



# 200HFS series

## Single & Dual Output DC/DC Converter



### DESCRIPTIONS

The 200HFS series is a family of cost effective 2 watt single and dual output DC/DC converters in ultra-miniature SIP packages. 21 models operate from input bus voltages of 5V, 12 and 24V; producing output voltage levels of 3.3V, 5V, 12V, 15V,  $\pm 5$ ,  $\pm 12$ V and  $\pm 15$ V for a wide choice.

The 200HFS series is ideal for a variety of applications including distributed power systems, mixed analog / digital subsystems, portable test equipment, local power networks and battery backed systems.

### OUTPUT CHARACTERISTICS

	Min	Typ	Max	Unit/Comments
Output Voltage Set Point	$\pm 1.0$	$\pm 3.0$		% Output voltage at nominal line & FL
Output Voltage Balance (Duals)	$\pm 0.1$	$\pm 1.0$		% Equal Output Loads
Line Regulation	$\pm 1.2$	$\pm 1.5$		%; % Change / 1 % change in Input voltage
Load Regulation	See Model Selection Chart			% Output voltage measured from FL to 20% load
Ripple/Noise	100	150		mV p-p, Nom.Line @FL, 20MHz B.W., using 1 $\mu$ f bypass capacitor
Ripple/Noise		200		mV p-p, Over Line, Load & Temp., 20 MHz B.W., using 1 $\mu$ f bypass capacitor
Overload Protection	120			%Rated Output Load
Short Circuit Protection		0.5		Second
Temperature Coefficient	$\pm 0.01$	$\pm 0.02$		% per degree C

### FEATURES

- Miniature Single-Inline-Package (SIP)
- 1000 VDC Input/Output Isolation
- High Efficiency
- Wide Operating Temperature Range
- MTBF > 2,000,000 Hours
- Low Cost

### INPUT CHARACTERISTICS

	Min	Typ	Max	Unit/Comments
Input Voltage				
5 VDC Input Models	4.5	5	5.5	VDC
12 VDC Input Models	10.8	12	13.2	VDC
24 VDC Input Models	21.6	24	26.4	VDC
Input Fuse Requirements				
5 VDC Input Models		1000		mA; Slow blow type
12 VDC Input Models		500		mA; Slow blow type
24 VDC Input Models		200		mA; Slow blow type
Reverse Polarity Input Current			0.3	A
Input Filter				Pi Filter

### GENERAL CHARACTERISTICS

	Min	Typ	Max	Unit/Comments
Switching Frequency	50	80	100	kHz
Isolation Voltage	1000			VDC, 60 sec
Isolation Resistance	1000			Mohm, 500VDC
Isolation Capacitance		80	120	pF, 100kHz, 1Volt
MTBF (MIL-HBK-217F)	2000			Thousand Hours, +25°C, Ground Benign



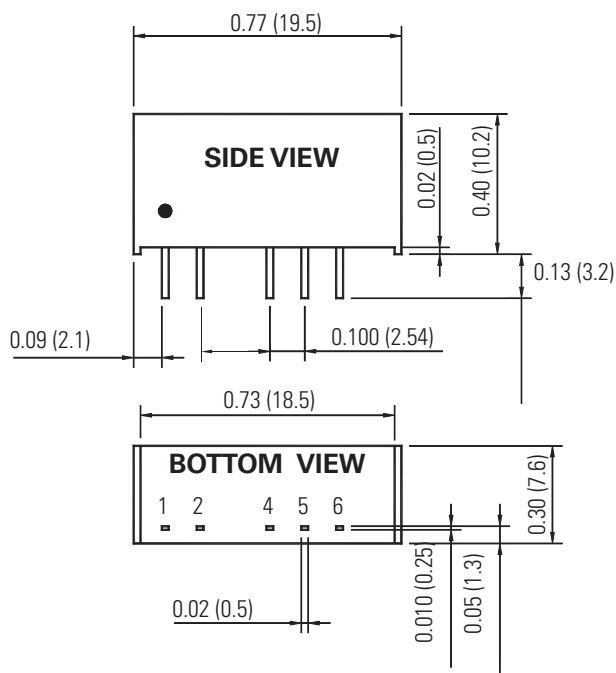
### ENVIRONMENTAL SPECIFICATIONS

	Min	Typ	Max	Unit/Comments
Operating Temp. Range	-40		+70	°C; Ambient
Operating Temp. Range	-25		+90	°C; Case
Storage Temp. Range	-40		+125	°C
Relative Humidity			95	% Humidity; non-condensing
Cooling				Free-Air Convection

### PHYSICAL CHARACTERISTICS

	Unit/Comments
Case Size	0.77 X 0.30 X 0.40 inches (19.5 X 7.6 X 10.2 mm)
Case Material	Non-Conductive Black Plastic
Flammability	UL94V-0
Weight	2.7 Grams

### OUTLINE DRAWING



### PIN OUT CHART

Pins	Single	Dual
1	+ Vin	+ Vin
2	- Vin	- Vin
4	- Vout	-Vout
5	No Pin	Common
6	+ Vout	+ Vout

### Notes:

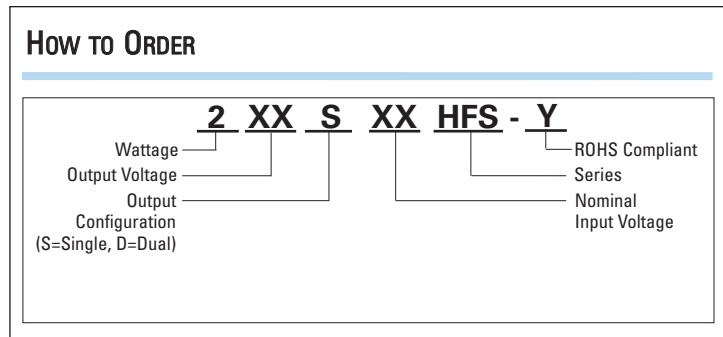
1. Unless otherwise specified dimensions are in inches (mm).

Tolerances	Inches	mm
	X.XX = ±0.02	X.X = ±0.5
	X.XXX = ±0.010	X.XX = ±0.25

All specifications are typical at nominal input, nominal load and 25° C unless otherwise specified.  
External, low ESR, 10 microfarad (minimum) capacitor across output is recommended for operation.



## How To ORDER



## MODEL SELECTION CHART

Model	Nominal Input Voltage (VDC)	Output Voltage (VDC)	Max. Output Current (mA)	Input Current @ Max. Load Typ. (mA)	Input Current @ No. Load Typ. (mA)	Efficiency @ FL (%)	Max. Load Regulation (%)	Min. Output Current (mA)
203S5HFS	5	3.3	500	452	60	73	11	10
205S5HFS	5	5.0	400	526	60	76	11	8
212S5HFS	5	12.0	165	495	60	80	7	3
215S5HFS	5	15.0	133	499	60	80	7	2.5
205D5HFS	5	±5.0	±200	519	60	77	10	±4
212D5HFS	5	±12.0	±83	504	60	79	7	±1.5
215D5HFS	5	±15.0	±66	501	60	79	7	±1
203S12HFS	12	3.3	500	185	30	74	8	10
205S12HFS	12	5.0	400	212	30	78	8	8
212S12HFS	12	12.0	165	200	30	82	5	3
215S12HFS	12	15.0	133	200	30	83	5	2.5
205D12HFS	12	±5.0	±200	210	30	79	8	±4
212D12HFS	12	±12.0	±83	201	30	82	5	±1.5
215D12HFS	12	±15.0	±66	200	30	82	5	±1
203S24HFS	24	3.3	500	92	15	74	8	10
205S24HFS	24	5.0	400	108	15	77	8	8
212S24HFS	24	12.0	165	101	15	77	8	3
215S24HFS	24	15.0	133	101	15	81	5	2.5
205D24HFS	24	±5.0	±200	105	15	79	8	±4
212D24HFS	24	±12.0	±83	102	15	81	5	±1.5
215D24HFS	24	±15.0	±66	100	15	82	5	±1



## DERATING CURVES

MODEL 200HFS

