



JMG600HF12G2S1

Trench FS IGBT

Features

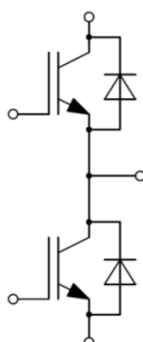
- Short Circuit Rated 10 μ s
- Low Stray Inductance
- Low Saturation Voltage
- Ultra Low loss
- HI-REL Power Terminals
- Lead Free, Compliant With RoHS Requirement

Applications

- Industrial Inverters
- Servo Applications
- SMPS UPS
- Induction Heating
- Welder

Product Summary

Parameter	Value	Unit
V_{CES}	1200	V
$I_C(@ T_C = 100^\circ\text{C})$	600	A
$I_{CRM}(@ t_P = 1\text{ms})$	1200	A
$V_{CE(sat)}(Typ)$	1.85	V



IGBT, 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	$T_{vj} = 25^\circ\text{C}$	V_{GES}	± 20	V
Continuous collector current	$T_C = 25^\circ\text{C}$	I_C	936	A
	$T_C = 100^\circ\text{C}$	$I_{C\text{ nom}}$	600	
Repetitive peak collector current	$t_P = 1\text{ms}$	I_{CRM}	900	A
Total power dissipation	$T_C = 25^\circ\text{C}$, $T_{vj\text{ max}} = 175^\circ\text{C}$	P_{tot}	2307	W

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

Parameter	Conditions		Symbol	Values			Unit
				Min.	Typ.	Max.	
Collector-emitter saturation voltage	$I_C = 600\text{A}$, $V_{GE} = 15\text{V}$	$T_{vj} = 25^\circ\text{C}$	$V_{CE(sat)}$		1.85	2.30	V
		$T_{vj} = 125^\circ\text{C}$			2.25		
Gate threshold voltage	$V_{CE} = V_{GE}$, $I_C = 23\text{mA}$		$V_{GE(th)}$	5.6	6.2	6.8	V
Collector leakage current	$V_{GE} = 0\text{V}$, $V_{CE} = 1200\text{V}$		I_{CES}			1	mA
Gate-emitter leakage current	$V_{CE} = 0\text{V}$, $V_{GE} = 20\text{V}$		I_{GES}			400	nA
Input capacitance	$f = 1\text{MHz}$, $T_{vj} = 25^\circ\text{C}$, $V_{CE} = 25\text{V}$, $V_{GE} = 0\text{V}$		C_{ies}		46.6		nF
Output capacitance			C_{oes}		1.31		nF
Turn-on delay time, inductive load	$V_{CC} = 600\text{V}$, $I_C = 600\text{A}$, $R_G = 1\Omega$, $V_{GE} = \pm 15\text{V}$, $T_{vj} = 25^\circ\text{C}$		$t_{d(on)}$		174		ns
Rise time, inductive load			t_r		44		ns
Turn-off delay time, inductive load			$t_{d(off)}$		42		ns
Fall time, inductive load			t_f		66		ns
Turn-on energy loss per pulse			E_{on}		19.2		mJ
Turn-off energy loss per pulse			E_{off}		35.8		mJ
Turn-on delay time, inductive load	$V_{CC} = 600\text{V}$, $I_C = 600\text{A}$, $R_G = 1\Omega$, $V_{GE} = \pm 15\text{V}$, $T_{vj} = 125^\circ\text{C}$		$t_{d(on)}$		188		ns
Rise time, inductive load			t_r		52		ns
Turn-off delay time, inductive load			$t_{d(off)}$		56		ns
Fall time, inductive load			t_f		102		ns
Turn-on energy loss per pulse			E_{on}		36.2		mJ
Turn-off energy loss per pulse			E_{off}		71.1		mJ
SC data	$t_p \leq 10\mu\text{s}$, $V_{GE} = 15\text{V}$, $V_{CC} = 800\text{V}$, $V_{CEM} \leq 1200\text{V}$, $T_{vj} = 125^\circ\text{C}$		I_{sc}		2500		A
Gate charge	$V_{GE} = -15 \dots +15\text{V}$		Q_G		3.50		uC
Thermal resistance, junction to case	per IGBT		$R_{th(j-c)}$			0.065	K/W
Temperature under switching conditions			$T_{vj op}$	-40		150	$^\circ\text{C}$

**FRED, 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		$I_{F(AV)}$	600	A
Repetitive peak forward current	$t_P = 1\text{ms}$	I_{FRM}	1200	A

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

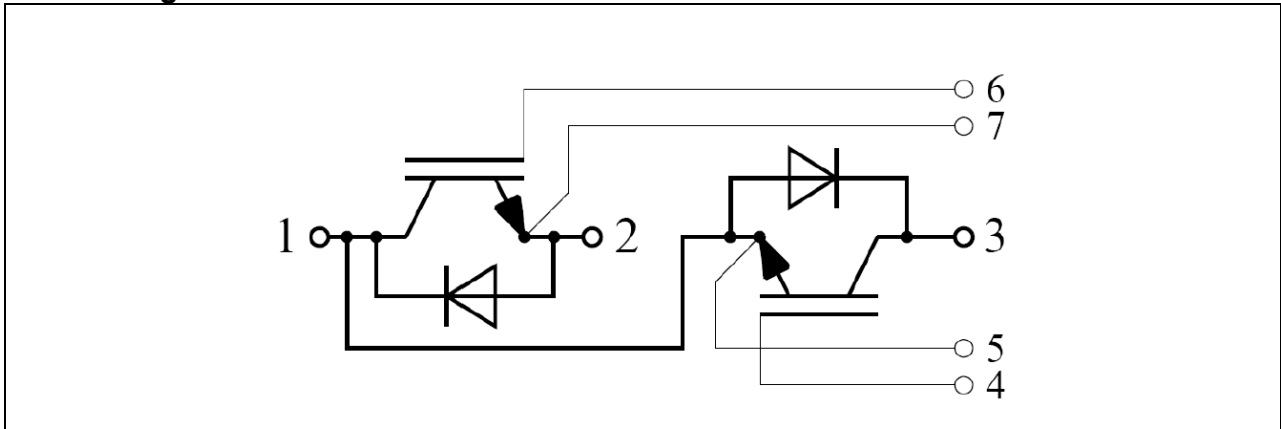
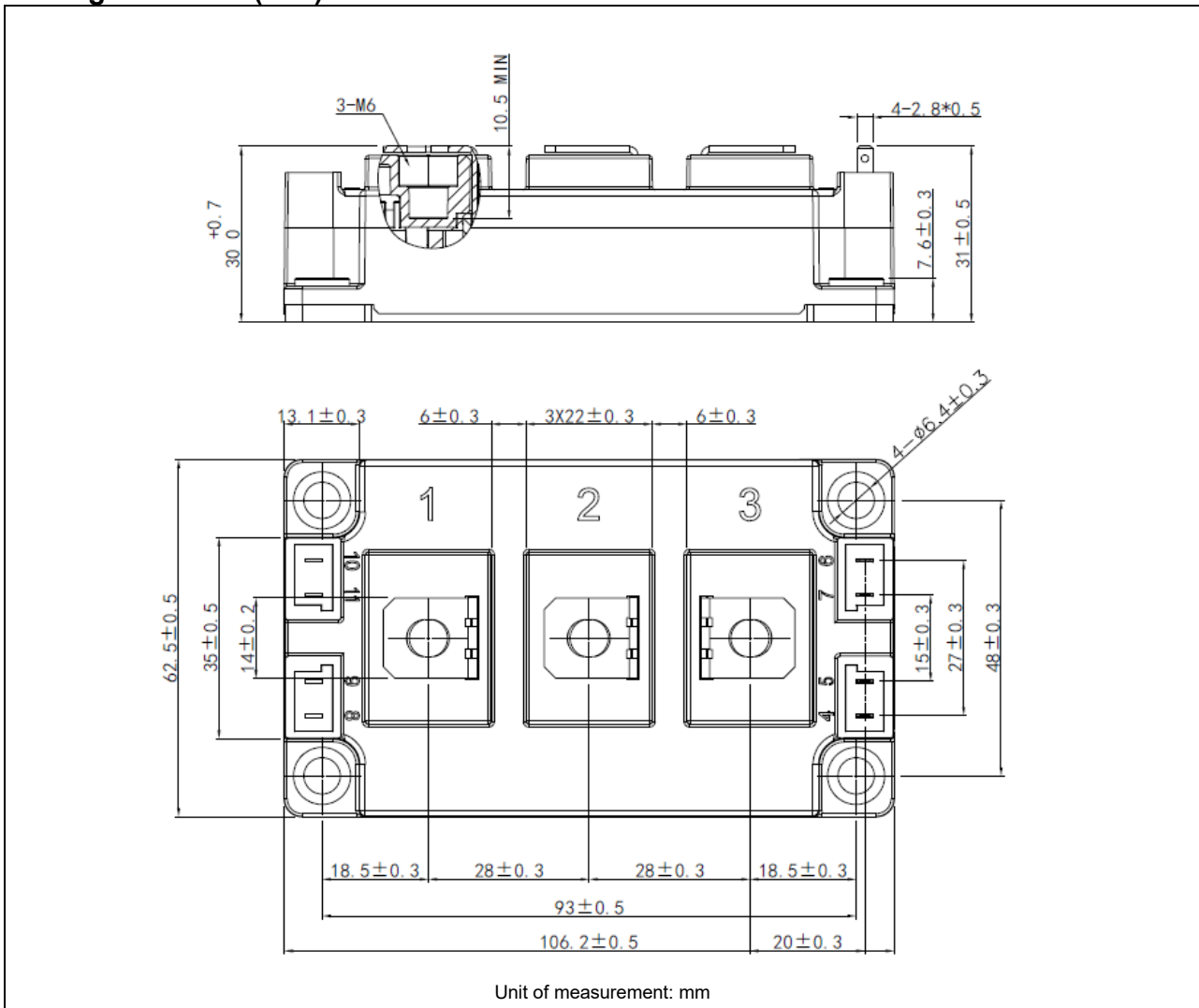
Parameter	Conditions		Symbol	Values			Unit
				Min.	Typ.	Max.	
Forward voltage	I _F = 600A	T _{vj} = 25°C	V _F		2.00	2.35	V
		T _{vj} = 125°C			1.60		
Peak reverse recovery current	I _F = 600A, di/dt = 4330A/μs, V _R = 600V, V _{GE} = -15V	T _{vj} = 25°C	I _{RM}		545		A
		T _{vj} = 125°C			701		
Recovered charge		T _{vj} = 25°C	Q _{rr}		56.2		μC
		T _{vj} = 125°C			66.5		
Reverse Recovery energy		T _{vj} = 25°C	E _{rec}		28.3		mJ
		T _{vj} = 125°C			51.6		
Thermal resistance, junction to case	per diode		R _{th(j-c)}			0.119	K/W
Temperature under switching conditions			T _{vj op}	-40		150	°C

**Module Characteristics**

Parameter	Conditions	Symbol	Values			Unit
			Min.	Typ.	Max.	
Isolation voltage (All terminals shorted)	f = 50Hz, 1 minute	V_{iso}	2.5			kV
Maximum junction temperature		T_J			175	°C
Thermal resistance, case to heatsink	per Module	$R_{th(c-s)}$		0.010		K/W
Storage temperature		T_{stg}	-40		125	°C
Mounting torque	M6	M	2.5		5.0	N·m
Terminal connection torque	M6	M	3.0		5.0	N·m

Ordering Information

Device	Marking	Package	Weight	Inner Box	Per Carton
JMG600HF12G2S1	JMG600HF12G2S1	G2	300g/PCS	12PCS	60PCS

Circuit Diagram

Package Outlines (mm)




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