

IDD I5U SERIES

DC - DC CONVERTER

13 ~ 15W SINGLE & DUAL OUTPUT



FEATURES

- EFFICIENCY UP TO 89%
- 2:1 & 4:1 WIDE INPUT RANGE
- I/O ISOLATION
- INPUT P_i FILTER
- SHORT CIRCUIT PROTECTION
- HIGH PERFORMANCE
- UL/cUL/TUV/CE
- 3 YEARS WARRANTY



MODEL LIST

MODEL NO.	INPUT VOLTAGE	INPUT CURRENT (typ.)	INPUT CURRENT (max.)	OUTPUT WATTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	EFF. (min.)	EFF. (typ.)	CAPACITOR LOAD (max.)
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Single Output Models

IDD15 - 03S1U	9~18 VDC	1.35 A	1.85 A	13 WATTS	+3.3 VDC	4000 mA	80%	82%	3500 μ F
IDD15 - 05S1U	9~18 VDC	1.52 A	2.05 A	15 WATTS	+ 5 VDC	3000 mA	82%	84%	3500 μ F
IDD15 - 12S1U	9~18 VDC	1.45 A	1.97 A	15 WATTS	+ 12 VDC	1250 mA	85%	87%	1000 μ F
IDD15 - 15S1U	9~18 VDC	1.43 A	1.97 A	15 WATTS	+ 15 VDC	1000 mA	87%	89%	1000 μ F
IDD15 - 03S2U	18~36 VDC	0.67 A	0.91 A	13 WATTS	+3.3 VDC	4000 mA	81%	83%	3500 μ F
IDD15 - 05S2U	18~36 VDC	0.74 A	1.00 A	15 WATTS	+ 5 VDC	3000 mA	83%	85%	3500 μ F
IDD15 - 12S2U	18~36 VDC	0.72 A	0.97 A	15 WATTS	+ 12 VDC	1250 mA	86%	88%	1000 μ F
IDD15 - 15S2U	18~36 VDC	0.71 A	0.97 A	15 WATTS	+ 15 VDC	1000 mA	87%	89%	1000 μ F
IDD15 - 03S3U	35~75 VDC	0.33 A	0.47 A	13 WATTS	+3.3 VDC	4000 mA	81%	83%	3500 μ F
IDD15 - 05S3U	35~75 VDC	0.37 A	0.52 A	15 WATTS	+ 5 VDC	3000 mA	83%	85%	3500 μ F
IDD15 - 12S3U	35~75 VDC	0.35 A	0.50 A	15 WATTS	+ 12 VDC	1250 mA	86%	88%	1000 μ F
IDD15 - 15S3U	35~75 VDC	0.35 A	0.50 A	15 WATTS	+ 15 VDC	1000 mA	87%	89%	1000 μ F
IDD15 - 03S4U	9~36 VDC	0.69 A	1.88 A	13 WATTS	+3.3 VDC	4000 mA	78%	80%	3500 μ F
IDD15 - 05S4U	9~36 VDC	0.77 A	2.06 A	15 WATTS	+ 5 VDC	3000 mA	81%	83%	3500 μ F
IDD15 - 12S4U	9~36 VDC	0.74 A	2.04 A	15 WATTS	+ 12 VDC	1250 mA	82%	84%	1000 μ F
IDD15 - 15S4U	9~36 VDC	0.74 A	2.04 A	15 WATTS	+ 15 VDC	1000 mA	82%	84%	1000 μ F
IDD15 - 03S5U	18~75 VDC	0.35 A	0.94 A	13 WATTS	+3.3 VDC	4000 mA	78%	80%	3500 μ F
IDD15 - 05S5U	18~75 VDC	0.38 A	1.03 A	15 WATTS	+ 5 VDC	3000 mA	81%	83%	3500 μ F
IDD15 - 12S5U	18~75 VDC	0.37 A	1.03 A	15 WATTS	+ 12 VDC	1250 mA	82%	84%	1000 μ F
IDD15 - 15S5U	18~75 VDC	0.37 A	1.03 A	15 WATTS	+ 15 VDC	1000 mA	82%	84%	1000 μ F

Dual Output Models

IDD15 - 05DIU	9~18 VDC	1.52 A	2.04 A	15 WATTS	$\pm$ 5 VDC	$\pm$ 1500 mA	82%	84%	$\pm$ 3500 μ F
IDD15 - 12DIU	9~18 VDC	1.48 A	2.00 A	15 WATTS	$\pm$ 12 VDC	$\pm$ 630 mA	85%	87%	$\pm$ 1000 μ F
IDD15 - 15DIU	9~18 VDC	1.43 A	1.98 A	15 WATTS	$\pm$ 15 VDC	$\pm$ 500 mA	85%	87%	$\pm$ 1000 μ F
IDD15 - 05D2U	18~36 VDC	0.74 A	1.00 A	15 WATTS	$\pm$ 5 VDC	$\pm$ 1500 mA	84%	86%	$\pm$ 3500 μ F

MODEL LIST

MODEL NO.	INPUT VOLTAGE	INPUT CURRENT (typ.) (max.)		OUTPUT WATTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	EFF. (min.)	EFF. (typ.)	CAPACITOR LOAD (max.)
Dual Output Models									
IDD15 - 12D2U	18~36 VDC	0.72 A	0.98 A	15 WATTS	± 12 VDC	± 630 mA	86%	88%	± 1000 μ F
IDD15 - 15D2U	18~36 VDC	0.71 A	0.98 A	15 WATTS	± 15 VDC	± 500 mA	87%	89%	± 1000 μ F
IDD15 - 05D3U	35~75 VDC	0.37 A	0.51 A	15 WATTS	± 5 VDC	± 1500 mA	84%	86%	± 3500 μ F
IDD15 - 12D3U	35~75 VDC	0.36 A	0.51 A	15 WATTS	± 12 VDC	± 630 mA	86%	88%	± 1000 μ F
IDD15 - 15D3U	35~75 VDC	0.35 A	0.51 A	15 WATTS	± 15 VDC	± 500 mA	87%	89%	± 1000 μ F
IDD15 - 05D4U	9~36 VDC	0.74 A	2.08 A	15 WATTS	± 5 VDC	± 1500 mA	80%	82%	± 3500 μ F
IDD15 - 12D4U	9~36 VDC	0.78 A	2.08 A	15 WATTS	± 12 VDC	± 630 mA	80%	82%	± 1000 μ F
IDD15 - 15D4U	9~36 VDC	0.75 A	2.04 A	15 WATTS	± 15 VDC	± 500 mA	82%	84%	± 1000 μ F
IDD15 - 05D5U	18~75 VDC	0.38 A	1.05 A	15 WATTS	± 5 VDC	± 1500 mA	81%	83%	± 3500 μ F
IDD15 - 12D5U	18~75 VDC	0.39 A	1.05 A	15 WATTS	± 12 VDC	± 630 mA	80%	82%	± 1000 μ F
IDD15 - 15D5U	18~75 VDC	0.38 A	1.05 A	15 WATTS	± 15 VDC	± 500 mA	81%	83%	± 1000 μ F

SPECIFICATION

All Specifications Typical At Nominal Line, Full Load, 25°C Unless Otherwise Noticed

GENERAL						
Characteristics	Conditions		min.	typ.	max.	unit
Switching frequency	Vi nom, Io nom			200		KHz
Isolation voltage	Input - Output		1,500			VDC
Isolation resistance	Input - Output, @ 500VDC		100			MΩ
Isolation capacitance	100KHz / 1V				1,000	PF
Ambient temperature	Vi nom, Io nom	3.3V & 5V models (2:1)	-40		+ 61	°C
		3.3V & 5V models (4:1)	-40		+ 51	°C
		12V & 15V models (2:1 & 4:1)	-40		+ 71	°C
Case temperature	Operating at Vi nom, Io nom				+ 100	°C
Derating	Vi nom		See derating curve			
Storage temperature	Non operational		-40		+ 100	°C
Relative humidity	Vi nom, Io nom		20		95	% RH
Temperature coefficient	Vi nom, Io min				± 0.02	% / °C
Dimension			L50.8 x W25.4 x H10.16			mm
MTBF	Bellcore issue 6@40°C, GB			1,166,000		Hours
Cooling	Free air convection					
INPUT SPECIFICATIONS						
Characteristics	Conditions		min.	typ.	max.	unit
Input voltage range	Ta min ... Ta max, Io nom	2:1	9	12	18	VDC
			18	24	36	VDC
			35	48	75	VDC
		4:1	9	24	36	VDC
			18	48	75	VDC
No load input current	Vi nom, Io = 0	12V		25	mA	
		24V		20	mA	
		48V		15	mA	
Input voltage w/o damage	Io nom	12V		20	VDC	
		24V		40	VDC	
		48V		80	VDC	
Startup voltage	Io nom	12V	8.5		VDC	
		24V	16		VDC	
		48V	33		VDC	
Input filter	Pi type					

SPECIFICATION

All Specifications Typical At Nominal Line, Full Load, 25°C Unless Otherwise Noticed

OUTPUT SPECIFICATIONS

Characteristics	Conditions	min.	typ.	max.	unit
Output voltage accuracy	Vi nom, Io nom			± 2	%
Minimum load	Vi nom single output models	0			%
	Vi nom dual output models (each output)	10			%
Line regulation	Io nom, Vi min ...Vi max			± 1	%
Load regulation	Vi nom, Io 0 ...Io nom, single output models			± 2	%
	Vi nom, Io min ...Io nom, dual output models			± 5	%
Cross regulation (Dual model)	Asymmetrical load 10% - 100% FL			± 5	%
Startup time	Vi nom, Io nom			30	ms
Transient recovery time	Vi nom, I ~0.5 Io nom			500	μs
Ripple & noise *	Vi nom, Io nom, BW = 20MHz			100	mV
	3.3V & 5V 12V, 15V & dual			150	mV
Efficiency	Vi nom, Io nom, Po / Pi	Up to 89%, See model list and efficiency curve			

* Note : Output must be added 0.1 μF / 35V capacitor when application.

CONTROL AND PROTECTION

Input reversed	Shunt diode built in, external fuse recommended 2:1 models (12Vin:2.5A, 24Vin:1.5A, 48Vin:1A) 4:1 models (24Vin:2.5A, 48Vin:1.5A)
Output short circuit	Current limited (Auto-recovery)
Rated over load protection	110%min....160%max

APPROVALS AND STANDARD

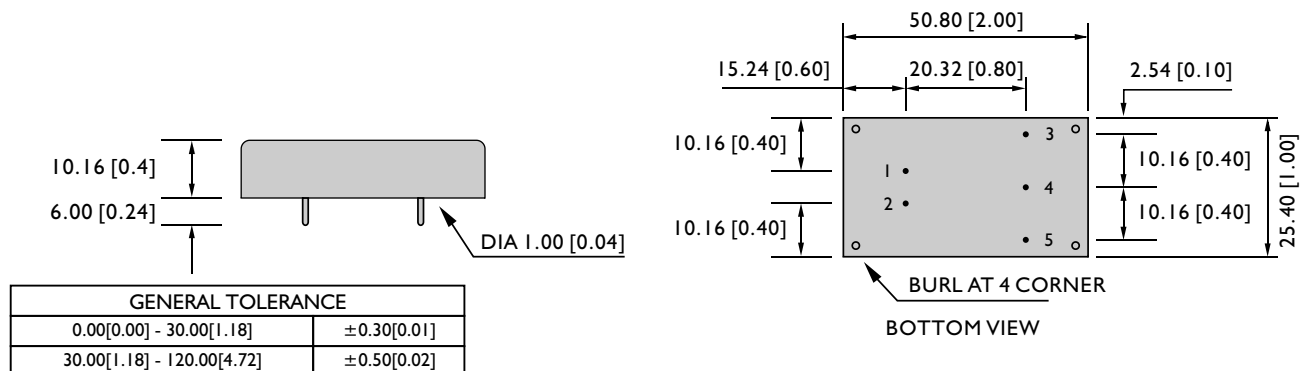
UL / cUL	UL 60950-1 Recognized
cTUVus	UL 62368-1
TUV	EN 62368-1
CE	EN 61204-3, EN 55032 Class A, EN 61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-6
Vibration	meet IEC 60068-2-6 (10-500 Hz, 2G, along X, Y, Z each Axis, 60 min for each Axis)

PHYSICAL CHARACTERISTICS

Case size	50.8 x 25.4 x 10.16 mm (2 x 1 x 0.4 inches)
Case material	Plastic base / Metal case
Weight	35 g
Potting material	Silicone

MECHANISM & PIN CONFIGURATION

mm [inch]



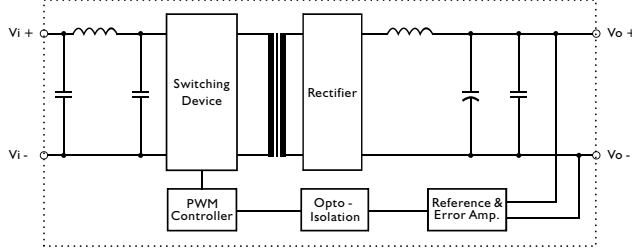
PIN ASSIGNMENT

GENERAL

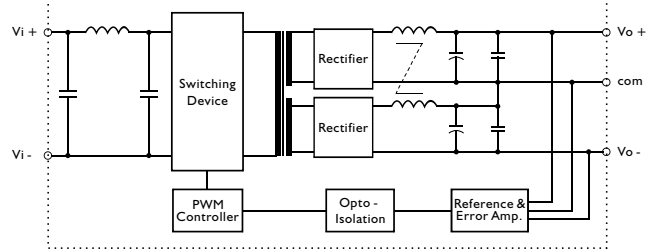
PIN NO.	1	2	3	4	5
SINGLE	Vi +	Vi -	Vo +	NO PIN	Vo -
DUAL	Vi +	Vi -	Vo +	com	Vo -

CIRCUIT SCHEMATIC

- Block diagram for IDD15U series with single output

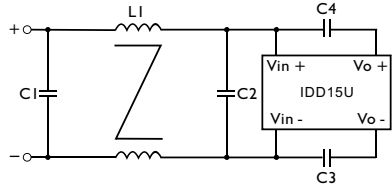


- Block diagram for IDD15U series with dual output

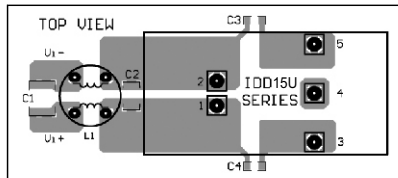


RECOMMENDED CIRCUIT

- Recommended filter for EN 55032 Class B compliance



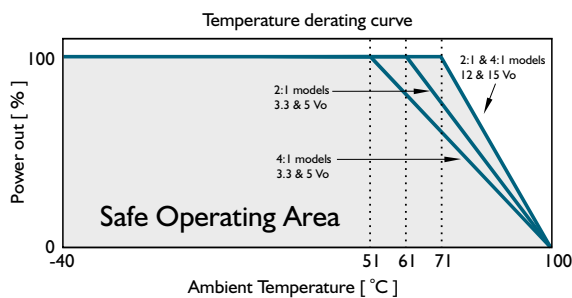
- Recommended EN 55032 Class B filter circuit layout.



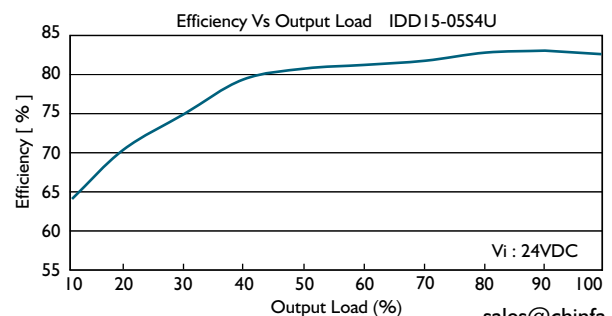
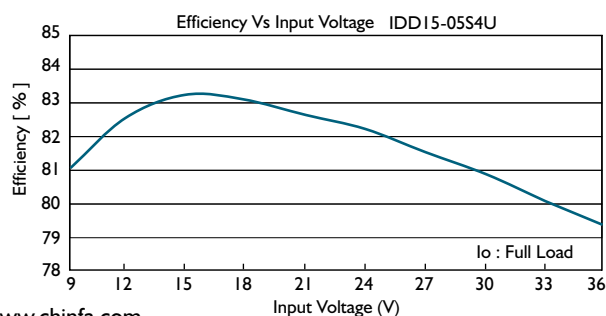
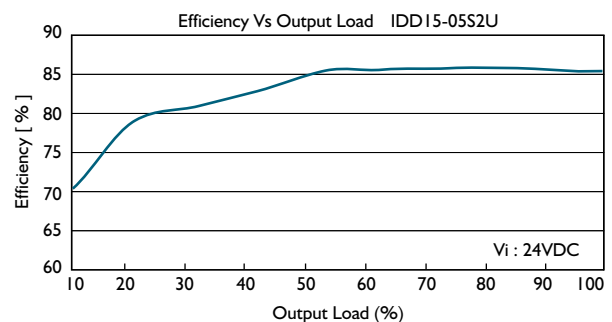
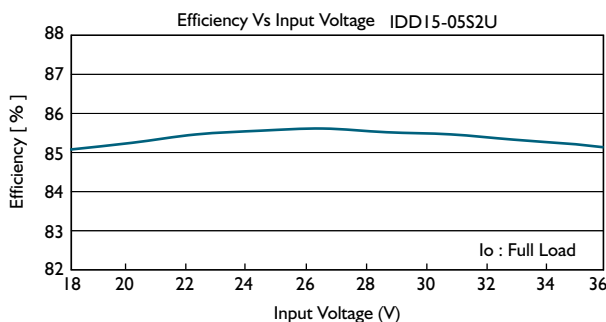
- The components used in the above figure, together with the manufacturer part numbers for these components, are as follows.

	C1	C2	C3	C4	L1
IDD15-XXX1U	3.3 μ F / 50V MLCC	2.2 μ F / 50V MLCC	1nF / 2KV MLCC	1nF / 2KV MLCC	500 μ H Common choke
IDD15-XXX2U	3.3 μ F / 50V MLCC	2.2 μ F / 50V MLCC	1nF / 2KV MLCC	1nF / 2KV MLCC	500 μ H Common choke
IDD15-XXX3U	3.3 μ F / 100V MLCC	2.2 μ F / 100V MLCC	1nF / 2KV MLCC	1nF / 2KV MLCC	500 μ H Common choke
IDD15-XXX4U	3.3 μ F / 50V MLCC	2.2 μ F / 50V MLCC	1nF / 2KV MLCC	1nF / 2KV MLCC	500 μ H Common choke
IDD15-XXX5U	3.3 μ F / 100V MLCC	2.2 μ F / 100V MLCC	1nF / 2KV MLCC	1nF / 2KV MLCC	1 mH Common choke

DERATING CURVE



EFFICIENCY CURVE



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