Make-Ps®
DC/DC CONVERTER

200HFR series

Single & Dual Output DC/DC Converter



Features

- Up to 63% Efficiency
- Single & Dual Output, 2 watt converter
- 3000 VDC Input / Output Isolation
- Short Circuit Protection
- MTBF > 800,000 Hours

Descriptions

The 200HFR series 2 watts power modules are high efficiency, low profile dc-dc converters that operate over input voltage ranges of 4.75-5.25 VDC, 10.8-13.2 VDC, and 21.6-26.4 VDC and provide precisely regulated output voltages of 5V, 12V, 15V, ±12V and ±15V.

The -25°C to +71°C operating temperature range makes it ideal for data communication equipment, mobile battery driven equipment, distributed power systems, telecommunication equipment, mixed analog/digital subsystems, process/ machine control equipment, computer peripheral systems and industrial robot systems.

Input Characteristics

	Min	Typ	Max	Unit/Comments
Start Voltage				
5 VDC Input Models	4.75		5.25	VDC
12 VDC Input Models	10.8		13.2	VDC
24 VDC Input Models	21.6		26.4	VDC

Output Characteristics

	Min	Typ	Max	Unit/Comments
Output Voltage Set Point			±5.0	% Output voltage at nominal line & FL
Output Voltage Balance (Duals)			±3.0	% Equal Output Loads
Line Regulation			±0.5	% Output voltage measured from min. input line to maximum
Load Regulation			±0.5	% Output voltage measured from FL to 10% load
Ripple/Noise			50	mV p-p, Nom.Line @FL, 20MHz B.W., using 1 µf bypass capacitor
Short Circuit Protection				Continuous, Automatic Recovery
Temperature Coefficient			±0.02	% per degree C

General Characteristics

	Min	Typ	Max	Unit/Comments
Switching Frequency	40			kHz
Isolation Voltage	3000			VDC, 1 minute
Isolation Resistance	1000			Mohm, 500VDC
Isolation Capacitance			20	pF, 100kHz, 1Volt
Input Filter				Pi Filter
MTBF (MIL-HBK-217F)	0.8			Million Hours, +25°C, Ground Benign

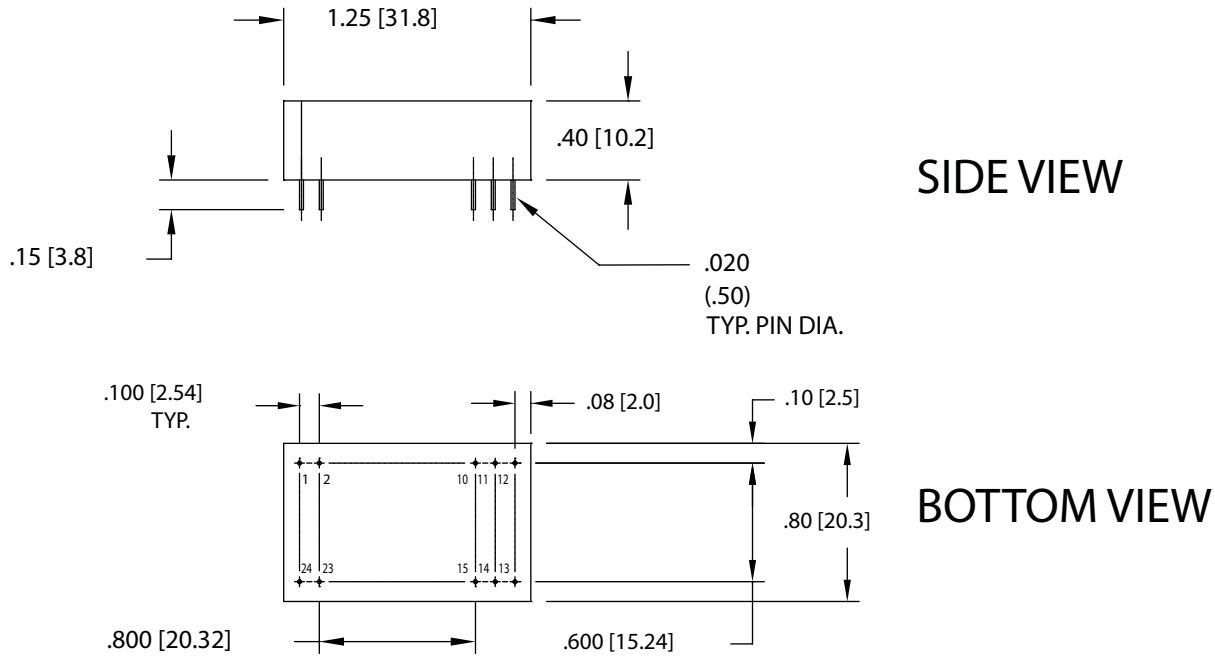
Environmental Specifications

	Min	Typ	Max	Unit/Comments
Operating Temp. Range	-25		+71	°C; Ambient
Storage Temp. Range	-40		+125	°C
Relative Humidity			95	% Humidity; non-condensing
Cooling				Free-Air Convection

Physical Characteristics

	Unit/Comments
Case Size	1.25 X 0.8 X 0.4 inches (31.8 X 20.3 X 10.2 mm)
Case Material	Non-conductive Black Plastic
Flammability	UL94V-0
Weight	14 Grams

Outline Drawing



Pin Out Chart

Pins	Single	Dual
1, 2	+ Vin	+Vin
23, 24	- Vin	- Vin
15	NC	+Vout
13	+ Vout	- Vout
10, 11	NC	± COMMON
12,	- Vout	NC
14	NC	NC

NC = No Connection

Notes:

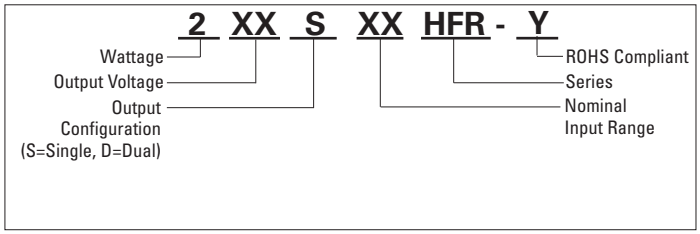
1. Unless otherwise specified dimensions are in inches (mm).

Tolerances	Inches	mm
	X.XX = ±0.02	X.X = ±0.5
	X.XXX= ±0.010	X.XX = ±0.25
Pin :	±0.002	±0.05

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

How to Order

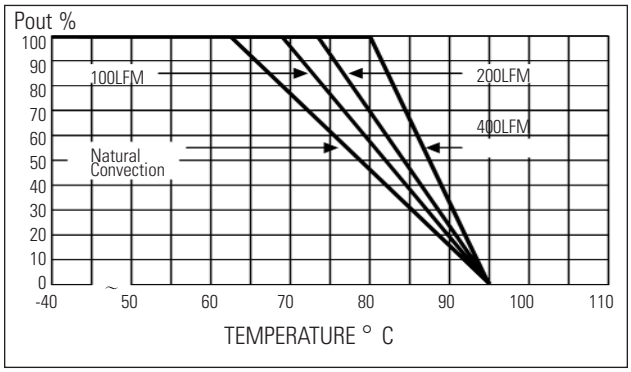


Model Selection Chart

Model	Nominal Input Voltage (VDC)	Input Current No Load (mA)	Input Current Full Load (mA)	Output Voltage (VDC)	Full Load Output Current (mA)	Efficiency @ FL (%)
205S5HFR	5	120	666	5	400	60
212S5HFR	5	120	660	12	165	63
215S5HFR	5	120	665	15	133	63
205S12HFR	12	50	277	5	400	60
212S12HFR	12	50	275	12	165	63
205S24HFR	24	25	138	5	400	60
212S24HFR	24	25	137	12	165	63
212D5HFR	5	120	664	±12	±83	62
215D5HFR	5	120	660	±15	±66	62
212D12HFR	12	50	276	±12	±83	62
212D24HFR	24	25	138	±12	±83	62

Derating Curves

MODEL 200HFR - SINGLE OUTPUT



MODEL 200HFR - DUAL OUTPUT

