Vincotech

B0-SP10NIA300S705-LM00F98T

target datasheet

***flow*NPC S3** **1500 V / 300 A**

Features

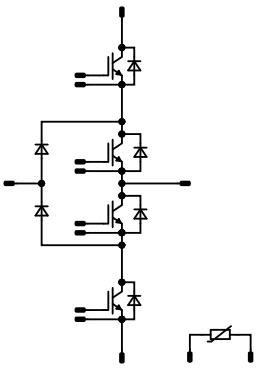
- Compact and low inductive design
- Three-level high efficient topology
- Optimized for bidirectional operation
- 950 V components enable 1500 V DC-Link voltage

flow S3 12 mm housing

Target applications

- Energy Storage Systems

Schematic



Types

- B0-SP10NIA300S705-LM00F98T

Maximum Ratings

T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Conditions	Value	Unit
Buck Switch				
Collector-emitter voltage	V_{CES}		950	V
Collector current	I_C	T_j = T_{jmax} T_s = 80 °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 °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 °C	300	A
Total power dissipation	P_{tot}	T_j = T_{jmax} T_s = 80 °C	283	W
Maximum junction temperature	T_{jmax}		175	°C
Boost Switch				
Collector-emitter voltage	V_{CES}		950	V
Collector current	I_C	T_j = T_{jmax} T_s = 80 °C	300	A
Repetitive peak collector current	I_{CRM}	t_p limited by T_{jmax}	600	A
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Maximum Ratings

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Parameter	Symbol	Conditions	Value	Unit
Boost Sw. Inv. Diode				
Peak repetitive reverse voltage	V_{RRM}		950	V
Continuous (direct) forward current	I_F	T_j = T_{jmax} T_s = 80 °C	300	A
Total power dissipation	P_{tot}	T_j = T_{jmax} T_s = 80 °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 s	6000	V
Creepage distance			11,65	mm
Clearance			10,14	mm
Comparative Tracking Index	CTI		≥ 600	

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}			0,005	25	4,35	5,1	5,85	V
Collector-emitter saturation voltage	V_{CEsat}		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}	f = 100 kHz	0	25		25		19500		pF
Output capacitance	C_{oes}							417		pF
Reverse transfer capacitance	C_{res}							60		pF
Gate charge	Q_g		15		0	25		690		nC
Thermal										
Thermal resistance junction to sink	$R_{th(j-s)}$	λ_{paste} = 3 W/mK (TCP)						0,26		K/W
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	$R_{th(j-s)}$	λ_{paste} = 3 W/mK (TCP)						0,34		K/W

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}			0,005	25	4,35	5,1	5,85	V
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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				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	$R_{th(j-s)}$	λ_{paste} = 3 W/mK (TCP)						0,34		K/W
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
Vincotech Thermistor Reference									I	

Ordering Code

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

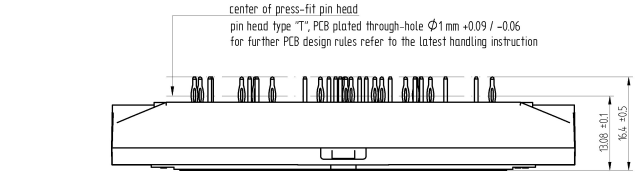
Marking

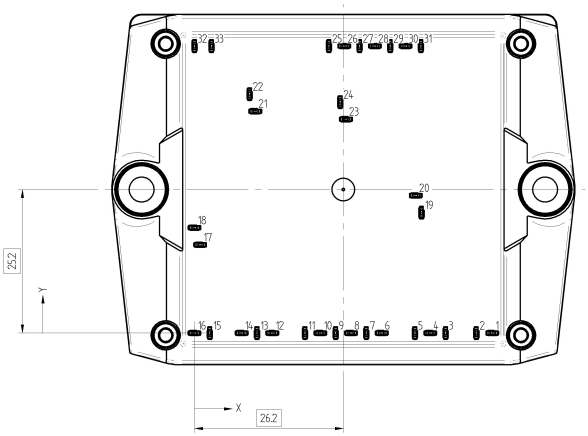
	Name	Date code	Logo	Lot	Serial
Text	NN-NNNNNNNNNNNNNN-TTTTTTVV	WWYY	VIN	LLLLL	SSSS

Datamatrix	Type&Ver	Lot number	Serial	Date code		
	TTTTTTTVV	LLLLL	SSSS	WWYY		

Outline

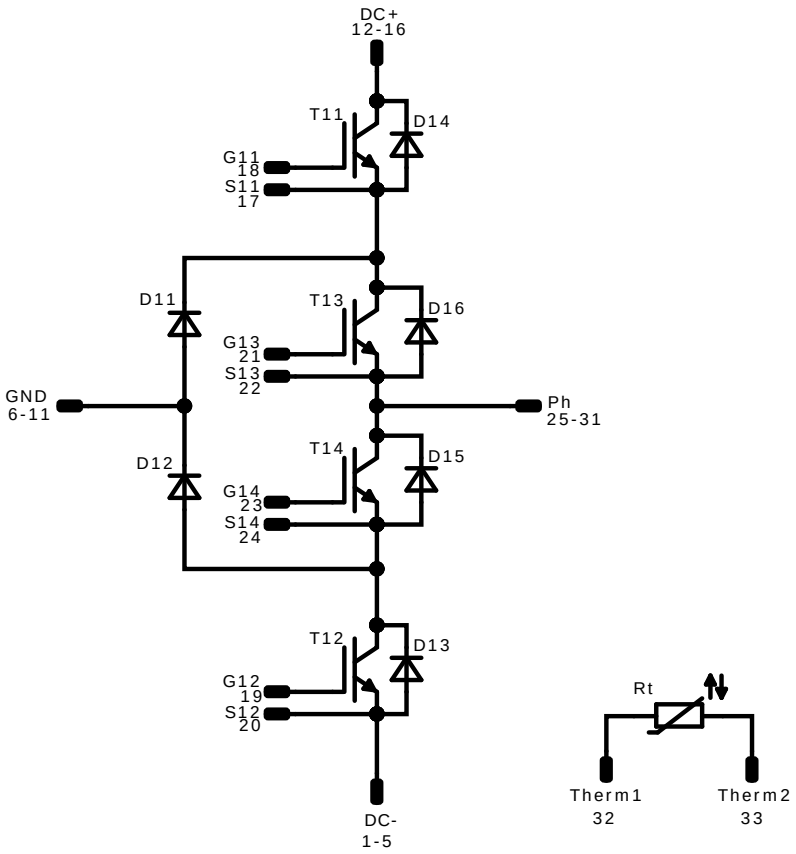
Pin table [mm]			
Pin	X	Y	Function
1	52,4	0	DC-
2	49,6	0	DC-
3	44,2	0	DC-
4	41,5	0	DC-
5	38,8	0	DC-
6	32,95	0	GND
7	30,25	0	GND
8	27,55	0	GND
9	24,85	0	GND
10	22,15	0	GND
11	19,45	0	GND
12	13,7	0	DC+
13	11	0	DC+
14	8,3	0	DC+
15	2,7	0	DC+
16	0	0	DC+
17	1	15,5	S11
18	0	18,5	G11
19	39,95	21,15	G12
20	38,95	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





Tolerance of pinpositions ±0.5mm at the end of pins
Dimension of coordinate axis is only offset without tolerance

Pinout



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 *flow* S3 packages see vincotech.com website.

Package data
Package data for *flow* S3 packages see vincotech.com website.

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B0-SP10NIA300S705-LM00F98T-T1-14	20 May. 2020		