



### VSF03 (H) Series 3 Watts

3W SINGLE AND DUAL OUTPUT

ISOLATED & REGULATED INPUT

1.5K & 3K(H) VDC ISOLATION VOLTAGE

UTRALMINIATURE SIP PACKAGE

INDUSTRY STANDARD PIN CONFIGURATION

ROHS COMPLIANCE

- High Efficiency up to 83%
- Short Circuit Protection
- No Heatsink Required
- Remote On/Off control
- Temperature Range: -40°C --+85°C

### APPLICATIONS

The VSF03 (H) series is specially designed for applications where a high isolation voltage power supplies. These products apply to:

- 1) Where the input voltage range is 2:1.
- 2) Where isolation voltage is necessary between input and output to be 1.5K and 3K(H) VDC.
- 3) Where the regulation of the output voltage and the lower output ripple noise are demanded.

### Product Program

Part Number	Input Voltage (VDC)		Output Voltage (VDC)	Output Current (mA)		Efficiency (% Typ)	Package Style
	Nominal	Range		Max	Min		
VSF03-05S03	5	4.5~9	3.3	758	38	67	SIP
VSF03-05S05(H)	5	4.5~9	5	500	25	72	SIP
VSF03-05S09(H)	5	4.5~9	9	278	14	73	SIP
VSF03-05S12(H)	5	4.5~9	12	208	10	76	SIP
VSF03-05S15(H)	5	4.5~9	15	167	8	73	SIP
VSF03-05S24	5	4.5~9	24	104	5	75	SIP
VSF03-12S03(H)	12	4.5~9	3.3	758	38	74	SIP
VSF03-12S05(H)	12	9~18	5	600	30	75	SIP
VSF03-12S09(H)	12	9~18	9	333	17	78	SIP
VSF03-12S12(H)	12	9~18	12	250	13	81	SIP
VSF03-12S15(H)	12	9~18	15	200	10	82	SIP
VSF03-12S24(H)	12	9~18	24	125	6	80	SIP
VSF03-24S03(H)	24	18~36	3.3	758	38	73	SIP
VSF03-24S05(H)	24	18~36	5	600	30	80	SIP
VSF03-24S09(H)	24	18~36	9	333	17	82	SIP
VSF03-24S12(H)	24	18~36	12	250	13	82	SIP
VSF03-24S15(H)	24	18~36	15	200	10	82	SIP
VSF03-24S24(H)	24	18~36	24	125	6	82	SIP
VSF03-48S03(H)	48	36~75	3.3	758	38	74	SIP
VSF03-48S05(H)	48	36~75	5	600	30	75	SIP
VSF03-48S12(H)	48	36~75	12	250	13	79	SIP
VSF03-48S15(H)	48	36~75	15	200	10	83	SIP
VSF03-48S24	48	36~75	24	125	6	81	SIP
VSF03-05D05(H)	5	4.5~9	±5	±250	±13	74	SIP
VSF03-05D12(H)	5	4.5~9	±12	±104	±5	77	SIP
VSF03-05D15(H)	5	4.5~9	±15	±83	±4	77	SIP
VSF03-05D24	5	4.5~9	±24	±52	±3	76	SIP
VSF03-12D05(H)	12	9~18	±5	±300	±15	77	SIP
VSF03-12D09	12	9~18	±9	±167	±8	77	SIP

VSF03-12D12(H)	12	9~18	±12	±125	±6	78	SIP
VSF03-12D15(H)	12	9~18	±15	±100	±5	79	SIP
VSF03-24D05(H)	24	18~36	±5	±300	±15	78	SIP
VSF03-24D09(H)	24	18~36	±9	±167	±8	80	SP
VSF03-24D12(H)	24	18~36	±12	±125	±6	82	SIP
VSF03-24D15(H)	24	18~36	±15	±100	±5	82	SIP
VSF03-48D05(H)	48	36~75	±5	±300	±15	78	SIP
VSF03-48D12(H)	48	36~75	±12	±125	±6	81	SIP
VSF03-48D15(H)	48	36~75	±15	±100	±5	81	SIP

### ISOLATION SPECIFICATIONS

Item	Test conditions	Min	Typ	Max	Units
Isolation voltage	Tested for 1 minute	1500		3000 (H)	VDC
Isolation resistance	Test at 500VDC	1000			MΩ

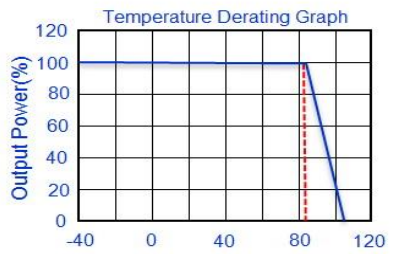
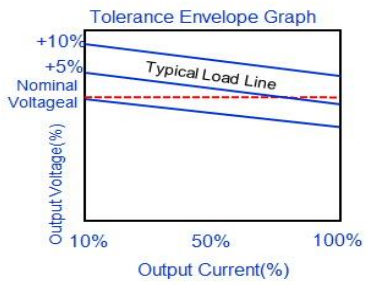
### COMMON SPECIFICATION

Temperature rise at full load	25°C MAX, 15°C TYP
Cooling	Free air convection
Operating temperature range	-40°C~+85°C
Storage temperature range	-55°C ~+125°C
Lead temperature	300°C (1.5mm from case for 10 seconds)
Storage humidity range(RH)	≤ 95%
Dimension	0.87 x 0.37 x 0.47 Inch ( 22.0 x 9.5 x 12.0mm )
MTBF	1,000,000 hours
Wight	4.9g (0.17oz)

### Output SPECIFICATION

Item	Test conditions	MIN	TYP	MAX	Units
Output voltage accuracy	5% to 100% load		±1	±3	W
Line regulation			±0.2	±0.5	%
Load regulation	5% to 100% load		±0.6	±0.1	%
Output ripple			40	100	mVp-p
Output noise	20MHz Bandwidth		75	150	mVp-p
Transient recovery time			3		ms
Temperature coefficient	100% load		±0.02	±0.03	% / °C
Remote control	On	control pin open			
	Off	contact	high volt	5-10	mA
Switching frequency	Full load, nominal input		250		KHz

### TYPICAL CHARECTERISTICS



## RECOMMENDED CIRCUIT

### Remote Control Circuit (CTL)

The VSF03(H) series normally operate when the CTL pin is open or with high resistance (R). The value of  $R$  can be set as follows:

$$R = \frac{V_C - V_D - 1.0}{I_C} - 300$$

The module can be turned off when CTL connecting to higher voltage, the current flow shall be within 5 - 10mA, the modules will be permanently damaged if over this range.

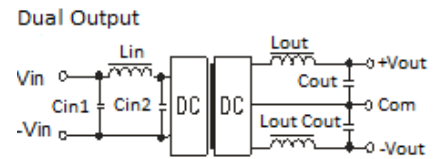
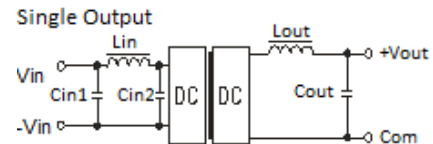
### Output Minimum Load

The minimum output load should be more than 5% of the nominal load. To connect a 5% dummy load (a resistor) in parallel at the output end.

### Extra Comments

For VSF03(H) series, to properly increase the input and output of external capacitors value ( Cin1, Cin2 and Cout) in order to decrease the input and output ripple is required. To select capacitors of low equivalent impedance like series capacitor to reduce ripple. The start-up problems may be caused if the capacitance is too large. For safe and reliable operation, the max. capacity of its filter capacitor should be lower than max. load.

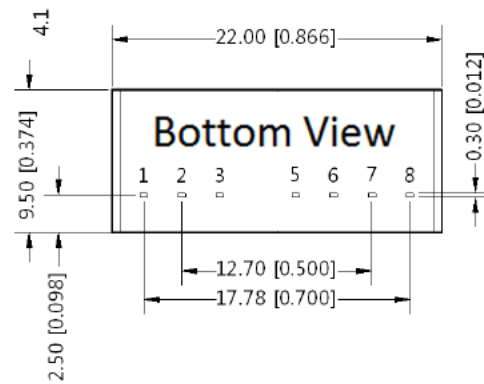
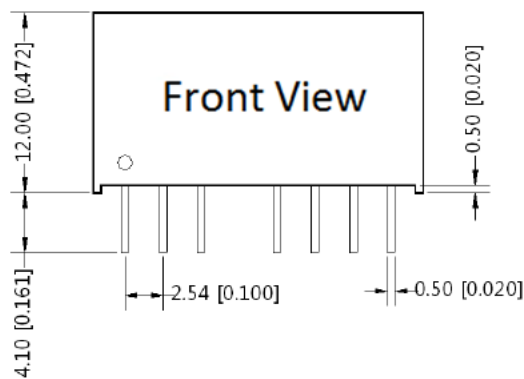
Vin	5 & 12VDC	24 & 48VDC
Cin 1	100uF	10uf
Cin 2	47uf	1uf
Lin	4.7uH ~ 12uH	
Cout	100uF	
Lout	2.2uH ~ 10uH	



## FOOTPRINT DETAILS

PIN	1	2	3	5	6	7	8
SINGLE	-Vin	+Vin	CTL	NC	+Vout	COMMON	CS
DUAL	-Vin	+Vin	CTL	NC	+Vout	COMMON	-Vout

## OUTLINE DIMENSIONS & RECOMMENDED FOOTPRINT



Dimensions: mm (Inch)  
Pin tolerance:  $\pm 0.10$  [ $\pm 0.004$ ]  
Pin pitch tolerance:  $\pm 0.25$  [ $\pm 0.01$ ]