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.007A1

Partial Test Report

USA FCC 15.31(h), 15.209, 15.247, 22, 27, 90
CANADA ISED RSS-119, RSS-132, RSS-139, RSS-199, RSS-247, RSS-Gen

(*) Identification of item tested	Machine Controller iCA202
(*) Trademark	iCON aps 202
(*) Model and /or type reference	iCA202 400MHz
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, 400MHz SDR, GNSS RTK
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 22 (10-1-20 Edition): Public Mobile Services. USA FCC Part 27 (10-1-20 Edition): Miscellaneous Wireless Communications Services. USA FCC Part 90 (10-1-20 Edition): Private Land Mobile Radio Services. CANADA ISED RSS-119 Issue 12 Amendment 1, Apr. 2022. CANADA ISED RSS-132 Issue 3, Jan. 2013. CANADA ISED RSS-139 Issue 3, Jul. 2015. CANADA ISED RSS-199 Issue 3, Dec. 2016. CANADA ISED RSS-247 Issue 2, Feb. 2017.

	CANADA ISED 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. Measurement Guidance for Certification of Licensed Digital Transmitters. 971168 D01 Power Meas License Digital Systems v03r01 dated April 9, 2018. 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 09:52:34 +02'00'
Date of issue	2022-05-10
Report template No.	FDT08_23 (*) "Data provided by the client"

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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 ≤ ±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 ≤ ±4.32 dB (with factor k=2).

The total uncertainty of the measurement system for the radiated emissions of the EUT from 17 to 26 GHz is: Measurement uncertainty ≤ ±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 400MHz 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 400MHz	3730430	2022/02/17
70707/006	Antenna	CGA100	--	2021/12/13
62082B/028	DUAL LTE Antenna	BPCTHPDLTE-SF-MM	19719/010	2019/09/16
62082B/092	Antenna	BMLPVMBLTENGP	--	2019/09/16
62082B/095	Antenna	BMLPVMBLTENGP	--	2019/09/16
62082B/104	Antenna	MLPV430	--	2019/09/16

Auxiliary elements used with the Sample S/01:

Control No.	Description	Model	Serial No.	Date of reception
62082B/010	888169 Ultron Test Box	--	--	2019/09/16
62082B/060	MAG Base	GMLFML195C	--	2019/09/16
62082B/064	MAG Base	GMLFML195C	--	2019/09/16
62082B/115	Ethernet Cable	--	--	2019/09/16
62779/150	Router	DSL-2750U	QXBC1H4003465	2019-09-16
62779/153	AC/DC adapter	F12W8-120100SPAS	E21703271030960	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) ... :	22.6 x 16.3 x 6.9						
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)	2022-03-24
Date (finish)	2022-05-10

Document history

Report number	Date	Description
70707RRF.007	2022-04-06	First release.
70707RRF.007A1	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.007

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 semi-anechoic 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: Daniel Mejías, Antonio Manuel Sánchez, Gonzalo Rueda.

Used instrumentation:

Equipment	Model	Manufacturer	Next Calibration
SEMIANECHOIC ABSORBER LINED CHAMBER VI	P29419	ALBATROSS	N.A.
SHIELDED ROOM	P29419	ALBATROSS PROJECTS GMBH	N.A.
EMI TEST RECEIVER 2Hz-44GHz	ESW44	ROHDE AND SCHWARZ	2023-12-30
SEMIANECHOIC ABOSORBER LINED CHAMBER	FACT 3 200 STP	ETS LINDGREN	N.A.
SIGNAL AND SPECTRUM ANALYZER 2Hz-50GHz	FSW50	ROHDE AND SCHWARZ	2022-07-06
HORN ANTENNA 1-18GHz	BBHA 9120 D	SCHWARZBECK MESS- ELEKTRONIK	2022-11-18
HORN ANTENNA 18-40GHz	BBHA 9170	SCHWARZBECK	2023-05-05
PRE-AMPLIFIER G>40dB 1-18 GHz	BLMA 0118-3A	BONN ELEKTRONIK	2022-06-07
ULTRALOG ANTENNA 30MHz-6GHz	HL562E_UPG	ROHDE AND SCHWARZ	2022-10-15
HORN ANTENNA 1-18GHz	BBHA 9120D	SCHWARZBECK MESS- ELEKTRONIK	2022-11-15
HORN ANTENNA 17-40GHz	BBHA 9170	SCHWARZBECK	2024-03-19
PREAMPLIFIER 30dB 500MHz-18GHz	BBV 9718 C	SCHWARZBECK	2023-03-25
PRE-AMPLIFIER G>30dB 18-40GHz	BLMA 1840-3G	BONN ELEKTRONIK	2023-02-15
DC POWER SUPPLY 30V/3A 90W	GPS-3030D	GW INSTEK	N.A.
DIGITAL MULTIMETER	175	FLUKE	2022-11-04
WIDEBAND RADIO COMMUNICATION TESTER	CMW500	ROHDE AND SCHWARZ	2022-07-12
SOFTWARE	EMC32	ROHDE AND SCHWARZ	N.A.

Testing verdicts

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

Summary

FCC 15, FCC 22, FCC 27 / RSS-119, RSS-132, RSS-139, RSS-199, RSS-247, RSS-Gen PARAGRAPH		
Requirement – Test case	**Verdict**	**Remark**
FCC 15.31 (h), FCC 15.209 (a), FCC 15.247 (d), FCC 22.917, FCC 27.53, FCC 90.210 / RSS-119 5.8, RSS-132 5.5, RSS-139 6.6, RSS-199 4.5 (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), 15.209, 15.247, 22, 27, 90 / RSS-119, RSS-132, RSS-139, RSS-199, RSS-247, RSS-Gen

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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:

Band	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 400 MHz:

Type of Antenna: External.
Maximum Declared Antenna Gain: 0 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) / Configuration
	Mid: 40620	2593 MHz (QPSK, BW 20 MHz, RB Size 1, RB Offset 0)
Band:	LTE Band 66	
Frequency Range:	1710 – 1780 MHz	
Transmit Channel:	Channel	Channel Frequency (MHz) / Configuration
	Middle: 132322	1745 MHz (QPSK, BW 20 MHz, RB Size 1, RB Offset 0)

	WLAN 2.4 GHz (IEEE 802.11 b/g/n)	
Mode:	802.11 b 1 Mbps	
Channel Bandwidth:	20 MHz	
Frequency Range:	2412 MHz to 2462 MHz	
Transmit Channel:	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 400 MHz	
Mode:	8FSK	
Channel Spacing:	12.5 kHz	
Frequency Range:	403 MHz to 473 MHz	
Transmit Channel:	Channel	Channel Frequency (MHz)
	Middle 2	450.5

The test set-up was made according to the general provisions of FCC 558074 D01 15.247 Meas Guidance v05r02 dated April 2, 2019.

The EUT was tested in the following operating mode during the transmitter tests:

For cellular technologies, the EUT was controlled by a communication tester to transmit at maximum power on the test channels and modes as required.

For non-cellular technologies, the EUT was controlled by the software tool provided by the applicant to operate in a continuous transmit mode on the test channel and modulation as required.

Selected Transmission Modes for each Radio:

The following configurations were selected based on preliminary testing that identified these settings as the worst cases:

* Cellular 3G Band V: Transmitter radiated spurious emissions tests were performed with the EUT transmitting on High Channel in WCDMA mode configuration as this combination was found to transmit the highest EIRP.

* Cellular LTE Band 41: Transmitter radiated spurious emissions tests were performed with the EUT transmitting on Mid Channel with the following configuration as this combination was found to transmit the highest EIRP: QPSK, BW 20 MHz, RB Size 1, RB Offset 0.

* Cellular LTE Band 66: Transmitter radiated spurious emissions tests were performed with the EUT transmitting on Middle Channel with the following configuration as this combination was found to transmit the highest EIRP: QPSK, BW 20 MHz, RB Size 1, RB Offset 0.

* 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.

* WLAN 2.4 GHz: Transmitter radiated spurious emissions tests were performed with the EUT transmitting on Middle Channel in 802.11 b / 1 Mbps mode configuration as this combination was found as the worst case in terms of spurious emissions compared with the other WLAN 2.4 GHz modes.

* SRD 400 MHz: Transmitter radiated spurious emissions tests were performed with the EUT transmitting at 450.5 MHz in 8FSK mode configuration as this combination was found as the worst case in terms of spurious emissions compared with the other SRD 400 MHz modes.

Simultaneous Transmission Modes tested:

*** Co-Location mode 3G V, WLAN 2.4 GHz, SRD 400 MHz**, with the EUT configured to simultaneously transmit three signals at maximum output power:

3G V WCDMA / High Channel (846.6 MHz), WLAN 2.4 GHz 802.11b / Middle Channel (CH6: 2437 MHz), SRD 400 MHz / Middle Channel 2 (450.5 MHz).

*** Co-Location mode LTE 66, WLAN 2.4 GHz, SRD 400 MHz**, with the EUT configured to simultaneously transmit three signals at maximum output power:

LTE 66 / Middle Channel (1745 MHz), WLAN 2.4 GHz 802.11b / Middle Channel (CH6: 2437 MHz), SRD 400 MHz / Middle Channel 2 (450.5 MHz).

*** Co-Location mode LTE 41, WLAN 2.4 GHz, SRD 400 MHz, BTEDR 2.4 GHz with the EUT configured to** simultaneously transmit four signals at maximum output power:

LTE 41 / Middle 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 400 MHz / Middle Channel 2 (450.5 MHz).

*** Co-Location mode WLAN 2.4 GHz, SRD 400 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 400 MHz / Middle Channel 2 (450.5 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

Limits

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
Above 960	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 specified when measuring with peak detector function corresponding to 20 dB above the indicated values in the table above.

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

SRD 400 MHz. FCC §90.210 (d) and RSS-119 Issue 12 Clause 5.8.3.

FCC 90.210 (d) Emission Mask D - 12.5 kHz channel bandwidth equipment.
RSS-119 Clause 5.8.3 Emission Mask D.

> For transmitters designed to operate with a 12.5 kHz channel bandwidth, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:
>
> (3) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 12.5 kHz: At least 50 + 10 log (P) dB or 70 dB, whichever is the lesser attenuation

At Po transmitting power, the specified minimum attenuation becomes 50+10 log (Po), and the level in dBm relative to Po becomes:

$$Po\ (dBm) – [50 + 10 \log (Po\ in\ mW) - 30] = -20\ dBm$$

3G Band V. FCC §2.1053 and §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 and §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 and §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 a semi-anechoic chamber.

The spectrum was scanned from 30 MHz to at least the 10th harmonic of the highest frequency of the co-located radios up to 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.

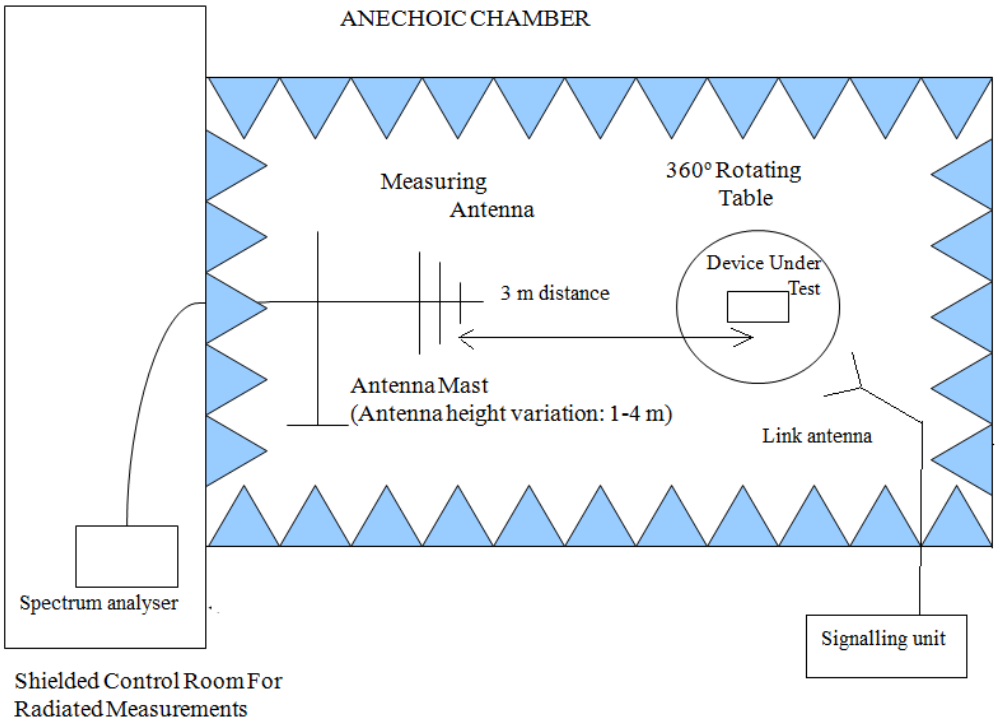
The field strength is calculated by adding correction factor to the measured level from the spectrum analyzer. This correction factor includes antenna factor, cable loss and pre-amplifiers gain.

These measurements were performed in order to check the impact of the Co-Location of all radio interfaces (that can transmit simultaneously).

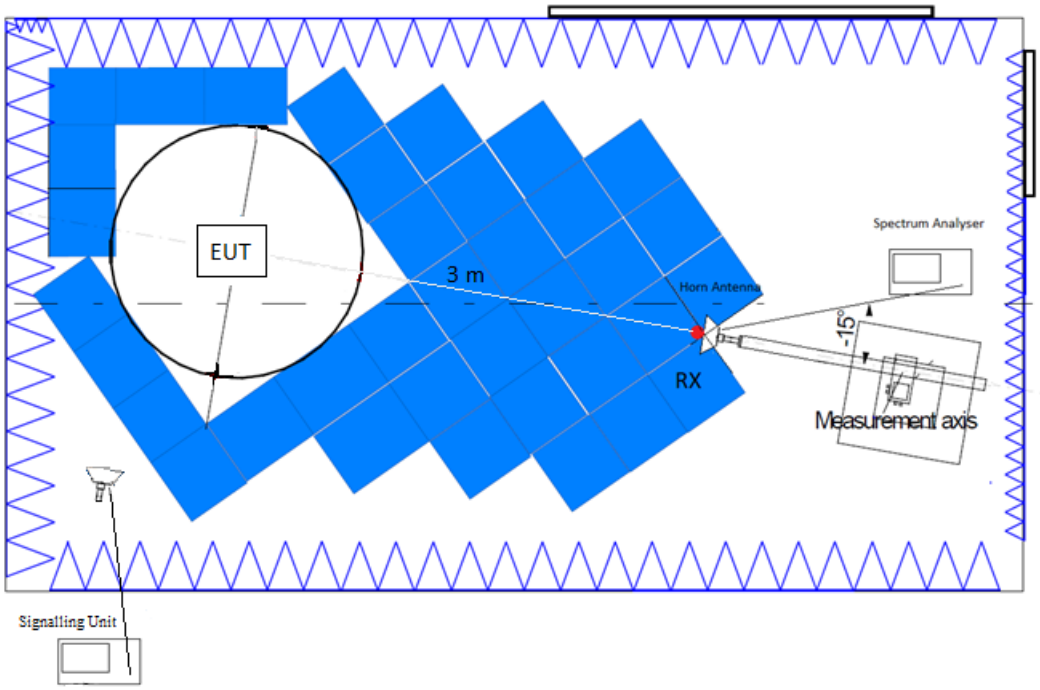
A resolution bandwidth / video bandwidth of 100 kHz / 300 kHz was used for spectrum below 1 GHz and 1MHz / 3 MHz for spectrum above 1 GHz.

Test setup

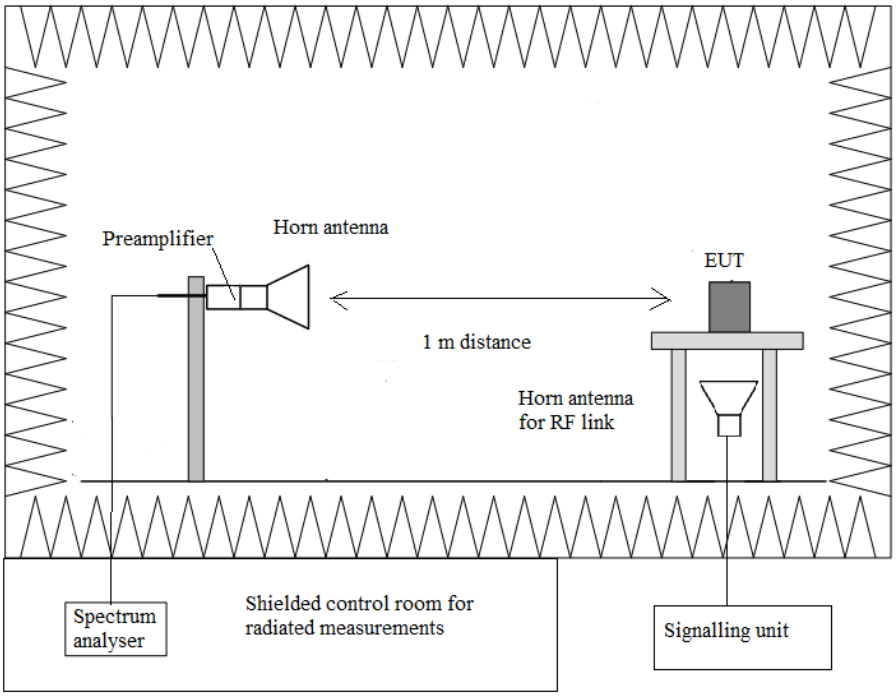
Radiated measurements below 1 GHz.



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 400 MHz.**

3G V:	High Channel (846.6 MHz). WCDMA.
WLAN 2.4 GHz:	Middle Channel (2437 MHz). 802.11 b. BW: 20 MHz. 1 Mbps.
SRD 400 MHz:	Middle Channel 2 (450.5 MHz). Channel spacing 12.5 kHz. 8FSK.

Power configuration used: SRD 400 MHz power 1000 mW, WLAN 2.4 GHz power 16 dBm.

The spurious frequencies were measured at 3 meters. The test limit is as follows:

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:

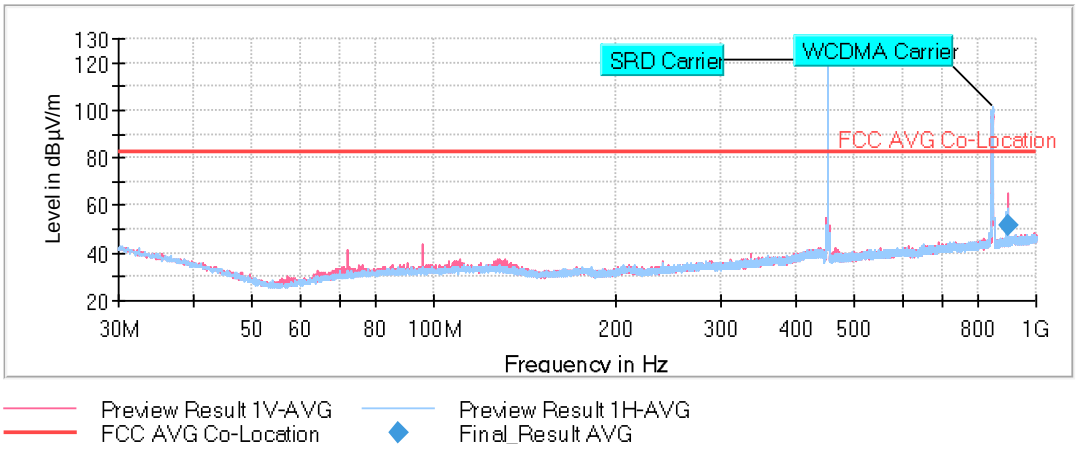
Spurious frequency (MHz)	Emission level (dBµV/m)	Polarization	Detector
1587.7333	63.61	H	Average

Verdict

Pass

Attachments

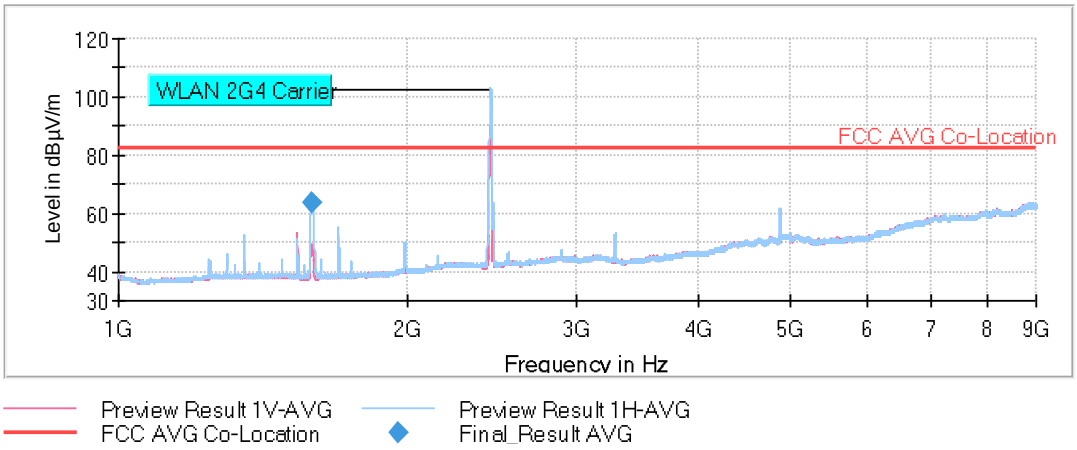
FREQUENCY RANGE 30 MHz – 1 GHz:



The peak above the limit is the carrier frequency SRD 400 MHz (450.5 MHz).

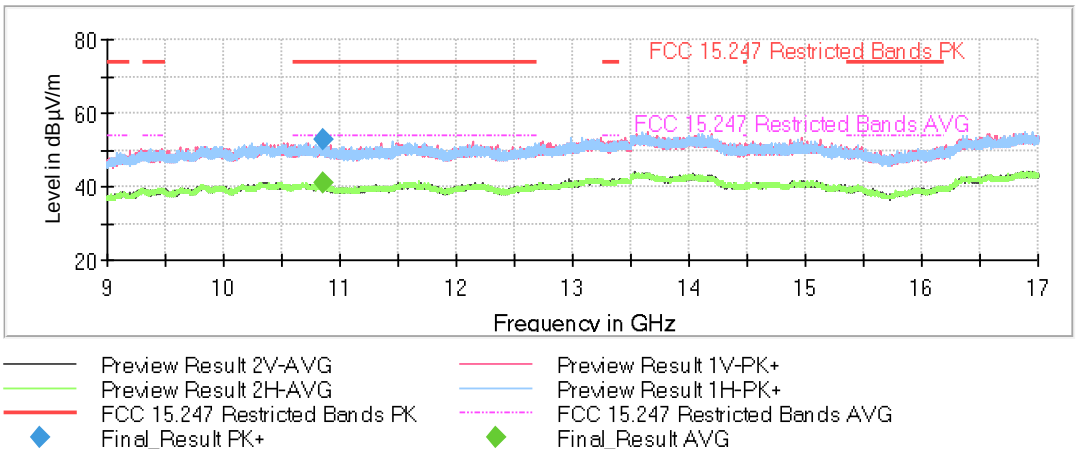
The peak above the limit is the carrier frequency 3G Band V (846.6 MHz).

FREQUENCY RANGE 1 GHz – 9 GHz:

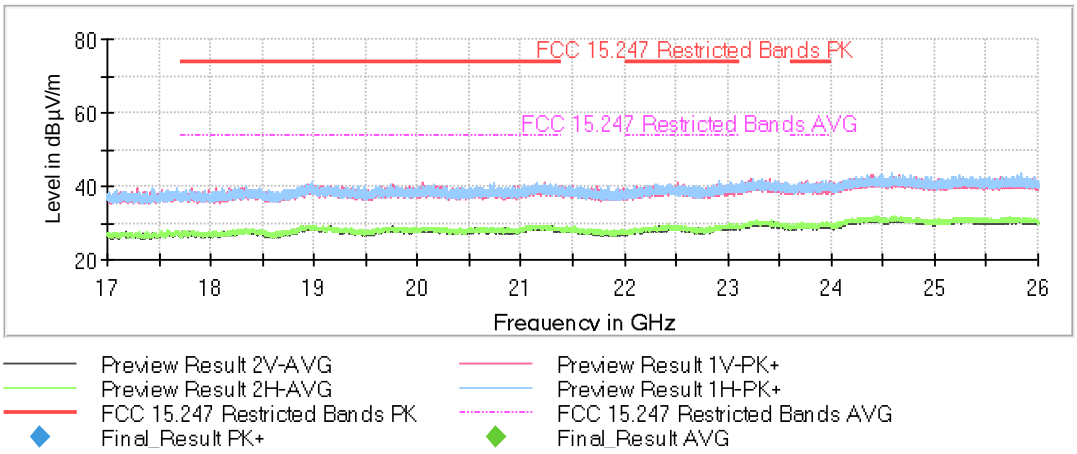


The peak above the limit is the carrier frequency WLAN 2.4 GHz (2437 MHz).

FREQUENCY RANGE 9 GHz – 17 GHz:



FREQUENCY RANGE 17 - 26 GHz:



Results

- **Co-location mode: Cellular LTE 66, WLAN 2.4 GHz, SRD 400 MHz.**

LTE 66:	Middle Channel (1745 MHz). QPSK, 20 MHz, RB 1, RB Offset 0.
WLAN 2.4 GHz:	Middle Channel (2437 MHz). 802.11 b. BW: 20 MHz. 1 Mbps.
SRD 400 MHz:	Middle Channel 2 (450.5 MHz). Channel spacing 12.5 kHz. 8FSK.

Power configuration used: SRD 400 MHz power 1000 mW, WLAN 2.4 GHz power 16 dBm.

The spurious frequencies were measured at 3 meters. The test limit is as follows:

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:

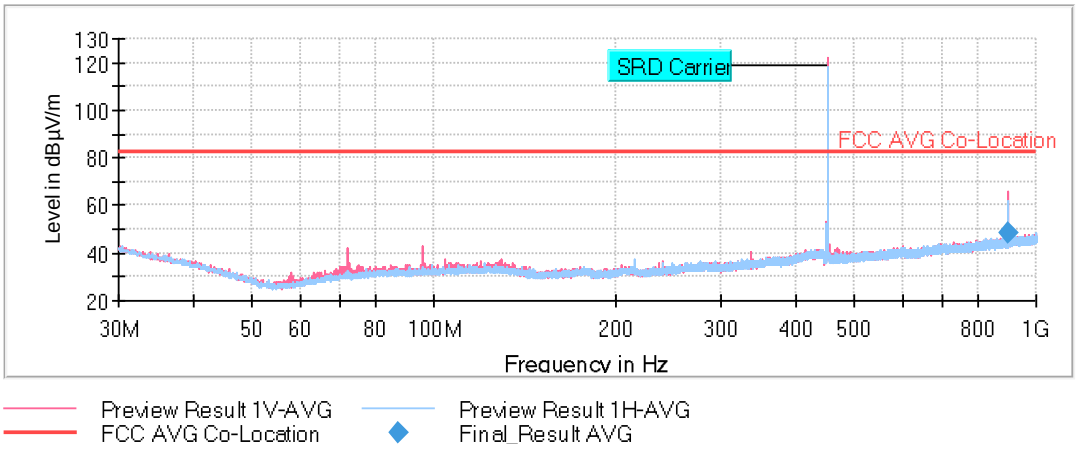
No spurious frequencies at less than 20 dB below the limit.

Verdict

Pass

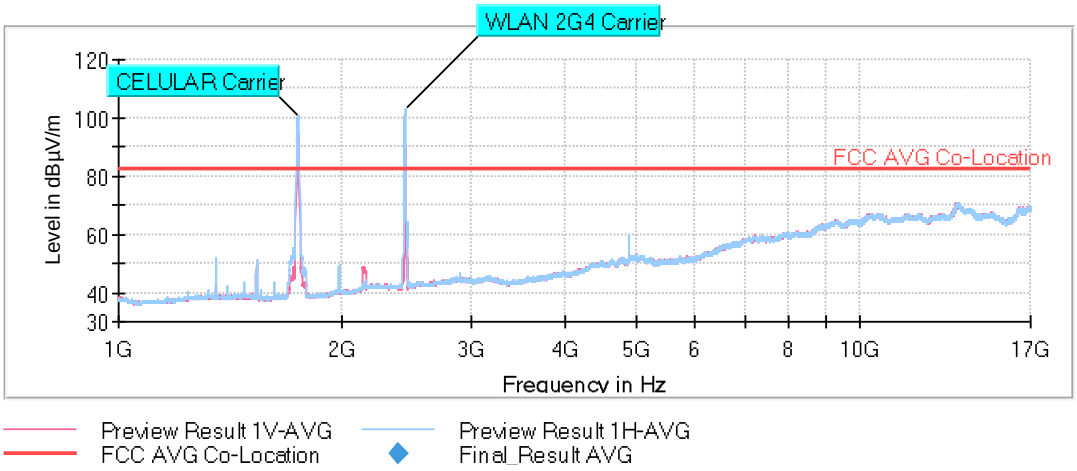
Attachments

FREQUENCY RANGE 30 MHz – 1 GHz:



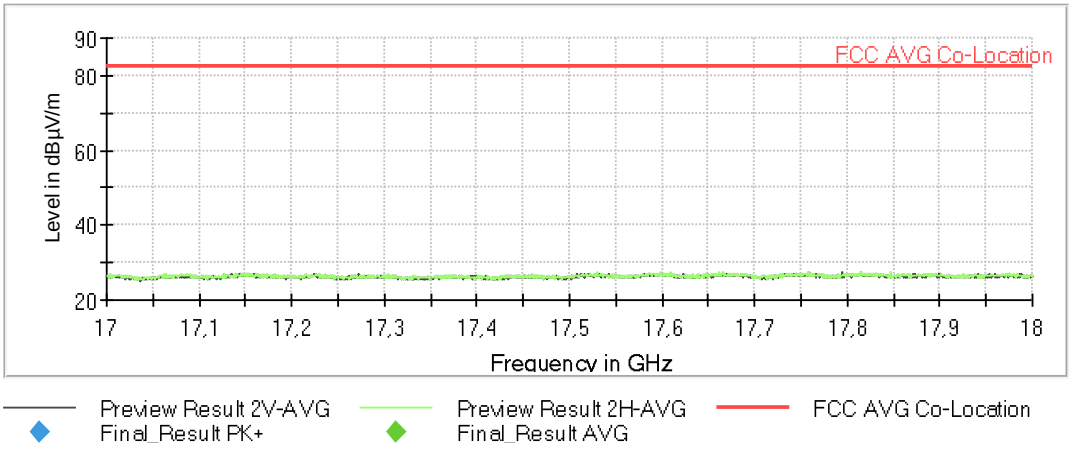
The peak above the limit is the carrier frequency SRD 400 MHz (450.5 MHz).

FREQUENCY RANGE 1 GHz – 18 GHz:

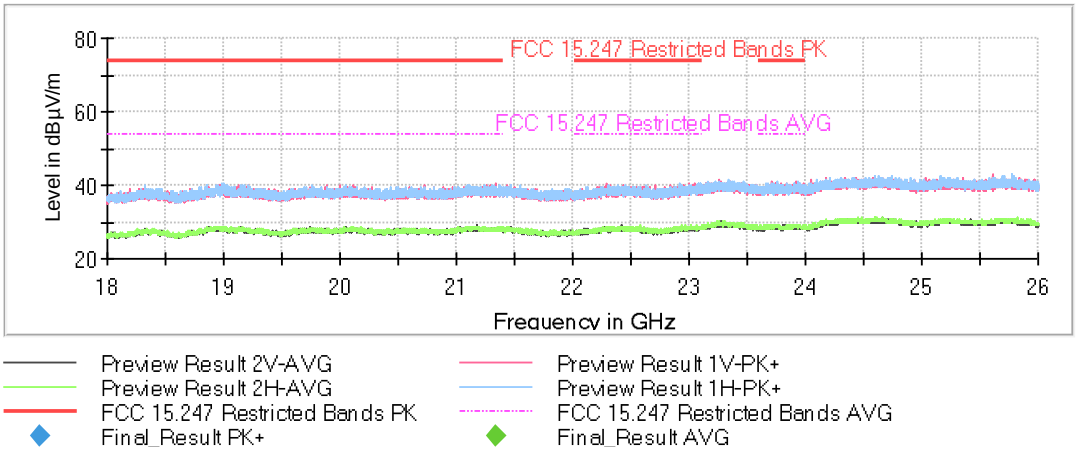


The peak above the limit is the carrier frequency LTE 66 (1745 MHz).

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



FREQUENCY RANGE 18 GHz – 26 GHz:



Results

- **Co-location mode: Cellular LTE 41, WLAN 2.4 GHz, BTEDR 2.4 GHz, SRD 400 MHz.**

LTE 41:	Mid Channel (2593 MHz). QPSK, 20 MHz, RB 1, RB Offset 0.
WLAN 2.4 GHz:	Middle Channel (2437 MHz). 802.11 b. BW: 20 MHz. 1 Mbps.
BTEDR 2.4 GHz:	Low Channel (2402 MHz, GFSK 1-DH5),
SRD 400 MHz:	Middle Channel 2 (450.5 MHz). Channel spacing 12.5 kHz. 8FSK.

Power configuration used: SRD 400 MHz power 1000 mW, WLAN 2.4 GHz power 16 dBm.

The spurious frequencies were measured at 3 meters. The test limit is as follows:

Frequency Range	Detector	Limit at 3m (dBµV/m)
30 MHz to 27 GHz	Peak	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:

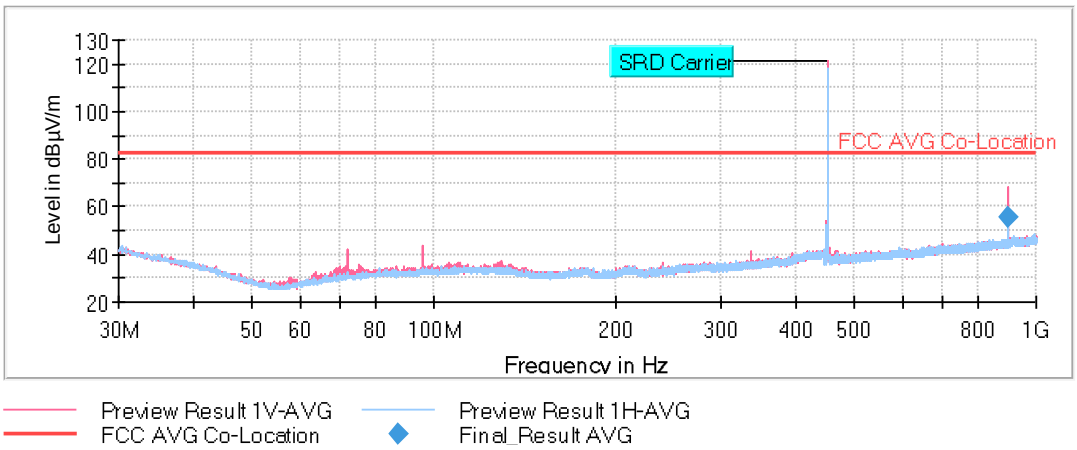
No spurious frequencies at less than 20 dB below the limit.

Verdict

Pass

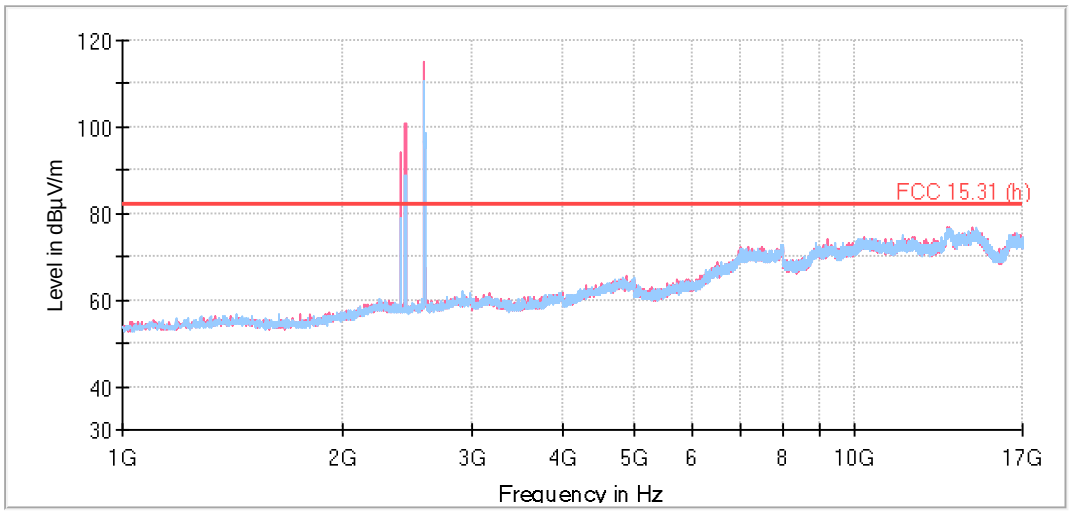
Attachments

FREQUENCY RANGE 30 MHz – 1 GHz:



The peak above the limit is the carrier frequency SRD 400 MHz (450.5 MHz).

FREQUENCY RANGE 1 GHz – 17 GHz:

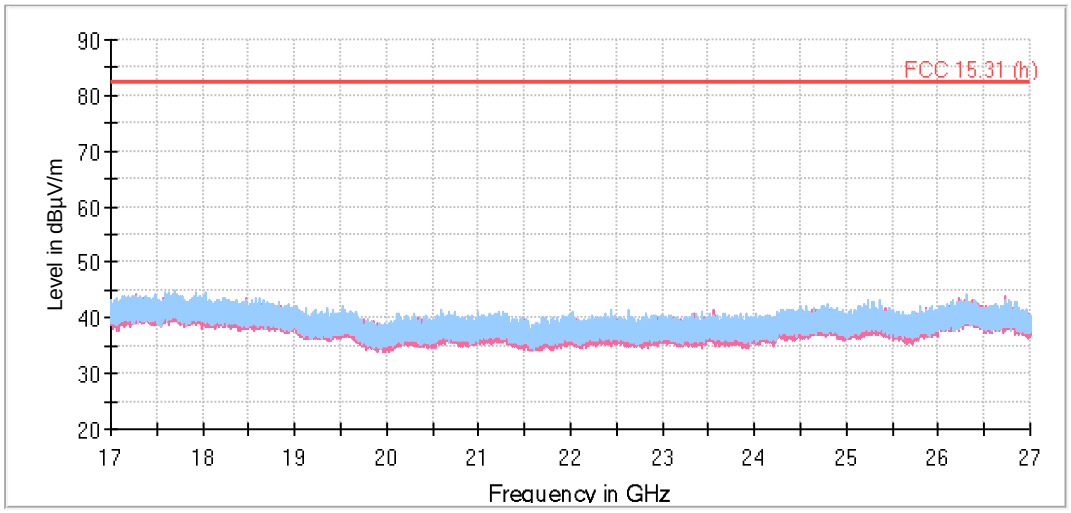


The peak above the limit is the carrier frequency WLAN 2.4 GHz (2437 MHz).

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

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

FREQUENCY RANGE 17 GHz – 27 GHz:



Results

- **Co-location mode: WLAN 2.4 GHz, SRD 400 MHz.**

WLAN 2.4 GHz: Middle Channel (2437 MHz). 802.11 b. BW: 20 MHz. 1 Mbps.
SRD 400 MHz: Middle Channel 2 (450.5 MHz). Channel spacing 12.5 kHz. 8FSK.

Power configuration used: SRD 400 MHz power 1000 mW, WLAN 2.4 GHz power 14 dBm.

The spurious frequencies were measured at 3 meters. The test limit is as follows:

Frequency Range	Detector	Limit at 3m (dBµV/m)
30 MHz to 4.7 GHz	Average	50 + 10 log (P) dB = -20 dBm → 75.26 dBµV/m
4.7 GHz to 26 GHz	Peak	74 dBµV/m
4.7 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)	Emission level (dBµV/m)	Polarization	Detector
901.0115	55.95	V	Average

Frequency range 1 GHz – 26 GHz:

Only spurious frequencies with peak levels above the average limit (54 dBµV/m at 3 m) are measured with average detector for average compliance checking.

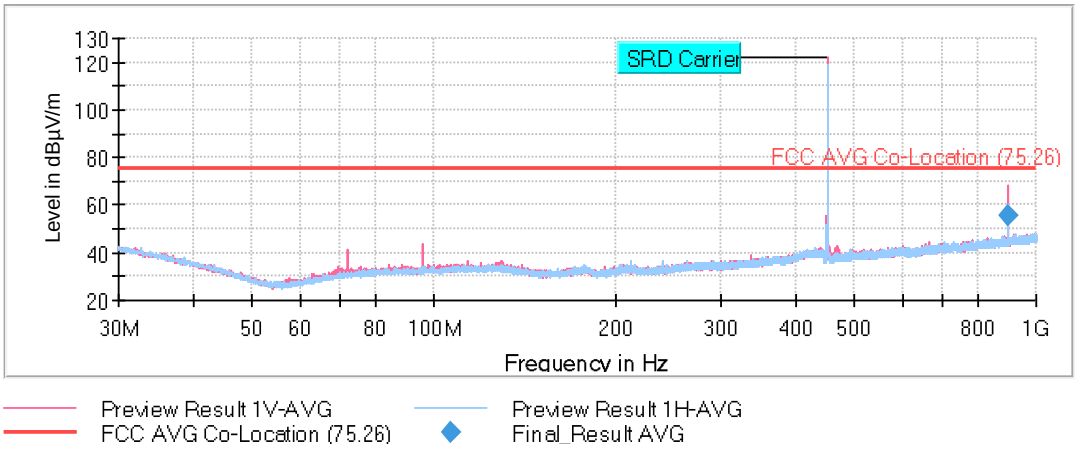
Spurious frequencies at less than 20 dB below the limit:

Spurious frequency (MHz)	Emission level (dBµV/m)	Polarization	Detector
4874.0621	53.78	V	Peak

Verdict

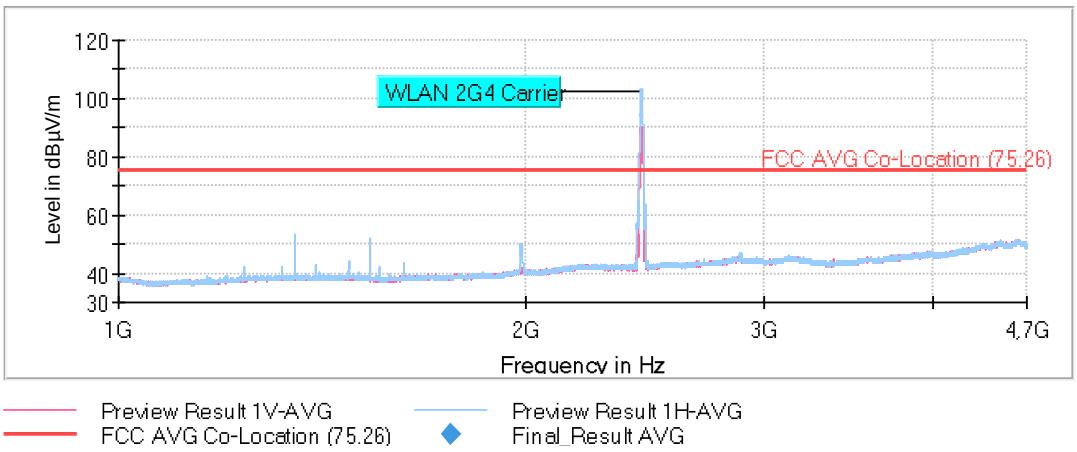
Pass

FREQUENCY RANGE 30 MHz – 1 GHz:



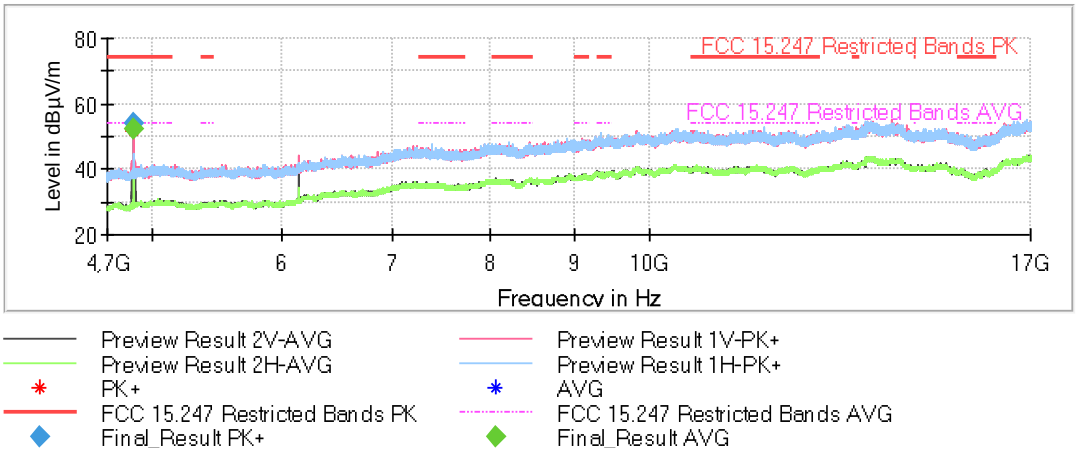
The peak above the limit is the carrier frequency SRD 400 MHz (450.5 MHz).

FREQUENCY RANGE 1 GHz – 4.7 GHz:



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

FREQUENCY RANGE 4.7 GHz –- 17 GHz:



FREQUENCY RANGE 17 GHz – 26 GHz: