

# ICNIRP Measurement Report

This report presents the results of measurements of electromagnetic field emission levels in the vicinity of mobile base stations. Results are presented as percentages of the power density reference levels for general public exposure in the 1998 edition of the Guidelines published by the International Commission on Non-Ionizing Radiation Protection (ICNIRP)<sup>1</sup>, with figures provided for individual frequency bands used for base station (downlink) transmissions as well as an overall figure for all other frequency bands between 30 MHz to 6 GHz. The total percentage equals the sum of all individual percentages.

The power density reference levels in the ICNIRP Guidelines are the root mean square (rms) values averaged over six minutes. In this report, we have measured the average E-field strength over a six-minute period in each measurement location.

We have applied a measurement threshold of 3dB above the system noise floor<sup>2</sup> of the measurement equipment, below which any E-field strength levels measured are deemed not sufficiently above the system noise floor to be valid. In the results tables below, measurement results are shown to a precision of four decimal places. Results which are not sufficiently above the system noise floor to record as a valid measurement are shown as a dash (-). Results which are too small to register to four decimal places are shown as 0.0000%.

<b>Date of Survey:</b>	12/11/2024	<b>Time Survey completed:</b>	12:08
<b>Survey address:</b>	Cardiff CF10		

Measurement equipment		Serial number	Calibration Date
<b>Meter</b>	Keysight Fieldfox N9915A Spectrum Analyser	MY56072612	28/09/2023
<b>Probe</b>	Agos Aria-6000 Antenna	ARIA-6000-1117	28/11/2022
<b>Cabling</b>	1.7m cable	1319	28/11/2022

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<sup>1</sup> <https://www.icnirp.org/cms/upload/publications/ICNIRPemfgdl.pdf>

<sup>2</sup> The noise floor of the measurement equipment is the level of background noise that is present before detecting any external signals. In other words, it indicates the absolute minimum level of detectable signals.

## Broadcast bands covered by this report

Frequency Band	Frequency Range	Technology*
	87.5-108 MHz	FM Radio
	174-230 MHz	DAB
	470-694 MHz	Digital TV

## Mobile bands covered by this report

Frequency Band	Frequency Range	Technology*
700 MHz	738-788 MHz	4G, 5G
800 MHz	791-821 MHz	4G
900 MHz	925-960 MHz	2G, 3G, 4G
1400 MHz	1452-1492 MHz	4G (Supplementary downlink)
1800 MHz	1805-1880 MHz	2G, 4G
1900 MHz	1900-1920 MHz	4G
2100 MHz	2110-2170 MHz	3G, 4G
2300 MHz	2350-2390 MHz	4G
2600 MHz TDD	2570-2620 MHz	4G
2600 MHz FDD	2620-2690 MHz	4G
3.4 GHz	3410-3680 MHz	5G, 4G
3.8 GHz	3680-4200 MHz	Various
Others**		

*\* This is an indication of the type of technologies typically deployed in these bands; not all frequency bands and technologies may be in use at all locations. \*\* All other frequencies between 420 MHz and 6 GHz.*

## Survey locations

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The survey was conducted within the area shown in the map below. Measurements were taken at five locations and are presented in the following pages of this report.



## Location 1

<b>Measurement time:</b>	11:28
<b>Frequency band</b>	<b>Percentage of the ICNIRP reference levels for general public exposure</b>
87.5-108 MHz	0.02998
174-230 MHz	0.01213
470-694 MHz	0.01093
700 MHz	0.00270
800 MHz	0.02569
900 MHz	0.01658
1400 MHz	0.00046
1800 MHz	0.00370
1900 MHz	0.00021
2100 MHz	0.00305
2300 MHz	0.00124
2600 MHz TDD	0.00037
2600 MHz FDD	0.00146
3.4 GHz	0.00465
3.8 GHz	0.00552
Others	0.14758
<b>Total</b>	<b>0.26624</b>

## Location 2

<b>Measurement time:</b>	<b>11:35</b>
<b>Frequency band</b>	<b>Percentage of the ICNIRP reference levels for general public exposure</b>
87.5-108 MHz	0.01895
174-230 MHz	0.01268
470-694 MHz	0.01009
700 MHz	0.02914
800 MHz	0.22678
900 MHz	0.07440
1400 MHz	0.00055
1800 MHz	0.02604
1900 MHz	0.00022
2100 MHz	0.01016
2300 MHz	0.00445
2600 MHz TDD	0.00041
2600 MHz FDD	0.00364
3.4 GHz	0.00309
3.8 GHz	0.00528
Others	0.15858
<b>Total</b>	<b>0.58447</b>

### Location 3

<b>Measurement time:</b>	11:45
<b>Frequency band</b>	<b>Percentage of the ICNIRP reference levels for general public exposure</b>
87.5-108 MHz	0.01563
174-230 MHz	0.01318
470-694 MHz	0.01013
700 MHz	0.00244
800 MHz	0.07510
900 MHz	0.06211
1400 MHz	0.00048
1800 MHz	0.00828
1900 MHz	0.00024
2100 MHz	0.00779
2300 MHz	0.00167
2600 MHz TDD	0.00047
2600 MHz FDD	0.00476
3.4 GHz	0.00454
3.8 GHz	0.00530
Others	0.15989
<b>Total</b>	<b>0.37198</b>

#### Location 4

<b>Measurement time:</b>	<b>11:53</b>
<b>Frequency band</b>	<b>Percentage of the ICNIRP reference levels for general public exposure</b>
87.5-108 MHz	0.01947
174-230 MHz	0.01328
470-694 MHz	0.01045
700 MHz	0.00187
800 MHz	0.00702
900 MHz	0.00549
1400 MHz	0.00048
1800 MHz	0.00218
1900 MHz	0.00023
2100 MHz	0.00232
2300 MHz	0.00072
2600 MHz TDD	0.00043
2600 MHz FDD	0.00187
3.4 GHz	0.00237
3.8 GHz	0.00474
Others	0.16466
<b>Total</b>	<b>0.23756</b>

## Location 5

<b>Measurement time:</b>	12:02
<b>Frequency band</b>	<b>Percentage of the ICNIRP reference levels for general public exposure</b>
87.5-108 MHz	0.02911
174-230 MHz	0.01364
470-694 MHz	0.01141
700 MHz	0.00201
800 MHz	0.00669
900 MHz	0.00820
1400 MHz	0.00052
1800 MHz	0.00273
1900 MHz	0.00025
2100 MHz	0.00353
2300 MHz	0.00141
2600 MHz TDD	0.00043
2600 MHz FDD	0.00167
3.4 GHz	0.00493
3.8 GHz	0.00626
Others	0.17036
<b>Total</b>	<b>0.26315</b>

*Disclaimer: The results detailed in this report apply only to the tests made at the reported time, using the test equipment detailed. They do not indicate that on another date an identical set of results would be achieved, due to changes in local environmental conditions or other factors which may or may not have an effect on the measurement results obtained at that future time.*