



# CFB600 SERIES

## 600 TO 700 WATTS 2:1 INPUT DC-DC CONVERTERS



### FEATURES

- \* 600-700W Isolated Output
- \* Efficiency to 92%
- \* Fixed Switching Frequency
- \* Input Under-Voltage Protection
- \* Over Temperature Protection
- \* Over Voltage/Current Protection
- \* Remote On/Off
- \* Industry Full-Brick Package
- \* Fully Isolated 1500VDC
- \* IEC/EN/UL 62368-1 Approval



| MODEL NUMBER | INPUT VOLTAGE | OUTPUT VOLTAGE | OUTPUT CURRENT |        | INPUT CURRENT |           | % EFF. | CAPACITOR LOAD MAX.          |
|--------------|---------------|----------------|----------------|--------|---------------|-----------|--------|------------------------------|
|              |               |                | MIN.           | MAX.   | NO LOAD       | FULL LOAD |        |                              |
| CFB600-24S12 | 18-36 VDC     | 12 VDC         | 0 mA           | 50 A   | 150 mA        | 28.09 A   | 88     | 10000 $\mu$ F <sup>(2)</sup> |
| CFB600-24S24 | 18-36 VDC     | 24 VDC         | 0 mA           | 25 A   | 150 mA        | 27.78 A   | 89     | 5000 $\mu$ F <sup>(2)</sup>  |
| CFB600-24S28 | 18-36 VDC     | 28 VDC         | 0 mA           | 21.5 A | 150 mA        | 27.87 A   | 90     | 5000 $\mu$ F <sup>(2)</sup>  |
| CFB600-24S32 | 18-36 VDC     | 32 VDC         | 0 mA           | 19 A   | 150 mA        | 27.84 A   | 91     | 70000 $\mu$ F <sup>(2)</sup> |
| CFB600-24S48 | 18-36 VDC     | 48 VDC         | 0 mA           | 12.5 A | 200 mA        | 27.47 A   | 91     | 5000 $\mu$ F <sup>(2)</sup>  |
| CFB600-48S12 | 36-75 VDC     | 12 VDC         | 0 mA           | 50 A   | 90 mA         | 13.89 A   | 90     | 10000 $\mu$ F <sup>(2)</sup> |
| CFB600-48S24 | 36-75 VDC     | 24 VDC         | 0 mA           | 25 A   | 100 mA        | 13.59 A   | 92     | 5000 $\mu$ F <sup>(2)</sup>  |
| CFB700-48S28 | 36-75 VDC     | 28 VDC         | 0 mA           | 25 A   | 105 mA        | 16.03 A   | 91     | 5000 $\mu$ F <sup>(2)</sup>  |
| CFB600-48S32 | 36-75 VDC     | 32 VDC         | 0 mA           | 19 A   | 90 mA         | 13.77 A   | 92     | 5000 $\mu$ F <sup>(2)</sup>  |
| CFB600-48S48 | 36-75 VDC     | 48 VDC         | 0 mA           | 12.5 A | 130 mA        | 13.59 A   | 92     | 5000 $\mu$ F <sup>(2)</sup>  |

#### NOTE:

1. Nominal Input Voltage 24, 48 VDC
2. The Output Terminal of All Models Required a Minimum Capacitor 470 $\mu$ F to Maintain Specified Regulation.

# SPECIFICATIONS

All Specifications Typical at Nominal Line, Full Load, and 25°C Unless Otherwise Noted

## INPUT SPECIFICATIONS:

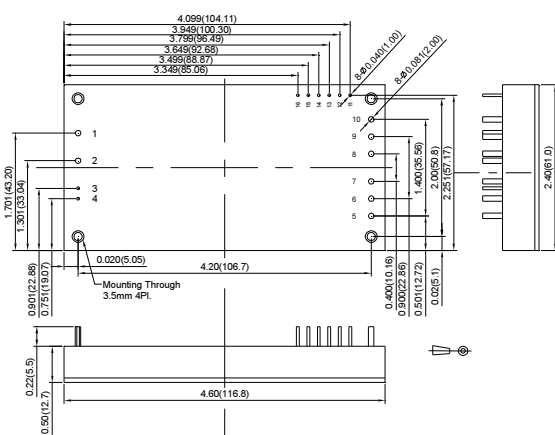
|                                        |                        |                       |
|----------------------------------------|------------------------|-----------------------|
| Input Voltage Range.....               | 24V .....              | 18-36V                |
|                                        | 48V .....              | 36-75V                |
| Input Surge Voltage (100ms max.) ..... | 24V .....              | 50Vdc max.            |
|                                        | 48V .....              | 100Vdc max.           |
| Under voltage lockout .....            | 24Vin power up .....   | 17V                   |
|                                        | 24Vin power down ..... | 16V                   |
|                                        | 48Vin power up .....   | 35V                   |
|                                        | 48Vin power down ..... | 33V                   |
| Input over voltage protection ...      | 24Vin turn off ....    | 40V, turn on .... 38V |
|                                        | 48Vin turn off ....    | 80V, turn on .... 77V |
| Opto Isolated Remote On/Off (note6)    |                        |                       |
| Input Filter .....                     | PI Type                |                       |

## OUTPUT SPECIFICATIONS:

|                                                    |                                  |
|----------------------------------------------------|----------------------------------|
| Voltage Accuracy .....                             | ±1.0% max.                       |
| Transient Response:25% Step Load Change .....      | <500us                           |
| External Trim Adj. Range .....                     | 60-110%                          |
| Load share Accuracy .....                          | ±10% at 50% to 100% Full Load    |
| Auxiliary output voltage/current .....             | 10±3Vdc/20mA max.                |
| Ripple & Noise, 20MHz BW                           |                                  |
| 12V .....                                          | 60mV RMS max., 120mV pk-pk max.  |
| 24V .....                                          | 100mV RMS max., 240mV pk-pk max. |
| 28V .....                                          | 100mV RMS max., 280mV pk-pk max. |
| 32V .....                                          | 120mV RMS max., 320mV pk-pk max. |
| 48V .....                                          | 200mV RMS max., 480mV pk-pk max. |
| Temperature Coefficient .....                      | ±0.03%/°C max.                   |
| Short Circuit Protection .....                     | Continuous                       |
| Line Regulation (note1) .....                      | ±0.2% max.                       |
| Load Regulation (note2) .....                      | ±0.5% max.                       |
| Over Voltage Protection Trip Range, % Vo Nom. .... | 115-140%                         |
| Current Limit .....                                | 110%-150% Nominal Output         |
| Start up Time .....                                | 160ms typ.                       |

## CASE FB

All Dimensions in Inches(mm)  
Tolerances Inches: XX±0.02 XXX±0.010 ±0.004  
Millimeters: X±0.5 XX±0.25 ±0.1



| PIN NUMBER | FUNCTION  |
|------------|-----------|
| 1          | -V Input  |
| 2          | +V Input  |
| 3          | -On/Off   |
| 4          | +On/Off   |
| 5-7        | +V Output |
| 8-10       | -V Output |
| 11         | -S        |
| 12         | +S        |
| 13         | TRIM      |
| 14         | PC/NC     |
| 15         | IOG       |
| 16         | AUX       |

The output voltage can be determined by below equations:

$$V_f = \frac{1.24 \times \left( \frac{R_t \times 33}{R_t + 33} \right)}{7.68 + \frac{R_t \times 33}{R_t + 33}}$$

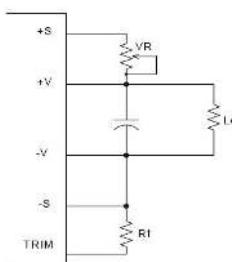
$$V_{out} = (V_o + V_R) \times V_f$$

Unit: KΩ

Vo: Nominal Output Voltage

Rt=6.8KΩ

Fig.1 The schematic of output voltage adjusted by using external resistor and/or variable resistor.

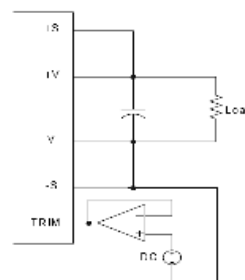


## GENRAL SPECIFICATIONS:

|                                   |                                             |                                           |
|-----------------------------------|---------------------------------------------|-------------------------------------------|
| Efficiency .....                  | See Table                                   |                                           |
| Isolation Voltage .....           | Input/Output, Input/Case, Output/Case ..... | 1500VDC min.                              |
| Isolation Resistance .....        |                                             | 10 <sup>7</sup> ohm min.                  |
| Isolation Capacitance .....       |                                             | 4000pF typ.                               |
| Switching Frequency .....         | 48S12&48S28&48S32 .....                     | 300KHz typ.                               |
|                                   | Others .....                                | 250KHz typ.                               |
| Operating Case Temperature .....  |                                             | -40℃ to 100℃                              |
| Storage Temperature .....         |                                             | -55℃ to +105℃                             |
| Thermal Shutdown, Case Temp. .... |                                             | 110℃ typ.                                 |
| Humidity .....                    |                                             | 95% RH max. Non Condensing                |
| MTBF .....                        | MIL-HDBK-217F, GB, 25℃, Full Load .....     | 450Khrs typ.                              |
| Dimensions .....                  |                                             | 4.60×2.40×0.50 Inches(116.8×61.0×12.7 mm) |
| Case Material .....               |                                             | Aluminum Baseplate with Plastic Case      |
| Weight .....                      |                                             | 220g                                      |

## NOTE:

1. Measured from high line to low line.
2. Measured from full load to zero load.
3. Output ripple and noise measured with 10uF tantalum and 1uF ceramic capacitor across output.
4. The output adjustment circuit and trim equations show as figure1 and figure2.
5. An external input capacitor 1000uF for CFB600-24S32, 220uF for other models are recommended to reduce input ripple voltage.
6. Standard model is negative logic, suffix "P" to the model number with positive logic. (refer application note)
7. If the remote sense feature is not to be used, the +sense pin should be connected to the +Vout pin and the -sense pin should be connected to the -Vout pin. (refer application note Item 6.9)



Output Voltage = TRIM  
Terminal Voltage \* Nominal  
Output Voltage

Fig.2 The schematic of output voltage adjusted by using external DC voltage.