



## Features

- Wide 4 : 1 Input Voltage Range(9~36V,18~75V)
- High Efficiency up to 90%
- Remote On/Off
- Input / Output Isolation Voltage: 1.5K Vdc
- Extended Operating Temperature Range: -40°C to+85°C
- Output Short Circuit Protection:  
Hiccup, continuous & Auto Recovery
- Over Voltage Protection: Clamp Mode
- Shielded Metal Case with Insulated Baseplate
- Lead Free Design, RoHS Compliant
- 6 pin DIP Package with Industry-Standard Footprint
- Standard 2"X1" Package
- Customer Design Available



## Description

The BUB20W Series are isolated 20W DC/DC converters. Designed with highly efficiency, allow the operating temperature range of these units to be -40°C to +85°C (with derating) in a 6 pin DIP package with industry-standard footprint. Further features include wide 4 : 1 input voltage range, remote on/off control, trimmable output, 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. (uF) <sup>(3)</sup>
			Min. Load <sup>(1)</sup>	Full. Load	No Load	Full Load		
BUB20-24S0W	9~36V Nominal:24VDC	3.3	0	5500	42	937	85	19760
BUB20-24S1W		5.0	0	4000	67	997	88	16000
BUB20-24S2W		12	53	1670	23	1005	87	3360
BUB20-24S3W		15	18	1330	23	996	87	2080
BUB20-24D1W		±5	0	±2000	66	998	88	9760
BUB20-24D2W		±12	33	±835	25	990	88	1760
BUB20-24D3W		±15	33	±665	29	996	88	880
BUB20-48S0W	18~75V Nominal:48VDC	3.3	0	5500	17	469	85	19760
BUB20-48S1W		5.0	0	4000	31	498	88	16000
BUB20-48S2W		12	53	1670	8	491	89	3360
BUB20-48S3W		15	18	1330	8	486	89	2080
BUB20-48D1W		±5	0	±2000	28	489	89	9760
BUB20-48D2W		±12	28	±835	9	487	90	1760
BUB20-48D3W		±15	33	±665	11	486	89	880



Input Specifications			
Input Voltage	24V nominal input		9-36Vdc
	48V nominal input		18-75Vdc
Input filter			Pi Type
Input surge voltage (100ms max.)	24V nominal input		50Vdc
	48V nominal input		100Vdc
Input reflected ripple current	Nominal Vin and full load		60mA <sub>p-p</sub> max.
Start up time	Nominal Vin and constant resistive load		76ms typ.
Remote ON/OFF	Converter: ON		Open or 3.5V < Vr < 12V
	Converter: OFF		Short <sup>(4)</sup> 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		< 12 mA
Environmental Specifications			
Operating ambient temperature			-40°C to +85°C (with derating)
Maximum case temperature			+105°C max.
Storage temperature range			-55°C to +125°C
Relative humidity			95% RH max.
Temperature coefficient			±0.02% / °C max.
Output Specifications			
Output power			20 Watts max.
Voltage accuracy	Full load and nominal Vin		±1%
Minimum load			See table
Line regulation	LL to HL at full load		±1.0%
	25% load to full load	Single	±1.0%
Load Regulation	Balanced load	Dual	±0.5%
	Unbalanced load 25% to 100% full load		±5%
Ripple and Noise	20MHz bandwidth		80mV <sub>p-p</sub> max.
	3.3V <sub>out</sub> models		3.9V
Over voltage protection (Zener Diode Clamp)	5.1V <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		110% min.
Short circuit protection			Hiccup, continuous (Auto Recovery)
Transient response settling time	50% load step change		700µs max.
			(1.4ms for 3.3V <sub>out</sub> )
Transient response over shoot	di/dt=0.8A/µs		≤ ±5% of Vo
			(≤ ±6% for 3.3V <sub>out</sub> )



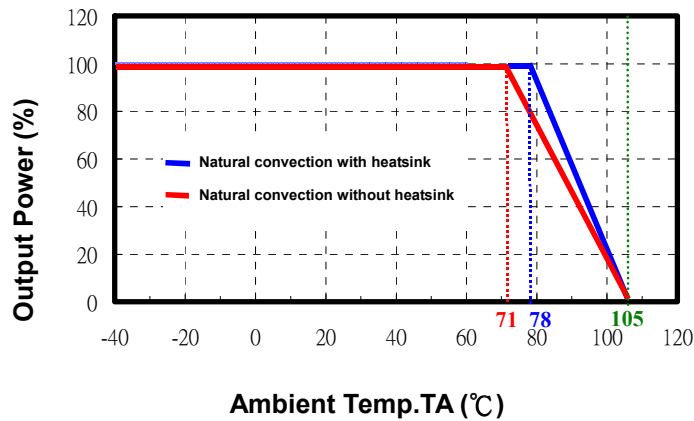
**General Specifications**

Efficiency	Nominal input	See table
Isolation voltage	Input to output	1500Vdc
Isolation resistance	500Vdc	10 <sup>9</sup> Ohms min.
Isolation capacitance		1050pF typ.
Switching frequency		330kHz typ.
Reliability, calculated MTBF		1.35 × 10 <sup>6</sup> Hrs

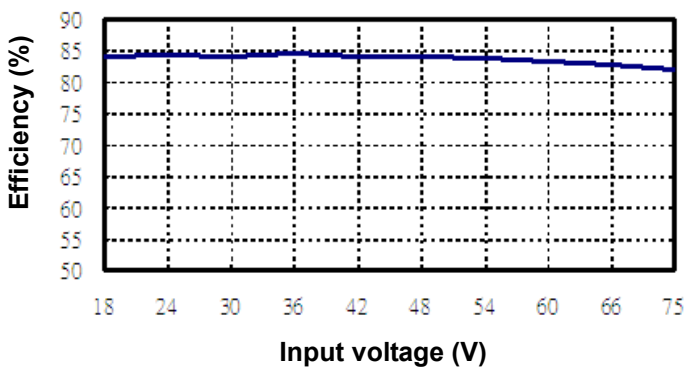
**Physical Specifications**

Case material	Nickel-coated copper
Base material	Non-conductive black plastic
Potting material	Silicon rubber (UL94V-0)
Dimensions	2.0 × 1.0 × 0.4 Inch (50.8 × 25.4 × 10.2 mm)
Weight	32.0g (1.13oz) typ.

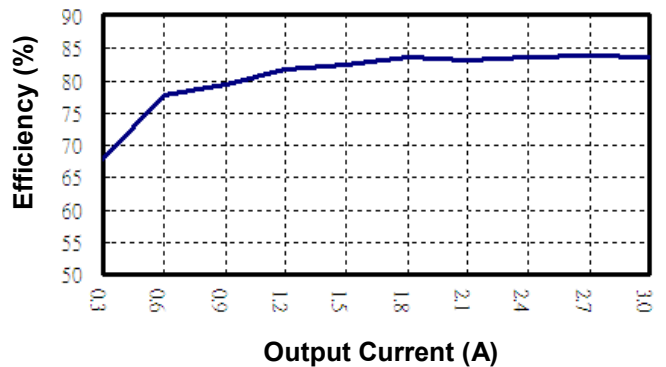
**BUB20W Series  
Power Derating Curve(5)**



**BUB20-48S1W  
Input voltage vs. Efficiency**



**BUB20-48S1W  
Output Current vs. Efficiency**



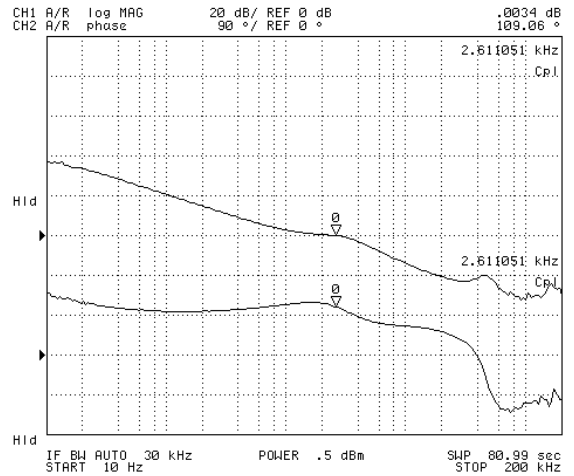
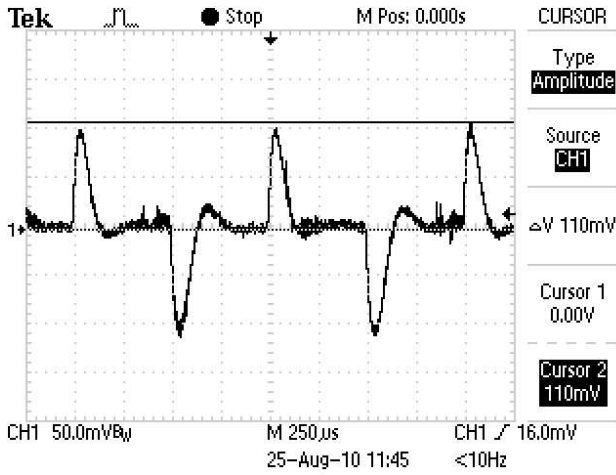


**BUB20-48S1W**

**BUB20-48S1W**

Transient Response at 50%~100% Max Load

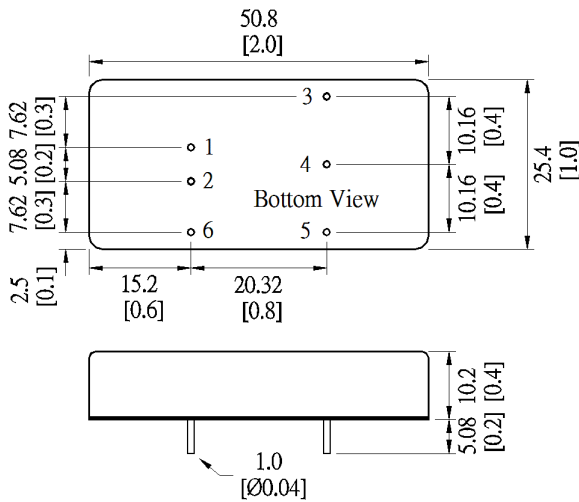
Loop Gain & Phase at Vi=48V, Full Load



**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 BUB20-48S1W.

**Mechanical Dimensions**



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

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

Specifications subject to change without noticed.



**Heat-sink (Option)**

Material: Aluminum

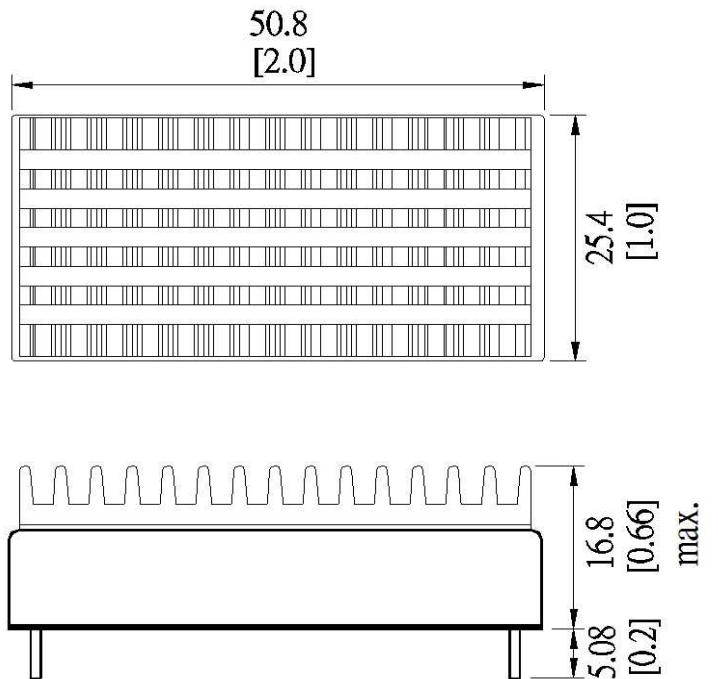
Weight: 10g (0.35oz)

**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.



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