DEKRA Testing and Certification, S.A.U.
Parque Tecnológico de Andalucía,
c/ Severo Ochoa nº 2 · 29590 Campanillas · Málaga · España
C.I.F. A29507456

ISED CABid: ES1909

Test Report No:
NIE: 68001RRF.002

Partial Test Report

Reference Standard:
USA FCC Part 22 & 90
CANADA RSS-132

(*) Identification of item tested	Telematic control unit with wireless technologies, used in automotive industry
(*) Trademark	BMW
(*) Model and /or type reference	WAVE-11-HAF-R2
(*) Derived model not tested	WAVE-11-HIGH-R2
Other identification of the product	Type: B424 HW version: D5 SW version: 21411A.004_045_017 IMEI TAC: 35011736 (OEM modem), 35894272 (CUS modem) Contains FCC ID: T8GSAN9000 Contains FCC ID: T8GSAN9001 Contains IC: 6434A-SAN9000 Contains IC: 6434A-SAN9001
(*) Features	GSM, UMTS, LTE, 5G, GNSS
Applicant	HARMAN BECKER AUTOMOTIVE SYSTEMS GMBH BECKER-GOERING-STR. 16; 76307 KARLSBAD, GERMANY
Test method requested, standard	USA FCC Part 22 (10-1-20 Edition). USA FCC Part 90 (10-1-20 Edition). CANADA RSS-132 Issue 3, Jan. 2013. - Radiated Emissions. ANSI C63.26 - 2015. KDB 971168 D01 Power Meas License Digital Systems v03r01, April. 2018.
Approved by (name / position & signature)	Rafael López Martín EMC Consumer & RF Lab. Manager  2022.01.11 16:39:08 +01'00'
Date of issue	2022-01-11
Report template No	FDT08_23 (*) "Data provided by the client"

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Uncertainty

Uncertainty (factor k=2) was calculated according to the DEKRA Testing and Certification S.A.U. internal document PODT000.

Data provided by the client

The following data has been provided by the client:

1. Information relating to the description of the sample ("Identification of the item tested", "Trademark", "Model and/or type reference tested").
2. The sample of the model WAVE-11-HAF-R2 is a Telematics control unit with wireless technologies, used in automotive, equipped with 2 modems, OEM and customer. The project name WAVE has the meaning “Wireless Access in Vehicular Environment” and thus describes the key features of this device as Communication and Data Interface. This unit was designed for automotive usage and contains the following features: GSM, UMTS, LTE, 5G, and GNSS.

3. Derived model not tested. These models have been declared by the supplier of the sample as being the same as the model under test.

HARMAN AUTOMOTIVE DIVISION
HARMAN BECKER AUTOMOTIVE SYSTEMS GMBH
BECKER-GOERING-STRASSE 16
76307 KARLSBAD, GERMANY

Declaration of similarity

To whom it may concern,

We, **Harman Becker Automotive Systems GmbH**, located in **Becker-Goering-Str. 16; 76307 Karlsbad, Germany**

Hereby declare that the following units: **WAVE-11-HIGH-R2** and **WAVE-11-HAF-R2** have integrated the same NAD modules, are using same schematic and same PCB layout.

The only difference between the two models is that **WAVE-11-HIGH-R2** is equipped with chipset U-Blox UBX-F9940, where **WAVE-11-HAF-R2** is equipped with chipset ST-Micro STA9100MGA & STA5635S.

Where only one of the aforementioned variants has been used as DUT, shall remain valid and applicable for these two models described.

This declaration is intended to be included in the test reports where applies

Regards

i. V. Alexandru Neacsu

By: Alexandru Costin Neacsu
Title: Regulatory Product Compliance Expert
Company: Harman Becker
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e-mail: costinalexandru.neacsu@harman.com

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DEKRA Testing and Certification S.A.U. declines any responsibility with respect to the information provided by the client and that may affect the validity of results.

Usage of samples

Samples undergoing test have been selected by: The client.

- Sample S/01 is composed of the following elements:

Control Nº	Description	Model	Serial Nº	Date of reception
68001/009	Telematic control unit with wireless technologies, used in automotive industry (Type B424)	WAVE-11-HAF-R2	B4250S0M4907002	2021/08/10
68000C/083	Antenna (DA WAVE HIGH US 5G ROW)	DA05DI20	--	2021/08/27
62486/024	Antenna Box	AB01-I20-01	--	2020/09/22
62486/027	Antenna Box	AB01-I20-01	--	2020/09/22
68000C/065	Spoiler Antenna (FSA-WAVE-5G Links)	FS01DI20	--	2021/10/28
62486/026	Antenna Box	AB01-I20-01	--	2020/09/22
62486/062	RF Harness	--	--	2020/09/22

Auxiliary elements used with the Sample S/01:

Control Nº	Description	Model	Serial Nº	Date of reception
68000C/009	Battery	607492	--	2021/07/29
62486/048	RF Cable for 4-Fakra	--	--	2020/09/22
62486/055	OABR Cable	--	--	2020/09/22
62486/047	RF Cable for 4-Fakra	--	--	2020/09/22
62486/162	OABR 1000 BaseT Converter	--	--	2020/09/28
62486/070	I-Box OABR Adapter	--	--	2020/09/22
62486/101	SOS Button (E-Call)	9385	11221	2020/09/28
62486/042	Antenna ground planes for roof	--	--	2020/09/22

Sample S/01 has undergone the following test(s): The Radiated tests indicated in the Appendix A.

Test sample description

Ports……:	Port name and description	Cable			
		Specified max length [m]	Attached during test	Shielded	Coupled to patient(3)
	RF connector –code D violet trunk/roof)	Port not used for SOP2021 (it has V2X interfaces and gateway for SDARS signal towards another ECU)	☐	☒	☐
	RF connector – code C blue (trunk/roof)	>5m	☒	☒	☐
	NanoMQS 20pol	>5m	☒	☐	☐
	NanoMQS 10pol	>8m	☒	☐	☐
	HDBT MATEnet 2-Pol (Roof/Trunk)	>5m	☒	☐	☐
	Antenna Connector grey (Roof)	<0.5m	☒	☒	☐

Supplementary information to the ports……:	-	
Rated power supply ..... :	Voltage and Frequency	
	☒	DC: 12V car battery / attenuator (4,5 V ≤ UB ≤ 18 V; UB typical: 12 V)
Rated Power..... :	12V DC	
Clock frequencies..... :	25MHz;26MHz;32,768kHz;49,58MHz;	
Other parameters ..... :	See Technical description	
Software version..... :	21411A.004_045_017	
Hardware version ..... :	D5	
Dimensions in cm (W x H x D) ... :	160x18x112 mm	
Mounting position ..... :	☐	Table top equipment
	☐	Wall/Ceiling mounted equipment
	☐	Floor standing equipment
	☐	Hand-held equipment
	☒	Other: automotive telematics control unit

Modules/parts..... :	Module/parts of test item	Type	Manufacturer
	-		
Accessories (not part of the test item) ..... :	Description	Type	Manufacturer
	Cable Harness	-	
	2G/3G4G/5G Antenna	-	Hirschmann/ Molex
	E-CALL button/LED	-	
	SOS Loudspeaker	-	

	Wake-up unit Box	-	
Documents as provided by the applicant ..... :	Description	File name	Issue date
	Technical Description		

(3) Only for Medical Equipment

Identification of the client

HARMAN BECKER AUTOMOTIVE SYSTEMS GMBH
BECKER-GOERING-STR. 16, 76307 KARLSBAD, GERMANY

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2021-09-28
Date (finish)	2021-10-05

Document history

Report number	Date	Description
68001RRF.002	2022-01-11	First release.

Environmental conditions

In the control chamber, the following limits were not exceeded during the test:

Temperature	Min. = 15 ºC Max. = 35 ºC
Relative humidity	Min. = 20 % Max. = 75 %

In the semianechoic chamber, the following limits were not exceeded during the test:

Temperature	Min. = 15 ºC Max. = 35 ºC
Relative humidity	Min. = 20 % Max. = 75 %

Remarks and comments

The tests have been performed by the technical personnel: Alfonso Gutiérrez, Miguel Manuel López, Javier Miguel Nadales.

Used instrumentation:

Radiated Measurements:

		Last Calibration	Due Calibration
1.	Semianechoic Absorber Lined Chamber ETS LINDGREN FACT 3 200 STP	N/A	N/A
2.	Shielded Room ETS LINDGREN S101	N/A	N/A
3.	Horn Antenna 1-18 GHz SCHWARZBECK MESS-ELEKTRONIK BBHA 9120 D	2020/08	2023/08
4.	Biconical/Log Antenna 30MHz - 6 GHz ETS LINDGREN 3142E	2020/10	2023/10
5.	RF Preamplifier G>30dB, 1-18GHz BONN ELEKTRONIK BLMA 0118-3A	2020/10	2021/10
6.	Signal and Spectrum Analyzer 10 Hz - 40 GHz ROHDE AND SCHWARZ FSV40	2019/10	2021/10
7.	EMI Test Receiver 7 GHz ROHDE AND SCHWARZ ESR7	2019/10	2021/10
8.	Wideband Radio Communication Tester ROHDE AND SCHWARZ CMW500	2020/07	2021/07
9.	Wideband Radio Communication Tester ROHDE AND SCHWARZ CMW500	N/A	N/A
10.	EMI Test Receiver 7 GHz ROHDE AND SCHWARZ ESR7	2020/12	2022/12
11.	DC Power Supply, 30V/5A KEYSIGHT TECHNOLOGIES U8002A	N/A	N/A
12.	Digital Multimeter FLUKE 175	2020/11	2021/11

Testing verdicts

Not applicable:	N/A
Pass:	P
Fail:	F
Not measured:	N/M

Summary

FCC PART 22 / RSS-132 PARAGRAPH		
Requirement – Test case	**Verdict**	**Remark**
FCC 22.913 / RSS-132 5.4: RF output power	N/M	(1)
FCC 2.1047 / RSS-132 5.2: Modulation characteristics	N/M	(1)
FCC 22.355 / RSS-132 5.3: Frequency stability	N/M	(1)
FCC 2.1049: Occupied Bandwidth	N/M	(1)
FCC 22.917 / RSS-132 5.5: Spurious emissions at antenna terminals	N/M	(1)
FCC 22.917 / RSS-132 5.5: Radiated emissions	P	
Supplementary information and remarks: (1) Test not requested.		

FCC PART 90 PARAGRAPH		
Requirement – Test case	**Verdict**	**Remark**
FCC 90.635 (b): RF output power	N/M	(1)
FCC 2.1047: Modulation characteristics	N/M	(1)
FCC 90.213 Frequency stability	N/M	(1)
FCC 2.1049: Occupied Bandwidth	N/M	(1)
FCC 90.691 Spurious emissions at antenna terminals (Emission mask requirements for EA-based systems)	N/M	(1)
FCC 90.691: Radiated emissions	P	
Supplementary information and remarks: (1) Test not requested.		

Appendix A: Test results for FCC Part 22 & 90 / RSS-132

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TEST CONDITIONS

The module with the highest antenna gain has been tested using the worst-case obtained for conducted output power. And the other module has been tested using an adjacent channel with a setting that would allow communication in the same band to both modules simultaneously.

(*): Data provided by the Applicant.

POWER SUPPLY (*):

Vnominal: 12 Vdc
Type of Power Supply: External DC (vehicle battery).

TEST FREQUENCIES (*):

2G Band 850 MHz. GPRS and EDGE modulations. MIMO 2x2:

Module NAD1		Module NAD2	
Low Channel (128)	824.2 MHz	Adjacent channel to Low Channel (130)	824.6 MHz
Middle Channel (190)	836.6 MHz	Adjacent channel to Middle Channel (192)	837 MHz
High Channel (251)	848.8 MHz	Adjacent channel to High Channel (249)	848.4 MHz

3G Band V. WCDMA and HSUPA modulations. MIMO 2x2

Module NAD1		Module NAD2	
Low Channel (4132)	826.4 MHz	Adjacent channel to Low Channel (4157)	831.4 MHz
Middle Channel (4182)	836.4 MHz	Adjacent channel to Middle Channel (4207)	841.4 MHz
High Channel (4233)	846.6 MHz	Adjacent channel to High Channel (4208)	841.6 MHz

LTE Band 5 (824-849 MHz). QPSK and 16QAM modulations. MIMO 2x2:

	Channel (Frequency)			
	BW = 1.4 MHz	BW = 3 MHz	**BW=5 MHz**	BW=10 MHz
Low	20407 (824.70 MHz)	20415 (825.50 MHz)	20425 (826.50 MHz)	20450 (829.00 MHz)
Middle	20525 (836.50 MHz)	20525 (836.50 MHz)	20525 (836.50 MHz)	20525 (836.50 MHz)
High	20643 (848.30 MHz)	20635 (847.50 MHz)	20625 (846.50 MHz)	20600 (844.00 MHz)

Module NAD1		Module NAD2	
Low Channel (20425)	826.5 MHz	Adjacent channel to Low Channel (20475)	831.5 MHz
Middle Channel (20525)	836.5 MHz	Adjacent channel to Middle Channel (20575)	841.5 MHz
High Channel (20625)	846.5 MHz	Adjacent channel to High Channel (20575)	841.5 MHz

LTE Band 26 (sub-band 824-849 MHz). QPSK and 16QAM modulations. MIMO 2x2:

	Channel (Frequency)				
	BW = 1.4 MHz	BW = 3 MHz	BW = 5 MHz	BW = 10 MHz	BW = 15 MHz
Low	26797 (824.70 MHz)	26805 (825.50 MHz)	26815 (826.50 MHz)	26840 (829.00 MHz)	26865 (831.50 MHz)
Middle	26915 (836.50 MHz)	26915 (836.50 MHz)	26915 (836.50 MHz)	26915 (836.50 MHz)	26915 (836.50 MHz)
High	27033 (848.30 MHz)	27025 (847.50 MHz)	27015 (846.50 MHz)	26990 (844.00 MHz)	26965 (841.50 MHz)

NOTE: LTE Band 26 sub-band 824-849 MHz is completely included in LTE Band 5, so the channels of Band 5 were tested to give conformity to the assigned block.

LTE Band 26 (sub-band 814-824 MHz). QPSK and 16QAM modulations. MIMO 2x2:

	Channel (Frequency)				
	BW = 1.4 MHz	**BW = 3 MHz**	BW = 5 MHz	BW = 10 MHz	BW = 15 MHz
Low	26697 (814.70 MHz)	26705 (815.5 MHz)	26715 (816.5 MHz)	N/A	26765 (821.5 MHz)
Middle	26740 (819 MHz)	26740 (819 MHz)	26740 (819 MHz)	26740 (819 MHz)	N/A
High	26783 (823.30 MHz)	26775 (822.50 MHz)	26765 (821.50 MHz)	N/A	N/A

Module NAD1		Module NAD2	
Low Channel (26705)	815.5 MHz	Adjacent channel to Low Channel (26735)	818.5 MHz
Middle Channel (26740)	819 MHz	Adjacent channel to Middle Channel (26770)	822 MHz
High Channel (26775)	822.5 MHz	Adjacent channel to High Channel (26745)	819.5 MHz

Radiated Emissions

SPECIFICATION:

* FCC §2.1051 and §22.917 (a): The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

* FCC §90.691 (a)(2): Emission mask requirements for EA-based systems:
For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 43 + 10Log_{10}(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

* RSS-132. 5.5: Mobile and base station equipment shall comply with the limits in (i) and (ii) below.

i. In the first 1.0 MHz band immediately outside and adjacent to each of the sub-bands specified in Section 5.1, the power of emissions per any 1% of the occupied bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 $\log_{10}$ P (watts).

ii. After the first 1.0 MHz immediately outside and adjacent to each of the sub-bands, the power of emissions in any 100 kHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 $\log_{10}$ P (watts). If the measurement is performed using 1% of the occupied bandwidth, power integration over 100 kHz is required.

METHOD:

The measurement was performed with the EUT inside an anechoic chamber. The spectrum was scanned from 30 MHz to at least the 10th harmonic of the High frequency generated within the equipment.

The EUT was placed on a 1 meter high non-conductive stand at a 3 meter distance from the measuring antenna.

Detected emissions were maximized at each frequency by rotating the EUT and adjusting the measuring antenna height and polarization. The maximum field strength (dBµV/m) is measured and recorded.

The maximum field strength (dBµV/m) of each detected emission at less than 20 dB respect to the limit is converted to an equivalent EIRP level (dBm) according to ANSI C63.26 with the formula:

EIRP (dBm) = E (dBµV/m) + 20 log(D) - 104.8; where D is the measurement distance (in the far field region) in m.
D = 3 m

Measurement Limit:

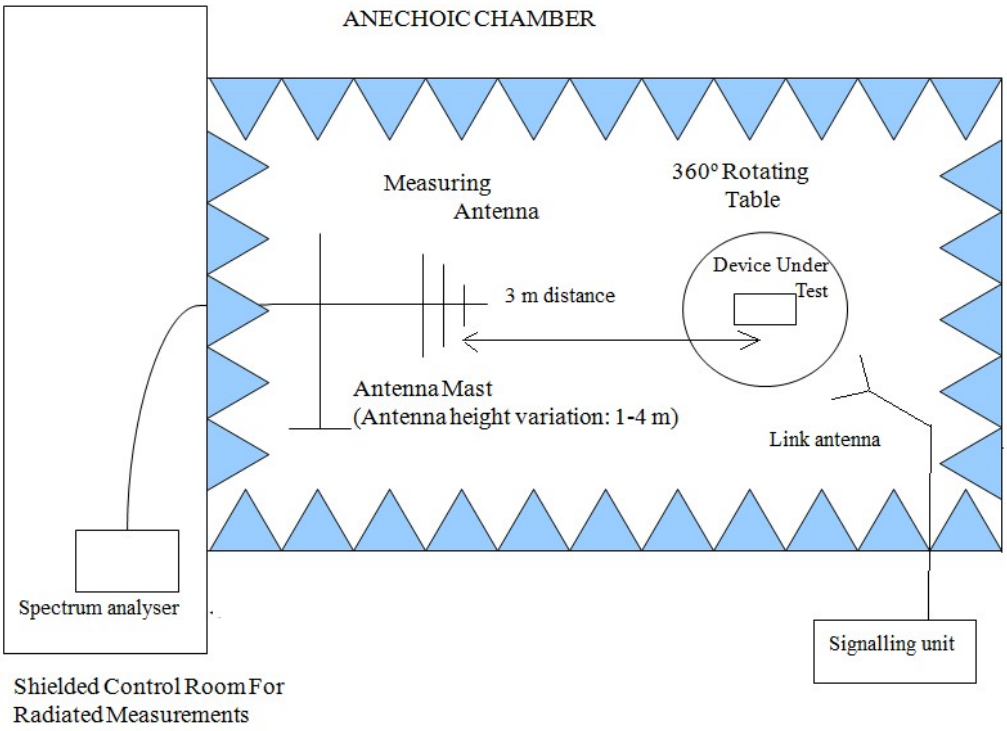
According to specification. the power of emissions shall be attenuated below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB. P in Watts.
At Po transmitting power. the specified minimum attenuation becomes 43+10log (Po). and the level in dBm relative Po becomes:

Po (dBm) – [43 + 10 log (Po in mWatts) - 30] = - 13 dBm

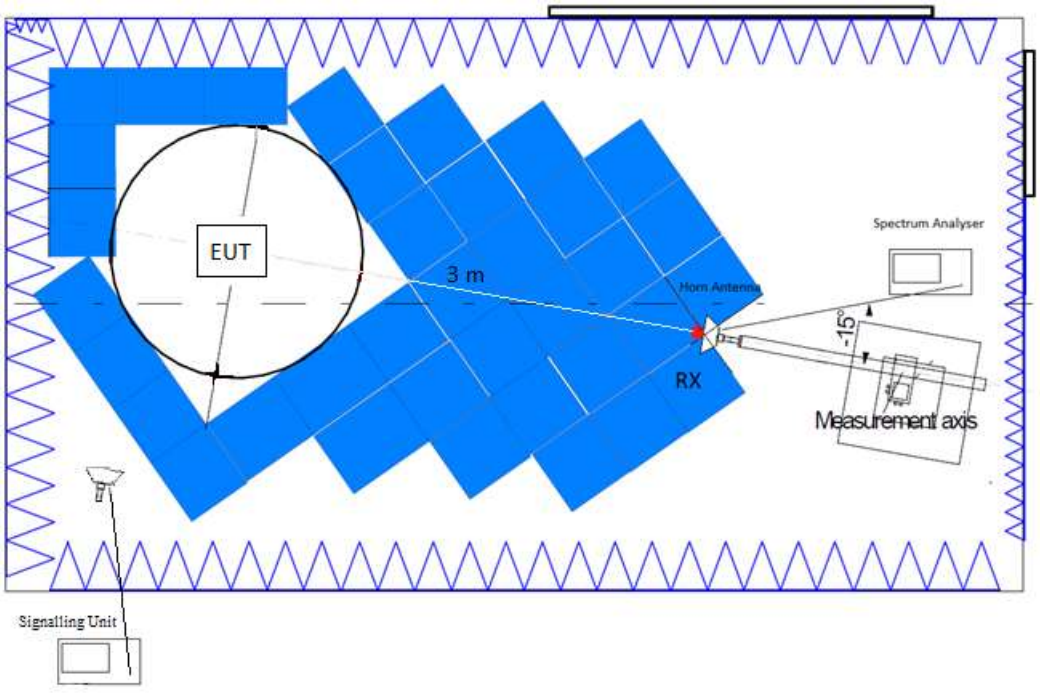
A resolution bandwidth / video bandwidth of 100 kHz / 300 kHz or higher were used for frequencies below 1 GHz and 1 MHz / 3 MHz for frequencies above 1 GHz.

TEST SETUP:

Radiated measurements below 1 GHz:



Radiated measurements above 1 GHz up to 8.5 GHz:



RESULTS:

2G Band 850 MHz:

GPRS and EDGE modulations: A preliminary scan determined the GPRS modulation as the worst-case. The following results are the ones of the worst-case.

- LOW CHANNEL:

Frequency range 30 MHz - 1 GHz:

No spurious frequencies at less than 20 dB below the limit.

Frequency range 1 - 8.5 GHz:

No spurious frequencies at less than 20 dB below the limit.

- MIDDLE CHANNEL:

Frequency range 30 MHz - 1 GHz:

No spurious frequencies at less than 20 dB below the limit.

Frequency range 1 - 8.5 GHz:

Spurious frequencies at less than 20 dB below the limit:

Spurious frequency (GHz)	E.I.R.P (dBm)	Polarization	Detector
2.509375	-31.71	V	Peak

- HIGH CHANNEL:

Frequency range 30 MHz - 1 GHz:

No spurious frequencies at less than 20 dB below the limit.

Frequency range 1 - 8.5 GHz:

Spurious frequencies at less than 20 dB below the limit:

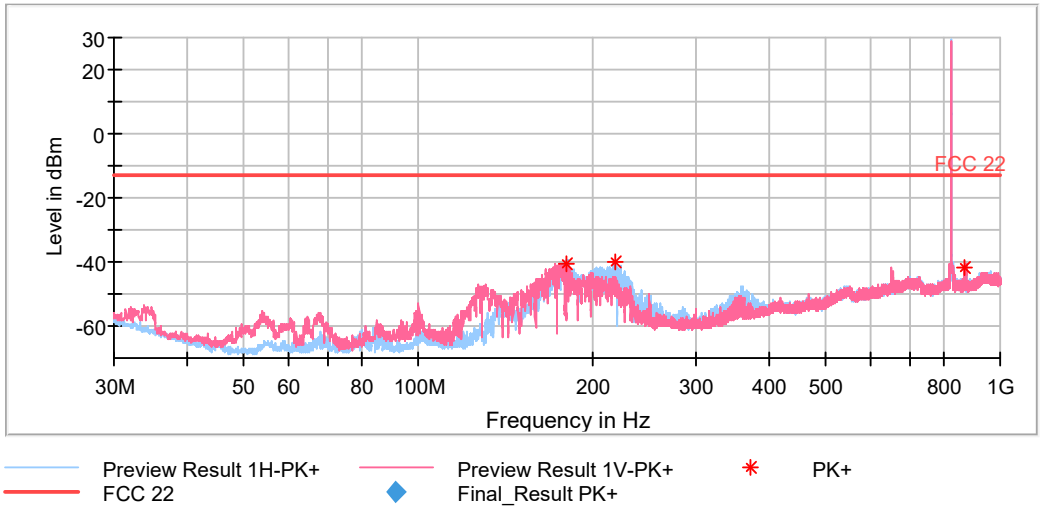
Spurious frequency (GHz)	E.I.R.P (dBm)	Polarization	Detector
2.5459375	-29.43	V	Peak

Measurement Uncertainty (dB): <± 5.08 for f ≥ 30 MHz up to 1 GHz
<± 5.13 for f ≥ 1 GHz up to 8.5 GHz

Verdict: PASS

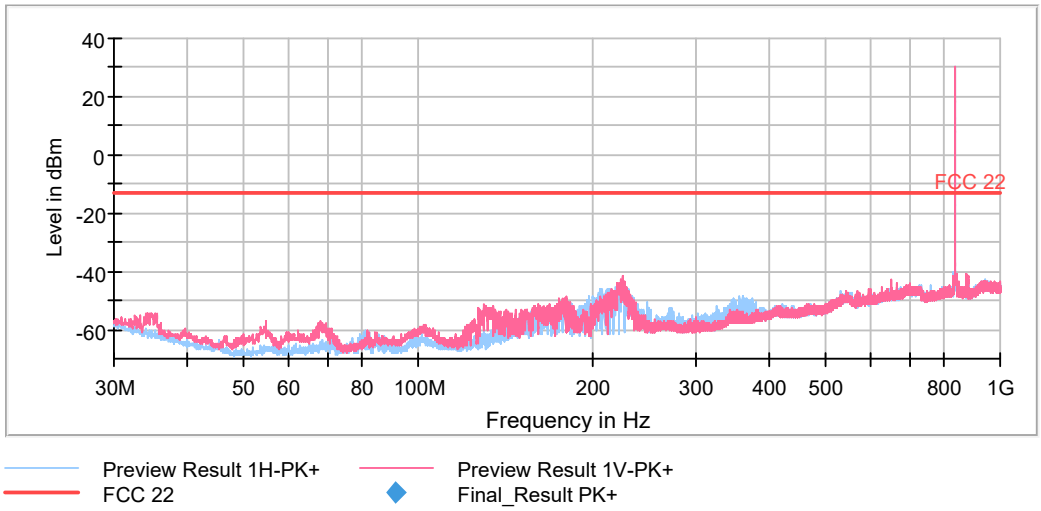
FREQUENCY RANGE 30 MHz - 1 GHz (worst-case):

- Low Channel:



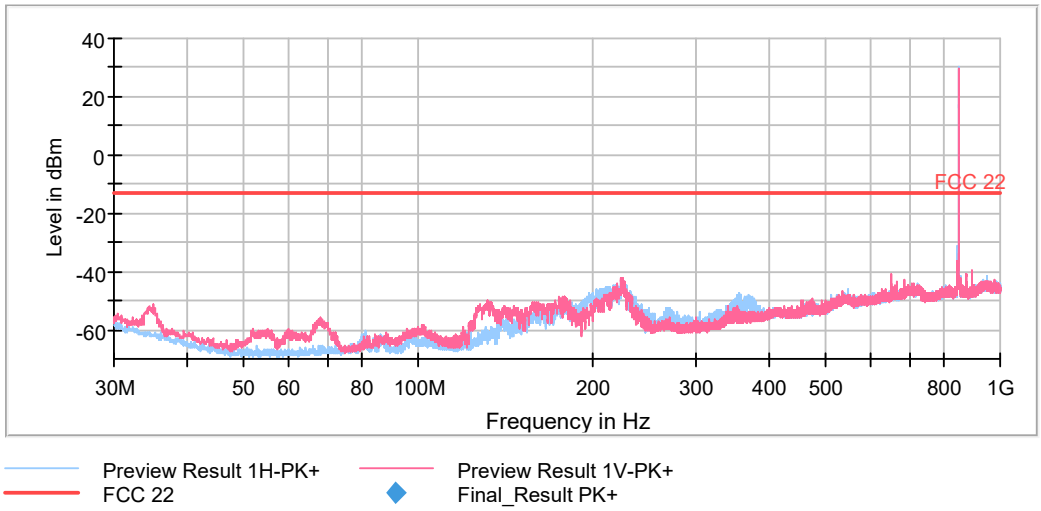
The peak above the limit is the carrier frequency.

- Middle Channel:



The peak above the limit is the carrier frequency.

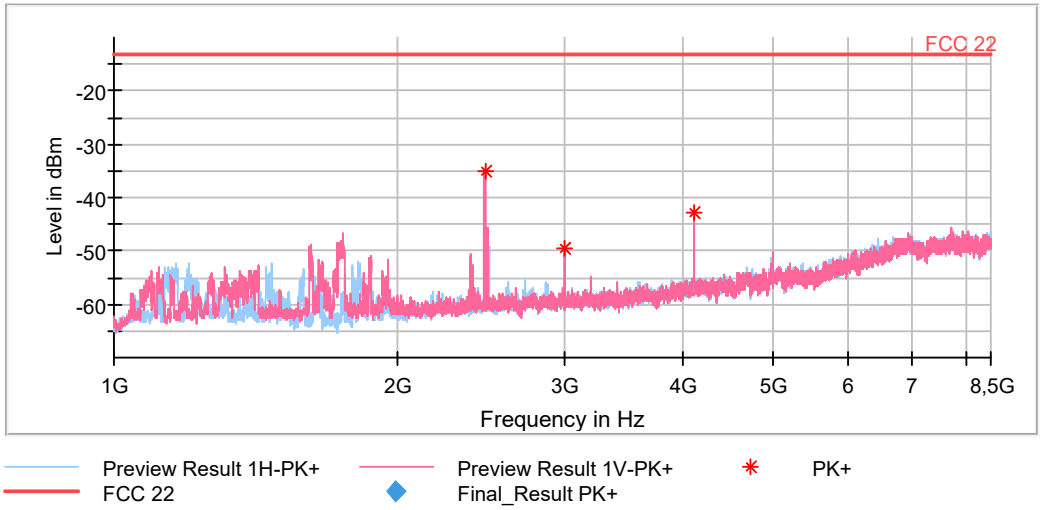
- High Channel:



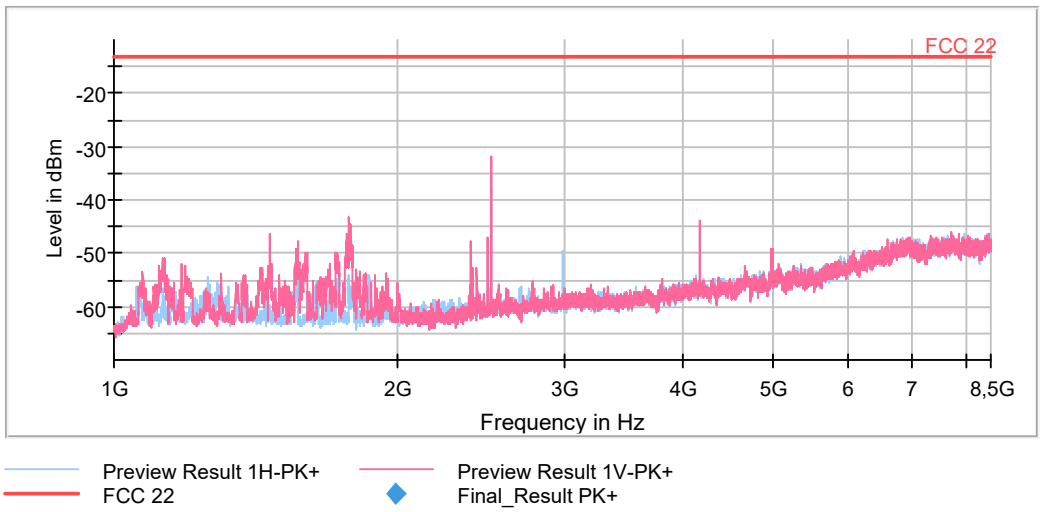
The peak above the limit is the carrier frequency.

FREQUENCY RANGE 1 - 8.5 GHz (worst-case):

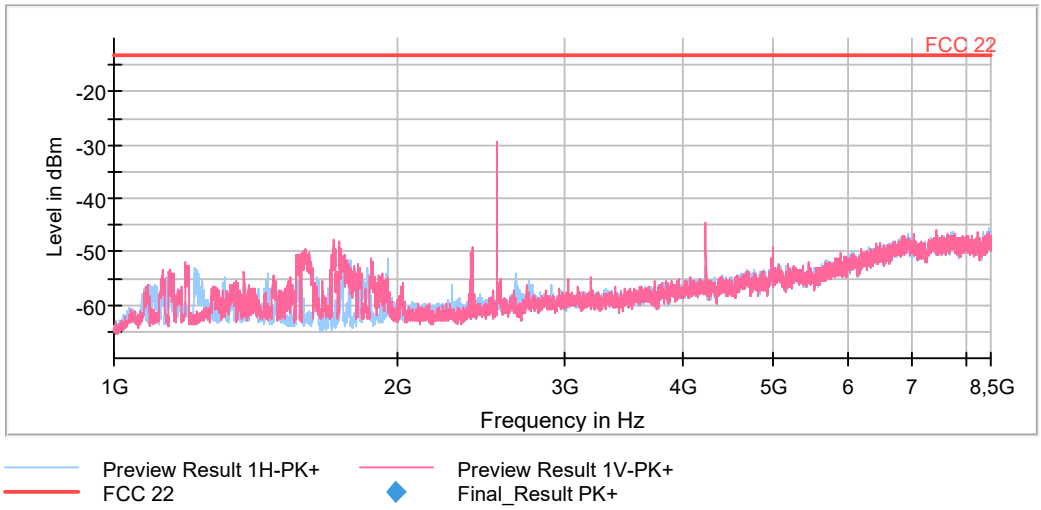
- Low Channel:



- Middle Channel:



- High Channel:



3G Band V:

WCDMA and HSUPA modulations: A preliminary scan determined the HSUPA modulation as the worst-case. The following results are the ones of the worst-case.

- LOW CHANNEL:

Frequency range 30 MHz - 1 GHz:

No spurious frequencies at less than 20 dB below the limit.

Frequency range 1 - 8.5 GHz:

No spurious frequencies at less than 20 dB below the limit.

- MIDDLE CHANNEL:

Frequency range 30 MHz - 1 GHz:

No spurious frequencies at less than 20 dB below the limit.

Frequency range 1 - 8.5 GHz:

Spurious frequencies at less than 20 dB below the limit:

Spurious frequency (GHz)	E.I.R.P (dBm)	Polarization	Detector
2.50796875	-32.71	V	Peak

- HIGH CHANNEL:

Frequency range 30 MHz - 1 GHz:

No spurious frequencies at less than 20 dB below the limit.

Frequency range 1 - 8.5 GHz:

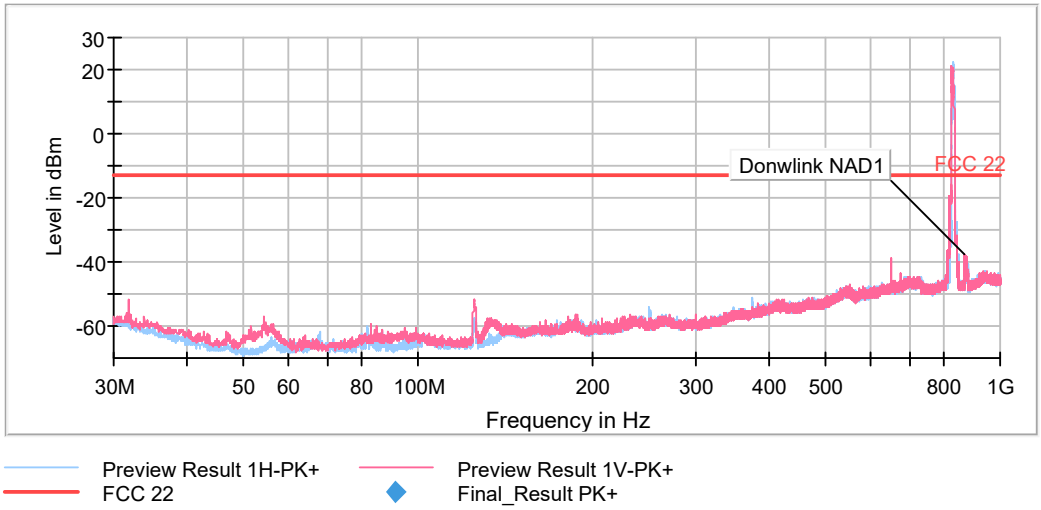
No spurious frequencies at less than 20 dB below the limit.

Measurement Uncertainty (dB): <± 5.08 for f ≥ 30 MHz up to 1 GHz
<± 5.13 for f ≥ 1 GHz up to 8.5 GHz

Verdict: PASS

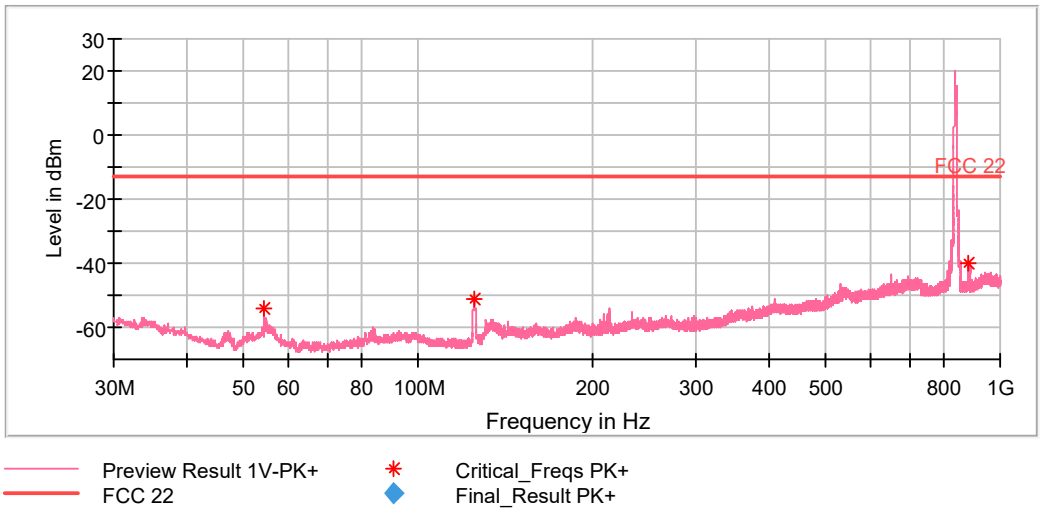
FREQUENCY RANGE 30 MHz - 1 GHz (worst-case):

- Low Channel:



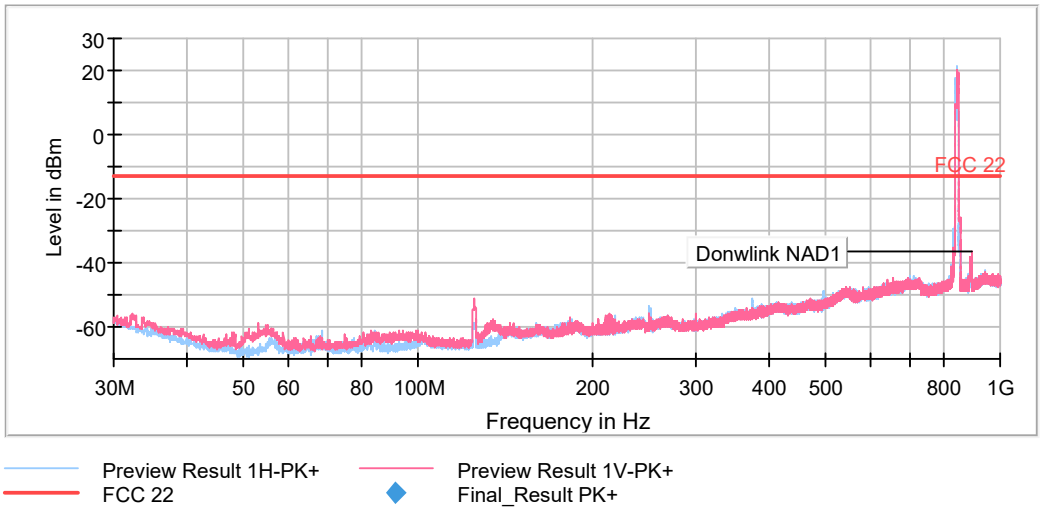
The peak above the limit is the carrier frequency. The peaks at 871.4MHz and 876.4MHz correspond to the downlink signals.

- Middle Channel:



The peak above the limit is the carrier frequency. The peak at 881.4MHz corresponds to the downlink signal.

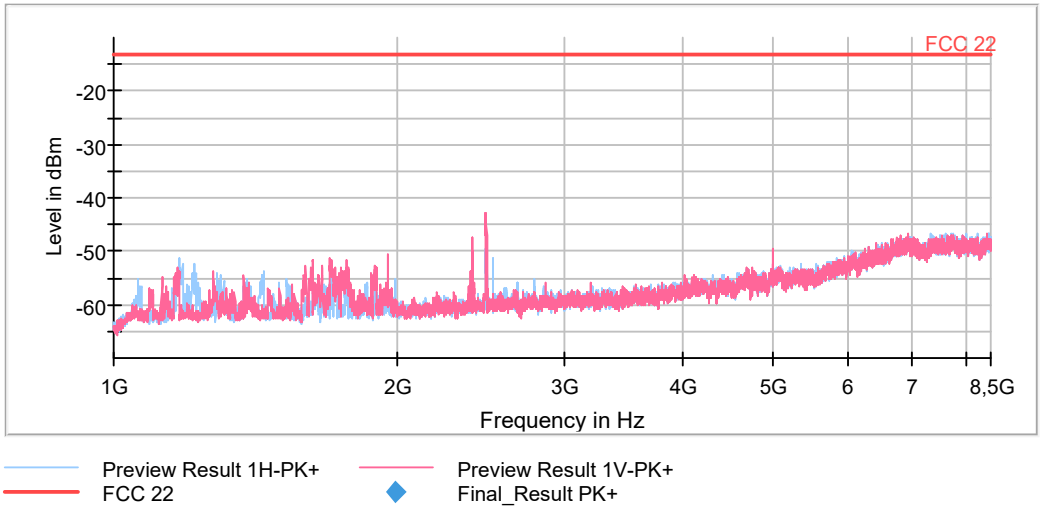
- High Channel:



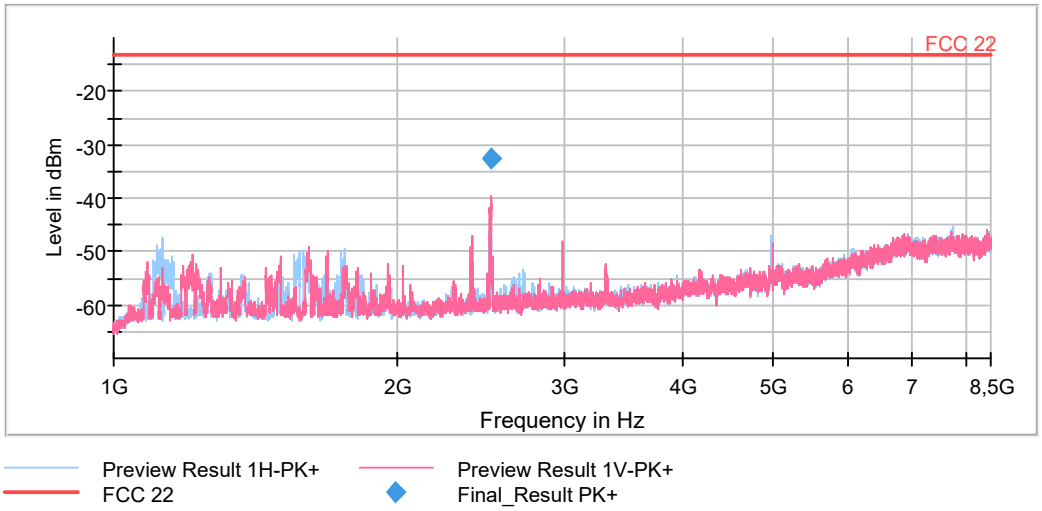
The peak above the limit is the carrier frequency. The peak at 891.6MHz corresponds to the downlink signal.

FREQUENCY RANGE 1 - 8.5 GHz (worst-case):

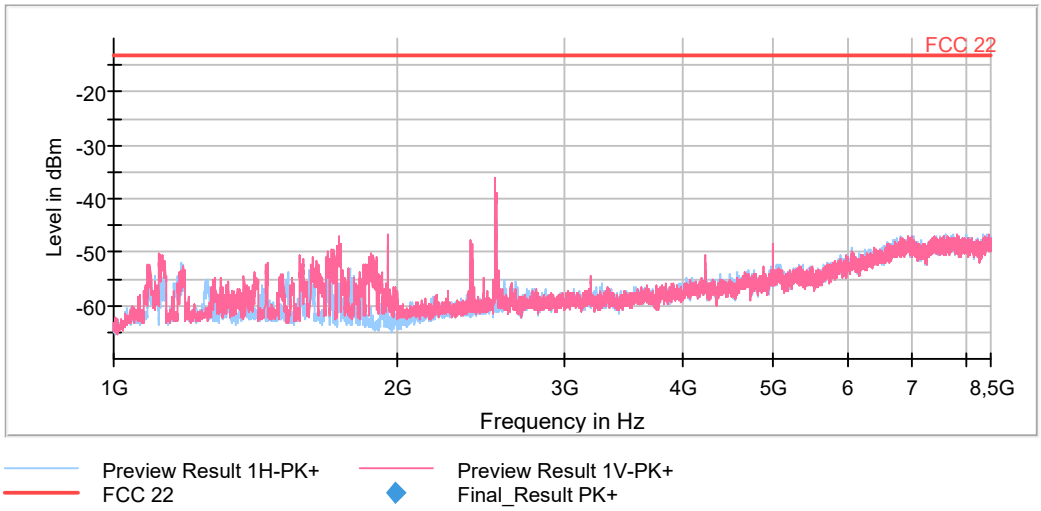
- Low Channel:



- Middle Channel:



- High Channel:



824-849 MHz (LTE Band 5 and this sub-band of the LTE Band 26):

QPSK and QAM modulations: A preliminary scan determined the QPSK modulation, Nominal Bandwidth 5 MHz, Resource Block Size 1, Resource Block Offset 0 as the worst-case.
The following results are the ones of the worst-case.

- LOW CHANNEL:

Frequency range 30 MHz - 1 GHz:

No spurious frequencies at less than 20 dB below the limit.

Frequency range 1 - 8.5 GHz:

No spurious frequencies at less than 20 dB below the limit.

- MIDDLE CHANNEL:

Frequency range 30 MHz - 1 GHz:

No spurious frequencies at less than 20 dB below the limit.

Frequency range 1 - 8.5 GHz:

Spurious frequencies at less than 20 dB below the limit:

Spurious frequency (GHz)	E.I.R.P (dBm)	Polarization	Detector
2.5028125	-28.37	V	Peak

- HIGH CHANNEL:

Frequency range 30 MHz - 1 GHz:

No spurious frequencies at less than 20 dB below the limit.

Frequency range 1 - 8.5 GHz:

Spurious frequencies at less than 20 dB below the limit:

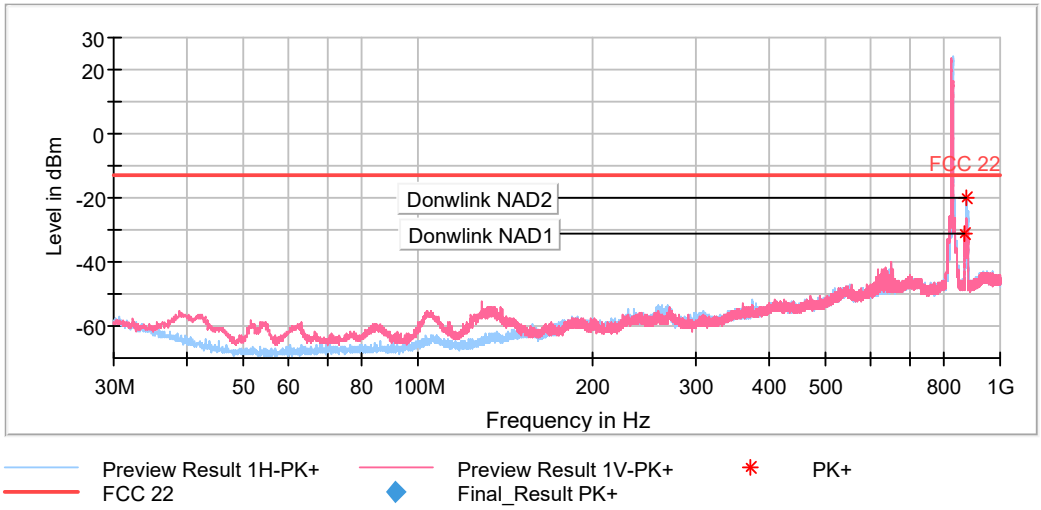
Spurious frequency (GHz)	E.I.R.P (dBm)	Polarization	Detector
2.5328125	-27.97	V	Peak

Measurement Uncertainty (dB): <± 4.99 for f ≥ 30 MHz up to 1 GHz
<± 4.98 for f ≥ 1 GHz up to 8.5 GHz

Verdict: PASS

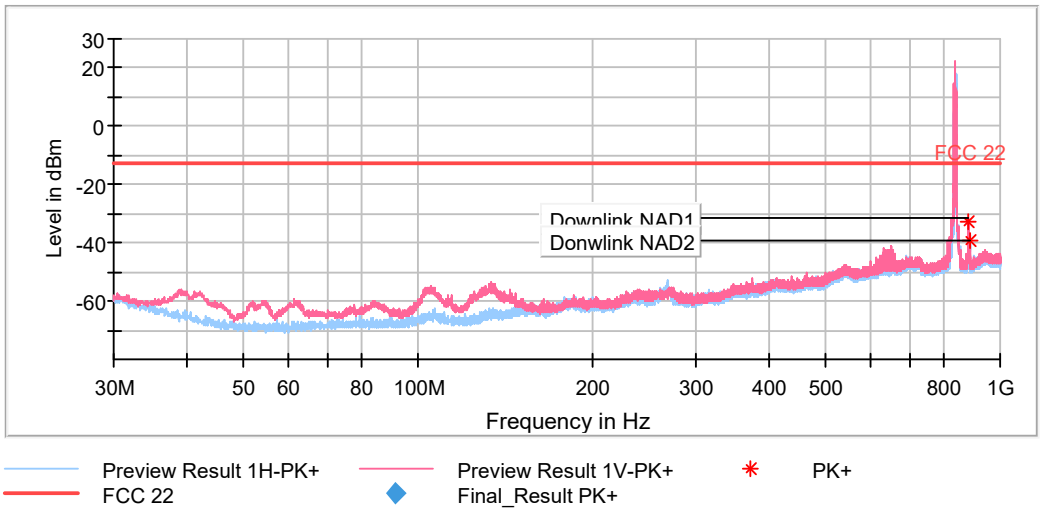
FREQUENCY RANGE 30 MHz - 1 GHz (worst-case):

- Low Channel:



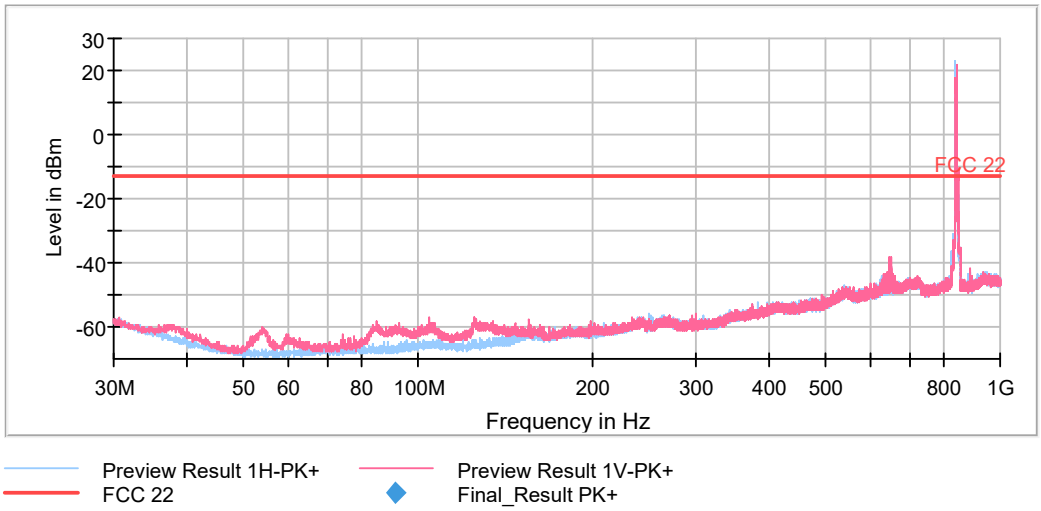
The peak above the limit is the carrier frequency. The peaks at 871.5MHz and 876.5MHz correspond to the downlink signals.

- Middle Channel:



The peak above the limit is the carrier frequency. The peaks at 881.5MHz and 886.5MHz correspond to the downlink signals.

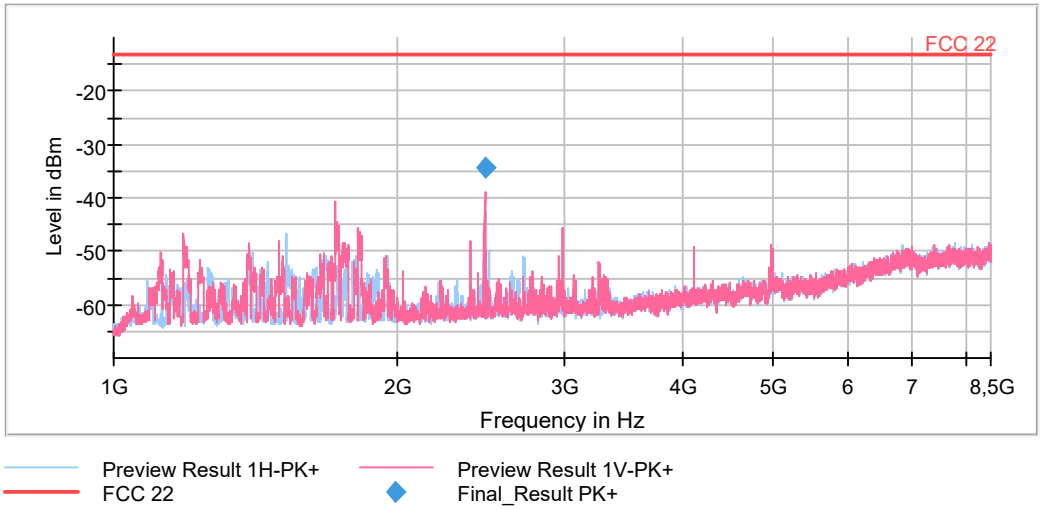
- High Channel:



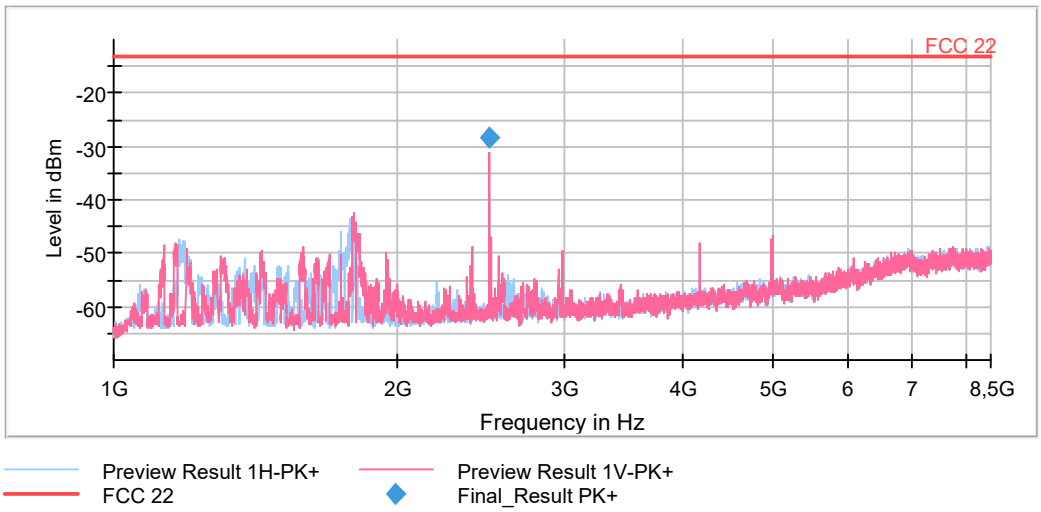
The peak above the limit is the carrier frequency.

FREQUENCY RANGE 1 - 8.5 GHz (worst-case):

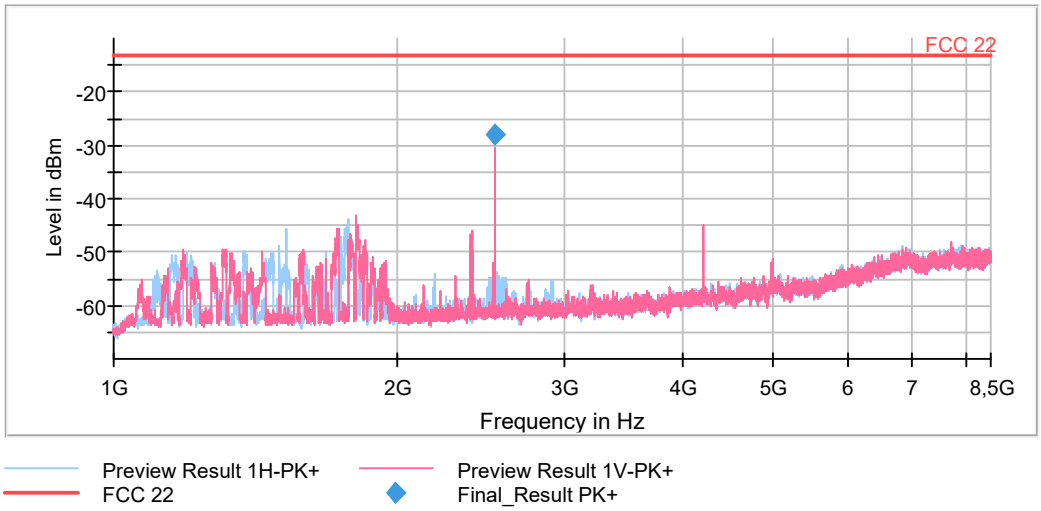
- Low Channel:



- Middle Channel:



- High Channel:



814-824 MHz (Sub-band of the LTE Band 26):

QPSK and QAM modulations: A preliminary scan determined the QPSK modulation, Nominal Bandwidth 3 MHz, Resource Block Size 1, Resource Block Offset 0 as the worst-case to maintain the two modules with established communication.
The following results are the ones of the worst-case.

- LOW CHANNEL:

Frequency range 30 MHz - 1 GHz:

No spurious frequencies at less than 20 dB below the limit.

Frequency range 1 - 8.5 GHz:

Spurious frequencies at less than 20 dB below the limit:

Spurious frequency (GHz)	E.I.R.P (dBm)	Polarization	Detector
2.44238	-28.78	V	Peak

- MIDDLE CHANNEL:

Frequency range 30 MHz - 1 GHz:

No spurious frequencies at less than 20 dB below the limit.

Frequency range 1 - 8.5 GHz:

No spurious frequencies at less than 20 dB below the limit.

- HIGH CHANNEL:

Frequency range 30 MHz - 1 GHz:

No spurious frequencies at less than 20 dB below the limit.

Frequency range 1 - 8.5 GHz:

Spurious frequencies at less than 20 dB below the limit:

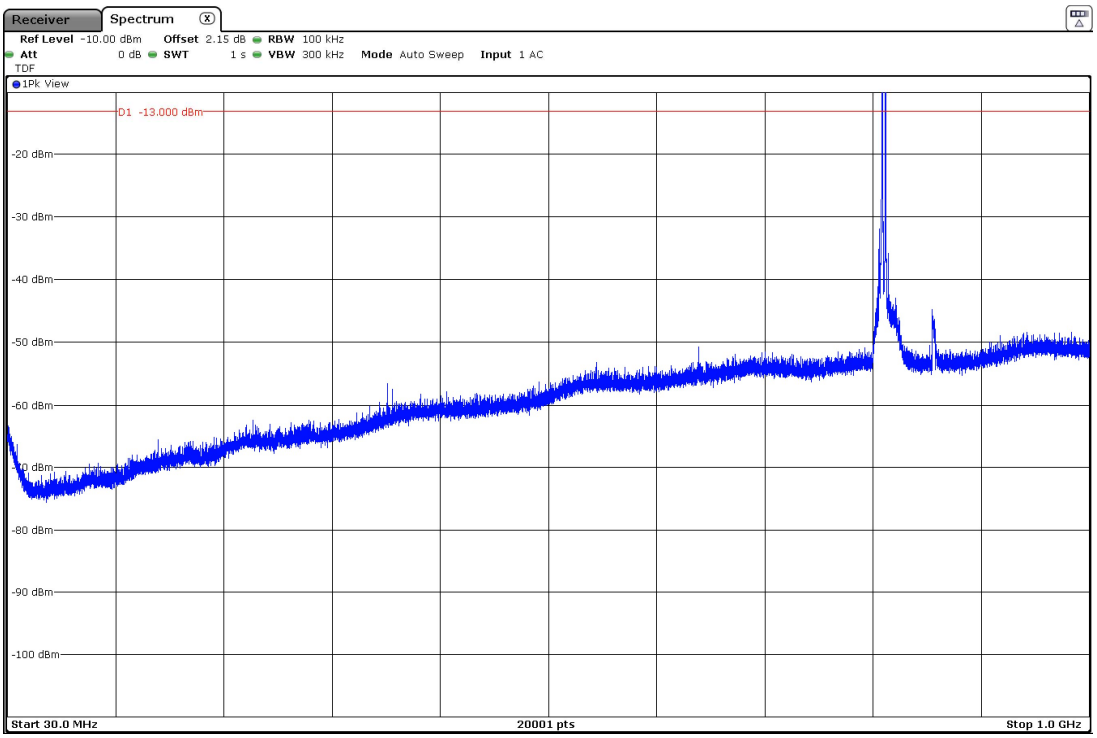
Spurious frequency (GHz)	E.I.R.P (dBm)	Polarization	Detector
2.46388	-31.79	V	Peak

Measurement Uncertainty (dB): <± 4.99 for f ≥ 30 MHz up to 1 GHz
<± 4.98 for f ≥ 1 GHz up to 10 GHz

Verdict: PASS

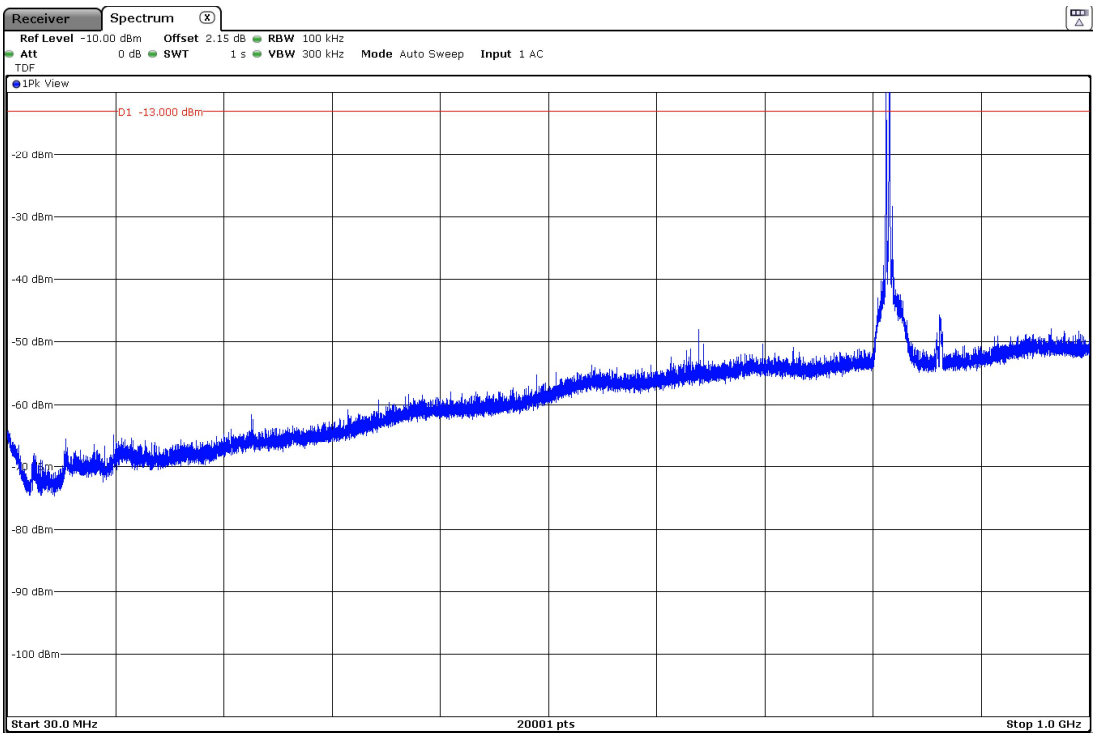
FREQUENCY RANGE 30 MHz - 1 GHz (worst-case):

- Low Channel:



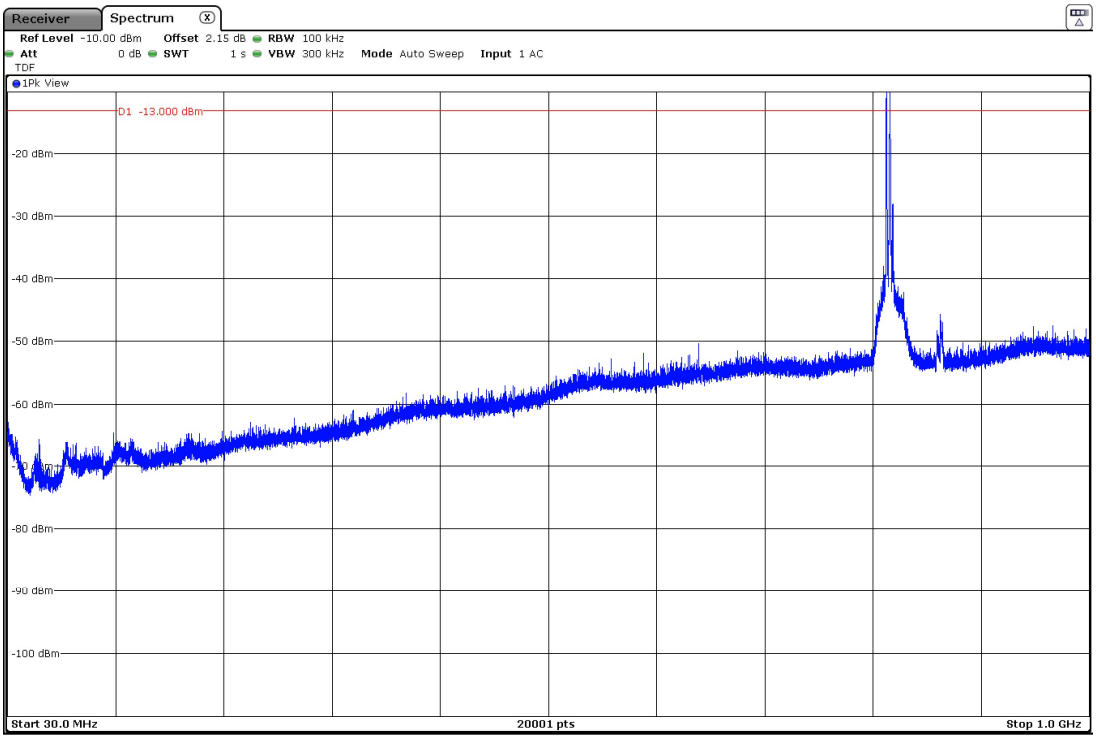
The peak above the limit is the carrier frequency. The peaks at 860.5MHz and 863.5MHz correspond to the downlink signals.

- Middle Channel:



The peak above the limit is the carrier frequency. The peaks at 864MHz and 867MHz correspond to the downlink signals.

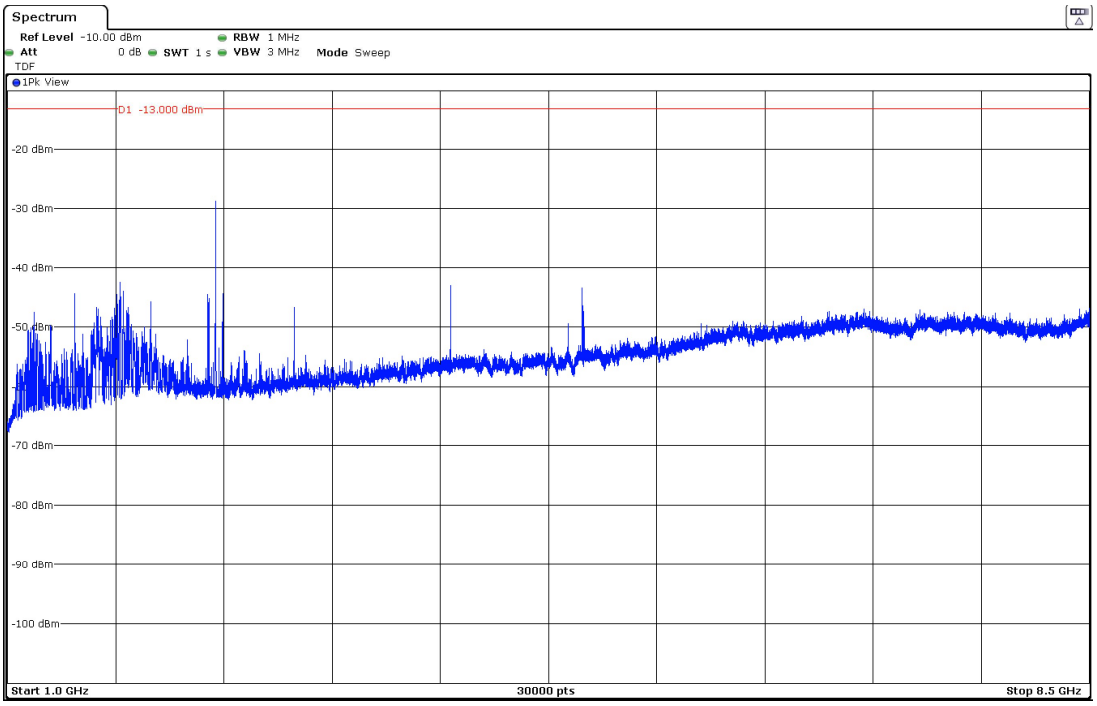
- High Channel:



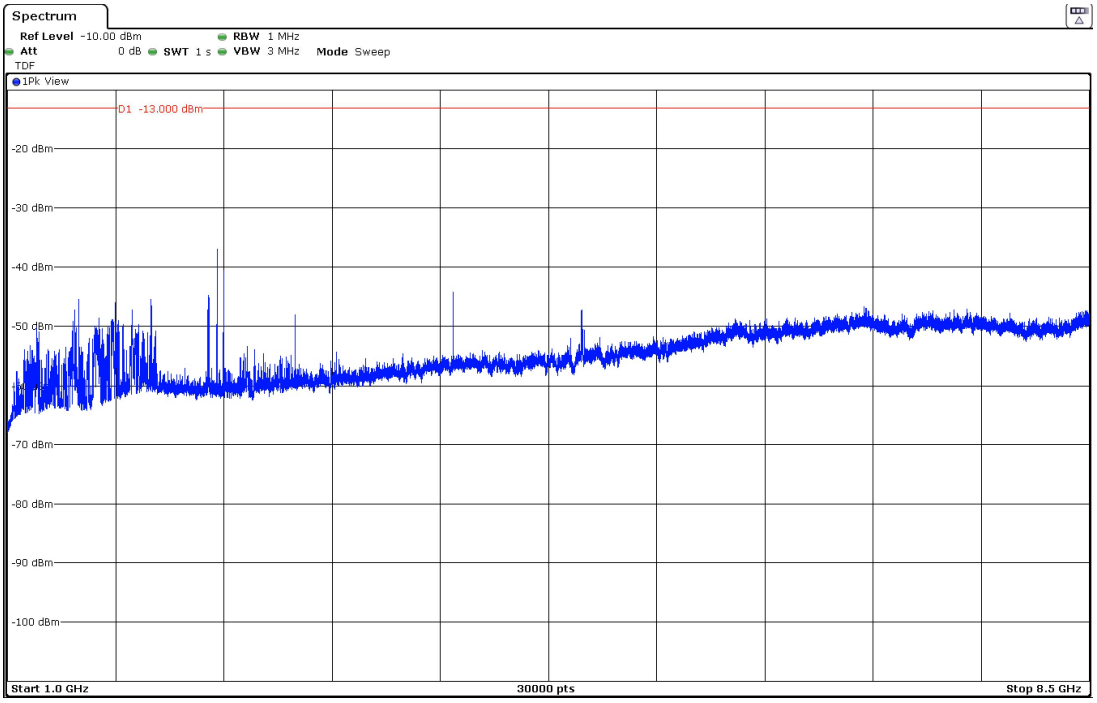
The peak above the limit is the carrier frequency. The peaks at 864.5MHz and 867.5MHz correspond to the downlink signals.

FREQUENCY RANGE 1 - 8.5 GHz (worst-case):

- Low Channel:



- Middle Channel:



- High Channel: