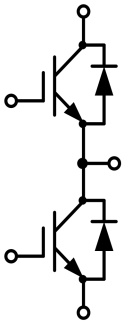
62mm Half Bridge IGBT Module

V_{CES}=1200V， $I_{C\,nom}$=200A / I_{CRM}=400A

D5



Equivalent Circuit

Features：

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

Applications:

- Variable Frequency Drive
- UPS
- Servo drive
- inverter

IGBT, Inverter

Maximum Ratings

Parameter	Conditions	Symbol	Value	Unit
Collector-Emitter voltage	T_{vj}=25°C	V_{CES}	1200	V
Continuous DC collector current	T_C=100°C, $T_{vj\,max}$=175°C	$I_{C\,nom}$	200	A
Repetitive peak collector current	t_P=1 ms	I_{CRM}	400	A
Gate emitter voltage		V_{GE}	±20	V

Characteristic Values

Parameter	Conditions	Symbol	Value			Unit
			Min.	Typ.	Max.	
Collector-Emitter saturation voltage	V_{GE}=15V, I_C=200A T_{vj}=25°C V_{GE}=15V, I_C=200A T_{vj}=125°C V_{GE}=15V, I_C=200A T_{vj}=150°C	V_{CEsat}		1.84 2.10 2.15	2.20	V
Gate-Emitter threshold voltage	I_C=7.6mA, V_{GE}= V_{CE} T_{vj}=25°C	$V_{GE(th)}$	5.3	5.9	6.5	
Gate charge	V_{GE}=-15V…+15V	Q_G		1.58		µC
Internal gate resistor		R_{Gint}		3.65		Ω
Input capacitance	f=1MHz, V_{CE}=25 V, V_{GE}=0 V T_{vj}=25°C	C_{ies}		17.33		nF
Reverse transfer capacitance	f=1MHz, V_{CE}=25 V, V_{GE}=0 V T_{vj}=25°C	C_{res}		0.70		nF
Collector-emitter cut-off current	V_{CE}=1200V , V_{GE}= 0 V T_{vj}=25°C	I_{CES}			1	mA
Gate-emitter leakage current	V_{CE}=0 V, V_{GE}= 20 V T_{vj}=25°C	I_{GES}			200	nA
Turn-on delay time	I_C=200A, V_{CE}=600 V T_{vj}=25°C V_{GE}=±15 V, R_G=2.5Ω T_{vj}=125°C (inductive load) T_{vj}=150°C	$t_{d\,on}$		211 227 225		ns
Rise time	I_C=200A, V_{CE}=600 V T_{vj}=25°C V_{GE}=±15 V, R_G=2.5Ω T_{vj}=125°C (inductive load) T_{vj}=150°C	t_r		102 104 112		
Turn-off delay time	I_C=200A, V_{CE}=600 V T_{vj}=25°C V_{GE}=±15 V, R_G=2.5Ω T_{vj}=125°C (inductive load) T_{vj}=150°C	$t_{d\,off}$		361 417 433		
Fall time	I_C=200A, V_{CE}=600 V T_{vj}=25°C V_{GE}=±15 V, R_G=2.5Ω T_{vj}=125°C (inductive load) T_{vj}=150°C	t_f		99 134 185		
Turn-on energy loss per pulse	I_C=200A, V_{CE}=600 V V_{GE}=±15 V, R_G=2.5Ω T_{vj}=25°C di/dt=1500A/µs(Tvj=150°C) T_{vj}=125°C (inductive load) T_{vj}=150°C	E_{on}		19.97 26.44 27.89		mJ
Turn-off energy loss per pulse	I_C=200A, V_{CE}=600 V V_{GE}=±15 V, R_G=2.5Ω T_{vj}=25°C du/dt=4500V/µs(Tvj=150°C) T_{vj}=125°C (inductive load) T_{vj}=150°C	E_{off}		13.08 17.99 18.75		
SC data	V_{GE}≤15V, Vce=800V V_{CEmax}=V_{CES}-L_{sCE}·di/dt t_P≤10us, T_{vj}=150°C	I_{SC}		1264		A
Temperature under switching conditions		$T_{vj\,op}$	-40		150	°C

Diode, Inverter

Maximum Ratings

Parameter	Conditions	Symbol	Value	Unit
Repetitive peak reverse voltage	T_{vj}=25°C	V_{RRM}	1200	V
Continuous DC forward current		I_F	200	A
Repetitive peak forward current	t_p=1ms	I_{FRM}	400	A
I^2t-value	t_p=10ms，sin180°，T_j=125°C	I^2t	10937	A^2S

Characteristic Values

Parameter	Conditions	Symbol	Value			Unit
			Min.	Typ.	Max.	
Forward voltage	I_F=200A, V_{GE}=0V T_{vj}=25°C I_F=200A, V_{GE}=0V T_{vj}=125°C I_F=200A, V_{GE}=0V T_{vj}=150°C	V_F		2.42 2.55 2.43	2.90	V
Peak reverse recovery current	I_F=200A, T_{vj}=25°C $-di_F/dt$=1500A/μs(T_{vj}=150°C) T_{vj}=125°C V_R=600V, V_{GE}=-15V T_{vj}=150°C	I_{RM}		90 115 128		A
Recovered charge	I_F=200A, T_{vj}=25°C $-di_F/dt$=1500A/μs(T_{vj}=150°C) T_{vj}=125°C V_R=600V, V_{GE}=-15V T_{vj}=150°C	Q_r		9.19 19.91 24.39		μC
Reverse recovered energy	I_F=200A, T_{vj}=25°C $-di_F/dt$=1500A/μs(T_{vj}=150°C) T_{vj}=125°C V_R=600V, V_{GE}=-15V T_{vj}=150°C	E_{rec}		3.15 7.56 9.32		mJ
Temperature under switching conditions		$T_{vj\ op}$	-40		150	°C

Module

Parameter	Conditions	Symbol	Value			Unit
Isolation test voltage	RMS, f=50Hz, t=1min	V_{ISOL}	4000			V
Internal isolation			Al_2O_3			
Storage temperature		T_{stg}	-40		125	°C
Mounting torque for modul mounting		M	3.0		6.0	Nm
Weight		W		324		g

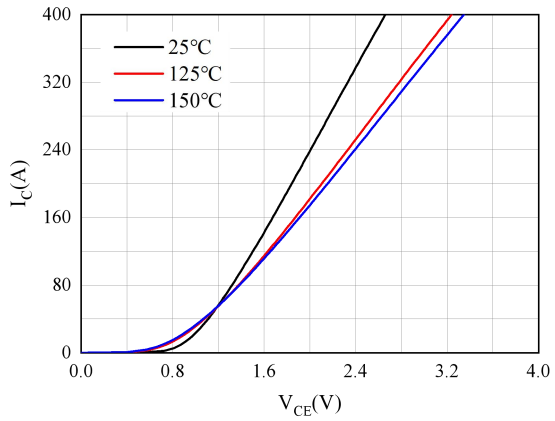


Fig 1. Typical output characteristics (V_{GE}=15V)

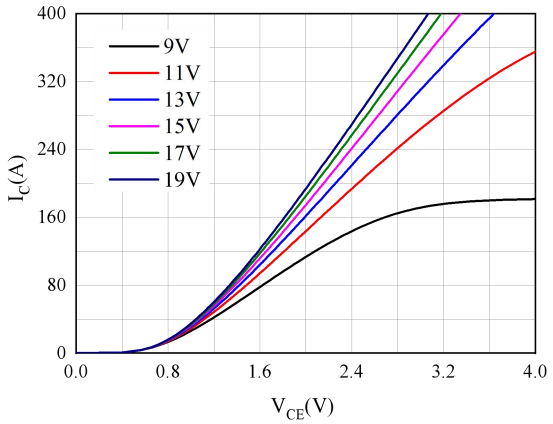


Fig2. Typical output characteristics (T_{vj}=150℃)

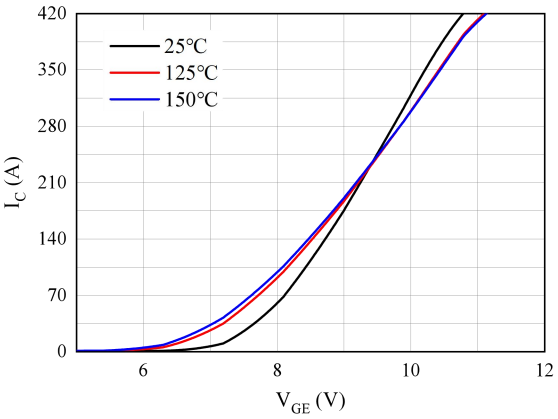


Fig 3. Typical transfer characteristic(V_{CE}=20V)

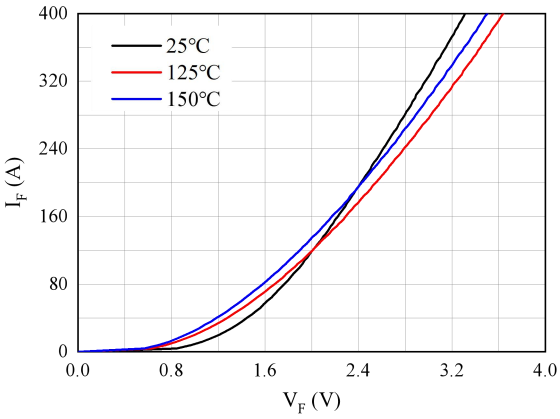


Fig 4. Forward characteristic of Diode

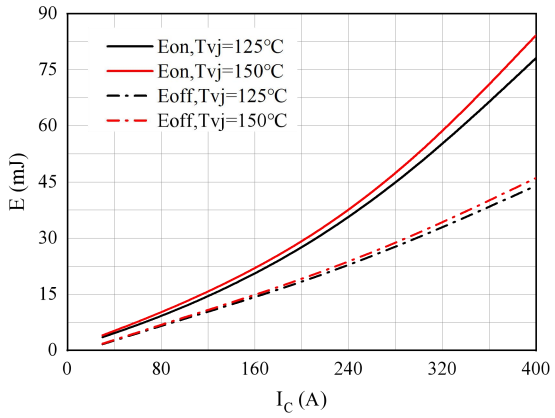


Fig 5. Switching losses of IGBT

VGE=±15V, RGon=2.5Ω, RGoff=2.5Ω, VCE=600V

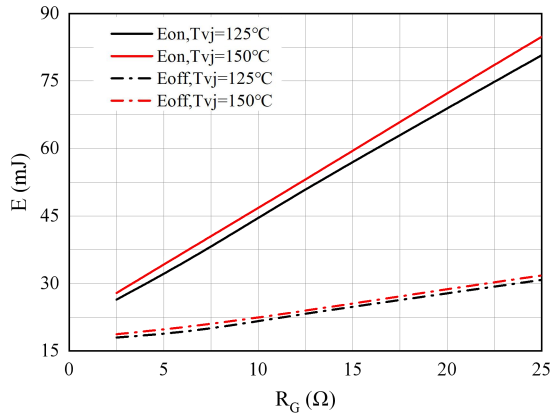


Fig 6. Switching losses of IGBT

VGE=±15V, IC=200A, VCE=600V

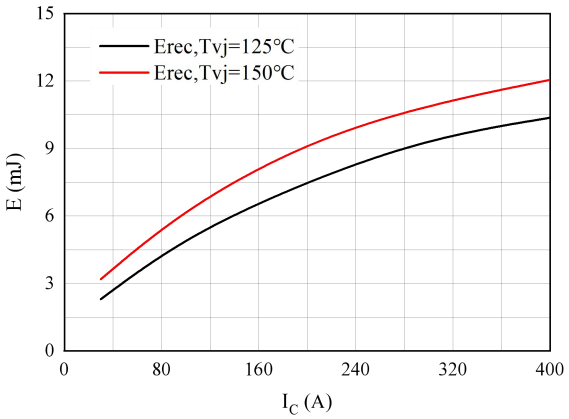


Fig 7. Switching losses of Diode
RGon=2.5Ω, VCE=600V

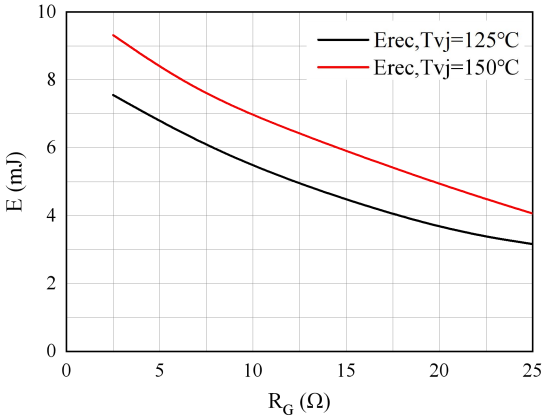


Fig 8. Switching losses of Diode
IF=200A, VCE=600V

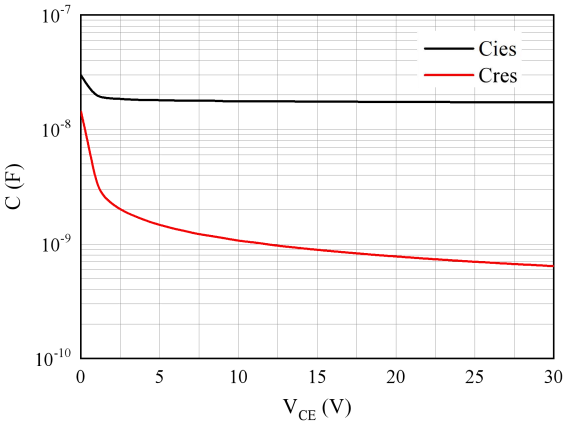
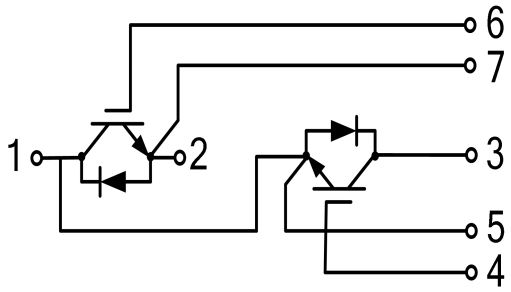


Fig 9. Capacitance characteristic

Circuit diagram



Package outlines