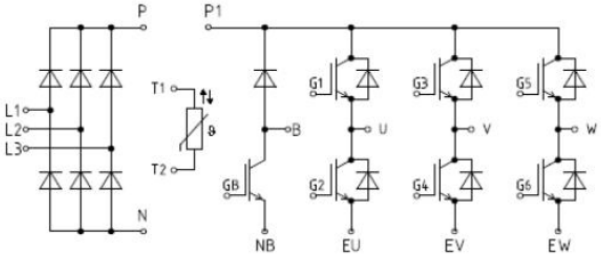
1200V，15A，PIM

Features

- High frequency operation
- Low stray inductance
- High reliability and Power density
- Low switching loss

Applications

- High frequency drivers
- Industry Inverter
- Industry servo
- AC motor control



Key parameter show as below

Part1: IGBT - Inverter
Part2: Diode- Inverter
Part3: Diode-Rectifier
Part4: IGBT - Chopper
Part5: Diode- Chopper
Part6: NTC- Thermistor
Part7: Module

Part1: IGBT - Inverter

Absolute Max Ratings				
Symbol	**Parameter**	**condition**	**Units**	**Maximum**
V_{CES}	Collector-to-Emitter Voltage	T_{VJ}=25 ℃	V	1200
I_C	Continuous DC collector current	TC = 25°C,$T_{VJ\ MAX}$=175 ℃	A	30
		TC = 100°C,$T_{VJ\ MAX}$=175 ℃	A	15
I_{CRM}	Repetitive peak collector current	t_p=1ms	A	30
P_{total}	Total power dissipation	TC = 25°C,$T_{VJ\ MAX}$=175 ℃	°C/W	136
V_{GES}	Gate-Emitter peak voltage		V	+/- 30

IGBT characteristics						
Symbol	**Parameter**	**Test conditions**	**Units**	**Min.**	**Typ.**	**Max.**
$V_{CE(sat)}$	Collector-Emitter Saturation voltage	V_{GE}=15V, I_C=15A,T_{VJ}=25°C	V	—	2.1	2.5
		V_{GE}=15V, I_C=15A,T_{VJ}=125°C	V	—	2.35	—
$V_{GE(th)}$	Gate threshold voltage	V_{GE}= V_{CE}, I_D = 1mA	V	4.8	-	6.8
C_{iss}	Input capacitance	V_{GE} = 0V V_{CE}= 25V T_{VJ}=25°C f = 1MHz	pF	—	980	—
C_{oss}	Output capacitance		pF	—	70	—
C_{rss}	Reverse transfer capacitance		pF	—	45	—
Q_g	Total gate charge	V_{GE} = -15.....+15V	nC	—	132	—
I_{CES}	Collector-Emitter leakage current	V_{CE}=1200V, V_{GE} = 0V,T_{VJ}=25°C	mA	-	-	1
I_{GES}	Gate-Emitter leakage current	V_{CE}=0V, V_{GE} =20V,T_{VJ}=25°C	nA	-	-	200
$T_{d(on)}$	Turn-On DelayTime	T_{VJ}=25°C,V_{CE}=600V, Ic=15A,Rg_{ON}=27ohm, V_{GE}=+/-15V	ns	-	32	-
Tr	Rise Time		ns	-	28	-
$T_{d(off)}$	Turn-Off DelayTime		ns	-	260	-
T_f	Turn-Off Fall Time		ns	-	80	-
$T_{d(on)}$	Turn-On DelayTime	T_{VJ}=125°C,V_{CE}=600V, Ic=15A,Rg_{ON}=27ohm, V_{GE}=+/-15V	ns	-	35	-
Tr	Rise Time		ns	-	33	-
$T_{d(off)}$	Turn-Off DelayTime		ns	-	289	-
T_f	Turn-Off Fall Time		ns	-	98	-
E_{on}	Turn-on switch loss	T_{VJ}=25°C,V_{CE}=600V,	mJ	-	1.4	-

E_{off}	Turn-off switch loss	Ic=15A,Rg_{ON}=27ohm, L_S=45nH, V_{GE}=+/-15V	mJ	-	0.9	-
E_{on}	Turn-on switch loss	T_{VJ}=125°C,V_{CE}=600V, Ic=15A,Rg_{ON}=27ohm, L_S=45nH, V_{GE}=+/-15V	mJ	-	1.8	-
E_{off}	Turn-off switch loss		mJ	-	1.25	-
I_{SC}	Short- circuit current	T_{VJ}=125°C,V_{GE}=15V, V_{CE}=720V, t_P<10us	A	-	65	-
R_{ThJC}	Junction-Case Thermal resistance		K/W		-	1.1
$T_{VJ\ OP}$	Temperature under switching		°C	-40		150

Part2: Diode- Inverter

Absolute Max Ratings				
Symbol	**Parameter**	**condition**	**Units**	**Maximum**
V_{RRM}	Repetitive peak reversevoltage	T_{VJ}=25 ℃	V	1200
I_F	Continuous DC forward current		A	15
I_{FRM}	Repetitive peak forward current	T_p=1ms	A	30
I^2t	I^2t Data	V_R=0V,T_p=10ms,T_{VJ}=125 ℃	A^2s	15

Diode characteristics						
Symbol	**Parameter**	**Test conditions**	**Units**	**Min.**	**Typ.**	**Max.**
V_F	Forward voltage	I_F=15A,T_{VJ}=25 ℃	V	-	2.2	2.6
I_{RM}	Peak reverse recovery current	I_F=15A,dif/dt=500A/us (T_{VJ}=25 ℃),V_R=600V, V_{GE}=-15V,T_{VJ}=25 ℃	A	-	14	-
Q_r	Recovery charge		uC	-	1.25	-
E_{rec}	Reverse recovery energy		mJ	-	0.385	-
I_{RM}	Peak reverse recovery current	I_F=15A,dif/dt=500A/us (T_{VJ}=125 ℃),V_R=600V, V_{GE}=-15V,T_{VJ}=125 ℃	A		13	
Q_r	Recovery charge		uC		2.3	
E_{rec}	Reverse recovery energy		mJ		0.75	
R_{ThJC}	Junction-Case Thermal resistance		K/W		-	1.8
$T_{VJ\ OP}$	Temperature under switching		°C	-40		150

Part3: Diode-Rectifier

Absolute Max Ratings				
Symbol	**Parameter**	**condition**	**Units**	**Maximum**
V_{RRM}	Repetitive peak reversevoltage	T_{VJ}=25 ℃	V	1600
I_{FRMSM}	Maximum RMS forward current	T_C= 80 ℃	A	30
I_{RMSM}	Maximum RMS current at rectifier output	T_C= 80 ℃	A	30
I_{FSM}	Surge forward current	T_p=10ms,T_{VJ}=25 ℃	A	300
I_{FSM}	Surge forward current	T_p=10ms,T_{VJ}=150 ℃	A	240
I^2t	I^2t Data	V_R=0V,T_p=10ms,T_{VJ}=25 ℃	A^2s	450
I^2t	I^2t Data	V_R=0V,T_p=10ms,T_{VJ}=150 ℃	A^2s	300

Diode characteristics						
Symbol	**Parameter**	**Test conditions**	**Units**	**Min.**	**Typ.**	**Max.**
V_F	Forward voltage	I_F=15A,T_{VJ}=25 ℃	V	-	1.3	-
I_R	Reverse Current	V_R=1600A,T_{VJ}=25 ℃	mA	-	1.0	-
R_{ThJC}	Junction-Case Thermal resistance		K/W		-	1.35
$T_{VJ\ OP}$	Temperature under switching		℃	-40		150

Part4: IGBT - Break /Chopper

Absolute Max Ratings				
Symbol	**Parameter**	**condition**	**Units**	**Maximum**
V_{CES}	Collector-to-Emitter Voltage	T_{VJ}=25 ℃	V	1200
I_C	Continuous DC collector current	TC = 25°C,$T_{VJ\ MAX}$=175 ℃	A	30
		TC = 100°C,$T_{VJ\ MAX}$=175 ℃	A	15
I_{CRM}	Repetitive peak collector current	t_p=1ms	A	30
P_{total}	Total power dissipation	TC = 25°C,$T_{VJ\ MAX}$=150 ℃	°C/W	136
V_{GES}	Gate-Emitter peak voltage		V	+/- 30

IGBT characteristics						
Symbol	**Parameter**	**Test conditions**	**Units**	**Min.**	**Typ.**	**Max.**
$V_{CE(sat)}$	Collector-Emitter Saturation voltage	V_{GE}=15V, I_C=15A,T_{VJ}=25°C	V	—	2.1	2.5
		V_{GE}=15V, I_C=15A,T_{VJ}=125°C	V	—	2.35	—
$V_{GE(th)}$	Gate threshold voltage	V_{GE}= V_{CE}, I_D = 1mA	V	4.8	-	6.8
C_{iss}	Input capacitance	V_{GE} = 0V V_{CE}= 25V T_{VJ}=25°C f = 1MHz	pF	—	980	—
C_{oss}	Output capacitance		pF	—	70	—
C_{rss}	Reverse transfer capacitance		pF	—	45	—
Q_g	Total gate charge	V_{GE} = -15.....+15V	nC	—	192	—
I_{CES}	Collector-Emitter leakage current	V_{CE}=1200V, V_{GE} = 0V,T_{VJ}=25°C	mA	-	-	1
I_{GES}	Gate-Emitter leakage current	V_{CE}=0V, V_{GE} =20V,T_{VJ}=25°C	nA	-	-	200
$T_{d(on)}$	Turn-On DelayTime	T_{VJ}=25°C,V_{CE}=600V, Ic=15A,Rg_{ON}=27ohm, V_{GE}=+/-15V	ns	-	32	-
Tr	Rise Time		ns	-	28	-
$T_{d(off)}$	Turn-Off DelayTime		ns	-	260	-
T_f	Turn-Off Fall Time		ns	-	80	-
$T_{d(on)}$	Turn-On DelayTime	T_{VJ}=125°C,V_{CE}=600V, Ic=15A,Rg_{ON}=27ohm, V_{GE}=+/-15V	ns	-	35	-
Tr	Rise Time		ns	-	33	-
$T_{d(off)}$	Turn-Off DelayTime		ns	-	289	-
T_f	Turn-Off Fall Time		ns	-	98	-

E_{on}	Turn-on switch loss	T_{VJ}=25°C,V_{CE}=600V, Ic=15A,Rg_{ON}=27ohm, L_S=45nH, V_{GE}=+/-15V	mJ	-	1.4	-
E_{off}	Turn-off switch loss		mJ	-	0.9	-
E_{on}	Turn-on switch loss	T_{VJ}=125°C,V_{CE}=600V, Ic=15A,Rg_{ON}=27ohm, L_S=45nH, V_{GE}=+/-15V	mJ	-	1.8	-
E_{off}	Turn-off switch loss		mJ	-	1.25	-
I_{SC}	Short- circuit current	T_{VJ}=125°C,V_{GE}=15V, V_{CE}=720V, t_P<10us	A	-	65	-
R_{ThJC}	Junction-Case Thermal resistance		K/W		-	1.1
$T_{VJ\ OP}$	Temperature under switching		°C	-40		150

Part5: Diode- Chopper

Absolute Max Ratings				
Symbol	**Parameter**	**condition**	**Units**	**Maximum**
V_{RRM}	Repetitive peak reversevoltage	T_{VJ}=25 ℃	V	1200
I_F	Continuous DC forward current		A	10
I_{FRM}	Repetitive peak forward current	T_p=1ms	A	20
I^2t	I^2t Data	V_R=0V,T_p=10ms,T_{VJ}=125 ℃	A^2s	15

Diode characteristics						
Symbol	**Parameter**	**Test conditions**	**Units**	**Min.**	**Typ.**	**Max.**
V_F	Forward voltage	I_F=10A,V_{GE}=0V,T_{VJ}=25 ℃	V	-	2.0	2.3
V_F	Forward voltage	I_F=10A,V_{GE}=0V,T_{VJ}=125 ℃	V	-	1.85	2.2
I_{RM}	Peak reverse recovery current	I_F=10A,diF/dt=400A/us (T_{VJ}=125 ℃),V_R=600V, V_{GE}=-15V,T_{VJ}=25 ℃	A	-	14	-
Q_r	Recovery charge		uC	-	1.0	-
E_{rec}	Reverse recovery energy		mJ	-	0.26	-
I_{RM}	Peak reverse recovery current	I_F=10A,diF/dt=400A/us (T_{VJ}=125 ℃),V_R=600V, V_{GE}=-15V,T_{VJ}=125 ℃	A	-	15	-
Q_r	Recovery charge		uC	-	1.8	-
E_{rec}	Reverse recovery energy		mJ	-	0.56	-
R_{ThJC}	Junction-Case Thermal resistance		K/W		-	2.1
$T_{VJ\ OP}$	Temperature under switching		°C	-40		150

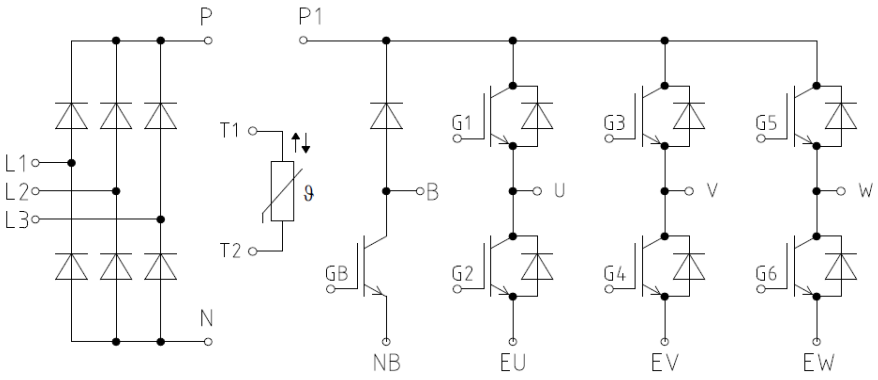
Part6: NTC- Thermistor

Diode characteristics						
Symbol	**Parameter**	**Test conditions**	**Units**	**Min.**	**Typ.**	**Max.**
R_{25}	Rated Resistance	T_C= 25 ℃	kΩ	-	5.0	-
ΔR/R	Deviation for R100	T_C= 25 ℃,R100=493Ω	%	-5	-	5
P_{25}	Power dissipation	T_C= 25 ℃	mW	-	-	20.0
$B_{25/50}$	B-value	$R_2=R_{25}\exp[B_{25/50}$ (1/T2-1/(298,15K))]	K	-	3375	-

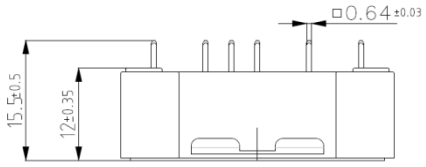
Part7: Module

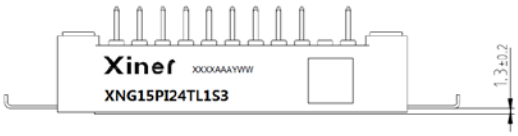
Module parameter						
Symbol	**Parameter**	**Test conditions**	**Units**	**Min.**	**Typ.**	**Max.**
V_{ISOL}	Isolation voltage	RMS,f=50Hz,t=1min	kV	-	2.5	
	Internal Isolation	Basic insulation (class1,IEC61140)			Al_2O_3	
	Cree page distance	Terminal to Terminal	mm		5	
CTI	Comperative tracking index			225		
$L_{s\ CE}$	Stray induction module		nH		30	
$R_{CC'+EE'}$	Module lead resistance	T_C= 25 ℃	mΩ		8.0	
$R_{AA'+CC'}$	Module lead resistance	T_C= 25 ℃	mΩ		6.0	
T_{STG}	Storage Temperature		℃	-40		125
M	Monuting torque		Nm	3.0		6.0
G	Weigh		g		24	

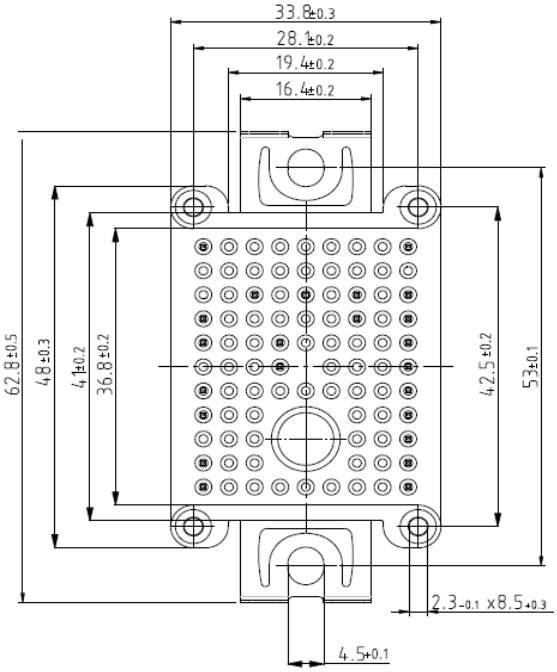
- **Circuit diagram headline**

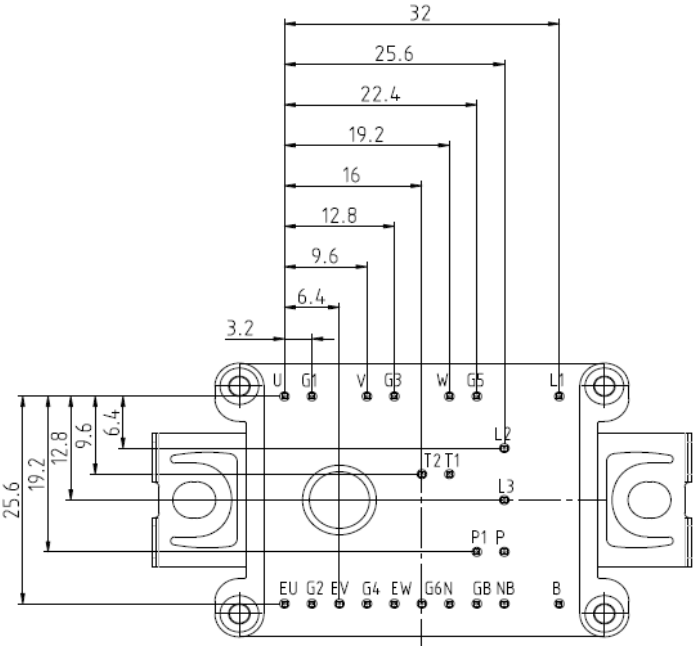


- **Package Dimensions** (Unit:mm)









Published by

ShenZhen Invsemi Co.,Ltd
2nd Floor,Building 8th,Huafeng Cyber Park,9th Baoqing Road,
Longgang District,ShenZhen,China 518119
Tel/Fax: 0755-89890048

Attention

- Specifications of any and all Invsemi 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.
- Any and all Invsemi 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 us described or contained herein in such applications.
- Invsemi 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 Silikron products described or contained herein.
- Any and all information described or contained herein are subject to change without notice due to product/technology improvement, etc.
- We hereby disclaim any and all warranties, including but not limited to warranties of non-infringement,regarding circuits, descriptions and charts stated herein.