

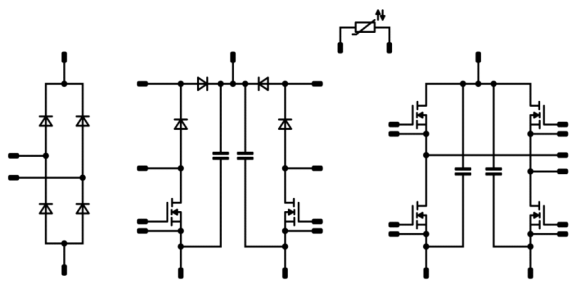




<i>flow</i> RPI 1	650 V / 80 mΩ
<div style="background-color: #eee; padding: 2px; text-align: center; font-weight: bold; margin-bottom: 5px;">Features</div> <ul style="list-style-type: none"> High integrated Rectifier-PFC-Inverter module High-efficiency Input Rectifier Ultra-fast Dual PFC, 70 mΩ MOSFET + 8 A SiC Diode High-efficiency, ultra-fast H-Bridge, 80 mΩ MOSFET Output snubber 	<div style="background-color: #eee; padding: 2px; text-align: center; font-weight: bold; margin-bottom: 5px;">flow 1 12mm housing</div> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  solder pins </div> <div style="text-align: center;">  Press-fit pins </div> </div>
<div style="background-color: #eee; padding: 2px; text-align: center; font-weight: bold; margin-bottom: 5px;">Target applications</div> <ul style="list-style-type: none"> SMPS Charger Welding 	<div style="background-color: #eee; padding: 2px; text-align: center; font-weight: bold; margin-bottom: 5px;">Schematic</div> 
<div style="background-color: #eee; padding: 2px; text-align: center; font-weight: bold; margin-bottom: 5px;">Types</div> <ul style="list-style-type: none"> 10-FY07ZAA080CR01-L445B18 10-PY07ZAA080CR01-L445B18Y 	

Maximum Ratings

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

Parameter	Symbol	Condition	Value	Unit
Rectifier Diode				
Peak Repetitive Reverse Voltage	V_{RRM}		1600	V
Continuous (direct) forward current	I_F	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	46	A
Surge (non-repetitive) forward current	I_{FSM}	50 Hz Single Half Sine Wave $t_p = 10\text{ ms}$ $T_j = 150\text{ °C}$	270	A
Surge current capability	I^2t		370	A ² s
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	56	W
Maximum Junction Temperature	T_{jmax}		150	°C



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 target datasheet

Maximum Ratings

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

Parameter	Symbol	Condition	Value	Unit
PFC Switch				
Drain-source voltage	V_{DSS}		650	V
Drain current	I_D	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	25	A
Peak drain current	I_{DM}	t_p limited by T_{jmax}	150	A
Avalanche energy, single pulse	E_{AS}	$I_D = 9,3\text{ A}$ $V_{DD} = 50\text{ V}$	1160	mJ
Avalanche energy, repetitive	E_{AR}	$I_D = 9,3\text{ A}$ $V_{DD} = 50\text{ V}$	1,76	mJ
Avalanche current, repetitive	I_{AR}	t_p limited by $P_{AV} = E_{AR} * f$	9,3	A
MOSFET dv/dt ruggedness	dv/dt	$V_{DS} = 0/480\text{ V}$	50	V/ns
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	87	W
Gate-source voltage	V_{GSS}		± 20	V
Reverse diode dv/dt	dv/dt		15	V/ns
Maximum Junction Temperature	T_{jmax}		150	°C

PFC Diode

Peak Repetitive Reverse Voltage	V_{RRM}		650	V
Continuous (direct) forward current	I_F	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	11	A
Repetitive peak forward current	I_{FRM}	$T_j = 25\text{ °C}$, limited by T_{jmax}	35	A
Surge (non-repetitive) forward current	I_{FSM}	60 Hz Single Half Sine Wave $T_j = 150\text{ °C}$	25	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	32	W
Maximum Junction Temperature	T_{jmax}		175	°C

C. T. Protection Diode

Peak Repetitive Reverse Voltage	V_{RRM}		650	V
Continuous (direct) forward current	I_F	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	17	A
Repetitive peak forward current	I_{FRM}	$T_j < 150\text{ °C}$	20	A
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	33	W
Maximum Junction Temperature	T_{jmax}		175	°C



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Maximum Ratings

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

Parameter	Symbol	Condition	Value	Unit
H-Bridge Switch				
Drain-source voltage	V_{DSS}		650	V
Drain current	I_D	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	18	A
Peak drain current	I_{DM}	t_p limited by T_{jmax}	137	A
Avalanche energy, single pulse	E_{AS}	$I_D = 8,7\text{ A}$ $V_{DD} = 50\text{ V}$	1160	mJ
Avalanche energy, repetitive	E_{AR}	$I_D = 8,7\text{ A}$ $V_{DD} = 50\text{ V}$	1,76	mJ
Avalanche current, repetitive	I_{AR}	t_p limited by $P_{AV} = E_{AR} * f$	8,7	A
MOSFET dv/dt ruggedness	dv/dt	$V_{DS} = 0/480\text{ V}$	50	V/ns
Total power dissipation	P_{tot}	$T_j = T_{jmax}$ $T_s = 80\text{ °C}$	87	W
Gate-source voltage	V_{GSS}		± 20	V
Reverse diode dv/dt	dv/dt		50	V/ns
Maximum Junction Temperature	T_{jmax}		150	°C
DC Link Capacitance				
Maximum DC voltage	V_{MAX}		1000	V
Operation Temperature	T_{op}		-55...+125	°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 $t_p = 2\text{ s}$	4000	V
Creepage distance			min. 12,7	mm
Clearance		Press-fit / solder pins	7,81 / 7,69	mm
Comparative Tracking Index	CTI		> 200	



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Characteristic Values

Parameter	Symbol	Conditions					Value			Unit
		V_{GE} [V]	V_{CE} [V]	I_C [A]	T_j [°C]	Min	Typ	Max		

Rectifier Diode

Static

Forward voltage	V_F				35	25 125	0,8	1,17 1,13	1,6	V
Reverse leakage current	I_r			1600		25 145			50 1100	μ A

Thermal

Thermal resistance junction to sink	$R_{th(j-s)}$	phase-change material $\lambda = 3,4$ W/mK						1,25		K/W
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PFC Switch

Static

Drain-source on-state resistance	$r_{DS(on)}$		10		17,6	25 125		66 125	70	m Ω
Gate-source threshold voltage	$V_{GS(th)}$	$V_{GS} = V_{DS}$			0,00176	25	2,5	3	3,5	V
Gate to Source Leakage Current	I_{GSS}		20	0		25			100	nA
Zero Gate Voltage Drain Current	I_{DSS}		0	650		25			1	μ A
Internal gate resistance	r_g							0,85		Ω
Gate charge	Q_g							170		nC
Gate to source charge	Q_{GS}		0/10	480	26,3	25		20		
Gate to drain charge	Q_{GD}							85		
Short-circuit input capacitance	C_{iss}	$f = 1$ MHz	0	100		25		3900		pF
Short-circuit output capacitance	C_{oss}							215		

Thermal

Thermal resistance junction to sink	$R_{th(j-s)}$	phase-change material $\lambda = 3,4$ W/mK						0,8		K/W
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 target datasheet

Characteristic Values

Parameter	Symbol	Conditions					Value			Unit
		V_{GE} [V]	V_{CE} [V]	I_C [A]	T_j [°C]	Min	Typ	Max		

PFC Diode

Static

Parameter	Symbol	V_{GE} [V]	V_{CE} [V]	I_C [A]	T_j [°C]	Min	Typ	Max	Unit
Forward voltage	V_F			8	25 125 150		1,37 1,55 1,63	1,55	V
Reverse leakage current	I_r		650		25			160	μA

Thermal

Thermal resistance junction to sink	$R_{th(j-s)}$	phase-change material $\lambda = 3,4$ W/mK					2,93		K/W
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C. T. Protection Diode

Static

Parameter	Symbol	V_{GE} [V]	V_{CE} [V]	I_C [A]	T_j [°C]	Min	Typ	Max	Unit
Forward voltage	V_F			10	25 125		1,67 1,56	1,87	V
Reverse leakage current	I_r		650		25			0,14	μA

Thermal

Thermal resistance junction to sink	$R_{th(j-s)}$	phase-change material $\lambda = 3,4$ W/mK					2,87		K/W
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Characteristic Values

Parameter	Symbol	Conditions					Value			Unit
		V_{GS} [V]	V_{GE} [V]	V_{DS} [V]	I_D [A]	T_j [°C]	Min	Typ	Max	

H-Bridge Switch

Static

Parameter	Symbol	Conditions	V_{GS} [V]	V_{GE} [V]	V_{DS} [V]	I_D [A]	T_j [°C]	Min	Typ	Max	Unit
Drain-source on-state resistance	$r_{DS(on)}$		10			17,6	25 125		78 159	80	mΩ
Gate-source threshold voltage	$V_{GS(th)}$	$V_{GS} = V_{DS}$				0,00176	25	3,5	4	4,5	V
Gate to Source Leakage Current	I_{GSS}		20	0			25			100	nA
Zero Gate Voltage Drain Current	I_{DSS}		0	650			25			3,5	μA
Internal gate resistance	r_g								0,75		Ω
Gate charge	Q_g								167		nC
Gate to source charge	Q_{GS}		0	480	26,3	25			32		
Gate to drain charge	Q_{GD}								87		
Short-circuit input capacitance	C_{iss}	$f = 1\text{ MHz}$	0	100			25		5030		pF
Short-circuit output capacitance	C_{oss}									215	

Reverse Diode Static

Parameter	Symbol	Conditions	V_{GS} [V]	V_{GE} [V]	V_{DS} [V]	I_D [A]	T_j [°C]	Min	Typ	Max	Unit
Diode forward voltage	V_{SD}					26,3	25		0,9		V

Thermal

Parameter	Symbol	Conditions	V_{GS} [V]	V_{GE} [V]	V_{DS} [V]	I_D [A]	T_j [°C]	Min	Typ	Max	Unit
Thermal resistance junction to sink	$R_{th(j-s)}$	phase-change material $\lambda = 3,4 \text{ W/mK}$							0,80		K/W

DC Link Capacitance

Parameter	Symbol	Conditions	V_{GS} [V]	V_{GE} [V]	V_{DS} [V]	I_D [A]	T_j [°C]	Min	Typ	Max	Unit
Capacitance	C								100		nF
Tolerance								-10		+10	%
Dissipation factor		$f = 1 \text{ kHz}$					25			2,5	%
Climatic category								55/125/56			



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Characteristic Values

Parameter	Symbol	Conditions					Value			Unit
		V_{GS} [V]	V_{GE} [V]	V_{DS} [V]	I_D [A]	I_C [A]	T_j [°C]	Min	Typ	

Thermistor

Rated resistance	R					25		22		kΩ
Deviation of R_{100}	$\Delta_{R/R}$	$R_{100} = 1484 \Omega$				100	-5		5	%
Power dissipation	P					25		5		mW
Power dissipation constant						25		1,5		mW/K
B-value	$B_{(25/50)}$	Tol. $\pm 1 \%$				25		3962		K
B-value	$B_{(25/100)}$	Tol. $\pm 1 \%$				25		4000		K
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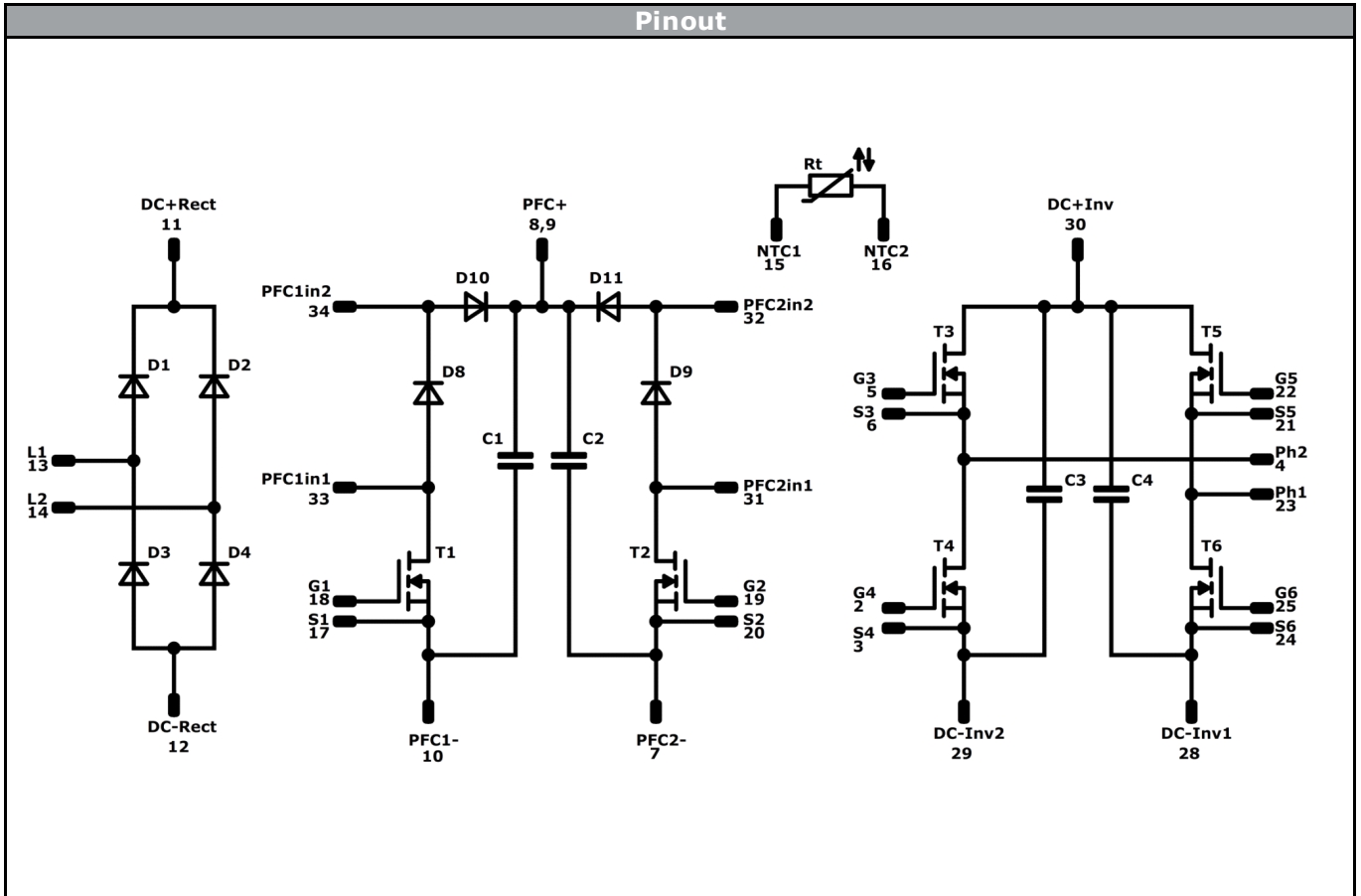
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Ordering Code & Marking																																
Version			Ordering Code																													
without thermal paste 12mm housing with solder pins			10-FY07ZAA080CR01-L445B18																													
without thermal paste 12mm housing with Press-fit pins			10-PY07ZAA080CR01-L445B18Y																													
<table border="1"> <thead> <tr> <th rowspan="3">Text</th> <th colspan="2">Name</th> <th>Date code</th> <th>UL & VIN</th> <th>Lot</th> <th>Serial</th> </tr> <tr> <td colspan="2">NN-NNNNNNNNNNNNNN-TTTTTWW</td> <td>WWYY</td> <td>UL VIN</td> <td>LLLLL</td> <td>SSSS</td> </tr> <tr> <th>Type&Ver</th> <th>Lot number</th> <th>Serial</th> <th>Date code</th> <td></td> <td></td> </tr> </thead> <tbody> <tr> <td>Datamatrix</td> <td>TTTTTTVV</td> <td>LLLLL</td> <td>SSSS</td> <td>WWYY</td> <td></td> <td></td> </tr> </tbody> </table>							Text	Name		Date code	UL & VIN	Lot	Serial	NN-NNNNNNNNNNNNNN-TTTTTWW		WWYY	UL VIN	LLLLL	SSSS	Type&Ver	Lot number	Serial	Date code			Datamatrix	TTTTTTVV	LLLLL	SSSS	WWYY		
Text	Name		Date code	UL & VIN	Lot	Serial																										
	NN-NNNNNNNNNNNNNN-TTTTTWW		WWYY	UL VIN	LLLLL	SSSS																										
	Type&Ver	Lot number	Serial	Date code																												
Datamatrix	TTTTTTVV	LLLLL	SSSS	WWYY																												

Outline								
Pin table [mm]				Pin table [mm]				<p>solder pin</p> <p>Press-fit pin</p> <p>Tolerance of pinpositions: ±0.5mm at the end of pins Dimension of coordinate axis is only offset without tolerance</p>
Pin	X	Y	Function	Pin	X	Y	Function	
1			Not assembled	30	34,8	18,4	DC+Inv	
2	48	0	G4	31	20	18,2	PFC2in1	
3	43,3	0	S4	32	20	14,7	PFC2in2	
4	35,3	0	Ph2	33	11,95	18,2	PFC1in1	
5	32,3	0	G3	34	11,95	14,7	PFC1in2	
6	28,5	0	S3					
7	24,2	7,3	PFC2-					
8	17,1	0	PFC+					
9	17,1	3	PFC+					
10	9,9	6,95	PFC1-					
11	4,8	0	DC+Rect					
12	0	6,4	DC-Rect					
13	0	14,4	L1					
14	0	22,4	L2					
15	4,8	28,8	NTC1					
16	7,8	28,8	NTC2					
17	11,5	28,8	S1					
18	14,5	28,8	G1					
19	17,5	28,8	G2					
20	20,5	28,8	S2					
21	28,5	28,8	S5					
22	32,3	28,8	G5					
23	35,3	28,8	Ph1					
24	43,3	28,8	S6					
25	48	28,8	G6					
26			Not assembled					
27			Not assembled					
28	44,6	16,3	DC-Inv1					
29	44,6	12,5	DC-Inv2					



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Identification					
ID	Component	Voltage	Current	Function	Comment
D1- D4	FWD	1600 V	35 A	Rectifier Diode	
T1, T2	MOSFET	650 V	70 mΩ	PFC Switch	
D10, D11	FWD	650 V	8 A	PFC Diode	
D8, D9	FWD	650 V	10 A	C. T. Protection Diode	
T1-T4	MOSFET	650 V	80 mΩ	H-Bridge Switch	
C1-C4	Capacitor	1000 V		DC Link Capacitance	
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 1</i> packages see vincotech.com website.

Package data
Package data for <i>flow 1</i> 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-xY07ZAA080CR01-L445B18x-T1-14	20 Jul. 2016		

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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