V-INFINITY
a division of CUI INC

date 06/2009

PART NUMBER: PK15 **DESCRIPTION:** dc-dc converter

features
- **industry standard pin out**
- **wide 2:1 input range**
- **fully isolated**
- **low ripple & noise**
- **over-current protection**
- **output voltage variation (TRM)**
- **HI-POT tested**
- **constant switching frequency**
- **high efficiency**
- **compact size 1.8”x2.0”x0.375”**
- **3 year warranty**

RoHS

MODEL[1]	output power (max)	input voltage	output voltage	output current (min)	output current (max)	ripple & noise [2] mV P-P	efficiency (typ.)
PK15-D5-S3.3	6.6W	4.5-7.2VDC	3.3VDC	0A	2.0A	50	76%
PK15-D5-S5	10.0W	4.5-7.2VDC	5VDC	0A	2.0A	50	78%
PK15-D5-S12	12.0W	4.5-7.2VDC	12VDC	0A	1.0A	120	80%
PK15-D5-S15	12.0W	4.5-7.2VDC	15VDC	0A	0.8A	150	80%
PK15-D5-D5	10.0W	4.5-7.2VDC	±5VDC	0A	1.0A	120/120	80%
PK15-D5-D12	12.0W	4.5-7.2VDC	±12VDC	0A	0.5A	150/150	80%
PK15-D5-D15	12.0W	4.5-7.2VDC	±15VDC	0A	0.4A	150/150	80%
PK15-D12-S3.3	7.92W	8-16.5VDC	3.3VDC	0A	2.4A	50	83%
PK15-D12-S5	12.0W	8-16.5VDC	5VDC	0A	2.4A	50	85%
PK15-D12-S12	14.4W	8-16.5VDC	12VDC	0A	1.2A	120	88%
PK15-D12-S15	15.0W	8-16.5VDC	15VDC	0A	1.0A	150	88%
PK15-D12-D5	15.0W	8-16.5VDC	±5VDC	0A	1.5A	120/120	85%
PK15-D12-D12	14.4W	8-16.5VDC	±12VDC	0A	0.6A	150/150	85%
PK15-D12-D15	15.0W	8-16.5VDC	±15VDC	0A	0.5A	150/150	85%
PK15-D24-S3.3	7.92W	18-32VDC	3.3VDC	0A	2.4A	50	84%
PK15-D24-S5	12.0W	18-32VDC	5VDC	0A	2.4A	50	85%
PK15-D24-S12	14.4W	18-32VDC	12VDC	0A	1.2A	120	88%
PK15-D24-S15	15.0W	18-32VDC	15VDC	0A	1.0A	150	87%
PK15-D24-D5	15.0W	18-32VDC	±5VDC	0A	1.5A	120/120	86%
PK15-D24-D12	14.4W	18-32VDC	±12VDC	0A	0.6A	150/150	86%
PK15-D24-D15	15.0W	18-32VDC	±15VDC	0A	0.5A	150/150	86%
PK15-D48-S3.3	7.92W	32-63VDC	3.3VDC	0A	2.4A	50	78%
PK15-D48-S5	12.0W	32-63VDC	5VDC	0A	2.4A	50	80%
PK15-D48-S12	14.4W	32-63VDC	12VDC	0A	1.2A	120	83%
PK15-D48-S15	15.0W	32-63VDC	15VDC	0A	1.0A	150	83%
PK15-D48-D5	15.0W	32-63VDC	±5VDC	0A	1.5A	120/120	83%
PK15-D48-D12	14.4W	32-63VDC	±12VDC	0A	0.6A	150/150	83%
PK15-D48-D15	15.0W	32-63VDC	±15VDC	0A	0.5A	150/150	83%

NOTE: 1. All models (excluding the 5 V dc input, D5) are also available in an extended temperature range of -40°C~85°C. For these models, append “M” to the model number, e.g. PK15-D12-S3.3M.

2. Ripple & noise measured with a 20MHz bandwidth, off a 10uF electrolytic and a 0.1uF ceramic cap in parallel at the ouptut.

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INPUT

parameter	conditions/description	min	nom	max	units
input voltage range		4.5	5	7.2	VDC
		8	12	16.5	VDC
		18	24	32	VDC
		32	48	63	VDC
switching frequency	constant		300		KHz
(CNT) remote on / off	TTL compatible on: 0 to 1.2 VDC or short Vin-V				
	off: 2.4 to 5.5 VDC or open				

OUTPUT

parameter	conditions/description	min	nom	max	units
set point accuracy		-2%		+2%	
line regulation	all models	-0.5%		+0.5%	
load regulation	single output models	-1.0%		+1.0%	
	dual output models (10% min. load)	-2.5%		+2.5%	
minimum load		0.0			Amps
ripple and noise	20 MHz bandwidth			1.0% Vout	mVpp

PROTECTION

parameter	conditions/description	min	nom	max	units
over-current	continuous auto recovery [3]	105%		135%	
over-voltage	internally zener clamped [3]	110%		140%	

NOTE: 3 continuous operation in a protected state may compromise long-term reliability.

GENERAL

parameter	conditions/description	min	nom	max	units
efficiency	typical at full load	76%		87%	
dielectric withstand	input/case, input/output, output/case	500			VAC
insulation resistance	at 500 VDC	100M			Ohms
agency standards	approved to UL1950, EN60950, CISPR22, CE				
case material			STS		
material flammability			94 V-0		
weight			55 (1.94)		grams (ounces)
MTBF	MIL-HDBK-217F		520k		hours
operating temperature	regular models	-20		+71	°C
	extended temperature models	-40		+85	°C
storage temperature		-40		+105	°C
humidity	operating (non-condensing)	20%		90%	RH
washability	not intended for aqueous wash				

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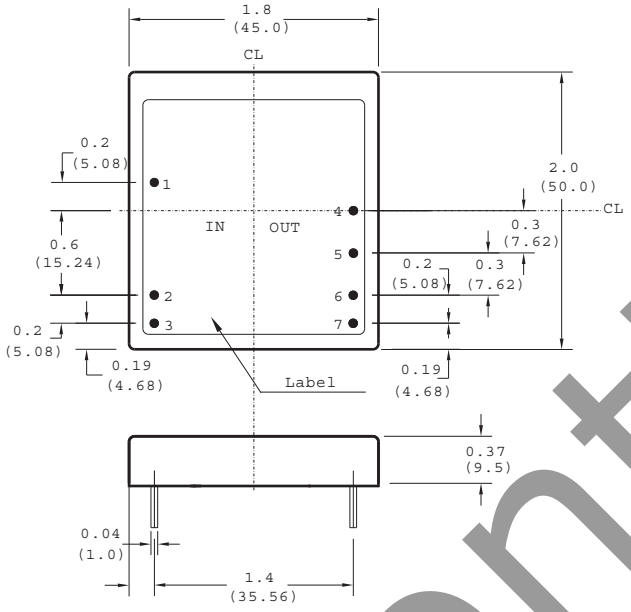
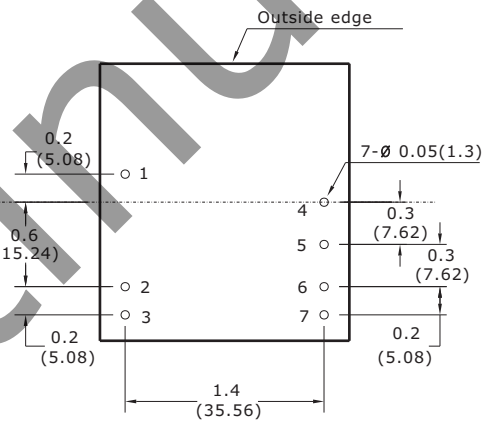
DIMENSIONS (mm)

All dimensions are in inches (mm).



Pin Assignments

Single Output	Dual Output
1. +Vin	1. +Vin
2. -Vin	2. -Vin
3. CNT	3. CNT
4. +Vout	4. +Vout
5. No pin	5. Com
6. -Vout	6. -Vout
7. Trim	7. Trim



TOP VIEW

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APPLICATION NOTES

1. OUTPUT TRIMMING

The output voltages are preset to nominal values as indicated by the models table at the factory. If desired, the output voltage may optionally be trimmed to a different value (+/- 10%) with external resistors and/or potentiometer as shown below.

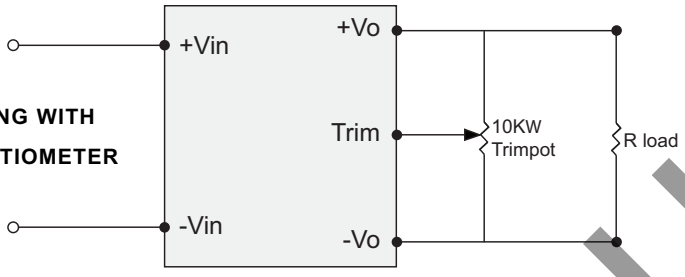
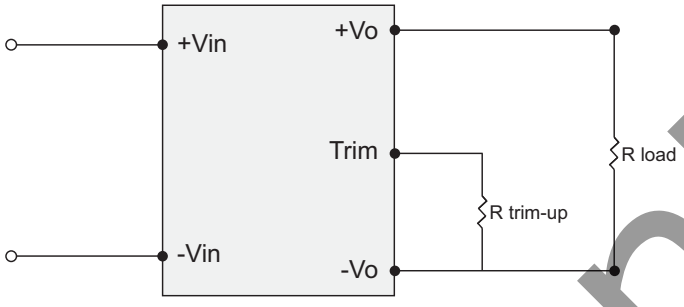


FIGURE 1. TRIMMING WITH EXTERNAL POTENTIOMETER

To trim the output voltage with fixed resistors, the output voltage can be calculated as follows.



Trim-Up

FIGURE 2: TRIM-UP VOLTAGE SETUP

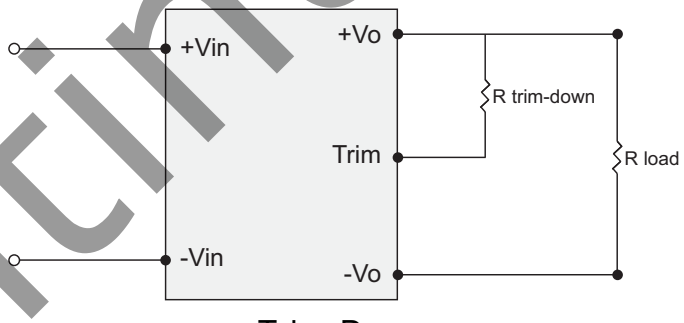
$$R_{trim\_up} = \frac{V_r \cdot R_1 \cdot R_2}{R_2 \cdot (V_o - V_r) - V_r \cdot R_1}$$

The value of $R_{trim-up}$ is defined as:

Where: $R_{trim-up}$ is the external resistor in $K\Omega$. V_o is the desired output voltage. R_1 and R_2 and V_r are internal to the unit and are defined in Table 1. For example to trim up the PK15-D5-D12 up by 5% to 25.2 V, $R_{trim-up}$ is calculated as follows:

$$V_o = 25.2 \,/\, R_1 = 21\ \text{K}\Omega \,/\, R_2 = 2.43\ \text{K}\Omega \,/\, V_r = 2.5$$

$$R_{trim\_up} = \frac{2.5 \cdot 21 \cdot 2.43}{2.43 \cdot (25.2 - 2.5) - 2.5 \cdot 21} = 47.94\ \text{K}\Omega$$



Trim-Down

FIGURE 3: TRIM-DOWN VOLTAGE SETUP

$$R_{trim\_down} = \frac{(V_o - V_r) \cdot R_1 \cdot R_2}{V_r \cdot R_1 - (V_o - V_r) \cdot R_2}$$

The value of $R_{trim-down}$ is defined as:

Where: $R_{trim-down}$ is the external resistor in $K\Omega$. V_o is the desired output voltage. R_1 and R_2 and V_r are internal to the unit and are defined in Table 1. For example to trim down the PK15-D5-D12 down by 5% to 22.8 V, $R_{trim-down}$ is calculated as follows:

$$V_o = 22.8 \,/\, R_1 = 21\ \text{K}\Omega \,/\, R_2 = 2.43\ \text{K}\Omega \,/\, V_r = 2.5$$

$$R_{trim\_down} = \frac{(22.8 - 2.5) \cdot 21 \cdot 2.43}{2.5 - 2.1\ (22.8 - 2.5) \cdot 2.43} = 326.68\ \text{K}\Omega$$

Model	R1 (KΩ)	R2 (KΩ)	Vr (V)
PK15-DXX-S3.3	0.402	0.24	1.25
PK15-DXX-S5	12.7	12.7	2.5
PK15-DXX-S12	9.31	2.43	2.5
PK15-DXX-S15	12.7	2.49	2.5
PK15-DXX-D5	7.5	2.49	2.5
PK15-DXX-D12	21	2.43	2.5
PK15-DXX-D15	26.7	2.43	2.5
*PK15-D5-S3.3	0.787	2.43	2.5
*PK15-D48-S3.3	0.787	2.43	2.5

Table 1