

Features

- 2:1/4:1 Wide Input Range
- One Sixteenth Brick
- Operating Temperature Range: -45~105°C
- Approved to UKCA, CE, RoHS & REACH
- Safety Standards to IEC/EN 62368-1 & EN 50155
- Efficiency up to 91%
- Single output 3.3~24V DC



Image for Illustration Purpose
Models may vary



Ideal Power's Full Brick 700W converter is a 700W isolated, regulated ac/dc converter with active PFC in full brick package and long hold-up time setting by external capacitors. It features a high efficiency up to 90%, wide working case temperature range -40~+100°C, no minimum load required, 3kVac reinforced insulation, OVP, OCP, SCP, OTP,

Part Number Structure

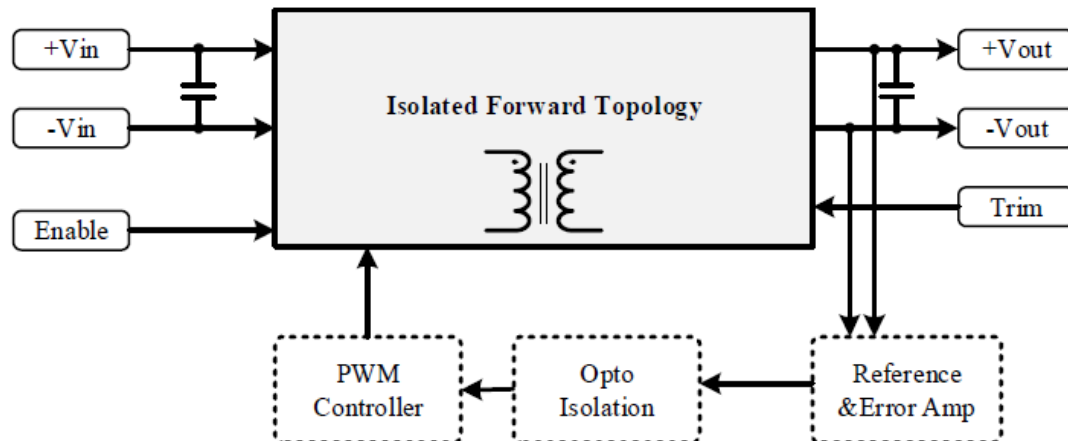
28STB	-	018	033	-	S	-	P	-	B	50
Series Name		Input Voltage (VDC)	Output Voltage (VDC)		Pin out		Remote control option		Shape	Watt
Supreme series		012 : 9-18	033 : 3.3		S : Dosa		P : Positive logic		B : Base Plate	50
Sixteenth		018 : 9-36	050 : 5				N : Negative logic		F : No Flange	
Brick		024 : 18-36	120 : 12							
		036 : 18-75	150 : 15							
		048 : 36-75	240 : 24							

Models

Model	Input		Current (A) Full load	Voltage (V)	Output		Efficiency Typ.(%)
	Range	Nominal			Current (A)	Power (W)	
28STB018033-S-□-□50-IP	9-36	18	3.16	3.3	15.1	50	88
28STB018050-S-□-□50-IP	9-36	18	3.09	5	10.0	50	90
28STB018120-S-□-□50-IP	9-36	18	3.12	12	4.2	50	89
28STB018240-S-□-□50-IP	9-36	18	3.12	24	2.1	50	89
28STB024033-S-□-□50-IP	18-36	24	2.34	3.3	15.1	50	89
28STB024050-S-□-□50-IP	18-36	24	2.29	5	10.0	50	91
28STB024120-S-□-□50-IP	18-36	24	2.31	12	4.2	50	90
28STB036033-S-□-□50-IP	18-75	36	1.58	3.3	15.1	50	88
28STB036050-S-□-□50-IP	18-75	36	1.54	5	10.0	50	90
28STB036120-S-□-□50-IP	18-75	36	1.56	12	4.2	50	89
28STB036240-S-□-□50-IP	18-75	36	1.56	24	2.1	50	89
28STB048033-S-□-□50-IP	36-75	48	1.17	3.3	15.1	50	89
28STB048050-S-□-□50-IP	36-75	48	1.14	5	10.0	50	91
28STB048120-S-□-□50-IP	36-75	48	1.16	12	4.2	50	90

Description

Ideal Power **Supreme series - Sixteenth Brick converter** is composed of Isolated, board-mountable, fixed switching frequency DC-DC converters that use synchronous rectification to achieve extremely high-power conversion efficiency. These DC-DC 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	28STB012 models (100ms Max)		--	--	50	VDC
	28STB018 models (100ms Max)				50	
	28STB024 models (100ms Max)				50	
	28STB036 models (100ms Max)				80	
	28STB048 models (100ms Max)				80	
Operating Input Voltage Ranges	28STB012 models		9	12	18	VDC
	28STB018 models		9	18	36	
	28STB024 models		18	24	36	
	28STB036 models		18	36	75	
	28STB048 models		36	48	75	
Under-Voltage Lockout Start-up Voltage	28STB012 models		--	8.5	9	VDC
	28STB018 models			8.5	9	
	28STB024 models			17.5	18	
	28STB036 models			17.5	18	
	28STB048 models			35.5	36	
Under-Voltage Lockout Shutdown Voltage	28STB012 models		7	8	--	VDC
	28STB018 models		7	8		
	28STB024 models		16	17		
	28STB036 models		16	17		
	28STB048 models		32	34		
Input filter		All models, Built-in PI filter				
Enable Function Input	Positive logic	ON OFF	Open or 8 ~ 20 Short or 0 ~ 1.2			VDC
	Negative logic	ON OFF	Short or 0 ~ 1.2 open Open or 8 ~ 20			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	--	%Vo
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	--	%

General Specifications & Environmental Data

Parameter	Notes and Conditions		Min.	Typ.	Max.	Unit
Switching frequency	VNOM	2:1 wide	270	300	330	kHz
		4:1 wide	220	260	300	
Storage temperature range	All models		-55	--	125	C
Operating case temperature	All models		-45	--	105	m
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		--	1.6	--	M HR
Thermal shock			MIL-STD-810F			
Vibration	Environmental Engineering		MIL-STD-810F			
Drop	Experimental Tests		MIL-STD-810F			
Weight	Shape-B (Base Plate)		34 (1.23)			g (oz.)
	Shape-F (No Flange Base Plate)		33 (1.2)			
Dimensions	Shape-B (Base Plate)		1.49" x 1.46" x 0.52" (37.8 x 37.2 x 13.2mm)			
	Shape-F (No Flange Base Plate)		1.48" x 1.08" x 0.52" (37.5 x 27.4 x 13.2mm)			
Case Material	Six-Sided Continuous Shield - Aluminium					
Potting material	Silicone					

Standards Compliance

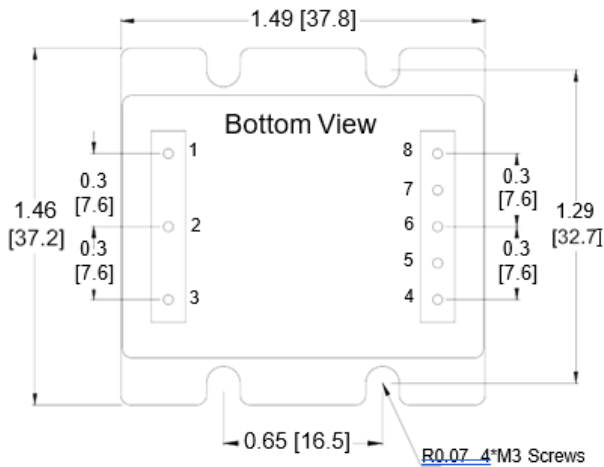
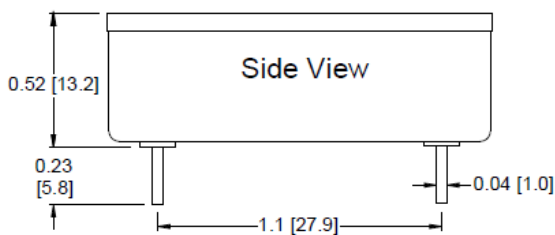
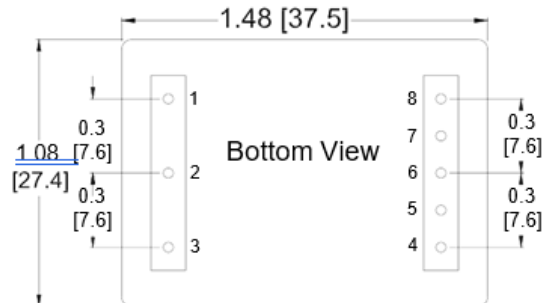
Parameter	Standard	Test conditions	Performance criteria
Environmental Compliance	Reach; RoHS	--	Pass
EMI	EN55022	--	Class A / Class B
ESD	EN61000-4-2	±4 kV Air Discharge ±4 kV Contact Discharge	Crit. A
Radiated Immunity	EN61000-4-3	Level 2, 3 V/m	Crit. A
Fast Transient	EN61000-4-4	±2 kV Applied	Crit. 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

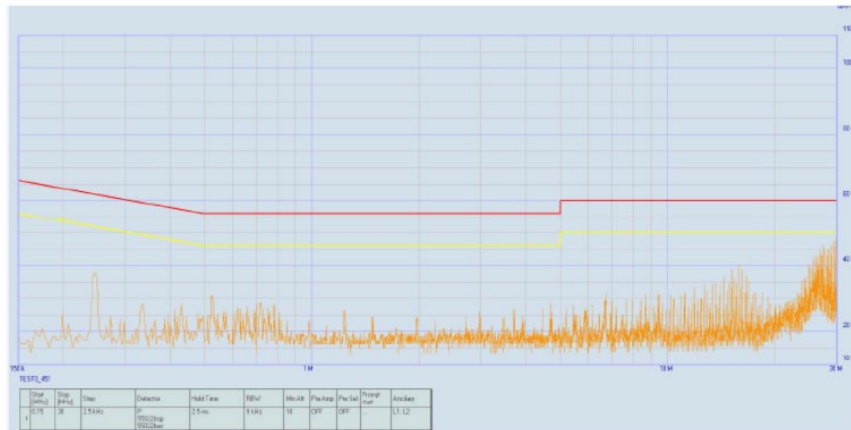
Shape – B (Base Plate)

Shape – F (No Flange Base Plate)


Pin Pitch tolerance: ± 0.01 [0.25]
Pin Dimensions: $.XX \pm 0.02$ [$.X \pm 0.5\text{mm}$]
Pin Material: Copper Alloy
Pin Plating: Gold
Dimensions in inches [mm]
Tolerances: $.XX \pm 0.02$ [$.X \pm 0.5\text{mm}$]
 $.XXX \pm 0.001$ [$.X \pm 0.025\text{mm}$]

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

Conducted EMI

Input terminal value (typ.) 28STB036050-S-P-B50-IP @Vin = 36VDC, Iout = 10A



Characteristic Curves

Testing conditions are at typical input, Ta=+25 °C, full load (horizontal mount) Unless otherwise indicated

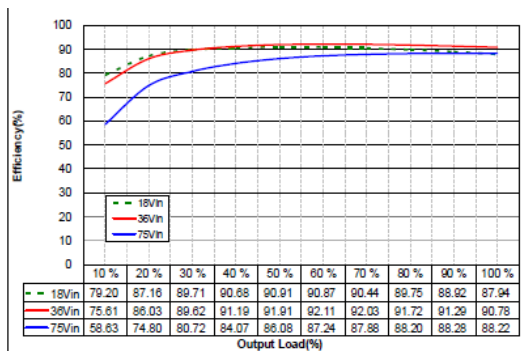


Figure 1: Efficiency at Minimum, Nominal and Maximum Input Voltages VS. Output Load.

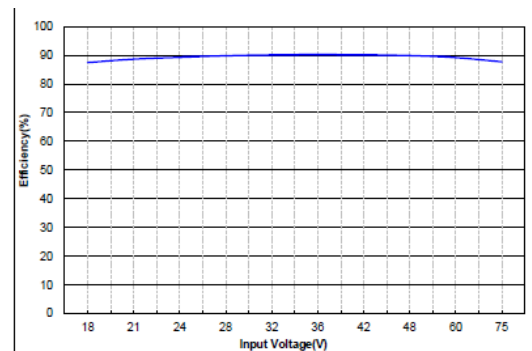


Figure 2: Efficiency VS. Input Voltages at 100% rated power

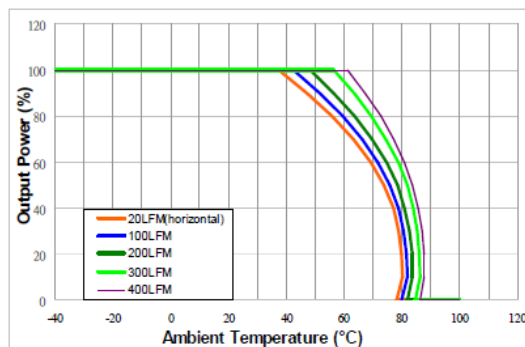


Figure 3: Ambient Temperature VS. Output Power Derating Curves (Note: 20LFM = Free Air)

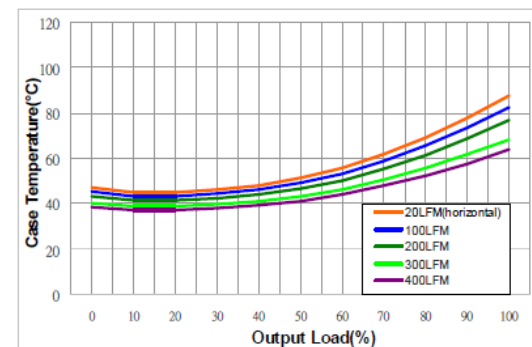


Figure 4: Case Temperature VS. Output rated Power (Note: 20LFM = Free Air)

Characteristic Curves

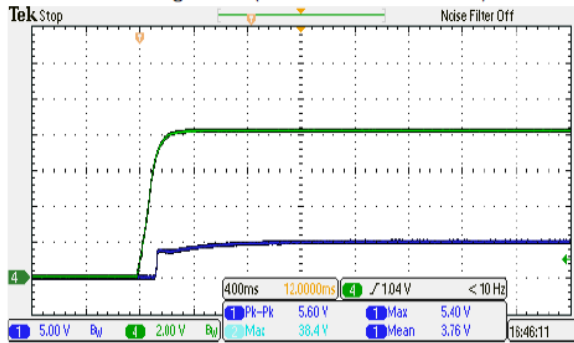


Figure 5 : CH1 = Vout, CH3 = Nominal Input
Typical Start-up waveform at Full load.

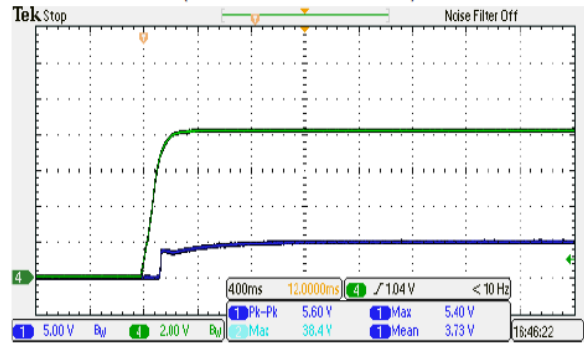


Figure 6 : CH1 = Vout, CH3 = Enable Pin
Typical Start-up waveform. Input voltage pre-applied

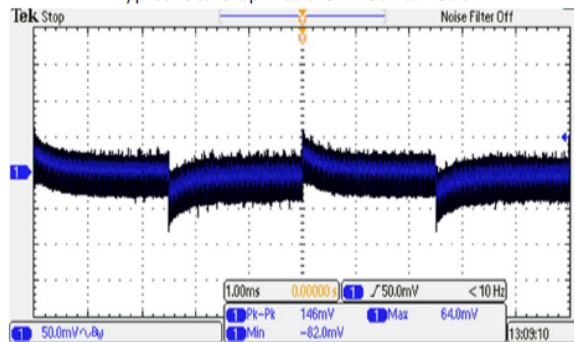


Figure 7 : Transient Response at Output step load
(Vin: Typical, 50~75% of output current; $\Delta I_o/\Delta t = 1A/\mu S$)

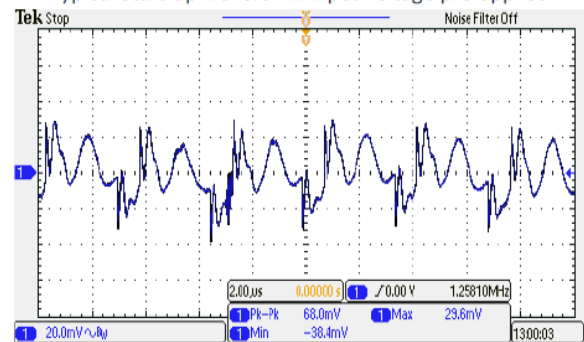


Figure 8 : Output Voltage Ripple & Noise at full load.
(Vin: Typical, With Output Capacitor to add 1uF MLCC)

Trimming Output Voltage - For Single Output Models

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.

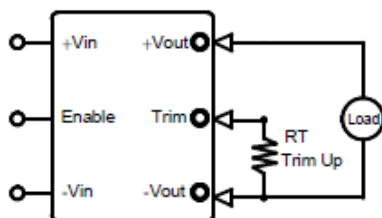


Figure 1. Trim Connections To increase Output Voltages Using Fixed Resistors

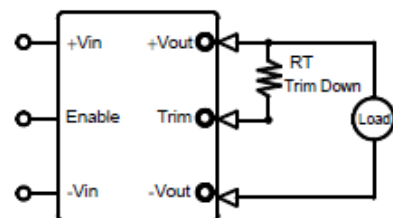


Figure 2. Trim Connections To decrease Output Voltages Using Fixed Resistors

Trim up resistor value(KΩ)

Vout	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
3.3	72.9	33.1	19.8	13.1	9.1	6.5	4.6	3.2	2.1	1.2
5	113.1	52.0	31.6	21.5	15.3	11.3	8.4	6.2	4.5	3.1
12	267.2	121.6	73.1	48.8	34.2	24.5	17.6	12.4	8.4	5.1
15	340.4	156.2	94.8	64.1	45.7	33.4	24.6	18.0	12.9	8.8
24	527.7	240.3	144.6	96.7	67.9	48.8	35.1	24.8	16.9	10.5

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.

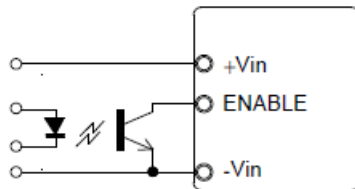


Figure 3. Driving the Enable Control pin

Trim down resistor value(KΩ)

Vo	-1%	-2%	-3%	-4%	-5%	-6%	-7%	-8%	-9%	-10%
3.3	81.9	36.7	21.6	14.1	9.6	6.6	4.4	2.8	1.5	0.5
5	115.2	51.8	30.7	20.1	13.8	9.5	6.5	4.3	2.5	1.1
12	297.6	133.7	79.1	51.8	35.4	24.4	16.6	10.8	6.2	2.6
15	346.1	155.3	91.7	59.9	40.8	28.1	19.0	12.2	6.9	2.7
24	665.3	302.7	181.8	121.3	85.1	60.9	43.6	30.7	20.6	12.5

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

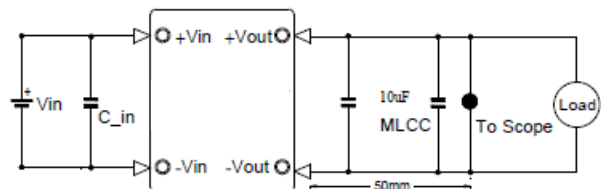


Figure 4. Measuring Output Ripple/Noise(20MHz bandwidth)