JMG450HF12G2S1

Trench FS IGBT

Features

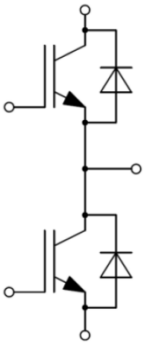
- Short Circuit Rated 10μs
- Low Stray Inductance
- Low Saturation Voltage
- Ultra Low loss
- HI-REL Power Terminals
- Lead Free, Compliant with RoHS Requirement

Product Summary

Parameter	Value	Unit
V_{CES}	1200	V
I_C(@ T_C= 100℃)	450	A
I_{CRM}(@ t_P= 1ms)	900	A
$V_{CE(sat)}$(Typ)	1.85	V

Applications

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



IGBT, Absolute Maximum Ratings (@ T_C = 25°C unless otherwise specified)

Parameter	Conditions	Symbol	Values	Unit
Collector-emitter voltage	Tvj = 25°C	V_{CES}	1200	V
Gate-emitter peak voltage	Tvj = 25°C	V_{GES}	±20	V
Continuous collector current	T_C = 25°C	I_C	704	A
	T_C = 100°C	$I_{C\ nom}$	450	
Repetitive peak collector current	t_P = 1ms	I_{CRM}	900	A
Total power dissipation	T_C = 25°C, Tvj max = 175℃	P_{tot}	2307	W

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IGBT, Electrical Characteristics (@ T_C = 25°C unless otherwise specified)

Parameter	Conditions		Symbol	Values			Unit
				Min.	Typ.	Max.	
Collector-emitter saturation voltage	I_C = 450A, V_{GE} = 15V	T_{vj} = 25°C	$V_{CE(sat)}$		1.85	2.30	V
		T_{vj} = 125°C			2.25		
Gate threshold voltage	V_{CE} = V_{GE}, I_C = 18mA		$V_{GE(th)}$	5.6	6.2	6.8	V
Collector leakage current	V_{GE} = 0V, V_{CE} =1200V		I_{CES}			1	mA
Gate-emitter leakage current	V_{CE} = 0V, V_{GE} = 20V		I_{GES}			400	nA
Input capacitance	f = 1MHz, T_{vj} = 25°C, V_{CE} = 25 V, V_{GE} = 0V		C_{ies}		46.6		nF
Output capacitance			C_{oes}		1.31		nF
Turn-on delay time, inductive load	V_{CC} = 600V, I_C = 450A , R_G = 2Ω, V_{GE} = ±15V , T_{vj} = 25℃		$t_{d(on)}$		284		ns
Rise time, inductive load			t_r		78		ns
Turn-off delay time, inductive load			$t_{d(off)}$		388		ns
Fall time, inductive load			t_f		200		ns
Turn-on energy loss per pulse			E_{on}		45.0		mJ
Turn-off energy loss per pulse			E_{off}		33.4		mJ
Turn-on delay time, inductive load	V_{CC} = 600V, I_C = 450A , R_G = 2Ω, V_{GE} = ±15V , T_{vj} = 125℃		$t_{d(on)}$		288		ns
Rise time, inductive load			t_r		86		ns
Turn-off delay time, inductive load			$t_{d(off)}$		456		ns
Fall time, inductive load			t_f		305		ns
Turn-on energy loss per pulse			E_{on}		60.1		mJ
Turn-off energy loss per pulse			E_{off}		48.4		mJ
SC data	tp≤10us，V_{GE}=15V，V_{CC}=800V, V_{CEM}≤1200V, T_{vj}=125℃		Isc		1800		A
Gate charge	V_{GE}=-15…+15V		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	℃

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FRED, Absolute Maximum Ratings (@ T_C = 25°C unless otherwise specified)

Parameter	Conditions	Symbol	Values	Unit
Repetitive peak reverse voltage	T_{vj} = 25°C	V_{RRM}	1200	V
Continuous DC forward current		$I_{F(AV)}$	450	A
Repetitive peak forward current	t_P = 1ms	I_{FRM}	900	A

FRED, Electrical Characteristics (@ T_C = 25°C unless otherwise specified)

Parameter	Conditions		Symbol	Values			Unit
				Min.	Typ.	Max.	
Forward voltage	I_F = 450A	T_{vj} = 25°C	V_F		2.00	2.35	V
		T_{vj} = 125°C			1.60		
Peak reverse recovery current	I_F = 450A, di/dt = 4330A/µs, V_R = 600V, V_{GE} = -15V	T_{vj} = 25°C	I_{RM}		296		A
		T_{vj} = 125°C			309		
Recovered charge		T_{vj} = 25°C	Q_{rr}		39.4		µC
		T_{vj} = 125°C			58.6		
Reverse Recovery energy		T_{vj} = 25°C	Erec		11.8		mJ
		T_{vj} = 125°C			17.7		
Thermal resistance, junction to case	per Diode		$R_{th(j-c)}$			0.119	K/W
Temperature under switching conditions			$T_{vj\ op}$	-40		150	℃

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Module Characteristics

Parameter	Conditions	Symbol	Values			Unit
			Min.	Typ.	Max.	
Isolation voltage (All terminals shorted)	f = 50Hz,1minute	V_{iso}	2.5			kV
Maximum junction temperature		T_J			175	℃
Thermal resistance, case to heatsink	per module	$R_{th(c-s)}$		0.010		K/W
Storage temperature		T_{stg}	-40		125	℃
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
JMG450HF12G2S1	JMG450HF12G2S1	G2	300g/PCS	12PCS	60PCS

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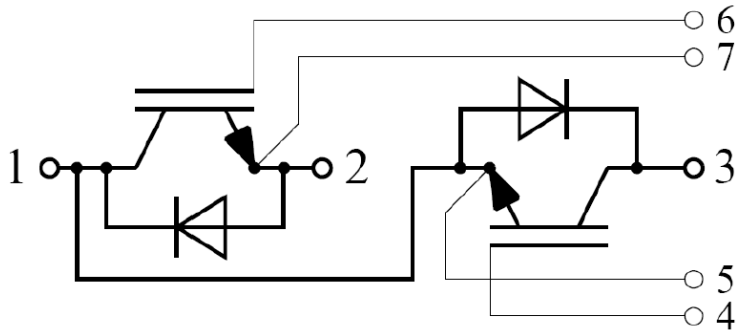
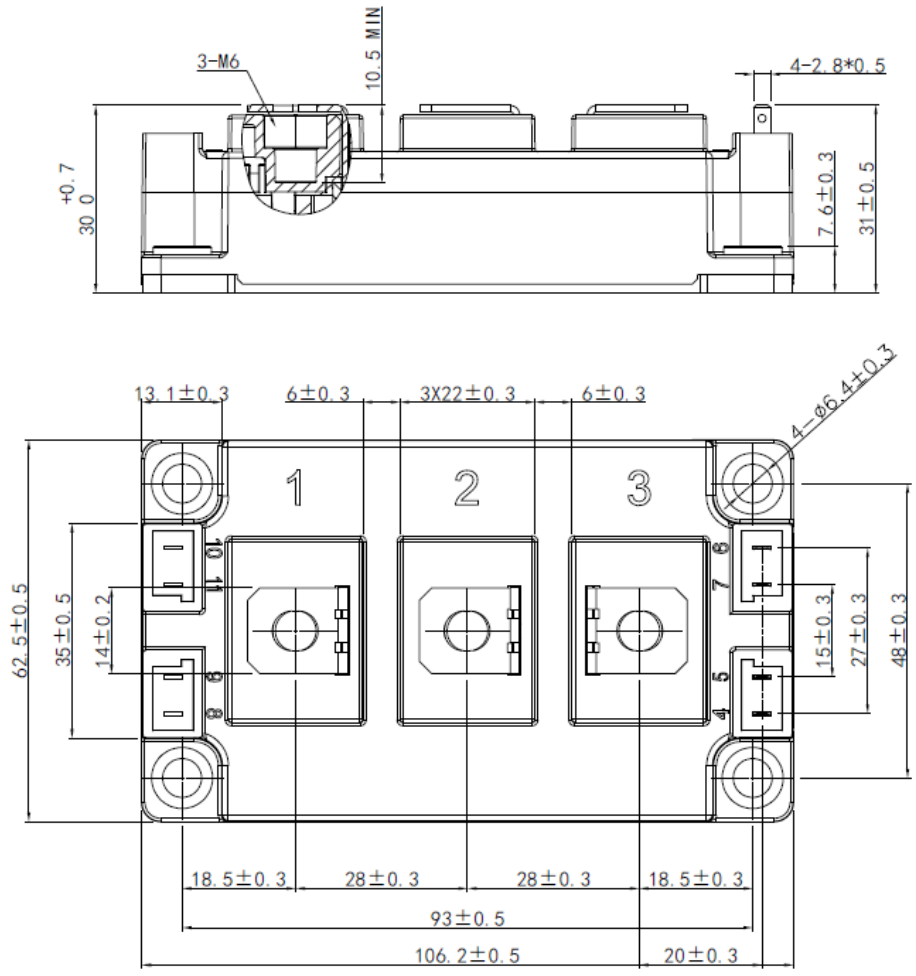
Circuit Diagram



Package Outlines (mm)



Unit of measurement: mm

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