

JLPI35B120RE2E7SN

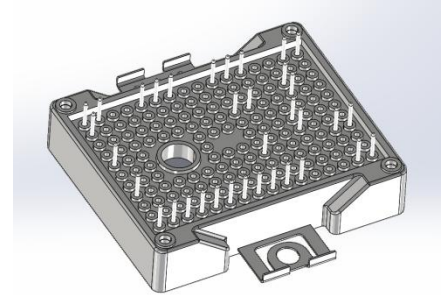
LE2 PACK module with Gen.7 Trench/Fieldstop IGBT and Emitter Controlled diode and NTC



Features

• Electrical features

- $V_{CES} = 1200\text{ V}$
- $I_{C\text{ nom}} = 35\text{ A} / I_{CRM} = 70\text{ A}$
- Low V_{CEsat}
- $10\mu\text{s}$ short circuit capability
- Overload operation up to 175°C

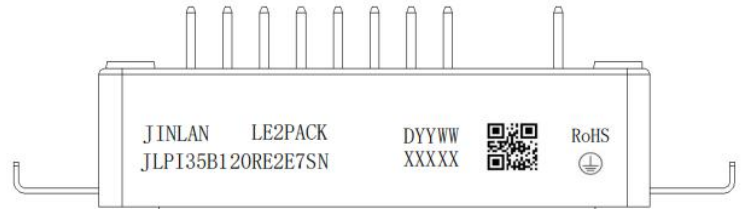


LE2 Pack

• Mechanical features

- Integrated NTC temperature sensor
- Isolated heatsink using DBC technology
- Low inductance case
- Solder contact technology

MARKING DIAGRAM



Typical Applications

- Inverter for motor drive
- AC and DC servo drive amplifier
- Uninterruptible power supply

JINLAN

= Company Name

JLPI35B120RE2E7SN

= Specific Device Code

YYWW

= Year and Work Week Code

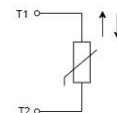
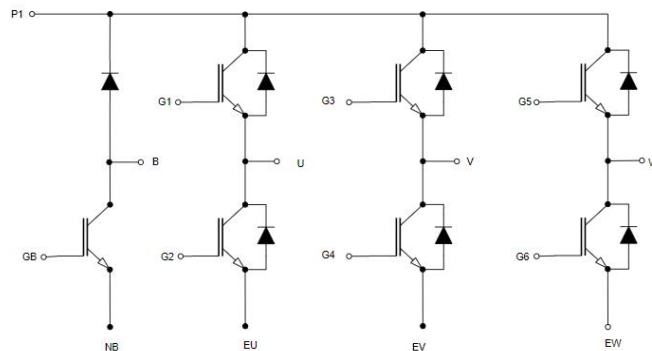
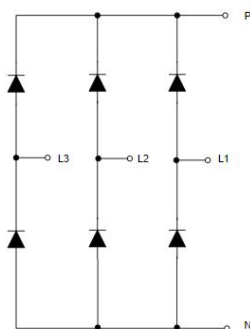
XXXXX

= Serial Number

QR code

= Custom Assembly

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	11.5	mm
Clearance	d_{clear}	terminal to heatsink	10	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		--	30	--	nH
Module Lead Resistance, Terminal to Chip	$R_{AA'+CC'}$	$T_c=25^\circ\text{C}$, per switch	--	6.0	--	mΩ
Module Lead Resistance, Terminal to Chip	$R_{CC'+EE'}$	$T_c=25^\circ\text{C}$, per switch	--	5.0	--	mΩ
Storage Temperature Range	T_{STG}		-40		125	°C
Mounting Torque	M	M5, Screw	40		80	N.m
Weight	G		--	39	--	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 @ $T_C=25^\circ\text{C}$	70	A
	Collector Current @ $T_C=80^\circ\text{C}$	35	A
I_{CM}	Pulsed Collector Current, $t_p=1\text{S}$	105	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 =35A, V _{GE} =15V	T _{vj} =25°C	--	1.70	2.50	V
			T _{vj} =175°C	--	1.90	--	
V _{GE(th)}	Gate Threshold Voltage	I _C =1mA, V _{CE} =V _{GE}		5.0	6.0	7.0	V
I _{CES}	Collector-Emitter Leakage Current	V _{GE} =0V, V _{CE} =1200V		--	--	10	uA
I _{GES}	Gate-Emitter Leakage Current	V _{GE} =30V, V _{CE} =0V		--	--	200	nA
R _{Gint}	Internal Gate Resistance	f=1MHz		--	0.6	--	Ω
C _{ies}	Input Capacitance	V _{CE} =25V, V _{GE} =0V, f=1MHz		--	4.20	--	nF
C _{oes}	Out Capacitance			--	0.107	--	nF
C _{res}	Reverse Transfer			--	0.024	--	nF
Q _G	Gate Charge	V _{CE} =960V, I _C =35A, V _{GE} =15V		--	0.147	--	uC
t _{d(on)}	Turn–On Delay Time	V _{CE} =600V, I _C =35A, V _{GE} =0/15V, R _g =25Ω, Inductive Load		--	71	--	ns
t _r	Rise Time			--	53	--	
t _{d(off)}	Turn–off Delay Time			--	261	--	
t _f	Fall Time			--	66.3	--	
E _{on}	Turn–On Switching Loss per Pulse			--	2.34	--	mJ
E _{off}	Turn Off Switching Loss per Pulse			--	1.44	--	
t _{d(on)}	Turn–On Delay Time	V _{CE} =600V, I _C =35A, V _{GE} =0/15V, R _g =25Ω, Inductive Load, T _j =175°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			--	3.64	--	mJ
E _{off}	Turn Off Switching Loss per Pulse			--	2.00	--	
I _{sc}	SC Data	V _{GE} =15V, V _{CC} ≤600V, t _{sc} ≤10us, T _j ≤150°C		--	150	--	A
R _{thJC}	Thermal resistance	Junction-to-Case (per IGBT)			0.5		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. For detailed specifications please refer to AN 2018-14.



Diode, Inverter

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

Symbol	Description	Value	Unit
V _{RRM}	Repetitive Peak Reverse Voltage	1200	V
I _F	Diode Continuous Forward Current	35	A
I _{FM}	Diode Maximum Forward Current t _p =1ms	105	A

Characteristics (Tc=25°C unless otherwise noted)

Symbol	Parameter	Test Condition	Min	Typ	Max	Unit
V _F	Diode Forward Voltage	I _F =35A		T _J =25°C	1.70	V
				T _J =175°C	1.90	
Q _r	Recovered Charge	I _F =35A, R _g =25Ω, T _J =25°C	--	1.01	--	μC
I _{RM}	Peak Reverse Recovery Current		--	37.7	--	A
T _{rr}	Reverse Recovery Time		--	120	--	ns
E _{rec}	Reverse Recovery Energy		--	0.42	--	mJ
Q _r	Recovered Charge	I _F =35A, R _g =25Ω, T _J =175°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)		0.72		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 (Tc = 25°C unless otherwise noted)

Symbol	Description	Value	Unit
V _{RRM}	Repetitive Peak Reverse Voltage	1600	V
I _F	Diode Continuous Forward Current	35	A
I _{FM}	Diode Maximum Forward Current t _p =1ms	70	A

Characteristics (Tc=25°C unless otherwise noted)

Symbol	Parameter	Test Condition	Min	Typ	Max	Unit
V _F	Diode Forward Voltage	I _F = 35 A, T _J = 150 °C	--	0.95	--	V
I _R	Reverse Current	T _J =175 °C, V _R =1600V	--	1.0	--	mA
R _{thJC}	Thermal resistance	Junction-to-Case (per diode)	--	0.53	--	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. For detailed specifications please refer to AN 2018-14.

**IGBT, 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	70	A
	Collector Current @ T _C =80°C	35	A
I _{CM}	Pulsed Collector Current, t _p =1S	105	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 =35A, V _{GE} =15V	T _{vj} =25°C	--	1.70	V
			T _{vj} =175°C	--	1.90	
V _{GE(th)}	Gate Threshold Voltage	I _C =1mA, V _{CE} =V _{GE}	5.0	6.0	7.0	V
I _{CES}	Collector-Emitter Leakage Current	V _{GE} =0V, V _{CE} =1200V	--	--	10	uA
I _{GES}	Gate-Emitter Leakage Current	V _{GE} =30V, V _{CE} =0V	--	--	200	nA
R _{Gint}	Internal Gate Resistance	f=1MHz	--	0.6	--	Ω
C _{ies}	Input Capacitance	V _{CE} =25V, V _{GE} =0V, f=1MHz	--	4.20	--	nF
C _{oes}	Out Capacitance		--	0.107	--	nF
C _{res}	Reverse Transfer		--	0.024	--	nF
Q _G	Gate Charge	V _{CE} =960V, I _C =35A, V _{GE} =15V	--	0.147	--	uC
t _{d(on)}	Turn-On Delay Time	V _{CE} =600V, I _C =35A, V _{GE} =0/15V, R _g =25Ω, Inductive Load	--	71	--	ns
t _r	Rise Time		--	53	--	
t _{d(off)}	Turn-off Delay Time		--	261	--	
t _f	Fall Time		--	66.3	--	
E _{on}	Turn-On Switching Loss per Pulse		--	2.34	--	mJ
E _{off}	Turn Off Switching Loss per Pulse		--	1.44	--	
t _{d(on)}	Turn-On Delay Time	V _{CE} =600V, I _C =35A, V _{GE} =0/15V, R _g =25Ω, Inductive Load, T _j =175°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		--	3.64	--	mJ
E _{off}	Turn Off Switching Loss per Pulse		--	2.00	--	
I _{sc}	SC Data	V _{GE} =15V, V _{CC} ≤600V, t _{sc} ≤10us, T _j ≤150°C	--	150	--	A
R _{thJC}	Thermal resistance	Junction-to-Case (per IGBT)		0.5		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. For detailed specifications please refer to AN 2018-14.



Diode, 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	15	A
I _{FM}	Diode Maximum Forward Current t _p =1ms	30	A

Characteristics (T_C=25°C unless otherwise noted)

Symbol	Parameter	Test Condition		Min	Typ	Max	Unit
V _F	Diode Forward Voltage	I _F =15A	T _J =25°C	--	1.50	2.30	V
			T _J =175°C	--	1.45	--	
Q _r	Recovered Charge	I _F =15A, R _g =25Ω, T _J =25°C		--	0.43	--	μC
I _{RM}	Peak Reverse Recovery Current			--	16.3	--	A
T _{rr}	Reverse Recovery Time			--	52	--	ns
E _{rec}	Reverse Recovery Energy			--	0.18	--	mJ
Q _r	Recovered Charge	I _F =15A, R _g =25Ω, T _J =175°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)			0.77		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. For detailed specifications please refer to AN 2018-14.

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 R ₁₀₀	T _C =100 °C, R ₁₀₀ =493.3 Ω	-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

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REVISION HISTORY

Document version	Date of release	Description of changes
Rev.00	2024-09-25	Preview



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