

CERTIFICATE

P3 communications GmbH

Am Kraftversorgungsturm 3, 52070 Aachen, Germany

hereby certifies that



Vodafone Malta

SkyParks Business Centre

Malta International Airport, Luqa, LQA 4000

achieved „**Best in Test**“ with a

Total Score of 861 of 1000

in the **Mobile Benchmark Malta 02/2016**.

(Score 320 of 400 in Telephony, Score 541 of 600 in Data Services)

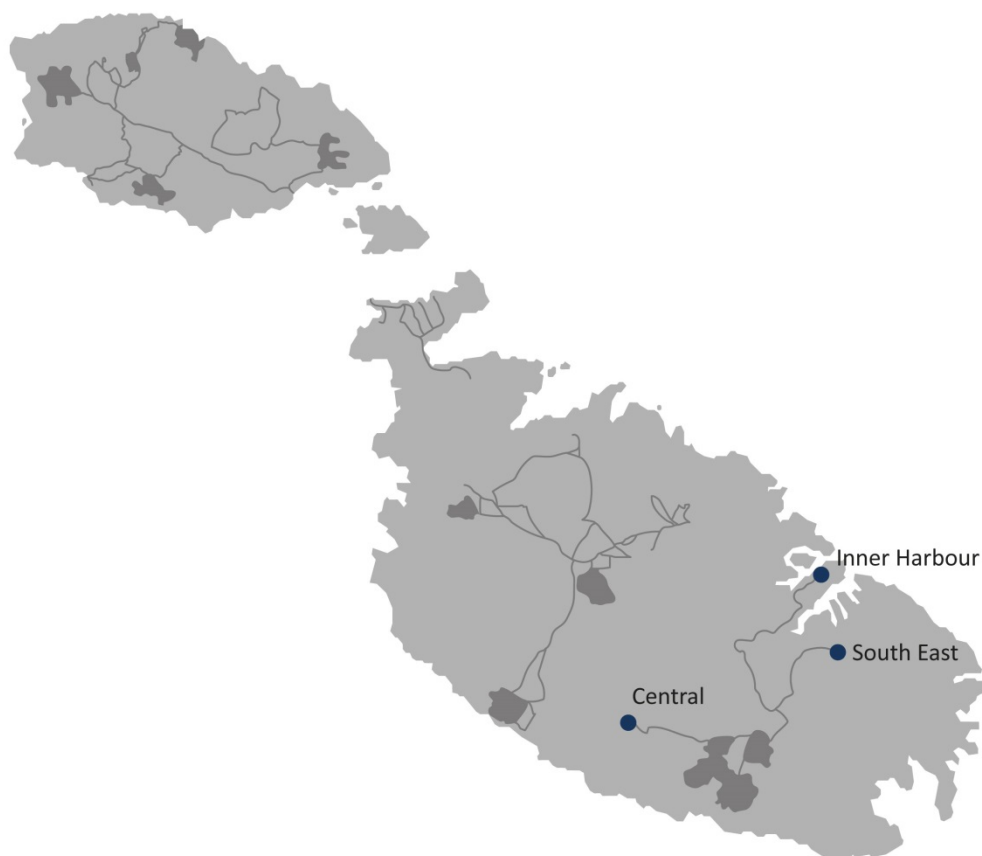


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*Head of Measurement
and Testing Solutions*
February 2016

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 54% in Cities, 19% in Towns and 27% on Roads Cities, towns and roads	
Samples	~ 2300 per Operator	~ 1300 per Operator
Dates	13 measurement days February 15th - February 29th, 2016	

Testing Route



Score Points and Breakdown

The following table indicates the score points achieved by the networks under test in the modules “Telephony” 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	320	298	320
	Cities	260	76%	68%	74%
	Towns and roads	140	88%	87%	91%
Data	Total	600	541	488	178
	Cities	390	91%	82%	23%
	Towns	90	83%	71%	45%
	Roads	120	93%	86%	42%
TOTAL		1.000	861	786	498

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	94%	89%	20%
	File Download	78,0	90%	81%	51%
	File Upload	78,0	81%	75%	17%
	YouTube	97,5	93%	80%	10%
Towns	Web Browsing	31,5	86%	80%	52%
	File Download	18,0	82%	74%	61%
	File Upload	18,0	76%	54%	30%
	YouTube	22,5	86%	69%	30%
Roads	Web Browsing	42,0	95%	91%	49%
	File Download	24,0	96%	87%	61%
	File Upload	24,0	89%	76%	36%
	YouTube	30,0	92%	86%	22%

Voice KPI Overview

The following table indicates the achieved values of all networks under test in each of the relevant Telephony 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	[%]	97,0%	95,5%	95,9%
	Call Setup Time	[s]	7,3	6,3	5,0
	AVG Speech Quality	[MOS-LQO]	3,5	2,8	2,9
Towns and roads	Qualified	[%]	97,5%	97,9%	98,8%
	Call Setup Time	[s]	6,9	5,8	4,7
	AVG Speech Quality	[MOS-LQO]	3,6	2,9	3,0

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	[%]	99,0%	97,9%	84,8%
	AVG Session Time	[s]	2,0	1,9	4,9
HTTP static page DL	Qualified	[%]	98,9%	98,0%	81,6%
	AVG Session Time	[s]	1,9	2,3	6,0
HTTP file DL 3MB	Qualified	[%]	99,4%	99,0%	95,7%
	AVG Session Time	[s]	1,4	2,7	13,7
	90% faster than	[kbit/s]	13962	5871	845
	10% faster than	[kbit/s]	42629	31250	7458
HTTP file UL 1MB	Qualified	[%]	99,0%	97,4%	23,7%
	AVG Session Time	[s]	2,0	2,4	9,7
	90% faster than	[kbit/s]	2816	1683	567
	10% faster than	[kbit/s]	8359	7306	1248
HTTP DL FDTT 10s	Qualified	[%]	99,6%	99,2%	98,6%
	AVG throughput	[kbit/s]	40854	31482	3195
	90% faster than	[kbit/s]	16950	7435	589
	10% faster than	[kbit/s]	70920	60261	8652
HTTP UL FDTT 10s	Qualified	[%]	99,7%	99,6%	91,8%
	AVG throughput	[kbit/s]	16205	15960	350
	90% faster than	[kbit/s]	2246	1423	95
	10% faster than	[kbit/s]	30417	27042	1099
YouTube SD	Qualified	[%]	99,3%	97,6%	88,0%
	Start Time	[s]	1,6	1,4	3,6
	Playouts w/o interruptions	[%]	99,9%	99,6%	93,6%
YouTube HD	Qualified	[%]	99,6%	96,0%	60,7%
	Start Time	[s]	1,6	1,8	5,9
	Playouts w/o interruptions	[%]	99,7%	98,7%	70,7%

Data Towns	Kpi Name	Unit	Vodafone	Operator 2	Operator 3
HTTP live page DL	Qualified	[%]	97,2%	95,9%	94,3%
	AVG Session Time	[s]	2,0	2,1	5,6
HTTP static page DL	Qualified	[%]	96,8%	97,0%	92,1%
	AVG Session Time	[s]	1,9	3,0	6,3
HTTP file DL 3MB	Qualified	[%]	96,8%	98,8%	99,0%
	AVG Session Time	[s]	1,8	3,4	11,4
	90% faster than	[kbit/s]	14230	4691	1554
	10% faster than	[kbit/s]	43716	20600	3359
HTTP file UL 1MB	Qualified	[%]	97,2%	92,5%	0,0%
	AVG Session Time	[s]	2,0	4,4	
	90% faster than	[kbit/s]	2483	1110	
	10% faster than	[kbit/s]	13937	5975	
HTTP DL FDTT 10s	Qualified	[%]	98,4%	99,2%	98,5%
	AVG throughput	[kbit/s]	44034	15693	2115
	90% faster than	[kbit/s]	14038	3510	933
	10% faster than	[kbit/s]	73063	25918	2797
HTTP UL FDTT 10s	Qualified	[%]	98,4%	98,8%	96,6%
	AVG throughput	[kbit/s]	19838	4221	152
	90% faster than	[kbit/s]	964	834	101
	10% faster than	[kbit/s]	34885	10294	233
YouTube SD	Qualified	[%]	98,8%	96,3%	96,5%
	Start Time	[s]	1,6	1,7	3,1
	Playouts w/o interruptions	[%]	100,0%	100,0%	99,5%
YouTube HD	Qualified	[%]	97,2%	93,3%	69,8%
	Start Time	[s]	1,8	1,9	5,6
	Playouts w/o interruptions	[%]	99,2%	97,3%	67,4%

Data Roads	Kpi Name	Unit	Vodafone	Operator 2	Operator 3
HTTP live page DL	Qualified	[%]	98,9%	98,3%	87,5%
	AVG Session Time	[s]	2,0	2,2	5,3
HTTP static page DL	Qualified	[%]	98,3%	97,9%	88,1%
	AVG Session Time	[s]	1,9	3,0	6,2
HTTP file DL 3MB	Qualified	[%]	98,2%	99,2%	97,7%
	AVG Session Time	[s]	1,7	3,5	14,9
	90% faster than	[kbit/s]	14.226	4.441	807
	10% faster than	[kbit/s]	44.776	22.409	3.393
HTTP file UL 1MB	Qualified	[%]	97,4%	95,7%	14,3%
	AVG Session Time	[s]	1,9	4,1	8,4
	90% faster than	[kbit/s]	2.490	1.145	637
	10% faster than	[kbit/s]	13.514	6.304	1.256
HTTP DL FDTT 10s	Qualified	[%]	99,0%	100,0%	99,4%
	AVG throughput	[kbit/s]	43.186	16.256	2.684
	90% faster than	[kbit/s]	12.979	4.282	633
	10% faster than	[kbit/s]	71.474	30.422	3.064
HTTP UL FDTT 10s	Qualified	[%]	99,0%	99,7%	98,1%
	AVG throughput	[kbit/s]	18.678	4.684	283
	90% faster than	[kbit/s]	1.527	691	100
	10% faster than	[kbit/s]	34.520	15.672	1.008
YouTube SD	Qualified	[%]	98,7%	98,7%	88,0%
	Start Time	[s]	1,6	1,7	3,3
	Playouts w/o interruptions	[%]	99,7%	97,8%	93,4%
YouTube HD	Qualified	[%]	97,1%	95,7%	52,3%
	Start Time	[s]	1,6	2,1	5,6
	Playouts w/o interruptions	[%]	99,5%	97,8%	68,9%