



TEST REPORT

Test Report No. : UL-RPT-RP10833755JD06A V3.0

Manufacturer : Panasonic Mobile Communications Development of Europe Ltd
Model No. : P-01H
FCC ID : UCE115064A
Technology : UMTS850 Band V
Test Standard(s) : FCC Part 22

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2. The results in this report apply only to the sample(s) tested.
3. The sample tested is in compliance with the above standard(s).
4. The test results in this report are traceable to the national or international standards.
5. Version 3.0 Supersedes all previous versions

Date of Issue: 21 September 2015

Checked by:

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Project Lead, Radio Laboratory

Issued by :

pp

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Quality Manager,
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This laboratory is accredited by UKAS.
The tests reported herein have been
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1. Customer Information








Company Name:	Panasonic Mobile Communications Development of Europe Ltd
Address:	Panasonic House Willoughby Road Bracknell Berkshire RG12 8FP United Kingdom

2. Summary of Testing

2.1. General Information

Specification Reference:	47CFR22
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications): Part 22 Subpart H (Public Mobile Services)
Site Registration:	209735
Location of Testing:	UL VS LTD, Unit 3 Horizon, Wade Road, Kingsland Business Park, Basingstoke, Hampshire, RG24 8AH, United Kingdom
Test Dates:	17 August 2015 to 24 August 2015

2.2. Summary of Test Results

FCC Reference (47CFR)	Measurement	Result
Part 22.913(a)(2)	Transmitter Effective Radiated Power (ERP)	
Part 2.1049	Transmitter Occupied Bandwidth	
Part 2.1053/22.917	Transmitter Out of Band Radiated Emissions	
Part 2.1053/22.917	Transmitter Band Edge Radiated Emissions	
Part 2.1055/22.355	Transmitter Frequency Stability (Temperature and Voltage Variation)	
Key to Results		
 = Complied  = Did not comply		

2.3. Methods and Procedures

Reference:	ANSI/TIA-603-C-2004
Title:	Land Mobile Communications Equipment, Measurements and performance Standards
Reference:	FCC KDB 971168 D01 v02r02, October 17 2014
Title:	Measurement Guidance for Certification of Licensed Digital Transmitters

2.4. Deviations from the Test Specification

For the measurements contained within this test report, there were no deviations from, additions to, or exclusions from the test specification identified above.

3. Equipment Under Test (EUT)

3.1. Identification of Equipment Under Test (EUT)

Brand Name:	Docomo
Model Name or Number:	P-01H
Test Sample IMEI:	351772070005235 (<i>Conducted sample</i>)
Hardware Version Number:	Rev C
Software Version Number:	ACPU: B-D52CS1-01.03.2007 CCPU: D52CS1_Cv18122302
FCC ID:	UCE115064A

Brand Name:	Docomo
Model Name or Number:	P-01H
Test Sample IMEI:	351772070005144 (<i>Radiated sample</i>)
Hardware Version Number:	Rev C
Software Version Number:	ACPU: B-D52CS1-01.03.2007 CCPU: D52CS1_Cv18122302
FCC ID:	UCE115064A

Brand Name:	NTT docomo
Description:	AC Adapter
Model Name or Number:	AC 01
Serial Number:	Not marked or stated

Brand Name:	NTT docomo
Description:	USB Cable with Charger Function
Model Name or Number:	02
Serial Number:	Not marked or stated

Brand Name:	NTT docomo
Description:	Stereo Earphone Set
Model Name or Number:	01
Serial Number:	Not marked or stated

Brand Name:	NTT docomo
Description:	Rechargeable Li-ion Battery Pack
Model Name or Number:	P32
Serial Number:	Not marked or stated

3.2. Description of EUT

The equipment under test was a Single Mode UTRA Mobile Phone with Bluetooth and RFID

3.3. Modifications Incorporated in the EUT

No modifications were applied to the EUT during testing.

3.4. Additional Information Related to Testing

Technology Tested:	UMTS850		
Type of Radio Device:	Transceiver		
Mode:	UMTS FDD V		
Modulation Type:	QPSK / 16QAM		
Channel Spacing:	5 MHz		
Power Supply Requirement(s):	Nominal	3.7 V	
	Minimum	3.4 V	
	Maximum	4.2 V	
Maximum Output Power (ERP):	Voice (12.2 kbps)	26.0 dBm	
	HSDPA Sub-Test 2	27.6 dBm	
	HSUPA Sub-Test 5	28.0 dBm	
Transmit Frequency Range:	824 to 849 MHz		
Transmit Channels Tested:	Channel ID	Channel Number	Channel Frequency (MHz)
	Bottom	4132	826.4
	Middle	4183	836.6
	Top	4233	846.6

3.5. Support Equipment

The following support equipment was used to exercise the EUT during testing:

Brand Name:	Not marked or stated
Description:	2 GB Micro SD Card
Model Name or Number:	Not marked or stated

Brand Name:	Not marked or stated
Description:	Dummy Battery
Model Name or Number:	Not marked or stated

Brand Name:	Belkin
Description:	USB Hub
Model Name or Number:	Not marked or stated

4. Operation and Monitoring of the EUT during Testing

4.1. Operating Modes

The EUT was tested in the following operating mode(s):

- Constantly transmitting at full power on bottom, middle and top channels as required.
- Occupied bandwidth, ERP and band edge tests were performed with the EUT in Voice (12.2 kbps), HSDPA (Sub-tests 1 to 4) or HSUPA (Sub-tests 1 to 5) modes.
- Transmitter radiated spurious emissions were checked in all modes during pre-scans. Voice was found to be the worst case and all final measurements were performed with the EUT in this mode.

4.2. Configuration and Peripherals

The EUT was tested in the following configuration(s):

- Connected to a Rohde & Schwarz CMW 500 Wideband Radio Communications Tester, operating in UMTS Band V mode.
- Transmit mode radiated spurious emissions tests were performed with the AC charger connected to the EUT. All the accessories were individually connected and measurements made during the pre-scans to determine the worst case combination. The micro SD card was fitted during all tests.
- The AC charger input was connected to a 120 VAC 60 Hz single phase supply when it was used.
- The dummy battery was fitted for frequency stability and conducted power measurements.
- The conducted sample with IMEI 351772070005235 was used for frequency stability, occupied bandwidth and conducted power measurements.
- The radiated sample with IMEI 351772070005144 was used for all other measurements.

5. Measurements, Examinations and Derived Results

5.1. General Comments

Measurement uncertainties are evaluated in accordance with current best practice. Our reported expanded uncertainties are based on standard uncertainties, which are multiplied by an appropriate coverage factor to provide a statistical confidence level of approximately 95%. Please refer to *Section 6. Measurement Uncertainty* for details.

In accordance with UKAS requirements all the measurement equipment is on a calibration schedule. All equipment was within the calibration period on the date of testing.

5.2. Test Results

5.2.1. Transmitter Effective Radiated Power (ERP)

Test Summary:

Test Engineer:	David Doyle	Test Date:	17 August 2015
Test Sample IMEI:	35177207005235		

FCC Reference:	Part 22.913(a)(2)
Test Method Used:	As detailed in KDB 971168 Section 5.1.1 and 5.2.1

Environmental Conditions:

Temperature (°C):	26
Relative Humidity (%):	33

Note(s):

- All modes were compared on each channel and the highest power recorded was subtracted from the limit to show the margin.
- The signal analyser was connected to the RF port on the EUT using suitable attenuation and RF cable. An RF level offset was entered on the signal analyser to compensate for the loss of the attenuator and RF cable.
- The customer stated a maximum antenna gain of 2.5 dBi. As the limit is an ERP limit, the gain in dBi has been converted to dBd. The dBd was calculated as:

$$2.5 \text{ dBi} - 2.15 \text{ dB} = 0.35 \text{ dBd.}$$

- The antenna gain was added to the conducted output power to obtain the ERP.

Results: Peak ERP / HSDPA and Voice

Modes		HSDPA				Voice			
Sub-test		1	2	3	4	12.2 kbps			
Band	Channel	Power (dBm)	Power (dBm)	Power (dBm)	Power (dBm)	Power (dBm)	Limit (dBm)	Margin (dB)	Result
850	4132	26.3	27.5	27.3	27.5	25.9	38.5	11.0	Complied
	4183	26.4	27.6	27.4	27.5	26.0	38.5	11.0	Complied
	4233	26.2	27.5	27.3	27.4	25.8	38.5	11.0	Complied
βc		2	11	15	15				
βd		15	15	8	4				
ΔACK, ΔNACK, ΔCQI		8	8	8	8				

Transmitter Effective Radiated Power (ERP) (continued)**Results: RMS ERP / HSDPA and Voice**

Modes		HSDPA				Voice			
Sub-test		1	2	3	4	12.2 kbps			
Band	Channel	Power (dBm)	Power (dBm)	Power (dBm)	Power (dBm)	Power (dBm)	Limit (dBm)	Margin (dB)	Result
850	4132	20.9	21.1	20.6	20.7	21.0	38.5	17.4	Complied
	4183	21.1	21.2	20.7	20.7	21.1	38.5	17.3	Complied
	4233	20.9	21.0	20.7	20.6	20.9	38.5	17.5	Complied
β_c		2	11	15	15				
β_d		15	15	8	4				
$\Delta ACK, \Delta NACK, \Delta CQI$		8	8	8	8				

Results: Peak ERP / HSUPA

Modes		HSUPA							
Sub-test		1	2	3	4	5			
Band	Channel	Power (dBm)	Power (dBm)	Power (dBm)	Power (dBm)	Power (dBm)	Limit (dBm)	Margin (dB)	Result
850	4132	27.0	26.7	27.1	26.8	27.7	38.5	10.8	Complied
	4183	27.3	26.9	27.2	26.9	28.0	38.5	10.5	Complied
	4233	27.1	26.8	27.2	26.8	27.7	38.5	10.8	Complied
β_c		10	6	15	2	15			
β_d		15	15	9	15	1			
$\Delta ACK, \Delta NACK, \Delta CQI$		8	8	8	8	8			

Results: RMS ERP / HSUPA

Modes		HSUPA							
Sub-test		1	2	3	4	5			
Band	Channel	Power (dBm)	Power (dBm)	Power (dBm)	Power (dBm)	Power (dBm)	Limit (dBm)	Margin (dB)	Result
850	4132	20.8	21.0	20.4	20.9	21.2	38.5	17.3	Complied
	4183	20.9	21.1	20.7	21.0	21.3	38.5	17.2	Complied
	4233	20.8	20.9	20.5	20.9	21.0	38.5	17.5	Complied
β_c		10	6	15	2	15			
β_d		15	15	9	15	1			
$\Delta ACK, \Delta NACK, \Delta CQI$		8	8	8	8	8			

Transmitter Effective Radiated Power (ERP) (continued)**Test Equipment Used**

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1659	Thermohygrometer	JM Handelpunkt	30.5015.13	None stated	23 Apr 2016	12
A1096	Directional Coupler	MIDISCO	MDC6223 W20	Not stated	Calibrated before use	-
A2507	Attenuator	AtlanTecRF	AN18-10	821846#2	Calibrated before use	-
M1835	Signal Analyzer	Rohde & Schwarz	FSV30	103050	18 Feb 2016	12
M1229	Multimeter	Fluke	179	87640015	23 Apr 2016	12
S0558	DC Power Supply	TTI	EL303R	395825	Calibrated before use	-

5.2.2. Transmitter Occupied Bandwidth**Test Summary:**

Test Engineer:	David Doyle	Test Date:	17 August 2015
Test Sample IMEI:	35177207005235		

FCC Reference:	Part 2.1049
Test Method Used:	As detailed in KBD 971168 Section 4.2

Environmental Conditions:

Temperature (°C):	26
Relative Humidity (%):	33

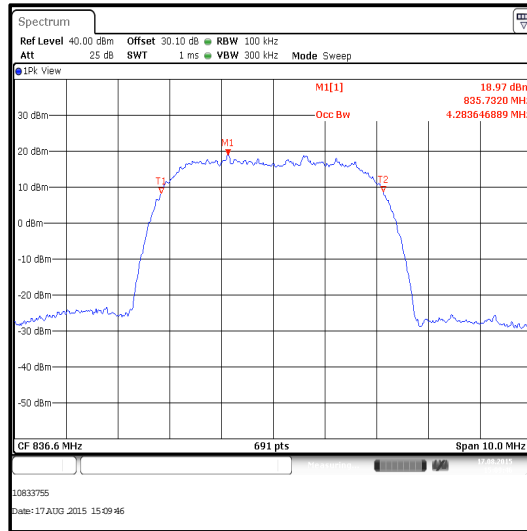
Note(s):

1. Occupied bandwidth (99% bandwidth) was measured using a signal analyser occupied bandwidth function.
2. The signal analyser was connected to the RF port on the EUT using suitable attenuation and RF cable.

Transmitter Occupied Bandwidth (continued)

Results: Voice / 12.2 kbps

Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Middle	836.6	4283.647



Middle Channel

Transmitter Occupied Bandwidth (continued)

Results: HSDPA Sub-Test 1

Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Middle	836.6	4298.119



Middle Channel

Transmitter Occupied Bandwidth (continued)

Results: HSDPA Sub-Test 2

Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Middle	836.6	4298.119



Middle Channel

Transmitter Occupied Bandwidth (continued)

Results: HSDPA Sub-Test 3

Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Middle	836.6	4312.590

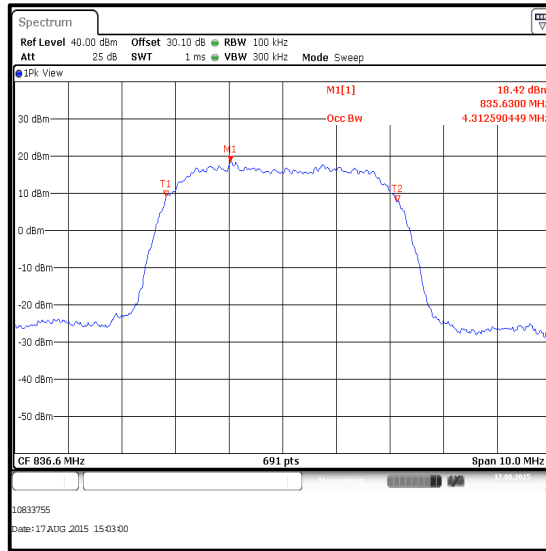


Middle Channel

Transmitter Occupied Bandwidth (continued)

Results: HSDPA Sub-Test 4

Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Middle	836.6	4312.590



Middle Channel

Transmitter Occupied Bandwidth (continued)

Results: HSUPA Sub-Test 1

Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Middle	836.6	4312.590

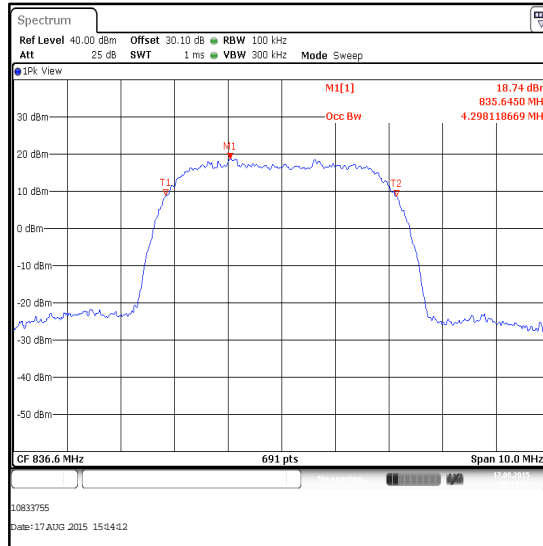


Middle Channel

Transmitter Occupied Bandwidth (continued)

Results: HSUPA Sub-Test 2

Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Middle	836.6	4298.119

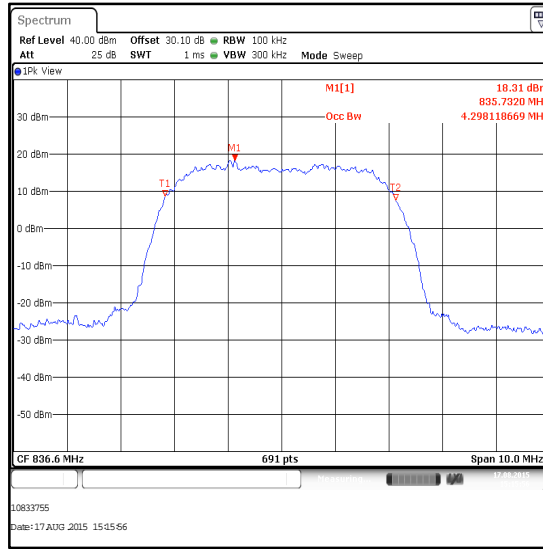


Middle Channel

Transmitter Occupied Bandwidth (continued)

Results: HSUPA Sub-Test 3

Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Middle	836.6	4298.119

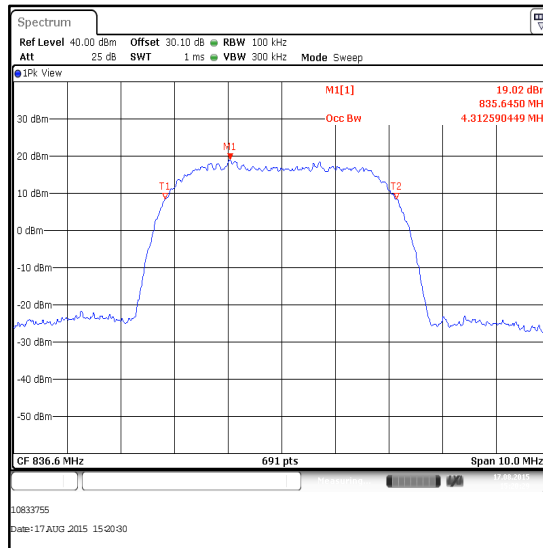


Middle Channel

Transmitter Occupied Bandwidth (continued)

Results: HSUPA Sub-Test 4

Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Middle	836.6	4312.590

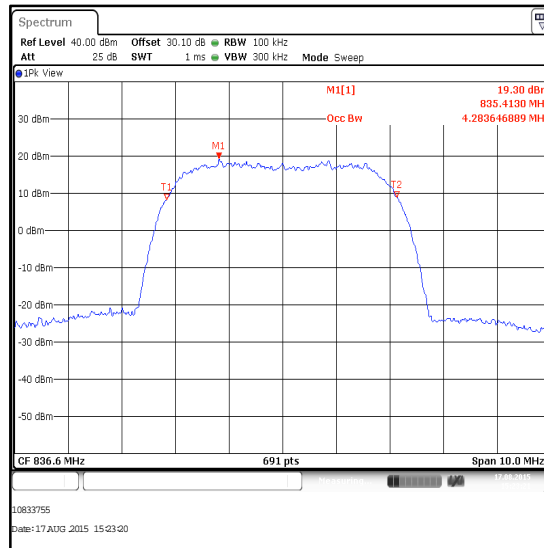


Middle Channel

Transmitter Occupied Bandwidth (continued)

Results: HSUPA Sub-Test 5

Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Middle	836.6	4283.647



Middle Channel

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1659	Thermohygrometer	JM Handelpunkt	30.5015.13	None stated	23 Apr 2016	12
A1096	Directional Coupler	MIDISCO	MDC6223 W20	Not Stated	Calibrated before use	-
A2507	Attenuator	AtlanTecRF	AN18-10	821846#2	Calibrated before use	-
M1835	Signal Analyzer	Rohde & Schwarz	FSV30	103050	18 Feb 2016	12
M1229	Multimeter	Fluke	179	87640015	23 Apr 2016	12
S0558	DC Power Supply	TTI	EL303R	395825	Calibrated before use	-

5.2.3. Transmitter Out of Band Radiated Emissions**Test Summary:**

Test Engineer:	David Doyle	Test Dates:	16 August 2015 & 18 August 2015
Test Sample IMEI:	351772070005144		

FCC Reference:	Parts 2.1053 & 22.917
Test Method Used:	As detailed in KDB 971168 Sections 6.1, 7 & 8 referencing FCC Part 2.1053
Frequency Range:	30 MHz to 9 GHz
Configuration:	Voice / 12.2 kbps

Environmental Conditions:

Temperature (°C):	22
Relative Humidity (%):	49

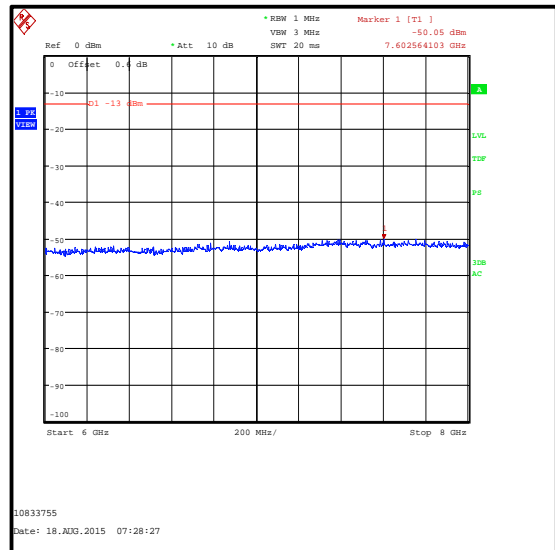
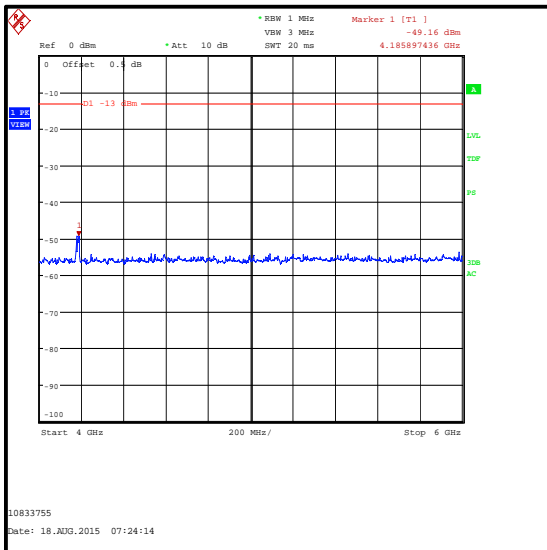
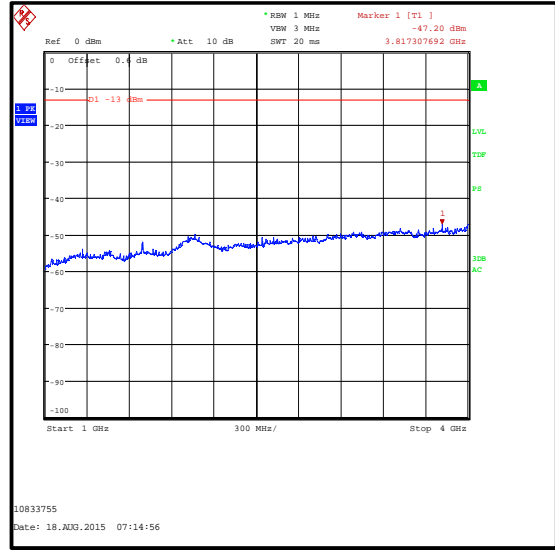
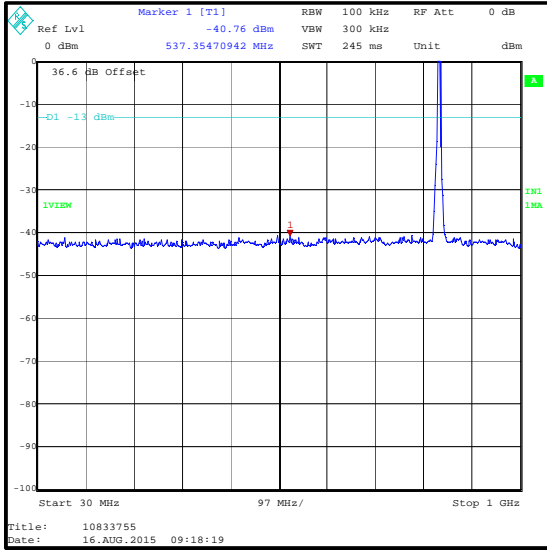
Note(s):

- The uplink traffic channel is shown on the 30 MHz to 1 GHz plot.
- All emissions shown on the pre-scan plots were investigated. Final measurements were made using appropriate RF filters and attenuators where required. All emissions shown on the pre-scan plots were found to be below the measurement system noise floor or ambient or > 20 dB below the applicable limit. Therefore the highest peak noise floor reading of the measuring receiver was recorded in the table below.
- Measurements below 1 GHz were performed in a semi-anechoic chamber (Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.
- Pre-scans above 1 GHz were performed in a fully anechoic chamber (Asset Number K0002) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above the test chamber floor in the centre of the chamber turntable. All measurement antennas were placed at a fixed height of 1.5 metres above the test chamber floor, in line with the EUT. Final measurements above 1 GHz were performed in a semi-anechoic chamber (Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

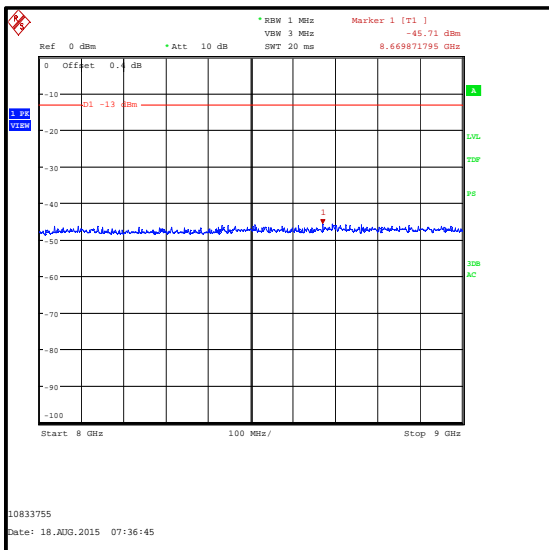
Results: Voice

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
902.806	-39.8	-13.0	26.8	Complied

Transmitter Out of Band Radiated Emissions (continued)



Transmitter Out of Band Radiated Emissions (continued)



Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1945	Thermohygrometer	JM Handelspunkt	30.5015.01	0112	23 Apr 2016	12
K0001	5 m RSE Chamber	Rainford EMC	N/A	N/A	19 Mar 2016	12
M1124	Test Receiver	Rohde & Schwarz	ESIB26	100046	06 Oct 2015	12
A259	Antenna	Chase	CBL6111	1513	09 Apr 2016	12
G0543	Amplifier	Sonoma	310N	230801	06 Nov 2015	3
A1834	Attenuator	Hewlett Packard	8491B	10444	05 Mar 2016	12
M1656	Thermohygrometer	JM Handelspunkt	30.5015.13	Not stated	23 Apr 2016	12
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	01 May 2016	12
M1874	Test Receiver	Rohde & Schwarz	ESU26	100553	12 Jun 2016	12
A259	Antenna	Chase	CBL6111	1513	09 Apr 2016	12
A1534	Pre Amplifier	Hewlett Packard	8449B	3008A00405	21 Dec 2015	12
A1818	Antenna	EMCO	3115	00075692	20 Dec 2015	12
A253	Antenna	Flann microwave	12240-20	128	20 Dec 2015	12
A254	Antenna	Flann microwave	14240-20	139	20 Dec 2015	12
A255	Antenna	Flann microwave	16240-20	519	20 Dec 2015	12
A1393	Attenuator	Huber & Suhner	6820.17.B	757456	05 May 2016	12
A1975	High Pass Filter	AtlanTecRF	AFH-03000	090424010	17 Apr 2016	12

5.2.4. Transmitter Band Edge Radiated Emissions**Test Summary:**

Test Engineer:	David Doyle	Test Dates:	20 August 2015 & 24 August 2015
Test Sample IMEI:	351772070005144		

FCC Reference:	Parts 2.1053 & 22.917
Test Method Used:	As detailed in KDB 971168 Section 6.1 referencing FCC Part 22.917

Environmental Conditions:

Temperature (°C):	22 to 24
Relative Humidity (%):	40 to 46

Note(s):

1. Measurements were performed with the EUT transmitting in all operating modes.
2. Measurements were performed in a fully anechoic chamber (Asset Number K0002) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above the test chamber floor in the centre of the chamber turntable. The measurement antenna was placed at a fixed height of 1.5 metres above the test chamber floor in line with the EUT.
3. In the first 1.0 MHz immediately outside and adjacent to the operating band, the test receiver resolution bandwidth was set to 50 kHz (>1% of 4.7 MHz, the widest 26 dB emission bandwidth) and video bandwidth 50 kHz (\geq the resolution bandwidth).

Transmitter Band Edge Radiated Emissions (continued)

Results: Voice / 12.2 kbps

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
824	-13.2	-13.0	0.2	Complied
849	-13.9	-13.0	0.9	Complied



Transmitter Band Edge Radiated Emissions (continued)

Results: HSDPA Sub-Test 1

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
824	-13.1	-13.0	0.1	Complied
849	-14.1	-13.0	1.1	Complied



Transmitter Band Edge Radiated Emissions (continued)

Results: HSDPA Sub-Test 2

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
824	-13.2	-13.0	0.2	Complied
849	-14.2	-13.0	1.2	Complied



Transmitter Band Edge Radiated Emissions (continued)

Results: HSDPA Sub-Test 3

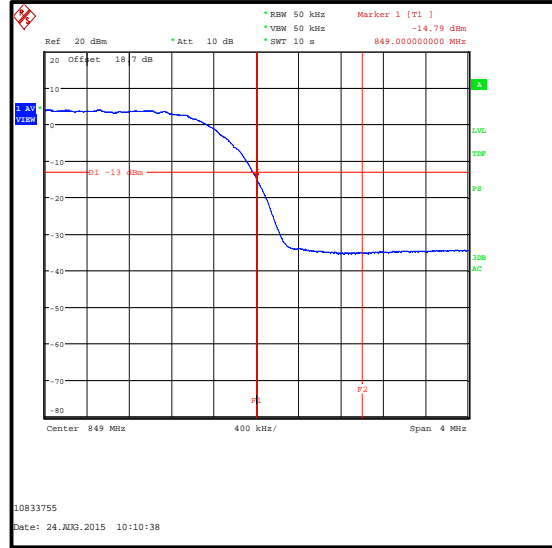
Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
824	-13.4	-13.0	0.4	Complied
849	-14.8	-13.0	1.8	Complied



Transmitter Band Edge Radiated Emissions (continued)

Results: HSDPA Sub-Test 4

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
824	-13.5	-13.0	0.5	Complied
849	-14.8	-13.0	1.8	Complied



Transmitter Band Edge Radiated Emissions (continued)

Results: HSUPA Sub-Test 1

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
824	-13.4	-13.0	0.4	Complied
849	-14.5	-13.0	1.5	Complied



Transmitter Band Edge Radiated Emissions (continued)

Results: HSUPA Sub-Test 2

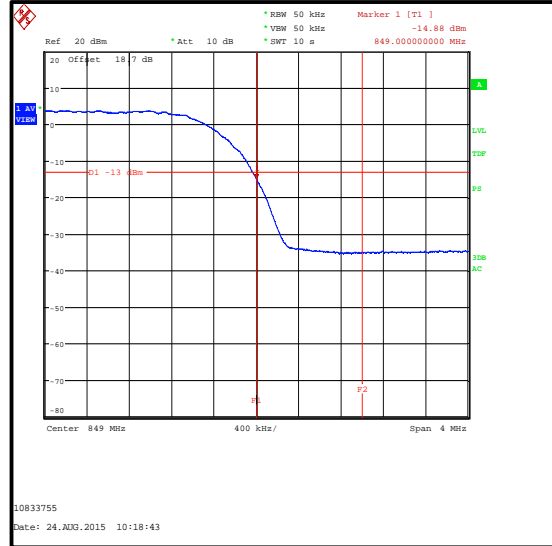
Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
824	-13.3	-13.0	0.3	Complied
849	-14.4	-13.0	1.4	Complied



Transmitter Band Edge Radiated Emissions (continued)

Results: HSUPA Sub-Test 3

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
824	-13.7	-13.0	0.7	Complied
849	-14.9	-13.0	1.9	Complied



Transmitter Band Edge Radiated Emissions (continued)

Results: HSUPA Sub-Test 4

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
824	-13.3	-13.0	0.3	Complied
849	-14.1	-13.0	1.1	Complied



Transmitter Band Edge Radiated Emissions (continued)

Results: HSUPA Sub-Test 5

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
824	-13.1	-13.0	0.1	Complied
849	-14.3	-13.0	1.3	Complied



Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
A259	Antenna	Chase	CBL6111	1513	09 Apr 2016	12
A1393	Attenuator	Huber & Suhner	6820.17.B	757456	05 May 2016	12
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	01 May 2016	12
M1874	Test Receiver	Rohde & Schwarz	ESU26	100553	12 Jun 2016	12
M1656	Thermohygrometer	JM Handelpunkt	30.5015.13	Not stated	23 Apr 2016	12

5.2.5. Transmitter Frequency Stability (Temperature Variation)**Test Summary:**

Test Engineer:	David Doyle	Test Date:	21 August 2015
Test Sample IMEI:	351772070005235		

FCC Reference:	Parts 2.1055 & 22.355
Test Method Used:	As detailed in KDB 971168 Section 9.0 referencing ANSI TIA-603-C-2004 Section 2.2.2 and FCC Part 2.1055
Test Mode:	RMC

Environmental Conditions:

Ambient Temperature (°C):	24
Ambient Relative Humidity (%):	42

Note(s):

1. A dummy battery was placed on the EUT and the dummy battery cables connected to a bench power supply.
2. Frequency error was measured using a calibrated Rohde & Schwarz CMW 500 Universal Radio Communications Tester in accordance with current Rohde & Schwarz application notes. The EUT was connected by suitable RF cables to the CMW 500. A bi-directional communications link was established between the EUT and CMW 500. The frequency meter value was recorded.
3. Temperature was monitored throughout the test with a calibrated digital thermometer.

Results: Middle Channel (836.6 MHz)

Temperature (°C)	Measured Frequency (MHz)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)	Margin (ppm)	Result
-10	836.600018	18	0.0215	2.5	2.4785	Complied
0	836.600016	16	0.0191	2.5	2.4809	Complied
10	836.600014	14	0.0167	2.5	2.4833	Complied
20	836.600020	20	0.0239	2.5	2.4761	Complied
30	836.600013	13	0.0155	2.5	2.4845	Complied
40	836.599983	17	0.0203	2.5	2.4797	Complied
50	836.599987	13	0.0155	2.5	2.4845	Complied
55	836.599989	11	0.0131	2.5	2.4845	Complied

Transmitter Frequency Stability (Temperature Variation) (continued)**Test Equipment Used:**

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1659	Thermohygrometer	JM Handelpunkt	30.5015.13	None stated	23 Apr 2016	12
M1859	Wideband Radio Comms Tester	Rohde & Schwarz	CMW500	145920	12 Jun 2016	12
S0537	DC power supply	TTI	EL302D	249928	Calibrated before use	-
M1269	Multimeter	Fluke	179	90250210	26 May 2016	12
E0513	Environmental Chamber	TAS	LT600 Series 3	23900506	Calibrated before use	-
M1249	Thermometer	Fluke	52II	88800049	27 May 2016	12

5.2.6. Transmitter Frequency Stability (Voltage Variation)**Test Summary:**

Test Engineer:	David Doyle	Test Date:	21 August 2015
Test Sample IMEI:	351772070005235		

FCC Reference:	Parts 2.1055 & 22.355
Test Method Used:	As detailed in KDB 971168 Section 9.0 referencing ANSI TIA-603-C-2004 Section 2.2.2 and FCC Part 2.1055
Test Mode:	RMC

Environmental Conditions:

Temperature (°C):	24
Relative Humidity (%):	42

Note(s):

1. A dummy battery was placed on the EUT and the dummy battery cables connected to a bench power supply.
2. Frequency error was measured using a calibrated Rohde & Schwarz CMW 500 Universal Radio Communications Tester in accordance with current Rohde & Schwarz application notes. The EUT was connected by suitable RF cables to the CMW 500. A bi-directional communications link was established between the EUT and CMW 500. The frequency meter value was recorded.
3. Voltage was monitored throughout the test with a calibrated digital voltmeter.

Results: Middle Channel (836.6 MHz)

Supply Voltage (V)	Measured Frequency (MHz)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)	Margin (ppm)	Result
3.4	836.600004	4	0.0048	2.5	2.4952	Complied
4.2	836.600011	11	0.0131	2.5	2.4869	Complied

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1659	Thermohygrometer	JM Handelpunkt	30.5015.13	None stated	23 Apr 2016	12
M1859	Wideband Radio Comms Tester	Rohde & Schwarz	CMW500	145920	12 Jun 2016	12
S0537	DC power supply	TTI	EL302D	249928	Calibrated before use	-
M1269	Multimeter	Fluke	179	90250210	26 May 2016	12
E0513	Environmental Chamber	TAS	LT600 Series 3	23900506	Calibrated before use	-
M1249	Thermometer	Fluke	52II	88800049	27 May 2016	12

6. Measurement Uncertainty

No measurement or test can ever be perfect and the imperfections give rise to error of measurement in the results. Consequently the result of a measurement is only an approximation to the value of the measurand (the specific quantity subject to measurement) and is only complete when accompanied by a statement of the uncertainty of the approximation.

The expression of uncertainty of a measurement result allows realistic comparison of results with reference values and limits given in specifications and standards.

The uncertainty of the result may need to be taken into account when interpreting the measurement results.

The reported expanded uncertainties below are based on a standard uncertainty multiplied by an appropriate coverage factor such that a confidence level of approximately 95% is maintained. For the purposes of this document "approximately" is interpreted as meaning "effectively" or "for most practical purposes".

Measurement Type	Range	Confidence Level (%)	Calculated Uncertainty
Conducted Output Power	824 to 849 MHz	95%	±1.13 dB
Frequency Stability	824 to 849 MHz	95%	±23 Hz
Occupied Bandwidth	824 to 849 MHz	95%	±3.92 %
Radiated Spurious Emissions	30 MHz to 1 GHz	95%	±5.65 dB
Radiated Spurious Emissions	1 GHz to 9 GHz	95%	±2.94 dB

The methods used to calculate the above uncertainties are in line with those recommended within the various measurement specifications. Where measurement specifications do not include guidelines for the evaluation of measurement uncertainty the published guidance of the appropriate accreditation body is followed.

7. Report Revision History

Version Number	Revision Details		
	Page No(s)	Clause	Details
1.0	-	-	Initial Version
2.0	14 – 24	-	Changes to OBW section of report
3.0	-	-	Sections 3.1, 3.4, 3.5 & 5.2.3 updated

--- END OF REPORT ---