



flowNPC S3

1500 V / 300 A

Features

- Compact and low inductive design
- Three-level high efficient topology
- Optimized for bidirectional operation
- 950 V components enable 1500 V DC-Link voltage

Target applications

- Energy Storage Systems

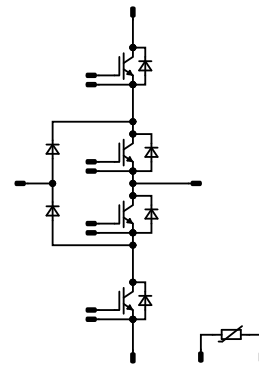
Types

- B0-SP10NIA300S705-LM00F98T

flow S3 12 mm housing



Schematic





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B0-SP10NIA300S705-LM00F98T
target datasheet

Maximum Ratings

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

Parameter	Symbol	Conditions	Value	Unit
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Buck Switch

Collector-emitter voltage	V_{CES}		950	V
Collector current	I_C	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	300	A
Repetitive peak collector current	I_{CRM}	t_p limited by T_{jmax}	600	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	367	W
Gate-emitter voltage	V_{GES}		± 20	V
Maximum junction temperature	T_{jmax}		175	°C

Buck Diode

Peak repetitive reverse voltage	V_{RRM}		950	V
Continuous (direct) forward current	I_F	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	300	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	283	W
Maximum junction temperature	T_{jmax}		175	°C

Boost Switch

Collector-emitter voltage	V_{CES}		950	V
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Boost Sw. Inv. Diode				
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Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	283	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 $t_p = 2\text{ s}$	6000	V
Creepage distance			11,65	mm
Clearance			10,14	mm
Comparative Tracking Index	CTI		≥ 600	



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Characteristic Values

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

Buck Switch

Static

Gate-emitter threshold voltage	$V_{GE(th)}$	$V_{CE} = V_{GE}$			0,005	25	4,35	5,1	5,85	V
Collector-emitter saturation voltage	$V_{CE(sat)}$		15		300	25 150		1,9 2,15	2,35	V
Collector-emitter cut-off current	I_{CES}		0	950		25			6	μA
Gate-emitter leakage current	I_{GES}		20	0		25			300	nA
Internal gate resistance	r_g							0,5		Ω
Input capacitance	C_{ies}							19500		pF
Output capacitance	C_{oes}	$f = 100$ kHz	0	25		25			417	pF
Reverse transfer capacitance	C_{res}								60	pF
Gate charge	Q_g		15		0	25		690		nC

Thermal

Thermal resistance junction to sink	$R_{th(j-s)}$	$\lambda_{paste} = 3$ W/mK (TCP)						0,26		K/W
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Buck Diode

Static

Forward voltage	V_F				300	25 150	2,1	2,5 2,35	2,8	V
Reverse leakage current	I_R	$V_r = 950$ V				25			12	μA

Thermal

Thermal resistance junction to sink	$R_{th(j-s)}$	$\lambda_{paste} = 3$ W/mK (TCP)						0,34		K/W
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Characteristic Values

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

Boost Switch

Static

Gate-emitter threshold voltage	$V_{GE(th)}$	$V_{CE} = V_{GE}$			0,005	25	4,35	5,1	5,85	V	
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Boost Diode

Static

Forward voltage	V_F				300	25 150	2,1	2,5 2,35	2,8	V
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Characteristic Values

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

Boost Sw. Inv. Diode

Static

Forward voltage	V_F				300	25 150	2,1	2,5 2,35	2,8	V
Reverse leakage current	I_R	$V_i = 950$ V				25			12	μA

Thermal

Thermal resistance junction to sink	$R_{th(j-s)}$	$\lambda_{paste} = 3$ W/mK (TCP)						0,34		K/W
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Thermistor

Static

Rated resistance	R					25		22		kΩ
Deviation of R_{100}	$\Delta_{R/R}$	$R_{100} = 1484$ Ω				100	-5		5	%
Power dissipation	P							5		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
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target datasheet

Ordering Code	
Version	Ordering Code
With thermal paste	B0-SP10NIA300S705-LM00F98T-/6/

Marking						
	Text	Name	Date code	Logo	Lot	Serial
		NN-NNNNNNNNNNNNNN- TTTTTVV	WWYY	VIN	LLLLL	SSSS
	Datamatrix	Type&Ver	Lot number	Serial	Date code	
		TTTTTVV	LLLLL	SSSS	WWYY	

Pin table [mm]			
Pin	X	Y	Function
1	52,4	0	DC-
2	49,6	0	DC-
3	44,2	0	DC-
4	41,5	0	DC-
5	38,8	0	DC-
6	32,95	0	GND
7	30,25	0	GND
8	27,55	0	GND
9	24,85	0	GND
10	22,15	0	GND
11	19,45	0	GND
12	13,7	0	DC+
13	11	0	DC+
14	8,3	0	DC+
15	2,7	0	DC+
16	0	0	DC+
17	1	15,5	S11
18	0	18,5	G11
19	39,95	21,15	G12
20	38,95	24,15	S12
21	10,7	38,95	G13
22	9,7	41,95	S13
23	26,65	37,55	G14
24	25,65	40,55	S14
25	23,65	50,4	Ph
26	26,35	50,4	Ph
27	29,05	50,4	Ph
28	31,75	50,4	Ph
29	34,45	50,4	Ph
30	37,15	50,4	Ph
31	39,85	50,4	Ph
32	0	50,4	Therm1
33	3	50,4	Therm2

Outline

center of press-fit pin head
pin head type "T", PCB plated through-hole $\Phi 1\text{mm} +0.09 / -0.06$
for further PCB design rules refer to the latest handling instruction

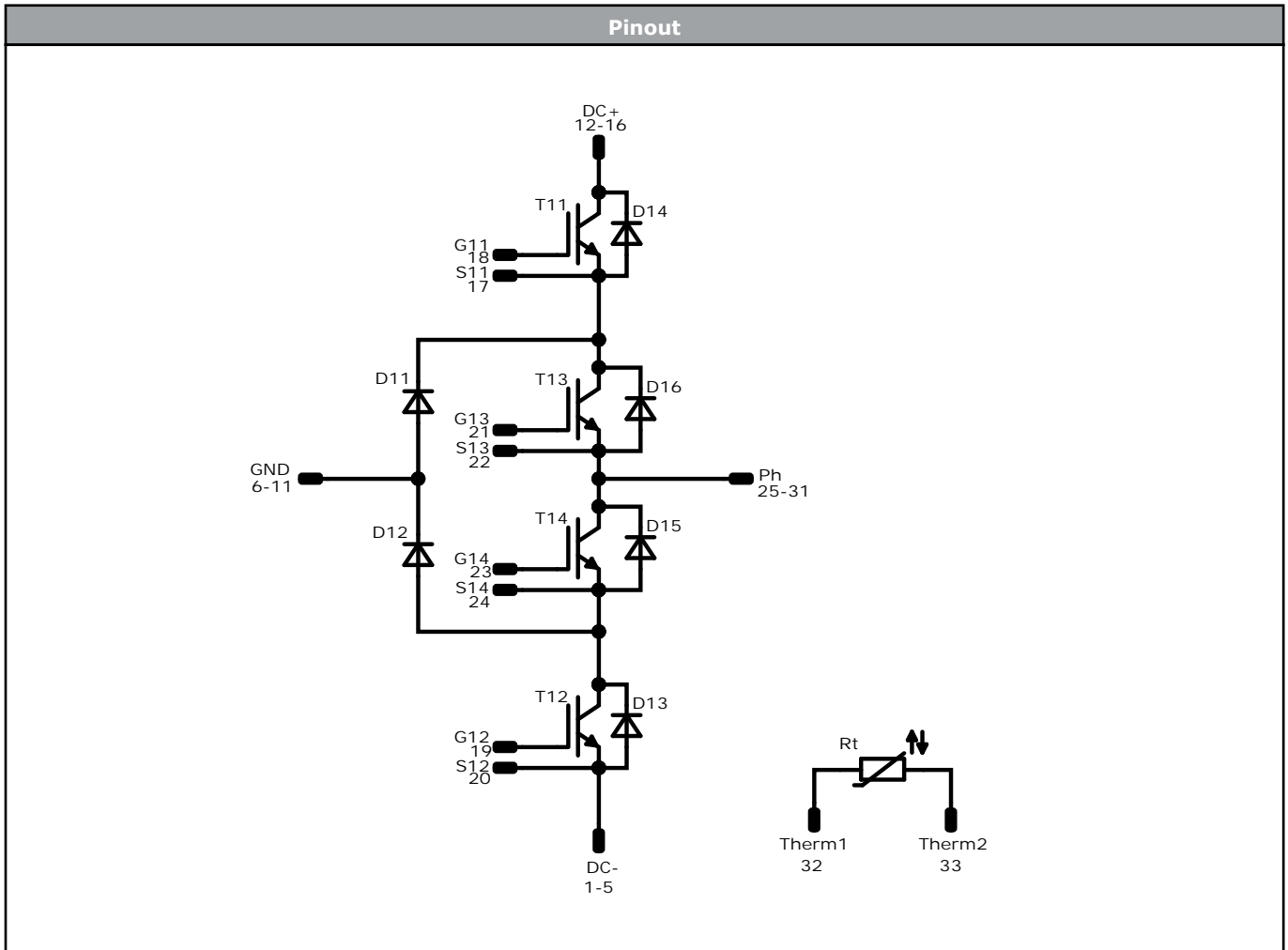
Dimensions: 30.08 ± 0.1 , 8.6 ± 0.5 , 26.2

Tolerance of pin positions $\pm 0.5\text{mm}$ at the end of pins
Dimension of coordinate axis is only offset without tolerance



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target datasheet



Identification					
ID	Component	Voltage	Current	Function	Comment
T11, T12	IGBT	950 V	300 A	Buck Switch	
D11, D12	FWD	950 V	300 A	Buck Diode	
T13, T14	IGBT	950 V	300 A	Boost Switch	
D13, D14	FWD	950 V	300 A	Boost Diode	
D15, D16	FWD	950 V	300 A	Boost Sw. Inv. Diode	
Rt	Thermistor			Thermistor	



Packaging instruction				
Standard packaging quantity (SPQ) 45	>SPQ	Standard	<SPQ	Sample

Handling instruction
Handling instructions for <i>flow</i> S3 packages see vincotech.com website.

Package data
Package data for <i>flow</i> S3 packages see vincotech.com website.

Document No.:	Date:	Modification:	Pages
B0-SP10NIA300S705-LM00F98T-T1-14	20 May. 2020		

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