

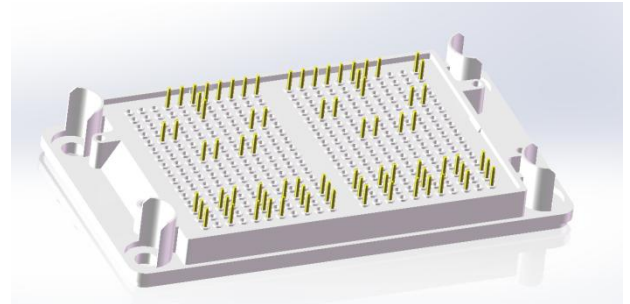


JL3T400V120SE3F7SN

LE3 Pack Module with NCE Gen.7 Trench/Fieldstop IGBT and Emitter Controlled diode and NTC

Features

- Neutral Point Clamped Three-Level Inverter Module
- Low Inductive Layout
- Solderable Pins
- Isolated copper baseplate using AMB technology

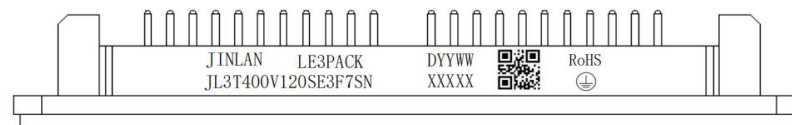


LE3 Pack

Benefits

- Higher System Efficiency
- Reduced Cooling Requirements
- Low Conduction Losses Over Temperature

MARKING DIAGRAM



Typical Applications

- Solar Inverters

JINLAN

= Company Name

JL3T400V120SE3F7SN

= Specific Device Code

YYWW

= Year and Work Week Code

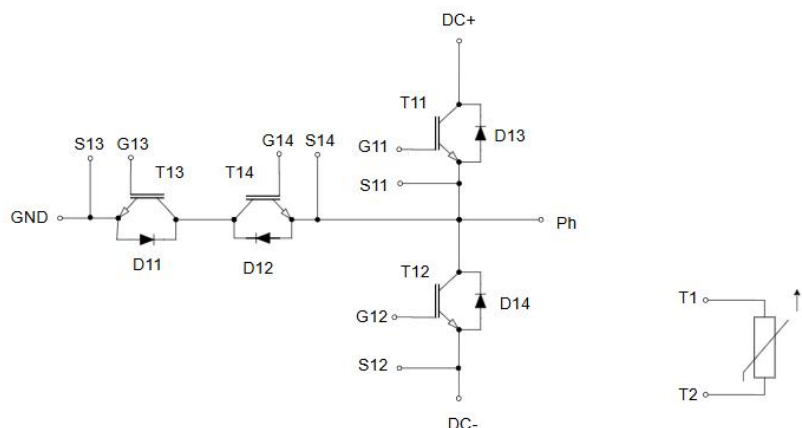
XXXXX

= 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=50Hz,t=60s	2.5	kV
Internal isolation		basic insulation(class 1,IEC 61140)	Si ₃ N ₄	
Creepage distance	d _{creep}	terminal to heatsink	> 12	mm
Clearance	d _{clear}	terminal to heatsink	> 11	mm
Comparative tracking index (electrical)	CTI		> 500	

Package Characteristic values

Parameter	Symbol	Note or test condition		Values			Unit
				Min.	Typ.	Max.	
Stray Inductance	L _{CE}			-	15	-	nH
Mounting torque for module mounting	M	-Mounting according to valid application note	M5, Screw	3		5	Nm
Storage Temperature Range	T _{STG}			-40		125	°C
Flatness of base plate						0.3	mm



IGBT(T11,T12)

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	± 20	V
I _C	Continuous Collector Current @ T _J = 150°C	400	A
I _{CP}	Pulsed Collector Current @ T _J = 150°C	800	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 =400 A	T _J = 25°C	--	1.60	2.2	V
			T _J = 150°C	--	1.80	--	
V _{GE(TH)}	Gate–Emitter Threshold Voltage	V _{GE} = V _{CE} , I _C =8 mA		4.5	5.25	6.0	V
I _{CES}	Collector–Emitter Cutoff Current	V _{GE} = 0 V, V _{CE} = 1200 V		--	--	800	μA
I _{GES}	Gate Leakage Current	V _{GE} = ± 30 V, V _{CE} = 0 V		--	--	± 200	nA
Q _g	Total Gate Charge	V _{CE} = 600 V, V _{GE} = ± 15 V		--	1.34	--	μC
C _{iss}	Input Capacitance	V _{CE} = 30 V, V _{GE} = 0 V, f = 100 kHz		--	37.72	--	nF
C _{rss}	Reverse Transfer Capacitance			--	0.22	--	nF
t _{d(on)}	Turn–On Delay Time (inductive load)	T _J = 25°C V _{CE} =600V, I _C =400A V _{GE} = -7 V to +15 V, R _{Gon} = 25Ω, R _{Goff} =25Ω		--	476	--	ns
t _r	Rise Time (inductive load)			--	268	--	
t _{d(off)}	Turn–off Delay Time (inductive load)			--	1227	--	
t _f	Fall Time (inductive load)			--	308	--	
E _{on}	Turn–On Switching Loss per Pulse	T _J = 150°C V _{CE} =600V, I _C =400A V _{GE} = -7 V to +15 V, R _{Gon} = 25Ω, R _{Goff} =25Ω		--	27.37	--	mJ
E _{off}	Turn Off Switching Loss per Pulse			--	10.95	--	
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	--	
R _{thJC}	Thermal Resistance – Chip–to–Case	Junction-to-Case (per diode)		--	0.088	--	°C/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 (D13, D14)

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

Symbol	Description	Value	Unit
V _{RRM}	Peak Repetitive Reverse Voltage	1200	V
I _F	Continuous Forward Current @T _J = 150°C	400	A
I _{FRM}	Repetitive Peak Forward Current @T _J = 150°C	800	A

Characteristics (T_c=25°C unless otherwise noted)

Symbol	Parameter	Test Condition		Min	Typ	Max	Unit
V _F	Diode Forward Voltage	I _F = 400 A	T _J = 25°C	--	1.50	2.3	V
			T _J = 150°C	--	1.40	--	
T _{rr}	Reverse Recovery Time	V _{CE} =600V, I _F =400A, V _{GE} =15/-5V R _g =25Ω		--	349		ns
I _{RRM}	Peak Reverse Recovery Current			--	87.5	--	A
Q _{rr}	Reverse Recovery Charge			--	3.8	--	μC
E _{REC}	Reverse Recovery Energy			--	7.2	--	mJ
R _{thJC}	Thermal Resistance – Chip-to-Case	Junction-to-Case (per diode)		--	0.127	--	°C/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.

**IGBT (T13,T14)****Absolute Maximum Ratings** ($T_c = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Description	Value	Unit
V_{CES}	Collector-Emitter Voltage	750	V
V_{GES}	Gate-Emitter Voltage	± 20	V
I_C	Continuous Collector Current @ $T_J = 150^\circ\text{C}$	400	A
I_{CP}	Pulsed Collector Current @ $T_J = 150^\circ\text{C}$	800	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	V _{GE} = 15 V, I _C =400 A	T _J = 25°C	--	1.4	2.0	V
			T _J = 150°C	--	1.6	--	
V _{GE(TH)}	Gate–Emitter Threshold Voltage	V _{GE} = V _{CE} , I _C =4mA		4.0	4.75	5.5	V
I _{CES}	Collector–Emitter Cutoff Current	V _{GE} = 0 V, V _{CE} = 650 V		--	--	800	μA
I _{GES}	Gate Leakage Current	V _{GE} = ± 30 V, V _{CE} = 0 V		--	--	± 200	nA
Q _g	Total Gate Charge	V _{CE} = 600 V, V _{GE} = ± 15 V		--	0.985	--	μC
C _{iss}	Input Capacitance	V _{CE} = 30 V, V _{GE} = 0 V, f = 100 kHz		--	29.00	--	nF
C _{oss}	Output Capacitance			--	1.03	--	
C _{rss}	Reverse Transfer Capacitance			--	0.20	--	
t _{d(on)}	Turn–On Delay Time	V _{CE} =400V, I _C =400A V _{GE} = -7 V to +15 V, R _{Gon} = 25Ω, R _{Goff} =25Ω T _J = 25°C		--	615	--	ns
t _r	Rise Time			--	219	--	
t _{d(off)}	Turn–off Delay Time			--	1764	--	
t _f	Fall Time			--	289	--	
E _{on}	Turn–On Switching Loss per Pulse			--	43.16	--	mJ
E _{off}	Turn Off Switching Loss per Pulse			--	27.96	--	
t _{d(on)}	Turn–On Delay Time	V _{CE} =400V, I _C =400A V _{GE} = -7 V to +15 V, R _{Gon} = 25Ω, R _{Goff} =25Ω T _J = 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
E _{off}	Turn Off Switching Loss per Pulse			--	TBD	--	
R _{thJC}	Thermal Resistance – Chip–to–Case	Junction-to-Case (per diode)		--	0.14	--	°C/W
T _{vj op}	Temperature under switching conditions			-40	--	175 ³⁾	°C

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

**Diode (D11, D12)****Absolute Maximum Ratings** ($T_C = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Description	Value	Unit
V_{RRM}	Peak Repetitive Reverse Voltage	750	V
I_F	Continuous Forward Current @ $T_C = 75^\circ\text{C}$ ($T_J = 150^\circ\text{C}$)	400	A
I_{FRM}	Repetitive Peak Forward Current @ $T_J = 150^\circ\text{C}$	800	A

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

Symbol	Parameter	Test Condition		Min	Typ	Max	Unit
V _F	Diode Forward Voltage	I _F = 400 A, V _{GE} = 0 V	T _J = 25°C	--	1.50	2.3	V
			T _J = 150°C	--	1.40	--	
T _{rr}	Reverse Recovery Time	V _{CE} =400 V, I _C =400A V _{GE} = -7 V to +15 V, R _{Gon} = 25Ω, R _{Goff} =25Ω, T _J = 25°C		--	336	--	ns
I _{RRM}	Peak Reverse Recovery Current			--	157	--	A
Q _{rr}	Reverse Recovery Charge			--	8.7	--	μC
E _{REC}	Reverse Recovery Energy			--	3.2	--	mJ
R _{thJC}	Thermal Resistance – Chip-to-Case			Junction-to-Case (per diode)		--	0.189
T _{vj op}	Temperature under switching conditions			-40	--	175 ⁴⁾	°C

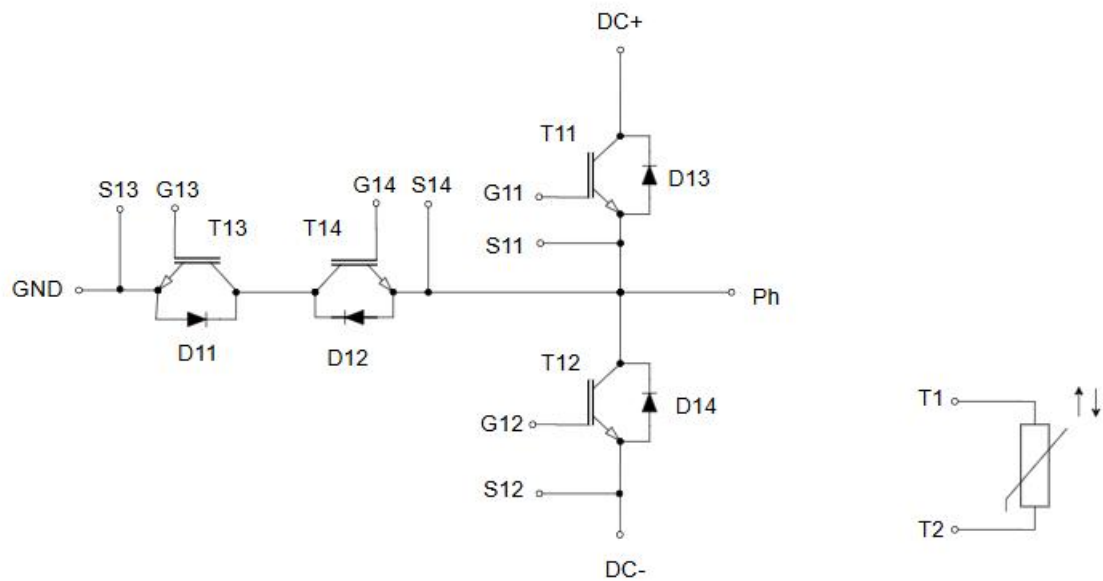
⁴⁾ $T_{vj\text{ op}} > 150^\circ\text{C}$ is only allowed for operation at overload conditions.

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

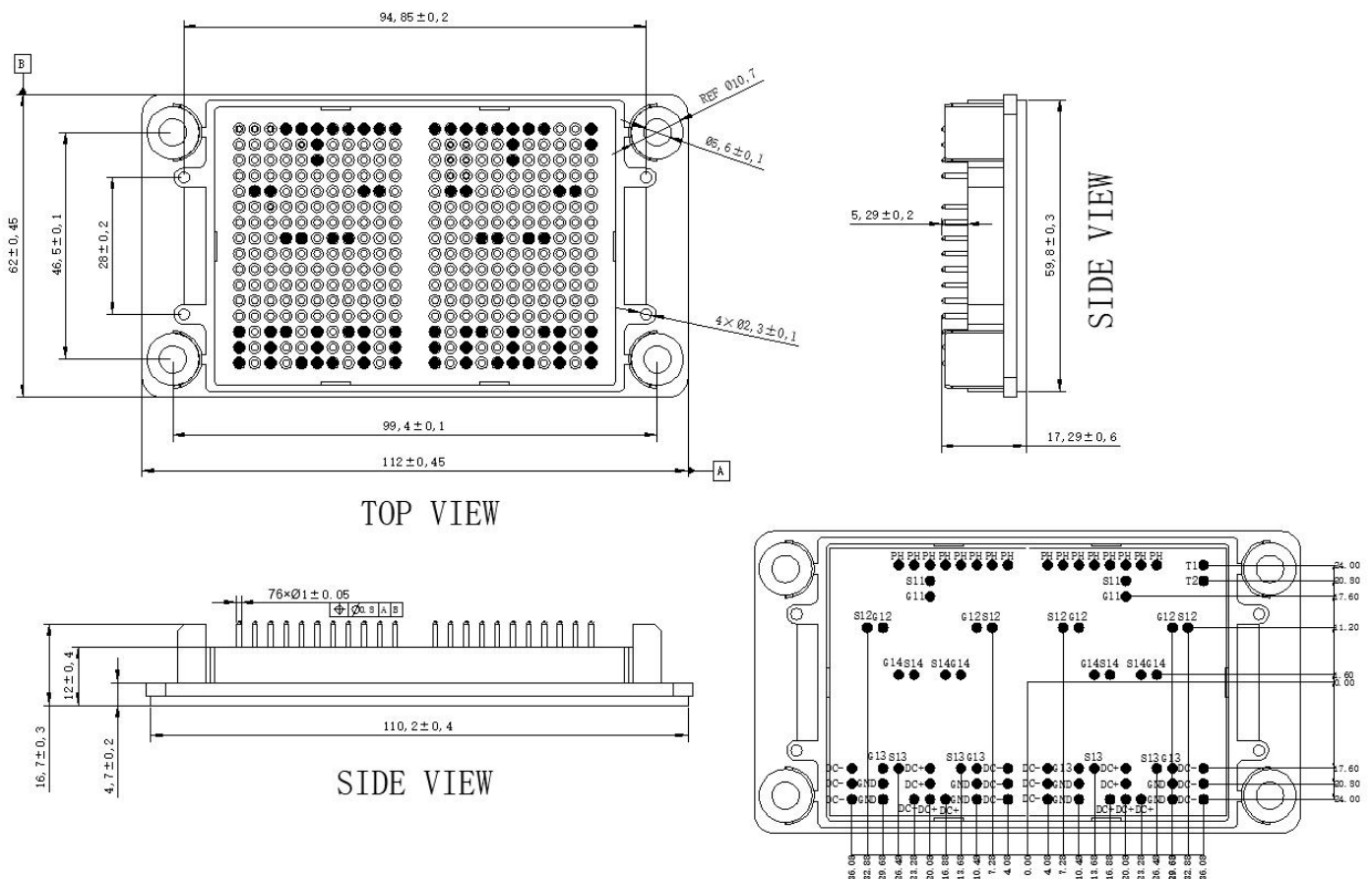
Symbol	Parameter	Test Condition	Min	Typ	Max	Unit
R_{25}	Nominal Resistance	$T = 25^\circ\text{C}$	--	22	--	k Ω
R_{100}	Nominal Resistance	$T = 100^\circ\text{C}$	--	1486	--	Ω
R/R	Deviation of R_{25}		-5	--	-5	%
PD	Power Dissipation		--	200	--	mW
	Power Dissipation Constant		--	2	--	mW/K
	B-value	$B_{(25/50)}$, tolerance $\pm 1\%$	--	3950	--	K
	B-value	$B_{(25/100)}$, tolerance $\pm 1\%$	--	3998	--	K



CIRCUIT DIAGRAM



PACKAGE DIMENSIONS





REVISION HISTORY

Document version	Date of release	Description of changes
Rev.00	2025-5-10	Preview



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