

Key performance:

- $V_{CE}=1200V$
- $I_C=150A@T_C=100^{\circ}C$
- $V_{CE(sat)}=1.6V$

Features:

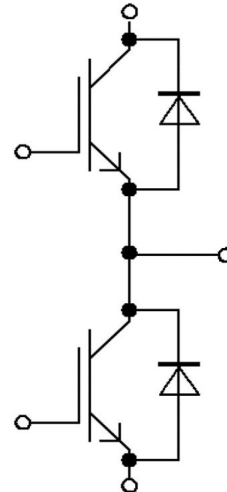
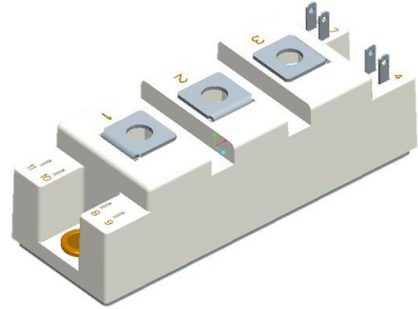
- Low V_{CEsat} .
- Low switching losses.
- Low stray inductance design.
- Positive V_{CEsat} temperature coefficient.

Benefits:

- High efficiency for application.
- Excellent current sharing in parallel operation.
- RoHS compliant.

Applications:

- Welding machine
- High frequency switching converters



Maximum rated values , IGBT

Parameter	Conditions	Symbol	Values	Unit
Collector-emitter voltage	$T_{vj} = 25^{\circ}\text{C}$	V_{CES}	1200	V
Continuous collector current	$T_C = 100^{\circ}\text{C}, T_{vj\text{ max}} = 175^{\circ}\text{C}$	I_C	150	A
Repetitive peak collector current	$t_p = 1\text{ ms}$	I_{CRM}	300	A
Total power dissipation	$T_C = 25^{\circ}\text{C}, T_{vj\text{ max}} = 175^{\circ}\text{C}$	P_{tot}	680	W
Gate-emitter peak voltage		V_{GES}	± 20	V

Characteristic values , IGBT

Parameter	Conditions	Symbol	Values			Unit
			Min.	Typ.	Max	
Collector-emitter saturation voltage	$I_C = 150\text{A}, V_{GE} = 15\text{ V}$	V_{CESat}	-	$T_{vj} = 25^{\circ}\text{C}$ 1.60	-	V
	$T_{vj} = 125^{\circ}\text{C}$ 1.80					
	$T_{vj} = 150^{\circ}\text{C}$ 1.85					
Gate threshold voltage	$I_C = 1\text{ mA}, V_{CE} = V_{GE}, T_{vj} = 25^{\circ}\text{C}$	V_{GEth}	-	5.8	-	V
Gate charge	$V_{GE} = -15 / 15\text{ V}$	Q_G	-	1.2	-	μC
Input capacitance	$f = 100\text{KHz}, T_{vj} = 25^{\circ}\text{C},$ $V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}$	C_{ies}	-	14.9	-	nF
Reverse transfer capacitance		C_{res}	-	133	-	pF
Collector-emitter leakage current	$V_{CE} = 1200\text{ V}, V_{GE} = 0\text{ V}, T_{vj} = 25^{\circ}\text{C}$	I_{CES}	-	-	1.0	mA
Gate-emitter leakage current	$V_{CE} = 0\text{ V}, V_{GE} = 20\text{ V}, T_{vj} = 25^{\circ}\text{C}$	I_{GES}	-	-	500	nA
Turn-on delay time, inductive load	$I_C = 150\text{A}$ $V_{CE} = 600\text{V}$ $V_{GE} = -15 / 15\text{ V}$ $R_G = 5.1\Omega$	$t_{d(on)}$	-	$T_{vj} = 25^{\circ}\text{C}$ 223	-	ns
				$T_{vj} = 125^{\circ}\text{C}$ 263		
				$T_{vj} = 150^{\circ}\text{C}$ 281		
Rise time, inductive load		t_r	-	$T_{vj} = 25^{\circ}\text{C}$ 128	-	ns
				$T_{vj} = 125^{\circ}\text{C}$ 141		
	$T_{vj} = 150^{\circ}\text{C}$ 149					
Turn-off delay time, inductive load	$t_{d(off)}$	-	$T_{vj} = 25^{\circ}\text{C}$ 412	-	ns	
			$T_{vj} = 125^{\circ}\text{C}$ 464			
			$T_{vj} = 150^{\circ}\text{C}$ 486			
Fall time, inductive load	t_f	-	$T_{vj} = 25^{\circ}\text{C}$ 83	-	ns	
			$T_{vj} = 125^{\circ}\text{C}$ 112			
			$T_{vj} = 150^{\circ}\text{C}$ 135			

Turn-on energy loss per pulse	$I_C = 150A$ $V_{CE} = 600V$ $V_{GE} = -15 / 15 V$ $R_G = 5.1\Omega$	$T_{vj} = 25^\circ C$ $T_{vj} = 125^\circ C$ $T_{vj} = 150^\circ C$	E_{on}	-	22.3	-	mJ
					30.7		
Turn-off energy loss per pulse		$T_{vj} = 25^\circ C$ $T_{vj} = 125^\circ C$ $T_{vj} = 150^\circ C$	E_{off}	-	8.2	-	mJ
					11.5		
					13.1		
Thermal resistance, junction to case	per IGBT		R_{thJC}	-	-	0.22	K/W
Thermal resistance, case to heatsink	per IGBT		R_{thCH}	-	0.04	-	K/W
Temperature under switching conditions			$T_{vj op}$	-40	-	150	$^\circ C$

Maximum rated values , Diode

Parameter	Conditions	Symbol	Values	Unit
Repetitive peak reverse voltage	$T_{vj} = 25^\circ C$	V_{RRM}	1200	V
Continuous DC forward current		I_F	150	A
Repetitive peak forward current	$t_p = 1 ms$	I_{FRM}	300	A

Characteristic values , Diode

Parameter	Conditions	Symbol	Values			Unit	
			Min.	Typ.	Max.		
Forward voltage	$I_F = 150A, V_{GE} = 0 V$	$T_{vj} = 25^\circ C$		1.85		V	
		$T_{vj} = 125^\circ C$	-	1.65	-		
		$T_{vj} = 150^\circ C$		1.60			
Peak reverse recovery current	$I_F = 150 A$	$T_{vj} = 25^\circ C$		51		A	
		$T_{vj} = 125^\circ C$	-	72	-		
		$T_{vj} = 150^\circ C$		78			
Recovered charge	$V_R = 600V$ $V_{GE} = -15V$ $R_G = 5.1\Omega$	$T_{vj} = 25^\circ C$		6.1		μC	
		$T_{vj} = 125^\circ C$	-	14.5	-		
		$T_{vj} = 150^\circ C$		17.6			
Reverse recovery energy	$- d_{if}/d_t = 1000A/\mu s$	$T_{vj} = 25^\circ C$		1.74		mJ	
		$T_{vj} = 125^\circ C$	-	4.17	-		
		$T_{vj} = 150^\circ C$		5.07			
Thermal resistance, junction to case	per diode		R_{thJC}	-	-	0.45	K/W
Thermal resistance, case to heatsink	per diode		R_{thCH}	-	0.08	-	K/W
Temperature under switching conditions			$T_{vj op}$	-40	-	150	$^\circ C$

Module characteristic values

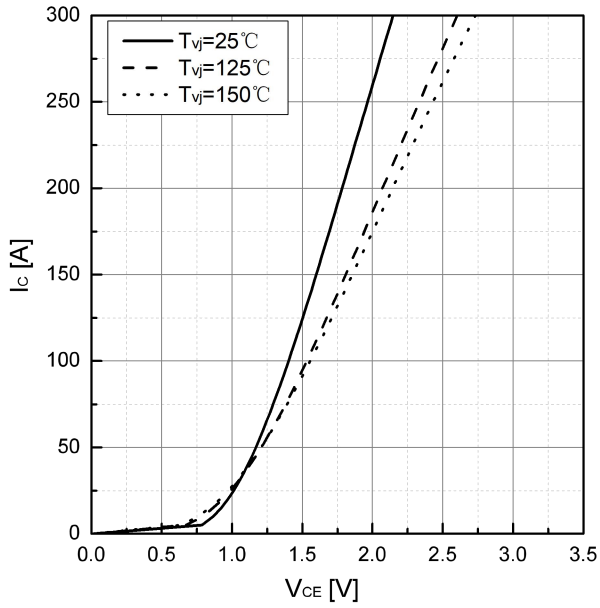
Parameter	Conditions	Symbol	Values	Unit
Isolation test voltage	RMS, f = 50 Hz, t = 1 min.	V_{ISOL}	2.5	kV
Internal isolation	basic insulation (class 1, IEC 61140)		Al_2O_3	
Creepage distance	terminal to heatsink		17	mm
	terminal to terminal		20	
Clearance	terminal to heatsink		17	mm
	terminal to terminal		9.5	
Comperative tracking index		CTI	> 200	

Parameter	Conditions	Symbol	Values			Unit
			Min.	Typ.	Max.	
Stray inductance module		L_{sCE}	-	35	-	nH
Module lead resistance, terminals - chip	$T_C = 25^\circ C$, per switch	$R_{CC+EE'}$	-	0.7	-	m Ω
Storage temperature		Tstg	-40	-	125	$^\circ C$
Mounting torque	Screw:M6	M	3	-	5	Nm
Terminal connection torque	Screw:M5	M	2.5	-	5	Nm
Weight		G	-	164	-	g

Output characteristic, IGBT

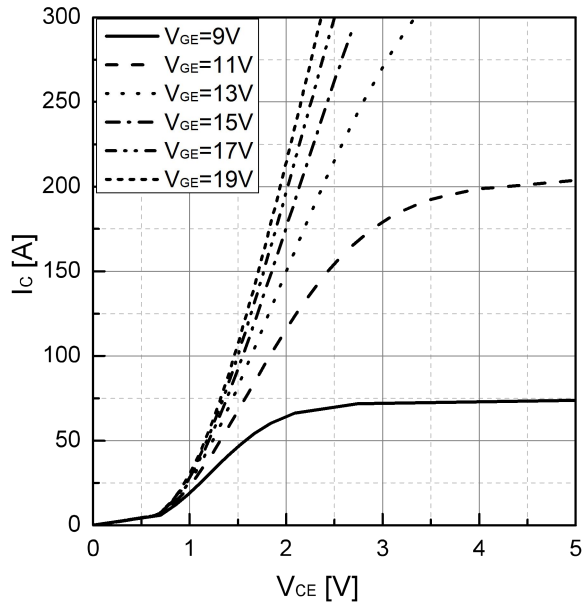
$$I_C = f(V_{CE})$$

$$V_{GE} = 15V$$


Output characteristic, IGBT

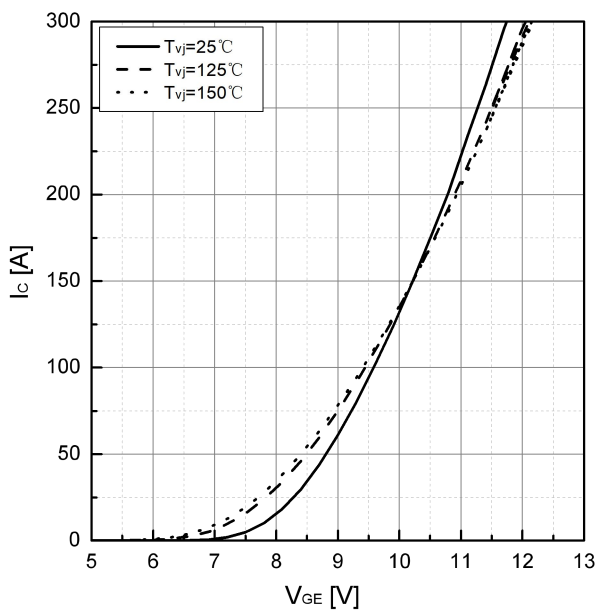
$$I_C = f(V_{CE})$$

$$T_{vj} = 150^\circ C$$


Transfer characteristic, IGBT

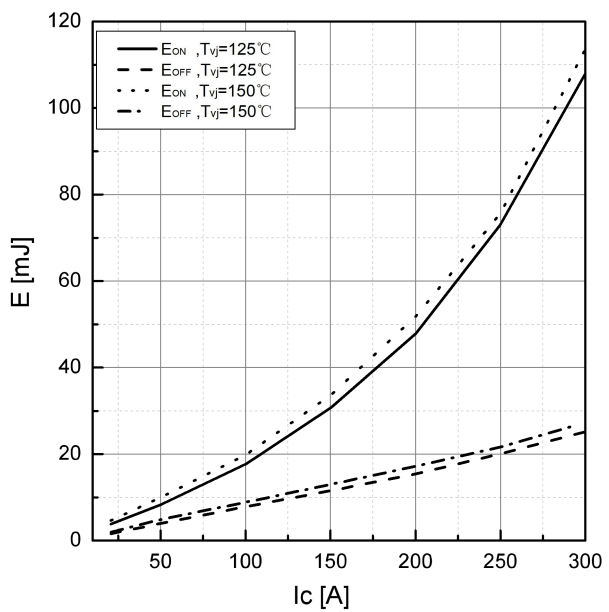
$$I_C = f(V_{GE})$$

$$V_{CE} = 20V$$


Switching losses vs. I_C, IGBT

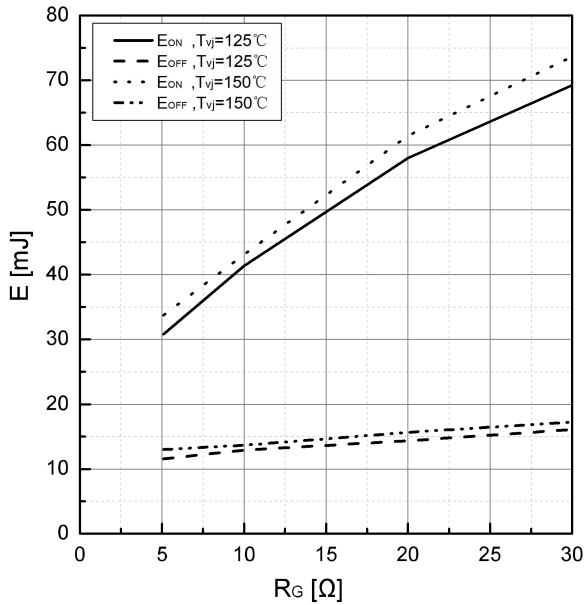
$$E_{on} = f(I_C), E_{off} = f(I_C)$$

$$V_{CE} = 600V, V_{GE} = 15/-15V, R_G = 5.1 \Omega$$

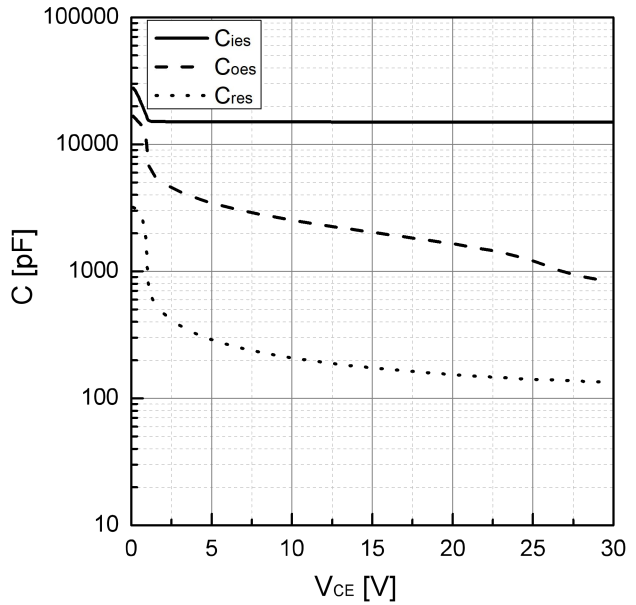


Switching losses vs. R_G , IGBT

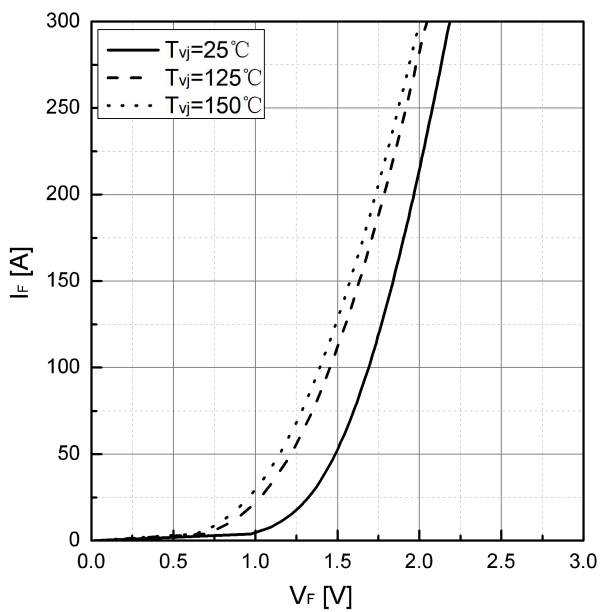
$$E_{on}=f(R_G), E_{off}=f(R_G)$$

 $V_{CE}=600V, V_{GE}=15/-15V, I_C=150A$

Capacity characteristic, IGBT

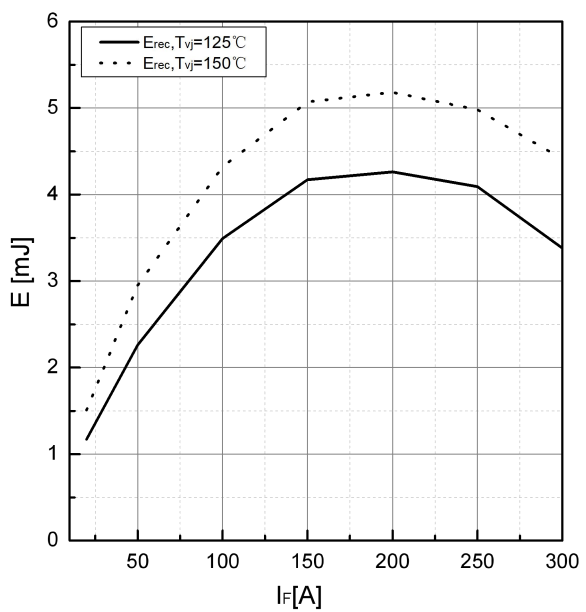
$$C=f(V_{CE})$$

 $f=100KHz, V_{GE}=0V, T_{vj}=25^\circ C$

Forward characteristic, Diode

$$I_F=f(V_F)$$

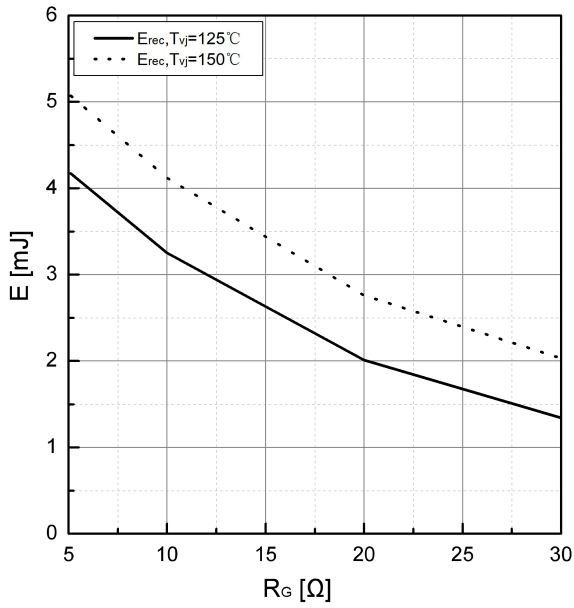
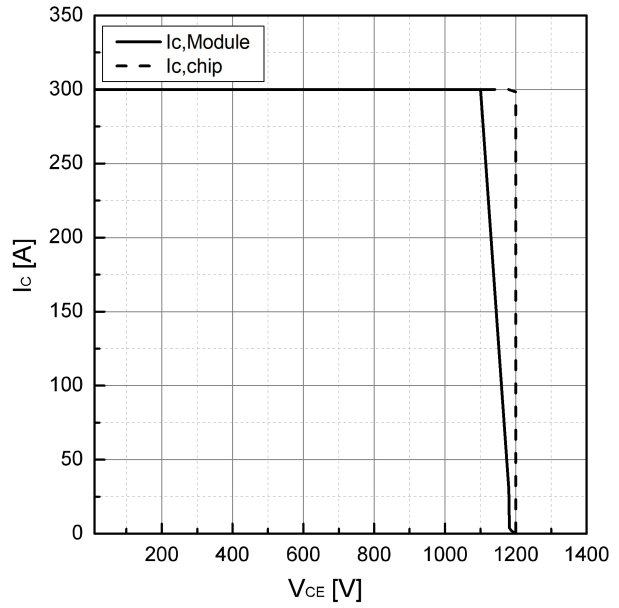

Switching losses vs. I_F , Diode

$$E_{rec}=f(I_F)$$

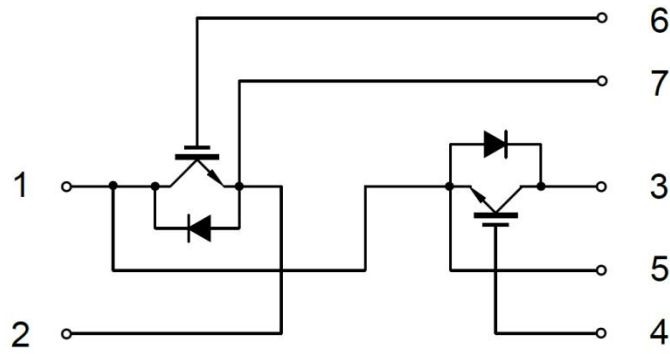
 $V_R=600V, R_G=5.1 \Omega$


Switching losses vs. R_G , Diode

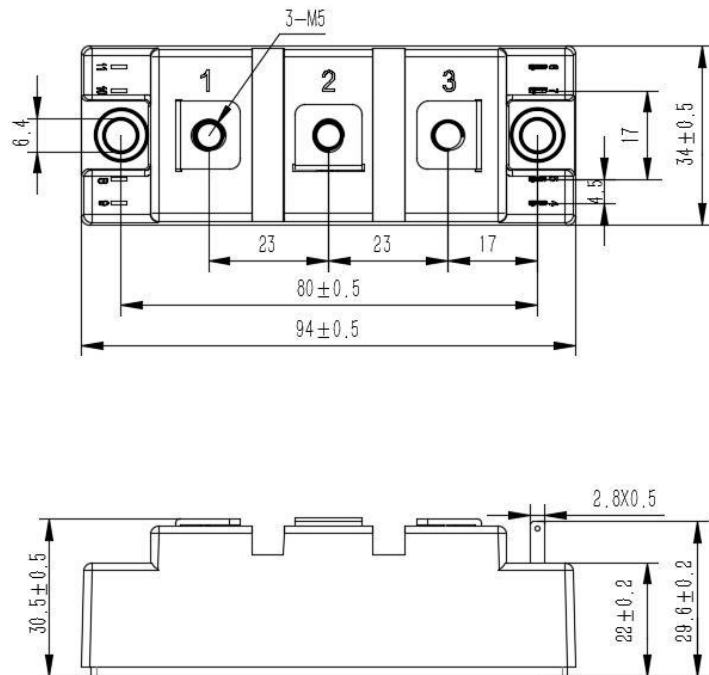
$$E_{rec} = f(R_G)$$

 $V_R = 600V, I_F = 150A$

Reverse bias safe operating area (RBSOA)
 $V_{CE} = 600V, V_{GE} = 15/-15V, R_G = 5.1 \Omega$


Circuit diagram



Package outlines (mm)



Revision history

Date	Revision	Changes
Oct 12, 2024	Rev 1.0	Release of the final datasheet.

Disclaimer

PLEASE NOTE - Jiangsu JieJie Microelectronics Co., Ltd ("JJM") reserves the right to amend, correct, modify and enhance the product and/or this document at any time without prior notice. If you intend to purchase this product, please obtain the latest information available before placing your order. The sale of JJM products is governed by JJM's prevailing terms and conditions at the time of purchase and purchasers are solely responsible for the selection and use of the products with no liability on JJM's part to supply application assistance or customization. Purchase of JJM products does not grant the purchaser license, express or implied, to JJM's intellectual property. Any warranties provided with JJM products are null and void upon resale unless accompanied by the information set forth herein in its entirety. The JJM name and logo are registered trademarks of Jiangsu JieJie Microelectronics Co., Ltd. This document supersedes all previous versions. ©2024 JJM - All rights reserved