



FCC RF Test Report

APPLICANT : Ring LLC
EQUIPMENT : Environmental Alert Device
BRAND NAME : ring
MODEL NAME : 7AFYA7
FCC ID : 2AEUP-7AFYA7
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : (DTS) Digital Transmission System
TEST DATE(S) : Oct. 15, 2025 ~ Dec. 16, 2025

We, Sporton International Inc. (ShenZhen), would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. (ShenZhen), the test report shall not be reproduced except in full.

Fly Liang

Approved by: Fly Liang



Sporton International Inc. (ShenZhen)

1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055

People's Republic of China



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR5N0301B	Rev. 01	Initial issue of report	Dec. 16, 2025
FR5N0301B	Rev. 02	Updated 99% Occupied Bandwidth for SF11 on Page 5 This report is an updated version, replacing the report issued on Dec. 16, 2025.	Dec. 18, 2025

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	6dB Bandwidth	$\geq 0.5\text{MHz}$	Pass	-
3.1	-	99% Bandwidth	-	Report Only	-
3.2	15.247(b)(3)	Output Power	$\leq 30\text{dBm}$	Pass	-
3.3	15.247(e)	Power Spectral Density	$\leq 8\text{dBm}/3\text{kHz}$	Pass	-
3.4	15.247(d)	Conducted Band Edges and Spurious Emission	$\leq 30\text{dBc}$	Pass	-
3.5	15.247(d)	Radiated Band Edges and Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 15.92 dB at 2743.50 MHz
-	15.207	AC Conducted Emission	15.207(a)	Not Applicable	1
3.6	15.203 & 15.247(b)	Antenna Requirement	15.203 & 15.247(b)	Pass	-

Remark1: Powered by a button battery only.

Conformity Assessment Condition:

1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacture who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
2. The measurement uncertainty please refer to each test result in the section "Measurement Uncertainty"

Disclaimer:

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.



1 General Description

1.1 Applicant

Ring LLC

12515 Cerise Ave, Hawthorne, CA 90250, USA

1.2 Product Feature of Equipment Under Test

Product Feature	
Equipment	Environmental Alert Device
Brand Name	ring
Model Name	7AFYA7
FCC ID	2AEUP-7AFYA7
SN Code	N/A
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.3 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx/Rx Frequency Range	902 MHz ~ 928 MHz
Number of Channels	31
Bandwidth / Spread Factor	500kHz / 7, 8, 9, 10, 11
Maximum Output Power to Antenna	LoRa DTS SF7 : 20.10 dBm (0.1023 W) LoRa DTS SF8 : 19.90 dBm (0.0977 W) LoRa DTS SF9 : 19.90 dBm (0.0977 W) LoRa DTS SF10 : 19.90 dBm (0.0977 W) LoRa DTS SF11 : 20.00 dBm (0.1000 W)
99% Occupied Bandwidth	LoRa DTS SF7 : 0.53 MHz LoRa DTS SF11 : 0.52 MHz
Antenna Type / Gain	Metal IFA antenna with gain 1.41 dBi
Type of Modulation	LoRa

Note: For SF7/8/9/10/11 mode, the bandwidth and modulation are the same, only the data rate is different, so the whole testing has assessed SF7/11 mode by referring to the higher conducted power.

1.4 Modification of EUT

No modifications are made to the EUT during all test items.



1.5 Testing Location

Sporton International Inc. (Shenzhen) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.01.

Test Firm	Sporton International Inc. (Shenzhen)		
Test Site Location	101, 1st Floor, Block B, Building 1, No. 2, Tengfeng 4th Road, Fenghuang Community, Fuyong Street, Baoan District, Shenzhen City, Guangdong Province 518103 People's Republic of China TEL: +86-755-86066985		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	TH01-SZ 03CH03-SZ	CN1256	421272

1.6 Test Software

Item	Site	Manufacturer	Name	Version
1.	03CH03-SZ	AUDIX	E3	6.2009-8-24

1.7 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- 47 CFR Part 15 Subpart C §15.247
- FCC KDB 558074 D01 15.247 Meas Guidance v05r02
- ANSI C63.10-2020

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.



2 Test Configuration of Equipment Under Test

2.1 Carrier Frequency Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
902-928 MHz	1	902.5	17	915.3
	2	903.3	18	916.1
	3	904.1	19	916.9
	4	904.9	20	917.7
	5	905.7	21	918.5
	6	906.5	22	919.3
	7	907.3	23	920.1
	8	908.1	24	920.9
	9	908.9	25	921.7
	10	909.7	26	922.5
	11	910.5	27	923.3
	12	911.3	28	924.1
	13	912.1	29	924.9
	14	912.9	30	925.7
	15	913.7	31	926.5
	16	914.5	-	-

Note: The above EUT's information was declared by manufacturer.

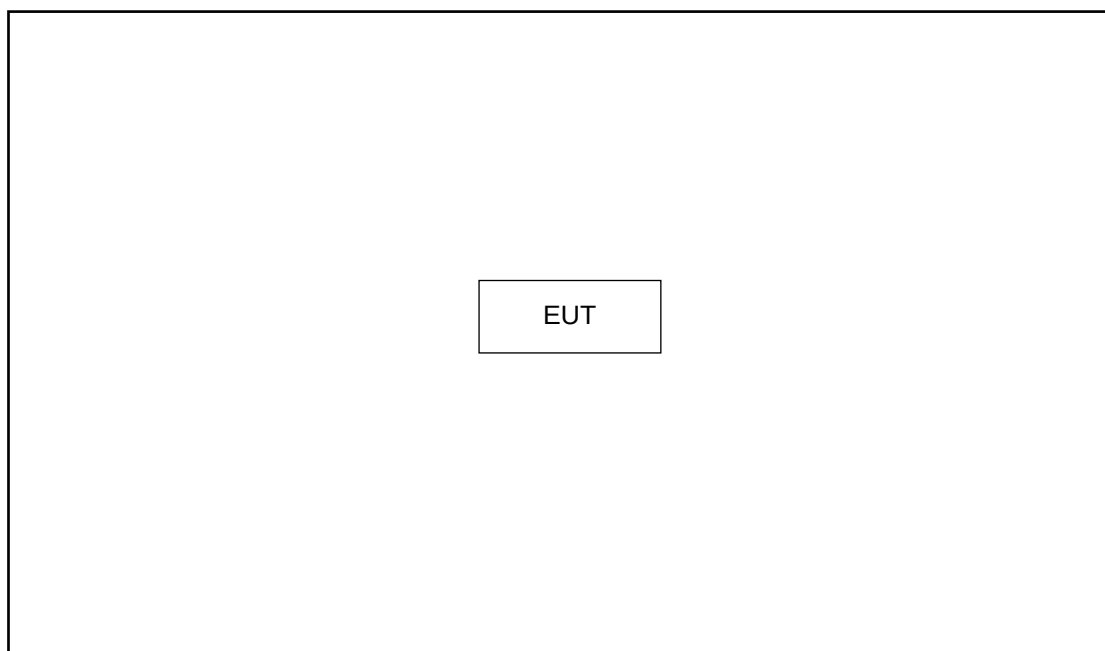
2.2 Test Mode

- a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (X plane) were recorded in this report.

The following summary table is showing all test modes to demonstrate in compliance with the standard.

Summary table of Test Cases	
Test Item	Modulation
	Lora 500kHz DTS
Conducted TCs	Mode 1: LoRa Tx CH01_902.5 MHz
	Mode 2: LoRa Tx CH16_914.5 MHz
	Mode 3: LoRa Tx CH31_926.5 MHz
Radiated TCs	Mode 1: LoRa Tx CH01_902.5 MHz
	Mode 2: LoRa Tx CH16_914.5 MHz
	Mode 3: LoRa Tx CH31_926.5 MHz

2.3 Connection Diagram of Test System





2.4 EUT Operation Test Setup

For LoRa function, the engineering test program was provided and enabled to make EUT continuous transmit.

2.5 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example:

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 0.3 dB and 20dB attenuator.

$$\begin{aligned}\text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)} \\ &= 0.3 + 20 = 20.3 \text{ (dB)}\end{aligned}$$

3 Test Result

3.1 6dB and 99% Bandwidth Measurement

3.1.1 Limit of 6dB and 99% Bandwidth

The minimum 6 dB bandwidth shall be at least 500 kHz.

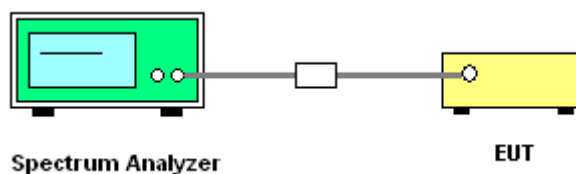
3.1.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

3.1.3 Test Procedures

1. The testing follows ANSI C63.10-2020 clause 11.8.1 for 6dB BW and 6.9.3 for 99% occupied bandwidth measurements
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = shall be in the range of 1% to 5% of the OBW but not less than 100 kHz. Set the Video bandwidth (VBW) $\geq 3 \times \text{RBW}$. Detector = Peak. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 kHz.
5. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) = 1%~5% of OBW and set the Video bandwidth (VBW) approximately three times the RBW.
6. Measure and record the results in the test report.

3.1.4 Test Setup



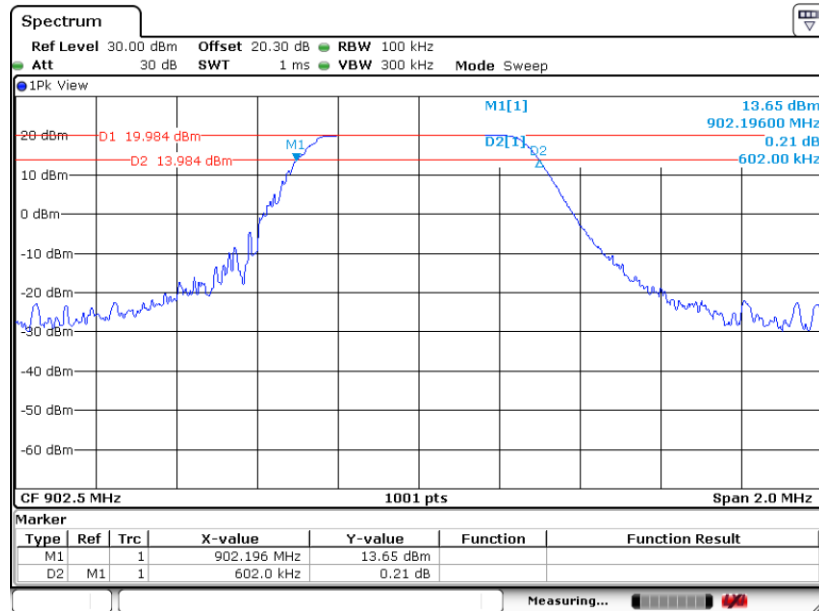


3.1.5 Test Result of 6dB Bandwidth

Please refer to Appendix A.

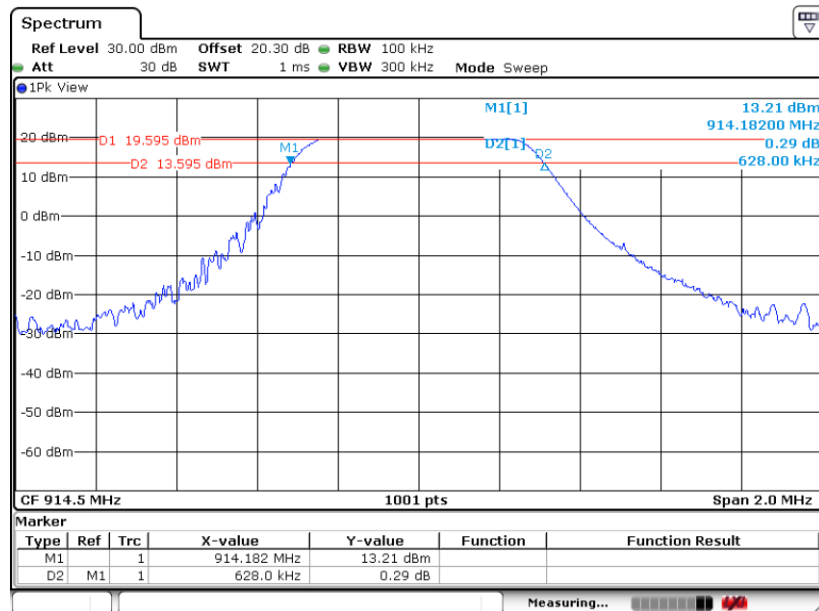
For SF7:

6 dB Bandwidth Plot on 902.5 MHz



Date: 15.OCT.2025 16:09:56

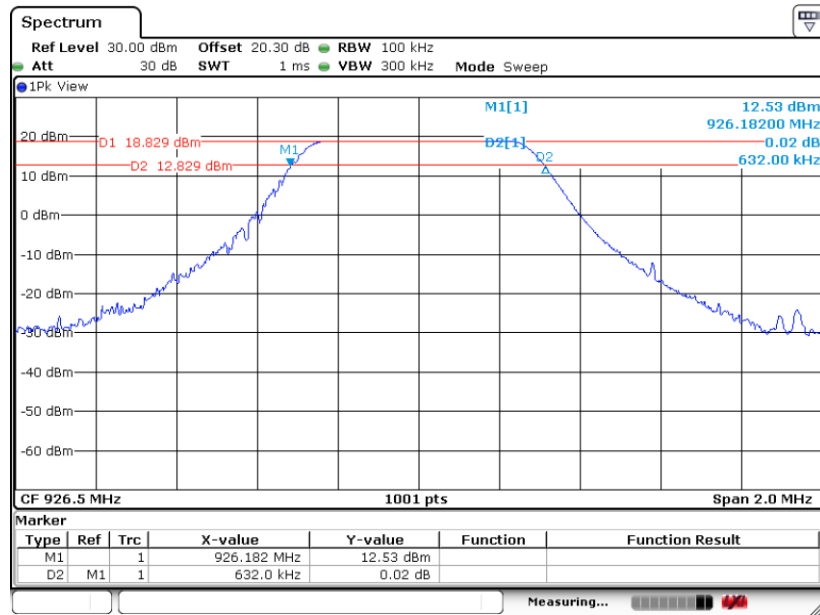
6 dB Bandwidth Plot on 914.5 MHz



Date: 15.OCT.2025 16:30:28



6 dB Bandwidth Plot on 926.5 MHz

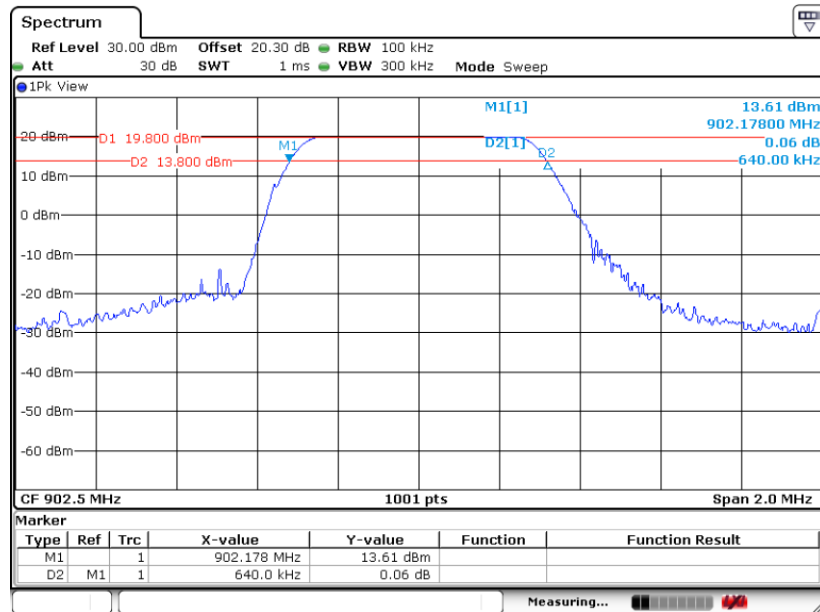


Date: 15.OCT.2025 16:38:45



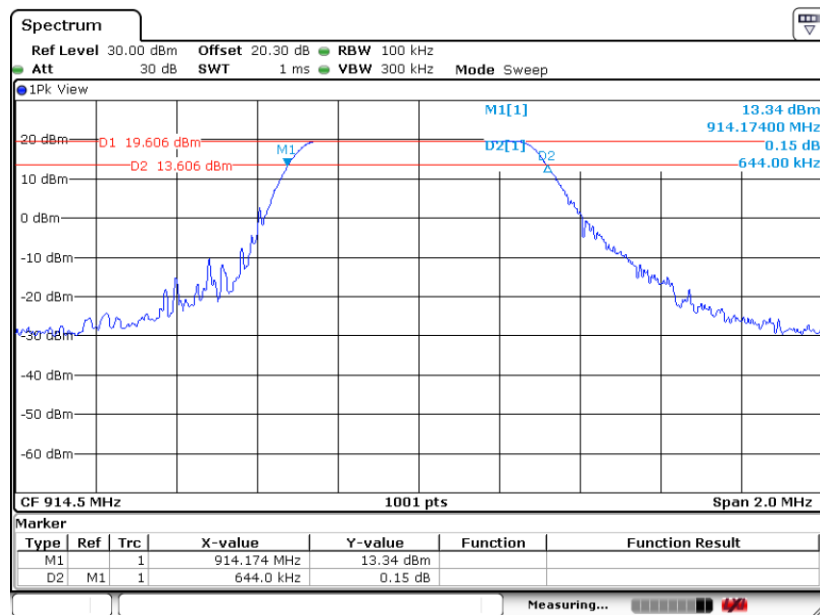
For SF11:

6 dB Bandwidth Plot on 902.5MHz



Date: 15.OCT.2025 16:57:16

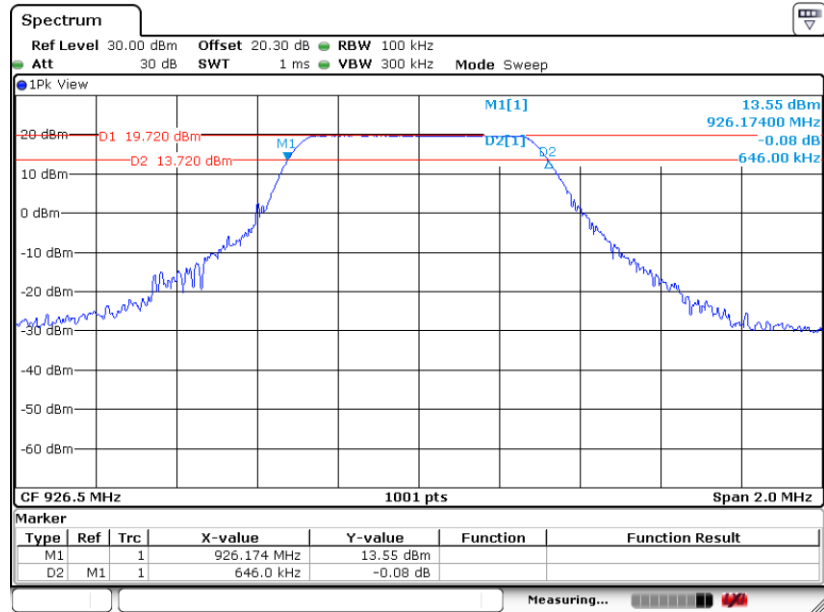
6 dB Bandwidth Plot on 914.5 MHz



Date: 15.OCT.2025 17:13:13



6 dB Bandwidth Plot on 926.5 MHz



Date: 15.OCT.2025 17:19:56

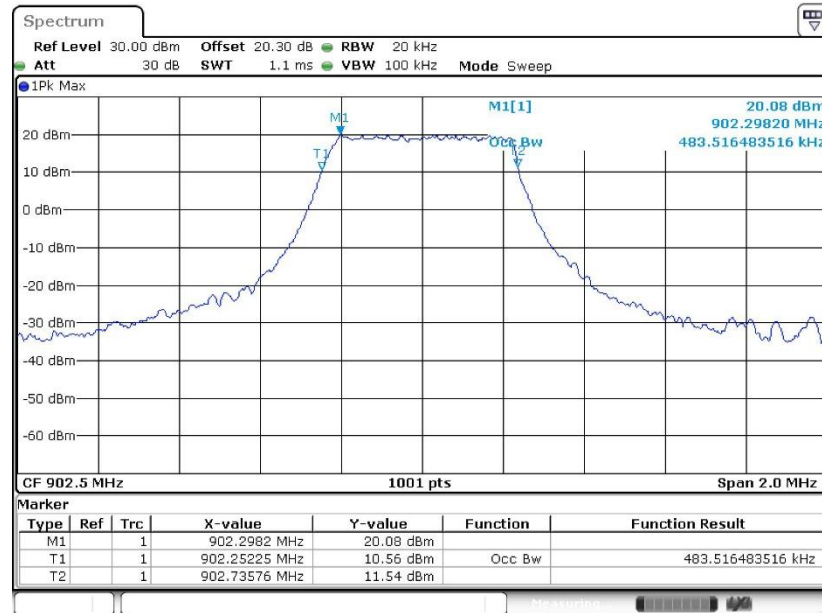


3.1.6 Test Result of 99% Occupied Bandwidth

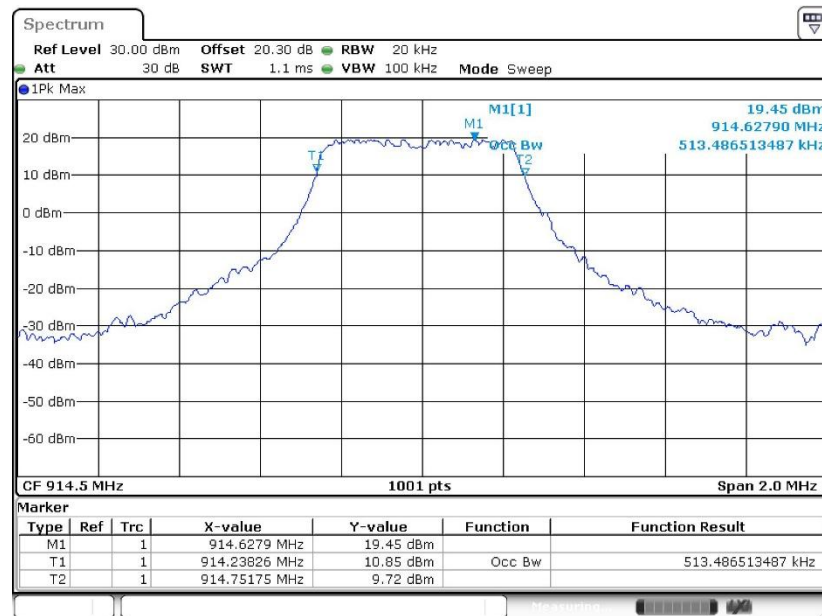
Please refer to Appendix A.

For SF7:

99% Bandwidth Plot on 902.5 MHz

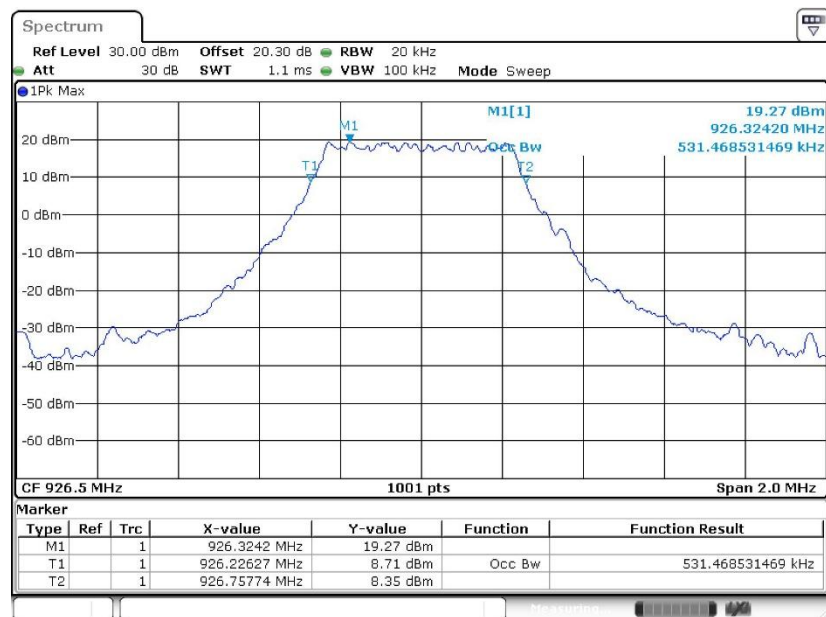


99% Occupied Bandwidth Plot on 914.5 MHz





99% Occupied Bandwidth Plot on 926.5 MHz

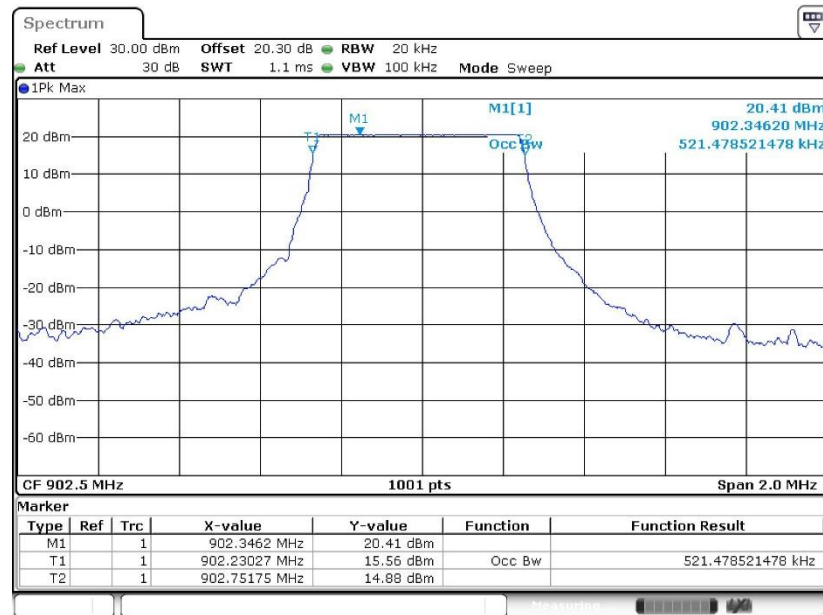


Date: 1.DEC.2025 17:41:11



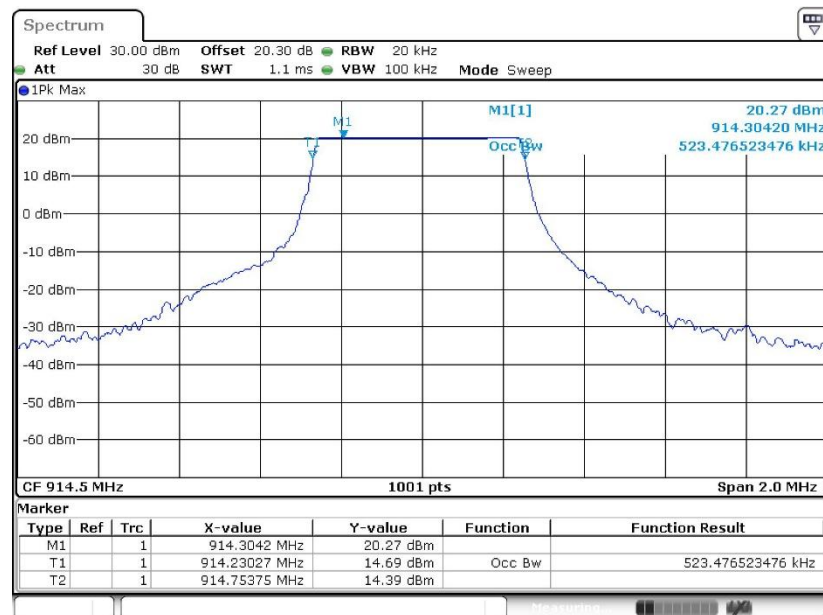
For SF11:

99% Bandwidth Plot on 902.5MHz



Date: 1.DEC.2025 17:36:16

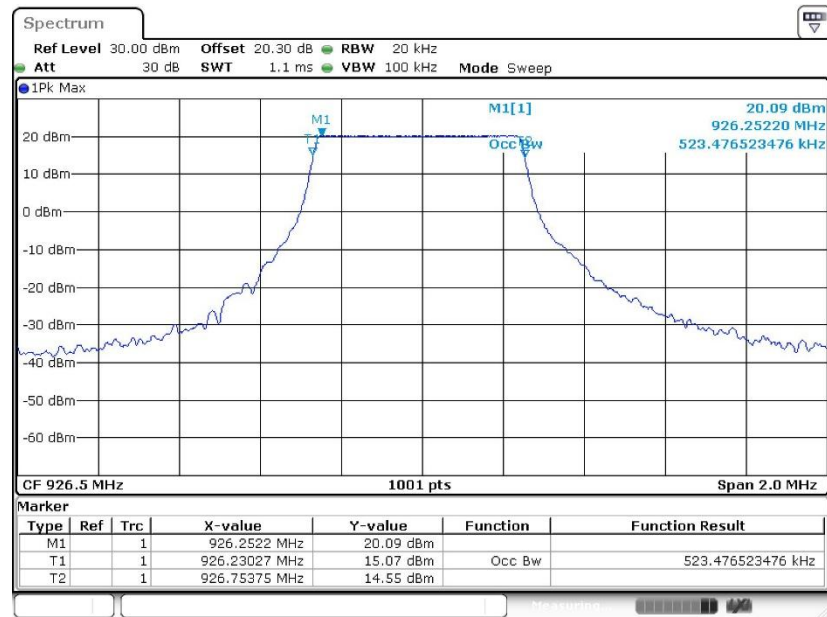
99% Bandwidth Plot on 914.5 MHz



Date: 1.DEC.2025 17:37:19



99% Bandwidth Plot on 926.5 MHz



Note : The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

3.2 Output Power Measurement

3.2.1 Limit of Output Power

For systems using digital modulation in the 902-928MHz, the limit for output power is 30dBm. If transmitting antenna of directional gain greater than 6dBi is used, the output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

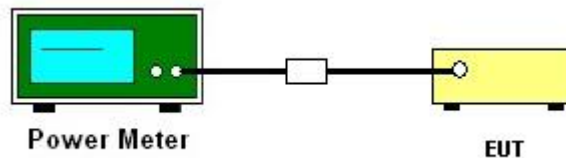
3.2.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

3.2.3 Test Procedures

1. The testing follows the Measurement Procedure of ANSI C63.10-2020 clause 11.9.2.3.1 Method AVGPM method.
2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.

3.2.4 Test Setup



3.2.5 Test Result of Average Output Power

Please refer to Appendix A.

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

The power spectral density shall not be greater than 8dBm in any 3kHz band at any time interval of continuous transmission.

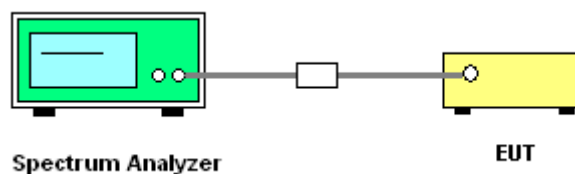
3.3.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

3.3.3 Test Procedures

1. The testing follows Measurement Procedure of ANSI C63.10-2020 clause 11.10.5 Method AVGPSD-2.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz. Video bandwidth VBW = 10 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)
5. Detector = power averaging (rms), Sweep time = auto couple. Use the peak marker function to determine the maximum power level.
6. Employ trace averaging (rms) mode over a minimum of 100 traces.
7. Ensure that the number of measurement points in the sweep $\geq [2 \times \text{span} / \text{RBW}]$.
8. Measure and record the results in the test report.
9. Add $[10 \log (1 / D)]$, where D is the duty cycle.
10. The Measured power density (dBm)/ 100kHz is a reference level and used as 30dBc down limit line for Conducted Band Edges and Conducted Spurious Emission.

3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

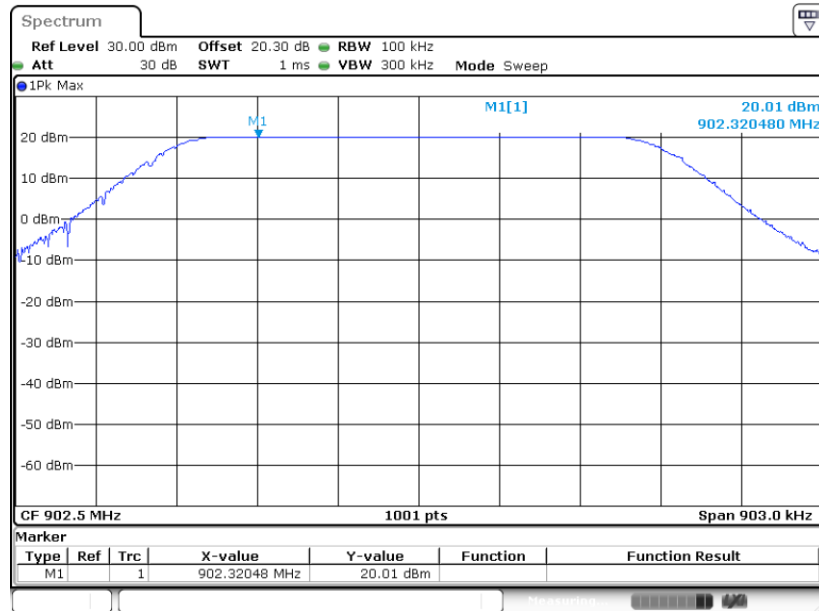
Please refer to Appendix A.



3.3.6 Test Result of Power Spectral Density Plots (100kHz)

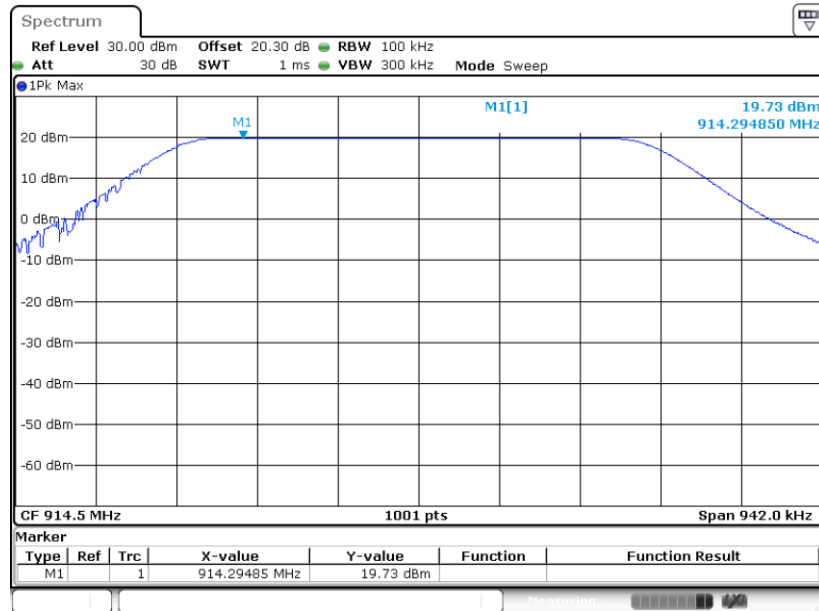
For SF7:

PSD 100kHz Plot on 902.5 MHz



Date: 15.OCT.2025 16:21:58

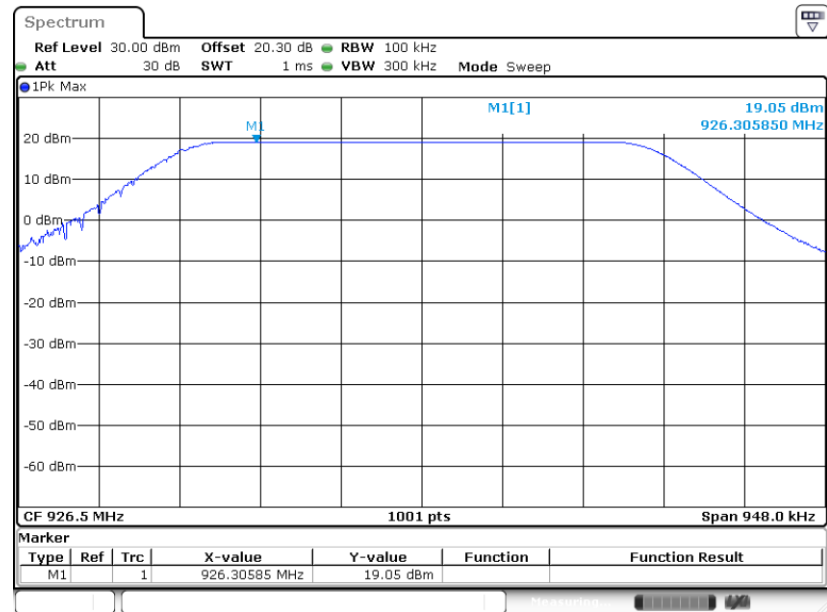
PSD 100kHz Plot on 914.5 MHz



Date: 15.OCT.2025 16:32:50



PSD 100kHz Plot on 926.5 MHz

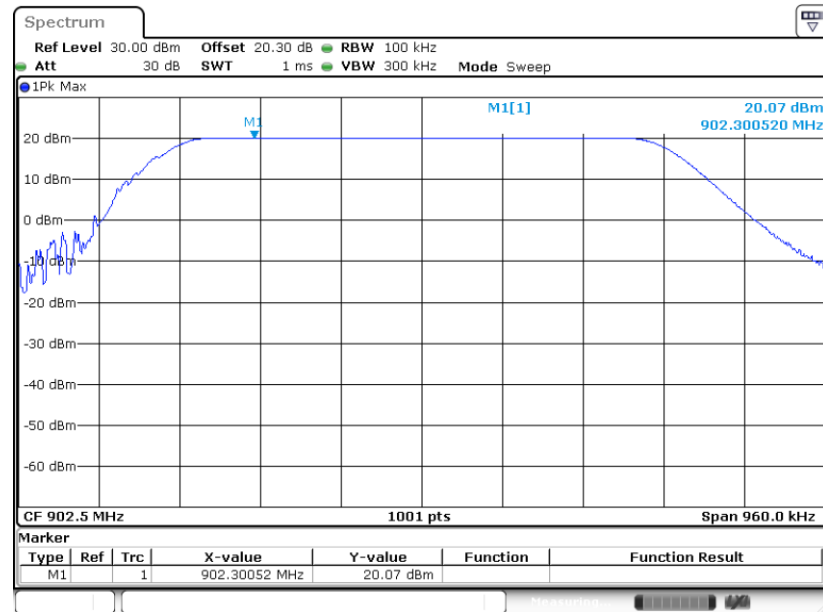


Date: 15.OCT.2025 16:40:23



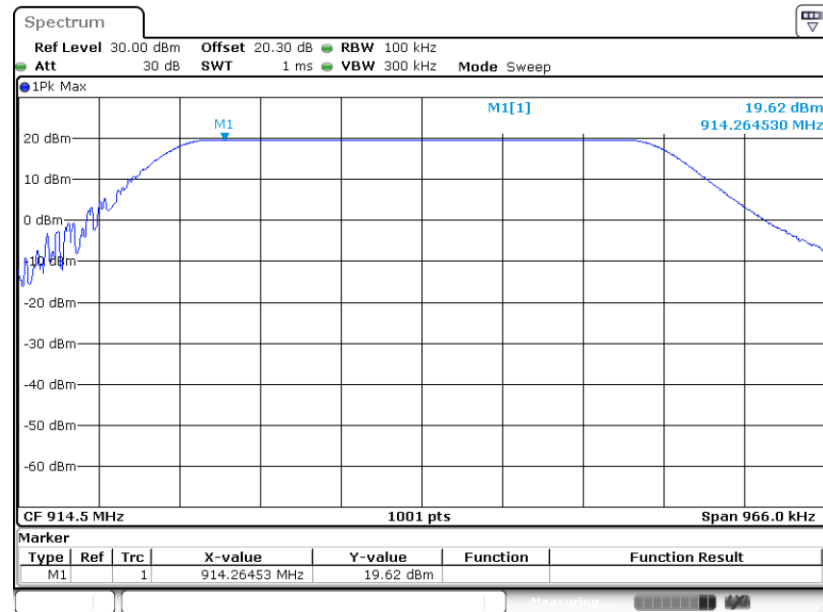
For SF11:

PSD 100kHz Plot on 902.5 MHz



Date: 15.OCT.2025 16:58:31

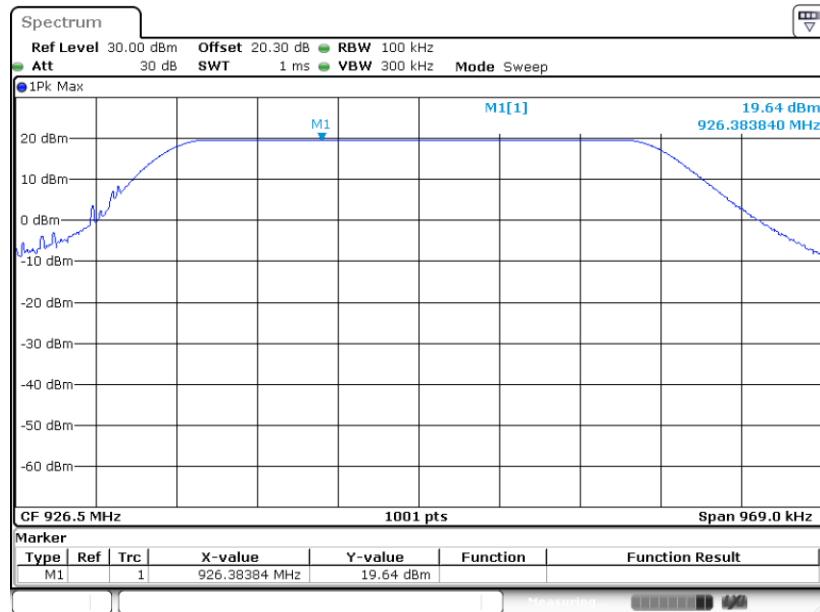
PSD 100kHz Plot on 914.5 MHz



Date: 15.OCT.2025 17:14:53



PSD 100kHz Plot on 926.5 MHz



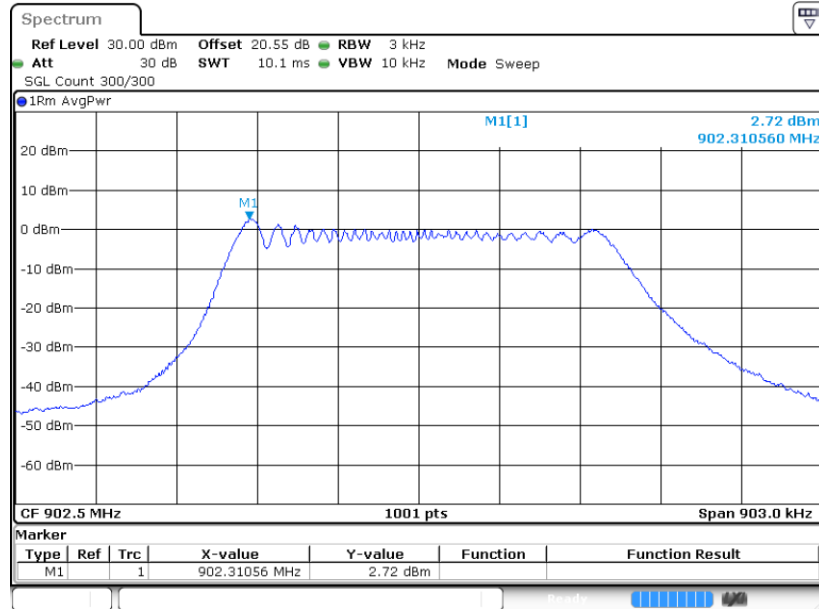
Date: 15.OCT.2025 17:21:41



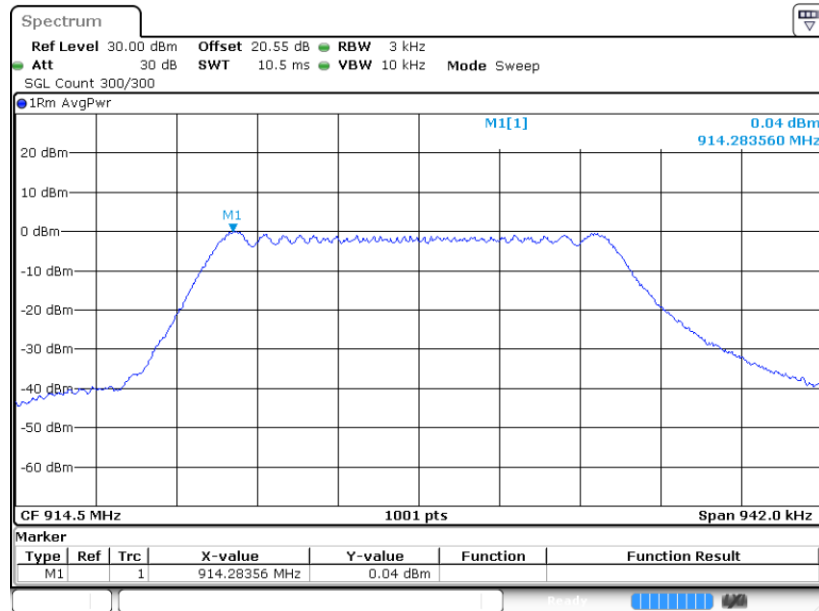
3.3.7 Test Result of Power Spectral Density Plots (3kHz)

For SF7:

PSD 3kHz Plot on 902.5 MHz

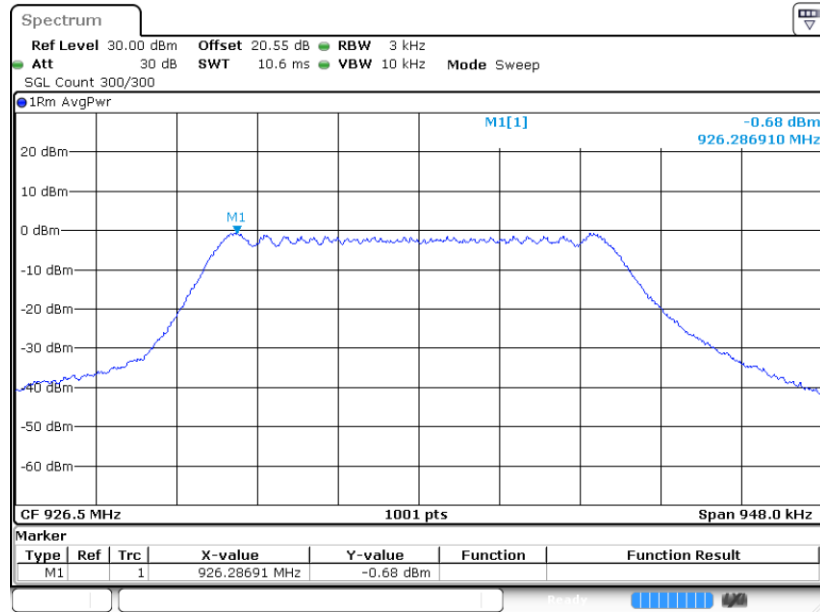


PSD 3kHz Plot on 914.5 MHz





PSD 3kHz Plot on 926.5 MHz

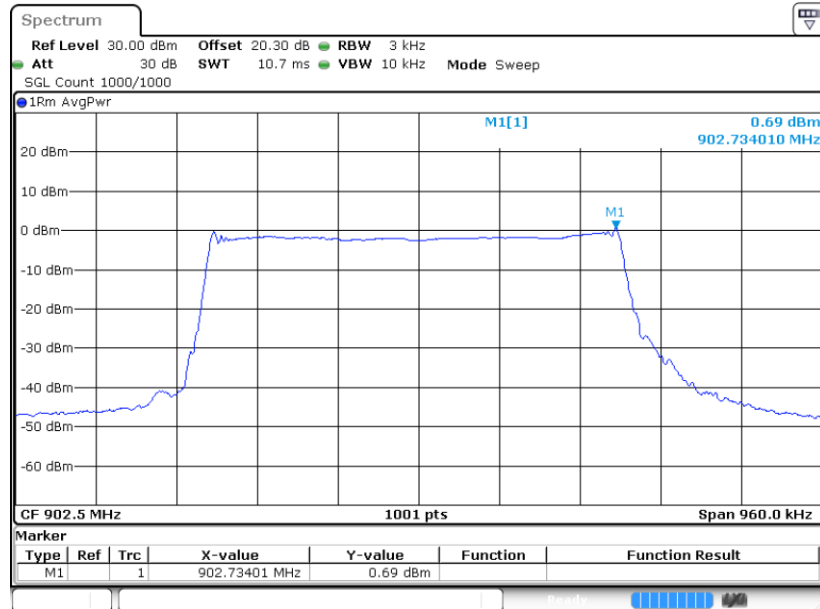


Date: 15.OCT.2025 16:40:01



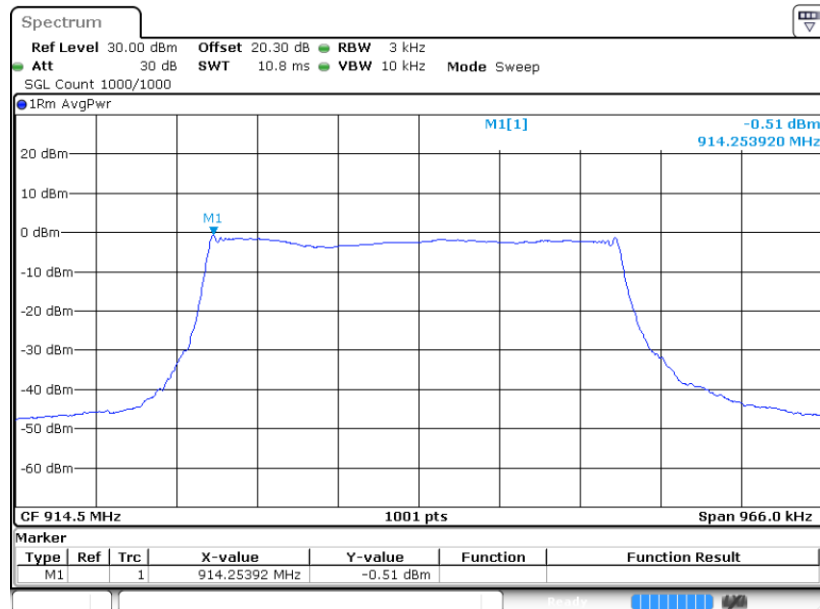
For SF11:

PSD 3kHz Plot on 902.5 MHz



Date: 15.OCT.2025 16:58:04

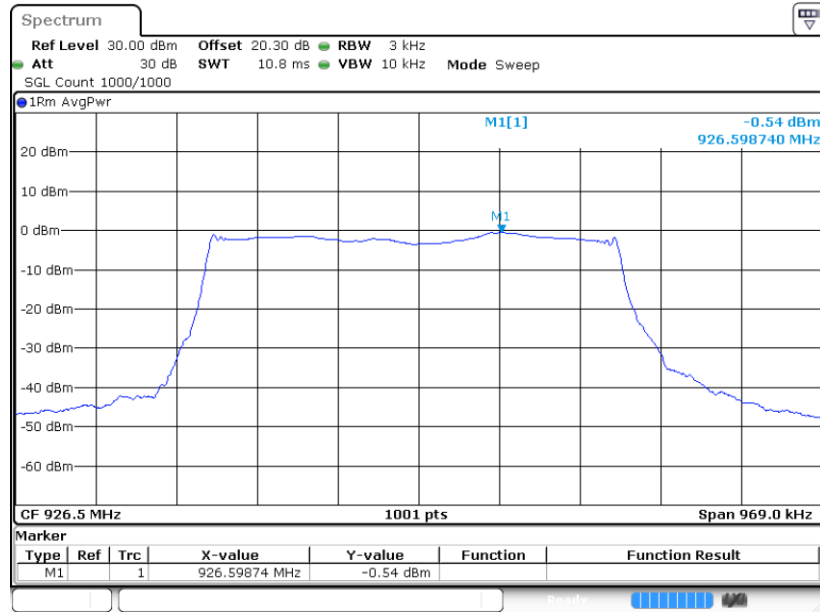
PSD 3kHz Plot on 914.5 MHz



Date: 15.OCT.2025 17:14:12



PSD 3kHz Plot on 926.5 MHz



3.4 Conducted Band Edges and Spurious Emission Measurement

3.4.1 Limit of Conducted Band Edges and Spurious Emission

All harmonics/spurious must be at least 30 dB down from the highest emission level within the authorized band.

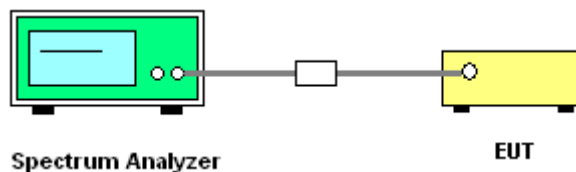
3.4.2 Measuring Instruments

The section 4.0 of List of Measuring Equipment of this test report is used for test.

3.4.3 Test Procedure

1. The testing follows ANSI C63.10-2020 clause 11.11.3
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Set RBW = 100 kHz, VBW=300 kHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum in-band peak PSD level in 100 kHz when the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval.
5. Measure and record the results in the test report.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

3.4.4 Test Setup

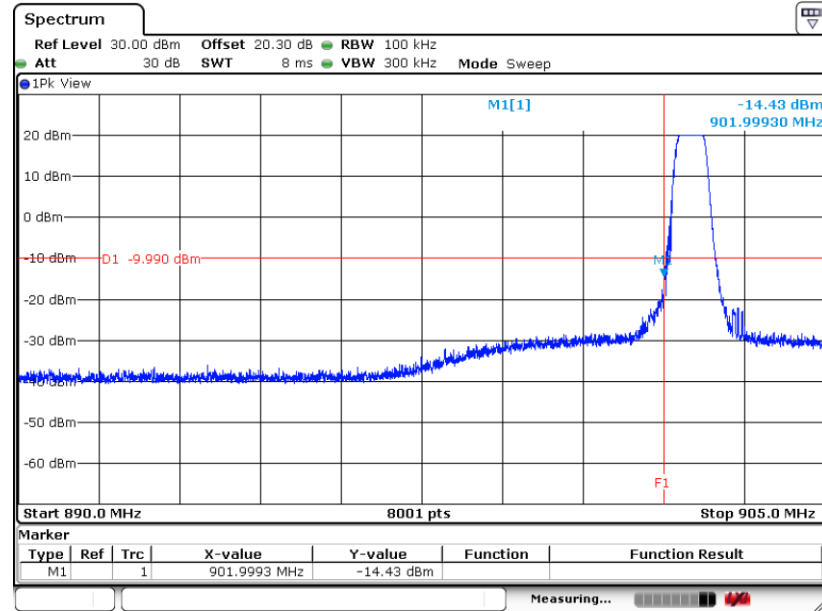




3.4.5 Test Result of Conducted Band Edges Plots

For SF7:

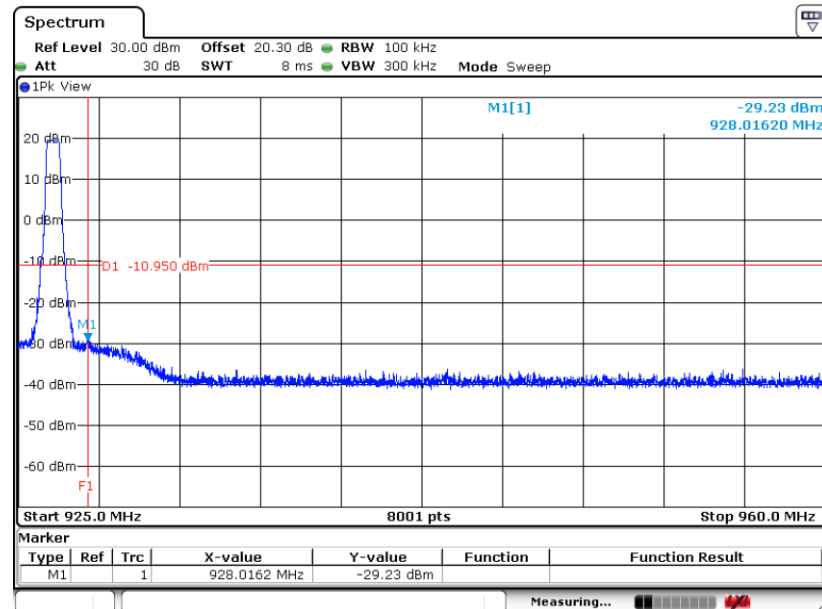
Low Band Edge Plot on 902.5 MHz



Date: 15.OCT.2025 16:25:32

Note: F1= 902MHz

High Band Edge Plot on 926.5 MHz



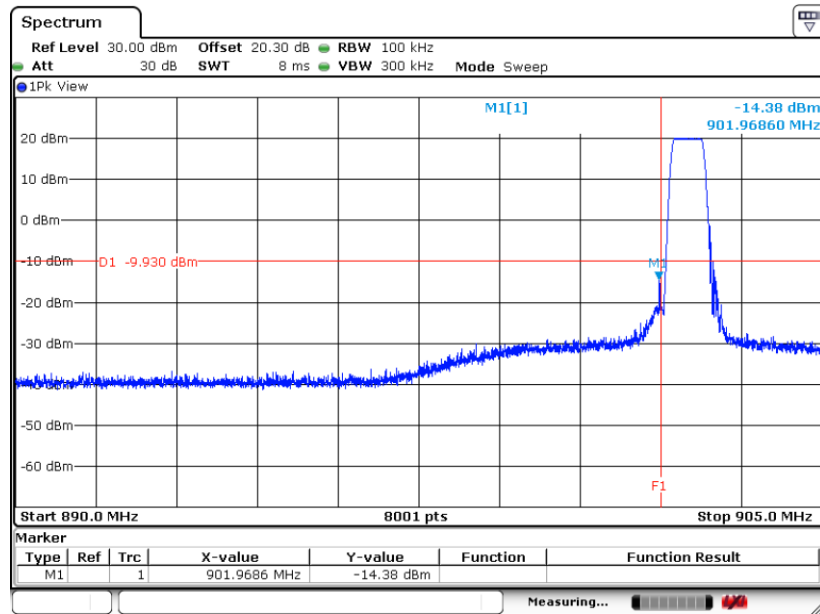
Date: 15.OCT.2025 16:43:50

Note: F1= 928MHz



For SF11:

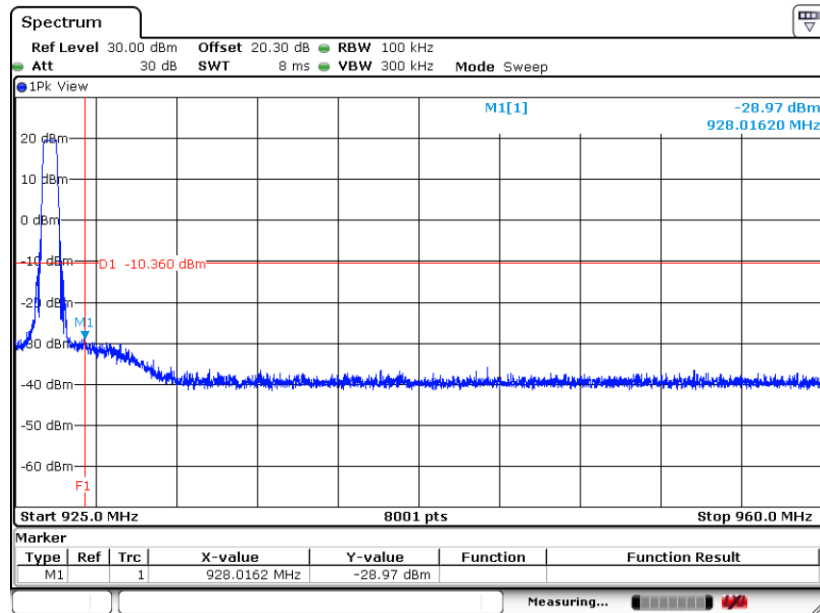
Low Band Edge Plot on 902.5 MHz



Date: 15.OCT.2025 17:04:14

Note: F1= 902MHz

High Band Edge Plot on 926.5 MHz



Date: 15.OCT.2025 17:25:02

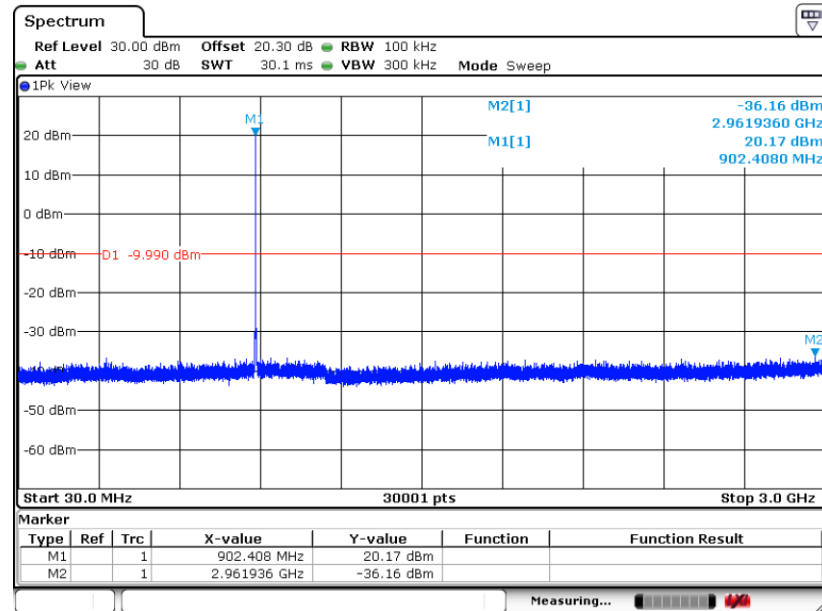
Note: F1= 928MHz



3.4.6 Test Result of Conducted Spurious Emission Plots

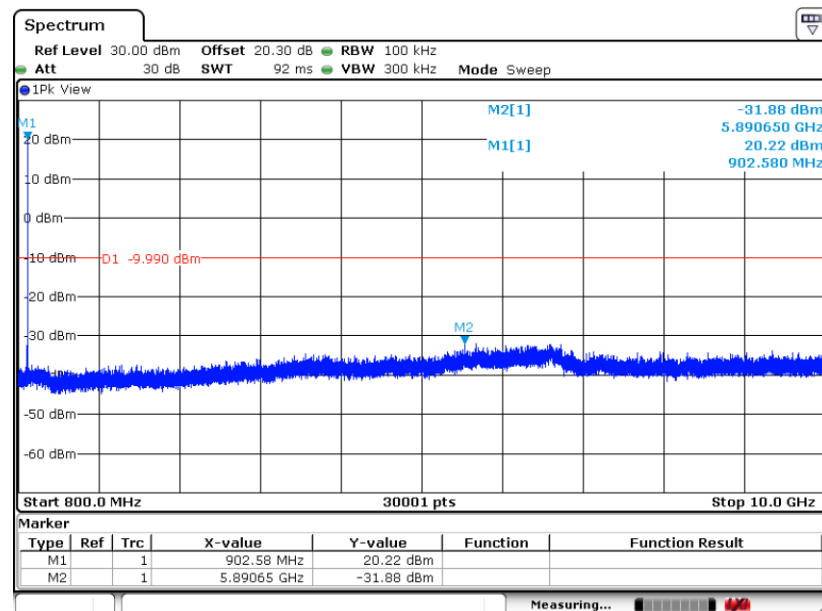
For SF7:

Conducted Spurious Emission Plot on 902.5 MHz



Date: 15.OCT.2025 16:22:58

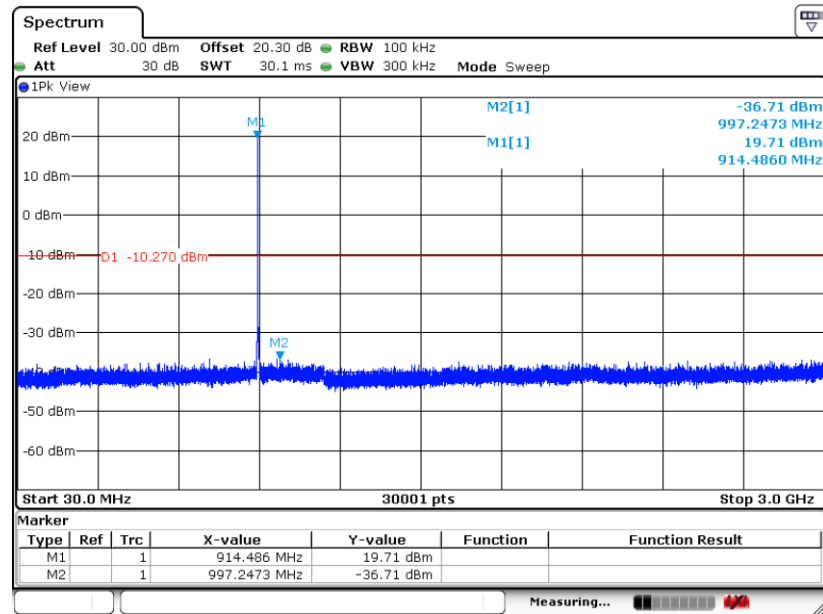
Conducted Spurious Emission Plot on 902.5 MHz



Date: 15.OCT.2025 16:23:46

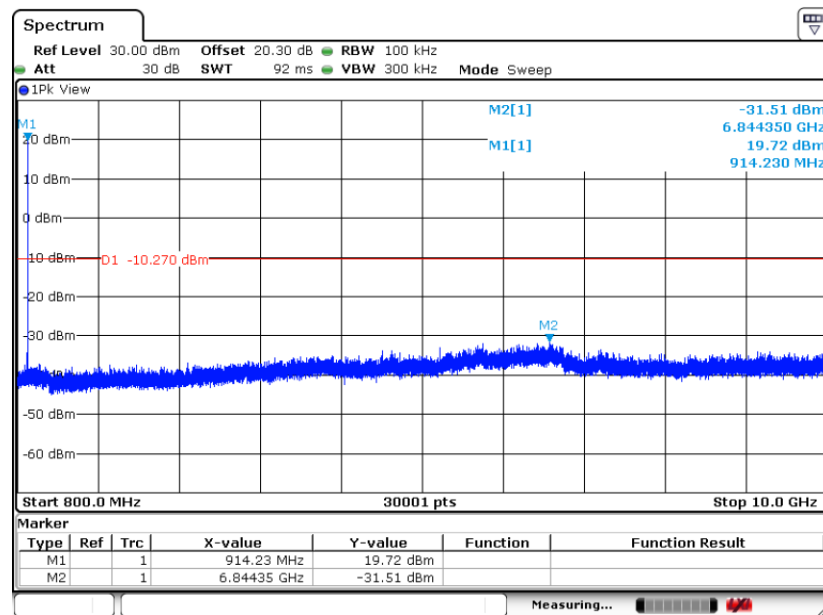


Conducted Spurious Emission Plot on 914.5 MHz



Date: 15.OCT.2025 16:33:58

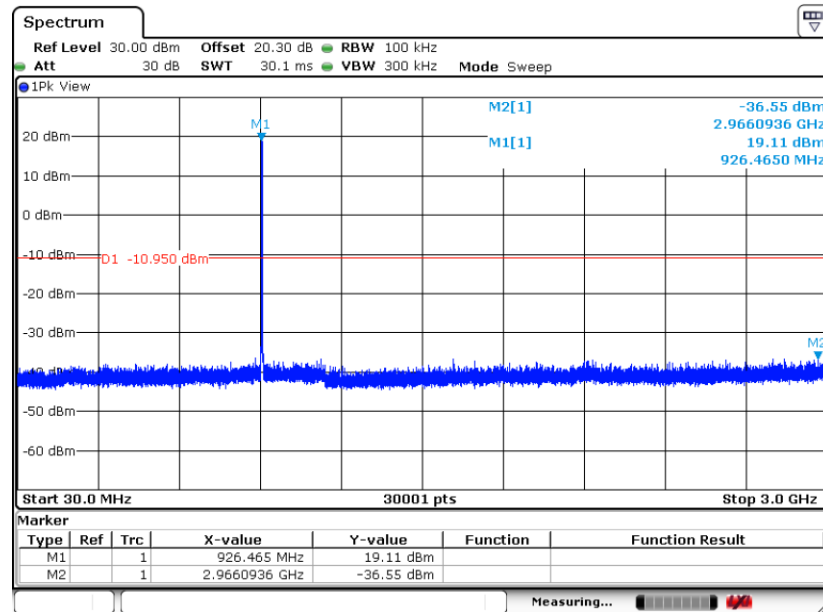
Conducted Spurious Emission Plot on 914.5 MHz



Date: 15.OCT.2025 16:35:00

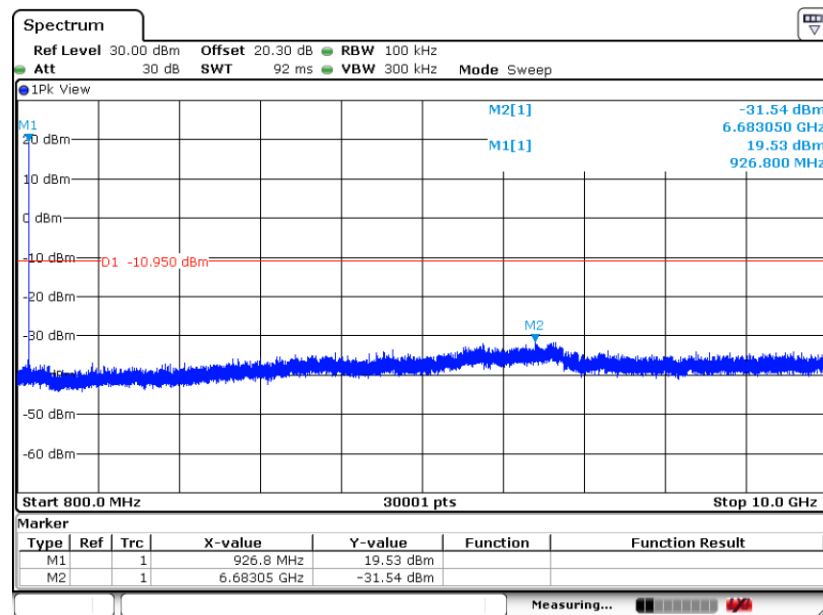


Conducted Spurious Emission Plot on 926.5 MHz



Date: 15.OCT.2025 16:41:24

Conducted Spurious Emission Plot on 926.5 MHz

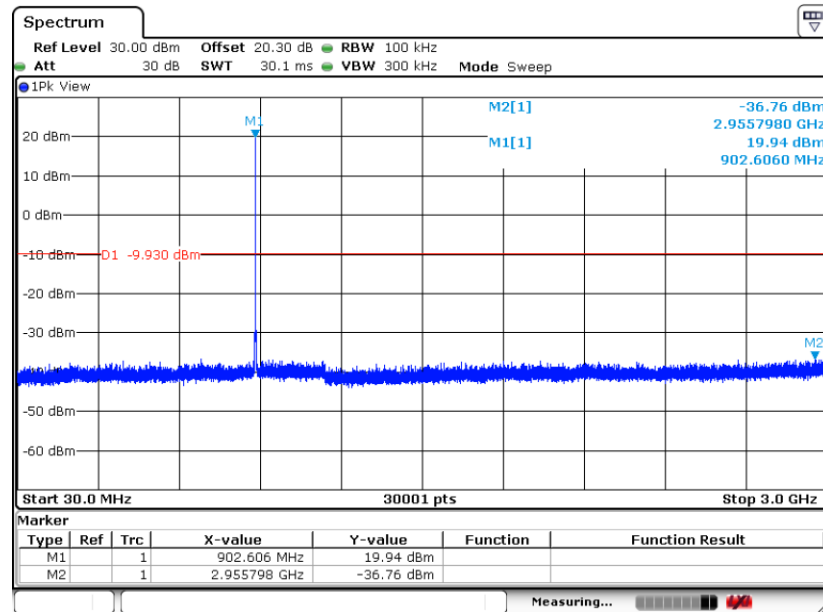


Date: 15.OCT.2025 16:42:14



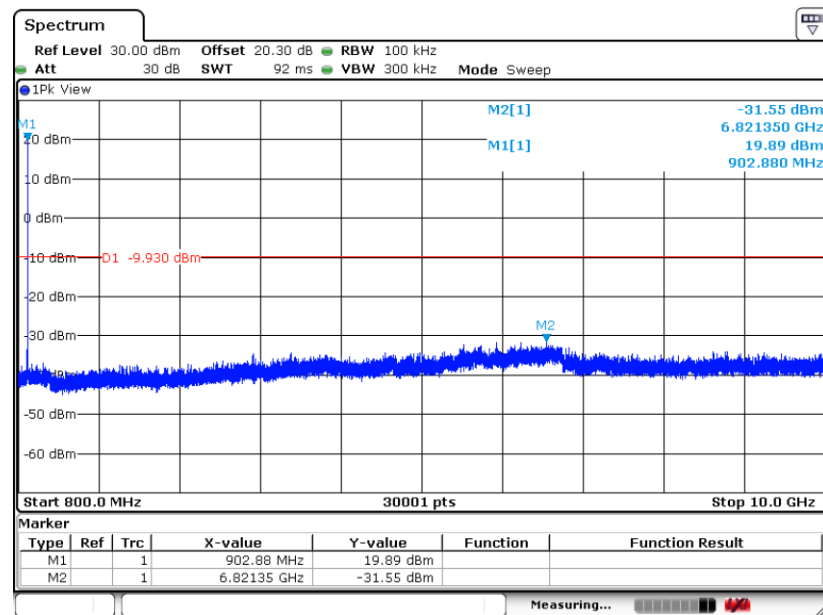
For SF11:

Conducted Spurious Emission Plot on 902.5 MHz



Date: 15.OCT.2025 17:00:03

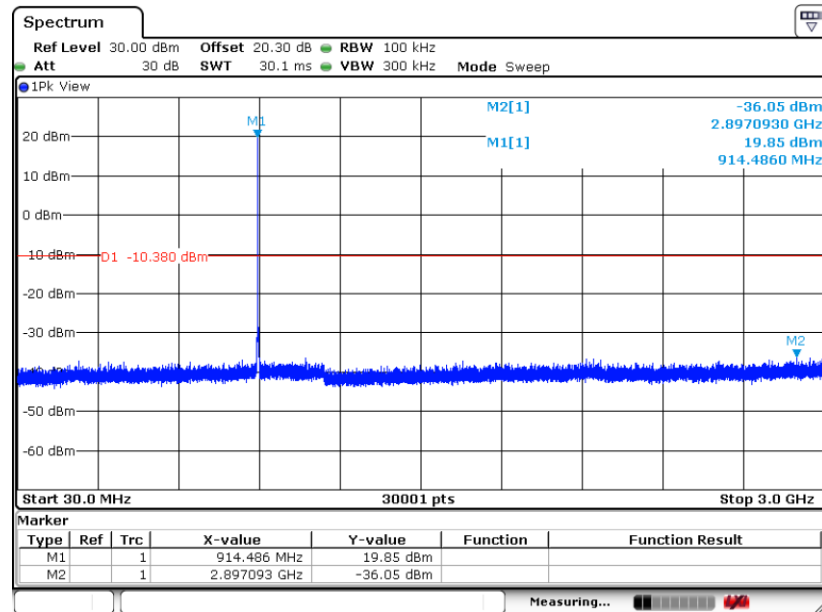
Conducted Spurious Emission Plot on 902.5 MHz



Date: 15.OCT.2025 17:00:56

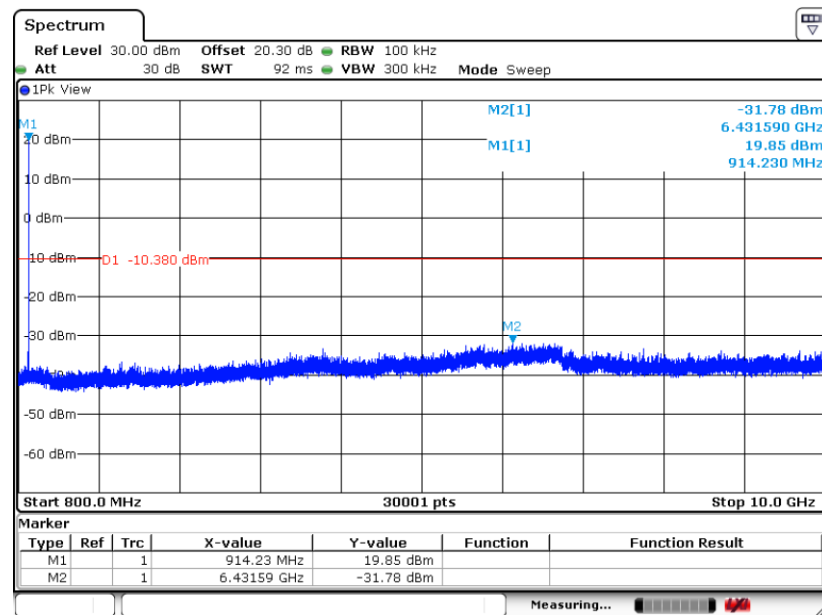


Conducted Spurious Emission Plot on 914.5 MHz



Date: 15.OCT.2025 17:16:46

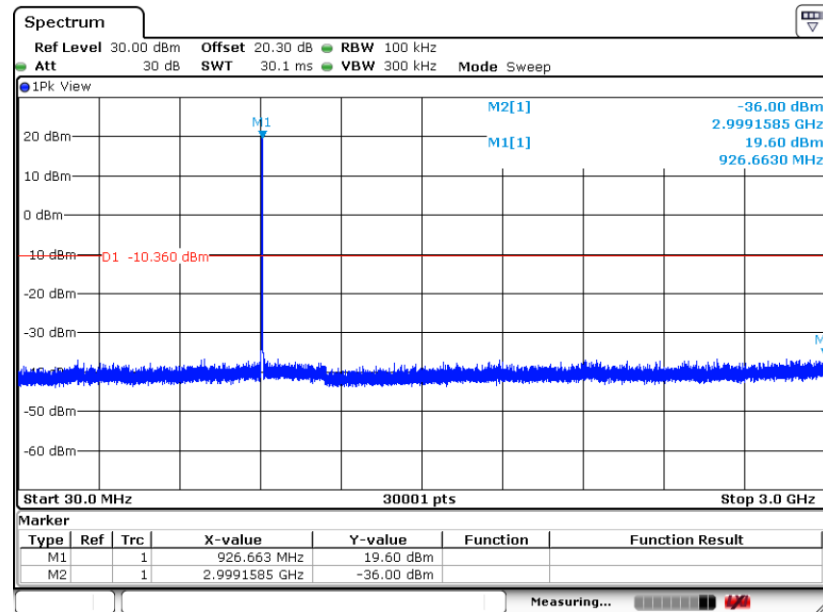
Conducted Spurious Emission Plot on 914.5 MHz



Date: 15.OCT.2025 17:17:56

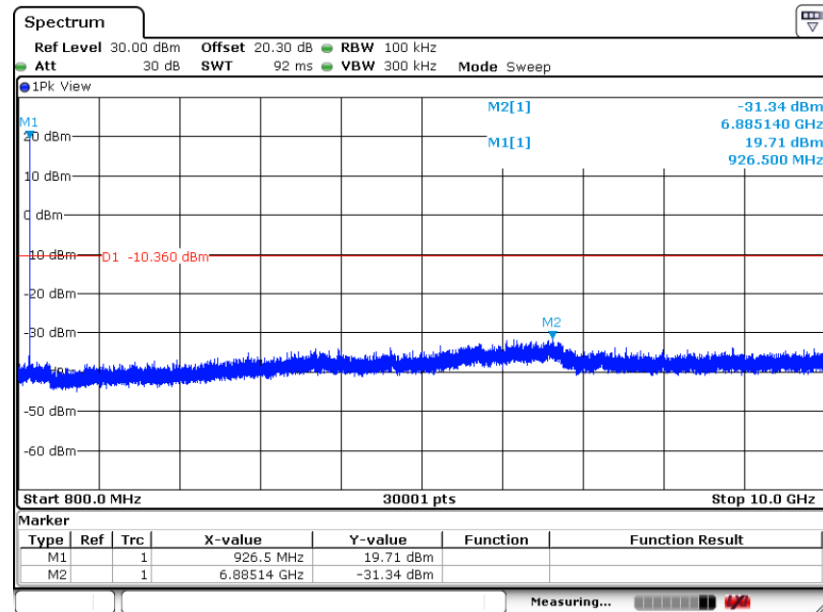


Conducted Spurious Emission Plot on 926.5 MHz



Date: 15.OCT.2025 17:22:49

Conducted Spurious Emission Plot on 926.5 MHz



Date: 15.OCT.2025 17:23:39

3.5 Radiated Spurious Emission Measurement

3.5.1 Limit of Radiated Spurious Emission

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the limits as below.

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
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	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

3.5.2 Measuring Instruments

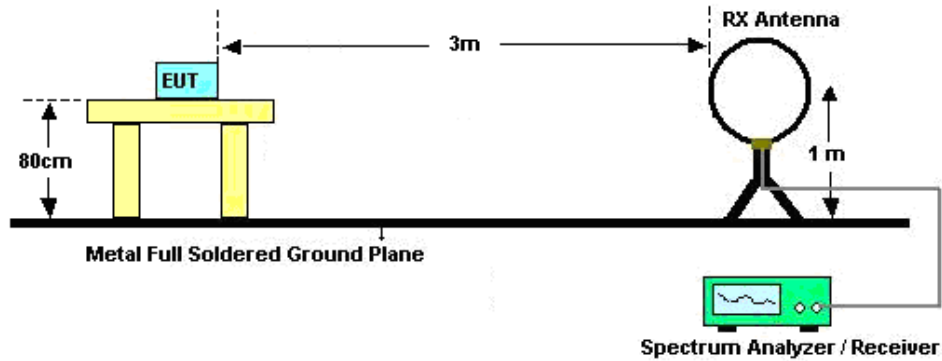
The section 4.0 of List of Measuring Equipment of this test report is used for test.

3.5.3 Test Procedures

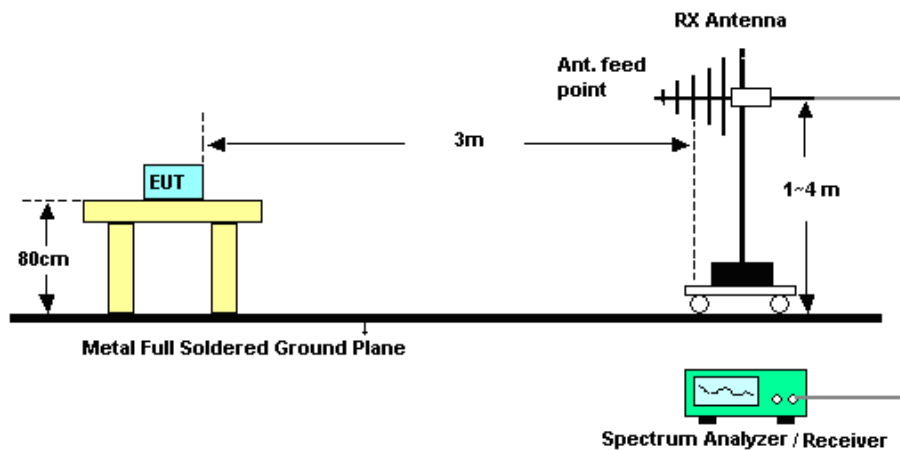
1. The testing follows ANSI C63.10-2020 clause 6.3, 6.5, 6.6, 11.11 and 11.12
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. For testing below 1GHz, if the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the CISPR quasi-peak method and reported.
7. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in average mode also complies with the limit in average mode), then peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
8. Use the following spectrum analyzer settings:
 - (1) Span shall wide enough to fully capture the emission being measured;
 - (2) Set RBW=100 kHz for $f < 1$ GHz; $VBW \geq RBW$; Sweep = auto; Detector function = peak; Trace = max hold;
 - (3) Set RBW = 1 MHz, VBW= 3MHz for $f \geq 1$ GHz for peak measurement.
For average measurement:
 - $VBW = 10$ Hz, when duty cycle is no less than 98 percent.
 - $VBW \geq 1/T$, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

3.5.4 Test Setup

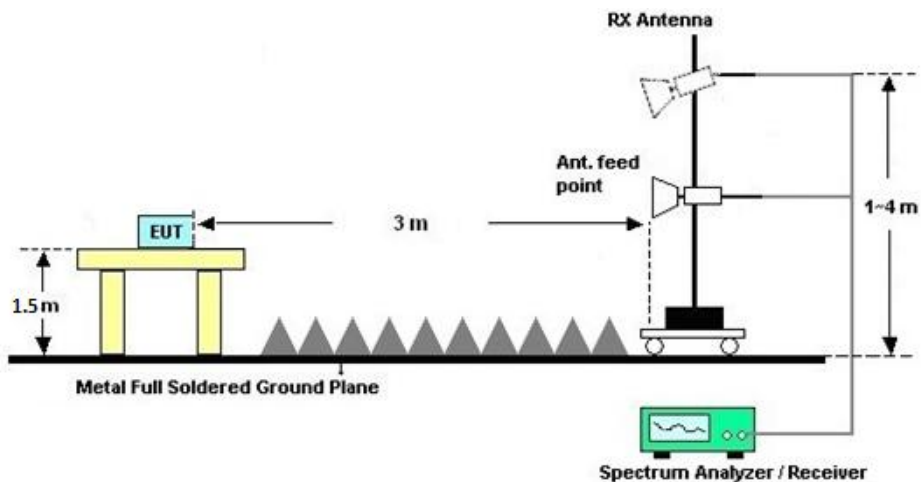
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz





3.5.5 Test Results of Radiated Spurious Emissions (9 kHz ~ 30 MHz)

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

3.5.6 Test Result of Radiated Spurious Emission (30MHz ~ 10th Harmonic)

Please refer to Appendix B&C.

3.5.7 Duty cycle

Please refer to Appendix D.



3.6 Antenna Requirements

3.6.1 Standard Applicable

If directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the rule.

3.6.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.6.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.



4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101078	10Hz~40GHz	Apr. 02, 2025	Oct. 15, 2025~ Dec. 01, 2025	Apr. 01, 2026	Conducted (TH01-SZ)
Pulse Power Sensor	Anritsu	MA2411B	1339473	30MHz~40GHz	Dec. 25, 2024	Oct. 15, 2025~ Dec. 01, 2025	Dec. 24, 2025	Conducted (TH01-SZ)
Power Meter	Anritsu	ML2495A	1218010	50MHz Bandwidth	Oct. 13, 2025	Oct. 15, 2025~ Dec. 01, 2025	Oct. 12, 2026	Conducted (TH01-SZ)
Attenuator	Woken Tech	WK0602-10	4	10dB	Jan. 13, 2025	Oct. 15, 2025~ Dec. 01, 2025	Jan. 12, 2026	Conducted (TH01-SZ)
EMI Test Receiver&SA	KEYSIGHT	N9038A	MY544500 83	20Hz~8.4GHz	Apr. 02, 2025	Nov. 02, 2025~ Dec. 16, 2025	Apr. 01, 2026	Radiation (03CH03-SZ)
EXA Signal Analyzer	KEYSIGHT	N9010B	MY590711 91	10KHz~44GHz	Apr. 02, 2025	Nov. 02, 2025~ Dec. 16, 2025	Apr. 01, 2026	Radiation (03CH03-SZ)
Loop Antenna	R&S	HFH2-Z2E	101141	9kHz~30MHz	Dec. 28, 2024	Nov. 02, 2025~ Dec. 16, 2025	Dec. 27, 2025	Radiation (03CH03-SZ)
Bilog Antenna	TeseQ	CBL6112D	35408	30MHz~2GHz	Aug. 19, 2025	Nov. 02, 2025~ Dec. 16, 2025	Aug. 18, 2026	Radiation (03CH03-SZ)
Double Ridge Guide Antenna	ETS-Lindgren	Burgeon-3117	00240107	1GHz~18GHz	Jul. 13, 2025	Nov. 02, 2025~ Dec. 16, 2025	Jul. 12, 2026	Radiation (03CH03-SZ)
HF Amplifier	MITEQ	TTA1840-35-H G	1871923	18GHz~40GHz	Jul. 03, 2025	Nov. 02, 2025~ Dec. 16, 2025	Jul. 02, 2026	Radiation (03CH03-SZ)
SHF-EHF Horn	com-power	AH-840	101071	18Ghz~40GHz	Apr. 03, 2025	Nov. 02, 2025~ Dec. 16, 2025	Apr. 02, 2027	Radiation (03CH03-SZ)
Amplifier	EM Electronics	EM330	060756	0.01Hz ~3000MHz	Apr. 02, 2025	Nov. 02, 2025~ Dec. 16, 2025	Apr. 01, 2026	Radiation (03CH03-SZ)
HF Amplifier	MITEQ	AMF-7D-00101 800-30-10P-R	1943528	1GHz~18GHz	Oct. 13, 2025	Nov. 02, 2025~ Dec. 16, 2025	Oct. 12, 2026	Radiation (03CH03-SZ)
HF Amplifier	Keysight	83017A	MY532703 57	500MHz~26.5G Hz	Apr. 02, 2025	Nov. 02, 2025~ Dec. 16, 2025	Apr. 01, 2026	Radiation (03CH03-SZ)
AC Power Source	Chroma	61601	616010002 729	N/A	Oct. 17, 2025	Nov. 02, 2025~ Dec. 16, 2025	Oct. 16, 2026	Radiation (03CH03-SZ)
Turn Table	EM	EM1000	N/A	0~360 degree	NCR	Nov. 02, 2025~ Dec. 16, 2025	NCR	Radiation (03CH03-SZ)
Antenna Mast	EM	EM1000	N/A	1 m~4 m	NCR	Nov. 02, 2025~ Dec. 16, 2025	NCR	Radiation (03CH03-SZ)

NCR: No Calibration Required

5 Uncertainty of Evaluation

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI 63.10. All the measurement uncertainty value were shown with a coverage K=2 to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

Uncertainty of Conducted Measurement

Test Item	Uncertainty
Conducted Spurious Emission & Bandedge	± 1.34 dB
Occupied Channel Bandwidth	± 0.012 MHz
Conducted Power	± 1.34 dB
Conducted Power Spectral Density	± 1.32 dB
Frequency	± 1.3 Hz

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	5.0dB
--	-------

Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	4.9dB
--	-------

Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	5.0dB
--	-------

----- THE END -----



Appendix A. Conducted Test Results

LoRa-DTS-Spreading Factor 7

Test Engineer:	Liu Qiu Qiu	Temperature:	20~26	°C
Test Date:	2025/10/15~2025/12/1	Relative Humidity:	40~51	%

TEST RESULTS DATA
6dB and 99% Occupied Bandwidth

Mod.	Channel	Freq. (MHz)	99% Occupied BW (MHz)	6dB BW (MHz)	6dB BW Limit (MHz)	Pass/Fail
SF7	1	902.5MHz	0.48	0.60	0.50	Pass
SF7	16	914.5MHz	0.51	0.63	0.50	Pass
SF7	31	926.5MHz	0.53	0.63	0.50	Pass

TEST RESULTS DATA
Average Power Table

Mod.	Channel	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	Power Setting	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
SF7	1	902.5MHz	0.24	20.10	22.00	30.00	1.41	21.51	36.00	Pass
SF7	16	914.5MHz	0.24	19.80	22.00	30.00	1.41	21.21	36.00	Pass
SF7	31	926.5MHz	0.24	19.20	22.00	30.00	1.41	20.61	36.00	Pass

TEST RESULTS DATA
Power Density

Mod.	Channel	Freq. (MHz)	Duty Factor (dB)	AVG PSD (dBm /3kHz)	DG (dBi)	AVG PSD Limit (dBm /3kHz)	Pass/Fail
SF7	1	902.5MHz	0.24	2.72	1.41	8.00	Pass
SF7	16	914.5MHz	0.24	0.04	1.41	8.00	Pass
SF7	31	926.5MHz	0.24	-0.68	1.41	8.00	Pass

LoRa-DTS-Spreading Factor 8

TEST RESULTS DATA Average Power Table										
Mod.	Channel	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	Power Setting	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
SF8	1	902.5MHz	0.15	19.90	22.00	30.00	1.41	21.31	36.00	Pass
SF8	16	914.5MHz	0.15	19.60	22.00	30.00	1.41	21.01	36.00	Pass
SF8	31	926.5MHz	0.15	19.10	22.00	30.00	1.41	20.51	36.00	Pass

LoRa-DTS-Spreading Factor 9

TEST RESULTS DATA Average Power Table										
Mod.	Channel	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	Power Setting	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
SF9	1	902.5MHz	0.07	19.90	22.00	30.00	1.41	21.31	36.00	Pass
SF9	16	914.5MHz	0.07	19.50	22.00	30.00	1.41	20.91	36.00	Pass
SF9	31	926.5MHz	0.07	19.10	22.00	30.00	1.41	20.51	36.00	Pass

LoRa-DTS-Spreading Factor 10**TEST RESULTS DATA****Average Power Table**

Mod.	Channel	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	Power Setting	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
SF10	1	902.5MHz	0.05	19.90	22.00	30.00	1.41	21.31	36.00	Pass
SF10	16	914.5MHz	0.05	19.50	22.00	30.00	1.41	20.91	36.00	Pass
SF10	31	926.5MHz	0.05	19.10	22.00	30.00	1.41	20.51	36.00	Pass

LoRa-DTS-Spreading Factor 11**TEST RESULTS DATA**
6dB and 99% Occupied Bandwidth

Mod.	Channel	Freq. (MHz)	99% Occupied BW (MHz)	6dB BW (MHz)	6dB BW Limit (MHz)	Pass/Fail
SF11	1	902.5Mhz	0.52	0.64	0.50	Pass
SF11	16	914.5Mhz	0.52	0.64	0.50	Pass
SF11	31	926.5MHz	0.52	0.65	0.50	Pass

TEST RESULTS DATA
Average Power Table

Mod.	Channel	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	Power Setting	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
SF11	1	902.5Mhz	0.00	20.00	22.00	30.00	1.41	21.41	36.00	Pass
SF11	16	914.5MHz	0.00	19.70	22.00	30.00	1.41	21.11	36.00	Pass
SF11	31	926.5MHz	0.00	19.50	22.00	30.00	1.41	20.91	36.00	Pass

TEST RESULTS DATA
Power Density

Mod.	Channel	Freq. (MHz)	Duty Factor (dB)	AVG PSD (dBm /3kHz)	DG (dBi)	AVG PSD Limit (dBm /3kHz)	Pass/Fail
SF11	1	902.5Mhz	0.00	0.69	1.41	8.00	Pass
SF11	16	914.5MHz	0.00	-0.51	1.41	8.00	Pass
SF11	31	926.5MHz	0.00	-0.54	1.41	8.00	Pass



Appendix B. Radiated Spurious Emission

LoRa DTS SF=7(Harmonic @ 3m)

	Note	Frequency	Level	Margin	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
		(MHz)	(dBμV/m)	(dB)	Line (dBμV/m)	Level (dBμV)	Factor (dB/m)	Loss (dB)	Factor (dB)	Pos (cm)	Pos (deg)	Avg. (P/A)	(H/V)
902.5MHz		1805	48.13	-37.32	85.45	68.76	30.63	6.64	57.9	-	-	P	H
		2707.5	45.82	-28.18	74	62.77	32.28	8.61	57.84	100	251	P	H
		2707.5	37.31	-16.69	54	54.26	32.28	8.61	57.84	100	251	A	H
		3610	44.5	-29.5	74	59.91	32.93	9.66	58	-	-	P	H
		1805	43.2	-33.0	76.20	63.83	30.63	6.64	57.9	-	-	P	V
		2707.5	47.31	-26.69	74	64.26	32.28	8.61	57.84	142	159	P	V
		2707.5	37.98	-16.02	54	54.93	32.28	8.61	57.84	142	159	A	V
		3610	43.03	-30.97	74	58.44	32.93	9.66	58	-	-	P	V
914.5MHz		1829	48.59	-36.72	85.31	69	30.77	6.72	57.9	-	-	P	H
		2743.5	46.44	-27.56	74	63.42	32.25	8.62	57.85	115	88	P	H
		2743.5	37.14	-16.86	54	54.12	32.25	8.62	57.85	115	88	A	H
		3658	42.62	-31.38	74	57.98	33	9.64	58	-	-	P	H
		1829	47.34	-28.62	75.96	67.75	30.77	6.72	57.9	-	-	P	V
		2743.5	47.65	-26.35	74	64.63	32.25	8.62	57.85	100	163	P	V
		2743.5	38.08	-15.92	54	55.06	32.25	8.62	57.85	100	163	A	V
		3658	43.04	-30.96	74	58.4	33	9.64	58	-	-	P	V
926.5MHz		1853	43.63	-41.21	84.84	63.83	30.9	6.8	57.9	-	-	P	H
		2779.5	46.51	-27.49	74	63.52	32.22	8.63	57.86	125	142	P	H
		2779.5	36.79	-17.21	54	53.8	32.22	8.63	57.86	125	142	A	H
		3706	41.91	-32.09	74	57.2	33.1	9.61	58	-	-	P	H
		1853	39.84	-34.79	74.63	60.04	30.9	6.8	57.9	-	-	P	V
		2779.5	47.19	-26.81	74	64.2	32.22	8.63	57.86	136	255	P	V
		2779.5	37.23	-16.77	54	54.24	32.22	8.63	57.86	136	255	A	V
		3706	42.04	-31.96	74	57.33	33.1	9.61	58	-	-	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



LoRa DTS SF=11(Harmonic @ 3m)

	Note	Frequency	Level	Margin	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
					Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
902.5MHz		1805	47.59	-38.13	85.72	68.22	30.63	6.64	57.9	-	-	P	H
		2707.5	46.73	-27.27	74	63.68	32.28	8.61	57.84	124	184	P	H
		2707.5	36.73	-17.27	54	53.68	32.28	8.61	57.84	124	184	A	H
		3610	43.21	-30.79	74	58.62	32.93	9.66	58	-	-	P	H
		1805	43.53	-32.28	75.81	64.16	30.63	6.64	57.9	-	-	P	V
		2707.5	47.31	-26.69	74	64.26	32.28	8.61	57.84	104	177	P	V
		2707.5	37.07	-16.93	54	54.02	32.28	8.61	57.84	104	177	A	V
		3610	42.91	-31.09	74	58.32	32.93	9.66	58	-	-	P	V
914.5MHz		2743.5	46.27	-27.73	74	63.25	32.25	8.62	57.85	104	15	P	H
		2743.5	36.72	-17.28	54	53.7	32.25	8.62	57.85	104	15	A	H
		3658	42.02	-31.98	74	57.38	33	9.64	58	-	-	P	H
		2743.5	46.82	-27.18	74	63.8	32.25	8.62	57.85	132	254	P	V
		2743.5	37.48	-16.52	54	54.46	32.25	8.62	57.85	132	254	A	V
		3658	42.59	-31.41	74	57.95	33	9.64	58	-	-	P	V
926.5MHz		1853	46.52	-38.35	84.87	66.72	30.9	6.8	57.9	-	-	P	H
		2779.5	46.45	-27.55	74	63.46	32.22	8.63	57.86	115	32	P	H
		2779.5	36.61	-17.39	54	53.62	32.22	8.63	57.86	115	32	A	H
		3706	42.42	-31.58	74	57.71	33.1	9.61	58	-	-	P	H
		1853	44.37	-30.83	75.20	64.57	30.9	6.8	57.9	-	-	P	V
		2779.5	46.77	-27.23	74	63.78	32.22	8.63	57.86	166	294	P	V
		2779.5	37.2	-16.8	54	54.21	32.22	8.63	57.86	166	294	A	V
		3706	41.99	-32.01	74	57.28	33.1	9.61	58	-	-	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



<30M-1G>

LoRa DTS SF=7(LF @ 3m)

	Note	Frequency	Level	Margin	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
		(MHz)	(dBμV/m)	(dB)	Line (dBμV/m)	Level (dBμV)	Factor (dB/m)	Loss (dB)	Factor (dB)	Pos (cm)	Pos (deg)	Avg. (P/A)	(H/V)
902.5MHz		134.76	21.61	-21.89	43.5	36.31	17.96	2.24	34.9	-	-	P	H
		281.23	23.46	-22.54	46	36.23	18.83	3.14	34.74	-	-	P	H
	*	870.02	41.28	-44.17	85.45	41.81	29.1	4.4	34.03	-	-	P	H
		902.5	115.45	----	----	115.89	29.14	4.42	34	-	-	P	H
		120.21	20.75	-22.75	43.5	36.76	16.74	2.15	34.9	-	-	P	V
		280.26	23.88	-22.12	46	36.7	18.79	3.13	34.74	-	-	P	V
	*	902.5	106.2	----	----	106.64	29.14	4.42	34	-	-	P	V
914.5MHz		134.76	21.09	-22.41	43.5	35.79	17.96	2.24	34.9	-	-	P	H
		283.17	24.52	-21.48	46	37.29	18.83	3.14	34.74	-	-	P	H
	*	914.5	115.31	----	----	115.52	29.34	4.45	34	-	-	P	H
		132.82	21.38	-22.12	43.5	36.21	17.84	2.23	34.9	-	-	P	V
		277.35	22.91	-23.09	46	35.89	18.65	3.12	34.75	-	-	P	V
	*	914.5	105.96	----	----	106.17	29.34	4.45	34	-	-	P	V
926.5MHz		137.67	21.36	-22.14	43.5	35.8	18.2	2.26	34.9	-	-	P	H
		284.14	23.24	-22.76	46	35.89	18.93	3.15	34.73	-	-	P	H
	*	804.06	49.65	-35.19	84.84	50.38	28.98	4.39	34.1	-	-	P	H
		926.5	114.84	----	----	114.65	29.72	4.47	34	-	-	P	H
		938.89	49.63	-35.21	84.84	49.12	30.02	4.49	34	-	-	P	H
		137.67	21.85	-21.65	43.5	36.29	18.2	2.26	34.9	-	-	P	V
		285.11	23.4	-22.6	46	36.02	18.96	3.15	34.73	-	-	P	V
		804.06	45.42	-29.21	74.63	46.15	28.98	4.39	34.1	-	-	P	V
		926.5	104.63	----	----	104.44	29.72	4.47	34	-	-	P	V
	*	938.89	43.04	-31.59	74.63	42.53	30.02	4.49	34	-	-	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



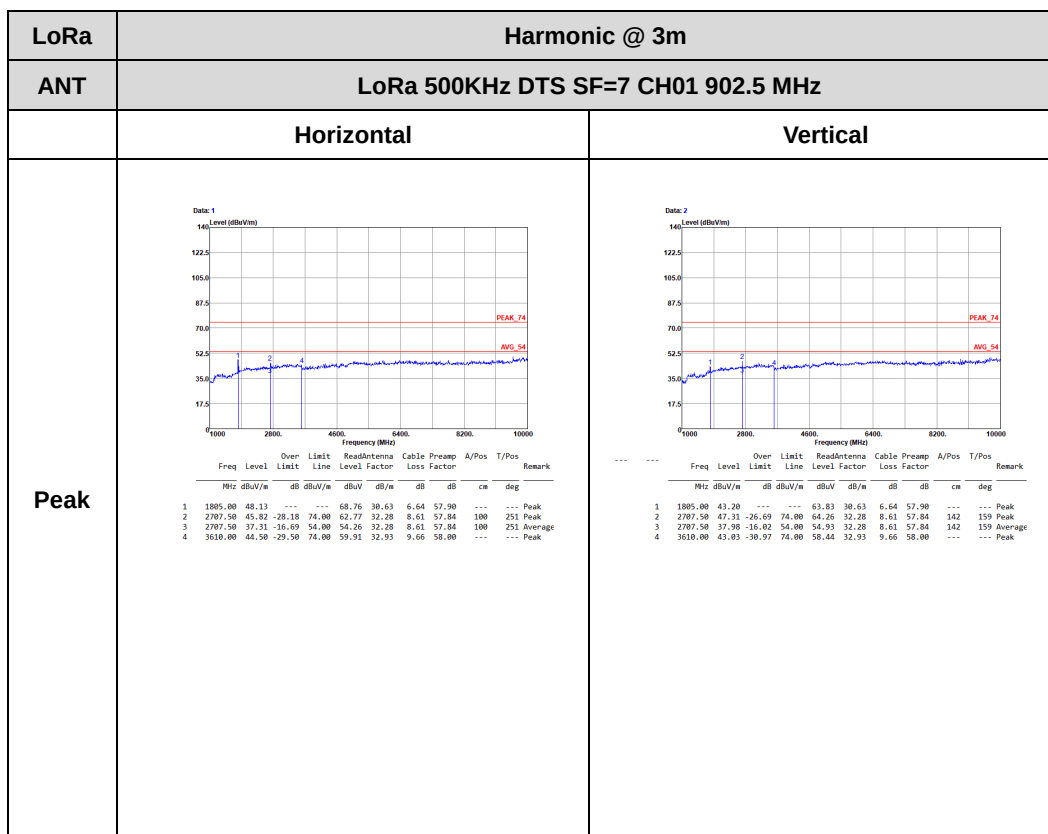
LoRa DTS SF=11(LF @ 3m)

	Note	Frequency	Level	Margin	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
					Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
902.5MHz		134.76	21.65	-21.85	43.5	36.35	17.96	2.24	34.9	-	-	P	H
		265.71	22.91	-23.09	46	36.33	18.28	3.07	34.77	-	-	P	H
	*	870.02	41.81	-43.91	85.72	42.34	29.1	4.4	34.03	-	-	P	H
		902.5	115.72	----	----	116.16	29.14	4.42	34	-	-	P	H
		934.04	47.01	-38.71	85.72	46.62	29.91	4.48	34	-	-	P	H
		134.76	20.95	-22.55	43.5	35.65	17.96	2.24	34.9	-	-	P	V
		279.29	23.52	-22.48	46	36.37	18.76	3.13	34.74	-	-	P	V
	*	902.5	105.81	----	----	106.25	29.14	4.42	34	-	-	P	V
914.5MHz		136.7	21.67	-21.83	43.5	36.25	18.07	2.25	34.9	-	-	P	H
		278.32	23.33	-22.67	46	36.27	18.68	3.12	34.74	-	-	P	H
	*	914.5	115.31	----	----	115.52	29.34	4.45	34	-	-	P	H
		137.67	22.12	-21.38	43.5	36.63	18.13	2.26	34.9	-	-	P	V
		274.44	23.73	-22.27	46	36.82	18.55	3.11	34.75	-	-	P	V
	*	914.5	105.81	----	----	106.02	29.34	4.45	34	-	-	P	V
926.5MHz		134.76	22	-21.5	43.5	36.7	17.96	2.24	34.9	-	-	P	H
		244.37	23.08	-22.92	46	37.38	17.53	2.98	34.81	-	-	P	H
	*	894.27	41.01	-43.86	84.87	41.51	29.09	4.42	34.01	-	-	P	H
		926.5	114.87	----	----	114.68	29.72	4.47	34	-	-	P	H
		938.89	51.03	-33.84	84.87	50.52	30.02	4.49	34	-	-	P	H
		136.7	21.31	-22.19	43.5	35.84	18.12	2.25	34.9	-	-	P	V
		285.11	24.03	-21.97	46	36.65	18.96	3.15	34.73	-	-	P	V
		926.5	105.2	----	----	105.01	29.72	4.47	34	-	-	P	V
	*	938.89	42.04	-33.16	75.2	41.53	30.02	4.49	34	-	-	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

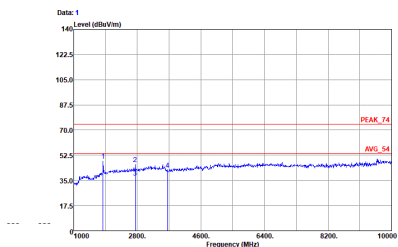
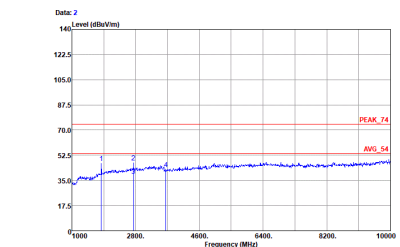


Appendix C. Radiated Spurious Emission Plots

LoRa 500KHz DTS SF=7 (Harmonic @ 3m)





LoRa	Harmonic @ 3m																																																																																																																																																							
ANT	LoRa 500KHz DTS SF=7 CH16 914.5 MHz																																																																																																																																																							
	Horizontal						Vertical																																																																																																																																																	
Peak	Date: 1  <table><tr><th></th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th></tr><tr><th>Freq</th><th>Level</th><th>Line</th><th>Level</th><th>Factor</th><th>Loss</th><th>Factor</th><th></th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dB/m</th><th>dB</th><th>dB</th><th></th></tr><tr><td>1</td><td>1829.00</td><td>48.59</td><td>---</td><td>69.00</td><td>30.77</td><td>6.72</td><td>57.90</td><td>---</td><td>Peak</td></tr><tr><td>2</td><td>2743.50</td><td>46.44</td><td>-27.56</td><td>74.00</td><td>63.42</td><td>32.25</td><td>8.62</td><td>57.85</td><td>115</td><td>88</td><td>Peak</td></tr><tr><td>3</td><td>2743.50</td><td>37.14</td><td>-16.86</td><td>54.00</td><td>54.12</td><td>32.25</td><td>8.62</td><td>57.85</td><td>115</td><td>88</td><td>Average</td></tr><tr><td>4</td><td>3658.00</td><td>42.62</td><td>-31.38</td><td>74.00</td><td>57.98</td><td>33.00</td><td>9.64</td><td>58.00</td><td>---</td><td>---</td><td>Peak</td></tr></table>							Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Freq	Level	Line	Level	Factor	Loss	Factor		MHz	dBuV/m	dB	dBuV/m	dB/m	dB	dB		1	1829.00	48.59	---	69.00	30.77	6.72	57.90	---	Peak	2	2743.50	46.44	-27.56	74.00	63.42	32.25	8.62	57.85	115	88	Peak	3	2743.50	37.14	-16.86	54.00	54.12	32.25	8.62	57.85	115	88	Average	4	3658.00	42.62	-31.38	74.00	57.98	33.00	9.64	58.00	---	---	Peak	Date: 2  <table><tr><th></th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th></tr><tr><th>Freq</th><th>Level</th><th>Line</th><th>Level</th><th>Factor</th><th>Loss</th><th>Factor</th><th></th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dB/m</th><th>dB</th><th>dB</th><th></th></tr><tr><td>1</td><td>1829.00</td><td>47.34</td><td>---</td><td>67.75</td><td>30.77</td><td>6.72</td><td>57.90</td><td>---</td><td>Peak</td></tr><tr><td>2</td><td>2743.50</td><td>47.65</td><td>-26.35</td><td>74.00</td><td>64.63</td><td>32.25</td><td>8.62</td><td>57.85</td><td>100</td><td>163</td><td>Peak</td></tr><tr><td>3</td><td>2743.50</td><td>38.00</td><td>-15.92</td><td>54.00</td><td>55.00</td><td>32.25</td><td>8.62</td><td>57.85</td><td>100</td><td>163</td><td>Average</td></tr><tr><td>4</td><td>3658.00</td><td>43.04</td><td>-30.96</td><td>74.00</td><td>58.40</td><td>33.00</td><td>9.64</td><td>58.00</td><td>---</td><td>---</td><td>Peak</td></tr></table>							Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark	Freq	Level	Line	Level	Factor	Loss	Factor		MHz	dBuV/m	dB	dBuV/m	dB/m	dB	dB		1	1829.00	47.34	---	67.75	30.77	6.72	57.90	---	Peak	2	2743.50	47.65	-26.35	74.00	64.63	32.25	8.62	57.85	100	163	Peak	3	2743.50	38.00	-15.92	54.00	55.00	32.25	8.62	57.85	100	163	Average	4	3658.00	43.04	-30.96	74.00	58.40	33.00	9.64	58.00	---	---	Peak
		Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark																																																																																																																																																
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2	2743.50	46.44	-27.56	74.00	63.42	32.25	8.62	57.85	115	88	Peak																																																																																																																																													
3	2743.50	37.14	-16.86	54.00	54.12	32.25	8.62	57.85	115	88	Average																																																																																																																																													
4	3658.00	42.62	-31.38	74.00	57.98	33.00	9.64	58.00	---	---	Peak																																																																																																																																													
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1	1829.00	47.34	---	67.75	30.77	6.72	57.90	---	Peak																																																																																																																																															
2	2743.50	47.65	-26.35	74.00	64.63	32.25	8.62	57.85	100	163	Peak																																																																																																																																													
3	2743.50	38.00	-15.92	54.00	55.00	32.25	8.62	57.85	100	163	Average																																																																																																																																													
4	3658.00	43.04	-30.96	74.00	58.40	33.00	9.64	58.00	---	---	Peak																																																																																																																																													



LoRa	Harmonic @ 3m																																																																																																																	
ANT	LoRa 500KHz DTS SF=7 CH31 926.5 MHz																																																																																																																	
	Horizontal	Vertical																																																																																																																
Peak	Date: 1 <table><tr><th></th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th></tr><tr><th></th><th>Freq</th><th>Level</th><th>Line</th><th>Level</th><th>Factor</th><th>Loss</th><th>Factor</th></tr><tr><th></th><th>MHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dB/m</th><th>dB</th><th>dB</th></tr><tr><td>1</td><td>1853.00</td><td>43.63</td><td>---</td><td>63.83</td><td>30.90</td><td>6.80</td><td>57.90</td></tr><tr><td>2</td><td>2779.50</td><td>46.51</td><td>-27.49</td><td>74.00</td><td>63.52</td><td>32.22</td><td>8.63</td></tr><tr><td>3</td><td>2779.50</td><td>36.79</td><td>-17.21</td><td>54.00</td><td>53.80</td><td>32.22</td><td>8.63</td></tr><tr><td>4</td><td>3706.00</td><td>41.91</td><td>-32.09</td><td>74.00</td><td>57.20</td><td>33.10</td><td>9.61</td></tr></table>		Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark		Freq	Level	Line	Level	Factor	Loss	Factor		MHz	dBuV/m	dB	dBuV/m	dB/m	dB	dB	1	1853.00	43.63	---	63.83	30.90	6.80	57.90	2	2779.50	46.51	-27.49	74.00	63.52	32.22	8.63	3	2779.50	36.79	-17.21	54.00	53.80	32.22	8.63	4	3706.00	41.91	-32.09	74.00	57.20	33.10	9.61	Date: 2 <table><tr><th></th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th></tr><tr><th></th><th>Freq</th><th>Level</th><th>Line</th><th>Level</th><th>Factor</th><th>Loss</th><th>Factor</th></tr><tr><th></th><th>MHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dB/m</th><th>dB</th><th>dB</th></tr><tr><td>1</td><td>1853.00</td><td>44.84</td><td>---</td><td>65.04</td><td>30.90</td><td>6.80</td><td>57.90</td></tr><tr><td>2</td><td>2779.50</td><td>47.19</td><td>-26.81</td><td>74.00</td><td>64.20</td><td>32.22</td><td>8.63</td></tr><tr><td>3</td><td>2779.50</td><td>37.23</td><td>-16.77</td><td>54.00</td><td>54.24</td><td>32.22</td><td>8.63</td></tr><tr><td>4</td><td>3706.00</td><td>42.04</td><td>-31.96</td><td>74.00</td><td>57.33</td><td>33.10</td><td>9.61</td></tr></table>		Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark		Freq	Level	Line	Level	Factor	Loss	Factor		MHz	dBuV/m	dB	dBuV/m	dB/m	dB	dB	1	1853.00	44.84	---	65.04	30.90	6.80	57.90	2	2779.50	47.19	-26.81	74.00	64.20	32.22	8.63	3	2779.50	37.23	-16.77	54.00	54.24	32.22	8.63	4	3706.00	42.04	-31.96	74.00	57.33	33.10	9.61
	Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark																																																																																																											
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LoRa 500KHz DTS SF=11 (Harmonic @ 3m)

LoRa	Harmonic @ 3m										
ANT	LoRa 500KHz DTS SF=11 CH01 902.5 MHz										
	Horizontal										
	Vertical										
Peak	Date: 1 Level (dBuV/m)										



LoRa	Harmonic @ 3m																																																											
ANT	LoRa 500KHz DTS SF=11 CH16 914.5 MHz																																																											
	Horizontal											Vertical																																																
Peak	Date: 1 Level (dBuV/m) 140 122.5 105.0 87.5 70.0 52.5 35.0 17.5 01000200040006000800010000 Frequency (MHz) PEAK_74 AVG_54 <table><tr><th></th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th></tr><tr><th></th><th>Freq</th><th>Level</th><th>Line</th><th>Level</th><th>Factor</th><th>Loss</th><th>Factor</th></tr><tr><th></th><th>MHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dBuV</th><th>dB/m</th><th>dB</th></tr><tr><td>1</td><td>2743.58</td><td>46.27</td><td>-27.73</td><td>74.00</td><td>63.25</td><td>32.25</td><td>8.62 57.85 104 15 Peak</td></tr><tr><td>2</td><td>2743.58</td><td>36.72</td><td>-17.28</td><td>54.00</td><td>53.70</td><td>32.25</td><td>8.62 57.85 104 15 Average</td></tr><tr><td>3</td><td>3658.00</td><td>42.02</td><td>-31.98</td><td>74.00</td><td>57.38</td><td>33.00</td><td>9.64 58.00 --- --- Peak</td></tr></table>													Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark		Freq	Level	Line	Level	Factor	Loss	Factor		MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	1	2743.58	46.27	-27.73	74.00	63.25	32.25	8.62 57.85 104 15 Peak	2	2743.58	36.72	-17.28	54.00	53.70	32.25	8.62 57.85 104 15 Average	3	3658.00	42.02	-31.98	74.00	57.38	33.00	9.64 58.00 --- --- Peak
		Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark																																																				
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	2	2743.58	36.72	-17.28	54.00	53.70	32.25	8.62 57.85 104 15 Average																																																				
	3	3658.00	42.02	-31.98	74.00	57.38	33.00	9.64 58.00 --- --- Peak																																																				
	Date: 2 Level (dBuV/m) 140 122.5 105.0 87.5 70.0 52.5 35.0 17.5 01000200040006000800010000 Frequency (MHz) PEAK_74 AVG_54 <table><tr><th></th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th></tr><tr><th></th><th>Freq</th><th>Level</th><th>Line</th><th>Level</th><th>Factor</th><th>Loss</th><th>Factor</th></tr><tr><th></th><th>MHz</th><th>dBuV/m</th><th>dB</th><th>dBuV/m</th><th>dBuV</th><th>dB/m</th><th>dB</th></tr><tr><td>1</td><td>2743.58</td><td>46.82</td><td>-27.18</td><td>74.00</td><td>63.80</td><td>32.25</td><td>8.62 57.85 132 254 Peak</td></tr><tr><td>2</td><td>2743.58</td><td>37.48</td><td>-16.52</td><td>54.00</td><td>54.46</td><td>32.25</td><td>8.62 57.85 132 254 Average</td></tr><tr><td>3</td><td>3658.00</td><td>42.59</td><td>-31.41</td><td>74.00</td><td>57.95</td><td>33.00</td><td>9.64 58.00 --- --- Peak</td></tr></table>													Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark		Freq	Level	Line	Level	Factor	Loss	Factor		MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	1	2743.58	46.82	-27.18	74.00	63.80	32.25	8.62 57.85 132 254 Peak	2	2743.58	37.48	-16.52	54.00	54.46	32.25	8.62 57.85 132 254 Average	3	3658.00	42.59	-31.41	74.00	57.95	33.00	9.64 58.00 --- --- Peak
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LoRa	Harmonic @ 3m											
ANT	LoRa 500KHz DTS SF=11 CH31 926.5 MHz											
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Peak	Date: 1 Level (dBuV/m) <											

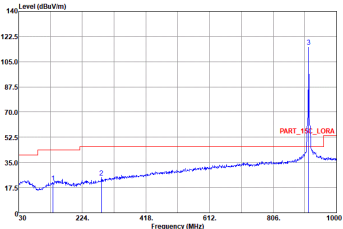
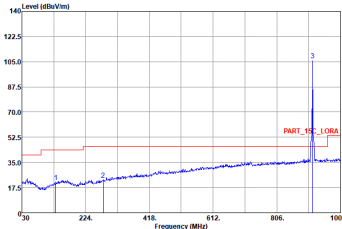


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LoRa 500KHz DTS SF=7 (LF @ 3m)

LoRa	LF @ 3m																																																																																																	
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Peak	Data: 1 Level (dBuV/m) Frequency (MHz) PART_03C_1.03A <table><tr><th></th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th></tr><tr><th></th><th>Freq</th><th>Level</th><th>Line</th><th>Level Factor</th><th>Loss Factor</th><th></th><th></th></tr><tr><td>1</td><td>134.76</td><td>21.61</td><td>-21.89</td><td>43.50</td><td>36.31</td><td>17.96</td><td>2.24 34.90 --- --- Peak</td></tr><tr><td>2</td><td>281.23</td><td>23.46</td><td>-22.54</td><td>46.00</td><td>36.23</td><td>18.83</td><td>3.14 34.74 --- --- Peak</td></tr><tr><td>3</td><td>879.82</td><td>41.28</td><td>-----</td><td>41.81</td><td>29.18</td><td>4.40</td><td>34.03 --- --- Peak</td></tr><tr><td>4</td><td>902.50</td><td>115.45</td><td>-----</td><td>115.89</td><td>29.14</td><td>4.42</td><td>34.00 --- --- Peak</td></tr><tr><td>5</td><td>934.04</td><td>48.14</td><td>-----</td><td>47.75</td><td>29.91</td><td>4.48</td><td>34.00 --- --- Peak</td></tr></table>		Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark		Freq	Level	Line	Level Factor	Loss Factor			1	134.76	21.61	-21.89	43.50	36.31	17.96	2.24 34.90 --- --- Peak	2	281.23	23.46	-22.54	46.00	36.23	18.83	3.14 34.74 --- --- Peak	3	879.82	41.28	-----	41.81	29.18	4.40	34.03 --- --- Peak	4	902.50	115.45	-----	115.89	29.14	4.42	34.00 --- --- Peak	5	934.04	48.14	-----	47.75	29.91	4.48	34.00 --- --- Peak	Data: 2 Level (dBuV/m) Frequency (MHz) PART_03C_1.03A <table><tr><th></th><th>Over</th><th>Limit</th><th>ReadAntenna</th><th>Cable Preamp</th><th>A/Pos</th><th>T/Pos</th><th>Remark</th></tr><tr><th></th><th>Freq</th><th>Level</th><th>Line</th><th>Level Factor</th><th>Loss Factor</th><th></th><th></th></tr><tr><td>1</td><td>120.21</td><td>20.75</td><td>-22.75</td><td>43.50</td><td>36.76</td><td>16.74</td><td>2.15 34.90 --- --- Peak</td></tr><tr><td>2</td><td>280.26</td><td>23.88</td><td>-22.12</td><td>46.00</td><td>36.70</td><td>18.79</td><td>3.13 34.74 --- --- Peak</td></tr><tr><td>3</td><td>902.50</td><td>106.20</td><td>-----</td><td>106.64</td><td>29.14</td><td>4.42</td><td>34.00 --- --- Peak</td></tr></table>		Over	Limit	ReadAntenna	Cable Preamp	A/Pos	T/Pos	Remark		Freq	Level	Line	Level Factor	Loss Factor			1	120.21	20.75	-22.75	43.50	36.76	16.74	2.15 34.90 --- --- Peak	2	280.26	23.88	-22.12	46.00	36.70	18.79	3.13 34.74 --- --- Peak	3	902.50	106.20	-----	106.64	29.14	4.42	34.00 --- --- Peak
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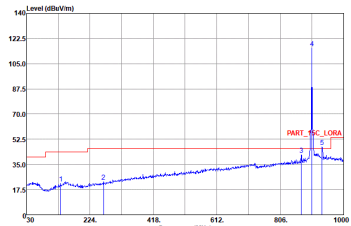
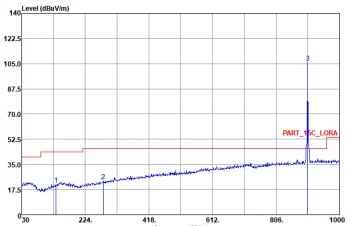
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ANT	LoRa 500KHz DTS SF=7 CH16 914.5MHz																																																																						
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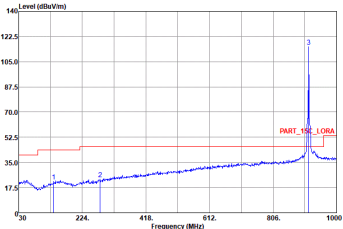
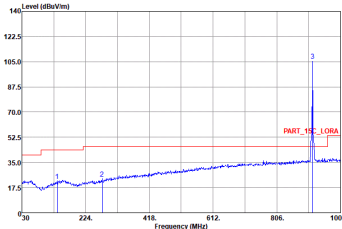
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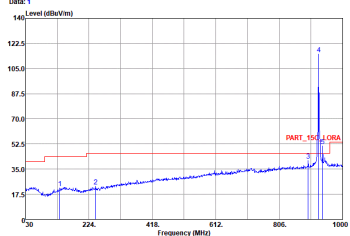
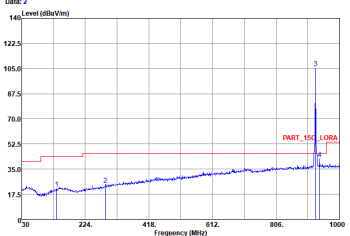
LoRa 500KHz DTS SF=11 (LF @ 3m)

LoRa	LF @ 3m																																																																																																																																							
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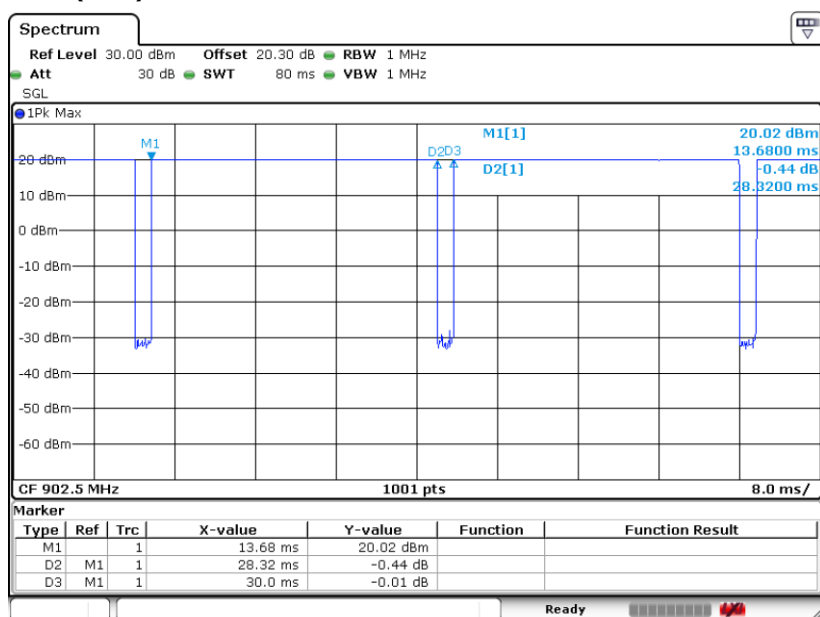
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Appendix D. Duty Cycle Plots

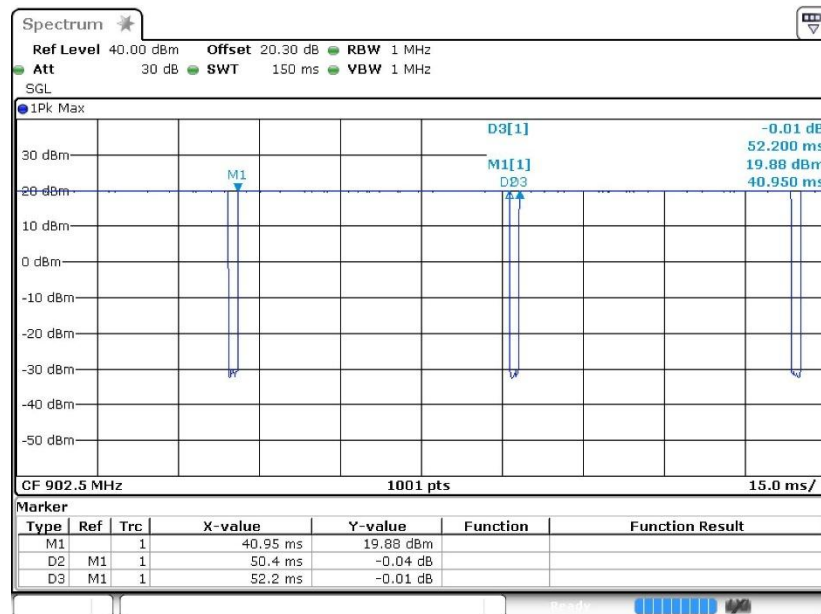
Band	Duty Cycle (%)	VBW Setting (Hz)	Duty Factor (dB)
LoRa(DTS)SF7	94.40	100	0.24
LoRa(DTS)SF8	96.55	-	0.15
LoRa(DTS)SF9	98.39	-	0.07
LoRa(DTS)SF10	98.91	-	0.05
LoRa(DTS)SF11	100	10	0

LoRa(DTS)SF 7

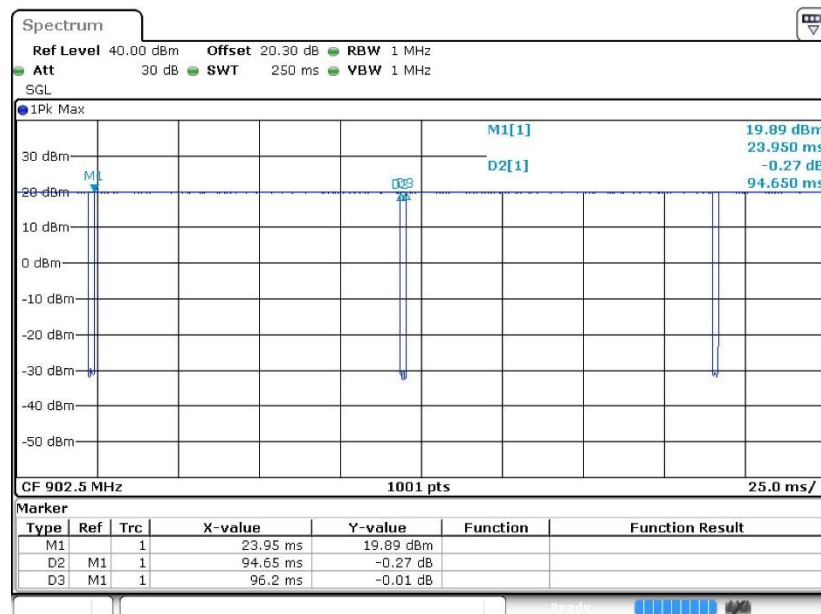




LoRa(DTS)SF 8

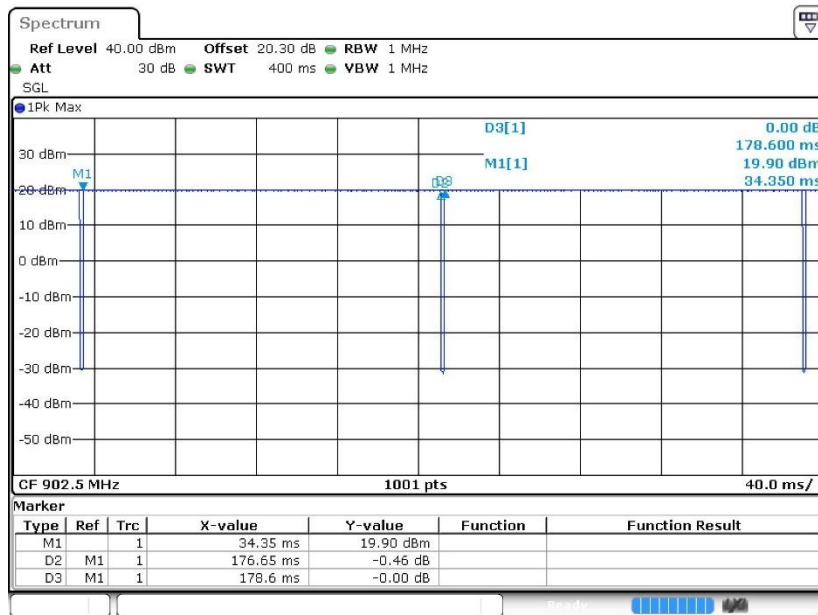


LoRa(DTS)SF 9





LoRa(DTS)SF 10



LoRa(DTS)SF 11

