CUI INC®

SERIES: VAWQ12 | DESCRIPTION: DC-DC CONVERTER

FEATURES

- up to 12 W isolated output
- wide input (4:1)
- industry standard 24 pin DIP package
- single regulated outputs
- 1,500 V isolation
- short circuit and over voltage protection
- wide temperature (-40~85°C)
- efficiency up to 88%

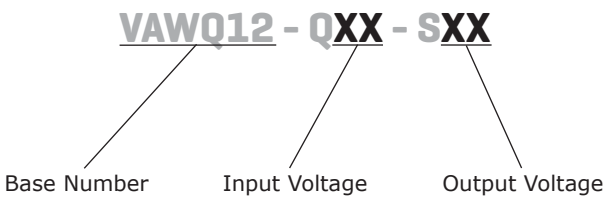
RoHS

MODEL

MODEL	input voltage typ (Vdc)	input voltage range (Vdc)	output voltage (Vdc)	output current max (mA)	output power max (W)	ripple and noise[1] max (mVp-p)	efficiency typ (%)
VAWQ12-Q24-S3R3	24	9.0~36.0	3.3	3,500	11.55	85	85
VAWQ12-Q24-S5	24	9.0~36.0	5	2,400	12	85	86
VAWQ12-Q24-S12	24	9.0~36.0	12	1,000	12	85	86
VAWQ12-Q24-S15	24	9.0~36.0	15	800	12	85	86
VAWQ12-Q48-S3R3	48	18.0~75.0	3.3	3,500	11.55	85	85
VAWQ12-Q48-S5	48	18.0~75.0	5	2,400	12	85	87
VAWQ12-Q48-S12	48	18.0~75.0	12	1,000	12	85	87
VAWQ12-Q48-S15	48	18.0~75.0	15	800	12	85	88

Notes: 1. ripple and noise are measured at 20 MHz BW

PART NUMBER KEY



INPUT

parameter	conditions/description	min	typ	max	units
operating input voltage		9.0 18.0	24 48	36.0 75.0	Vdc Vdc
CTRL[1]	module on	3		40	Vdc
			or open circuit		
	module off	0		1.2	Vdc

Note: 1. Control pin voltage referenced to GND

OUTPUT

parameter	conditions/description	min	typ	max	units
output power		1.2		12	W
line regulation	input voltage from low to high		±0.2	±0.5	%
load regulation	measured from 10% load to full load		±0.5	±1.5	%
voltage accuracy			±1	±3	%
switching frequency	measured from 10% load to full load	350	400	450	kHz
temperature coefficient			±0.02		%/°C

PROTECTIONS

parameter	conditions/description		min	typ	max	units
over voltage protection	3.3 V model 5 V model 12 V model 15 V model			4.3 6 13 16		Vdc Vdc Vdc Vdc
under voltage protection	24 V input	module on		8.8	9	Vdc
		module off		8.3	8.5	Vdc
	48 V input	module on		17	17.5	Vdc
		module off		16.5	17	Vdc
short circuit protection	continuous, automatic recovery					

SAFETY AND COMPLIANCE

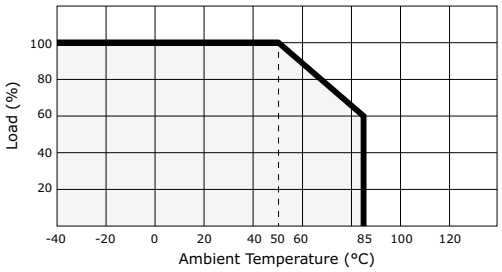
parameter	conditions/description	min	typ	max	units
isolation voltage	for 1 minute at 1 mA max.	1,500			Vdc
isolation resistance	at 500 Vdc	1,000			MΩ
MTBF	MIL-HDBK-217F, at 25°C	1,000,000			hours
RoHS compliant	yes				

ENVIRONMENTAL

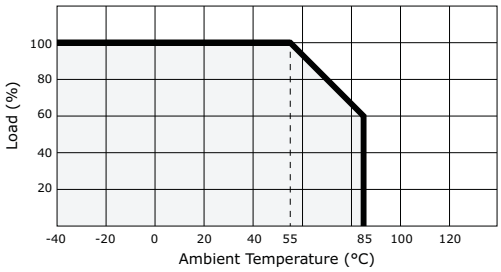
parameter	conditions/description	min	typ	max	units
operating temperature	see derating curves	-40		85	°C
storage temperature		-55		125	°C
case temperature			95	105	°C
storage humidity	non-condensing			95	%
lead temperature	1.5 mm from case for 10 seconds			300	°C

DERATING CURVES

1. output power vs. ambient temperature (3.3 V)



2. output power vs. ambient temperature (≥5 V)

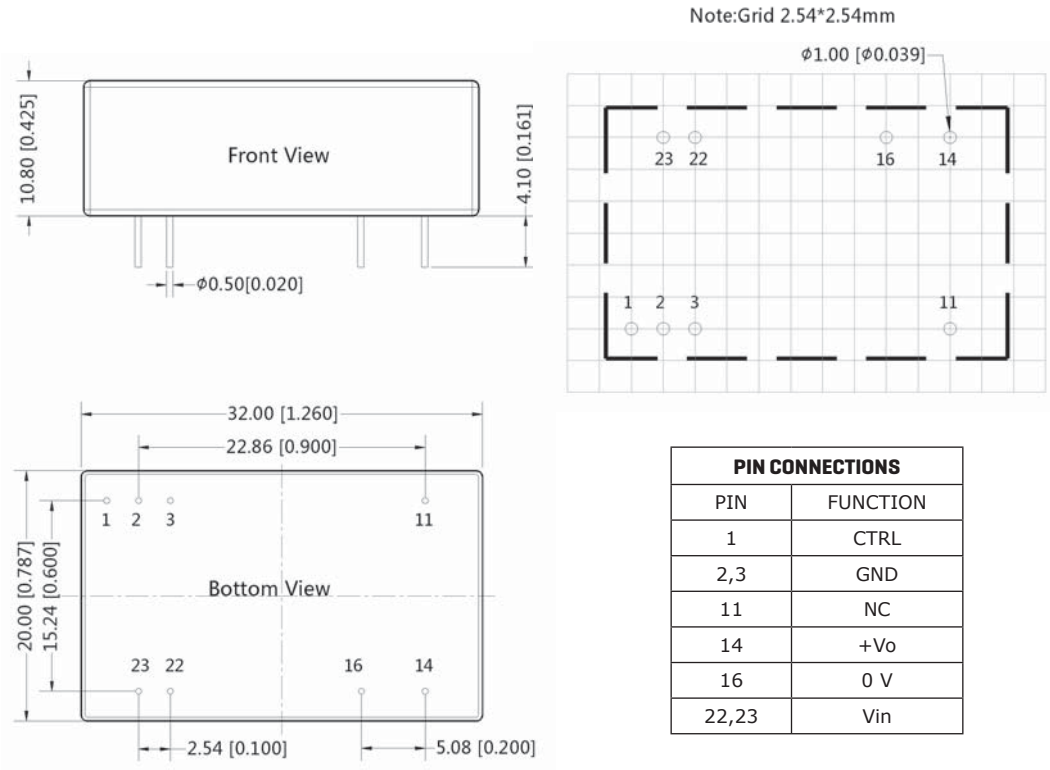


MECHANICAL

parameter	conditions/description	min	typ	max	units
dimensions	32.00 x 20.00 x 10.80 (1.260 x 0.787 x 0.425 inch)				mm
case material	aluminum alloy				
weight			14		g

MECHANICAL DRAWING

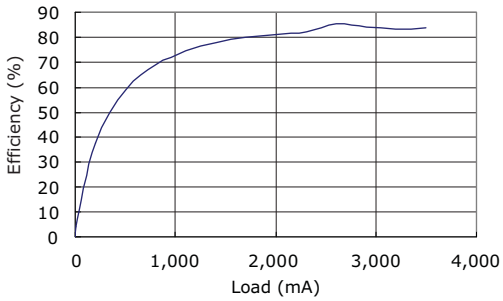
units: mm [inches]
tolerance: ±0.25 [±0.010]
pin section tolerance: ±0.10 mm [±0.004]



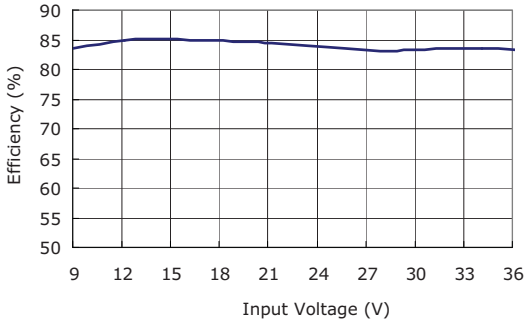
PIN CONNECTIONS	
PIN	FUNCTION
1	CTRL
2,3	GND
11	NC
14	+Vo
16	0 V
22,23	Vin

EFFICIENCY CURVES

1. efficiency vs. load
VAWQ12-Q24-S3R3



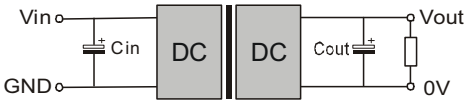
2. efficiency vs. input voltage
VAWQ12-Q24-S3R3



APPLICATION NOTES

1. **Recommended Circuit**
All of the VAWQ12 models have been tested according to the following recommended testing circuit before leaving factory. If you want to further decrease the input ripple, Cin is recommended to use 100 μF. If ripple and noise are required, you can increase capacitance of Cout properly. However, the capacitance should not be higher than Max capacitance. (see Figure 1).

Figure 1



2. **Recommended Capacitance**

Table 1

Vout (Vdc)	Cin (μF)	Cout (μF)
3.3/5	100	220
12/15	100	100

Note: 1. All specifications measured at Ta: 25°C, humidity <75%, nominal input voltage and rated output load unless otherwise specified
2. When product begins to work, the temperature may rise slowly until the unit is stabilized. It is normal that the output voltage, derating, and efficiency may reduce during this time.
3. Min. load shouldn't be less than 10%, otherwise ripple maybe increased dramatically. If the product operates under min. load may not meet all specifications listed. Operation under minimum load will not damage the converter.

REVISION HISTORY

rev.	description	date
1.0	initial release	09/10/2009
1.01	new template applied	04/17/2012
1.02	V-Infinity branding removed	09/11/2012
1.03	case material changed to aluminum alloy, dimensions changed, spec updated	07/19/2013
1.04	added minimum load note	09/19/2013

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

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