



Preliminary Data

Circuit Diagram

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- Motor Drives
- Air Conditioning
- Servo Drives
- UPS

V _{CES}	Collector-Emitter Blocking Voltage	T _J =25℃	1200	V
V _{GES}	Gate-Emitter Voltage		±20	V
I _C	Continuous Collector Current	T _C =100℃	15	A
		T _C =25℃	30	A
I _{CM}	Peak Collector Current Repetitive	tp=1ms	30	A
P _D	Maximum Power Dissipation (IGBT)	T _C =25℃ T _{Jmax} =175℃	199	W



Electrical Characteristics of IGBT

Static Characteristics

Symbol	Description	Conditions	Min.	Typ.	Max.	Units
$V_{GE(th)}$	Gate-Emitter Threshold Voltage	$I_C=1mA, V_{CE}=V_{GE}, T_J=25^{\circ}C$	5.0	5.9	6.8	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=15A, V_{GE}=15V$	$T_J=25^{\circ}C$	1.85	2.10	V
			$T_J=125^{\circ}C$	2.05		
			$T_J=150^{\circ}C$	2.10		
I_{CES}	Collector-Emitter Leakage Current	$V_{GE}=0V, V_{CE}=V_{CES}, T_J=25^{\circ}C$			1	mA
I_{GES}	Gate-Emitter Leakage Current	$V_{GE}=\pm 20V, V_{CE}=0V, T_J=25^{\circ}C$			± 100	nA
C_{ies}	Input Capacitance	$V_{CE}=25V, V_{GE}=0V, f=100kHz, T_J=25^{\circ}C$		1.45		nF
C_{oes}	Output Capacitance			0.10		
C_{res}	Reverse Transfer Capacitance			0.06		

Switching Characteristics

t _{d(on)}	Turn-on Delay Time	V _{CC} =600V, I _C =15A, R _{Gon} =68Ω, V _{GE} =±15V, Inductive Load	T _J =25℃		115		ns
			T _J =125℃		140		
			T _J =150℃		154		
t _r	Rise Time		T _J =25℃		95		ns
			T _J =125℃		95		
			T _J =150℃		102		
t _{d(off)}	Turn-off Delay Time	V _{CC} =600V, I _C =15A, R _{Goff} =68Ω, V _{GE} =±15V, Inductive Load	T _J =25℃		158		ns
			T _J =125℃		166		
			T _J =150℃		166		
t _f	Fall Time		T _J =25℃		331		ns
			T _J =125℃		422		
			T _J =150℃		416		
E _{on}	Turn-on Switching Loss	V _{CC} =600V, I _C =15A, R _{Gon} =68Ω, V _{GE} =±15V, di/dt=117A/μs(T _J =150℃), Inductive Load	T _J =25℃		3.25		mJ
			T _J =125℃		4.01		
			T _J =150℃		4.38		



E _{off}	Turn-off Switching Loss	V _{CC} =600V, I _C =15A, R _{Goff} =68Ω, V _{GE} =±15V, du/dt=1963V/μs(T _J =150°C), Inductive Load	T _J =25°C		0.76		mJ
			T _J =125°C		1.16		
			T _J =150°C		1.27		
Q _g	Total Gate Charge	V _{GE} =-15V...+15V	T _J =25°C		363		nC
R _{g internal}	Internal Gate Resistor		T _J =25°C		0		Ω
SCSOA	V _{CC} =600V, V _{GE} =±15V, R _G =68Ω, T _J =150°C			10			μs
R _{θJC}	Thermal Resistance: Junction-to-Case (per IGBT)					0.753	°C/W

Diode, Inverter

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

V _{RRM}	Repetitive Peak Reverse Voltage	T _J =25°C	1200	V
I _F	Diode Continuous Forward Current		15	A
I _{FM}	Peak FWD Current Repetitive	tp=1ms	30	A

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

Symbol	Description	Conditions		Min.	Typ.	Max.	Units
V _{FM}	Forward Voltage	I _F =15A	T _J =25°C		1.90		V
			T _J =125°C		2.05		
			T _J =150°C		2.00		
I _{rr}	Peak Reverse Recovery Current	I _F =15A, di/dt=174A/μs(T _J =150°C), V _{rr} =600V, V _{GE} =-15V	T _J =25°C		15.6		A
			T _J =125°C		20.6		
			T _J =150°C		16.3		
t _{rr}	Reverse Recovery Time		T _J =25°C		241		ns
			T _J =125°C		249		
			T _J =150°C		276		
Q _{rr}	Reverse Recovery Charge		T _J =25°C		0.89		μC
			T _J =125°C		1.34		
			T _J =150°C		1.38		



E _{rec}	Reverse Recovery Energy	I _F =15A, di/dt=174A/μs(T _J =150°C), V _{rr} =600V, V _{GE} =-15V	T _J =25°C		0.12		mJ
			T _J =125°C		0.13		
			T _J =150°C		0.14		
R _{θJC}	Thermal Resistance: Junction-to-Case (per Diode)					1.127	°C/W

Internal NTC-Thermistor Characteristics

Symbol	Description	Min.	Typ.	Max.	Units
R ₂₅	T _C =25°C		5		kΩ
ΔR/R	T _C =100°C, R ₁₀₀ =465Ω	-5		5	%
P ₂₅	T _C =25°C			10	mW
B _{25/50}	$R_2 = R_{25} \exp[B_{25/50}(1/T_2 - 1/(298.15K))]$		3380		K
B _{25/80}	$R_2 = R_{25} \exp[B_{25/80}(1/T_2 - 1/(298.15K))]$		3440		K
B _{25/100}	$R_2 = R_{25} \exp[B_{25/100}(1/T_2 - 1/(298.15K))]$		3545		K



Module

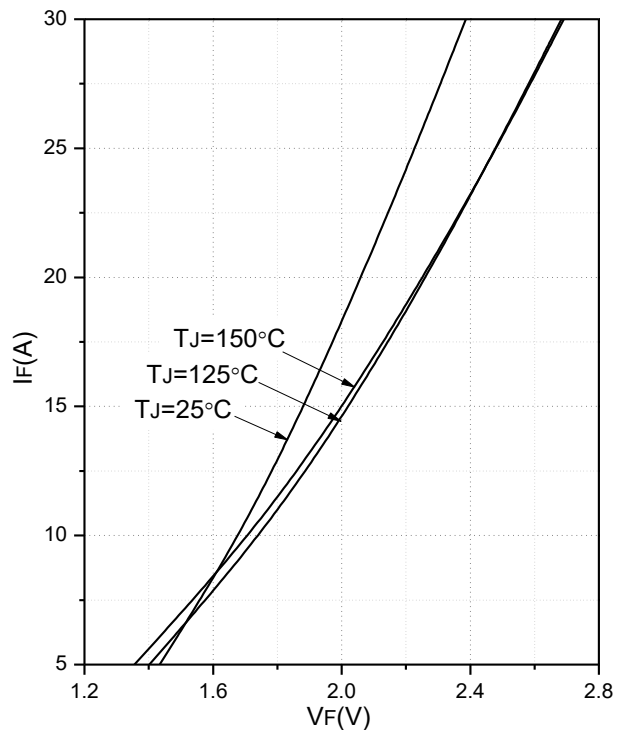
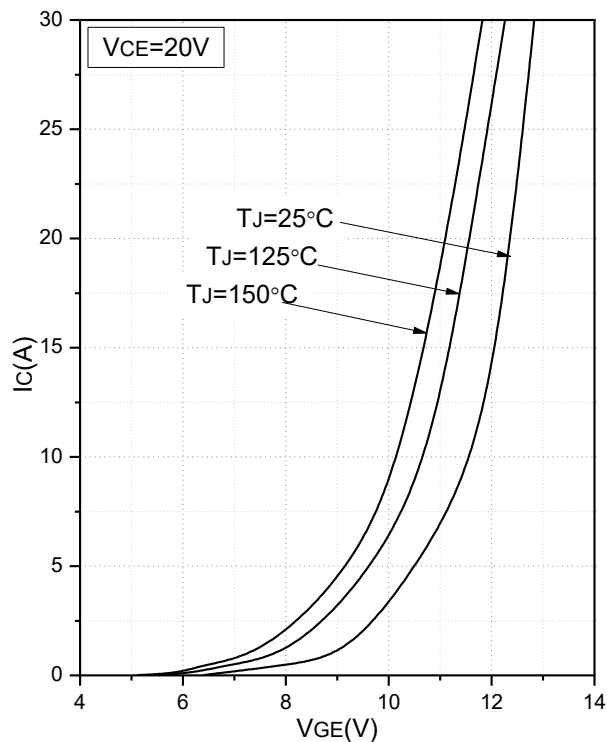
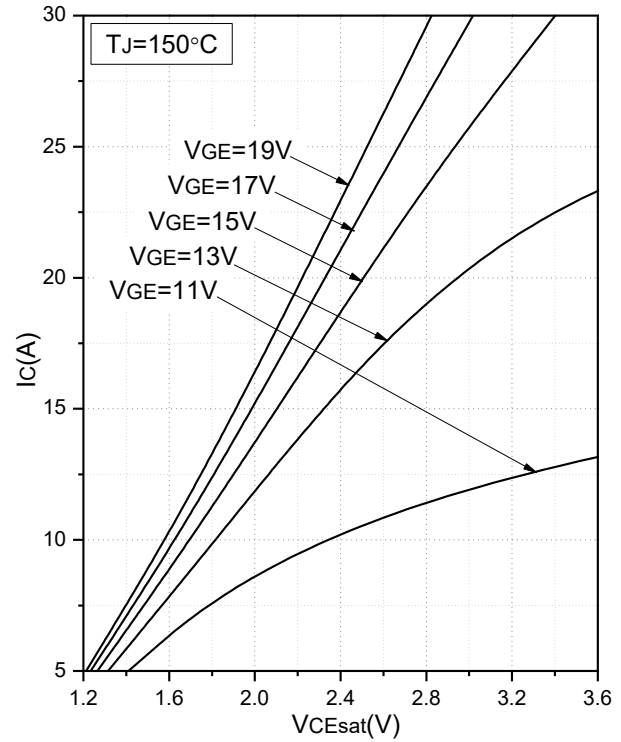
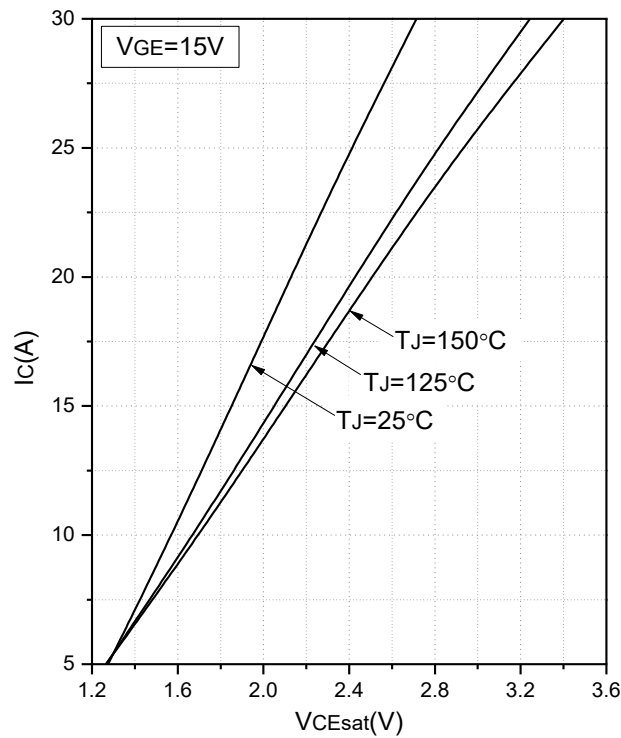
Symbol	Description		Min.	Typ.	Max.	Units
V _{IOS}	Isolation Voltage (All Terminals Shorted)	AC Test Voltage, t=30s	4500			V
Internal Isolation			Al ₂ O ₃			
T _J	Maximum Junction Temperature				175	°C
T _{JOP}	Maximum Operating Junction Temperature Range		-40		+150	°C
T _{stg}	Storage Temperature		-40		+150	°C
CTI	Comparative Tracking Index		200			
R _{θCS}	Case-to-Sink Thermally (Conductive Grease Applied)				0.06	°C/W
M	Mounting Screw:M3		0.75		1.20	N·m
G	Weight			30		g

Ordering Information Table

Device code

G	T	15	FF	120	A1	H
①	②	③	④	⑤	⑥	⑦

- ① - IGBT Module
- ② - Trench, Low Switching Losses IGBT
- ③ - Rated Current (15=15A)
- ④ - Circuit Configuration (FF=Full Bridge)
- ⑤ - Rated Voltage (120=1200V)
- ⑥ - Package Type
- ⑦ - Test Level (Pass the Important Reliability Test-Industrial Grade)



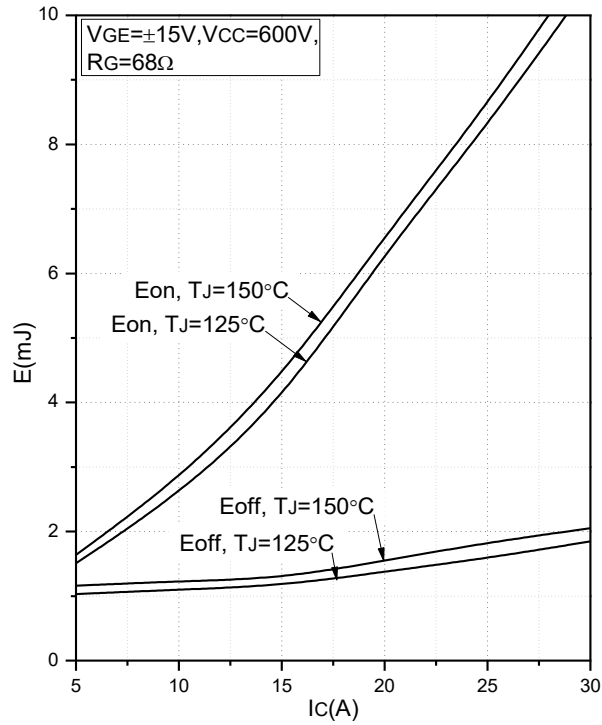


Fig.5 Typical Switching Loss vs. Collector Current

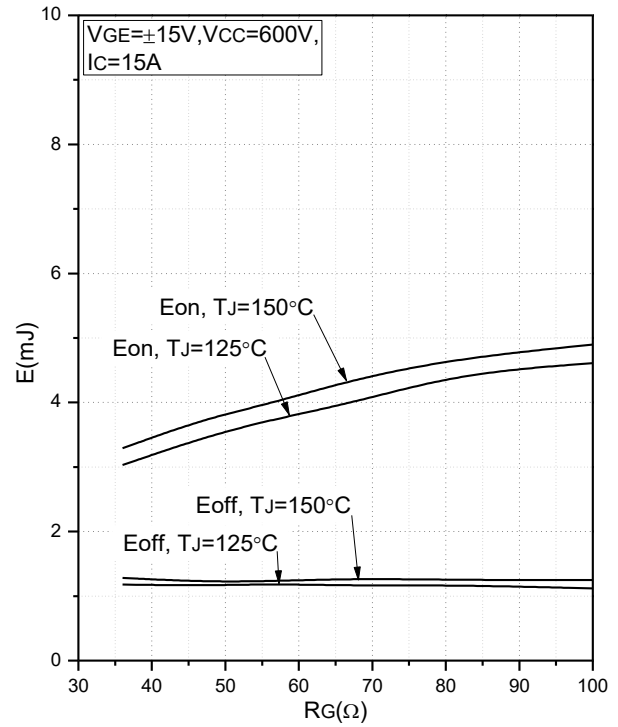


Fig.6 Typical Switching Loss vs. Gate Resistance

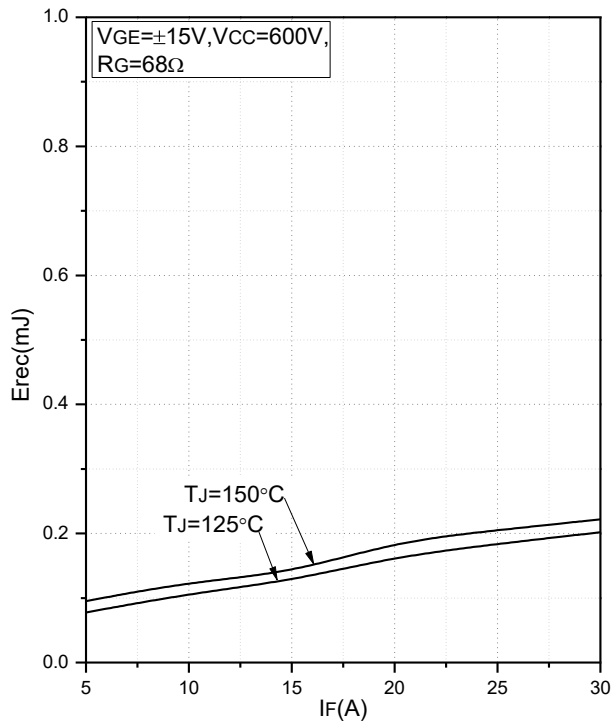


Fig.7 Typical Switching Loss vs. Forward Current

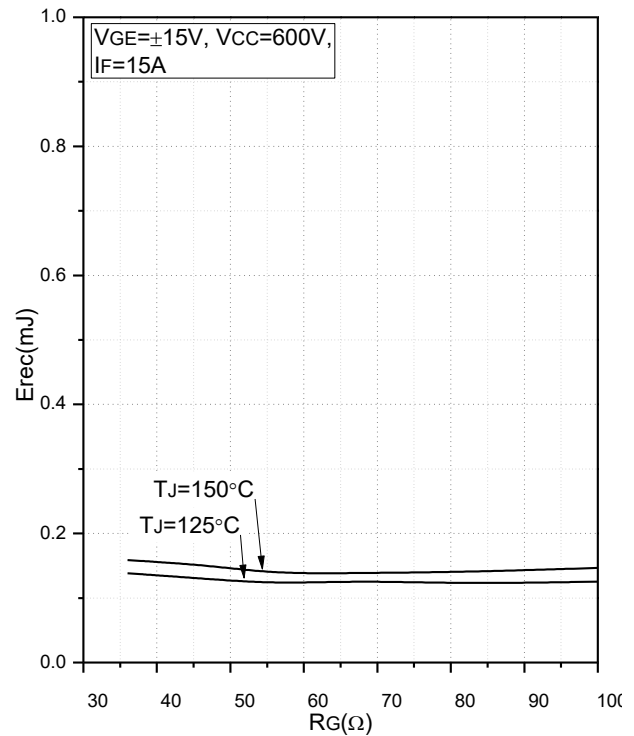


Fig.8 Typical Switching Loss vs. Gate Resistance

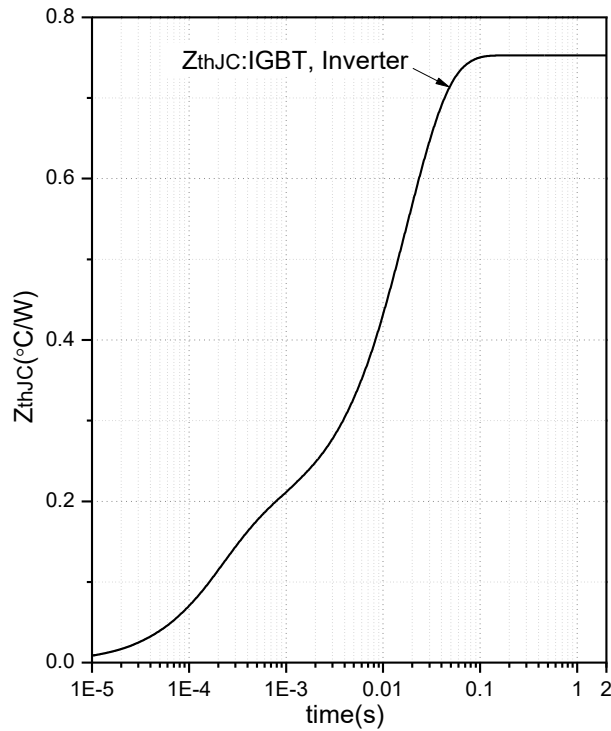


Fig.9 Transient Thermal Impedance

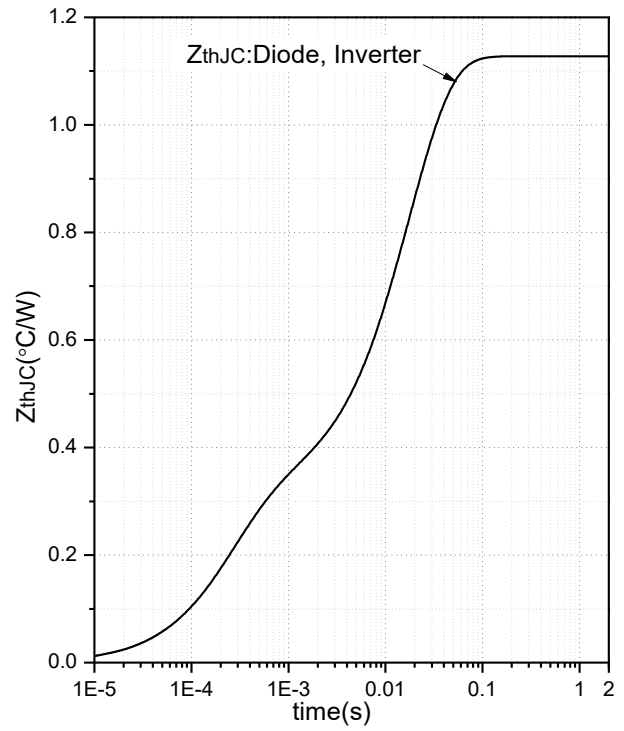


Fig.10 Transient Thermal Impedance

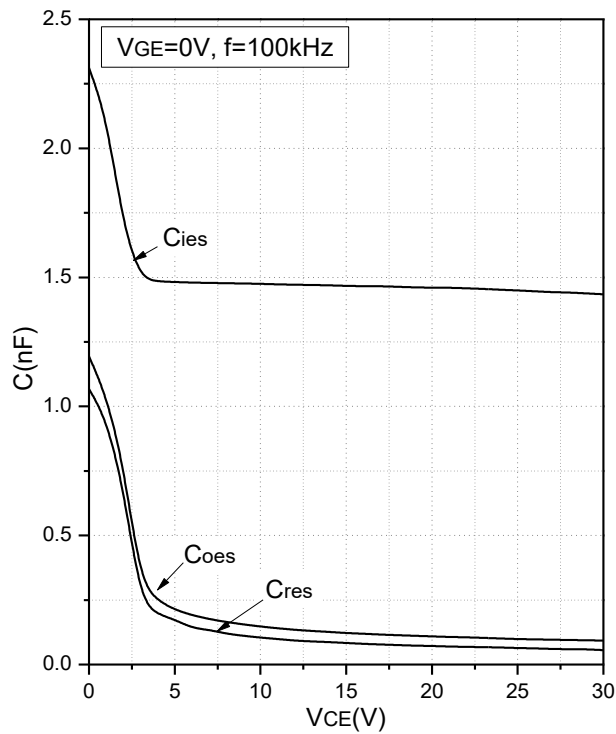


Fig.11 Capacitance Characteristics

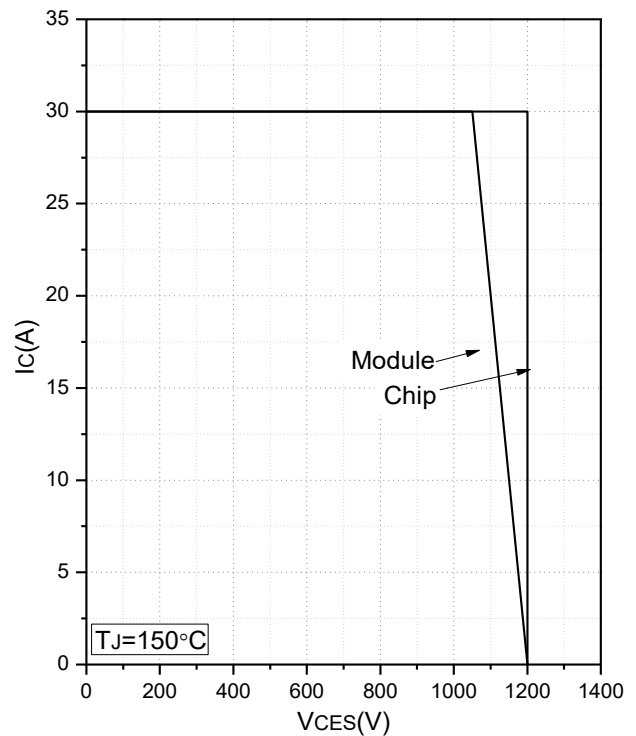


Fig.12 Reverse Bias Safe Operation Area (RBSOA)

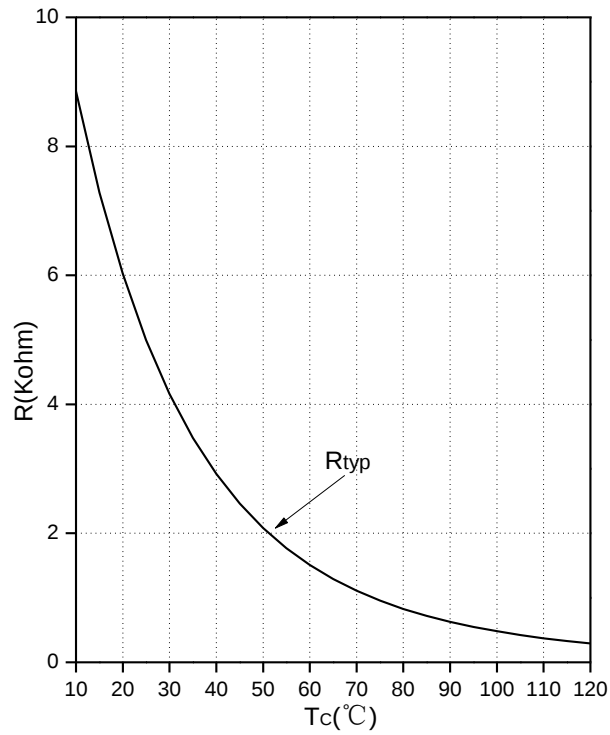
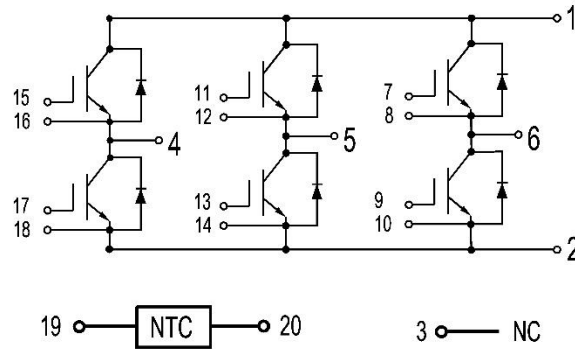


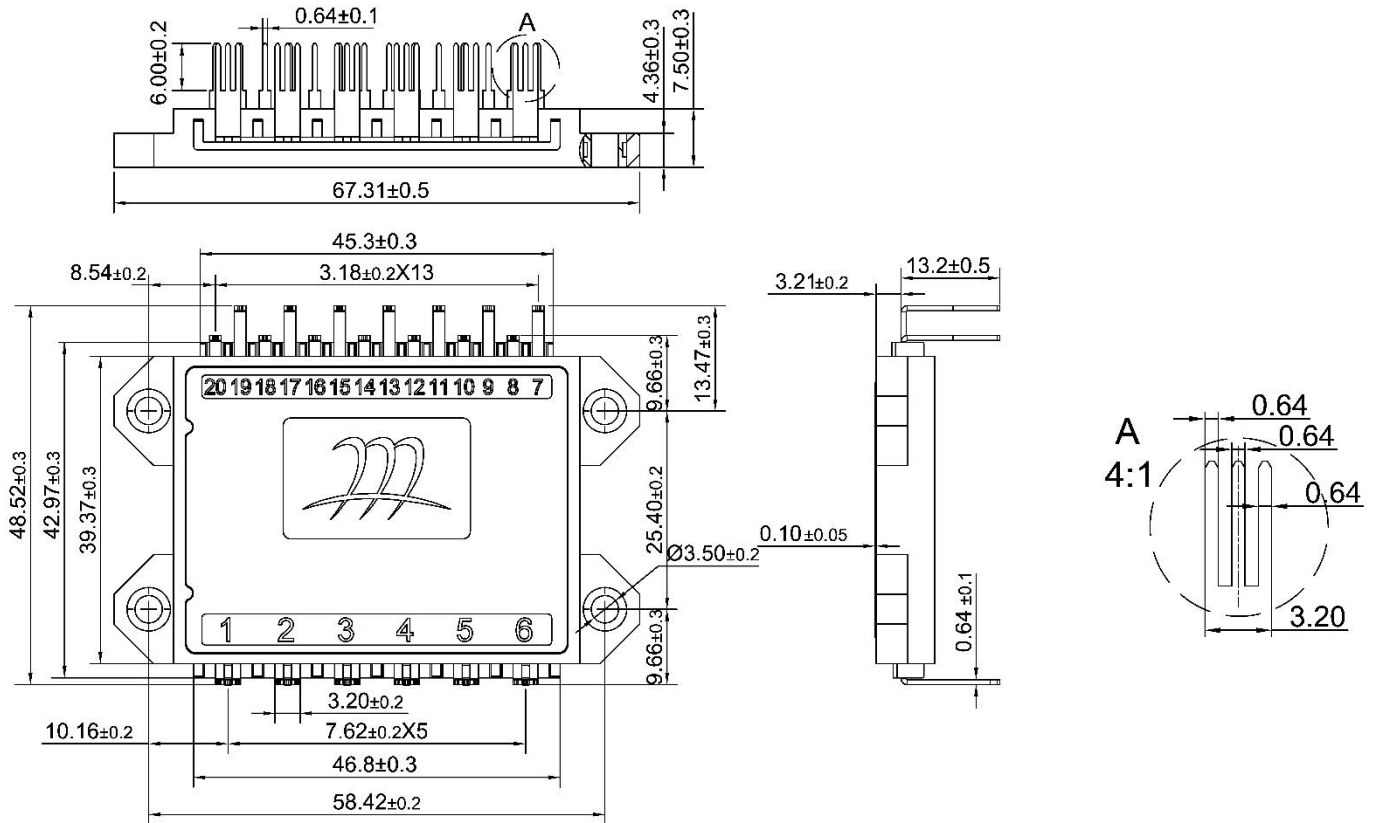
Fig.13 NTC Temperature Characteristics



Internal Circuit:



Package Outline (Unit: mm):





Date	Revision	Notes
01/10/2024	01	Initial Release
05/15/2024	02	Update Outlines

Announcements

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