

High efficiency 88% @ 3.3V (SR topology)
Save up to 20% board space
Standard pin out; **Fully replaceable** with 2"x1" standard case
1500V **Basic Insulation** (input to output)
Built-in EMC filter meets **EN 55022 class B** and **FCC Level B**
without external components
MTBF ≥ 2,195,000 hours @ 50°C GB (BellCore TR-332)



Model Selection Guide

Typical @ Ta=+25°C under nominal line voltage and full load conditions unless noted.

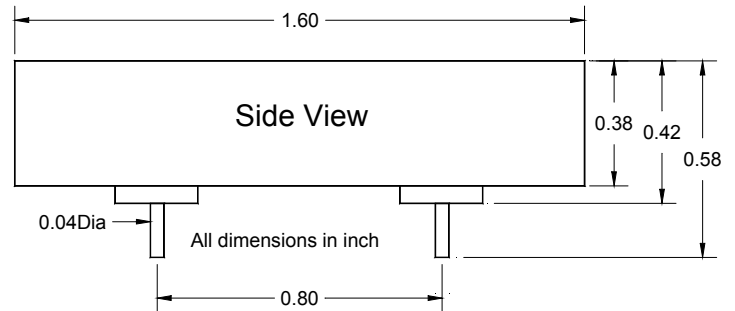
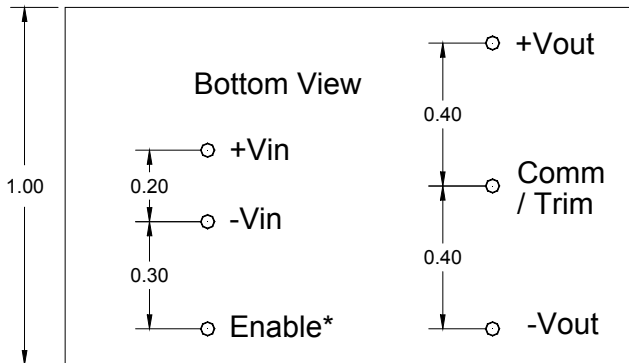
Model	Input				Output			Efficiency @FL
	Voltage (V)		Current (A)		Voltage (V)	Current (A)	Power (W)	
	Nominal	Range	No load	Full load				Typ.
ESB4850-4-E	48	36-75	0.025	0.47	5.0	4	20	89%
ESB4833-6-E	48	36-75	0.025	0.47	3.3	6	19.8	88%
ESB4825-6-E	48	36-75	0.025	0.36	2.5	6	15	86%
ESB4818-6-E	48	36-75	0.025	0.26	1.8	6	10.8	85%
ESB2450-4-E	24	18-36	0.045	0.95	5.0	4	20	88%
ESB2433-6-E	24	18-36	0.045	0.95	3.3	6	19.8	87%
ESB2425-6-E	24	18-36	0.045	0.74	2.5	6	15	85%
ESB2418-6-E	24	18-36	0.045	0.54	1.8	6	10.8	84%
ESB4850-3-E	48	36-75	0.025	0.36	5.0	3	15	88%
ESB4833-4-E	48	36-75	0.025	0.36	3.3	4.5	14.9	87%
ESB4825-4-E	48	36-75	0.025	0.28	2.5	4.5	11.3	85%
ESB2450-3-E	24	18-36	0.045	0.71	5.0	3	15	88%
ESB2433-4-E	24	18-36	0.045	0.71	3.3	4.5	14.9	87%
ESB2425-4-E	24	18-36	0.045	0.55	2.5	4.5	11.3	85%
ESB1250-4-E	12	9-18	0.1	1.91	5.0	4	20	87%
ESB1233-6-E	12	9-18	0.1	1.92	3.3	6	19.8	86%
ESB48120-S-E	48	36-75	0.005	0.34	12	1.25	15	88%
ESB48150-S-E	48	36-75	0.005	0.337	15	1	15	89%
ESB24120-S-E	24	18-36	0.010	0.718	12	1.25	15	87%
ESB24150-S-E	24	18-36	0.010	0.71	15	1	15	88%
ESB12120-S-E	12	9-18	0.02	1.45	12	1.25	15	86%
ESB12150-S-E	12	9-18	0.02	1.43	15	1	15	87%
ESB48120-D-E	48	36-75	0.005	0.34	±12	±0.625	15	88%
ESB48150-D-E	48	36-75	0.005	0.337	±15	±0.5	15	88%
ESB48240-D-E	48	36-75	0.005	0.46	±24	±0.4	20	87%
ESB24120-D-E	24	18-36	0.010	0.718	±12	±0.625	15	87%
ESB24150-D-E	24	18-36	0.010	0.71	±15	±0.5	15	88%
ESB24240-D-E	24	18-36	0.010	1.29	±24	±0.4	20	87%
ESB12120-D-E	12	9-18	0.02	1.45	±12	±0.625	15	86%
ESB12150-D-E	12	9-18	0.02	1.43	±15	±0.5	15	87%

Enable polarity : "-1" for positive logic Built-In EMC Input Filter, "-P" for positive logic PI Input Filter
"-0" for negative logic Built-In EMC Input Filter, "-N" for negative logic PI Input Filter

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* typical tolerance is ± 0.01

Electrical Specifications

Typical @ $T_a = +25^\circ\text{C}$ under nominal line voltage and full load conditions unless noted.

Input

Parameter	Notes and Conditions	Min.	Typ	Max.	Unit
Operating Input Voltage ranges	ESB12 models	9	12	18	VDC
	ESB24 models	18	24	36	VDC
	ESB36 models	18	36	75	VDC
	ESB48 models	36	48	75	VDC
Under-Voltage Lockout Turn-ON Threshold	ESB12 models	8.5			VDC
	ESB24 models/ ESB36 models	17.5			VDC
	ESB48 models	35			VDC
Under-Voltage Lockout Turn-OFF Threshold	ESB12 models			8	VDC
	ESB24 models/ ESB36 models			17	VDC
	ESB48 models			34	VDC
Input Current	See model selection guide, Standby mode (OFF, UVLO) 5mA				
High Input Level	Enable Function Input	3		5.5	VDC
Low Input Level		0		1.2	VDC
Input Filter	All models	Pi Filter			

Output

Parameter	Notes and Conditions	Min.	Typ	Max.	Unit
Output Voltage Accuracy	50% Load			± 1.5	%
Line Regulation	Low line to High line			± 0.3	%
Load Regulation	10% to 100% load			± 0.5	%
Ripple & Noise (20MHz bandwidth)	Over Line, Load & Temp.		80	150	mV pk-pk
				30	mV RMS
Temperature Coefficient				± 0.04	% / $^\circ\text{C}$
Transient Recovery Time	25% load step change			800	$\mu\text{Sec.}$
Transient Peck Deviation	25% load step change			2	%Vo
Start-Up Time			50	100	mSec.
Output Power Protection		100	120	140	%

General Specifications

Parameter	Notes and Conditions	Min.	Typ	Max.	Unit
Switching Frequency		270	300	330	KHz
Storage Temperature range	All models	-55		125	$^\circ\text{C}$
Operating Case Temperature	All models	-40		100	$^\circ\text{C}$
Isolation Voltage	All models, 1 Minute			1500	VDC
Isolation Resistance	All models, 500VDC	10			M Ω
Isolation Capacitance	All models			1000	pF
Humidity	All models			95	%
Calculated MTBF	BellCore TR-332 @ 50°C G.B.		2,195,000		Hours
Weight				22(0.8)	g (oz.)
Efficiency	See model selection guide				
Dimensions	1.6" x 1.0" x 0.42" (40.6 x 25.4 x 10.7mm)				
Case Material	Aluminum				

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

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