IDD15U SERIES

DC - DC CONVERTER
13.2 ~ 15W SINGLE & DUAL OUTPUT

FEATURES

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

TÜV Rheinland Product Safety | BAUART GEPRÜFT | TYPE APPROVED — EN 60950-1
c UL us — UL 60950-1
CE

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.)
Single Output Models									
IDD15 - 03S1U	9~18 VDC	1.35 A	1.85 A	13.2 WATTS	+3.3 VDC	4000 mA	80%	82%	3500 μF
IDD15 - 05S1U	9~18 VDC	1.52 A	2.05 A	15 WATTS	+ 5 VDC	3000 mA	82%	84%	3500 μF
IDD15 - 12S1U	9~18 VDC	1.45 A	1.97 A	15 WATTS	+ 12 VDC	1250 mA	85%	87%	1000 μF
IDD15 - 15S1U	9~18 VDC	1.43 A	1.97 A	15 WATTS	+ 15 VDC	1000 mA	87%	89%	1000 μF
IDD15 - 03S2U	18~36 VDC	0.67 A	0.91 A	13.2 WATTS	+3.3 VDC	4000 mA	81%	83%	3500 μF
IDD15 - 05S2U	18~36 VDC	0.74 A	1.00 A	15 WATTS	+ 5 VDC	3000 mA	83%	85%	3500 μF
IDD15 - 12S2U	18~36 VDC	0.72 A	0.97 A	15 WATTS	+ 12 VDC	1250 mA	86%	88%	1000 μF
IDD15 - 15S2U	18~36 VDC	0.71 A	0.97 A	15 WATTS	+ 15 VDC	1000 mA	87%	89%	1000 μF
IDD15 - 03S3U	35~75 VDC	0.33 A	0.47 A	13.2 WATTS	+3.3 VDC	4000 mA	81%	83%	3500 μF
IDD15 - 05S3U	35~75 VDC	0.37 A	0.52 A	15 WATTS	+ 5 VDC	3000 mA	83%	85%	3500 μF
IDD15 - 12S3U	35~75 VDC	0.35 A	0.50 A	15 WATTS	+ 12 VDC	1250 mA	86%	88%	1000 μF
IDD15 - 15S3U	35~75 VDC	0.35 A	0.50 A	15 WATTS	+ 15 VDC	1000 mA	87%	89%	1000 μF
IDD15 - 03S4U	9~36 VDC	0.69 A	1.88 A	13.2 WATTS	+3.3 VDC	4000 mA	78%	80%	3500 μF
IDD15 - 05S4U	9~36 VDC	0.77 A	2.06 A	15 WATTS	+ 5 VDC	3000 mA	81%	83%	3500 μF
IDD15 - 12S4U	9~36 VDC	0.74 A	2.04 A	15 WATTS	+ 12 VDC	1250 mA	82%	84%	1000 μF
IDD15 - 15S4U	9~36 VDC	0.74 A	2.04 A	15 WATTS	+ 15 VDC	1000 mA	82%	84%	1000 μF
IDD15 - 03S5U	18~75 VDC	0.35 A	0.94 A	13.2 WATTS	+3.3 VDC	4000 mA	78%	80%	3500 μF
IDD15 - 05S5U	18~75 VDC	0.38 A	1.03 A	15 WATTS	+ 5 VDC	3000 mA	81%	83%	3500 μF
IDD15 - 12S5U	18~75 VDC	0.37 A	1.03 A	15 WATTS	+ 12 VDC	1250 mA	82%	84%	1000 μF
IDD15 - 15S5U	18~75 VDC	0.37 A	1.03 A	15 WATTS	+ 15 VDC	1000 mA	82%	84%	1000 μF
Dual Output Models									
IDD15 - 05D1U	9~18 VDC	1.52 A	2.04 A	15 WATTS	± 5 VDC	± 1500 mA	82%	84%	± 3500 μF
IDD15 - 12D1U	9~18 VDC	1.48 A	2.00 A	15 WATTS	± 12 VDC	± 630 mA	85%	87%	± 1000μ F
IDD15 - 15D1U	9~18 VDC	1.43 A	1.98 A	15 WATTS	± 15 VDC	± 500 mA	85%	87%	± 1000 μF
IDD15 - 05D2U	18~36 VDC	0.74 A	1.00 A	15 WATTS	± 5 VDC	± 1500 mA	84%	86%	± 3500 μF

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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.)
Dual Output Models									
IDD15 - 12D2U	18~36 VDC	0.72 A	0.98 A	15 WATTS	± 12 VDC	± 630 mA	86%	88%	± 1000 μF
IDD15 - 15D2U	18~36 VDC	0.71 A	0.98 A	15 WATTS	± 15 VDC	± 500 mA	87%	89%	± 1000 μF
IDD15 - 05D3U	35~75 VDC	0.37 A	0.51 A	15 WATTS	± 5 VDC	± 1500 mA	84%	86%	± 3500 μF
IDD15 - 12D3U	35~75 VDC	0.36 A	0.51 A	15 WATTS	± 12 VDC	± 630 mA	86%	88%	± 1000 μF
IDD15 - 15D3U	35~75 VDC	0.35 A	0.51 A	15 WATTS	± 15 VDC	± 500 mA	87%	89%	± 1000 μF
IDD15 - 05D4U	9~36 VDC	0.74 A	2.08 A	15 WATTS	± 5 VDC	± 1500 mA	80%	82%	± 3500 μF
IDD15 - 12D4U	9~36 VDC	0.78 A	2.08 A	15 WATTS	± 12 VDC	± 630 mA	80%	82%	± 1000 μF
IDD15 - 15D4U	9~36 VDC	0.75 A	2.04 A	15 WATTS	± 15 VDC	± 500 mA	82%	84%	± 1000 μF
IDD15 - 05D5U	18~75 VDC	0.38 A	1.05 A	15 WATTS	± 5 VDC	± 1500 mA	81%	83%	± 3500 μF
IDD15 - 12D5U	18~75 VDC	0.39 A	1.05 A	15 WATTS	± 12 VDC	± 630 mA	80%	82%	± 1000 μF
IDD15 - 15D5U	18~75 VDC	0.38 A	1.05 A	15 WATTS	± 15 VDC	± 500 mA	81%	83%	± 1000 μF

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					

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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			%
		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, 1~0.5 Io nom				500	μs
Ripple & noise *	Vi nom, Io nom, BW = 20MHz	3.3V & 5V			100	mV
		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

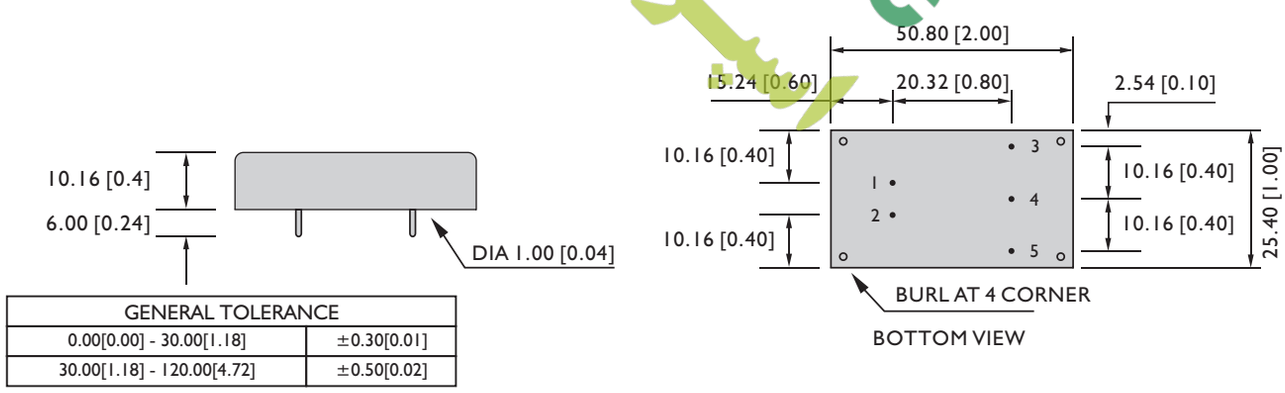
UL/cUL	UL 60950-1 Recognized
TUV	EN 60950-1
CE	EN 61204-3, EN 55022 Class A, EN 61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-6
Vibration	meet IEC 60068-2-6 (10-500 Hz, 2G, along X, Y, Z each Axis, 60 min for each Axis)

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]



GENERAL TOLERANCE	
0.00[0.00] - 30.00[1.18]	±0.30[0.01]
30.00[1.18] - 120.00[4.72]	±0.50[0.02]

PIN ASSIGNMENT

GENERAL

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

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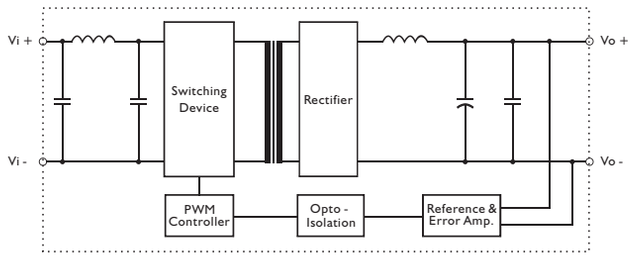
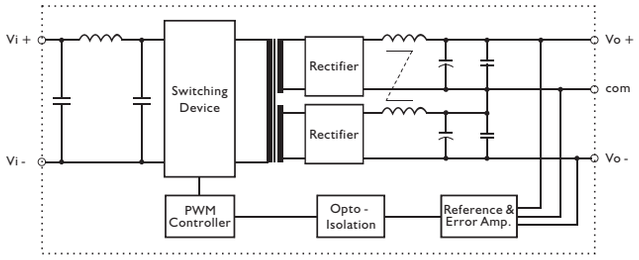
CIRCUIT SCHEMATIC

• Block diagram for IDD15U series with single output

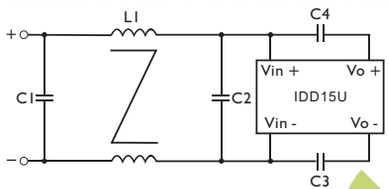


• Block diagram for IDD15U series with dual output

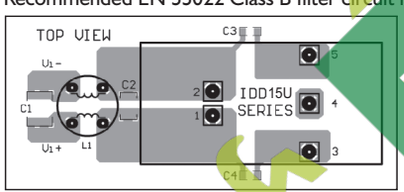


RECOMMENDED CIRCUIT

• Recommended filter for EN55022 Class B compliance



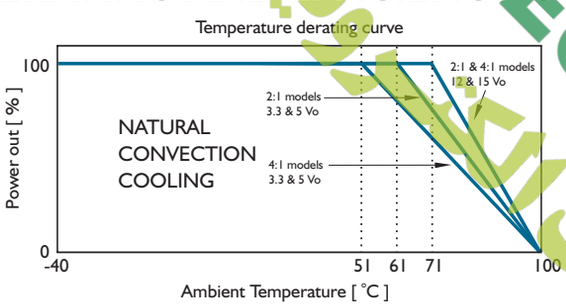
• Recommended EN 55022 Class B filter circuit layout.



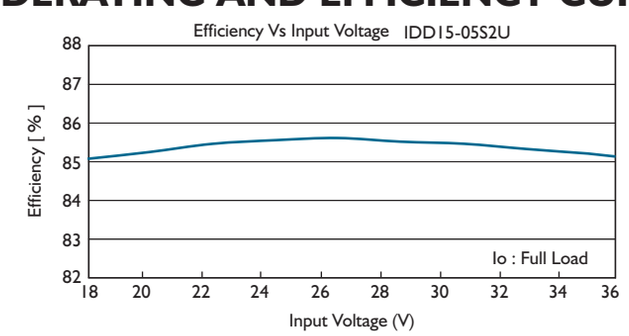
• The components used in the above figure, together with themanufacturer part numbers for these components, are as follows.

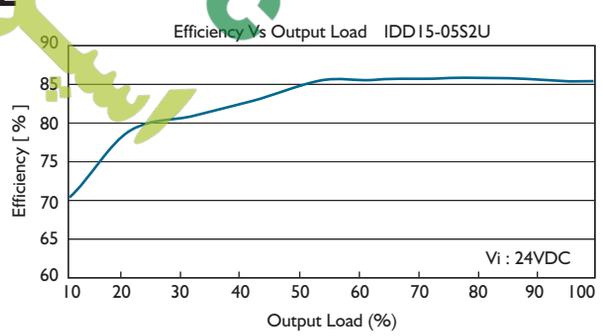
	C1	C2	C3	C4	L1
IDD15-XXX1U	3.3 μF / 50V MLCC	2.2 μF / 50V MLCC	1nF / 2KV MLCC	1nF / 2KV MLCC	500 μH Common choke
IDD15-XXX2U	3.3 μF / 50V MLCC	2.2 μF / 50V MLCC	1nF / 2KV MLCC	1nF / 2KV MLCC	500 μH Common choke
IDD15-XXX3U	3.3 μF / 100V MLCC	2.2 μF / 100V MLCC	1nF / 2KV MLCC	1nF / 2KV MLCC	500 μH Common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

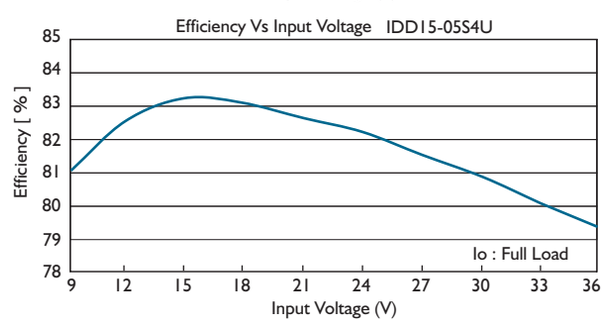
DERATING AND EFFICIENCY CURVE

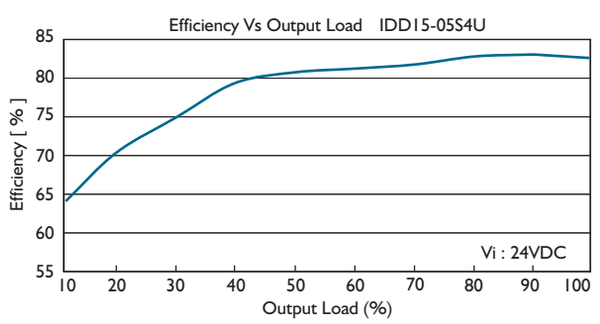


DERATING AND EFFICIENCY CURVE









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