



## The dB: - The RF Engineers friend.

Learn to master the use of this tool and your life will be a lot easier.

The definition: A dB is the logarithmic ratio between two powers

Rules:

- you can only add or subtract dB and
- not multiply or divide (effect)

$$\text{dB} = 10 \log (P1/P2)$$

For direct power applications:

dB	Power change
3	2
6	4
10	10
20	100
30	1000
60	1000000
-3	½
-6	¼
-10	1/10
-20	1/100
-30	1/1000
-60	1/1000000
1	1.25
-1	0.8

For Voltages where R (or Z) is the same:

$$\text{Power} = V^2/R$$

Applied to the formula  $\text{dB} = 10 \log (P1/P2)$

$$\text{Therefore, } \text{dB} = 10 \log (V1^2/R)/(V2^2/R)$$

dB	Voltage change
6	2
20	10
40	100
60	1000
-6	½
-20	1/10
-40	1/100
-60	1/1000

### Steve Williams

steve.williams@electrotest.co.nz

021 729 429

12A Te Kea Place, Albany, Auckland, New Zealand

PO Box 300-475, Albany, Auckland, New Zealand

Phone: +64 9 448 2600

Fax: +64 9 448 2611

[www.electrotest.co.nz](http://www.electrotest.co.nz)