



Vincotech

30-E312NIB560H710-PR40F07Z

target datasheet

flowNPC E3BP

1200 V / 560 A

Topology features

- Low side Kelvin Emitter for improved switching performance
- Neutral Point Clamped Topology (I-Type)
- Split topology
- Temperature sensor

Component features

- High speed switching
- Low collector emitter saturation voltage
- Low turn-off losses
- Optimized for hard switching topologies
- Positive temperature coefficient

Housing features

- Cu baseplate
- Convex shaped baseplate for superior thermal contact
- CTI600 housing material
- Baseplate with rough surface
- Thermo-mechanical push-and-pull force relief
- Solder pin

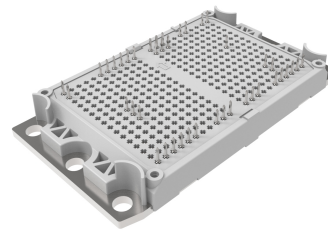
Target applications

- Energy Storage Systems

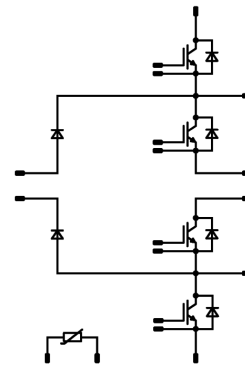
Types

- 30-E312NIB560H710-PR40F07Z

flow E3BP 12 mm housing



Schematic





Vincotech

30-E312NIB560H710-PR40F07Z
target datasheet

Maximum Ratings

$T_j = 25\text{ °C}$, unless otherwise specified

Parameter	Symbol	Conditions	Value	Unit
-----------	--------	------------	-------	------

Buck Switch

Collector-emitter voltage	V_{CES}		1200	V
Collector current (DC current)	I_C	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	462	A
Repetitive peak collector current	I_{CRM}	t_p limited by T_{jmax}	1680	A
Turn off safe operating area		$T_j = 150\text{ °C}$, $V_{CE} = 1200\text{ V}$	1680	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	646	W
Gate-emitter voltage	V_{GES}		± 20	V
Maximum junction temperature	T_{jmax}		175	°C

Buck Diode

Peak repetitive reverse voltage	V_{RRM}		1200	V
Forward current (DC current)	I_F	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	349	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{jmax}	1680	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	450	W
Maximum junction temperature	T_{jmax}		175	°C

Boost Switch

Collector-emitter voltage	V_{CES}		1200	V
Collector current (DC current)	I_C	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	462	A
Repetitive peak collector current	I_{CRM}	t_p limited by T_{jmax}	1680	A
Turn off safe operating area		$T_j = 150\text{ °C}$, $V_{CE} = 1200\text{ V}$	1680	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	646	W
Gate-emitter voltage	V_{GES}		± 20	V
Maximum junction temperature	T_{jmax}		175	°C



Vincotech

30-E312NIB560H710-PR40F07Z
target datasheet

Maximum Ratings

$T_j = 25\text{ °C}$, unless otherwise specified

Parameter	Symbol	Conditions	Value	Unit
Boost Diode				
Peak repetitive reverse voltage	V_{RRM}		1200	V
Forward current (DC current)	I_F	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	349	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{jmax}	1680	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	450	W
Maximum junction temperature	T_{jmax}		175	°C

Boost Sw. Inv. Diode

Peak repetitive reverse voltage	V_{RRM}		1200	V
Forward current (DC current)	I_F	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	349	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{jmax}	1680	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	450	W
Maximum junction temperature	T_{jmax}		175	°C

Module Properties

Thermal Properties

Storage temperature	T_{stg}		-40...+125	°C
Operation temperature under switching condition	T_{jop}		-40...+($T_{jmax} - 25$)	°C

Isolation Properties

Isolation voltage	V_{isol}	DC Test Voltage $t_p = 2\text{ s}$	6800	V
Creepage distance			>12,7	mm
Clearance			>12,7	mm
Comparative Tracking Index	CTI		≥ 600	



Vincotech

30-E312NIB560H710-PR40F07Z
target datasheet

Characteristic Values

Parameter	Symbol	Conditions						Values			Unit
			V_{GE} [V] V_{GS} [V]	V_{CE} [V] V_{DS} [V] V_F [V]	I_C [A] I_D [A] I_F [A]	T_j [°C]	Min	Typ	Max		

Buck Switch

Static

Gate-emitter threshold voltage	$V_{GE(th)}$	$V_{CE} = V_{GE}$			0,0048	25	4,7	5,5	6,2	V
Collector-emitter saturation voltage	V_{CEsat}		15		560	25		1,7	2,15	V
Collector-emitter cut-off current	I_{CES}		0	1200		25			16	μA
Gate-emitter leakage current	I_{GES}		20	0		25			400	nA
Internal gate resistance	r_g							None		Ω
Input capacitance	C_{ies}	$f = 100 \text{ kHz}$	0	25		25		74000		pF
Output capacitance	C_{oes}							1268		pF
Reverse transfer capacitance	C_{res}							376		pF
Gate charge	Q_g	$V_{CC} = 960 \text{ V}$	0/15		560	25		4128		nC

Thermal

Thermal resistance junction to sink	$R_{th(j-s)}$	$\lambda_{paste} = 5,2 \text{ W/mK}$ (PTM)						0,15		K/W
-------------------------------------	---------------	---	--	--	--	--	--	------	--	-----

Buck Diode

Static

Forward voltage	V_F				144	25		1,7	2	V
Reverse leakage current	I_R	$V_r = 1200 \text{ V}$				25			16	μA

Thermal

Thermal resistance junction to sink	$R_{th(j-s)}$	$\lambda_{paste} = 5,2 \text{ W/mK}$ (PTM)						0,21		K/W
-------------------------------------	---------------	---	--	--	--	--	--	------	--	-----



Vincotech

30-E312NIB560H710-PR40F07Z
target datasheet

Characteristic Values

Parameter	Symbol	Conditions					Values			Unit
		V_{GE} [V] V_{GS} [V]	V_{CE} [V] V_{DS} [V] V_F [V]	I_C [A] I_D [A] I_F [A]	T_j [°C]		Min	Typ	Max	

Boost Switch

Static

Gate-emitter threshold voltage	$V_{GE(th)}$	$V_{CE} = V_{GE}$			0,0048	25	4,7	5,5	6,2	V
Collector-emitter saturation voltage	V_{CEsat}		15		560	25		1,7	2,15	V
Collector-emitter cut-off current	I_{CES}		0	1200		25			16	µA
Gate-emitter leakage current	I_{GES}		20	0		25			400	nA
Internal gate resistance	r_g							None		Ω
Input capacitance	C_{ies}	$f = 100 \text{ kHz}$	0	25	25			74000		pF
Output capacitance	C_{oes}							1268		pF
Reverse transfer capacitance	C_{res}							376		pF
Gate charge	Q_g	$V_{CC} = 960 \text{ V}$	0/15		560	25		4128		nC

Thermal

Thermal resistance junction to sink	$R_{th(j-s)}$	$\lambda_{paste} = 5,2 \text{ W/mK}$ (PTM)						0,15		K/W
-------------------------------------	---------------	---	--	--	--	--	--	------	--	-----

Boost Diode

Static

Forward voltage	V_F				144	25		1,7	2	V
Reverse leakage current	I_R	$V_r = 1200 \text{ V}$				25			16	µA

Thermal

Thermal resistance junction to sink	$R_{th(j-s)}$	$\lambda_{paste} = 5,2 \text{ W/mK}$ (PTM)						0,21		K/W
-------------------------------------	---------------	---	--	--	--	--	--	------	--	-----



Vincotech

Characteristic Values

Parameter	Symbol	Conditions					Values			Unit
			V_{GE} [V] V_{GS} [V]	V_{CE} [V] V_{DS} [V] V_F [V]	I_C [A] I_D [A] I_F [A]	T_j [°C]	Min	Typ	Max	

Boost Sw. Inv. Diode

Static

Forward voltage	V_F				144	25		1,7	2	V
Reverse leakage current	I_R	$V_r = 1200$ V				25			16	μA

Thermal

Thermal resistance junction to sink	$R_{th(j-s)}$	$\lambda_{paste} = 5,2$ W/mK (PTM)						0,21		K/W
-------------------------------------	---------------	---------------------------------------	--	--	--	--	--	------	--	-----

Thermistor

Static

Rated resistance	R					25		22		kΩ
Deviation of R100	$\Delta_{R/R}$	$R_{100} = 1484$ Ω				100	-5		5	%
Power dissipation	P					25		130		mW
Power dissipation constant	d					25		1,5		mW/K
B-value	$B_{(25/50)}$	Tol. ± 1 %						3962		K
B-value	$B_{(25/100)}$	Tol. ± 1 %						4000		K
Vincotech Thermistor Reference									I	



Vincotech

30-E312NIB560H710-PR40F07Z

target datasheet

Ordering Code	
Version	Ordering Code
Without thermal paste	30-E312NIB560H710-PR40F07Z
With thermal paste (5,2 W/mK, PTM6000HV)	30-E312NIB560H710-PR40F07Z-/7/

Marking						
	Text	Name		Date code	UL & VIN	Lot
		NN-NNNNNNNNNNNNNNNN- TTTTUVV		WWYY	UL VIN	LLLL
	Datamatrix	Type&Ver	Lot number	Serial	Date code	Serial
		TTTTTUVV	LLLLL	SSSS	WWYY	SSSS

Outline

Pin table [mm]

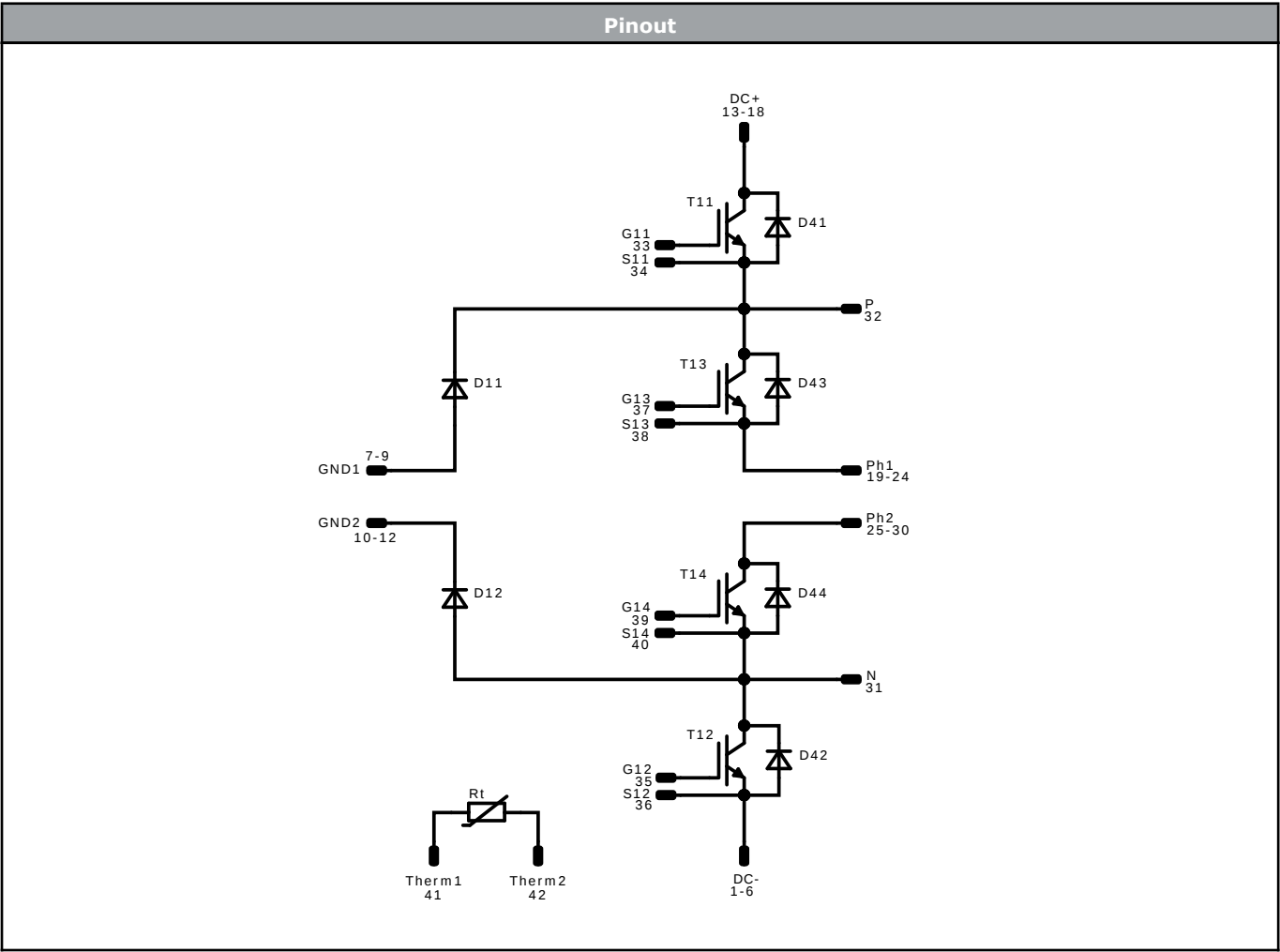
Pin	X	Y	Function
1	56,16	0	DC-1
2	59,36	0	DC-1
3	62,56	0	DC-1
4	65,76	0	DC-1
5	68,96	0	DC-1
6	72,16	0	DC-1
7	25,6	0	GND2
8	28,8	0	GND2
9	32	0	GND2
10	40,16	0	GND1
11	43,36	0	GND1
12	46,56	0	GND1
13	0	0	DC+1
14	3,2	0	DC+1
15	6,4	0	DC+1
16	9,6	0	DC+1
17	12,8	0	DC+1
18	16	0	DC+1
19	16	48	PH2
20	19,2	48	PH2
21	22,4	48	PH2
22	25,6	48	PH2
23	28,8	48	PH2
24	32	48	PH2
25	40,16	44,8	PH1
26	43,36	44,8	PH1
27	46,56	44,8	PH1
28	40,16	48	PH1
29	43,36	48	PH1
30	46,56	48	PH1
31	62,56	28,8	N
32	9,6	25,6	P
33	9,6	19,2	G11
34	9,6	22,4	S11
35	62,56	9,6	G12
36	62,56	6,4	S12
37	0	44,8	G13
38	0	48	S13
39	72,16	48	G14
40	68,96	48	S14
41	56,16	48	Therm1
42	59,36	48	Therm2

The image displays two views of a rectangular component. The top view shows a series of pins along the top edge, with a dimension of 0.64±0.03 mm for the pin pitch. The bottom view shows a grid of pins, with dimensions 36.08 mm and 14.5 mm indicated. A coordinate system (X, Y) is shown at the bottom left. A note at the bottom right states: "Tolerance of pinposition: ±0.1mm at the end of pins. Direction of coordinate axis is only offset without tolerance."



Vincotech

30-E312NIB560H710-PR40F07Z
target datasheet



Identification					
ID	Component	Voltage	Current	Function	Comment
T11, T12	IGBT	1200 V	560 A	Buck Switch	
D11, D12	FWD	1200 V	560 A	Buck Diode	
T13, T14	IGBT	1200 V	560 A	Boost Switch	
D42, D41	FWD	1200 V	560 A	Boost Diode	
D43, D44	FWD	1200 V	560 A	Boost Sw. Inv. Diode	
Rt	Thermistor			Thermistor	



Vincotech

30-E312NIB560H710-PR40F07Z
target datasheet

Packaging instruction				
Standard packaging quantity (SPQ) 24	>SPQ	Standard	<SPQ	Sample
Handling instruction				
Handling instructions for <i>flow</i> E3BP packages see vincotech.com website.				
Package data				
Package data for <i>flow</i> E3BP packages see vincotech.com website.				
Vincotech thermistor reference				
See Vincotech thermistor reference table at vincotech.com website.				
UL recognition and file number				
This device is UL 1557 recognized under E192116 up to a junction temperature under switching condition $T_{j,op}=175^{\circ}\text{C}$ and up to 4000VAC/1min isolation voltage. For more information see vincotech.com website.				

Document No.:	Date:	Modification:	Pages
30-E312NIB560H710-PR40F07Z-T1-14	10 Mar. 2025	Initial Release	
30-E312NIB560H710-PR40F07Z-T2-14	13 Mar. 2025	Correct Outline and Reference Designator in Pinout	

Product status definition		
Datasheet Status	Product Status	Definition
Target	Formative or In Design	This datasheet contains the design specifications for product development. Specifications may change in any manner without notice. The data contained is exclusively intended for technically trained staff.

DISCLAIMER

The information, specifications, procedures, methods and recommendations herein (together "information") are presented by Vincotech to reader in good faith, are believed to be accurate and reliable, but may well be incomplete and/or not applicable to all conditions or situations that may exist or occur. Vincotech reserves the right to make any changes without further notice to any products to improve reliability, function or design. No representation, guarantee or warranty is made to reader as to the accuracy, reliability or completeness of said information or that the application or use of any of the same will avoid hazards, accidents, losses, damages or injury of any kind to persons or property or that the same will not infringe third parties rights or give desired results. It is reader's sole responsibility to test and determine the suitability of the information and the product for reader's intended use.

LIFE SUPPORT POLICY

Vincotech products are not authorised for use as critical components in life support devices or systems without the express written approval of Vincotech.

As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, or (c) whose failure to perform when properly used in accordance with instructions for use provided in labelling can be reasonably expected to result in significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.