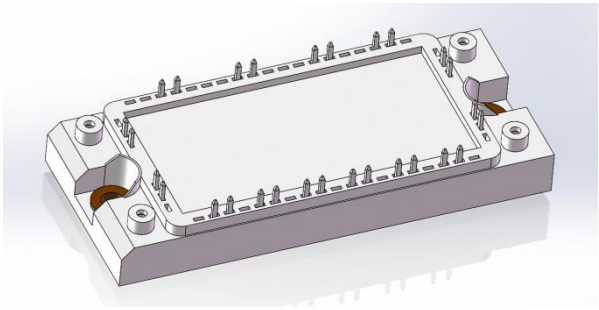
JLFF100B120RN2E7SN

LN2 PACK module with NCE Gen.7 Trench/Fieldstop IGBT and Emitter Controlled diode and NTC

RoHS

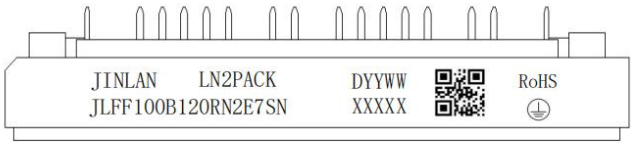
Features

- Low $V_{CE(sat)}$ Trench IGBT technology
- 10μs short circuit capability
- $V_{CE(sat)}$ with positive temperature coefficient
- Overload operation up to 175℃
- Low inductance case
- Copper Base Plate
- Integrated NTC temperature sensor



LN2 Pack

MARKING DIAGRAM

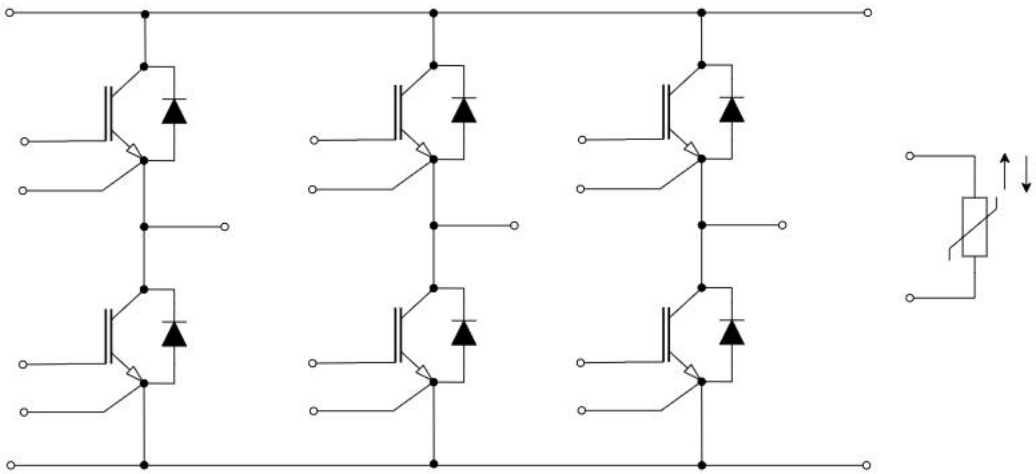


Typical Applications

- Motor Drives
- Inverter
- Welding machines
- UPS

JINLAN	= Company Name
JLFF100B120RN2E7SN	= 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	10.0	mm
Clearance	d_{clear}	terminal to heatsink	7.5	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	L_{CE}		--	19	--	nH
Module Lead Resistance, Terminal to Chip	$R_{CC'+EE'}$	T_C=25℃, per switch	--	1.80	--	mΩ
Storage Temperature Range	T_{STG}		-40		125	℃
Mounting Torque, Screw M5	M	M5, Screw	3		6	N.m
Weight	G		--	180	--	g

IGBT, Inverter

Absolute Maximum Ratings (Tc = 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℃	200	A
	Collector Current @ T_C=80℃	100	A
I_{CM}	Pulsed Collector Current，t_p=1S	300	A
P_{tot}	Total power dissipation,T_C = 25°C, $T_{vj\ max}$ = 150°C	341	W

Characteristics (Tc = 25°C 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	--	1.7	2.55	V
			T_{vj}= 150°C	--	2.1	--	
$V_{GE(th)}$	Gate Threshold Voltage	I_C=1mA,V_{CE}=V_{GE}		5.0	--	7.0	V
I_{CES}	Collector-Emitter Leakage Current	V_{GE}=0V,V_{CE}=1200V		--	--	1	mA
I_{GES}	Gate-Emitter Leakage Current	V_{GE}=30V,V_{CE}=0V		--	--	100	nA
R_{Gint}	Internal Gate Resistance	f=1MHz		--	1.65	--	Ω
C_{ies}	Input Capacitance	V_{CE}=25V,V_{GE}=0V, f=1MHz		--	11.8	--	nF
C_{oes}	Out Capacitance			--	0.34	--	nF
C_{res}	Reverse Transfer			--	0.053	--	nF
Q_G	Gate Charge	V_{GE} = ± 15 V		--	0.36	--	μC
$t_{d(on)}$	Turn−On Delay Time	T_J = 25°C V_{CE} =600V, I_C =100A V_{GE} =±15V, R_{Gon} =10Ω, R_{Goff} =25Ω		--	0.07	--	μs
t_r	Rise Time			--	0.043	--	
$t_{d(off)}$	Turn−off Delay Time			--	0.71	--	
t_f	Fall Time			--	0.045	--	
E_{on}	Turn−On Switching Loss per Pulse			--	18.8	--	mJ
E_{off}	Turn Off Switching Loss per Pulse			--	4.15	--	
$t_{d(on)}$	Turn−On Delay Time	T_J = 150°C V_{CE} =600V, I_C =100A V_{GE} =±15V, R_{Gon} =10Ω, R_{Goff} =25Ω		--	0.107	--	μs
t_r	Rise Time			--	0.056	--	
$t_{d(off)}$	Turn−off Delay Time			--	0.728	--	
t_f	Fall Time			--	0.083	--	
E_{on}	Turn−on Switching Loss per Pulse			--	32.7	--	mJ
E_{off}	Turn Off Switching Loss per Pulse			--	8.58	--	
I_{SC}	SC Data	V_{GE}=15V,V_{CC}≤800V, t_{SC}≤10us,T_j≤150°C		--	300	--	A
R_{thJC}	Thermal resistance	Junction-to-Case (per IGBT)			0.327		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.

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	100	A
I_{FM}	Diode Maximum Forward Current t_p=1ms	200	A

Caracteristics （Tc=25℃ unless otherwise noted）

Symbol	Parameter	Note or Test Condition		Min	Typ	Max	Unit
V_F	Diode Forward Voltage	I_F = 100A, V_{GE} = 0 V	T_J = 25°C	--	1.60	--	V
			T_J = 150°C	--	1.45	--	
Q_{rr}	Reverse Recovery Charge	T_J = 25°C V_{CE} =600V, I_C =100A V_{GE} =±15V, R_{Gon} =10Ω, R_{Goff} =25Ω		--	13	--	μC
I_{RRM}	Peak Reverse Recovery Current			--	44.8	--	A
E_{REC}	Reverse Recovery Energy			--	4.55	--	mJ
Q_{rr}	Reverse Recovery Charge	T_J = 150°C V_R =600 V, I_F =200A V_{GE} = ±15 V, R_{Gon} =10Ω, R_{Goff} = 10Ω		--	35.3	--	μC
I_{RRM}	Peak Reverse Recovery Current			--	51.9	--	A
E_{REC}	Reverse Recovery Energy			--	11	--	mJ
R_{thJC}	Thermal Resistance − Chip−to−Case				0.592		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.

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

Figure1.output characteristic IGBT(typical)
T_{vj}=25°C

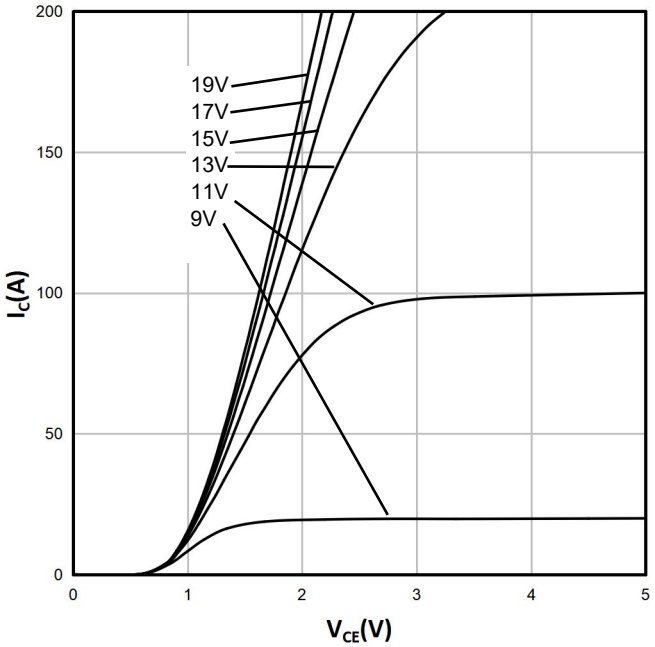


Figure2.output characteristic IGBT(typical)
T_{vj}=150°C

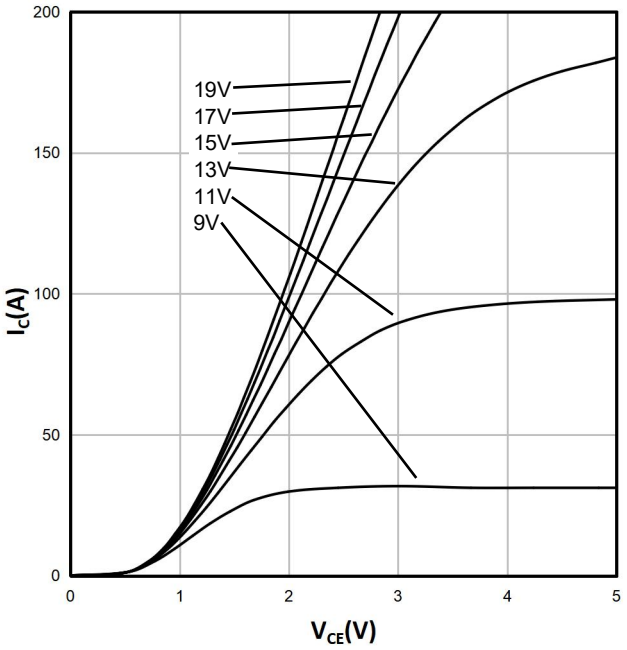


Figure3. $V_{CE(sat)}$ vs. Temperature

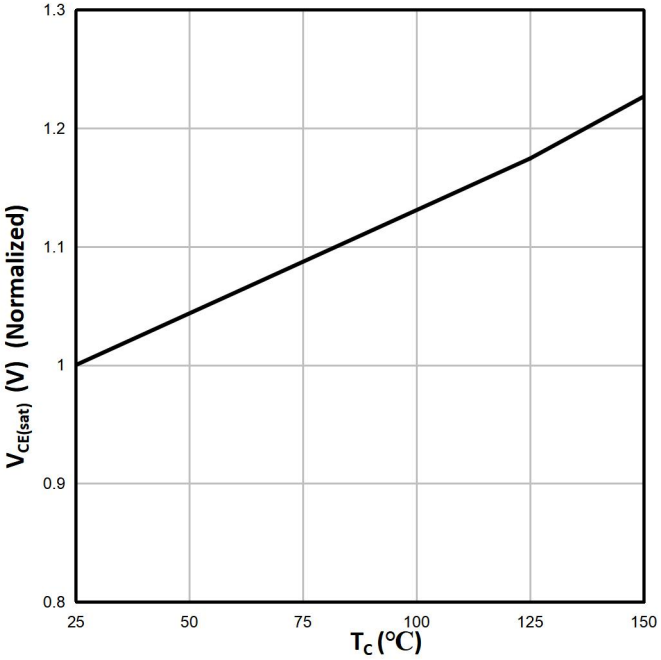


Figure4.transfer characteristic IGBT(typical)
V_{CE}=20V

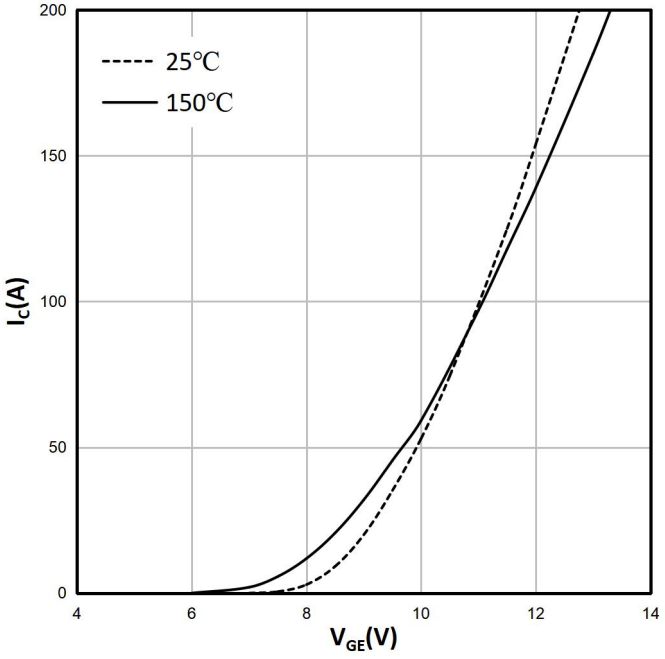


Figure5. FBSOA IGBT(typical)
D=0, Tc=25℃,Tj<=175℃,Vge=15V

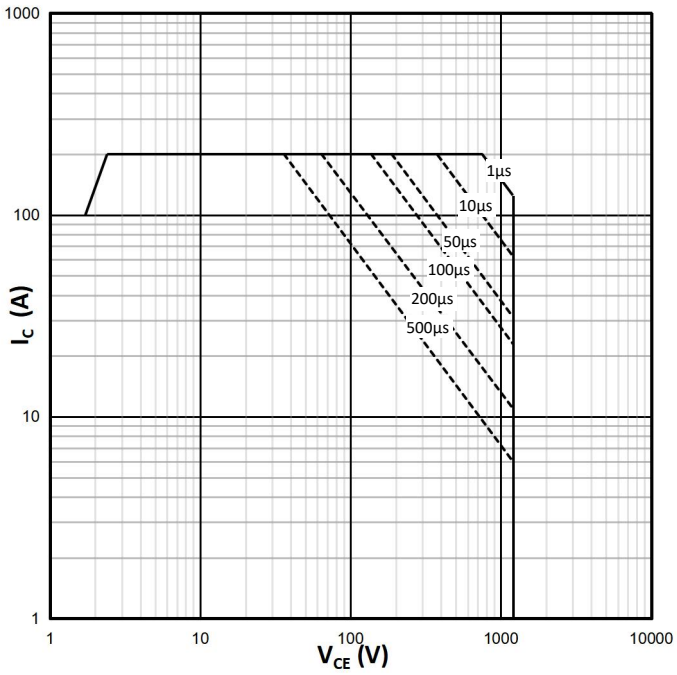


Figure6. Gate Charge Waveform
Vcc=600V,IC=100A,VGE=15V

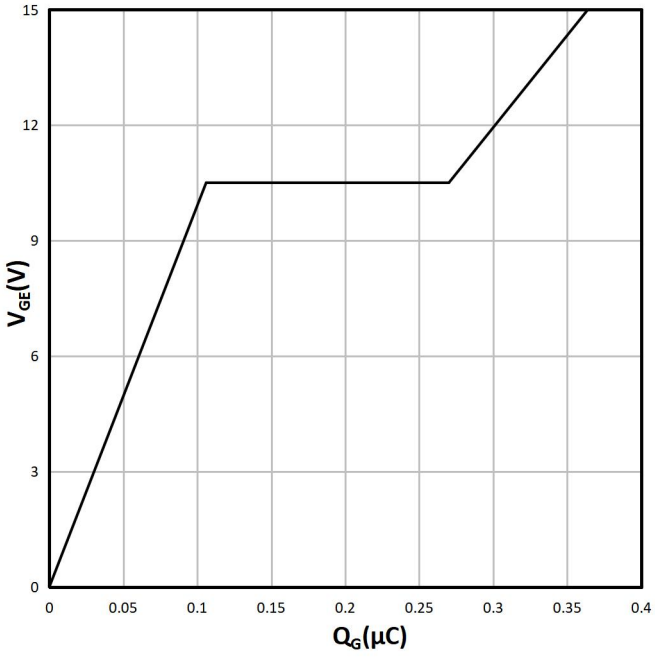


Figure7.switching losses IGBT(typical)
Vcc=600V,R_{Gon} =10Ω, R_{Goff} =25Ω,Vge=±15V

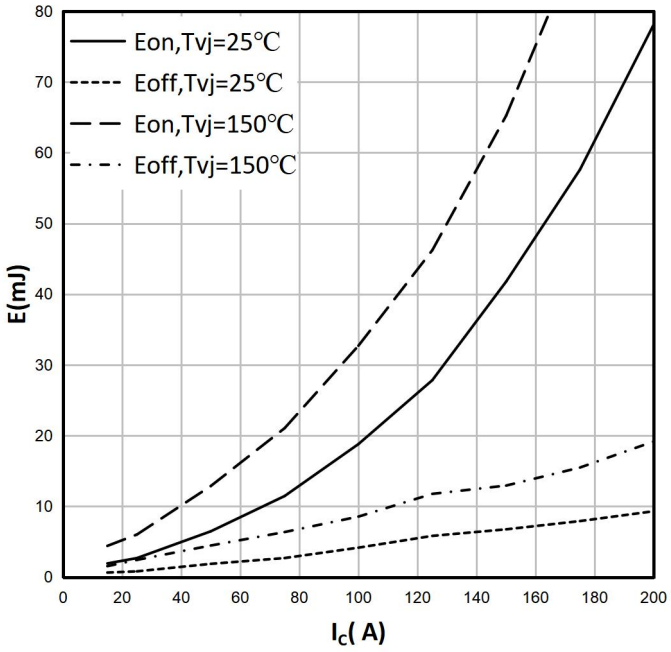


Figure 8.switching losses IGBT,Inverter(typical)
Vcc=600V,Ic=100A,Vge=±15V

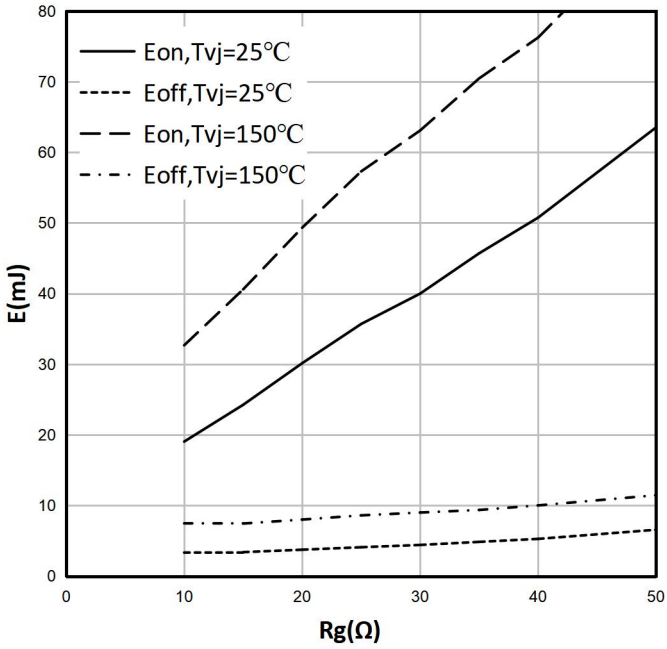


Figure9. transient thermal impedance

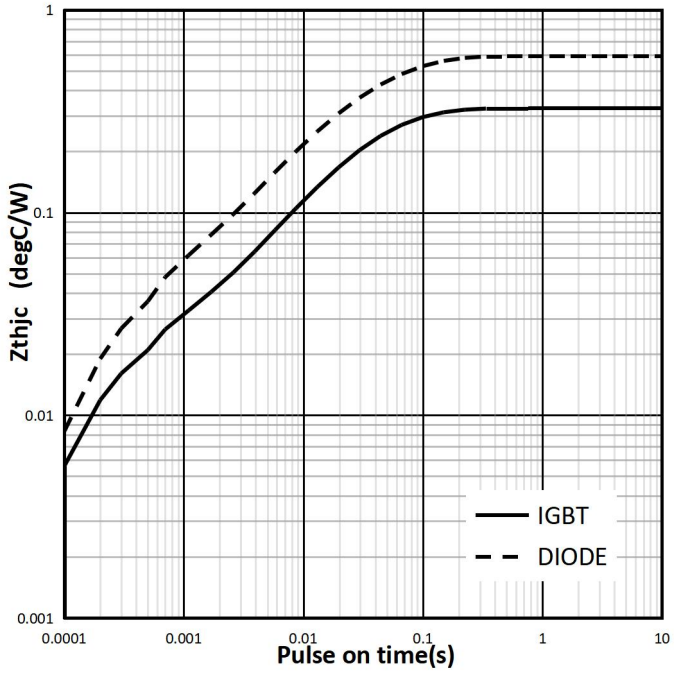


Figure10. forward characteristic of Diode(typical)

VGE=0V

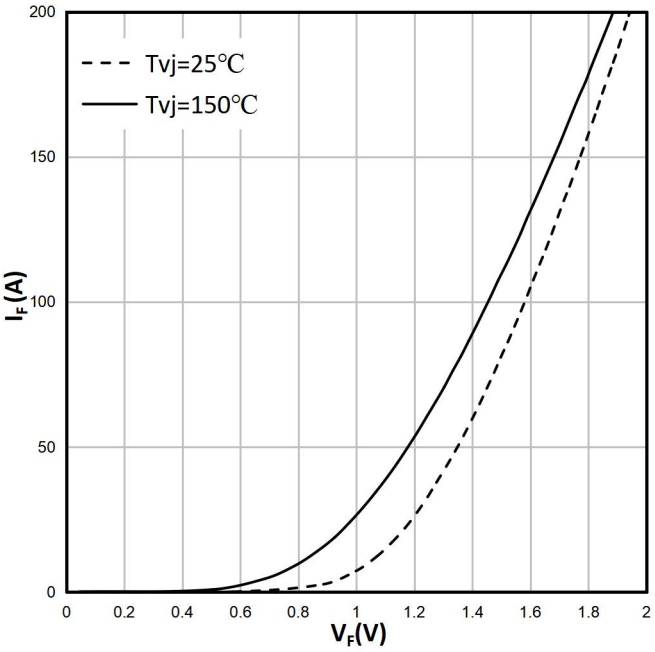


Figure11.Reverse Recovery Energy Loss vs. IC

Vcc=600V,R_{Gon} =10Ω, R_{Goff} =25Ω,Vge=±15V

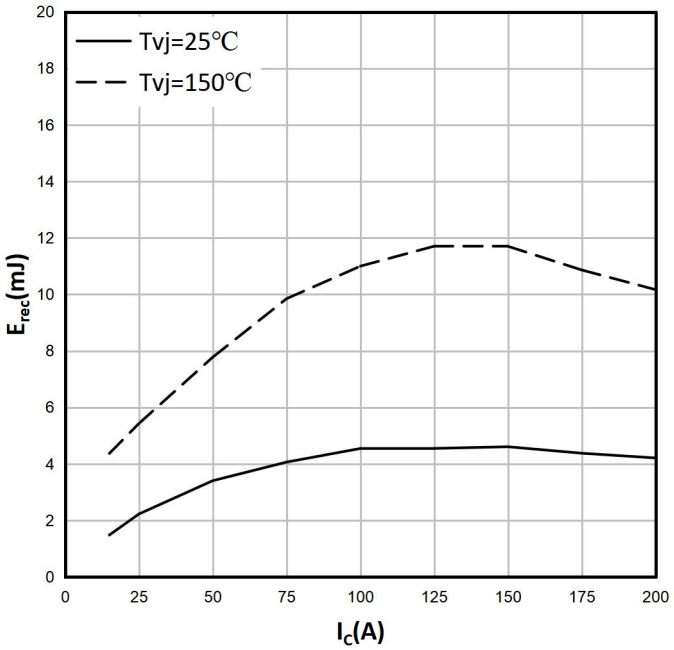
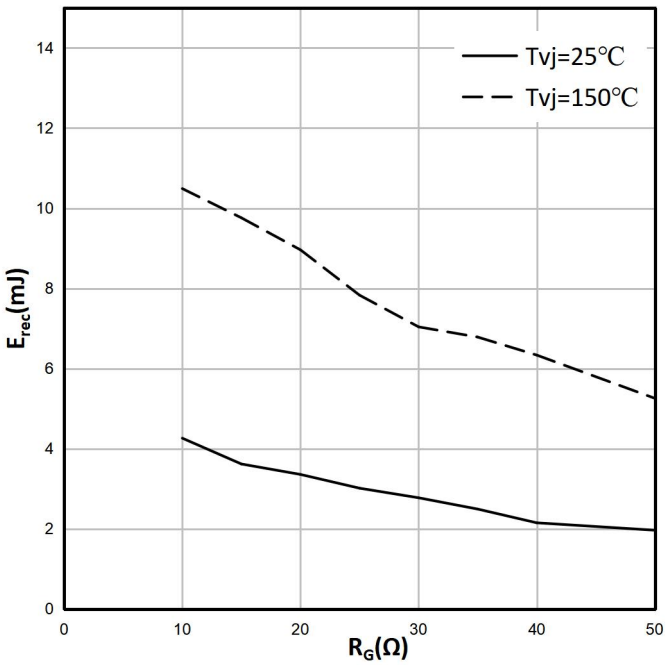
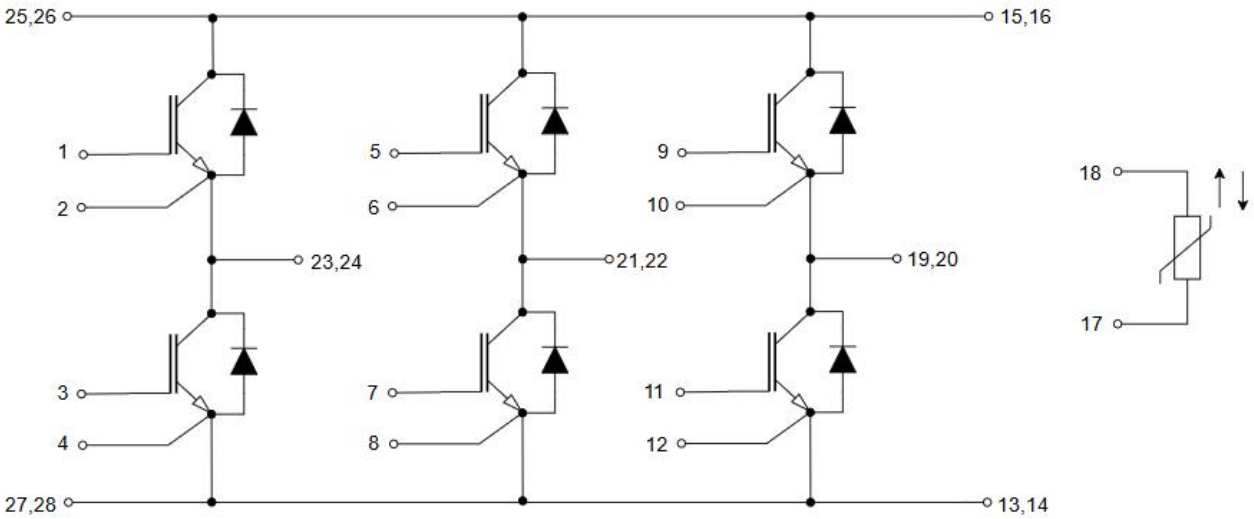


Figure12.Reverse Recovery Energy Loss vs.RG（Diode）

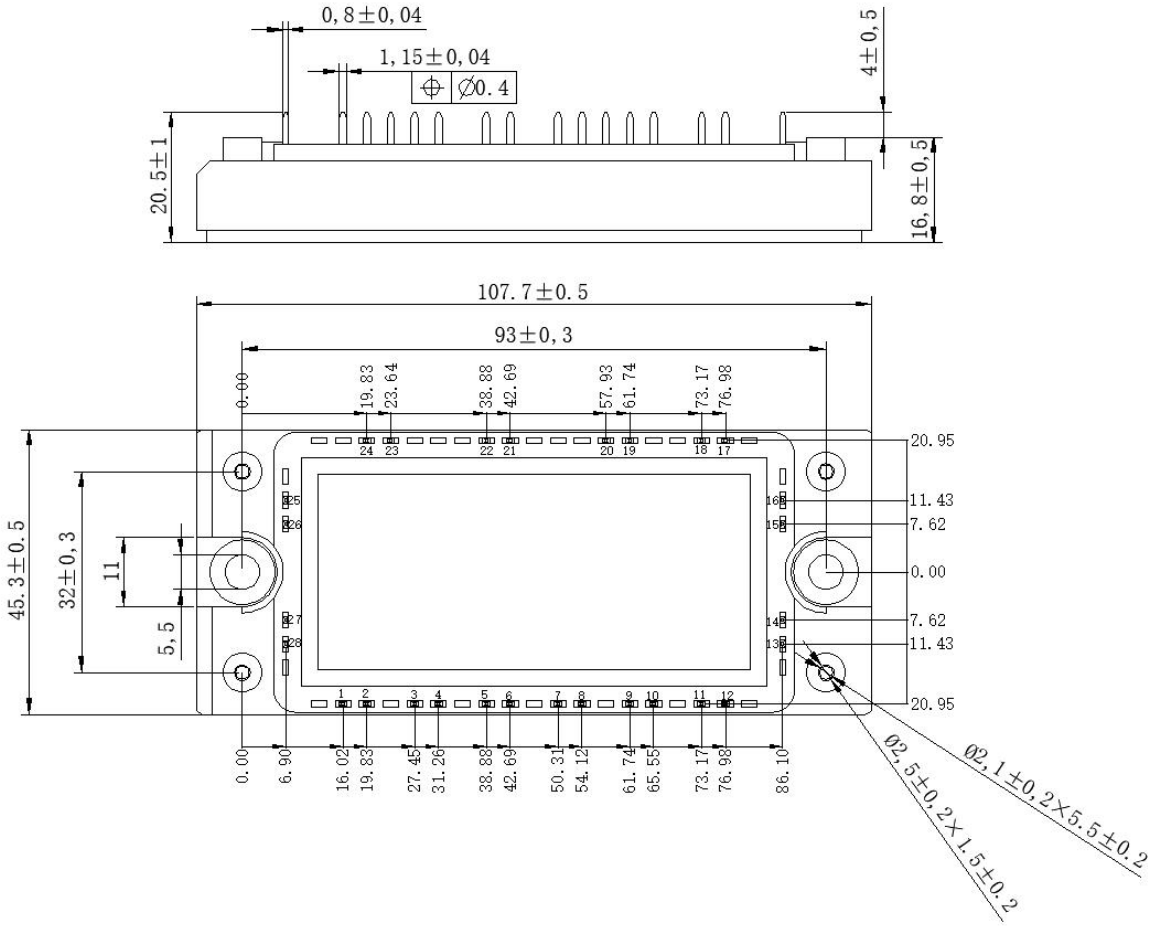
Vcc=600V,Ic=100A,,Vge=±15V



CIRCUIT DIAGRAM



PACKAGE DIMENSION



REVISION HISTORY

Document version	Date of release	Description of changes
Rev.00	2025-04-27	Preview

ATTENTION

■ Any and all Jinlan power products described or contained herein do not have specifications that can handle applications that require extremely high levels of reliability, such as life-support systems, aircraft's control systems, or other applications whose failure can be reasonably expected to result in serious physical and/or material damage. Consult with your Jinlan Power Semiconductor representative nearest you before using any Jinlan power products described or contained herein in such applications.

■ Jinlan Power Semiconductor assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all Jinlan power modules described or contained herein.

■ Specifications of any and all Jinlan power products described or contained herein stipulate the performance, characteristics, and functions of the described products in the independent state, and are not guarantees of the performance, characteristics, and functions of the described products as mounted in the customer's products or equipment. To verify symptoms and states that cannot be evaluated in an independent device, the customer should always evaluate and test devices mounted in the customer's products or equipment.

■ Jinlan Power Semiconductor (Wuxi).co.,LTD. strives to supply high-quality high-reliability products. However,any and all semiconductor products fail with some probability. It is possible that these probabilistic failures could give rise to accidents or events that could endanger human lives, that could give rise to smoke or fire, or that could cause damage to other property. When designing equipment, adopt safety measures so that these kinds of accidents or events cannot occur. Such measures include but are not limited to protective circuits and error prevention circuits for safe design, redundant design, and structural design.

■ In the event that any or all Jinlan power products(including technical data, services) described or contained herein are controlled under any of applicable local export control laws and regulations,such products must not be exported without obtaining the export license from the authorities concerned in accordance with the above law.

■ No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or any information storage or retrieval system, or otherwise, without the prior written permission of Jinlan Power Semiconductor (Wuxi).co.,LTD.

■ Information (including circuit diagrams and circuit parameters) herein is for example only; it is not guaranteed for volume production. Jinlan Power Semiconductor believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringements of intellectual property rights or other rights of third parties.

■ Any and all information described or contained herein are subject to change without notice due to product/technology improvement, etc. When designing equipment, refer to the "Delivery Specification" for the Jinlan power product that you intend to use.

■ This catalog provides information as of Apr.2025.specifications and information herein are subject to change without notice.