

Features

- Standard pin out; DIP24 packages compliant
- Compact size – 1.27” x 0.65” x 0.4”
- 2:1 / 4:1 Ultra-Wide input range
- -40°C to +60°C operation without derating
- No life-span constrained Capacitor inside
- Output current limit and short circuit protection
- Output voltage trim range of -10%, +10%
- Input under-voltage lockout
- Input-to-output isolation 1600V_{DC}
- Thermal shutdown

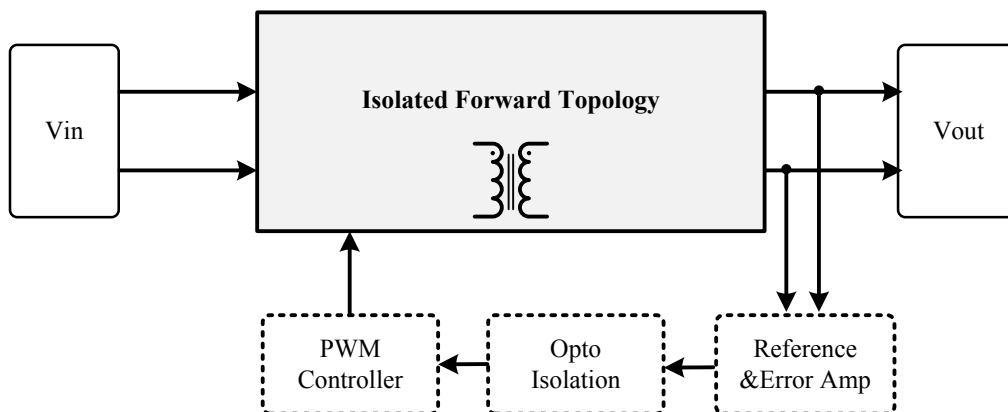
Applications

- Telecom / Datacom
- Industry Control System
- Measurement Equipment
- Semiconductor Equipment
- Railway System



Description

ESAN converter series 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 supplied completely encased to provide protection from the harsh environments seen in many industrial and transportation applications.



ESAN Series Block Diagram



PART NUMBER STRUCTURE

ESAN 010 050 - S - P - S 07

Series Name	Input Voltage (VDC)	Output Voltage (VDC)	Output Quantity	Remote Control Option	Shape	Watt
	018 : 9-36	033 : 3.3	S: Single	P:Positive logic	NA : DIP	07 : 07 Watt
	024 : 18-36	050 : 5		N:Negative logic	S : SMD	10 : 10 Watt
	036 : 18-75	120 : 12				15 : 15 Watt
	048 : 36-75	150 : 15				
	110 : 40-160					
		050 : ±5	D: Dual			
		120 : ±12				
		150 : ±15				

Model Selection Guide

All specifications are typical at nominal input, full load and 25°C otherwise noted

※ modification or customer designs are available. Please contact us for details

Model	Input			Output			Efficiency @FL
	Voltage(V)		Current(A)	Voltage	Current	Power	
	Range	Nominal	Full load	(V)	(A)	(W)	Typ.(%)
ESAN018033-S-P-07	9-36	18	0.47	3.3	2.1	7	85%
ESAN018050-S-P-07	9-36	18	0.46	5	1.4	7	86%
ESAN018120-S-P-07	9-36	18	0.47	12	0.6	7	85%
ESAN018150-S-P-07	9-36	18	0.47	15	0.5	7	85%
ESAN018050-D-P-07	9-36	18	0.47	±5.0	±0.7	7	85%
ESAN018120-D-P-07	9-36	18	0.47	±12.0	±0.3	7	85%
ESAN018150-D-P-07	9-36	18	0.47	±15.0	±0.2	7	85%
ESAN018033-S-P-10	9-36	18	0.65	3.3	3	10	87%
ESAN018050-S-P-10	9-36	18	0.65	5	2	10	87%
ESAN018120-S-P-10	9-36	18	0.65	12	0.9	10	87%
ESAN018150-S-P-10	9-36	18	0.65	15	0.7	10	87%
ESAN018050-D-P-10	9-36	18	0.65	±5.0	±1.0	10	87%
ESAN018120-D-P-10	9-36	18	0.65	±12.0	±0.4	10	87%
ESAN018150-D-P-10	9-36	18	0.65	±15.0	±0.3	10	87%
ESAN018033-S-P-15	9-36	18	0.97	3.3	4.5	15	88%
ESAN018050-S-P-15	9-36	18	0.95	5	3	15	89%
ESAN018120-S-P-15	9-36	18	0.97	12	1.3	15	88%
ESAN018150-S-P-15	9-36	18	0.97	15	1	15	88%
ESAN018050-D-P-15	9-36	18	0.97	±5.0	±1.5	15	88%
ESAN018120-D-P-15	9-36	18	0.97	±12.0	±0.6	15	88%
ESAN018150-D-P-15	9-36	18	0.97	±15.0	±0.5	15	88%



Model	Input			Output			Efficiency @FL Typ.(%)
	Voltage(V)		Current(A)	Voltage	Current	Power	
	Range	Nominal	Full load	(V)	(A)	(W)	
ESAN024033-S-P-07	18-36	24	0.36	3.3	2.1	7	85%
ESAN024050-S-P-07	18-36	24	0.35	5	1.4	7	86%
ESAN024120-S-P-07	18-36	24	0.36	12	0.6	7	85%
ESAN024150-S-P-07	18-36	24	0.36	15	0.5	7	85%
ESAN024050-D-P-07	18-36	24	0.36	±5.0	±0.7	7	85%
ESAN024120-D-P-07	18-36	24	0.36	±12.0	±0.3	7	85%
ESAN024150-D-P-07	18-36	24	0.36	±15.0	±0.2	7	85%
ESAN024033-S-P-10	18-36	24	0.49	3.3	3	10	87%
ESAN024050-S-P-10	18-36	24	0.49	5	2	10	87%
ESAN024120-S-P-10	18-36	24	0.49	12	0.9	10	87%
ESAN024150-S-P-10	18-36	24	0.49	15	0.7	10	87%
ESAN024050-D-P-10	18-36	24	0.49	±5.0	±1.0	10	87%
ESAN024120-D-P-10	18-36	24	0.49	±12.0	±0.4	10	87%
ESAN024150-D-P-10	18-36	24	0.49	±15.0	±0.3	10	87%
ESAN024033-S-P-15	18-36	24	0.73	3.3	4.5	15	88%
ESAN024050-S-P-15	18-36	24	0.71	5	3	15	89%
ESAN024120-S-P-15	18-36	24	0.73	12	1.3	15	88%
ESAN024150-S-P-15	18-36	24	0.73	15	1	15	88%
ESAN024050-D-P-15	18-36	24	0.73	±5.0	±1.5	15	88%
ESAN024120-D-P-15	18-36	24	0.73	±12.0	±0.6	15	88%
ESAN024150-D-P-15	18-36	24	0.73	±15.0	±0.5	15	88%
ESAN036033-S-P-07	18-75	36	0.24	3.3	2.1	7	85%
ESAN036050-S-P-07	18-75	36	0.24	5	1.4	7	86%
ESAN036120-S-P-07	18-75	36	0.24	12	0.6	7	85%
ESAN036150-S-P-07	18-75	36	0.24	15	0.5	7	85%
ESAN036050-D-P-07	18-75	36	0.24	±5.0	±0.7	7	85%
ESAN036120-D-P-07	18-75	36	0.24	±12.0	±0.3	7	85%
ESAN036150-D-P-07	18-75	36	0.24	±15.0	±0.2	7	85%
ESAN036033-S-P-10	18-75	36	0.33	3.3	3	10	87%
ESAN036050-S-P-10	18-75	36	0.33	5	2	10	87%
ESAN036120-S-P-10	18-75	36	0.33	12	0.9	10	87%
ESAN036150-S-P-10	18-75	36	0.33	15	0.7	10	87%
ESAN036050-D-P-10	18-75	36	0.33	±5.0	±1.0	10	87%
ESAN036120-D-P-07	18-75	36	0.33	±12.0	±0.4	10	87%
ESAN036150-D-P-07	18-75	36	0.33	±15.0	±0.3	10	87%
ESAN036033-S-P-15	18-75	36	0.48	3.3	4.5	15	88%
ESAN036050-S-P-15	18-75	36	0.48	5	3	15	89%
ESAN036120-S-P-15	18-75	36	0.48	12	1.3	15	88%
ESAN036150-S-P-15	18-75	36	0.48	15	1	15	88%
ESAN036050-D-P-15	18-75	36	0.48	±5.0	±1.5	15	88%
ESAN036120-D-P-15	18-75	36	0.48	±12.0	±0.6	15	88%
ESAN036150-D-P-15	18-75	36	0.48	±15.0	±0.5	15	88%



Model	Input			Output			Efficiency @FL Typ.(%)
	Voltage(V)		Current(A)	Voltage	Current	Power	
	Range	Nominal	Full load	(V)	(A)	(W)	
ESAN048033-S-P-07	36-75	48	0.19	3.3	2.1	7	85%
ESAN048050-S-P-07	36-75	48	0.18	5	1.4	7	86%
ESAN048120-S-P-07	36-75	48	0.19	12	0.6	7	85%
ESAN048150-S-P-07	36-75	48	0.19	15	0.5	7	85%
ESAN048050-D-P-07	36-75	48	0.19	±5.0	±0.7	7	85%
ESAN048120-D-P-07	36-75	48	0.19	±12.0	±0.3	7	85%
ESAN048150-D-P-07	36-75	48	0.19	±15.0	±0.2	7	85%
ESAN048033-S-P-10	36-75	48	0.25	3.3	3	10	87%
ESAN048050-S-P-10	36-75	48	0.25	5	2	10	87%
ESAN048120-S-P-10	36-75	48	0.25	12	0.9	10	87%
ESAN048150-S-P-10	36-75	48	0.25	15	0.7	10	87%
ESAN048050-D-P-10	36-75	48	0.25	±5.0	±1.0	10	87%
ESAN048120-D-P-07	36-75	48	0.25	±12.0	±0.4	10	87%
ESAN048150-D-P-07	36-75	48	0.25	±15.0	±0.3	10	87%
ESAN048033-S-P-15	36-75	48	0.37	3.3	4.5	15	88%
ESAN048050-S-P-15	36-75	48	0.36	5	3	15	89%
ESAN048120-S-P-15	36-75	48	0.37	12	1.3	15	88%
ESAN048150-S-P-15	36-75	48	0.37	15	1	15	88%
ESAN048050-D-P-15	36-75	48	0.37	±5.0	±1.5	15	88%
ESAN048120-D-P-15	36-75	48	0.37	±12.0	±0.6	15	88%
ESAN048150-D-P-15	36-75	48	0.37	±15.0	±0.5	15	88%
ESAN110033-S-P-07	40-160	110	0.08	3.3	2.1	7	85%
ESAN110050-S-P-07	40-160	110	0.08	5	1.4	7	86%
ESAN110120-S-P-07	40-160	110	0.08	12	0.6	7	85%
ESAN110150-S-P-07	40-160	110	0.08	15	0.5	7	85%
ESAN110050-D-P-07	40-160	110	0.08	±5.0	±0.7	7	85%
ESAN110120-D-P-07	40-160	110	0.08	±12.0	±0.3	7	85%
ESAN110150-D-P-07	40-160	110	0.08	±15.0	±0.2	7	85%
ESAN110033-S-P-10	40-160	110	0.11	3.3	3	10	87%
ESAN110050-S-P-10	40-160	110	0.11	5	2	10	87%
ESAN110120-S-P-10	40-160	110	0.11	12	0.9	10	87%
ESAN110150-S-P-10	40-160	110	0.11	15	0.7	10	87%
ESAN110050-D-P-10	40-160	110	0.11	±5.0	±1.0	10	87%
ESAN110120-D-P-07	40-160	110	0.11	±12.0	±0.4	10	87%
ESAN110150-D-P-07	40-160	110	0.11	±15.0	±0.3	10	87%
ESAN110033-S-P-15	40-160	110	0.15	3.3	4.5	15	88%
ESAN110050-S-P-15	40-160	110	0.15	5	3	15	89%
ESAN110120-S-P-15	40-160	110	0.15	12	1.3	15	88%
ESAN110150-S-P-15	40-160	110	0.15	15	1	15	88%
ESAN110050-D-P-15	40-160	110	0.15	±5.0	±1.5	15	88%
ESAN110120-D-P-15	40-160	110	0.15	±12.0	±0.6	15	88%
ESAN110150-D-P-15	40-160	110	0.15	±15.0	±0.5	15	88%



Electrical Specifications

Input Specifications

Parameter	Notes and Conditions	Min.	Typ	Max.	Unit
Transient Input Voltage ranges	ESAN018 models			50	VDC
	ESAN024 models			50	
	ESAN036 models			80	
	ESAN048 models			80	
	ESAN110 models			180	
Operating Input Voltage ranges	ESAN018 models	9	18	36	VDC
	ESAN024 models	18	24	36	
	ESAN036 models	18	36	75	
	ESAN048 models	36	48	75	
	ESAN110 models	40	110	160	
Under-Voltage Lockout Start up voltage	ESAN018 models	8.8			VDC
	ESAN024 models	17.5			
	ESAN036 models	17.5			
	ESAN048 models	35			
	ESAN110 models	35			
Under-Voltage Lockout Shutdown voltage	ESAN018 models			8.5	VDC
	ESAN024 models			17	
	ESAN036 models			17	
	ESAN048 models			34	
	ESAN110 models			34	
Input Current	See model selection guide, Standby mode (OFF,UVLO)5mA				
Enable Function Input	Positive logic	ON	Open or 8 ~ 20		VDC
		OFF	Short or 0 ~ 1.2		
	Negative logic	ON	Short or 0 ~ 1.2		VDC
		OFF	Open or 8 ~ 20		
Input Filter	All models	Built-in Pi Filter			

Output Specifications

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	%
Minimum Load	Single output	0			%
	Dual output	10			%
Output Ripple and Noise Voltage each output	Bandwidth 20MHz and with 1uF MLCC.Output Capacitor each output	3.3V & 5V		100	mVp-p
		All others	1	1.5	%V _{pk-pk}
Temperature Coefficient				±0.04	% / °C
Transient Recovery Time	25% load step change		800		µSec.
Transient Peak Deviation	ΔIo/Δt=2.5A/us			±2	%Vo
Start-Up time	When use Enable Function		5	20	mSec.
Trimming Output Voltage	Single output		±10		%
Output Power Protection	Hiccup Mode		120		%

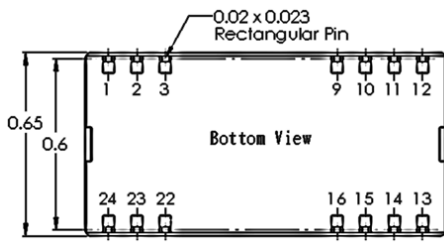


General Specifications

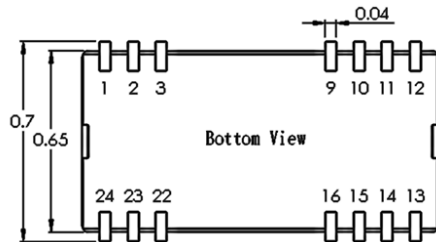
Parameter	Notes and Conditions	Min.	Typ	Max.	Unit
Switching Frequency	2:1 wide	270	300	330	KHz
	4:1 wide	220	260	300	
Storage Temperature range	All models	-55		125	°C
Operating Case Temperature	All models	-45		75	°C
Over temperature Protection	All models, Auto. Recovery		85		
Thermal impedance	Natural convection	12 (Vertical)			°C/Watt
		16(horizontal)			
Thermal shock		MIL-STD-810F			
Vibration		MIL-STD-810F			
Drop		MIL-STD-810F			
Isolation Voltage Input to Output	All models, 1 Minute	1600			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
Weight			12(0.42)		g (oz.)
Dimensions	1.27" x 0.65" x 0.4" (32.3 x 16.5 x 10.2mm)				
Case Material	Plastic				
Potting Material	Silicone				

Mechanical Dimensions :

Bottom View

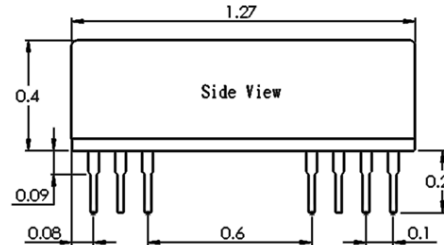


NO Suffix

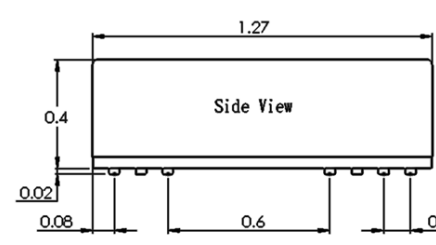


Suffix-S

Side View



NO Suffix



Suffix-S

All dimension in inch
Tolerance: X.X±0.02

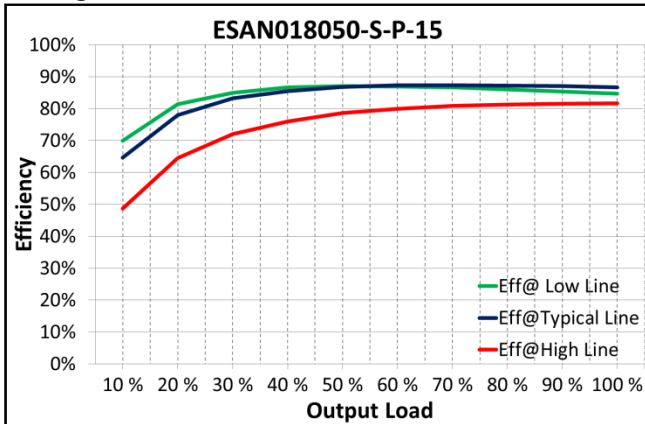
Pin Connections:

Pin#	Single	Dual
1	EN	EN
2	-Vin	-Vin
3	-Vin	-Vin
4	No Pin	No Pin
5	No Pin	No Pin
6	No Pin	No Pin
7	No Pin	No Pin
8	No Pin	No Pin
9	NC	Comm
10	NC	NC
11	NC	-Vout
12	Trim	NC
13	NC	NC
14	+Vout	+Vout
15	NC	NC
16	-Vout	Comm
17	No Pin	No Pin
18	No Pin	No Pin
19	No Pin	No Pin
20	No Pin	No Pin
21	No Pin	No Pin
22	+Vin	+Vin
23	+Vin	+Vin
24	NC	NC

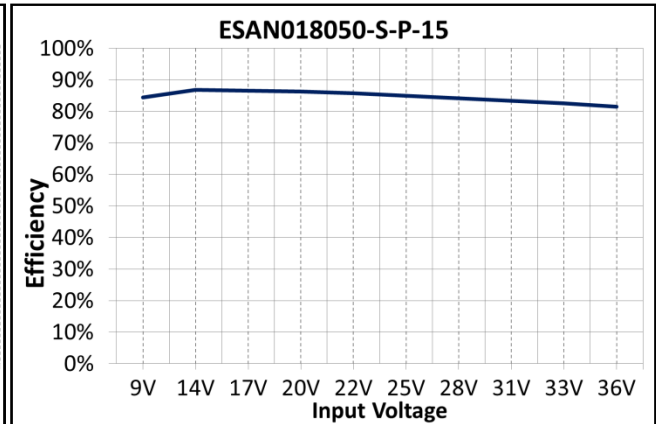


Characteristic Curves

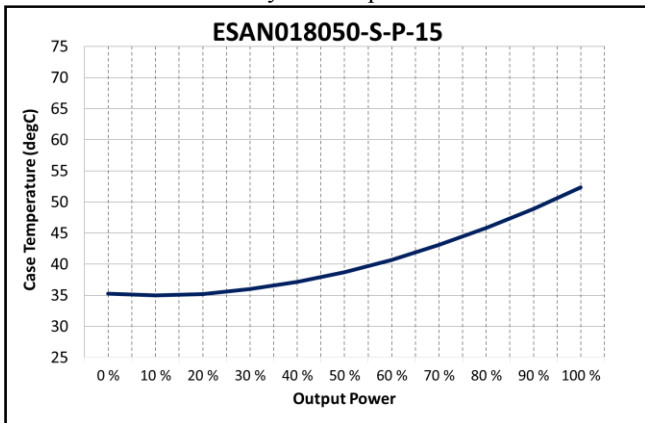
Testing conditions are at typical input, Ta=+25°C, full load (horizontal mount) Unless otherwise indicated
 The figures of **ESAN018050-S-P-15**



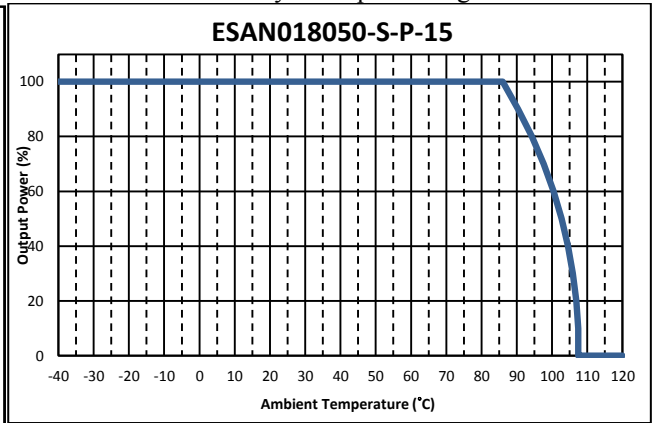
Efficiency VS Output Power



Efficiency VS Input Voltage



Case Temp. VS Output Power



Derating curve

Standards Compliance

Parameter	Standard	Test Conditions	Performance Criteria
Environmental Compliance	Reach; RoHS		PASS
EMI	EN55022		Class A
ESD	EN61000-4-2	±8 kV Air Discharge ±6 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

Conducted EMI

