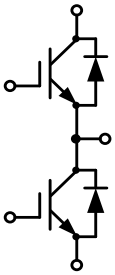
62mm Half Bridge IGBT Module

V_{CES}=1200V， $I_{C\ nom}$=300A / I_{CRM}=600A

D5



Equivalent Circuit

Features：

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

Applications:

- Inverter welding machine
- induction heating
- high-frequency switch power supply
- 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	$I_{C\ nom}$	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	P_{tot}	1400	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}		2.15 2.65 2.90	2.65	V
Gate-Emitter threshold voltage	I_C = 8mA, V_{GE}= V_{CE} T_{vj}=25°C	$V_{GE(th)}$	5.10	5.70	6.30	
Gate charge	V_{GE}=-15V…+15V	Q_G		1.56		μC
Internal gate resistor		R_{Gint}		1.74		Ω
Input capacitance	f=1 MHz, V_{CE}=25 V, V_{GE}=0 V T_{vj}=25°C	C_{ies}		22.46		nF
Reverse transfer capacitance		C_{res}		0.84		
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=300A, V_{CE}=600 V T_{vj}=25°C V_{GE}=±15 V, R_G=3Ω T_{vj}=125°C (inductive load) T_{vj}=150°C	$t_{d\,on}$		225 230 231		ns
Rise time	I_C=300A, V_{CE}=600 V T_{vj}=25°C V_{GE}=±15 V, R_G=3Ω T_{vj}=125°C (inductive load) T_{vj}=150°C	t_r		57 62 64		
Turn-off delay time	I_C=300A, V_{CE}=600 V T_{vj}=25°C V_{GE}=±15 V, R_G=3Ω T_{vj}=125°C (inductive load) T_{vj}=150°C	$t_{d\,off}$		268 305 317		
Fall time	I_C=300A, V_{CE}=600 V T_{vj}=25°C V_{GE}=±15 V, R_G=3Ω T_{vj}=125°C (inductive load) T_{vj}=150°C	t_f		105 147 156		
Turn-on energy loss per pulse	I_C=300A, V_{CE}=600 V T_{vj}=25°C V_{GE}=±15 V, R_G=3Ω T_{vj}=125°C (inductive load) T_{vj}=150°C	E_{on}		7.53 9.90 11.03		mJ
Turn-off energy loss per pulse	I_C=300A, V_{CE}=600 V T_{vj}=25°C V_{GE}=±15 V, R_G=3Ω T_{vj}=125°C (inductive load) T_{vj}=150°C	E_{off}		14.42 18.12 19.34		
SC data	V_{GE}≤15V, Vcc=800V V_{CEmax}=V_{CES}-L_{sCE}·di/dt t_P≤10us, T_{vj}=150°C	I_{SC}		897		A
Thermal resistance, junction to case	per IGBT	R_{thJC}			0.064	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}=25ºC	V_{RRM}	1200	V
Continuous DC forward current		I_F	160	A
Repetitive peak forward current	t_p=1ms	I_{FRM}	320	A
I^2t-value	t_p=10ms，sin180°，T_j=125ºC	I^2t	8500	A^2s

Characteristic Values

Parameter	Conditions		Symbol	Value			Unit
				Min.	Typ.	Max.	
Forward voltage	I_F=160A I_F=160A I_F=160A	T_{vj}=25°C T_{vj}=125°C T_{vj}=150°C	V_F		1.56 1.87 2.09	2.10	V
Peak reverse recovery current	I_F=160A, -di$_F$/dt=3397A/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}		38 42 42		A
Recovered charge	I_F=160A, -di$_F$/dt=3397A/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		1.64 1.71 1.75		µC
Reverse recovered energy	I_F=160A, -di$_F$/dt=3397A/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}		0.37 0.55 0.56		mJ
Thermal resistance, junction to case	per diode		R_{thJC}			0.10	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				g

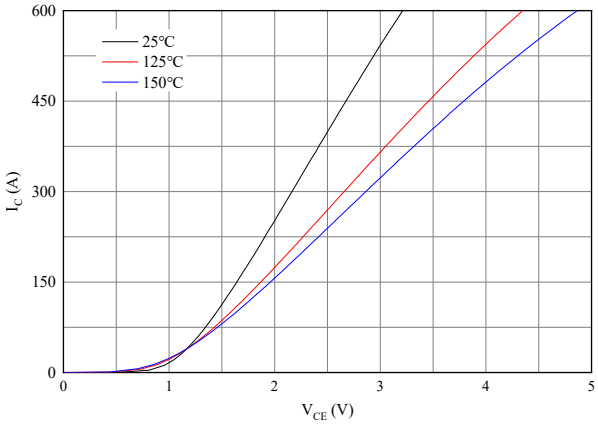


Fig 1. Typical output characteristics (V_{GE}=15V)

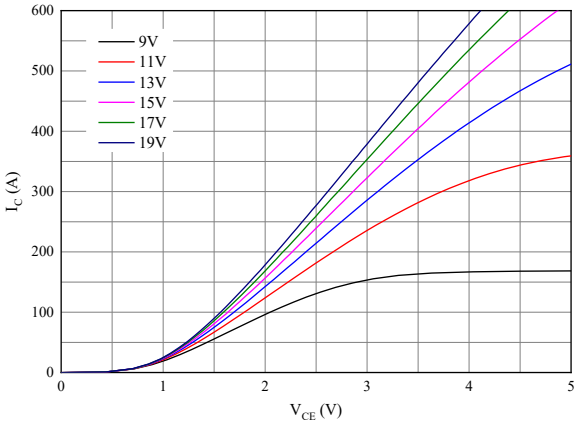


Fig 2. Typical output characteristics (T_{vj}=150℃)

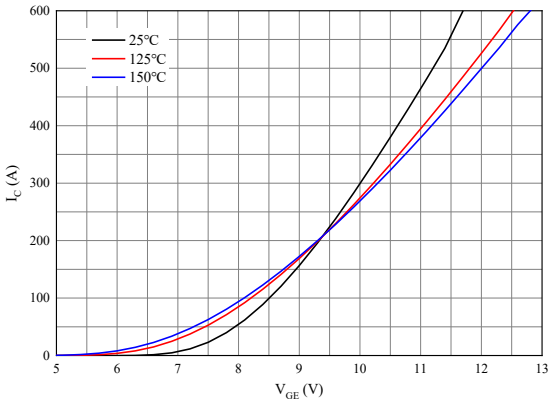


Fig 3. Typical transfer characteristic(V_{CE}=20V)

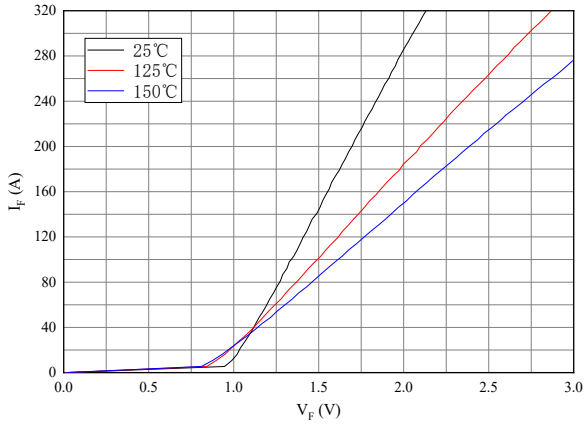


Fig 4. Forward characteristic of Diode

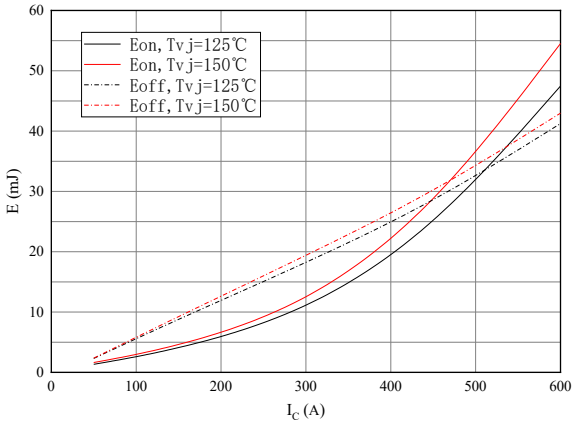


Fig 5. Switching losses of IGBT

VGE=±15V, RGon=3Ω, RGoff=3Ω, VCE=600V

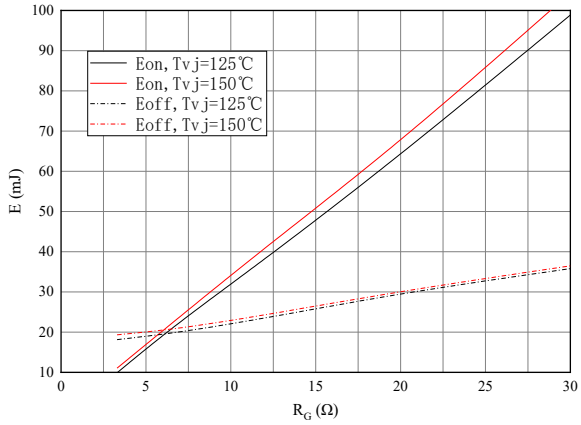


Fig 6. Switching losses of IGBT

VGE=±15V, IC=300A, VCE=600V

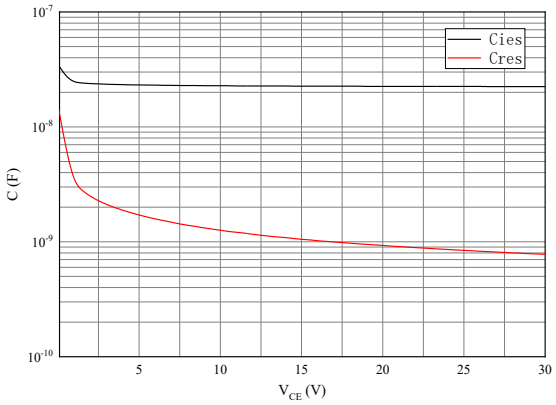
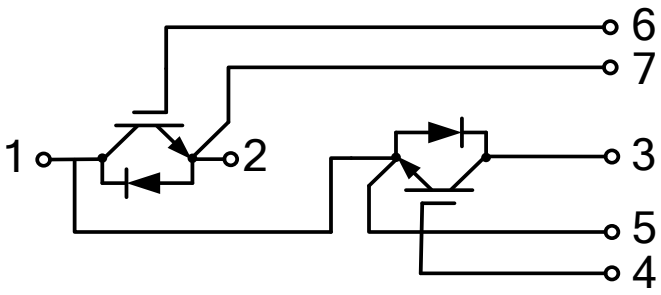


Fig 7. Capacitance characteristic

Circuit diagram



Package outlines