

RF Test Report

Project Number: 4724254

Proposal: SUW-202101000320

Report Number: 4724254EMC17

Revision Level: 0

Client: Deere & Company

Equipment Under Test: JDLINK R Modem - 4G

Model Number: MA4R

FCC ID: OV5-MA4R

IC ID: 11137A-MA4R

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 3; RSS-GEN, Issue 5

Report issued on: 18 April 2022


Test Result: Compliant




FOR THE SCOPE OF ACCREDITATION UNDER CERTIFICATE NUMBER: 3212.01

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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 (6.5)	Peak-to-Average Ratio	<13 dB		Compliant
2.1049 22.917(a) 24.238(a)	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 (6.6)	Band Edge / Conducted Spurious Emissions	< 43 +10log ₁₀ (P _[Watts]) at band edge and for all out of band emissions		Compliant
22.913(a)(2)	--	Effective Radiated Power	< 7 Watts max ERP	Radiated	Compliant
--	RSS-132 (5.4)	Equivalent Isotropically Radiated Power	< 11.5 Watts max ERP		Compliant
24.232(c)	RSS-133 (6.4) SRSP-510 (5.1.2)		< 2 Watts max EIRP		Compliant
27.50(d)(4)	RSS-139 (6.5)		< 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 (6.6)		Radiated Spurious Emissions		< 43 +10log ₁₀ (P _[Watts]) at band edge and for all out of band emissions
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 (6.4)	Frequency Stability	<2.5 ppm		Compliant

1.1 Modifications Required to Compliance

None

2 General Information

2.1 Client Information

Name: Deere & Company
Address: One John Deere Place
City, State, Zip, Country: Moline, IL 61265, 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 R Modem - 4G
Model Number: MA4R
Serial Number: PCMA4MA200091

Modes of Operation: WCDMA Bands II / IV / V

Antenna Type: External Proprietary
IMEI: 004401083921102

Sample Received Date: 10 April 2021
Dates of testing: 22 February – 30 March 2022

2.4 Description of Test Modes

The EUT was tested under normal operating conditions with a base station simulator directly connect to port C2. 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) RSS-132 (5.4)	Compliant
Effective Isotropic Radiated Power	24.232(c) FCC 27.50(d)(4) RSS-133 (6.4) RSS-139 (6.5)	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: 23.2 °C

Relative Humidity: 32.1 %

Atmospheric Pressure: 97.9 kPa

3.4 Test Equipment

Test End Date:

2/24/2022

Tester: JOP

Equipment	Model	Manufacturer	Asset Number	Cal Date	Cal Due Date
RF CABLE SMA TO SMA, 0.01-40GHZ	084-0505-059	TELEDYNE STORM	20107	16-Mar-2022	16-Mar-2023
MULTIMETER	87V	FLUKE	B079677	18-Aug-2021	18-Aug-2022
POWER SPLITTER	ZFRSC-123-S+	MINI-CIRCUITS	B101739	8-Jul-2021	8-Jul-2022
WIDEBAND RADIO COMMUNICATION	CMW500	ROHDE & SCHWARZ	B094874	13-Jan-2021	13-Jan-2023

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	18.59	19.28	19.58	/	0.90	19.49	20.18	20.48	33.01	PASS
	Subtest 2	18.58	19.75	19.30	/	0.90	19.48	20.65	20.20	33.01	PASS
	Subtest 3	19.63	18.60	19.72	/	0.90	20.53	19.50	20.62	33.01	PASS
	Subtest 4	19.95	19.29	20.06	/	0.90	20.85	20.19	20.96	33.01	PASS
	Subtest 5	19.27	19.75	19.77	/	0.90	20.17	20.65	20.67	33.01	PASS
HSDPA	Subtest 1	19.37	19.60	18.89	/	0.90	20.27	20.50	19.79	33.01	PASS
	Subtest 2	19.27	19.81	19.77	/	0.90	20.17	20.71	20.67	33.01	PASS
	Subtest 3	19.25	19.04	19.05	/	0.90	20.15	19.94	19.95	33.01	PASS
	Subtest 4	19.25	19.58	19.04	/	0.90	20.15	20.48	19.94	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	20.02	19.48	18.77	/	1.70	21.72	21.18	20.47	30.0	PASS
	Subtest 2	19.26	19.38	19.72	/	1.70	20.96	21.08	21.42	30.0	PASS
	Subtest 3	19.44	19.11	19.12	/	1.70	21.14	20.81	20.82	30.0	PASS
	Subtest 4	19.07	20.00	19.80	/	1.70	20.77	21.70	21.50	30.0	PASS
	Subtest 5	19.44	19.26	19.27	/	1.70	21.14	20.96	20.97	30.0	PASS
HSDPA	Subtest 1	19.25	19.50	19.22	/	1.70	20.95	21.20	20.92	30.0	PASS
	Subtest 2	19.63	19.41	19.51	/	1.70	21.33	21.11	21.21	30.0	PASS
	Subtest 3	19.39	18.96	19.26	/	1.70	21.09	20.66	20.96	30.0	PASS
	Subtest 4	18.88	19.04	19.49	/	1.70	20.58	20.74	21.19	30.0	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	18.30	18.97	19.34	-2.45	-0.30	15.85	16.52	16.89	40.61	PASS
	Subtest 2	19.51	18.59	19.12	-2.45	-0.30	17.06	16.14	16.67	40.61	PASS
	Subtest 3	19.92	20.16	19.32	-2.45	-0.30	17.47	17.71	16.87	40.61	PASS
	Subtest 4	19.24	19.01	19.54	-2.45	-0.30	16.79	16.56	17.09	40.61	PASS
	Subtest 5	18.62	20.16	19.83	-2.45	-0.30	16.17	17.71	17.38	40.61	PASS
HSDPA	Subtest 1	19.61	19.91	20.31	-2.45	-0.30	17.16	17.46	17.86	40.61	PASS
	Subtest 2	19.52	19.63	19.79	-2.45	-0.30	17.07	17.18	17.34	40.61	PASS
	Subtest 3	19.33	19.52	19.08	-2.45	-0.30	16.88	17.07	16.63	40.61	PASS
	Subtest 4	18.84	19.39	19.53	-2.45	-0.30	16.39	16.94	17.08	40.61	PASS

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

Band II Max: 20.06dBm (0.101W)
 Band IV Max: 20.02dBm (0.100W)
 Band V Max: 20.31dBm (0.107W)

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 (6.5)	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: 23.2 °C

Relative Humidity: 32.1 %

Atmospheric Pressure: 97.9 kPa

4.4 Test Equipment

Test End Date:

2/24/2022

Tester: JOP

Equipment	Model	Manufacturer	Asset Number	Cal Date	Cal Due Date
ATTENUATOR, 10DB	BW-S10W2	MINI-CIRCUITS	15034	7-Oct-2021	7-Oct-2022
RF CABLE SMA TO SMA, 0.01-40GHZ	084-0505-059	TELEDYNE STORM	20108	16-Mar-2022	16-Mar-2023
SIGNAL ANALYZER (TS8997)	FSV30	ROHDE & SCHWARZ	B085749	4-Jan-2022	4-Jan-2024
WIDEBAND RADIO COMMUNICATION	CMW500	ROHDE & SCHWARZ	B094874	13-Jan-2021	13-Jan-2023
RF CABLE (TS8997)	141	HUBER & SUHNER	B095588	1-Jul-2021	1-Jul-2022
POWER SPLITTER	ZFRSC-123-S+	MINI-CIRCUITS	B101739	8-Jul-2021	8-Jul-2022
POWER SPLITTER	ZFRSC-123-S+	MINI-CIRCUITS	B101739	8-Jul-2021	8-Jul-2022

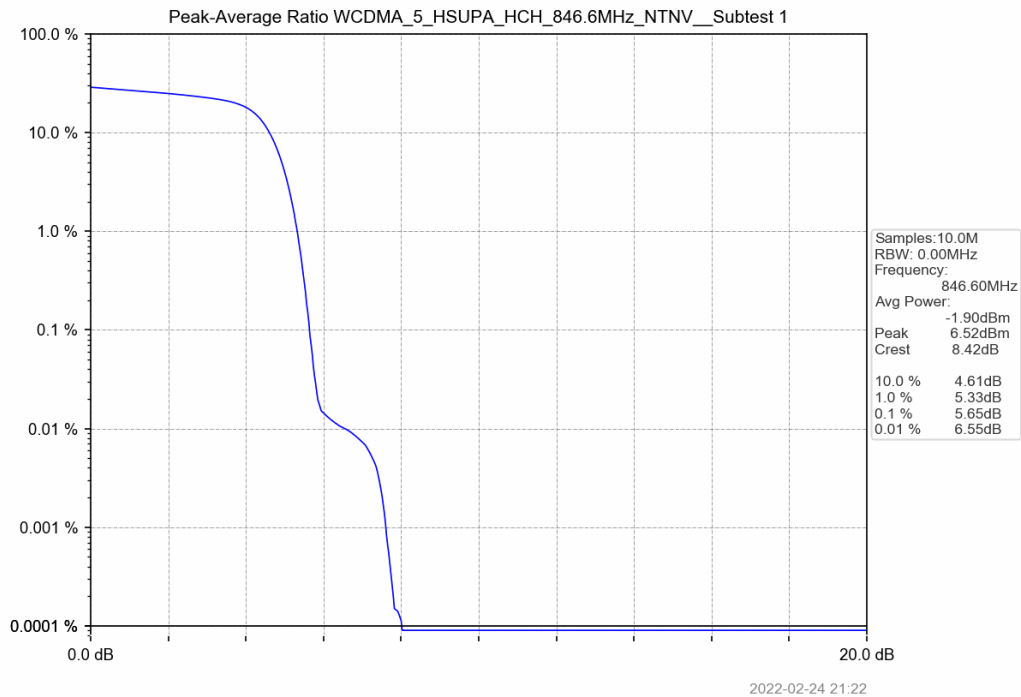
4.5 Test Data

Test Band: 2					
Test Mode	Test result (dB)			Limit (dB)	Verdict
	LCH	MCH	HCH		
HSUPA	4.58	5.19	5.51	13	PASS
HSDPA	5.25	4.78	5.48	13	PASS

Test Band: 4					
Test Mode	Test result (dB)			Limit (dB)	Verdict
	LCH	MCH	HCH		
HSUPA	4.67	5.01	4.81	13	PASS
HSDPA	4.67	4.75	5.48	13	PASS

Test Band: 5					
Test Mode	Test result (dB)			Limit (dB)	Verdict
	LCH	MCH	HCH		
HSUPA	5.07	4.84	5.65	13	PASS
HSDPA	5.10	4.72	5.48	13	PASS

Sample Plot



5 Occupied Bandwidth

5.1 Test Result

Test Description	Specification	Test Result
Occupied Bandwidth	FCC Part 2.1049 FCC Part 22.917(a) FCC Part 24.238(a) 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 n dB down function was used for the 26dB emission bandwidth measurements.

The measurement was conducted at the center channel of each band.

5.3 Test Site

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature: 23.2 °C

Relative Humidity: 32.1 %

Atmospheric Pressure: 97.9 kPa

5.4 Test Equipment

Test End Date:

2/24/2022

Tester: JOP

Equipment	Model	Manufacturer	Asset Number	Cal Date	Cal Due Date
ATTENUATOR, 10DB	BW-S10W2	MINI-CIRCUITS	15034	7-Oct-2021	7-Oct-2022
RF CABLE SMA TO SMA, 0.01-40GHZ	084-0505-059	TELEDYNE STORM	20108	16-Mar-2022	16-Mar-2023
SIGNAL ANALYZER (TS8997)	FSV30	ROHDE & SCHWARZ	B085749	4-Jan-2022	4-Jan-2024
WIDEBAND RADIO COMMUNICATION	CMW500	ROHDE & SCHWARZ	B094874	13-Jan-2021	13-Jan-2023
RF CABLE (TS8997)	141	HUBER & SUHNER	B095588	1-Jul-2021	1-Jul-2022
POWER SPLITTER	ZFRSC-123-S+	MINI-CIRCUITS	B101739	8-Jul-2021	8-Jul-2022
POWER SPLITTER	ZFRSC-123-S+	MINI-CIRCUITS	B101739	8-Jul-2021	8-Jul-2022

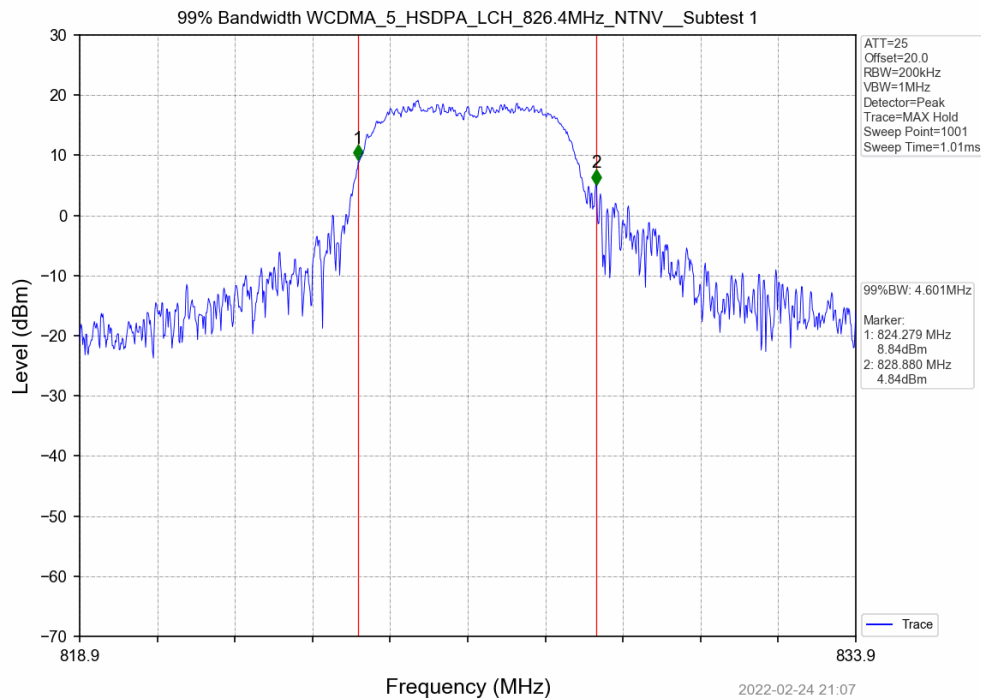
5.5 Test Data – 99% OBW

Test Band: 2					
Test Mode	99% Occupied Bandwidth (MHz)			Limit	Verdict
	LCH	MCH	HCH		
HSUPA	4.297	4.287	4.164	N/A	PASS
HSDPA	4.289	4.317	4.182	N/A	PASS

Test Band: 4					
Test Mode	99% Occupied Bandwidth (MHz)			Limit	Verdict
	LCH	MCH	HCH		
HSUPA	4.326	4.275	4.346	N/A	PASS
HSDPA	4.289	4.294	4.327	N/A	PASS

Test Band: 5					
Test Mode	99% Occupied Bandwidth (MHz)			Limit	Verdict
	LCH	MCH	HCH		
HSUPA	4.573	4.415	4.286	N/A	PASS
HSDPA	4.601	4.413	4.273	N/A	PASS

Sample Plot



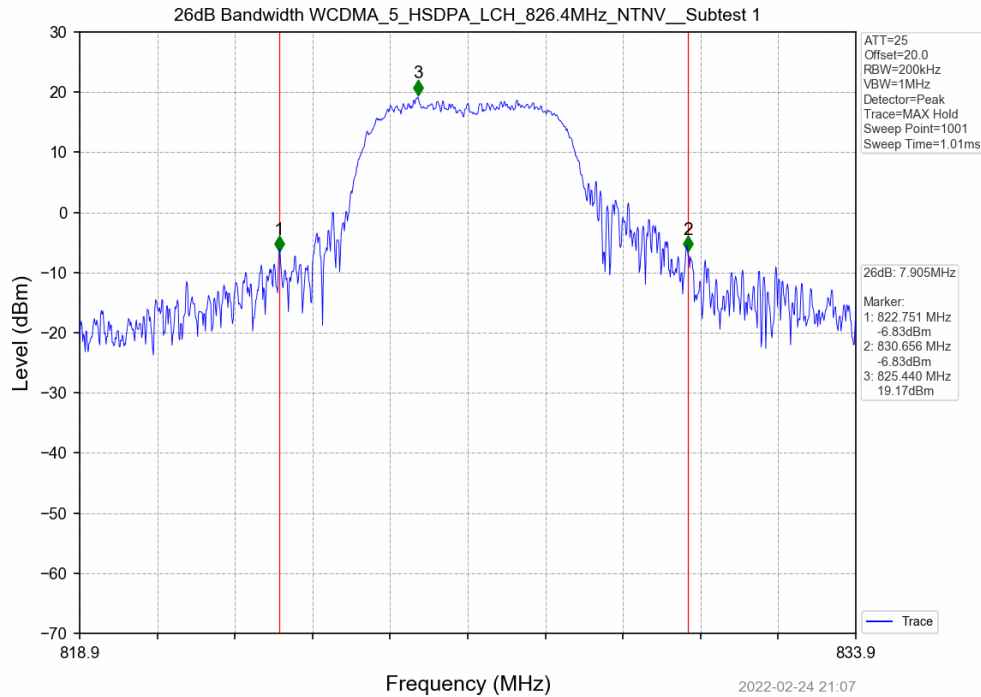
5.6 Test Data – 26dB EBW

Test Band: 2					
Test Mode	99% Occupied Bandwidth (MHz)			Limit	Verdict
	LCH	MCH	HCH		
HSUPA	7.093	6.133	4.817	N/A	PASS
HSDPA	7.381	7.246	4.818	N/A	PASS

Test Band: 4					
Test Mode	99% Occupied Bandwidth (MHz)			Limit	Verdict
	LCH	MCH	HCH		
HSUPA	6.598	6.307	6.692	N/A	PASS
HSDPA	6.307	6.714	6.645	N/A	PASS

Test Band: 5					
Test Mode	99% Occupied Bandwidth (MHz)			Limit	Verdict
	LCH	MCH	HCH		
HSUPA	7.159	6.637	6.902	N/A	PASS
HSDPA	7.905	6.729	6.368	N/A	PASS

Sample Plot



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(6.6)	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: 23.2 °C

Relative Humidity: 32.1 %

Atmospheric Pressure: 97.9 kPa

6.4 Test Equipment

Test End Date:

2/24/2022

Tester: JOP

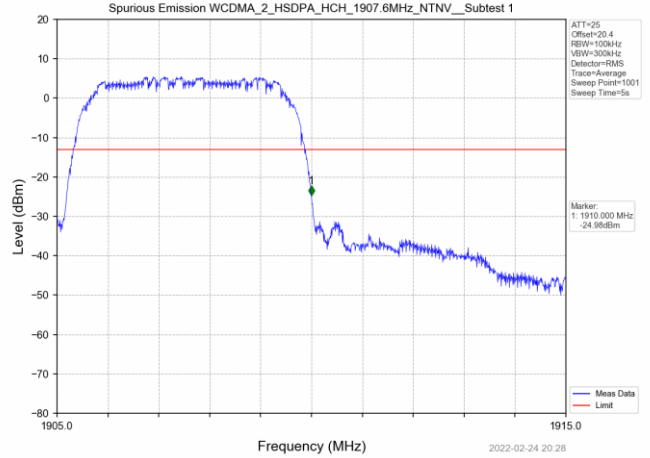
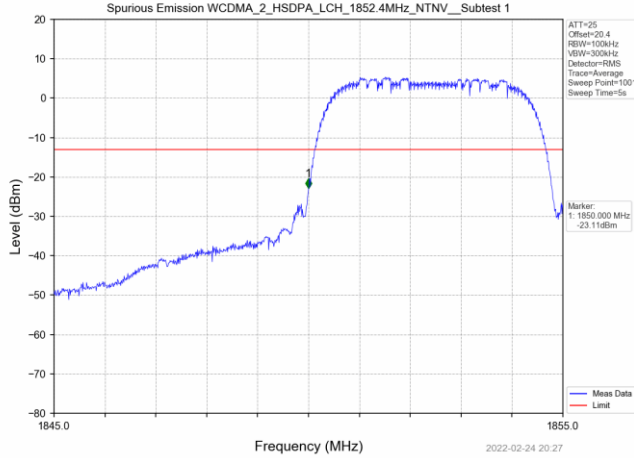
Equipment	Model	Manufacturer	Asset Number	Cal Date	Cal Due Date
ATTENUATOR, 10DB	BW-S10W2	MINI-CIRCUITS	15034	7-Oct-2021	7-Oct-2022
RF CABLE SMA TO SMA, 0.01-40GHZ	084-0505-059	TELEDYNE STORM	20108	16-Mar-2022	16-Mar-2023
SIGNAL ANALYZER (TS8997)	FSV30	ROHDE & SCHWARZ	B085749	4-Jan-2022	4-Jan-2024
WIDEBAND RADIO COMMUNICATION	CMW500	ROHDE & SCHWARZ	B094874	13-Jan-2021	13-Jan-2023
RF CABLE (TS8997)	141	HUBER & SUHNER	B095588	1-Jul-2021	1-Jul-2022
POWER SPLITTER	ZFRSC-123-S+	MINI-CIRCUITS	B101739	8-Jul-2021	8-Jul-2022
POWER SPLITTER	ZFRSC-123-S+	MINI-CIRCUITS	B101739	8-Jul-2021	8-Jul-2022

6.5 Test Data – Band Edges

WCDMA, Band II

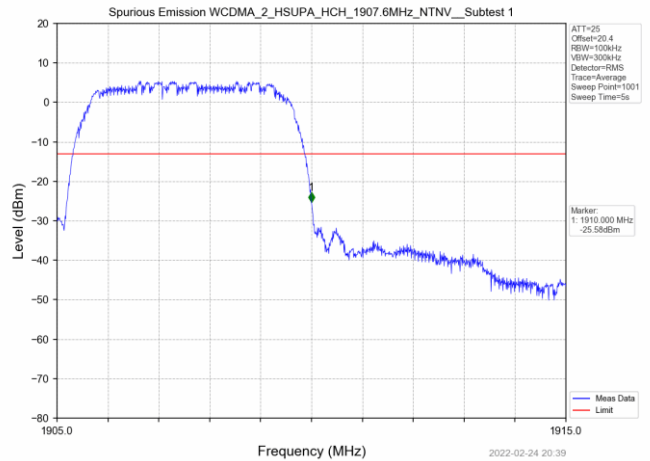
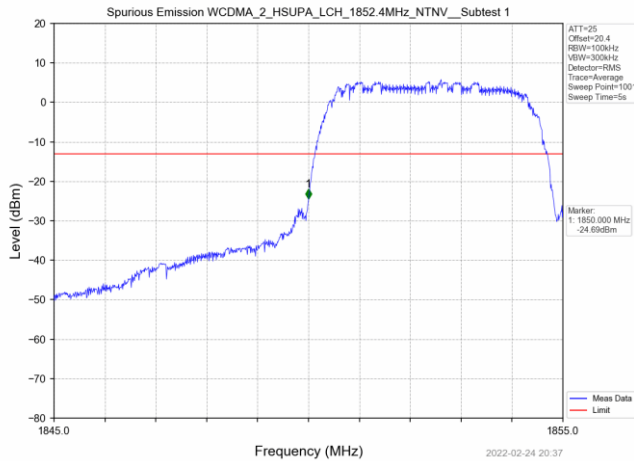
Lower Band Edge (Channel 9262, HSDPA, 1852.4 MHz)

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



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

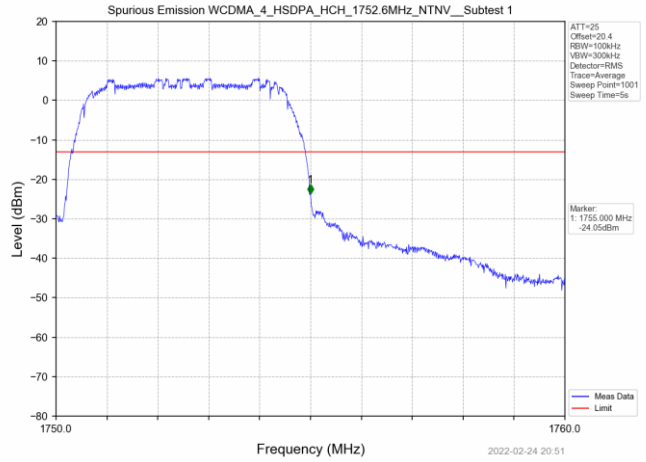
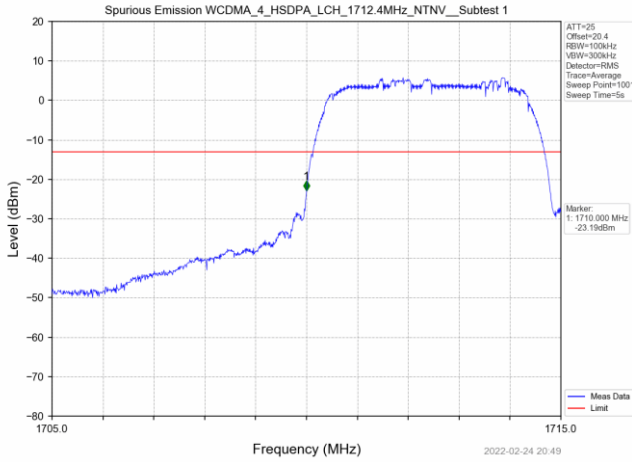
Upper Band Edge (Channel 9538, HSUPA, 1907.6 MHz)



WCDMA, Band IV

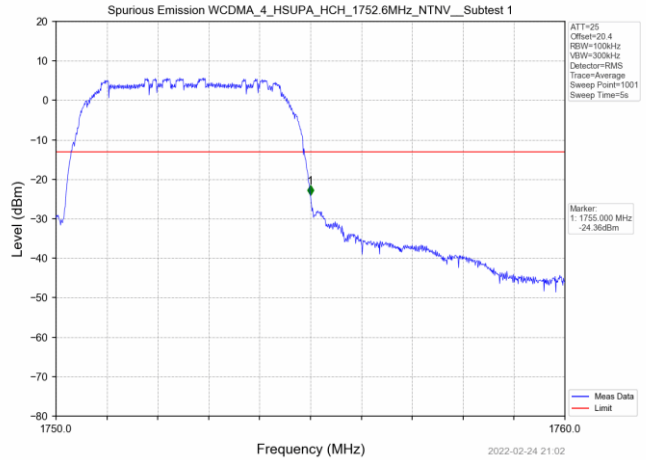
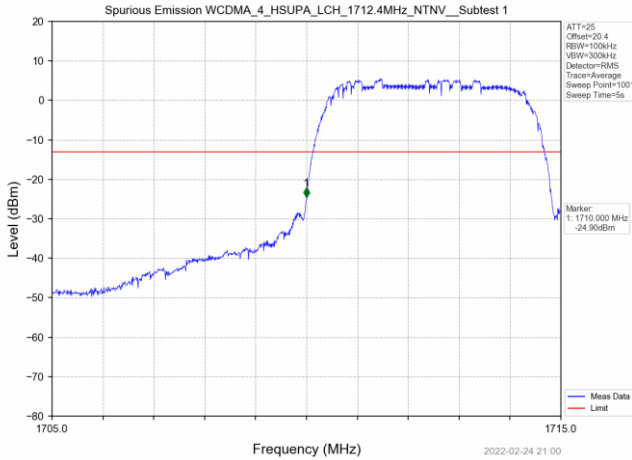
Lower Band Edge (Channel 1312, HSDPA, 1712.4 MHz)

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



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

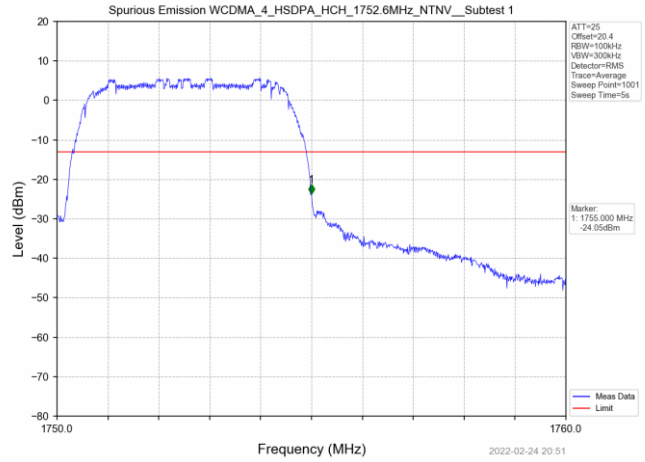
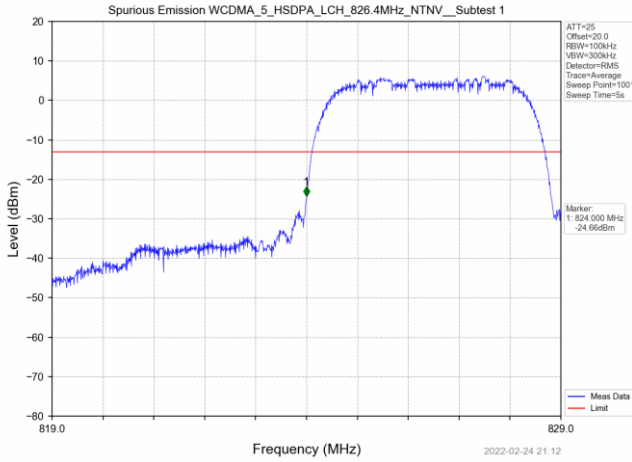
Upper Band Edge (Channel 1513, HSUPA, 1752.6 MHz)



WCDMA, Band V

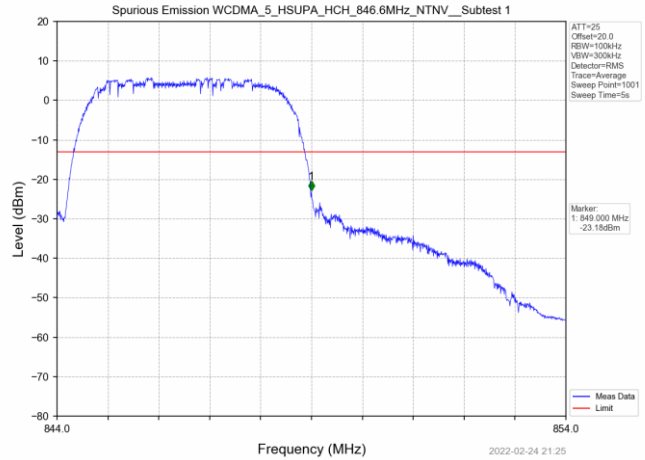
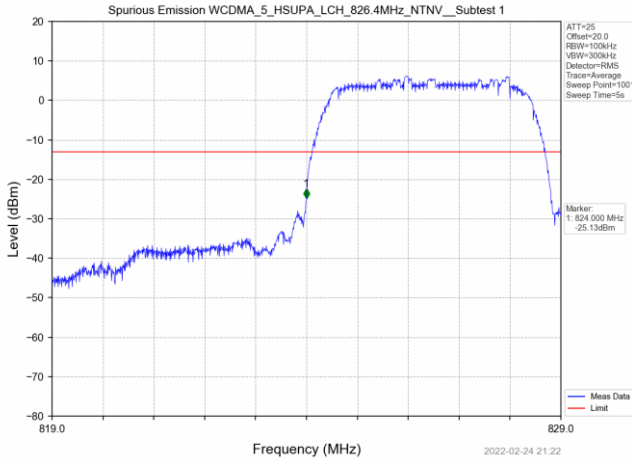
Lower Band Edge (Channel 4132, HSDPA, 826.4 MHz)

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



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

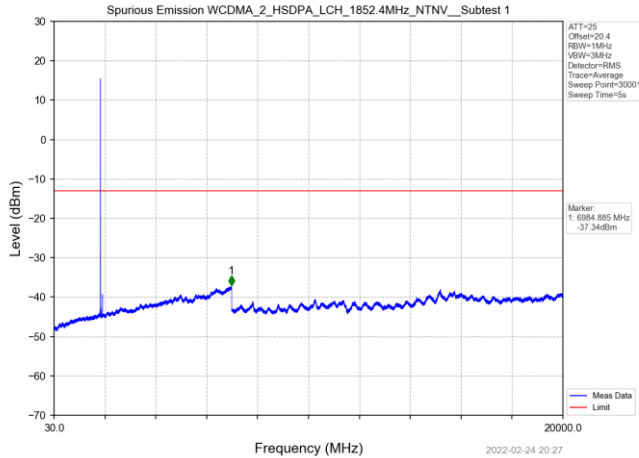
Upper Band Edge (Channel 4233, HSUPA, 846.6 MHz)



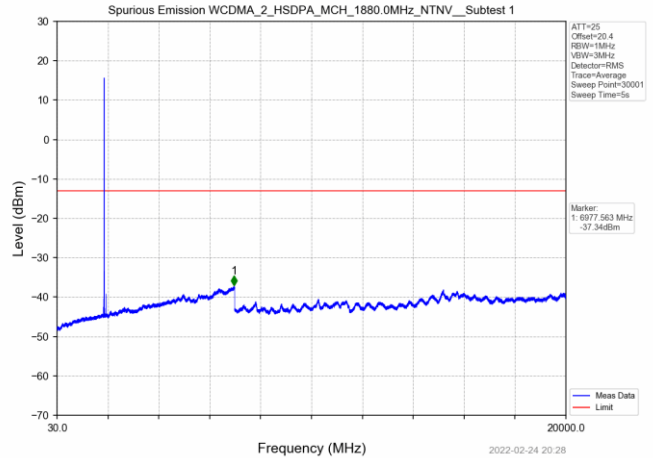
6.6 Test Data - Conducted Spurious Emissions

WCDMA Band II

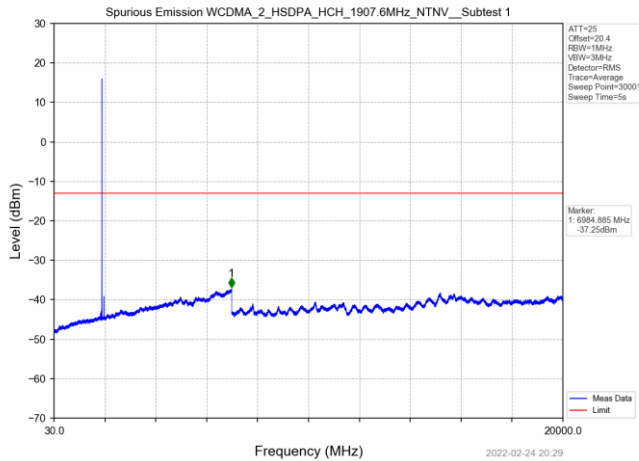
LCH (Channel 9262, HSDPA, 1852.4 MHz)



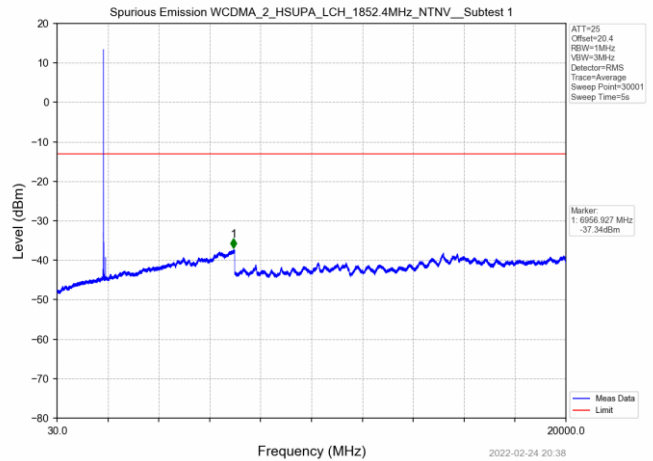
MCH (Channel 9400, HSDPA, 1880 MHz)



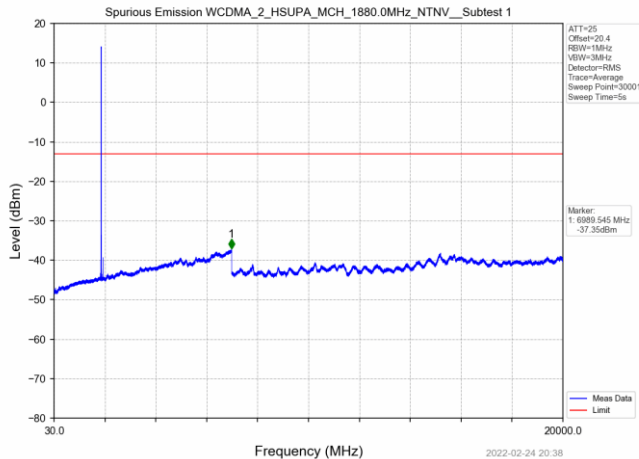
HCH (Channel 9538, HSDPA, 1907.6 MHz)



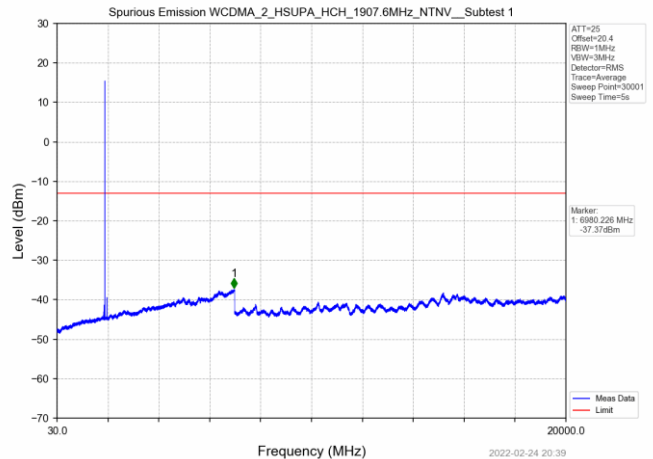
LCH (Channel 9262, HSUPA, 1852.4 MHz)



MCH (Channel 9400, HSUPA, 1880 MHz)



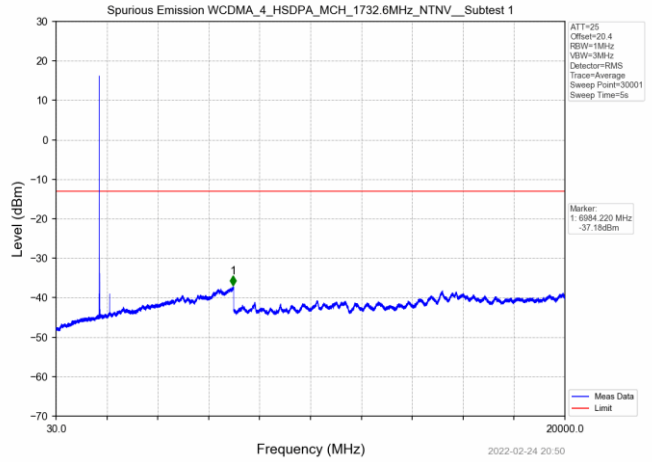
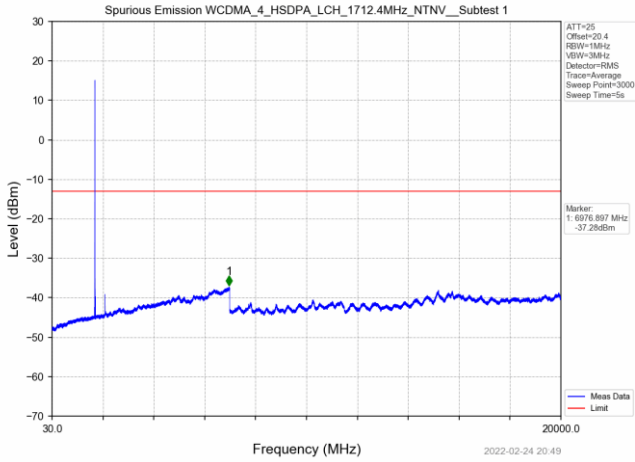
HCH (Channel 9538, HSUPA, 1907.6 MHz)



WCDMA Band IV

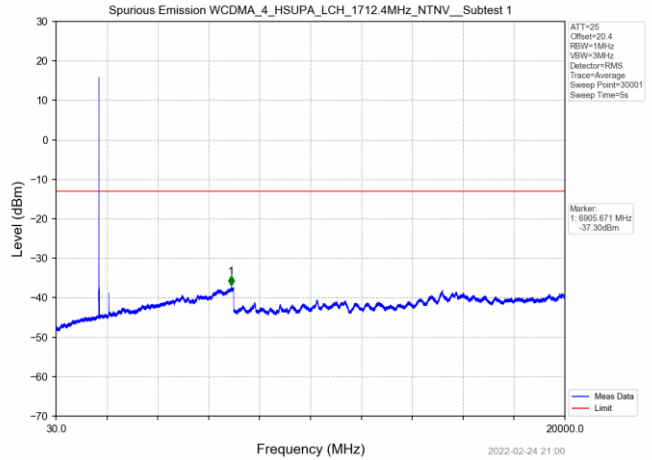
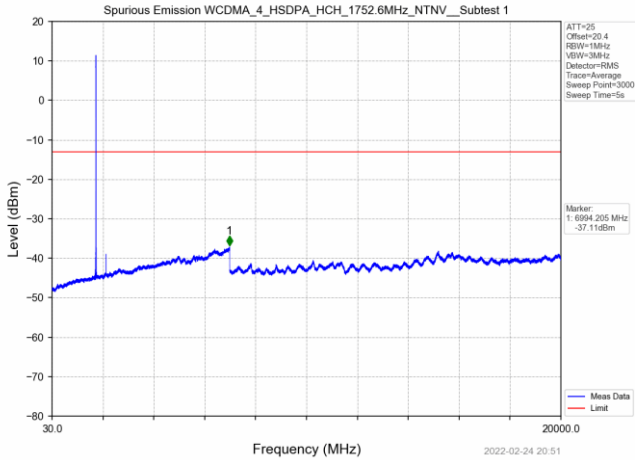
LCH (Channel 1312, HSDPA, 1712.4 MHz)

MCH (Channel 1413, 1732.6 MHz, HSDPA)



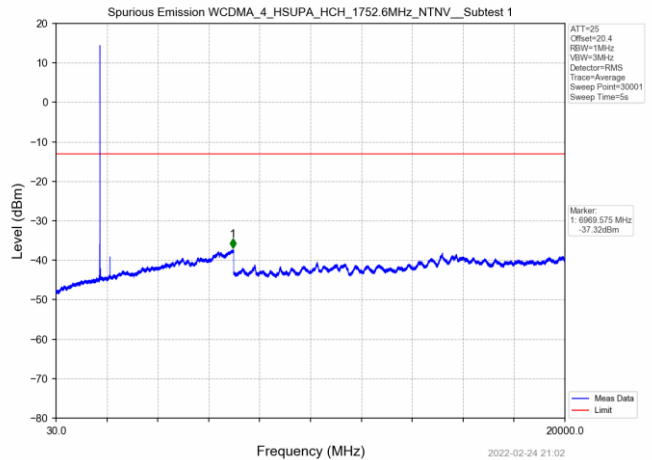
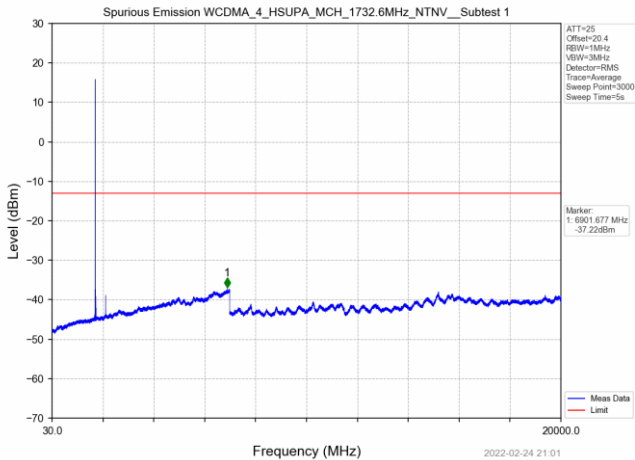
HCH (Channel 1513, HSDPA, 1752.6 MHz)

LCH (Channel 1312, HSUPA, 1712.4 MHz)



MCH (Channel 1413, 1732.6 MHz, HSUPA)

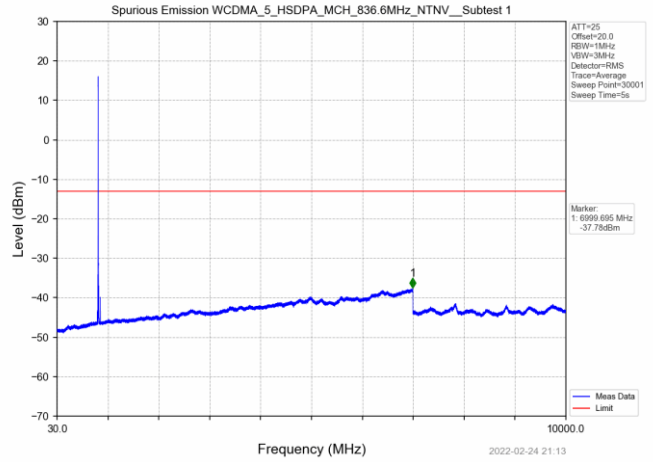
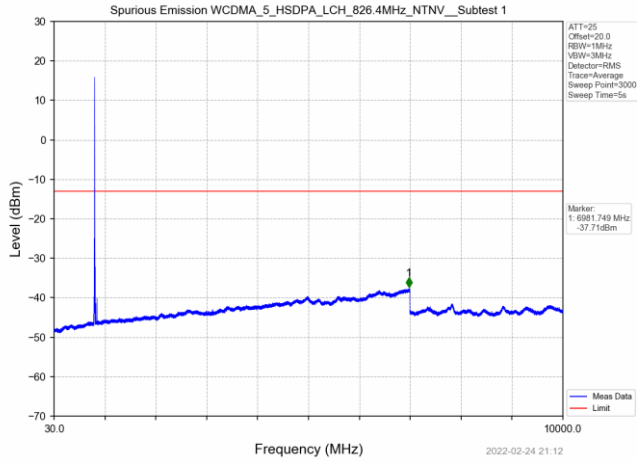
HCH (Channel 1513, HSUPA, 1752.6 MHz)



WCDMA Band V

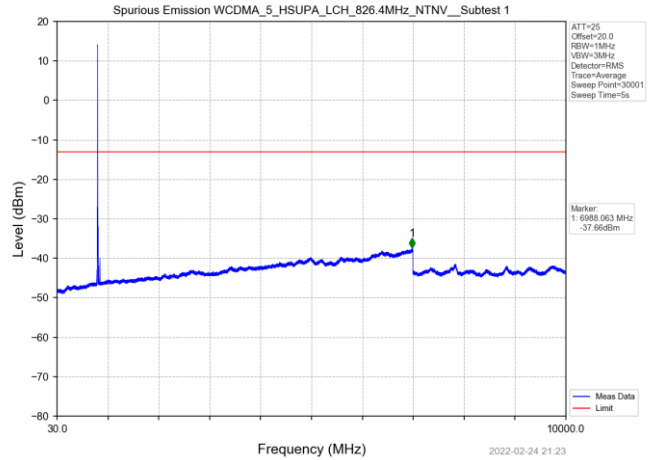
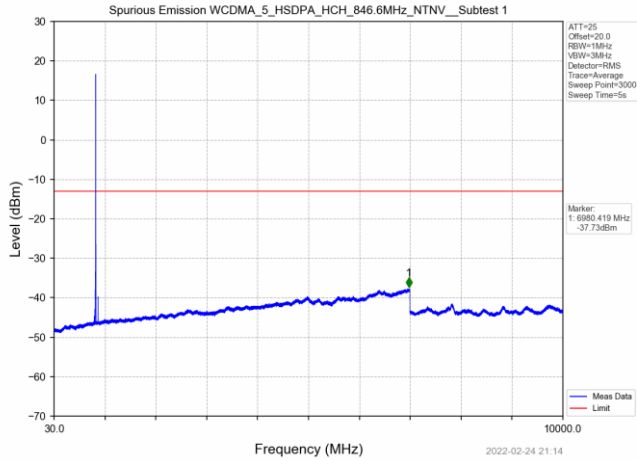
LCH (Channel 4132, HSDPA, 826.4 MHz)

MCH (Channel 4183, 836.6 MHz, HSDPA)



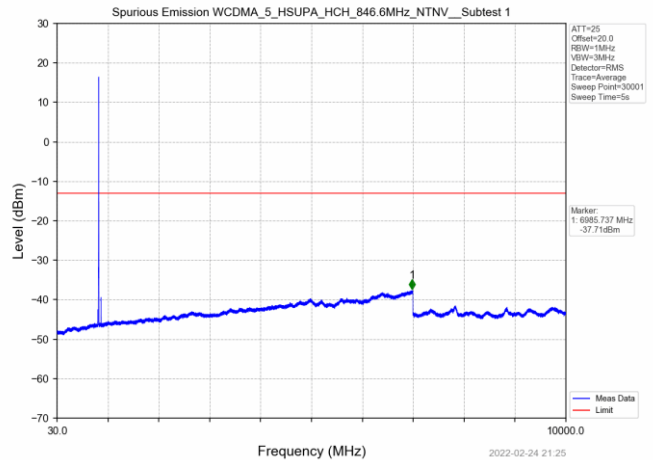
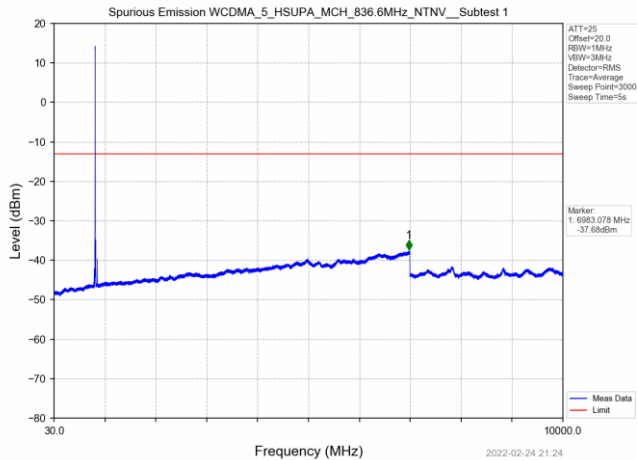
HCH (Channel 4233, HSDPA, 846.6 MHz)

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	ANSI C63.26	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 through direct connection. 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

10m Absorber Lined Shielded Enclosure (ALSE), Suwanee, GA

Environmental Conditions

Temperature: 22.3 °C

Relative Humidity: 36.2 %

Atmospheric Pressure: 97.31 kPa

7.4 Test Equipment

Test End Date: 24-Mar-2022
25-Mar-2022

Tester: AB/ZH

Equipment	Model	Manufacturer	Asset Number	Cal Date	Cal Due Date
ANTENNA, DRG HORN (MEDIUM)	3117	ETS LINDGREN	B079699	15-Jul-2020	15-Jul-2022
RF CABLE, NM TO NM.	90-195-276	TELEDYNE STORM MICROWAVE	21020	16-Mar-2022	16-Mar-2023
LOW NOISE AMPLIFIER	TS-PR18	ROHDE & SCHWARZ	B094463	7-Jul-2021	7-Jul-2022
RF CABLE	104PE	HUBER & SUHNER	B079793	24-Aug-2021	24-Aug-2022
EMI TEST RECEIVER	ESU40	ROHDE & SCHWARZ	B079629	21-Jun-2021	21-Jun-2022
ANTENNA, BILOG	CBL 6143A	TESEQ	B085931	27-Feb-2022	27-Feb-2024
N to N RF Cable	IC12-N1N1-27	MEGAPHASE	22001	10-Jan-2022	10-Jan-2023
RF CABLE NM TO NF, 0.01-18GHZ	90-213-118	TELEDYNE STORM MICROWAVE	20117	17-Feb-2022	17-Feb-2023
RF CABLE NM TO NM, 0.01-	90-195-079	TELEDYNE STORM MICROWAVE	20123	14-Feb-2022	14-Feb-2023
RF CABLE	UCOFLEX 10	HUBER & SUHNER	B108523	26-Aug-2021	26-Aug-2022
LOW NOISE AMPLIFIER	ZKL-2+	MINI-CIRCUITS	B079800	18-Oct-2021	18-Oct-2022
EMI TEST RECEIVER	ESU8	ROHDE & SCHWARZ	B085759	9-Jul-2021	9-Jul-2022

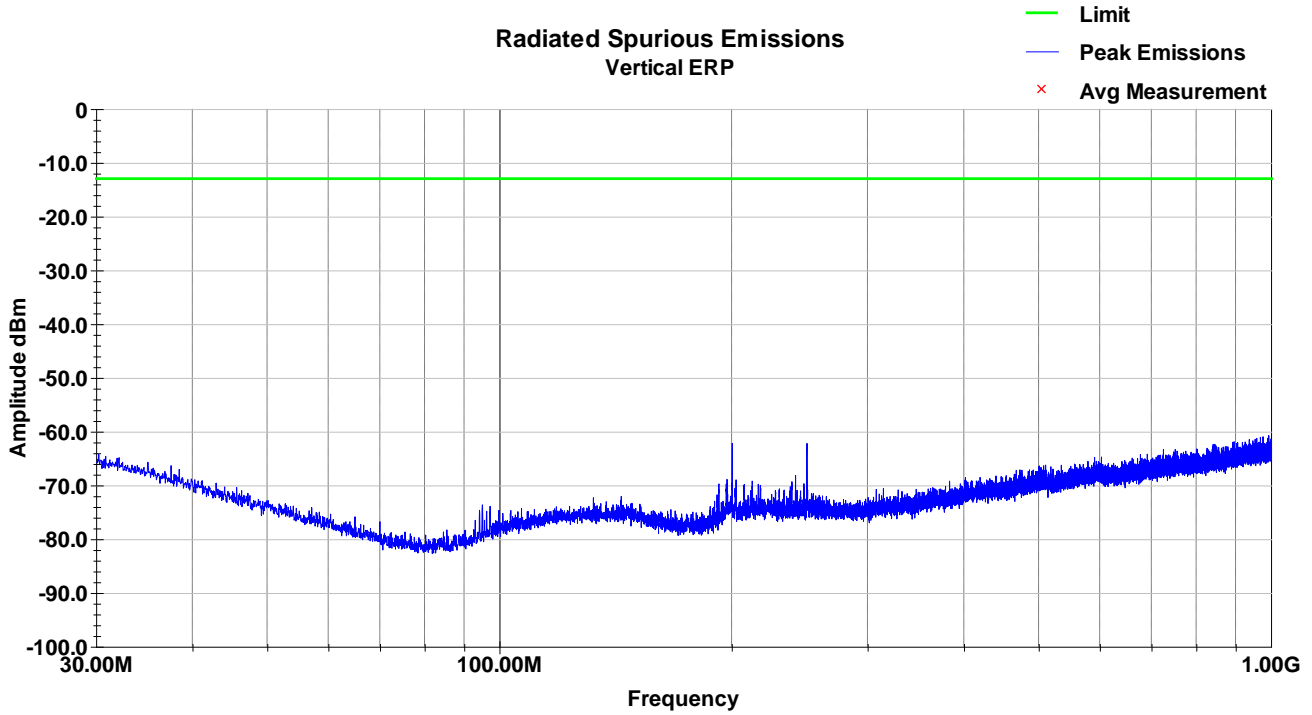
Software:

"RSE 30-1000 MHz T7 220318" TILE! profile dated 07October 2020

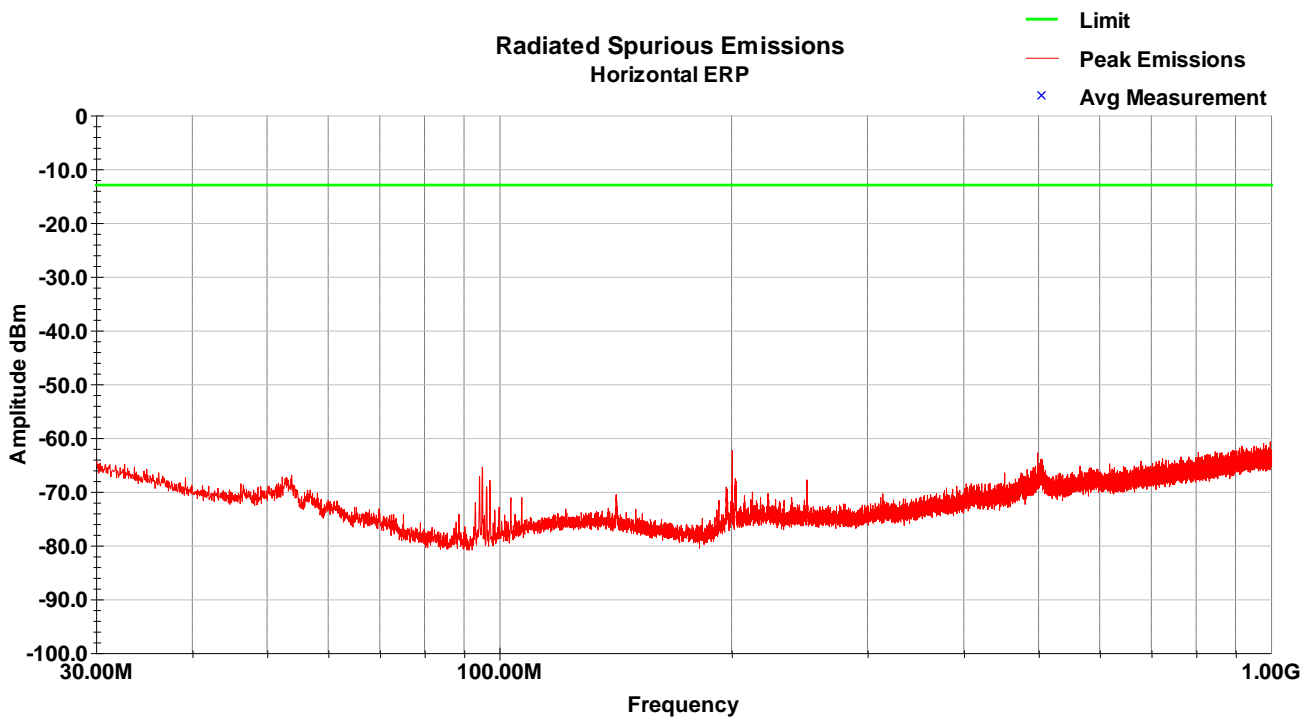
"RSE 1-18 GHz T7 210212" TILE! profile dated 02 February 2021

7.5 Test Data – WCDMA Band II

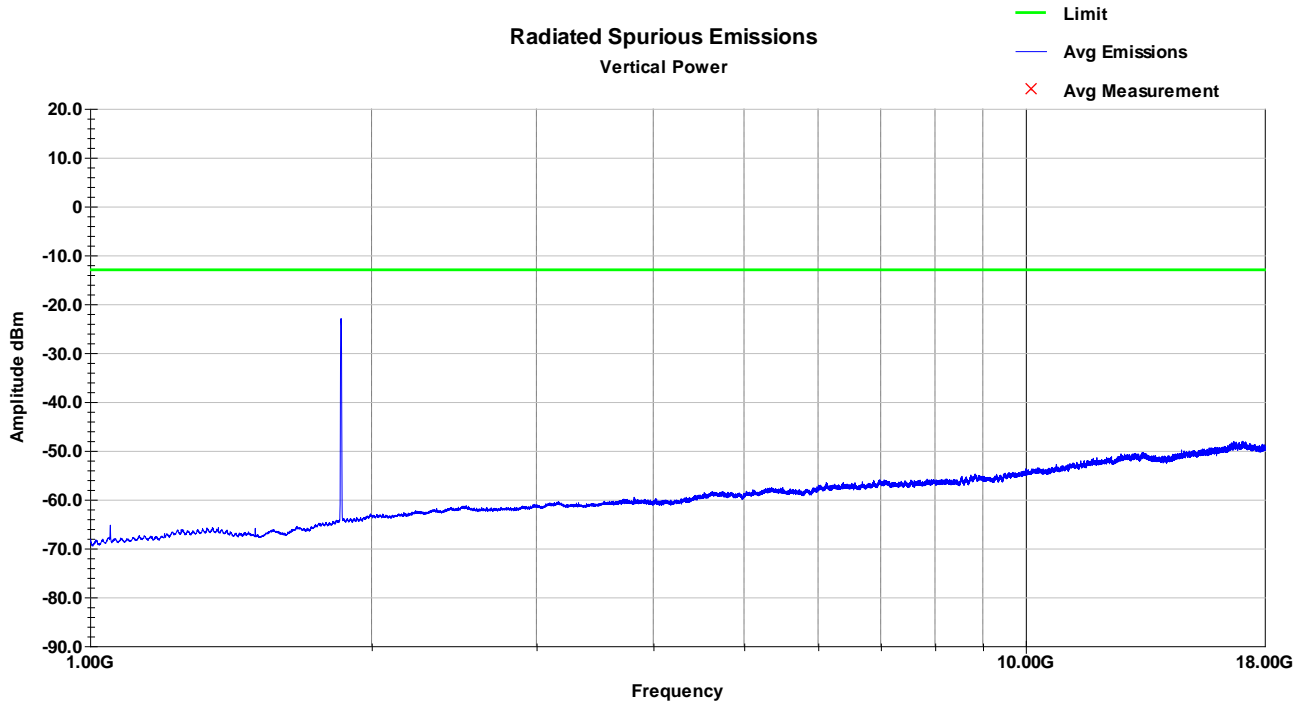
WCDMA Band II – LCH – 30-1000MHz – Vertical



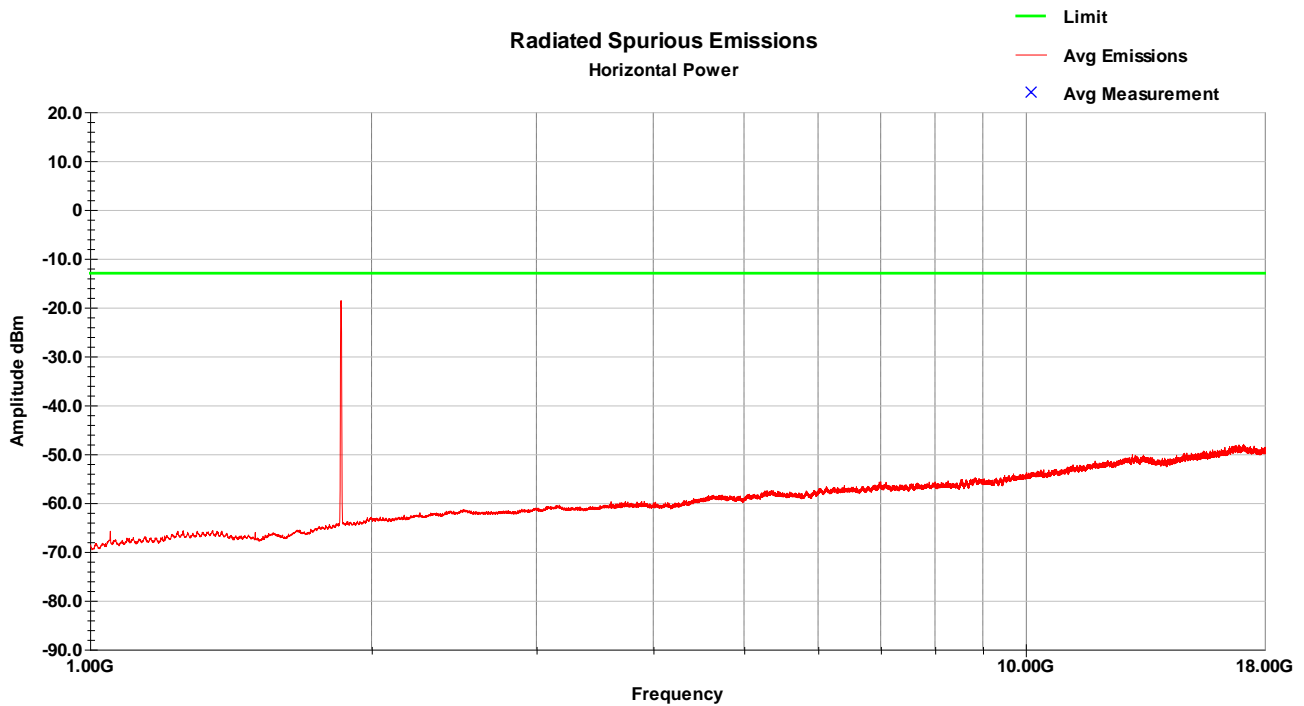
WCDMA Band II – LCH – 30-1000MHz – Horizontal



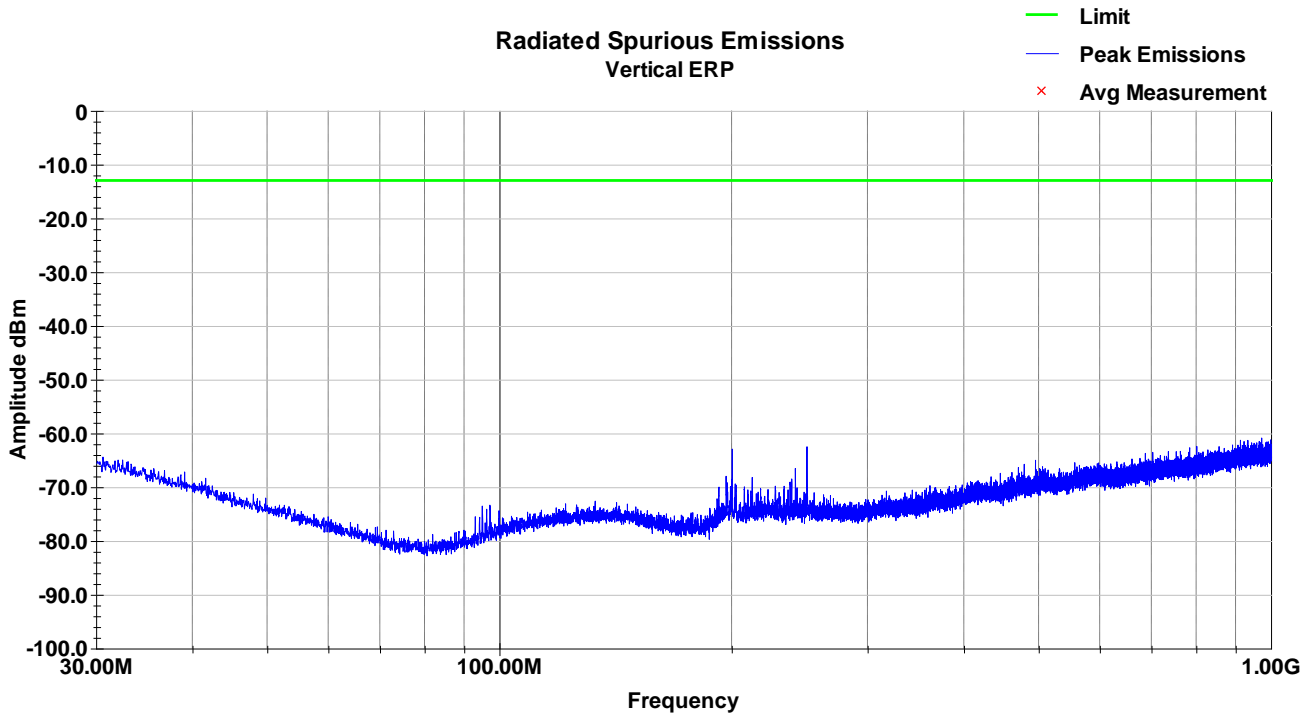
WCDMA Band II – LCH – 1-18GHz – Vertical



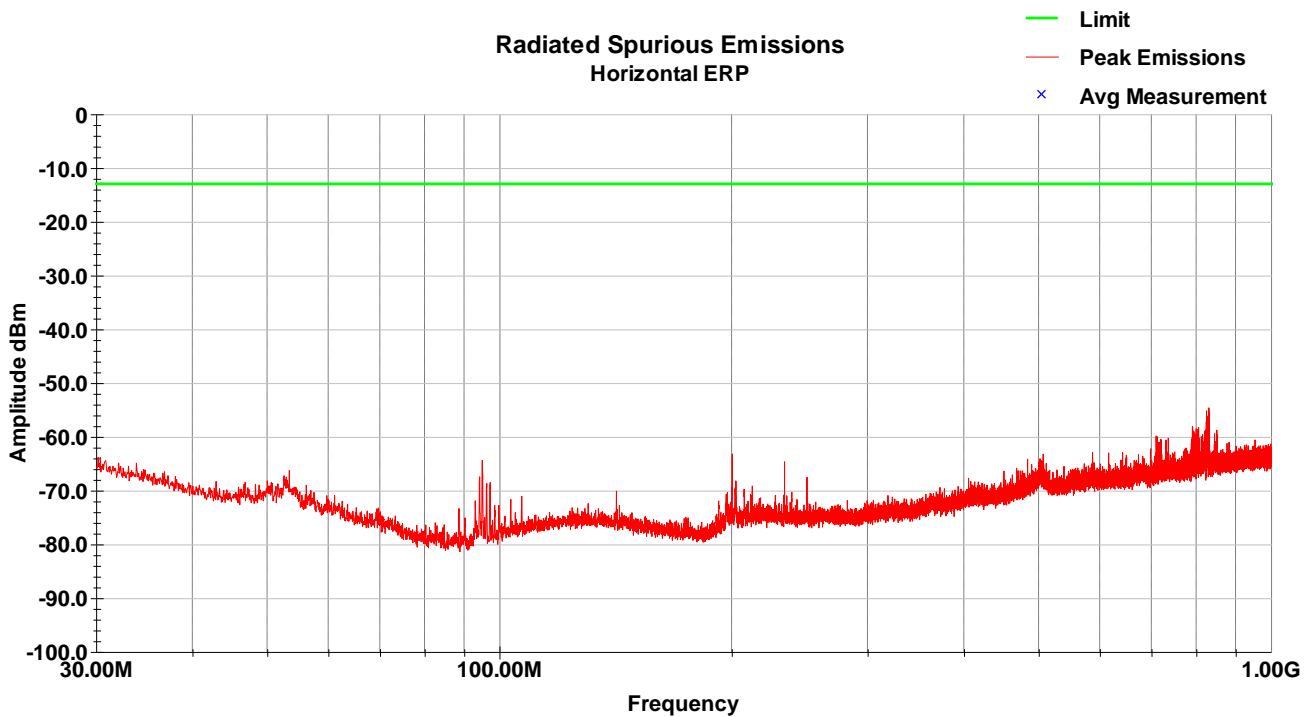
WCDMA Band II – LCH – 1-18G Hz – Horizontal



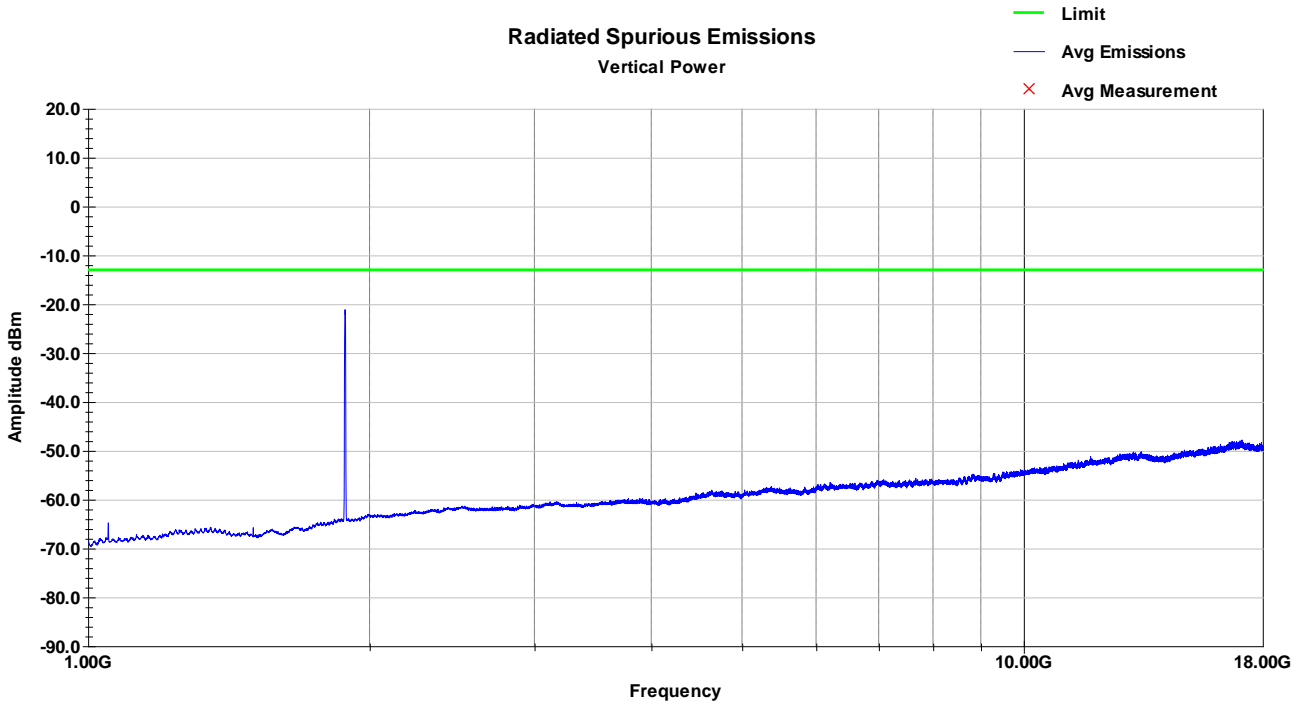
WCDMA Band II – MCH – 30-1000MHz – Vertical



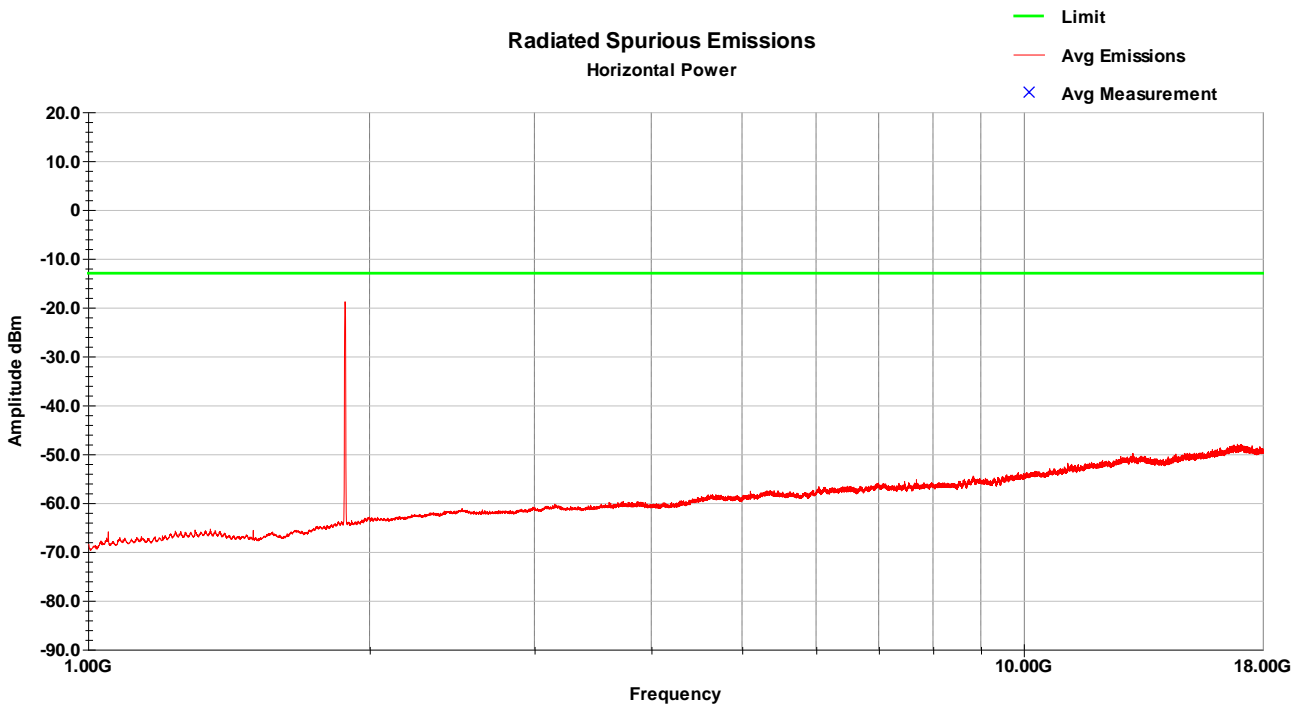
WCDMA Band II – MCH – 30-1000MHz – Horizontal



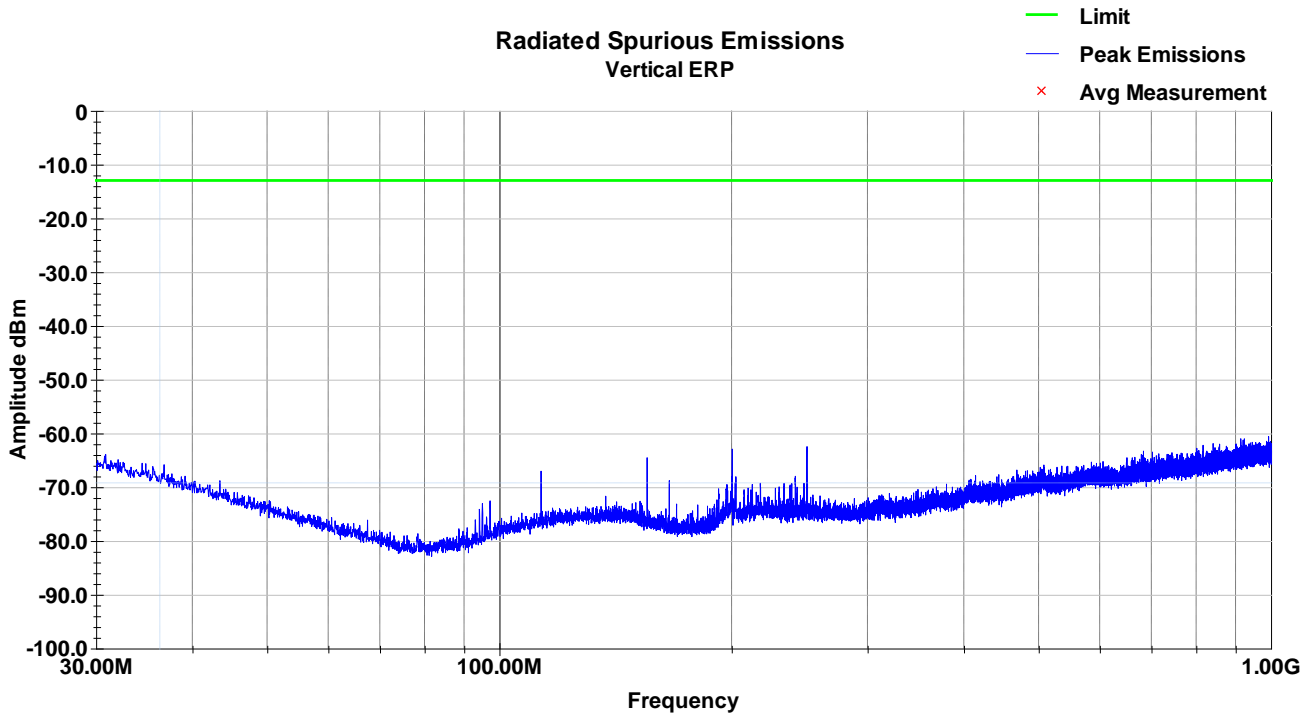
WCDMA Band II – MCH – 1-18GHz – Vertical



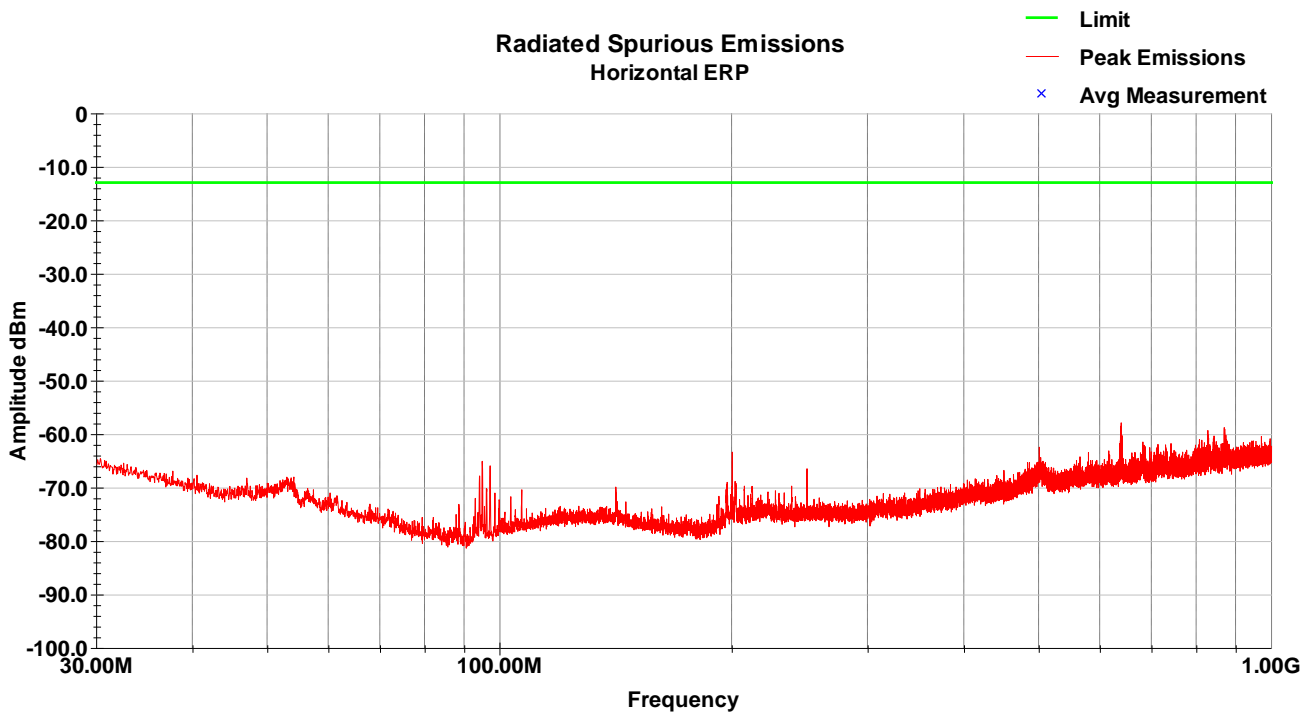
WCDMA Band II – MCH – 1-18G Hz – Horizontal



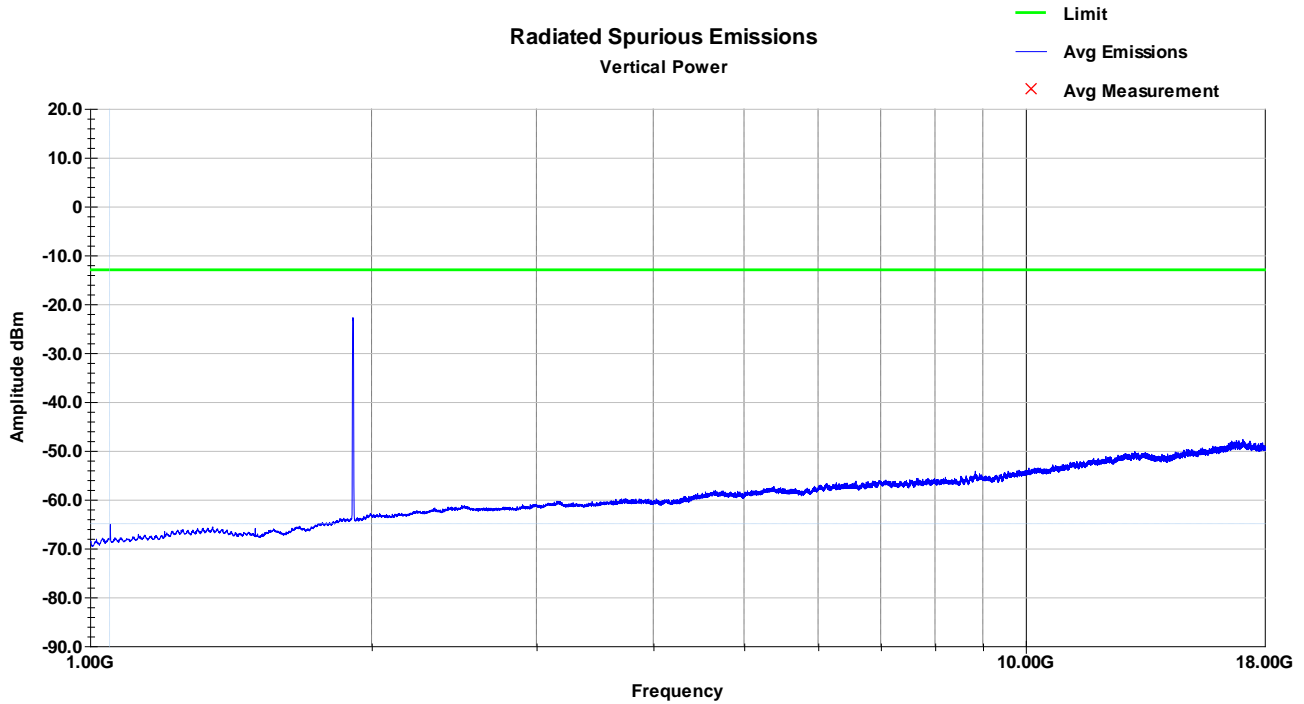
WCDMA Band II – HCH – 30-1000MHz – Vertical



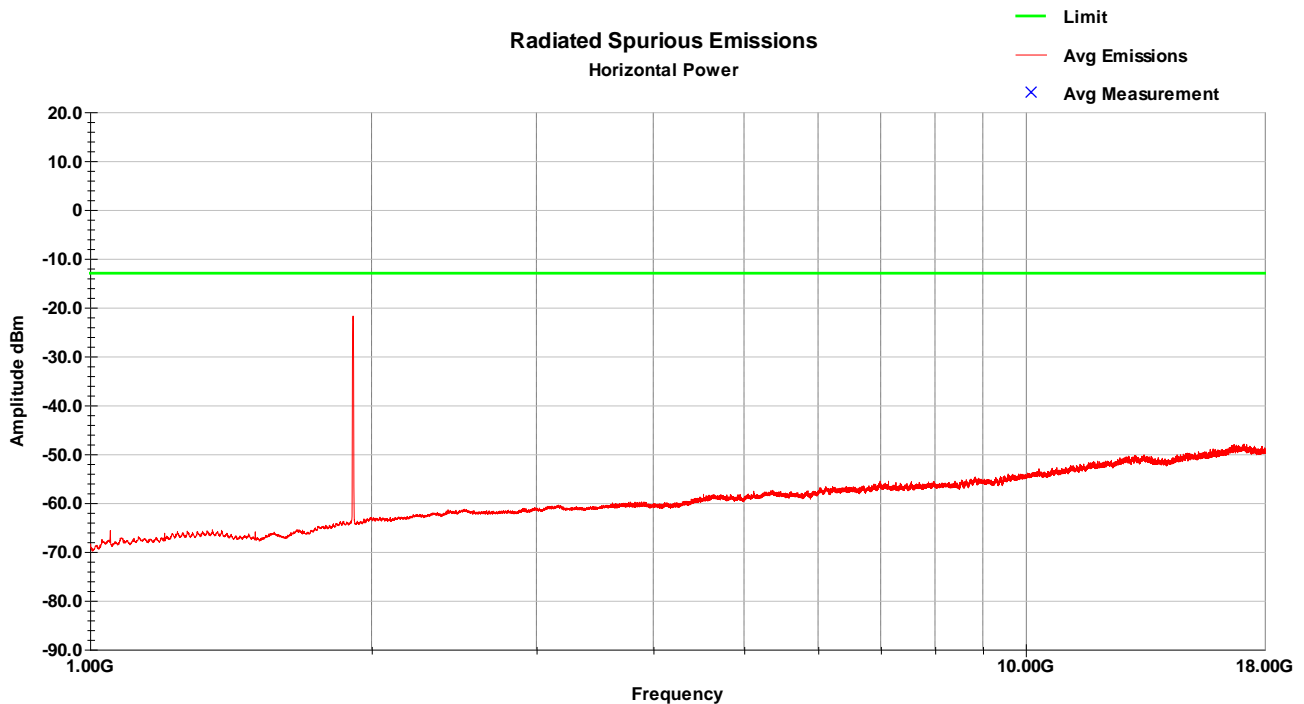
WCDMA Band II – HCH – 30-1000MHz – Horizontal



WCDMA Band II – HCH – 1-18GHz – Vertical



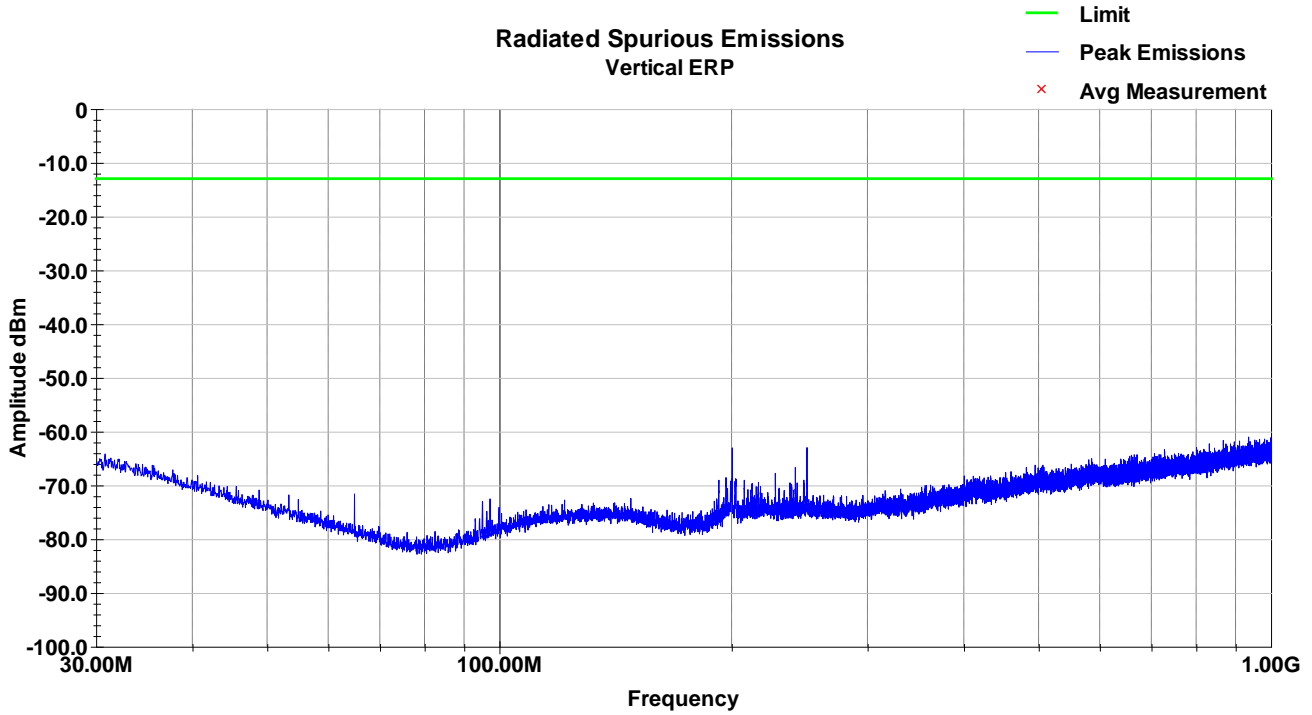
WCDMA Band II – HCH – 1-18G Hz – Horizontal



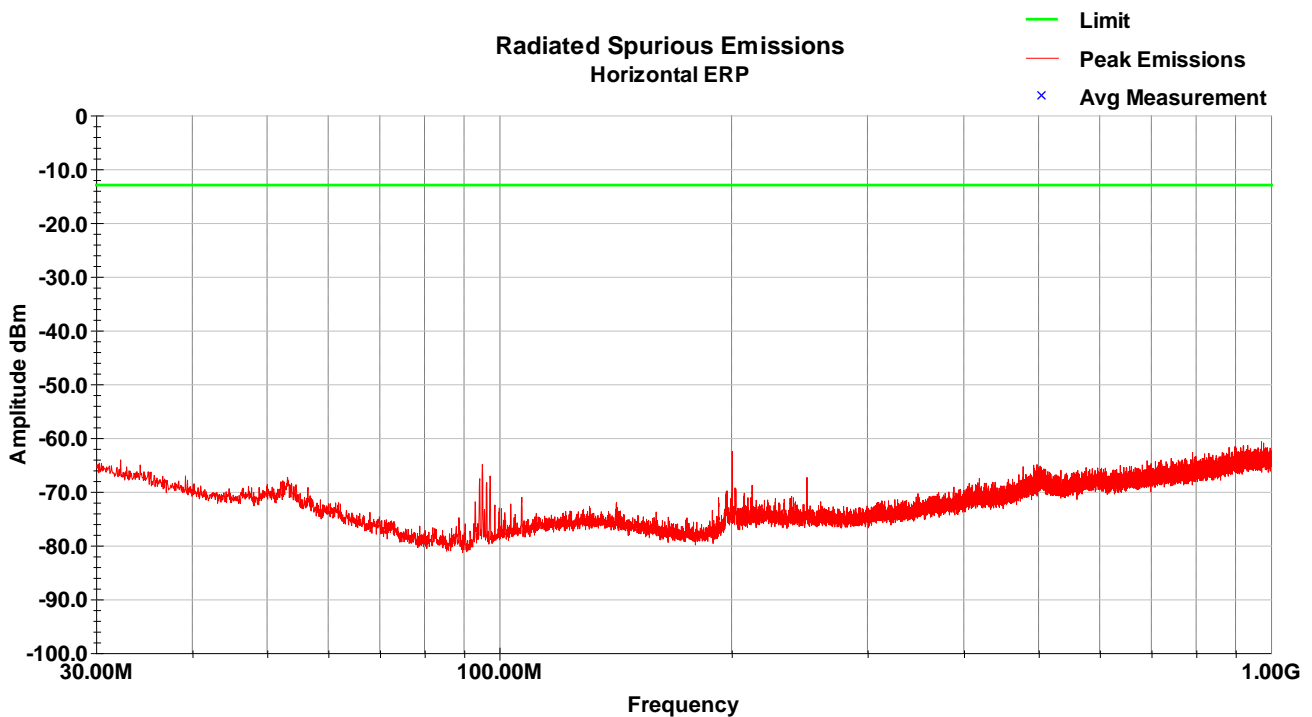
No emissions associated with the radio were detected other than the fundamental

7.6 Test Data – WCDMA Band IV

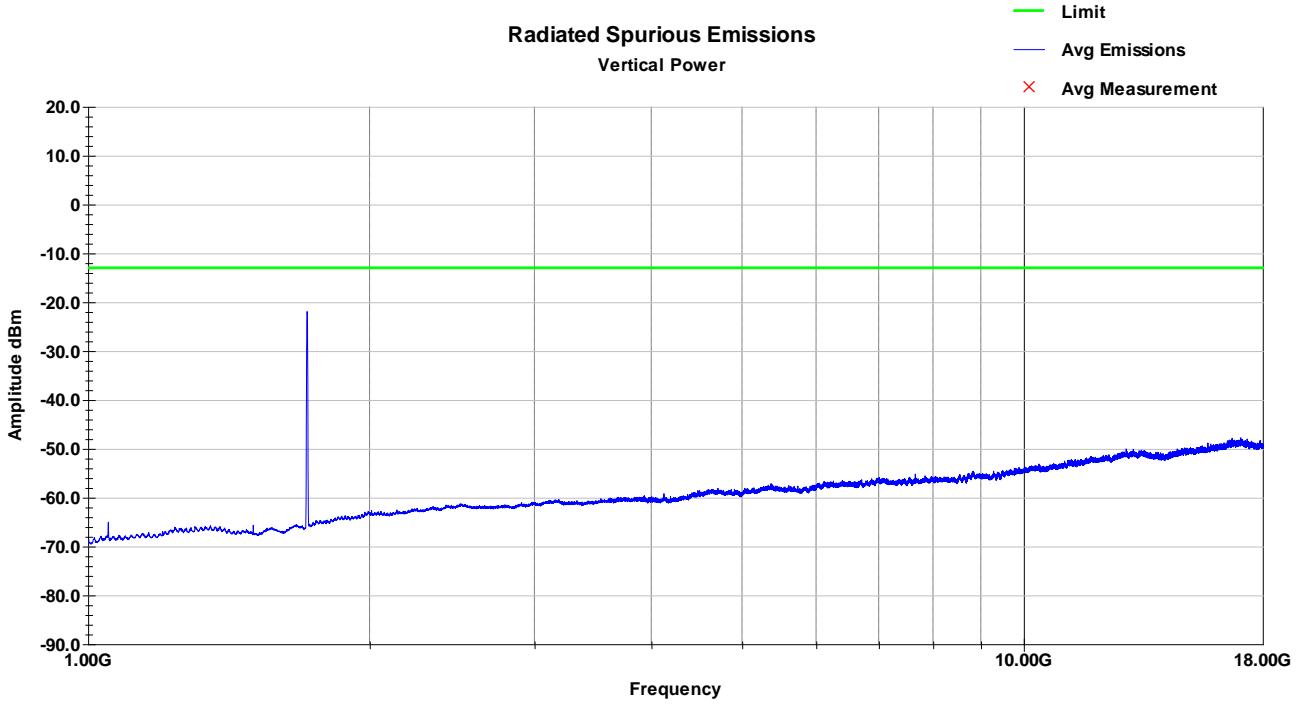
WCDMA Band IV – LCH – 30-1000MHz – Vertical



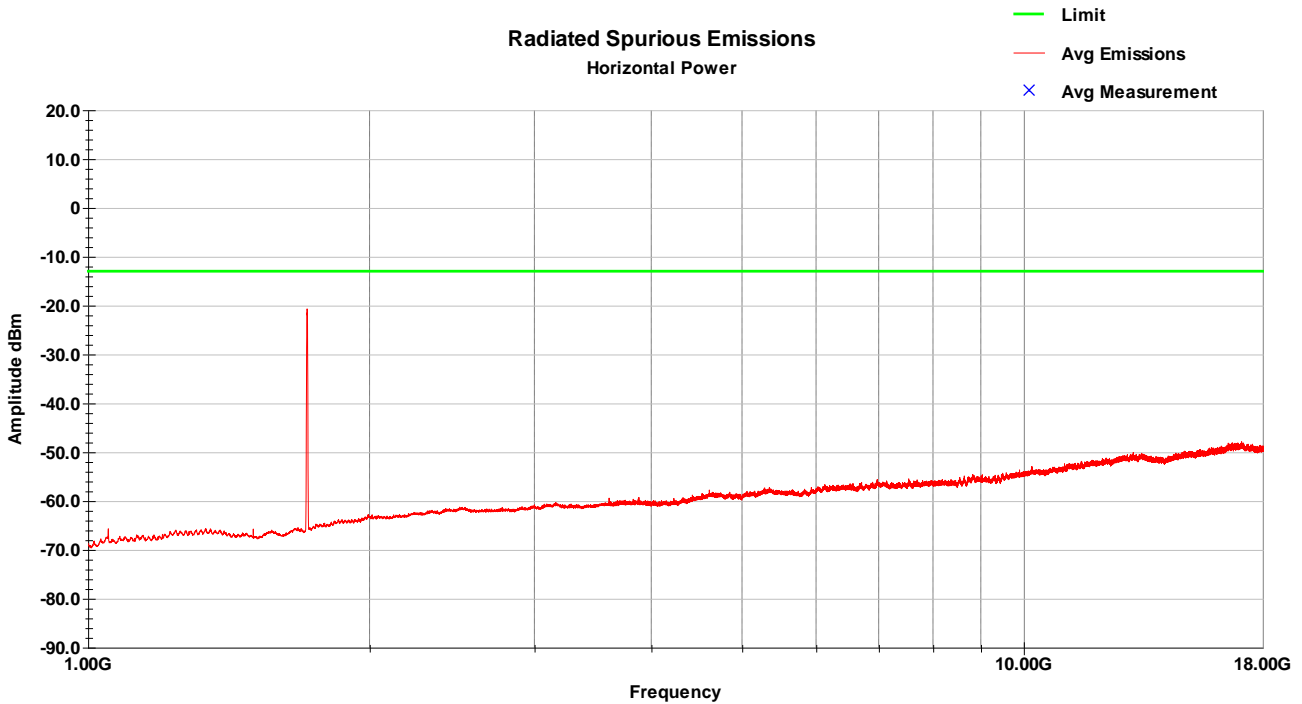
WCDMA Band IV – LCH – 30-1000MHz – Horizontal



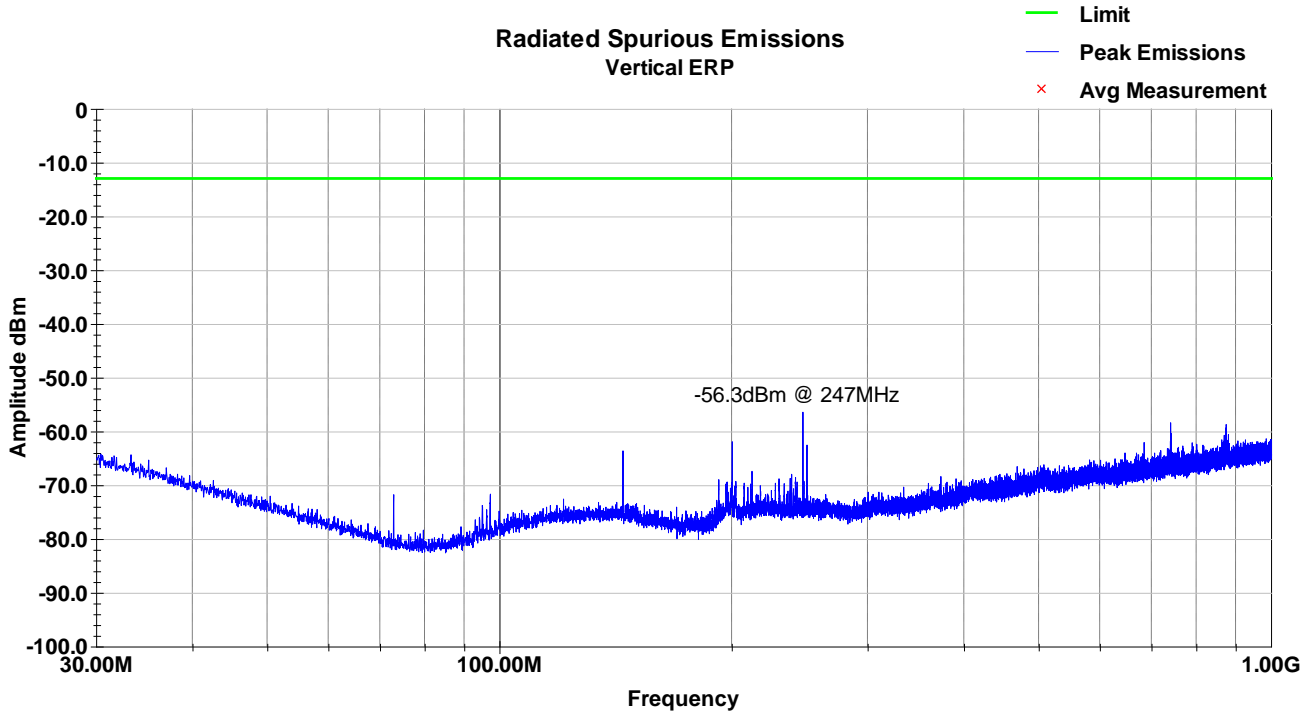
WCDMA Band IV – LCH – 1-18GHz – Vertical



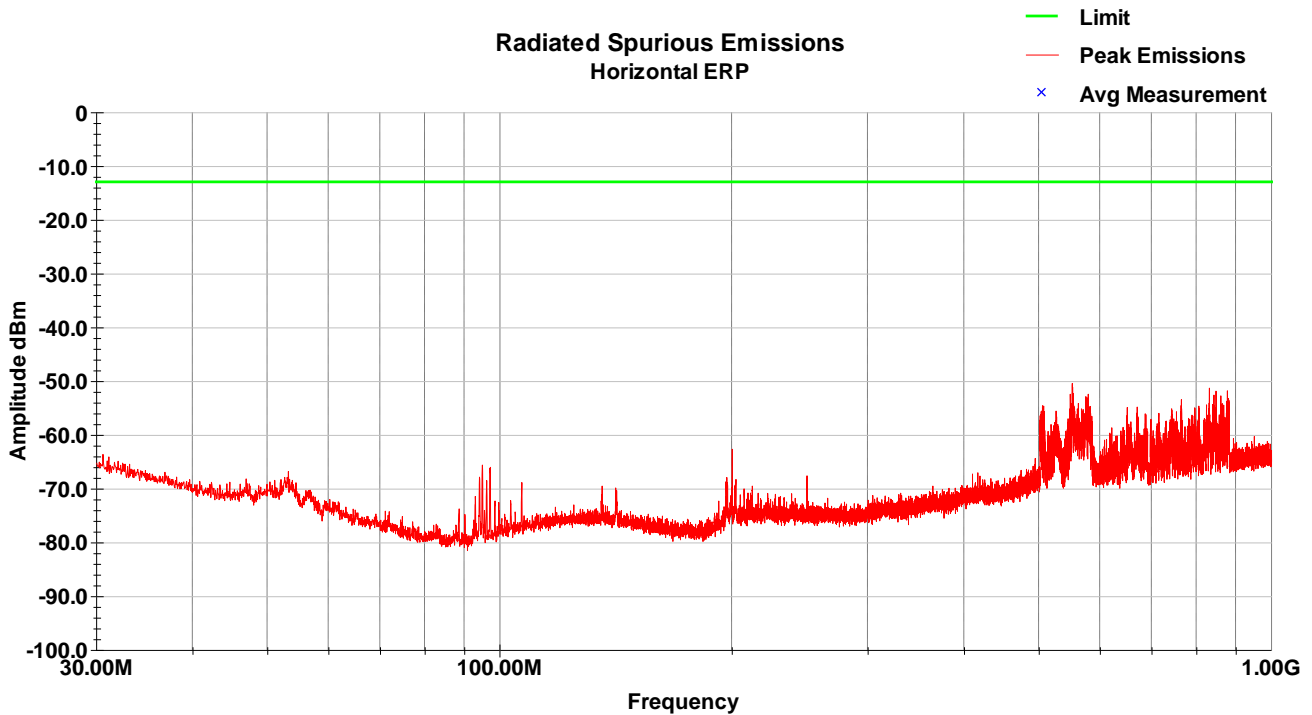
WCDMA Band IV – LCH – 1-18G Hz – Horizontal



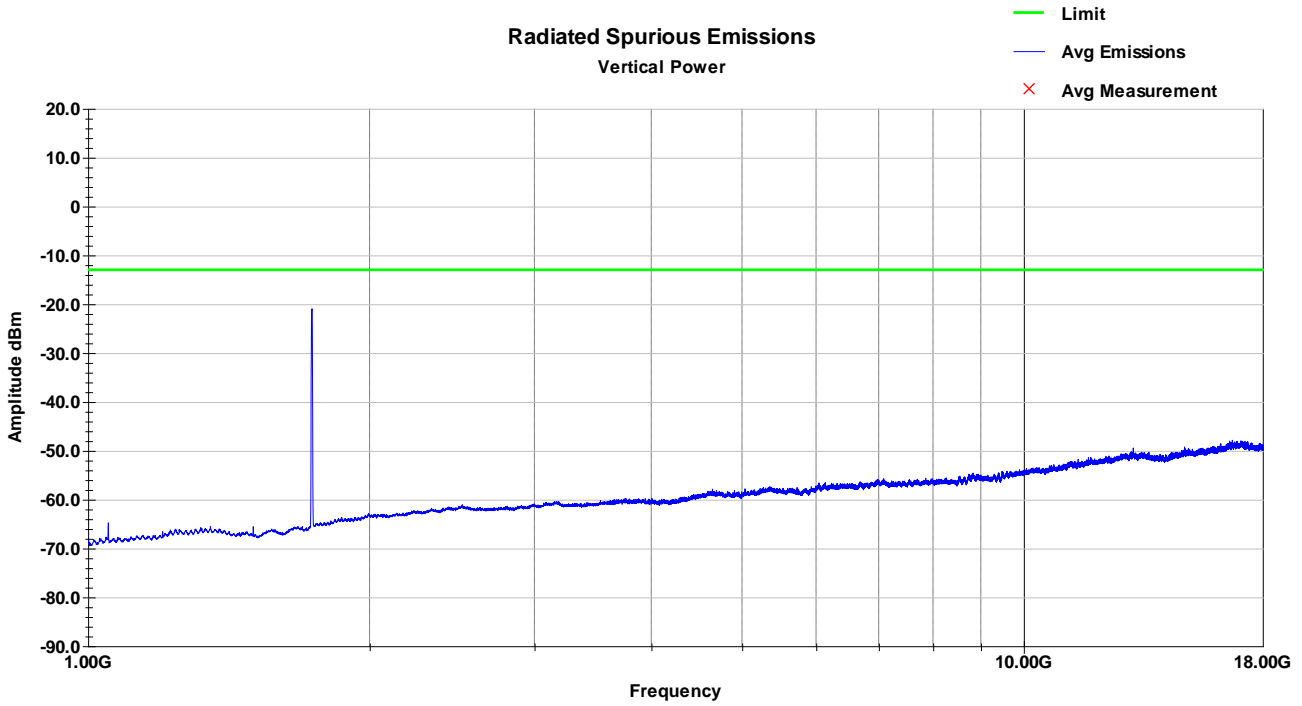
WCDMA Band IV – MCH – 30-1000MHz – Vertical



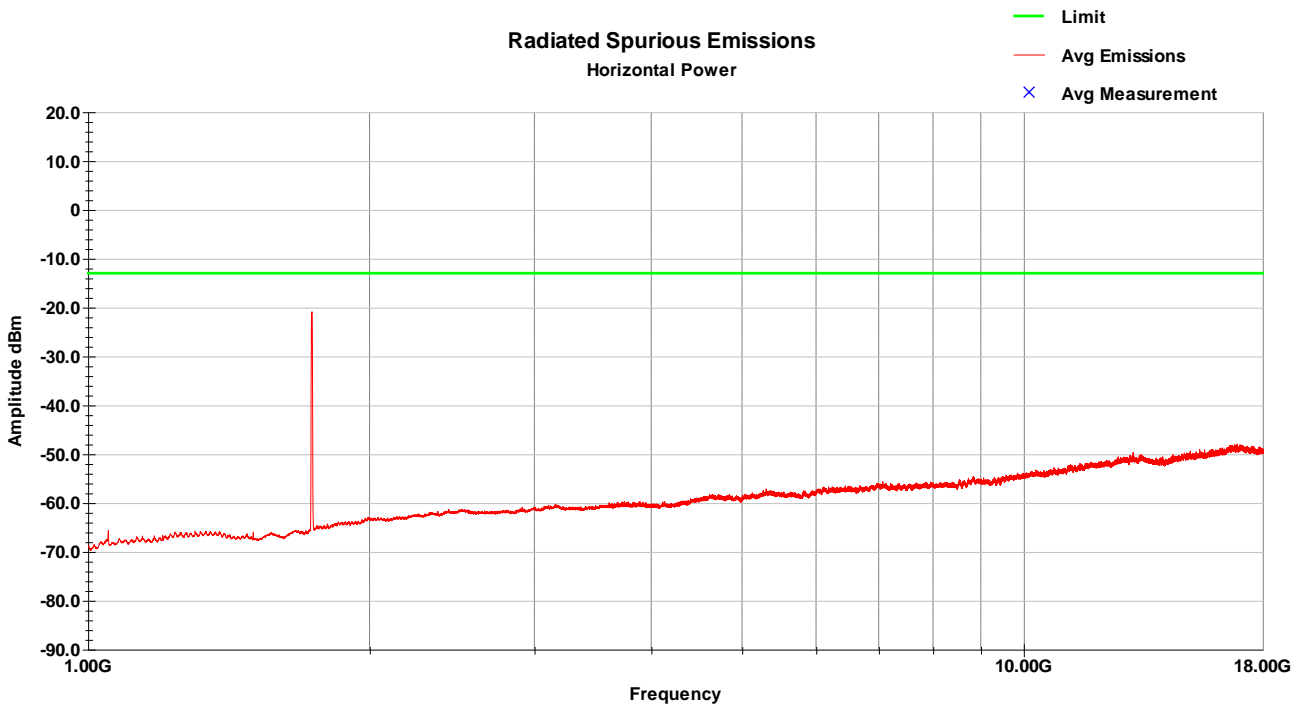
WCDMA Band IV – MCH – 30-1000MHz – Horizontal



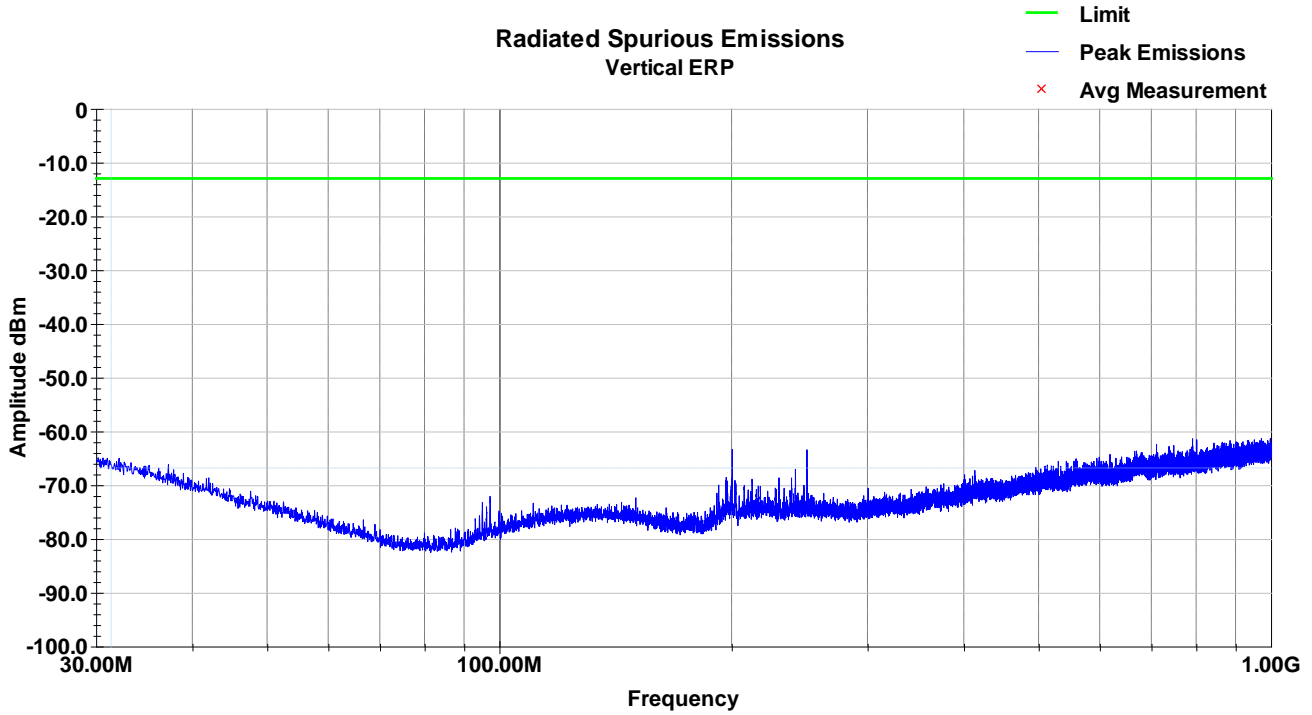
WCDMA Band IV – MCH – 1-18GHz – Vertical



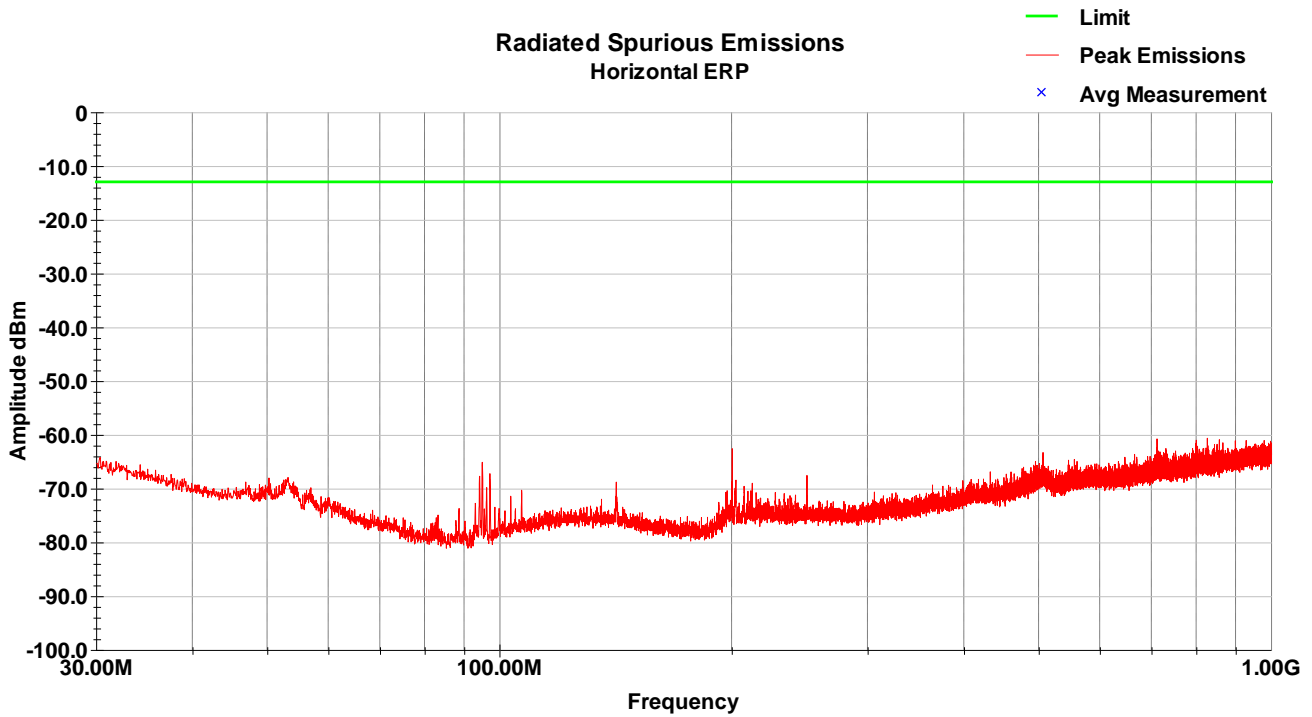
WCDMA Band IV – MCH – 1-18G Hz – Horizontal



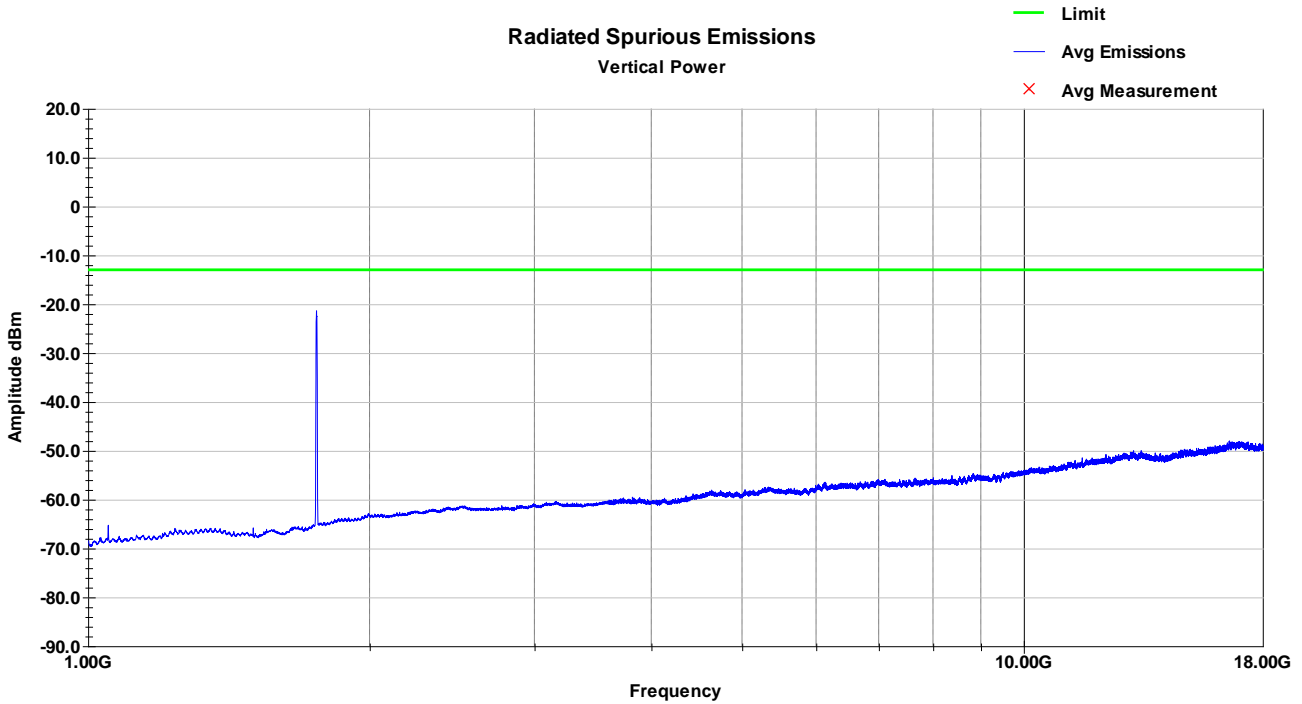
WCDMA Band IV – HCH – 30-1000MHz – Vertical



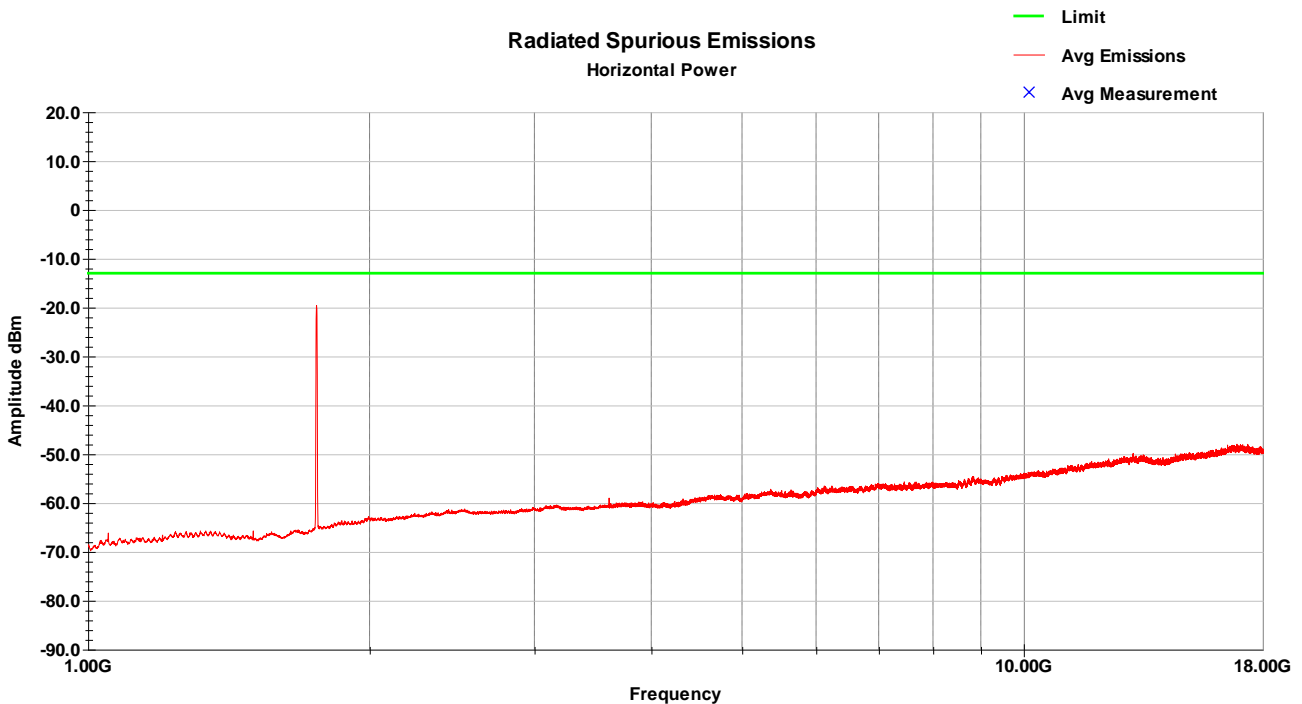
WCDMA Band IV – HCH – 30-1000MHz – Horizontal



WCDMA Band IV – HCH – 1-18GHz – Vertical



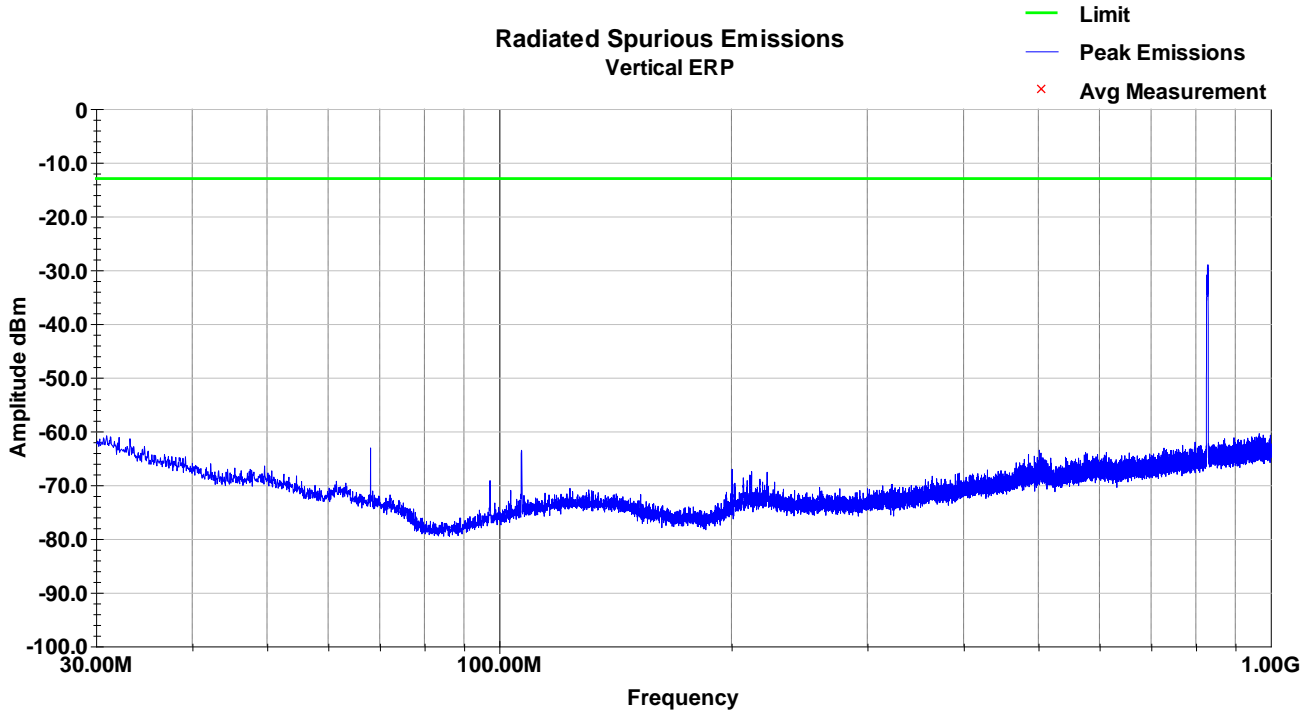
WCDMA Band IV – HCH – 1-18G Hz – Horizontal



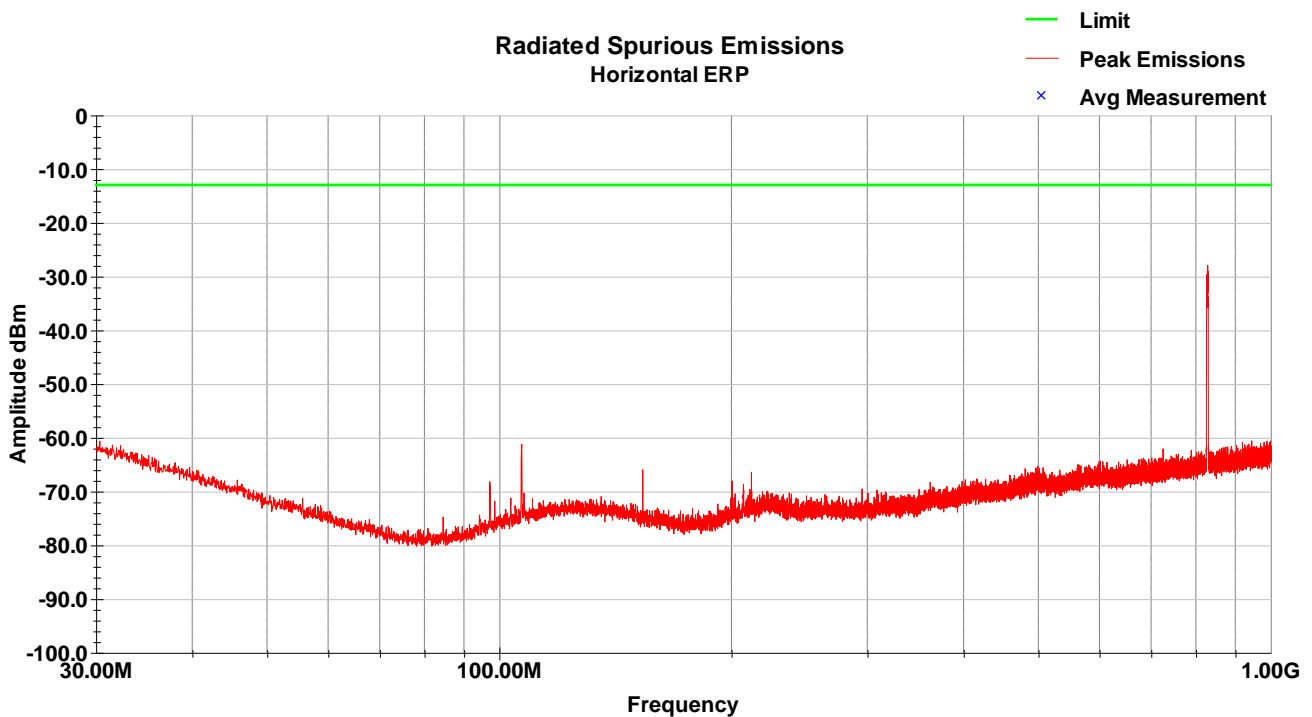
No emissions associated with the radio were detected other than the fundamental

7.7 Test Data – WCDMA Band V

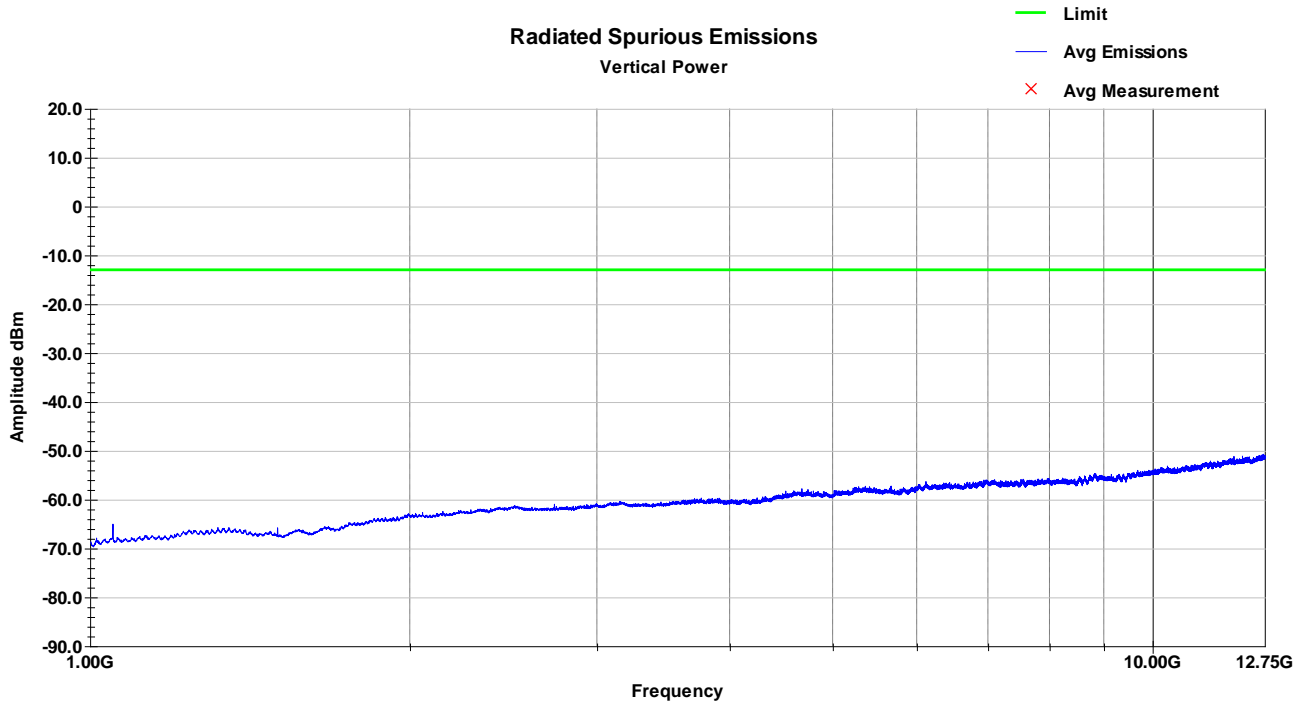
WCDMA Band V – LCH – 30-1000MHz – Vertical



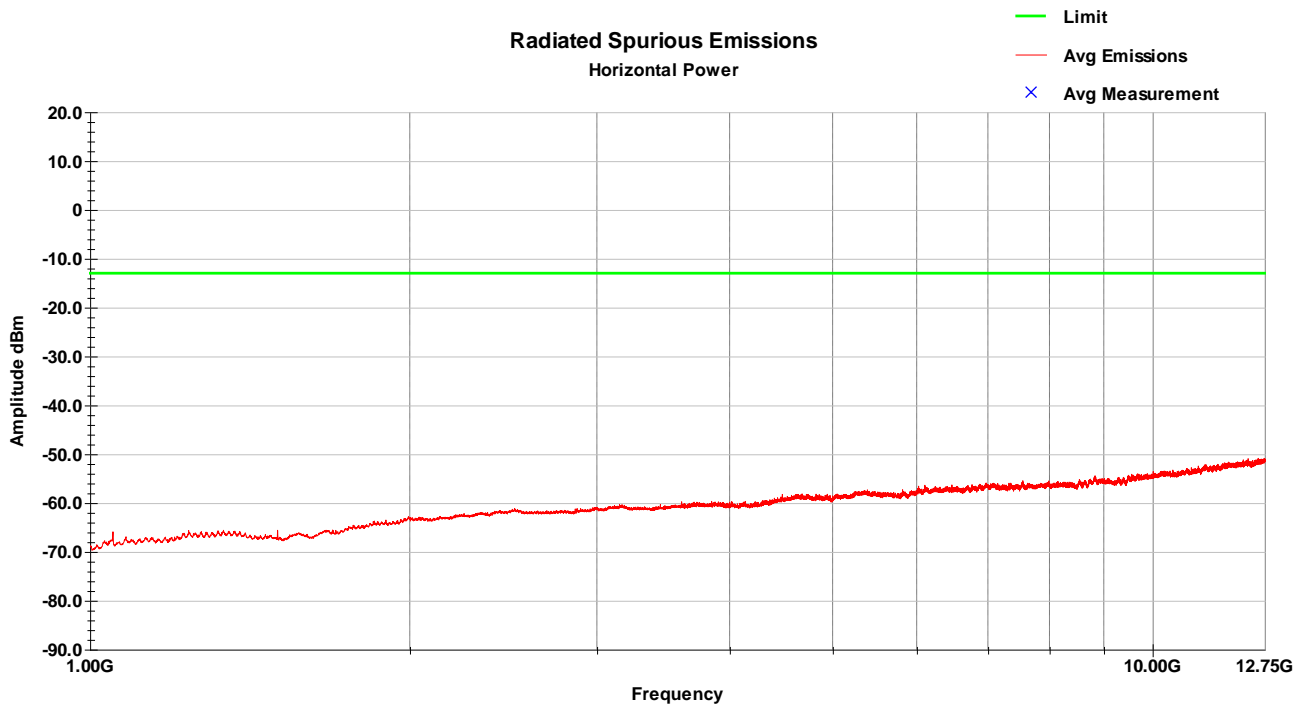
WCDMA Band V – LCH – 30-1000MHz – Horizontal



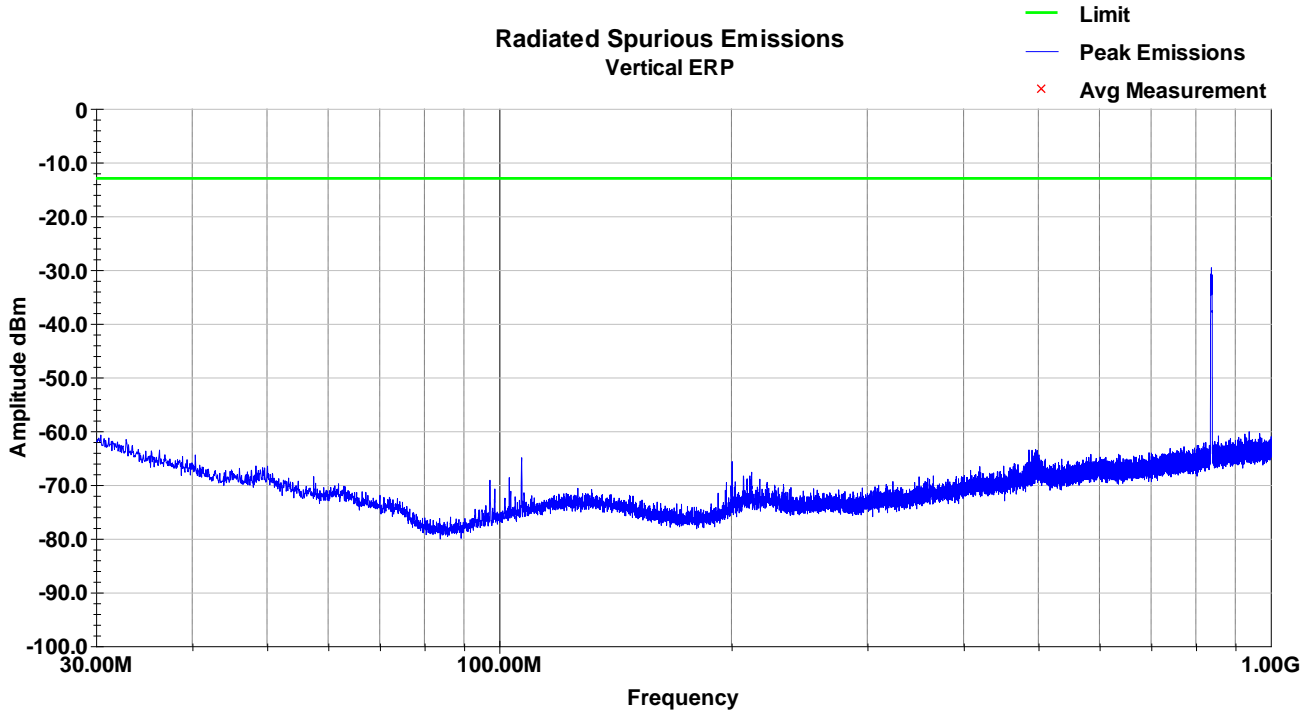
WCDMA Band V – LCH – 1-12.75GHz – Vertical



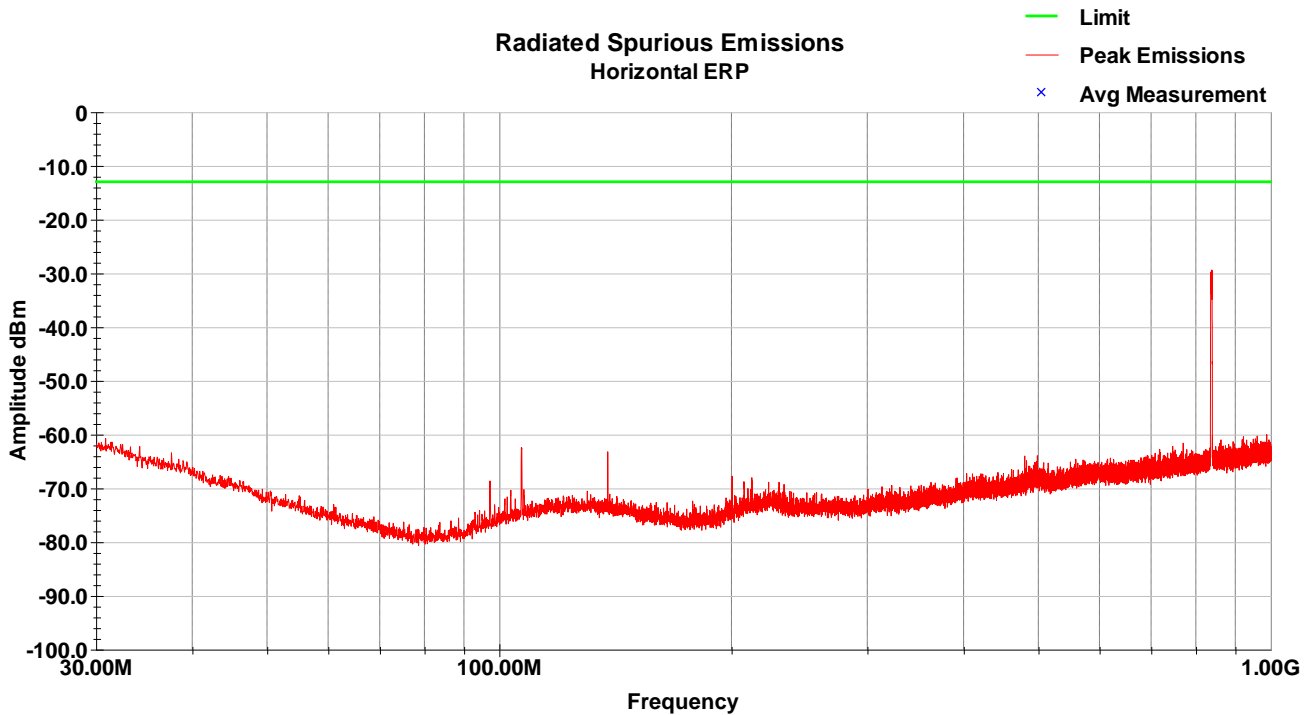
WCDMA Band V – LCH – 1-12.75G Hz – Horizontal



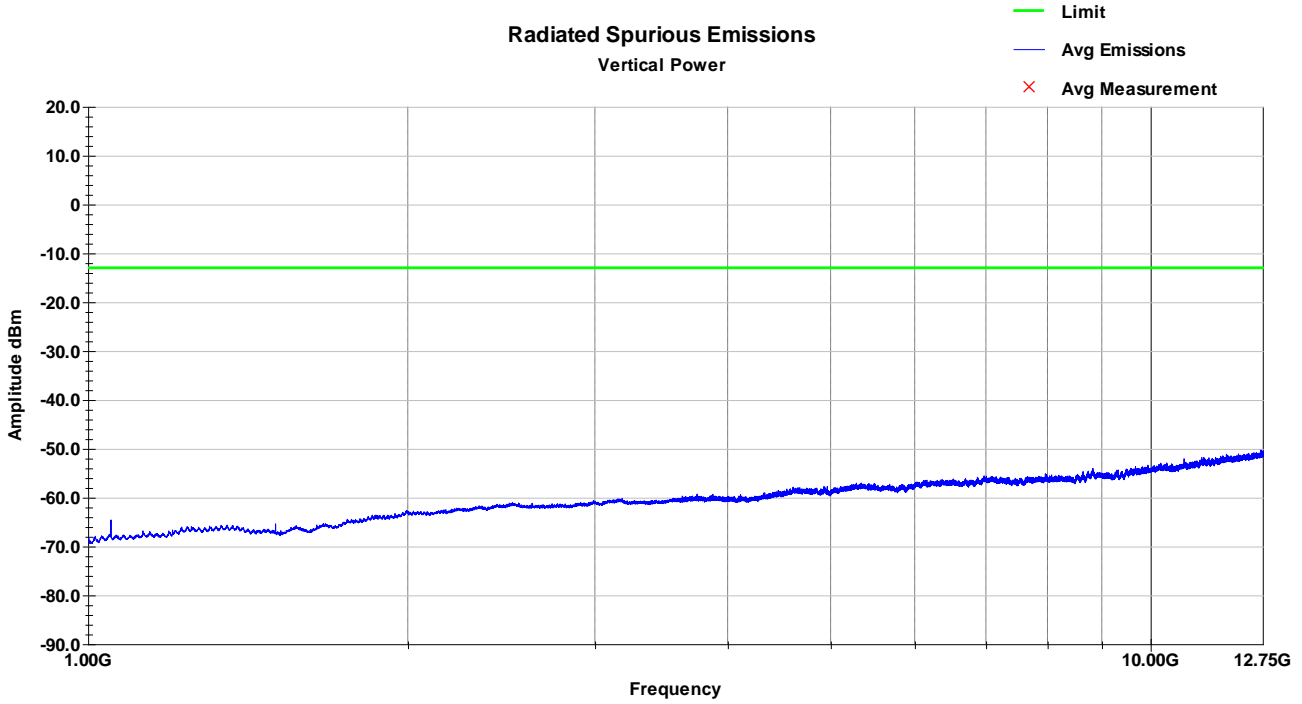
WCDMA Band V – MCH – 30-1000MHz – Vertical



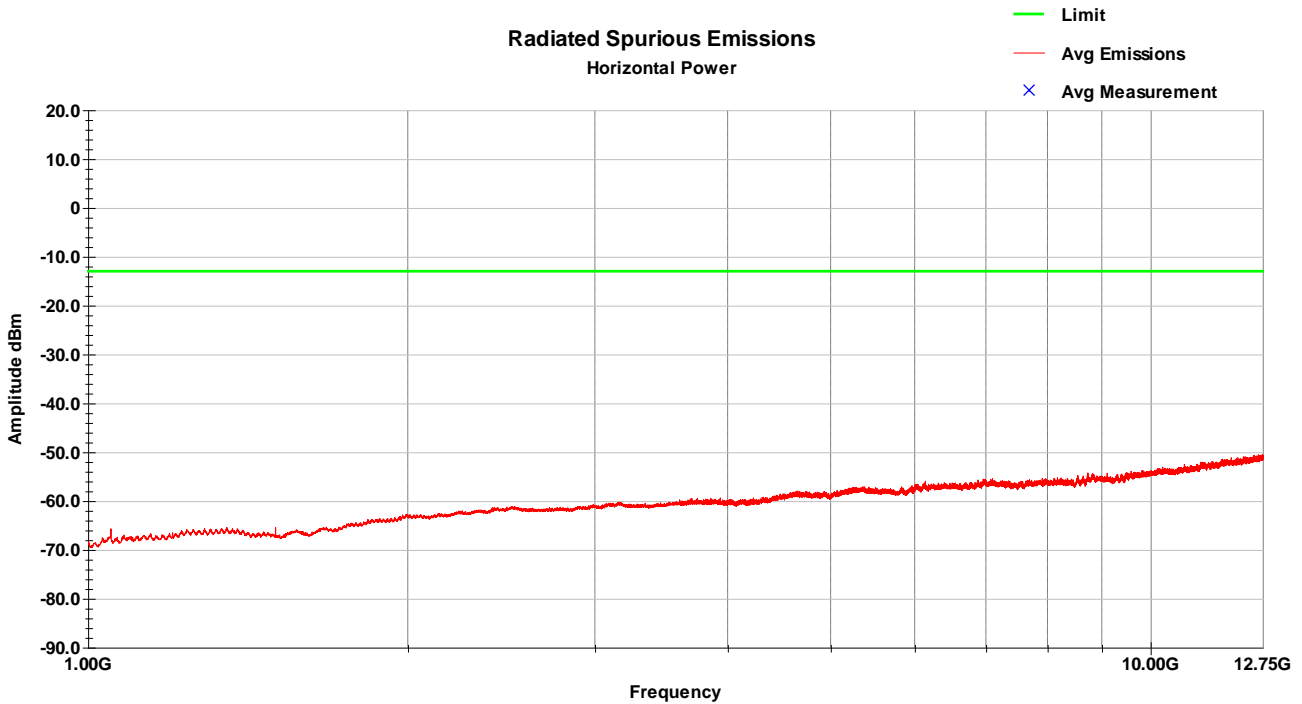
WCDMA Band V – MCH – 30-1000MHz – Horizontal



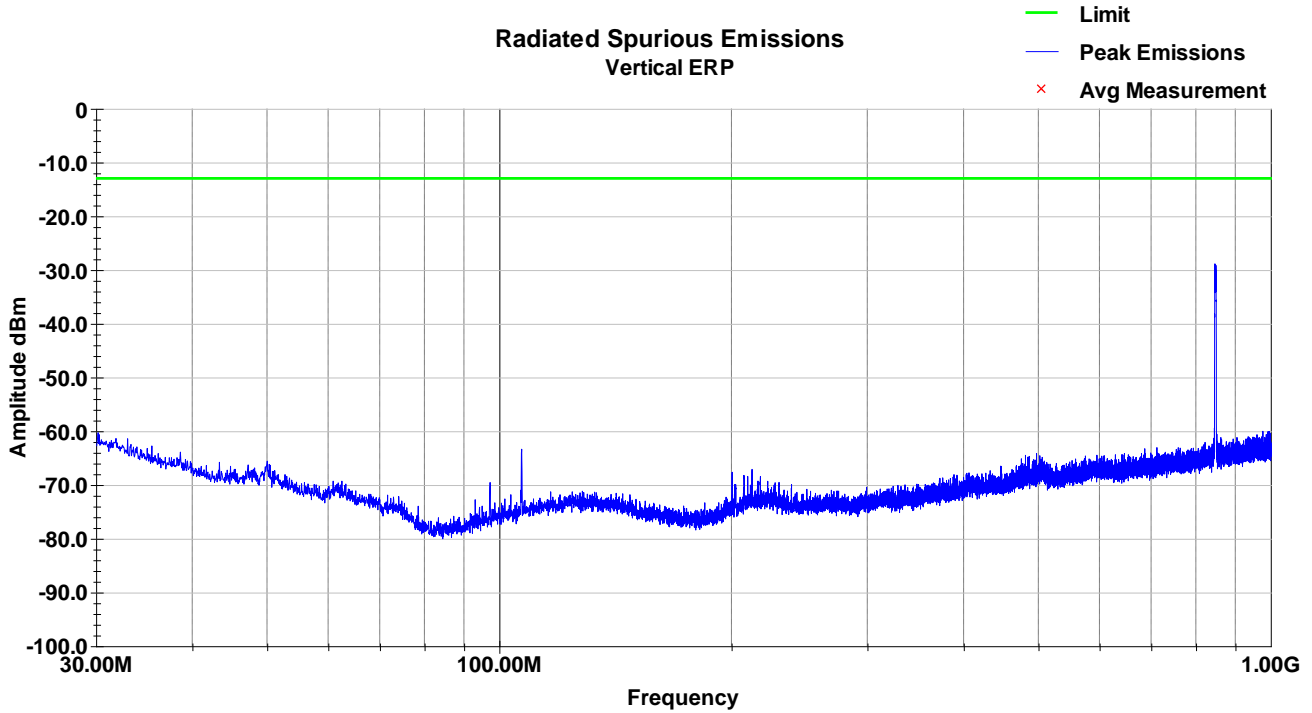
WCDMA Band V – MCH – 1-12.75GHz – Vertical



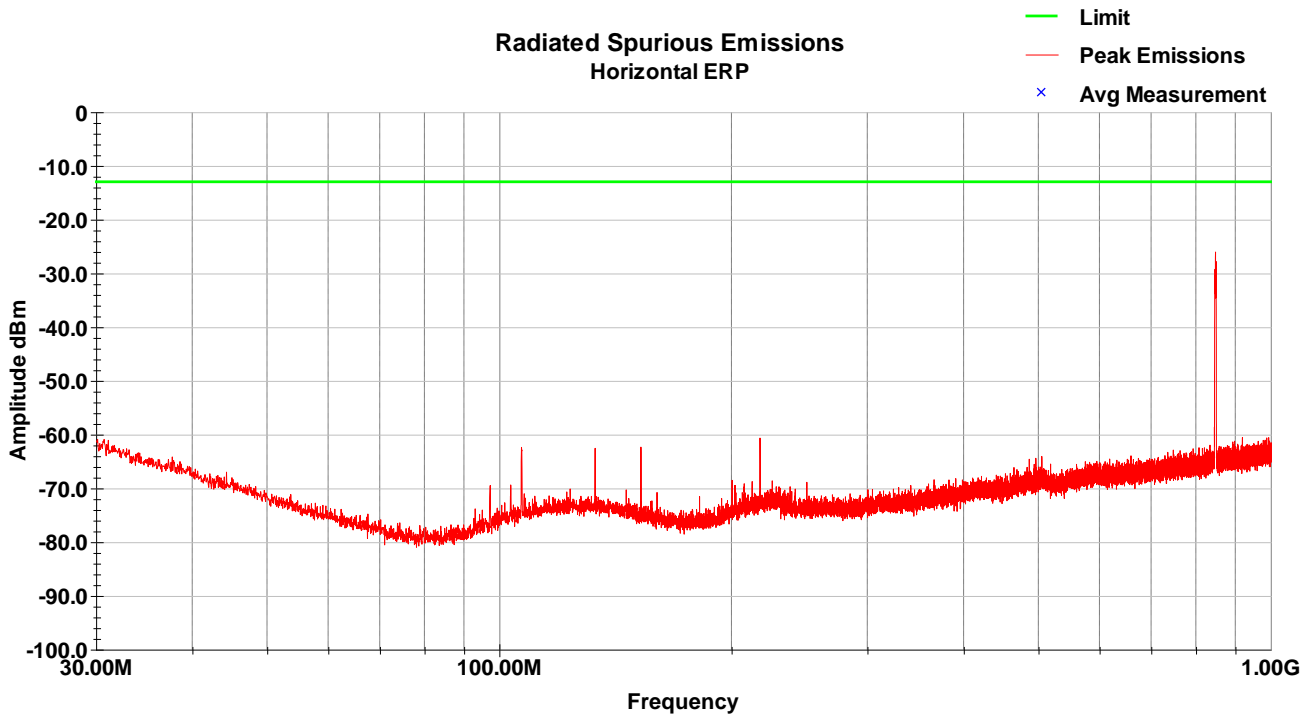
WCDMA Band V – MCH – 1-12.75G Hz – Horizontal



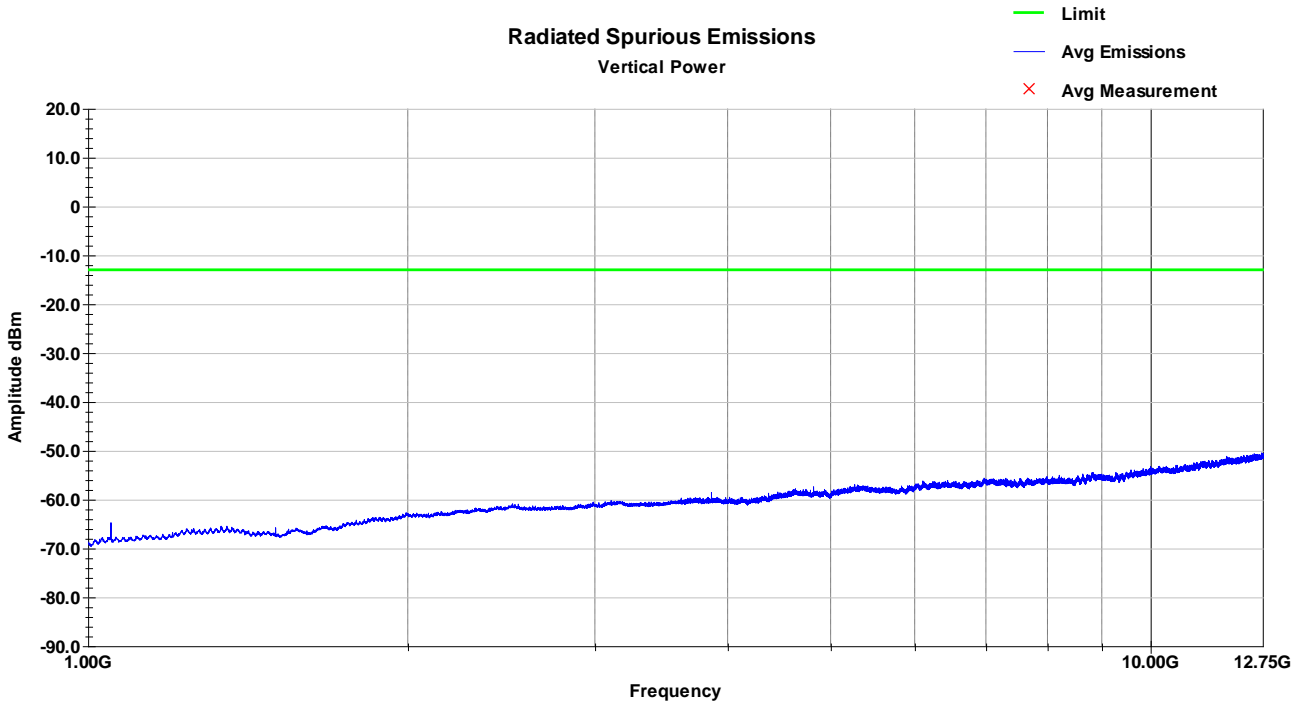
WCDMA Band V – HCH – 30-1000MHz – Vertical



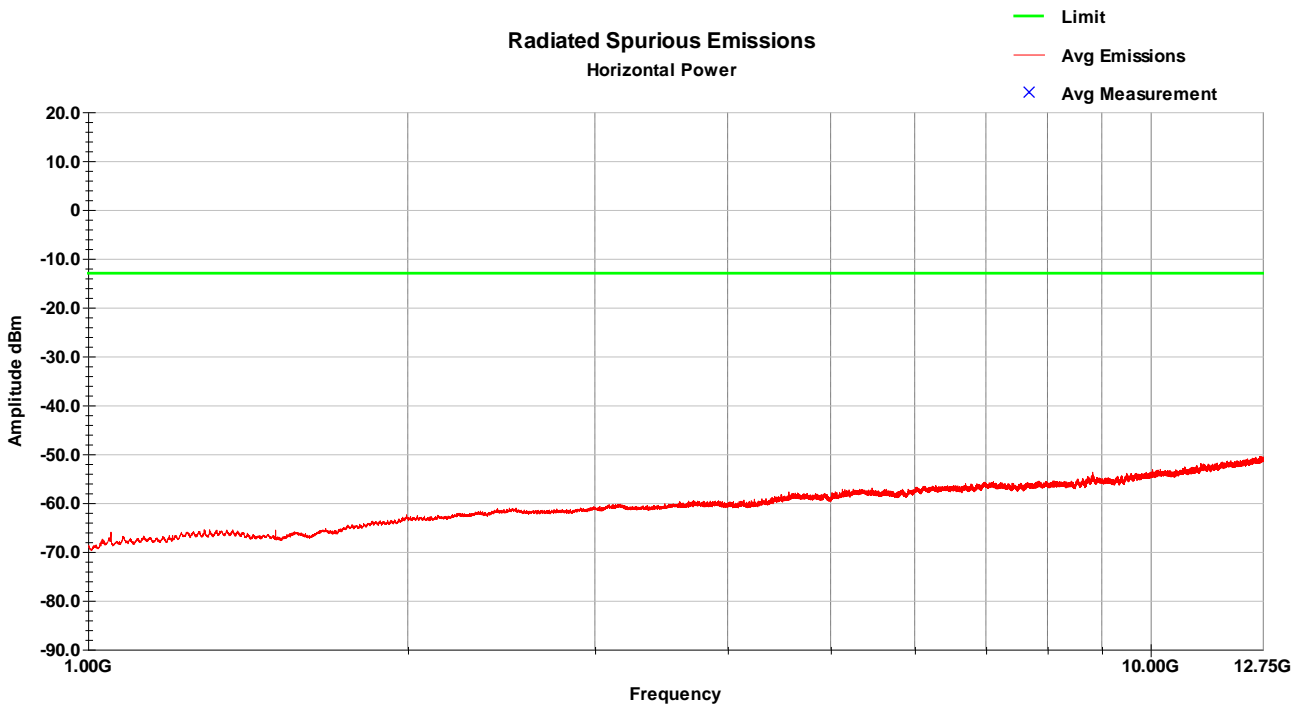
WCDMA Band V – HCH – 30-1000MHz – Horizontal



WCDMA Band V – HCH – 1-12.75GHz – Vertical



WCDMA Band V – HCH – 1-12.75G Hz – Horizontal



No emissions associated with the radio were detected other than the fundamental

8 Frequency Stability

8.1 Test Result

Test Description	Specification	Test Result
Frequency Stability	FCC Part 2.1055 FCC Part 22.235 FCC Part 24.235 FCC 27.54 RSS-GEN (6.11) RSS-132 (5.3) RSS-133 (6.3) RSS-139 (6.4)	Compliant

8.2 Test Method

The EUT was placed inside the Environmental Chamber and was left inside chamber to stabilize to set temperature for minimum of thirty minutes before any measurements were made. The EUT was tested at Band II Channel 9400, Band IV Channel 1450, and Band V Channel 4175.

8.3 Test Site

SGS EMC Laboratory, Suwanee, GA

8.4 Test Equipment

Test End Date: 1/31/2022

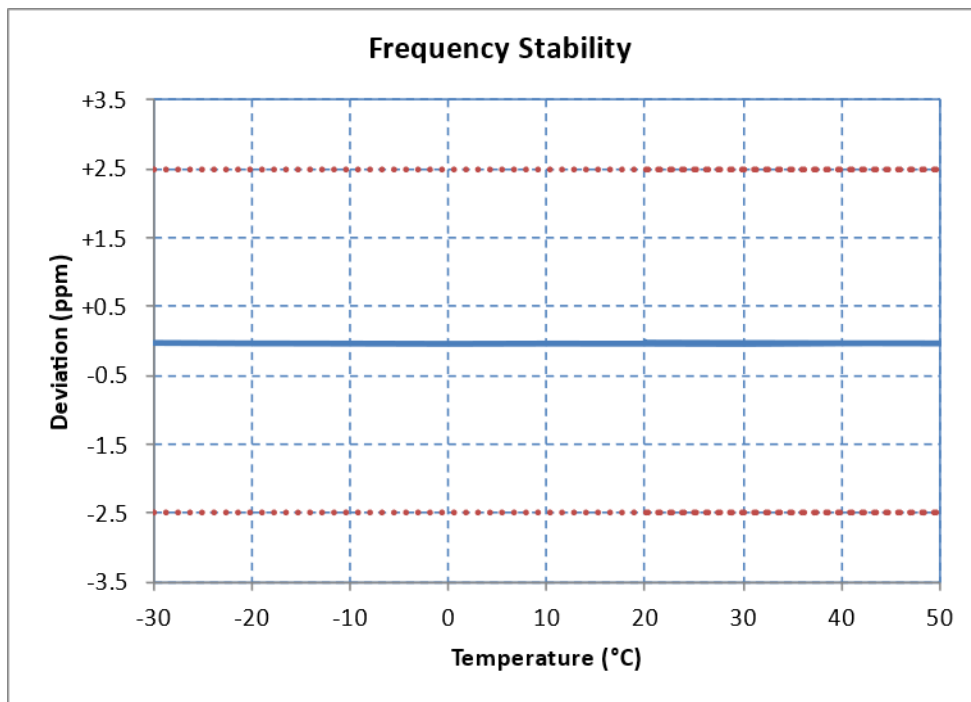
Tester: JOP

Equipment	Model	Manufacturer	Asset Number	Cal Date	Cal Due Date
RF CABLE SMA TO SMA, 0.01-40GHZ	084-0505-059	TELEDYNE STORM	20107	16-Mar-2022	16-Mar-2023
MULTIMETER	87V	FLUKE	B079677	18-Aug-2021	18-Aug-2022
WIDEBAND RADIO COMMUNICATION	CMW500	ROHDE & SCHWARZ	B094874	13-Jan-2021	13-Jan-2023
ENVIRONMENTAL TEST CHAMBER	T2RC	TENNEY	B094877	CNR	CNR

8.5 Test Data

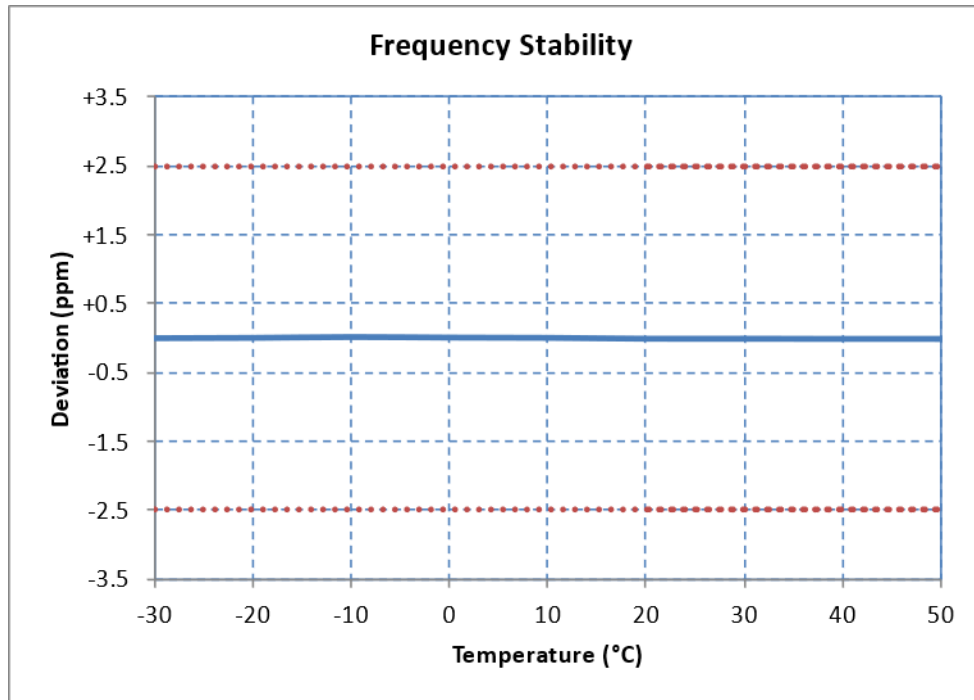
WCDMA Band 2, Channel 9400 (1880MHz)

Voltage %	Power V _{DC}	Temp °C	Frequency Hz	Freq Dev Hz	Freq Dev ppm	Deviation %
100%	12.00	+20 (Ref)	1,879,999,994	-6	-0.00	-0.000000
100%	12.00	-30	1,879,999,996	-4	-0.00	-0.000000
100%	12.00	-20	1,879,999,995	-5	-0.00	-0.000000
100%	12.00	-10	1,879,999,995	-5	-0.00	-0.000000
100%	12.00	0	1,879,999,994	-6	-0.00	-0.000000
100%	12.00	+10	1,879,999,995	-5	-0.00	-0.000000
100%	12.00	+20	1,879,999,994	-6	-0.00	-0.000000
100%	12.00	+30	1,879,999,994	-6	-0.00	-0.000000
100%	12.00	+40	1,879,999,995	-5	-0.00	-0.000000
100%	12.00	+50	1,879,999,995	-5	-0.00	-0.000000
100%	12.00	+55	1,879,999,995	-5	-0.00	-0.000000
115%	13.80	+20	1,879,999,997	-3	-0.00	-0.000000
85%	10.20	+20	1,879,999,998	-2	-0.00	-0.000000



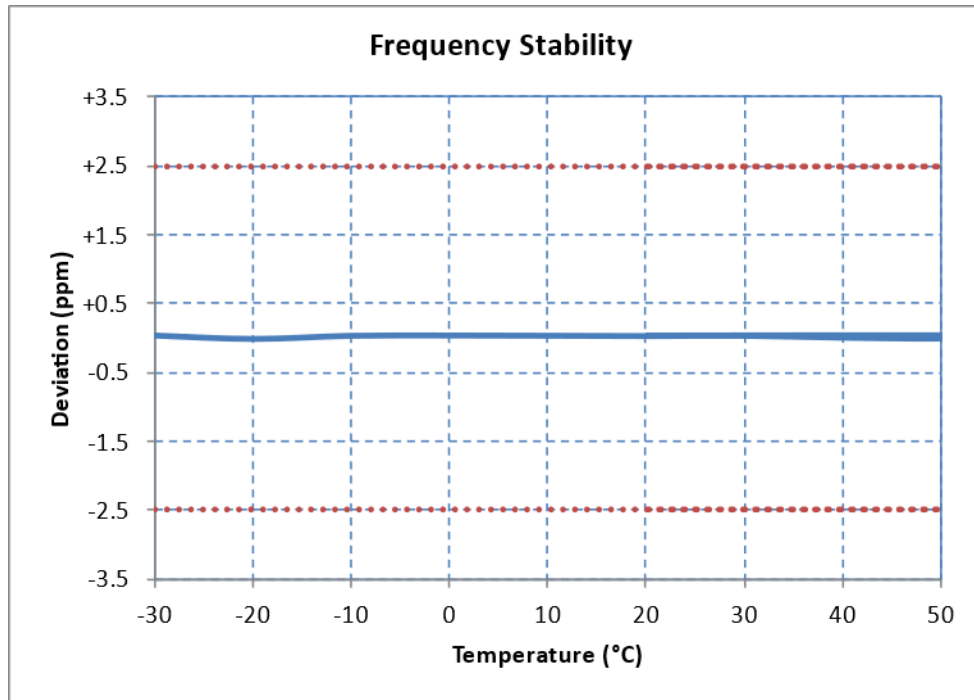
WCDMA Band 4, Channel 1450 (1740MHz)

Voltage %	Power V _{DC}	Temp °C	Frequency Hz	Freq Dev Hz	Freq Dev ppm	Deviation %
100%	12.00	+20 (Ref)	1,739,999,995	-5	-0.00	-0.000000
100%	12.00	-30	1,740,000,000	+0	+0.00	+0.000000
100%	12.00	-20	1,740,000,004	+4	+0.00	+0.000000
100%	12.00	-10	1,740,000,012	+12	+0.01	+0.000001
100%	12.00	0	1,740,000,007	+7	+0.00	+0.000000
100%	12.00	+10	1,740,000,004	+4	+0.00	+0.000000
100%	12.00	+20	1,739,999,995	-5	-0.00	-0.000000
100%	12.00	+30	1,739,999,995	-5	-0.00	-0.000000
100%	12.00	+40	1,739,999,993	-7	-0.00	-0.000000
100%	12.00	+50	1,739,999,993	-7	-0.00	-0.000000
100%	12.00	+55	1,739,999,993	-7	-0.00	-0.000000
115%	13.80	+20	1,739,999,995	-5	-0.00	-0.000000
85%	10.20	+20	1,739,999,996	-4	-0.00	-0.000000



WCDMA, Band 5, Channel 4175 (835MHz)

Voltage %	Power V _{DC}	Temp °C	Frequency Hz	Freq Dev Hz	Freq Dev ppm	Deviation %
100%	12.00	+20 (Ref)	835,000,017	+17	+0.02	+0.000002
100%	12.00	-30	835,000,024	+24	+0.03	+0.000003
100%	12.00	-20	834,999,976	-24	-0.03	-0.000003
100%	12.00	-10	835,000,021	+21	+0.02	+0.000002
100%	12.00	0	835,000,025	+25	+0.03	+0.000003
100%	12.00	+10	835,000,021	+21	+0.03	+0.000003
100%	12.00	+20	835,000,017	+17	+0.02	+0.000002
100%	12.00	+30	835,000,021	+21	+0.02	+0.000002
100%	12.00	+40	834,999,994	-6	-0.01	-0.000001
100%	12.00	+50	834,999,983	-17	-0.02	-0.000002
100%	12.00	+55	835,000,026	+26	+0.03	+0.000003
115%	13.80	+20	835,000,025	+25	+0.03	+0.000003
85%	10.20	+20	835,000,018	+18	+0.02	+0.000002



9 Revision History

Revision Level	Description of changes	Revision Date
0	Initial release	18 April 2022
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