

Features

- 2:1/4:1 Wide Input Range
- Operating Temperature Range: -45°C~105°C<
- Approved to CE, RoHS & REACH
- Safety Standards to IEC/EN 62368-1/ EN 50155
- Efficiency up to 91%
- EMC Class A & B
- Single output 9~425V DC



Certified to UKCA, CE, RoHS, REACH & EN 62368-1/IEC 62368-1/EN 50155 Standards and complies with Efficiency Regulations. These are primarily used in ITE, Audio & Video, Railway Industries and customised solutions are available upon request.

Part Number Structure

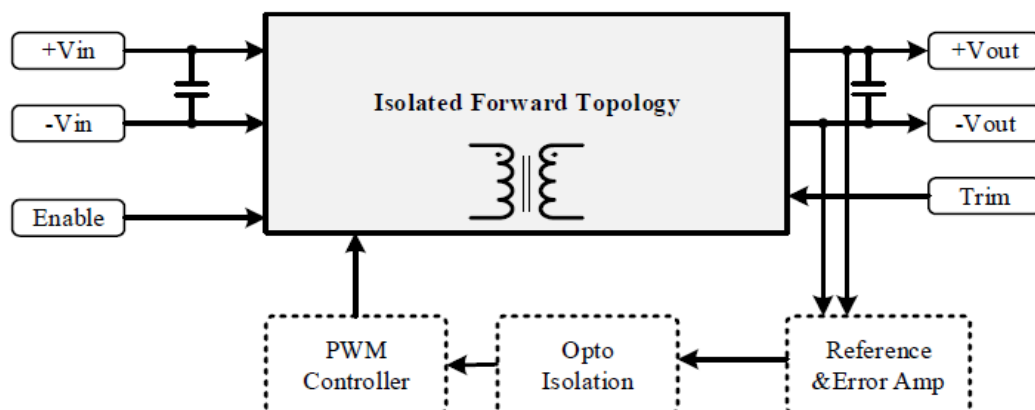
28SFB	-	110	120	-	V	-	P	-	B	600
Series Name		Input Voltage (VDC)	Output Voltage (VDC)		Pin out		Remote control option		Shape	Watt
Supreme Series		018 : 9-36	120 : 12		V : Vicor		P : Positive logic N : Negative logic		B : Base Plate	400
Full		024 : 18-36	240 : 24							600
Brick		036 : 18-75	280 : 28							
		110 : 40-180	480 : 48							
		300 : 180-425								

Models

Model	Input			Output			Efficiency Typ.(%)
	Voltage (V) Range	Nominal	Current (A) Full load	Voltage (V)	Current (A)	Power (W)	
28SFB018120-V-□-B400-IP	9-36	18	25.25	12	33.33	400	88
28SFB018240-V-□-B400-IP	9-36	18	25.25	24	16.67	400	88
28SFB018280-V-□-B400-IP	9-36	18	25.25	28	14.28	400	88
28SFB018480-V-□-B400-IP	9-36	18	25.25	48	8.33	400	88
28SFB024120-V-□-B600-IP	18-36	24	28.09	12	50	600	89
28SFB024240-V-□-B600-IP	18-36	24	28.09	24	25	600	89
28SFB024280-V-□-B600-IP	18-36	24	28.09	28	21.42	600	89
28SFB024480-V-□-B600-IP	18-36	24	28.09	48	12.5	600	89
28SFB036120-V-□-B600-IP	18-75	36	18.94	12	50	600	88
28SFB036240-V-□-B600-IP	18-75	36	18.94	24	25	600	88
28SFB036280-V-□-B600-IP	18-75	36	18.94	28	21.42	600	88
28SFB036480-V-□-B600-IP	18-75	36	18.94	48	12.5	600	88
28SFB110120-V-□-B600-IP	40-180	110	6.20	12	50	600	88
28SFB110240-V-□-B600-IP	40-180	110	6.20	24	25	600	88
28SFB110280-V-□-B600-IP	40-180	110	6.20	28	21.42	600	88
28SFB110480-V-□-B600-IP	40-180	110	6.20	48	12.5	600	88
28SFB300120-V-□-B600-IP	14-154	300	2.22	12	50	600	90
28SFB300240-V-□-B600-IP	14-154	300	2.20	24	25	600	91
28SFB300280-V-□-B600-IP	14-154	300	2.20	28	21.42	600	91
28SFB300480-V-□-B600-IP	14-154	300	2.25	48	12.5	600	89

Description

Ideal Power **Supreme series - Full Brick converter** is composed of Isolated, board-mountable, fixed switching frequency DCDC converters that use synchronous rectification to achieve extremely high-power conversion efficiency. These DCDC converter modules use advanced power processing, control, and packaging technologies to enhance the performance, flexibility, reliability, and cost effectiveness of mature power components. Each module is six-sided metal case enclosed to provide protection from the harsh environments seen in many industrial and transportation applications.



Input Data

Parameter	Notes and Conditions		Min.	Typ.	Max.	Unit
Transient Input Voltage Ranges	28SFB018 models (100ms Max)		--	--	50	VDC
	28SFB024 models (100ms Max)				50	
	28SFB036 models (100ms Max)				100	
	28SFB110 models (100ms Max)				250	
	28SFB300 models (100ms Max)				500	
Operating Input Voltage Ranges	28SFB018 models		9	18	36	VDC
	28SFB024 models		18	24	36	
	28SFB036 models		18	36	75	
	28SFB110 models		40	110	180	
	28SFB300 models		180	300	425	
Over-Voltage Turn-off Voltage	28SFB018 models		--	--	48	
	28SFB024 models				48	
	28SFB036 models				85	
	28SFB110 models				195	
	28SFB300 models				470	
Over-Voltage Turn-on Voltage	28SFB018 models		36	--	--	
	28SFB024 models		36			
	28SFB036 models		75			
	28SFB110 models		180			
	28SFB300 models		425			
Under-Voltage Lockout Turn-on Voltage	28SFB018 models		--	--	9	VDC
	28SFB024 models				18	
	28SFB036 models				18	
	28SFB110 models				40	
	28SFB300 models				180	
Under-Voltage Lockout Turn-off Voltage	28SFB018 models		--	8	--	VDC
	28SFB024 models			17		
	28SFB036 models			17		
	28SFB110 models			38		
	28SFB300 models			175		
Input Current		See model selection guide, Standby mode (OFF, UVLO) 5mA				
Enable Function Input	Positive logic	ON OFF	Open Short or 0 ~ 1.2			VDC
	Negative logic	ON OFF	Short or 0 ~ 1.2 open			VDC

Output Data

Parameter	Notes and Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	VNOM 50% Load	--	--	±1.5	%
Line Regulation	Low Line to High Line	--	--	±0.3	%
Load Regulation	10% to 100% Load	--	--	±0.5	%
Ripple & Noise Voltage	Bandwidth 20MHz and with 1µF MLCC Output Capacitor	--	1.5	--	%Vpk-pk
Temperature Coefficient	--	--	--	+0.04	% / °C
Transient Recovery Time	25% load step change	--	800	--	µSec
Transient Peak Deviation	$\Delta I_o / \Delta t = 2.5A/\mu s$	--	+2	--	%V _o
Start-Up Time	When use Enable Function	--	20	--	mSec.
Trimming Output Protection	VNOM 10% Load	--	+10	--	%
Output power protection	VNOM 10% Load	--	120	--	%

Over Voltage Protection	VNOM	--	120	--	%
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General Specifications & Environmental Data

Parameter	Notes and Conditions	Min.	Typ.	Max.	Unit
Switching frequency	V _{NOM}	--	250	--	kHz
Storage temperature range	All models	-60	--	125	°C
Operating case temperature	All models	-45	--	105	°C
Over temperature protection	All models, Auto. Recovery	--	110	--	°C
Isolation Voltage Input to Output Input to Output to case	All models, 1 Minute	2250	--	--	VDC
Isolation Resistance Input to Output	All models, 500VDC, At 70%RH	100	--	--	MΩ
Isolation Capacitance Input to Output	All models	--	1500	--	pF
Humidity (non condensing)	All models	--	--	95	%
Calculated MTBF	BellCore-TR-332@ 50°C G.B	--	TBD	--	M HR
Thermal shock		MIL-STD-810F			
Vibration	Environmental Engineering Experimental Tests	MIL-STD-810F			
Drop		MIL-STD-810F			
Weight	Shape-B		225		G (oz)
Dimensions	Shape-B	4.62" x 2.40" x 0.59" (117.3 x 61.0 x 15.0mm)			
Case Material	Aluminium				
Potting material	Silicone				

Standards Compliance

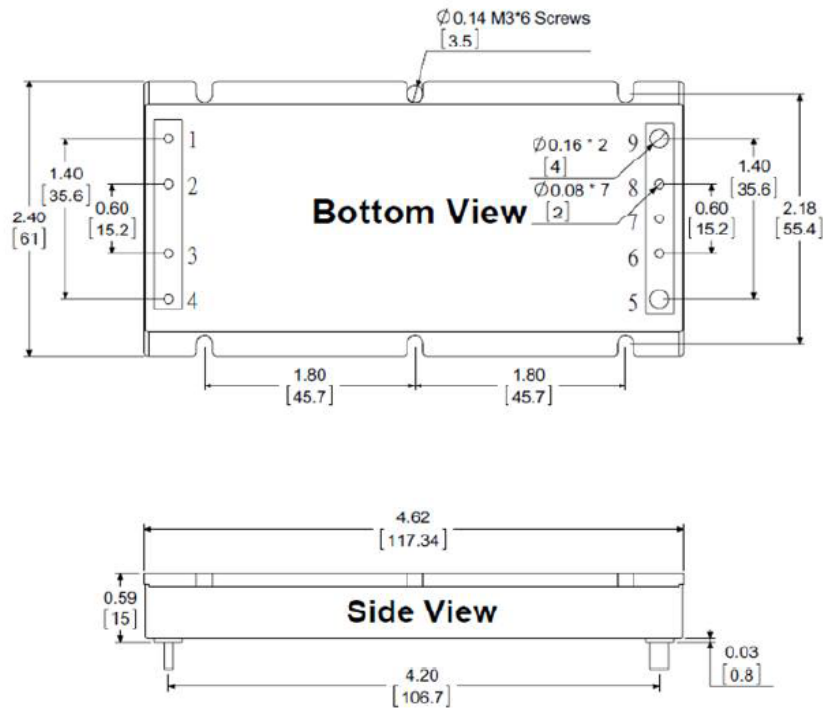
Parameter	Standard	Test conditions	Performance criteria
Environmental Compliance	Reach; RoHS	--	Pass
EMI	EN55032	--	Class A / Class B
ESD	EN61000-4-2	±4 kV Air Discharge ±4 kV Contact Discharge	Crit. A
Radiated Immunity	EN61000-4-3	Level 2, 3 V/m	Crit. A
Fast Transient	EN61000-4-4	±2 kV Applied	Crit. A
Surge	EN61000-4-5	±2 kV Applied	Crit. A
Conducted Immunity	EN61000-4-6	Level 2, 3 V rms	Crit. A

It is recommended to protect the input by fuses or other protection devices.

Modules could meet EN55022 Class A and Class B standard with external components.

The information and specifications contained in this data sheet are believed to be correct at time of publication. All specifications are subject to change without notice. No rights under any patent accompany the sale of any such products or information contained herein

Mechanical Drawings & Pin Assignment



Pin#	Single
1	-Vin
2	--
3	Enable
4	+Vin
5	+Vout
6	+Sense
7	Trim
8	-Sense
9	Vout

Note:
Pin Material: Copper Alloy
Pin Plating: Gold
Dimensions in inches [mm]
Tolerances: .XX $\pm$ 0.02 [.X $\pm$ 0.5mm]

Characteristic Curves

Testing conditions are at typical input, $T_a = +25^\circ\text{C}$, full load (horizontal mount) Unless otherwise indicated

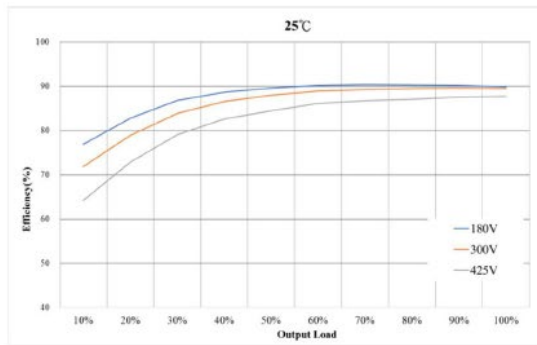


Figure 1 : Efficiency at Minimum, Nominal and Maximum Input Voltages VS. Output Load.

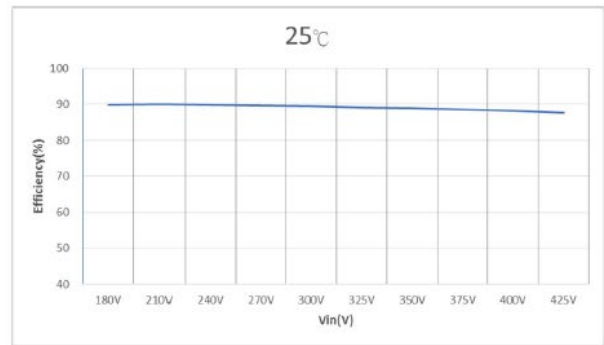


Figure 2 : Efficiency VS. Input Voltages at 100% rated power

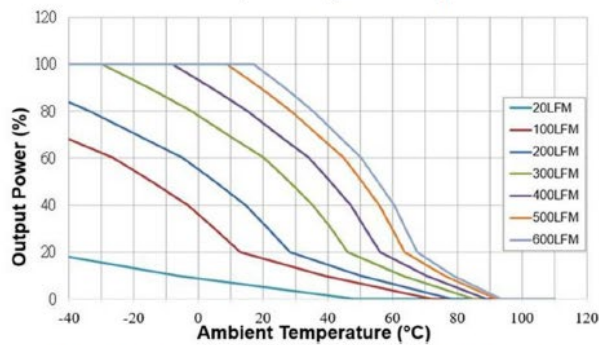


Figure 3 : Ambient Temperature VS. Output Power Derating Curves (Note: 20LFM = Free Air)

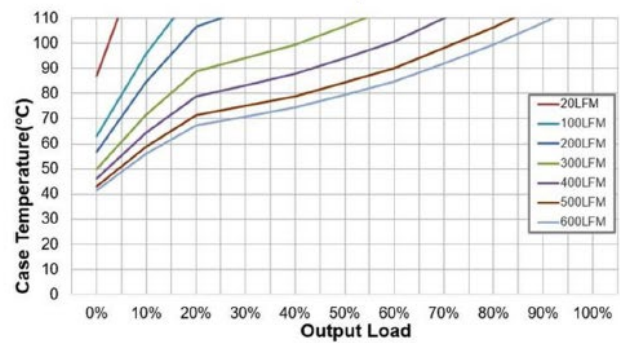


Figure 4 : Case Temperature VS. Output rated Power (Note: 20LFM = Free Air)

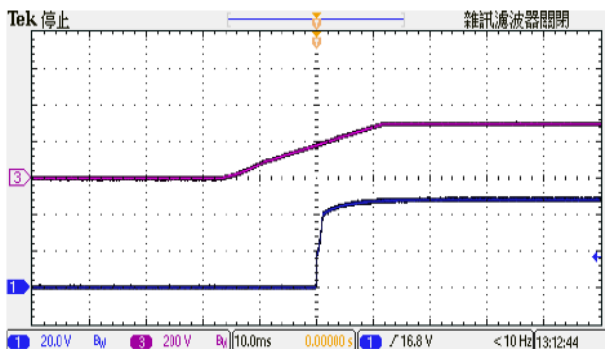


Figure 5 : CH1 = Vout, CH3 = Nominal Input
Typical Start-up waveform at Full load.

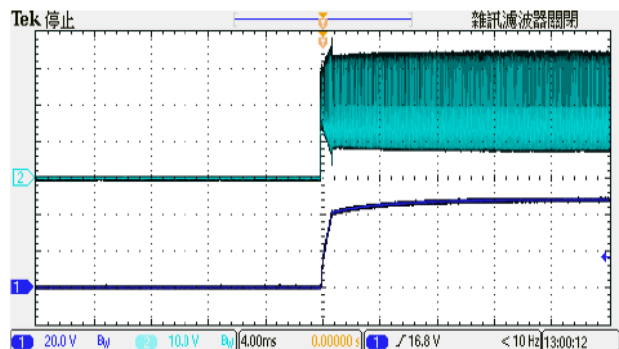


Figure 6 : CH1 = Vout, CH3 = Enable Pin
Typical Start-up waveform. Input voltage pre-applied

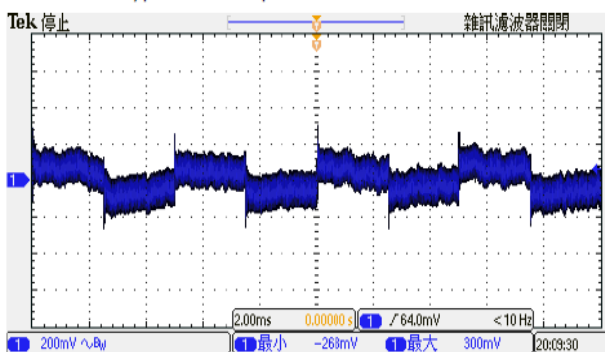


Figure 7 : Transient Response at Output step load
(V_{in} : Typical, 25~50% of output current; $\Delta I_o/\Delta t = 1\text{A}/\mu\text{s}$)

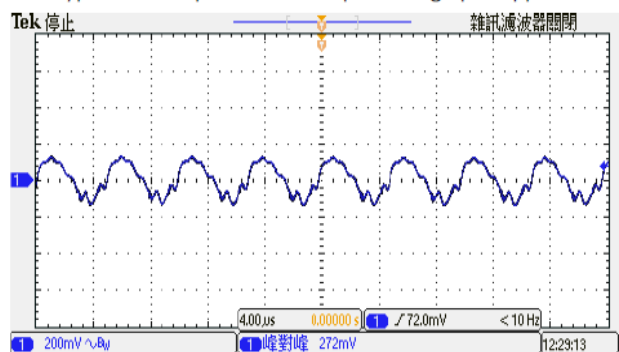


Figure 8 : Output Voltage Ripple & Noise at full load.
(V_{in} : Typical, With Output Capacitor to add $1\mu\text{F}$ MLCC)

Characteristic Curves

Only the single output converters have a trim function. That allows users to adjust the output voltage from +10% to -10%, please refer to the trim table that follow for details. Adjustments to the output voltage can be used with a simple fixed resistor as shown in Figures 1 and 2. A single fixed resistor can increase or decrease the output voltage depending on its connection.

Note:

✂ Trim adjustments higher than the specified range can have an adverse effect on the converter's performance and are not recommended.

✂ If the trim function is not used, leave the trim pin open.

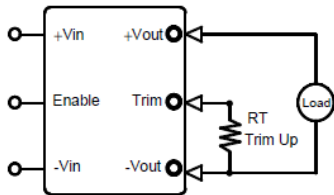


Figure 1. Trim Connections To increase Output Voltages Using Fixed Resistors

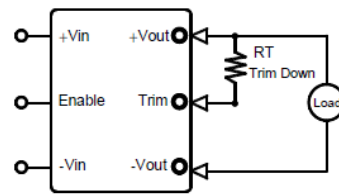


Figure 2. Trim Connections To Decrease Output Voltages Using Fixed Resistors

Trim up resistor value(KΩ)

Vout	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
5	109	50	30	20	14	10	7	5	3.3	2
12	258	115	67	44	29	20	13	7.8	3.8	0.6
24	514	232	137	90	62	43	30	20	12	5.5
28	602	271	161	105	72	50	34	22	13	5.9
48	1039	464	273	177	120	81	54	34	18	5

Trim down resistor value(KΩ)

Vout	-1%	-2%	-3%	-4%	-5%	-6%	-7%	-8%	-9%	-10%
5	137	62	37	25	17	12	9	6	4	2.2
12	358	162	96	63	44	31	21	14	8.9	4.5
24	769	352	213	143	102	74	54	39	28	18
28	860	392	236	158	111	80	57	41	28	17
48	1413	638	380	251	173	121	85	57	35	18

Enable Control Function

The primary-side, Enable Control function can be specified to operate with either positive or negative polarity. Positive-polarity devices are enabled when the enable pin is left open or is pulled high. See "Enable Function Input." Positive-polarity devices are disabled when the enable pin is pulled low (under +1.0V with respect to -input). Negative-polarity devices are off when the enable pin is high/open and on when the enable pin is pulled low. See Figure 3.

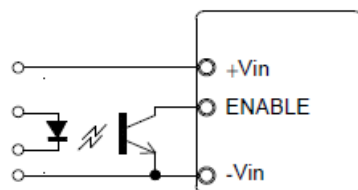


Figure 3. Driving the Enable Control pin

Output Ripple Noise

The two copper strips simulate real-world PCB impedances between the converter and its load. Scope measurements should be made using BNC connectors or the probe ground should be less than 1/2 inch and soldered directly to the fixture.

All external capacitors should have appropriate voltage ratings and be located as close to the converter as possible. Temperature variations for all relevant parameters should be taken into consideration. The most effective combination of external I/O capacitors will be a function of line voltage and source impedance, as well as load and layout conditions. See Figure 4

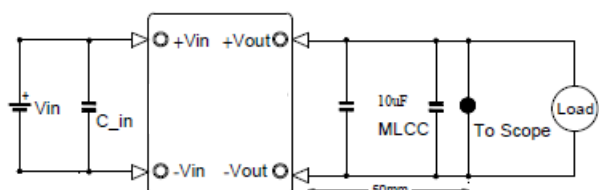


Figure 4. Measuring Output Ripple/Noise(20MHz bandwidth)