



Trench FS IGBT

Features

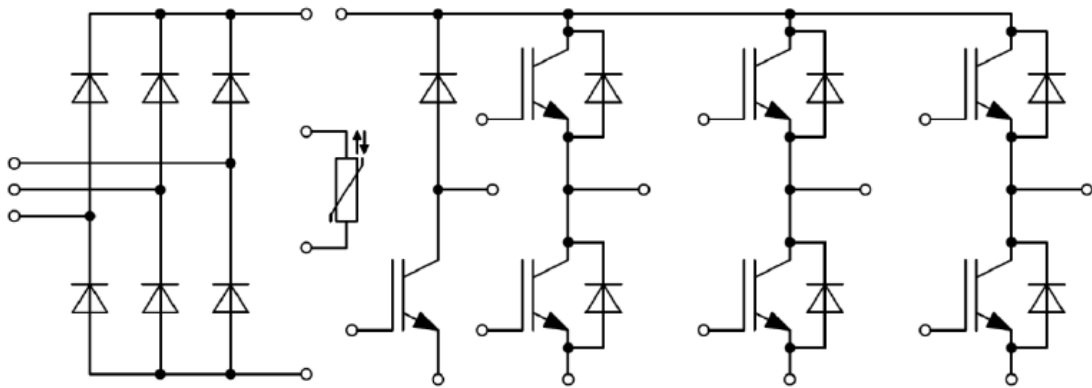
- High Power Density
- High mechanical robustness
- Compact design
- Isolated heatsink using DBC technology
- Very low forward voltage drop
- Fast & soft reverse recovery anti-parallel FWD

Product Summary

Parameter	Value	Unit
V_{CES}	1200	V
I_C (@ $T_C = 100^\circ\text{C}$)	15	A
I_{CRM} (@ $t_P = 1\text{ms}$)	30	A
$V_{CE(sat)}$ (Typ)	1.85	V

Applications

- Active Rectifier
- Air Conditioning
- Motor Drives



IGBT, Inverter Absolute Maximum Ratings (@ $T_C = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Conditions	Symbol	Values	Unit
Collector-emitter voltage	$T_{vj} = 25^\circ\text{C}$	V_{CES}	1200	V
Gate-emitter peak voltage		V_{GES}	± 20	V
Continuous collector current	$T_C = 25^\circ\text{C}, T_{vj} = 175^\circ\text{C}$	I_C	28	A
	$T_C = 100^\circ\text{C}, T_{vj} = 175^\circ\text{C}$	$I_{C\text{ nom}}$	15	
Repetitive peak collector current	$t_P = 1\text{ms}$	I_{CRM}	30	A
Total power dissipation	$T_C = 25^\circ\text{C}, T_{vj\text{ max}} = 175^\circ\text{C}$	P_{tot}	130	W



IGBT, Inverter Electrical Characteristics (@ $T_C = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Conditions	Symbol	Values			Unit
			Min.	Typ.	Max.	
Collector-emitter saturation voltage	$I_C = 15\text{A}$, $V_{GE} = 15\text{V}$	$V_{CE(sat)}$		1.85	2.25	V
			$T_{vj} = 25^\circ\text{C}$			
			$T_{vj} = 125^\circ\text{C}$		2.30	
			$T_{vj} = 150^\circ\text{C}$		2.35	
Gate threshold voltage	$V_{CE}=V_{GE}$, $I_C=0.3\text{mA}$	$V_{GE(th)}$	5.2	5.8	6.4	V
Gate-emitter leakage current	$V_{CE} = 0\text{V}$, $V_{GE} = 20\text{V}$	I_{GES}			400	nA
Collector leakage current	$V_{CE}=1200\text{V}$, $V_{GE}=0\text{V}$	I_{CES}			1	mA
Input capacitance	$f = 1\text{MHz}$, $T_{vj} = 25^\circ\text{C}$, $V_{CE} = 25\text{V}$, $V_{GE} = 0\text{V}$	C_{ies}		0.89		nF
Output capacitance		C_{oes}		0.03		nF
Gate charge	$V_{GE} = -15\text{V}\dots+15\text{V}$	Q_G		0.12		μC
Turn-on delay time, inductive load	$V_{CE} = 600\text{V}$, $I_C = 15\text{A}$, $R_G = 51\Omega$, $V_{GE} = \pm 15\text{V}$, $T_{vj} = 25^\circ\text{C}$	$t_{d(on)}$		98.4		ns
Rise time, inductive load		t_r		98.2		ns
Turn-off delay time, inductive load		$t_{d(off)}$		114		ns
Fall time, inductive load		t_f		174		ns
Turn-on energy loss per pulse		E_{on}		1.81		mJ
Turn-off energy loss per pulse		E_{off}		0.69		mJ
Turn-on delay time, inductive load		$V_{CE} = 600\text{V}$, $I_C = 15\text{A}$, $R_G = 51\Omega$, $V_{GE} = \pm 15\text{V}$, $T_{vj} = 125^\circ\text{C}$	$t_{d(on)}$		94.2	
Rise time, inductive load	t_r			107.2		ns
Turn-off delay time, inductive load	$t_{d(off)}$			132		ns
Fall time, inductive load	t_f			220		ns
Turn-on energy loss per pulse	E_{on}			2.61		mJ
Turn-off energy loss per pulse	E_{off}			0.86		mJ
SC date	$t_p \leq 10\mu\text{s}$, $V_{GE} \leq 15\text{V}$, $V_{CC} = 800\text{V}$, $V_{CEM} \leq 1200\text{V}$, $T_{vj} = 125^\circ\text{C}$	I_{sc}		55		A
Thermal resistance, junction to case	per module	$R_{th(j-c)}$		1.05	1.15	K/W
Temperature under switching conditions		$T_{vj op}$	-40		150	$^\circ\text{C}$



FRED, Inverter Absolute Maximum Ratings (@ $T_C = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Conditions	Symbol	Values	Unit
Repetitive peak reverse voltage	$T_{vj} = 25^\circ\text{C}$	V_{RRM}	1200	V
Continuous DC forward current		I_F	15	A
Repetitive peak forward current	$t_P = 1\text{ms}$	I_{FRM}	30	A
I^2t value for fusing	$t = 10\text{ms}, V_R = 0\text{V}, T_{vj} = 150^\circ\text{C}$,	I^2t	14	A^2s

FRED, Inverter Electrical Characteristics (@ $T_C = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Conditions	Symbol	Values			Unit
			Min.	Typ.	Max.	
Forward voltage	$I_F = 15\text{A}, V_{GE} = 0\text{V}$	V_F		2.00	2.65	V
			$T_{vj} = 125^\circ\text{C}$	1.60		
			$T_{vj} = 150^\circ\text{C}$	1.55		
Peak reverse recovery current		I_{RM}		3.63		A
			$T_{vj} = 125^\circ\text{C}$	5.79		
Recovered charge	$I_F = 15\text{A}, di/dt = 100\text{A}/\mu\text{s}, V_R = 600\text{V}, V_{GE} = -15\text{V}$	Q_{rr}		0.69		μC
			$T_{vj} = 125^\circ\text{C}$	1.63		
Peak reverse recovery energy		E_{rec}		0.19		mJ
			$T_{vj} = 125^\circ\text{C}$	0.43		
Thermal resistance, junction to case	per module	$R_{th(j-c)}$		1.75	1.90	K/W
Temperature under switching conditions		$T_{vj\ op}$	-40		150	$^\circ\text{C}$

**Diode, Rectifier Absolute Maximum Ratings (@ $T_C = 25^\circ\text{C}$ unless otherwise specified)**

Parameter	Conditions	Symbol	Values	Unit
Repetitive peak reverse voltage	$T_{vj} = 25^\circ\text{C}$	V_{RRM}	1600	V
Maximum RMS forward current per chip	$T_C = 80^\circ\text{C}$	I_{FRMSM}	30	A
Maximum RMS current at rectifier output	$T_C = 80^\circ\text{C}$	I_{RMSM}	30	A
Repetitive peak forward current	$t_P = 10\text{ ms}, T_{vj} = 25^\circ\text{C}$	I_{FSM}	300	A
I^2t value for fusing	$t_P = 10\text{ ms}, T_{vj} = 25^\circ\text{C}$	I^2t	450	A^2s

Diode, Rectifier Electrical Characteristics (@ $T_C = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Conditions	Symbol	Values			Unit
			Min.	Typ.	Max.	
Forward voltage	$T_{vj} = 150^\circ\text{C}, I_F = 15\text{A}$	V_F		1.10		V
Reverse current	$T_{vj} = 150^\circ\text{C}, V_R = 1600\text{V}$	I_R		1.0		mA
Thermal resistance, junction to case	per module	$R_{th(j-c)}$		1.20	1.35	K/W
Temperature under switching conditions		$T_{vj\text{ op}}$	-40		150	$^\circ\text{C}$

IGBT, Brake-Chopper Absolute Maximum Ratings (@ $T_C = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Conditions	Symbol	Values	Unit
Collector-emitter voltage	$T_{vj} = 25^\circ\text{C}$	V_{CES}	1200	V
Gate-emitter peak voltage		V_{GES}	± 20	V
Continuous collector current	$T_C = 25^\circ\text{C}, T_{vj} = 175^\circ\text{C}$	I_C	28	A
	$T_C = 100^\circ\text{C}, T_{vj} = 175^\circ\text{C}$	$I_{C\text{ nom}}$	15	
Repetitive peak collector current	$t_P = 1\text{ ms}$	I_{CRM}	30	A
Total power dissipation	$T_C = 25^\circ\text{C}, T_{vj\text{ max}} = 125^\circ\text{C}$	P_{tot}	130	W

IGBT, Brake-Chopper Electrical Characteristics (@ $T_C = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Conditions	Symbol	Values			Unit
			Min.	Typ.	Max.	
Collector-emitter saturation voltage	$I_C = 15\text{A}$, $V_{GE} = 15\text{V}$	$V_{CE(sat)}$		1.85	2.25	V
			$T_{vj} = 125^\circ\text{C}$	2.30		
			$T_{vj} = 150^\circ\text{C}$	2.35		
Gate threshold voltage	$V_{CE}=V_{GE}$, $I_C=0.3\text{mA}$,	$V_{GE(th)}$	5.2	5.8	6.4	V
Gate-emitter leakage current	$V_{CE} = 0\text{V}$, $V_{GE} = 20\text{V}$	I_{GES}			400	nA
Collector leakage current	$V_{CE}=1200\text{V}$, $V_{GE}=0\text{V}$	I_{CES}			1.0	mA
Input capacitance	$f = 1\text{MHz}$, $T_{vj} = 25^\circ\text{C}$, $V_{CE} = 25\text{V}$, $V_{GE} = 0\text{V}$	C_{ies}		0.89		nF
Output capacitance		C_{oes}		0.03		nF
Gate charge	$V_{GE} = -15\text{V}\dots+15\text{V}$	Q_G		0.12		uC
Turn-on delay time, inductive load	$V_{CC} = 600\text{V}$, $I_C = 15\text{A}$, $R_G = 51\Omega$, $V_{GE} = \pm 15\text{V}$, $T_{vj} = 25^\circ\text{C}$	$t_{d(on)}$		93.6		ns
Rise time, inductive load		t_r		81.6		ns
Turn-off delay time, inductive load		$t_{d(off)}$		112.8		ns
Fall time, inductive load		t_f		131.2		ns
Turn-on energy loss per pulse		E_{on}		0.95		mJ
Turn-off energy loss per pulse		E_{off}		0.47		mJ
Turn-on delay time, inductive load		$V_{CC} = 600\text{V}$, $I_C = 15\text{A}$, $R_G = 51\Omega$, $V_{GE} = \pm 15\text{V}$, $T_{vj} = 125^\circ\text{C}$	$t_{d(on)}$		88	
Rise time, inductive load	t_r			84.8		ns
Turn-off delay time, inductive load	$t_{d(off)}$			123.2		ns
Fall time, inductive load	t_f			147.2		ns
Turn-on energy loss per pulse	E_{on}			1.44		mJ
Turn-off energy loss per pulse	E_{off}			0.54		mJ
SC date	$t_p \leq 10\mu\text{s}$, $V_{GE} \leq 15\text{V}$, $V_{CE} = 800\text{V}$, $V_{CEM} \leq 1200\text{V}$, $T_{vj} = 125^\circ\text{C}$	I_{SC}		55		A
Thermal resistance, junction to case	per module	$R_{th(j-c)}$		1.05	1.15	K/W
Temperature under switching conditions		$T_{vj op}$	-40		150	$^\circ\text{C}$



FRED, Brake-Chopper Absolute Maximum Ratings (@ $T_C = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Conditions	Symbol	Values	Unit
Repetitive peak reverse voltage	$T_{vj} = 25^\circ\text{C}$	V_{RRM}	1200	V
Continuous DC forward current		I_F	10	A
Repetitive peak forward current	$t_P = 1\text{ms}$	I_{FRM}	20	A
I^2t value for fusing	$T_{vj} = 125^\circ\text{C}$, $t_P = 10\text{ms}$, $V_R = 0\text{V}$	I^2t	16	A^2s

FRED, Brake-Chopper Electrical Characteristics (@ $T_C = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Conditions		Symbol	Values			Unit
				Min.	Typ.	Max.	
Forward voltage	$I_F = 10\text{A}$, $V_{GE} = 0\text{V}$	$T_{vj} = 25^\circ\text{C}$	V_F		1.90	2.25	V
		$T_{vj} = 125^\circ\text{C}$			1.55		
		$T_{vj} = 150^\circ\text{C}$			1.50		
Peak reverse recovery current		$T_{vj} = 25^\circ\text{C}$	I_{RM}		3.18		A
		$T_{vj} = 125^\circ\text{C}$			5.76		
Recovered charge	$I_F = 10\text{A}$, $di/dt = 100\text{A}/\mu\text{s}$, $V_R = 600\text{V}$, $V_{GE} = -15\text{V}$	$T_{vj} = 25^\circ\text{C}$	Q_{rr}		0.54		μC
		$T_{vj} = 125^\circ\text{C}$			1.2		
Peak reverse recovery energy		$T_{vj} = 25^\circ\text{C}$	Erec		0.17		mJ
		$T_{vj} = 125^\circ\text{C}$			0.36		
Thermal resistance, junction to case	per module		$R_{th(j-c)}$		1.75	1.90	$^\circ\text{C}/\text{W}$
Temperature under switching conditions			$T_{vj\text{ op}}$	-40		150	$^\circ\text{C}$

**NTC-Thermistor Characteristics (@ T_C = 25°C unless otherwise specified)**

Parameter	Conditions	Symbol	Values			Unit
			Min.	Typ.	Max.	
Rated resistance	T _C =25°C	R ₂₅		5		KΩ
Deviation of R100	T _C = 100°C, R ₁₀₀ = 493 Ω	ΔR/R	-5		5	%
Power dissipation	T _C = 25°C	P ₂₅			20	mW
B-value	$R_2 = R_{25} \exp [B_{25/50}(1/T_2 - 1/(298,15 K))]$	B _{25/50}		3375		K
B-value	$R_2 = R_{25} \exp [B_{25/80}(1/T_2 - 1/(298,15 K))]$	B _{25/80}		3411		K
B-value	$R_2 = R_{25} \exp [B_{25/100}(1/T_2 - 1/(298,15 K))]$	B _{25/100}		3433		K

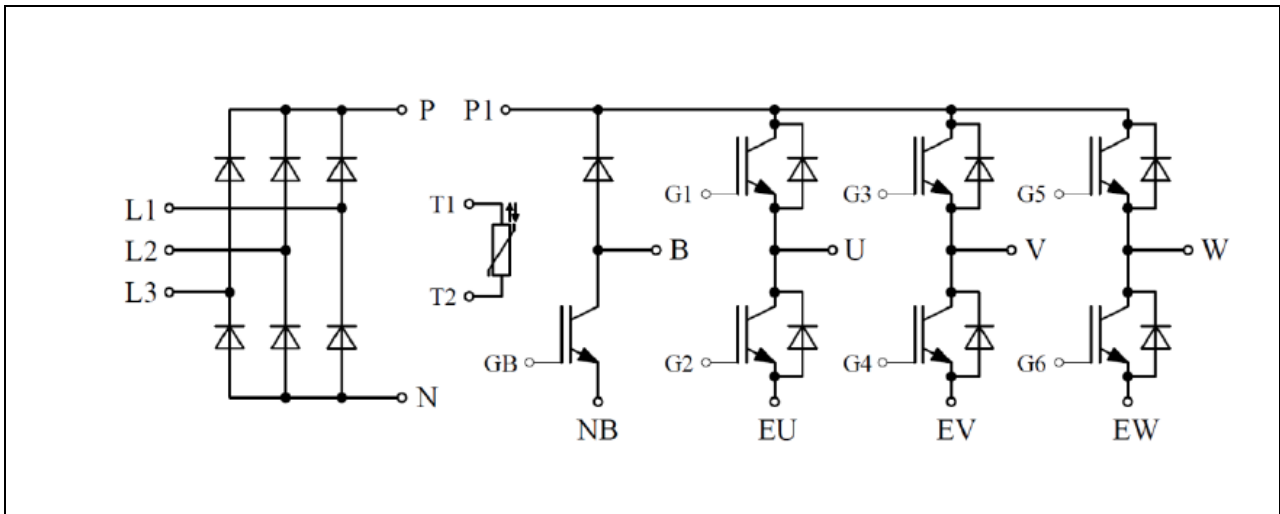
Module Characteristics

Parameter	Conditions	Symbol	Values			Unit
			Min.	Typ.	Max.	
Isolation Voltage (All Terminals Shorted)	RMS, f = 50Hz, 1 minute	V _{iso}	2.5			KV
Thermal resistance, case to heatsink	per module	R _{th(c-s)}		0.037		K/W
Maximum Junction Temperature	Inverter, brake-chopper	T _{vj max}			175	°C
	rectifier				150	°C
Stray inductance module		L _{SCE}		30		nH
Module lead resistance, terminals - chip	per switch	R _{CC'+EE'}		8.0		mΩ
		R _{AA'+CC'}		6.0		mΩ
Storage Temperature		T _{stg}	-40		125	°C
Mounting force per clamp		F	20		50	N

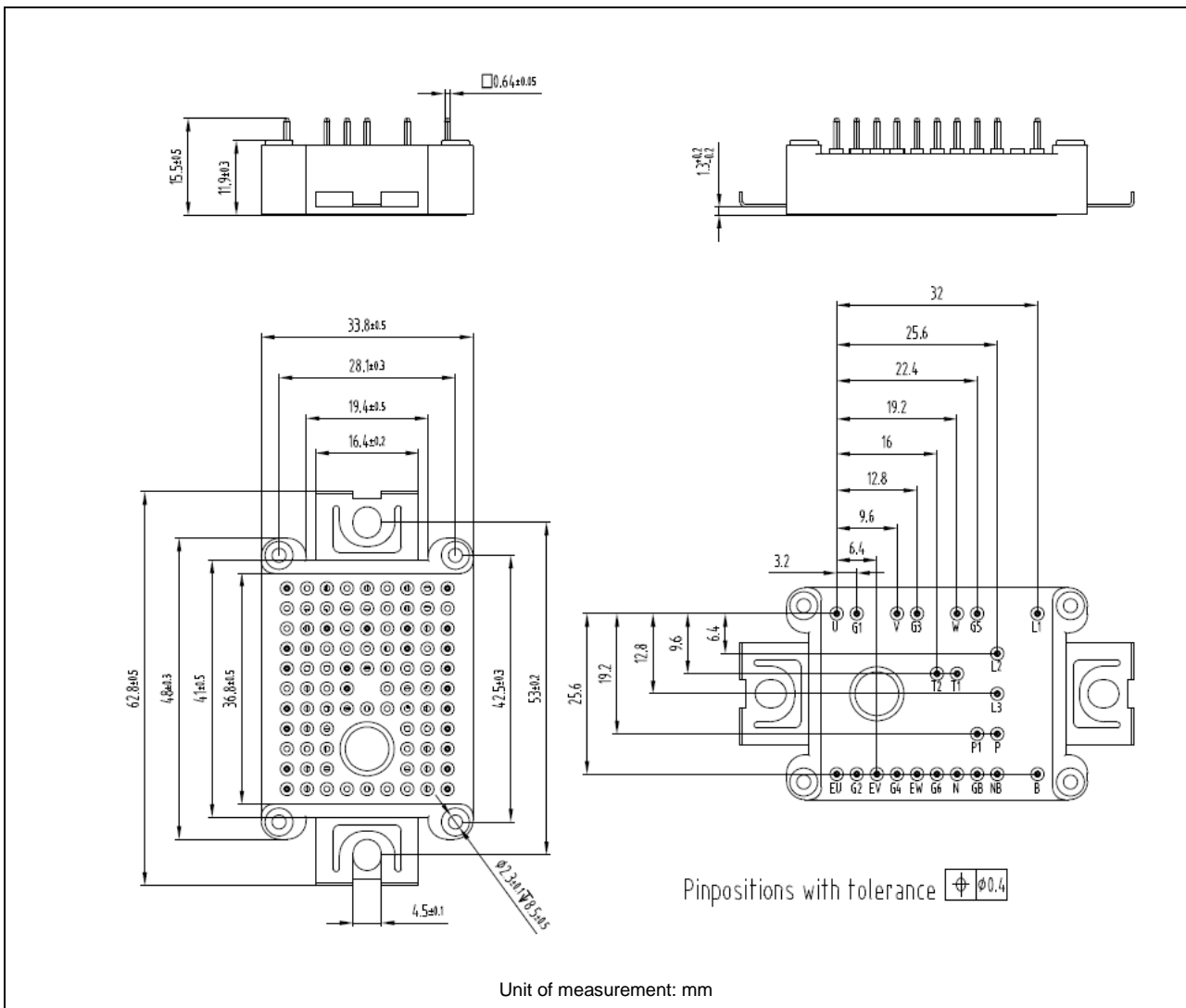
Ordering Information

Device	Marking	Package	Weight	Inner Box	Pre Carton
JMG15PM12E1S1	JMG15PM12E1S1	E1(33.8mm)	24±3g/PCS	30PCS	150PCS

Circuit Diagram



Package Outlines (mm)



Typical Electrical & Thermal Characteristics

Fig 1. IGBT Output Characteristics, Inverter(typical) VGE=15 V

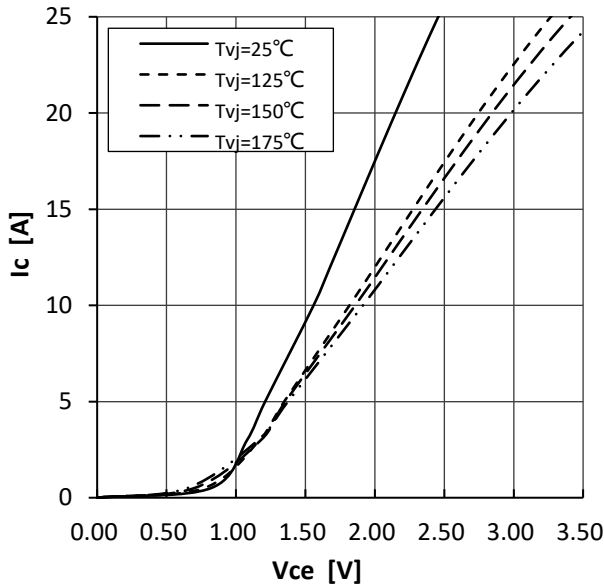


Fig 2. IGBT Output Characteristics, Inverter(typical)

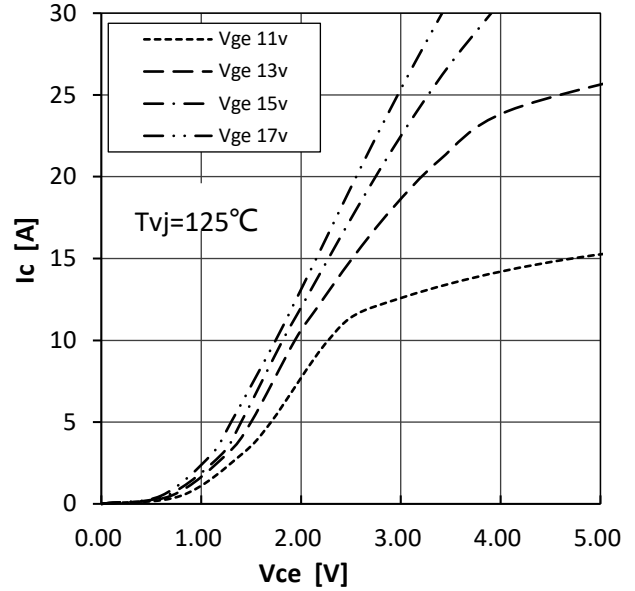


Fig 3. IGBT Switching Loss vs. I_c Inverter (typical)
Rg=51 Ω , VCE=600 V, VGE= ± 15 V

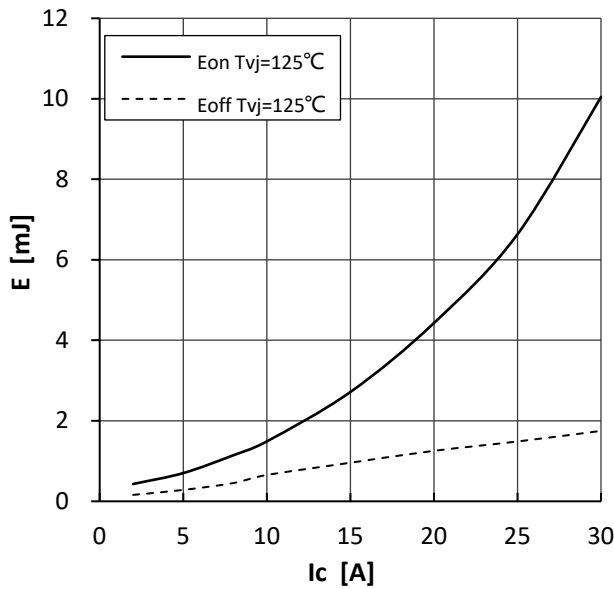


Fig 4. Reverse bias safe operating area IGBT, Inverter(RBSOA)

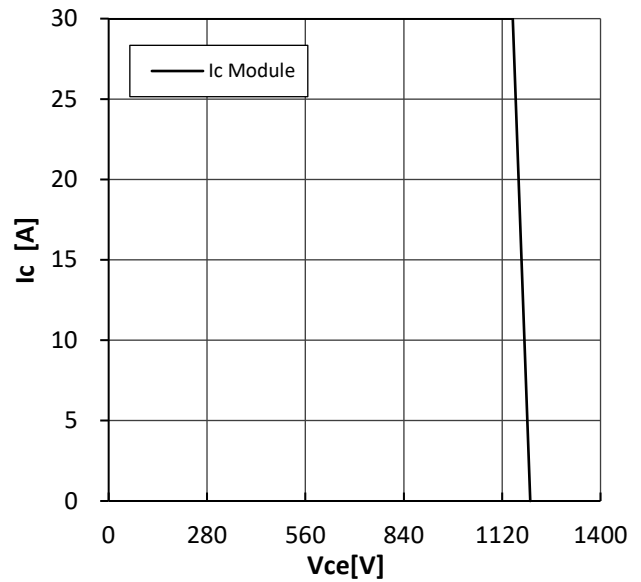


Fig 5. FRED Foward Characteristics, Inverter(typcial)

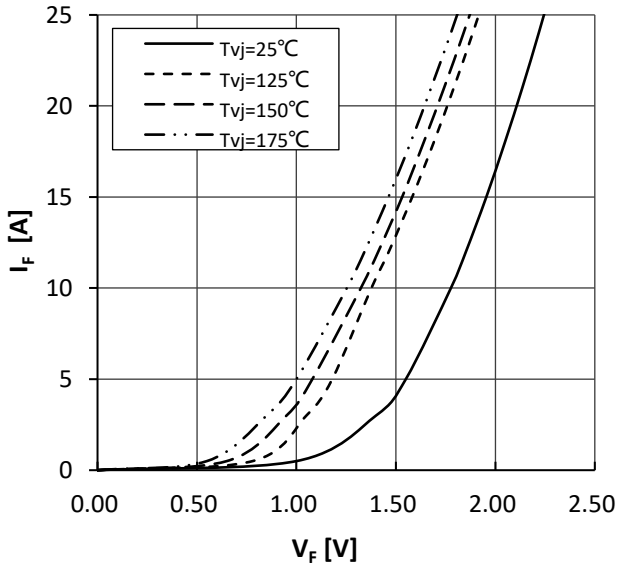


Fig 6. FRED Forward Characteristics, Inverter(typcial)

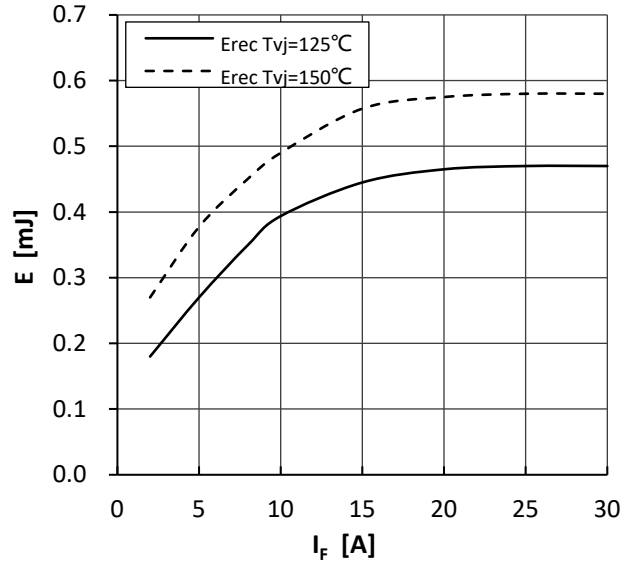
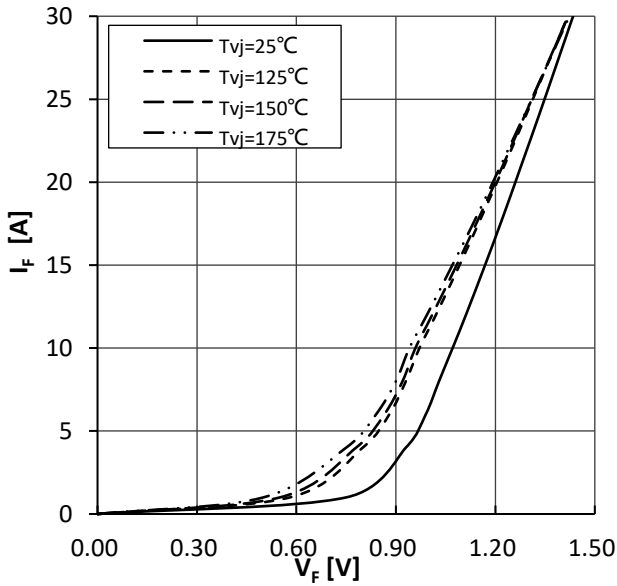



Fig 7. Diode Rectifier Forward Characteristics





Information furnished in this document is believed to be accurate and reliable. However, Jiangsu JieJie Semiconductor Co., Ltd assumes no responsibility for the consequences of use without consideration for such information nor use beyond it. This information in this document is subject to change without prior notice. Notwithstanding this, Jiangsu JieJie will fully comply with the terms outlined in a signed agreement. Products and information provided in this document have no infringement of patents. Jiangsu JieJie assumes no responsibility for any infringement of other rights of third parties which may result from the use of such products and information. This document is the initial release, dated 8 May 2026. This document supersedes and replaces all information previously supplied.

 is registered trademark of Jiangsu JieJie Semiconductor Co., Lt ©2026 Jiangsu JieJie Semiconductor Co., Ltd. All rights reserved.