



An Coimisiún um
Rialáil Cumarsáide
Commission for
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Mobile Handset Performance (Data) Clarification

Information Notice

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Commission for Communications Regulation

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1: Clarification

1. ComReg recently published its scientific report (ComReg document 18/82¹) setting out the results of its measurements of mobile handset performance for data.
2. This report stems from the Mobile Phone and Broadband Taskforce² which recommended, amongst other things, that ComReg should carry out regular testing to determine the sensitivity of mobile phone handsets on the Irish market.
3. A mobile handset performance for data is determined by measuring the total isotropic sensitivity received by the antenna over a three-dimensional sphere – this is referred to as the Total Isotropic Sensitivity (“TIS”).
4. TIS is a measure of the **lowest** power level that can be received by the handset while maintaining connection with the base station. The **lower** the TIS measurements, the weaker the signal that the phone requires for operation and the **better** the sensitivity of the handset³. It should be noted that TIS is a negative number and the more negative it is, the more sensitive the handset. For instance, -94.5 dBm would be a better performance compared to -89.5 dBm.
5. The standardised procedures for the measurement of TIS is set by The Cellular Telephone Industries Association (“CTIA”) and the 3rd Generation Partnership Program (“3GPP”). Using these procedures, the Global System for Mobile Communications Association (“GSMA”) has published recommended TIS values for assessing acceptable mobile handset performance across the 3G and 4G/LTE bands.

Table 1: GSMA⁴ Operator Acceptance Values for TIS

Technology (3G/4G)		Bands (MHz)	Acceptance Values for TIS (dBm)
			GSMA Browsing
UMTS	Band 1	2100	-103
	Band 8	900	-101
LTE	FDD Band 3	1800	-91
	FDD Band 20	800	-89.5

¹ <https://www.comreg.ie/publication-download/mobile-handset-performance-data>

² <https://www.chg.gov.ie/app/uploads/2016/12/taskforce-report.pdf>

³ See ComReg document 18/82, paragraph 1.33.

⁴ <https://www.gsma.com/newsroom/wp-content/uploads//TS-24-v3-01.pdf>

6. Because more negative TIS numbers indicate better handset performance, an acceptable handset will have a TIS measurement that is **more negative** than the GSMA threshold. This means a measurement of -94.5 dBm would be better than the GSMA Acceptance value of -89.5 dBm in respect of LTE 800 MHz frequency (the most widely used for data). Similarly a value of, for example, -86.5 dBm does not meet the GSMA acceptance value.
7. ComReg's findings, contained in document 18/82, are set out in tables, one for right hand use and one for left hand use. Both tables are presented in *decreasing* order of handset sensitivity in the LTE - 800 band. ComReg wishes to clarify that its test results show that, in most cases, the handsets examined comfortably meet the GSMA Acceptance Values, contrary to reports by some media outlets.
8. Decibels (dB) is a logarithmic ratio generally used in scientific testing of this nature to describe change in signal strength. The dB is a way of describing a ratio which may be power, sound pressure, voltage or intensity or several other things. For example, a change in power by a factor of 2 corresponds to 3 dB and a change in power by a factor of 10 corresponds to 10 dB. dBm is an abbreviation for signal power relative to 1 mW.

Decibels	Change in Signal Factor	dBm	Power in mW
0 dB	x 1	0 dBm	= 1 mW
3 dB	x 2	3 dBm	= 2 mW
6 dB	x 4	6 dBm	= 4 mW
10 dB	x 10	10 dBm	= 10 mW
20 dB	x 100	20 dBm	= 100 m W

Table 2 Decibels and Signal Factor

9. To help assist understanding of these scientific results, ComReg has brought this misreading to the attention of the media outlets concerned and will repeat this clarification in any further tests it may undertake.