



Decibels and Power

Decibels are always a ratio of some quantity, and are often referenced to one particular level. A decibel as a symbol is dB, but if its relative to something a suffix denotes what that is.

Power Levels in the Radio licence are quoted in dBW, which are dB relative to 1 Watt.

For Power Ratios relative to 1 Watt :-

$$^*Power, dBW=10xLog_{10}(Power,Watts)$$

*Note: Voltage ratios in Amplifiers are $20xLog_{10}$

Power, dBW	Absolute Power
0dBW	1 Watt
3dBW	2 Watts
6dBW	4 Watts
9dBW	8 Watts
10dBW	10 Watts
20dBW	100 Watts
26dBW	400 Watts

Note that 3dB is a ratio of 2:1, and 10dB is a ratio of 10:1

Example-1:

Thus 50 Watts (Intermediate Licence) can be derived from:-

$$100 \text{ Watts (20dBW) minus } 3\text{dB} = 17\text{dBW}$$

Example-2:

5 Watts is a half of 10 Watts:-

$$10\text{dBW}-3\text{dB}=7\text{dBW}$$

OR...

It's a tenth of 50 Watts:-

$$17\text{dBW}-10\text{dB}=7\text{dBW}$$

Antenna Gain should be quoted as dBi (relative to an Ideal Isotropic radiator), or dBd (relative to a Dipole). As $0\text{dBd}=2.15\text{dBi}$, dBi numbers can 'enhance' gain specs