



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	π				

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			± 1	± 2	%
Ripple & Noise	@20MHz BW, $V_{IN} = 24\text{Vdc}$, $I_O = 900\text{mA}$; See Figure 1			50	mV _{pp}
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 Ω
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

BOTTOM VIEW

Dimensions (Inch [mm]):

- 0.80 [20.30] (Total height)
- 0.600 [15.24] (Distance from top edge to pin 2)
- 0.100 [2.54] (Distance from bottom edge to pin 23)
- 0.184 [4.67] (Distance between pins 2 and 23)
- 1.260 [32.00] (Total width)
- 0.402 [10.20] (Distance from top edge to mounting hole center)
- 0.160 [4.10] (Distance from bottom edge to mounting hole center)
- 0.600 [15.24] (Distance between mounting holes)
- 0.100 [2.54] TYP. (Distance between mounting holes)
- 0.020 [0.51] DIA. ±.003 [0.07] (Mounting hole diameter)

Pin	Function	
	Single	Dual
2,3	-V _{IN}	-V _{IN}
9	NC	COM
11	NC	-V _{OUT}
14	+V _{OUT}	+V _{OUT}
16	-V _{OUT}	COM
22,23	+V _{IN}	+V _{IN}

DIMENSIONS ARE IN INCH(mm)
TOLERANCE:
.XX ±.02[0.50]
.XXX±.010[0.254]

