

LEGM150BH120L1ST

IGBT Power Module

Features:

- $V_{CE}=1200V$ $I_C=150A$
- Low V_{CEsat}
- Maximum junction temperature $175^{\circ}C$
- Isolation Type Package

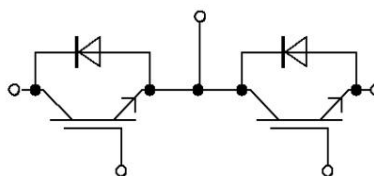
Applications:

- Induction heating
- Inverter welding machine

Package Type & Internal Circuit



L1



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	$T_C=100^{\circ}C$	150	A
I_{CRM}	Peak Collector Current	$I_{CRM}=2I_C$	300	A
V_{GES}	Gate-Emitter Voltage	$T_{vj}=25^{\circ}C$	± 20	V
P_{tot}	Total Power Dissipation	$T_C=25^{\circ}C, T_{vjmax}=175^{\circ}C$	789	W

Maximum Rated Values (IGBT Inverter)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=150\text{ A}, V_{GE}=15\text{ V}, T_{vj}=25\text{ }^{\circ}\text{C}$		1.65	2.2	V
		$I_C=150\text{ A}, V_{GE}=15\text{ V}, T_{vj}=150\text{ }^{\circ}\text{C}$		2.05		V
$V_{GE(th)}$	Gate Threshold Voltage	$I_C=5.7\text{ mA}, V_{CE}=V_{GE}, T_{vj}=25\text{ }^{\circ}\text{C}$	5.1	5.7	6.3	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	mA
I_{GES}	Gate-Emitter Leakage Current	$V_{CE}=0\text{ V}, V_{GE}=15\text{ V}, T_{vj}=25\text{ }^{\circ}\text{C}$			450	nA
$t_{d(on)}$	Turn-on Delay Time, Inductive Load	$I_C=150\text{ A}, V_{CE}=600\text{ V}$ $V_{GE}=\pm 15\text{ V}$ $R_G=10\text{ }\Omega$ $T_{vj}=25\text{ }^{\circ}\text{C}$		137		ns
t_r	Rise Time, Inductive Load			70		ns
$t_{d(off)}$	Turn-off Delay Time, Inductive Load			457		ns
t_f	Fall Time, Inductive Load			64		ns
E_{on}	Turn-on Energy Loss per Pulse			6.83		mJ
E_{off}	Energy Loss per Pulse			5.92		mJ
$t_{d(on)}$	Turn-on Delay Time, Inductive Load			116		ns
t_r	Rise Time, Inductive Load			72		ns
$t_{d(off)}$	Turn-off Delay Time, Inductive Load	$I_C=150\text{ A}, V_{CE}=600\text{ V}$ $V_{GE}=\pm 15\text{ V}$ $R_G=10\text{ }\Omega$ $T_{vj}=150\text{ }^{\circ}\text{C}$		476		ns
t_f	Fall Time, Inductive Load			123		ns
E_{on}	Turn-on Energy Loss per Pulse			10.1		mJ
E_{off}	Energy Loss per Pulse			7.79		mJ
R_{thJC}	Thermal resistance, junction to case	per IGBT			0.19	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	$T_C = 100\text{ }^{\circ}\text{C}$		75		A
I_{FRM}	Repetitive Peak Forward Current	$t_p = 1\text{ ms}$		150		A

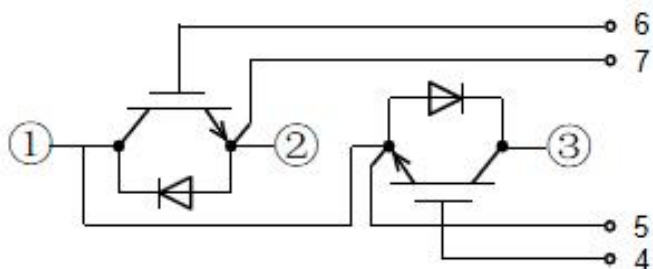
Characteristic Values (Diode Inverter)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_F	Forward Voltage	$I_F = 75\text{ A}, V_{CE} = 0\text{ V}, T_{vj} = 25\text{ }^{\circ}\text{C}$		1.91		V
		$I_F = 75\text{ A}, V_{CE} = 0\text{ V}, T_{vj} = 150\text{ }^{\circ}\text{C}$		1.63		V
I_{rr}	Peak reverse recovery current	$I_F = 75\text{ A}, V_R = 600\text{ V}$ $-di/dt = 1200\text{ A/us}$ $T_{vj} = 25\text{ }^{\circ}\text{C}$		92		A
Q_r	Recovered Charge			5.39		uC
E_{rec}	Reverse Recovery Energy			1.82		mJ
I_{rr}	Peak reverse recovery current	$I_F = 75\text{ A}, V_R = 600\text{ V}$ $-di/dt = 1200\text{ A/us}$ $T_{vj} = 150\text{ }^{\circ}\text{C}$		103		A
Q_r	Recovered Charge			9.73		uC
E_{rec}	Reverse Recovery Energy			3.42		mJ
R_{thJC}	Thermal resistance, junction to case	per Diode			0.97	K/W
$T_{vj\text{ op}}$	Operating Junction Temperature		-40		150	$^{\circ}\text{C}$

Module Characteristics

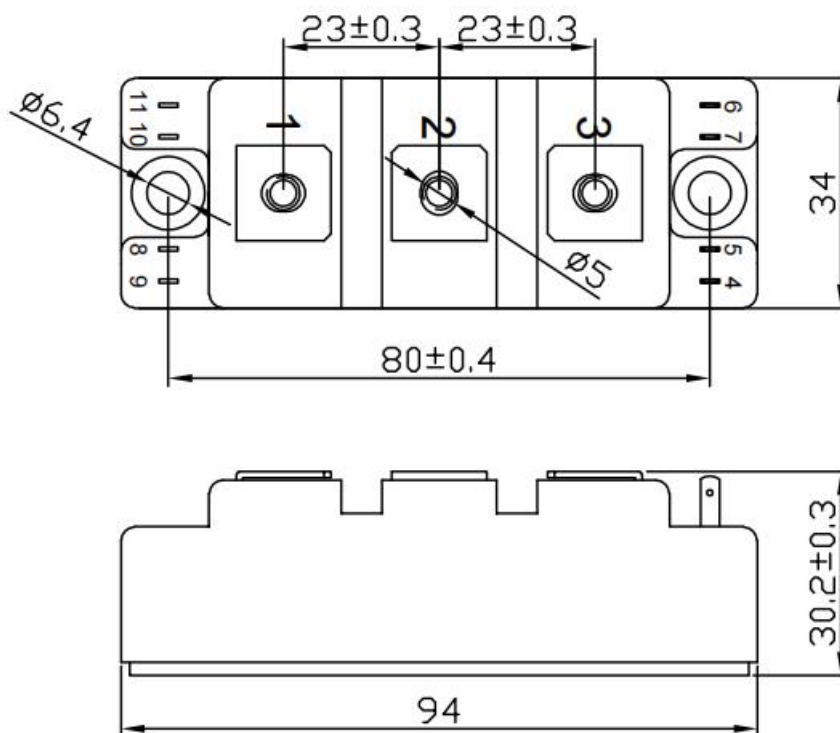
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{isol}	Isolation voltage	$t = 1\text{ min}, f = 50\text{ Hz}$	2500			V
T_{stg}	Storage Temperature		-40		125	$^{\circ}\text{C}$
M_t	Module Electrodes Torque	Recommended(M5)	2.5		5.0	N·m
M_s	Module-to-Sink Torque	Recommended(M6)	3.0		6.0	N·m
G	Weight of Module			160		g

Circuit Diagram



Package Dimensions

(Dimensions in Millimeters)



DISCLAIMER

1. This product datasheet is subject to change without prior notice. Leading Energy reserves the right to modify products for performance enhancement or other purposes.
2. Operating conditions may differ from simulation assumptions in several aspects like level of DC-link voltage, applied gate-voltage and gate-resistor, case and junction temperatures as well as the power circuit stray-inductance. Therefore, deviations of parameters and assumptions used for the simulation and the real application may exist.
3. Although Leading Energy is continuously working to improve product reliability and quality, semiconductors can break down and malfunction due to various factors. Therefore, in order to prevent personal injury or fire arising from failure, please take necessary safety measures. Leading Energy shall have no responsibility for any damages arising out of the use of our products beyond the rating specified by Leading Energy.
4. Due to the technical requirements, our product may contain dangerous substances. For further information, please contact the relevant sales representative.
5. This product datasheet is for reference only and is not part of the contract. The technical agreement signed by both parties shall prevail.