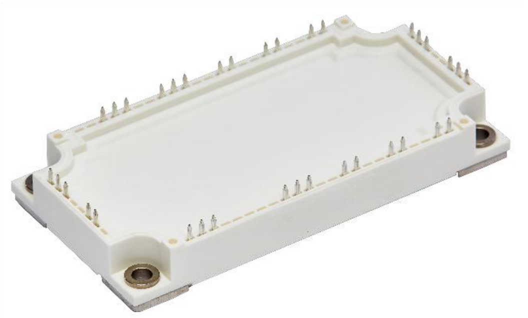
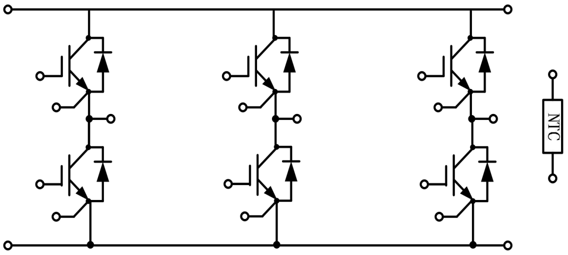
EconoPIM3 SixPack IGBT Module

V_{CES}= 1200V, I_C= 100A, $V_{CE(sat)}$= 1.6V



Features

- 1200V Trench Gate/Field Termination Process
- Low Switching Losses
- $V_{CE(Sat)}$ With Positive Temperature Coefficient
- Integrated NTC Temperature Sensor



Applications

- Power Conversion System
- Inverter
- Servo Drives

IGBT, Inverter

Maximum Ratings

Parameter	Symbol	Condition	Value	Unit
Collector-emitter voltage	V_{CES}	T_{vj}=25℃, V_{GE}=0V	1200	V
Continuous DC collector current	$I_{C\ nom}$	T_C=100℃, $T_{vj\ max}$=175℃	100	A
Repetitive peak collector current	I_{CRM}	t_P=1ms	200	A
Gate-emitter peak voltage	V_{GES}	T_{vj}=25℃	±20	V
Maximum Power Dissipation (IGBT)	P_D	T_C=25℃, T_J=175℃	656	W
Short Circuit Withstand Time	t_{sc}	V_{CC}=600V, V_{GE}≤15V	10	us

Characteristics Values

Parameter	Symbol	Conditions		Value			Unit
				Min.	Typ.	Max.	
Collector-emitter saturation voltage	$V_{CE(sat)}$	I_C=100A, V_{GE}=15V	T_{vj}=25℃		1.6	1.7	V
			T_{vj}=125℃		1.8	1.9	V
Gate-emitter threshold voltage	$V_{GE(th)}$	I_C=1mA, V_{CE}=V_{GE}	T_{vj}=25℃	5.4	5.5	5.7	V
Input capacitance	C_{ies}	V_{CE}=25V, V_{GE}=0V, f=1MHz	T_{vj}=25℃		10		nF
Reverse transfer capacitance	C_{res}		T_{vj}=25℃		0.28		nF
Collector-emitter cut-off current	I_{CES}	V_{CE}=1200V, V_{GE}=0V	T_{vj}=25℃			1	mA
Gate-emitter leakage current	I_{GES}	V_{CE}=0V, V_{GE}=20V	T_{vj}=25℃			100	nA

Turn-on delay time	$t_{d\ on}$	V_{CC}=600V, I_C=100A, V_{GE}=±15V, R_g=15Ω	T_{vj}=25℃		260		ns
			T_{vj}=125℃		200		ns
Rise time	t_r		T_{vj}=25℃		74		ns
			T_{vj}=125℃		76		ns
Turn-off delay time	$t_{d\ off}$		T_{vj}=25℃		359		ns
			T_{vj}=125℃		404		ns
Fall time	t_f		T_{vj}=25℃		310		ns
			T_{vj}=125℃		435		ns
Turn-on energy loss per pulse	E_{on}		T_{vj}=25℃		12.5		mJ
			T_{vj}=125℃		16.5		mJ
Turn-off energy loss per pulse	E_{off}		T_{vj}=25℃		8.35		mJ
			T_{vj}=125℃		11.8		mJ
Junction-To-Case (IGBT)	$R_{θJC}$				0.33		K/W

Diode, Inverter

Maximum Ratings

Parameter	Symbol	Conditions	Value	Unit
Repetitive peak reverse voltage	V_{RRM}	T_{vj}=25℃	1200	V
Continuous forward current	I_F		100	A
Repetitive peak forward current	I_{FRM}	t_P= 1ms	200	A

Characteristics Values

Parameter	Symbol	Conditions		Value			Unit
				Min.	Typ.	Max.	
Forward voltage	V_F	I_F=100A, V_{GE}=0V	T_{vj}=25℃	1.69	1.7	1.75	V
			T_{vj}=125℃		1.79		V
Peak reverse recovery current	I_{rr}	I_F=100A, di/dt=800A/μs, V_{rr}=600V, V_{GE}= -15V	T_{vj}=25℃		55		A
			T_{vj}=125℃		60		A
Recovered charge	Q_{rr}		T_{vj}=25℃		5.8		μC
			T_{vj}=125℃		12		μC
Reverse recovery energy	E_{rec}		T_{vj}=25℃			2.0	mJ
			T_{vj}=125℃			3.9	mJ
Junction-To-Case Diode	$R_{θJC}$					0.39	K/W

Module

Characteristics Values

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Isolation test voltage	V_{ISOL}	RMS, f=50Hz, t=1min		2.5		kV
Maximum Junction Temperature	T_J				175	℃
Maximum Operating Junction Temperature Range	T_{JOP}		-40		+150	℃
Storage temperature	T_{stg}		-40		125	℃
Case-To-Sink (Conductive Grease Applied)	$R_{\theta CS}$			0.1		K/W
Mounting torque for module mounting	M		3	-	5	N·m
Weight	G			300		g

Typical Characteristics

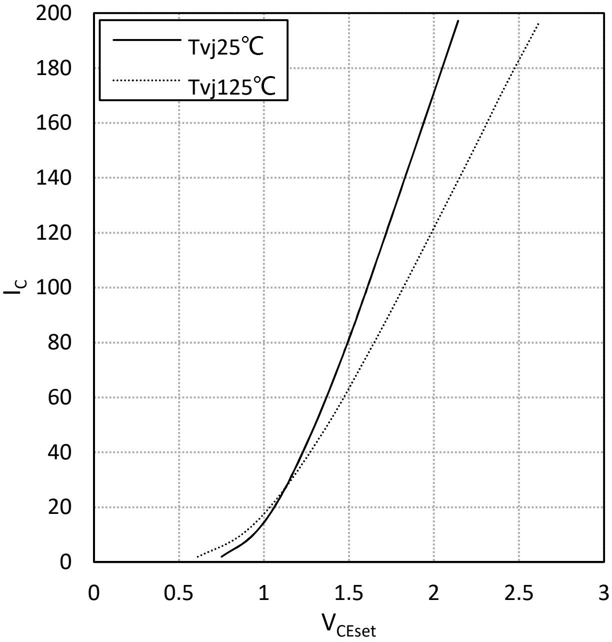


Fig.1 output characteristic IGBT Inverter (typical)

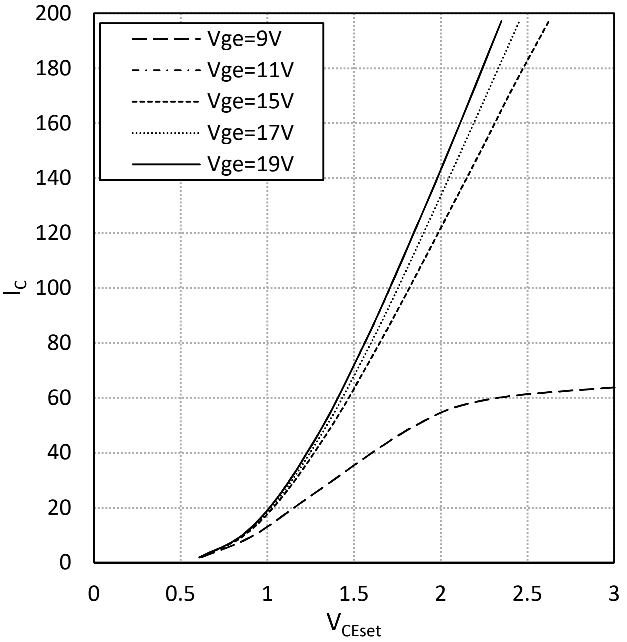


Fig.2 output characteristic IGBT Inverter (typical)

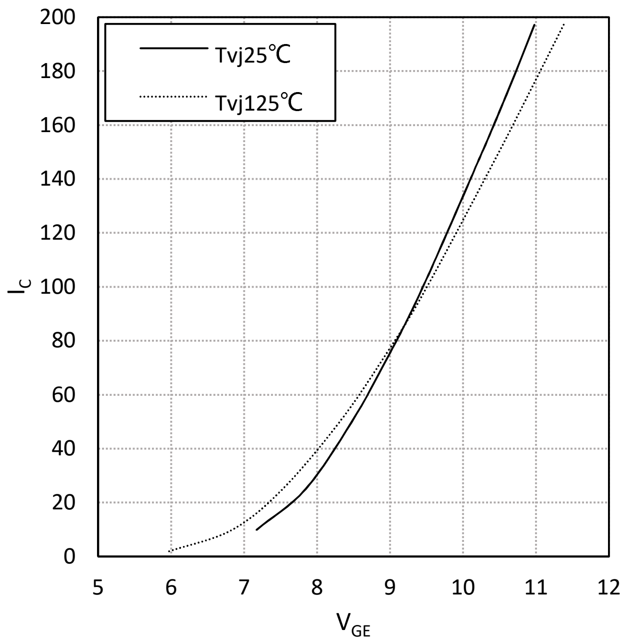


Fig.3 transfer characteristic IGBT Inverter (typical)

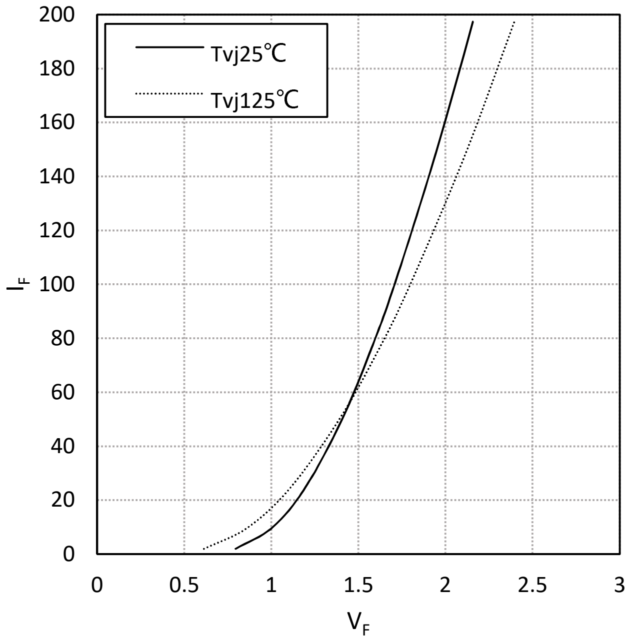


Fig.4 forward characteristic of Diode, Inverter (typical)

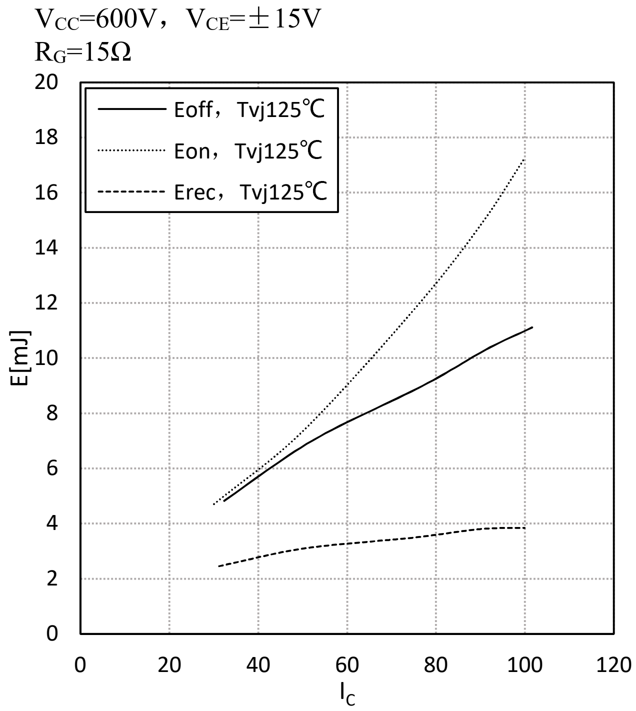


Fig.5 switching losses IGBT Inverter (typical)

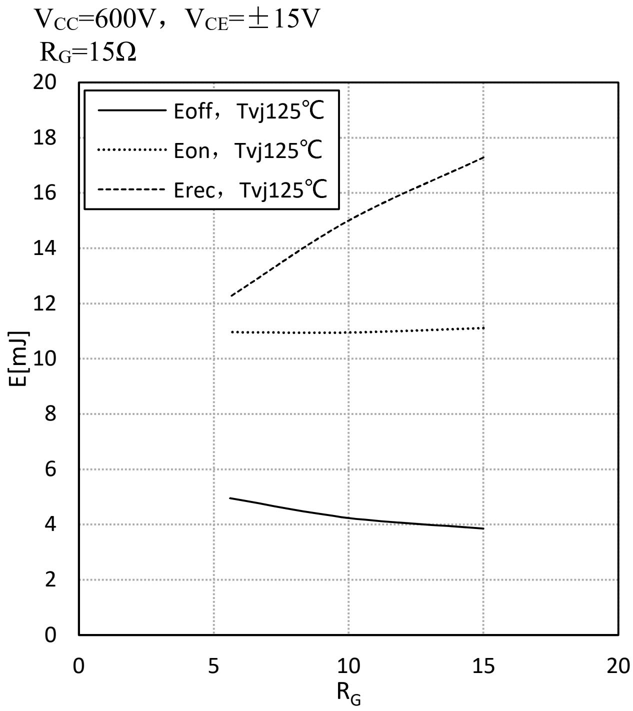


Fig.6 switching Losses vs. Gate Resistance (Typical)

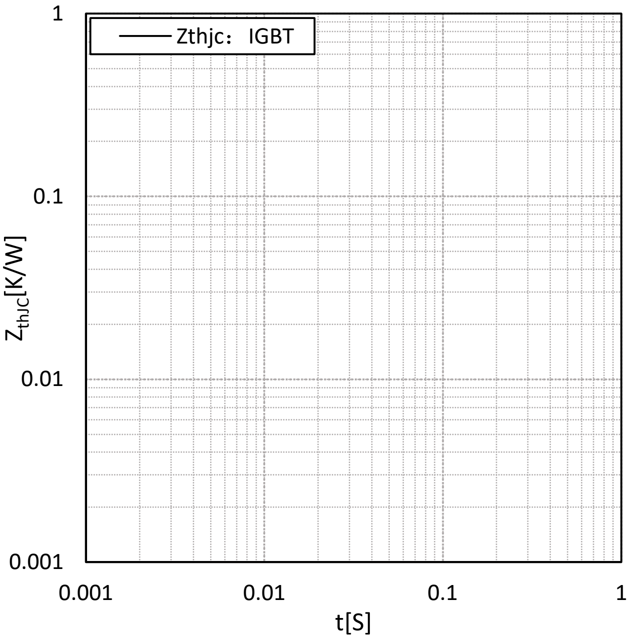


Fig.7 Transient thermal impedance IGBT

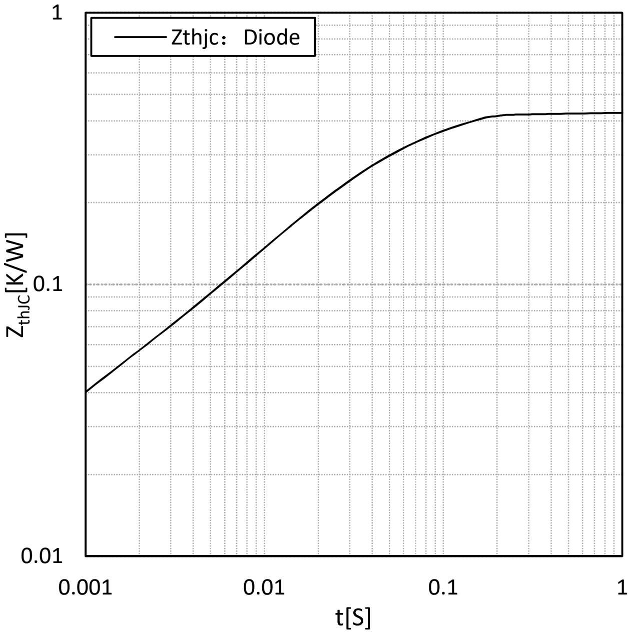
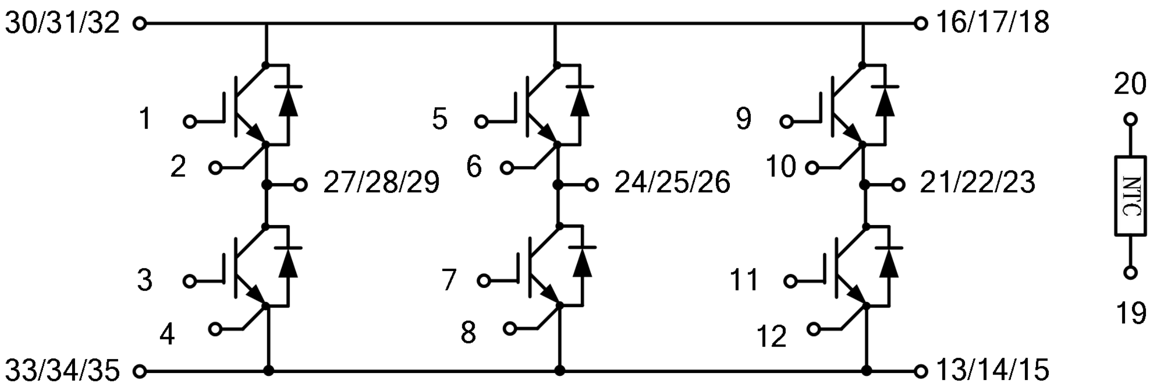
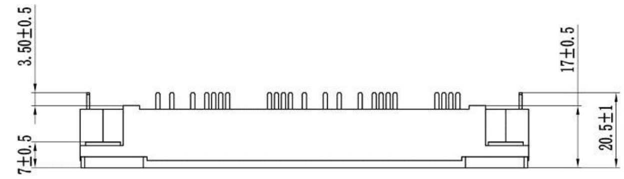


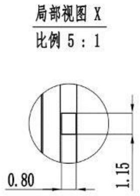
Fig.8 Transient thermal impedance Diode

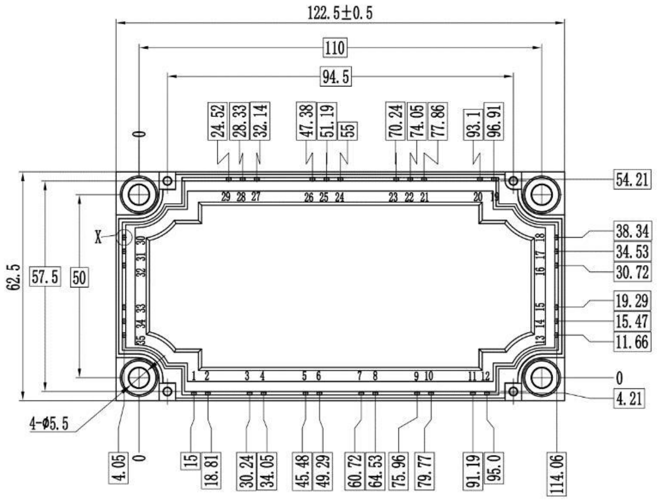
Circuit Diagram

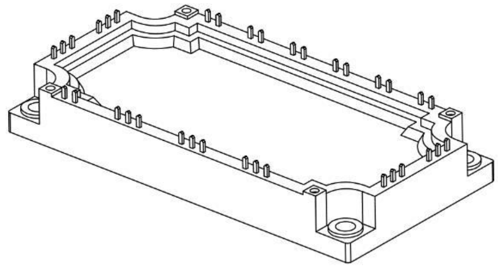


Package Outlines (Unit:mm)









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