

date 05/29/2025

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SERIES: VFK600 | DESCRIPTION: DC-DC CONVERTER

FEATURES

- up to 700 W isolated output
- rugged metal enclosure with integrated heat sink
- 2:1 input range (18~36 Vdc, 36~75 Vdc)
- single output from 12~48 Vdc
- 1,500 Vdc isolation
- over current, over temperature, over voltage, and short circuit protections
- remote on/off
- N+1 current sharing
- efficiency up to 92%

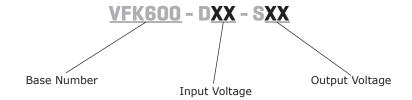




MODEL	input voltage	output voltage	output current	output power	ripple and noise¹	efficiency
	range (Vdc)	(Vdc)	max (A)	max (W)	max (mVp-p)	typ (%)
VFK600-D24-S12	18 ~ 36	12	50.0	600	120	89
VFK600-D24-S24	18 ~ 36	24	25.0	600	240	91
VFK600-D24-S28	18 ~ 36	28	21.5	600	280	90
VFK600-D24-S32	18 ~ 36	32	19.0	608	320	91
VFK600-D24-S48	18 ~ 36	48	12.5	600	480	92
VFK600-D48-S12	36 ~ 75	12	50.0	600	120	90
VFK600-D48-S24	36 ~ 75	24	25.0	600	240	91
VFK600-D48-S28	36 ~ 75	28	25.0	700	280	91
VFK600-D48-S32	36 ~ 75	32	19.0	608	320	92
VFK600-D48-S48	36 ~ 75	48	12.5	600	480	92

Notes: 1. Ripple and noise are measured at full load, 20 MHz BW with 10µF tantalum capacitor and 1µF ceramic capacitor across output

PART NUMBER KEY



INPUT

conditions/d	escription	min	typ	max	units
		18 36	24 48	36 75	Vdc Vdc
			37.7 21.7		A A
24 Vdc input	power up power down	16 15	17 16	18 17	Vdc Vdc
48 Vdc input	power up power down	34 32	35 33	36 34	Vdc Vdc
24 Vdc input	power up power down	:	38 40		Vdc Vdc
48 Vdc input	power up power down		77 80		Vdc Vdc
nasitiva lasia	models ON (3.5~7.5 Vdc or open circuit)				
positive logic	models OFF (0~0.7 Vdc)				
Pi filter					
	24 Vdc input n 48 Vdc input n 24 Vdc input n 48 Vdc input n 24 Vdc input 48 Vdc input 48 Vdc input 48 Vdc input 48 Vdc input 60 A time dela 30 A time dela	power down 48 Vdc input power down 24 Vdc input power up power down 48 Vdc input power down 48 Vdc input power up power down positive logic models ON (3.5~7.5 Vdc or oper models OFF (0~0.7 Vdc) 60 A time delay fuse for 24 Vin models, 30 A time delay fuse for 48 Vin models	24 Vdc input models 48 Vdc input models, Vin = 18 Vdc, full load 48 Vdc input models, Vin = 36 Vdc, full load 48 Vdc input models, Vin = 36 Vdc, full load 24 Vdc input power up power down 15 48 Vdc input power up power down 32 24 Vdc input power up power down 32 24 Vdc input power up power down 48 Vdc input power up power down 48 Vdc input power up power down 60 A time delay fuse for 24 Vin models, 30 A time delay fuse for 48 Vin models	24 Vdc input models 18 24 48 Vdc input models 36 48 24 Vdc input models, Vin = 18 Vdc, full load 37.7 48 Vdc input models, Vin = 36 Vdc, full load 21.7 24 Vdc input power up power down 16 17 48 Vdc input power up power down 34 35 24 Vdc input power up power down 38 38 48 Vdc input power up power down 77 80 Positive logic models ON (3.5~7.5 Vdc or open circuit) models OFF (0~0.7 Vdc) 60 A time delay fuse for 24 Vin models, 30 A time delay fuse for 48 Vin models 30 A time delay fuse for 48 Vin models	24 Vdc input models 48 Vdc input models 48 Vdc input models 24 Vdc input models, Vin = 18 Vdc, full load 48 Vdc input models, Vin = 18 Vdc, full load 48 Vdc input models, Vin = 36 Vdc, full load 21.7 24 Vdc input power up power down 15 16 17 48 Vdc input power up power down 32 33 34 24 Vdc input power up power down 32 33 34 24 Vdc input power up power down 40 48 Vdc input power up power down 40 77 power up power down 40 8 Vdc input power up power down 40 77 models ON (3.5~7.5 Vdc or open circuit) models OFF (0~0.7 Vdc) 60 A time delay fuse for 24 Vin models, 30 A time delay fuse for 48 Vin models

OUTPUT

parameter	conditions/description	min	typ	max	units
maximum capacitive load	12 V output models 24~48 V output models	470 470		10,000 5,000	μF μF
line regulation	measured from low line to high line			±0.2	%
load regulation	measured from zero load to full load			±0.5	%
voltage accuracy				±1.5	%
load share accuracy	50~100% load		±10		%
adjustability		60		110	%
switching frequency	48 V input, 12/28/32 V output models all other models		300 250		kHz kHz
transient response	25% step load change			500	μs
temperature coefficient			±0.03		%/°C

PROTECTIONS

parameter	conditions/description	min	typ	max	units
short circuit protection	continuous				
over current protection	% nominal output current	110		150	%
over voltage protection	%Vo	115		140	%
over temperature protection	shutdown		110		°C

SAFETY AND COMPLIANCE

parameter	conditions/description	min	typ	max	units
isolation voltage	for 1 minute: input to output; input to case; output to case	1,500			Vdc
isolation resistance		10			МΩ
RoHS	yes				

ENVIRONMENTAL

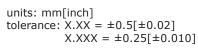
parameter	conditions/description	min	typ	max	units
operating temperature	see derating curves	-40		85	°C
storage temperature		-55		105	°C

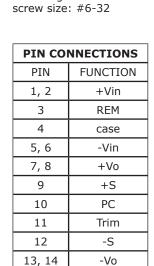
MECHANICAL

parameter	conditions/description	min	typ	max	units
dimensions	199.14 x 126.75 x 39.12 (7.84 x 4.99 x 1.54 inch)				mm
case material	steel and aluminum extrusion				
weight			1.2		kg

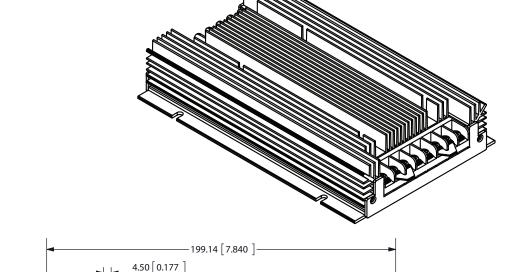
MECHANICAL DRAWING

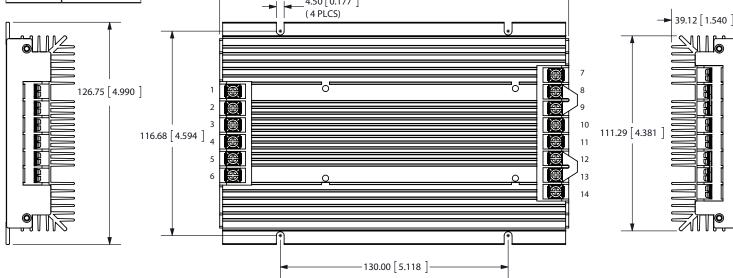






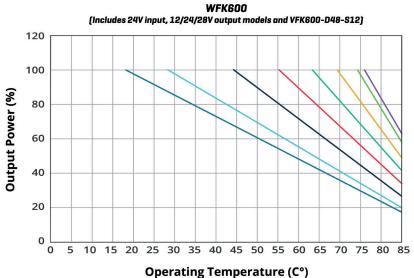
wire range: 22~12 AWG

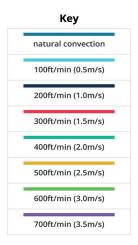




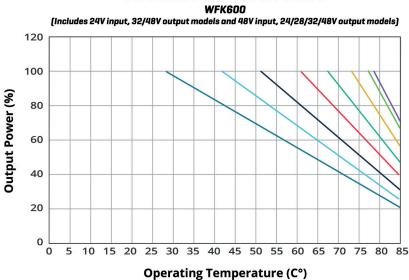
DERATING CURVES

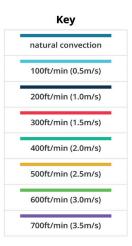
TEMPERATURE DERATING CURVE





TEMPERATURE DERATING CURVE





TEST CONFIGURATION

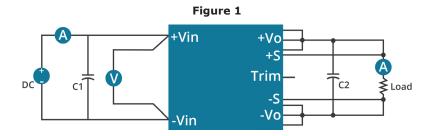


Table 1

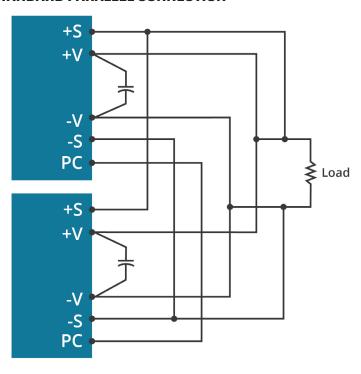
Recommended External components				
C1	220 μF/100 V			
C2	470 μF/100 V			

APPLICATION NOTES

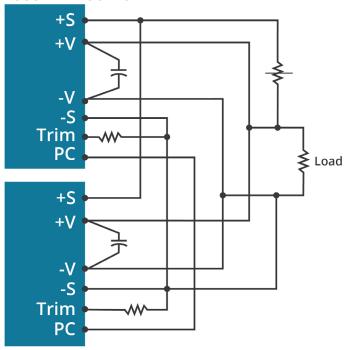
Parallel Operation

The VFK600 series are designed for parallel operation. When in parallel the load current can be shared equally between the two modules by connecting their PC pins. The VFK600 can be setup in two different modes to achieve parallel operation. The stan dard parallel operation is suitable when load cannot be handled by a single unit, whereas the N+1 redundant operation is suitable for loads when backup power is required.

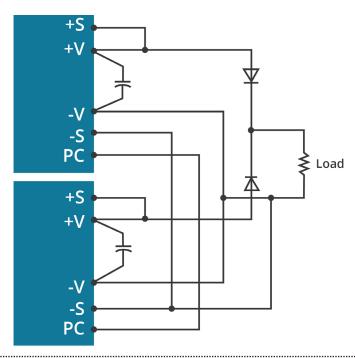
STANDARD PARALLEL CONNECTION



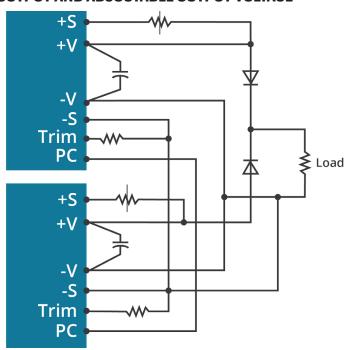
PARALLEL CONNECTION WITH PROGRAMMED AND **ADJUSTABLE OUTPUT**



N+1 REDUNDANT CONNECTION



N+1 REDUNDANT CONNECTION WITH PROGRAMMED **OUTPUT AND ADJUSTABLE OUTPUT VOLTAGE**

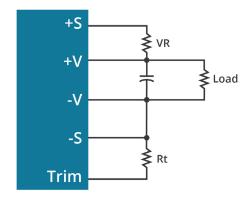


APPLICATION NOTES (CONTINUED)

Output Voltage Trimming

Leave open if not used.

Figure 2 External Resistors



Trim-Up/Trim-Down Formulas

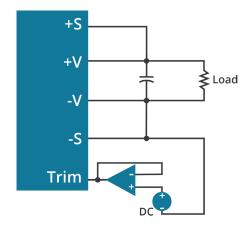
$$Vf = \frac{1.24 \times (\frac{Rt \times 33}{mt + 33})}{7.68 + (\frac{Rt \times 33}{mt + 33})}$$

$$Vout = (Vo + VR) \times Vf$$

Note: Rt = $6.8 \text{ K}\Omega$

 V_{o} is the nominal output voltage V_{out} is the desired output voltage (up or down) VR is the trim resistor in $K\Omega$

Figure 3 External DC Voltage



Note:

Trim-Up/Trim-Down Formulas

Vout =
$$V_T \times V_O$$

Note: V_{τ} is the trim terminal voltage $V_{\rm o}$ is the nominal output voltage $V_{\rm out}$ is the desired output voltage (up or down)

REVISION HISTORY

rev.	description	date
1.0	initial release	11/04/2011
1.01	derating curves added	03/12/2012
1.02	V-Infinity branding removed	08/07/2012
1.03	updated spec	03/13/2013
1.04	added parallel operation and trimming information	12/17/2013
1.05	company logo updated	02/15/2021
1.06	derating curve and circuit figures updated	09/13/2021
1.07	company address updated	11/20/2024
1.08	datasheet updated	05/29/2025

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



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CUI offers a two (2) year limited warranty. Complete warranty information is listed on our website.

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