TEST REPORT
FROM
RFI GLOBAL SERVICES LTD

Test of: Panasonic EB-3901

FCC ID: UCE211048A

To: FCC Part 15.225: 2011 Subpart C

TEST REPORT Serial No.:
RFI-RPT-RP85011JD01E V2.0

Version 2.0 supersedes all previous versions

This Test Report Is Issued Under The Authority Of Chris Guy, Head of Global Approvals:	
Checked By:	Ian Watch
Signature:	
Date of Issue:	08 February 2012

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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:	47CFR15.225
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2011: Part 15 Subpart C (Radio Frequency Devices) - Section 15.225
Specification Reference:	47CFR15.107 and 47CFR15.109
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2011: Part 15 Subpart B (Radio Frequency Devices) - Sections 15.107 and 15.109
Specification Reference:	47CFR15.209
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications) 2011: Part 15 Subpart C (Intentional Radiators) - Section 15.209
Site Registration:	209735
Location of Testing:	RFI Global Services Ltd, Wade Road, Basingstoke, Hampshire, RG24 8AH.
Test Dates:	05 January 2012 to 07 February 2012

2.2. Summary of Test Results

FCC Reference (47CFR)	Measurement	Result
Part 15.107(a)	Receiver/Idle Mode AC Conducted Spurious Emissions	✓
Part 15.109	Receiver/Idle Mode Radiated Spurious Emissions	✓
Part 15.207	Transmitter AC Conducted Emissions	✓
Part 15.225(a)(b)(c)(d)	Transmitter Fundamental Field Strength	✓
Part 15.209(a), 15.225(d)	Transmitter Radiated Spurious Emissions	✓
Part 15.209(a), 15.225(c)(d)	Transmitter Band Edge Radiated Emissions	✓
Part 2.1049	Transmitter 20 dB Bandwidth	✓
Part 15.225(e)	Transmitter Frequency Stability (Temperature & Voltage Variation)	✓

Key to Results

✓ = Complied ✗ = Did not comply

2.3. Methods and Procedures

Reference:	ANSI C63.4 (2009)
Title:	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
Reference:	ANSI C63.10 (2009)
Title:	American National Standard for Testing Unlicensed Wireless Devices

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:	Panasonic
Model Name or Number:	EB-3901
IMEI:	004401221200245 *(Radiated sample #1)* 004401221200260 *(Radiated Sample #2)* 004401221200252 *(Radiated Sample #3)* 004401221200302 *(Conducted RF port sample)*
Hardware Version Number:	Rev C
Software Version Number:	ACPU: eu-07-0181 CCPU: R1B_1_EC02_01_E02
FCC ID:	UCE211048A

Brand Name:	Panasonic
Description:	AC Charger
Model Name or Number:	VSK0775

Brand Name:	Panasonic
Description:	Charge/USB Data cable
Model Name or Number:	Not marked or stated

Brand Name:	Panasonic
Description:	Personal Hands-Free
Model Name or Number:	Not marked or stated

3.2. Description of EUT

The equipment under test was a dual mode UMTS/GSM Mobile Phone with WLAN, *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

Tested Technology:	RFID	
Category of Equipment:	Transceiver	
Channel Spacing:	Single channel device	
Transmit Frequency Range:	13.56 MHz	
Receive Frequency Range:	13.56 MHz	
Power Supply Requirement:	Nominal	3.8 V
	Minimum	3.4 V
	Maximum	4.35 V
Tested Temperature Range:	Minimum	-20°C
	Maximum	50°C

3.5. Support Equipment

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

Brand Name:	Buffalo
Description:	USB Hub
Model Name or Number:	BSH3U01

4. Operation and Monitoring of the EUT during Testing

4.1. Operating Modes

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

- Receiver/Idle mode.
- Constantly transmitting at full power with a modulated carrier in RFID test mode.

4.2. Configuration and Peripherals

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

- The conducted sample with IMEI 004401221200302 was used for frequency stability and occupied bandwidth measurements.
- The radiated sample with IMEI 004401221200252 was used for idle mode radiated spurious emissions tests <30 MHz and fundamental field strength measurements.
- The radiated sample with IMEI 004401221200260 was used for AC conducted emissions measurements.
- The radiated sample with IMEI 004401221200245 was used for all other measurements.
- The RFID transmitter test mode was enabled by turning on the Near Field Communications tab within the EUT settings in accordance with the Customer's instructions.
- Receiver Idle/standby mode radiated spurious emission tests were performed with the AC Charger and Personal Hands-Free connected to the EUT.
- Transmitter radiated spurious emission tests were performed with the Personal Hands-Free and USB hub connected to the EUT.

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 Uncertainties* for details.

5.2. Test Results

5.2.1. Receiver/Idle Mode AC Conducted Spurious Emissions

Test Summary:

Test Engineer:	Sarah Williams	**Test Date:**	16 January 2012
Test Sample IMEI:	004401221200260		

FCC Part:	15.107(a)
Test Method Used:	As detailed in ANSI C63.10 Section 6.2 referencing ANSI C63.4

Environmental Conditions:

Temperature (°C):	20
Relative Humidity (%):	23

Results: Live / Quasi Peak

Frequency (MHz)	Line	Level (dBµV)	Limit (dBµV)	Margin (dB)	Result
2.067	Live	34.5	56.0	21.5	Complied
2.792	Live	35.6	56.0	20.4	Complied
3.588	Live	34.5	56.0	21.5	Complied
8.826	Live	37.4	60.0	22.6	Complied
9.119	Live	37.9	60.0	22.1	Complied
9.915	Live	38.1	60.0	21.9	Complied

Results: Live / Average

Frequency (MHz)	Line	Level (dBµV)	Limit (dBµV)	Margin (dB)	Result
0.407	Live	28.2	47.7	19.5	Complied
0.461	Live	26.2	46.7	20.5	Complied
2.094	Live	25.9	46.0	20.1	Complied
3.147	Live	25.9	46.0	20.1	Complied
3.921	Live	25.2	46.0	20.8	Complied
8.781	Live	28.4	50.0	21.6	Complied

Receiver/Idle Mode AC Conducted Spurious Emissions (continued)

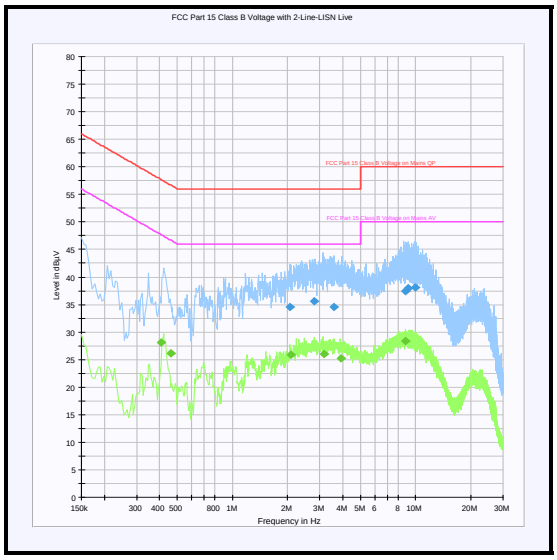
Results: Neutral / Quasi Peak

Frequency (MHz)	Line	Level (dBµV)	Limit (dBµV)	Margin (dB)	Result
0.420	Neutral	30.5	57.4	26.9	Complied
2.153	Neutral	25.8	56.0	30.2	Complied
2.945	Neutral	27.4	56.0	28.6	Complied
7.238	Neutral	32.6	60.0	27.4	Complied
7.737	Neutral	32.2	60.0	27.8	Complied
8.453	Neutral	32.9	60.0	27.1	Complied

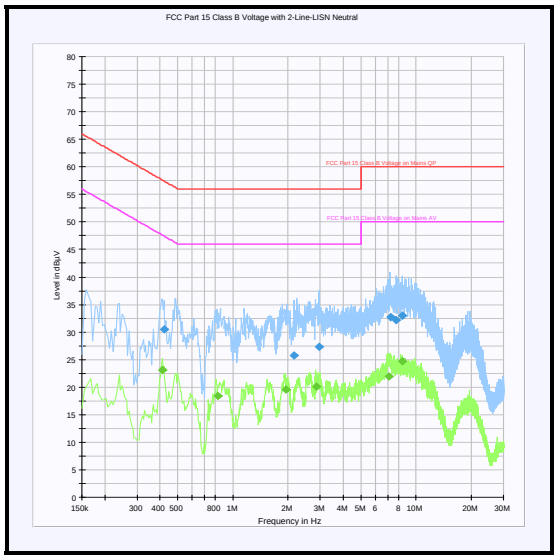
Results: Neutral / Average

Frequency (MHz)	Line	Level (dBµV)	Limit (dBµV)	Margin (dB)	Result
0.411	Neutral	23.1	47.6	24.5	Complied
0.830	Neutral	18.4	46.0	27.6	Complied
1.950	Neutral	19.6	46.0	26.4	Complied
2.850	Neutral	20.1	46.0	25.9	Complied
7.121	Neutral	21.9	50.0	28.1	Complied
8.376	Neutral	24.7	50.0	25.3	Complied

Receiver/Idle Mode AC Conducted Spurious Emissions (continued)



Live



Neutral

Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

5.2.2. Receiver/Idle Mode Radiated Spurious Emissions

Test Summary:

Test Engineers:	Nick Steele & Andrew Edwards	**Test Dates:**	09 January 2012 & 16 January 2012
Test Sample IMEIs:	004401221200245 & 004401221200252		

FCC Part:	15.109
Test Method Used:	As detailed in ANSI C63.10 Sections 6.3, 6.4 and 6.5 referencing ANSI C63.4
Frequency Range:	9 kHz to 1000 MHz

Environmental Conditions:

Temperature (°C):	24
Relative Humidity (%):	29

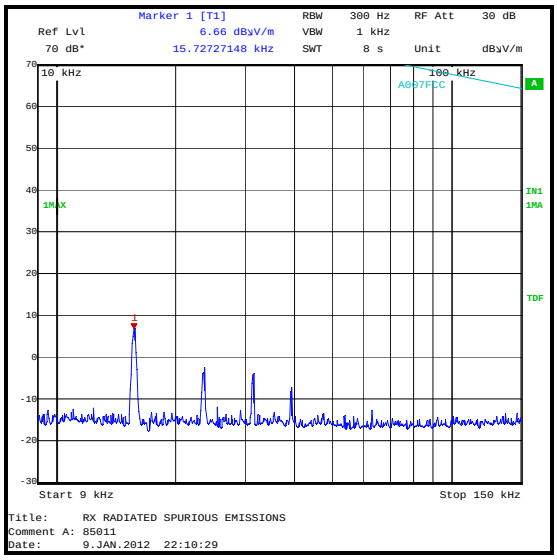
Results: Quasi Peak

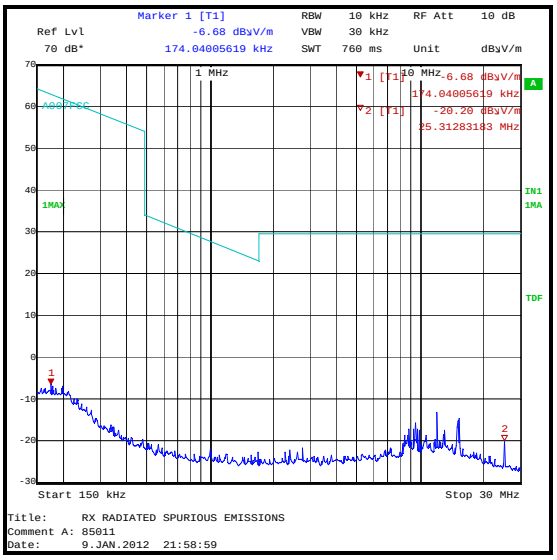
Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
44.843	Vertical	26.2	40.0	13.8	Complied
65.523	Vertical	24.4	40.0	15.6	Complied
76.802	Vertical	13.7	40.0	26.3	Complied
125.264	Vertical	18.1	43.5	25.4	Complied
133.223	Horizontal	13.5	43.5	30.0	Complied
458.777	Vertical	21.4	46.0	24.6	Complied

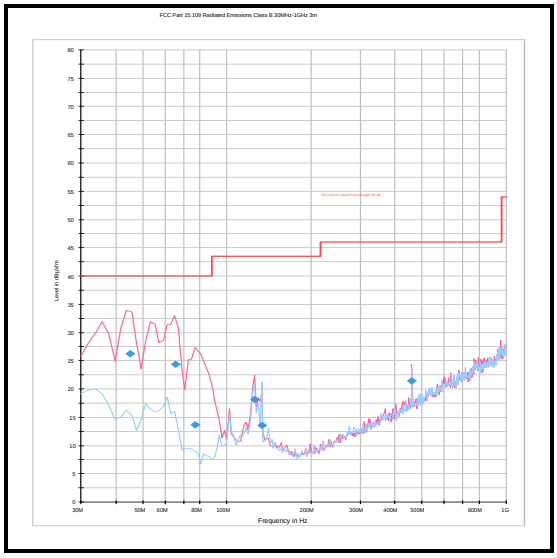
Note(s):

1. Limits below 30 MHz are specified at a test distance of 30 metres, whilst below 0.49 MHz they are specified at a test distance of 300 metres. However, as specified by FCC Section 15.31 (f)(2), measurements may be performed at a closer distance and the measured level corrected to the specified measurement distance by using the square of an inverse linear distance extrapolation factor (40dB/decade).
2. A transducer factor on the measuring instrument was used to extrapolate the results at 3 metres to a distance of 30 metres where required. A distance extrapolation factor of 40 dB was used.
3. Final measurement values include corrections for antenna factor and cable losses.
4. All emissions on the 9 kHz to 150 kHz plot were investigated and found to be radiating from the test site turntable.
5. All other emissions shown on the pre-scan plots were investigated and found to be >20 dB below the applicable limit or below the measurement system noise floor.
6. Measurements in the range 30 MHz to 1 GHz were performed in a semi-anechoic chamber (RFI 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

Receiver/Idle Mode Radiated Spurious Emissions (continued)







Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying table.

5.2.3. Transmitter AC Conducted Spurious Emissions

Test Summary:

Test Engineer:	Mark Percival	**Test Date:**	07 February 2012
Test Sample IMEI:	004401221200260		

FCC Part:	15.207
Test Method Used:	As detailed in ANSI C63.10 Section 6.2 referencing ANSI C63.4

Environmental Conditions:

Temperature (°C):	21
Relative Humidity (%):	25

Results: Live / Quasi Peak

Frequency (MHz)	Line	Level (dBµV)	Limit (dBµV)	Margin (dB)	Result
0.154	Live	44.2	65.8	21.6	Complied
0.208	Live	37.2	63.3	26.1	Complied
2.562	Live	28.5	56.0	27.5	Complied
3.223	Live	28.0	56.0	28.0	Complied
4.375	Live	26.5	56.0	29.5	Complied
9.186	Live	31.2	60.0	28.8	Complied

Results: Live / Average

Frequency (MHz)	Line	Level (dBµV)	Limit (dBµV)	Margin (dB)	Result
0.150	Live	26.2	56.0	29.8	Complied
0.208	Live	20.9	53.3	32.4	Complied
0.411	Live	22.9	47.6	24.7	Complied
0.807	Live	17.7	46.0	28.3	Complied
3.624	Live	18.9	46.0	27.1	Complied
3.714	Live	19.0	46.0	27.0	Complied

Transmitter AC Conducted Spurious Emissions (continued)

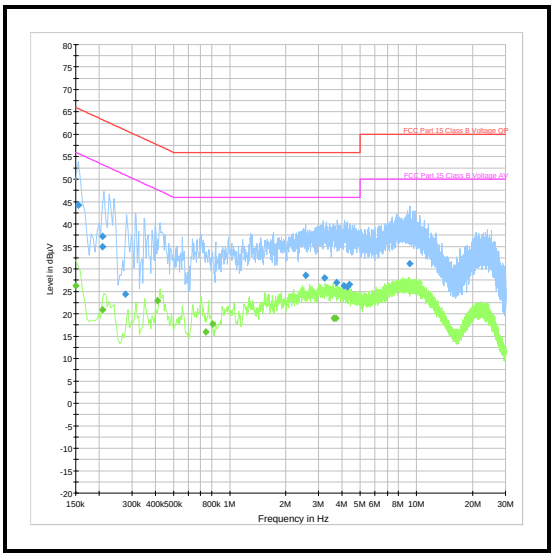
Results: Neutral / Quasi Peak

Frequency (MHz)	Line	Level (dBµV)	Limit (dBµV)	Margin (dB)	Result
0.478	Neutral	29.6	56.4	26.8	Complied
2.868	Neutral	25.3	56.0	30.7	Complied
4.020	Neutral	26.1	56.0	29.9	Complied
7.201	Neutral	30.5	60.0	29.5	Complied
8.290	Neutral	30.8	60.0	29.2	Complied
9.060	Neutral	31.6	60.0	28.4	Complied

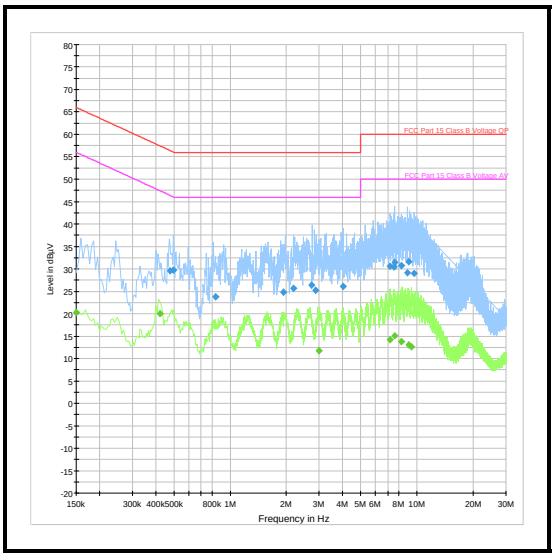
Results: Neutral / Average

Frequency (MHz)	Line	Level (dBµV)	Limit (dBµV)	Margin (dB)	Result
0.150	Neutral	20.3	56.0	35.7	Complied
0.420	Neutral	20.0	47.7	27.4	Complied
2.981	Neutral	11.8	46.0	34.2	Complied
7.589	Neutral	15.0	50.0	35.0	Complied
8.291	Neutral	13.8	50.0	36.2	Complied
9.371	Neutral	12.6	50.0	37.4	Complied

Transmitter AC Conducted Spurious Emissions (continued)



Live



Neutral

Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

5.2.4. Transmitter Fundamental Field Strength

Test Summary:

Test Engineer:	Nick Steele	**Test Date:**	09 January 2012
Test Sample IMEI:	004401221200245		

FCC Part:	15.225(a)(b)(c)(d)
Test Method Used:	ANSI C63.10 Section 6.4

Environmental Conditions:

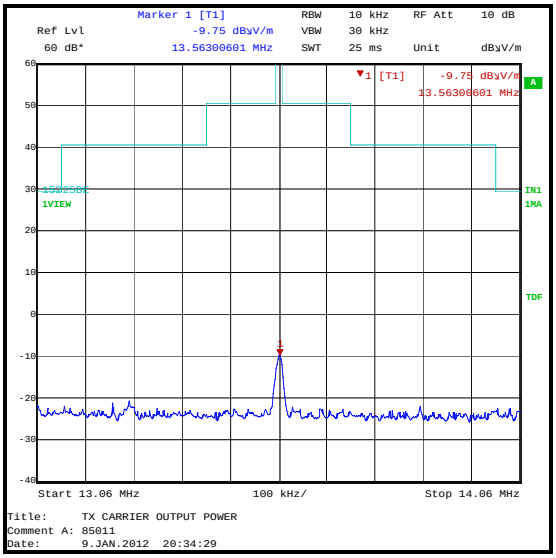
Temperature (°C):	24
Relative Humidity (%):	29

Results: Quasi Peak

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit at 30 m (dBµV/m)	Margin (dB)	Result
13.56	90° to EUT	-6.3	84.0	90.3	Complied

Note(s):

1. The limit is specified at a test distance of 30 metres. However, as specified by FCC Section 15.31 (f)(2), measurements may be performed at a closer distance and the measured level corrected to the specified measurement distance by using the square of an inverse linear distance extrapolation factor (40dB/decade).
2. A transducer factor on the measuring instrument was used to extrapolate the results at 3 metres to a distance of 30 metres. A distance extrapolation factor of 40 dB was used.



5.2.5. Transmitter Radiated Spurious Emissions

Test Summary:

Test Engineer:	Nick Steele	**Test Date:**	09 January 2012 & 10 January 2012
Test Sample IMEI:	004401221200245		

FCC Part:	15.225(d) & 15.209(a)
Test Method Used:	As detailed in ANSI C63.10 Sections 6.3, 6.4 and 6.5 referencing ANSI C63.4
Frequency Range:	9 kHz to 1000 MHz

Environmental Conditions:

Temperature (°C):	24
Relative Humidity (%):	29

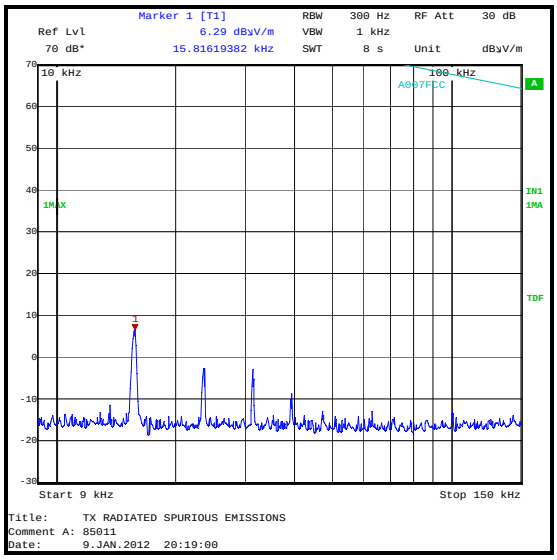
Results: Quasi Peak

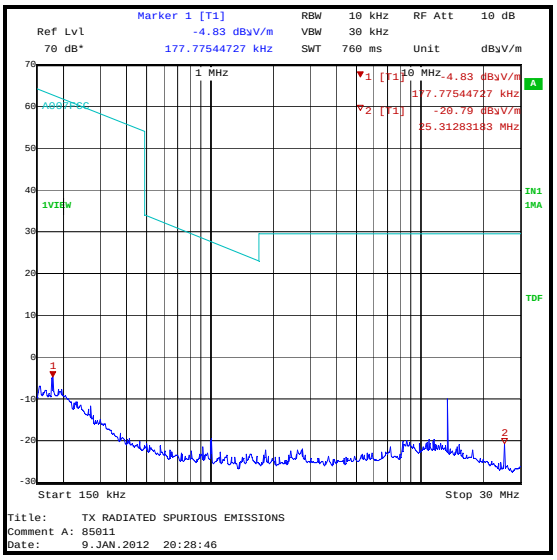
Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
51.349	Vertical	16.8	40.0	23.2	Complied
56.758	Vertical	9.9	40.0	30.1	Complied
95.972	Vertical	12.1	43.5	31.4	Complied
159.986	Vertical	11.7	43.5	31.8	Complied
458.786	Horizontal	18.3	46.0	27.7	Complied
627.443	Horizontal	17.0	46.0	29.0	Complied
993.441	Horizontal	22.2	54.0	31.8	Complied

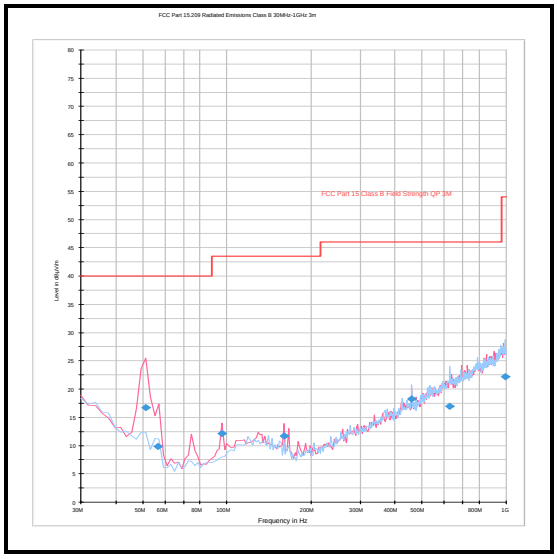
Note(s):

1. Limits below 30 MHz are specified at a test distance of 30 metres, whilst below 0.49 MHz they are specified at a test distance of 300 metres. However, as specified by FCC Section 15.31 (f)(2), measurements may be performed at a closer distance and the measured level corrected to the specified measurement distance by using the square of an inverse linear distance extrapolation factor (40dB/decade).
2. A transducer factor on the measuring instrument was used to extrapolate the results at 3 metres to a distance of 30 metres where required. A distance extrapolation factor of 40 dB was used.
3. Final measurement values include corrections for antenna factor and cable losses.
4. The emission shown at approximately 13.56 MHz is the fundamental.
5. All emissions on the 9 kHz to 150 kHz plot were investigated and found to be radiating from the test site turntable.
6. All other emissions shown on the pre-scan plots were investigated and found to be >20 dB below the applicable limit or below the measurement system noise floor.
7. Measurements in the range 30 MHz to 1 GHz were performed in a semi-anechoic chamber (RFI 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.

Transmitter Radiated Spurious Emissions (continued)







Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying table.

5.2.6. Transmitter Band Edge Radiated Emissions

Test Summary:

Test Engineer:	Nick Steele	**Test Date:**	09 January 2012
Test Sample IMEI:	004401221200245		

FCC Part:	15.225(c)(d) & 15.209(a)
Test Method Used:	As detailed in ANSI C63.10 Section 6.9.2

Environmental Conditions:

Temperature (°C):	24
Relative Humidity (%):	29

Results: Quasi Peak Lower Band Edge

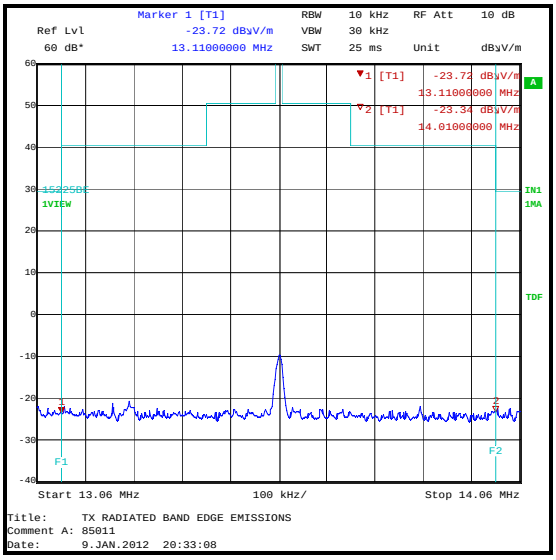
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
13.11	-38.7	29.5	68.2	Complied

Results: Quasi Peak Upper Band Edge

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
14.01	-37.9	29.5	67.4	Complied

Note(s):

1. A transducer factor on the measuring instrument was used to extrapolate the results at 3 metres to a distance of 30 metres where required.
2. A transducer factor on the measuring instrument was used to extrapolate the results at 3 metres to a distance of 30 metres where required. A distance extrapolation factor of 40 dB was used.



5.2.7. Transmitter 20 dB Bandwidth

Test Summary:

Test Engineer:	Sarah Williams	**Test Date:**	25 January 2012
Test Sample IMEI:	004401221200302		

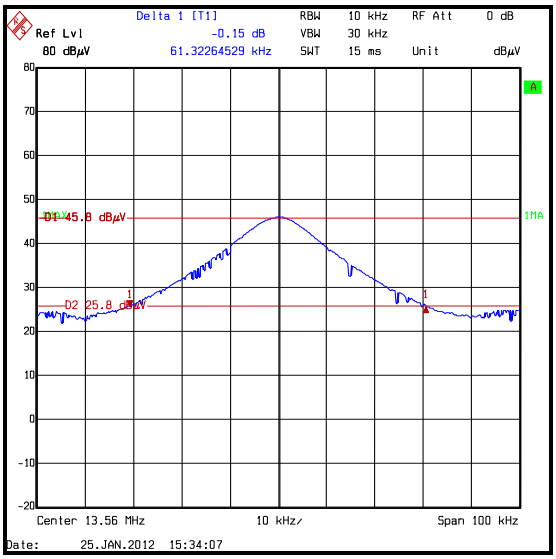
FCC Part:	2.1049
Test Method Used:	As detailed in ANSI C63.10 Section 6.9.1

Environmental Conditions:

Temperature (°C):	24
Relative Humidity (%):	31

Results:

20 dB Bandwidth (kHz)
61.323



Note(s):

1. The emission remained below -20 dBc beyond the span of the plot.

5.2.8. Transmitter Frequency Stability (Temperature & Voltage Variation)

Test Summary:

Test Engineer:	David Doyle	**Test Date:**	26 January 2012
Test Sample IMEI:	004401221200302		

FCC Part:	15.225(e)
Test Method Used:	As detailed in ANSI C63.10 Section 6.8.1 and 6.8.2

Environmental Conditions:

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

Results: Maximum frequency error of the EUT with variations in ambient temperature

Temperature (°C)	Time after Start-up			
	0 minutes	**2 minutes**	**5 minutes**	**10 minutes**
-20	13.559810	13.559830	13.559830	13.559830
20	13.559790	13.559770	13.559770	13.559750
50	13.559689	13.559669	13.559669	13.559669

Frequency with Worst Case Deviation (MHz)	Frequency Error (Hz)	Frequency Error (%)	Limit (%)	Margin (%)	Result
13.559669	331	0.0024	0.01	0.0076	Complied

Results: Maximum frequency error of the EUT with variations in nominal operating voltage at an ambient temperature of 20°C

Supply Voltage (V)	Nominal Frequency (MHz)	Measured Frequency (MHz)	Frequency Error (Hz)	Frequency Error (%)	Limit (%)	Margin (%)	Result
3.24	13.56	13.559750	250	0.0018	0.01	0.0082	Complied
3.8	13.56	13.559750	250	0.0018	0.01	0.0082	Complied
4.37	13.56	13.559770	230	0.0017	0.01	0.0083	Complied

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
AC Conducted Spurious Emissions	0.15 MHz to 30 MHz	95%	±3.25 dB
20 dB Bandwidth	13 MHz to 14 MHz	95%	±0.92 ppm
Frequency Stability	13 MHz to 14 MHz	95%	±0.92 ppm
Radiated Spurious Emissions	9 kHz to 30 MHz	95%	±3.53 dB
Radiated Spurious Emissions	30 MHz to 1000 MHz	95%	±2.94 dB
Transmitter Fundamental Field Strength	13 MHz to 14 MHz	95%	±3.53 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.

Appendix 1. Test Equipment Used

RFI No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (months)
A067	LISN	Rohde & Schwarz	ESH3-Z5	890603/002	02 Jun 2012	12
A1830	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100668	05 Mar 2012	12
A1834	Attenuator	Hewlett Packard	8491B	10444	26 Jul 2012	12
A553	Antenna	Chase	CBL6111A	1593	26 Mar 2012	12
E013	Environmental Chamber	Sanyo	ATMOS chamber	None	Calibrated Before Use	-
K0001	5m RSE chamber	Rainford EMC	N/A	N/A	29 May 2012	12
M1068	Thermometer	Iso-Tech	RS55	93102884	15 Nov 2012	12
M1242	Spectrum Analyser	Rohde & Schwarz	FSEM30	845986/022	12 Dec 2012	12
M1263	Test Receiver	Rohde & Schwarz	ESIB7	100265	13 Jul 2012	12
M1269	Multimeter	Fluke	179	90250210	20 Jul 2012	12
M1273	Test Receiver	Rohde & Schwarz	ESIB 26	100275	04 Feb 2012	12
M1568	Magnetic Loop	Rohde & Schwarz	HFH2-Z2	879284/2	27 Jan 2012	12
S0529	DC Power Supply Unit	ISO-Tech	IPS2302A	504E005G2	Calibrated before use	-

NB In accordance with UKAS requirements all the measurement equipment is on a calibration schedule.