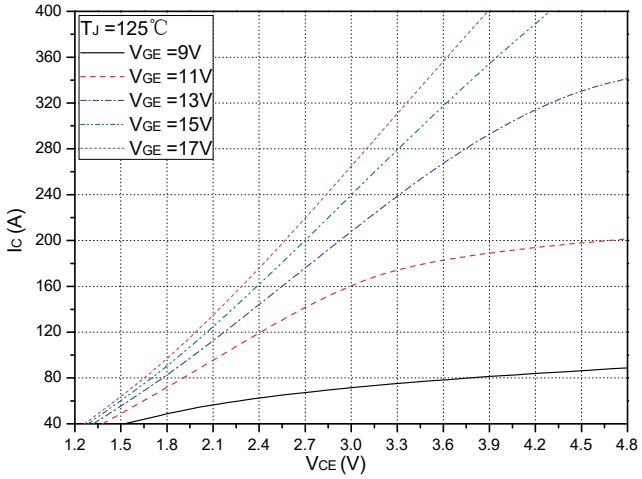


Fig.2 Typical Output Characteristics

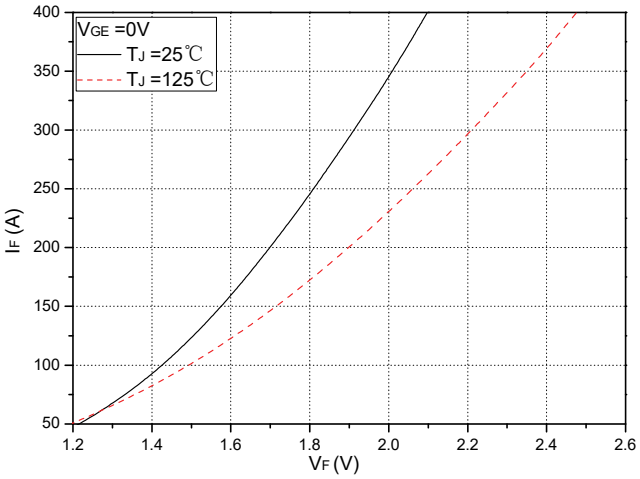


Fig.3 Forward Characteristics of FWD

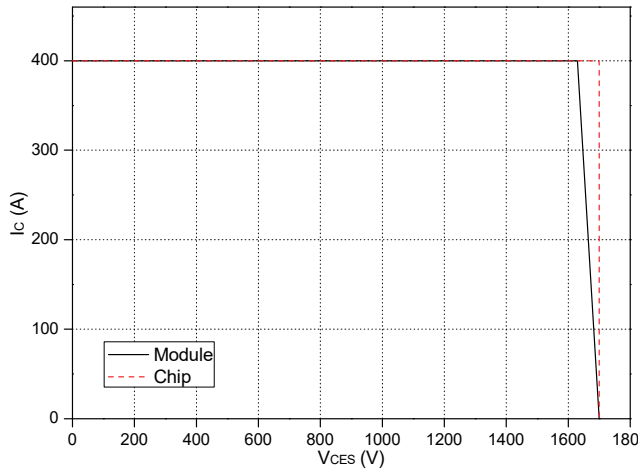


Fig.4 Reverse Bias Safe Operation Area (RBSOA)

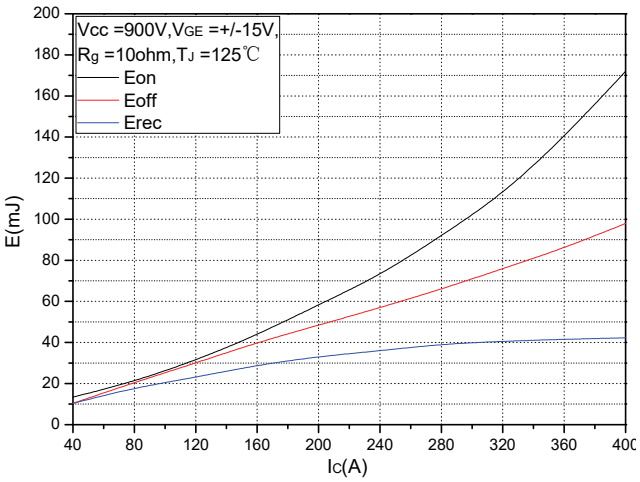


Fig.5 Typical Switching Loss vs. Collector Current

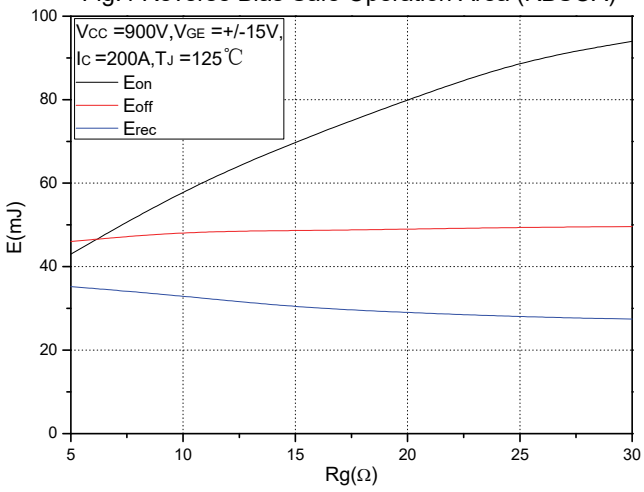


Fig.6 Typical Switching Loss vs. Gate Resistance

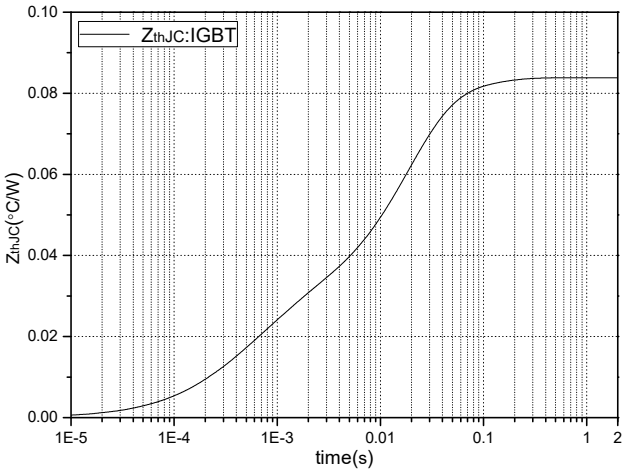


Fig.7 Transient Thermal Impedance (IGBT)

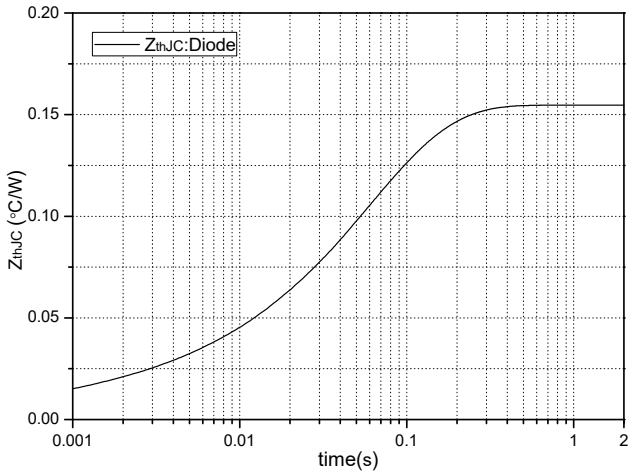


Fig.8 Transient Thermal Impedance (Diode)

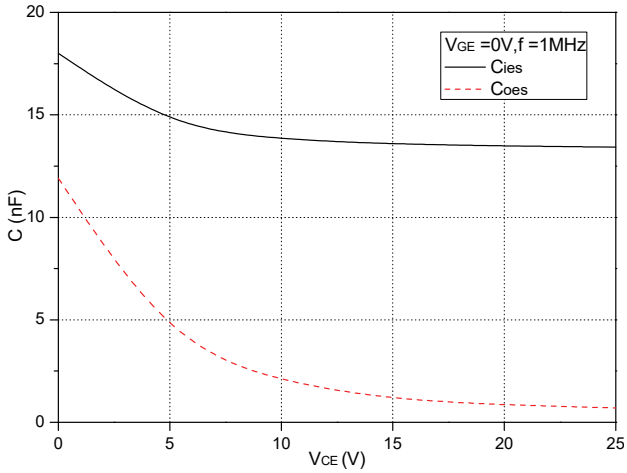
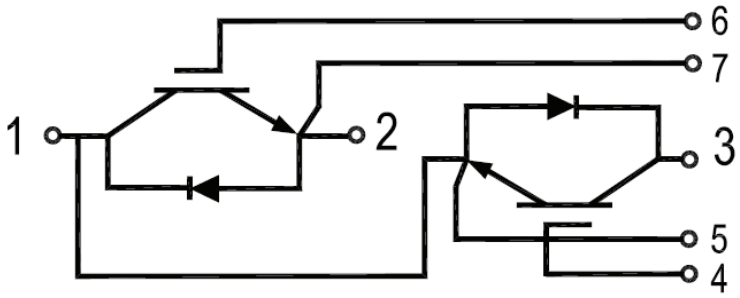


Fig.9 Capacitance Characteristics

Internal Circuit



Package Outline (Unit: mm):