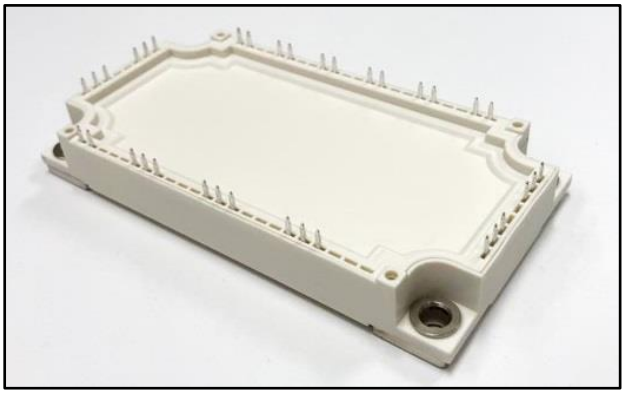
JG1H200S120DT2

Features

- Low $V_{CE(sat)}$
- Fast Switching
- High Ruggedness
- Short-Circuit Rated

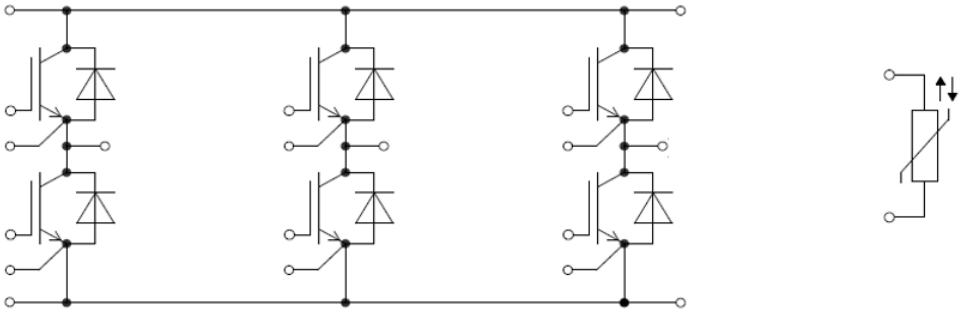
Product Summary	
V_{CES}	1200V
I_C	200A
$V_{CE(sat),typ}$	1.6V



Applications

- General Purpose Inverters
- Frequency Converters
- Industrial Motor Drives
- Uninterruptible Power Supply (UPS)
- Servos

Internal Connection



• IGBT, Inverter

Absolute Maximum Ratings

Parameter	Symbol	Limit	Unit
Collector-to-Emitter Voltage	V_{CES}	1200	V
Gate-to-Emitter Voltage	V_{GES}	±20	
Transient Gate-emitter Voltage ($t_p \leq 10\mu s$, D < 0.010)		±30	
Continuous DC Collector Current (T_c = 100°C, T_J = 175°C)	I_{CDC}	200	A
Repetitive Peak Collector Current (t_p = 1ms)	I_{CRM}	400	
Maximum Power Dissipation (T_c = 25°C, T_J = 175°C)	$P_{D(max)}$	1042	W

Electrical Characteristics (1), (2)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector-to-Emitter Breakdown Voltage	BV_{CES}	V_{GE} = 0V, I_C = 250μA	1200	-	-	V
Collector-to-Emitter Leakage Current	I_{CES}	V_{CE} = 1200V, V_{GE} = 0V	-	-	5	mA
Gate-to-Emitter Leakage Current	I_{GES}	V_{CE} = 0V, V_{GE} = ±20V	-	-	400	nA
Gate Threshold Voltage	$V_{GE(th)}$	V_{CE} = V_{GE} , I_C = 8mA	5.0	6.5	7.5	V
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	V_{GE} = 15V, I_C = 200A	-	1.6	2.0	
		V_{GE} = 15V, I_C = 200A, T_J = 150°C	-	2.15	-	
		V_{GE} = 15V, I_C = 200A, T_J = 175°C	-	2.25	-	
Total Gate Charge	Q_g	V_{CC} = 600V, V_{GE} = ±15V, I_C = 200A	-	2.2	-	μC
Internal Gate Resistance	R_{Gint}	-	-	2.4	-	Ω
Input Capacitance	C_{iss}	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz	-	15.4	-	nF
Output Capacitance	C_{oss}		-	0.73	-	
Reverse Transfer Capacitance	C_{rss}		-	0.15	-	
Turn-on Delay time	$t_{d(ON)}$	V_{CC} = 600V, V_{GE} = ±15V, R_G = 1Ω, I_C =200A, L_{load} = 0.3mH, Energy losses include “tail” and diode reverse recovery.	-	374	-	ns
Rise Time	t_r		-	82	-	
Turn-off Delay time	$t_{d(OFF)}$		-	387	-	
Fall Time	t_f		-	83	-	
Turn-On Switching Loss	E_{on}		-	13	-	mJ
Turn-Off Switching Loss	E_{off}		-	13.9	-	
IGBT Total Switching Loss	E_{ts}		-	26.9	-	
Turn-on Delay time	$t_{d(ON)}$	V_{CC} = 600V, V_{GE} = ±15V, R_G = 1Ω, I_C =200A, L_{load} = 0.3mH, Energy losses include “tail” and diode reverse recovery. T_J = 150°C	-	396	-	ns
Rise Time	t_r		-	93	-	
Turn-off Delay time	$t_{d(OFF)}$		-	486	-	
Fall Time	t_f		-	139	-	
Turn-On Switching Loss	E_{on}		-	28.5	-	mJ
Turn-Off Switching Loss	E_{off}		-	21.9	-	
IGBT Total Switching Loss	E_{ts}		-	50.4	-	
Short Circuit Collector Current	$I_{C(SC)}$	V_{GE} = 15V, V_{CC} ≤ 600V, t_{SC} ≤ 10μs	-	850	-	A

• Diode, Inverter

Absolute Maximum Ratings

Parameter	Symbol	Limit	Unit
Repetitive Peak Reverse Voltage	V_{RRM}	1200	V
Continuous DC Forward Current	I_F	200	A
Repetitive Peak Forward Current	I_{FRM}	400	

Electrical Characteristics (1)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Diode Forward Voltage	V_F	I_F = 200A	-	1.65	2.0	V
		I_F = 200A T_J = 150°C	-	1.95	-	
		I_F = 200A T_J = 175°C	-	2.0	-	
Diode Reverse-Recovery Charge	Q_{rr}	V_R = 600V, I_F = 200A, dI_F/dt = -1850A/μs	-	19.5	-	μC
Diode Peak Reverse-Recovery Current	I_{rrm}		-	89	-	A
Diode Reverse-Recovery Loss	E_{rr}		-	8.35	-	mJ

• NTC thermistors

Characteristics

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Rated Resistance	R_{25}		-	5.0	-	kΩ
Deviation of R100	ΔR/R	T_C =100°C R_{100} = 493.3Ω	-5	-	5	%
Power Dissipation	P_{25}		-	-	20.0	mW
B-value	$B_{25/50}$	$R_2 = R_{25} \exp [B_{25/50}(1/T_2 - 1/(298.15\ K))]$	-	3375	-	K

• Module

Absolute Maximum Ratings

Parameter	Symbol	Limit	Unit
Maximum Junction Temperature	T_j	-40 to +175	°C
Operating Junction Temperature	$T_{vj\ op}$	-40 to +150	
Storage Temperature	T_{stg}	-40 to +125	
Isolation Voltage (f = 50Hz, t = 1min)	V_{ISO}	2.5	kV

Characteristics

Parameter	Symbol	Min	Typ	Max	Unit
Material of Module Baseplate	-	-	Cu	-	-
Internal Isolation	-	-	Al_2O_3	-	-
Creepage Distance, Terminal to Terminal	-	-	10	-	mm
Clearance, Terminal to Terminal	-	-	7.5	-	mm
Stray Inductance, Module	L_{SCE}	-	21	-	nH
Module Lead Resistance, Terminal to Chip	$R_{CC'+EE'}$	-	1.8	-	mΩ
Junction-to-Case Thermal Resistance, per IGBT, Inverter	$R_{\theta JC}$	-	0.12	-	°C/W
Junction-to-Case Thermal Resistance, per Diode, Inverter		-	0.19	-	
Case-to-Heatsink Thermal Resistance, per IGBT, Inverter	$R_{\theta CH}$	-	0.09	-	°C/W
Case-to-Heatsink Thermal Resistance, per Diode, Inverter		-	0.16	-	
Case-to-Heatsink Thermal Resistance, per Module		-	0.01	-	
Mounting Torque for Module Mounting, Screw M5	M	3.0	-	6.0	Nm
Weight per Module	G	-	300	-	g

(1) T_J = 25°C unless otherwise specified

(2) t_r: from 10% of Ic to 90% of Ic; t_f: from 90% of Ic to 10% of Ic;

E_{on}: from 10% of V_{GE} to 10% of V_{CE}; E_{off}: from 90% of V_{GE} to 10% of Ic.

• Typical Electrical Characteristics

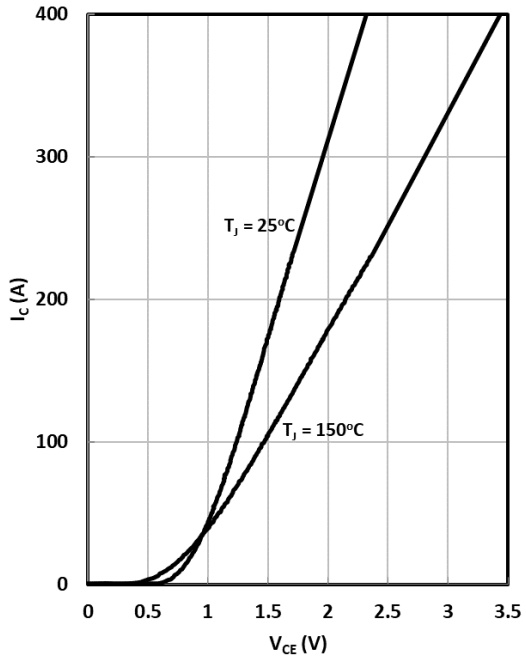


Fig. 1 IGBT (Inverter) Output Characteristics

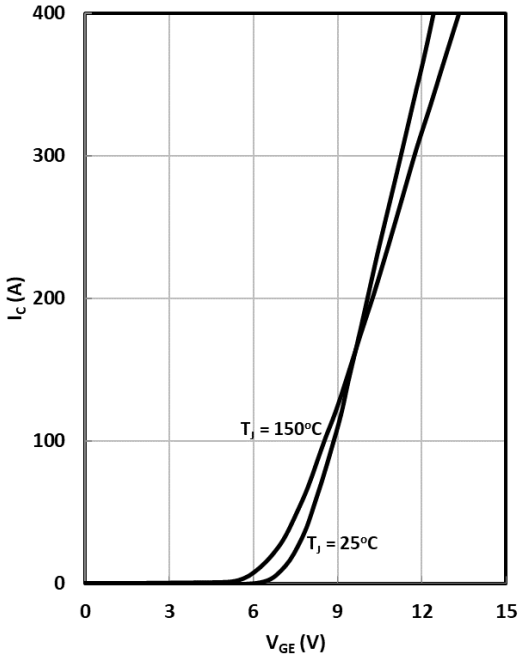


Fig. 2 IGBT (Inverter) Transfer Characteristics

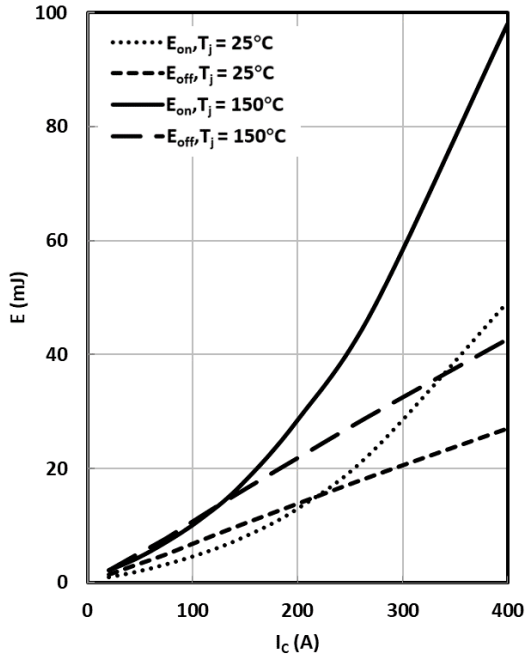


Fig. 3 IGBT (Inverter) Switching Loss vs.Ic
(V_{CC} = 600V, V_{GE} = ±15V, R_G = 1Ω)

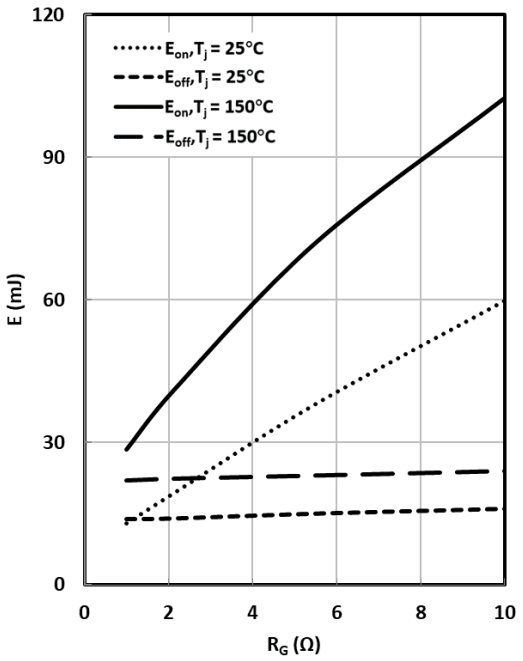


Fig. 4 IGBT (Inverter) Switching Loss vs.R_G
(V_{CC} = 600V, V_{GE} = ±15V, I_C = 200A)

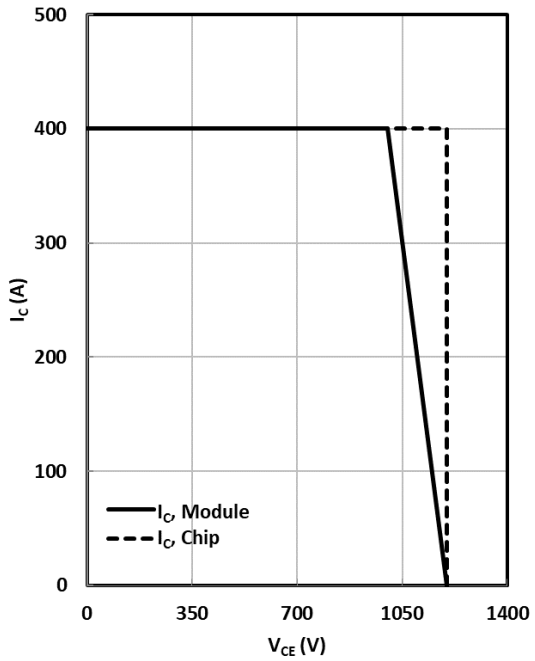


Fig. 5 RBSOA

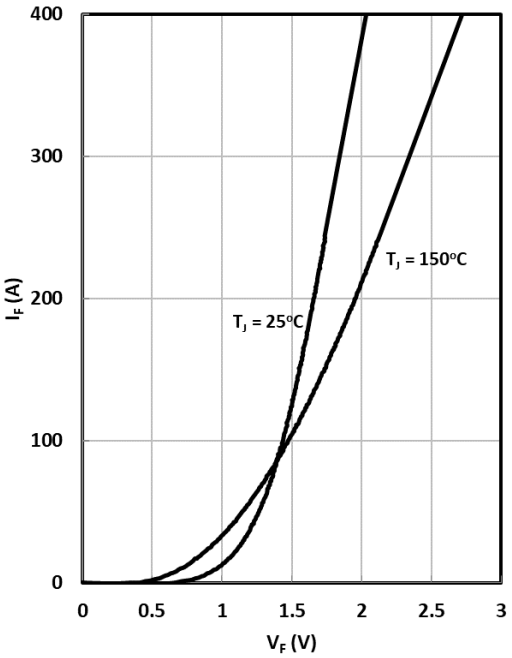


Fig. 6 Diode (Inverter) Forward Characteristics

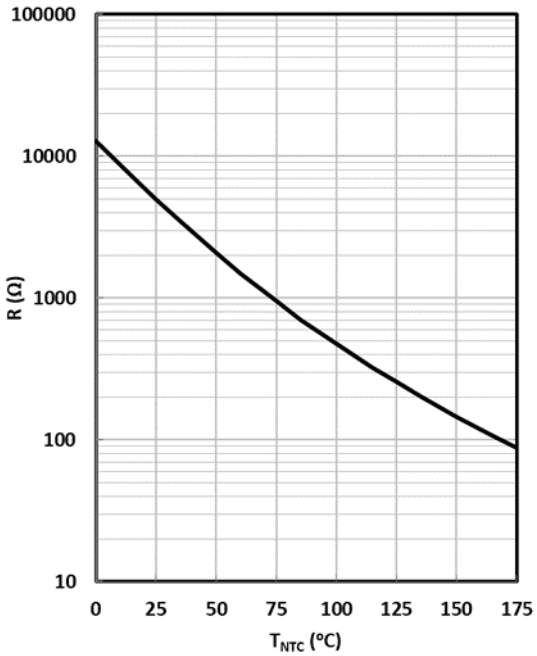
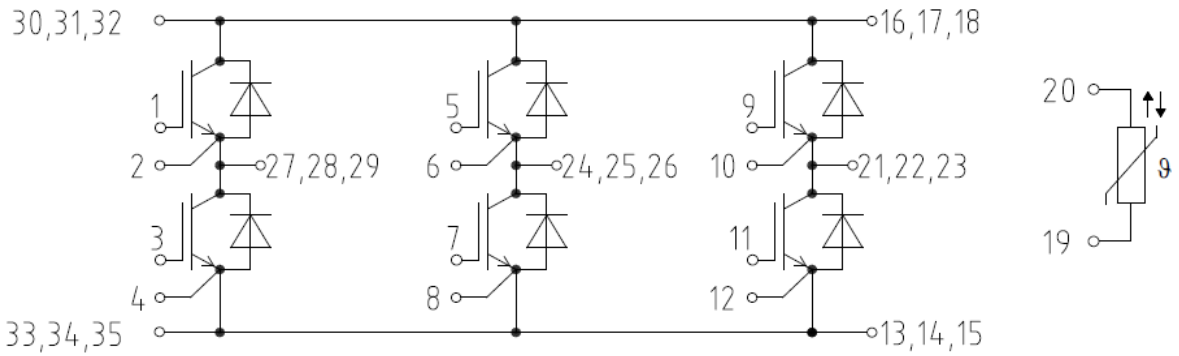
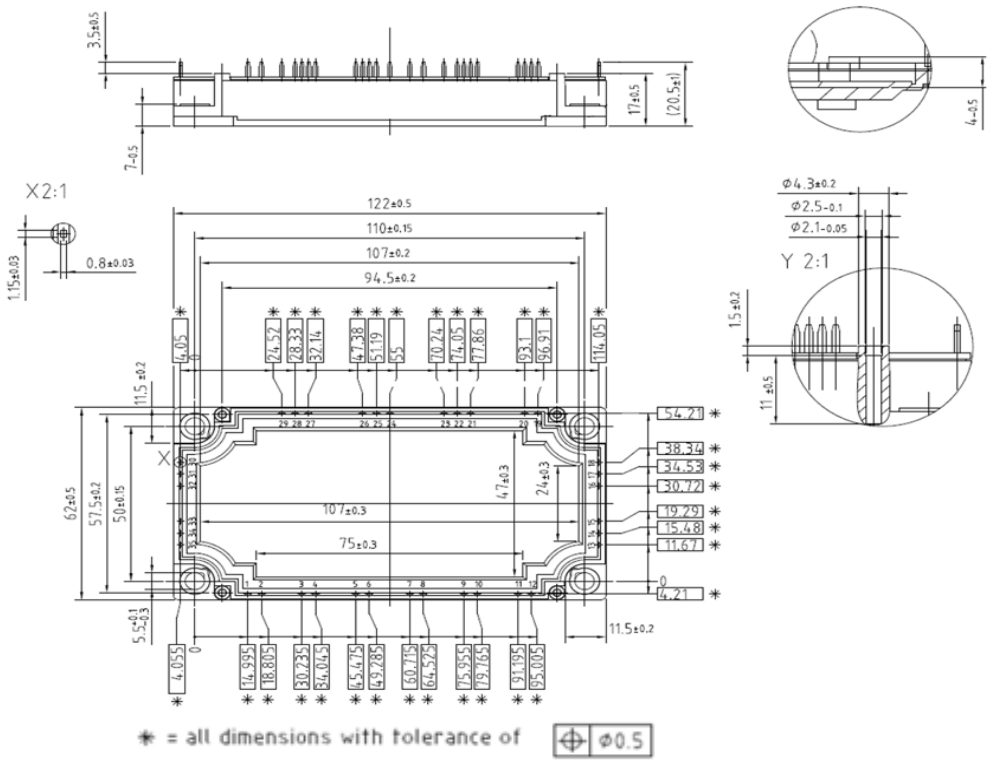


Fig. 7 NTC Temperature Characteristics

- **Circuit diagram**



- **Package Dimensions**



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