LOW PROFILE DC/DC CONVERTER IN A HERMETIC METAL PACKAGE

Low Profile Hermetic DC/DC Converter
+5. +12. And +15 Volt In A Metal Package

FEATURES

- Up To 20 Watts Output Power
- 5, 12, 15 Vdc Outputs
- MIL-STD-704D Compatible
- NAVMAT P-4855-1A Component Derating
- Ultra-Low Profile: 0.385" Height
- Constant Frequency PWM Design
- Seam Welded Case For Enhanced Reliability
- Low Voltage Lockout
- 16 to 40 Vdc Input Range
- -55° to +125°C Full Power Operation
- Up to 81% Efficiency
- Industry Standard Pin-Outs
- Magnetic Feedback
- Short Circuit Current Limiting Protection
- Cascaded Dual Loop Control Scheme For Superior Load Transient Characteristics
- Available Hi-Rel Screened

DESCRIPTION

Omnirel's OHD2800S series of DC/DC Converters are rated up to 20 watts of output power over the full military temperature range. These converters are supplied in a fully hermetic, ultra-low profile package to produce a power density of up to 22 watts per cubic inch.

MAXIMUM RATINGS (T = 25°C, V_{IN} = 28 Vdc unless otherwise specified)

Operating Temperature Range ..... -55°C to +125°C (T_{case})
Storage Temperature Range ..... -65°C to +150°C
Isolation ..... >100 MΩ @ 500 Vdc
Conversion Frequency: Free Run Mode ..... 400 KHz
Sync. Mode ..... 425 KHz - 525 KHz

ELECTRICAL CHARACTERISTICS

Parameters	Conditions	OHD2805S	OHD2812S	OHD2815S	Units
Input Voltage Range	No Load to Full Load -55°C to +125°C	16 to 40	16 to 40	16 to 40	Vdc
Max. Input Current	No Load	40	50	60	mA
Max. Input Ripple Current	Full Load DC to 2 MHz	25	25	25	mAp-p
Output Voltage	Full Load	5.0 (±3%)	12.0 (±2%)	15.0 (±2%)	Vdc
Min. Output Power	V_{IN} = +16 Vdc to +40 Vdc -55°C to +125°C	15	20	20	W
Min. Output Current	V_{IN} = +16 Vdc to +40 Vdc -55°C to +125°C	0 to 3.0	0 to 1.67	0 to 1.33	A
Max. Output Ripple Voltage	Full Load DC to 2 MHz	35	35	35	mVp-p
Max. Load Regulation	No Load to Full Load	15	15	15	mV
Max. Line Regulation	Full Load	10	10	10	mV
Typ. Efficiency	Full Load	79	81	81	%
Step Load Response					
Typ. Transient	No Load to Full Load Full Load to No Load	±200	±250	±300	mV
Typ. Recovery	No Load to Full Load Full Load to No Load	65	65	65	µs

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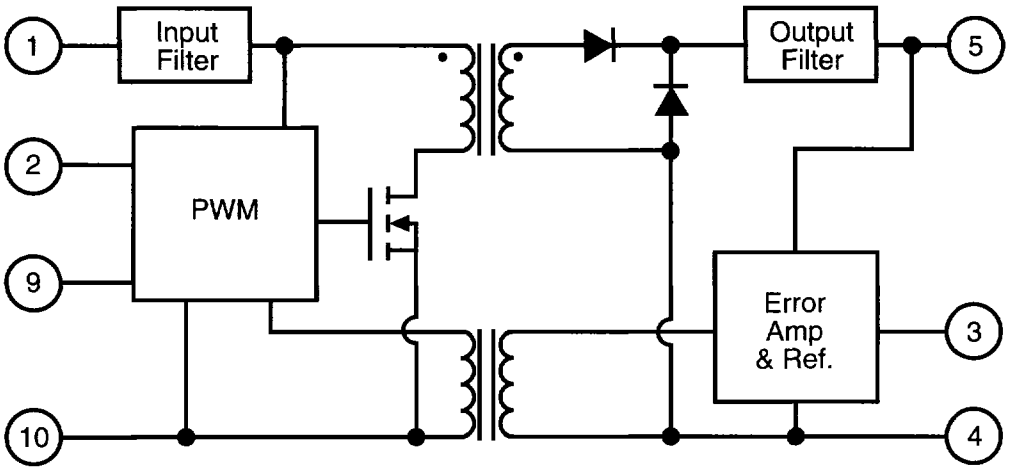
BLOCK DIAGRAM



Topology

The OHD2800S series is a single ended forward converter operating at a nominal oscillator frequency of 400 KHz. These fixed frequency converters use a resonant transformer reset circuit which allows for a maximum duty cycle of 67% without increasing the voltage stress on the primary MOSFET or output rectifiers. Tight line and load regulation are achieved through wide bandwidth magnetic feedback circuit. This magnetic feedback circuit, in conjunction with bipolar control ICs, offers greater long term reliability and radiation tolerance when compared to converters using an optocoupler feedback circuit and/or CMOS control ICs.

Flexible Synchronization

The OHD2800S series offers two different synchronization options. The standard OHD2800S can be synchronized to an external system clock for any rate between 425 KHz and 525 KHz. A second option allows the system designer to synchronize multiple "slave" converters to one "master" converter. The appropriate parts must be ordered to utilize this master/slave configuration. A suffix of "-MST" is added for the master part number and "-SLV" suffix for the slave part number.

Example:

Part No.:	**OHD2805S-MST**
Description:	**Master Synch. Config.**

High Reliability Design

Omnirel's OHD2800S series of DC/DC converters are designed to achieve the high reliability demanded by military programs. The case is resistance seam welded for superior long term hermeticity. The converters use only ceramic input capacitors to provide high product reliability over the military temperature range of -55°C to +125°C. All semiconductor devices are of the highest level of performance and reliability.

Omnirel's converters are designed in accordance with the NAVMAT P-4855-1A component derating guidelines when operating over the MIL-STD-704D input voltage range. The converters meet the conducted emissions (CE03) noise limits of MIL-STD-461C when operated with Omnirel's OFC461 EMI filter module.

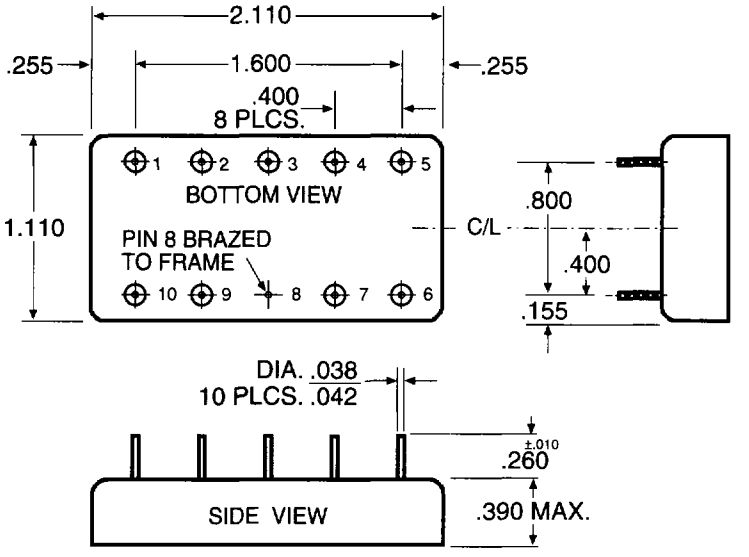
Inhibit Feature

The OHD2800S series of converters provide an active low (<0.8 V) inhibit pin that can be used to disable the converter, resulting in a zero output voltage and very low quiescent current.

Low Voltage Lockout

Omnirel's OHS2800S series of converters are designed to operate from an input voltage of 16 to 40 Vdc. The converter will not start until the input voltage reaches approximately 15 Vdc. Once operating, the unit will shut down when the input voltage drops below approximately 14 Vdc.

MECHANICAL OUTLINE



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PIN CONNECTION

Pin	OHD2805S	OHD2812S/OHD2815S
1	+ Input	+ Input
2	Inhibit Input	Inhibit Input
3	Output Adjust	N/C
4	Output Common	Output Common
5	+ Output	+ Output
6	N/C	N/C
7	N/C	N/C
8	Case Ground	Case Ground
9	Sync	Sync
10	Input Common	Input Common

ORDERING INFORMATION