

Features

- Wide 2 : 1 Input Voltage Range(9~18V,18~36V,36~75V)
- Remote On/Off
- Input / Output Isolation Voltage: 3.0kVDC
- Extended Operating Temperature Range: -40°C to +85°C
- Output Short Circuit Protection:
Continuous & Auto Recovery
- Over Voltage Protection: Clamp Mode
- Meet EN55022, Class A (Radiation)
- Shielded Metal Case with Insulated Baseplate
- Lead Free Design, RoHS Compliant
- 24pin DIP Package with Industry-Standard Footprint
- Customer Design Available
- Safety Standard / Approval : IEC / EN 60950-1



Description

The BOB8H3 Series are isolated 8W DC/DC converters. Designed with highly efficiency, allow the operating temperature range of these units to be -40°C to +85°C in a 24 pin DIP package with industry-standard footprint. Further features include wide 2 : 1 input voltage range, remote on/off control, short-circuit protection and over voltage protection.

Applications

These converters are well suitable for battery operated equipment, measurement equipment, telecom, wireless network, Industry control system, everywhere where isolated, tightly regulated voltages and compact size are required.

Technical Specification

All specifications are typical at nominal input, full load and 25°C unless otherwise stated.

Model Number	Input Voltage Range	Output Voltage (V)	Output Current (mA)		Input Current (mA)		Eff. ⁽²⁾ (%)	Capacitive Load, max. ⁽³⁾ (uF)
			Min. Load ⁽¹⁾	Full. Load	No Load	Full Load		
BOB8-12S0H3	9~18V Nominal:12V	3.3	30	2000	6	719	80	2600
BOB8-12S1H3		5	22	1500	4	787	83	1600
BOB8-12S2H3		12	0	665	28	825	85	350
BOB8-12S3H3		15	0	535	27	823	85	240
BOB8-12D1H3		±5	0	±800	28	849	83	800
BOB8-12D2H3		±12	0	±335	31	827	85	160
BOB8-12D3H3		±15	0	±265	29	805	86	100
BOB8-24S0H3	18~36V Nominal:24V	3.3	34	2000	11	360	80	2600
BOB8-24S1H3		5	0	1500	12	394	83	1600
BOB8-24S2H3		12	0	665	15	412	85	350
BOB8-24S3H3		15	0	535	13	411	85	240
BOB8-24D1H3		±5	0	±800	17	423	83	800
BOB8-24D2H3		±12	0	±335	19	414	85	160
BOB8-24D3H3		±15	0	±265	16	405	86	100
BOB8-48S0H3	36~75V Nominal:48V	3.3	42	2000	2	180	80	2600
BOB8-48S1H3		5	0	1500	5	197	83	1600
BOB8-48S2H3		12	0	665	8	204	86	350
BOB8-48S3H3		15	0	535	8	205	86	240
BOB8-48D1H3		±5	0	±800	7	210	83	800
BOB8-48D2H3		±12	0	±335	9	205	86	160

BOB8-48D3H3		±15	0	±265	9	205	85	100
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Input Specifications

Input Voltage	12V nominal input	9-18V
	24V nominal input	18-36V
	48V nominal input	36-75V
Input filter		Pi Type
Input surge voltage (100ms max.)	12V input	25V
	24V input	50V
	48V input	100V
Input reflected ripple current	Nominal Vin and full load	100mA _{p-p} max.
Start up time	Nominal Vin and constant resistive load	1020ms max.
Remote ON/OFF	Converter: ON	Open or $3.5V < V_r < 12V$
	Converter: OFF	Short ⁽⁴⁾ or $0V < V_r < 1.2V$
Sourcing current of remote control pin	Nominal Vin	< 0.2 mA
Idle input current (at Remote OFF state)	Nominal Vin	< 2.5 mA

Environmental Specifications

Operating ambient temperature	-40°C to +85°C (with derating)
Maximum case temperature	+100°C
Storage temperature range	-55°C to +105°C
Relative humidity	5% to 95% RH
Temperature coefficient	±0.02% / °C max.

EMC Characteristics

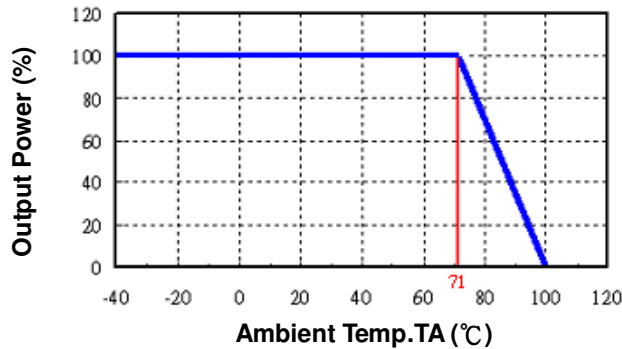
EMI	EN55022 (radiation)	Meet class A
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Output Specifications

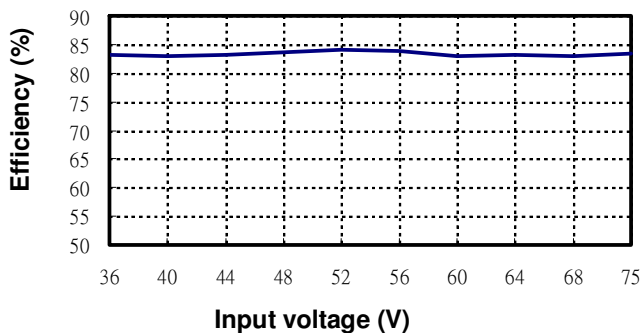
Output power	8 Watts max.	
Voltage accuracy	Full load and nominal Vin	±2%
Minimum load	See table	
Line regulation	LL to HL at full load	±0.5%
Load Regulation	25% load to full load	Single ±1%
	Balanced load	Dual ±1%
	Unbalanced load 25% to 100% full load	±5%
Ripple and Noise	20MHz bandwidth	65mV _{p-p} max.
Over voltage protection (Zener Diode Clamp)	3.3V _{out} models	3.9V
	5V _{out} models	6.2V
	12V _{out} models	15V
	15V _{out} models	18V
Capacitive load	See table	
Over load protection	% of full load at nominal input	150% typ.
Short circuit protection	Continuous, automatic recovery	
Transient response settling time	50% load step change	1200µs max.

Transient response over shoot	di/dt=0.8A/μs	≤ ±5% of Vo
General Specifications		
Efficiency	Nominal input	See table
Isolation voltage	Input to output	3000VDC
Isolation resistance	500 VDC	10 ⁹ Ohms min.
Isolation capacitance		280pF typ.
Switching frequency		300kHz typ.
Reliability, calculated MTBF		3.76 × 10 ⁶ Hrs
Physical Specifications		
Case material		Nickel-coated copper
Base material		Non-conductive black plastic
Potting material		Silicon rubber (UL94V-0)
Dimensions		1.25 × 0.80 × 0.40 Inch (31.75 × 20.32 × 10.16 mm)
Weight		17.2g (0.59oz) typ.

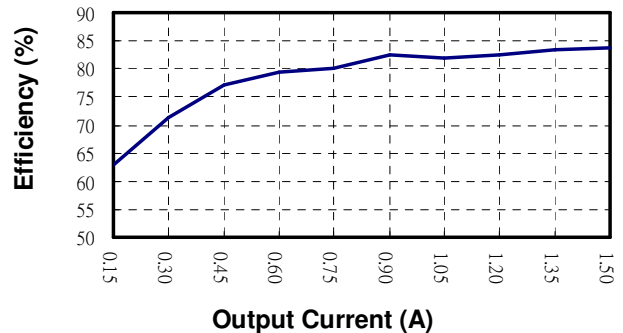
**BOB8H3 Series
Power Derating Curve(5)**



**BOB8-48S1H3
Input voltage vs. Efficiency**

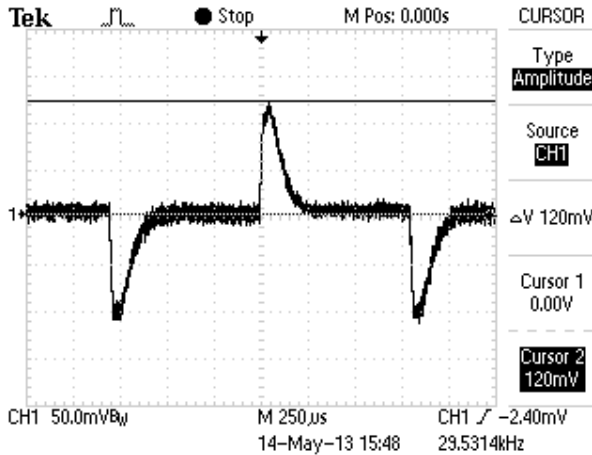


**BOB8-48S1H3
Output Current vs. Efficiency**



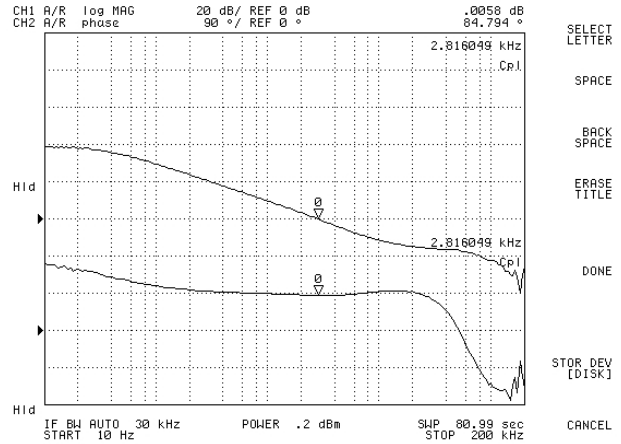
BOB8-48S1H3

Transient Response at 50%~100% Max Load



BOB8-48S1H3

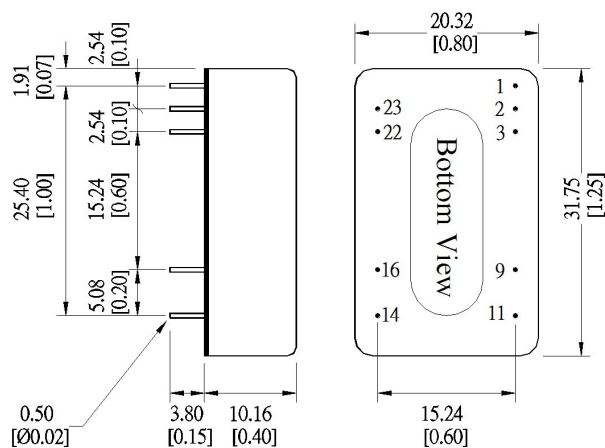
Loop Gain & Phase at Vi=48V, Full Load



Note

1. Io below this value will not damage these converters, however, they may not meet all listed specifications.
2. Typical value, tested at nominal input and full load.
3. For each output.
4. Short to -Vin (Pin 2,3).
5. Based on BOB8-48S1H3.

Mechanical Dimensions



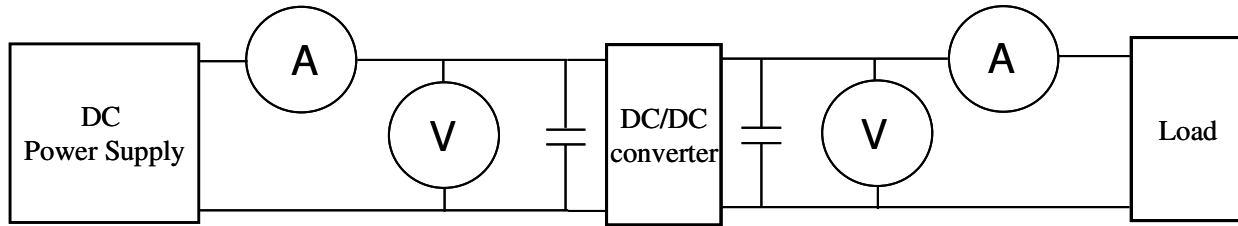
Unit: mm [inch]
Tolerance: ±0.5 [0.02]

Pin Assignment		
Pin	Single	Dual
1	Remote On/Off	Remote On/Off
2	-Vin	-Vin
3	-Vin	-Vin
9	No function	Common
11	No function	-Vout
14	+Vout	+Vout
16	-Vout	Common
22	+Vin	+Vin
23	+Vin	+Vin

Specifications subject to change without notice.

Test Configurations

All specifications are typical at nominal input, full load and 25°C unless otherwise stated.



- ⊙ DC Power Supply: It offers a wide voltage and current range precisely.
- ⊙ Current meter (A): Accuracy → 200μA ~ 200mA 4 ranges ±(0.2% rdg + 2 digits)
2000mA ~ 20A 2 ranges ±(0.3% rdg + 2 digits).
- ⊙ Voltage meter (V): Accuracy → ±(0.03% rdg + 4 digits).
- ⊙ Load: At full load.
- ⊙ Wires: The resistance of the wires must be small.

1. Input voltage range: Narrow input voltage range (±10%) · wide input voltage range (2:1 and 4:1) ·

EX: Narrow input voltage range (±10%)

5V nominal input	→	4.5~5.5V
12V nominal input	→	10.8~13.2V
24V nominal input	→	21.6~26.4V

Wide input voltage range 2:1

5V nominal input	→	4.5~9V
12V nominal input	→	9~18V
24V nominal input	→	18~36V
48V nominal input	→	36~75V

Wide input voltage range 4:1 (W)

24V nominal input	→	9~36V
48V nominal input	→	18~75V

2. Input power :

$$P_{in} = V_{in} \times I_{in}$$

V_{in} : Input voltage
 I_{in} : Input current

3. Output power :

$$P_{out} = V_{out} \times I_{out}$$

V_{out} : Output voltage
 I_{out} : Output current

4. Efficiency :

$$\text{Efficiency} = \frac{P_{out}}{P_{in}} \times 100\%$$

P_{out} : Output power
 P_{in} : Input power

5. Voltage accuracy:

$$\frac{|V_{out} - V_{out}(\text{nominal})|}{V_{out}} \times 100\%$$

V_{out} : Output voltage
 $V_{out}(\text{nominal})$: Nominal output voltage

6. Line regulation: (1) Wide input voltage range and regulated output voltage series.

$$\frac{|V_{out(LL)} - V_{out(HL)}|}{V_{out(LL)}} \times 100\%$$

LL: Low Line input voltage
HL: High Line input voltage

- (2) Narrow input voltage range ($\pm 10\%$) and unregulated output voltage series.

$$\text{Line regulation} = \left| \frac{\Delta V_{out}}{\Delta V_{in}} \right|$$

$$\Delta V_{out} = \frac{V_{out(+10\%)} - V_{out(-10\%)}}{V_{out}} \times 100\%$$

$V_{out(+10\%)}$: Output voltage at $V_{in} = 1.1 \times V_{in}(\text{nominal})$ & full load

$V_{out(-10\%)}$: Output voltage at $V_{in} = 0.9 \times V_{in}(\text{nominal})$ & full load

V_{out} : Output voltage at $V_{in} = V_{in}(\text{nominal})$ & full load

$$\Delta V_{in} = \frac{V_{in(+10\%)} - V_{in(-10\%)}}{V_{in}(\text{nominal})} \times 100\%$$

$V_{in(+10\%)}$: Input voltage = $1.1 \times V_{in}(\text{nominal})$

$V_{in(-10\%)}$: Input voltage = $0.9 \times V_{in}(\text{nominal})$

$V_{in}(\text{nominal})$: Nominal Input voltage

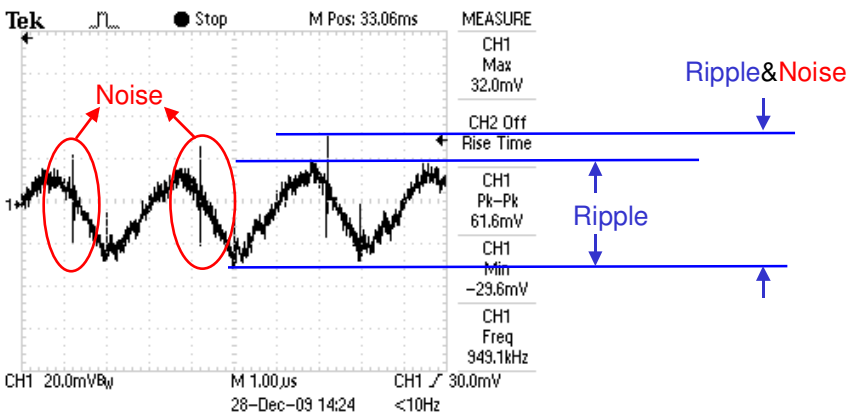
7. Load regulation :

$$\frac{|V_{out(FL)} - V_{out(NL)}|}{V_{out(FL)}} \times 100\%$$

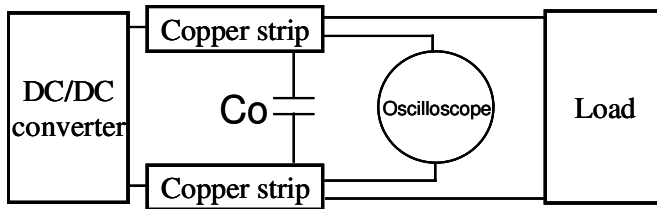
$V_{out(FL)}$: Output voltage at full load

$V_{out(NL)}$: Output voltage at 25% full load or 10% full load

8. Ripple and Noise: as shown below. The bandwidth is 0-20MHz.

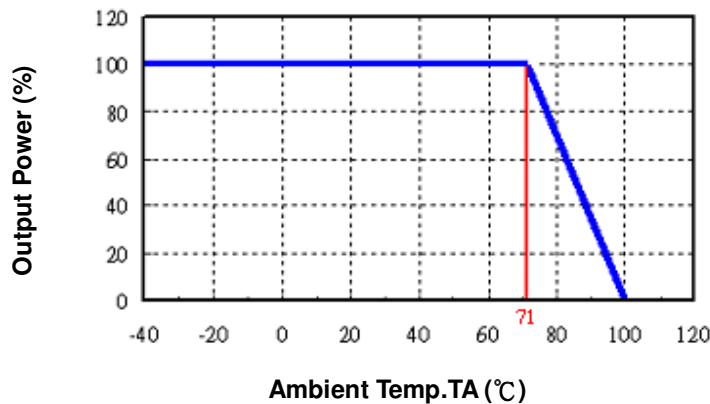


Output Ripple&Noise measurement test circuit: as shown below.



C_o : usually 0.47 μ F.

9. [Temperature derating curve](#): The DC-DC converter will operate over a wider temperature range if less power is drawn from the output and the device is already running. The temperature derating curve shows the operating power-temperature range. As shown below.



10. [Switching frequency](#): The nominal operating frequency of the DC-DC converters.
11. [Input to output isolation](#): The dielectric breakdown strength test between input and output circuits. This is the isolation voltage the device is capable of withstanding for a specified time, usually 1 second or 1 minute.