34mm Half Bridge IGBT Module

V_{CES} =1200V，$I_{C\ nom}$ =75A / I_{CRM} =150A

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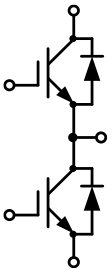


Electrical characteristics：

- 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	$I_{C\ nom}$	75	A
Repetitive peak collector current	t_P=1 ms	I_{CRM}	150	A
Total power dissipation	T_C = 25°C, $T_{vj\ max}$ = 175°C	P_{tot}	395	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=75A V_{GE}=15V, I_C=75A V_{GE}=15V, I_C=75A	T_{vj}=25°C T_{vj}=125°C T_{vj}=150°C	V_{CEsat}		1.98 2.45 2.56	2.50	V
Gate-Emitter threshold voltage	I_C = 2.6mA, 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		0.36		µC
Internal gate resistor			R_{Gint}		6.00		Ω
Input capacitance	f=1MHz, V_{CE}=25 V, V_{GE}=0 V	T_{vj}=25°C	C_{ies}		4.49		nF
Reverse transfer capacitance			C_{res}		0.20		
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=75A, V_{CE}=600 V V_{GE}=±15 V, R_G=10Ω (inductive load)	T_{vj}=25°C T_{vj}=125°C T_{vj}=150°C	$t_{d\,on}$		97 107 111		ns
Rise time	I_C=75A, V_{CE}=600 V V_{GE}=±15 V, R_G=10Ω (inductive load)	T_{vj}=25°C T_{vj}=125°C T_{vj}=150°C	t_r		47 58 63		
Turn-off delay time	I_C=75A, V_{CE}=600 V V_{GE}=±15 V, R_G=10Ω (inductive load)	T_{vj}=25°C T_{vj}=125°C T_{vj}=150°C	$t_{d\,off}$		242 280 289		
Fall time	I_C=75A, V_{CE}=600 V V_{GE}=±15 V, R_G=10Ω (inductive load)	T_{vj}=25°C T_{vj}=125°C T_{vj}=150°C	t_f		119 142 135		
Turn-on energy loss per pulse	I_C=75A, V_{CE}=600 V V_{GE}=±15 V, R_G=10Ω (inductive load)	T_{vj}=25°C T_{vj}=125°C T_{vj}=150°C	E_{on}		6.72 10.62 11.89		mJ
Turn-off energy loss per pulse	I_C=75A, V_{CE}=600 V V_{GE}=±15 V, R_G=10Ω (inductive load)	T_{vj}=25°C T_{vj}=125°C T_{vj}=150°C	E_{off}		3.16 4.09 4.41		
Thermal resistance, junction to case	per IGBT		R_{thJC}			0.38	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	60	A
Repetitive peak forward current	t_p=1ms	I_{FRM}	120	A
I^2t-value	t_p=10ms，sin180°，T_j=125ºC	I^2t	1200	A^2s

Characteristic Values

Parameter	Conditions	Symbol	Value			Unit
			Min.	Typ.	Max.	
Forward voltage	I_F=60A, V_{GE}=0V T_{vj}=25°C I_F=60A, V_{GE}=0V T_{vj}=125°C I_F=60A, V_{GE}=0V T_{vj}=150°C	V_F		1.90 1.62 1.54	2.40	V
Peak reverse recovery current	I_F=60A, T_{vj}=25°C -di$_F$/dt=900A/µs(T_{vj}=150°C) T_{vj}=125°C V_R=600V, V_{GE}=-15V T_{vj}=150°C	I_{RM}		29 43 48		A
Recovered charge	I_F=60A, T_{vj}=25°C -di$_F$/dt=900A/µs(T_{vj}=150°C) T_{vj}=125°C V_R=600V, V_{GE}=-15V T_{vj}=150°C	Q_r		5.46 11.68 13.88		µC
Reverse recovered energy	I_F=60A, T_{vj}=25°C -di$_F$/dt=900A/µs(T_{vj}=150°C) T_{vj}=125°C V_R=600V, V_{GE}=-15V T_{vj}=150°C	E_{rec}		2.07 4.26 5.06		mJ
Thermal resistance, junction to case	每个二极管 / per diode	R_{thJC}			0.58	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		155		g

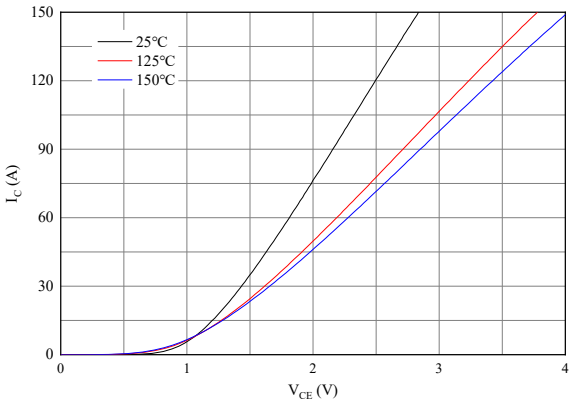


Fig 1. Typical output characteristics (V_{GE}=15V)

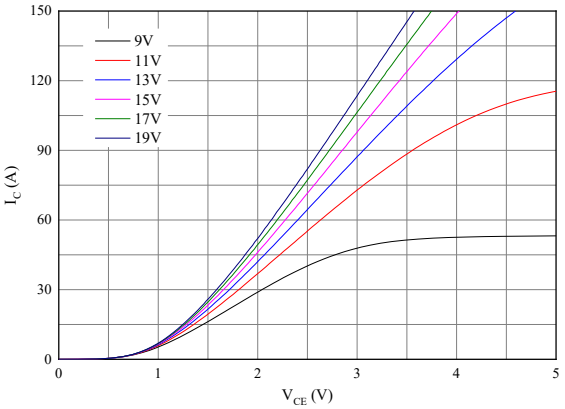


Fig 2. Typical output characteristics (T_{vj}=150℃)

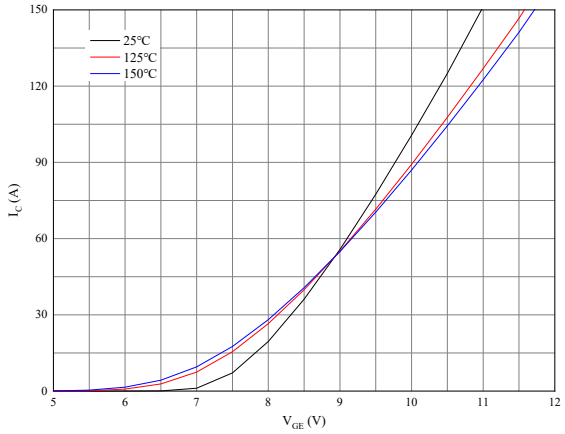


Fig 3. Typical transfer characteristic(V_{CE}=20V)

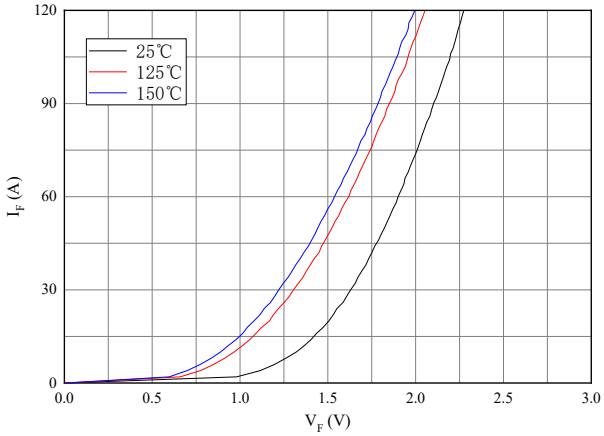


Fig 4. Forward characteristic of Diode

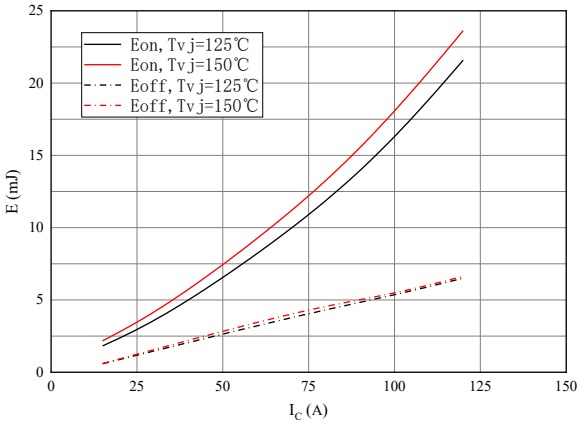


Fig 5. Switching losses of IGBT
VGE=±15V, RGon=10Ω, RGoff=10Ω, VCE=600V

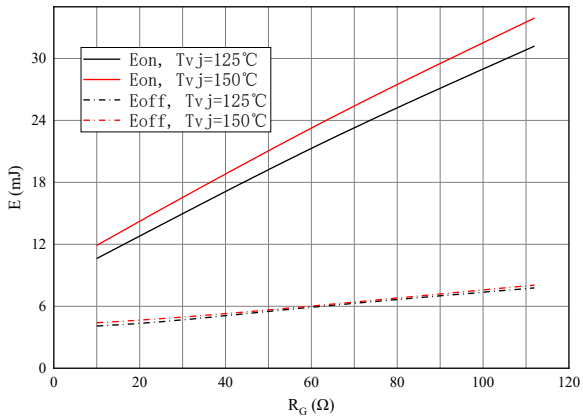


Fig 6. Switching losses of IGBT
VGE=±15V, IC=75A, VCE=600V

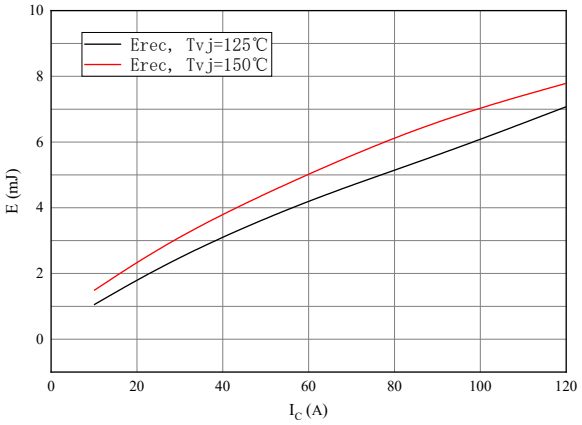


Fig 7. Switching losses of Diode
RGon=10Ω, VCE=600V

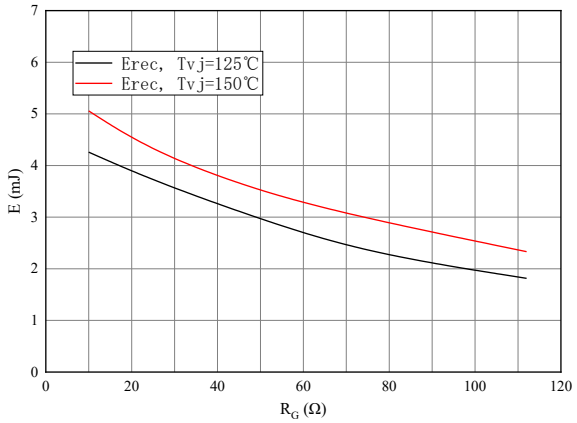


Fig 8. Switching losses of Diode
IF=60A, VCE=600V

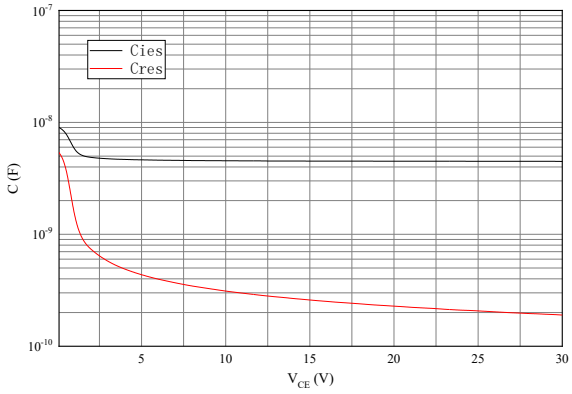
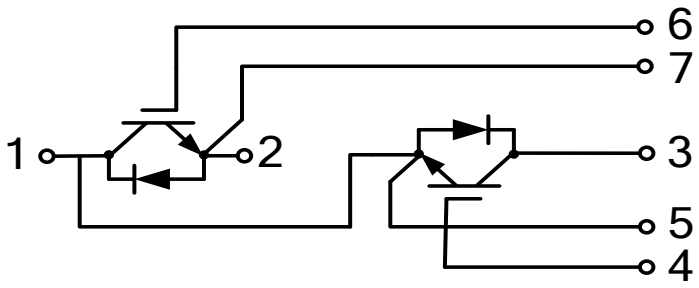


Fig 9. Capacitance characteristic

Circuit diagram



Package outlines