南京银茂微电子

NJSM

GT100PI120T6H-T4

IGBT Module

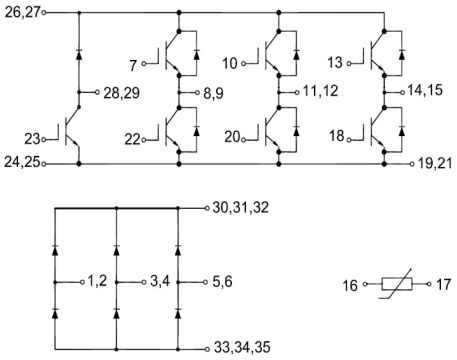
Features:

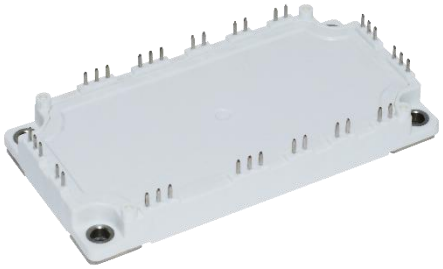
- Vces=1200V Ic=100A Trench & Field Stop IGBT Module
- Short Circuit Capability
- Low Switching Loss
- 100% RBSOA Tested(2×Ic)
- Low Stray Inductance
- Lead Free, Compliant with RoHS Requirement

Applications:

- Industrial Inverters
- Motor Drives
- Servo Drives

Circuit Diagram





Type	Package	Marking
GT100PI120T6H-T4	T6	GT100PI120T6H-T4

IGBT, Inverter

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 Limited by T_{Jmax}	T_C=90℃	100	A
		T_C=25℃	200	A
I_{CM}	Peak Collector Current Repetitive	Tp limited by T_{Jmax}	200	A
P_D	Maximum Power Dissipation (IGBT)	T_C=25℃, T_{Jmax}=175℃	700	W

2026 NJSM All rights reserved

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=4mA, V_{CE}=V_{GE}		5.0	5.8	6.6	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C=100A, V_{GE}=15V	T_J=25℃		2.20	2.65	V
			T_J=125℃		2.90		V
			T_J=175℃		3.20		V
I_{CES}	Collector-Emitter Leakage Current	V_{GE}=0V, V_{CE}=1200V, 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			11.38		nF
C_{oes}	Output Capacitance				4.18		nF
C_{res}	Reverse Transfer Capacitance				0.99		nF

Switching Characteristics

$t_{d(on)}$	Turn-on Delay Time	V_{CC}=600V, I_C=100A, R_{Gon}=4.7Ω, V_{GE}=±15V, Inductive Load	T_J=25℃		174		ns
			T_J=125℃		186		
			T_J=175℃		190		
t_r	Rise Time		T_J=25℃		53		ns
			T_J=125℃		60		
			T_J=175℃		64		
$t_{d(off)}$	Turn-off Delay Time	V_{CC}=600V, I_C=100A, R_{Goff}=4.7Ω, V_{GE}=±15V, Inductive Load	T_J=25℃		178		ns
			T_J=125℃		209		
			T_J=175℃		226		
t_f	Fall Time		T_J=25℃		86		ns
			T_J=125℃		106		
			T_J=175℃		123		
E_{on}	Turn-on Switching Loss	V_{CC}=600V, I_C=100A, R_{Gon}=4.7Ω, V_{GE}=±15V, di/dt=1250A/μs(T_J=175℃) Inductive Load	T_J=25℃		5.0		mJ
			T_J=125℃		6.3		
			T_J=175℃		6.9		

2026 NJSM All rights reserved

E_{off}	Turn-off Switching Loss	V_{CC}=600V, I_C=100A, R_{Goff}=4.7Ω, V_{GE}=±15V, du/dt=7900V/μs(T_J=175℃) Inductive Load	T_J=25℃		3.1		mJ
			T_J=125℃		4.2		
			T_J=175℃		4.8		
Q_g	Total Gate Charge	V_{GE}=+15V…-15V	T_J=25℃		663		nC
T_{SC}	V_{CC}=600V, V_{GE}=±15V,T_J=175℃note1					10	us
$R_{\theta JC}$	IGBT Thermal Resistance: Junction-to-Case (per IGBT)					0.215	℃/W
$R_{\theta CS}$	IGBT Thermal Resistance: Case-to-Sink (per IGBT, λ_{grease} = 1 W/(m • K))				0.184		℃/W

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

Diode, Inverter(SiC SBD)

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		100	A
I_{FM}	Diode Maximum Forward Current	tp=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℃		1.60	1.95	V
			T_J=125℃		2.15		
			T_J=175℃		2.52		
$R_{\theta JC}$	Diode Thermal Resistance: Junction-to-Case (per Diode)					0.420	℃/W
$R_{\theta CS}$	Diode Thermal Resistance: Case-to-Sink (per Diode, λ_{grease} = 1 W/(m • K))				0.360		℃/W

IGBT, Brake-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 Limited by T_{Jmax}	T_C=100℃	50	A
		T_C=25℃	100	A
I_{CM}	Peak Collector Current Repetitive	Tp limited by T_{Jmax}	100	A
P_D	Maximum Power Dissipation (IGBT)	T_C=25℃, T_{Jmax}=175℃	390	W

2026 NJSM All rights reserved

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=1.7mA, V_{CE}=V_{GE}		5.0	5.8	6.6	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C=50A, V_{GE}=15V	T_J=25℃		1.72	2.10	V
			T_J=125℃		2.15		V
			T_J=175℃		2.30		V
I_{CES}	Collector-Emitter Leakage Current	V_{GE}=0V, V_{CE}=1200V, 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			5.28		nF
C_{oes}	Output Capacitance				0.47		nF
C_{res}	Reverse Transfer Capacitance				0.07		nF

Switching Characteristics

$t_{d(on)}$	Turn-on Delay Time	V_{CC}=600V, I_C=50A, R_{Gon}=10Ω, V_{GE}=±15V, Inductive Load	T_J=25℃		58		ns
			T_J=125℃		58		
			T_J=175℃		59		
t_r	Rise Time		T_J=25℃		26		ns
			T_J=125℃		28		
			T_J=175℃		31		
$t_{d(off)}$	Turn-off Delay Time	V_{CC}=600V, I_C=50A, R_{Goff}=10Ω, V_{GE}=±15V, Inductive Load	T_J=25℃		183		ns
			T_J=125℃		213		
			T_J=175℃		222		
t_f	Fall Time		T_J=25℃		175		ns
			T_J=125℃		240		
			T_J=175℃		263		
E_{on}	Turn-on Switching Loss	V_{CC}=600V, I_C=50A, R_{Gon}=10Ω, V_{GE}=±15V, di/dt=1200A/μs(T_J=175℃) Inductive Load	T_J=25℃		2.5		mJ
			T_J=125℃		3.3		
			T_J=175℃		3.8		

2026 NJSM All rights reserved

E_{off}	Turn-off Switching Loss	V_{CC}=600V, I_C=50A, R_{Goff}=10Ω, V_{GE}=±15V, du/dt=5600V/μs(T_J=175℃) Inductive Load	T_J=25℃		3.3		mJ
			T_J=125℃		4.3		
			T_J=175℃		4.7		
Q_g	Total Gate Charge	V_{GE}=+15V…-15V	T_J=25℃		90		nC
T_{SC}	V_{CC}=600V, V_{GE}=±15V,T_J=175℃note2					10	us
$R_{\theta JC}$	IGBT Thermal Resistance: Junction-to-Case (per IGBT)					0.384	℃/W
$R_{\theta CS}$	IGBT Thermal Resistance: Case-to-Sink (per IGBT) (per IGBT, λ_{grease} = 1 W/(m • K))				0.329		℃/W

note2: Short circuit withstand time cannot exceed 10us under specified condition

Diode, Brake-Chopper

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		25	A
I_{FM}	Diode Maximum Forward Current	tp=1ms	50	A

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

Symbol	Description	Conditions		Min.	Typ.	Max.	Units
V_{FM}	Forward Voltage	I_F=25A	T_J=25℃		1.64	2.05	V
			T_J=125℃		1.75		
			T_J=175℃		1.73		
t_{rr}	Reverse Recovery Time	I_F=25A, -diF/dt=1500A/μs(T_J=175℃), V_R=600V, V_{GE}=-15V	T_J=25℃		240		ns
			T_J=125℃		380		
			T_J=175℃		460		
I_{rr}	Peak Reverse Recovery Current		T_J=25℃		37		A
			T_J=125℃		38		
			T_J=175℃		38		
Q_{rr}	Reverse Recovery Charge		T_J=25℃		2.5		μC
			T_J=125℃		4.2		
			T_J=175℃		5.0		

2026 NJSM All rights reserved

E_{rec}	Reverse Recovery Energy	I_F=25A, -diF/dt=1500A/μs(T_J=175℃), V_R=600V, V_{GE}=-15V	T_J=25℃		1.0		mJ
			T_J=125℃		1.8		
			T_J=175℃		2.2		
$R_{\theta JC}$	Diode Thermal Resistance: Junction-to-Case (per Diode)					1.107	℃/W
$R_{\theta CS}$	Diode Thermal Resistance: Case-to-Sink (per Diode, λ_{grease} = 1 W/(m • K))				0.949		℃/W

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

V_{RRM}	Repetitive Peak Reverse Voltage	T_J=25℃	1600	V
I_{FRMSM}	Maximum RMS Forward Current per Chip	T_J=80℃	118	A
I_{RMSM}	Maximum RMS Forward Current at Rectifier Output	T_J=80℃	150	A
I_{FSM}	Surge Current @t_p=10ms	T_J=25℃	1350	A
		T_J=150℃	1030	
I^2t	I^2t - value	T_J=25℃	9110	A^2s
		T_J=150℃	5300	

Electrical Characteristic values (T_C=25℃unless otherwise specified)

Symbol	Description	Conditions		Min.	Typ.	Max.	Units
V_F	Forward Voltage	I_F=100A	T_J=25℃		1.20		V
			T_J=125℃		1.17		
			T_J=150℃		1.17		
I_R	Reverse Current	V_R=1600V	T_J=25℃			1	mA
$R_{\theta JC}$	Thermal Resistance: Junction-to-Case (per Diode)					0.311	℃/W
$R_{\theta CS}$	Diode Thermal Resistance: Case-to-Sink (per Diode, λ_{grease} = 1 W/(m • K))				0.266		℃/W

2026 NJSM All rights reserved

Internal NTC-Thermistor Characteristics

Symbol	Conditions	Min.	Typ.	Max.	Units.
R_{25}	T_C=25℃		5		kΩ
△R/R	T_C=100℃, R_{100}=465Ω	-5		+5	%
P_{25}	T_C=25℃			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_{iso}	Isolation Voltage (All Terminals Shorted)	RMS, f=50Hz, 60s		2500		V
T_J	Maximum Junction Temperature		-40		175	℃
T_{JOP}	Maximum Operating Junction Temperature Range[note3]		-40		150	℃
T_{stg}	Storage Temperature		-40		125	℃
CTI	Comparative Tracking Index			200		
T	Mounting Screw:M5		3		6	N·m
G	Weight			300		g

note3: T_{JOP}> 150°C is only allowed for operation at overload conditions.

Ordering Information Table

Device code

G	T	100	PI	120	T6	H	-	T4
①	②	③	④	⑤	⑥	⑦		⑧

① - IGBT Module
② - Field Stop Trench Gate IGBT
③ - Rated Current (100=100A)
④ - Circuit Configuration:PI (Power Integrated)
⑤ - Rated Voltage (120=1200V)
⑥ - Package Type
⑦ - Test Level (Pass the Important Reliability Test-Industrial Grade)
⑧ - Internal Control Code

2026 NJSM All rights reserved

Characteristic diagram

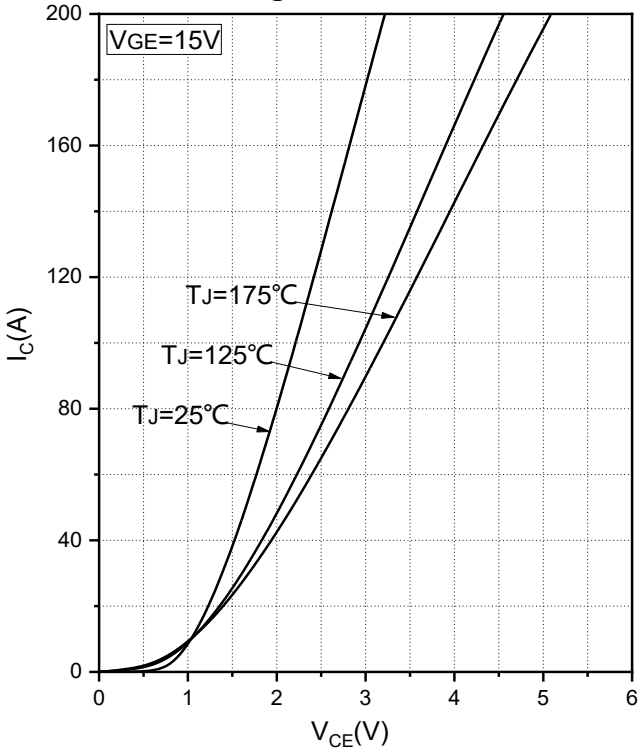


Fig.1 Typical Saturation Voltage Characteristics(Inverter)

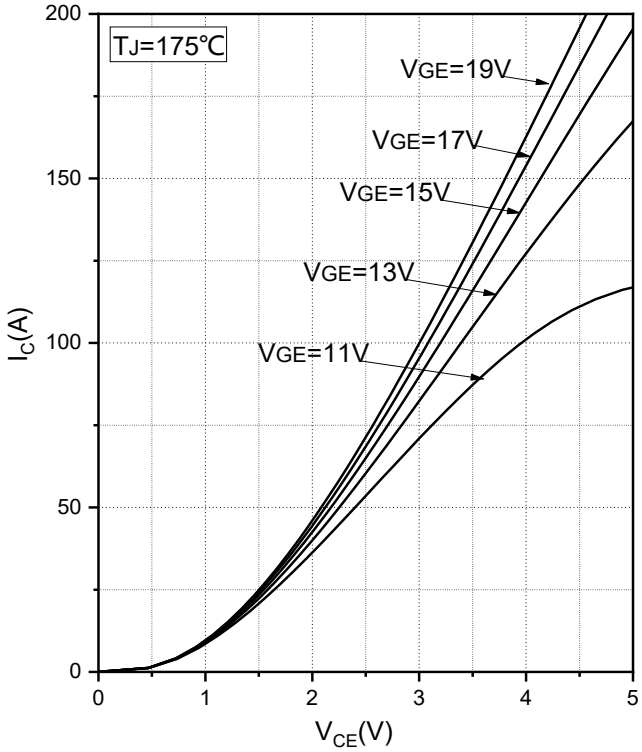


Fig.2 Typical Output Characteristics(Inverter)

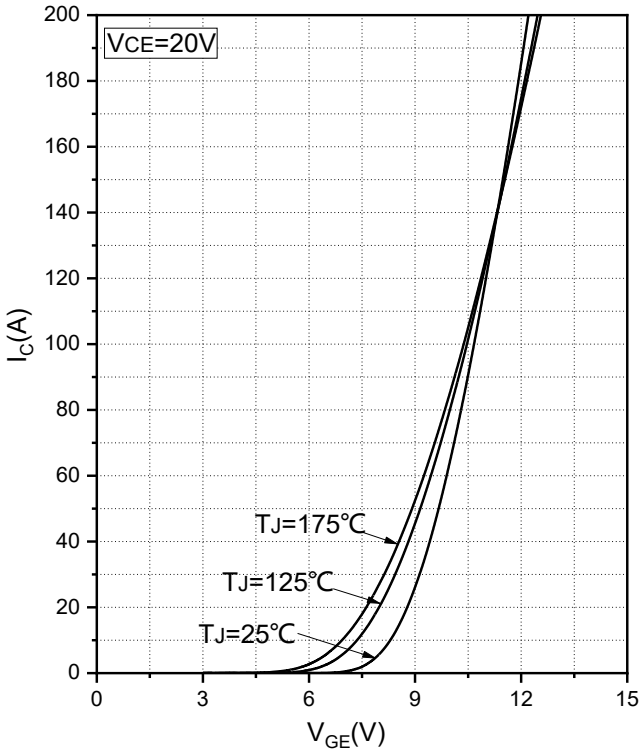


Fig.3 Transfer Characteristic(Inverter)

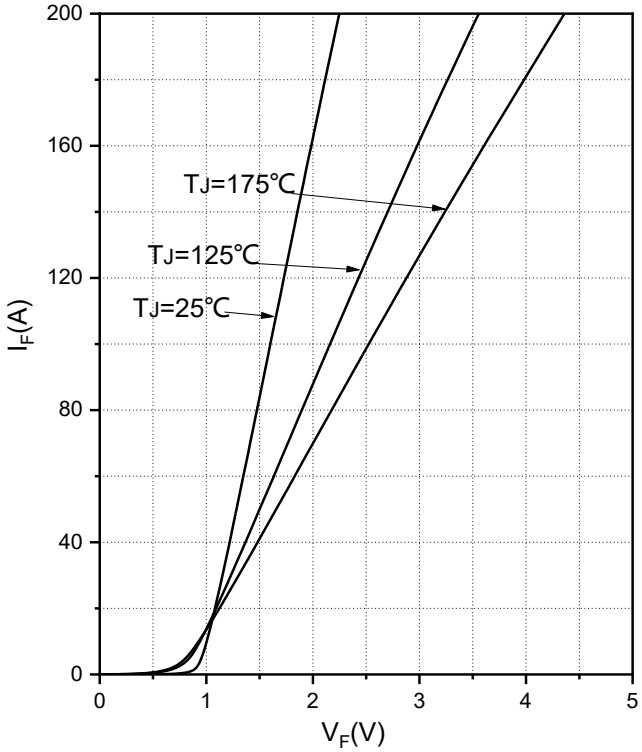


Fig.4 Forward Characteristics of SiC SBD(Inverter)

2026 NJSM All rights reserved

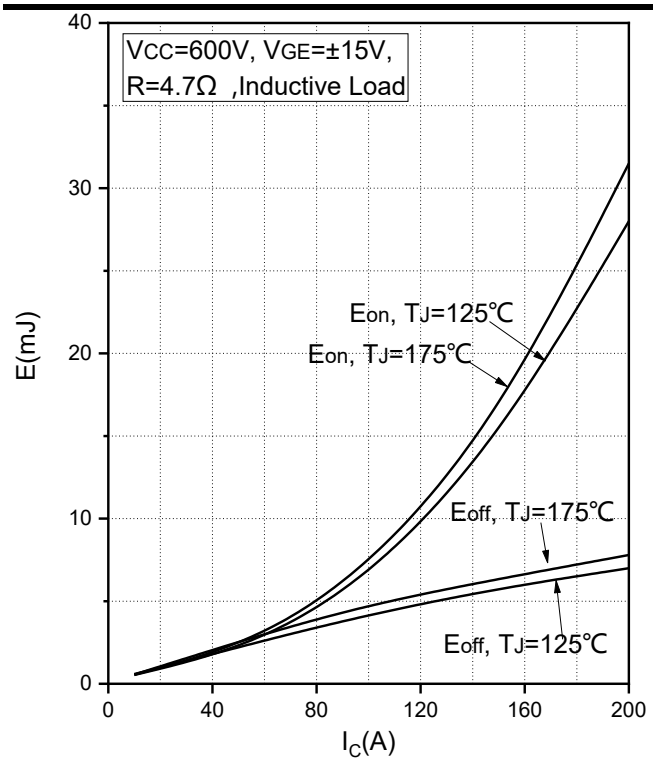


Fig.5 Typical Switching Loss vs. Collector Current(Inverter)

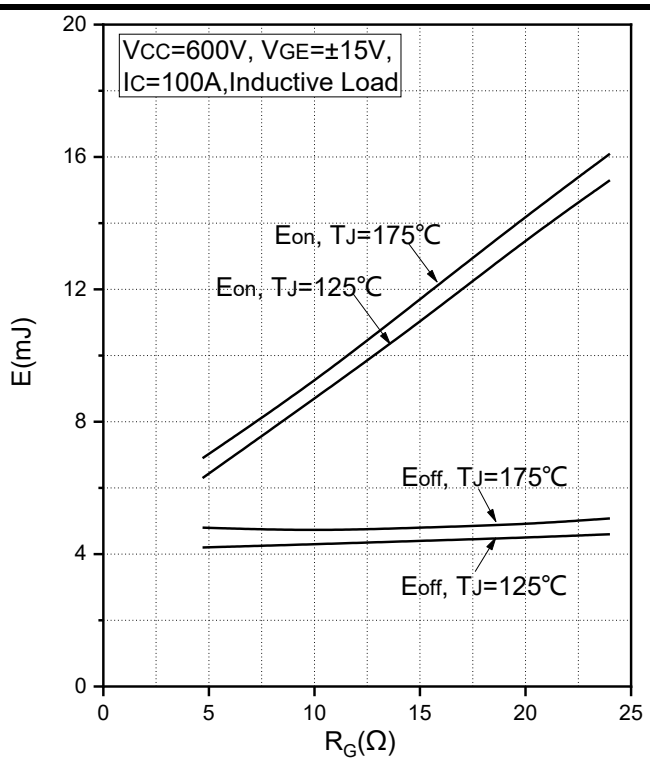


Fig.6 Typical Switching Loss vs. Gate Resistance(Inverter)

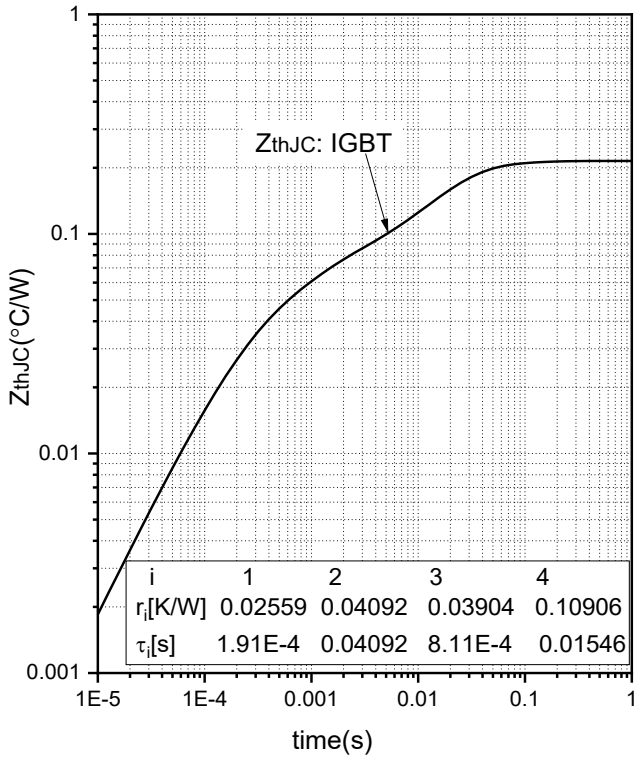


Fig.7 Transient Thermal Impedance (Inverter IGBT)

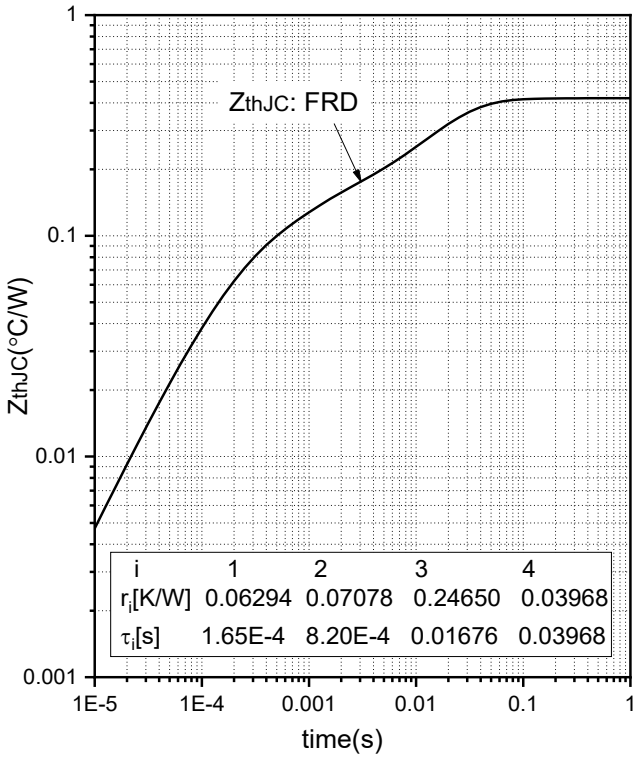


Fig.8 Transient Thermal Impedance (Inverter SiC SBD)

2026 NJSM All rights reserved

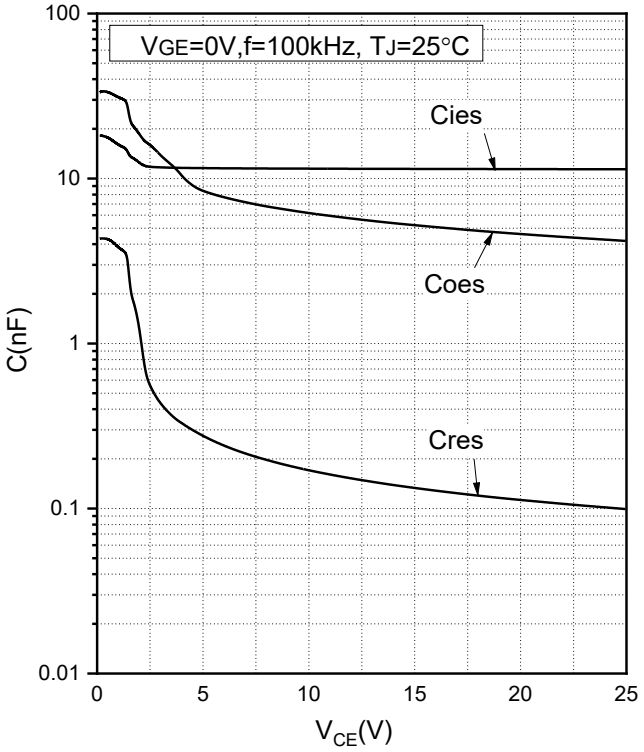


Fig.9 Capacitance Characteristics(Inverter)

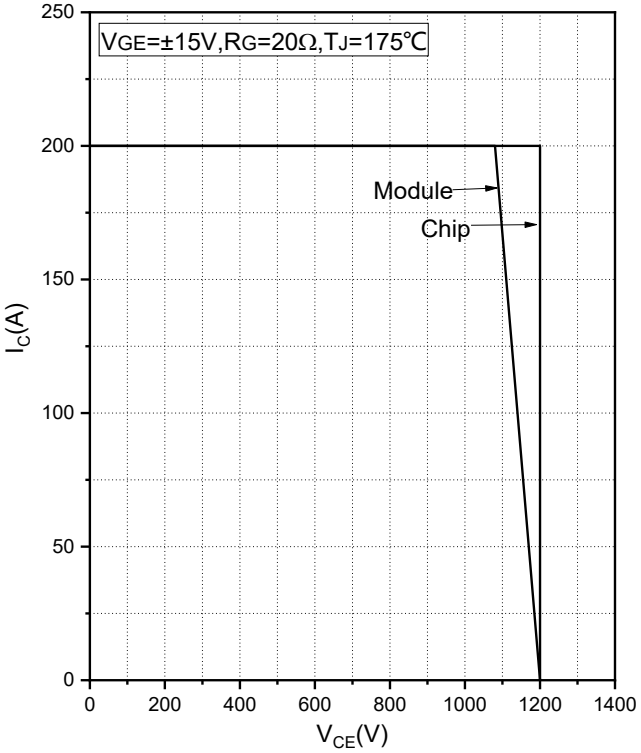


Fig.10 Reverse Bias Safe Operation Area (RBSOA) (Inverter)

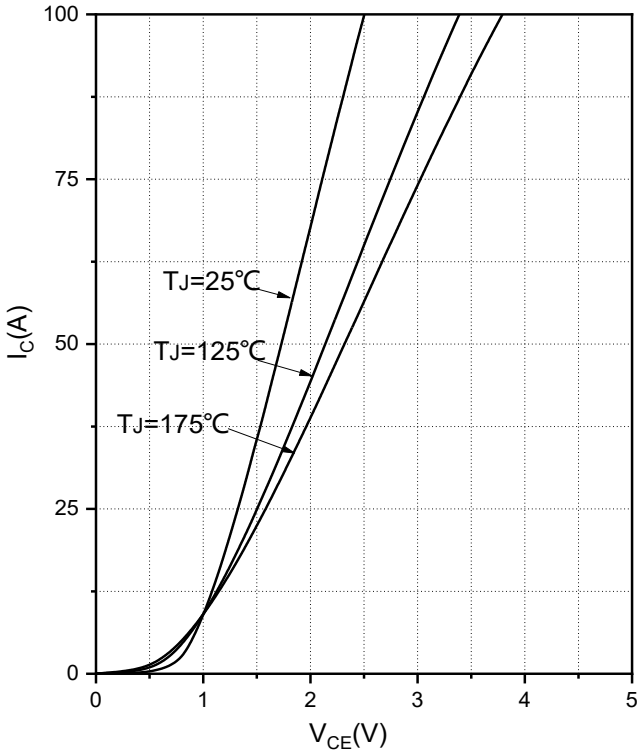


Fig.11 Typical Saturation Voltage Characteristics (Chopper)

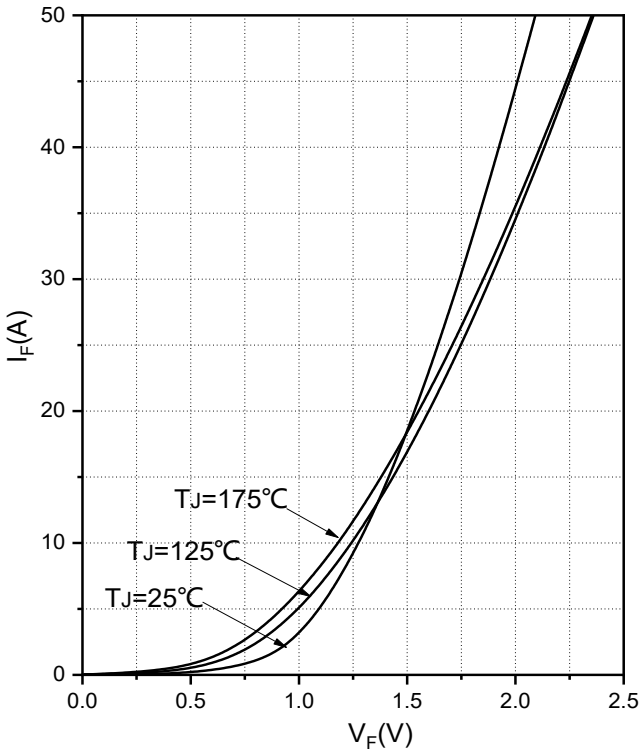


Fig.12 Forward Characteristics of Diode(Chopper)

2026 NJSM All rights reserved

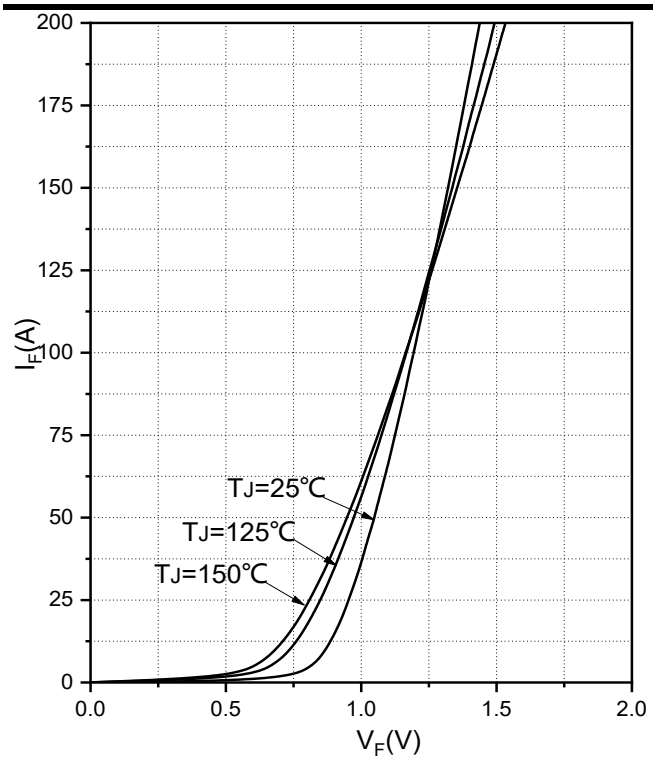


Fig.13 Forward Characteristics of Diode (Rectifier)

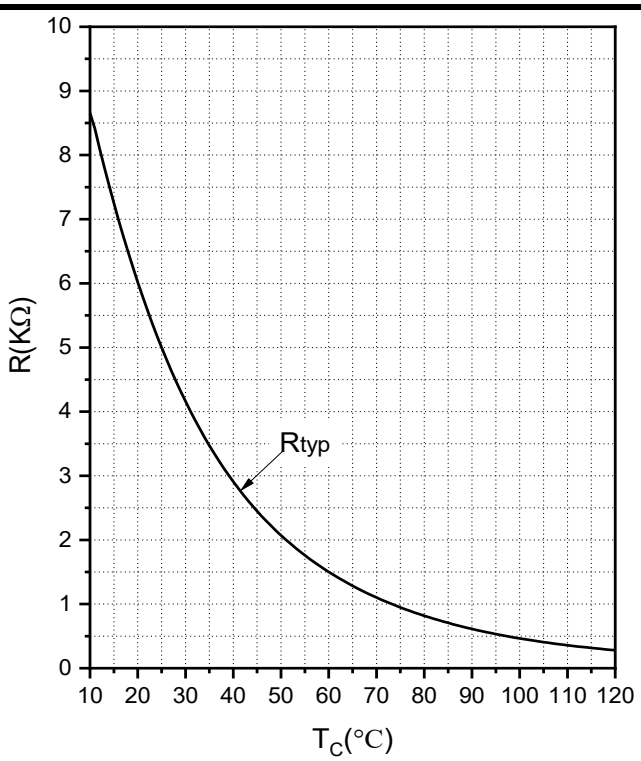
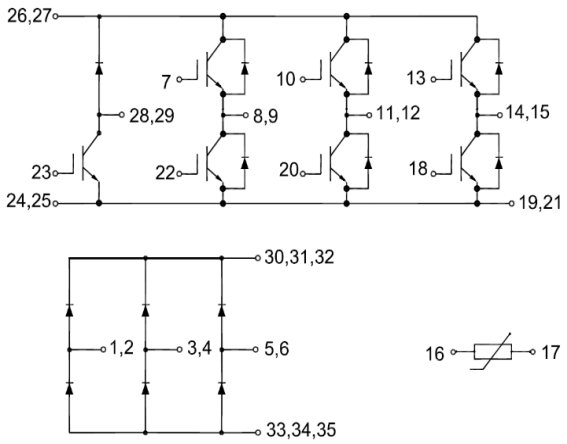


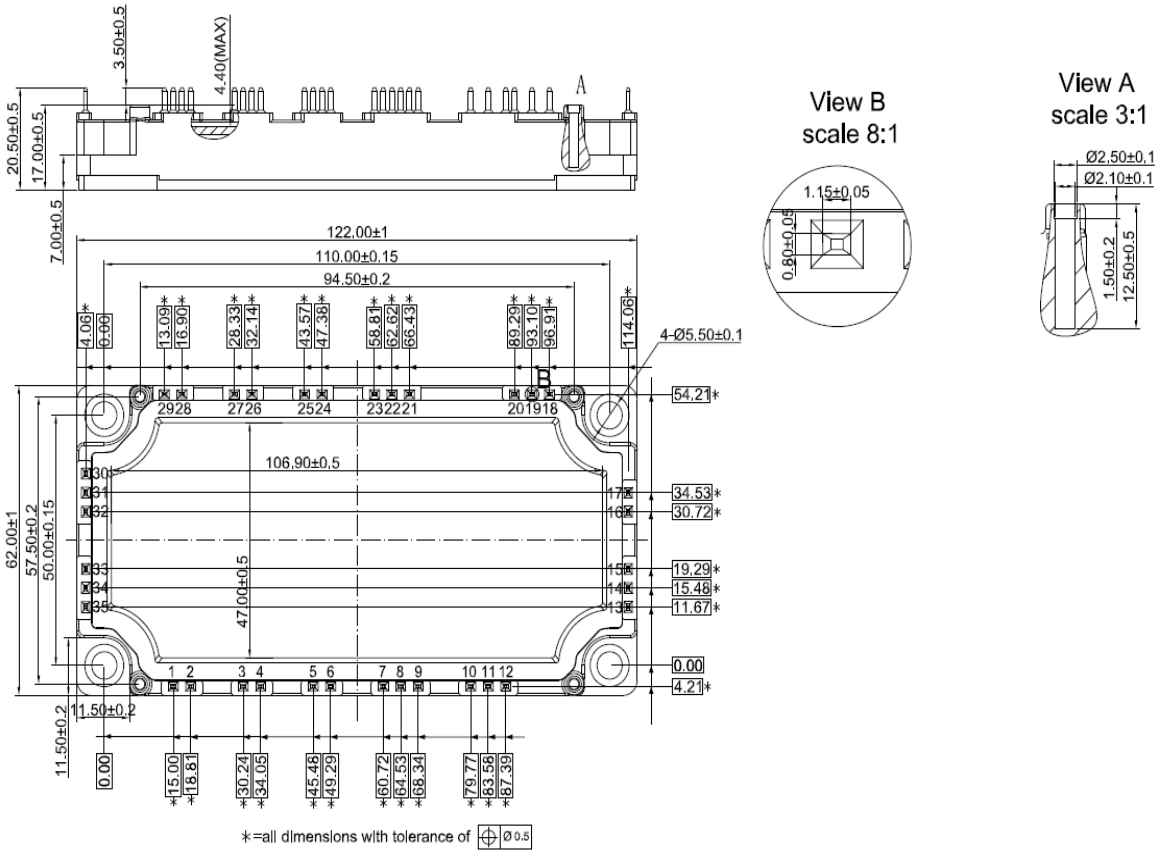
Fig.14 NTC Temperature Characteristics

2026 NJSM All rights reserved

Internal Circuit:



Package Outline (Unit: mm):



2026 NJSM All rights reserved

Revision	Notes
03	Engineering Sample Datasheet

Announcement

Information in this document is believed to be accurate and reliable. However, NJSME does not give any representations or warranties, expressed or implied, as to the accuracy or completeness of such information and shall have no liability for the consequences of use of such information.

Right to Make Changes

NJSME reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.

The datasheet with “REV.” + “Arabic numerals” is based on engineering data for initial reference purpose only.

The released datasheet would be issued with “REV.” + “alphabet characters”.

2026 NJSM All rights reserved