

CERTIFICATE

P3 communications GmbH

Am Kraftversorgungsturm 3, D-52070 Aachen, Germany

hereby certifies that



Vodafone New Zealand

20 Viaduct Harbour Avenue, Auckland 1010, New Zealand

achieved „**Best in Test**“ with a
Total Score of **745 of 1000**
in the **Mobile Benchmark New Zealand 04/2016**.
(Score 317 of 400 in Voice, Score 428 of 600 in Data Services)



Maziar Kianzad
Head of Measurement
and Testing Solutions
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Measurement Setup

	Voice	Data
Device	Samsung Galaxy S5 LTE cat4 (SM-G900I) LTE / HSPA+ DC / HSUPA 5.76 P3 attenuator	Samsung Galaxy Note4 LTE cat6 (SM-N910G) LTE / HSPA+ DC / HSUPA 5.76 P3 attenuator
Test Cases	Mobile-to-Mobile Side1 (4G preferred) to Side2 (3G preferred) 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 57% in Cities, 20% in Towns and 23% on Roads	
Samples	~ 3100 per Operator	~ 1200 per Operator
Dates	13,5 measurement days April 13th - April 29th, 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	Operator 3
Voice	Total	400	317	261	288
	Cities	260	87%	67%	83%
	Towns and roads	140	66%	61%	51%
Data	Total	600	428	363	318
	Cities	390	81%	71%	68%
	Towns	90	67%	50%	28%
	Roads	120	43%	35%	22%
TOTAL		1.000	745	624	606

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 breakdown.

Data	Service Group	Max.	Vodafone	Operator 2	Operator 3
Cities	Web Browsing	136,5	80%	69%	66%
	File Download	78,0	88%	64%	76%
	File Upload	78,0	75%	68%	67%
	YouTube	97,5	82%	80%	66%
Towns	Web Browsing	31,5	65%	45%	25%
	File Download	18,0	75%	48%	43%
	File Upload	18,0	62%	49%	14%
	YouTube	22,5	66%	61%	32%
Roads	Web Browsing	42,0	38%	31%	26%
	File Download	24,0	61%	41%	18%
	File Upload	24,0	44%	37%	19%
	YouTube	30,0	35%	32%	23%

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” and “Towns and Roads”.

Voice M2M	Kpi Name	Unit	Vodafone	Operator 2	Operator 3
Cities	Qualified	[%]	97,9	94,8	97,1
	Call Setup Time	[s]	4,8	5,4	4,8
	AVG Speech Quality	[MOS-LQO]	3,6	3,0	3,6
Towns and roads	Qualified	[%]	88,8	88,6	84,3
	Call Setup Time	[s]	4,8	5,2	5,2
	AVG Speech Quality	[MOS-LQO]	3,5	2,9	3,3

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	Operator 3
HTTP live page DL	Qualified	[%]	95,8	92,9	93,1
	AVG Session Time	[s]	3,3	3,4	4,0
HTTP static page DL	Qualified	[%]	99,0	97,9	97,4
	AVG Session Time	[s]	1,6	1,7	2,1
HTTP file DL 3MB	Qualified	[%]	99,7	94,2	98,5
	AVG Session Time	[s]	1,9	4,1	3,8
	90% faster than	[kbit/s]	8116	2879	3390
	10% faster than	[kbit/s]	57007	40748	40886
HTTP file UL 1MB	Qualified	[%]	97,6	93,7	94,9
	AVG Session Time	[s]	2,6	2,2	2,4
	90% faster than	[kbit/s]	1323	1813	1535
	10% faster than	[kbit/s]	12327	11527	12461
HTTP DL FDTT 10s	Qualified	[%]	99,7	99,3	99,4
	AVG throughput	[kbit/s]	45063	11337	21021
	90% faster than	[kbit/s]	6614	2816	3072
	10% faster than	[kbit/s]	89858	25484	46565
HTTP UL FDTT 10s	Qualified	[%]	99,6	99,0	98,2
	AVG throughput	[kbit/s]	14953	18304	12382
	90% faster than	[kbit/s]	1012	1449	1111
	10% faster than	[kbit/s]	33900	36121	28196
YouTube SD	Qualified	[%]	99,1	98,2	98,7
	Start Time	[s]	1,7	1,9	2,3
	Playouts w/o interruptions	[%]	99,9	99,3	98,9
YouTube HD	Qualified	[%]	96,4	96,2	92,5
	Start Time	[s]	1,9	2,2	2,7
	Playouts w/o interruptions	[%]	98,0	98,9	96,4

Data Towns	Kpi Name	Unit	Vodafone	Operator 2	Operator 3
HTTP live page DL	Qualified	[%]	92,5	86,9	79,8
	AVG Session Time	[s]	3,5	3,9	4,7
HTTP static page DL	Qualified	[%]	95,3	95,0	84,4
	AVG Session Time	[s]	1,7	2,2	3,0
HTTP file DL 3MB	Qualified	[%]	98,0	89,6	92,5
	AVG Session Time	[s]	2,8	5,8	6,0
	90% faster than	[kbit/s]	4994	2024	1973
	10% faster than	[kbit/s]	50847	32609	12195
HTTP file UL 1MB	Qualified	[%]	95,9	90,5	77,5
	AVG Session Time	[s]	3,7	3,8	4,9
	90% faster than	[kbit/s]	763	747	795
	10% faster than	[kbit/s]	9709	8914	11252
HTTP DL FDTT 10s	Qualified	[%]	96,3	97,9	93,0
	AVG throughput	[kbit/s]	42596	8672	10601
	90% faster than	[kbit/s]	4305	1562	1272
	10% faster than	[kbit/s]	85663	20836	21905
HTTP UL FDTT 10s	Qualified	[%]	96,7	95,4	85,8
	AVG throughput	[kbit/s]	10044	12653	5513
	90% faster than	[kbit/s]	692	598	304
	10% faster than	[kbit/s]	25814	28135	16523
YouTube SD	Qualified	[%]	95,5	97,5	92,5
	Start Time	[s]	1,9	2,4	3,0
	Playouts w/o interruptions	[%]	99,2%	99,2%	97,2%
YouTube HD	Qualified	[%]	92,7	92,6	75,0
	Start Time	[s]	1,9	2,8	3,6
	Playouts w/o interruptions	[%]	97,8	94,7	95,9

Data Roads	Kpi Name	Unit	Vodafone	Operator 2	Operator 3
HTTP live page DL	Qualified	[%]	77,5	72,9	55,8
	AVG Session Time	[s]	4,1	4,2	4,7
HTTP static page DL	Qualified	[%]	82,3	81,3	60,9
	AVG Session Time	[s]	2,8	3,2	3,3
HTTP file DL 3MB	Qualified	[%]	88,7	82,5	65,5
	AVG Session Time	[s]	7,3	10,1	7,6
	90% faster than	[kbit/s]	1212	1201	1526
	10% faster than	[kbit/s]	47059	28571	17608
HTTP file UL 1MB	Qualified	[%]	82,0	76,6	56,8
	AVG Session Time	[s]	5,6	6,3	5,4
	90% faster than	[kbit/s]	555	564	743
	10% faster than	[kbit/s]	8484	8929	10681
HTTP DL FDTT 10s	Qualified	[%]	92,4	89,3	67,1
	AVG throughput	[kbit/s]	20304	6460	10807
	90% faster than	[kbit/s]	838	880	1081
	10% faster than	[kbit/s]	61944	17396	26221
HTTP UL FDTT 10s	Qualified	[%]	89,7	88,2	64,3
	AVG throughput	[kbit/s]	5173	7569	5640
	90% faster than	[kbit/s]	293	378	256
	10% faster than	[kbit/s]	19840	27256	19565
YouTube SD	Qualified	[%]	86,4	83,8	64,4
	Start Time	[s]	3,0	3,1	3,2
	Playouts w/o interruptions	[%]	98,4	96,6	98,3
YouTube HD	Qualified	[%]	71,1	72,2	48,0
	Start Time	[s]	3,2	3,2	3,8
	Playouts w/o interruptions	[%]	90,2	91,2	91,5