TEST REPORT

Test Report No. : UL-RPT-RP10363939JD09A V2.0

Manufacturer	:	Panasonic Mobile Communications Development of Europe Ltd
Model No.	:	NTT docomo P-01G/EB-4068
FCC ID	:	UCE114061A
Technology	:	RFID – 13.56 MHz
Test Standard(s)	:	FCC Parts 15.207, 15.209(a) & 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 all previous versions.

Date of Issue: 10 September 2014

Checked by:

Ian Watch
Senior Engineer, Radio Laboratory

Issued by :

pp

John Newell
Quality Manager,
UL VS LTD

0644

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:	47CFR15.207 and 47CFR15.209
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications): Part 15 Subpart C (Intentional Radiators) - Sections 15.207 and 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 August 2014 to 18 August 2014

2.2. Summary of Test Results

FCC Reference (47CFR)	Measurement	Result
Part 15.225(a)(b)(c)(d)	Transmitter Fundamental Field Strength	✓
Part 15.209(a)/15.225(d)	Transmitter Radiated 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-01G/EB-4068
Test Sample IMEI:	353758060006554
Hardware Version Number:	Rev C
Software Version Number:	ACPU: B-D42CS1-02.01.001 CCPU: D42CS1_Cv18122202
FCC ID:	UCE114061A

Brand Name:	NTT docomo
Description:	AC Adapter
Model Name or Number:	AC 01 (Part Number MAS-BH0008-A 002)
Serial Number:	Not marked or stated

Brand Name:	NTT docomo
Description:	USB Cable with Charger Function
Model Name or Number:	02
Serial Number:	#62

Brand Name:	NTT docomo
Description:	Stereo Earphone Set
Model Name or Number:	01
Serial Number:	#26

Brand Name:	NTT docomo
Description:	Battery
Model Name or Number:	P31

3.2. Description of EUT

The Equipment Under Test was a single mode UTRA mobile phone with *Bluetooth*® (V2.0 + EDR) 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	
Power Supply Requirement:	Nominal	3.7 V
	Minimum	3.4 V
	Maximum	4.2 V
Tested Temperature Range:	Minimum	-20°C
	Maximum	55°C

3.5. Support Equipment

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

Description:	Dummy battery / test jig
Brand Name:	Panasonic
Model Name or Number:	Not marked or stated

Description:	Mini Test SIM
Brand Name:	Rohde & Schwarz
Model Name or Number:	CMW-Z04

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 with a modulated carrier in RFID test mode.

4.2. Configuration and Peripherals

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

- RFID transmitter test mode was enabled using a test USIM and a customer specific test application on the EUT.
- All tests were performed without the AC charger connected. The RFID transmitter is only enabled in the absence of the charger.
- Testing at voltage extremes was performed with a supplied dummy battery / test jig fitted to the EUT which was then powered by an external DC supply.

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.

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 Fundamental Field Strength

Test Summary:

Test Engineer:	Sandeep Bharat	**Test Date:**	12 August 2014
Test Sample IMEI:	353758060006554		

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

Environmental Conditions:

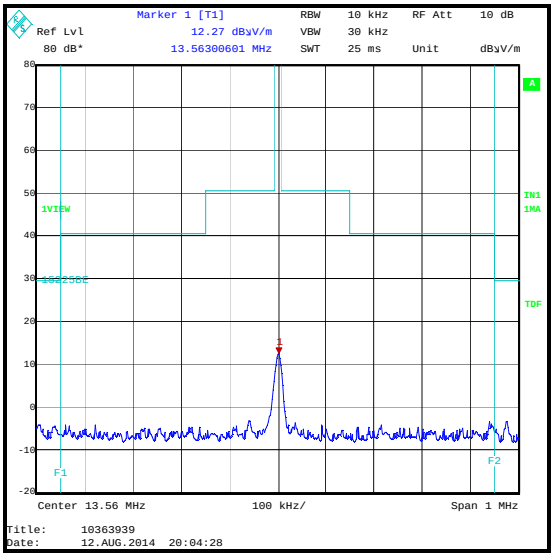
Temperature (°C):	24
Relative Humidity (%):	48

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.
3. Pre-scans were performed with a peak detector. Final measurements were performed with a quasi-peak detector.

Results: Quasi Peak

Frequency (MHz)	Antenna Orientation	Level (dBµV/m)	Limit at 30 m (dBµV/m)	Margin (dB)	Result
13.56	0°to EUT	12.2	84.0	71.8	Complied



Transmitter Fundamental Field Strength (continued)

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1622	Thermohygrometer	JM Handelspunkt	30.5015.13	None stated	31 Dec 2014	12
K0001	5m RSE Chamber	Rainford EMC	N/A	N/A	26 Nov 2014	12
M1568	Magnetic Loop Antenna	Rohde & Schwarz	HFH2-Z2	879284/2	26 Feb 2015	12
M1273	Test Receiver	Rohde & Schwarz	ESIB 26	100275	15 Feb 2015	12

5.2.2. Transmitter Radiated Spurious Emissions

Test Summary:

Test Engineer:	Sandeep Bharat	**Test Date:**	12 August 2014
Test Sample IMEI:	353758060006554		

FCC Reference:	Parts 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 (%):	48

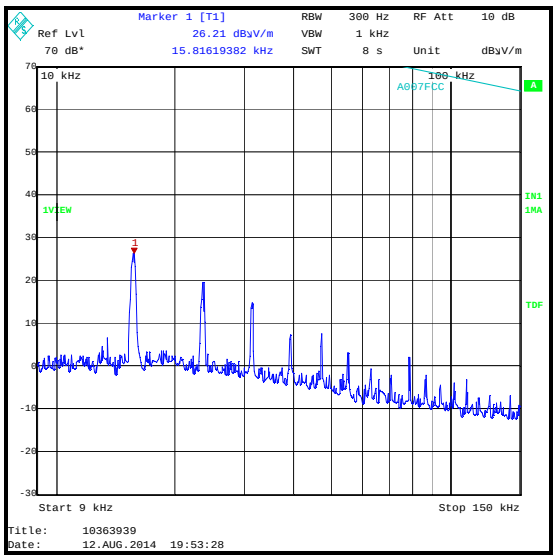
Note(s):

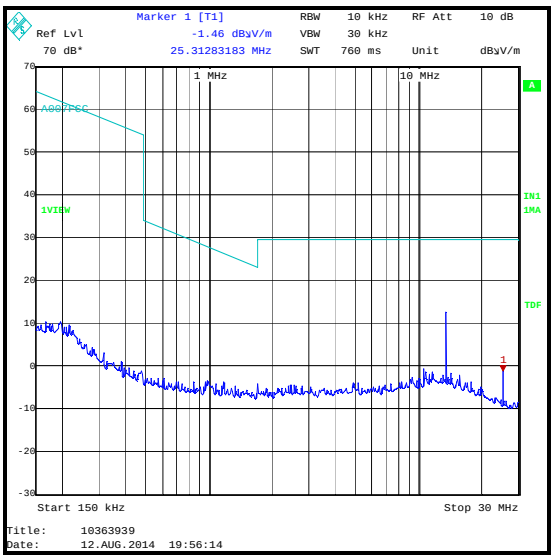
1. Limits below 30 MHz are specified at a test distance of 30 metres, whilst below 0.49 MHz they are specified at a test distance of 300 metres. However, as specified by FCC Section 15.31 (f)(2), measurements may be performed at a closer distance and the measured level corrected to the specified measurement 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, therefore the highest measurement system noise floor level is recorded in the table below.
7. Measurements in the range 30 MHz to 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.

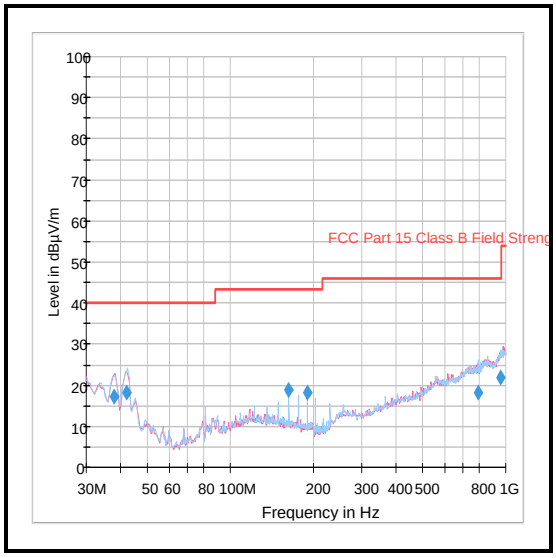
Results:

Frequency (MHz)	Antenna Polarity	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
956.044	Horizontal	22.0	46.0	24.0	Complied

Transmitter Radiated Spurious Emissions (continued)







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

Transmitter Radiated Spurious Emissions (continued)

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1622	Thermohygrometer	JM Handelspunkt	30.5015.13	None stated	31 Dec 2014	12
K0001	5m RSE Chamber	Rainford EMC	N/A	N/A	26 Nov 2014	12
M1568	Magnetic Loop Antenna	Rohde & Schwarz	HFH2-Z2	879284/2	26 Feb 2015	12
M1273	Test Receiver	Rohde & Schwarz	ESIB 26	100275	15 Feb 2015	12
A490	Antenna	Chase	CBL6111A	1590	29 Apr 2015	12
A1834	Attenuator	Hewlett Packard	8491B	10444	15 Nov 2014	12
G0543	Amplifier	Sonoma	310N	230801	19 Aug 2014	3

5.2.3. Transmitter Band Edge Radiated Emissions

Test Summary:

Test Engineer:	Sandeep Bharat	**Test Date:**	18 August 2014
Test Sample IMEI:	353758060006554		

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

Environmental Conditions:

Temperature (°C):	22
Relative Humidity (%):	40

Note(s):

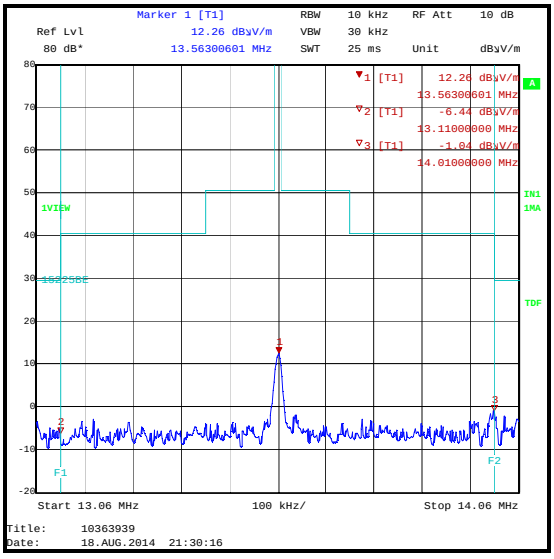
1. A transducer factor on the measuring instrument was used to extrapolate the results at 3 metres to a distance of 30 metres where required. A distance extrapolation factor of 40 dB was used.

Results: Lower Band Edge

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
13.11	-6.4	29.5	30.5	Complied

Results: Upper Band Edge

Frequency (MHz)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
14.01	-1.0	29.5	30.5	Complied



Transmitter Band Edge Radiated Emissions (continued)

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1622	Thermohygrometer	JM Handelspunkt	30.5015.13	None stated	31 Dec 2014	12
K0001	5m RSE Chamber	Rainford EMC	N/A	N/A	26 Nov 2014	12
M1568	Magnetic Loop Antenna	Rohde & Schwarz	HFH2-Z2	879284/2	26 Feb 2015	12
M1273	Test Receiver	Rohde & Schwarz	ESIB 26	100275	15 Feb 2015	12

5.2.4. Transmitter 20 dB Bandwidth

Test Summary:

Test Engineer:	David Doyle	**Test Date:**	18 August 2014
Test Sample IMEI:	353758060006554		

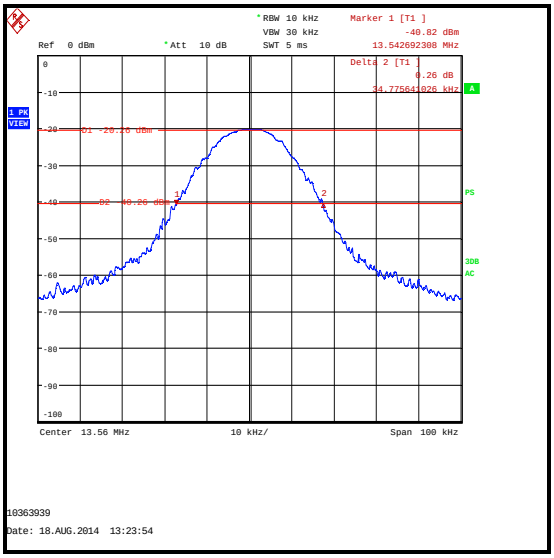
FCC Reference:	Part 2.1049
Test Method Used:	As detailed in ANSI C63.10 Section 6.9.1

Environmental Conditions:

Temperature (°C):	23
Relative Humidity (%):	42

Results:

20 dB Bandwidth (kHz)
34.776



Transmitter 20 dB Bandwidth (continued)

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1886	Test Receiver	Rohde & Schwarz	ESU 26	100554	09 May 2015	12
M1229	Multimeter	Fluke	179	87640015	24 Apr 2015	12
S0557	DC Power Supply	TTi	EL303R	395819	Calibrated before use	-

5.2.5. Transmitter Frequency Stability (Temperature & Voltage Variation)

Test Summary:

Test Engineer:	David Doyle	**Test Date:**	18 August 2014
Test Sample IMEI:	353758060006554		

FCC Reference:	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 (℃):	23
Ambient Relative Humidity (%):	42

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	13.560124 MHz	13.560127 MHz	13.560123 MHz	13.560105 MHz
20	13.560061 MHz	13.560057 MHz	13.560054 MHz	13.560048 MHz
50	13.560010 MHz	13.560012 MHz	13.560012 MHz	13.560012 MHz

Frequency with Worst Case Deviation (MHz)	Frequency Error (Hz)	Frequency Error (%)	Limit (%)	Margin (%)	Result
13.560127 MHz	127	0.000937	0.01	0.009063	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	13.560056	56	0.000413	0.01	0.009587	Complied
3.7	13.56	13.560061	61	0.000450	0.01	0.009550	Complied
4.2	13.56	13.560060	60	0.000442	0.01	0.009558	Complied

Transmitter Frequency Stability (Temperature & Voltage Variation) (continued)

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1886	Test Receiver	Rohde & Schwarz	ESU 26	100554	09 May 2015	12
M1229	Multimeter	Fluke	179	87640015	24 Apr 2015	12
M1068	Thermometer	Iso-Tech	RS55	93102884	02 May 2015	12
E013	Environmental Chamber	Sanyo	MTH-4200PR	None	Calibrated before use	-
S0557	DC Power Supply	TTi	EL303R	395819	Calibrated before use	-

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
20 dB Bandwidth	13 MHz to 14 MHz	95%	±3.92 %
Frequency Stability	13 MHz to 14 MHz	95%	±0.92 ppm
Radiated Spurious Emissions	9 kHz to 30 MHz	95%	±3.73 dB
Radiated Spurious Emissions	30 MHz to 1000 MHz	95%	±5.65 dB
Transmitter Fundamental Field Strength	13 MHz to 14 MHz	95%	±3.73 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	18 & 20	-	Corrected test equipment descriptions and cal due dates

--- END OF REPORT ---