M7420 SERIES

DC/DC POWER SUPPLY

PRODUCT HIGHLIGHTS

- MINIATURE
- HIGH DENSITY
- SINGLE OUTPUT
- UP TO 100W

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Amphenol
MILITARY HIGH SPEED

M7420 SERIES DC/DC POWER SUPPLY

Applications

Military (Airborne, ground-fix, shipboard), Ruggedized, Telecom, Industrial Power Supply

Special Features

- Miniature size
- High efficiency
- Wide input range
- Input / Output isolation
- Remote sense compensation
- Remote inhibit (On/Off)
- Fixed switching freq. (250 kHz)
- External sync. capability
- EMI filters included
- Non-latching protections:
- Short-circuit/overload
  - Output over-voltage
  - Over temperature

Electrical Specifications

DC Input

Normal range: 18 to 48 V_{DC}

Not damaged (may restart) when exposed to surges IAW MIL-STD-1275A (100V/50ms) and IAW MIL-STD-704A (80V for 0.1s)

DC Output

Voltage range: 3.3 V to 50 V
Current: 0 to 10 A
Power: 0 to 100 W

Isolation

Input to Output: 200 V_{DC}
Input to Case: 200 V_{DC}
Output to Case: 100 V_{DC}

Output Voltage Regulation

Up to ±1%
(low to high line voltage, no load to full load, –55 °C to +85 °C).

Efficiency

Typically 80-90%, depending on output voltage.

Up to 92% @ 28 V output, 28 V input, full load and room temperature.

EMC

*Designed to meet MIL-STD-461F CE101, CE102, CS101, CS114, CS115, CS116, RS103

Ripple and Noise

Less than 50 mV_{p-p}, typical (max. 1%) without external capacitance. When connected to system capacitance ripple drops significantly.

Transient Over-and-undershoot

Output resistance at load change of 50%-100% is 30-70 mΩ (depending on output voltage). Output back to steady stated within 300-500 µs

Turn on Transient

Voltage overshoot at during power on is less than 3% nominal voltage.

* Compliance achieved when tested with shielded cable, static resistive load and 5 µH LISNs (if LISNs are used).

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Protections †

Input

- **Under-Voltage Lockout**
  Unit may shut down if input voltage drops below 16 ± 2 V.
- **Over-Voltage Lockout**
  Unit may shut down if input voltage rises above 52 ± 4 V.
- **Reverse Voltage Protection**
  Unit is protected if connected to the power source with reverse polarity.

Output

- **Over-Voltage Protection**
  Passive transorb, chosen at 120% ± 10% of nominal voltage.
- **Current Limiting**
  Converter goes into constant current mode, until fault is removed.

General

- **Over temperature protection:**
  Shutdown if base plate temperature rises above +105 °C ± 5 °C.
  Auto recovery when baseplate cools down to +95 °C ± 5 °C.

Environmental Conditions

Designed to Meet MIL-STD-810F

Temperature
Methods 501.4 & 502.4
Operating: –55 °C to +85 °C (at baseplate)
Storage: –55 °C to +125 °C (ambient)

Vibration
Method 514.5
Procedure I
Category 24 - General minimum integrity exposure

Altitude
Method 500.4
Procedures I – Storage/Air transport: up to 70 kft
Procedure II – Operation/Air Carriage: up to 70 kft

Shock
Method 516.5
30 g, 11 ms terminal peak saw-tooth

Humidity
Method 507.4
Up to 95% RH

Salt Fog
Method 509.4

Reliability

150,000 hours, calculated IAW MIL-HDBK-217F Notice 2, at +85 °C baseplate, Ground Fix conditions.

Environmental Stress Screening (ESS)

Including random vibration and thermal cycles is also available. **Please consult factory for details.**

† Thresholds and protections can be modified / removed – please consult factory.

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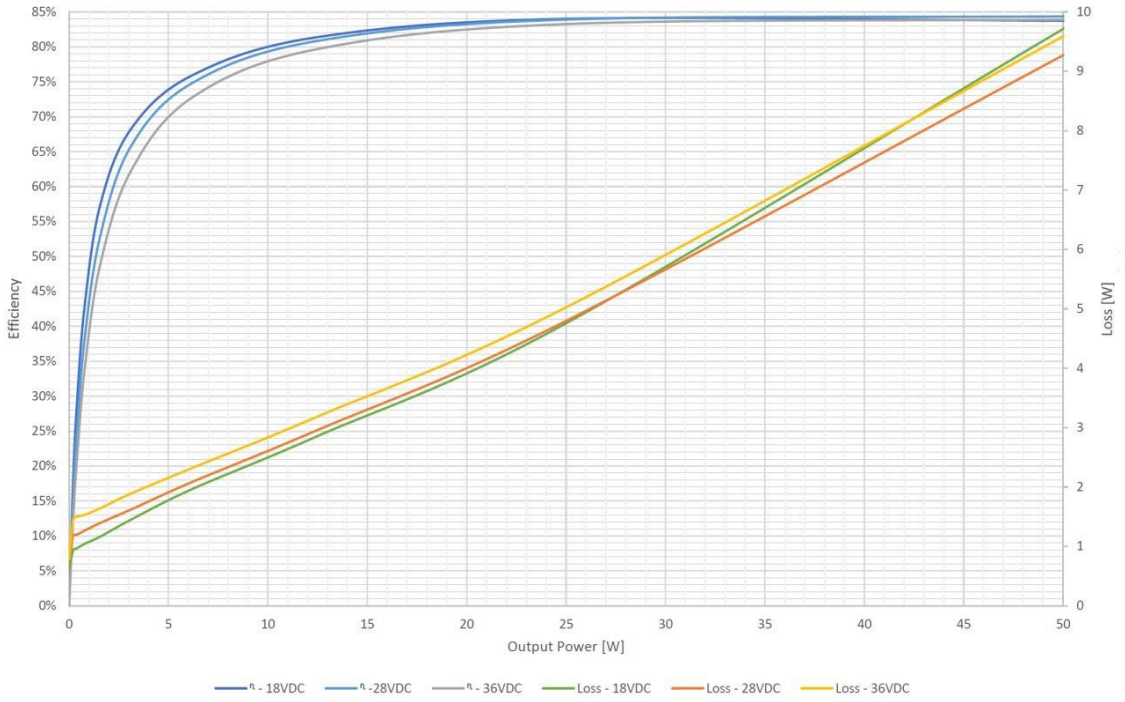
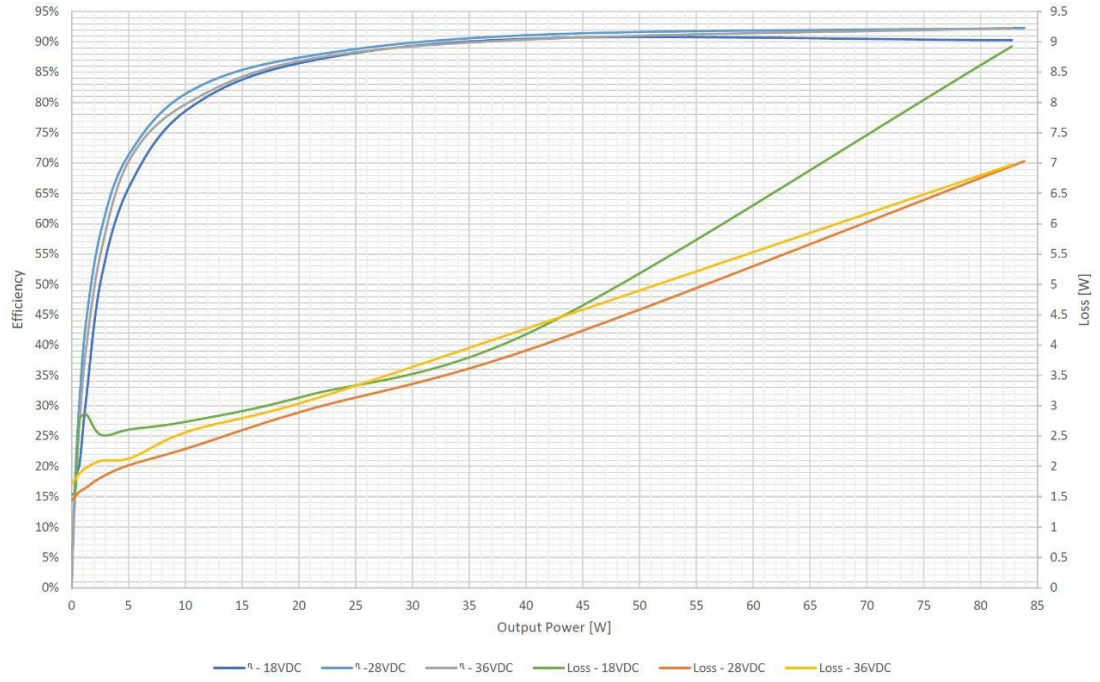
Efficiency Curves

5 V_{DC} variant:



28 V_{DC} variant:



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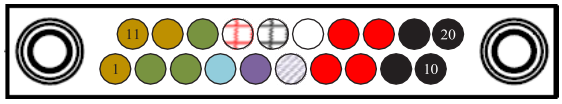
Pin Assignment

Connector Type: RM272-020-312-2900 or eq.

Mates with: RM242-020-571-5900 or eq.

Pin #	Function	Polarity	
1	Input	+	
2	Input RTN	–	
3	Input RTN	–	
4	Inhibit		
5	Sync	+	
6	Sync RTN	–	
7	Output	+	
8	Output	+	
9	Output RTN	–	
10	Output RTN	–	

Pin #	Function	Polarity	
11	Input	+	
12	Input	+	
13	Input RTN	–	
14	Sense	+	
15	Sense RTN	–	
16	N.C.		
17	Output	+	
18	Output	+	
19	Output RTN	–	
20	Output RTN	–	



Note: All output pins with the same function should be connected together for best performance.

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Functions and Signals

Inhibit signal

Description: The ***Inhibit*** signal is used to turn the power supply ON and OFF.

Operation: Applying "1"or leaving open will turn the power supply ON. For constant operation, leave this pin unconnected.
Applying "0" or shorting this pin to its return line will turn the power supply OFF.

Signal Type: 5V TTL or dry contact (open/short).

Return line: This signal is referenced to ***Input RTN*** pin.

Sync signal

Description: The ***Sync*** signal can be used to allow the power supply switching frequency to synchronize with a system clock.

Operation: Apply a square wave clock with frequency in the range of 250 kHz ± 10 kHz and duty cycle of 50% ± 10%., TTL level.
If not required, leave open. The power supply will work at 250 kHz ± 10 kHz (internal clock).

Signal Type: 5V TTL

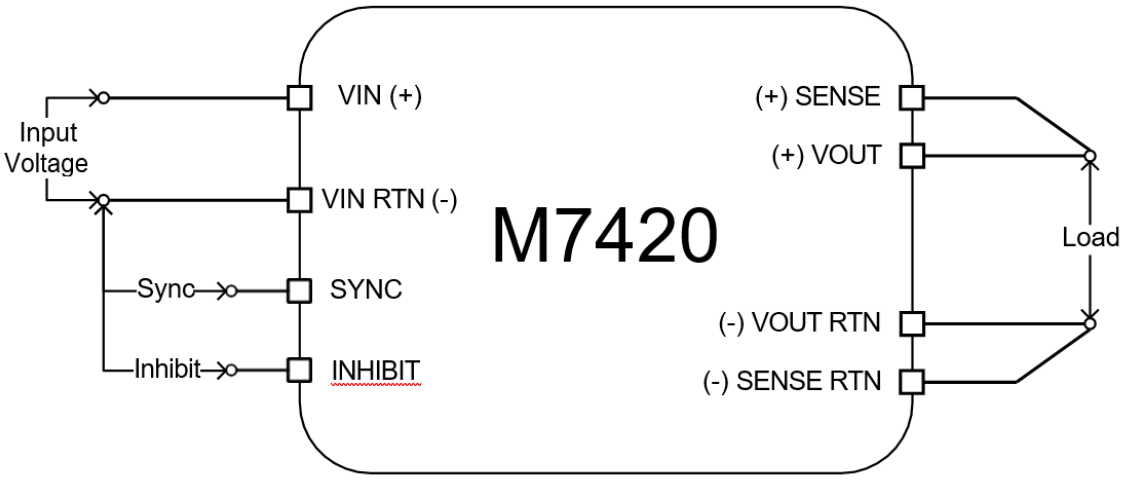
Return line: This signal is referenced to ***Sync RTN*** pin.

Sense

Description: The ***Sense*** is used to compensate for voltage drop across the output wires by sensing the voltage at the load and correcting the increasing the output voltage accordingly, to provide the desired voltage at the load's terminals.

Operation: Connect the ***Sense*** pin to the positive load terminal, and the ***Sense RTN*** pin to the negative (return) load terminal.
The sense compensation is typically limited to 5% or 0.5V – the lesser of the two.
If not used, connect ***Sense*** directly to ***Output*** pins**,** and the ***Sense RTN*** pin directly to the ***Output RTN*** pins**.**
IMPORTANT: to avoid damage to the converter and/or the load - DO NOT LEAVE THE Sense/Sense RTN PINS UNCONNECTED.

Typical Connection Diagram



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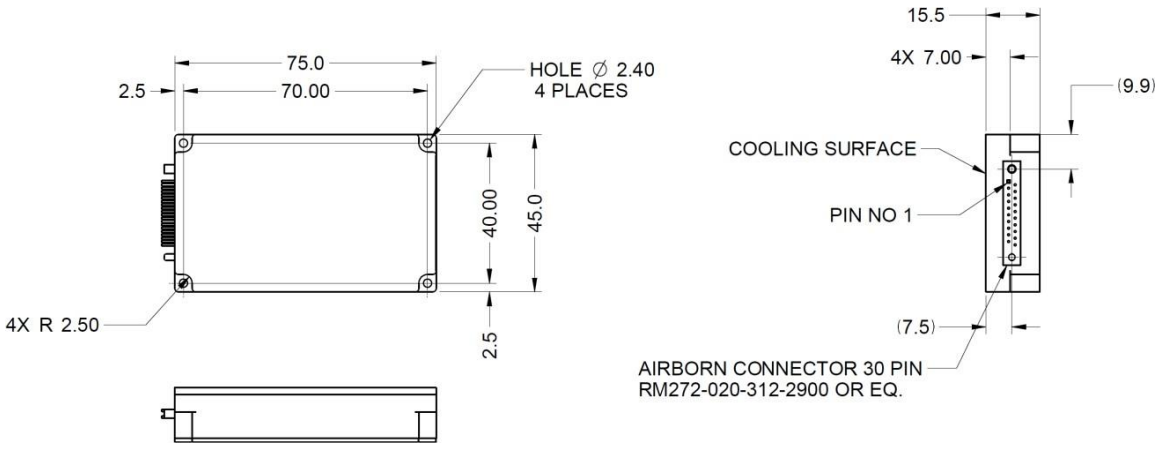
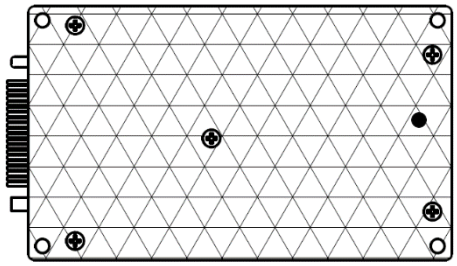
Outline Drawing



Heat Dissipation Surface



Dissipation Area
5.133 in²
(3,312 mm²)

Notes

1. Dimensions are mm
2. Tolerance is:
   .X ± 0.2 mm.
   .XX ± 0.4 mm.
3. Weight: 4.23 oz (120 g) max.

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Standard Configurations

Part number	Input voltage range	Output Voltage	Output Current
M7420-100	18 to 48 V_{DC}	5 V_{DC}	10 A
M7420-101	18 to 48 V_{DC}	12 V_{DC}	8 A
M7420-102	18 to 48 V_{DC}	15 V_{DC}	6 A
M7420-103	18 to 48 V_{DC}	24 V_{DC}	4 A
M7420-104	18 to 48 V_{DC}	28 V_{DC}	3.5 A
M7420-105	18 to 48 V_{DC}	48 V_{DC}	2 A

Note: Specifications are subject to change without prior notice by the manufacturer.

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