

Make-Ps®

DC/DC CONVERTER

200F Series

Key Features:

- ▶ Low Profile, 24 Pin DIP Package
- ▶ 500 VDC Input/Output Isolation
- ▶ 7.38W/In³ Power Density
- ▶ No Derating to +71°C
- ▶ Internal π (Pi) Filter
- ▶ Low Noise Operation
- ▶ Low Cost
- ▶ 72 Hour Burn-in (100% of Production)

General Description

The **200F** series is a family of low cost, 2.25W DC/DC converters specifically designed for applications such as local area networks where low cost, miniature size and long reliable operation are critical. Four models operate from power bus voltages of 5 or 12 VDC, providing a single 9 VDC output. Two packaging options are offered.

High performance features include efficiency as high as 80%, 500 VDC input/output isolation and low noise. Each model also includes an input π filter to reduce reflected ripple current and output short circuit protection with automatic recovery.

Two models of the **200F** series are packaged in a miniature, low profile 24 pin DIP case measuring 1.27 x 0.6 x 0.4 inches. The two "A" models are packaged in a compact, low profile 24 pin DIP compatible case measuring 1.25 x 0.80 x 0.40 inches. Both cases are non-conductive, black plastic. This miniature size yields a power density as high as 7.38W/in³.

Operation is specified over the wide operating temperature range of -0°C to +71°C with no derating required. Cooling is by free-air convection.

Electrical Specifications

Input Specifications:

Input Voltage Range	See Model Selection Guide
Input Filter	π (Pi) Network
Reflected Ripple Current	See Model Selection Guide

Output Specifications:

Output Voltage and Current ⁽¹⁾	See Model Selection Guide
Output Voltage Accuracy	±5%, Max.
Ripple & Noise (20 MHz BW)	50 mV Pk-Pk, Max.
Line Regulation	See Table 1 and Table 2
Load Regulation	See Table 1 and Table 2
Temperature Coefficient @ FL ⁽²⁾	±0.02%/°C
Short Circuit Protection	Momentary
Short Circuit Restart	Automatic

General Specifications:

Efficiency	See Model Selection Guide
Isolation Voltage (1 min)	500 VDC, Min.
Isolation Resistance	10 ⁹ Ω
Isolation Capacitance	80 pF
Switching Frequency	20 kHz Min.

Environmental Specifications:

Operating Temperature Range (Ambient)	-0°C to +71°C
Storage Temperature Range	-25°C to +125°C
Derating	None Required
Humidity	Up to 95%, Non-condensing
Cooling	Free-air Convection

Physical Characteristics:

Size (Case A)	1.27 x 0.6 x 0.4 inches (32.3 x 15.24 x 10.2 mm)
Size (Case A1)	1.25 x 0.8 x 0.4 inches (32 x 20.3 x 10.2 mm)
Weight	0.5 Oz (14g)
Case Material	Non-conductive Black Plastic

Absolute Maximum Ratings: ⁽³⁾

Input Voltage	130% of Input Range
Internal Power Dissipation	1.45W

Specifications typical @+25°C with nominal input voltage and under full output load conditions, unless otherwise noted. Specifications subject to change without notice.

Typical Applications:

- ▶ Local Area Networks
- ▶ Distributed Power Networks
- ▶ Telecommunications Equipment
- ▶ General Purpose, Board Mountable DC/DC Converter

200F Series
LOW COST, HIGH POWER DENSITY
24 PIN DIP COMPATIBLE, 2.25W
LAN DC/DC CONVERTERS

Model Selection Guide

Model Number	Input				Reflected Ripple (mA P-P)	Output		Efficiency @FL (%)	Case Style
	Voltage (VDC)		Current (mA)			Voltage (VDC)	Current (mA)		
	Nominal	Range	No-Load	Full-Load					
209S5F	5	4.5 - 5.5	170	560	57	9	250	78	A
209S12F	12	10.8 - 13.2	75	240	24	9	250	80	A
209S5FA	5	4.5 - 5.5	170	560	57	9	250	78	A1
209S12FA	12	10.8 - 13.2	75	240	24	9	250	80	A1

Line and Load Regulation: Table 1

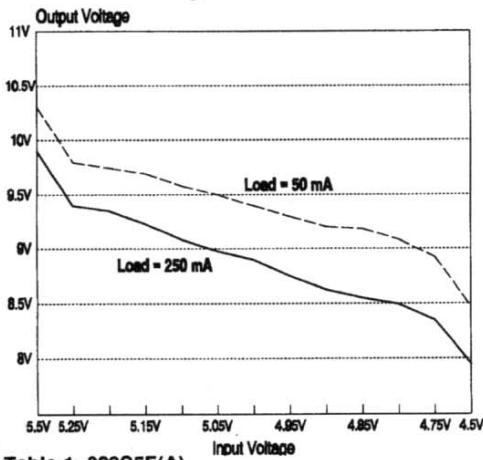


Table 1. 209S5F(A)

Table 2

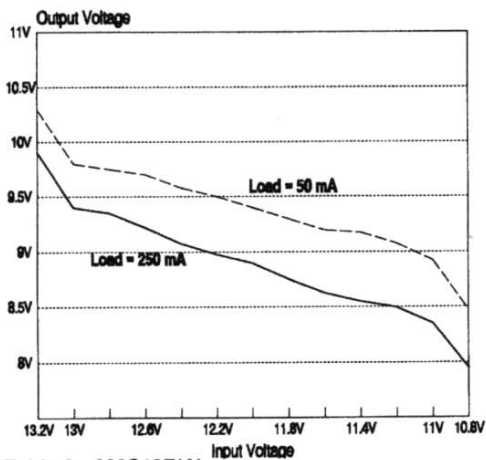
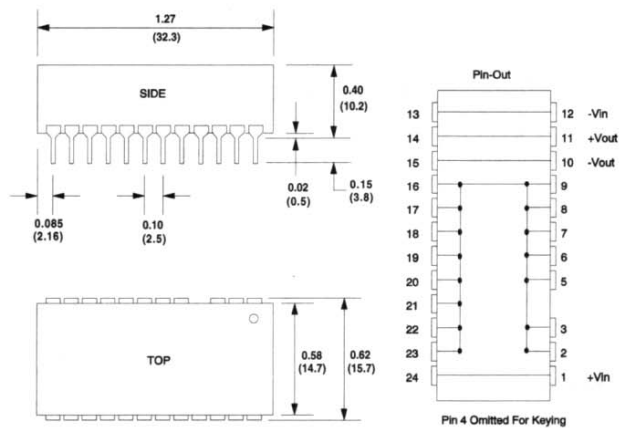
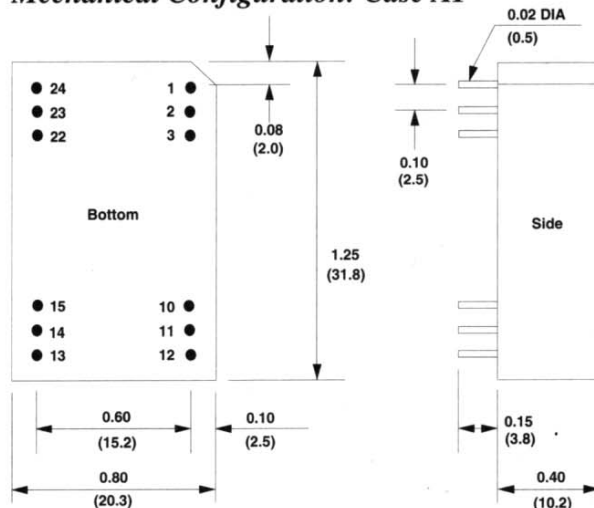


Table 2. 209S12F(A)

Mechanical Configuration: Case A



Mechanical Configuration: Case A1



Pin-Out Case A1

Pin	Description	Pin	Description
1,24	+V Input	11,14	+V Output
2,3	N/C	12,13	-V Input
10,15	-V Output	22,23	N/C

Ordering Information:
 Case A1 is standard and these models do not require a suffix. Case A is alternate. These models require a "A" suffix when ordering, i.e. 209S5FA

Note: All dimensions are typical in inches (mm).
 Tolerance X.XX = ± 0.02, (± 0.5)
 X.XXX = ± 0.010, (± 0.25)
 N/C = No Connection
 Pin 1 (A1 case) may be shown by a dot on the case top