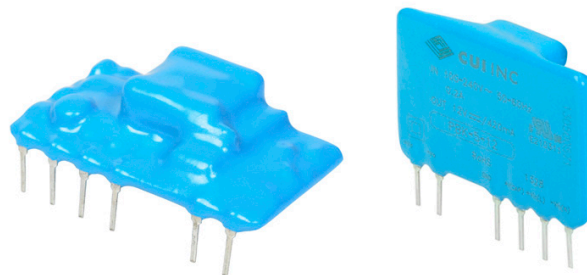


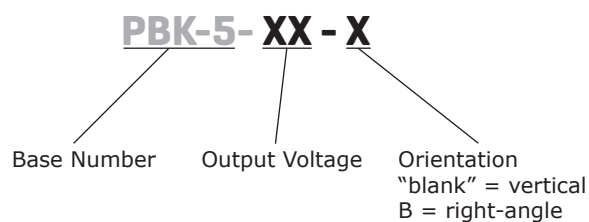
**SERIES: PBK-5 | DESCRIPTION: AC-DC POWER SUPPLY**
**FEATURES**

- up to 5 W continuous output
- ultra compact SIP package
- universal input voltage: (85~264 Vac / 100~400 Vdc)
- single regulated outputs from 3.3~24 Vdc
- 3,000 Vac isolation
- over current, short circuit, and over voltage protections
- UL 60950-1 safety approval
- efficiency up to 75%



MODEL	output voltage	output current max	output power max	ripple and noise <sup>1</sup> max	efficiency
	(Vdc)	(A)	(W)	(mVp-p)	typ (%)
PBK-5-3	3.3	1	3.3	150	65
PBK-5-5	5	1	5	120	70
PBK-5-9	9	0.56	5	120	72
PBK-5-12	12	0.42	5	120	74
PBK-5-15	15	0.34	5	120	75
PBK-5-24	24	0.21	5	150	75

Note: 1. Measured at 20 MHz bandwidth, see Test Configuration section.

**PART NUMBER KEY**


## INPUT

parameter	conditions/description	min	typ	max	units
voltage		85 100		264 400	Vac Vdc
frequency		47		440	Hz
current	at 115 Vac at 230 Vac			200 100	mA mA
inrush current	at 115 Vac at 230 Vac		20 30		A A
leakage current	CY0 is 1nF/400Vac			0.25	mA
no load power consumption				0.5	W
input fuse	1 A/250 V, slow-blow type (external, recommended)				

## OUTPUT

parameter	conditions/description	min	typ	max	units
output current		10			%
capacitive load	3.3 Vdc output models			2200	μF
	5 Vdc output models			1500	μF
	9 Vdc output models			680	μF
	12 Vdc output models			470	μF
	15 Vdc output models			330	μF
	24 Vdc output models			100	μF
line regulation	at full load		±0.1	±0.5	%
load regulation	at 10%~100% load		±1.0	±1.5	%
voltage set accuracy	PBK-5-3		±2	±3	%
	all other models		±1	±2	%
hold-up time	at 115 Vac	20			ms
	at 230 Vac	80			ms
switching frequency			100		kHz
temperature coefficient			±0.02		%/°C

## PROTECTIONS

parameter	conditions/description	min	typ	max	units
short circuit protection	continuous, auto restart				
over current protection	auto restart	110			%
over voltage protection	zener diode clamp				

## SAFETY & COMPLIANCE

parameter	conditions/description	min	typ	max	units
isolation voltage	input to output for 1 minute at 5mA	3,000			Vac
isolation resistance		100			MΩ
safety approvals	UL 60950-1				
safety standards	UL 60950-1				
safety class	class II				
conducted emissions	CISPR22/EN55022 external circuit required, Class A (see figure 2); Class B (see figure 3)				
radiated emissions	CISPR22/EN55022 external circuit required, Class B (see figures 2 or 3)				
ESD	IEC/EN61000-4-2 Class B, contact ±4 kV				
radiated immunity	IEC/EN61000-4-3 Class A, 10V/m				
EFT/burst	IEC/EN61000-4-4 Class B, ±2 kV (external circuit required, see figure 2)				
	IEC/EN61000-4-4 Class B, ±4 kV (external circuit required, see figure 3)				

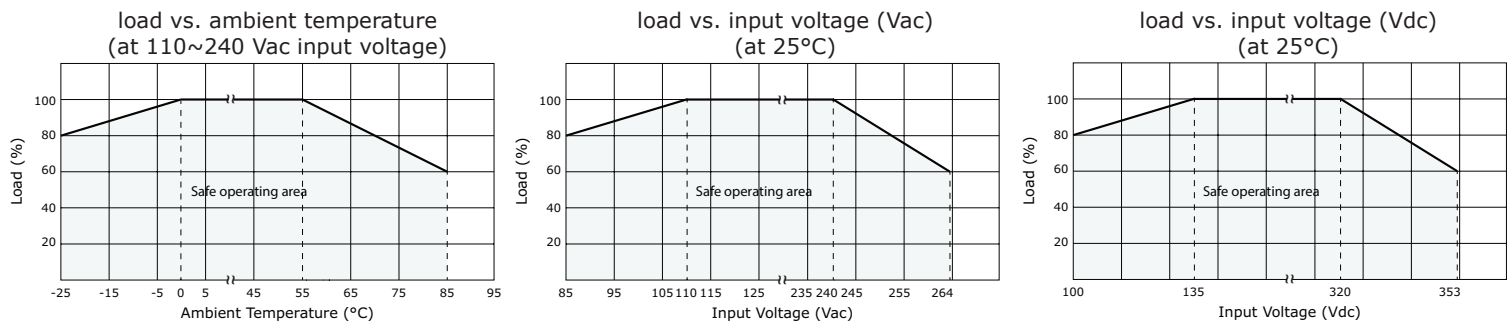
## SAFETY & COMPLIANCE (CONTINUED)

parameter	conditions/description	min	typ	max	units
surge	IEC/EN61000-4-5 Class B, $\pm 1$ kV/ $\pm 2$ kV (external circuit required, see figure 3)				
conducted immunity	IEC/EN61000-4-6 Class A, 3 Vr.m.s (external circuit required, see figure 3)				
PFM	IEC/EN61000-4-8 Class A, 10 A/m				
voltage dips & interruptions	IEC/EN61000-4-11 Class B, 0%-70%				
MTBF	at 25°C, max. load	300,000			hours
RoHS	2011/65/EU				

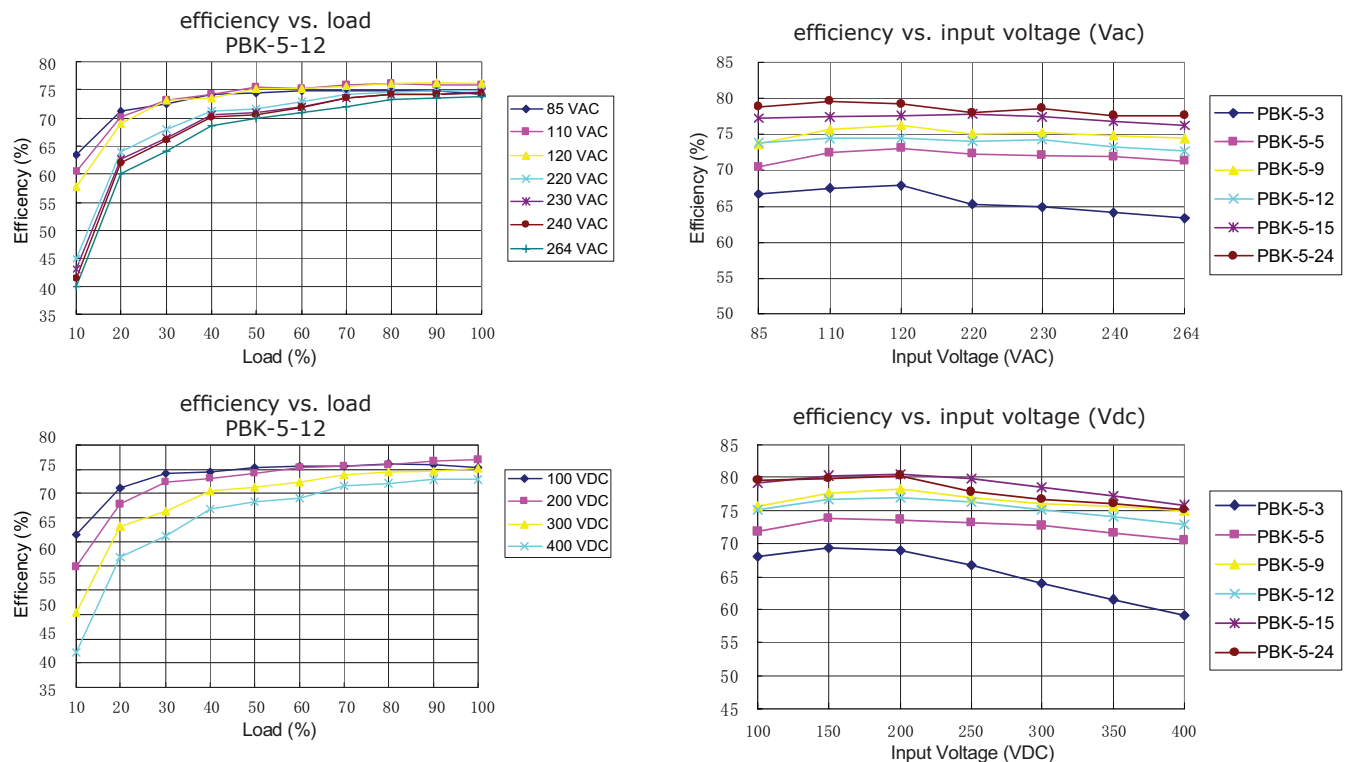
## ENVIRONMENTAL

parameter	conditions/description	min	typ	max	units
operating temperature	see derating curves	-25		85	°C
storage temperature		-40		105	°C
case temperature				100	°C
humidity	non-condensing			85	%

## DERATING CURVES



## EFFICIENCY CURVES



## SOLDERABILITY

parameter	conditions/description	min	typ	max	units
hand soldering	for 3~5 seconds	350	360	370	°C
wave soldering	for 5~10 seconds	255	260	265	°C

## MECHANICAL

parameter	conditions/description	min	typ	max	units
dimensions	vertical models: 42 x 11 x 27 right-angle models: 42 x 25 x 13				mm mm
material	UL94V-0				
weight			10		g

## MECHANICAL DRAWING

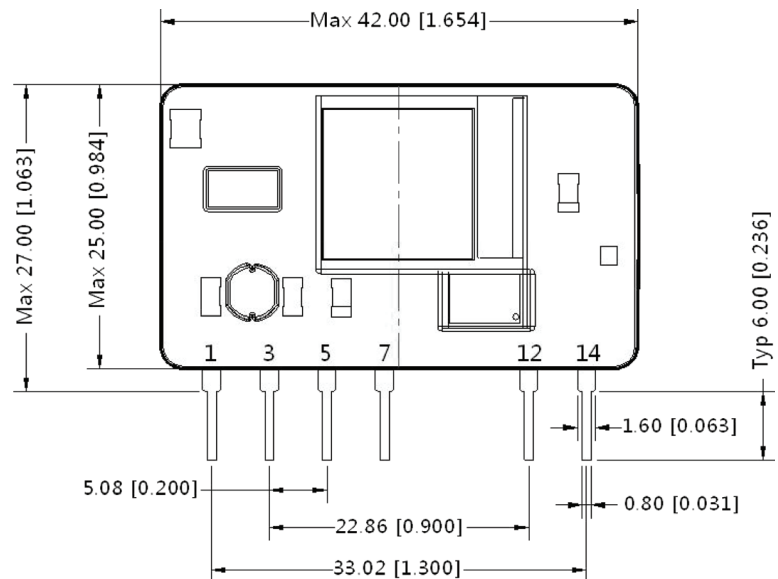
### VERTICAL ORIENTATION

units: mm[inch]

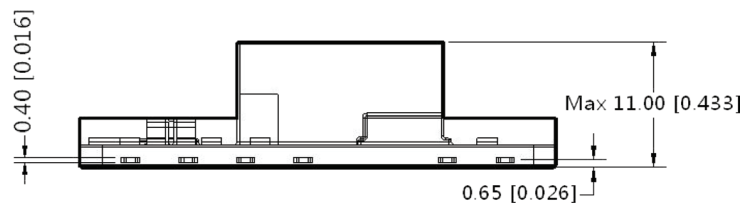
tolerance:  $\pm 0.5$  [ $\pm 0.020$ ]pin tolerance:  $\pm 0.1$  [ $\pm 0.004$ ]

PIN CONNECTIONS	
PIN	FUNCTION
1	-Vin (N)
3	+Vin (L)
5	+V(CAP)
7	-V(CAP)
10	-Vo
12	+Vo

Note: 1. It is required to add C1 between pins 5 & 7 (see application circuits).

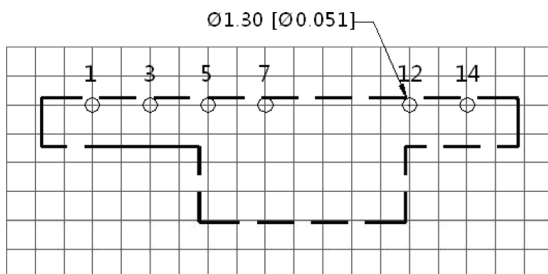


Front View



Bottom View

Note: Grid 2.54\*2.54mm



Top View  
PCB Layout

## MECHANICAL DRAWING (CONTINUED)

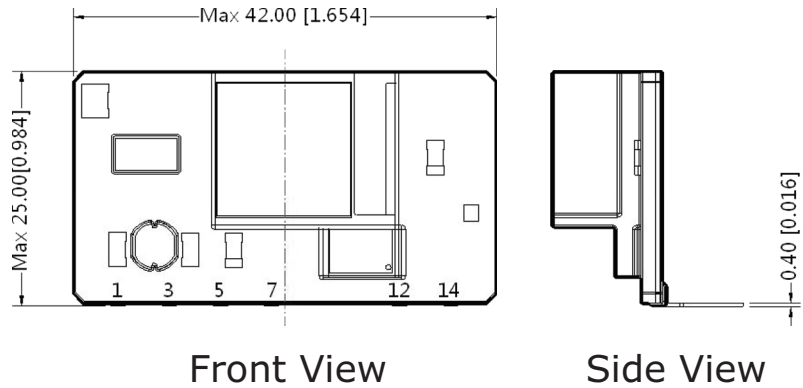
### RIGHT-ANGLE ORIENTATION

units: mm[inch]

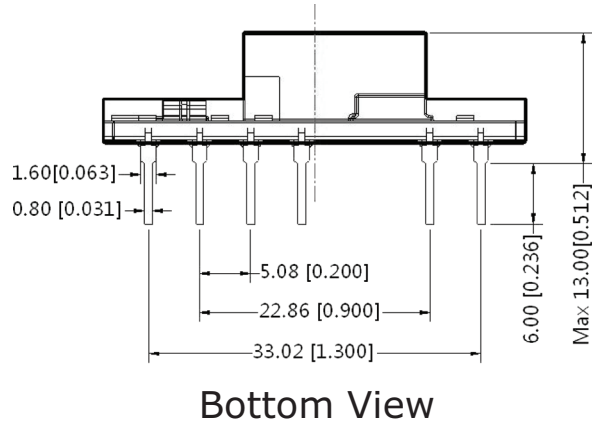
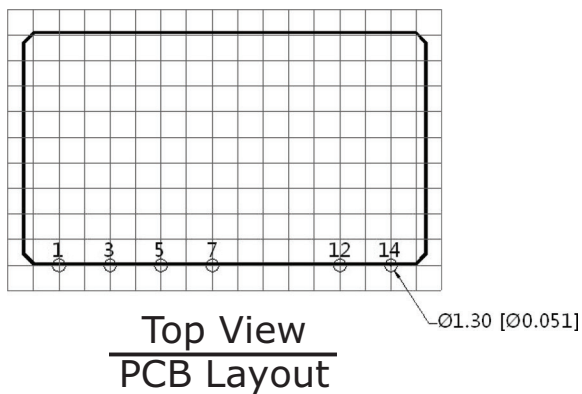
tolerance:  $\pm 0.5[\pm 0.020]$ pin tolerance:  $\pm 0.1[\pm 0.004]$ 

PIN CONNECTIONS	
PIN	FUNCTION
1	-Vin (N)
3	+Vin (L)
5	+V(CAP)
7	-V(CAP)
10	-Vo
12	+Vo

Note: 1. It is required to add C1 between pins 5 & 7 (see application circuits).



Note: Grid 2.54\*2.54mm



## TEST CONFIGURATION

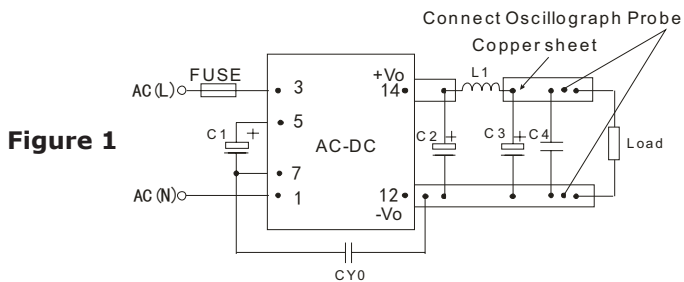


Figure 1

Table 1

Recommended External Circuit Components						
$V_{OUT}$ (Vdc)	C1 <sup>1</sup>	C2 <sup>1</sup>	L1 <sup>1</sup>	C3 <sup>1</sup>	C4	CY0 (Y1 capacitor)
3.3	22 $\mu$ F/400V	470 $\mu$ F/10V	0.47 $\mu$ H	150 $\mu$ F/35V	100nF/50V	1nF/400Vac
5	22 $\mu$ F/400V	470 $\mu$ F/16V	0.47 $\mu$ H	150 $\mu$ F/35V	100nF/50V	1nF/400Vac
9	22 $\mu$ F/400V	330 $\mu$ F/25V	1 $\mu$ H	150 $\mu$ F/35V	100nF/50V	1nF/400Vac
12	22 $\mu$ F/400V	330 $\mu$ F/25V	1 $\mu$ H	150 $\mu$ F/35V	100nF/50V	1nF/400Vac
15	22 $\mu$ F/400V	330 $\mu$ F/25V	1 $\mu$ H	150 $\mu$ F/35V	100nF/50V	1nF/400Vac
24	22 $\mu$ F/400V	100 $\mu$ F/35V	4.7 $\mu$ H	47 $\mu$ F/35V	100nF/50V	1nF/400Vac

Note: 1. Required components.  
2. 1 A/250 V fuse required.



## REVISION HISTORY

rev.	description	date
1.0	initial release	08/09/2013
1.01	added bent pin model options, updated emc recommendations	06/20/2014

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



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CUI offers a two (2) year limited warranty. Complete warranty information is listed on our website.

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CUI products are not authorized or warranted for use as critical components in equipment that requires an extremely high level of reliability. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.