

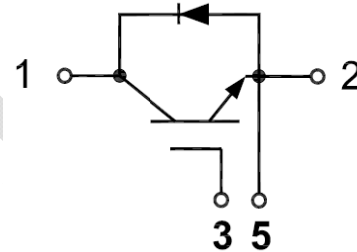
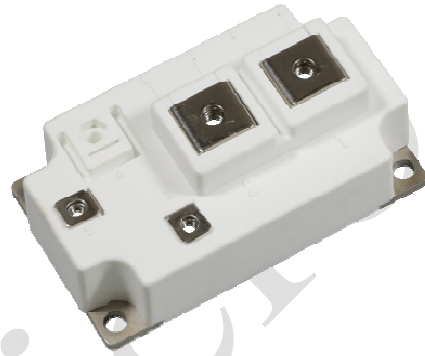
GT600SD65T2ZH-M

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:

- Induction Heating
- UPS Systems
- High Power converters

IGBT, Inverter

Maximum Rated Values of IGBT (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	600	A
		T _c =25°C	1200	A
I _{CM}	Peak Collector Current Repetitive	T _j =175°C	1200	A
t _{sc}	Short Circuit Withstand Time		>10	μs
P _D	Maximum Power Dissipation (IGBT)	T _c =25°C T _{jmax} =175°C	2450	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	$I_C=12\text{mA}$, $V_{CE}=V_{GE}$	5.00	5.90	6.80	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=600\text{A}$, $V_{GE}=15\text{V}$	$T_J=25^\circ\text{C}$	1.50	1.70	V
			$T_J=125^\circ\text{C}$	1.70		V
			$T_J=150^\circ\text{C}$	1.70		
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	$V_{GE}=\pm 20\text{V}$, $V_{CE}=0\text{V}$, $T_J=25^\circ\text{C}$			800	nA
C_{ies}	Input Capacitance			44		nF
C_{oes}	Output Capacitance	$V_{CE}=25\text{V}$, $V_{GE}=0\text{V}$, $f=1\text{MHz}$		3.38		nF
C_{res}	Reveres Transfer Capacitance			1.81		nF

Switching Characteristics

$t_{d(on)}$	Turn-on Delay Time	$V_{CC}=300\text{V}$, $I_C=600\text{A}$, $R_{Gon}=2\Omega$, $V_{GE}=\pm 15\text{V}$, Inductive Load	$T_J=25^\circ\text{C}$	0.52		μs
			$T_J=125^\circ\text{C}$	0.52		
			$T_J=150^\circ\text{C}$	0.53		
t_r	Rise Time		$T_J=25^\circ\text{C}$	0.37		μs
			$T_J=125^\circ\text{C}$	0.38		
			$T_J=150^\circ\text{C}$	0.39		
$t_{d(off)}$	Turn-off Delay Time		$T_J=25^\circ\text{C}$	0.46		μs
			$T_J=125^\circ\text{C}$	0.47		
			$T_J=150^\circ\text{C}$	0.48		
t_f	Fall Time	$T_J=25^\circ\text{C}$	0.21		μs	
		$T_J=125^\circ\text{C}$	0.24			
		$T_J=150^\circ\text{C}$	0.25			
E_{on}	Turn-on Switching Loss	$V_{CC}=300\text{V}$, $I_C=600\text{A}$, $R_{Gon}=2\Omega$, $V_{GE}=\pm 15\text{V}$, $di/dt=1350\text{A}/\mu\text{s}$ ($T_J=150^\circ\text{C}$) Inductive Load	$T_J=25^\circ\text{C}$	14.8		mJ
			$T_J=125^\circ\text{C}$	17.5		
			$T_J=150^\circ\text{C}$	18.8		

E _{off}	Turn-off Switching Loss	V _{CC} =300V, I _C =600A, R _{Goff} =2Ω, V _{GE} =±15V, du/dt=1766V/μs (T _J =150°C) Inductive Load	T _J =25°C	58.1	mJ
			T _J =125°C	62.8	
			T _J =150°C	65.6	
Q _g	Total Gate Charge	V _{GE} =+15V...-15V	T _J =25°C	3.77	μC
RBSOA	I _C =1200A, V _{CC} =600V, V _p =650V, R _{Goff} = 2Ω, V _{GE} =+15V to 0V, T _J =150°C			Trapezoid	
SCSOA	V _{CC} = 300V, V _{GE} = 15V, T _J = 150°C			10	μs
R _{θJC}	IGBT Thermal Resistance: Junction-To-Case(per leg)			0.061	°C/W

Diode, Inverter

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

V _{RRM}	Repetitive Peak Reverse Voltage	650	V
I _F	Diode Continuous Forward Current	600	A
I _{FM}	Peak FWD Current Repetitive	1200	A

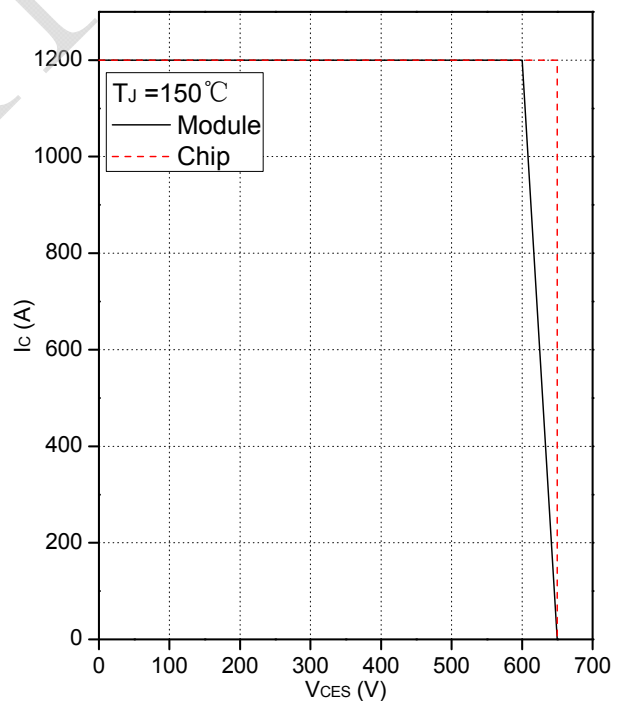
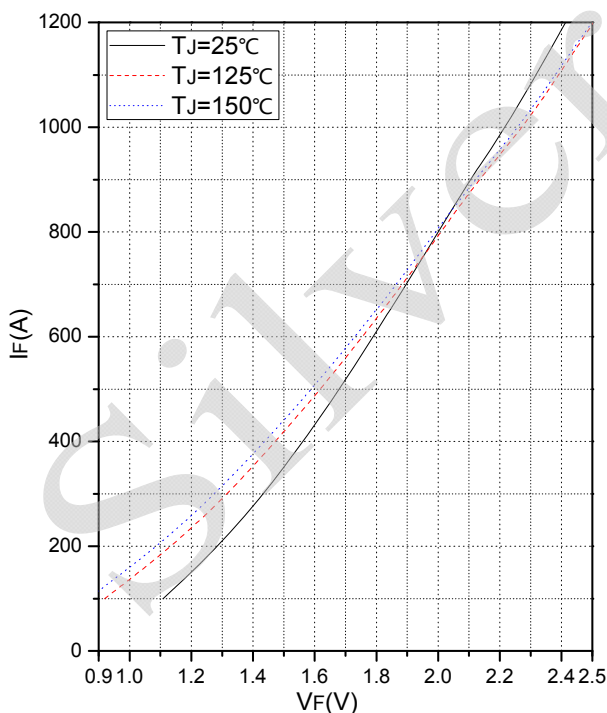
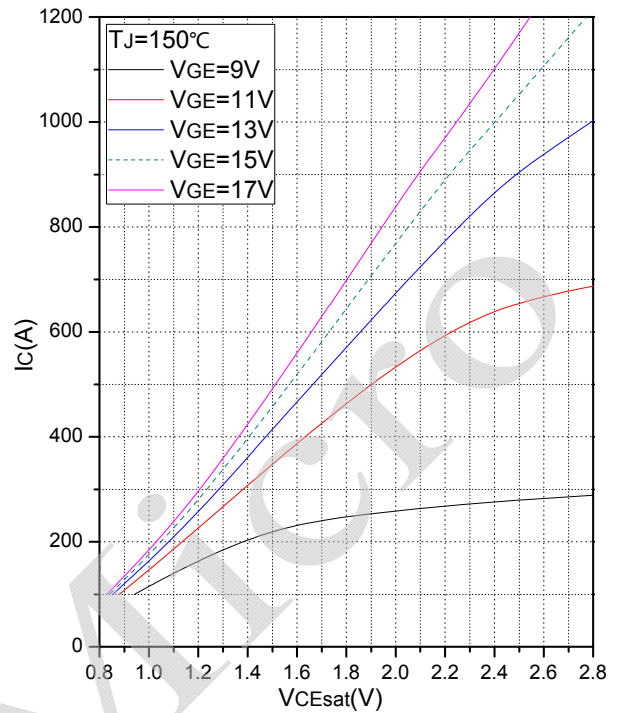
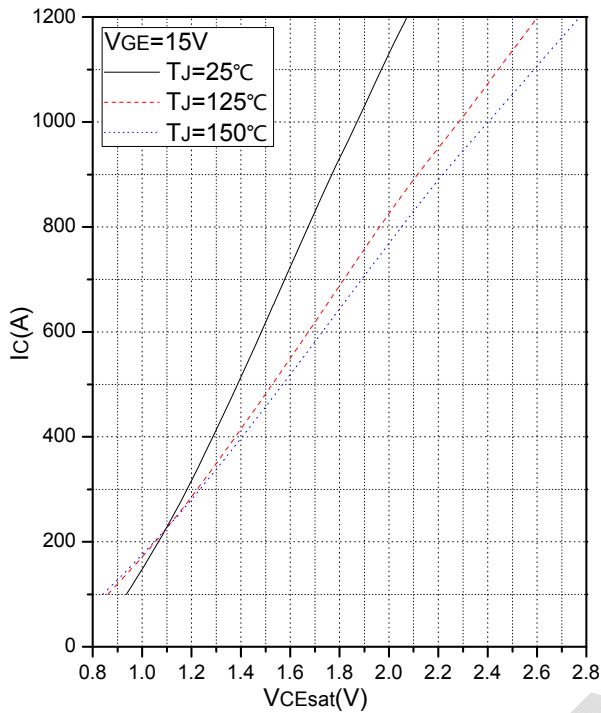
Electrical Characteristics of Diode (T_C=25°C unless otherwise specified)

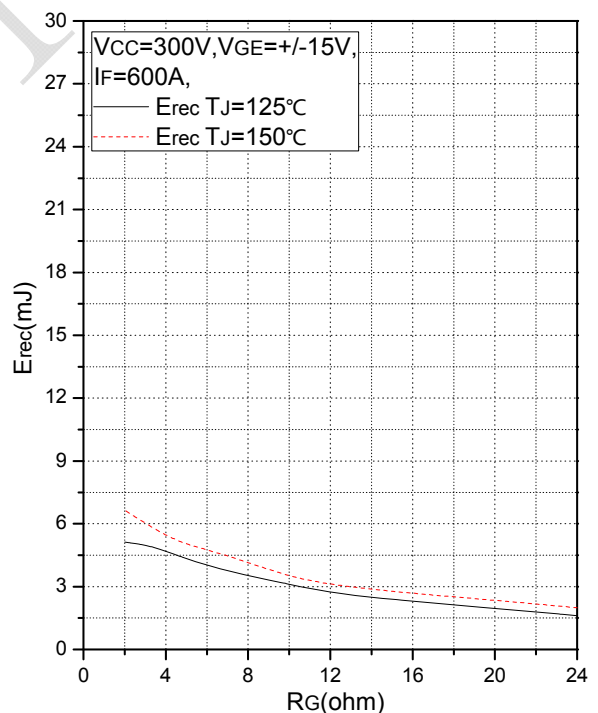
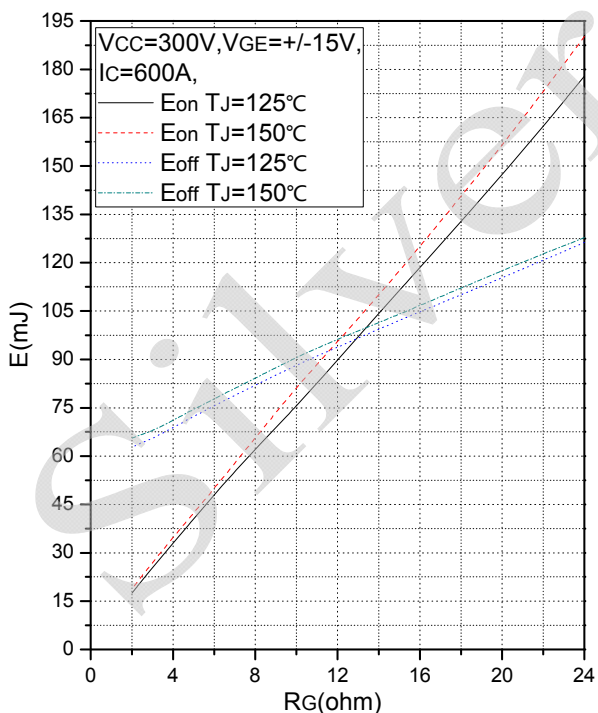
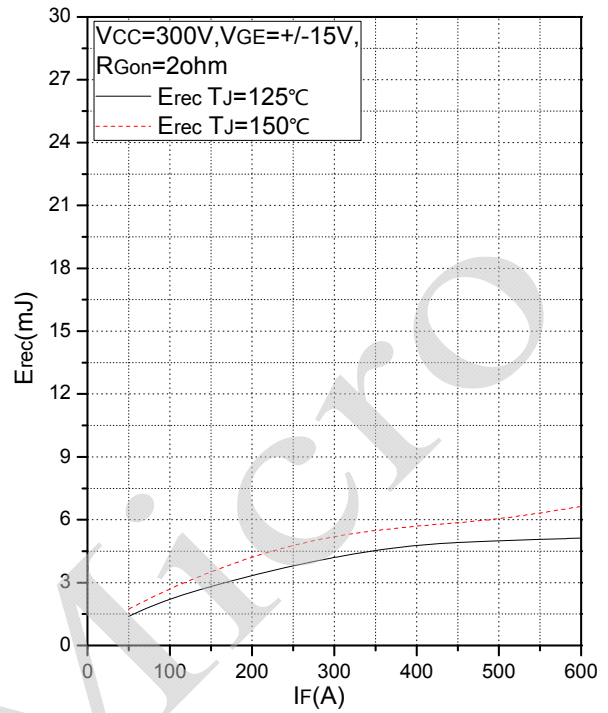
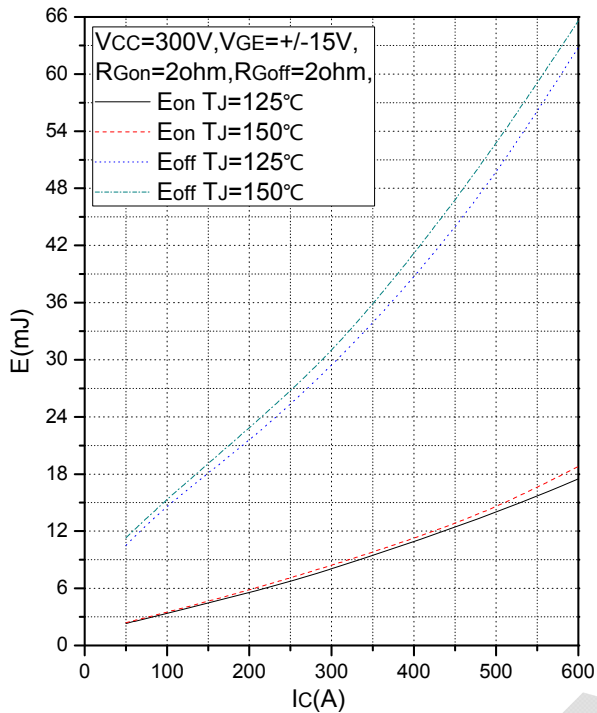
Symbol	Description	Conditions	Min	Typ	Max	Unit
V _{FM}	Forward Voltage	I _F =600A	T _J =25°C	1.80		V
			T _J =125°C	1.75		
			T _J =150°C	1.70		
t _{rr}	Reverse Recovery Time		T _J =25°C	0.19		μs
			T _J =125°C	0.27		
			T _J =150°C	0.29		
I _{rr}	Peak Reverse Recovery Current	I _F =600A, -diF/dt =1490A/μs(T _J =125°C), V _R =300V, V _{GE} =-15V	T _J =25°C	84		A
			T _J =125°C	155		
			T _J =150°C	169		
Q _{rr}	Reverse Recovery Charge		T _J =25°C	9.96		μC
			T _J =125°C	25.58		
			T _J =150°C	30.6		

E _{rec}	Reverse Recovery Energy	I _F =600A, -di _F /dt=1490A/μs(T _J =125°C), V _R =300V, V _{GE} =-15V	T _J =25°C	1.92	mJ
			T _J =125°C	5.12	
			T _J =150°C	6.64	
R _{θJC}	Diode Thermal Resistance: Junction-To-Case (per leg)			0.119	°C/W

Module

Symbol	Description	Min	Typ	Max	Unit
V _{iso}	Isolation Voltage (All Terminals Shorted)	RMS, f = 50Hz, 1minute		2.5	kV
L _{sCE}	Stray Inductance Module		16		nH
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)		0.03		°C/W
T	Signal Terminals Screw:M4	1.0		2.0	N·m
	Power Terminals Screw:M6	3.0		5.0	N·m
T	Mounting Screw:M6	4.0		6.0	N·m
G	Weight		320		g





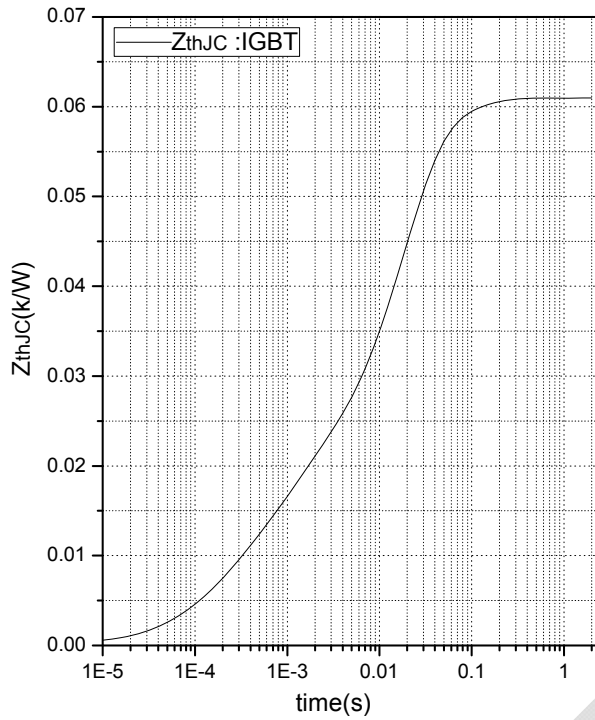


Fig.9 Transient Thermal Impedance (IGBT)

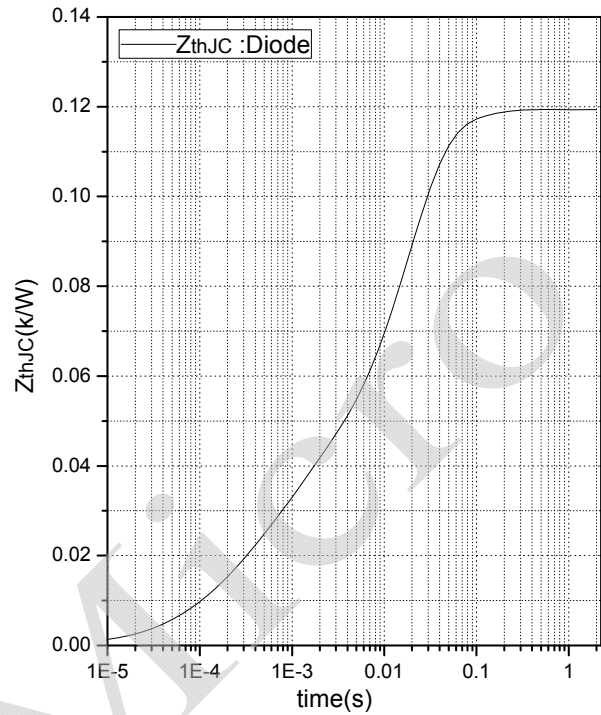


Fig.10 Transient Thermal Impedance (Diode)

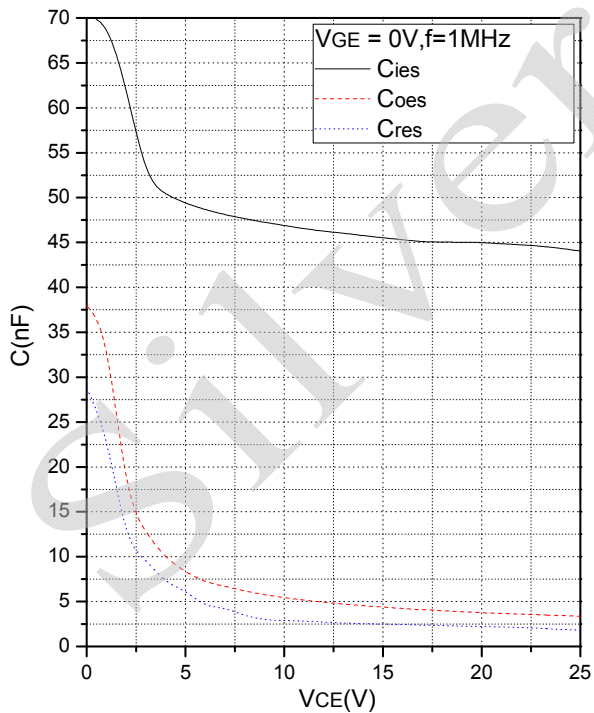
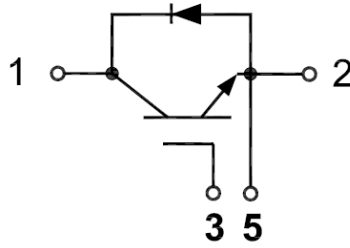
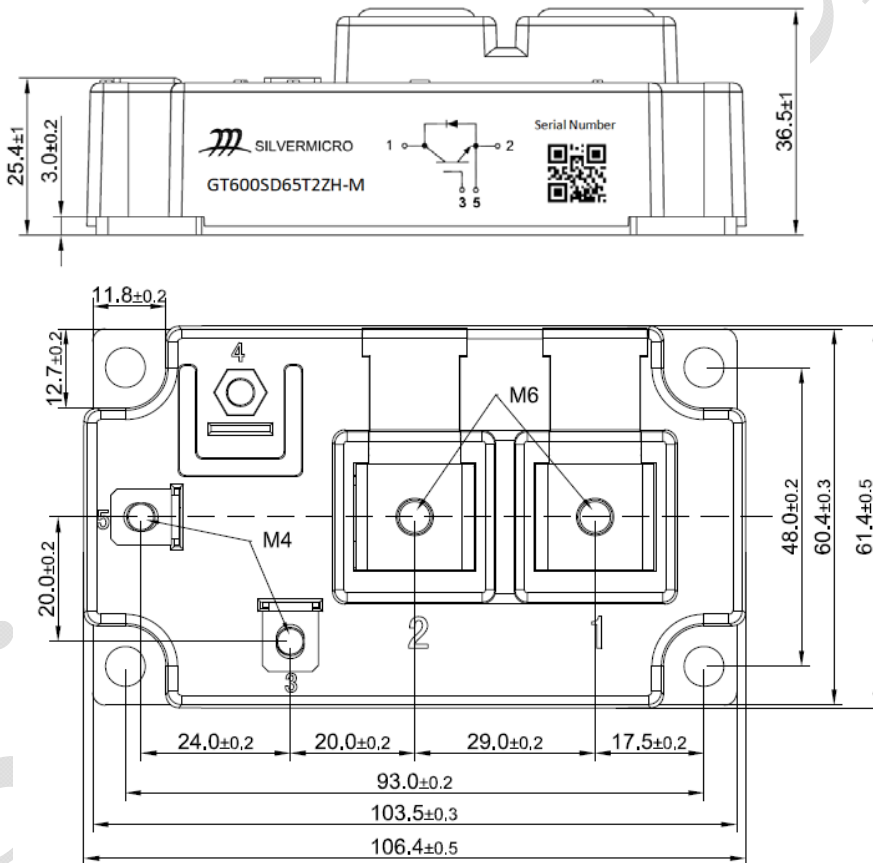


Fig.11 Capacitance Characteristics

Internal Circuit



Package Outline (Unit: mm):





Revision History

Date	Revision	Notes
06/04/2019	01	Initial Release

Announcement

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