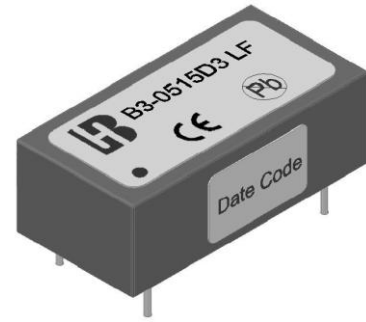


**1. Features :**

- 1.1. 14 Pin DIL Package
- 1.2. Low Ripple and Noise
- 1.3. Input / Output Isolation : 1000Vdc
- 1.4. Net Weight : 2.7 g Typical
- 1.5. RoHS Converter Certified By SGS

**2. Input Specifications :**

- |                          |                      |  |
|--------------------------|----------------------|--|
| 2.1. Input Voltage       | : 4.5 ~ 5.5 Vdc      | 5V ± 10 %  |
| 2.2. Max. Input Current  | : 720mA Max.         | @ Vin = 5 V and Output at Full Load.   |
| 2.3. Quiescent Current   | : 35 mA Typical      | @ Vin = 5 V and No Load.   |
| 2.4. Input Ripple        | : 100 mV Typical     | @ Vin = 5 V ,Output at Full Load ,No Input Electrolytic Capacitor and 20 MHz BW. |
| 2.5. Input Filter        | : Internal Capacitor |  |
| 2.6. Switching Frequency | : 90 KHz Typ.        |  |
| 2.7. Input Efficiency    | : 83 % Min.          | @ Vin = 5V and 100 % Load. ( 87% Typical )                                       |

**3. Output Specification :**

- |                              |                      |                                      |
|------------------------------|----------------------|--------------------------------------|
| 3.1. Output Voltage          | : ±15 Vdc            | @ Vin = 5 V and Output at Full Load. |
| 3.2. Output Voltage Accuracy | : ± 3 %              | Vo = 14.55 ~ 15.45 Vdc               |
| 3.3. Max. Output Current     | : ± 100 mA           |                                      |
| 3.4. Min. Output Current     | : ± 20 mA            |                                      |
| 3.5. Ripple                  | : ±120 mVp-p Max.    | @ 20 MHz BW                          |
| 3.6. Line Regulation         | : ±1.3 %/ 1.0 % Max. | See Note (1).                        |
| 3.7. Load Regulation         | : ±8 % Max.          | See Note (2).                        |
| 3.8. Max. Capacitive Load    | : ±330 uF            |                                      |
| 3.9. Temperature Coefficient | : ± 0.02 % / °C      |                                      |

Note :

- (1). Line Regulation : Set output load to full load, Then adjust input voltage from 4. 5V to 5. 5V ( 10% change ), The output voltage difference must be within 13% of the output at full load and nominal input.
- (2). Load Regulation : Set input voltage at 5V, Then changing Output load from 20% to 100% rated Load. The output voltage difference must be within 8% of the output at full load and nominal input.
- (3). All specification are typical at 25°C unless otherwise state.

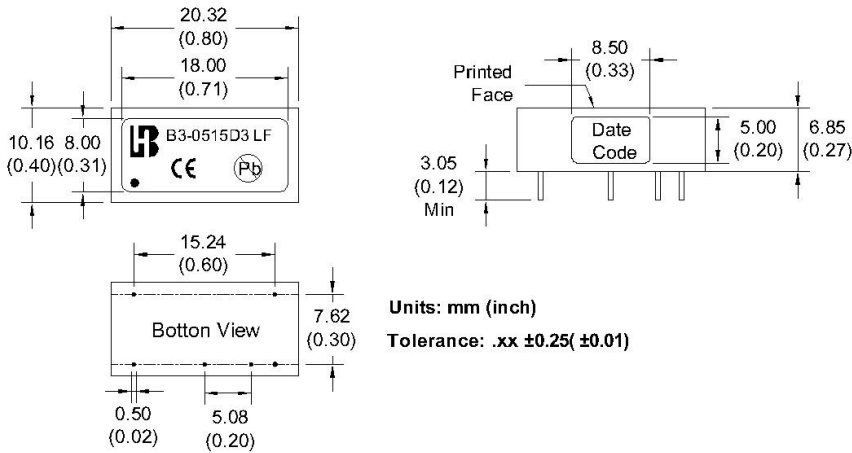
**4. General Specification :**

- |                                |                       |   |
|--------------------------------|-----------------------|---|
| 4.1. Isolation Voltage         | : 1000 Vdc            | Test duration 60 Seconds / 0.5 mA             |
| 4.2. Isolation Resistance      | : 1000 MΩ Min.        | @ 500 Vdc                                     |
| 4.3. Operating Temperature (1) | : -40°C ~ +85°C       | @ Ambient Temperature with Natural convention |
| 4.4. Operating Temperature (2) | : -40°C ~ +95°C       | @ Case Surface Temperature                    |
| 4.5. Storage Temperature       | : -55°C ~ +105°C      |   |
| 4.6. Humidity                  | : Up to 95 %          |   |
| 4.7. Cooling                   | : Free air convection |   |



4.8. Case Type : Non-Conductive Plastic

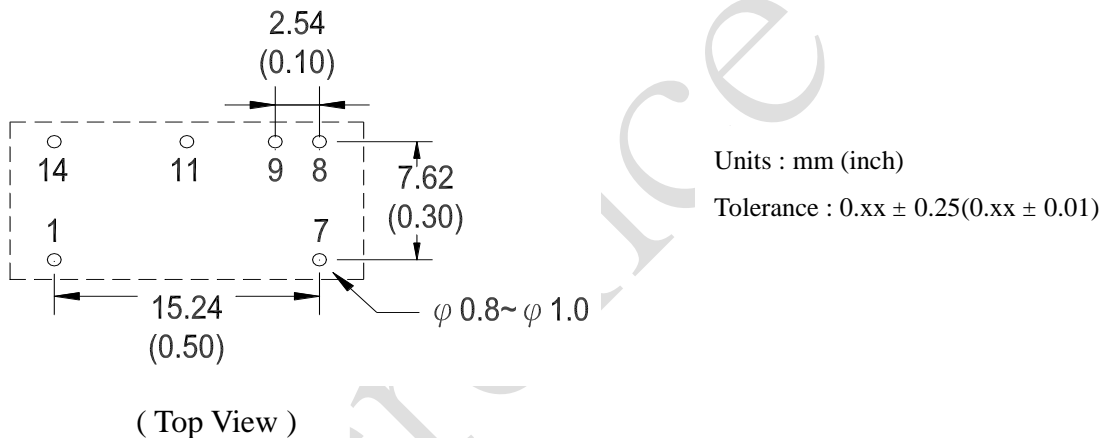
5. Mechanical Dimension :



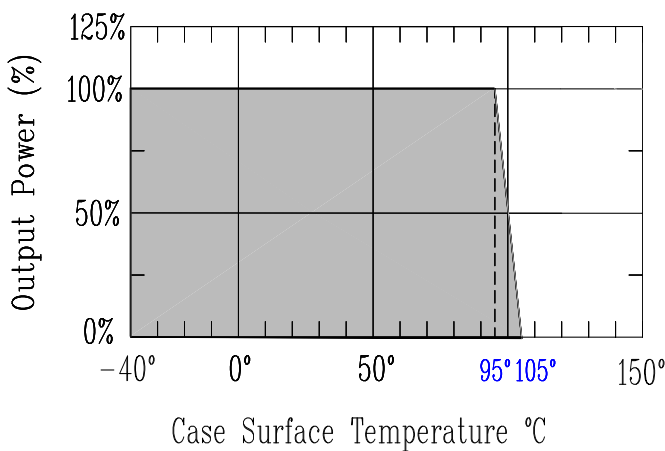
Pin	1K Vdc – Dual		Pin
1	-Vin	+Vin	14
2			13
3		---	12
4	---	-Vo	11
5		---	10
6		+Vo	9
7	NC	Common	8

Note : “---” means Omitted

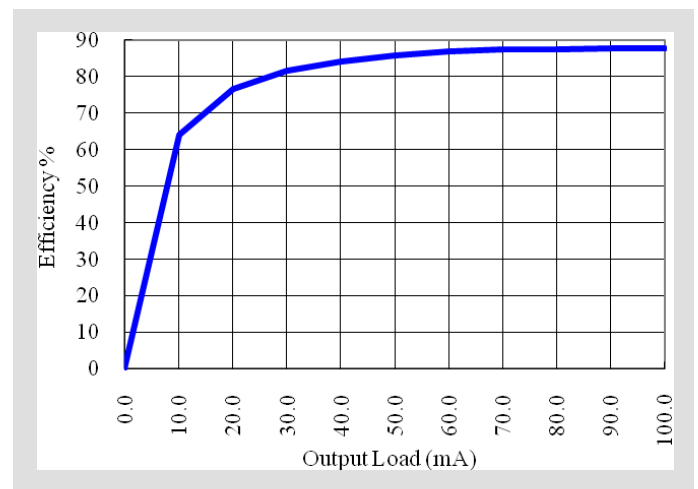
6. Recommended Footprint Details :



7. Power Derating Curve :



8. Efficiency & Output Load Chart :



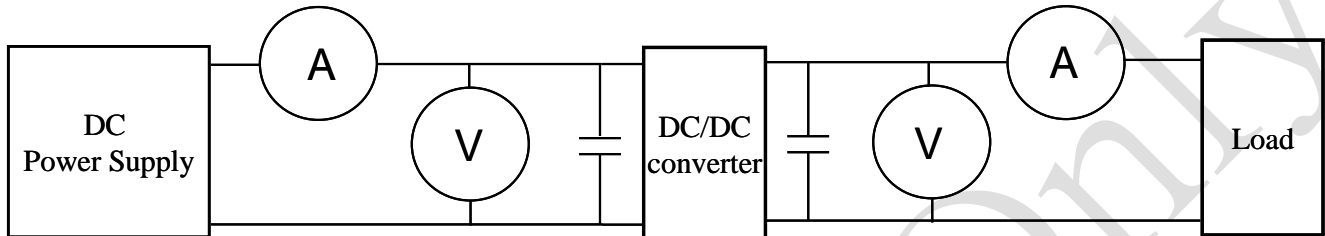


# BOTHHAND USA

## Application note

### 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  $\pm(0.2\% \text{ rdg} + 2 \text{ digits})$   
2000mA ~ 20A 2 ranges  $\pm(0.3\% \text{ rdg} + 2 \text{ digits})$ .
- ◎Voltage meter (V): Accuracy →  $\pm(0.03\% \text{ rdg} + 4 \text{ digits})$ .
- ◎Load: At full load.
- ◎Wires: The resistance of the wires must be small.

### 1. Input voltage range: Narrow input voltage range ( $\pm 10\%$ )、wide input voltage range (2:1 and 4:1)。

EX: Narrow input voltage range ( $\pm 10\%$ )

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

Wide input voltage range 2:1

5VDC nominal input	→	4.5~4.5VDC
5VDC nominal input	→	4.5~9VDC
24VDC nominal input	→	9~36VDC
48VDC nominal input	→	36~75VDC

Wide input voltage range 4:1 (W)

24VDC nominal input	→	4.5~36VDC
48VDC nominal input	→	9~75VDC

### 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.

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

LL: Low Line input voltage

HL: High Line input voltage

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

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

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

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

Vin(-10%) : Input voltage = 0.4.5xVin(nominal)

Vin(nominal) : Nominal Input voltage

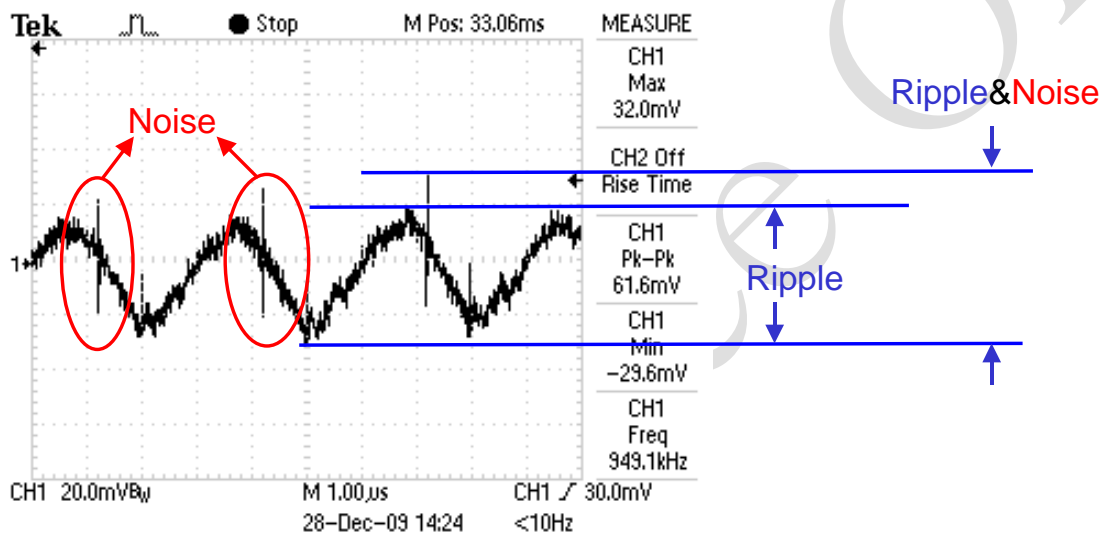
7. Load regulation :

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

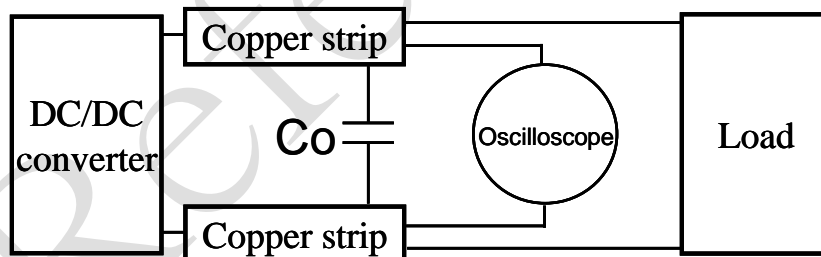
Vout(FL): Output voltage at full load

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

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

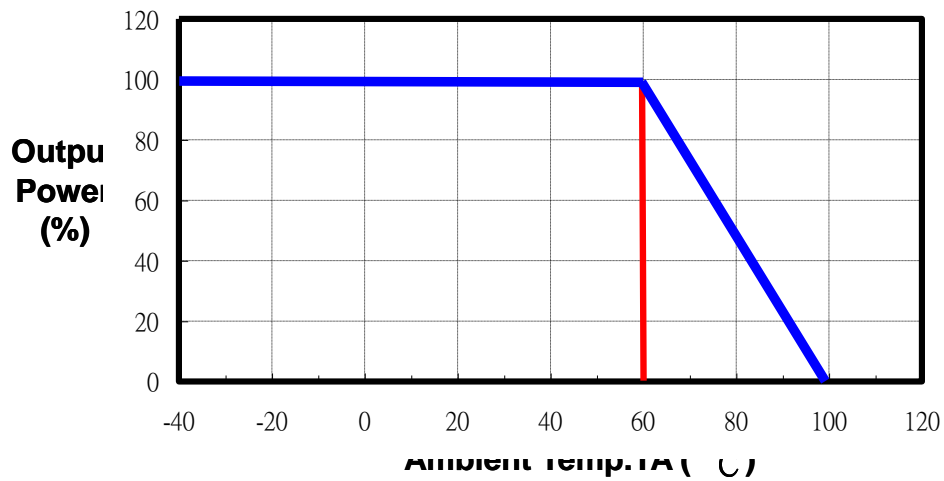


Output Ripple&Noise measurement test circuit: as shown below.



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.