

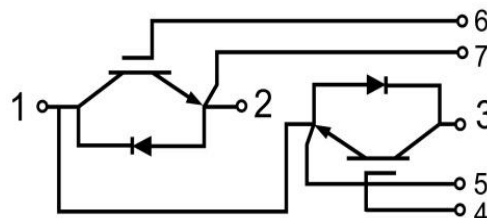
GT100HF170T1VH

IGBT Module

Circuit Diagram

Features:

- $V_{CES}=1700V$ $I_C=100A$ Trench & Field Stop IGBT Module
- Short Circuit Capability
- Low Saturation Voltage
- Low Switching Loss
- 100% RBSOA Tested($2 \times I_C$)
- Low Stray Inductance
- Lead Free, Compliant with RoHS Requirement



Applications:

- High Power Converters
- Motor Drives
- UPS Systems
- Wind Turbines

Type	Package	Marking
GT100HF170T1VH	T1V	GT100HF170T1VH

IGBT

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

V_{CES}	Collector-Emitter Blocking Voltage		1700	V
V_{GES}	Gate-Emitter Voltage		± 20	V
I_C	Continuous Collector Current, Limited by T_{Jmax}	$T_C=90^\circ C$	100	A
		$T_C=25^\circ C$	200	A
I_{CM}	Peak Collector Current Repetitive	t_p limited by T_{Jmax}	200	A
P_D	Maximum Power Dissipation (IGBT)	$T_C=25^\circ C, T_{Jmax}=175^\circ C$	850	W

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

Static Characteristics

Symbol	Description	Conditions	Min.	Typ.	Max.	Units
$V_{GE(th)}$	Gate-Emitter Threshold Voltage	$I_C=4\text{mA}$, $V_{CE}=V_{GE}$	5.0	6.1	7.0	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=100\text{A}$, $V_{GE}=15\text{V}$	$T_J=25^\circ\text{C}$	1.65	2.00	V
			$T_J=125^\circ\text{C}$	2.05		V
			$T_J=150^\circ\text{C}$	2.15		V
I_{CES}	Collector-Emitter Leakage Current	$V_{GE}=0\text{V}$, $V_{CE}=1700\text{V}$, $T_J=25^\circ\text{C}$			1	mA
I_{GES}	Gate-Emitter Leakage Current	$V_{GE}=20\text{V}$, $V_{CE}=0\text{V}$, $T_J=25^\circ\text{C}$			400	nA
C_{ies}	Input Capacitance	$V_{CE}=25\text{V}$, $V_{GE}=0\text{V}$, $f=100\text{kHz}$		9460		pF
C_{oes}	Output Capacitance			835		pF
C_{res}	Reverse Transfer Capacitance			118		pF

Switching Characteristics

$t_{d(on)}$	Turn-on Delay Time	$V_{CC}=900V, I_C=100A,$ $R_{Gon}=1\Omega, V_{GE}=+15V/-15V,$ Inductive Load	$T_J=25^{\circ}C$		113		ns
			$T_J=125^{\circ}C$		115		
			$T_J=150^{\circ}C$		120		
t_r	Rise Time		$T_J=25^{\circ}C$		30		ns
			$T_J=125^{\circ}C$		35		
			$T_J=150^{\circ}C$		40		
$t_{d(off)}$	Turn-off Delay Time	$V_{CC}=900V, I_C=100A,$ $R_{Goff}=1\Omega, V_{GE}=+15V/-15V,$ Inductive Load	$T_J=25^{\circ}C$		260		ns
			$T_J=125^{\circ}C$		300		
			$T_J=150^{\circ}C$		315		
t_f	Fall Time		$T_J=25^{\circ}C$		175		ns
			$T_J=125^{\circ}C$		195		
			$T_J=150^{\circ}C$		210		
E_{on}	Turn-on Switching Loss	$V_{CC}=900V, I_C=100A,$ $R_{Gon}=1\Omega, V_{GE}=+15V/-15V,$ $di/dt=1100A/\mu s(T_J=150^{\circ}C)$ Inductive Load	$T_J=25^{\circ}C$		24		mJ
			$T_J=125^{\circ}C$		30		
			$T_J=150^{\circ}C$		33		

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E _{off}	Turn-off Switching Loss	V _{CC} =900V, I _C =100A, R _{Goff} =1Ω, V _{GE} =+15V/-15V, du/dt=1900V/μs(T _J =150°C) Inductive Load	T _J =25°C		21		mJ
			T _J =125°C		23		
			T _J =150°C		29		
Q _g	Total Gate Charge	V _{GE} =+15V...-15V	T _J =25°C		792		nC
R _{G (int)}	Internal Gate Resistance		T _J =25°C		5.0		Ω
T _{SC}	V _{CC} =1000V, V _{GE} =±15V, T _J =150°C ^{note1}					10	us
R _{θJC}	IGBT Thermal Resistance: Junction-to-Case (per IGBT)					0.175	°C/W
R _{θCS}	IGBT Thermal Resistance: Case-to-Sink (per IGBT) (per IGBT, λ _{grease} = 1 W/(m · K))				0.098		°C/W

note1: Short circuit withstand time cannot exceed 10us under specified condition.

Diode

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

V _{RRM}	Repetitive Peak Reverse Voltage	T _J =25°C	1700	V
I _F	Diode Continuous Forward Current		100	A
I _{FM}	Diode Maximum Forward Current	t _p =1ms	200	A

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

Symbol	Description	Conditions		Min.	Typ.	Max.	Units
V _{FM}	Forward Voltage	I _F =100A	T _J =25°C		1.93	2.30	V
			T _J =125°C		2.10		
			T _J =150°C		2.08		
t _{rr}	Reverse Recovery Time	I _F =100A, -diF/dt=1200A/μs(T _J =150°C), V _{CC} =900V, V _{GE} =-15V	T _J =25°C		275		ns
			T _J =125°C		440		
			T _J =150°C		450		
I _{rr}	Peak Reverse Recovery Current		T _J =25°C		90		A
			T _J =125°C		93		
			T _J =150°C		93		
Q _{rr}	Reverse Recovery Charge		T _J =25°C		20		μC
			T _J =125°C		31		
			T _J =150°C		33		

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E _{rec}	Reverse Recovery Energy	I _F =100A, -diF/dt=1200A/μs(T _J =150°C), V _{CC} =900V, V _{GE} =-15V	T _J =25°C		13		mJ
			T _J =125°C		16		
			T _J =150°C		17		
R _{θJC}	Diode Thermal Resistance: Junction-to-Case (per Diode)					0.268	°C/W
R _{θCS}	Diode Thermal Resistance: Case-to-Sink (per Diode, λ _{grease} = 1 W/(m • K))				0.151		°C/W

Module

Symbol	Description	Conditions	Min.	Typ.	Max.	Units
V _{iso}	Isolation Voltage (All Terminals Shorted)	RMS, f=50Hz, 60s	3400			V
T _J	Maximum Junction Temperature		-40		175	°C
T _{JOP}	Maximum Operating Junction Temperature Range ^{note2}		-40		150	°C
T _{stg}	Storage Temperature		-40		125	°C
CTI	Comparative Tracking Index		200			
M	Power Terminals Screw:M5		3.0		5.0	N·m
M	Mounting Screw:M6		4.0		6.0	N.m
G	Weight			165		g

note2: T_{JOP}> 150°C is only allowed for operation at overload conditions.

Ordering Information Table

Device code

G	T	100	HF	170	T1V	H
①	②	③	④	⑤	⑥	⑦

- ① - IGBT Module
- ② - Trench, Low Switching Losses IGBT
- ③ - Rated Current (100=100A)
- ④ - Circuit Configuration: HF (Half Bridge)
- ⑤ - Rated Voltage (170=1700V)
- ⑥ - Package Type
- ⑦ - Test Level (Pass the Important Reliability Test-Industrial Grade)

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Characteristic diagram

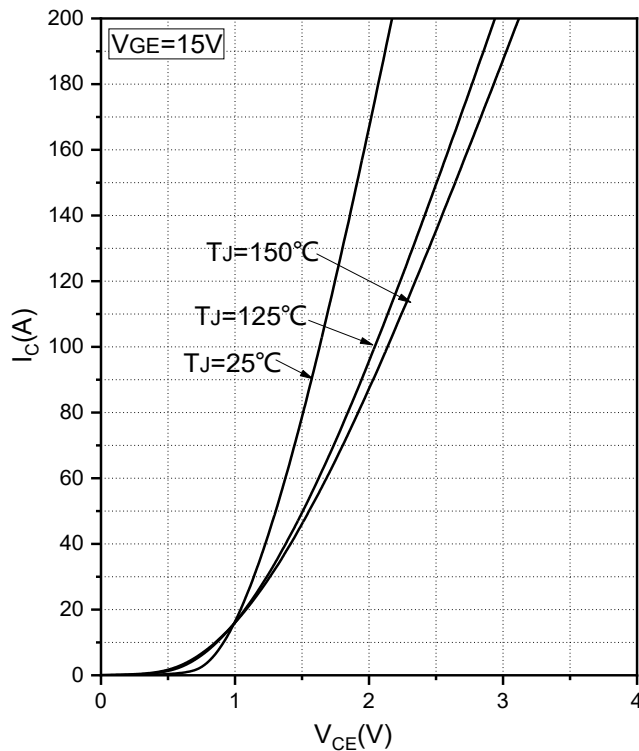


Fig.1 Typical Saturation Voltage Characteristics

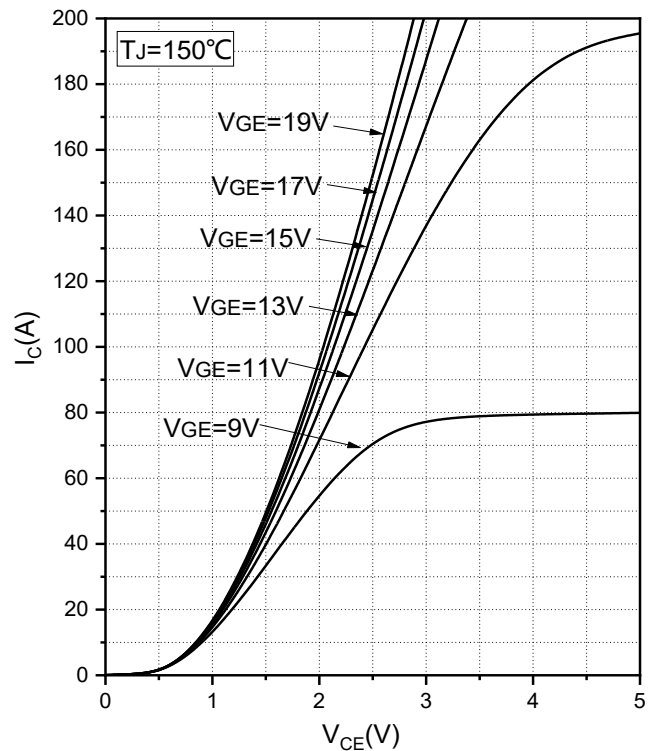


Fig.2 Typical Output Characteristics

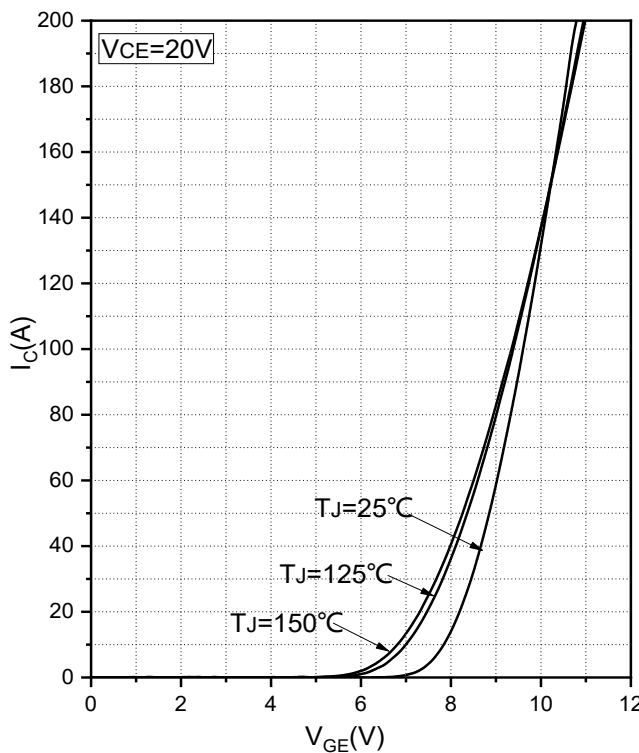


Fig.3 Transfer Characteristic

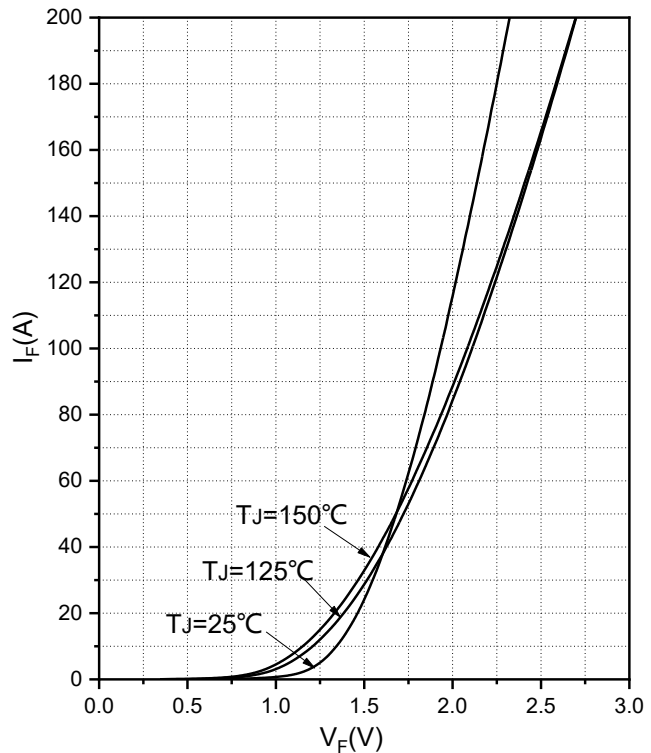
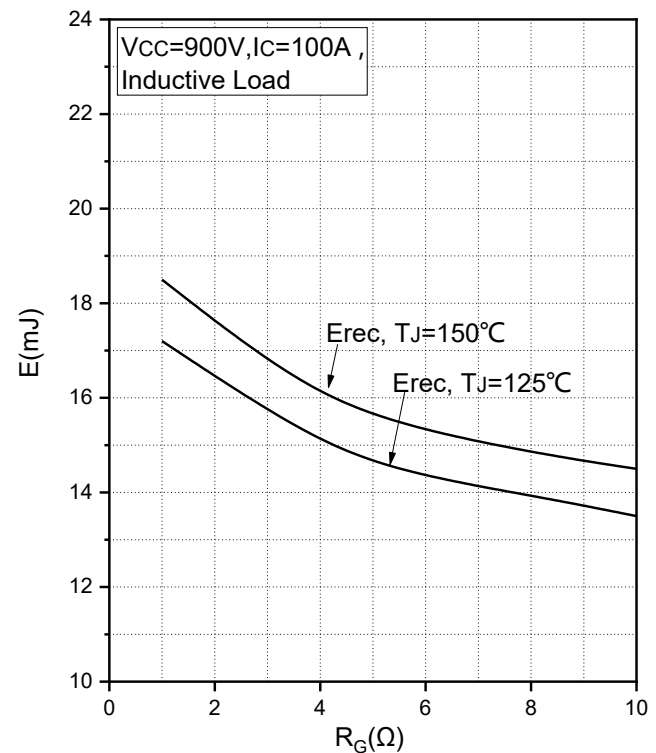
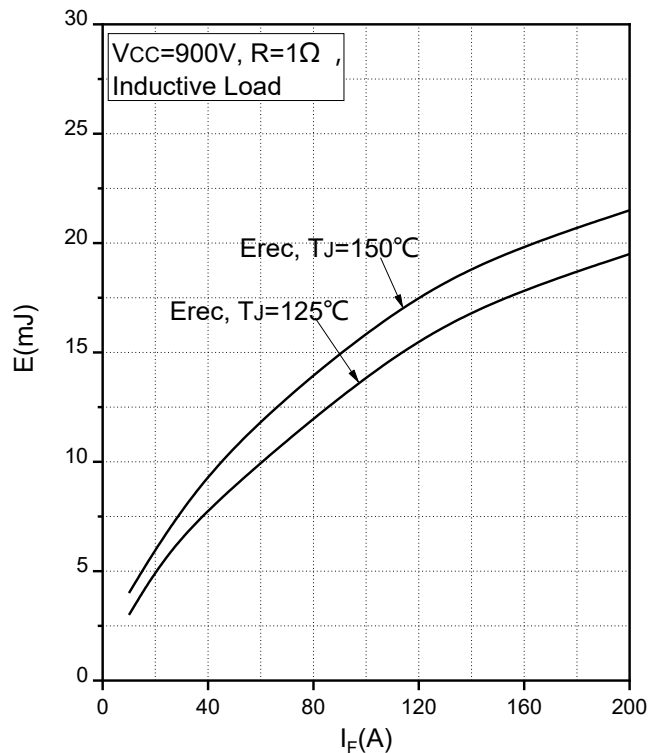
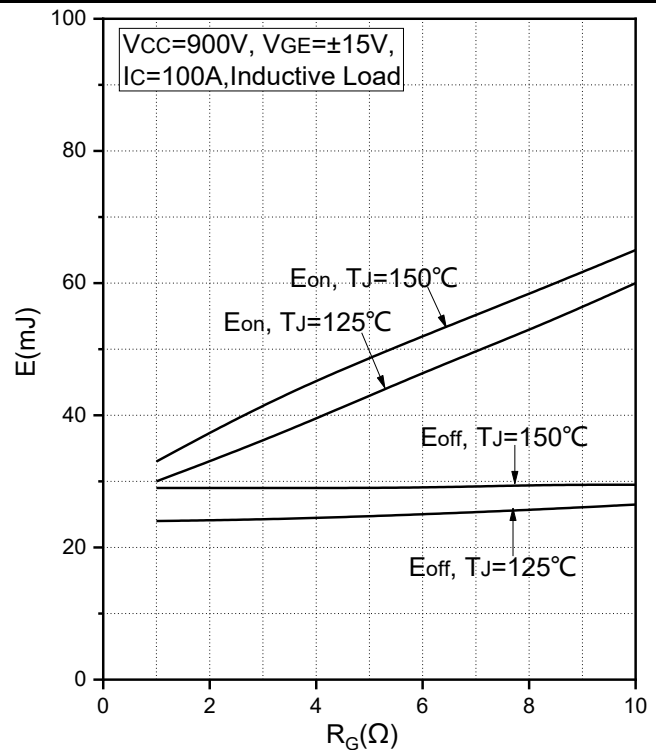
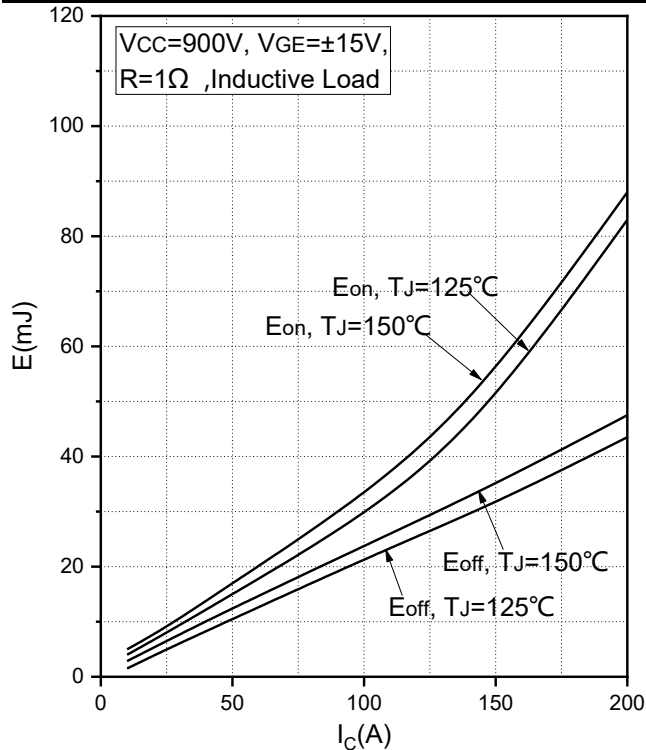


Fig.4 Forward Characteristics of Diode

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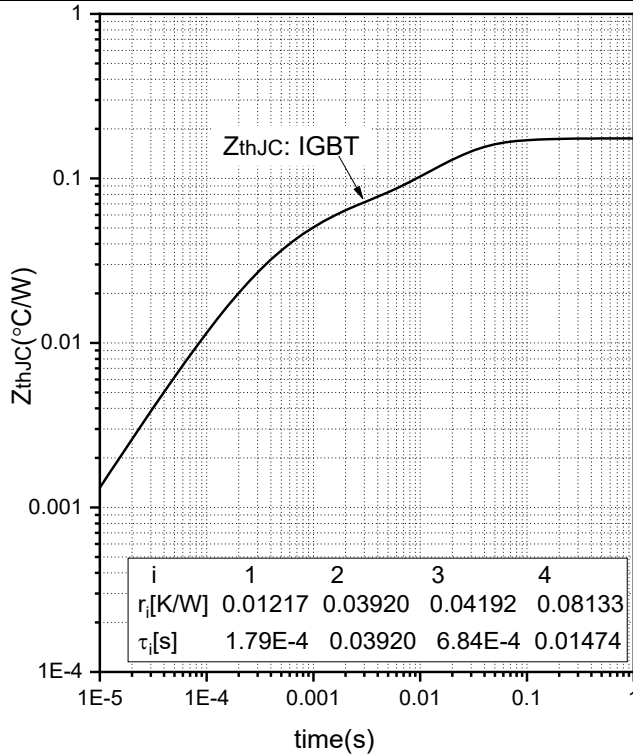


Fig.9 Transient Thermal Impedance (IGBT)

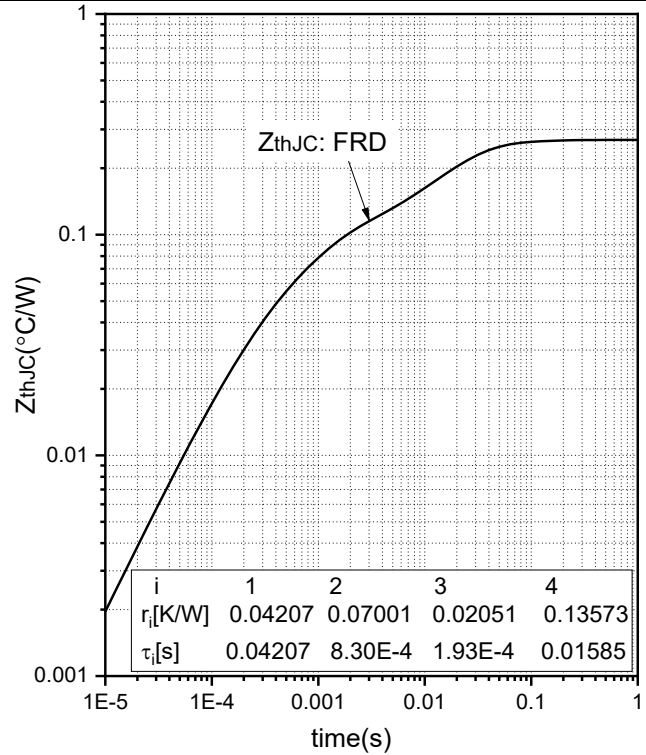


Fig.10 Transient Thermal Impedance (Diode)

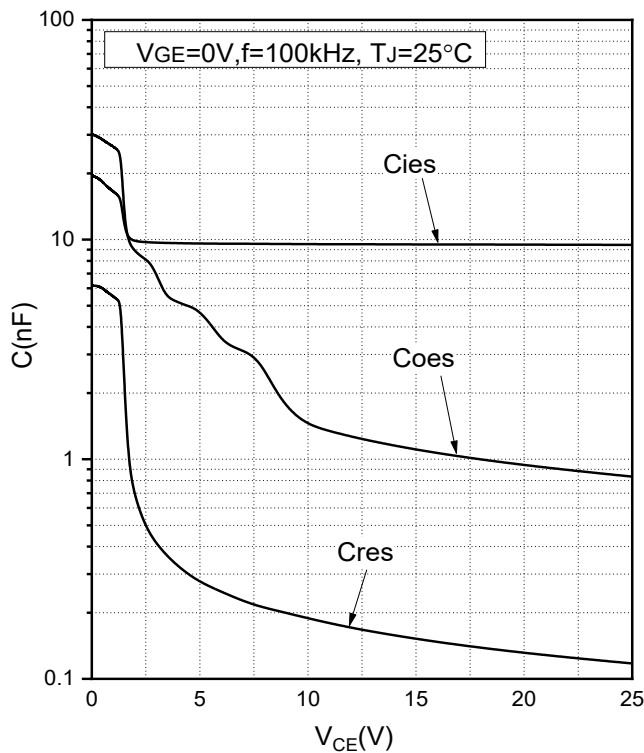


Fig.11 Capacitance Characteristics

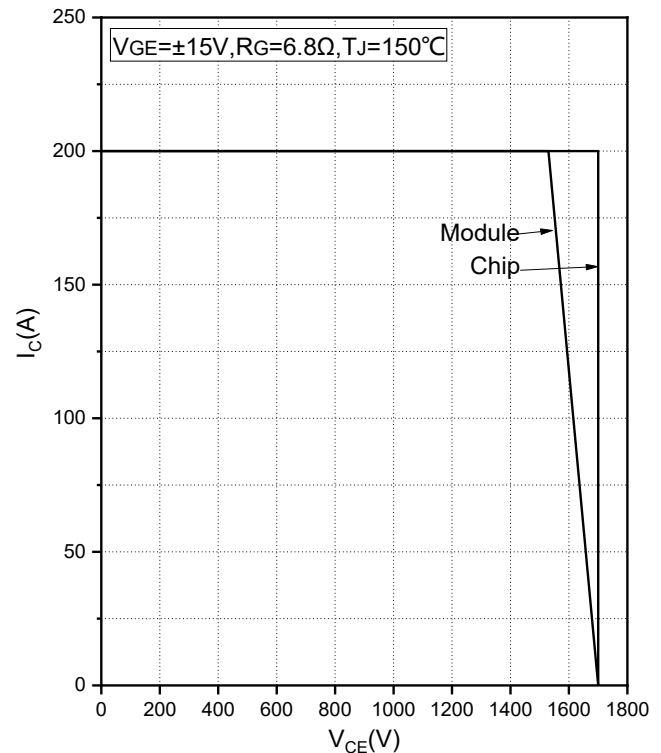


Fig.12 Reverse Bias Safe Operation Area (RBSOA)

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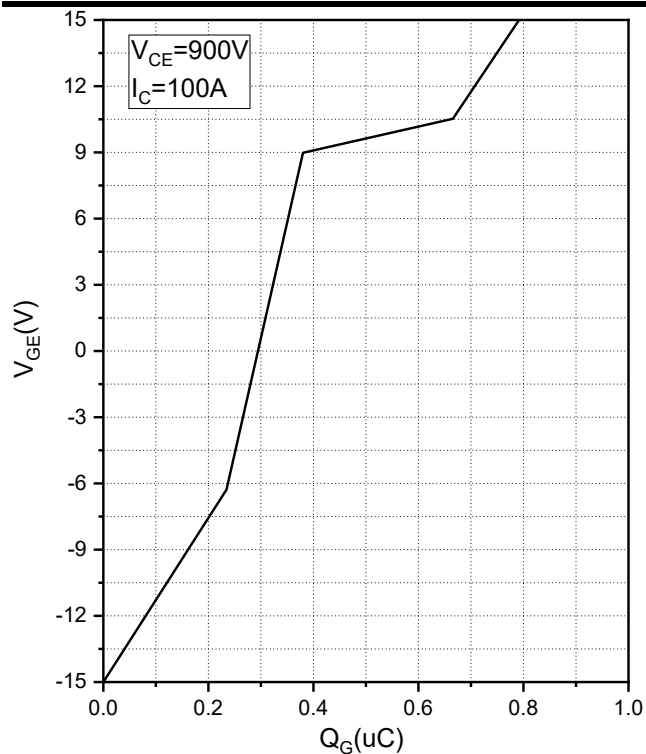
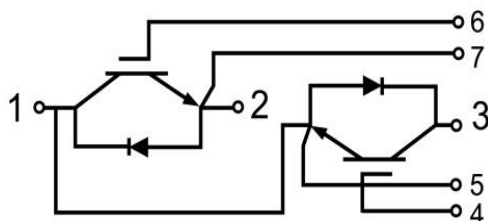


Fig.13 Gate Charge Characteristics

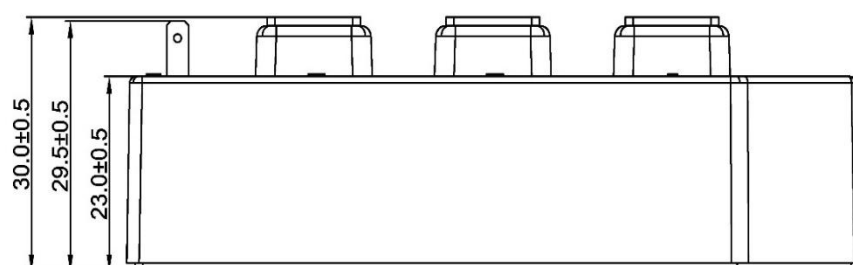
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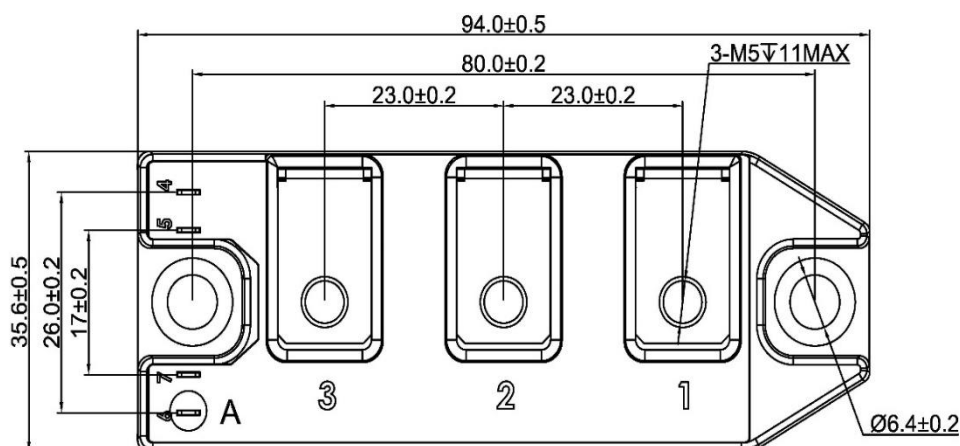
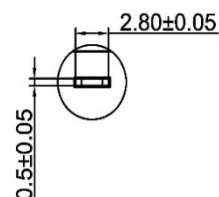
Internal Circuit:



Package Outline (Unit: mm):



View A
scale 3:1



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Revision	Notes
02	Engineering Sample Datasheet

Announcement

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