B3-0515D3 LF　　　　　3 Watt Dual Output DC-DC Converter

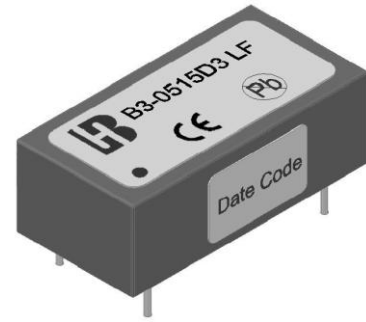## 1. Features：

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 %／℃	

Note :

(1). <u>Line Regulation</u> : 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). <u>Load Regulation</u> : 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.

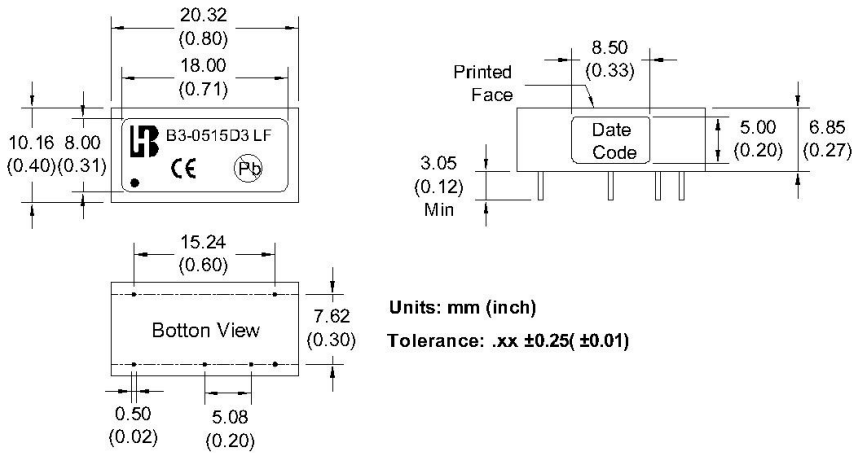(3). All specification are typical at 25℃　unless otherwise state.

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℃ ~ +85℃	@ Ambient Temperature with Natural convention
4.4.	Operating Temperature (2)	： -40℃ ~ +95℃	@ Case Surface Temperature
4.5.	Storage Temperature	： -55℃ ~ +105℃	
4.6.	Humidity	： Up to 95 %	
4.7.	Cooling	： Free air convection	

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4.8.　Case Type　　　　　　：　Non-Conductive Plastic

5.　Mechanical Dimension：

20.32 (0.80)
18.00 (0.71)
10.16 (0.40) 8.00 (0.31)
B3-0515D3 LF
CE (Pb)

15.24 (0.60)
Botton View
7.62 (0.30)
0.50 (0.02)
5.08 (0.20)

Printed Face
8.50 (0.33)
Date Code
5.00 (0.20)
6.85 (0.27)
3.05 (0.12) Min

Units: mm (inch)
Tolerance: .xx ±0.25(±0.01)

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 :

2.54 (0.10)

14　11　9　8
7.62 (0.30)
1　　　7
15.24 (0.50)
φ 0.8~ φ 1.0

Units : mm (inch)
Tolerance : 0.xx ± 0.25(0.xx ± 0.01)

(Top View)

7.　Power Derating Curve :
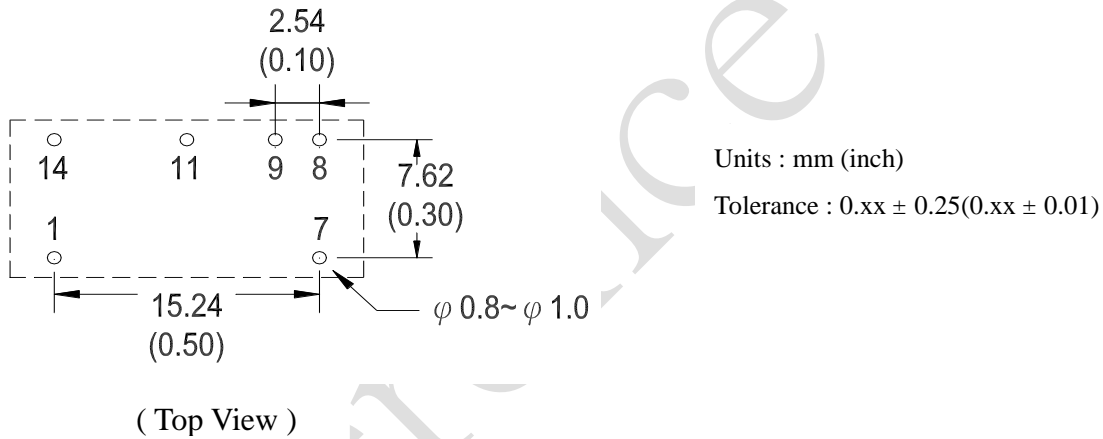
Output Power (%)
125%
100%
50%
0%
-40°　0°　50°　95° 105°　150°
Case Surface Temperature ℃
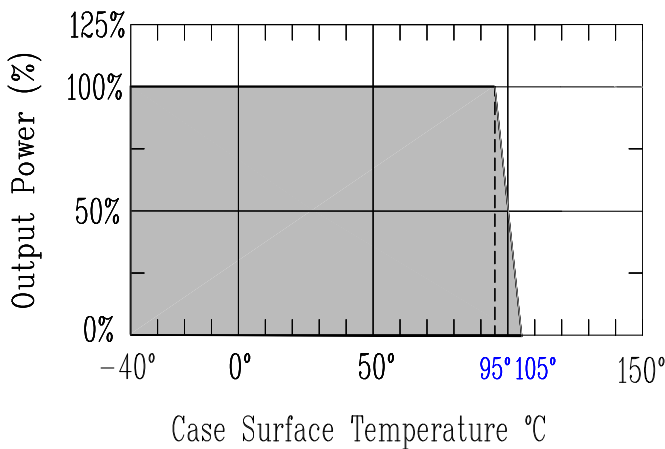
8.　Efficiency & Output Load Chart :

Efficiency %
90
80
70
60
50
40
30
20
10
0
0.0　10.0　20.0　30.0　40.0　50.0　60.0　70.0　80.0　90.0　100.0
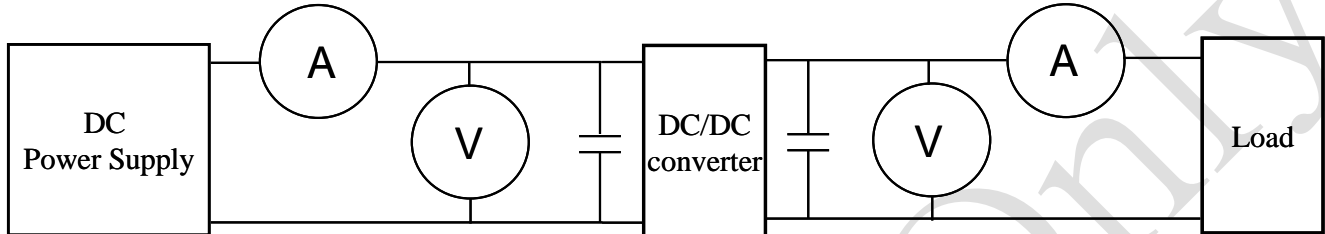Output Load (mA)
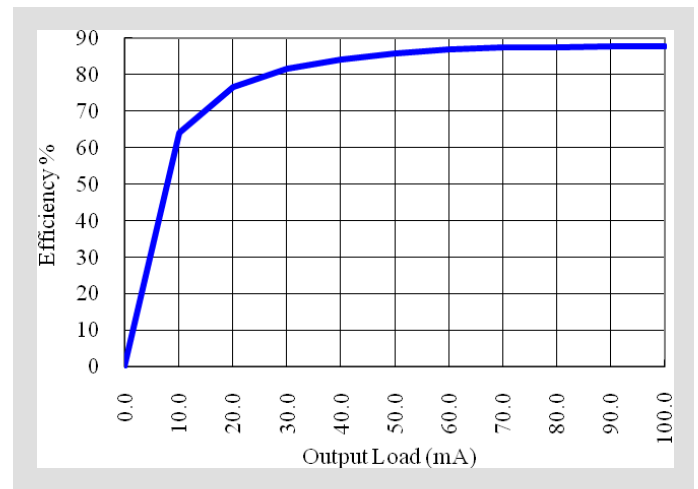
BOTHHAND USA

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+(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%）

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 :

$$Pin = Vin \times Iin$$

Vin：Input voltage

Iin：Input current

3. <u>Output power</u>：

$$Pout = Vout \times Iout$$

Vout：Output voltage

Iout：Output current

4. <u>Efficiency</u>：

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

Pout: Output power

Pin: Input power

5. <u>Voltage accuracy</u>:

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

Vout：Output voltage

Vout(nominal)：Nominal output voltage

6. <u>Line regulation</u>: (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.

$$Line\ regulation = \frac{\Delta Vout}{\Delta Vin}$$

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

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

Vout(-10%)：Output voltage at Vin = 0.4.5xVin(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)

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

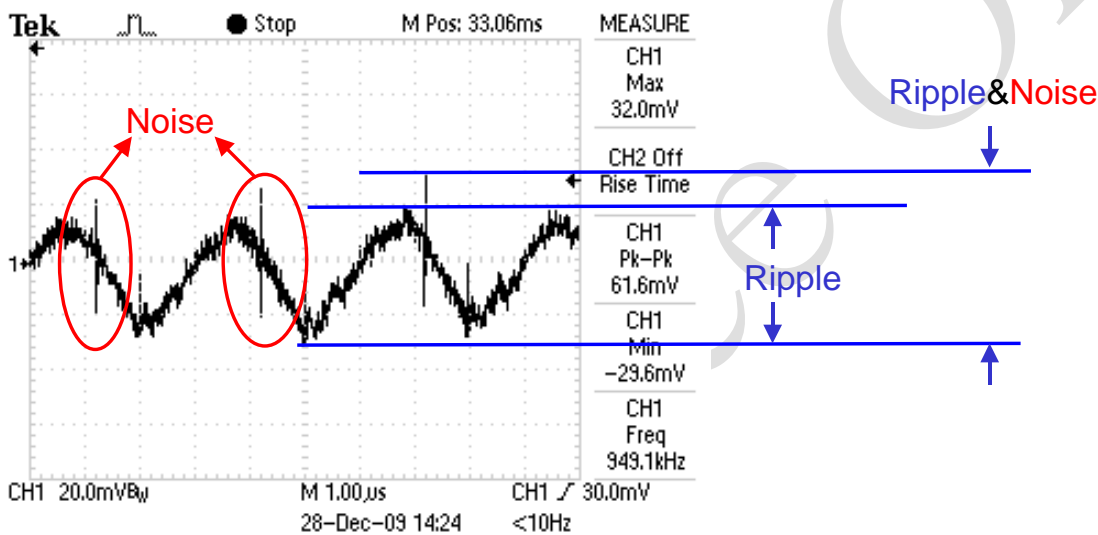Vin(nominal)：Nominal Input voltage

7. Load regulation :

$$\frac{\mid Vout(FL)\text{-}Vout(NL) \mid}{Vout(FL)} \times 100\%$$
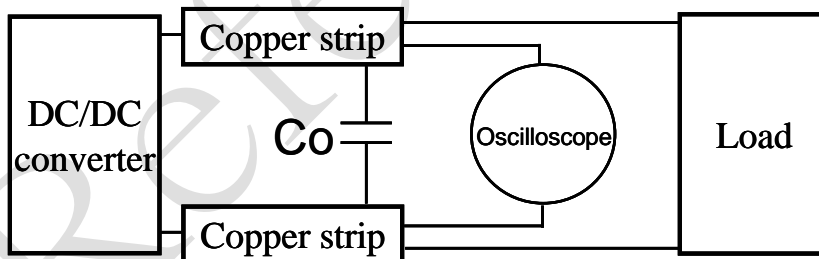
Vout(FL): Output voltage at full load

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.
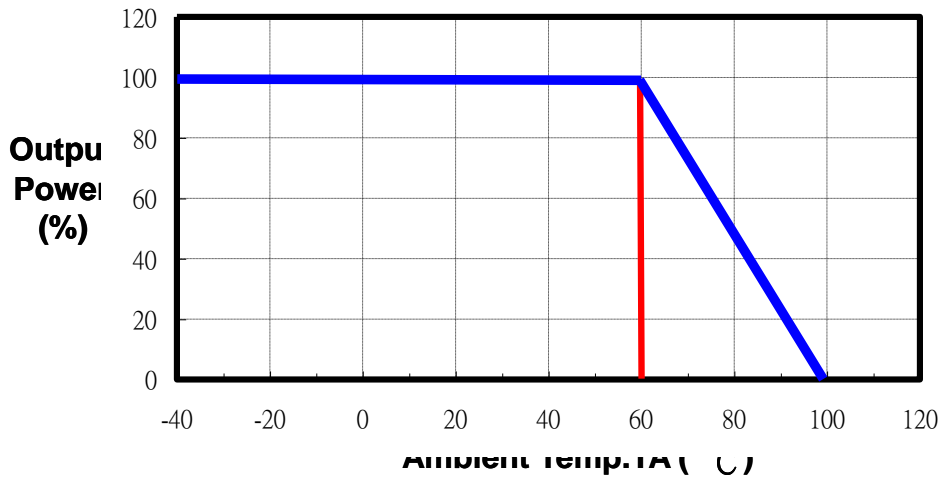
10. Switching frequency: The nominal operating frequency of the DC-DC converters.

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.

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