RF Test Report

Project Number:	**4975321**	**Proposal:**	**SUW-202108001433**
Report Number:	**4975321EMC17**	**Revision Level:**	**1**
Client:	**Deere & Company**		

Equipment Under Test:	**JDLink™ M Modem - 4G**
Model Number:	**MA4M**
FCC ID:	**OV5-MA4M**
IC ID:	**11137A-MA4M**

Applicable Standards:	**ANSI C63.26:2014**
	Part 2, Part 22(H), Part 24(E), Part 27
	RSS-132 Issue 3; RSS-133 Issue 6
	RSS-139, Issue 4; RSS-GEN, Issue 5

Report issued on:	**24 February 2023**
Test Result:	**Compliant**

FOR THE SCOPE OF ACCREDITATION UNDER CERTIFICATE NUMBER: 3212.01
This report must not be used by the client to claim product certification, approval, or endorsement by A2LA, NIST, or any agency of the Federal Government.

Prepared by: Andrew Bluhm
Andrew Bluhm, Jr RF/EMC Engineer

Reviewed by: Martin Taylor
Martin Taylor, Sr RF/EMC Project Engineer

Table of Contents

1 Summary of Test Results

Reference Sections		Test Description	Test Limit	Test Condition	Test Result
FCC	IC				
2.1046	RSS-GEN (6.12)	Conducted Output Power	N/A	Conducted	Compliant
24.232(d) 27.50(d)(5)	RSS-132 (5.4) RSS-133 (6.4) RSS-139 (5.5)	Peak-to-Average Ratio	<13 dB		Compliant
2.1049 22.917(b) 24.238(b)	RSS-GEN (6.7) RSS-133 (2.3)	Occupied Bandwidth	N/A		Reported
2.1051 22.917(a) 24.238(a) 27.53(h)	RSS-132 (5.5) RSS-133 (6.5.1) RSS-139 (5.6)	Band Edge / Conducted Spurious Emissions	< 43 +10log$_{10}$ ($P_{[Watts]}$) at band edge and for all out of band emissions		Compliant
22.913(a)(5)	--	Effective Radiated Power	< 7 Watts max ERP	Radiated	Compliant
--	RSS-132 (5.4)	Equivalent Isotropically Radiated Power	< 11.5 Watts max EIRP		Compliant
24.232(c)	RSS-133 (6.4) SRSP-510 (5.1.2)		< 2 Watts max EIRP		Compliant
27.50(d)(4)	RSS-139 (5.5)		< 1 Watt max EIRP		Compliant
2.1053 22.917(a) 24.238(a) 27.53(h)	RSS-GEN (6.13) RSS-132 (5.5) RSS-133 (6.5.1) RSS-139 (5.6)	Radiated Spurious Emissions	< 43 +10log$_{10}$ ($P_{[Watts]}$) at band edge and for all out of band emissions		Compliant
2.1055 22.355 24.235 27.5(h) 27.54	RSS-GEN (6.11) RSS-132 (5.3) RSS-133 (6.3) RSS-139 (5.4)	Frequency Stability	<2.5 ppm		Compliant

1.1 *Modifications Required to Compliance*

None

2 General Information

2.1 *Client Information*

Name:	Deere & Company dba John Deere Intelligent Solutions
Address:	9505 Northpark Drive
City, State, Zip, Country:	Urbandale, IA 50131 USA

2.2 *Test Laboratory*

Name:	SGS North America, Inc.
Address:	620 Old Peachtree Road NW, Suite 100
City, State, Zip, Country:	Suwanee, GA 30024, USA
Accrediting Body:	A2LA
Type of lab:	Testing Laboratory
Certificate Number:	3212.01
Designation Number:	US1126
CAB Identifier:	US0186

2.3 *General Information of EUT*

Product Description:	JDLink™ M Modem - 4G
Model Number:	MA4M
Serial Number:	PCMA4MA101508 (Conducted); PCMA4MA101503 (Radiated)
Modes of Operation:	WCDMA Bands II / IV / V
Antenna Type:	Internal – Band II (3.2dBi); Band IV (4.1dBi); Band V (0dBi)
IMEI:	351072640039065
Sample Received Date:	22 October 2022
Dates of testing:	02 November – 01 December 2022

2.4 *Description of Test Modes*

The EUT was tested under normal operating conditions. A Rohde & Schwarz test SIM was installed in the unit with a base station simulator directly connected to the cellular port for conducted measurements and over the air for radiated measurements. The base station simulator was set to control the EUT to output maximum power and operate in WCDMA Bands II, IV, and V. Using the base station simulator, the device was configured for maximum uplink transmit power.

3 RF Output Power / Effective Radiated Power

3.1 *Test Result*

Test Description	Specification	Test Result
RF Output Power	FCC Part 2.1046 RSS-GEN (6.12)	Compliant
Effective Radiated Power	FCC Part 22.913(a)(5)	Compliant
Effective Isotropic Radiated Power	24.232(c) FCC 27.50(d)(4) RSS-132 (5.4) RSS-133 (6.4) RSS-139 (5.5)	Compliant

3.2 *Test Method*

A radio link was established between EUT and Radio Communication Tester. The output power of the EUT was set to maximum value by using the maximum power setting on the Radio Communications Tester. The CMW500 was used to measure the output power.

The measurements were conducted at the low, middle, and high channel.

For ERP/EIRP calculations, the antenna gain was added to the conducted measurements.

3.3 *Test Site*

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature:	22.8 °C
Relative Humidity:	41.1 %
Atmospheric Pressure:	97.8 kPa

3.4 *Test Equipment*

Test End Date: 28-Nov-2022 Tester: AB

Equipment	Model	Manufacturer	Asset	Cal Date	Cal Due Date
WIDEBAND RADIO COMMUNICATION TESTER	CMW500	ROHDE & SCHWARZ	B094874	13-Jan-2021	13-Jan-2023
RF CABLE SMA TO SMA, 0.01-40GHZ	084-0505-059	TELEDYNE STORM MICROWAVE	20109	16-Mar-2022	16-Mar-2023
RF CABLE (TS8997)	141	HUBER & SUHNER	B095588	5-Jul-2022	5-Jul-2023
ATTENUATOR, 10DB (TS8997)	10DB	ROHDE & SCHWARZ	B095593	12-May-2022	12-May-2023
POWER SPLITTER	ZFRSC-123-S+	MINI-CIRCUITS	B101739	13-Jul-2022	13-Jul-2023
RF CABLE SMA TO SMA, 0.01-40GHZ	084-0505-020	TELEDYNE STORM MICROWAVE	20105	16-Mar-2022	16-Mar-2023
EXA SIGNAL ANALYZER	N9010B	KEYSIGHT	1245605	17-Nov-2022	17-Nov-2023
TSTPASS SWITCHBOX	SB1	TSTPASS	20168	CNR	CNR

Software Profile:
TESTPass Version: 1.0.0, build: 2020.11.15.01

3.5 *Test Data*

Test Band: 2											
Test Mode		Conducted Power (dBm)			Antenna gain		EIRP(dBm)			Limit (dBm)	Verdict
		LCH	MCH	HCH	(dBd)	(dBi)	LCH	MCH	HCH		
HSUPA	Subtest 1	19.41	19.61	19.25	/	3.20	22.61	22.81	22.45	33.01	PASS
	Subtest 2	19.81	19.09	19.25	/	3.20	23.01	22.29	22.45	33.01	PASS
	Subtest 3	19.37	19.64	19.28	/	3.20	22.57	22.84	22.48	33.01	PASS
	Subtest 4	19.85	19.12	18.73	/	3.20	23.05	22.32	21.93	33.01	PASS
	Subtest 5	19.81	19.58	19.22	/	3.20	23.01	22.78	22.42	33.01	PASS
HSDPA	Subtest 1	19.95	20.14	19.29	/	3.20	23.15	23.34	22.49	33.01	PASS
	Subtest 2	19.85	19.75	19.71	/	3.20	23.05	22.95	22.91	33.01	PASS
	Subtest 3	19.47	19.19	19.43	/	3.20	22.67	22.39	22.63	33.01	PASS
	Subtest 4	19.42	19.71	19.09	/	3.20	22.62	22.91	22.29	33.01	PASS

Note:
1) dBd = dBi - 2.15
2) EIRP = Conducted output power + Antenna gain (dBi)

Test Band: 4											
Test Mode		Conducted Power (dBm)			Antenna gain		EIRP(dBm)			Limit (dBm)	Verdict
		LCH	MCH	HCH	(dBd)	(dBi)	LCH	MCH	HCH		
HSUPA	Subtest 1	18.99	19.18	19.21	/	4.10	23.09	23.28	23.31	30.00	PASS
	Subtest 2	19.15	19.20	19.36	/	4.10	23.25	23.30	23.46	30.00	PASS
	Subtest 3	19.70	19.12	19.05	/	4.10	23.80	23.22	23.15	30.00	PASS
	Subtest 4	19.29	19.63	19.21	/	4.10	23.39	23.73	23.31	30.00	PASS
	Subtest 5	19.26	19.17	19.79	/	4.10	23.36	23.27	23.89	30.00	PASS
HSDPA	Subtest 1	19.36	20.43	20.28	/	4.10	23.46	24.53	24.38	30.00	PASS
	Subtest 2	19.37	20.08	19.91	/	4.10	23.47	24.18	24.01	30.00	PASS
	Subtest 3	19.08	19.41	19.37	/	4.10	23.18	23.51	23.47	30.00	PASS
	Subtest 4	19.66	19.21	20.11	/	4.10	23.76	23.31	24.21	30.00	PASS

Note:
1) dBd = dBi - 2.15
2) EIRP = Conducted output power + Antenna gain (dBi)

Test Band: 5											
Test Mode		Conducted Power (dBm)			Antenna gain		ERP(dBm)			Limit (dBm)	Verdict
		LCH	MCH	HCH	(dBd)	(dBi)	LCH	MCH	HCH		
HSUPA	Subtest 1	19.02	19.65	19.14	-2.15	0.00	16.87	17.50	16.99	38.45	PASS
	Subtest 2	19.09	19.71	19.20	-2.15	0.00	16.94	17.56	17.05	38.45	PASS
	Subtest 3	19.62	19.64	19.61	-2.15	0.00	17.47	17.49	17.46	38.45	PASS
	Subtest 4	19.62	19.64	19.67	-2.15	0.00	17.47	17.49	17.52	38.45	PASS
	Subtest 5	19.26	19.62	19.69	-2.15	0.00	17.11	17.47	17.54	38.45	PASS
HSDPA	Subtest 1	19.49	19.59	19.72	-2.15	0.00	17.34	17.44	17.57	38.45	PASS
	Subtest 2	19.85	19.58	19.50	-2.15	0.00	17.70	17.43	17.35	38.45	PASS
	Subtest 3	19.75	19.81	19.92	-2.15	0.00	17.60	17.66	17.77	38.45	PASS
	Subtest 4	19.78	19.63	19.06	-2.15	0.00	17.63	17.48	16.91	38.45	PASS

Note:
1) dBd = dBi - 2.15
2) EIRP = Conducted output power + Antenna gain (dBi)
3) ERP = Conducted output power + Antenna gain (dBd)

Band II Max: 20.14dBm (0.103W)
Band IV Max: 20.43dBm (0.110W)
Band V Max: 19.92dBm (0.098W)

4 Peak to Average Ratio

4.1 *Test Result*

Test Description	Specification	Test Result
Peak to Average Ratio	FCC 24.232(d) FCC 27.50(d)(5) RSS-132 (5.4) RSS-133 (6.4) RSS-139 (5.5)	Compliant

4.2 *Test Method*

KDB document 971168 D01 Power Meas License Digital Systems v03r01 was used to determine peak-to-average ratio. For the measurements, Clause 5.7.1 was used which defined the measurement method using the CCDF function of the spectrum analyzer. Measurements were recorded at the lowest, middle, and highest channels.

4.3 *Test Site*

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature:	22.8 °C
Relative Humidity:	41.1 %
Atmospheric Pressure:	97.8 kPa

4.4 *Test Equipment*

Test End Date: 23-Nov-2022 Tester: AB

Equipment	Model	Manufacturer	Asset	Cal Date	Cal Due Date
WIDEBAND RADIO COMMUNICATION TESTER	CMW500	ROHDE & SCHWARZ	B094874	13-Jan-2021	13-Jan-2023
RF CABLE SMA TO SMA, 0.01-40GHZ	084-0505-059	TELEDYNE STORM MICROWAVE	20109	16-Mar-2022	16-Mar-2023
RF CABLE (TS8997)	141	HUBER & SUHNER	B095588	5-Jul-2022	5-Jul-2023
ATTENUATOR, 10DB (TS8997)	10DB	ROHDE & SCHWARZ	B095593	12-May-2022	12-May-2023
POWER SPLITTER	ZFRSC-123-S+	MINI-CIRCUITS	B101739	13-Jul-2022	13-Jul-2023
RF CABLE SMA TO SMA, 0.01-40GHZ	084-0505-020	TELEDYNE STORM MICROWAVE	20105	16-Mar-2022	16-Mar-2023
EXA SIGNAL ANALYZER	N9010B	KEYSIGHT	1245605	17-Nov-2022	17-Nov-2023
TSTPASS SWITCHBOX	SB1	TSTPASS	20168	CNR	CNR

Software Profile:
TESTPass Version: 1.0.0, build: 2020.11.15.01

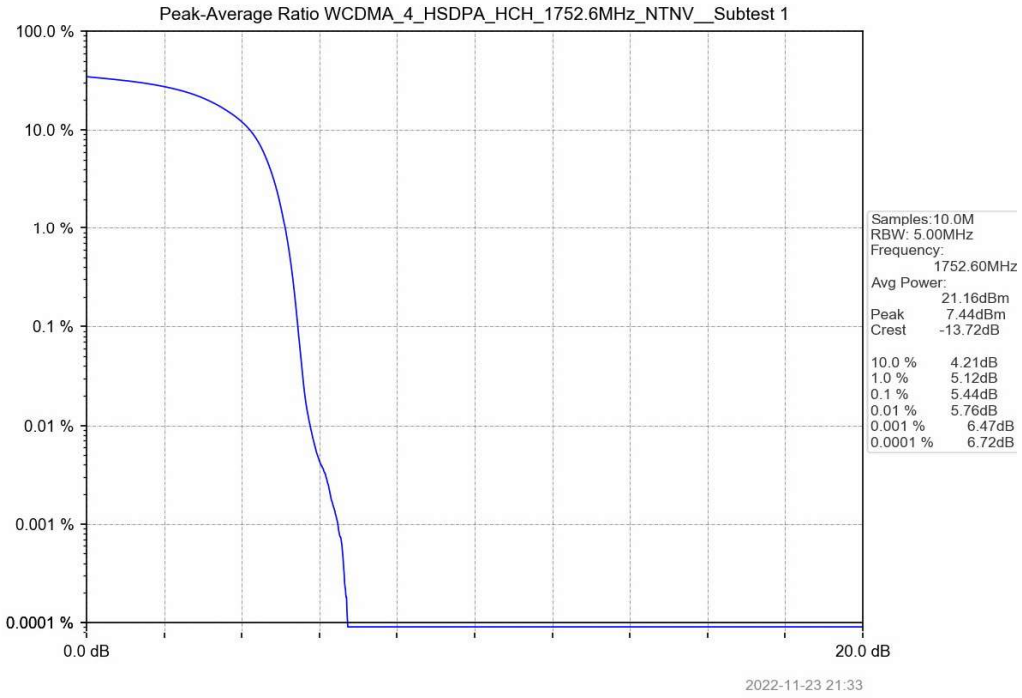
4.5 *Test Data*

Test Band: 2					
Test Mode	Test result (dB)			Limit (dB)	Verdict
	LCH	MCH	HCH		
HSUPA	5.18	5.28	5.43	13	PASS
HSDPA	5.10	5.35	5.28	13	PASS

Test Band: 4					
Test Mode	Test result (dB)			Limit (dB)	Verdict
	LCH	MCH	HCH		
HSUPA	5.24	5.02	5.38	13	PASS
HSDPA	5.20	5.08	5.44	13	PASS

Test Band: 5					
Test Mode	Test result (dB)			Limit (dB)	Verdict
	LCH	MCH	HCH		
HSUPA	5.17	5.08	5.29	13	PASS
HSDPA	5.11	5.12	5.33	13	PASS

Representative Plot taken from data measured



5 Occupied Bandwidth

5.1 *Test Result*

Test Description	Specification	Test Result
Occupied Bandwidth	FCC Part 2.1049 FCC Part 22.917(b) FCC Part 24.238(b) FCC Part 27.53(h)(3) RSS-GEN (6.7) RSS-133 (2.3)	Reported

5.2 *Test Method*

KDB document 971168 D01 Power Meas License Digital Systems v03r01, Clause 4 was used to determine the bandwidth measurements.

The 99% measurement function of the spectrum analyzer was used for occupied bandwidth and the ndB down function was used for the 26dB emission bandwidth measurements.

The measurement was conducted at the low, middle, and high channel of each band.

5.3 *Test Site*

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature:	22.8 °C
Relative Humidity:	41.1 %
Atmospheric Pressure:	97.8 kPa

5.4 *Test Equipment*

Test End Date: 1-Dec-2022 Tester: AB

Equipment	Model	Manufacturer	Asset	Cal Date	Cal Due Date
WIDEBAND RADIO COMMUNICATION TESTER	CMW500	ROHDE & SCHWARZ	B094874	13-Jan-2021	13-Jan-2023
RF CABLE SMA TO SMA, 0.01-40GHZ	084-0505-059	TELEDYNE STORM MICROWAVE	20109	16-Mar-2022	16-Mar-2023
RF CABLE (TS8997)	141	HUBER & SUHNER	B095588	5-Jul-2022	5-Jul-2023
ATTENUATOR, 10DB (TS8997)	10DB	ROHDE & SCHWARZ	B095593	12-May-2022	12-May-2023
POWER SPLITTER	ZFRSC-123-S+	MINI-CIRCUITS	B101739	13-Jul-2022	13-Jul-2023
RF CABLE SMA TO SMA, 0.01-40GHZ	084-0505-020	TELEDYNE STORM MICROWAVE	20105	16-Mar-2022	16-Mar-2023
EXA SIGNAL ANALYZER	N9010B	KEYSIGHT	1245605	17-Nov-2022	17-Nov-2023
TSTPASS SWITCHBOX	SB1	TSTPASS	20168	CNR	CNR

Software Profile:
TESTPass Version: 1.0.0, build: 2020.11.15.01

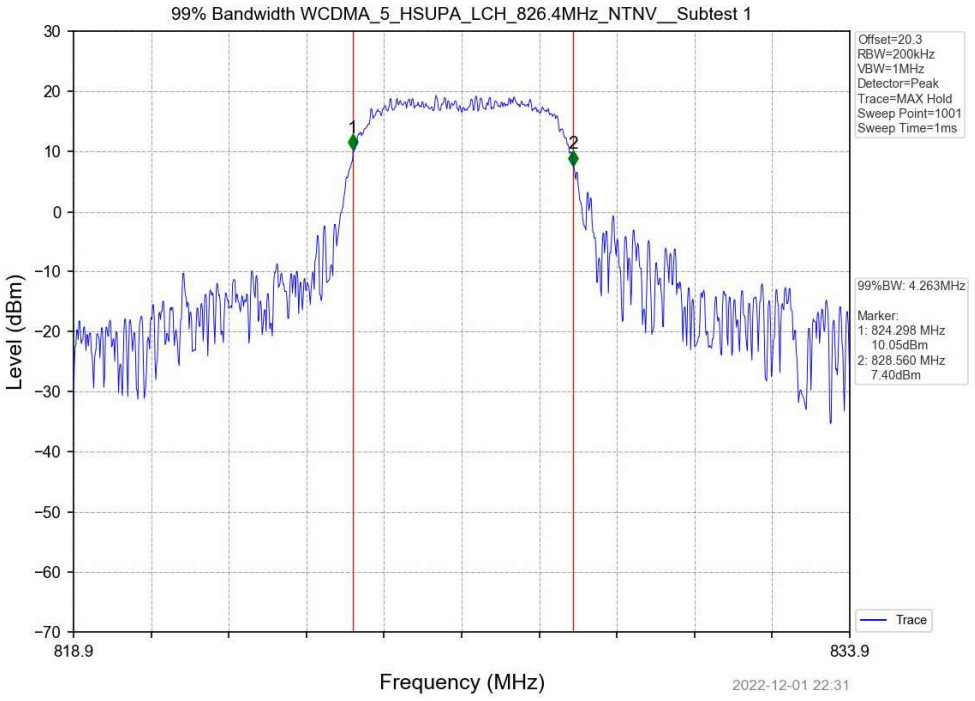
5.5 *Test Data – 99% OBW*

Test Band: 2					
Test Mode	99% Occupied Bandwidth (MHz)			Limit	Verdict
	LCH	MCH	HCH		
HSUPA	4.179	4.160	4.173	N/A	PASS
HSDPA	4.174	4.175	4.164	N/A	PASS

Test Band: 4					
Test Mode	99% Occupied Bandwidth (MHz)			Limit	Verdict
	LCH	MCH	HCH		
HSUPA	4.227	4.240	4.222	N/A	PASS
HSDPA	4.238	4.228	4.200	N/A	PASS

Test Band: 5					
Test Mode	99% Occupied Bandwidth (MHz)			Limit	Verdict
	LCH	MCH	HCH		
HSUPA	4.263	4.198	4.175	N/A	PASS
HSDPA	4.239	4.259	4.181	N/A	PASS

Representative Plot taken from data measured



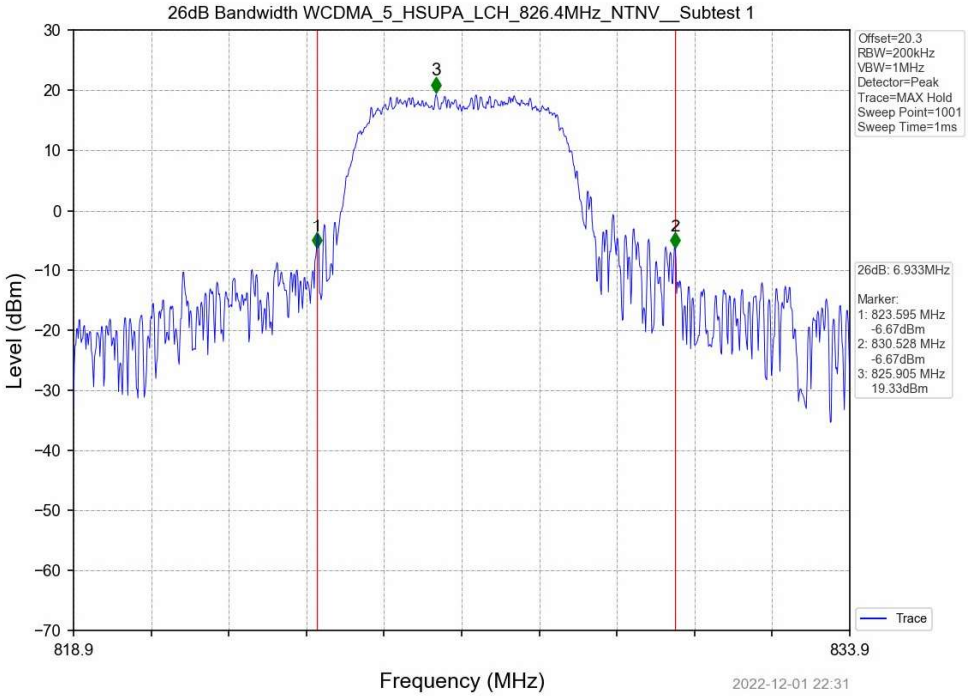
5.6 *Test Data – 26dB EBW*

Test Band: 2					
Test Mode	26dB Bandwidth (MHz)			Limit	Verdict
	LCH	MCH	HCH		
HSUPA	4.802	4.811	4.817	N/A	PASS
HSDPA	4.825	6.212	4.793	N/A	PASS

Test Band: 4					
Test Mode	26dB Bandwidth (MHz)			Limit	Verdict
	LCH	MCH	HCH		
HSUPA	5.427	6.387	6.486	N/A	PASS
HSDPA	6.526	5.925	5.777	N/A	PASS

Test Band: 5					
Test Mode	26dB Bandwidth (MHz)			Limit	Verdict
	LCH	MCH	HCH		
HSUPA	6.933	6.334	6.085	N/A	PASS
HSDPA	6.826	6.406	5.399	N/A	PASS

Representative Plot taken from data measured



6 Band Edge and Conducted Spurious Emissions

6.1 *Test Result*

Test Description	Specification	Test Result
Conducted spurious emissions and Band Edge	2.1051 22.917(a) 24.238(a) 27.53(h) RSS-132 (5.5) RSS-133 (6.5.1) RSS-139(5.6)	Compliant

6.2 *Test Method*

KDB document 971168 D01 Power Meas License Digital Systems v03r01, Clause 6 was used to measure spurious emissions at the antenna terminals.

6.3 *Test Site*

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature: 22.8 °C
Relative Humidity: 41.1 %
Atmospheric Pressure: 97.8 kPa

6.4 *Test Equipment*

Test End Date: 1-Dec-2022 Tester: AB

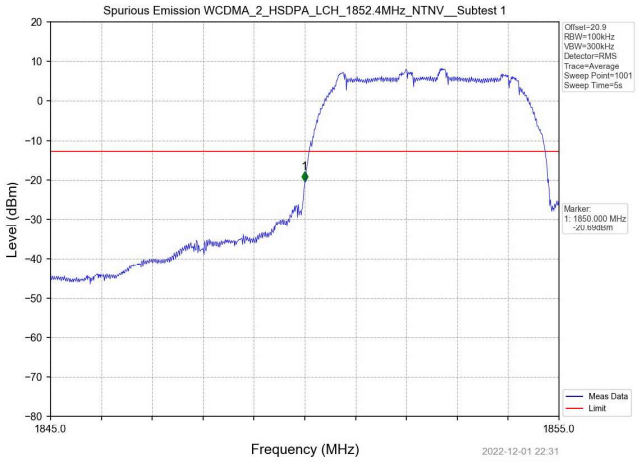
Equipment	Model	Manufacturer	Asset	Cal Date	Cal Due Date
WIDEBAND RADIO COMMUNICATION TESTER	CMW500	ROHDE & SCHWARZ	B094874	13-Jan-2021	13-Jan-2023
RF CABLE SMA TO SMA, 0.01-40GHZ	084-0505-059	TELEDYNE STORM MICROWAVE	20109	16-Mar-2022	16-Mar-2023
RF CABLE (TS8997)	141	HUBER & SUHNER	B095588	5-Jul-2022	5-Jul-2023
ATTENUATOR, 10DB (TS8997)	10DB	ROHDE & SCHWARZ	B095593	12-May-2022	12-May-2023
POWER SPLITTER	ZFRSC-123-S+	MINI-CIRCUITS	B101739	13-Jul-2022	13-Jul-2023
RF CABLE SMA TO SMA, 0.01-40GHZ	084-0505-020	TELEDYNE STORM MICROWAVE	20105	16-Mar-2022	16-Mar-2023
EXA SIGNAL ANALYZER	N9010B	KEYSIGHT	1245605	17-Nov-2022	17-Nov-2023
TSTPASS SWITCHBOX	SB1	TSTPASS	20168	CNR	CNR

Software Profile:
TESTPass Version: 1.0.0, build: 2020.11.15.01

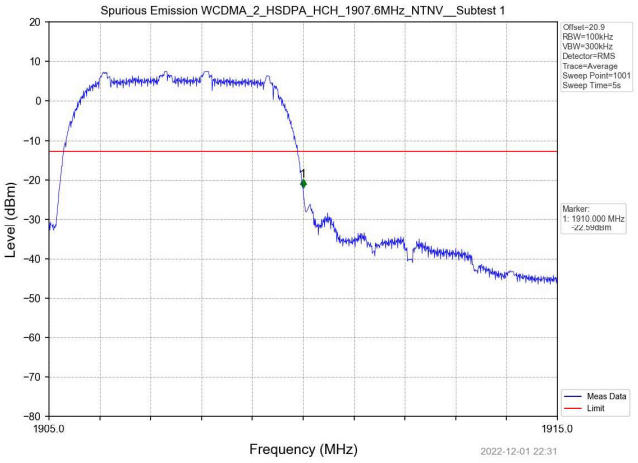
6.5 *Test Data – Band Edges*

WCDMA, Band II

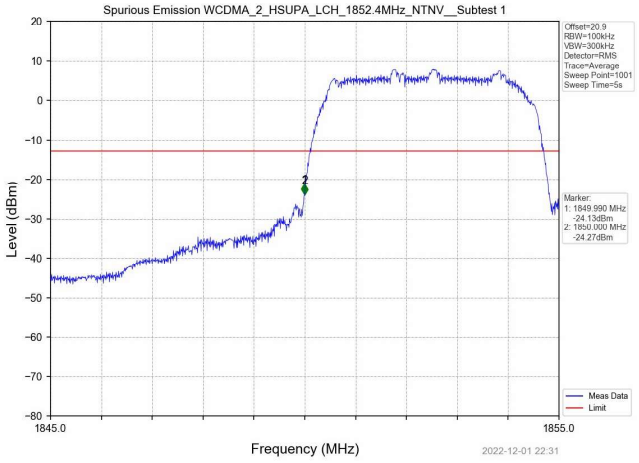
Lower Band Edge (Channel 9262, HSDPA, 1852.4 MHz)



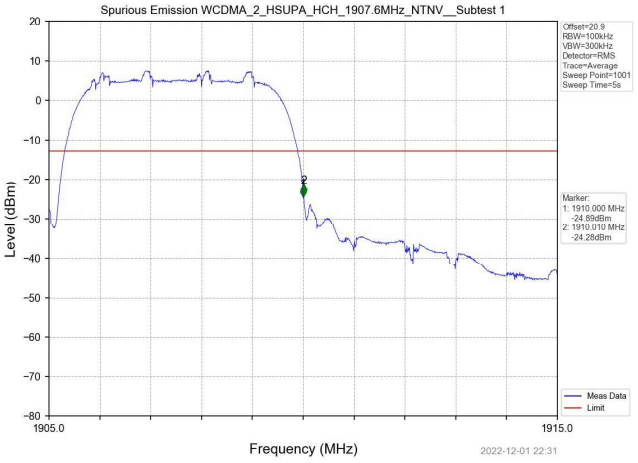
Upper Band Edge (Channel 9538, HSDPA, 1907.6 MHz)



Lower Band Edge (Channel 9262, HSUPA, 1852.4 MHz)

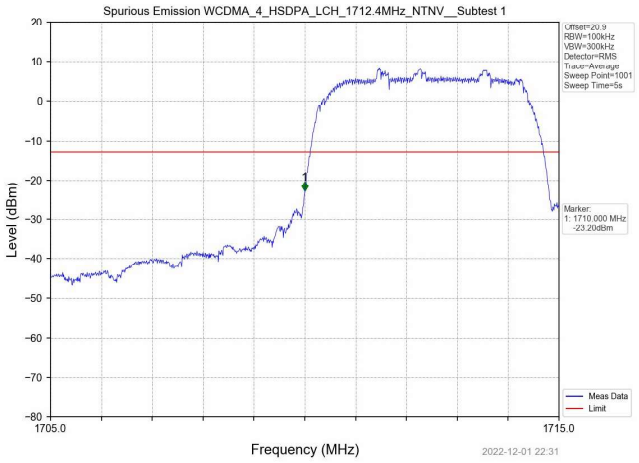


Upper Band Edge (Channel 9538, HSUPA, 1907.6 MHz)

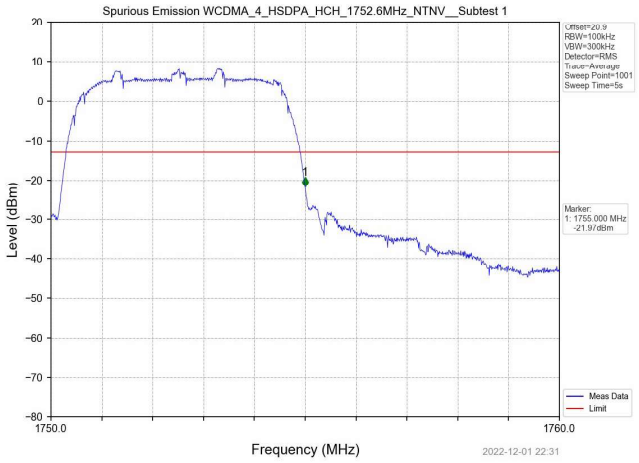


WCDMA, Band IV

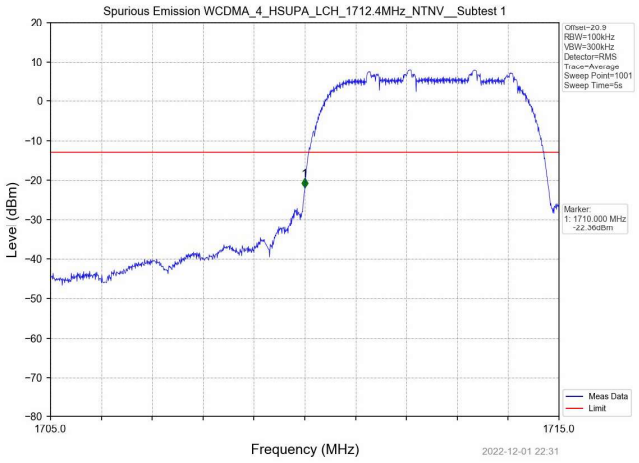
Lower Band Edge (Channel 1312, HSDPA, 1712.4 MHz)



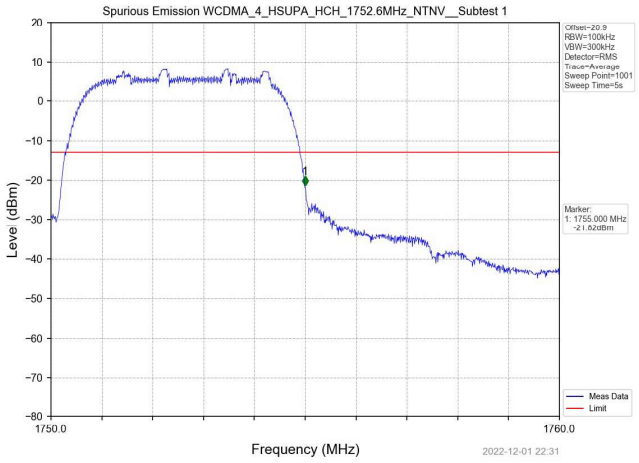
Upper Band Edge (Channel 1513, HSDPA, 1752.6 MHz)



Lower Band Edge (Channel 1312, HSUPA, 1712.4 MHz)

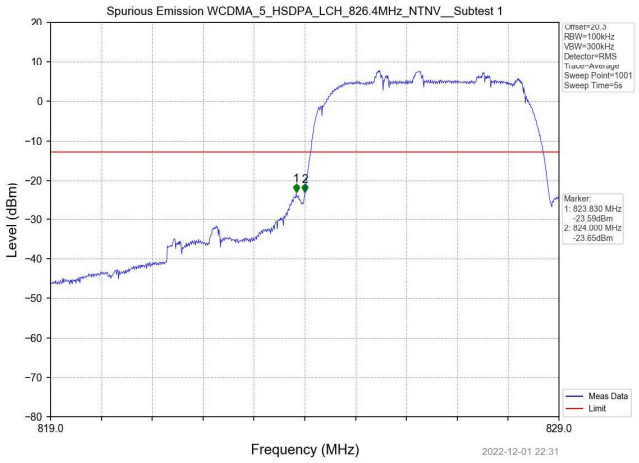


Upper Band Edge (Channel 1513, HSUPA, 1752.6 MHz)

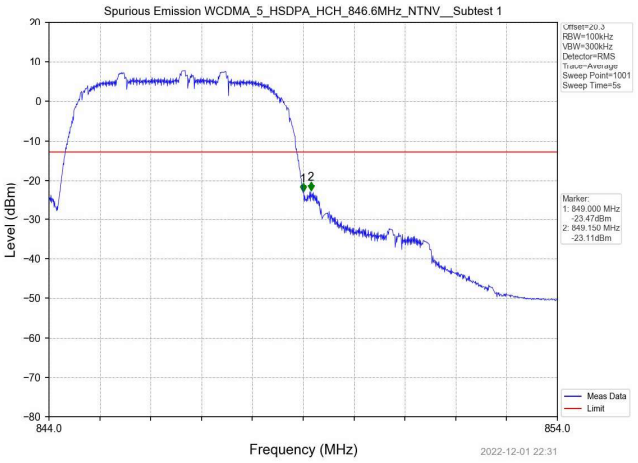


WCDMA, Band V

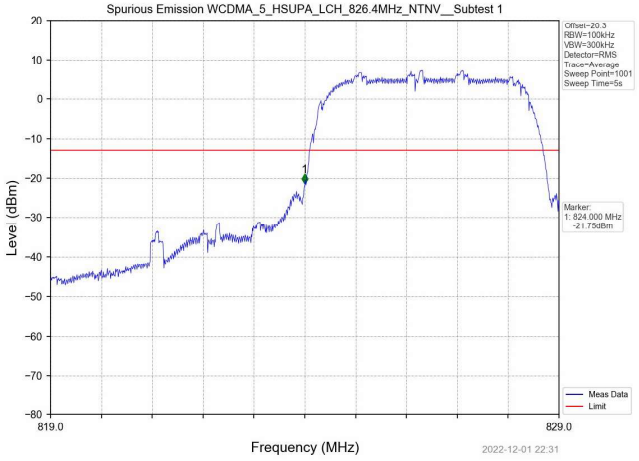
Lower Band Edge (Channel 4132, HSDPA, 826.4 MHz)



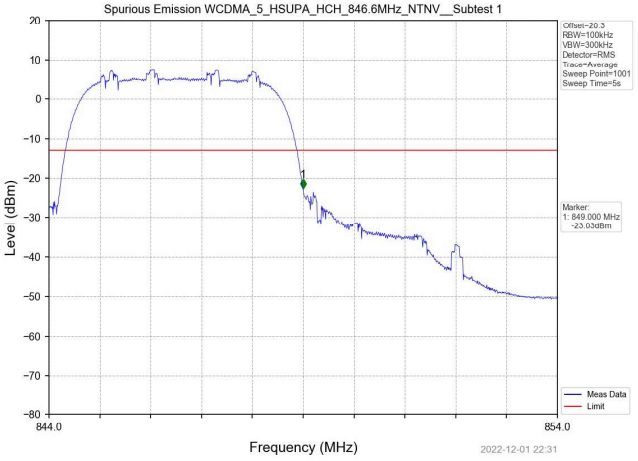
Upper Band Edge (Channel 4233, HSDPA, 846.6 MHz)



Lower Band Edge (Channel 4132, HSUPA, 826.4 MHz)



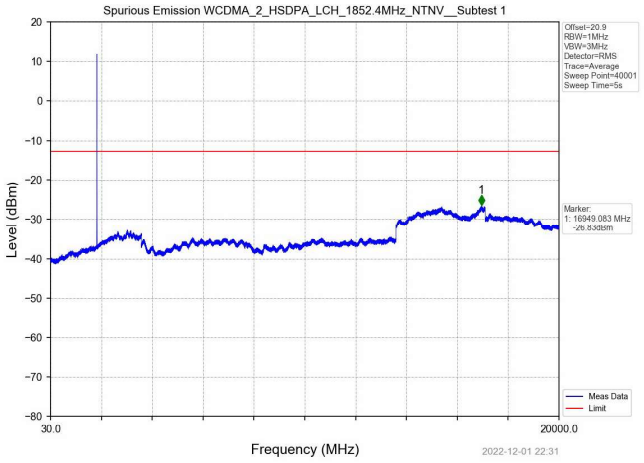
Upper Band Edge (Channel 4233, HSUPA, 846.6 MHz)



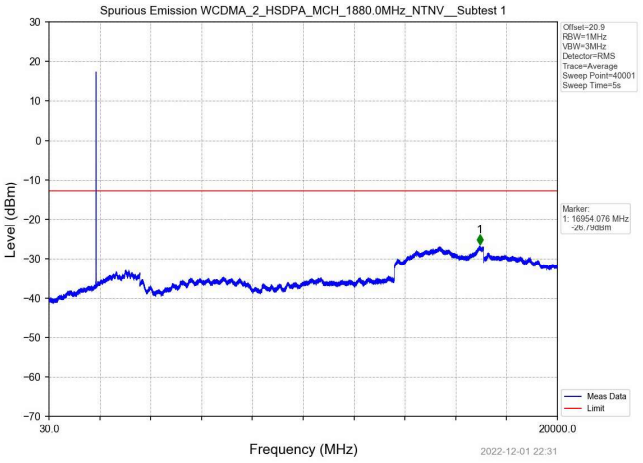
6.6 *Test Data - Conducted Spurious Emissions*

WCDMA Band II

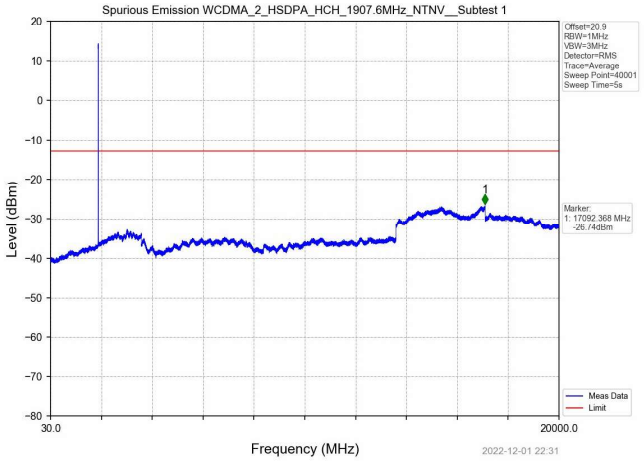
LCH (Channel 9262, HSDPA, 1852.4 MHz)



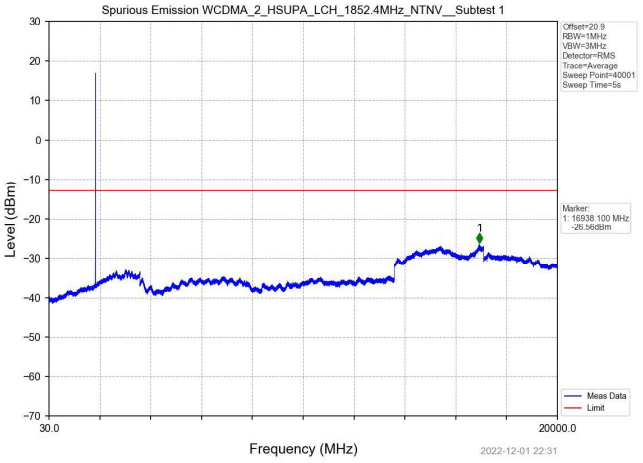
MCH (Channel 9400, 1880 MHz, HSDPA)



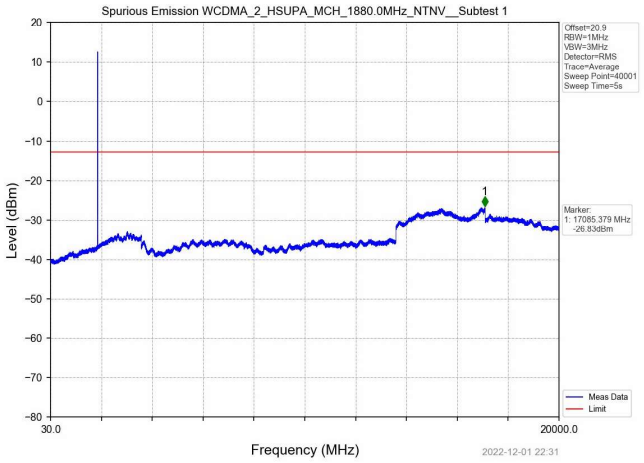
HCH (Channel 9538, HSDPA, 1907.6 MHz)



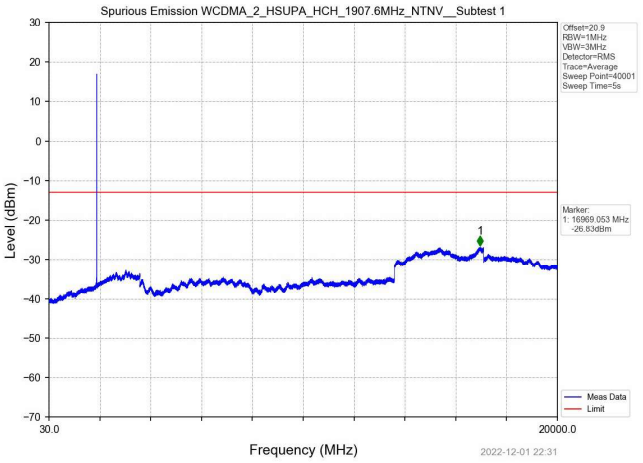
LCH (Channel 9262, HSUPA, 1852.4 MHz)



MCH (Channel 9400, HSUPA, 1880 MHz)

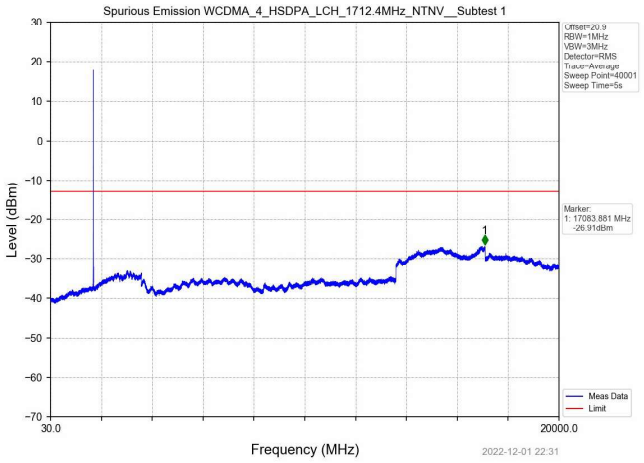


HCH (Channel 9538, HSUPA, 1907.6 MHz)

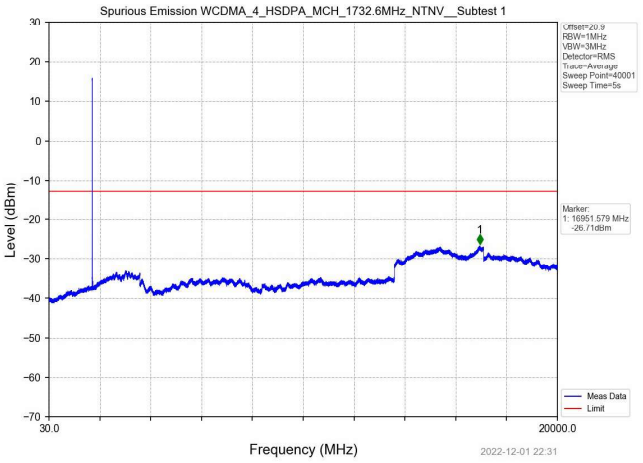


WCDMA Band IV

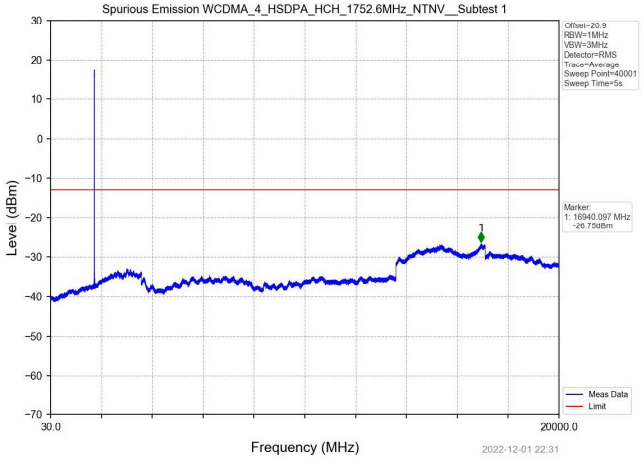
LCH (Channel 1312, HSDPA, 1712.4 MHz)



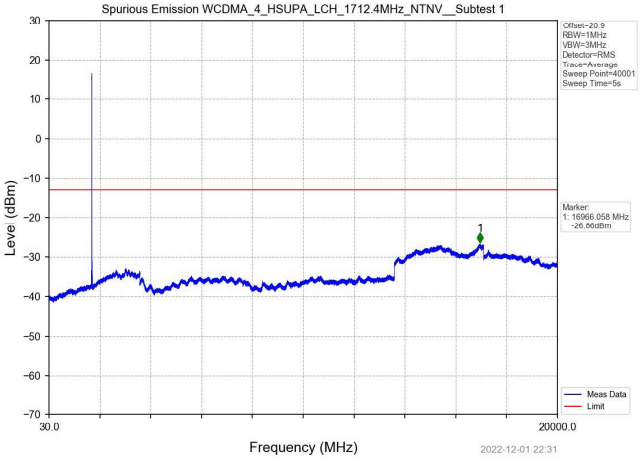
MCH (Channel 1413, 1732.6 MHz, HSDPA)



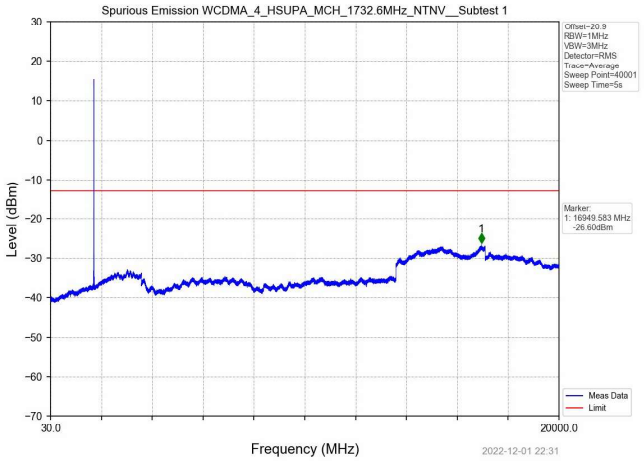
HCH (Channel 1513, HSDPA, 1752.6 MHz)



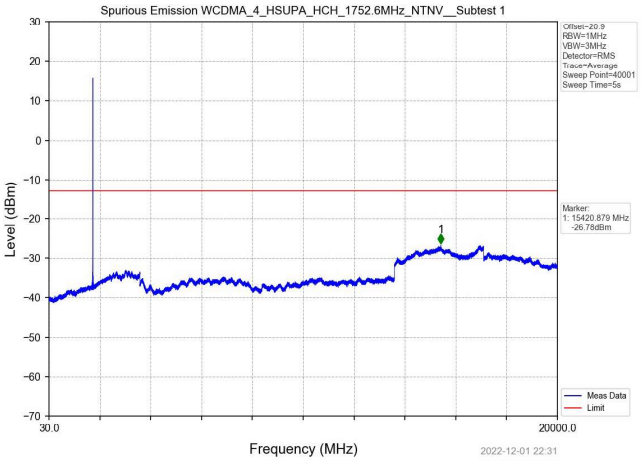
LCH (Channel 1312, HSUPA, 1712.4 MHz)



MCH (Channel 1413, 1732.6 MHz, HSUPA)

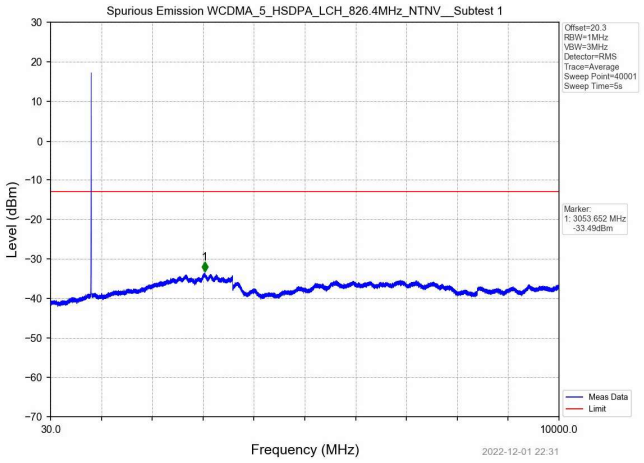


HCH (Channel 1513, HSUPA, 1752.6 MHz)

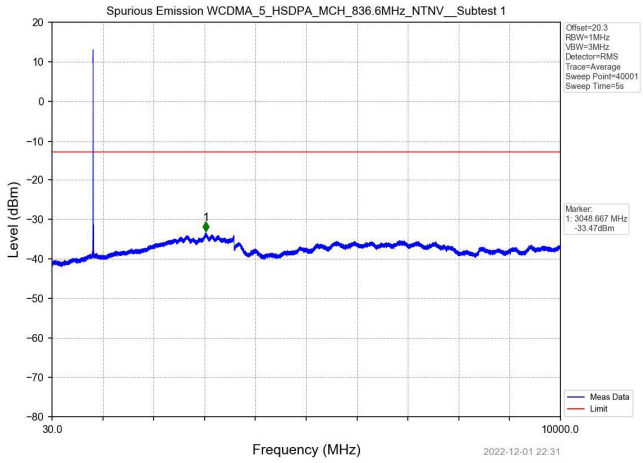


WCDMA Band V

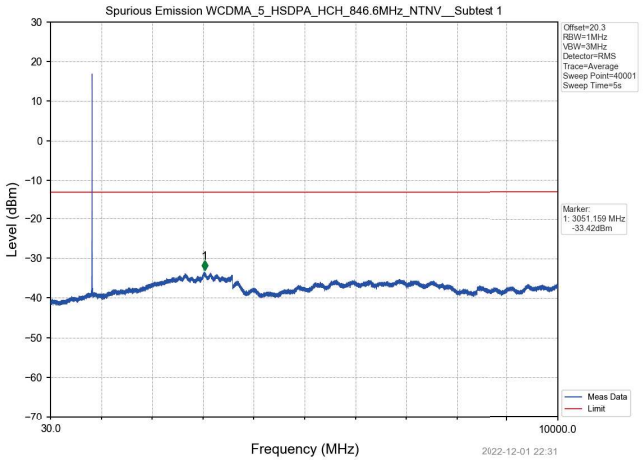
LCH (Channel 4132, HSDPA, 826.4 MHz)



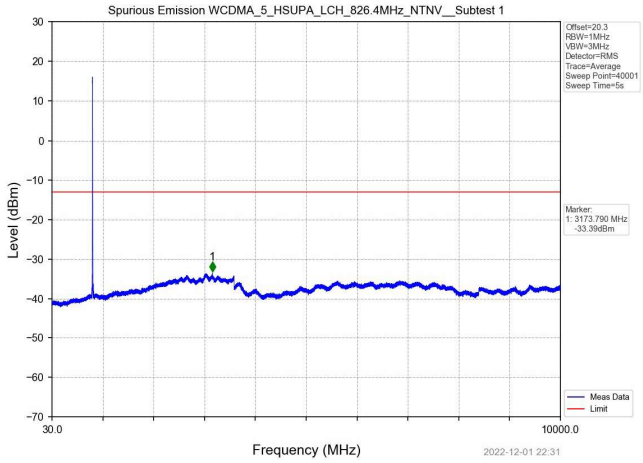
MCH (Channel 4183, 836.6 MHz, HSDPA)



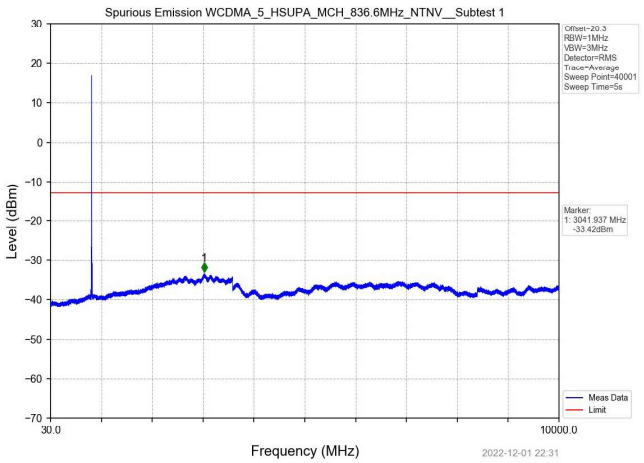
HCH (Channel 4233, HSDPA, 846.6 MHz)



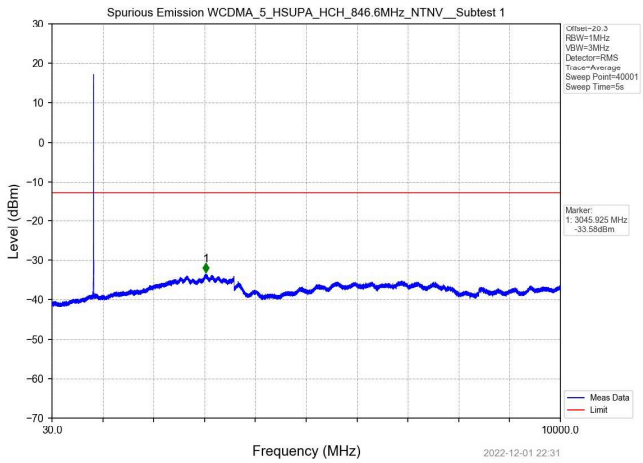
LCH (Channel 4132, HSUPA, 826.4 MHz)



MCH (Channel 4183, 836.6 MHz, HSUPA)



HCH (Channel 4233, HSUPA, 846.6 MHz)



7 Radiated Spurious Emissions

7.1 *Test Result*

Test Description	Specification	Test Result
Transmitter Spurious Emissions	2.1053 22.917(a) 24.238(a) 27.53(h) RSS-GEN (6.11) RSS-132 (5.3) RSS-133 (6.3) RSS-139 (5.4)	Compliant

7.2 *Test Method*

The levels of the carrier and the various conducted spurious and harmonics frequencies are measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB.

A radio link was established between EUT and Radio Communications Tester over the air. The output power of the EUT was set to maximum value by using the maximum power setting on the Radio Communications Tester.

7.3 *Test Site*

3m Absorber Lined Shielded Enclosure (ALSE), Suwanee, GA

Environmental Conditions

Temperature:	21.48 °C
Relative Humidity:	45.5 %
Atmospheric Pressure:	91.25 kPa

7.4 *Test Equipment*

30-1000MHz:

Test End Date: 2-Nov-2022 Tester: EW

Equipment	Model	Manufacturer	Asset	Cal Date	Cal Due Date
ANTENNA, BILOG	JB6	SUNOL	B079689	26-May-2022	26-May-2024
N to N RF Cable	NC12-N1N1-276	MEGAPHASE	22001	9-Jan-2023	9-Jan-2024
RF CABLE NM TO NF, 0.01-18GHZ	90-213-118	TELEDYNE STORM MICROWAVE	20117	13-Feb-2023	13-Feb-2024
RF CABLE NM TO NM, 0.01-18GHZ	90-195-079	TELEDYNE STORM MICROWAVE	20124	13-Feb-2023	13-Feb-2024
RF CABLE	104PE	HUBER & SUHNER	B079793	25-Aug-2022	25-Aug-2023
LOW NOISE AMPLIFIER	ZKL-2+	MINI-CIRCUITS	B079817	25-Aug-2022	25-Aug-2023
EXA SIGNAL ANALYZER	N9010B	KEYSIGHT	B085759	17-Nov-2022	17-Nov-2023
WIDEBAND RADIO COMMUNICATION TESTER	CMW500	ROHDE & SCHWARZ	B085757	CNR	CNR
SOFTWARE	TILE 7	ETS LINDGREN	N/A	CNR	CNR

Above 1GHz:

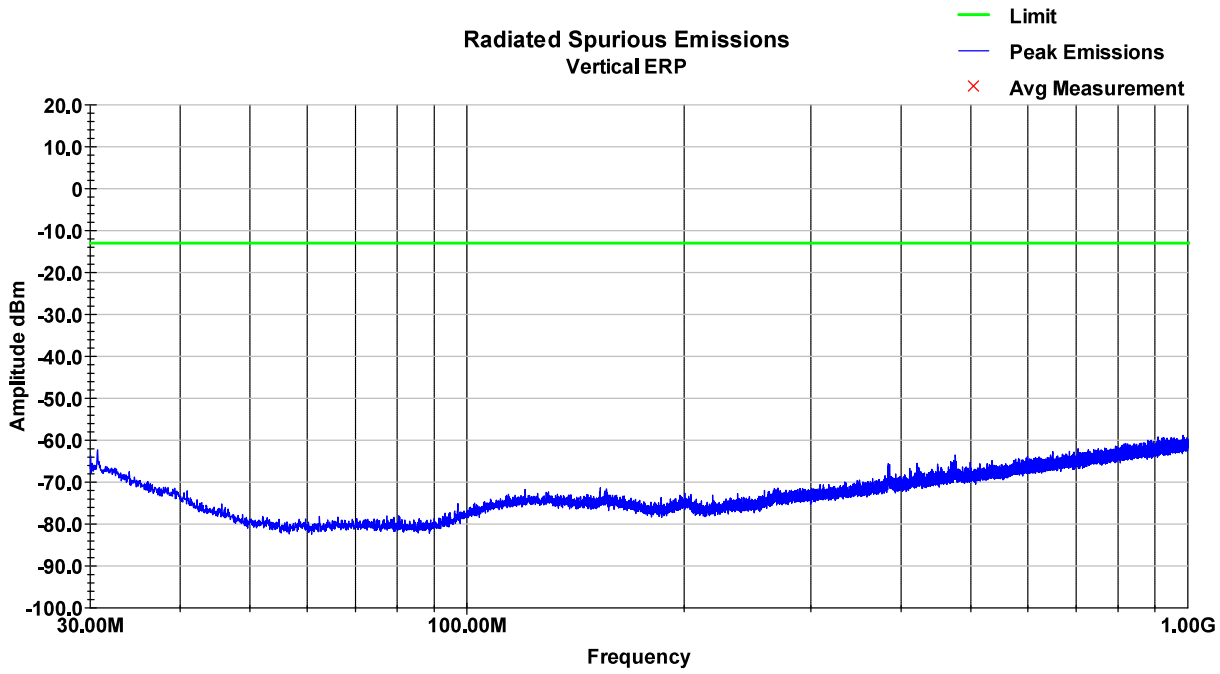
Test End Date: 7-Nov-2022
8-Nov-2022 Tester: PL, ZH

Equipment	Model	Manufacturer	Asset	Cal Date	Cal Due Date
ANTENNA, DRG HORN (MEDIUM)	3117	ETS LINDGREN	B079691	15-Aug-2022	15-Aug-2024
RF CABLE NM TO NF, 0.01-18GHZ	90-213-118	TELEDYNE STORM MICROWAVE	20118	16-Mar-2022	16-Mar-2023
RF CABLE NM TO NM, 0.01-18GHZ	90-195-118	TELEDYNE STORM MICROWAVE	20126	9-Feb-2023	9-Feb-2024
RF CABLE RIGHT ANGLE NM TO NM, 0.01-18GHZ	90-076-020	TELEDYNE STORM MICROWAVE	20131	16-Mar-2022	16-Mar-2023
LOW NOISE AMPLIFIER	TS-PR18	ROHDE & SCHWARZ	B094463	13-Jul-2022	13-Jul-2023
EMI TEST RECEIVER	ESW44	ROHDE & SCHWARZ	22027	13-Sep-2022	13-Sep-2023
EXA SIGNAL ANALYZER	N9010B	KEYSIGHT	B079802	17-Nov-2022	17-Nov-2023
FILTER, HIGH PASS, >2800MHZ	HPM50111	MICRO-TRONICS	22017	16-Jun-2022	16-Jun-2023
SOFTWARE	TILE 7	ETS LINDGREN	N/A	CNR	CNR

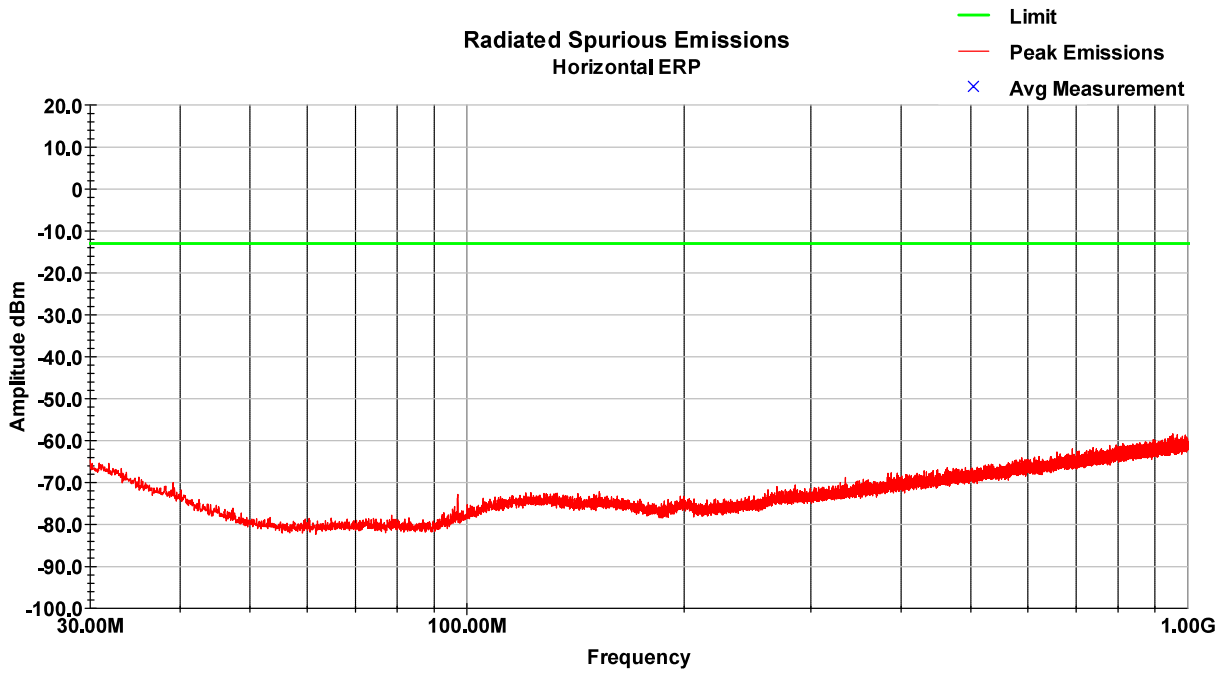
Software:
“RSE 30-1000 MHz T7 220318” TILE! profile dated 18 March 2022
“RSE 1-18 GHz T7 220307” TILE! profile dated 07 March 2022

7.5 *Test Data – WCDMA Band II*

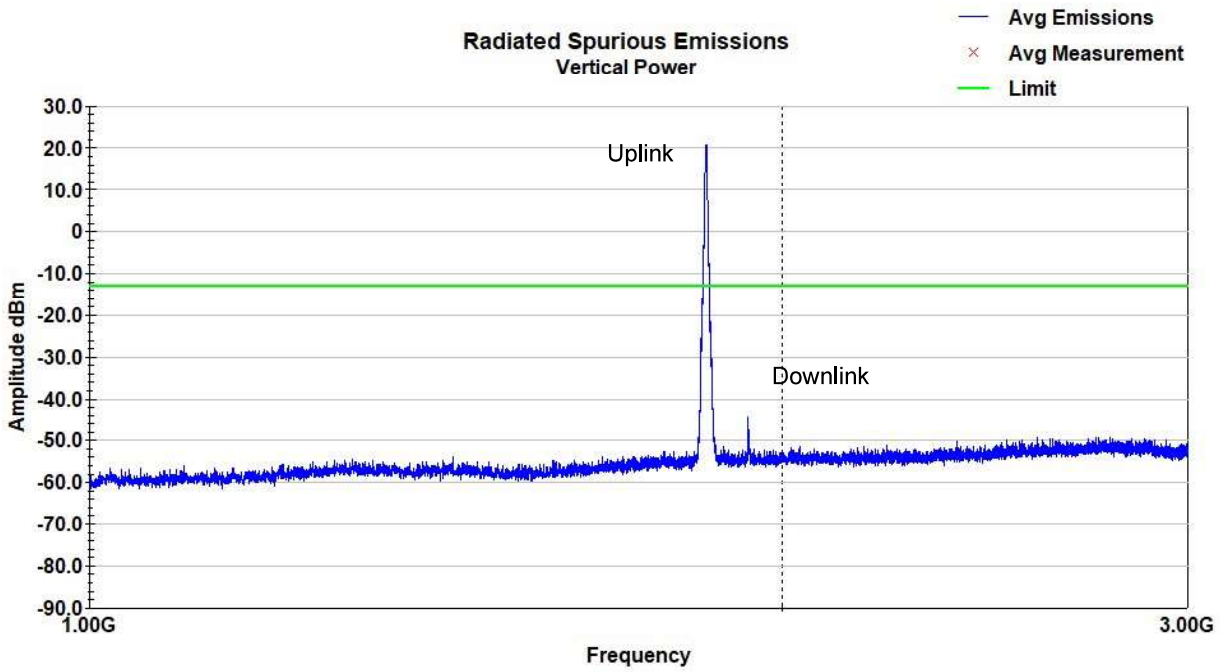
WCDMA Band II – LCH – 30-1000MHz – Vertical



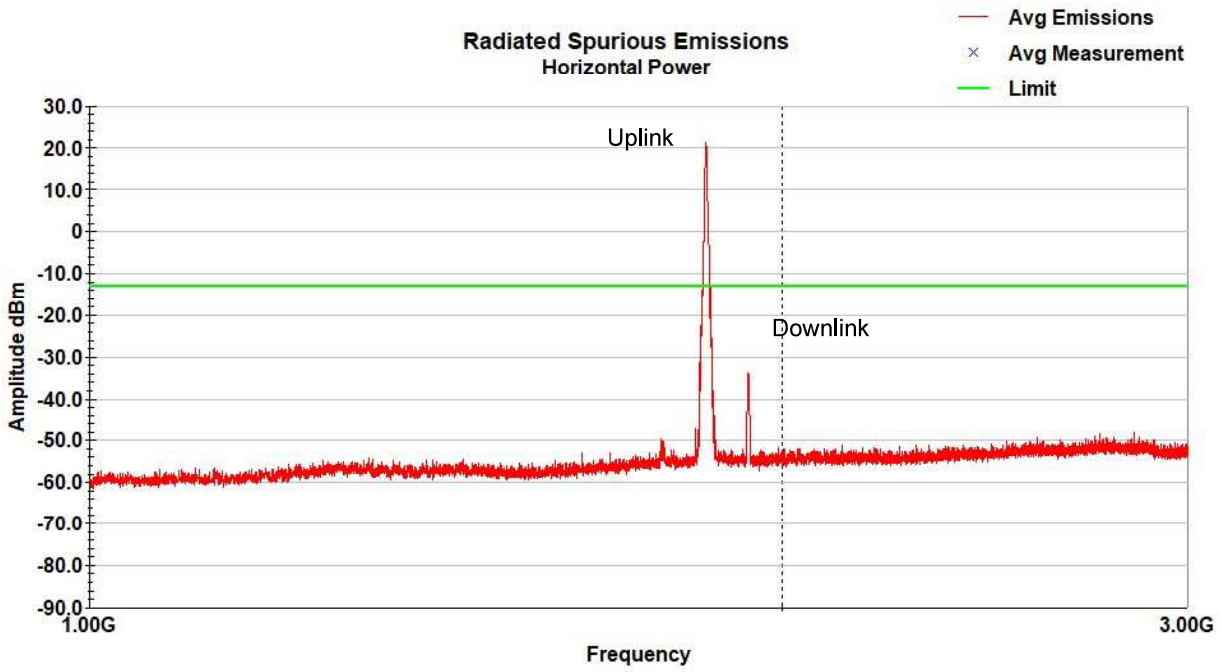
WCDMA Band II – LCH – 30-1000MHz – Horizontal



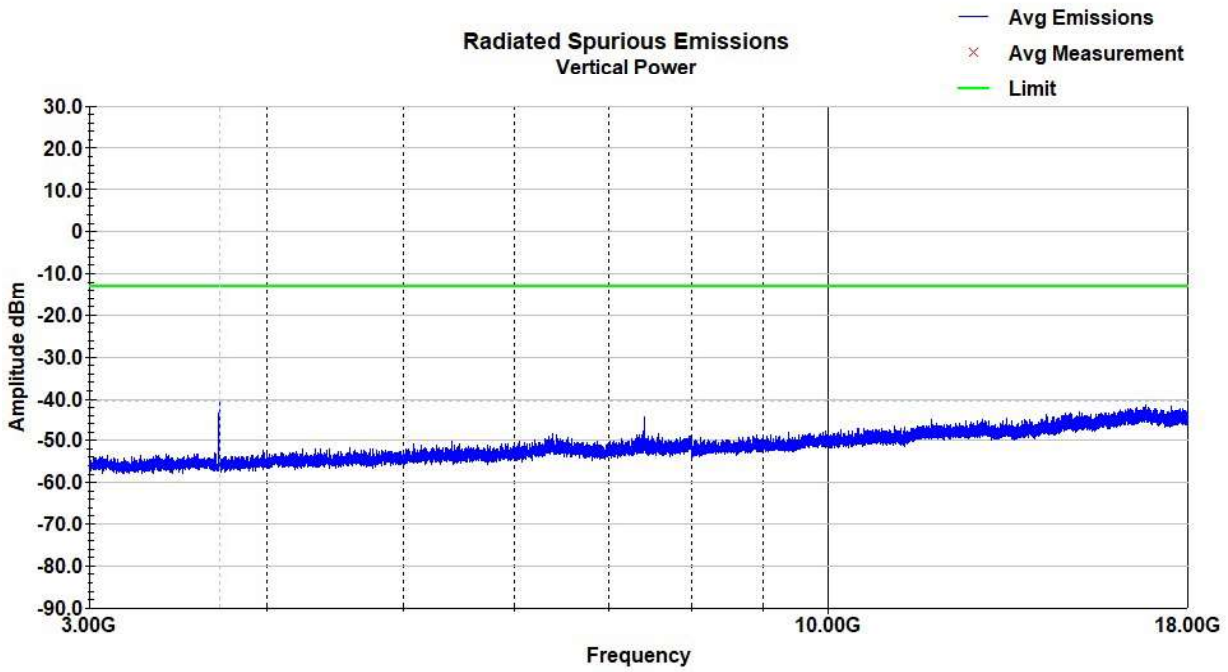
WCDMA Band II – LCH – 1-3GHz – Vertical



WCDMA Band II – LCH – 1-3GHz – Horizontal



WCDMA Band II – LCH – 3-18GHz – Vertical



WCDMA Band II – LCH – 3-18GHz – Horizontal