



Description

IES DC-DC converters provide up to 20 watts of output power in an industry-standard package. With 87% efficiency and a maximum case temperature of 100 °C, the IES is well suited for the most demanding telecom, networking, and industrial applications. The IES features 1500 VDC isolation, short circuit, and overtemperature protection.

Technical Specifications

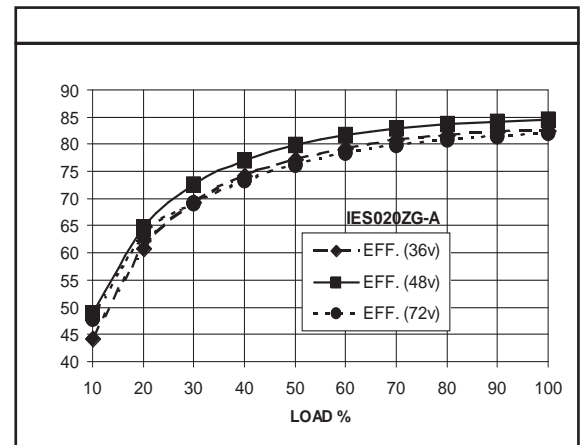
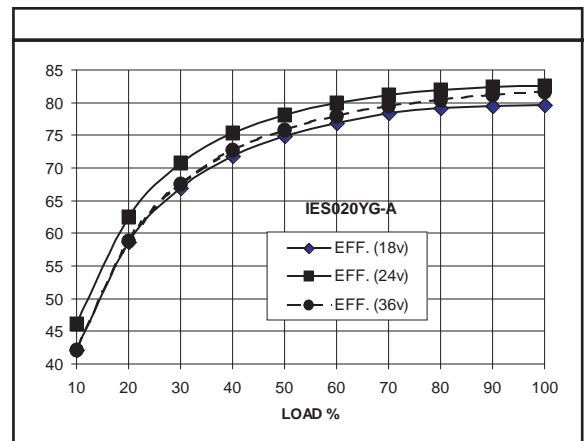
Input	
Voltage Range	16 - 36 VDC
24 VDC Nominal	36 - 72 VDC
48 VDC Nominal	<34V or <17V
Input Undervoltage Lockout	1V Nom.
UVLO Hysteresis	25 mA
Reflected Ripple	Shunt Diode
Input Reverse Voltage Protection	

Output	
Setpoint Accuracy	±1%
Line Regulation V_{in} Min. - V_{in} Max., I_{out} Rated	0.2% V_{out}
Load Regulation I_{out} Min. - I_{out} Max., V_{in} Nom.	0.5% V_{out}
Minimum Output Current	10 %
Dynamic Regulation, Loadstep	25% I_{out}
Pk Deviation	4% V_{out}
Settling Time	500 μ s
Voltage Trim Range	±10%
Short Circuit / Overcurrent Protection	Shutdown / Hiccup
Current Limit Threshold Range, % of I_{out} Rated	110 - 140%
OVP Trip Range	115 - 140% V_{out} Nom.
OVP Type	Second Control Loop, Self-Recovering

Turn-On Time	10 ms
Remote Shutdown	Positive Logic
Switching Frequency	300 kHz Open Frame / 450 kHz Cased
Isolation	
Input - Output	1500 VDC
Input - Case (24 V_{in} Units)	500 VDC
Output - Case (48 V_{in} Units)	500 VDC
Temperature Coefficient	0.03%/°C
Case Temperature	
Operating Range	-40 To +100 °C
Storage Range	-40 To +125 °C
Humidity Max., Non-Condensing	95%
Vibration, 3 Axes, 5 Min Each	5 g, 10 - 55 Hz
MTBF† (Bellcore TR-NWT-000332)	1.9 x 10 ⁶ hrs
Safety	UL, CSA, EN60950
Weight (approx.)	1.2 oz

Features

- RoHS lead-solder-exemption compliant
- 20 W standard package
- 100 °C case operation
- 3.3 V output available
- Open-frame or encapsulated
- 87% efficiency at 5 V
- Wide range input
- 1500 V isolation
- Short circuit protection



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.

Safety: Agency approvals may vary from model to model. Please consult factory for specific model information.

Units are water-washable and fully compatible with commercial spray or immersion post wave-solder washing equipment.

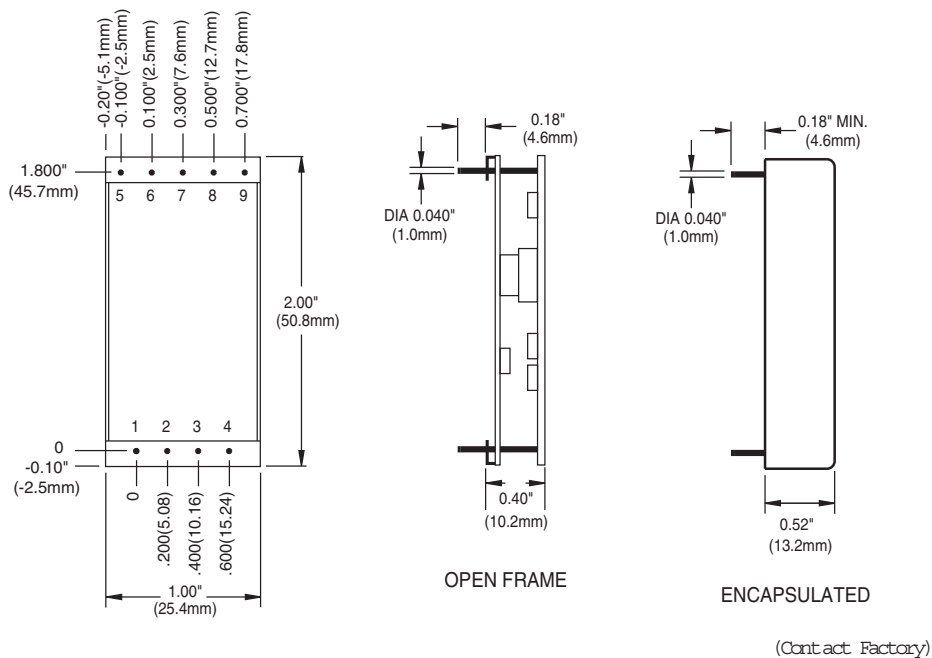
Model Selection

MODEL	INPUT VOLTAGE (VOLTS)	INPUT VOLTAGE RANGE (VOLTS)	MAXIMUM INPUT CURRENT (AMPS)*	OUTPUT VOLTAGE (VOLTS)	RATED OUTPUT CURRENT (AMPS)	RIPPLE & NOISE pk-pk (mV)	TYPICAL EFFICIENCY**
IES020YG-A	24	16-36	1.23	5.0	4.0	75	87%
IES013ZE-A	48	36-72	0.45	3.3	4.0	150	83%
IES020ZG-A	48	36-72	0.65	5.0	4.0	75	87%

NOTES: * Maximum input current at minimum input voltage, maximum rated output power.
** At nominal V_{in} , rated output.

Model numbers highlighted in yellow or shaded are not recommended for new designs.

Mechanical Drawing



	Thermal Impedance	
	Encapsulated Modules	Open Frame Modules
Natural Convection	15.4 °C/W	14.9 °C/W
100 LFM	12.2 °C/W	11.3 °C/W
200 LFM	9.3 °C/W	8.3 °C/W
300 LFM	7.4 °C/W	6.8 °C/W
400 LFM	6.4 °C/W	5.4 °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 _{in}
2	-V _{in}
3	No Pin
4	Shutdown
5	+V _{out}
6	-V _{out}
7	Trim
8	No Pin
9	No Pin

Tolerances	
Inches:	(Millimeters)
.XX ± 0.020	.X ± 0.5
.XXX ± 0.010	.XX ± 0.25
Pin:	
± 0.002	± 0.05
Case:	
+ 0.04, - 0.00	+ 1.0, - 0.00
(Dimensions as listed unless otherwise specified.)	

NUCLEAR AND MEDICAL APPLICATIONS - Power-One products are not designed, intended for use in, or 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 respective divisional president of Power-One, Inc.

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