

**SERIES:** VSKM-S10 Series | **DESCRIPTION:** MEDICAL SWITCHING POWER SUPPLY

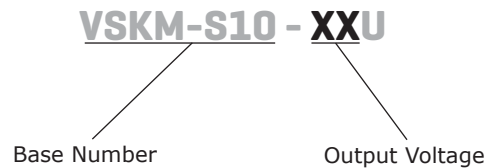
**FEATURES**

- Up to 10 W continuous power
- Compact board mount design
- Universal input (85~264 Vac / 120~370 Vdc)
- Single output from 3.3 to 24 V
- Over current and short circuit protections
- Full medical approvals
- Efficiency up to 80%


**V-Infinity**


MODEL	output voltage	output current	output power	ripple and noise <sup>1</sup>	efficiency
	(Vdc)	max (A)	max (W)	typ (mVp-p)	typ (%)
VSKM-S10-3R3U	3.3	2	6.6	50	70
VSKM-S10-5U	5	2	10	50	74
VSKM-S10-9U	9	1.1	10	50	76
VSKM-S10-12U	12	0.9	10	50	76
VSKM-S10-15U	15	0.7	10	50	78
VSKM-S10-24U	24	0.45	10	50	80

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
		120		370	Vdc
frequency		47		63	Hz
input current	at 110 Vac		230		mA
	at 230 Vac		150		mA
inrush current	at 110 Vac		10		A
	at 230 Vac		20		A
external input fuse (recommended)	slow blow, 250 V		2		A
leakage current	230 V ac, 50 Hz		0.1		mA

## OUTPUT

parameter	conditions/description	min	typ	max	units
line regulation			±0.5		%
load regulation	10 ~ 100%		±1		%
temperature coefficient			0.02		%/°C
hold-up time	at 230 Vac		50		ms
voltage set point accuracy	3.3 V output		±3		%
	all other models		±2		%
switching frequency			60		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				

## SAFETY & COMPLIANCE

parameter	conditions/description	min	typ	max	units
isolation voltage	primary to secondary (for 1 minute)	4,000			Vac
safety approvals	IEC 60601-1, EN 60601-1, UL 60601-1				
safety class	class II				
EMI/EMC <sup>1</sup>	EN 55011 (level B), IEC/EN 61000-4-2 level 4 (8kV/15kV), IEC/EN 61000-4-3, IEC/EN 61000-4-4 level 4 (4kV), IEC/EN 61000-4-5 level 4 (2kV/4kV)				
RoHS compliant	yes				
MTBF	25°C	300,000			hrs

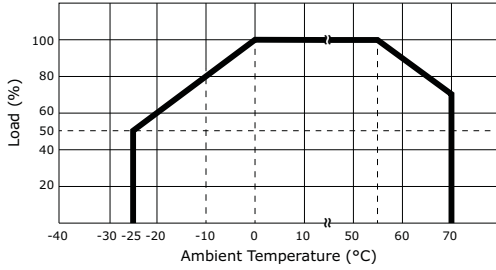
Notes: 1. external EMC application circuit is required

## ENVIRONMENTAL

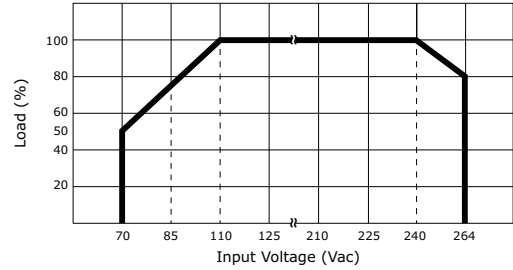
parameter	conditions/description	min	typ	max	units
operating temperature		-25		70	°C
storage temperature		-40		105	°C
case temperature				95	°C
operating humidity	non-condensing			95	%

## DERATING CURVES

1. output power vs. ambient temperature



2. output power vs. input voltage

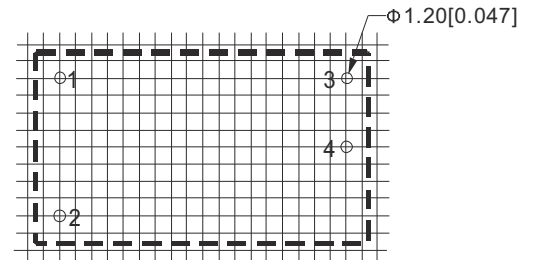
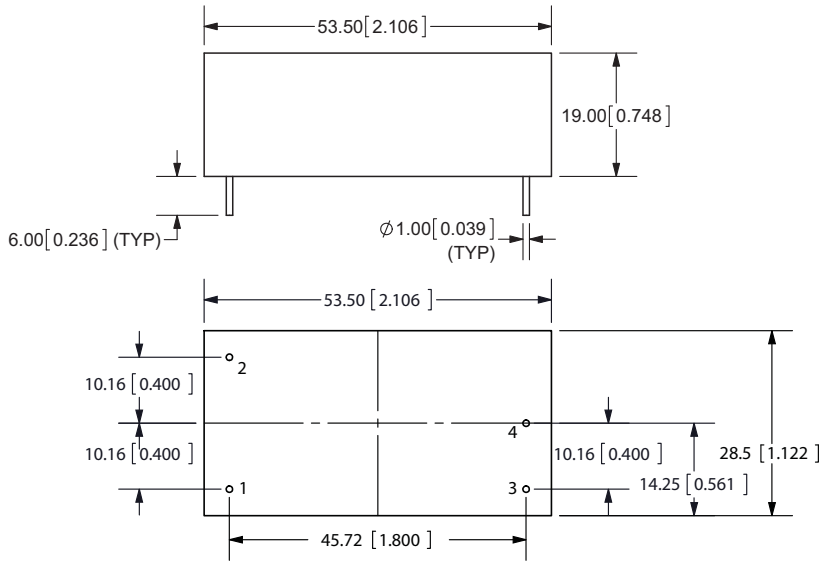


## MECHANICAL

parameter	conditions/description	min	typ	max	units
dimensions	2.1 x 1.12 x 0.75 inch (53.5 x 28.5 x 19.0 mm)				
case material	UL94V-0				
weight		47	50	53	g

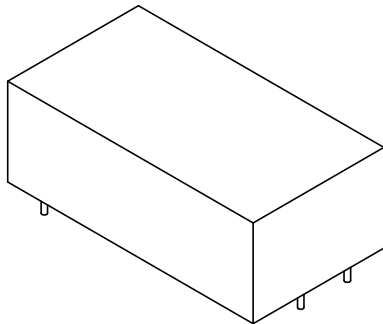
## MECHANICAL DRAWING

units: mm [inches]  
 tolerance: ±0.5 [±0.02]  
 pin section tolerance: ±0.10 mm [±0.004]

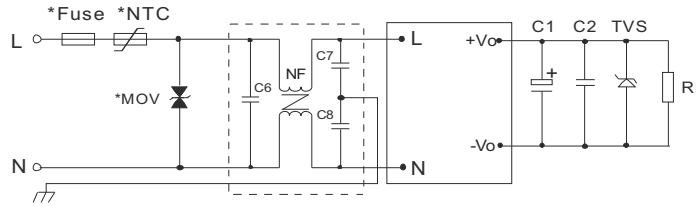


recommended PCB footprint (top view)  
 grid: 2.54 mm (0.10 inch)

PIN CONNECTIONS	
PIN	FUNCTION
1	AC(N)
2	AC(L)
3	+Vo
4	-Vo



## TYPICAL APPLICATION CIRCUIT



EXTERNAL CAPACITORS TYPICAL VALUE (Unit: $\mu\text{F}$ )			
MODEL	C1	C2	TVS
VSKM-S10-3R3U	220 $\mu\text{F}/10\text{ V}$	0.1 $\mu\text{F}/50\text{ V}$	P6KE6.8A
VSKM-S10-5U	220 $\mu\text{F}/10\text{ V}$	0.1 $\mu\text{F}/50\text{ V}$	P6KE6.8A
VSKM-S10-9U	120 $\mu\text{F}/25\text{ V}$	0.1 $\mu\text{F}/50\text{ V}$	P6KE12A
VSKM-S10-12U	120 $\mu\text{F}/25\text{ V}$	0.1 $\mu\text{F}/50\text{ V}$	P6KE20A
VSKM-S10-15U	120 $\mu\text{F}/25\text{ V}$	0.1 $\mu\text{F}/50\text{ V}$	P6KE20A
VSKM-S10-24U	68 $\mu\text{F}/35\text{ V}$	0.1 $\mu\text{F}/50\text{ V}$	P6KE30A

- Notes:
- Output filtering capacitor C1 is an electrolytic capacitor. 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 is ceramic capacitor, it is used to filter high frequency noise. TVS is a recommended component to protect post-circuits (if converter fails).
  - MOV is required to protect the device under surge.
  - It is recommended to use a 2A/250V slow blow FUSE. External input NTC is recommended to use 5D-9.
  - If EMC performance is required, it is recommended to add "EMC filter" at the input end (see EMC Application Figure).  
 C6: X capacitor, recommended parameter 0.1 $\mu\text{F}/275\text{V}$ ;  
 C7,C8: Y capacitor, recommended parameter 2200pF/400V;  
 NF: common model choke, recommended inductance is about 10mH-30mH.

## REVISION HISTORY

rev.	description	date
1.0	initial release	01/16/2012

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



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