Vincotech

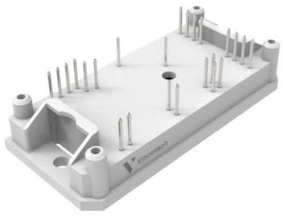
10-F124NID150SH03-LG18F98
10-F124NIE150SH03-LG28F98
target datasheet

flow NPC 1 split — **2400 V / 150 A**

Features

- Enhanced efficiency
- Low inductive package
- Tandem diodes

flow 1 housing

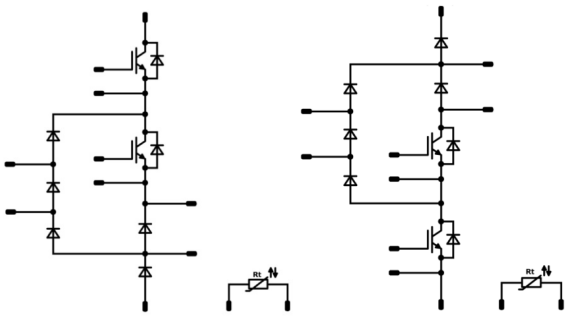


LG18F98 LG28F98

Target applications

- Solar Inverters

Schematic



LG18F98 LG28F98

Types

- 10-F124NIE150SH03-LG28F98

Maximum Ratings

T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Condition	Value	Unit
Buck Switch				
Collector-emitter voltage	V_{CES}		1200	V
Collector current	I_C	$T_j = T_{jmax}$ T_s = 80 °C	109	A
Repetitive peak collector current	I_{CRM}	t_p limited by T_{jmax}	450	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ T_s = 80 °C	243	W
Gate-emitter voltage	V_{GES}		±20	V
Short circuit ratings	t_{SC} V_{CC}	$T_j \leq$ 150 °C V_{GE} = 15 V	10 800	µs V
Maximum junction temperature	T_{jmax}		175	°C

Maximum Ratings

T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Condition	Value	Unit
Buck Diode				
Peak Repetitive Reverse Voltage	V_{RRM}		1300	V
Continuous (direct) forward current	I_F	$T_j = T_{jmax}$ T_s = 80 °C	81	A
Repetitive peak forward current	I_{FRM}		300	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ T_s = 80 °C	187	W
Maximum Junction Temperature	T_{jmax}		175	°C
Boost Switch				
Collector-emitter voltage	V_{CES}		1200	V
Collector current	I_C	$T_j = T_{jmax}$ T_s = 80 °C	137	A
Repetitive peak collector current	I_{CRM}	t_p limited by T_{jmax}	300	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ T_s = 80 °C	232	W
Gate-emitter voltage	V_{GES}		±20	V
Maximum junction temperature	T_{jmax}		175	°C
Boost Diode				
Peak repetitive reverse voltage	V_{RRM}		1200	V
Continuous (direct) forward current	I_F	$T_j = T_{jmax}$ T_s = 80 °C	45	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ T_s = 80 °C	94	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	66	A
Surge (non-repetitive) forward current	I_{FSM}	50 Hz Single Half Sine Wave t_p = 10 ms T_j = 150 °C	490	A
Surge current capability	I^2t		1200	A^2s
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ T_s = 80 °C	77	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}		1200	V
Continuous (direct) forward current	I_F	$T_j = T_{jmax}$ T_s = 80 °C	45	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ T_s = 80 °C	94	W
Maximum junction temperature	T_{jmax}		175	°C
Boost Sw. Protection Diode				
Peak Repetitive Reverse Voltage	V_{RRM}		1600	V
Continuous (direct) forward current	I_F	$T_j = T_{jmax}$ T_s = 80 °C	66	A
Surge (non-repetitive) forward current	I_{FSM}	50 Hz Single Half Sine Wave t_p = 10 ms T_j = 150 °C	490	A
Surge current capability	I^2t		1200	A^2s
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ T_s = 80 °C	77	W
Maximum Junction Temperature	T_{jmax}		150	°C
Boost D. Protection Diode				
Peak Repetitive Reverse Voltage	V_{RRM}		1200	V
Continuous (direct) forward current	I_F	$T_j = T_{jmax}$ T_s = 80 °C	33	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ T_s = 80 °C	73	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
		AC Voltage t_p = 1 min	2500	V
Creepage distance			min. 12,7	mm
Clearance			min. 12,7	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	$V_{GE(th)}$	$V_{GE} = V_{CE}$			0,0052	25	5,3	5,8	6,3	V
Collector-emitter saturation voltage	V_{CEsat}		15		150	25 125 150	1,78	2,16 2,48 2,56	2,42	V
Collector-emitter cut-off current	I_{CES}		0	1200		25			2	µA
Gate-emitter leakage current	I_{GES}		20	0		25			240	nA
Internal gate resistance	r_g							none		Ω
Input capacitance	C_{ies}	f = 1 MHz	0	25		25		8800		pF
Reverse transfer capacitance	C_{res}							470		
Gate charge	Q_g		15			25		1140		nC
Thermal										
Thermal resistance junction to sink	$R_{th(j-s)}$	λ_{paste} = 3,4 W/mK (PSX)						0,39		K/W
Buck Diode										
Static										
Forward voltage	V_F				150	25 125 150		3,12 3,00 2,96	3,84	V
Reverse leakage current	I_r			1300		25			7,6	µA
Thermal										
Thermal resistance junction to sink	$R_{th(j-s)}$	λ_{paste} = 3,4 W/mK (PSX)						0,51		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 Switch										
Static										
Gate-emitter threshold voltage	$V_{GE(th)}$	$V_{GE} = V_{CE}$			0,015	25	5,4	6	6,6	V
Collector-emitter saturation voltage	V_{CEsat}		15		150	25 125 150		1,55 1,75 1,80	2,05	V
Collector-emitter cut-off current	I_{CES}		0	1200		25			220	µA
Gate-emitter leakage current	I_{GES}		20	0		25			1000	nA
Internal gate resistance	r_g							2		Ω
Input capacitance	C_{ies}		0	10		25		32000		pF
Output capacitance	C_{oes}							960		
Reverse transfer capacitance	C_{res}							380		
Gate charge	Q_g		15	600	150	25		980		nC
Thermal										
Thermal resistance junction to sink	$R_{th(j-s)}$	λ_{paste} = 3,4 W/mK (PSX)						0,41		K/W
Boost Diode										
Static										
Forward voltage	V_F				50	25		2,19	2,54	V
Reverse leakage current	I_R			1200		25 150			60 8800	µA
Thermal										
Thermal resistance junction to sink	$R_{th(j-s)}$	λ_{paste} = 3,4 W/mK (PSX)						1,02		K/W
Boost Sw. Inv. Diode										
Static										
Forward voltage	V_F				50	25 125		1,14 1,08	1,35	V
Reverse leakage current	I_r			1600		25 145			50 1100	µA
Thermal										
Thermal resistance junction to sink	$R_{th(j-s)}$	λ_{paste} = 3,4 W/mK (PSX)						0,82		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 Sw. Protection Diode										
Static										
Forward voltage	V_F				50	25		2,19	2,54	V
Reverse leakage current	I_R			1200		25 150			60 8800	µA
Thermal										
Thermal resistance junction to sink	$R_{th(j-s)}$	λ_{paste} = 3,4 W/mK (PSX)						1,02		K/W
Boost Sw. Protection Diode										
Static										
Forward voltage	V_F				50	25 125		1,14 1,08	1,35	V
Reverse leakage current	I_r			1600		25 145			50 1100	µA
Thermal										
Thermal resistance junction to sink	$R_{th(j-s)}$	λ_{paste} = 3,4 W/mK (PSX)						0,82		K/W
Boost D. Protection Diode										
Static										
Forward voltage	V_F				35	25 150		2,30 2,29	2,62	V
Reverse leakage current	I_r			1200		25 150			60 5500	µA
Thermal										
Thermal resistance junction to sink	$R_{th(j-s)}$	λ_{paste} = 3,4 W/mK (PSX)						1,30		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	

Vincotech

10-F124NID150SH03-LG18F98
10-F124NIE150SH03-LG28F98
target datasheet

Ordering Code & Marking

Version	Ordering Code
without thermal paste 17 mm housing with solder pins	10-F124NID150SH03-LG18F98
with thermal paste 17 mm housing with solder pins	10-F124NID150SH03-LG18F98-/3/

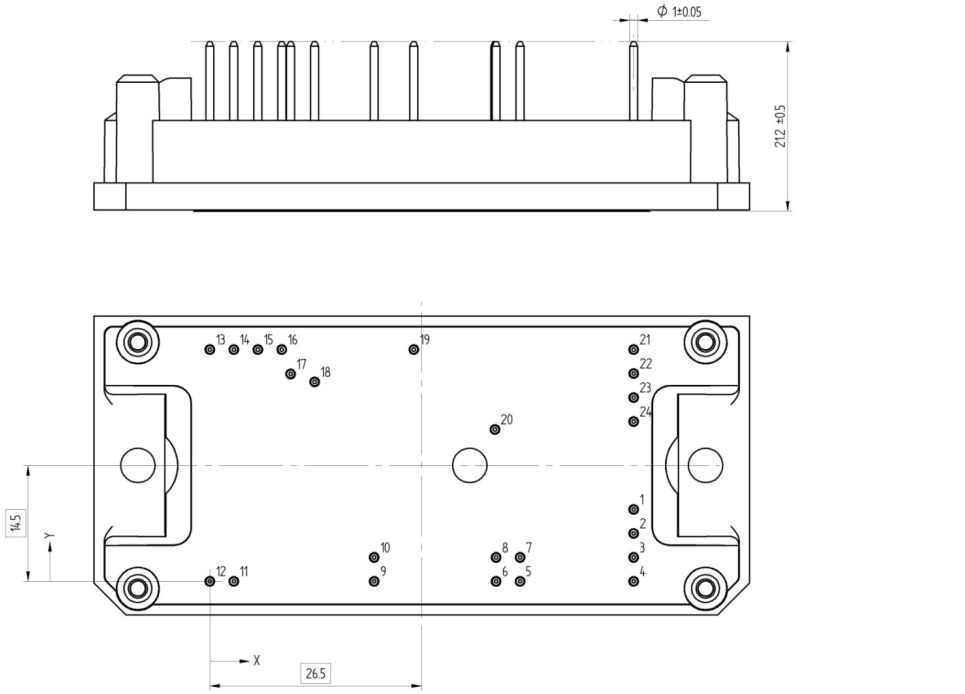
Text	Name		Date code	UL & VIN	Lot	Serial
	NN-NNNNNNNNNNNNN-TTTTTTVV		WWYY	UL VIN	LLLLL	SSSS
Datamatrix	**Type&Ver**	**Lot number**	**Serial**	**Date code**		
	TTTTTTTVV	LLLLL	SSSS	WWYY		

High Side Module 10-F124NID150SH03-LG18F98

Outline

Pin table [mm]

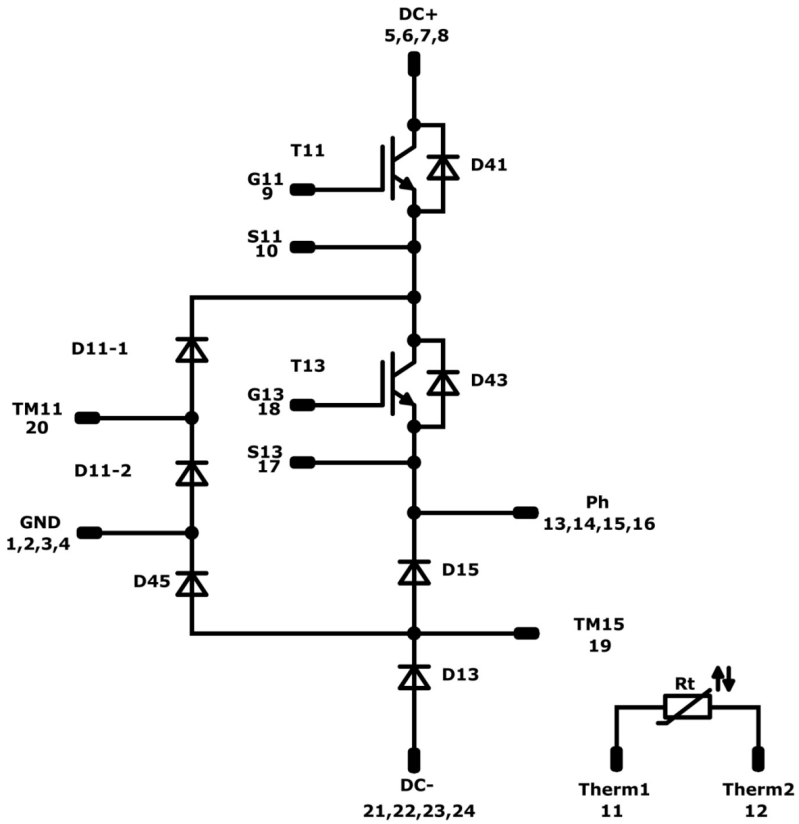
Pin	X	Y	Function
1	53	9	GND
2	53	6	GND
3	53	3	GND
4	53	0	GND
5	38,8	0	DC+
6	35,8	0	DC+
7	38,8	3	DC+
8	35,8	3	DC+
9	20,55	0	G11
10	20,55	3	S11
11	3	0	Therm1
12	0	0	Therm2
13	0	29	Ph
14	3	29	Ph
15	6	29	Ph
16	9	29	Ph
17	10,1	25,95	S13
18	13,1	24,95	G13
19	25,5	29	TM15
20	35,65	19	TM11
21	53	29	DC-
22	53	26	DC-
23	53	23	DC-
24	53	20	DC-



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

High Side Module 10-F124NID150SH03-LG18F98

Pinout



Identification

ID	Component	Voltage	Current	Function	Comment
T11	IGBT	1200 V	150 A	Buck Switch	
D11-1, D11-2	FWD	1300 V	150 A	Buck Diode	Serial devices. Values apply to complete device.
T13	IGBT	1200 V	150 A	Boost Switch	
D13	FWD	1200 V	50 A	Boost Diode	
D15	Rectifier	1600 V	50 A	Boost Sw. Inv. Diode	
D41	FWD	1200 V	50 A	Buck Sw. Protection Diode	
D43	Rectifier	1600 V	50 A	Boost Sw. Protection Diode	
D45	FWD	1200 V	35 A	Boost D. Protection Diode	
Rt	NTC			Thermistor	

Ordering Code & Marking

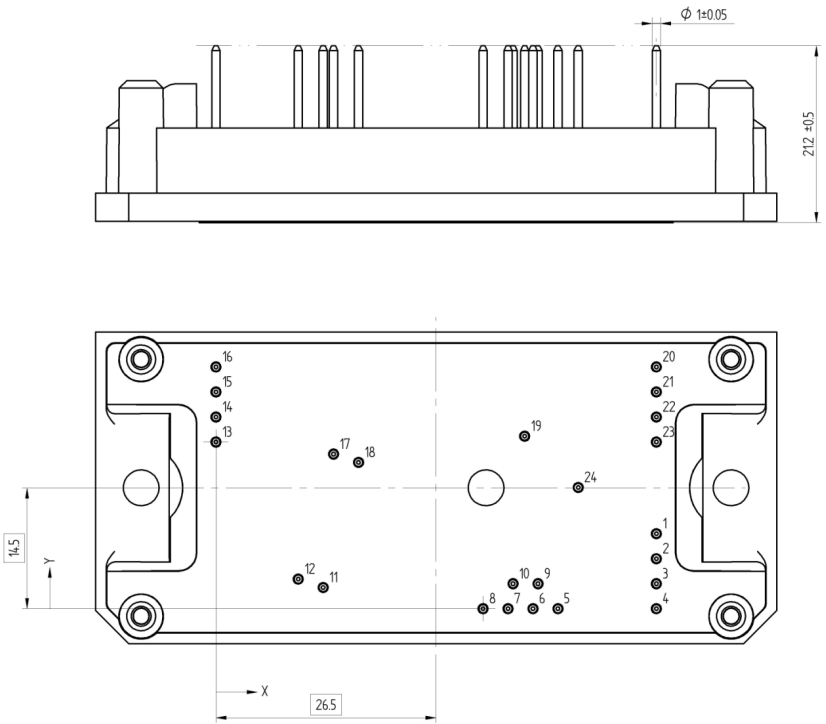
Version	Ordering Code
without thermal paste 17 mm housing with solder pins	10-F124NIE150SH03-LG28F98
with thermal paste 17 mm housing with solder pins	10-F124NIE150SH03-LG28F98-/3/

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

Low Side Module 10-F124NIE150SH03-LG28F98

Outline

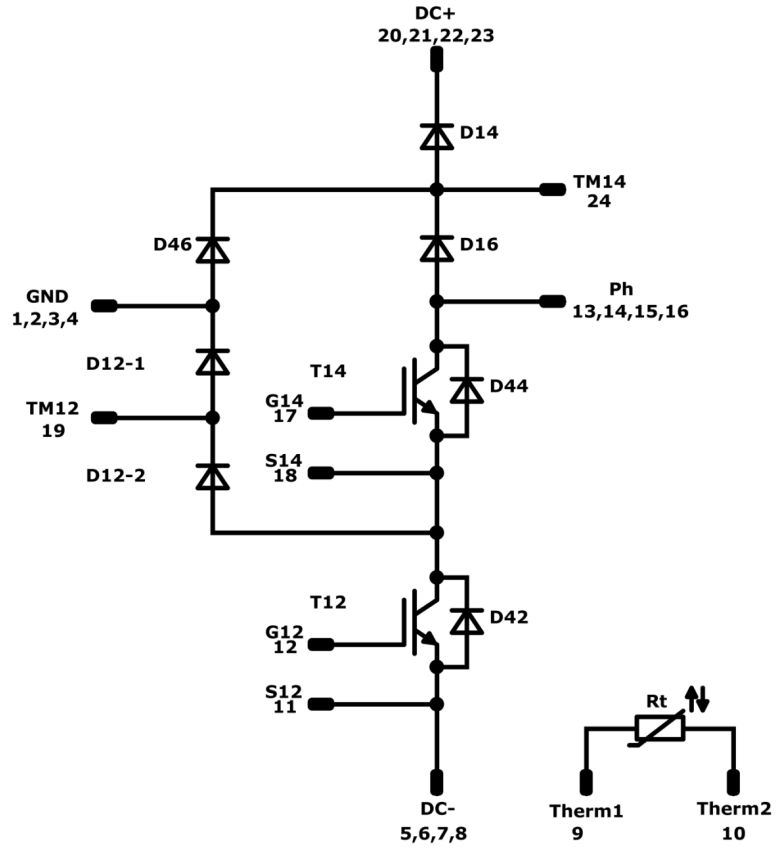
Pin table [mm]			
Pin	X	Y	Function
1	53	9	GND
2	53	6	GND
3	53	3	GND
4	53	0	GND
5	41,15	0	DC-
6	38,15	0	DC-
7	35,15	0	DC-
8	32,15	0	DC-
9	38,75	3	Therm1
10	35,75	3	Therm2
11	12,9	2,55	S12
12	9,9	3,55	G12
13	0	20	Ph
14	0	23	Ph
15	0	26	Ph
16	0	29	Ph
17	14,15	18,55	G14
18	17,15	17,55	S14
19	37,15	20,7	TM12
20	53	29	DC+
21	53	26	DC+
22	53	23	DC+
23	53	20	DC+
24	43,6	14,55	TM14



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

Low Side Module 10-F124NIE150SH03-LG28F98

Pinout



Identification

ID	Component	Voltage	Current	Function	Comment
T12	IGBT	1200 V	150 A	Buck Switch	
D12-1, D12-2	FWD	1300 V	150 A	Buck Diode	Serial devices. Values apply to complete device.
T14	IGBT	1200 V	150 A	Boost Switch	
D14	FWD	1200 V	50 A	Boost Diode	
D16	Rectifier	1600 V	50 A	Boost Sw. Inv. Diode	
D42	FWD	1200 V	50 A	Buck Sw. Protection Diode	
D44	Rectifier	1600 V	50 A	Boost Sw. Protection Diode	
D46	FWD	1200 V	35 A	Boost D. Protection Diode	
Rt	NTC			Thermistor	

Packaging instruction				
Standard packaging quantity (SPQ) 100	>SPQ	Standard	<SPQ	Sample

Handling instruction
Handling instructions for *flow* 1 packages see vincotech.com website.

Package data
Package data for *flow* 1 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
10-F124NIx150SH03-LGx8F98-T2-14	20 Oct. 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.