



TEST REPORT

Test Report No. : UL-RPT-RP12761350-116A

Customer : Remote Diagnostic Technologies Ltd

Model No. / HVIN : 00-1026-R

PMN : Tempus Pro

FCC ID : Contains FCC ID: NCMOMO6012 & PV7-WIBEAR11N-DF2

ISED Certification No. : Contains IC: 2734A-M06012 & 7738A-WB11NDF2

Technology : *Bluetooth*, GSM 850, PCS 1900, UMTS 850 & UMTS 1900

Test Standard(s) : FCC Parts 15.209(a), 15.247(d), 22.917 & 24.238;
Innovation, Science and Economic Development Canada
RSS-Gen 6.13, RSS-247 5.5, RSS-132 5.5 & RSS-133 6.5

1. This test report shall not be reproduced except in full, without the written approval of UL VS LTD.
2. The results in this report apply only to the sample(s) tested.
3. This 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:

02 May 2019

Checked by:

Ben Mercer

Senior Test Engineer, Radio Laboratory

Company Signatory:

Sarah Williams

Senior Test Engineer, Radio Laboratory
UL VS LTD



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

The *Bluetooth*® word mark and logos are owned by the *Bluetooth* SIG, Inc. and any use of such marks by UL VS LTD is under licence. Other trademarks and trade names are those of their respective owners.

UL VS LTD

Unit 1-3 Horizon, Kingsland Business Park, Wade Road, Basingstoke, Hampshire, RG24 8AH, UK
Telephone: +44 (0)1256 312000
Facsimile: +44 (0)1256 312001

Customer Information

Company Name:	Remote Diagnostic Technology Ltd
Address:	Pavilion C2 Ashwood Park Ashwood Way Basingstoke RG23 8BG United Kingdom

Report Revision History

Version Number	Issue Date	Revision Details	Revised By
1.0	02/05/2019	Initial Version	Ben Mercer

Table of Contents

Customer Information.....	2
Report Revision History	2
1. Attestation of Test Results.....	4
1.1. Description of EUT	4
1.2. General Information	4
1.3. Summary of Test Results	5
1.4. Deviations from the Test Specification	5
2. Summary of Testing.....	6
2.1. Facilities and Accreditation	6
2.2. Methods and Procedures	6
2.3. Calibration and Uncertainty	7
2.4. Test and Measurement Equipment	8
3. Equipment Under Test (EUT)	9
3.1. Identification of Equipment Under Test (EUT)	9
3.2. Modifications Incorporated in the EUT	9
3.3. Additional Information Related to Testing	10
3.4. Description of Available Antennas	11
3.5. Description of Test Setup	12
4. Radiated Test Results.....	18
4.1. Transmitter Out of Band Radiated Emissions (GSM 850 & <i>Bluetooth</i>)	18
4.2. Transmitter Out of Band Radiated Emissions (PCS 1900 & <i>Bluetooth</i>)	22
4.3. Transmitter Out of Band Radiated Emissions (UMTS 850 & <i>Bluetooth</i>)	26
4.4. Transmitter Out of Band Radiated Emissions (UMTS 1900 & <i>Bluetooth</i>)	30

1. Attestation of Test Results

1.1. Description of EUT

The equipment under test was a medical vital signs monitor that contains FCC / ISED Canada certified GSM/UMTS, *Bluetooth* and 2.4 GHz WLAN radio modules (FCC ID: NCMOMO6012 & PV7-WIBEAR11N-DF2, ISED Certification No. IC: 2734A-M06012 & 7738A-WB11NDF2).

1.2. 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
Specification Reference:	47CFR22
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications): Part 22 Subpart H (Public Mobile Services)
Specification Reference:	47CFR24
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications): Part 24 Subpart E (Personal Communication Services)
Specification Reference:	RSS-Gen Issue 5 April 2018
Specification Title:	General Requirements for Compliance of Radio Apparatus
Specification Reference:	RSS-247 Issue 2 February 2017
Specification Title:	Digital Transmission Systems (DTSS), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices
Specification Reference:	RSS-132 Issue 3, January 2013
Specification Title:	Cellular Telephone Systems Operating in the Bands 824-849 MHz and 869-894 MHz
Specification Reference:	RSS-133 Issue 6, January 2018
Specification Title:	2 GHz Personal Communications Services
FCC Test Firm Registration No.:	621311
ISED#:	20903
CAB Identifier:	UK0001
Location of Testing:	UL VS LTD, Unit 3 Horizon, Wade Road, Kingsland Business Park, Basingstoke, Hampshire, RG24 8AH, United Kingdom
Test Dates:	10 March 2019 to 28 March 2019

1.3. Summary of Test Results

FCC Reference (47CFR)	ISED Canada Reference	Measurement	Result
Transmit Mode; <i>Bluetooth</i> & Cellular (GSM850) Band			
15.209(a)/15.247(d), 2.1053/22.917	RSS-Gen 6.13, RSS- 247 5.5, RSS-132 5.5	Transmitter Out of Band Radiated Emissions	
Transmit Mode; <i>Bluetooth</i> & Cellular (GSM1900) Band			
15.209(a)/15.247(d)/ 2.1053/22.917	RSS-Gen 6.13, RSS- 247 5.5, RSS-132 5.5	Transmitter Out of Band Radiated Emissions	
Transmit Mode; <i>Bluetooth</i> & Cellular (UMTS 850) Band			
15.209(a)/15.247(d)/ 2.1053/24.238	RSS-Gen 6.13, RSS- 247 5.5, RSS-133 6.5	Transmitter Out of Band Radiated Emissions	
Transmit Mode; <i>Bluetooth</i> & Cellular (UMTS 1900) Band			
15.209(a)/15.247(d)/ 2.1053/24.238	RSS-Gen 6.13, RSS- 247 5.5, RSS-133 6.5	Transmitter Out of Band Radiated Emissions	
Key to Results  = Complied  = Did not comply			

Note(s):**1.4. 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.

2. Summary of Testing

2.1. Facilities and Accreditation

The test site and measurement facilities used to collect data are located at Unit 3 Horizon, Wade Road, Kingsland Business Park, Basingstoke, Hampshire, RG24 8AH, United Kingdom. The following table identifies which facilities were utilised for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

Site 1	X
Site 2	
Site 17	X

UL VS LTD is accredited by UKAS. The tests reported herein have been performed in accordance with its terms of accreditation.

2.2. Methods and Procedures

Reference:	ANSI C63.26-2015
Title:	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services
Reference:	KDB 971168 D01 v03r01 April 9, 2018
Title:	Procedure for Measurements on Wideband Licenced DTS
Reference:	ANSI C63.10 (2013)
Title:	American National Standard for Testing Unlicensed Wireless Devices

2.3. Calibration and Uncertainty

Measuring Instrument Calibration

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.

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".

Measurement Type	Range	Confidence Level (%)	Calculated Uncertainty
Radiated Spurious Emissions	30 MHz to 1 GHz	95%	±4.65 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.

2.4. Test and Measurement Equipment

Test Equipment Used for Transmitter Radiated Emissions

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
K0017	3m RSE Chamber	Rainford	N/A	N/A	16 Feb 2020	12
M2003	Thermoygrometer	Testo	608-H1	45046641	06 Jan 2020	12
M1995	Test Receiver	Rohde & Schwarz	ESU40	100428	10 Aug 2019	12
A3167	Pre-Amplifier	Com-Power	PAM-103	18020010	11 Feb 2020	12
A3161	Antenna	Teseq	CBL6111D	50859	17 Dec 2019	12
A2918	Attenuator	AltanTecRF	AN18W5-20	832828#1	20 Feb 2020	12
A2131	Low Pass Filter	AltanTecRF	AFL-02000	JFB1004-002	20 Feb 2020	12
M2040	Thermoygrometer	Testo	608-H1	45124934	06 Jan 2020	12
K0001	5m RSE Chamber	Rainford	N/A	N/A	04 Oct 2019	12
M1630	Test Receiver	Rohde & Schwarz	ESU40	100233	20 Sep 2019	12
A3155	Pre-Amplifier	Com-Power	PAM-118A	18040037	14 Sep 2019	12
A2896	Pre-Amplifier	Schwarzbeck	BBV 9721	9721-023	08 Feb 2020	12
A3138	Antenna	Schwarzbeck	BBHA 9120 B	00702	03 Oct 2019	12
A553	Antenna	Chase	CBL6111A	1593	08 Oct 2019	12
A3139	Antenna	Schwarzbeck	HWRD750	00027	04 Oct 2019	12
A2895	Antenna	Schwarzbeck	BBHA 9170	9170-728	08 Feb 2020	12
A2937	Attenuator	AltanTecRF	AN18W5-06	208147#1	04 Mar 2020	12
A2523	Attenuator	AltanTecRF	AN18W5-10	832827#1	04 Mar 2020	12
A2924	Attenuator	AltanTecRF	AN18W5-20	832828#7	04 Mar 2020	12
A3085	Low Pass Filter	AltanTecRF	AFL-02000	18051600014	29 Jun 2019	12
A2467	High Pass Filter	Wainwright Instruments GmbH	WHJE5-920-1000-4000-60EE	2	18 Feb 2020	12
A3093	High Pass Filter	AltanTecRF	AFH-03000	18051800077	29 Jun 2019	12
A3095	High Pass Filter	AltanTecRF	AFH-07000	18051600012	29 Jun 2020	12

3. Equipment Under Test (EUT)

3.1. Identification of Equipment Under Test (EUT)

Brand Name:	Remote Diagnostic Technology Ltd
Model No. / HVIN:	00-1026-R
PMN:	Tempus Pro
Serial Number:	602429
IMEI:	001010123456789
Hardware Version Number:	Trizeps VII
Software Version Number:	V7.01
FCC ID:	Contains FCC ID: NCMOMO6012 & PV7-WIBEAR11N-DF2
ISED Certification Number:	Contains IC: 2734A-M06012 & 7738A-WB11NDF2

3.2. Modifications Incorporated in the EUT

No modifications were applied to the EUT during testing.

3.3. Additional Information Related to Testing

Power Supply Requirement:	Nominal	12 VDC via 120 VAC 60 Hz	
Technology Tested:	GSM 850		
Mode:	Circuit switched		
Transmit Frequency Range:	824 to 849 MHz		
Transmit Channels Tested:	Channel ID	Channel Number	Channel Frequency (MHz)
	Middle	190	836.6
Technology Tested:	PCS 1900		
Mode:	Circuit switched		
Transmit Frequency Range:	1850 to 1910 MHz		
Transmit Channels Tested:	Channel ID	Channel Number	Channel Frequency (MHz)
	Middle	660	1879.8
Technology Tested:	UMTS FDDV		
Mode:	Voice (12.2 kbps)		
Transmit Frequency Range:	824 to 849 MHz		
Transmit Channels Tested:	Channel ID	Channel Number	Channel Frequency (MHz)
	Middle	4183	836.6
Technology Tested:	UMTS FDDII		
Mode:	Voice (12.2 kbps)		
Transmit Frequency Range:	1850 to 1910 MHz		
Transmit Channels Tested:	Channel ID	Channel Number	Channel Frequency (MHz)
	Middle	9400	1880.0
Technology Tested:	Bluetooth		
Mode:	Basic Rate (DH5)		
Transmit Frequency Range:	2400 to 2483.5 MHz		
Transmit Channels Tested:	Channel ID	Channel Number	Channel Frequency (MHz)
	Middle	39	2441

3.4. Description of Available Antennas

The radio utilises 2 integrated antennas with the following maximum gains:

Manufacturer	Model	Type	Frequency Range (MHz)	Antenna Gain (dBi)
Antenova	A10470-GSM	PIFA	824 to 849	Not specified
			1850 to 1910	Not specified
	A10470-BLADE	Monopole	2400 to 2500	Not specified

3.5. Description of Test Setup

EUT Accessories

The following accessories were used to exercise the EUT during testing:

Description:	Power Supply
Brand Name:	ASTEC
Model Name or Number:	DPS53-M / RDT Tempus PSU 01-2049
Serial Number:	Not marked or stated

Description:	Earpiece. Quantity 1
Brand Name:	Not marked or stated
Model Name or Number:	Not marked or stated
Serial Number:	Not marked or stated

Description:	Pulse Oximeter (Masimo rainbow finger sensor). Quantity 1
Brand Name:	Not marked or stated
Model Name or Number:	Not marked or stated
Serial Number:	Not marked or stated

Description:	End Tidal CO2 Monitor (plastic hose). Quantity 1
Brand Name:	Not marked or stated
Model Name or Number:	Not marked or stated
Serial Number:	Not marked or stated

Description:	ECG (RDT 12-lead cable 01-2073). Quantity 1
Brand Name:	Not marked or stated
Model Name or Number:	Not marked or stated
Serial Number:	Not marked or stated

Description:	Non-invasive blood pressure monitor (plastic hose). Quantity 1
Brand Name:	Not marked or stated
Model Name or Number:	Not marked or stated
Serial Number:	Not marked or stated

Description:	Contact temperature thermocouple. Quantity 2
Brand Name:	Not marked or stated
Model Name or Number:	Not marked or stated
Serial Number:	Not marked or stated

EUT Accessories (continued)

Description:	USB Cable (RDT data transfer cable 01-2243). Quantity 1
Brand Name:	Not marked or stated
Model Name or Number:	Not marked or stated
Serial Number:	Not marked or stated

Description:	Invasive blood pressure; internal (RDT 2-channel cable 01-2108 & 01-2113 with transducers)
Brand Name:	Not marked or stated
Model Name or Number:	Not marked or stated
Serial Number:	Not marked or stated

Support Equipment

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

Description:	Laptop PC
Brand Name:	Lenovo
Model Name or Number:	L430
Serial Number:	R9-Z2L03 13/06

Description:	USB Cable. Length 2 metres. Quantity 1
Brand Name:	Not marked or stated
Model Name or Number:	Not marked or stated
Serial Number:	Not marked or stated

Description:	Ethernet Cable. Length 2 metres. Quantity 1
Brand Name:	Not marked or stated
Model Name or Number:	Not marked or stated
Serial Number:	Not marked or stated

Description:	USB Hub
Brand Name:	HAMA
Model Name or Number:	00078498
Serial Number:	Not marked or stated

Description:	Ethernet Hub
Brand Name:	Netgear
Model Name or Number:	DG834G
Serial Number:	1JX167B008C4A

Support Equipment (continued)

Description:	Wideband Radio Comms Tester
Brand Name:	Rohde & Schwarz
Model Name or Number:	CMW 500
Serial Number:	145923

Operating Modes

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

- Transmitting simultaneously with *Bluetooth* and cellular at maximum power.

Configuration and Peripherals

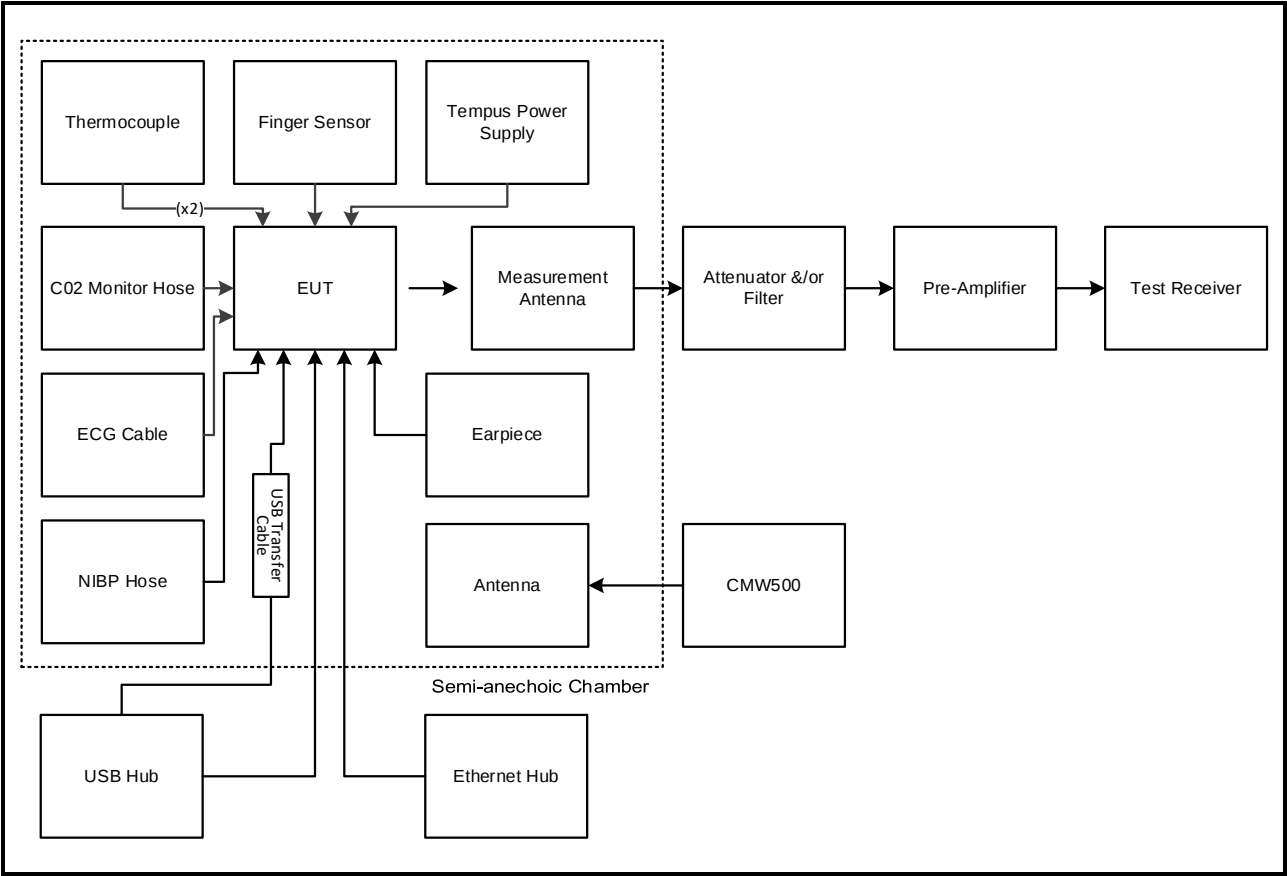
The EUT was tested in the following configuration(s):

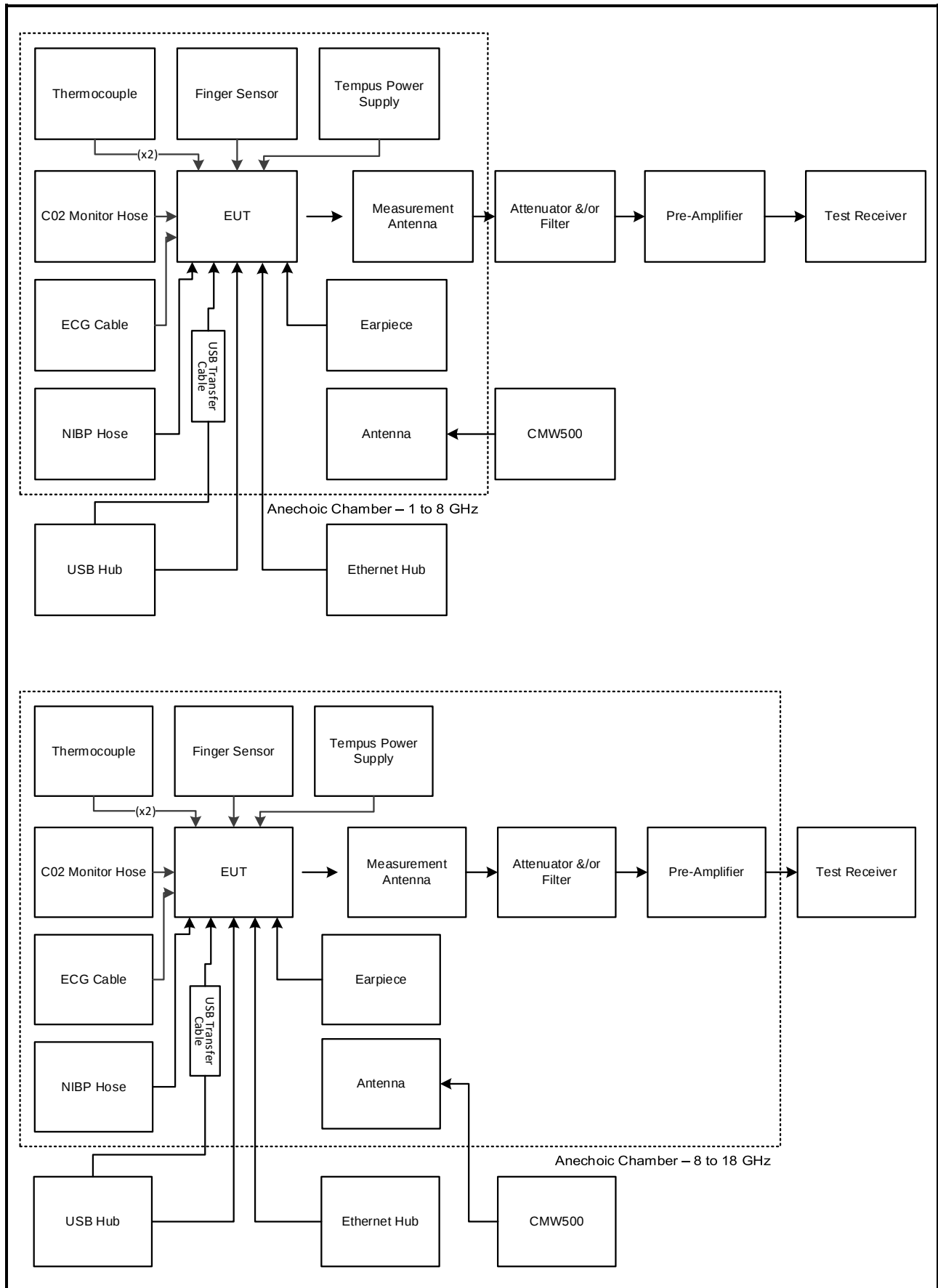
- GSM 850 and *Bluetooth* co-location tests. The EUT was configured to simultaneously transmit two signals at maximum output power. (GSM 850 circuit switched carrier on middle channel 190 / 836.6 MHz and *Bluetooth* DH5 carrier middle channel 39 / 2441 MHz).
- GSM 1900 and *Bluetooth* co-location tests. The EUT was configured to simultaneously transmit two signals at maximum output power. (GSM 1900 circuit switched carrier on middle channel 660 / 1879.8 MHz and *Bluetooth* DH5 carrier middle channel 39 / 2441 MHz).
- UMTS 850 and *Bluetooth* co-location tests. The EUT was configured to simultaneously transmit two signals at maximum output power. (UMTS Band 850 Voice / 12.2 kbps carrier on middle channel 4183 / 836.6 MHz and *Bluetooth* DH5 carrier middle channel 39 / 2441 MHz).
- UMTS 1900 and *Bluetooth* co-location tests. The EUT was configured to simultaneously transmit two signals at maximum output power. (UMTS Band 1900 Voice / 12.2 kbps carrier on middle channel 9400 / 1880.0 MHz and *Bluetooth* DH5 carrier middle channel 39 / 2441 MHz).
- The cellular link was controlled using a Rhode & Schwarz CMW 500 base station simulator.
- *Bluetooth* was configured using a command prompt application installed 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 120 VAC 60Hz single phase supply via a 12V power adaptor.
- All unused ports were terminated with typical end-user hardware during testing.

Test Setup Diagrams

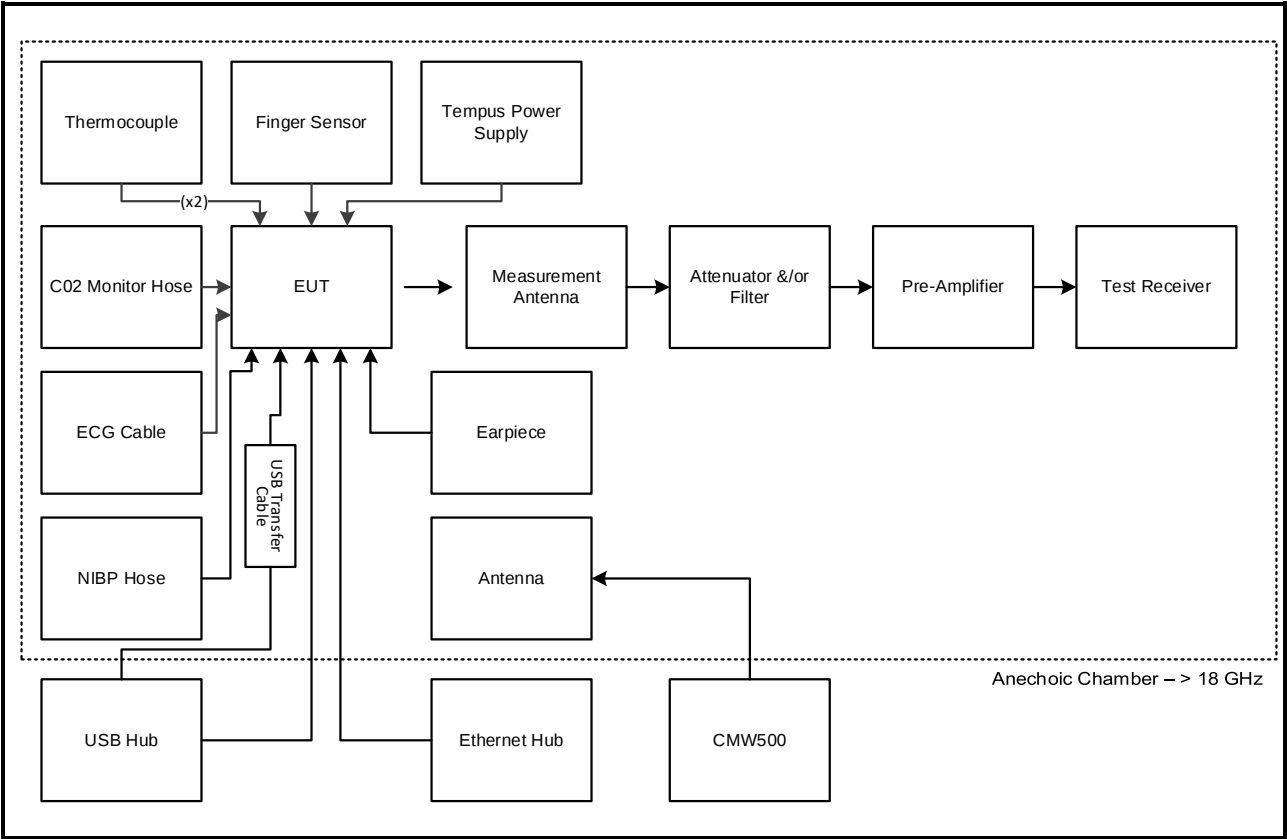
Radiated Tests:

Test Setup for Transmitter Radiated Emissions



Test Setup for Transmitter Radiated Emission (continued)

Test Setup for Transmitter Radiated Emission (continued)



4. Radiated Test Results

4.1. Transmitter Out of Band Radiated Emissions (GSM 850 & Bluetooth)

Test Summary:

Test Engineers:	James O'Reilly & Andrew Edwards	Test Dates:	10 March 2019, 24 March 2019 & 28 March 2019
Test Sample Serial Number:	602429		

FCC Reference:	Parts 15.209(a), 15.247(d) & 22.917
ISED Canada Reference:	RSS-Gen 6.13, RSS-247 5.5 & RSS-132 5.5
Test Method Used:	ANSI C63.26 Section 5.5, KDB 971168 Section 6.1 and ANSI C63.10 Sections 6.3, 6.5 and 6.6
Frequency Range:	30 MHz to 25 GHz
Configuration:	GSM 850 circuit switched / <i>Bluetooth</i> DH5

Environmental Conditions:

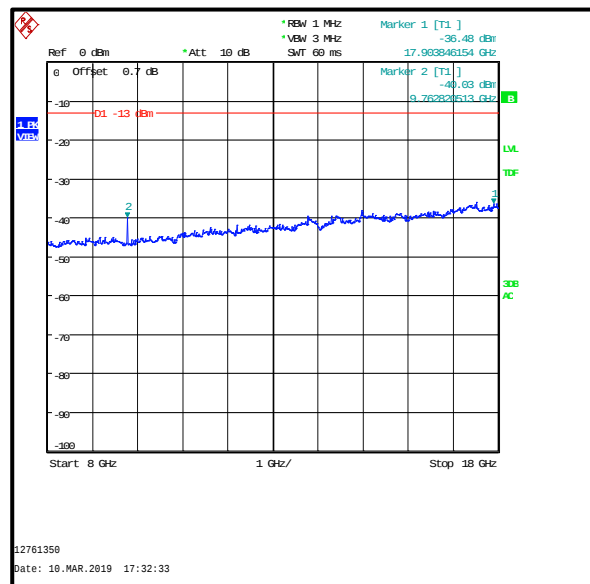
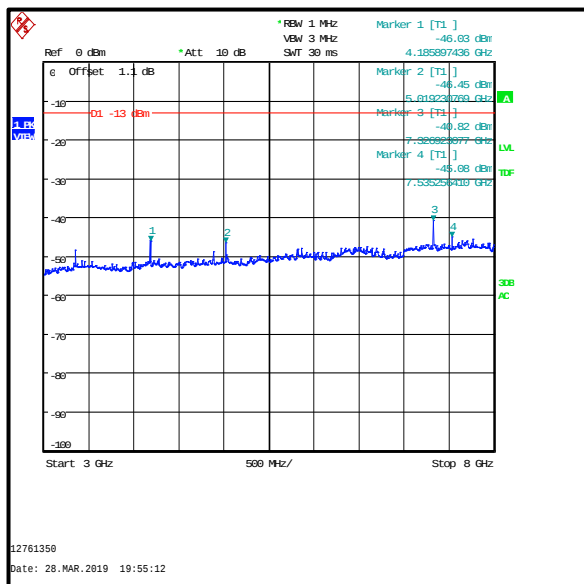
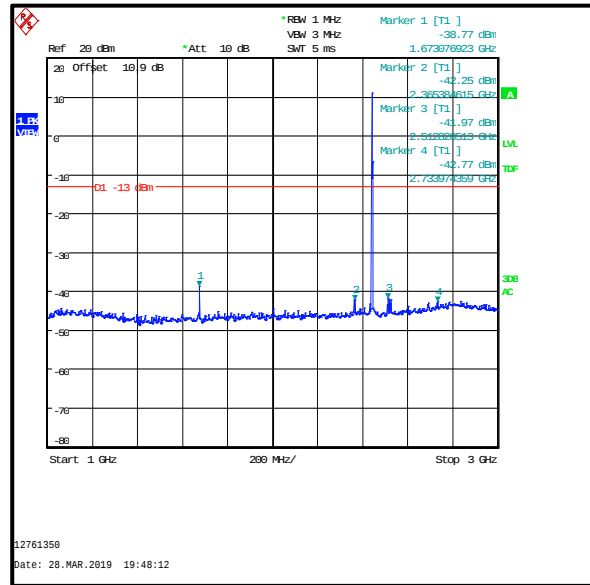
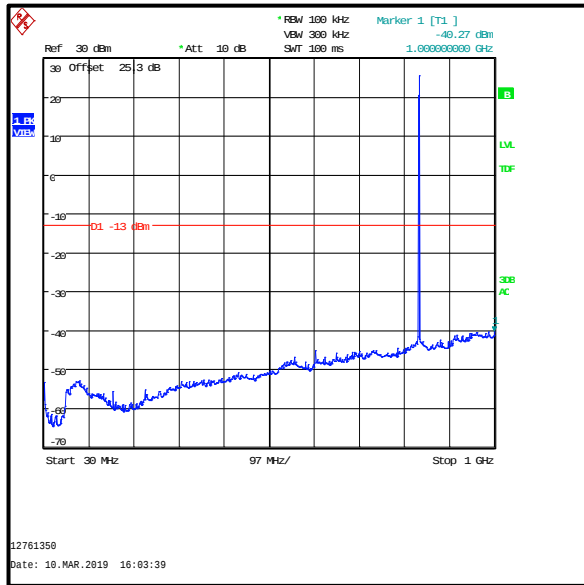
Temperature (°C):	21 to 25
Relative Humidity (%):	36 to 37

Transmitter Out of Band Radiated Emissions (GSM 850 & Bluetooth) continued**Note(s):**

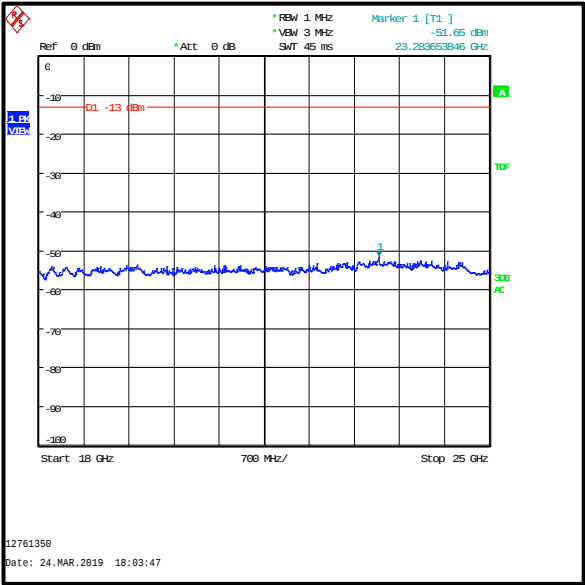
1. All intermodulation products were below the noise floor level or greater than 20 dB of the specification limit.
2. The GSM 850 uplink carrier is shown on the 30 MHz to 1 GHz plot.
3. The *Bluetooth* fundamental is shown on the 1 GHz to 3 GHz plot.
4. A -13 dBm limit was applied as it is the least onerous of the spurious emissions limits for Part 15 & Part 22.
5. The emissions at 1.673 GHz, 4.186 GHz and 5.019 GHz are harmonics of the GSM signal and were therefore not measured.
6. The emissions at 2.365 GHz and 2.513 GHz were investigated and found not to be intermodulation products.
7. The emissions at 7.327 GHz and 9.763 GHz are harmonics of the *Bluetooth* signal and were therefore not measured.
8. Pre-scans below 1GHz were performed and a marker placed on the highest measured level. 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.
9. Pre-scans above 1GHz were performed and markers placed on the highest measured levels 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 respective detectors.
10. Measurements were performed in a semi-anechoic/anechoic chamber (Asset Number K0001 & K0017) at a distance of 3 metres. The EUT was placed at a height of 80 cm (measurements below 1 GHz) and 1.5 metres (measurements above 1 GHz) above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

Results: GSM 850 - Middle Channel / Bluetooth - Middle Channel

Emission Frequency (MHz)	Emission Level	Applicable Limit	Margin (dB)	Result
See Note 1				

Transmitter Out of Band Radiated Emissions (GSM 850 & Bluetooth) continued

Transmitter Out of Band Radiated Emissions (GSM 850 & Bluetooth) continued



4.2. Transmitter Out of Band Radiated Emissions (PCS 1900 & Bluetooth)**Test Summary:**

Test Engineers:	James O'Reilly & Andrew Edwards	Test Dates:	10 March 2019, 24 March 2019 & 28 March 2019
Test Sample Serial Number:	602429		

FCC Reference:	Parts 15.209(a), 15.247(d) & 24.238
ISED Canada Reference:	RSS-Gen 6.13, RSS-247 5.5 & RSS-133 6.5
Test Method Used:	ANSI C63.26 Section 5.5, KDB 971168 Section 6.1 and ANSI C63.10 Sections 6.3, 6.5 and 6.6
Frequency Range:	30 MHz to 25 GHz
Configuration:	PCS 1900 circuit switched / <i>Bluetooth</i> DH5

Environmental Conditions:

Temperature (°C):	21 to 25
Relative Humidity (%):	36 to 37

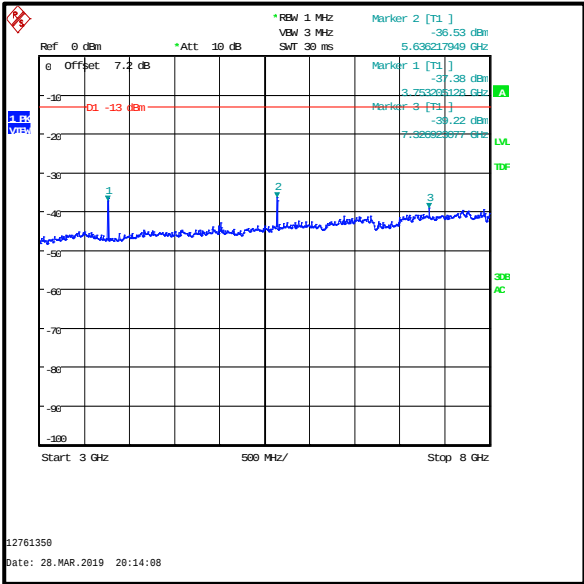
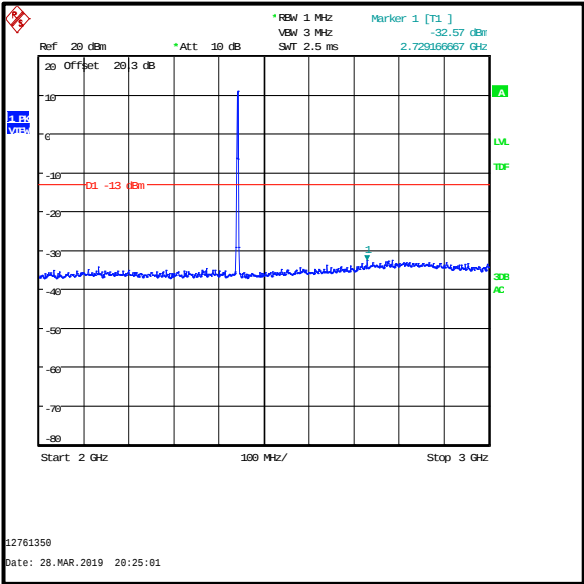
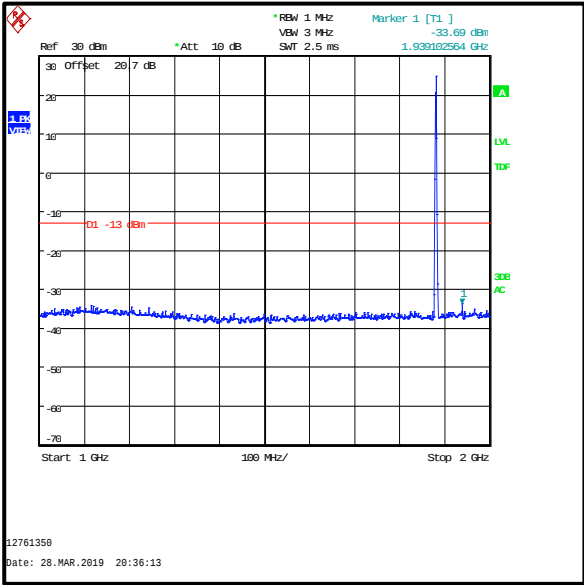
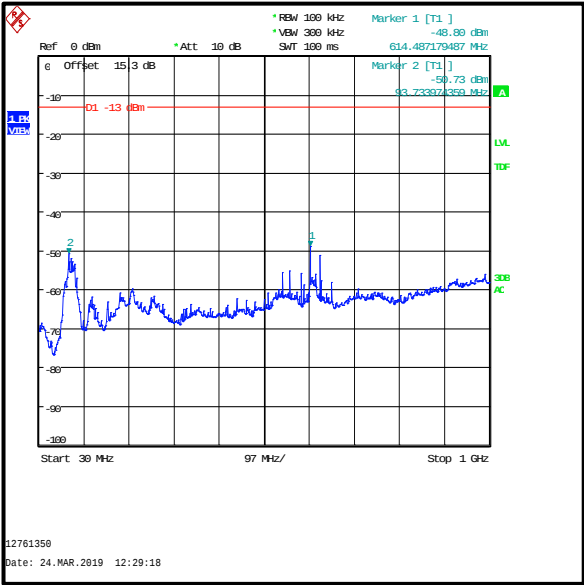
Transmitter Out of Band Radiated Emissions (PCS 1900 & Bluetooth) continued**Note(s):**

1. All intermodulation products were below the noise floor level or greater than 20 dB of the specification limit.
2. The PCS 1900 uplink carrier is shown on the 1 GHz to 2 GHz plot.
3. The *Bluetooth* fundamental is shown on the 2 GHz to 3 GHz plot.
4. A -13 dBm limit was applied as it is the least onerous of the spurious emissions limits for Part 15 & Part 24.
5. The emissions at 3.753 GHz and 5.636 GHz are harmonics of the PCS signal and were therefore not measured.
6. The emissions at 7.326 GHz and 9.763 GHz are harmonics of the *Bluetooth* signal and were therefore not measured.
7. Pre-scans below 1GHz 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.
8. Pre-scans above 1GHz were performed and markers placed on the highest measured levels 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 respective detectors.
9. Measurements were performed in a semi-anechoic/anechoic chamber (Asset Number K0001 & K0017) at a distance of 3 metres. The EUT was placed at a height of 80 cm (measurements below 1 GHz) and 1.5 metres (measurements above 1 GHz) above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

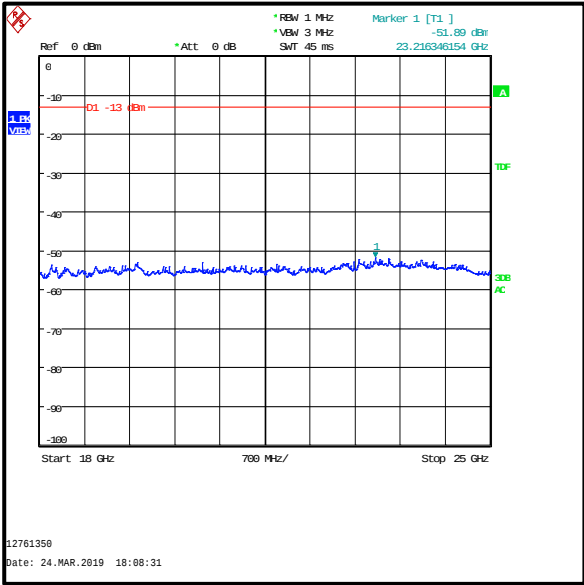
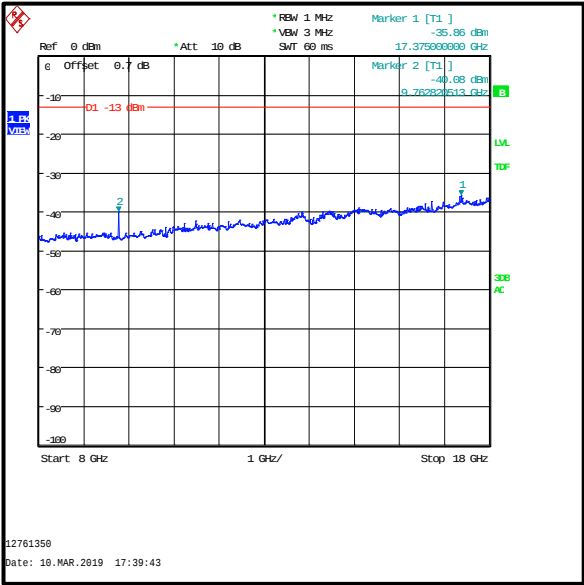
Results: PCS 1900 - Middle Channel / Bluetooth - Middle Channel

Emission Frequency (MHz)	Emission Level	Applicable Limit	Margin (dB)	Result
See Note 1				

Transmitter Out of Band Radiated Emissions (PCS 1900 & Bluetooth) continued



Transmitter Out of Band Radiated Emissions (PCS 1900 & Bluetooth) continued



4.3. Transmitter Out of Band Radiated Emissions (UMTS 850 & Bluetooth)**Test Summary:**

Test Engineers:	James O'Reilly & Andrew Edwards	Test Dates:	10 March 2019, 24 March 2019 & 28 March 2019
Test Sample Serial Number:	602429		

FCC Reference:	Parts 15.209(a), 15.247(d) & 22.917
ISED Canada Reference:	RSS-Gen 6.13, RSS-247 5.5 & RSS-132 5.5
Test Method Used:	ANSI C63.26 Section 5.5, KDB 971168 Section 6.1 and ANSI C63.10 Sections 6.3, 6.5 and 6.6
Frequency Range:	30 MHz to 25 GHz
Configuration:	UMTS 850 Voice / Bluetooth DH5

Environmental Conditions:

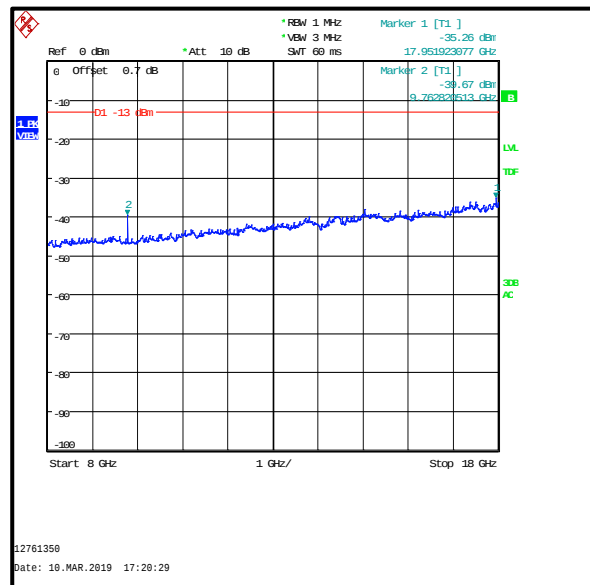
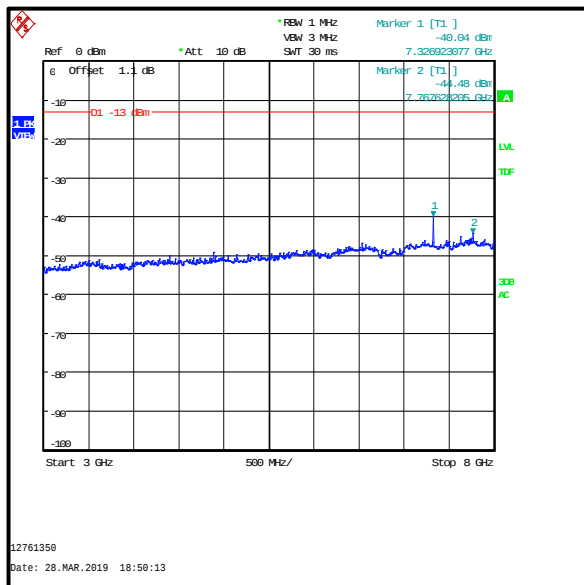
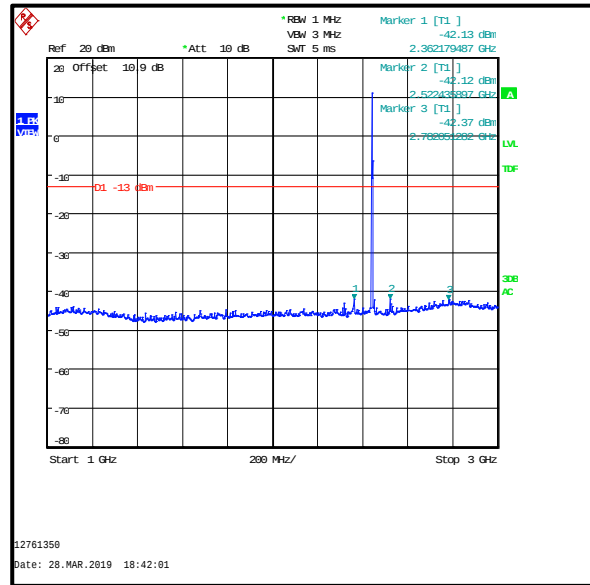
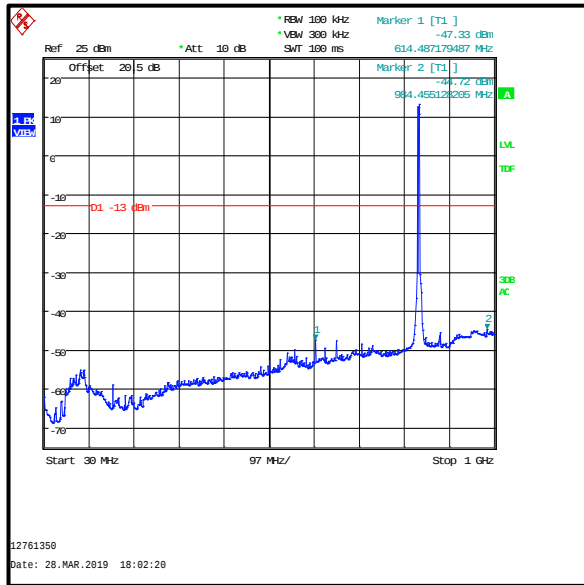
Temperature (°C):	21 to 25
Relative Humidity (%):	36 to 37

Transmitter Out of Band Radiated Emissions (UMTS 850 & Bluetooth) continued**Note(s):**

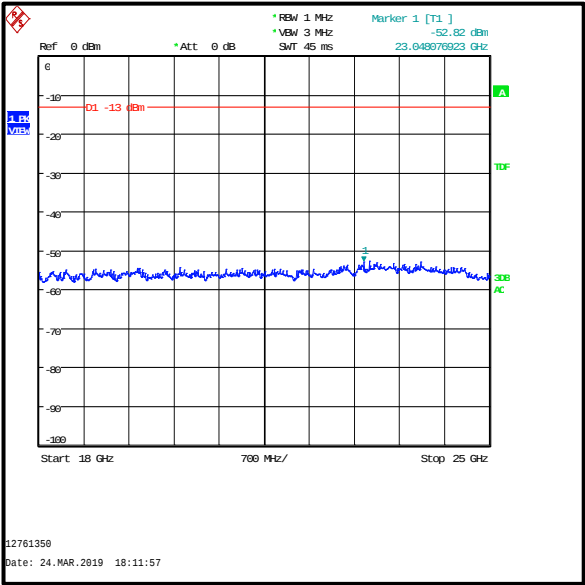
1. All intermodulation products were below the noise floor level or greater than 20 dB of the specification limit.
2. The UMTS 850 uplink carrier is shown on the 30 MHz to 1 GHz plot.
3. The *Bluetooth* fundamental is shown on the 1 GHz to 3 GHz plot.
4. A -13 dBm limit was applied as it is the least onerous of the spurious emissions limits for Part 15 & Part 22.
11. The emissions at 2.362 GHz and 2.522 GHz were investigated and found not to be intermodulation products.
5. The emissions at 7.326 GHz and 9.763 GHz are harmonics of the *Bluetooth* signal and were therefore not measured.
6. Pre-scans below 1GHz 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. Pre-scans above 1GHz were performed and markers placed on the highest measured levels 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 respective detectors.
8. Measurements were performed in a semi-anechoic/anechoic chamber (Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm (measurements below 1 GHz) and 1.5 metres (measurements above 1 GHz) above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

Results: UMTS 850 Middle Channel / Bluetooth Middle Channel

Emission Frequency (MHz)	Emission Level	Applicable Limit	Margin (dB)	Result
See Note 1				

Transmitter Out of Band Radiated Emissions (UMTS 850 & Bluetooth) continued

Transmitter Out of Band Radiated Emissions (UMTS 850 & Bluetooth) continued



4.4. Transmitter Out of Band Radiated Emissions (UMTS 1900 & Bluetooth)**Test Summary:**

Test Engineers:	James O'Reilly & Andrew Edwards	Test Dates:	10 March 2019, 24 March 2019 & 28 March 2019
Test Sample Serial Number:	602429		

FCC Reference:	Parts 15.209(a), 15.247(d) & 24.238
ISED Canada Reference:	RSS-Gen 6.13, RSS-247 5.5 & RSS-133 6.5
Test Method Used:	ANSI C63.26 Section 5.5, KDB 971168 Section 6.1 and ANSI C63.10 Sections 6.3, 6.5 and 6.6
Frequency Range:	30 MHz to 25 GHz
Configuration:	UMTS 1900 Voice / Bluetooth DH5

Environmental Conditions:

Temperature (°C):	21 to 25
Relative Humidity (%):	36 to 37

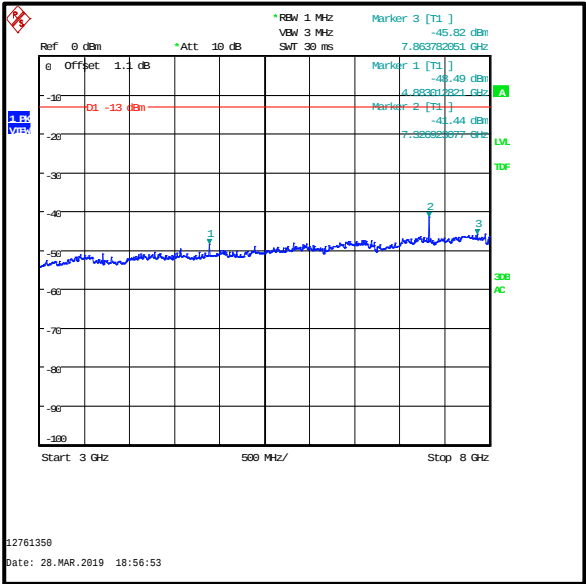
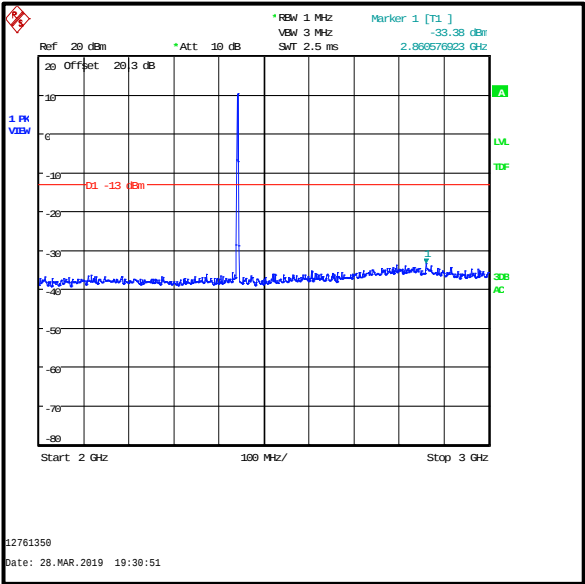
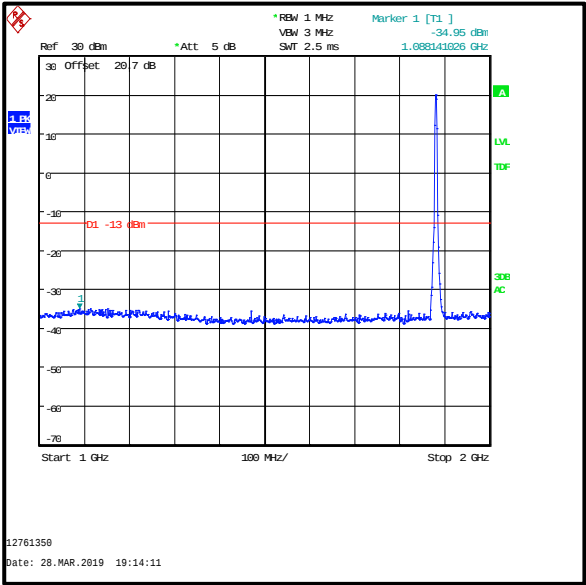
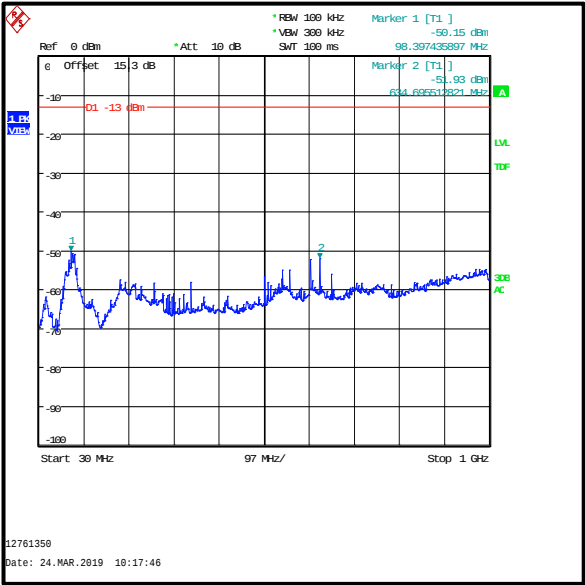
Transmitter out of Band Radiated Emissions (UMTS 1900 & Bluetooth) continued**Note(s):**

1. All intermodulation products were below the noise floor level or greater than 20 dB of the specification limit.
2. The UMTS 1900 uplink carrier is shown on the 1 GHz to 2 GHz plot.
3. The *Bluetooth* fundamental is shown on the 2 GHz to 3 GHz plot.
4. A -13 dBm limit was applied as it is the least onerous of the spurious emissions limits for Part 15 & Part 24.
5. The emissions at 4.883 GHz, 7.326 GHz and 9.763 GHz are harmonics of the *Bluetooth* signal and were therefore not measured.
6. Pre-scans below 1GHz 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. Pre-scans above 1GHz were performed and markers placed on the highest measured levels 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 respective detectors.
8. Measurements were performed in a semi-anechoic/anechoic chamber (Asset Number K0001 & K0017) at a distance of 3 metres. The EUT was placed at a height of 80 cm (measurements below 1 GHz) and 1.5 metres (measurements above 1 GHz) above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

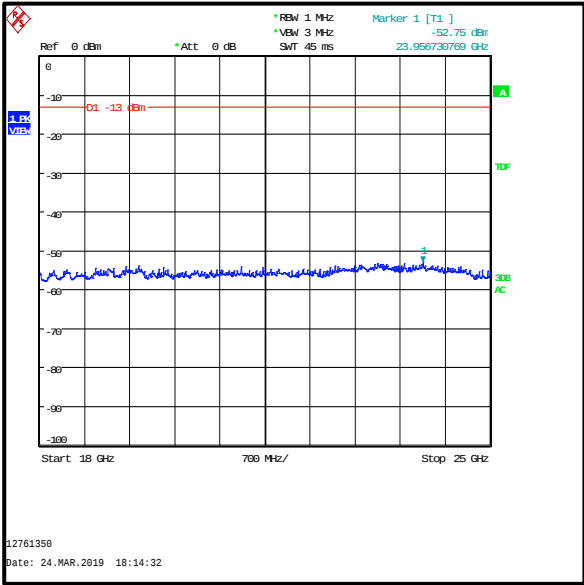
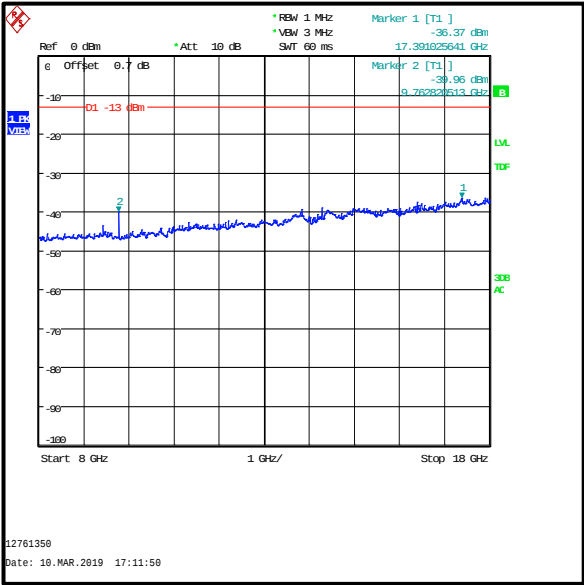
Results: UMTS 1900 - Middle Channel / Bluetooth Middle Channel

Emission Frequency (MHz)	Emission Level	Applicable Limit	Margin (dB)	Result
See Note 1				

Transmitter out of Band Radiated Emissions (UMTS 1900 & Bluetooth) continued



Transmitter out of Band Radiated Emissions (UMTS 1900 & Bluetooth) continued



--- END OF REPORT ---