



Vincotech

10-PY07PMA030I7-P584B68Y

target datasheet

flowPIM 1 + PFC

650 V / 30 A

Topology features

- Converter+Brake+Inverter
- Open Emitter configuration
- Temperature sensor

Component features

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

Housing features

- Base isolation: Al₂O₃
- Convex shaped substrate for superior thermal contact
- Thermo-mechanical push-and-pull force relief
- Press-fit pin
- Reliable cold welding connection

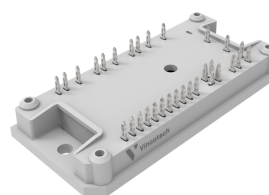
Target applications

- Embedded Drives
- Heat Pumps
- HVAC
- Industrial Drives

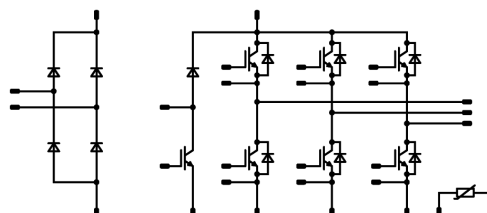
Types

- 10-PY07PMA030I7-P584B68Y

flow 1 12 mm housing



Schematic





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Maximum Ratings

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

Parameter	Symbol	Conditions	Value	Unit
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Inverter Switch

Collector-emitter voltage	V_{CES}		650	V
Collector current (DC current)	I_C	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	37	A
Repetitive peak collector current	I_{CRM}	t_p limited by T_{jmax}	90	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	58	W
Gate-emitter voltage	V_{GES}		± 20	V
Short circuit ratings	t_{SC}	$V_{GE} = 15\text{ V}$, $V_{CC} = 400\text{ V}$ $T_j = 150\text{ °C}$	3	μs
Maximum junction temperature	T_{jmax}		175	$^{\circ}\text{C}$

Inverter Diode

Peak repetitive reverse voltage	V_{RRM}		650	V
Forward current (DC current)	I_F	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	32	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{jmax}	90	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	48	W
Maximum junction temperature	T_{jmax}		175	$^{\circ}\text{C}$

Brake Switch

Collector-emitter voltage	V_{CES}		650	V
Collector current (DC current)	I_C	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	37	A
Repetitive peak collector current	I_{CRM}	t_p limited by T_{jmax}	90	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	58	W
Gate-emitter voltage	V_{GES}		± 20	V
Short circuit ratings	t_{SC}	$V_{GE} = 15\text{ V}$, $V_{CC} = 400\text{ V}$ $T_j = 150\text{ °C}$	3	μs
Maximum junction temperature	T_{jmax}		175	$^{\circ}\text{C}$



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Maximum Ratings

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

Parameter	Symbol	Conditions	Value	Unit
Brake Diode				
Peak repetitive reverse voltage	V_{RRM}		650	V
Forward current (DC current)	I_F	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	25	A
Repetitive peak forward current	I_{FRM}	t_p limited by T_{jmax}	60	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	41	W
Maximum junction temperature	T_{jmax}		175	°C

Rectifier Diode

Peak repetitive reverse voltage	V_{RRM}		1600	V
Forward current (DC current)	I_F	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	48	A
Surge (non-repetitive) forward current	I_{FSM}	Single Half Sine Wave, $t_p = 10\text{ ms}$ $T_j = 150\text{ °C}$	270	A
Surge current capability	I^2t		370	A²s
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	57	W
Maximum junction temperature	T_{jmax}		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			8,34	mm
Comparative Tracking Index	CTI		≥ 200	



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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

Gate-emitter threshold voltage	$V_{GE(th)}$	$V_{CE} = V_{GE}$			0,0003	25	4,35	5	5,65	V
Collector-emitter saturation voltage	V_{CEsat}		15		30	25		1,35	1,65	V
Collector-emitter cut-off current	I_{CES}		0	650		25			20	µA
Gate-emitter leakage current	I_{GES}		0	650		25			100	nA
Internal gate resistance	r_g							None		Ω
Input capacitance	C_{ies}	$f = 1 \text{ Mhz}$	0	25		25		1900		pF
Output capacitance	C_{oes}							62		pF
Reverse transfer capacitance	C_{res}							20		pF
Gate charge	Q_g	$V_{CC} = 520 \text{ V}$	15		30	25		180		nC

Thermal

Thermal resistance junction to sink	$R_{th(j-s)}$	$\lambda_{paste} = 5,2 \text{ W/mK}$ (PTM)						1,64		K/W
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Inverter Diode

Static

Forward voltage	V_F				30	25		1,65	2	V
Reverse leakage current	I_R	$V_r = 650 \text{ V}$				25			20	µA

Thermal

Thermal resistance junction to sink	$R_{th(j-s)}$	$\lambda_{paste} = 5,2 \text{ W/mK}$ (PTM)						2		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	

Brake Switch

Static

Gate-emitter threshold voltage	$V_{GE(th)}$	$V_{CE} = V_{GE}$			0,0003	25	4,35	5	5,65	V
Collector-emitter saturation voltage	V_{CEsat}		15		30	25		1,35	1,65	V
Collector-emitter cut-off current	I_{CES}		0	650		25			20	µA
Gate-emitter leakage current	I_{GES}		0	650		25			100	nA
Internal gate resistance	r_g							None		Ω
Input capacitance	C_{ies}	$f = 1 \text{ Mhz}$	0	25		25		1900		pF
Output capacitance	C_{oes}							62		pF
Reverse transfer capacitance	C_{res}							20		pF
Gate charge	Q_g	$V_{CC} = 520 \text{ V}$	15		30	25		180		nC

Thermal

Thermal resistance junction to sink	$R_{th(j-s)}$	$\lambda_{paste} = 5,2 \text{ W/mK}$ (PTM)						1,64		K/W
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Brake Diode

Static

Forward voltage	V_F				20	25		1,65	2	V
Reverse leakage current	I_R	$V_r = 650 \text{ V}$				25			20	µA

Thermal

Thermal resistance junction to sink	$R_{th(j-s)}$	$\lambda_{paste} = 5,2 \text{ W/mK}$ (PTM)						2,34		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				28	25			1,5	V
Reverse leakage current	I_R	$V_r = 1600$ V				25 150			100 1000	μA

Thermal

Thermal resistance junction to sink	$R_{th(j-s)}$	$\lambda_{paste} = 5,2$ W/mK (PTM)						1,24		K/W
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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	



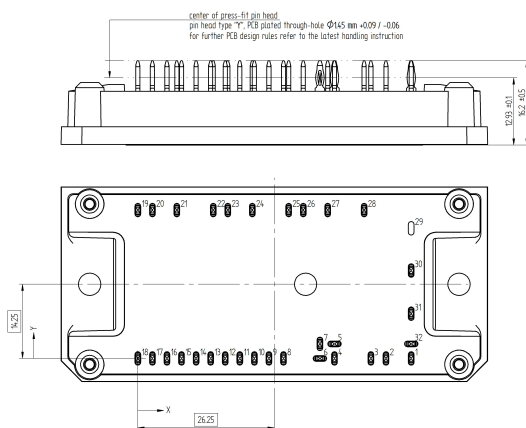
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Ordering Code	
Version	Ordering Code
Without thermal paste	10-PY07PMA030I7-P584B68Y
With thermal paste (5,2 W/mK, PTM6000HV)	10-PY07PMA030I7-P584B68Y-/7/

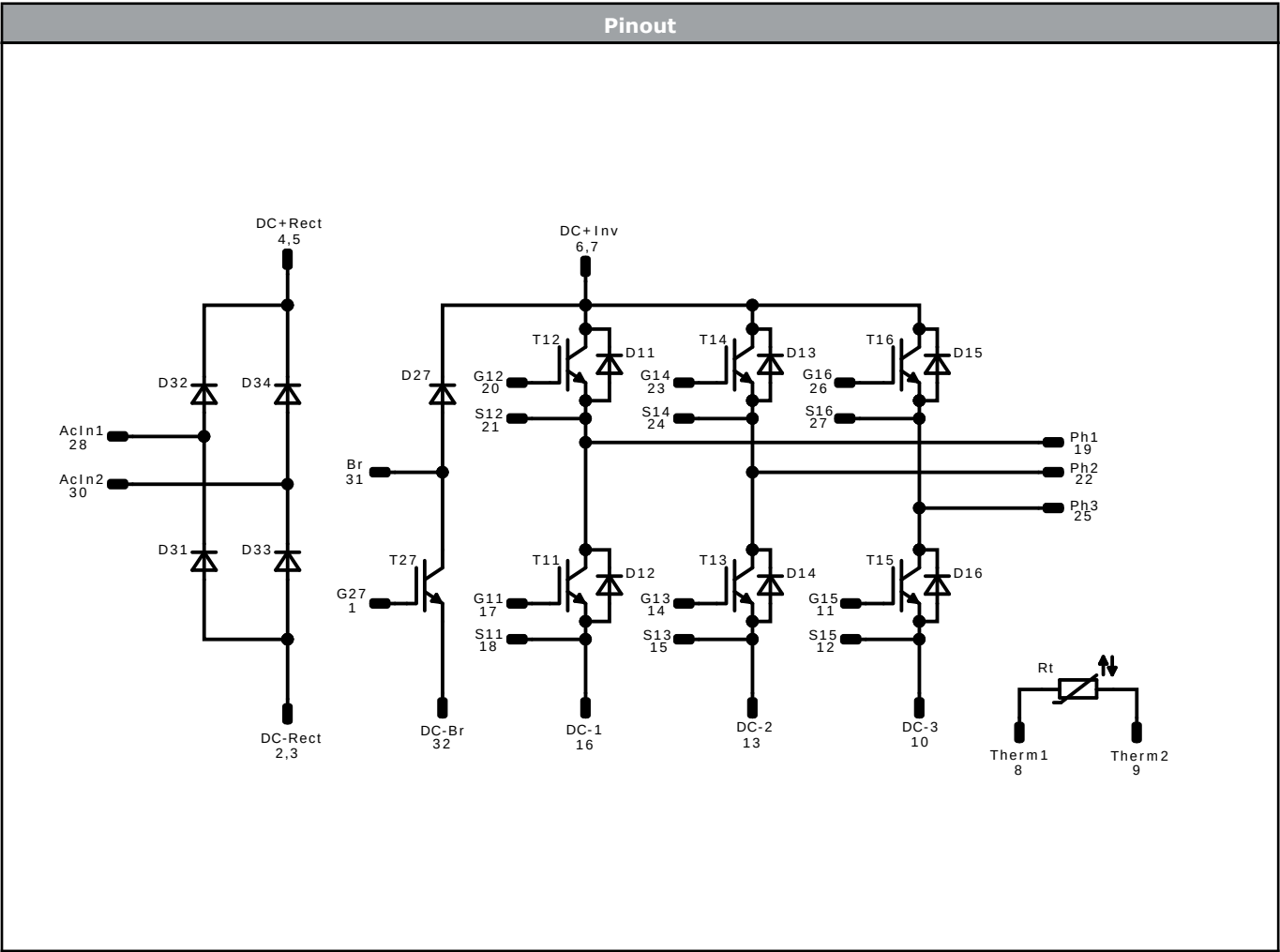
Marking						
	Text	Name NN-NNNNNNNNNNNNNN- TTTTTV	Date code WWYY	UL & VIN UL VIN	Lot LLLLL	Serial SSSS
	Datamatrix	Type&Ver TTTTTVV	Lot number LLLLL	Serial SSSS	Date code WWYY	

Outline																																																																																																																																							
Pin table [mm] <table><tr><th>Pin</th><th>X</th><th>Y</th><th>Function</th></tr><tr><td>1</td><td>52,55</td><td>0</td><td>G27</td></tr><tr><td>2</td><td>47,7</td><td>0</td><td>DC-Rect</td></tr><tr><td>3</td><td>44,8</td><td>0</td><td>DC-Rect</td></tr><tr><td>4</td><td>37,8</td><td>0</td><td>DC+Rect</td></tr><tr><td>5</td><td>37,8</td><td>2,8</td><td>DC+Rect</td></tr><tr><td>6</td><td>35</td><td>0</td><td>DC+Inv</td></tr><tr><td>7</td><td>35</td><td>2,8</td><td>DC+Inv</td></tr><tr><td>8</td><td>28</td><td>0</td><td>Therm1</td></tr><tr><td>9</td><td>25,2</td><td>0</td><td>Therm2</td></tr><tr><td>10</td><td>22,4</td><td>0</td><td>DC-3</td></tr><tr><td>11</td><td>19,6</td><td>0</td><td>G15</td></tr><tr><td>12</td><td>16,8</td><td>0</td><td>S15</td></tr><tr><td>13</td><td>14</td><td>0</td><td>DC-2</td></tr><tr><td>14</td><td>11,2</td><td>0</td><td>G13</td></tr><tr><td>15</td><td>8,4</td><td>0</td><td>S13</td></tr><tr><td>16</td><td>5,6</td><td>0</td><td>DC-1</td></tr><tr><td>17</td><td>2,8</td><td>0</td><td>G11</td></tr><tr><td>18</td><td>0</td><td>0</td><td>S11</td></tr><tr><td>19</td><td>0</td><td>28,5</td><td>Ph1</td></tr><tr><td>20</td><td>2,8</td><td>28,5</td><td>G12</td></tr><tr><td>21</td><td>7,5</td><td>28,5</td><td>S12</td></tr><tr><td>22</td><td>14,5</td><td>28,5</td><td>Ph2</td></tr><tr><td>23</td><td>17,3</td><td>28,5</td><td>G14</td></tr><tr><td>24</td><td>22</td><td>28,5</td><td>S14</td></tr><tr><td>25</td><td>29</td><td>28,5</td><td>Ph3</td></tr><tr><td>26</td><td>31,8</td><td>28,5</td><td>G16</td></tr><tr><td>27</td><td>36,5</td><td>28,5</td><td>S16</td></tr><tr><td>28</td><td>43,5</td><td>28,5</td><td>ACIn1</td></tr><tr><td>29</td><td colspan="3">not assembled</td></tr><tr><td>30</td><td>52,55</td><td>16,9</td><td>ACIn2</td></tr><tr><td>31</td><td>52,55</td><td>8,6</td><td>Br</td></tr><tr><td>32</td><td>52,55</td><td>2,8</td><td>DC-Br</td></tr></table>				Pin	X	Y	Function	1	52,55	0	G27	2	47,7	0	DC-Rect	3	44,8	0	DC-Rect	4	37,8	0	DC+Rect	5	37,8	2,8	DC+Rect	6	35	0	DC+Inv	7	35	2,8	DC+Inv	8	28	0	Therm1	9	25,2	0	Therm2	10	22,4	0	DC-3	11	19,6	0	G15	12	16,8	0	S15	13	14	0	DC-2	14	11,2	0	G13	15	8,4	0	S13	16	5,6	0	DC-1	17	2,8	0	G11	18	0	0	S11	19	0	28,5	Ph1	20	2,8	28,5	G12	21	7,5	28,5	S12	22	14,5	28,5	Ph2	23	17,3	28,5	G14	24	22	28,5	S14	25	29	28,5	Ph3	26	31,8	28,5	G16	27	36,5	28,5	S16	28	43,5	28,5	ACIn1	29	not assembled			30	52,55	16,9	ACIn2	31	52,55	8,6	Br	32	52,55	2,8	DC-Br
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Identification					
ID	Component	Voltage	Current	Function	Comment
T11, T12, T13, T14, T15, T16	IGBT	650 V	30 A	Inverter Switch	
D11, D12, D13, D14, D15, D16	FWD	650 V	30 A	Inverter Diode	
T27	IGBT	650 V	30 A	Brake Switch	
D27	FWD	650 V	20 A	Brake Diode	
D31, D32, D33, D34	Rectifier	1600 V	28 A	Rectifier Diode	
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-PY07PMA030I7-P584B68Y-T1-14	20 Feb. 2025		

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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2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.