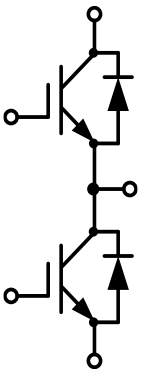
62mm Half Bridge IGBT Module

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 V_{GE}=15V, I_C=200A V_{GE}=15V, I_C=200A	T_{vj}=25°C T_{vj}=125°C T_{vj}=150°C	V_{CEsat}		2.02 2.36 2.44	2.6	V
Gate-Emitter threshold voltage	I_C=8mA, V_{GE}= V_{CE}	T_{vj}=25°C	$V_{GE(th)}$	5.2	5.8	6.4	
Gate charge	V_{GE}=-15V…+15V		Q_G		1.04		µC
Internal gate resistor			R_{Gint}		3.70		Ω
Input capacitance	f=100KHz, V_{CE}=25 V, V_{GE}=0 V	T_{vj}=25°C	C_{ies}		11.69		nF
Reverse transfer capacitance			C_{res}		0.49		nF
Collector-emitter cut-off current	V_{CE}=1200V , V_{GE}= 0 V	T_{vj}=25°C	I_{CES}			2	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 V_{GE}=±15 V, R_G=6.8Ω (inductive load)	T_{vj}=25°C T_{vj}=125°C T_{vj}=150°C	$t_{d\,on}$		170 173 179		ns
Rise time	I_C=200A, V_{CE}=600 V V_{GE}=±15 V, R_G=6.8Ω (inductive load)	T_{vj}=25°C T_{vj}=125°C T_{vj}=150°C	t_r		69 71 72		
Turn-off delay time	I_C=200A, V_{CE}=600 V V_{GE}=±15 V, R_G=6.8Ω (inductive load)	T_{vj}=25°C T_{vj}=125°C T_{vj}=150°C	$t_{d\,off}$		324 377 395		
Fall time	I_C=200A, V_{CE}=600 V V_{GE}=±15 V, R_G=6.8Ω (inductive load)	T_{vj}=25°C T_{vj}=125°C T_{vj}=150°C	t_f		38 83 99		
Turn-on energy loss per pulse	I_C=200A, V_{CE}=600 V V_{GE}=±15 V, R_G=6.8Ω di/dt = 2100A/µs (Tvj = 150°C) (inductive load)	T_{vj}=25°C T_{vj}=125°C T_{vj}=150°C	E_{on}		24.11 31.54 33.55		mJ
Turn-off energy loss per pulse	I_C=200A, V_{CE}=600 V V_{GE}=±15 V, R_G=6.8Ω dv/dt = 5500V/µs (Tvj = 150°C) (inductive load)	T_{vj}=25°C T_{vj}=125°C T_{vj}=150°C	E_{off}		7.86 11.23 12.73		
SC data	V_{GE}≤15V, Vce=800V V_{CEmax}=V_{CES}-L_{sCE}·di/dt	t_P≤10us, T_{vj}=150°C	I_{SC}		800		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	7000	A^2S

Characteristic Values

Parameter	Conditions		Symbol	Value			Unit
				Min.	Typ.	Max.	
Forward voltage	I_F=200A, V_{GE}=0V I_F=200A, V_{GE}=0V I_F=200A, V_{GE}=0V	T_{vj}=25°C T_{vj}=125°C T_{vj}=150°C	V_F		2.16 2.11 2.02	2.8	V
Peak reverse recovery current	I_F=200A, -di$_F$/dt=2100A/µs(T_{vj}=150°C) V_R=600V, V_{GE}=-15V	T_{vj}=25°C T_{vj}=125°C T_{vj}=150°C	I_{RM}		57 77 83		A
Recovered charge	I_F=200A, -di$_F$/dt=2100A/µs(T_{vj}=150°C) V_R=600V, V_{GE}=-15V	T_{vj}=25°C T_{vj}=125°C T_{vj}=150°C	Q_r		9.99 22.24 24.81		µC
Reverse recovered energy	I_F=200A, -di$_F$/dt=2100A/µs(T_{vj}=150°C) V_R=600V, V_{GE}=-15V	T_{vj}=25°C T_{vj}=125°C T_{vj}=150°C	E_{rec}		2.70 6.74 7.54		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

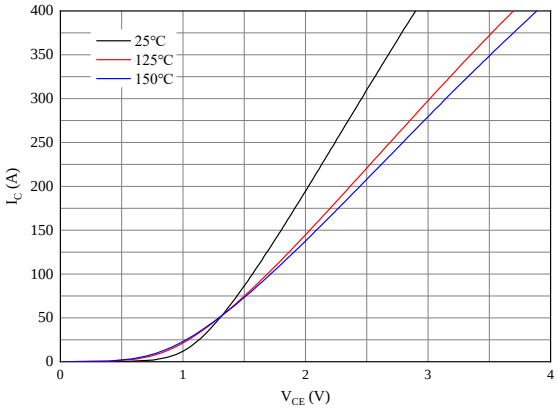


Fig 1. Typical output characteristics (V_{GE}=15V)

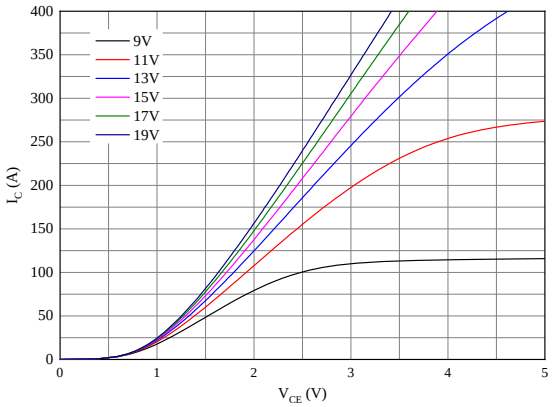


Fig 2. Typical output characteristics (T_{vj}=150℃)

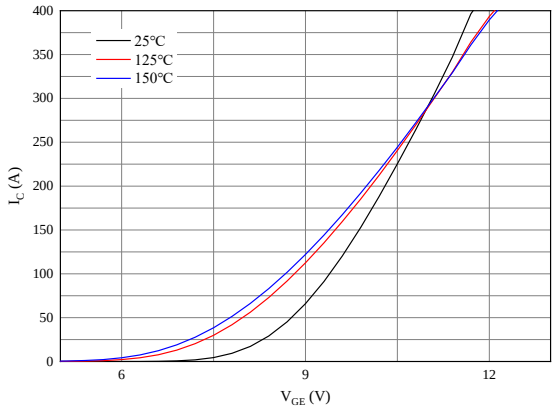


Fig 3. Typical transfer characteristic(V_{CE}=20V)

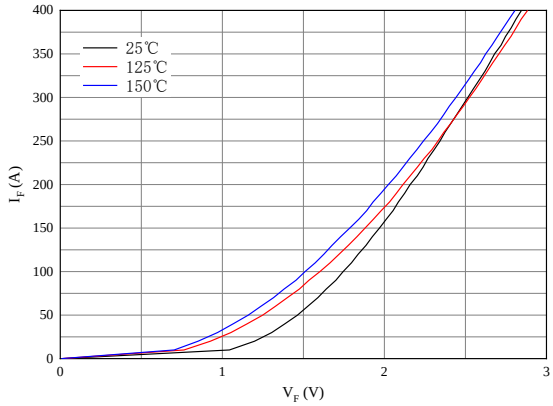


Fig 4. Forward characteristic of Diode

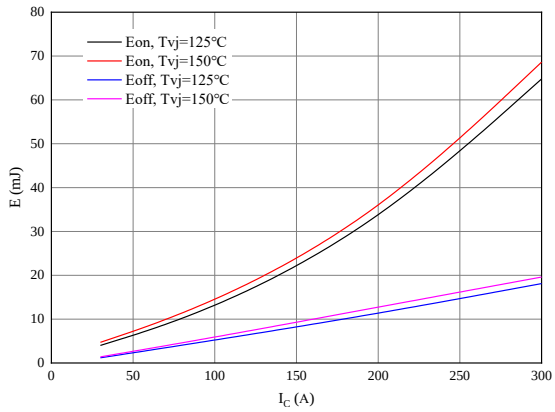


Fig 5. Switching losses of IGBT
VGE=±15V, RGon=6.8Ω, RGoff=6.8Ω, VCE=600V

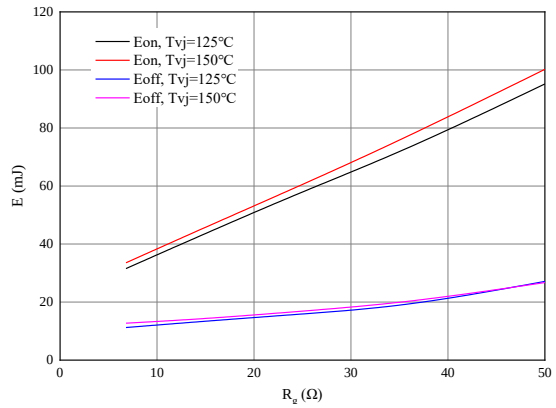


Fig 6. Switching losses of IGBT
VGE=±15V, IC=200A, VCE=600V

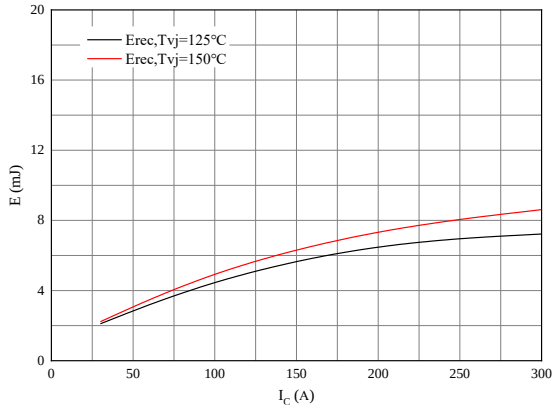


Fig 7. Switching losses of Diode

RGon=6.8Ω, VCE=600V

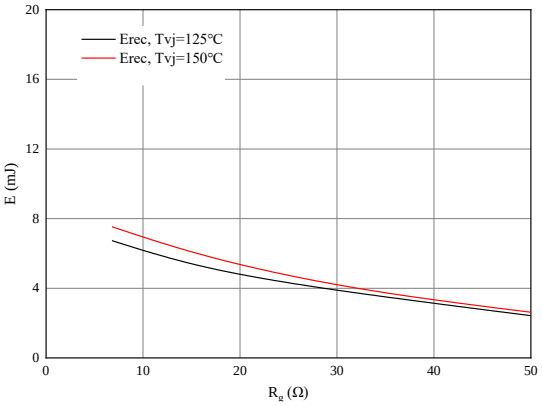


Fig 8. Switching losses of Diode

IF=200A, VCE=600V

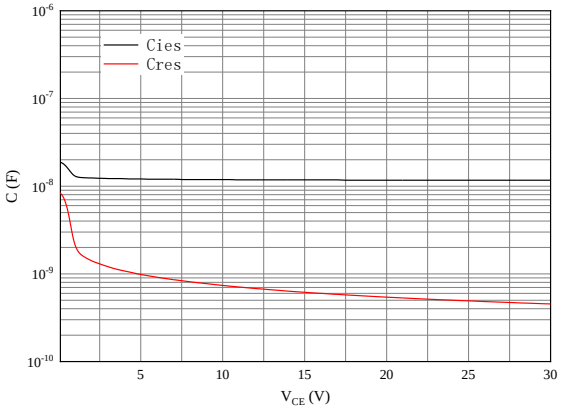
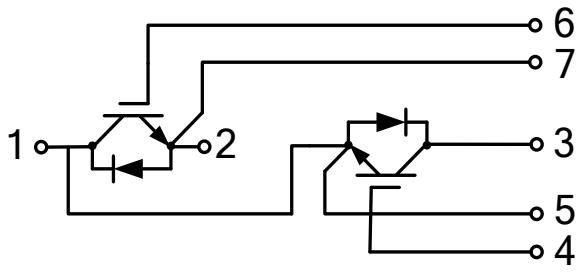


Fig 9. Capacitance characteristic

Circuit diagram



Package outlines