Vincotech

10-PY073AA050RG01-LK14L08Y-/3/

target datasheet

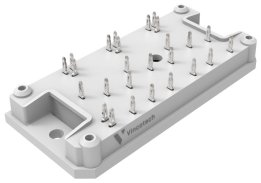
for virtual products created by Vincotech Product Creator, only for evaluation purposes, no commitment for product development!

flow3xANPFC 1 **650 V / 50 A**

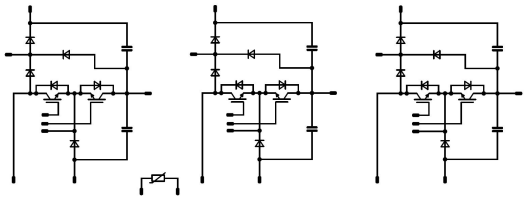
Features

- 3-Phase Application
- High power low inductive package
- High speed IGBT
- Integrated NTC

flow 1 12 mm housing



Schematic



Target applications

- Charging Stations
- Power Supply

Types

- 10-PY073AA050RG01-LK14L08Y

Maximum Ratings

T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Conditions	Value	Unit
Neutral Point Switch				
Collector-emitter voltage	V_{CES}		650	V
Collector current	I_C		50	A
Repetitive peak collector current	I_{CRM}	t_p limited by T_{jmax}	200	A
Total power dissipation	P_{tot}	T_j = T_{jmax} T_s = 80 °C	79	W
Gate-emitter voltage	V_{GES}		±30	V
Maximum junction temperature	T_{jmax}		175	°C
Negative Boost Diode				
Peak repetitive reverse voltage	V_{RRM}		600	V
Continuous (direct) forward current	I_F		30	A
Surge (non-repetitive) forward current	I_{FSM}	T_j = 25 °C	300	A
Total power dissipation	P_{tot}	T_j = T_{jmax} T_s = 80 °C	66	W
Maximum junction temperature	T_{jmax}		175	°C
Positive Boost Diode				
Peak repetitive reverse voltage	V_{RRM}		600	V
Continuous (direct) forward current	I_F		30	A
Surge (non-repetitive) forward current	I_{FSM}	T_j = 25 °C	300	A
Total power dissipation	P_{tot}	T_j = T_{jmax} T_s = 80 °C	66	W
Maximum junction temperature	T_{jmax}		175	°C

Maximum Ratings

T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Conditions	Value	Unit
Positive Boost Blocking Diode				
Peak repetitive reverse voltage	V_{RRM}		1600	V
Continuous (direct) forward current	I_F		20	A
Surge (non-repetitive) forward current	I_{FSM}	Single Half Sine Wave, t_p = 10 ms, T_j = 45 °C	0	A
Surge current capability	I^2t	Single Half Sine Wave, t_p = 10 ms, T_j = 45 °C	450	A^2s
Total power dissipation	P_{tot}	T_j = T_{jmax}, T_s = 80 °C	51	W
Maximum junction temperature	T_{jmax}		150	°C
Positive Boost Diode Protection Diode				
Peak repetitive reverse voltage	V_{RRM}		650	V
Continuous (direct) forward current	I_F		10	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{jmax}	20	A
Total power dissipation	P_{tot}	T_j = T_{jmax}, T_s = 80 °C	32	W
Maximum junction temperature	T_{jmax}		175	°C
Neutral Point Diode				
Peak repetitive reverse voltage	V_{RRM}		1600	V
Continuous (direct) forward current	I_F		20	A
Surge (non-repetitive) forward current	I_{FSM}	Single Half Sine Wave, t_p = 10 ms, T_j = 45 °C	0	A
Surge current capability	I^2t	Single Half Sine Wave, t_p = 10 ms, T_j = 45 °C	450	A^2s
Total power dissipation	P_{tot}	T_j = T_{jmax}, T_s = 80 °C	51	W
Maximum junction temperature	T_{jmax}		150	°C
Capacitor (DC)				
Maximum DC voltage	V_{MAX}		500	V
Operation Temperature	T_{op}		0 ... 125	°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			>12.7mm	mm
Clearance			8.58mm	mm
Comparative Tracking Index	CTI		≥ 200	

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	$V_{GE(th)}$				0,03	25	5	6	7	V
Collector-emitter saturation voltage	V_{CEsat}		15		50	25 175		1,5 1,85	1,9	V
Collector-emitter cut-off current	I_{CES}		0	650		25			0,01	mA
Gate-emitter leakage current	I_{GES}		30	0		25			0,2	µA
Input capacitance	C_{ies}	f = 1 Mhz	0	30		25		4200		pF
Output capacitance	C_{oes}							104		pF
Reverse transfer capacitance	C_{res}							79		pF
Gate charge	Q_g		15	400	50	25		141		nC
Thermal										
Thermal resistance junction to sink	$R_{th(j-s)}$	λ_{paste} = 3,4 W/mK (PSX)						1,21		K/W
Negative Boost Diode										
Static										
Forward voltage	V_F				30	25 125	1,88	2,1 1,6	2,78	V
Reverse leakage current	I_R			600		25 125			10 500	µA
Thermal										
Thermal resistance junction to sink	$R_{th(j-s)}$	λ_{paste} = 3,4 W/mK (PSX)						1,43		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	
Positive Boost Diode										
Static										
Forward voltage	V_F				30	25 125	1,88	2,1 1,6	2,78	V
Reverse leakage current	I_R			600		25 125			10 500	µA
Thermal										
Thermal resistance junction to sink	$R_{th(j-s)}$	λ_{paste} = 3,4 W/mK (PSX)						1,43		K/W
Positive Boost Blocking Diode										
Static										
Forward voltage	V_F				30	25 150			1,29 1,26	V
Reverse leakage current	I_R			1600		25			10	µA
Thermal										
Thermal resistance junction to sink	$R_{th(j-s)}$	λ_{paste} = 3,4 W/mK (PSX)						1,36		K/W
Positive Boost Diode Protection Diode										
Static										
Forward voltage	V_F				10	25	1,23	1,55	1,87	V
Reverse leakage current	I_R			650		25			0,14	µA
Thermal										
Thermal resistance junction to sink	$R_{th(j-s)}$	λ_{paste} = 3,4 W/mK (PSX)						2,93		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 Diode										
Static										
Forward voltage	V_F				30	25 150			1,29 1,26	V
Reverse leakage current	I_R			1600		25			10	µA
Thermal										
Thermal resistance junction to sink	$R_{th(j-s)}$	λ_{paste} = 3,4 W/mK (PSX)						1,36		K/W
Capacitor (DC)										
Static										
Capacitance	C							150		nF
NTC										
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	$B_{(25/50)}$					25		3962		K
B-value	$B_{(25/100)}$					25		4000		K
Vincotech Thermistor Reference									I	

Ordering Code & Marking

Version	Ordering Code
without thermal paste 12 mm housing with Press-fit pins	10-PY073AA050RG01-LK14L08Y
with thermal paste 12 mm housing with Press-fit pins	10-PY073AA050RG01-LK14L08Y-/3/

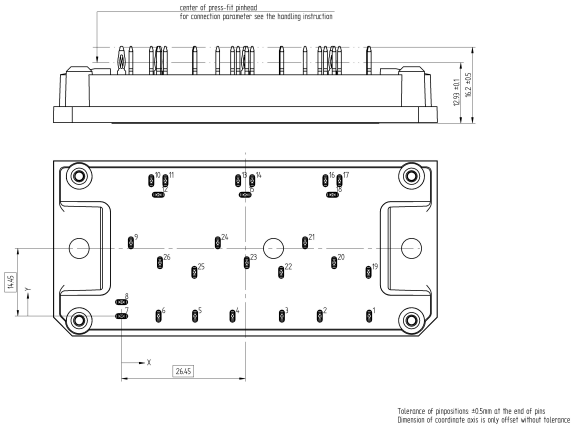
NN-NNNNNNNNNNNNNN
TTTTTTVV WWYY UL
VIN LLLLL SSSS

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		

Outline

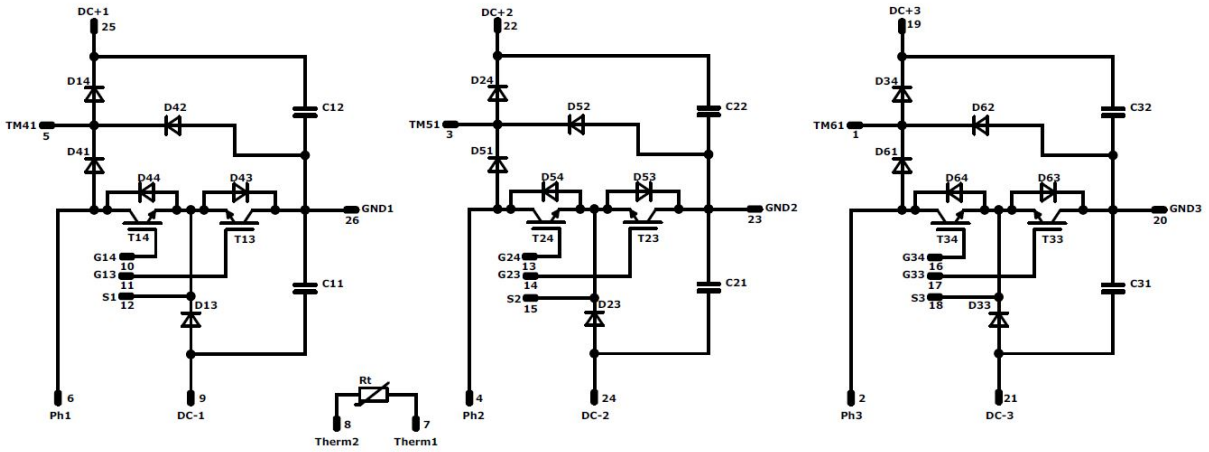
Pin table [mm]

Pin	X	Y	Function
1	52,9	0	TM61
2	42,35	0	Ph3
3	34,25	0	TM51
4	23,7	0	Ph2
5	15,7	0	TM41
6	7,9	0	Ph1
7	0	0	Therm1
8	0	3	Therm2
9	2	15,65	DC-1
10	6,35	28,9	G14
11	9,35	28,9	G13
12	7,85	25,9	S1
13	24,9	28,9	G24
14	27,9	28,9	G23
15	26,4	25,9	S2
16	43,55	28,9	G34
17	46,55	28,9	G33
18	45,05	25,9	S3
19	52,75	9,35	DC+3
20	45,4	11,4	GND3
21	39,2	15,65	DC-3
22	34,1	9,35	DC+2
23	26,75	11,4	GND2
24	20,55	15,65	DC-2
25	15,55	9,35	DC+1
26	8,2	11,4	GND1



Tolerance of pinpositions ±0,5mm of the end of pins
Dimension of coordinate axis is only offset without tolerance

Pinout



Identification

ID	Component	Voltage	Current	Function	Comment
T13, T14, T23, T24, T33, T34	IGBT	650 V	50 A	Neutral Point Switch	
D13, D23, D33	FWD	600 V	30 A	Negative Boost Diode	
D14, D24, D34	FWD	600 V	30 A	Positive Boost Diode	
D41, D51, D61	Rectifier	1600 V	20 A	Positive Boost Blocking Diode	
D42, D52, D62	FWD	650 V	10 A	Positive Boost Diode Protection Diode	
D43, D44, D53, D54, D63, D64	Rectifier	1600 V	20 A	Neutral Point Diode	
C11, C12, C21, C22, C31, C32	Capacitor	500 V		Capacitor (DC)	
Rt	Thermistor			NTC	

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
Packaging 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-PY073AA050RG01-LK14L08Y-/3/-T1-14	10 Feb. 2019	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.