TEST REPORT

Test Report No. : UL-RPT-RP10407443JD12B V2.0

Manufacturer	:	Apple Inc.
Model No.	:	A1600
FCC ID	:	BCGA1600
IC Certification No.	:	579C-A1600
Technology	:	CDMA BC1
Test Standard(s)	:	FCC Part 24; Industry Canada RSS-Gen Issue 3 December 2010 & RSS-133 Issue 6 January 2013

1. This test report shall not be reproduced in full or partial, without the written approval of UL VS LTD.
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: 15 September 2014

Checked by:

Sarah Williams
Engineer, Radio Laboratory

Issued by:

pp
John Newell
Quality Manager,
UL VS LTD

UKAS TESTING 0644

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

UL VS LTD

Pavilion A, Ashwood Park, Ashwood Way, Basingstoke, Hampshire, RG23 8BG, UK
Telephone: +44 (0)1256 312000
Facsimile: +44 (0)1256 312001

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1. Customer Information

Company Name:	Apple Inc.
Address:	1 Infinite Loop Cupertino, CA 95014 U.S.A.

2. Summary of Testing

2.1. General Information

Specification Reference:	47CFR24
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications): Part 24 Subpart E (Personal Communication Services)
Specification Reference:	RSS-Gen Issue 3, December 2010
Specification Title:	General Requirements and Information for the Certification of Radio Apparatus
Specification Reference:	RSS-133 Issue 6, January 2013
Specification Title:	2 GHz Personal Communications Services
Site Registration:	FCC: 209735; Industry Canada: 3245B-2
Location of Testing:	UL VS LTD, Unit 3 Horizon, Wade Road, Kingsland Business Park, Basingstoke, Hampshire, RG24 8AH, United Kingdom
Test Dates:	04 August 2014 to 19 August 2014

2.2. Summary of Test Results

FCC Reference	IC Reference	Measurement	Result
Part 24.232(c)	RSS-Gen 4.8 / RSS-133 6.4	Transmitter Output Power and E.I.R.P.	
Part 24.232(d)	RSS-133 6.4	Transmitter Peak-to-Average Power Ratio (PAPR)	
Part 2.1049	RSS-Gen 4.6.1	Transmitter Occupied Bandwidth	
Part 2.1053 / 24.238	RSS-Gen 4.9 / RSS-133 6.5	Transmitter Out of Band Radiated Emissions	
Part 2.1053 / 24.238	RSS-Gen 4.9 / RSS-133 6.5	Transmitter Band Edge Radiated Emissions	
Part 2.1055 / 24.235	RSS-Gen 4.7 / RSS-133 6.3	Transmitter Frequency Stability (Temperature and Voltage Variation)	

Key to Results

 = Complied  = Did not comply

2.3. Methods and Procedures

Reference:	FCC KDB 971168 D01 v02r01, 7 June 2013
Title:	Measurement Guidance for Certification of Licensed Digital Transmitters

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:	Apple
Model Name or Number:	A1600
Test Sample ESN:	80C51D54 *(Conducted sample #1)*
Test Sample MEID:	35202506027472
Hardware Version Number:	REV1.0
Software Version Number:	iOS 12A314 BB: 3.08.08
FCC ID:	BCGA1600
Industry Canada Certification Number:	579C-A1600

Brand Name:	Apple
Model Name or Number:	A1600
Test Sample ESN:	80BCF6E7 *(Conducted sample #2)*
Test Sample MEID:	35202506027453
Hardware Version Number:	REV1.0
Software Version Number:	iOS 12A314 BB: 3.08.08
FCC ID:	BCGA1600
Industry Canada Certification Number:	579C-A1600

Brand Name:	Apple
Model Name or Number:	A1600
Test Sample ESN:	8084BC87 *(Radiated sample)*
Test Sample MEID:	35202506023879
Hardware Version Number:	REV1.0
Software Version Number:	iOS 12A314 BB: 3.08.08
FCC ID:	BCGA1600
Industry Canada Certification Number:	579C-A1600

3.2. Description of EUT

The Equipment Under Test was a tablet with GSM/GPRS/EGPRS/UMTS/LTE and CDMA technologies. It also supports IEEE 802.11a/b/g/n (MIMO 2x2) and *Bluetooth*®. The rechargeable battery is not user accessible.

3.3. Modifications Incorporated in the EUT

No modifications were applied to the EUT during testing.

3.4. Additional Information Related to Testing

Technology Tested:	CDMA BC1		
Type of Radio Device:	Transceiver		
Modes:	1xRTT, EV-DO Rev 0 & EV-DO Rev A		
Modulation Type:	O-QPSK & H-PSK		
Power Supply Requirement(s):	Nominal	3.8 VDC	
	Minimum	3.4 VDC	
	Maximum	4.2 VDC	
Maximum Output Power (E.I.R.P.):	1xRTT	26.25 dBm (0.422 Watts)	
	EV-DO Rev. 0	24.35 dBm (0.272 Watts)	
	EV-DO Rev. A	24.25 dBm (0.266 Watts)	
Transmit Frequency Range:	1850 to 1910 MHz		
Transmit Channels Tested:	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Bottom	25	1851.25
	Middle	600	1880.0
	Top	1175	1908.75

3.5. Support Equipment

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

Brand Name:	Dell
Description:	Laptop PC
Model Name or Number:	Latitude E5400
Serial Number:	UL VS LTD Asset No. 01150

Brand Name:	Not marked or stated
Description:	USB Diagnostic cable
Model Name or Number:	Not marked or stated
Serial Number:	Not marked or stated

Brand Name:	Apple
Description:	USB Cable
Model Name or Number:	A1480
Serial Number:	Not marked or stated

Brand Name:	Apple
Description:	USB Charger
Model Name or Number:	A1399
Serial Number:	Not marked or stated

Brand Name:	Apple
Description:	PHF
Model Name or Number:	Apple Ear Plugs
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):

- Constantly transmitting at full power on bottom, middle and top channels as required.
- Occupied bandwidth, ERP and band edge tests were performed with the EUT in 1xRTT and EV-DO modes.
- Transmitter radiated spurious emissions were checked in all modes during pre-scans. 1xRTT RC1/1 was found to be the worst case and all final measurements were performed with the EUT in this mode.

4.2. Configuration and Peripherals

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

- Connected to a Rohde & Schwarz CMW 500 Wideband Radio Communications Tester operating in CDMA and EV-DO modes.
- Transmitter radiated spurious emissions tests were performed with the AC Charger and PHF connected to the EUT as this was found to be the worst case during pre-scans. All the accessories were individually connected and measurements made during the pre-scans to determine the worst case combination.
- Testing for frequency stability and measurements at temperature and voltage extremes was performed using a conducted sample supplied by the customer. Short 4-wire DC flying leads were connected internally to the device in place of the battery, and exited through a hole in the casing. These leads were then extended to a DC power supply for testing purposes.
- For conducted cellular measurements, the RF conducted port was created by removing a micro connector from the pcb antenna and extending it with a short flexible microstrip supplied by the customer. This microstrip exited the device through a hole in the casing and was terminated in a proprietary micro-coax to SMA adaptor.
- The conducted sample with ESN 80C51D54 was used for power and occupied bandwidth measurements.
- The conducted sample with ESN 80BCF6E7 was used for frequency stability measurements.
- The radiated sample with ESN 8084BC87 was used for all other measurements.

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 Output Power and E.I.R.P

Test Summary:

Test Engineer:	Ian Watch	**Test Dates:**	04 August 2014 to 07 August 2014
Test Sample ESN:	80C51D54		

FCC Reference:	Part 24.232(c)
Industry Canada Reference:	RSS-Gen 4.8 / RSS-133 6.4
Test Method Used:	See Notes below

Environmental Conditions:

Temperature (°C):	24 to 25
Relative Humidity (%):	38 to 46

Note(s):

1. Transmitter average output power was measured using a Rohde & Schwarz CMW 500 following current Rohde & Schwarz measurement procedures. All configurations were tested with the EUT transmitting at maximum power on the bottom, middle and top channels. An RF level offset was entered on the CMW 500 to compensate for the loss of the attenuator and RF cables.
2. The antenna gain was added to the conducted output power to obtain the E.I.R.P.
   The E.I.R.P. was subtracted from the limit to show the margin.

Transmitter Output Power and E.I.R.P. (continued)

Results: 1xRTT

Radio Configuration (RC)	Service Option (SO)	Conducted Output Power (dBm)		
		Ch. 25 / 1851.25 MHz	Ch. 600 / 1880 MHz	Ch. 1175 / 1908.75
		Average	Average	Average
RC1/1	2 (Loopback)	24.1	24.1	24.2
	55 (Loopback)	24.1	24.1	24.2
RC2/2	9 (Loopback)	24.1	24.1	24.2
	55 (Loopback)	24.1	24.1	24.2
RC3/3	2 (Loopback)	24.1	24.1	24.2
	55 (Loopback)	24.1	24.1	24.2
RC4/3	2 (Loopback)	24.1	24.1	24.2
	55 (Loopback)	24.1	24.1	24.2
RC5/4	55 (Loopback)	24.1	24.1	24.2

Channel	Frequency (MHz)	Highest Conducted Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	1851.25	24.1	2.15	26.25	33.0	6.75	Complied
Middle	1880.0	24.1	2.15	26.25	33.0	6.75	Complied
Top	1908.75	24.2	2.15	26.35	33.0	6.65	Complied

Transmitter Output Power and E.I.R.P. (continued)

Results: EV-DO Rev. 0

FTAP Rate	RTAP Rate	Average Conducted Output Power (dBm)		
		Ch. 25 / 1851.25 MHz	Ch. 600 / 1880 MHz	Ch. 1175 / 1908.75
307.2 kbit/s	153.6 kbit/s	22.2	22.1	22.1

Channel	Frequency (MHz)	Conducted Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
Bottom	1851.25	22.2	2.15	24.35	33.0	8.65	Complied
Middle	1880	22.1	2.15	24.25	33.0	8.75	Complied
Top	1908.75	22.1	2.15	24.25	33.0	8.75	Complied

Results: EV-DO Rev. A

FETAP Format	RETAP Data Payload Size	Average Conducted Output Power (dBm)		
		Ch. 25 / 1851.25 MHz	Ch. 600 / 1880 MHz	Ch. 1175 / 1908.75
307.2 kbit/s	4096 bits	22.1	22.1	22.0

Channel	Frequency (MHz)	Conducted Output Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
Bottom	1851.25	22.1	2.15	24.25	33.0	8.75	Complied
Middle	1880	22.1	2.15	24.25	33.0	8.75	Complied
Top	1908.75	22.0	2.15	24.15	33.0	8.85	Complied

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1657	Thermohygrometer	JM Handelspunkt	30.5015.13	None stated	14 Mar 2015	12
G0608	Signal Generator	Rohde & Schwarz	SMIQ 06B	838341/033	14 Feb 2015	12
A2137	Directional Coupler	AtlanTecRF	A4224-10	26861	Calibrated before use	-
M1870	Radio Comms Tester	Rohde & Schwarz	CMW 500	145919	02 May 2015	12
M1873	Signal Analyser	Rohde & Schwarz	FSV30	103074	15 May 2015	12
A2142	Attenuator	AtlanTecRF	AN18-20	081120-23	Calibrated before use	-

5.2.2. Transmitter Peak-To-Average Power Ratio (PAPR)

Test Summary:

Test Engineer:	Ian Watch	**Test Date:**	18 August 2014
Test Sample ESN:	80C51D54		

FCC Reference:	24.232(d)
Industry Canada Reference:	RSS-133 6.4
Test Method Used:	As detailed in FCC KDB 971168 Section 5.7.1

Environmental Conditions:

Temperature (°C):	23
Relative Humidity (%):	39

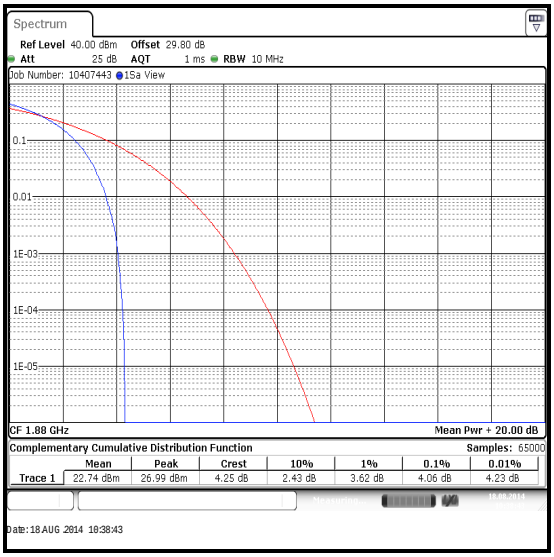
Note(s):

1. The CCDF function of a spectrum analyser was used to measure PAPR when the EUT was transmitting in 1xRTT and EV-DO modes. Maximum PAPR levels associated with a probability of 0.1% were recorded.
2. The signal analyser was connected to the RF port on the EUT using suitable attenuation and RF cables. An RF level offset was entered on the signal analyser to compensate for the loss of the attenuator and RF cables.

Transmitter Peak-To-Average Power Ratio (continued)

Results: 1xRTT

Channel	Frequency (MHz)	Peak (dBm)	Average (dBm)	Peak to Average Ratio (dB)	Ratio Limit (dB)	Margin (dB)	Result
Middle	1880.0	26.99	22.74	4.06	13.0	8.94	Complied

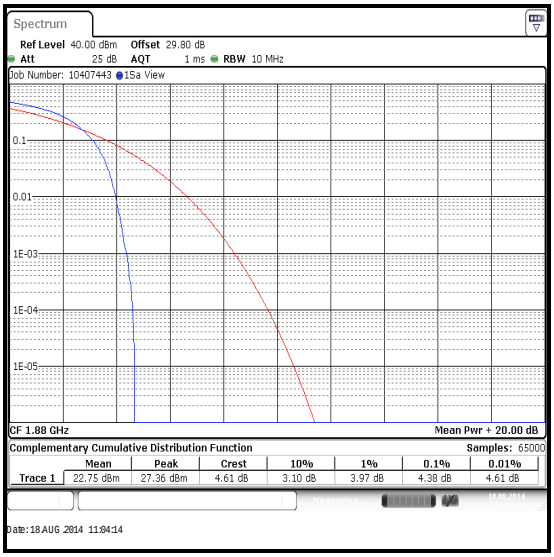


Middle Channel

Transmitter Peak-To-Average Power Ratio (continued)

Results: EV-DO Rev. 0

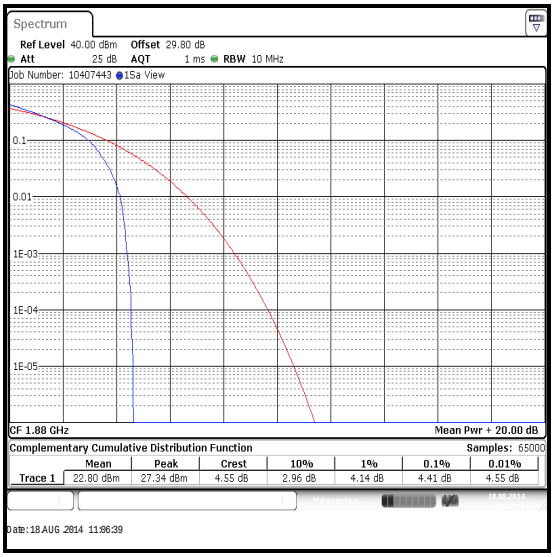
Channel	Frequency (MHz)	Peak (dBm)	Average (dBm)	Peak to Average Ratio (dB)	Ratio Limit (dB)	Margin (dB)	Result
Middle	1880.0	27.36	22.75	4.38	13.0	8.62	Complied



Middle Channel

Results: EV-DO Rev. A

Channel	Frequency (MHz)	Peak (dBm)	Average (dBm)	Peak to Average Ratio (dB)	Ratio Limit (dB)	Margin (dB)	Result
Middle	1880.0	27.34	22.80	4.41	13.0	8.59	Complied



Middle Channel

Transmitter Peak-To-Average Power Ratio (continued)

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1658	Thermohygrometer	JM Handelspunkt	30.5015.13	None stated	14 Mar 2015	12
G0608	Signal Generator	Rohde & Schwarz	SMIQ 06B	838341/033	14 Feb 2015	12
A2137	Directional Coupler	AtlanTecRF	A4224-10	26861	Calibrated before use	-
M1873	Signal Analyser	Rohde & Schwarz	FSV	103074	15 May 2015	12
A2142	Attenuator	AtlanTecRF	AN18-20	081120-23	Calibrated before use	-

5.2.3. Transmitter Occupied Bandwidth

Test Summary:

Test Engineer:	Ian Watch	**Test Date:**	05 August 2014
Test Sample ESN:	80C51D54		

FCC Reference:	Part 2.1049
Industry Canada Reference:	RSS-Gen 4.6.1
Test Method Used:	As detailed in FCC KDB 971168 Sections 4.1 & 4.2

Environmental Conditions:

Temperature (°C):	24
Relative Humidity (%):	45

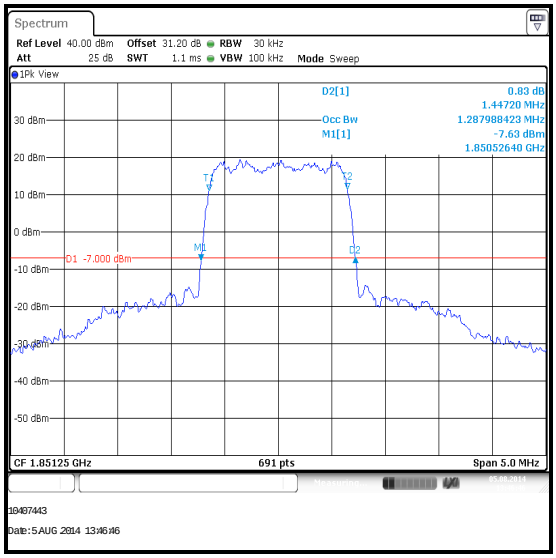
Note(s):

1. Occupied bandwidth (99% bandwidth) was measured using a signal analyser occupied bandwidth function.
2. The signal analyser was connected to the RF port on the EUT using suitable attenuation and RF cable.

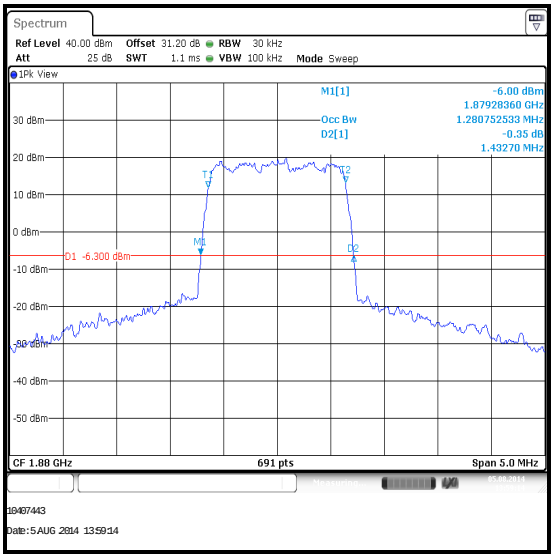
Transmitter Occupied Bandwidth (continued)

Results: 1xRTT

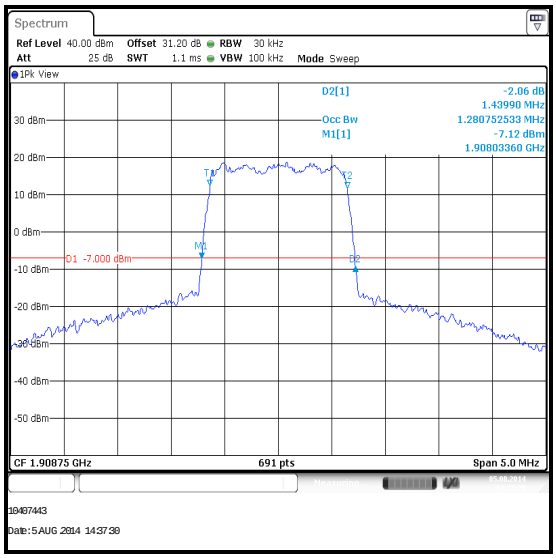
Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	-26 dB Bandwidth (kHz)
Bottom	1851.25	1287.988	1447.200
Middle	1880.0	1280.753	1432.700
Top	1908.75	1280.753	1439.900



Bottom Channel



Middle Channel

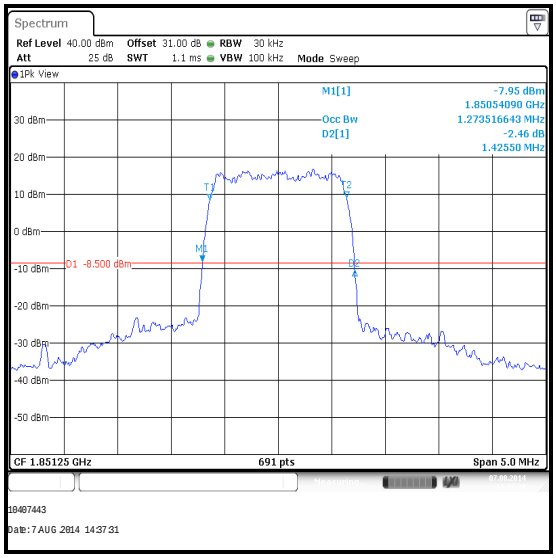


Top Channel

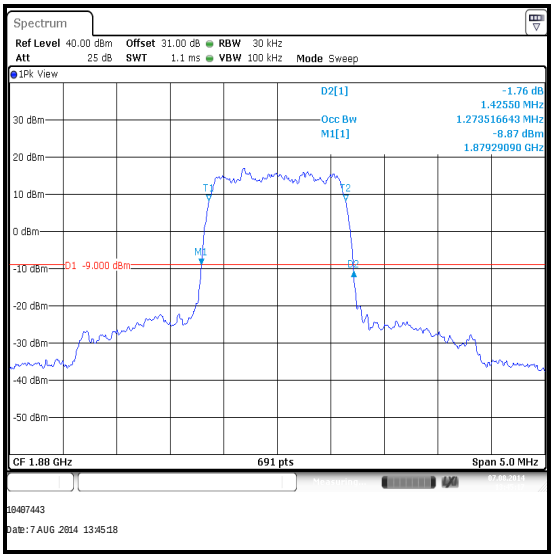
Transmitter Occupied Bandwidth (continued)

Results: EV-DO Rev. 0

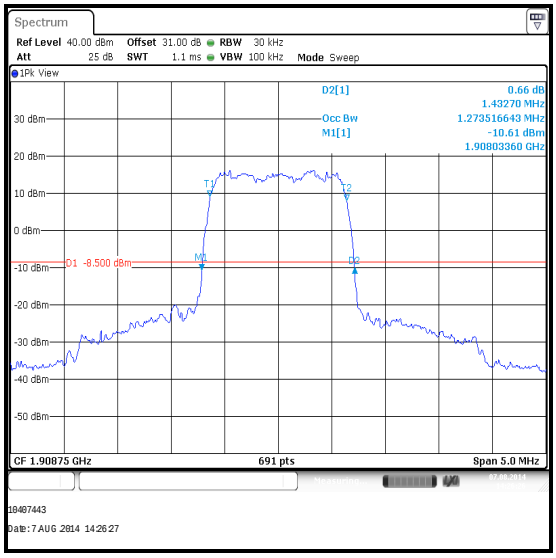
Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	-26 dB Bandwidth (kHz)
Bottom	1851.25	1273.517	1425.500
Middle	1880.0	1273.517	1425.500
Top	1908.75	1273.517	1432.700



Bottom Channel



Middle Channel

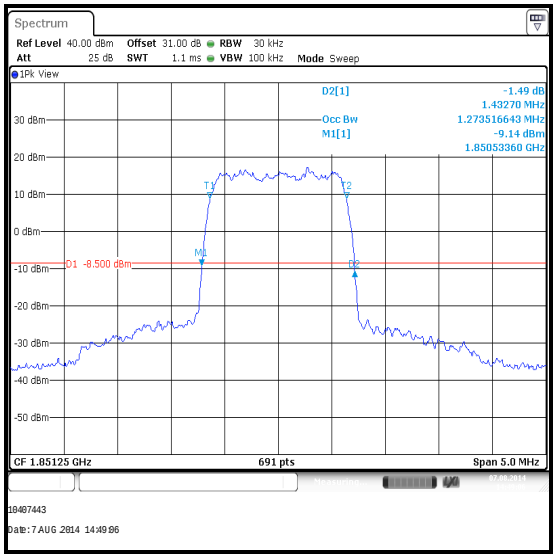


Top Channel

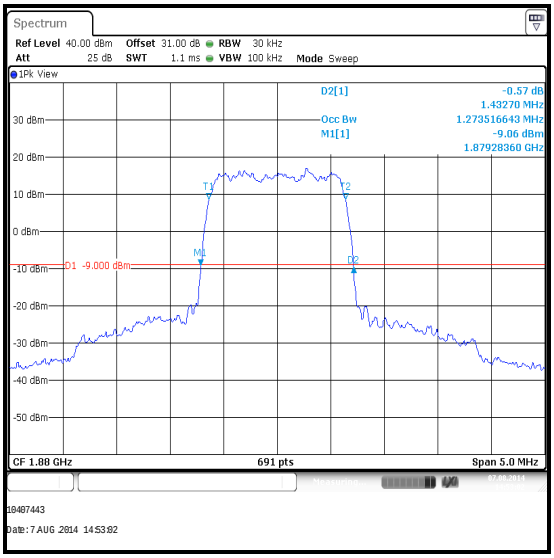
Transmitter Occupied Bandwidth (continued)

Results: EV-DO Rev. A

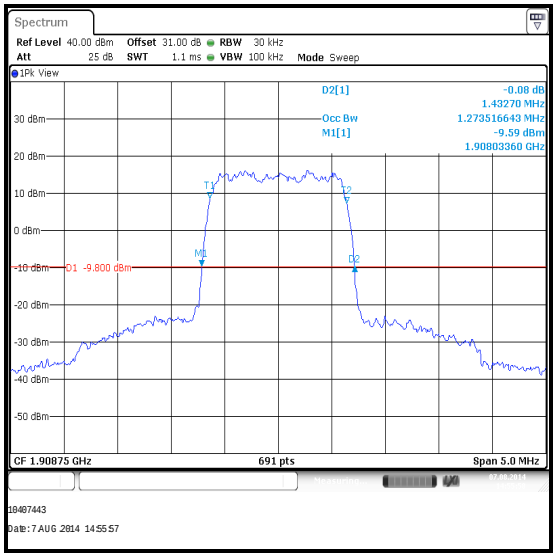
Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	-26 dB Bandwidth (kHz)
Bottom	1851.25	1273.517	1432.700
Middle	1880.0	1273.517	1432.700
Top	1908.75	1273.517	1432.700



Bottom Channel



Middle Channel



Top Channel

Transmitter Occupied Bandwidth (continued)

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1657	Thermohygrometer	JM Handelspunkt	30.5015.13	None stated	14 Mar 2015	12
A2137	Directional Coupler	AtlanTecRF	A4224-10	26861	Calibrated before use	-
M1835	Signal Analyser	Rohde & Schwarz	FSV	103050	26 Mar 2015	12
A2142	Attenuator	AtlanTecRF	AN18-20	081120-23	Calibrated before use	-

5.2.4. Transmitter Out of Band Radiated Emissions

Test Summary:

Test Engineer:	David Doyle	**Test Dates:**	12 August 2014 & 19 August 2014
Test Sample ESN:	8084BC87		

FCC Reference:	Part 2.1053 / 24.238
Industry Canada Reference:	RSS-Gen 4.9 / RSS-133 6.5
Test Method Used:	As detailed in KDB 971168 Section 6.1, FCC Part 24.238(b), Industry Canada RSS-133 Section 6.5, RSS-Gen Section 4.9 & Notes below
Frequency Range:	30 MHz to 19.1 GHz
Configuration:	1xRTT RC1/1

Environmental Conditions:

Temperature (°C):	23 to 24
Relative Humidity (%):	30 to 41

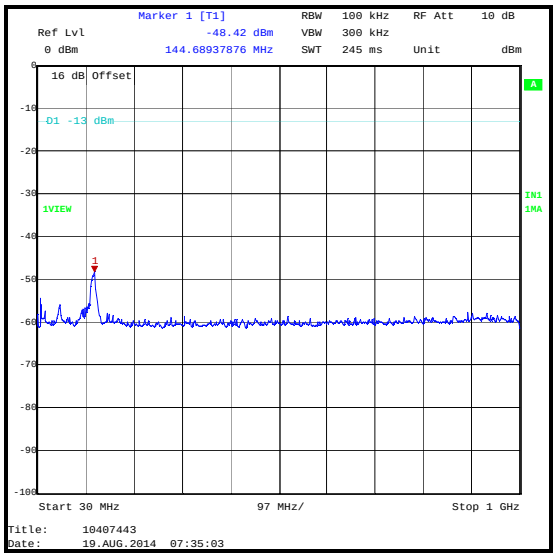
Note(s):

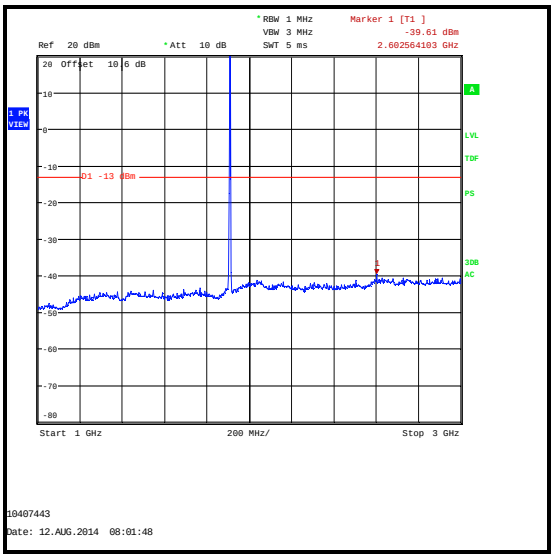
1. The uplink traffic channel is shown on the 1 GHz to 3 GHz plot.
2. All emissions shown on the pre-scan plots were investigated. Final measurements were made using appropriate RF filters and attenuators where required. All emissions shown on the pre-scan plots were found to be below the measurement system noise floor or ambient, therefore the highest peak noise floor reading of the measuring receiver was recorded in the table below.
3. 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.
4. 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 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. The test receiver resolution bandwidth was set to 1 MHz and video bandwidth 3 MHz, with the sweep time set to auto. A peak detector and trace mode of Max Hold were used to perform pre-scans, with markers placed on the highest measured levels. Final measurements were performed on the marker frequencies and the results entered into the table below.

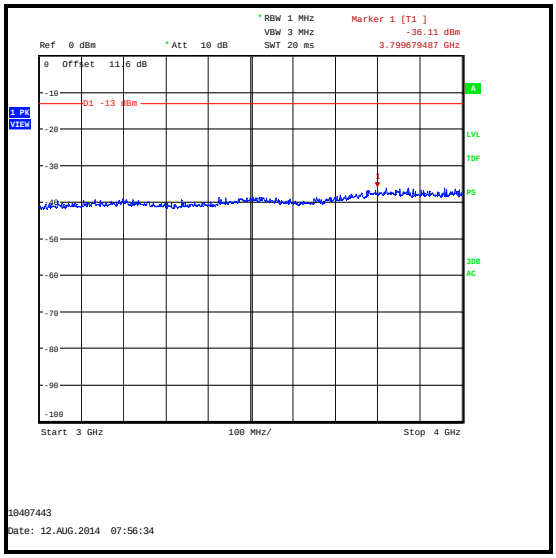
Results: 1xRTT RC1/1 - Top Channel

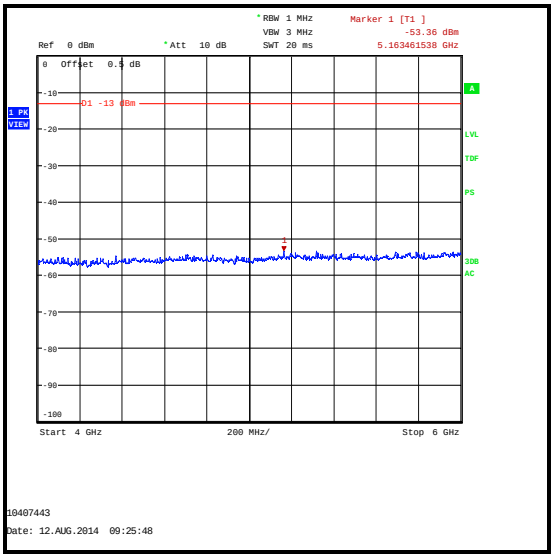
Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
3799.679	-36.1	-13.0	23.1	Complied

Transmitter Out of Band Radiated Emissions (continued)

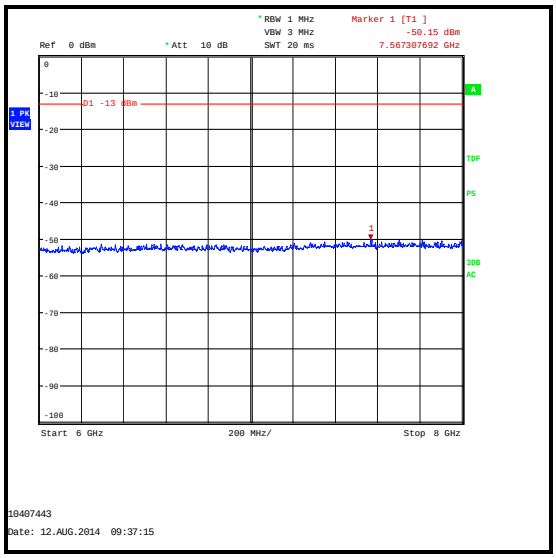


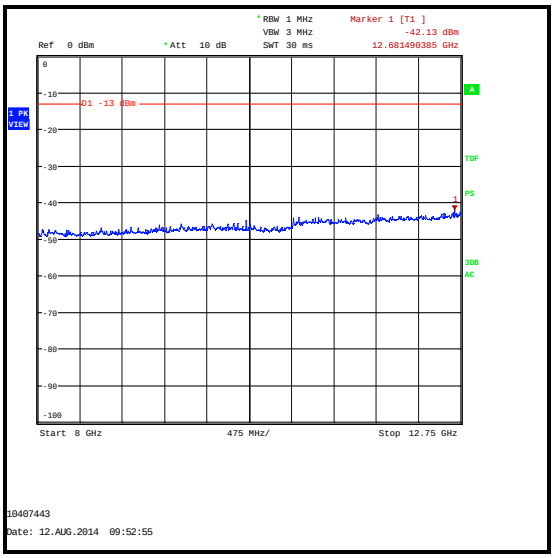


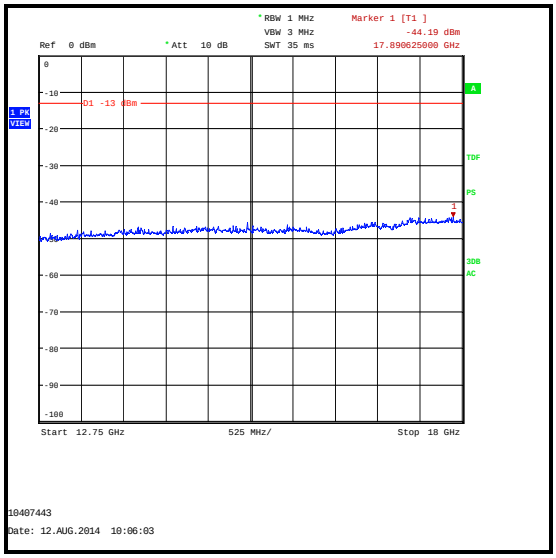


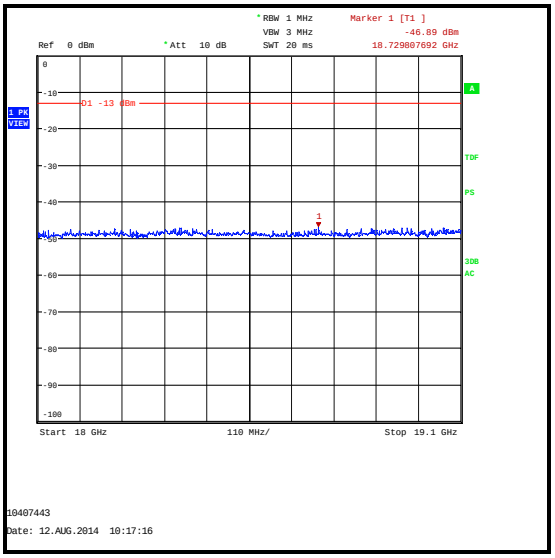


Transmitter Out of Band Radiated Emissions (continued)









Transmitter Out of Band Radiated Emissions (continued)

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1622	Thermohygrometer	JM Handelspunkt	30.5015.06	None stated	31 Dec 2014	12
K0001	5m RSE Chamber	Rainford EMC	N/A	N/A	26 Nov 2014	12
M1273	Test Receiver	Rohde & Schwarz	ESIB26	100275	15 Feb 2015	12
G0543	Pre-Amplifier	Sonoma	310N	230801	19 Aug 2014	3
A490	Antenna	Chase	CBL6111A	1590	29 Apr 2015	12
A1834	Attenuator	Hewlett Packard	8491B	10444	15 Nov 2014	12
M1656	Thermohygrometer	JM Handelspunkt	30.5015.13	Not stated	14 Mar 2015	12
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	14 Nov 2014	12
M1874	Test Receiver	Rohde & Schwarz	ESU26	100553	13 May 2015	12
A1534	Pre Amplifier	Hewlett Packard	8449B	3008A00405	18 May 2015	12
A1818	Antenna	EMCO	3115	00075692	14 Nov 2014	12
A253	Antenna	Flann Microwave	12240-20	128	14 Nov 2014	12
A254	Antenna	Flann Microwave	14240-20	139	14 Nov 2014	12
A255	Antenna	Flann Microwave	16240-20	519	14 Nov 2014	12
A256	Antenna	Flann Microwave	18240-20	400	14 Nov 2014	12
A436	Antenna	Flann Microwave	20240-20	330	14 Nov 2014	12
A1396	Attenuator	Huber & Suhner	6810.17.B	757987	02 May 2015	12
A1975	High Pass Filter	AtlanTecRF	AFH-03000	090424010	12 Apr 2015	12

5.2.5. Transmitter Radiated Emissions at Band Edges

Test Summary:

Test Engineer:	David Doyle	**Test Dates:**	12 August 2014 & 15 August 2014
Test Sample ESN:	8084BC87		

FCC Reference:	Part 2.1053 / 24.238
Industry Canada Reference:	RSS-Gen 4.9 / RSS-133 6.5
Test Method Used:	As detailed in KDB 971168 Section 6.1, FCC Part 24.238(b), Industry Canada RSS-133 Section 6.5, RSS-Gen Section 4.9 & Notes below

Environmental Conditions:

Temperature (°C):	22 to 23
Relative Humidity (%):	41 to 46

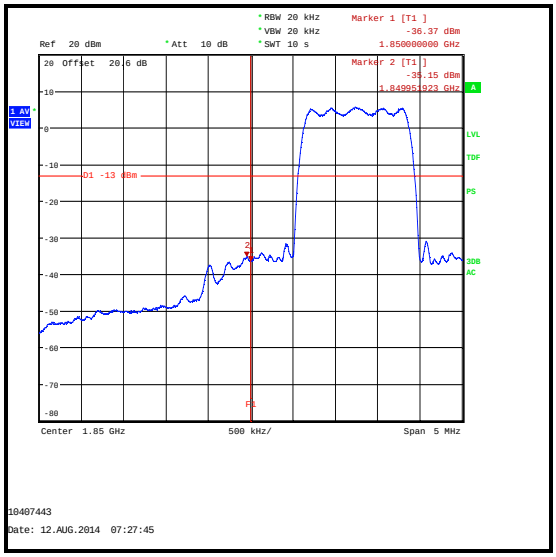
Note(s):

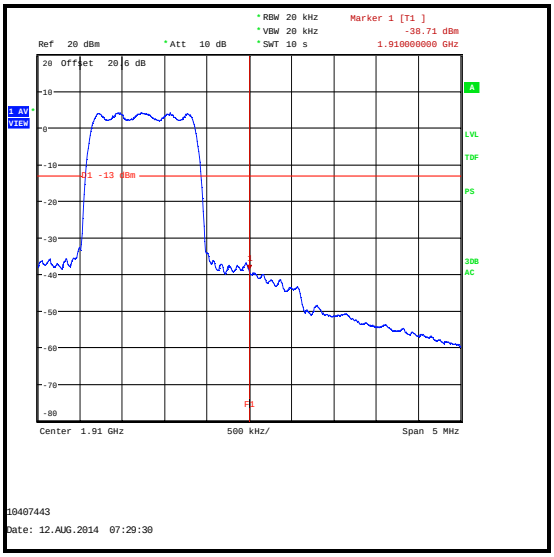
1. The final measured value, for the given emission, in the table below incorporates the calibrated antenna factor and cable loss.
2. Measurements were performed in a fully anechoic chamber (Asset Number K0002) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above the test chamber floor in the centre of the chamber turntable. The measurement antenna was placed at a fixed height of 1.5 metres above the test chamber floor, in line with the EUT. In the first 1.0 MHz immediately outside and adjacent to the band edges, the test receiver resolution bandwidth was set to 20 kHz (>1% of the occupied bandwidth) and video bandwidth 20 kHz. Sweep time was set to 10 seconds and an average detector with a trace mode of Max Hold was used.

Transmitter Radiated Emissions at Band Edges (continued)

Results: 1xRTT

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
1849.952	-35.2	-13.0	22.2	Complied
1850	-36.4	-13.0	23.4	Complied
1910	-38.7	-13.0	25.7	Complied

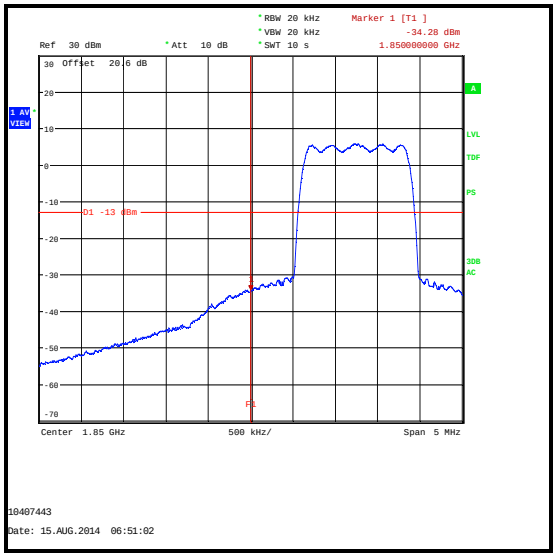


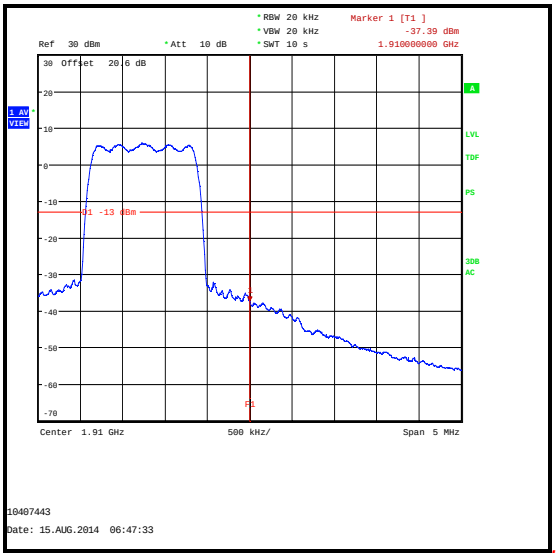


Transmitter Radiated Emissions at Band Edges (continued)

Results: 1xEV-DO Rev. A

Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	-34.3	-13.0	21.3	Complied
1910	-37.4	-13.0	24.4	Complied





Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1656	Thermohygrometer	JM Handelspunkt	30.5015.13	Not stated	14 Mar 2015	12
K0002	3m RSE Chamber	Rainford	N/A	N/A	14 Nov 2014	12
M1874	Test Receiver	Rohde & Schwarz	ESU26	100553	13 May 2015	12
A1534	Pre-Amplifier	Hewlett Packard	8449B	3008A00405	18 May 2015	12
A1818	Antenna	EMCO	3115	00075692	14 Nov 2014	12
A1396	Attenuator	Huber & Suhner	6820.17.B	757456	02 May 2015	12

5.2.6. Transmitter Frequency Stability (Temperature Variation)

Test Summary:

Test Engineer:	Ian Watch	**Test Date:**	19 August 2014
Test Sample ESN:	80BCF6E7		

FCC Reference:	Parts 24.235 and 2.1055
Industry Canada Reference:	RSS-Gen 4.7 / RSS-133 6.3
Test Method Used:	FCC Part 2.1055, Industry Canada RSS-Gen Section 4.7 and Notes below
Test Mode:	RC1/1 with Service Option 2

Environmental Conditions:

Ambient Temperature (°C):	22 to 24
Ambient Relative Humidity (%):	33 to 42

Note(s):

1. Flying leads were connected internally to the EUT in place of the battery. These leads were extended and connected to a bench power supply.
2. Frequency error was measured using a calibrated Rohde & Schwarz CMW 500 Universal Radio Communications Tester in accordance with current Rohde & Schwarz application notes. The EUT was connected by suitable RF cables to the CMW 500. A bi-directional communications link was established between the EUT and CMW 500. The frequency meter value was recorded.
3. Temperature was monitored throughout the test with a calibrated digital thermometer. Nominal voltage was monitored throughout the test with a calibrated digital voltmeter.

Results: Middle Channel (1880 MHz)

Temperature (°C)	Measured Frequency (MHz)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)	Margin (ppm)	Result
-30	1880.000019	19	0.0101	2.5	2.4899	Complied
-20	1880.000014	14	0.0074	2.5	2.4926	Complied
-10	1880.000016	16	0.0085	2.5	2.4915	Complied
0	1880.000013	13	0.0074	2.5	2.4926	Complied
10	1880.000014	14	0.0074	2.5	2.4926	Complied
20	1880.000014	14	0.0074	2.5	2.4926	Complied
30	1880.000016	16	0.0085	2.5	2.4915	Complied
40	1880.000020	20	0.0106	2.5	2.4894	Complied
50	1880.000014	14	0.0074	2.5	2.4926	Complied

Transmitter Frequency Stability (Temperature Variation) (continued)

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1657	Thermohygrometer	JM Handelspunkt	30.5015.13	None stated	14 Mar 2015	12
M1870	Radio Comms Tester	Rohde & Schwarz	CMW 500	145919	05 May 2015	12
S0537	DC power supply	TTi	EL302D	249928	Calibrated before use	-
M1643	Thermometer	Fluke	52II	18890136	07 Apr 2015	12
M122	Multimeter	Fluke	77	6491017	24 Apr 2015	12
E0520	Environmental Chamber	Thermatron	S-1.2CB	23840	Calibrated before use	-

5.2.7. Transmitter Frequency Stability (Voltage Variation)

Test Summary:

Test Engineer:	Ian Watch	**Test Date:**	19 August 2014
Test Sample ESN:	80BCF6E7		

FCC Reference:	Parts 24.235 and 2.1055
Industry Canada Reference:	RSS-Gen 4.7 / RSS-133 6.3
Test Method Used:	FCC Part 2.1055, Industry Canada RSS-Gen Section 4.7 and Notes below
Test Mode:	RC1/1 with Service Option 2

Environmental Conditions:

Temperature (°C):	20
Ambient Relative Humidity (%):	40

Note(s):

1. Flying leads were connected internally to the EUT in place of the battery. These leads were extended and connected to a bench power supply.
2. Frequency error was measured using a calibrated Rohde & Schwarz CMW 500 Universal Radio Communications Tester in accordance with current Rohde & Schwarz application notes. The EUT was connected by suitable RF cables to the CMW 500. A bi-directional communications link was established between the EUT and CMW 500. The frequency meter value was recorded.
3. Voltage was monitored throughout the test with a calibrated digital voltmeter.

Results: Middle Channel (1880 MHz)

Supply Voltage (V)	Measured Frequency (MHz)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)	Margin (ppm)	Result
3.4	1880.000014	14	0.0074	2.5	2.4926	Complied
4.2	1880.000014	14	0.0074	2.5	2.4926	Complied
3.2 (End Point)	1880.000014	14	0.0074	2.5	2.4926	Complied

Transmitter Frequency Stability (Voltage Variation) (continued)

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1657	Thermohygrometer	JM Handelspunkt	30.5015.13	None stated	14 Mar 2015	12
M1870	Radio Comms Tester	Rohde & Schwarz	CMW 500	145919	05 May 2015	12
S0537	DC power supply	TTi	EL302D	249928	Calibrated before use	-
M1643	Thermometer	Fluke	52II	18890136	07 Apr 2015	12
M122	Multimeter	Fluke	77	6491017	24 Apr 2015	12
E0520	Environmental Chamber	Thermatron	S-1.2CB	23840	Calibrated before use	-

6. Measurement Uncertainty

No measurement or test can ever be perfect and the imperfections give rise to error of measurement in the results. Consequently the result of a measurement is only an approximation to the value of the measurand (the specific quantity subject to measurement) and is only complete when accompanied by a statement of the uncertainty of the approximation.

The expression of uncertainty of a measurement result allows realistic comparison of results with reference values and limits given in specifications and standards.

The uncertainty of the result may need to be taken into account when interpreting the measurement results.

The reported expanded uncertainties below are based on a standard uncertainty multiplied by an appropriate coverage factor such that a confidence level of approximately 95% is maintained. For the purposes of this document “approximately” is interpreted as meaning “effectively” or “for most practical purposes”.

Measurement Type	Range	Confidence Level (%)	Calculated Uncertainty
Conducted Output Power	1850 to 1910 MHz	95%	±1.13 dB
Frequency Stability	1850 to 1910 MHz	95%	±23 Hz
Occupied Bandwidth	1850 to 1910 MHz	95%	±3.92 %
Radiated Spurious Emissions	30 MHz to 1 GHz	95%	±5.65 dB
Radiated Spurious Emissions	1 GHz to 20 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	-	-	Admin updates

--- END OF REPORT ---