

LEGM300CH120L2H1

IGBT Power Module

Features

- $V_{CE}=1200V$ $I_C=300A$
- Low $V_{CE(sat)}$
- V_{CEsat} with positive temperature coefficient
- Maximum junction temperature 175°C
- Isolation Type Package

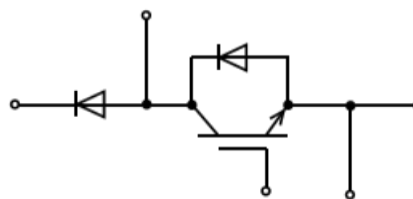
Applications

- 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}	Maximum Power Dissipation	$V_{EC}=0V, I_C=1mA, T_{vj}=25^{\circ}C$	1200	V
I_C	Continuous Collector Current	$T_C=100^{\circ}C$	300	A
I_{CRM}	Peak Collector Current	$I_{CRM}=2I_C$	600	A
V_{GES}	Gate-Emitter Voltage	$T_{vj}=25^{\circ}C$	± 30	V
P_{tot}	Total Power Dissipation	$T_C=25^{\circ}C, T_{vjmax}=175^{\circ}C$	1750	W

Maximum Rated Values (IGBT Inverter)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C=300\text{ A}, V_{GE}=15\text{ V}, T_{vj}=25\text{ }^{\circ}\text{C}$		1.7		V
		$I_C=300\text{ A}, V_{GE}=15\text{ V}, T_{vj}=150\text{ }^{\circ}\text{C}$		2.3		V
$V_{GE(th)}$	Gate Threshold Voltage	$I_C=6.0\text{ mA}, V_{CE}=V_{GE}, T_{vj}=25\text{ }^{\circ}\text{C}$	5.5	6.1	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
R_{Gint}	Internal gate resistor			0.64		Ω
C_{ies}	Input Capacitance	$V_{CE}=25\text{ V}, V_{GE}=0\text{ V},$ $f=1\text{ MHz}$		358		nF
C_{oes}	Output Capacitance			1.4		nF
C_{res}	Reverse Transfer Capacitance			1.8		nF
$t_{d(on)}$	Turn-on Delay Time, Inductive Load	$I_C=300\text{ A}, V_{CE}=600\text{ V}$ $V_{GE}=\pm 15\text{ V}$ $R_G=2\text{ }\Omega$ $T_{vj}=25\text{ }^{\circ}\text{C}$		268		ns
t_r	Rise Time, Inductive Load			118		ns
$t_{d(off)}$	Turn-off Delay Time, Inductive Load			756		ns
t_f	Fall Time, Inductive Load			204		ns
E_{on}	Turn-on Energy Loss per Pulse			15.4		mJ
E_{off}	Energy Loss per Pulse			20.6		mJ
$t_{d(on)}$	Turn-on Delay Time, Inductive Load	$I_C=300\text{ A}, V_{CE}=600\text{ V}$ $V_{GE}=\pm 15\text{ V}$ $R_G=2\text{ }\Omega$ $T_{vj}=150\text{ }^{\circ}\text{C}$		314		ns
t_r	Rise Time, Inductive Load			128		ns
$t_{d(off)}$	Turn-off Delay Time, Inductive Load			862		ns
t_f	Fall Time, Inductive Load			417		ns
E_{on}	Turn-on Energy Loss per Pulse			30		mJ
E_{off}	Energy Loss per Pulse			29.2		mJ
R_{thJC}	Thermal resistance, junction to case	per IGBT			0.085	K/W
$T_{vj\text{ op}}$	Temperature under switching conditions		-40		150	$^{\circ}\text{C}$
I_{SC}	SC data	$V_{GE} \leq 15\text{ V}, V_{CC} = 900\text{ V}$ $V_{CEmax} = V_{CES} - L_{sCE} \cdot di/dt$ $t_p \leq 10\text{ }\mu\text{s}, T_{vj} = 150\text{ }^{\circ}\text{C}$		1350		A

Maximum Rated Values (Diode Inverter)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{RRM}	Repetitive Peak Reverse Voltage	$T_{vj}=25\text{ }^{\circ}\text{C}$		1200		V
I_F	Continuous DC Forward Current	$T_C=100\text{ }^{\circ}\text{C}$		300		A
I_{FRM}	Repetitive Peak Forward Current	$t_p=1\text{ ms}$		600		A

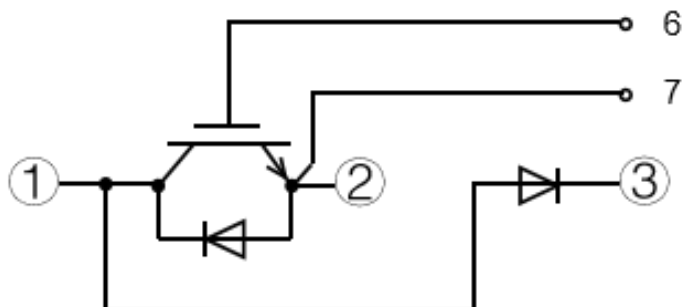
Characteristic Values (Diode Inverter)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_F	Forward Voltage	$I_F=300\text{ A}, V_{CE}=0\text{ V}, T_{vj}=25\text{ }^{\circ}\text{C}$		1.9		V
		$I_F=300\text{ A}, V_{CE}=0\text{ V}, T_{vj}=150\text{ }^{\circ}\text{C}$		2.0		V
I_{rr}	Peak reverse recovery current	$I_F=300\text{ A}, V_R=600\text{ V}$ $-di/dt=2300\text{ A/us}$ $T_{vj}=25\text{ }^{\circ}\text{C}$		264		A
Q_r	Recovered Charge			20		uC
E_{rec}	Reverse Recovery Energy			7.8		mJ
I_{rr}	Peak reverse recovery current	$I_F=300\text{ A}, V_R=600\text{ V}$ $-di/dt=2300\text{ A/us}$ $T_{vj}=150\text{ }^{\circ}\text{C}$		304		A
Q_r	Recovered Charge			44		uC
E_{rec}	Reverse Recovery Energy			17.6		mJ
R_{thJC}	Thermal resistance, junction to case	per Diode			0.14	K/W
$T_{vj\text{ op}}$	Operating Junction Temperature		-40		150	$^{\circ}\text{C}$

Module Characteristics

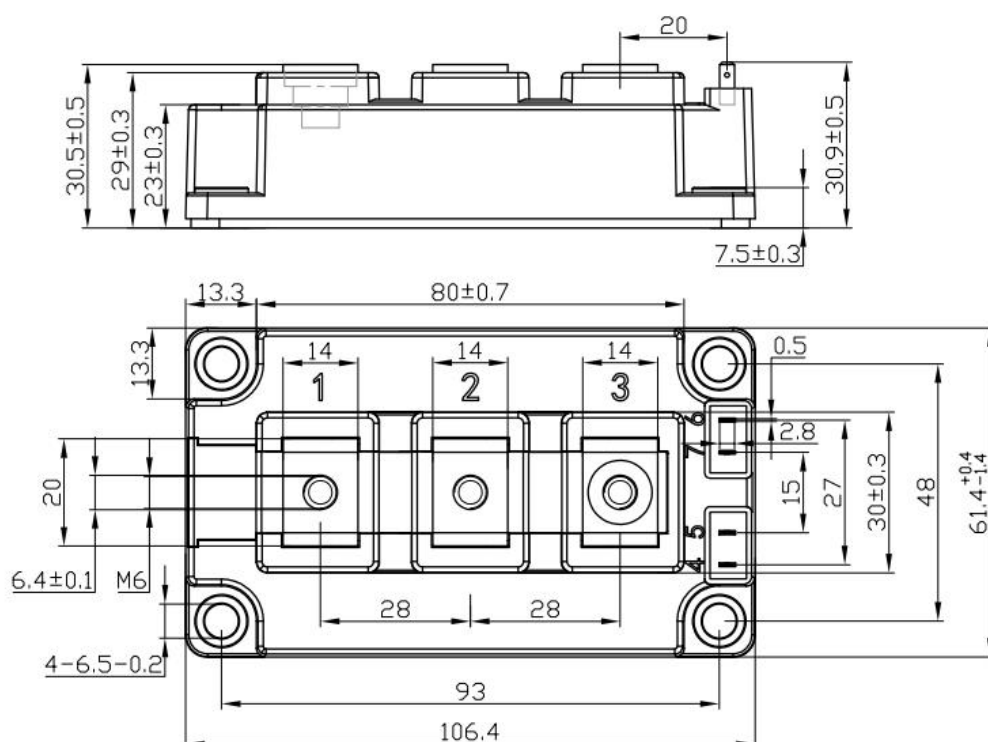
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{isol}	Isolation voltage	$t=1\text{ min}, f=50\text{ Hz}$	2500			V
T_{stg}	Storage Temperature		-40		125	$^{\circ}\text{C}$
M_t	Module Electrodes Torque	Recommended(M6)	2.5		5.0	N·m
M_s	Module-to-Sink Torque	Recommended(M6)	3.0		6.0	N·m
G	Weight of Module			317		g

Circuit Diagram



Package Dimensions

(Dimensions in Millimeters)



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