34mm Half Bridge IGBT Module

V_{CES} =1700V， $I_{C\ nom}$ =100A / I_{CRM} =200A

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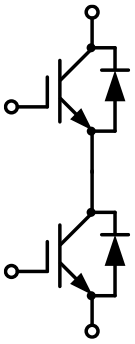


Equivalent Circuit

Features：

- 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	$I_{C\ nom}$	100	A
Repetitive peak collector current	t_P=1 ms	I_{CRM}	200	A
Total power dissipation	T_C = 25°C, $T_{vj\ max}$ = 175°C	P_{tot}	789	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=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}		1.81 2.10 2.16	2.30	V
Gate-Emitter threshold voltage	I_C=6mA, V_{GE}= V_{CE} T_{vj}=25°C	$V_{GE(th)}$	5.10	5.70	6.30	
Internal gate resistor		R_{Gint}		5.10		Ω
Input capacitance	f=1 MHz, V_{CE}=25 V, V_{GE}=0 V T_{vj}=25°C	C_{ies}		13.60		nF
Reverse transfer capacitance		C_{res}		0.40		
Collector-emitter cut-off current	V_{CE}=1700V , 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}=900 V T_{vj}=25°C V_{GE}=±15 V, R_G=1Ω T_{vj}=125°C (inductive load) T_{vj}=150°C	$t_{d\ on}$		154 166 169		ns
Rise time	I_C=100A, V_{CE}=900 V T_{vj}=25°C V_{GE}=±15 V, R_G=1Ω T_{vj}=125°C (inductive load) T_{vj}=150°C	t_r		33 36 40		
Turn-off delay time	I_C=100A, V_{CE}=900 V T_{vj}=25°C V_{GE}=±15 V, R_G=1Ω T_{vj}=125°C (inductive load) T_{vj}=150°C	$t_{d\ off}$		291 330 343		
Fall time	I_C=100A, V_{CE}=900 V T_{vj}=25°C V_{GE}=±15 V, R_G=1Ω T_{vj}=125°C (inductive load) T_{vj}=150°C	t_f		383 211 224		
Turn-on energy loss per pulse	I_C=100A, V_{CE}=900 V T_{vj}=25°C V_{GE}=±15 V, R_G=1Ω T_{vj}=125°C (inductive load) T_{vj}=150°C	E_{on}		11.22 14.01 15.13		mJ
Turn-off energy loss per pulse	I_C=100A, V_{CE}=900 V T_{vj}=25°C V_{GE}=±15 V, R_G=1Ω T_{vj}=125°C (inductive load) T_{vj}=150°C	E_{off}		17.73 20.54 20.17		
SC data	V_{GE}≤15V, Vce=900V V_{CEmax}=V_{CES}-L_{sCE}·di/dt t_P≤10us, T_{vj}=150°C	I_{SC}		665		A
Thermal resistance, junction to case	per IGBT	R_{thJC}			0.19	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	100	A
Repetitive peak forward current	t_p=1ms	I_{FRM}	200	A
I^2t-value	t_p=10ms，sin180°，T_j=125°C	I^2t	3000	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		2.08 2.40 2.39	2.60	V
Peak reverse recovery current	I_F=100A -di$_F$/dt=1975A/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}		74 77 74		A
Recovered charge	I_F=100A -di$_F$/dt=1975A/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		9.0 17.3 20.9		µC
Reverse recovered energy	I_F=100A -di$_F$/dt=1975A/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}		4.73 17.34 20.88		mJ
Thermal resistance, junction to case	per diode		R_{thJC}			0.38	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

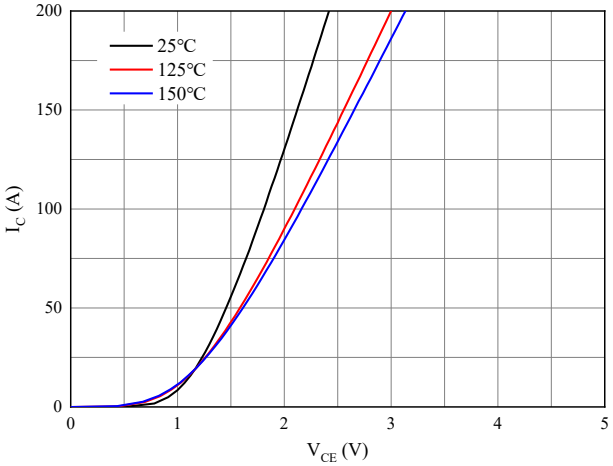


Fig 1. Typical output characteristics (V_{GE}=15V)

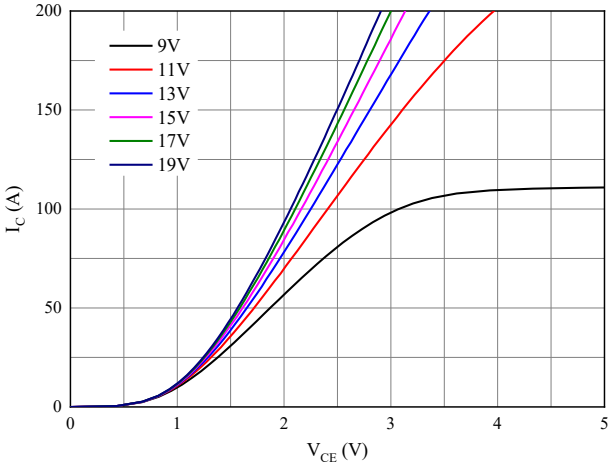


Fig 2. Typical output characteristics (T_{vj}=150℃)

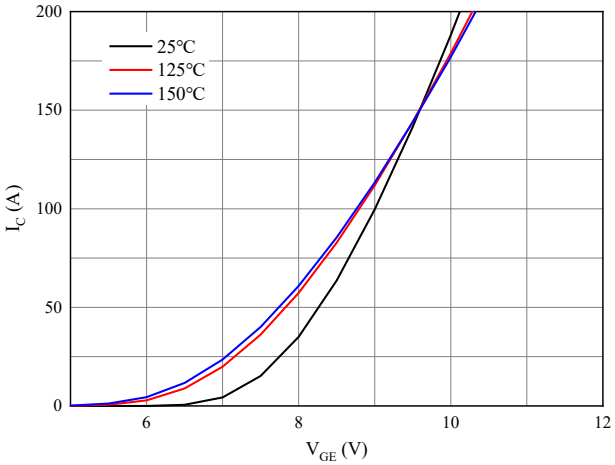


Fig 3. Typical transfer characteristic(V_{CE}=20V)

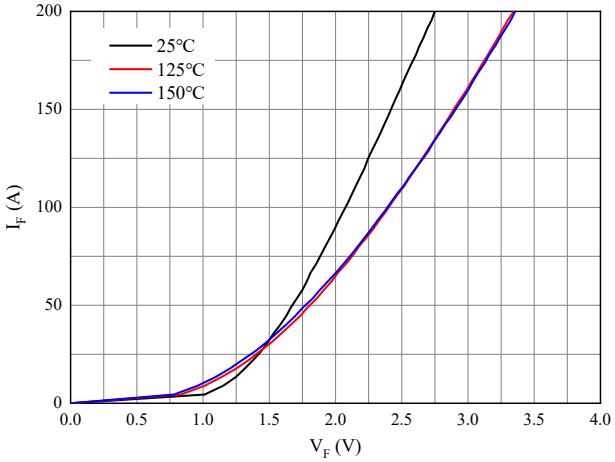


Fig 4. Forward characteristic of Diode

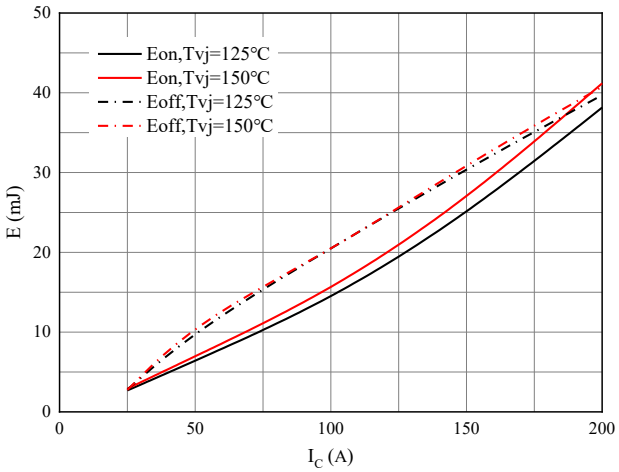


Fig 5. Switching losses of IGBT
VGE=±15V, RGon=1Ω, RGoff=1Ω, VCE=900V

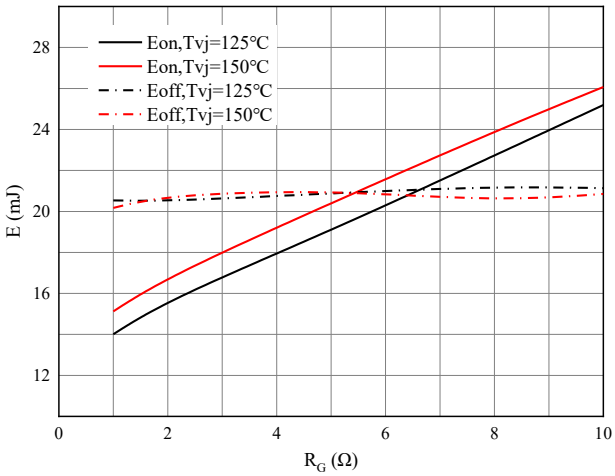


Fig 6. Switching losses of IGBT
VGE=±15V, IC=100A, VCE=900V

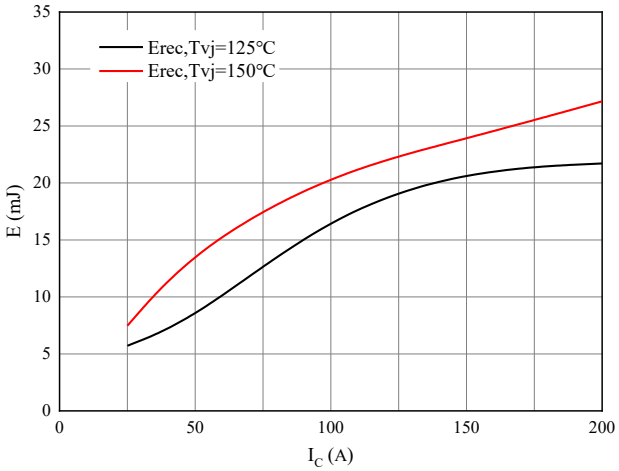


Fig 7. Switching losses of Diode

RGon=1Ω, VCE=900V

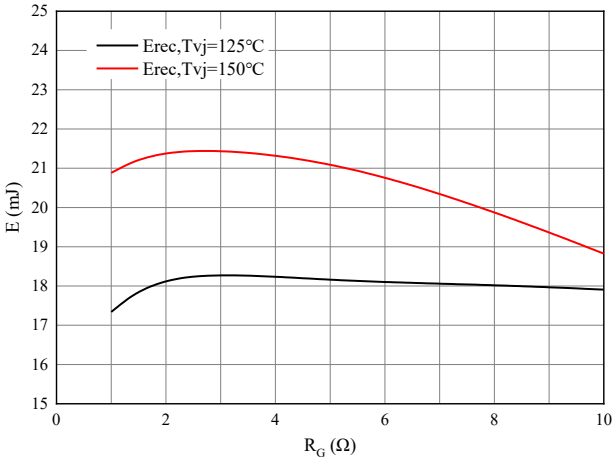


Fig 8. Switching losses of Diode

IF=100A, VCE=900V

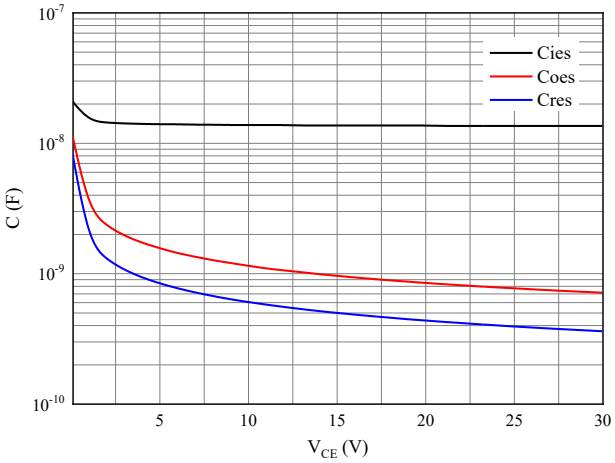
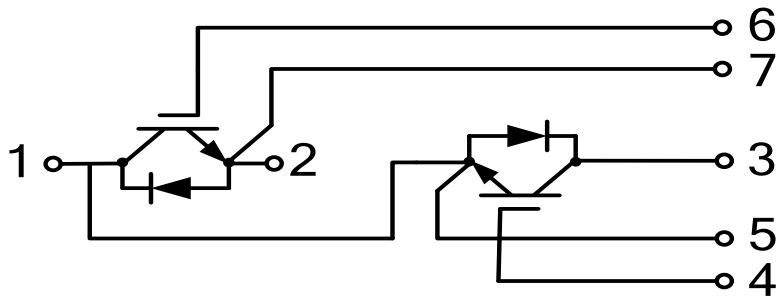


Fig 9. Capacitance characteristic

Circuit diagram



Package outlines