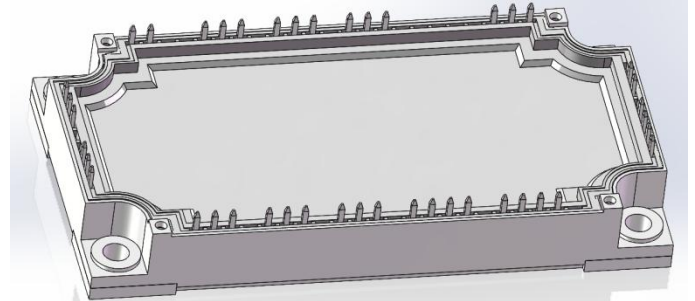


JLPI200B120RN3E7SN

LN3 PACK module with NCE Gen.7 Trench/Fieldstop IGBT and Emitter Controlled diode and NTC

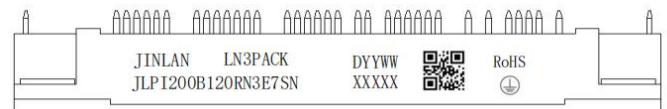
Features

- Electrical features
 - VCES = 1200 V
 - IC nom = 200A / ICRM = 400 A
 - Low V_{CEsat}
 - Overload operation up to 175°C
- Mechanical features
 - High power and thermal cycling capability
 - Integrated NTC temperature sensor
 - Copper base plate
 - Al_2O_3 substrate with low thermal resistance



LN3 Pack

MARKING DIAGRAM

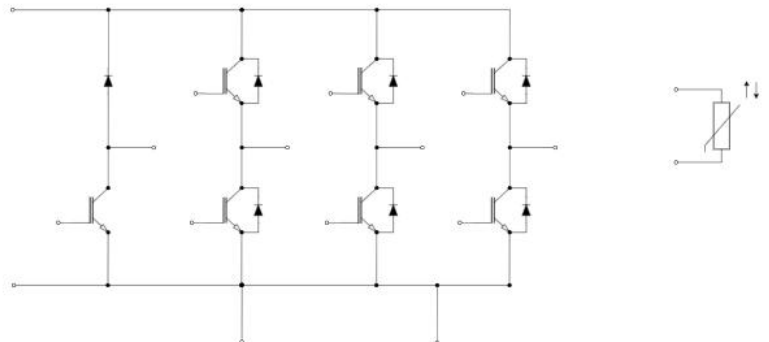
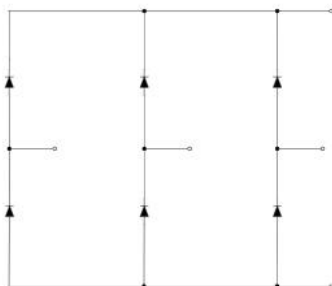


Typical Applications

- Auxiliary inverters
- Motor drives
- Servo drives

JINLAN	= Company Name
JLPI200B120RN3E7SN	= Specific Device Code
YYWW	= Year and Work Week Code
XXXXX	= Serial Number
QR code	= Custom Assembly Information

Description





Package Insulation coordination

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

Package Characteristic values

Parameter	Symbol	Note or test condition	Values			Unit
			Min.	Typ.	Max.	
Stray Inductance	LCE		--	25	--	nH
Module Lead Resistance, Terminal to Chip	$R_{AA'+CC'}$	TC=25°C, per switch	--	1.1	--	mΩ
Module Lead Resistance, Terminal to Chip	$R_{CC'+EE'}$	TC=25°C, per switch	--	1.6	--	mΩ
Storage Temperature Range	T_{STG}		-40		125	°C
Mounting Torque, Screw M5	M	M5, Screw	3		6	N.m
Weight	G		--	300	--	g

**IGBT, Inverter****Absolute Maximum Ratings** ($T_C = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Description	Value	Unit
V_{CES}	Collector-Emitter Voltage	1200	V
V_{GES}	Gate-Emitter Voltage	± 30	V
I_C	Collector Current @ $T_C=80^\circ\text{C}$	200	A
I_{CM}	Pulsed Collector Current, $t_p=1\text{S}$	400	A

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

Symbol	Parameter	Test Condition		Min	Typ	Max	Unit
V _{CE(sat)}	Collector-Emitter Saturation Voltage	I _C =200A, V _{GE} =15V	T _{vj} =25°C	--	1.55	1.80	V
			T _{vj} = 150 °C	--	1.90	--	
V _{GE(th)}	Gate Threshold Voltage	I _C =12mA,V _{CE} =V _{GE}		5.6	6.2	6.8	V
I _{CES}	Collector-Emitter Leakage Current	V _{GE} =0V,V _{CE} =1200V		--	--	20	μA
I _{GES}	Gate-Emitter Leakage Current	V _{GE} =20V,V _{CE} =0V		--	--	200	nA
R _{Gint}	Internal Gate Resistance	T _{vj} =25°C		--	4.0	--	Ω
C _{ies}	Input Capacitance	V _{CE} =25V,V _{GE} =0V, f=100kHz		--	32	--	nF
C _{res}	Reverse Transfer Capacitance			--	0.16	--	nF
Q _G	Gate Charge	V _{CE} =600V,V _{GE} =15V		--	1.11	--	μC
t _{d(on)}	Turn-On Delay Time	V _{CC} = 600 V, I _C =200 A, R _{Gon} = 25 Ω,R _{Goff} = 25 Ω V _{GE} =±15V Inductive Load T _{vj} = 25°C		--	590	--	ns
t _r	Rise Time			--	145	--	
t _{d(off)}	Turn-off Delay Time			--	780	--	
t _f	Fall Time			--	120	--	
E _{on}	Turn-On Switching Loss per Pulse			--	130	--	mJ
E _{off}	Turn Off Switching Loss per Pulse			--	21	--	
t _{d(on)}	Turn-On Delay Time	V _{CC} = 600 V, I _C =200 A, R _{Gon} = 25 Ω,R _{Goff} = 25 Ω V _{GE} =±15V Inductive Load T _{vj} = 150 °C		--	TBD	--	ns
t _r	Rise Time			--	TBD	--	
t _{d(off)}	Turn-off Delay Time			--	TBD	--	
t _f	Fall Time			--	TBD	--	
E _{on}	Turn-on Switching Loss per Pulse			--	TBD	--	mJ
E _{off}	Turn Off Switching Loss per Pulse			--	TBD	--	
I _{sc}	SC Data	t _p ≤10μs,V _{GE} ≤15V, T _{vj} ≤150 °C,V _{CC} =800V,		--	700	--	A
R _{thJC}	Thermal resistance	Junction-to-Case (per IGBT)		--	TBD	--	K/W
T _{vj op}		Temperature under switching conditions		-40		175 ¹⁾	°C

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



Diode, Inverter

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

Symbol	Description	Value	Unit
V _{RRM}	Repetitive Peak Reverse Voltage	1200	V
I _F	Diode Continuous Forward Current	200	A
I _{FM}	Diode Maximum Forward Current t _p =1ms	400	A

Characteristics (T_C=25°C unless otherwise noted)

V _F	Diode Forward Voltage	I _F =200A	T _J =25°C	--	1.85	2.65	V
			T _J =150°C	--	1.80	--	
Q _r	Recovered Charge	V _{CC} = 600 V, I _C =200 A, R _{Gon} = 25 Ω, R _{Goff} = 25 Ω V _{GE} =±15V Inductive Load T _{vj} = 25°C	--	--	26	--	μC
I _{RM}	Peak Reverse Recovery Current		--	--	109	--	A
E _{rec}	Reverse Recovery Energy		--	--	8.9	--	mJ
Q _r	Recovered Charge	V _{CC} = 600 V, I _C =200 A, R _{Gon} = 25 Ω, R _{Goff} =25 Ω V _{GE} =±15V Inductive Load T _{vj} = 150°C	--	--	TBD	--	μC
I _{RM}	Peak Reverse Recovery Current		--	--	TBD	--	A
E _{rec}	Reverse Recovery Energy		--	--	TBD	--	mJ
R _{thJC}	Thermal resistance	Junction-to-Case (per diode)		--	TBD	--	K/W
T _{vj op}	Temperature under switching conditions		-40			175 ²⁾	°C

²⁾T_{vj op} > 150°C is only allowed for operation at overload conditions. For detailed specifications please refer to AN 2018-14.

Diode, Rectifier

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

Symbol	Description	Value	Unit
V _{RRM}	Repetitive Peak Reverse Voltage	1600	V
I _F	Diode Continuous Forward Current	150	A
I _{FM}	Diode Maximum Forward Current t _p =1ms	150	A

Characteristics (T_C=25°C unless otherwise noted)

V _F	Diode Forward Voltage	I _F =200A, T _J = 150 °C		1.3		V
I _R	Reverse Current	T _J =150°C, V _R =1600V		3		mA
R _{thJC}	Thermal resistance	Junction-to-Case (per diode)		0.234		K/W
T _{vj op}	Temperature under switching conditions		-40		175 ³⁾	°C

³⁾T_{vj op} > 150°C is only allowed for operation at overload conditions.



IGBT, Brake-Chopper

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

Symbol	Description	Value	Unit
V _{CES}	Collector-Emitter Voltage	1200	V
V _{GES}	Gate-Emitter Voltage	±30	V
I _C	Collector Current @ T _C =25°C	200	A
	Collector Current @ T _C =100°C	150	A
I _{Cpuls}	Pulsed Collector Current, t _p limited by T _{Jmax}	300	A

Characteristics (T_C = 25°C unless otherwise noted)

Symbol	Parameter	Test Condition		Min	Typ	Max	Unit
V _{CE(sat)}	Collector-Emitter Saturation Voltage	I _C =150A, V _{GE} =15V	T _{Vj} =25°C	--	1.60	2.10	V
			T _{Vj} =125°C	--	1.75	--	
			T _{Vj} = 175 °C	--	1.80	--	
V _{GE(th)}	Gate Threshold Voltage	I _C =5mA, V _{CE} =V _{GE}		5.00	6.00	7.00	V
I _{CES}	Collector-Emitter Leakage Current	V _{GE} =0V, V _{CE} =1200V		--	--	500	μA
I _{GES}	Gate-Emitter Leakage Current	V _{GE} =20V, V _{CE} =0V		--	--	100	nA
R _{Gint}	Internal Gate Resistance	T _{Vj} =25°C		--	2.0	--	Ω
C _{ies}	Input Capacitance	V _{CE} =25V, V _{GE} =0V, f=100kHz		--	14.911	--	nF
C _{oes}	Out Capacitance			--	0.369	--	nF
C _{res}	Reverse Transfer			--	0.72	--	nF
Q _G	Gate Charge	V _{CE} =600V, V _{GE} =15V		--	0.523	--	μC
t _{d(on)}	Turn-On Delay Time	V _{CC} = 600 V, I _C =150 A, R _{Gon} = 25Ω, R _{Goff} = 25Ω V _{GE} =±15V Inductive Load T _{Vj} = 25°C		--	142	--	ns
t _r	Rise Time			--	97	--	
t _{d(off)}	Turn-off Delay Time			--	450	--	
t _f	Fall Time			--	73	--	
E _{on}	Turn-On Switching Loss per Pulse			--	11.00	--	mJ
E _{off}	Turn Off Switching Loss per Pulse			--	7.62	--	
t _{d(on)}	Turn-On Delay Time	V _{CC} = 600 V, I _C =150 A, R _{Gon} = 10Ω, R _{Goff} = 25Ω V _{GE} =±15V Inductive Load T _{Vj} = 150°C		--	TBD	--	ns
t _r	Rise Time			--	TBD	--	
t _{d(off)}	Turn-off Delay Time			--	TBD	--	
t _f	Fall Time			--	TBD	--	
E _{on}	Turn-on Switching Loss per Pulse			--	TBD	--	mJ
E _{off}	Turn Off Switching Loss per Pulse			--	TBD	--	
I _{sc}	SC Data	t _p ≤10μs, V _{GE} ≤15V, T _{Vj} ≤150°C, V _{CC} =800V, V _{CEmax} =V _{CES} -L _{sCE} •di/dt		--	800	--	A
R _{thJC}	Thermal resistance	Junction-to-Case (per IGBT)		--	TBD	--	K/W
T _{Vj op}		Temperature under switching conditions		-40		175 ¹⁾	°C

⁴⁾T_{Vj op} > 150°C is only allowed for operation at overload conditions.



Diode, Brake-Chopper

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

Symbol	Description	Value	Unit
V _{RRM}	Repetitive Peak Reverse Voltage	1200	V
I _F	Diode Continuous Forward Current	75	A
I _{FM}	Diode Maximum Forward Current t _p =1ms	150	A

Characteristics (T_C=25°C unless otherwise noted)

V _F	Diode Forward Voltage	I _F =75A	T _{VJ} =25 °C	--	1.80	2.70	V
			T _{VJ} =150°C	--	1.75	--	
Q _r	Recovered Charge	V _R = 600 V I _F =75A, R _{Gon} = 25 Ω, R _{Goff} = 25 Ω T _J =25°C	--	--	1.24	--	μC
I _{RM}	Peak Reverse Recovery Current		--	--	27	--	A
T _{rr}	Reverse Recovery Time		--	--	175	--	ns
E _{rec}	Reverse Recovery Energy		--	--	1.23	--	mJ
Q _r	Recovered Charge	V _R = 600 V I _F =75A, R _{Gon} = 25 Ω, R _{Goff} = 25 Ω T _J =150°C	--	--	TBD	--	μC
I _{RM}	Peak Reverse Recovery Current		--	--	TBD	--	A
T _{rr}	Reverse Recovery Time		--	--	TBD	--	ns
E _{rec}	Reverse Recovery Energy		--	--	TBD	--	mJ
R _{thJC}	Thermal resistance	Junction-to-Case (per diode)		--	TBD	--	K/W
T _{VJ op}	Temperature under switching conditions		-40			175 ⁵⁾	°C

⁵⁾T_{VJ op} > 150°C is only allowed for operation at overload conditions.

NTC Characteristics (T_C = 25°C unless otherwise noted)

Symbol	Parameter	Test Condition	Min	Typ	Max	Unit
R ₂₅	Rated Resistance		--	5.0	--	kΩ
ΔR/R	Deviation of R100	T _C =100 °C, R ₁₀₀ =493.3Ω	-5	--	5	%
P ₂₅	Power Dissipation		--	--	20.0	mW
B _{25/50}	B-value	R ₂ =R ₂₅ exp[B _{25/50} (1/T ₂ - 1/(298.15K))]	--	3375	--	K
B _{25/80}	B-value	R ₂ =R ₂₅ exp[B _{25/80} (1/T ₂ - 1/(298.15K))]	--	3411	--	K
B _{25/100}	B-value	R ₂ =R ₂₅ exp[B _{25/100} (1/T ₂ - 1/(298.15K))]	--	3433	--	K

JLPI200B120RN3E7SN



REVISION HISTORY

Document version	Date of release	Description of changes
Rev.00	2025-06-05	Preview



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