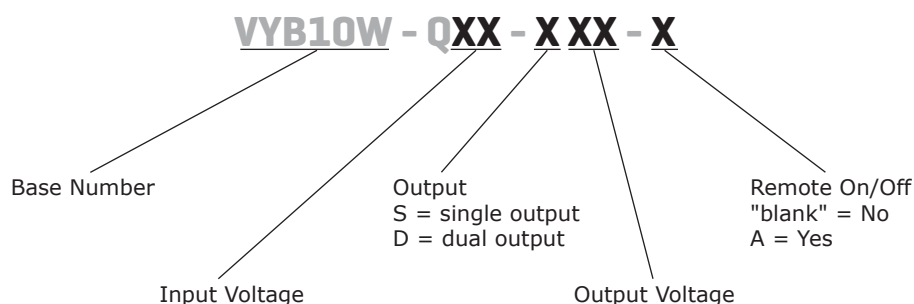# CUI INC®

SERIES: VYB10W │ **DESCRIPTION:** DC-DC CONVERTER

FEATURES

• 8 ~ 10 W output
• industry standard pinout
• 4:1 input range (9 ~ 36 V, 18 ~ 72 V)
• single and dual outputs
• 1,500 V isolation
• short circuit protection
• wide temperature operation (-40 ~ 85°C)
• efficiency up to 83%

RoHS

MODEL

MODEL	input voltage range (Vdc)	output voltage (Vdc)	output current min (mA)	output current max (mA)	output power max (W)	ripple[1] max (mVp-p)	noise[1] max (mVp-p)	efficiency typ (%)
VYB10W-Q24-S3[2]	9 ~ 36	3.3	240	2,400	8	50	150	76
VYB10W-Q24-S5	9 ~ 36	5	200	2,000	10	50	150	79
VYB10W-Q24-S12	9 ~ 36	12	83	833	10	50	150	81
VYB10W-Q24-S15	9 ~ 36	15	67	666	10	50	150	82
VYB10W-Q24-D5	9 ~ 36	±5	±100	±1,000	10	50	150	80
VYB10W-Q24-D12	9 ~ 36	±12	±42	±416	10	50	150	82
VYB10W-Q24-D15	9 ~ 36	±15	±33	±333	10	50	150	83
VYB10W-Q48-S3[2]	18 ~ 72	3.3	240	2,400	8	50	150	77
VYB10W-Q48-S5[2]	18 ~ 72	5	200	2,000	10	50	150	78
VYB10W-Q48-S12	18 ~ 72	12	83	833	10	50	150	82
VYB10W-Q48-S15	18 ~ 72	15	67	666	10	50	150	83
VYB10W-Q48-D5[2]	18 ~ 72	±5	±100	±1,000	10	50	150	78
VYB10W-Q48-D12	18 ~ 72	±12	±42	±416	10	50	150	82
VYB10W-Q48-D15	18 ~ 72	±15	±33	±333	10	50	150	83

Notes: 1. Ripple and noise are measured at 20 MHz BW with 10µF tantalum capacitor and 1µF ceramic capacitor across output
2. PWM mode, others PFM mode

PART NUMBER KEY

VYB10W - Q XX - X XX - X

Base Number

Input Voltage

Output
S = single output
D = dual output

Output Voltage

Remote On/Off
"blank" = No
A = Yes

INPUT

parameter	conditions/description	min	typ	max	units
operating input voltage		9 18	24 48	36 72	Vdc Vdc
start up time	nominal imput, full load		180		ms
filter	PI type				

OUTPUT

parameter	conditions/description	min	typ	max	units
line regulation	measured from low line to high line		±0.2	±0.5	%
load regulation	measured from 10% to full load		±0.5	±1[1]	%
voltage accuracy	positive, refer to recommended circuit negative, refer to recommended circuit		±1 ±3	±3 ±5	% %
transient recovery time	25% load step change (PWM type) 25% load step change (PFM type)		200 10	500 20	ms ms
transient peak deviation			±3	±5	%
cross regulation	main output 55% supplemental output from 10-100%			±5	%
switching frequency	100% load, input voltage range		300		kHz
temperature coefficient				±0.03	%/°C

Notes: 1. Dual output models unbalanced load: ±5%

PROTECTIONS

parameter	conditions/description	min	typ	max	units
short circuit protection	continuous, automatic recovery				

SAFETY AND COMPLIANCE

parameter	conditions/description	min	typ	max	units
isolation voltage	tested for 1 minute at 1 mA max.	1,500			Vdc
isolation resistance	at 500 Vdc	1,000			MΩ
isolation capacitance	input to output, 100 kHz / 1 V		1,000		pF
RoHS compliant	yes				
MTBF		1,000,000			hours

ENVIRONMENTAL

parameter	conditions/description	min	typ	max	units
case operating temperature		-40		85	°C
maximum case temperature	during operation			105	°C
storage temperature		-55		105	°C
storage humidity	non-condensing			95	%
temperature rise	100% load		40		°C
lead temperature	1.5 mm from the case for 10 seconds			300	°C

DERATING CURVES
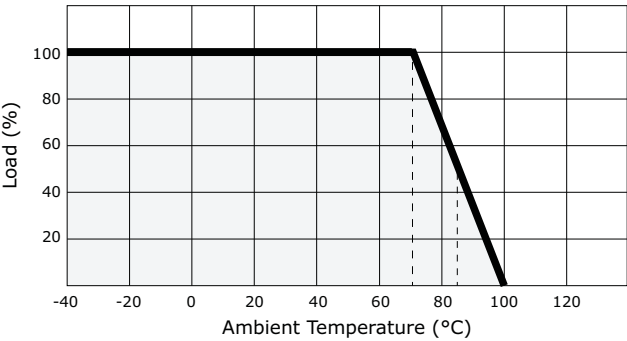
MECHANICAL

parameter	conditions/description	min	typ	max	units
dimensions	2.00 x 1.00 x 0.44 inch (50.8 x 25.4 x 11.2 mm)				
case material	aluminum				
weight			23.5		g

MECHANICAL DRAWING

11.20[0.441]

4.10[0.161]
(6 PLCS)

⌀1.00[0.039]
(6 PLCS)

50.80[2.000]

20.32[0.800]

10.16[0.400]

5.08[0.200]

25.40[1.000]

7.62[0.300]

10.16[0.400]

BOTTOM VIEW
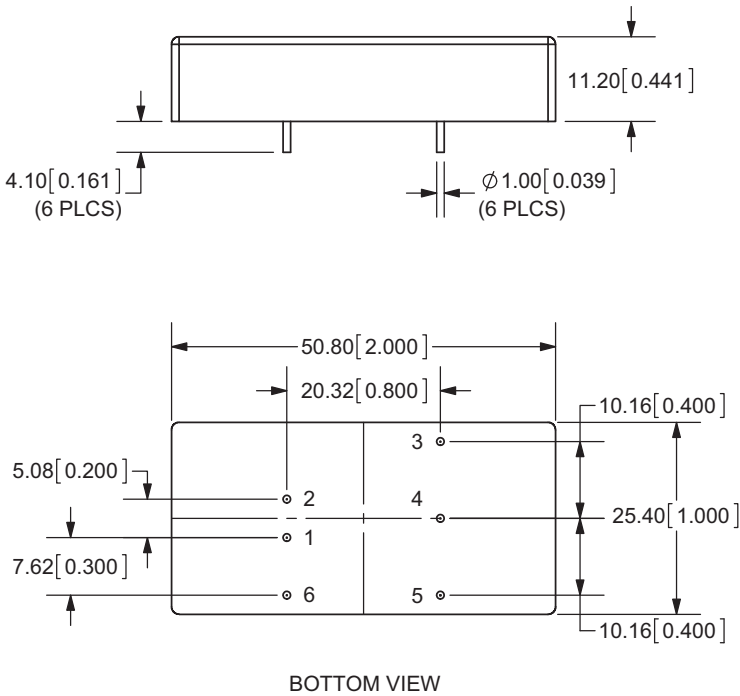
RECOMMENDED FOOTPRINT (TOP VIEW)

⌀1.20 [0.047]

7.62 [0.300]

5.08 [0.200]

2.54 [0.100]

20.32 [0.800]

2.54 [0.100]

20.32 [0.800]
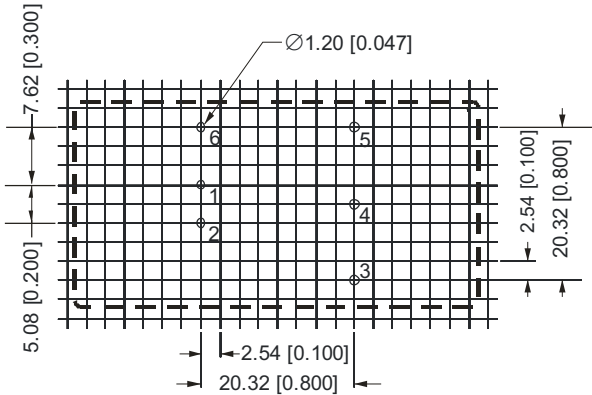
Pin section tolerances:±0.10mm[±0.004inch]
General tolerances:±0.25mm[±0.010inch]

PIN CONNECTIONS		
Pin	Single	Dual
1	GND	GND
2	Vin	Vin
3	+Vo	+Vo
4	No Pin	0V
5	0V	-Vo
6*	No Pin*	No Pin*

*Pin 6 added for optional Remote on/off

APPLICATION NOTES

1. **Requirement on Output Load**
   In order to ensure the product operates efficiently and reliably, make sure the specified range of input voltage is not exceeded and the minimum output load is not less than 10% load. If the actual load is less than the specified minimum load, the output ripple may increase sharply while its efficiency and reliability will reduce greatly. If the actual output power is very small, please add an appropriate resistor as extra loading.

2. **Recommended Circuit**
   The VYB10W series has been tested according to the following recommended testing circuit. This series should be tested under load. (see Figure 1)

   Figure 1
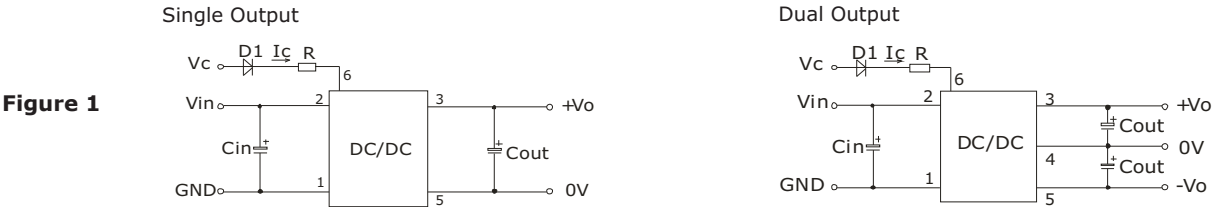
   If you want to further decrease the input/output ripple, you can increase capacitance properly or choose capacitors with low ESR. If the capacitance is too big, a startup problem might arise. The maximum allowable capacitance to ensure safe and reliable operation is listed in Table 1.

   General:

           Cin: 10 ~ 47 µF

           Cout: 10 µF / 100 mA

   Table 1

Single Vout (Vdc)	Cout (µF)	Dual Vout (Vdc)	Cout (µF)
3.3	2,200	--	--
5	1,000	±5	680
12	470	±12	330
15	330	±15	220

3. **Remote On/Off**
   When open or high impedance,the converter will be on; When this pin is 'high'; the converter will shutdown; It should be noted that the input current (Ic) should between 5 ~ 10 mA, exceeding the maximum 20 mA will cause permanent damage to the converter. The value of R Can be derived as follows :

   $$R = \frac{V_C - V_D - 1.0}{I_C}$$

4. **Input Current**
   When using an unstable power source, please ensure the output voltage and ripple voltage do not excced indexes of the converter. The preceding power source must be able to provide for converter sufficient starting current Ip.

   General: Ip ≤1.6*Iin-max

5. **No parallel connection or plug and play**

REVISION HISTORY

rev.	description	date
1.0	initial release	08/08/2011
1.01	V-Infinity branding removed	08/29/2012

The revision history provided is for informational purposes only and is believed to be accurate.

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