



# TEST REPORT

**Test Report No. : UL-RPT-RP11906202-816A**

**Manufacturer** : Dyson Technology Limited  
**Model No.** : DBWIFIBLE01  
**FCC ID** : QVHDBWIFIBLE01  
**Technology** : *Bluetooth* – Low Energy  
**Test Standard(s)** : FCC Parts 15.209(a) & 15.247

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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 1.0.

**Date of Issue:** 20 December 2017

**Checked by:**

Ian Watch  
Senior Engineer, Radio Laboratory

**Company Signatory:**

Sarah Williams  
Senior Engineer, Radio Laboratory  
UL VS LTD



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**1. Customer Information**







<b>Company Name:</b>	Dyson Technology Limited
<b>Address:</b>	Tetbury Hill Malmesbury Swindon SN16 0RP United Kingdom

## 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>	27 September 2017 to 01 November 2017

### 2.2. Summary of Test Results

<b>FCC Reference (47CFR)</b>	<b>Measurement</b>	<b>Result</b>
Part 15.247(a)(2)	Transmitter Minimum 6 dB Bandwidth	
Part 15.35(c)	Transmitter Duty Cycle	Note 1
Part 15.247(b)(3)	Transmitter Maximum Peak Output Power	
Part 15.247(e)	Transmitter Power Spectral Density	Note 2
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		

#### Note(s):

1. The measurement was performed to assist in the calculation of the level of the average emissions. The EUT cannot transmit continuously and sweep triggering/signal gating cannot be implemented.
2. In accordance with FCC KDB 558074 Section 10.1, PSD measurements are not required if the maximum conducted output power is less than the PSD limit of 8 dBm / 3 kHz. The PSD level is therefore deemed to equal to the measured total output power.

**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
<b>Reference:</b>	KDB 558074 D01 DTS Meas Guidance v04 April 5, 2017
<b>Title:</b>	Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under Section 15.247

**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>	Dyson
<b>Model Name or Number:</b>	DBWIFIBLE01
<b>Test Sample Serial Number:</b>	44 ( <i>Radiated sample</i> )
<b>Hardware Version:</b>	259866-01/05 (EB2.2)
<b>Software Version:</b>	MFG SDK 442.1
<b>FCC ID:</b>	QVHDBWIFIBLE01

<b>Brand Name:</b>	Dyson
<b>Model Name or Number:</b>	DBWIFIBLE01
<b>Test Sample Serial Number:</b>	25 ( <i>Conducted sample with RF port</i> )
<b>Hardware Version:</b>	259866-01/05 (EB2.2)
<b>Software Version:</b>	MFG SDK 442.1
<b>FCC ID:</b>	QVHDBWIFIBLE01

#### **3.2. Description of EUT**

The Equipment Under Test was a *Bluetooth* Low Energy and WLAN module operating in the 2.4 & 5 GHz bands.

#### **3.3. Modifications Incorporated in the EUT**

No modifications were applied to the EUT during testing.

**3.4. Additional Information Related to Testing**

<b>Technology Tested:</b>	<i>Bluetooth</i> Low Energy (Digital Transmission System)		
<b>Type of Unit:</b>	Transceiver		
<b>Channel Spacing:</b>	2 MHz		
<b>Modulation:</b>	GFSK		
<b>Data Rate:</b>	1 Mbit/s		
<b>Power Supply Requirement(s):</b>	Nominal	3.3 VDC	
<b>Antenna Gain:</b>	1.7 dBi		
<b>Transmit Frequency Range:</b>	2402 MHz to 2480 MHz		
<b>Transmit Channels Tested:</b>	<b>Channel ID</b>	<b>RF Channel</b>	<b>Channel Frequency (MHz)</b>
	Bottom	0	2402
	Middle	19	2440
	Top	39	2480

**3.5. Support Equipment**

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

<b>Description:</b>	Laptop PC
<b>Brand Name:</b>	Lenovo
<b>Model Name or Number:</b>	T420
<b>Serial Number:</b>	R8-VM66D

<b>Description:</b>	USB Micro-B Cable. Length 1.5 metres
<b>Brand Name:</b>	Not stated or marked
<b>Model Name or Number:</b>	Not stated or marked
<b>Serial Number:</b>	Not stated or marked

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



## **4. Operation and Monitoring of the EUT during Testing**

### **4.1. Operating Modes**

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

- Transmitting at maximum power in *Bluetooth* LE mode with modulation, maximum possible data length available and Pseudorandom Bit Sequence 9.

### **4.2. Configuration and Peripherals**

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

- The test setup instructions were supplied in a file "*Radio Test Mode Instructions.pdf*" -08/18/2017. This is archived on the UL VS LTD IT network and is available for inspection if required.
- Controlled using a software application on the laptop PC supplied by the customer. The application was used to enable continuous transmission and to select the test channels as required
- The EUT was powered from a 3.3 VDC bench power supply. The power supply was monitored throughout the testing with a calibrated multimeter. The bench power supply was placed inside the test site antechamber during radiated emissions tests..
- The conducted sample was used for the minimum 6 dB bandwidth, duty cycle and maximum peak output power tests.
- The radiated sample was used for radiated spurious emissions and band edge tests.

## **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 Minimum 6 dB Bandwidth**

#### **Test Summary:**

<b>Test Engineer:</b>	Stefan Ho	<b>Test Date:</b>	01 November 2017
<b>Test Sample Serial Number:</b>	25		

<b>FCC Reference:</b>	Part 15.247(a)(2)
<b>Test Method Used:</b>	FCC KDB 558074 Section 8.1 Option 1

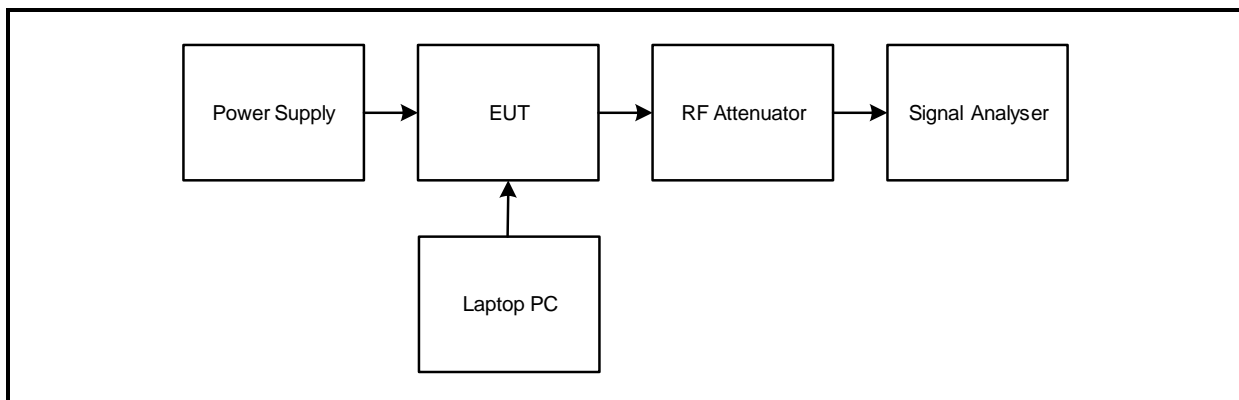
#### **Environmental Conditions:**

<b>Temperature (°C):</b>	24
<b>Relative Humidity (%):</b>	44

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

1. 6 dB DTS bandwidth tests were performed using a signal analyser in accordance with FCC KDB 558074 Section 8.1 Option 1 measurement procedure. The signal analyser resolution bandwidth was set to 100 kHz and video bandwidth 300 kHz. A peak detector was used, sweep time was set to auto and the trace mode was Max Hold. The DTS bandwidth was measured at 6 dB down from the peak of the signal.
2. The signal analyser was connected to the RF port on the EUT using suitable attenuation RF cable and UFL cable.

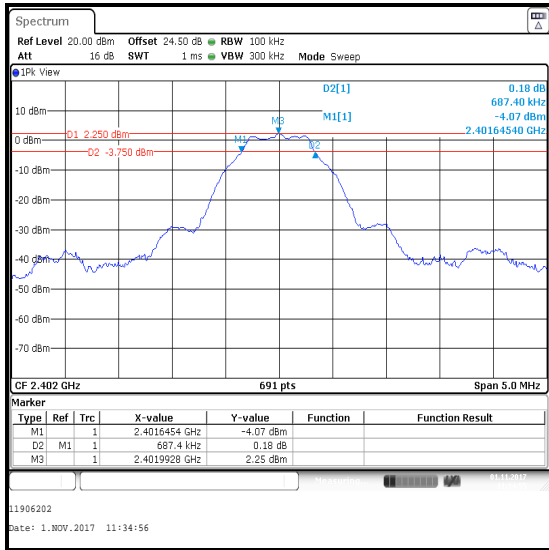
#### **Test setup:**



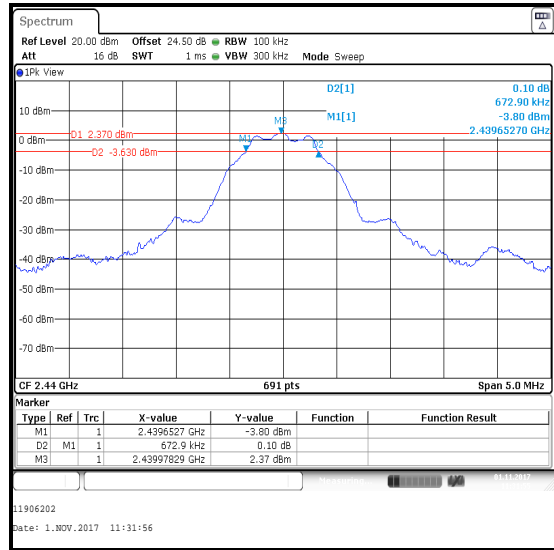
**Transmitter Minimum 6 dB Bandwidth (continued)**

**Results:**

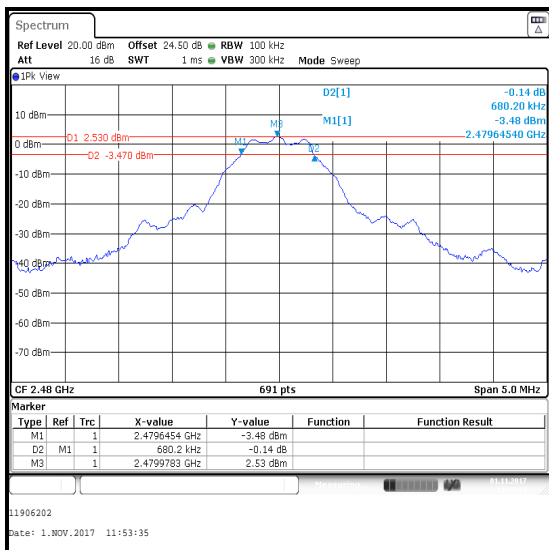
Channel	6 dB Bandwidth (kHz)	Limit (kHz)	Margin (kHz)	Result
Bottom	687.400	≥500	187.400	Complied
Middle	672.900	≥500	172.900	Complied
Top	680.200	≥500	180.200	Complied



**Bottom Channel**



**Middle Channel**



**Top Channel**

**Transmitter Minimum 6 dB Bandwidth (continued)****Test Equipment Used:**

<b>Asset No.</b>	<b>Instrument</b>	<b>Manufacturer</b>	<b>Type No.</b>	<b>Serial No.</b>	<b>Date Calibration Due</b>	<b>Cal. Interval (Months)</b>
M2005	Thermohygrometer	Testo	608-H1	45046700	22 Feb 2018	12
M1996	Signal Analyser	Rohde & Schwarz	FSV13	100975	22 Nov 2017	12
A2522	Attenuator	AtlanTecRF	A18-20	832797#3	Calibrated before use	-
M1804	Signal Generator	Rohde & Schwarz	SMP22	100026	03 Feb 2018	24

**5.2.2. Transmitter Duty Cycle**

**Test Summary:**

<b>Test Engineer:</b>	Andrew Edwards	<b>Test Date:</b>	27 September 2017
<b>Test Sample Serial Number:</b>	44		

<b>FCC Reference:</b>	Part 15.35(c)
<b>Test Method Used:</b>	FCC KDB 558074 Section 6.0

**Environmental Conditions:**

<b>Temperature (°C):</b>	23
<b>Relative Humidity (%):</b>	52

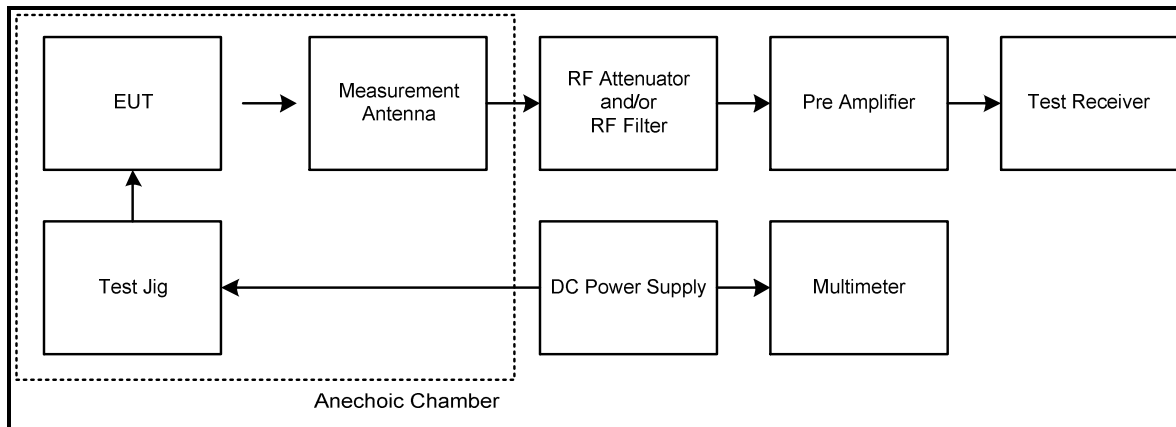
**Note(s):**

- In order to assist with the determination of the average level of fundamental and spurious emissions field strength, measurements were made of duty cycle to determine the transmission duration and the silent period time of the transmitter. The transmitter on time and period was measured using a test receiver in the time domain and duty cycle calculated as shown below:

$$10 \log (1 / (\text{On Time} / [\text{Period or } 100 \text{ ms whichever is the lesser}])))$$

$$10 \log (1 / (397.436 \mu\text{s} / 628.205 \mu\text{s})) = 2.0 \text{ dB}$$

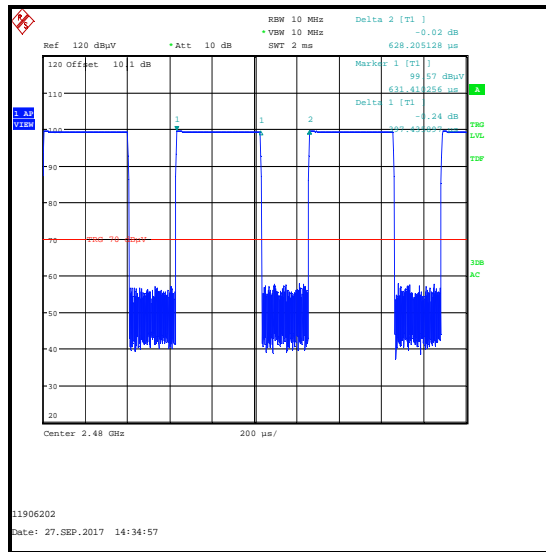
**Test setup:**



**Transmitter Duty Cycle (continued)**

**Results:**

Pulse Duration (µs)	Period (µs)	Duty Cycle %	Duty Cycle Correction factor (dB)
397.436	628.205	63.3	2.0



**Test Equipment Used:**

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M2003	Thermohygrometer	Testo	608-H1	45046641	22 Feb 2018	12
K0017	3m RSE Chamber	Rainford EMC	N/A	N/A	14 Feb 2018	12
M1995	Test Receiver	Rohde & Schwarz	ESU40	100428	13 Apr 2018	12
A2863	Pre Amplifier	Agilent	8449B	3008A02100	11 Apr 2018	12
A2889	Antenna	Schwarzbeck	BBHA 9120 B	BBHA 9120 B 653	11 Apr 2018	12
A2916	Attenuator	AtlanTecRF	AN18W5-10	832827#1	03 Mar 2018	12

**5.2.3. Transmitter Maximum Peak Output Power****Test Summary:**

<b>Test Engineer:</b>	Stefan Ho	<b>Test Date:</b>	01 November 2017
<b>Test Sample Serial Number:</b>	25		

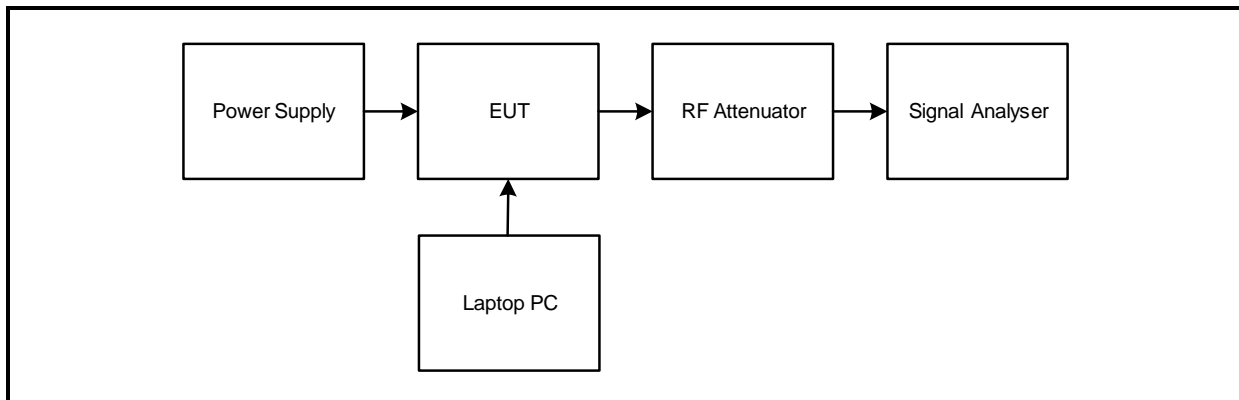
<b>FCC Reference:</b>	Part 15.247(b)(3)
<b>Test Method Used:</b>	FCC KDB 558074 Section 9.1.1

**Environmental Conditions:**

<b>Temperature (°C):</b>	24
<b>Relative Humidity (%):</b>	44

**Note(s):**

1. Conducted power tests were performed using a signal analyser in accordance with FCC KDB 558074 Section 9.1.1 with the RBW > *DTS bandwidth* procedure. A resolution bandwidth of 5 MHz was used and the video bandwidth was set to 20 MHz.
2. The signal analyser was connected to the RF port on the EUT using suitable attenuation and RF cable. An RF level offset was entered on the signal analyser to compensate for the loss of the attenuator and RF cable.
3. The conducted power was added to the declared antenna gain to obtain the EIRP.

**Test setup:**

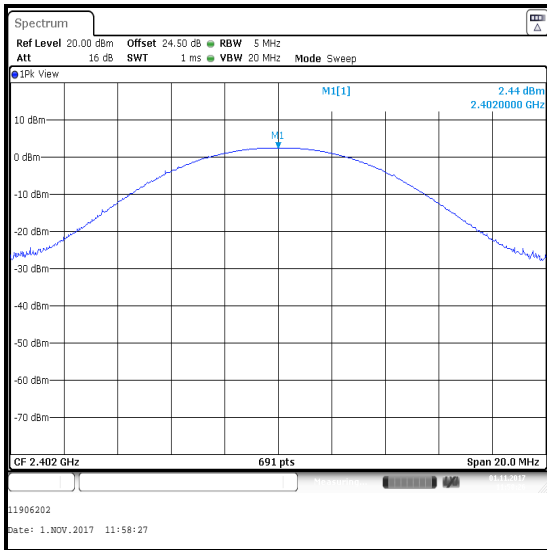


**Transmitter Maximum Peak Output Power (continued)****Results:**

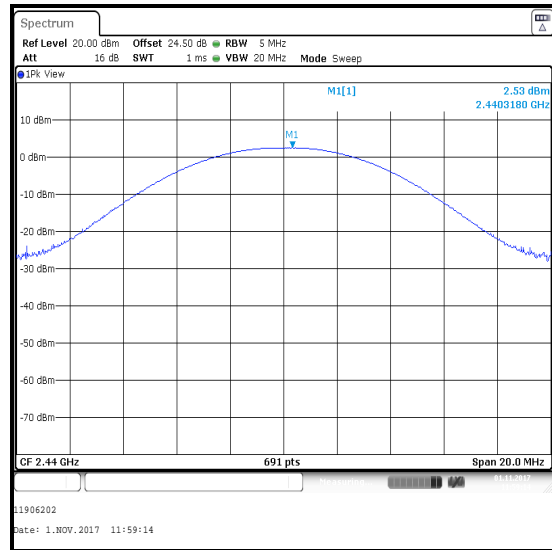
Channel	Conducted Peak Power (dBm)	Conducted Peak Power Limit (dBm)	Margin (dB)	Result
Bottom	2.4	30.0	27.6	Complied
Middle	2.5	30.0	27.5	Complied
Top	2.7	30.0	27.3	Complied

Channel	Conducted Peak Power (dBm)	Declared Antenna Gain (dBi)	EIRP (dBm)	De Facto EIRP Limit (dBm)	Margin (dB)	Result
Bottom	2.4	1.7	4.1	36.0	31.9	Complied
Middle	2.5	1.7	4.2	36.0	31.8	Complied
Top	2.7	1.7	4.4	36.0	31.6	Complied

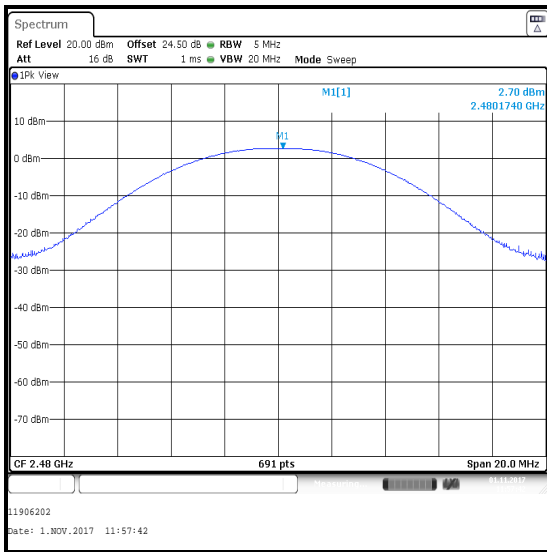
**Transmitter Maximum Peak Output Power (continued)**



**Bottom Channel**



**Middle Channel**



**Top Channel**

**Test Equipment Used:**

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M2005	Thermohygrometer	Testo	608-H1	45046700	22 Feb 2018	12
M1996	Signal Analyser	Rohde & Schwarz	FSV13	100975	22 Nov 2017	12
A2522	Attenuator	AtlanTecRF	A18-20	832797#3	Calibrated before use	-
M1804	Signal Generator	Rohde & Schwarz	SMP22	100026	03 Feb 2018	24

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

<b>Test Engineer:</b>	Andrew Edwards	<b>Test Date:</b>	03 October 2017
<b>Test Sample Serial Number:</b>	44		

<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:**

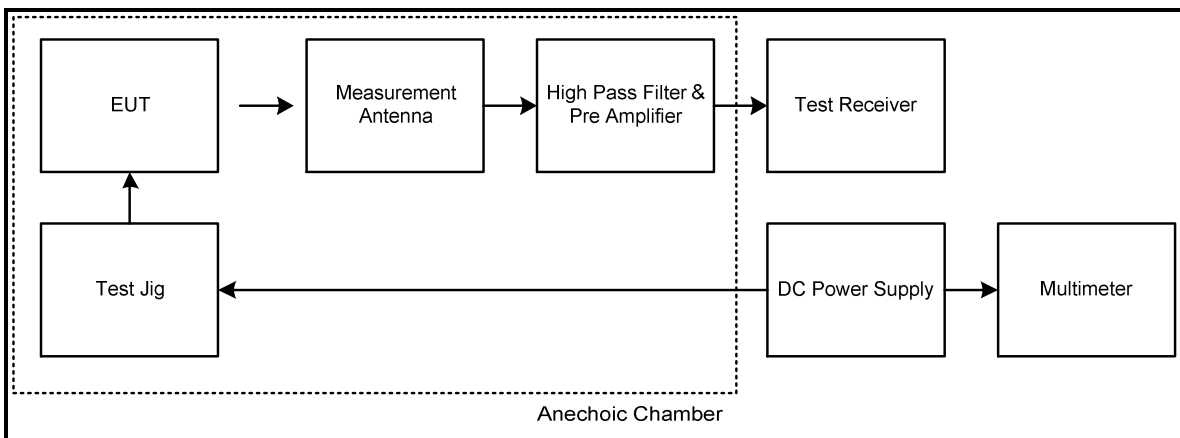
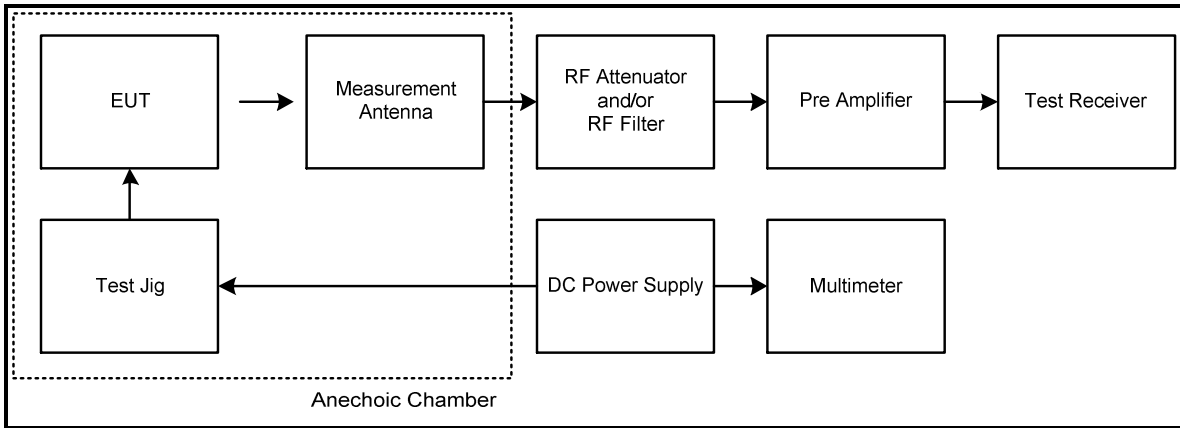
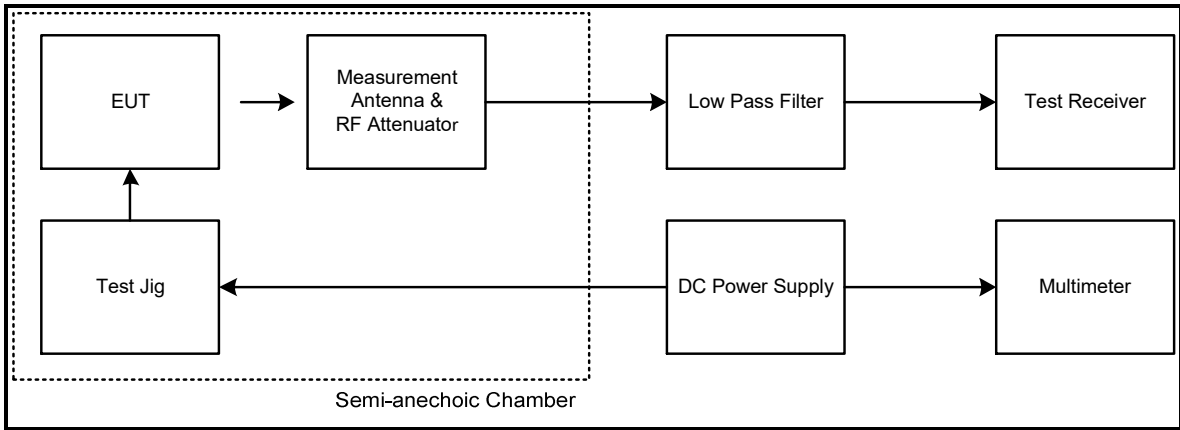
<b>Temperature (°C):</b>	23
<b>Relative Humidity (%):</b>	46

**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 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.
3. All other emissions shown on the pre-scan plots were investigated and found to be ambient, or >20 dB below the applicable limit or below the measurement system noise floor and therefore not recorded.
4. Measurements below 1 GHz were performed in a semi-anechoic chamber (Asset Number K0017) 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.
5. Pre-scans and final measurements were performed and markers placed on the highest measured levels. The test receiver resolution bandwidth was set to 120 kHz and video bandwidth 500 kHz. A peak detector was used, sweep time was set to auto and trace mode was Max Hold.

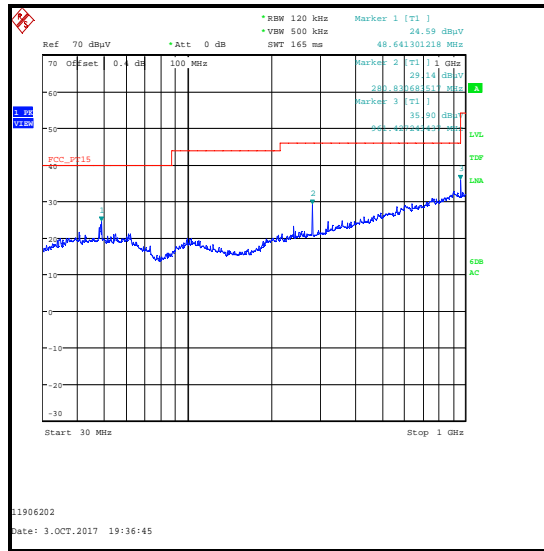
**Transmitter Radiated Emissions (continued)**

**Test setup for radiated measurements:**



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

Frequency (MHz)	Antenna Polarity	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
280.001	Horizontal	32.5	46.0	13.5	Complied
960.012	Horizontal	38.2	54.0	15.8	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)
M2003	Thermohygrometer	Testo	608-H1	45046641	22 Feb 2018	12
K0017	3m RSE Chamber	Rainford EMC	N/A	N/A	14 Feb 2018	12
M1995	Test Receiver	Rohde & Schwarz	ESU40	100428	13 Apr 2018	12
A2888	Antenna	Schwarzbeck	VULB 9163	9163-941	25 Apr 2018	12
A2147	Attenuator	AtlanTecRF	AN18-06	09020206-06	25 Apr 2018	12
A2131	Low Pass Filter	AtlanTecRF	AFL-02000	JFB1004-002	27 Feb 2018	12
M1269	Multimeter	Fluke	179	90250210	02 May 2018	12
S0538	Bench Power Supply	TTI	PL154	250135	Calibrated before use	-

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

<b>Test Engineer:</b>	Andrew Edwards	<b>Test Date:</b>	03 October 2017
<b>Test Sample Serial Number:</b>	44		

<b>FCC Reference:</b>	Parts 15.247(d) & 15.209(a)
<b>Test Method Used:</b>	FCC KDB 558074 Sections 11 & 12 referencing ANSI C63.10 Sections 6.3 and 6.6
<b>Frequency Range</b>	1 GHz to 25 GHz

**Environmental Conditions:**

<b>Temperature (°C):</b>	23
<b>Relative Humidity (%):</b>	44

**Note(s):**

1. The final measured value, for the given emission, in the table below incorporates the calibrated antenna factor and cable loss.
2. No spurious emissions were detected above the noise floor of the measuring receiver therefore the highest peak noise floor reading for peak and average detectors of the measuring receiver was recorded as shown in the tables below.
3. The emission shown on the 1 GHz to 3 GHz plot is the EUT fundamental.
4. Pre-scans above 1 GHz were performed in a fully anechoic chamber (Asset Number K0017) 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.
5. 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.

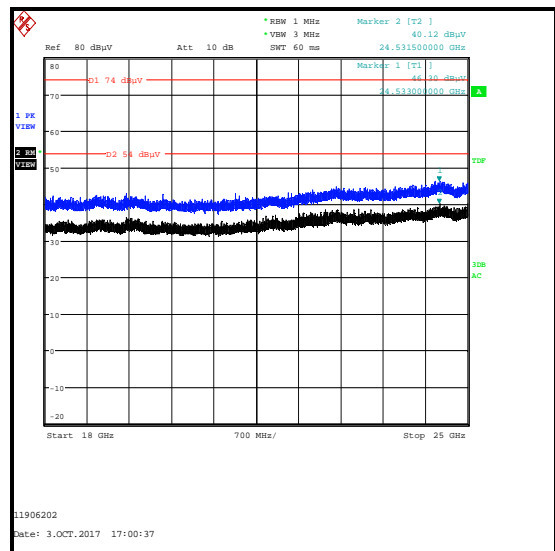
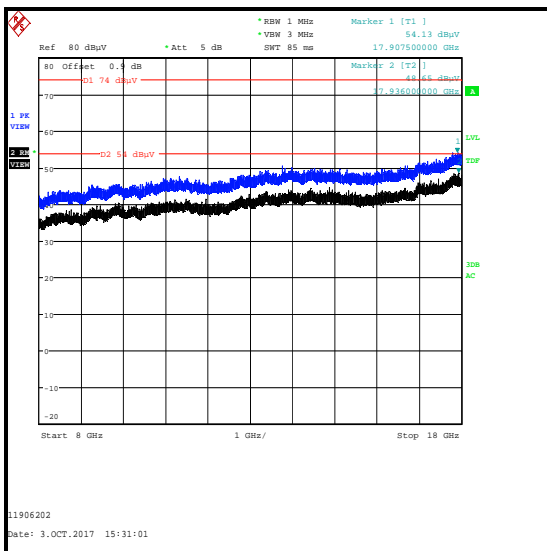
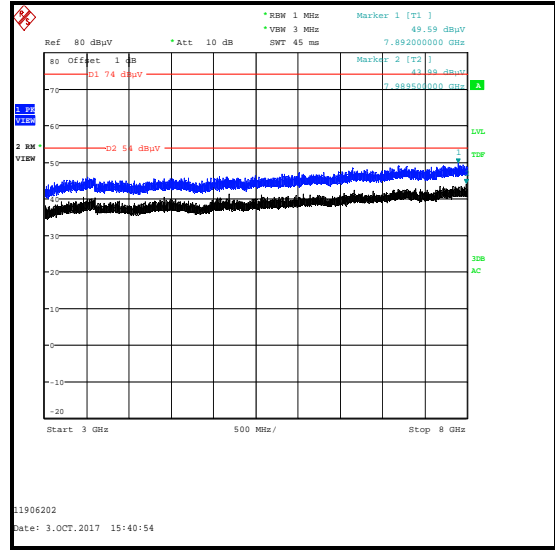
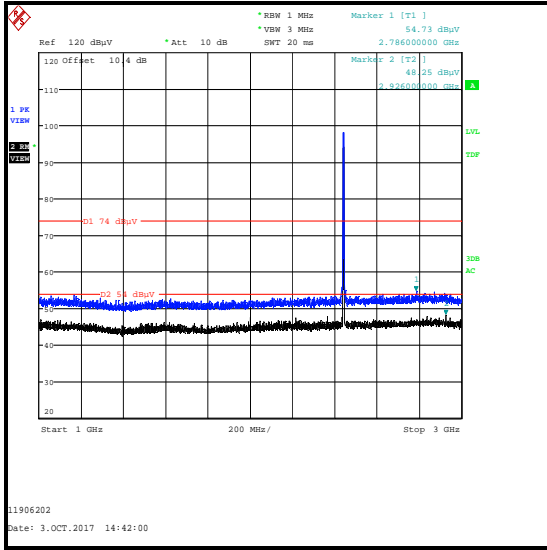
**Results: Peak**

Frequency (MHz)	Antenna Polarity	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2786.000	Vertical	54.7	74.0	19.3	Complied

**Results: Average**

Frequency (MHz)	Antenna Polarity	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
17936.000	Vertical	48.7	54.0	5.3	Complied

**Transmitter Radiated Emissions (continued)**



**Transmitter Radiated Emissions (continued)****Test Equipment Used:**

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M2003	Thermohygrometer	Testo	608-H1	45046641	22 Feb 2018	12
K0017	3m RSE Chamber	Rainford EMC	N/A	N/A	14 Feb 2018	12
M1995	Test Receiver	Rohde & Schwarz	ESU40	100428	13 Apr 2018	12
A2863	Pre Amplifier	Agilent	8449B	3008A02100	11 Apr 2018	12
A2891	Pre Amplifier	Schwarzbeck	BBV 9718	9718-306	11 Apr 2018	12
A2893	Pre Amplifier	Schwarzbeck	BBV 9721	9721-021	11 Apr 2018	12
A2889	Antenna	Schwarzbeck	BBHA 9120 B	653	11 Apr 2018	12
A2890	Antenna	Schwarzbeck	HWRD 750	014	11 Apr 2018	12
A2892	Antenna	Schwarzbeck	BBHA 9170	9170-727	11 Apr 2018	12
A2916	Attenuator	AtlanTecRF	AN18W5-10	832827#1	03 Mar 2018	12
A2914	High Pass Filter	AtlanTecRF	AFH-03000	2155	06 Mar 2018	12
A2947	High Pass Filter	AtlanTecRF	AFH-07000	1601900001	18 May 2018	12
M1269	Multimeter	Fluke	179	90250210	02 May 2018	12
S0538	Bench Power Supply	TTI	PL154	250135	Calibrated before use	-



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

<b>Test Engineer:</b>	Andrew Edwards	<b>Test Date:</b>	27 September 2017
<b>Test Sample Serial Number:</b>	44		

<b>FCC Reference:</b>	Parts 15.247(d) & 15.209(a)
<b>Test Method Used:</b>	KDB 558074 Section 11 & 12

**Environmental Conditions:**

<b>Temperature (°C):</b>	23
<b>Relative Humidity (%):</b>	52

**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 maximum peak conducted output power was previously measured. In accordance with FCC KDB 558074 Section 11.1(a), the lower band edge measurement was performed with a peak detector and the -20 dBc limit applied.
3. As the lower band edge is adjacent to a non-restricted band, only peak measurements are required. In accordance with FCC KDB 558074 Section 11.1, the test method in Section 11.3 was followed: 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 was placed on the band edge spot frequency. Marker frequencies and levels were recorded.
4. As the upper band edge is adjacent to a restricted band, both peak and average measurements were recorded by placing a marker at the edge of the band. For peak measurements the test receiver resolution bandwidth was set to 1 MHz and the video bandwidth 3 MHz. A peak detector was used, sweep time was set to auto and trace mode was Max Hold. For average measurements the test receiver resolution bandwidth was set to 1 MHz and the video bandwidth 3 MHz. An RMS detector was used, sweep time was set to auto and trace mode was trace averaging over 300 sweeps. A marker was placed on the band edge spot frequencies and a second marker placed on the highest emission level in the adjacent restricted band of operation (where a higher level emission was present). Marker frequencies and levels were recorded.
5. 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 peak and RMS detectors respectively. Markers were placed on the highest point on each trace.
6. \* -20 dBc limit.

**Transmitter Band Edge Radiated Emissions (continued)****Results: Lower Band edge / Peak**

Frequency (MHz)	Antenna Polarity	Level (dB $\mu$ V/m)	-20 dBc Limit (dB $\mu$ V/m)	Margin (dB)	Result
2400.000	Vertical	70.2	78.3	8.1	Complied

**Results: Upper Band edge / Restricted Band / Peak**

Frequency (MHz)	Antenna Polarity	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2483.500	Vertical	60.6	74.0	13.4	Complied

**Results: Upper Band edge / Restricted Band / Average**

Frequency (MHz)	Level (dB $\mu$ V/m)	Duty Cycle correction (dB)	Corrected Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2483.500	44.0	2.0	46.0	54.0	8.0	Complied
2484.141	44.3	2.0	46.3	54.0	7.7	Complied

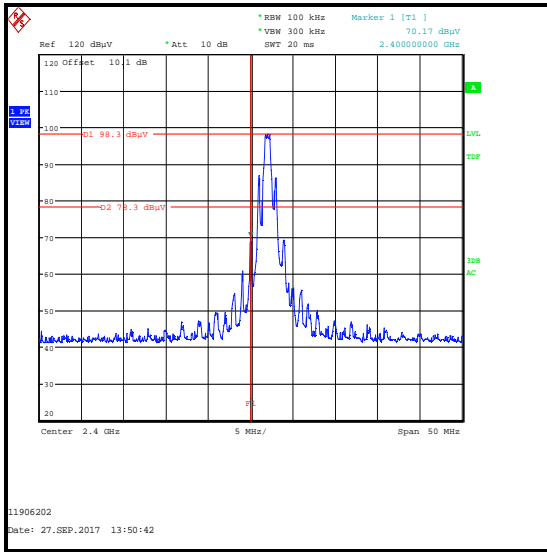
**Results: 2310 MHz to 2390 MHz Restricted Band / Peak**

Frequency (MHz)	Antenna Polarity	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2389.872	Vertical	55.3	74.0	18.7	Complied

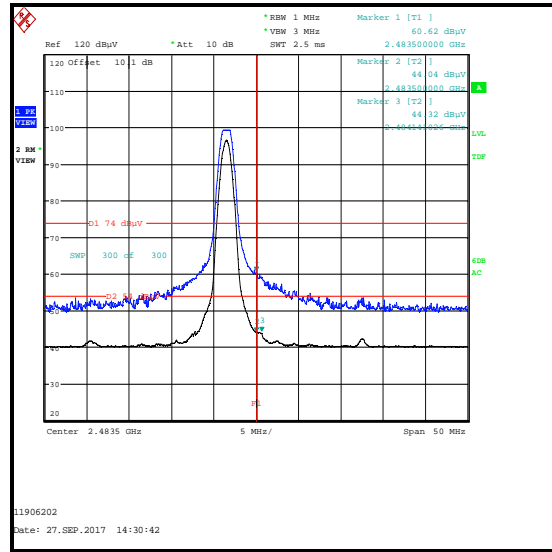
**Results: 2310 MHz to 2390 MHz Restricted Band / Average**

Frequency (MHz)	Level (dB $\mu$ V/m)	Duty Cycle correction (dB)	Corrected Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
2321.923	41.6	2.0	43.6	54.0	10.4	Complied

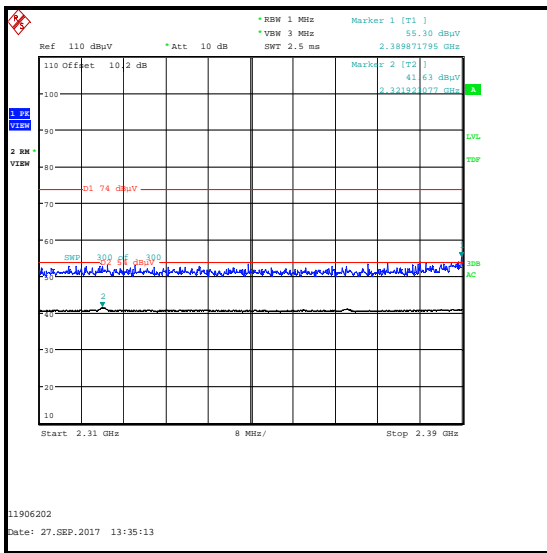
### Transmitter Band Edge Radiated Emissions (continued)



Lower Band Edge Peak Measurement



Upper Band Edge Measurement



2310 MHz to 2390 MHz Restricted Band

**Transmitter Band Edge Radiated Emissions (continued)****Test Equipment Used:**

<b>Asset No.</b>	<b>Instrument</b>	<b>Manufacturer</b>	<b>Type No.</b>	<b>Serial No.</b>	<b>Date Calibration Due</b>	<b>Cal. Interval (Months)</b>
M2003	Thermohygrometer	Testo	608-H1	45046641	22 Feb 2018	12
K0017	3m RSE Chamber	Rainford EMC	N/A	N/A	14 Feb 2018	12
M1995	Test Receiver	Rohde & Schwarz	ESU40	100428	13 Apr 2018	12
A2863	Pre Amplifier	Agilent	8449B	3008A02100	11 Apr 2018	12
A2889	Antenna	Schwarzbeck	BBHA 9120 B	BBHA 9120 B 653	11 Apr 2018	12
A2916	Attenuator	AtlanTecRF	AN18W5-10	832827#1	03 Mar 2018	12
M1269	Multimeter	Fluke	179	90250210	02 May 2018	12
S0538	Bench Power Supply	TTI	PL154	250135	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 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".

<b>Measurement Type</b>	<b>Range</b>	<b>Confidence Level (%)</b>	<b>Calculated Uncertainty</b>
Conducted Maximum Peak Output Power	2.4 GHz to 2.4835 GHz	95%	±1.13 dB
Minimum 6 dB Bandwidth	2.4 GHz to 2.4835 GHz	95%	±4.59 %
Radiated Spurious Emissions	30 MHz to 1 GHz	95%	±5.65 dB
Radiated Spurious Emissions	1 GHz to 25 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

--- END OF REPORT ---