

Prüfbericht - Nr.: <i>Test Report No.:</i>	50361122 001	Auftrags-Nr.: <i>Order No.:</i>	180123644	Seite 1 von 73 <i>Page 1 of 73</i>
Kunden-Referenz-Nr.: <i>Client Reference No.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	2020.03.05	
Auftraggeber: <i>Client:</i>	Ring LLC 1523 26th St, Santa Monica, CA 90404, USA			
Prüfgegenstand: <i>Test item:</i>	Steplight			
Bezeichnung / Typ-Nr.: <i>Identification / Type No.:</i>	5LD1S8			
Auftrags-Inhalt: <i>Order content:</i>	TÜV Rheinland – FCC/IC Service			
Prüfgrundlage: <i>Test specification:</i>	CFR47 FCC Part 15: Subpart C Section 15.209 CFR47 FCC Part 15: Subpart C Section 15.247 RSS-247 Issue 2 February 2017 RSS-Gen Issue 5 March 2019 FCC Part15, Subpart B:2019 ICES-005:2018			
Wareneingangsdatum: <i>Date of receipt:</i>	2020.03.05			
Prüfmuster-Nr.: <i>Test sample No.:</i>	A001076653 001			
Prüfzeitraum: <i>Testing period:</i>	2020.03.22-2020.03.25			
Ort der Prüfung: <i>Place of testing:</i>	Refer to section 1.1.			
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland / CCIC (Ningbo) Co., Ltd.			
Prüfergebnis*: <i>Test result*:</i>	Pass			
geprüft von / tested by:	kontrolliert von / reviewed by:			
2020.10.12 Caidong Xie/PE	<i>Caidong Xie</i>	2020.10.12 Feng Liang/TC	<i>Feng Liang</i>	<i>Liang</i>
Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>	Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>
				Unterschrift <i>Signature</i>
Sonstiges/ Other: Refer to the test report 50361123 001 for the conformance of Radio Frequency Exposure requirement. Refer to page 5 to 6 for more information.				
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>		Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>		
*Legende:	1= Sehr gut	2 = gut	3= befriedigend	4= ausreichend
	P(ass) =entspricht o.g. Prüfgrundlage(n)	F(ail)= entspricht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T =nicht getestet
Legend:	1= very good	2 = good	3= satisfactory	4= sufficient
	P(ass) = passed a.m. test specification(s)	F(ail)= failed a.m. test specification(s)	N/A = not applicable	N/T = not tested
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any safety mark on this or similar products.</i>				

v04

TEST SUMMARY

4.1.1 ANTENNA REQUIREMENT

Result:

Pass

4.1.2 6dB AND 20dB BANDWIDTH MEASUREMENT

Result:

Pass

4.1.3 99% EMISSION BANDWIDTH MEASUREMENT

Result:

Pass

4.1.4 MAXIMUM PEAK CONDUCTED OUTPUT POWER

Result:

Pass

4.1.5 EQUIVALENT ISOTROPICALLY RADIATED POWER

Result:

Pass

4.1.6 PEAK POWER SPECTRAL DENSITY

Result:

Pass

4.1.7 CONDUCTED SPURIOUS EMISSIONS MEASURED IN 100 KHZ BANDWIDTH

Result:

Pass

4.1.8 CARRIER SEPARATION MEASUREMENT

Result:

Pass

4.1.9 THE NUMBER OF HOPPING CHANNELS

Result:

Pass

4.1.10 CHANNEL OCCUPANCY TIME

Result:

Pass

4.1.11 CONDUCTED EMISSION (AC POWER-LINE)

Result:

N.A

4.1.12 RADIATED EMISSION

Result:

Pass

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1 Test Sites

1.1 Test Facilities

Laboratory: TÜV Rheinland /CCIC(Ningbo) Co., Ltd.

1st Floor, Building 11, Scholar Innovation Park, No.1188 Zhongguan Road, Zhenhai District, Ningbo 315200 P.R. China.

The used test equipment is in accordance with CISPR 16-1 series standards for measurement of radio interference.

1.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

No.	Equipment	Model	Inventory no.	Last cal. date	Cal. due date
1.	EMI test receiver	ESR7	101929	2019.11.26	2020.11.25
2.	Spectrum analyzer	FSV40	101412	2019.11.26	2020.11.25
3.	Pre-amplifier	SCU-18F	180051	2019.11.26	2020.11.25
4.	Horn antenna	HF907	102653	2017.08.03	2020.08.02
5.	Bilog Antenna	CBL6112D	49033	2018.04.13	2021.04.12

1.3 Measurement Uncertainty

Test Item	Expanded Measurement Uncertainty (k=2)
Conducted Emission (9-150kHz)	3.70dB
Conducted Emission (150k-30MHz)	3.30dB
Radiated Emission (30-1000MHz)	4.52dB
Radiated Emission (1-18GHz)	4.37dB

2 General Product Information

2.1 Product Function and Intended Use

The EUT(equipment under test) is a Steplight which support Bluetooth, LoRa DTS, LoRa FHSS and FSK HFSS function operated at 2400-2483.5MHz and 902-928MHz respectively. For the further information, refer to the user's manual.

Model list:

Model name	Function
5LD1S8	Block A: BLE operated at 2.4GHz Block B: LoRa DTS, LoRa FHSS and FSK FHSS operated at 902-928MHz

2.2 Ratings and System Details

Power input	: DC 4.5V 3C Cells
Protection Class	: Class III
FCC ID	: 2AEUPBHADB001
IC	: 20271-BHADB001
HVIN	: 5LD1S8
FVIN	: 1.7.16-56
PMN	: Steplight

Technical Specification of BLE

Technical Specification	BLE
Operating Frequency band	2402 – 2480 MHz
Bluetooth Core Version	Bluetooth Low Energy 4.2
Channel separation	2MHz
Extreme Temperature Range	-20°C ~ 50°C
Modulation	GFSK
Antenna Type	PCB Layout Antenna
Antenna Gain(dBi)	3.26
Channel	0~39

Technical Specification of LoRa DTS

Technical Specification	LoRa DTS 500kHz 902.5-926.5MHz
Operating Frequency band	902 – 928 MHz
Extreme Temperature Range	-20°C ~ 50°C
Bandwidth(kHz)	500
Modulation	LoRa DTS
Antenna Type	LTCC Antenna
Antenna Gain(dBi)	1.1
Channel Separation (kHz)	800
Channel Number	31
Channel (MHz)	902.5, 903.3, 904.1, 904.9, 905.7, 906.5, 907.3, 908.1, 908.9, 909.7, 910.5, 911.3, 912.1, 912.9, 913.7, 914.5, 915.3, 916.1, 916.9, 917.7, 918.5, 919.3, 920.1, 920.9, 921.7, 922.5, 923.3, 924.1, 924.9, 925.7, 926.5

Technical Specification of LoRa FHSS

Technical Specification	LoRa 125kHz FHSS 902.2-927.8MHz
Operating Frequency band	902 – 928 MHz
Extreme Temperature Range	-20°C ~ 50°C
Modulation	LoRa FHSS
Antenna Type	LTCC Antenna
Antenna Gain(dBi)	1.1
Channel Separation (kHz)	200
Channel Number	129
Bandwidth (kHz)	125
Hopping channel(MHz)	902.2-927.8

Technical Specification of FSK FHSS

Technical Specification	FSK 150Kbps FHSS	FSK 50Kbps FHSS	FSK 250Kbps FHSS
Operating Frequency band	902 – 928 MHz		
Extreme Temperature Range	-20°C ~ 50°C		
Modulation	FSK FHSS		
Antenna Type	LTCC Antenna		
Antenna Gain(dBi)	1.1		
Channel Separation (kHz)	400	200	500
Channel Number	64	129	51
Data Rate (Kbps)	150	50	250
Hopping Channel(MHz)	902.4~927.6	902.2~927.8	902.5~927.5

2.3 Independent Operation Modes

The basic operation modes are:

Mode A: Transmitting continuously in a channel

Mode B: Hopping in a sequence of hopping channels and Transmitting

Mode C: Transmitting continuously or Receiving continuously in a channel, the worst case recorded

Mode D: Light working (The worst case recorded when having dimmer)

2.4 Noise Generating and Noise Suppressing Parts

Refer to the Circuit diagram for further information.

2.5 Submitted Documents

Circuit diagram, PCB layout, Labels, user's manual, etc.

3 Test Set-up and Operation Modes

3.1 Principle of Configuration Selection

The equipment under test (EUT) was configured to measure its maximum power level. The Mode Cs were adapted accordingly in reference to the instructions for use.

3.2 Test Operation and Test Software

During testing, Channel & Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power was selected according to the instruction given by the manufacturer. The setting of the RF output power expected by the customer shall be fixed on the firmware of the final end product.

All testing were performed according to the procedures in ANSI C63.10: 2013.

Test Software EMC32 V10.30 was used in the radiated emission test.

3.3 Special Accessories and Auxiliary Equipment

Description	Manufacturer	Model No.
notebook	Lenovo	T420

3.4 Countermeasures to achieve EMC Compliance

The tested sample contained noise suppression components as specified in the circuit diagram. No special measure is employed to achieve the requirement.

3.5 Test set-up

Diagram of Measurement Configuration for Radiation Test (Below 1GHz)

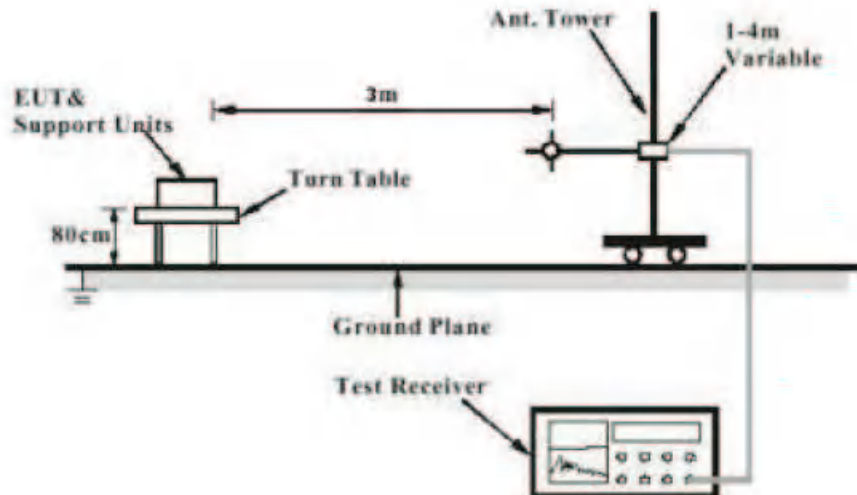


Diagram of Measurement Configuration for Radiation Test (Above 1GHz)

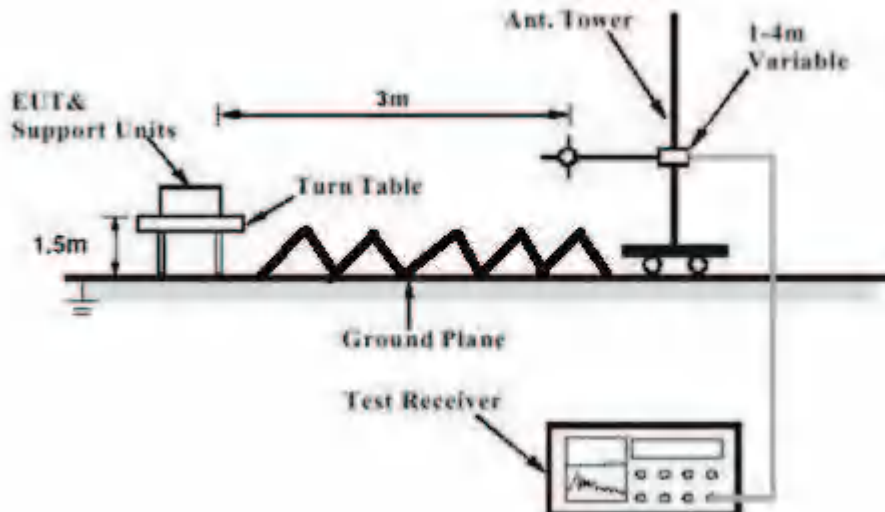
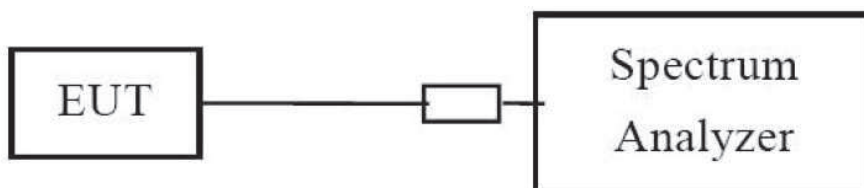


Diagram of Measurement Configuration for Conducted Transmitter Measurement



4 Test Results

4.1 Transmitter Requirement & Test Suites

4.1.1 Antenna Requirement

Result:

Pass

Test Specification
Test standard : FCC Part 15.203

The EUT has two internal antennas, which permanently attached and no consideration of replacement. Therefore, the EUT is considered sufficient to comply with the provision. Refer to EUT Photo for further details.

4.1.2 6dB and 20dB Bandwidth Measurement

Result:

Pass

Test Specification

Test standard : FCC Part 15.247(a)(1)(i), (a)(2)
RSS-247 Issue 2 February 2017 Clause 5.1, Clause 5.2

Basic standard : ANSI C63.10: 2013, clause 6.9.2
KDB558074 D01v05r02, clause 8.3.1.1

Limits : At least 500kHz for 6dB bandwidth(DTS)
Not more than 500kHz for 20dB bandwidth(FHSS)

Kind of test site : Shielded Room

Test Setup

Date of testing : 22.03.2020-25.03.2020

Input voltage : DC 4.5V

Operational mode : Mode A

Test channel : Lo, Mi, Hi

Temperature : 23°C

Relative humidity : 51%

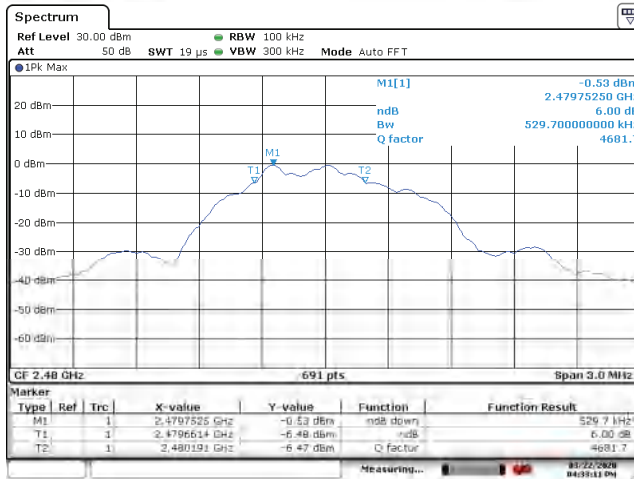
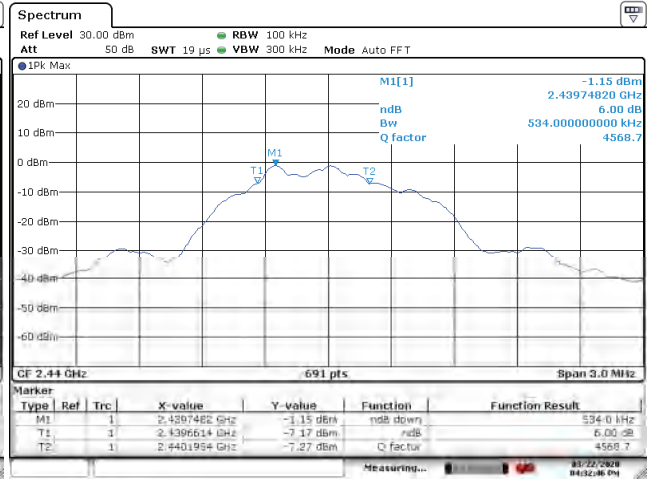
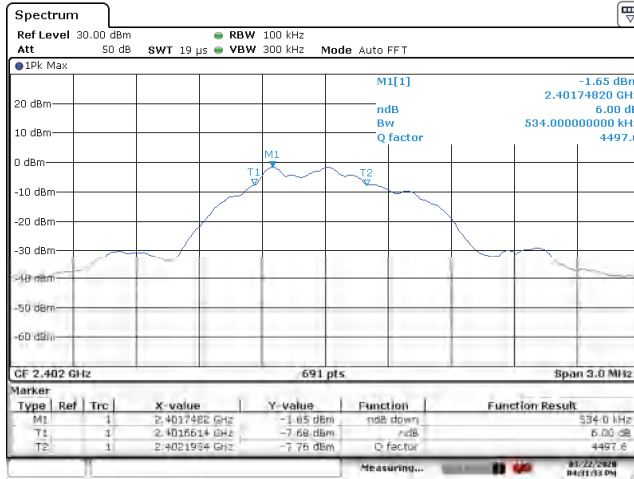
Atmospheric pressure : 101 kPa

Table 2: Test result of 6dB Bandwidth for BLE and LoRa DTS, 20dB Bandwidth for LoRa FHSS and FSK FHSS

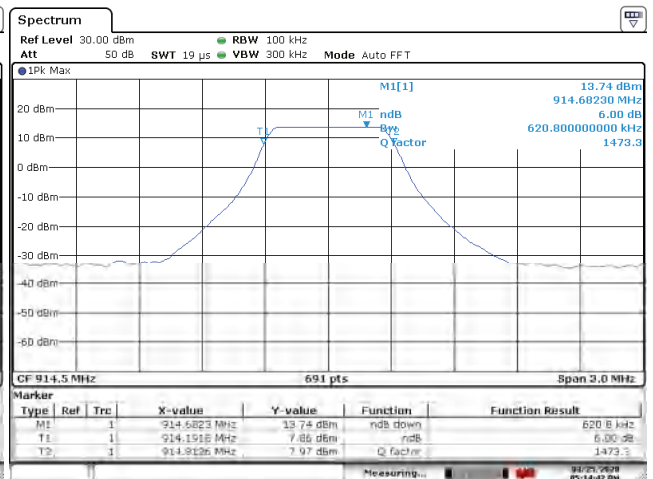
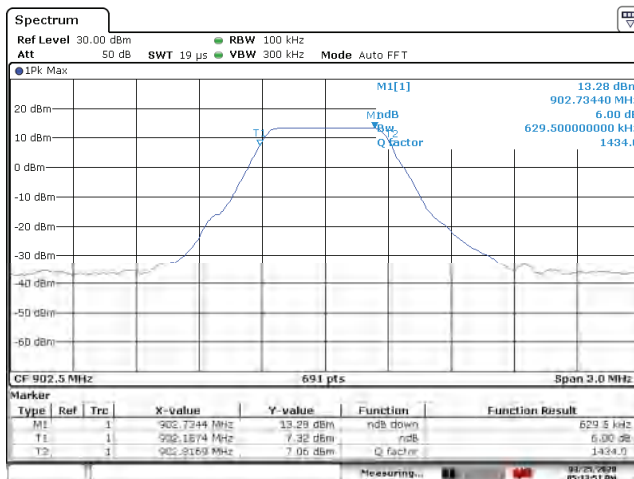
Modulation Type and Operation band	Channel	Channel Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Result
1. BLE 2402MHz~2480MHz 6dB Bandwidth	Low Channel	2402	534.0	500	Pass
	Mid Channel	2440	534.0	500	Pass
	High Channel	2480	529.7	500	Pass
2. LoRa 500kHz DTS 902.5MHz~926.5MHz 6dB Bandwidth	Low Channel	902.5	629.5	500	Pass
	Mid Channel	914.5	620.8	500	Pass
	High Channel	926.5	620.8	500	Pass
3. LoRa 125kHz FHSS 902.2-927.8MHz 20dB Bandwidth	Low Channel	902.2	148.34	500	Pass
	Mid Channel	915	148.34	500	Pass
	High Channel	927.8	147.61	500	Pass
4. FSK 150Kbps FHSS 902.4MHz~927.6MHz 20dB Bandwidth	Low Channel	902.4	170.77	500	Pass
	Mid Channel	914.8	171.49	500	Pass
	High Channel	927.6	167.15	500	Pass
5. FSK 50Kbps FHSS 902.2MHz~927.8MHz 20dB Bandwidth	Low Channel	902.2	109.99	500	Pass
	Mid Channel	915	109.26	500	Pass
	High Channel	927.8	105.64	500	Pass
6. FSK 250Kbps FHSS 902.5MHz~927.5MHz 20dB Bandwidth	Low Channel	902.5	277.9	500	Pass
	Mid Channel	915	275.0	500	Pass
	High Channel	927.5	277.9	500	Pass

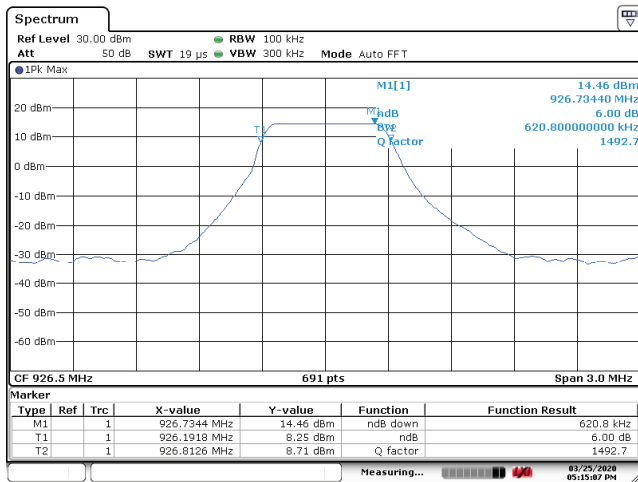
Figure 1: 6dB&20dB Bandwidth Measurement

1. BLE, 6dB Bandwidth, 2402MHz~2480MHz

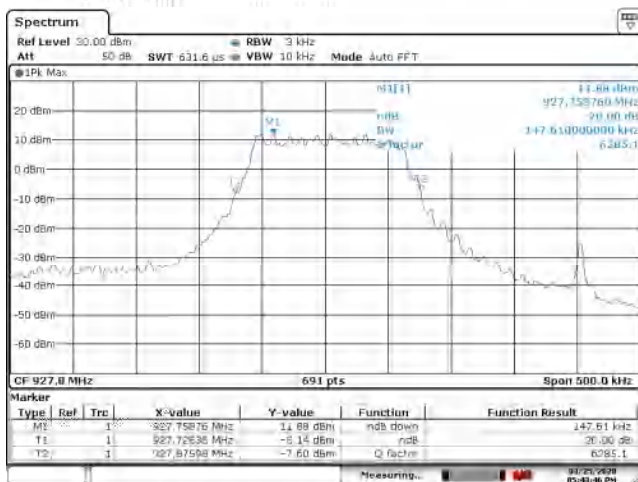
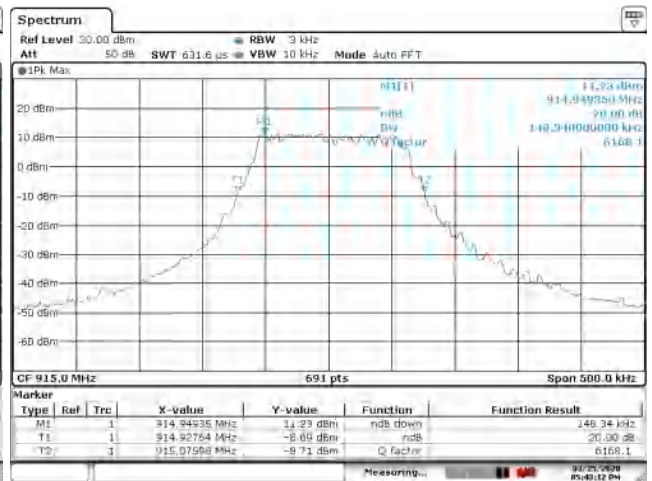
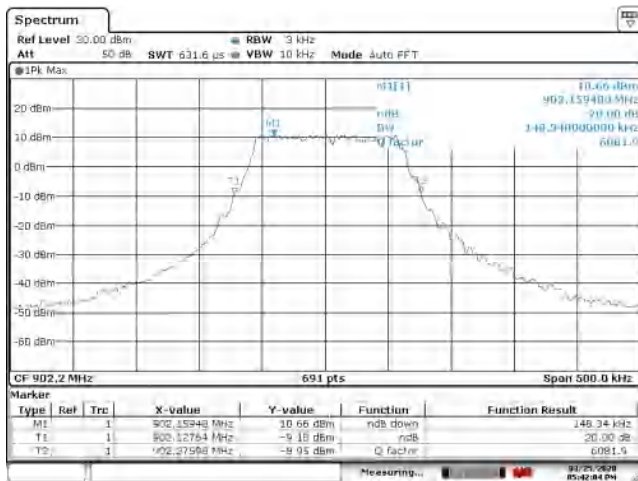


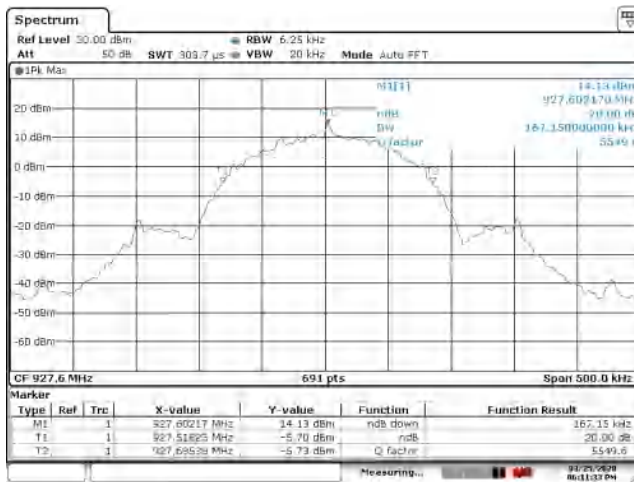
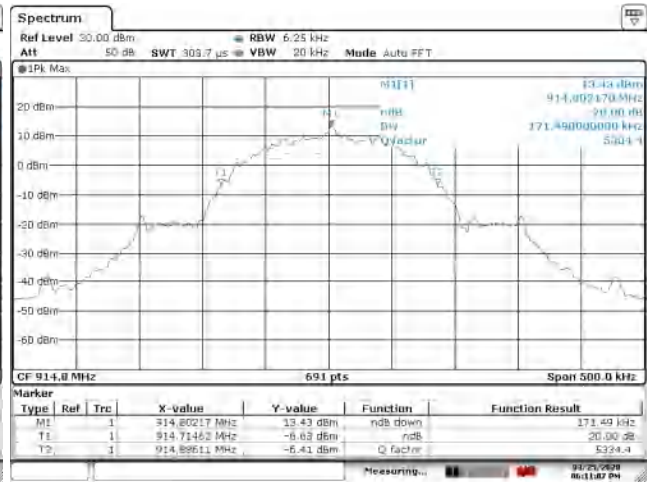
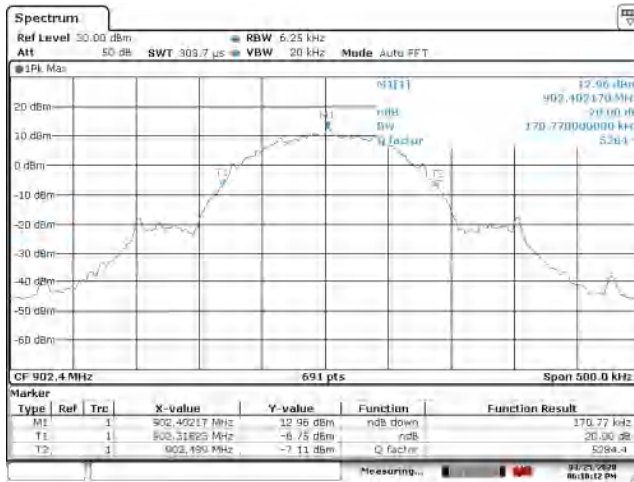
2. LoRa 500kHz DTS, 6dB Bandwidth, 902.5MHz~926.5MHz



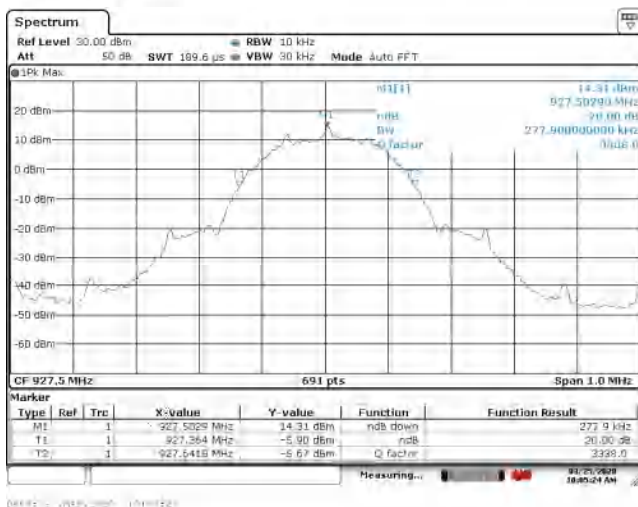
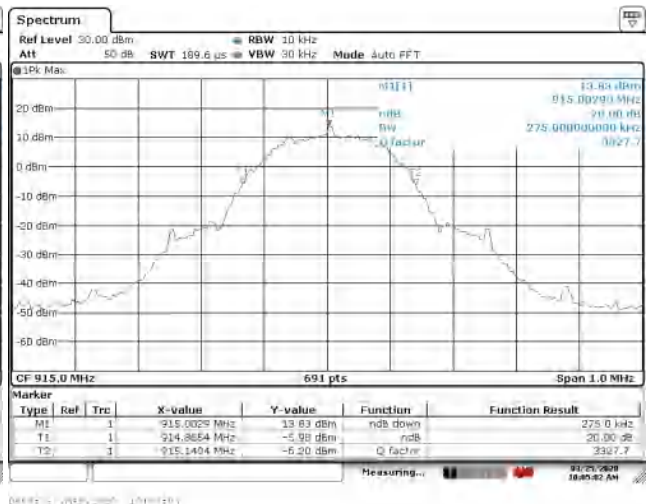
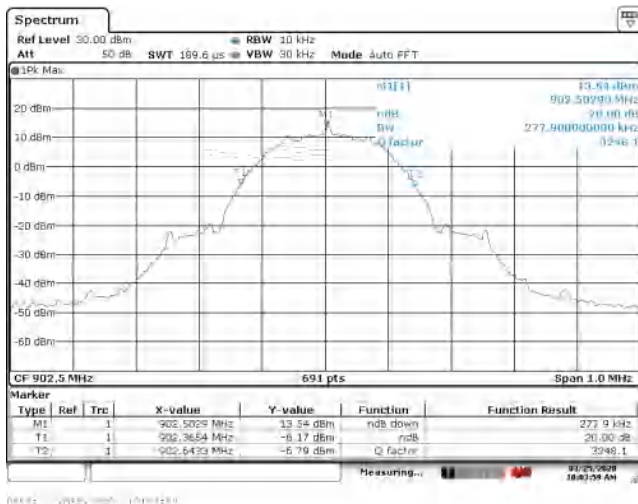


3. LoRa 125kHz FHSS, 20dB Bandwidth, 902.2-927.8MHz



4. FSK 150Kbps FHSS, 20dB Bandwidth, 902.4MHz~927.6MHz

5. FSK 50Kbps FHSS, 20dB Bandwidth, 902.2MHz~927.8MHz



6. FSK 250Kbps FHSS, 20dB Bandwidth, 902.5MHz~927.5MHz


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4.1.3 99% Emission Bandwidth Measurement

Result:

Pass

Test Specification

Test standard : RSS Gen Issue 5 March 2019, clause 6.7

Basic standard : ANSI C63.10: 2013, clause 6.9.3

Kind of test site : Shielded Room

Test Setup

Date of testing : 22.03.2020-25.03.2020

Input voltage : DC 4.5V

Operational mode : Mode A

Test channel : Lo, Mi, Hi

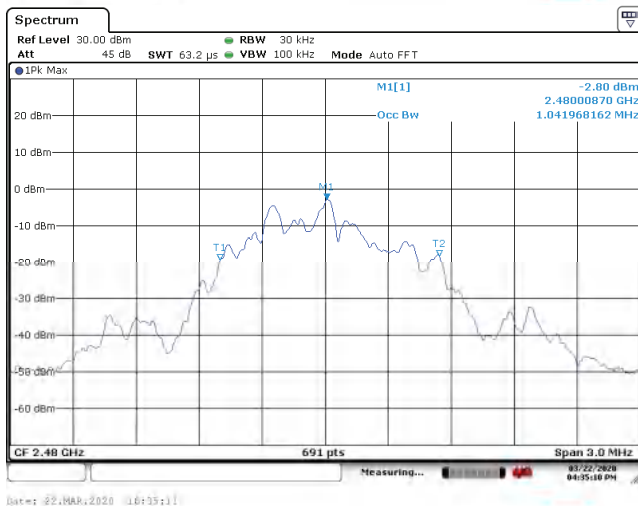
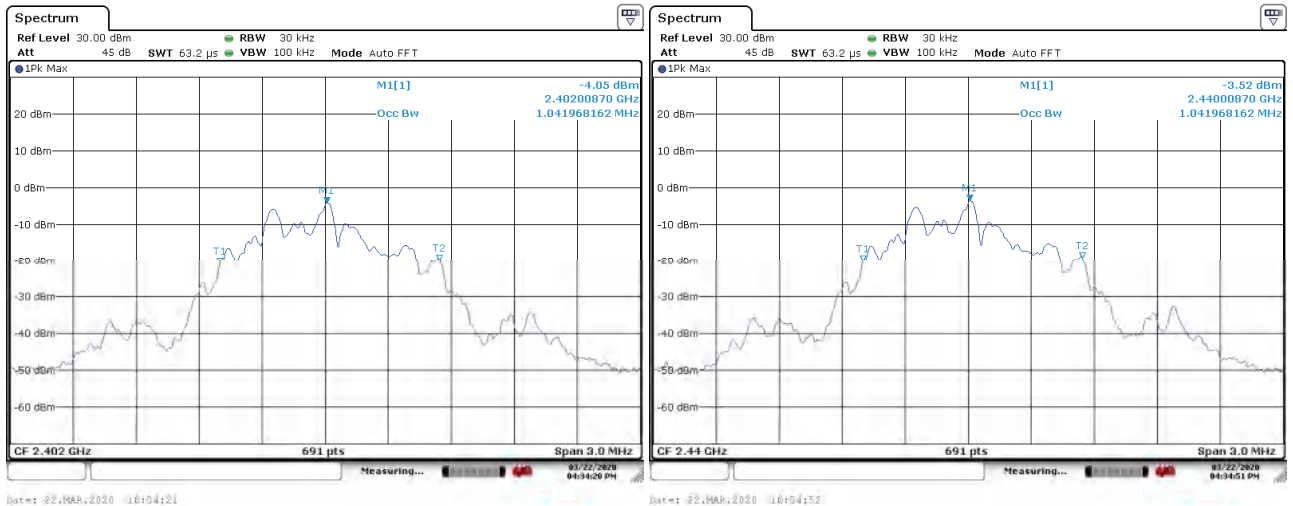
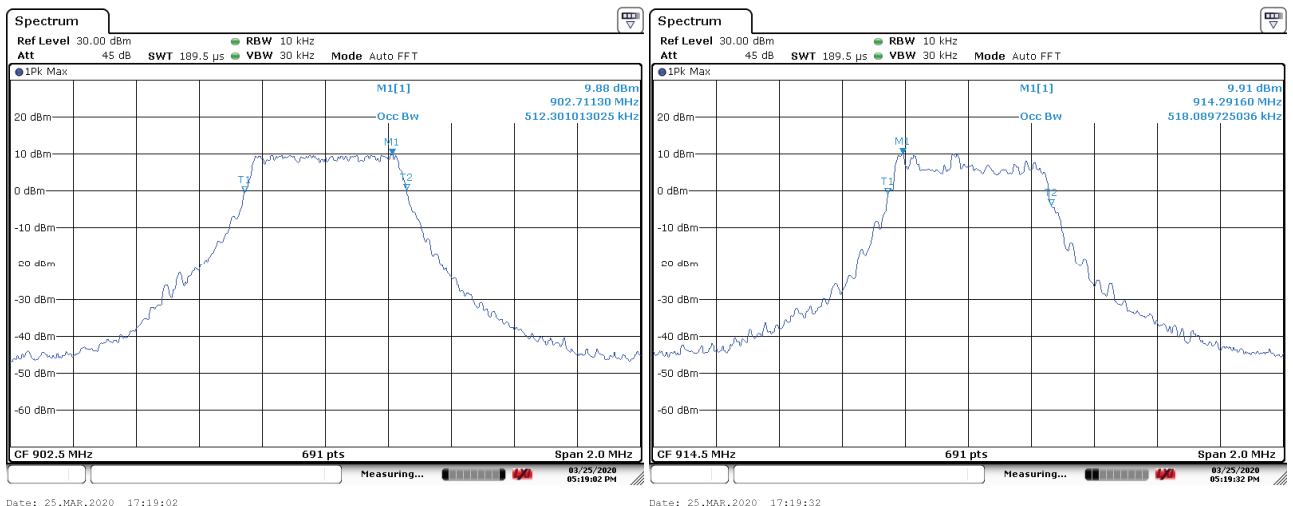
Temperature : 23°C

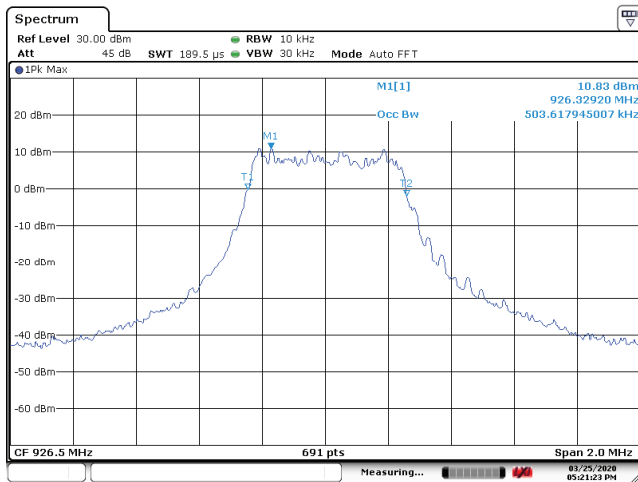
Relative humidity : 51%

Atmospheric pressure : 101 kPa

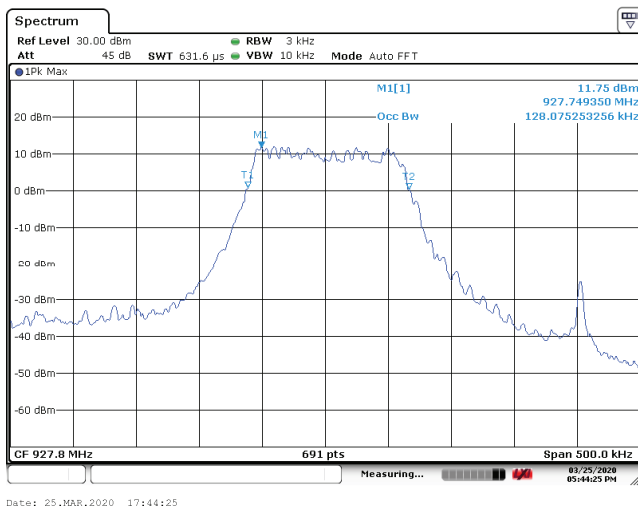
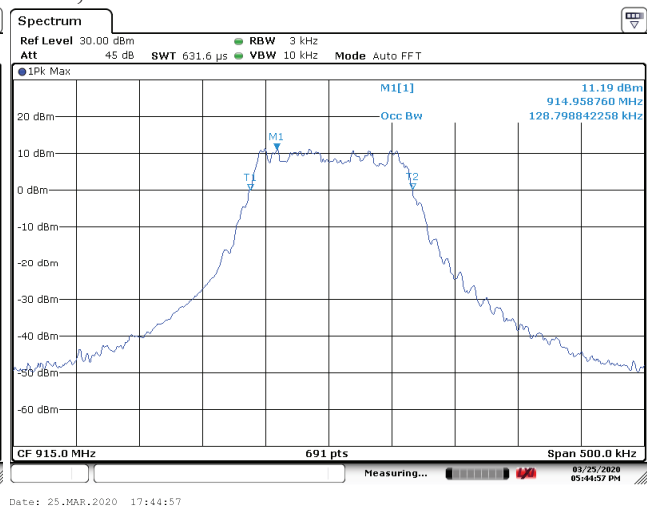
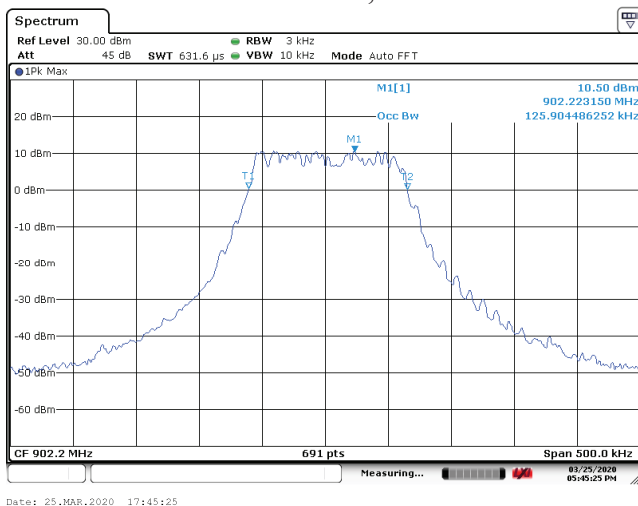
Table 3 Test result of 99% Emission Bandwidth for BLE, LoRa DTS, LoRa FHSS and FSK FHSS

Modulation Type and Operation band	Channel	Channel Frequency (MHz)	Bandwidth (kHz)
1. BLE 2402MHz~2480MHz 99% Emission Bandwidth	Low Channel	2402	1041.97
	Mid Channel	2440	1041.97
	High Channel	2480	1041.97
2. LoRa 500kHz DTS 902.5MHz~926.5MHz 99% Emission Bandwidth	Low Channel	902.5	512.30
	Mid Channel	914.5	518.09
	High Channel	926.5	503.62
3. LoRa 125kHz FHSS 902.2MHz~927.8MHz 99% Emission Bandwidth	Low Channel	902.2	125.90
	Mid Channel	915	128.80
	High Channel	927.8	128.08
4. FSK 150Kbps FHSS 902.4MHz~927.6MHz 99% Emission Bandwidth	Low Channel	902.4	154.12
	Mid Channel	914.8	157.02
	High Channel	927.6	153.40
5. FSK 50Kbps FHSS 902.2MHz~927.8MHz 99% Emission Bandwidth	Low Channel	902.2	103.47
	Mid Channel	915	102.75
	High Channel	927.8	101.30
6. FSK 250Kbps FHSS 902.5MHz~927.5MHz 99% Emission Bandwidth	Low Channel	902.5	248.91
	Mid Channel	915	250.36
	High Channel	927.5	251.81

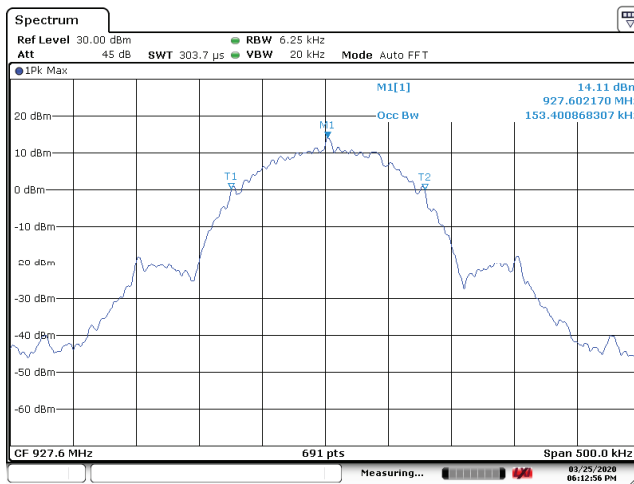
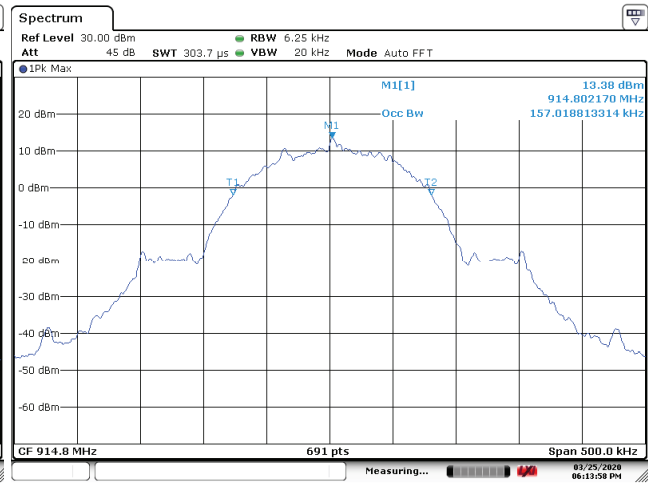
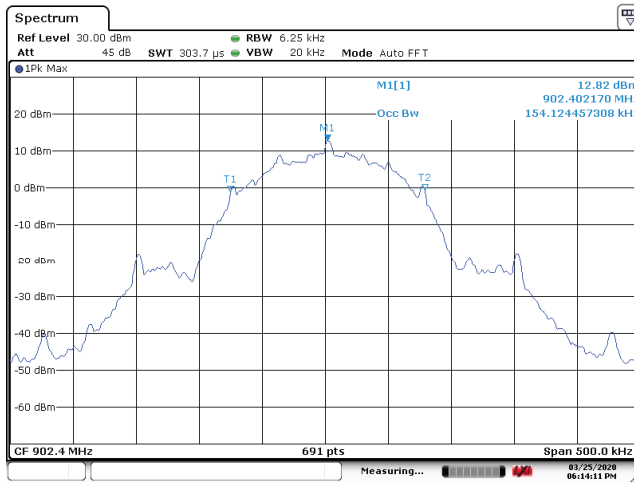
Figure 2: 99% Emission Bandwidth Measurement
1. BLE, 99% Emission Bandwidth, 2402MHz~2480MHz

2. LoRa 500kHz DTS, 99% Emission Bandwidth, 902.5MHz~926.5MHz




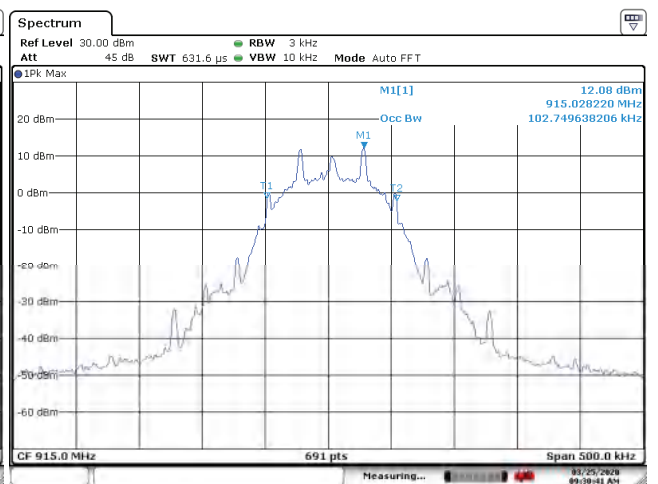
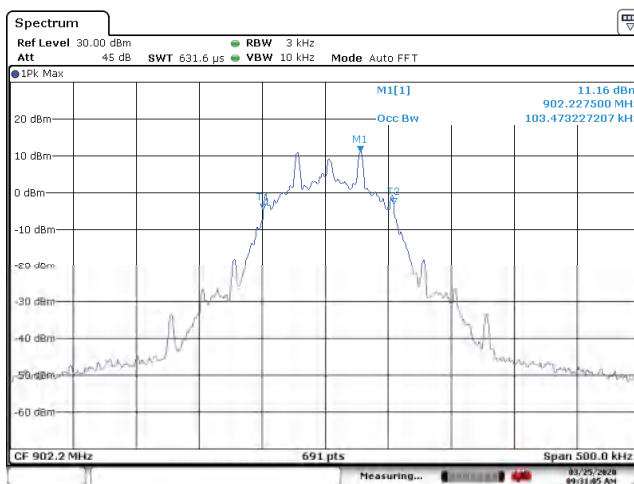
3. LoRa 125kHz FHSS, 99% Emission Bandwidth, 902.2MHz~927.8MHz

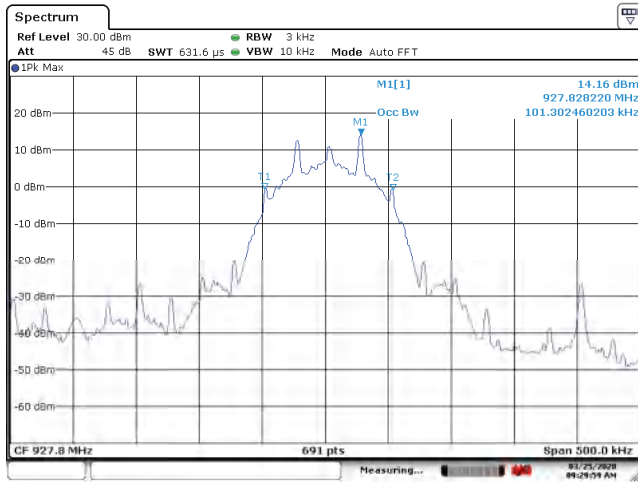


4. FSK 150Kbps FHSS, 99% Emission Bandwidth, 902.4MHz~927.6MHz

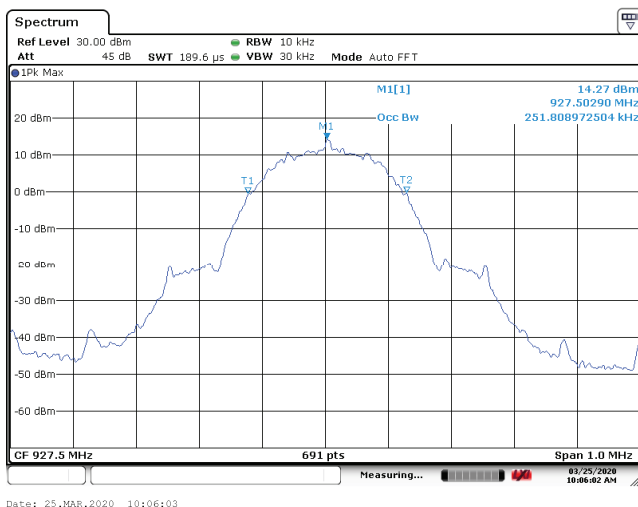
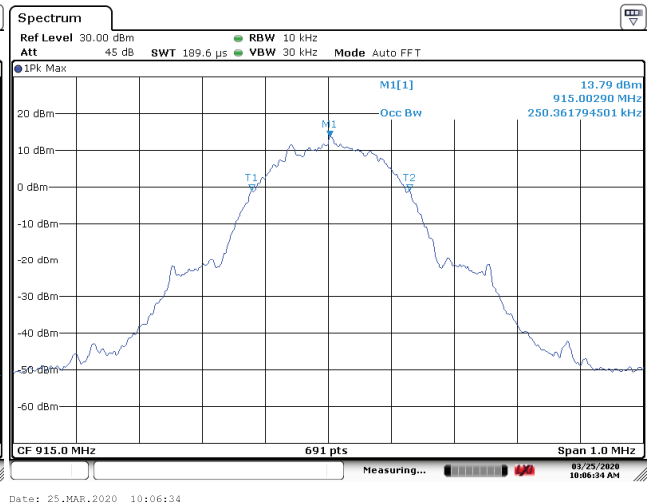
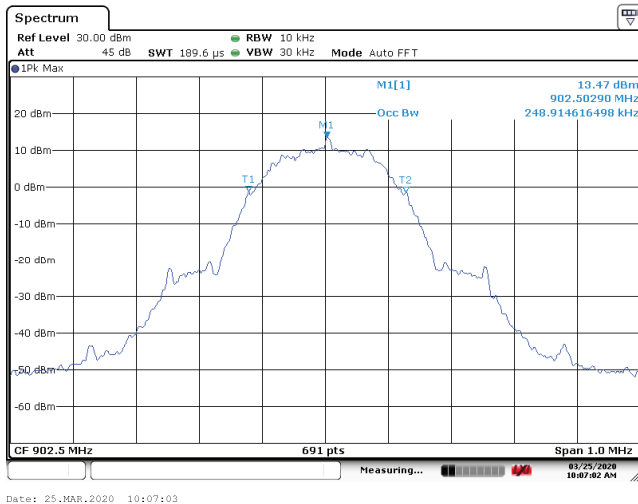


5. FSK 50Kbps FHSS, 99% Emission Bandwidth, 902.2MHz~927.8MHz





6. FSK 250Kbps FHSS, 99% Emission Bandwidth, 902.5MHz~927.5MHz



4.1.4 Maximum Peak Conducted Output Power

Result:

Pass

Test Specification

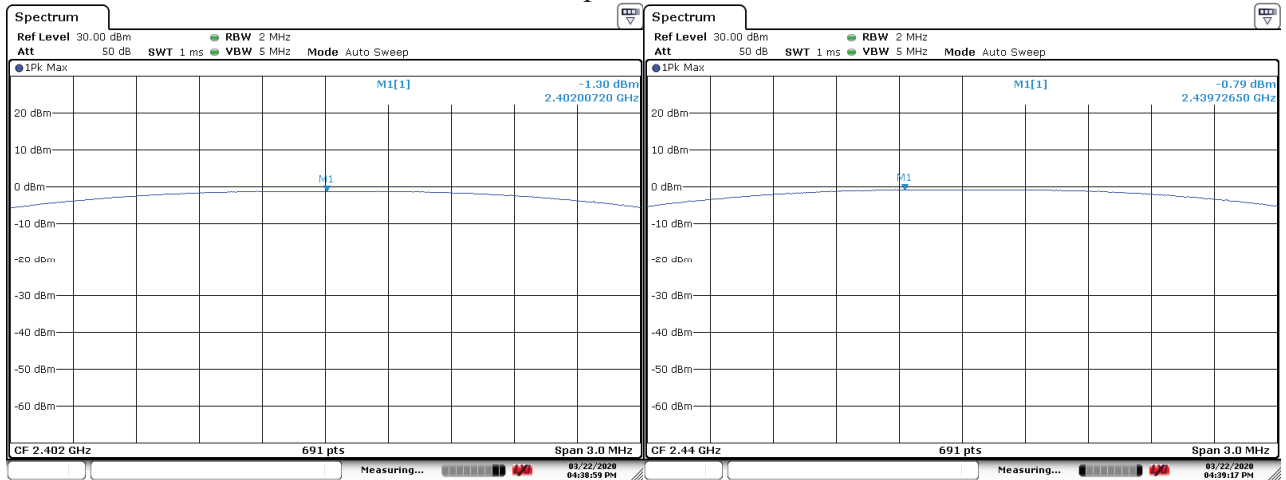
- Test standard : FCC Part 15.247(b)(2), (3)
RSS-247 Issue 2 February 2017 Clause 5.4(a), (d)
- Basic standard : ANSI C63.10: 2013, clause 11.9.1
KDB558074 D01v05r02, clause 8.3.1.3
- Limits : Not more than 1Watt(30dBm) for DTS in the band
902-928MHz and 2400-2483.5MHz;
Not more than 1Watt(30dBm) for FHSS with at least
50 hopping channels in the band 902-928MHz
- Kind of test site : Shielded Room

Test Setup

- Date of testing : 22.03.2020-25.03.2020
- Input voltage : DC 4.5V
- Operational mode : Mode A
- Test channel : Lo, Mi, Hi
- Temperature : 23 °C
- Relative humidity : 51%
- Atmospheric pressure : 101 kPa

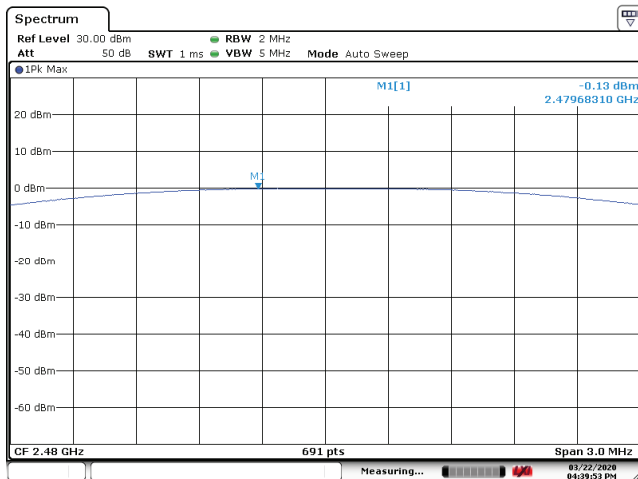
Table 4: Test result of Maximum Peak Output Power for BLE, LoRa DTS, LoRa FHSS and FSK FHSS

Modulation Type and Operation band	Channel	Channel Frequency (MHz)	Peak Output Power (dBm)	Limit (dBm)
1. BLE 2402MHz~2480MHz	Low Channel	2402	-1.30	30
	Mid Channel	2440	-0.79	30
	High Channel	2480	-0.13	30
2. LoRa 500kHz DTS 902.5MHz~926.5MHz	Low Channel	902.5	13.39	30
	Mid Channel	914.5	14.00	30
	High Channel	926.5	14.54	30
3. LoRa 125kHz FHSS 902.2MHz~927.8MHz	Low Channel	902.2	13.20	30
	Mid Channel	915	13.72	30
	High Channel	927.8	14.49	30
4. FSK 150Kbps FHSS 902.4MHz~927.6MHz	Low Channel	902.4	13.19	30
	Mid Channel	914.8	13.69	30
	High Channel	927.6	14.47	30
5. FSK 50Kbps FHSS 902.2MHz~927.8MHz	Low Channel	902.2	13.11	30
	Mid Channel	915	13.62	30
	High Channel	927.8	14.40	30
6. FSK 250Kbps FHSS 902.5MHz~927.5MHz 20dB Bandwidth	Low Channel	902.5	13.69	30
	Mid Channel	915	13.95	30
	High Channel	927.5	14.56	30

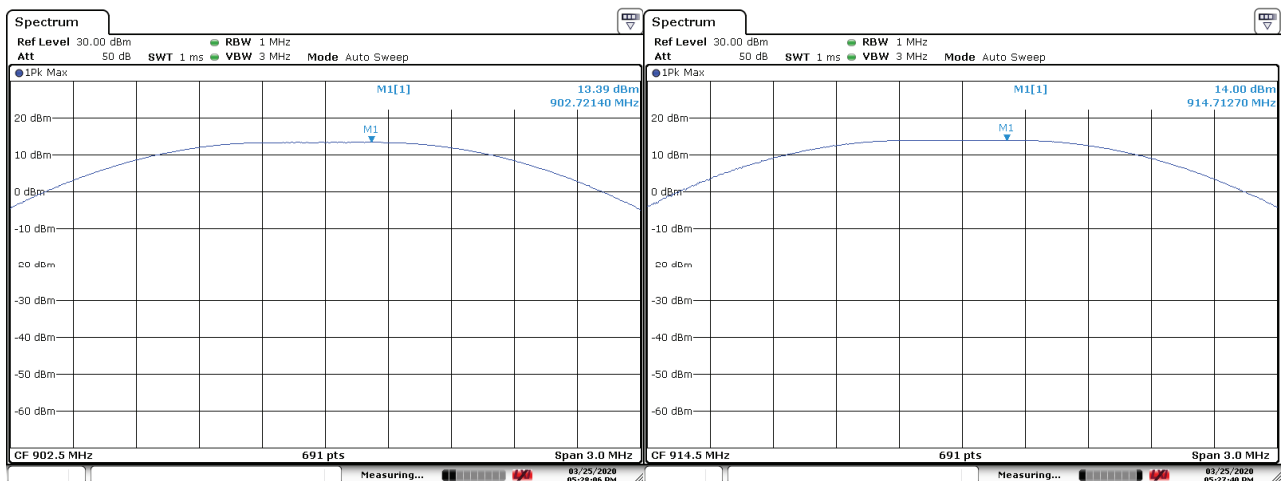
Figure 3: Maximum peak Conducted Output Power
1. BLE, Maximum Peak Conducted Output Power, 2402MHz~2480MHz


Date: 22.MAR.2020 16:38:59

Date: 22.MAR.2020 16:39:18

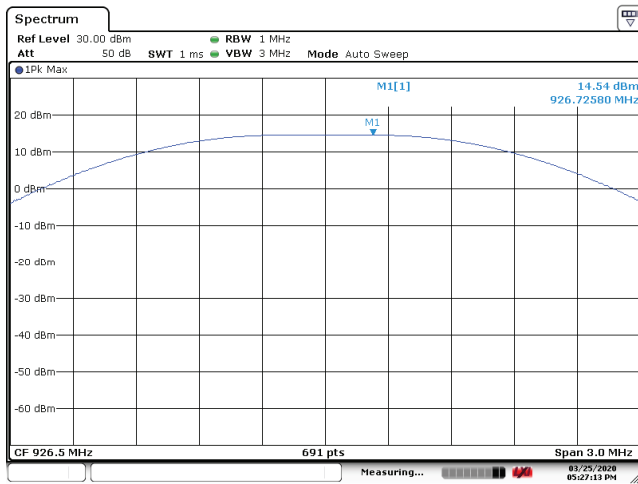


Date: 22.MAR.2020 16:39:54

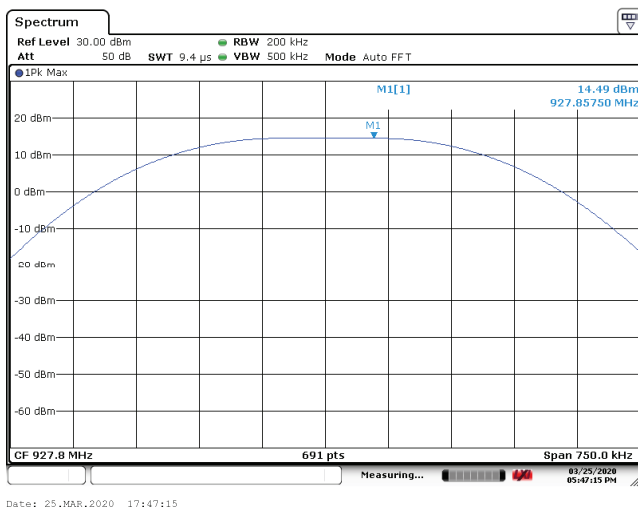
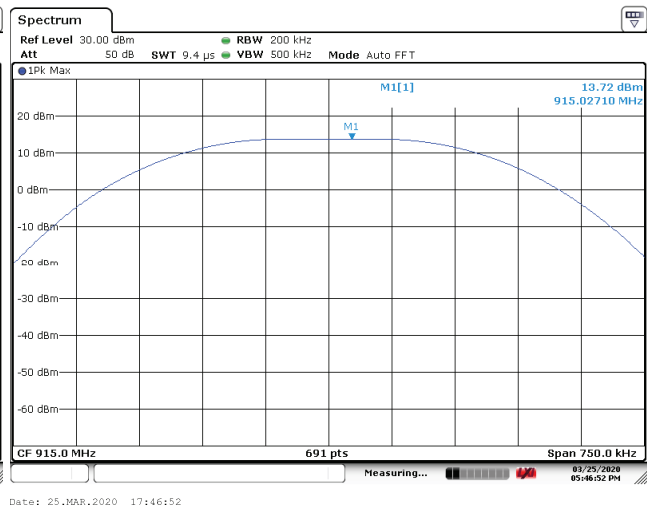
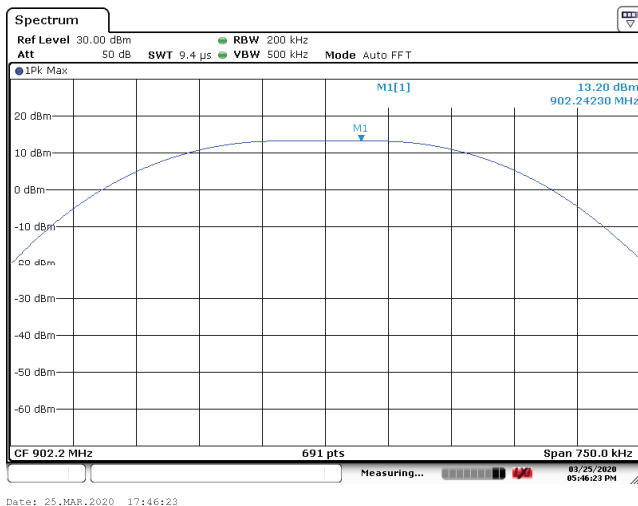
2. LoRa 500kHz DTS, Maximum Peak Conducted Output Power, 902.5MHz~926.5MHz


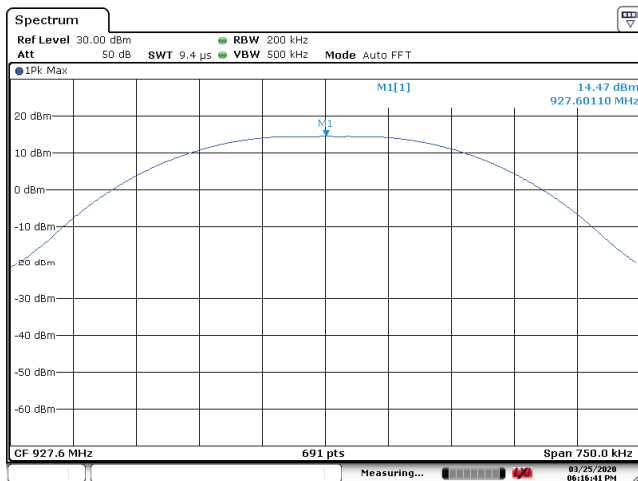
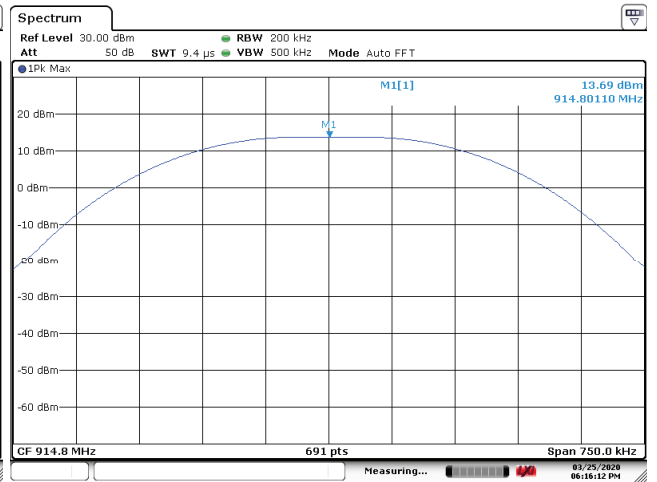
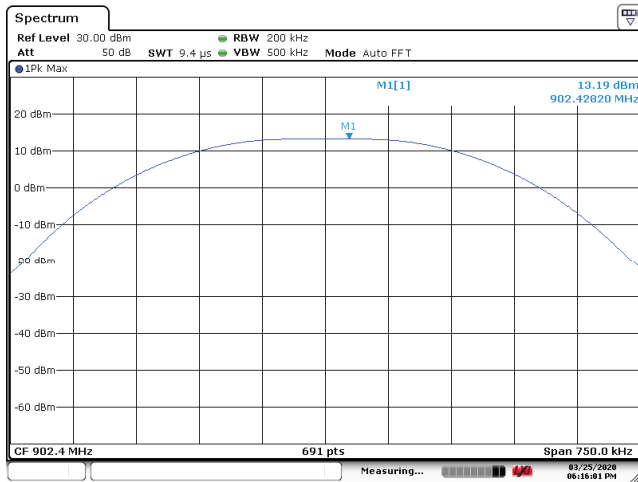
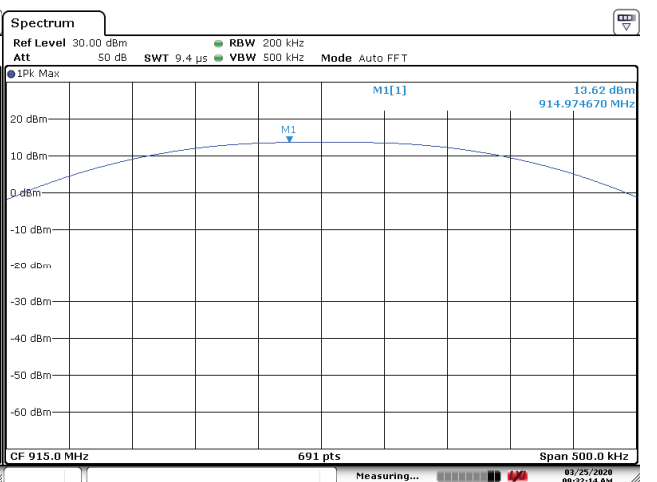
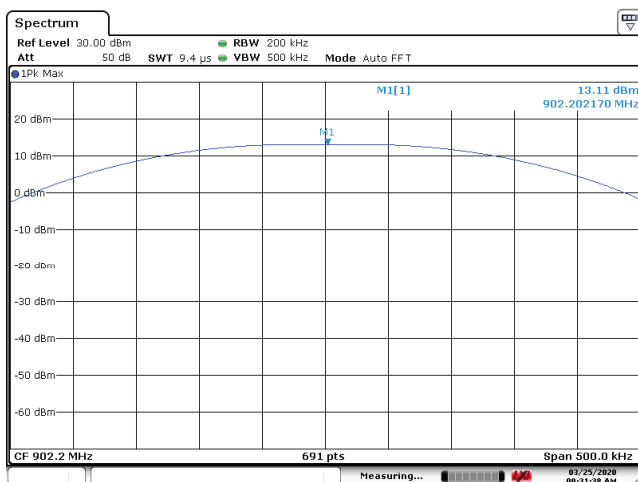
Date: 25.MAR.2020 17:28:06

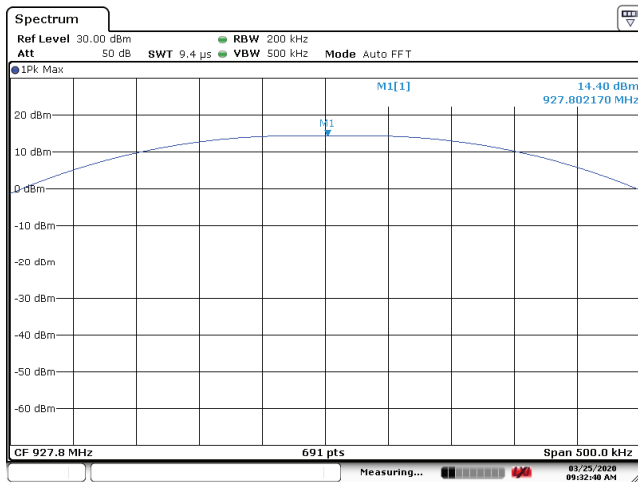
Date: 25.MAR.2020 17:27:40



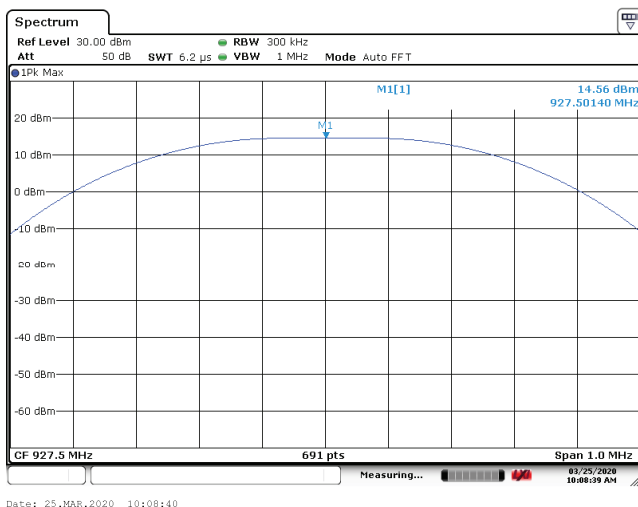
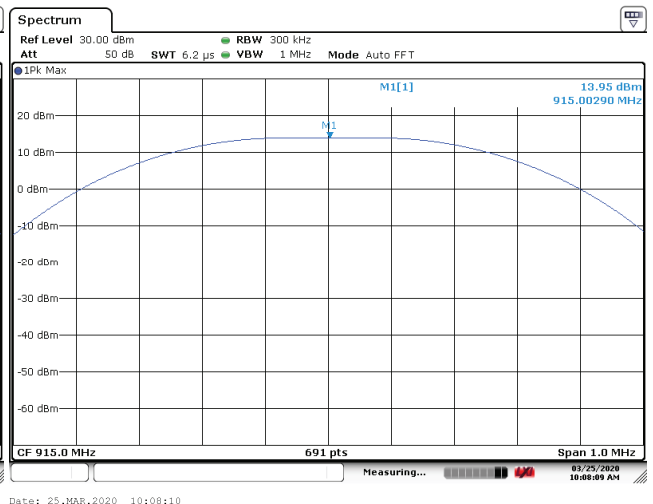
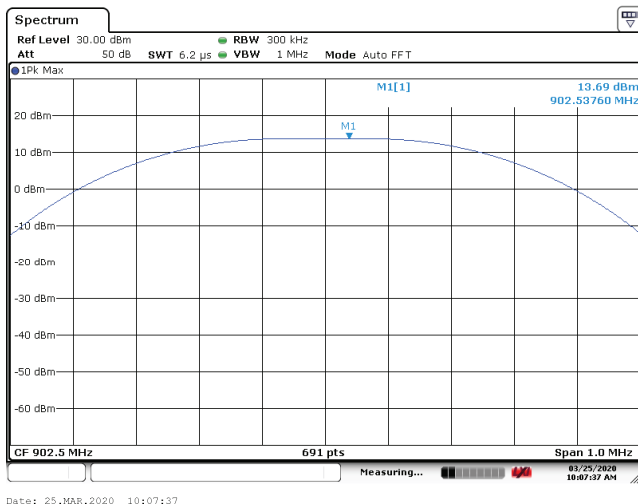
3. LoRa 125kHz FHSS, Maximum Peak Conducted Output Power, 902.2MHz~927.8MHz



4. FSK 150Kbps FHSS, Maximum Peak Conducted Output Power, 902.4MHz~927.6MHz

5. FSK 50Kbps FHSS, Maximum Peak Conducted Output Power, 902.2MHz~927.8MHz




6. FSK 250Kbps FHSS, Maximum Peak Conducted Output Power, 902.5MHz~927.5MHz



4.1.5 Equivalent Isotropically Radiated Power

Result:

Pass

Test Specification

Test standard : RSS-247 Issue 2 February 2017 Clause 5.4(a), (d)
 Basic standard : ANSI C63.10: 2013, clause 9.5
 Limits : Not more than 4Watt(36dBm) for DTS in the band 902-928MHz and 2400-2483.5MHz;
 Not more than 4Watt(36dBm) for FHSS system with at least 50 hopping channels in the band 902-928MHz
 Kind of test site : Shielded Room

Test Setup

Date of testing : 22.03.2020-25.03.2020
 Input voltage : DC 4.5V
 Operational mode : Mode A
 Test channel : Lo, Mi, Hi
 Temperature : 23 °C
 Relative humidity : 51%
 Atmospheric pressure : 101 kPa

Table 5: Test result of E.I.R.P. for BLE, LoRa DTS, LoRa FHSS and FSK FHSS

Modulation Type and Operation band	Channel	Channel Frequency (MHz)	Peak Output Power (dBm)	Antenna Gain (dBi)	E.I.R.P. (dBm)	Limit (dBm)
1. BLE 2402MHz~2480MHz	Low Channel	2402	-1.30	3.26	1.96	36
	Mid Channel	2440	-0.79	3.26	2.47	36
	High Channel	2480	-0.13	3.26	3.13	36
2. LoRa 500kHz DTS 902.5MHz~926.5MHz	Low Channel	902.5	13.39	1.1	14.49	36
	Mid Channel	914.5	14.00	1.1	15.10	36
	High Channel	926.5	14.54	1.1	15.64	36
3. LoRa 125kHz FHSS 902.2MHz~927.8MHz	Low Channel	902.2	13.20	1.1	14.30	36
	Mid Channel	915	13.72	1.1	14.82	36
	High Channel	927.8	14.49	1.1	15.59	36
4. FSK 150Kbps FHSS 902.4MHz~927.6MHz	Low Channel	902.4	13.19	1.1	14.29	36
	Mid Channel	914.8	13.69	1.1	14.79	36
	High Channel	927.6	14.47	1.1	15.57	36
5. FSK 50Kbps FHSS 902.2MHz~927.8MHz	Low Channel	902.2	13.11	1.1	14.21	36
	Mid Channel	915	13.62	1.1	14.72	36
	High Channel	927.8	14.40	1.1	15.50	36
6. FSK 250Kbps FHSS 902.5MHz~927.5MHz	Low Channel	902.5	13.69	1.1	14.79	36
	Mid Channel	915	13.95	1.1	15.05	36
	High Channel	927.5	14.56	1.1	15.66	36

4.1.6 Peak Power Spectral Density

Result:

Pass

Test Specification

Test standard : FCC Part 15.247(e)
RSS-247 Issue 2 February 2017 Clause 5.2(b)

Basic standard : ANSI C63.10: 2013, clause 11.10.2
KDB558074 D01v05r02, clause 8.4

Limits : Not more than 8 dBm in any 3 kHz band

Kind of test site : Shielded Room

Test Setup

Date of testing : 22.03.2020-25.03.2020

Input voltage : DC 4.5V

Operational mode : Mode A

Test channel : Lo, Mi, Hi

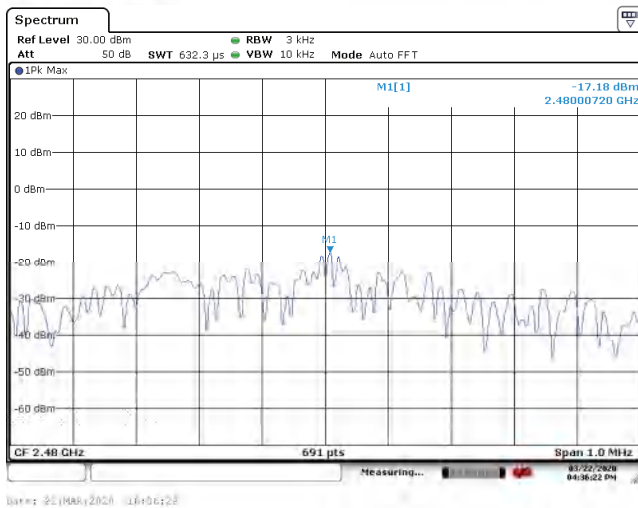
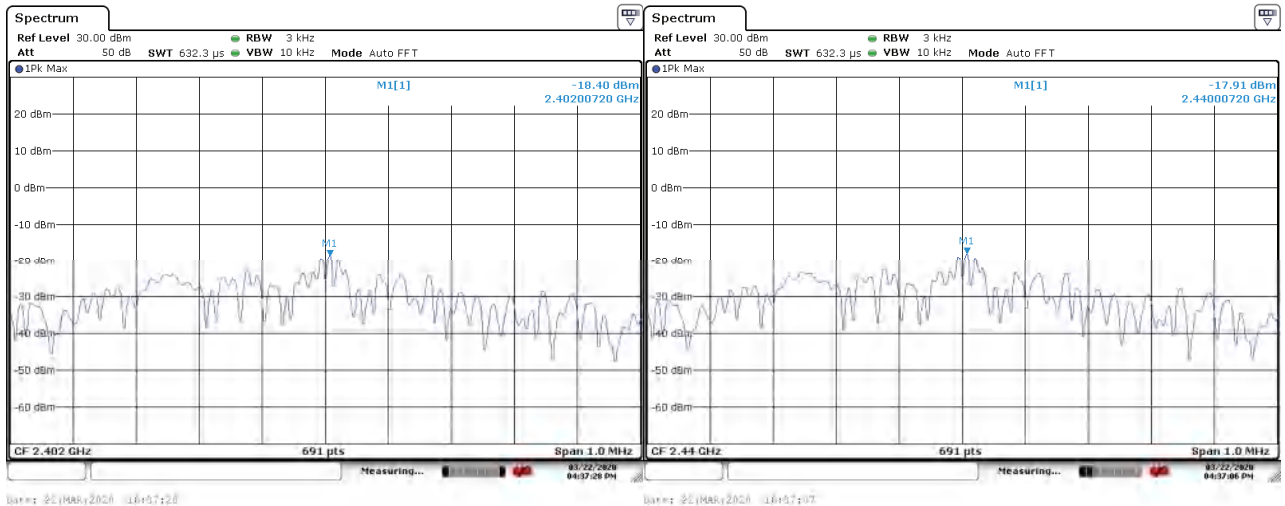
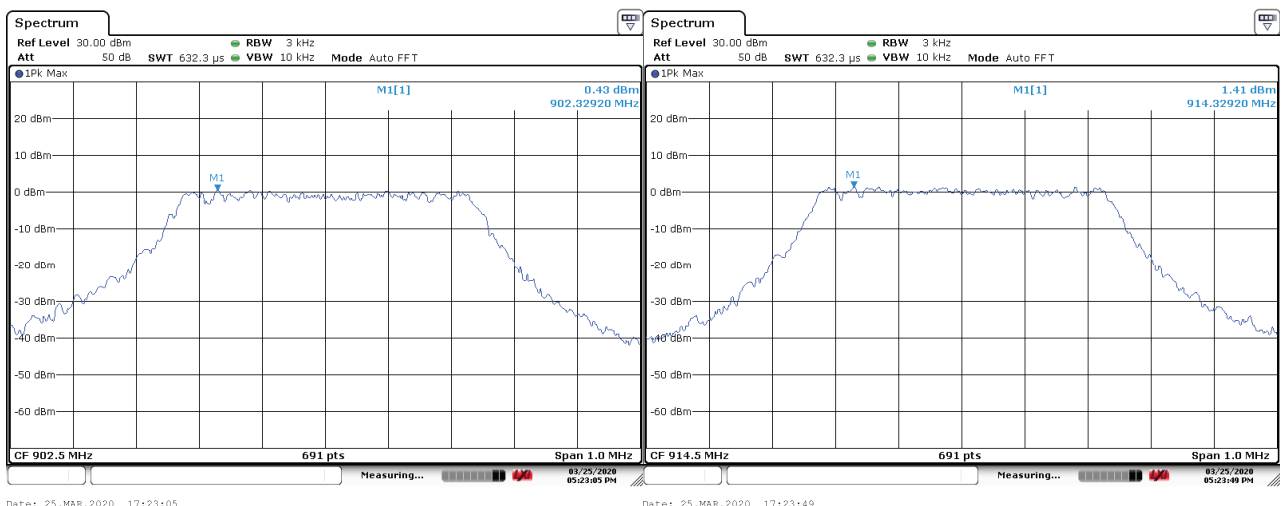
Temperature : 23°C

Relative humidity : 51%

Atmospheric pressure : 101 kPa

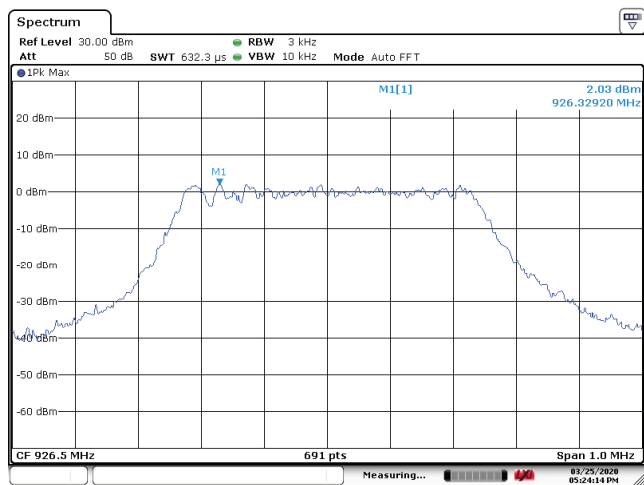
Table 6: Test result of Power Spectral Density for BLE, LoRa DTS

Modulation Type and Operation band	Channel	Channel Frequency (MHz)	Measured Power Density (dBm)	Limit (dBm)	Result
1. BLE 2402MHz~2480MHz	Low Channel	2402	-18.40	8.0	Pass
	Mid Channel	2440	-17.91	8.0	Pass
	High Channel	2480	-17.81	8.0	Pass
2. LoRa 500kHz DTS 902.5MHz~926.5MHz	Low Channel	902.5	0.43	8.0	Pass
	Mid Channel	914.5	1.41	8.0	Pass
	High Channel	926.5	2.03	8.0	Pass

Figure 4: Power Spectral Density
1. BLE, PSD, 2402MHz~2480MHz

2. LoRa 500KHz DTS, PSD, 902.5MHz~926.5MHz


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4.1.7 Conducted Spurious Emissions Measured in 100 kHz Bandwidth

Result:

Pass

Test Specification

Test standard : FCC Part 15.247(d)
RSS-247 Issue 2 February 2017 Clause 5.5

Basic standard : ANSI C63.10: 2013, 14.3.3(Spurious)
ANSI C63.10: 2013, 6.10(Band edge)
KDB 558074 D01 v05r02, clause 8.5

Limits : 20dB (below that in the 100kHz bandwidth within
the band that contains the highest level of the
desired power)

Kind of test site : Shielded Room

Test Setup

Date of testing : 22.03.2020-25.03.2020

Input voltage : DC 4.5V

Operational mode : Mode A, Mode B

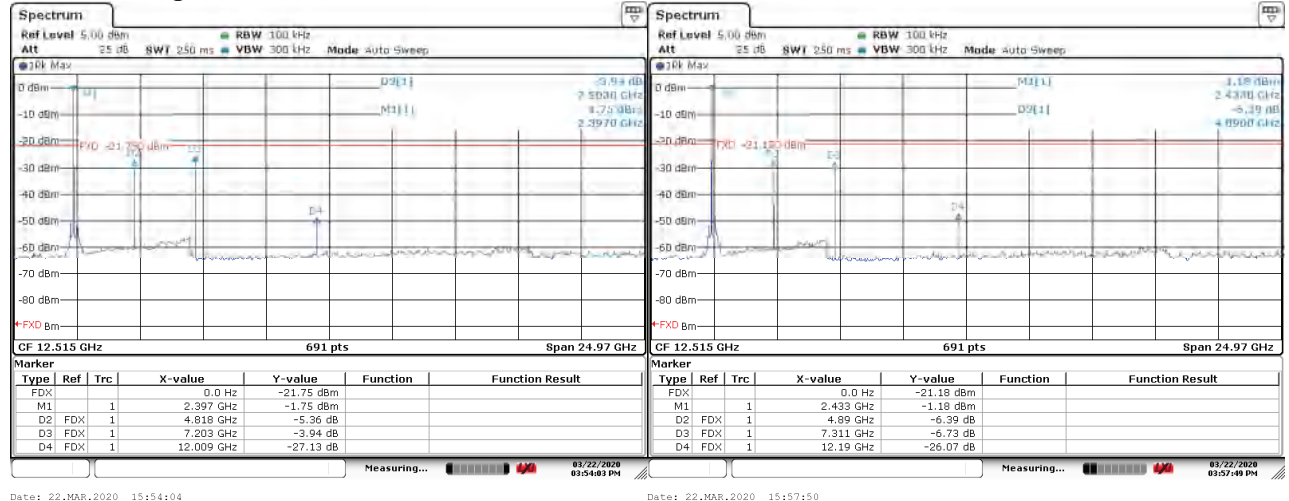
Test channel : Lo, Mi, Hi

Temperature : 23°C

Relative humidity : 51%

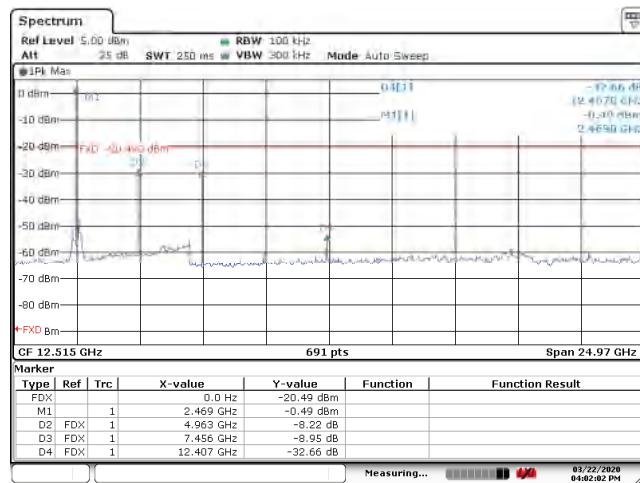
Atmospheric pressure : 101 kPa

All emissions are more than 20dB below fundamental, compliance is achieved as well.

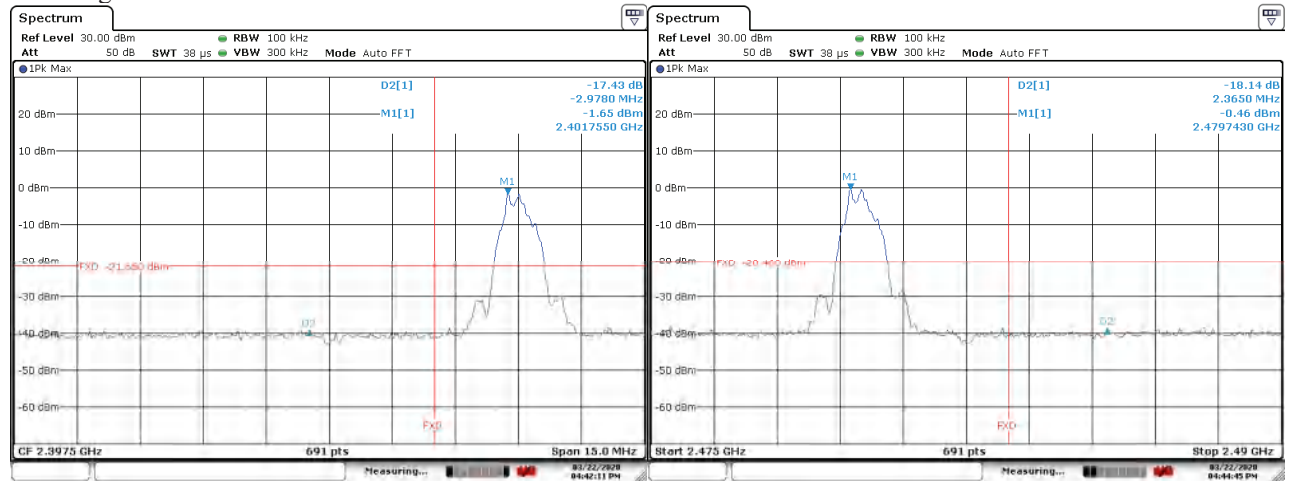
Figure 5: Conducted Spurious Emission
1. BLE, Conducted Spurious Emission and Band edge, 2402MHz~2480MHz
Conducted Spurious Emission


Date: 22.MAR.2020 15:54:04

Date: 22.MAR.2020 15:57:50



Date: 22.MAR.2020 16:02:02

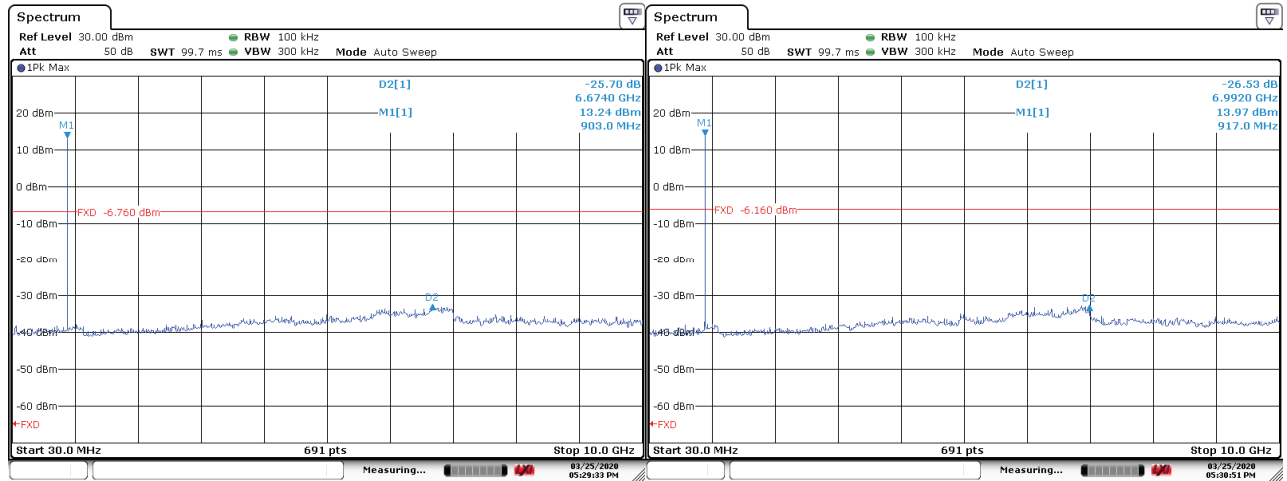
Band edge


Date: 22.MAR.2020 16:42:10

Date: 22.MAR.2020 16:44:46

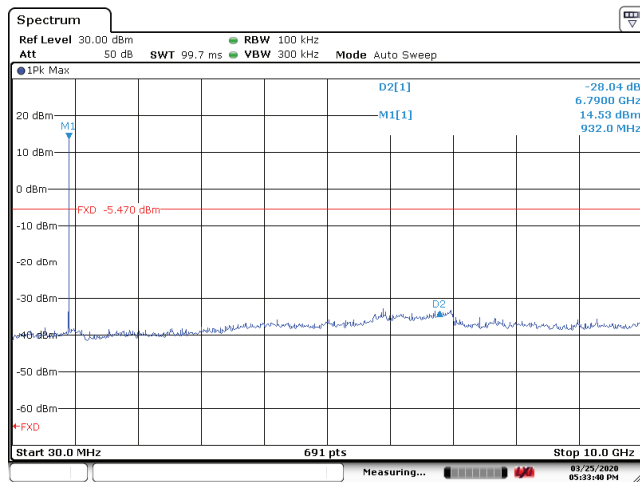
2. LoRa 500kHz DTS, Conducted Spurious Emission and Band edge, 902.5MHz~926.5MHz

Conducted Spurious Emission



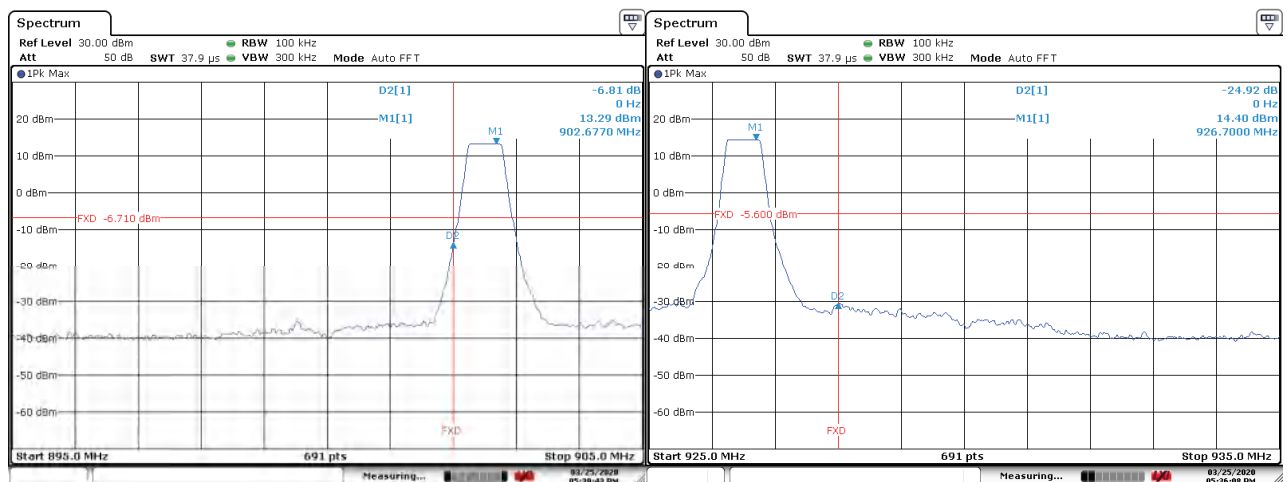
Date: 25.MAR.2020 17:29:33

Date: 25.MAR.2020 17:30:51



Date: 25.MAR.2020 17:33:40

Band edge

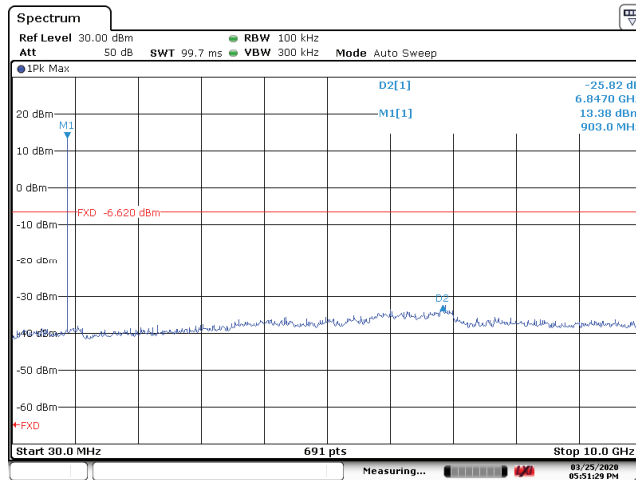


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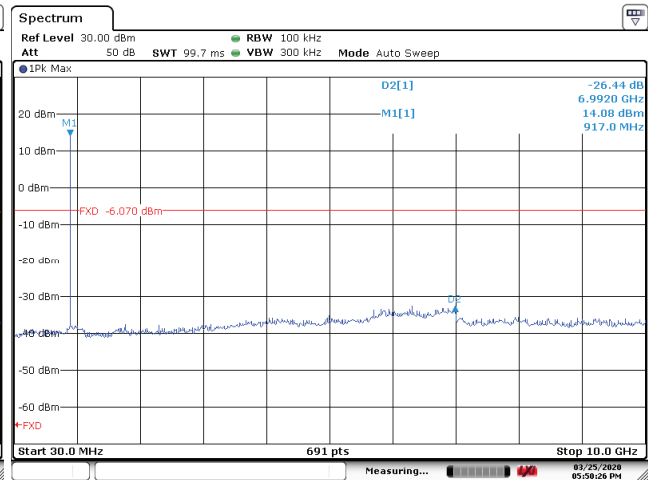
Date: 25.MAR.2020 17:36:08

3. LoRa 125kHz FHSS, Conducted Spurious Emission, 902.2MHz~927.8MHz

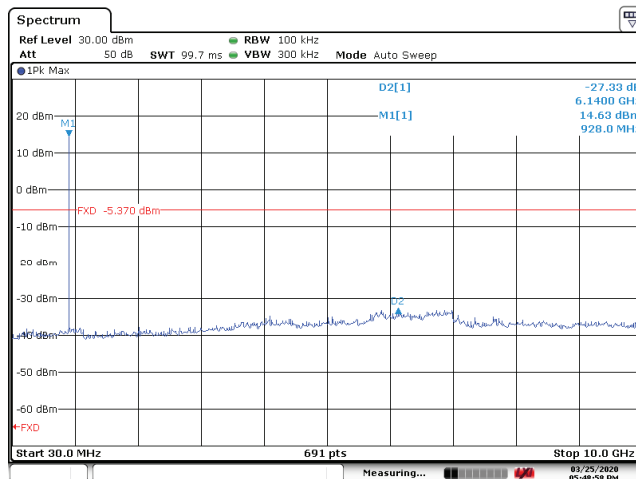
Conducted Spurious Emission



Date: 25.MAR.2020 17:51:29

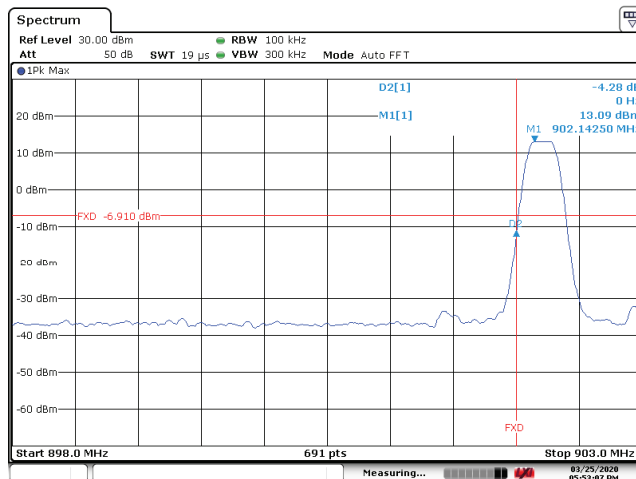


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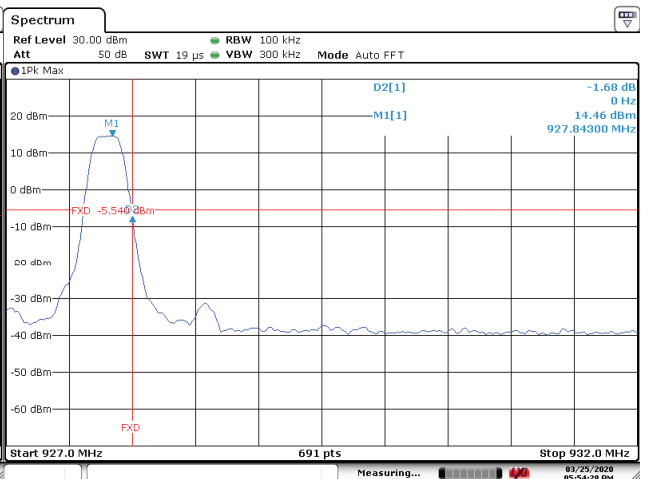


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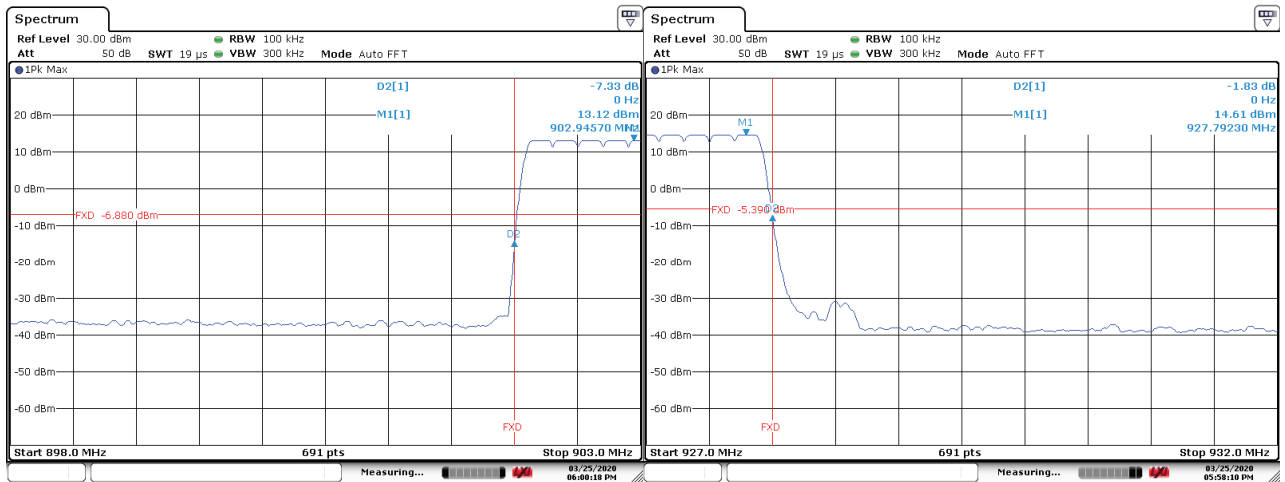
Band edge



Date: 25.MAR.2020 17:53:07

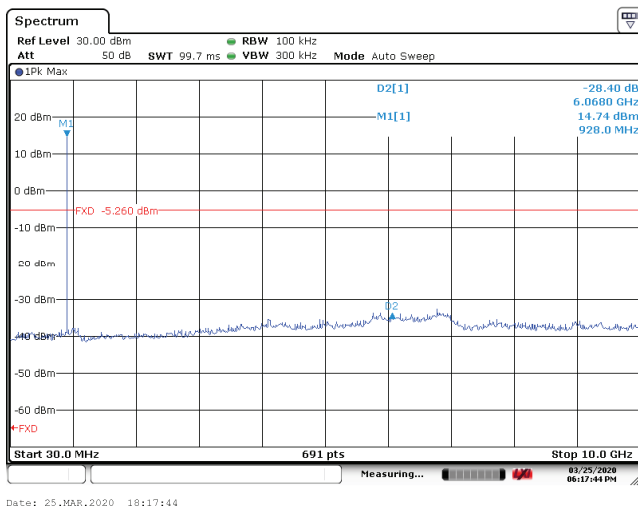
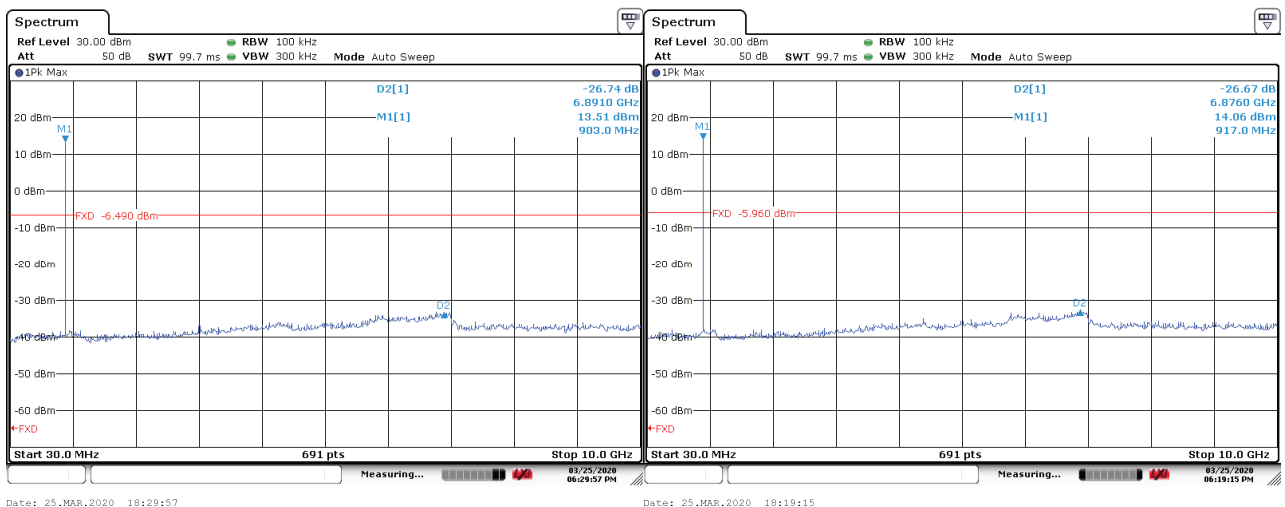


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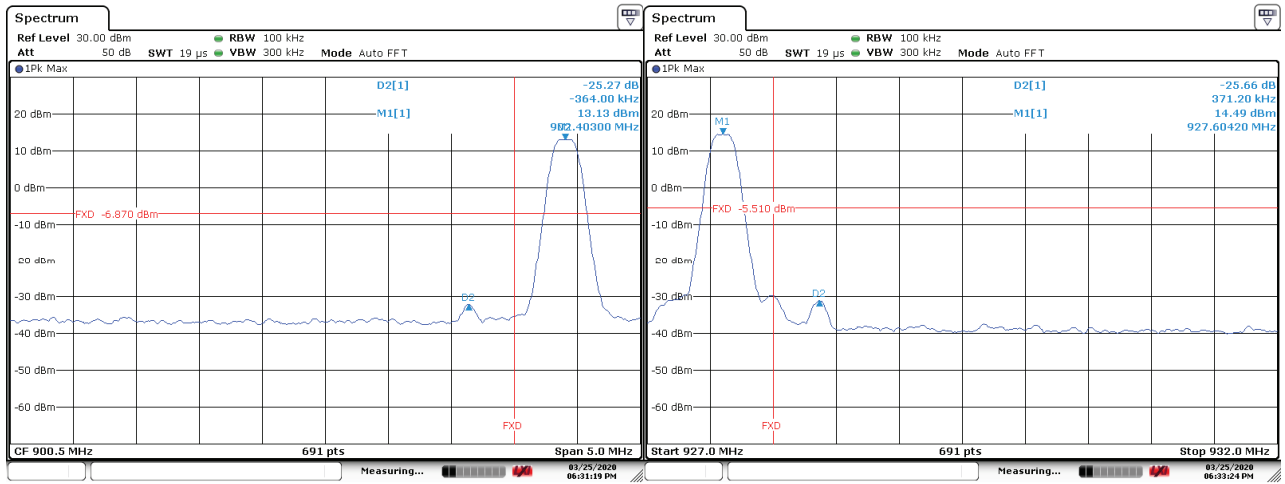


4. FSK 150Kbps FHSS, Conducted Spurious Emission and Band edge, 902.4MHz~927.6MHz

Conducted Spurious Emission

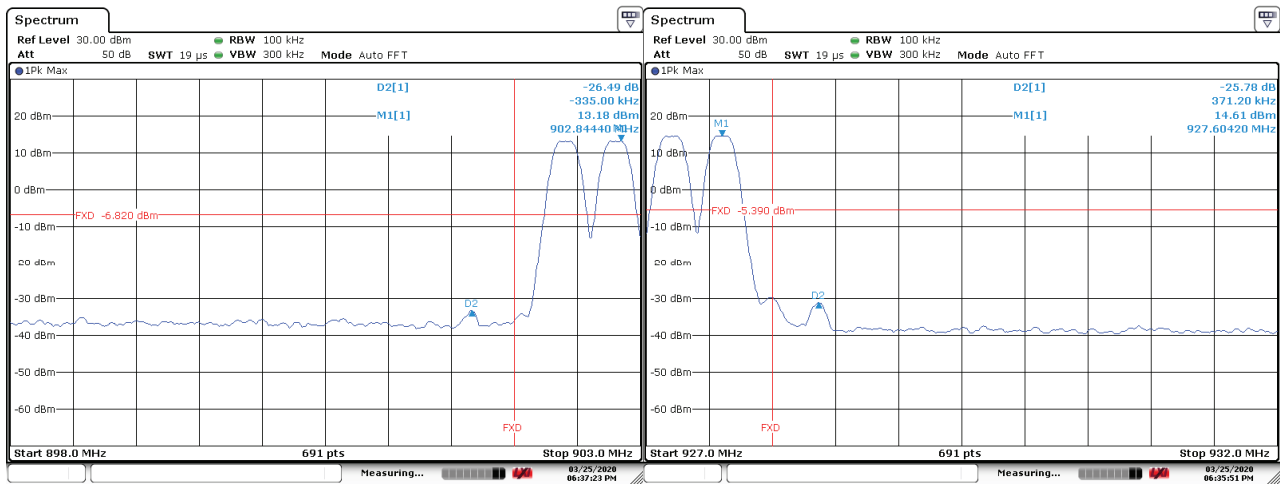


Band edge



Date: 25.MAR.2020 18:31:19

Date: 25.MAR.2020 18:33:24

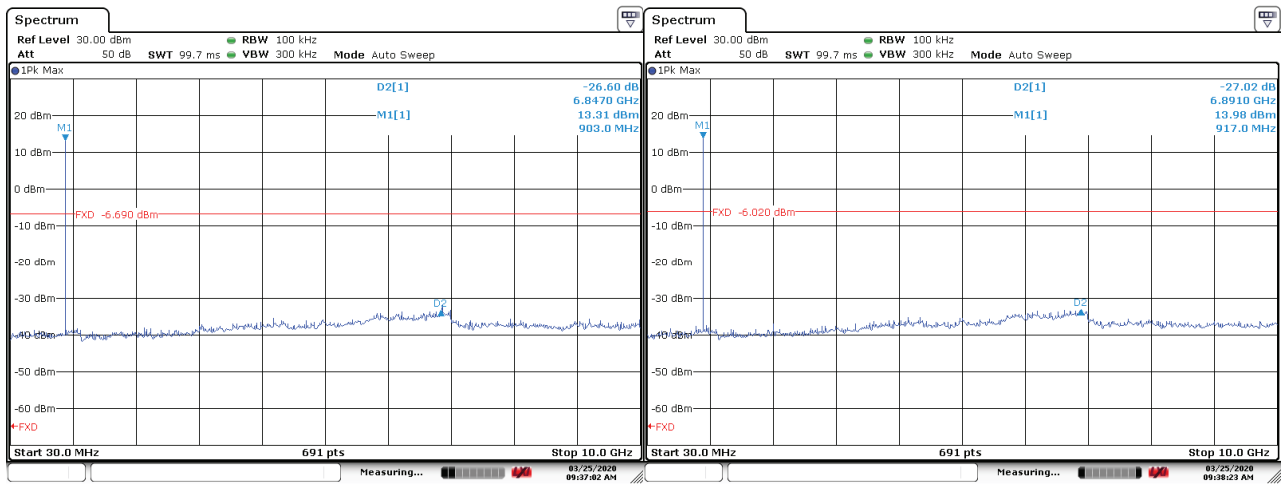


Date: 25.MAR.2020 18:37:24

Date: 25.MAR.2020 18:35:51

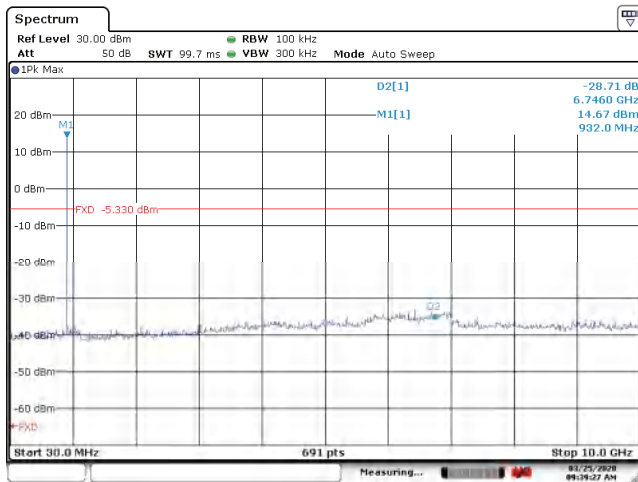
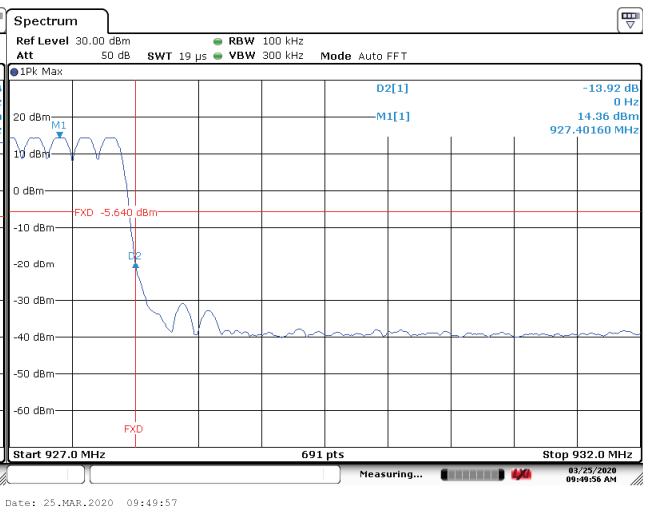
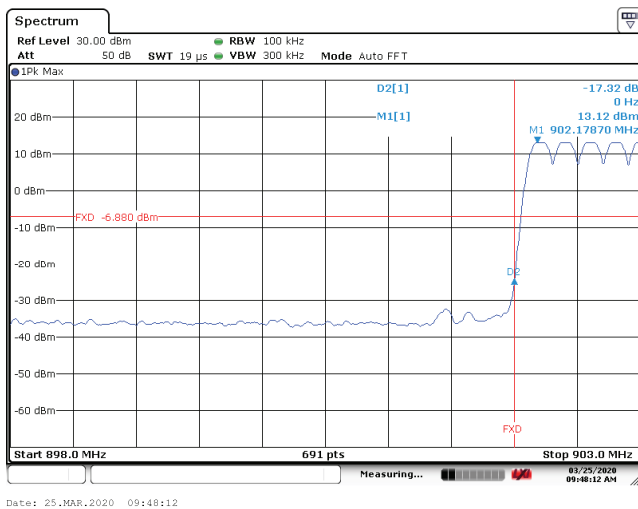
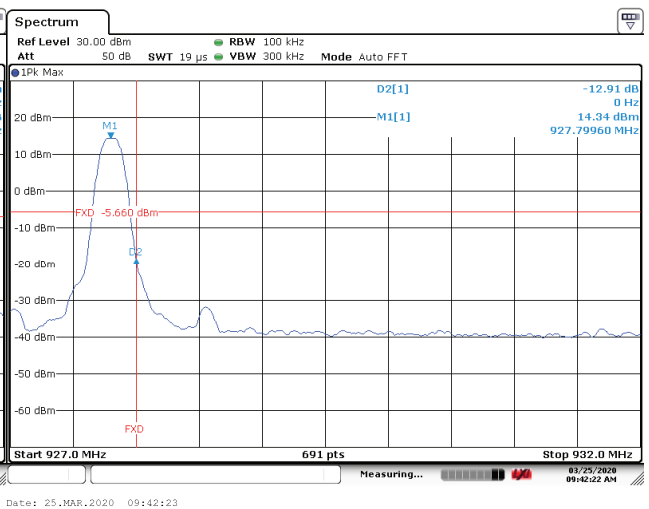
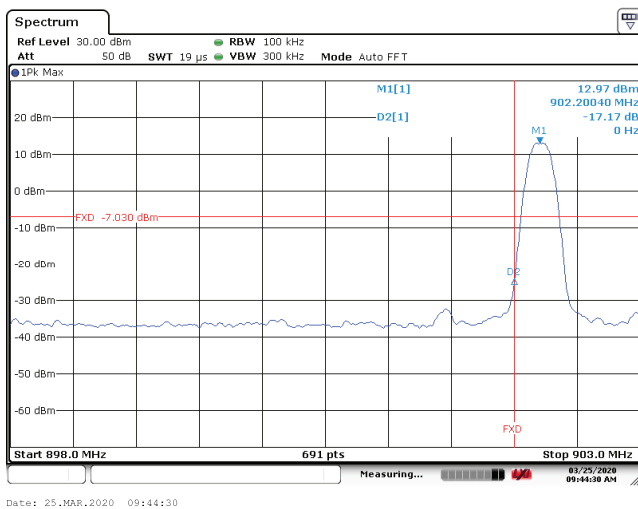
5. FSK 50Kbps FHSS, Conducted Spurious Emission and Band edge, 902.2MHz~927.8MHz

Conducted Spurious Emission



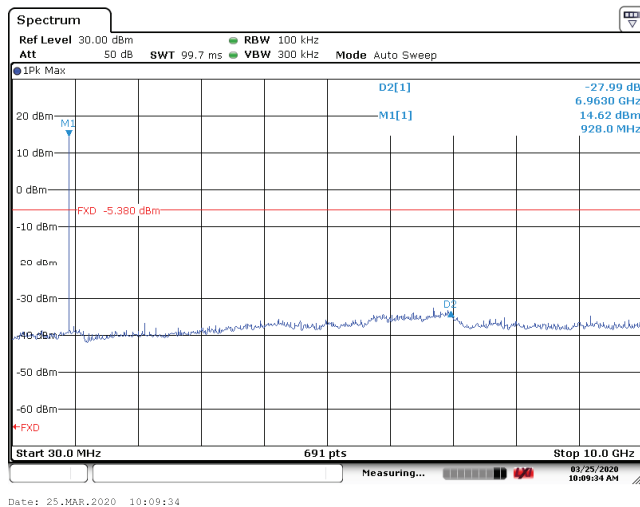
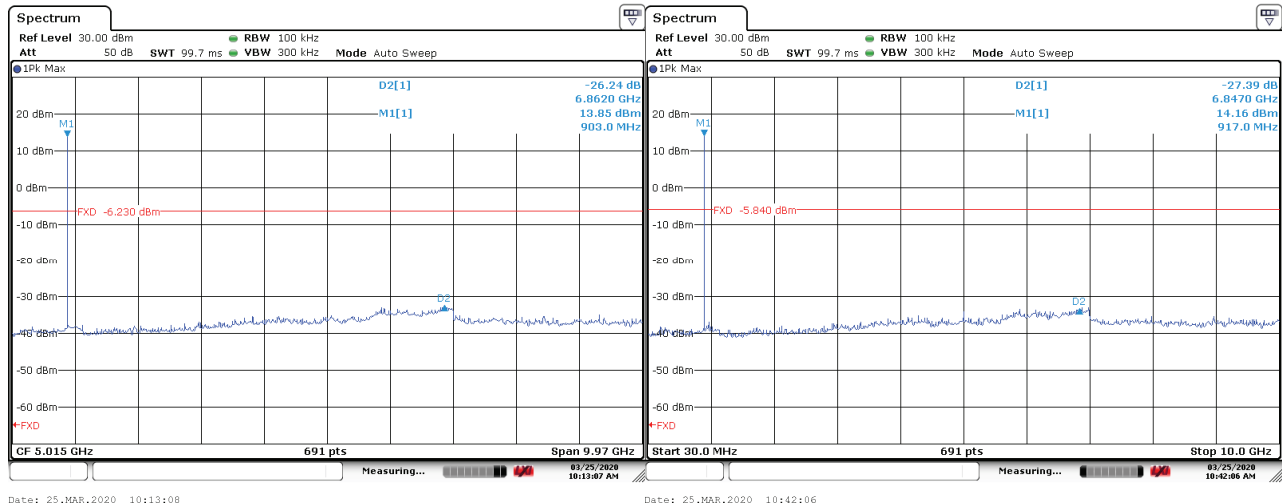
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Date: 25.MAR.2020 09:38:24

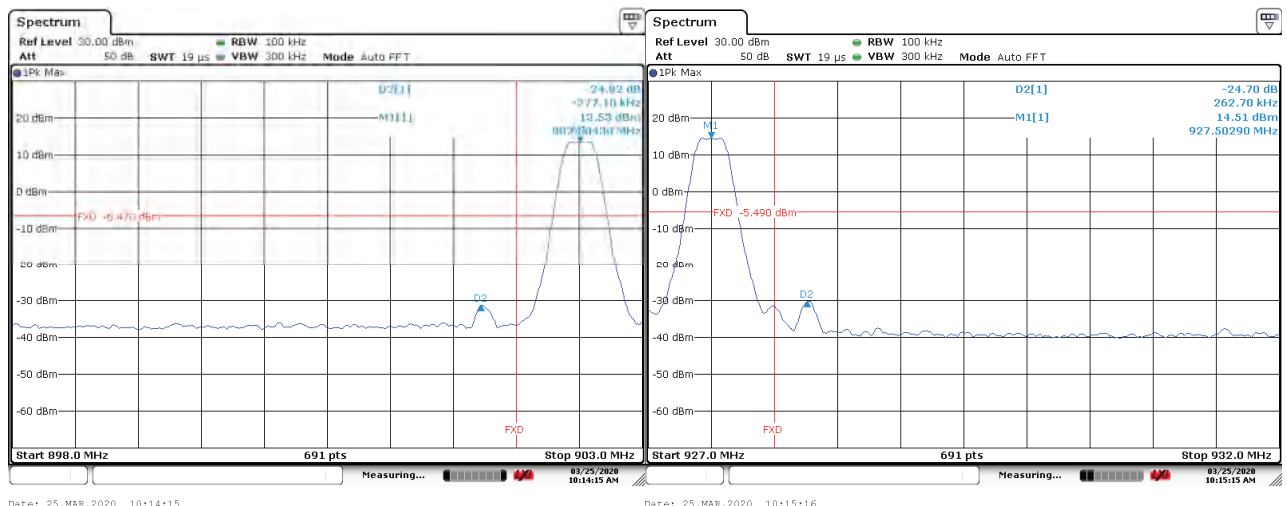

Band edge


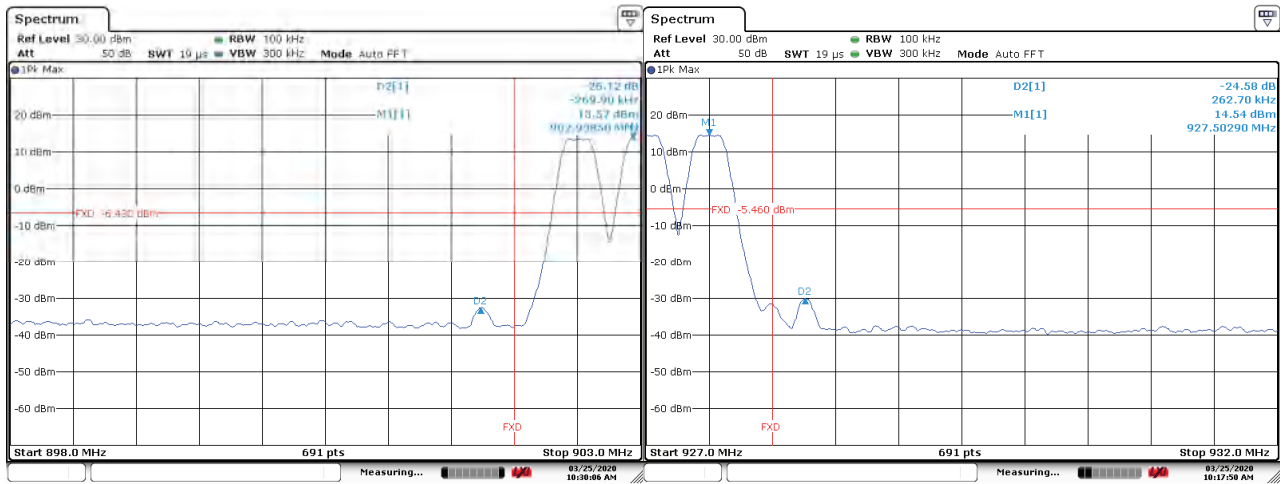
6. FSK 250Kbps FHSS, Conducted Spurious Emission and Band edge, 902.5MHz~927.5MHz

Conducted Spurious Emission



Band edge





Date: 25.MAR.2020 10:30:06

Date: 25.MAR.2020 10:17:51

4.1.8 Carrier Separation Measurement

Result:

Pass

Test Specification

- Test standard : FCC Part 15.247(a)(1)
RSS-247 Issue 2 February 2017 Clause 5.1(b)
- Basic standard : ANSI C63.10: 2013, clause 7.8.2
- Limits : At least 20 dB bandwidth or 25kHz, whichever is greater.
- Kind of test site : Shielded Room

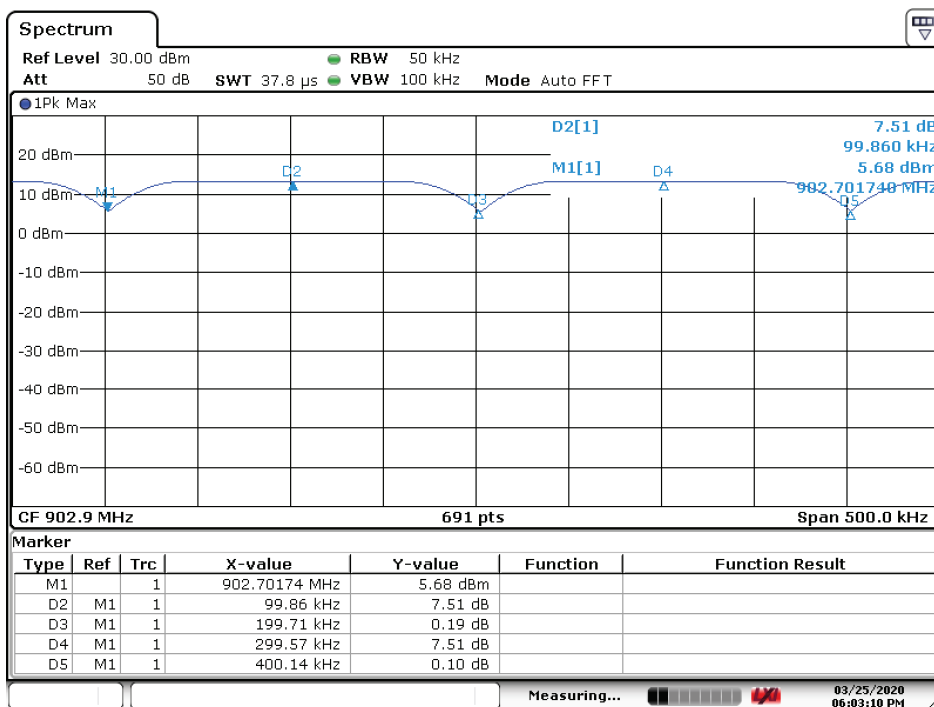
Test Setup

- Date of testing : 25.03.2020
- Input voltage : DC 4.5V
- Operational mode : Mode B
- Temperature : 23°C
- Relative humidity : 51%
- Atmospheric pressure : 101 kPa

Figure 6: Carrier Separation

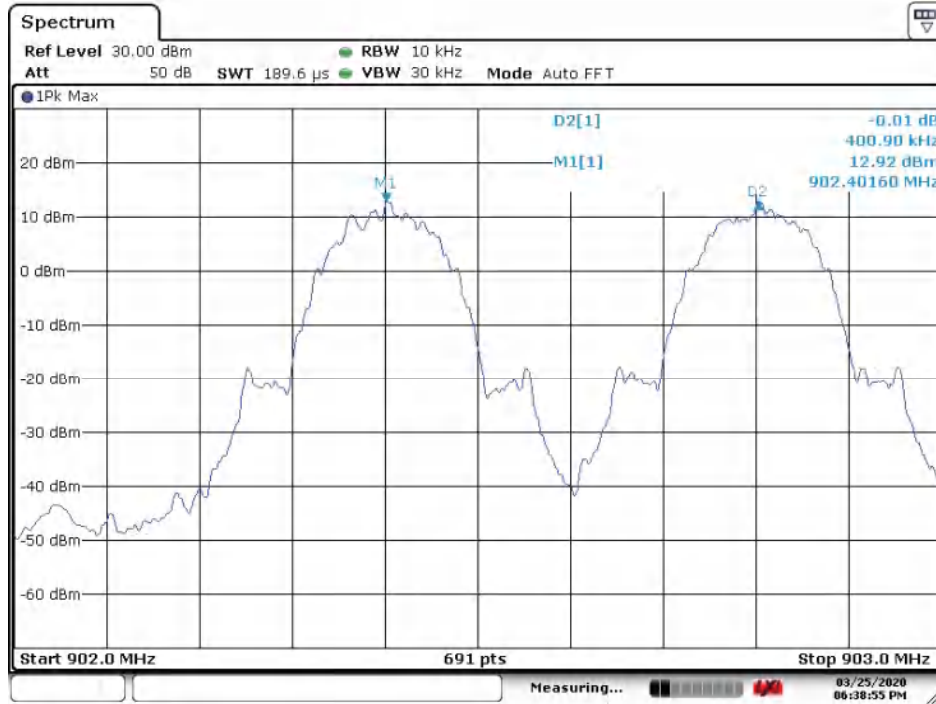
1. LoRa125kHz FHSS, Carrier Separation, 902.2MHz~927.8MHz

Carrier Separation: 199.71kHz



2. FSK 150Kbps FHSS, Carrier Separation, 902.4MHz~927.6MHz

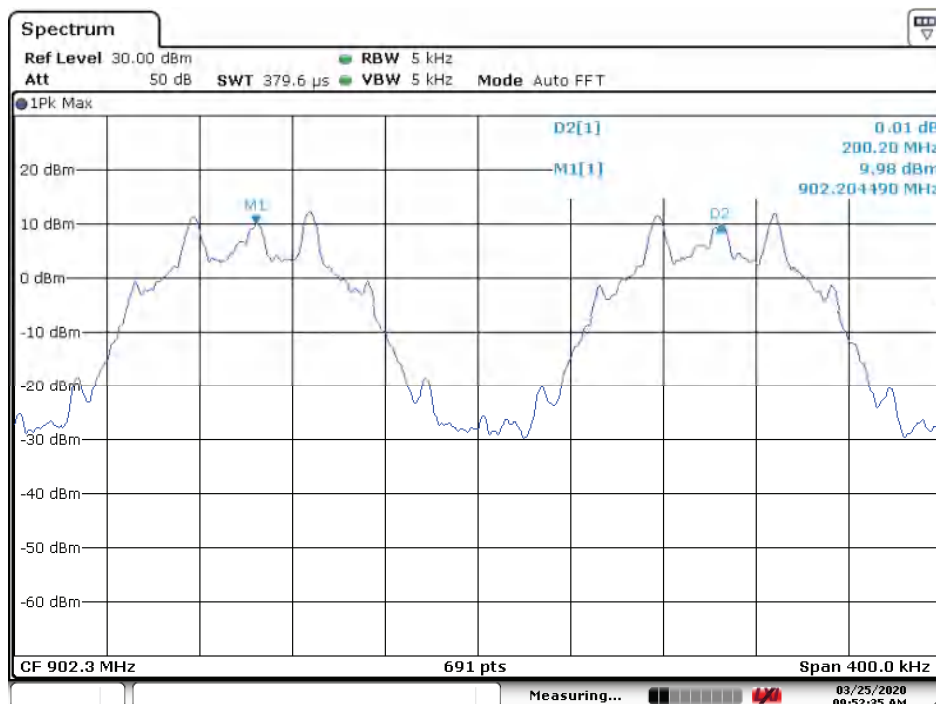
Carrier Separation: 400.90kHz



Date: 25.MAR.2020 18:38:55

3. FSK 50Kbps FHSS, Carrier Separation, 902.2MHz~927.8MHz

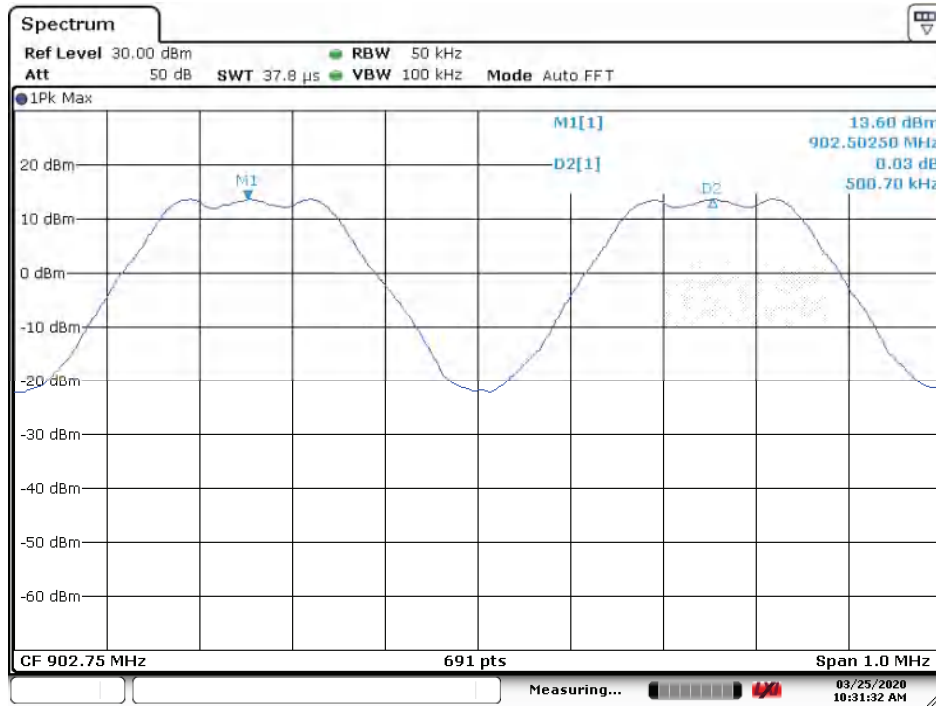
Carrier Separation: 200.20kHz



Date: 25.MAR.2020 09:52:35

4. FSK 250Kbps FHSS, Carrier Separation, 902.5MHz~927.5MHz

Carrier Separation: 500.70kHz



Date: 25.MAR.2020 10:31:33

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4.1.9 The number of hopping channels

Result:

Pass

Test Specification

Test standard : FCC Part 15.247(a)(1)(i)
RSS-247 Issue 2 February 2017 Clause 5.1(c)

Basic standard : ANSI C63.10: 2013, clause 7.8.3

Limits : At least 50 for 20dB bandwidth less than 250kHz
At least 25 for 20dB bandwidth at least 250kHz

Kind of test site : Shielded Room

Test Setup

Date of testing : 25.03.2020

Input voltage : DC 4.5V

Operational mode : Mode B

Temperature : 23°C

Relative humidity : 51%

Atmospheric pressure : 101 kPa

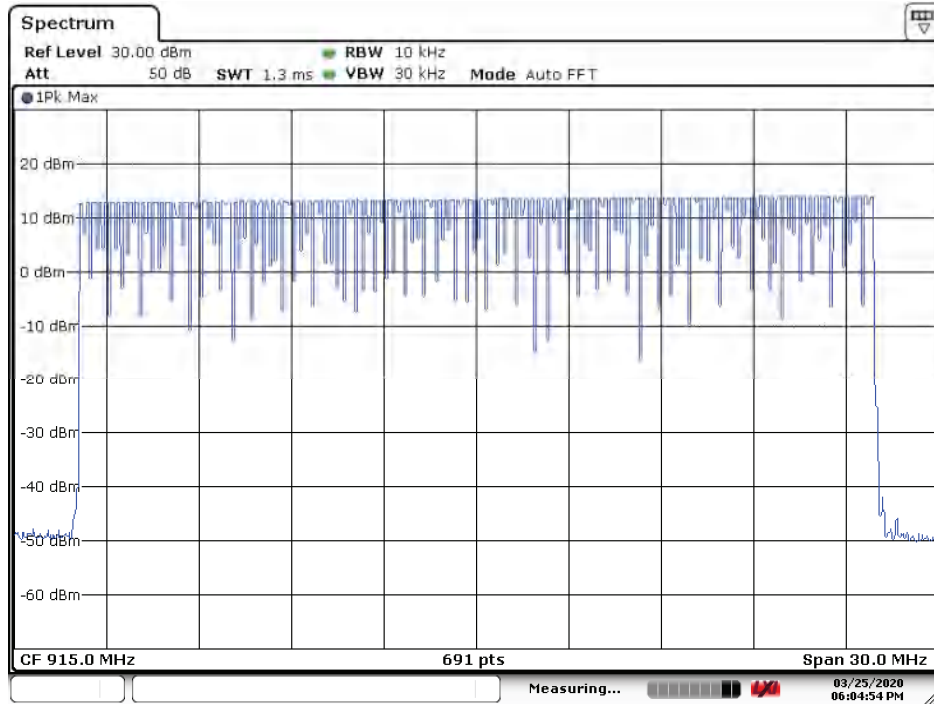
Table 7: Test result of hopping channel number for LoRa FHSS and FSK FHSS

Modulation Type and Operation band	20dB Bandwidth(kHz)	Channel Number	Limit	Result
LoRa 125kHz FHSS 902.2MHz~927.8MHz	20dB Bandwidth < 250	129	50	Pass
FSK 150Kbps FHSS 902.4MHz~927.6MHz	20dB Bandwidth < 250	64	50	Pass
FSK 50Kbps FHSS 902.2MHz~927.8MHz	20dB Bandwidth < 250	129	50	Pass
FSK 250Kbps FHSS 902.5MHz~927.5MHz	$250 \leq 20\text{dB Bandwidth} < 500$	51	25	Pass

Figure 7: The number of hopping channels

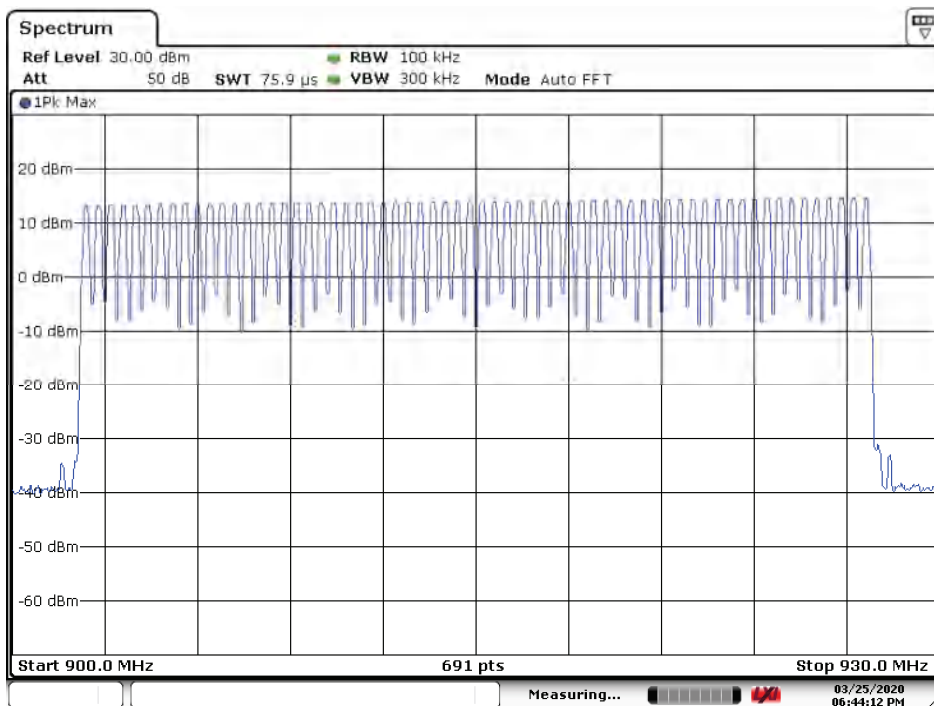
1. LoRa 125kHz FHSS, 902.2MHz~927.8MHz

Channel Number: 129



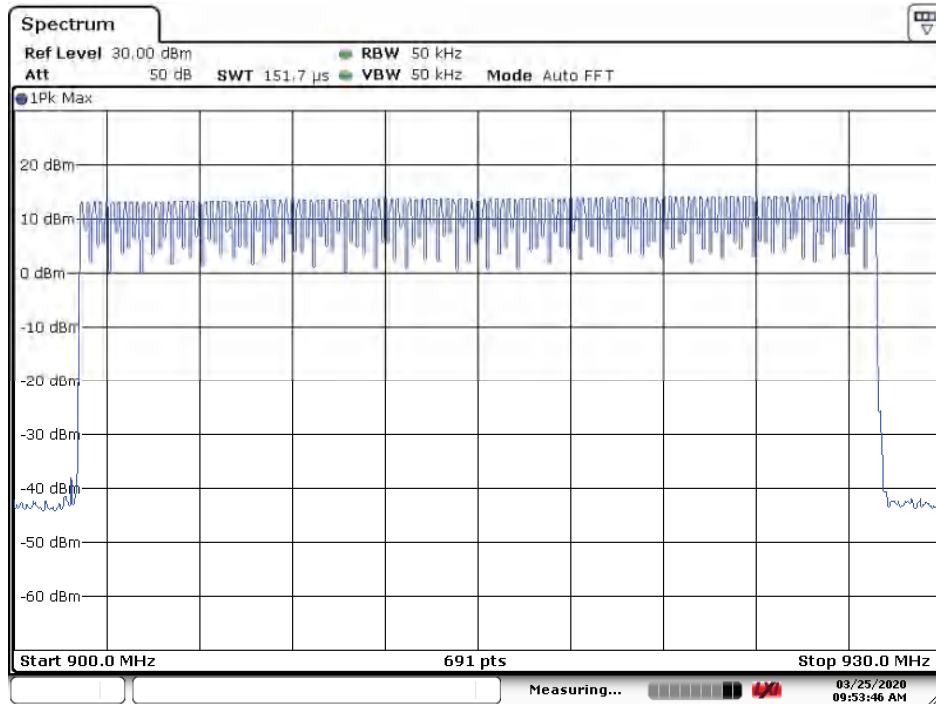
2. FSK 150Kbps FHSS, 902.4MHz~927.6MHz

Channel Number: 64



3. FSK 50Kbps FHSS, 902.2MHz~927.8MHz

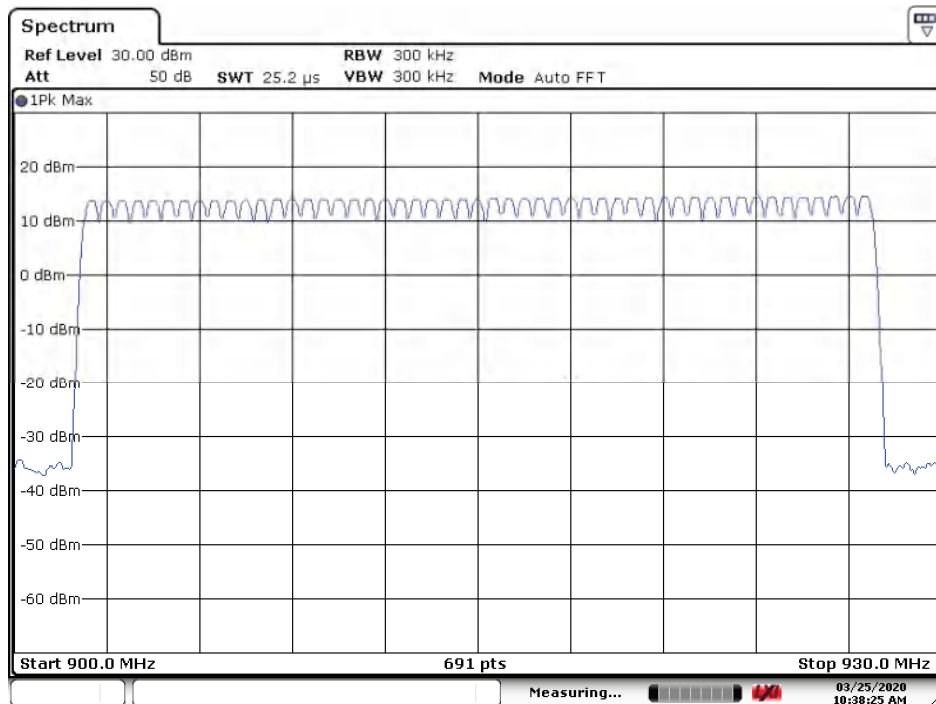
Channel Number: 129



Date: 25.MAR.2020 09:53:46

4. FSK 250Kbps FHSS, 902.5MHz~927.5MHz

Channel Number: 51



Date: 25.MAR.2020 10:38:25

4.1.10 Channel Occupancy Time

Result:

Pass

Test Specification

Test standard : FCC Part 15.247(a)(1)(i)
RSS-247 Issue 2 February 2017 Clause 5.1(c)

Basic standard : ANSI C63.10: 2013, clause 7.8.4

Limits : Not more than 0.4s

Kind of test site : Shielded Room

Test Setup

Date of testing : 25.03.2020

Input voltage : DC 4.5V

Operational mode : Mode B

Temperature : 22°C

Relative humidity : 55%

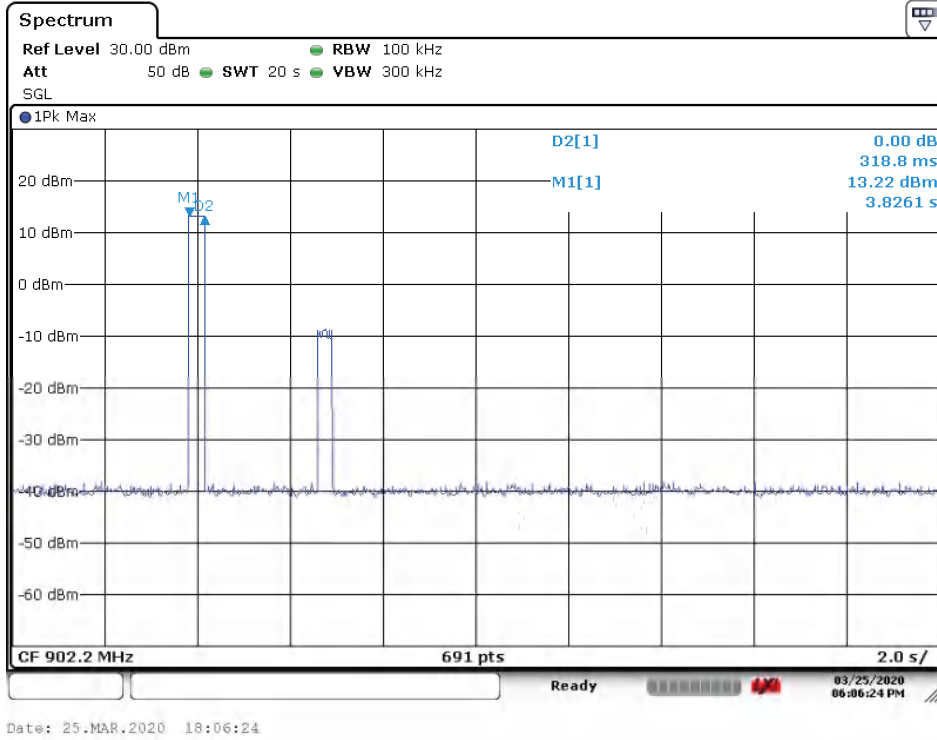
Atmospheric pressure : 101 kPa

Table 8: Test result of Channel Occupancy Time for LoRa FHSS and FSK FHSS

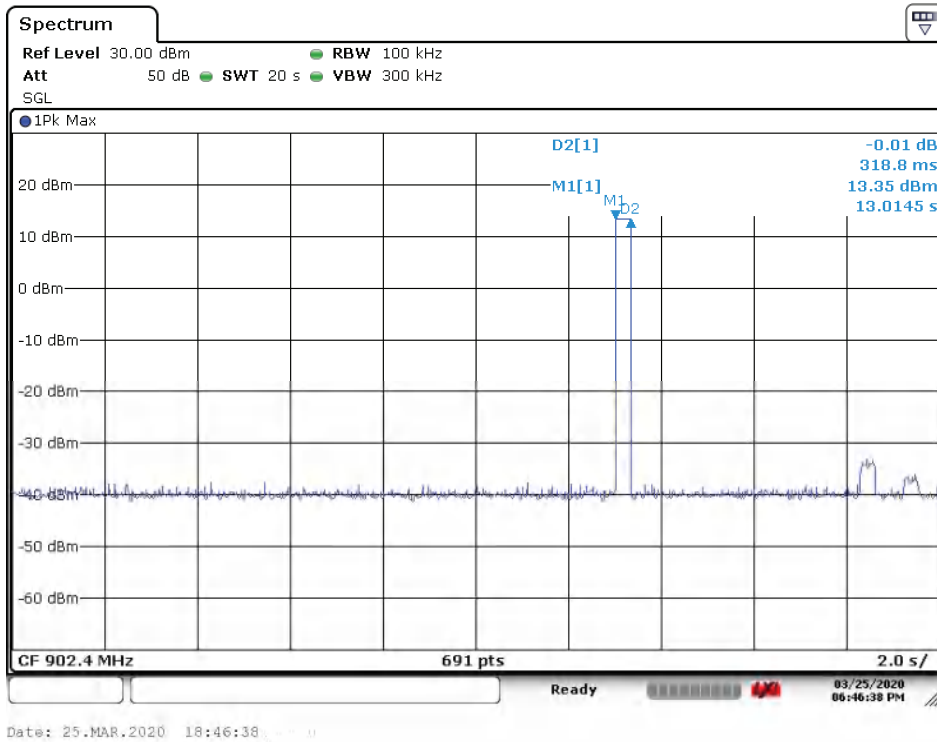
Modulation Type and Operation band	20dB Bandwidth(kHz)	Period (s)	Channel Occupancy Time (ms)	Limit (s)	Result
LoRa 125kHz FHSS 902.2MHz~927.8MHz	20dB Bandwidth < 250	20	318.8	0.4	Pass
FSK 150kbps FHSS 902.4MHz~927.6MHz	20dB Bandwidth <250	20	318.8	0.4	Pass
FSK 50Kbps FHSS 902.2MHz~927.8MHz	20dB Bandwidth < 250	20	260.9	0.4	Pass
FSK 250Kbps FHSS 902.5MHz~927.5MHz	250 ≤ 20dB Bandwidth < 500	10	318.8	0.4	Pass

Figure 8: Channel Occupancy Time

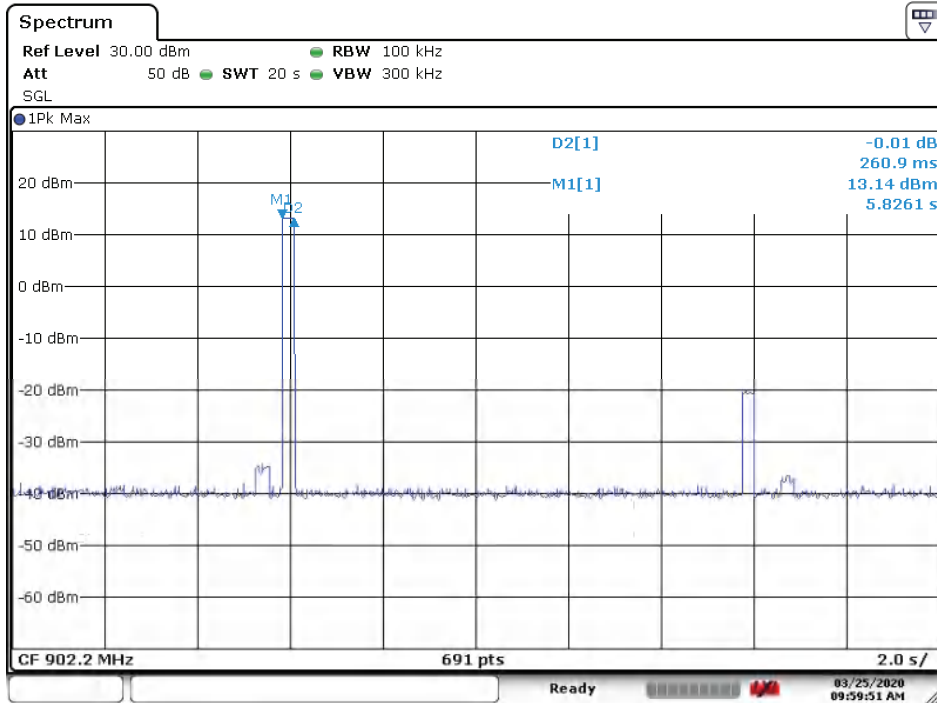
1. LoRa 125kHz FHSS, 902.2MHz~927.8MHz



2. FSK 150Kbps FHSS, 902.4MHz~927.6MHz

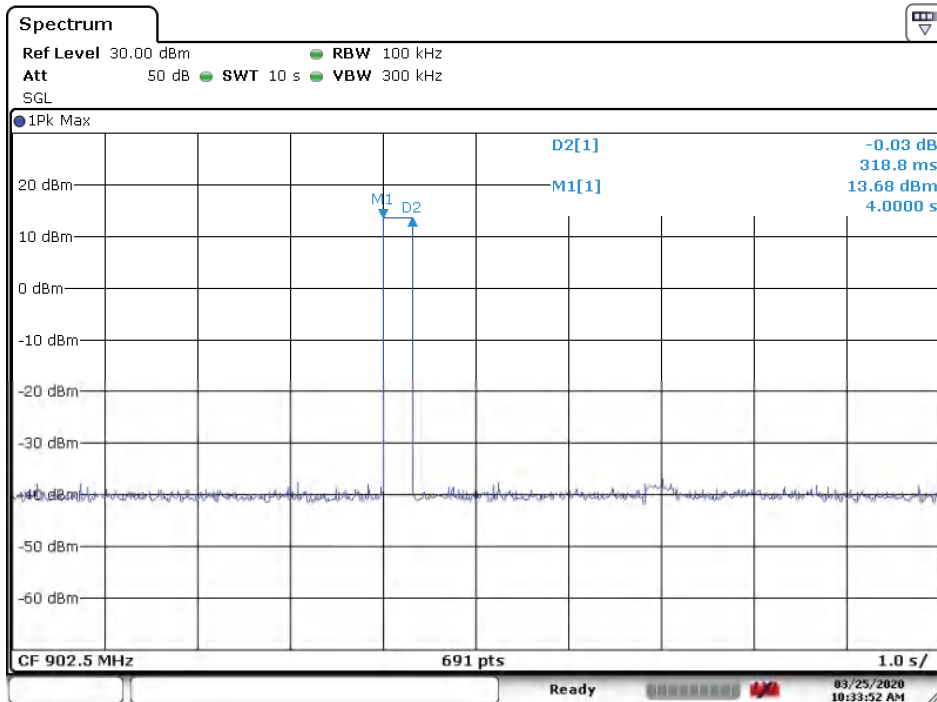


3. FSK 50Kbps FHSS, 902.2MHz~927.8MHz



Date: 25.MAR.2020 09:59:51

4. FSK 250Kbps FHSS, 902.5MHz~927.5MHz



Date: 25.MAR.2020 10:33:52

4.1.11 Conducted Emission (AC power-line)

Result:

N.A

Test Specification

Test standard

: FCC Part 15.207
RSS-Gen Issue 5 March 2019
FCC part 15, Subpart B:2019
ICES-005:2018

Basic standard

: ANSI C63.10: 2013, clause 6.2
ANSI C63.4:2014, clause 7

Port

: Mains

Frequency range

: 0.15 – 30MHz

Limits

: FCC part 15.107(a)
FCC part 15.207(a)
RSS Gen Issue 5 March 2019, table 4
ICES-005:2018, table 2

Kind of test site

: 3m Semi-anechoic Chamber

The EUT is supplied by battery and it cannot be connected to the public low-voltage distribution systems directly. Charging for battery is performed independently and without using EUT. Therefore, no disturbance voltage test is performed.

4.1.12 Radiated Emission

Result:

Pass

Test Specification	
Test standard	: FCC Part 15.209 RSS-Gen Issue 5 March 2019 FCC Part 15, Subpart B:2019 ICES-005:2018
Basic standard	: ANSI C63.10: 2013, clause 6.3 ANSI C63.4:2014, clause 8 KDB 558074 D01 v05r02, clause 8.6
Port	: Enclosure
Frequency range	: 30MHz-10 th Harmonic for intentional radiator 30MHz-1GHz for unintentional radiator
Limits	: FCC part 15.109(a) FCC part 15.209(a) RSS Gen Issue 5 March 2019, table 3, table 5 ICES-005:2018, table 4
Kind of test site	: 3m Semi-anechoic Chamber

Test Setup

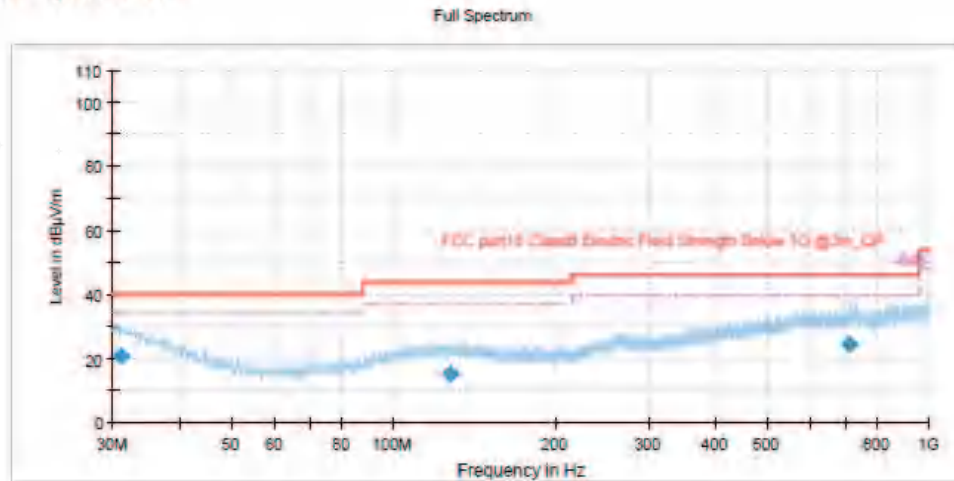
Date of testing	: 23.03.2020-24.03.2020
Input voltage	: DC 4.5V
Operational mode	: Mode C, Mode D
Test channel	: Lo, Mi, Hi
Temperature	: 20°C
Relative humidity	: 57%
Atmospheric pressure	: 101 kPa

Remark:

Testing was carried out within frequency range 9kHz to the tenth harmonics. Only the worst case emissions configuration of the each mode were reported.

The measurement result is calculated based on the following formula by the test software:
Emission Level = Reading level + Correction (Antenna factor + Cable loss – Preamplifier)

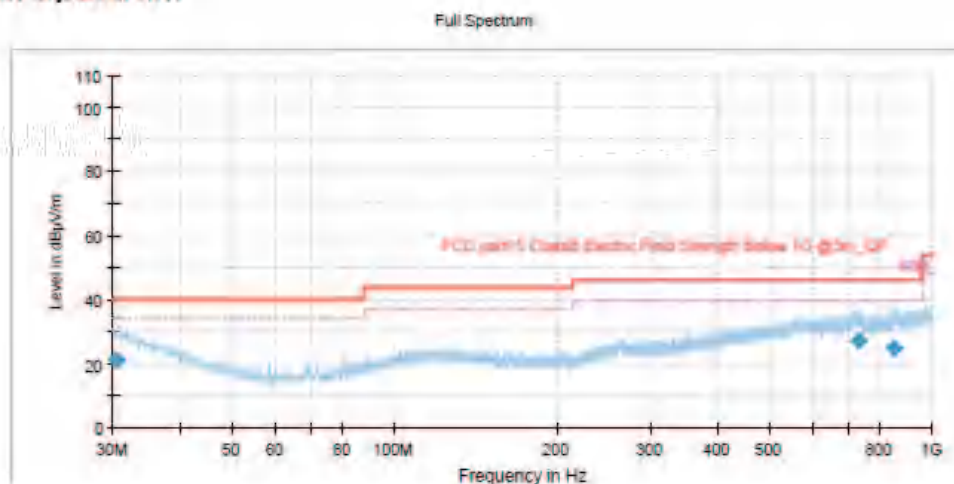
Figure 9: Spectral Diagrams, Radiated Emission, 30MHz-1000MHz, Horizontal, for mode D
Full Spectrum



Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
31.073333	20.93	40.00	19.07	1000.0	120.000	100.0	H	325.0	24.7
127.934444	15.36	43.50	28.14	1000.0	120.000	140.0	H	244.0	19.0
708.953889	24.30	46.00	21.70	1000.0	120.000	126.0	H	166.0	27.8

Figure 10: Spectral Diagrams, Radiated Emission, 30MHz-1000MHz, Vertical, for mode D
Full Spectrum



Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
30.466667	21.34	40.00	18.66	1000.0	120.000	150.0	V	55.0	25.0
729.643889	27.19	46.00	18.81	1000.0	120.000	143.0	V	230.0	28.1
845.586667	24.90	46.00	21.10	1000.0	120.000	143.0	V	259.0	29.4

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Table 9: BLE, Mode C, Radiated Emission, below 1GHz, Horizontal, Channel 0

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)
31.541111	22.98	40.00	17.02	1000.0	120.000	H	24.5
716.103889	24.50	46.00	21.50	1000.0	120.000	H	27.8
850.422778	24.93	46.00	21.07	1000.0	120.000	H	29.4

Table 10: BLE, Mode C, Radiated Emission, below 1GHz, Vertical, Channel 0

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)
30.906667	21.08	40.00	18.92	1000.0	120.000	V	24.8
132.275000	15.21	43.50	28.29	1000.0	120.000	V	18.8
842.515000	25.10	46.00	20.90	1000.0	120.000	V	29.5

Table 11: BLE, Mode C, Radiated Emission, below 1GHz, Horizontal, Channel 19

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)
30.223333	21.51	40.00	18.49	1000.0	120.000	H	25.2
115.713889	15.66	43.50	27.84	1000.0	120.000	H	19.3
845.009444	25.10	46.00	20.90	1000.0	120.000	H	29.4

Table 12: BLE, Mode C, Radiated Emission, below 1GHz, Vertical, Channel 19

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)
30.882222	21.14	40.00	18.86	1000.0	120.000	V	24.8
121.751111	15.71	43.50	27.79	1000.0	120.000	V	19.3
845.563889	25.05	46.00	20.95	1000.0	120.000	V	29.4

Table 13: BLE, Mode C, Radiated Emission, below 1GHz, Horizontal, Channel 39

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)
30.103333	21.62	40.00	18.38	1000.0	120.000	H	25.2
125.280000	15.55	43.50	27.95	1000.0	120.000	H	19.2
849.765556	24.94	46.00	21.06	1000.0	120.000	H	29.4

Table 14: BLE, Mode C, Radiated Emission, below 1GHz, Vertical, Channel 39

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)
30.000000	23.86	40.00	16.14	1000.0	120.000	V	25.3
134.388889	15.27	43.50	28.23	1000.0	120.000	V	18.7
845.426667	25.04	46.00	20.96	1000.0	120.000	V	29.4

Table 15: LoRa 500KHz DTS, 902.5~926.5 MHz, Mode C, Radiated Emission, Horizontal, CH 902.5

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)
30.706667	21.27	40.00	18.73	1000.0	120.000	H	24.9
136.115000	15.08	43.50	28.42	1000.0	120.000	H	18.5
846.478333	25.14	46.00	20.86	1000.0	120.000	H	29.4

Limit and Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
4343.685000	44.2	1000.0	1000.000	H	1.2	29.8	74.0
5414.155000	54.0	1000.0	1000.000	H	1.5	20.0	74.0
8022.060000	45.3	1000.0	1000.000	H	5.1	28.7	74.0

Limit and Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
4343.685000	33.1	1000.0	1000.000	H	1.2	20.9	54.0
5414.155000	51.9	1000.0	1000.000	H	1.5	2.1	54.0
8022.060000	34.7	1000.0	1000.000	H	5.1	19.3	54.0

Table 16: LoRa 500KHz DTS, 902.5~926.5 MHz, Mode C, Radiated Emission, Vertical, CH 902.5

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)
31.003889	21.03	40.00	18.97	1000.0	120.000	V	24.8
124.661111	15.67	43.50	27.83	1000.0	120.000	V	19.2
847.714444	25.04	46.00	20.96	1000.0	120.000	V	29.4

Limit and Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
4349.530000	44.0	1000.0	1000.000	V	1.2	30.0	74.0
5415.750000	50.6	1000.0	1000.000	V	1.5	23.4	74.0
8121.405000	48.8	1000.0	1000.000	V	5.4	25.2	74.0

Limit and Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
4349.530000	33.0	1000.0	1000.000	V	1.2	21.0	54.0
5415.750000	48.0	1000.0	1000.000	V	1.5	6.0	54.0
8121.405000	42.4	1000.0	1000.000	V	5.4	11.6	54.0

Table 17: LoRa 500KHz DTS, 902.5~926.5 MHz, Mode C, Radiated Emission, Horizontal, CH 914.5

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)
30.317222	21.50	40.00	18.50	1000.0	120.000	H	25.1
130.291667	15.44	43.50	28.06	1000.0	120.000	H	18.9
882.580556	34.74	46.00	11.26	1000.0	120.000	H	29.7

Limit and Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
4573.720000	49.8	1000.0	1000.000	H	0.3	24.2	74.0
5488.000000	54.5	1000.0	1000.000	H	1.6	19.5	74.0
6402.810000	49.0	1000.0	1000.000	H	2.8	25.0	74.0

Limit and Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
4573.720000	47.0	1000.0	1000.000	H	0.3	7.0	54.0
5488.000000	52.7	1000.0	1000.000	H	1.6	1.3	54.0
6402.810000	44.6	1000.0	1000.000	H	2.8	9.4	54.0

Table 18: LoRa 500KHz DTS, 902.5~926.5 MHz, Mode C, Radiated Emission, Vertical, CH 914.5

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)
30.400556	21.46	40.00	18.54	1000.0	120.000	V	25.1
627.929444	23.43	46.00	22.57	1000.0	120.000	V	27.3
882.620556	26.34	46.00	19.66	1000.0	120.000	V	29.7

Limit and Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
1829.280000	42.3	1000.0	1000.000	V	-10.2	31.7	74.0
4571.060000	48.0	1000.0	1000.000	V	0.3	26.0	74.0
5485.345000	51.3	1000.0	1000.000	V	1.6	22.7	74.0

Limit and Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
1829.280000	38.8	1000.0	1000.000	V	-10.2	15.2	54.0
4571.060000	43.4	1000.0	1000.000	V	0.3	10.6	54.0
5485.345000	48.3	1000.0	1000.000	V	1.6	5.7	54.0

Table 19: LoRa 500KHz DTS, 902.5~926.5 MHz, Mode C, Radiated Emission, Horizontal, CH 926.5

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)
30.492778	21.40	40.00	18.60	1000.0	120.000	H	25.0
121.053889	15.71	43.50	27.79	1000.0	120.000	H	19.3
894.561111	39.25	46.00	6.75	1000.0	120.000	H	29.9

Limit and Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
4633.220000	52.9	1000.0	1000.000	H	0.3	21.1	74.0
5558.125000	55.2	1000.0	1000.000	H	1.7	18.8	74.0
6485.155000	48.8	1000.0	1000.000	H	3.1	25.2	74.0

Limit and Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
4633.220000	51.1	1000.0	1000.000	H	0.3	2.9	54.0
5558.125000	53.5	1000.0	1000.000	H	1.7	0.5	54.0
6485.155000	45.5	1000.0	1000.000	H	3.1	8.5	54.0

Table 20: LoRa 500KHz DTS, 902.5~926.5 MHz, Mode C, Radiated Emission, Vertical, CH 926.5

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)
31.231667	20.94	40.00	19.06	1000.0	120.000	V	24.7
729.697778	27.22	46.00	18.78	1000.0	120.000	V	28.1
848.672222	25.05	46.00	20.95	1000.0	120.000	V	29.4

Limit and Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
4632.685000	52.8	1000.0	1000.000	V	0.3	21.2	74.0
5559.185000	53.2	1000.0	1000.000	V	1.7	20.8	74.0
6486.750000	48.1	1000.0	1000.000	V	3.1	25.9	74.0

Limit and Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
4632.685000	50.9	1000.0	1000.000	V	0.3	3.1	54.0
5559.185000	51.1	1000.0	1000.000	V	1.7	2.9	54.0
6486.750000	43.8	1000.0	1000.000	V	3.1	10.2	54.0

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Table 21: LoRa 125KHz FHSS, 902.2~927.8MHz, Mode C, Radiated Emission, Horizontal, CH 902.2

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)
30.826667	21.27	40.00	18.73	1000.0	120.000	H	24.9
710.586111	24.54	46.00	21.46	1000.0	120.000	H	27.8
844.941667	25.23	46.00	20.77	1000.0	120.000	H	29.4

Limit and Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
4269.845000	43.7	1000.0	1000.000	H	0.9	30.3	74.0
5413.095000	54.4	1000.0	1000.000	H	1.5	19.6	74.0
8050.220000	45.5	1000.0	1000.000	H	5.2	28.5	74.0

Limit and Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
4269.845000	32.8	1000.0	1000.000	H	0.9	21.2	54.0
5413.095000	52.6	1000.0	1000.000	H	1.5	1.4	54.0
8050.220000	34.9	1000.0	1000.000	H	5.2	19.1	54.0

Table 22: LoRa 125KHz FHSS, 902.2~927.8MHz, Mode C, Radiated Emission, Vertical, CH 902.2

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)
30.814444	21.25	40.00	18.75	1000.0	120.000	V	24.9
709.087778	24.49	46.00	21.51	1000.0	120.000	V	27.8
844.967778	25.10	46.00	20.90	1000.0	120.000	V	29.4

Limit and Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
4510.500000	45.4	1000.0	1000.000	V	0.6	28.6	74.0
5413.095000	51.8	1000.0	1000.000	V	1.5	22.2	74.0
8119.810000	49.5	1000.0	1000.000	V	5.4	24.5	74.0

Limit and Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
4510.500000	36.9	1000.0	1000.000	V	0.6	17.1	54.0
5413.095000	49.5	1000.0	1000.000	V	1.5	4.5	54.0
8119.810000	43.4	1000.0	1000.000	V	5.4	10.6	54.0

Table 23: LoRa 125KHz FHSS, 902.2~927.8MHz, Mode C, Radiated Emission, Horizontal, CH 915

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)
30.400556	21.47	40.00	18.53	1000.0	120.000	H	25.1
711.349444	24.53	46.00	21.47	1000.0	120.000	H	27.8
729.859444	27.33	46.00	18.67	1000.0	120.000	H	28.1

Limit and Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
4575.310000	50.0	1000.0	1000.000	H	0.3	24.0	74.0
5489.595000	54.5	1000.0	1000.000	H	1.6	19.5	74.0
6404.935000	49.7	1000.0	1000.000	H	2.8	24.3	74.0

Limit and Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
4575.310000	47.5	1000.0	1000.000	H	0.3	6.5	54.0
5489.595000	53.0	1000.0	1000.000	H	1.6	1.0	54.0
6404.935000	44.6	1000.0	1000.000	H	2.8	9.4	54.0

Table 24: LoRa 125KHz FHSS, 902.2~927.8MHz, Mode C, Radiated Emission, Vertical, CH 915

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)
30.451111	21.45	40.00	18.55	1000.0	120.000	V	25.1
125.469444	15.66	43.50	27.84	1000.0	120.000	V	19.1
845.252778	25.14	46.00	20.86	1000.0	120.000	V	29.4

Limit and Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
1829.810000	42.3	1000.0	1000.000	V	-10.2	31.7	74.0
4574.780000	48.7	1000.0	1000.000	V	0.3	25.3	74.0
5489.595000	52.0	1000.0	1000.000	V	1.6	22.0	74.0

Limit and Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
1829.810000	39.3	1000.0	1000.000	V	-10.2	14.7	54.0
4574.780000	45.4	1000.0	1000.000	V	0.3	8.6	54.0
5489.595000	50.0	1000.0	1000.000	V	1.6	4.0	54.0

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Table 25: LoRa 125KHz FHSS, 902.2~927.8MHz, Mode C, Radiated Emission, Horizontal, CH 927.8

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)
31.167222	21.10	40.00	18.90	1000.0	120.000	H	24.7
729.608889	27.33	46.00	18.67	1000.0	120.000	H	28.1
895.812778	39.40	46.00	6.60	1000.0	120.000	H	29.9

Limit and Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
4639.060000	52.9	1000.0	1000.000	H	0.3	21.1	74.0
5567.155000	55.2	1000.0	1000.000	H	1.7	18.8	74.0
6495.250000	49.2	1000.0	1000.000	H	3.1	24.8	74.0

Limit and Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
4639.060000	50.9	1000.0	1000.000	H	0.3	3.1	54.0
5567.155000	53.5	1000.0	1000.000	H	1.7	0.5	54.0
6495.250000	45.2	1000.0	1000.000	H	3.1	8.8	54.0

Table 26: LoRa 125KHz FHSS, 902.2~927.8MHz, Mode C, Radiated Emission, Vertical, CH 927.8

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)
30.000000	23.88	40.00	16.12	1000.0	120.000	V	25.3
719.836111	24.67	46.00	21.33	1000.0	120.000	V	27.8
845.362222	25.20	46.00	20.80	1000.0	120.000	V	29.4

Limit and Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
3710.970000	45.9	1000.0	1000.000	V	-1.2	28.1	74.0
4639.060000	53.2	1000.0	1000.000	V	0.3	20.8	74.0
5566.625000	53.0	1000.0	1000.000	V	1.7	21.0	74.0

Limit and Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
3710.970000	41.8	1000.0	1000.000	V	-1.2	12.2	54.0
4639.060000	51.4	1000.0	1000.000	V	0.3	2.6	54.0
5566.625000	51.0	1000.0	1000.000	V	1.7	3.0	54.0

Table 27: FSK 150Kbps FHSS, 902.4~927.6MHz, Mode C, Radiated Emission, Horizontal, CH 902.4

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)
30.211111	21.63	40.00	18.37	1000.0	120.000	H	25.2
729.765556	27.24	46.00	18.76	1000.0	120.000	H	28.1
847.742222	25.15	46.00	20.85	1000.0	120.000	H	29.4

Limit and Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
4966.310000	42.6	1000.0	1000.000	H	1.4	31.4	74.0
5414.155000	49.5	1000.0	1000.000	H	1.5	24.4	74.0
8046.500000	45.8	1000.0	1000.000	H	5.2	28.2	74.0

Limit and Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
4966.310000	32.4	1000.0	1000.000	H	1.4	21.6	54.0
5414.155000	45.7	1000.0	1000.000	H	1.5	8.3	54.0
8046.500000	34.9	1000.0	1000.000	H	5.2	19.1	54.0

Table 28: FSK 150Kbps FHSS, 902.4~927.6MHz, Mode C, Radiated Emission, Vertical, CH 902.4

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)
30.157222	21.63	40.00	18.37	1000.0	120.000	V	25.2
709.585000	24.48	46.00	21.52	1000.0	120.000	V	27.8
846.478333	25.20	46.00	20.80	1000.0	120.000	V	29.4

Limit and Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
4317.655000	43.7	1000.0	1000.000	V	1.1	30.3	74.0
5414.155000	47.6	1000.0	1000.000	V	1.5	26.4	74.0
8121.405000	48.7	1000.0	1000.000	V	5.4	25.3	74.0

Limit and Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
4317.655000	32.9	1000.0	1000.000	V	1.1	21.1	54.0
5414.155000	43.2	1000.0	1000.000	V	1.5	10.8	54.0
8121.405000	41.3	1000.0	1000.000	V	5.4	12.7	54.0

Table 29: FSK 150Kbps FHSS, 902.4~927.6MHz, Mode C, Radiated Emission, Horizontal, CH 914.8

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)
31.610556	22.93	40.00	17.07	1000.0	120.000	H	24.5
728.705000	27.33	46.00	18.67	1000.0	120.000	H	28.1
848.416667	25.47	46.00	20.53	1000.0	120.000	H	29.4

Limit and Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
4574.250000	49.9	1000.0	1000.000	H	0.3	24.1	74.0
5489.060000	54.2	1000.0	1000.000	H	1.6	19.8	74.0
6403.345000	49.3	1000.0	1000.000	H	2.8	24.7	74.0

Limit and Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
4574.250000	46.8	1000.0	1000.000	H	0.3	7.2	54.0
5489.060000	52.0	1000.0	1000.000	H	1.6	2.0	54.0
6403.345000	44.6	1000.0	1000.000	H	2.8	9.4	54.0

Table 30: FSK 150Kbps FHSS, 902.4~927.6MHz, Mode C, Radiated Emission, Vertical, CH 914.8

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)
31.019444	21.07	40.00	18.93	1000.0	120.000	V	24.8
728.433889	27.24	46.00	18.76	1000.0	120.000	V	28.0
844.769444	25.18	46.00	20.82	1000.0	120.000	V	29.5

Limit and Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
4574.250000	48.9	1000.0	1000.000	V	0.3	25.1	74.0
5489.060000	53.6	1000.0	1000.000	V	1.6	20.4	74.0
6403.875000	49.2	1000.0	1000.000	V	2.8	24.8	74.0

Limit and Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
4574.250000	45.7	1000.0	1000.000	V	0.3	8.3	54.0
5489.060000	51.5	1000.0	1000.000	V	1.6	2.4	54.0
6403.875000	44.9	1000.0	1000.000	V	2.8	9.1	54.0

Table 31: FSK 150Kbps FHSS, 902.4~927.6MHz, Mode C, Radiated Emission, Horizontal, CH 927.6

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)
30.372778	21.47	40.00	18.53	1000.0	120.000	H	25.1
729.320556	27.28	46.00	18.72	1000.0	120.000	H	28.1
895.557222	37.05	46.00	8.95	1000.0	120.000	H	29.9

Limit and Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
4638.000000	53.5	1000.0	1000.000	H	0.3	20.5	74.0
5566.095000	55.6	1000.0	1000.000	H	1.7	18.4	74.0
6493.655000	49.7	1000.0	1000.000	H	3.1	24.3	74.0

Limit and Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
4638.000000	51.5	1000.0	1000.000	H	0.3	2.5	54.0
5566.095000	51.9	1000.0	1000.000	H	1.7	2.1	54.0
6493.655000	44.0	1000.0	1000.000	H	3.1	10.0	54.0

Table 32: FSK 150Kbps FHSS, 902.4~927.6MHz, Mode C, Radiated Emission, Vertical, CH 927.6

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)
33.521111	21.60	40.00	18.40	1000.0	120.000	V	23.4
711.848333	24.58	46.00	21.42	1000.0	120.000	V	27.8
845.063333	25.32	46.00	20.68	1000.0	120.000	V	29.4

Limit and Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
1854.780000	42.8	1000.0	1000.000	V	-10.2	31.2	74.0
4638.000000	53.7	1000.0	1000.000	V	0.3	20.3	74.0
5565.560000	53.5	1000.0	1000.000	V	1.7	20.5	74.0

Limit and Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
1854.780000	39.3	1000.0	1000.000	V	-10.2	14.7	54.0
4638.000000	51.8	1000.0	1000.000	V	0.3	2.2	54.0
5565.560000	51.3	1000.0	1000.000	V	1.7	2.7	54.0

Table 33: FSK 50Kbps FHSS, 902.2~927.8MHz, Mode C, Radiated Emission, Horizontal, CH 902.2

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)
30.760556	21.27	40.00	18.73	1000.0	120.000	H	24.9
709.437222	24.45	46.00	21.55	1000.0	120.000	H	27.8
844.953889	25.30	46.00	20.70	1000.0	120.000	H	29.4

Limit and Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
4350.060000	43.7	1000.0	1000.000	H	1.2	30.3	74.0
5413.625000	49.0	1000.0	1000.000	H	1.5	25.0	74.0
8061.375000	45.5	1000.0	1000.000	H	5.3	28.5	74.0

Limit and Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
4350.060000	32.9	1000.0	1000.000	H	1.2	21.1	54.0
5413.625000	45.4	1000.0	1000.000	H	1.5	8.6	54.0
8061.375000	34.7	1000.0	1000.000	H	5.3	19.3	54.0

Table 34: FSK 50Kbps FHSS, 902.2~927.8MHz, Mode C, Radiated Emission, Vertical, CH 902.2

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)
30.854444	21.19	40.00	18.81	1000.0	120.000	V	24.9
558.788333	23.55	46.00	22.45	1000.0	120.000	V	27.2
720.757222	24.62	46.00	21.38	1000.0	120.000	V	27.9

Limit and Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
4223.625000	42.9	1000.0	1000.000	V	0.6	31.1	74.0
5413.095000	47.3	1000.0	1000.000	V	1.5	26.7	74.0
8120.345000	45.5	1000.0	1000.000	V	5.4	28.5	74.0

Limit and Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
4223.625000	32.2	1000.0	1000.000	V	0.6	21.8	54.0
5413.095000	42.3	1000.0	1000.000	V	1.5	11.7	54.0
8120.345000	36.3	1000.0	1000.000	V	5.4	17.7	54.0

Table 35: FSK 50Kbps FHSS, 902.2~927.8MHz, Mode C, Radiated Emission, Horizontal, CH 915

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Height (cm)	Pol	Corr. (dB)
31.136111	21.08	40.00	18.92	1000.0	123.0	H	24.7
729.417778	27.32	46.00	18.68	1000.0	130.0	H	28.1
882.987222	34.25	46.00	11.75	1000.0	150.0	H	29.7

Limit and Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
4575.310000	49.5	1000.0	1000.000	H	0.3	24.5	74.0
5490.125000	54.8	1000.0	1000.000	H	1.6	19.2	74.0
6404.935000	49.1	1000.0	1000.000	H	2.8	24.9	74.0

Limit and Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
4575.310000	46.6	1000.0	1000.000	H	0.3	7.4	54.0
5490.125000	53.0	1000.0	1000.000	H	1.6	1.0	54.0
6404.935000	44.7	1000.0	1000.000	H	2.8	9.3	54.0

Table 36: FSK 50Kbps FHSS, 902.2~927.8MHz, Mode C, Radiated Emission, Vertical, CH 915

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)
31.464444	20.85	40.00	19.15	1000.0	120.000	V	24.5
720.807778	24.69	46.00	21.31	1000.0	120.000	V	27.9
844.983333	25.13	46.00	20.87	1000.0	120.000	V	29.4

Limit and Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
4574.780000	48.6	1000.0	1000.000	V	0.3	25.4	74.0
5490.125000	52.5	1000.0	1000.000	V	1.6	21.5	74.0
6405.470000	47.5	1000.0	1000.000	V	2.8	26.5	74.0

Limit and Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
4574.780000	44.6	1000.0	1000.000	V	0.3	9.4	54.0
5490.125000	50.2	1000.0	1000.000	V	1.6	3.8	54.0
6405.470000	42.5	1000.0	1000.000	V	2.8	11.4	54.0

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Table 37: FSK 50Kbps FHSS, 902.2~927.8MHz, Mode C, Radiated Emission, Horizontal, CH 927.8

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)
30.974444	21.17	40.00	18.83	1000.0	120.000	H	24.8
726.591111	27.12	46.00	18.88	1000.0	120.000	H	28.0
895.772778	39.78	46.00	6.22	1000.0	120.000	H	29.9

Limit and Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
4639.060000	52.8	1000.0	1000.000	H	0.3	21.2	74.0
5567.155000	55.2	1000.0	1000.000	H	1.7	18.8	74.0
6494.720000	48.7	1000.0	1000.000	H	3.1	25.3	74.0

Limit and Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
4639.060000	50.8	1000.0	1000.000	H	0.3	3.2	54.0
5567.155000	53.3	1000.0	1000.000	H	1.7	0.7	54.0
6494.720000	43.8	1000.0	1000.000	H	3.1	10.2	54.0

Table 38: FSK 50Kbps FHSS, 902.2~927.8MHz, Mode C, Radiated Emission, Vertical, CH 927.8

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)
30.960556	21.14	40.00	18.86	1000.0	120.000	V	24.8
130.682778	15.37	43.50	28.13	1000.0	120.000	V	18.9
846.678333	25.20	46.00	20.80	1000.0	120.000	V	29.4

Limit and Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
4638.530000	51.5	1000.0	1000.000	V	0.3	22.5	74.0
5566.625000	53.5	1000.0	1000.000	V	1.7	20.5	74.0
6494.720000	48.6	1000.0	1000.000	V	3.1	25.4	74.0

Limit and Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
4638.530000	48.9	1000.0	1000.000	V	0.3	5.1	54.0
5566.625000	51.7	1000.0	1000.000	V	1.7	2.3	54.0
6494.720000	44.5	1000.0	1000.000	V	3.1	9.5	54.0

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Table 39: FSK 250Kbps FHSS, 902.5~927.5MHz, Mode C, Radiated Emission, Horizontal, CH 902.5

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)
31.461111	20.83	40.00	19.17	1000.0	120.000	H	24.5
120.826111	15.77	43.50	27.73	1000.0	120.000	H	19.3
844.940000	25.16	46.00	20.84	1000.0	120.000	H	29.4

Limit and Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
4619.405000	42.1	1000.0	1000.000	H	0.3	31.9	74.0
5415.220000	50.2	1000.0	1000.000	H	1.5	23.8	74.0
8106.530000	45.4	1000.0	1000.000	H	5.4	28.6	74.0

Limit and Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
4619.405000	31.3	1000.0	1000.000	H	0.3	22.7	54.0
5415.220000	46.5	1000.0	1000.000	H	1.5	7.5	54.0
8106.530000	34.6	1000.0	1000.000	H	5.4	19.4	54.0

Table 40: FSK 250Kbps FHSS, 902.5~927.5MHz, Mode C, Radiated Emission, Vertical, CH 902.5

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)
30.372778	21.49	40.00	18.51	1000.0	120.000	V	25.1
728.433889	27.28	46.00	18.72	1000.0	120.000	V	28.0
844.833889	25.09	46.00	20.91	1000.0	120.000	V	29.5

Limit and Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
4298.530000	44.0	1000.0	1000.000	V	1.1	30.0	74.0
5415.220000	44.8	1000.0	1000.000	V	1.5	29.2	74.0
8256.345000	44.6	1000.0	1000.000	V	5.6	29.4	74.0

Limit and Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
4298.530000	32.7	1000.0	1000.000	V	1.1	21.3	54.0
5415.220000	36.3	1000.0	1000.000	V	1.5	17.7	54.0
8256.345000	33.7	1000.0	1000.000	V	5.6	20.3	54.0

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Table 41: FSK 250Kbps FHSS, 902.5~927.5MHz, Mode C, Radiated Emission, Horizontal, CH 915

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)
30.760556	21.25	40.00	18.75	1000.0	120.000	H	24.9
729.014444	27.30	46.00	18.70	1000.0	120.000	H	28.1
844.700000	25.21	46.00	20.79	1000.0	120.000	H	29.5

Limit and Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
4574.780000	49.9	1000.0	1000.000	H	0.3	24.1	74.0
5490.125000	54.8	1000.0	1000.000	H	1.6	19.2	74.0
6405.470000	49.0	1000.0	1000.000	H	2.8	25.0	74.0

Limit and Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
4574.780000	46.2	1000.0	1000.000	H	0.3	7.8	54.0
5490.125000	52.7	1000.0	1000.000	H	1.6	1.3	54.0
6405.470000	44.1	1000.0	1000.000	H	2.8	9.9	54.0

Table 42: FSK 250Kbps FHSS, 902.5~927.5MHz, Mode C, Radiated Emission, Vertical, CH 915

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)
31.341111	20.88	40.00	19.12	1000.0	120.000	V	24.6
716.548889	24.55	46.00	21.45	1000.0	120.000	V	27.8
850.600000	25.08	46.00	20.92	1000.0	120.000	V	29.4

Limit and Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
1829.810000	42.7	1000.0	1000.000	V	-10.2	31.3	74.0
4574.780000	48.3	1000.0	1000.000	V	0.3	25.7	74.0
5490.125000	53.0	1000.0	1000.000	V	1.6	21.0	74.0

Limit and Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
1829.810000	39.0	1000.0	1000.000	V	-10.2	15.0	54.0
4574.780000	44.6	1000.0	1000.000	V	0.3	9.4	54.0
5490.125000	50.1	1000.0	1000.000	V	1.6	3.9	54.0

Table 43: FSK 250Kbps FHSS, 902.5~927.5MHz, Mode C, Radiated Emission, Horizontal, CH 927.5

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)
30.814444	21.07	40.00	18.93	1000.0	120.000	H	24.9
128.516667	15.37	43.50	28.13	1000.0	120.000	H	19.0
895.489444	39.56	46.00	6.44	1000.0	120.000	H	29.9

Limit and Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
4638.000000	52.3	1000.0	1000.000	H	0.3	21.7	74.0
5565.030000	55.2	1000.0	1000.000	H	1.7	18.8	74.0
6492.595000	49.1	1000.0	1000.000	H	3.1	24.9	74.0

Limit and Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
4638.000000	50.5	1000.0	1000.000	H	0.3	3.5	54.0
5565.030000	53.3	1000.0	1000.000	H	1.7	0.7	54.0
6492.595000	44.0	1000.0	1000.000	H	3.1	10.0	54.0

Table 44: FSK 250Kbps FHSS, 902.5~927.5MHz, Mode C, Radiated Emission, Vertical, CH 927.5

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)
30.882222	21.30	40.00	18.70	1000.0	120.000	V	24.8
134.846111	15.42	43.50	28.08	1000.0	120.000	V	18.7
845.308333	25.65	46.00	20.35	1000.0	120.000	V	29.4

Limit and Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - PK+ (dB)	Limit - PK+ (dBµV/m)
4637.470000	53.2	1000.0	1000.000	V	0.3	20.8	74.0
5565.030000	52.8	1000.0	1000.000	V	1.7	21.2	74.0
6492.595000	48.6	1000.0	1000.000	V	3.1	25.4	74.0

Limit and Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
4637.470000	50.8	1000.0	1000.000	V	0.3	3.2	54.0
5565.030000	50.6	1000.0	1000.000	V	1.7	3.4	54.0
6492.595000	44.0	1000.0	1000.000	V	3.1	10.0	54.0