# Testing Signal Strength

Signals are recorded in dBm. Angles are counted with the top of the phone as 0 degrees, increasing clockwise around. Speed is tested with an angle of 0 degrees and are averages of five separate tests.

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| --- | --- | --- | --- | --- | --- |
|  | Zero Distance | 3.3 meters | 6.6 meters | 10 meters | 13.3 meters |
| Signal Strength | 5 bars | 3 bars | 3 bars | 2 bars | 1 bar |
| 0 degrees | -45 dBm | -71 dBm | -76 dBm | -79 dBm | -81 dBm |
| 45 degrees | -43 dBm | -70 dBm | -72 dBm | -74 dBm | -81 dBm |
| 90 degrees | -44 dBm | -65 dBm | -72 dBm | -74 dBm | -77 dBm |
| 135 degrees | -47 dBm | -62 dBm | -70 dBm | -70 dBm | -76 dBm |
| 180 degrees | -46 dBm | -65 dBm | -76 dBm | -73 dBm | -75 dBm |
| 225 degrees | -43 dBm | -68 dBm | -71 dBm | -70 dBm | -74 dBm |
| 270 degrees | -45 dBm | -70 dBm | -73 dBm | -77 dBm | -79 dBm |
| 315 degrees | -50 dBm | -71 dBm | -80 dBm | -78 dBm | -80 dBm |
| **Speed Test**  Up  Down  Ping | 15.37 Mbps  25.91 Mbps  67 ms | 7.39 Mbps  2.43 Mbps  70 ms | 1.83 Mbps  0.11 Mbps  78 ms | 0.55 Mbps  0.08 Mbps  71 ms | FtC  FtC  89 ms |

**FtC:** Failed to Connect – could not run test (also failed to connect to google.se).

Most likely cause: Time Out

## Interpreting the Results

It seems like the signal strength tends to be better from the sides of the phone, rather than from one of the ends. This might be caused by the placement of the WiFi unit (in case it's in the middle of the phone for example, which might make it easier for the signals to propagate from the sides where they don't have to pass through the phone first).

I'd say the effective range of the WiFi is 10 meters. Any more than that and it starts getting unreliable due to disconnections and time-outs.

## dBm

dBm stands for “decibel milliwatts” (in this case) and is a way to measure power.

Formula: P(dBm) = 10 · log10( P(W) / 1mW )

where  
P(dBm) = Power expressed in dBm  
P(W) = the absolute power measured in Watts  
mW = milliWatts  
log10 = log to base 10

If a dBm value is negative then the higher absolute value the less received signal energy ( i.e. -80 dBm is less powerful than for example -60 dBm).