Feb.2024

LEGM150BH120L2S

IGBT Power Module

Features:

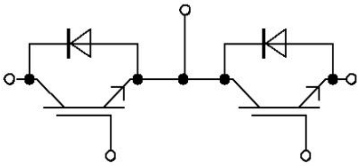
- V_{CE}=1200V I_C=150A
- Low $V_{CE(sat)}$
- V_{CEsat} with positive temperature coefficient
- Maximum junction temperature 150℃
- Isolation Type Package

Applications:

- Welder
- Inductive heating

Package Type & Internal Circuit

L2



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℃	1200	V
I_C	Continuous Collector Current	T_C=100℃	150	A
I_{CRM}	Peak Collector Current	I_{CRM}=2I_C	300	A
V_{GES}	Gate-Emitter Voltage	T_{vj}=25℃	±20	V
P_{tot}	Total Power Dissipation	T_C=25℃,T_{vjmax}=150℃	830	W

Characteristics Values (IGBT Inverter)

Symbolc	Parameter	Conditions	Min.	Typ.	Max.	Unit
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C=150 A, V_{GE}=15 V, T_{vj}=25 ℃	2.2	2.5	2.85	V
		I_C=150 A, V_{GE}=15 V, T_{vj}=150 ℃		3.2		V
$V_{GE(th)}$	Gate Threshold Voltage	I_C=1.5 mA,V_{CE}=V_{GE},T_{vj}= 25 ℃	5.1	5.6	6.3	V
I_{CES}	Collector-Emitter Cut-off Current	V_{CE}=1200 V, V_{GE}=0 V, T_{vj}=25 ℃			20	uA
I_{GES}	Gate-Emitter Leakage Current	V_{CE}=0 V, V_{GE}=15 V, T_{vj}=25 ℃			100	nA
R_{gint}	Internal gate resistor	T_{vj}=25 ℃		1		Ω
$t_{d(on)}$	Turn-on Delay Time, Inductive Load	I_C=150 A,V_{CE}=600 V V_{GE}=±15 V R_{Gon}=6.8 Ω T_{vj}=25 ℃		107		ns
t_r	Rise Time, Inductive Load			83		ns
$t_{d(off)}$	Turn-off Delay Time, Inductive Load			228		ns
t_f	Fall Time, Inductive Load			61		ns
E_{on}	Turn-on Energy Loss per Pulse			11.1		mJ
E_{off}	Energy Loss per Pulse			9.2		mJ
$t_{d(on)}$	Turn-on Delay Time, Inductive Load	I_C=150 A,V_{CE}=600 V V_{GE}=±15 V R_{Gon}=6.8 Ω T_{vj}=150 ℃		111		ns
t_r	Rise Time, Inductive Load			89		ns
$t_{d(off)}$	Turn-off Delay Time, Inductive Load			251		ns
t_f	Fall Time, Inductive Load			101		ns
E_{on}	Turn-on Energy Loss per Pulse			16		mJ
E_{off}	Energy Loss per Pulse			11.3		mJ
R_{thJC}	Thermal resistance, junction to case	per IGBT			0.091	K/W
$T_{vj\ op}$	Temperature under switching conditions		-40		125	℃
I_{SC}	SC data	V_{GE} ≤15 V, V_{CC} = 900 V V_{CEmax} = V_{CES} -L_{sCE} ·di/dt t_P ≤ 10 μs, T_{vj} = 150 ℃		900		A

Maximum Rated Values (Diode Inverter)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{RRM}	Repetitive Peak Reverse Voltage	T_{vj}= 25 ℃		1200		V
I_F	Continuous DC Forward Current	T_C=100 ℃		75		A
I_{FRM}	Repetitive Peak Forward Current	t_P=1 ms		150		A

Characteristic Values (Diode Inverter)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_F	Forward Voltage	I_F=75 A, V_{CE}=0 V, T_{vj}=25 ℃		1.81	2.3	V
		I_F=75 A, V_{CE}=0 V, T_{vj}=150 ℃		1.95	2.5	V
t_{rr}	Reverse Recovery time	I_F= 75 A,V_R= 600 V -di/dt = 1200A/us T_{vj} = 25 ℃		200		ns
Q_r	Recovered Charge			4		uC
E_{rec}	Reverse Recovery Energy			1.3		mJ
t_{rr}	Reverse Recovery time	I_F= 75A,V_R= 600 V -di/dt = 1200A/us T_{vj} = 150 ℃		350		ns
Q_r	Recovered Charge			8		uC
E_{rec}	Reverse Recovery Energy			2.7		mJ
R_{thJC}	Thermal resistance, junction to case	per Diode			0.65	K/W
$T_{vj\ op}$	Temperature under switching conditions		-40		150	℃

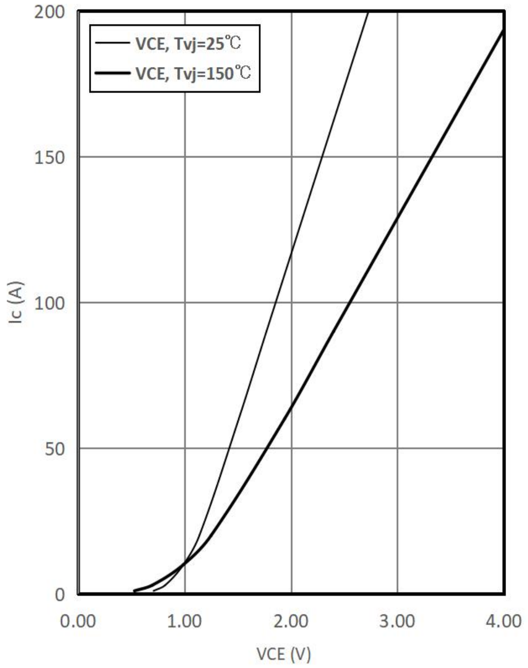
Module Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{isol}	Isolation voltage	t=1min,f=50Hz	2500			V
T_{stg}	Storage Temperature		-40		125	℃
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

Output characteristic of IGBT,Inverter (typical)

$I_c = f(V_{CE})$

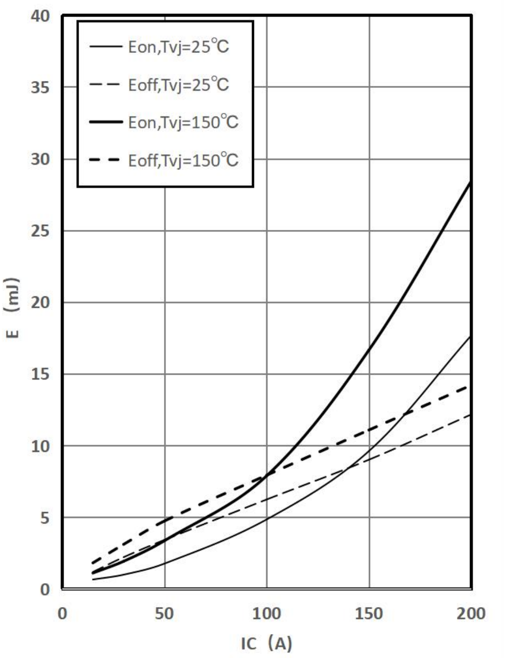
$V_{GE} = 15V$



Switching losses of IGBT,Inverter (typical)

$E_{on} = f(I_C)$, $E_{off} = f(I_C)$

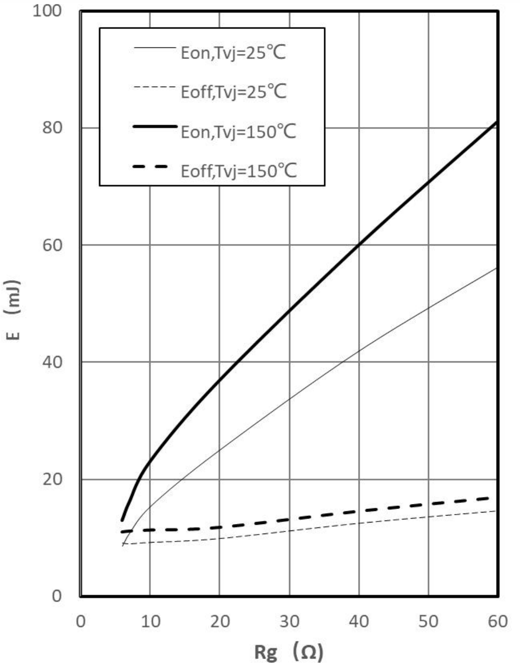
$V_{GE} = \pm15V$, $R_G = 6.8\Omega$, $V_{CE} = 600V$



Switching losses of IGBT,Inverter (typical)

$E_{on} = f(R_G)$, $E_{off} = f(R_G)$

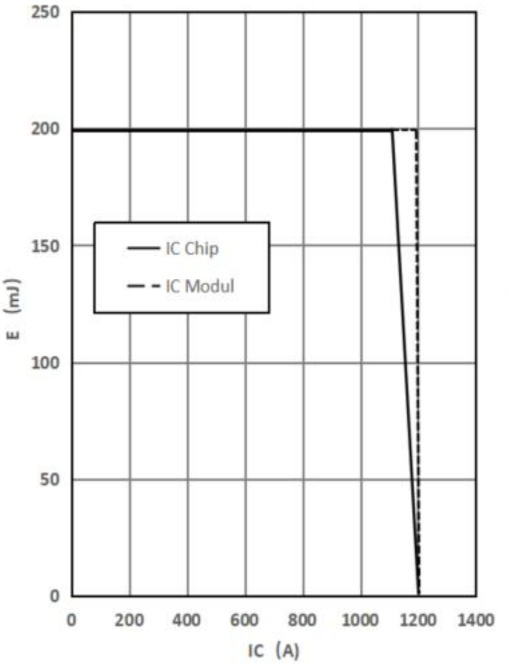
$V_{GE} = \pm15V$, $I_C = 150A$, $V_{CE} = 600V$



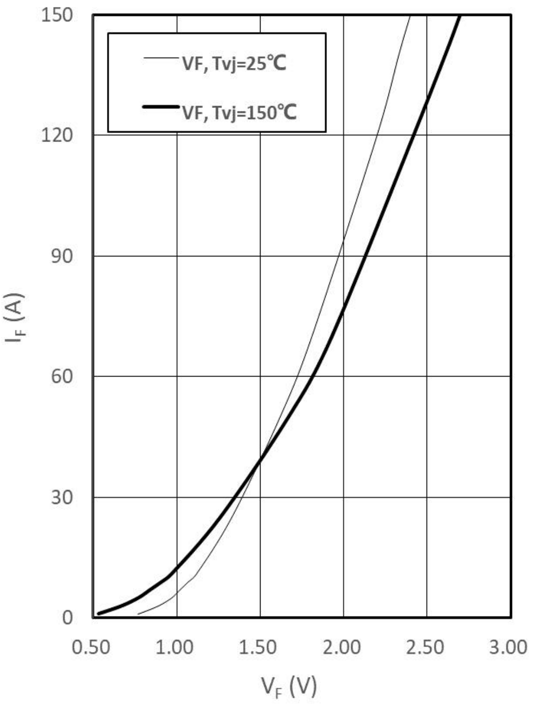
RBSOA IGBT,Inverter (typical)

$I_C = f(V_{CE})$

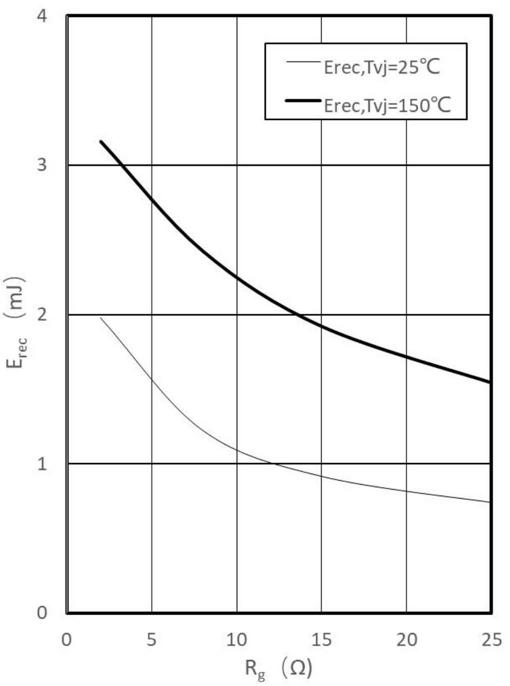
$V_{GE} = \pm15V$, $R_G = 6.8\Omega$, $T_{vj} = 150$ ℃



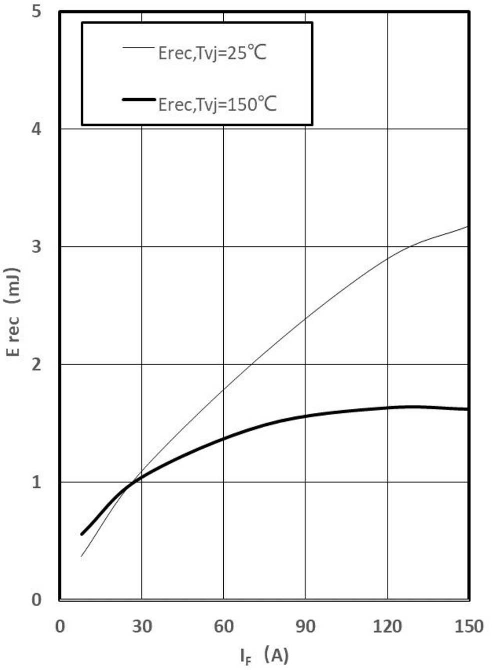
Forward characteristic of Diode, Inverter (typical)
$I_F = f(V_F)$



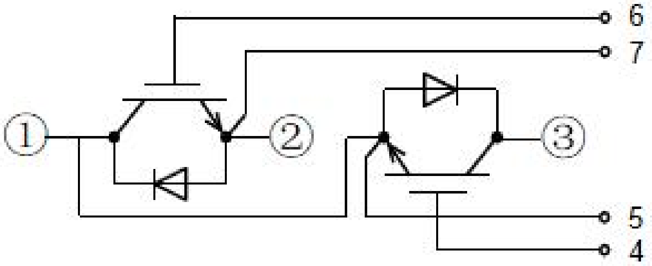
Switching losses Diode, Inverter (typical)
$E_{rec} = f(R_G)$
$I_F = 75$ A, $V_{CE} = 600$ V



Switching losses Diode, Inverter (typical)
$E_{rec} = f(I_F)$
$R_{Gon} = 7Ω$, $V_{CE} = 600$ V

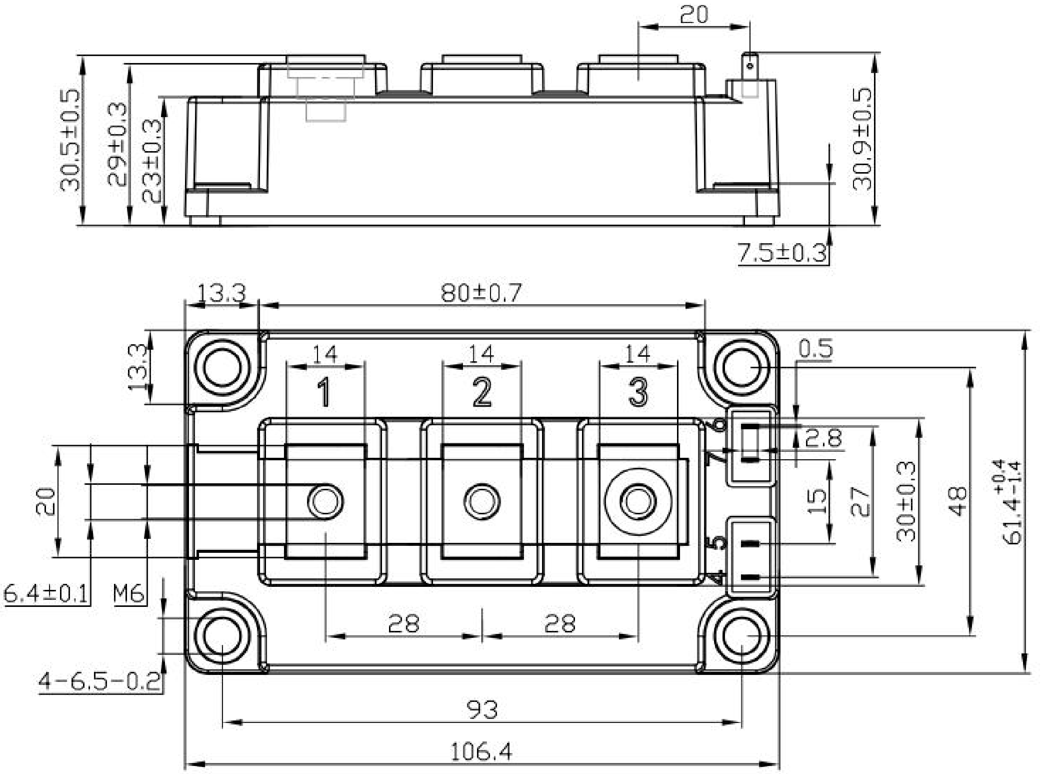


Circuit Diagram



Package Dimensions

(Dimensions in Millimeters)



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