Features

- Wide 2 : 1 Input Voltage Range(9~18V,18~36V,36~75V)
- High Efficiency up to 91%
- Remote On/Off
- Input / Output Isolation Voltage: 1.5kVDC
- Operating Temperature Range: -40℃ to +85℃
- Output Short Circuit Protection:
  Hiccup, continuous & Auto Recovery
- Over Temperature Protection
- Shielded Metal Case with Insulated Baseplate
- Customer Design Available
- Optional Heat-sink
- Safety Standard / Approval : IEC / EN 60950-1

RoHS compliant

Description

The BUC30 Series are isolated 30W DC/DC converters. Designed with highly efficiency, allow the operating temperature range of these units to be -40℃ to +85℃ (with derating) in a 50.8×25.4×10.2mm shielded metal case. Further features include wide 2 : 1 input voltage range, remote on/off control, trimmable output, short-circuit protection, over voltage protection and over temperature 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

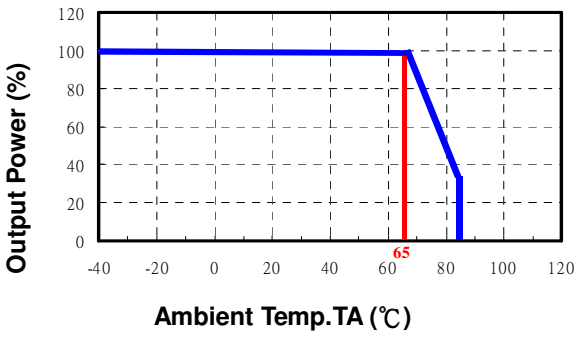
All specifications are typical at nominal input, full load and 25℃ unless otherwise stated.

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		
BUC30-12S7	9~18V Nominal:12V	1.5	0	8500	85	1476	78	56000
BUC30-12S9		2.5	0	8000	75	2137	82	47000
BUC30-12S0		3.3	0	7500	100	2611	83	47000
BUC30-12S1		5.1	0	6000	150	3148	85	33000
BUC30-12S2		12	50	2500	70	3012	87	4700
BUC30-12S3		15	150	2000	30	3012	87	3300
BUC30-12D1		±5	0	±3000	130	3012	87	10000
BUC30-12D2		±12	±20	±1250	120	3012	87	2200
BUC30-12D3		±15	±100	±1000	100	2976	88	1800
BUC30-24S7	18~36V Nominal:24V	1.5	0	8500	35	699	80	56000
BUC30-24S9		2.5	0	8000	35	1029	85	47000
BUC30-24S0		3.3	0	7500	40	1242	87	47000
BUC30-24S1		5.1	0	6000	50	1500	89	33000
BUC30-24S2		12	50	2500	85	1453	90	4700
BUC30-24S3		15	20	2000	80	1453	90	3300
BUC30-24D1		±5	0	±3000	50	1453	90	10000
BUC30-24D2		±12	±50	±1250	50	1453	90	2200
BUC30-24D3		±15	0	±1000	50	1453	90	1800
BUC30-48S7	36~75V Nominal:48V	1.5	0	8500	20	345	81	56000
BUC30-48S9		2.5	0	8000	15	508	86	47000
BUC30-48S0		3.3	0	7500	20	614	88	47000
BUC30-48S1		5.1	0	6000	25	741	90	33000
BUC30-48S2		12	150	2500	25	727	90	4700
BUC30-48S3		15	20	2000	25	718	91	3300
BUC30-48D1		±5	0	±3000	25	727	90	10000
BUC30-48D2		±12	0	±1250	25	718	91	2200
BUC30-48D3		±15	0	±1000	25	718	91	1800

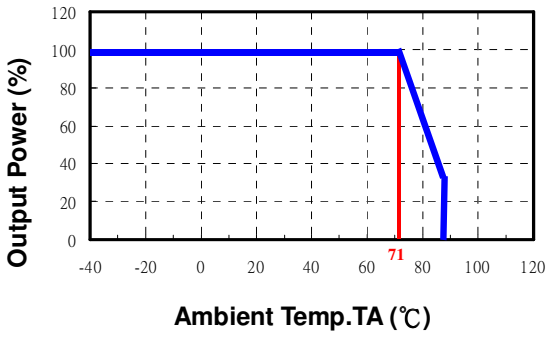
Input Specifications		
Input voltage	12V nominal input	9-18V
	24V nominal input	18-36V
	48V nominal input	36-75V
Input filter		Pi type
Input surge voltage (100ms max.)	12V input	25V
	24V input	50V
	48V input	100V
Input reflected ripple current	Nominal Vin and full load	120mAp-p typ.
Start up time	Nominal Vin and constant resistive load	80ms typ.
Remote ON/OFF	Converter: ON	Open or 3.5V＜Vr＜12V
	Converter: OFF	Short (4) or 0V＜Vr＜0.7V
Sourcing current of remote control pin	Nominal Vin	＜0.2 mA
Idle input current (at Remote OFF state)	Nominal Vin	＜15 mA
Environmental Specifications		
Operating ambient temperature		-40℃ to +85℃ (with derating)
Maximum case temperature		+100℃
Storage temperature range		-55℃ to +105℃
Relative humidity		95% RH max.
Temperature coefficient		±0.02% / ℃ max.
Output Specifications		
Output power		30 Watts max.
Voltage accuracy	Full load and nominal Vin	±1%
Minimum load		See table
Line regulation	LL to HL at full load	±0.5%
Load Regulation	25% load to full load Single	±0.8%
	Balanced load Dual	±0.5%
	Unbalanced load 25% to 100% full load	±3%
Ripple and Noise	20MHz bandwidth	85mVp-p max.
	(Measured with a 2.2uF/50V MLCC)	(120mVp-p for 12/15Vout)
Over voltage protection (Zener Diode Clamp)	1.5Vout models	3V
	2.5Vout models	3.6V
	3.3Vout models	3.9V
	5Vout models	6.2V
	12Vout models	15V
	15Vout models	18V
Capacitive load		See table
Over load protection	% of full load at nominal input	110% min.
Thermal shutdown		115℃ typ.

Short circuit protection		Hiccup, continuous(Auto Recovery)
Transient response settling time	50% load step change	400μs typ (1.7ms for 1.5/2.5/3.3Vout)
Transient response over shoot	di/dt=0.8A/μs	≤ ±5% of Vo (≤ ±10% for 1.5/2.5/3.3Vout)
General Specifications		
Efficiency	Nominal input	See table
Isolation voltage	Input to output	1500VDC
Isolation resistance	500VDC	10^9 Ohms min.
Isolation capacitance		1200pF typ.
Switching frequency		300kHz typ.
Reliability, calculated MTBF		1.06×10^6 Hrs
Physical Specifications		
Case material		Nickel-coated copper
Base material		Non-conductive black plastic
Potting material		Silicon rubber (UL94 V-0)
Dimensions		2.0 × 1.0 × 0.4 Inch (50.8 × 25.4 × 10.2 mm)
Weight		32.0g (1.13oz) typ.

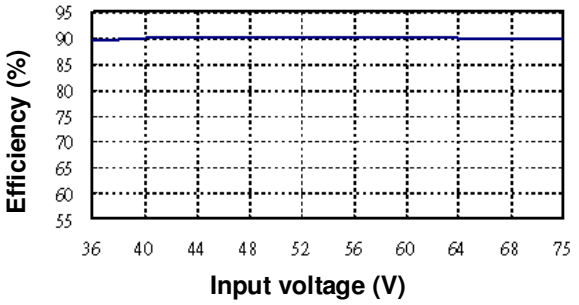
BUC30 Series
Power Derating Curve without Heatsink(5)



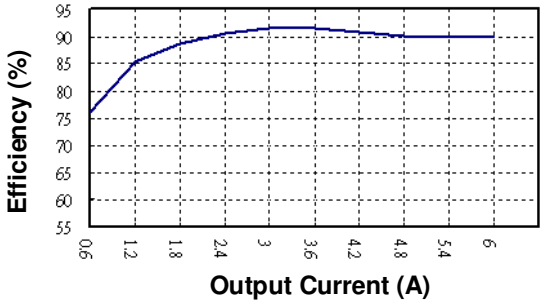
BUC30 Series
Power Derating Curve with Heatsink (5)



BUC30-48S1
Input Voltage vs. Efficiency

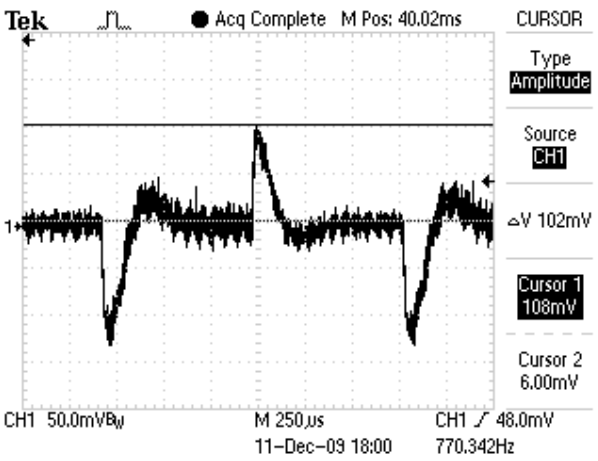


BUC30-48S1
Output Current vs. Efficiency



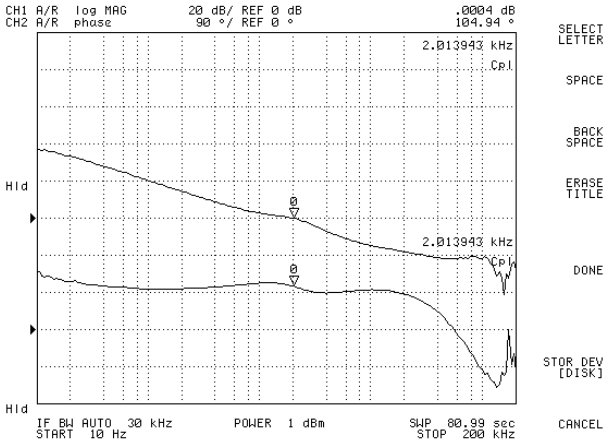
BUC30-48S1

Transient Response at 50%~100% Max Load



BUC30-48S1

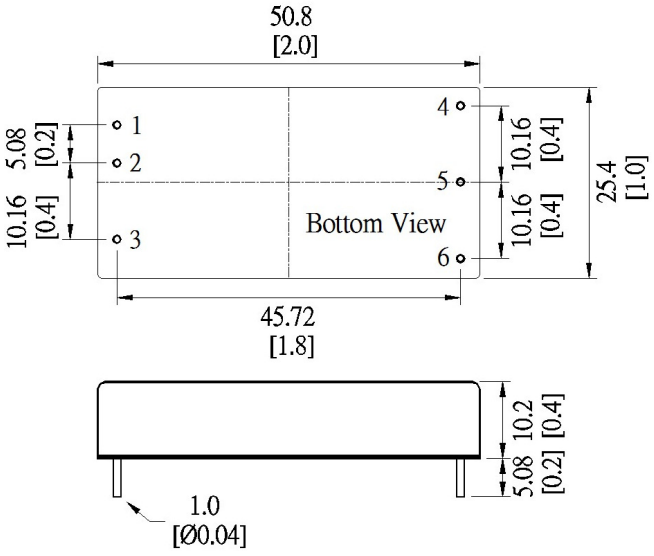
Loop Gain & Phase at Vi=48V,Full Load



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).
5. Based on BUC30-48S1.

Mechanical Dimensions



Pin Assignment		
Pin	Single	Dual
1	+Vin	+Vin
2	-Vin	-Vin
3	Remote On/Off	
4	+Vout	+Vout
5	-Vout	Common
6	Trim	-Vout

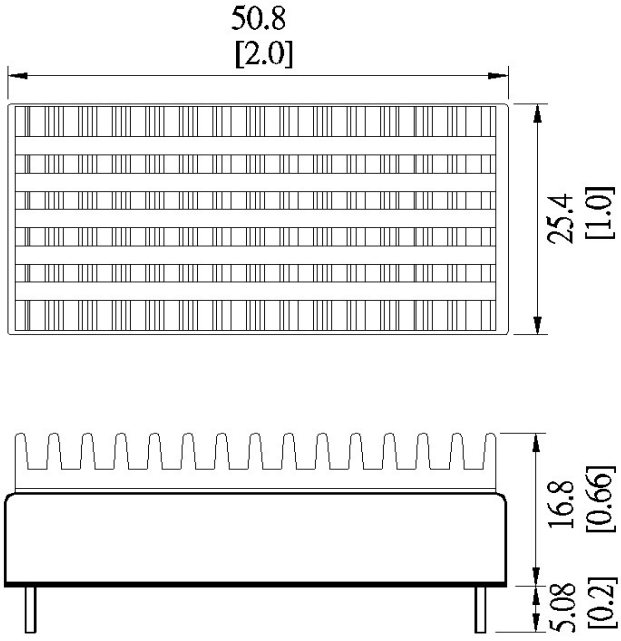
Unit: mm [inch]
Tolerance:±0.5[0.02]

Heat-sink (Option)

Material: Aluminum

Weight: 10g (0.35oz)

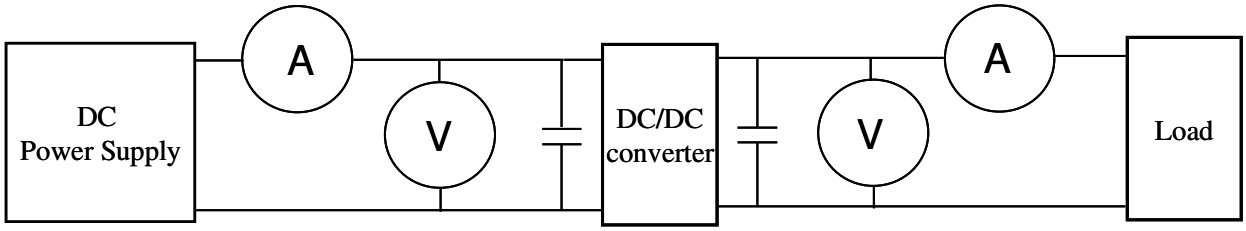
Note:
The product label on converter has to be removed before mounting the heat-sink.
For volume orders, converters will be supplied with heat-sink already mounted. Please contact factory for quotation.
Separate heat-sinks are only available for prototypes and small quantity orders.



Specifications subject to change without notice.

Test Configurations

All specifications are typical at nominal input, full load and 25℃ 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 :

Pin = Vin x Iin

Vin：Input voltage
Iin：Input current

3. Output power :

Pout = Vout x Iout

Vout：Output voltage
Iout：Output current

4. Efficiency :

$$\text{Efficiency} = \frac{\text{Pout}}{\text{Pin}} \times 100\%$$

Pout: Output power
Pin: Input power

5. Voltage accuracy:

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

Vout：Output voltage
Vout(nominal)：Nominal output voltage

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

$$\frac{|\,Vout(LL)-Vout(HL)\,|}{Vout(LL)} \times 100\%$$

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

(2) Narrow input voltage range（±10%）and unregulated output voltage series.

$$\text{Line regulation} = \left| \frac{\Delta Vout}{\Delta Vin} \right|$$

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

Vout(+10%)：Output voltage at Vin = 1.1xVin(nominal)&full load

Vout(-10%)：Output voltage at Vin = 0.9xVin(nominal)&full load

Vout：Output voltage at Vin = Vin(nominal)&full load

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

Vin(+10%)：Input voltage = 1.1xVin(nominal)

Vin(-10%)：Input voltage = 0.9xVin(nominal)

Vin(nominal)：Nominal Input voltage

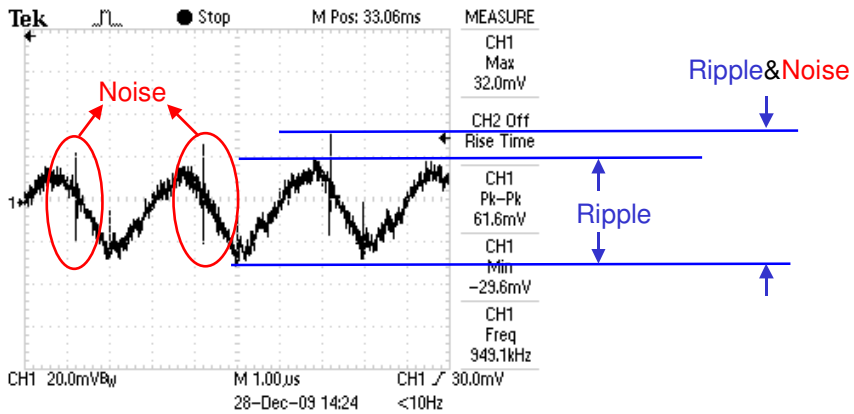
7. Load regulation :

$$\frac{|\,Vout(FL)-Vout(NL)\,|}{Vout(FL)} \times 100\%$$

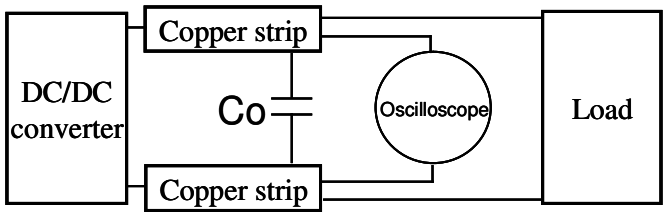
Vout(FL): Output voltage at full load

Vout(NL): Output voltage at 25% full load or 10% full load

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

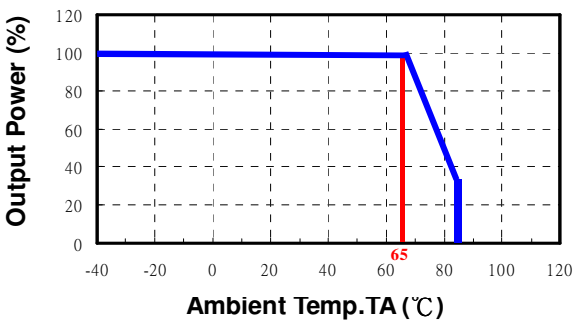


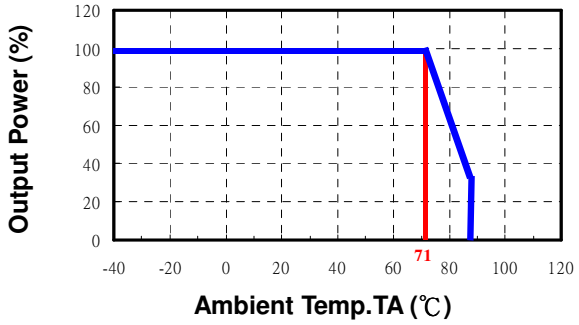
Output Ripple&Noise measurement test circuit: as shown below.



Co: usually 0.47uF.

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.