34mm Half Bridge IGBT Module

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

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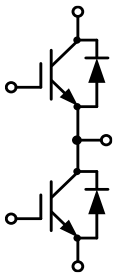


Equivalent Circuit

Features：

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

Applications:

- Inverter welding machine

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
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	$V_{GE(th)}$	5.00	5.70	6.30	
Gate charge	V_{GE}=-15V…+15V		Q_G		0.63		µC
Internal gate resistor	T_{vj}=25°C		R_{Gint}		None		Ω
Input capacitance	f=100KHz, V_{CE}=25 V, V_{GE}=0 V	T_{vj}=25°C	C_{ies}		8.28		nF
Reverse transfer capacitance			C_{res}		0.13		
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=30A, V_{CE}=600 V V_{GE}=±15 V, R_G=15Ω (inductive load)	T_{vj}=25°C T_{vj}=125°C T_{vj}=150°C	$t_{d\ on}$		59 53 50		ns
Rise time	I_C=30A, V_{CE}=600 V V_{GE}=±15 V, R_G=15Ω (inductive load)	T_{vj}=25°C T_{vj}=125°C T_{vj}=150°C	t_r		26 24 26		
Turn-off delay time	I_C=30A, V_{CE}=600 V V_{GE}=±15 V, R_G=15Ω (inductive load)	T_{vj}=25°C T_{vj}=125°C T_{vj}=150°C	$t_{d\ off}$		270 292 302		
Fall time	I_C=30A, V_{CE}=600 V V_{GE}=±15 V, R_G=15Ω (inductive load)	T_{vj}=25°C T_{vj}=125°C T_{vj}=150°C	t_f		85 144 170		
Turn-on energy loss per pulse	I_C=30A, V_{CE}=600 V V_{GE}=±15 V, R_G=15Ω di/dt =900A/µs (Tvj = 150°C) (inductive load)	T_{vj}=25°C T_{vj}=125°C T_{vj}=150°C	E_{on}		1.42 2.15 2.32		mJ
Turn-off energy loss per pulse	I_C=30A, V_{CE}=600 V V_{GE}=±15V,R_G=15Ω dv/dt=6500V/µs (Tvj = 150°C) (inductive load)	T_{vj}=25°C T_{vj}=125°C T_{vj}=150°C	E_{off}		1.22 1.66 1.74		
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	30	A
Repetitive peak forward current	t_p=1ms	I_{FRM}	60	A
I^2t-value	t_p=10ms，sin180°，T_j=125°C	I^2t	490	A^2s

Characteristic Values

Parameter	Conditions		Symbol	Value			Unit
				Min.	Typ.	Max.	
Forward voltage	I_F=30A, V_{GE}=0V I_F=30A, V_{GE}=0V I_F=30A, V_{GE}=0V	T_{vj}=25°C T_{vj}=125°C T_{vj}=150°C	V_F		1.86 1.60 1.50	2.60	V
Peak reverse recovery current	I_F=30A, -di$_F$/dt=900A/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}		47 76 86		A
Recovered charge	I_F=30A, -di$_F$/dt=900A/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		1.28 4.94 7.08		µC
Reverse recovered energy	I_F=30A, -di$_F$/dt=900A/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}		0.24 1.75 2.79		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}	2500			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		150		g

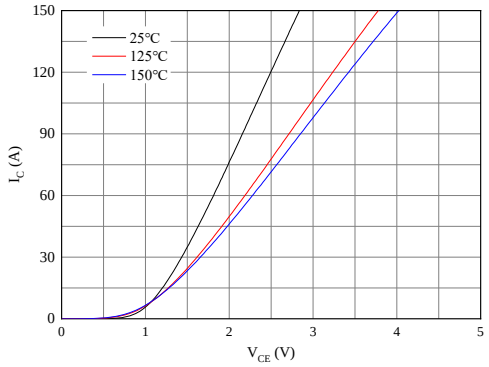


Fig 1. Typical output characteristics (V_{GE}=15V)

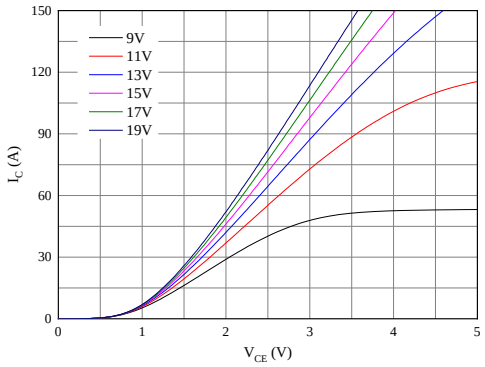


Fig 2. Typical output characteristics (T_{vj}=150℃)

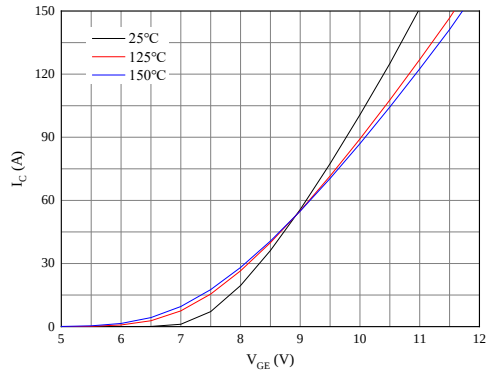


Fig 3. Typical transfer characteristic(V_{CE}=20V)

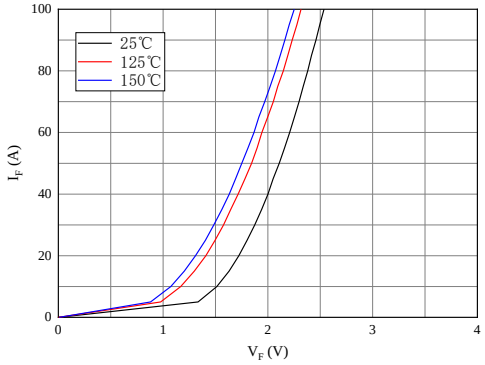


Fig 4. Forward characteristic of Diode

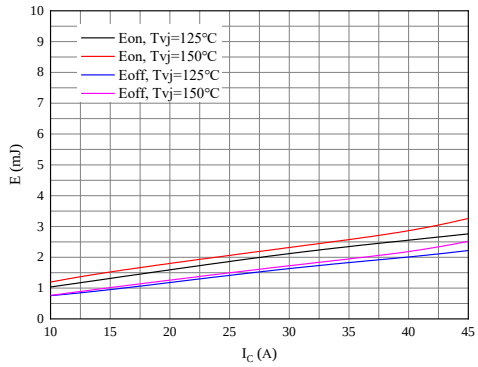


Fig 5. Switching losses of IGBT

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

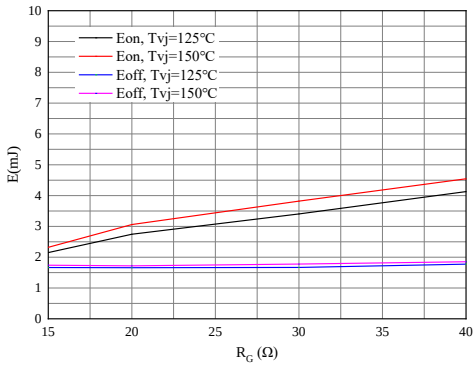


Fig 6. Switching losses of IGBT

VGE=±15V, IC=30A, VCE=600V

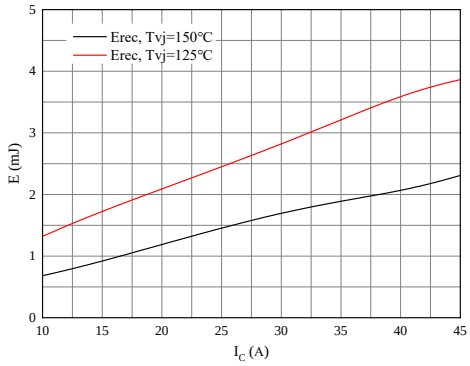


Fig 7. Switching losses of Diode

RGon=15Ω, VCE=600V

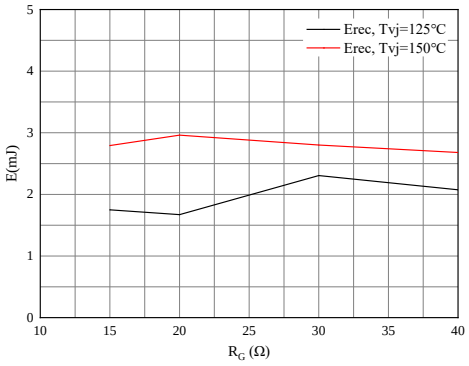


Fig 8. Switching losses of Diode

IF=30A, VCE=600V

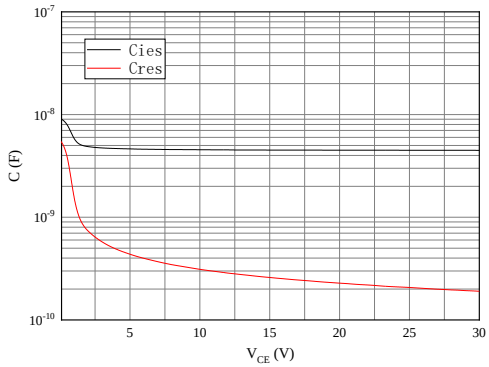
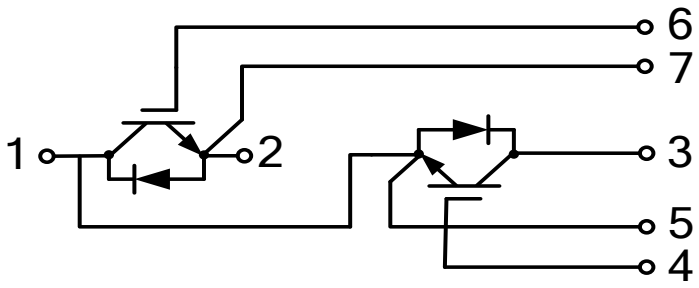


Fig 9. Capacitance characteristic

Circuit diagram



Package outlines