What are dBm and dBW?

In itself a decibel is not an absolute level. It is purely a comparison between two levels, and on its own it cannot be used to measure an absolute level. As a result of this the quantities of dBm and dBW are used:

- dBm - This is a power expressed in decibels relative to one milliwatt.

- dBW - This is a power expressed in decibels relative to one watt.

From this it can be seen that a level of 10 dBm is ten dB above one milliwatt, i.e. 10 mW. Similarly a power level of 20 dBW is 100 times that of one watt, i.e. 100 watts.

A more extensive conversion table of dBm, dBW and power is given below:

dBm	dBW	Watts	Terminology
+100	+70	10 000 000	10 Megawatts
+90	+60	1 000 000	1 Megawatt
+80	+50	100 000	100 kilowatts
+70	+40	10 000	10 kilowatts
+60	+30	1 000	1 kilowatt
+50	+20	100	100 watts
+40	+10	10	10 watts
+30	0	1	1 watt
+20	-10	0.1	100 milliwatts
+10	-20	0.01	10 milliwatts
0	-30	0.001	1 milliwatt
-10	-40	0.0001	100 microwatts
-20	-50	0.00001	10 microwatts
-30	-60	0.000001	1 microwatt
-40	-70	0.0000001	100 nanowatts
-50	-80	0.00000001	10 nanowatts

-60	-90	0.000000001	1 nanowatt

The use of the values dBm and dBW is widespread. They are found as direct calibration scales on many items of RF test equipment often being used in preference to the more elementary basic units of watts or milliwatts. Items of RF test equipment including power meters, signal generators and RF spectrum analyzers in particular use these units. Accordingly to be able to understand the RF test equipment specifications it is necessary to have an understanding of dBm and dBW. Also many RF components are also specified in terms of dBm or dBW.