

Make-Ps®

DC/DC CONVERTER

100HFS series

Single & Dual Output DC/DC Converter

FEATURES

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

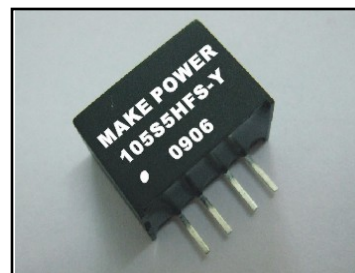
DESCRIPTIONS

The 100HFS series is a family of cost effective 1 watt single and dual output DC/DC converters in ultra-miniature SIP packages. 24 models operate from input bus voltages of 5V, 12 and 24V; producing output voltage levels of 5V, 9V, 12V, 15V, ± 5 , ± 9 V, ± 12 V or ± 15 V.

With footprint as little as 0.108 in², the 100HFS series is ideal for innumerable board level power distribution applications where space is critical.

OUTPUT CHARACTERISTICS

	Min	Typ	Max	Unit/Comments
Output Voltage Set Point	± 1.0	± 3.0		% Output voltage at nominal line & FL
Output Voltage Balance (Duals)	± 0.1	± 1.0		% Equal Output Loads
Line Regulation	± 1.2	± 1.5		%; % Change / Percentage change in Input voltage
Load Regulation	See Model Selection Chart			% Output voltage measured from FL to 20% load
Ripple/Noise - Single	100	150		mV p-p, Nom.Line @FL, 20MHz B.W., using 1 μ f bypass capacitor
Ripple/Noise - Dual	50	75		
Ripple/Noise - Single		200		mV p-p, Over Line, Load & Temp., 20 MHz B.W., using 1 μ f bypass capacitor
Ripple/Noise - Dual		150		
Short Circuit Protection		0.5		Second
Temperature Coefficient	± 0.01	± 0.02		% per degree C



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
15 VDC Input Models	13.5	15	16.5	VDC
24 VDC Input Models	21.6	24	26.4	VDC
Input Fuse Requirements				
5 VDC Input Models		500		mA; Slow blow type
12 VDC Input Models		200		mA; Slow blow type
15 VDC Input Models		150		mA; Slow blow type
24 VDC Input Models		100		mA; Slow blow type
Reverse Polarity Input Current			0.3	A
Input Filter				Internal Capacitor

GENERAL CHARACTERISTICS

	Min	Typ	Max	Unit/Comments
Switching Frequency				
Single	50	90	110	kHz
Dual	70	100	120	kHz
Isolation Voltage	1100			VDC, 1 sec
Isolation Resistance	1000			Mohm, 500VDC
Isolation Capacitance		60	100	pF, 100kHz, 1Volt
MTBF (MIL-HBK-217F)	2000			Thousand Hours, +25°C, Ground Benign

ENVIRONMENTAL SPECIFICATIONS

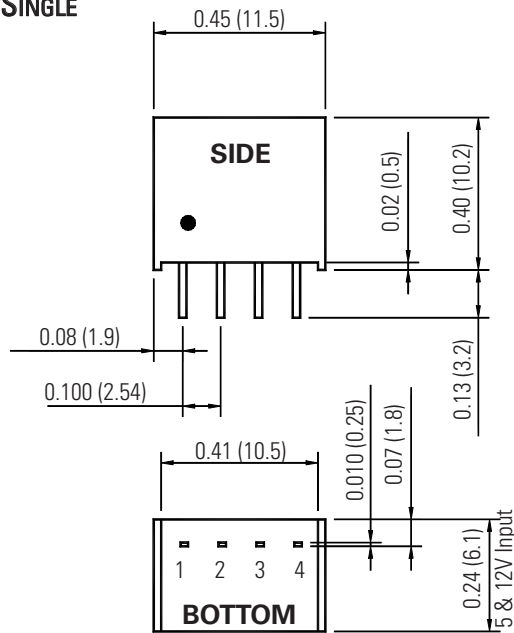
	Min	Typ	Max	Unit/Comments
Operating Temp.				
Single	-40		+75	°C; Ambient
Dual	-40		+85	°C; Ambient
Operating Temp. Range	-25		+90	°C; Case
Storage Temp. Range	-40		+125	°C
Relative Humidity			95	% Humidity; non-condensing
Cooling				Free-Air Convection

PHYSICAL CHARACTERISTICS

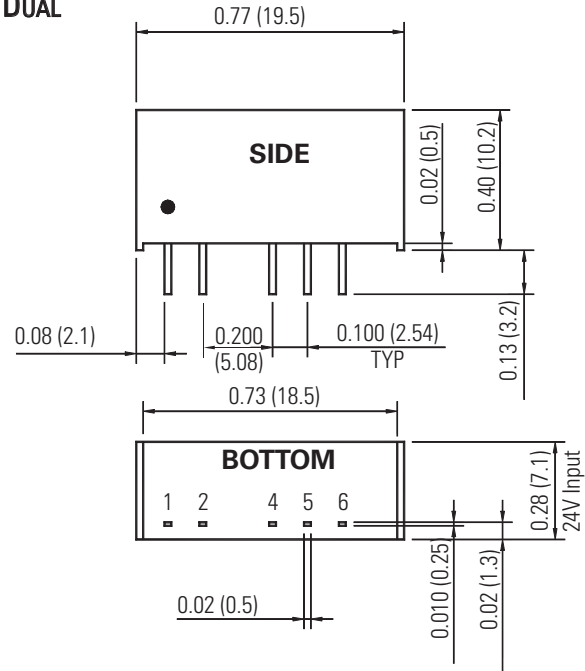
	Unit/Comments
Case Size	
Single: 5 & 12 VDC Input	0.45 X 0.24 X 0.40 inches (11.5 X 6.1 X 10.2 mm)
24 VDC Input	0.45 X 0.28 X 0.40 inches (11.5 X 7.1 X 10.2 mm)
Dual: 5 & 12 VDC Input	0.77 X 0.24 X 0.40 inches (19.5 X 6.1 X 10.2 mm)
24 VDC Input	0.77 X 0.28 X 0.40 inches (19.5 X 7.1 X 10.2 mm)
Case Material	Non-Conductive Black Plastic
Flammability	UL94V-0
Weight	
Single: 5 & 12 VDC Input	1.3 Grams
24 VDC Input	1.7 Grams
Dual: 5 & 12 VDC Input	2.2 Grams
24 VDC Input	2.6 Grams

OUTLINE DRAWING

SINGLE



DUAL



PIN OUT CHART

Pins	Single	Dual
1	- Vin	+ Vin
2	+ Vin	- Vin
3	- Vout	-
4	+ Vout	- Vout
5	-	Common
6	-	+ Vout

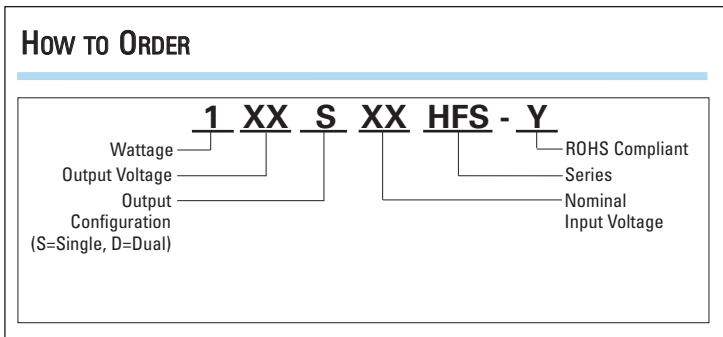
Notes:

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

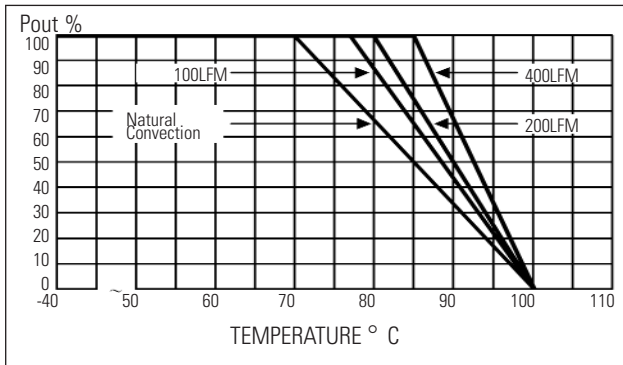


MODEL SELECTION CHART

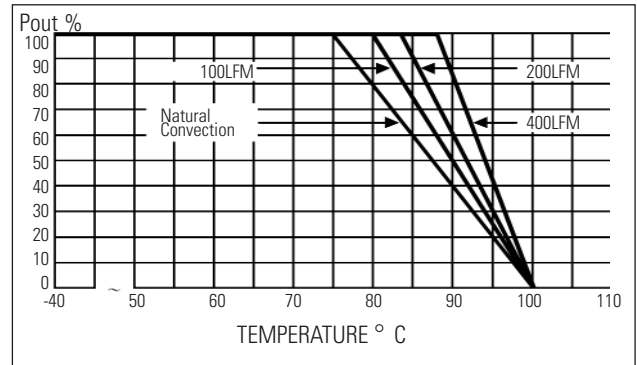
Model	Nominal Input Voltage (VDC)	Input Voltage Range (VDC)	Output Voltage (VDC)	Max. Output Current (mA)	Efficiency @ FL (%)	Max. Load Regulation (%)
105S5HFS	5	4.5 - 5.5	5.0	200	69	11
109S5HFS	5	4.5 - 5.5	9.0	110	76	8
112S5HFS	5	4.5 - 5.5	12.0	84	77	7
115S5HFS	5	4.5 - 5.5	15.0	67	78	6
105D5HFS	5	4.5 - 5.5	±5.0	±100	72	8
109D5HFS	5	4.5 - 5.5	±9.0	±56	77	8
112D5HFS	5	4.5 - 5.5	±12.0	±42	78	8
115D5HFS	5	4.5 - 5.5	±15.0	±34	79	8
105S12HFS	12	10.8 - 13.2	5.0	200	71	9
109S12HFS	12	10.8 - 13.2	9.0	110	77	5
112S12HFS	12	10.8 - 13.2	12.0	84	79	5
115S12HFS	12	10.8 - 13.2	15.0	67	80	4
105D12HFS	12	10.8 - 13.2	±5.0	±100	74	8
109D12HFS	12	10.8 - 13.2	±9.0	±56	79	8
109D12HFS	12	10.8 - 13.2	±12.0	±42	81	8
115D12HFS	12	10.8 - 13.2	±15.0	±34	81	8
105S24HFS	24	21.6 - 26.4	5.0	200	70	8
109S24HFS	24	21.6 - 26.4	9.0	100	76	5
112S24HFS	24	21.6 - 26.4	12.0	84	79	4
115S24HFS	24	21.6 - 26.4	15.0	67	79	4
105D24HFS	24	21.6 - 26.4	±5.0	±100	72	8
109D24HFS	24	21.6 - 26.4	±9.0	±56	76	8
112D24HFS	24	21.6 - 26.4	±12.0	±42	79	8
115D24HFS	24	21.6 - 26.4	±15.0	±34	80	8

DERATING CURVES

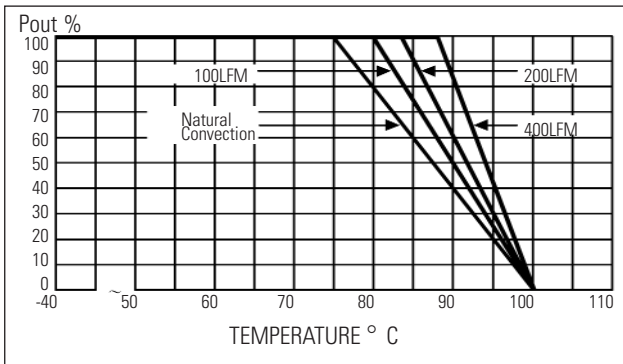
MODEL 100HFS Single - 3.3V, 5V & ±5V Output



MODEL 100HFS Single - 24V



MODEL 100HFS Dual - 5V Output



MODEL 100HFS Dual - all other outputs

