

Test Report

Product	Transportable Base Station System	
Name and address of the applicant	EXFO Finland Elektroniikkatie 2 FI-90590 Oulu, Finland	
Name and address of the manufacturer	EXFO Finland Elektroniikkatie 2 FI-90590 Oulu, Finland	
Model	FXm-C, FXm-XG, FXm-B100 Model J	
Rating	See clause 1.1	
Trademark	EXFO	
Serial number	See clause 1.1	
Additional information	GSM, WCDMA, LTE	
Tested according to	FCC Part 2 Subpart J FCC Part 24 Subpart E FCC Part 27 Subpart C	ISED RSS-GEN Issue 5 ISED RSS-130 Issue 2 ISED RSS-133 Issue 6 ISED RSS-139 Issue 4 ISED RSS-140 Issue 1 ISED RSS-195 Issue 2
Order number	450342	
Tested in period	2021-11-10 to 2022-02-07	
Issue date	2023-06-21	
Name and address of the testing laboratory	<div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="text-align: center;">  Instituttveien 6 Kjeller, Norway www.nemko.com </div> <div style="text-align: center;"> CAB Number: FCC: NO0001 ISED: NO0470 </div> <div style="text-align: center;">   </div> </div> <p style="text-align: center; color: red; font-weight: bold;">An accredited technical test executed under the Norwegian accreditation scheme</p>	
	 Prepared by [Frode Sveinsen]	 Approved by [G.Suhanthakumar]
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Revision history

Revision	Date	Comment	Sign
00	2022-09-15	First edition	FS
01	2023-01-24	First update	FS
02	2023-06-21	Corrected RSS references	FS



THIS TEST REPORT APPLIES ONLY TO THE ITEM(S) AND CONFIGURATIONS TESTED.

Deviations from, additions to, or exclusions from the test specifications are described in "Summary of Test Data".

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Annex 1 – Plots for B100 J

1 INFORMATION

1.1 Test Item

Name	EXFO
Model	FXm-C FXm-XG FXm-B100 Model J
FCC ID	2A7IGEXCBTS100J
ISED ID	28799-EXCBTS100J
Power Supplies	PowerStax Model:MS1U-6M-444400 (Input: 100-240V~50-60Hz, Output: 10A, Max 900W) TDK-Lambda Model: DTM300PW280D1 (Input 100-240V~3.3-1.4A, 50-60Hz, Output: 28.0V=10.71A, Max 300W)

Model	FXm-C	FXm-XG	FXm-B100 Model J
Description	Controller	Main Unit	Amplifier Unit
Serial Number	1353058	1359742	1362273
HW Version	3.0	4.1	4.0
SW Version	BSP 01.14.04-B328	/	/
Input Voltage	10-32 V _{DC}	N/A	24-32 V _{DC}
Antenna Conn.	N/A	N/A	N-Female
RF-Coupler	N/A	N/A	JFCC0617T2360NF-EXF S/N: 20030500356
Power Supply	TDK-Lambda DTM300PW280D1	Powered from FXm-C	PowerStax

Characteristics	Description	
Radio System Type	GSM, WCDMA, LTE	
Channel Spacing	GSM, WCDMA	0.2 MHz
	LTE	0.1 MHz
Channel Bandwidths	GSM	0.2 MHz
	WCDMA, LTE	5 MHz
Type of Modulation	GSM	8PSK
	WCDMA	QPSK
	LTE	QPSK

1.2 Normal Test Conditions

Temperature:	21 - 24 °C
Relative humidity:	30 - 50 %
Normal test voltage:	120 V 60Hz AC

The values are the limit registered during the test period.

All tests were performed with the listed power supplies powered from a regulated AC Power Source.

1.3 Test Engineer

Frode Sveinsen

1.4 Test Methods

FCC KDB 971168 D01 Power Meas License Digital Systems v03r01
ANSI C63.25-2015

1.5 EUT Operating Modes and Test Set-up

Description of operating modes	<p>A laptop computer with Remote Desktop was used to connect to the the Controller Unit. The EUT was controlled with a test software application on the Controller.</p> <p>The test software application allowed selection of operating mode, frequency band, operating channel and power level.</p>
Description of Test Set-up	<p>The Controller is latched on to the Main Unit.</p> <p>The Main Unit is connected to the amplifier unit by the supplied cable.</p> <p>The amplifier unit B100J is connected to FXm-C with an ethernet cable and an 8-pin RF-cable. This amplifier unit have 5 N-type RF connectors for each frequency band, these RF connctors are connected to a pentaplex coupling box with a single N-connector output.</p>

1.6 Comments

The measurements were done with the EUT powered by 120 V AC. It was checked that power variations between 85% and 115% did not have any influence on the measurements.

The output stages were pre-programmed with maximum power levels for each operating mode and frequency band, however for most band edge frequencies the power levels were reduced further to satisfy the emission limits.

1.7 Supported Operating Modes and Frequency Bands

Output Stage Model B100 J							
Operating Mode	Frequency Band	Low Channel	High Channel	Min Freq (MHz)	Max Freq (MHz)	FCC Part	RSS Part
GSM (2G)	B02	515	806	1930.8	1989.0	Part 24E	RSS-133, Issue 6
WCDMA (3G)	B02	9675	9920	1935.0	1984.0	Part 24E	RSS-133, Issue 6
	B04	1540	1735	2113.0	2152.0	Part 27C	RSS-139, Issue 4
LTE (4G)	B02	630	1160	1933.0	1986.0	Part 24E	RSS-133, Issue 6
	B04	1980	2360	2113.0	2151.0	Part 27C	RSS-139, Issue 4
	B10	4180	4720	2113.0	2167.0	Part 27C	RSS-139, Issue 4
	B13	5205	5240	748.5	752.0	Part 27C	RSS-130, Issue 2
	B14	5306	5330	760.6	763.0	Part 27C	RSS-140, Issue 1
	B25	8070	8660	1933.0	1992.0	Part 24E	RSS-133, Issue 6
	B30	9820	9830	2355.0	2356.0	Part 27C	RSS-195, Issue 2
	B66	66486	67135	2115.0	2179.9	Part 27C	RSS-139, Issue 4
	B71	68610	68912	619.4	649.6	Part 27C	RSS-130, Issue 2

2 TEST REPORT SUMMARY

2.1 General

All measurements are traceable to national standards.

Radiated tests were made in a semi-anechoic chamber at measuring distance of 3m.

A description of the test facility is on file with the FCC and Industry Canada.

<input checked="" type="checkbox"/> New Submission	<input checked="" type="checkbox"/> Production Unit
<input type="checkbox"/> Class II Permissive Change	<input type="checkbox"/> Pre-production Unit
TNB Equipment Code	<input type="checkbox"/> Family Listing

2.2 Test Summary

Name of test	FCC Reference	ISED Canada RSS Reference	Test Method ANSI C63.26-2015 Reference	Result
RF Power Output	2.1046 24.232 27.50	4.6 (RSS-130) 6.4 (RSS-133) 5.5 (RSS-139) 5.5 (RSS-195)	5.2.3.4	Complies
Peak-Average Ratio	2.1046 24.232 27.50	4.6 (RSS-130) 6.4 (RSS-133) 5.5 (RSS-139) 5.5 (RSS-195)	5.2.3.4	Complies
Modulation Characteristics	2.1047	4.2 (RSS-130) 6.2 (RSS-133) 5.3 (RSS-139) 5.3 (RSS-195)	5.3	Complies
Bandwidth	2.1049	6.7 (RSS-GEN)	5.4.3 5.4.4	Complies
Band Edge Compliance	2.1051 24.238 27.53	4.7 (RSS-130) 6.5 (RSS-133) 5.6 (RSS-139) 5.6 (RSS-195)	5.7	Complies
Emission Mask	N/A	N/A	-	N/A
Spurious Emissions at antenna terminals	2.1051 24.238 27.53	4.7 (RSS-130) 6.5 (RSS-133) 5.6 (RSS-139) 5.6 (RSS-195)	5.7	Complies
Field Strength of Spurious Radiations	2.1053, 2.1057 24.238 27.53	4.7 (RSS-130) 6.5 (RSS-133) 5.6 (RSS-139) 5.6 (RSS-195)	5.5	Complies

Name of test	FCC Reference	ISED Canada RSS Reference	Test Method ANSI C63.26-2015 Reference	Result
Frequency Stability	2.1055 24.235 27.54	4.5 (RSS-130) 6.3 (RSS-133) 5.4 (RSS-139) 5.5 (RSS-195)	5.6	Complies

3 TEST RESULTS

3.1 RF Output Power / Peak Excursion / Emission Bandwidth

Test Results: Complies

Measurement Method:

ANSI C63.26-2015 Clause 5.2 / 5.4

Output Power (dBm)	CCDF Function of Spectrum analyzer Number of Samples: 1,000,000 Bandwidth: Same as or higher than Channel BW (5, 10 or 20 MHz) EUT was transmitting continuously with modulation
PSD Average Power (dBm/MHz)	Spectrum analyzer RMS Detector, Max Hold, RBW: 1MHz, VBW: 3MHz Trace was allowed to stabilize EUT was transmitting continuously with modulation
Emission BW (20 dB)	Spectrum Analyzer with 20dB Marker function Peak Detector, Max Hold, RBW: 1-5% of EBW, VBW: 3xRBW Trace was allowed to stabilize EUT was transmitting continuously with modulation
Occupied BW (99%)	Spectrum Analyzer with 99% OBW function Peak Detector, Max Hold, RBW: 1-5% of EBW, VBW: 3xRBW Trace was allowed to stabilize EUT was transmitting continuously with modulation

Measurement data:

B100 Model J 2G, GSM									
Band	Channel	Tx Freq (MHz)	Power Level	Average Power (dBm)	Peak Power (dBm)	Peak-Average Ratio, 0.1% (dB)	Average Power (dBm/MHz)	EBW 26dB BW (kHz)	OBW 99% BW (kHz)
B02	515	1930.8	0	26.2	26.5	0.38		307.7	245.7
	520	1931.8	92	38.8	39.2	0.40		301.7	247.3
	540	1935.8	100	40.1	40.7	0.60		299.7	
	661	1960.0	100	41.8	42.1	0.36	41.8	301.7	243.2
	780	1983.8	100	40.8	41.4	0.58			
	805	1988.8	78	38.1	38.7	0.60		300.7	
	806	1989.0	54	34.5	35.1	0.62			

B100 Model J 3G, WCDMA									
Band	Channel	Tx Freq (MHz)	Power Level	Average Power (dBm)	Peak Power (dBm)	Peak-Average Ratio, 0.1% (dB)	Average Power (dBm/MHz)	EBW 26dB BW (MHz)	OBW 99% BW (MHz)
B02	9675	1935.0	42	36.4	45.0	7.66		4.75	
	9680	1936.0	55	38.6	45.9	6.36		4.82	
	9690	1938.0	65	40.1	45.7	5.34		9.71	4.39
	9800	1960.0	65	41.6	46.9	5.22	46.0	8.85	4.38

B100 Model J 3G, WCDMA									
Band	Channel	Tx Freq (MHz)	Power Level	Average Power (dBm)	Peak Power (dBm)	Peak-Average Ratio, 0.1% (dB)	Average Power (dBm/MHz)	EBW 26dB BW (MHz)	OBW 99% BW (MHz)
	9905	1981.0	65	41.5	46.8	5.08		11.3	4.38
	9910	1982.0	61	40.8	47.4	6.12		5.34	
	9920	1984.0	48	38.1	46.2	7.20		4.76	4.22
B04	1540	2113.0	32	33.2	43.1	8.68			
	1560	2117.0	57	39.3	47.5	7.30		4.76	4.21
	1570	2119.0	75	42.6	48.7	5.76		10.4	
	1638	2132.6	75	41.7	46.7	4.80	45.7	11.4	4.44
	1700	2145.0	75	41.6	46.4	4.62		11.4	
	1710	2147.0	68	40.5	46.0	5.36		8.15	
	1720	2149.0	56	38.3	46.1	7.04		4.82	
	1735	2152.0	30	32.9	42.2	8.34			

B100 Model J 4G, LTE									
Band	Channel	Tx Freq (MHz)	Power Level	Average Power (dBm)	Peak Power (dBm)	Peak-Average Ratio, 0.1% (dB)	Average Power (dBm/MHz)	EBW 26dB BW (MHz)	OBW 99% BW (MHz)
B02	630	1933.0	0	30.6	39.1	7.60			
	640	1934.0	54	33.2	41.4	7.42		5.00	
	660	1936.0	80	39.0	45.9	6.34		6.17	4.55
	900	1960.0	80	40.3	47.2	6.30	43.6	6.57	4.56
	1140	1984.0	80	39.6	46.3	6.28		5.82	
	1160	1986.0	56	34.3	42.6	7.50		5.01	
B04	1980	2113.0	33	31.5	40.2	7.84			
	2000	2115.0	54	36.8	45.1	7.38		5.01	
	2020	2117.0	72	41.0	47.9	6.30		5.29	
	2175	2132.5	72	40.2	46.9	6.12	43.4	6.94	4.57
	2315	2146.5	72	40.4	46.9	5.94		7.86	
	2320	2147.0	71	40.2	46.7	5.98		7.76	
	2340	2149.0	60	37.9	45.3	6.74		5.03	
	2360	2151.0	46	34.7	43.0	7.44			
B10	4180	2113.0	30	31.0	40.0	7.90			
	4200	2115.0	52	36.6	44.8	7.46		5.00	
	4225	2117.5	79	42.5	47.6	4.90		9.41	
	4450	2140.0	79	41.7	46.4	4.54	44.3	10.1	4.67
	4665	2161.5	79	41.9	46.7	4.54		9.91	

B100 Model J 4G, LTE									
Band	Channel	Tx Freq (MHz)	Power Level	Average Power (dBm)	Peak Power (dBm)	Peak-Average Ratio, 0.1% (dB)	Average Power (dBm/MHz)	EBW 26dB BW (MHz)	OBW 99% BW (MHz)
	4690	2164.0	61	38.5	46.0	6.82		5.00	
	4710	2166.0	48	35.6	44.1	7.46			
	4720	2167.0	40	33.9	42.5	7.72			
B13	5205	748.5	50	33.8	42.4	7.66		5.03	4.52
	5206	748.6	42	32.6	41.3	7.70		5.01	4.52
	5210	749.0	75	38.0	46.4	7.58			
	5230	751.0	75	37.9	46.2	7.58	41.7	5.01	4.51
	5240	752.0	76	38.0	46.3	7.62	41.8	5.00	4.51
	5249	752.9	70	37.2	46.0	7.82		5.00	
B14	5306	760.6	25	29.2	37.7	7.50	33.0	5.00	4.52
	5310	761.0	24	29.2	37.7	7.52	32.9	5.00	4.53
	5320	762.0	15	27.6	35.8	7.40		5.01	4.53
B25	8070	1933.0	0	30.8	39.4	7.66			
	8075	1933.5	29	33.6	42.2	7.52			
	8090	1935.0	42	36.5	44.5	7.08		5.01	
	8110	1937.0	58	39.5	46.2	6.18		5.25	
	8120	1938.0	62	40.2	45.5	5.12		9.68	
	8365	1962.5	62	41.4	46.3	4.60	44.1	10.5	4.71
	8610	1987.0	62	40.9	46.3	5.12		7.65	
	8630	1989.0	52	38.9	46.1	6.70		5.00	
	8650	1991.0	38	35.8	44.2	7.42		5.00	
	8660	1992.0	0	30.9	39.3	7.66			
B30	9800	2353.0	30	26.1	35.0	7.74	31.2	5.00	4.53
	9810	2354.0	28	25.5	34.3	7.70	30.2	5.00	4.53
	9820	2355.0	20	24.2	33.0	7.66	28.2	5.01	4.53
B66	66466	2113.0	26	30.9	39.8	7.94		5.01	
	66486	2115.0	48	36.6	44.8	7.50		5.03	4.52
	66501	2116.5	71	41.5	47.4	5.48	44.8	6.66	4.57
	66886	2155.0	71	40.8	45.9	4.84		9.39	4.63
	67135	2179.9	71	40.9	45.9	4.88		8.85	4.64
B71	68610	619.4	42	32.4	41.3	7.72			
	68611	619.5	67	37.3	45.9	7.76		5.01	
	68616	620.0	70	37.5	46.0	7.64			
	68638	622.2	89	41.3	49.0	7.02		5.00	
	68761	634.5	89	40.7	48.0	6.76	44.1	5.04	4.54

B100 Model J 4G, LTE									
Band	Channel	Tx Freq (MHz)	Power Level	Average Power (dBm)	Peak Power (dBm)	Peak-Average Ratio, 0.1% (dB)	Average Power (dBm/MHz)	EBW 26dB BW (MHz)	OBW 99% BW (MHz)
	68885	646.9	89	39.0	47.2	7.46		5.04	
	68901	648.5	80	37.4	46.2	7.92			
	68912	649.6	48	32.4	41.3	7.86			

Requirements:

FCC Part	Maximum Average Power (dBm)	Maximum Peak-Average Ratio, 0.1% (dB)
24.232	Base Stations: 1640 Watts/MHz Mobile and Portable Stations: 2 Watts (33 dBm)	Must not exceed 13 dB
27.50	Base and Fixed Stations: 2305-2315MHz and 2350-2360MHz: 400 Watts/MHz (56 dBm/MHz) 746-757MHz and 776-788MHz: 1000 Watts/MHz 600 MHz and 698-746 MHz: 1000 Watts Control Stations and Mobile Stations: 746-757MHz and 776-788MHz: 30 Watts ERP 698-746 MHz: 30 Watts ERP Mobile and Portable Stations: 2305-2315 MHz and 2350-2360 MHz: 50 mW/MHz (17 dBm/MHz) 746-757 MHz and 776-788 MHz: 3 Watts ERP 600 MHz and 698-746 MHz: 3 Watts	Must not exceed 13 dB

ISED Part	Maximum Average Power (dBm)	Maximum Peak-Average Ratio, 0.1% (dB)
RSS-133	Base Stations: 1640 Watts/MHz Mobile and Portable Stations: 2 Watts (33 dBm)	Must not exceed 13 dB
RSS-130 RSS-139 RSS-195	Base and Fixed Stations: 2305-2315MHz and 2350-2360MHz: 400 Watts/MHz (56 dBm/MHz) 746-757MHz and 776-788MHz: 1000 Watts/MHz 600 MHz and 698-746 MHz: 1000 Watts 758-768 MHz: 1000 Watts Control Stations and Mobile Stations: 746-757MHz and 776-788MHz: 30 Watts ERP 698-746 MHz: 30 Watts ERP 758-768 MHz: 30 Watts ERP Mobile and Portable Stations: 2305-2315 MHz and 2350-2360 MHz: 50 mW/MHz (17 dBm/MHz) 746-757 MHz and 776-788 MHz: 3 Watts ERP 600 MHz and 698-746 MHz: 3 Watts ERP 758-768 MHz: 3 Watts ERP	Must not exceed 13 dB

3.2 Band Edge Compliance

Test Results: Complies

Measurement Method:

ANSI C63.26-2015 Clause 5.7

Spurious Emissions at Antenna Terminals	Measured with Spectrum Analyzer RMS Detector, Trace Averaging over 500 sweeps Below 1GHz: RBW/VBW: 100kHz/300kHz Above 1GHz: RBW/VBW: 1MHz/3MHz EUT was transmitting continuously with modulation Power levels were reduced to the noted levels
Band Edge	Same as above, but with reduced RBW/VBW at less than 1MHz from Band Edge

Measurement Data:

B100 Model J 2G, GSM								
Band	Channel	Tx Freq (MHz)	Band Edge (MHz)	Power Level	Band Edge Emissions (dBm)	Limit (dBm)	Margin (dB)	Verdict
B02	515	1930.8	1930	0	-13.2	-13	0.2	Pass
	520	1931.8	1930	92	-28.2	-13	15.2	Pass
	540	1935.8	1930	100	-30.7	-13	17.7	Pass
	780	1983.8	1990	100	-29.7	-13	16.7	Pass
	805	1988.8	1990	78	-19.1	-13	6.1	Pass
	806	1989.0	1990	54	-13.4	-13	0.4	Pass

B100 Model J 3G, WCDMA								
Band	Channel	Tx Freq (MHz)	Band Edge (MHz)	Power Level	Band Edge Emissions (dBm)	Limit (dBm)	Margin (dB)	Verdict
B02	9675	1935.0	1930	42	-14.5	-13	1.5	Pass
	9680	1936.0	1930	55	-15.9	-13	2.9	Pass
	9690	1938.0	1930	65	-14.0	-13	1.0	Pass
	9905	1981.0	1990	65	-18.1	-13	5.1	Pass
	9910	1982.0	1990	61	-14.8	-13	1.8	Pass
	9920	1984.0	1990	48	-19.2	-13	6.2	Pass
B04	1540	2113.0	2110	32	-13.3	-13	0.3	Pass
	1560	2117.0	2110	57	-19.5	-13	6.5	Pass
	1570	2119.0	2110	75	-18.6	-13	5.6	Pass
	1700	2145.0	2155	75	-16.0	-13	3.0	Pass
	1710	2147.0	2155	68	-13.9	-13	0.9	Pass
	1720	2149.0	2155	56	-16.1	-13	3.1	Pass
	1735	2152.0	2155	30	-13.9	-13	0.9	Pass

B100 Model J 4G, LTE								
Band	Channel	Tx Freq (MHz)	Band Edge (MHz)	Power Level	Band Edge Emissions (dBm)	Limit (dBm)	Margin (dB)	Verdict
B02	630	1933.0	1930	0	-13.1	-13	0.1	Pass
	640	1934.0	1930	54	-13.3	-13	0.3	Pass
	660	1936.0	1930	80	-13.3	-13	0.3	Pass
	1140	1984.0	1990	80	-13.0	-13	0.0	Pass
	1160	1986.0	1990	56	-13.5	-13	0.5	Pass
B04	1980	2113.0	2110	33	-13.2	-13	0.2	Pass
	2000	2115.0	2110	54	-13.3	-13	0.3	Pass
	2020	2117.0	2110	72	-16.3	-13	3.3	Pass
	2315	2146.5	2155	72	-13.7	-13	0.7	Pass
	2320	2147.0	2155	71	-13.4	-13	0.4	Pass
	2340	2149.0	2155	60	-13.7	-13	0.7	Pass
	2360	2151.0	2155	46	-13.7	-13	0.7	Pass
B10	4180	2113.0	2110	30	-13.5	-13	0.5	Pass
	4200	2115.0	2110	52	-13.7	-13	0.7	Pass
	4225	2117.5	2110	79	-13.4	-13	0.4	Pass
	4665	2161.5	2170	79	-13.3	-13	0.3	Pass
	4690	2164.0	2170	61	-13.7	-13	0.7	Pass
	4710	2166.0	2170	48	-13.6	-13	0.6	Pass
	4720	2167.0	2170	40	-14.2	-13	1.2	Pass
B13	5205	748.5	746	50	-13.0	-13	0.0	Pass
	5206	748.6	746	42	-20.9	-13	7.9	Pass
	5210	749.0	746	75	-16.9	-13	3.9	Pass
	5230	751.0	756	75	-22.6	-13	9.6	Pass
	5240	752.0	756	76	-18.3	-13	5.3	Pass
	5249	752.9	756	70	-16.3	-13	3.3	Pass
B14	5306	760.6	758	25	-18.4	-13	5.4	Pass
	5310	761.0	758	24	-19.0	-13	6.0	Pass
			768	24	-31.0	-13	18.0	Pass
	5320	762.0	768	15	-30.9	-13	17.9	Pass
	5330	763.0	768	5	-28.5	-13	15.5	Pass
B25	8070	1933.0	1930	0	-13.2	-13	0.2	Pass
	8075	1933.5	1930	29	-13.4	-13	0.4	Pass
	8090	1935.0	1930	42	-13.8	-13	0.8	Pass
	8110	1937.0	1930	58	-13.3	-13	0.3	Pass
	8120	1938.0	1930	62	-13.6	-13	0.6	Pass

B100 Model J 4G, LTE								
Band	Channel	Tx Freq (MHz)	Band Edge (MHz)	Power Level	Band Edge Emissions (dBm)	Limit (dBm)	Margin (dB)	Verdict
	8610	1987.0	1995	62	-13.4	-13	0.4	Pass
	8630	1989.0	1995	52	-13.9	-13	0.9	Pass
	8650	1991.0	1995	38	-13.3	-13	0.3	Pass
	8660	1992.0	1995	0	-13.6	-13	0.6	Pass
B30	9800	2353.0	2350	30	-18.5	-13	5.5	Pass
			2337	30	<-45	-37	>8	Pass
	9810	2354.0	2350	28	-22.5	-13	9.5	Pass
			2337	28	<-45	-37	>8	Pass
	9820	2355.0	2360	20	-28.9	-13	15.9	Pass
			2337	20	<-50	-37	>13	Pass
B66	66466	2113.0	2110	26	-14.0	-13	1.0	Pass
	66486	2115.0	2110	48	-13.7	-13	0.7	Pass
	66501	2116.5	2110	71	-13.1	-13	0.1	Pass
	67135	2179.9	2200	71	-27.7	-13	14.7	Pass
B71	68610	619.4	617	42	-13.5	-13	0.5	Pass
	68611	619.5	617	67	-13.1	-13	0.1	Pass
	68616	620.0	617	70	-14.6	-13	1.6	Pass
	68638	622.2	617	89	-13.0	-13	0.0	Pass
	68885	646.9	652	89	-15.6	-13	2.6	Pass
	68901	648.5	652	80	-13.6	-13	0.6	Pass
	68912	649.6	652	48	-14.5	-13	1.5	Pass

3.3 Emissions at Antenna Terminals

Test Results: Complies

Measurement Method:

ANSI C63.26-2015 Clause 5.7

Spurious Emissions at Antenna Terminals	<p>Measured with Spectrum Analyzer RMS Detector, Trace Averaging over 500 sweeps Below 1GHz: RBW/VBW: 100kHz/300kHz Above 1GHz: RBW/VBW: 1MHz/3MHz EUT was transmitting continuously with modulation Power level was set to maximum supported in the EUT</p>
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Measurement Data:

B100 Model J								
Tech/ Band	Channel	Tx Freq (MHz)	Measured Freq. (MHz)	Power Level	Emissions (dBm)	Limit (dBm)	Margin (dB)	Verdict
4G B13	5240	752.0	2256	76	-38.3	-13	25.3	Pass
4G B14	5310	761.0	2283	75	-41.6	-13	28.6	Pass
4G B30	9830	2356.0	4712	0	-54.8	-13	41.8	Pass
4G B71	68610	619.4	1858	70	-38.4	-13	25.4	Pass
	68638	622.2	1867	89	-36.5	-13	23.5	Pass
	68761	634.5	1904	89	-37.5	-13	24.5	Pass
	68885	646.9	1941	89	-38.2	-13	25.2	Pass
	68912	649.6	1949	80	-36.4	-13	23.4	Pass
Any	Any	Any	Any	Any	<-23	-13	>10	Pass

3.4 Cabinet Radiations

Test Results: Complies

Measurement Method:

ANSI C63.26-2015 Clause 5.5

Cabinet Radiations	<p>Field Strength was measured using the Spectrum Analyzer</p> <p>Power Levels were calculated using the methods in KDB 412172 D01 v01r01</p> <p>RMS Detector, Trace Averaging over 500 sweeps</p> <p>Below 1GHz: RBW/VBW: 100kHz/300kHz</p> <p>Above 1GHz: RBW/VBW: 1MHz/3MHz</p> <p>EUT was transmitting continuously with modulation</p> <p>Power level was set to maximum supported in the EUT</p> <p>Antenna connector was terminated into a 50 Ohm load</p>
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Measurement Data:

B100 Model J								
Tech/ Band	Channel	Tx Freq (MHz)	Measured Freq. (MHz)	Emissions (dBμV/m @3m)	Emissions (dBm)	Limit (dBm)	Margin (dB)	Verdict
2G B02	661	1960.0	3920	57.1	-38.1	-13	25.1	Pass
			5880	58.9	-36.3	-13	23.3	Pass
3G B02	9800	1960.0	3920	61.4	-33.8	-13	20.8	Pass
			5880	56.7	-38.5	-13	25.5	Pass
3G B04	1638	2132.6	6398	65.7	-29.5	-13	16.5	Pass
4G B02	900	1960.0	3921	56.7	-38.5	-13	25.5	Pass
			5881	54.6	-40.6	-13	27.6	Pass
4G B04	2175	2132.5	4265	61.5	-33.7	-13	20.7	Pass
			6400	63.4	-31.8	-13	18.8	Pass
			12794	53.3	-41.9	-13	28.9	Pass
4G B14	5330	763.0	3816	67.9	-27.3	-13	14.3	Pass
4G B66	66886	2155	4310	71.6	-23.6	-13	10.6	Pass
			6465	62.3	-32.9	-13	19.9	Pass
4G B71	68761	634.5	4444	69.2	-26.0	-13	13.0	Pass
Any	Any	Any	Any	<62	<-33	-13	>20	Pass

3.5 Frequency Stability

Test Results: Complies

Measurement Method:

ANSI C63.26-2015 Clause 5.6

EUT State	EUT was transmitting continuously a modulated signal on a channel in the middle of the band. It was not possible to get the EUT to transmit without modulation.
Measurement Method	The measurement was performed using the OBW Function (99%) of the analyzer. RBW/VBW = 1 kHz for 2G and 10 kHz for 3G and 4G. Span was 500 kHz for 2G and 10 MHz for 3G and 4G.
Comment	For 3G the spectrum is rounded off at the edges, this causes the frequency reading to be very strongly affected by random noise. 2G and 4G spectrum have sharper edges, these frequency readings are therefore more consistent.

Measurement Data:

B100 Model J								
Band	Nom. Freq.	Parameter	+50 °C	+40 °C	+30 °C	+20 °C	+10 °C	0 °C
2G Band 02	1960.0 MHz	Deviation (Hz)	384.0	48.5	-146.2	418.0	130.8	-282.8
		Deviation (ppm)	-0.017	-0.189	-0.288	0	-0.147	-0.358
3G Band 02	1960.0 MHz	Deviation (Hz)	-1067	-2322	-1986	1342	28.8	1200
		Deviation (ppm)	-1.229	-1.869	-1.698	0	-0.670	-0.072
3G Band 04	2132.6 MHz	Deviation (Hz)	-10914	-12040	-11345	-7950	-10564	-12544
		Deviation (ppm)	-1.390	-1.918	-1.592	0	-1.226	-2.154
4G Band 02	1960.0 MHz	Deviation (Hz)	1446	1785	790.4	615.7	1129	1096
		Deviation (ppm)	0.424	0.597	0.089	0	0.262	0.245
4G Band 04	2132.5 MHz	Deviation (Hz)	-876.3	-826.1	1687	419.6	-1132	-1518
		Deviation (ppm)	-0.608	-0.584	0.594	0	-0.728	-0.909
4G Band 10	2140.0 MHz	Deviation (Hz)	423.5	309.2	531.0	-651.4	72.2	103.1
		Deviation (ppm)	0.502	0.449	0.553	0	0.338	0.353
4G Band 13	751.0 MHz	Deviation (Hz)	-1759	-1788	-1428	-1556	-1527	-1607
		Deviation (ppm)	-0.270	-0.309	0.170	0	0.039	-0.068
4G Band 14	763.0 MHz	Deviation (Hz)	-1848	-1493	-1690	-1013	-2328	-1108
		Deviation (ppm)	-1.094	-0.629	-0.889	0	-1.723	-0.125
4G Band 25	1962.5 MHz	Deviation (Hz)	-490.0	-635.2	-300.7	1029	254.8	1073
		Deviation (ppm)	-0.774	-0.848	-0.678	0	-0.394	0.022
4G Band 30	2355.0 MHz	Deviation (Hz)	-1637	-1730	-2154	-883.6	-2301	-1973
		Deviation (ppm)	-0.320	-0.359	-0.539	0	-0.602	-0.463
4G Band 66	2155.0 MHz	Deviation (Hz)	-348.9	-501.8	-1144	-1877	-734.7	-1350
		Deviation (ppm)	0.709	0.638	0.340	0	0.530	0.245
4G Band 71	634.5 MHz	Deviation (Hz)	-952.1	-1022	-569.7	-675.2	-900.5	-930.9
		Deviation (ppm)	-0.436	-0.547	0.166	0	-0.355	-0.403

B100 Model J					
Band	Nom. Freq.	Parameter	120V 60Hz	98V 60Hz	138V 60Hz
2G Band 02	1960.0 MHz	Deviation (Hz)	418.0	1221	-36.3
		Deviation (ppm)	0	0.410	-0.232
3G Band 02	1960.0 MHz	Deviation (Hz)	1342	1633	1491
		Deviation (ppm)	0	0.148	0.076
3G Band 04	2132.6 MHz	Deviation (Hz)	-7950	-7490	-8084
		Deviation (ppm)	0	0.216	-0.063
4G Band 02	1960.0 MHz	Deviation (Hz)	615.7	638.5	742.7
		Deviation (ppm)	0	0.012	0.065
4G Band 04	2132.5 MHz	Deviation (Hz)	419.6	359.2	329.0
		Deviation (ppm)	0	-0.028	-0.042
4G Band 10	2140.0 MHz	Deviation (Hz)	-651.4	-783.3	-948.6
		Deviation (ppm)	0	-0.062	-0.139
4G Band 13	751.0 MHz	Deviation (Hz)	-1556	-1648	-1648
		Deviation (ppm)	0	-0.123	-0.123
4G Band 14	763.0 MHz	Deviation (Hz)	-1013	-1040	-1127
		Deviation (ppm)	0	-0.035	-0.149
4G Band 25	1962.5 MHz	Deviation (Hz)	1029	454.6	534.0
		Deviation (ppm)	0	-0.293	-0.252
4G Band 30	2355.0 MHz	Deviation (Hz)	-883.6	-633.0	-826.6
		Deviation (ppm)	0	0.106	0.024
4G Band 66	2155.0 MHz	Deviation (Hz)	-1877	-1587	-1772
		Deviation (ppm)	0	0.135	0.049
4G Band 71	634.5 MHz	Deviation (Hz)	-675.2	-665.4	-616.8
		Deviation (ppm)	0	0.015	0.092

Requirements:

	FCC	ISED
Band 02	stays within AFB	1.0 ppm, or stays within AFB
Band 04	stays within AFB	stays within AFB
Band 10	stays within AFB	stays within AFB
Band 13	stays within AFB	stays within AFB
Band 14	stays within AFB	stays within AFB
Band 25	stays within AFB	1.0 ppm, or stays within AFB
Band 30	stays within AFB	stays within AFB
Band 66	stays within AFB	stays within AFB
Band 71	stays within AFB	stays within AFB

AFB = Authorized Frequency Block

4 Measurement Uncertainty

Measurement Uncertainty Values		
Test Item		Uncertainty
Output Power		±0.5 dB
Power Spectral Density		±0.5 dB
Out of Band Emissions, Conducted (RBW < 100 kHz)	< 3.6 GHz	±0.6 dB
	> 3.6 GHz	±0.9 dB
Spurious Emissions, Radiated	< 1 GHz	±2.5 dB
	> 1 GHz	±2.2 dB
Emission Bandwidth		±4 %
Power Line Conducted Emissions		+2.9 / -4.1 dB
Spectrum Mask Measurements	Frequency	±5 %
	Amplitude	±1.0 dB
Frequency Error		±0.6 ppm
Temperature Uncertainty		±1 °C

All uncertainty values are expanded standard uncertainty to give a confidence level of 95%, based on coverage factor k=2

5 LIST OF TEST EQUIPMENT

To facilitate inclusion on each page of the test equipment used for related tests, each item of test equipment and ancillaries are identified (numbered) by the Test Laboratory.

No.	Model number	Description	Manufacturer	Ref. no.	Cal. date	Cal. Due
1	FSW26	Spectrum Analyzer	Rohde & Schwarz	LR 1640	2020-10 2022-01	2022-10 2024.01
2	ESU40	Measuring Receiver	Rohde & Schwarz	LR 1639	2021-02 2022-01	2022-02 2023-01
3	770-20	Attenuator	Narda	LR 1777	COU	
4	6810.17B	Attenuator	Suhner	LR 1669	COU	
5	JB3	BiLog Antenna	Sunol Sciences	N-4525	2020-03	2023-03
6	3115	Horn Antenna	EMCO	LR 1330	2016-10	2026-10
7	Model 310	Pre-amplifier	Sonoma	LR 1686	2021-08	2022-08
8	8449A	Pre-amplifier	Hewlett Packard	LR 1322	2021-08	2022-08
9	3117-PA	Horn Antenna w.PreAmp	EMCO	LR 1717	2021-08	2022-08
10	6812A	Power Source	Agilent	LR 1515	2020-04	2022-04

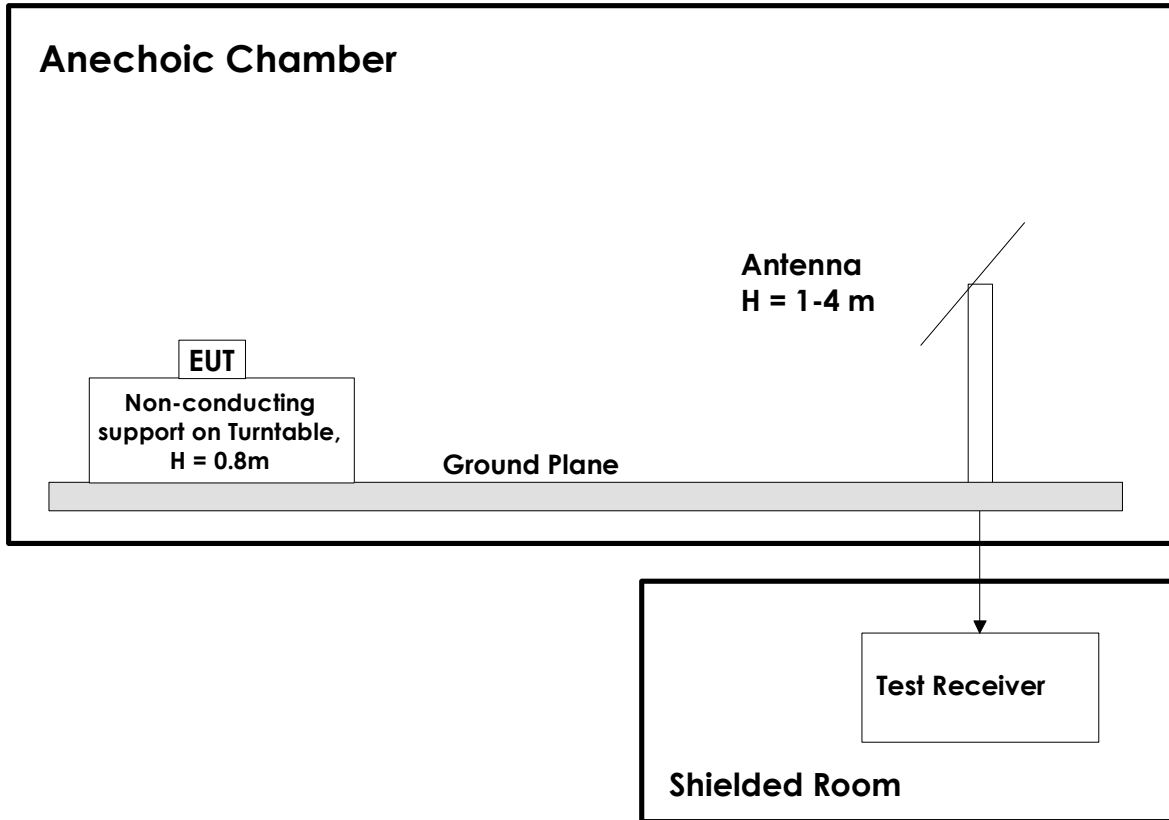
COU = Calibrate on Use

The software listed below has been used for one or more tests in this report.

No.	Manufacturer	Name	Version	Comment
1	Rohde & Schwarz	EMC32	10.50.40	EMC test software
2	Nemko AS	RSPlot	1.0.8.0	Captures screenshots from R&S Analyzers

6 BLOCK DIAGRAM

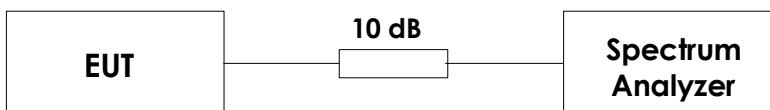
6.1 Test Site Radiated Emission



For measurements above 1 GHz the ground plane is covered by absorbers.

Below 30 MHz, measuring distance of 10m is used for spurious emissions measurements.

6.2 Conducted Test



This setup is used for all conducted tests where a spectrum analyser is used.
The actual value of the attenuator will depend on the output power of the EUT.