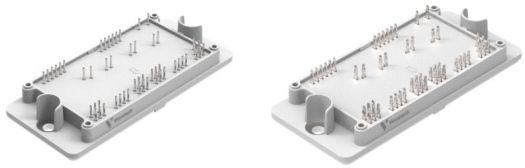
Vincotech

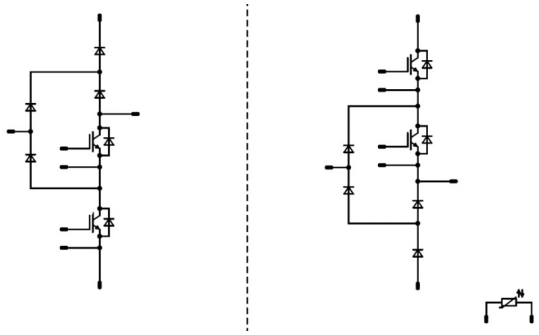
30-FT07NIB300S502-LE06F58
30-PT07NIB300S502-LE06F58Y
target datasheet

flow **NPC 2** **1200 V / 300 A**

Features
- Enhanced efficiency
- Enables high switching frequencies
- Low inductive package
- Allows four quadrant operation

flow 2 12 mm housing


Target applications
- UPS

Schematic


Types
- 30-FT07NIB300S502-LE06F58
- 30-PT07NIB300S502-LE06F58Y

Maximum Ratings

T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Condition	Value	Unit
Buck Switch				
Collector-emitter voltage	V_{CES}		650	V
Collector current	I_C	$T_j = T_{jmax}$ T_s = 80 °C	215	A
Repetitive peak collector current	I_{CRM}	t_p limited by T_{jmax}	900	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ T_s = 80 °C	254	W
Gate-emitter voltage	V_{GES}		±20	V
Maximum junction temperature	T_{jmax}		175	°C

Maximum Ratings

T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Condition	Value	Unit
Boost Switch				
Collector-emitter voltage	V_{CES}		650	V
Collector current	I_C	$T_j = T_{jmax}$ T_s = 80 °C	215	A
Repetitive peak collector current	I_{CRM}	t_p limited by T_{jmax}	900	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ T_s = 80 °C	254	W
Gate-emitter voltage	V_{GES}		±20	V
Maximum junction temperature	T_{jmax}		175	°C
Buck Diode				
Peak Repetitive Reverse Voltage	V_{RRM}		650	V
Continuous (direct) forward current	I_F	$T_j = T_{jmax}$ T_s = 80 °C	229	A
Repetitive peak forward current	I_{FRM}		600	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ T_s = 80 °C	224	W
Maximum Junction Temperature	T_{jmax}		175	°C
Boost Diode				
Peak Repetitive Reverse Voltage	V_{RRM}		650	V
Continuous (direct) forward current	I_F	$T_j = T_{jmax}$ T_s = 80 °C	229	A
Repetitive peak forward current	I_{FRM}		600	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ T_s = 80 °C	224	W
Maximum Junction Temperature	T_{jmax}		175	°C
Boost Sw. Inv. Diode				
Peak Repetitive Reverse Voltage	V_{RRM}		1600	V
Continuous (direct) forward current	I_F	$T_j = T_{jmax}$ T_s = 80 °C	178	A
Surge (non-repetitive) forward current	I_{FSM}	50 Hz Single Half Sine Wave t_p = 10 ms T_j = 150 °C	1780	A
Surge current capability	I^2t		7920	A^2s
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ T_s = 80 °C	195	W
Maximum Junction Temperature	T_{jmax}		150	°C

Maximum Ratings

T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Condition	Value	Unit
Buck Sw. Protection Diode				
Peak Repetitive Reverse Voltage	V_{RRM}		650	V
Continuous (direct) forward current	I_F	$T_j = T_{jmax}$ T_s = 80 °C	36	A
Repetitive peak forward current	I_{FRM}		60	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ T_s = 80 °C	59	W
Maximum Junction Temperature	T_{jmax}		175	°C
Boost Sw. Protection Diode				
Peak Repetitive Reverse Voltage	V_{RRM}		650	V
Continuous (direct) forward current	I_F	$T_j = T_{jmax}$ T_s = 80 °C	36	A
Repetitive peak forward current	I_{FRM}		60	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ T_s = 80 °C	59	W
Maximum Junction Temperature	T_{jmax}		175	°C
Boost D. Protection Doide				
Peak Repetitive Reverse Voltage	V_{RRM}		650	V
Continuous (direct) forward current	I_F	$T_j = T_{jmax}$ T_s = 80 °C	36	A
Repetitive peak forward current	I_{FRM}		60	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ T_s = 80 °C	59	W
Maximum Junction Temperature	T_{jmax}		175	°C

Maximum Ratings

T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Condition	Value	Unit
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 s	4000	V
		Equivalent AC Voltage min 12,7	2500	V
Creepage distance			min. 12,7	mm
Clearance			9,89	mm
Comparative Tracking Index	CTI		> 200	

* 100% tested in production

Characteristic Values

Parameter	Symbol	Conditions					Value			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	$V_{GE(th)}$	$V_{GE} = V_{CE}$			0,003	25	3,2	4	4,8	V
Collector-emitter saturation voltage	V_{CEsat}		15		300	25 125 175		1,42 1,55 1,65	1,75	V
Collector-emitter cut-off current	I_{CES}		0	650		25			200	µA
Gate-emitter leakage current	I_{GES}		20	0		25			400	nA
Internal gate resistance	r_g							none		Ω
Input capacitance	C_{ies}	f= 1 MHz	0	25		25		18000		pF
Output capacitance	C_{oes}							520		
Reverse transfer capacitance	C_{res}							68		
Gate charge	Q_g		15	520	300	25		656		nC
Thermal										
Thermal resistance junction to sink	$R_{th(j-s)}$	phase-change material λ = 3,4 W/mK						0,37		K/W
Boost Switch										
Static										
Gate-emitter threshold voltage	$V_{GE(th)}$	$V_{GE} = V_{CE}$			0,003	25	3,2	4	4,8	V
Collector-emitter saturation voltage	V_{CEsat}		15		300	25 125 175		1,42 1,55 1,65	1,75	V
Collector-emitter cut-off current	I_{CES}		0	650		25			200	µA
Gate-emitter leakage current	I_{GES}		20	0		25			400	nA
Internal gate resistance	r_g							none		Ω
Input capacitance	C_{ies}	f= 1 MHz	0	25		25		18000		pF
Output capacitance	C_{oes}							520		
Reverse transfer capacitance	C_{res}							68		
Gate charge	Q_g		15	520	300	25		656		nC
Thermal										
Thermal resistance junction to sink	$R_{th(j-s)}$	phase-change material λ = 3,4 W/mK						0,37		K/W

Characteristic Values

Parameter	Symbol	Conditions					Value			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 Diode										
Static										
Forward voltage	V_F				300	25		1,35	1,92	V
Reverse leakage current	I_r			650		25			15,2	µA
Thermal										
Thermal resistance junction to sink	$R_{th(j-s)}$	phase-change material λ = 3,4 W/mK						0,42		K/W
Boost Diode										
Static										
Forward voltage	V_F				300	25		1,35	1,92	V
Reverse leakage current	I_r			650		25			15,2	µA
Thermal										
Thermal resistance junction to sink	$R_{th(j-s)}$	phase-change material λ = 3,4 W/mK						0,42		K/W
Boost Sw. Inv. Diode										
Static										
Forward voltage	V_F				150	25 125 150		1,10 1,05 1,05	1,3	V
Reverse leakage current	I_r			1600		25 150			100 2200	µA
Thermal										
Buck Sw. Protection Diode										
Static										
Forward voltage	V_F				30	25 150		1,64 1,56	1,87	V
Reverse leakage current	I_r			650		25			0,36	µA
Thermal										
Thermal resistance junction to sink	$R_{th(j-s)}$	phase-change material λ = 3,4 W/mK						1,61		K/W

Characteristic Values

Parameter	Symbol	Conditions					Value			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. Protection Diode										
Static										
Forward voltage	V_F				30	25 150		1,64 1,56	1,87	V
Reverse leakage current	I_r			650		25			0,36	µA
Thermal										
Thermal resistance junction to sink	$R_{th(j-s)}$	phase-change material λ = 3,4 W/mK						1,61		K/W
Boost D. Protection Doide										
Static										
Forward voltage	V_F				30	25 150		1,64 1,56	1,87	V
Reverse leakage current	I_r			650		25			0,36	µA
Thermal										
Thermal resistance junction to sink	$R_{th(j-s)}$	phase-change material λ = 3,4 W/mK						1,61		K/W
Thermistor										
Rated resistance	R					25		22		kΩ
Deviation of R_{100}	$\Delta_{R/R}$	R_{100} = 1484 Ω				100	-5		5	%
Power dissipation	P					25		5		mW
Power dissipation constant						25		1,5		mW/K
B-value	$B_{(25/50)}$	Tol. ±1 %				25		3962		K
B-value	$B_{(25/100)}$	Tol. ±1 %				25		4000		K
Vincotech NTC Reference									I	

Ordering Code & Marking

Version	Ordering Code
without thermal paste	30-FT07NIB300S502-LE06F58
without thermal paste with Press-fit pins	30-PT07NIB300S502-LE06F58Y

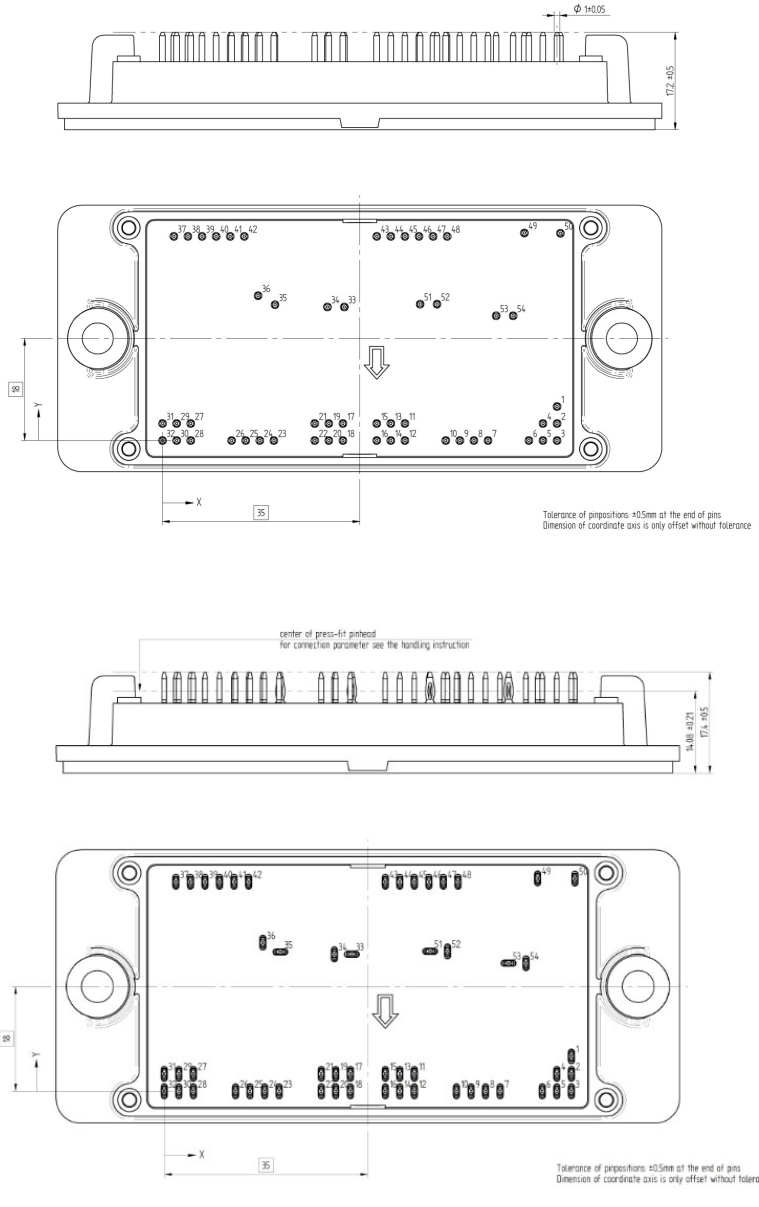
NN-NNNNNNNNNNNNNN
TTTTTTVV WWYY UL
VIN LLLLL SSSS

	Name		Date code	UL & VIN	Lot	Serial
Text	N-NNNNNNNNNNNNNN-TTTTTTV		WWYY	UL VIN	LLLLL	SSSS
	Type&Ver	**Lot number**	**Serial**	**Date code**		
Datamatrix	TTTTTTVV	LLLLL	SSSS	WWYY		

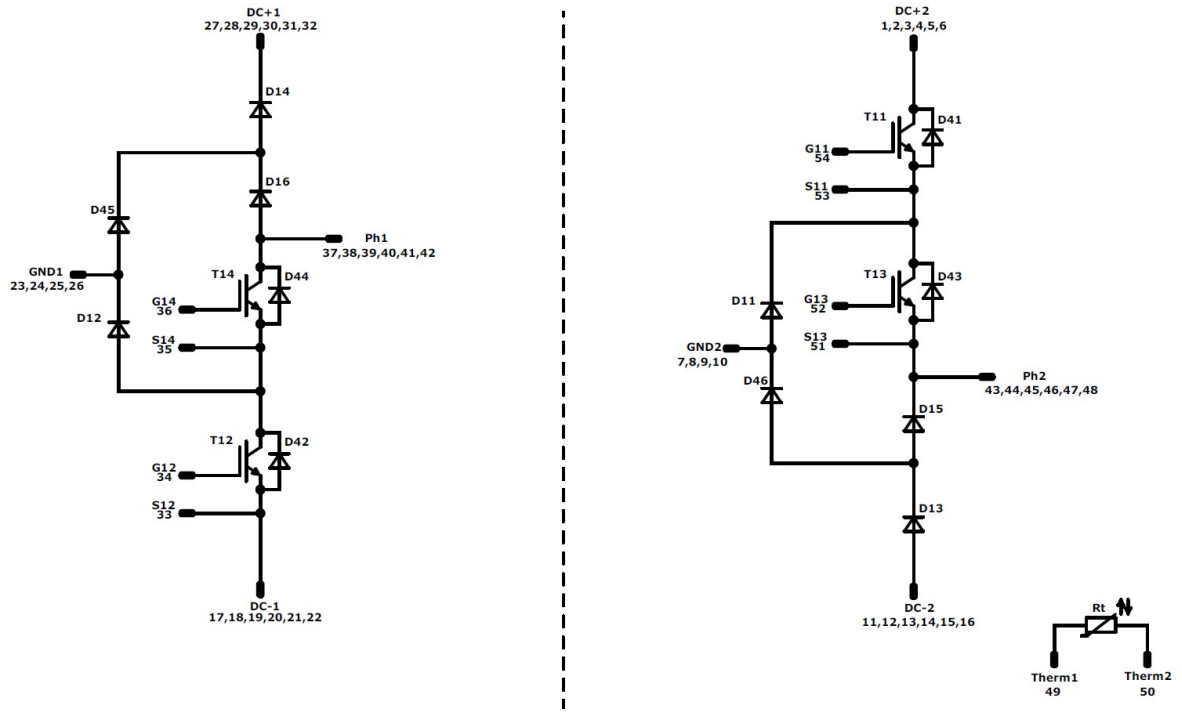
Outline

Pin table [mm]			
Pin	X	Y	Function
1	70	6	DC+2
2	70	3	DC+2
3	70	0	DC+2
4	67,5	3	DC+2
5	67,5	0	DC+2
6	65	0	DC+2
7	57,75	0	GND2
8	55,25	0	GND2
9	52,75	0	GND2
10	50,25	0	GND2
11	43	3	DC-2
12	43	0	DC-2
13	40,5	3	DC-2
14	40,5	0	DC-2
15	38	3	DC-2
16	38	0	DC-2
17	32	3	DC-1
18	32	0	DC-1
19	29,5	3	DC-1
20	29,5	0	DC-1
21	27	3	DC-1
22	27	0	DC-1
23	19,75	0	GND1
24	17,25	0	GND1
25	14,75	0	GND1
26	12,25	0	GND1
27	5	3	DC+1
28	5	0	DC+1
29	2,5	3	DC+1
30	2,5	0	DC+1
31	0	3	DC+1
32	0	0	DC+1
33	32,25	23,55	S12
34	29,25	23,55	G12
35	19,95	23,95	S14
36	16,95	25,55	G14
37	2	36	Ph1
38	4,5	36	Ph1
39	7	36	Ph1
40	9,5	36	Ph1
41	12	36	Ph1
42	14,5	36	Ph1
43	38	36	Ph2
44	40,5	36	Ph2
45	43	36	Ph2
46	45,5	36	Ph2
47	48	36	Ph2
48	50,5	36	Ph2
49	64,2	36,6	Therm1
50	70,6	36,55	Therm2
51	45,7	24,05	S13

Pin table [mm]			
Pin	X	Y	Function
52	48,7	24,05	G13
53	59,2	22	S11
54	62,2	22	G11



Pinout



Identification

ID	Component	Voltage	Current	Function	Comment
T11,T12	IGBT	650 V	300 A	Buck Switch	
T13,T14	IGBT	650 V	300 A	Boost Switch	
D11,D12	FWD	650 V	300 A	Buck Diode	
D13,D14	FWD	650 V	300 A	Boost Diode	
D15,D16	FWD	1600 V	150 A	Boost Sw. Inv. Diode	
D41,D42	FWD	650 V	30 A	Buck Sw. Protection Diode	
D43,D44	FWD	650 V	30 A	Boost Sw. Protection Diode	
D44,D45	FWD	650 V	30 A	Boost D. Protection Doide	
Rt	Thermistor			Thermistor	

Packaging instruction				
Standard packaging quantity (SPQ) 36	>SPQ	Standard	<SPQ	Sample

Handling instruction
Handling instructions for *flow* 2 packages see vincotech.com website.

Package data
Package data for *flow* 2 packages see vincotech.com website.

UL recognition and file number
This device is certified according to UL 1557 standard, UL file number E192116. For more information see vincotech.com website.

Document No.:	Date:	Modification:	Pages
30-xT07NIB300S502-LE06F58x-T1-14	11 May. 2017		

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.