



# TEST REPORT

**Test Report No. :** UL-RPT-RP10895473JD04C V2.0

**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 2.0 supersedes all previous versions.

**Date of Issue:** 25 January 2017

**Checked by:**

Sarah Williams  
Senior Engineer, Radio Laboratory

**Company Signatory:**

Ian Watch  
Senior Engineer, Radio Laboratory  
UL VS LTD



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





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

## **2. Summary of Testing**

### **2.1. General Information**

<b>Specification Reference:</b>	47CFR15.247
<b>Specification Title:</b>	Code of Federal Regulations Volume 47 (Telecommunications): Part 15 Subpart C (Intentional Radiators) - Section 15.247
<b>Specification Reference:</b>	47CFR15.209
<b>Specification Title:</b>	Code of Federal Regulations Volume 47 (Telecommunications): Part 15 Subpart C (Intentional Radiators) - Section 15.209
<b>Site Registration:</b>	209735
<b>Location of Testing:</b>	UL VS LTD, Unit 3 Horizon, Wade Road, Kingsland Business Park, Basingstoke, Hampshire, RG24 8AH, United Kingdom
<b>Test Dates:</b>	22 January 2017 to 25 January 2017

### **2.2. Summary of Test Results**

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

### **2.3. Methods and Procedures**

<b>Reference:</b>	ANSI C63.10-2013
<b>Title:</b>	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)**

<b>Brand Name:</b>	WUS-AC08V
<b>Model Name or Number:</b>	WUS-AC08V
<b>Test Sample MAC address:</b>	542AA22F8F19 ( <i>Conducted sample</i> )
<b>Hardware Version:</b>	A1G
<b>Software Version:</b>	4.2.3.5
<b>FCC ID:</b>	TTUWUSAC08V

##### **3.1.1 Host Product Details**

<b>Brand Name:</b>	BeoVision Avant 75 NG
<b>Model Name or Number:</b>	BeoVision Avant 75 NG
<b>Test Sample Serial Number:</b>	93010 ( <i>Radiated sample</i> )
<b>Hardware Version:</b>	8009004
<b>Software Version:</b>	1.0.66

<b>Description:</b>	AC power cable
<b>Brand Name:</b>	Not marked or stated
<b>Model Name or Number:</b>	Not marked or stated
<b>Serial Number:</b>	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 75" 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:	Bluetooth		
Power Supply Requirement(s):	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:

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

<b>Description:</b>	BTLE box to turn on turn on TV
<b>Brand Name:</b>	Alpha Network
<b>Model Name or Number:</b>	WUS-AC08V
<b>Serial Number:</b>	H11145216

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

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

**Support Equipment (continued)**

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

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

<b>Description:</b>	Freeview HD Set Top Box
<b>Brand Name:</b>	Technika
<b>Model Name or Number:</b>	STBHDIS2010
<b>Serial Number:</b>	GRTB58073912047

<b>Description:</b>	HDMI media player
<b>Brand Name:</b>	SUMVISION
<b>Model Name or Number:</b>	Cyclone Micro
<b>Serial Number:</b>	SUM091104017

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

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

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



**Support Equipment (continued)**

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

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

<b>Description:</b>	ADSL Modem Router
<b>Brand Name:</b>	Linksys
<b>Model Name or Number:</b>	WAG54G
<b>Serial Number:</b>	CF610E100799

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

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

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

<b>Description:</b>	Freeview Set Top Box
<b>Brand Name:</b>	Sagem
<b>Model Name or Number:</b>	251657024
<b>Serial Number:</b>	441901036882

**Support Equipment (continued)**

<b>Description:</b>	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
<b>Brand Name:</b>	Not marked or stated
<b>Model Name or Number:</b>	Not marked or stated
<b>Serial Number:</b>	Not marked or stated

<b>Description:</b>	Laptop PC
<b>Brand Name:</b>	Lenovo
<b>Model Name or Number:</b>	T61
<b>Serial Number:</b>	L3E7586

<b>Description:</b>	USB Hub
<b>Brand Name:</b>	Belkin
<b>Model Name or Number:</b>	Not marked or stated
<b>Serial Number:</b>	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.
- For 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.
- Transmitter radiated spurious emissions tests were performed with the EUT transmitting in DH5 mode as this mode was found to transmit the highest power.
- 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:**

<b>Test Engineer:</b>	Georgios Vrezas	<b>Test Date:</b>	25 January 2017
<b>Test Sample Serial Number:</b>	93010		

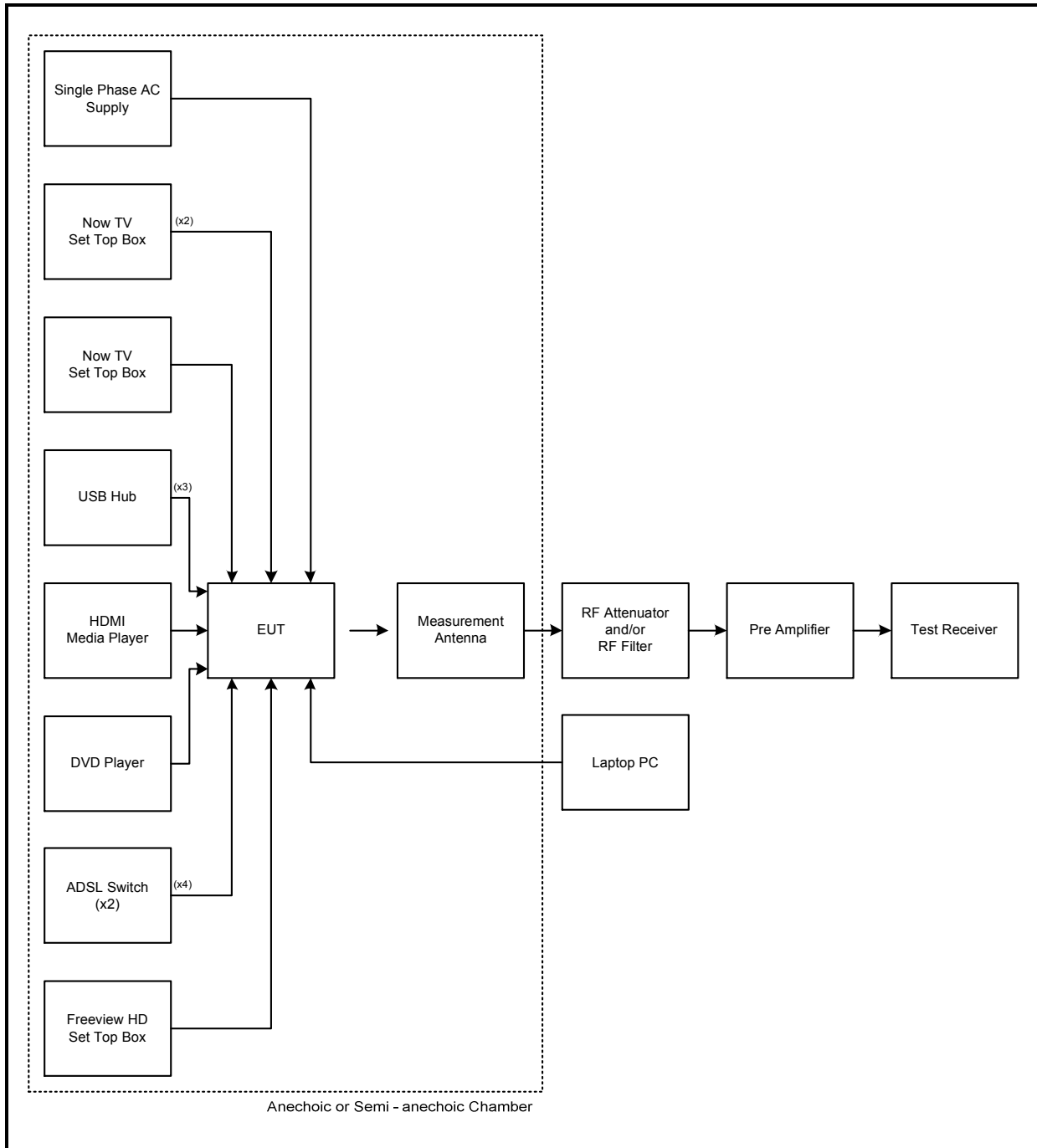
<b>FCC Reference:</b>	Parts 15.247(d) & 15.209(a)
<b>Test Method Used:</b>	ANSI C63.10 Sections 6.3 and 6.5
<b>Frequency Range</b>	30 MHz to 1000 MHz

#### **Environmental Conditions:**

<b>Temperature (°C):</b>	22
<b>Relative Humidity (%):</b>	30

#### **Note(s):**

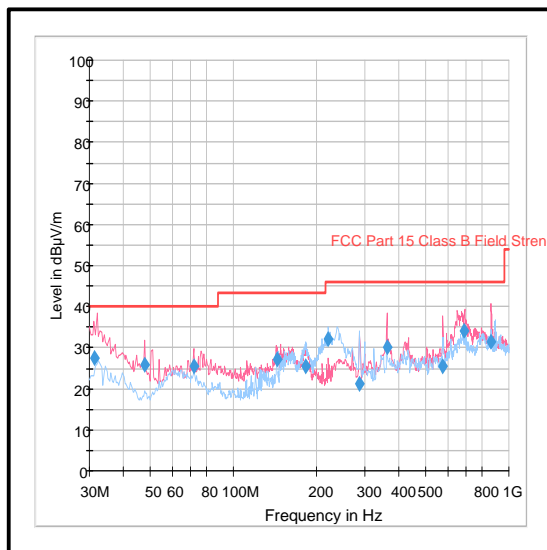
1. Transmitter radiated spurious emissions tests were performed with the EUT transmitting in DH5 mode as this was found to transmit the highest power and therefore deemed worst case.
2. The final measured value, for the given emission, in the table below incorporates the calibrated antenna factor and 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-scans were investigated and found to be ambient, or > 20 dB below the appropriate limit or below the noise floor of the measurement system.
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 0.5 metres above the reference ground- plane (in agreement with the FCC via lab KDB correspondence), 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.
8. \*-20 dBc limit applies in non-restricted band as the conducted output power measurements were performed using a peak detector.

**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: Middle Channel**

Frequency (MHz)	Antenna Polarity	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
689.720	Vertical	34.0	73.4*	39.4	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)
M2014	Thermohygrometer	Testo	608-H1	45046246	10 Jun 2017	12
K0001	5m RSE Chamber	Rainford EMC	N/A	N/A	07 Dec 2017	12
G0543	Amplifier	Sonoma	310N	230801	09 Jun 2017	6
M1124	Test Receiver	Rohde & Schwarz	ESIB26	100046	31 May 2017	12
A2959	Antenna	Schwarzbeck	VULB 9163	9163-967	08 Sep 2017	12
A1834	Attenuator	Hewlett Packard	8491B	10444	30 Mar 2017	12

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

<b>Test Engineers:</b>	Georgios Vrezas & David Doyle	<b>Test Dates:</b>	24 January 2017 & 25 January 2017
<b>Test Sample Serial Number:</b>	93010		

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

**Environmental Conditions:**

<b>Temperature (°C):</b>	22
<b>Relative Humidity (%):</b>	30

**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. Measurements above 1 GHz were performed in a semi-anechoic chamber (Asset Number K0001) at a distance of 3 metres. The EUT was placed 0.5 metres above the reference ground- plane (in agreement with the FCC via lab KDB correspondence), 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.



**Transmitter Radiated Emissions (continued)****Results: Bottom Channel**

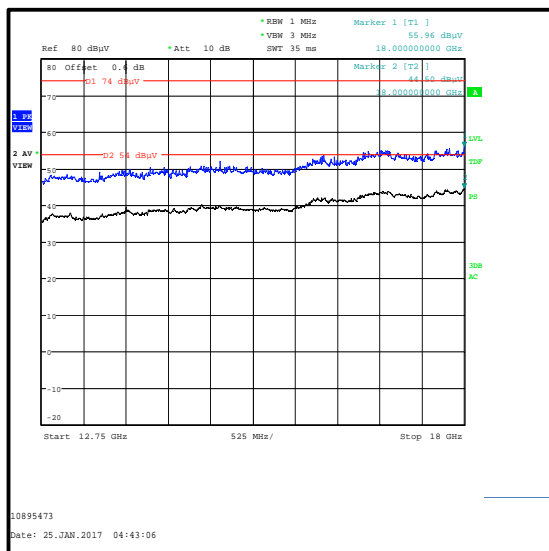
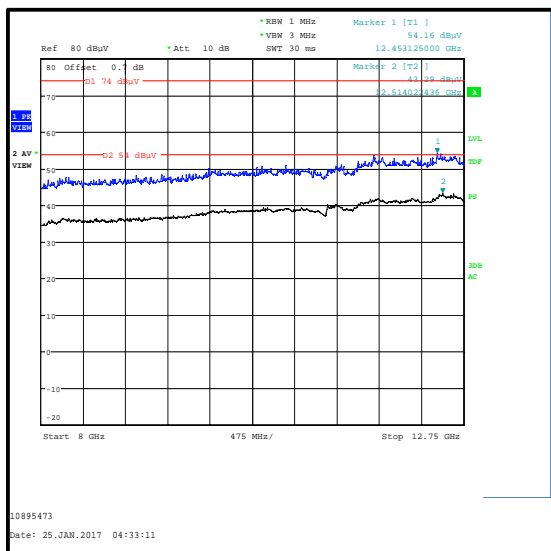
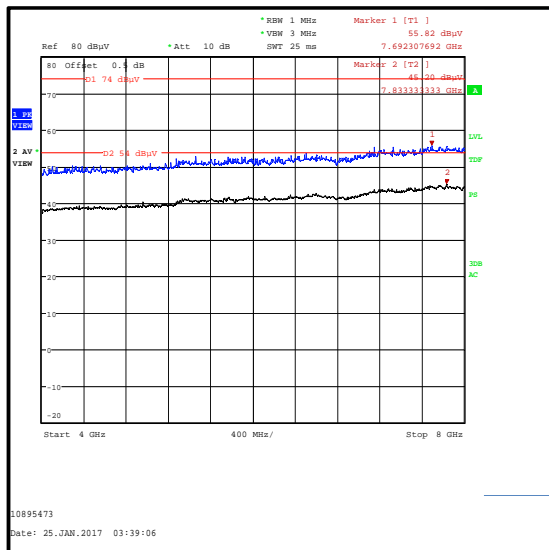
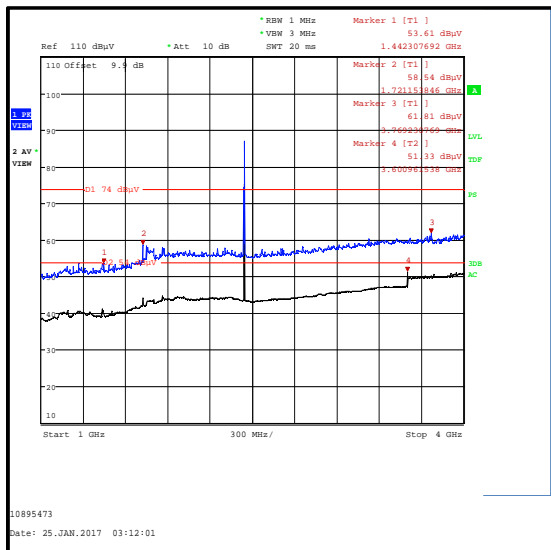
Frequency (MHz)	Antenna Polarity	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
1427.023	Vertical	53.3	72.9**	19.6	Complied
1437.263	Vertical	53.1	54.0*	0.9	Complied
1746.211	Horizontal	55.9	72.9**	17.0	Complied
1766.636	Horizontal	53.6	72.9**	19.3	Complied
1800.149	Horizontal	57.1	72.9**	15.8	Complied

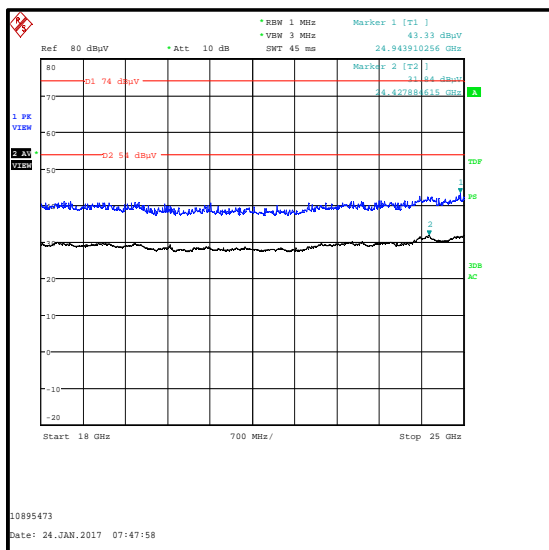
**Results: Middle Channel**

Frequency (MHz)	Antenna Polarity	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
1427.023	Vertical	53.3	73.4**	20.1	Complied
1437.263	Vertical	53.1	54.0*	0.9	Complied
1746.211	Horizontal	55.9	73.4**	17.5	Complied
1766.636	Horizontal	53.6	73.4**	19.8	Complied
1800.149	Horizontal	57.1	73.4**	16.3	Complied

**Results: Top Channel**

Frequency (MHz)	Antenna Polarity	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
1427.023	Vertical	53.3	74.3**	21.0	Complied
1437.263	Vertical	53.1	54.0*	0.9	Complied
1746.211	Horizontal	55.9	74.3**	18.4	Complied
1766.636	Horizontal	53.6	74.3**	20.7	Complied
1800.149	Horizontal	57.1	74.3**	17.2	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)
M2014	Thermohygrometer	Testo	608-H1	45046246	10 Jun 2017	12
K0001	3m RSE Chamber	Rainford EMC	N/A	N/A	07 Dec 2017	12
M1630	Test receiver	Rohde & Schwarz	ESU40	100233	17 Feb 2017	12
A1227	Pre-Amplifier	Agilent	8449B	3008A01566	09 Jun 2017	6
A2893	Pre-Amplifier	Schwarzbeck	BBV 9721	9721-021	07 Apr 2017	12
A1817	Antenna	EMCO	3115	00075694	14 Oct 2017	12
A2898	Antenna	Schwarzbeck	HWRD 750	013	06 May 2017	12
A2899	Antenna	Schwarzbeck	BBHA 9120 B	BBHA 9120 B 652	06 May 2017	12
A2892	Antenna	Schwarzbeck	BBHA 9170	9170-727	07 Apr 2017	12
A1395	Attenuator	Huber & Suhner	6806.17.B	753459	04 Nov 2017	12
A1975	High Pass Filter	AtlanTecRF	AFH-03000	090424010	26 Apr 2017	12
A2974	High Pass Filter	AtlanTecRF	AFH-06000	15032501232	04 Nov 2017	12

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

<b>Test Engineer:</b>	Georgios Vrezas	<b>Test Date:</b>	22 January 2017
<b>Test Sample Serial Number:</b>	93010		

<b>FCC Reference:</b>	Parts 15.247(d) & 15.209(a)
<b>Test Method Used:</b>	ANSI C63.10 Section 6.10.4 & 6.10.5

**Environmental Conditions:**

<b>Temperature (°C):</b>	21
<b>Relative Humidity (%):</b>	26

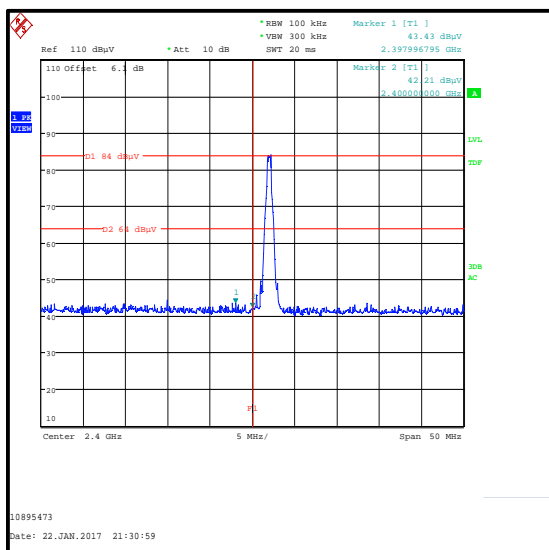
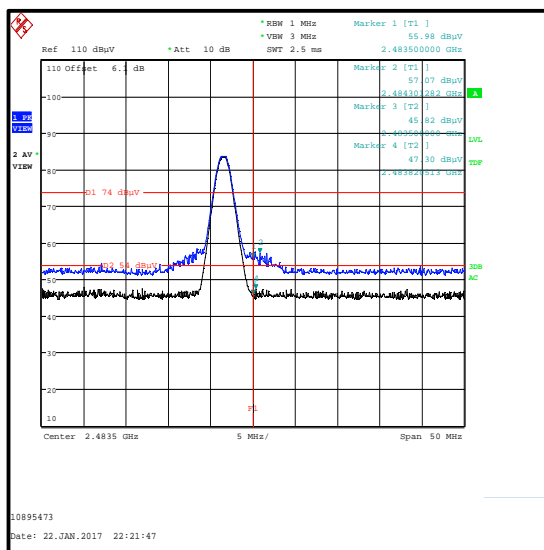
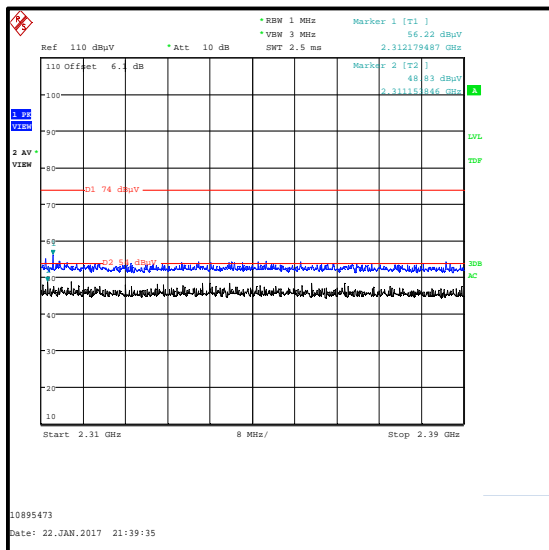
**Note(s):**

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 $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2312.179	Vertical	56.2	74.0	17.8	Complied
2397.997	Vertical	43.4	64.0*	20.6	Complied
2400.0	Vertical	42.2	64.0*	21.8	Complied
2483.5	Vertical	56.0	74.0	18.0	Complied
2484.301	Vertical	57.1	74.0	16.9	Complied

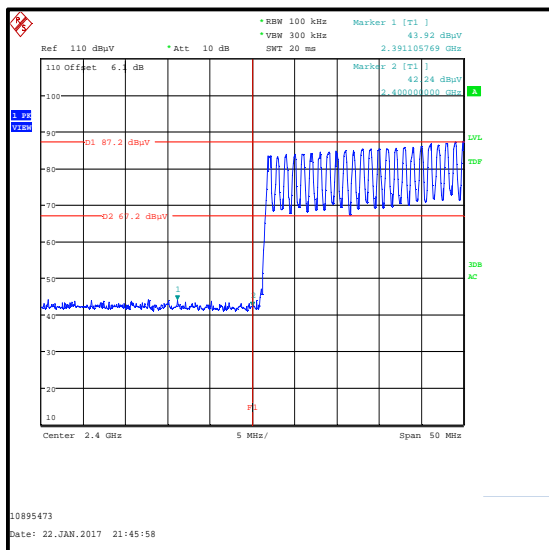
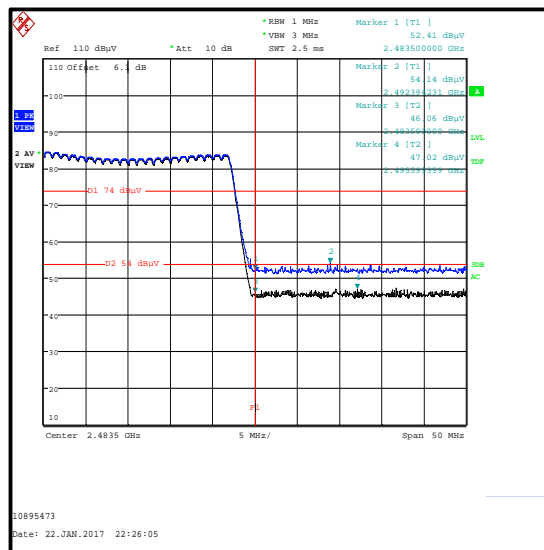
Frequency (MHz)	Antenna Polarity	Average Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2311.154	Vertical	48.8	54.0	5.2	Complied
2483.5	Vertical	45.8	54.0	8.2	Complied
2483.821	Vertical	47.3	54.0	6.7	Complied

**Transmitter Band Edge Radiated Emissions (continued)****Results: Static Mode / DH5****Lower Band Edge Peak Static****Upper Band Edge Peak & Average Static****2310 MHz to 2390 MHz Restricted Band Plot**

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

Frequency (MHz)	Antenna Polarity	Peak Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2391.106	Vertical	43.9	67.2*	23.3	Complied
2400.0	Vertical	42.2	67.2*	25.0	Complied
2483.5	Vertical	52.4	74.0	21.6	Complied
2492.394	Vertical	54.1	74.0	19.9	Complied

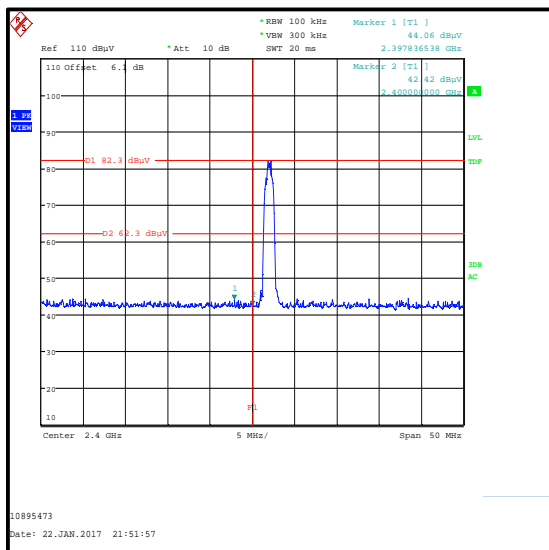
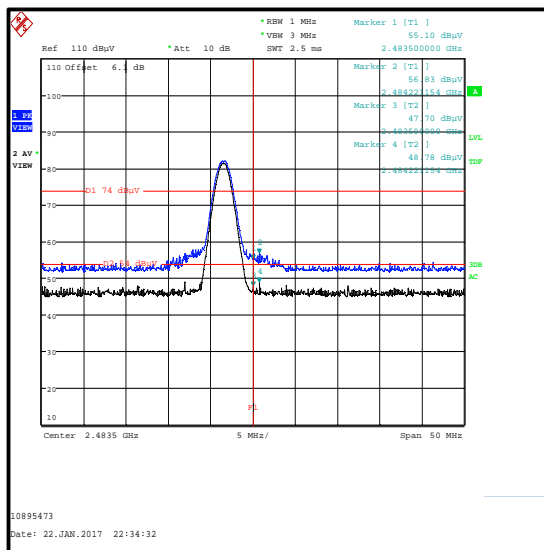
Frequency (MHz)	Antenna Polarity	Average Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2483.5	Vertical	46.1	54.0	7.9	Complied
2495.599	Vertical	47.0	54.0	7.0	Complied

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

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

Frequency (MHz)	Antenna Polarity	Peak Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2397.837	Vertical	44.1	62.3*	18.2	Complied
2400.0	Vertical	42.4	62.3*	19.9	Complied
2483.5	Vertical	55.1	74.0	18.9	Complied
2484.221	Vertical	56.8	74.0	17.2	Complied

Frequency (MHz)	Antenna Polarity	Average Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2483.5	Vertical	47.7	54.0	6.3	Complied
2484.221	Vertical	48.8	54.0	5.2	Complied

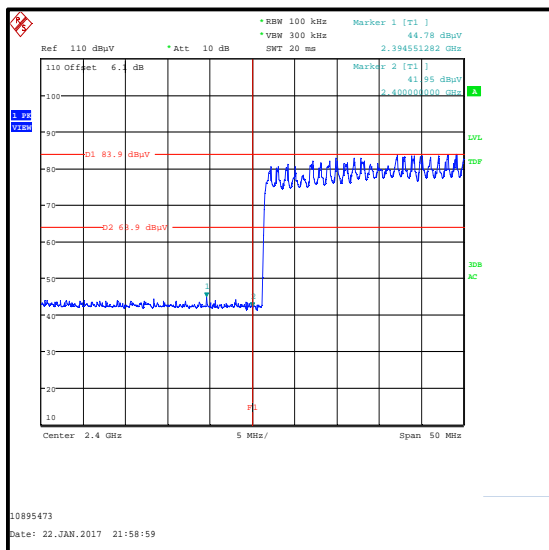
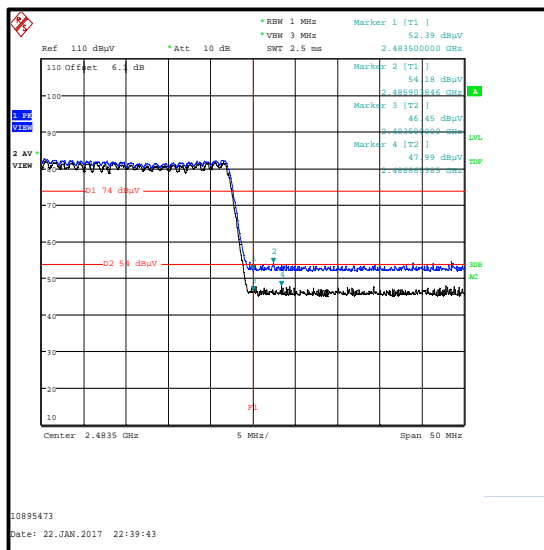
**Lower Band Edge Peak Static****Upper Band Edge Peak & Average Static**



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

Frequency (MHz)	Antenna Polarity	Peak Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2394.551	Vertical	44.8	63.9*	19.1	Complied
2400.0	Vertical	42.0	63.9*	21.9	Complied
2483.5	Vertical	52.4	74.0	21.6	Complied
2485.904	Vertical	54.2	74.0	19.8	Complied

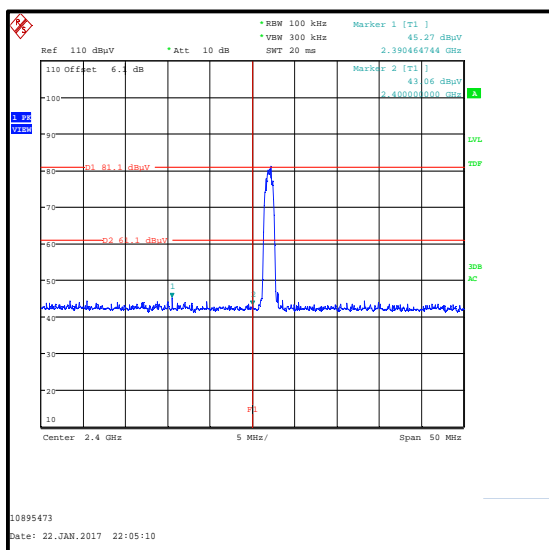
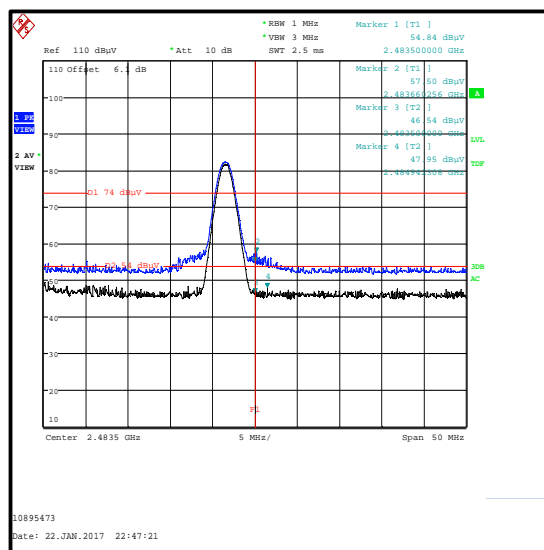
Frequency (MHz)	Antenna Polarity	Average Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2483.5	Vertical	46.5	54.0	7.5	Complied
2486.865	Vertical	48.0	54.0	6.0	Complied

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

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

Frequency (MHz)	Antenna Polarity	Peak Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2390.465	Vertical	45.3	61.1*	15.8	Complied
2400.0	Vertical	43.1	61.1*	18.0	Complied
2483.5	Vertical	54.8	74.0	19.2	Complied
2483.660	Vertical	57.5	74.0	16.5	Complied

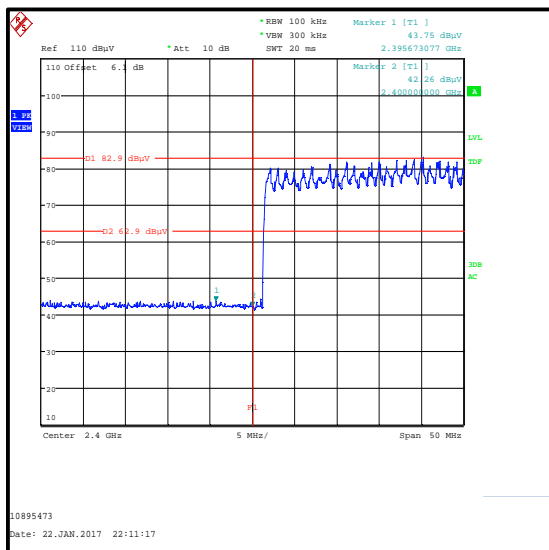
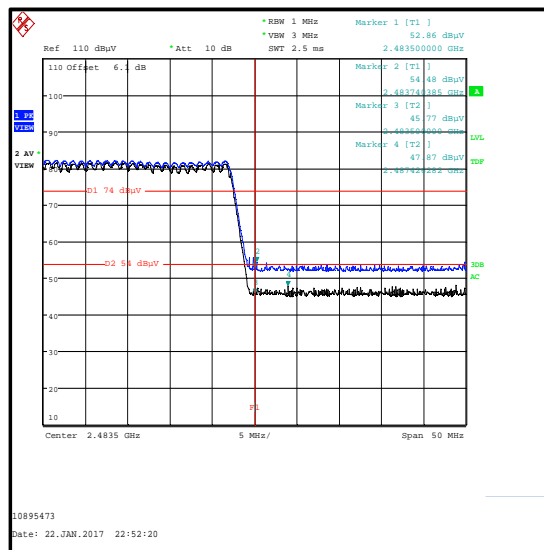
Frequency (MHz)	Antenna Polarity	Average Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2483.5	Vertical	46.5	54.0	7.5	Complied
2484.942	Vertical	48.0	54.0	6.0	Complied

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

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

Frequency (MHz)	Antenna Polarity	Peak Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2395.673	Vertical	43.8	62.9*	19.1	Complied
2400.0	Vertical	42.3	62.9*	20.6	Complied
2483.5	Vertical	52.9	74.0	21.1	Complied
2483.740	Vertical	54.5	74.0	19.5	Complied

Frequency (MHz)	Antenna Polarity	Average Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2483.5	Vertical	45.8	54.0	8.2	Complied
2487.426	Vertical	47.9	54.0	6.1	Complied

**Lower Band Edge Peak Hopping****Upper Band Edge Peak Hopping****Test Equipment Used:**

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M2014	Thermohygrometer	Testo	608-H1	45046246	10 Jun 2017	12
K0001	3m RSE Chamber	Rainford EMC	N/A	N/A	07 Dec 2017	12
M1630	Test receiver	Rohde & Schwarz	ESU40	100233	17 Feb 2017	12
A1227	Pre-Amplifier	Agilent	8449B	3008A01566	09 Jun 2017	6
A1817	Antenna	EMCO	3115	00075694	14 Oct 2017	12
A1395	Attenuator	Huber & Suhner	6806.17.B	753459	04 Nov 2017	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	-	-	Tested in accordance with FCC KDB correspondence

--- END OF REPORT ---