LEGM600CU120L7H

IGBT Power Module

Features:

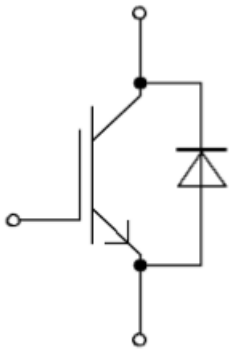
- V_{CE}=1200V I_C=600A
- Low $V_{CE(sat)}$
- V_{CEsat} with positive temperature coefficient
- Maximum junction temperature 150℃
- Isolation Type Package

Applications:

- The inverter
- Motor control and drives

Package Type & Internal Circuit

L7



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 ℃	600	A
I_{CRM}	Peak Collector Current	I_{CRM}= 2 I_C	1200	A
V_{GES}	Gate-Emitter Voltage	T_{vj}= 25 ℃	±30	V
P_{tot}	Total Power Dissipation	T_C=25℃,T_{vjmax}=150 ℃	2500	W

Maximum Rated Values (IGBT Inverter)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C=600 A, V_{GE}=15 V, T_{vj}=25 ℃		1.63		V
		I_C=600 A, V_{GE}=15 V, T_{vj}=125 ℃		2.11		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 ℃			5.1	mA
I_{GES}	Gate-Emitter Leakage Current	V_{CE}=0 V, V_{GE}=15 V, T_{vj}=25 ℃			400	nA
$t_{d(on)}$	Turn-on Delay Time, Inductive Load	I_C= 600 A,V_{CE}= 600 V V_{GE}= ±15 V R_G= 1Ω T_{vj}= 25 ℃		190		ns
t_r	Rise Time, Inductive Load			100		ns
$t_{d(off)}$	Turn-off Delay Time, Inductive Load			570		ns
t_f	Fall Time, Inductive Load			140		ns
E_{on}	Turn-on Energy Loss per Pulse			21.6		mJ
E_{off}	Energy Loss per Pulse			61.5		mJ
$t_{d(on)}$	Turn-on Delay Time, Inductive Load	I_C= 600 A,V_{CE}= 600 V V_{GE}= ±15 V R_G= 1Ω T_{vj}= 125 ℃		200		ns
t_r	Rise Time, Inductive Load			110		ns
$t_{d(off)}$	Turn-off Delay Time, Inductive Load			620		ns
t_f	Fall Time, Inductive Load			190		ns
E_{on}	Turn-on Energy Loss per Pulse			25.3		mJ
E_{off}	Energy Loss per Pulse			80.1		mJ
R_{thJC}	Thermal resistance, junction to case	per IGBT			0.048	K/W
$T_{vj\ op}$	Temperature under switching conditions		-40		125	°C
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} = 125 ℃		3000		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 ℃		600		A
I_{FRM}	Repetitive Peak Forward Current	t_P= 1 ms		1200		A
I^2t	I^2t Value	V_R= 0 V, t_P= 10 ms, T_{vj}= 125 ℃		48000		A^2s

Characteristic Values (Diode Inverter)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_F	Forward Voltage	I_F= 600 A, V_{CE}=0 V, T_{vj}=25 ℃		1.89		V
		I_F= 600 A, V_{CE}=0 V, T_{vj}=125 ℃		2.34		V
t_{rr}	Reverse Recovery time	I_F= 600 A,V_R= 600 V -di/dt= 5100 A/us T_{vj}=25 ℃		210		ns
Q_r	Recovered Charge			52		uC
E_{rec}	Reverse Recovery Energy			29.1		mJ
t_{rr}	Reverse Recovery time	I_F= 600 A,V_R= 600 V -di/dt= 5100 A/us T_{vj}=125 ℃		290		ns
Q_r	Recovered Charge			82		uC
E_{rec}	Reverse Recovery Energy			45.1		mJ
R_{thJC}	Thermal resistance, junction to case	per Diode			0.078	K/W
$T_{vj\ op}$	Operating Junction Temperature		-40		125	℃

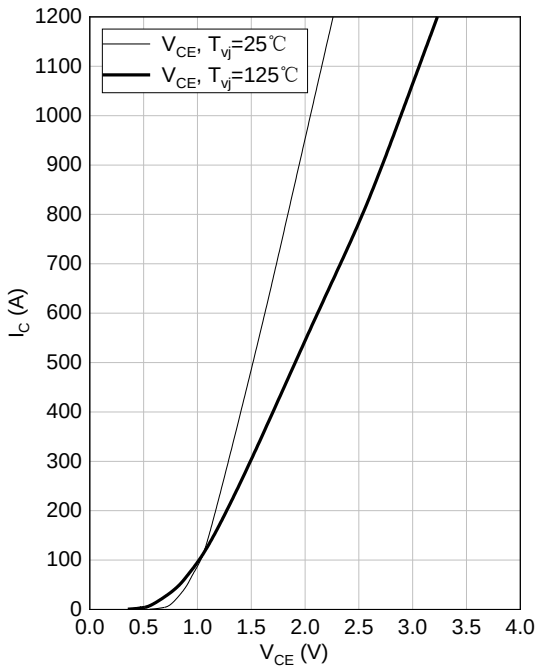
Module Characteristics

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(M6) Recommended(M4)	3.0 1.1		6.0 2.0	N·m
M_s	Module-to-Sink Torque	Recommended(M6)	3.0		6.0	N·m
G	Weight of Module			300		g

output characteristic of IGBT,Inverter (typical)

$I_c = f(V_{CE})$

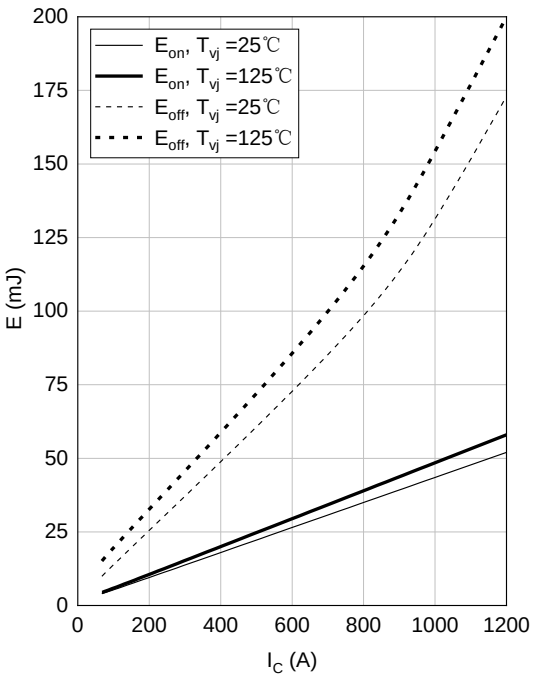
V_{GE} = 15 V



switching losses of IGBT,Inverter (typical)

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

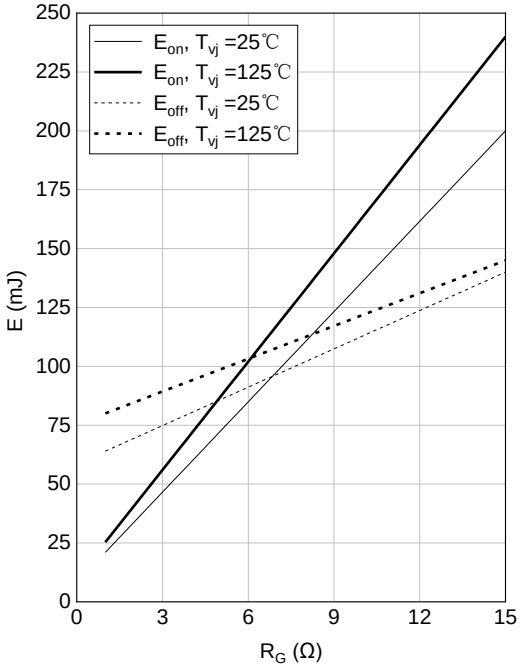
V_{GE} = ±15 V, R_G = 1 Ω, V_{CE} = 600 V



switching losses of IGBT,Inverter (typical)

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

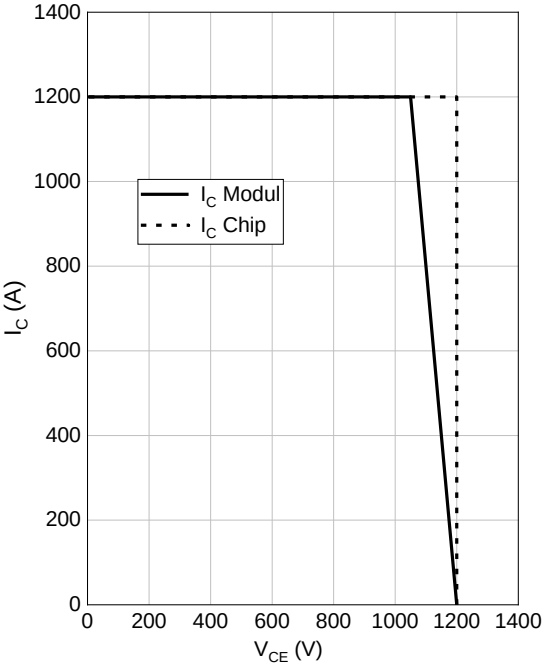
V_{GE} = ±15 V, I_C =600 A, V_{CE} = 600 V



RBSOA IGBT,Inverter (typical)

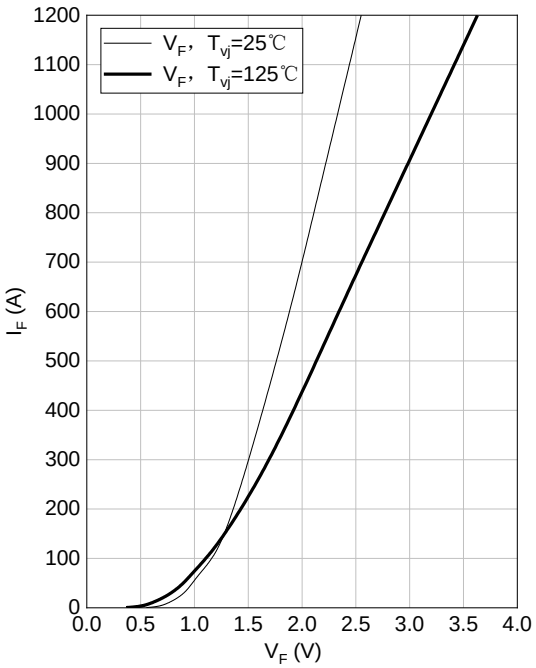
$I_C = f(V_{CE})$

V_{GE} = ±15 V, R_G = 1 Ω, T_{vj} =125 ℃



forward characteristic of Diode,Inverter (typical)

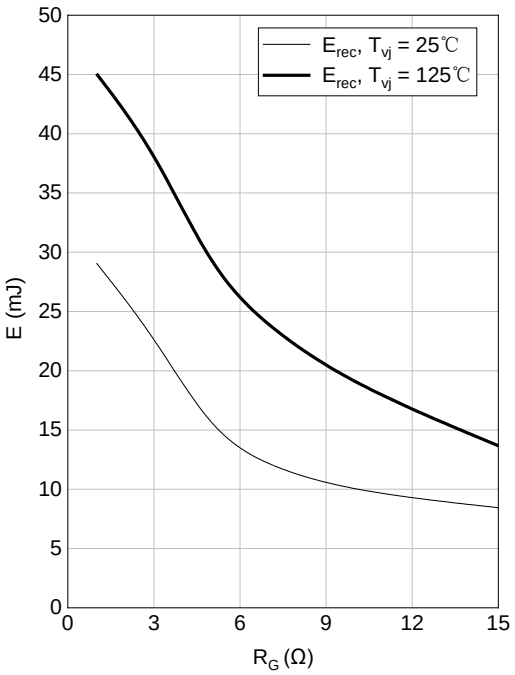
$I_F = f(V_F)$



switching losses of Diode, Inverter (typical)

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

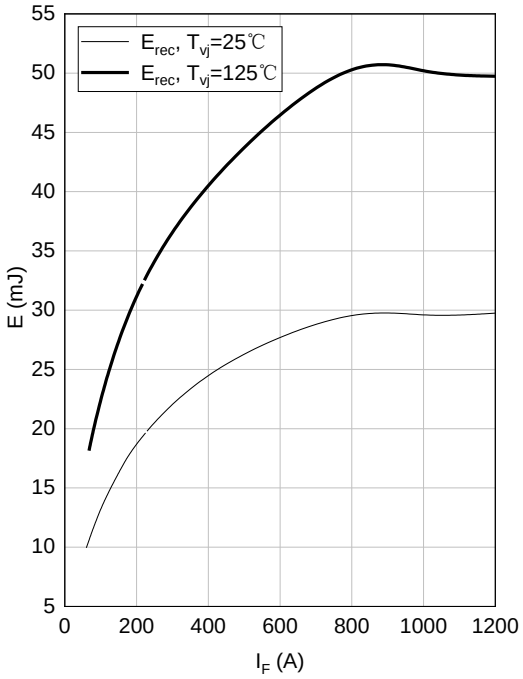
I_F = 600 A，V_{CE} = 600 V



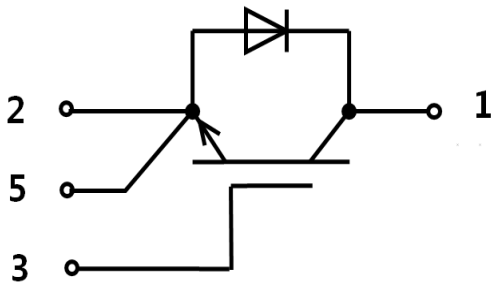
switching losess of Diode, Inverter (typical)

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

R_G = 1 Ω，V_{CE} = 600 V

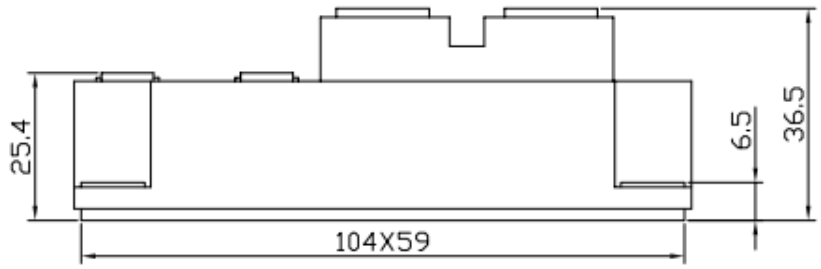


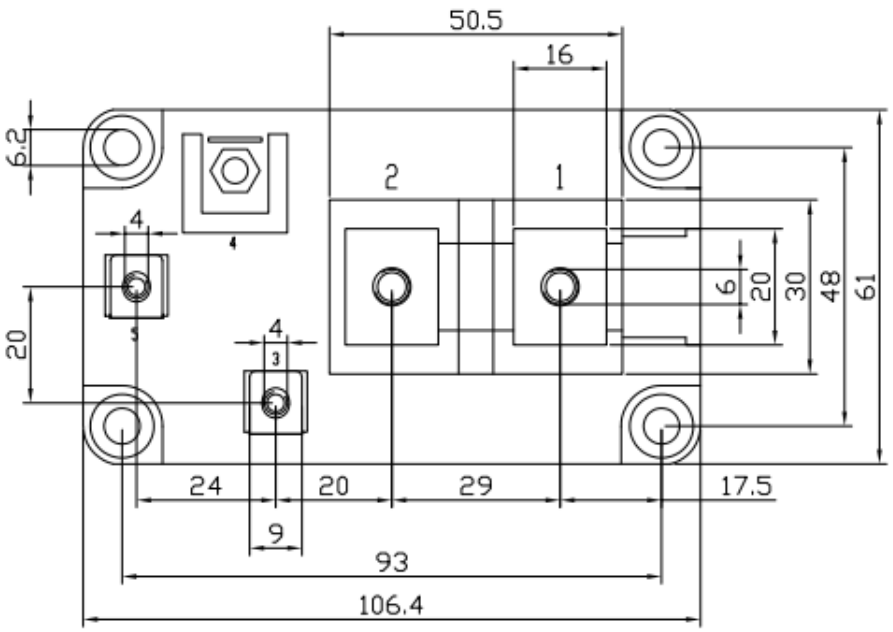
Circuit Diagram



Package Dimensions

(Dimensions in Millimeters)





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