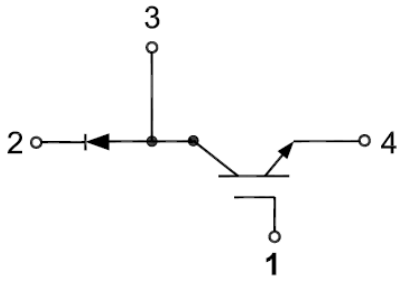
GT100CU120B5H

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



Applications:

- Welding
- HEV Inverter
- Industrial Motor Drives
- UPS

IGBT, 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=80℃	100	A
		T_C=25℃	200	A
I_{CM}	Repetitive Peak Collector Current	T_J=150℃	200	A
t_{SC}	Short Circuit Withstand Time		>10	μs
P_D	Maximum Power Dissipation (IGBT)	T_C=25℃ T_{Jmax}=150℃	604	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=1mA, V_{CE}=V_{GE}		5.0	5.8	6.5	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C=100A, V_{GE}=15V	T_J=25℃		1.70	2.00	V
			T_J=125℃		2.00		V
			T_J=150℃		2.10		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, T_J=25℃			8.87		nF
C_{oes}	Output Capacitance				0.61		nF
C_{res}	Reveres Transfer Capacitance				0.24		nF

Switching Characteristics

$t_{d(on)}$	Turn-on Delay Time	V_{CC}=600V, I_C=100A, R_{Gon}=10Ω, V_{GE}=±15V, Inductive Load	T_J=25℃		283		ns
			T_J=125℃		297		
			T_J=150℃		293		
t_r	Rise Time		T_J=25℃		83		ns
			T_J=125℃		89		
			T_J=150℃		96		
$t_{d(off)}$	Turn-off Delay Time	V_{CC}=600V, I_C=100A, R_{Goff}=10Ω, V_{GE}=±15V, Inductive Load	T_J=25℃		186		ns
			T_J=125℃		205		
			T_J=150℃		213		
t_f	Fall Time		T_J=25℃		344		ns
			T_J=125℃		466		
			T_J=150℃		468		
E_{on}	Turn-on Switching Loss	V_{CC}=600V, I_C=100A, R_{Gon}=10Ω, V_{GE}=±15V, di/dt=867A/μs (T_J=150℃) Inductive Load	T_J=25℃		7.6		mJ
			T_J=125℃		12.3		
			T_J=150℃		13.4		

E_{off}	Turn-off Switching Loss	V_{CC}=600V, I_C=100A, R_{Goff}=10Ω, V_{GE}=±15V, du/dt=3812V/μs (T_J=150℃) Inductive Load	T_J=25℃		7.1		mJ
			T_J=125℃		10.6		
			T_J=150℃		11.1		
Q_g	Total Gate Charge	V_{GE}=+15V…-15V	T_J=25℃		410		nC
$R_{gint.}$	Internal Gate Resistor		T_J=25℃		6		Ω
RBSOA	I_C=200A, V_{CC}=1050V, Vp=1200V, R_G=10Ω, V_{GE}=+15V to 0V, T_J=150°C			Trapezoid			
SC data	Vcc=600V, R_{Gon}=10Ω, R_{Goff}=10Ω, tp=10us, V_{GE}=+/-15V,T_J=125℃				372		A
$R_{\theta JC}$	IGBT Thermal Resistance: Junction-To-Case (per IGBT)					0.207	℃/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	100	A
I_{FM}	Diode Maximum Forward Current	200	A

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

Symbol	Description	Conditions		Min	Typ	Max	Unit
V_{FM}	Forward Voltage	I_F=100A	T_J=25℃		1.65		V
			T_J=125℃		1.70		
			T_J=150℃		1.70		
t_{rr}	Reverse Recovery Time	I_F=100A, -diF/dt=1167A/μs(T_J=150℃), V_R=600V, V_{GE}=-15V	T_J=25℃		319		ns
			T_J=125℃		473		
			T_J=150℃		597		
I_{rr}	Peak Reverse Recovery Current		T_J=25℃		73.4		A
			T_J=125℃		87.5		
			T_J=150℃		90.6		

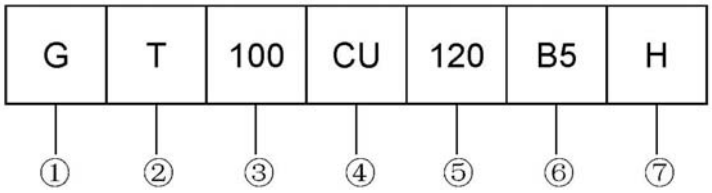
Q_{rr}	Reverse Recovery Charge	I_F=100A, -diF/dt=1167A/μs(T_J=150℃), V_R=600V, V_{GE}=-15V	T_J=25℃		10.8		μC
			T_J=125℃		18.6		
			T_J=150℃		21.9		
E_{rec}	Reverse Recovery Energy		T_J=25℃		4.15		mJ
			T_J=125℃		6.89		
			T_J=150℃		8.37		
$R_{\theta JC}$	Diode Thermal Resistance: Junction-To-Case (per Diode)					0.251	℃/W

Module

Symbol	Description		Min	Typ	Max	Unit
V_{iso}	Isolation Voltage (All Terminals Shorted)	f = 50Hz, 30s		4500		V
Material of Module Base plate				Copper		
Internal Isolation				Al_2O_3		
T_J	Maximum Junction Temperature				150	℃
T_{JOP}	Maximum Operating Junction Temperature Range		-40		+125	℃
T_{stg}	Storage Temperature		-40		+125	℃
CTI	Comparative Tracking Index			200		
$R_{\theta CS}$	Case-To-Sink Thermally (Conductive Grease Applied)				0.21	℃/W
T	Power Terminals Screw(M4)		1.1		1.5	N·m
T	Mounting Screw(M4)		1.1		1.5	N·m
G	Weight			30		g

Ordering Information Table

Device code



① - IGBT Module
② - Field Stop Trench Gate IGBT
③ - Rated Current (100=100A)
④ - Circuit Configuration: Chopper (Diode on High Side)
⑤ - Rated Voltage (120=1200V)
⑥ - Package Type
⑦ - Test Level (Pass the Important Reliability Test-Industrial Grade)

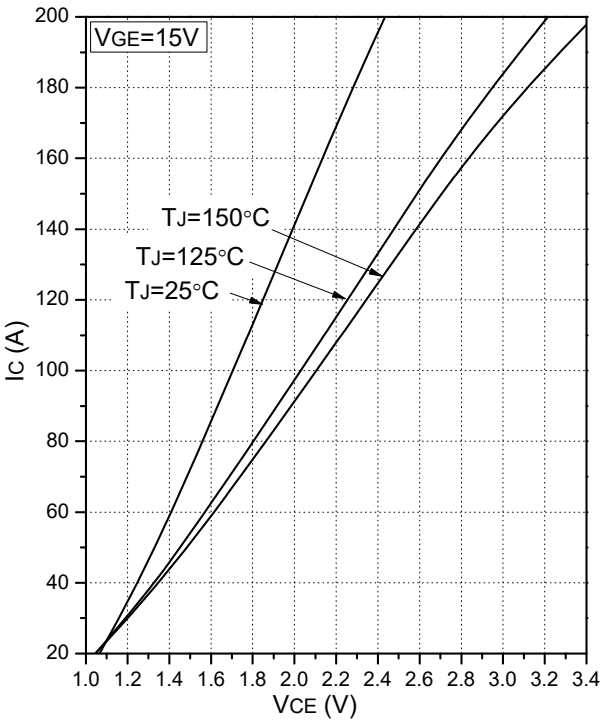


Fig.1 Typical Saturation Voltage Characteristics

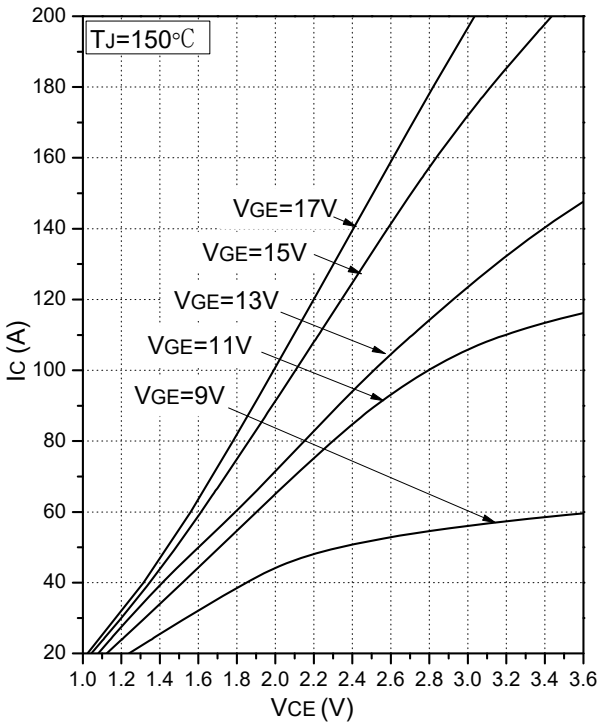


Fig.2 Typical Output Characteristics

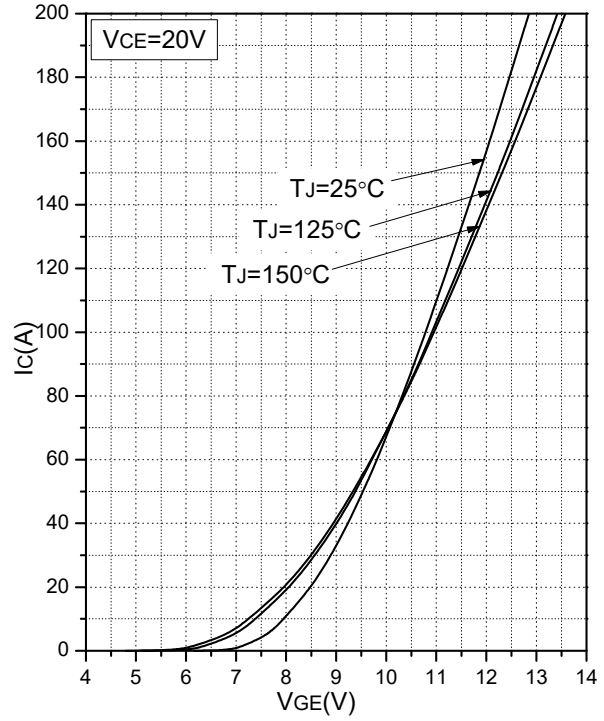


Fig.3 Transfer Characteristic

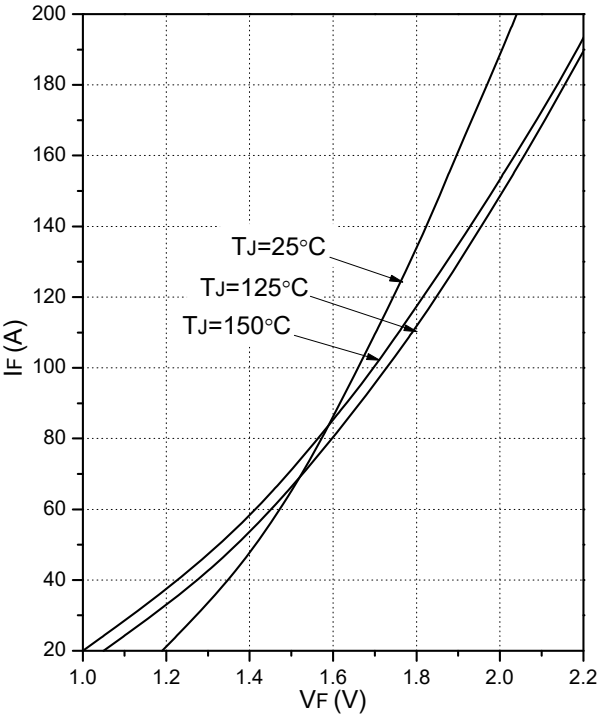


Fig.4 Forward Characteristics of Diode

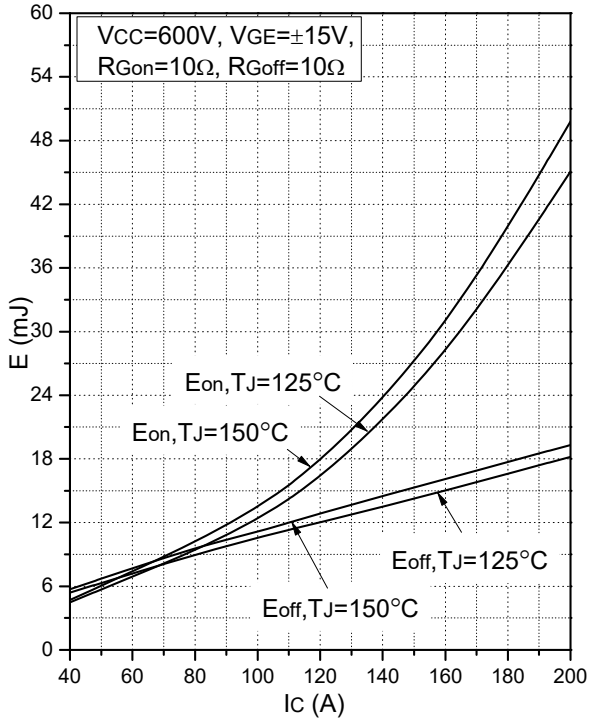


Fig.5 Typical Switching Loss vs. Collector Current

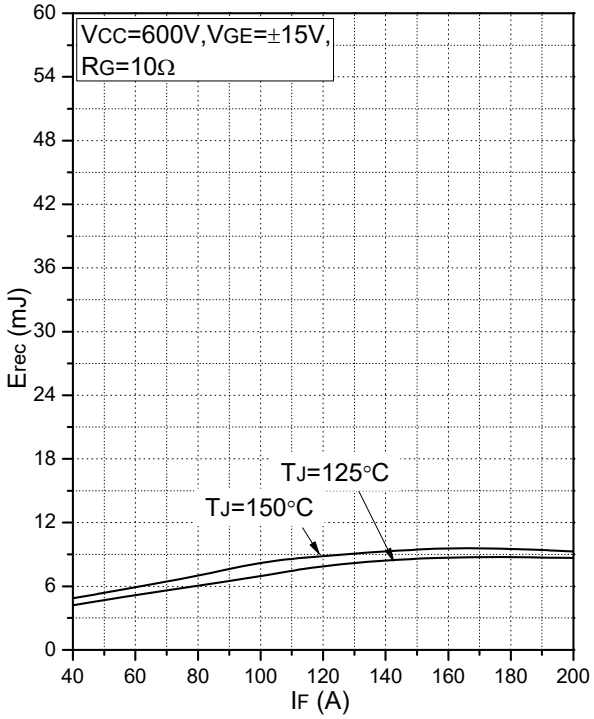


Fig.6 Typical Switching Loss vs. Forward Current

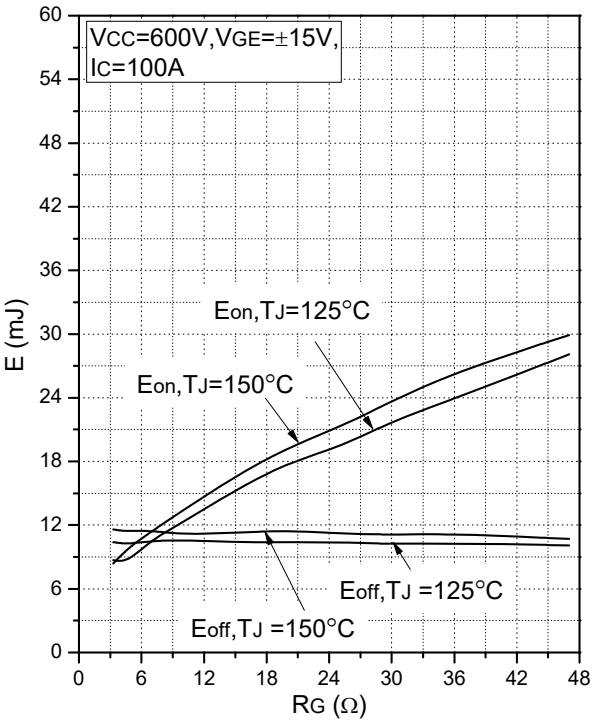


Fig.7 Typical Switching Loss vs. Gate Resistance

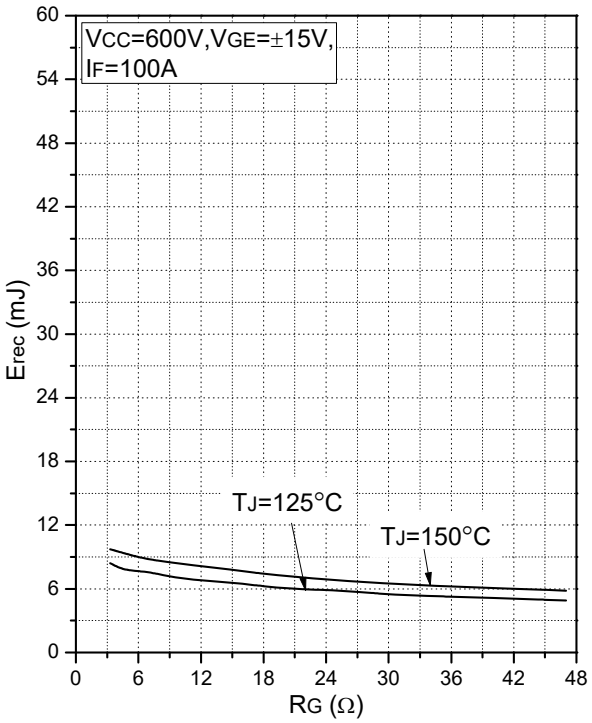


Fig.8 Typical Switching Loss vs. Gate Resistance

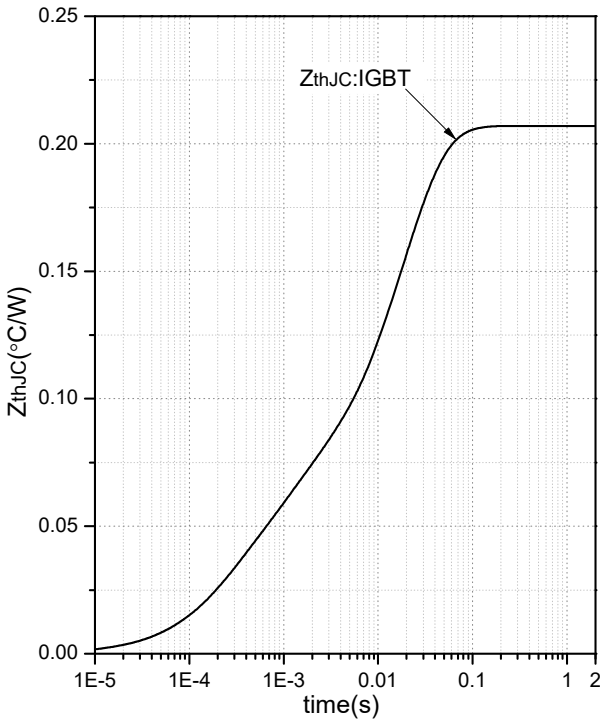


Fig.9 Transient Thermal Impedance (IGBT)

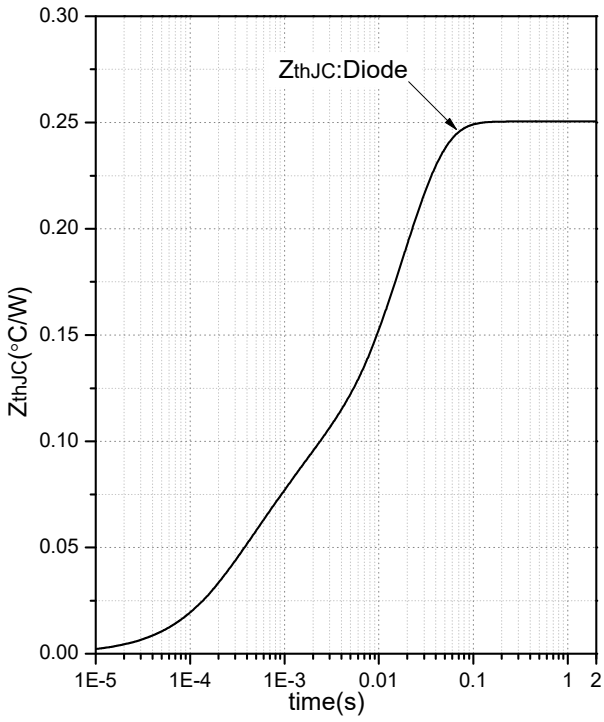


Fig.10 Transient Thermal Impedance (Diode)

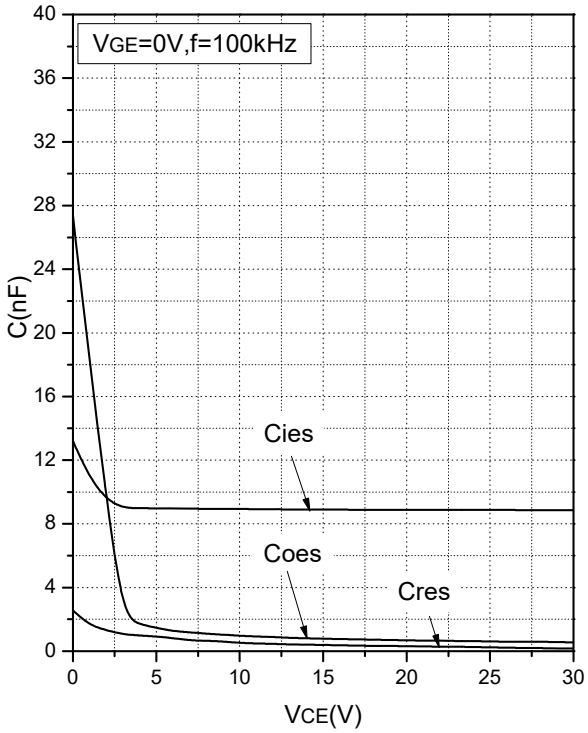


Fig.11 Capacitance Characteristics

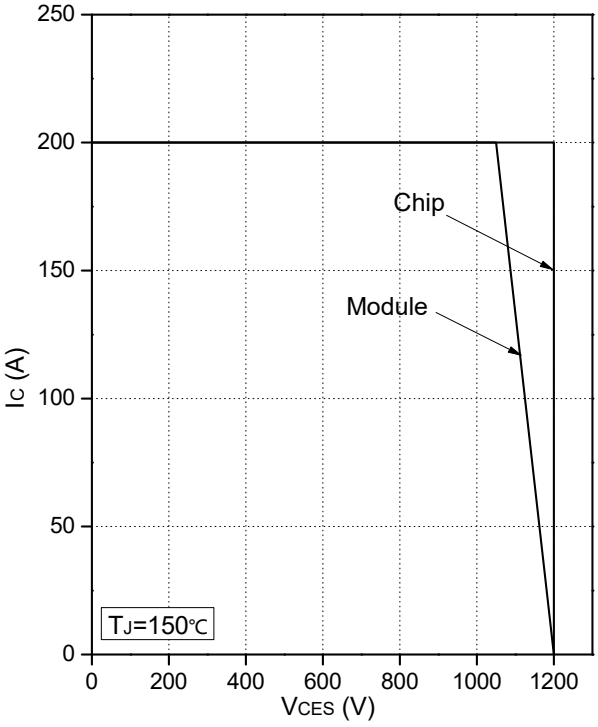
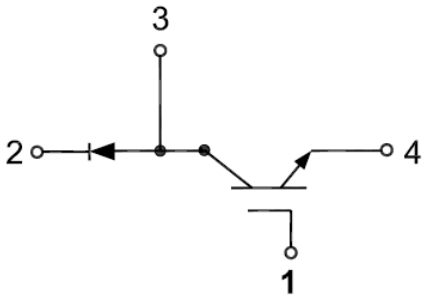
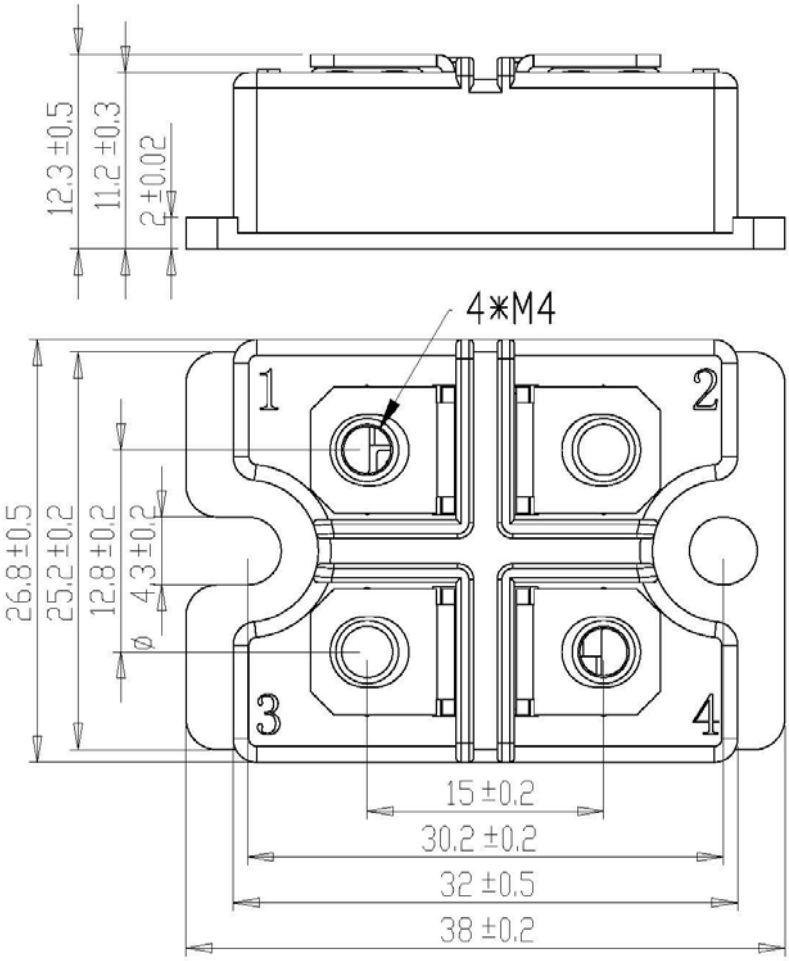


Fig.12 Reverse Bias Safe Operation Area (RBSOA)

Internal Circuit:



Package Outline (Unit: mm):



Date	Revision	Notes
08/17/2023	A	Final Version

Announcement

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