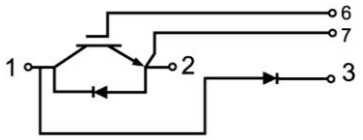
GT150CU120A5H
GT150CL120A5H

Preliminary Data

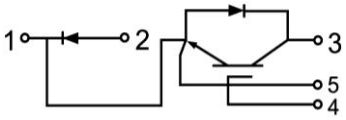
IGBT Module

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



CU



CL

Applications：

- Industrial Inverters
- Servo Applications
- Power Supply
- Chopper Applications
- Three-level Applications

IGBT, Chopper
Maximum Rated Values (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℃	150	A
		T_C=25℃	300	A
I_{CM}	Peak Collector Current Repetitive	t_P=1ms	300	A
P_D	Maximum Power Dissipation (IGBT)	T_C=25℃ T_{Jmax}=175℃	1045	W

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

Static Characteristics

Symbol	Description	Conditions		Min.	Typ.	Max.	Units
$V_{GE(th)}$	Gate-Emitter Threshold Voltage	I_C=5.3mA, V_{CE}=V_{GE}		5.0	5.8	6.5	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C=150A, V_{GE}=15V	T_J=25℃		1.65	2.10	V
			T_J=125℃		1.90		V
			T_J=150℃		1.95		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			16.5		nF
C_{oes}	Output Capacitance				2.5		nF
C_{res}	Reveres Transfer Capacitance				0.5		nF

Switching Characteristics

$t_{d(on)}$	Turn-on Delay Time	V_{CC}=600V, I_C=150A, R_{Gon}=6.8Ω, V_{GE}=±15V, Inductive Load	T_J=25℃		449		ns
			T_J=125℃		454		
			T_J=150℃		537		
t_r	Rise Time		T_J=25℃		130		ns
			T_J=125℃		133		
			T_J=150℃		141		
$t_{d(off)}$	Turn-off Delay Time	V_{CC}=600V, I_C=150A, R_{Goff}=6.8Ω, V_{GE}=±15V, Inductive Load	T_J=25℃		409		ns
			T_J=125℃		414		
			T_J=150℃		439		
t_f	Fall Time		T_J=25℃		262		ns
			T_J=125℃		454		
			T_J=150℃		454		
E_{on}	Turn-on Switching Loss	V_{CC}=600V, I_C=150A, R_{Gon}=6.8Ω, V_{GE}=±15V, di/dt=964A/μs(T_J=150℃), Inductive Load	T_J=25℃		15.6		mJ
			T_J=125℃		21.2		
			T_J=150℃		22.6		

E_{off}	Turn-off Switching Loss	V_{CC}=600V, I_C=150A, R_{Goff}=6.8Ω, V_{GE}=±15V, du/dt=3545V/μs(T_J=150℃), Inductive Load	T_J=25℃		10.4		mJ
			T_J=125℃		15.4		
			T_J=150℃		16.0		
Q_g	Total Gate Charge	V_{GE}=+15V…-15V	T_J=25℃		1164		uC
$R_{G(int)}$	Internal Gate Resistor		T_J=25℃		3.4		Ω
I_{SC}	V_{CC}=600V, V_{GE}=±15V, R_G=6.8Ω, tp=10μs, T_J=150℃				630		A
$R_{\theta JC}$	Thermal Resistance: Junction-to-Case (per IGBT)					0.14	℃/W

Diode, Chopper

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

V_{RRM}	Repetitive Peak Reverse Voltage	T_J=25℃	1200	V
I_F	Diode Continuous Forward Current	T_C=100℃	150	A
I_{FM}	Peak Diode Current Repetitive	t_P=1ms	300	A

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

Symbol	Description	Conditions		Min.	Typ.	Max.	Units
V_{FM}	Forward Voltage	I_F=150A	T_J=25℃		1.75		V
			T_J=125℃		1.90		
			T_J=150℃		1.85		
t_{rr}	Reverse Recovery Time	I_F=150A, -diF/dt=1245A/μs(T_J=150℃), V_{rr}=600V, V_{GE}=-15V	T_J=25℃		296		ns
			T_J=125℃		507		
			T_J=150℃		528		
I_{rr}	Peak Reverse Recovery Current		T_J=25℃		64.1		A
			T_J=125℃		92.5		
			T_J=150℃		99.5		
Q_{rr}	Reverse Recovery Charge		T_J=25℃		10.3		μC
			T_J=125℃		21.5		
			T_J=150℃		22.7		

E_{rec}	Reverse Recovery Energy	I_F=150A, -diF/dt=1245A/μs(T_J=150℃), V_{rr}=600V, V_{GE}=-15V	T_J=25℃		2.8		mJ
			T_J=125℃		7.3		
			T_J=150℃		7.6		
$R_{\theta JC}$	Thermal Resistance: Junction-to-Case (per Diode)					0.21	℃/W

Diode, Reverse

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

V_{RRM}	Repetitive Peak Reverse Voltage	T_J=25℃	1200	V
I_F	Diode Continuous Forward Current	T_C=100℃	100	A
I_{FM}	Diode Maximum Forward Current	t_P=1ms	200	A

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

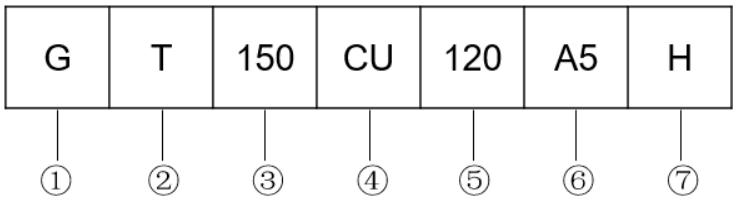
Symbol	Description	Conditions		Min.	Typ.	Max.	Units
V_{FM}	Forward Voltage	I_F=100A	T_J=25℃		1.65		V
			T_J=125℃		1.80		
			T_J=150℃		1.75		
t_{rr}	Reverse Recovery Time	I_F=100A, -diF/dt=2356A/μs(T_J=150℃), V_R=600V, V_{GE}=-15V	T_J=25℃		138		ns
			T_J=125℃		182		
			T_J=150℃		212		
I_{rr}	Peak Reverse Recovery Current		T_J=25℃		136		A
			T_J=125℃		155		
			T_J=150℃		159		
Q_{rr}	Reverse Recovery Charge		T_J=25℃		10.6		μC
			T_J=125℃		15.4		
			T_J=150℃		17.5		
E_{rec}	Reverse Recovery Energy		T_J=25℃		5.0		mJ
			T_J=125℃		6.7		
			T_J=150℃		7.6		
$R_{\theta JC}$	Thermal Resistance: Junction-to-Case (per Diode)					0.25	℃/W

Module

Symbol	Description	Conditions	Min.	Typ.	Max.	Units
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		-40		+150	℃
T_{stg}	Storage Temperature		-40		+150	℃
CTI	Comparative Tracking Index			200		
$R_{\theta CS}$	Case-to-Sink Thermally (Conductive Grease Applied)				0.05	℃/W
T	Power Terminals Screw:M5		3.0		5.0	N·m
T	Mounting Screw:M6		4.0		6.0	N·m
G	Weight			200		g

Ordering Information Table

Device code



① - IGBT Module
② - Trench, Low Switching Losses IGBT
③ - Rated Current (150=150A)
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)

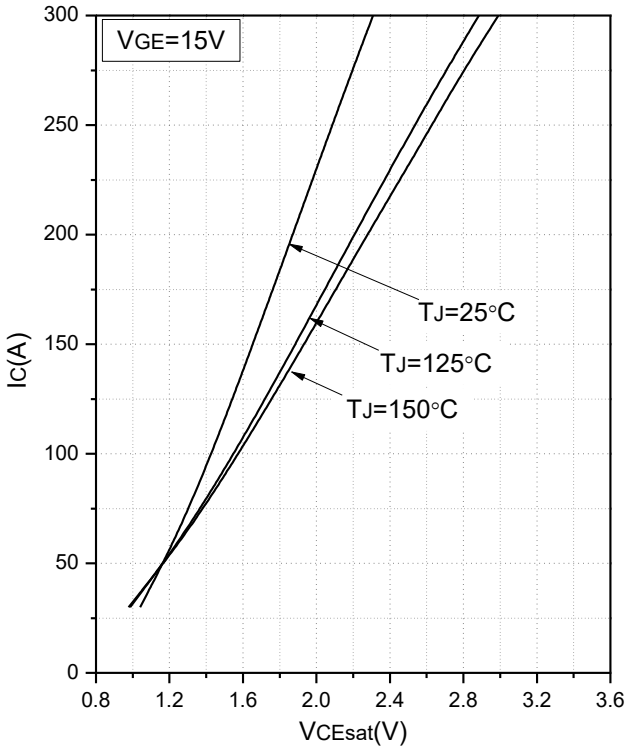


Fig.1 Typical Saturation Voltage Characteristics

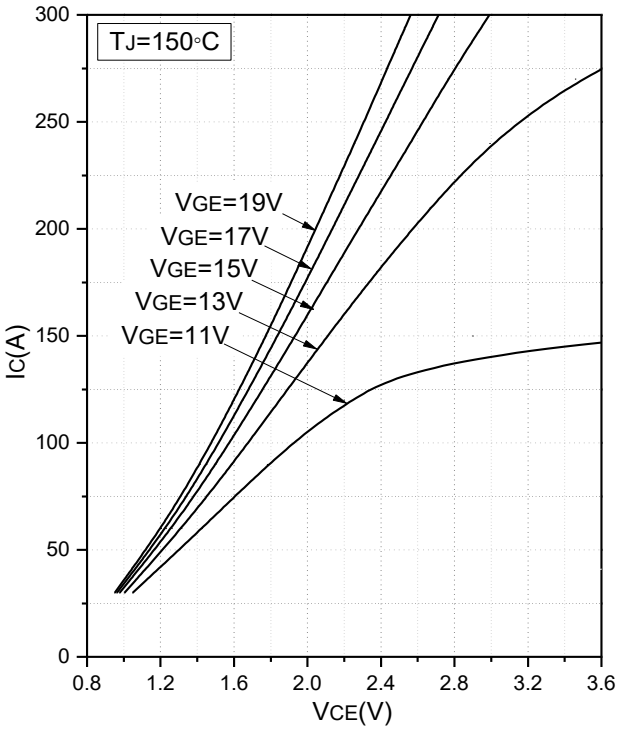


Fig.2 Typical Output Characteristics

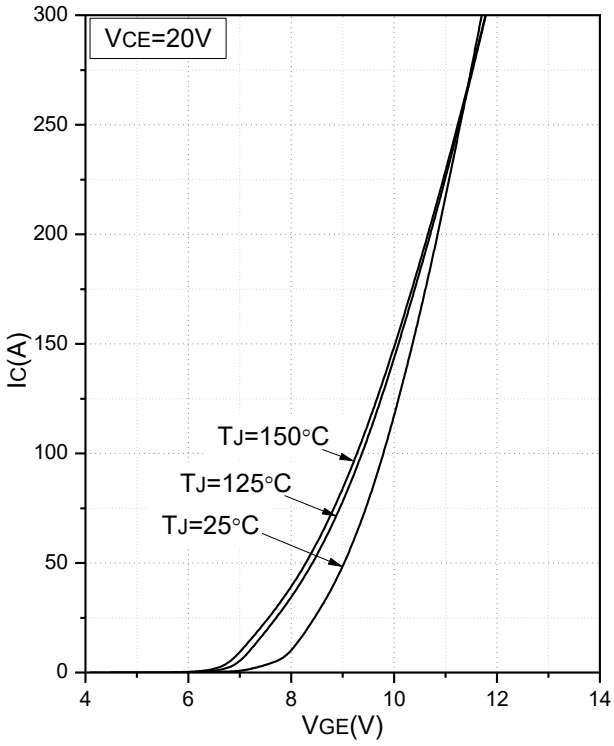


Fig.3 Transfer Characteristics

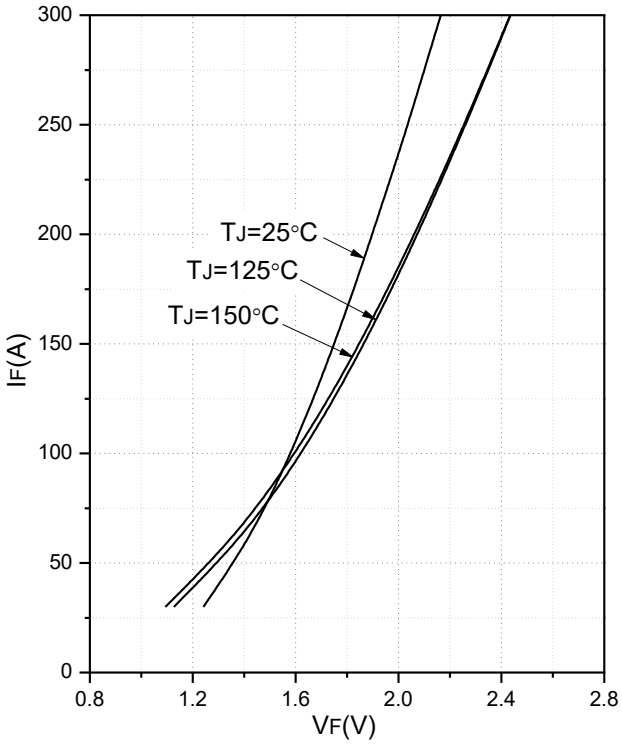


Fig.4 Forward Characteristics of Diode

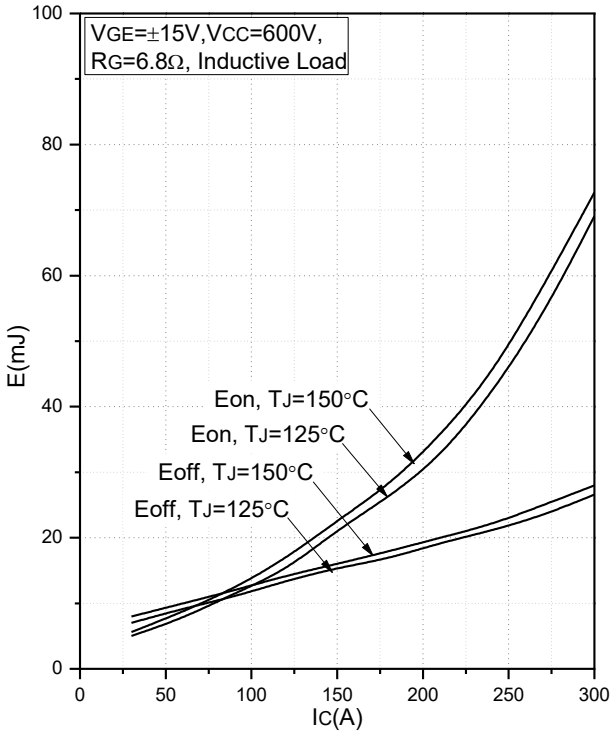


Fig.5 Typical Switching Loss vs. Collector Current

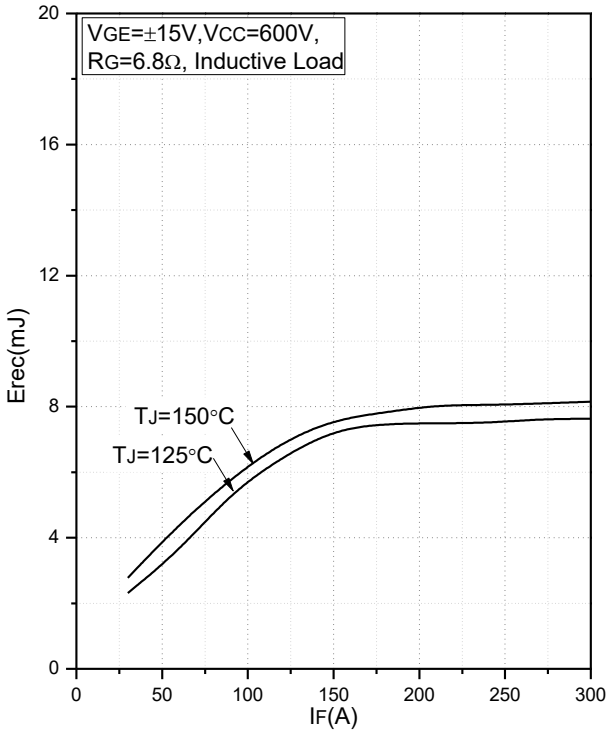


Fig.6 Typical Switching Loss vs. Forward Current

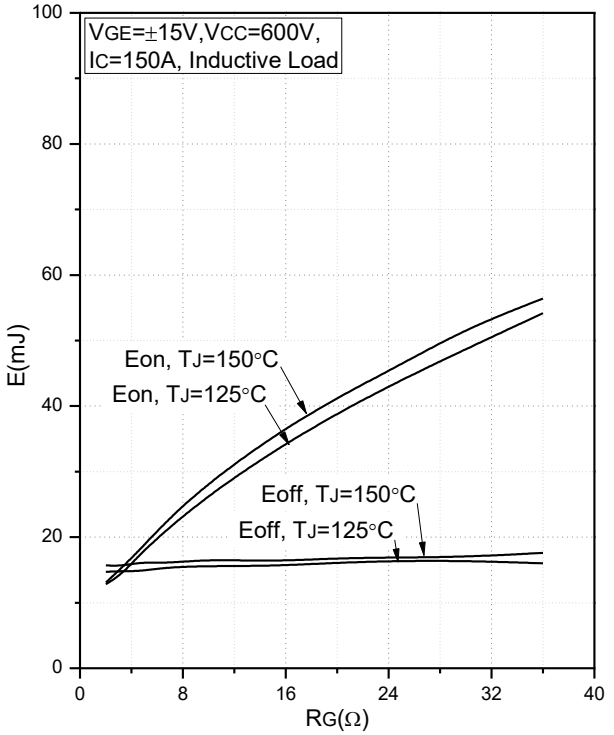


Fig.7 Typical Switching Loss vs. Gate Resistance

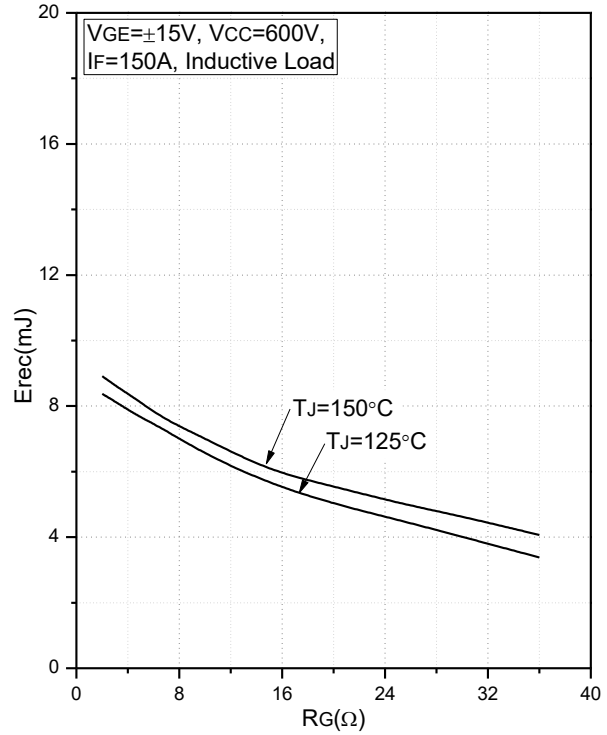


Fig.8 Typical Switching Loss vs. Gate Resistance

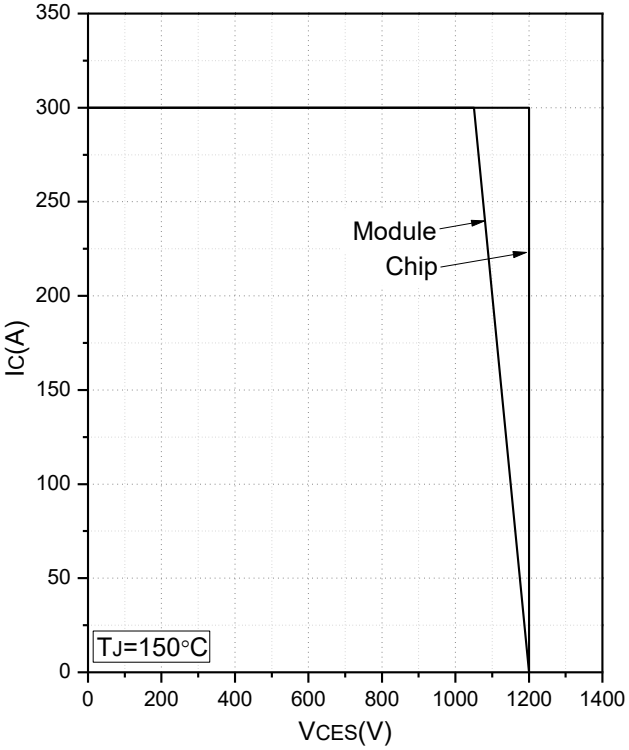


Fig.9 Reverse Bias Safe Operation Area (RBSOA)

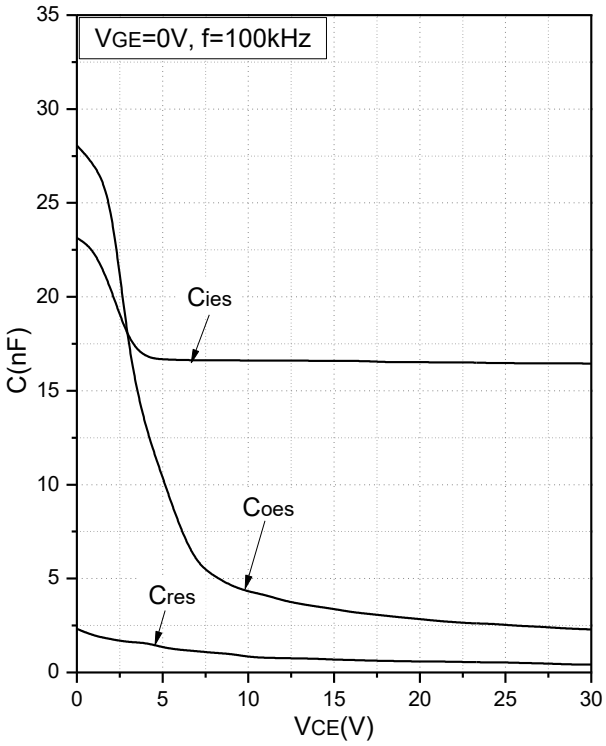


Fig.10 Capacitance Characteristics

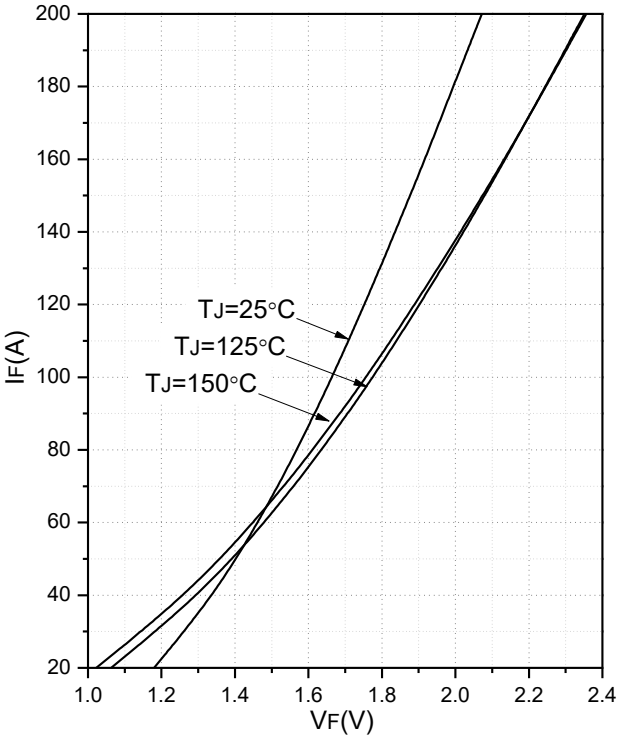


Fig.11 Forward Characteristics of Diode (Reverse)

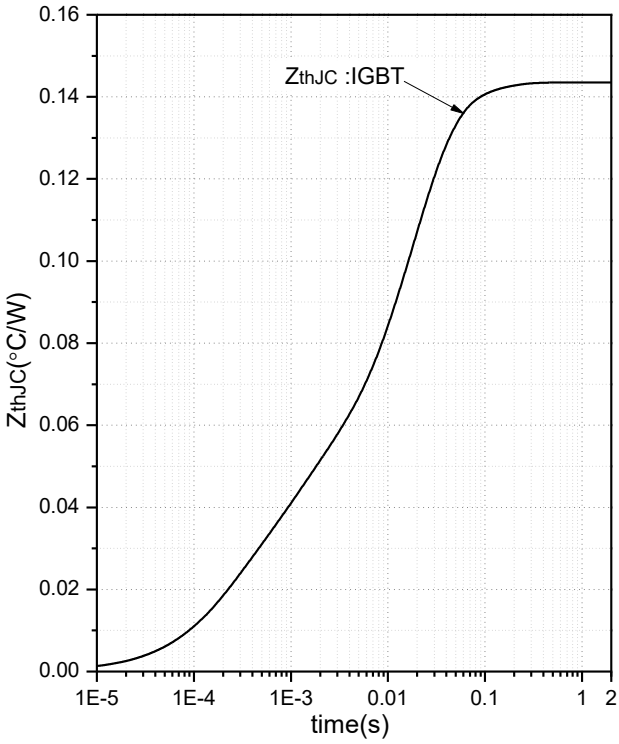


Fig.12 Transient Thermal Impedance (Chopper-IGBT)

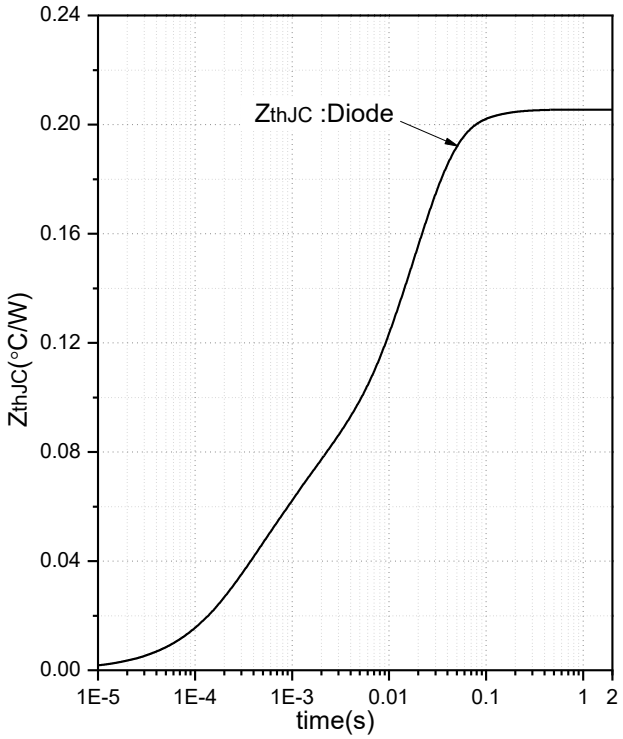
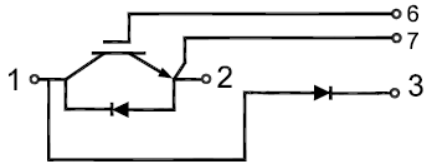
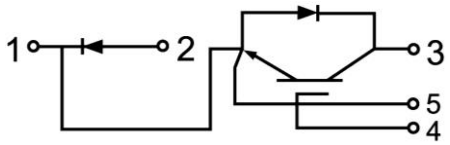


Fig.13 Transient Thermal Impedance (Chopper-Diode)

Internal Circuit:

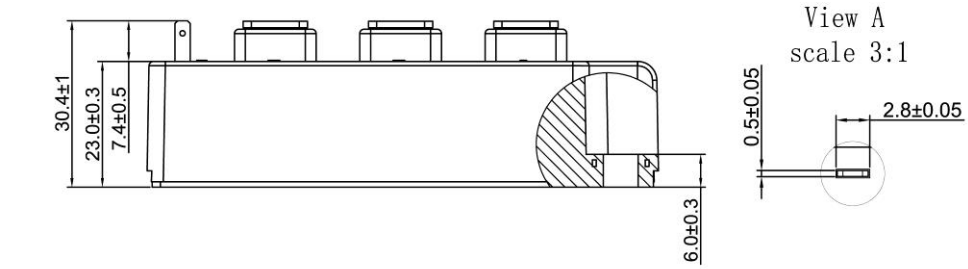


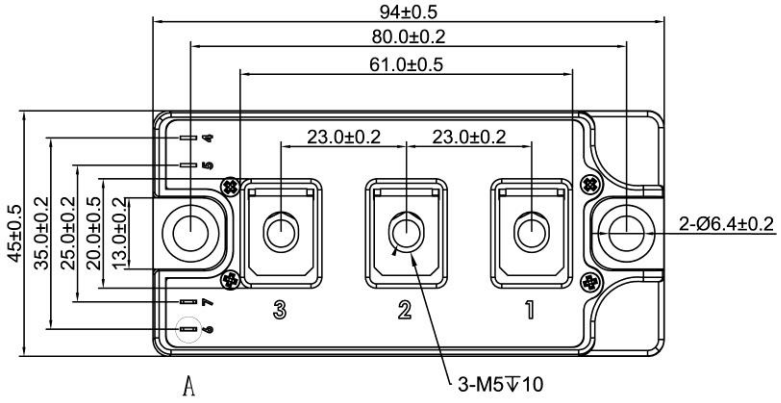
CU



CL

Package Outline (Unit: mm):





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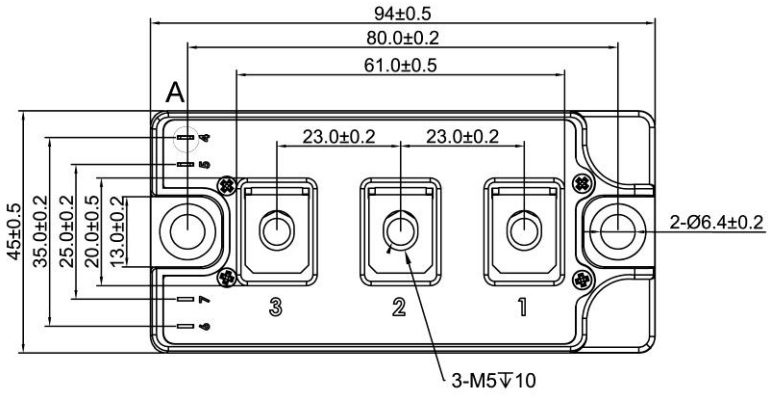

CL

Revision	Notes
01	Initial release

Announcement

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