JL3I200V65SE2E7SN

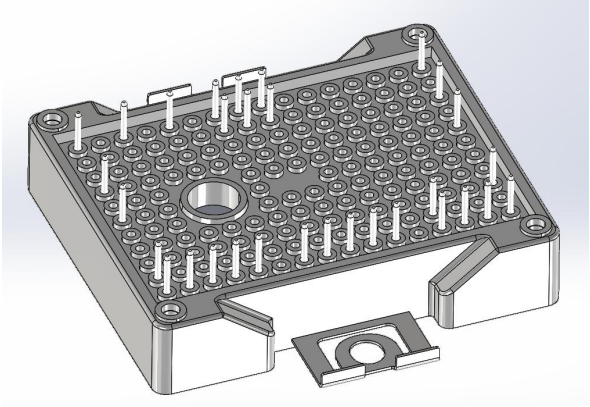
3-Level NPC Inverter Module with 650V Trench Stop IGBTs

RoHS

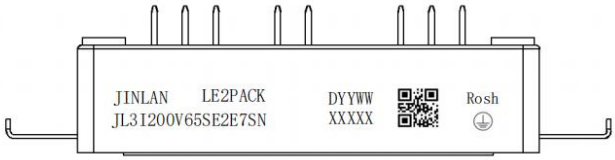
Features

• Electrical features
- 650V Trench Stop IGBTs
- Low Inductive Design
- Low Switching Losses
- Low Inductive Layout
- Thermistor

• Mechanical features
- Compact Design
- Pressfit contact technology
- Al_2O_3 Substrate with Low Thermal Resistance



LE2 Pack

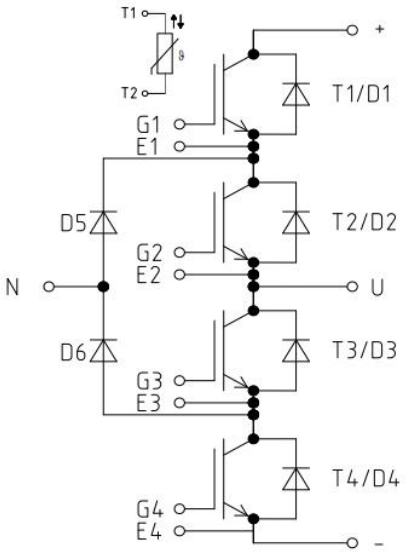


Typical Applications

- 3-Level-Applications
- Solar Applications
- UPS Systems
- Motor drivers

JINLAN	= Company Name
JL3I200V65SE2E7SN	= 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)	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	℃

Package Characteristic values

Parameter	Symbol	Note or test condition	Values			Unit
			Min.	Typ.	Max.	
Stray Inductance	LCE		--	20	--	nH
Module Lead Resistance, Terminal to Chip	RCC'+EE'		--	2	--	mΩ
Storage Temperature Range	T_{STG}		-40		125	℃
Mountig force per clamp	F		40	--	80	N
Weight	G		--	39	--	g

IGBT（T1、T2、T3、T4）

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

Symbol	Description	Value	Unit
V_{CES}	Collector-Emitter Voltage	650	V
V_{GES}	Gate-Emitter Voltage	±30	V
I_{CDC}	Continuous Collector Current @ T_C = 80°C (T_{JMAX} = 175°C)	200	A
I_{CM}	Pulsed Collector Current，t_p limited by $T_{vj\ max}$	400	A
Tjmax	Maximum Junction Temperature	175	℃
P_D	Power Dissipation @ T_C = 25°C	456	W
	Power Dissipation @T_C = 100 °C	227	W

Characteristics （Tc=25℃ unless otherwise noted）

Symbol	Parameter	Test Condition		Min	Typ	Max	Unit
$V_{CE(sat)}$	Collector−Emitter Saturation Voltage	I_C =100A, V_{GE} = 15V	T_{vj} = 25 °C	--	1.15	1.90	V
			T_{vj} = 175 °C	--	1.25	--	
		I_C =200A, V_{GE} = 15V	T_{vj} = 25 °C	--	1.45	2.20	
			T_{vj} = 175 °C	--	1.75	--	
$V_{GE(TH)}$	Gate−Emitter Threshold Voltage	I_C=3mA,V_{CE}=V_{GE}		4.0	--	5.5	V
I_{CES}	Collector−Emitter Cutoff Current	V_{GE} = 0 V, V_{CE} = 650 V		--	--	200	μA
I_{GES}	Gate-Emitter Leakage Current	V_{GE} = ±30 V, V_{CE} = 0 V, T_{vj} = 25°C		--	--	±100	nA
RGint	Internal Gate Resistance	T_{vj} = 25 °C		--	0.8	--	Ω
Cies	Input Capacitance	V_{CE}=25V,V_{GE}=0V, f=1MHz		--	12080	--	pF
Coes	Output capacitance			--	424	--	pF
Cres	Reverse Transfer			--	52	--	pF
Q_G	Gate Charge	T_J = 25°C V_{CE} = 400 V, I_C = 200 A V_{GE} = −5 V to +15 V		--	0.381	--	μC
td(on)	Turn−On Delay Time	V_{CE}=400V, I_C=200A, V_{GE}= −5 V to +15 V, R_G=5Ω Inductive Load Tvj=25°C		--	124	--	ns
tr	Rise Time			--	99	--	
td(off)	Turn−off Delay Time			--	288	--	
tf	Fall Time			--	55	--	
Eon	Turn−On Switching Loss per Pulse			--	9.1	--	mJ
Eoff	Turn Off Switching Loss per Pulse			--	5.3	--	
td(on)	Turn−On Delay Time	V_{CE}=400V, IC=200A, V_{GE}= −5 V to +15 V, R_G=5Ω T_j=175°C		--	TBD	--	ns
tr	Rise Time			--	TBD	--	
td(off)	Turn−off Delay Time			--	TBD	--	
tf	Fall Time			--	TBD	--	
Eon	Turn−on Switching Loss per Pulse			--	13.0	--	mJ
Eoff	Turn Off Switching Loss per Pulse			--	7.0	--	
RthJC	Thermal resistance	Junction-to-Case (per IGBT)		--	0.294	--	K/W
$T_{vj\ op}$		Temperature under switching conditions		-40		175[1)]	℃

[1)] $T_{vj\ op}$ > 150℃ is only allowed for operation at overload conditions. For detailed specifications please refer to AN 2018-14.

Diode (D1、D2、D3、D4)

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

Symbol	Description	Value	Unit
V_{RRM}	Repetitive Peak Reverse Voltage	650	V
I_F	Diode Continuous Forward Current	200	A
I_{FM}	Diode Maximum Forward Current t_p=1ms	400	A

Characteristics （Tc=25℃ unless otherwise noted）

Symbol	Parameter	Test Condition		Min	Typ	Max	Unit
V_F	Diode Forward Voltage	I_F = 100 A	T_J = 25°C	--	1.40	2.40	V
			T_J = 175°C	--	1.30	--	
		I_F = 200 A	T_J = 25°C	--	1.80	2.80	V
			T_J = 175°C	--	1.65	--	
Trr	Reverse Recovery Time	V_{CE}=400V, V_{GE}= −5 V to +15 V, I_F=200A,R_G=5Ω, T_{vj}=25°C		--	265	--	ns
I_{RM}	Peak Reverse Recovery Current			--	58	--	A
Qrr	Recovered Charge			--	7.69	--	μC
E_{rec}	Reverse Recovery Energy			--	0.83	--	mJ
Trr	Reverse Recovery Time	V_{CE}=400V, V_{GE}= −5 V to +15 V I_F=200A,R_G=5Ω, T_{vj}=175°C		--	357	--	ns
I_{RM}	Peak Reverse Recovery Current			--	83	--	A
Qrr	Recovered Charge			--	14.64	--	μC
E_{rec}	Reverse Recovery Energy			--	1.06	--	mJ
R_{thJC}	Thermal resistance	Junction-to-Case (per diode)		--	0.32	--	K/W
$T_{vj\ op}$		Temperature under switching conditions		-40		175[2)]	℃

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

Diode (D5、D6)

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

Symbol	Description	Value	Unit
V_{RRM}	Repetitive Peak Reverse Voltage	650	V
I_F	Diode Continuous Forward Current	200	A
I_{FM}	Diode Maximum Forward Current t_p=1ms	400	A

Characteristics （Tc=25℃ unless otherwise noted）

Symbol	Parameter	Test Condition		Min	Typ	Max	Unit
V_F	Diode Forward Voltage	I_F = 100 A	T_J = 25°C	--	0.85	1.70	V
			T_J = 175°C	--	0.75	--	
		I_F = 200 A	T_J = 25°C	--	1.10	1.90	V
			T_J = 175°C	--	1.0	--	
Trr	Reverse Recovery Time	V_{CE}=400V, V_{GE}= −5 V to +15 V, I_F=200A,R_G=5Ω, T_{vj}=25°C		--	159	--	ns
I_{RM}	Peak Reverse Recovery Current			--	34.8	--	A
Q_{rr}	Recovered Charge			--	4.61	--	μC
E_{rec}	Reverse Recovery Energy			--	0.5	--	mJ
Trr	Reverse Recovery Time	V_{CE}=400V, V_{GE}= −5 V to +15 V I_F=200A,R_G=5Ω, T_{vj}=175°C		--	214	--	ns
IRM	Peak Reverse Recovery Current			--	49.8	--	A
Q_{rr}	Recovered Charge			--	8.78	--	μC

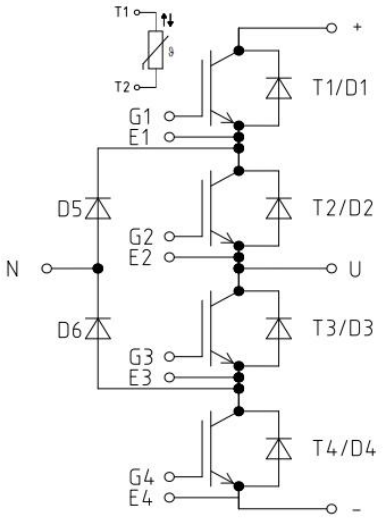
E_{rec}	Reverse Recovery Energy		--	0.64	--	mJ
R_{thJC}	Thermal resistance	Junction-to-Case (per diode)	--	0.31	--	K/W
$T_{vj\ op}$		Temperature under switching conditions	-40		175[3)]	℃

[3)] $T_{vj\ op}$ > 150℃ is only allowed for operation at overload conditions. For detailed specifications please refer to AN 2018-14.

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

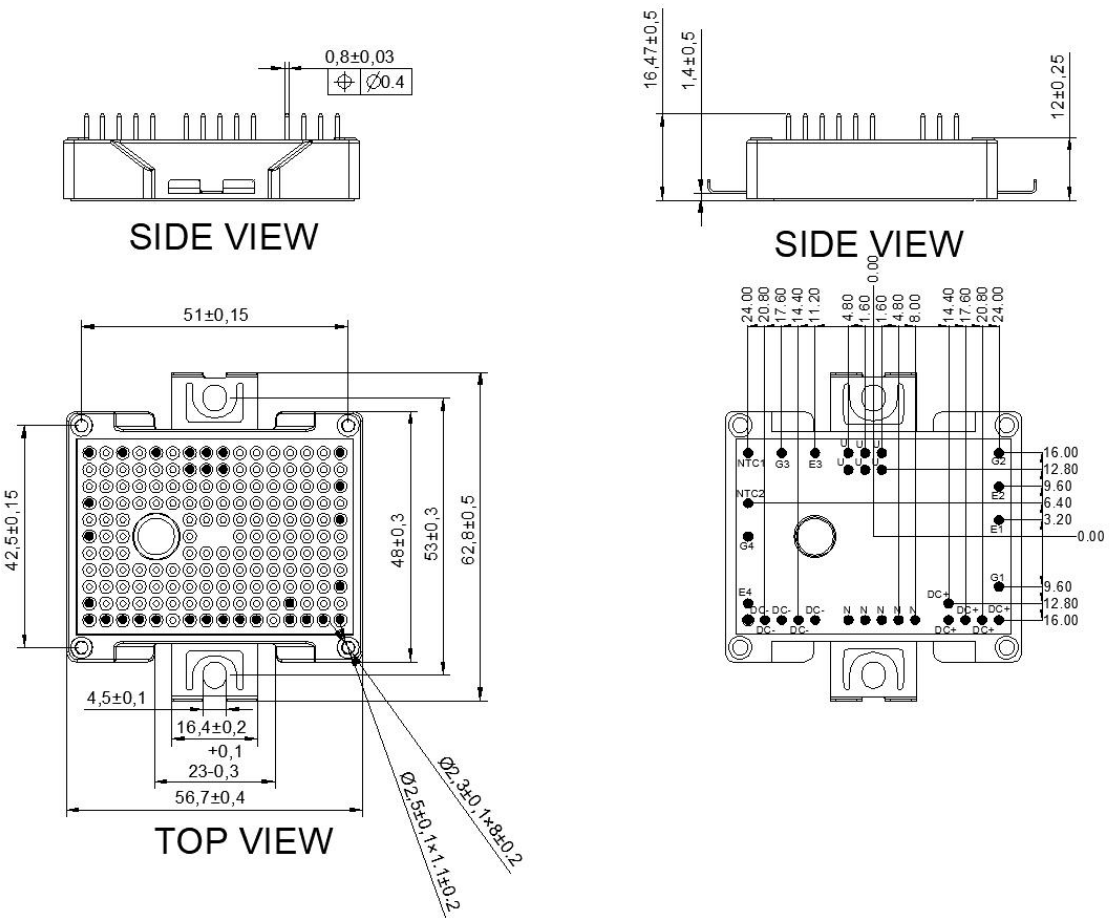
Symbol	Parameter	Test Condition	Min	Typ	Max	Unit
R_{25}	Rated Resistance		--	5.0	--	kΩ
ΔR/R	Deviation of R100	Tc=100 ℃,R_{100}=493.3Ω	-5	--	5	%
P_{25}	Power Dissipation		--	--	20.0	mW
$B_{25/50}$	B-value	$R_2=R_{25}\exp[B_{25/50}(1/T_2- 1/(298.15K))]$	--	3375	--	K
$B_{25/80}$	B-value	$R_2=R_{25}\exp[B_{25/80}(1/T_2- 1/(298.15K))]$	--	3411	--	K
$B_{25/100}$	B-value	$R_2=R_{25}\exp[B_{25/100}(1/T_2- 1/(298.15K))]$	--	3433	--	K

CIRCUIT DIAGRAM



PACKAGE DIMENSION

Dimensions in Millimeters



REVISION HISTORY

Document version	Date of release	Description of changes
Rev.00	2024-11-08	Preview

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