

# F3000ERU Series

## Compact 30W, 4:1 Input Single & Dual Output DC/DC Converters



### Key Features:

- 30W Output Power
- 4:1 Input Voltage Range
- 1,500 VDC Isolation
- Single & Dual Outputs
- Compact 1.6 x 2 In. Case
- -40°C to +85°C Operation
- >1.0 MHour MTBF
- Remote ON/OFF
- Industry Standard Pin-Out

Triple Output Models Available F3000TERU Series



RoHS



### MicroPower Direct

292 Page Street  
Suite D  
Stoughton, MA 02072  
USA

T: (781) 344-8226  
F: (781) 344-8481  
E: sales@micropowerdirect.com  
W: www.micropowerdirect.com



### Electrical Specifications

Specifications typical @ +25°C, nominal input voltage & rated output current, unless otherwise noted. Specifications subject to change without notice.

#### Input

Parameter	Conditions	Min.	Typ.	Max.	Units
Input Voltage Range	24 VDC Input	9.0	24.0	36.0	VDC
	48 VDC Input	18.0	48.0	75.0	
Under Voltage Shutdown	24 VDC Input	8.0		9.0	VDC
	48 VDC Input	16.0		17.8	
Input Filter, See Note 1	$\pi$ (Pi) Filter				
Input Reflected Ripple Current			30		mA
Start Up Time			10		mS

#### Output

Parameter	Conditions	Min.	Typ.	Max.	Units
Output Voltage Accuracy			±2.0		%
Line Regulation	For $V_{IN}$ Min to Max		±0.2	±0.5	%
Load Regulation	$I_{OUT} = 10\%$ to 100%		±0.5	±1.0	%
Ripple & Noise, See Note 2			85	120	mV P - P
Output Power Protection			130		%
Transient Recovery Time, See Note 3	25% Load Step Change		300	500	$\mu$ Sec
Transient Response Deviation				±5.0	
Temperature Coefficient			±0.02		%/°C
Output Short Circuit	Continuous (Autorecovery)				

#### General

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation Voltage	60 Seconds	1,500			VDC
Isolation Resistance	500 VDC	1,000			M $\Omega$
Isolation Capacitance	100 kHz, 0.1V		2,000		pF
Switching Frequency			400		kHz

#### Remote On/Off (Note 4)

Parameter	Conditions	Min.	Typ.	Max.	Units
Supply On		3.5		12.0	VDC
Supply Off		-0.0		1.2	VDC
Standby Input Current				1	mA
Control Common					Referenced to Negative Input (pin 2)

#### Environmental

Parameter	Conditions	Min.	Typ.	Max.	Units
Operating Temperature Range	Ambient	-40		+85	°C
	Case			+105	°C
Storage Temperature Range		-55		+125	°C
Cooling	Free Air Convection				
Humidity	RH, Non-condensing			95	%

#### Physical

Case Size	2.0 x 1.6 x 0.465 Inches (50.8 x 40.6 x 11.8 mm)
Case Material	Metal with Non-Conductive Base
Weight	1.76 Oz (50g)

#### Reliability Specifications

Parameter	Conditions	Min.	Typ.	Max.	Units
MTBF	MIL HDBK 217F, 25°C, Gnd Benign	1,000			kHours

#### Absolute Maximum Ratings

Parameter	Conditions	Min.	Typ.	Max.	Units
Input Voltage Surge (1 Sec)	24 VDC Input	-0.7		40.0	VDC
	48 VDC Input	-0.7		80.0	
Lead Temperature	1.5 mm From Case For 10 Sec			300	°C

**Caution:** Exceeding Absolute Maximum Ratings may damage the module. These are not continuous operating ratings.

[www.micropowerdirect.com](http://www.micropowerdirect.com)

Model Number	Input				Output			Efficiency (% Typ)	Overvoltage Protection (VDC)	Capacitive Load (µF Max.)	Fuse Rating Slow-Blow (mA)
	Voltage (VDC)		Current (mA)		Voltage (VDC)	Current (mA, Max)	Current (mA, Min)				
	Nominal	Range	Full-Load	No-Load							
F3003ERU	24	9.0 - 36.0	1,420	120	5.0	6,000	300	88	6.1	6,000	6,000
F3004ERU	24	9.0 - 36.0	1,420	30	12.0	2,500	125	88	15.0	2,500	6,000
F3005ERU	24	9.0 - 36.0	1,420	30	15.0	2,000	100	90	18.0	1,100	6,000
F3007ERU	24	9.0 - 36.0	1,450	30	±5.0	±3,000	±150	86	±6.1	±2,000	6,000
F3008ERU	24	9.0 - 36.0	1,420	30	±12.0	±1,250	±63	89	±15.0	±1,250	6,000
F3009ERU	24	9.0 - 36.0	1,420	30	±15.0	±1,000	±50	90	±18.0	±680	6,000
F3013ERU	48	18.0 - 75.0	710	100	5.0	6,000	300	88	6.1	6,000	3,000
F3014ERU	48	18.0 - 75.0	710	30	12.0	2,500	125	88	15.0	2,500	3,000
F3015ERU	48	18.0 - 75.0	710	30	15.0	2,000	100	89	18.0	1,100	3,000
F3017ERU	48	18.0 - 75.0	712	30	±5.0	±3,000	±150	86	±6.1	±2,000	3,000
F3018ERU	48	18.0 - 75.0	710	30	±12.0	±1,250	±63	87	±15.0	±1,250	3,000
F3019ERU	48	18.0 - 75.0	710	30	±15.0	±1,000	±50	87	±18.0	±680	3,000

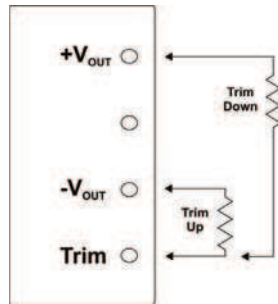
For Heatsink Option, add suffix "H" to model number (i.e. F3003ERU-H)

Notes:

- With the addition of a simple external circuit, the units will pass EN 55022 and EN 61000 EMI specifications. Contact the factory for recommendations.
- When measuring output ripple, it is recommended that an external ceramic capacitor (see table at right) be placed from the +Vout pin to the -Vout pin for single output units and from each output to common for dual output units.
- Transient recovery is measured to within a 1% error band for a load step change of 75% to 100%.
- The Remote On/Off Control input (Pin 4) is referenced to -Vin (Pin 2). This input may be tied directly to ground, but it is recommended that connection to the pin should be made through a 1kΩ resistor and diode (1N4148). If it is not used, the control pin should be left open.
- Operation at no-load will not damage these units. However, they may not meet all specifications.
- It is recommended that a fuse be used on the input of a power supply for protection. See the table above for the correct rating.

Vout	Output Cap.
5 VDC	10 µF
12 VDC	4.7 µF
15 VDC	4.7 µF
±5 VDC	±10 µF
±12 VDC	±4.7 µF
±15 VDC	±4.7 µF

External Trim



A simple external circuit may be used to adjust the converter output ±10%. The following formulas may be used to calculate the correct resistor value. To trim the output up, the correct resistor value (in kΩ) equals:

$$R_{UP} = \frac{A \times R_2}{R_2 - A} - R_3 \quad \text{Where: } A = \frac{2.5}{V_{ADJ} - 2.5} \times R_1$$

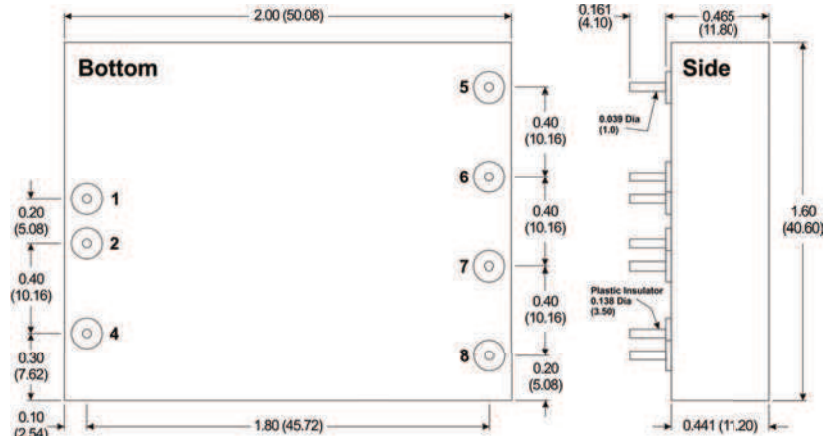
To trim the output down, the correct resistor value (in kΩ) equals:

$$R_{DOWN} = \frac{A \times R_1}{R_1 - A} - R_3 \quad \text{Where: } A = \frac{V_{ADJ} - 2.5}{2.5} \times R_2$$

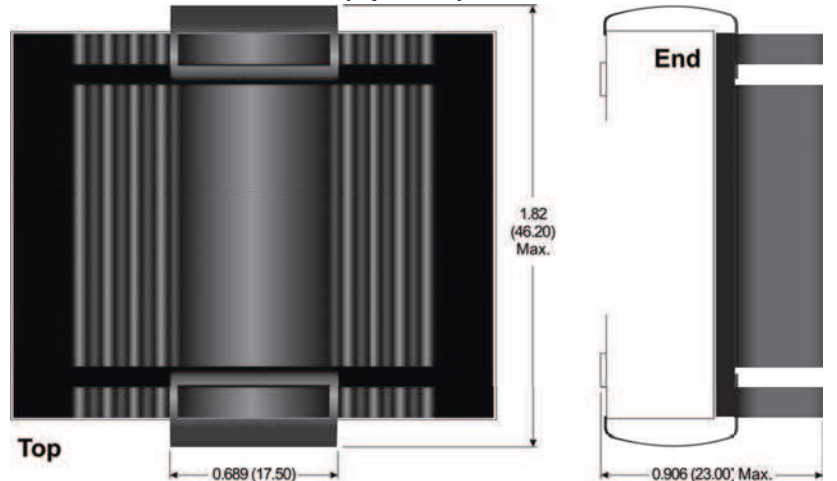
Other equation values are:

	Unit Input Voltage		
	5V	12V	15V
R <sub>1</sub>	2.883	10.971	14.497
R <sub>2</sub>	2.864	2.864	2.864
R <sub>3</sub>	10.0	17.8	17.8
V <sub>ADJ</sub>	Amount of Adjustment		

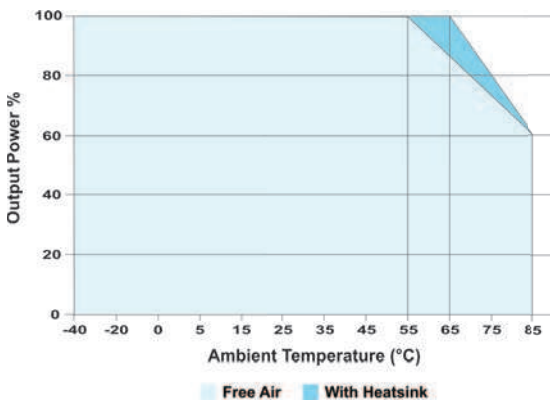
Mechanical Dimensions



Heatsink Dimensions (Optional)



Derating Curves



Pin Connections

Pin	Single	Pin	Dual
1	+VIN	1	+VIN
2	-VIN	2	-VIN
4	ON/OFF	4	ON/OFF
5	No Pin	5	+VOUT
6	+VOUT	6	Common
7	-VOUT	7	-VOUT
8	Trim	8	Trim

Mechanical Notes:

- All dimensions are typical in inches (mm)
- Tolerance x.xx = ±0.01 (±0.25)



**MicroPower Direct**  
We Power Your Success - For Less!