



Powering Communications and Technology



## OES SERIES 40 WATT

### DESCRIPTION

OES DC/DC converters are ultra-dense, 40 Watt, single output converters produced for the telecom and networking markets. Making use of open-frame packaging, planar magnetics, high efficiency topologies, and surface-mount design, the OES has superior thermal performance. The OES features 1500 VDC isolation and overvoltage protection, as well as input undervoltage lockout.

### FEATURES

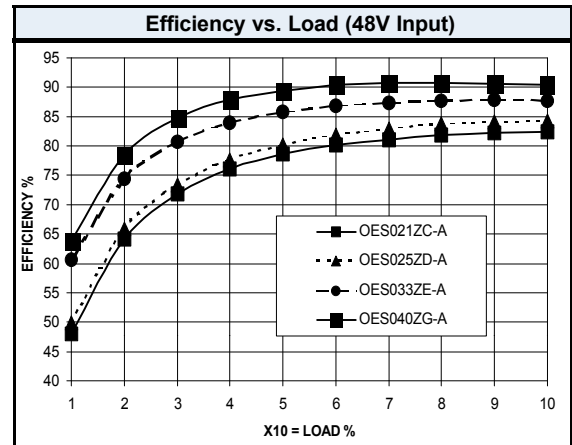
- Ultra-Dense 40W converter
- Industry standard package
- 100 °C baseplate operation
- Open-Frame packaging
- 5, 3.3, 2.5, and 2.1V Outputs
- Remote Enable Pin
- 1500V Isolation
- Input Pi Filter

### TECHNICAL SPECIFICATIONS

Input	
Voltage Range	36 - 72 VDC
48 VDC Nominal	<34V
Input Under Voltage Lockout	1V Nominal
Input Undervoltage Hysteresis	50 mA Pk-Pk
Reflected Ripple	Shunt Diode
Input Reverse Voltage Protection	

Output	
Setpoint Accuracy	±1%
3.3/5.0 V Line Regulation $V_{in}$ Min. - $V_{in}$ Max., $I_{out}$ Rated	0.2% $V_{out}$
2.5/2.1 V Line Regulation $V_{in}$ Min. - $V_{in}$ Max., $I_{out}$ Rated	0.4% $V_{out}$
Load Regulation $I_{out}$ Min. - $I_{out}$ Max., $V_{in}$ Nom.	0.5% $V_{out}$
Minimum Output Current	10%, $I_{out}$ Rated
Dynamic Regulation, Loadstep	25% $I_{out}$
Pk Deviation	6% $V_{out}$
Settling Time	500 $\mu$ s
Voltage Trim Range	±10%
Short Circuit / Overcurrent Protection	Shutdown / Hiccup
Current Limit Threshold Range, % of $I_{out}$ Rated	110 - 140%
OVP Trip Range	120 - 140% $V_{out}$ Nom.
Remote Shutdown Reference	$V_{in}$ Negative

Notes	
† MTBF predictions may vary slightly from model to model.	
Specifications typically at 25°C, normal line, and full load, unless otherwise stated.	
Soldering Conditions: I/O pins, 260°C, ten seconds; fully compatible with commercial wave-soldering equipment.	
Units are water-washable and fully compatible with commercial spray or immersion post wave-solder washing equipment.	



General	
Turn-On Time	10 ms
Remote Shutdown	Positive Logic
Switching Frequency, 3.3V Output	400 kHz
Switching Frequency, 5.0, 2.5, 2.1V Outputs	300 kHz
Isolation	
Input - Output	1500 VDC
Input - Case	1050 VDC
Output - Case	500 VDC
Temperature Coefficient	±0.03%/°C
Case Temperature	
Operating Range	-40 To +100°C
Storage Range	-40 To +125°C
Thermal Shutdown Range	105 To 115°C
Vibration, 3 Axes, 5 Min Each	5 g, 10 - 55 Hz
MTBF† (Bellcore TR-NWT-000332)	2.5 X 10 <sup>6</sup> hrs
Safety	UL, cUL, TUV
Weight (Approx.)	1.4 oz



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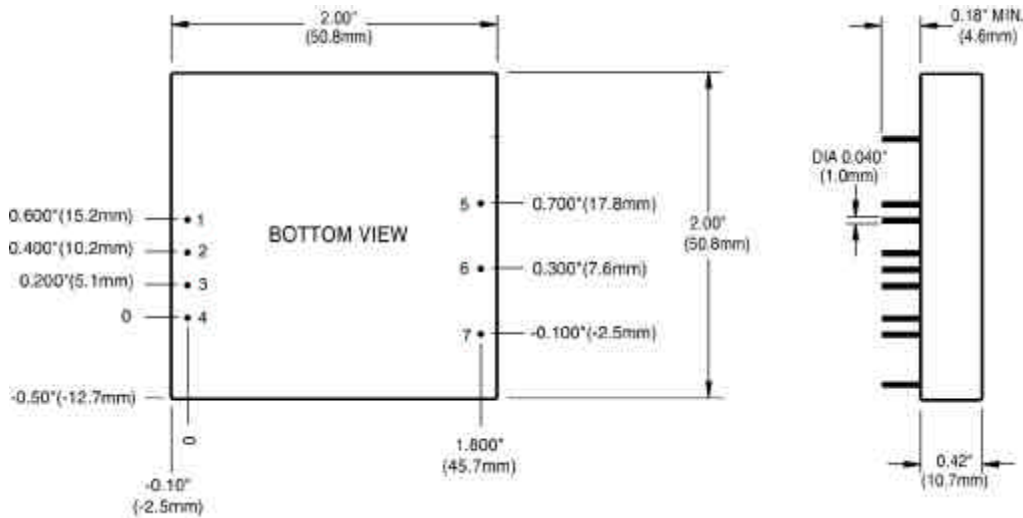
MODELS - (See the last page of Section for options.)

Vin (Volts)	Vin Range (Volts)	Iin Max.* (Amps)	Vout (Volts)	Iout Rated (Amps)	Ripple & Noise Pk-Pk (mV)	Efficiency Typ. **	Model
48	36 - 72	0.77	2.1	10.00	50	84%	OES021ZC-A
48	36 - 72	0.87	2.5	10.00	50	81%	OES025ZD-A
48	36 - 72	1.12	3.3	10.00	75	85%	OES033ZE-A
48	36 - 72	1.31	5	8.00	75	89%	OES040ZG-A

\* Maximum input current at minimum input voltage, maximum rated output power.

\*\* At nominal Vin, rated output.

## MECHANICAL DRAWING



High Density - Board Mounted Power Division

Thermal Impedance	
Natural Convection	11.3 C/W
100 LFM	8.9 C/W
200 LFM	6.2 C/W
300 LFM	4.4 C/W
400 LFM	3.4 C/W

Note:  
Thermal impedance data is dependent on many environmental factors. The exact thermal performance should be validated for specific application.

Pin	Function
1	+V <sub>in</sub>
2	-V <sub>in</sub>
3	No Conn.
4	Enable
5	+V <sub>out</sub>
6	-V <sub>out</sub>
7	Trim

Tolerances	
Inches:	(Millimeters)
.XX ± 0.020	.X ± 0.5
.XXX ± 0.010	.XX ± 0.25
Pin:	
± 0.002	± 0.05
(Dimensions as listed unless otherwise specified.)	



# OPTIONS

## Powering Communications and Technology

When ordering equipment options, use the following suffix information. Select the option(s) that you prefer and add them to the model number. Example ordering options are located below the options table.

OPTIONS	SUFFIX	APPLICATIONS SERIES	REMARKS
Negative Logic	N	HAS, HBD, HBS, HES, LES, QBS, QES, TES, TQD	TTL "Low" Turns Module ON TTL "High" Turns Module OFF
Lucent Compatible Trim	T	HAS, HBD, HBS, HES, QBS, QES	
Terminal Strip	TS	XWS, XWD, XWT	
Trim	1	IAS, LES	
Enable	2	IAD, IAS, LES, SMS	
Trim and Enable	3	IAS, LES	
Current Share	4	SMS	
Headerless	Y	Encapsulated EWS, IWS, OWS	
<b>PIN LENGTH AND HEATSINK OPTIONS</b>			Standard Pin Length is 0.180" (4.6mm)
0.110" (2.8mm) Pin Length	8	All Units (Except SMS)	
0.150" (3.8mm) Pin Length	9	All Units (Except SMS)	
0.24" (6.1mm) Horizontal Heatsink	1H	All Units (Except DIP, SIP, and SM Packages)	Includes Thermal Pad
0.24" (6.1mm) Vertical Heatsink	1V	All Units (Except DIP, SIP, and SM Packages)	Includes Thermal Pad
0.45" (11.4mm) Horizontal Heatsink	2H	All Units (Except DIP, SIP, and SM Packages)	Includes Thermal Pad
0.45" (11.4mm) Vertical Heatsink	2V	All Units (Except DIP, SIP, and SM Packages)	Includes Thermal Pad
0.95" (24.1mm) Horizontal Heatsink	3H	All Units (Except DIP, SIP, and SM Packages)	Includes Thermal Pad
0.95" (24.1mm) Vertical Heatsink	3V	All Units (Except DIP, SIP, and SM Packages)	Includes Thermal Pad

**Example Options:**

HBS050ZG-ANT3V = HBS050ZG-A with negative logic, Lucent compatible trim, and 0.95" vertical heatsink.

LES015YJ-3N = LES015YJ with optional trim and enable, negative logic.

QBS066ZG-AT8 = QBS066ZG-A with Lucent compatible trim and 0.110" pin length.

**NUCLEAR AND MEDICAL APPLICATIONS** - Power-One are not authorized for use as critical components in life support systems, equipment used in hazardous environments, or nuclear control systems without the express written consent of the President of Power-One, Inc.

**TECHNICAL REVISIONS** - The appearance of products, including safety agency certifications pictured on labels, may change depending on the date manufactured. Specifications are subject to change without notice.