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: 70707RRF.008A1

Partial Test Report

USA FCC 15.31(h), 27, 15.209, 15.247, 15.249 CANADA RSS-132, RSS-139, RSS-199, RSS-210, RSS-247, RSS-Gen

(*) Identification of item tested	Machine Controller iCA202
(*) Trademark	iCON aps 202
(*) Model and /or type reference	iCA202 900MHz
Other identification of the product	HW version: 7E SW version: 0.9.104 FCC ID: RFD-ICA20X IC: 3177A-ICA20X -Contains FCC ID: N7NEM75 -Contains IC: 2417C-EM75 -Contains FCC ID: 2AG87DLM168N -Contains IC: 21411-DLM1683 -Contains FCC ID: MRBSATEL-TA43 -Contains IC: 2422A-SATELTA43
(*) Features	Bluetooth 3.0 EDR, 802.11@2.4GHz, LTE, 900 MHz
Applicant	LEICA GEOSYSTEMS AG Heinrich-Wild-Strasse 201, 9435 Heerbrugg, Switzerland
Test method requested, standard	USA FCC Part 15.31(h) (10-1-20 Edition): Measurement standard. USA FCC Part 15.209 (10-1-20 Edition): Radiated emission limits; general requirements. USA FCC Part 15.247 (10-1-20 Edition): Operation within the bands 902 - 928 MHz, 2400 -2483.5 MHz, and 5725 - 5850 MHz. USA FCC Part 15.249 (10-1-20 Edition): Operation within the bands 902 - 928 MHz, 2400 -2483.5 MHz, 5725 - 5875 MHz, and 24.0 – 24.25 GHz. USA FCC Part 27 (10-1-20 Edition): Miscellaneous Wireless Communications Services. CANADA RSS-132 Issue 3, Jan. 2013. CANADA RSS-139 Issue 3, Jul. 2015. CANADA RSS-199 Issue 3, Dec. 2016. CANADA RSS-210 Issue 10, Dec. 2019. CANADA RSS-247 Issue 2, Feb. 2017. CANADA RSS-Gen Issue 5, Amendment 2, Feb. 2021. Guidance for Performing Compliance Measurements on Digital Transmission System, Frequency Hopping Spread Spectrum System, and Hybrid Systems Devices Operating Under Section 15.247 of the FCC Rules. 558074 D01 Meas Guidance v05r02 dated April 2, 2019.

	Guidance for Performing Compliance Measurements on Digital Transmission System, Frequency Hopping Spread Spectrum System, and Hybrid Systems Devices Operating Under Section 15.247 of the FCC Rules. 558074 D01 Meas Guidance v05r02 dated April 2, 2019. ANSI C63.26-2015. ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices. ANSI C63.26-2015. IEEE/ANSI Standard for Testing of Transmitters Used in Licensed Radio Services
Approved by (name / position & signature)	Rafael López Martín EMC Consumer & RF Lab. Manager  2022.05.10 09:53:25 +02'00'
Date of issue	2022-05-10
Report template No	FDT08_23 (*) "Data provided by the client"

Index

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DEKRA Testing and Certification S.A.U is an ISED-recognized accredited testing laboratory, CABid: ES1909, with the appropriate scope of accreditation that covers the performed tests in this report.

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Uncertainty

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

The total uncertainty of the measurement system for the radiated emissions of the EUT from 30 MHz to 1 GHz is:
Measurement uncertainty $\leq \pm$ 5.35 dB with factor (k=2).
The total uncertainty of the measurement system for the radiated emissions of the EUT from 1 to 17 GHz is:
Measurement uncertainty $\leq \pm$ 4.32 dB with factor (k=2).
The total uncertainty of the measurement system for the radiated emissions of the EUT from 17 to 27 GHz is:
Measurement uncertainty $\leq \pm$ 5.51 dB with factor (k=2).

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 iCA202 900MHz is a Machine Controller which supplies RTK positioning data to an earthmoving machine or paver. GNSS correction data can be supplied to the unit through a variety of interfaces. The positioning data and sensor data is supplied to the machine primarily through CAN bus. The machine controller can be accessed remotely through a variety of RF or wired interfaces.

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
70707/010	Machine Controller iCA202	iCA202 900MHz	3730430	2022/02/17

Auxiliary elements used with the Sample S/03:

Control Nº	Description	Model	Serial Nº	Date of reception
70707/004	Antenna	--	--	2021/12/13
62082B/010	888169 Ultron Test Box	--	--	2019/09/16
62082B/059	USB cable	--	--	2019/09/16
62082B/060	MAG Base	GMLFML195C	--	2019/09/16
62082B/064	MAG Base	GMLFML195C	--	2019/09/16
62082B/092	Antenna	BMLPVMBLTENGP	--	2019/09/16
62082B/095	Antenna	BMLPVMBLTENGP	--	2019/09/16
62082B/101	Antenna	BMLPVMBLTENGP	--	2019/09/16
62082B/115	Ethernet Cable	--	--	2019/09/16
62082B/116	Ethernet Cable	--	--	2019/09/16
62082B/121	SMA cable	--	--	2019/09/16
62082B/129	SMA cable	--	--	2019/09/16
62082B/141	Splitter	ZFSC-2-11-S+	--	2019/09/16
62779/150	Router	DSL-2750U	QXBC1H4003465	2019/09/16
62779/151	Router	DSL-2750U	QXBC1H5003852	2019/09/16
62779/153	AC/DC Adapter	F12W8-120100SPAS	E21703271030960	2019/09/16
62779/154	AC/DC Adapter	F12W8-120100SPAS	E21705024033720	2019/09/16

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)			
	CAN1, 2, 3	5	☐	☐	☐			
	ETH1, 2	5	☐	☐	☐			
	USB	N/A	☐	☐	☐			
	Serial S1/S2	5	☐	☐	☐			
Supplementary information to the ports……:	-							
Rated power supply¡ ..... :	Voltage and Frequency			Reference poles				
				L1	L2	L3	N	PE
	☐	AC:		☐	☐	☐	☐	☐
	☐	AC:		☐	☐	☐	☐	☐
	☒	DC: 12V						
	☒	DC: 24V						
Rated Power..... :	12W							
Clock frequencies..... :	-							
Other parameters ..... :	-							
Software version..... :	0.9.104							
Hardware version ..... :	7E							
Dimensions in cm (W x H x D) ... :	226mm x 163mm x 69mm							
Mounting position ..... :	☐	Table top equipment						
	☐	Wall/Ceiling mounted equipment						
	☐	Floor standing equipment						
	☐	Hand-held equipment						
	☒	Other: Machine mount typically engine/cab compartment mount						
Modules/parts..... :	Module/parts of test item			Type		Manufacturer		
	EM7565			LTE Cellular		Sierra Wireless		
	TR489			SRD		Satel		
	ACM-DB-2			WLAN		Doodle labs		
	OEM719D			GNSS		Novatel		
Accessories (not part of the test item) ..... :	Description			Type		Manufacturer		
	CSR8510A10			Test Box		Leica		
Documents as provided by the applicant..... :	Description			File name		Issue date		
	Ultron Compliance Test Instructions V1.1							
	Ultron Product Description V1.1							

(3) Only for Medical Equipment

Identification of the client

LEICA GEOSYSTEMS AG

Heinrich-Wild-Strasse, 9435 Heerbrugg, Switzerland

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2022-03-25
Date (finish)	2022-05-10

Document history

Report number	Date	Description
70707RRF.008	2022-04-06	First release.
70707RRF.008	2022-05-10	Second release. First modification due to changes in the colocation modes. This modification test report cancels and replaces the test report 70707RRF.008

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: Gonzalo Rueda.

Used instrumentation:

Radiated Measurements:

		Last Calibration	Due Calibration
1.	Semianechoic Absorber Lined Chamber ALBATROSS P29419	2020/01	2023/01
2.	Shielded Room ALBATROSS PROJECTS GMBH P29419	N.A.	N.A.
3.	Ultralog Antenna 30MHz-6GHz, ROHDE AND SCHWARZ HL562E_UPG	2019/10	2022/10
4.	Signal and Spectrum Analyzer 2Hz-50GHz FSW50 Rohde and Schwarzbeck	2020/07	2022/07
5-	Semianechoic Absorber Lined Chamber FACT 3 200 STP ETS Lindgren	N.A.	N.A.
6.	Horn Antenna 1-18 GHz SCHWARZBECK MESS-ELEKTRONIK BBHA 9120 D	2019/11	2022/11
7.	EMI Test Receiver 2 Hz - 44 GHz Rhode and Schwarz ESW44	2021/12	2023/12
8.	Horn Antenna 1-18 GHz SCHWARZBECK MESS-ELEKTRONIK BBHA 9120 D	2019/11	2022/11
9.	Preamplifier 30dB 500MHz-18GHz, SCHWARZBECK BBV 9718 C	2022/02	2023/02
10.	Horn Antenna 18-40 GHz SCHWARZBECK BBHA 9170	2021/03	2024/03
11.	Pre-amplifier G>30dB 18-40 GHz BONN ELEKTRONIK BLMA 1840-3G	2022/02	2023/02

Testing verdicts

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

Summary

FCC 15, FCC 27 / RSS-132, RSS-139, RSS-199, RSS-210, RSS-247, RSS-Gen PARAGRAPH Requirement – Test case	Verdict	Remark
FCC 15.31 (h), FCC 27.53, FCC 15.209 (a), FCC 15.247 (d), FCC 15.249 (d) / RSS-132 5.5, RSS-139 6.6, RSS-199 4.5 (b), RSS-210 B.10 (b), RSS-247 5.5, RSS-Gen 8.9 Emission limitations radiated (Transmitter)	P	(1)
Supplementary information and remarks: (1) Only Co-location radiated spurious emission test was requested.		

Appendix A: Test results FCC 15.31(h), 27, 15.209, 15.247, 15.249 / RSS-132, RSS-139, RSS-199, RSS-210, RSS-247, RSS-Gen

INDEX

TEST CONDITIONS

(*): Data provided by the Applicant.

POWER SUPPLY (*):

Vnominal: 24 Vdc
Type of Power Supply: External DC.

ANTENNA (*):

BTEDR and WLAN 802.11 b/g/n SISO:

Type of Antenna: External.

Maximum Declared Antenna Gain: +3 dBi

Cellular:

High Bands	Maximum Declared Antenna Gain	Type of Antenna
3G Band V	+2.5 dBi	External
LTE Band 41	+2.5 dBi	
LTE Band 66	+2.5 dBi	

SRD 900 MHz:

Type of Antenna: External.

Maximum Declared Antenna Gain: +3 dBi .

TEST FREQUENCIES (*):

	CELLULAR	
Band:	3G Band V	
Frequency Range:	824 – 849 MHz	
Transmit Channel:	Channel	Channel Frequency (MHz)
	High: 4233	846.6
Band:	LTE Band 41	
Frequency Range:	2496 – 2690 MHz	
Transmit Channel:	Channel	Channel Frequency (MHz)
	Mid: 40620	2593 MHz (BW 20 MHz, RB Size 1, RB Offset 0, Narrowband=0, QPSK)
Band:	LTE Band 66	
Frequency Range:	1710 – 1780 MHz	
Transmit Channel:	Channel	Channel Frequency (MHz)
	Mid: 132322	1745 MHz (BW 20 MHz, RB Size 1, RB Offset 0, Narrowband=0, QPSK)

	WLAN 2.4 GHz (IEEE 802.11 bgn20) / DTS	
Mode:	802.11 b: 1 Mbps	
Channel Spacing:	20 MHz	
Frequency Range:	2412 MHz to 2462 MHz	
Transmit Channels	Channel	Channel Frequency (MHz)
	Middle: 6	2437

	BTEDR 2.4 GHz	
Mode:	GFSK: 1-DH5	
Channel Spacing:	1 MHz	
Frequency Range:	2402 MHz to 2480 MHz	
Transmit Channels	Channel	Channel Frequency (MHz)
	Low	2402

	SRD 900 MHz	
Mode:	GFSK	
Channel Spacing:	1 MHz	
Frequency Range:	902 MHz to 928 MHz	
Transmit Channel:	Channel	Channel Frequency (MHz)
	Low	902.2464

The test set-up was made in accordance to the general provisions of FCC DTS Measurement 558074 D01 DTS Meas Guidance v05r02 dated April 2, 2019.

The EUT was tested in the following operating mode:

During transmitter test the EUT was being controlled by the SW tool to operate in a continuous transmit mode on the test channel as required and in each of the different modulation modes.

The following configurations were selected based on preliminary testing that identified those corresponding to the worst-cases:

Selected Transmission Modes for each Radio:

The following configurations were selected based on preliminary testing that identified those corresponding to the worst-cases:

* Cellular 3G Band V: Transmitter radiated spurious emissions tests were performed with the EUT transmitting in: Cellular 3G Band V / High Channel in WCDMA mode configuration.

* Cellular LTE Band 41: Transmitter radiated spurious emissions tests were performed with the EUT transmitting in Cellular LTE Band 41 / Mid Channel configuration as this channel was found to transmit higher EIRP than all the other LTE Band 41 channels.

* Cellular LTE Band 66: Transmitter radiated spurious emissions tests were performed with the EUT transmitting in Cellular LTE Band 66 / Mid Channel configuration as this channel was found to transmit higher EIRP than all the other LTE Band 66 channels.

* WLAN 2.4 GHz: Transmitter radiated spurious emissions tests were performed with the EUT transmitting in 802.11 b / 1 Mbps mode configuration as this mode was found as the worst-case for spurious emissions than all the other WLAN 2.4 GHz SISO modes.

* BTEDR 2.4 GHz: Transmitter radiated spurious emissions tests were performed with the EUT transmitting in GFSK 1-DH5 mode configuration as this mode was found as the worst-case for spurious emissions than all the other BTEDR.

* SRD 900 MHz: Transmitter radiated spurious emissions tests were performed with the EUT transmitting in SRD 902.2464 MHz / GFSK mode configuration as this mode was found as the worst-case for spurious emissions than all the other SRD 900 MHz modes.

TESTED SIMULTANEOUS TRANSMISSION MODES:

*** Co-Location mode 3G V, WLAN 2.4 GHz, SRD 900 MHz**, with the EUT configured to simultaneously transmit three signals at maximum output power:

3G V / High Channel (846.6 MHz), WLAN 2.4 GHz / Middle Channel (CH6: 2437 MHz, 802.11 b), SRD 900 MHz / Low Channel 902.2464 MHz).

*** Co-Location mode LTE 66, WLAN 2.4 GHz, SRD 900 MHz**, with the EUT configured to simultaneously transmit three signals at maximum output power:

LTE 66 / Mid Channel (1745 MHz), WLAN 2.4 GHz / Middle Channel (CH6: 2437 MHz, 802.11 b), SRD 900 MHz / Low Channel 902.2464 MHz).

*** Co-Location mode LTE 41, WLAN 2.4 GHz, SRD 900 MHz, BTEDR 2.4 GHz with the EUT configured to** simultaneously transmit four signals at maximum output power:

LTE 41 / Mid Channel (2593 MHz), WLAN 2.4 GHz / Middle Channel (CH6: 2437 MHz, 802.11 b), BTEDR 2.4 GHz / Low Channel (2402 MHz, GFSK 1-DH5), SRD 900 MHz / Low Channel 902.2464 MHz).

*** Co-Location mode WLAN 2.4 GHz SRD 900 MHz**, with the EUT configured to simultaneously transmit two signals at maximum output power:

WLAN 2.4 GHz 802.11b / Middle Channel (CH6: 2437 MHz), SRD 900 MHz / Low Channel 902.2464 MHz).

After checking simultaneous transmission with all radios, the worst case was determined with cellular, WLAN 2.4 GHz and SRD, so that configuration was measured in the rest of possible modes

Radiated emissions

SPECIFICATION:

BTEDR and 802.11 WLAN 2.4 GHz. FCC §15.247 (d) and RSS-247 Issue 2 Clause 5.5.

Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c) / RSS-Gen):

Frequency Range (MHz)	Field strength (µV/m)	Field strength (dBµV/m)	Measurement distance (m)
0.009-0.490	2400/F(kHz)	-	300
0.490-1.705	24000/F(kHz)	-	30
1.705 - 30.0	30	-	30
30 - 88	100	40	3
88 - 216	150	43.5	3
216 - 960	200	46	3
960 - 25000	500	54	3

The emission limits shown in the above table are based on measurements employing CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

For average radiated emission measurements above 1000 MHz, there is also a limit corresponding to 20 dB above the indicated values in the table is specified when measuring with peak detector function.

RSS-247. Attenuation below the general field strength limits specified in RSS-Gen is not required.

SRD 900 MHz:

The field strength of harmonics from intentional radiators shall comply with the following:

Fundamental frequency (MHz)	Field strength of harmonics (µV/m)	Field strength of harmonics (dBµV/m)	Measurement distance (m)
902 - 928	500	54	3
2400 – 2483.5	500	54	3
5725 - 5875	500	54	3
24000-24250	2500	67.96	3

Emissions radiated outside of the specific frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of fundamental or to the general radiated emission limits specified in section 15.209:

Frequency Range (MHz)	Field strength (µV/m)	Field strength (dBµV/m)	Measurement distance (m)
0.009-0.490	2400/F(kHz)	-	300
0.490-1.705	24000/F(kHz)	-	30
1.705 - 30.0	30	-	30
30 - 88	100	40	3
88 - 216	150	43.5	3
216 - 960	200	46	3
960 - 25000	500	54	3

Whichever is the lesser attenuation.

3G Band V. FCC §2.1053 & §22.917 / RSS-132 Issue 3 Clause 5.5.:

FCC §2.1053 and §22.917. RSS-132 Clause 5.5.

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.

In the spectrum below 1 GHz, instrumentation should employ a reference bandwidth of 100 kHz or greater. In the spectrum above 1 GHz, instrumentation should employ a reference bandwidth of 1 MHz.

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

LTE Band 41. FCC §2.1053 & §27.53 (m) (4) / RSS-199 Issue 3 Clause 4.5 (b).

FCC §27.53 (m)

(4) For mobile digital stations, the attenuation factor shall be not less than 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz.

RSS-199 Clause 4.5

(b) for mobile subscriber equipment, the power of any unwanted emissions measured as above shall be attenuated (in dB) below the transmitter power, P (dBW), by at least:

iii. 55 + 10 log10 p at X MHz and beyond from the channel edges

In addition, the attenuation shall not be less than 43 + 10 log10 p on all frequencies between 2490.5 MHz and 2496 MHz, and 55 + 10 log10 p at or below 2490.5 MHz.

In (b), p is the transmitter power measured in watts and X is 6 MHz or the equipment occupied bandwidth, whichever is greater.

At Po transmitting power, the specified minimum attenuations become:

Po (dBm) – [55 + 10 log (Po in mW) - 30] = -25 dBm

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

LTE Band 66. FCC §2.1053 & §27.53 (h) / RSS-139 Issue 3 Clause 6.6.

FCC §2.1053 and §27.53 (h). RSS-139 Clause 6.6.

For operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log10 (P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater.

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 of the co-located radios till 26 GHz.

The EUT was placed on a 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 meter reading was recorded.

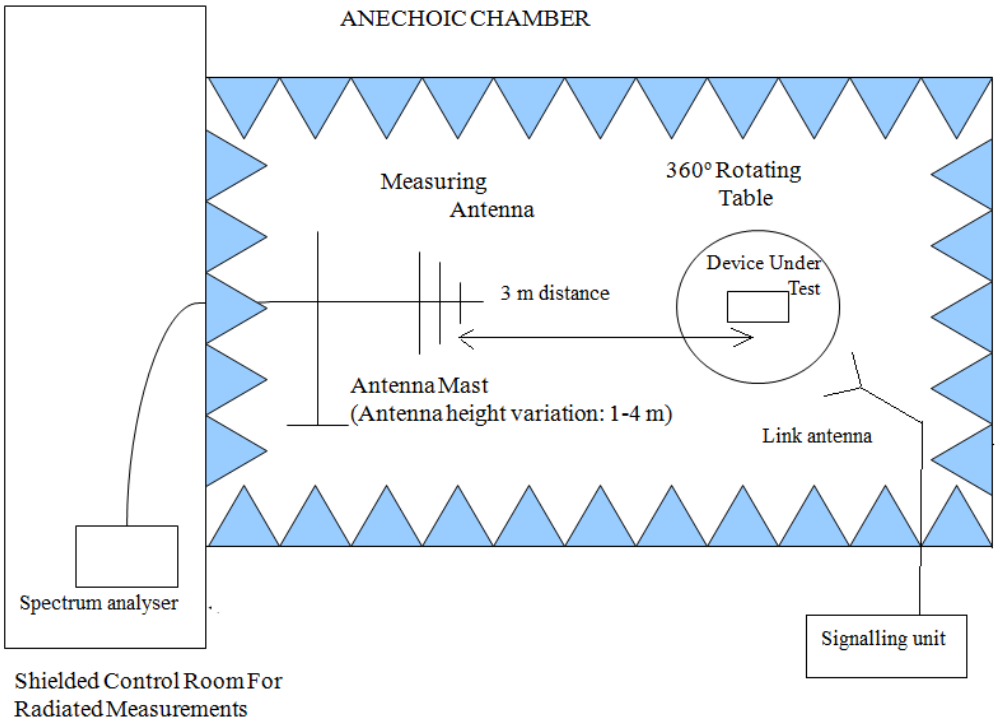
The field strength is calculated by adding correction factor to the measured level from the spectrum analyzer. This correction factor includes antenna factor, cable loss and pre-amplifiers gain.

These measurements have been performed in order to check the impact of the Co-Location of all radio interfaces (that can be transmitting simultaneously).

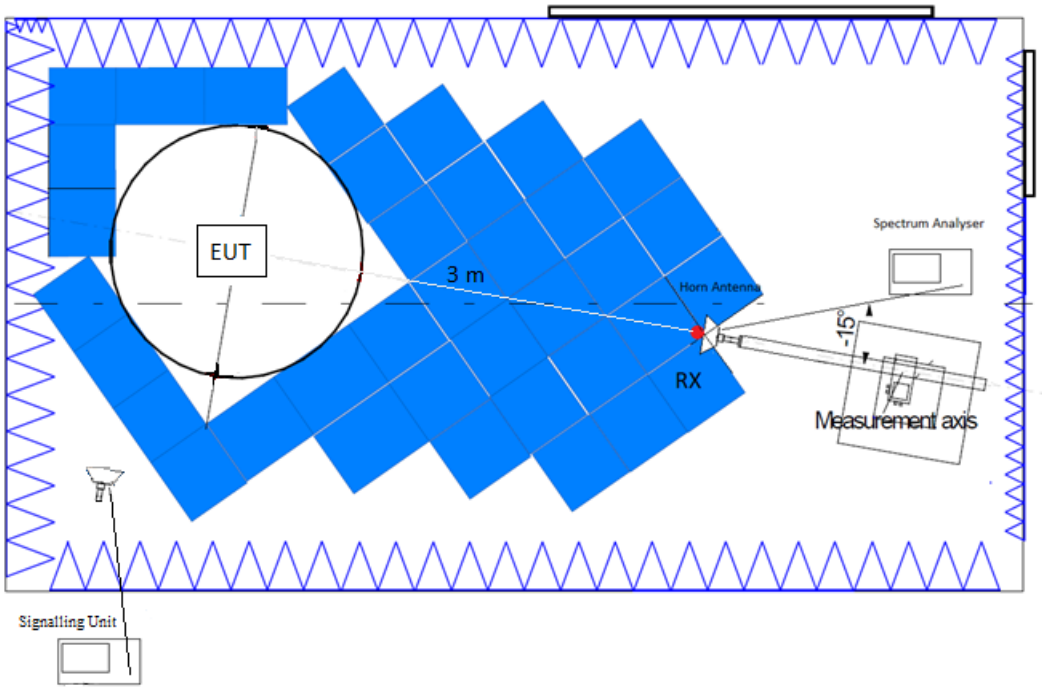
A resolution bandwidth / video bandwidth of 100 kHz / 300 kHz was used for spectrum below 1 GHz and 1MHz / 3 MHz for spectrum above 1 GHz

TEST SETUP:

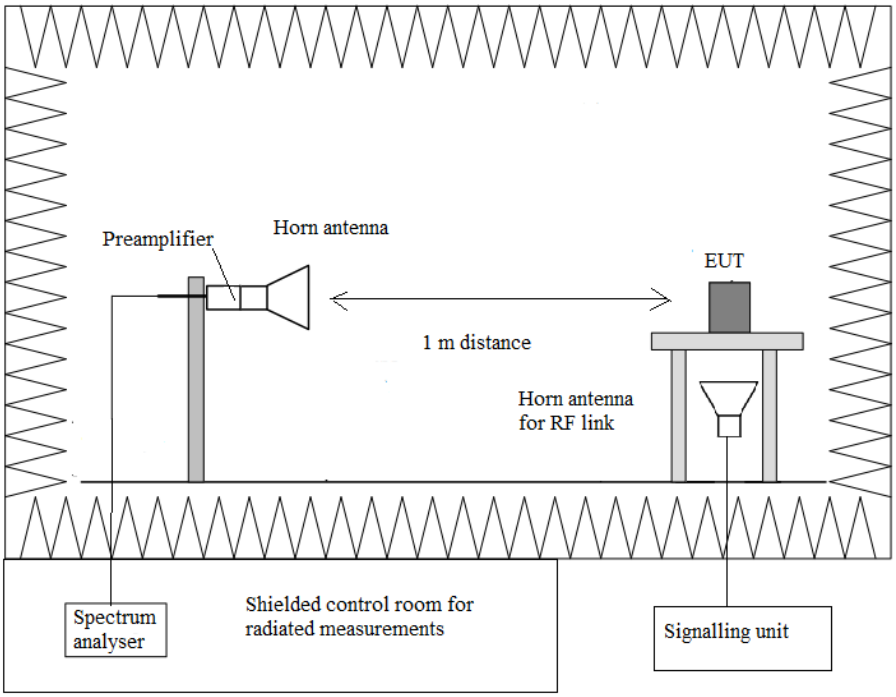
Radiated measurements below 1 GHz.



Radiated measurements between 1 GHz and 17 GHz.



Radiated measurements above 17 GHz.



RESULTS:

- **Co-location mode Cellular 3G V, WLAN 2.4 GHz, SRD 900 MHz:**

WCDMA & HSUPA:
A preliminary scan determined the WCDMA modulation in the High Channel as the worst-case.

3G V:	High Channel (846.6 MHz). WCDMA.
WLAN 2.4 GHz:	Middle Channel (2437 MHz). 802.11 b. BW: 20 MHz. 6.5 Mbps.
SRD 900 MHz:	Low Channel (902.2464 MHz). GFSK.

LIMIT: The spurious frequencies were measured at 3 meter. The limit of the test is determined by:

Frequency Range	Detector	Limit at 3m (dBµV/m)
30 MHz to 9 GHz	Average	43 + 10 log (P) dB = -13 dBm -> 82.23 dBµV/m
9 GHz to 26 GHz	Peak	74 dBµV/m
9 GHz to 26 GHz	Average	54 dBµV/m (*)

(*) Radiated emissions which fall in the restricted bands, as defined in §15.205(a).

Frequency range 30 MHz - 1 GHz:

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

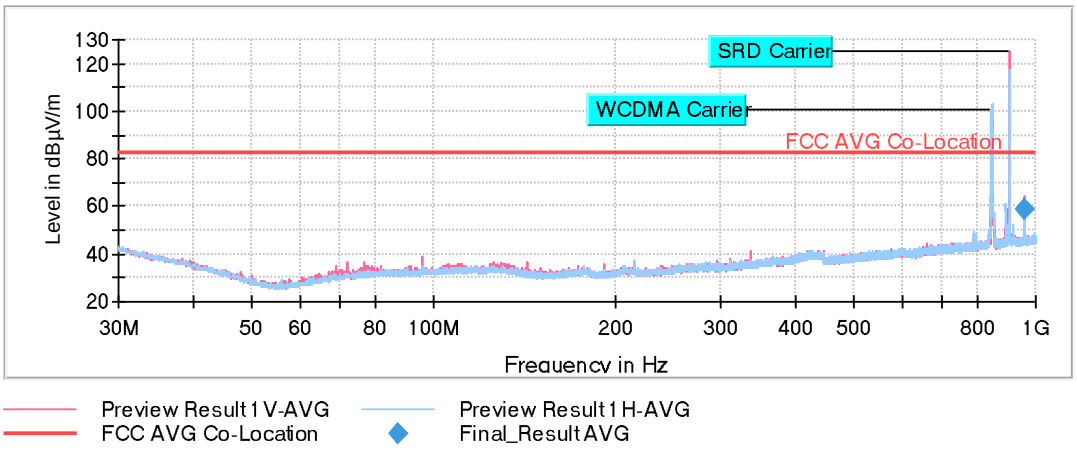
Frequency range 1 - 26 GHz:

Spurious frequencies at less than 20 dB below the limit:

Spurious frequency (GHz)	(dBµV/m)	Polarization	Detector
1.5328	68.19	V	Average
4.8738	63.10	V	Average
12.1123	51.23	V	Peak

Verdict: PASS

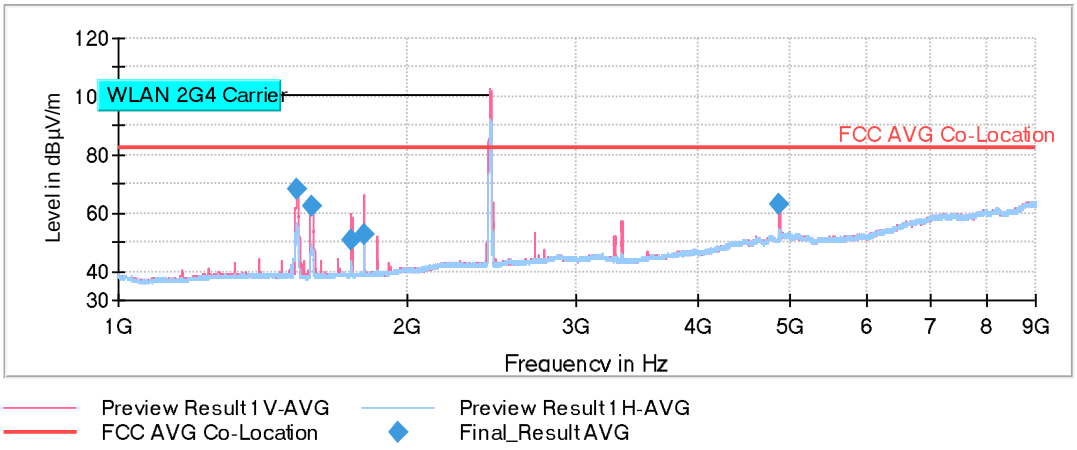
FREQUENCY RANGE 30 MHz - 1 GHz:



The peak above the limit is the carrier frequency SRD 900 MHz (902.2464 MHz).

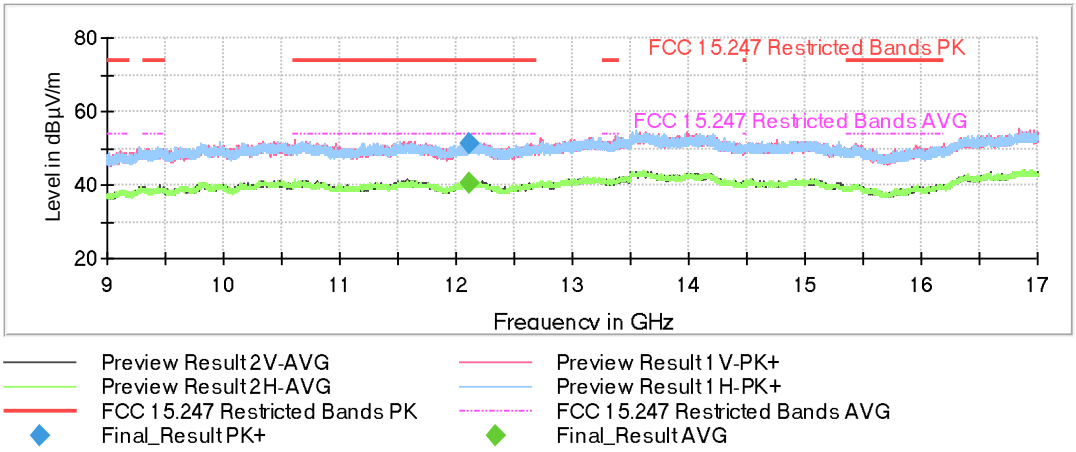
The peak above the limit is the carrier frequency 3G V (846.6 MHz).

FREQUENCY RANGE 1 - 9 GHz:

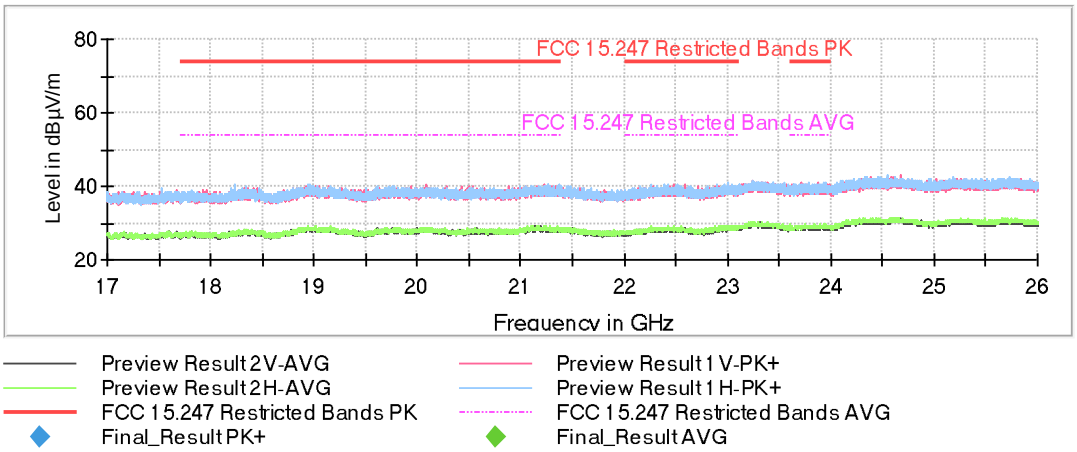


The peak above the limit is the carrier frequency WLAN 2.4 GHz (2437 MHz).

FREQUENCY RANGE 9 - 17 GHz:



FREQUENCY RANGE 17 - 26 GHz:



- **Co-location mode LTE 66, WLAN 2.4 GHz, SRD 900 MHz:**

QPSK & 16QAM:
A preliminary scan determined the QPSK modulation in the High Channel as the worst-case.

LTE 66:	Mid Channel (1745 MHz). QPSK.
WLAN 2.4 GHz:	Middle Channel (2437 MHz). 802.11 b.
SRD 900 MHz:	Low Channel (902.2464 MHz). GFSK.

LIMIT: The spurious frequencies were measured at 3 meter. The limit of the test is determined by:

Frequency Range	Detector	Limit at 3m (dBµV/m)
30 MHz to 18 GHz	Average	43 + 10 log (P) dB = -13 dBm -> 82.23 dBµV/m
18 GHz to 26 GHz	Peak	74 dBµV/m
18 GHz to 26 GHz	Average	54 dBµV/m (*)

(*) Radiated emissions which fall in the restricted bands, as defined in §15.205(a).

Frequency range 30 MHz - 1 GHz:

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

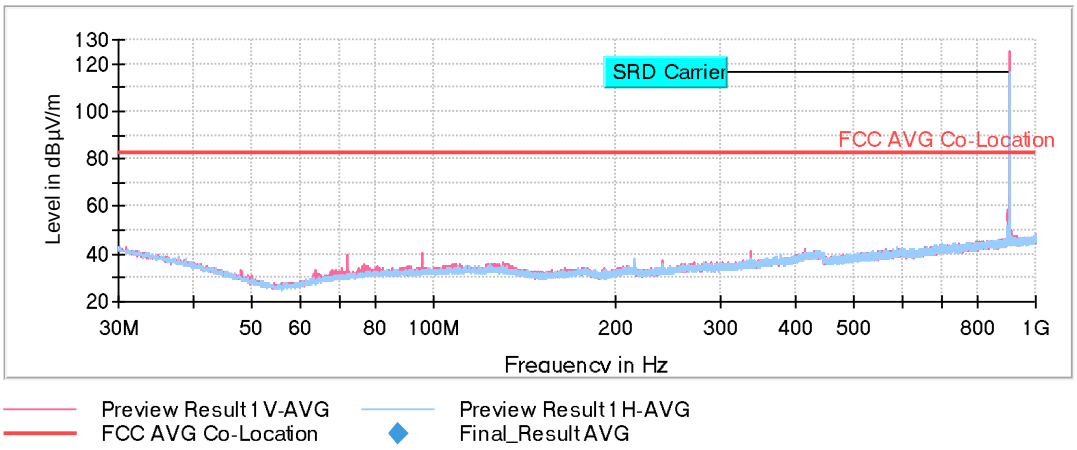
Frequency range 1 - 26 GHz:

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

Spurious frequency (GHz)	E.I.R.P (dBµV/m)	Polarization	Detector
1.5322	69.82	V	Average
13.5482	71.16	H	Average

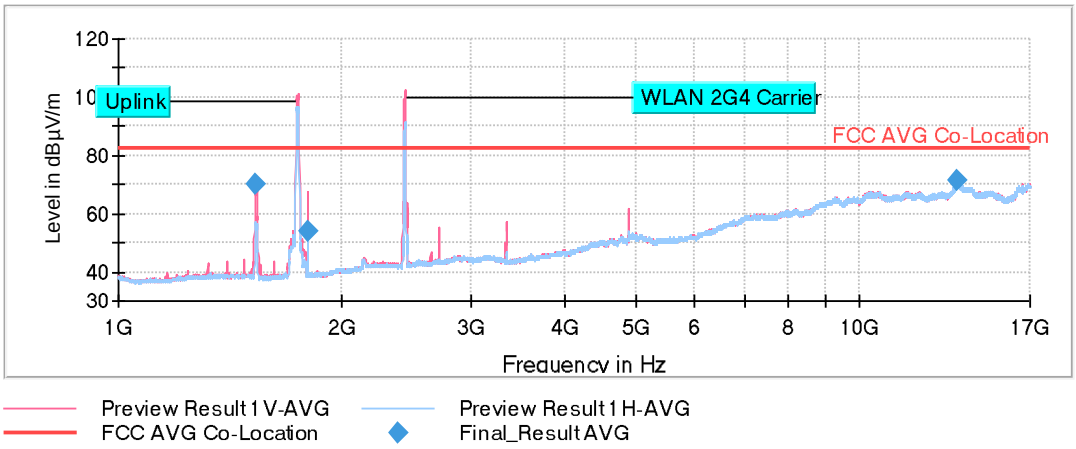
Verdict: PASS

FREQUENCY RANGE 30 MHz - 1 GHz:



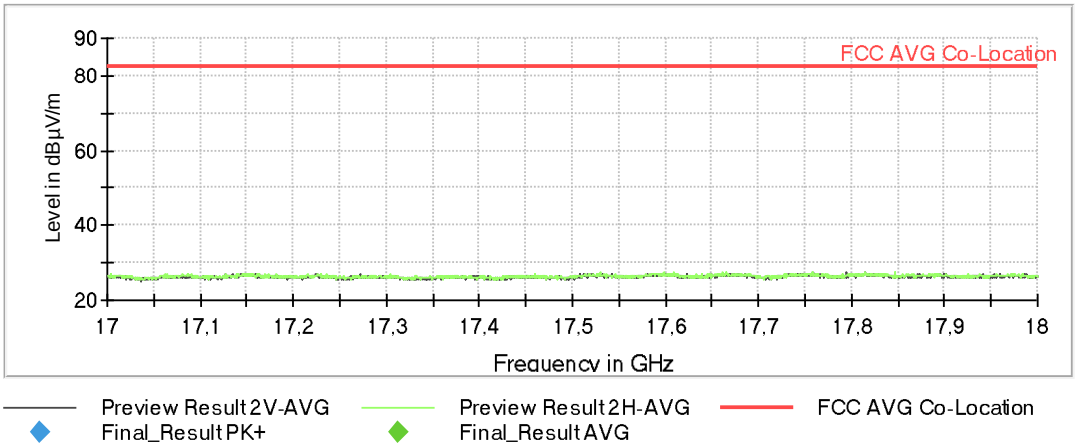
The peak above the limit is the carrier frequency SRD 900 MHz (902.2464 MHz).

FREQUENCY RANGE 1 - 18 GHz:

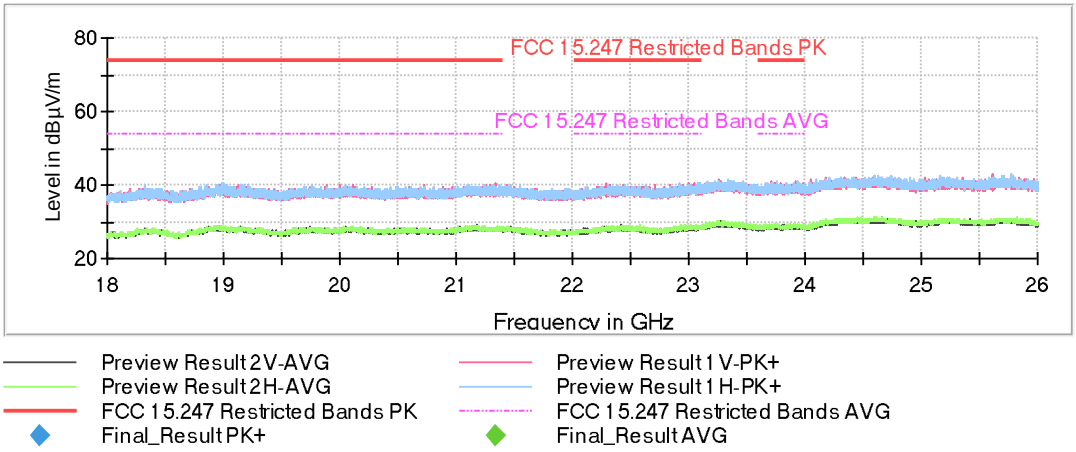


The peak above the limit is the carrier frequency LTE 66 (1745 MHz).

The peak above the limit is the carrier frequency WLAN 2.4 GHz (2437 MHz).



FREQUENCY RANGE 18 - 26 GHz:



- **Co-location mode LTE 41, WLAN 2.4 GHz, BTEDR 2.4 GHz, SRD 900 MHz:**

QPSK & 16QAM:
A preliminary scan determined the QPSK modulation in the High Channel as the worst-case.

LTE 41:	Middle Channel (2593 MHz). QPSK.
WLAN 2.4 GHz:	Middle Channel (2437 MHz). 802.11 b.
BTEDR 2.4 GHz:	Low Channel (2402 MHz, GFSK 1-DH5),
SRD 900 MHz:	Low Channel (902.2464 MHz). GFSK.

LIMIT: The spurious frequencies were measured at 3 meter. The limit of the test is determined by:

Frequency Range	Detector	Limit at 3m (dBµV/m)
30 MHz to 27 GHz	Average	43 + 10 log (P) dB = -13 dBm -> 82.23 dBµV/m

Frequency range 30 MHz - 1 GHz:

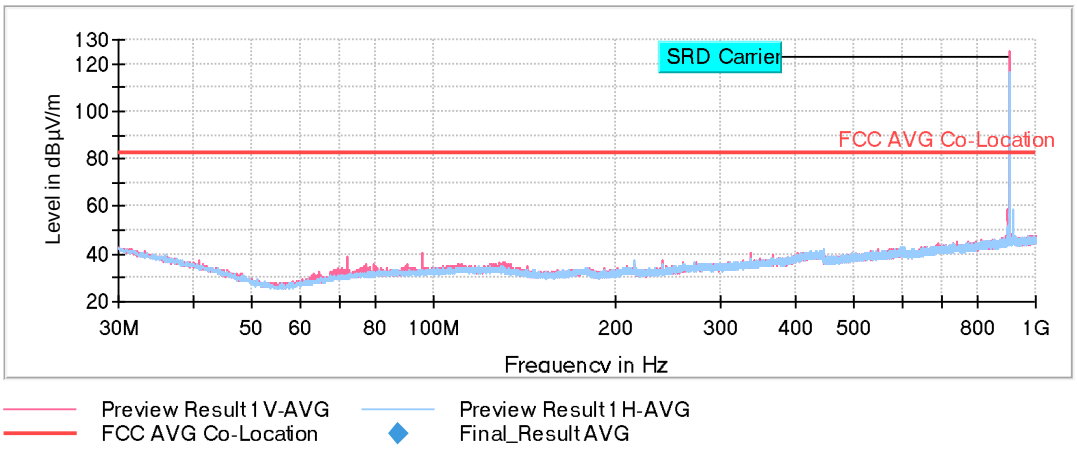
No spurious frequencies at less than 20 dB below the limit.

Frequency range 1 - 26 GHz:

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

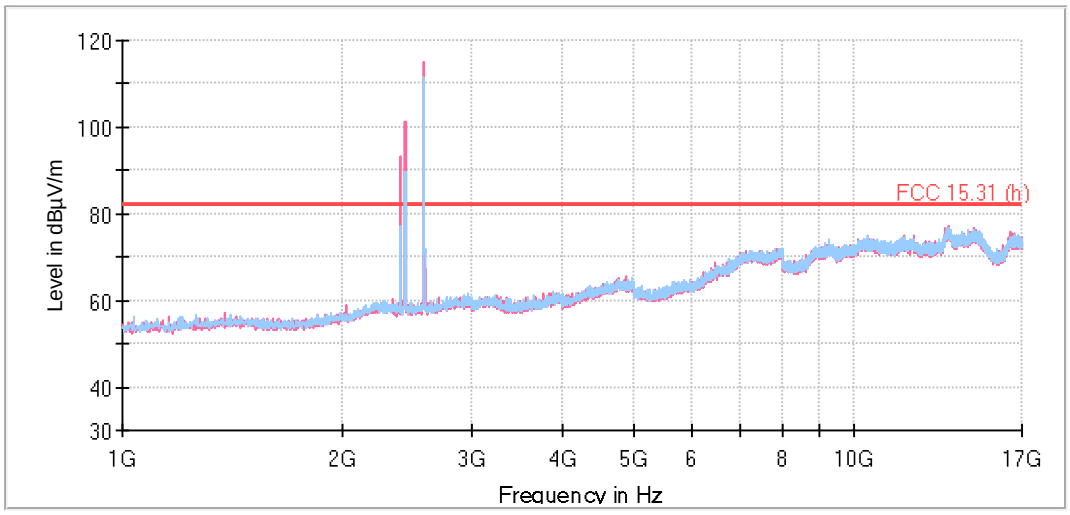
Verdict: PASS

FREQUENCY RANGE 30 MHz - 1 GHz:



The peak above the limit is the carrier frequency SRD 900 MHz (902.2464 MHz).

FREQUENCY RANGE 1 - 17 GHz:

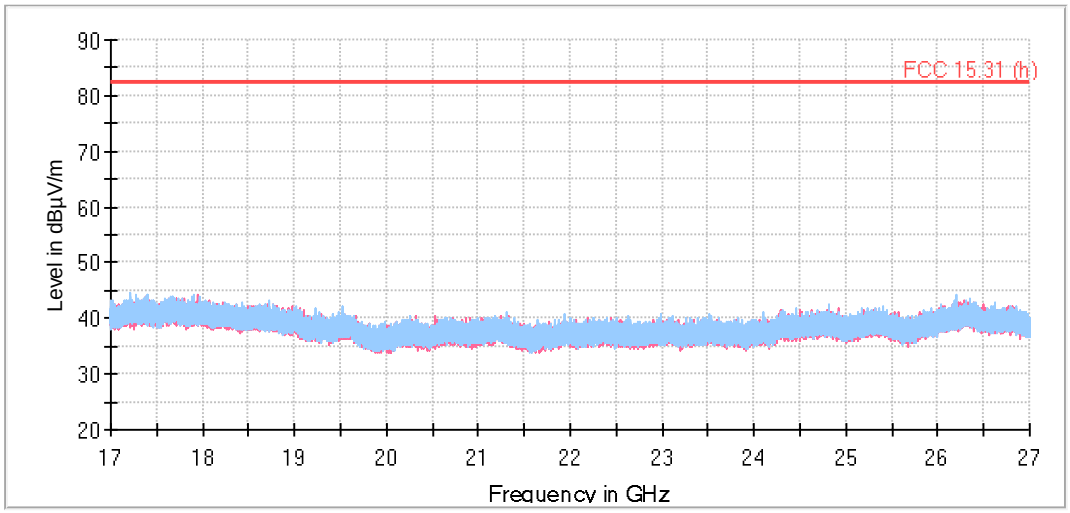


The peak above the limit is the carrier frequency BTEDR 2.4 GHz (2402 MHz).

The peak above the limit is the carrier frequency WLAN 2.4 GHz (2437 MHz).

The peak above the limit is the carrier frequency LTE 41 (2593 MHz).

FREQUENCY RANGE 17 - 27 GHz:



- **Co-location mode WLAN 2.4 GHz, SRD 900 MHz:**

WCDMA & HSUPA:
A preliminary scan determined the WCDMA modulation in the High Channel as the worst-case.

WLAN 2.4 GHz:	Middle Channel (2437 MHz). 802.11 b. BW: 20 MHz. 6.5 Mbps.
SRD 900 MHz:	Low Channel (902.2464 MHz). GFSK.

LIMIT: The spurious frequencies were measured at 3 meter. The limit of the test is determined by:

Frequency Range	Detector	Limit at 3m (dBµV/m)
30 - 88	Quasi-Peak	40
88 - 216	Quasi-Peak	43.5
216 - 960	Quasi-Peak	46
960 - 1000	Quasi-Peak	54
1 GHz to 26 GHz	Peak	74 dBµV/m
1 GHz to 26 GHz	Average	54 dBµV/m (*)

(*) Radiated emissions which fall in the restricted bands, as defined in §15.205(a).

Frequency range 30 MHz - 1 GHz:

Spurious frequencies at less than 20 dB below the limit:

Spurious frequency (MHz)	E.I.R.P (dBµV/m)	Polarization	Detector
71.9525	30.44	V	Quasi-Peak
78.0635	28.22	V	Quasi-Peak
90.6250	28.34	V	Quasi-Peak
95.9600	32.05	V	Quasi-Peak
109.7340	26.21	V	Quasi-Peak
129.9100	27.75	V	Quasi-Peak
191.8930	29.87	V	Quasi-Peak
215.9005	35.27	H	Quasi-Peak
311.8335	30.37	V	Quasi-Peak
335.7925	36.16	V	Quasi-Peak
503.7480	34.29	V	Quasi-Peak

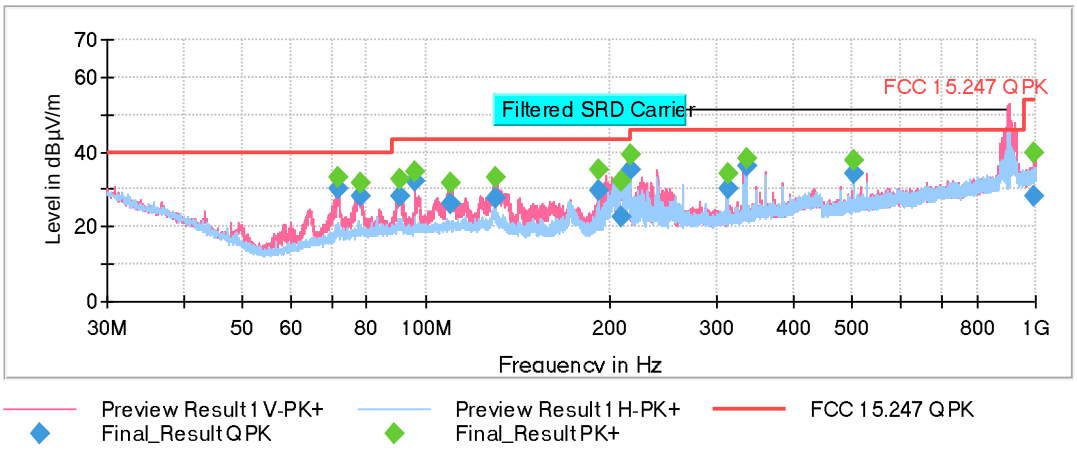
Frequency range 1 - 26 GHz:

Spurious frequencies at less than 20 dB below the limit:

Spurious frequency (GHz)	E.I.R.P (dBµV/m)	Polarization	Detector
1.5329	58.81	V	Peak
	53.47		Average
1.8044	67.11	V	Peak
	51.41		Average
2.7066	61.54	V	Peak
	49.30		Average

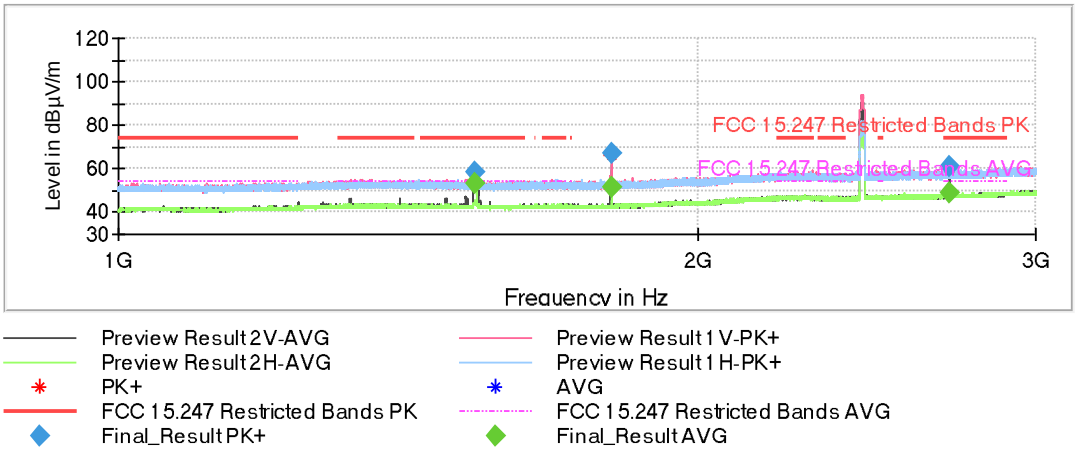
Verdict: PASS

FREQUENCY RANGE 30 MHz - 1 GHz:



The peak above the limit is the carrier frequency SRD 900 MHz (902.2464 MHz).

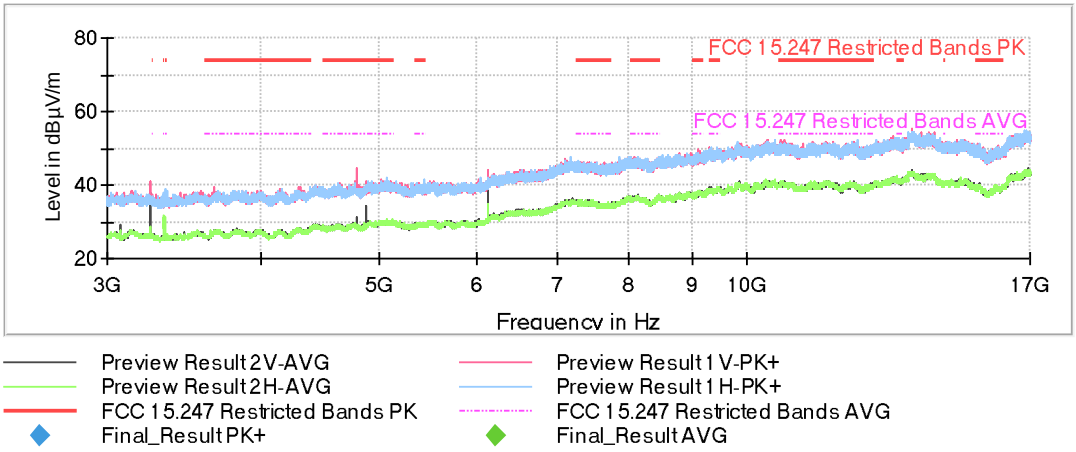
FREQUENCY RANGE 1 - 3 GHz:



Note: SRD 900 MHz power 200 mW, WLAN 2.4 GHz power 6 dBm.

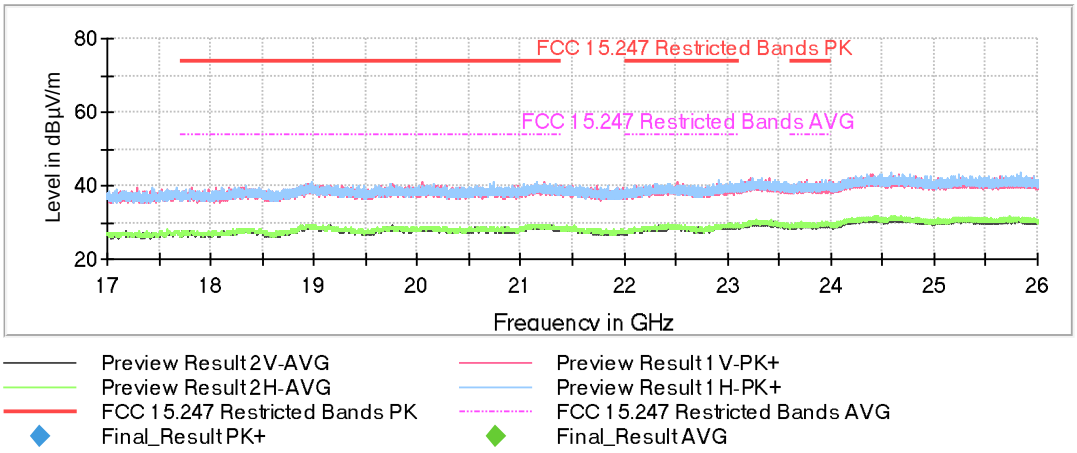
The peak above the limit is the carrier frequency WLAN 2.4 GHz (2437 MHz).

FREQUENCY RANGE 3 - 17 GHz:



Note: SRD 900 MHz power 200 mW, WLAN 2.4 GHz power 6 dBm.

FREQUENCY RANGE 17 - 26 GHz:



FREQUENCY RANGE 17 - 27 GHz: