IES DC-DC Series Data Sheet
Single-Output, 20 Watts

RoHS Compliant

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.

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

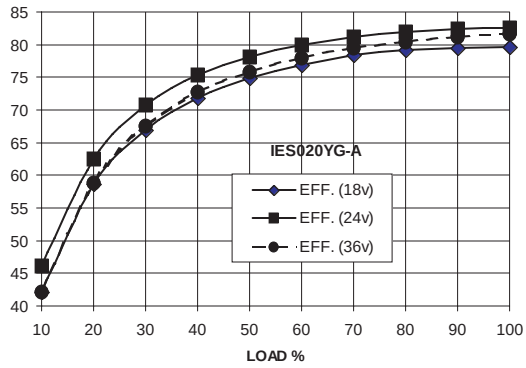
Technical Specifications

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

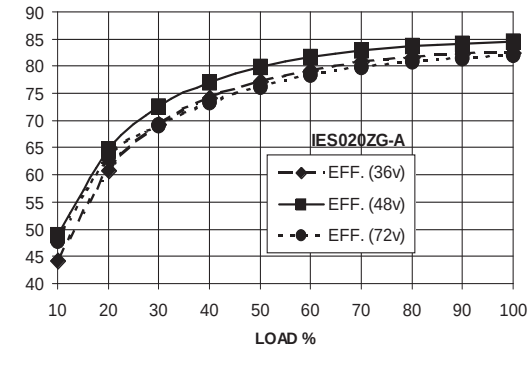
Output	
Setpoint Accuracy	±1%
Line Regulation V_{in} Min. - V_{in} Max., I_{out} Rated	0.2% V_{out}
Load Regulation I_{out} Min. - I_{out} Max., V_{in} Nom.	0.5% V_{out}
Minimum Output Current	10 %
Dynamic Regulation, Loadstep	25% I_{out}
Pk Deviation	4% V_{out}
Settling Time	500 µs
Voltage Trim Range	±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

General	
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

Efficiency vs. Load (24V Input)



Efficiency vs. Load (48V Input)



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.

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Changing the Shape of Power

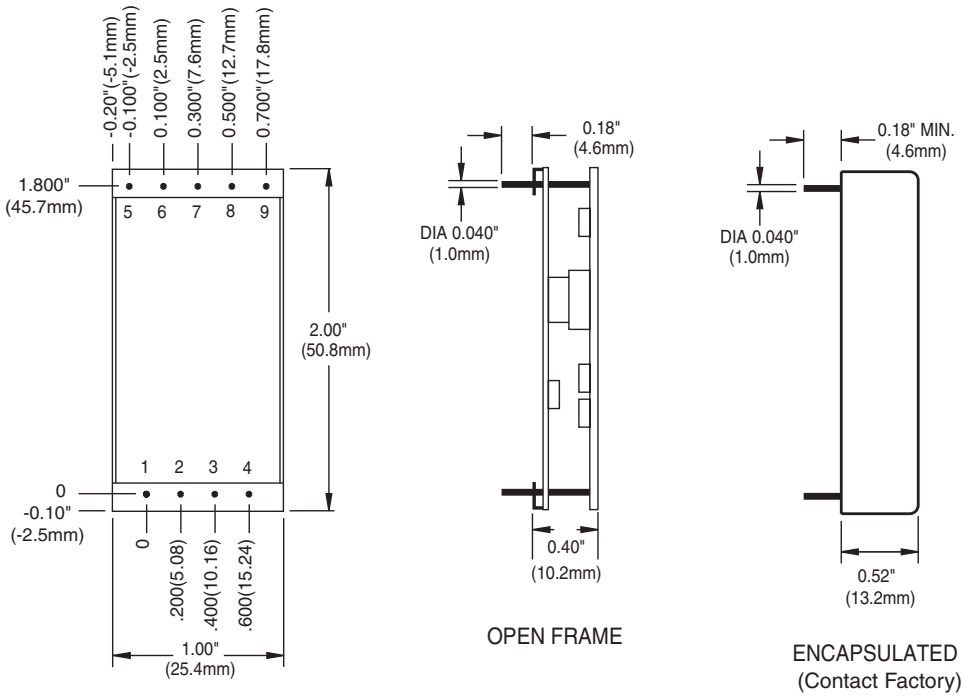
Model Selection

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.)