

CERTIFICATE

P3 communications GmbH

Am Kraftversorgungsturm 3, D-52070 Aachen, Germany

hereby certifies that



vodafone

Vodafone Qatar

Vodafone Qatar QSC, PO Box 27727, Doha, Qatar

achieved „**Best in Test**“ with a
Total Score of **796 of 1000**
in the **Mobile Benchmark Qatar 04/2016**.
(Score 311 of 400 in Voice, Score 484 of 600 in Data Services)



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Measurement Setup

	Voice	Data
Device	Samsung Galaxy S5 LTE cat4 (SM-G900F) LTE/HSPA+ DC/HSUPA 5.76 P3 attenuator	Samsung Galaxy Note4 LTE cat6 (SM-N910F) LTE/HSPA+ DC/HSUPA 5.76 P3 attenuator
Test Cases	Mobile-to-Mobile Side1 (4G preferred) to Side2 (3Gpref) 115 sec call window 70 sec call duration 15 sec call setup timeout Email traffic injection on both sides (1 email per call window)	4G CA preferred HTTP DL datastream 10s HTTP UL datastream 10s HTTP 3MB DL fixed file transfer HTTP 1MB UL fixed file transfer Web Browsing - Kepler ETSI Ref. Page 5 live web pages YouTube SD video - 30s clip YouTube HD video - 30s clip
Mobility and Route Types	100% Drivetest 58% in Cities, 20% in Towns and 22% on Roads Cities, towns and roads	
Samples	~ 2100 per Operator	~ 1200 per Operator
Dates	13 measurement days April 05th - April 20th, 2016	

Testing Route



Score Points and Breakdown

The following table indicates the score points achieved by the networks under test in the modules “Voice” and “Data Services” as well as the breakdown of achieved points in the geographical categories “Cities”, “Towns” and “Roads”.

Module	Infrastructure	Max.	Vodafone	Operator 2
Voice	Total	400	311	269
	Cities	260	75%	58%
	towns and roads	140	83%	84%
Data	Total	600	484	485
	Cities	390	83%	80%
	Towns	90	82%	82%
	Roads	120	73%	84%
TOTAL		1.000	796	754

Shown voice, data and total scores are rounded

The following table indicates the achieved percentage of the maximum score in each of the different infrastructural breakdowns.

Data	Service Group	Max.	Vodafone	Operator 2
Cities	Web Browsing	136,5	80%	88%
	File Download	78,0	77%	75%
	File Upload	78,0	88%	77%
	YouTube	97,5	87%	73%
Towns	Web Browsing	31,5	79%	83%
	File Download	18,0	72%	78%
	File Upload	18,0	88%	78%
	YouTube	22,5	89%	86%
Roads	Web Browsing	42,0	72%	88%
	File Download	24,0	70%	81%
	File Upload	24,0	83%	84%
	YouTube	30,0	70%	81%

Voice KPI Overview

The following table indicates the achieved values of all networks under test in each of the relevant Voice Key Performance Indicators (KPIs) for the geographical categories “Cities”, “Towns” and “Roads”.

Voice M2M	Kpi Name	Unit	Vodafone	Operator 2
Cities	Qualified	[%]	96,2	93,2
	Call Setup Time	[s]	6,2	7,3
	AVG Speech Quality	[MOS-LQO]	3,6	3,5
Towns and roads	Qualified	[%]	95,6	96,2
	Call Setup Time	[s]	6,0	6,6
	AVG Speech Quality	[MOS-LQO]	3,6	3,5

Data KPI Overview

The following table indicates the achieved values of all networks under test in each of the relevant Data Key Performance Indicators (KPIs) for the geographical categories “Cities” “Towns” and “Roads”.

Data Cities	Kpi Name	Unit	Vodafone	Operator 2
HTTP live page DL	Qualified	[%]	98,6	99,4
	AVG Session Time	[s]	3,3	3,4
HTTP static page DL	Qualified	[%]	89,9	99,0
	AVG Session Time	[s]	1,6	2,6
HTTP file DL 3MB	Qualified	[%]	97,3	99,3
	AVG Session Time	[s]	2,0	4,8
	90% faster than	[kbit/s]	6931	2986
	10% faster than	[kbit/s]	37442	12214
HTTP file UL 1MB	Qualified	[%]	97,4	100,0
	AVG Session Time	[s]	1,0	3,9
	90% faster than	[kbit/s]	7576	1811
	10% faster than	[kbit/s]	15152	3268
HTTP DL FDTT 10s	Qualified	[%]	98,2	99,9
	AVG throughput	[kbit/s]	27401	16762
	90% faster than	[kbit/s]	8959	2878
	10% faster than	[kbit/s]	51906	38138
HTTP UL FDTT 10s	Qualified	[%]	99,4	99,9
	AVG throughput	[kbit/s]	21422	6446
	90% faster than	[kbit/s]	12243	3365
	10% faster than	[kbit/s]	28593	10064
YouTube SD	Qualified	[%]	99,0	99,0
	Start Time	[s]	1,6	1,8
	Playouts w/o interruptions	[%]	100,0	99,0
YouTube HD	Qualified	[%]	98,1	95,7
	Start Time	[s]	1,9	2,4
	Playouts w/o interruptions	[%]	98,7	95,1

Data Towns	Kpi Name	Unit	Vodafone	Operator 2
HTTP live page DL	Qualified	[%]	99,0	97,7
	AVG Session Time	[s]	3,3	3,5
HTTP static page DL	Qualified	[%]	87,2	99,6
	AVG Session Time	[s]	1,7	2,7
HTTP file DL 3MB	Qualified	[%]	94,2	100,0
	AVG Session Time	[s]	2,1	4,1
	90% faster than	[kbit/s]	8843	3578
	10% faster than	[kbit/s]	42254	12183
HTTP file UL 1MB	Qualified	[%]	98,3	100,0
	AVG Session Time	[s]	1,1	3,8
	90% faster than	[kbit/s]	6369	1833
	10% faster than	[kbit/s]	15564	3271
HTTP DL FDTT 10s	Qualified	[%]	98,0	99,6
	AVG throughput	[kbit/s]	30459	18435
	90% faster than	[kbit/s]	10809	3874
	10% faster than	[kbit/s]	57692	40265
HTTP UL FDTT 10s	Qualified	[%]	99,2	100,0
	AVG throughput	[kbit/s]	20545	6921
	90% faster than	[kbit/s]	10413	3619
	10% faster than	[kbit/s]	28549	10546
YouTube SD	Qualified	[%]	99,6	99,6
	Start Time	[s]	1,6	1,7
	Playouts w/o interruptions	[%]	100,0	98,7
YouTube HD	Qualified	[%]	98,3	98,3
	Start Time	[s]	1,7	2,2
	Playouts w/o interruptions	[%]	98,7	98,7

Data Roads	Kpi Name	Unit	Vodafone	Operator 2
HTTP live page DL	Qualified	[%]	93,7	97,3
	AVG Session Time	[s]	3,5	3,4
HTTP static page DL	Qualified	[%]	81,9	99,2
	AVG Session Time	[s]	2,1	2,4
HTTP file DL 3MB	Qualified	[%]	91,6	99,6
	AVG Session Time	[s]	3,6	5,2
	90% faster than	[kbit/s]	3873	2488
	10% faster than	[kbit/s]	30419	12140
HTTP file UL 1MB	Qualified	[%]	93,5	99,6
	AVG Session Time	[s]	1,8	4,1
	90% faster than	[kbit/s]	2392	1769
	10% faster than	[kbit/s]	14572	3247
HTTP DL FDTT 10s	Qualified	[%]	93,5	99,3
	AVG throughput	[kbit/s]	19437	16369
	90% faster than	[kbit/s]	2733	2414
	10% faster than	[kbit/s]	44371	36886
HTTP UL FDTT 10s	Qualified	[%]	98,1	100,0
	AVG throughput	[kbit/s]	14461	6084
	90% faster than	[kbit/s]	2104	2327
	10% faster than	[kbit/s]	26021	9733
YouTube SD	Qualified	[%]	93,9	97,7
	Start Time	[s]	2,1	1,9
	Playouts w/o interruptions	[%]	98,4	97,7
YouTube HD	Qualified	[%]	89,0	93,9
	Start Time	[s]	2,2	2,3
	Playouts w/o interruptions	[%]	95,7	97,2