

GT200CH120T2H

IGBT Module

Preliminary Data

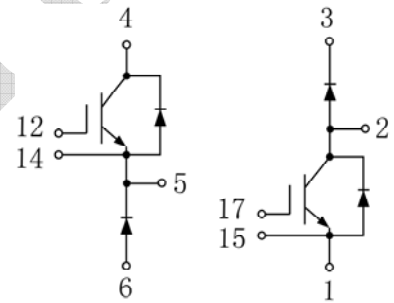
Features:

- Short Circuit Rated 10 μ s
- Low Saturation Voltage: $V_{CE(sat)} = 1.90V @ I_C = 200A, T_C = 25^\circ C$
- Low Switching Loss
- 100% RBSOA Tested ($2 \times I_C$)
- Low Stray Inductance
- Lead Free, Compliant with RoHS Requirement



Applications:

- Industrial Motor Drive
- UPS, SMPS
- Servo Drive, Switched Reluctance Drive



IGBT, Brake-Chopper

Maximum Rated Values ($T_C = 25^\circ C$ Unless otherwise specified)

V_{CES}	Collector-Emitter Blocking Voltage		1200	V
V_{GES}	Gate-Emitter Voltage		± 20	V
I_C	Continuous Collector Current	$T_C = 80^\circ C,$	200	A
		$T_C = 25^\circ C$	340	A
I_{CM}	Peak Collector Current Repetitive	$T_J = 175^\circ C$	400	A
t_{SC}	Short Circuit Withstand Time		>10	μs
P_D	Maximum Power Dissipation (IGBT)	$T_C = 25^\circ C$ $T_{Jmax} = 175^\circ C$	1290	W

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

Static characteristics

Symbol	Description	Conditions	Min	Typ	Max	Unit
$V_{GE(th)}$	Gate-Emitter Threshold Voltage	$I_C = 1\text{mA}, V_{CE} = V_{GE}$	5.0	5.5	6.0	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 200\text{A}, V_{GE} = 15\text{V}$	$T_J = 25^\circ\text{C}$	1.90	2.20	V
			$T_J = 125^\circ\text{C}$	2.20		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	$V_{GE} = \pm 20\text{V}, V_{CE} = 0\text{V}, T_J = 25^\circ\text{C}$			200	nA
C_{ies}	Input Capacitance			25.5		nF
C_{oes}	Output capacitance	$V_{CE} = 25\text{V}, V_{GE} = 0\text{V}, f = 1\text{MHz}$		0.92		nF
C_{res}	Reveres transfer capacitance			0.64		nF

Switching Characteristics

$t_{d(on)}$	Turn-on Delay Time	$V_{CC} = 600\text{V}, I_C = 200\text{A}, R_G = 10\Omega, V_{GE} = \pm 15\text{V},$ Inductive Load	$T_J = 25^\circ\text{C}$		355		ns
			$T_J = 125^\circ\text{C}$		320		
t_r	Rise Time		$T_J = 25^\circ\text{C}$		200		ns
			$T_J = 125^\circ\text{C}$		210		
$t_{d(off)}$	Turn-off Delay Time		$T_J = 25^\circ\text{C}$		525		ns
			$T_J = 125^\circ\text{C}$		560		
t_f	Fall Time		$T_J = 25^\circ\text{C}$		190		ns
			$T_J = 125^\circ\text{C}$		260		
E_{on}	Turn-on Switching Loss		$T_J = 25^\circ\text{C}$		24.6		mJ
			$T_J = 125^\circ\text{C}$		33.0		
E_{off}	Turn-off Switching Loss	$T_J = 25^\circ\text{C}$		12.7		mJ	
		$T_J = 125^\circ\text{C}$		17.2			
Q_g	Total Gate Charge	$T_J = 25^\circ\text{C}$		1800		nC	
RBSOA	RBSOA	$I_C=400\text{A}, V_{CC}=1050\text{V}, V_p=1200\text{V}, R_g = 10\Omega, V_{GE}=+15\text{V to } 0\text{V}, T_J = 150^\circ\text{C}$	Trapezoid				
SCSOA	SCSOA	$V_{CC} = 600\text{V}, V_{GE} = 15\text{V}, T_J = 150^\circ\text{C}$	10			μs	
$R_{\theta JC}$	IGBT Thermal Resistance: Junction-To-Case			0.116		$^\circ\text{C/W}$	

Diode, Reverse

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

V_{RRM}	Repetitive peak reverse voltage	1200	V
I_F	Diode Continuous Forward Current	200	A
I_{FM}	Peak FWD Current Repetitive	400	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	$I_F = 200A$, $V_{GE} = 0V$	$T_J = 25^\circ\text{C}$	2.20	2.40	V
			$T_J = 125^\circ\text{C}$	2.40		
I_{rr}	Peak Reverse Recovery Current		$T_J = 25^\circ\text{C}$	70		A
			$T_J = 125^\circ\text{C}$	110		
Q_{rr}	Reverse Recovery Charge	$I_F = 200A$, $di/dt = 1100A/\mu s$, $V_{rr} = 600V$, $V_{GE} = -15V$	$T_J = 25^\circ\text{C}$	10.6		μC
			$T_J = 125^\circ\text{C}$	22.3		
E_{rec}	Reverse Recovery Energy		$T_J = 25^\circ\text{C}$	3.7		mJ
			$T_J = 125^\circ\text{C}$	8.1		
$R_{\theta JC}$	Diode Thermal Resistance: Junction-To-Case			0.227		$^\circ\text{C}/\text{W}$

Diode, Brake-Chopper

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

V_{RRM}	Repetitive peak reverse voltage	1200	V
I_F	Diode Continuous Forward Current	200	A
I_{FM}	Peak FWD Current Repetitive	400	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	$I_F = 200A$, $V_{GE} = 0V$	$T_J = 25^{\circ}\text{C}$		2.00	2.30	V
			$T_J = 125^{\circ}\text{C}$		2.20		
$R_{\theta JC}$	Diode Thermal Resistance: Junction-To-Case				0.143		$^{\circ}\text{C}/\text{W}$

Module

Symbol	Description		Min	Typ	Max	Unit
V_{iso}	Isolation Voltage(All Terminals Shorted)	$f = 50\text{Hz}$, 1minute	2500			V
T_J	Maximum Junction Temperature				175	$^{\circ}\text{C}$
T_{JOP}	Maximum Operating Junction Temperature Range		-40 +150			$^{\circ}\text{C}$
T_{stg}	Storage Temperature		-40 +125			$^{\circ}\text{C}$
$R_{\theta CS}$	Case-To-Sink (Conductive Grease Applied)			0.03		$^{\circ}\text{C}/\text{W}$
M	Power Terminals Screw:M5		3.0		5.0	N·m
M	Mounting Screw:M6		4.0		6.0	N·m
G	Weight			280		g

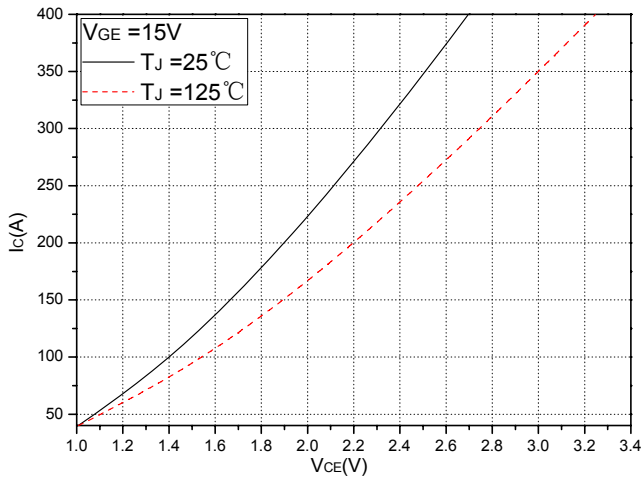


Fig.1 Typical Saturation Voltage Characteristics

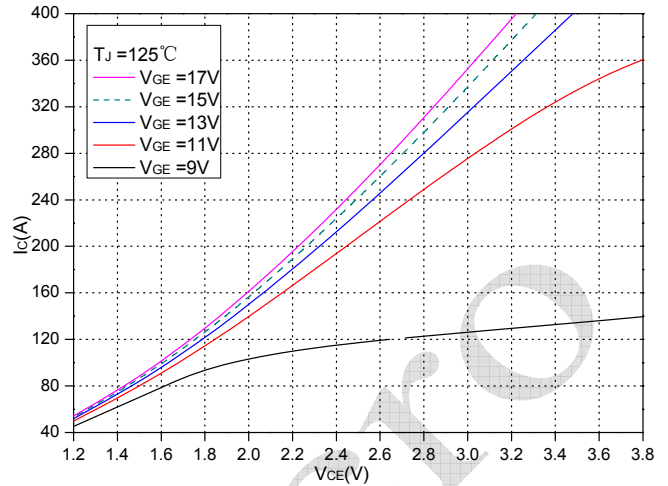


Fig.2 Typical Output Characteristics

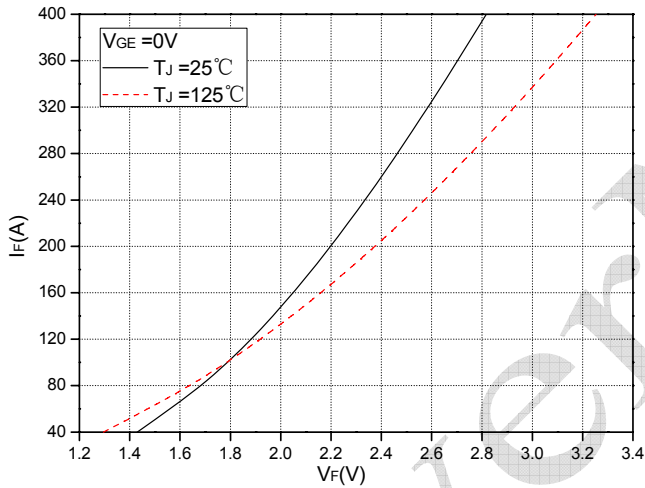


Fig.3 Forward Characteristics of FWD (Reverse)

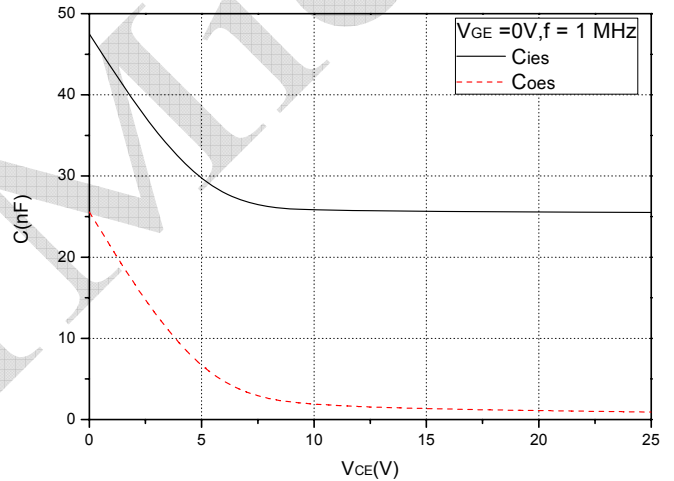


Fig.4 Capacitance Characteristics

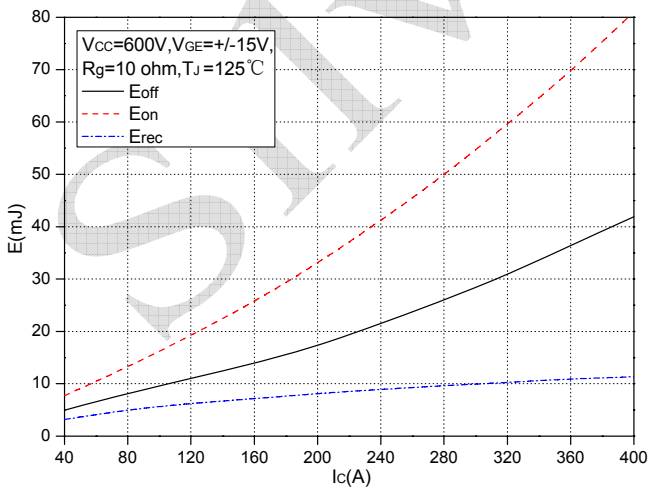


Fig.5 Typical Switching Loss vs. Collector Current

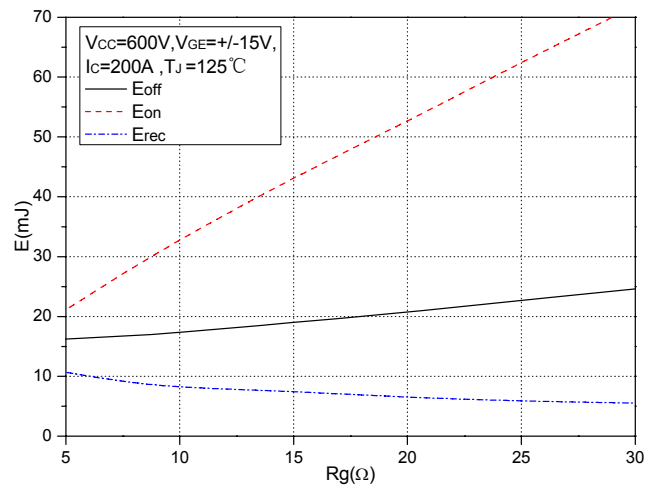


Fig.6 Typical Switching Loss vs. Gate Resistance

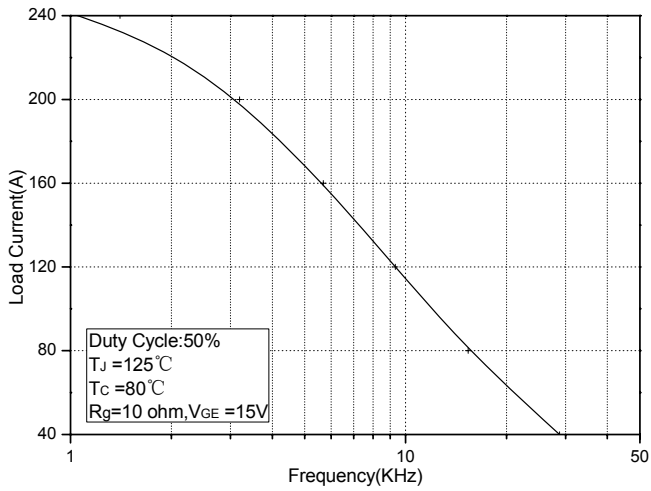


Fig.7 Typical Load Current vs. Frequency

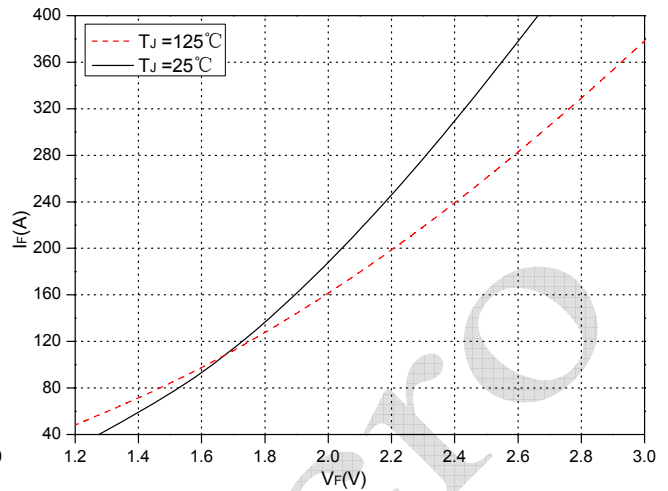


Fig.8 Forward Characteristics of FWD(Brake-Chopper)

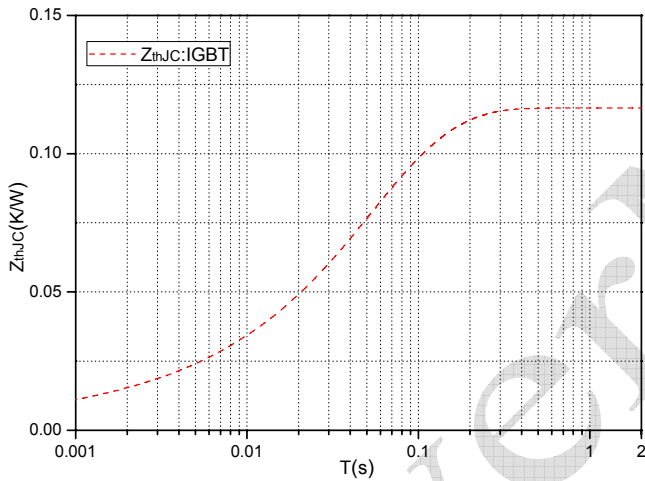


Fig.9 Transient thermal impedance (IGBT)

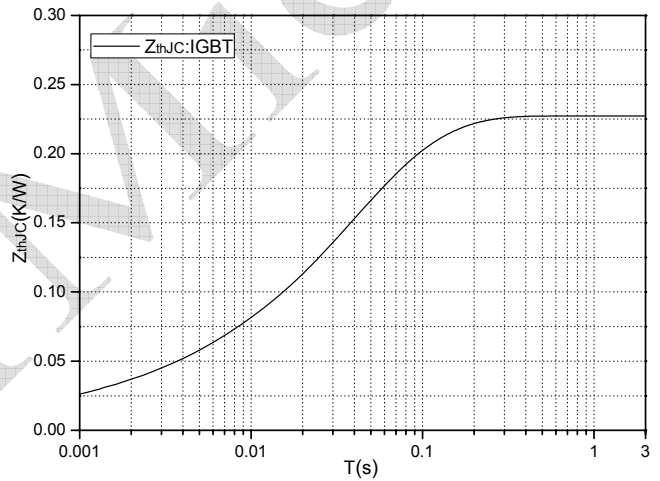


Fig.10 Transient thermal impedance (Diode)

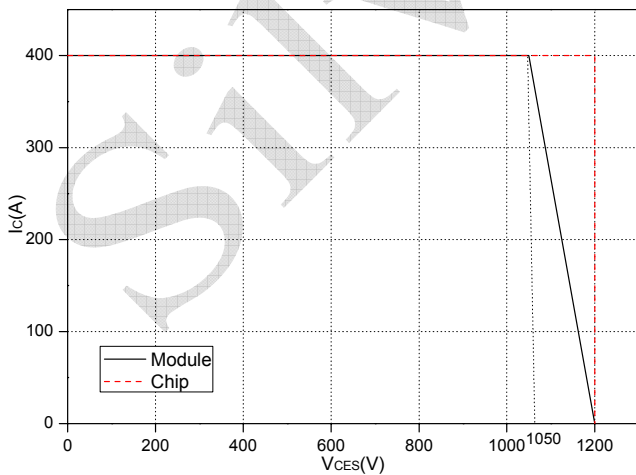
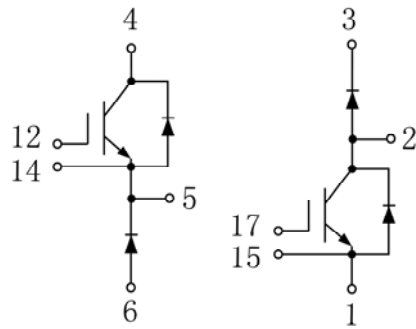
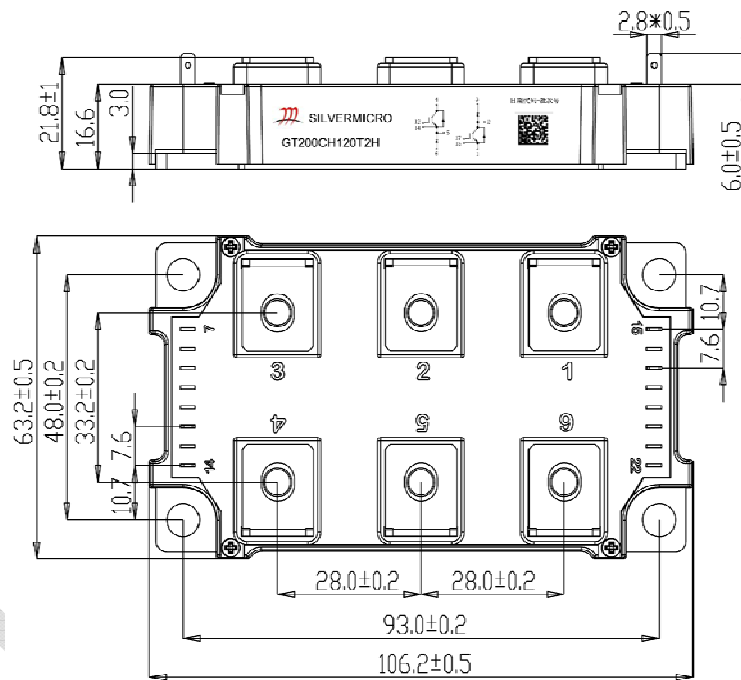


Fig.11 Reverse Bias Safe Operation Area (RBSOA)

Internal Circuit:



Package Outline (Unit: mm):





Announcement

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