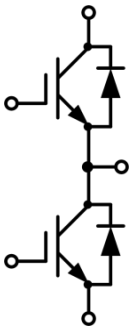
62mm Half Bridge IGBT Module

V_{CES}= 1200V, I_C= 600A, $V_{CE(sat)}$= 1.82V

Features

- 1200V Trench/Field Stop Technology
- Low switching losses
- Vcesat has a positive temperature coefficient



Applications

- UPS Systems
- Motor Drivers
- Three-level Application
- Servo Drivers

IGBT, Inverter

Maximum Ratings

Parameter	Symbol	Test Condition	Value	Unit
Collector-Emitter voltage	V_{CES}	T_{vj}=25℃	1200	V
Continuous DC collector current	$I_{C\ nom}$	T_C=100℃, $T_{vj\ max}$=175℃	600	A
Repetitive peak collector current	I_{CRM}	t_P=1ms	1200	A
Total power dissipation	P_{tot}	T_C=25℃, $T_{vj\ max}$=175℃	2050	W
Gate emitter voltage	V_{GE}		±20	V

Characteristics Values

Parameter	Symbol	Test Condition		Value			Unit
				Min.	Typ.	Max.	
Collector-Emitter saturation voltage	V_{CEsat}	V_{GE}=15V, I_C=600A V_{GE}=15V, I_C=600A V_{GE}=15V, I_C=600A	T_{vj}=25℃ T_{vj}=125℃ T_{vj}=150℃		1.82 2.18 2.29	2.6	V
Gate-Emitter threshold voltage	$V_{GE(th)}$	I_C=12mA, V_{GE}=V_{CE}	T_{vj}=25℃	5.2	5.8	6.4	
Gate charge	Q_G	V_{GE}=-15V…+15V			7.52		μC
Internal gate resistor	R_{Gint}		T_{vj}=25℃		0.9		Ω
Input capacitance	C_{ies}	f=100KHz, V_{CE}=25V, V_{GE}=0V	T_{vj}=25℃		94.9		nF
Reverse transfer capacitance	C_{res}				0.39		nF
Collector-emitter cut-off current	I_{CES}	V_{CE}=1200V, V_{GE}=0V	T_{vj}=25℃			2	mA
Gate-emitter leakage current	I_{GES}	V_{CE}=0V, V_{GE}=20V	T_{vj}=25℃			200	nA
Turn-on delay time	$t_{d\ on}$	I_C=600A, V_{CE}=600V V_{GE}=±15V, R_G=0.5Ω (inductive load)	T_{vj}=25℃ T_{vj}=125℃ T_{vj}=150℃		366 393 396		ns

Rise time	t_r	I_C=600A, V_{CE}=600V V_{GE}=±15V, R_G=0.5Ω (inductive load)	T_{vj}=25℃ T_{vj}=125℃ T_{vj}=150℃		86 98 101		ns
Turn-off delay time	$t_{d\ off}$	I_C=600A, V_{CE}=600V V_{GE}=±15V, R_G=0.5Ω (inductive load)	T_{vj}=25℃ T_{vj}=125℃ T_{vj}=150℃		397 444 461		
Fall time	t_f	I_C=600A, V_{CE}=600V V_{GE}=±15 V, R_G=0.5Ω (inductive load)	T_{vj}=25℃ T_{vj}=125℃ T_{vj}=150℃		124 215 243		
Turn-on energy loss per pulse	E_{on}	I_C=600A, V_{CE}=600V V_{GE}=±15V, R_G=0.5Ω di/dt=4700A/μs (T_{vj}=150℃) (inductive load)	T_{vj}=25℃ T_{vj}=125℃ T_{vj}=150℃		28.54 49.61 59.54		mJ
Turn-off energy loss per pulse	E_{off}	I_C=600A, V_{CE}=600V V_{GE}=±15V, R_G=0.5Ω dv/dt=4200V/μs (T_{vj}=150°C)(inductive load)	T_{vj}=25℃ T_{vj}=125℃ T_{vj}=150℃		55.75 71.68 77.16		
SC data	I_{SC}	V_{GE}≤15V, V_{CE}=800V V_{CEmax}=V_{CES}-L_{sCE}·di/dt, t_P≤8μs	T_{vj}=150℃		2000		A
Thermal resistance, junction to case	R_{thJC}	per IGBT				0.065	K/W
Temperature under switching conditions	$T_{vj\ op}$			-40		150	℃

Diode, Inverter

Maximum Ratings

Parameter	Symbol	Test Condition	Value	Unit
Repetitive peak reverse voltage	V_{RRM}	T_{vj}=25℃	1200	V
Continuous DC forward current	I_F		600	A
Repetitive peak forward current	I_{FRM}	t_p=1ms	1200	A
I^2t-value	I^2t	t_p=10ms, sin180°, T_{vj}=125℃	45000	A^2S

Characteristics Values

Parameter	Symbol	Test Condition		Value			Unit
				Min.	Typ.	Max.	
Forward voltage	V_F	I_F=600A, V_{GE}=0V I_F=600A, V_{GE}=0V I_F=600A, V_{GE}=0V	T_{vj}=25℃ T_{vj}=125℃ T_{vj}=150℃		2.24 2.17 2.10	2.80	V
Peak reverse recovery current	I_{RM}	I_F=600A, -di$_F$/dt=4700A/us(T_{vj}=150℃) V_R=600V, V_{GE}=-15V	T_{vj}=25℃ T_{vj}=125℃ T_{vj}=150℃		320 448 464		A
Recovered charge	Q_r	I_F=600A, -di$_F$/dt=4700A/us(T_{vj}=150℃) V_R=600V, V_{GE}=-15V	T_{vj}=25℃ T_{vj}=125℃ T_{vj}=150℃		29.00 70.94 87.43		℃
Reverse recovered energy	E_{rec}	I_F=600A, -di$_F$/dt=4700A/us(T_{vj}=150℃) V_R=600V, V_{GE}=-15V	T_{vj}=25℃ T_{vj}=125℃ T_{vj}=150℃		12.25 27.93 34.12		mJ
Thermal resistance, junction to case	R_{thJC}	per diode				0.078	K/W
Temperature under switching conditions	$T_{vj\ op}$			-40		150	℃

Characteristics Values(Module)

Parameter	Symbol	Test Condition	Value			Unit
Isolation test voltage	V_{ISOL}	RMS, f=50Hz, t=1min		4000		V
Internal isolation				Al_2O_3		
Storage temperature	T_{stg}		-40		125	℃
Mounting torque for modul mounting	M		3.0		6.0	Nm
Weight	W			325		g

Typical Characteristics

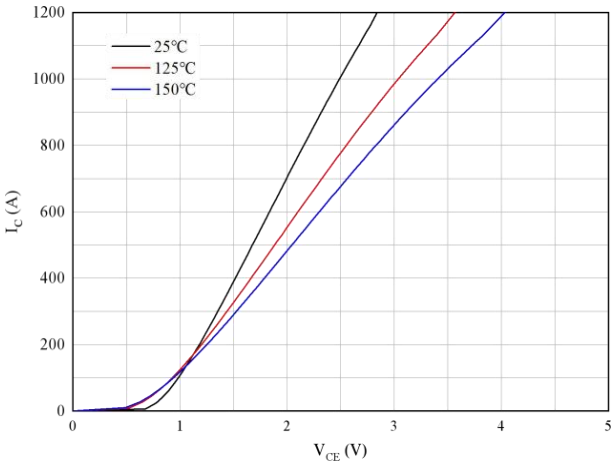


Fig 1. Typical output characteristics (V_{GE}=15V)

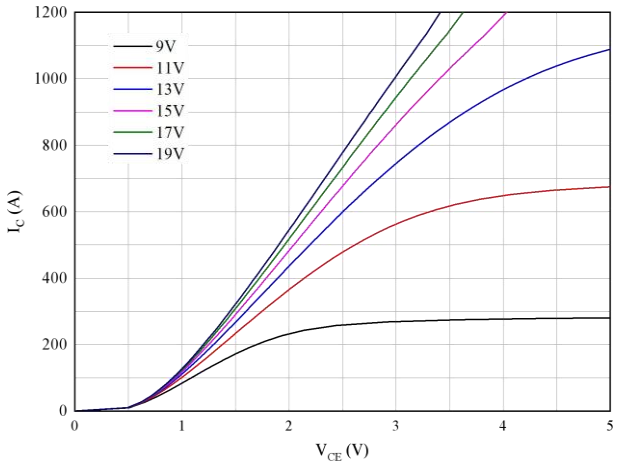


Fig 2. Typical output characteristics (T_{vj}=150℃)

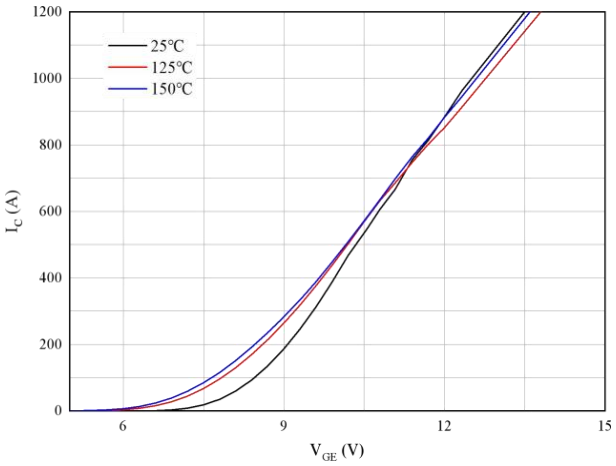


Fig 3. Typical transfer characteristic(V_{CE}=20V)

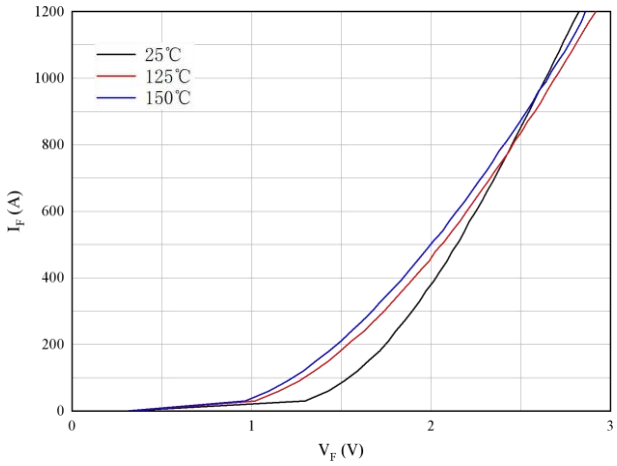


Fig 4. Forward characteristic of Diode

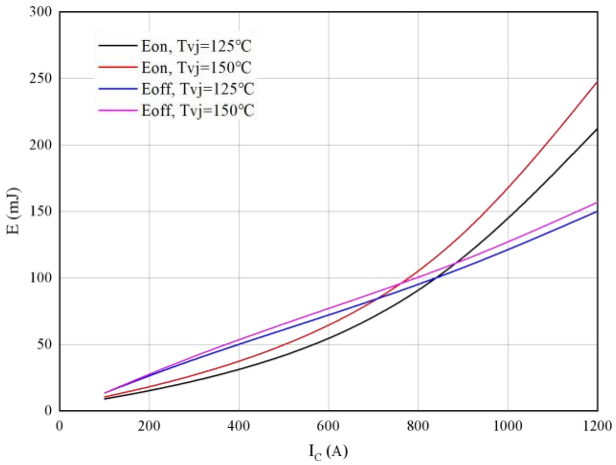


Fig 5. Switching losses of IGBT
V_{GE}=±15V, R_{Gon}=0.5Ω, R_{Goff}=0.5Ω, V_{CE}=600V

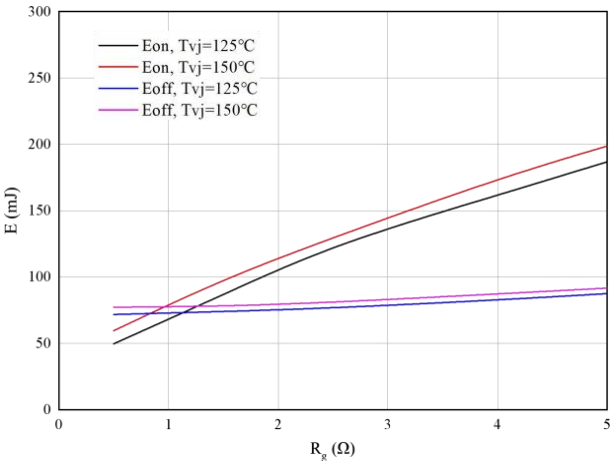


Fig 6. Switching losses of IGBT
V_{GE}=±15V, I_C=600A, V_{CE}=600V

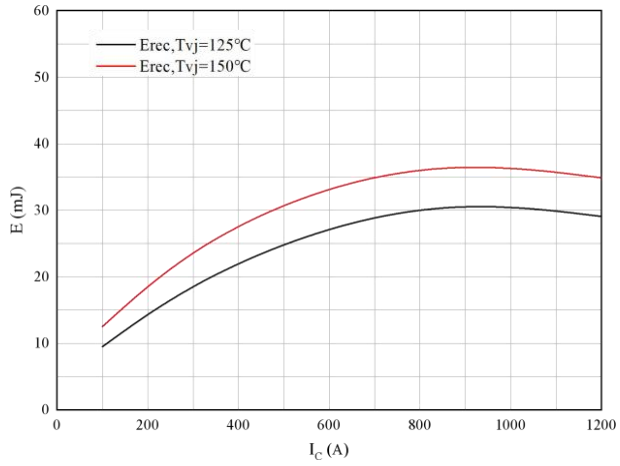


Fig 7. Switching losses of Diode
R_{Gon}=0.5Ω, V_{CE}=600V

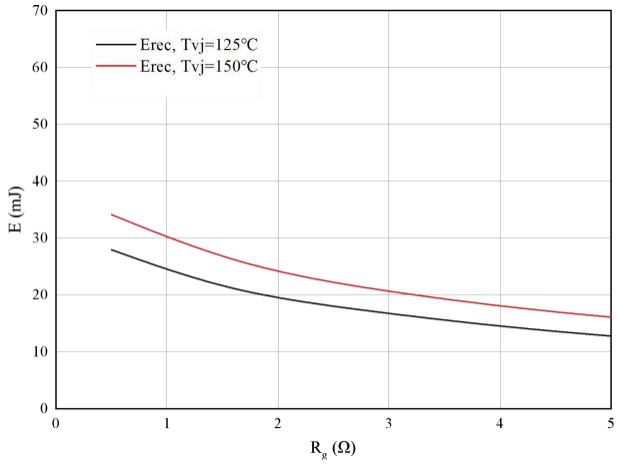


Fig 8. Switching losses of Diode
I_F=600A, V_{CE}=600V

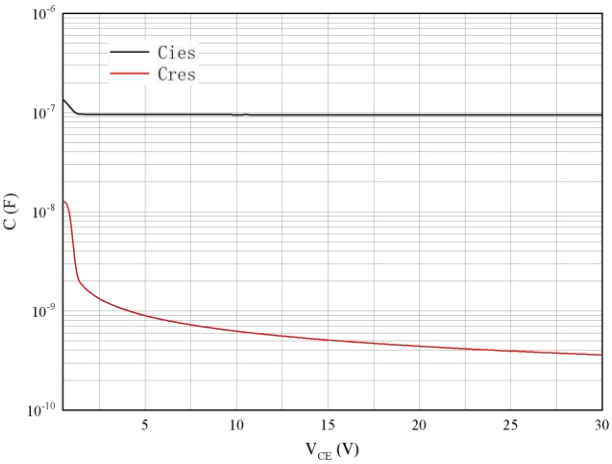


Fig 9. Capacitance characteristic

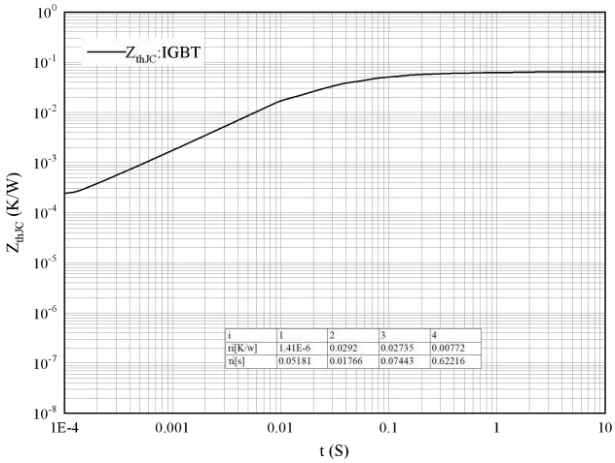
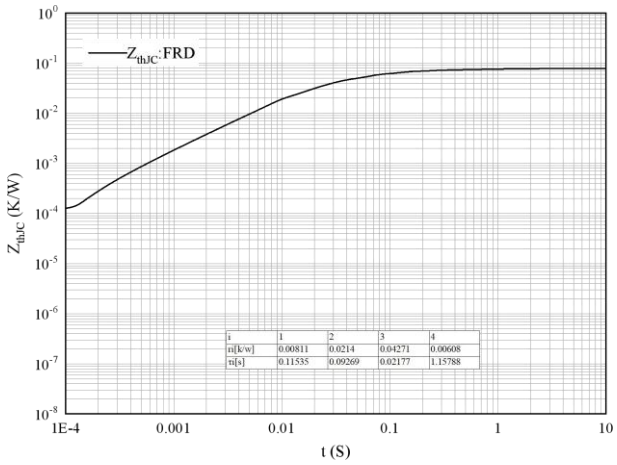


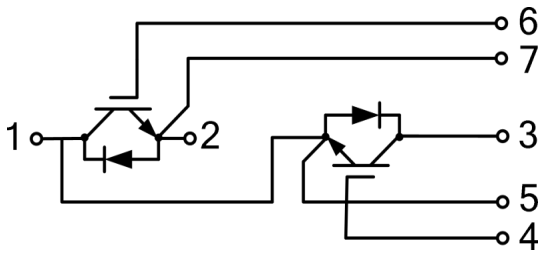
Fig10. Transient thermal impedance IGBT,Inverter
Z_{thJC}=f(t)



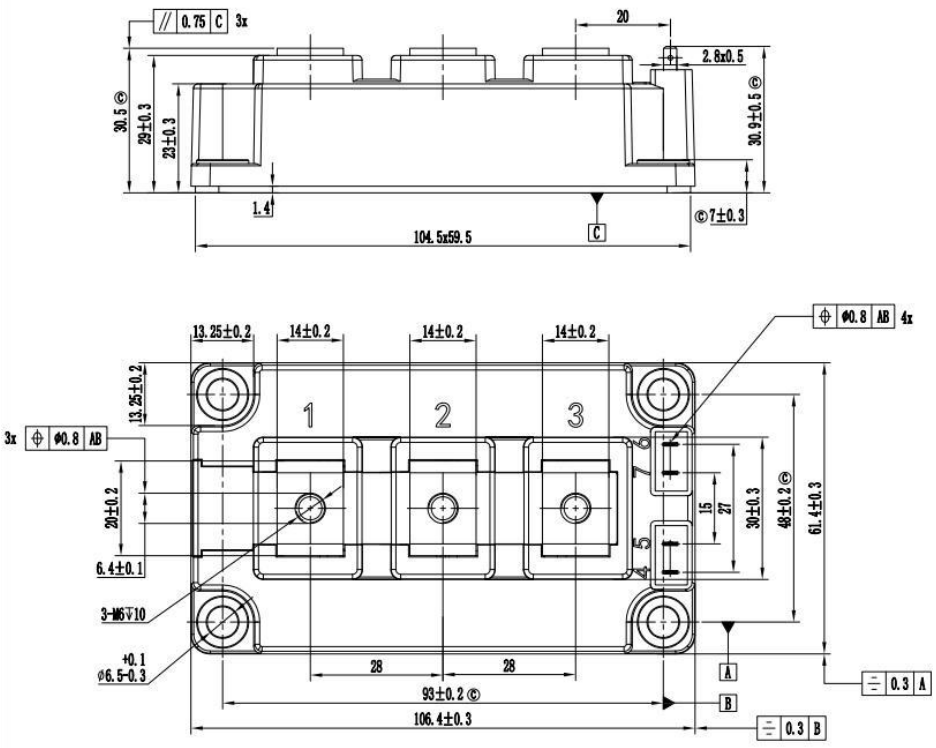
i	1	2	3	4
ri[k/w]	0.00811	0.0214	0.04271	0.00608
τi[s]	0.11535	0.09269	0.02177	1.15788

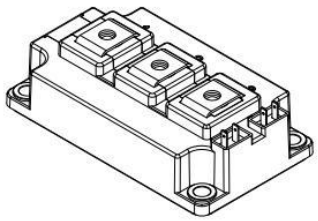
Fig 11. Transient thermal impedance FRD ,Inverter
Z_{thJC}=f(t)

Circuit Diagram



Package Outlines(Unit: mm)





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