Vincotech

10-FE07PPA020I7-LK23B23Z

target datasheet

***flow*PIM 1 + PFC** **650 V / 20 A**

Topology features

- Integrated temperature sensor

Component features

- Easy paralleling
- Low collector emitter saturation voltage
- Low turn-off losses
- Positive temperature coefficient

Housing features

- Base isolation: Al_2O_3
- Convex shaped substrate for superior thermal contact
- Solder pin
- Thermo-mechanical push-and-pull force relief

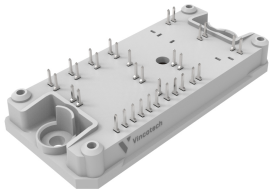
Target applications

- Embedded Drives
- Heat Pumps
- HVAC
- Industrial Drives

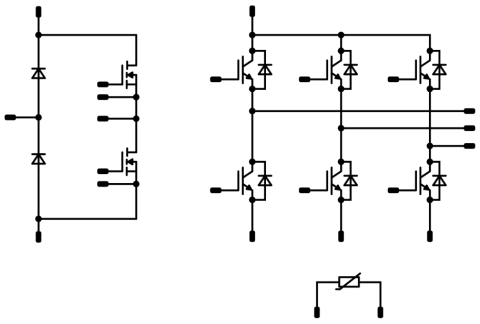
Types

- 10-FE07PPA020I7-LK23B23Z

flow 1 12 mm housing



Schematic



Maximum Ratings

T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Conditions	Value	Unit
Inverter Switch				
Collector-emitter voltage	V_{CES}		650	V
Collector current (DC current)	I_C	$T_j = T_{jmax}$ T_s = 80 °C	31	A
Repetitive peak collector current	I_{CRM}	t_p limited by T_{jmax}	60	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ T_s = 80 °C	57	W
Gate-emitter voltage	V_{GES}		±20	V
Short circuit ratings	t_{SC}	V_{GE} = 15 V, V_{CC} = 400 V T_j = 150 °C	3	µs
Maximum junction temperature	T_{jmax}		175	°C
Inverter Diode				
Peak repetitive reverse voltage	V_{RRM}		650	V
Forward current (DC current)	I_F	$T_j = T_{jmax}$ T_s = 80 °C	28	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{jmax}	60	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ T_s = 80 °C	48	W
Maximum junction temperature	T_{jmax}		175	°C
PFC Switch				
Drain-source voltage	V_{DSS}		750	V
Drain current (DC current)[(2)]	I_D	$T_j = T_{jmax}$ T_s = 80 °C	19	A
Peak drain current	I_{DM}	t_p limited by T_{jmax}	58	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ T_s = 80 °C	46	W
Gate-source voltage	V_{GSS}	static	-4 / 21	V
		dynamic	-4 / 23	V
Maximum Junction Temperature	T_{jmax}		175	°C

[(1)]Calculation based on chip supplier datasheet at T_j=175°C

Maximum Ratings

T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Conditions	Value	Unit
Rectifier Diode				
Peak repetitive reverse voltage	V_{RRM}		1600	V
Forward current (DC current)	I_F	T_j = T_{jmax}, T_s = 80 °C	76	A
Surge (non-repetitive) forward current	I_{FSM}	Single Half Sine Wave, t_p = 10 ms, T_j = 150 °C	400	A
Surge current capability	I^2t		800	A^2s
Total power dissipation	P_{tot}	T_j = T_{jmax}, T_s = 80 °C	99	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			>12,7	mm
Clearance			8,17	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	
Inverter Switch										
Static										
Gate-emitter threshold voltage	$V_{GE(th)}$	V_{CE} = V_{GE}			0,0002	25	4,35	5	5,65	V
Collector-emitter saturation voltage	V_{CEsat}		15		20	25		1,35	1,65	V
Collector-emitter cut-off current	I_{CES}		0	650		25			20	µA
Gate-emitter leakage current	I_{GES}		20	0		25			100	nA
Internal gate resistance	r_g							None		Ω
Input capacitance	C_{ies}	f = 1 Mhz	0	25		25		1310		pF
Output capacitance	C_{oes}							42		pF
Reverse transfer capacitance	C_{res}							13		pF
Gate charge	Q_g	V_{CC} = 520 V	15		20	25		128		nC
Thermal										
Thermal resistance junction to sink	$R_{th(j-s)}$	λ_{paste} = 5,2 W/mK (PTM)						1,66		K/W
Inverter Diode										
Static										
Forward voltage	V_F				20	25		1,65	2	V
Reverse leakage current	I_R	V_r = 650 V				25			20	µA
Thermal										
Thermal resistance junction to sink	$R_{th(j-s)}$	λ_{paste} = 5,2 W/mK (PTM)						1,97		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	
PFC Switch										
Static										
Drain-source on-state resistance	$r_{DS(on)}$		18		12	25 150		65 111	82	mΩ
Gate-source threshold voltage	$V_{GS(th)}$				0,00615	25	2,8	3,5	4,8	V
Gate to Source Leakage Current	I_{GSS}		21	0		25	-100		100	nA
Zero Gate Voltage Drain Current	I_{DSS}		0	750		25		1	80	µA
Internal gate resistance	r_g							4		Ω
Gate charge	Q_g		18	500	12	25		48		nC
Gate to source charge	Q_{GS}							13		
Gate to drain charge	Q_{GD}							15		
Short-circuit input capacitance	C_{iss}	f = 1 Mhz	0	500	0	25		1066		pF
Short-circuit output capacitance	C_{oss}							65		
Reverse transfer capacitance	C_{rss}							7		
Diode forward voltage	V_{SD}		0		12	25		3,3		V
Thermal										
Thermal resistance junction to sink	$R_{th(j-s)}$	λ_{paste} = 5,2 W/mK (PTM)						2,08		K/W
Rectifier Diode										
Static										
Forward voltage	V_F				35	25		1	1,5	V
Reverse leakage current	I_R	V_r = 1600 V				25 150			50 1000	µA
Thermal										
Thermal resistance junction to sink	$R_{th(j-s)}$	λ_{paste} = 5,2 W/mK (PTM)						0,96		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					25		130		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

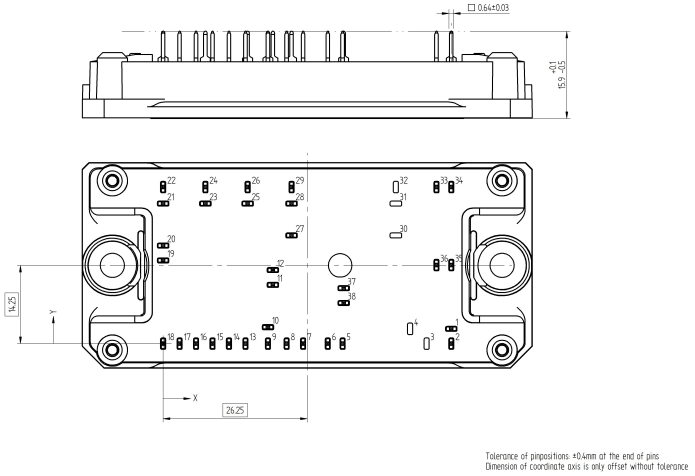
Version	Ordering Code
Without thermal paste	10-FE07PPA020I7-LK23B23Z
With thermal paste (5,2 W/mK, PTM6000HV)	10-FE07PPA020I7-LK23B23Z-/7/

Marking

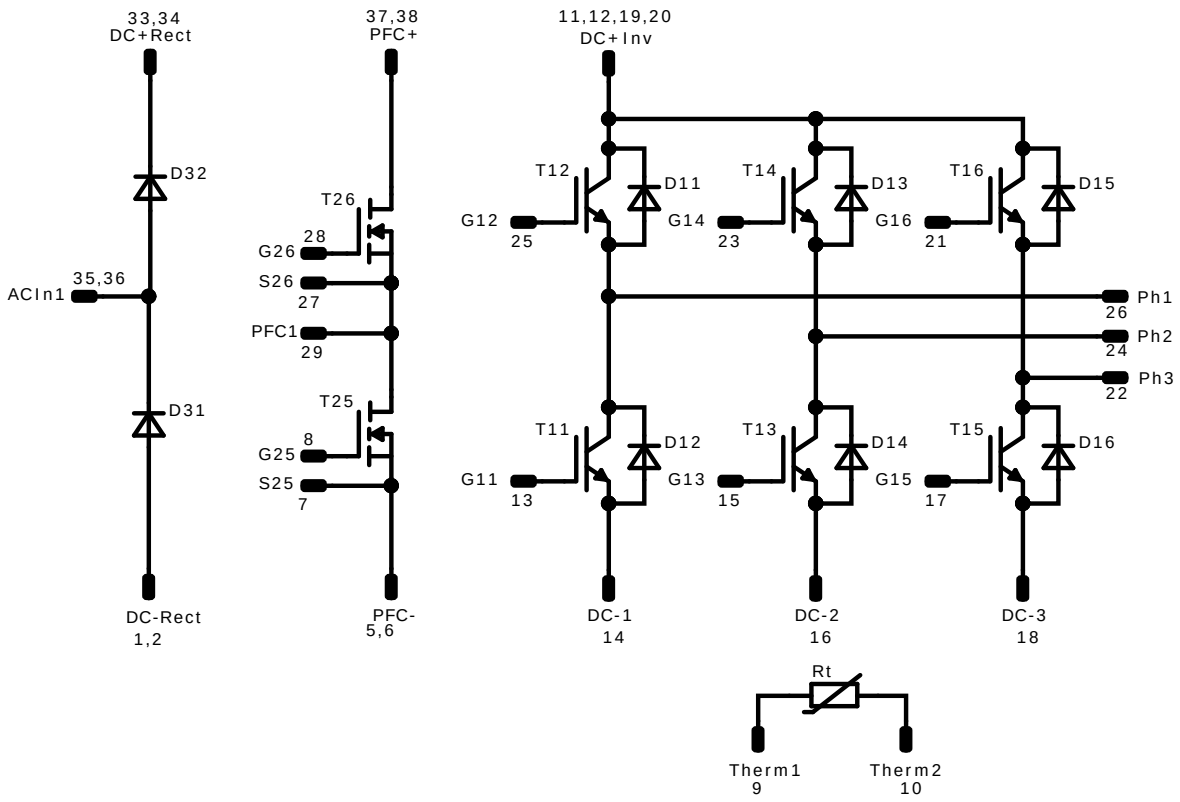
	Name		Date code	UL & VIN	Lot	Serial
Text	NN-NNNNNNNNNNNNNN-TTTTTTVV		WWYY	UL VIN	LLLLL	SSSS
Datamatrix	**Type&Ver**	**Lot number**	**Serial**	**Date code**		
	TTTTTTVV	LLLLL	SSSS	WWYY		

Outline

Pin table [mm]			
Pin	X	Y	Function
1	52,5	2,7	DC-Rect
2	52,5	0	DC-Rect
3	not assembled		
4	not assembled		
5	32,7	0	PFC-
6	30	0	PFC-
7	25,5	0	S25
8	22,5	0	G25
9	19,1	0	Therm1
10	19,1	3	Therm2
11	20	10,7	DC+Inv
12	20	13,4	DC+Inv
13	15	0	G11
14	12	0	DC-1
15	9	0	G13
16	6	0	DC-2
17	3	0	G15
18	0	0	DC-3
19	0	15,15	DC+Inv
20	0	17,85	DC+Inv
21	0	25,5	G16
22	0	28,5	Ph3
23	7,7	25,5	G14
24	7,7	28,5	Ph2
25	15,4	25,5	G12
26	15,4	28,5	Ph1
27	23,4	19,7	S26
28	23,4	25,5	G26
29	23,4	28,5	PFC1
30	not assembled		
31	not assembled		
32	not assembled		
33	49,8	28,5	DC+Rect
34	52,5	28,5	DC+Rect
35	52,5	14,3	ACIn1
36	49,8	14,3	ACIn1
37	32,9	10,1	PFC+
38	32,9	7,4	PFC+



Pinout



Identification

ID	Component	Voltage	Current	Function	Comment
T11, T12, T13, T14, T15, T16	IGBT	650 V	20 A	Inverter Switch	
D11, D12, D13, D14, D15, D16	FWD	650 V	20 A	Inverter Diode	
T25, T26	MOSFET	750 V	65 mΩ	PFC Switch	
D31, D32	Rectifier	1600 V	35 A	Rectifier Diode	
Rt	Thermistor			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.

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°C and up to 3500VAC/1min isolation voltage. For more information see vincotech.com website.

Document No.:	Date:	Modification:	Pages
10-FE07PPA020I7-LK23B23Z-T1-14	8 Mar. 2026	Initial Release	
10-FE07PPA020I7-LK23B23Z-T1-14	8 Mar. 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.