



TEST REPORT

Test Report No. : UL-RPT-RP81001JD04B V2.0

Manufacturer : Panasonic Mobile Communications Development of Europe Ltd.
Model No. : NTT docomo P-05C
FCC ID : UCE211039A
Technology : RFID – 13.56 MHz
Test Standard(s) : FCC Part 15.225

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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 2.0 supersedes Test Report Serial Number RFI-RPT-RP81001JD04B. The original test report was issued under the previous company name of RFI Global Services Ltd.

Date of Issue: 18 JUNE 2015

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This laboratory is accredited by UKAS.
The tests reported herein have been
performed in accordance with its terms
of accreditation.

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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): 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): 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): Part 15 Subpart C (Intentional Radiators) - Section 15.209
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:	12 March 2011 to 15 March 2011

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 15.225(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:	NTT docomo
Model Name or Number:	P-05C
IMEI:	355320040013438
Hardware Version Number:	Rev C
Software Version Number:	B-D11SL1-00.01.037 D11SL1_Cv58091405
FCC ID:	UCE211039A

Brand Name:	NTT docomo
Description:	Battery
Model Name or Number:	P20*

Brand Name:	NTT docomo
Description:	AC Charger
Model Name or Number:	FOMA AC Adapter 01 for Global use / MAS-BH0008-A 002

Brand Name:	NTT docomo
Description:	DC Charger
Model Name or Number:	FOMA DC Adapter 02

Brand Name:	NTT docomo
Description:	Charge/USB Data cable
Model Name or Number:	FOMA USB Cable with Charge Function 02

Brand Name:	NTT docomo
Description:	Personal Hands-Free
Model Name or Number:	Stereo Earphone Set 01

3.2. Description of EUT

The equipment under test was a dual mode UMTS/GSM cellular handset with *Bluetooth*, WLAN 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	3.7 V
	Minimum	3.4 V
	Maximum	4.2 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:	Generic
Description:	Micro SD Memory Card
Model Name or Number:	Not Stated

Brand Name:	Not Stated
Description:	Dummy Battery
Model Name or Number:	Not Stated

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 RFID transmitter test mode was enabled using a USIM card supplied by the customer.
- Receiver Idle/standby mode radiated spurious emission tests were performed with the AC Charger connected to the EUT as this was found to be the worst case during pre-scans. All accessories were individually connected and measurements made during pre-scans to determine the worst case combination.
- Transmitter radiated spurious emission tests were performed with the USB Data cable and hub connected to the EUT as this was found to be the worst case during pre-scans. All appropriate accessories were individually connected and measurements made during pre-scans to determine the worst case combination.
- As the EUT is not capable of transmitting while charging, no AC Mains conducted emissions (150 kHz to 30 MHz) test were performed in transmit mode.

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:	Patrick Jones	Test Date:	16 March 2011
Test Sample IMEI:	355320040013438		

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

Environmental Conditions:

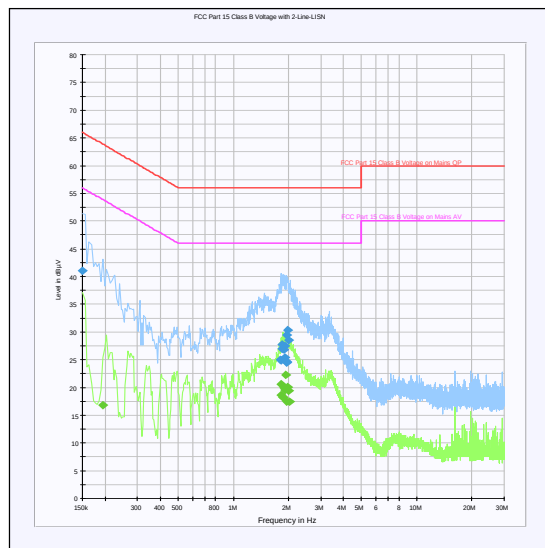
Temperature (°C):	25
Relative Humidity (%):	29

Results: Quasi Peak

Frequency (MHz)	Line	Level (dBμV)	Limit (dBμV)	Margin (dB)	Result
0.150000	Neutral	41.0	66.0	25.0	Complied
1.806000	Live	25.0	56.0	31.0	Complied
1.833000	Live	24.9	56.0	31.1	Complied
1.842000	Live	27.0	56.0	29.0	Complied
1.851000	Live	27.8	56.0	28.2	Complied
1.878000	Live	27.4	56.0	28.6	Complied
1.891500	Live	26.9	56.0	29.1	Complied
1.900500	Live	25.4	56.0	30.6	Complied
1.918500	Live	27.4	56.0	28.6	Complied
1.923000	Live	24.7	56.0	31.3	Complied
1.945500	Live	24.7	56.0	31.3	Complied
1.954500	Live	29.5	56.0	26.5	Complied
1.963500	Live	24.5	56.0	31.5	Complied
1.986000	Live	30.4	56.0	25.6	Complied
1.999500	Live	28.6	56.0	27.4	Complied

Receiver/Idle Mode AC Conducted Spurious Emissions (continued)**Results: Average**

Frequency (MHz)	Line	Level (dBμV)	Limit (dBμV)	Margin (dB)	Result
0.195000	Neutral	16.8	53.8	37.0	Complied
1.824000	Live	18.6	46.0	27.4	Complied
1.828500	Live	20.6	46.0	25.4	Complied
1.860000	Live	18.2	46.0	27.8	Complied
1.864500	Live	18.2	46.0	27.8	Complied
1.896000	Live	20.0	46.0	26.0	Complied
1.905000	Live	19.5	46.0	26.5	Complied
1.941000	Live	22.2	46.0	23.8	Complied
1.963500	Live	17.5	46.0	28.5	Complied
1.968000	Live	20.1	46.0	25.9	Complied
1.995000	Live	19.4	46.0	26.6	Complied
2.026500	Live	17.5	46.0	28.5	Complied



Note: This plot is a pre-scan and for indication purposes only. For final measurements, see accompanying tables.

5.2.2. Receiver/Idle Mode Radiated Spurious Emissions**Test Summary:**

Test Engineer:	Andrew Edwards	Test Date:	12 & 13 March 2011
Test Sample IMEI:	355320040013438		

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:

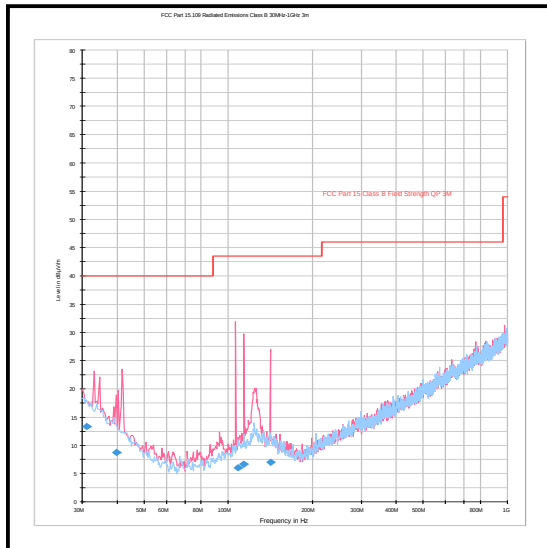
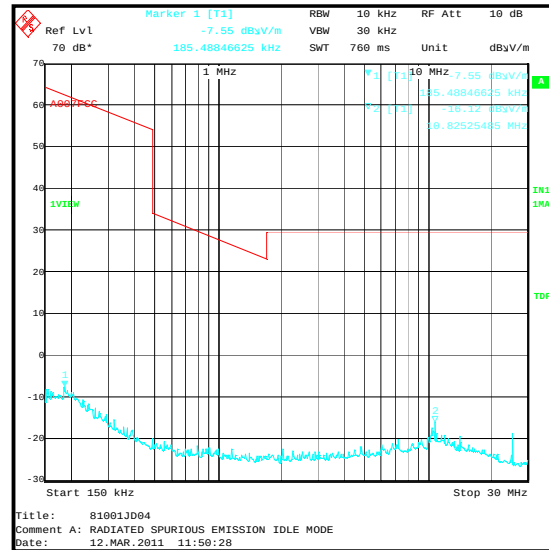
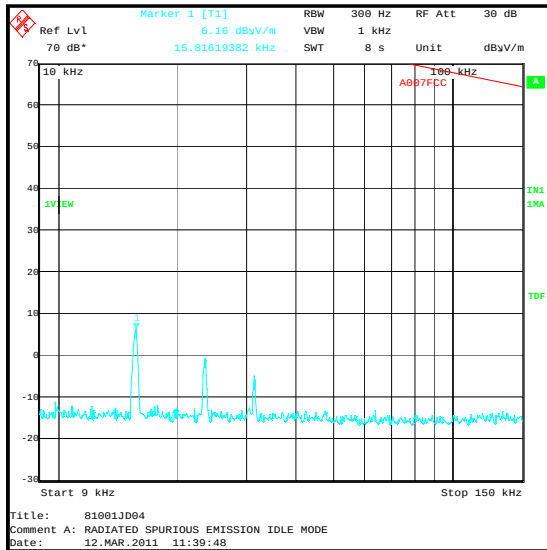
Temperature (°C):	26
Relative Humidity (%):	23

Results: Quasi Peak

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
31.096	Vertical	13.4	40.0	26.6	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 Fundamental Field Strength**Test Summary:**

Test Engineer:	Andrew Edwards	Test Date:	12 March 2011
Test Sample IMEI:	355320040013438		

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

Environmental Conditions:

Temperature (°C):	27
Relative Humidity (%):	22

Results: Quasi Peak

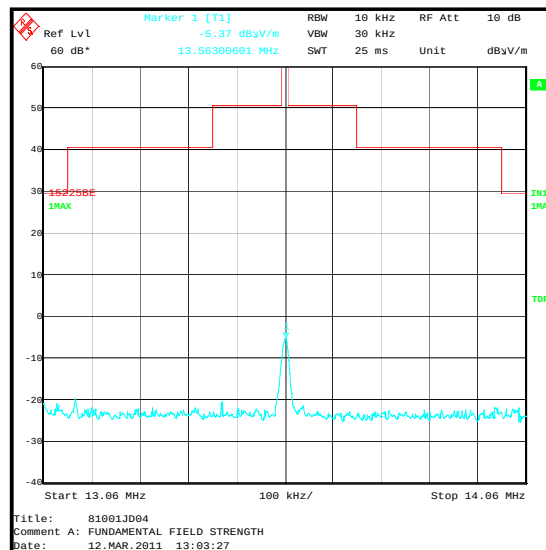
Frequency (MHz)	Antenna Polarity	Level (dBμV/m)	Limit at 30 m (dBμV/m)	Margin (dB)	Result
13.56	90° to EUT	14.4	84.0	69.6	Complied

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.

Note: An additional 20 dB has been added to attain the final value shown in the table; this is to account for a transducer factor that was not included during the original measurement.

$$i.e.: -5.6 \text{ dBuV/m} + 20 \text{ dB} = 14.4 \text{ dBuV/m}$$



5.2.4. Transmitter Radiated Spurious Emissions**Test Summary:**

Test Engineer:	Andrew Edwards	Test Date:	12 March 2011 13 March 2011
Test Sample IMEI:	355320040013438		

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:

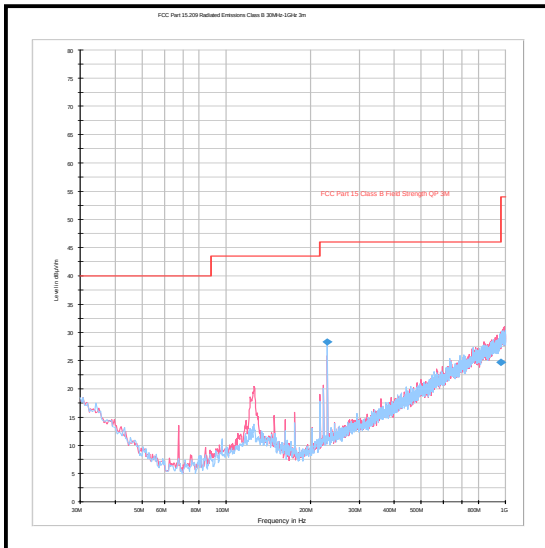
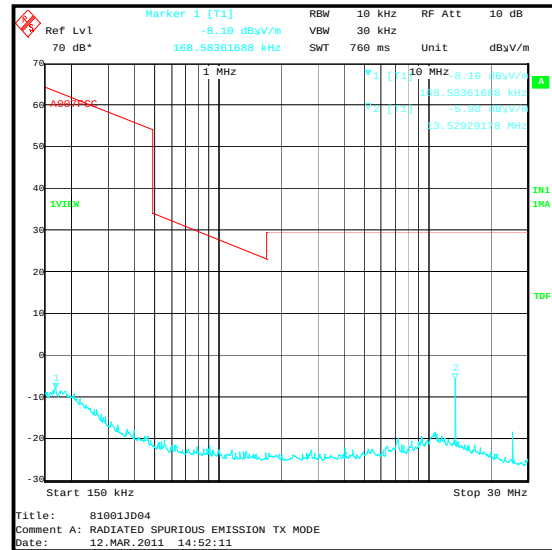
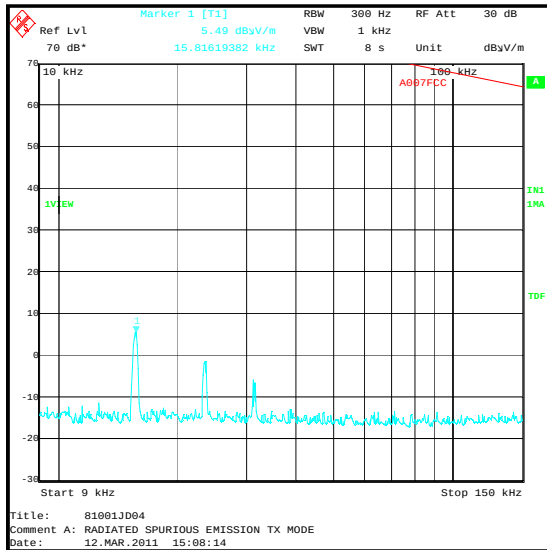
Temperature (°C):	29
Relative Humidity (%):	21

Results: Quasi Peak

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
230.508	Horizontal	28.3	46.0	17.7	Complied

Note(s):

- 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).
- 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.
- Final measurement values include corrections for antenna factor and cable losses.
- The emission shown at approximately 13.56 MHz is the fundamental.
- All emissions on the 9 kHz to 150 kHz plot were investigated and found to be radiating from the test site turntable.
- 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.
- 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.

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

Test Engineer:	Andrew Edwards	Test Date:	12 March 2011
Test Sample IMEI:	355320040013438		

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):	27
Relative Humidity (%):	22

Results: Quasi Peak Lower Band Edge

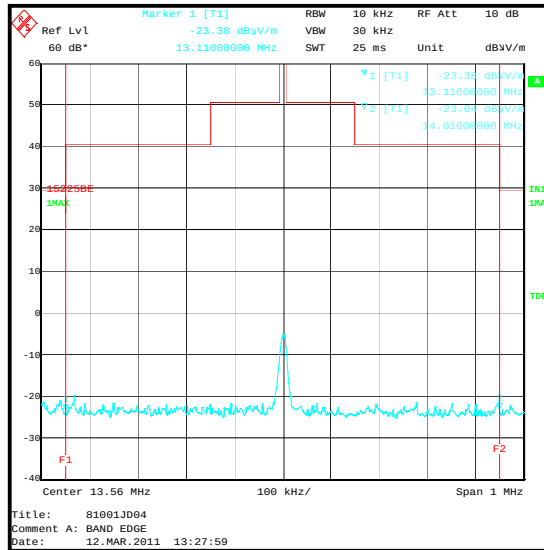
Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
13.11	-3.4	29.5	32.9	Complied

Results: Quasi Peak Upper Band Edge

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
14.01	-3.0	29.5	32.5	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.
3. The band edge emission plot shown below is low by a factor of 20 dB, due to the absence of a transducer factor at the time of measurement. An additional 20 dB was subsequently added to any band edge measurements, for comparisons with the limit, when determining compliance.

Transmitter Band Edge Radiated Emissions (continued)

5.2.6. Transmitter 20 dB Bandwidth**Test Summary:**

Test Engineer:	Andrew Edwards	Test Date:	12 March 2011
Test Sample IMEI:	355320040013438		

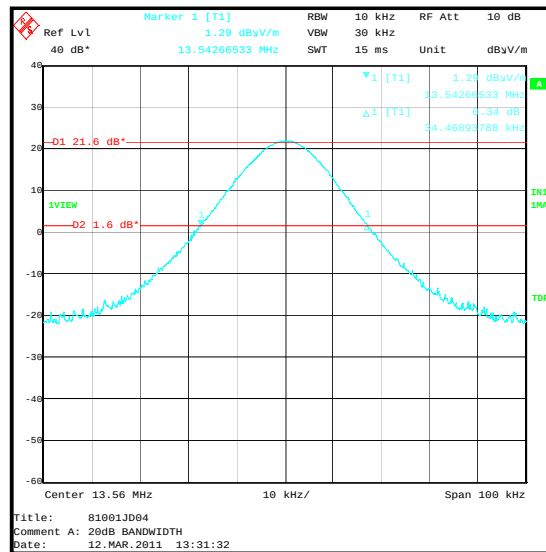
FCC Part:	2.1049
Test Method Used:	As detailed in ANSI C63.10 Section 6.9.1

Environmental Conditions:

Temperature (°C):	27
Relative Humidity (%):	22

Results:

20 dB Bandwidth (kHz)
34.469



5.2.7. Transmitter Frequency Stability (Temperature & Voltage Variation)**Test Summary:**

Test Engineer:	Patrick Jones	Test Date:	15 March 2011
Test Sample IMEI:	355320040013438		

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

Environmental Conditions:

Temperature (°C):	25
Relative Humidity (%):	30

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	13.560054 MHz	13.560055 MHz	13.560054 MHz	13.560053 MHz
20	13.560026 MHz	13.560025 MHz	13.560027 MHz	13.560026 MHz
50	13.559968 MHz	13.559965 MHz	13.559964 MHz	13.559964 MHz

Frequency with Worst Case Deviation (MHz)	Frequency Error (Hz)	Frequency Error (%)	Limit (%)	Margin (%)	Result
13.560055	55	0.00041	0.01	0.0096	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
3.4	13.56	13.560033	33	0.000243	0.01	0.0098	Complied
3.7	13.56	13.560034	34	0.000251	0.01	0.0097	Complied
4.2	13.56	13.560031	31	0.000229	0.01	0.0098	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 measured (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.

7. Report Revision History

Version Number	Revision Details		
	Page No(s)	Clause	Details
1.0	-	-	Initial Version
2.0	15 & 18	-	Corrected previously reported emissions levels by +20 dB

Appendix 1. Test Equipment Used

UL No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval Months
A1069	LISN	Rohde & Schwarz	ESH3-Z5	837469/012	13 Apr 2011	12
A1830	Pulse Limiter	Rhode & Schwarz	ESH3-Z2	100668	05 Mar 2012	12
A1834	Attenuator	Hewlett Packard	8491B	10444	30 Jun 2011	12
A553	Antenna	Chase	CBL6111A	1593	16 Mar 2011	12
E0516	Environmental Chamber	TAS	LT1000	23880706	Calibrated before use	12
G0543	Amplifier	Sonoma Instrument	310N	230801	30 Jun 2011	12
K0001	5m Semi-Anechoic Chamber	Rainford EMC	N/A	N/A	25 Apr 2011	12
L1001	Test Receiver	Rohde & Schwarz	ESU26	100239	16 Mar 2011	12
M1068	Thermometer	Iso-Tech	RS55	93102884	10 Nov 2011	12
M1229	Multimeter	Fluke	179	87640015	15 Jul 2011	12
M1263	Test Receiver	Rohde & Schwarz	ESIB7	100265	28 Jun 2011	12
M1273	Test Receiver	Rohde & Schwarz	ESIB 26	100275	04 Feb 2012	12
M1568	Antenna	Rohde & Schwarz	HFH2-Z2	879284/2	27 Jan 2012	12
S0537	Power Supply	TTI	EL302D	249928	Calibrated before use	-

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

--- END OF REPORT ---