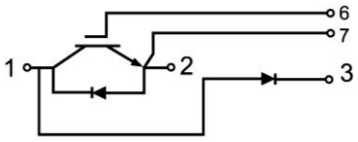
GT200CU120T2VH
GT200CL120T2VH

IGBT Module

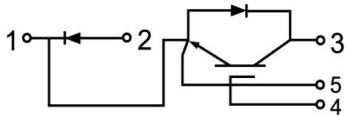
Features：

- Field Stop Trench Gate IGBT
- Short Circuit Rated ＞10μs
- Low Saturation Voltage
- Low Switching Loss
- 100% RBSOA Tested(2×Ic)
- Low Stray Inductance
- Lead Free, Compliant with RoHS Requirement

Circuit Diagram



CU



CL

Applications：

- Welding
- HEV Inverter
- Industrial Motor Drives
- UPS

IGBT, Brake-Chopper

Maximum Rated Values of IGBT(T_C=25℃ 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=100℃	200	A
		T_C=25℃	400	A
I_{CM}	Repetitive Peak Collector Current	T_J=175℃	400	A
t_{SC}	Short Circuit Withstand Time		>10	μs
P_D	Maximum Power Dissipation per IGBT	T_C=25℃ T_{Jmax}=175℃	1440	W

Electrical Characteristics of IGBT (T_C=25℃ unless otherwise specified)

Static Characteristics

Symbol	Description	Conditions		Min	Typ	Max	Unit
$V_{GE(th)}$	Gate-Emitter Threshold Voltage	I_C=3mA, V_{CE}=V_{GE}, T_J=25℃		5.0	5.8	6.5	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C=200A, V_{GE}=15V	T_J=25℃		1.80	2.10	V
			T_J=125℃		2.20		V
			T_J=150℃		2.30		V
I_{CES}	Collector-Emitter Leakage Current	V_{GE}=0V,V_{CE}=V_{CES},T_J=25℃				1	mA
I_{GES}	Gate-Emitter Leakage Current	V_{GE}=±20V,V_{CE}=0V,T_J=25℃				200	nA
C_{ies}	Input Capacitance	V_{CE}=25V, V_{GE}=0V,f=100kHz			17.84		nF
C_{oes}	Output Capacitance				1.23		nF
C_{res}	Reverse Transfer Capacitance				0.59		nF

Switching Characteristics

$t_{d(on)}$	Turn-on Delay Time	V_{CC}=600V,I_C=200A, R_{Gon}=4.7Ω,V_{GE}=±15V, Inductive Load	T_J=25℃		338		ns
			T_J=125℃		342		
			T_J=150℃		344		
t_r	Rise Time		T_J=25℃		114		ns
			T_J=125℃		124		
			T_J=150℃		126		
$t_{d(off)}$	Turn-off Delay Time	V_{CC}=600V,I_C=200A, R_{Goff}=4.7Ω,V_{GE}=±15V, Inductive Load	T_J=25℃		226		ns
			T_J=125℃		240		
			T_J=150℃		238		
t_f	Fall Time		T_J=25℃		229		ns
			T_J=125℃		314		
			T_J=150℃		353		
E_{on}	Turn-on Switching Loss	V_{CC}=600V,I_C=200A, R_{Gon}=4.7Ω,V_{GE}=±15V, di/dt=1359A/μs (T_J=150℃) Inductive Load	T_J=25℃		18.5		mJ
			T_J=125℃		28.8		
			T_J=150℃		32.6		

E_{off}	Turn-off Switching Loss	V_{CC}=600V,I_C=200A, R_{Goff} =4.7Ω,V_{GE}=±15V, du/dt=3855V/μs (T_J=150℃) Inductive Load	T_J=25℃		15.8		mJ
			T_J=125℃		22.1		
			T_J=150℃		23.8		
Q_g	Total Gate Charge	V_{GE}=+15V…-15V	T_J=25℃		0.85		μC
$R_{g\ internal}$	Internal Gate Resistance		T_J=25℃		3		Ω
RBSOA	I_C=400A,V_{CC}=1050V,Vp=1200V, R_{Goff}=4.7Ω, V_{GE}=+15V to 0V, T_J=150°C				Trapezoid		
SC Data	Vcc=600V, R_{Gon}=4.7Ω, R_{Goff}=4.7Ω, tp=10us, V_{GE}=+/-15V,T_J=125℃				712		A
$R_{\theta JC}$	IGBT Thermal Resistance: Junction-To-Case(per leg)					0.104	℃/W

Diode, Reverse

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

V_{RRM}	Repetitive Peak Reverse Voltage	1200	V
I_F	Diode Continuous Forward Current	150	A
I_{FM}	Diode Maximum Forward Current	300	A

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

Symbol	Description	Conditions		Min	Typ	Max	Unit
V_{FM}	Forward Voltage	I_F=150A	T_J=25℃		1.50		V
			T_J=125℃		1.50		
			T_J=150℃		1.50		
t_{rr}	Reverse Recovery Time	I_F=150A, -diF/dt=1670A/μs(T_J=150℃), V_R=600V, V_{GE}=-15V	T_J=25℃		371		ns
			T_J=125℃		562		
			T_J=150℃		625		
I_{rr}	Peak Reverse Recovery Current		T_J=25℃		127		A
			T_J=125℃		142		
			T_J=150℃		145		

Q_{rr}	Reverse Recovery Charge	I_F=150A, -diF/dt=1670A/μs(T_J=150℃), V_R=600V, V_{GE}=-15V	T_J=25℃		22.6		μC
			T_J=125℃		34.6		
			T_J=150℃		39.4		
E_{rec}	Reverse Recovery Energy		T_J=25℃		9.7		mJ
			T_J=125℃		15.2		
			T_J=150℃		17.6		
$R_{\theta JC}$	Diode Thermal Resistance: Junction-To-Case (per leg)					0.213	℃/W

Diode-Chopper

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

Symbol	Description	Conditions		Min	Typ	Max	Unit
V_{FM}	Forward Voltage	I_F=200A	T_J=25℃		1.70		V
			T_J=125℃		1.75		
			T_J=150℃		1.75		
t_{rr}	Reverse Recovery Time	I_F=200A, -d_{iF}/d_t=1657A/μs(T_J=150℃), V_R=600V, V_{GE}=-15V	T_J=25℃		317		ns
			T_J=125℃		535		
			T_J=150℃		635		
I_{rr}	Peak Reverse Recovery Current		T_J=25℃		119		A
			T_J=125℃		138		
			T_J=150℃		144		

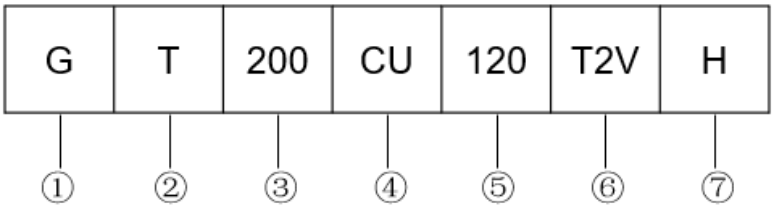
Q_{rr}	Reverse Recovery Charge	I_F=200A, -diF/dt=1657A/μs(T_J=150℃), V_R=600V, V_{GE}=-15V	T_J=25℃		19.4		μC
			T_J=125℃		35.9		
			T_J=150℃		42.3		
E_{rec}	Reverse Recovery Energy		T_J=25℃		6.9		mJ
			T_J=125℃		12.6		
			T_J=150℃		15.2		
$R_{\theta JC}$	Diode Thermal Resistance: Junction-To-Case (per leg)					0.165	℃/W

Module

Symbol	Description		Min	Typ	Max	Unit
V_{iso}	Isolation Voltage (All Terminals Shorted)	f=50Hz,30s	4500			V
T_J	Maximum Junction Temperature				175	℃
T_{JOP}	Maximum Operating Junction Temperature Range		-55		+150	℃
T_{stg}	Storage Temperature		-55		+150	℃
CTI	Comparative Tracking Index		200			
$R_{\theta CS}$	Case-To-Sink Thermally (Conductive Grease Applied)				0.03	℃/W
T	Power Terminals Screw:M6		2.5		5.0	N·m
T	Mounting Screw:M6		3.0		6.0	N·m
G	Weight			300		g

Ordering Information Table

Device code



① - IGBT Module
② - Field Stop Trench Gate IGBT
③ - Rated Current (200=200A)
④ - Circuit Configuration: Chopper, CU(Diode on High Side) / CL(Diode on Low Side)
⑤ - Rated Voltage (120=1200V)
⑥ - Package Type
⑦ - Test Level (Pass the Important Reliability Test-Industrial Grade)

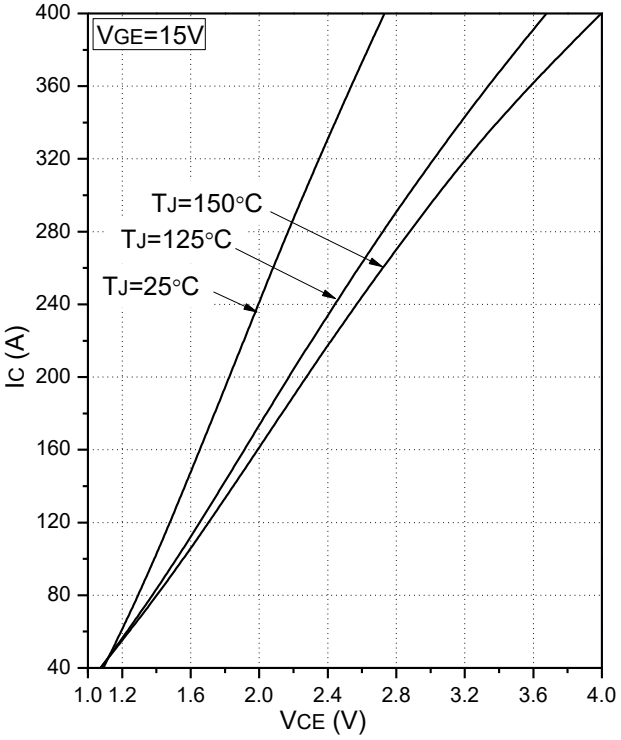


Fig.1 Typical Saturation Voltage Characteristics

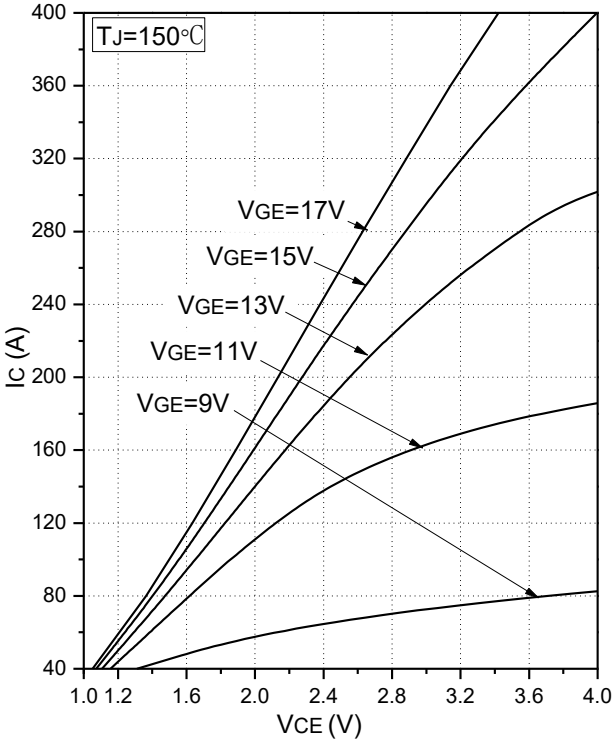


Fig.2 Typical Output Characteristics

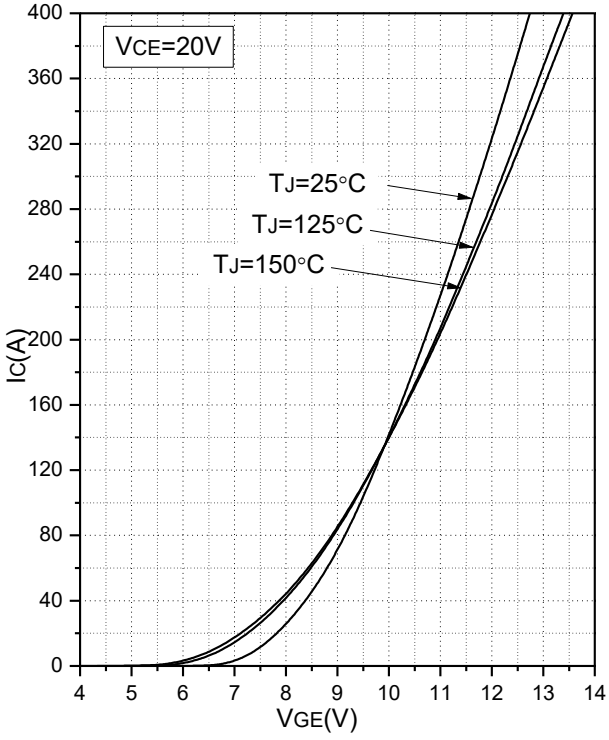


Fig.3 Transfer Characteristic

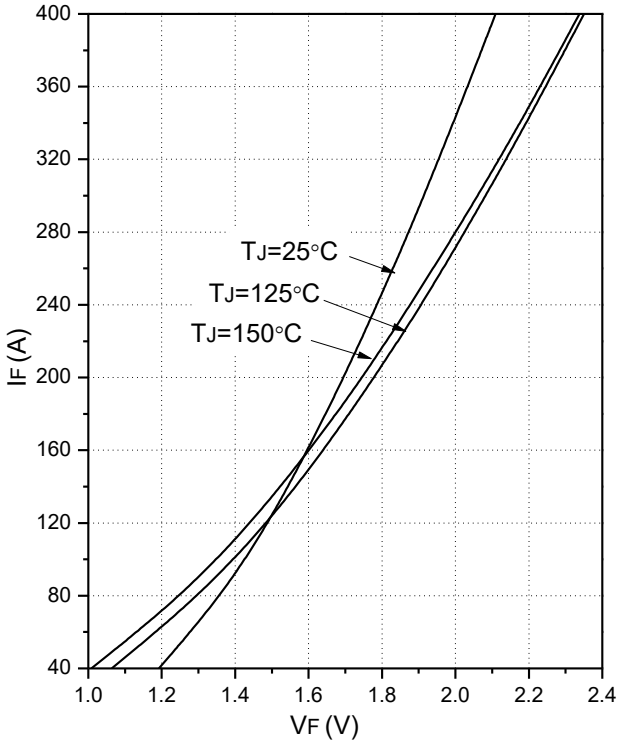


Fig.4 Forward Characteristics of Diode-Chopper

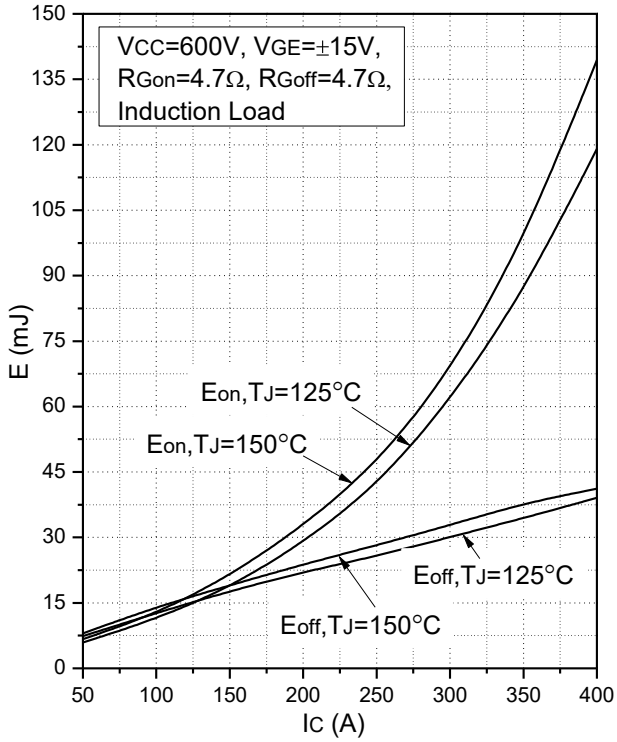


Fig.5 Typical Switching Loss vs. Collector Current

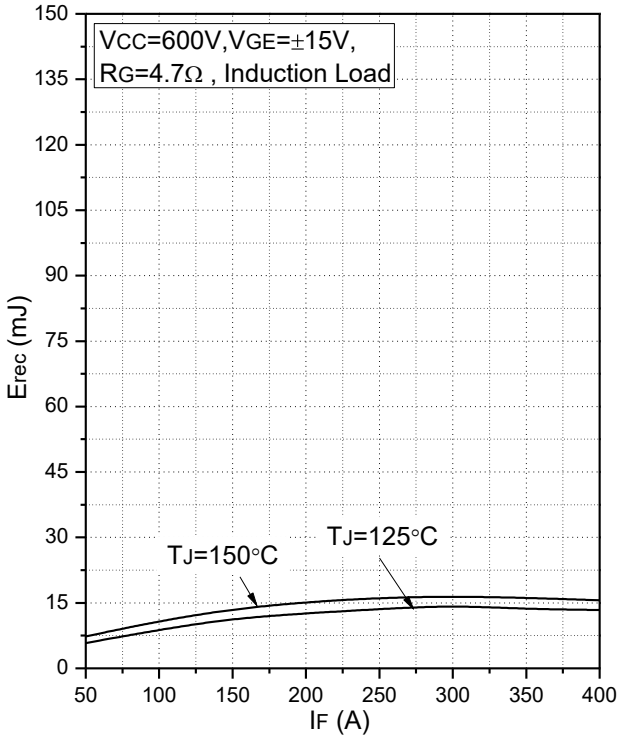


Fig.6 Typical Switching Loss vs. Forward Current(Diode-Chopper)

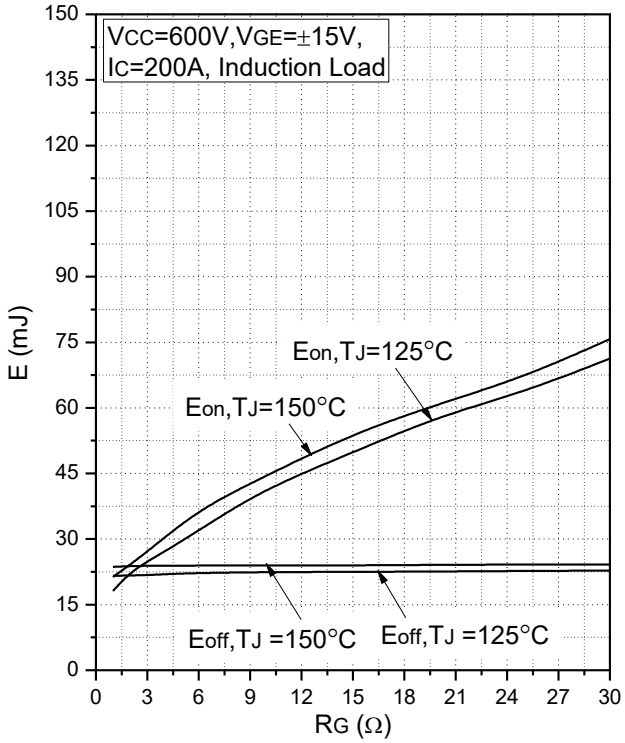


Fig.7 Typical Switching Loss vs. Gate Resistance

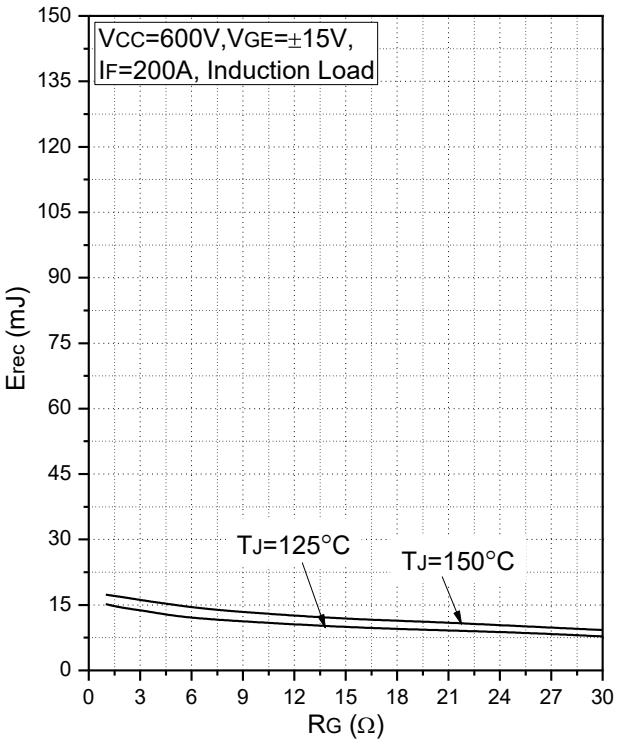


Fig.8 Typical Switching Loss vs. Gate Resistance(Diode-Chopper)

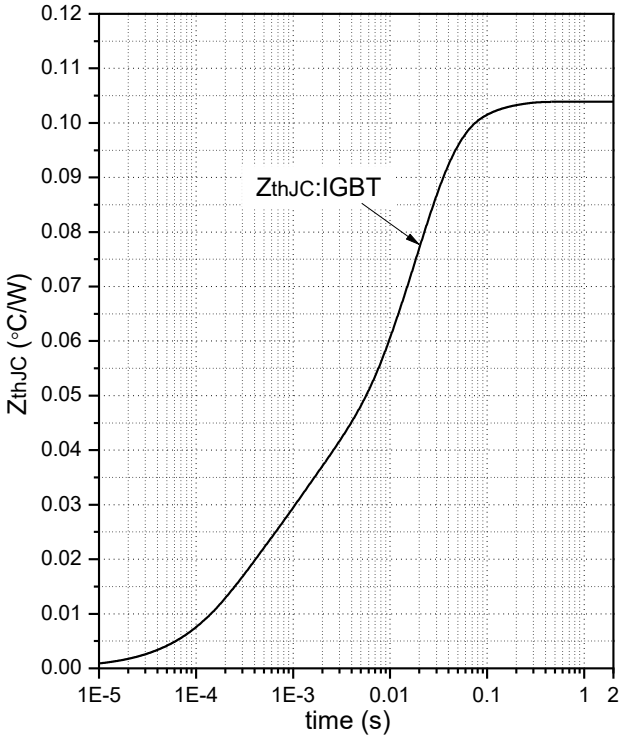


Fig.9 Transient Thermal Impedance (IGBT)

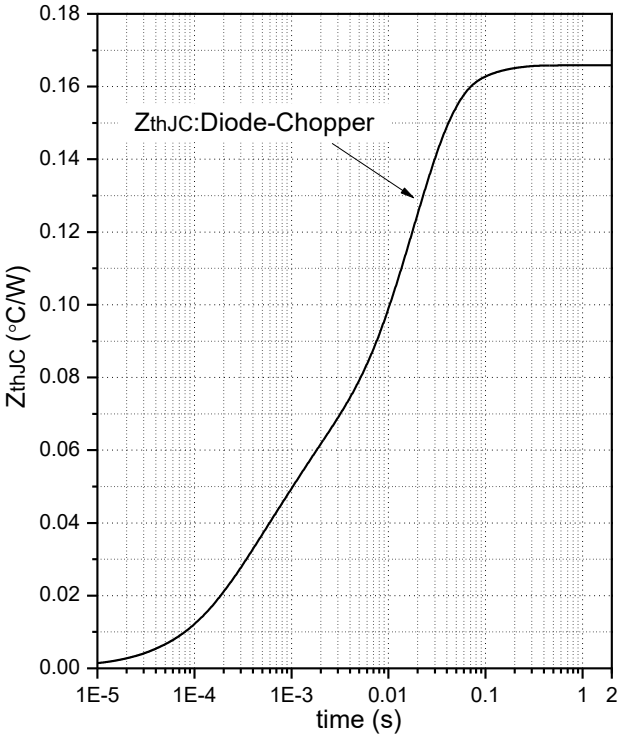


Fig.10 Transient Thermal Impedance (Diode-Chopper)

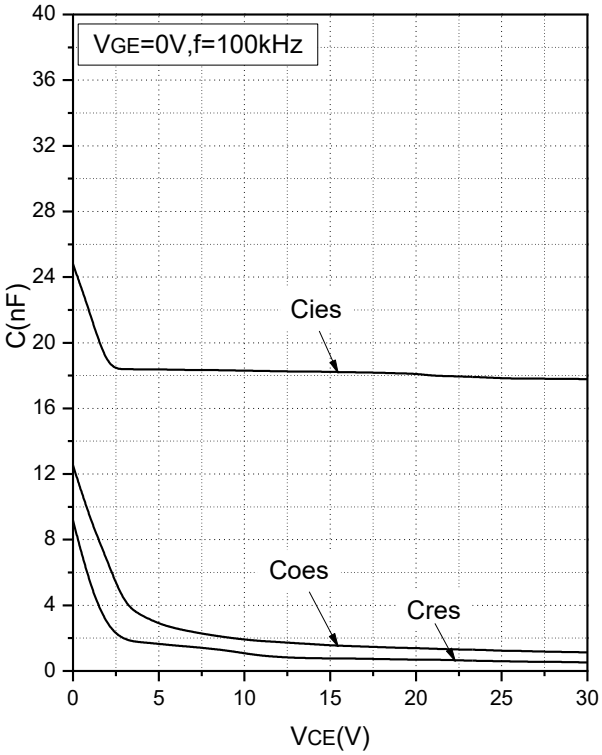


Fig.11 Capacitance Characteristics

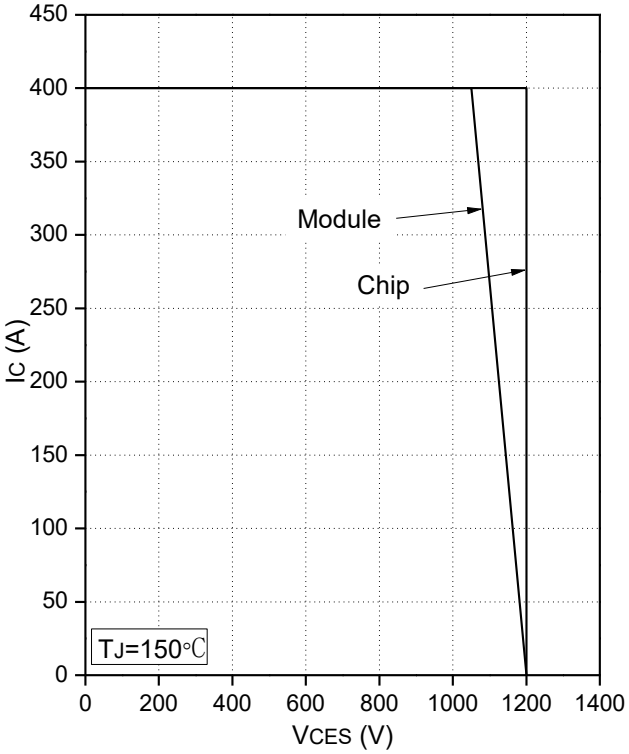


Fig.12 Reverse Bias Safe Operation Area (RBSOA)

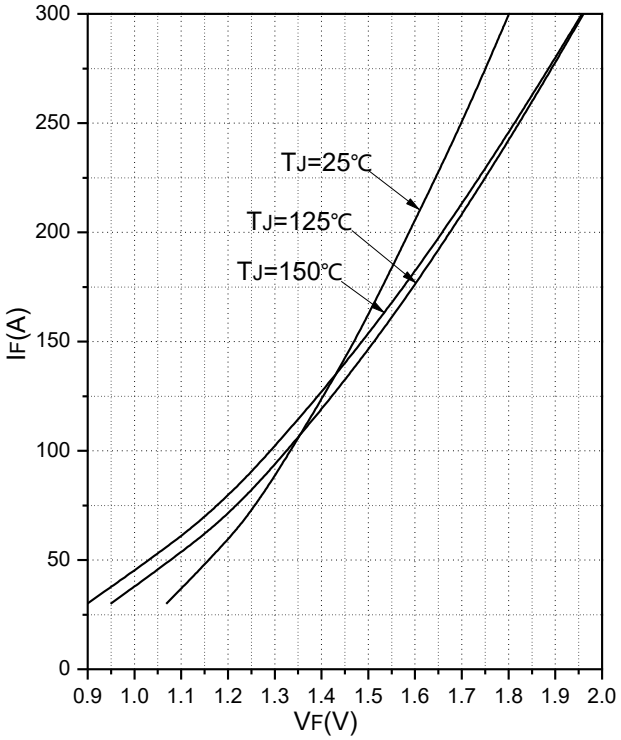
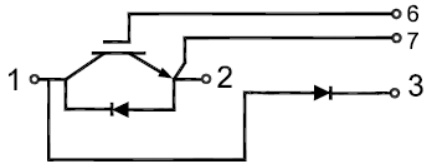
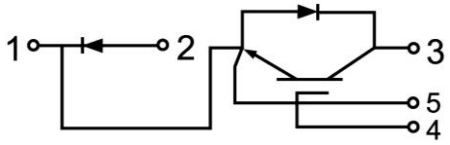


Fig.13 Forward Characteristics of Reverse Diode

Internal Circuit

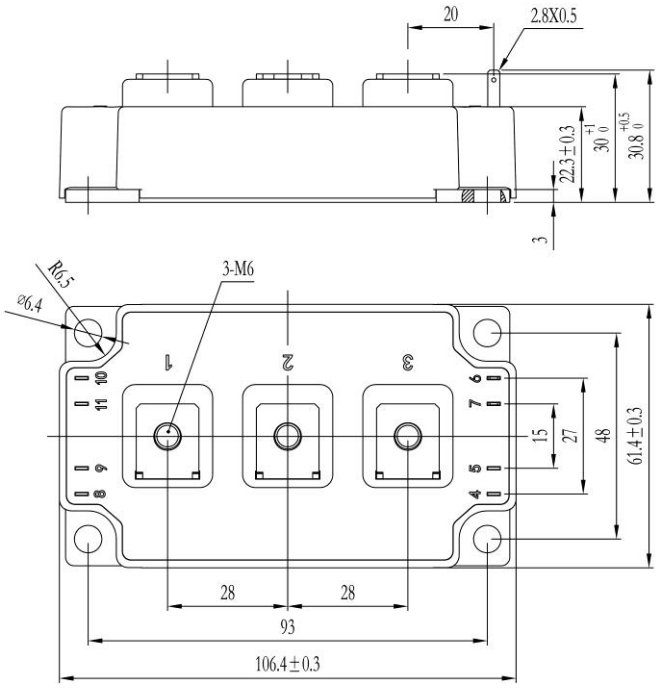


CU



CL

Package Outline (Unit: mm):



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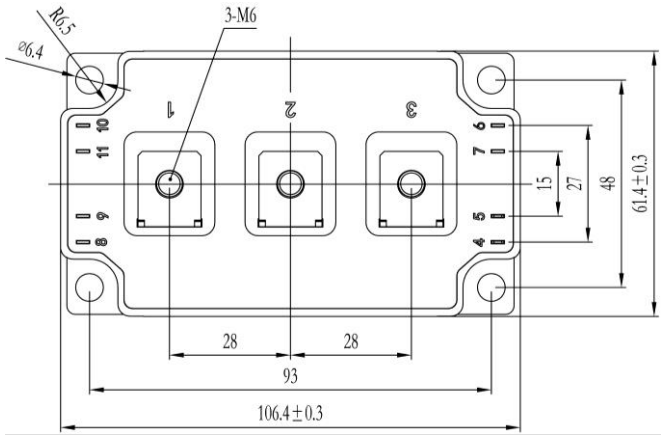

CL

Date	Revision	Notes
09/01/2023	A	Final Version

Announcement

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