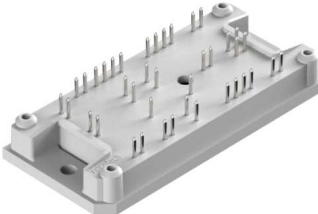
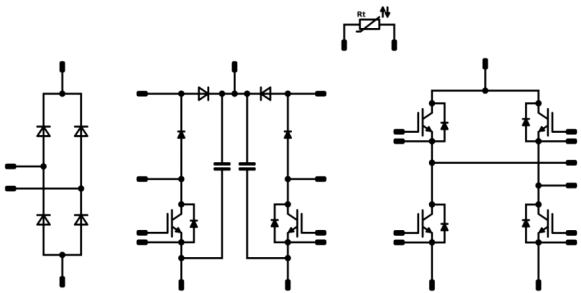




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<i>flow</i> RPI 1	650 V / 50 A
<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center; background-color: #ccc; margin: 0;"><b>Features</b></p> <ul style="list-style-type: none"> <li>High integration level of Rectifier, PFC and Inverter</li> <li>High efficiency input rectifier</li> <li>Dual PFC with high efficiency, fast IGBT H5+ ultra-fast Si diode</li> <li>High efficiency H-Bridge inverter with fast IGBT H5</li> <li>Temperature sensor</li> </ul> </div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center; background-color: #ccc; margin: 0;"><b>Target applications</b></p> <ul style="list-style-type: none"> <li>Welding</li> <li>Charger</li> </ul> </div> <div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center; background-color: #ccc; margin: 0;"><b>Types</b></p> <ul style="list-style-type: none"> <li>10-FY07ZAA050SM-L514B28</li> </ul> </div>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center; background-color: #ccc; margin: 0;"><i>flow</i> 1 12mm housing</p>  </div> <div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center; background-color: #ccc; margin: 0;"><b>Schematic</b></p>  </div>

## Maximum Ratings

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

Parameter	Symbol	Conditions	Value	Unit
<b>Rectifier Diode</b>				
Peak Repetitive Reverse Voltage	$V_{RRM}$		1600	V
Continuous (direct) forward current	$I_F$	$T_j = T_{jmax}$ $T_h = 80^\circ\text{C}$	53	A
Surge (non-repetitive) forward current	$I_{FSM}$	50 Hz Single Half Sine Wave	490	A
Surge current capability	$I^2t$	$t_p = 10$ ms 50 Hz sine $T_j = 150^\circ\text{C}$	1200	$\text{A}^2\text{s}$
Total power dissipation	$P_{tot}$	$T_j = T_{jmax}$ $T_h = 80^\circ\text{C}$	86	W
Maximum Junction Temperature	$T_{jmax}$		150	$^\circ\text{C}$



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Parameter	Symbol	Condition	Value	Unit
<b>PFC Switch</b>				
Collector-emitter voltage	$V_{CES}$		650	V
Collector current	$I_C$	$T_j = T_{jmax}$ $T_S = 80\text{ °C}$	28	A
Repetitive peak collector current	$I_{CRM}$	$t_p$ limited by $T_{jmax}$	90	A
Turn off safe operating area		$T_j \leq 150\text{ °C}$ , $V_{CE} \leq 650\text{ V}$	90	A
Total power dissipation	$P_{tot}$	$T_j = T_{jmax}$ $T_S = 80\text{ °C}$	57	W
Gate-emitter voltage	$V_{GES}$		$\pm 20$	V
Maximum Junction Temperature	$T_{jmax}$		175	°C

Parameter	Symbol	Conditions	Value	Unit
<b>PFC Diode</b>				
Peak Repetitive Reverse Voltage	$V_{RRM}$		650	V
Continuous (direct) forward current	$I_F$	$T_j = T_{jmax}$ $T_h = 80\text{ °C}$	29	A
Repetitive peak forward current	$I_{FRM}$		180	A
Total power dissipation	$P_{tot}$	$T_j = T_{jmax}$ $T_h = 80\text{ °C}$	52	W
Maximum Junction Temperature	$T_{jmax}$		175	°C

Parameter	Symbol	Conditions	Value	Unit
<b>C. T. Protection Diode</b>				
Peak Repetitive Reverse Voltage	$V_{RRM}$		650	V
DC forward current	$I_F$	$T_j = T_{jmax}$ $T_h = 80\text{ °C}$	17	A
Repetitive peak forward current	$I_{FRM}$		20	A
Power dissipation	$P_{tot}$	$T_j = T_{jmax}$ $T_h = 80\text{ °C}$	33	W
Maximum Junction Temperature	$T_{jmax}$		175	°C



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Parameter	Symbol	Condition	Value	Unit
<b>H-Bridge Switch Lo/Hi Side</b>				
Collector-emitter voltage	$V_{CES}$		650	V
Collector current	$I_C$	$T_j = T_{jmax}$ $T_S = 80^\circ\text{C}$	43	A
Repetitive peak collector current	$I_{CRM}$	$t_p$ limited by $T_{jmax}$	150	A
Total power dissipation	$P_{tot}$	$T_j = T_{jmax}$ $T_S = 80^\circ\text{C}$	84	W
Gate-emitter voltage	$V_{GES}$		$\pm 20$	V
Maximum Junction Temperature	$T_{jmax}$		175	$^\circ\text{C}$

Parameter	Symbol	Conditions	Value	Unit
<b>H-Bridge Diode Lo/Hi Side</b>				
Peak Repetitive Reverse Voltage	$V_{RRM}$		650	V
Continuous (direct) forward current	$I_F$	$T_j = T_{jmax}$ $T_h = 80^\circ\text{C}$	28	A
Repetitive peak forward current	$I_{FRM}$		80	A
Total power dissipation	$P_{tot}$	$T_j = T_{jmax}$ $T_h = 80^\circ\text{C}$	55	W
Maximum Junction Temperature	$T_{jmax}$		175	$^\circ\text{C}$



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Parameter	Symbol	Conditions	Value	Unit
<b>DC Capacitor</b>				
Maximum DC voltage	$V_{MAX}$		630	V
Operation Temperature	$T_{op}$		-55...+125	°C

Parameter	Symbol	Conditions	Value	Unit
<b>Module Properties</b>				
<b>Thermal Properties</b>				
Storage temperature	$T_{stg}$		-40...+125	°C
Operation Junction Temperature	$T_{jop}$		-40...+( $T_{jmax} - 25$ )	°C

<b>Isolation Properties</b>					
Isolation voltage	$V_{isol}$	DC voltage	$t_p=2s$	4000	V
Creepage distance				min 12,7	mm
Clearance				7,74	mm
Comparative Tracking Index	CTI			>200	



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## Characteristic Values

### Rectifier Diode

Parameter	Symbol	Conditions					Value			Unit
				$V_r$ [V]	$I_F$ [A]	$T_j$ [°C]	Min	Typ	Max	
<b>Static</b>										
Forward voltage	$V_F$				25	25 125 150		1,07 1,13	1,21	V
Reverse leakage current	$I_r$			1600		25 150			50 1100	μA
<b>Thermal</b>										
Thermal resistance junction to sink	$R_{th(j-s)}$	phase-change material $\lambda=3,4W/mK$						0,82		K/W

### PFC Switch

Parameter	Symbol	Conditions					Value			Unit	
				$V_{GE}$ [V]	$V_{CE}$ [V]	$I_C$ [A]	$T_j$ [°C]	Min	Typ		Max
<b>Static</b>											
Gate-emitter threshold voltage	$V_{GE(th)}$	$V_{GE}=V_{CE}$			0,0003	25 125		3,3	4	4,7	V
Collector-emitter saturation voltage	$V_{CEsat}$		15		30	25 125 150		1,69 1,92	2,22	V	
Collector-emitter cut-off current	$I_{CES}$		0	650		25 125			40	μA	
Gate-emitter leakage current	$I_{GES}$		20	0		25 125			120	nA	
Internal gate resistance	$r_g$							none		Ω	
Input capacitance	$C_{ies}$	f=1MHz	0	25		25		2100		pF	
Output capacitance	$C_{oes}$							45			
Reverse transfer capacitance	$C_{res}$							7,7			
Gate charge	$Q_g$		15	520	30	25		70		nC	
<b>Thermal</b>											
Thermal resistance junction to sink	$R_{th(j-s)}$	phase-change material $\lambda=3,4W/mK$						1,67		K/W	



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**PFC Diode**

Parameter	Symbol	Conditions					Value			Unit
				$V_r$ [V]	$I_F$ [A]	$T_j$ [°C]	Min	Typ	Max	

**Static**

Forward voltage	$V_F$				30	25 125 150		2,46 2,03	2,6	V
Reverse leakage current	$I_r$			665		25 150			10	$\mu$ A

**Thermal**

Thermal resistance junction to sink	$R_{th(j-s)}$	phase-change material $\lambda=3,4W/mK$						1,83		K/W
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**C. T. Protection Diode**

Parameter	Symbol	Conditions					Value			Unit
				$V_r$ [V]	$I_F$ [A]	$T_j$ [°C]	Min	Typ	Max	

**Static**

Forward voltage	$V_F$				10	25 125 150		1,67 1,56	1,87	V
Reverse leakage current	$I_{rm}$			650		25 150			0,14	$\mu$ A

**Thermal**

Thermal resistance junction to sink	$R_{th(j-s)}$	phase-change material $\lambda=3,4W/mK$						2,87		K/W
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## H-Bridge Switch Lo/Hi Side

Parameter	Symbol	Conditions					Value			Unit
		$V_{GE}$ [V]	$V_{CE}$ [V]	$I_C$ [A]	$T_j$ [°C]	Min	Typ	Max		
<b>Static</b>										
Gate-emitter threshold voltage	$V_{GE(th)}$	$V_{GE}=V_{CE}$			0,0005	25 125	3,3	4	4,7	V
Collector-emitter saturation voltage	$V_{CEsat}$		15		50	25 125 150	1	1,82 2,00	2,22	V
Collector-emitter cut-off current	$I_{CES}$		0	650		25 125			40	µA
Gate-emitter leakage current	$I_{GES}$		20	0		25 125			120	nA
Internal gate resistance	$r_g$							none		Ω
Input capacitance	$C_{ies}$	f=1 MHz	0	25		25		3000		pF
Output capacitance	$C_{oes}$							50		
Reverse transfer capacitance	$C_{res}$							11		
Gate charge	$Q_g$		15	520	50	25		120		nC

### Thermal

Thermal resistance junction to sink	$R_{th(j-s)}$	phase-change material $\lambda=3,4W/mK$						1,13		K/W
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## H-Bridge Diode Lo/Hi Side

Parameter	Symbol	Conditions					Value			Unit
		$V_r$ [V]	$I_F$ [A]	$T_j$ [°C]	Min	Typ	Max			
<b>Static</b>										
Forward voltage	$V_F$				40	25 125 150		1,35	1,77	V
Reverse leakage current	$I_r$			650		25 150			2,1	µA

### Thermal

Thermal resistance junction to sink	$R_{th(j-s)}$	phase-change material $\lambda=3,4W/mK$						1,73		K/W
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## DC Capacitor

Parameter	Symbol	Conditions					Value			Unit
						$T_j$ [°C]	Min	Typ	Max	
Capacitance	$C$							100		nF
Tolerance							-10		+10	%

## Thermistor

Parameter	Symbol	Conditions					Value			Unit
			$V_{GE}$ [V]	$V_{CE}$ [V]	$I_C$ [A]	$T_j$ [°C]	Min	Typ	Max	
Rated resistance	$R$					25		21,5		kΩ
Deviation of R100	$\Delta_{R/R}$	R100=1486 Ω				100	-4,5		+4,5	%
Power dissipation	$P$					25		210		mW
Power dissipation constant						25		3,5		mW/K
B-value	$B_{(25/50)}$					25		3884		K
B-value	$B_{(25/100)}$					25		3964		K
Vincotech NTC Reference									F	





# 10-FY07ZAA050SM-L514B28

target datasheet

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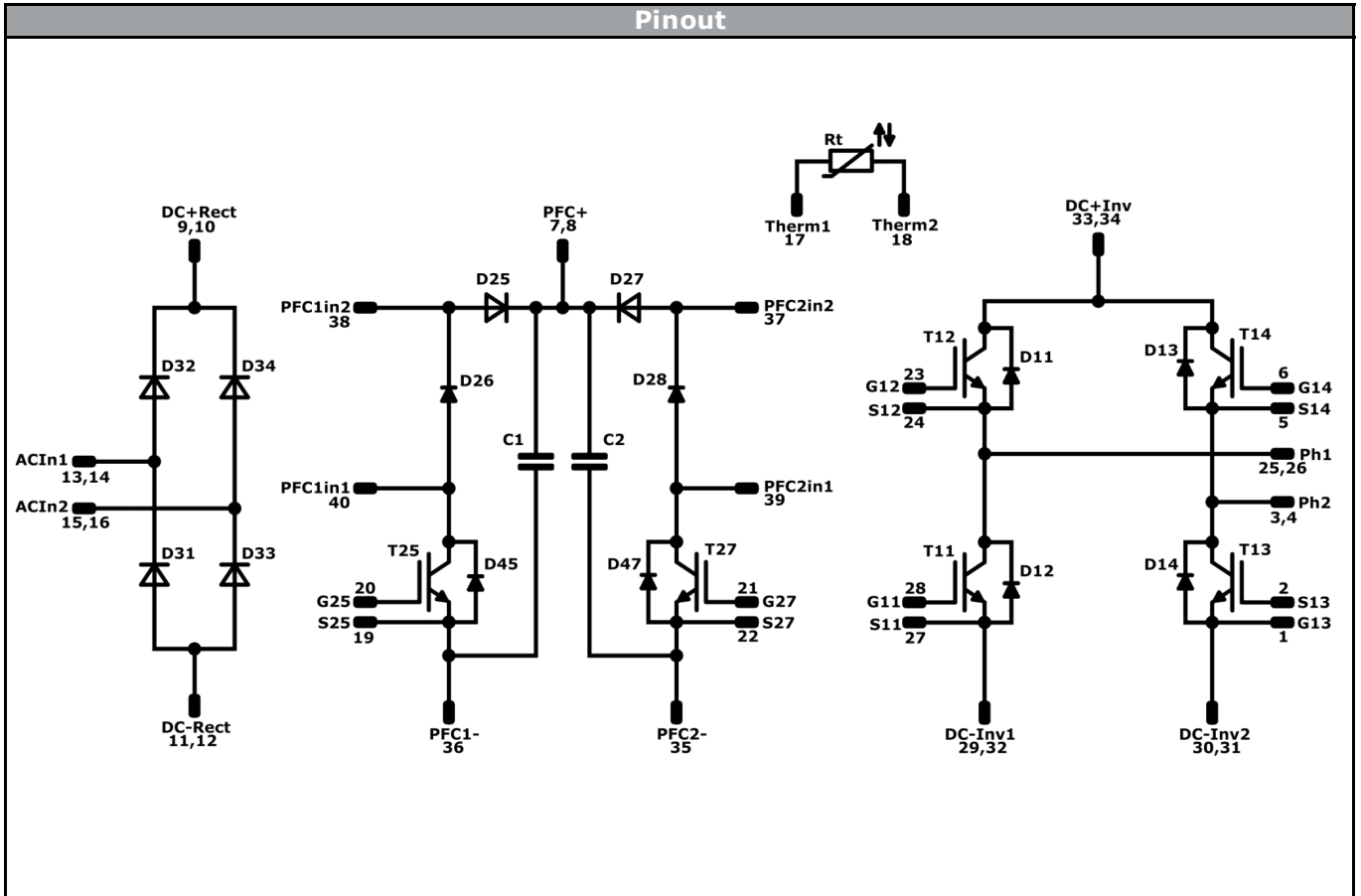
Ordering Code & Marking							
Version	Ordering Code		in DataMatrix as	in packaging barcode as			
without thermal paste 12mm housing	10-FY07ZAA050SM-L514B28		L514B28	L514B28			
NN-NNNNNNNNNNNNNN NNNNNNNN WWYY UL Vinco LLLLL SSSS		<b>Text</b>	<b>Name</b>	<b>Date code</b>	<b>UL &amp; Vinco</b>	<b>Lot</b>	<b>Serial</b>
			NN-NNNNNNNNNNNNNN-NNNNNNNN	WWYY	UL Vinco	LLLLL	SSSS
		<b>Datamatrix</b>	<b>Type&amp;Ver</b>	<b>Lot number</b>	<b>Serial</b>	<b>Date code</b>	
		TTTTTTTV	LLLLL	SSSS	WWYY		

Outline							
Pin table [mm]				Pin table [mm]			
Pin	X	Y	Function	Pin	X	Y	Function
1	52,9	0	G13	30	49,8	12,9	DC-Inv2
2	49,9	0	S13	31	52,9	12,9	DC-Inv2
3	41,9	0	Ph2	32	52,9	15,9	DC-Inv1
4	39,2	0	Ph2	33	41,8	14,4	DC+Inv
5	36,2	0	S14	34	39,1	14,4	DC+Inv
6	33,2	0	G14	35	29,2	9,2	PFC2-
7	22	0	PFC+	36	15	9,2	PFC1-
8	22	3,5	PFC+	37	25	17,4	PFC2in2
9	13,4	0	DC+Rect	38	16,5	17	PFC1in2
10	10,7	0	DC+Rect	39	25	20,9	PFC2in1
11	2,7	0	DC-Rect	40	17	20,5	PFC1in1
12	0	0	DC-Rect				
13	0	13	ACIn1				
14	0	15,7	ACIn1				
15	0	23,7	ACIn2				
16	0	26,4	ACIn2				
17	7,7	28,8	Therm1				
18	10,7	28,8	Therm2				
19	14,6	28,8	S25				
20	17,6	28,8	G25				
21	20,6	28,8	G27				
22	23,6	28,8	S27				
23	33,2	28,8	G12				
24	36,2	28,8	S12				
25	39,2	28,8	Ph1				
26	41,9	28,8	Ph1				
27	49,9	28,8	S11				
28	52,9	28,8	G11				
29	49,8	15,9	DC-Inv1				

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



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<b>Identification</b>					
<b>ID</b>	<b>Component</b>	<b>Voltage</b>	<b>Current</b>	<b>Function</b>	<b>Comment</b>
T25,T27	IGBT	650V	30A	PFC Switch	
D25,D27	FWD	650V	30A	PFC Diode	
D26, D28	FWD	650V	10A	C.T. Protection Diode	
T11, T13 / T12, T14	IGBT	650V	50A	H-Bridge Switch Lo/Hi Side	
D12, D14 / D11, D13	FWD	650V	40A	H- Bridge Diode Lo/Hi Side	
D31, D32, D33, D34	Rectifier	1600V	50A	Rectifier Diode	
C1,C2	Capacitor	630V	-	DC Capacitor	
NTC	NTC	-	-	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.

Document No.:	Date:	Modification:	Pages
10-FY07ZAA050SM-L514B28-T1-14	17 Aug. 2015		

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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