



## Functional Description

The FRA3S & FRA3D series of regulated 3W single & dual DC/DC converters feature industry standard pinout in a 24-pin DIP package with a minimum isolation voltage of 1000Vdc, maximum efficiency of 85% and operating temperature range from -40°C to +85°C.

## Electrical Specifications: Regulated

### INPUT SPECIFICATIONS

Measured at 25°C with the condition of  $V_{IN}$  = Nominal and Full Load. Specifications subject to change without notice.

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Input Voltage Range	4:1; See Model Selection Guide				
Input Filter	$\pi$				

### OUTPUT SPECIFICATIONS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Output Voltage	$I_O = 900\text{mA}$ ; See Model Selection Guide				
Output Current	See Model Selection Guide				
Output Voltage Accuracy			$\pm 1$	$\pm 2$	%
Ripple & Noise	@20MHz BW, $V_{IN} = 24\text{Vdc}$ , $I_O = 900\text{mA}$ ; See Figure 1			50	mV <sub>pp</sub>
Line Regulation	Minimum $V_{IN}$ to maximum $V_{IN}$			0.3	%
Load Regulation	20% FL to FL			0.6	%
Short Circuit Protection	Continuous, Auto-restarting				

### GENERAL SPECIFICATIONS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Efficiency	$V = 24\text{Vdc}$ , $I = 900\text{mA}$ ; See Model Selection Guide				
Isolation Voltage (1 min.), Input to Output		2000			Vdc
Isolation Resistance		1			G $\Omega$
Isolation Capacitance			60		pF
Operating Frequency	$V = \text{Nominal Input}$		160		kHz

### ENVIRONMENTAL SPECIFICATIONS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Operating Temperature Range	Ambient	-40		+85	°C
Storage Temperature Range		-50		+125	°C
Case Temperature	$V_{IN} = \text{Nominal Input}$ @ $T_a = 25^\circ\text{C}$		38		°C
Humidity				95	%
MTBF	per MIL-HNBK-217F		$10^6$		hrs

### PHYSICAL CHARACTERISTICS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Dimensions (L×W×H)	1.26×0.80×0.40 in. (32.00×20.30×10.20mm)				
Weight	0.42 oz. (12g)				
Case Material	Non-conductive black plastic				
Potting Material	Epoxy (UL94V-0)				

**MODEL SELECTION GUIDE** (Insert **ι** after Model Number for 4000Vdc minimum Isolation Voltage; Insert **M** for Metal Case)

MODEL NUMBER	OUTPUT VOLTAGE (Vdc)	OUTPUT CURRENT (mA)	INPUT VOLTAGE (Vdc)	EFFICIENCY (%)
FRA3S3.3/24	3.3	850	9–36	77
FRA3S5/24 / FRA3D5/24	5 / ±5	600 / ±300	9–36	79
FRA3S9/24 / FRA3D9/24	9 / ±9	333 / ±167	9–36	81
FRA3S12/24 / FRA3D12/24	12 / ±12	250 / ±125	9–36	83
FRA3S15/24 / FRA3D15/24	15 / ±15	200 / ±100	9–36	84
FRA3S3.3/48	3.3	900	18–72	78
FRA3S5/48 / FRA3D5/48	5 / ±5	600 / ±300	18–72	80
FRA3S9/48 / FRA3D9/48	9 / ±9	333 / ±167	18–72	82
FRA3S12/48 / FRA3D12/48	12 / ±12	250 / ±125	18–72	84
FRA3S15/48 / FRA3D15/48	15 / ±15	200 / ±100	18–72	85

**Mechanical Specifications**

