

**SINGLE, DUAL, TRIPLE OUTPUT SWITCHING POWER SUPPLIES**

— Active Power Factor Correction, Up to 200W Output, Rugged Low-Profile Package —

**Features**

- 3.3V and 5V Singles
- 3.3/5V, 3.3/12V, and 5/12V Duals
- 3.3/5/12V Triple with N+1, Current Share
- Continuous Output Ratings to 200W
- Universal AC Input
- EN60555-2 (Power Factor) Compliant
- EN55022/FCC Class B Input Filter
- EN61000-4 EMC/ESD Immunity
- EN61000-3-2 Harmonic Current Limits
- Remote Sense
- TTL-Compatible Output Failure Warning (Single Output, Dual Output Models)
- TTL-Compatible Remote On/Off (Triple Output Model)
- Over-Voltage/Short-Circuit/Overload Protection
- Thermal Protection
- 7.5×4.5×1.47" U-Channel Chassis with Cover
- 2-Year W



**FDA200 Characteristics**

Input Voltage Range.....	85-265 VAC (120/240 VAC, nominal).
Input Line Frequency .....	47-63 Hz (50/60 Hz, nominal).
Input Current .....	3.5A, maximum.
In-Rush Current.....	50A, peak, at T <sub>A</sub> = +25°C.
Input Line Protection .....	MOV transient protected. Input line fuse provided on-board. (See Note 3.)
EMI Suppression Filter.....	Standard; performance better than the requirements of conducted emissions standards EN55022/FCC Class B.
Continuous Output Power.....	Models FDA1-200-1BD and FDA2-200-1BD, 165W, maximum. Models FDA1-200-2BD, FDA2-200-2BD, and FDA3-200-1BD, 200W, maximum.
Turn-On Delay.....	0.8 seconds, maximum.
Output Rise Time .....	50 ms, maximum.
Turn-On Overshoot .....	None.
Design Topology .....	Forward converter operating under current-mode control.
Frequency of Operation .....	67 kHz, fixed.
Output Voltage Adjustment.....	FDA1-200 and FDA2-200, all outputs adjustable ±5%. FDA3-200, outputs V1 and V2 adjustable ±5%; V3 fixed.
Short-Circuit Protection.....	Continuous, cycle-by-cycle current limiting, all outputs; hiccup mode, automatic recovery.

**FDA200 Characteristics** (Continued)

Thermal Protection.....	+120°C critical component cutoff; automatic recovery.
Over-Voltage Protection.....	Latched OVP shutdown; input OFF/ON reset required. FDA1-200 and FDA2-200: Output V1, 110% to 130% of nominal. Output V2, 120% to 140% of nominal. FDA3-200: Output V1, 110% to 130% of nominal. Output V2, 110% to 130% of nominal. Output V3, 120% to 140% of nominal.
Efficiency .....	FDA1-200 & FDA2-200, 78%, typical, at 120 VAC input, full load conditions; 80%, typical, at 240 VAC input, full load. FDA3-200, 76%, typical, at 120 VAC input, full load conditions; 78%, typical, at 240 VAC input, full load.
Output-Fail Warning .....	FDA1-200 and FDA2-200 models: TTL-compatible; an active LOW signal, 16 ms, minimum, before loss of regulation.
Output DISABLE.....	FDA3-200: TTL-compatible; all outputs disabled with connector J4 pins shorted, or with voltage across them 0.8V or less; outputs enabled with connector J4 pins open, or with voltage across them 2.4V or more. Maximum voltage across connector J4 pins = 60V.
Electromagnetic Immunity.....	Meets the Electrostatic Discharge Immunity requirements of EN61000-4-2 (IEC801-2) at Level 4. Meets the Radiated Fields Immunity standards of EN61000-4-3 (IEC801-3) at Level 3.
Shock Immunity .....	Operating unit withstands triple 5g shocks (11 ms duration) on X, Y and Z axes without negative effect on performance.
Vibration Immunity .....	Unpowered unit withstands 1.5g vibration (5.5 to 200 Hz cycling over an 84-minute period, per Mil Std 810C, Method 514) on X, Y, Z axes without damage.
Transient Response .....	3 ms, maximum, recovery time to within 1% of the regulation window (150 mV peak deviation) after a step load change of 10A, maximum, at a slew rate of 0.1 A/μs.
Hi-Pot Isolation.....	4300 VDC, input-to-output, for 60 seconds (Note 4).
Operating Temperature Range .....	0°C to +50°C. Forced air cooling (100 LFM, minimum) is required.
Temperature De-Rating.....	2.5W/°C above +50°C to a maximum of +70°C.
Temperature Coefficient.....	±0.04%/°C over the operating temperature range.
Relative Humidity .....	0% to 95%, non-condensing.
Altitude .....	0 to 10,000 feet.
Storage Temperature Range.....	-20°C to +85°C.
Storage Humidity .....	0% to 95%, non-condensing.
Mean Time Between Failures .....	>165,000 hours (Note 12).

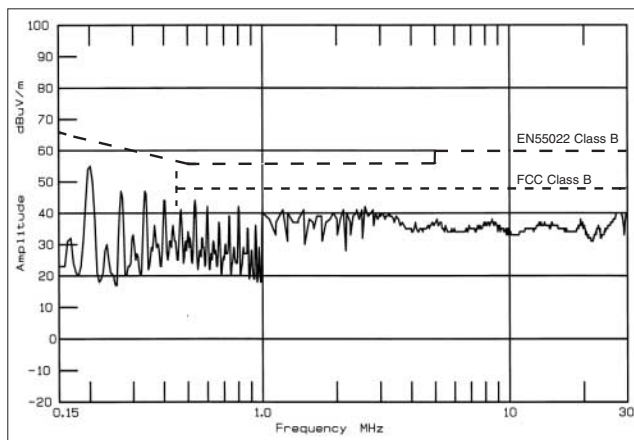
## Electrical Characteristics

Model Number	Output	Output Voltage (V)	Output Current			Output Voltage Tolerance	Initial Setting Tolerance	Ripple & Noise <sup>5</sup> (mVpp)	Line Regulation	Load Regulation	Cross- Regulation
			Min. (A)	Nom. (A)	Max. (A)						
FDA1-200-1CD	V1	3.3	0	50	50	±3%	±1.0%	100	±0.2%	±1.0%	—
FDA1-200-2CD	V1	5.0	0	40	40	±3%	±1.0%	100	±0.2%	±1.0%	—
FDA2-200-1CD	V1	3.3	0	40	50	±3%	±1.0%	100	±0.2%	±1.0%	—
	V2	+5.0	0	5.0	6.0	±5%	±2.0%	100	±0.5%	±3.0%	±3.0%
FDA2-200-2CD	V1	5.0	0	30	40	±3%	±1.0%	100	±0.2%	±1.0%	—
	V2	+12	0	4.0	5.0	±5%	±2.0%	100	±0.5%	±3.0%	±3.0%
FDA3-200-1CD	V1	5.0	3.0 <sup>9</sup>	22	40	±3%	±1.0%	100	±0.3%	±1.0%	—
	V2	3.3	0	22	40	±3%	±1.0%	100	±0.3%	±1.0%	±2.0%
	V3(ISO)	12	0	1.0	1.0	±3%	±3.0%	100	±0.3%	±1.0%	±2.0%

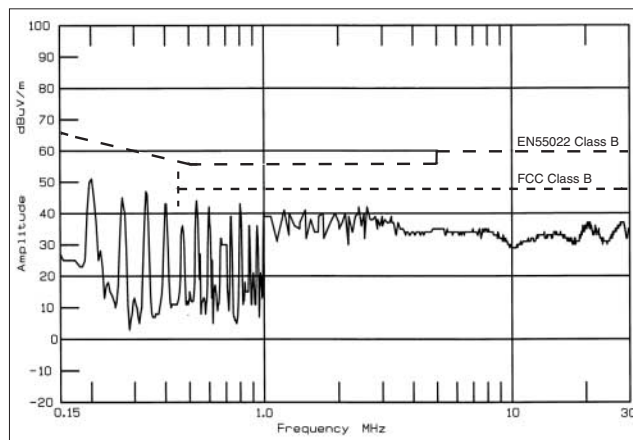
### Notes:

1. All measurements are at nominal input, nominal load and +25°C, unless otherwise specified.
2. All measurements are made directly at the terminals of the power supply.
3. Replace the input line fuse with the same type and rating. Recommended: 4A/250V slow-blow fuse.
4. High-pot isolation is 2200 VDC from the input of the power supply to ground for 60 seconds.
5. Ripple and noise figures shown in the Electrical Characteristics table are maximum values.
6. Peak-to-peak and RMS metering equipment must have a 20 MHz response with probes and cables that maintain a frequency response of 20 Hz to 20 MHz. Output ripple and spikes are measured directly at the output terminals of the power supply across a 0.1 µF ceramic capacitor without use of the probe ground. The probe ground must make contact with the output return to prevent erroneous noise measurements.
7. Output voltage tolerance is the total maximum variation from rated output, including the initial setting tolerance, line and load regulation variations, and cross-regulation swings.
8. Line regulation is measured under full load conditions as the input voltage is varied from 90 to 250 VAC.
9. Minimum current required to meet load regulation characteristic on V2 and V3 outputs.
10. Load regulation is measured at 120 VAC or 240 VAC input. The output under test is brought to 60% of full load. The load current is then varied ±40% of its maximum rating while the other outputs are held at full load conditions.
11. Cross-regulation is tested by changing the load on the V1 output from 10% to 100% of full load while measuring voltage change on the auxiliary output.
12. MTBF is calculated using the parts stress method in MIL-HDBK 217F (ground benign, T<sub>A</sub> = +25°C).

## Conducted EMI

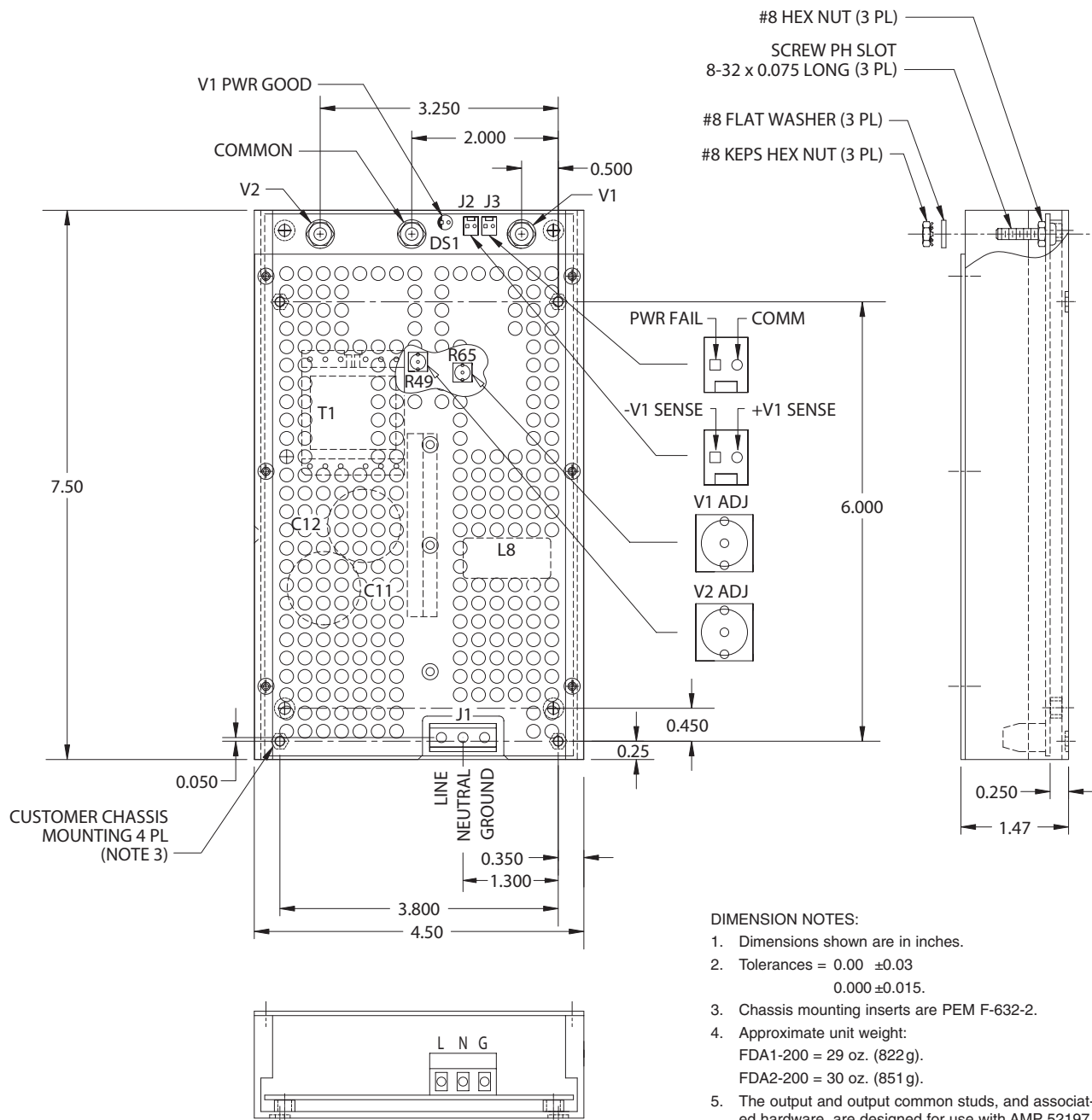


FDA1-200-1BD: V<sub>in</sub> = 120 VAC, Line-to-Ground



FDA1-200-1BD: V<sub>in</sub> = 240 VAC, Line-to-Ground

## Mechanical Outline and Terminal Configuration FDA1-200 and FDA2-200 Models



## Mechanical Outline and Terminal Configuration FDA3-200

