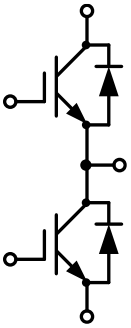
62mm Half Bridge IGBT Module

V_{CES} =1700V， $I_{C\ nom}$ =300A / I_{CRM} =600A

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	$I_{C\ nom}$	300	A
Repetitive peak collector current	t_P=1 ms	I_{CRM}	600	A
Total power dissipation	T_C = 25°C, $T_{vj\ max}$ = 175°C	Ptot	1800	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=300A T_{vj}=25°C V_{GE}=15V, I_C=300A T_{vj}=125°C V_{GE}=15V, I_C=300A T_{vj}=150°C	V_{CEsat}		2.07 2.47 2.57	2.55	V
Gate-Emitter threshold voltage	I_C=12mA, V_{GE}= V_{CE} T_{vj}=25°C	$V_{GE(th)}$	4.90	5.50	6.10	
Internal gate resistor		R_{Gint}		2.50		Ω
Input capacitance	f=1MHz, V_{CE}=25 V, V_{GE}=0 V T_{vj}=25°C	C_{ies}		21.30		nF
Reverse transfer capacitance		C_{res}		0.86		
Collector-emitter cut-off current	V_{CE}=1700V , 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=300A, V_{CE}=900 V T_{vj}=25°C V_{GE}=±15 V, R_G=2.5Ω T_{vj}=125°C (inductive load) T_{vj}=150°C	$t_{d\,on}$		198 230 297		ns
Rise time	I_C=300A, V_{CE}=900 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		63 69 73		
Turn-off delay time	I_C=300A, V_{CE}=900 V T_{vj}=25°C V_{GE}=±15 V, R_G=2.5Ω T_{vj}=125°C (inductive load) T_{vj}=150°C	$t_{d\,off}$		431 485 498		
Fall time	I_C=300A, V_{CE}=900 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		314 380 380		
Turn-on energy loss per pulse	I_C=300A, V_{CE}=900 V T_{vj}=25°C V_{GE}=±15 V, R_G=2.5Ω T_{vj}=125°C (inductive load) T_{vj}=150°C	E_{on}		54.94 73.05 80.71		mJ
Turn-off energy loss per pulse	I_C=300A, V_{CE}=900 V T_{vj}=25°C V_{GE}=±15 V, R_G=2.5Ω T_{vj}=125°C (inductive load) T_{vj}=150°C	E_{off}		57.48 68.22 65.84		
SC data	V_{GE}≤15V, Vce=1000V V_{CEmax}=V_{CES}-L_{sCE}·di/dt t_P≤10us, T_{vj}=150°C	I_{SC}		1400		A
Thermal resistance, junction to case	per IGBT	R_{thJC}			0.08	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	300	A
Repetitive peak forward current	t_p=1ms	I_{FRM}	600	A
I^2t-value	t_p=10ms，sin180°，T_j=125°C	I^2t	14500	A^2s

Characteristic Values

Parameter	Conditions		Symbol	Value			Unit
				Min.	Typ.	Max.	
Forward voltage	I_F=300A, V_{GE}=0V I_F=300A, V_{GE}=0V I_F=300A, V_{GE}=0V	T_{vj}=25°C T_{vj}=125°C T_{vj}=150°C	V_F		2.03 2.18 2.15	2.45	V
Peak reverse recovery current	I_F=300A -di$_F$/dt=2720A/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}		147 165 171		A
Recovered charge	I_F=300A -di$_F$/dt=2720A/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		41.60 72.20 79.90		µC
Reverse recovered energy	I_F=300A -di$_F$/dt=2720A/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}		24.07 42.59 46.96		mJ
Thermal resistance, junction to case	per diode		R_{thJC}			0.13	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		318		g

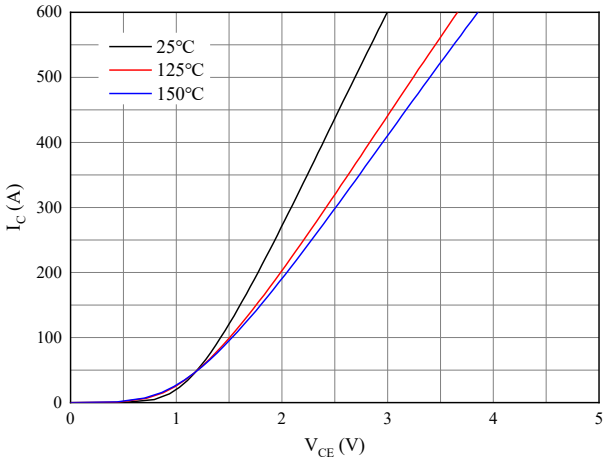


Fig 1. Typical output characteristics (V_{GE}=15V)

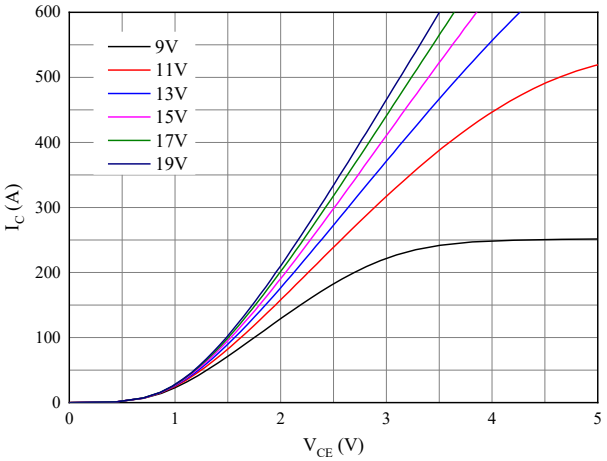


Fig 2. Typical output characteristics (T_{vj}=150℃)

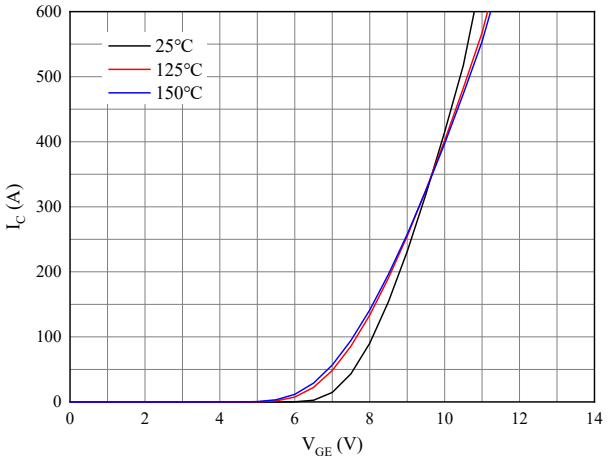


Fig 3. Typical transfer characteristic(V_{CE}=20V)

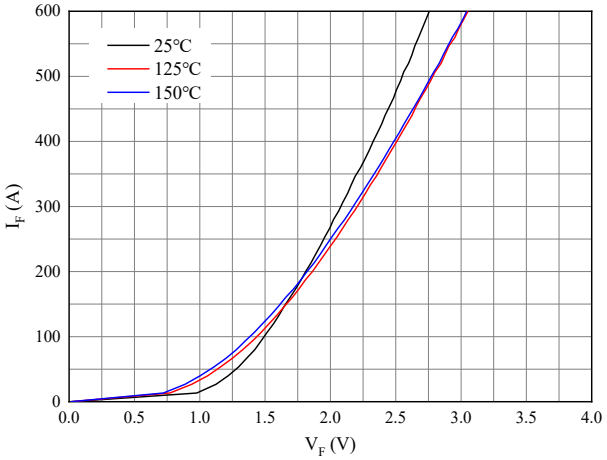


Fig 4. Forward characteristic of Diode

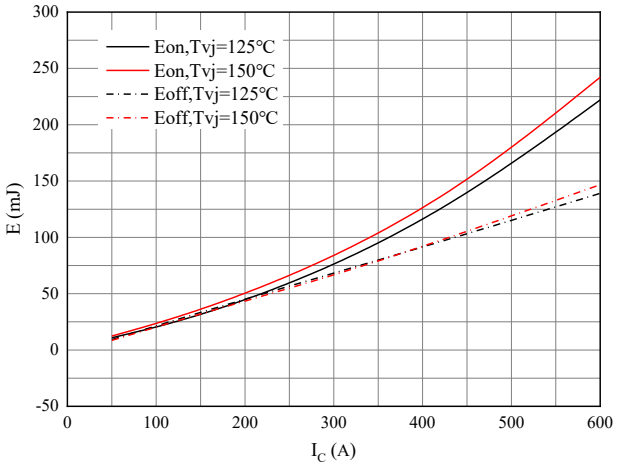


Fig 5. Switching losses of IGBT
VGE=±15V, RGon=2.5Ω, RGoff=2.5Ω, VCE=900V

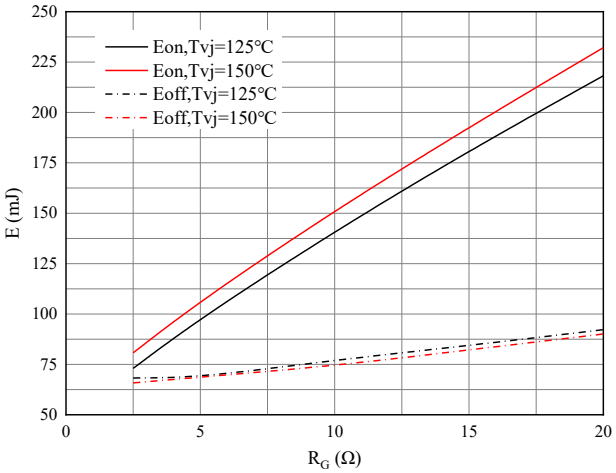


Fig 6. Switching losses of IGBT
VGE=±15V, IC=300A, VCE=900V

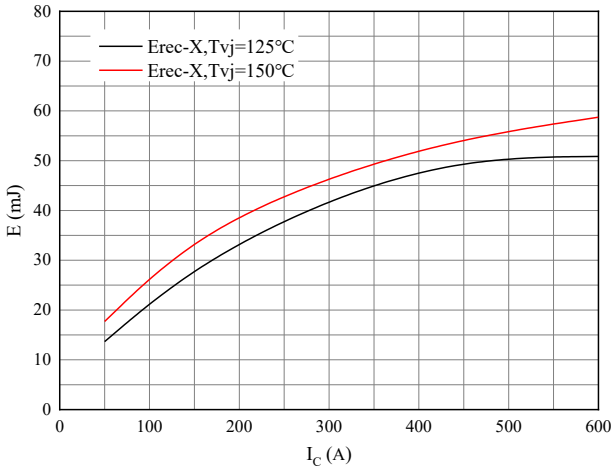


Fig 7. Switching losses of Diode

RGon=2.5 Ω , VCE=900V

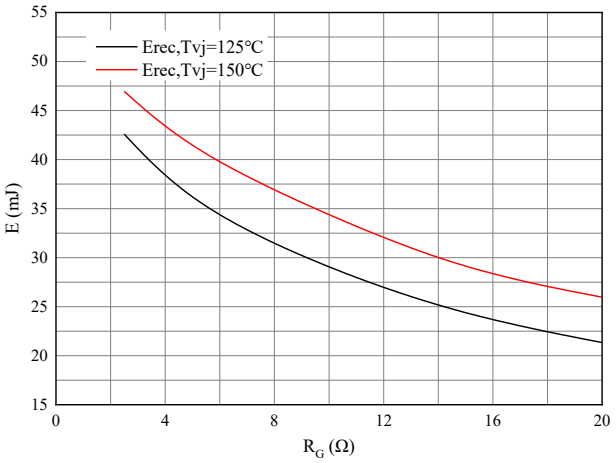


Fig 8. Switching losses of Diode

IF=300A, VCE=900V

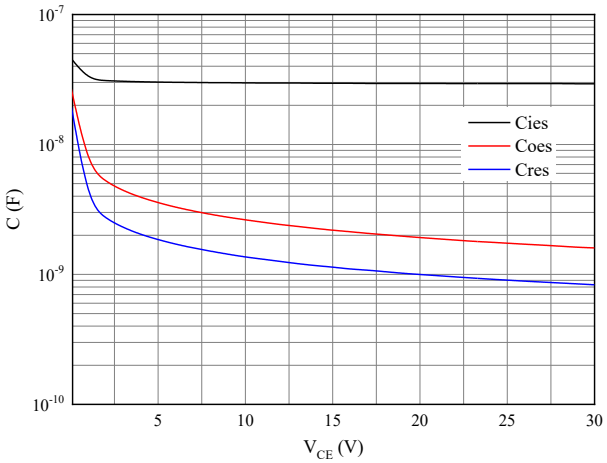
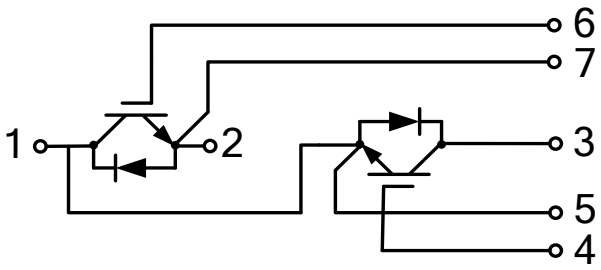


Fig 9. Capacitance characteristic

Circuit diagram



Package outlines