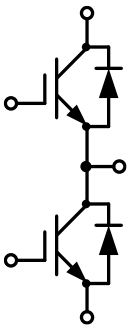
62mm Half Bridge IGBT Module

V_{CES} =1700V， $I_{C\ nom}$ =150A / I_{CRM} =300A

D5



Electrical characteristics：

- 1700V 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}	1700	V
Continuous DC collector current	T_C=100°C, $T_{vj\ max}$=175°C	$I_{C\ nom}$	150	A
Repetitive peak collector current	t_P=1 ms	I_{CRM}	300	A
Total power dissipation	T_C = 25°C, $T_{vj\ max}$ = 175°C	Ptot	1071	W
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=150A T_{vj}=25°C V_{GE}=15V, I_C=150A T_{vj}=125°C V_{GE}=15V, I_C=150A T_{vj}=150°C	V_{CEsat}		1.93 2.25 2.34	2.35	V
Gate-Emitter threshold voltage	I_C=6mA, V_{GE}= V_{CE} T_{vj}=25°C	$V_{GE(th)}$	4.90	5.50	6.10	
Internal gate resistor		R_{Gint}		4.30		Ω
Input capacitance	f=1MHz, V_{CE}=25 V, V_{GE}=0 V T_{vj}=25°C	C_{ies}		17.20		nF
Reverse transfer capacitance		C_{res}		0.50		
Collector-emitter cut-off current	V_{CE}=1700V , 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}			150	nA
Turn-on delay time	I_C=150A, V_{CE}=900 V T_{vj}=25°C V_{GE}=±15 V, R_G=4.8Ω T_{vj}=125°C (inductive load) T_{vj}=150°C	$t_{d\,on}$		189 221 234		ns
Rise time	I_C=150A, V_{CE}=900 V T_{vj}=25°C V_{GE}=±15 V, R_G=4.8Ω T_{vj}=125°C (inductive load) T_{vj}=150°C	t_r		55 61 63		
Turn-off delay time	I_C=150A, V_{CE}=900 V T_{vj}=25°C V_{GE}=±15 V, R_G=4.8Ω T_{vj}=125°C (inductive load) T_{vj}=150°C	$t_{d\,off}$		419 491 505		
Fall time	I_C=150A, V_{CE}=900 V T_{vj}=25°C V_{GE}=±15 V, R_G=4.8Ω T_{vj}=125°C (inductive load) T_{vj}=150°C	t_f		335 417 436		
Turn-on energy loss per pulse	I_C=150A, V_{CE}=900 V T_{vj}=25°C V_{GE}=±15 V, R_G=4.8Ω T_{vj}=125°C (inductive load) T_{vj}=150°C	E_{on}		29.92 40.98 45.47		mJ
Turn-off energy loss per pulse	I_C=150A, V_{CE}=900 V T_{vj}=25°C V_{GE}=±15 V, R_G=4.8Ω T_{vj}=125°C (inductive load) T_{vj}=150°C	E_{off}		28.64 35.68 38.29		
SC data	V_{GE}≤15V, Vce=1000V V_{CEmax}=V_{CES}-L_{sCE}·di/dt t_P≤10us, T_{vj}=150°C	I_{SC}		800		A
Thermal resistance, junction to case	per IGBT	R_{thJC}			0.14	K/W
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}	1700	V
Continuous DC forward current		I_F	150	A
Repetitive peak forward current	t_p=1ms	I_{FRM}	300	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=150A, V_{GE}=0V I_F=150A, V_{GE}=0V I_F=150A, V_{GE}=0V	T_{vj}=25°C T_{vj}=125°C T_{vj}=150°C	V_F		2.18 2.33 2.35	2.70	V
Peak reverse recovery current	I_F=150A -di$_F$/dt=1650A/µs(T_{vj}=150°C) V_R=900V, V_{GE}=-15V	T_{vj}=25°C T_{vj}=125°C T_{vj}=150°C	I_{RM}		93 106 108		A
Recovered charge	I_F=150A -di$_F$/dt=1650A/µs(T_{vj}=150°C) V_R=900V, V_{GE}=-15V	T_{vj}=25°C T_{vj}=125°C T_{vj}=150°C	Q_r		23.20 40.90 44.50		µC
Reverse recovered energy	I_F=150A -di$_F$/dt=1650A/µs(T_{vj}=150°C) V_R=900V, V_{GE}=-15V	T_{vj}=25°C T_{vj}=125°C T_{vj}=150°C	E_{rec}		12.63 23.34 25.21		mJ
Thermal resistance, junction to case	per diode		R_{thJC}			0.16	K/W
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		316		g

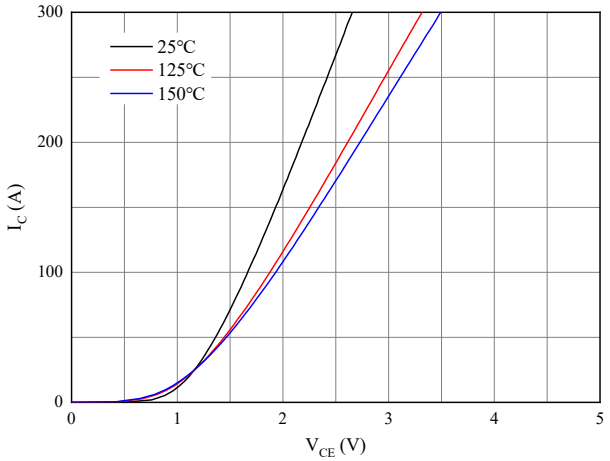


Fig 1. Typical output characteristics (V_{GE}=15V)

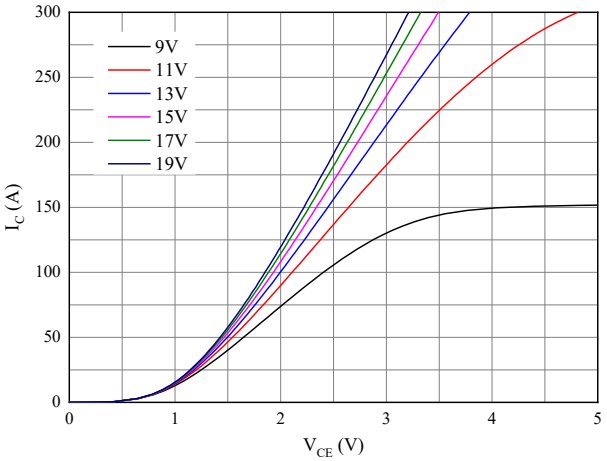


Fig 2. Typical output characteristics (T_{vj}=150℃)

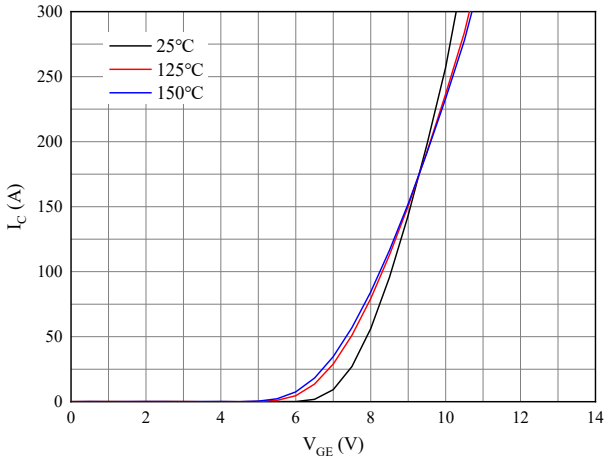


Fig 3. Typical transfer characteristic(V_{CE}=20V)

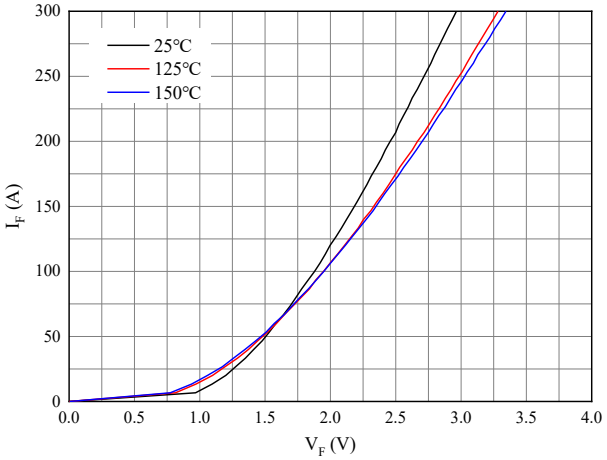


Fig 4. Forward characteristic of Diode

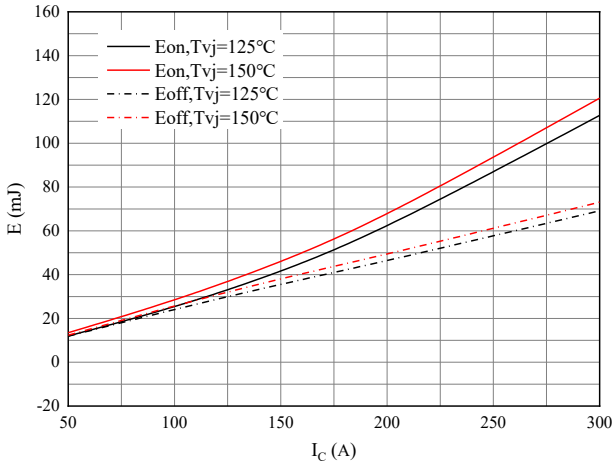


Fig 5. Switching losses of IGBT

VGE=±15V, RGon=4.8Ω, RGoff=4.8Ω, VCE=900V

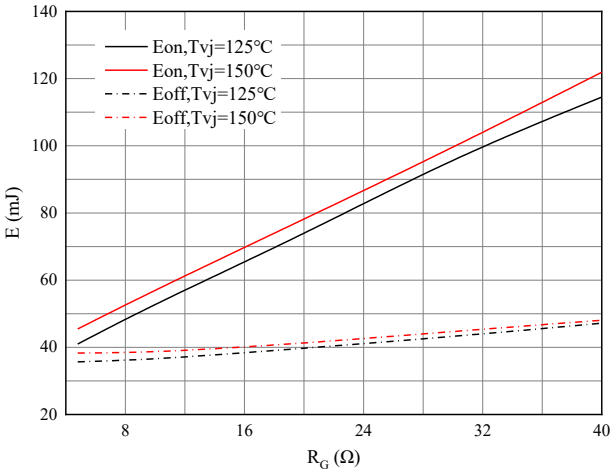


Fig 6. Switching losses of IGBT

VGE=±15V, IC=150A, VCE=900V

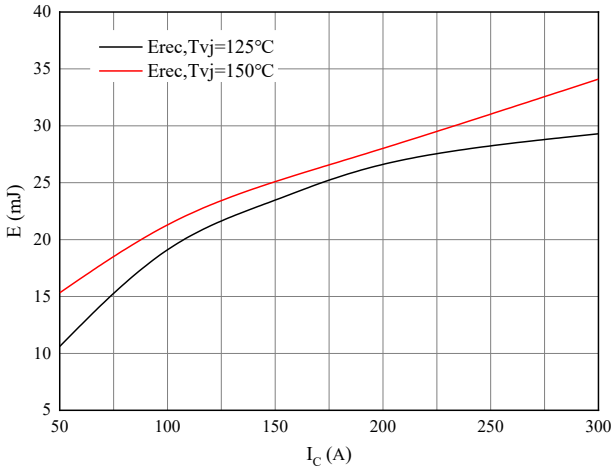


Fig 7. Switching losses of Diode

RGon=4.8Ω, VCE=900V

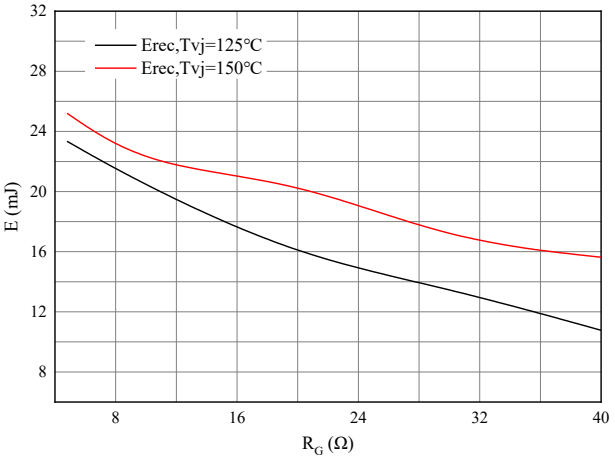


Fig 8. Switching losses of Diode

IF=150A, VCE=900V

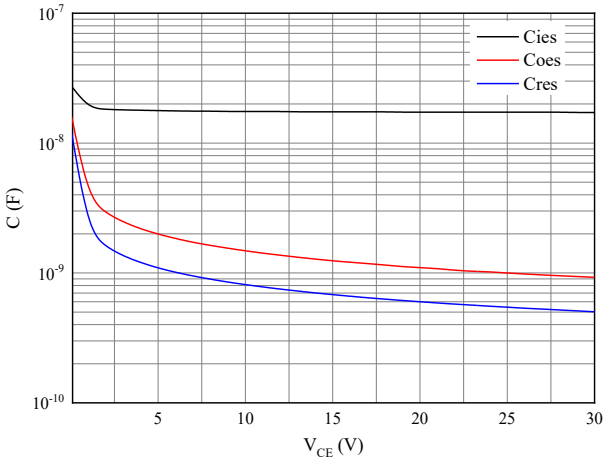
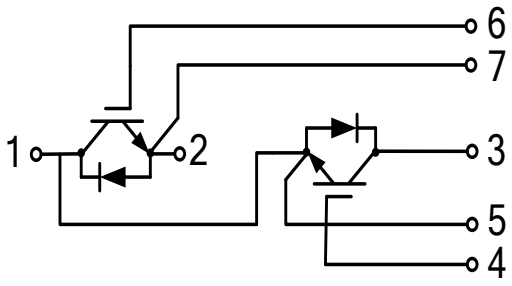


Fig 9. Capacitance characteristic

Circuit diagram



Package outlines