

LEGM300CJ120L3H

IGBT Power Module

Features:

- $V_{CE}=1200V$ $I_C=300A$
- Low V_{CEsat}
- V_{CEsat} with positive temperature coefficient
- Fast switching and short tail current
- Free wheeling diodes with fast and soft reverse recovery
- High short circuit capability self limiting short circuit current

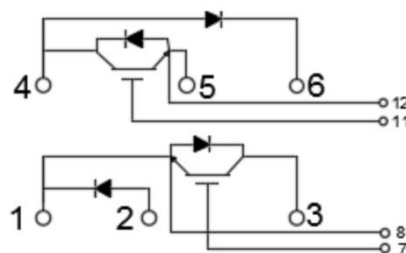
Applications:

- AC and DC motor control
- AC servo and robot driver
- Power supplier
- Welding inverters

Package Type & Internal Circuit



L3



Internal Circuit

Maximum Rated Values (IGBT Inverter)

Symbol	Parameter	Conditions	Ratings	Unit
V_{CES}	Collector-emitter voltage	$T_{vj}=25\text{ }^{\circ}\text{C}$	1250	V
I_C	Continuous Collector Current	$T_C=80\text{ }^{\circ}\text{C}$	300	A
I_{CRM}	Peak Collector Current	$I_{CRM}=2\text{ }I_C$	600	A
V_{GES}	Gate-Emitter Voltage	$T_{vj}=25\text{ }^{\circ}\text{C}$	± 30	V
P_{tot}	Total Power Dissipation	$T_C=25\text{ }^{\circ}\text{C}, T_{vjmax}=150\text{ }^{\circ}\text{C}$	1460	W

Maximum Rated Values (IGBT Inverter)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=300\text{ A}, V_{GE}=15\text{ V}, T_{vj}=25\text{ }^{\circ}\text{C}$		2.2	2.65	V
		$I_C=300\text{ A}, V_{GE}=15\text{ V}, T_{vj}=125\text{ }^{\circ}\text{C}$		2.6		V
$V_{GE(th)}$	Gate Threshold Voltage	$I_C=2.0\text{ mA}, V_{CE}=V_{GE}, T_{vj}=25\text{ }^{\circ}\text{C}$	5.0		6.8	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	$V_{CE}=0\text{ V}, V_{GE}=15\text{ V}, T_{vj}=25\text{ }^{\circ}\text{C}$	-500		500	nA
R_{gint}	Integrated Gate Resistor			7.5		Ω
Q_{ge}	Gate Charge	$V_{CE}=600\text{ V}, I_C=300\text{ A}, V_{GE}=\pm 15\text{ V}$		1.9		μC
C_{ies}	Input Capacitance	$V_{CE}=25\text{ V}, V_{GE}=0\text{ V}, f=1\text{ MHz}$		17.2		nF
C_{res}	Reverse Transfer Capacitance			0.65		nF
$t_{d(on)}$	Turn-on Delay Time, Inductive Load	$I_C=300\text{ A}, V_{CE}=600\text{ V}$ $V_{GE}=\pm 15\text{ V}$ $R_{Gon}=3.3\text{ }\Omega$ $T_{vj}=25\text{ }^{\circ}\text{C}$		335		ns
t_r	Rise Time, Inductive Load			73		ns
$t_{d(off)}$	Turn-off Delay Time, Inductive Load			370		ns
t_f	Fall Time, Inductive Load			155		ns
E_{on}	Turn-on Energy Loss per Pulse			14.8		mJ
E_{off}	Energy Loss per Pulse			15.2		mJ
$t_{d(on)}$	Turn-on Delay Time, Inductive Load	$I_C=300\text{ A}, V_{CE}=600\text{ V}$ $V_{GE}=\pm 15\text{ V}$ $R_{Gon}=2\text{ }\Omega$ $T_{vj}=125\text{ }^{\circ}\text{C}$		361		ns
t_r	Rise Time, Inductive Load			78		ns
$t_{d(off)}$	Turn-off Delay Time, Inductive Load			390		ns
t_f	Fall Time, Inductive Load			188		ns
E_{on}	Turn-on Energy Loss per Pulse			14.3		mJ
E_{off}	Energy Loss per Pulse			15.9		mJ
R_{thJC}	Thermal resistance, junction to case	per IGBT			0.11	K/W
$T_{vj\text{ op}}$	Temperature under switching conditions		-40		125	$^{\circ}\text{C}$
I_{SC}	SC data	$V_{GE} \leq 15\text{ V}, V_{CC} = 900\text{ V}$ $V_{CEmax} = V_{CES} - L_{sCE} \cdot di/dt$ $t_p \leq 10\text{ }\mu\text{s}, T_{vj} = 125\text{ }^{\circ}\text{C}$		900		A

Maximum Rated Values (Diode - Serial)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{RRM}	Repetitive Peak Reverse Voltage	$T_{vj}= 25\text{ }^{\circ}\text{C}$		1250		V
I_F	Continuous DC Forward Current	$T_C=80\text{ }^{\circ}\text{C}$		300		A
I_{FRM}	Repetitive Peak Forward Current	$t_p=1\text{ ms}$		600		A

Characteristic Values (Diode - Serial)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_F	Forward Voltage	$I_F=300\text{ A}, V_{GE}=0\text{ V}, T_{vj}=25\text{ }^{\circ}\text{C}$		1.95	2.35	V
		$I_F=300\text{ A}, V_{GE}=0\text{ V}, T_{vj}=125\text{ }^{\circ}\text{C}$		1.85		V
Q_{rr}	Recovered Charge	$I_F=300\text{ A}, V_R=600\text{ V},$ $di_F/dt= - 2400\text{ A}/\mu\text{s}, T_{vj}=125\text{ }^{\circ}\text{C}$		30		μC
E_{rec}	Reverse Recovery Energy			17		mJ
I_{RRM}	Max. Reverse Recovery Current			210		A
R_{thJC}	Thermal resistance, junction to case	per Diode			0.19	K/W

Maximum Rated Values (Diode - Reverse)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{RRM}	Repetitive Peak Reverse Voltage	$T_{vj}= 25\text{ }^{\circ}\text{C}$		1250		V
I_F	Continuous DC Forward Current	$T_C=80\text{ }^{\circ}\text{C}$		75		A
I_{FRM}	Repetitive Peak Forward Current	$t_p=1\text{ ms}$		150		A

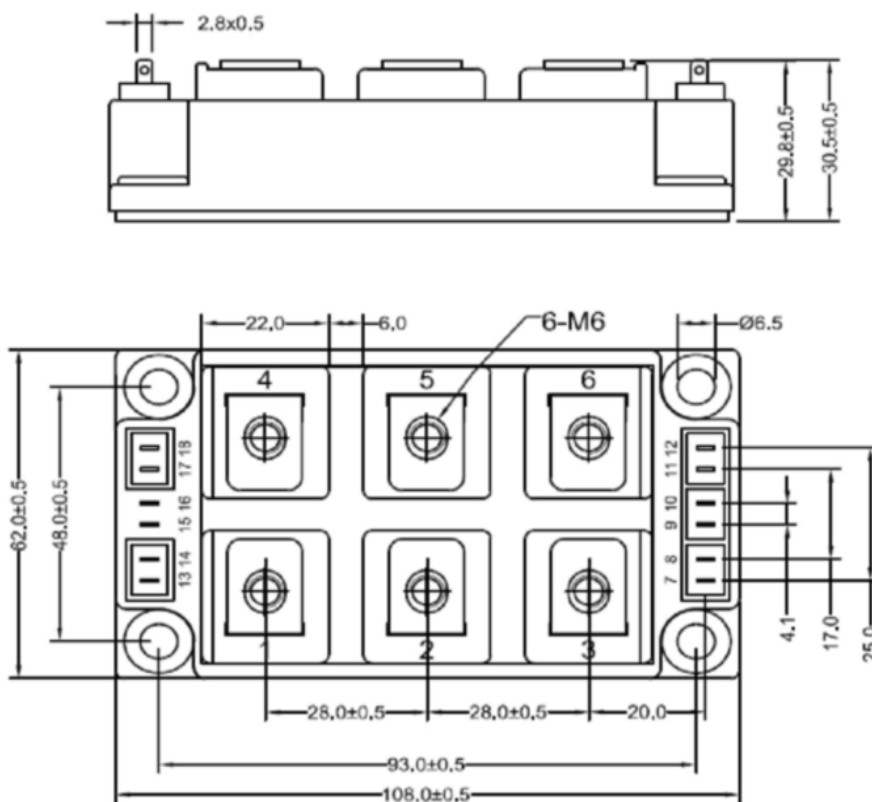
Characteristic Values (Diode – Reverse)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_F	Forward Voltage	$I_F=75\text{ A}, V_{GE}=0\text{ V}, T_{vj}=25\text{ }^{\circ}\text{C}$		1.65	2.1	V
		$I_F=75\text{ A}, V_{GE}=0\text{ V}, T_{vj}=125\text{ }^{\circ}\text{C}$		1.65		V
Q_{rr}	Recovered Charge	$I_F=200\text{ A}, V_R=600\text{ V},$ $di_F/dt = -2000\text{ A}/\mu\text{s}, T_{vj}=125\text{ }^{\circ}\text{C}$		106		μC
E_{rec}	Reverse Recovery Energy			7.8		mJ
I_{RRM}	Max. Reverse Recovery Current			69		A
R_{thJC}	Thermal resistance, junction to case	per Diode			0.45	K/W

Module Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{isol}	Isolation voltage	$t=1\text{ min}, \text{AC}$		3000		V
$T_{vj\text{ op}}$	Max. Junction Temperature				150	$^{\circ}\text{C}$
$T_{vj\text{ op}}$	Operating Temperature		-40		125	$^{\circ}\text{C}$
T_{stg}	Storage Temperature		-40		125	$^{\circ}\text{C}$
M_t	Module Electrodes Torque	Recommended(M6)	3.0		5.0	N·m
M_s	Module-to-Sink Torque	Recommended(M6)	3.0		5.0	N·m
G	Weight of Module			316		g

(Dimensions in Millimeters)



DISCLAIMER

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.