

## FCC Part 22/24/27 Compliance Test Report

<b>Test Report no.:</b>	FCC_Cellular_RM-1104_24_ant1.docx	<b>Date of Report:</b>	31-Oct-2015
<b>Number of pages:</b>	30	<b>Customer's Contact person:</b>	Jari Rontu
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<b>FCC listing no.:</b>	94436		
<b>IC recognition no.:</b>	661AK-1		
<b>Tested devices/ accessories:</b>	<b>Phone RM-1104 / Battery BV-T5E / AC charger AC-100E / Headset WH-308</b>		
<b>FCC ID:</b>	PYASTT	<b>IC:</b>	661X-STT
<b>Supplement reports:</b>	-		
<b>Testing has been carried out in accordance with:</b>	CFR 47, FCC rules Parts 22/24/27, TIA-603-C-2004 and IC standards, RSS-GEN (Issue 4, November 2014), RSS-133 (Issue 6, January 2013), RSS-139 (Issue 2, February 2009), RSS-132 (Issue 3, January 2013), RSS-199 (Issue 2, October 2014), RSS-130 (Issue 1, October 2013). Deviations, modifications or clarifications (if any) to above mentioned documents are written in each section under "Test method and limit".		
<b>Documentation:</b>	The test report must always be reproduced in full; reproduction of an excerpt only is subject to written approval of the testing laboratory. The documentation of the testing performed on the tested devices is archived for 15 years at TCC Microsoft.		
<b>Test Results:</b>	<b>The EUT complies with the requirements in respect of all parameters subject to the test.</b> The test results relate only to devices specified in this document		
<b>Date and signature for the contents:</b>			

Timo Raiskio, System Manager, EMC

## 1. Summary for FCC Part 22/24/27 Compliance Test Report

<b>Date of receipt</b>	01-Jul-2015
<b>Testing completed</b>	21-Sep-2015
<b>The customer's contact person</b>	Jari Rontu
<b>Test Plan referred to</b>	T:\Projects\RM-1104\TestPlan\RS_TestPlan_RM-1104_EMCC_FCC.xlsm
<b>Notes</b>	LTE conducted output power results can be found in chapter 5. Appendix.
<b>Document name</b>	T:\Projects\RM-1104\EMC\FCC_Cellular_RM-1104_24_ant1.docx

### 1.1. EUT and Accessory Information

The EUT is a mobile phone with following features:  
GSM/WCDMA/WLAN/Bluetooth  
The EUT is tested with maximum rated TX power.

Devices under tests

Product	Type	SN	HW	MV	SW	DUT
Phone	RM-1104	004402742178365	2012	-	01065.00000.15264.47000	400026
Battery	BV-T5E	4181575182S10605121;0670775	V6	-	-	400028
AC charger	AC-100E	40904951255803017590675758	0.3	-	-	400013
Headset	WH-308	-	-	-	-	400014

### 1.2. Summary of Test Results

#### GSM 850:

Section in CFR 47	Section in RSS-GEN or RSS-132	Name of the test	Result
§2.1046(a), 22.913(a)	4.4	Conducted RF output power	NP
§22.913(a)	4.4	Radiated RF output power	PASSED
N/A	5.4	Peak to average power ratio	NP
§2.1049(h)	6.6	99 % occupied bandwidth	NP
§22.917(a)	4.5	Band edge compliance	NP
§22.917(a), §2.1051	4.5	Spurious emissions at antenna terminals	NP
§22.917(a), §2.1053	4.5	Spurious radiated emissions	PASSED
§2.1055(a)	4.3	Frequency stability, temperature variation	NP
§2.1055(d)	4.3	Frequency stability, voltage variation	NP

#### GSM 1900:

Section in CFR 47	Section in RSS-GEN or RSS-133	Name of the test	Result
§2.1046(a)	6.4	Conducted RF output power	NP
§24.232(b)	6.4	Radiated RF output power	PASSED
N/A	6.4	Peak to average power ratio	NP
§2.1049(h)	6.6	99 % occupied bandwidth	NP
§24.238(a)	6.5	Band edge compliance	NP
§24.238(a), §2.1051	6.5	Spurious emissions at antenna terminals	NP
§24.238(a), §2.1053	6.5	Spurious radiated emissions	PASSED
§2.1055(a)	6.3	Frequency stability, temperature variation	NP
§2.1055(d)	6.3	Frequency stability, voltage variation	NP

**WCDMA2:**

Section in CFR 47	Section in RSS-GEN or RSS-133	Name of the test	Result
§2.1046(a)	6.4	Conducted RF output power	NP
§24.232(b)	6.4	Radiated RF output power	PASSED
N/A	6.4	Peak to average power ratio	NP
§2.1049(h)	6.6	99 % occupied bandwidth	NP
§24.238(a)	6.5	Band edge compliance	NP
§24.238(a), §2.1051	6.5	Spurious emissions at antenna terminals	NP
§24.238(a), §2.1053	6.5	Spurious radiated emissions	PASSED
§2.1055(a)	6.3	Frequency stability, temperature variation	NP
§2.1055(d)	6.3	Frequency stability, voltage variation	NP

**WCDMA4:**

Section in CFR 47	Section in RSS-GEN or RSS-139	Name of the test	Result
§2.1046(a)	6.4	Conducted RF output power	NP
§27.50(d)(2)	6.4	Radiated RF output power	PASSED
N/A	6.4	Peak to average power ratio	NP
§2.1049(h)	6.6	99 % occupied bandwidth	NP
§27.53(g)	6.5	Band edge compliance	NP
§27.53(g), §2.1051	6.5	Spurious emissions at antenna terminals	NP
§24.238(a), §2.1053	6.5	Spurious radiated emissions	PASSED
§2.1055(a)	6.3	Frequency stability, temperature variation	NP
§2.1055(d)	6.3	Frequency stability, voltage variation	NP

**WCDMA5:**

Section in CFR 47	Section in RSS-GEN or RSS-132	Name of the test	Result
§2.1046(a), 22.913(a)	4.4	Conducted RF output power	NP
§22.913(a)	4.4	Radiated RF output power	PASSED
N/A	5.4	Peak to average power ratio	NP
§2.1049(h)	6.6	99 % occupied bandwidth	NP
§22.917(a)	4.5	Band edge compliance	NP
§22.917(a), §2.1051	4.5	Spurious emissions at antenna terminals	NP
§22.917(a), §2.1053	4.5	Spurious radiated emissions	PASSED
§2.1055(a)	4.3	Frequency stability, temperature variation	NP
§2.1055(d)	4.3	Frequency stability, voltage variation	NP

**LTE2:**

Section in CFR 47	Section in RSS-GEN or RSS-133	Name of the test	Result
§2.1046(a)	6.4	Conducted RF output power	NP
§24.232(b)	6.4	Radiated RF output power	PASSED
N/A	6.4	Peak to average power ratio	NP
§2.1049(h)	6.6	99 % occupied bandwidth	NP
§24.238(a)	6.5	Band edge compliance	NP
§24.238(a), §2.1051	6.5	Spurious emissions at antenna terminals	NP
§24.238(a), §2.1053	6.5	Spurious radiated emissions	PASSED
§2.1055(a)	6.3	Frequency stability, temperature variation	NP
§2.1055(d)	6.3	Frequency stability, voltage variation	NP

**LTE4:**

Section in CFR 47	Section in RSS-GEN or RSS-139	Name of the test	Result
§2.1046(a)	6.4	Conducted RF output power	NP
§27.50(d)(4)	6.4	Radiated RF output power	PASSED
N/A	6.4	Peak to average power ratio	NP
§2.1049(h)	6.6	99 % occupied bandwidth	NP
§27.53(h)	6.5	Band edge compliance	NP
§27.53(h), §2.1051	6.5	Spurious emissions at antenna terminals	NP
§27.53(h), §2.1053	6.5	Spurious radiated emissions	PASSED
§2.1055(a)	6.3	Frequency stability, temperature variation	NP
§2.1055(d)	6.3	Frequency stability, voltage variation	NP

**LTE5:**

Section in CFR 47	Section in RSS-GEN or RSS-132	Name of the test	Result
§2.1046(a), 22.913(a)	4.4	Conducted RF output power	NP
§22.913(a)	4.4	Radiated RF output power	PASSED
N/A	5.4	Peak to average power ratio	NP
§2.1049(h)	6.6	99 % occupied bandwidth	NP
§22.917(a)	4.5	Band edge compliance	NP
§22.917(a), §2.1051	4.5	Spurious emissions at antenna terminals	NP
§22.917(a), §2.1053	4.5	Spurious radiated emissions	PASSED
§2.1055(a)	4.3	Frequency stability, temperature variation	NP
§2.1055(d)	4.3	Frequency stability, voltage variation	NP

**LTE7:**

Section in CFR 47	Section in RSS-GEN or RSS-199	Name of the test	Result
§2.1046(a)	4.4	Conducted RF output power	NP
§27.50(h)(2)	4.4	Radiated RF output power	PASSED
N/A	N/A	Peak to average power ratio	NP
§2.1049(h)	6.6	99 % occupied bandwidth	NP
§27.53(l)	4.5(b)	Band edge compliance	NP
§2.1051	4.5(b)	Spurious emissions at antenna terminals	NP
§27.53(l), §2.1053	4.5(b)	Spurious radiated emissions	PASSED
§27.54	4.3	Frequency stability, temperature variation	NP
§27.54	4.3	Frequency stability, voltage variation	NP

**LTE12:**

Section in CFR 47	Section in RSS-GEN or RSS-130	Name of the test	Result
§2.1046(a)	4.4	Conducted RF output power	NP
§27.50(c)10	4.4	Radiated RF output power	PASSED
N/A	N/A	Peak to average power ratio	NP
§2.1049(h)	6.6	99 % occupied bandwidth	NP
§27.53(f)	4.6	Band edge compliance	NP
§27.53(f)	4.6	Spurious emissions at antenna terminals	NP
§27.53(f)	4.6	Spurious radiated emissions	PASSED
§27.54	4.3	Frequency stability, temperature variation	NP
§27.54	4.3	Frequency stability, voltage variation	NP

**LTE17:**

Section in CFR 47	Section in RSS-GEN or RSS-130	Name of the test	Result
§2.1046(a)	4.4	Conducted RF output power	NP
§27.50(c)(10)	4.4	Radiated RF output power	PASSED
N/A	N/A	Peak to average power ratio	NP
§2.1049(h)	6.6	99 % occupied bandwidth	NP
§27.53(g)	4.6	Band edge compliance	NP
§27.53(g), §2.1051	4.6	Spurious emissions at antenna terminals	NP
§27.53(g), §2.1051	4.6	Spurious radiated emissions	PASSED
§2.1055(a)	4.3 (a)	Frequency stability, temperature variation	NP
§2.1055(d)	4.3 (a)	Frequency stability, voltage variation	NP

PASSED  
 FAILED  
 NP

The EUT complies with the essential requirements in the standard.  
 The EUT does not comply with the essential requirements in the standard.  
 The test was not performed by the TCC Microsoft Laboratory.

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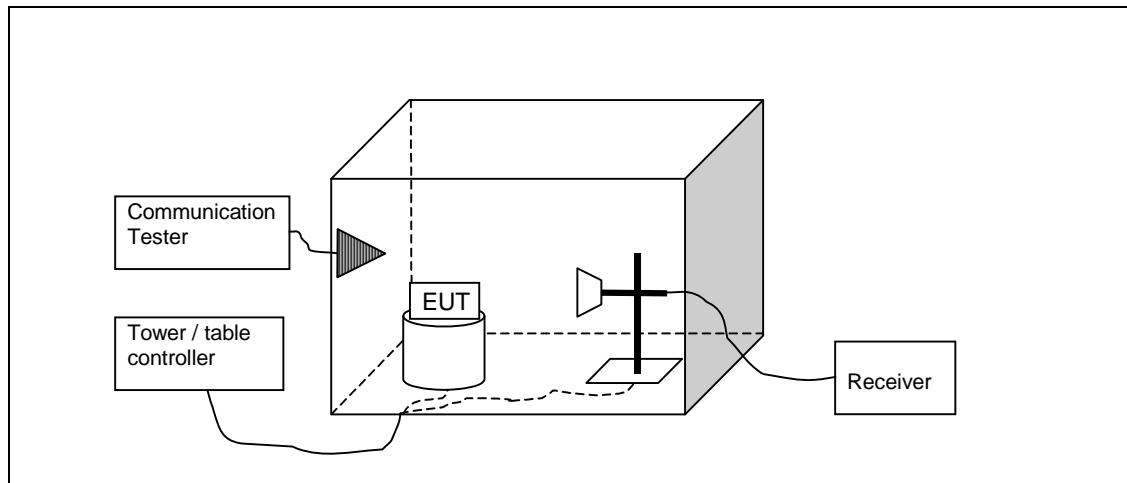
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## 2. Radiated RF output power, Antenna 1

(FCC §22.913(a), §27.50(c)(10), §27.50(c)10, §27.50(h)(2), §27.50(d)(4), §27.50(d)(2), §24.232(b), RSS-132 4.4, RSS-133 6.4, RSS-139 6.4, RSS-199 4.4, RSS-130 4.4)

<b>EUT with DUT number</b>	RM-1104, DUT 400026
<b>Accessories with DUT numbers</b>	BV-T5E, DUT 400028
<b>Operation Voltage [V] / [Hz]</b>	Nominal
<b>Results</b>	PASSED
<b>Remarks</b>	-
<b>Temp [°C] / Humidity [%RH] / Air Pressure [kPa]</b>	20 / 47 / 101.1
<b>Date of measurements</b>	21-Sep-2015
<b>Measured by</b>	Timo Raiskio

### 2.1.1 Test setup



### 2.2. Test method and limit

The measurement is made according to TIA-603-C-2004 as follows:

The measurement is performed in the Anechoic Chamber with absorbers on the floor and measuring antenna at fixed height using 2-axis EUT position system. The turntable is rotated 360 degrees and this is repeated for both horizontal and vertical receive antenna polarizations.

The EUT is placed on a nonconductive plate at 170 cm height.

The substitution method is used. The measurement results are obtained as described below:

$$P[\text{dBm}] = P_{\text{SUBST TX}} + P_{\text{MEAS}} - P_{\text{SUBST RX}} - L_{\text{SUBST CABLES}} + G_{\text{SUBST TX ANT}}$$

Where  $P_{\text{SUBST TX}}$  is signal generator level.  $P_{\text{MEAS}}$  is measured power level from the EUT.  $P_{\text{SUBST RX}}$  is measured power level in substitute measurement.  $L_{\text{SUBST CABLE}}$  is the loss of the cable between the signal generator and the substitution antenna and  $G_{\text{SUBST TX ANT}}$  is substitution antenna gain.

The RF power levels were measured in conducted manner with all CBWs. The CBW with highest power was selected for radiated tests.



Limits for radiated RF output power measurements

Frequency range [MHz]	Limit [W]	Limit [dBm]
824 - 849	7 ERP	38.5
1850 - 1910	2 EIRP	33
1710 - 1755	1 EIRP	30
2502.5 - 2567.5	2 EIRP	33
699 - 712	2 ERP	33
704 - 716	3 ERP	34.8

### 2.3. GSM 850 test results

RMS detector

Channel / f <sub>c</sub> [MHz]	ERP [dBm]	ERP [W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Results
128 / 824.2	27.43	0.554	-4.9	32.33	VERTICAL	PASSED
190 / 836.6	28.84	0.766	-2.79	31.63	VERTICAL	PASSED
251 / 848.8	27.59	0.574	-3.22	30.81	VERTICAL	PASSED

### 2.4. GSM 850 E-GPRS (MSC9) test results

RMS detector

Channel / f <sub>c</sub> [MHz]	ERP [dBm]	ERP [W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Results
128 / 824.2	24.93	0.311	-7.35	32.28	HORIZONTAL	PASSED
190 / 836.6	25.55	0.359	-6.08	31.63	VERTICAL	PASSED
251 / 848.8	24.28	0.268	-6.53	30.81	VERTICAL	PASSED

### 2.5. GSM 1900 test results

RMS detector

Channel / f <sub>c</sub> [MHz]	EIRP [dBm]	EIRP [W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Results
512 / 1850.2	30.6	1.148	-12.17	42.77	HORIZONTAL	PASSED
661 / 1880	30.28	1.066	-12.48	42.76	HORIZONTAL	PASSED
810 / 1909.8	30.29	1.068	-12.62	42.91	HORIZONTAL	PASSED

### 2.6. GSM 1900 E-GPRS (MSC9) test results

RMS detector

Channel / f <sub>c</sub> [MHz]	EIRP [dBm]	EIRP [W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Results
512 / 1850.2	27.11	0.514	-15.66	42.77	HORIZONTAL	PASSED
661 / 1880	27.29	0.535	-15.47	42.76	HORIZONTAL	PASSED
810 / 1909.8	27.59	0.574	-15.32	42.91	HORIZONTAL	PASSED

### 2.7. WCDMA2 test results

RMS detector

Channel / f <sub>c</sub> [MHz]	EIRP [dBm]	EIRP [W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Results
9262 / 1852.4	23.89	0.245	-18.9	42.79	HORIZONTAL	PASSED
9400 / 1880	22.98	0.199	-19.78	42.76	HORIZONTAL	PASSED
9538 / 1907.6	21.7	0.148	-21.15	42.85	HORIZONTAL	PASSED

## 2.8. WCDMA4 test results

RMS detector

Channel / $f_c$ [MHz]	EIRP [dBm]	EIRP [W]	$P_{MEAS}$ [dBm]	$A_{TOT}$ [dB]	Polarisation	Results
1312 / 1712.4	23.76	0.238	-18.04	41.8	HORIZONTAL	PASSED
1412 / 1732.4	23.85	0.242	-18.04	41.89	HORIZONTAL	PASSED
1513 / 1752.6	23.8	0.24	-18.09	41.89	HORIZONTAL	PASSED

## 2.9. WCDMA5 test results

RMS detector

Channel / $f_c$ [MHz]	ERP [dBm]	ERP [W]	$P_{MEAS}$ [dBm]	$A_{TOT}$ [dB]	Polarisation	Results
4132 / 826.4	19.14	0.082	-13.34	32.48	VERTICAL	PASSED
4175 / 835	18.94	0.078	-12.99	31.93	VERTICAL	PASSED
4233 / 846.6	17.86	0.061	-12.42	30.28	HORIZONTAL	PASSED

## 2.10. LTE2 test results

FDD, CBW 3MHz, QPSK, 1RB mid, RMS detector

Channel / $f_c$ [MHz]	EIRP [dBm]	EIRP [W]	$P_{MEAS}$ [dBm]	$A_{TOT}$ [dB]	Polarisation	Results
0 / 1851.5	24.05	0.254	-18.72	42.77	HORIZONTAL	PASSED
18900 / 1880	23.41	0.219	-19.35	42.76	HORIZONTAL	PASSED
18900 / 1908.5	22.18	0.165	-20.7	42.88	HORIZONTAL	PASSED

FDD, CBW 20MHz, QPSK, 1RB mid, RMS detector

Channel / $f_c$ [MHz]	EIRP [dBm]	EIRP [W]	$P_{MEAS}$ [dBm]	$A_{TOT}$ [dB]	Polarisation	Results
0 / 1860	24.29	0.269	-18.51	42.8	HORIZONTAL	PASSED
18900 / 1880	23.59	0.228	-19.17	42.76	HORIZONTAL	PASSED
18900 / 1900	22.75	0.188	-20.08	42.83	HORIZONTAL	PASSED

FDD, CBW 1.4MHz, 16QAM, 1RB mid, RMS detector

Channel / $f_c$ [MHz]	EIRP [dBm]	EIRP [W]	$P_{MEAS}$ [dBm]	$A_{TOT}$ [dB]	Polarisation	Results
0 / 1850.7	23.96	0.249	-18.81	42.77	HORIZONTAL	PASSED
18900 / 1880	23.36	0.217	-19.4	42.76	HORIZONTAL	PASSED
18900 / 1909.3	22.9	0.195	-19.99	42.89	HORIZONTAL	PASSED

FDD, CBW 20MHz, 16QAM, 1RB mid, RMS detector

Channel / $f_c$ [MHz]	EIRP [dBm]	EIRP [W]	$P_{MEAS}$ [dBm]	$A_{TOT}$ [dB]	Polarisation	Results
0 / 1860	24.29	0.269	-18.51	42.8	HORIZONTAL	PASSED

18900 / 1880	23.4	0.219	-19.36	42.76	HORIZONTAL	PASSED
18900 / 1900	22.54	0.18	-20.29	42.83	HORIZONTAL	PASSED

## 2.11. LTE4 test results

FDD, CBW 3MHz, QPSK, 1RB mid, RMS detector

Channel / fc [MHz]	EIRP [dBm]	EIRP [W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Results
0 / 1711.5	23.49	0.223	-18.3	41.79	HORIZONTAL	PASSED
20175 / 1732.5	24.1	0.257	-17.79	41.89	HORIZONTAL	PASSED
20175 / 1753.5	24.57	0.286	-17.31	41.88	HORIZONTAL	PASSED

FDD, CBW 20MHz, QPSK, 1RB mid, RMS detector

Channel / fc [MHz]	EIRP [dBm]	EIRP [W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Results
0 / 1720	23.89	0.245	-18	41.89	HORIZONTAL	PASSED
20175 / 1732.5	24.29	0.268	-17.6	41.89	HORIZONTAL	PASSED
20175 / 1745	24.13	0.259	-17.77	41.9	HORIZONTAL	PASSED

FDD, CBW 5MHz, 16QAM, 1RB mid, RMS detector

Channel / fc [MHz]	EIRP [dBm]	EIRP [W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Results
19975 / 1712.5	23.59	0.229	-18.21	41.8	HORIZONTAL	PASSED
20175 / 1732.5	24.14	0.26	-17.75	41.89	HORIZONTAL	PASSED
20375 / 1752.5	24.6	0.288	-17.29	41.89	HORIZONTAL	PASSED

FDD, CBW 20MHz, 16QAM, 1RB mid, RMS detector

Channel / fc [MHz]	EIRP [dBm]	EIRP [W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Results
0 / 1720	23.62	0.23	-18.27	41.89	HORIZONTAL	PASSED
20175 / 1732.5	23.77	0.238	-18.12	41.89	HORIZONTAL	PASSED
20175 / 1745	24.09	0.257	-17.81	41.9	HORIZONTAL	PASSED

## 2.12. LTE5 test results

FDD, CBW 3MHz, QPSK, 1RB mid, RMS detector

Channel / fc [MHz]	ERP [dBm]	ERP [W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Results
0 / 825.5	19.6	0.091	-12.76	32.36	VERTICAL	PASSED
20525 / 836.5	19.26	0.084	-12.38	31.64	VERTICAL	PASSED
20525 / 847.5	18.54	0.072	-11.81	30.35	HORIZONTAL	PASSED

FDD, CBW 10MHz, QPSK, 1RB mid, RMS detector

Channel / f <sub>c</sub> [MHz]	ERP [dBm]	ERP [W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Results
0 / 829	19.64	0.092	-12.58	32.22	VERTICAL	PASSED
20525 / 836.5	19.76	0.095	-11.88	31.64	VERTICAL	PASSED
20525 / 844	18.52	0.071	-12.48	31	VERTICAL	PASSED

FDD, CBW 5MHz, 16QAM, 1RB mid, RMS detector

Channel / f <sub>c</sub> [MHz]	ERP [dBm]	ERP [W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Results
20425 / 826.5	19.5	0.089	-12.97	32.47	VERTICAL	PASSED
20525 / 836.5	19.01	0.08	-12.63	31.64	VERTICAL	PASSED
20625 / 846.5	18.07	0.064	-12.21	30.28	HORIZONTAL	PASSED

FDD, CBW 10MHz, 16QAM, 1RB mid, RMS detector

Channel / f <sub>c</sub> [MHz]	ERP [dBm]	ERP [W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Results
0 / 829	19.82	0.096	-12.41	32.23	HORIZONTAL	PASSED
20525 / 836.5	19.83	0.096	-11.81	31.64	VERTICAL	PASSED
20525 / 844	18.75	0.075	-12.25	31	VERTICAL	PASSED

## 2.13. LTE7 test results

FDD, CBW 15MHz, QPSK, 1RB mid, RMS detector

Channel / f <sub>c</sub> [MHz]	EIRP [dBm]	EIRP [W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Results
0 / 2507.5	25.89	0.388	-20.76	46.65	HORIZONTAL	PASSED
21100 / 2535	27	0.501	-19.95	46.95	HORIZONTAL	PASSED
21100 / 2562.5	26.12	0.409	-20.83	46.95	HORIZONTAL	PASSED

FDD, CBW 15MHz, QPSK, 1RB mid, Peak detector

Channel / f <sub>c</sub> [MHz]	EIRP [dBm]	EIRP [W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Results
0 / 2507.5	28.66	0.734	-17.99	46.65	HORIZONTAL	PASSED
21100 / 2535	29.9	0.977	-17.05	46.95	HORIZONTAL	PASSED
21100 / 2562.5	28.1	0.646	-18.85	46.95	HORIZONTAL	PASSED

FDD, CBW 20MHz, QPSK, 1RB mid, RMS detector

Channel / f <sub>c</sub> [MHz]	EIRP [dBm]	EIRP [W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Results
0 / 2510	26.36	0.432	-20.38	46.74	HORIZONTAL	PASSED
21100 / 2535	26.72	0.47	-20.23	46.95	HORIZONTAL	PASSED
21100 / 2560	25.89	0.388	-21.13	47.02	HORIZONTAL	PASSED

FDD, CBW 20MHz, QPSK, 1RB mid, Peak detector

Channel / f <sub>c</sub> [MHz]	EIRP [dBm]	EIRP [W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Results
0 / 2510	28.68	0.738	-18.06	46.74	HORIZONTAL	PASSED
21100 / 2535	29.75	0.944	-17.2	46.95	HORIZONTAL	PASSED
21100 / 2560	28.63	0.729	-18.39	47.02	HORIZONTAL	PASSED

FDD, CBW 10MHz, 16QAM, 1RB mid, RMS detector

Channel / f <sub>c</sub> [MHz]	EIRP [dBm]	EIRP [W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Results
0 / 2505	25.31	0.34	-21.26	46.57	HORIZONTAL	PASSED
21100 / 2535	26.45	0.442	-20.5	46.95	HORIZONTAL	PASSED
21100 / 2565	25.22	0.332	-21.66	46.88	HORIZONTAL	PASSED

FDD, CBW 10MHz, 16QAM, 1RB mid, Peak detector

Channel / f <sub>c</sub> [MHz]	EIRP [dBm]	EIRP [W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Results
0 / 2505	28.79	0.757	-17.78	46.57	HORIZONTAL	PASSED
21100 / 2535	29.82	0.96	-17.13	46.95	HORIZONTAL	PASSED
21100 / 2565	28.43	0.696	-18.45	46.88	HORIZONTAL	PASSED

FDD, CBW 20MHz, 16QAM, 1RB mid, RMS detector

Channel / f <sub>c</sub> [MHz]	EIRP [dBm]	EIRP [W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Results
0 / 2510	25.98	0.396	-20.76	46.74	HORIZONTAL	PASSED
21100 / 2535	26.62	0.46	-20.33	46.95	HORIZONTAL	PASSED
21100 / 2560	25.65	0.367	-21.37	47.02	HORIZONTAL	PASSED

FDD, CBW 20MHz, 16QAM, 1RB mid, Peak detector

Channel / f <sub>c</sub> [MHz]	EIRP [dBm]	EIRP [W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Results
0 / 2510	28.18	0.657	-18.56	46.74	HORIZONTAL	PASSED
21100 / 2535	28.62	0.728	-18.33	46.95	HORIZONTAL	PASSED
21100 / 2560	27.53	0.566	-19.49	47.02	HORIZONTAL	PASSED

## 2.14. LTE12 test results

FDD, CBW 10MHz, QPSK, 1RB mid, RMS detector

Channel / f <sub>c</sub> [MHz]	ERP [dBm]	ERP [W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Results
0 / 704	19.58	0.091	-11.14	30.72	VERTICAL	PASSED
23095 / 707.5	20.18	0.104	-9.97	30.15	HORIZONTAL	PASSED
23095 / 711	20.08	0.102	-10.55	30.63	VERTICAL	PASSED

FDD, CBW 3MHz, 16QAM, 1RB mid, RMS detector

Channel / fc [MHz]	ERP [dBm]	ERP [W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Results
0 / 700.5	18.67	0.074	-11.79	30.46	VERTICAL	PASSED
23095 / 707.5	19.5	0.089	-11.18	30.68	VERTICAL	PASSED
23095 / 714.5	19.89	0.098	-10.61	30.5	VERTICAL	PASSED

FDD, CBW 10MHz, 16QAM, 1RB mid, RMS detector

Channel / fc [MHz]	ERP [dBm]	ERP [W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Results
0 / 704	19.37	0.086	-10.56	29.93	HORIZONTAL	PASSED
23095 / 707.5	19.59	0.091	-11.09	30.68	VERTICAL	PASSED
23095 / 711	20.07	0.102	-10.23	30.3	HORIZONTAL	PASSED

## 2.15. LTE17 test results

FDD, CBW 10MHz, QPSK, 1RB mid, RMS detector

Channel / fc [MHz]	ERP [dBm]	ERP [W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Results
23780 / 709	19.86	0.097	-10.37	30.23	HORIZONTAL	PASSED
23790 / 710	20.04	0.101	-10.25	30.29	HORIZONTAL	PASSED
23800 / 711	20.05	0.101	-10.25	30.3	HORIZONTAL	PASSED

FDD, CBW 10MHz, 16QAM, 1RB mid, RMS detector

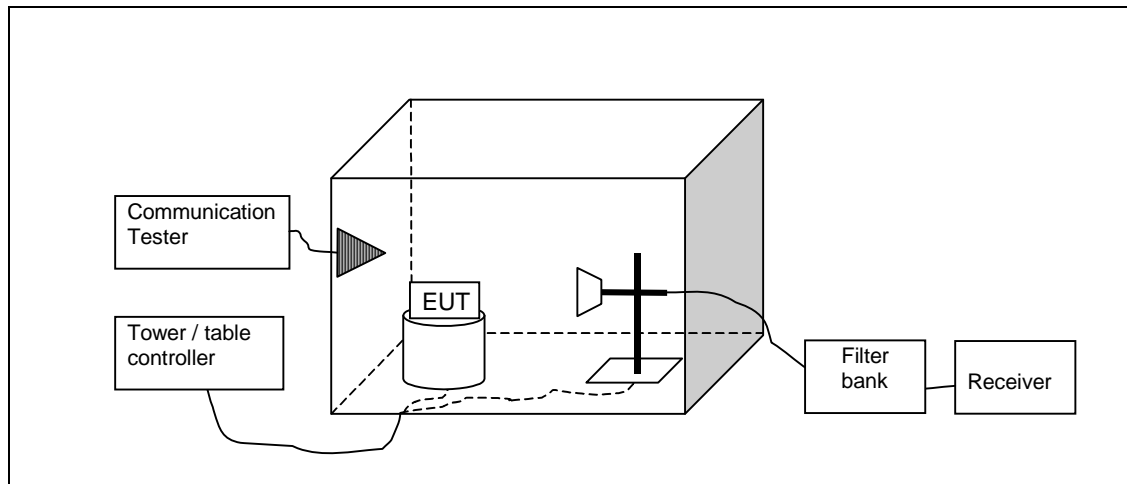
Channel / fc [MHz]	ERP [dBm]	ERP [W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Results
23780 / 709	19.49	0.089	-10.74	30.23	HORIZONTAL	PASSED
23790 / 710	19.82	0.096	-10.85	30.67	VERTICAL	PASSED
23800 / 711	20.51	0.113	-9.79	30.3	HORIZONTAL	PASSED

### 3. Spurious radiated emissions, Antenna 1

(FCC §24.238(a), §24.238(a), §2.1053, §27.53(g), §2.1051, §27.53(f), §27.53(l), §2.1053, §22.917(a), §2.1053, §27.53(h), §2.1053, §2.1053, RSS-133 6.5, RSS-139 6.5, RSS-132 4.5, RSS-199 4.5(b), RSS-130 4.6)

<b>EUT with DUT number</b>	RM-1104, DUT 400026
<b>Accessories with DUT numbers</b>	BV-T5E, DUT 400028 ; AC-100E, DUT 400013 ; WH-308, DUT 400014
<b>Operation Voltage [V] / [Hz]</b>	Nominal
<b>Results</b>	PASSED
<b>Remarks</b>	-
<b>Temp [°C] / Humidity [%RH] / Air Pressure [kPa]</b>	20 / 48
<b>Date of measurements</b>	12-Jul-2015
<b>Measured by</b>	Jari Jantunen

#### 3.1.1 Test setup



#### 3.2. Test method and limit

The measurement is made according to TIA-603-C-2004 as follows:

The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with absorbers on the floor and measuring antenna at fixed height using 2-axis EUT position system.

The Final Measurement is performed in the Semi-Anechoic Chamber with conducting metal floor, if the Preliminary Measurement results are closer than 20 dB to the permissible value.

The EUT is placed at nonconductive plate at the turntable center.

For each suspected frequency, the turntable is rotated 360 degrees and antenna is scanned from 1 to 4 m. This is repeated for both horizontal and vertical receive antenna polarizations.

The emissions less than 20 dB below the permissible value are reported.

The measurement is made up to 10th harmonic of the EUT highest TX channel.



The substitution method is used.

The measurement results are obtained as described below:

$$P [dBm] = P_{SUBST TX} + G_{SUBST TX ANT} - L_{SUBST CABLE}$$

Where  $P_{SUBST TX}$  is signal generator level, which produces the same receiver reading  $P_{MEAS}$  in dBm as EUT.  $G_{SUBST TX ANT}$  is substitution antenna gain and  $L_{SUBST CABLE}$  is the loss of the cable between the signal generator and the substitution antenna.

Previous evaluations have shown, that the currently selected CBW/RB configurations represent the worst case for this test. The evaluations are repeated every now and then to ensure, that the selections remain valid.

Limits for spurious radiated emissions measurements

Operation band	Frequency range [MHz]	Limit [dBm]
LTE2	30 - 19100	-13
LTE4	30 - 17500	-13
LTE5	30 - 8500	-13
LTE7	30 - 25700	-13
LTE12	30 - 7200	-13
LTE17	30 - 7200	-13 (RBW = 100 kHz, ERP)
GSM 850	30 - 8500	-13
GSM 1900	30 - 19100	-13
WCDMA2	30 - 19100	-13
WCDMA4	30 - 17500	-13
WCDMA5	30 - 8500	-13

### 3.3. GSM 850 test results

Channel 190 / 836.6 MHz

Peak detector

Frequency [MHz]	P [dBm]	P [ $\mu$ W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Results
1673.307	-51.44	0.00718	-44.74	-6.7	HORIZONTAL	PASSED
1708.457	-60.19	0.00096	-53.69	-6.5	HORIZONTAL	PASSED
2509.98	-41.36	0.07311	-41.56	0.2	HORIZONTAL	PASSED
2509.98	-44.96	0.03192	-45.26	0.3	VERTICAL	PASSED
3352.585	-60.06	0.00099	-60.76	0.7	VERTICAL	PASSED
3354.589	-59.5	0.00112	-60.1	0.6	HORIZONTAL	PASSED

### 3.4. GSM 850 E-GPRS (MSC9) test results

Channel 190 / 836.6 MHz

Peak detector

Frequency [MHz]	P [dBm]	P [ $\mu$ W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Results
1673.22	-54.95	0.0032	-48.25	-6.7	HORIZONTAL	PASSED
2509.78	-46.64	0.02168	-46.84	0.2	HORIZONTAL	PASSED

### 3.5. GSM 1900 test results

Channel 661 / 1880.0 MHz

Peak detector

Frequency [MHz]	P [dBm]	P [ $\mu$ W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Results
5640.2	-52.19	0.00604	-60.39	8.2	HORIZONTAL	PASSED
5664.248	-52.86	0.00518	-60.96	8.1	HORIZONTAL	PASSED
7532.705	-48.17	0.01524	-62.57	14.4	VERTICAL	PASSED
8197.956	-47.07	0.01963	-62.57	15.5	HORIZONTAL	PASSED
9315.912	-44.35	0.03673	-63.65	19.3	VERTICAL	PASSED

### 3.6. GSM 1900 E-GPRS (MSC9) test results

Channel 661 / 1880.0 MHz

Peak detector

Frequency [MHz]	P [dBm]	P [ $\mu$ W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Results
3758.978	-56.47	0.00225	-60.97	4.5	VERTICAL	PASSED
5639.86	-46.73	0.02123	-54.93	8.2	HORIZONTAL	PASSED

### 3.7. WCDMA2 test results

Channel 9400 / 1880.0 MHz

FDD mode, Peak detector

Frequency [MHz]	P [dBm]	P [ $\mu$ W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Results
1910.215	-41.53	0.07031	-38.33	-3.2	HORIZONTAL	PASSED
1910.889	-42.17	0.06067	-38.97	-3.2	HORIZONTAL	PASSED
3758.176	-52.2	0.00603	-56.7	4.5	HORIZONTAL	PASSED
5634.85	-51.39	0.00726	-59.29	7.9	VERTICAL	PASSED
5641.944	-50.13	0.00971	-58.33	8.2	HORIZONTAL	PASSED
5644.269	-50.22	0.00951	-58.02	7.8	VERTICAL	PASSED
7518.257	-48.67	0.01358	-62.67	14	HORIZONTAL	PASSED
9229.238	-43.83	0.0414	-63.13	19.3	VERTICAL	PASSED
9344.309	-43.36	0.04613	-61.96	18.6	VERTICAL	PASSED
9402.585	-44.84	0.03281	-62.94	18.1	HORIZONTAL	PASSED
11287.515	-44.92	0.03221	-63.72	18.8	HORIZONTAL	PASSED
13158.056	-52.08	0.00619	-63.68	11.6	VERTICAL	PASSED
15042.144	-51.34	0.00735	-65.74	14.4	VERTICAL	PASSED
16915.411	-50.96	0.00802	-67.16	16.2	HORIZONTAL	PASSED

### 3.8. WCDMA4 test results

Channel 1412 / 1732.4 MHz

FDD mode, Peak detector

Frequency [MHz]	P [dBm]	P [ $\mu$ W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Results
1713.236	-39.86	0.10328	-35.26	-4.6	HORIZONTAL	PASSED
1755.261	-39.75	0.10593	-35.35	-4.4	HORIZONTAL	PASSED
2030.381	-54.68	0.0034	-53.48	-1.2	VERTICAL	PASSED
2163.457	-55.25	0.00299	-54.05	-1.2	HORIZONTAL	PASSED
2721.162	-52.07	0.00621	-55.27	3.2	VERTICAL	PASSED
2804.96	-50.88	0.00817	-55.28	4.4	VERTICAL	PASSED
3462.816	-53.69	0.00428	-57.39	3.7	VERTICAL	PASSED
5193.332	-52.23	0.00598	-60.03	7.8	HORIZONTAL	PASSED
6926.213	-47.16	0.01923	-58.36	11.2	VERTICAL	PASSED
8661.178	-46.17	0.02415	-62.77	16.6	HORIZONTAL	PASSED
10393.779	-45.95	0.02541	-63.95	18	HORIZONTAL	PASSED
12123.133	-45.71	0.02685	-64.31	18.6	VERTICAL	PASSED
13858.058	-51.56	0.00698	-63.56	12	HORIZONTAL	PASSED
15593.303	-51.1	0.00776	-66.6	15.5	HORIZONTAL	PASSED
17331.916	-49.07	0.01239	-67.07	18	VERTICAL	PASSED

### 3.9. WCDMA5 test results

Channel 4175 / 835.0 MHz

FDD mode, Peak detector

Frequency [MHz]	P [dBm]	P [ $\mu$ W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Results
822.039	-43.77	0.04198	-76.07	32.3	VERTICAL	PASSED
847.921	-46.74	0.02118	-77.54	30.8	VERTICAL	PASSED
848.748	-46.98	0.02004	-77.78	30.8	VERTICAL	PASSED
1007.635	-63.97	0.0004	-52.87	-11.1	HORIZONTAL	PASSED
1678.517	-59.11	0.00123	-52.51	-6.6	VERTICAL	PASSED
2501.022	-54.62	0.00345	-54.62	0	VERTICAL	PASSED
2508.317	-54.89	0.00324	-54.99	0.1	HORIZONTAL	PASSED
2512.715	-54.63	0.00344	-55.13	0.5	HORIZONTAL	PASSED
3332.886	-59.22	0.0012	-59.92	0.7	VERTICAL	PASSED
4166.082	-57.31	0.00186	-60.91	3.6	HORIZONTAL	PASSED
5018.677	-54.68	0.0034	-60.58	5.9	HORIZONTAL	PASSED
5852.876	-53.74	0.00423	-59.84	6.1	HORIZONTAL	PASSED
6689.399	-50.95	0.00804	-59.05	8.1	HORIZONTAL	PASSED
7508.768	-51.28	0.00745	-63.18	11.9	HORIZONTAL	PASSED
8356.032	-49.58	0.01102	-63.08	13.5	VERTICAL	PASSED

### 3.10. LTE2 test results

Channel 18900 / 1880.0 MHz

FDD, CBW 5MHz, QPSK, 1 RB, RMS detector

Frequency [MHz]	P [dBm]	P [ $\mu$ W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Results
3760.381	-56.92	0.00203	-61.42	4.5	HORIZONTAL	PASSED
5640.581	-48.75	0.01334	-56.95	8.2	HORIZONTAL	PASSED
7514.649	-59.55	0.00111	-73.65	14.1	HORIZONTAL	PASSED

Channel 18900 / 1880.0 MHz

FDD, CBW 5MHz, 16QAM, 1 RB, RMS detector

Frequency [MHz]	P [dBm]	P [ $\mu$ W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Results
3760.301	-57.88	0.00163	-62.38	4.5	HORIZONTAL	PASSED
5640.701	-59.1	0.00123	-67.3	8.2	HORIZONTAL	PASSED
7519.78	-59.98	0.001	-73.98	14	HORIZONTAL	PASSED

### 3.11. LTE4 test results

Channel 20175 / 1732.5 MHz

FDD, CBW 5MHz, QPSK, 1 RB, RMS detector

Frequency [MHz]	P [dBm]	P [ $\mu$ W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Results
3465.421	-57.66	0.00171	-61.66	4	HORIZONTAL	PASSED
5197.881	-62.58	0.00055	-70.28	7.7	HORIZONTAL	PASSED
6925.01	-58.69	0.00135	-69.89	11.2	VERTICAL	PASSED
8672.42	-57.21	0.0019	-74.31	17.1	VERTICAL	PASSED
10396.062	-55.92	0.00256	-73.92	18	VERTICAL	PASSED

Channel 20175 / 1732.5 MHz

FDD, CBW 5MHz, 16QAM, 1 RB, RMS detector

Frequency [MHz]	P [dBm]	P [ $\mu$ W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Results
3465.381	-58.31	0.00148	-62.31	4	HORIZONTAL	PASSED
5197.72	-63.01	0.0005	-70.71	7.7	HORIZONTAL	PASSED
6924.729	-58.5	0.00141	-69.7	11.2	VERTICAL	PASSED
8672.46	-57.21	0.0019	-74.31	17.1	VERTICAL	PASSED
10395.902	-55.91	0.00256	-73.91	18	VERTICAL	PASSED

### 3.12. LTE5 test results

Channel 20525 / 836.5 MHz

FDD, CBW 5MHz, QPSK, 1 RB, RMS detector

Frequency [MHz]	P [dBm]	P [ $\mu$ W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Results
858.78	-61.75	0.00067	-93.05	31.3	HORIZONTAL	PASSED
1663.2	-78.62	1E-05	-71.72	-6.9	HORIZONTAL	PASSED
2509.921	-72.26	6E-05	-72.46	0.2	HORIZONTAL	PASSED
3350.228	-78.45	1E-05	-79.05	0.6	HORIZONTAL	PASSED

Channel 20525 / 836.5 MHz

FDD, CBW 5MHz, 16QAM, 1 RB, RMS detector

Frequency [MHz]	P [dBm]	P [ $\mu$ W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Results
857.597	-61.89	0.00065	-92.99	31.1	HORIZONTAL	PASSED
1665.004	-78.31	1E-05	-71.41	-6.9	HORIZONTAL	PASSED
2519.3	-73.72	4E-05	-74.22	0.5	HORIZONTAL	PASSED
3355.479	-78.41	1E-05	-79.01	0.6	HORIZONTAL	PASSED

### 3.13. LTE7 test results

Channel 21100 / 2535.0 MHz

FDD, CBW 5MHz, QPSK, 1 RB, RMS detector

Frequency [MHz]	P [dBm]	P [ $\mu$ W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Results
2554.013	-51.83	0.00656	-53.03	1.2	HORIZONTAL	PASSED
5070.461	-58.93	0.00128	-67.43	8.5	HORIZONTAL	PASSED
7598.367	-59.77	0.00105	-73.97	14.2	HORIZONTAL	PASSED
10139.299	-56.79	0.00209	-73.29	16.5	HORIZONTAL	PASSED

Channel 21100 / 2535.0 MHz

FDD, CBW 5MHz, 16QAM, 1 RB, RMS detector

Frequency [MHz]	P [dBm]	P [ $\mu$ W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Results
2553.973	-53.32	0.00466	-54.52	1.2	HORIZONTAL	PASSED
5070.22	-60.07	0.00098	-68.57	8.5	HORIZONTAL	PASSED
7612.916	-59.77	0.00105	-73.67	13.9	HORIZONTAL	PASSED
10146.794	-56.89	0.00205	-73.29	16.4	HORIZONTAL	PASSED

### 3.14. LTE12 test results

Channel 23095 / 707.5 MHz

FDD, CBW 5MHz, QPSK, 1 RB, RMS detector

Frequency [MHz]	P [dBm]	P [ $\mu$ W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Results
1415.381	-66.56	0.00022	-57.86	-8.7	VERTICAL	PASSED
2123.041	-48.8	0.01318	-45.4	-3.4	HORIZONTAL	PASSED
2839.639	-71.65	7E-05	-74.25	2.6	HORIZONTAL	PASSED

Channel 23095 / 707.5 MHz

FDD, CBW 5MHz, 16QAM, 1 RB, RMS detector

Frequency [MHz]	P [dBm]	P [ $\mu$ W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Results
1415.421	-66.83	0.00021	-58.13	-8.7	HORIZONTAL	PASSED
2123.121	-48.48	0.01419	-45.08	-3.4	HORIZONTAL	PASSED
2839.479	-71.99	6E-05	-74.59	2.6	HORIZONTAL	PASSED

### 3.15. LTE17 test results

Channel 23790 / 710 MHz

FDD, CBW 5MHz, QPSK, 1 RB, RMS detector

Frequency [MHz]	P [dBm]	P [ $\mu$ W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Results
1420.381	-69.93	0.0001	-61.23	-8.7	HORIZONTAL	PASSED
2130.541	-46.95	0.02018	-43.65	-3.3	HORIZONTAL	PASSED
2847.675	-71.66	7E-05	-74.26	2.6	HORIZONTAL	PASSED

Channel 23790 / 710 MHz

FDD, CBW 5MHz, 16QAM, 1 RB, RMS detector

Frequency [MHz]	P [dBm]	P [ $\mu$ W]	P <sub>MEAS</sub> [dBm]	A <sub>TOT</sub> [dB]	Polarisation	Results
1420.421	-71.13	8E-05	-62.43	-8.7	HORIZONTAL	PASSED
2130.541	-48.01	0.01581	-44.71	-3.3	HORIZONTAL	PASSED
2845.471	-71.31	7E-05	-74.31	3	VERTICAL	PASSED

## 4. Test Equipment

### 4.1. Conducted measurements

Eq. No	Equipment	Type	Manufacturer	Used in
TM38112	Power supply	6632A	Agilent	22/24/27, 15C, 15E
TM38114	Power supply	6632A	Agilent	22/24/27, 15C, 15E
TM210233	Communication Tester	CMU200	R&S	22/24/27
TM30600	Impulse limiter	ESH3-Z2	R&S	15C, 15B
TM26490	LISN 50 µH	ESH3-Z5	R&S	15C, 15B
TM26491	LISN 50 µH	ESH3-Z5	R&S	15C, 15B
TM37610	Spectrum Analyzer	FSU26	R&S	22/24/27, 15C, 15E
TM23007	Oscilloscope	TDS684B	Tektronix	15E
TM22806	Battery	BAT 20/E	Fiskars	15C, 15B
TM22805	UPS	PS 20/1.2	Fiskars	15C, 15B
-	Temperature and humidity logger	175-H2	Testo	15C, 15B
-	Temperature and humidity logger	175-H2	Testo	22/24/27, 15C
-	Air pressure and temperature logger	635-2	Testo	22/24/27, 15C, 15B
-	Air pressure sensor	0638-1835	Testo	22/24/27, 15C, 15B
-	Temperature test chamber	VT 4002	Vötsch	22/24/27
2001	Bluetooth tester	CBT	R&S	15C, 15B
2009	LISN 50 µH	ENV216	R&S	15C, 15B
2010	LISN 50 µH	ENV216	R&S	15C, 15B
2012	Power splitter	11667B	Agilent	22/24/27, 15C
2013	Attenuator	8493C	Agilent	22/24/27, 15C
2014	Attenuator	8493C	Agilent	22/24/27, 15C
2019	Power splitter	ZN2PD-9G-S+	Mini-Circuits	15E
2020	Power splitter	ZN2PD-9G-S+	Mini-Circuits	15E
2021	Communication Tester	CMW500	R&S	22/24/27
2022	Communication Tester	CMU200	R&S	22/24/27
2023	Spectrum Analyzer	ESMI-RF	R&S	15B/15C
2024	Analyzer display unit	ESAI-D	R&S	15B/15C
2026	Signal Generator	SMF 100A	R&S	22/24/27, 15C, 15E, 15B
-	Bluetooth tester	CBT	R&S	15C, 15B
-	Communication Tester	CMU200	R&S	22/24/27, 15B



## 4.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
-	Antenna	BBHA 9120 D	Schwarzbeck	22/24/27, 15C
TM38845	Receiver	ESIB 26	R&S	22/24/27, 15C, 15E, 15B
-	Antenna	HL562	R&S	22/24/27, 15C, 15E, 15B
-	Turntable	2188	EMCO	22/24/27, 15C, 15E, 15B
-	Turntable controller	2090	EMCO	22/24/27, 15C, 15E, 15B
-	RF system panel	OSP130	R&S	22/24/27, 15C, 15E, 15B
-	Mini mast	2075-2	ETS Lindgren	22/24/27, 15C, 15B
TM38843	Mini mast	2075	Emco	22/24/27, 15C, 15B
TM38842	Antenna mast controller	2090	Emco	22/24/27, 15C, 15B
TM30643	LISN 50 µH	LISN-5-20-2	FCC	22/24/27, 15C, 15B
TM30644	LISN 50 µH	LISN-5-20-2	FCC	22/24/27, 15C, 15B
-	Temperature and humidity logger	175-H2	Testo	22/24/27, 15C, 15B
-	Air pressure and temperature logger	635-2	Testo	22/24/27, 15C, 15B
-	Air pressure sensor	0638-1835	Testo	22/24/27, 15C, 15B
TM37523	Preamplifier	AMF-4D-10M-3G-25-20P	Miteq	22/24/27, 15C, 15B
TM37498	Preamplifier	AMF-5D-020180-26-10P	Miteq	22/24/27, 15C, 15B
TM30599	Semi anechoic chamber	UNKNOWN	TDK	22/24/27, 15C, 15B
TM22638	Power supply	OL63743-901	-	22/24/27, 15C, 15E, 15B
TM38066	High pass filter	WHKX3.0/18G-12SS	Wainwright	22/24/27, 15C, 15E, 15B
2028	High pass filter	WHKX 1.0/15G-12SS	Wainwright	22/24/27, 15C, 15E, 15B
TM37545	Tunable notch filter	800.0/960.0-0.2/40-8SSK	Wainwright	22
TM26512	Tunable notch filter	WRCD1850/1910-0.2/40-10SSK	Wainwright	24
-	Band reject filter	WRCG1877/1883-1870/1890-40/6EE	Wainwright	24
-	Band reject filter	WRCG1729.4/1735.4-1722.4/1742.4-40/6SS	Wainwright	27
TM23892	Controller	G-1000SDX	Yaesu	22/24/27, 15C, 15E
2001	Bluetooth tester	CBT	R&S	15C, 15B
2002	Communication Tester	CMU200	R&S	22/24/27, 15B
6023	Antenna	VUBA 9117	Schwarzbeck	22/24/27
2021	Communication Tester	CMW500	R&S	22/24/27
2025	Antenna	HFH2-Z2	R&S	15C
2026	Signal Generator	SMF 100A	R&S	22/24/27, 15C, 15E, 15B
2052	Antenna	BBHA 9120 D	Schwarzbeck	22/24/27, 15C, 15B, 15E
-	Antenna	QSH18S20	Q-Par	22/24/27, 15C, 15B, 15E
-	Antenna	QSH20S20	Q-Par	22/24/27, 15C, 15B, 15E
-	Antenna	QSH20S20	Q-Par	22/24/27, 15C, 15B, 15E
-	Bluetooth tester	CBT	R&S	15C, 15B

## 5. Appendix

### 5.1. Conducted LTE RF output power values measured by the customer

#### 5.1.1 Tolerance

Tolerance [dB]	
Low	-0.5
High	0.4

### 5.1.2 LTE 2

SN: 004402742178365				Nominal			A-MPR active		
Band / BW	Modulation	RB Allocation	RB Offset	Ch18607 / 1850.7 MHz	Ch18900 / 1880 MHz	Ch19193 / 1909.3 MHz	Ch18607 / 1850.7 MHz	Ch18900 / 1880 MHz	Ch19193 / 1909.3 MHz
LTE2	QPSK	1	2	23.1	22.9	22.9			
1.4 MHz	16QAM	1	2	22.7	22.5	22.2			

SN: 004402742178365				Nominal			A-MPR active		
Band / BW	Modulation	RB Allocation	RB Offset	Ch18615 / 1851.5 MHz	Ch18900 / 1880 MHz	Ch19185 / 1908.5 MHz	Ch18615 / 1851.5 MHz	Ch18900 / 1880 MHz	Ch19185 / 1908.5 MHz
LTE2	QPSK	1	7	23.2	23.0	23.0			
3 MHz	16QAM	1	7	22.3	22.1	22.2			

SN: 004402742178365				Nominal			A-MPR active		
Band / BW	Modulation	RB Allocation	RB Offset	Ch18625 / 1852.5 MHz	Ch18900 / 1880 MHz	Ch19175 / 1907.5 MHz	Ch18625 / 1852.5 MHz	Ch18900 / 1880 MHz	Ch19175 / 1907.5 MHz
LTE2	QPSK	1	12	23.2	22.8	22.7			
5 MHz	16QAM	1	12	22.7	21.9	21.9			

SN: 004402742178365				Nominal			A-MPR active		
Band / BW	Modulation	RB Allocation	RB Offset	Ch18650 / 1855 MHz	Ch18900 / 1880 MHz	Ch19150 / 1905 MHz	Ch18650 / 1855 MHz	Ch18900 / 1880 MHz	Ch19150 / 1905 MHz
LTE2	QPSK	1	24	23.0	22.9	22.8			
10 MHz	16QAM	1	24	22.0	21.9	22.0			

SN: 004402742178365				Nominal			A-MPR active		
Band / BW	Modulation	RB Allocation	RB Offset	Ch18675 / 1857.5 MHz	Ch18900 / 1880 MHz	Ch19125 / 1902.5 MHz	Ch18675 / 1857.5 MHz	Ch18900 / 1880 MHz	Ch19125 / 1902.5 MHz
LTE2	QPSK	1	36	23.1	23.1	22.9			
15 MHz	16QAM	1	36	22.6	22.5	22.2			

SN: 004402742178365				Nominal			A-MPR active		
Band / BW	Modulation	RB Allocation	RB Offset	Ch18700 / 1860 MHz	Ch18900 / 1880 MHz	Ch19100 / 1900 MHz	Ch18700 / 1860 MHz	Ch18900 / 1880 MHz	Ch19100 / 1900 MHz
LTE2	QPSK	1	49	23.1	23.0	23.1			
20 MHz	16QAM	1	49	22.2	22.3	22.5			

### 5.1.3 LTE 4

SN: 004402742178365				Nominal			A-MPR active		
Band / BW	Modulation	RB Allocation	RB Offset	Ch19957 / 1710.7 MHz	Ch20175 / 1732.5 MHz	Ch20393 / 1754.3 MHz	Ch19957 / 1710.7 MHz	Ch20175 / 1732.5 MHz	Ch20393 / 1754.3 MHz
LTE4 1.4 MHz	QPSK 16QAM	1	2	23.0	23.0	22.9			
		1	2	21.9	22.1	22.0			

SN: 004402742178365				Nominal			A-MPR active		
Band / BW	Modulation	RB Allocation	RB Offset	Ch19965 / 1711.5 MHz	Ch20175 / 1732.5 MHz	Ch20385 / 1753.5 MHz	Ch19965 / 1711.5 MHz	Ch20175 / 1732.5 MHz	Ch20385 / 1753.5 MHz
LTE4 3 MHz	QPSK 16QAM	1	7	23.0	23.1	23.0			
		1	7	22.2	21.9	21.9			

SN: 004402742178365				Nominal			A-MPR active		
Band / BW	Modulation	RB Allocation	RB Offset	Ch19975 / 1712.5 MHz	Ch20175 / 1732.5 MHz	Ch20375 / 1752.5 MHz	Ch19975 / 1712.5 MHz	Ch20175 / 1732.5 MHz	Ch20375 / 1752.5 MHz
LTE4 5 MHz	QPSK 16QAM	1	12	22.9	22.9	22.8			
		1	12	22.2	22.5	22.4			

SN: 004402742178365				Nominal			A-MPR active		
Band / BW	Modulation	RB Allocation	RB Offset	Ch20000 / 1715 MHz	Ch20175 / 1732.5 MHz	Ch20350 / 1750 MHz	Ch20000 / 1715 MHz	Ch20175 / 1732.5 MHz	Ch20350 / 1750 MHz
LTE4 10 MHz	QPSK 16QAM	1	24	23.0	22.9	22.8			
		1	24	22.4	22.3	22.1			

SN: 004402742178365				Nominal			A-MPR active		
Band / BW	Modulation	RB Allocation	RB Offset	Ch20025 / 1717.5 MHz	Ch20175 / 1732.5 MHz	Ch20325 / 1747.5 MHz	Ch20025 / 1717.5 MHz	Ch20175 / 1732.5 MHz	Ch20325 / 1747.5 MHz
LTE4 15 MHz	QPSK 16QAM	1	36	22.7	22.9	22.7			
		1	36	22.1	22.2	21.7			

SN: 004402742178365				Nominal			A-MPR active		
Band / BW	Modulation	RB Allocation	RB Offset	Ch20050 / 1720 MHz	Ch20175 / 1732.5 MHz	Ch20300 / 1745 MHz	Ch20050 / 1720 MHz	Ch20175 / 1732.5 MHz	Ch20300 / 1745 MHz
LTE4 20 MHz	QPSK 16QAM	1	49	22.9	22.8	22.8			
		1	49	21.7	21.8	21.8			

### 5.1.4 LTE 5

SN: 004402742178365				Nominal			A-MPR active		
Band / BW	Modulation	RB Allocation	RB Offset	Ch20407 / 824.7 MHz	Ch20525 / 836.5 MHz	Ch20643 / 848.3 MHz	Ch20407 / 824.7 MHz	Ch20525 / 836.5 MHz	Ch20643 / 848.3 MHz
LTE5 1.4 MHz	QPSK 16QAM	1	2	23.4	23.5	23.5			
		1	2	22.7	22.9	23.0			
SN: 004402742178365				Nominal			A-MPR active		
Band / BW	Modulation	RB Allocation	RB Offset	Ch20415 / 825.5 MHz	Ch20525 / 836.5 MHz	Ch20635 / 847.5 MHz	Ch20415 / 825.5 MHz	Ch20525 / 836.5 MHz	Ch20635 / 847.5 MHz
LTE5 3 MHz	QPSK 16QAM	1	7	23.4	23.4	23.6			
		1	7	22.4	22.3	22.7			
SN: 004402742178365				Nominal			A-MPR active		
Band / BW	Modulation	RB Allocation	RB Offset	Ch20425 / 826.5 MHz	Ch20525 / 836.5 MHz	Ch20625 / 846.5 MHz	Ch20425 / 826.5 MHz	Ch20525 / 836.5 MHz	Ch20625 / 846.5 MHz
LTE5 5 MHz	QPSK 16QAM	1	12	23.1	23.2	23.2			
		1	12	22.7	22.9	23.1			
SN: 004402742178365				Nominal			A-MPR active		
Band / BW	Modulation	RB Allocation	RB Offset	Ch20450 / 829 MHz	Ch20525 / 836.5 MHz	Ch20600 / 844 MHz	Ch20450 / 829 MHz	Ch20525 / 836.5 MHz	Ch20600 / 844 MHz
LTE5 10 MHz	QPSK 16QAM	1	24	23.5	23.4	23.4			
		1	24	22.7	22.6	22.8			

### 5.1.5 LTE 7

SN: 004402742178365				Nominal			A-MPR active		
Band / BW	Modulation	RB Allocation	RB Offset	Ch20775 / 2502.5 MHz	Ch21100 / 2535 MHz	Ch21425 / 2567.5 MHz	Ch20775 / 2502.5 MHz	Ch21100 / 2535 MHz	Ch21425 / 2567.5 MHz
LTE7 5 MHz	QPSK 16QAM	1	12	23.9	24.1	24.2			
		1	12	23.4	23.3	23.5			
SN: 004402742178365				Nominal			A-MPR active		
Band / BW	Modulation	RB Allocation	RB Offset	Ch20800 / 2505 MHz	Ch21100 / 2535 MHz	Ch21400 / 2565 MHz	Ch20800 / 2505 MHz	Ch21100 / 2535 MHz	Ch21400 / 2565 MHz
LTE7 10 MHz	QPSK 16QAM	1	24	24.2	24.2	24.1			
		1	24	23.2	23.7	23.6			
SN: 004402742178365				Nominal			A-MPR active		
Band / BW	Modulation	RB Allocation	RB Offset	Ch20825 / 2507.5 MHz	Ch21100 / 2535 MHz	Ch21375 / 2562.5 MHz	Ch20825 / 2507.5 MHz	Ch21100 / 2535 MHz	Ch21375 / 2562.5 MHz
LTE7 15 MHz	QPSK 16QAM	1	36	23.9	24.4	24.0			
		1	36	23.2	23.5	23.3			
SN: 004402742178365				Nominal			A-MPR active		
Band / BW	Modulation	RB Allocation	RB Offset	Ch20850 / 2510 MHz	Ch21100 / 2535 MHz	Ch21350 / 2560 MHz	Ch20850 / 2510 MHz	Ch21100 / 2535 MHz	Ch21350 / 2560 MHz
LTE7 20 MHz	QPSK 16QAM	1	49	24.0	24.0	23.9			
		1	49	23.4	23.2	23.1			

### 5.1.6 LTE 12

SN: 004402742178365				Nominal			A-MPR active		
Band / BW	Modulation	RB Allocation	RB Offset	Ch23017 / 699.7 MHz	Ch23095 / 707.5 MHz	Ch23173 / 715.3 MHz	Ch23017 / 699.7 MHz	Ch23095 / 707.5 MHz	Ch23173 / 715.3 MHz
LTE12	QPSK	1	2	23.1	23.2	23.2			
1.4 MHz	16QAM	1	2	22.8	22.4	22.1			

SN: 004402742178365				Nominal			A-MPR active		
Band / BW	Modulation	RB Allocation	RB Offset	Ch23025 / 700.5 MHz	Ch23095 / 707.5 MHz	Ch23165 / 714.5 MHz	Ch23025 / 700.5 MHz	Ch23095 / 707.5 MHz	Ch23165 / 714.5 MHz
LTE12	QPSK	1	7	23.1	23.3	23.4			
3 MHz	16QAM	1	7	22.2	22.4	22.9			

SN: 004402742178365				Nominal			A-MPR active		
Band / BW	Modulation	RB Allocation	RB Offset	Ch23035 / 701.5 MHz	Ch23095 / 707.5 MHz	Ch23155 / 713.5 MHz	Ch23035 / 701.5 MHz	Ch23095 / 707.5 MHz	Ch23155 / 713.5 MHz
LTE12	QPSK	1	12	22.9	23.1	23.2			
5 MHz	16QAM	1	12	22.7	22.7	22.5			

SN: 004402742178365				Nominal			A-MPR active		
Band / BW	Modulation	RB Allocation	RB Offset	Ch23060 / 704 MHz	Ch23095 / 707.5 MHz	Ch23130 / 711 MHz	Ch23060 / 704 MHz	Ch23095 / 707.5 MHz	Ch23130 / 711 MHz
LTE12	QPSK	1	24	23.1	23.3	23.4			
10 MHz	16QAM	1	24	22.5	22.6	22.8			

### 5.1.7 LTE 17

SN: 004402742178365				Nominal			A-MPR active		
Band / BW	Modulation	RB Allocation	RB Offset	Ch23755 / 706.5 MHz	Ch23790 / 710 MHz	Ch23825 / 713.5 MHz	Ch23755 / 706.5 MHz	Ch23790 / 710 MHz	Ch23825 / 713.5 MHz
LTE17	QPSK	1	12	22.7	23.1	23.0			
5 MHz	16QAM	1	12	22.2	22.2	22.3			

SN: 004402742178365				Nominal			A-MPR active		
Band / BW	Modulation	RB Allocation	RB Offset	Ch23780 / 709 MHz	Ch23790 / 710 MHz	Ch23800 / 711 MHz	Ch23780 / 709 MHz	Ch23790 / 710 MHz	Ch23800 / 711 MHz
LTE17	QPSK	1	24	23.1	23.2	23.1			
10 MHz	16QAM	1	24	22.2	22.8	22.7			