Vincotech

B0-SP10NAD600S7-LQ79F08Y

target datasheet

for virtual products created by Vincotech Product Creator, only for evaluation purposes, no commitment for product development!

***flow*ANPC S3 split** **950 V / 600 A**

Features

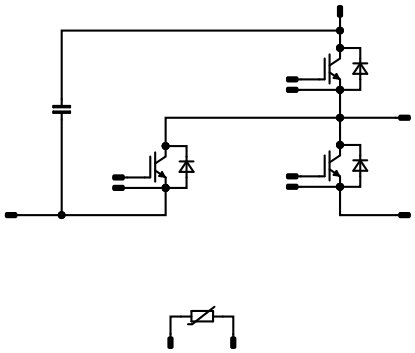
- Three-level Active NPC topology
- Ultra efficient SiC Diodes
- Low inductive mid-power package

flow S3 12 mm housing

Target applications

- Solar Inverters

Schematic



Types

- B0-SP10NAD600S7-LQ79F08Y

Maximum Ratings

T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Conditions	Value	Unit
AC Switch				
Collector-emitter voltage	V_{CES}		950	V
Collector current	I_C		400	A
Repetitive peak collector current	I_{CRM}	t_p limited by T_{jmax}	800	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
AC Diode				
Peak repetitive reverse voltage	V_{RRM}		950	V
Continuous (direct) forward current	I_F		300	A
Total power dissipation	P_{tot}	T_j = T_{jmax} T_s = 80 °C	283	W
Maximum junction temperature	T_{jmax}		175	°C
Neutral Point Switch				
Collector-emitter voltage	V_{CES}		950	V
Collector current	I_C		200	A
Repetitive peak collector current	I_{CRM}	t_p limited by T_{jmax}	400	A
Total power dissipation	P_{tot}	T_j = T_{jmax} T_s = 80 °C	276	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	Conditions	Value	Unit
DC-Link Diode				
Peak repetitive reverse voltage	V_{RRM}		1200	V
Continuous (direct) forward current	I_F		120	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{jmax}	546	A
Surge (non-repetitive) forward current	I_{FSM}	Single Half Sine Wave, t_p = 10 ms	780	A
Total power dissipation	P_{tot}	T_j = T_{jmax} T_s = 80 °C	254	W
Maximum junction temperature	T_{jmax}		175	°C
DC-Link Switch				
Collector-emitter voltage	V_{CES}		950	V
Collector current	I_C		600	A
Repetitive peak collector current	I_{CRM}	t_p limited by T_{jmax}	1200	A
Total power dissipation	P_{tot}	T_j = T_{jmax} T_s = 80 °C	487	W
Gate-emitter voltage	V_{GES}		±20	V
Maximum junction temperature	T_{jmax}		175	°C
Neutral Point Diode				
Peak repetitive reverse voltage	V_{RRM}		950	V
Continuous (direct) forward current	I_F		300	A
Total power dissipation	P_{tot}	T_j = T_{jmax} T_s = 80 °C	283	W
Maximum junction temperature	T_{jmax}		175	°C
Capacitor (DC)				
Maximum DC voltage	V_{MAX}		750	V
Operation Temperature	T_{op}		-55 ... 150	°C

Maximum Ratings

T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Conditions	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	6000	V
Isolation voltage	V_{isol}	AC Voltage t_p = 1 min	2500	V
Creepage distance			min. 12,7	mm
Clearance			12,33	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	
AC Switch										
Static										
Gate-emitter threshold voltage	$V_{GE(th)}$	$V_{CE} = V_{GE}$			0,0065	25	4,15	4,85	5,65	V
Collector-emitter saturation voltage	V_{CEsat}		15		400	25 150		1,3 1,35	1,4	V
Collector-emitter cut-off current	I_{CES}		0	950		25			8	µA
Gate-emitter leakage current	I_{GES}		20	0		25			200	nA
Input capacitance	C_{ies}	f = 100 kHz	0	25		25		49200		pF
Reverse transfer capacitance	C_{res}							220		pF
Thermal										
Thermal resistance junction to sink	$R_{th(j-s)}$	λ_{paste} = 3 W/mK (TCP)						0,26		K/W
AC Diode										
Static										
Forward voltage	V_F				300	25 150	2,1	2,5 2,35	2,8	V
Reverse leakage current	I_R			950		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	
Neutral Point Switch										
Static										
Gate-emitter threshold voltage	$V_{GE(th)}$	V_{CE} = V_{GE}			0,0033	25	4,35	5,1	5,85	V
Collector-emitter saturation voltage	V_{CEsat}		15		200	25 150		1,9 2,15	2,35	V
Collector-emitter cut-off current	I_{CES}		0	950		25			4	µA
Gate-emitter leakage current	I_{GES}		20	0		25			200	nA
Input capacitance	C_{ies}	f = 100 kHz	0	25		25		13000		pF
Reverse transfer capacitance	C_{res}							40		pF
Thermal										
Thermal resistance junction to sink	$R_{th(j-s)}$	λ_{paste} = 3 W/mK (TCP)						0,34		K/W
DC-Link Diode										
Static										
Forward voltage	V_F				120	25		1,5	1,8	V
Reverse leakage current	I_R			1200		25		210	1200	µA
Thermal										
Thermal resistance junction to sink	$R_{th(j-s)}$	λ_{paste} = 3 W/mK (TCP)						0,37		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	
DC-Link Switch										
Static										
Gate-emitter threshold voltage	$V_{GE(th)}$	V_{CE} = V_{GE}			0,0098	25	4,35	5,1	5,85	V
Collector-emitter saturation voltage	V_{CEsat}		15		600	25 150		1,85 2,15	2,25	V
Collector-emitter cut-off current	I_{CES}		0	950		25			12	µA
Gate-emitter leakage current	I_{GES}		20	0		25			300	nA
Input capacitance	C_{ies}	f = 100 kHz	0	25		25		37800		pF
Reverse transfer capacitance	C_{res}							120		pF
Thermal										
Thermal resistance junction to sink	$R_{th(j-s)}$	λ_{paste} = 3 W/mK (TCP)						0,19		K/W
Neutral Point Diode										
Static										
Forward voltage	V_F				300	25 150	2,1	2,5 2,35	2,8	V
Reverse leakage current	I_R			950		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	
Thermistor										
Static										
Rated resistance	R					25		22		kΩ
Deviation of R100	$\Delta_{R/R}$	R_{100} = 1484 Ω				100	-5		5	%
Power dissipation	P							5		mW
Power dissipation constant						25		1,5		mW/K
B-value	$B_{(25/50)}$					25		3962		K
B-value	$B_{(25/100)}$					25		4000		K
Vincotech Thermistor Reference									I	
Capacitor (DC)										
Static										
Capacitance	C							33		nF

Ordering Code & Marking

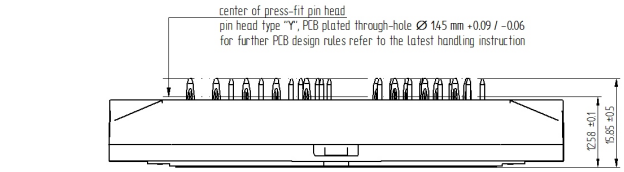
Version	Ordering Code
with thermal paste 12mm housing with Press-fit pins	B0-SP10NAD600S7-LQ79F08Y-/6/

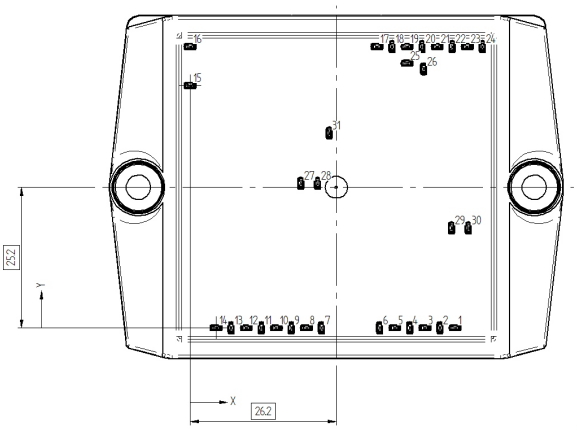
NN-NNNNNNNNNNNNNN
TTTTTTVV WWYY
VIN LLLLL SSSS

		Name		Date code	VIN	Lot	Serial
Text		NN-NNNNNNNNNNNNNN-TTTTTTVV		WWYY	VIN	LLLLL	SSSS
Datamatrix	Type&Ver	Lot number	Serial	Date code			
	TTTTTTTVV	LLLLL	SSSS	WWYY			

Outline

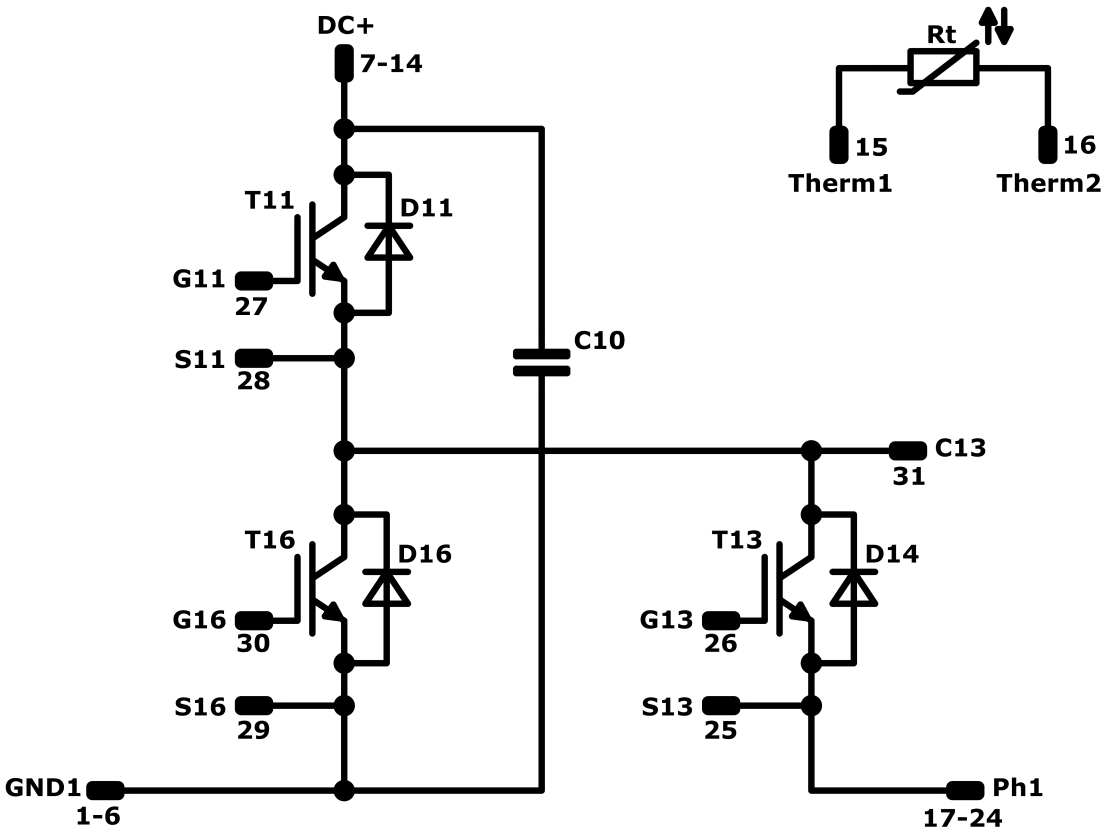
Pin	X	Y	Function
1	47.5	0	GND1
2	44.8	0	GND1
3	42.1	0	GND1
4	39.4	0	GND1
5	36.7	0	GND1
6	34	0	GND1
7	23.55	0	DC+
8	20.85	0	DC+
9	18.15	0	DC+
10	15.45	0	DC+
11	12.75	0	DC+
12	10.05	0	DC+
13	7.35	0	DC+
14	4.65	0	DC+
15	0	43.4	Therm1
16	0	50.4	Therm2
17	33.5	50.4	Ph1
18	36.2	50.4	Ph1
19	38.9	50.4	Ph1
20	41.6	50.4	Ph1
21	44.3	50.4	Ph1
22	47	50.4	Ph1
23	49.7	50.4	Ph1
24	52.4	50.4	Ph1
25	38.9	47.4	S13
26	41.9	46.4	G13
27	19.85	25.9	G11
28	22.85	25.9	S11
29	46.9	17.9	S16
30	49.9	17.9	G16
31	24.95	34.9	C13





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
T13	IGBT	950 V	400 A	AC Switch	
D14	FWD	950 V	300 A	AC Diode	
T16	IGBT	950 V	200 A	Neutral Point Switch	
D16	FWD	1200 V	120 A	DC-Link Diode	
T11	IGBT	950 V	600 A	DC-Link Switch	
D11	FWD	950 V	300 A	Neutral Point Diode	
Rt	Thermistor			Thermistor	
C10	Capacitor			Capacitor (DC)	

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

Document No.:	Date:	Modification:	Pages
B0-SP10NAD600S7-LQ79F08Y-T1-14	20 Feb. 2020	Initial Release	

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.