Sep.2020

LEGM100BH120L1S

IGBT Power Module

Features:

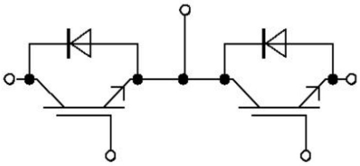
- V_{CE}=1200V I_C=100A
- Low V_{CEsat}
- Maximum junction temperature 175℃
- Isolation Type Package

Applications:

- Welder
- Inductive heating

Package Type & Internal Circuit

L1



Internal Circuit

Maximum Rated Values (IGBT Inverter)

Symbol	Parameter	Conditions	Ratings	Unit
V_{CES}	Collector-emitter voltage	V_{EC}=0 V,I_C=1mA,T_{vj}=25 ℃	1200	V
I_C	Continuous Collector Current	T_C=100 ℃	100	A
I_{CRM}	Peak Collector Current	I_{CRM}=2I_C	200	A
V_{GES}	Gate-Emitter Voltage	T_{vj}=25 ℃	±20	V
P_{tot}	Total Power Dissipation	T_C=25℃,T_{vjmax}=175 ℃	530	W

Maximum Rated Values（IGBT,Inverter)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C=100 A, V_{GE}=15 V, T_{vj}=25 ℃		1.95		V
		I_C=100 A, V_{GE}=15 V, T_{vj}=150 ℃		2.45		V
$V_{GE(th)}$	Gate Threshold Voltage	I_C=5.0 mA,V_{CE}=V_{GE},T_{vj}= 25 ℃		5.8		V
I_{CES}	Collector-Emitter Cut-off Current	V_{CE}=1200 V, V_{GE}=0 V, T_{vj}=25 ℃			4.0	mA
I_{GES}	Gate-Emitter Leakage Current	V_{CE}=0 V, V_{GE}=15 V, T_{vj}=25 ℃			450	nA
$t_{d(on)}$	Turn-on Delay Time, Inductive Load	I_C=100 A,V_{CE}=600 V V_{GE}=±15 V R_{Gon}=2 Ω T_{vj}=25 ℃		120		ns
t_r	Rise Time, Inductive Load			50		ns
$t_{d(off)}$	Turn-off Delay Time, Inductive Load			320		ns
t_f	Fall Time, Inductive Load			100		ns
E_{on}	Turn-on Energy Loss per Pulse			3.6		mJ
E_{off}	Energy Loss per Pulse			6.1		mJ
$t_{d(on)}$	Turn-on Delay Time, Inductive Load	I_C=100 A,V_{CE}=600 V V_{GE}=±15 V R_{Gon}=2 Ω T_{vj}=150 ℃		140		ns
t_r	Rise Time, Inductive Load			55		ns
$t_{d(off)}$	Turn-off Delay Time, Inductive Load			400		ns
t_f	Fall Time, Inductive Load			115		ns
E_{on}	Turn-on Energy Loss per Pulse			5.1		mJ
E_{off}	Energy Loss per Pulse			9.4		mJ
R_{thJC}	Thermal resistance, junction to case	pro IGBT / per IGBT			0.23	K/W
$T_{vj\ op}$	Temperature under switching conditions		-40		125	℃
I_{SC}	SC data	V_{GE} ≤15 V, V_{CC} = 600 V V_{CEmax} = V_{CES} -L_{sCE} ·di/dt t_P ≤ 10 μs, T_{vj} = 150 ℃		450		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 ℃		100		A
I_{FRM}	Repetitive Peak Forward Current	t_P=1 ms		200		A
I^2t	I^2t Value	V_R=0 V, t_P=10 ms, T_{vj}=150 ℃		2000		A^2s

Characteristic Values (Diode Inverter)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_F	Forward Voltage	I_F=100 A, V_{CE}=0 V, T_{vj}=25 ℃		1.60		V
		I_F=100 A, V_{CE}=0 V, T_{vj}=150 ℃		1.70		V
t_{rr}	Reverse Recovery time	I_F=100 A,V_R=600 V -di/dt=5500 A/us T_{vj}=25 ℃		100		ns
Q_r	Recovered Charge			7.4		uC
E_{rec}	Reverse Recovery Energy			2.8		mJ
t_{rr}	Reverse Recovery time	I_F=100 A,V_R=600 V -di/dt=5500 A/us T_{vj}=150 ℃		170		ns
Q_r	Recovered Charge			15.9		uC
E_{rec}	Reverse Recovery Energy			6.6		mJ
R_{thJC}	Thermal resistance, junction to case	pro Diode / per Diode			0.50	K/W
$T_{vj\ op}$	Operating Junction Temperature		-40		150	℃

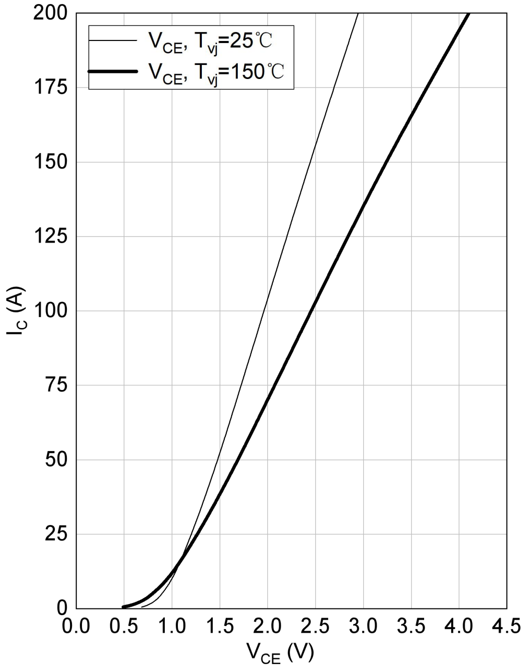
Module Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{isol}	Isolation voltage	t=1 min,f=50 Hz	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)

$I_c = f\ (V_{CE})$

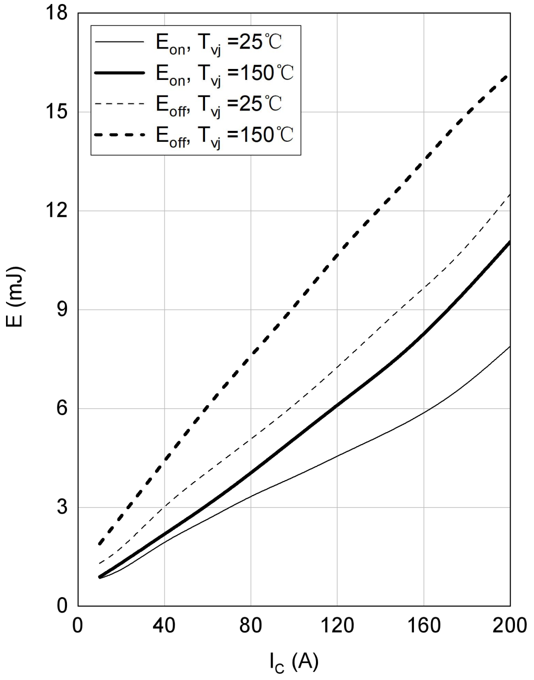
$V_{GE} = 15V$



Switching losses of IGBT,Inverter (typical)

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

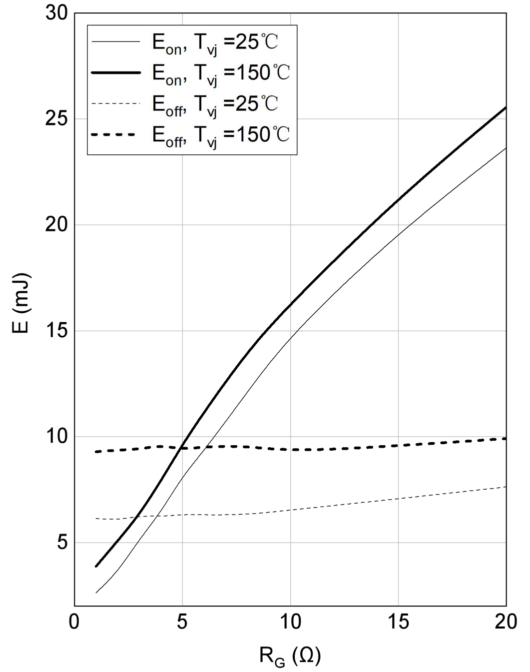
$V_{GE} = \pm 15V$, $R_G = 2\Omega$, $V_{CE} = 600V$



Switching losses of IGBT,Inverter (typical)

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

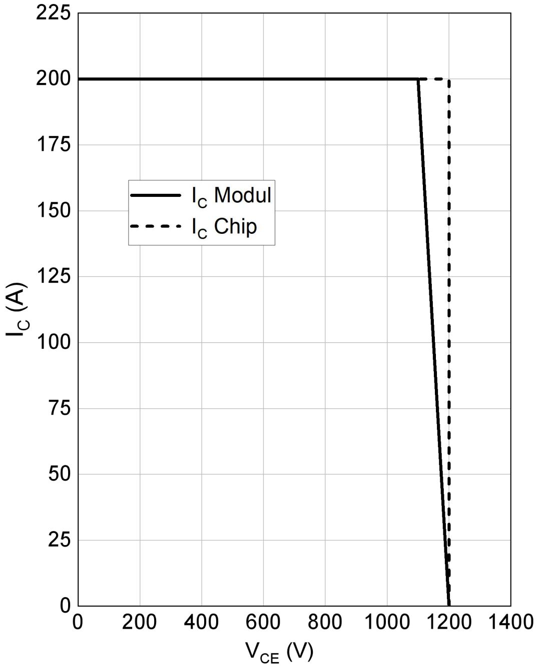
$V_{GE} = \pm 15V$, $I_C = 100A$, $V_{CE} = 600V$



RBSOA IGBT,Inverter (typical)

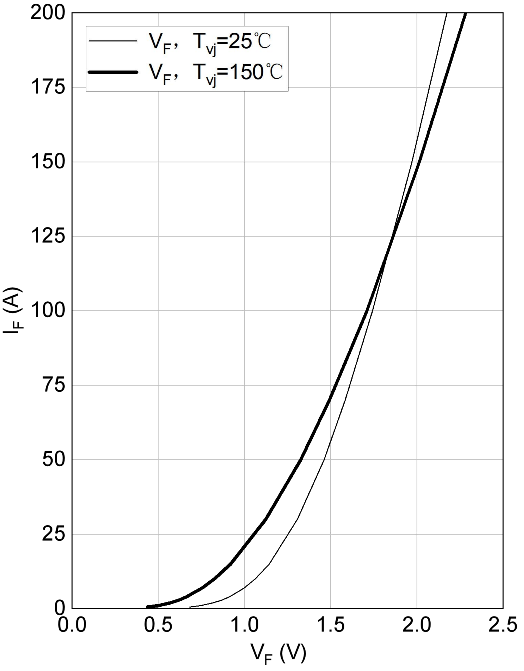
$I_C = f\ (V_{CE})$

$V_{GE} = \pm 15V$, $R_{Goff} = 2\Omega$, $T_{vj} = 150$ ℃



forward characteristic of Diode,Inverter (typical)

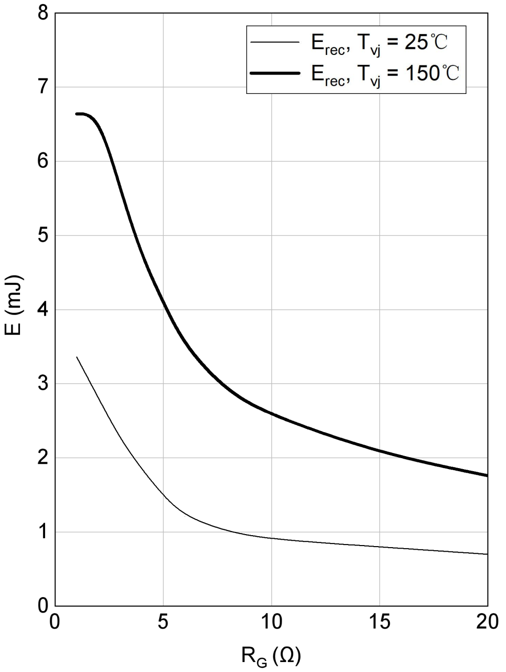
$I_F = f(V_F)$



switching losses of Diode, Inverter (typical)

$E_{rec} = f(R_G)$,

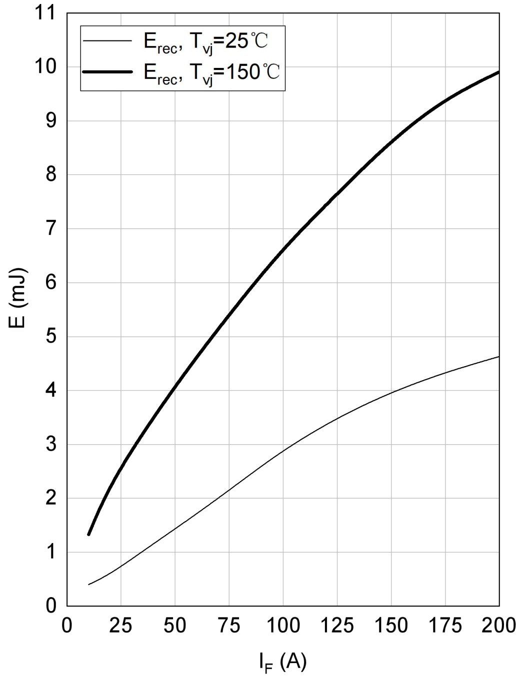
I_F = 100A，V_{CE} = 600V



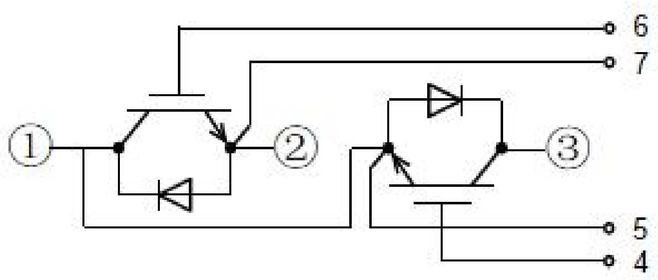
switching losses of Diode, Inverter (typical)

$E_{rec} = f(I_F)$,

R_{Gon} = 2Ω，V_{CE} = 600V

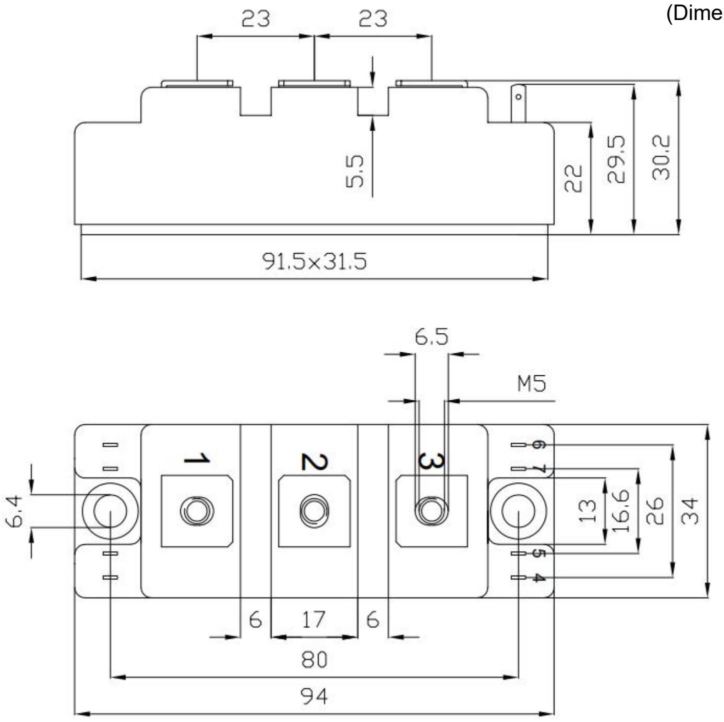


Circuit Diagram



Package Dimensions

(Dimensions in Millimeters)



DISCLAIMER