



Vincotech

# 10-F112VPA080MS-LK88A09

target datasheet

flowPIM 1 + 3xPFC

1200 V / 80 mΩ

## Topology features

- 3ph Vienna rectifier
- Inverter
- Open Emitter configuration
- Temperature sensor

## Component features

- High Blocking Voltage with low drain source on state resistance
- High speed SiC-MOSFET technology
- Resistant to Latch-up

## Housing features

- Base isolation: Al<sub>2</sub>O<sub>3</sub>
- Convex shaped substrate for superior thermal contact
- Thermo-mechanical push-and-pull force relief
- Solder pin

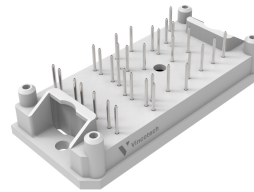
## Target applications

- Embedded Drives
- HVAC
- Heat Pumps
- Industrial Drives

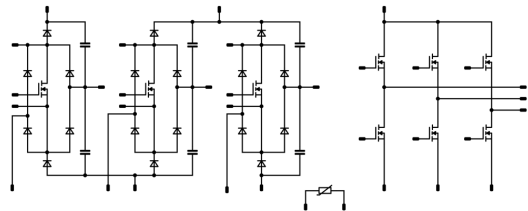
## Types

- 10-F112VPA080MS-LK88A09

## flow 1 17 mm housing



## Schematic





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## Maximum Ratings

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

Parameter	Symbol	Conditions	Value	Unit
<b>Inverter Switch</b>				
Drain-source voltage	$V_{DS}$		1200	V
Drain current (DC current) <sup>(2)</sup>	$I_D$	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	24	A
Peak drain current	$I_{DM}$	$t_p$ limited by $T_{jmax}$	68	A
Total power dissipation	$P_{tot}$	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	52	W
Gate-source voltage	$V_{GSS}$	static	0 / 18	V
		dynamic	-5 / 22	V
Maximum Junction Temperature	$T_{jmax}$		175	°C

<sup>(1)</sup>Calculation based on chip supplier datasheet at  $T_j=175\text{°C}$

## Boost Switch

Drain-source voltage	$V_{DS}$		600	V
Drain current (DC current)	$I_D$	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	16	A
Peak drain current	$I_{DM}$	$t_p$ limited by $T_{jmax}$	100	A
Avalanche energy, single pulse	$E_{AS}$	$V_{DD} = 50\text{ V}$ $I_D = 5,1\text{ A}$	105	mJ
Avalanche energy, repetitive	$E_{AR}$	$V_{DD} = 50\text{ V}$ $I_D = 5,1\text{ A}$	0,53	mJ
MOSFET dv/dt ruggedness	dv/dt	$V_{DS} = 0..400\text{ V}$ $T_s = 25\text{ °C}$	80	V/ns
Total power dissipation	$P_{tot}$	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	49	W
Gate-source voltage	$V_{GSS}$	static	±20	V
Reverse diode dv/dt	dv/dt		50	V/ns
Maximum Junction Temperature	$T_{jmax}$		150	°C



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## Maximum Ratings

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

Parameter	Symbol	Conditions	Value	Unit
<b>Boost Diode</b>				
Peak repetitive reverse voltage	$V_{RRM}$		600	V
Forward current (DC current)	$I_F$	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	35	A
Surge (non-repetitive) forward current	$I_{FSM}$	Single Half Sine Wave, $t_p = 10\text{ ms}$ $T_j = 25\text{ °C}$	185	A
Total power dissipation	$P_{tot}$	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	50	W
Maximum junction temperature	$T_{jmax}$		175	°C

## Negative Boost Diode

Peak repetitive reverse voltage	$V_{RRM}$		600	V
Forward current (DC current)	$I_F$	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	35	A
Surge (non-repetitive) forward current	$I_{FSM}$	Single Half Sine Wave, $t_p = 10\text{ ms}$ $T_j = 25\text{ °C}$	185	A
Total power dissipation	$P_{tot}$	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	50	W
Maximum junction temperature	$T_{jmax}$		175	°C

## Neutral Point Diode

Peak repetitive reverse voltage	$V_{RRM}$		1600	V
Forward current (DC current) <sup>(4)</sup>	$I_F$	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	34	A
Surge (non-repetitive) forward current	$I_{FSM}$	Single Half Sine Wave, $t_p = 8,3\text{ ms}$ $T_j = 25\text{ °C}$	150	A
Surge current capability	$I^2t$		112	A <sup>2</sup> s
Total power dissipation	$P_{tot}$	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	39	W
Maximum junction temperature	$T_{jmax}$		150	°C

<sup>(3)</sup>Calculation based on chip supplier datasheet at  $T_j=150\text{°C}$



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## Maximum Ratings

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

Parameter	Symbol	Conditions	Value	Unit
<b>Rectifier Diode</b>				
Peak repetitive reverse voltage	$V_{RRM}$		1600	V
Forward current (DC current) <sup>(6)</sup>	$I_F$	$T_j = T_{jmax}$ $T_a = 80\text{ °C}$	34	A
Surge (non-repetitive) forward current	$I_{FSM}$	Single Half Sine Wave, $t_p = 8,3\text{ ms}$ $T_j = 25\text{ °C}$	150	A
Surge current capability	$I^2_t$		112	A <sup>2</sup> s
Total power dissipation	$P_{tot}$	$T_j = T_{jmax}$ $T_a = 80\text{ °C}$	39	W
Maximum junction temperature	$T_{jmax}$		150	°C

<sup>(5)</sup>Calculation based on chip supplier datasheet at  $T_j=150\text{°C}$

## Capacitor (DC)

Maximum DC voltage	$V_{MAX}$		630	V
Operation Temperature	$T_{op}$		-55 ... 150	°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			>12,7	mm
Clearance			12,67	mm
Comparative Tracking Index	CTI		≥ 600	



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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	

### Inverter Switch

#### Static

Drain-source on-state resistance	$r_{DS(on)}$		18		15	25 150		80 88	110	mΩ
Gate-source threshold voltage	$V_{GS(th)}$				0,0015	25	3,6	4,6	5,6	V
Gate to Source Leakage Current	$I_{GSS}$		22	0		25			200	nA
Zero Gate Voltage Drain Current	$I_{DSS}$		0	1200		25			50	μA
Internal gate resistance	$r_g$							3		Ω
Short-circuit input capacitance	$C_{iss}$		0	10	0	25		2000		pF
Reverse transfer capacitance	$C_{rss}$							46		

#### Thermal

Thermal resistance junction to sink	$R_{th(j-s)}$	$\lambda_{paste} = 3,4 \text{ W/mK}$ (PSX)						1,82		K/W
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### Boost Switch

#### Static

Drain-source on-state resistance	$r_{DS(on)}$		10		10,5	25		77	99	mΩ
Gate-source threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$			0,00053	25	3	3,5	4	V
Gate to Source Leakage Current	$I_{GSS}$		20	0		25			100	nA
Zero Gate Voltage Drain Current	$I_{DSS}$		0	600		25			1	μA
Internal gate resistance	$r_g$							5,9		Ω
Gate charge	$Q_g$		0/10	400	10,5	25		45		nC
Short-circuit input capacitance	$C_{iss}$	$f = 250 \text{ kHz}$	0	400	0	25		1952		pF
Short-circuit output capacitance	$C_{oss}$							33		

#### Thermal

Thermal resistance junction to sink	$R_{th(j-s)}$	$\lambda_{paste} = 3,4 \text{ W/mK}$ (PSX)						1,43		K/W
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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 Diode

#### Static

Forward voltage	$V_F$				15	25 125		1,6 1,3	2,5	V
Reverse leakage current	$I_R$	$V_r = 600$ V				25			10	μA

#### Thermal

Thermal resistance junction to sink	$R_{th(j-s)}$	$\lambda_{paste} = 3,4$ W/mK (PSX)						1,89		K/W
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### Negative Boost Diode

#### Static

Forward voltage	$V_F$				15	25 125		1,6 1,3	2,5	V
Reverse leakage current	$I_R$	$V_r = 600$ V				25			10	μA

#### Thermal

Thermal resistance junction to sink	$R_{th(j-s)}$	$\lambda_{paste} = 3,4$ W/mK (PSX)						1,89		K/W
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### Neutral Point Diode

#### Static

Forward voltage	$V_F$				7	25 150		1 0,95	1,11 1,01	V
Reverse leakage current	$I_R$	$V_r = 1600$ V				25 150			5 700	μA

#### Thermal

Thermal resistance junction to sink	$R_{th(j-s)}$	$\lambda_{paste} = 3,4$ W/mK (PSX)						1,78		K/W
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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	

### Rectifier Diode

#### Static

Forward voltage	$V_F$				7	25 150		1 0,95	1,11 1,01	V
Reverse leakage current	$I_R$	$V_r = 1600$ V				25 150			5 700	μA

#### Thermal

Thermal resistance junction to sink	$R_{th(j-s)}$	$\lambda_{paste} = 3,4$ W/mK (PSX)						1,78		K/W
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### Capacitor (DC)

#### Static

Capacitance	$C$	DC bias voltage = 0 V				25		33		nF
Tolerance							-5		5	%

### Thermistor

#### Static

Rated resistance	$R$					25		22		kΩ
Deviation of R100	$\Delta_{R/R}$	$R_{100} = 1484$ Ω				100	-5		5	%
Power dissipation	$P$					25		130		mW
Power dissipation constant	$d$					25		1,5		mW/K
B-value	$B_{(25/50)}$	Tol. $\pm 1$ %						3962		K
B-value	$B_{(25/100)}$	Tol. $\pm 1$ %						4000		K
Vincotech Thermistor Reference									I	



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Pin table [mm]				Outline	
Pin	X	Y	Function		
1	52,2	3,45	DC+PFC1		
2	46,7	3,45	ST1		
3	40,7	3,45	DC-PFC12		
4	34,4	3,45	ST2		
5	29,25	0	DC+PFC23		
6	24,7	3,45	ST3		
7	17,75	3,45	DC-PFC3		
8	14,75	0	DC-1		
9	14,75	3	G11		
10	0	0	Ph1		
11	0	3,3	G12		
12	0	9,15	DC+Inv		
13	0	14,9	Ph2		
14	0	17,9	G14		
15	0	25,2	G16		
16	0	28,2	Ph3		
17	15,95	28,2	G15		
18	15,95	25,2	DC-3		
19	25,8	28,2	ACIn3		
20	32,55	28,2	ACIn2		
21	52,2	28,2	ACIn1		
22	44,95	23,4	G25		
23	44,95	20,4	S25		
24	45,9	13,85	PFC1		
25	37,95	23,35	G35		
26	37,95	20,4	S35		
27	37,95	13,85	PFC2		
28	27,95	17,2	PFC3		
29	23,35	20,4	G45		
30	22,1	23,4	S45		
31	15,95	19,5	G13		
32	15,95	16,5	DC-2		
33	13,8	11,4	Therm2		
34	13,8	8,4	Therm1		

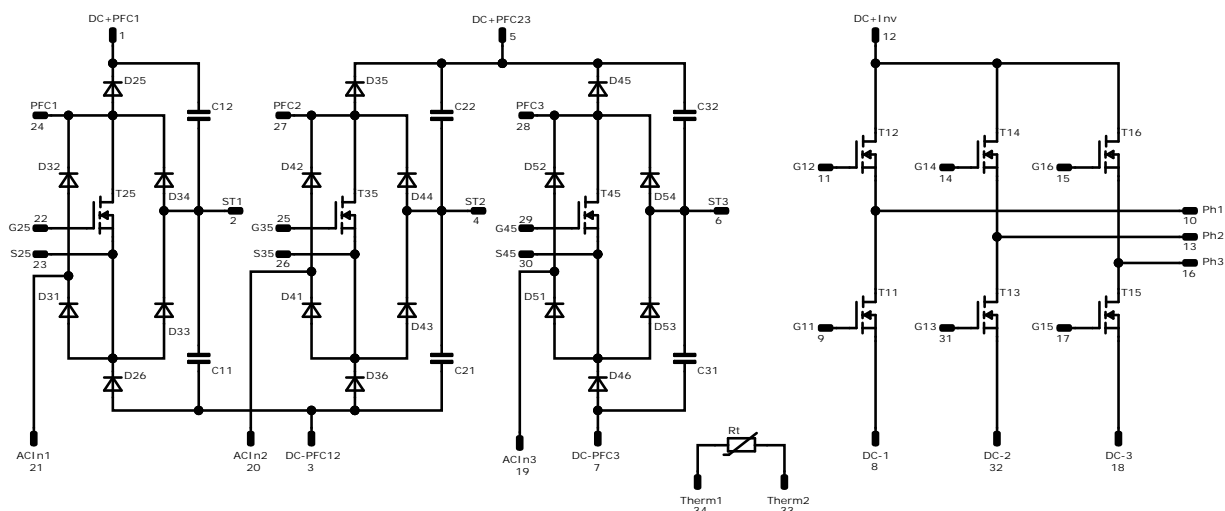
Tolerance of positions: ±0,5mm at the end of pins  
Dimension of coordinate axis is only offset without tolerance



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Pinout




Identification

ID	Component	Voltage	Current	Function	Comment
T11, T12, T13, T14, T15, T16	MOSFET	1200 V	80 mΩ	Inverter Switch	
T25, T35, T45	MOSFET	600 V	77 mΩ	Boost Switch	
D25, D35, D45	FWD	600 V	15 A	Boost Diode	
D26, D36, D46	FWD	600 V	15 A	Negative Boost Diode	
D33, D34, D43, D44, D53, D54	Rectifier	1600 V	12 A	Neutral Point Diode	
D31, D32, D41, D42, D51, D52	Rectifier	1600 V	12 A	Rectifier Diode	
C11, C12, C21, C22, C31, C32	Capacitor	630 V		Capacitor (DC)	
Rt	Thermistor			Thermistor	



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Packaging instruction				
Standard packaging quantity (SPQ) 100	>SPQ	Standard	<SPQ	Sample
Handling instruction				
Handling instructions for <i>flow</i> 1 packages see vincotech.com website.				
Package data				
Package data for <i>flow</i> 1 packages see vincotech.com website.				
Vincotech thermistor reference				
See Vincotech thermistor reference table at vincotech.com website.				
UL recognition and file number				
This device is UL 1557 recognized under E192116 up to a junction temperature under switching condition $T_{j,op}=175^{\circ}\text{C}$ and up to 3500VAC/1min isolation voltage. For more information see vincotech.com website.				

Document No.:	Date:	Modification:	Pages
10-F112VPA080MS-LK88A09-T1-14	1 Jun. 2026	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.

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