



TEST REPORT

Test Report No. : UL-RPT-RP10895533JD04C V3.0

Manufacturer : Bang & Olufsen a/s
Model No. : WUS-AC08V
FCC ID : TTUWUSAC08V
Technology : *Bluetooth* – Basic Rate & EDR
Test Standard(s) : FCC Parts 15.209(a) & 15.247(d)

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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: 20 December 2016

Checked by:

Sarah Williams
Engineer, Radio Laboratory

Company Signatory:

Ian Watch
Senior Engineer, Radio Laboratory
UL VS LTD



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1. Customer Information

Company Name:	Bang & Olufsen A/S
Address:	Peter Bangs Vej 15 7600 Struer Denmark

2. Summary of Testing

2.1. General Information

Specification Reference:	47CFR15.247
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications): Part 15 Subpart C (Intentional Radiators) - Section 15.247
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:	05 April 2016 to 13 April 2016

2.2. Summary of Test Results

FCC Reference (47CFR)	Measurement	Result
Part 15.247(d) & 15.209(a)	Transmitter Radiated Emissions	✓
Part 15.247(d) & 15.209(a)	Transmitter Band Edge Radiated Emissions	✓
Key to Results		
 = Complied		 = Did not comply

2.3. Methods and Procedures

Reference:	ANSI C63.10-2013
Title:	American National Standard of Procedures for Compliance Testing of 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:	WUS-AC08V
Model Name or Number:	WUS-AC08V
Test Sample MAC address:	542AA22F8F19 (<i>Conducted sample</i>)
Hardware Version:	A1G
Software Version:	4.2.3.5
FCC ID:	TTUWUSAC08V

3.1.1 Host Product Details

Brand Name:	BeoVision 14-55
Model Name or Number:	BeoVision 14-55
Test Sample Serial Number:	92875 (<i>Radiated sample</i>)
Hardware Version:	8009004
Software Version:	7.77

Description:	AC power cable
Brand Name:	Not marked or stated
Model Name or Number:	Not marked or stated
Serial Number:	Not marked or stated

3.2. Description of EUT

The equipment under test was a *Bluetooth* Basic Rate + EDR, *Bluetooth* Low Energy, IEEE 802.11a,b,g,n,ac WLAN module operating in the 2.4 GHz and 5 GHz bands, which was incorporated into a 55" Television. The EUT has two external antenna ports with two transmit chains and MIMO is supported. For 802.11a/g/n/ac operation the device uses two by two MIMO transmitters. Depending on the 802.11 data rate, the device transmits 1 or 2 spatial stream. The device uses spatial multiplexing and from an RF point of view the streams are correlated.

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:	<i>Bluetooth</i>				
Power Supply Requirement:	Nominal	120 VAC 60 Hz			
Type of Unit:	Transceiver				
Channel Spacing:	1 MHz				
Mode:	Basic Rate	Enhanced Data Rate			
Modulation:	GFSK	$\pi/4$ -DQPSK	8DPSK		
Packet Type: (Maximum Payload):	DH5	2DH5	3DH5		
Data Rate (Mbps):	1	2	3		
Transmit Frequency Range:	2402 MHz to 2480 MHz				
Transmit Channels Tested:	Channel ID	Channel Number	Channel Frequency (MHz)		
	Bottom	0	2402		
	Middle	39	2441		
	Top	78	2480		

3.5. Support Equipment

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

Description:	Remote control
Brand Name:	Bang & Olufsen a/s
Model Name or Number:	BeoRemote One T30
Serial Number:	25143484

Description:	BTLE box
Brand Name:	Alpha Network
Model Name or Number:	WUS-AC08V
Serial Number:	H11145216

Description:	HDMI cable. Quantity 3. Length 2m
Brand Name:	Not marked or stated
Model Name or Number:	Not marked or stated
Serial Number:	Not marked or stated

Description:	HDMI cable. Quantity 1. Length 3m
Brand Name:	Not marked or stated
Model Name or Number:	Not marked or stated
Serial Number:	Not marked or stated

Support Equipment (continued)

Description:	Now TV set top box
Brand Name:	Sky
Model Name or Number:	2400SK
Serial Number:	1MM4DE006281

Description:	Now TV set top box
Brand Name:	Sky
Model Name or Number:	2400SK
Serial Number:	1MM552038807

Description:	Now TV set top box
Brand Name:	Sky
Model Name or Number:	2400SK
Serial Number:	1MM4D8006255

Description:	HDMI media player
Brand Name:	SUMVISION
Model Name or Number:	Cyclone Micro
Serial Number:	SUM091104017

Description:	Ethernet cable. Quantity 3. Length 2m
Brand Name:	Not marked or stated
Model Name or Number:	Not marked or stated
Serial Number:	Not marked or stated

Description:	Ethernet cable. Quantity 3. Length 3m
Brand Name:	Not marked or stated
Model Name or Number:	Not marked or stated
Serial Number:	Not marked or stated

Description:	Ethernet cable. Quantity 1. Length 5m
Brand Name:	Not marked or stated
Model Name or Number:	Not marked or stated
Serial Number:	Not marked or stated

Support Equipment (continued)

Description:	Ethernet cable. Quantity 1. Length 10m
Brand Name:	Not marked or stated
Model Name or Number:	Not marked or stated
Serial Number:	Not marked or stated

Description:	ADSL2+ Modem Router
Brand Name:	Netgear
Model Name or Number:	DG834 v4
Serial Number:	1PL596BD001A4

Description:	ADSL Modem Router
Brand Name:	Linksys
Model Name or Number:	WAG54G
Serial Number:	CF610E100799

Description:	USB cable type A male to type A male. Quantity 3. Length 3m
Brand Name:	Not marked or stated
Model Name or Number:	Not marked or stated
Serial Number:	Not marked or stated

Description:	Audio cable 3.5mm male to 3.5mm male. Quantity 1. Length 3m
Brand Name:	Not marked or stated
Model Name or Number:	Not marked or stated
Serial Number:	Not marked or stated

Description:	Aerial cable. Quantity 1. Length 2m
Brand Name:	Belkin
Model Name or Number:	Not marked or stated
Serial Number:	Not marked or stated

Description:	Freeview Set Top Box
Brand Name:	Sagem
Model Name or Number:	251657024
Serial Number:	441901036882

Support Equipment (continued)

Description:	USB cable type A male to type B male. Quantity 1. Length 3m with 3 FAIR-RITE V0 ferrites and 1 unmarked or stated ferrite
Brand Name:	Not marked or stated
Model Name or Number:	Not marked or stated
Serial Number:	Not marked or stated

Description:	Laptop PC
Brand Name:	Lenovo
Model Name or Number:	T61
Serial Number:	L3E7586

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

- Continuously transmitting at maximum power on bottom, middle, top and hopping channels in Basic Rate (DH5 packets) or EDR (2DH5 or 3DH5 packets) as required.

4.2. Configuration and Peripherals

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

- Controlled using a test application, WCN Combo Tool (version 2.1434.00, build Aug 18, 2014) by MediaTek Inc, supplied by the customer. The relevant instructions for using the tool on the EUT were contained within the document MT7662 BT tool user manual v0_20141204.pdf.
- Transmit tests: The EUT was placed into *RF Test* mode using a laptop PC and the Combo Tool application. *Pattern* was set to Tx PRBS, *Packet type* was set to DH5, 2DH5 or 3DH5 as required. *Data length* was the default maximum allowed for each packet type. The EUT was set to a particular single test channel, or hopping mode, as required.
- Transmit tests: The continuous transmit power level was set on the test application. *Tx Power Level* was set to 5 for all tests, at the request of the customer.
- Radiated measurements: In order to operate the EUT the TV needed to be enabled. This was done by turning on the TV and pairing it with T30 remote control with the external BTLE box which was connected to the TV. The external BTLE box has 0.83m cable with a USB type A male connector. Once the TV was enabled, the EUT could be controlled using the MT7662U application. This was connected between the TV and laptop by the means of a 2m USB cable (type A to type B) with four ferrites on it.
- Once the EUT was in transmit mode, the T30 remote control and external BTLE box were removed from the chamber before testing commenced.
- For all radiated tests the support equipment was used to terminate all active ports.

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 Radiated Emissions

Test Summary:

Test Engineer:	David Doyle	Test Date:	13 April 2016
Test Sample Serial Number:	92875		

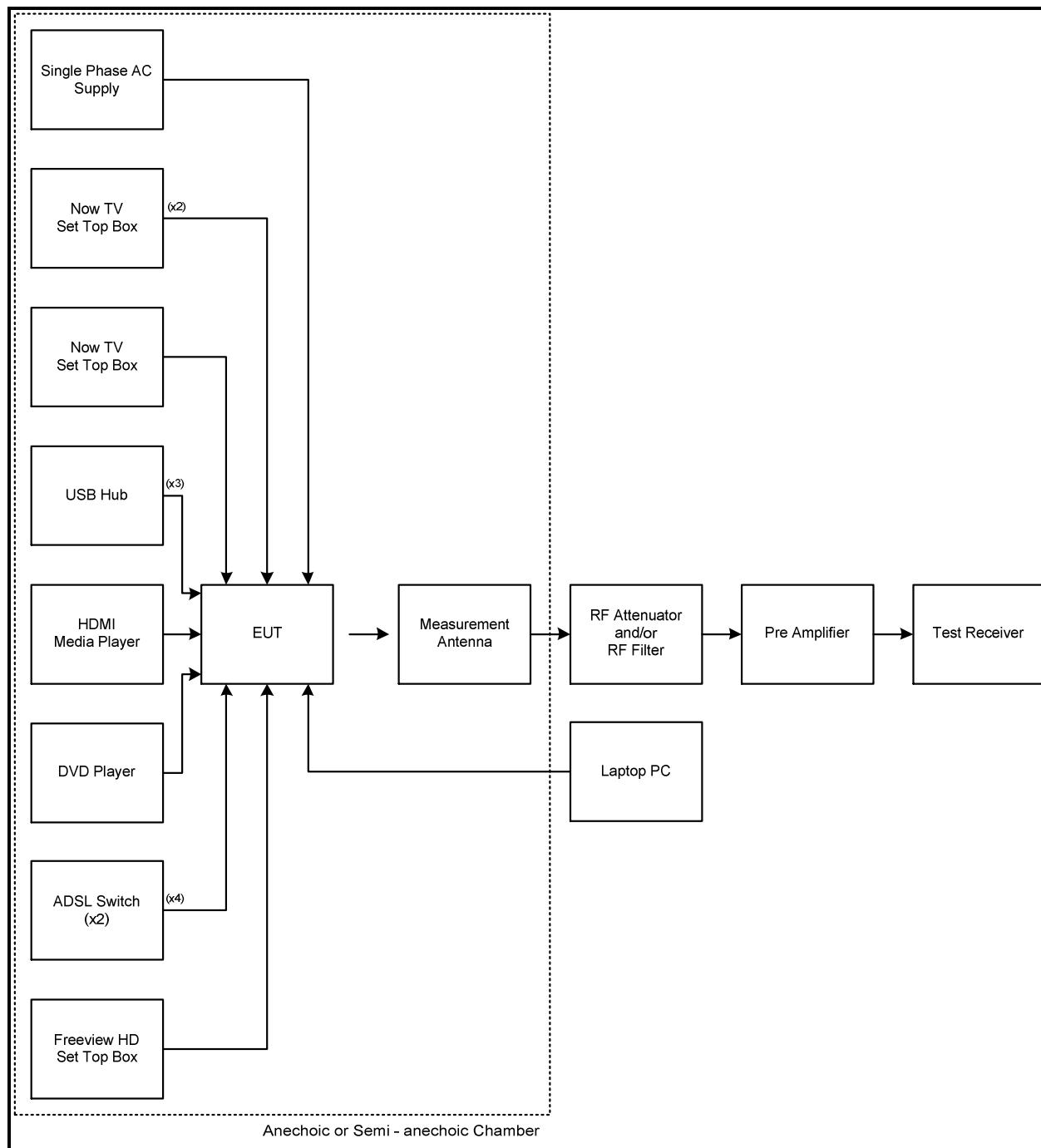
FCC Reference:	Parts 15.247(d) & 15.209(a)
Test Method Used:	ANSI C63.10 Sections 6.3 and 6.5
Frequency Range	30 MHz to 1000 MHz

Environmental Conditions:

Temperature (°C):	21
Relative Humidity (%):	32

Note(s):

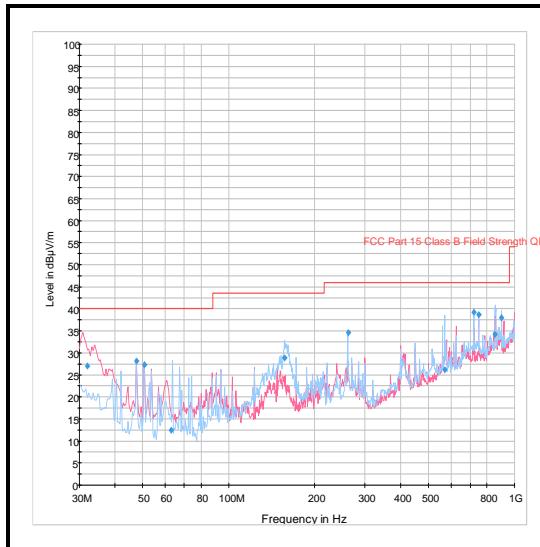
1. Transmitter radiated spurious emissions tests were performed with the EUT transmitting in DH5 mode as this was found to transmit the highest power and therefore deemed worst case.
2. The final measured value, for the given emission, in the table below incorporates the calibrated antenna factor and cable loss.
3. The preliminary scans showed similar emission levels below 1 GHz, for each channel of operation. Therefore final radiated emissions measurements were performed with the EUT set to the middle channel only.
4. All other emissions shown on the pre-scan plot were investigated and found to be ambient or >20 dB below the applicable limit or below the measurement system noise floor.
5. 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.
6. Pre-scans were performed and markers placed on the highest measured levels. The test receiver resolution bandwidth was set to 100 kHz and video bandwidth 300 kHz. The sweep time was set to auto. A peak detector was used, sweep time was set to auto and trace mode was Max Hold.
7. Final measurements were performed on the marker frequencies and the results entered into the table below. The test receiver resolution bandwidth was set to 120 kHz, using a CISPR quasi-peak detector and span big enough to see the whole emission.

Transmitter Radiated Emissions (continued)**Test setup for radiated measurements:**

Note: The number in brackets relates to the quantity of cables which were connected between the TV and the support equipment.

Transmitter Radiated Emissions (continued)**Results: Quasi-Peak / DH5**

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
262.142	Horizontal	34.7	46.0	11.3	Complied



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

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1627	Thermohygrometer	JM Handelspunkt	30.5015.10	None stated	11 Jan 2017	12
K0001	5m RSE Chamber	Rainford EMC	N/A	N/A	12 Jan 2017	12
G0543	Amplifier	Sonoma	310N	230801	29 May 2016	3
M1124	Test Receiver	Rohde & Schwarz	ESIB26	100046	18 Nov 2016	12
A259	Antenna	Chase	CBL6111	1513	19 Jul 2016	12
A1834	Attenuator	Hewlett Packard	8491B	10444	30 Mar 2017	12

Transmitter Radiated Emissions (continued)**Test Summary:**

Test Engineers:	Andrew Edwards & David Doyle	Test Dates:	05 April 2016 & 11 April 2016
Test Sample Serial Number:	92875		

FCC Reference:	Parts 15.247(d) & 15.209(a)
Test Method Used:	ANSI C63.10 Sections 6.3 and 6.6
Frequency Range	1 GHz to 25 GHz

Environmental Conditions:

Temperature (°C):	23 to 24
Relative Humidity (%):	33 to 35

Note(s):

1. Transmitter radiated spurious emissions tests were performed with the EUT transmitting in DH5 mode as this was found to transmit the highest power and therefore deemed worst case.
2. The final measured value, for the given emission, in the table below incorporates the calibrated antenna factor and cable loss.
3. All other emissions shown on the pre-scans were investigated and found to be ambient, or > 20 dB below the appropriate limit or below the noise floor of the measurement system.
4. The emission shown on the 1 GHz to 4 GHz plot is the EUT fundamental at 2441 MHz.
5. 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 1.5 m 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.
6. Pre-scans were performed and a marker placed on the highest measured level of the appropriate plot. The test receiver resolution bandwidth was set to 1 MHz and video bandwidth 3 MHz. The sweep time was set to auto. Peak and average measurements were performed with their own appropriate detectors during the pre-scan measurements.
7. *In accordance with ANSI C63.10 Section 6.6.4.3, Note 1, if the peak measured value complies with the average limit, it is unnecessary to perform an average measurement.
8. **-20 dBc limit applies in non-restricted band as the conducted output power measurements were performed using a peak detector.
9. The six highest spurious emissions relative to the limit were recorded in table below, as stated in ANSI C63.10 Section 6.6.4.3.

Transmitter Radiated Emissions (continued)**Results: Peak / Bottom Channel / DH5**

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
1145.192	Vertical	54.6	74.0	19.4	Complied
1499.984	Vertical	52.4	54.0*	1.6	Complied
1745.682	Horizontal	60.5	72.9**	12.4	Complied
2251.086	Horizontal	50.1	54.0*	3.9	Complied
2700.286	Vertical	52.4	54.0*	1.6	Complied
2854.487	Vertical	58.9	74.0	15.1	Complied

Results: Average / Bottom Channel / DH5

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
1145.192	Vertical	51.2	54.0	2.8	Complied
2854.487	Horizontal	48.1	54.0	5.9	Complied

Results: Peak / Middle Channel / DH5

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
1145.192	Vertical	54.6	74.0	19.4	Complied
1499.984	Vertical	52.4	54.0*	1.6	Complied
1745.682	Horizontal	60.5	73.7**	13.2	Complied
2251.086	Horizontal	50.1	54.0*	3.9	Complied
2700.286	Vertical	52.4	54.0*	1.6	Complied
2854.487	Vertical	58.9	74.0	15.1	Complied

Results: Average / Middle Channel / DH5

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
1145.192	Vertical	51.2	54.0	2.8	Complied
2854.487	Horizontal	48.1	54.0	5.9	Complied

Transmitter Radiated Emissions (continued)**Results: Peak / Top Channel / DH5**

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
1145.192	Vertical	54.6	74.0	19.4	Complied
1499.984	Vertical	52.4	54.0*	1.6	Complied
1745.682	Horizontal	60.5	74.9**	14.4	Complied
2251.086	Horizontal	50.1	54.0*	3.9	Complied
2700.286	Vertical	52.4	54.0*	1.6	Complied
2854.487	Vertical	58.9	74.0	15.1	Complied

Results: Average / Top Channel / DH5

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
1145.192	Vertical	51.2	54.0	2.8	Complied
2854.487	Horizontal	48.1	54.0	5.9	Complied

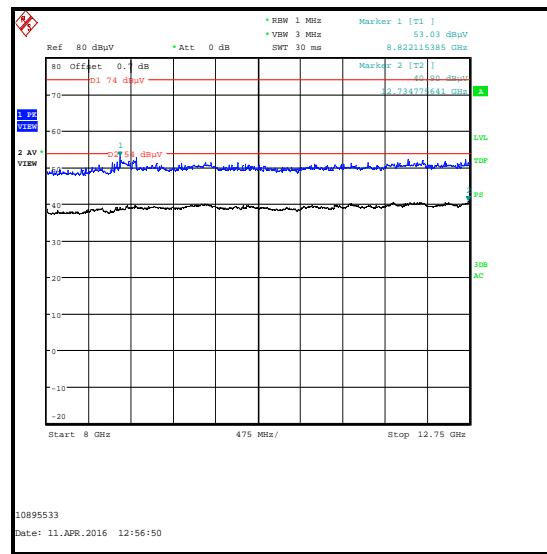
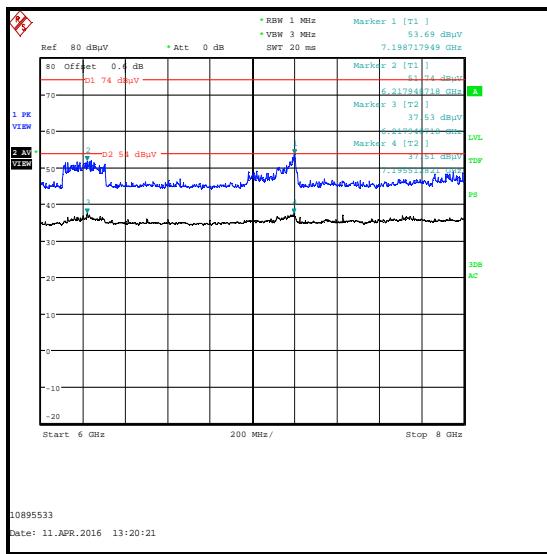
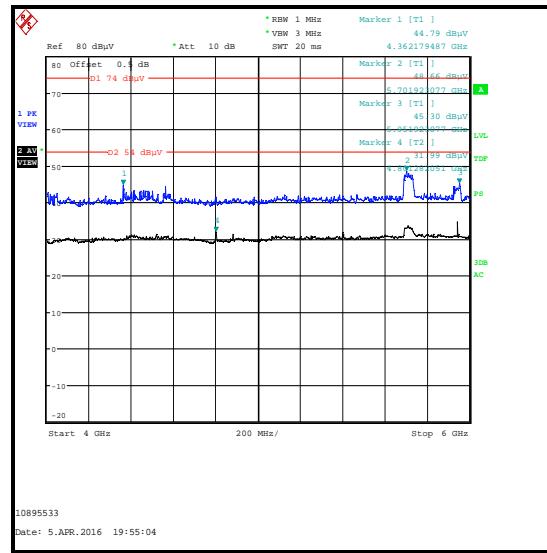
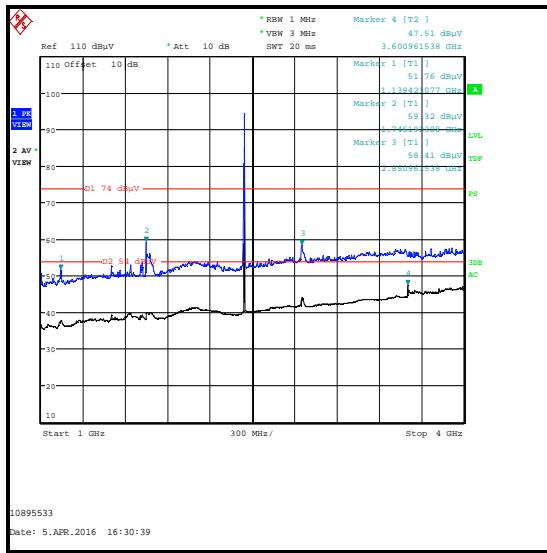
Results: Peak / Hopping Mode / DH5

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
1145.192	Vertical	54.6	74.0	19.4	Complied
1499.984	Vertical	52.4	54.0*	1.6	Complied
1745.682	Horizontal	60.5	74.8**	14.3	Complied
2251.086	Horizontal	50.1	54.0*	3.9	Complied
2700.286	Vertical	52.4	54.0*	1.6	Complied
2854.487	Vertical	58.9	74.0	15.1	Complied

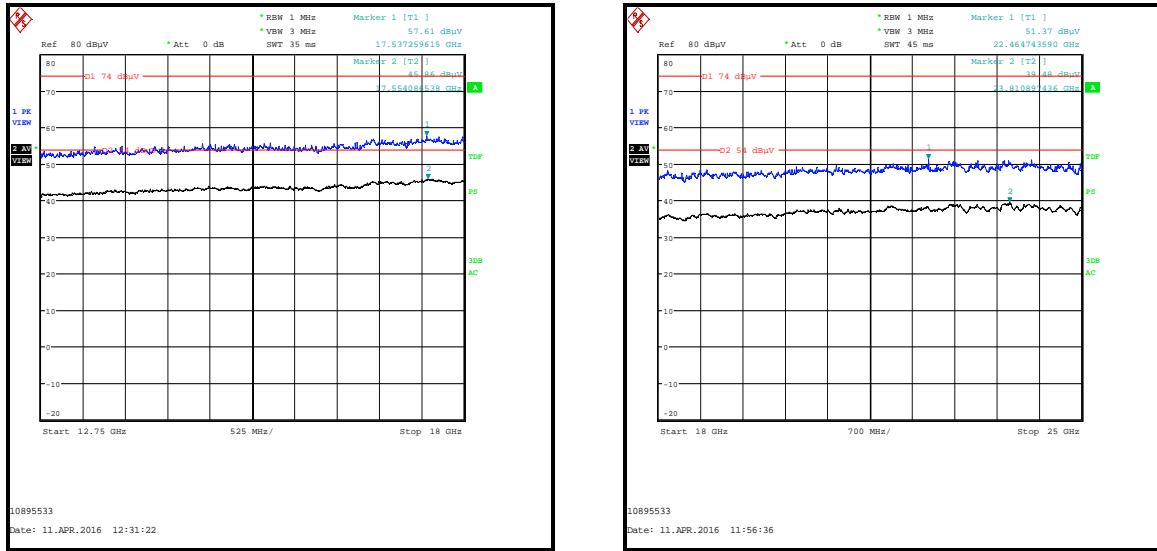
Results: Average / Hopping Channel / DH5

Frequency (MHz)	Antenna Polarity	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
1145.192	Vertical	51.2	54.0	2.8	Complied
2854.487	Horizontal	48.1	54.0	5.9	Complied

Transmitter Radiated Emissions (continued)



Transmitter Radiated Emissions (continued)



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

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1656	Thermohygrometer	JM Handelpunkt	30.5015.13	Not stated	23 Apr 2016	12
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	21 Dec 2016	12
M1886	Test Receiver	Rohde & Schwarz	ESU26	100554	21 Mar 2017	12
A1534	Pre Amplifier	Hewlett Packard	8449B	3008A00405	19 Dec 2016	12
A1818	Antenna	EMCO	3115	00075692	17 Dec 2016	12
A253	Antenna	Flann Microwave	12240-20	128	17 Dec 2016	12
A254	Antenna	Flann Microwave	14240-20	139	17 Dec 2016	12
A255	Antenna	Flann Microwave	16240-20	519	17 Dec 2016	12
A256	Antenna	Flann Microwave	18240-20	400	17 Dec 2016	12
A436	Antenna	Flann Microwave	20240-20	330	19 Dec 2016	12
A239	Attenuator	Huber & Suhner	6806.17.B	Not stated	05 May 2016	12
A1975	High Pass Filter	AtlanTecRF	AFH-03000	090424010	17 Apr 2016	12
K0001	5m RSE Chamber	Rainford EMC	N/A	N/A	12 Jan 2017	12
M1124	Test Receiver	Rohde & Schwarz	ESIB26	100046	18 Nov 2016	12
M1945	Thermohygrometer	JM Handelpunkt	30.5015.01	None stated	23 Apr 2016	12

5.2.2. Transmitter Band Edge Radiated Emissions

Test Summary:

Test Engineer:	David Doyle	Test Date:	05 April 2016
Test Sample Serial Number:	92875		

FCC Reference:	Parts 15.247(d) & 15.209(a)
Test Method Used:	ANSI C63.10 Sections 6.10.4 & 6.10.5

Environmental Conditions:

Temperature (°C):	23
Relative Humidity (%):	31

Note(s):

1. The final measured value, for the given emission, in the table below incorporates the calibrated antenna factor and cable loss.
2. The lower band edge falls within a non-restricted band. The test receiver resolution bandwidth was set to 100 kHz and video bandwidth 300 kHz. A peak detector was used, sweep time was set to auto and trace mode was Max Hold. The test receiver was left to sweep for a sufficient length of time in order to maximise the carrier level and out-of-band emissions. A marker and corresponding reference level line were placed on the peak of the carrier. A marker was placed on the band edge spot frequencies and a second marker placed on the highest emission level in the adjacent band (where a higher level emission was present). Marker frequencies and levels were recorded.
3. The upper band edge falls within a restricted band. The test receiver resolution bandwidth was set to 1 MHz and video bandwidth 3 MHz. Peak and average measurements were performed with their respective detectors, sweep time was set to auto and trace mode was Max Hold. The test receiver was left to sweep for a sufficient length of time in order to maximise the carrier level and out-of-band emissions. A marker was placed on the band edge spot frequencies and a second marker placed on the highest emission level in the adjacent band (where a higher level emission was present). Marker frequencies and levels were recorded.
4. There is a restricted band 10 MHz below the lower band edge. The test receiver was set up as follows: the RBW set to 1 MHz, the VBW set to 3 MHz, with the sweep time set to auto couple. Peak and average measurements were performed with their respective detectors. Markers were placed on the highest point on each trace.
5. The restricted band plot for 2310 MHz to 2390 MHz can be found under the results for DH5 static as this mode had the highest output power and was therefore deemed worst case.
6. * -20 dBc limit.

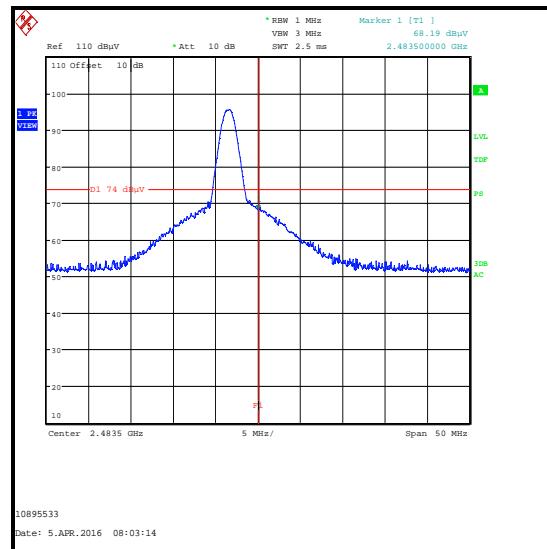
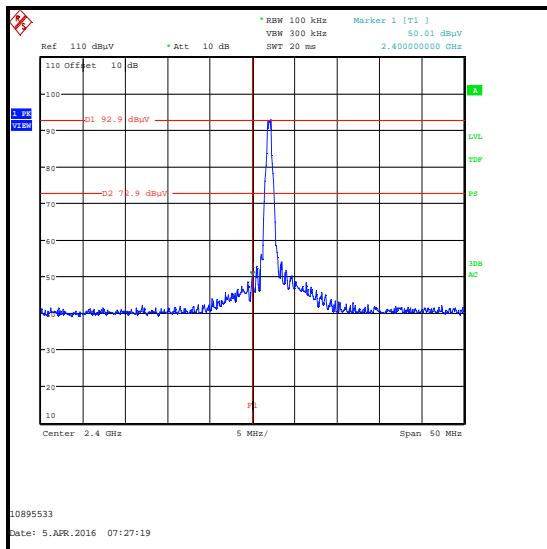
Transmitter Band Edge Radiated Emissions (continued)**Results: Static Mode / DH5**

Frequency (MHz)	Antenna Polarity	Peak Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2385.641	Horizontal	53.9	74.0	20.1	Complied
2400.0	Horizontal	50.0	72.9*	22.9	Complied
2483.5	Horizontal	68.2	74.0	5.8	Complied

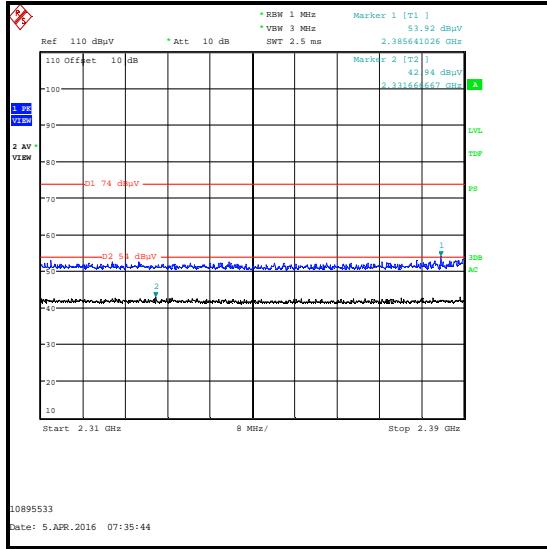
Frequency (MHz)	Antenna Polarity	Average Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2331.667	Horizontal	42.9	54.0	11.1	Complied
2483.5	Horizontal	51.2	54.0	2.8	Complied

Transmitter Band Edge Radiated Emissions (continued)

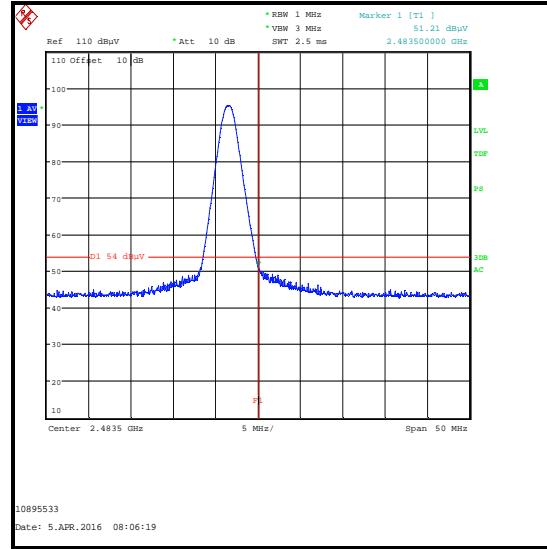
Results: Static Mode / DH5



Lower Band Edge Peak Static



Upper Band Edge Peak Static



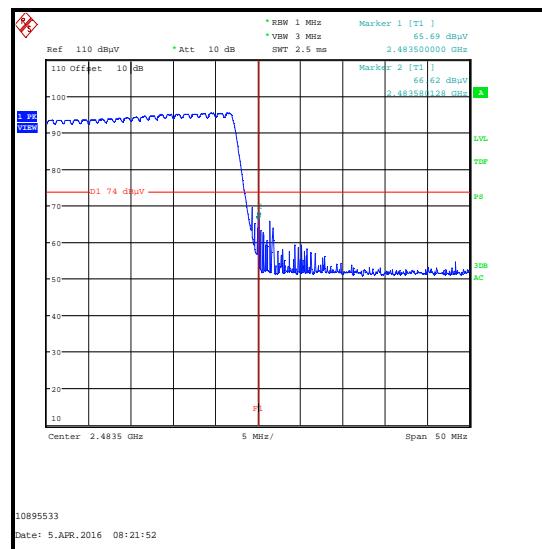
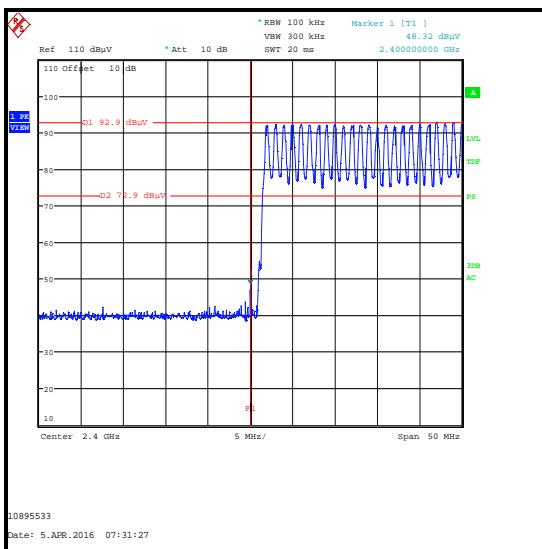
2310 MHz to 2390 MHz Restricted Band Plot

Upper Band Edge Average Static

Transmitter Band Edge Radiated Emissions (continued)**Results: Hopping Mode / DH5**

Frequency (MHz)	Antenna Polarity	Peak Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2400.0	Horizontal	48.3	72.9*	24.6	Complied
2483.5	Horizontal	65.7	74.0	8.3	Complied
2483.580	Horizontal	66.6	74.0	7.4	Complied

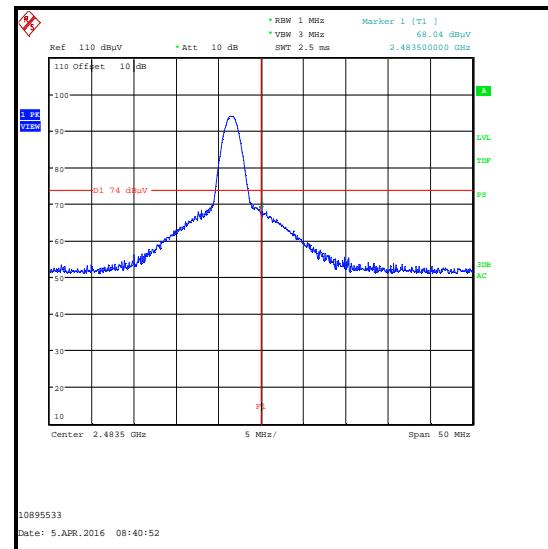
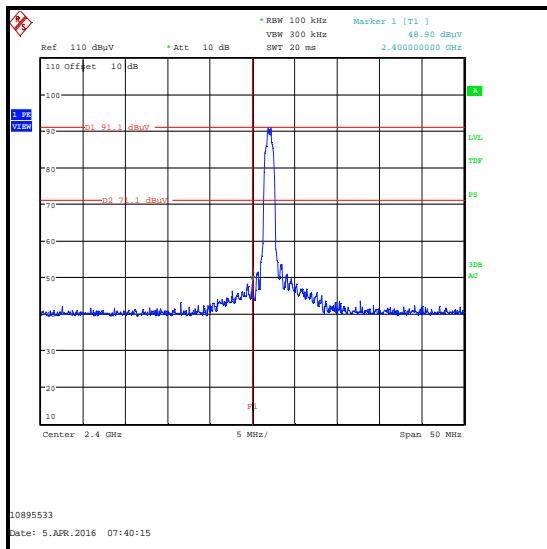
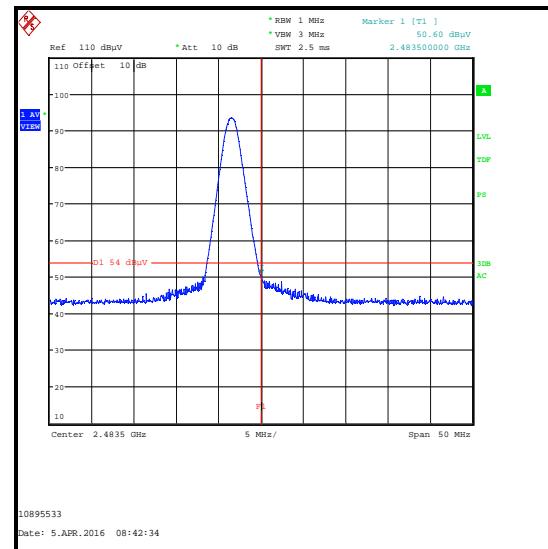
Frequency (MHz)	Antenna Polarity	Average Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2483.5	Horizontal	50.0	54.0	4.0	Complied

**Lower Band Edge Peak Hopping****Upper Band Edge Average Hopping**

Transmitter Band Edge Radiated Emissions (continued)**Results: Static Mode / 2DH5**

Frequency (MHz)	Antenna Polarity	Peak Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2400.0	Horizontal	48.9	71.1*	22.2	Complied
2483.5	Horizontal	68.0	74.0	6.0	Complied

Frequency (MHz)	Antenna Polarity	Average Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2483.5	Horizontal	50.6	54.0	3.4	Complied

**Lower Band Edge Peak Static****Upper Band Edge Peak Static****Upper Band Edge Average Static**

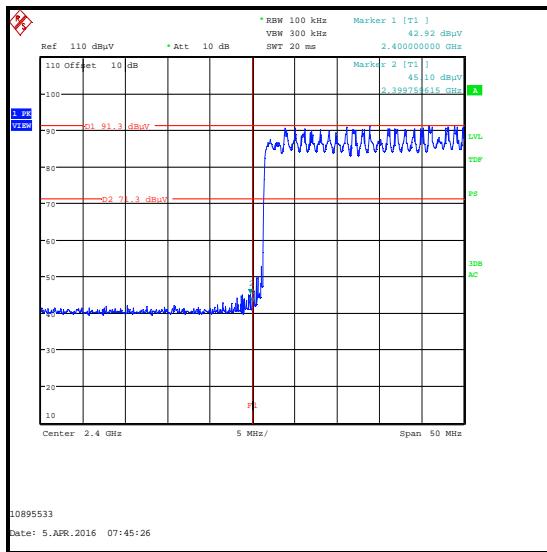
Transmitter Band Edge Radiated Emissions (continued)**Results: Hopping Mode / 2DH5**

Frequency (MHz)	Antenna Polarity	Peak Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2399.760	Horizontal	45.1	71.3*	26.2	Complied
2400.0	Horizontal	42.9	71.3*	28.4	Complied
2483.5	Horizontal	59.8	74.0	14.2	Complied
2483.580	Horizontal	67.7	74.0	6.3	Complied

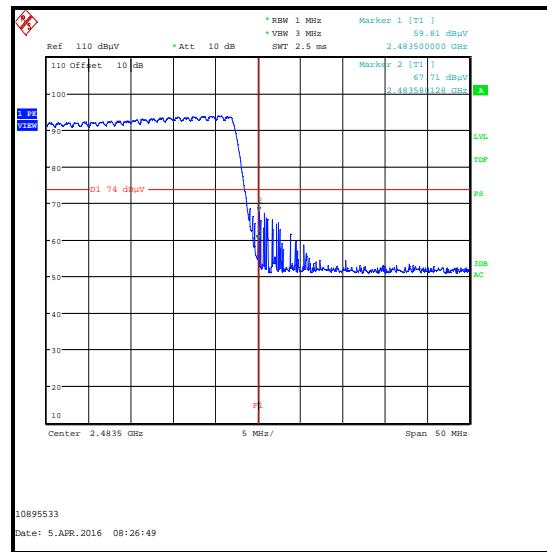
Frequency (MHz)	Antenna Polarity	Average Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2483.5	Horizontal	49.7	54.0	4.3	Complied

Transmitter Band Edge Radiated Emissions (continued)

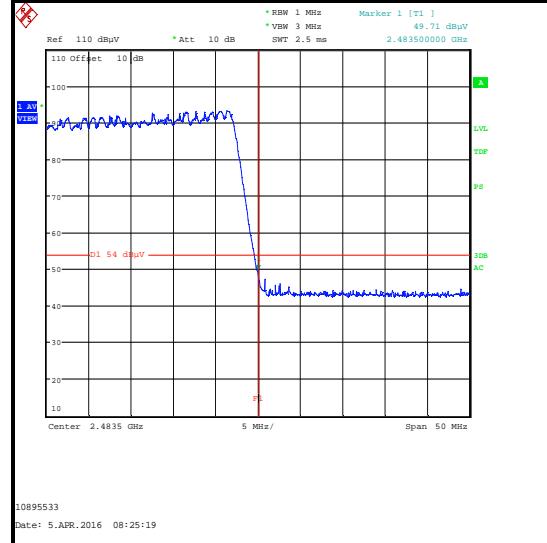
Results: Hopping Mode / 2DH5



Lower Band Edge Peak Hopping



Upper Band Edge Peak Hopping

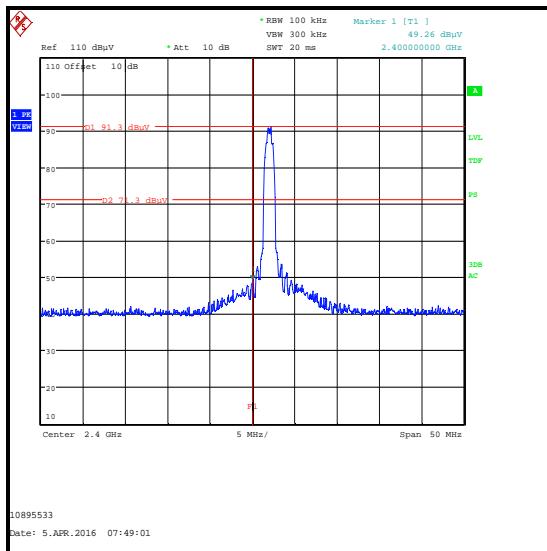


Upper Band Edge Average Hopping

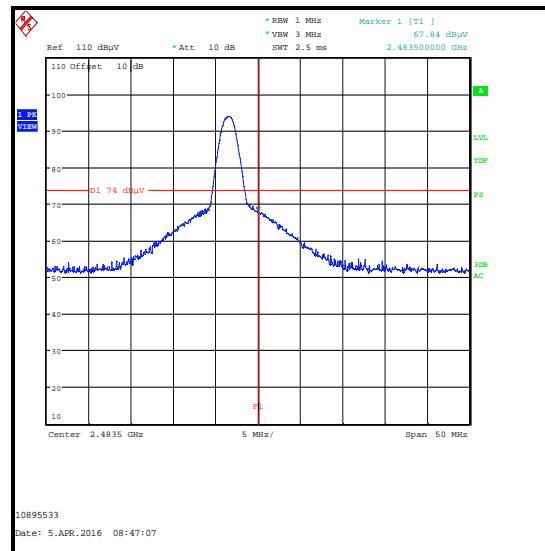
Transmitter Band Edge Radiated Emissions (continued)**Results: Static Mode / 3DH5**

Frequency (MHz)	Antenna Polarity	Peak Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2400.0	Horizontal	49.3	71.3*	22.0	Complied
2483.5	Horizontal	67.8	74.0	6.2	Complied

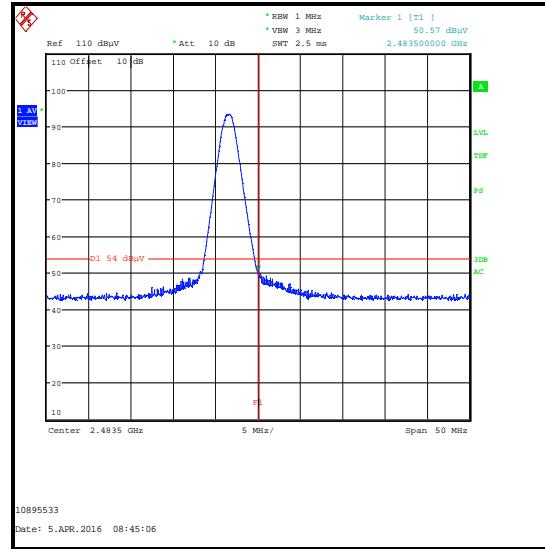
Frequency (MHz)	Antenna Polarity	Average Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2483.5	Horizontal	50.6	54.0	3.4	Complied



Lower Band Edge Peak Static



Upper Band Edge Peak Static



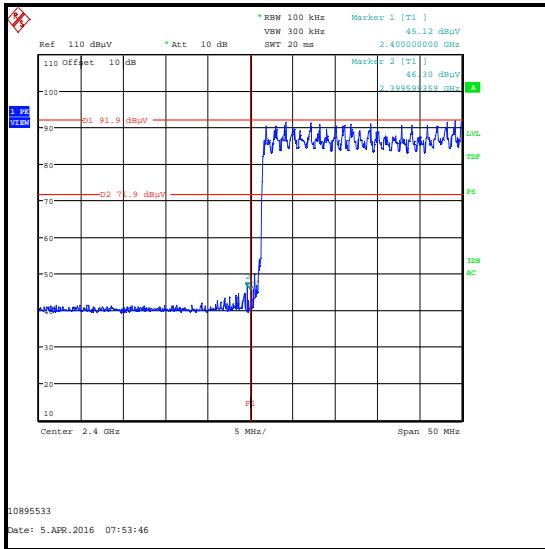
Upper Band Edge Average Static

Transmitter Band Edge Radiated Emissions (continued)**Results: Hopping Mode / 3DH5**

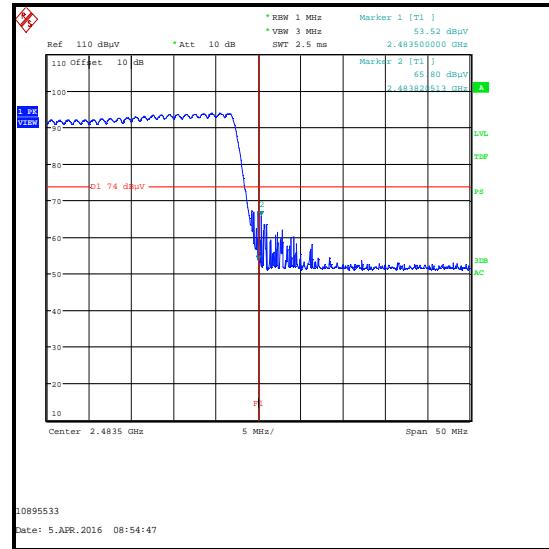
Frequency (MHz)	Antenna Polarity	Peak Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2399.599	Horizontal	46.3	71.9*	25.6	Complied
2400.0	Horizontal	45.1	71.9*	26.8	Complied
2483.5	Horizontal	53.5	74.0	20.5	Complied
2483.821	Horizontal	65.8	74.0	8.2	Complied

Frequency (MHz)	Antenna Polarity	Average Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
2483.5	Horizontal	49.4	54.0	4.6	Complied

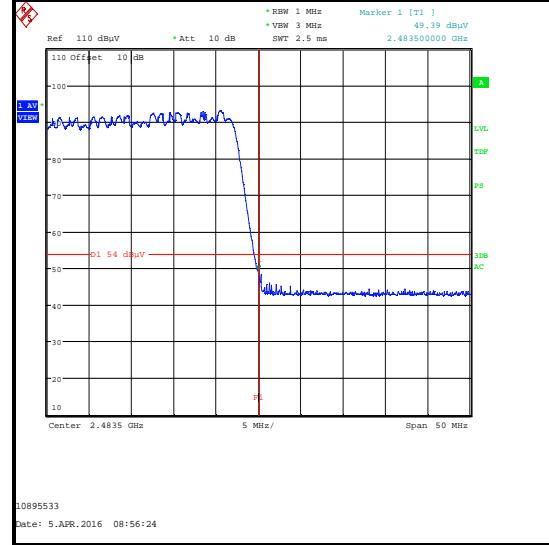
Transmitter Band Edge Radiated Emissions (continued)



Lower Band Edge Peak Hopping



Upper Band Edge Peak Hopping



Upper Band Edge Average Hopping

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1656	Thermohygrometer	JM Handelpunkt	30.5015.13	None stated	23 Apr 2016	12
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	21 Dec 2016	12
M1886	Test Receiver	Rohde & Schwarz	ESU26	100554	21 Mar 2017	12
A1534	Pre Amplifier	Hewlett Packard	8449B	3008A00405	19 Dec 2016	12
A1818	Antenna	EMCO	3115	00075692	17 Dec 2016	12
A1396	Attenuator	Huber & Suhner	6810.17.B	757987	05 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
Radiated Spurious Emissions	30 MHz to 1 GHz	95%	±5.65 dB
Radiated Spurious Emissions	1 GHz to 26.5 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	-	-	FCC ID updated
3.0	-	-	Model Number updated, Sections 3.1 and 3.2 updated

--- END OF REPORT ---