



RootMetrics®  
By IHS Markit

# Substantiation of claim “The UK’s #1 5G Network”

Claim:

1. The UK’s #1 5G Network

Substantiation

RootMetrics Testing Methodology Facts:

- RootMetrics uses a well-controlled drive test methodology using off the shelf smartphones to perform testing in all four UK nations as well as extensive testing in the 16 most populous urban areas every six months. Testing is performed simultaneously across all four operators to show a same-place, same-time view and ensure an apples-to-apples comparison. This methodology controls for variables that may distort “crowd”-based methodologies and truly measures differences in network performance rather than differences in testing device, time, or location.
- In the first half of 2020 RootMetrics utilized the Samsung Galaxy Note 10+ 5G for testing on EE, O2, Three, and Vodafone. RootMetrics personnel drove over 22,082 miles around the United Kingdom obtaining approximately 537,780 tests, assessing each network’s performance across call, text, and data. Drive tests were conducted along freeways and motorways, major arterials, and residential streets where the population within a market generally lives and travels. Due to government restrictions and safety concerns caused by COVID-19, testing from the first half of 2020 does not include indoor locations.
- RootMetrics tests data, call, and text performance by downloading and uploading files, downloading small files that represent web and app usage (secure and non-secure connections), making mobile-to-mobile phone calls, and sending and receiving text messages. Data from this testing is categorized into “speed”, “reliability”, and “accessibility” measures to characterize performance across the consumer experience.
- In the comparison of network performance relatively small differences in the overall results may or may not prove significant. RootMetrics’ ranking methodology includes statistical tests to ensure that operators are not rewarded or penalized based on performance differences that are statistically indistinguishable from another operator. If networks with divergent scores are determined to be statistically indistinguishable, then they are given the same rank. Per RootMetrics’ marketing guidelines, claims must communicate that a win is tied when another operator shares a first-place rank.

Ranking Methodology:

To determine how the four UK-wide mobile network operators’ 5G networks performed, RootMetrics identified 5G-specific key performance indicators (KPIs) reflective of consumer priorities in 5G performance. The KPIs used capture download speed, reliability, and availability. No operator with less than 1% of tests on 5G were used in comparisons due to the difficulty of accurately characterizing network performance based on such a small sample of tests.

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KPI values were ranked using the same statistical comparison methodology used for RootScores, with statistically indistinguishable results sharing a ranking. To determine the best overall 5G network, operators were assigned points based on first place rankings in each of the relevant KPIs:

KPIs and assigned point values:

- 5th percentile 5G download speed (1 point)
- Median 5G download speed (1 point)
- 95th percentile 5G download speed (1 point)
- Lite data retrieval access success on 5G (1 point)
- Lite data retrieval task success on 5G (1 point)
- Secure lite data retrieval access success on 5G (1 point)
- Secure lite data retrieval task success on 5G (1 point)
- 5G availability (2 points)
  - Note: 5G availability, determined by the percentage of tests conducted on 5G, was given more weight in our assessment due to the fact that network availability is required to measure 5G performance, making it the most important indicator in 5G network measurement.

## Key performance indicator results

Below is a table that provides the KPI-level information and rankings used to determine the best 5G network in the UK. First place rankings have been bolded and shared rankings are noted with a tilde (~).

Metric	Operator	Metric Rank	Value
<b>5<sup>th</sup> percentile 5G download speed</b>	<b>EE</b>	<b>1</b>	<b>26.5 Mbps</b>
	Vodafone	3	4.5 Mbps
	Three	2	25.7 Mbps
<b>Median 5G download speed</b>	<b>EE</b>	<b>1~</b>	<b>135.2 Mbps</b>
	<b>Vodafone</b>	<b>1~</b>	<b>134.3 Mbps</b>
	Three	3	118.2 Mbps
<b>95<sup>th</sup> percentile 5G download speed</b>	<b>Three</b>	<b>1</b>	<b>332.1 Mbps</b>
	Vodafone	2~	265.0 Mbps
	EE	2~	257.0 Mbps
<b>Lite data retrieval access success on 5G</b>	<b>Three</b>	<b>1</b>	<b>99.7%</b>
	EE	2~	99.0%

	Vodafone	2~	98.5%
Lite data retrieval task success on 5G	Three	1~	99.9%
	Vodafone	1~	99.8%
	EE	3	99.6%
Secure lite data retrieval task success on 5G	Three	1	99.7%
	EE	2~	99.2%
	Vodafone	2~	98.8%
Secure lite data retrieval task success on 5G	EE	1	99.8%
	Three	2	99.6%
	Vodafone	3	99.1%
Percentage of tests conducted on 5G (availability)	EE	1	25.0%
	Vodafone	2	5.0%
	Three	3	3.5%

## UK 5G Rankings

A table of the four major UK mobile operators and where they placed in our ranking for best 5G network in the UK is below:

Rank	Operator	KPI Point Accumulation
1	EE	5
2	Three	4
3	Vodafone	2
Did not rank due to limited availability	O2	N/A