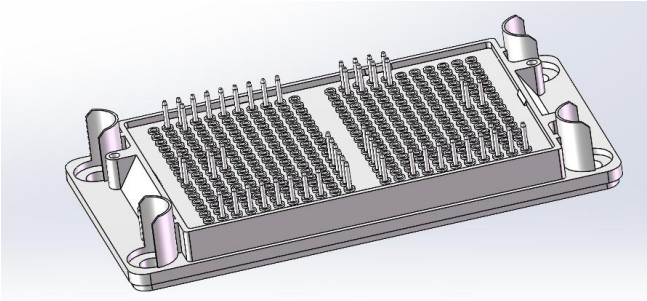
JL3I480V120RE3F7SN

RoHS

Features

- Low Switching Losses
- Low Inductive Design
- Integrated NTC

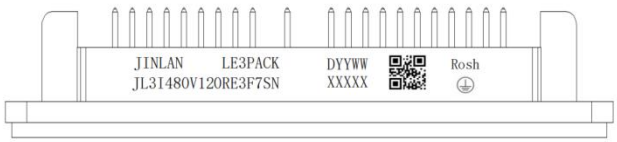


LE3 Pack

Typical Applications

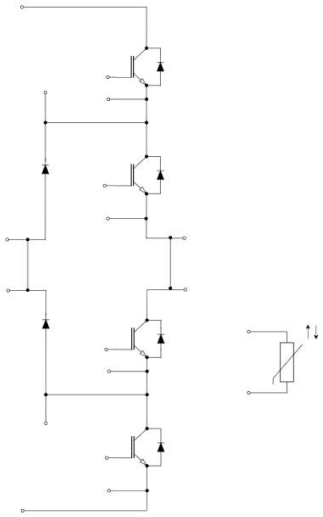
- Solar Applications
- 3-level-applications Converters
- UPS Systems

MARKING DIAGRAM



JINLAN	= Company Name
JL3I480V120RE3F7SN	= 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	4	kV
Creepage distance	d_{creep}	terminal to heatsink	14.2	mm
Creepage distance	d_{creep}	terminal to terminal	6.8	mm
Clearance	d_{clear}	terminal to heatsink	12.4	mm
Clearance	d_{clear}	terminal to terminal	5.5	mm
Comparative tracking index (electrical)	*CTI*		⩾600	

Package Characteristic values

Parameter	Symbol	Note or test condition		Values			Unit
				Min.	Typ.	Max.	
Mounting torque for module mounting	*M*	-Mounting according to valid application note	M5, Screw	3		5	Nm
Flatness of base plate						0.3	mm
Weight	*G*				250		g

MAXIMUM RATINGS (Note 1)

Symbol	Rating	Value	Unit
IGBT (Q1,Q4)			
V_{CES}	Collector−Emitter Voltage	1200	V
V_{GE}	Gate− Emitter Voltage	±30	V
I_C	Continuous Collector Current @ Tc = 80°C, T_J = 175°C	480	A
$I_{C(RM)}$	T_p=1ms	960	A
T_J	Junction Temperature	-40 to +175	℃
IGBT (Q2, Q3)			
V_{CES}	Collector−Emitter Voltage	1200	V
V_{GE}	Gate− Emitter Voltage	±30	V
I_C	Continuous Collector Current @ Tc = 80°C, T_J = 175°C	480	A
$I_{C(RM)}$	T_p=1ms	960	A
T_J	Junction Temperature	-40 to +175	℃
DIODE (D5, D6)			
V_{RRM}	Peak Repetitive Reverse Voltage	1200	V
I_F	Continuous Forward Current @ T_c = 80°C (T_J = 175°C)	640	A
I_{FRM}	T_p=1ms	1280	A
T_J	Junction Temperature	-40 to +175	℃
INVERSE DIODES (D1, D2,D3, D4)			
V_{RRM}	Peak Repetitive Reverse Voltage	1200	V
I_F	Continuous Forward Current @T_J = 150°C	480	A
I_{FRM}	Repetitive Peak Forward Current @T_J = 150°C	960	A
T_J	Junction Temperature	-40 to +175	℃

THERMAL PROPERTIES

T_{stg}	Storage Temperature Range	−40 to 125	℃
$T_{vj\,op}$	Temperature under switching condition	−40 to 150	℃

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. Refer to ELECTRICAL CHARACTERISTICS, RECOMMENDED OPERATING RANGES and/ or APPLICATION INFORMATION for Safe Operating parameters.

RECOMMENDED OPERATING RANGES

Symbol	Rating	Min	Max	Unit
T_J	Module Operating Junction Temperature	-40	175	℃

Functional operation above the stresses listed in the Recommended Operating Ranges is not implied. Extended exposure to stresses beyond the Recommended Operating Ranges limits may affect device reliability.

ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise noted)(AC test is three-level test mode)

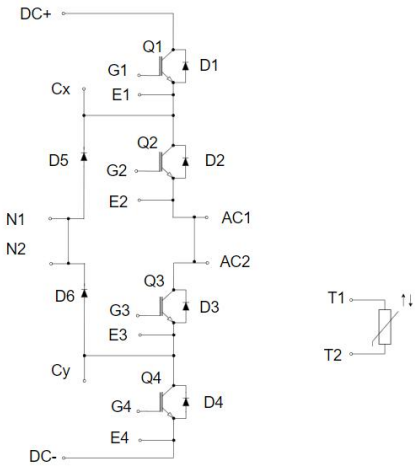
Symbol	Parameter	Test Condition		Min	Typ	Max	Unit
IGBT (Q1,Q2,Q3,Q4)							
I_{CES}	Collector−Emitter Cutoff Current	V_{GE} = 0 V, V_{CE} =1200V ,T_{vj}= 25°C		--	--	800	μA
$V_{CE(sat)}$	Collector−Emitter Saturation Voltage	V_{GE} = 15 V, I_C =400 A	T_J = 25°C	--	1.2	--	V
			T_J = 150°C	--	1.4	--	
$V_{CE(sat)}$	Collector−Emitter Saturation Voltage	V_{GE} = 15 V, I_C =480 A	T_J = 25°C	--	1.6	2.2	V
			T_J = 150°C	--	1.8	--	
$V_{GE(TH)}$	Gate−Emitter Threshold Voltage	V_{GE} = V_{CE} , I_C =15 mA		4.0	5.0	6.0	V
R_{Gint}	Internal Gate Resistance	T_{vj} = 25 °C		--	0.5	--	Ω
I_{GES}	Gate Leakage Current	V_{GE} = ±20 V, V_{CE} = 0 V		--	--	400	nA
$t_{d(on)}$	Turn−On Delay Time	T_J = 25°C V_{CE} =600 V, I_C =240A V_{GE} =±15 V, R_{Gon} = 4.7Ω, R_{Goff} = 4.7Ω		--	200	--	ns
t_r	Rise Time			--	101	--	
$t_{d(off)}$	Turn−off Delay Time			--	698	--	
t_f	Fall Time			--	62	--	
E_{on}	Turn−On Switching Loss per Pulse			--	11.3	--	mJ
E_{off}	Turn Off Switching Loss per Pulse			--	8.75	--	
$t_{d(on)}$	Turn−On Delay Time	T_J = 150°C V_{CE} =600 V, I_C =240A V_{GE} = ±15 V, R_{Gon} = 4.7Ω, R_{Goff} = 4.7Ω		--	220	--	ns
t_r	Rise Time			--	111	--	
$t_{d(off)}$	Turn−off Delay Time			--	767	--	
t_f	Fall Time			--	65	--	
E_{on}	Turn−on Switching Loss per Pulse			--	13.5	--	mJ
E_{off}	Turn Off Switching Loss per Pulse			--	10.5	--	
C_{iss}	Input Capacitance	V_{CE} = 25 V, V_{GE} = 0 V, f = 100 kHz		--	46.1	--	nF
C_{oss}	Output Capacitance			--	1.09	--	
C_{rss}	Reverse Transfer Capacitance			--	0.26	--	
Q_g	Total Gate Charge	V_{GE} = ± 15 V		--	1.423	--	μC
R_{thJC}	Thermal Resistance − Chip−to−Case			--	0.06	--	K/W
DIODE (D5, D6)							
V_F	Diode Forward Voltage	I_F = 480 A, V_{GE} = 0 V	T_J = 25°C	--	1.9	2.8	V
			T_J = 150°C	--	1.8	--	
Q_{rr}	Reverse Recovery Charge	T_J = 25°C V_R =600 V, I_F =240A V_{GE} = ±15 V, R_{Gon} = 4.7Ω, R_{Goff} = 4.7Ω		--	8.1	--	μC
I_{RRM}	Peak Reverse Recovery Current			--	72	--	A
E_{REC}	Reverse Recovery Energy			--	1.15	--	mJ
Q_{rr}	Reverse Recovery Charge	T_J = 150°C V_R =600 V, I_F =240A V_{GE} = ±15 V, R_{Gon} = 4.7Ω, R_{Goff} = 4.7Ω		--	18.2	--	μC
I_{RRM}	Peak Reverse Recovery Current			--	110	--	A
E_{REC}	Reverse Recovery Energy			--	3.88	--	mJ
R_{thJC}	Thermal Resistance − Chip−to−Case				0.12		K/W

ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise noted) (AC test is three-level test mode)

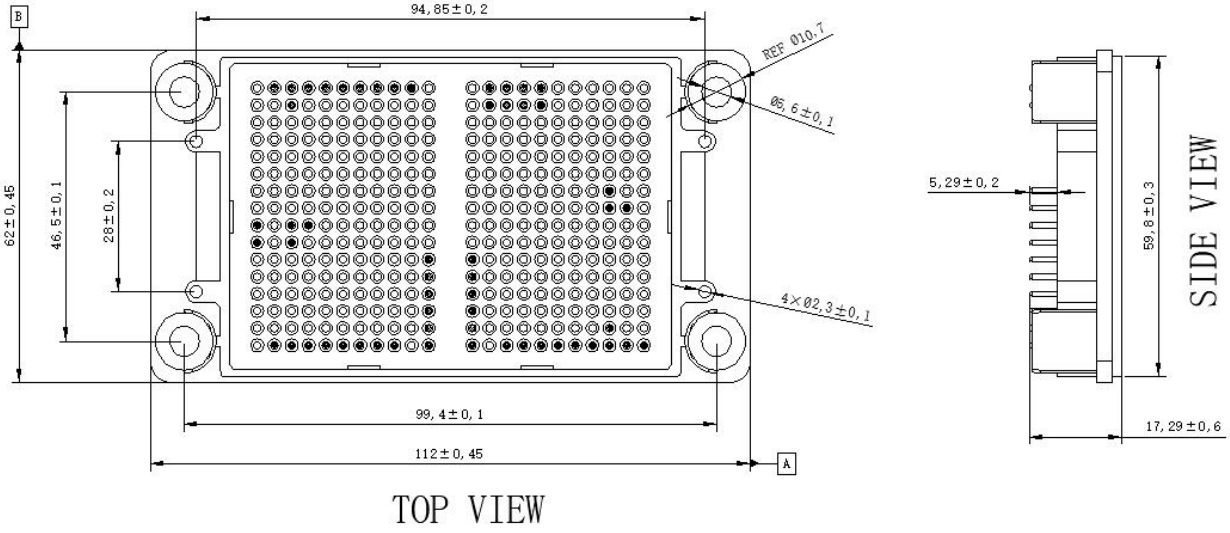
Symbol	Parameter	Test Condition		Min	Typ	Max	Unit
INVERSE DIODES (D1, D2,D3, D4)							
V_F	Diode Forward Voltage	I_F = 480 A, V_{GE} = 0 V	T_J = 25°C	--	1.7	2.6	V
			T_J = 150°C	--	1.6	--	
Q_{rr}	Reverse Recovery Charge	T_J = 25°C V_R =600 V, I_F =240A V_{GE} = ±15 V, R_{Gon} = 4.7Ω, R_{Goff} = 4.7Ω		--	6.08	--	μC
I_{RRM}	Peak Reverse Recovery Current			--	54	--	A
E_{REC}	Reverse Recovery Energy			--	0.86	--	mJ
Q_{rr}	Reverse Recovery Charge	T_J = 150°C V_R =600 V, I_F =240A V_{GE} = ±15 V, R_{Gon} = 4.7Ω, R_{Goff} = 4.7Ω		--	13.6	--	μC
I_{RRM}	Peak Reverse Recovery Current			--	82.8	--	A
E_{REC}	Reverse Recovery Energy			--	2.91	--	mJ
R_{thJC}	Thermal Resistance − Chip−to−Case				0.18		K/W
THERMISTOR PROPERTIES							
R_{25}	Rated Resistance	T_C = 25°C		--	5	--	kQ
ΔR/R	Deviation of R100	T_C=100 ℃,R_{100}=493Ω		-5	--	5	%
P_{25}	Power Dissipation	TNTC = 25°C		--	--	60	mW
$B_{25/50}$	B-value	B (25/50), tolerance ±3%		--	3375	--	K
$B_{25/100}$	B-value	B (25/100), tolerance ±3%		--	3433	--	K

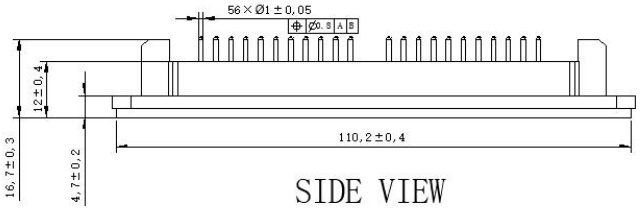
Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted.
Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

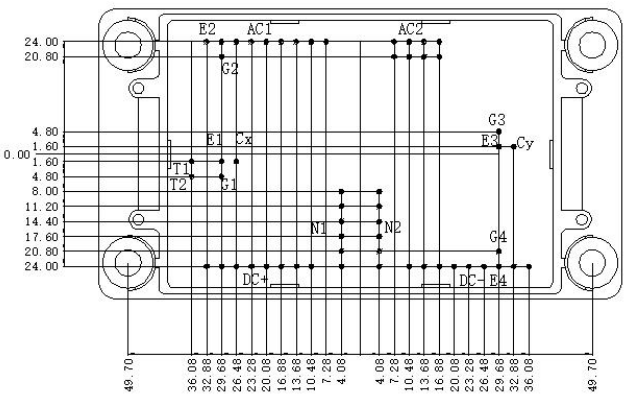
CIRCUIT DIAGRAM



PACKAGE DIMENSIONS







REVISION HISTORY

Document version	Date of release	Description of changes
Rev.00	2024-7-29	Preview

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