



JLFF240B120RN3E7DN

LN3 module with GEN7 IGBT and emitter controlled diode

Features

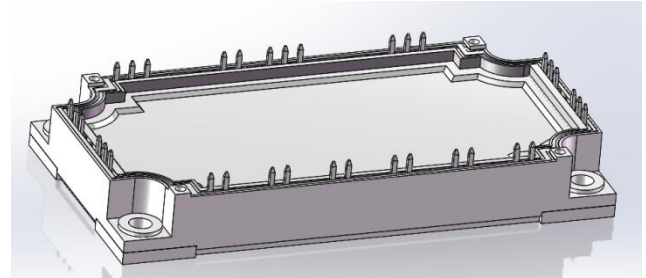


• Electrical features

- $V_{CES} = 1200\text{ V}$
- $I_{C\text{ nom}} = 240\text{ A} / I_{CRM} = 400\text{ A}$
- V_{CESat} with positive temperature coefficient
- $10\mu\text{s}$ short circuit capability

• Mechanical features

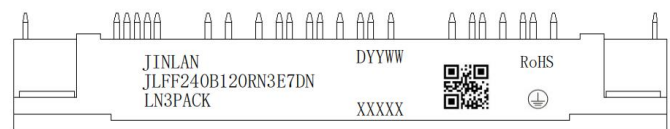
- Standard housing
- 2.5 kV AC 1 min insulation
- High creepage and clearance distances
- Isolated base plate



LN3

Typical Applications

- Inverters
- UPS (Uninterruptible Power Supplies)
- Motor Control



JINLAN

= Company Name

JLFF240B120RN3E7DN

= Specific Device Code

YYWW

= Year and Work Week Code

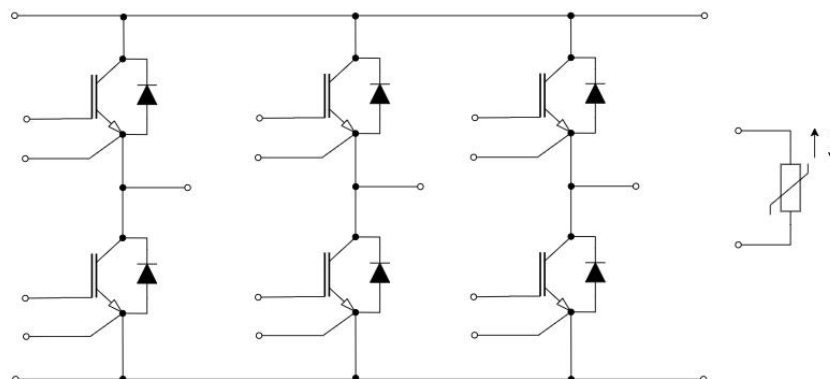
XXXXX

= Serial Number

QR code

= Custom Assembly Information

Description





Package Insulation coordination

Symbol	Parameter	Note or test condition	Values	Unit
V_{ISOL}	Isolation test voltage	RMS, $f=50\text{Hz}$, $t=60\text{s}$	2.5	kV
	Internal isolation	basic insulation(class 1, IEC 61140)	Al_2O_3	
d_{creep}	Creepage distance	terminal to heatsink	10.0	mm
d_{clear}	Clearance	terminal to heatsink	7.5	mm
CTI	Comparative tracking index (electrical)		>200	
RTI	RTI Elec.	housing	140	°C

Package Characteristic values

Symbol	Parameter	Note or test condition	Values			Unit
			Min.	Typ.	Max.	
LCE	Stray Inductance		--	21	--	nH
R_{CC+EE}	Module Lead Resistance, Terminal to Chip	$T_C=25^\circ\text{C}$, per switch	--	1.80	--	mΩ
T_{STG}	Storage Temperature Range		-40		125	°C
M	Mounting Torque, Screw M5	M5, Screw	3		6	N.m
G	Weight		--	300	--	g



IGBT

Absolute Maximum Ratings (T_c = 25°C unless otherwise noted)

Symbol	Description	Note or test condition	Value	Unit
V _{CES}	Collector-Emitter Voltage	T _{vj} = 25 °C	1200	V
I _{CDC}	Continuous Collector Current @ T _c = 80°C (T _{JMAX} = 175°C)		240	A
I _{CRM}	Repetitive peak collector current	Peak Collector Current@ tp=1ms	400	A
P _{tot}	Total power dissipation	T _c = 25°C, T _{vj max} = 175°C	961	W
V _{GES}	Gate-emitter peak voltage		±30	V

Characteristics (T_c = 25°C unless otherwise noted)

Symbol	Parameter	Test Condition		Rating			Unit
				Min	Typ	Max	
V _{CE(sat)}	Collector–Emitter Saturation Voltage	I _C =200A V _{GE} =15V	T _J =25°C T _J =150°C		1.40 1.60	2.20	V
V _{GE(TH)}	Gate–Emitter Threshold Voltage	I _C = 5mA, V _{CE} = V _{GE}		5.0	6.0	7.0	V
I _{CES}	Collector–Emitter Cutoff Current	V _{GE} =0V, V _{CE} =1200V, T _{vj} = 25°C				500	uA
I _{GES}	Gate-Emitter Leakage Current	V _{GE} = ±20V , V _{CE} = 0 V , T _{vj} = 25°C				+/-200	nA
R _{Gint}	Internal Gate Resistance	T _{vj} = 25 °C			1.0		Ω
C _{ies}	Input Capacitance	V _{CE} =30V, V _{GE} =0V, f=1MHz, T _{vj} = 25°C			33067		nF
C _{oes}	Output Capacitance				752		
C _{res}	Reverse Transfer Capacitance				167		
Q _g	Total Gate Charge	V _{CC} =960V, I _C =200A, V _{GE} =15V, T _{vj} = 25°C			1569		uC
Q _{ge}	Gate to Emitter Charge				133		
Q _{gc}	Gate to Collector Charge				546		
t _{d(ON)}	Turn-on Delay Time	V _{CE} =600V, I _C =200A, V _{GE} =15/-5V, R _g =25Ω			387		ns
t _r	Rise Time				262		



$t_{d(OFF)}$	Turn-Off Delay Time	$T_{vj}=25^{\circ}\text{C}$ Inductive Load		1307		mJ
t_f	Fall Time			193		
E_{on}	Turn-On Switching Loss			17.93		
E_{off}	Turn-Off Switching Loss		--	9.03	--	
E_{ts}	Total Switching Loss		--	26.96	--	
$t_{d(ON)}$	Turn-on Delay Time	$V_{CE}=600\text{V}, I_C=200\text{A},$ $V_{GE}=15/-5\text{V}, R_g=25\Omega$ $T_{vj}=150^{\circ}\text{C}$ Inductive Load		379		ns
t_r	Rise Time			432		
$t_{d(OFF)}$	Turn-Off Delay Time			1399		
t_f	Fall Time			171		
E_{on}	Turn-On Switching Loss			26.53		mJ
E_{off}	Turn-Off Switching Loss			13.36		
E_{ts}	Total Switching Loss			39.89		
$I_{C(SC)}$	Short circuit collector curren	$V_{GE}=15\text{V}, V_{CC}=600\text{V}, t_{sc}\leq 10\mu\text{s}, T_{vj}\leq 150^{\circ}\text{C}$	--	1000	--	A
R_{thJC}	Thermal resistance,junction to case	per IGBT	--	0.156	--	K/W
$T_{vj\text{ op}}$	Temperature under switching conditions		-40	--	175 ¹⁾	$^{\circ}\text{C}$

¹⁾ $T_{vj\text{ op}} > 150^{\circ}\text{C}$ is only allowed for operation at overload conditions.

Diode

Absolute Maximum Ratings ($T_c = 25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Description	Note or test condition	Value	Unit
V_{RRM}	Repetitive peak reverse voltage	$T_{vj} = 25^{\circ}\text{C}$	1200	V
I_F	Continuous DC forward current		200	A
I_{FRM}	Repetitive peak forward current	$t_p = 1\text{ ms}$	400	A

**Characteristics** ($T_c = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
V_F	Diode Forward Voltage	$I_F=150\text{A}$		1.6	2.6	V
T_{rr}	Reverse Recovery Time	$V_{CE}=600\text{V}, I_F=200\text{A},$ $V_{GE}=15/-5\text{V}$ $R_g=25\Omega$ $T_{vj}=25^\circ\text{C}$		175		ns
I_{RRM}	Diode Peak Reverse Recovery Current			27		A
Q_{rr}	Reverse Recovery Charge			1.24		μC
E_{rec}	Reverse Recovery Energy			1.23		mJ
T_{rr}	Reverse Recovery Time	$V_{CE}=600\text{V}, I_F=200\text{A},$ $V_{GE}=15/-5\text{V}$ $R_g=25\Omega$ $T_{vj}=150^\circ\text{C}$		165		ns
I_{RRM}	Diode Peak Reverse Recovery Current			63		A
Q_{rr}	Reverse Recovery Charge			1.92		μC
E_{rec}	Reverse Recovery Energy			2.91		mJ
R_{thJC}	Thermal resistance, junction to case	per Diode	--	0.3	--	K/W
$T_{vj\text{ op}}$	Temperature under switching conditions		-40	--	$175^{2)}$	$^\circ\text{C}$

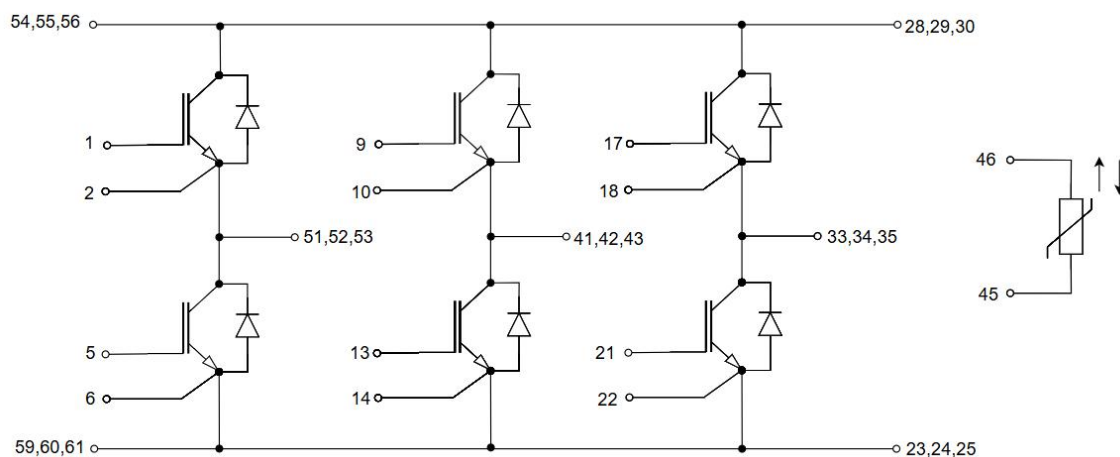
²⁾ $T_{vj\text{ op}} > 150^\circ\text{C}$ is only allowed for operation at overload conditions.

NTC Characteristics

Symbol	Parameter	Note or Test Condition	Value			Unit
			Min	Typ	Max	
R_{25}	Rated Resistance	$T_C = 25^\circ\text{C}$	--	5	--	k Ω
$\Delta R/R$	Deviation of R100	$T_C=100^\circ\text{C}, R_{100}=493\Omega$	-5	--	5	%
P_{25}	Power Dissipation	$T_C = 25^\circ\text{C}$	--	--	20	mW
$B_{25/50}$	B-value	$R_2=R_{25} \exp[B_{25/50}(1/T_2 - 1/(298.15\text{K}))]$	--	3375	--	K
$B_{25/80}$	B-value	$R_2=R_{25} \exp[B_{25/80}(1/T_2 - 1/(298.15\text{K}))]$	--	3411	--	K
$B_{25/100}$	B-value	$R_2=R_{25} \exp[B_{25/100}(1/T_2 - 1/(298.15\text{K}))]$	--	3433	--	K

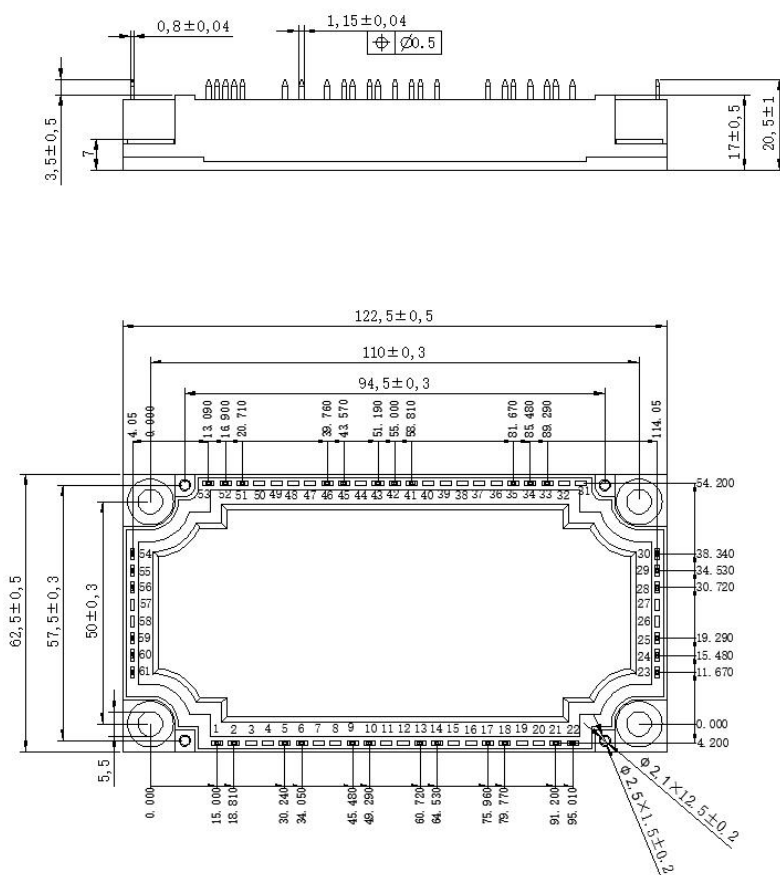


Circuit Diagram



Package Dimensions

Dimensions in Millimeters





REVISION HISTORY

Document version	Date of release	Description of changes
Rev.00	2025-03-05	Preview

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