WDD30U SERIES

DC - DC CONVERTER

23 ~ 30W SINGLE & DUAL OUTPUT

FEATURES

- EFFICIENCY UP TO 89%
- 2:1 WIDE INPUT RANGE
- I/O ISOLATION
- INPUT Pi FILTER
- SHORT CIRCUIT PROTECTION
- HIGH PERFORMANCE
- 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									
WDD30 - 03S1U	9~18 VDC	2.4 A	3.3 A	23 WATTS	+3.3 VDC	7000 mA	79%	81%	7000 μF
WDD30 - 05S1U	9~18 VDC	2.5 A	3.35 A	25 WATTS	+ 5 VDC	5000 mA	83%	85%	7000 μF
WDD30 - 12S1U	9~18 VDC	3.0 A	4.1 A	30 WATTS	+ 12 VDC	2500 mA	82%	84%	1000 μF
WDD30 - 15S1U	9~18 VDC	2.97 A	4.1 A	30 WATTS	+ 15 VDC	2000 mA	83%	85%	470 μF
WDD30 - 03S2U	18~36 VDC	1.19 A	1.62 A	23 WATTS	+3.3 VDC	7000 mA	80%	82%	7000 μF
WDD30 - 05S2U	18~36 VDC	1.22 A	1.66 A	25 WATTS	+ 5 VDC	5000 mA	84%	86%	7000 μF
WDD30 - 12S2U	18~36 VDC	1.42 A	1.95 A	30 WATTS	+ 12 VDC	2500 mA	86%	88%	1000 μF
WDD30 - 15S2U	18~36 VDC	1.42 A	1.95 A	30 WATTS	+ 15 VDC	2000 mA	87%	89%	470 μF
WDD30 - 03S3U	35~75 VDC	0.59 A	0.82 A	23 WATTS	+3.3 VDC	7000 mA	81%	83%	7000 μF
WDD30 - 05S3U	35~75 VDC	0.6 A	0.82 A	25 WATTS	+ 5 VDC	5000 mA	82%	84%	7000 μF
WDD30 - 12S3U	35~75 VDC	0.71 A	1.0 A	30 WATTS	+ 12 VDC	2500 mA	86%	88%	1000 μF
WDD30 - 15S3U	35~75 VDC	0.7 A	1.0 A	30 WATTS	+ 15 VDC	2000 mA	87%	89%	470 μF
Dual Output Models									
WDD30 - 05D1U	9~18 VDC	2.51 A	3.4 A	25 WATTS	± 5 VDC	± 2500 mA	82%	84%	±3500 μF
WDD30 - 12D1U	9~18 VDC	2.95 A	4.1 A	30 WATTS	± 12 VDC	± 1250 mA	83%	85%	± 470 μF
WDD30 - 15D1U	9~18 VDC	2.94 A	4.0 A	30 WATTS	± 15 VDC	± 1000 mA	84%	86%	± 470 μF
WDD30 - 05D2U	18~36 VDC	1.24 A	1.7 A	25 WATTS	± 5 VDC	± 2500 mA	83%	85%	±3500 μF
WDD30 - 12D2U	18~36 VDC	1.41 A	1.95 A	30 WATTS	± 12 VDC	± 1250 mA	86%	88%	± 470 μF
WDD30 - 15D2U	18~36 VDC	1.42 A	1.95 A	30 WATTS	± 15 VDC	± 1000 mA	87%	89%	± 470 μF
WDD30 - 05D3U	35~75 VDC	0.62 A	0.88 A	25 WATTS	± 5 VDC	± 2500 mA	83%	85%	±3500 μF
WDD30 - 12D3U	35~75 VDC	0.7 A	1.0 A	30 WATTS	± 12 VDC	± 1250 mA	86%	88%	± 470 μF
WDD30 - 15D3U	35~75 VDC	0.71 A	1.0 A	30 WATTS	± 15 VDC	± 1000 mA	87%	89%	± 470 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			250		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 output models	-40		+ 61	°C
		12V, 15V & dual output models	-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 W40.64 x H10.16		mm
MTBF	Bellcore issue 6@40°C, GB			7,480,000		Hours
Cooling	Free air convection					

INPUT SPECIFICATIONS

Characteristics	Conditions		min.	typ.	max.	unit
Input voltage range	Ta min ...Ta max, Io nom		9	12	18	VDC
			18	24	36	VDC
			35	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					

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)	Aymmetrical 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 models			100	mV
		12V, 15V & dual			150	mV
Voltage trim range 1)	Vi nom	3.3V model		± 5		%
		5V, 12V, 15V & dual		±10		%
Efficiency	Vi nom, Io nom, Po / Pi			Up to 89%, See model list and efficiency curve		

NOTE 1 : Pls refer to Fig 1 & Table 1 for connection and resistance recommended.

SPECIFICATION

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

CONTROL AND PROTECTION

Remote ON / OFF	ON : opened or 8 ~ 10VDC applied, reference to input GND OFF : -0.3 ~ 2VDC applied, reference to input GND
Input reversed	Shunt diode built in, external fuse recommended (12Vin : 5A, 24Vin : 2A, 48Vin : 1.25A)
Output short circuit	Current limited (Auto-recovery)
Rated over load protection	110%min....140%max

APPROVALS AND STANDARD

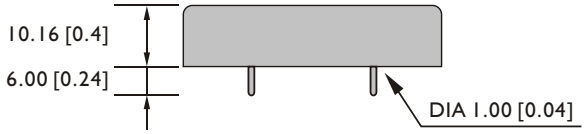
UL/cUL	UL 60950-1 Recognized
TUV	EN 60950-1
CE	EN 61204-3, EN 55032, Class A, EN 61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-6
Vibration	meet IEC 60068-2-6 (10-500 Hz, 2G, along X, Y, Z each Axis, 60 min for each Axis)

PHYSICAL CHARACTERISTICS

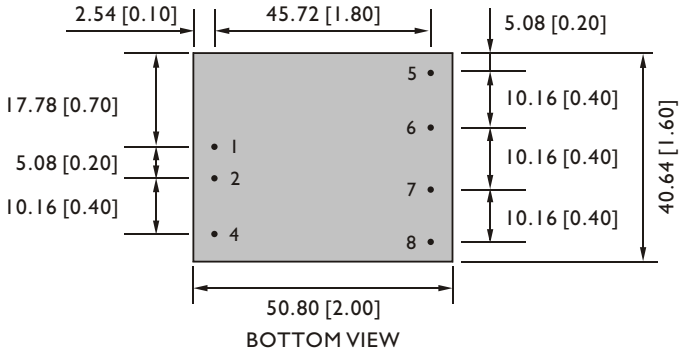
Case size	50.8 x 40.64 x 10.16 mm (2 x 1.6 x 0.4 inches)
Case material	Plastic base / Metal case
Weight	60 g
Potting material	Silicone

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]



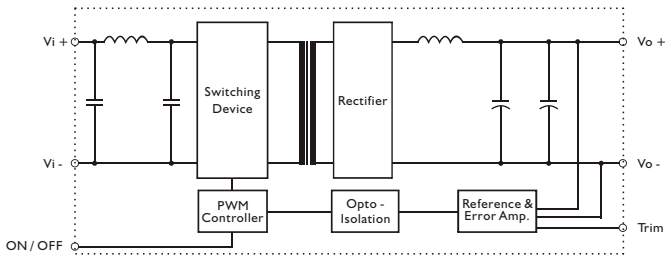
PIN ASSIGNMENT

GENERAL

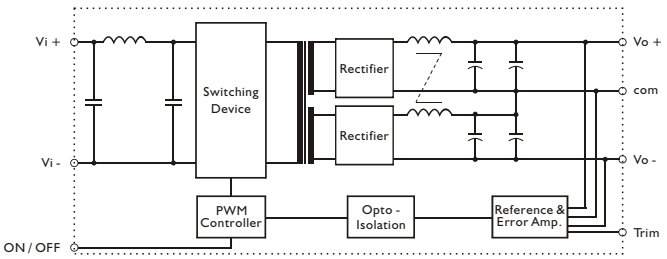
PIN NO.	1	2	4	5	6	7	8
SINGLE	Vi+	Vi -	ON / OFF	NO PIN	Vo +	Vo -	Trim
DUAL	Vi+	Vi -	ON / OFF	Vo +	com	Vo -	Trim

CIRCUIT SCHEMATIC

• Block diagram for WDD30U series with single output

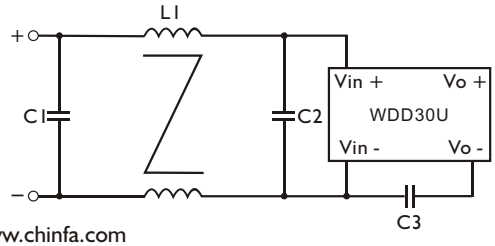


• Block diagram for WDD30U series with dual output

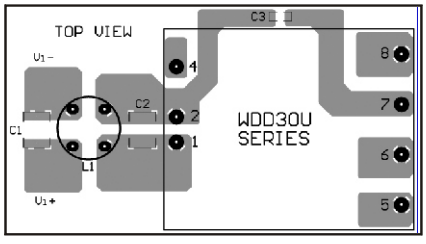


RECOMMENDED CIRCUIT

• Recommended filter for EN 55032 Class B compliance



• Recommended EN 55032 Class B filter circuit layout.

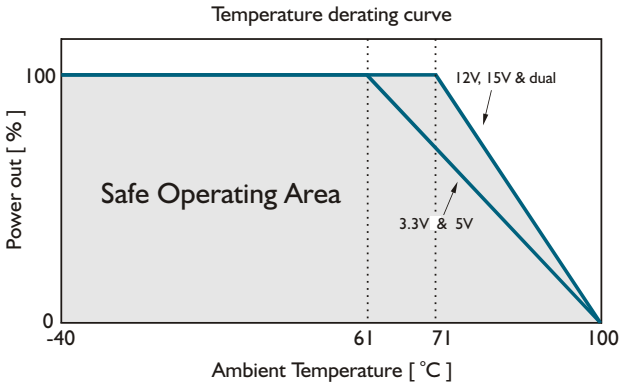


RECOMMENDED CIRCUIT

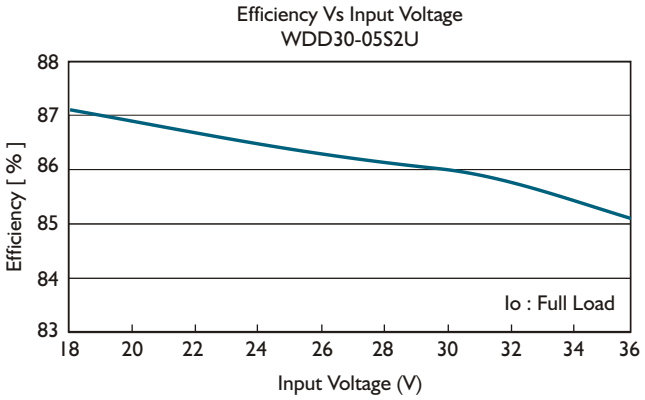
- The components used in the above figure, together with the manufacturer part numbers for these components, are as follows.

	C1	C2	C3	L1
WDD30-XXX1U	3.3μF / 50V MLCC	3.3μF / 50V MLCC	InF / 2KV MLCC	1.5mH Common Choke
WDD30-XXX2U	1.5μF / 50V MLCC	1.5μF / 50V MLCC	InF / 2KV MLCC	3.5mH Common Choke
WDD30-XXX3U	3.3μF / 100V MLCC	3.3μF / 100V MLCC	InF / 2KV MLCC	0.5mH Common Choke

DERATING CURVE



EFFICIENCY CURVE



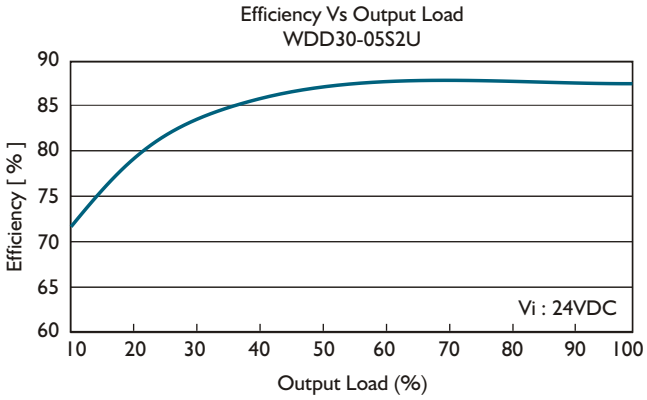


Fig. 1 Trim connection

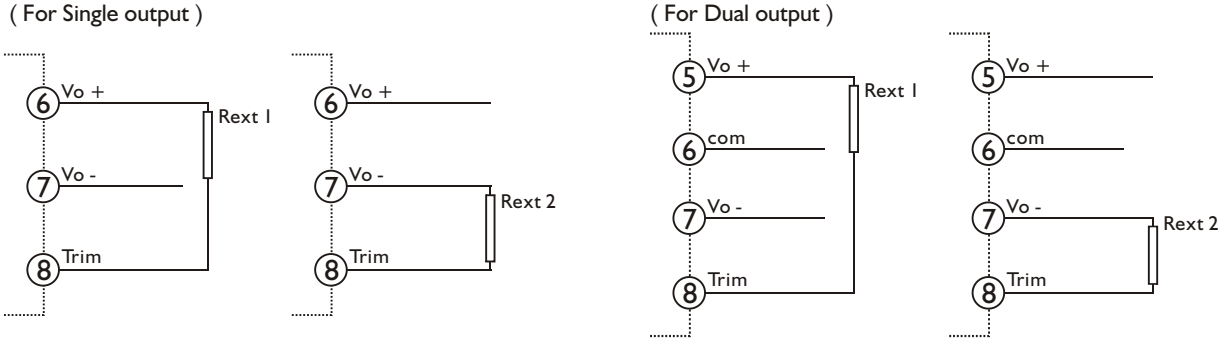


Table 1 Typical resistor values for various output voltage adjustment settings

Type	Rext 1		Rext 2	
	Vo nom -2.5%	Vo nom -5%	Vo nom +2.5%	Vo nom +5%
WDD30-03SXU	20KΩ	0Ω	30KΩ	5.6KΩ
Type	Vo nom -5%	Vo nom -10%	Vo nom +5%	Vo nom +10%
WDD30-05SXU	5.6KΩ	0Ω	1.5KΩ	1KΩ
WDD30-12SXU	43KΩ	20KΩ	10KΩ	1KΩ
WDD30-15SXU	120KΩ	56KΩ	24KΩ	4.7KΩ
WDD30-05DXU	330KΩ	150KΩ	10KΩ	3KΩ
WDD30-12DXU	130KΩ	56KΩ	10KΩ	2KΩ
WDD30-15DXU	130KΩ	68KΩ	15KΩ	2KΩ