

# CERTIFICATE

P3 communications GmbH  
hereby certifies that

## VIETTEL ACHIEVED BEST IN TEST

in the Mobile Benchmark Vietnam 12/2018.

**Score 815 of 1000 in Total**

Operator 2 achieved a Total Score of 805,  
Operator 3 a Total of 731.



Hakan Ekmen  
CEO



Viettel  
Vietnam

# MEASUREMENT OVERVIEW

## MEASUREMENT SETUP

| Drivetest                       | Voice  | Data  |
|---------------------------------|--|---|
| <b>Device</b>                   | Samsung Galaxy S8  | Samsung Galaxy S8   |
| <b>Test Cases</b>               | <b>Mobile-to-Mobile (M2M)</b><br>Channel-01: 4G preferred to 4G preferred<br>115 sec call window<br>70 sec call duration<br>15 sec call setup timeout<br>Multi-RAB traffic injection on both sides | <b>Data 4G preferred CA</b><br>HTTP DL datastream 7s<br>HTTP UL datastream 7s<br>HTTP 3MB DL fixed file transfer<br>HTTP 1MB UL fixed file transfer<br>Web Browsing - Kepler ETSI Ref. Page<br>10 Live web pages (50% http / 50% https)<br>2 YouTube HD video ~ 45s<br>1 YouTube Live video ~ 45s |
| <b>Mobility and Route Types</b> | <b>Drivetest:</b> 56% in Cities, 12% in Towns and 32% on Roads<br><b>Walktest:</b> 100% in Cities  |   |
| <b>Samples</b>                  | Drivetest: ~ 5700 per Operator<br>Walktest: ~ 540 per Operator   | Drivetest: ~ 4800 per Operator<br>Walktest: ~ 260 per Operator  |
| <b>Dates</b>                    | <b>30 measurement days</b><br>15.11.2018 – 16.12.2018  |   |

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tested and measured the performance of its voice and data services on smartphones in comparison to other LTE/UMTS/GSM mobile radio networks in metropolitan and rural areas of Vietnam.

The audit was done as a performance benchmark performed by P3 communications between November 15th 2018 and December 16th 2018 in cities and towns as well as on connection roads.

Measurements have been executed as drive tests outdoors using a Samsung Galaxy S8 cat16 Smartphone 1000 Mbit/s Download / 105 Mbit/s Upload.


All data measurements have been performed in 4G preferred mode. Voice measurements have been done in 4G/4G preferred mode on both sides, while call origin has been alternated.

The following pages provide a comparative overview about the performance results observed for the different tested service types.

# TESTING ROUTE



**11400 km**  
measuring distance

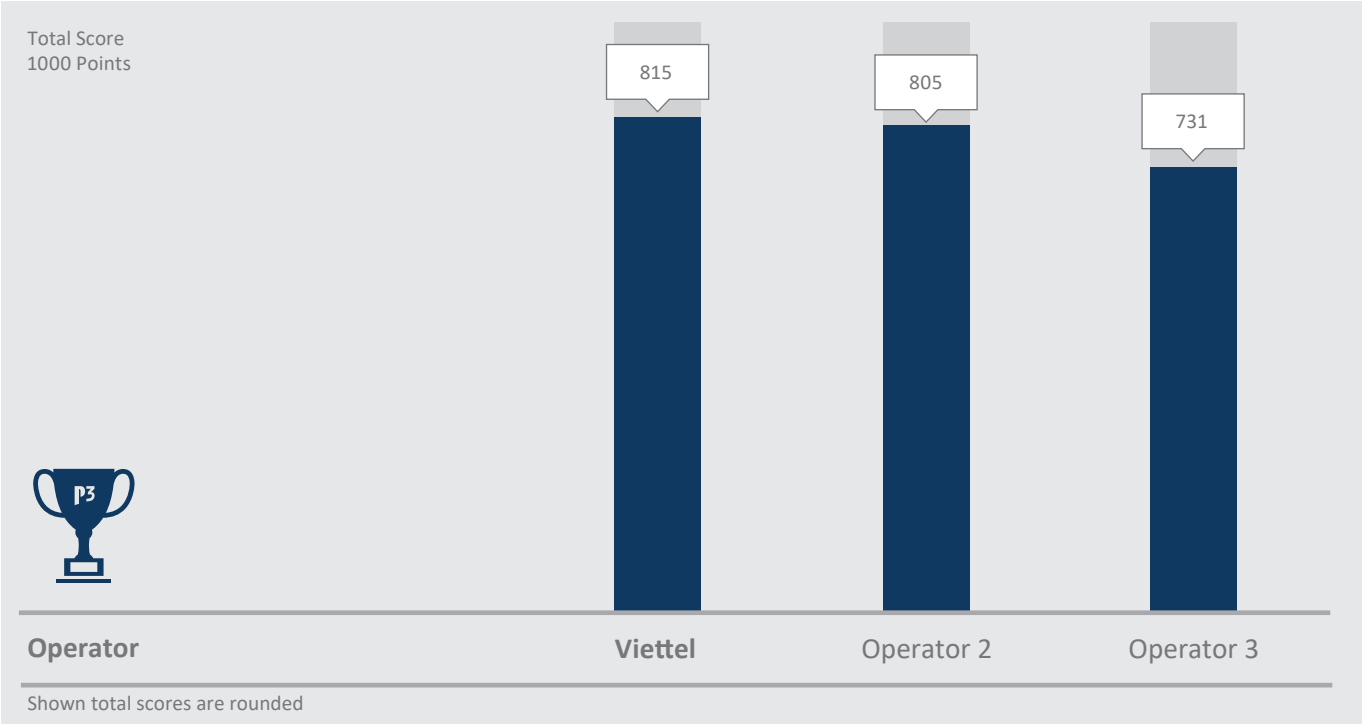


**18%**  
of population measured

# OVERALL SCORE

VIETTEL ACHIEVED THE HIGHEST SCORE AMONG COMPETITORS WITH 815 POINTS OUT OF MAXIMUM 1000.

## TOTAL SCORE



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