

JLPI25B120RE2E6SN

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



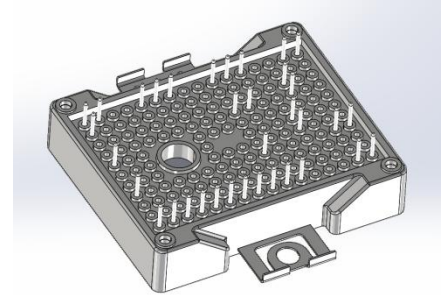
Features

• Electrical features

- $V_{CES} = 1200\text{ V}$
- $I_{C\text{ nom}} = 25\text{ A} / I_{CRM} = 50\text{ A}$
- Low V_{CESat}
- $10\mu\text{s}$ short circuit capability
- Overload operation up to 175°C

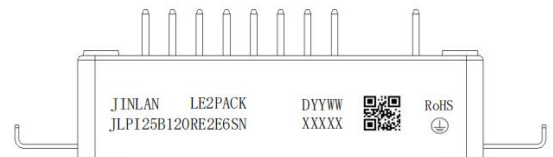
• Mechanical features

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



LE2 Pack

MARKING DIAGRAM



Typical Applications

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

JINLAN

= Company Name

JLPI25B120RE2E6SN

= Specific Device Code

YYWW

= Year and Work Week Code

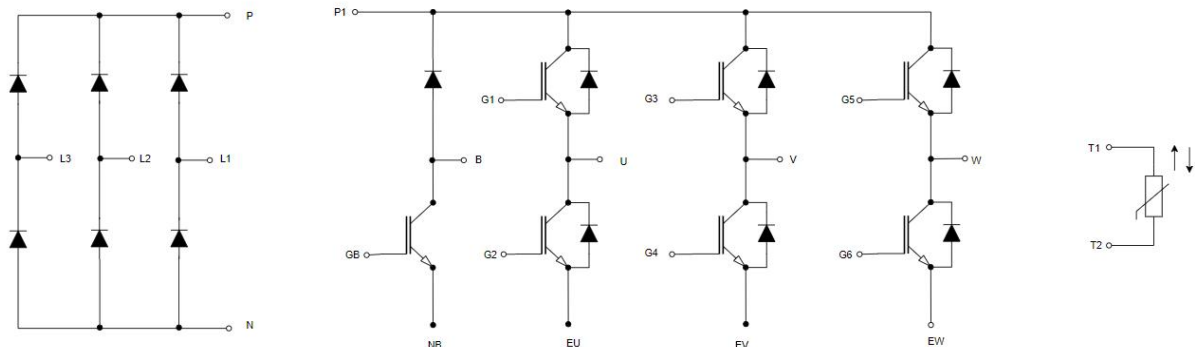
XXXXX

= 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=50Hz, t=60s	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	$R_{AA'+CC'}$	$T_C=25^{\circ}C$, per switch	--	6.0	--	mΩ
Module Lead Resistance, Terminal to Chip	$R_{CC'+EE'}$	$T_C=25^{\circ}C$, 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°C unless otherwise noted)

Symbol	Description	Value	Unit
V _{CES}	Collector-Emitter Voltage	1200	V
V _{GES}	Gate-Emitter Voltage	±25	V
I _C	Collector Current @ T _C =25°C	50	A
	Collector Current @ T _C =100°C	25	A
I _{CM}	Pulsed Collector Current, t _p limited by T _{vj} max	50	A

Characteristics (T_C = 25°C unless otherwise noted)

Symbol	Parameter	Test Condition	Min	Typ	Max	Unit
V _{CE(sat)}	Collector-Emitter Saturation Voltage	V _{GE} = 15 V, I _C = 25 A, T _{vj} = 25°C	--	1.55	1.90	V
		V _{GE} = 15 V, I _C = 25 A, T _{vj} = 150°C	--	1.80	--	
V _{GE(TH)}	Gate-Emitter Threshold Voltage	V _{GE} = V _{CE} , I _C = 1mA, T _{vj} = 25°C	5.0	6.0	7.0	V
I _{CES}	Collector-Emitter Cutoff Current	V _{GE} = 0 V, V _{CE} = V _{CES} , T _{vj} = 25°C	--	--	150	μA
I _{GES}	Gate-Emitter Leakage Current	V _{GE} = V _{GES} , V _{CE} = 0 V, T _{vj} = 25°C	--	--	200	nA
R _{Gint}	Internal Gate Resistance	f=1MHz	--	0.5	--	Ω
C _{ies}	Input Capacitance	V _{CE} =30V, f=1MHz, V _{GE} =0V	--	2674	--	pF
C _{oes}	Output Capacitance		--	72	--	pF
C _{res}	Reverse Transfer		--	59	--	pF
Q _G	Gate Charge	V _{CC} =960V, V _{GE} =15V, I _C =25A	--	146	--	nC
t _{d(on)}	Turn-On Delay Time	V _{CC} = 600 V, I _C = 25 A R _{Gon} = 25Ω, R _{Goff} = 25Ω V _{GE} = ±15V Inductive Load T _{vj} = 25°C	--	23	--	ns
t _r	Rise Time		--	21	--	
t _{d(off)}	Turn-off Delay Time		--	206	--	
t _f	Fall Time		--	22	--	
E _{on}	Turn-On Switching Loss per Pulse		--	1.5	--	mJ
E _{off}	Turn Off Switching Loss per Pulse		--	0.8	--	
E _{ts}	Total Switching Loss		--	2.3	--	
t _{d(on)}	Turn-On Delay Time	V _{CC} = 600 V, I _C = 25 A R _{Gon} = 25Ω, 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	--	
E _{ts}	Total Switching Loss		--	TBD	--	
I _{sc}	SC Data	t _p ≤ 10μs, V _{GE} ≤ 15V, T _{vj} = 150°C, V _{CC} = 600V	--	100	--	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°C is only allowed for operation at overload conditions.



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	25	A
I_{FM}	Diode Maximum Forward Current $t_p=1ms$	50	A

Characteristics (Tc=25°C unless otherwise noted)

Symbol	Parameter	Test Condition	Min	Typ	Max	Unit
V_F	Diode Forward Voltage	$I_F = 25A, V_{GE}=0V, T_{vj} = 25^\circ C$	--	1.75	--	V
		$I_F = 25A, V_{GE}=0V, T_{vj} = 150^\circ C$	--	1.65	--	
Q_r	Recovered Charge	$V_R=600V, I_F=25A,$ $R_{Gon} = 10\Omega, R_{Goff} = 25\Omega,$ $V_{GE} = \pm 15V,$ $T_{vj} = 25^\circ C$	--	0.24	--	μC
I_{RM}	Peak Reverse Recovery Current		--	5.22	--	A
T_{rr}	Reverse Recovery Time		--	30.25	--	ns
E_{rec}	Reverse Recovery Energy		--	0.076	--	mJ
Q_r	Recovered Charge	$V_R=600V, I_F=25A,$ $R_{Gon} = 10\Omega, R_{Goff} = 25\Omega,$ $V_{GE} = \pm 15V,$ $T_{vj} = 150^\circ C$	--	0.54	--	μC
I_{RM}	Peak Reverse Recovery Current		--	7.97	--	A
T_{rr}	Reverse Recovery Time		--	47.2	--	ns
E_{rec}	Reverse Recovery Energy		--	0.247	--	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⁾ $T_{vj op} > 150^\circ C$ is only allowed for operation at overload conditions.

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	25	A
I_{FM}	Diode Maximum Forward Current $t_p=1ms$	50	A

Characteristics (Tc=25°C unless otherwise noted)

Symbol	Parameter	Test Condition	Min	Typ	Max	Unit
V_F	Diode Forward Voltage	$I_F = 25A, T_j = 150^\circ C$	--	1.25	--	V
I_R	Reverse Current	$T_j = 150^\circ C, V_R = 1600V$	--	1	--	mA
R_{thJC}	Thermal resistance	Junction-to-Case (per diode)	--	TBD	--	K/W
$T_{vj op}$		Temperature under switching conditions	-40		175 ³⁾	°C

³⁾ $T_{vj op} > 150^\circ C$ is only allowed for operation at overload conditions.

**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	50	A
	Collector Current @ T _C =80°C	25	A
I _{CM}	Pulsed Collector Current, t _p =1S	50	A

Characteristics (T_C = 25°C unless otherwise noted)

Symbol	Parameter	Test Condition	Min	Typ	Max	Unit
V _{CE(sat)}	Collector-Emitter Saturation Voltage	V _{GE} = 15 V, I _C = 25 A, T _{vj} = 25°C	--	1.55	1.90	V
		V _{GE} = 15 V, I _C = 25 A, T _{vj} = 150°C	--	1.70	--	
V _{GE(TH)}	Gate-Emitter Threshold Voltage	V _{GE} = V _{CE} , I _C = 1mA, T _{vj} = 25°C	5.0	6.0	7.0	V
I _{CES}	Collector-Emitter Cutoff Current	V _{GE} = 0 V, V _{CE} = V _{CES} , T _{vj} = 25°C	--	--	100	μA
I _{GES}	Gate-Emitter Leakage Current	V _{GE} = V _{GES} , V _{CE} = 0 V, T _{vj} = 25°C	--	--	200	nA
R _{Gint}	Internal Gate Resistance	f=1MHz	--	0.5	--	Ω
C _{ies}	Input Capacitance	V _{CE} =30V, f=1MHz, V _{GE} =0V	--	1430	--	pF
C _{oes}	Output Capacitance		--	35	--	pF
C _{res}	Reverse Transfer Capacitance		--	25	--	pF
Q _G	Gate Charge	V _{CC} =960V, V _{GE} =15V, I _C =25A	--	90	--	nC
t _{d(on)}	Turn-On Delay Time	V _{CC} = 600 V, I _C = 25 A R _{Gon} = 25Ω, R _{Goff} = 25Ω V _{GE} = ±15V Inductive Load T _{vj} = 25°C	--	23	--	ns
t _r	Rise Time		--	21	--	
t _{d(off)}	Turn-off Delay Time		--	206	--	
t _f	Fall Time		--	22	--	
E _{on}	Turn-On Switching Loss per Pulse		--	0.9	--	mJ
E _{off}	Turn Off Switching Loss per Pulse	V _{CC} = 600 V, I _C = 25 A R _{Gon} = 25Ω, R _{Goff} = 25Ω V _{GE} = ±15V Inductive Load T _{vj} = 150°C	--	0.6	--	
E _{ts}	Total Switching Loss		--	1.5	--	
t _{d(on)}	Turn-On Delay Time		--	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	--	
E _{ts}	Total Switching Loss		--	TBD	--	
I _{sc}	SC Data	t _p ≤10μs, V _{GE} ≤15V, T _{vj} =150°C, V _{CC} =600V	--	70	--	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, 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	10	A
I _{FM}	Diode Maximum Forward Current t _p =1ms	20	A

Characteristics (T_C=25°C unless otherwise noted)

Symbol	Parameter	Test Condition	Min	Typ	Max	Unit
V _F	Diode Forward Voltage	I _F = 10A, V _{GE} =0V, T _{vj} = 25°C	--	1.60	--	V
		I _F =10A, V _{GE} =0V, T _{vj} = 150°C	--	1.50	--	
Q _r	Recovered Charge	V _R =600V, I _F =10A, R _{Gon} = 10Ω, R _{Goff} = 25Ω, V _{GE} =±15V, T _{vj} =25°C	--	0.214	--	μC
I _{RM}	Peak Reverse Recovery Current		--	5.22	--	A
T _{rr}	Reverse Recovery Time		--	27.5	--	ns
E _{rec}	Reverse Recovery Energy		--	0.090	--	mJ
Q _r	Recovered Charge	V _R =600V, I _F =10A, R _{Gon} = 10Ω, R _{Goff} = 25Ω, V _{GE} =±15V, T _{vj} =150°C	--	0.495	--	μC
I _{RM}	Peak Reverse Recovery Current		--	7.97	--	A
T _{rr}	Reverse Recovery Time		--	42.9	--	ns
E _{rec}	Reverse Recovery Energy		--	0.291	--	mJ
R _{thJC}	Thermal resistance	Junction-to-Case (per diode)	--	TBD	--	K/W
T _{vj op}		Temperature under switching conditions	-40		175 ²⁾	°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 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

JLPI25B120RE2E6SN



REVISION HISTORY

Document version	Date of release	Description of changes
Rev.00	2025-05-30	Preview



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