DEKRA Testing and Certification, S.A.U.
Parque Tecnológico de Andalucía,
c/ Severo Ochoa nº 2 · 29590 Campanillas · Málaga · España
C.I.F. A29 507 456

Test report No:

NIE: 65531RRF.002

Test report

REFERENCE STANDARD:
USA FCC Part 24
CANADA RSS-133

(*) Identification of item tested	Vaisala Beacon Edge Gateway EGW501
(*) Trademark	VAISALA
(*) Model and /or type reference	EGW501
Other identification of the product	SW version: V0708_01.002.01.002 HW version: B FCC ID: 2AO39-EGW501 IC: 23830-EGW501
(*) Features	GSM, WCDMA, LTE
Applicant	Vaisala Oyj Vanha Nurmijärventie 21, 01670 Vantaa FINLAND
Test method requested, standard	USA FCC Part 24 (10-1-19 Edition). CANADA RSS-133 Issue 6, Jan. 2018. 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 RAFAEL LÓPEZ MARTÍN 2021.01.14 12:26:59 +01'00'
Date of issue	2021-01-13
Report template No	FDT08_23 (*) "Data provided by the client"

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Competences and guarantees

DEKRA Testing and Certification is a testing laboratory accredited by the National Accreditation Body (ENAC - Entidad Nacional de Acreditación), to perform the tests indicated in the Certificate No. 51/LE 147.

DEKRA Testing and Certification is a FCC-recognized accredited testing laboratory with appropriate scope of accreditation that include testing performed in this test report.

DEKRA Testing and Certification is an ISED-recognized accredited testing laboratory with appropriate scope of accreditation that include testing performed in this test report.

In order to assure the traceability to other national and international laboratories, DEKRA Testing and Certification has a calibration and maintenance program for its measurement equipment.

DEKRA Testing and Certification guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated on the report and, it is based on the knowledge and technical facilities available at DEKRA Testing and Certification at the time of performance of the test.

DEKRA Testing and Certification is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

IMPORTANT: No parts of this report may be reproduced or quoted out of context, in any form or by any means, except in full, without the previous written permission of DEKRA Testing and Certification.

General conditions

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or competent Authorities.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA Testing and Certification.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA Testing and Certification and the Accreditation Bodies.

Uncertainty

Uncertainty (factor k=2) was calculated according to the DEKRA Testing and Certification 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 EGW501 is a compact weather station for environmental monitoring. The complete solution provides measurements, data collection, and data visualization in one package. Vaisala Beacon Station includes Vaisala Beacon Edge Gateway EGW501, a multi parameter Vaisala Weather Transmitter WXT536,powering equipment, and mounting accessories. To maximize ease-of-use, the station comes with a data plan and a variety of service packages to choose from.

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
65531/003	Vaisala Beacon Station BWS500	EGW501	S3240004	2020/10/01
65531/038	Power Supply Unit	PSU501	S3926080	2020/10/14

Auxiliary elements used with the Sample S/01:

Control Nº	Description	Model	Serial Nº	Date of reception
65531/013	Load	--	--	2020/10/01
65531/017	DC out cable	--	--	2020/10/01
65531/021	DC in cable	--	--	2020/10/01
65531/039	Power Cable	--	--	2020/10/14

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

- Sample S/02 is composed of the following elements:

Control Nº	Description	Model	Serial Nº	Date of reception
65531/004	Vaisala Beacon Station BWS500	EGW501	S3240010	2020/10/01
65531/006	Weather Transmitter	WXT536	S3240235	2020/10/01
65531/038	Power Supply Unit	PSU501	S3926080	2020/10/14

Auxiliary elements used with the Sample S/02:

Control Nº	Description	Model	Serial Nº	Date of reception
65531/014	Load	--	--	2020/10/01
65531/015	WXT cable	--	--	2020/10/01
65531/017	DC out cable	--	--	2020/10/01
65531/021	DC in cable	--	--	2020/10/01
65531/039	Power Cable	--	--	2020/10/14

Sample S/02 has undergone the following test(s): The radiated tests for 2G 1900 MHz, 3G Band II and LTE Band 2 16QAM indicated in Appendix A.

- Sample S/03 is composed of the following elements:

Control Nº	Description	Model	Serial Nº	Date of reception
65531/042	Vaisala Beacon Station BWS500	EGW501	S324008	2020/11/23
65531/006	Weather Transmitter	WXT536	S3240235	2020/10/01
65531/038	Power Supply Unit	PSU501	S3926080	2020/10/14

Auxiliary elements used with the Sample S/03:

Control Nº	Description	Model	Serial Nº	Date of reception
65531/014	Load	--	--	2020/10/01
65531/015	WXT cable	--	--	2020/10/01
65531/017	DC out cable	--	--	2020/10/01
65531/021	DC in cable	--	--	2020/10/01
65531/039	Power Cable	--	--	2020/10/14

Sample S/03 has undergone the following test(s): The radiated tests for LTE band 2 QPSK indicated in Appendix A.

Test sample description

Ports…… :	Port name and description	Cable				
		Specified length [m]	Attached during test	Shielded		
	PSU501	2	☒	☐		
	PSU502	2	☒	☐		
	WXT	10	☒	☒		
Supplementary information to the ports…… :	Connecting power cable to gateway turns station automatically on if power is available from battery or other power source. Other ports reserved future use.					
Rated power supply .....:	Voltage and Frequency		Reference poles			
			L1	L2	L3	N	PE
	☒	AC: 100 – 240 V	☒	☒	☐	☐	☒
	☒	DC: 9 – 32 V					
Rated Power .....:	--						
Clock frequencies.....:	max. 2GHz						
Other parameters .....:	--						
Software version .....:	V0708_01.002.01.002						
Hardware version .....:	B						
Dimensions in cm (L x W x D).....:	306 x 184 x 156						
Mounting position .....:	☐	Table top equipment					
	☒	Wall/Ceiling mounted equipment					
	☐	Floor standing equipment					
	☐	Hand-held equipment					
	☐	Other:					
Modules/parts.....:	Module/parts of test item		Type	Manufacturer		
	--					
Accessories (not part of the test item) .....:	Description	Type	Manufacturer			
	PSU501, AC power supply	PSU501	Vaisala Oyj			
	PSU502, DC solar power supply	PSU502	Vaisala Oyj			
	WXT536,Weather transmitter	WXT536	Vaisala Oyj			
Documents as provided by the applicant.....:	Description	File name	Issue date			
	--					

Identification of the client

Vaisala Oyj
Vanha Nurmijärventie 21, 01670 Vantaa FINLAND

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2020-10-28
Date (finish)	2020-12-02

Document history

Report number	Date	Description
65531RRF.002	2021-01-13	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 %

In the chamber for conducted measurements, 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: José Manuel Jimenez, Pablo Redondo, Verónica García, Cristina Calle and Nicolás Salguero.

Used instrumentation:

Conducted Measurements

		Last Calibration	Due Calibration
1.	Shielded Room ETS LINDGREN S101	N.A.	N.A.
2.	Wideband Radio Communication tester ROHDE AND SCHWARZ CMW500	2020/07	2021/07
3.	Digital Multimeter FLUKE 179	2020/10	2021/10

Radiated Measurements

		Last Cal. date	Cal. due date
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.	Biconical/Log Antenna ETS LINDGREN 3142E	2020/04	2023/04
4.	EMI Test Receiver 7 GHz ROHDE AND SCHWARZ ESR7	2019/10	2021/10
5.	Broadband Horn antenna 1-18 GHz SCHWARZBECK MESS-ELEKTRONIK BBHA 9120 D	2019/11	2022/11
6.	RF Pre-amplifier 1-18 GHz BONN ELEKTRONIK BLMA 0118-1M	2020/05	2021/05
7.	Signal and Spectrum Analyzer ROHDE AND SCHWARZ FSW 50	2020/07	2022/07
8.	HORN ANTENNA 18-40GHz SCHWARZBECK BBHA 9170	2020/05	2023/05
9.	PRE-AMPLIFIER G>30dB 18-40GHz BONN ELEKTRONIK BLMA 1840-1M	2019/02	2021/02
10.	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 24 / RSS-133 PARAGRAPH		
Requirement – Test case	**Verdict**	**Remark**
Clause 24.232/RSS-133 Clause 6.4: RF output power	P	(2)
Clause 2.1047/RSS-133 Clause 6.2: Modulation characteristics	N/M	(1)
Clause 24.235/RSS-133 Clause 6.3: Frequency stability	N/M	(1)
Clause 2.1049: Occupied Bandwidth	N/M	(1)
Clause 24.238/RSS-133 Clause 6.5: Spurious emissions at antenna terminals	N/M	(1)
Clause 24.238/RSS-133 Clause 6.5: Radiated emissions	P	(2)
Supplementary information and remarks: (1) Test not requested. (2) RF Output Power and Radiated emissions tests were tested in the worst case		

Appendix A: Test results for FCC PART 24 / RSS-133

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TEST CONDITIONS

POWER SUPPLY (V):

Vnominal = 110 Vac

Type of power supply = AC voltage

ANTENNA:

Type of antenna = Integral antenna.

Declared Gain for antenna = +3.50 dBi.

TEST FREQUENCIES:

2G Band 1900 MHz:

GPRS and EDGE MODULATIONS:

Lowest channel (512): 1850.2 MHz
Middle channel (662): 1880.2 MHz
Highest channel (810): 1909.8 MHz

3G Band II:

WCDMA MODULATION:

Lowest channel (9262): 1852.4 MHz
Middle channel (9400): 1880.0 MHz
Highest channel (9538): 1907.6 MHz

LTE QPSK AND 16QAM MODULATIONS (Band 2):

	Channel (Frequency. MHz)					
	BW = 1.4 MHz	BW = 3 MHz	BW = 5 MHz	BW = 10 MHz	BW = 15 MHz	BW = 20 MHz
Lowest	18607 (1850.7)	18615 (1851.5)	18650 (1852.5)	18675 (1855)	18675 (1857.5)	18700 (1860)
Middle	18900 (1880)	18900 (1880)	18900 (1880)	18900 (1880)	18900 (1880)	18900 (1880)
Highest	19193 (1909.3)	19185 (1908.5)	19150 (1907.5)	19150 (1905)	19125 (1902.5)	19100 (1900)

Results show below were performed in the worst case of modulation, and combination between bandwidth and Resource Blocks through a preliminary scan

RF Output Power

SPECIFICATION:

FCC §2.1046 and §24.232

Mobile/portable stations are limited to 2 Watts (33 dBm) Effective Isotropic Radiated Power (E.I.R.P.).
The peak-to-average ratio (PAR) of the transmission shall not exceed 13 dB.

RSS-133. Clause 6.4.

The peak-to-average power ratio (PAPR) shall not exceed 13 dB for more than 0.1% of the time using a signal corresponding to the highest PAPR during periods of continuous transmission.

METHOD:

The conducted RF output power measurements were made at the RF output terminals of the EUT using the power meter of the Universal Radio Communication tester CMW500, selecting maximum transmission power of the EUT and different modes of modulation.

The maximum equivalent isotropically radiated power (e.i.r.p.) is calculated by adding the declared maximum antenna gain (dBi).

The EUT was controlled via the Universal Radio Communication tester R&S CMW500 selecting maximum transmission power of the EUT and different modes of modulation.

TEST SETUP:

CONDUCTED AVERAGE POWER:

RESULTS:

CONDUCTED AVERAGE POWER:

2G Band 1900 MHz :

GPRS MODULATION:

Channel	Lowest	Middle	Highest
Maximum declared antenna gain (dBi)	3.50	3.50	3.50
Measured maximum average power (dBm) at antenna port	28.46	28.90	28.92
Maximum effective isotropically radiated average power E.I.R.P. (dBm)	31.96	32.40	32.42
Measurement uncertainty (dB)	< ±0.941		

EDGE MODULATION:

Channel	Lowest	Middle	Highest
Maximum declared antenna gain (dBi)	3.50	3.50	3.50
Measured maximum average power (dBm) at antenna port	24.81	25.06	25.03
Maximum effective isotropically radiated average power E.I.R.P. (dBm)	28.31	28.56	28.53
Measurement uncertainty (dB)	< ±0.941		

3G Band II:

WCDMA and HSUPA Modulations:

A preliminary scan determined the WCDMA modulation as the worst case. The following tables show the results for WCDMA modulation.

Channel	Lowest	Middle	Highest
Maximum declared antenna gain (dBi)	3.50	3.50	3.50
Measured maximum average power (dBm) at antenna port	23.43	23.33	23.42
Maximum effective isotropically radiated average power E.I.R.P. (dBm)	26.93	26.83	26.92
Measurement uncertainty (dB)	< ±0.941		

LTE BAND 2:

LTE Band 2. QPSK MODULATION. Bandwidth = 20 MHz.

A preliminary scan determined the QPSK modulation, BW=20 MHz, RB=1, Offset=49 as the worst case. The following tables show the results for the worst case modulation.

Channel	Lowest	Middle	Highest
Maximum declared antenna gain (dBi)	3.50	3.50	3.50
Measured maximum average power (dBm) at antenna port	22.48	23.52	22.31
Maximum equivalent isotropically radiated power (E.I.R.P.) (dBm)	25.98	27.02	25.81
Measurement uncertainty (dB)	< ±0.941		

LTE Band 2. 16QAM MODULATION. Bandwidth = 1.4 MHz.

A preliminary scan determined the 16QAM modulation, BW=1.4 MHz, RB=3, Offset=1 as the worst case. The following tables show the results for the worst case modulation.

Channel	Lowest	Middle	Highest
Maximum declared antenna gain (dBi)	3.50	3.50	3.50
Measured maximum average power (dBm) at antenna port	22.01	22.02	21.99
Maximum equivalent isotropically radiated power (E.I.R.P.) (dBm)	25.51	25.52	25.49
Measurement uncertainty (dB)	< ±0.941		

Verdict: PASS

Radiated emissions

SPECIFICATION:

FCC § 24.238. RSS-133 Clause 6.5.

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+10 log (Po), and the level in dBm relative to Po becomes:

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

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 highest frequency generated within the equipment.

The EUT was placed on a non-conductive stand at a 3 meter distance from the measuring antenna for measurements from 30 MHz up to 18 GHz and at 1 m distance for measurements above 18 GHz.

Detected emissions were maximized at each frequency by rotating the EUT and adjusting the measuring antenna height and polarization. The maximum meter reading was recorded.

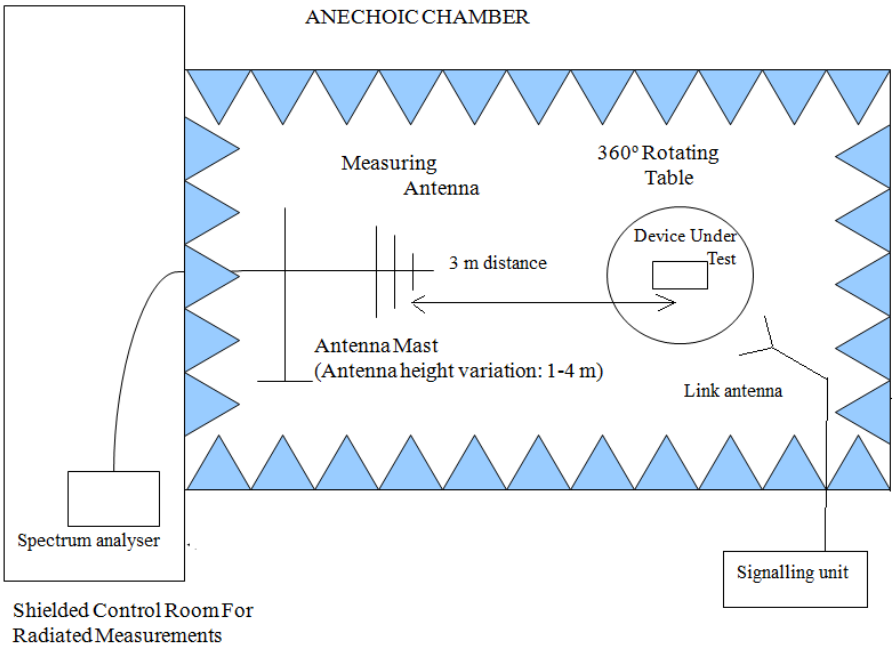
Measurement Limit:

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:

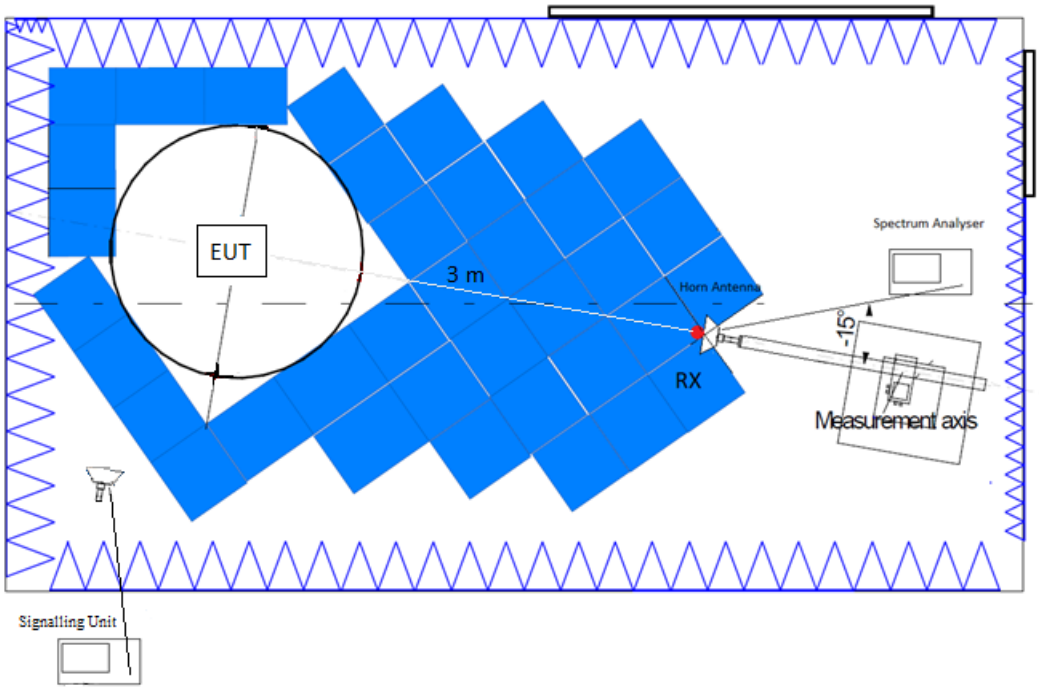
Po (dBm) – [43 + 10 log (Po in mwatts) - 30] = - 13 dBm

TEST SETUP:

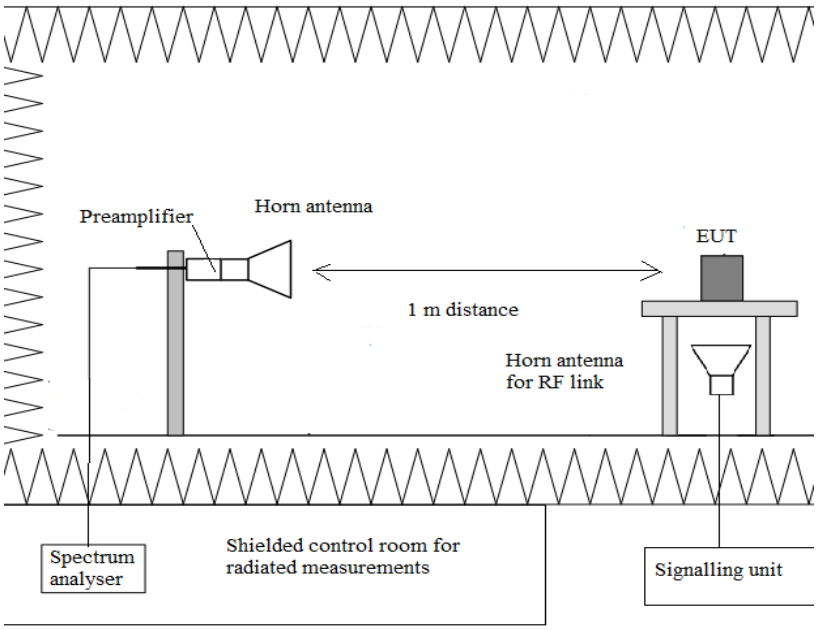
Radiated measurements below 1 GHz.



Radiated measurements between 1 GHz and 18 GHz.



Radiated measurements above 18 GHz.



RESULTS:

2G Band 1900 MHz:

GPRS AND EDGE MODULATION:
A preliminary scan determined the GPRS modulation as the worst case. The following tables and plots show the results for the worst case modulation.

- LOW CHANNEL:

Frequency range 30 MHz - 1 GHz

No spurious signals were found at less than 20 dB below the limit.

Frequency range 1 - 18 GHz.

No spurious signals were found at less than 20 dB below the limit.

Frequency range 18 - 20 GHz

No spurious signals were found at less than 20 dB below the limit.

- MIDDLE CHANNEL:

Frequency range 30 MHz-1000 MHz

No spurious signals were found at less than 20 dB below the limit.

Frequency range 1 - 18 GHz

Spurious frequencies detected at less than 20 dB below the limit:

Spurious frequency (MHz)	Detector	E.I.R.P (dBm)	Polarization
1156	Peak	-31.96	H
1433.5	Peak	-30.73	H
1550	Peak	-30.83	H

Frequency range 18 - 20 GHz

No spurious signals were found at less than 20 dB below the limit.

- HIGH CHANNEL:

Frequency range 30 MHz - 1 GHz

No spurious signals were found at less than 20 dB below the limit.

Frequency range 1 - 18 GHz

No spurious signals were found at less than 20 dB below the limit.

Frequency range 18 - 20 GHz

No spurious signals were found at less than 20 dB below the limit.

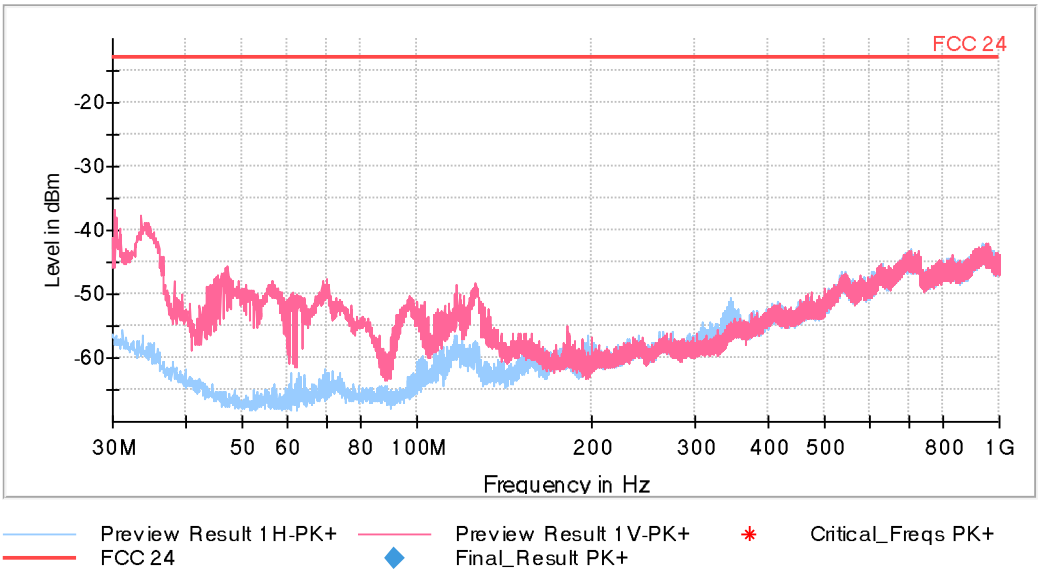
Measurement Uncertainty (dB):	<± 4.68 for f ≥ 30 MHz up to 1 GHz <± 4.00 for f ≥ 1 GHz up to 3 GHz <± 4.99 for f ≥ 3 GHz up to 18 GHz <± 5.08 for f ≥ 17 GHz up to 20 GHz

Verdict: PASS

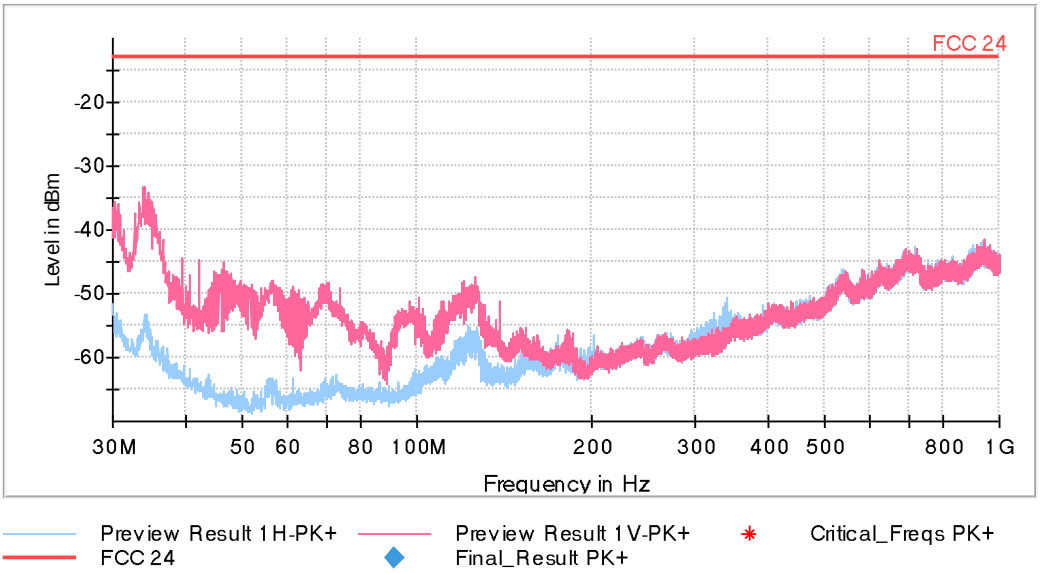
FREQUENCY RANGE 30 MHz - 1 GHz

GPRS MODULATION.

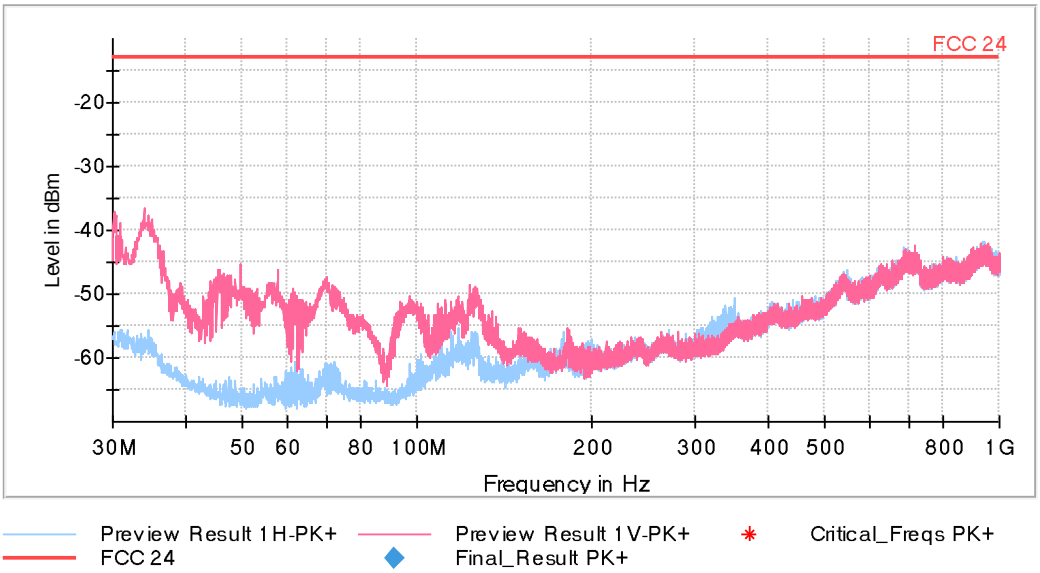
- Lowest Channel:



- Middle Channel:



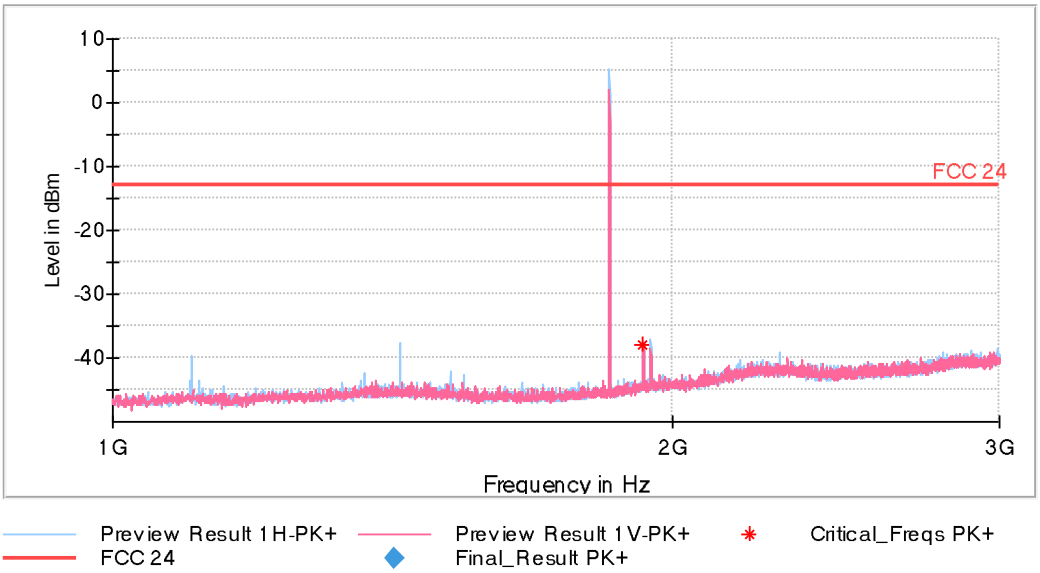
- Highest Channel:



FREQUENCY RANGE 1 - 3 GHz

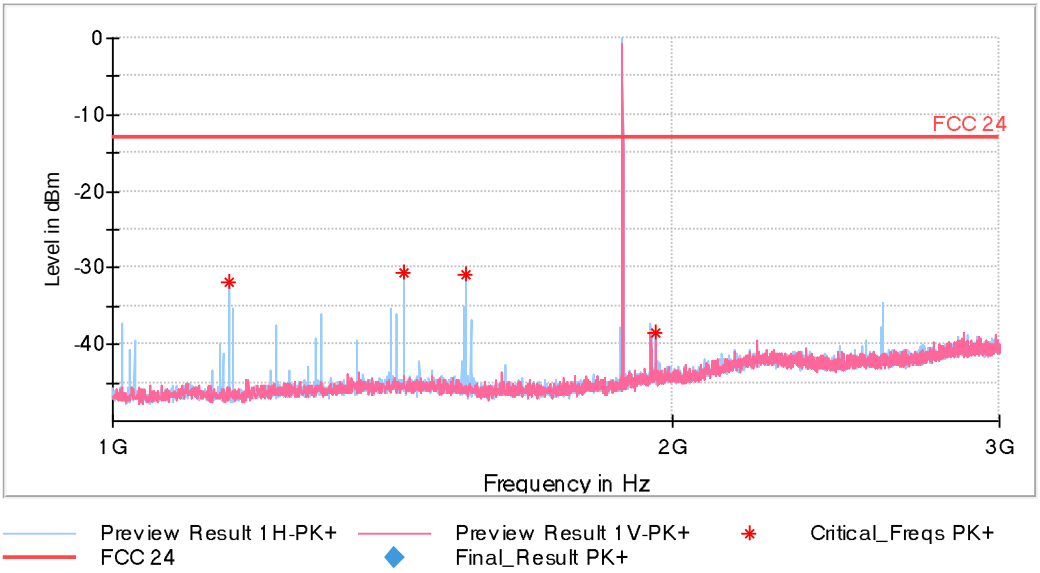
GPRS MODULATION

- Lowest Channel:



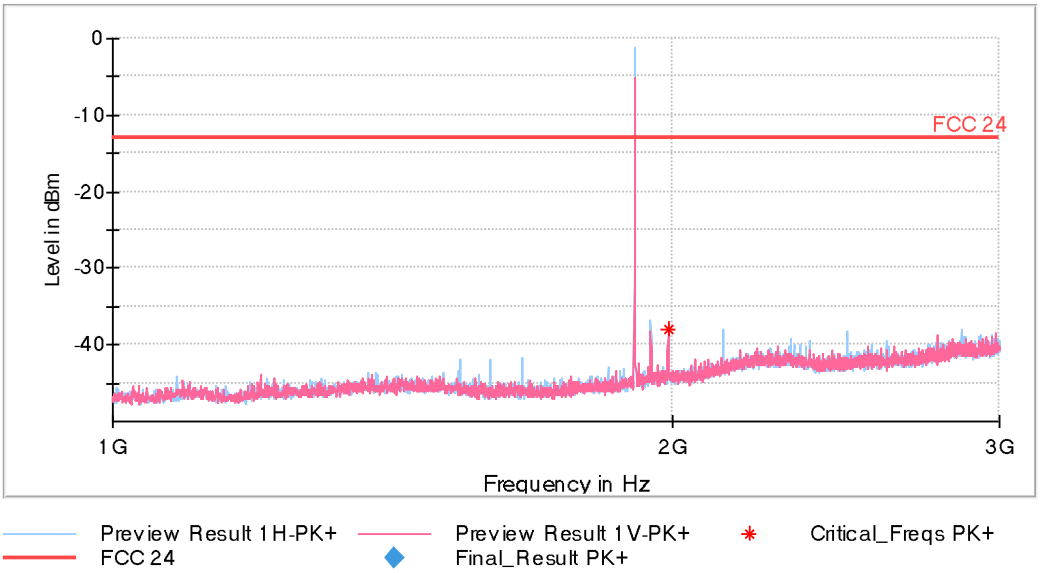
The peak above the limit is the carrier frequency.

- Middle Channel:



The peak above the limit is the carrier frequency.

- Highest Channel:

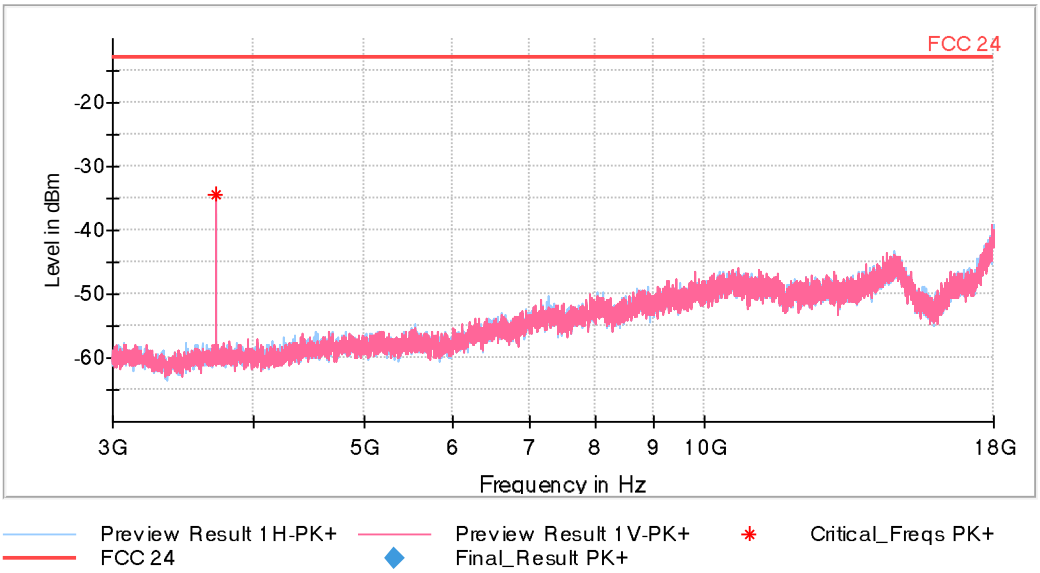


The peak above the limit is the carrier frequency.

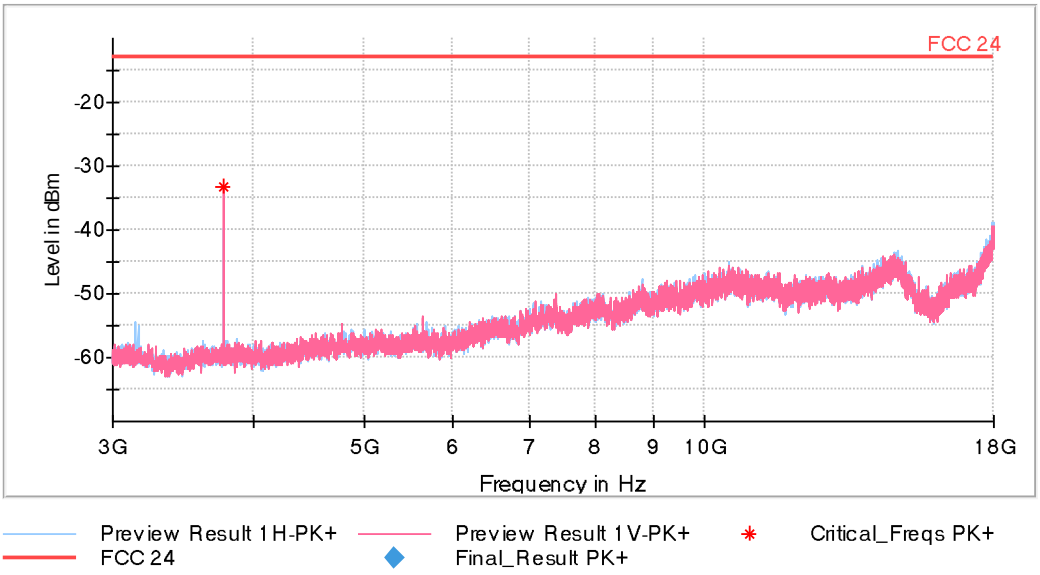
FREQUENCY RANGE 3 - 18 GHz

GPRS MODULATION

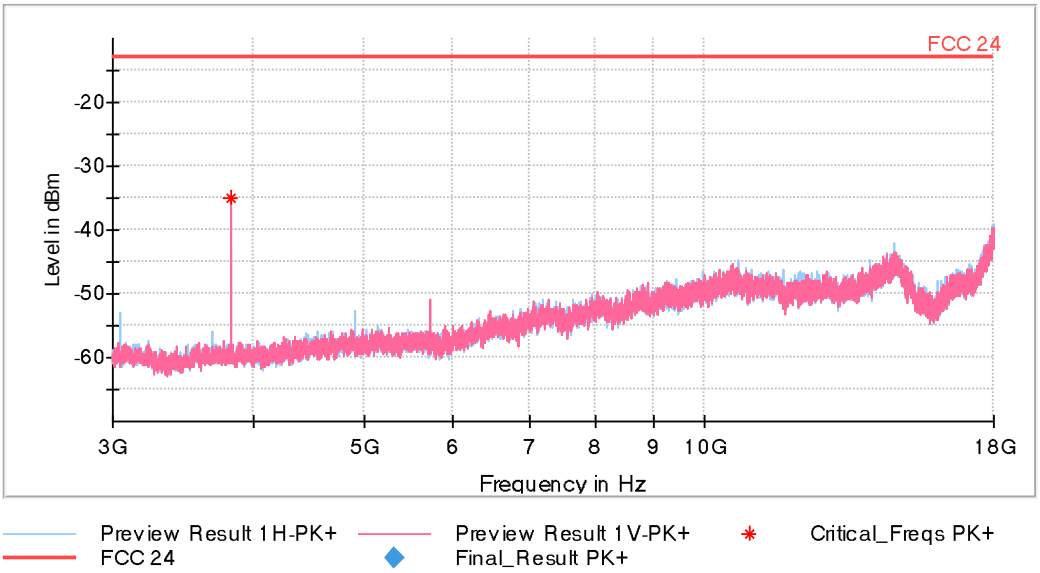
- Lowest Channel:



- Middle Channel:



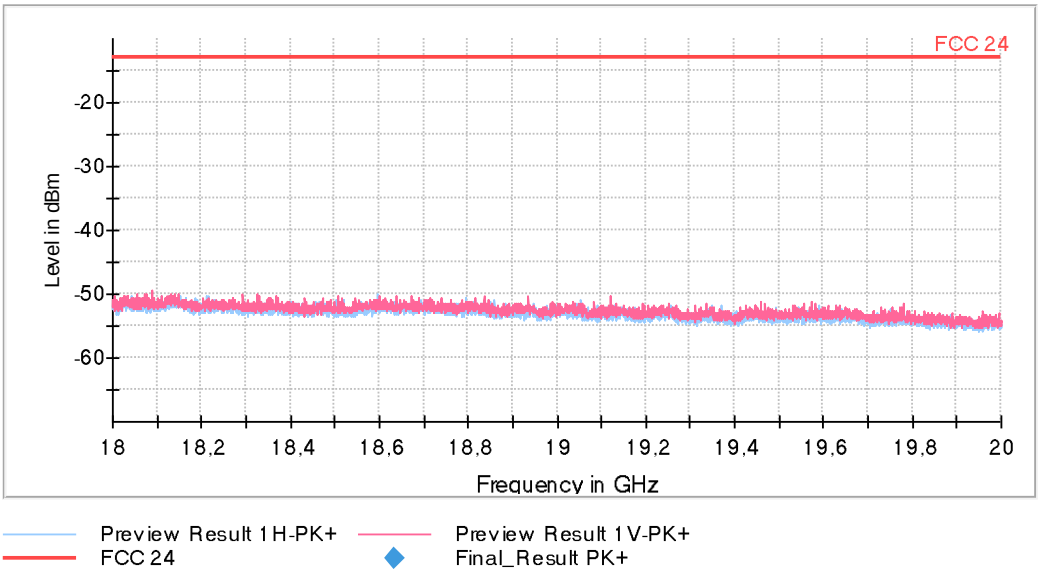
- Highest Channel:



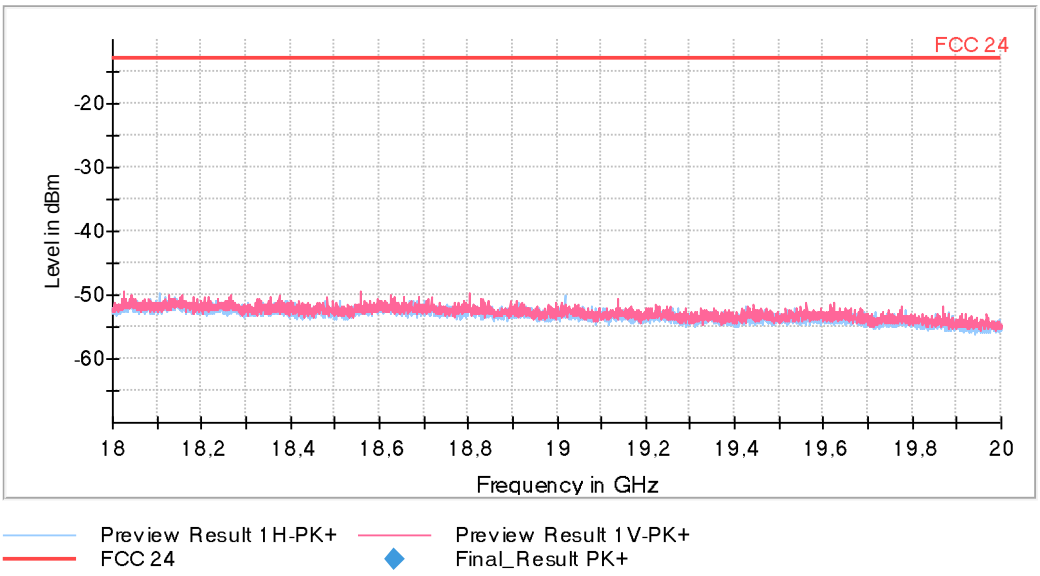
FREQUENCY RANGE 18 - 20 GHz

GPRS MODULATION

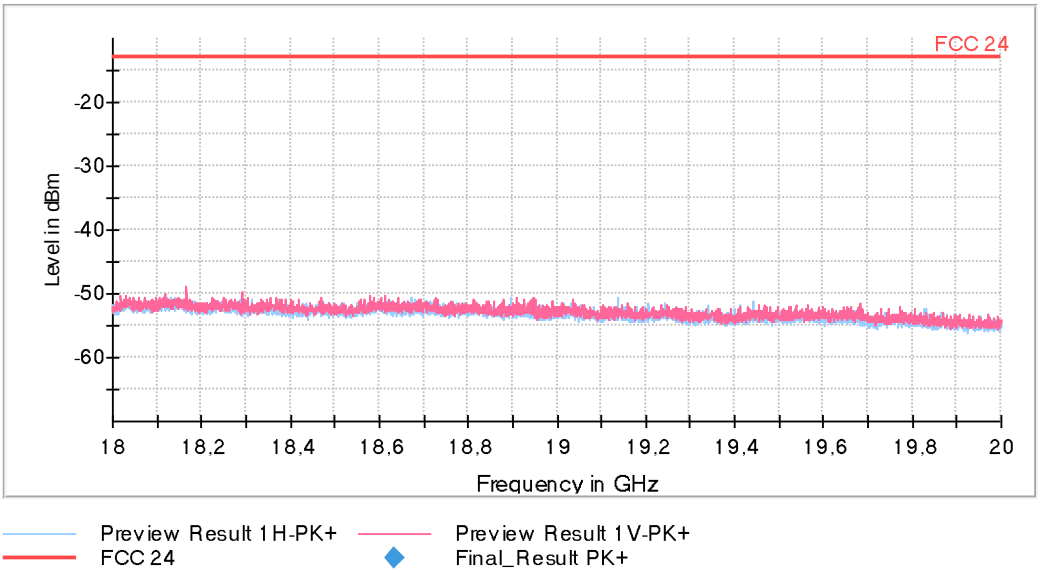
- Lowest Channel:



- Middle Channel:



- Highest Channel:



3G Band II:

WCDMA AND HSUPA MODULATION:
A preliminary scan determined the WCDMA modulation as the worst case. The following tables and plots show the results for the worst case modulation.

- Lowest Channel:

Frequency range 30 MHz - 1 GHz

Spurious frequencies detected at less than 20 dB below the limit:

Spurious frequency (MHz)	Detector	E.I.R.P (dBm)	Polarization
30.291	Peak	-27.97	V
33.686	Peak	-27.60	V
496.812	Peak	-32.25	V
695.080	Peak	-22.81	H

Frequency range 1 - 18 GHz

No spurious signals were found at less than 20 dB below the limit.

Frequency range 18 - 20 GHz

No spurious signals were found at less than 20 dB below the limit.

- Middle Channel:

Frequency range 30 MHz - 1 GHz

No spurious signals were found at less than 20 dB below the limit.

Frequency range 1 - 18 GHz

No spurious signals were found at less than 20 dB below the limit.

Frequency range 18 - 20 GHz

No spurious signals were found at less than 20 dB below the limit.

- Highest Channel:

Frequency range 30 MHz - 1 GHz

Spurious frequencies detected at less than 20 dB below the limit:

Spurious frequency (MHz)	Detector	E.I.R.P (dBm)	Polarization
30.242	Peak	-31.62	V
33.686	Peak	-27.94	V
259.938	Peak	-32.46	V
640.954	Peak	-24.63	V
669.472	Peak	-27.98	V
851.929	Peak	-30.94	H

Frequency range 1 - 18 GHz

Spurious frequencies detected at less than 20 dB below the limit:

Spurious frequency (MHz)	Detector	E.I.R.P (dBm)	Polarization
1337.5	Peak	-32.51	V
1544.5	Peak	-28.87	V

Frequency range 18 - 20 GHz

No spurious signals were found at less than 20 dB below the limit.

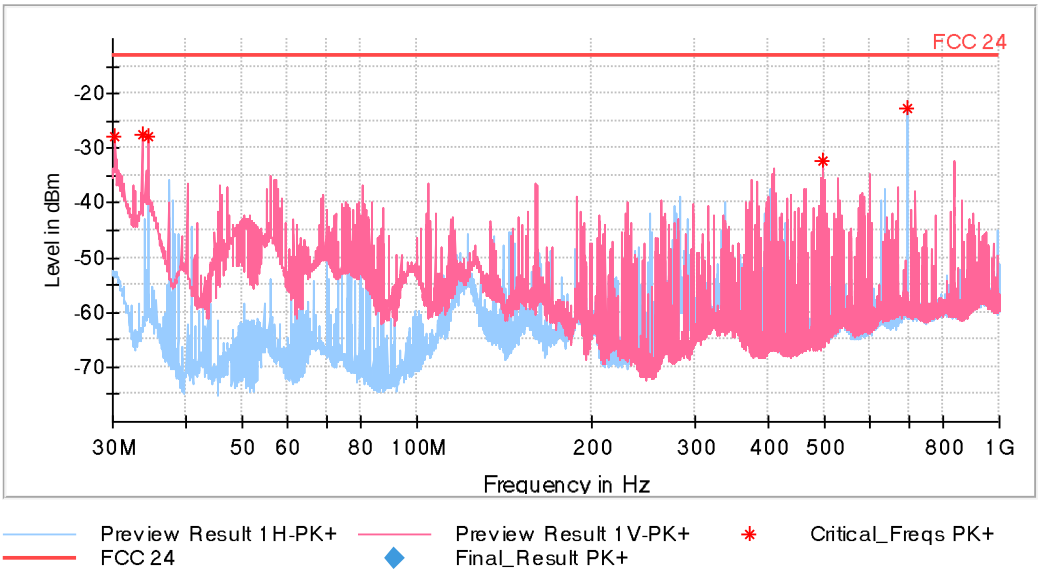
Measurement Uncertainty (dB): <± 4.68 for f ≥ 30 MHz up to 1 GHz
<± 4.00 for f ≥ 1 GHz up to 3 GHz
<± 4.99 for f ≥ 3 GHz up to 18 GHz
<± 5.08 for f ≥ 17 GHz up to 20 GHz

Verdict: PASS

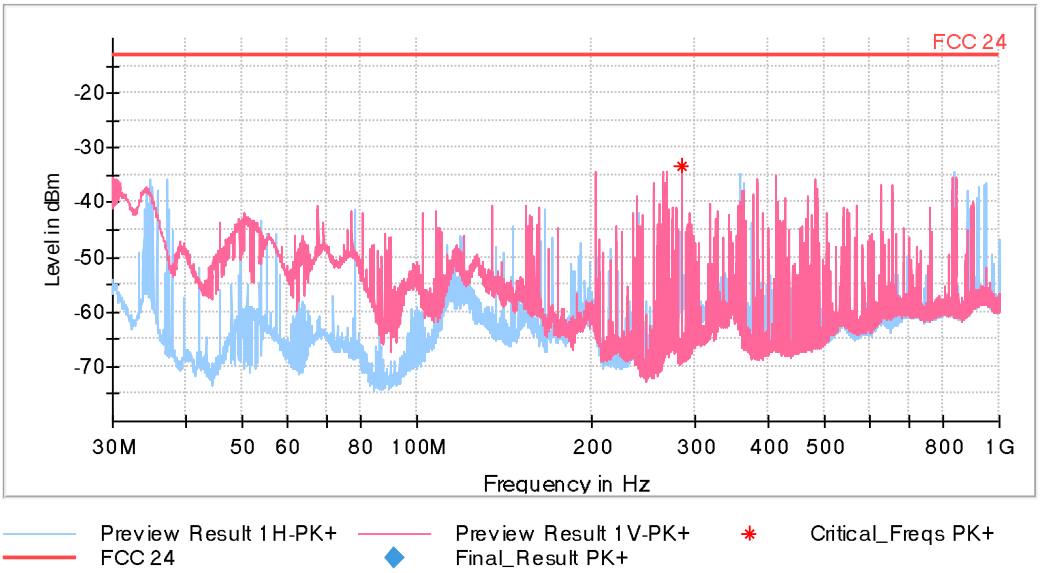
FREQUENCY RANGE 30 MHz - 1 GHz

WCDMA

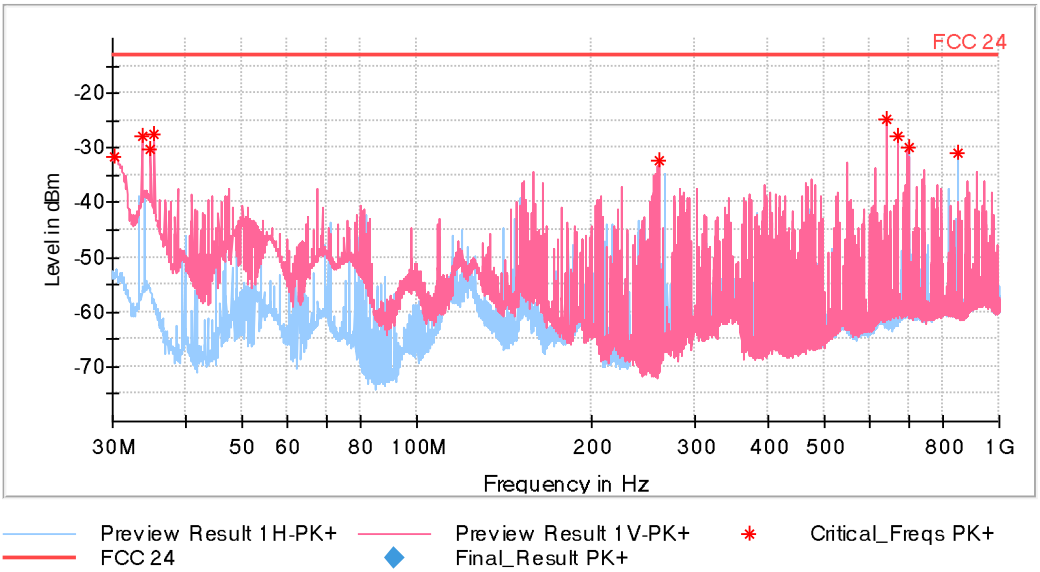
- Lowest Channel:



- Middle Channel:



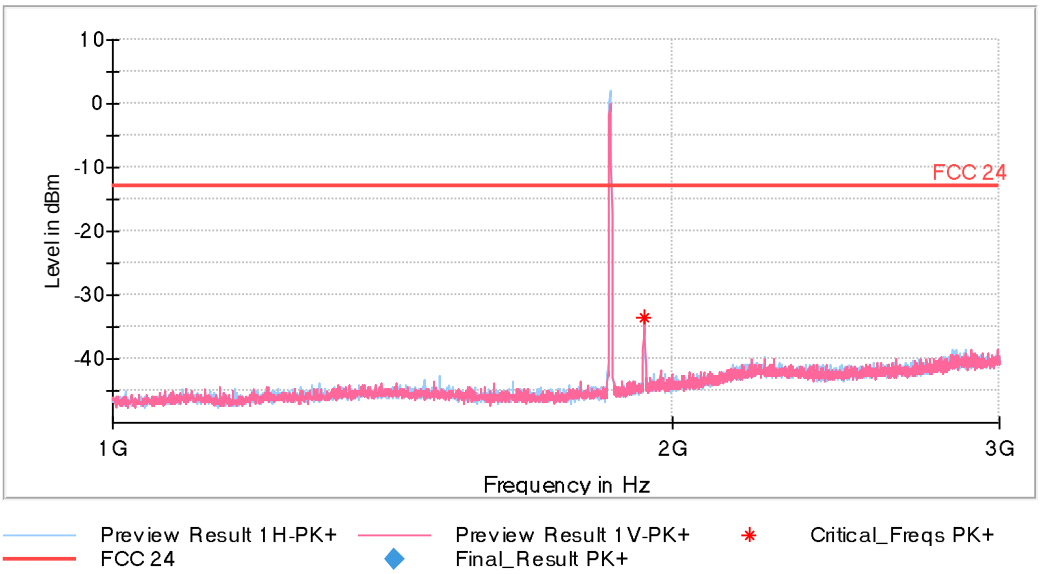
- Highest Channel:



FREQUENCY RANGE 1 - 3 GHz

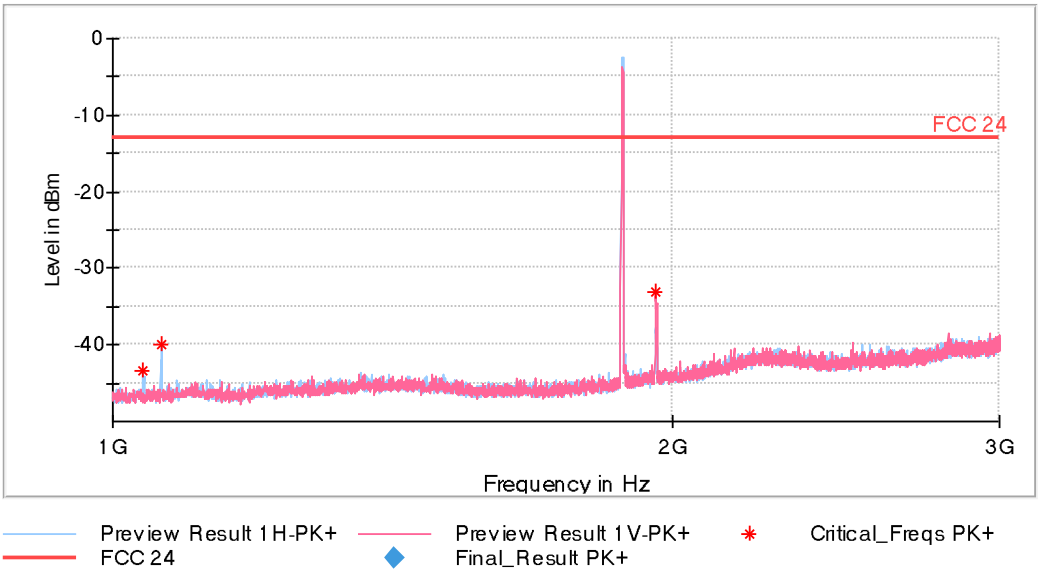
WCDMA

- Lowest Channel:



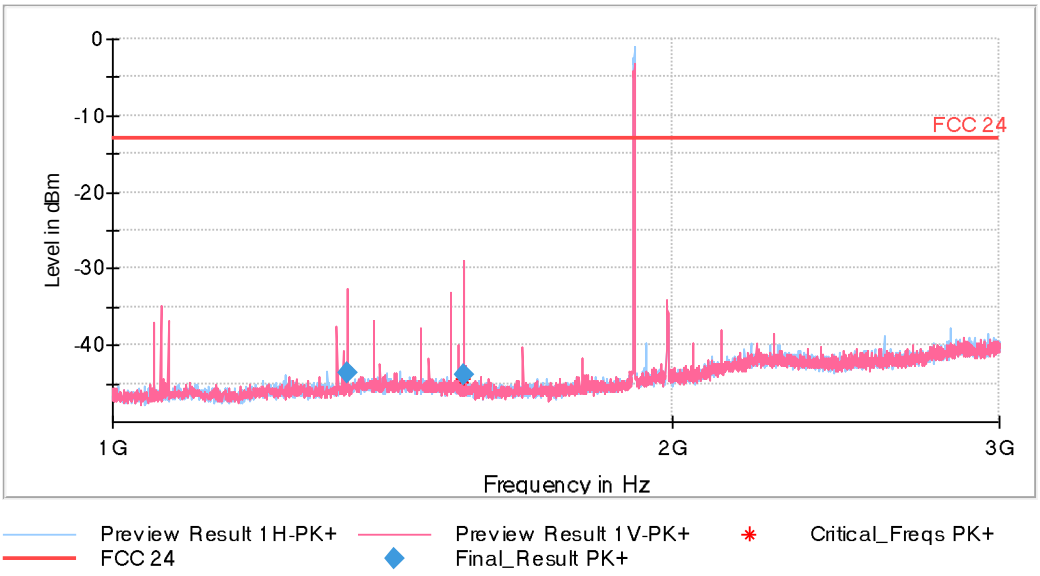
The peak above the limit is the carrier frequency.

- Middle Channel:



The peak above the limit is the carrier frequency.

- Highest Channel:

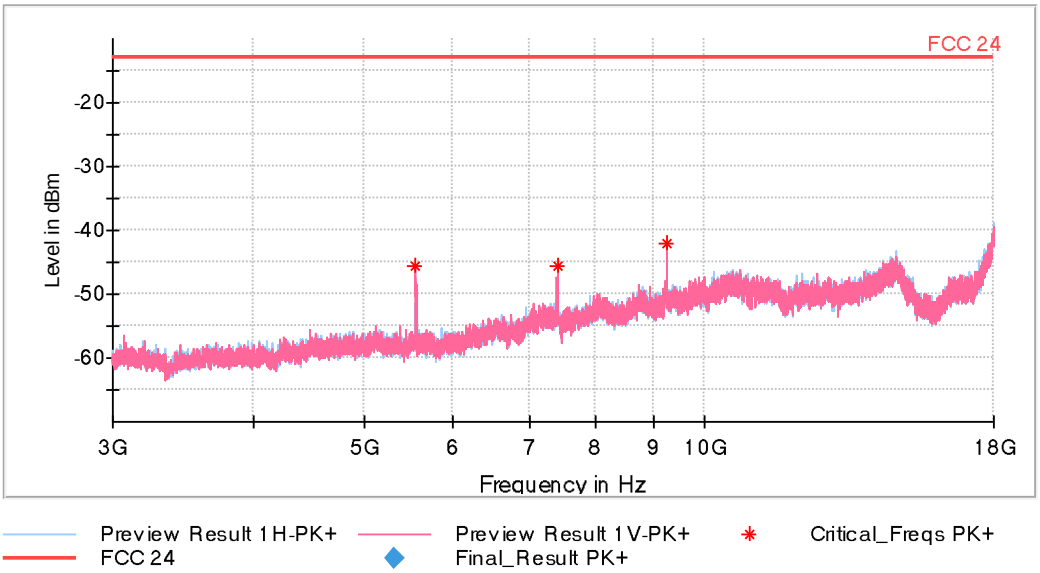


The peak above the limit is the carrier frequency.

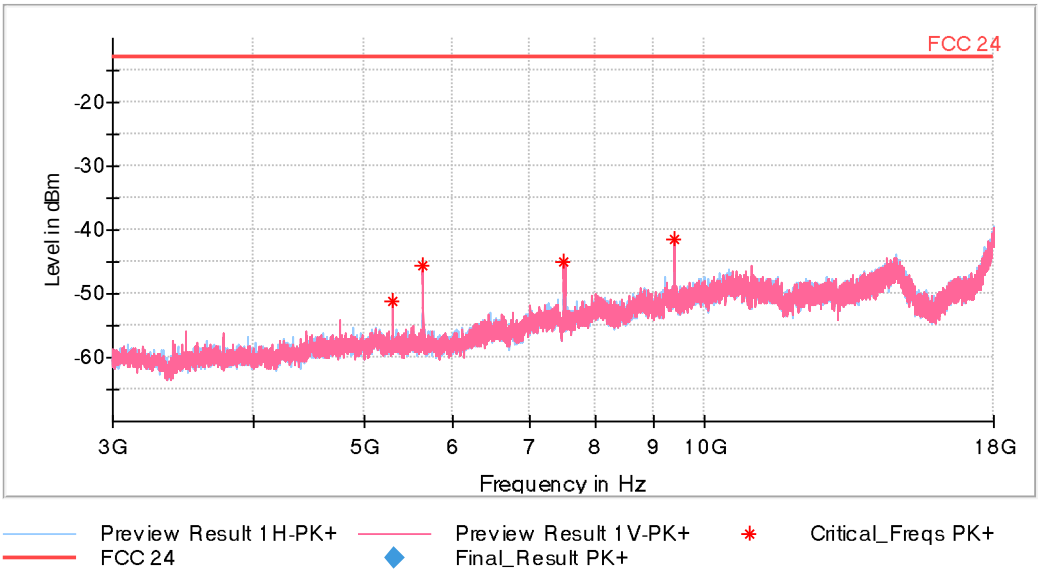
FREQUENCY RANGE 3 - 18 GHz

WCDMA

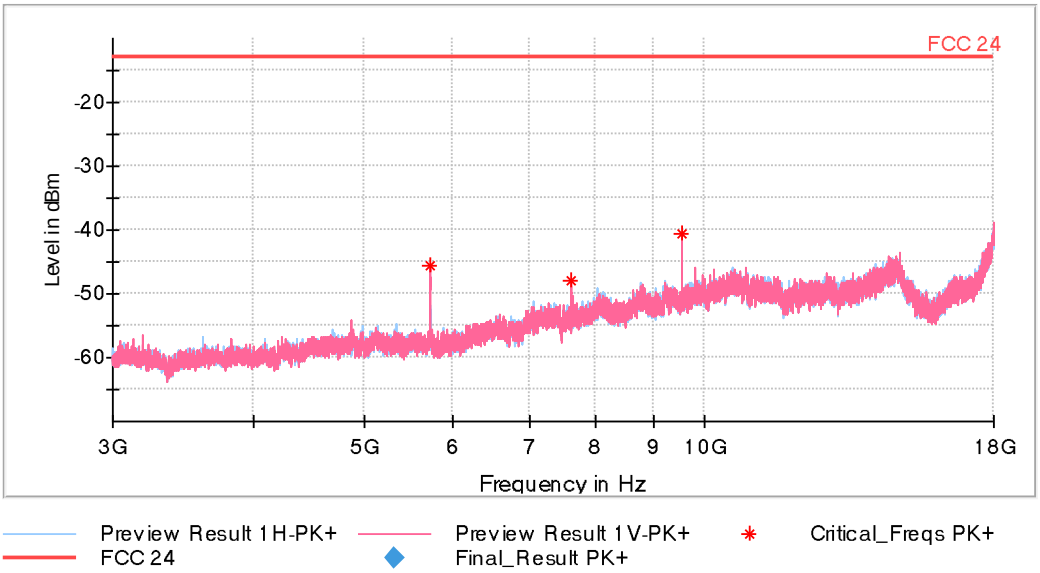
- Lowest Channel:



- Middle Channel:



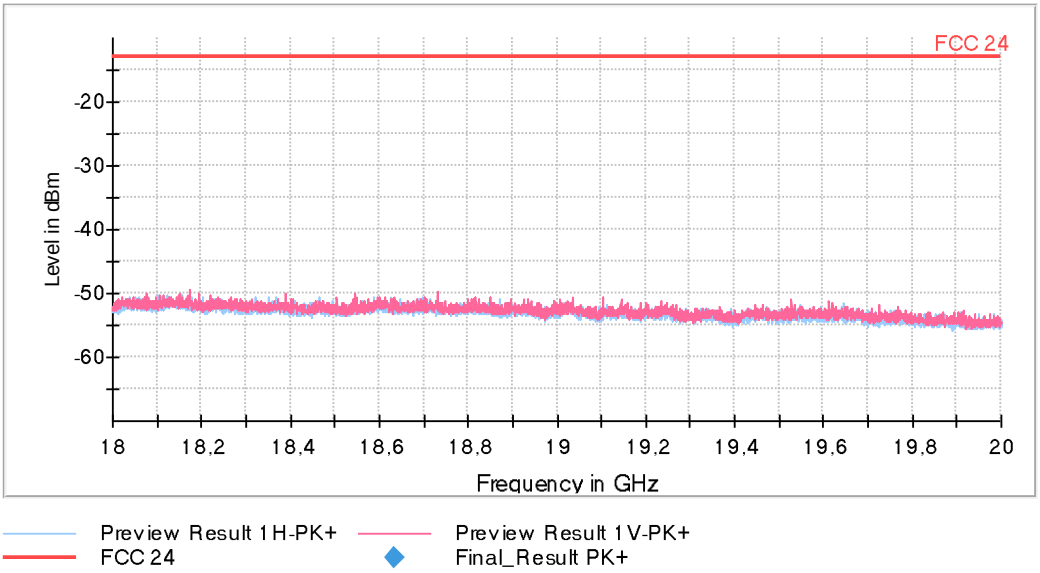
- Highest Channel:



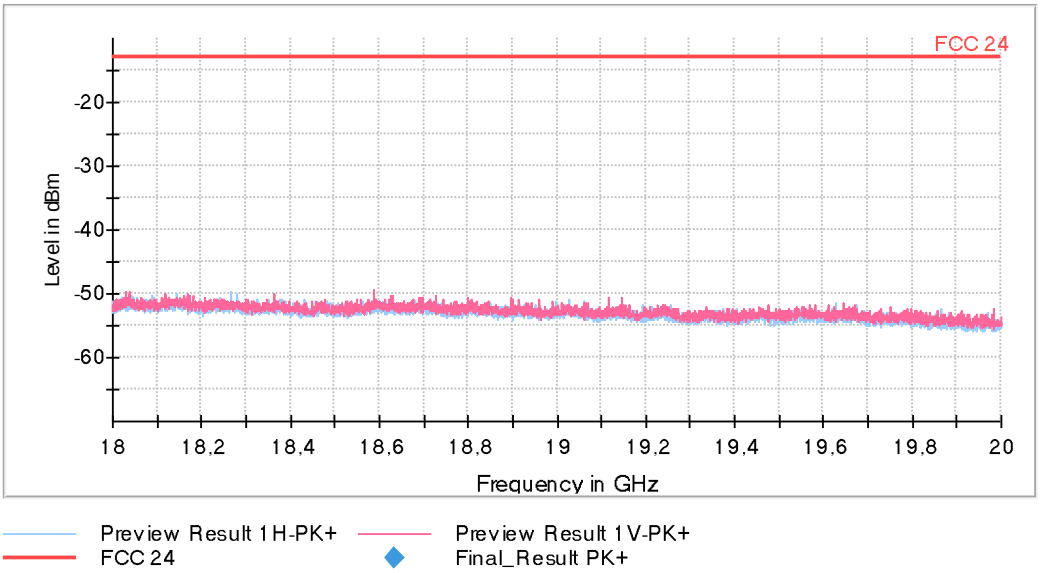
FREQUENCY RANGE 18 - 20 GHz

WCDMA

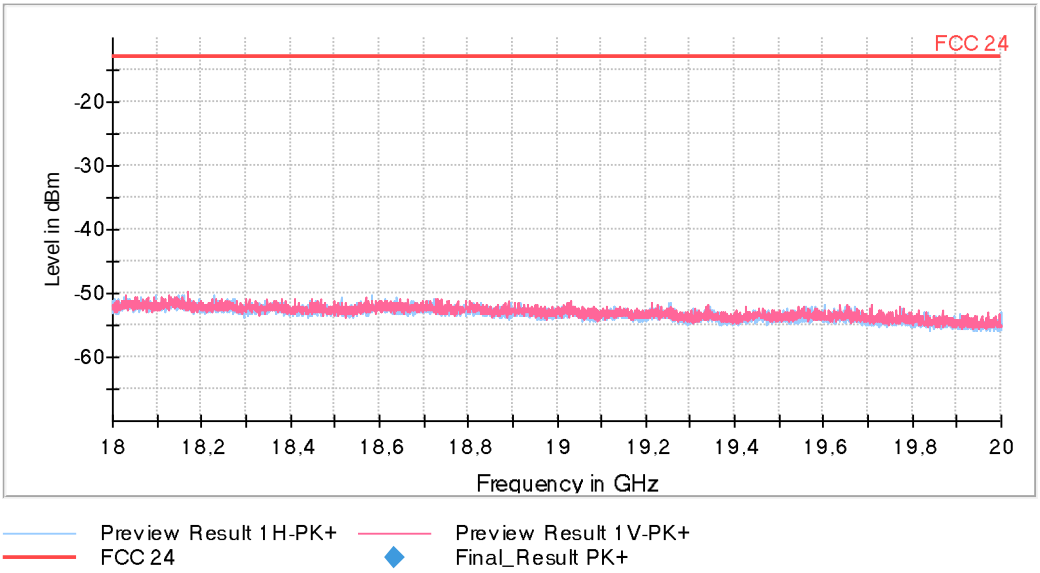
- Lowest Channel:



- Middle Channel:



- Highest Channel:



LTE Band 2:

QPSK:
A preliminary scan determined BW=20 MHz, RB Size=1, RB Offset=49 as the worst case. The following tables and plots show the results for the worst case modulation.

- Lowest Channel:

Frequency range 30 MHz - 1 GHz

Spurious frequencies detected at less than 20 dB below the limit:

Spurious frequency (MHz)	Detector	E.I.R.P (dBm)	Polarization
39.7485	Peak	-30.92	V

Frequency range 1 - 18 GHz

No spurious signals were found at less than 20 dB below the limit.

Frequency range 18 - 20 GHz

No spurious signals were found at less than 20 dB below the limit.

- Middle Channel:

Frequency range 30 MHz - 1 GHz

Spurious frequencies detected at less than 20 dB below the limit:

Spurious frequency (MHz)	Detector	E.I.R.P (dBm)	Polarization
39.9425	Peak	-28.18	V
256.155	Peak	-32.34	H

Frequency range 1 GHz-18 GHz

No spurious signals were found at less than 20 dB below the limit.

Frequency range 18 - 20 GHz

No spurious signals were found at less than 20 dB below the limit.

- Highest Channel:

Frequency range 30 MHz - 1 GHz

No spurious signals were found at less than 20 dB below the limit.

Frequency range 1 GHz-18 GHz.

No spurious signals were found at less than 20 dB below the limit.

Frequency range 18 - 20 GHz

No spurious signals were found at less than 20 dB below the limit.

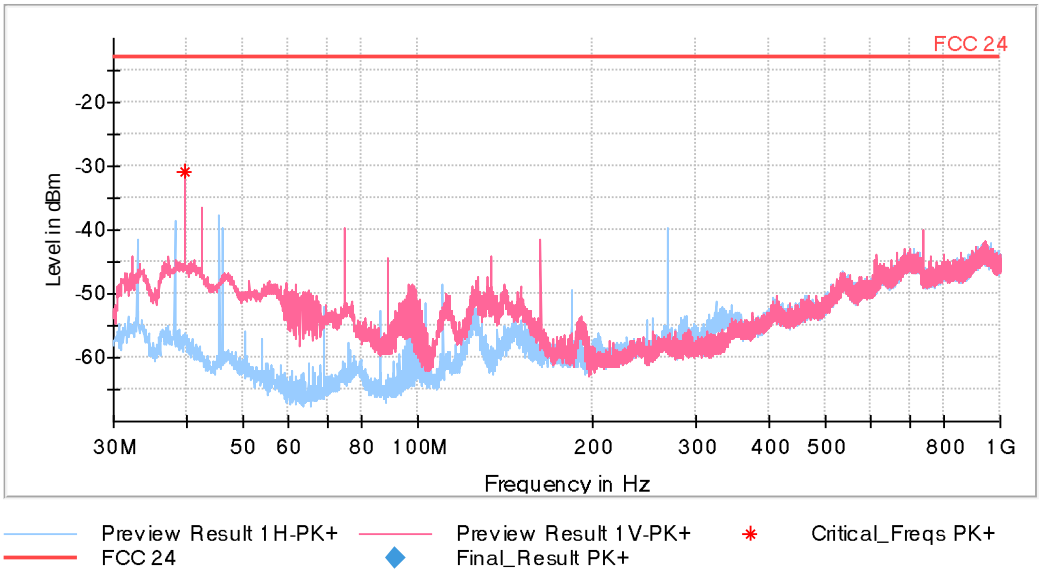
Measurement Uncertainty (dB): <± 4.68 for f ≥ 30 MHz up to 1 GHz
<± 4.00 for f ≥ 1 GHz up to 3 GHz
<± 4.99 for f ≥ 3 GHz up to 18 GHz
<± 5.08 for f ≥ 17 GHz up to 20 GHz

Verdict: PASS

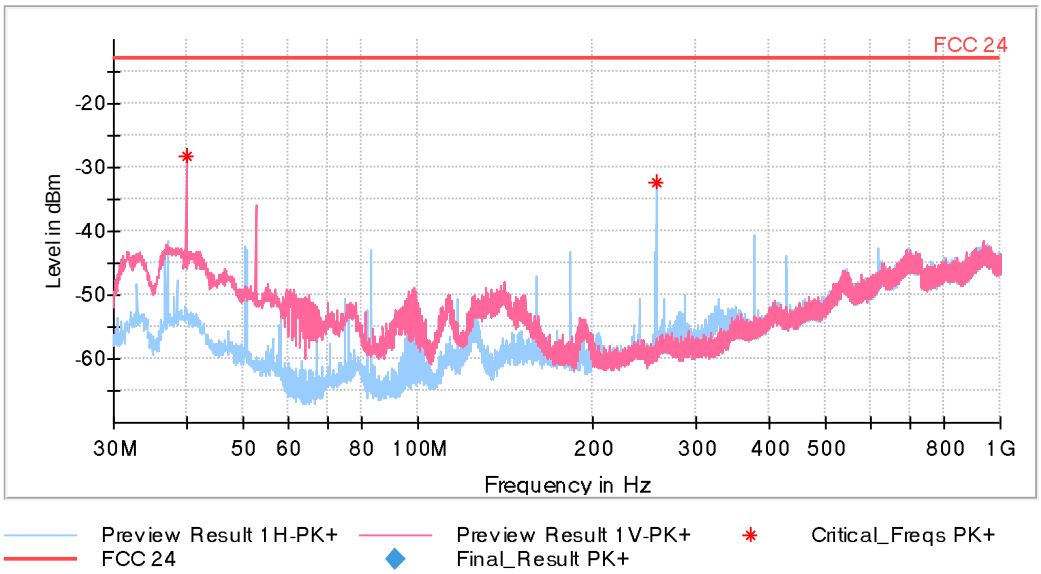
FREQUENCY RANGE 30 MHz - 1 GHz

QPSK MODULATION

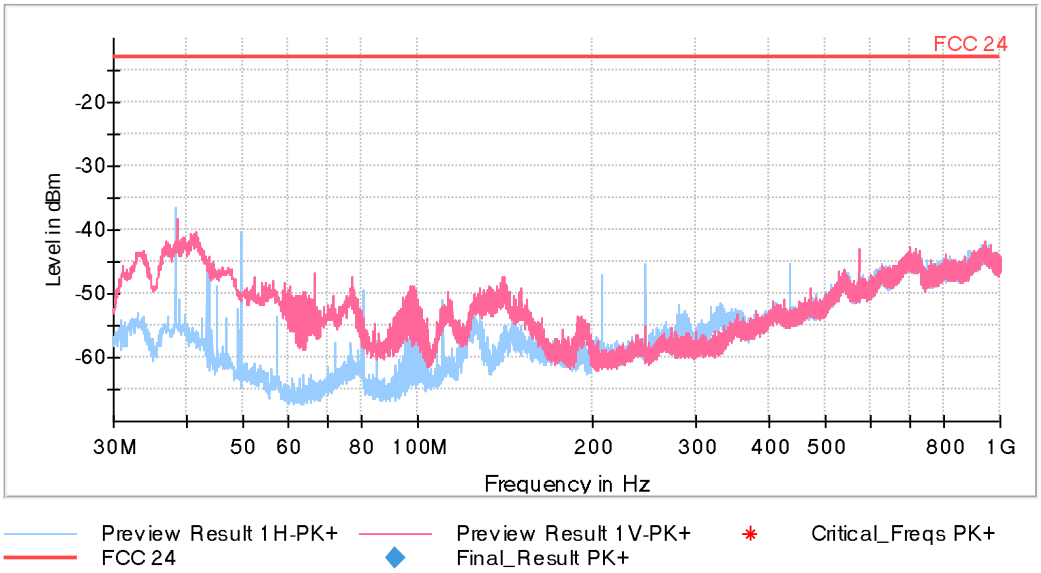
- Lowest Channel:



- Middle Channel:



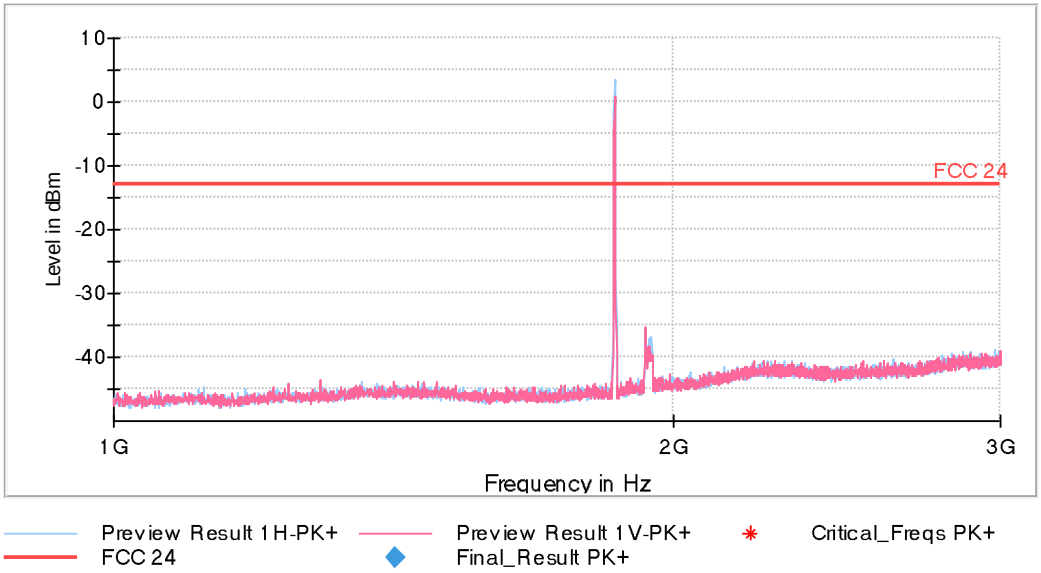
- Highest Channel:



FREQUENCY RANGE 1 - 3 GHz

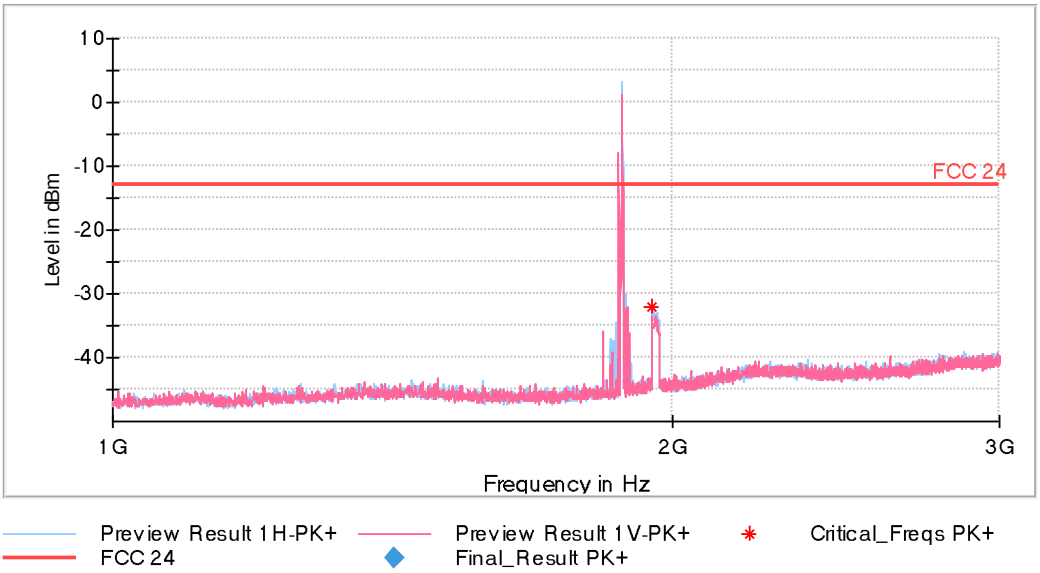
QPSK MODULATION

- Lowest Channel:



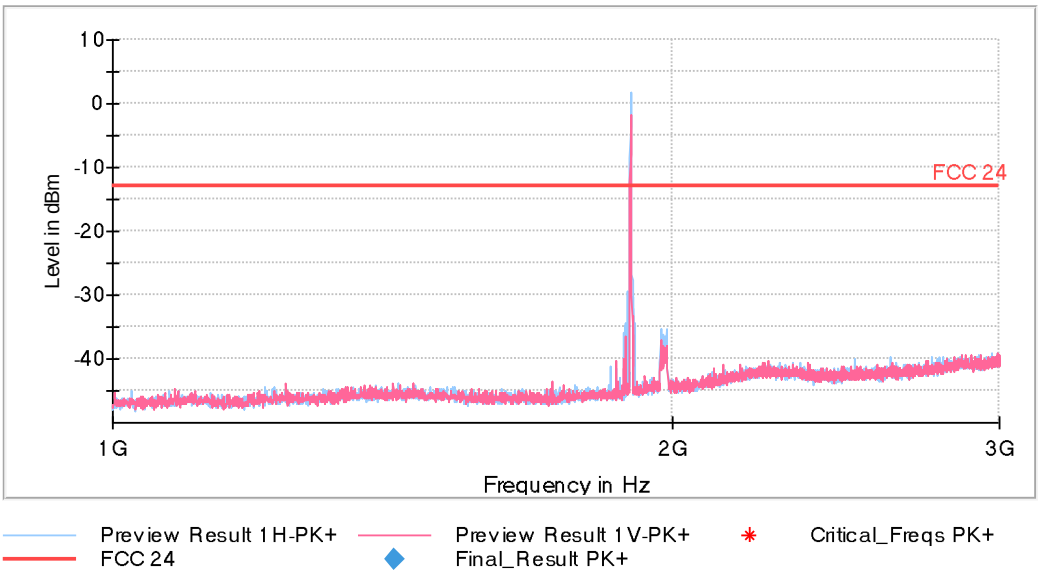
The peak above the limit is the carrier frequency.

- Middle Channel:



The peak above the limit is the carrier frequency.

- Highest Channel:

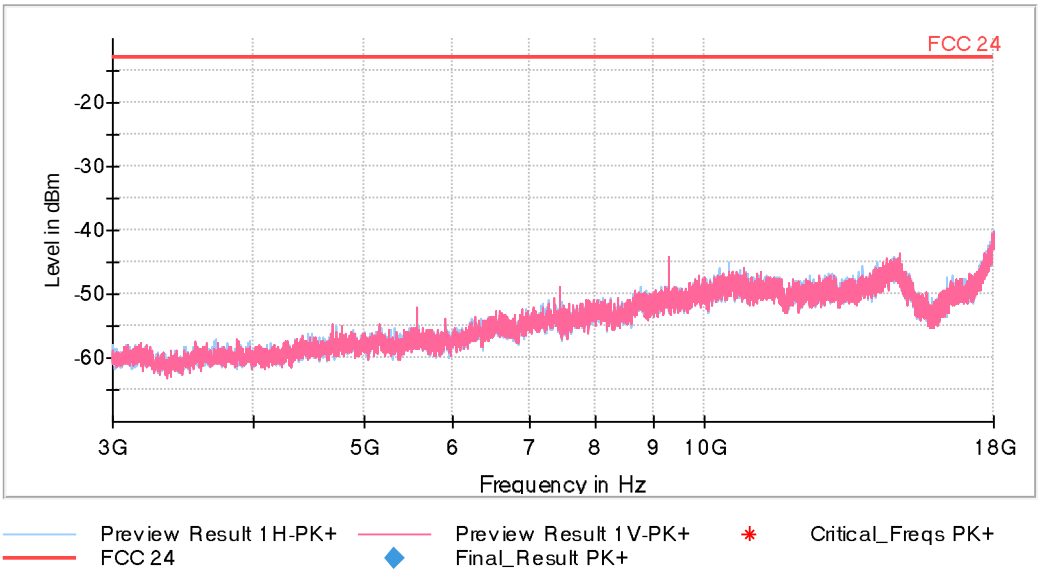


The peak above the limit is the carrier frequency.

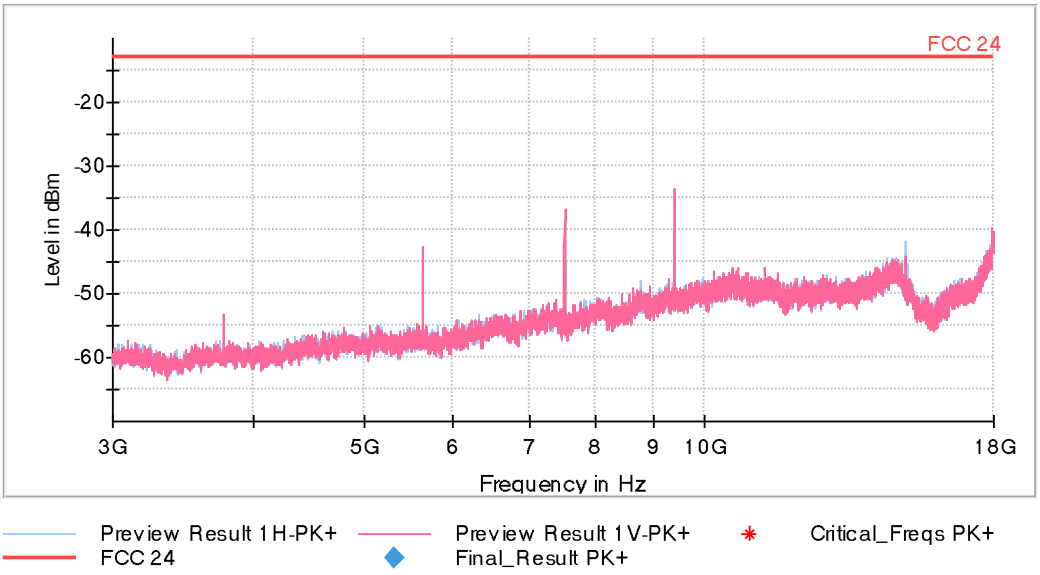
FREQUENCY RANGE 3 - 18 GHz

QPSK MODULATION

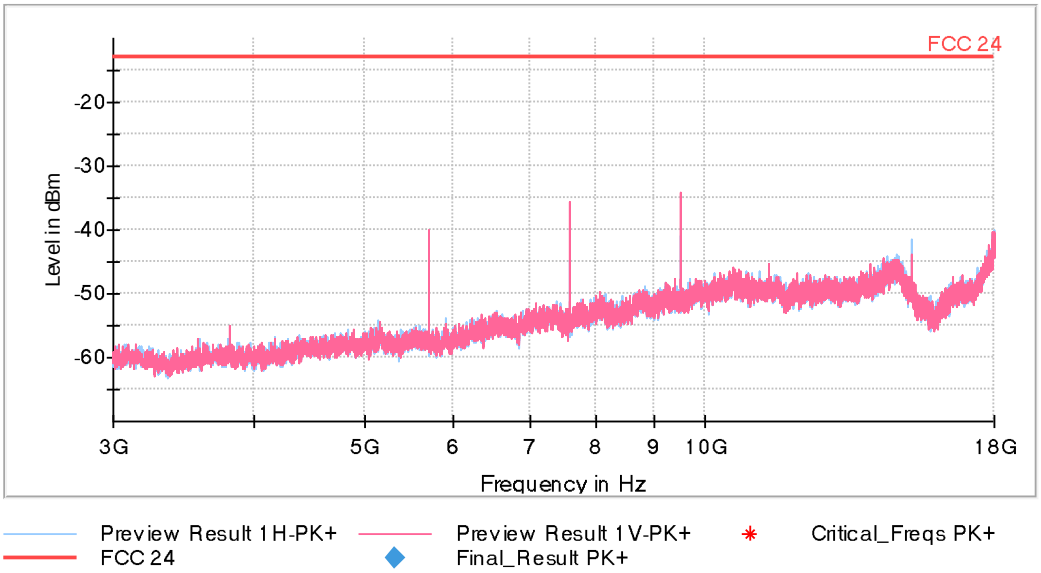
- Lowest Channel:



- Middle Channel:



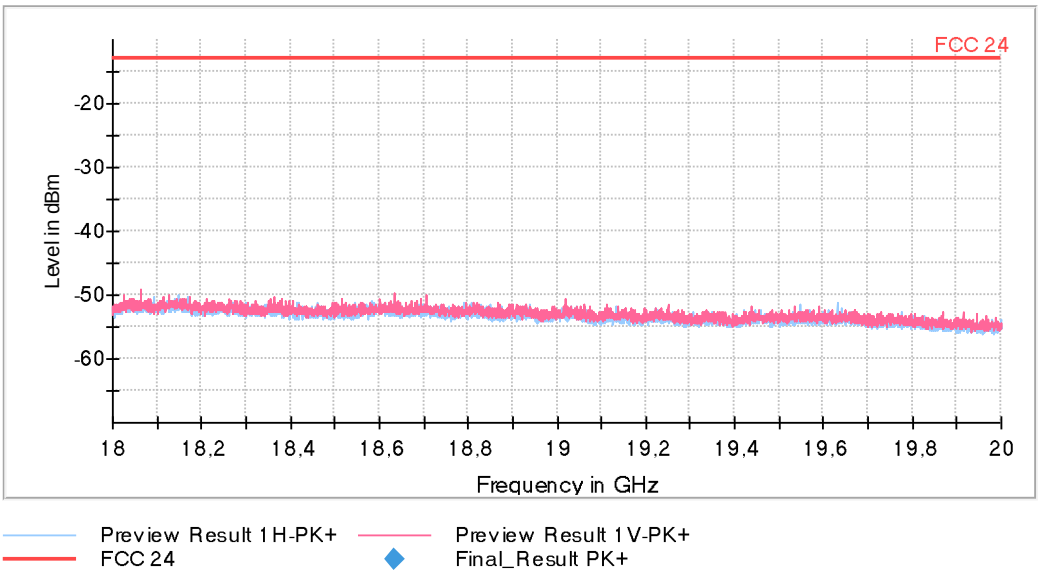
- Highest Channel:



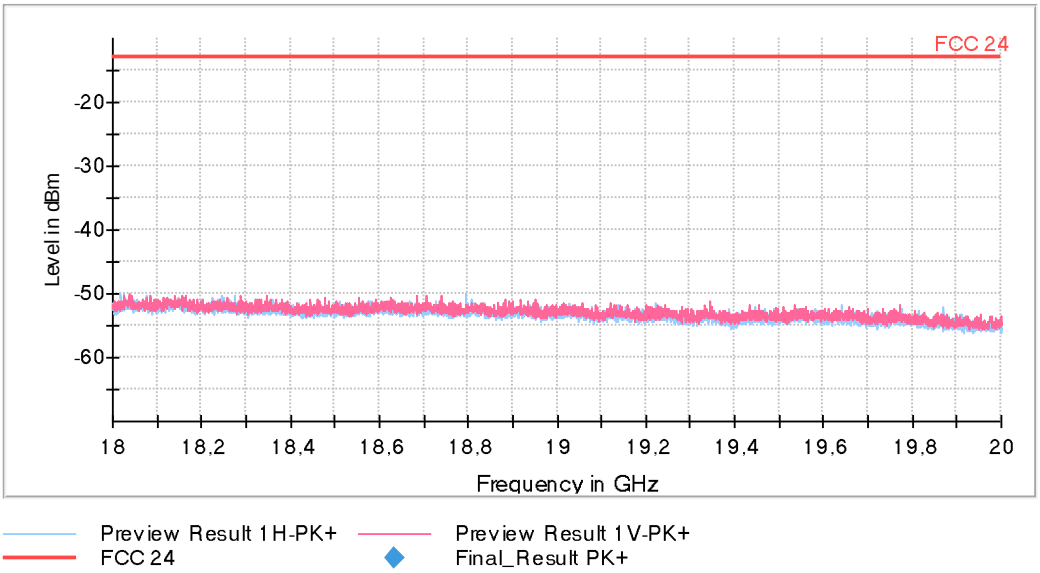
FREQUENCY RANGE 18 - 20 GHz

QPSK MODULATION

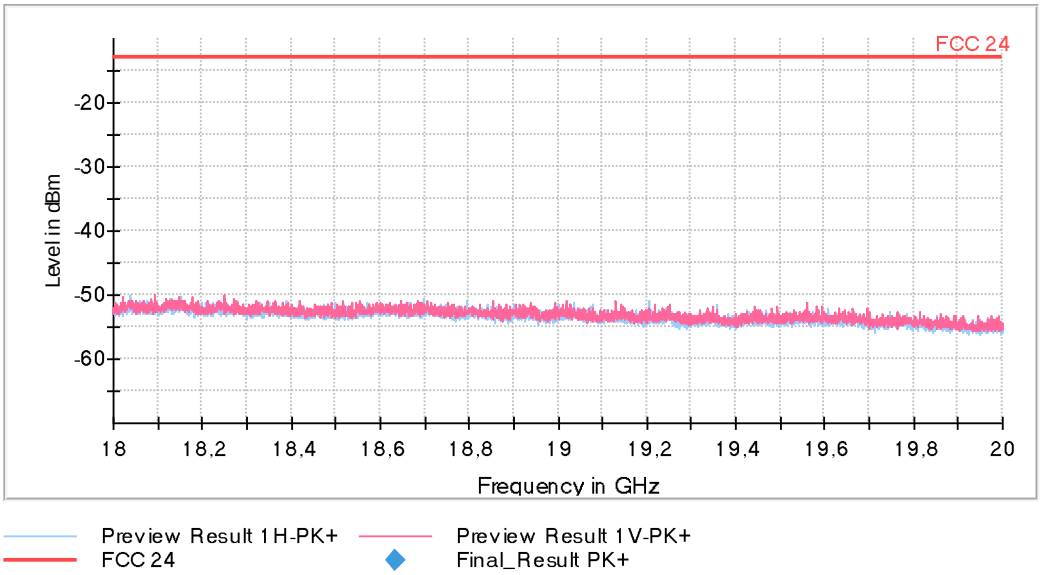
- Lowest Channel:



- Middle Channel:



- Highest Channel:



16QAM:
A preliminary scan determined BW=1.4 MHz, RB Size=3, RB Offset=1 as the worst case. The following tables and plots show the results for the worst case modulation.

- Lowest Channel:

Frequency range 30 MHz - 1 GHz

No spurious signals were found at less than 20 dB below the limit.

Frequency range 1 - 18 GHz

Spurious frequencies detected at less than 20 dB below the limit:

Spurious frequency (MHz)	Detector	E.I.R.P (dBm)	Polarization
9253.0	Peak	-32.61	V

Frequency range 18 - 20 GHz

No spurious signals were found at less than 20 dB below the limit.

- Middle Channel:

Frequency range 30 MHz - 1 GHz

Spurious frequencies detected at less than 20 dB below the limit:

Spurious frequency (MHz)	Detector	E.I.R.P (dBm)	Polarization
35.9655	Peak	-30.55	V
38.8270	Peak	-30.96	V
49.7395	Peak	-30.04	V
68.7030	Peak	-32.86	V

Frequency range 1 GHz-18 GHz

Spurious frequencies detected at less than 20 dB below the limit:

Spurious frequency (MHz)	Detector	E.I.R.P (dBm)	Polarization
9399.0	Peak	-32.29	V

Frequency range 18 - 20 GHz

No spurious signals were found at less than 20 dB below the limit.

- Highest Channel:

Frequency range 30 MHz - 1 GHz

No spurious signals were found at less than 20 dB below the limit.

Frequency range 1 GHz-18 GHz.

Spurious frequencies detected at less than 20 dB below the limit:

Spurious frequency (MHz)	Detector	E.I.R.P (dBm)	Polarization
9546.0	Peak	-32.46	V

Frequency range 18 - 20 GHz

No spurious signals were found at less than 20 dB below the limit.

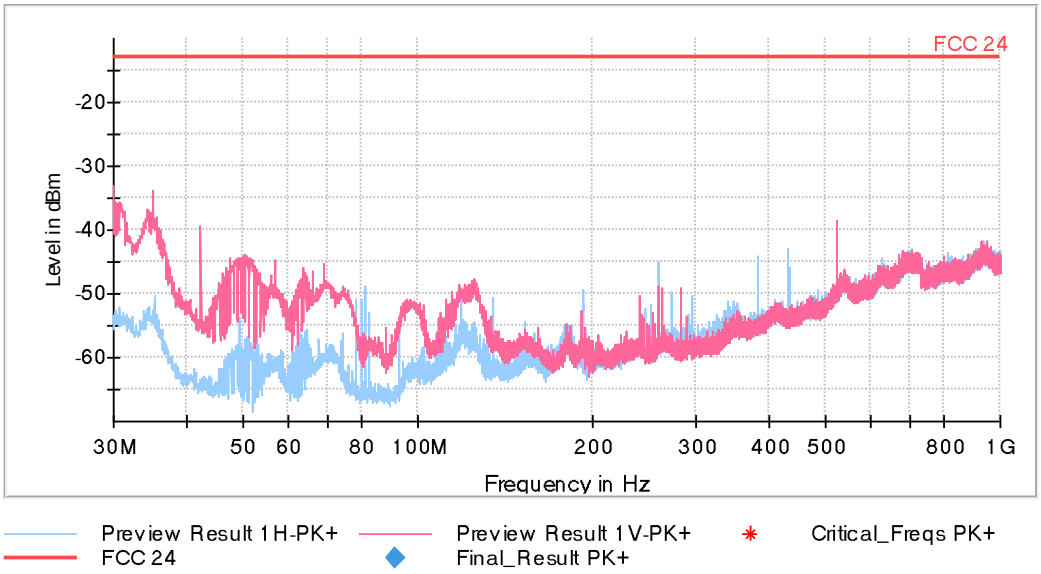
Measurement Uncertainty (dB): <± 4.68 for f ≥ 30 MHz up to 1 GHz
<± 4.00 for f ≥ 1 GHz up to 3 GHz
<± 4.99 for f ≥ 3 GHz up to 18 GHz
<± 5.08 for f ≥ 17 GHz up to 20 GHz

Verdict: PASS

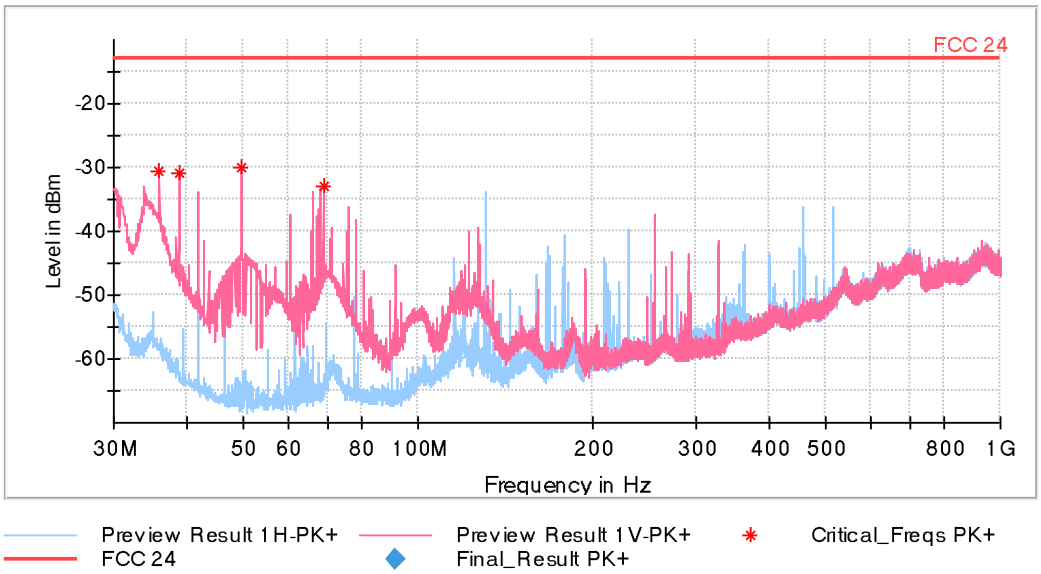
FREQUENCY RANGE 30 MHz - 1 GHz

16QAM MODULATION

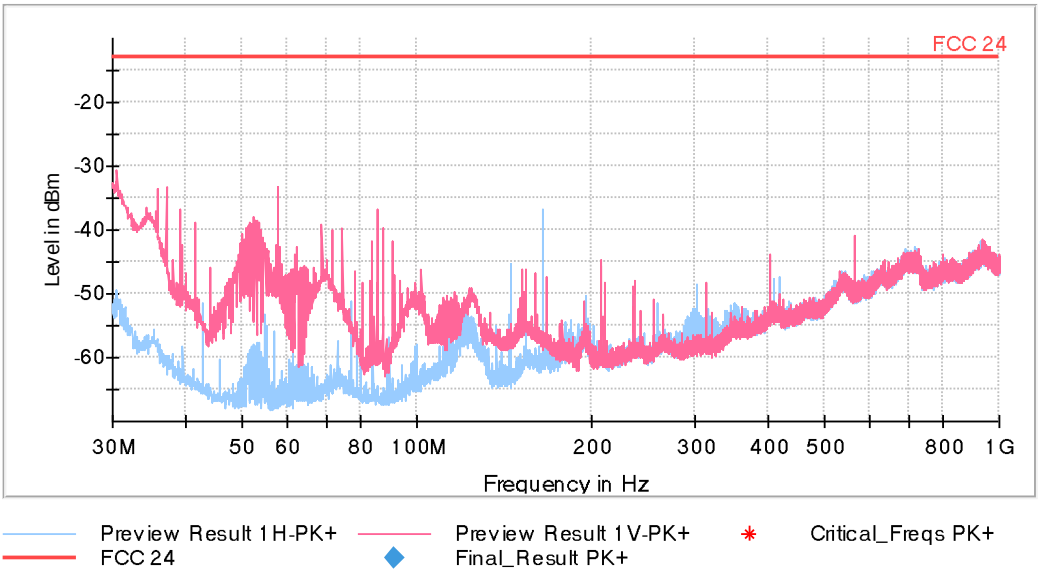
- Lowest Channel:



- Middle Channel:



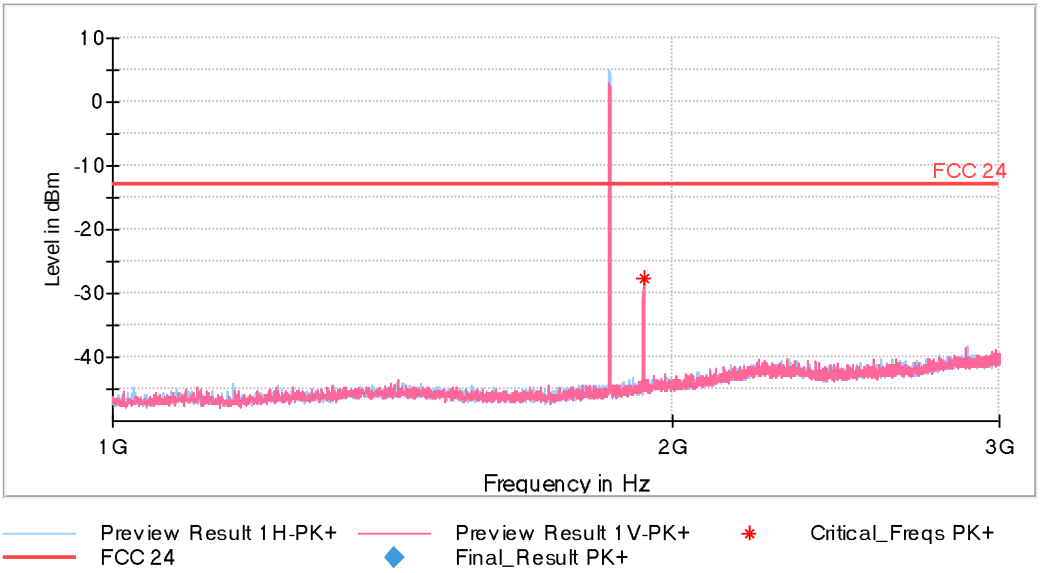
- Highest Channel:



FREQUENCY RANGE 1 - 3 GHz

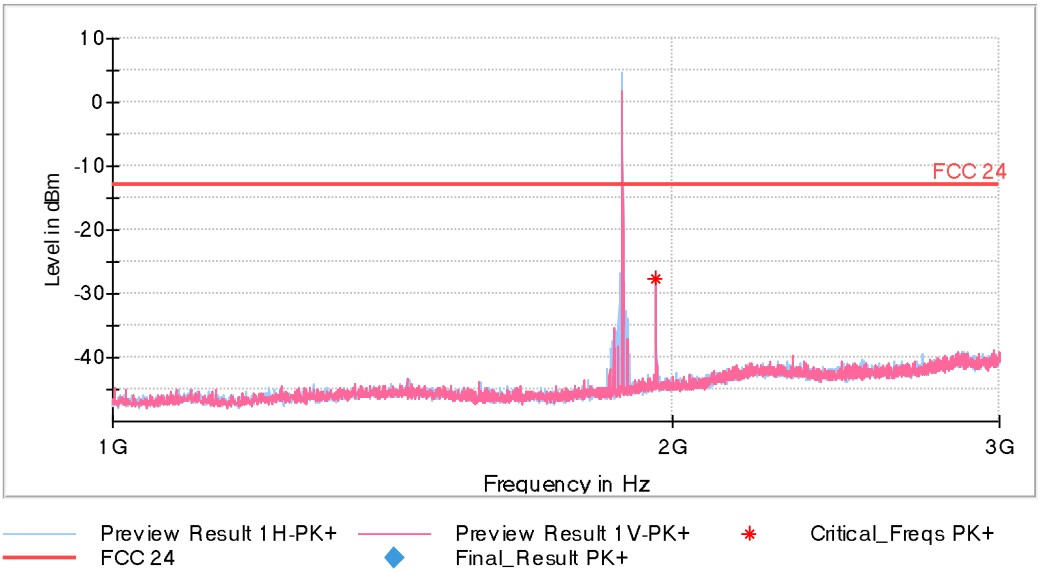
16QAM MODULATION

- Lowest Channel:



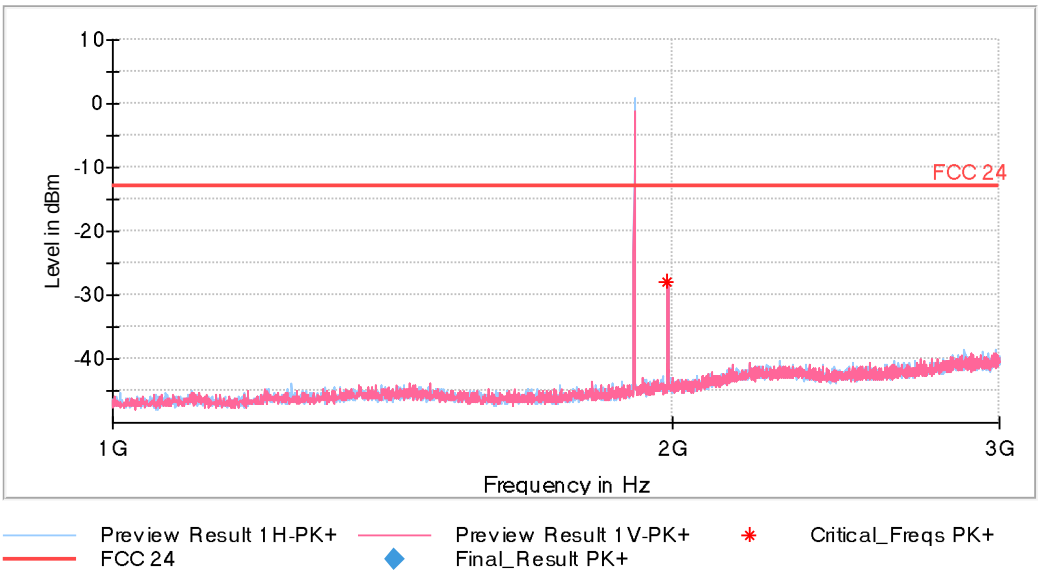
The peak above the limit is the carrier frequency.

- Middle Channel:



The peak above the limit is the carrier frequency.

- Highest Channel:

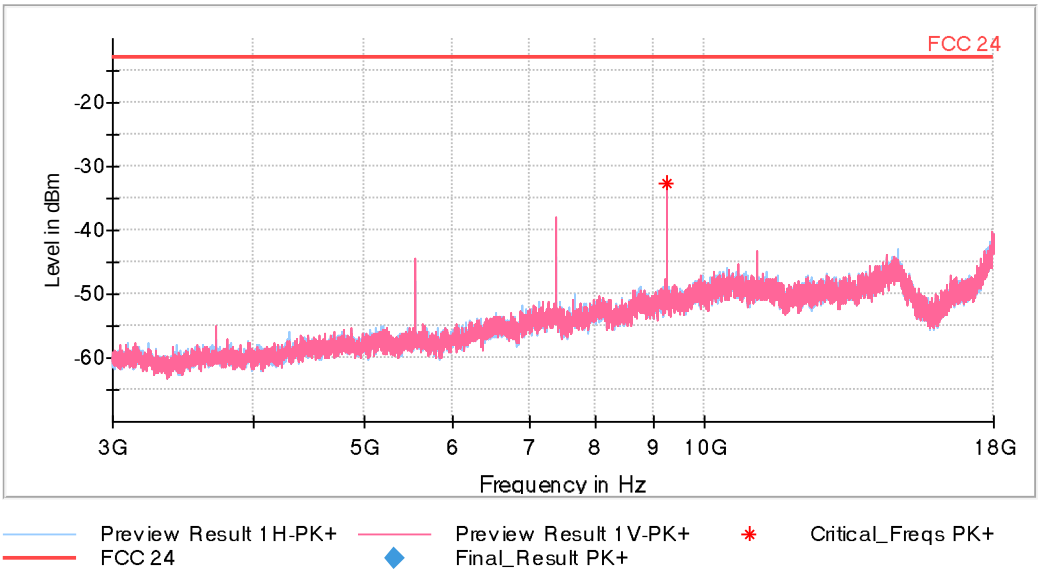


The peak above the limit is the carrier frequency.

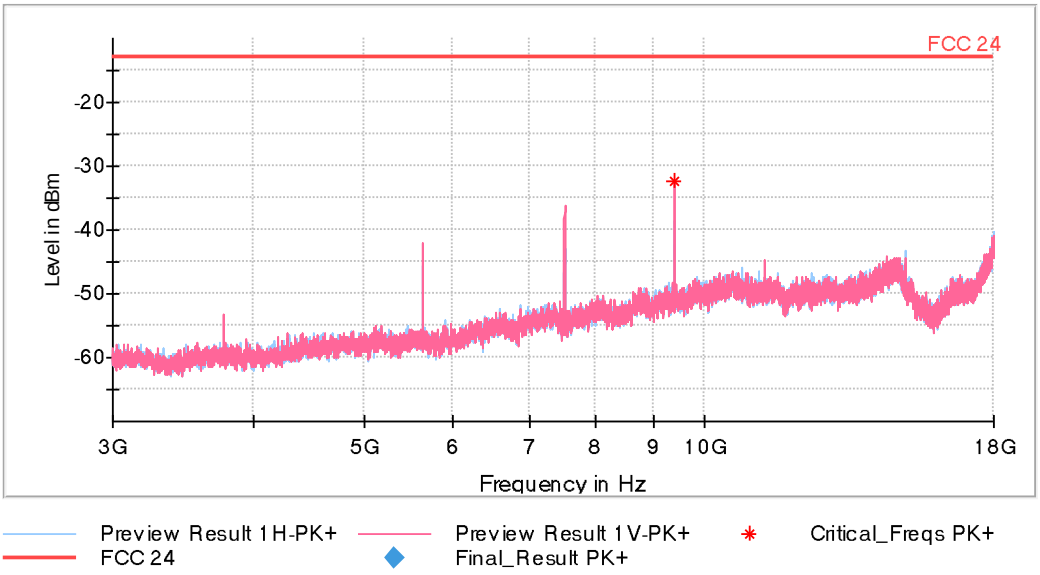
FREQUENCY RANGE 3 - 18 GHz

16QAM MODULATION

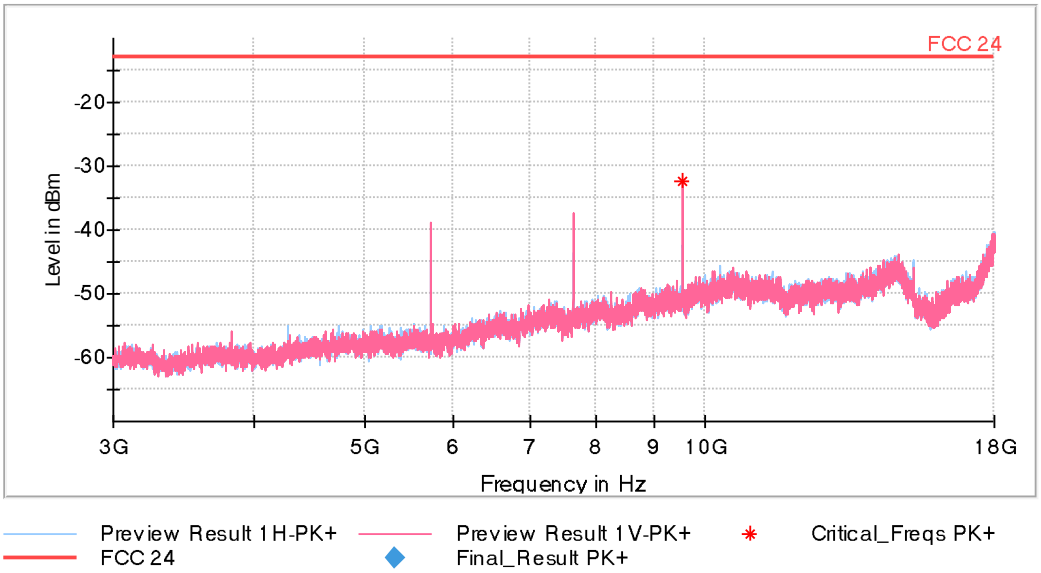
- Lowest Channel:



- Middle Channel:



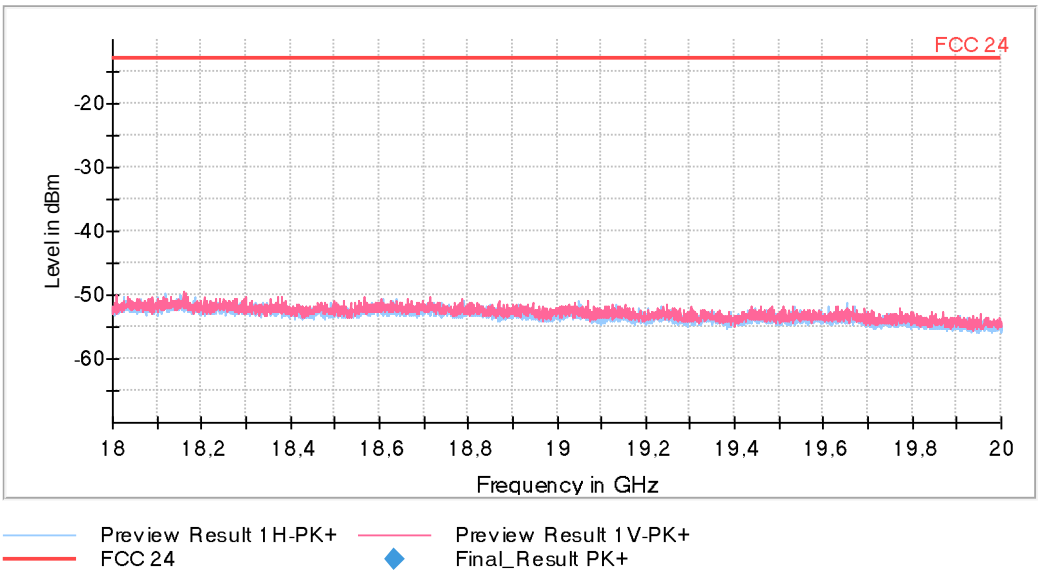
- Highest Channel:



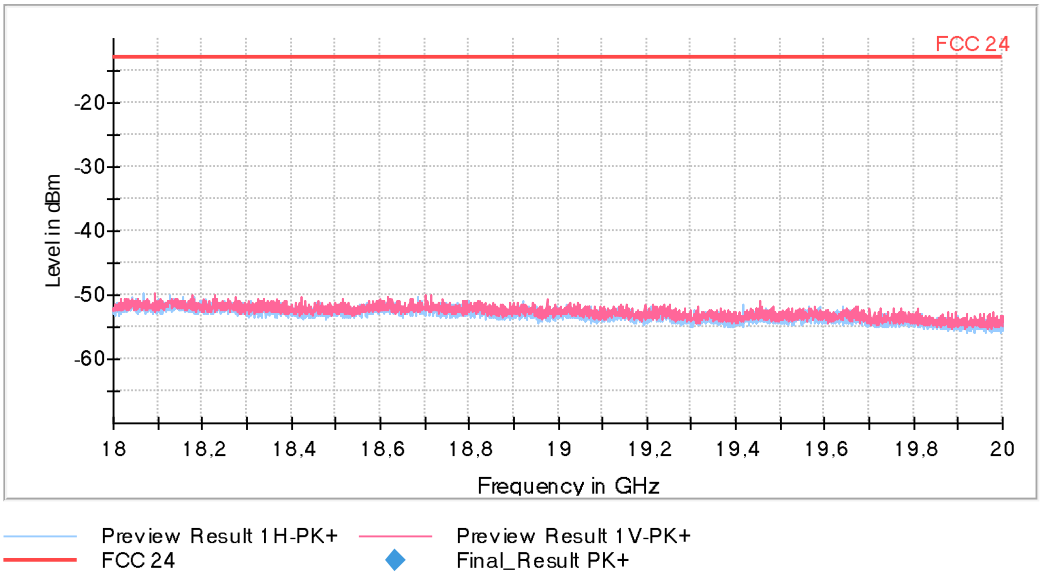
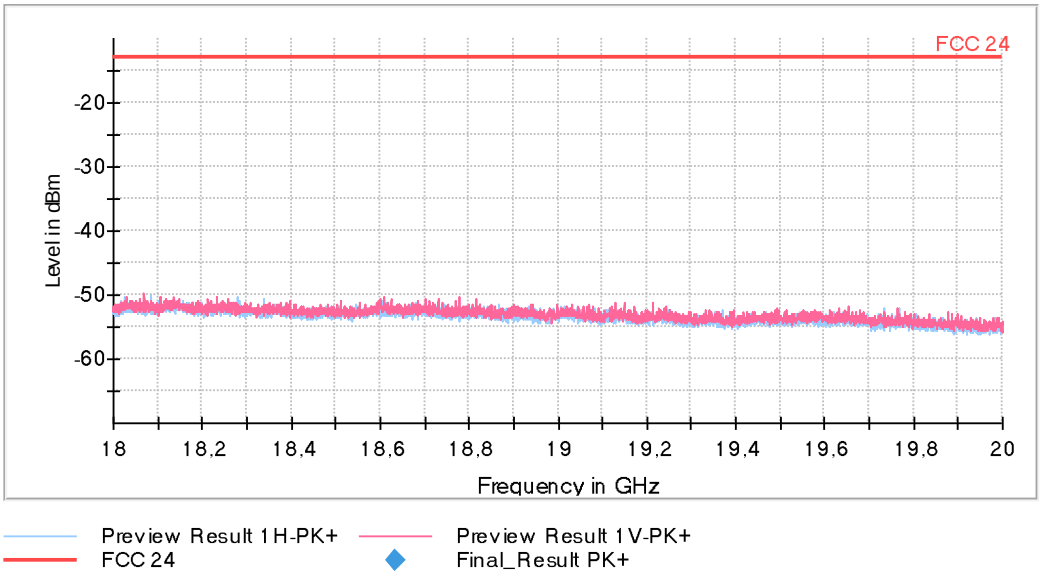
FREQUENCY RANGE 18 - 20 GHz

16QAM MODULATION

- Lowest Channel:



- Middle Channel:



- Highest Channel: