

# M7727 SERIES

## DC/DC POWER SUPPLY



### DESCRIPTION

M7727 SERIES SINGLE-OUTPUT, 500W (750W PEAK) DC TO DC BASEPLATE COOLED POWER SUPPLY

The M7727 is a series of mechanically robust, base-plate cooled, high performance, power supplies, designed for Ground Mobile (MIL-STD-1275), Airborne (MIL-STD-704) and other Hi-Reliability applications where 28VDC has to be converted to a tightly regulated, filtered and protected DC output.

### FEATURES

- DC/DC Single outputs power supply up to 500W (750W Peak)
- 18 to 50VDC Standard Input version
- For extended input version 12 to 100VDC operation
- High efficiency – up to 90% (depending on output voltage).
- Full galvanic isolation between Input, Chassis and Outputs
- External Inhibit (On/Off)
- Conduction cooled via the baseplate
- For standard Input version No damage due to abnormal transients
- Fixed switching freq. (250 kHz)
- EMI filters included
- Remote sense compensation
- Indefinite short circuit protection with auto-recovery
- Over-voltage protection
- Over temperature shutdown with auto-recovery
- High density

## HOW TO ORDER

Part Number	Input Volatage Range	Output Volatage   Current	Power	Special Features
CF-02EM7727-1	18 to 50VDC	12VDC   40A	480W	
CF-02EM7727-2	18 to 50VDC	24VDC   21A	495W	
CF-02EM7727-3	18 to 50VDC	28VDC   18A	504 W	
CF-02EM7727-4	18 to 50VDC	48VDC   10.5A	504 W	
CF-02EM7727-5	18 to 50VDC	28VDC   18A	504 W	Parallel operation via output voltage droop. Voltage regulation is $\pm 2\%$ .

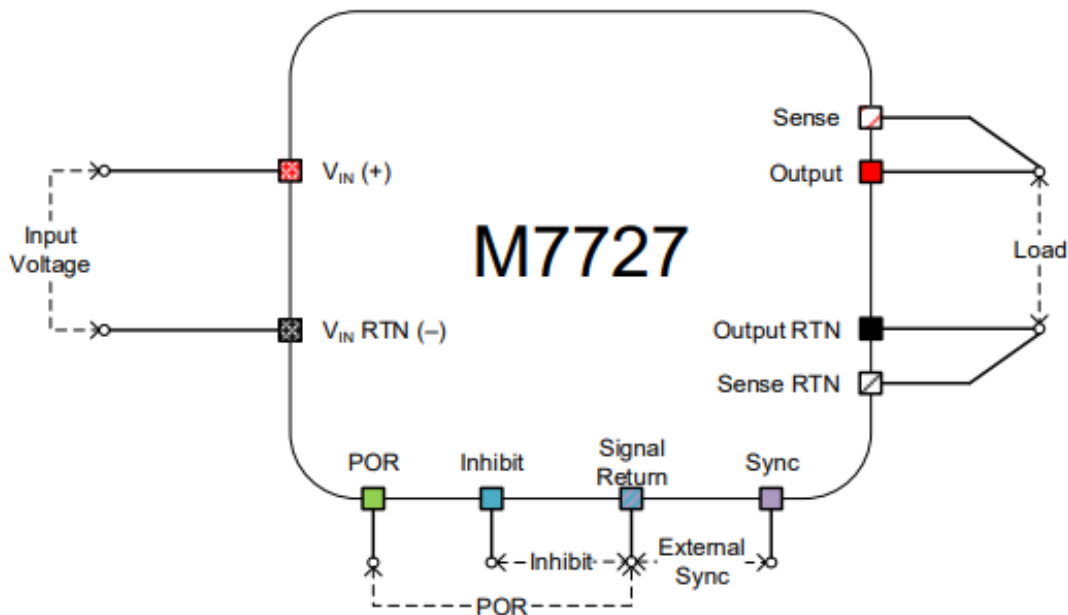
PRODUCT SPECIFICATIONS:

DC INPUT	<b>Voltage Range</b>	18 to 50 VDC Extended input range option: 12 to 100VDC IAW MIL-STD-1275E
	<b>Isolation</b>	Protection for unlimited time
	<b>Input Reverse Polarity</b>	The unit shuts down below $15V \pm 1V^*$ . Resumes operation at $17V \pm 1V^*$ . Min. hysteresis $2V^*$ . *Estimated values.
	<b>UnderVoltage LockOut</b>	The unit shuts down above $55V \pm 4V$ . Optional: At 12-100V input unit shuts down $105 \pm 2V$
	<b>Over-Voltage Lock-Out</b>	Better than or equal to $\pm 1\%$ (low to high line voltage, no load to full load, $-55^\circ\text{C}$ to $+85^\circ\text{C}$ at baseplate).
DC OUTPUT	<b>Voltage Regulation</b>	Better than or equal to $\pm 1\%$ (low to high line voltage, no load to full load, $-55^\circ\text{C}$ to $+85^\circ\text{C}$ at baseplate).
	<b>Remote Sense</b>	The SENSE is used to achieve accurate load regulations at load terminals (this is done by connecting the pins directly to the load's terminals). For output voltage above 8V, the use of remote sense has a max limit of 0.25V voltage dropout between converter's output and load terminals. For output voltage below 8V, the use of remote sense has a max limit of 0.5V voltage dropout between converter's output and load terminals. When not used connect SENSE 1 to OUT 1 and SENSE 1 RTN to OUT 1 RTN.
	<b>Ripple</b>	Less than 50mVp-p, typical (max. 1% of output voltage)
	<b>Isolation</b>	Output to Case: 100VDC
	<b>Overvoltage Protection</b>	<ul style="list-style-type: none"> <li>Active Over-Voltage Protection: The secondary control circuit takes the over if output voltage exceeds <math>110\% \pm 5\%</math> of nominal voltage. Beyond this, output voltage clamps.</li> <li>Passive Over-Voltage Protection: Zener diode installed on output terminals, selected at <math>120\% \pm 10\%</math> of nominal voltage.</li> </ul>
	<b>Peak Load Duration Limiter</b>	Peak load is enabled for up to 4 seconds. Beyond this, output voltage folds to limit the output power to the nominal value.
	<b>Efficiency</b>	Typical: 88% - 90% Extended input range: 83% - 86% (28VDC output, nominal input, full load, room temperature)
	<b>Current Limit &amp; Overload</b>	Output voltage turns off and on periodically with low duty cycle (hiccup) to protect system conductors and converter from short circuit
	<b>Over Temp. Protection</b>	Output shuts down if base plate temperature exceeds $+105^\circ\text{C} \pm 5^\circ\text{C}$ . Automatic recovery when baseplate temperature returns to below $+95^\circ\text{C} \pm 5^\circ\text{C}$ .

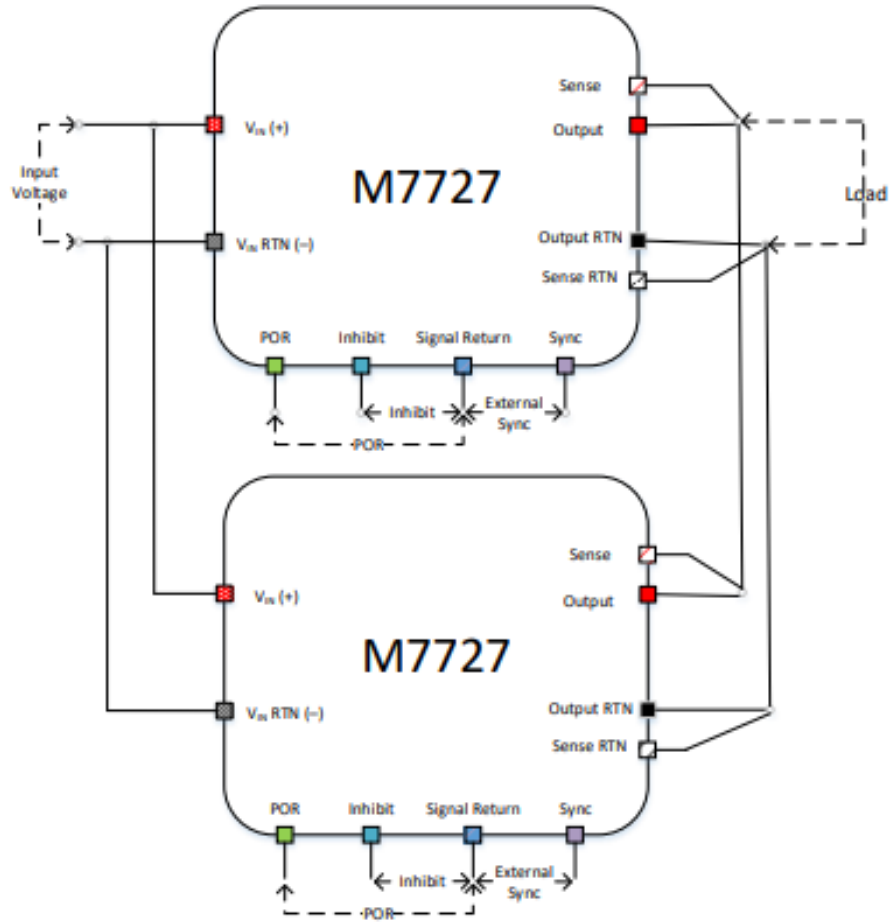
<b>Control &amp; Indication</b>	<b>INHIBIT Signal</b>	<p>The INHIBIT signal is used to turn the power supply ON and OFF. To turn the power supply OFF, apply a TTL “0” signal or SHORT to SIGNAL RTN.</p> <p>To turn the power supply ON, apply a TTL “1” signal or leave this pin OPEN.</p> <p>If not used (always ON), leave this pin OPEN.</p> <p>This signal is referenced to SIGNAL RTN.</p> <p>ENABLE Signal - Optional - Please consult factory.</p> <p>To turn the power supply OFF, apply a TTL “1” signal or leave this pin OPEN.</p> <p>To turn the power supply ON, apply a TTL “0” signal or SHORT to SIGNAL RTN</p>
	<b>SYNC IN</b>	<p>The SYNC IN signal is used to allow the power supply frequency to sync with the system frequency.</p> <p>The system frequency should be 250 kHz ± 10 kHz.</p> <p>When not connected the power supply will work at 250 kHz ± 10 kHz.</p> <p>This signal is referenced to SIGNAL RTN</p>
	<b>SIGNAL RTN</b>	<p>INHIBIT and SYNC signals are referenced to this pin.</p> <p>This pin is referenced to IN RTN.</p>
	<b>POR Optional</b>	<p>Protection Override signal (BATTLE SHORT function) overrides over temperature protection and input over/under-voltage lockout</p>
<b>Environment Designed to meet MIL- STD-810F</b>	<b>Temperature</b>	<p>Methods 501.4 &amp; 502.4</p> <p>Operating: -55°C to +85°C (at baseplate)</p> <p>Storage: -55°C to +125°C (ambient)</p>
	<b>Humidity</b>	<p>Method 507.4</p> <p>Up to 95% RH</p>
	<b>Salt-fog</b>	<p>Method 509.4</p>
	<b>Altitude</b>	<p>Method 500.4</p> <p>Procedures I – Storage/Air transport: up to 70,000 ft. (non-operational)</p> <p>Procedure II – Operation/Air Carriage: up to 70,000 ft. (operational)</p>
	<b>Mechanical Shock</b>	<p>Method 516.5</p> <p>Procedure I</p> <p>50 g / 11 ms terminal peak half-sine shock pulse</p>
<b>Vibration</b>	<p>Method 514.5</p> <p>Procedure I</p> <p>14.76 grms 20-2000 Hz for 500 seconds at each of 3 perpendicular axes</p>	

<b>ENVIRONMENT</b>	Fungus	Does not support fungus growth, in accordance with the guidelines of MIL-STD-454, Requirement 4.
<b>EMI</b>	MIL-STD-461F	Meets* MIL-STD-461F CE101, CE102, CS101, CS114, CS115, CS116, RE101, RE102, RS101, RS103 *EMI Compliance achieved with 5μH LISN, shielded harness and static resistive load.
<b>Reliability</b>	150,000 hours, calculated per MIL-HDBK-217F Notice 2 at +85°C baseplate, Ground Fix conditions.	
<b>Cooling Requirements</b>	The M7727 is a baseplate cooled unit. The base of the M7727 should be thermally attached to a suitable heatsink that maintains it below +85 °C.	
<b>Form factor</b>	2.76" wide, 0.81" high and 5.31" deep. For detailed dimensions and tolerances see Drawing: M7727001.	
<b>Weight</b>	Approx. 14.1 oz [400 g]	
<b>Connectors</b>	Connector type: M24308/24-34F or eq. Mates with: M24308/2-4F or eq.	

## TYPICAL CONNECTION DIAGRAM:



## PARALLEL OPERATION - TYPICAL CONNECTION DIAGRAM



## OUTPUTS RANGE

Output #	Voltage Range	Current Range	Output Regulation	Power Range
1	12 to 50 V <sub>DC</sub>	40A max	±1%	500W max

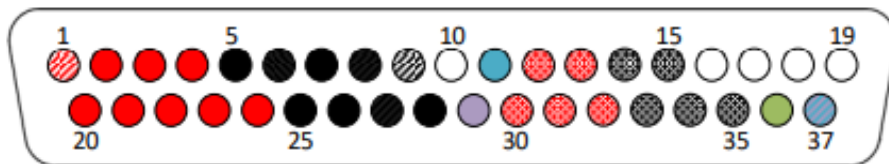
## PIN ASSIGNMENT

Connector type: M24308/24-34F or eq.  
 Mates with: M24308/2-4F or eq.

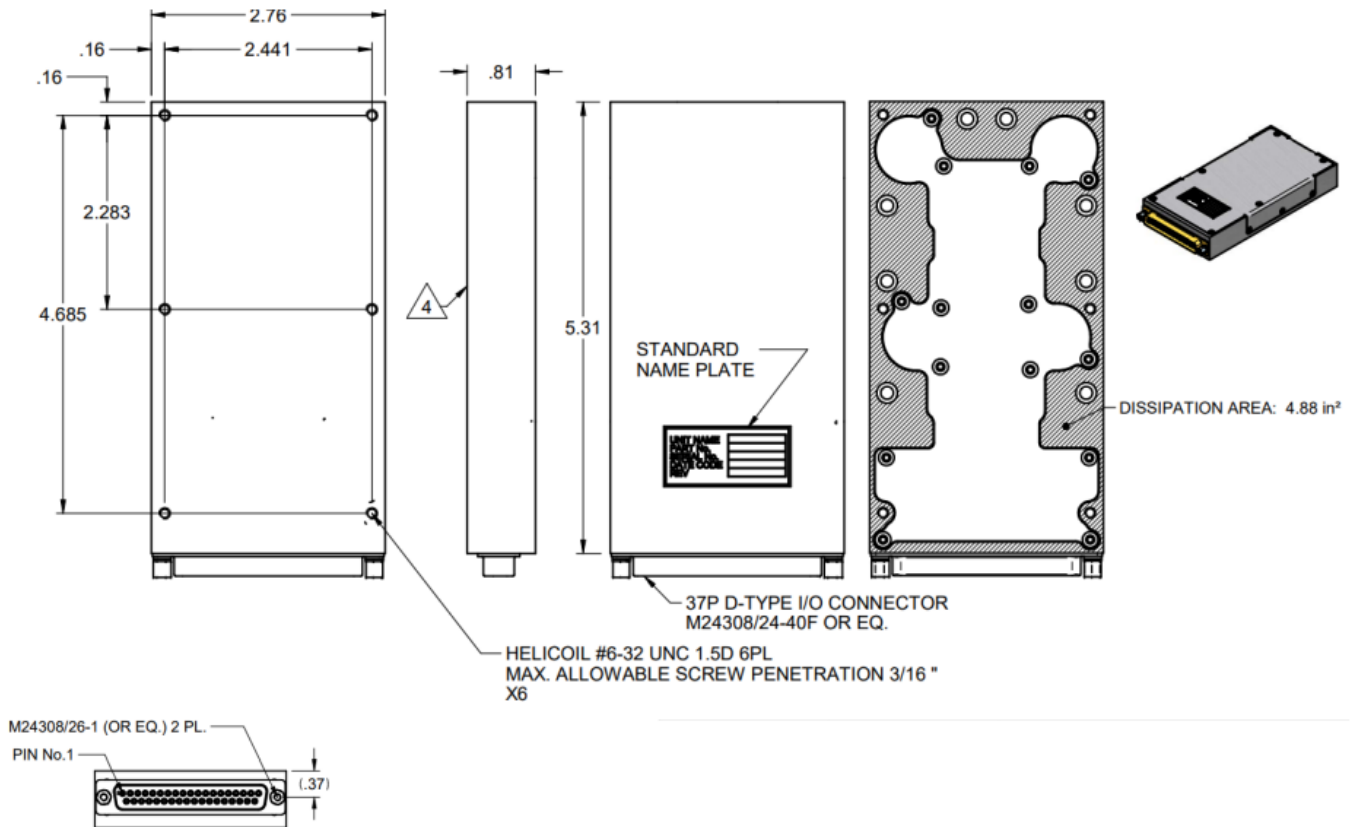
Pin No.	Function	P	
1	SENSE	+	⊙
2	OUT	+	●
3	OUT	+	●
4	OUT	+	●
5	OUT RTN	-	●
6	OUT RTN	-	●
7	OUT RTN	-	●
8	OUT RTN	-	●
9	SENSE RTN	-	
10	N.C.		
11	INHIBIT		
12	IN	+	⊙
13	IN	+	⊙

Pin No.	Function	P	
14	IN RTN	-	⊙
15	IN RTN	-	⊙
16	N.C.		
17	N.C.		
18	N.C.		
19	N.C.		
20	OUT	+	●
21	OUT	+	●
22	OUT	+	●
23	OUT	+	●
24	OUT	+	●
25	OUT RTN	-	●
26	OUT RTN	-	●

Pin No.	Function	P	
27	OUT RTN	-	●
28	OUT RTN	-	●
29	SYNC IN		
30	IN	+	⊙
31	IN	+	⊙
32	IN	+	⊙
33	IN RTN	-	⊙
34	IN RTN	-	⊙
35	IN RTN	-	⊙
36	POR	+	
37	SIGNAL RTN	-	



## OUTLINE DRAWING



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PRELIMINARY

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# Amphenol

MILITARY HIGH SPEED

40-60 Delaware Avenue  
Sidney, NY 13838  
amphenol-aerospace.com | amphenolmao.com

Jared Sibrava | +1 (607) 643-1845 | jsibrava@amphenol-aao.com  
amphenol-aerospace.com