

LEGM200BC120L3H

IGBT Power Module

Features

- $V_{CE}=700V$ $I_C=200A$
- Low $V_{CE(sat)}$
- V_{CEsat} with positive temperature coefficient
- Maximum junction temperature 150°C
- Isolation Type Package

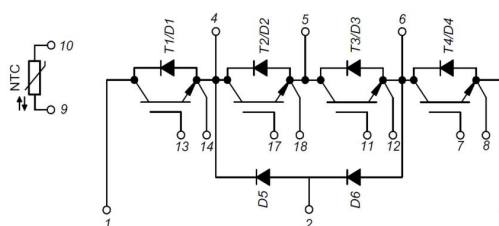
Applications:

- 3-Level-Applications
- Solar Applications
- UPS Systems

Package Type & Internal Circuit



L3



Internal Circuit

Maximum Rated Values (IGBT Inverter)

Symbol	Parameter	Conditions	Ratings	Unit
V_{CES}	Maximum Power Dissipation	$V_{EC}=0V, I_C=1mA, T_{vj}=25^\circ C$	700	V
I_C	Continuous Collector Current	$T_C=100^\circ C$	200	A
I_{CRM}	Peak Collector Current	$I_{CRM}=2I_C$	400	A
V_{GES}	Gate-Emitter Voltage	$T_{vj}=25^\circ C$	± 30	V
P_{tot}	Total Power Dissipation	$T_C=25^\circ C, T_{vjmax}=150^\circ C$	650	W

Maximum Rated Values (IGBT T1 T2 T3 T4)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=200\text{ A}, V_{GE}=15\text{ V}, T_{vj}=25\text{ }^{\circ}\text{C}$		1.8	2.3	V
		$I_C=200\text{ A}, V_{GE}=15\text{ V}, T_{vj}=125\text{ }^{\circ}\text{C}$		2.0		V
$V_{GE(th)}$	Gate Threshold Voltage	$I_C=5.0\text{ mA}, V_{CE}=V_{GE}, T_{vj}=25\text{ }^{\circ}\text{C}$	5.2	6	6.5	V
I_{CES}	Collector-Emitter Cut-off Current	$V_{CE}=700\text{ V}, V_{GE}=0\text{ V}, T_{vj}=25\text{ }^{\circ}\text{C}$			1	mA
I_{GES}	Gate-Emitter Leakage Current	$V_{CE}=0\text{ V}, V_{GE}=15\text{ V}, T_{vj}=25\text{ }^{\circ}\text{C}$			200	nA
$t_{d(on)}$	Turn-on Delay Time, Inductive Load	$I_C=200\text{ A}, V_{CE}=300\text{ V}$ $V_{GE}=\pm 15\text{ V}$ $R_G=1\text{ }\Omega$ $T_{vj}=25\text{ }^{\circ}\text{C}$		52.3		ns
t_r	Rise Time, Inductive Load			41.0		ns
$t_{d(off)}$	Turn-off Delay Time, Inductive Load			223		ns
t_f	Fall Time, Inductive Load			51		ns
E_{on}	Turn-on Energy Loss per Pulse			1		mJ
E_{off}	Energy Loss per Pulse			7		mJ
$t_{d(on)}$	Turn-on Delay Time, Inductive Load	$I_C=200\text{ A}, V_{CE}=300\text{ V}$ $V_{GE}=\pm 15\text{ V}$ $R_G=1\text{ }\Omega$ $T_{vj}=125\text{ }^{\circ}\text{C}$		52.6		ns
t_r	Rise Time, Inductive Load			43.2		ns
$t_{d(off)}$	Turn-off Delay Time, Inductive Load			251		ns
t_f	Fall Time, Inductive Load			121		ns
E_{on}	Turn-on Energy Loss per Pulse			1.5		mJ
E_{off}	Energy Loss per Pulse			9.3		mJ
R_{thJC}	Thermal resistance, junction to case	per IGBT			0.23	K/W
$T_{vj\text{ op}}$	Temperature under switching conditions		-40		125	$^{\circ}\text{C}$
I_{sc}	SC	$V_{GE}\leq 15\text{ V}, V_{CE}=360\text{ V},$ $t_p\leq 10\text{ }\mu\text{s}, T_{vj}=125\text{ }^{\circ}\text{C},$ $V_{CEmax}=V_{CES}-L_{sCE}\cdot di/dt$		1500		A

Maximum Rated Values (Diode D1 D2 D3 D4)

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	$I_F = 200\text{ A}, V_{CE} = 0\text{ V}, T_{vj} = 25\text{ }^{\circ}\text{C}$		1.7		V
		$I_F = 200\text{ A}, V_{CE} = 0\text{ V}, T_{vj} = 125\text{ }^{\circ}\text{C}$		1.6		V
t_{rr}	Reverse Recovery time	$I_F = 200\text{ A}, V_R = 300\text{ V}$ $-di/dt = 2800\text{ A/us}$ $T_{vj} = 25\text{ }^{\circ}\text{C}$		170		ns
Q_r	Recovered Charge			14		uC
E_{rec}	Reverse Recovery Energy			1.5		mJ
t_{rr}	Reverse Recovery time	$I_F = 200\text{ A}, V_R = 300\text{ V}$ $-di/dt = 2800\text{ A/us}$ $T_{vj} = 125\text{ }^{\circ}\text{C}$		230		ns
Q_r	Recovered Charge			19.5		uC
E_{rec}	Reverse Recovery Energy			4.3		mJ
R_{thJC}	Thermal resistance, junction to case	per Diode			0.36	K/W
$T_{vj\text{ op}}$	Operating Junction Temperature		-40		125	$^{\circ}\text{C}$

Maximum Rated Values (Diode D5 D6)

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

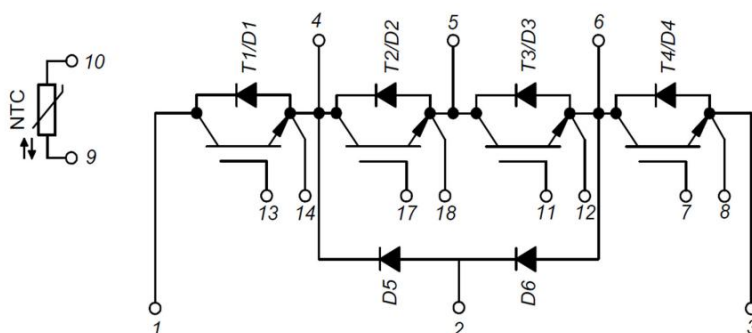
Characteristic Values (Diode Inverter)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_F	Forward Voltage	$I_F=200\text{ A}, V_{CE}=0\text{ V}, T_{vj}=25\text{ }^{\circ}\text{C}$		1.7		V
		$I_F=200\text{ A}, V_{CE}=0\text{ V}, T_{vj}=125\text{ }^{\circ}\text{C}$		1.6		V
t_{rr}	Reverse Recovery time	$I_F=200\text{ A}, V_R=300\text{ V}$ $-di/dt=2800\text{ A/us}$ $T_{vj}=25\text{ }^{\circ}\text{C}$		170		ns
Q_r	Recovered Charge			14		uC
E_{rec}	Reverse Recovery Energy			1.5		mJ
t_{rr}	Reverse Recovery time	$I_F=200\text{ A}, V_R=300\text{ V}$ $-di/dt=2800\text{ A/us}$ $T_{vj}=125\text{ }^{\circ}\text{C}$		230		ns
Q_r	Recovered Charge			19.5		uC
E_{rec}	Reverse Recovery Energy			4.3		mJ
R_{thJC}	Thermal resistance, junction to case	per Diode			0.36	K/W
$T_{vj\text{ op}}$	Operating Junction Temperature		-40		125	$^{\circ}\text{C}$

Module Characteristics

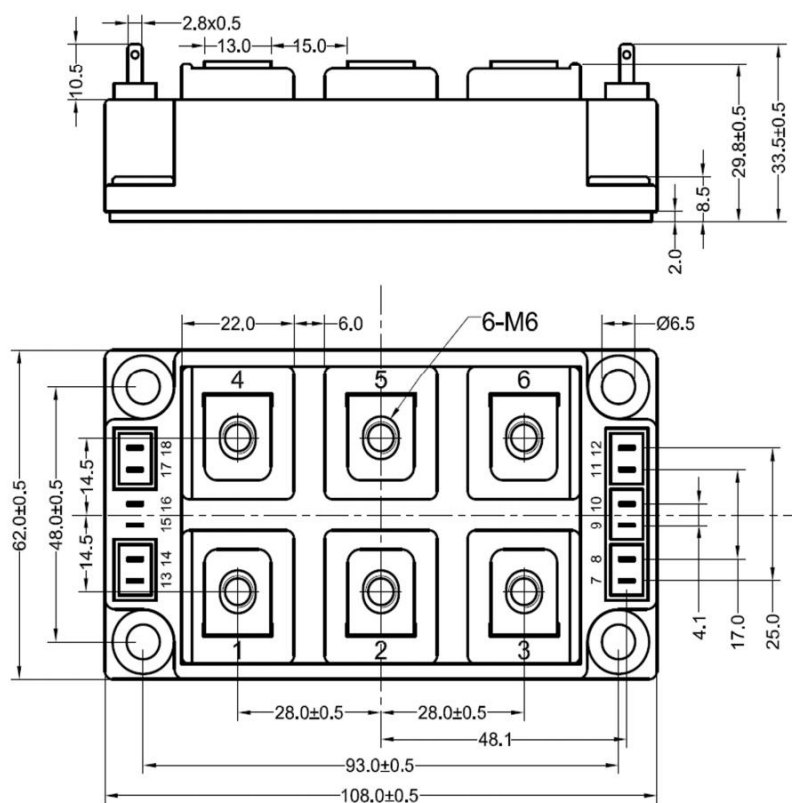
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{isol}	Isolation voltage	$t=1\text{ min}, f=50\text{ Hz}$	2500			V
T_{stg}	Storage Temperature		-40		125	$^{\circ}\text{C}$
M_t	Module Electrodes Torque	Recommended(M6)	2.5		5.0	N·m
M_s	Module-to-Sink Torque	Recommended(M6)	3.0		6.0	N·m
G	Weight of Module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

Circuit Diagram



Package Dimensions

(Dimensions in Millimeters)



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