IDD10U SERIES

DC - DC CONVERTER
10W SINGLE & DUAL OUTPUT

FEATURES

- EFFICIENCY UP TO 89%
- 2:1 & 4:1 WIDE INPUT RANGE
- 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									
IDD10 - 03S1U	9~18 VDC	1.00 A	1.34 A	10 WATTS	+ 3.3 VDC	3000 mA	81%	83%	3500 μF
IDD10 - 05S1U	9~18 VDC	1.00 A	1.34 A	10 WATTS	+ 5 VDC	2000 mA	83%	85%	3500 μF
IDD10 - 12S1U	9~18 VDC	0.95 A	1.30 A	10 WATTS	+ 12 VDC	830 mA	87%	89%	1000 μF
IDD10 - 15S1U	9~18 VDC	0.95 A	1.30 A	10 WATTS	+ 15 VDC	670 mA	87%	89%	1000 μF
IDD10 - 03S2U	18~36 VDC	0.50 A	0.67 A	10 WATTS	+ 3.3 VDC	3000 mA	81%	83%	3500 μF
IDD10 - 05S2U	18~36 VDC	0.49 A	0.67 A	10 WATTS	+ 5 VDC	2000 mA	83%	85%	3500 μF
IDD10 - 12S2U	18~36 VDC	0.47 A	0.64 A	10 WATTS	+ 12 VDC	830 mA	87%	89%	1000 μF
IDD10 - 15S2U	18~36 VDC	0.48 A	0.64 A	10 WATTS	+ 15 VDC	670 mA	87%	89%	1000 μF
IDD10 - 03S3U	35~75 VDC	0.25 A	0.35 A	10 WATTS	+ 3.3 VDC	3000 mA	81%	83%	3500 μF
IDD10 - 05S3U	35~75 VDC	0.25 A	0.35 A	10 WATTS	+ 5 VDC	2000 mA	83%	85%	3500 μF
IDD10 - 12S3U	35~75 VDC	0.23 A	0.35 A	10 WATTS	+ 12 VDC	830 mA	87%	89%	1000 μF
IDD10 - 15S3U	35~75 VDC	0.23 A	0.35 A	10 WATTS	+ 15 VDC	670 mA	87%	89%	1000 μF
IDD10 - 03S4U	9~36 VDC	0.52 A	1.41 A	10 WATTS	+3.3 VDC	3000 mA	78%	80%	3500 μF
IDD10 - 05S4U	9~36 VDC	0.52 A	1.37 A	10 WATTS	+ 5 VDC	2000 mA	80%	82%	3500 μF
IDD10 - 12S4U	9~36 VDC	0.49 A	1.37 A	10 WATTS	+ 12 VDC	830 mA	82%	84%	1000 μF
IDD10 - 15S4U	9~36 VDC	0.50 A	1.37 A	10 WATTS	+ 15 VDC	670 mA	83%	85%	1000 μF
IDD10 - 03S5U	18~75 VDC	0.26 A	0.71 A	10 WATTS	+3.3 VDC	3000 mA	78%	80%	3500 μF
IDD10 - 05S5U	18~75 VDC	0.26 A	0.70 A	10 WATTS	+ 5 VDC	2000 mA	80%	82%	3500 μF
IDD10 - 12S5U	18~75 VDC	0.25 A	0.70 A	10 WATTS	+ 12 VDC	830 mA	82%	84%	1000 μF
IDD10 - 15S5U	18~75 VDC	0.25 A	0.70 A	10 WATTS	+ 15 VDC	670 mA	82%	84%	1000 μF
Dual Output Models									
IDD10 - 05D1U	9~18 VDC	1.00 A	1.36 A	10 WATTS	± 5 VDC	±1000 mA	83%	85%	± 3500 μF
IDD10 - 12D1U	9~18 VDC	0.96 A	1.33 A	10 WATTS	± 12 VDC	± 420 mA	86%	88%	± 1000 μF
IDD10 - 15D1U	9~18 VDC	0.95 A	1.33 A	10 WATTS	± 15 VDC	± 340 mA	87%	89%	± 1000 μF
IDD10 - 05D2U	18~36 VDC	0.49 A	0.66 A	10 WATTS	± 5 VDC	±1000 mA	84%	86%	± 3500 μF

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									
IDD10 - 12D2U	18~36 VDC	0.47 A	0.66 A	10 WATTS	± 12 VDC	± 420 mA	87%	89%	± 1000μF
IDD10 - 15D2U	18~36 VDC	0.47 A	0.66 A	10 WATTS	± 15 VDC	± 340 mA	87%	89%	± 1000μF
IDD10 - 05D3U	35~75 VDC	0.24 A	0.34 A	10 WATTS	± 5 VDC	±1000 mA	84%	86%	± 3500μF
IDD10 - 12D3U	35~75 VDC	0.23 A	0.34 A	10 WATTS	± 12 VDC	± 420 mA	87%	89%	± 1000μF
IDD10 - 15D3U	35~75 VDC	0.23 A	0.34 A	10 WATTS	± 15 VDC	± 340 mA	87%	89%	± 1000μF
IDD10 - 05D4U	9~36 VDC	0.51 A	1.40 A	10 WATTS	± 5 VDC	±1000 mA	80%	82%	± 3500μF
IDD10 - 12D4U	9~36 VDC	0.52 A	1.40 A	10 WATTS	± 12 VDC	± 420 mA	80%	82%	± 1000μF
IDD10 - 15D4U	9~36 VDC	0.50 A	1.40 A	10 WATTS	± 15 VDC	± 340 mA	82%	84%	± 1000μF
IDD10 - 05D5U	18~75 VDC	0.26 A	0.70 A	10 WATTS	± 5 VDC	±1000 mA	80%	82%	± 3500μF
IDD10 - 12D5U	18~75 VDC	0.25 A	0.70 A	10 WATTS	± 12 VDC	± 420 mA	81%	83%	± 1000μF
IDD10 - 15D5U	18~75 VDC	0.25 A	0.70 A	10 WATTS	± 15 VDC	± 340 mA	82%	84%	± 1000μF

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	Operating at Vi nom, Io nom	-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		1,284,000		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			%
		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.

SPECIFICATION

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

CONTROL AND PROTECTION

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

APPROVALS AND STANDARD

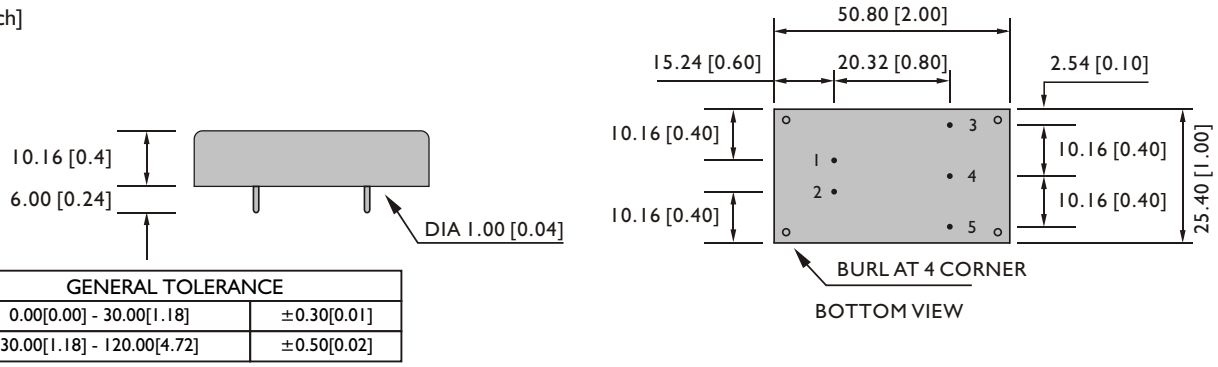
UL/cUL	UL 60950-1 Recognized
TUV	EN 60950-1
CE	EN 61204-3, EN 55022 Class A, EN 61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-6
	meet IEC 60068-2-6 (10-500 Hz, 2G, along X, Y, Z each Axis, 60 min for each Axis)

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]

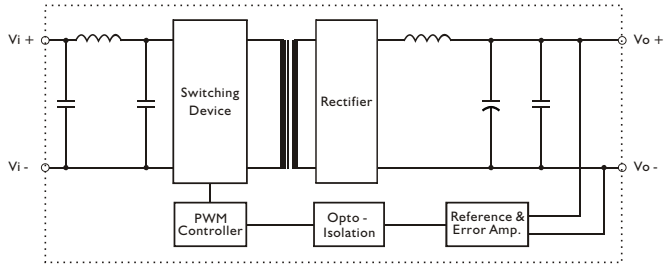
PIN ASSIGNMENT

GENERAL

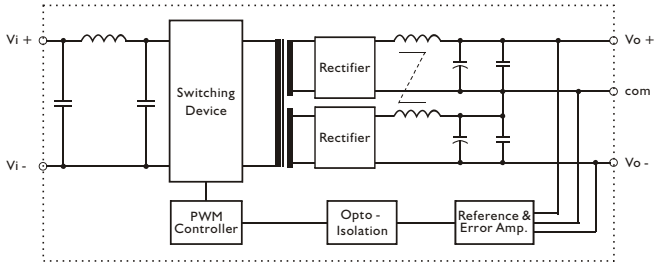
PIN NO.	1	2	3	4	5
SINGLE	Vi+	Vi -	Vo +	NO PIN	Vo -
DUAL	Vi+	Vi -	Vo +	com	Vo -

CIRCUIT SCHEMATIC

• Block diagram for IDD10U series with single output

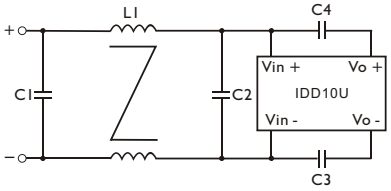


• Block diagram for IDD10U series with dual output

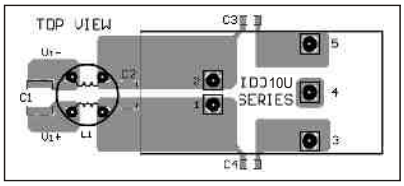


RECOMMENDED CIRCUIT

• Recommended filter for EN55022 Class B compliance



• Recommended EN 55022 Class B filter circuit layout.

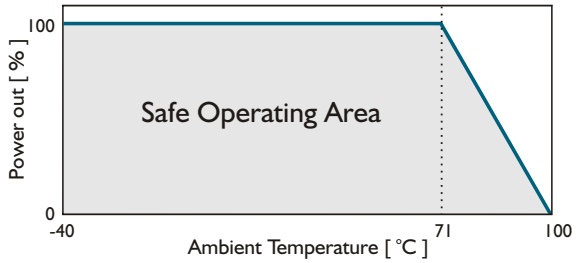


• The components used in the above figure, together with themanufacturer part numbers for these components, are as follows.

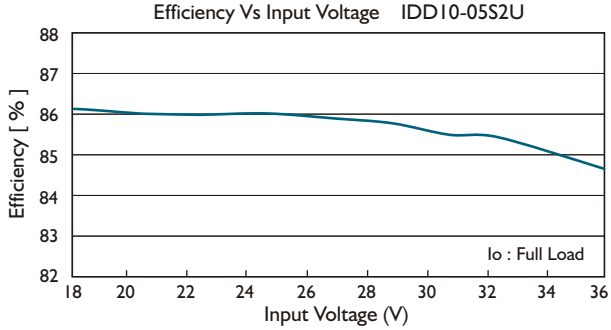
	C1	C2	C3	C4	L1
IDD10-XXX1U	3.3μF/50V MLCC	2.2μF/50V MLCC	1nF/2KV MLCC	1nF/2KV MLCC	500μH Common choke
IDD10-XXX2U	3.3μF/50V MLCC	2.2μF/50V MLCC	1nF/2KV MLCC	1nF/2KV MLCC	500μH Common choke
IDD10-XXX3U	3.3μF/100V MLCC	2.2μF/100V MLCC	1nF/2KV MLCC	1nF/2KV MLCC	500μH Common choke
IDD10-XXX4U	3.3μF/50V MLCC	2.2μF/50V MLCC	1nF/2KV MLCC	1nF/2KV MLCC	500μH Common choke
IDD10-XXX5U	3.3μF/100V MLCC	2.2μF/100V MLCC	1nF/2KV MLCC	1nF/2KV MLCC	1mH Common choke

DERATING AND EFFICIENCY CURVE

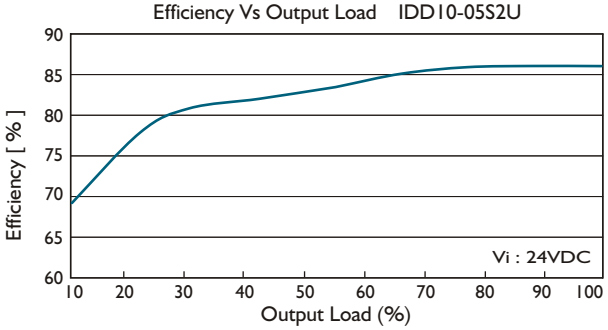
Temperature derating curve



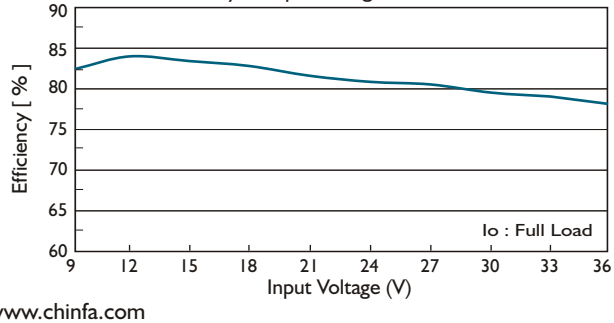
Efficiency Vs Input Voltage IDD10-05S2U



Efficiency Vs Output Load IDD10-05S2U



Efficiency Vs Input Voltage IDD10-05S4U



Efficiency Vs Output Load IDD10-05S4U