

**SERIES:** VAWQ12 | **DESCRIPTION:** DC-DC CONVERTER

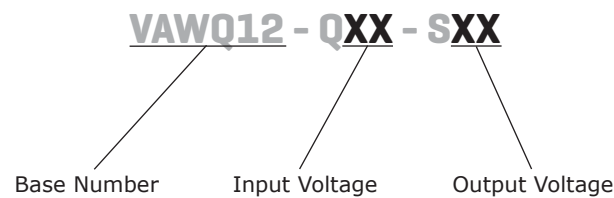
**FEATURES**

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



MODEL	input voltage		output voltage (Vdc)	output current		output power max (W)	ripple and noise <sup>1</sup> max (mVp-p)	efficiency typ (%)
	typ (Vdc)	range (Vdc)		min (mA)	max (mA)			
VAWQ12-Q24-S3R3	24	9.0~36.0	3.3	0	3,500	2	85	85
VAWQ12-Q24-S5	24	9.0~36.0	5	0	2,400	2	85	86
VAWQ12-Q24-S12	24	9.0~36.0	12	0	1,000	2	85	86
VAWQ12-Q24-S15	24	9.0~36.0	15	0	800	2	85	86
VAWQ12-Q48-S3R3	48	18.0~75.0	3.3	0	3,500	2	85	85
VAWQ12-Q48-S5	48	18.0~75.0	5	0	2,400	2	85	87
VAWQ12-Q48-S12	48	18.0~75.0	12	0	1,000	2	85	87
VAWQ12-Q48-S15	48	18.0~75.0	15	0	800	2	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	24	36.0	Vdc
		18.0	48	75.0	Vdc
CTRL	module on	3		40	Vdc
	module off	0	or open circuit	1.2	Vdc

**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	see derating curves		±1	±3	%
transient recovery time	25% load step change			25	ms
transient response deviation	25% load step change		±3	±5	%
switching frequency	measured from 10% load to full load	300	400	450	kHz
temperature coefficient			±0.02		%/°C

**PROTECTIONS**

parameter	conditions/description	min	typ	max	units
over voltage protection	3.3 V model		4.3		Vdc
	5 V model		6		Vdc
	12 V model		13		Vdc
	15 V model		16		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**

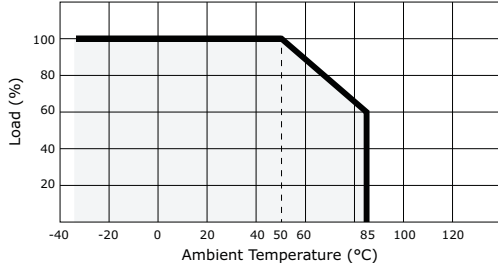
parameter	conditions/description	min	typ	max	units
isolation voltage	for 1 minute at 1 mA max.	1,500			Vdc
isolation resistance	at 500 Vdc	1,000			MΩ
MTBF		1,000,000			hours
RoHS compliant	yes				

**ENVIRONMENTAL**

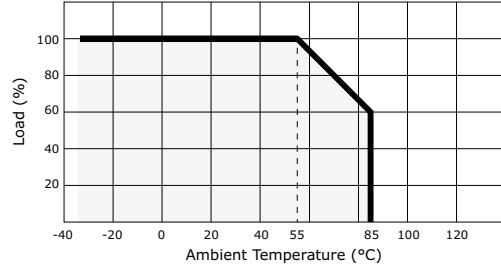
parameter	conditions/description	min	typ	max	units
operating temperature		-40		85	°C
storage temperature		-55		125	°C
case temperature			95	105	°C
storage humidity	non-condensing			95	%
temperature rise	at full load		15		°C
lead temperature	1.5 mm from case for 10 seconds			300	°C

## DERATING CURVES

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



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

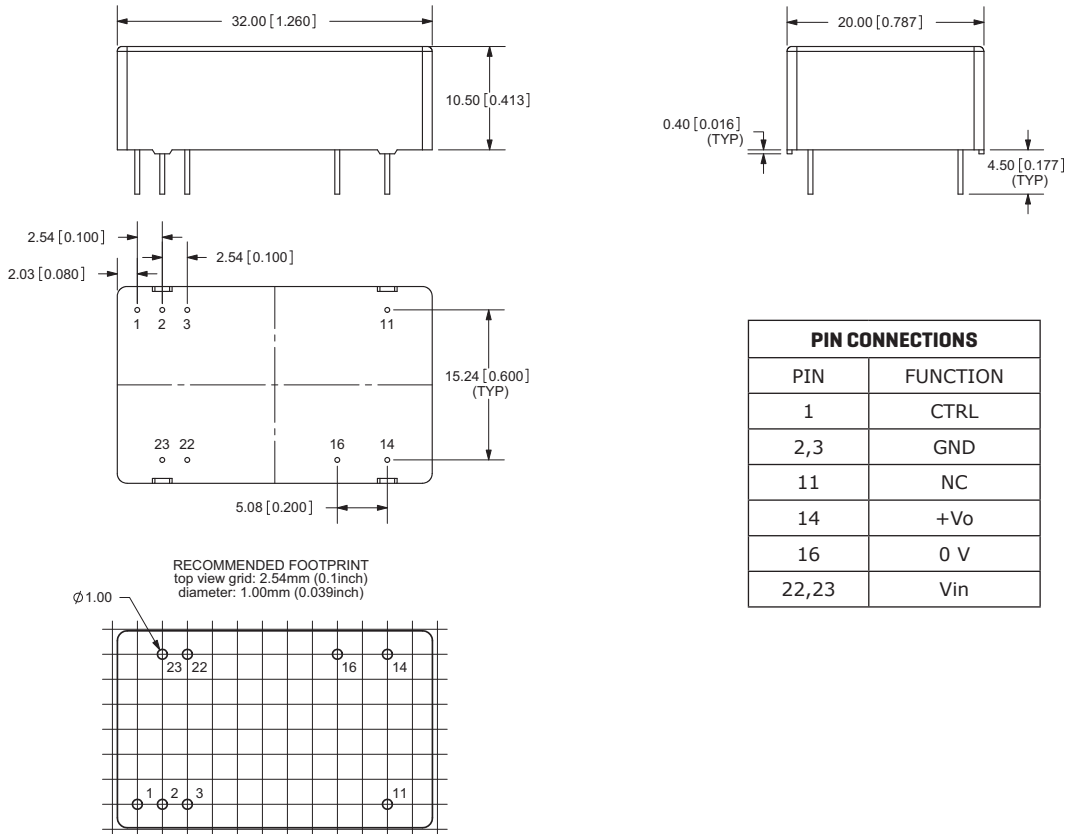


## MECHANICAL

parameter	conditions/description	min	typ	max	units
dimensions	1.260 x 0.787 x 0.394 (32.00 x 20.00 x 10.00 mm)				inch
case material	copper plating nickel (five-sided shielding)				
weight			18.5		g

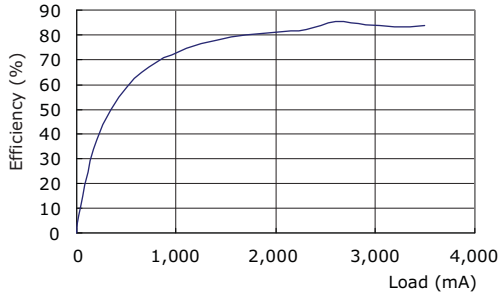
## MECHANICAL DRAWING

units: mm [inches]  
 tolerance: ±0.25 [±0.010]  
 pin section tolerance: ±0.05 mm [±0.002]

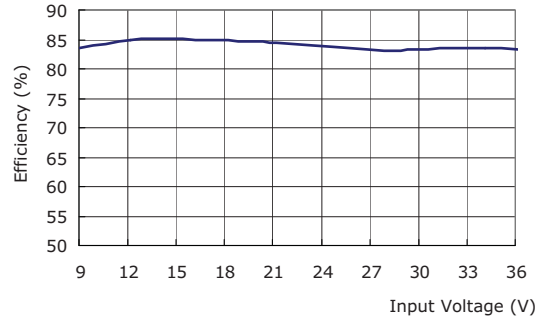


## EFFICIENCY CURVES

1. efficiency vs. load



2. efficiency vs. input voltage



## 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

Cin	Cout (μF)	Vout (Vdc)	Cout (μF)
24	100	3.3/5	220
48	100	12/15	100

## REVISION HISTORY

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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

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



**CUI INC**<sup>®</sup>

**Headquarters**  
20050 SW 112th Ave.  
Tualatin, OR 97062  
**800.275.4899**

Fax 503.612.2383  
**cui.com**  
techsupport@cui.com

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