LEGM100TD120L5H

IGBT Power Module

Features:

- V_{CE}=1200V I_C=100A
- Low $V_{CE(sat)}$
- V_{CEsat} with positive temperature coefficient
- Maximum junction temperature 175℃
- Isolation Type Package

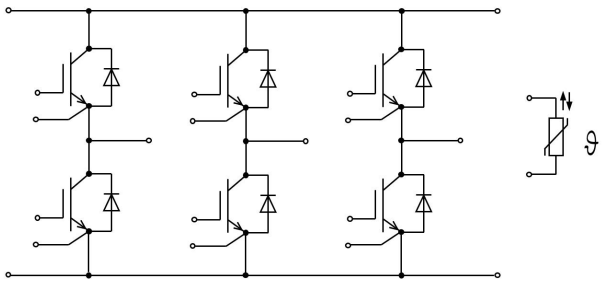
Applications:

- The inverter
- Motor control and drives

Package Type & Internal Circuit



L5



Internal Circuit

Maximum Rated Values (IGBT Inverter)

Symbol	Parameter	Conditions	Ratings	Unit
V_{CES}	Collector-emitter voltage	V_{EC}=0 V,I_C=1 mA,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 ℃	±30	V
P_{tot}	Total Power Dissipation	T_C=25 ℃,T_{vjmax}=150 ℃	430	W

Characteristics Values (IGBT Inverter)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C=100A, V_{GE}=15 V, T_{vj}=25 ℃		1.8	2.3	V
		I_C=100A, V_{GE}=15 V, T_{vj}=150 ℃		2.0	2.7	V
$V_{GE(th)}$	Gate Threshold Voltage	I_C=5.0 mA,V_{CE}=V_{GE},T_{vj}= 25 ℃	5.2	6	6.5	V
I_{CES}	Collector-Emitter Cut-off Current	V_{CE}=1200 V, V_{GE}=0 V, T_{vj}=25 ℃			20	μA
I_{GES}	Gate-Emitter Leakage Current	V_{CE}=0 V, V_{GE}=15 V, T_{vj}=25 ℃			200	nA
r_G	Integrated gate resister		-	4.2	-	Ω
C_{ies}	Input Capacitance	V_{CE} = 25V, V_{GE} = 0V, f = 1MHZ	-	9.65	-	nF
C_{oes}	Output Capacitance		-	492	-	pF
C_{res}	Reverse Transfer Capacitance		-	328	-	pF
$t_{d(on)}$	Turn-on Delay Time, Inductive Load	I_C=100 A,V_{CE}=600 V V_{GE}=±15 V R_G= 2Ω T_{vj}=25 ℃		106		ns
t_r	Rise Time, Inductive Load			40		ns
$t_{d(off)}$	Turn-off Delay Time, Inductive Load			330		ns
t_f	Fall Time, Inductive Load			240		ns
E_{on}	Turn-on Energy Loss per Pulse			2.6		mJ
E_{off}	Energy Loss per Pulse			8.3		mJ
$t_{d(on)}$	Turn-on Delay Time, Inductive Load	I_C=100 A,V_{CE}=600 V V_{GE}=±15 V R_G=2Ω T_{vj}=150 ℃		120		ns
t_r	Rise Time, Inductive Load			43		ns
$t_{d(off)}$	Turn-off Delay Time, Inductive Load			421		ns
t_f	Fall Time, Inductive Load			327		ns
E_{on}	Turn-on Energy Loss per Pulse			5.1		mJ
E_{off}	Energy Loss per Pulse			14.9		mJ
R_{thJC}	Thermal resistance, junction to case	per IGBT			0.29	K/W
$T_{vj\ op}$	Temperature under switching conditions		-40		150	℃
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 ℃		400		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 ℃		1200		A^2s

Characteristic Values (Diode Inverter)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_F	Forward Voltage	I_F=100A, V_{CE}=0 V, T_{vj}=25 ℃		2.0	2.3	V
		I_F=100A, V_{CE}=0 V, T_{vj}=150 ℃		2.2	2.5	V
t_{rr}	Reverse Recovery time	I_F= 100 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= 100 A,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	℃

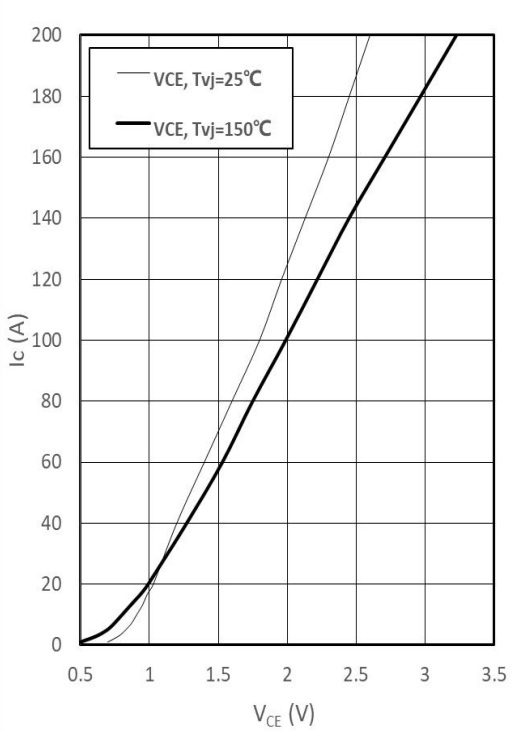
NTC-Thermistor (Characteristic Values)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
R_{25}	Rated resistance	T_c=25 ℃		5		KΩ
ΔR/R	Deviation of R100	T_c=100 ℃	-5		5	%
P_{25}	Power dissipation	T_c=25 ℃		20		mW
$B_{25/50}$	B-value	$R_2=R_{25}\exp[B_{25/50}(1/T_2-1/(298,15K))]$		3380		K
$B_{25/100}$	B-value	$R_2=R_{25}\exp[B_{25/100}(1/T_2-1/(298,15K))]$		3450		K

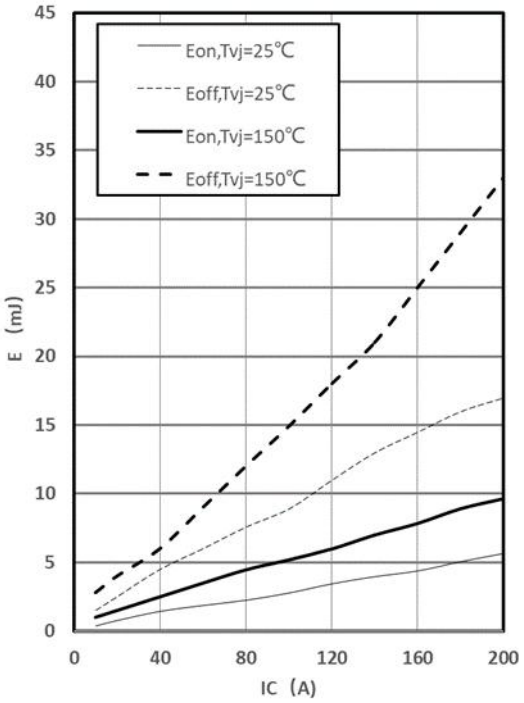
Module Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{isol}	Isolation voltage	t=1min,f=50Hz	2500			V
T_{stg}	Storage Temperature		-40		150	℃
F	Mountig Force per Clamp		40		80	N
G	Weight of Module			40		g

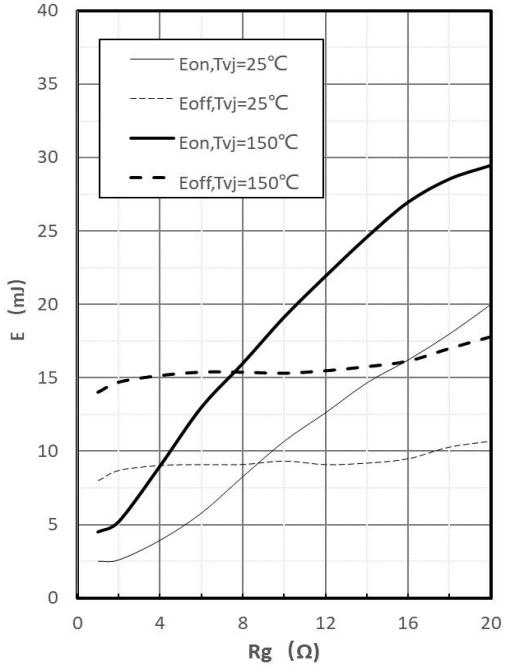
Output characteristic of IGBT,Inverter(typical)
$I_C = f(V_{CE})$
V_{GE} = 15V



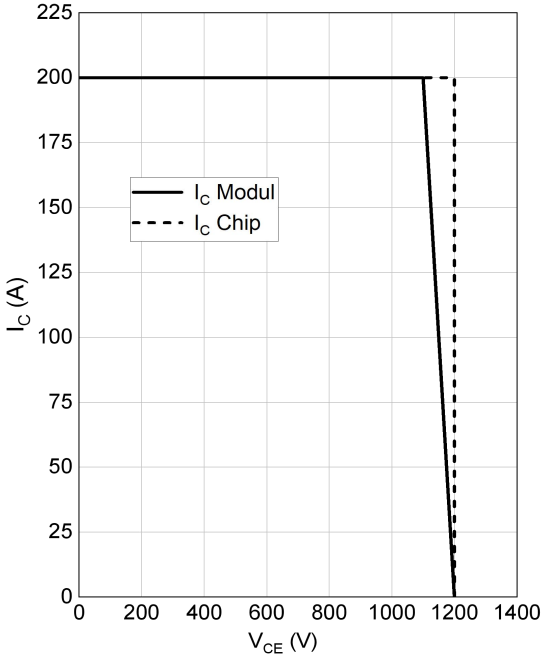
Switching losses IGBT,Inverter(typical)
$E_{on} = f(I_C)$, $E_{off} = f(I_C)$
V_{GE}= ±15V, R_G = 2Ω, V_{CE} = 600V



Switching losses IGBT,Inverter(typical)
$E_{on} = f(R_G)$, $E_{off} = f(R_G)$
V_{GE} = ±15V, I_C = 100A , V_{CE} = 600V

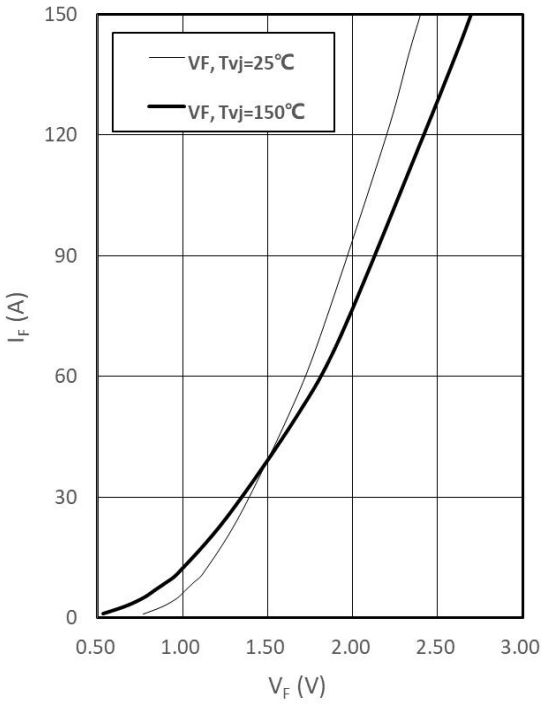


RBSOA IGBT,Inverter (typical)
$I_C = f(V_{CE})$
V_{GE} = ±15V, R_G = 2Ω, T_{vj} =150 ℃



Forward characteristic of Diode, Inverter (typical)

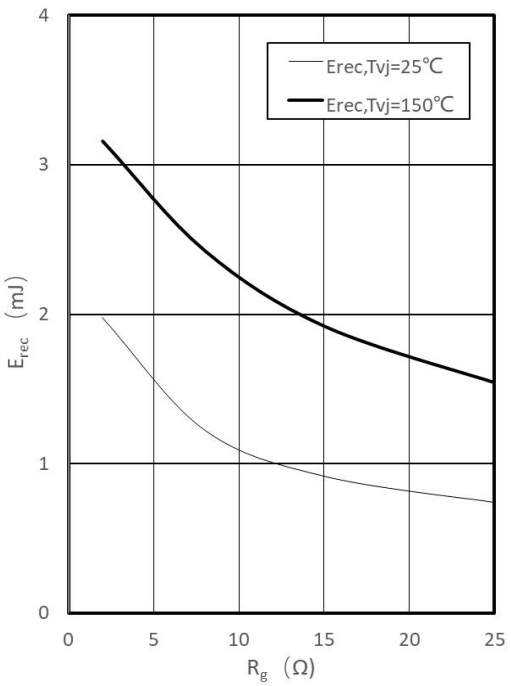
$I_F = f(V_F)$



Switching losses Diode, Inverter (typical)

$E_{rec} = f(R_G)$

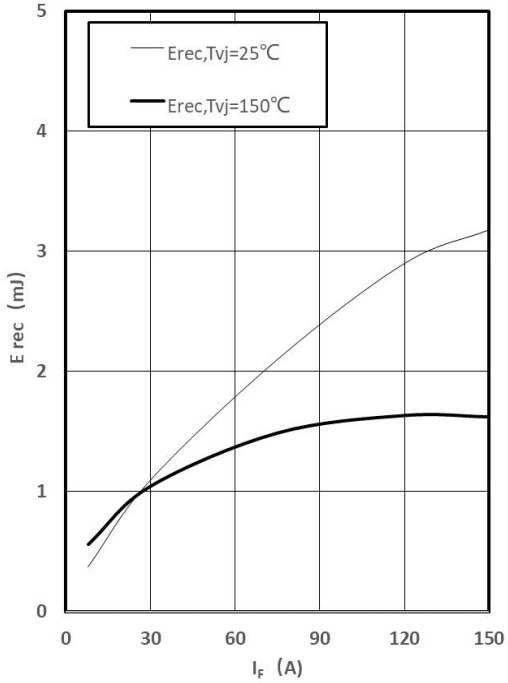
$I_F = 100$ A, $V_{CE} = 600$ V



Switching losses Diode, Inverter (typical)

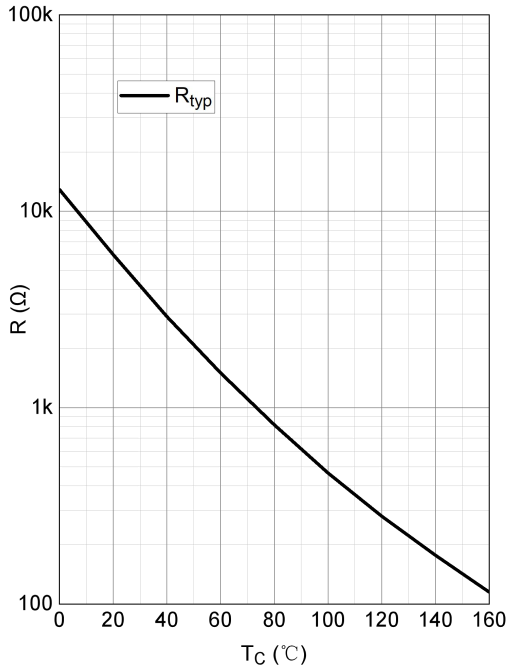
$E_{rec} = f(I_F)$

$R_{Gon} = 2\Omega$, $V_{CE} = 600$ V

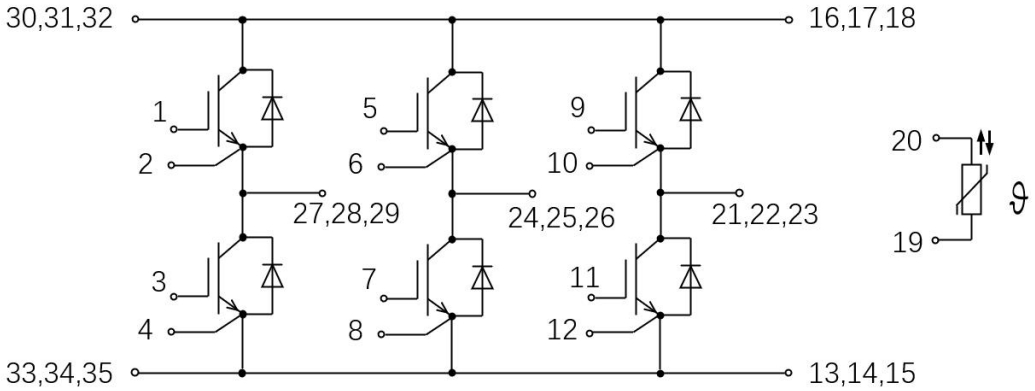


NTC-Thermistor-temperature characteristic (typical)

$R = f(T)$

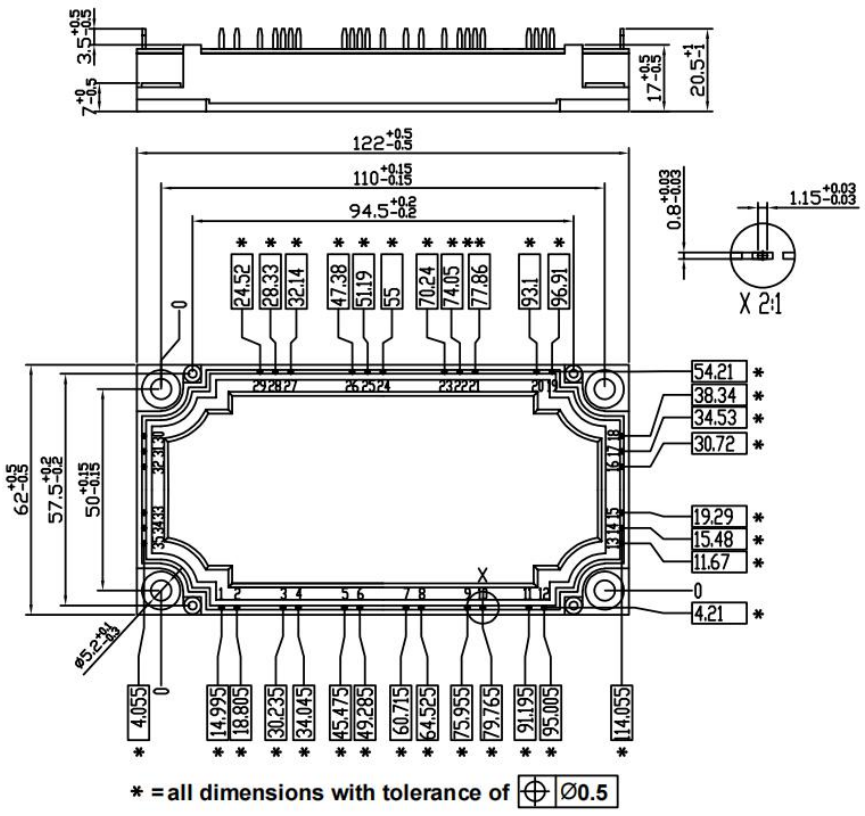


Circuit Diagram



Package Dimensions

(Dimensions in Millimeters)



DISCLAIMER

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