

LEGM450BH120L2S

IGBT Power Module

Features:

- $V_{CE}=1200V$ $I_C=450A$
- Low $V_{CE(sat)}$
- V_{CEsat} with positive temperature coefficient
- Maximum junction temperature $175^{\circ}C$
- Isolation Type Package

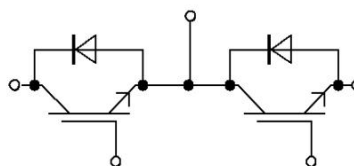
Applications:

- The inverter
- Motor control and drives

Package Type & Internal Circuit



L2



Internal Circuit

Maximum Rated Values (IGBT Inverter)

Symbol	Parameter	Conditions	Ratings	Unit
V_{CES}	Collector-emitter voltage	$V_{EC}=0V, I_C=1mA, T_{vj}=25^{\circ}C$	1200	V
I_C	Continuous Collector Current	$T_C=100^{\circ}C$	450	A
I_{CRM}	Peak Collector Current	$I_{CRM}=2I_C$	900	A
V_{GES}	Gate-Emitter Voltage	$T_{vj}=25^{\circ}C$	± 30	V
P_{tot}	Total Power Dissipation	$T_C=25^{\circ}C, T_{vjmax}=175^{\circ}C$	2110	W

Maximum Rated Values (IGBT Inverter)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=450\text{ A}, V_{GE}=15\text{ V}, T_{vj}=25\text{ }^{\circ}\text{C}$		2.0		V
		$I_C=450\text{ A}, V_{GE}=15\text{ V}, T_{vj}=150\text{ }^{\circ}\text{C}$		2.6		V
$V_{GE(th)}$	Gate Threshold Voltage	$I_C=5.0\text{ mA}, V_{CE}=V_{GE}, T_{vj}=25\text{ }^{\circ}\text{C}$	5.7	6.0	6.5	V
I_{CES}	Collector-Emitter Cut-off Current	$V_{CE}=1200\text{ V}, V_{GE}=0\text{ V}, T_{vj}=25\text{ }^{\circ}\text{C}$			1.0	mA
I_{GES}	Gate-Emitter Leakage Current	$V_{CE}=0\text{ V}, V_{GE}=15\text{ V}, T_{vj}=25\text{ }^{\circ}\text{C}$			400	nA
$t_{d(on)}$	Turn-on Delay Time, Inductive Load	$I_C=450\text{ A}, V_{CE}=600\text{ V}$ $V_{GE}=\pm 15\text{ V}$ $R_G=0.5\text{ }\Omega$ $T_{vj}=25\text{ }^{\circ}\text{C}$		204		ns
t_r	Rise Time, Inductive Load			104		ns
$t_{d(off)}$	Turn-off Delay Time, Inductive Load			720		ns
t_f	Fall Time, Inductive Load			106		ns
E_{on}	Turn-on Energy Loss per Pulse			7.02		mJ
E_{off}	Energy Loss per Pulse			15.9		mJ
$t_{d(on)}$	Turn-on Delay Time, Inductive Load	$I_C=450\text{ A}, V_{CE}=600\text{ V}$ $V_{GE}=\pm 15\text{ V}$ $R_G=0.5\text{ }\Omega$ $T_{vj}=150\text{ }^{\circ}\text{C}$		220		ns
t_r	Rise Time, Inductive Load			114		ns
$t_{d(off)}$	Turn-off Delay Time, Inductive Load			792		ns
t_f	Fall Time, Inductive Load			142		ns
E_{on}	Turn-on Energy Loss per Pulse			17.6		mJ
E_{off}	Energy Loss per Pulse			23.4		mJ
R_{thJC}	Thermal resistance, junction to case	per IGBT			0.071	K/W
$T_{vj\text{ op}}$	Temperature under switching conditions		-40		150	$^{\circ}\text{C}$

Maximum Rated Values (Diode Inverter)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{RRM}	Repetitive Peak Reverse Voltage	$T_{vj}=25\text{ }^{\circ}\text{C}$		1200		V
I_F	Continuous DC Forward Current	$T_C=100\text{ }^{\circ}\text{C}$		200		A
I_{FRM}	Repetitive Peak Forward Current	$t_p=1\text{ ms}$		400		A

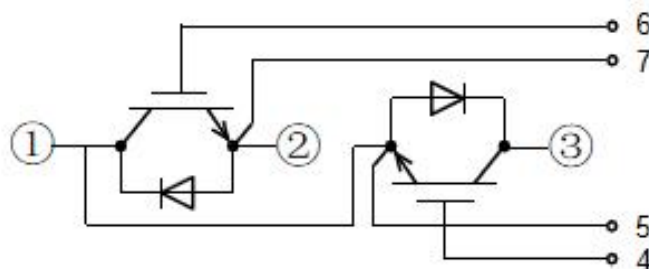
Characteristic Values (Diode Inverter)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_F	Forward Voltage	$I_F=200\text{ A}, V_{CE}=0\text{ V}, T_{vj}=25\text{ }^{\circ}\text{C}$		1.81		V
		$I_F=200\text{ A}, V_{CE}=0\text{ V}, T_{vj}=150\text{ }^{\circ}\text{C}$		1.95		V
t_{rr}	Reverse Recovery time	$I_F=200\text{ A}, V_R=600\text{ V}$ -di/dt=1600 A/us $T_{vj}=25\text{ }^{\circ}\text{C}$		303		ns
Q_r	Recovered Charge			18.2		uC
E_{rec}	Reverse Recovery Energy			9.38		mJ
t_{rr}	Reverse Recovery time	$I_F=200\text{ A}, V_R=600\text{ V}$ -di/dt=1600 A/us $T_{vj}=150\text{ }^{\circ}\text{C}$		674		ns
Q_r	Recovered Charge			29.3		uC
E_{rec}	Reverse Recovery Energy			14.4		mJ
R_{thJC}	Thermal resistance, junction to case	per Diode			0.24	K/W
$T_{vj\text{ op}}$	Operating Junction Temperature		-40		150	$^{\circ}\text{C}$

Module Characteristics

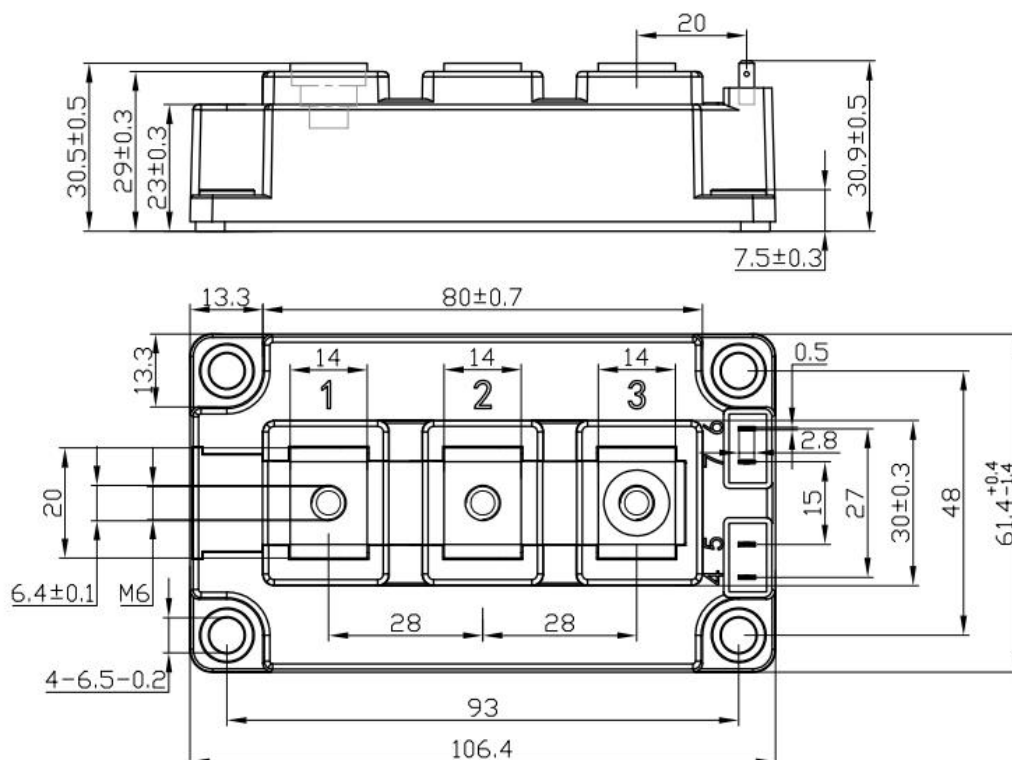
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{isol}	Isolation voltage	$t=1\text{ min}, f=50\text{ Hz}$	2500			V
T_{stg}	Storage Temperature		-40		125	$^{\circ}\text{C}$
M_t	Module Electrodes Torque	Recommended(M6)	2.5		5.0	N·m
M_s	Module-to-Sink Torque	Recommended(M6)	3.0		6.0	N·m
G	Weight of Module			340		g

Circuit Diagram



Package Dimensions

(Dimensions in Millimeters)



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