34mm Half Bridge IGBT Module

V_{CES}=1200V， $I_{C\,nom}$=100A / I_{CRM}=200A

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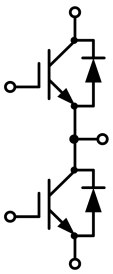


Equivalent Circuit

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	$I_{C\,nom}$	100	A
Repetitive peak collector current	t_P=1 ms	I_{CRM}	200	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=100A T_{vj}=25°C V_{GE}=15V, I_C=100A T_{vj}=125°C V_{GE}=15V, I_C=100A T_{vj}=150°C	V_{CEsat}		1.98 2.25 2.32	2.50	V
Gate-Emitter threshold voltage	I_C = 3.8mA, V_{GE}= V_{CE} T_{vj}=25°C	$V_{GE(th)}$	4.80	5.80	6.40	
Gate charge	V_{GE}=-15V…+15V	Q_G		0.49		µC
Internal gate resistor	T_{vj}=25°C	R_{Gint}		8.24		Ω
Input capacitance	f=1MHz, V_{CE}=25 V, V_{GE}=0 V T_{vj}=25°C	C_{ies}		5.80		nF
Reverse transfer capacitance		C_{res}		0.25		
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}			100	nA
Turn-on delay time	I_C=100A, V_{CE}=600 V T_{vj}=25°C V_{GE}=±15 V, R_G=6.8Ω T_{vj}=125°C (inductive load) T_{vj}=150°C	$t_{d\,on}$		182 191 207		ns
Rise time	I_C=100A, V_{CE}=600 V T_{vj}=25°C V_{GE}=±15 V, R_G=6.8Ω T_{vj}=125°C (inductive load) T_{vj}=150°C	t_r		41 43 40		
Turn-off delay time	I_C=100A, V_{CE}=600 V T_{vj}=25°C V_{GE}=±15 V, R_G=6.8Ω T_{vj}=125°C (inductive load) T_{vj}=150°C	$t_{d\,off}$		254 308 326		
Fall time	I_C=100A, V_{CE}=600 V T_{vj}=25°C V_{GE}=±15 V, R_G=6.8Ω T_{vj}=125°C (inductive load) T_{vj}=150°C	t_f		61 102 114		
Turn-on energy loss per pulse	I_C=100A, V_{CE}=600 V T_{vj}=25°C V_{GE}=±15 V, R_G=6.8Ω T_{vj}=125°C di/dt =1900A/µs(Tvj = 150°C) T_{vj}=150°C (inductive load)	E_{on}		5.05 8.22 9.19		mJ
Turn-off energy loss per pulse	I_C=100A, V_{CE}=600 V T_{vj}=25°C V_{GE}=±15 V, R_G=6.8Ω T_{vj}=125°C dv/dt=5600V/µs(Tvj = 150°C) T_{vj}=150°C (inductive load)	E_{off}		3.31 4.94 5.62		
SC data	V_{GE}≤15V, Vcc=800V V_{CEmax}=V_{CES}-L_{sCE}·di/dt t_P≤10us, T_{vj}=150°C	I_{SC}		448		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	100	A
Repetitive peak forward current	t_p=1ms	I_{FRM}	200	A
I^2t-value	t_p=10ms，sin180°，T_{vj}=125°C	I^2t	1920	A^2s

Characteristic Values

Parameter	Conditions		Symbol	Value			Unit
				Min.	Typ.	Max.	
Forward voltage	I_F=100A, V_{GE}=0V I_F=100A, V_{GE}=0V I_F=100A, V_{GE}=0V	T_{vj}=25°C T_{vj}=125°C T_{vj}=150°C	V_F		2.38 1.91 1.79	2.60	V
Peak reverse recovery current	I_F=100A, -di_F/dt=1900A/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 92 104		A
Recovered charge	I_F=100A, -di_F/dt=1900A/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		4.28 10.83 13.21		µC
Reverse recovered energy	I_F=100A, -di_F/dt=1900A/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}		1.49 3.68 4.51		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		5.0	Nm
Terminal Connection Torque		M	2.5		5.0	Nm
Weight		W		155		g

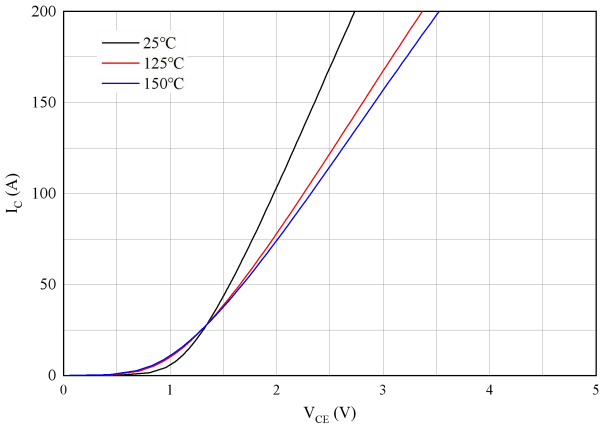


Fig 1. Typical output characteristics (V_{GE}=15V)

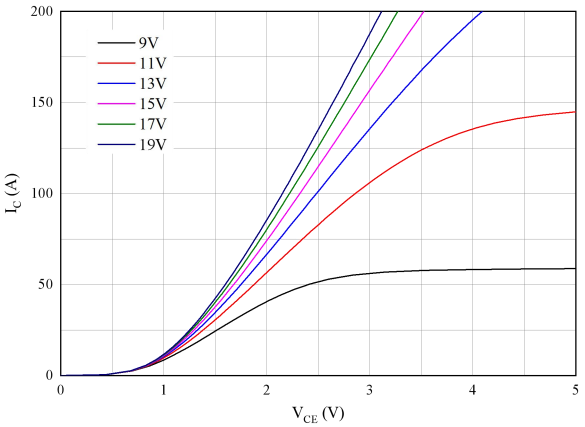


Fig 2. Typical output characteristics (T_{vj}=150℃)

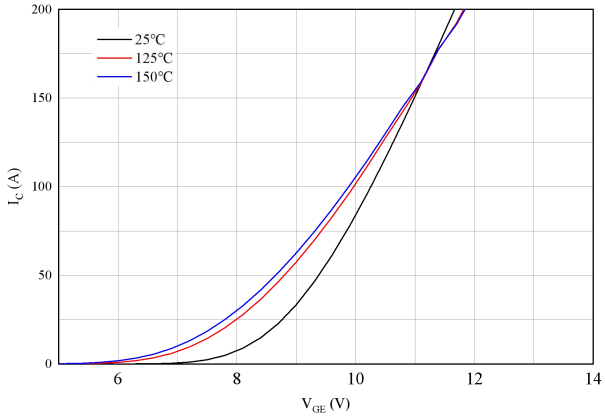


Fig 3. Typical transfer characteristic(V_{CE}=20V)

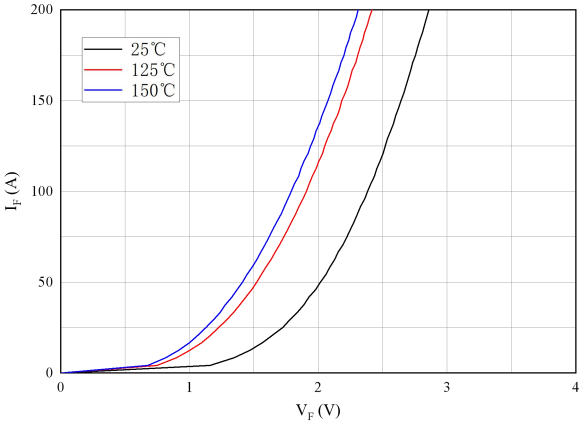


Fig4. Forward characteristic of Diode

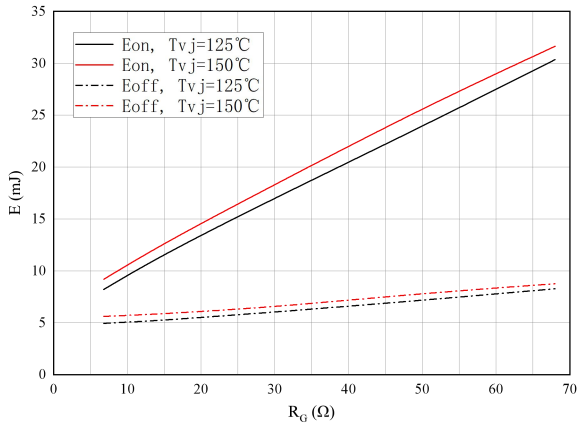


Fig 5. Switching losses of IGBT

VGE=±15V, RGon=6.8Ω, RGoff=6.8Ω, VCE=600V

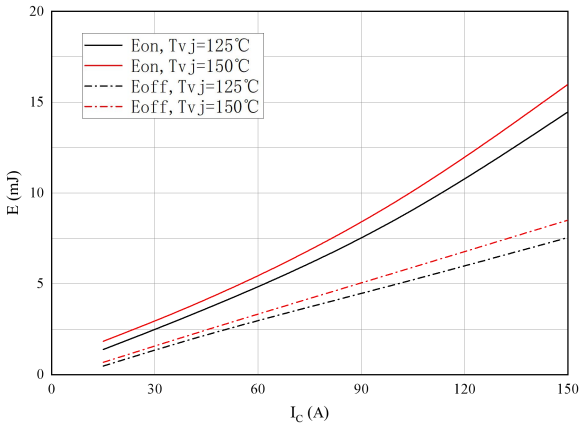


Fig 6. Switching losses of IGBT

VGE=±15V, IC=100A, VCE=600V

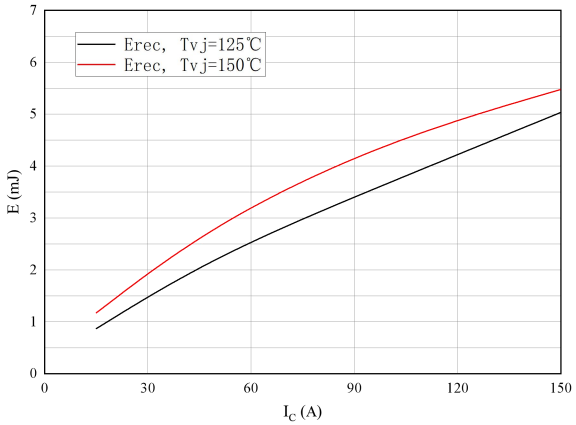


Fig 7. Switching losses of Diode

RGon=6.8Ω, VCE=600V

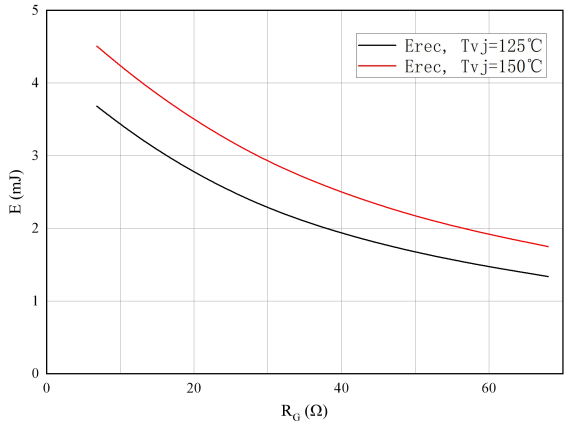


Fig 8. Switching losses of Diode

IF=100A, VCE=600V

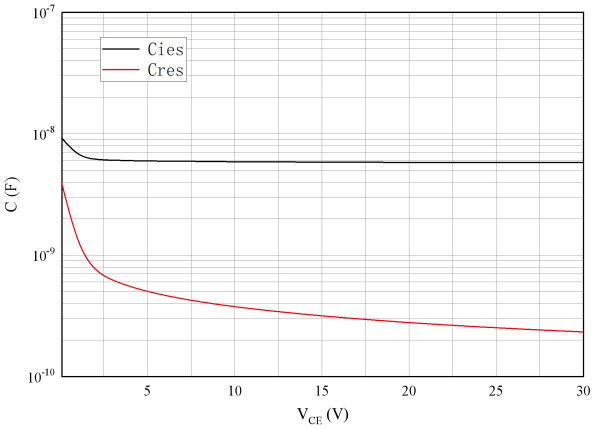
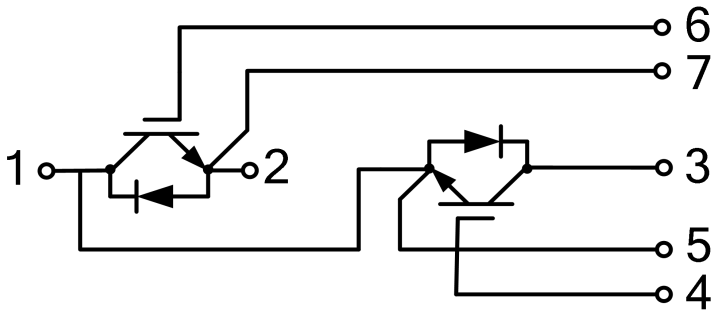


Fig 9. Capacitance characteristic

Circuit diagram



Package outlines