

**SERIES:** VSK 15W | **DESCRIPTION:** AC-DC POWER SUPPLY

**FEATURES**

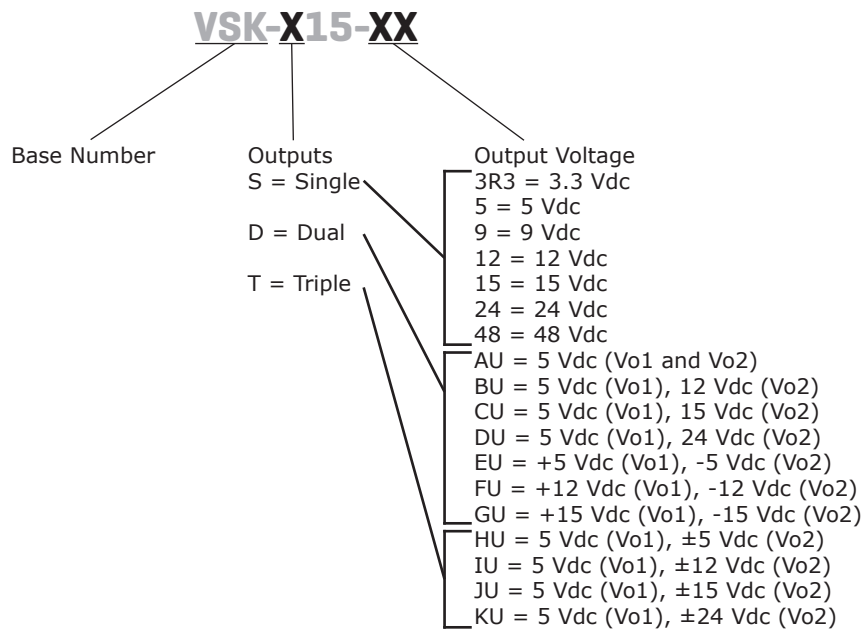
- up to 15W continuous power
- compact board mount design
- universal input (85~264 Vac / 120~370 Vdc)
- single output from 3.3~48 V
- over voltage, over current, and short circuit protections
- UL/cUL safety approvals
- efficiency up to 85%



MODEL		output voltage	output current	output power	ripple and noise <sup>1</sup>	efficiency
		(Vdc)	max (A)	max (W)	typ (mVp-p)	typ (%)
VSK-S15-3R3U		3.3	3	9.9	50	73
VSK-S15-5U		5	2.8	15	50	76
VSK-S15-9U		9	1.6	15	50	78
VSK-S15-12U		12	1.25	15	50	80
VSK-S15-15U		15	1.0	15	50	80
VSK-S15-24U		24	0.625	15	50	84
VSK-S15-48U		48	0.32	15	50	85
VSK-D15-AU	Vo1 Vo2	5 5	2.2 0.8	15	50	76
VSK-D15-BU	Vo1 Vo2	5 12	2 0.4	15	50	81
VSK-D15-CU	Vo1 Vo2	5 15	2 0.3	15	50	83
VSK-D15-DU	Vo1 Vo2	5 24	2 0.2	15	50	76
VSK-D15-EU	Vo1 Vo2	+5 -5	1.5 1.5	15	50	80
VSK-D15-FU	Vo1 Vo2	+12 -12	0.65 0.65	15	50	80
VSK-D15-GU	Vo1 Vo2	+15 -15	0.5 0.5	15	50	81
VSK-T15-HU	Vo1 Vo2	5 ±5	2 0.5	15	50	75
VSK-T15-IU	Vo1 Vo2	5 ±12	2 0.5	15	50	77
VSK-T15-JU	Vo1 Vo2	5 ±15	2 0.5	15	50	78
VSK-T15-KU	Vo1 Vo2	5 ±24	2 0.5	15	50	78

Notes: 1. Ripple and noise measured at 20 MHz bandwidth

## PART NUMBER KEY



## INPUT

parameter	conditions/description	min	typ	max	units
voltage		85		264	Vac
		110		370	Vdc
frequency		47		63	Hz
current	at 110 Vac, cold start		250		mA
	at 230 Vac, cold start		140		mA
inrush current	at 110 Vac, full load, cold start		10		A
	at 220 Vac, full load, cold start		20		A
input fuse	slow blow, 250 V		2		A
leakage current	230 V ac, 50 Hz		0.3		mA

## OUTPUT

parameter	conditions/description	min	typ	max	units	
line regulation	main output		±0.5		%	
	supplemental output		±1.5		%	
load regulation (10 ~ 100%)	single output		±1		%	
	dual output (balanced load)		±2		%	
	isolated triple output (balanced load)	Vo1 (main output)		±3		%
	isolated and separated	±Vo2 (supplemental output)		±5		%
	twin output (balanced load)	Vo1 (main output) Vo2 (supplemental output)		±3 ±5		%
minimum load	single output	0%				
	dual output (main output)	10%				
	isolated triple output (main output)	10%				
	isolated and separated twin output (main output)	10%				
temperature coefficient	main output		0.02		%/°C	
	supplemental output		0.15		%/°C	
hold-up time	at 230 Vac		80		ms	
switching frequency				150	kHz	

## PROTECTIONS

parameter	conditions/description	min	typ	max	units
over current protection				110	%
short circuit protection	auto recovery with no damage from a short on any output				
over voltage protection	3.3 V, 5 V output			7.5	Vdc
	9 V output			12	Vdc
	12 V, 15 V output			20	Vdc
	24 V output			30	Vdc
	48 V output			60	Vdc

## SAFETY & COMPLIANCE

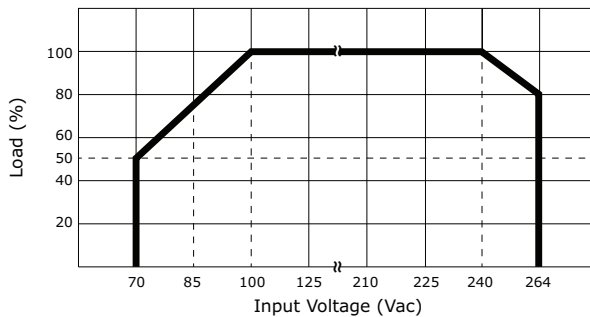
parameter	conditions/description	min	typ	max	units
isolation voltage	primary to secondary (for 1 minute)	3,000			Vac
safety approvals	UL 60950-1, EN 60950-1				
safety class	class II				
EMI/EMC	EN55022 (level B), IEC/EN 61000-4-2 level 3 (6kV/8kV), IEC/EN 61000-4-3, IEC/EN 61000-4-4 level 3 (2kV), IEC/EN 61000-4-5 level 3 (1kV/2kV)				
RoHS compliant	yes				
MTBF	25°C	300,000			hrs

## ENVIRONMENTAL

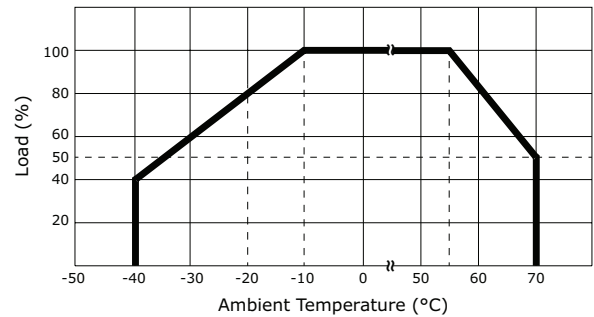
parameter	conditions/description	min	typ	max	units
operating temperature		-40		70	°C
storage temperature		-40		105	°C
case temperature				90	°C
operating humidity	non-condensing			85	%

## DERATING CURVES

1. output power vs. input voltage



2. output power vs. ambient temperature



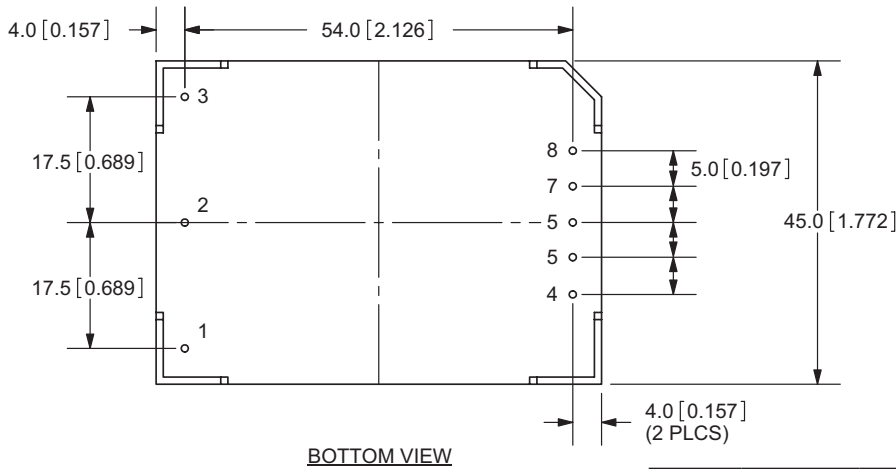
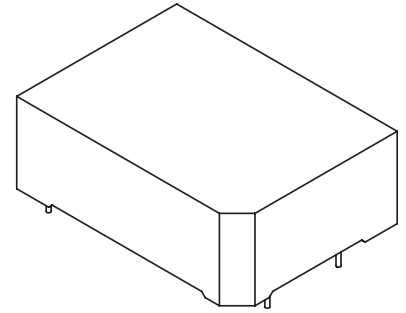
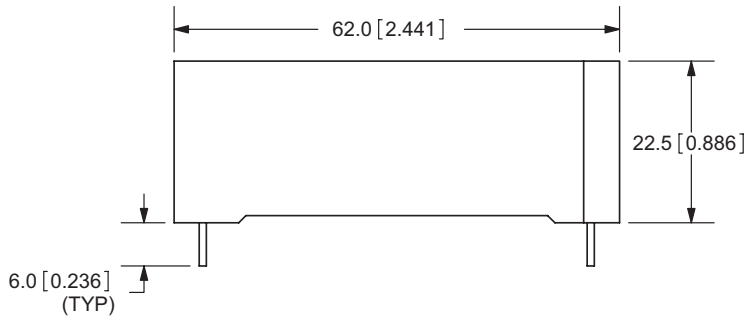
Note: When input is DC voltage, Vdc=1.414Vac-20Vdc.

## MECHANICAL

parameter	conditions/description	min	typ	max	units
dimensions	2.44 x 1.77 x 0.88 (62.0 x 45.0 x 22.5 mm)				inch
weight			80		g
case material	UL94V-0				

## MECHANICAL DRAWING

units: mm [inches]  
 tolerance: ±0.5 [±0.02]  
 pin diameter: 1.00±0.05mm



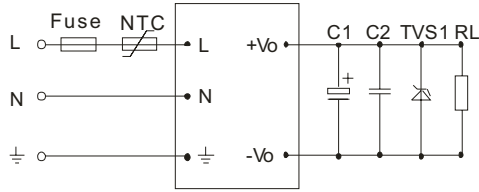
BOTTOM VIEW

### PIN CONNECTIONS

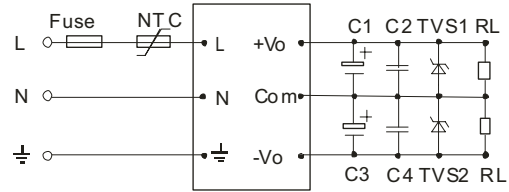
PIN	FUNCTION			
	Single	Dual	Isolated and separated twin	Triple
1	NP	GND	GND	GND
2	AC(N)	AC(N)	AC(N)	AC(N)
3	AC(L)	AC(L)	AC(L)	AC(L)
4	-Vo	-Vo	-Vo1	-Vo1
5	NP	NP	+Vo1	+Vo1
6	NP	COM	NP	-Vo2
7	NP	NP	-Vo2	COM
8	+Vo	+Vo	+Vo2	+Vo2

## TYPICAL APPLICATION CIRCUIT

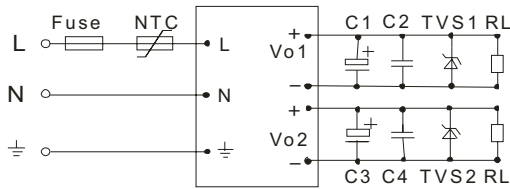
Single Output



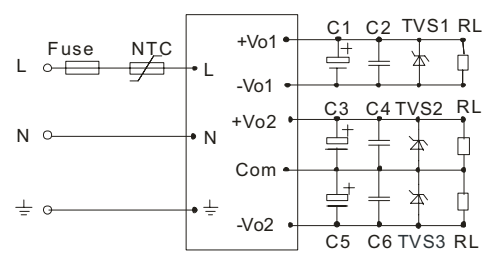
Dual Output



Isolated and Separated Twin Output



Triple Output



### EXTERNAL CAPACITORS TYPICAL VALUE (Unit: $\mu\text{F}$ )

MODEL	C1	C3	C5
VSK-S15-3R3U	680	---	---
VSK-S15-5U	680	---	---
VSK-S15-9U	470	---	---
VSK-S15-12U	220	---	---
VSK-S15-15U	220	---	---
VSK-S15-24U	68	---	---
VSK-S15-48U	33	---	---
VSK-D15-AU	470	470	---
VSK-D15-BU	470	220	---
VSK-D15-CU	470	120	---
VSK-D15-DU	470	47	---
VSK-D15-EU	470	470	---
VSK-D15-FU	220	220	---
VSK-D15-GU	120	120	---
VSK-T15-HU	470	220	220
VSK-T15-IU	470	120	120
VSK-T15-JU	470	120	120
VSK-T15-KU	470	120	120

- Notes:
- Output filtering capacitors C1, C2, and C3 are electrolytic capacitors. It is recommended to use high frequency and low impedance electrolytic capacitors. For capacitance and current of capacitor please refer to manufacture's datasheet. Voltage derating of capacitor should be 80% or above. C2, C4, and C6 are used to filter high frequency noise and it is suggested that 0.1 $\mu\text{F}$  capacitors are used. TVS is recommended component to protect post-circuits (when converter fails).
  - External input NTC is recommended to use 5D-9

## REVISION HISTORY

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rev.	description	date
1.0	initial release	07/26/2011
1.01	V-Infinity branding removed	08/16/2012
1.02	added dual and triple output models	11/16/2012
1.03	updated derating curves	01/29/2013

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



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