



**Features**

- Wide 2 : 1 Input Voltage Range(4.5~9V,9~18V,18~36V,36~75V)
- Remote On/Off
- Input / Output Isolation Voltage: 1.5K Vdc
- 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



**Description**

The BOB5 Series are isolated 5W 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 (Vdc)	Output Current (mA)		Input Current (mA)		Eff. <sup>(2)</sup> (%)	Capacitive Load, max. <sup>(3)</sup> (uF)
			Min. Load <sup>(1)</sup>	Full. Load	No Load	Full Load		
BOB5-05S0	4.5~9V Nominal:5Vdc	3.3	0	1200	46	1115	75	14700
BOB5-05S1		5	15	1000	8	1351	78	6900
BOB5-05S2		12	0	500	42	1558	81	1660
BOB5-05S3		15	0	400	65	1558	81	880
BOB5-05D1		±5	0	±500	55	1351	78	2200
BOB5-05D2		±12	0	±250	76	1600	79	330
BOB5-05D3		±15	0	±200	77	1579	80	330
BOB5-12S0	9~18V Nominal:12Vdc	3.3	12	1200	21	440	79	4700
BOB5-12S1		5	0	1000	22	541	81	2630
BOB5-12S2		12	0	500	25	625	84	330
BOB5-12S3		15	0	400	27	617	85	220
BOB5-12D1		±5	0	±500	22	541	81	1100
BOB5-12D2		±12	0	±250	31	625	84	132
BOB5-12D3		±15	0	±200	32	617	85	69
BOB5-24S0	18~36V Nominal:24Vdc	3.3	17	1200	10	223	78	3200
BOB5-24S1		5	0	1000	10	267	82	3080
BOB5-24S2		12	0	500	12	313	84	377
BOB5-24S3		15	0	400	14	313	84	230
BOB5-24D1		±5	0	±500	12	271	81	990
BOB5-24D2		±12	0	±250	17	316	83	122
BOB5-24D3		±15	0	±200	17	313	84	194
BOB5-48S0	36~75V Nominal:48Vdc	3.3	0	1200	6	111	78	3750
BOB5-48S1		5	0	1000	6	135	81	2730
BOB5-48S2		12	0	500	7	156	84	277
BOB5-48S3		15	0	400	8	156	84	147
BOB5-48D1		±5	0	±500	7	135	81	1330
BOB5-48D2		±12	0	±250	9	156	84	230
BOB5-48D3		±15	0	±200	9	156	84	132



Input Specifications			
Input Voltage	5V nominal input		4.5-9Vdc
	12V nominal input		9-18Vdc
	24V nominal input		18-36Vdc
	48V nominal input		36-75Vdc
Input filter			Pi Type
	5V input		10Vdc
	12V input		25Vdc
Input surge voltage (100ms max.)	24V input		50Vdc
	48V input		100Vdc
Input reflected ripple current	Nominal Vin and full load		100mA <sub>p-p</sub> typ.
Start up time	Nominal Vin and constant resistive load		730ms typ.
Remote ON/OFF	Converter: ON	Open or 3.5V < Vr < 12V	
	Converter: OFF	Short <sup>(4)</sup> or 0V < Vr < 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
Output Specifications			
Output power	6 Watts max.		
Voltage accuracy	Full load and nominal Vin		±1%
Minimum load	See table		
Line Regulation	LL to HL at full load		±0.5%
	25% load to full load	Single	±1%
Load Regulation	Balanced load	Dual	±0.5%
	Unbalanced load 25% to 100% full load		±3%
Ripple and Noise	20MHz bandwidth		60mV <sub>p-p</sub> max.
	3.3V <sub>out</sub> models		3.9V
Over voltage protection (Zener Diode Clamp)	5V <sub>out</sub> models		6.2V
	12V <sub>out</sub> models		15V
	15V <sub>out</sub> 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	490µs typ.
Transient response over shoot	di/dt=0.8A/µs	≤ ±5% of Vo

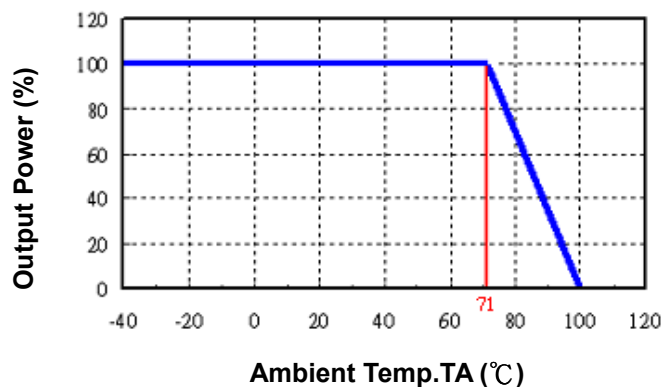
**General Specifications**

Efficiency	Nominal input	See table
Isolation voltage	Input to output	1500Vdc
Isolation resistance	500Vdc	10 <sup>9</sup> Ohms min.
Isolation capacitance		280pF typ.
Switching frequency		300kHz typ.
Reliability, calculated MTBF		2.40 × 10 <sup>6</sup> Hrs

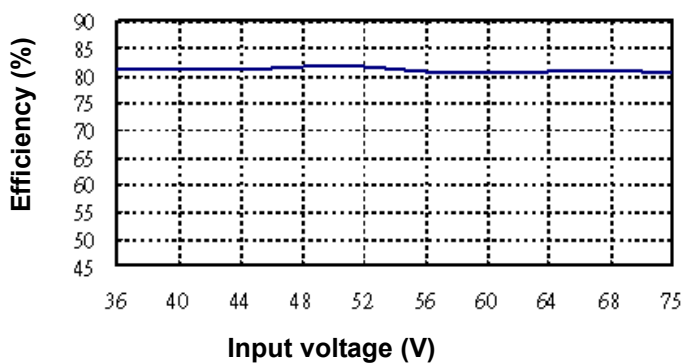
**Physical Specifications**

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.

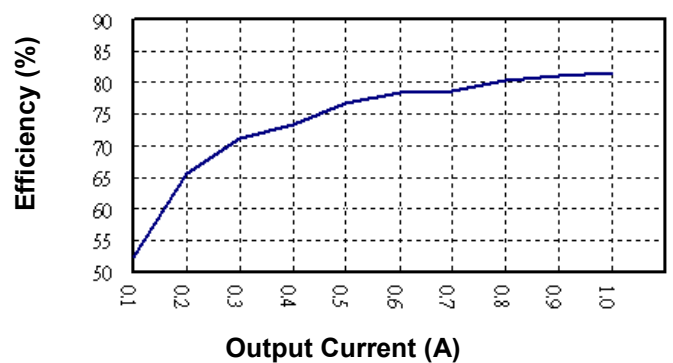
**BOB5 Series  
Power Derating Curve(5)**



**BOB5-48S1  
Input voltage vs. Efficiency**



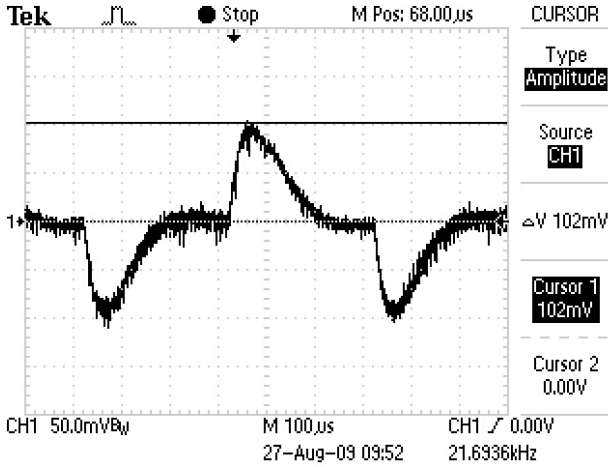
**BOB5-48S1  
Output Current vs. Efficiency**





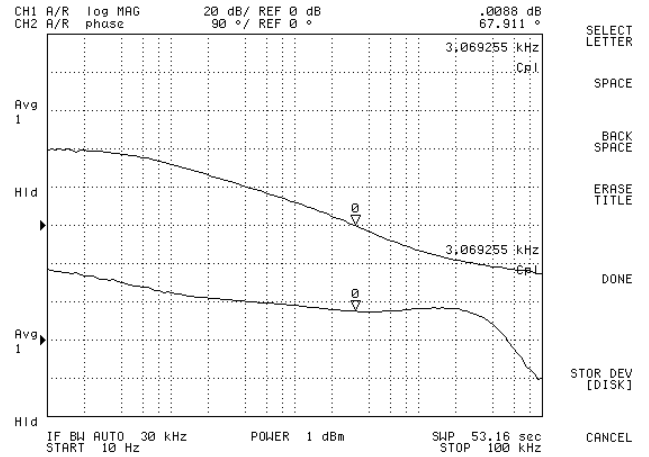
**BOB5-48S1**

**Transient Response at 50%~100% Max Load**



**BOB5-48S1**

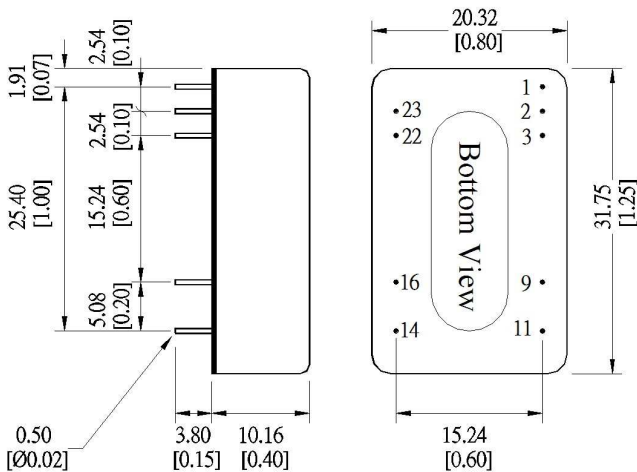
**Loop Gain & Phase at Vi=48V, Full Load**



**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 BOB5-48S1.

**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 pin	Common
11	No function	-Vout
14	+Vout	+Vout
16	-Vout	Common
22	+Vin	+Vin
23	+Vin	+Vin

Specifications subject to change without notice.