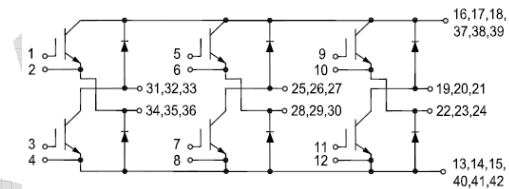


GT75CZ120T6H-M

IGBT Module

Features:

- Field Stop Trench Gate IGBT
- 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:

- Switched Reluctance Drive
- Servo Applications

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		\pm 20	V
I _C	Continuous Collector Current	T _C = 100 $^{\circ}$ C	75	A
		T _C = 25 $^{\circ}$ C	150	A
I _{CM}	Peak Collector Current Repetitive	T _J = 175 $^{\circ}$ C	150	A
t _{SC}	Short Circuit Withstand Time		>10	μ s
P _D	Maximum Power Dissipation (IGBT)	T _C = 25 $^{\circ}$ C T _{Jmax} = 175 $^{\circ}$ C	555	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	$I_C = 2.6 \text{ mA}$, $V_{CE} = V_{GE}$	5.0	5.5	6.8	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 75\text{A}$, $V_{GE} = 15\text{V}$	$T_J = 25^\circ\text{C}$	1.60		V
			$T_J = 125^\circ\text{C}$	1.80		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	$V_{CE} = 25\text{V}$, $V_{GE} = 0\text{V}$, $f = 1\text{MHz}$		7.5		nF
C_{res}	Reveres Transfer Capacitance			0.21		nF

Switching Characteristics

$t_{d(on)}$	Turn-on Delay Time	$V_{CC} = 600\text{V}$, $I_C = 75\text{A}$, $R_G = 2\Omega$, $V_{GE} = \pm 15\text{V}$, Inductive Load	$T_J = 25^\circ\text{C}$	158		ns
			$T_J = 125^\circ\text{C}$	163		
t_r	Rise Time		$T_J = 25^\circ\text{C}$	49		ns
			$T_J = 125^\circ\text{C}$	53		
$t_{d(off)}$	Turn-off Delay Time		$T_J = 25^\circ\text{C}$	193		ns
			$T_J = 125^\circ\text{C}$	211		
t_f	Fall Time		$T_J = 25^\circ\text{C}$	204		ns
			$T_J = 125^\circ\text{C}$	371		
E_{on}	Turn-on Switching Loss		$T_J = 25^\circ\text{C}$	3.22		mJ
			$T_J = 125^\circ\text{C}$	4.35		
E_{off}	Turn-off Switching Loss	$T_J = 25^\circ\text{C}$	3.40		mJ	
		$T_J = 125^\circ\text{C}$	5.91			
Q_g	Total Gate Charge	$T_J = 25^\circ\text{C}$	374		nC	
$R_{g \text{ internal}}$	Internal Gate Resistance	$T_J = 25^\circ\text{C}$	10		Ω	
RBSOA	RBSOA	$I_C = 150\text{A}$, $V_{CC} = 1050\text{V}$, $V_p = 1200\text{V}$, $R_g = 2\Omega$, $V_{GE} = +15\text{V}$ to 0V , $T_J = 150^\circ\text{C}$	Trapezoid			
SC data	$V_{CC} = 800\text{V}$ $t_p = 10\mu\text{s}$ $V_{ge} = \pm 15\text{V}$ $R_g = 10\text{ohm}$ $T_J = 25^\circ\text{C}$			469	A	
$R_{\theta JC}$	IGBT Thermal Resistance: Junction-To-Case			0.27	$^\circ\text{C/W}$	

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	75	A
I_{FM}	Diode Maximum Forward Current	150	A

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

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	$I_F = 75\text{A},$ $di/dt = 1250\text{A}/\mu\text{s},$ $V_{rr} = 600\text{V},$ $V_{GE} = -15\text{V}$	$T_J = 25^\circ\text{C}$	204		ns	
			$T_J = 125^\circ\text{C}$	389			
I_{rr}	Peak Reverse Recovery Current		$T_J = 25^\circ\text{C}$	47.8		A	
			$T_J = 125^\circ\text{C}$	64.7			
Q_{rr}	Reverse Recovery Charge		$T_J = 25^\circ\text{C}$	4.56		μC	
			$T_J = 125^\circ\text{C}$	9.42			
E_{rec}	Reverse Recovery Energy		$T_J = 25^\circ\text{C}$	1.68		mJ	
			$T_J = 125^\circ\text{C}$	3.60			
$R_{\theta JC}$	Diode Thermal Resistance: Junction-To-Case			0.43		$^\circ\text{C}/\text{W}$	

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)		0.02		°C/W
M	Mounting Screw:M5	4.0		6.0	N·m
G	Weight		300		g

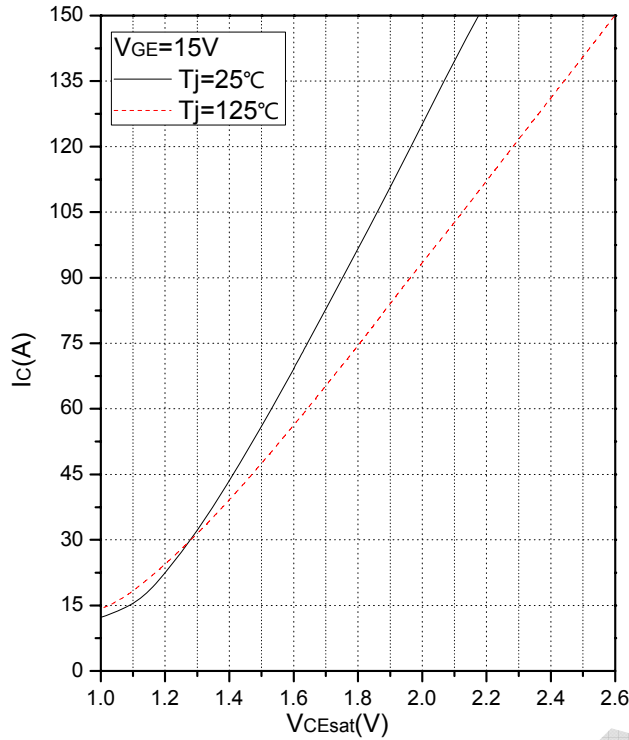


Fig.1 Typical Saturation Voltage Characteristics

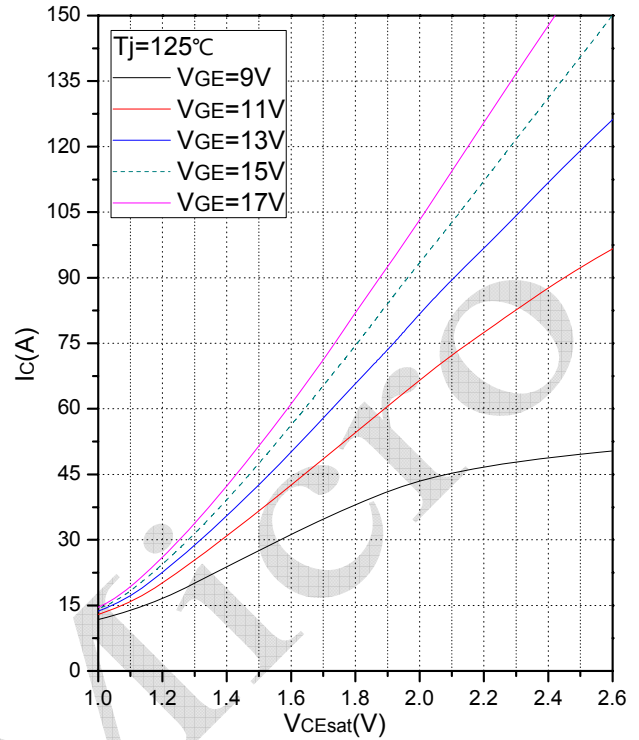


Fig.2 Typical Output Characteristics

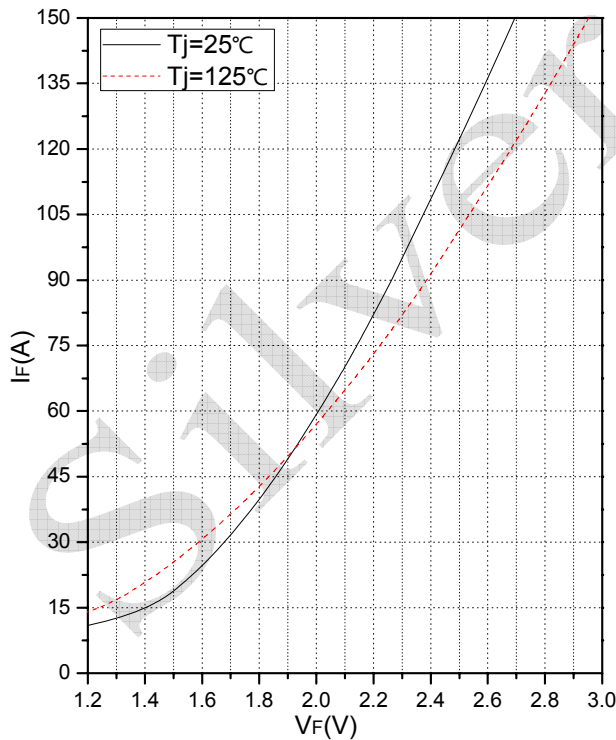


Fig.3 Forward Characteristics of Brake-Chopper Diode

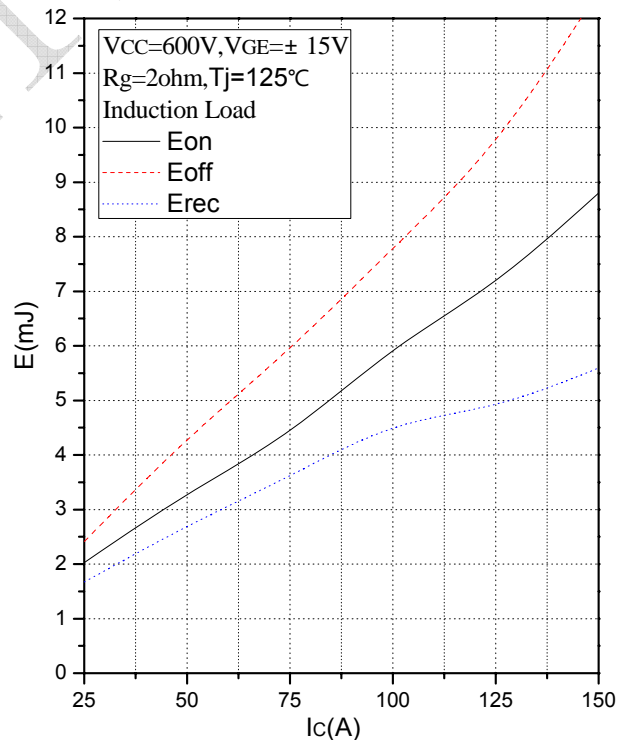


Fig.4 Typical Switching Loss vs. Collector Current

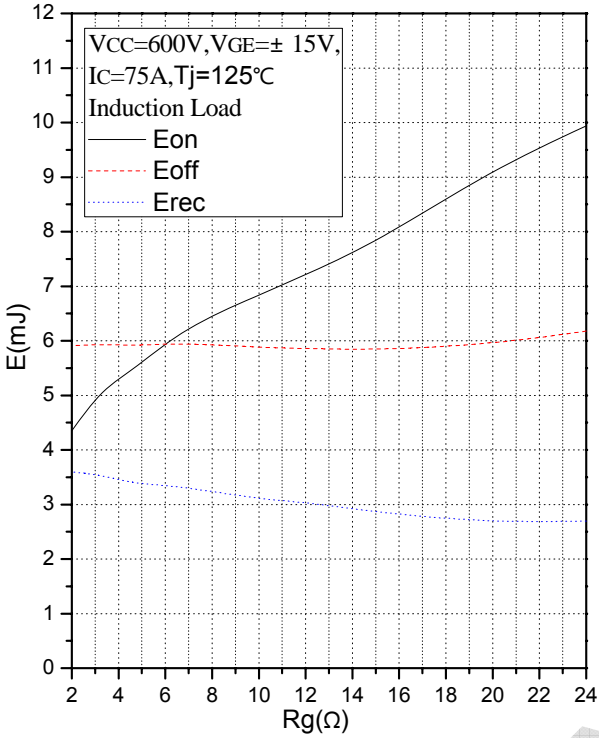


Fig.5 Typical Switching Loss vs. Gate Resistance

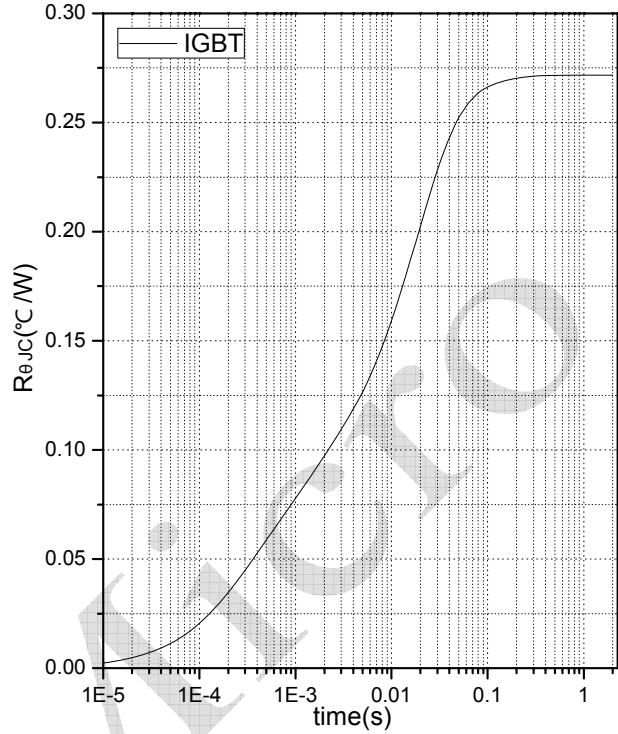


Fig.6 Typical Switching Loss vs. Forward Current

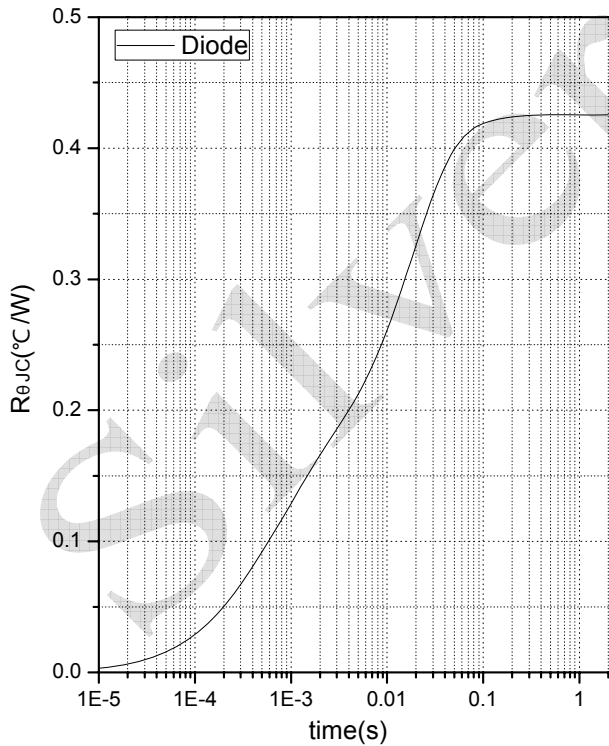


Fig.7 Transient Thermal Impedance

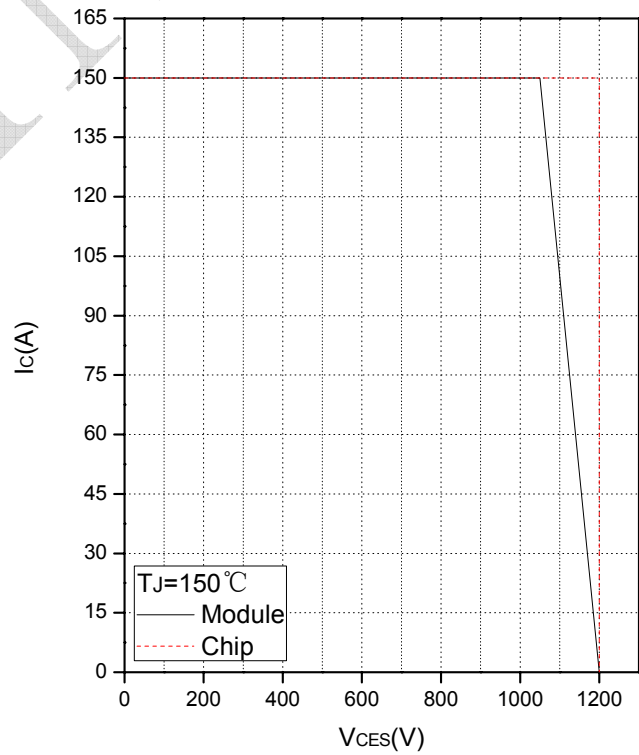
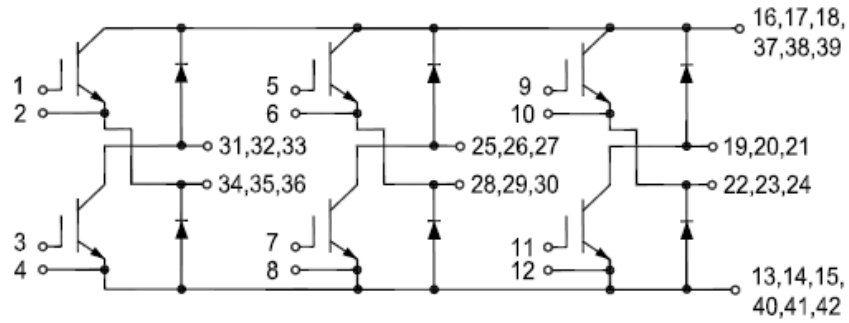
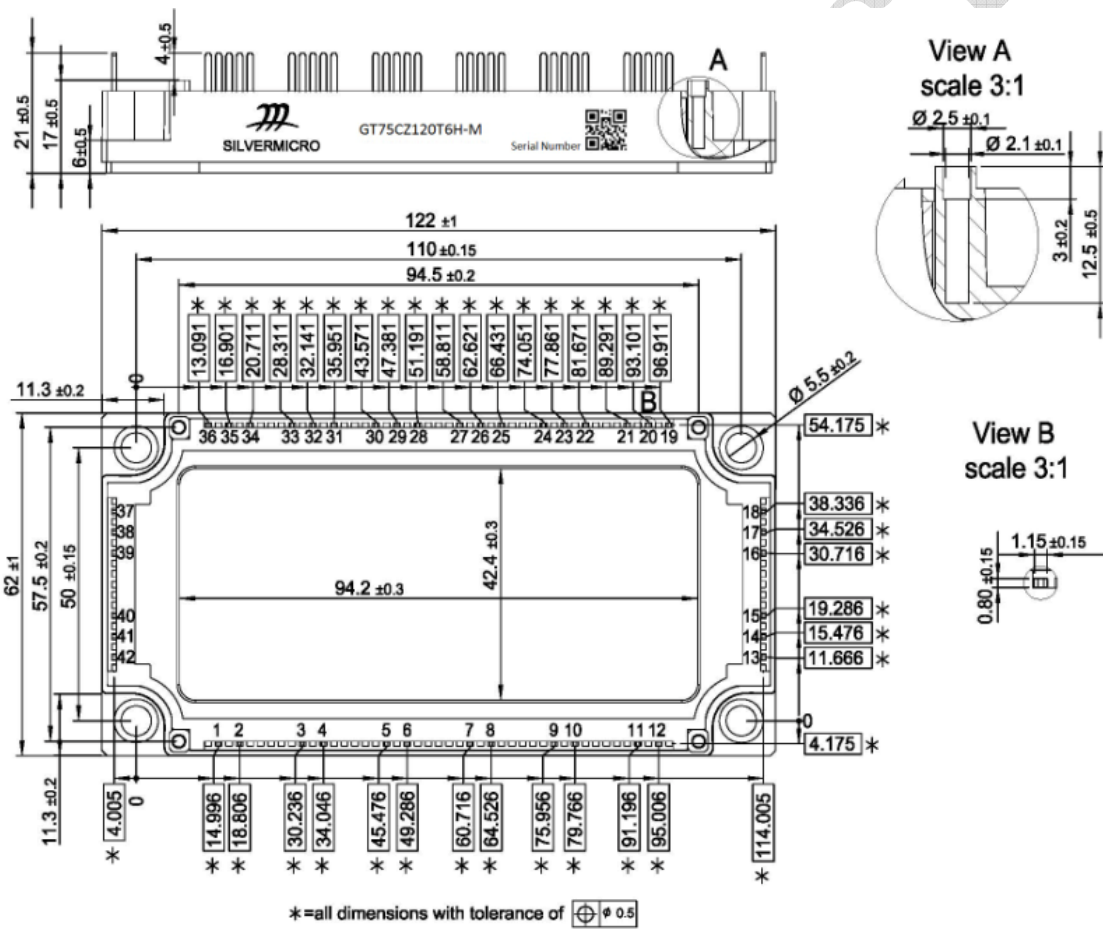


Fig.8 Reverse Bias Safe Operation Area (RBSOA)

Internal Circuit:



Package Outline (Unit: mm):



Date	Revision	Notes
07/22/2019	A	Final Version
09/12/2019	B	Add R _g internal

Announcement

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