

34mm Half Bridge IGBT Module

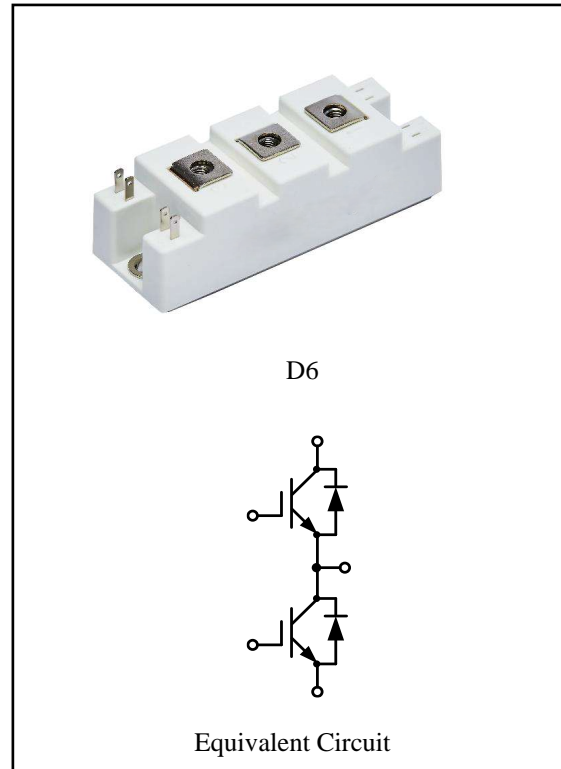
$V_{CES}=1700V$, $I_{C\ nom}=75A$ / $I_{CRM}=150A$

Features :

- 1700V Trench / Field Stop process
- Low switching losses
- V_{cesat} 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	$T_{vj}=25^{\circ}C$	V_{CES}	1700	V
Continuous DC collector current	$T_C=100^{\circ}C$, $T_{vj\ max}=175^{\circ}C$	$I_{C\ nom}$	75	A
Repetitive peak collector current	$t_p=1\ ms$	I_{CRM}	150	A
Total power dissipation	$T_C = 25^{\circ}C$, $T_{vj\ max}=175^{\circ}C$	P_{tot}	600	W
Gate emitter voltage		V_{GE}	± 20	V

Characteristic Values

Parameter	Conditions	Symbol	Value			Unit
			Min.	Typ.	Max.	
Collector-Emitter saturation voltage	$V_{GE}=15V, I_C=75A$ $T_{vj}=25^{\circ}C$	V_{CEsat}		1.77	2.30	V
	$V_{GE}=15V, I_C=75A$ $T_{vj}=125^{\circ}C$			2.02		
	$V_{GE}=15V, I_C=75A$ $T_{vj}=150^{\circ}C$			2.09		
Gate-Emitter threshold voltage	$I_C = 2.6mA, V_{GE} = V_{CE}$ $T_{vj}=25^{\circ}C$	$V_{GE(th)}$	4.90	5.50	6.10	
Gate charge	$V_{GE}=-15V...+15V$	Q_G		0.62		μC
Internal gate resistor		R_{Gint}		8.50		Ω
Input capacitance	$f=1MHz, V_{CE}=25V, V_{GE}=0V$ $T_{vj}=25^{\circ}C$	C_{ies}		8.67		nF
Reverse transfer capacitance		C_{res}		0.28		
Collector-emitter cut-off current	$V_{CE}=1700V, V_{GE}=0V$ $T_{vj}=25^{\circ}C$	I_{CES}			1	mA
Gate-emitter leakage current	$V_{CE}=0V, V_{GE}=20V$ $T_{vj}=25^{\circ}C$	I_{GES}			100	nA
Turn-on delay time	$I_C=75A, V_{CE}=900V$ $V_{GE}=\pm 15V, R_G=2\Omega$ (inductive load) $T_{vj}=25^{\circ}C$	t_{don}		157		ns
	$T_{vj}=125^{\circ}C$			171		
	$T_{vj}=150^{\circ}C$			171		
Rise time	$I_C=75A, V_{CE}=900V$ $V_{GE}=\pm 15V, R_G=2\Omega$ (inductive load) $T_{vj}=25^{\circ}C$	t_r		36		ns
	$T_{vj}=125^{\circ}C$			41		
	$T_{vj}=150^{\circ}C$			44		
Turn-off delay time	$I_C=75A, V_{CE}=900V$ $V_{GE}=\pm 15V, R_G=2\Omega$ (inductive load) $T_{vj}=25^{\circ}C$	t_{doff}		302		ns
	$T_{vj}=125^{\circ}C$			347		
	$T_{vj}=150^{\circ}C$			364		
Fall time	$I_C=75A, V_{CE}=900V$ $V_{GE}=\pm 15V, R_G=2\Omega$ (inductive load) $T_{vj}=25^{\circ}C$	t_f		401		ns
	$T_{vj}=125^{\circ}C$			158		
	$T_{vj}=150^{\circ}C$			154		
Turn-on energy loss per pulse	$I_C=75A, V_{CE}=900V$ $V_{GE}=\pm 15V, R_G=2\Omega$ (inductive load) $T_{vj}=25^{\circ}C$	E_{on}		11.73		mJ
	$T_{vj}=125^{\circ}C$			16.25		
	$T_{vj}=150^{\circ}C$			17.55		
Turn-off energy loss per pulse	$I_C=75A, V_{CE}=900V$ $V_{GE}=\pm 15V, R_G=2\Omega$ (inductive load) $T_{vj}=25^{\circ}C$	E_{off}		13.82		mJ
	$T_{vj}=125^{\circ}C$			16.61		
	$T_{vj}=150^{\circ}C$			16.75		
SC data	$V_{GE}\leq 15V, V_{ce}=900V$ $V_{CEmax}=V_{CES}-L_{sCE}\cdot di/dt$ $t_p\leq 10\mu s, T_{vj}=150^{\circ}C$	I_{sc}		477		A
Thermal resistance, junction to case	per IGBT	R_{thJC}			0.25	K/W
Temperature under switching conditions		$T_{vj op}$	-40		150	$^{\circ}C$

Diode, Inverter

Maximum Ratings

Parameter	Conditions	Symbol	Value	Unit
Repetitive peak reverse voltage	$T_{vj}=25^{\circ}\text{C}$	V_{RRM}	1700	V
Continuous DC forward current		I_F	75	A
Repetitive peak forward current	$t_p=1\text{ms}$	I_{FRM}	150	A
I^2t -value	$t_p=10\text{ms}$, $\sin 180^{\circ}$, $T_j=150^{\circ}\text{C}$	I^2t	1100	A^2s

Characteristic Values

Parameter	Conditions	Symbol	Value			Unit
			Min.	Typ.	Max.	
Forward voltage	$I_F=75\text{A}$, $V_{GE}=0\text{V}$ $T_{vj}=25^{\circ}\text{C}$	V_F		1.81	2.30	V
	$I_F=75\text{A}$, $V_{GE}=0\text{V}$ $T_{vj}=125^{\circ}\text{C}$		1.89			
	$I_F=75\text{A}$, $V_{GE}=0\text{V}$ $T_{vj}=150^{\circ}\text{C}$		1.87			
Peak reverse recovery current	$I_F=75\text{A}$, $-di_F/dt=1428\text{A}/\mu\text{s}$ ($T_{vj}=150^{\circ}\text{C}$) $V_R=900\text{V}$, $V_{GE}=-15\text{V}$	I_{RM}		64		A
	$T_{vj}=125^{\circ}\text{C}$		72			
	$T_{vj}=150^{\circ}\text{C}$		77			
Recovered charge	$I_F=75\text{A}$, $-di_F/dt=1428\text{A}/\mu\text{s}$ ($T_{vj}=150^{\circ}\text{C}$) $V_R=900\text{V}$, $V_{GE}=-15\text{V}$	Q_f		12.30		μC
	$T_{vj}=125^{\circ}\text{C}$		19.50			
	$T_{vj}=150^{\circ}\text{C}$		23.20			
Reverse recovered energy	$I_F=75\text{A}$, $-di_F/dt=1428\text{A}/\mu\text{s}$ ($T_{vj}=150^{\circ}\text{C}$) $V_R=900\text{V}$, $V_{GE}=-15\text{V}$	E_{rec}		6.51		mJ
	$T_{vj}=125^{\circ}\text{C}$		10.74			
	$T_{vj}=150^{\circ}\text{C}$		12.98			
Thermal resistance, junction to case	per diode	R_{thJC}			0.46	K/W
Temperature under switching conditions		$T_{vj\text{ op}}$	-40		150	$^{\circ}\text{C}$

Module

Parameter	Conditions	Symbol	Value			Unit
Isolation test voltage	RMS, $f=50\text{Hz}$, $t=1\text{min}$	V_{ISOL}	4000			V
Internal isolation			Al_2O_3			
Storage temperature		T_{stg}	-40		125	$^{\circ}\text{C}$
Mounting torque for modul mounting		M	3.0		6.0	Nm
Weight		W		152		g

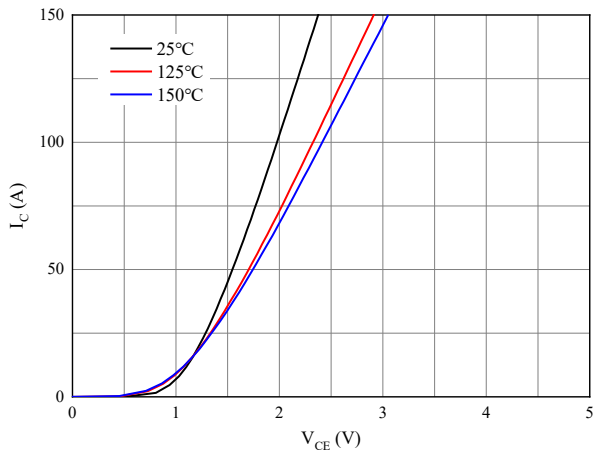


Fig 1. Typical output characteristics ($V_{GE}=15V$)

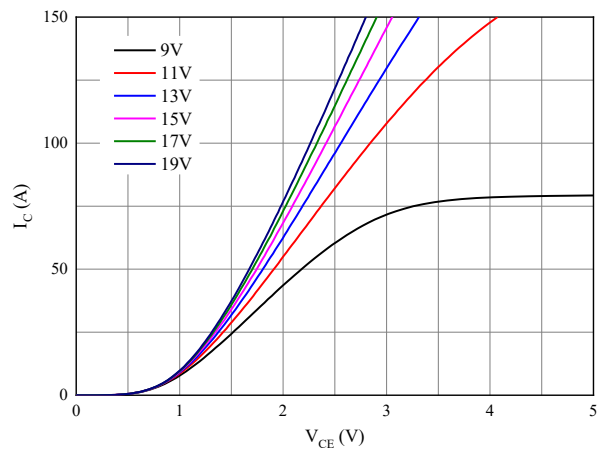


Fig 2. Typical output characteristics ($T_{vj}=150^{\circ}C$)

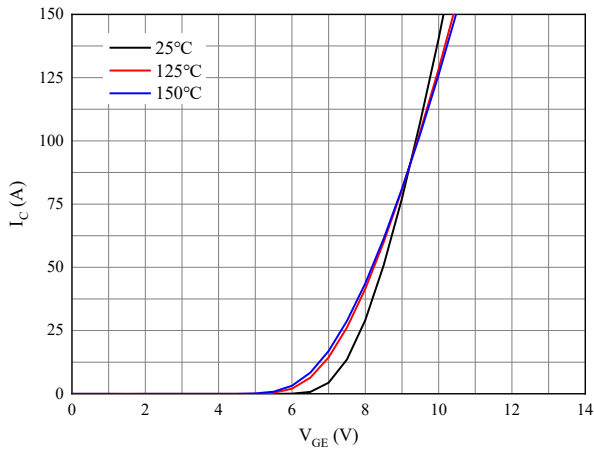


Fig 3. Typical transfer characteristic ($V_{CE}=20V$)

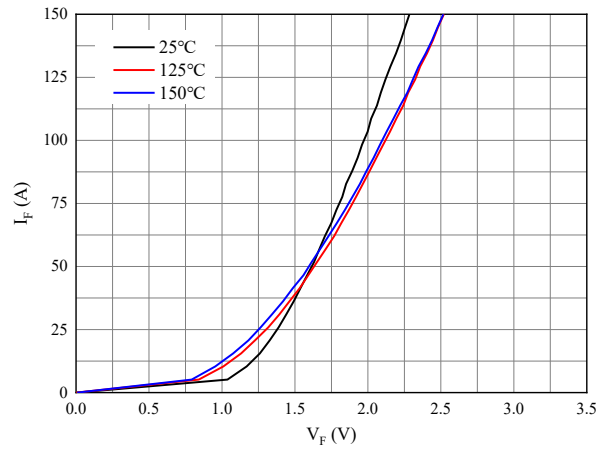


Fig 4. Forward characteristic of Diode

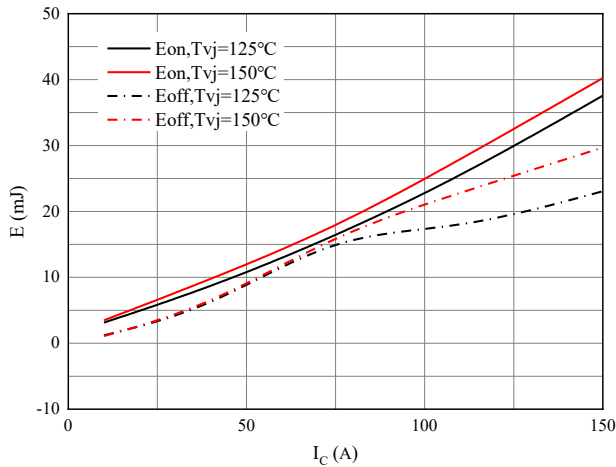


Fig 5. Switching losses of IGBT

$V_{GE}=\pm 15V, R_{Gon}=2\Omega, R_{Goff}=2\Omega, V_{CE}=900V$

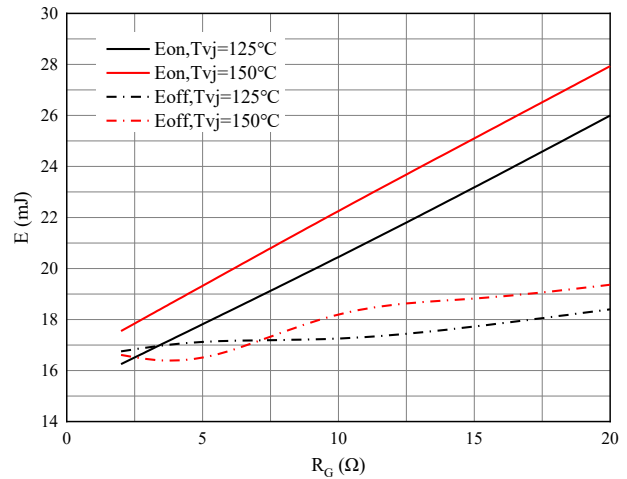


Fig 6. Switching losses of IGBT

$V_{GE}=\pm 15V, I_C=75A, V_{CE}=900V$

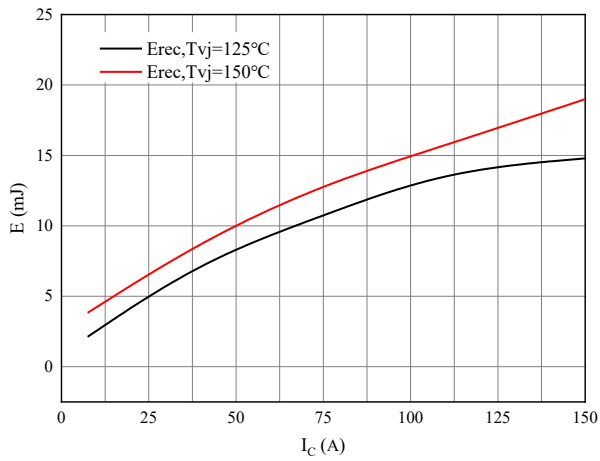


Fig 7. Switching losses of Diode
R_{Gon}=2Ω, V_{CE}=900V

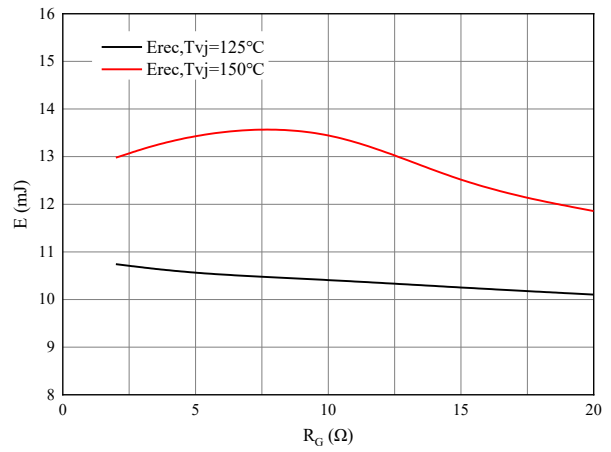


Fig 8. Switching losses of Diode
I_F=75A, V_{CE}=900V

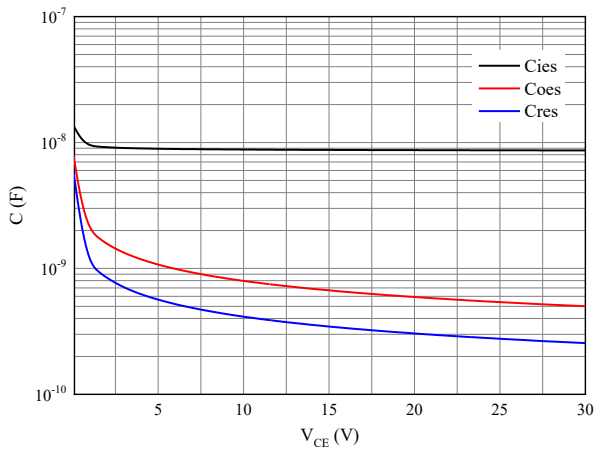
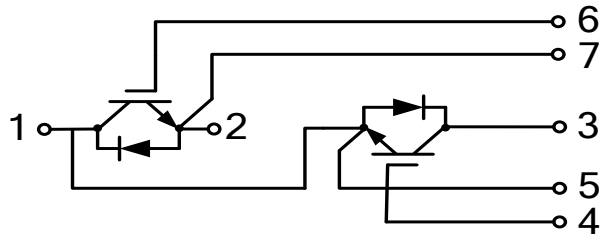
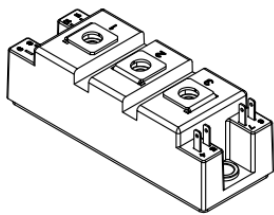
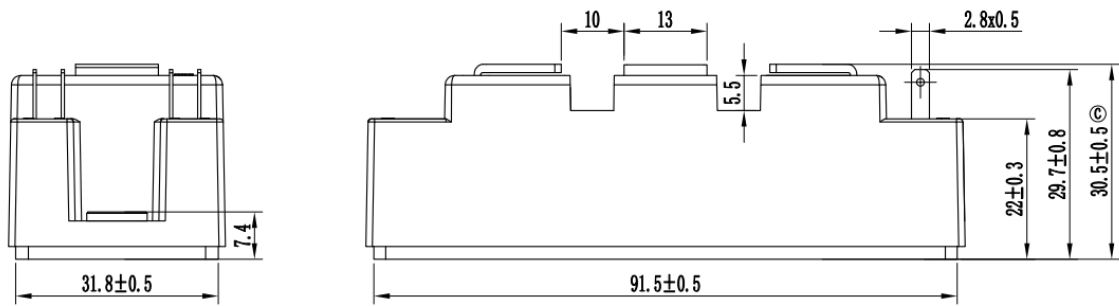


Fig 9. Capacitance characteristic

Circuit diagram



Package outlines



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2. 未标注公差按GB/T1804-m执行

