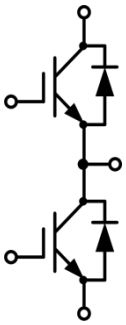
62mm Half Bridge IGBT Module

V_{CES}= 1200V, I_C= 200A, $V_{CE(sat)}$= 1.84V

Features

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



Applications

- Power Converters
- Uninterruptible power supplies
- Servo Drives
- Inverter

IGBT, Inverter

Maximum Ratings

Parameter	Symbol	Test Condition	Value	Unit
Collector-Emitter voltage	VCES	T_{vj}=25℃	1200	V
Continuous DC collector current	IC nom	T_C=100℃, $T_{vj\ max}$=175℃	200	A
Repetitive peak collector current	ICRM	t_P=1ms	400	A
Gate-Emitter voltage	VGE		±20	V

Characteristics Values

Parameter	Symbol	Test Condition		Value			Unit
				Min.	Typ.	Max.	
Collector-Emitter saturation voltage	V_{CEsat}	V_{GE}=15V, I_C=200A V_{GE}=15V, I_C=200A V_{GE}=15V, I_C=200A	T_{vj}=25℃ T_{vj}=125℃ T_{vj}=150℃		1.84 2.10 2.15	2.20	V
Gate-Emitter threshold voltage	$V_{GE(th)}$	I_C=7.6mA, V_{GE}=V_{CE}	T_{vj}=25℃	5.30	5.90	6.50	
Gate charge	Q_G	V_{GE}=-15V…+15V			1.58		μC
Internal gate resistor	R_{Gint}				3.65		Ω
Input capacitance	C_{ies}	f=1MHz, V_{CE}=25V, V_{GE}=0V	T_{vj}=25℃		17.33		nF
Reverse transfer capacitance	C_{res}	f=1MHz, V_{CE}=25V, V_{GE}=0V	T_{vj}=25℃		0.70		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℃			200	nA
Turn-on delay time	$t_{d\ on}$	I_C=200A, V_{CE}=600V V_{GE}= ±15V, R_G=2.5Ω (inductive load)	T_{vj}=25℃ T_{vj}=125℃ T_{vj}=150℃		211 227 225		ns

Rise time	t_r	I_C=200A, V_{CE}=600V V_{GE}=±15V, R_G=2.5Ω (inductive load)	T_{vj}=25℃ T_{vj}=125℃ T_{vj}=150℃		102 104 112		ns
Turn-off delay time	$t_{d\ off}$	I_C=200A, V_{CE}=600V V_{GE}=±15V, R_G=2.5Ω (inductive load)	T_{vj}=25℃ T_{vj}=125℃ T_{vj}=150℃		361 417 433		
Fall time	t_f	I_C=200A, V_{CE}=600V V_{GE}=±15V, R_G=2.5Ω (inductive load)	T_{vj}=25℃ T_{vj}=125℃ T_{vj}=150℃		99 134 185		
Turn-on energy loss per pulse	E_{on}	I_C=200A, V_{CE}=600V V_{GE}=±15V, R_G=2.5Ω di/dt=1500A/μs (T_{vj}=150℃)	T_{vj}=25℃ T_{vj}=125℃ T_{vj}=150℃		19.97 26.44 27.89		mJ
Turn-off energy loss per pulse	E_{off}	I_C=200A, V_{CE}=600V V_{GE}=±15V, R_G=2.5Ω dv/dt=4500V/μs (T_{vj}=150℃) (inductive load)	T_{vj}=25℃ T_{vj}=125℃ T_{vj}=150℃		13.08 17.99 18.75		
SC data	I_{SC}	V_{GE}≤15V, V_{CE}=800V V_{CEmax}=V_{CES}-L_{sCE}·di/dt, t_P≤10us,	T_{vj}=150℃		1264		A
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		200	A
Repetitive peak forward current	I_{FRM}	t_p=1ms	400	A
I^2t-value	I^2t	t_p=10ms, sin180°, T_{vj}=125℃	10937	A^2S

Characteristics Values

Parameter	Symbol	Test Condition		Value			Unit
				Min.	Typ.	Max.	
Forward voltage	V_F	I_F=200A,V_{GE}=0V I_F=200A,V_{GE}=0V I_F=200A,V_{GE}=0V	T_{vj}=25℃ T_{vj}=125℃ T_{vj}=150℃		2.42 2.55 2.43	2.90	V
Peak reverse recovery current	I_{RM}	I_F=200A, -diF/dt=1500A/us(T_{vj}=150℃) V_R=600V, V_{GE}=-15V	T_{vj}=25℃ T_{vj}=125℃ T_{vj}=150℃		90 115 128		A
Recovered charge	Q_r	I_F=200A, -diF/dt=1500A/us(T_{vj}=150℃) V_R=600V, V_{GE}=-15V	T_{vj}=25℃ T_{vj}=125℃ T_{vj}=150℃		9.19 19.91 24.39		μC
Reverse recovered energy	E_{rec}	I_F=200A, -diF/dt=1500A/us(T_{vj}=150℃) V_R=600V, V_{GE}=-15V	T_{vj}=25℃ T_{vj}=125℃ T_{vj}=150℃		3.15 7.56 9.32		mJ
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 module mounting	M		3.0		6.0	Nm
Weight	W			324		g

Typical Characteristics

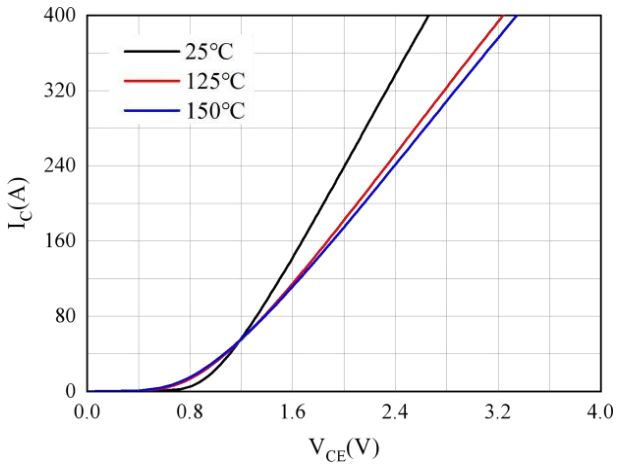


Fig 1. Typical output characteristics (V_{GE}=15V)

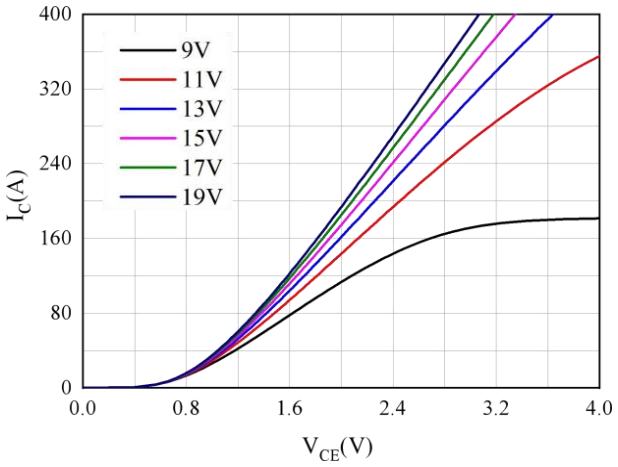


Fig 2. Typical output characteristics (T_{vj}=150℃)

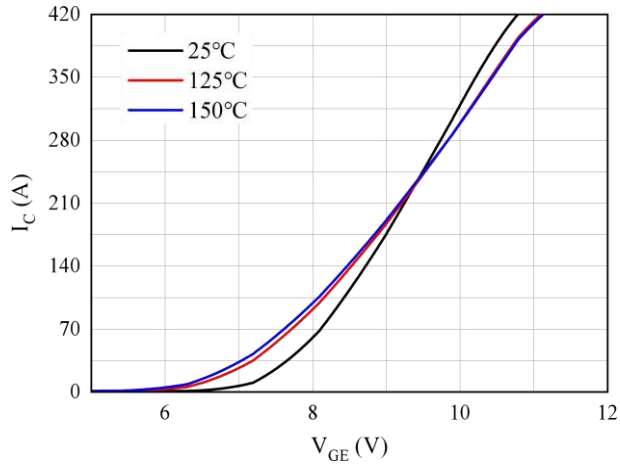


Fig 3. Typical transfer characteristic(V_{CE}=20V)

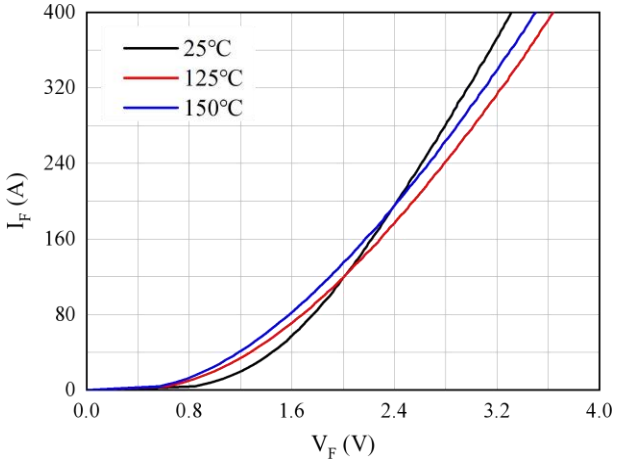


Fig 4. Forward characteristic of Diode

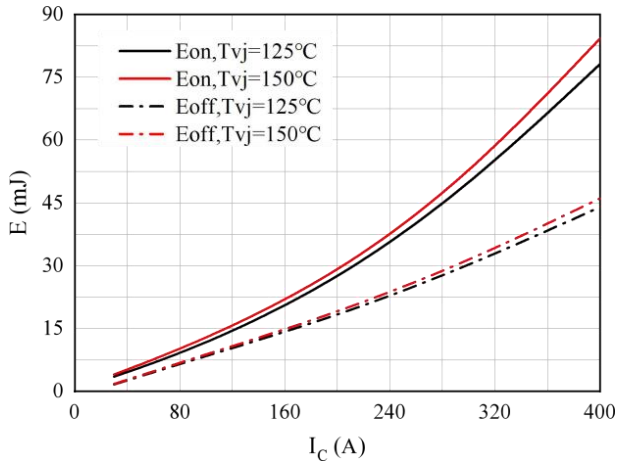


Fig 5. Switching losses of IGBT
VGE=±15V, RGon=2.5Ω, RGoff=2.5Ω, VCE=600V

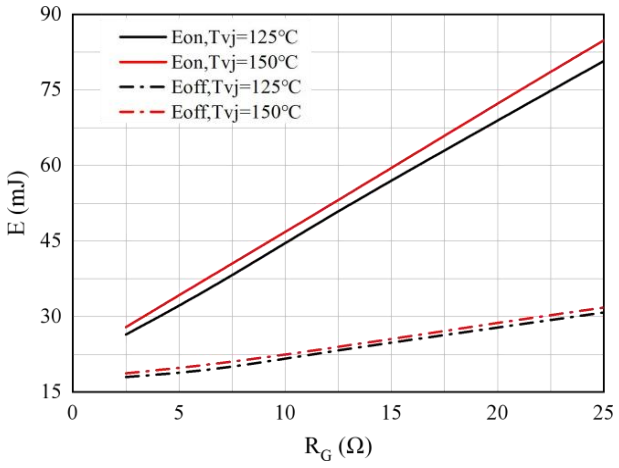


Fig 6. Switching losses of IGBT
VGE=±15V, IC=200A, VCE=600V

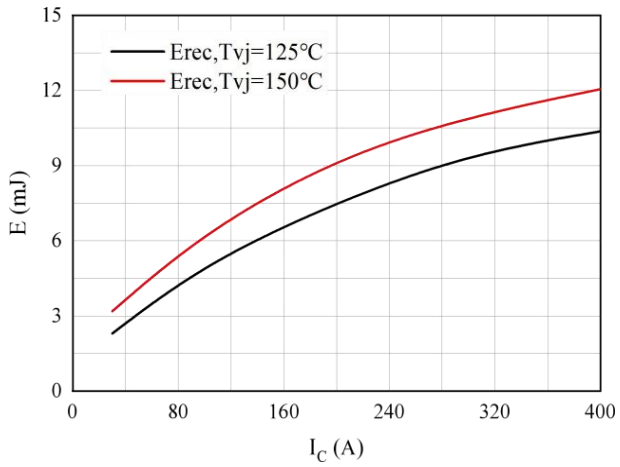


Fig 7. Switching losses of Diode
RGon=2.5Ω, VCE=600V

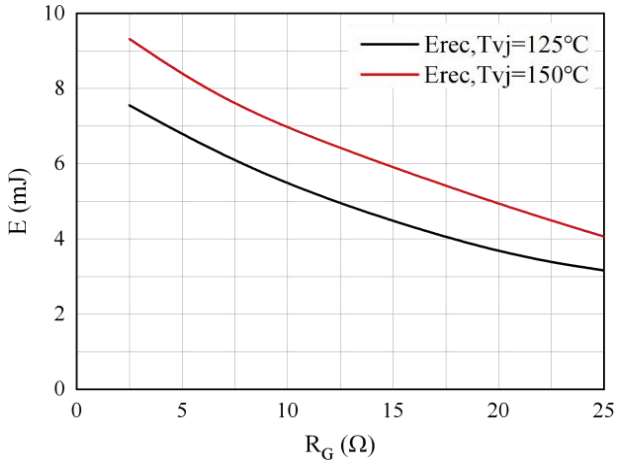
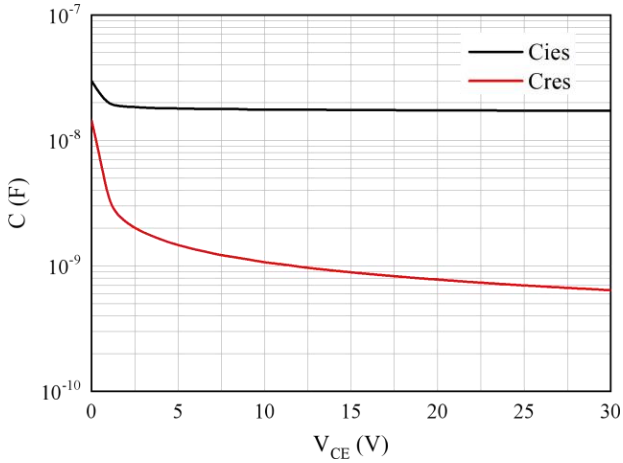
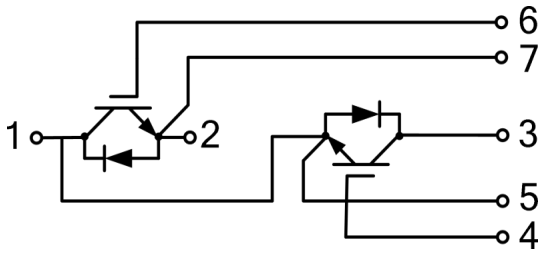


Fig 8. Switching losses of Diode
IF=200A, VCE=600V

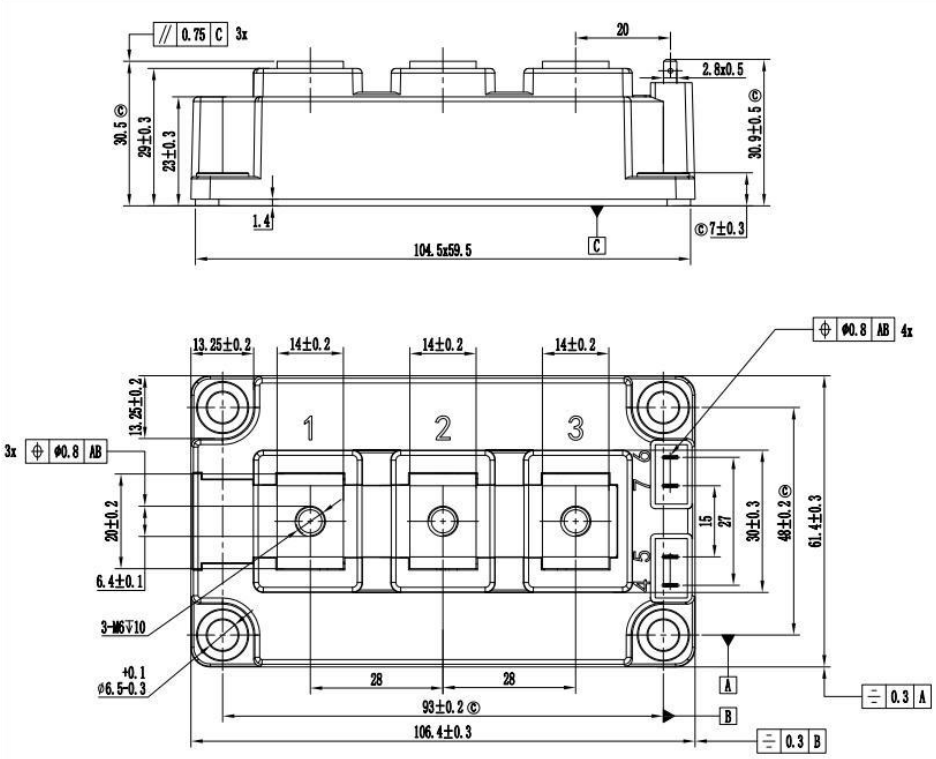


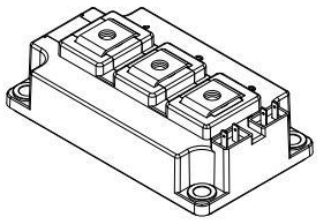
Fige 9. Capacitance characteristic

Circuit Diagram



Package Outlines(Unit: mm)





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