DEKRA Certification, Inc.
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Sterling, VA 20164
United States of America

FCC LISTED, REGISTRATION NUMBER: 2764.01

ISED LISTED REGISTRATION NUMBER: 23595-1

Test report No:
4316ERM.002A1

Test Report

USA FCC Part 15.247, 15.209, 15.207; & CANADA RSS-247, RSS-Gen

Radio Frequency Devices. Operation within the bands 902 - 928 MHz, 2400 -2483.5 MHz, and 5725 - 5850 MHz

Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and License-Exempt Local Area Network (LE-LAN) Devices.

(*) Identification of item tested	Gateway for Tractian's industrial sensors
(*) Trademark	Tractian
(*) Model and /or type reference tested	Smart Receiver Pro
Other identification of the product	FCC ID: 2BCIS-SR-PRO IC ID: IC ID: 31644-SRPRO HVIN: Smart Receiver Pro
(*) Features	LTE; Wi-fi and 915 MHz ISM
Manufacturer	Tractian Tecnologia Ltda. Av. dos Imares, 437 - Indianápolis São Paulo - SP - Brazil 04085-000
Test method requested, standard	USA FCC Part 15.247 (2020): Operation within the bands 902 - 928 MHz, 2400 -2483.5 MHz, and 5725 - 5850 MHz. USA FCC Part 15.209 (2018): Radiated emission limits; general requirements. USA FCC Part 15.207 (2018): Conducted emission limits. CANADA RSS-247 Issue 3 (August 2023). CANADA RSS-Gen Issue 5 amendment 1 (March 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 C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.
Summary	IN COMPLIANCE
Approved by (name / position & signature)	Domingo Galvez EMC&RF Lab Manager  Digitally signed by Domingo Galvez DN: cn=Domingo Galvez, o=Dekra Certification Inc., ou=Regulatory Lab Manager, email=domingo.galvez@dekra.com, c=US
Date of issue	02-05-2024
Report template No	FDT08_23 (*) “Data provided by the client”

Index

Competences and guarantees

DEKRA Certification Inc. is a testing laboratory accredited by A2LA (The American Association for Laboratory Accreditation), to perform the tests indicated in the Certificate 2764.01

DEKRA Certification Inc. is a testing laboratory competent to carry out the tests described in this report.

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

DEKRA Certification Inc. 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 Certification at the time of performance of the test.

DEKRA Certification Inc. 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.

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 Certification Inc.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA Certification Inc. and the Accreditation Bodies.

Uncertainty

Uncertainty (factor k=2) was calculated according to the DEKRA Certification internal document PODT000.

Test case	Frequency (MHz)	U(k=2)	Units
Conducted emission	0,009 - 30	3.54	dB
RF Power and PSD	2402-2483	0.88	dB
Occupied Bandwidth		1.87	%
Band Edge		0.64	dB
Radiated Spurious Emission	30-180	4.27	dB
	180-1000	3.14	dB
	1000-18000	3.30	dB
	18000-40000	3.49	dB

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 consists of a Gateway for Tractian's industrial sensors.

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

Usage of samples

Samples used for test have been selected by: The client.

Id	Control Number	Description	Manufacturer / Model	Serial Nº	Date of Reception	Application
S/01	4316/02	Sensor + Antennas (x2) + AC Adapter	Tractian / Smart Receiver Pro	EZH2H85	2023-11-13	Element Under Test
S/01	4316/08	Serial-USB converter	--	--	2023-11-13	Accessory
S/01	4316/10	USB 2.0 Cable A Male to Mini B Male 6.00' (1.83m) Shielded	--	--	2023-11-13	Accessory
S/01	1484	Laptop	Lenovo / V14 G2 ITL	PF3Q2NKL	--	Auxiliary

Notes referenced to samples during the project:

Id	Type	Note
S/01	Commercial	Sample S/01 was used for all test(s) indicated in appendix A.

Test sample description

Ports……:	Port name and description		Cable				
			Specified length [m]	Attached during test	Shielded	Coupled to patient	
	PSU Cable		2m	☒	☐	N/A	
	N/A			☐	☐	N/A	
	N/A			☐	☐	N/A	
	N/A			☐	☐	N/A	
	N/A			☐	☐	N/A	
Supplementary information to the ports……:	No Data Provided						
Rated power supply..... :	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	☒	AC: 127 V/220V 50/60Hz	☐	☐	☐	☐	☐
	☐	AC: N/A	☐	☐	☐	☐	☐
	☐	DC: N/A					
	☐	DC: N/A					
Rated Power..... :	No Data Provided						
Clock frequencies..... :	No Data Provided						
Other parameters ..... :	No Data Provided						
Software version..... :	1.0.2						
Hardware version ..... :	Smart Receiver Pro						
Dimensions in cm (W x H x D) ... :	No Data Provided						
Mounting position ..... :	☐	Table top equipment					
	☒	Wall/Ceiling mounted equipment					
	☐	Floor standing equipment					
	☐	Hand-held equipment					
	☐	Other: Bed rail or IV pole mounting					

Modules/parts ..... :	Module/parts of test item	Type	Manufacturer
	2AC7Z-ESP32WROVERE		Espressif
	2AJYU-8PYA00x		SIMCOM
Accessories (not part of the test item) ..... :	Description	Type	Manufacturer
	USB – SERIAL converter FTDI		
Documents as provided by the applicant ..... :	Description	File name	Issue date
	FDT30_18 Declaration Equipment Data	Smart Receiver Pro - FDT30_18 Declaration Equipment Data	20/11/2023
Copy of marking plate:			

Identification of the client

Tractian Technologies Inc.
201 17th St. NW,
2nd Floor
Atlanta, GA 30309,
USA

Testing period and place

Test Location	DEKRA Certification Inc.
Date (start)	11-13-2023
Date (finish)	12-05-2023

Document history

Report number	Date	Description
4316ERM.002	01-05-2024	First release
4316ERM.002A1	02-05-2024	Second release. Standard information on the cover page, antenna gain information and spurious emissions limits in Emissions Compliance Radiated test results page in Appendix A were updated. This modification test report cancels and replaces the test report 4316ERM.002.

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. = 30 % Max. = 75 %
Air pressure	Min. = 860mbar Max. = 1060mbar

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

Temperature	Min. = 15 ºC Max. = 35 ºC
Relative humidity	Min. = 30 % Max. = 75 %
Air pressure	Min. = 860mbar Max. = 1060mbar

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. = 30 % Max. = 75 %
Air pressure	Min. = 860mbar Max. = 1060mbar

Remarks and comments

The tests have been performed by the technical personnel: Juliana Cherry, Yuqi Wang, Koji Nishimoto, Qi Zhang and Victor Albrecht.

Testing verdicts

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

Summary

Requirement – Test case	FCC PART 15 PARAGRAPH / RSS-247	Verdict	Remark
RSS-GEN 8.8 / FCC 15.207 - Conducted Emission limits.		P	N/A
RSS-247 5.2 (a) / FCC 15.247 (a) (2) 6 dB Bandwidth		P	N/A
RSS-247 5.2 (b) / FCC 15.247 (e) Power spectral density		P	N/A
RSS-247 5.4 (d) / FCC 15.247 (b) (3) Maximum Peak Conducted output power		P	N/A
RSS-247 5.5 / FCC 15.247 (d) Band-edge emissions compliance (Transmitter) - Conducted		P	N/A
FCC 2.1049 / 99dBw Occupied Channel Bandwidth 99%		P	N/A
RSS-247 5.5 / FCC 15.247 (d) Emissions compliance (Transmitter) - Conducted		P	N/A
RSS-247 5.5 / FCC 15.247 (d) Emissions compliance (Transmitter) - Radiated		P	N/A
Supplementary information and remarks: None			

List of equipment used during the test

FCC 47 CFR Part 15.247 / RSS-247

Conducted Measurements

Control Number	Description	Serial No	Last Calibration	Next Calibration
1010	ESR7 EMI Test receiver	101790	2022-10-14	2024-10-14
1039	Signal Analyzer 40GHz	101627	2022-11-01	2024-11-01
1073	Pulse Limiter PMM PL01	111WX70503	N/A	N/A
1107	Ethernet SNMP Thermometer	60038026952	2022-10-18	2024-10-18
1110	Ethernet SNMP Thermometer		2022-10-18	2024-10-18
1313	Wireless Measurement Software R&S WMS32	-	N/A	N/A
1314	Wireless Measurement Software R&S EMC32	-	N/A	N/A
1379	Two line V-Network (ENV216)	101498	2022-05-17	2024-05-17

Radiated Measurements

Control Number	Description	Serial No	Last Calibration	Next Calibration
1012	ESR26 EMI Test Receiver	101478	2022-04-12	2024-04-12
1014	FSV40 Signal Analyzer 40GHz	101626	2022-08-01	2024-08-01
1057	3115 Double-Ridged Waveguide Horn Antenna 1-18 GHz	211373	2023-07-18	2026-07-18
1064	3142E Biconilog Antenna	208600	2021-12-13	2024-12-13
1111	Ethernet SNMP Thermometer- SAC	60038026577	2022-10-18	2024-10-18
1179	Semi-Anechoic Chamber	F169021	N/A	N/A
1314	Wireless Measurement Software R&S EMC32	1040-OT102236	N/A	N/A
1461	Low Noise Preamplifier (1-18GHz)	BLMA0118-4A	2022-06-01	2024-06-01

Appendix A: Test results

Appendix A

PRODUCT INFORMATION

The following information is provided by the client:

Information	Description
Modulation	OQPSK, DSSS
Operation mode	
- Operating Frequency Range	915-925 MHz
- Nominal Channel Bandwidth	2 MHz
- RF Output Power	18 dBm
Antenna type	Dipole - ANT-LTE-WS-SMA
Antenna gain	+ 3.4 dBi
Nominal Voltage	
- Supply Voltage	127 V / 220V AC
- Type of power source	DC Power supply
Equipment type	ZigBee

DESCRIPTION OF TEST CONDITIONS

TEST CONDITIONS	DESCRIPTION
TC/01	Power supply (V): $V_{nominal}$: 120 Vac Temperature: $T_{nominal}$: +15 to +35 ºC Test Frequencies for Conducted tests: Lowest channel: 915.0 MHz Middle channel: 921.0 MHz Highest channel: 925.0 MHz

CONDUCTED MEASUREMENTS:

Continuous conducted emission on Power leads:
The EUT is placed on the test table, raised 80 cm above the reference ground plane. The vertical conducting plane is located 40 cm to the rest of the EUT.

The EUT is connected to line impedance stabilization network (LISN) and other accessories are connected to other LISN. Measured levels of AC power line conducted emission are across the 50 ohms LISN port.

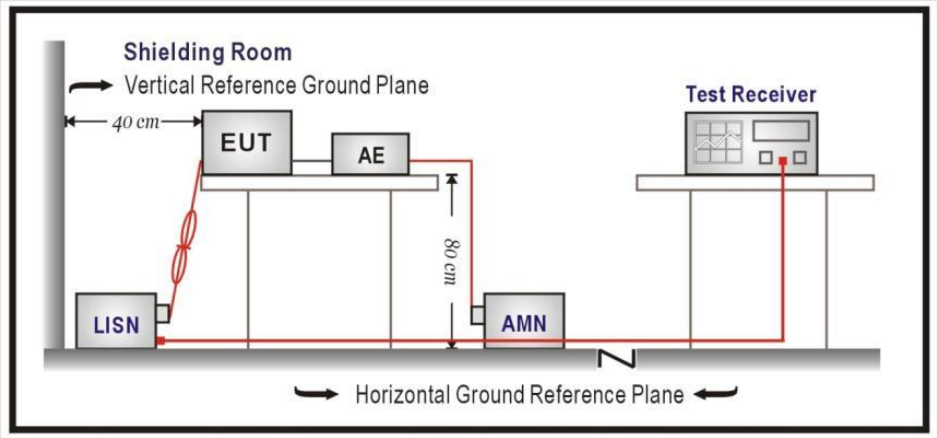
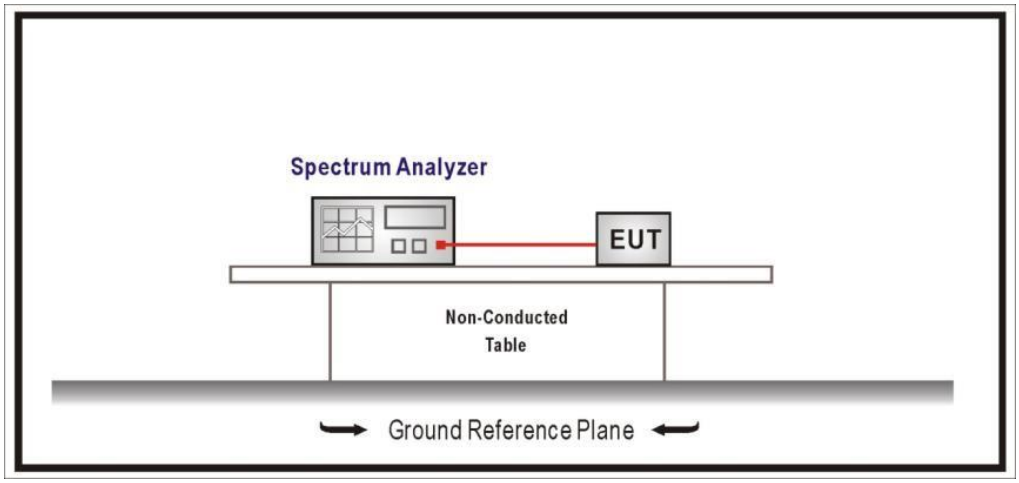


Fig A4: Generic setup for measurements from 0.150 to 30 mHz

6 dB Bandwidth, Power spectral density, Maximum Peak Conducted output power & Antenna gain, Band-edge emissions compliance (Transmitter), Occupied Channel Bandwidth 99%, and Emissions compliance (Transmitter):



RADIATED MEASUREMENTS:

All radiated tests were performed in a semi-anechoic chamber. The measurement antenna is situated at 3 m for the frequency range 30-1000 MHz (Bilog antenna) and 1-18 GHz Double ridge horn antennas.

The equipment under test was set up on a non-conductive platform above the ground plane and the situation and orientation was varied to find the maximum radiated emission. It was also rotated 360º and the antenna height was varied from 1 to 4 meters to find the maximum radiated emission.

Measurements were made in both horizontal and vertical planes of polarization.

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.

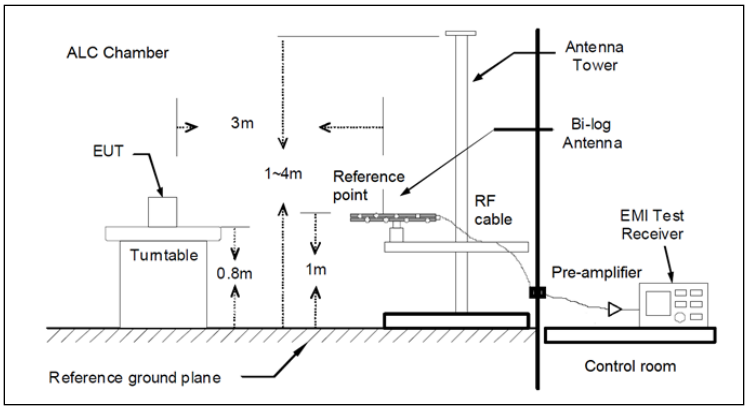


Fig 1: Radiated measurements Setup f < 1 GHz

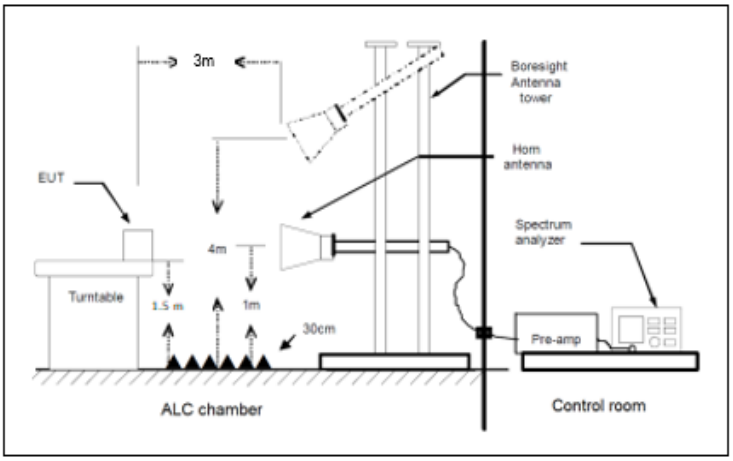


Fig 2: Radiated measurements setup f > 1 GHz

Test Cases Details

RSS-GEN 8.8 / FCC 15.207 - Conducted Emission limits

Limits

Limits of interference Class C

The applied limit for continuous conducted emissions in power leads, according with the requirements of:

- **FCC Rules and Regulations 47 CFR Part 15, Subpart C, Secs. 15.207 (a).** [54 FR 17714, Apr. 25, 1989, as amended at 56 FR 373, Jan. 4, 1991; 57 FR 33448, July 29, 1992; 58 FR 51249, Oct. 1, 1993; 67 FR 45671, July 10, 2002]
- **ICES-003 Issue 7, Secs 3.2.1, table 1 (October 2020).**

in the frequency range 0,15 to 30 MHz, for Class C equipment was:

Frequency range	Limit (dBµV) (1)	
(MHz)	Quasi-Peak	Average
0,15 to 0,5	66 – 56 (2)	56 – 46 (2)
0,5 to 5	56	46
5 to 30	60	50

(1) At the transition frequency, the lower limit applies.
(2) The limit decreases linearly with the logarithm of the frequency.

Code: CEmmnnHH

- CE: Conducted Emission,
- mm: Sample number,
- nn: Test Condition,
- HH: Wire (L1: Phase1, L2: Phase2, L3:Phase3, 0N: Neutral)

Results

S/	TC	Code	Freq Rng (MHz)	Line	V
01	01	CE01010N	[0.15, 30]	N	P
01	01	CE0101L1	[0.15, 30]	L1	P

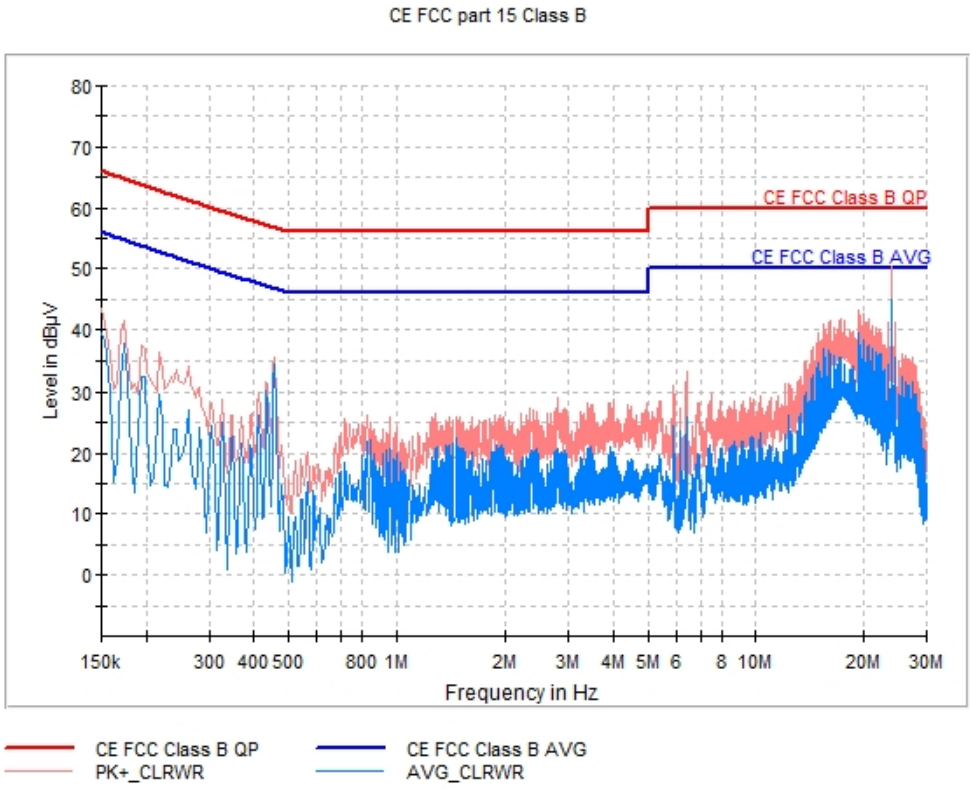
Verdict

Pass

Attachments

EMC Test Code = CE01010N Frequency Range MHz = [0.15, 30]
Conducted Emissions - Tested Line = N
Sample ID: S/01
Test Condition: TC/01. DUT ON. Zigbee in Tx mode. Powered by 120Vac.

Images:



Tables:

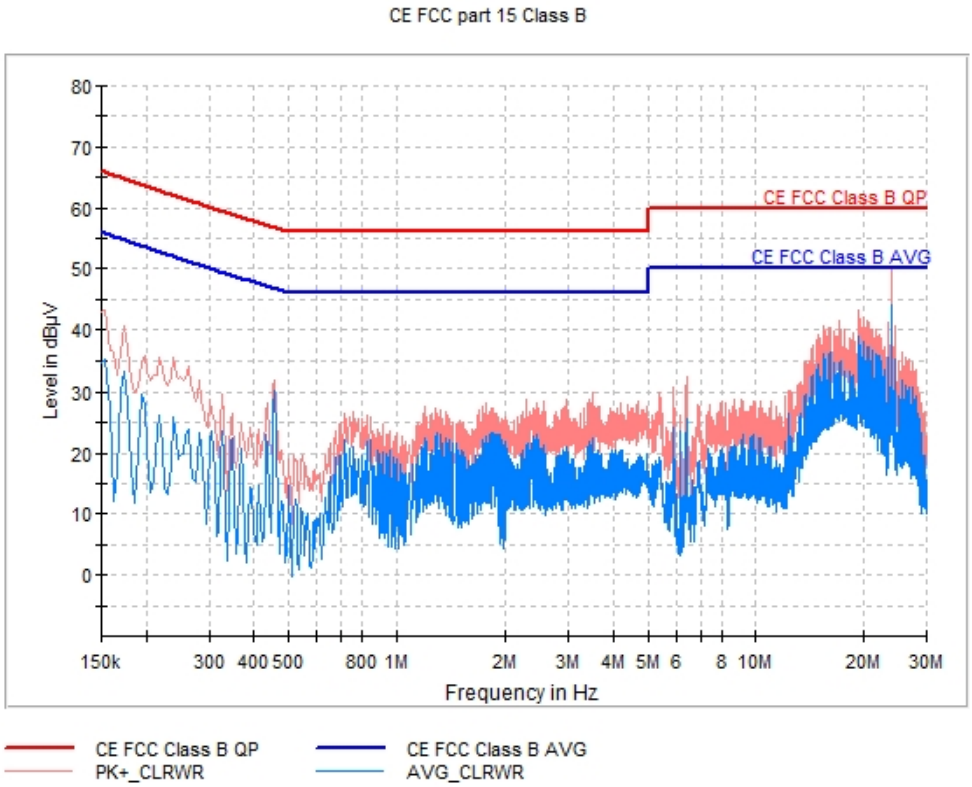
Frequency (MHz)	PK+_CLRWR (dBµV)	AVG_CLRWR (dBµV)	Line	Margin – AVG (dB)	Limit – AVG (dBµV)
0.150000	43.5	39.4	N	16.6	56.0
0.414000	30.0	26.3	N	21.1	47.4
0.458000	35.5	34.4	N	12.3	46.7
0.850000	25.0	22.3	N	23.7	46.0
1.458000	25.8	22.6	N	23.4	46.0
3.442000	28.0	21.2	N	24.8	46.0
3.918000	28.3	21.1	N	24.9	46.0
6.398000	33.0	26.0	N	24.0	50.0
15.478000	40.2	37.0	N	13.0	50.0
24.002000	50.4	45.0	N	5.0	50.0

Spectrum Analyzer Parameters

Subrange	Step Size	Detectors	IF BW	Meas. Time
150 kHz - 30 MHz	4 kHz	PK+ ; AVG	9 kHz	0.01 s

EMC Test Code = CE0101L1 Frequency Range MHz = [0.15, 30]
Conducted Emissions - Tested Line = L1
Sample ID: S/01
Test Condition: TC/01. DUT ON. Zigbee in Tx mode. Powered by 120Vac.

Images:



Tables:

Frequency (MHz)	PK+_CLRWR (dBµV)	AVG_CLRWR (dBµV)	Line	Margin – AVG (dB)	Limit – AVG (dBµV)
0.154000	43.2	35.2	L1	20.6	55.8
0.326000	29.6	23.6	L1	25.7	49.3
0.458000	31.9	30.1	L1	16.5	46.7
1.826000	26.5	23.5	L1	22.5	46.0
1.826000	26.5	23.5	L1	22.5	46.0
2.438000	28.2	23.1	L1	22.9	46.0
4.070000	26.0	20.6	L1	25.4	46.0
6.394000	32.3	25.7	L1	24.3	50.0
16.078000	40.1	36.3	L1	13.7	50.0
24.002000	49.9	44.0	L1	6.1	50.0

Spectrum Analyzer Parameters

Subrange	Step Size	Detectors	IF BW	Meas. Time
150 kHz - 30 MHz	4 kHz	PK+ ; AVG	9 kHz	0.01 s

RSS-247 5.2 (a) / FCC 15.247 (a) (2) 6dB Bandwidth

Limits

Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

Test conditions modes: TC/01
Results

	Lowest frequency 915.0 MHz	Middle frequency 921.0 MHz	Highest frequency 925.0 MHz
6 dB Spectrum bandwidth (MHz)	1.71	1.71	1.71

Verdict

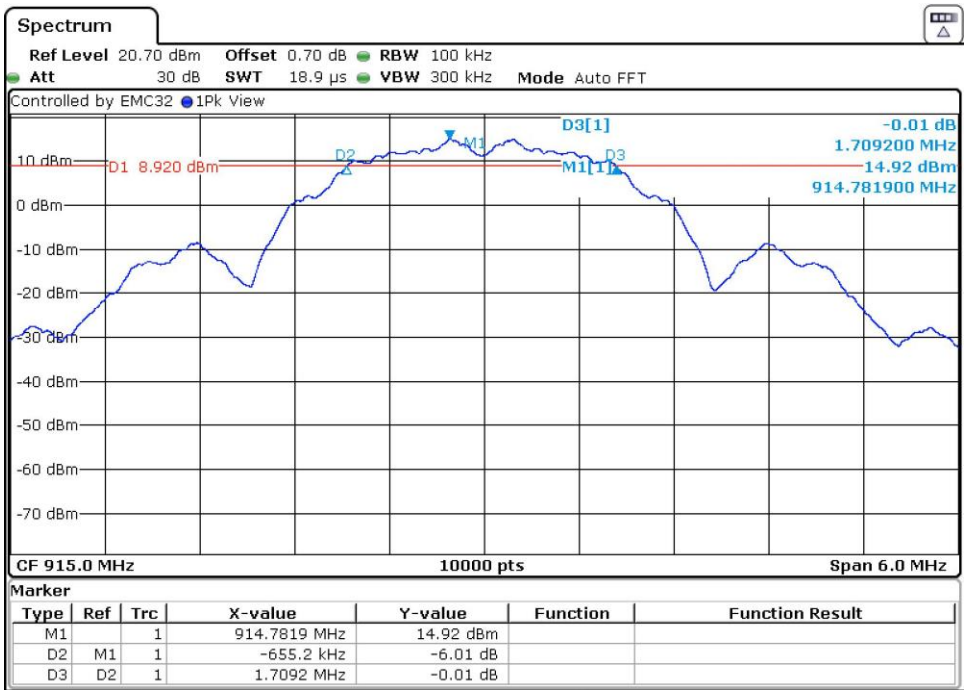
Pass

Results

Attachments

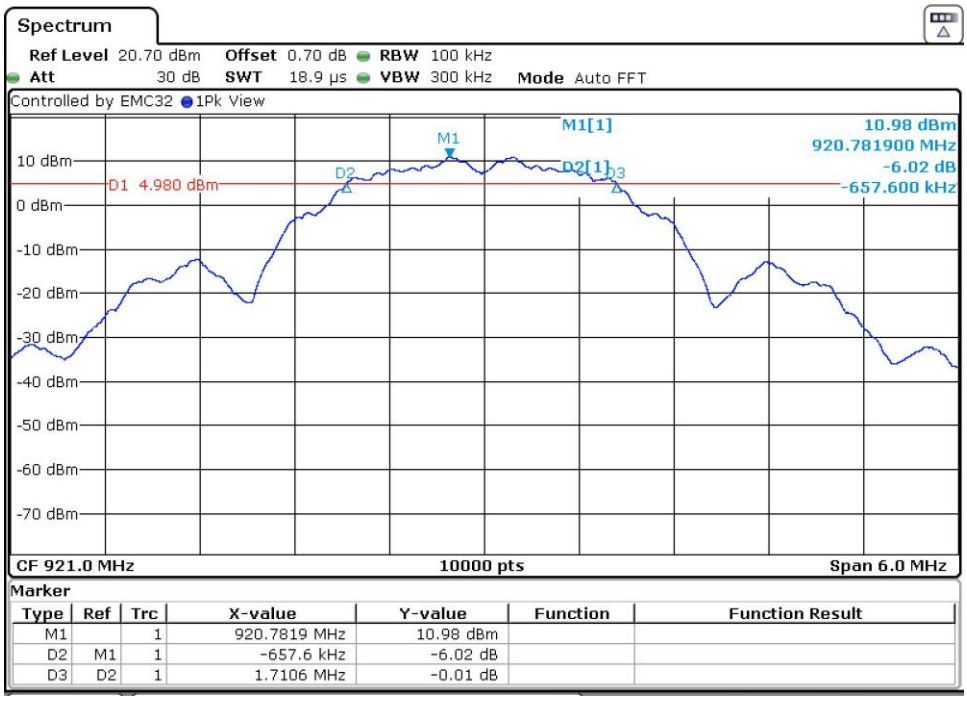
Frequency = 915.0 MHz, Bandwidth = 2 MHz

Images:



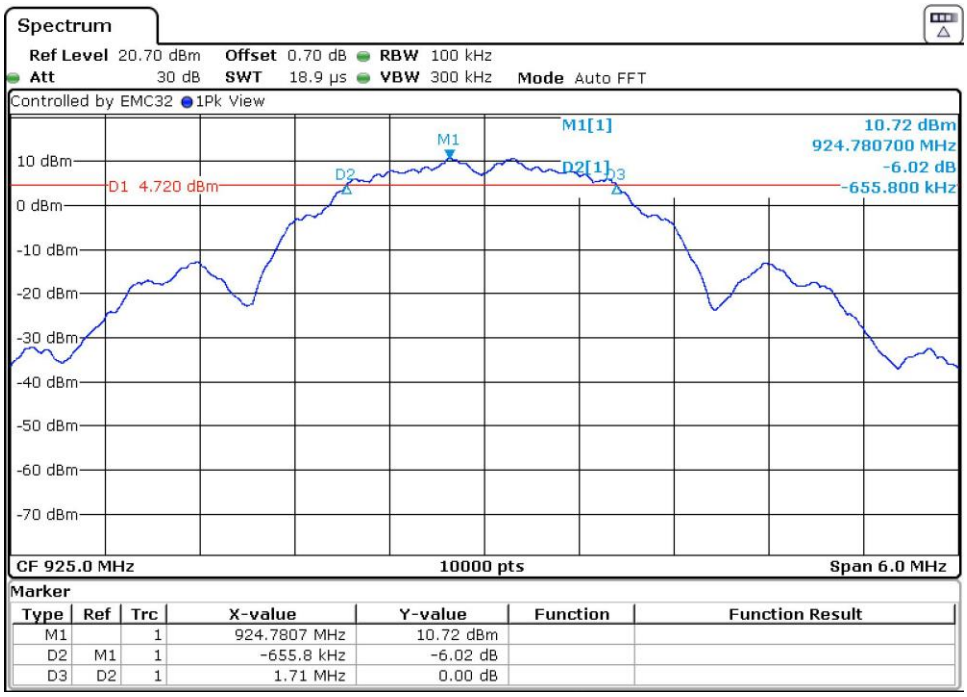
Frequency = 921.0 MHz, Bandwidth = 2 MHz

Images:



Frequency = 925.0 MHz, Bandwidth = 2 MHz

Images:



RSS-247 5.2 (b) / FCC 15.247 (e) Power Spectral Density

Limits

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

The maximum power spectral density level in the fundamental emission was measured using the method AVGPSD-1 (Average PSD) according to Section 8.4 of KDB 558074 D01 15.247 Meas Guidance v05r02.

Test conditions modes: TC/01

Results

	Lowest frequency 915.0 MHz	Middle frequency 921.0 MHz	Highest frequency 925.0 MHz
Power spectral density (dBm)	6.24	2.00	1.78

Verdict

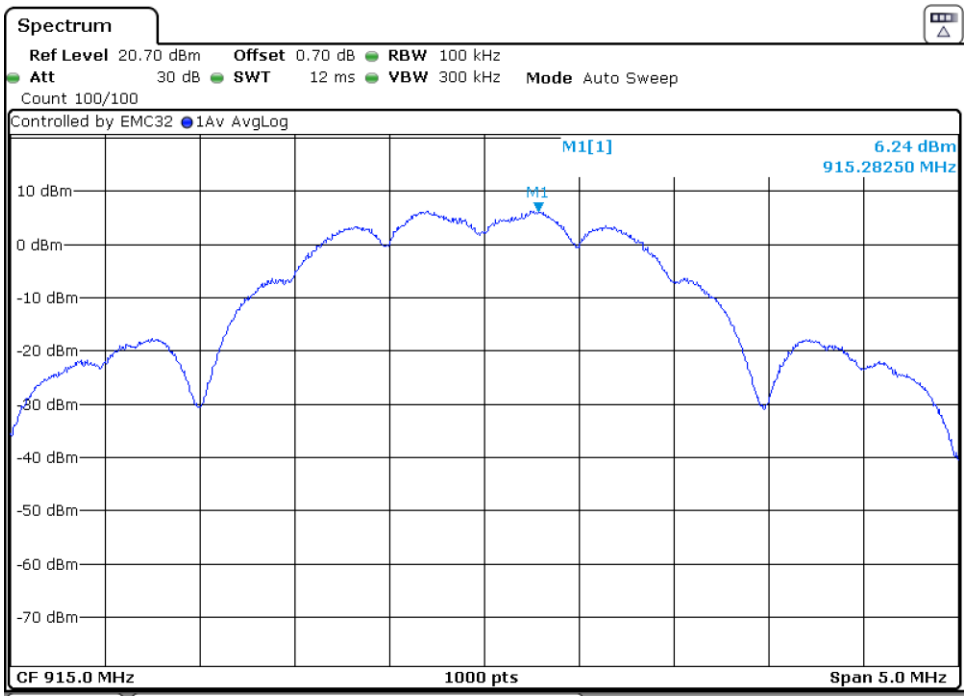
Pass

Results

Attachments

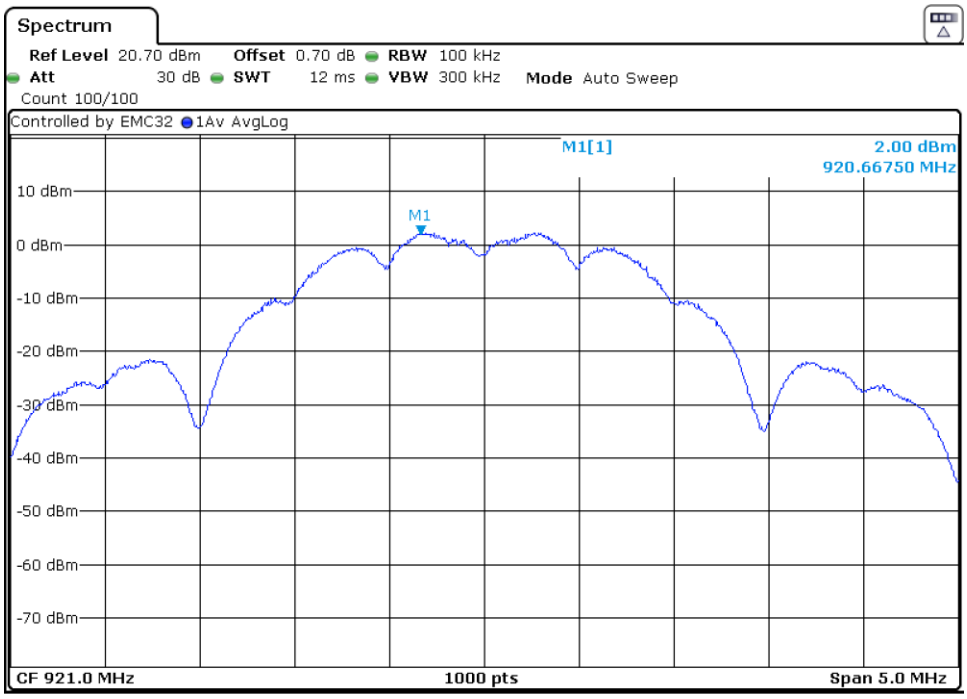
Frequency = 915.0 MHz, Bandwidth = 2 MHz

Images:



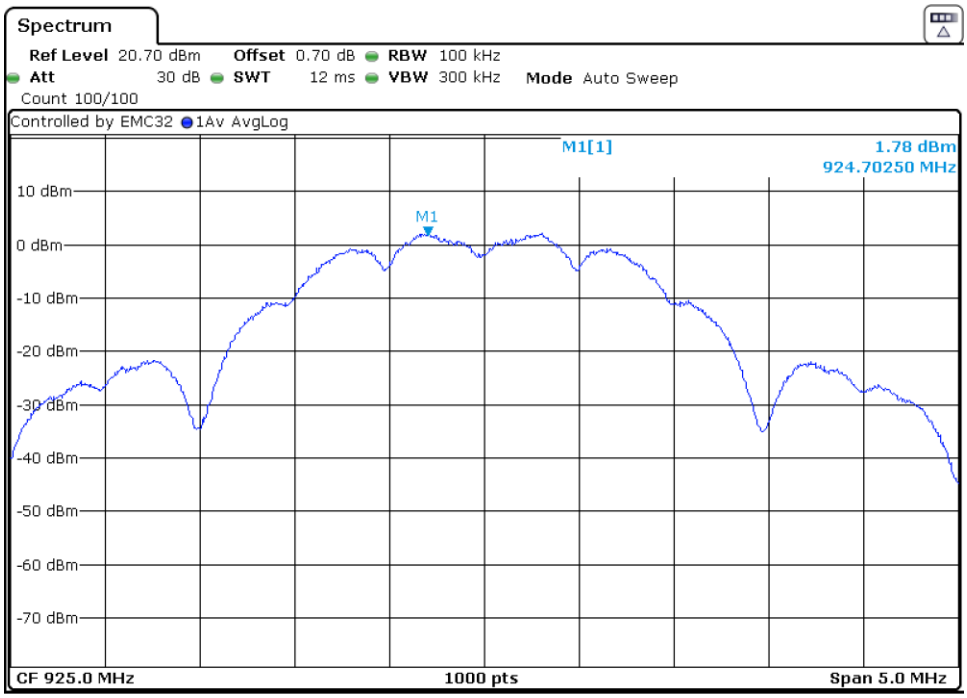
Frequency = 921.0 MHz, Bandwidth = 2 MHz

Images:



Frequency = 925.0 MHz, Bandwidth = 2 MHz

Images:



RSS-247 5.4 (d) / FCC 15.247 (b) (3) Maximum Peak Conducted output power & Antenna gain

Limits

§15.247(b)(3) and RSS-247 5.4(d):

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt (30 dBm). As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

The maximum peak conducted output power was measured using the method using a power meter (PM) according to 8.3.2.3. measurement of Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 558074 D01 DTS Meas Guidance v05r02 dated 04/02/2019.

RSS-247 5.4(d): The e.i.r.p. shall not exceed 4 W (36 dBm)

The EIRP power (dBm) is calculated by adding the declared maximum antenna gain to the measured conducted power.

Maximum declared antenna gain: +3.4 dBi

Test conditions modes: TC/01

Results

	Lowest frequency 915.0 MHz	Middle frequency 921.0 MHz	Highest frequency 925.0 MHz
Maximum conducted power (dBm)	21.60	21.69	21.67
Maximum EIRP power (dBm)	25.00	25.09	25.07

The maximum directional gain of the antenna is less than 6 dBi and therefore the maximum output power limit is not required to be reduced from the stated values.

Verdict

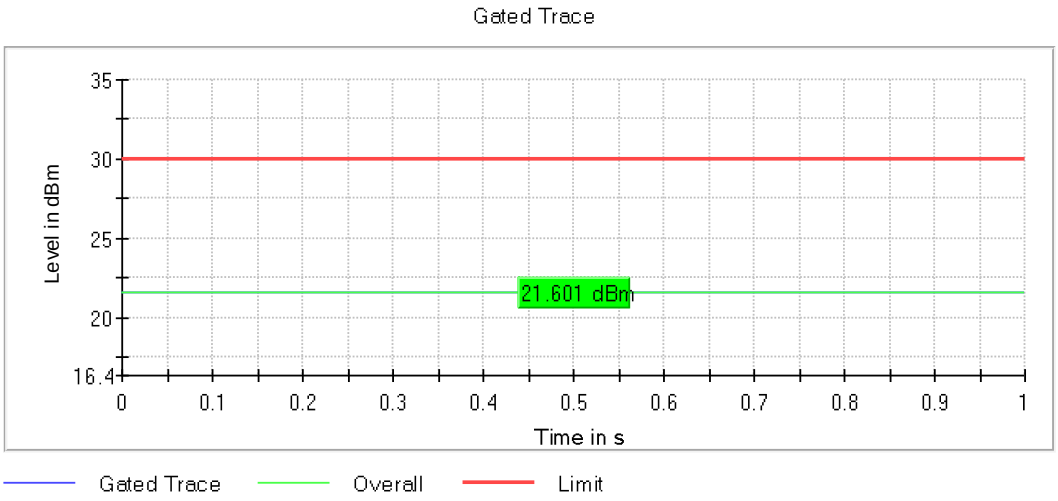
Pass

Results

Attachments

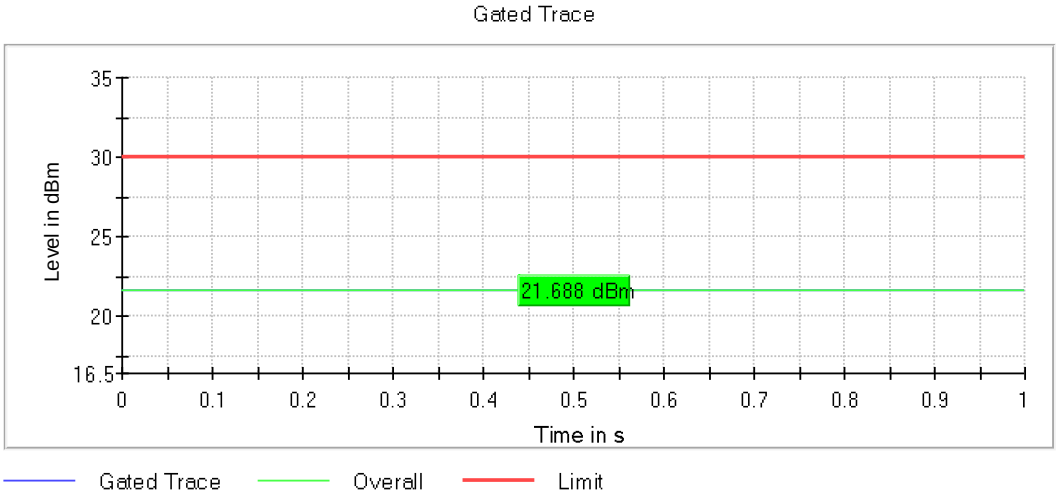
Frequency = 915.0 MHz, Bandwidth = 2 MHz

Images:



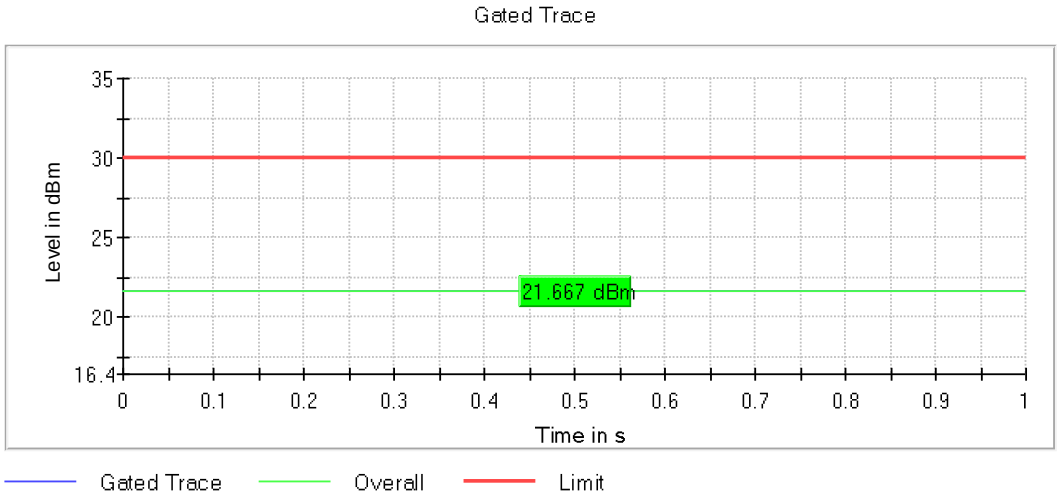
Frequency = 921.0 MHz, Bandwidth = 2 MHz

Images:



Frequency = 925.0 MHz, Bandwidth = 2 MHz

Images:



OSP PowerMeter settings

Setting	Instrument Value	Target Value
Measurement Time	1.000 s	1.000 s
Points	1000000	1000000
Time resolution	1.000 µs	1.000 µs

RSS-247 5.5 / FCC 15.247 (d) Band-edge emissions compliance (Transmitter) - Conducted

Limits

In any 100 kHz bandwidths outside the frequency band in which the intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

Note: Radiated measurements are also used to show compliance with the limits in the restricted bands 2.31-2.39 GHz and 2.4835-2.5 GHz.

Test conditions modes: TC/01

Results

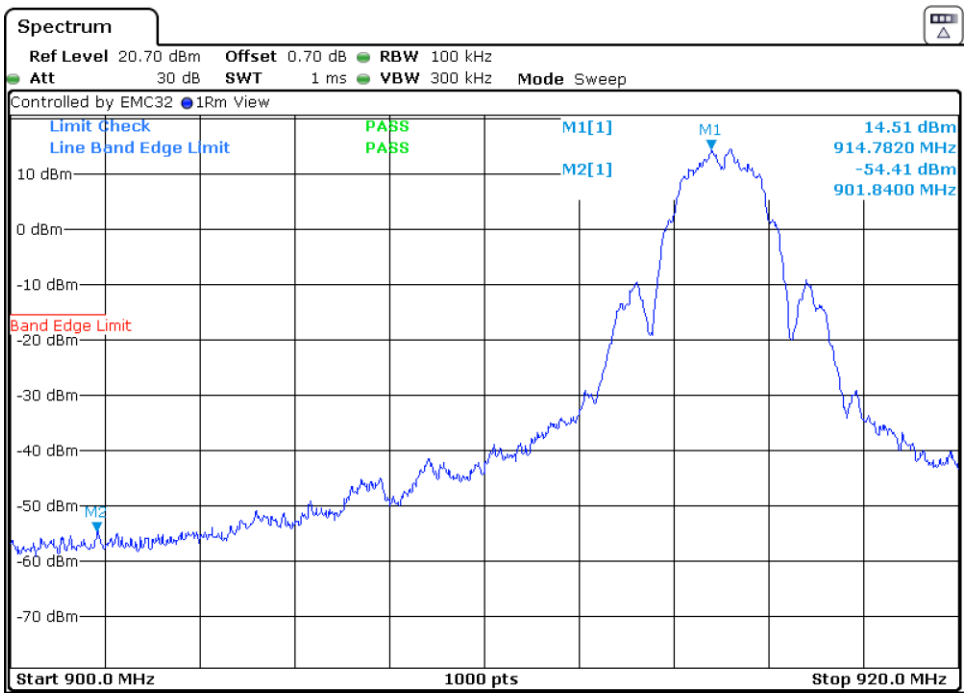
Conducted spurious signals detected were minimum 18 dB below the reference limit for the lowest and highest operating channels.

Verdict

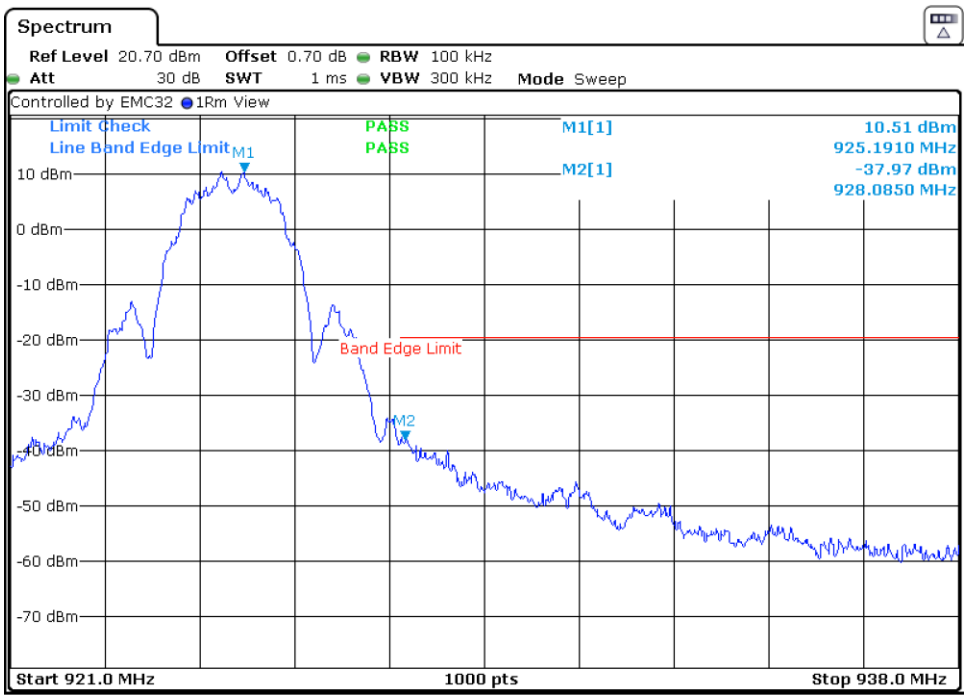
Pass

Results

Attachments
Frequency = 915.0 MHz
Images:



Frequency = 925.0 MHz
Images:



RSS-247 5.2 (a) / RSS-GEN 6.7 FCC 15.247 (a) (2) 99dBw Occupied Channel Bandwidth 99%

Limits

The occupied bandwidth shall be reported for all equipment in addition to the specified bandwidth required in the applicable RSSs

Test conditions modes: TC#01

Results

	Lowest frequency 915.0 MHz	Middle frequency 921.0 MHz	Highest frequency 925.0 MHz
99% bandwidth (MHz)	2.32	2.32	2.32

Verdict

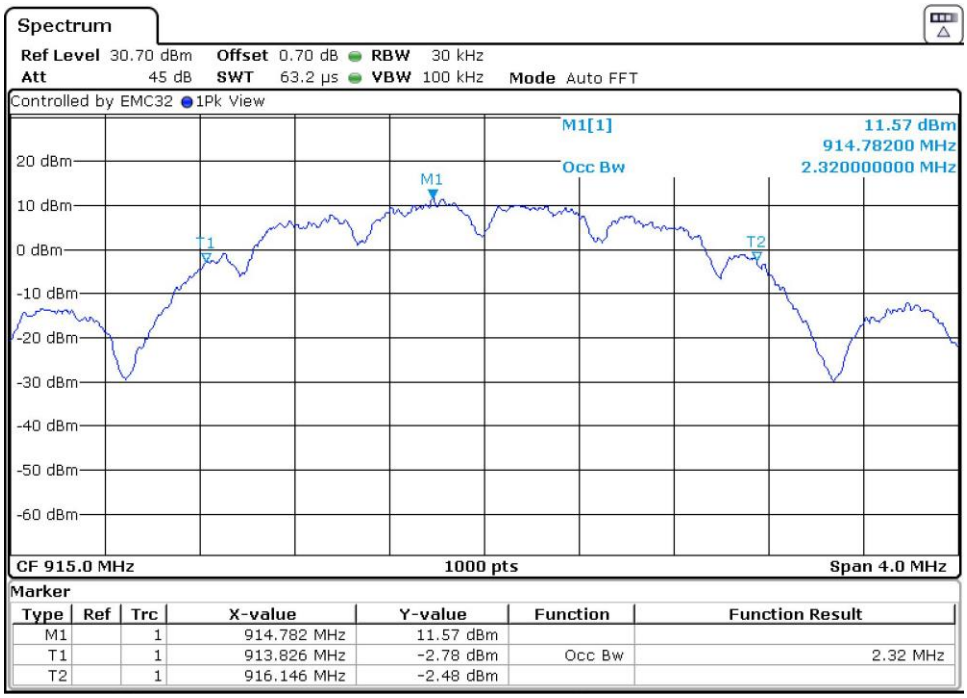
Pass

Results

Attachments

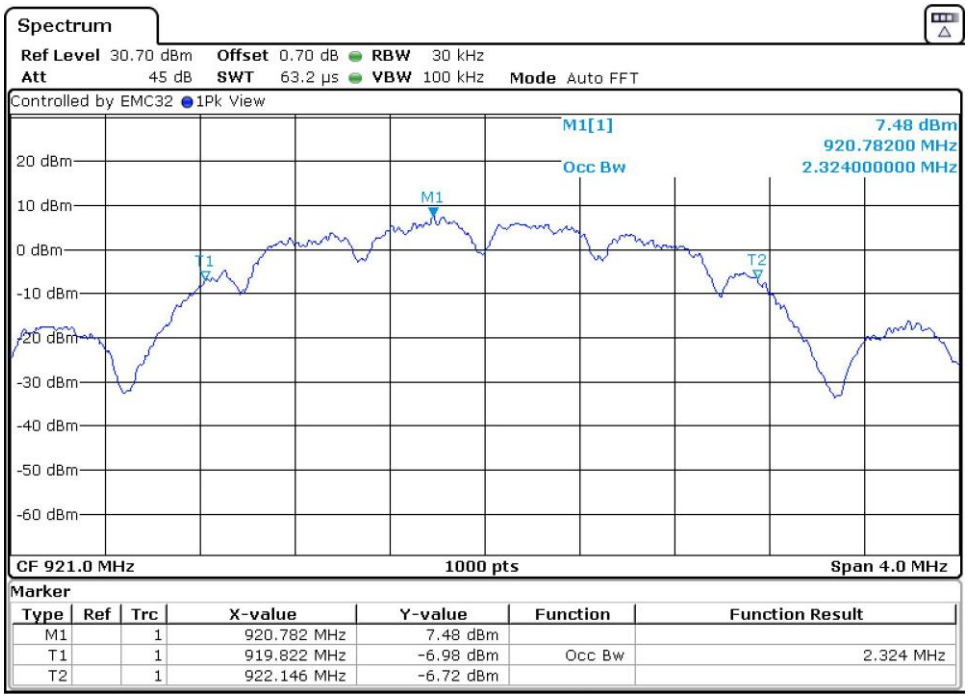
Frequency = 915.0 MHz, Bandwidth = 2 MHz

Images:



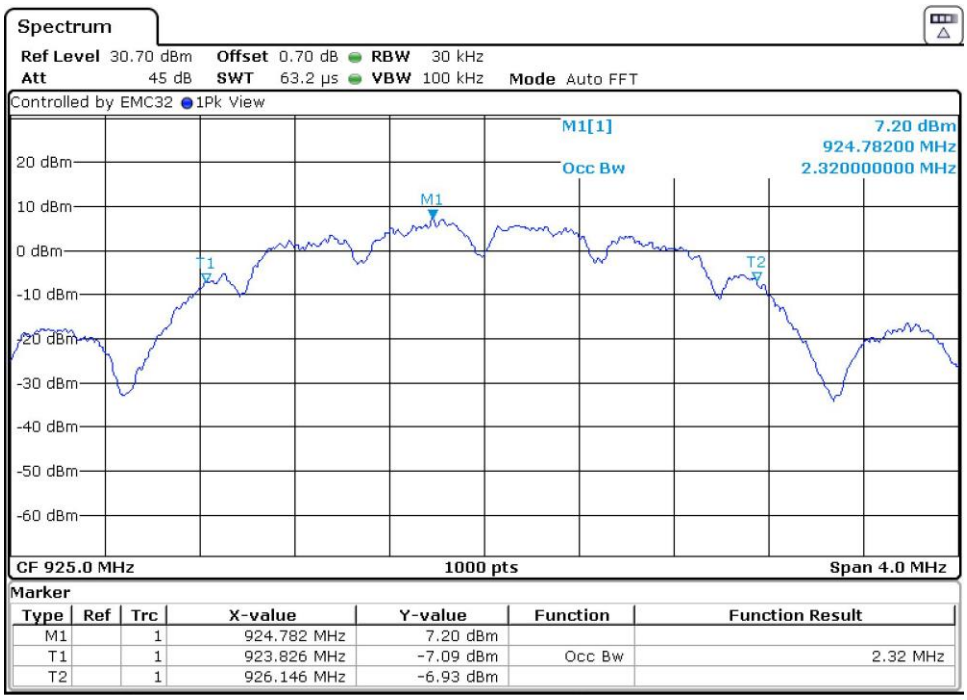
Frequency = 921.0 MHz, Bandwidth = 2 MHz

Images:



Frequency = 925.0 MHz, Bandwidth = 2 MHz

Images:



RSS-247 5.5 / FCC 15.247 (d) Emissions compliance (Transmitter) - Conducted

Limits

In any 100 kHz bandwidth outside the frequency band in which the digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required shall be 30 dB instead of 20 dB.

Verdict

Pass

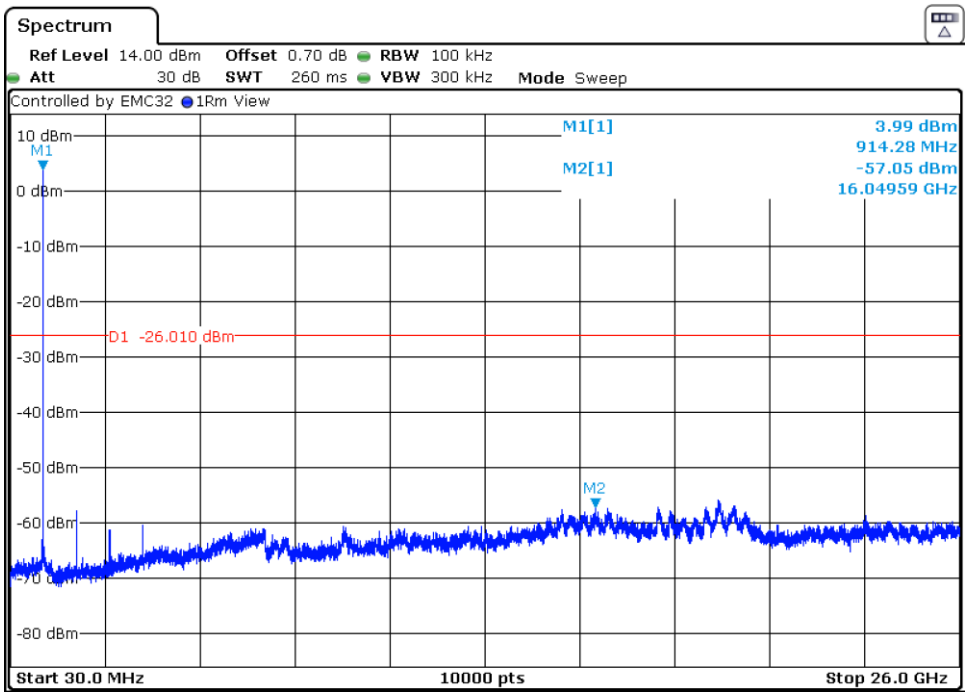
Test conditions modes: TC/01

Results

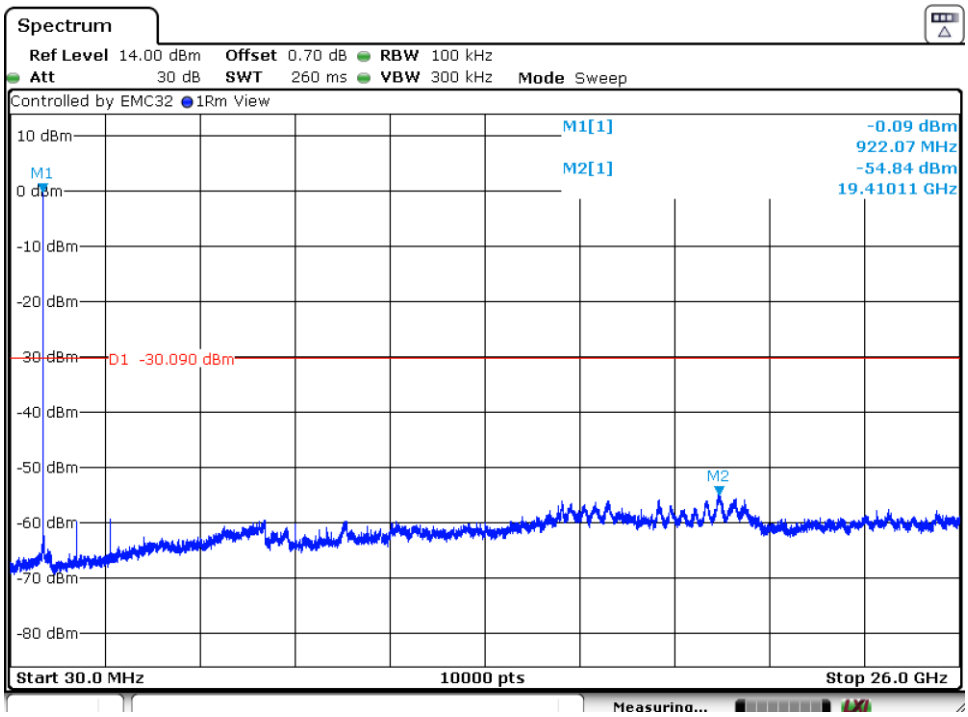
Conducted spurious signals detected were minimum 24 dB below the reference limit for the lowest, middle and highest operating channels.

Attachments

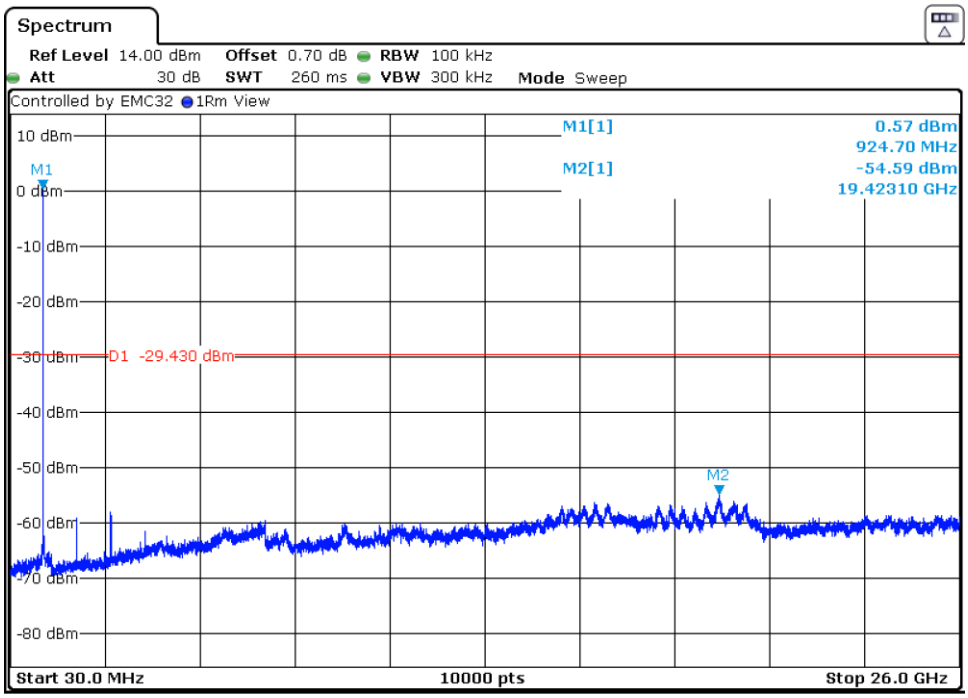
Frequency = 915.0 MHz
Images:



Frequency = 921.0 MHz
Images:



Frequency = 925.0 MHz, Bandwidth = 2 MHz
Images:



RSS-247 5.5 / FCC 15.247 (d) Emissions compliance (Transmitter) - Radiated

Limits

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 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 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.

Verdict

Pass

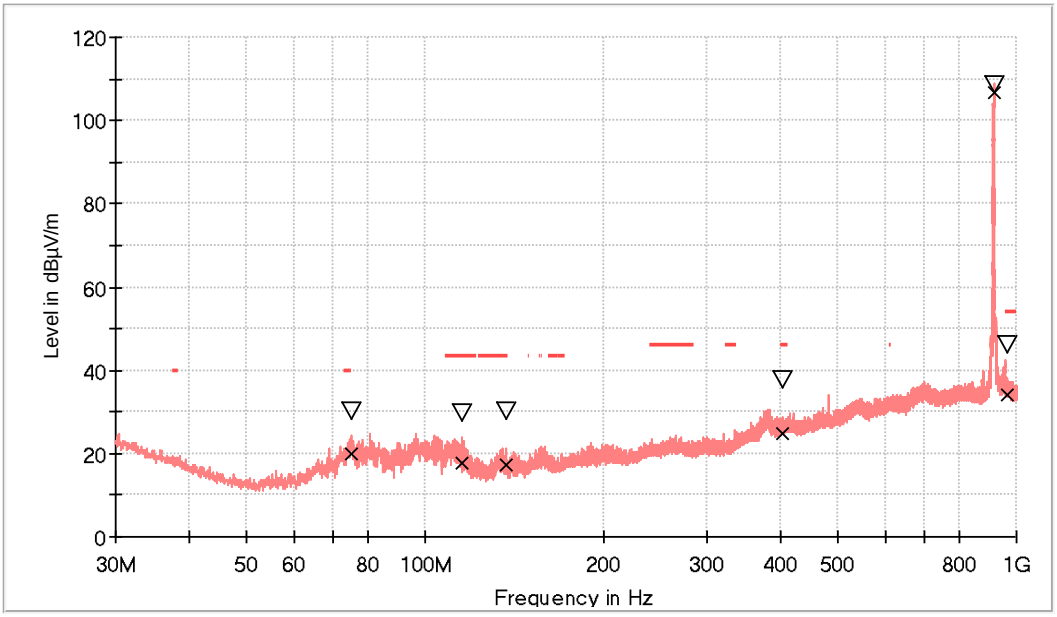
Test conditions modes: TC/01

Results: Frequency range 0.03 - 1 GHz

The level of spurious emissions was measured as their effective radiated power when radiated by cabinet and antenna.

Low channel

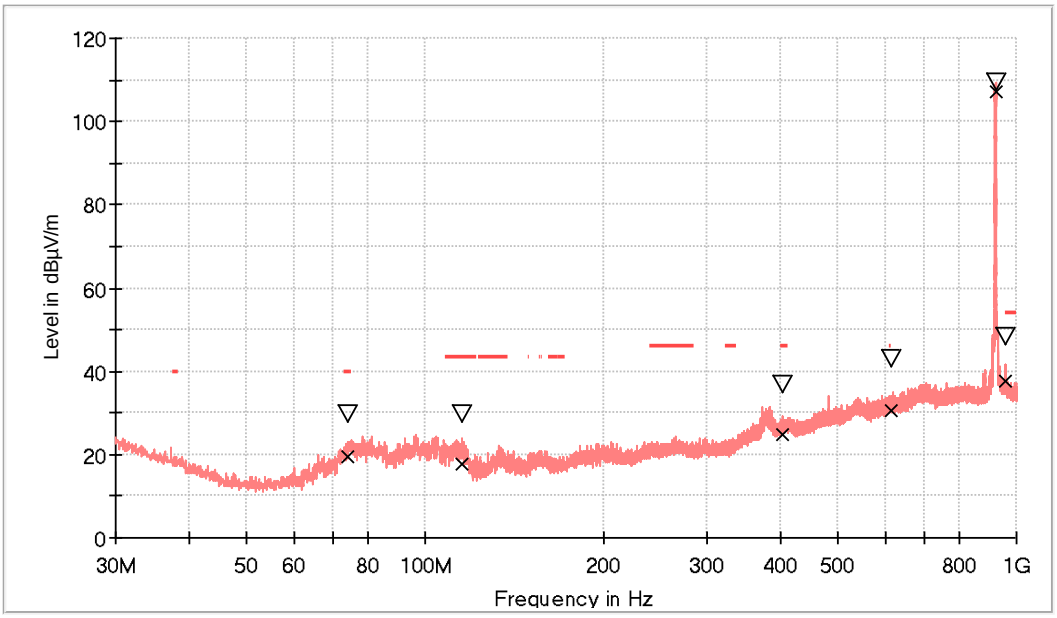
Images:



Frequency (MHz)	MaxPeak (dBµV/m)	QuasiPeak (dBµV/m)	Pol	Margin - QPK (dB)	Limit - QPK (dBµV/m)	Comments
74.959500	30.3	19.8	V	20.3	40.0	
115.263000	29.6	17.6	V	25.9	43.5	
137.282000	30.2	17.5	V	26.0	43.5	
401.219000	37.6	24.8	V	21.2	46.0	
915.173500	108.6	106.6	V	---	---	Fundamental
967.165500	45.9	34.1	V	19.9	54.0	

Middle channel

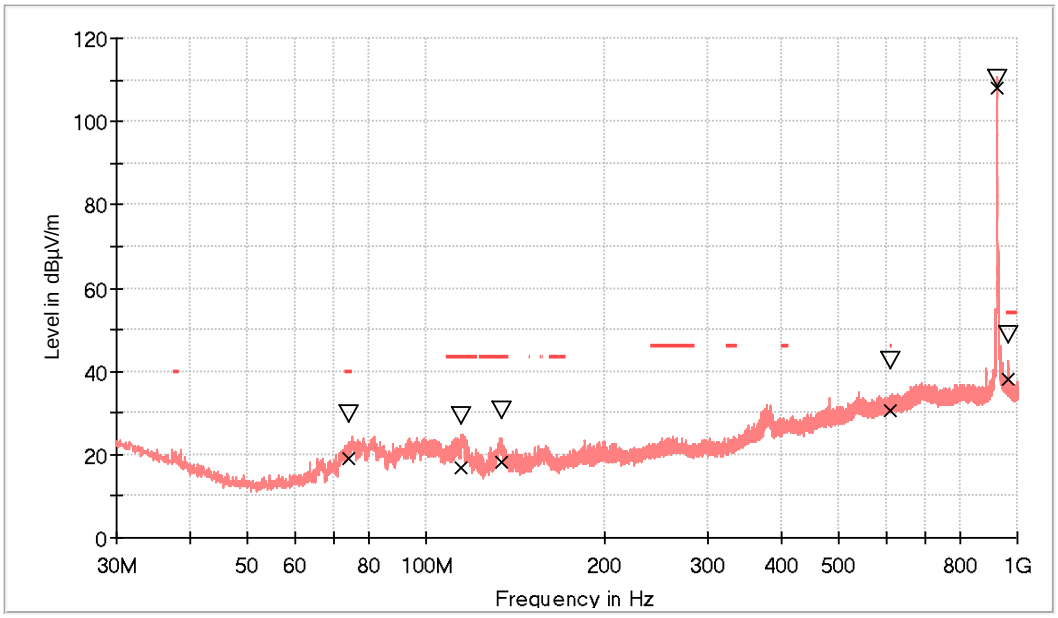
Images:



Frequency (MHz)	MaxPeak (dBµV/m)	QuasiPeak (dBµV/m)	Pol	Margin - QPK (dB)	Limit - QPK (dBµV/m)	Comments
73.844000	29.5	19.6	V	20.4	40.0	
115.263000	29.7	17.6	V	26.0	43.5	
401.849500	36.8	24.8	H	21.2	46.0	
612.388000	42.8	30.6	H	15.4	46.0	
921.187500	109.4	107.2	V	---	---	Fundamental
960.666500	48.2	37.7	V	16.3	54.0	

High channel

Images:



108

Frequency (MHz)	MaxPeak (dBµV/m)	QuasiPeak (dBµV/m)	Pol	Margin - QPK (dB)	Limit - QPK (dBµV/m)	Comments
73.989500	29.5	19.2	H	20.8	40.0	
114.778000	29.3	16.8	V	26.8	43.5	
133.984000	30.5	18.1	V	25.5	43.5	
610.448000	42.7	30.7	V	15.3	46.0	
924.825000	110.1	108.2	V	---	---	Fundamental
964.789000	48.5	38.3	V	15.7	54.0	

Test conditions modes: TC#01

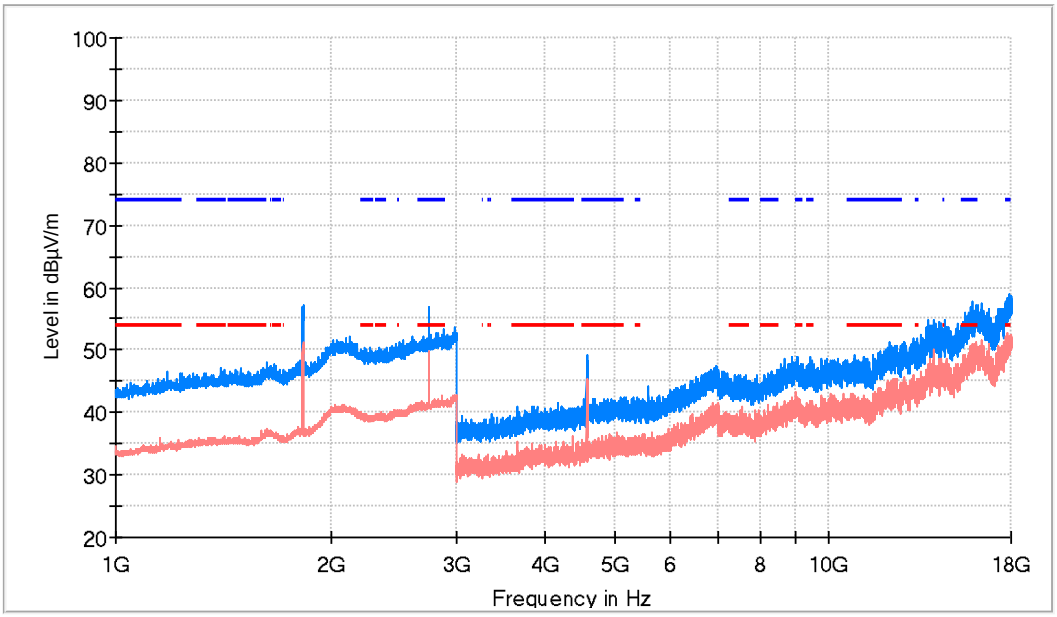
Results: Frequency range 1 - 18 GHz

Lowest Channel

Attachments

Frequency = 915.0 MHz, Bandwidth = 2 MHz, Frequency Range GHz = [1, 18]

Images:



Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol	Margin (dB)	Limit (dBµV/m)
1829.000000	57.0	---	V	31.7	88.7
2744.000000	---	49.7	H	4.3	54.0
4572.500000	---	45.5	V	8.5	54.0
16060.000000	---	51.2	H	2.8	54.0
17738.500000	---	52.9	H	1.1	54.0

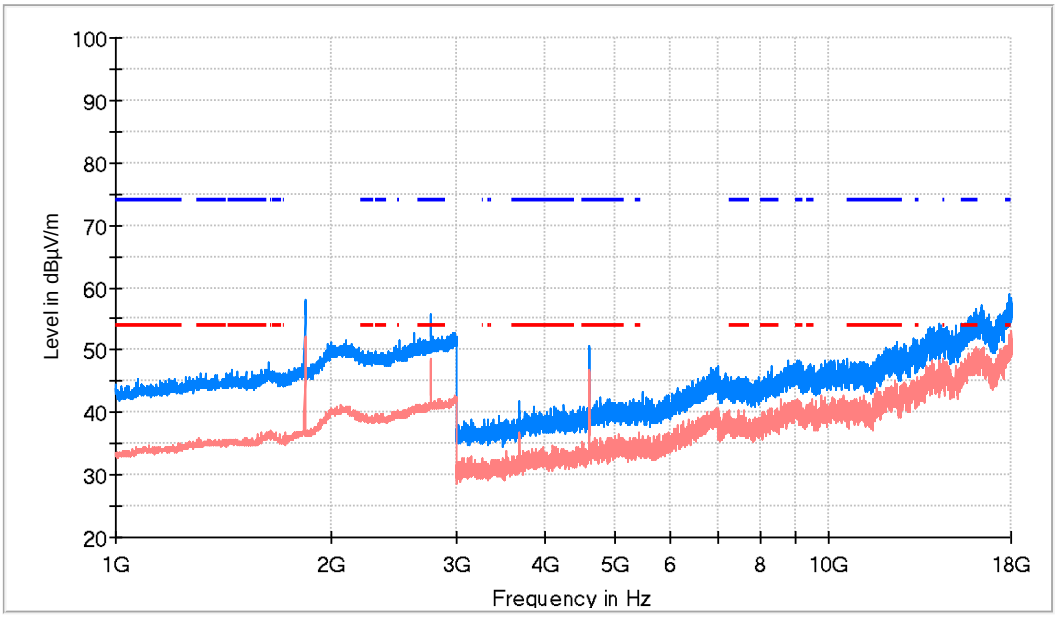
Results: Frequency range 1 - 18 GHz

Middle Channel

Attachments

Frequency = 921.0 MHz, Bandwidth = 2 MHz, Frequency Range GHz = [1, 18]

Images:



Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol	Margin (dB)	Limit (dBµV/m)
1843.000000	58.2	---	V	31.2	89.4
2761.500000	---	48.6	V	5.4	54.0
4607.500000	---	46.8	V	7.2	54.0
16055.000000	---	50.5	V	3.5	54.0
17983.500000	---	53.0	V	1.0	54.0

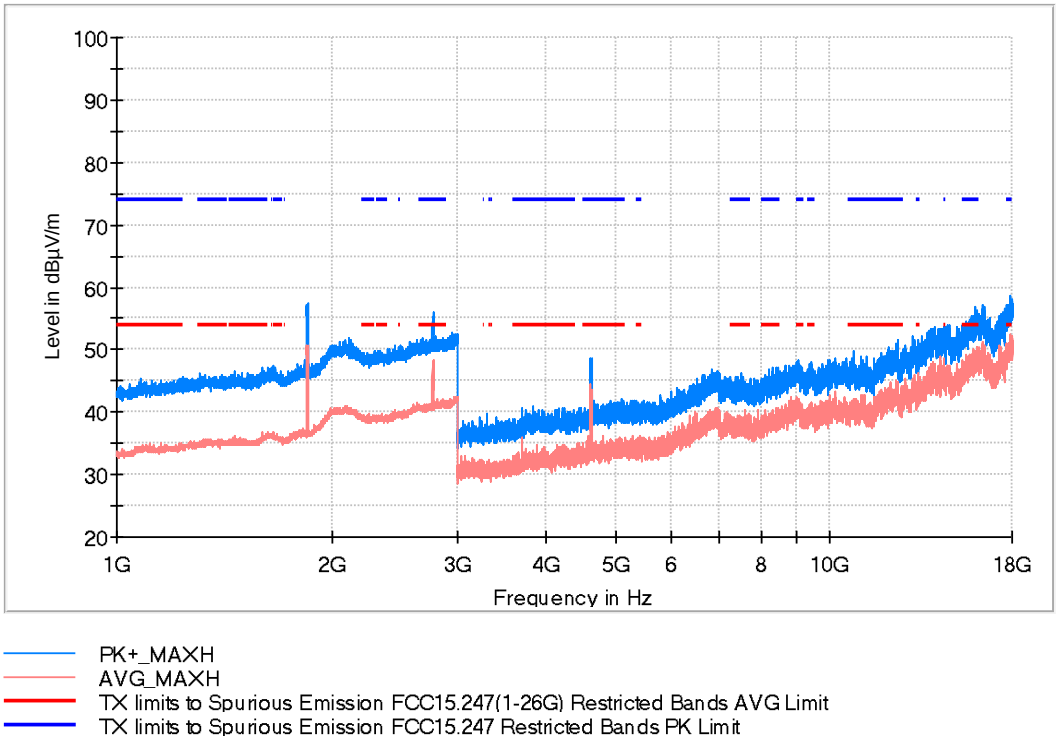
Results: Frequency range 1 - 18 GHz

Highest Channel

Attachments

Frequency = 925.0 MHz, Bandwidth = 2 MHz, Frequency Range GHz = [1, 18]

Images:



Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol	Margin (dB)	Limit (dBµV/m)
1851.000000	57.6	---	V	32.5	90.1
2776.500000	---	48.3	V	5.7	54.0
4622.000000	---	44.4	V	9.6	54.0
16063.500000	---	50.5	V	3.5	54.0
17917.500000	---	52.6	V	1.4	54.0

Spectrum Analyzer Parameters

Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
30 MHz - 1 GHz	48.5 kHz	PK+	100 kHz	1 s	20 dB
1 GHz - 3 GHz	500 kHz	PK+ ;	1 MHz	0.1 s	20 dB
3 GHz - 18 GHz	500 kHz	PK+ ;	1 MHz	0.1 s	30 dB