

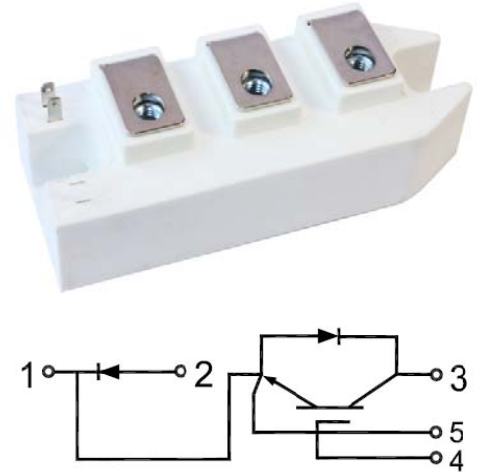
GT100CL120T1VH-M

IGBT Module

Preliminary Data

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:

- Welding Machine, Cutting Machine
- Plating Power Supply, Induction Heating
- SMPS, UPS

IGBT, Brake-Chopper

Maximum Rated Values of IGBT(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	100	A
		T _C = 25 $^{\circ}$ C	200	A
I _{CM}	Repetitive Peak Collector Current	T _J = 175 $^{\circ}$ C	200	A
t _{SC}	Short Circuit Withstand Time		>10	μ s
P _D	Maximum Power Dissipation per IGBT	T _C = 25 $^{\circ}$ C T _{Jmax} =175 $^{\circ}$ C	714	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	6.6	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=100\text{A}, V_{GE}=15\text{V}$	$T_J=25^\circ\text{C}$	1.70	2.00	V
			$T_J=125^\circ\text{C}$	1.90		V
			$T_J=150^\circ\text{C}$	1.90		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	$V_{CE}=25\text{V}, V_{GE}=0\text{V}, f=1\text{MHz}$		8.03		nF
C_{oes}	Output Capacitance			1.22		nF
C_{res}	Reveres Transfer Capacitance			0.59		nF

Switching Characteristics

$t_{d(on)}$	Turn-on Delay Time	$V_{CC}=600\text{V}, I_C=100\text{A}, R_{Gon}=1\Omega, V_{GE}=\pm 15\text{V},$ Inductive Load	$T_J=25^\circ\text{C}$	228		ns
			$T_J=125^\circ\text{C}$	250		
			$T_J=150^\circ\text{C}$	254		
t_r	Rise Time		$T_J=25^\circ\text{C}$	63		ns
			$T_J=125^\circ\text{C}$	67		
			$T_J=150^\circ\text{C}$	69		
$t_{d(off)}$	Turn-off Delay Time		$T_J=25^\circ\text{C}$	269		ns
			$T_J=125^\circ\text{C}$	279		
			$T_J=150^\circ\text{C}$	284		
t_f	Fall Time	$T_J=25^\circ\text{C}$	184		ns	
		$T_J=125^\circ\text{C}$	291			
		$T_J=150^\circ\text{C}$	317			
E_{on}	Turn-on Switching Loss	$V_{CC}=600\text{V}, I_C=100\text{A}, R_{Gon}=1\Omega, V_{GE}=\pm 15\text{V},$ $di/dt=1387\text{A}/\mu\text{s}(T_J=150^\circ\text{C}),$ Inductive Load	$T_J=25^\circ\text{C}$	3.1		mJ
			$T_J=125^\circ\text{C}$	4.3		
			$T_J=150^\circ\text{C}$	4.8		

E _{off}	Turn-off Switching Loss	V _{CC} =600V, I _C =100A, R _{Goff} =1Ω, V _{GE} =±15V, du/dt=4448V/μs(T _J =150°C), Inductive Load	T _J =25°C	5.28	mJ
			T _J =125°C	8.33	
			T _J =150°C	9.30	
Q _g	Total Gate Charge	V _{GE} =+15V...-15V	T _J =25°C	745	nC
R _{g internal}	Internal Gate Resistance		T _J =25°C	7.5	Ω
RBSOA	I _C =200A, V _{CC} =1050V, V _p =1200V, R _{Goff} =1Ω, V _{GE} =+15V to 0V, T _J =150°C			Trapezoid	
SC data	V _{CC} =600V, t _p =10us, V _{ge} =+/-15V, R _{Gon} =1ohm, R _{Goff} =1ohm, T _J =25°C			575	A
R _{θJC}	IGBT Thermal Resistance: Junction-To-Case			0.21	°C/W

Diode, Reverse

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

V _{RRM}	Repetitive Peak Reverse Voltage	1200	V
I _F	Diode Continuous Forward Current	75	A
I _{FM}	Peak FWD Current Repetitive	150	A

Electrical Characteristics of Diode

 (T_C=25°C unless otherwise specified)

Symbol	Description	Conditions	Min	Typ	Max	Unit
V _{FM}	Forward Voltage	I _F = 75A	T _J =25°C	2.10		V
			T _J =125°C	2.20		
t _{rr}	Reverse Recovery Time	I _F = 75A, -di _F /dt = 1738A/μs(T _J =125°C), V _R = 600V, V _{GE} = -15V	T _J =25°C	204		ns
			T _J =125°C	388		
I _{rr}	Peak Reverse Recovery Current		T _J =25°C	47		A
			T _J =125°C	64		
Q _{rr}	Reverse Recovery Charge		T _J =25°C	4.56		μC
			T _J =125°C	9.42		
E _{rec}	Reverse Recovery Energy	T _J =25°C	1.67		mJ	
		T _J =125°C	3.60			

$R_{\theta JC}$	Diode Thermal Resistance: Junction-To-Case		0.425		$^{\circ}C/W$
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Diode-Chopper

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

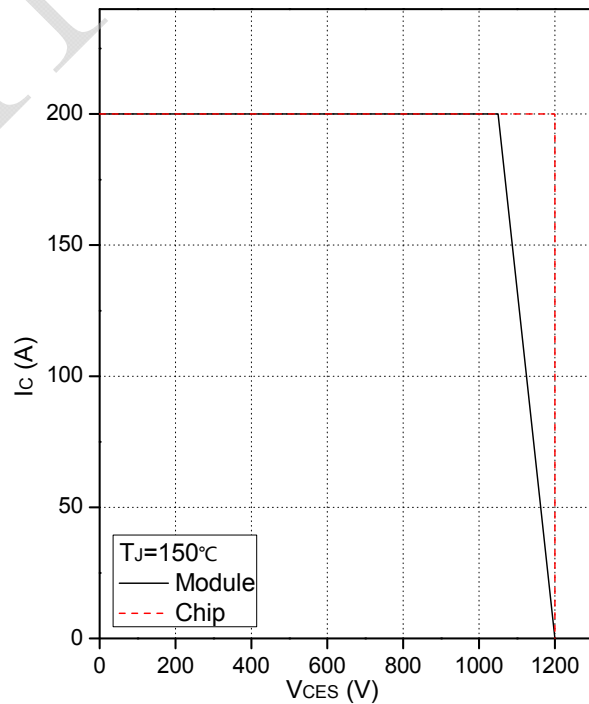
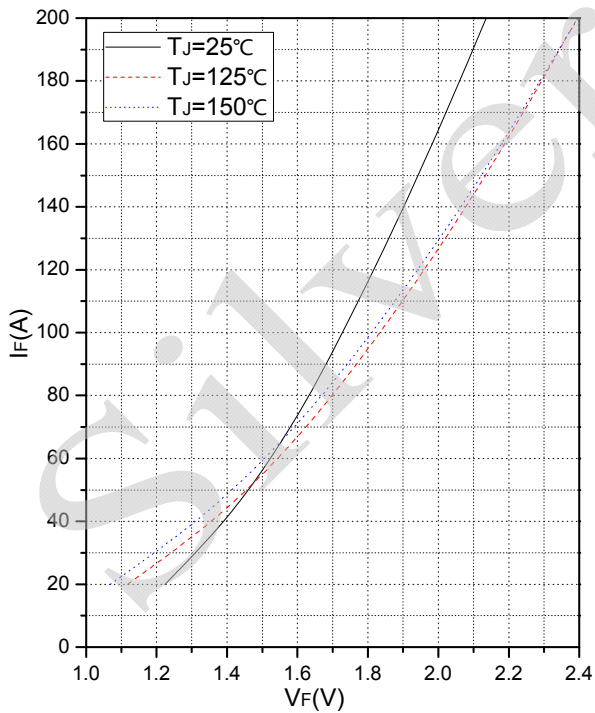
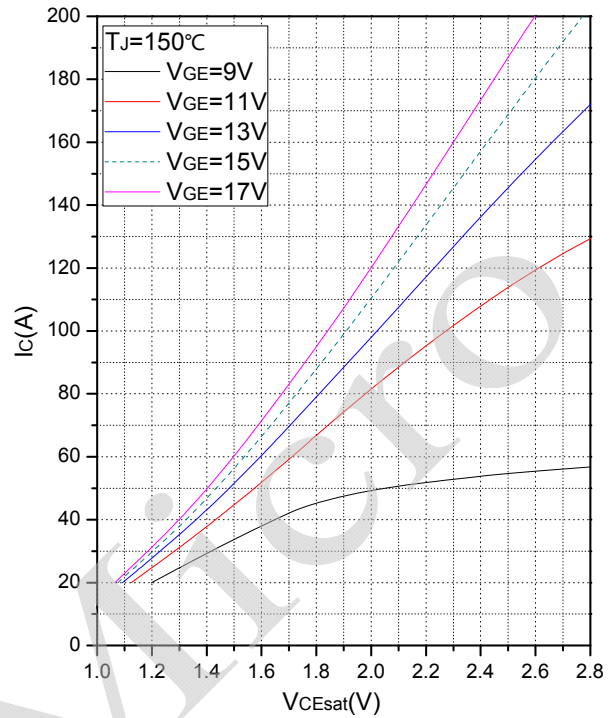
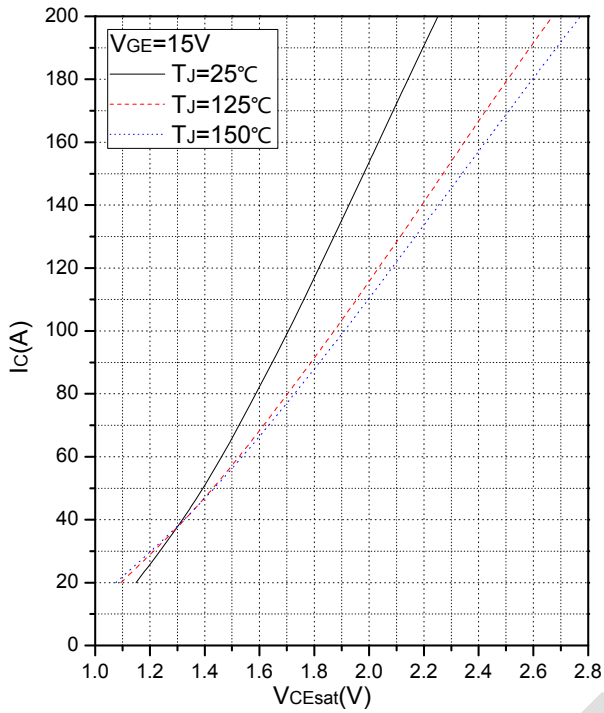
V_{RRM}	Repetitive Peak Reverse Voltage		1200		V
I_F	Diode Continuous Forward Current		100		A
I_{FM}	Diode Maximum Forward Current		200		A

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

Symbol	Description	Conditions	Min	Typ	Max	Unit
V_{FM}	Forward Voltage	$I_F=100A$	$T_J=25^{\circ}C$	1.70		V
			$T_J=125^{\circ}C$		1.80	
			$T_J=150^{\circ}C$		1.80	
t_{rr}	Reverse Recovery Time		$T_J=25^{\circ}C$	260		ns
			$T_J=125^{\circ}C$		396	
			$T_J=150^{\circ}C$		454	
I_{rr}	Peak Reverse Recovery Current	$I_F=100A,$ $-diF/dt = 1911A/\mu s(T_J=150^{\circ}C),$ $V_R=600V,$ $V_{GE}=-15V$	$T_J=25^{\circ}C$	92		A
			$T_J=125^{\circ}C$		104	
			$T_J=150^{\circ}C$		105	
Q_{rr}	Reverse Recovery Charge		$T_J=25^{\circ}C$	10.2		μC
			$T_J=125^{\circ}C$		16.8	
			$T_J=150^{\circ}C$		19.2	
E_{rec}	Reverse Recovery Energy	$I_F=100A,$ $-diF/dt = 1911A/\mu s(T_J=150^{\circ}C),$ $V_R=600V,$ $V_{GE}=-15V$	$T_J=25^{\circ}C$	4.83		mJ
			$T_J=125^{\circ}C$		7.92	
			$T_J=150^{\circ}C$		9.13	
$R_{\theta JC}$	Diode Thermal Resistance: Junction-To-Case			0.33		$^{\circ}C/W$

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



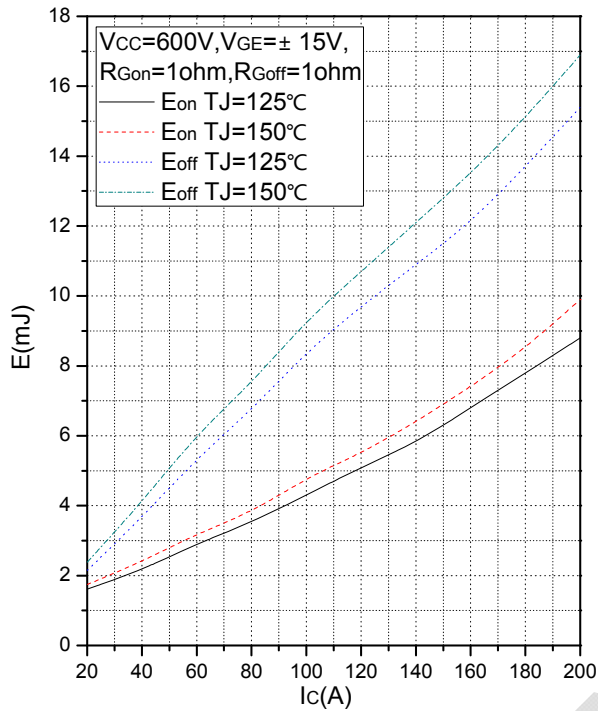


Fig.5 Typical Switching Loss vs. Collector Current

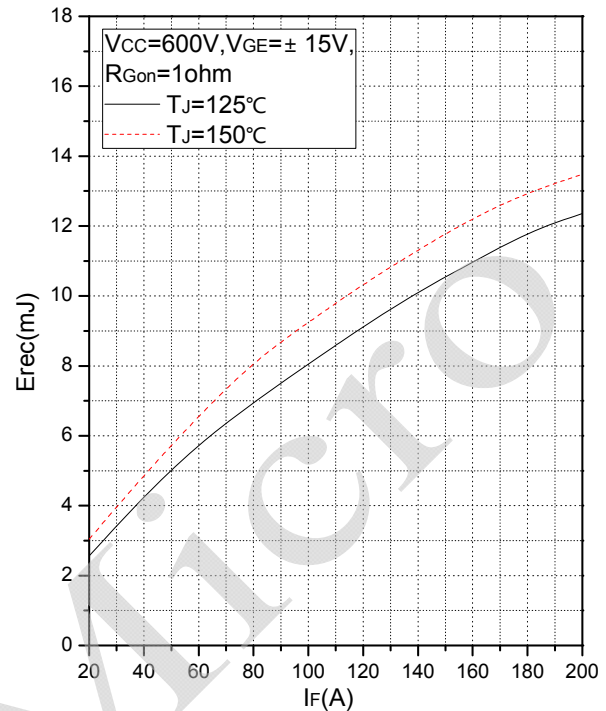


Fig.6 Typical Switching Loss vs. Forward Current

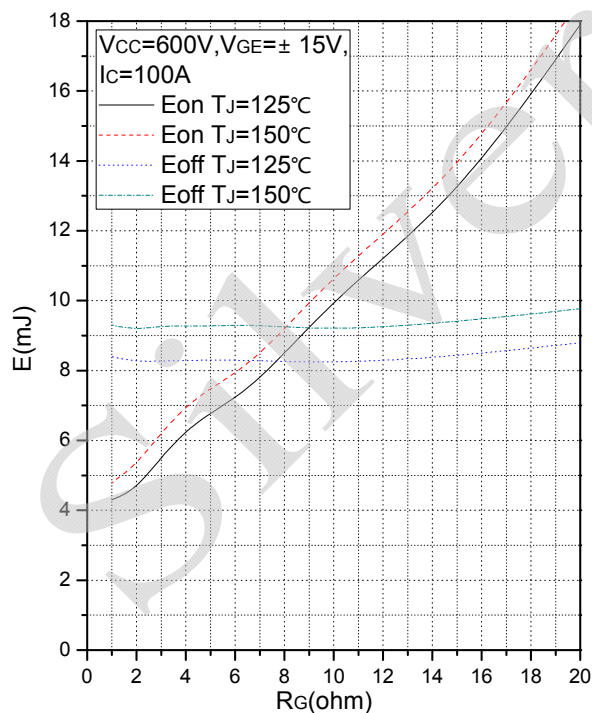


Fig.7 Typical Switching Loss vs. Gate Resistance

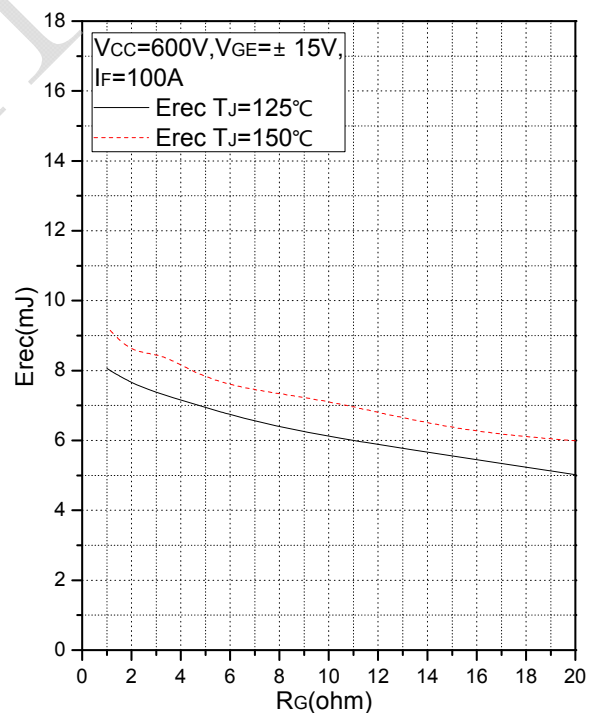


Fig.8 Typical Switching Loss vs. Gate Resistance

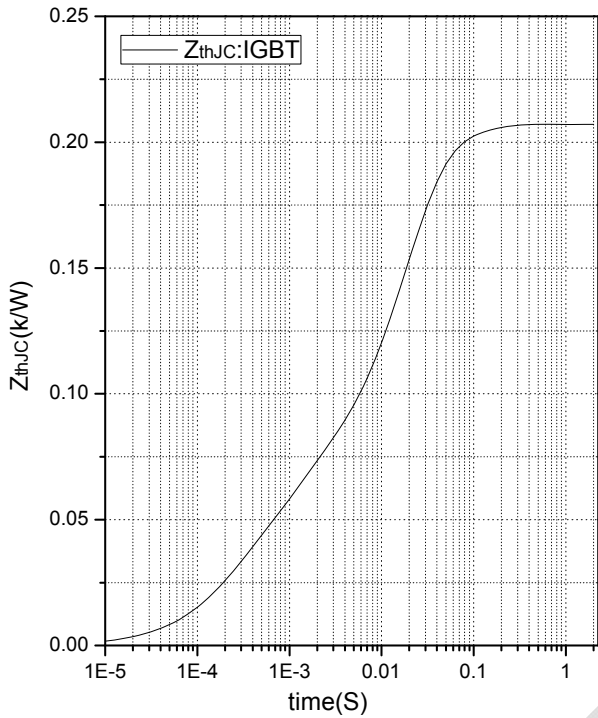


Fig.9 Transient Thermal Impedance (IGBT)

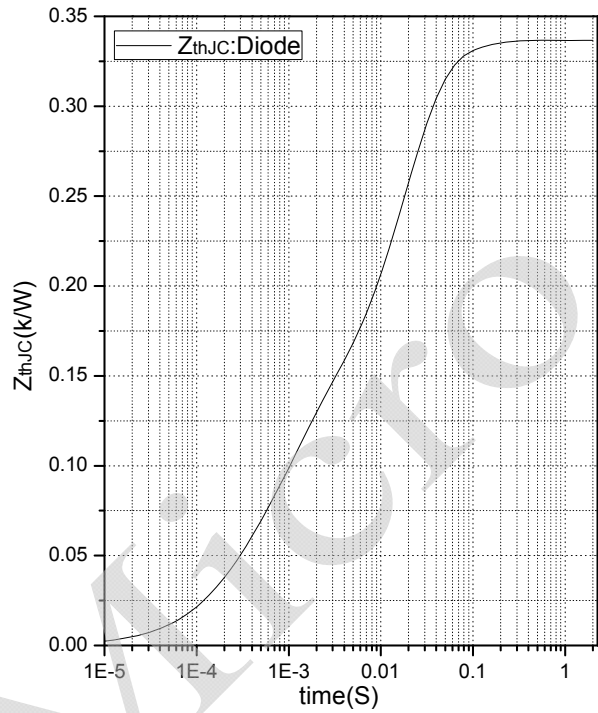


Fig.10 Transient Thermal Impedance (Diode)

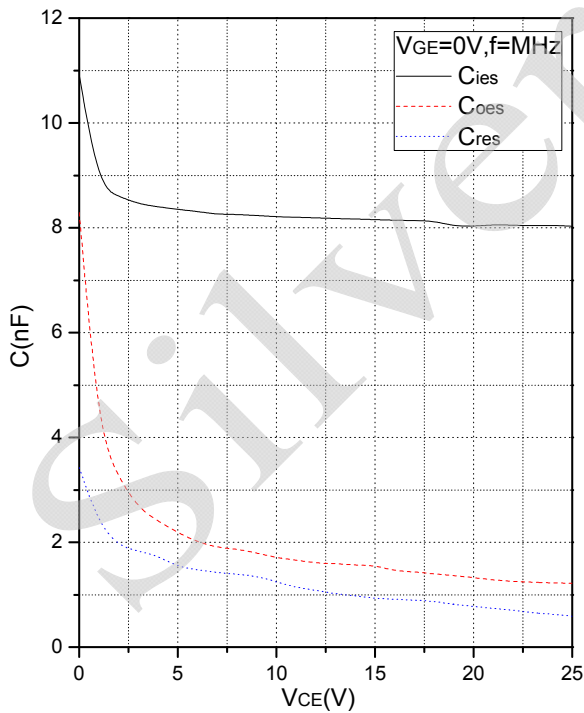


Fig.11 Capacitance Characteristics

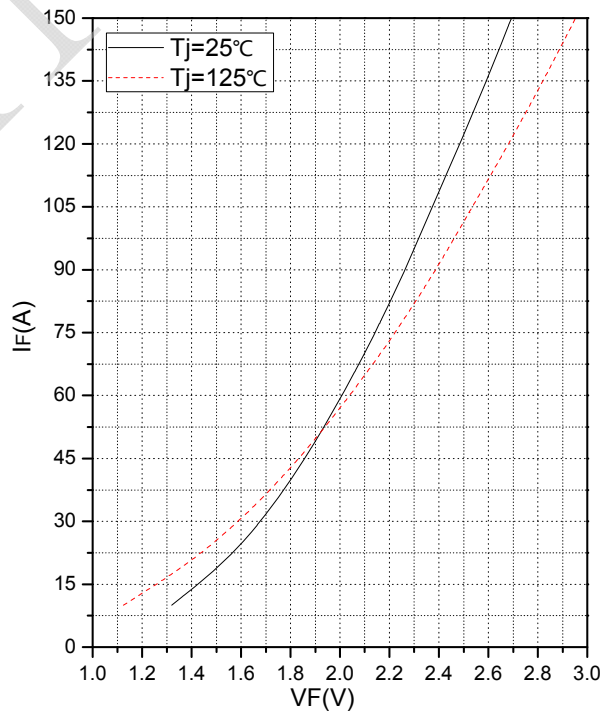
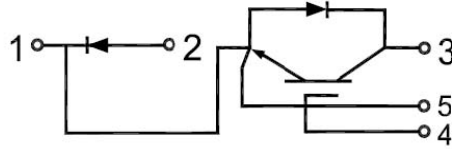
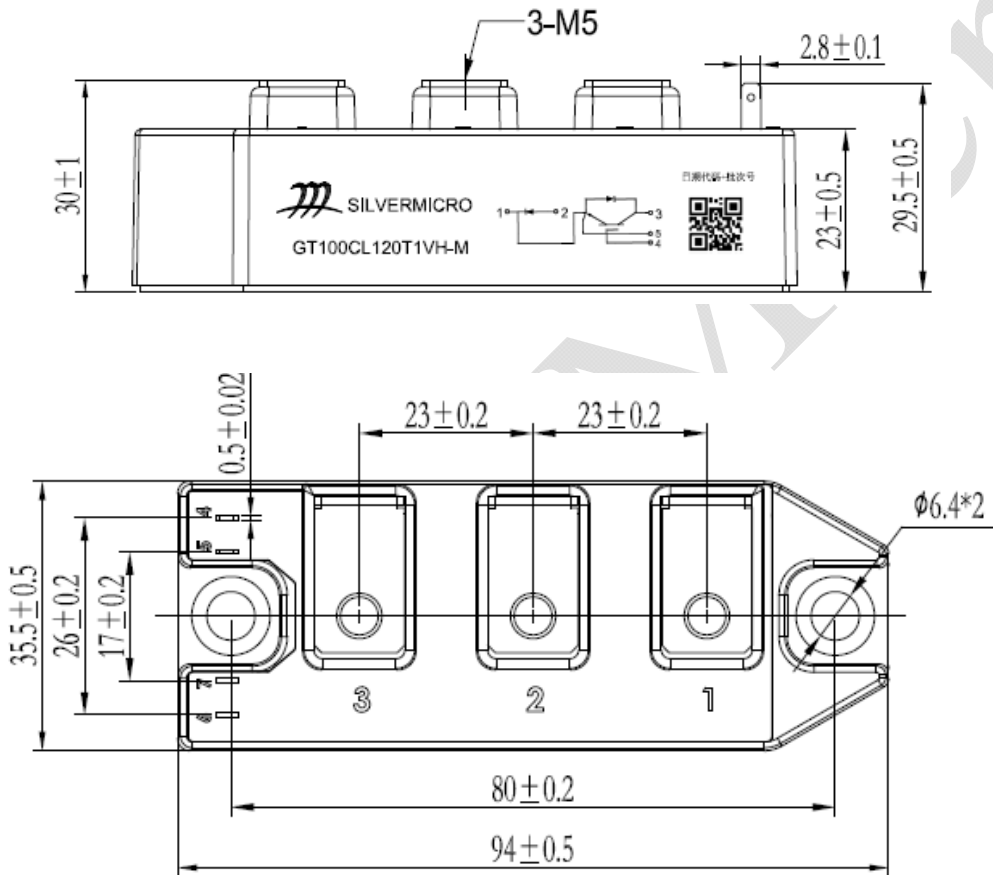


Fig.12 Forward Characteristics of Reverse Diode

Internal Circuit



Package Outline (Unit: mm):





Date	Revision	Notes
03/19/2019	01	Initial release

Announcements

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