

**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



MODEL <sup>1</sup>	output power (max)	input voltage	output voltage	output current (min)	output current (max)	ripple & noise <sup>2</sup> 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 output.

**PART NUMBER:** PK15**DESCRIPTION:** dc-dc converter**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 <sup>3</sup>	105%		135%	
over-voltage	internally zener clamped <sup>3</sup>	110%		140%	

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

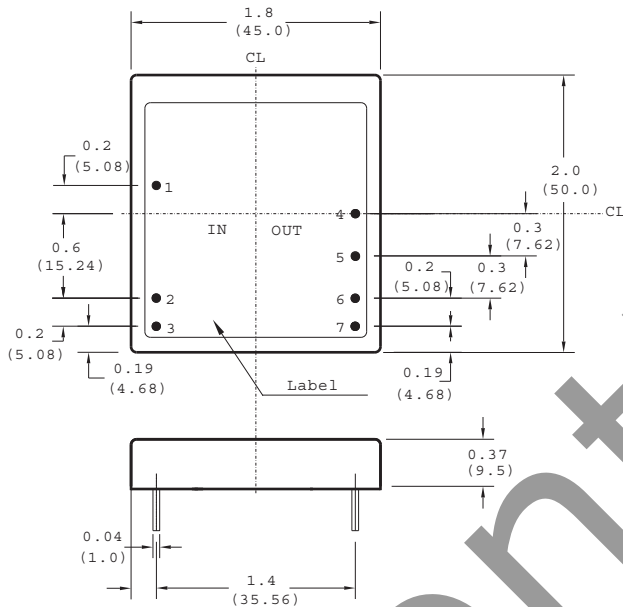
parameter	conditions/description	min	nom	max	units
efficiency	typical at full load	76%		87%	
dielectric withstand	input/case, input/output, output/case	500			VAC
insulation resistance	at 500 VDC	100M			Ohms
agency standards	approved to UL1950, EN60950, CISPR22, CE				
case material			STS		
material flammability			94 V-0		
weight			55		grams
			(1.94)		(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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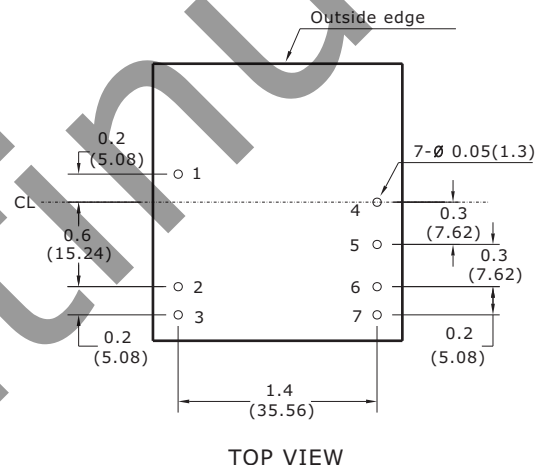
**DIMENSIONS (mm)**

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



Discontinued

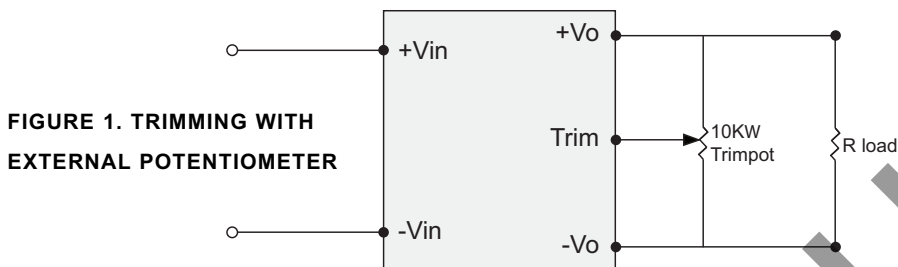
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## APPLICATION NOTES

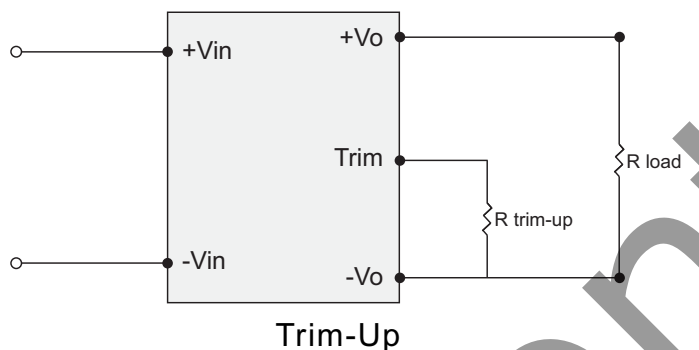
### 1. OUTPUT TRIMMING

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:

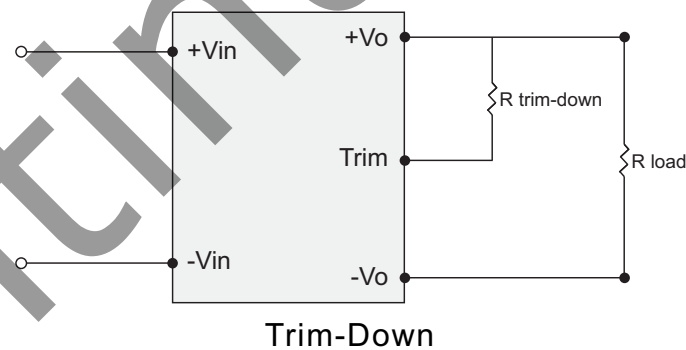
Where:  $R_{trim-up}$  is the external resistor in  $K\Omega$ .  $V_o$  is the desired output voltage.  $R_1$  and  $R_2$  and  $V_r$  are internal to the unit and are defined in Table 1. For example to trim up the PK15-D5-D12 up by 5% to 25.2 V,  $R_{trim-up}$  is calculated as follows:

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

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

**Table 1**

Model	R1 (K $\Omega$ )	R2 (K $\Omega$ )	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



**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:

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

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