

LEGM75BD170L5H

IGBT Power Module

Features:

- $V_{CE}=1700V$ $I_C=75 A$
- V_{CEsat} with positive temperature coefficient
- Low V_{CEsat}
- Unbeatable robustness
- $T_{vjmax}=175^{\circ}C$

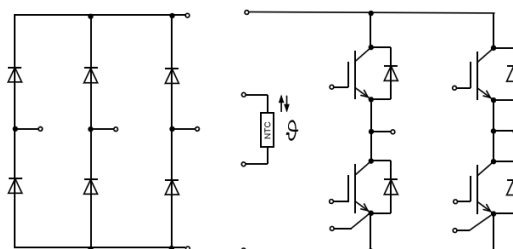
Applications

- Motor control and drives
- High power Converters
- UPS systems
- Wind turbines

Package Type & Internal Circuit



L5



Internal Circuit

Maximum Rated Values (IGBT Inverter)

Symbol	Parameter	Conditions	Ratings	Unit
V_{CES}	Collector-emitter voltage	$T_{vj}=25^{\circ}C$	1700	V
I_C	Continuous Collector Current	$T_C=150^{\circ}C$	75	A
I_{CRM}	Peak Collector Current	$t_p=1ms$	150	A
V_{GES}	Gate-Emitter Voltage	$T_{vj}=25^{\circ}C$	± 20	V
P_{tot}	Total Power Dissipation	$T_C=25^{\circ}C, T_{vjmax}=175^{\circ}C$	625	W

Maximum Rated Values (IGBT Inverter)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=75A, V_{GE}=15V, T_{vj}=25^\circ C$		1.70		V
		$I_C=75A, V_{GE}=15V, T_{vj}=150^\circ C$		2.07		V
$V_{GE(th)}$	Gate Threshold Voltage	$I_C=4.5mA, V_{CE}=V_{GE}, T_{vj}=25^\circ C$	5.00	6.15	7.50	V
I_{CES}	Collector-Emitter Cut-off Current	$V_{CE}=1700V, V_{GE}=0V, T_{vj}=25^\circ C$			1.0	μA
I_{GES}	Gate-Emitter Leakage Current	$V_{CE}=0V, V_{GE}=20V, T_{vj}=25^\circ C$	-0.5		0.5	μA
R_{Gint}	Internal gate resistor	$T_{vj}=25^\circ C$		11.2		Ω
C_{ies}	Input capacitance	$f = 100\text{ kHz}, T_{vj} = 25^\circ C,$ $V_{CE} = 25V, V_{GE} = 0V$		5.8		nF
C_{res}	Reverse transfer capacitance			0.18		nF
$t_{d(on)}$	Turn-on Delay Time, Inductive Load	$I_C=75A, V_{CE}=900V$ $V_{GE}=\pm 15V$ $R_G=10\Omega$ $T_{vj}=25^\circ C$		101		ns
t_r	Rise Time, Inductive Load			23		ns
$t_{d(off)}$	Turn-off Delay Time, Inductive Load			554		ns
t_f	Fall Time, Inductive Load			368		ns
E_{on}	Turn-on Energy Loss per Pulse			10.1		mJ
E_{off}	Energy Loss per Pulse			15.6		mJ
$t_{d(on)}$	Turn-on Delay Time, Inductive Load	$I_C=75A, V_{CE}=900V$ $V_{GE}=\pm 15V$ $R_G=10\Omega$ $T_{vj}=150^\circ C$		122		ns
t_r	Rise Time, Inductive Load			23		ns
$t_{d(off)}$	Turn-off Delay Time, Inductive Load			686		ns
t_f	Fall Time, Inductive Load			622		ns
E_{on}	Turn-on Energy Loss per Pulse			13.8		mJ
E_{off}	Energy Loss per Pulse			23.4		mJ
$R_{th(j-c)}$	IGBT thermal resistance junction to case IGBT	per switch			0.24	K/W
$T_{vj op}$	Temperature under switching conditions		-40		150	$^\circ C$
I_{sc}	SC	$V_{GE}=15V, V_{CC}=1200V, t_p \leq 10\mu s,$ $T_{vj}=175^\circ C, V_{CEmax} = V_{CES} - L_{sCE} \cdot di/dt$		375		A

Maximum Rated Values (Diode Inverter)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{RRM}	Repetitive Peak Reverse Voltage	$T_{vj}=25\text{ }^{\circ}\text{C}$		1700		V
I_F	Continuous DC Forward Current			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	$I_F=75\text{ A}, V_{CE}=0\text{ V}, T_{vj}=25\text{ }^{\circ}\text{C}$		1.79		V
		$I_F=75\text{ A}, V_{CE}=0\text{ V}, T_{vj}=150\text{ }^{\circ}\text{C}$		1.98		V
I_{rr}	Peak reverse recovery current	$I_F=75\text{ A}, V_R=900\text{ V},$ $di/dt=2550\text{ A/us}$ $T_{vj}=25\text{ }^{\circ}\text{C}$		130		A
Q_r	Recovered Charge			15.7		uC
E_{rec}	Reverse Recovery Energy			9.36		mJ
I_{rr}	Peak reverse recovery current	$I_F=75\text{ A}, V_R=900\text{ V},$ $di/dt=2550\text{ A/us}$ $T_{vj}=150\text{ }^{\circ}\text{C}$		144		A
Q_r	Recovered Charge			20.1		uC
E_{rec}	Reverse Recovery Energy			16.7		mJ
$R_{th(j-c)}$	Thermal resistance, junction to case	per switch			0.39	K/W
$T_{vj\text{ op}}$	Operating Junction Temperature		-40		150	$^{\circ}\text{C}$

Maximum Rated Values (Diode Rectifier)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{RRM}	Repetitive peak reverse voltage	$T_{vj}=25\text{ }^{\circ}\text{C}$		1800		V
I_{FRMSM}	Maximum RMS forward current per chip	$T_c=80\text{ }^{\circ}\text{C}$		30		A
I_{RMSM}	Maximum RMS current at rectifier chip	$T_c=80\text{ }^{\circ}\text{C}$		30		A
I_{FSM}	Surge forward current	$t_p=10\text{ms}$ $T_{vj}=25\text{ }^{\circ}\text{C}$		600		A

Characteristic Values (Diode Rectifier)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_F	Forward voltage	$T_c=25\text{ }^{\circ}\text{C}$		1.8		V
I_R	Reverse current	$T_{vj}=25\text{ }^{\circ}\text{C}$ $V_R=V_{RRM}$			10	μA
R_{thjc}	Thermal resistance junction to case	$T_c=25\text{ }^{\circ}\text{C}$		0.58		K/W
T_{vjop}	Temperature under switching conditions	per diode	-40		150	$^{\circ}\text{C}$

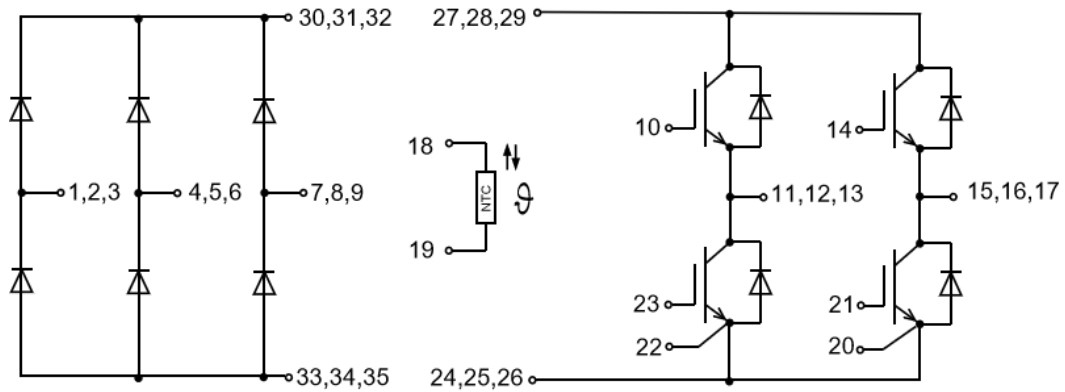
NTC-Thermistor (Characteristic Values)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
R_{25}	Rated resistance	$T_c=25\text{ }^{\circ}\text{C}$		5		K Ω
$\Delta R/R$	Deviation of R100	$T_c=100\text{ }^{\circ}\text{C}$	-5		5	%
P_{25}	Power dissipation	$T_c=25\text{ }^{\circ}\text{C}$		20		mW
$B_{25/50}$	B-value	$R_2=R_{25}\exp[B_{25/50}(1/T_2-1/(298,15K))]$		3380		K
$B_{25/100}$	B-value	$R_2=R_{25}\exp[B_{25/100}(1/T_2-1/(298,15K))]$		3450		K

Module Characteristics

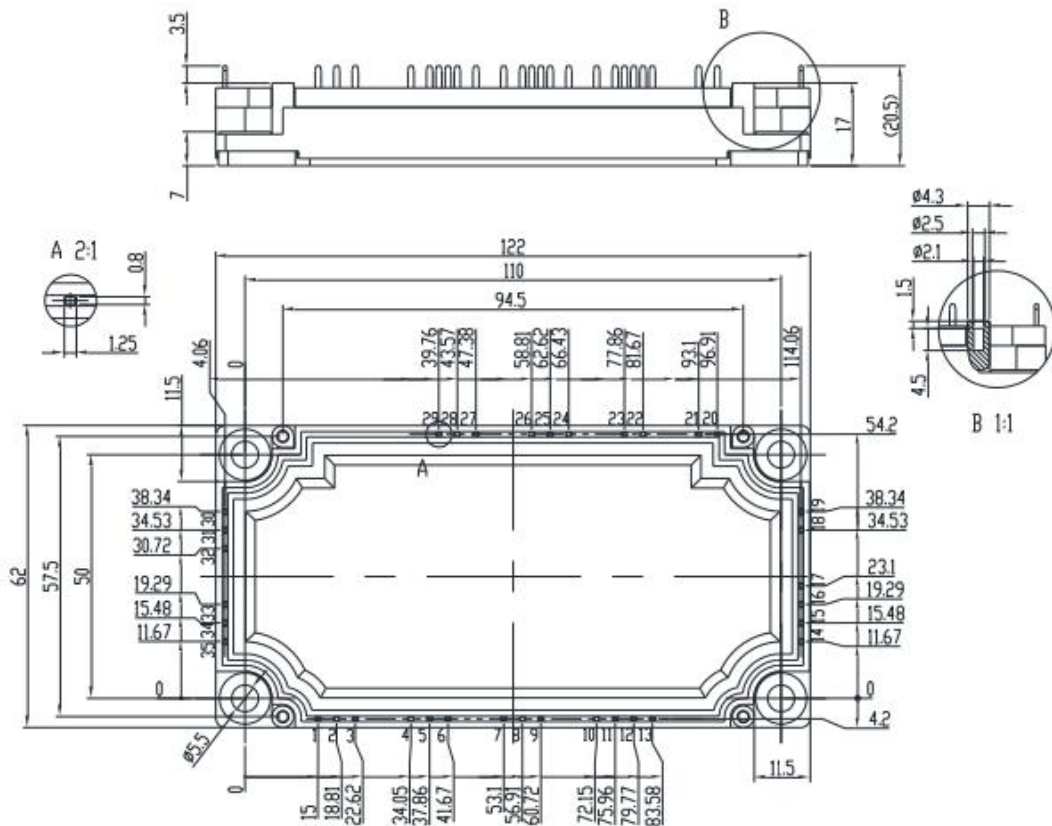
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{isol}	Isolation voltage	$t=1\text{min}, f=50\text{Hz}$	2500			V
T_{stg}	Storage Temperature		-40		125	$^{\circ}\text{C}$
M	Mounting Torque	Recommended(M5)	2.5		5.0	N·m
G	Weight of Module			310		g

Circuit Diagram



Package Dimensions

(Dimensions in Millimeters)



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