FCC/ISED Test Report

Product Name	:	Module
Brand Name	:	AirPrime
Model No.	:	HL7812
FCC ID	:	N7NHL78C
IC	:	2417C-HL78C

Applicant	:	Sierra Wireless, Inc.
Address	:	13811 Wireless Way, Richmond, BC V6V 3A4, Canada

Date of Receipt	:	Mar. 16, 2022
Issued Date	:	Sep. 30, 2022
Report No.	:	2230599R-RFUSOTHV13-B
Report Version	:	V3.0

The test results relate only to the samples tested.
The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.
This report must not be used to claim product endorsement by TAF or any agency of the government.
Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

Product Name	:	Module
Applicant	:	Sierra Wireless, Inc.
Address	:	13811 Wireless Way, Richmond, BC V6V 3A4, Canada
Manufacturer	:	Sierra Wireless, Inc.
Address	:	13811 Wireless Way, Richmond, BC V6V 3A4, Canada
Brand Name	:	AirPrime
Model No.	:	HL7812
FCC ID	:	N7NHL78C
IC	:	2417C-HL78C
EUT Voltage	:	DC 2.8~4.35V (host equipment)
Testing Voltage	:	DC 3.7V
Applicable Standard	:	FCC CFR Title 47 Part 22 Subpart H FCC CFR Title 47 Part 24 Subpart E FCC CFR Title 47 Part 27 Subpart F, Subpart L, Subpart P FCC CFR Title 47 Part 90 Subpart S RSS-130 Issue 2 RSS-132 Issue 3 RSS-133 Issue 6 RSS-139 Issue 3 RSS-199 Issue 3 RSS-Gen Issue 5 ANSI/TIA-603-E-2016 ANSI C63.26-2015
Laboratory Name	:	DEKRA Testing and Certification Co., Ltd. Hsin Chu Laboratory
Address	:	No.372-2, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County 310, Taiwan, R.O.C.
Test Result	:	Complied

Documented By : Hailey Peng

(Hailey Peng / Senior Engineer)

Approved By : Rueyyan.Lin

(Rueyyan Lin / Supervisor)

The test results relate only to the samples tested.

Revision History

Version	Description	Issued Date
V1.0	Initial issue of report	Jul. 27, 2022
V2.0	Revised the product name to “Module”.	Aug. 19, 2022
V3.0	Adding the verify results of LTE Band 2, LTE Band 4, LTE Band 5, LTE Band 12, LTE Band 13, LTE Band 25, LTE Band 26, LTE Band 66, and the worst result of original report is selected to verify radiated spurious emission test and record in the report.	Sep. 30, 2022

TABLE OF CONTENTS

1. General Information

1.1. EUT Description

Product Name	Module
Brand Name	AirPrime
Model No.	HL7812
Uplink Frequency Range (MHz)	LTE Band 2: 1850~1910 LTE Band 4: 1710~1755 LTE Band 5: 824~849 LTE Band 8: 897.5~900.5 (FCC only) LTE Band 12: 699~716 LTE Band 13: 777~787 LTE Band 25: 1850~1915 LTE Band 26: 814~849 (ISED Not support 814~824MHz) LTE Band 66: 1710~1780 LTE Band 85: 698 ~716
Downlink Frequency Range (MHz)	LTE Band 2: 1930~1990 LTE Band 4: 2110~2115 LTE Band 5: 869~894 LTE Band 8: 925~960 (FCC only) LTE Band 12: 729~746 LTE Band 13: 746~756 LTE Band 25: 1930~1995 LTE Band 26: 859~894 LTE Band 66: 2110~2200 LTE Band 85: 728 ~ 746
Bandwidth (MHz)	LTE Band 2: 1.4 / 3 / 5 / 10 / 15 / 20 LTE Band 4: 1.4 / 3 / 5 / 10 / 15 / 20 LTE Band 5: 1.4 / 3 / 5 / 10 LTE Band 8: 1.4 / 3 (FCC only) LTE Band 12: 1.4 / 3 / 5 / 10 LTE Band 13: 5 / 10 LTE Band 25: 1.4 / 3 / 5 / 10 / 15 / 20 LTE Band 26: 1.4 / 3 / 5 / 10 / 15 LTE Band 66: 1.4 / 3 / 5 / 10 / 15 / 20 LTE Band 85: 5 / 10
Function	Cat-M1
	NB-IoT
Type of Modulation	Cat-M1: QPSK / 16QAM
	NB-IoT: BPSK / QPSK
Hardware Version	1.0
Software Version	HL78xx.5.4.10.0
IMEI No.	356240280000359

Antenna Information				
Ant.	Brand Name	Model No.	Type	Antenna Gain (dBi)
0	Pulse	SPDA24700/2700	Dipole	2
1	Pulse	SPDA24700/2700	Dipole	2

Note:

1. Regarding frequency band operation, the lowest, middle and highest frequency of channel were selected to perform the test, and the details were shown on this report.
2. The EUT description is from the customer declaration.
3. The manufacturer declares that this device (Model: HL7812) uses only 897.5 ~ 900.5 MHz in Band 8.
4. The device was tested under all bandwidths, RB configurations and modulations, and the worst case was found in BPSK / QPSK modulation and show in “Conducted Band Edge” & “Spurious Emission”.

1.2. Mode of Operation

DEKRA has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Test Mode	Mode 1: Cat-M1 Band 8 (FCC only) Mode 2: Cat-M1 Band 85 Mode 3: NB-IoT Band 8 (FCC only) Mode 4: NB-IoT Band 85 Mode 5: Cat-M1 Band 2 Mode 6: Cat-M1 Band 4 Mode 7: Cat-M1 Band 5 Mode 8: Cat-M1 Band 12 Mode 9: Cat-M1 Band 13 Mode 10: Cat-M1 Band 25 Mode 11: Cat-M1 Band 26 (Part 22) Mode 12: Cat-M1 Band 26 (Part 90) Mode 13: Cat-M1 Band 66 Mode 14: NB-IoT Band 2 Mode 15: NB-IoT Band 4 Mode 16: NB-IoT Band 5 Mode 17: NB-IoT Band 12 Mode 18: NB-IoT Band 13 Mode 19: NB-IoT Band 25 Mode 20: NB-IoT Band 26 (Part 22) Mode 21: NB-IoT Band 26 (Part 90) Mode 22: NB-IoT Band 66

Note:

1. Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. The difference compared to the DEKRA Project No.: 19C0344R (FCC ID: N7NHL7802, IC: 2417C-HL7802) is the add in LTE Band 8 (FCC only) and LTE Band 85.
   After evaluating as below:
   (a) For LTE Band 8 (FCC only) and LTE Band 85: Add all test result and record in the report.
   (b) For other Band: The worst result of DEKRA Project No.: 19C0344R (FCC ID: N7NHL7802, IC: 2417C-HL7802) is selected to verify radiated spurious emission test and record in the report.

1.3. Comments and Remarks

The product specification and testing instructions for the EUT declared in the report are provided by the manufacturer who will take all responsibilities for the accuracy.

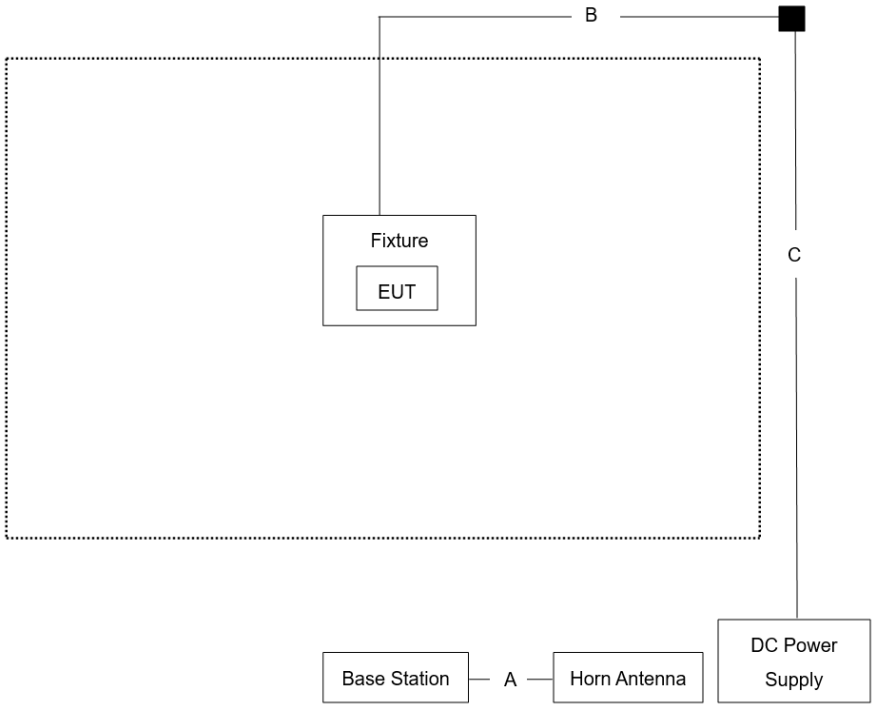
1.4. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system.

Product		Manufacturer	Model No.	Serial No.
1	Fixture	AirPrime	HL7812	N/A
2	DC Power Supply	Topward	6030D	809508
3	Horn Antenna	Schwarzbeck	BBHA 9120D	1640
4	Base Station	R&S	CMW500	157118

1.5. Configuration of Tested System

Connection Diagram



Signal Cable Type		Signal cable Description
A	RF Cable*1	Shielded, 6m
B	DC Cable*2	Non-shielded, 1m
C	DC Cable*2	Non-shielded, 6m

1.6. EUT Operation of during Test

1	Setup the EUT and Base station as shown on.
2	Turn on the power of all equipment.
3	Configure test mode, test channel and data rate.
4	Keep the EUT and base station in Link mode.
5	Repeat the above procedure (3&4).

2. Technical Test

2.1. Summary of Test Result

☒ No deviations from the test standards

☐ Deviations from the test standards as below description:

<For FCC>

LTE Band 2			
FCC Part 24 Subpart E			
Performed Item	FCC Reference Section	Limit	Result
Spurious Emission	§2.1053 §24.238	< -13 dBm	Pass

Note: Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

LTE Band 4			
FCC Part 27 Subpart L			
Performed Item	FCC Reference Section	Limit	Result
Spurious Emission	§27.53	< -13 dBm	Pass

Note: Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

LTE Band 5			
FCC Part 22 Subpart H			
Performed Item	FCC Reference Section	Limit	Result
Spurious Emission	§22.917	< -13 dBm	Pass

Note: Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

LTE Band 8			
FCC Part 27 Subpart P			
Performed Item	FCC Reference Section	Limit	Result
RF Output Power	§2.1046 §27.1507	< 3 Watts ERP	Pass
Occupied Bandwidth	§2.1049	N/A	Pass
Peak to Average Ratio	§27.1507	< 13 dB	Pass
Conducted Band Edge	§2.1051 §27.1509	< -13dBm	Pass
Spurious Emission	§2.1053 §27.1509	< -13dBm	Pass
Frequency Stability	§2.1055 §27.54	± 2.5 ppm	Pass

Note: Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

LTE Band 12			
FCC Part 27 Subpart F			
Performed Item	FCC Reference Section	Limit	Result
Spurious Emission	§27.53	< -13dBm	Pass

Note: Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

LTE Band 13			
FCC Part 27 Subpart F			
Performed Item	FCC Reference Section	Limit	Result
Spurious Emission	§27.53	< -13 dBm < −70 dBW/MHz e.i.r.p. of all emissions, including harmonics in the band 1559-1610 MHz	Pass

Note: Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

LTE Band 25			
FCC Part 24 Subpart E			
Performed Item	FCC Reference Section	Limit	Result
Spurious Emission	§27.238	< -13 dBm	Pass

Note: Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

LTE Band 26			
FCC Part 22 Subpart H FCC Part 90 Subpart S			
Performed Item	FCC Reference Section	Limit	Result
Spurious Emission	§90.691 §22.917	< -13 dBm	Pass

Note: Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

LTE Band 66			
FCC Part 27 Subpart L			
Performed Item	FCC Reference Section	Limit	Result
Spurious Emission	§27.53	< -13 dBm	Pass

Note: Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

LTE Band 85			
FCC Part 27 Subpart F			
Performed Item	FCC Reference Section	Limit	Result
RF Output Power	§2.1046 §27.50	< 3 Watts	Pass
Occupied Bandwidth	§2.1049	N/A	Pass
Peak to Average Ratio	§27.50	< 13 dB	Pass
Conducted Band Edge	§2.1051 §27.53	< -13dBm	Pass
Spurious Emission	§2.1053 §27.53	< -13dBm	Pass
Frequency Stability	§2.1055 §27.54	± 2.5 ppm	Pass

Note: Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

<For ISED>

LTE Band 2			
RSS-133, RSS-GEN			
Performed Item	IC Reference Section	Limit	Result
Spurious Emission	§6.5	< -13 dBm	Pass

Note: Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

LTE Band 4			
RSS-139, RSS-GEN			
Performed Item	IC Reference Section	Limit	Result
Spurious Emission	§6.6	< -13 dBm	Pass

Note: Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

LTE Band 5			
RSS-132, RSS-GEN			
Performed Item	IC Reference Section	Limit	Result
Spurious Emission	§5.5	< -13 dBm	Pass

Note: Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

LTE Band 12			
RSS-130, RSS-GEN			
Performed Item	IC Reference Section	Limit	Result
Spurious Emission	§4.6	< -13 dBm	Pass

Note: Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

LTE Band 13			
RSS-130, RSS-GEN			
Performed Item	IC Reference Section	Limit	Result
Spurious Emission	§4.6	< -13 dBm	Pass

Note: Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

LTE Band 25			
RSS-133, RSS-GEN			
Performed Item	IC Reference Section	Limit	Result
Spurious Emission	§6.5	< -13 dBm	Pass

Note: Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

LTE Band 26 (Uplink: Not support 814-824MHz)			
RSS-132, RSS-GEN			
Performed Item	IC Reference Section	Limit	Result
Spurious Emission	§5.5	< -13 dBm	Pass

Note: Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

LTE Band 66			
RSS-199, RSS-GEN			
Performed Item	IC Reference Section	Limit	Result
Spurious Emission	§6.6	< -13 dBm	Pass

Note: Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

LTE Band 85			
RSS-130, RSS-GEN			
Performed Item	IC Reference Section	Limit	Result
RF Output Power	§4.6	< 3 Watts E.R.P for portable equipment or for indoor fixed subscriber equipment	Pass
Occupied Bandwidth	RSS-GEN §6.7	N/A	Pass
Peak to Average Ratio	§4.6	< 13 dB	Pass
Conducted Band Edge	§4.7	< -13dBm	Pass
Spurious Emission	§4.7	< -13dBm	Pass
Frequency Stability	§4.5	Within the frequency range	Pass

Note: Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.2. Test Environment

Ambient conditions in the laboratory:

Items	Test Item	Actually	Tested by	Test Date	Test Site
Temperature (°C)	RF Output Power	22	Clemens Fang	2022/04/15	HC-SR12
Humidity (%RH)		68			
Temperature (°C)	Occupied Bandwidth	22	Clemens Fang	2022/04/16	HC-SR12
Humidity (%RH)		67			
Temperature (°C)	Peak to Average Ratio	22	Clemens Fang	2022/04/16 ~ 2022/04/18	HC-SR12
Humidity (%RH)		67 ~ 68			
Temperature (°C)	Conducted Band Edge	22	Clemens Fang	2022/04/15 ~ 2022/04/20	HC-SR12
Humidity (%RH)		68			
Temperature (°C)	Conducted Spurious Emission	22	Clemens Fang	2022/04/16 ~ 2022/04/18	HC-SR12
Humidity (%RH)		67 ~ 68			
Temperature (°C)	Radiated Spurious Emission for mode 1 ~ mode 4	23.2	Cyril Chen	2022/04/12	HC-CB02
Humidity (%RH)		60			
Temperature (°C)	Radiated Spurious Emission for mode 5 ~ mode 22	23	Cyril Chen	2022/09/26	HC-CB02
Humidity (%RH)		61			
Temperature (°C)	Frequency Stability	21	Clemens Fang	2022/04/19	HC-SR12
Humidity (%RH)		69			

Note: Test site information refers to Laboratory Information.

Laboratory Information

USA	**:**	**FCC Registration Number: TW3024**
Canada		**CAB identifier : TW3024**

The address and introduction of DEKRA Testing and Certification Co., Ltd. laboratories can be founded in our Web site: http://www.dekra.com.tw

If you have any comments, please don't hesitate to contact us. Our test sites as below:

Test Laboratory	DEKRA Testing and Certification Co., Ltd.
Address	1. No.372-2, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County 31061, Taiwan, R.O.C. 2. No.372, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County 31061, Taiwan, R.O.C.
Phone number	1. +886-3-582-8001 2. +886-3-582-8001
Fax number	1. +886-3-582-8958 2. +886-3-582-8958
E mail address	info.tw@dekra.com
Website	http://www.dekra.com.tw
Note: Test site for address 1 includes HC-SR02. Test site for address 2 includes HC-CB02, HC-CB03, HC-CB04, HC-SR10 and HC-SR12.	

2.3. List of Test Equipment

HC-SR12

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
High Speed Peak Power Meter Dual Input	Anritsu	ML2496A	1602004	2021/11/12	2022/11/11
Pulse Power Sensor	Anritsu	MA2411B	1531043	2021/11/12	2022/11/11
EXA Signal Analyzer	Keysight	N9010A	MY51440132	2022/01/07	2023/01/06
Pulse Power Sensor	Anritsu	MA2411B	1531044	2021/11/12	2022/11/11
Spectrum Analyzer	Keysight	N9010B	MY57110159	2022/03/15	2023/03/14
Signal and Spectrum Analyzer	R&S	FSVA40	101435	2021/06/04	2022/06/03
Temperature & Humidity Test Chamber	KSON	THS-B4T-150	A0401	2021/12/16	2022/12/15
Wireless Conn. Tester	R&S	CMW500	157118	2021/07/07	2022/07/06

HC-CB02

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Signal Analyzer	R&S	FSVA40	101455	2021/10/22	2022/10/21
EXA Signal Analyzer	Keysight	N9010A	MY51440132	2022/01/07	2023/01/06
Trilog Broadband Antenna	Schwarzbeck	VULB 9168	1209	2021/05/28	2022/05/27
Trilog Broadband Antenna	Schwarzbeck	VULB 9168	1272	2022/05/19	2023/05/18
Horn Antenna	Schwarzbeck	BBHA 9120D	639	2021/05/17	2022/05/16
Horn Antenna	Schwarzbeck	BBHA 9120D	639	2022/05/06	2023/05/05
Horn Antenna	Schwarzbeck	BBHA 9170	202	2021/12/01	2022/11/30
Pre-Amplifier	EMCI	EMC01820I	980364	2021/08/27	2022/08/26
Pre-Amplifier	EMCI	EMC01820I	980365	2022/04/15	2023/04/14
Pre-Amplifier	EMEC	EM01G18GA	060741	2021/07/02	2022/07/01
Pre-Amplifier	EMEC	EM01G18GA	060741	2022/05/06	2023/05/05
Pre-Amplifier	DEKRA	AP-400C	201801231	2021/12/24	2022/12/23
Wireless Conn. Tester	R&S	CMW500	157118	2021/07/07	2022/07/06
Coaxial Cable(13m)	Suhner	SF104	HC-CB02	2021/08/17	2022/08/16
Coaxial Cable(13m)	Suhner	SF104	HC-CB02	2022/08/15	2023/08/14
Coaxial Cable(3m)	Suhner,Rosnol	SF102_UP0264	HC-CB02_1	2021/08/17	2022/08/16
Coaxial Cable(3m)	Suhner,Rosnol	SF102_UP0264	HC-CB02_1	2022/08/14	2023/08/13
Radiated Software	AUDIX	e3 V9	HC-CB02	N/A	N/A

Note: All equipment upon which need to calibrated are with calibration period of 1 year.

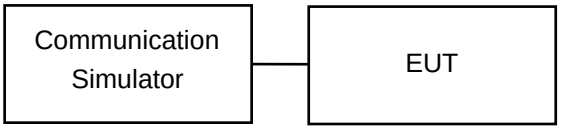
2.4. Measurement Uncertainty

Uncertainties have been calculated according to the DEKRA internal document with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2).

Test Item	Uncertainty
RF Output Power	± 1.16 dB
Occupied Bandwidth	± 217.9 Hz
Peak to Average Ratio	± 1.16 dB
Conducted Band Edge	± 1.16 dB
Spurious Emissions	± 3.25 dB below 1 GHz ± 3.32 dB above 1 GHz
Frequency Stability	± 217.9 Hz

3. RF Output Power

3.1. Test Setup



3.2. Test Procedure

The EUT makes a call to the communication simulator. The communication simulator station system controlled a EUT to export maximum conducted RF output power under transmission mode and specific channel frequency. The relevant equation for determining the ERP or EIRP from the conducted RF output power measured using the guidance provided above is:

$$ERP \text{ or } EIRP = P_{Meas} + G_T - L_C$$

where:

ERP or EIRP = effective radiated power or equivalent isotropically radiated power, respectively (expressed in the same units as PMeas, typically dBW or dBm);

P_{Meas} = measured transmitter output power or PSD, in dBm or dBW;

G_T = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);

L_C = signal attenuation in the connecting cable between the transmitter and antenna, in dB

3.3. Test Methodology and Reference Procedures

KDB 971168 D01 Power Meas License Digital Systems v03r01

ANSI C63.26-2015

3.4. Test Result of RF Output Power

Mode 1: Cat-M1 Band 8 (FCC only)

Band	Channel Freq. (MHz)	Modulation	RB No.	RB Offset	NB Position	Conducted Output Power (dBm)	RF Output Power (W) ERP	Limit (W) ERP
Band 8 1.4 MHz	21632 898.2	QPSK	1	0	Low	23.72	0.228	3
			6	0		22.12	0.157	3
		16-QAM	1	0		22.08	0.156	3
			5	0		21.37	0.132	3
	21640 899	QPSK	1	0		23.65	0.224	3
			6	0		22.09	0.156	3
		16-QAM	1	0		22.07	0.156	3
			5	0		21.32	0.131	3
	21648 899.8	QPSK	1	5	Low	23.82	0.233	3
			6	0		21.63	0.141	3
		16-QAM	1	5		22.48	0.171	3
			5	1		21.61	0.140	3
Band 8 3 MHz	21640 899	QPSK	1	0	Low	23.83	0.233	3
			6	0		21.78	0.146	3
		16-QAM	1	0		22.50	0.172	3
			5	0		21.69	0.143	3
		QPSK	1	5	High	23.76	0.230	3
			6	0		21.65	0.141	3
		16-QAM	1	5		22.45	0.170	3
			5	1		21.66	0.142	3

Note:

1. RF Output Power (W) ERP = Conducted Output Power (dBm) + Antenna Gain (dBi) - 2.15 dB

2. Power (W)= $(10^{(\text{Power(dBm)}/10)})*10^{-3}$

Mode 2: Cat-M1 Band 85

Band	Channel Freq. (MHz)	Modulation	RB No.	RB Offset	NB Position	Conducted Output Power (dBm)	RF Output Power (W) ERP	Limit (W) ERP
Band 85 5 MHz	134027 700.5	QPSK	1	0	Low	23.65	0.224	3
			6	0		22.87	0.187	3
		16-QAM	1	0		23.63	0.223	3
			5	0		21.64	0.141	3
	134092 707	QPSK	1	0		23.66	0.224	3
			6	0		22.91	0.189	3
		16-QAM	1	0		23.60	0.221	3
			5	0		22.00	0.153	3
	134157 713.5	QPSK	1	5	High	23.67	0.225	3
			6	0		22.93	0.190	3
		16-QAM	1	5		23.65	0.224	3
			5	1		21.74	0.144	3
Band 85 10 MHz	134052 703	QPSK	1	0	Low	23.66	0.224	3
			6	0		22.89	0.188	3
		16-QAM	1	0		23.60	0.221	3
			5	0		22.57	0.175	3
	134092 707	QPSK	1	0		23.68	0.225	3
			6	0		22.85	0.186	3
		16-QAM	1	0		23.65	0.224	3
			5	0		22.64	0.177	3
	134132 711	QPSK	1	5	High	23.79	0.231	3
			6	0		22.96	0.191	3
		16-QAM	1	5		23.77	0.230	3
			5	1		22.75	0.182	3

Note:

1. RF Output Power (W) ERP = Conducted Output Power (dBm) + Antenna Gain (dBi) - 2.15 dB

2. Power (W)= $(10^{(\text{Power(dBm)}/10)})*10^{-3}$

Mode 3: NB-IoT Band 8 (FCC only)

Channel	Frequency (MHz)	Modulation	BW (kHz)	RB No.	RB Offset	Conducted Output Power (dBm)	RF Output Power (W) ERP	Limit (W) ERP
21627	897.7	BPSK	3.75	1	0	24.22	0.255	3
			15	1	0	22.92	0.189	3
		QPSK	3.75	1	0	24.28	0.259	3
			15	1	0	22.88	0.187	3
				12	0	22.01	0.153	3
21640	899	BPSK	3.75	1	0	24.19	0.254	3
			15	1	0	23.03	0.194	3
		QPSK	3.75	1	0	24.24	0.256	3
			15	1	0	23.00	0.193	3
				12	0	22.03	0.154	3
21653	900.3	BPSK	3.75	1	47	24.20	0.254	3
			15	1	11	23.83	0.233	3
		QPSK	3.75	1	47	24.27	0.258	3
			15	1	11	23.76	0.230	3
				12	0	22.02	0.154	3

Note:

1. RF Output Power (W) ERP = Conducted Output Power (dBm) + Antenna Gain (dBi) - 2.15 dB

2. Power (W)= $(10^{(Power(dBm)/10)})*10^{-3}$

Mode 4: NB-IoT Band 85

Channel	Frequency (MHz)	Modulation	BW (kHz)	RB No.	RB Offset	Conducted Output Power (dBm)	RF Output Power (W) ERP	Limit (W) ERP
134004	698.2	BPSK	3.75	1	0	23.53	0.218	3
			15	1	0	23.03	0.194	3
		QPSK	3.75	1	0	23.56	0.219	3
			15	1	0	22.95	0.191	3
				12	0	22.12	0.157	3
134082	706	BPSK	3.75	1	0	24.03	0.244	3
			15	1	0	23.01	0.193	3
		QPSK	3.75	1	0	24.10	0.248	3
			15	1	0	22.95	0.191	3
				12	0	22.11	0.157	3
134180	715.8	BPSK	3.75	1	47	24.13	0.250	3
			15	1	11	22.98	0.192	3
		QPSK	3.75	1	47	24.17	0.252	3
			15	1	11	22.94	0.190	3
				12	0	22.10	0.157	3

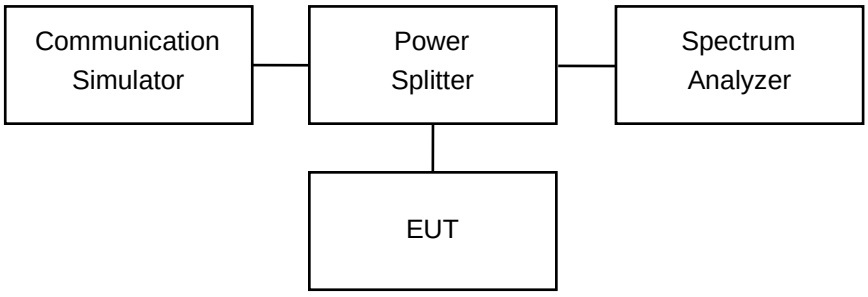
Note:

1. RF Output Power (W) ERP = Conducted Output Power (dBm) + Antenna Gain (dBi) - 2.15 dB

2. Power (W)= $(10^{(Power(dBm)/10)})*10^{-3}$

4. Occupied Bandwidth

4.1. Test Setup



4.2. Test Procedure

The EUT makes a call to the communication simulator. The 26dB bandwidth and 99% occupied bandwidth measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. The path loss was compensated to the results for each measurement.

4.3. Test Methodology and Reference Procedures

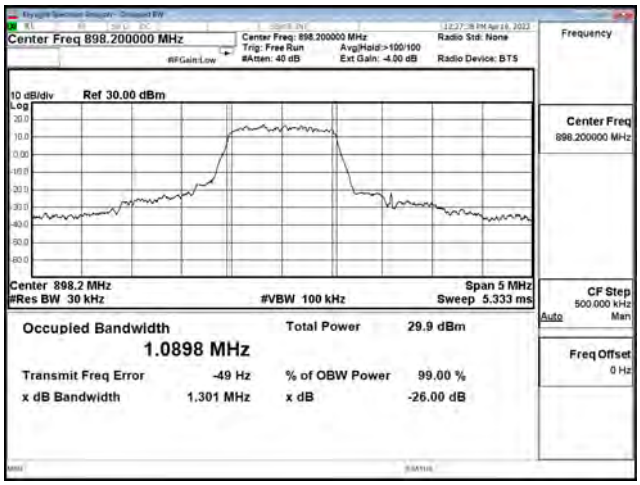
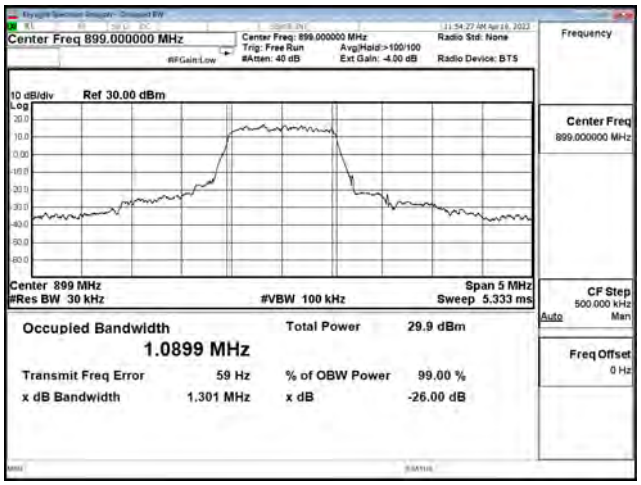
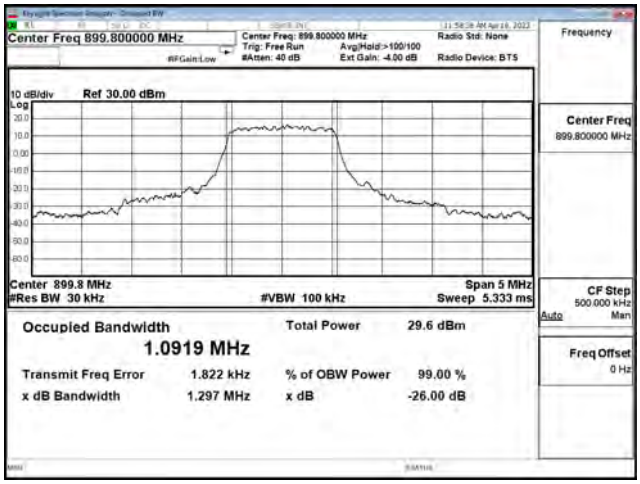
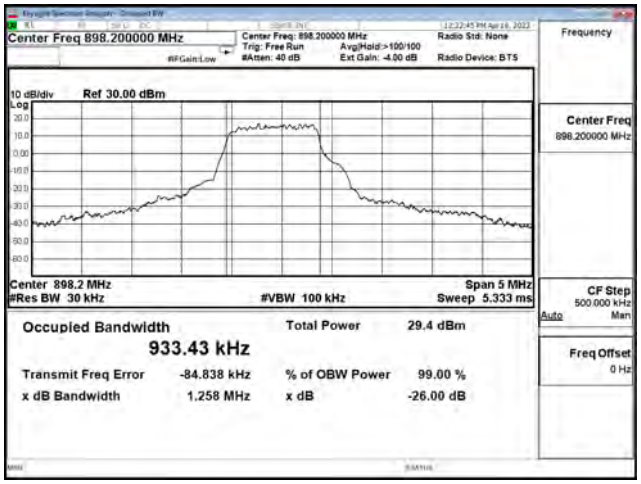
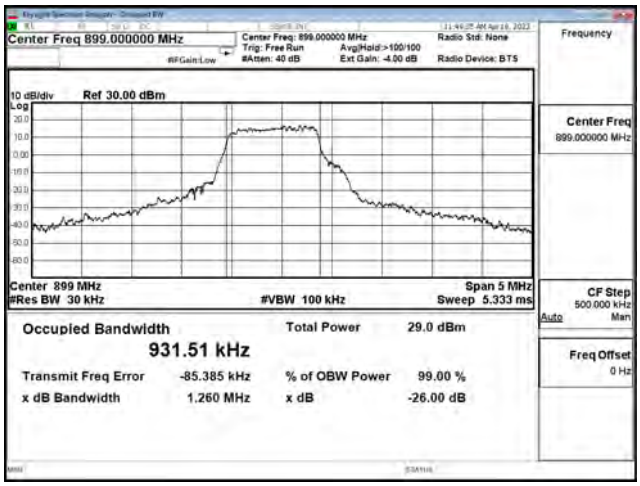
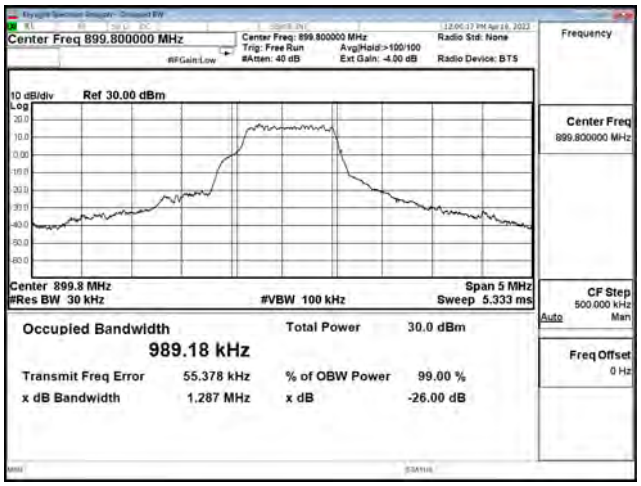
KDB 971168 D01 Power Meas License Digital Systems v03r01

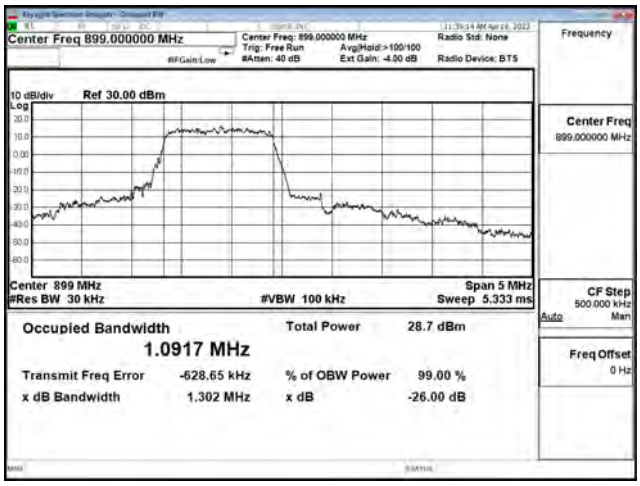
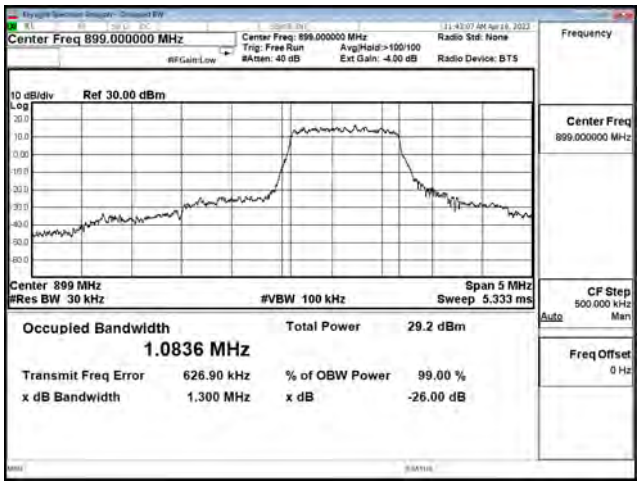
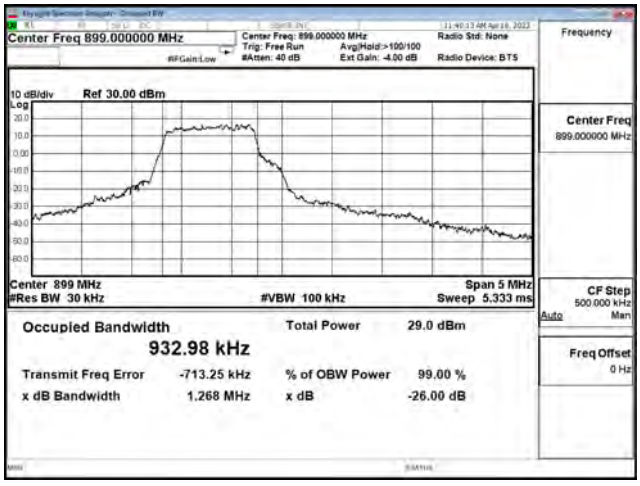
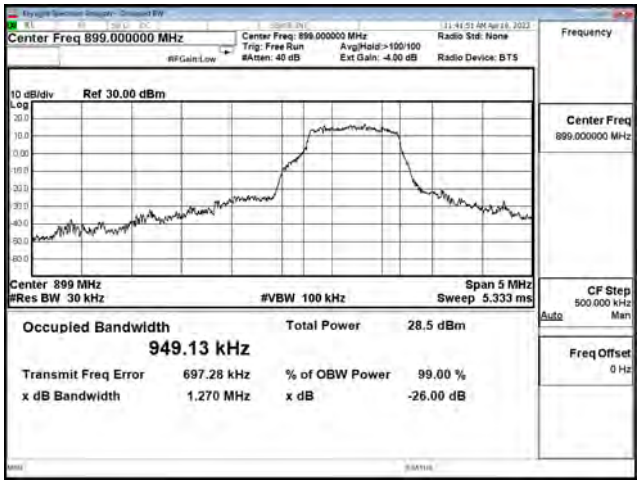
ANSI C63.26-2015

4.4. Test Result of Occupied Bandwidth

Mode 1: Cat-M1 Band 8 (FCC only)

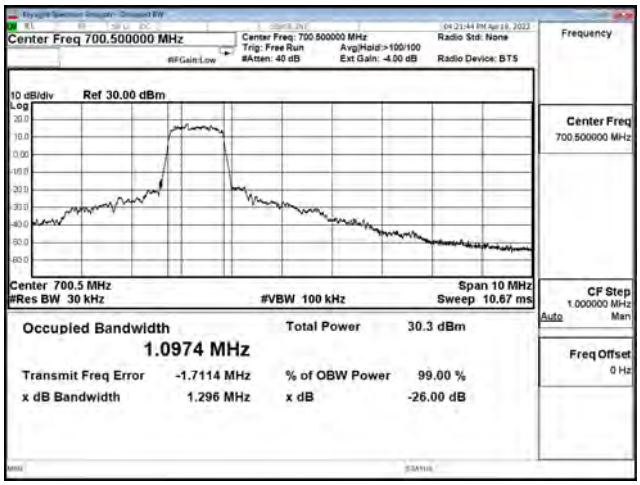
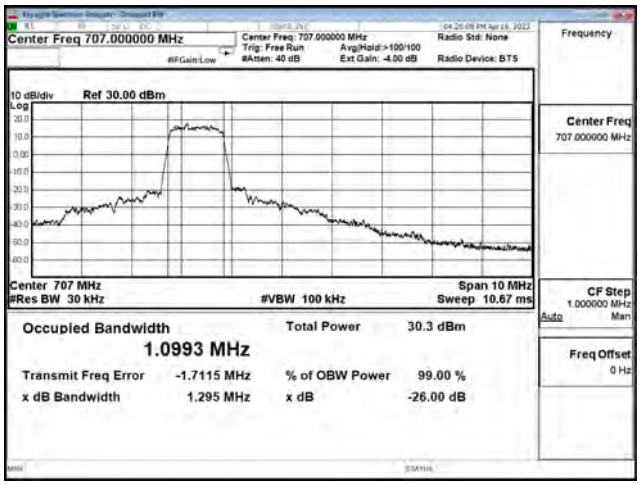
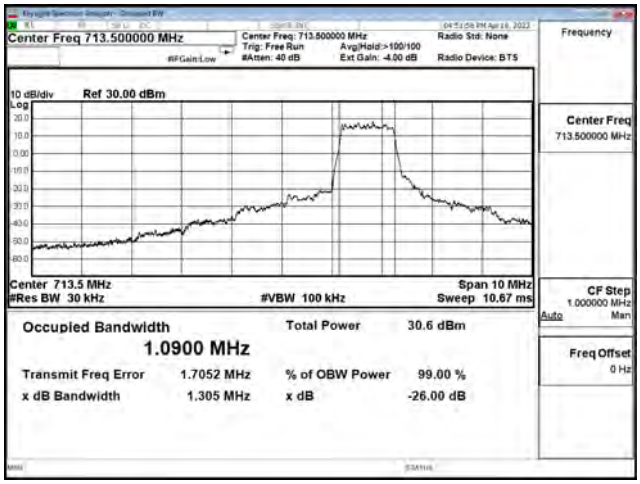
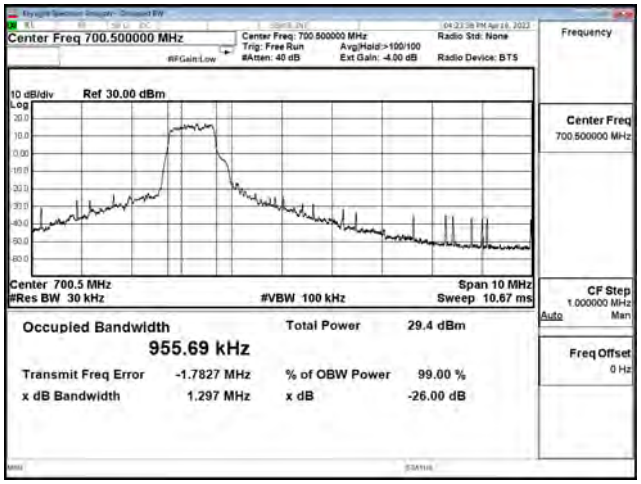
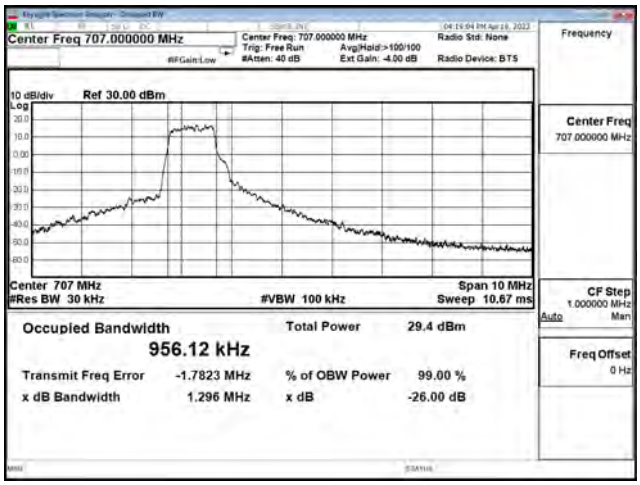
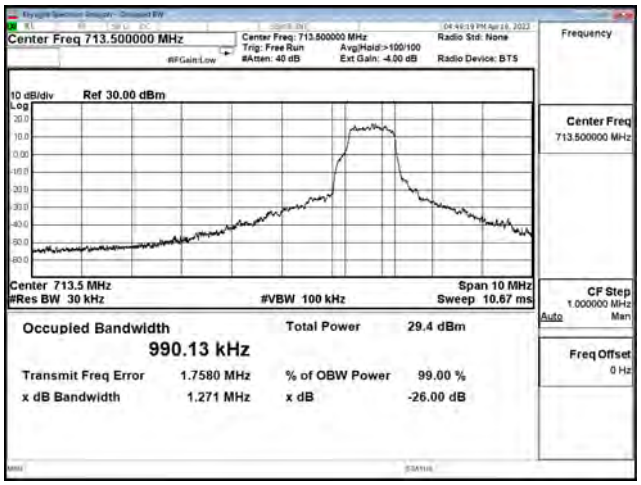
Bandwidth (MHz)	Modulation	Frequency (MHz)	Measure Level (MHz)		Limit (MHz)
			26dB BW	99% BW	
1.4	QPSK	898.2	1.301	1.089	N/A
		899.0	1.301	1.089	N/A
		899.8	1.297	1.091	N/A
	16-QAM	898.2	1.258	0.933	N/A
		899.0	1.260	0.931	N/A
		899.8	1.287	0.989	N/A
3	QPSK - Low	899.0	1.302	1.091	N/A
	QPSK - High	899.0	1.300	1.083	N/A
	16-QAM - Low	899.0	1.268	0.932	N/A
	16-QAM - High	899.0	1.270	0.949	N/A

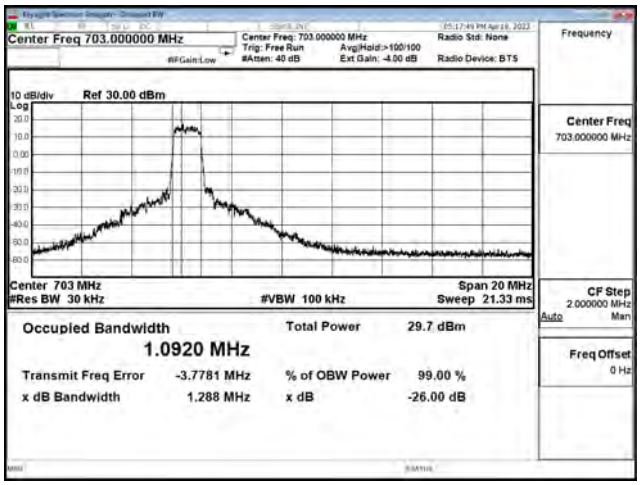
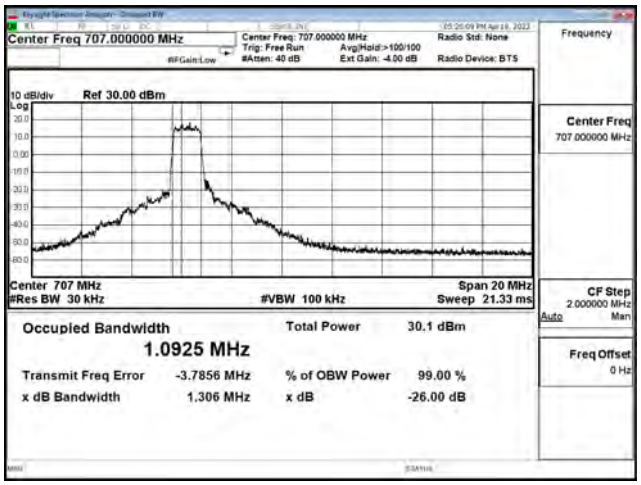
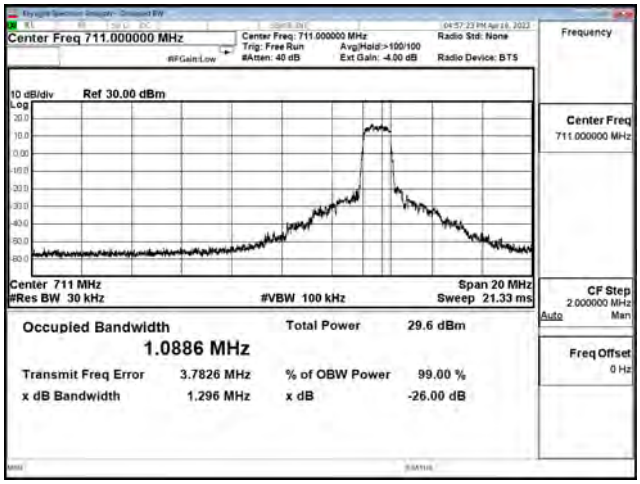
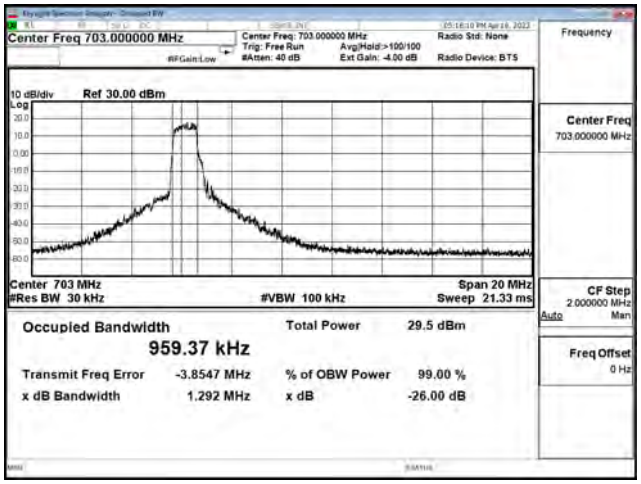
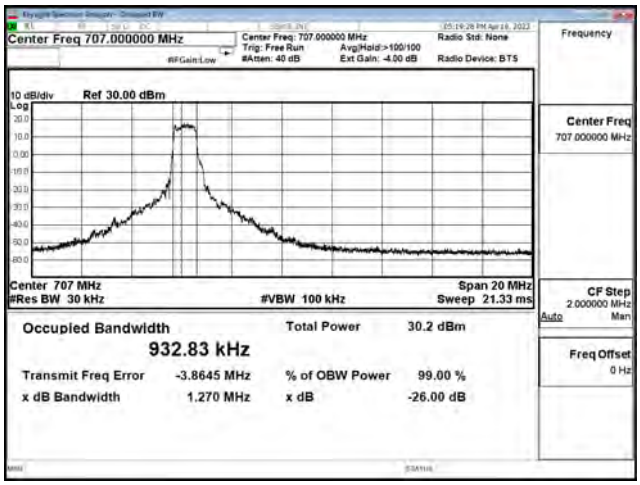
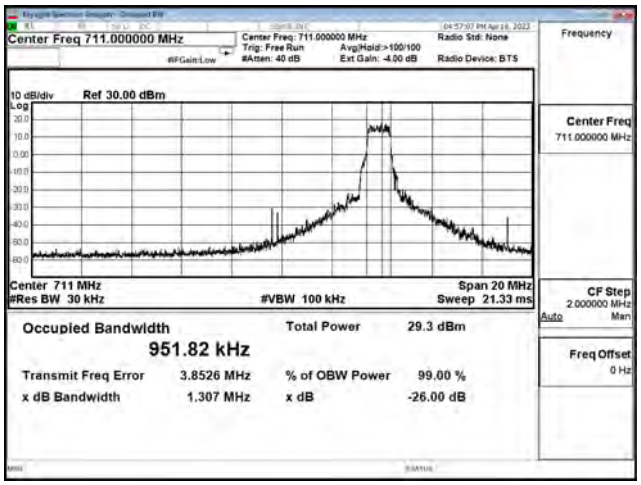
1.4 MHz / QPSK / CH21632 / 6RB0	1.4 MHz / QPSK / CH21640 / 6RB0
	
1.4 MHz / QPSK / CH21648 / 6RB0	**1.4 MHz / 16-QAM / CH21632 / 5RB0**
	
1.4 MHz / 16-QAM / CH21640 / 5RB0	**1.4 MHz / 16-QAM / CH21648 / 5RB0**
	

3 MHz / QPSK - Low / CH21640 / 6RB0	3 MHz / QPSK - Hight / CH21640 / 6RB0
	
3 MHz / 16-QAM - Low / CH21640 / 5RB0	**3 MHz / 16-QAM - Hight / CH21640 / 5RB1**
	

Mode 2: Cat-M1 Band 85

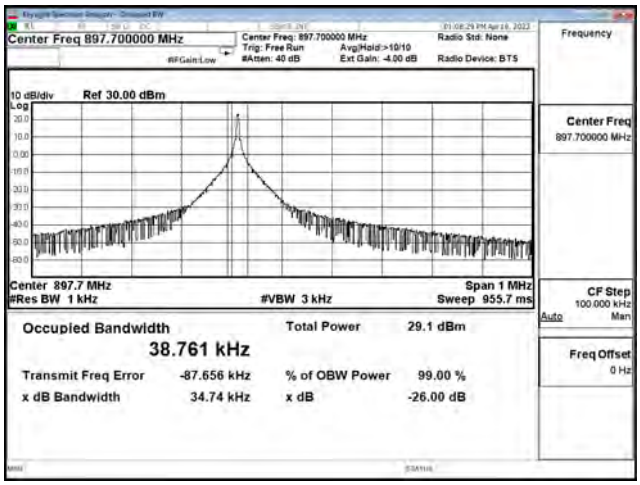
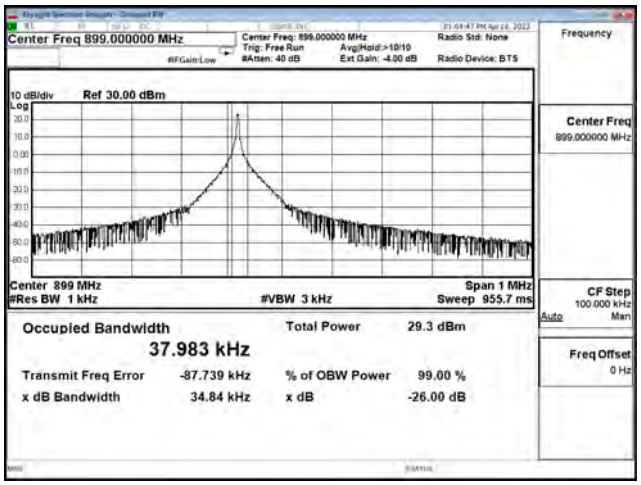
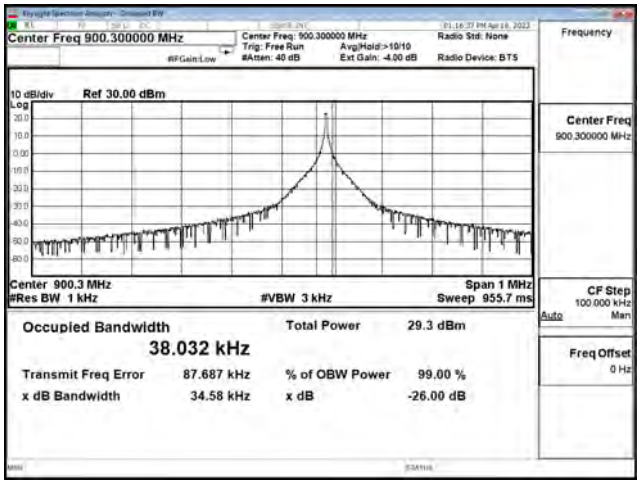
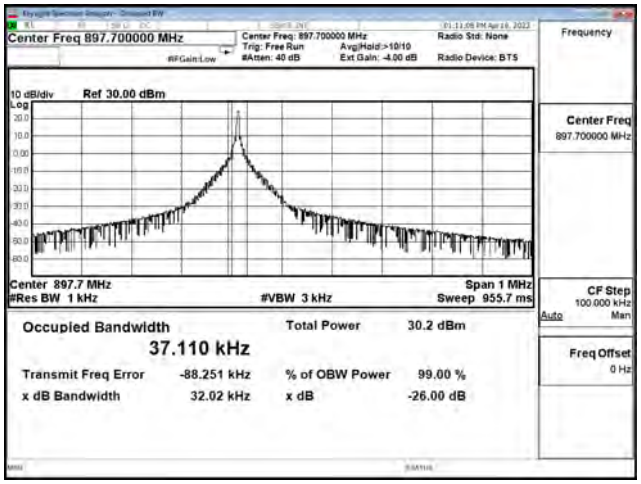
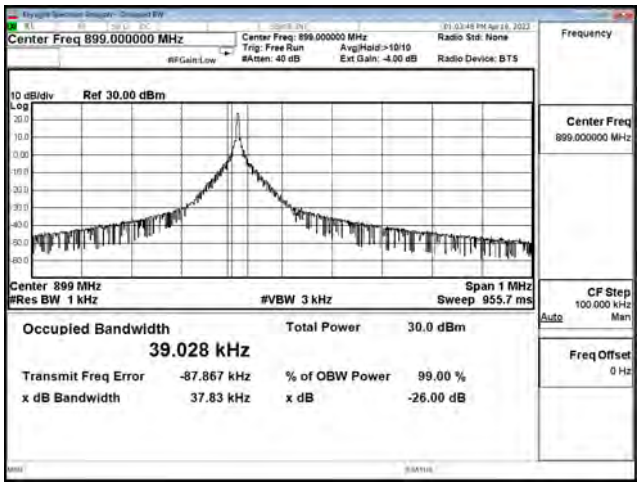
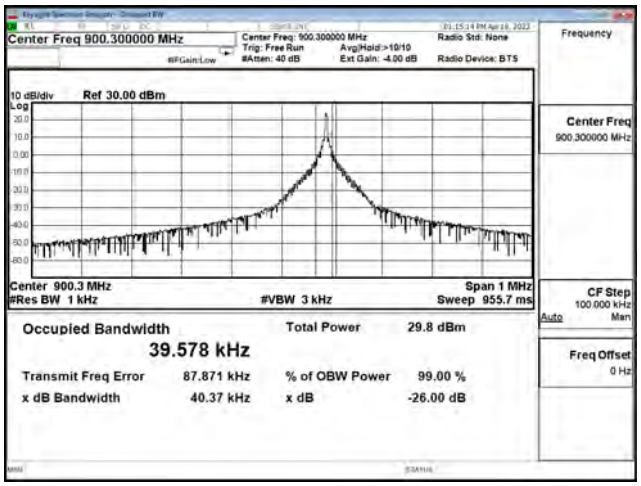
Bandwidth (MHz)	Modulation	Frequency (MHz)	Measure Level (MHz)		Limit (MHz)
			26dB BW	99% BW	
5	QPSK	700.5	1.296	1.097	N/A
		707.0	1.295	1.099	N/A
		713.5	1.305	1.090	N/A
	16-QAM	700.5	1.297	0.955	N/A
		707.0	1.296	0.956	N/A
		713.5	1.271	0.990	N/A
10	QPSK	703.0	1.288	1.092	N/A
		707.0	1.306	1.092	N/A
		711.0	1.296	1.088	N/A
	16-QAM	703.0	1.292	0.959	N/A
		707.0	1.270	0.932	N/A
		711.0	1.307	0.951	N/A

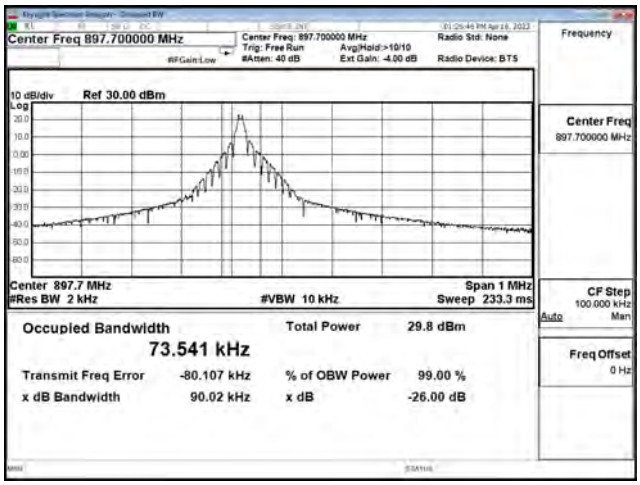
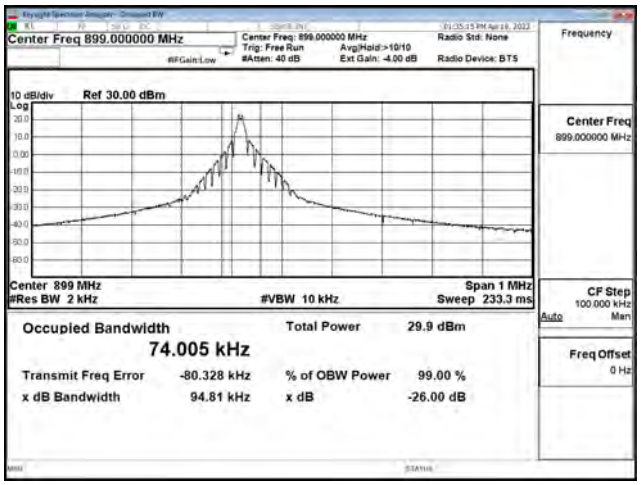
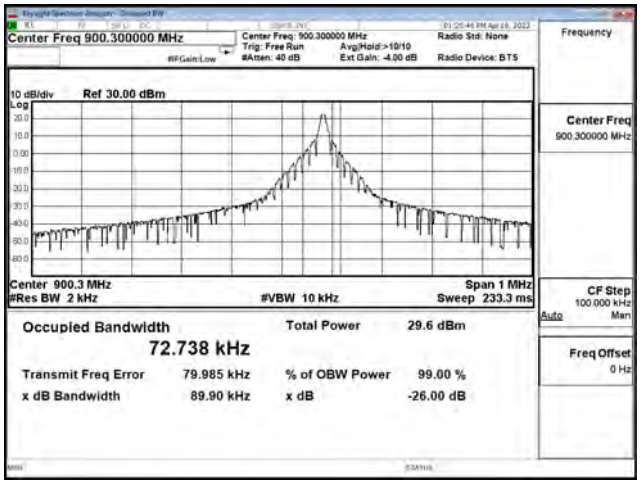
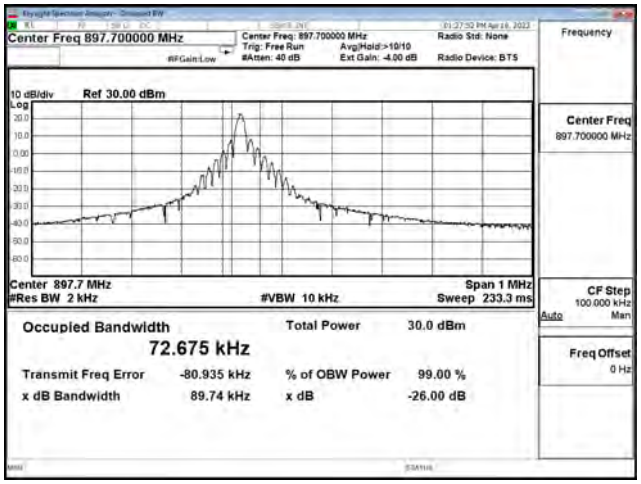
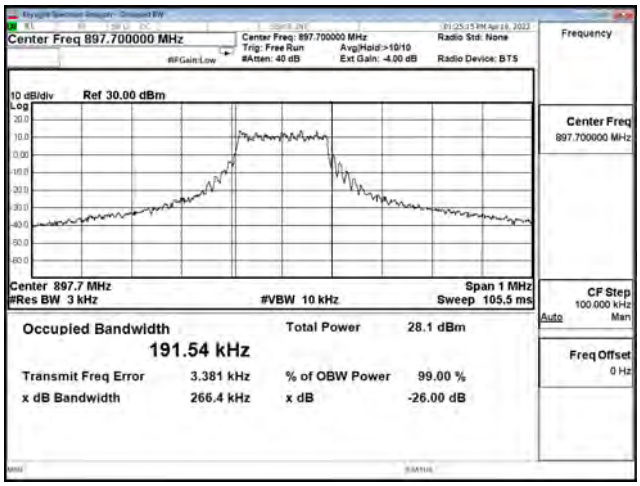
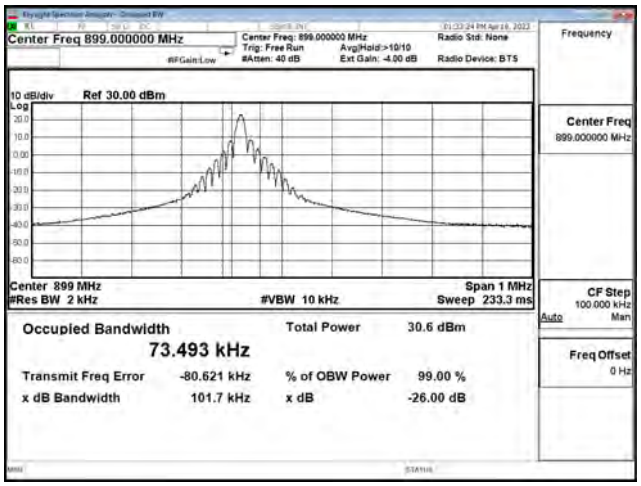
5 MHz / QPSK / CH134027 / 6RB0	5 MHz / QPSK / CH134092 / 6RB0
	
5 MHz / QPSK / CH134157 / 6RB0	**5 MHz / 16-QAM / CH134027 / 5RB0**
	
5 MHz / 16-QAM / CH134092 / 5RB0	**5 MHz / 16-QAM / CH134157 / 5RB1**
	

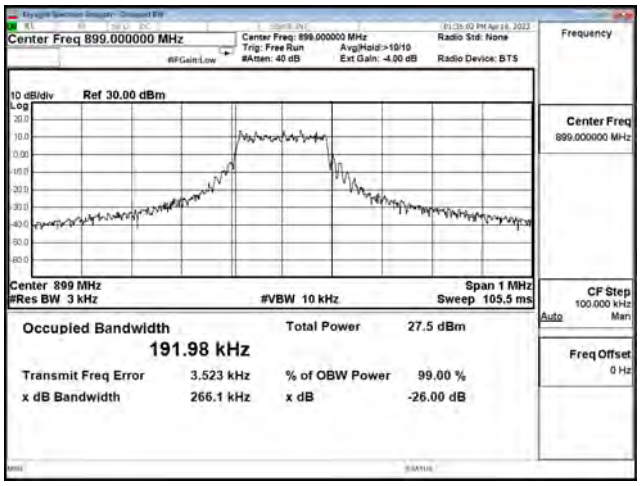
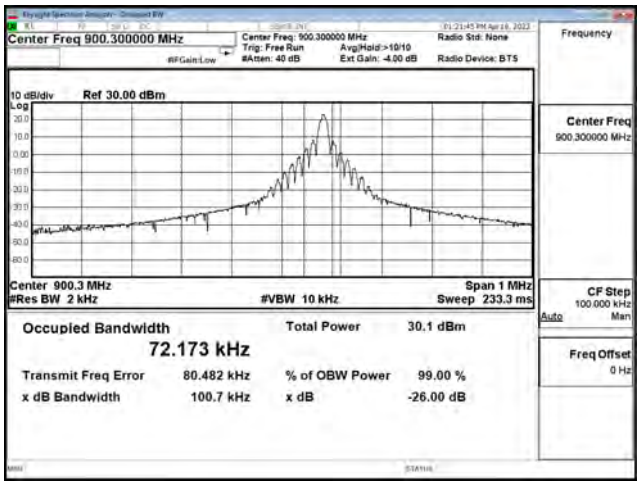
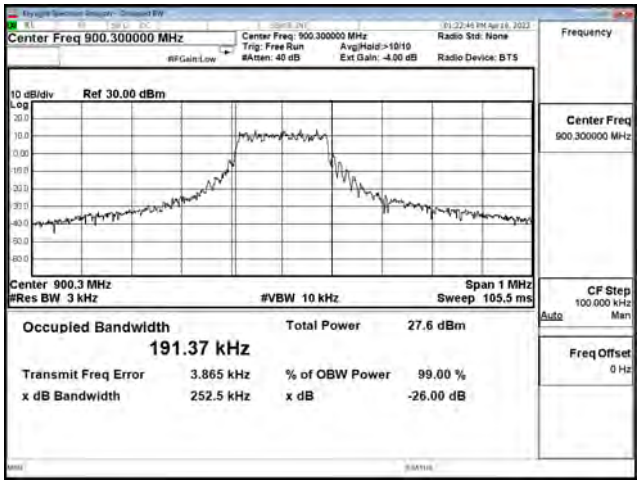
10 MHz / QPSK / CH134052 / 6RB0	10 MHz / QPSK / CH134092 / 6RB0
	
10 MHz / QPSK / CH134132 / 6RB0	**10 MHz / 16-QAM / CH134052 / 5RB0**
	
10 MHz / 16-QAM / CH134092 / 5RB0	**10 MHz / 16-QAM / CH134132 / 5RB1**
	

Mode 3: NB-IoT Band 8 (FCC only)

Channel	Frequency (MHz)	Modulation	Bandwidth (kHz)	RB No.	RB Offset	Measure Level (kHz)		Limit (kHz)
						26dB BW	99% BW	
21627	897.7	BPSK	3.75	1	0	34.740	38.761	N/A
			15	1	0	90.020	73.541	N/A
		QPSK	3.75	1	0	32.020	37.110	N/A
			15	1	0	89.740	72.675	N/A
				12	0	266.400	191.540	N/A
21640	899	BPSK	3.75	1	0	34.840	37.983	N/A
			15	1	0	94.810	74.005	N/A
		QPSK	3.75	1	0	37.830	39.028	N/A
			15	1	0	101.700	73.493	N/A
				12	0	266.100	191.980	N/A
21653	900.3	BPSK	3.75	1	47	34.580	38.032	N/A
			15	1	11	89.900	72.738	N/A
		QPSK	3.75	1	47	40.370	39.578	N/A
			15	1	11	100.700	72.173	N/A
				12	0	252.500	191.370	N/A

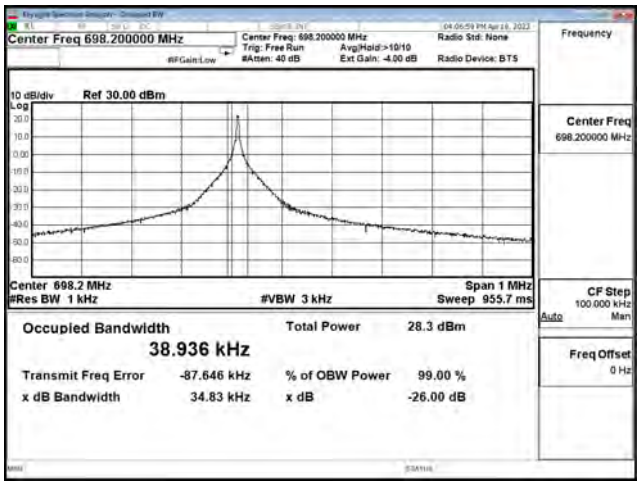
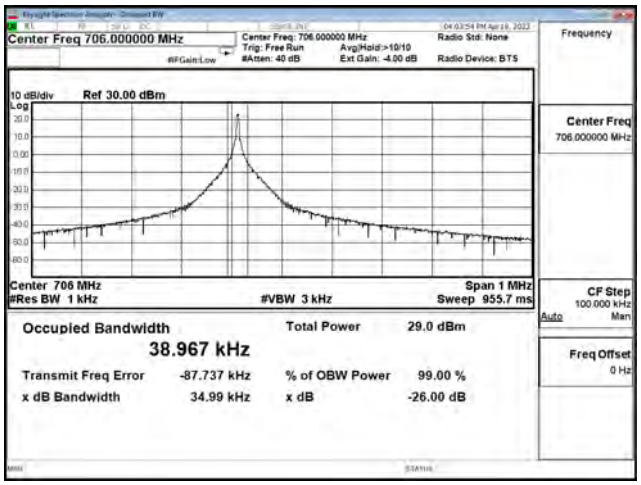
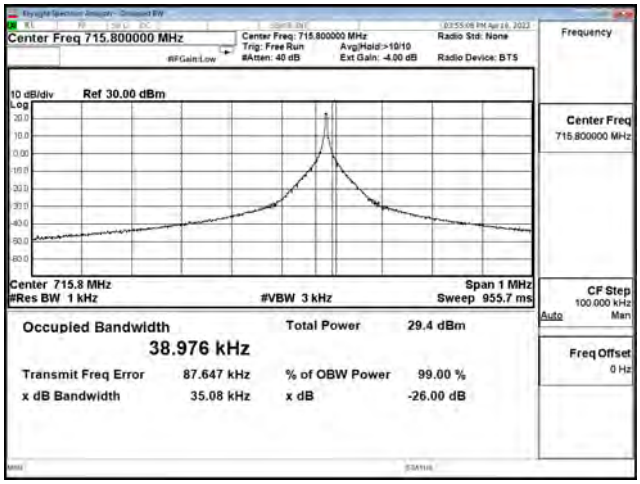
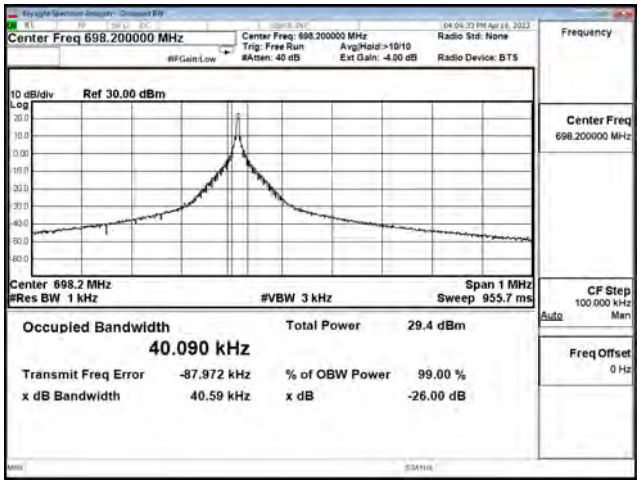
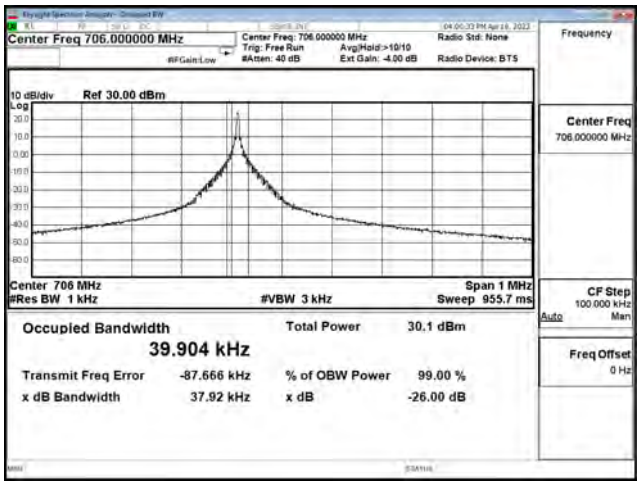
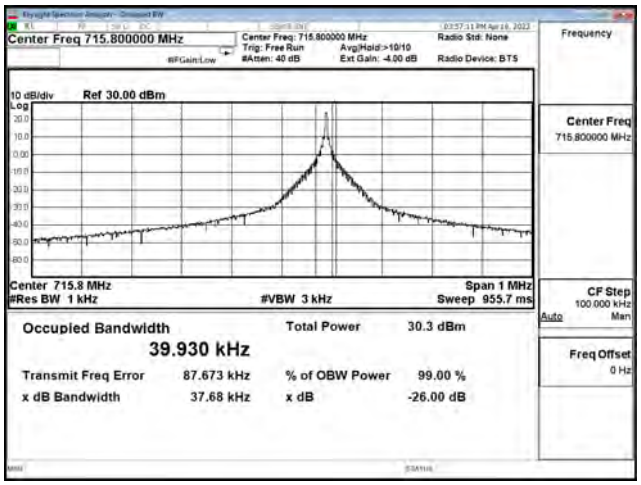
3.75 kHz / BPSK / CH21627 / 1RB0	3.75 kHz / BPSK / CH21640 / 1RB0
	
3.75 kHz / BPSK / CH21653 / 1RB47	3.75 kHz / QPSK / CH21627 / 1RB0
	
3.75 kHz / QPSK / CH21640 / 1RB0	3.75 kHz / QPSK / CH21653 / 1RB47
	

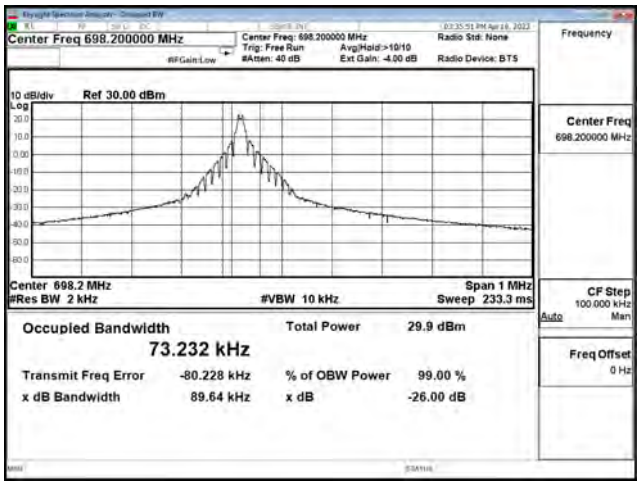
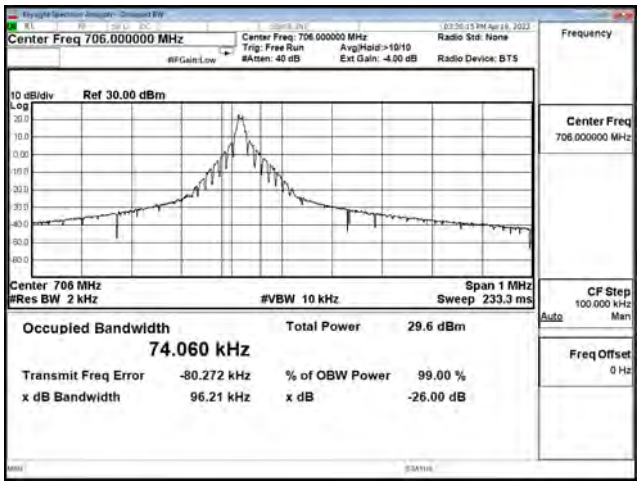
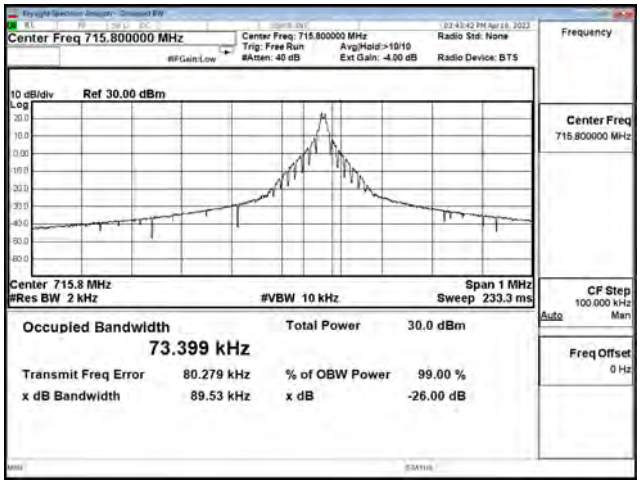
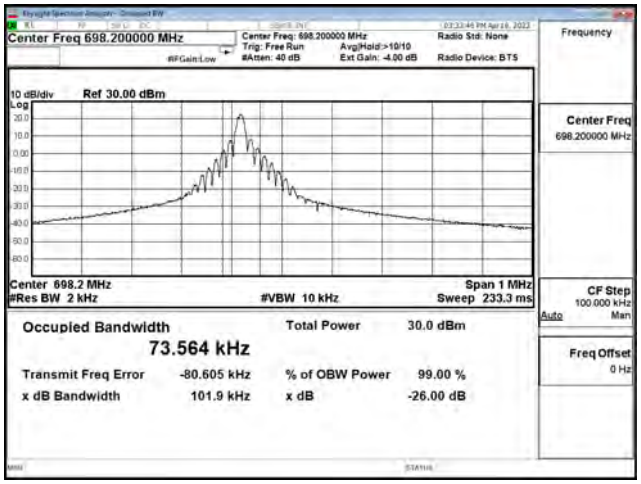
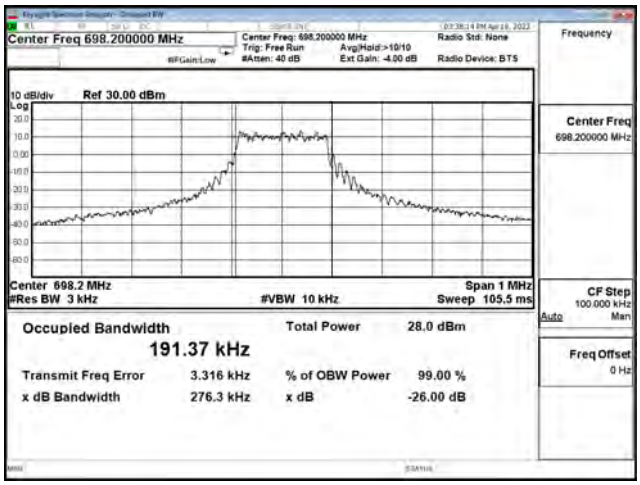
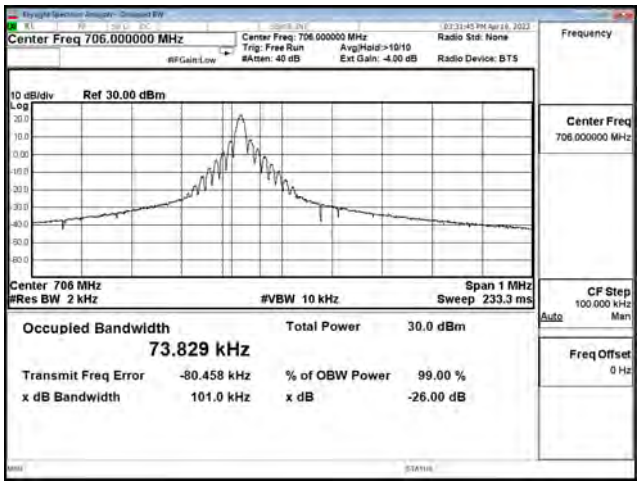
15 kHz / BPSK / CH21627 / 1RB0	15 kHz / BPSK / CH21640 / 1RB0
	
15 kHz / BPSK / CH21653 / 1RB11	**15 kHz / QPSK / CH21627 / 1RB0**
	
15 kHz / QPSK / CH21627 / 12RB0	**15 kHz / QPSK / CH21640 / 1RB0**
	

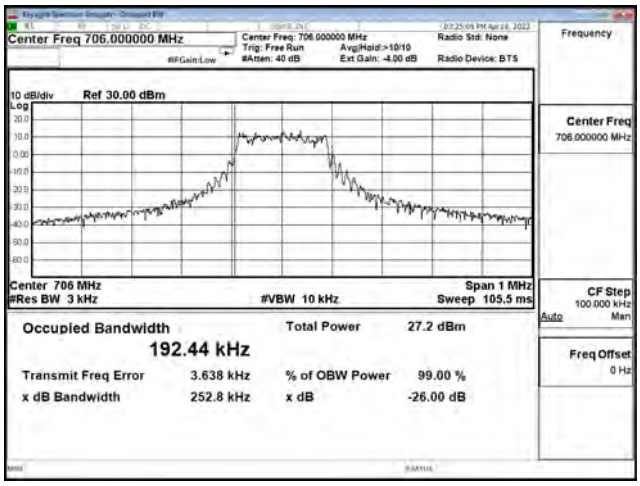
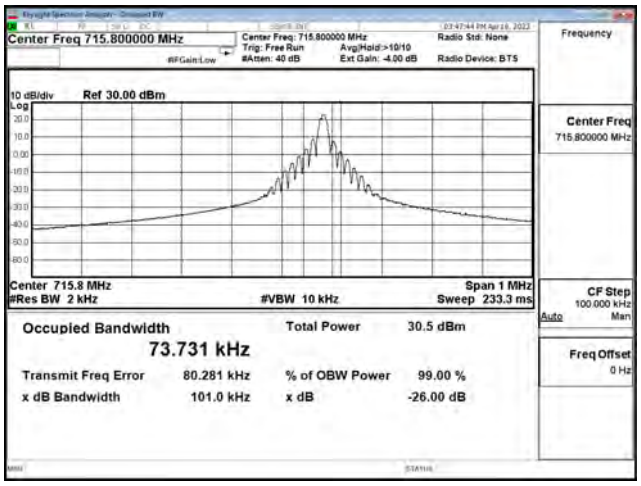
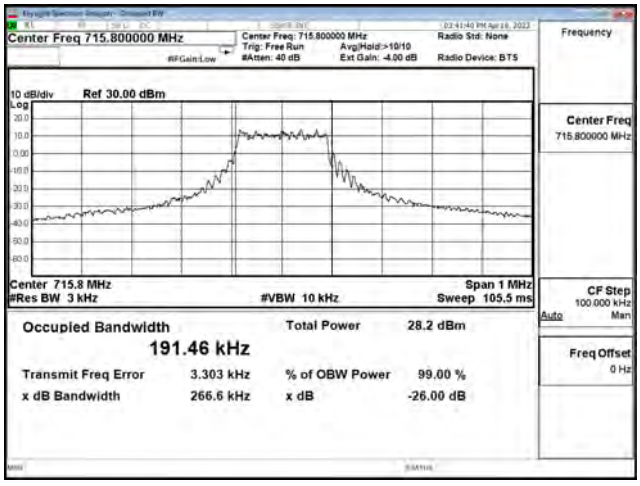
15 kHz / QPSK / CH21640 / 12RB0	15 kHz / QPSK / CH21653 / 1RB11
	
15 kHz / QPSK / CH21653 / 12RB0	
	

Mode 4: NB-IoT Band 85

Channel	Frequency (MHz)	Modulation	Bandwidth (kHz)	RB No.	RB Offset	Measure Level (kHz)		Limit (kHz)
						26dB BW	99% BW	
134004	698.2	BPSK	3.75	1	0	34.830	38.936	N/A
			15	1	0	89.640	73.232	N/A
		QPSK	3.75	1	0	40.590	40.090	N/A
			15	1	0	101.900	73.564	N/A
				12	0	276.300	191.370	N/A
134082	706	BPSK	3.75	1	0	34.990	38.967	N/A
			15	1	0	96.210	74.060	N/A
		QPSK	3.75	1	0	37.920	39.904	N/A
			15	1	0	101.000	73.829	N/A
				12	0	252.800	192.440	N/A
134180	715.8	BPSK	3.75	1	47	35.080	38.976	N/A
			15	1	11	89.530	73.399	N/A
		QPSK	3.75	1	47	37.680	39.930	N/A
			15	1	11	101.000	73.731	N/A
				12	0	266.600	191.460	N/A

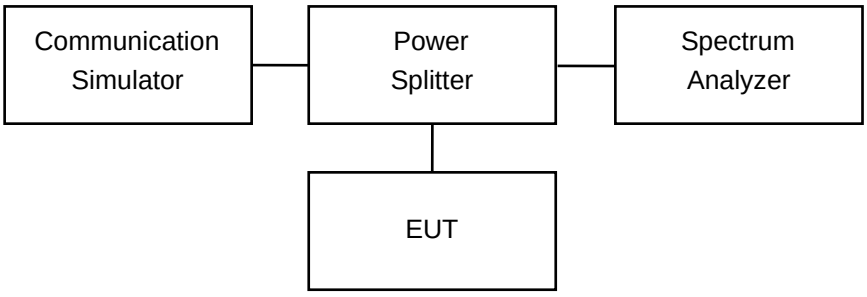
3.75 kHz / BPSK / CH134004 / 1RB0	3.75 kHz / BPSK / CH134082 / 1RB0
	
3.75 kHz / BPSK / CH134180 / 1RB47	**3.75 kHz / QPSK / CH134004 / 1RB0**
	
3.75 kHz / QPSK / CH134082 / 1RB0	**3.75 kHz / QPSK / CH134180 / 1RB47**
	

15 kHz / BPSK / CH134004 / 1RB0	15 kHz / BPSK / CH134082 / 1RB0
	
15 kHz / BPSK / CH134180 / 1RB11	**15 kHz / QPSK / CH134004 / 1RB0**
	
15 kHz / QPSK / CH134004 / 12RB0	**15 kHz / QPSK / CH134082 / 1RB0**
	

15 kHz / QPSK / CH134082 / 12RB0	15 kHz / QPSK / CH134180 / 1RB11
	
15 kHz / QPSK / CH134180 / 12RB0	
	

5. Peak to Average Ratio

5.1. Test Setup



5.2. Test Procedure

1. The EUT makes a call to the communication simulator. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. The path loss was compensated to the results for each measurement.
2. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth.
3. Set the number of counts to a value that stabilizes the measured CCDF curve.
4. Record the maximum PAPR level associated with a probability of 0.1 %.

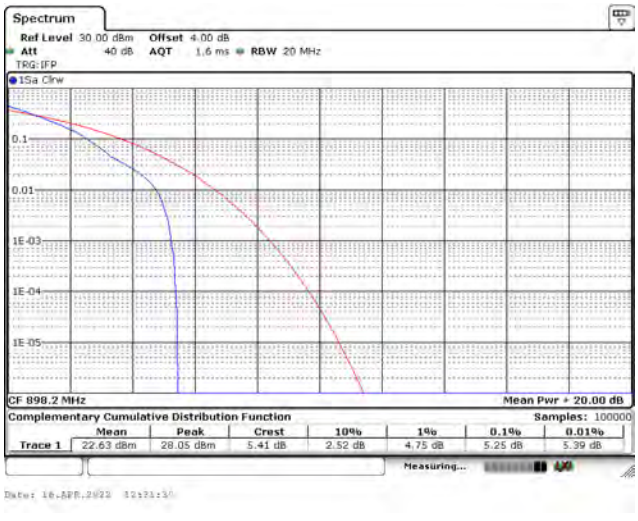
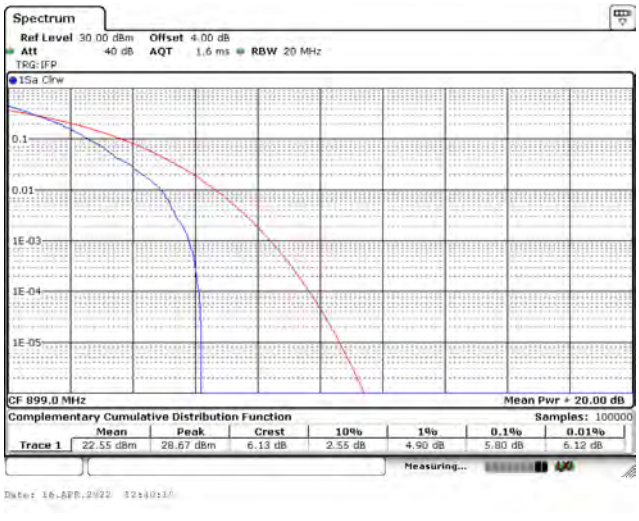
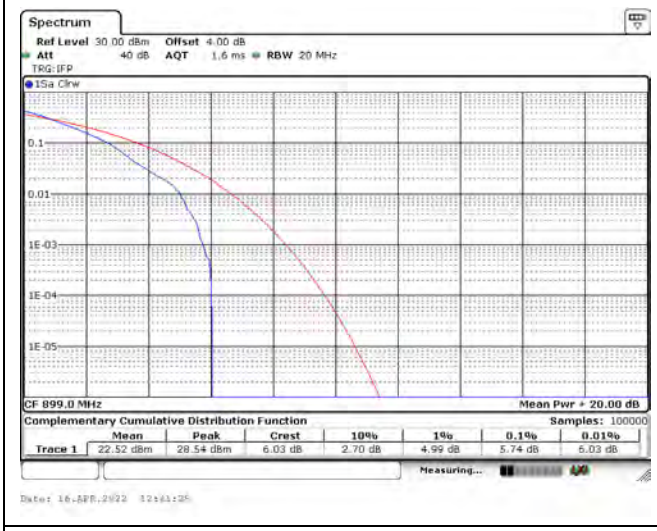
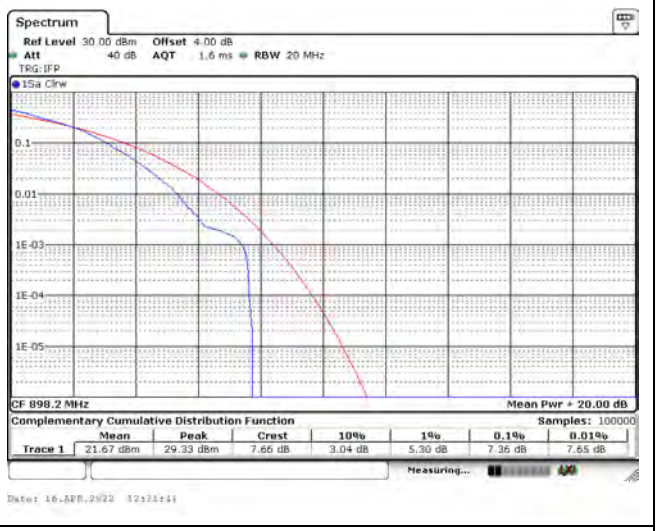
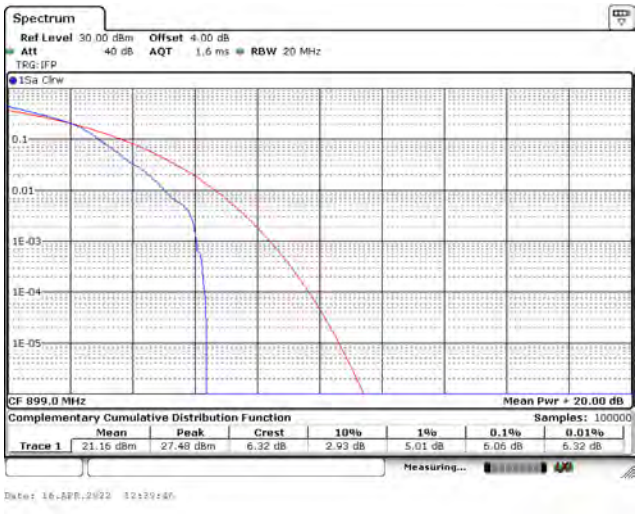
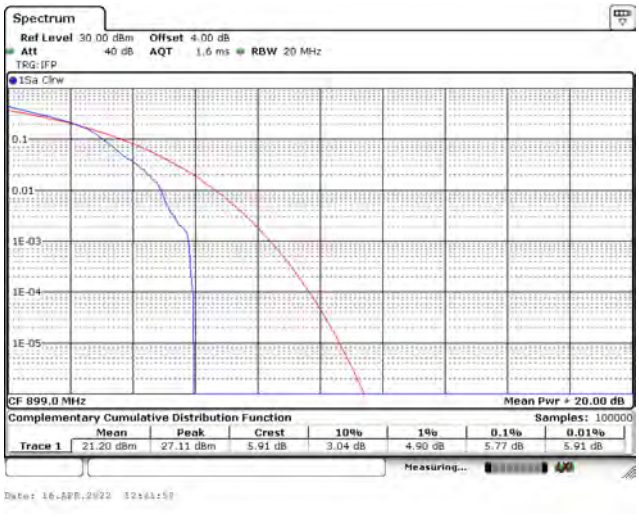
5.3. Test Methodology and Reference Procedures

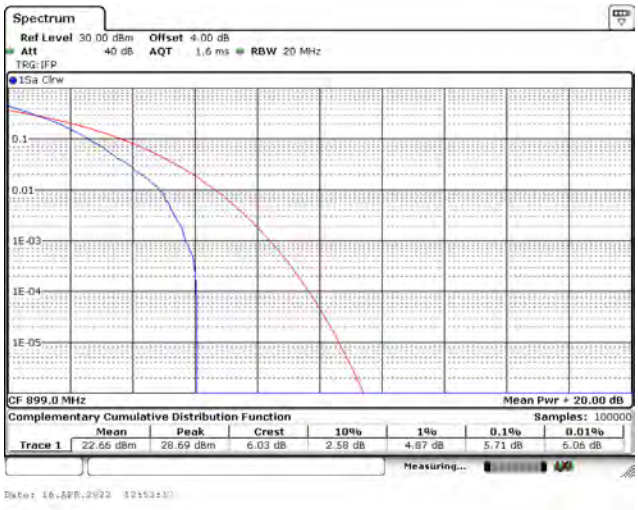
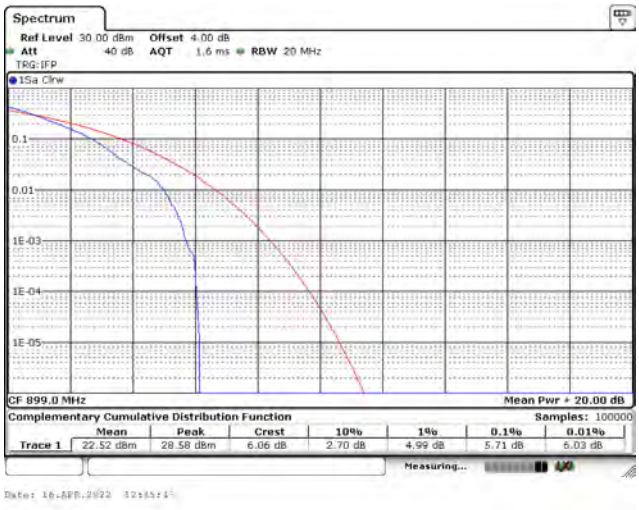
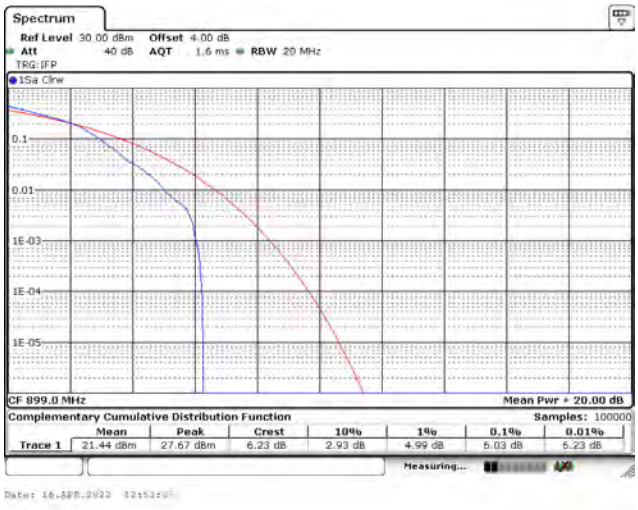
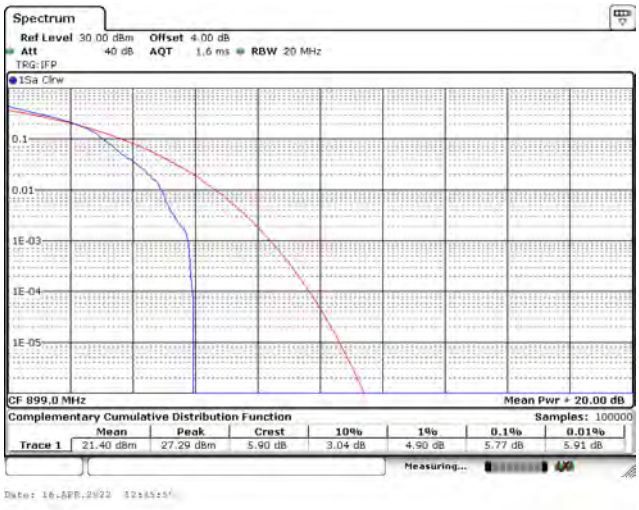
KDB 971168 D01 Power Meas License Digital Systems v03r01

ANSI C63.26-2015

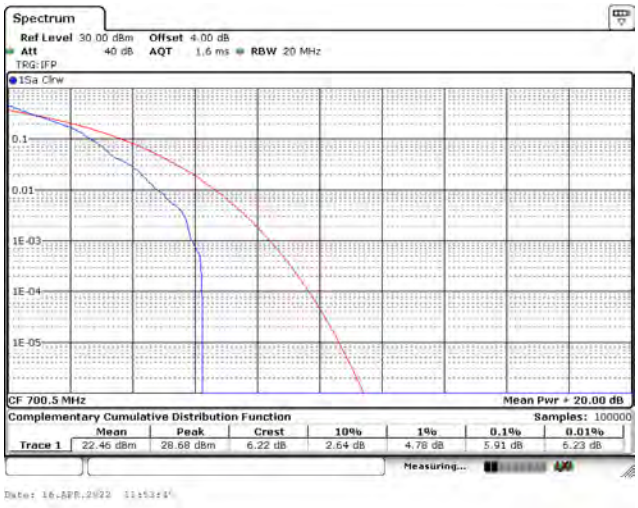
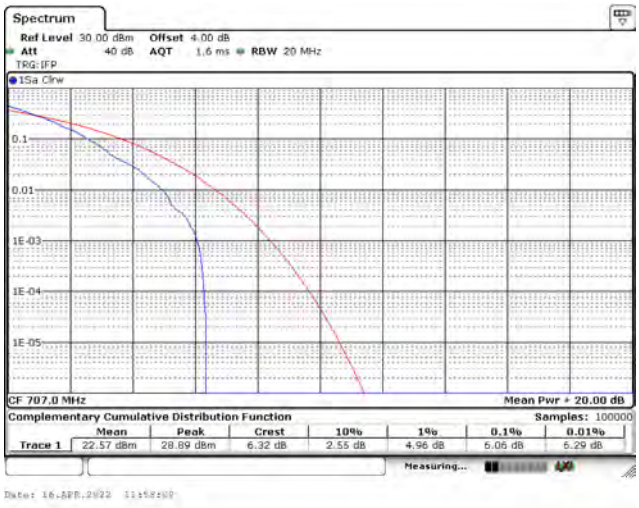
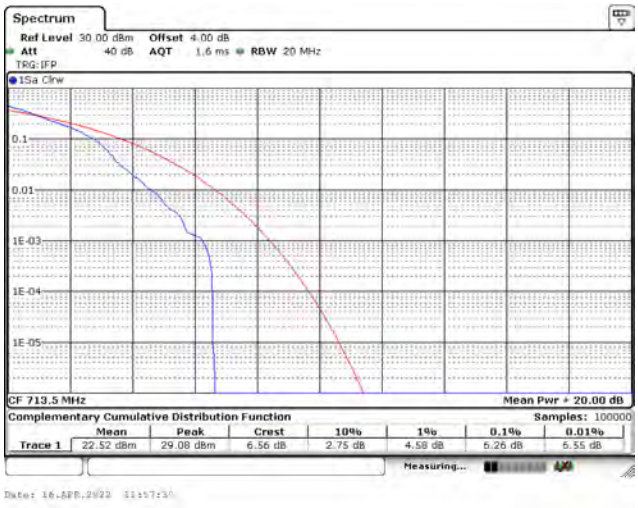
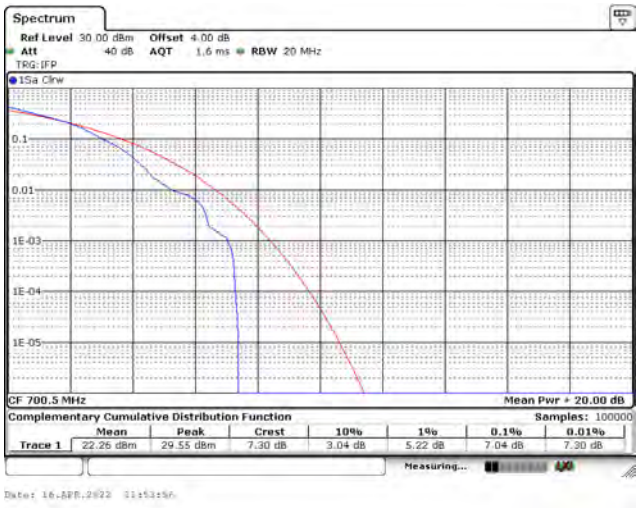
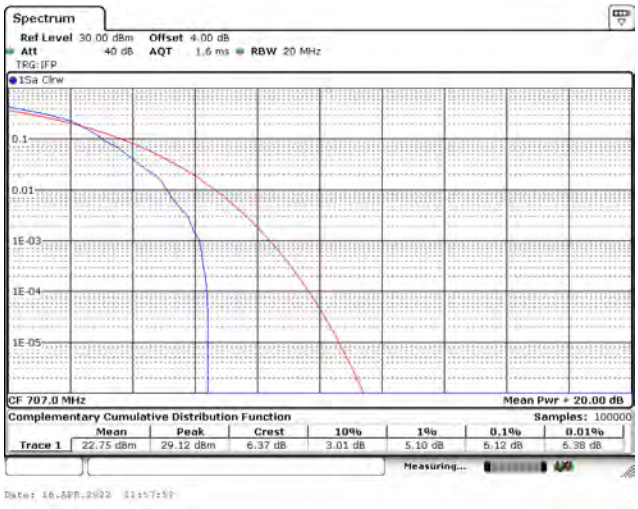
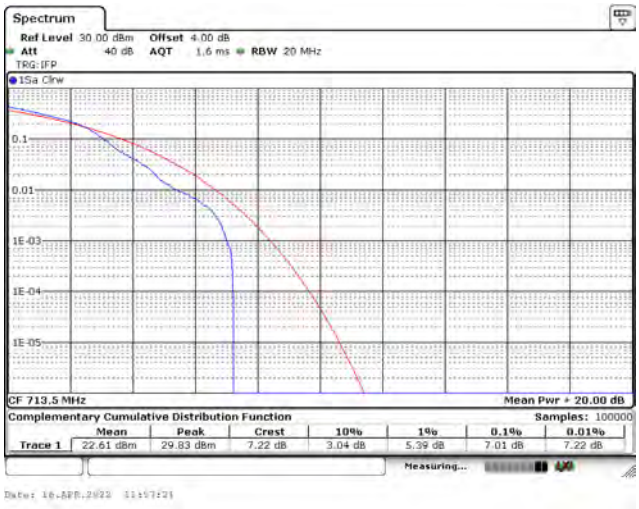
5.4. Test Result of Peak to Average Ratio

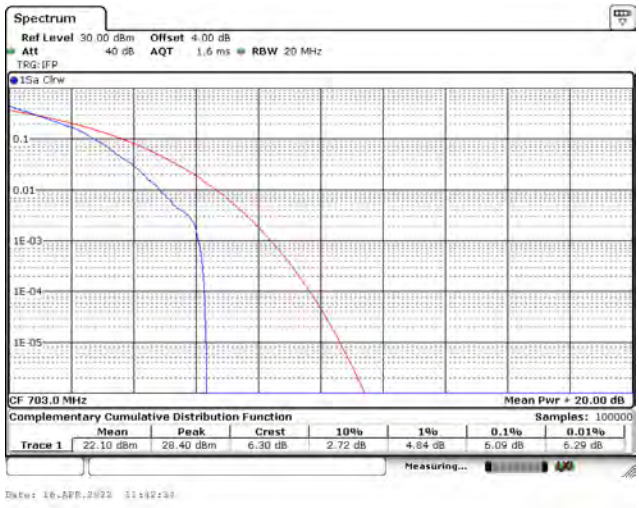
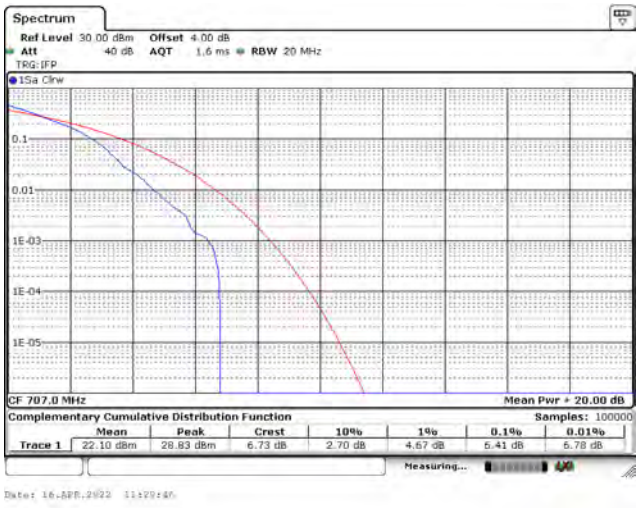
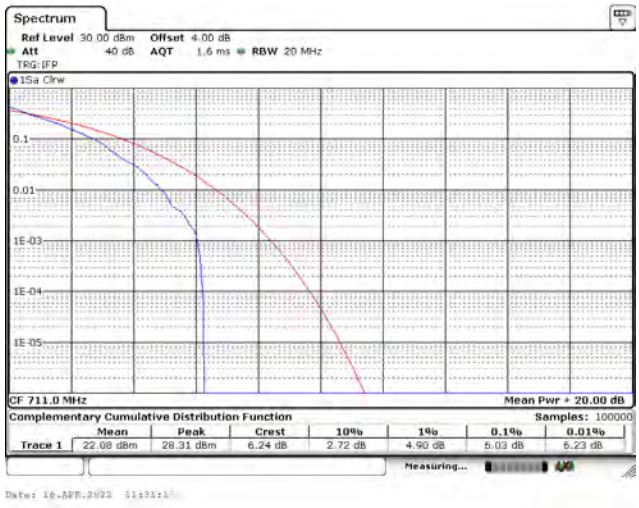
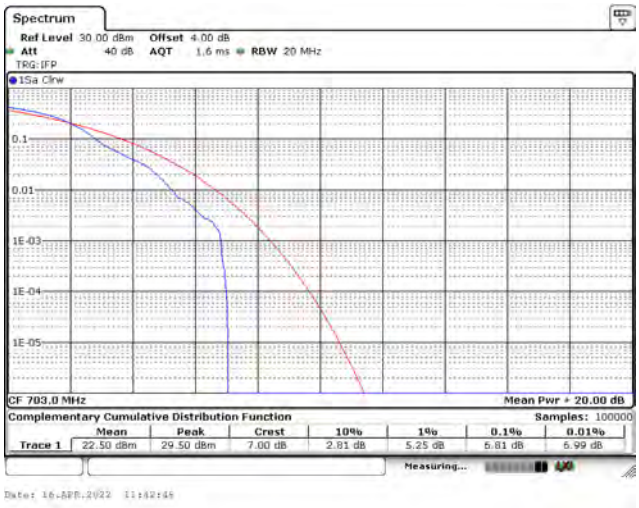
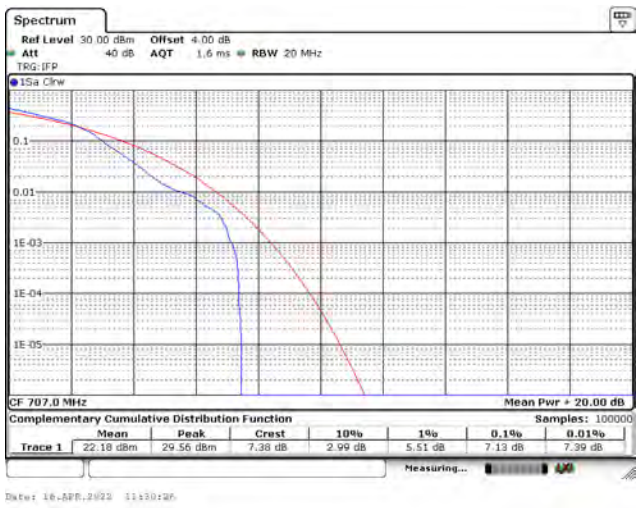
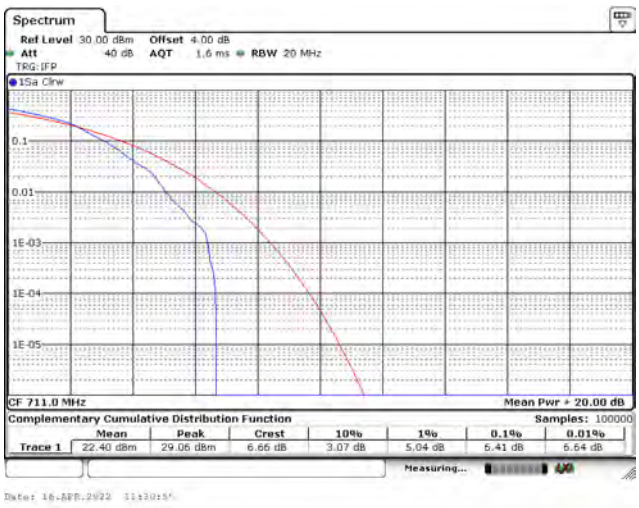
Mode 1: Cat-M1 Band 8 (FCC only)

1.4 MHz / QPSK / CH21632 / 1RB0	1.4 MHz / QPSK / CH21640 / 1RB0
	
1.4 MHz / QPSK / CH21648 / 1RB5	1.4 MHz / 16-QAM / CH21632 / 1RB0
	
1.4 MHz / 16-QAM / CH21640 / 1RB0	1.4 MHz / 16-QAM / CH21648 / 1RB5
	

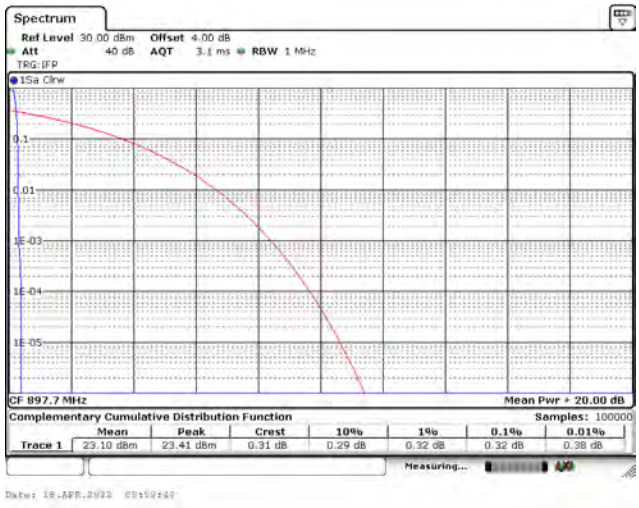
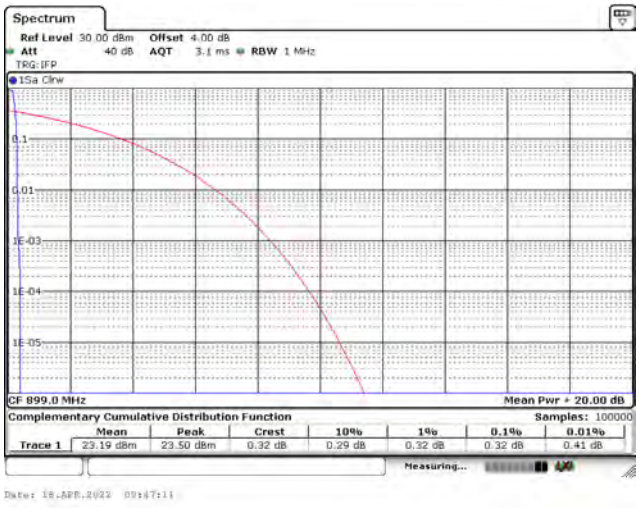
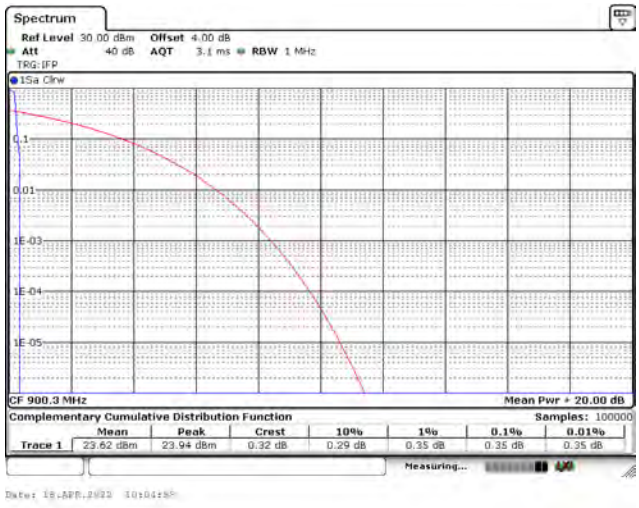
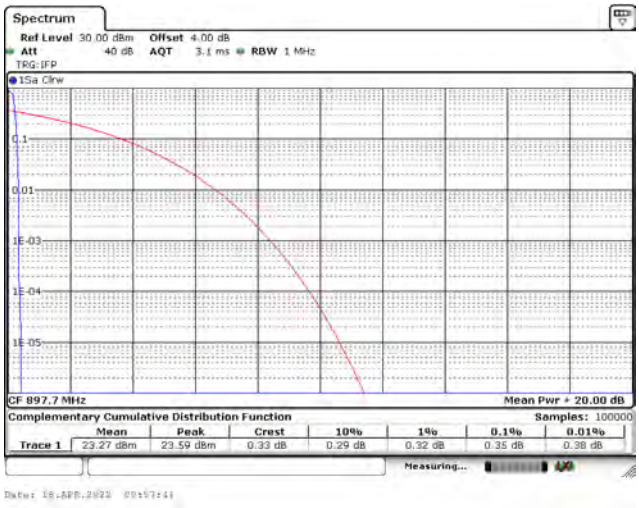
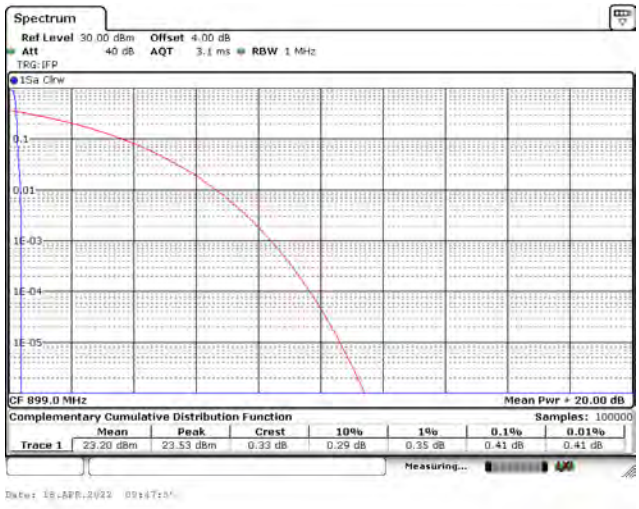
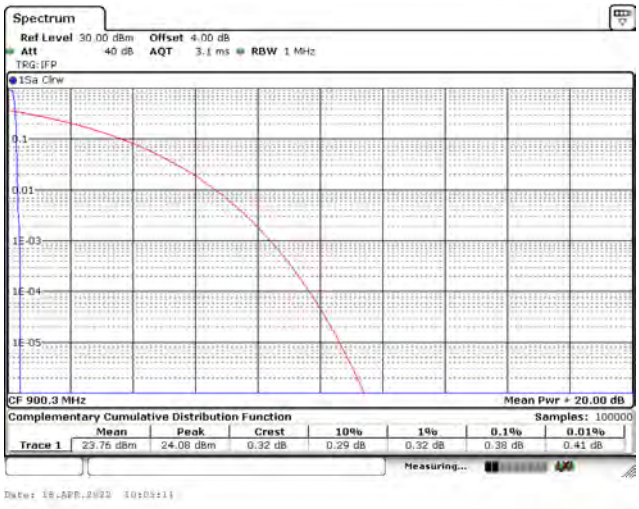
3 MHz / QPSK - Low / CH21640 / 1RB0	3 MHz / QPSK - Hight / CH21640 / 1RB5
	
3 MHz / 16-QAM - Low / CH21640 / 1RB0	**3 MHz / 16-QAM - Hight / CH21640 / 1RB5**
	

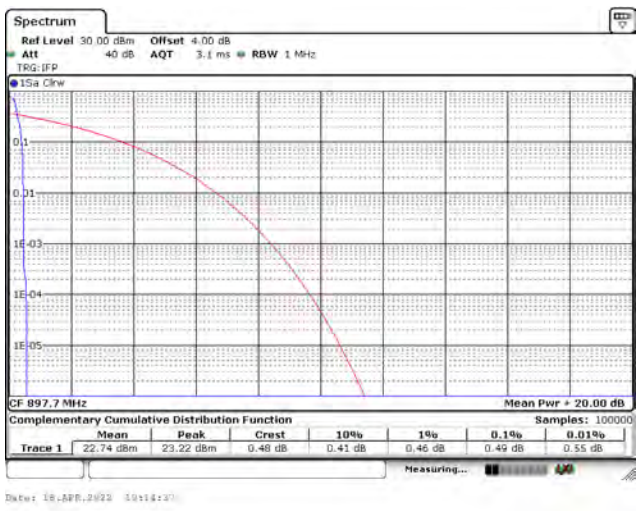
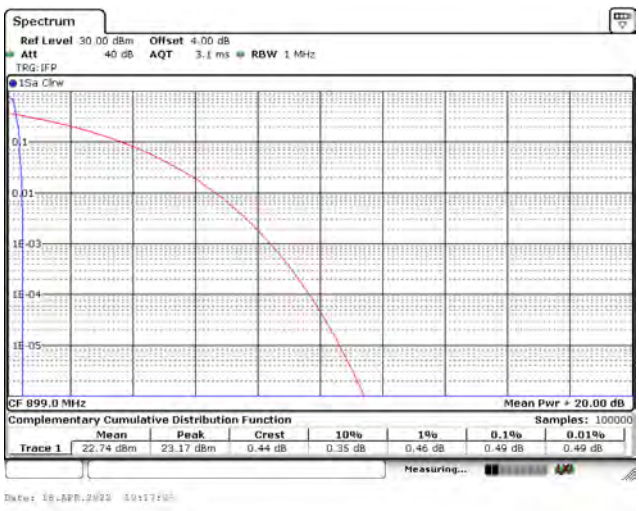
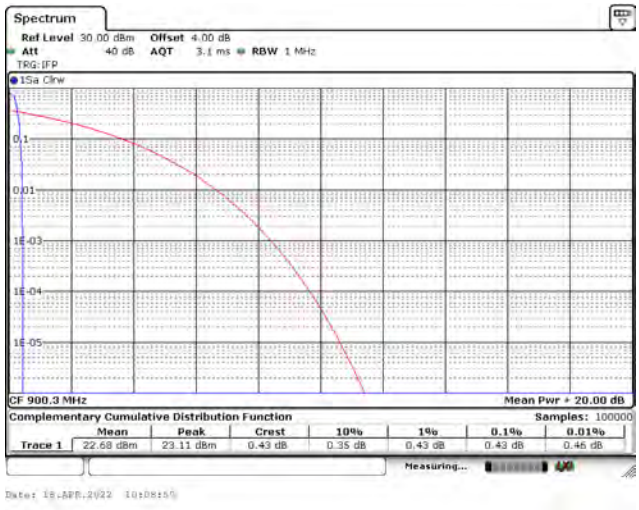
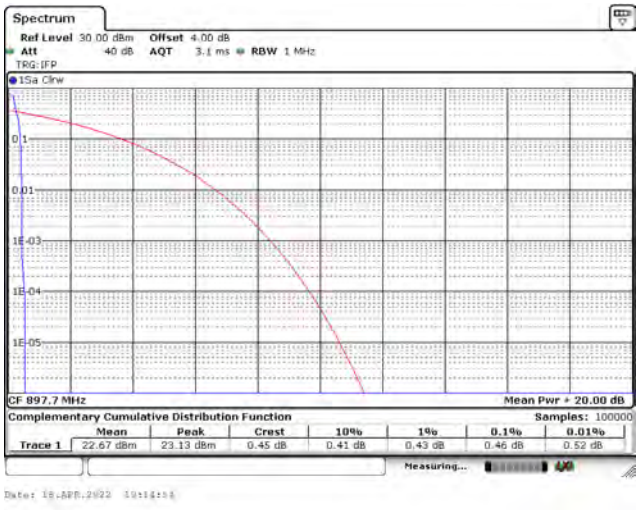
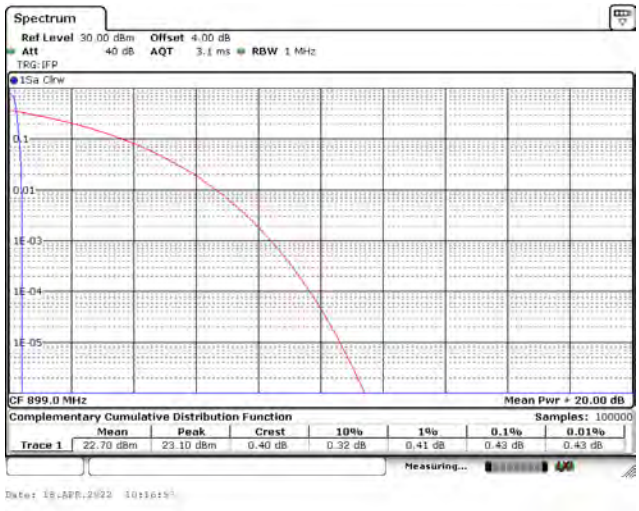
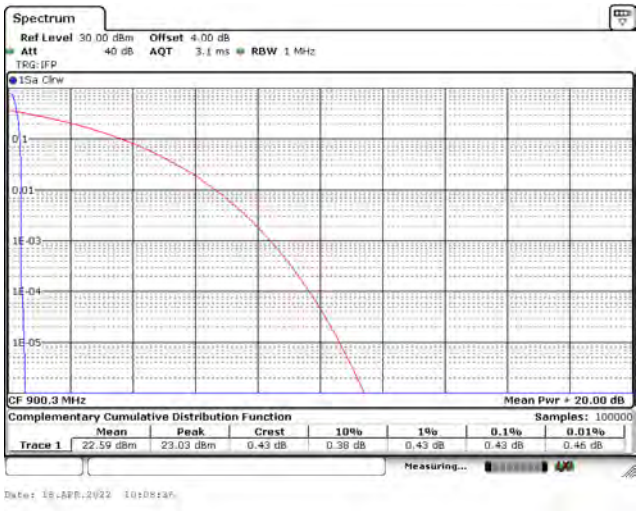
Mode 2: Cat-M1 Band 85

5 MHz / QPSK / CH134027 / 1RB0	5 MHz / QPSK / CH134092 / 1RB0
	
5 MHz / QPSK / CH134157 / 1RB5	**5 MHz / 16-QAM / CH134027 / 1RB0**
	
5 MHz / 16-QAM / CH134092 / 1RB0	**5 MHz / 16-QAM / CH134157 / 1RB5**
	

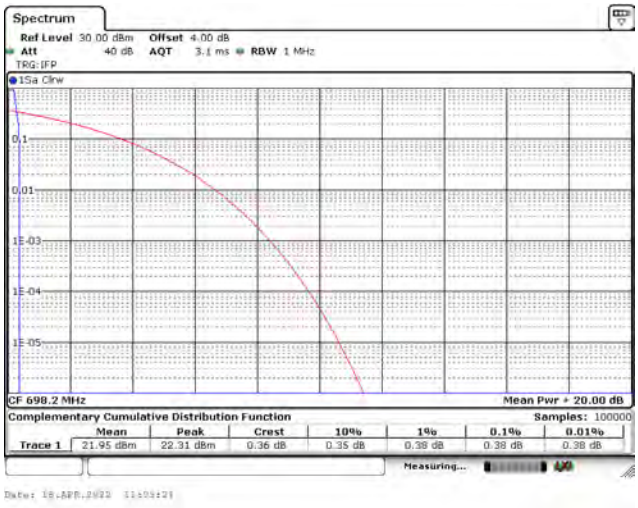
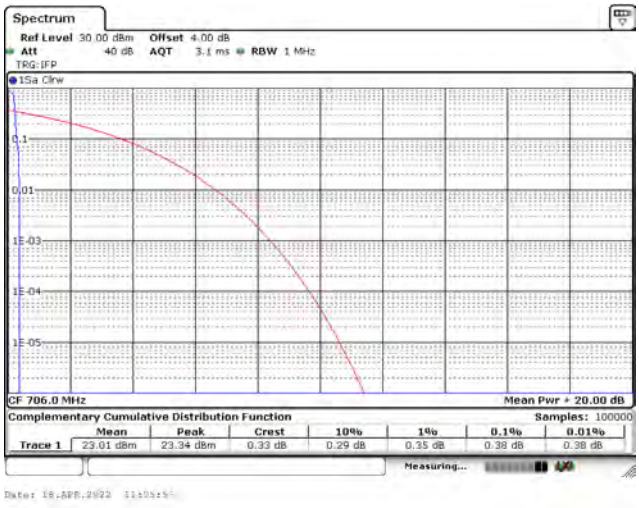
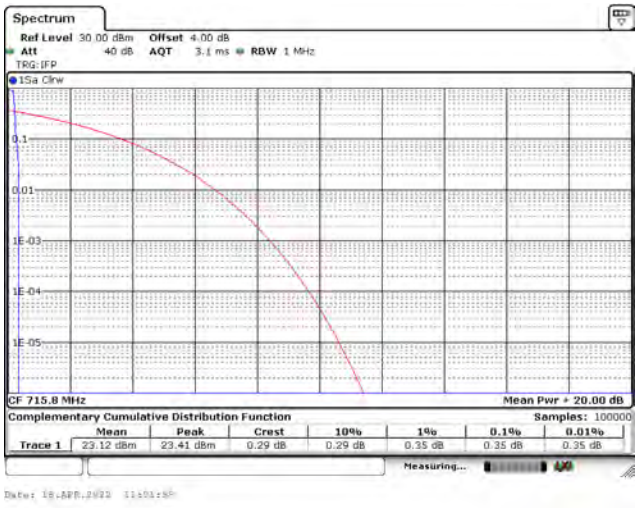
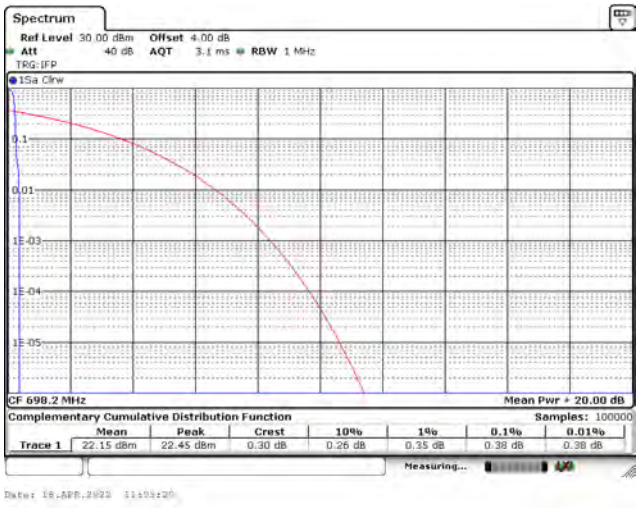
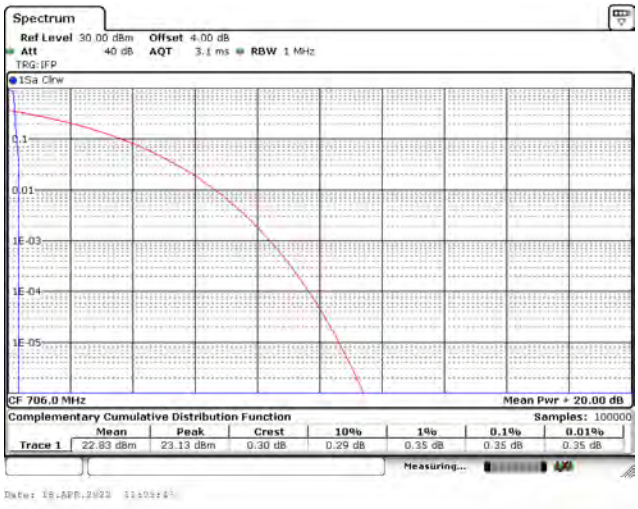
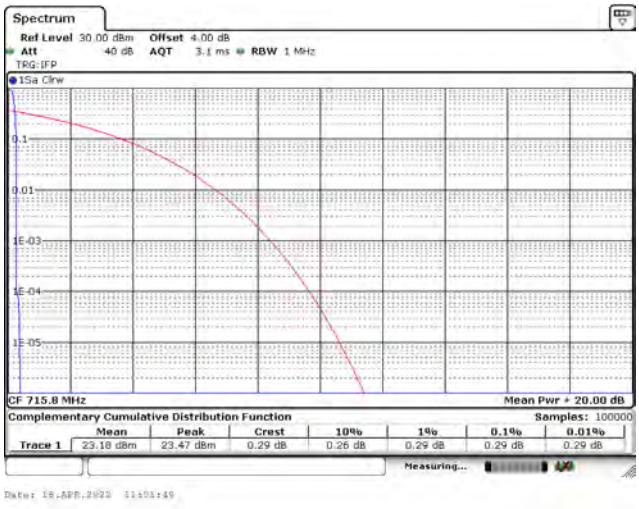
10 MHz / QPSK / CH134052 / 1RB0	10 MHz / QPSK / CH134092 / 1RB0
	
10 MHz / QPSK / CH134132 / 1RB5	10 MHz / 16-QAM / CH134052 / 1RB0
	
10 MHz / 16-QAM / CH134092 / 1RB0	10 MHz / 16-QAM / CH134132 / 1RB5
	

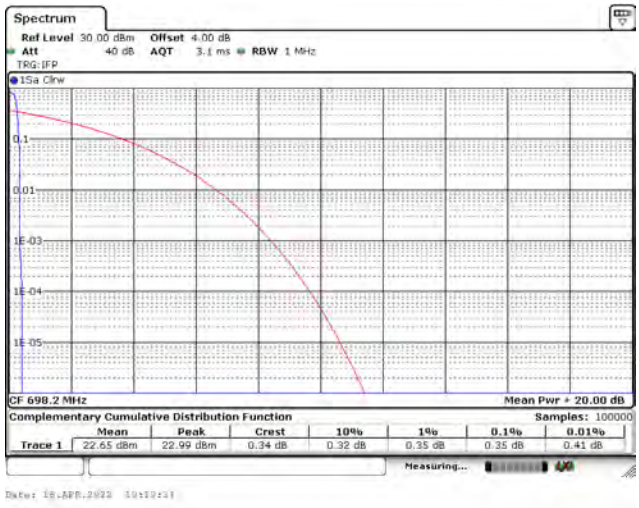
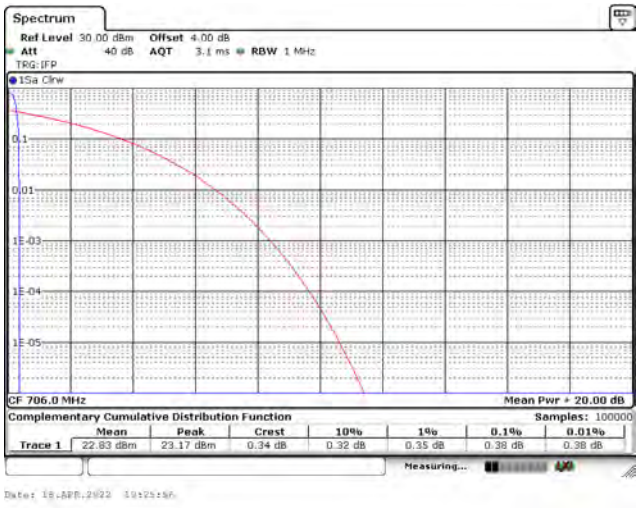
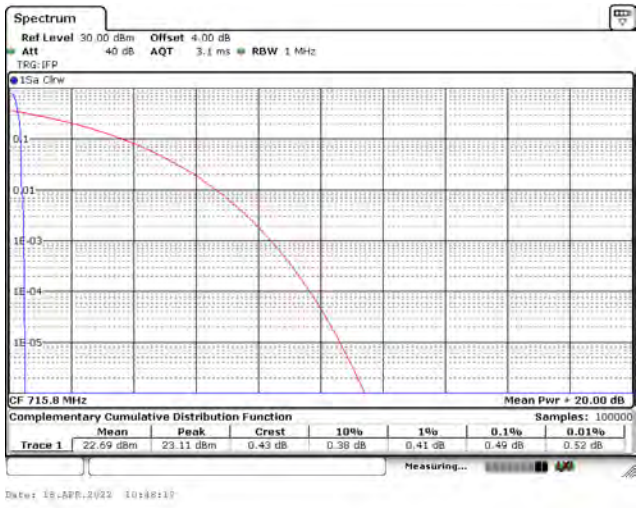
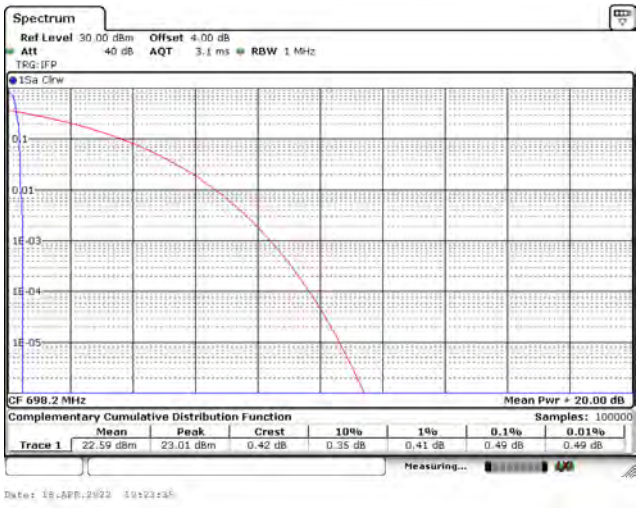
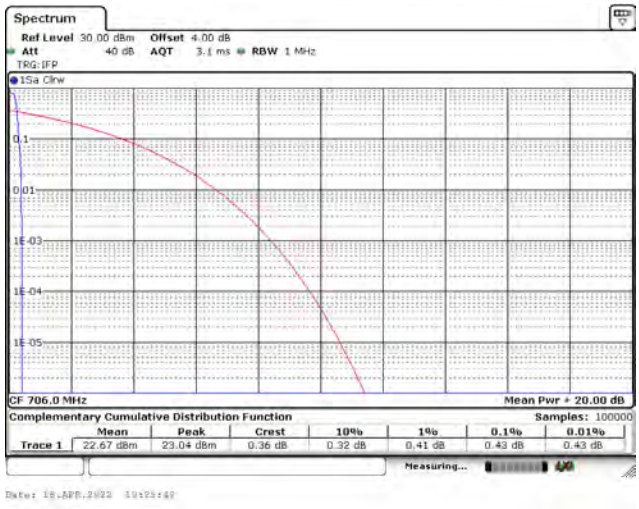
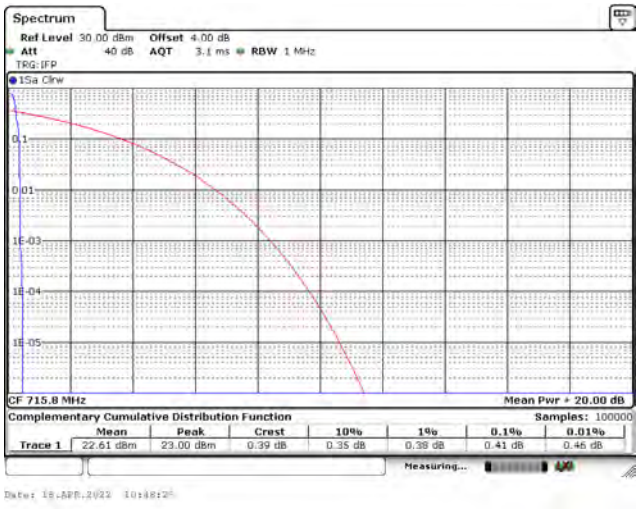
Mode 3: NB-IoT Band 8 (FCC only)

3.75 kHz / BPSK / CH21627 / 1RB0	3.75 kHz / BPSK / CH21640 / 1RB0
	
3.75 kHz / BPSK / CH21653 / 1RB47	3.75 kHz / QPSK / CH21627 / 1RB0
	
3.75 kHz / QPSK / CH21640 / 1RB0	3.75 kHz / QPSK / CH21653 / 1RB47
	

15 kHz / BPSK / CH21627 / 1RB0	15 kHz / BPSK / CH21640 / 1RB0
	
15 kHz / BPSK / CH21653 / 1RB11	15 kHz / QPSK / CH21627 / 1RB0
	
15 kHz / QPSK / CH21640 / 1RB0	15 kHz / QPSK / CH21653 / 1RB11
	

Mode 4: NB-IoT Band 85

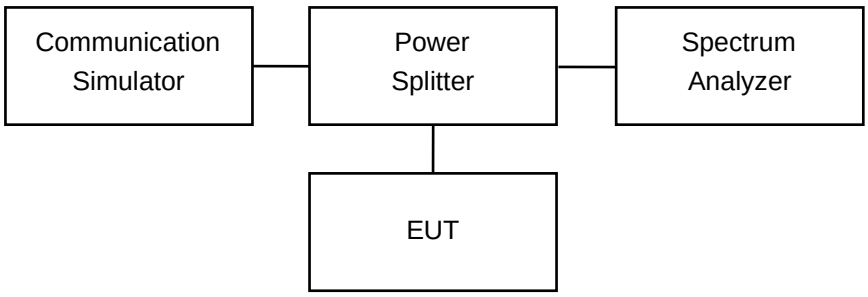
3.75 kHz / BPSK / CH134004 / 1RB0	3.75 kHz / BPSK / CH134082 / 1RB0
	
3.75 kHz / BPSK / CH134180 / 1RB47	3.75 kHz / QPSK / CH134004 / 1RB0
	
3.75 kHz / QPSK / CH134082 / 1RB0	3.75 kHz / QPSK / CH134180 / 1RB47
	

15 kHz / BPSK / CH134004 / 1RB0	15 kHz / BPSK / CH134082 / 1RB0
	
15 kHz / BPSK / CH134180 / 1RB11	15 kHz / QPSK / CH134004 / 1RB0
	
15 kHz / QPSK / CH134082 / 1RB0	15 kHz / QPSK / CH134180 / 1RB11
	

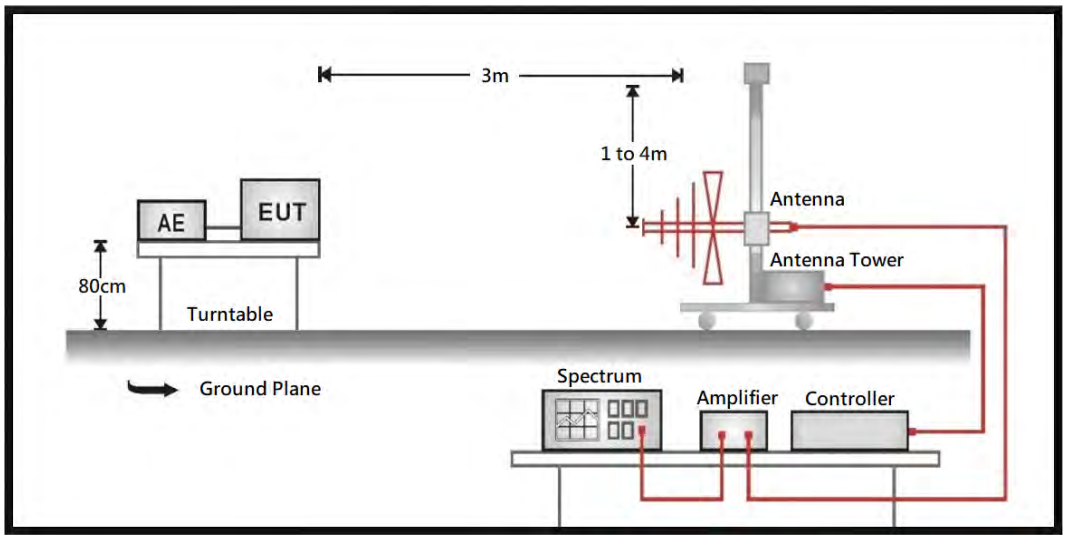
6. Spurious Emissions

6.1. Test Setup

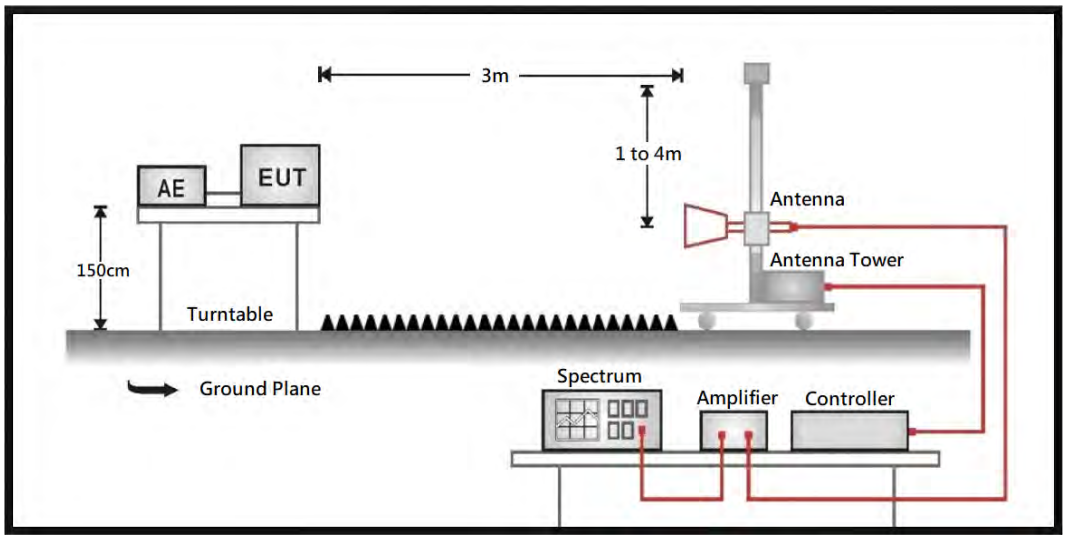
Conducted Spurious Measurement



Radiated Spurious Measurement: below 1GHz



Radiated Spurious Measurement: above 1GHz



6.2. Test Procedure

Conducted Spurious Measurement:

The EUT makes a call to the communication simulator. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. The path loss was compensated to the results for each measurement. The resolution bandwidth of the spectrum analyzer was set at 1 MHz, sufficient scans were taken to show the out of band Emission if any up to 10^{th} harmonic.

Radiated Spurious Measurement:

The EUT and its simulators are placed on a turn table which is 0.8 or 1.5 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations. The resolution bandwidth of the spectrum analyzer was set at 1 MHz, sufficient scans were taken to show the out of band Emission if any up to 10th harmonic. Taking the record of maximum spurious emission.

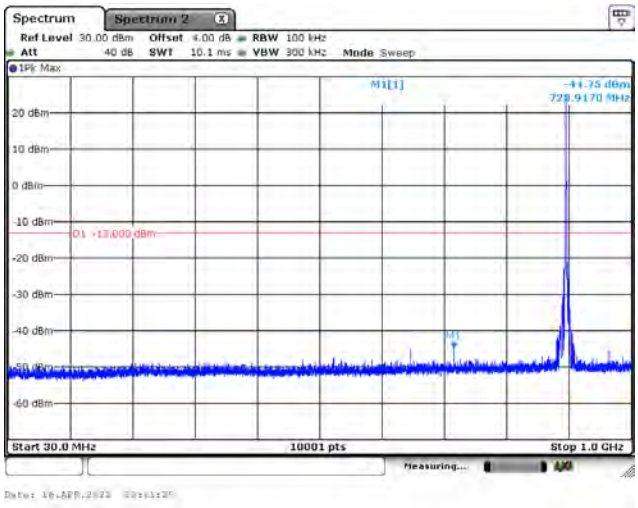
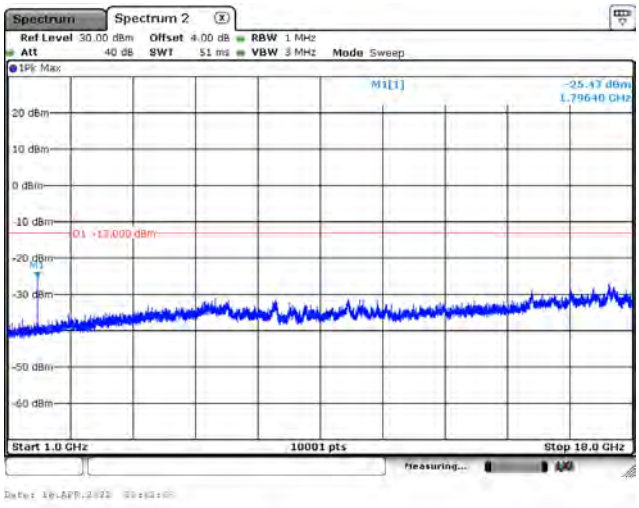
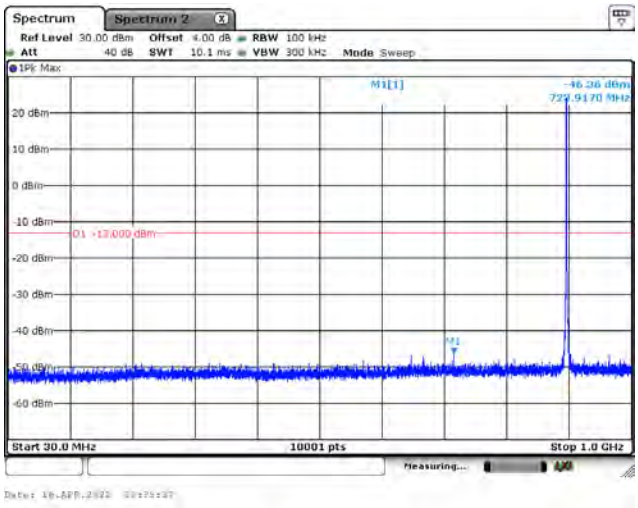
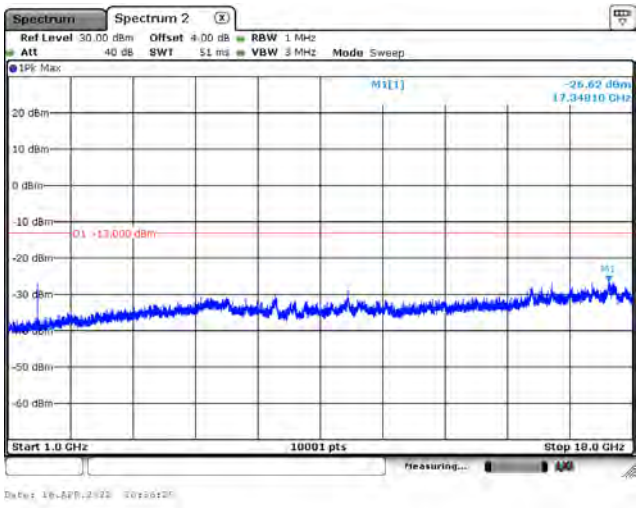
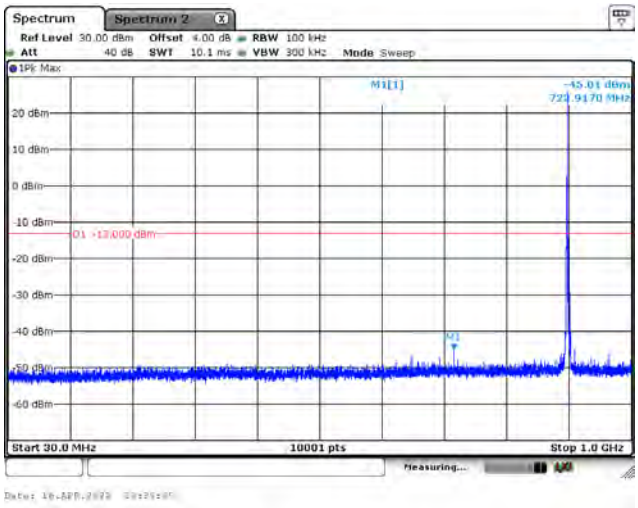
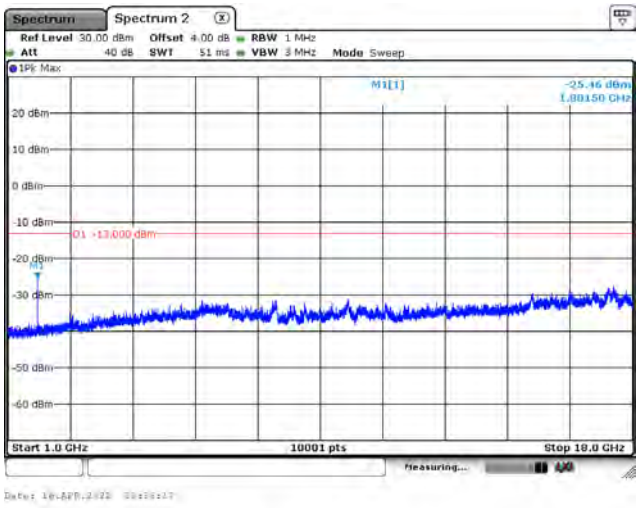
6.3. Test Methodology and Reference Procedures

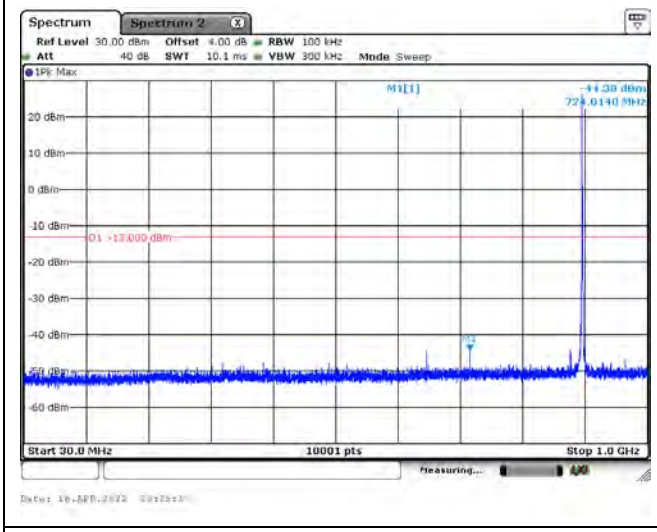
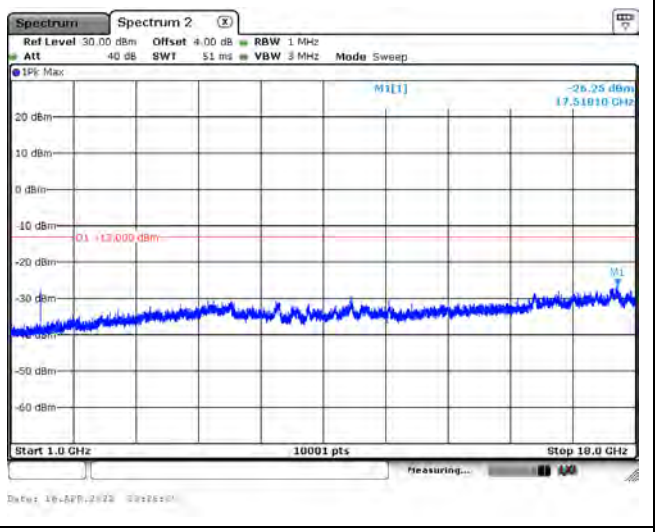
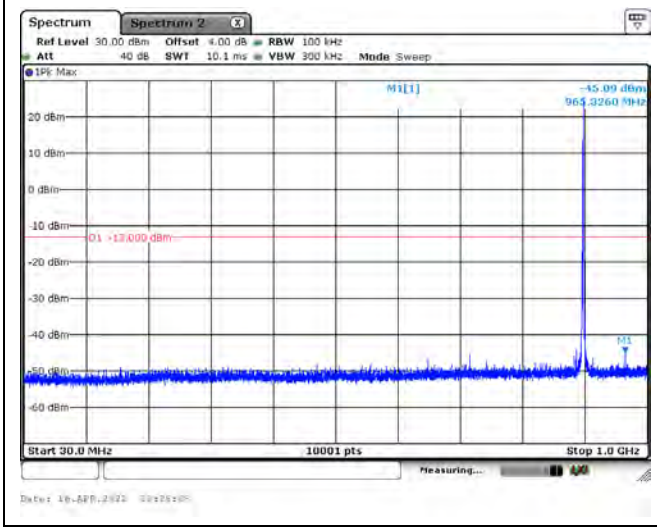
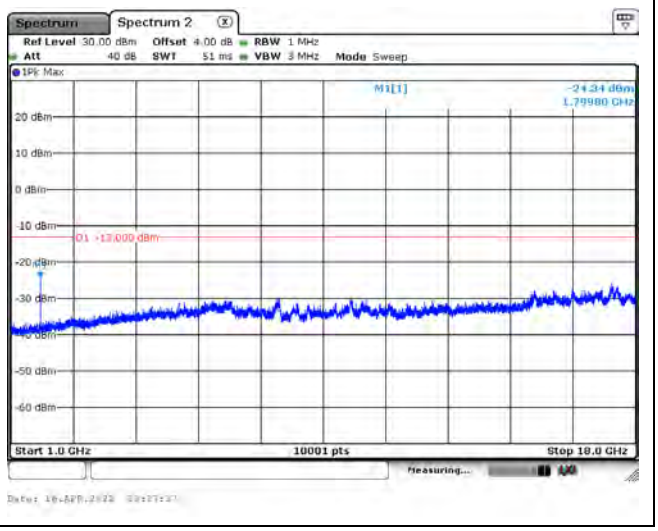
KDB 971168 D01 Power Meas License Digital Systems v03r01

ANSI C63.26-2015

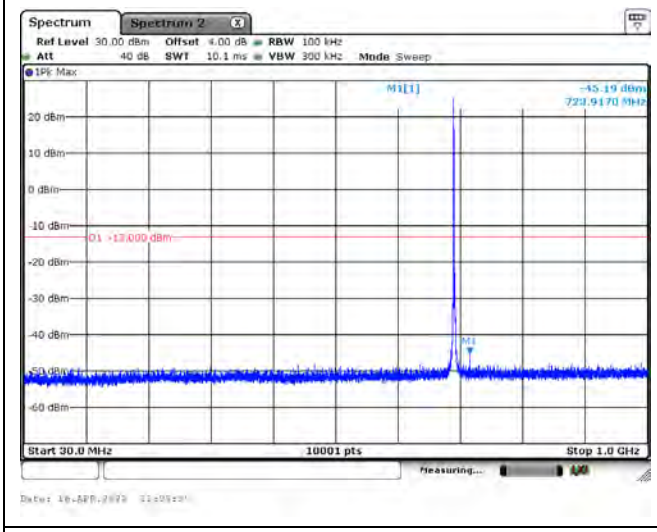
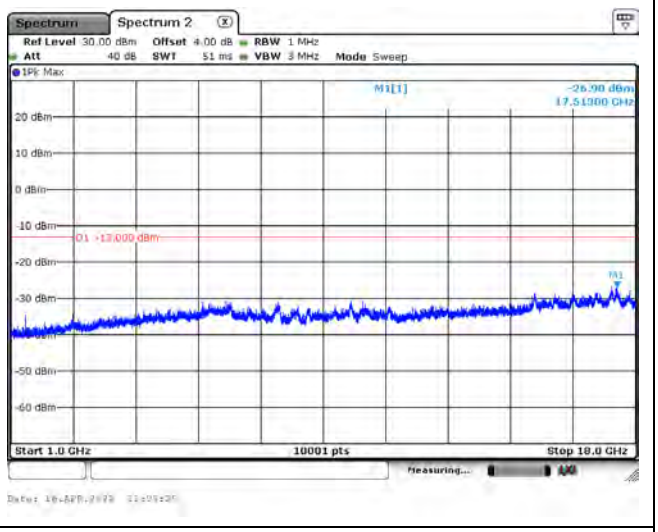
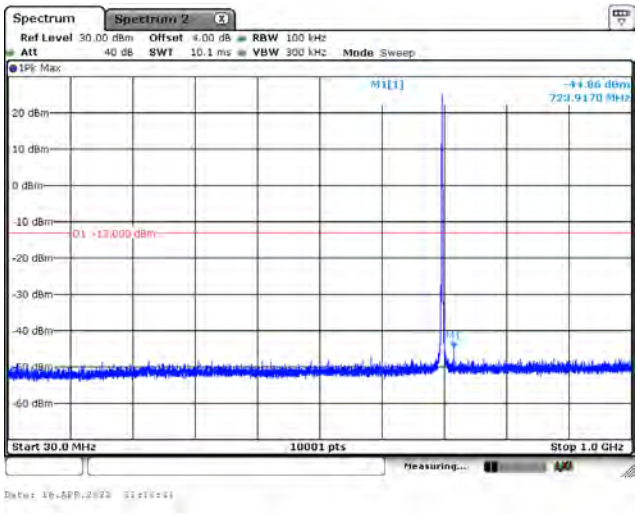
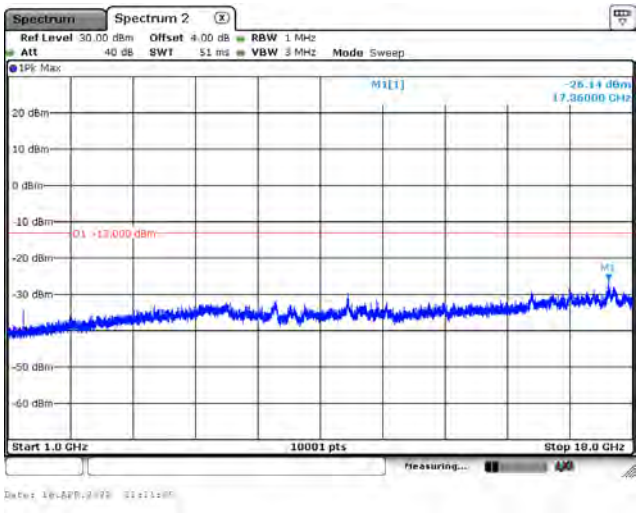
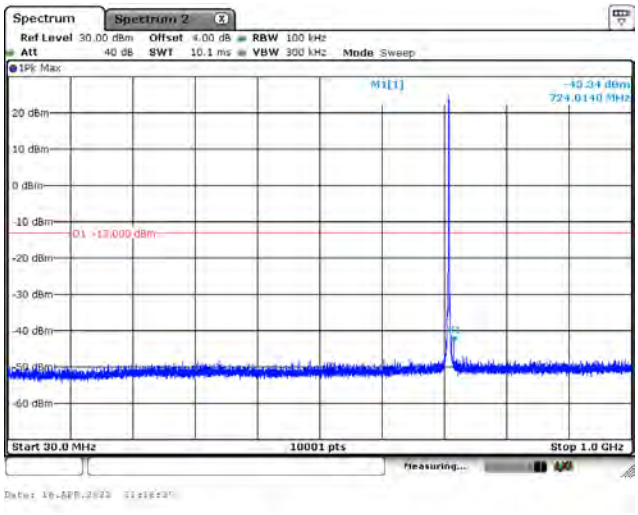
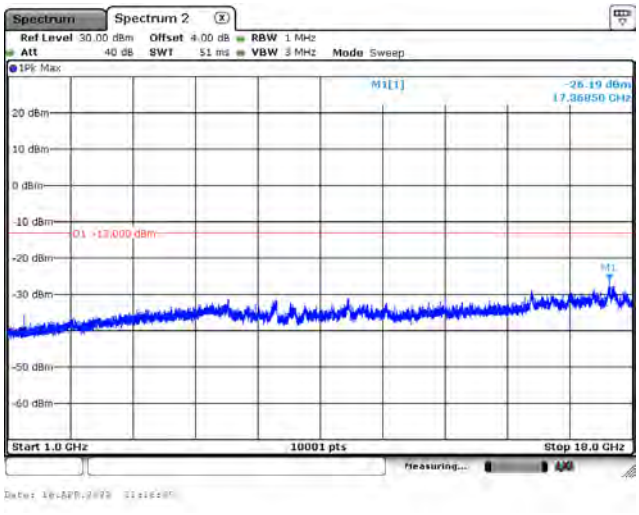
6.4. Test Result of Conducted Spurious Emission

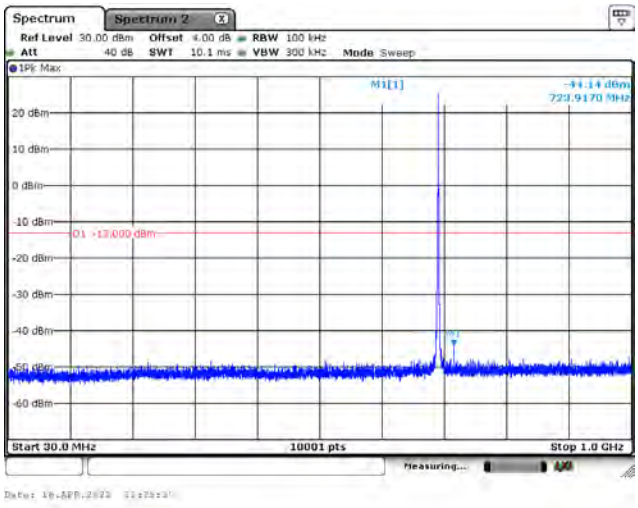
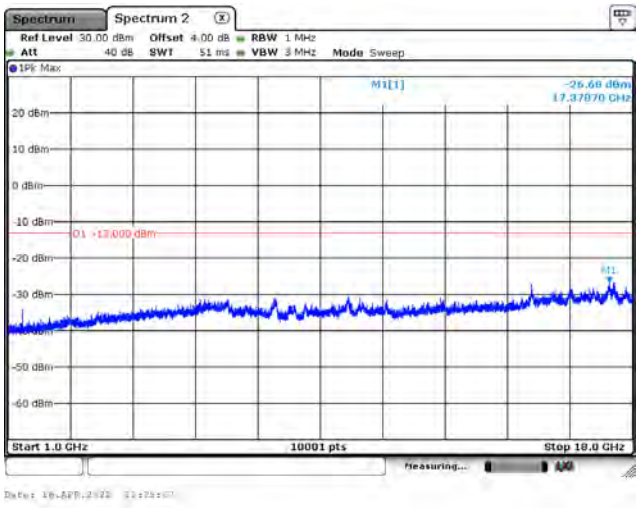
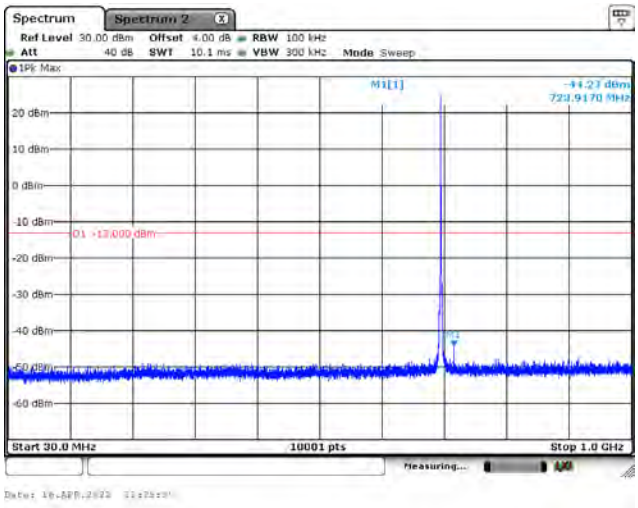
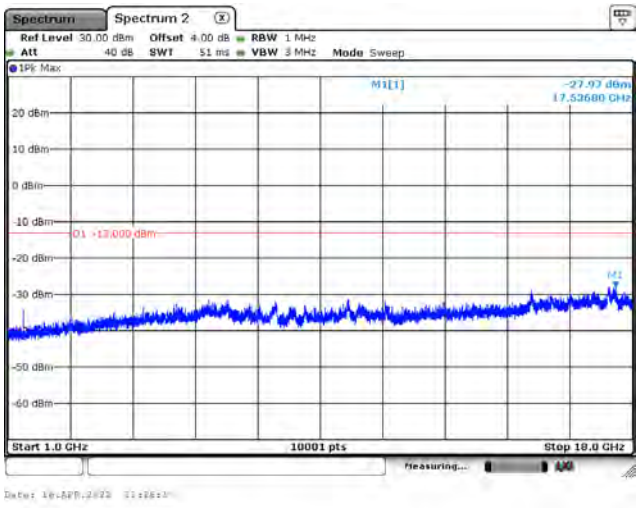
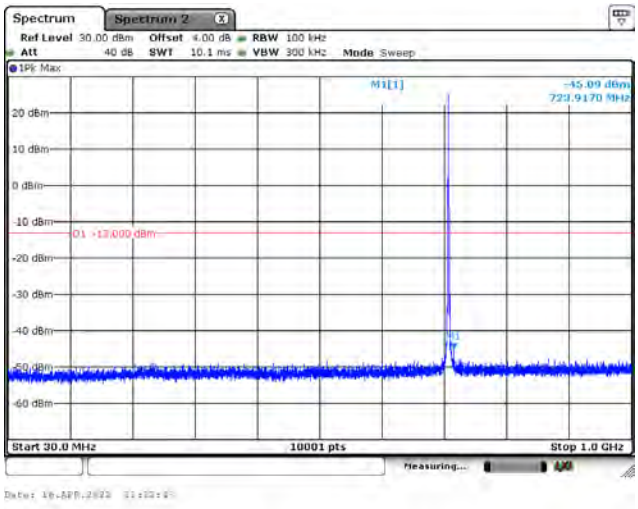
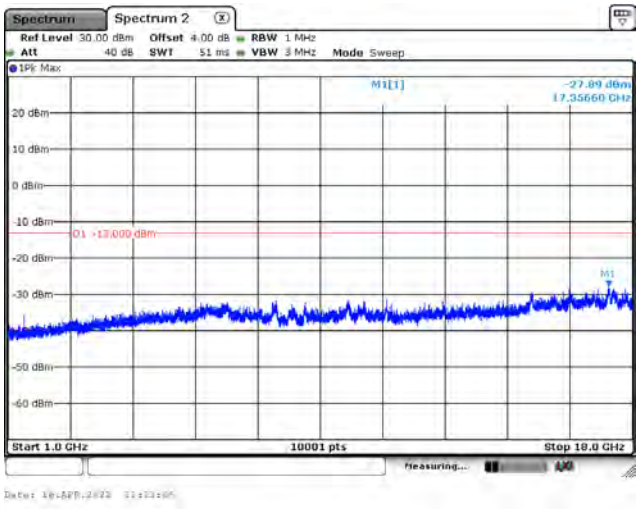
Mode 1: Cat-M1 Band 8 (FCC only)

1.4 MHz / QPSK / CH21632 / 1RB0 / Below 1 GHz	1.4 MHz / QPSK / CH21632 / 1RB0 / Above 1 GHz
	
1.4 MHz / QPSK / CH21640 / 1RB0 / Below 1 GHz	1.4 MHz / QPSK / CH21640 / 1RB0 / Above 1 GHz
	
1.4 MHz / QPSK / CH21648 / 1RB5 /Below 1 GHz	1.4 MHz / QPSK / CH21648 / 1RB5 /Above 1 GHz
	

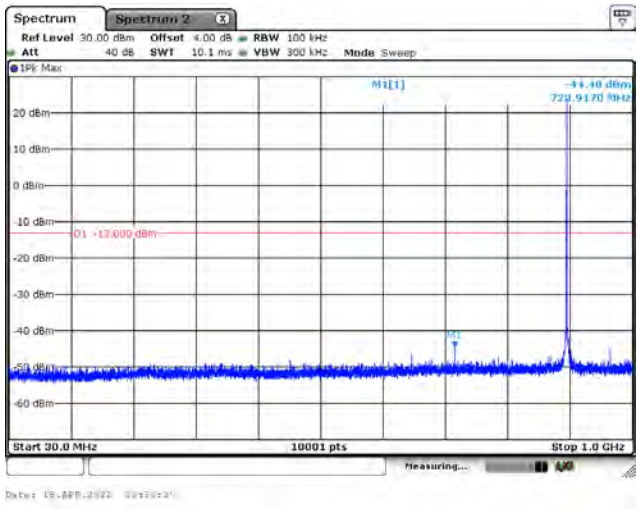
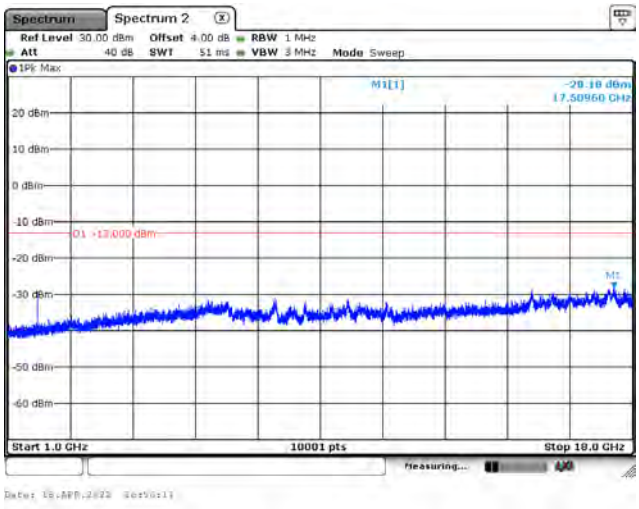
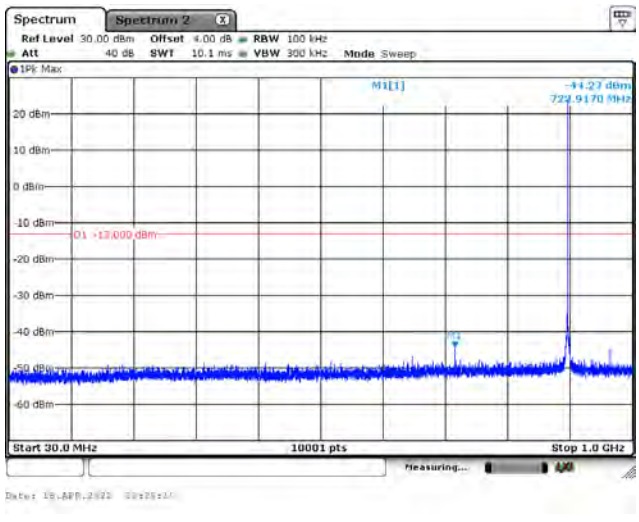
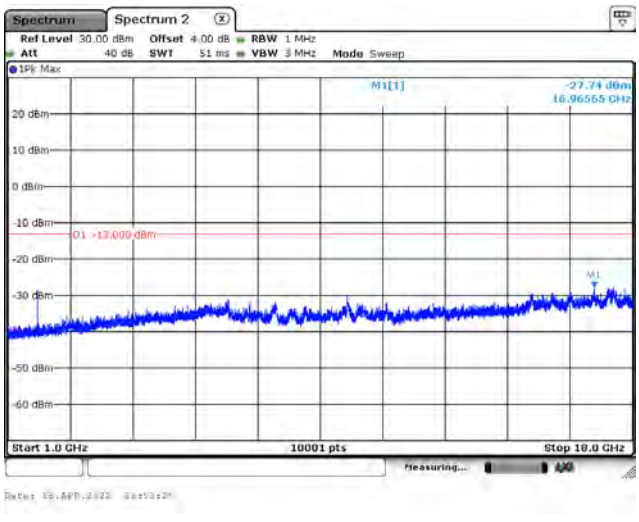
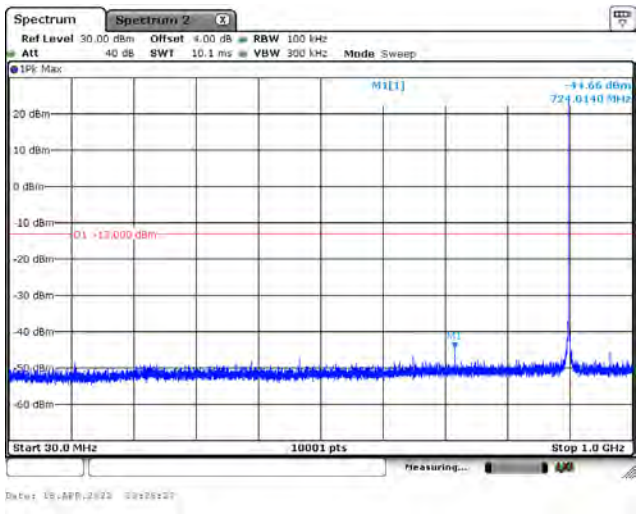
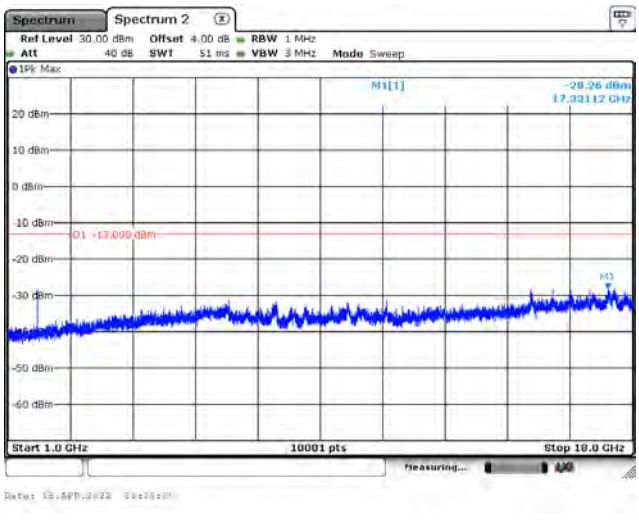
3 MHz / QPSK - Low / CH21640 / 1RB0 / Below 1 GHz	3 MHz / QPSK - Low / CH21640 / 1RB0 / Above 1 GHz
	
3 MHz / QPSK - Hight / CH21640 / 1RB5 / Below 1 GHz	3 MHz / QPSK - Hight / CH21640 / 1RB5 / Above 1 GHz
	

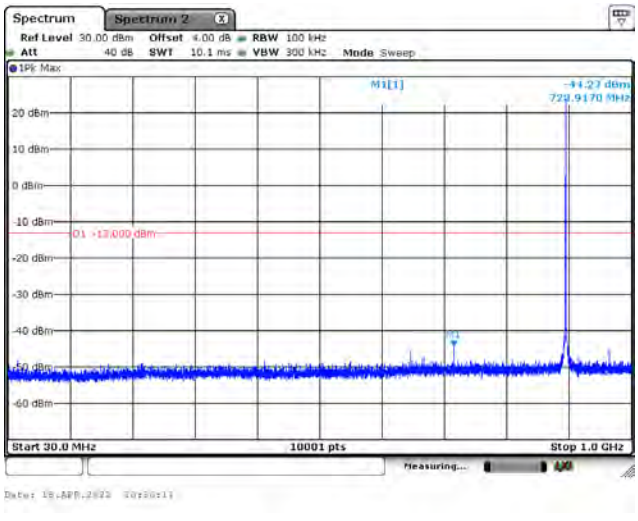
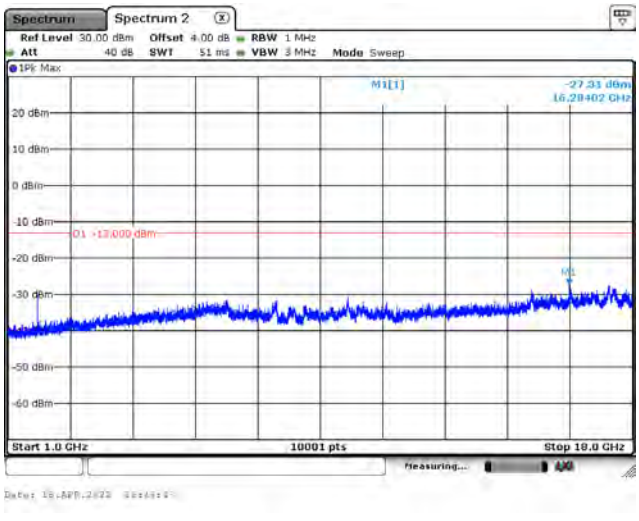
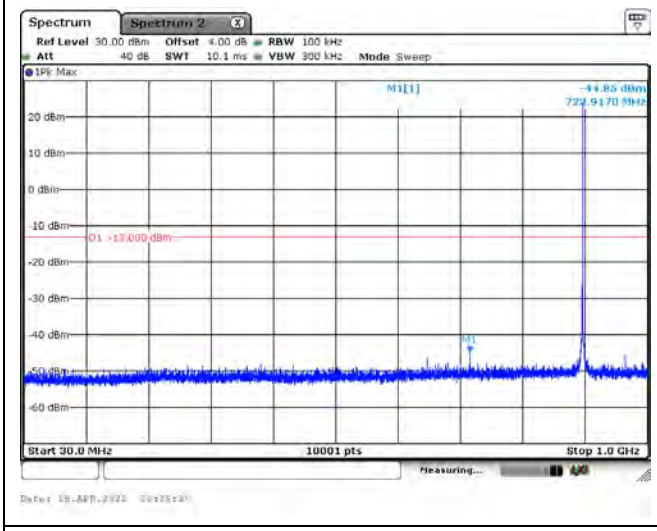
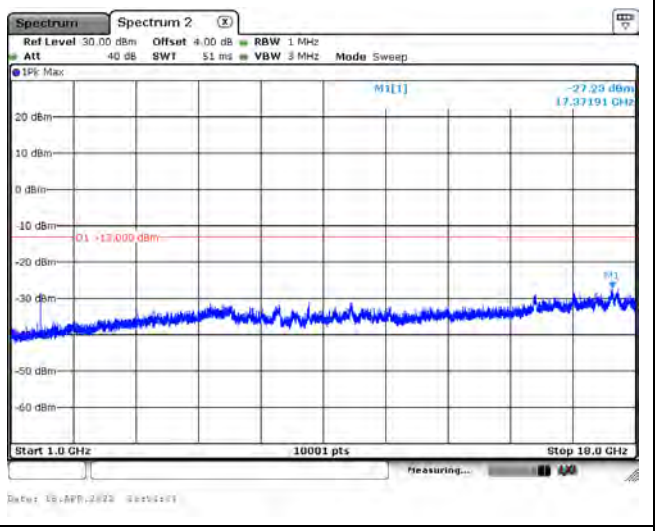
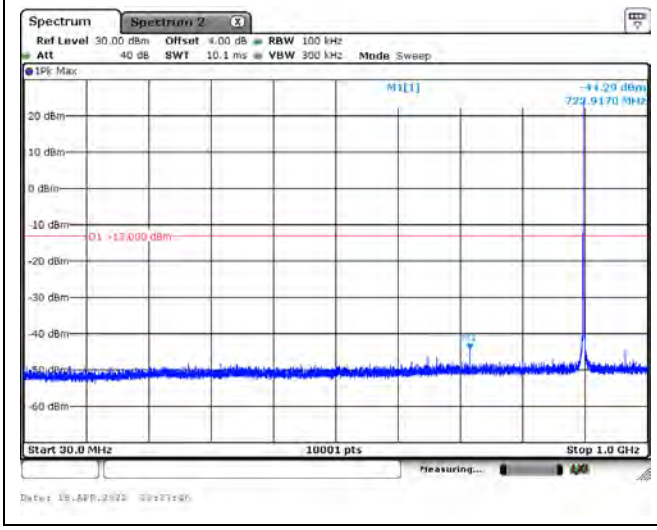
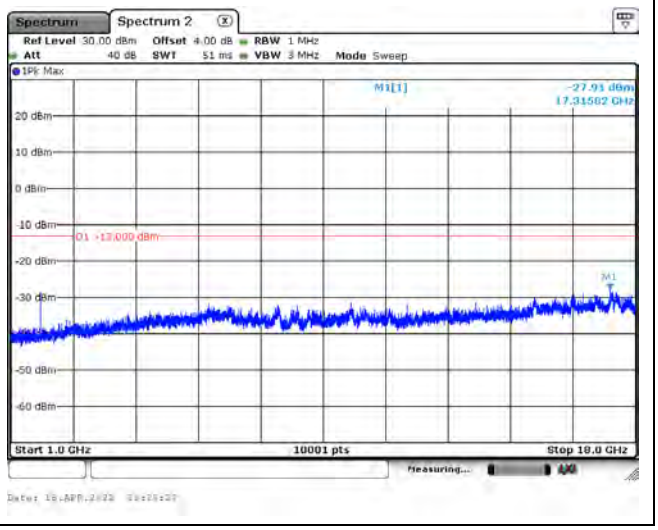
Mode 2: Cat-M1 Band 85

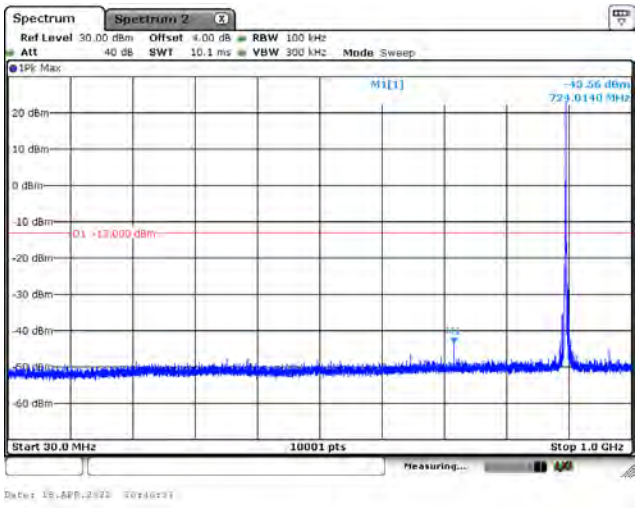
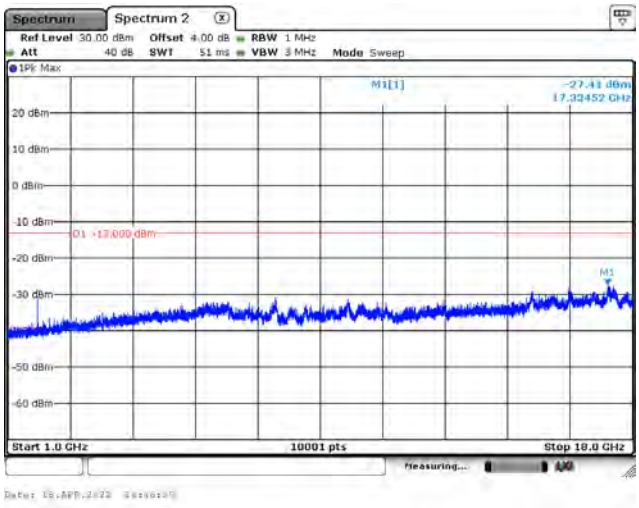
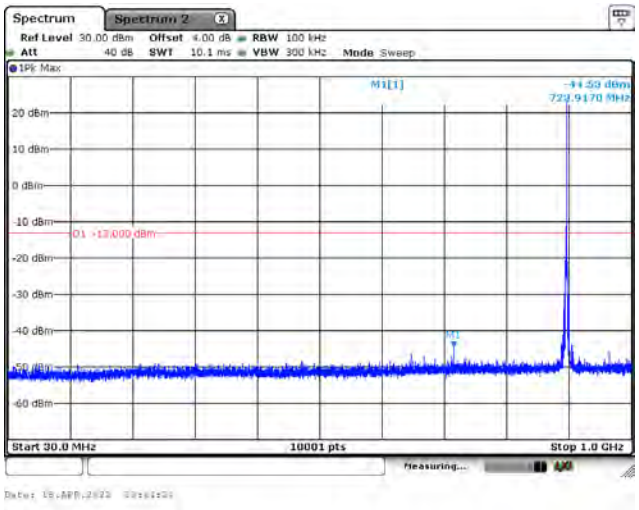
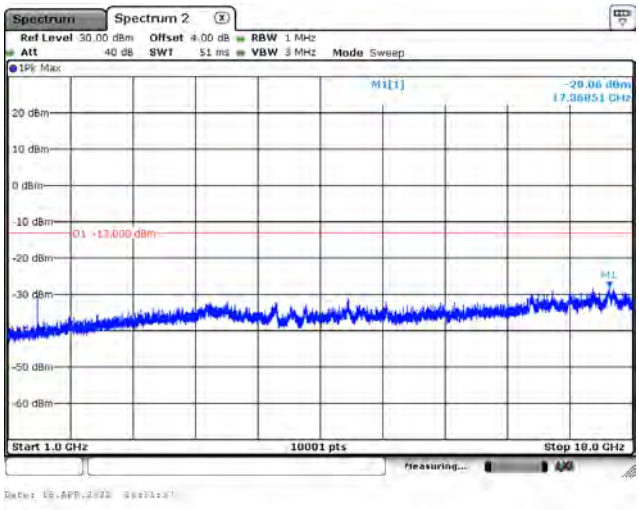
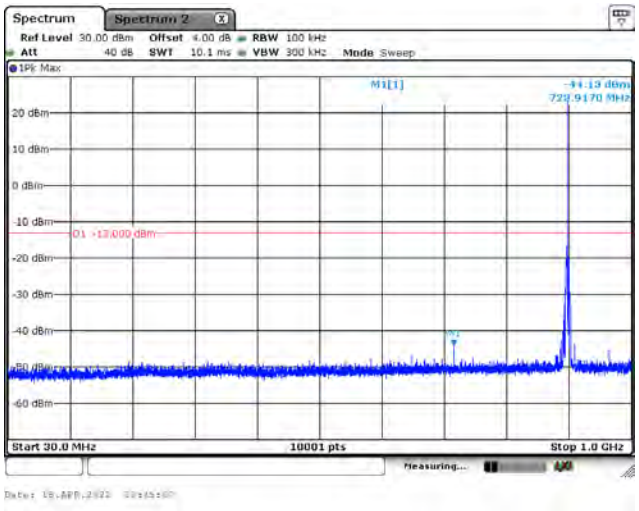
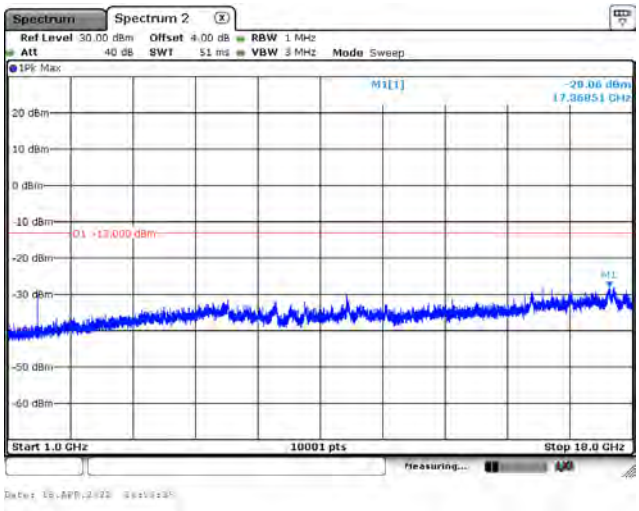
5 MHz / QPSK / CH134027 / 1RB0 / Below 1 GHz	5 MHz / QPSK / CH134027 / 1RB0 / Above 1 GHz
	
5 MHz / QPSK / CH134092 / 1RB0 / Below 1 GHz	5 MHz / QPSK / CH134092 / 1RB0 / Above 1 GHz
	
5 MHz / QPSK / CH134157 / 1RB5 / Below 1 GHz	5 MHz / QPSK / CH134157 / 1RB5 / Above 1 GHz
	

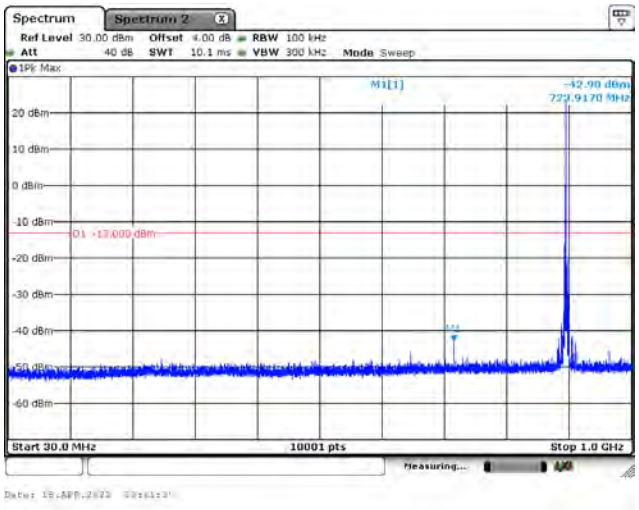
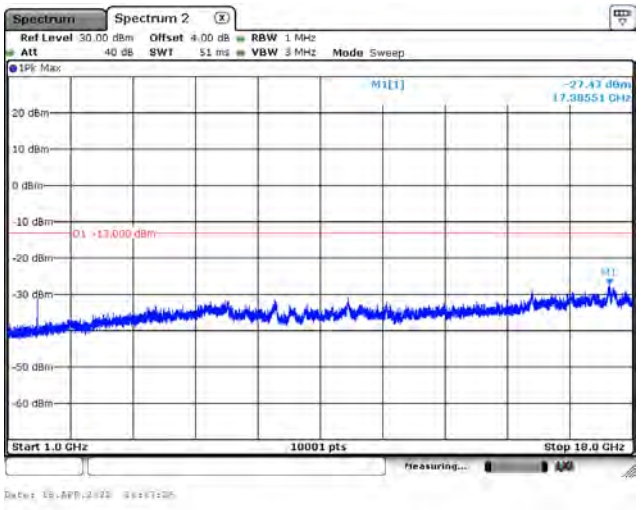
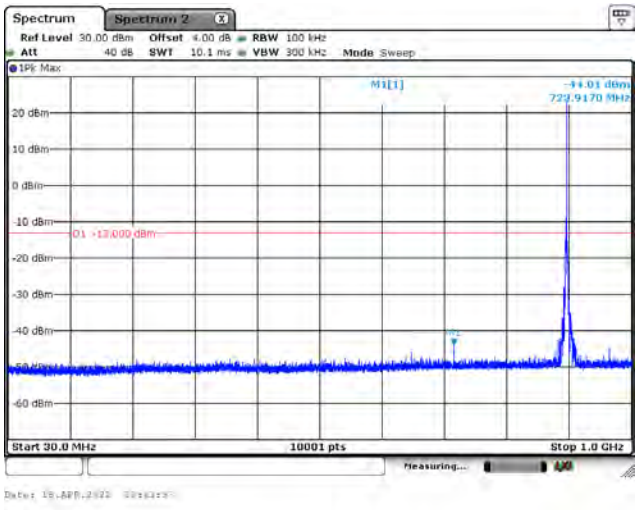
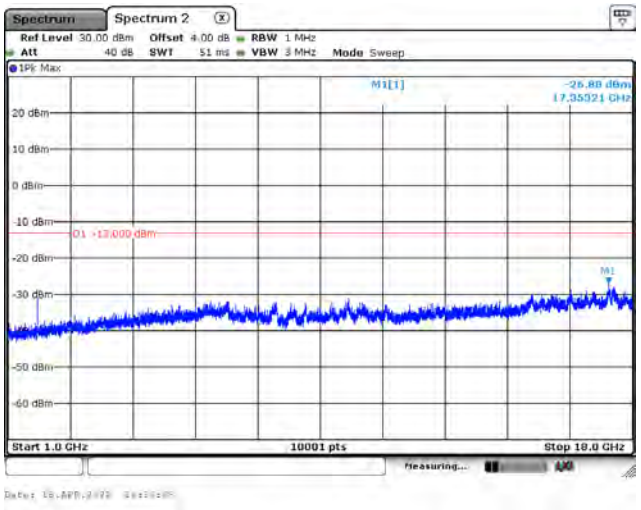
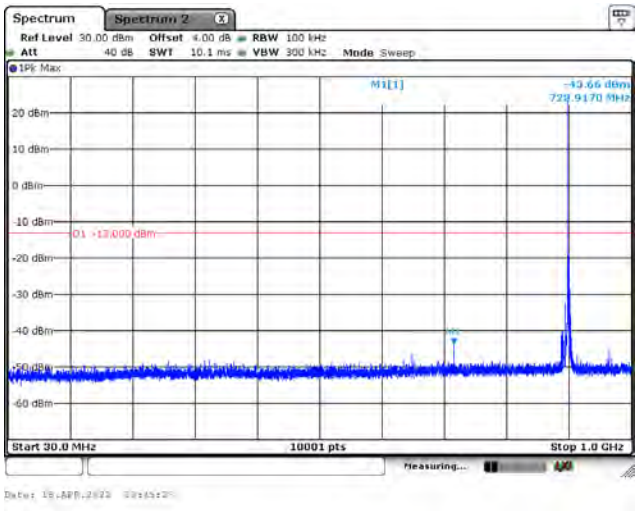
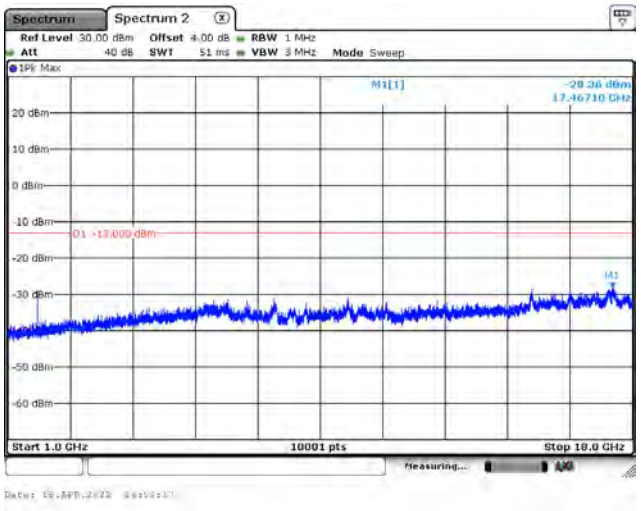
10 MHz / QPSK / CH134052 / 1RB0 / Below 1 GHz	10 MHz / QPSK / CH134052 / 1RB0 / Above 1 GHz
	
10 MHz / QPSK / CH134092 / 1RB0 / Below 1 GHz	10 MHz / QPSK / CH134092 / 1RB0 / Above 1 GHz
	
10 MHz / QPSK / CH134132 / 1RB5 / Below 1 GHz	10 MHz / QPSK / CH134132 / 1RB5 / Above 1 GHz
	

Mode 3: NB-IoT Band 8 (FCC only)

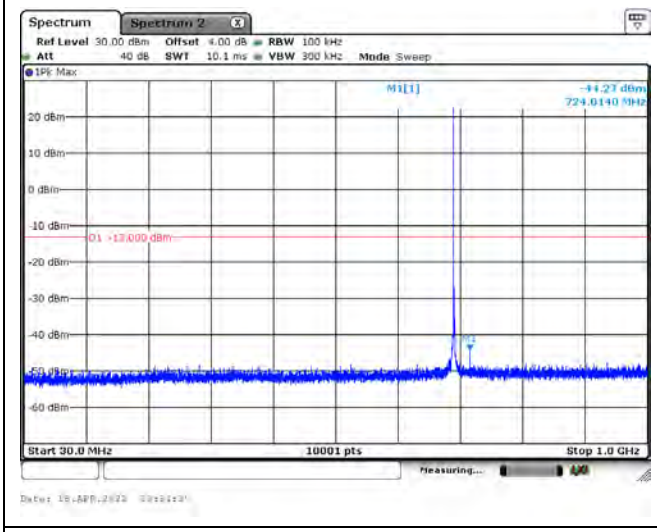
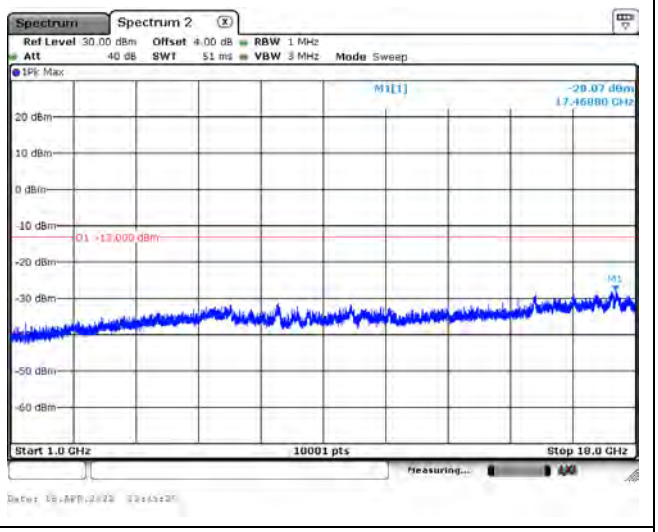
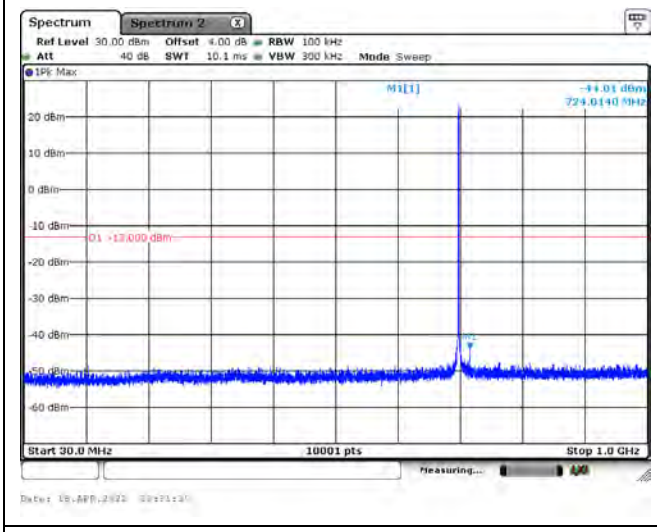
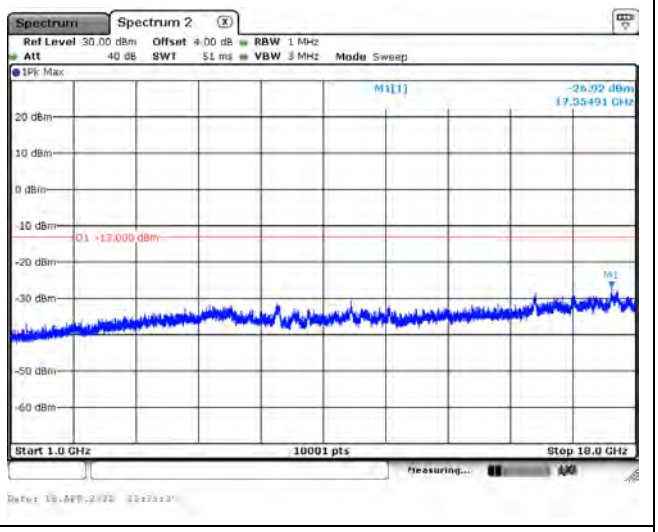
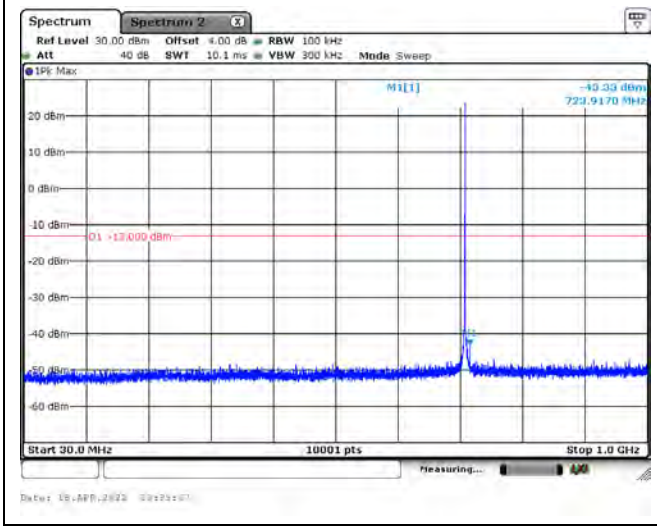
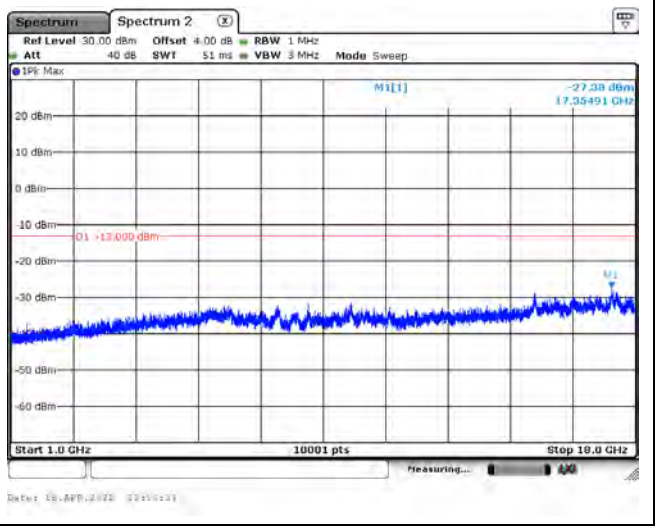
3.75 kHz / BPSK / CH21627 / 1RB0 / Below 1 GHz	3.75 kHz / BPSK / CH21627 / 1RB0 / Above 1 GHz
	
3.75 kHz / BPSK / CH21640 / 1RB0 / Below 1 GHz	3.75 kHz / BPSK / CH21640 / 1RB0 / Above 1 GHz
	
3.75 kHz / BPSK / CH21653 / 1RB47 / Below 1 GHz	3.75 kHz / BPSK / CH21653 / 1RB47 / Above 1 GHz
	

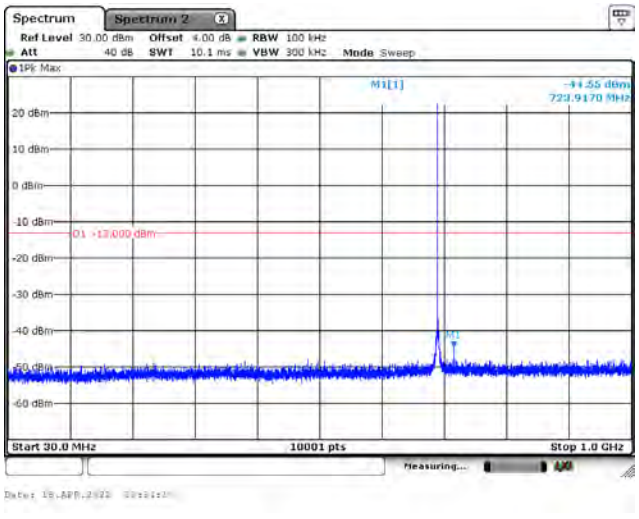
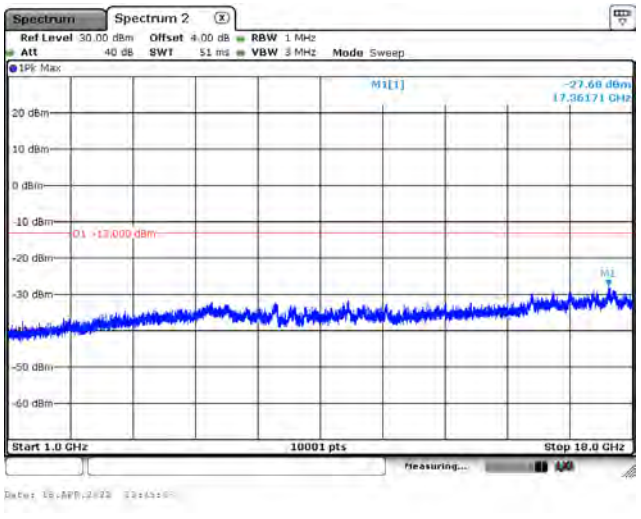
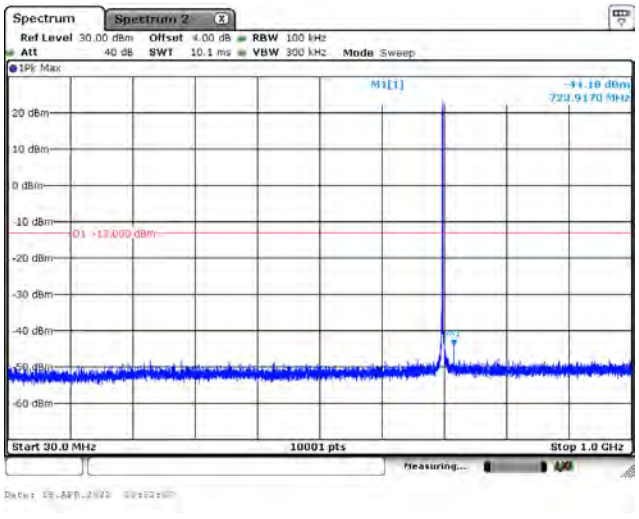
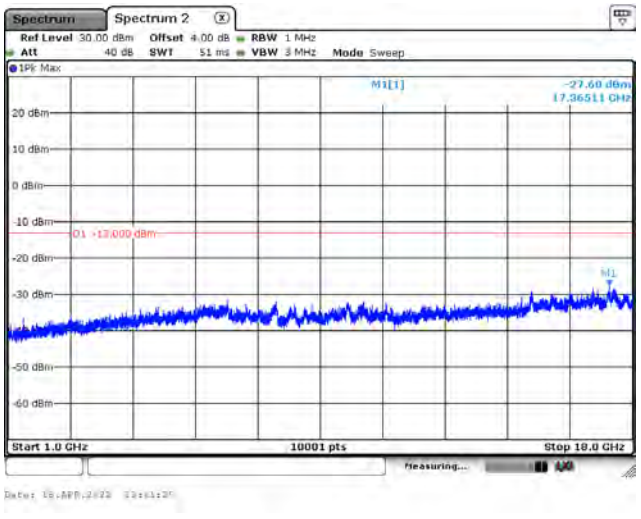
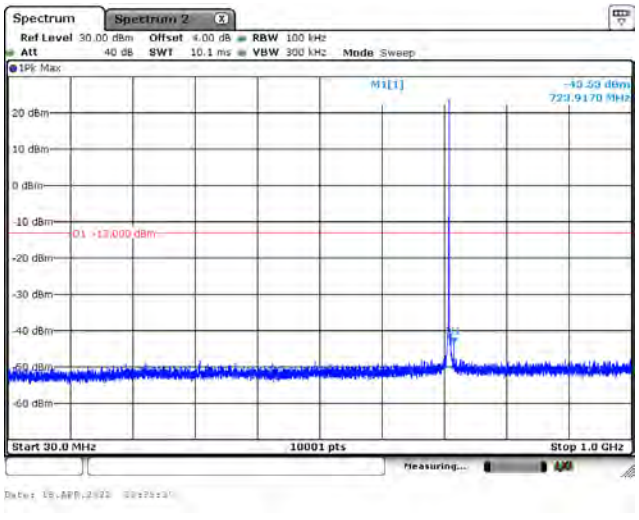
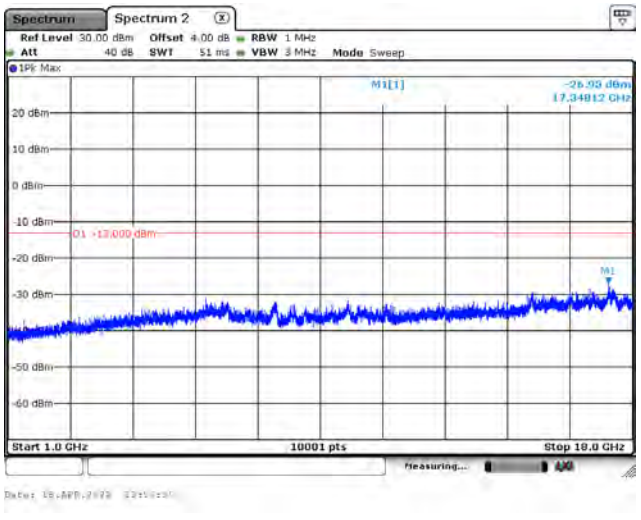
3.75 kHz / QPSK / CH21627 / 1RB0 / Below 1 GHz	3.75 kHz / QPSK / CH21627 / 1RB0 / Above 1 GHz
	
3.75 kHz / QPSK / CH21640 / 1RB0 / Below 1 GHz	3.75 kHz / QPSK / CH21640 / 1RB0 / Above 1 GHz
	
3.75 kHz / QPSK / CH21653 / 1RB47 / Below 1 GHz	3.75 kHz / QPSK / CH21653 / 1RB47 / Above 1 GHz
	

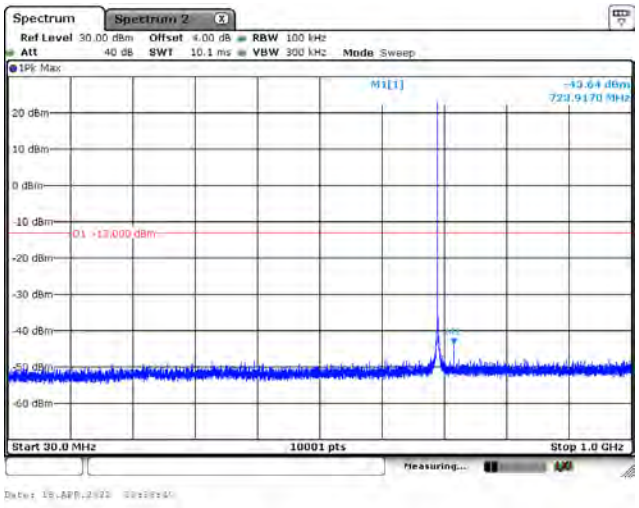
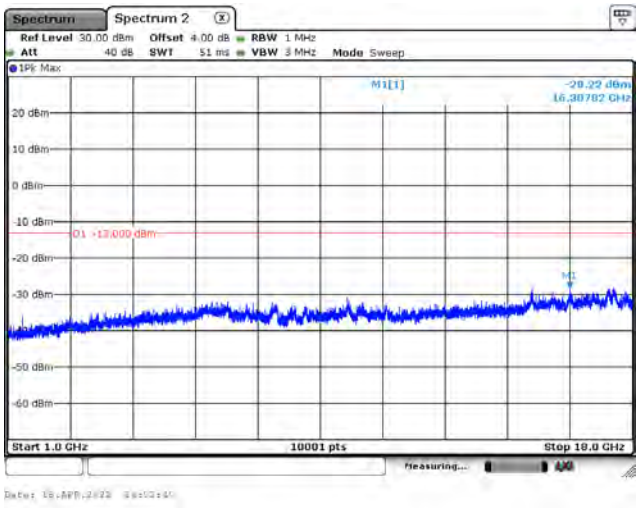
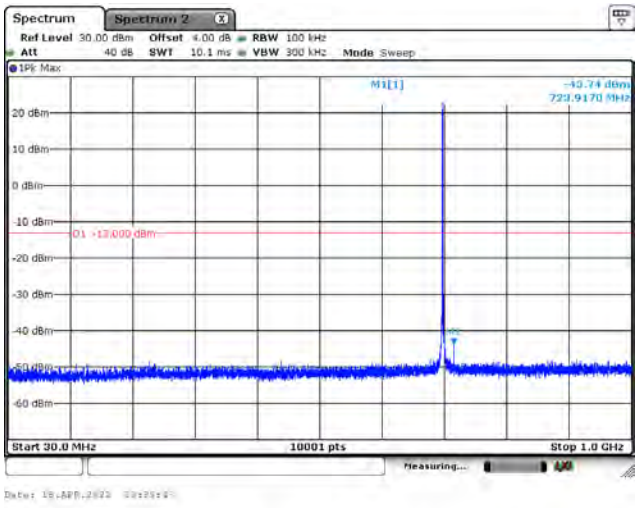
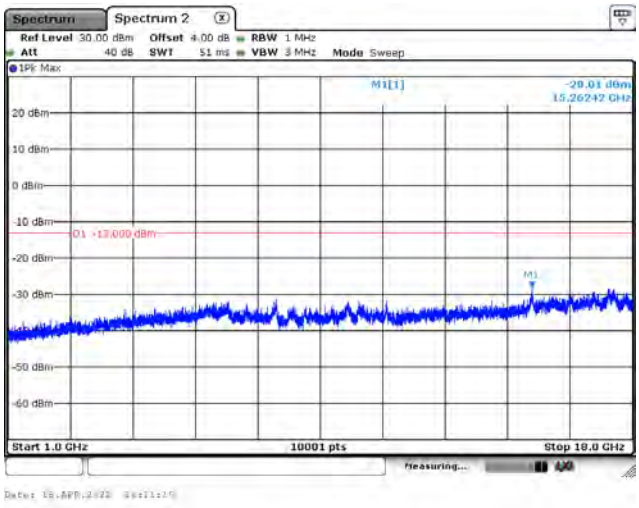
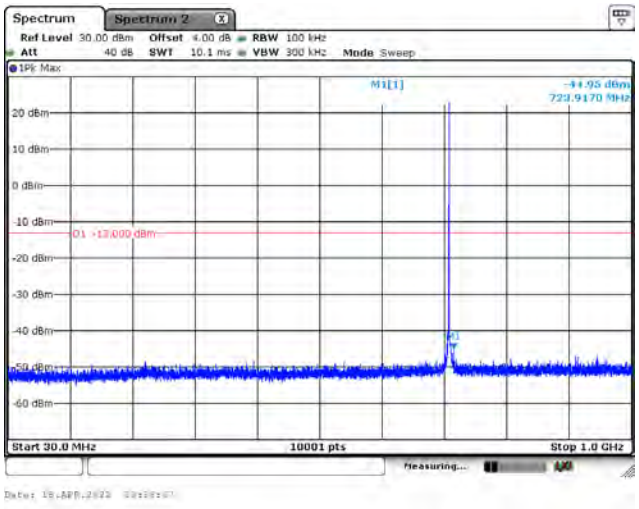
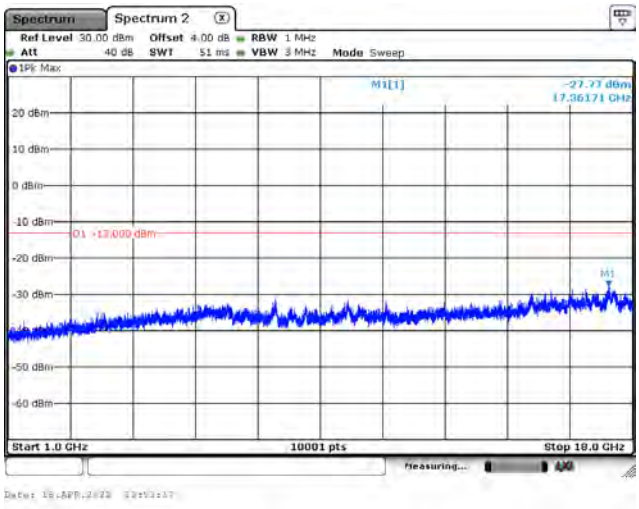
15 kHz / BPSK / CH21627 / 1RB0 / Below 1 GHz	15 kHz / BPSK / CH21627 / 1RB0 / Above 1 GHz
	
15 kHz / BPSK / CH21640 / 1RB0 / Below 1 GHz	15 kHz / BPSK / CH21640 / 1RB0 / Above 1 GHz
	
15 kHz / BPSK / CH21653 / 1RB11 / Below 1 GHz	15 kHz / BPSK / CH21653 / 1RB11 / Above 1 GHz
	

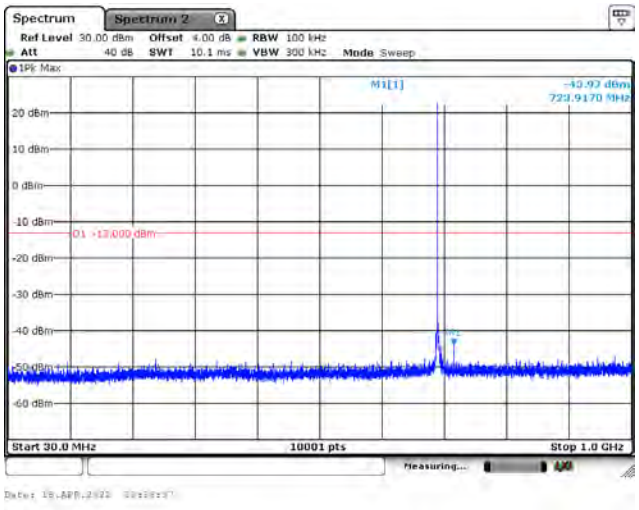
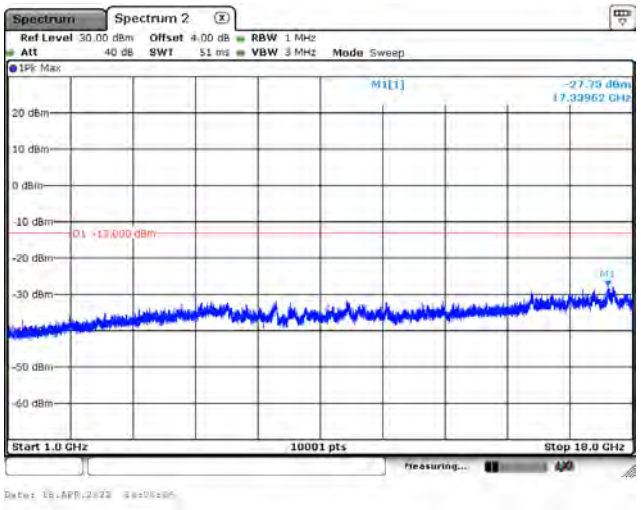
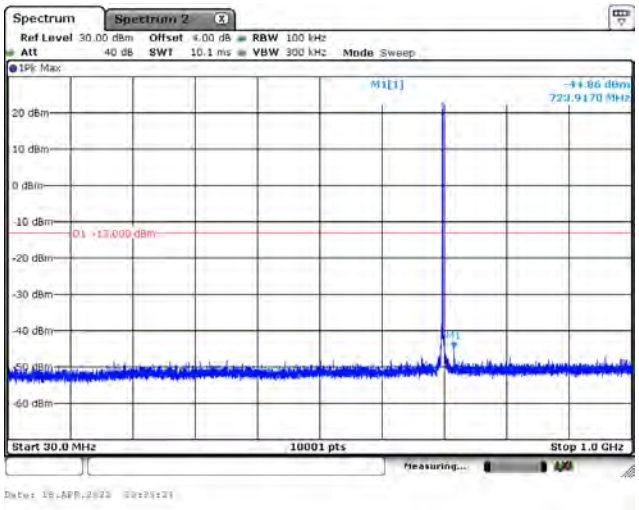
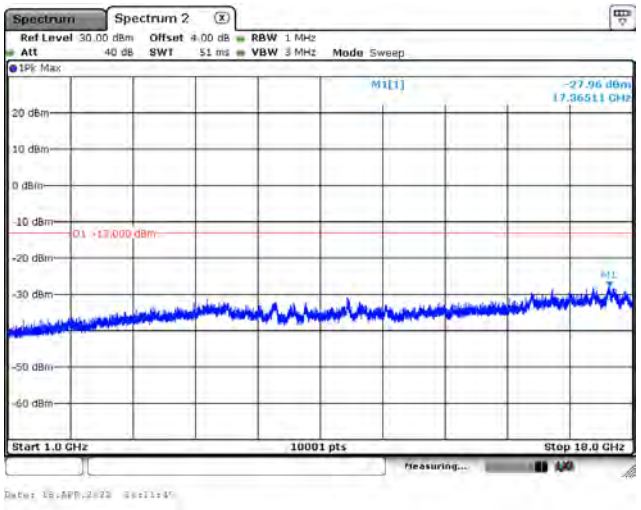
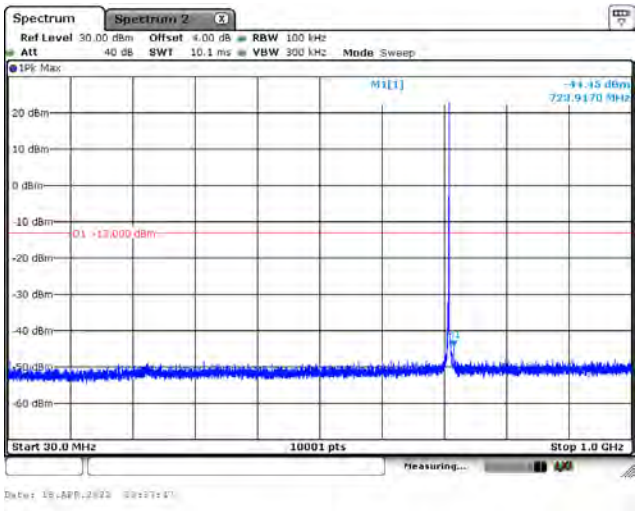
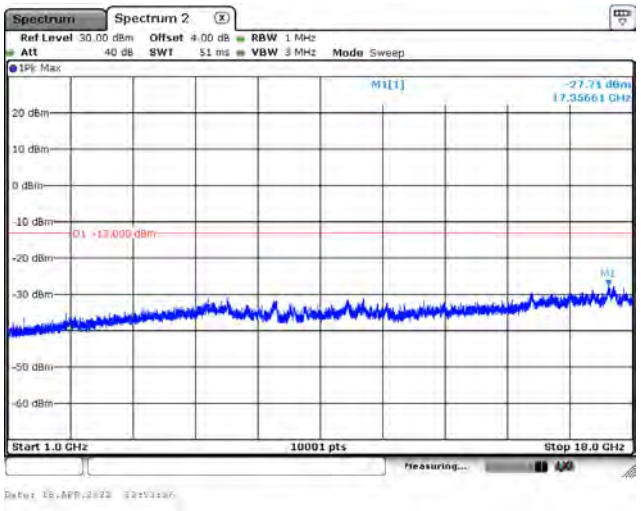
15 kHz / QPSK / CH21627 / 1RB0 / Below 1 GHz	15 kHz / QPSK / CH21627 / 1RB0 / Above 1 GHz
	
15 kHz / QPSK / CH21640 / 1RB0 / Below 1 GHz	15 kHz / QPSK / CH21640 / 1RB0 / Above 1 GHz
	
15 kHz / QPSK / CH21653 / 1RB11 / Below 1 GHz	15 kHz / QPSK / CH21653 / 1RB11 / Above 1 GHz
	

Mode 4: NB-IoT Band 85

3.75 kHz / BPSK / CH134004 / 1RB0 / Below 1 GHz	3.75 kHz / BPSK / CH134004 / 1RB0 / Above 1 GHz
	
3.75 kHz / BPSK / CH134082 / 1RB0 / Below 1 GHz	3.75 kHz / BPSK / CH134082 / 1RB0 / Above 1 GHz
	
3.75 kHz / BPSK / CH134180 / 1RB47 / Below 1 GHz	3.75 kHz / BPSK / CH134180 / 1RB47 / Above 1 GHz
	

3.75 kHz / QPSK / CH134004 / 1RB0 / Below 1 GHz	3.75 kHz / QPSK / CH134004 / 1RB0 / Above 1 GHz
	
3.75 kHz / QPSK / CH134082 / 1RB0 / Below 1 GHz	3.75 kHz / QPSK / CH134082 / 1RB0 / Above 1 GHz
	
3.75 kHz / QPSK / CH134180 / 1RB47 / Below 1 GHz	3.75 kHz / QPSK / CH134180 / 1RB47 / Above 1 GHz
	

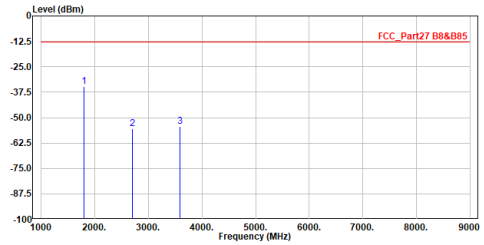
15 kHz / BPSK / CH134004 / 1RB0 / Below 1 GHz	15 kHz / BPSK / CH134004 / 1RB0 / Above 1 GHz
	
15 kHz / BPSK / CH134082 / 1RB0 / Below 1 GHz	15 kHz / BPSK / CH134082 / 1RB0 / Above 1 GHz
	
15 kHz / BPSK / CH134180 / 1RB11 / Below 1 GHz	15 kHz / BPSK / CH134180 / 1RB11 / Above 1 GHz
	

15 kHz / QPSK / CH134004 / 1RB0 / Below 1 GHz	15 kHz / QPSK / CH134004 / 1RB0 / Above 1 GHz
	
15 kHz / QPSK / CH134082 / 1RB0 / Below 1 GHz	15 kHz / QPSK / CH134082 / 1RB0 / Above 1 GHz
	
15 kHz / QPSK / CH134180 / 1RB11 / Below 1 GHz	15 kHz / QPSK / CH134180 / 1RB11 / Above 1 GHz
	

6.5. Test Result of Radiated Spurious Emission

Mode 1: Cat-M1 Band 8 (FCC only)

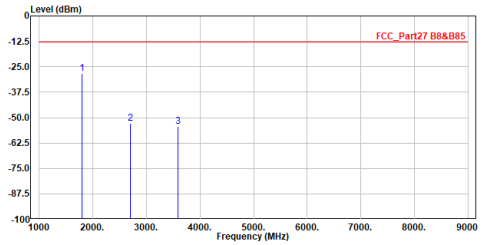
Site :CB2-H
Condition :3m Horizontal
Mode :Cat-M1_B8_3M_Ch21640
Test By :Cyril



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1798.000	-34.87	-13.00	-21.87	-22.60	-12.27	Peak
2	2697.000	-55.44	-13.00	-42.44	-46.96	-8.48	Peak
3	3596.000	-54.21	-13.00	-41.21	-48.02	-6.19	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) - 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

Site :CB2-H
Condition :3m Vertical
Mode :Cat-M1_B8_3M_Ch21640
Test By :Cyril

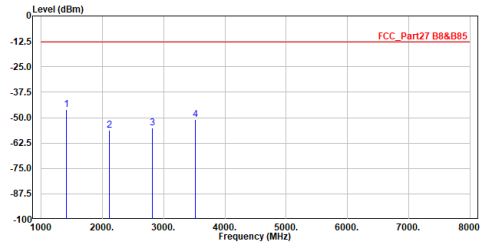


No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1798.000	-28.38	-13.00	-15.38	-16.11	-12.27	Peak
2	2697.000	-52.88	-13.00	-39.88	-44.40	-8.48	Peak
3	3596.000	-54.45	-13.00	-41.45	-48.26	-6.19	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) - 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

Mode 2: Cat-M1 Band 85

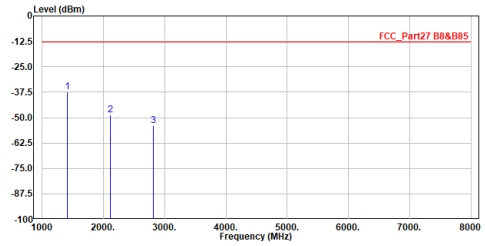
Site :CB2-H
Condition :3m Horizontal
Mode :Cat-M1_B85_10M_Ch134052
Test By :Cyril



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1406.000	-46.02	-13.00	-33.02	-32.41	-13.61	Peak
2	2109.000	-56.25	-13.00	-43.25	-45.17	-11.08	Peak
3	2812.000	-55.08	-13.00	-42.08	-47.09	-7.99	Peak
4	3515.000	-50.98	-13.00	-37.98	-44.48	-6.50	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) - 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

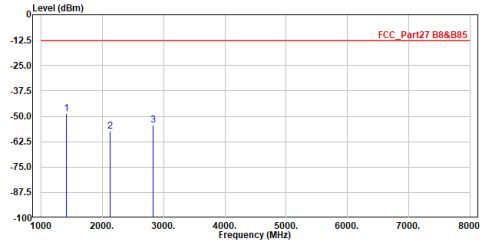
Site :CB2-H
Condition :3m Vertical
Mode :Cat-M1_B85_10M_Ch134052
Test By :Cyril



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1406.000	-37.36	-13.00	-24.36	-23.75	-13.61	Peak
2	2109.000	-48.67	-13.00	-35.67	-37.59	-11.08	Peak
3	2812.000	-54.01	-13.00	-41.01	-46.02	-7.99	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) - 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

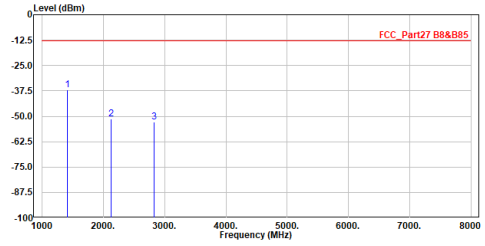
Site :CB2-H
Condition :3m Horizontal
Mode :Cat-M1_B85_10M_Ch134092
Test By :Cyril



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1414.000	-48.67	-13.00	-35.67	-35.09	-13.58	Peak
2	2121.000	-57.27	-13.00	-44.27	-46.24	-11.03	Peak
3	2828.000	-54.49	-13.00	-41.49	-46.57	-7.92	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) - 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

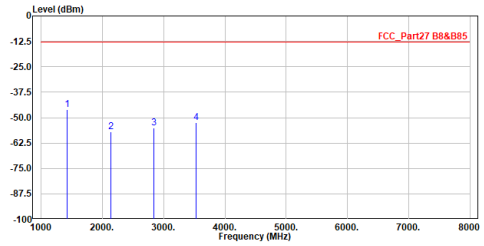
Site :CB2-H
Condition :3m Vertical
Mode :Cat-M1_B85_10M_Ch134092
Test By :Cyril



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1414.000	-36.94	-13.00	-23.94	-23.36	-13.58	Peak
2	2121.000	-51.35	-13.00	-38.35	-40.32	-11.03	Peak
3	2828.000	-52.64	-13.00	-39.64	-44.72	-7.92	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) - 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

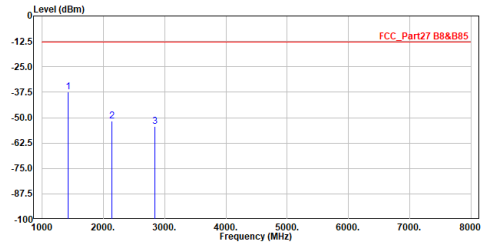
Site :CB2-H
Condition :3m Horizontal
Mode :Cat-M1_B85_10M_Ch134132
Test By :Cyril



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1422.000	-46.08	-13.00	-33.08	-32.53	-13.55	Peak
2	2133.000	-57.06	-13.00	-44.06	-46.10	-10.96	Peak
3	2844.000	-55.02	-13.00	-42.02	-47.17	-7.85	Peak
4	3533.000	-52.51	-13.00	-39.51	-46.08	-6.43	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) - 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

Site :CB2-H
Condition :3m Vertical
Mode :Cat-M1_B85_10M_Ch134132
Test By :Cyril

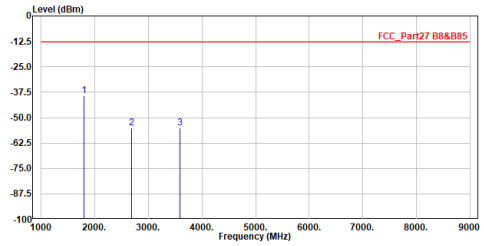


No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1422.000	-37.47	-13.00	-24.47	-23.92	-13.55	Peak
2	2133.000	-51.77	-13.00	-38.77	-40.81	-10.96	Peak
3	2844.000	-54.37	-13.00	-41.37	-46.52	-7.85	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) - 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

Mode 3: NB-IoT Band 8 (FCC only)

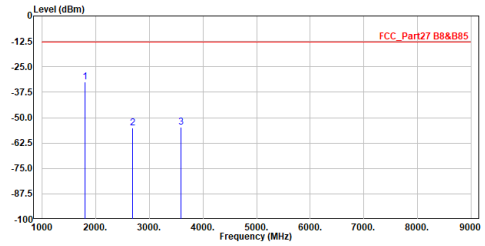
Site :CB2-H
Condition :3m Horizontal
Mode :NB-IoT_B8_3.75k_Ch21627
Test By :Cyril



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1795.400	-39.37	-13.00	-26.37	-27.08	-12.29	Peak
2	2693.100	-54.99	-13.00	-41.99	-46.50	-8.49	Peak
3	3590.800	-55.27	-13.00	-42.27	-49.06	-6.21	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) – 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

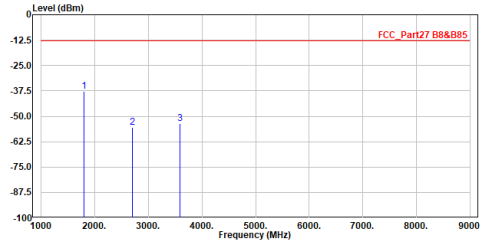
Site :CB2-H
Condition :3m Vertical
Mode :NB-IoT_B8_3.75k_Ch21627
Test By :Cyril



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1795.400	-32.30	-13.00	-19.30	-20.01	-12.29	Peak
2	2693.100	-55.04	-13.00	-42.04	-46.55	-8.49	Peak
3	3590.800	-54.64	-13.00	-41.64	-48.43	-6.21	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) – 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

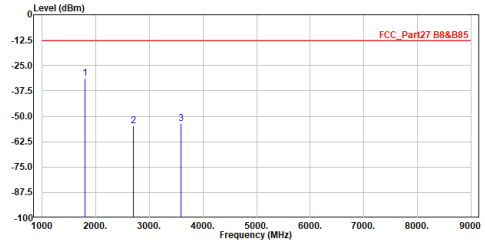
Site :CB2-H
Condition :3m Horizontal
Mode :NB-IoT_B8_3.75k_Ch21640
Test By :Cyril



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1798.000	-37.65	-13.00	-24.65	-25.38	-12.27	Peak
2	2697.000	-55.46	-13.00	-42.46	-46.98	-8.48	Peak
3	3596.000	-53.73	-13.00	-40.73	-47.54	-6.19	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) – 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

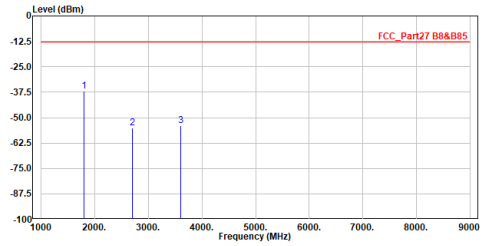
Site :CB2-H
Condition :3m Vertical
Mode :NB-IoT_B8_3.75k_Ch21640
Test By :Cyril



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1798.000	-31.50	-13.00	-18.50	-19.23	-12.27	Peak
2	2697.000	-54.58	-13.00	-41.58	-46.10	-8.48	Peak
3	3596.000	-53.69	-13.00	-40.69	-47.50	-6.19	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) – 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

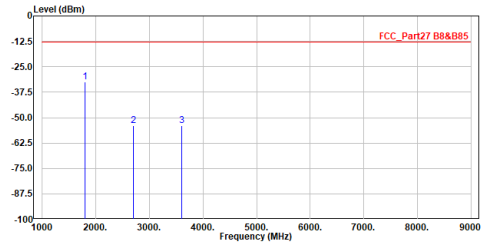
Site :CB2-H
Condition :3m Horizontal
Mode :NB-IoT_B8_3.75k_Ch21653
Test By :Cyril



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1800.600	-36.89	-13.00	-23.89	-24.63	-12.26	Peak
2	2700.900	-55.20	-13.00	-42.20	-46.75	-8.45	Peak
3	3601.200	-53.99	-13.00	-40.99	-47.82	-6.17	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) – 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

Site :CB2-H
Condition :3m Vertical
Mode :NB-IoT_B8_3.75k_Ch21653
Test By :Cyril

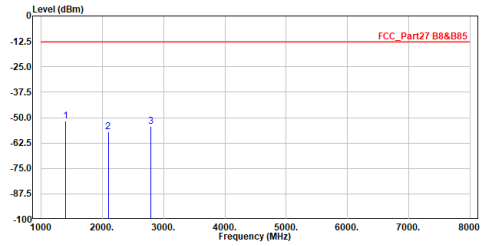


No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1800.600	-32.56	-13.00	-19.56	-20.30	-12.26	Peak
2	2700.900	-53.81	-13.00	-40.81	-45.36	-8.45	Peak
3	3601.200	-54.00	-13.00	-41.00	-47.83	-6.17	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) – 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

Mode 4: NB-IoT Band 85

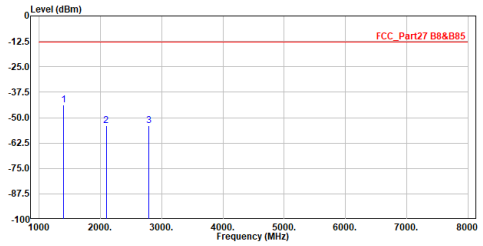
Site :CB2-H
Condition :3m Horizontal
Mode :NB-IoT_B85_3.75k_Ch134004
Test By :Cyril



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1396.400	-51.71	-13.00	-38.71	-38.07	-13.64	Peak
2	2094.600	-56.86	-13.00	-43.86	-45.71	-11.15	Peak
3	2792.800	-54.24	-13.00	-41.24	-46.17	-8.07	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) – 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

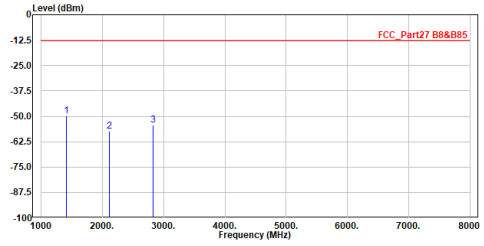
Site :CB2-H
Condition :3m Vertical
Mode :NB-IoT_B85_3.75k_Ch134004
Test By :Cyril



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1396.400	-43.78	-13.00	-30.78	-30.14	-13.64	Peak
2	2094.600	-53.81	-13.00	-40.81	-42.66	-11.15	Peak
3	2792.800	-53.99	-13.00	-40.99	-45.92	-8.07	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) – 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

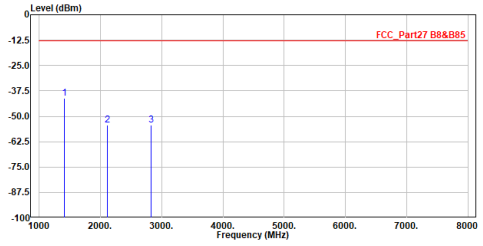
Site :CB2-H
Condition :3m Horizontal
Mode :NB-IoT_B85_3.75k_Ch134082
Test By :Cyril



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1412.000	-49.74	-13.00	-36.74	-36.15	-13.59	Peak
2	2118.000	-57.42	-13.00	-44.42	-46.38	-11.04	Peak
3	2824.000	-54.33	-13.00	-41.33	-46.39	-7.94	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) – 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

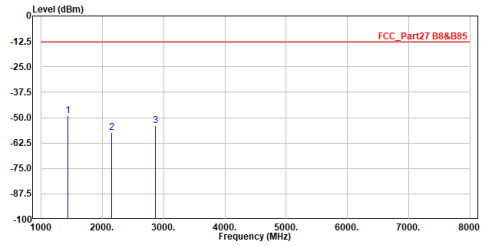
Site :CB2-H
Condition :3m Vertical
Mode :NB-IoT_B85_3.75k_Ch134082
Test By :Cyril



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1412.000	-41.29	-13.00	-28.29	-27.70	-13.59	Peak
2	2118.000	-54.36	-13.00	-41.36	-43.32	-11.04	Peak
3	2824.000	-54.36	-13.00	-41.36	-46.42	-7.94	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) – 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

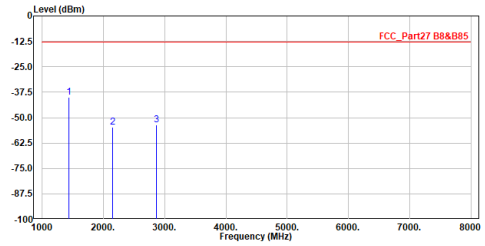
Site :CB2-H
Condition :3m Horizontal
Mode :NB-IoT_B85_3.75k_Ch134180
Test By :Cyril



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1431.600	-48.94	-13.00	-35.94	-35.42	-13.52	Peak
2	2147.400	-57.53	-13.00	-44.53	-46.63	-10.90	Peak
3	2863.200	-54.15	-13.00	-41.15	-46.38	-7.77	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) – 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

Site :CB2-H
Condition :3m Vertical
Mode :NB-IoT_B85_3.75k_Ch134180
Test By :Cyril

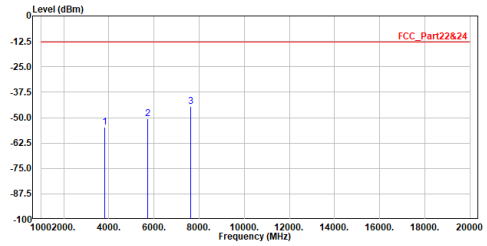


No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1431.600	-40.03	-13.00	-27.03	-26.51	-13.52	Peak
2	2147.400	-54.86	-13.00	-41.86	-43.96	-10.90	Peak
3	2863.200	-53.53	-13.00	-40.53	-45.76	-7.77	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) – 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

Mode 5: Cat-M1 Band 2

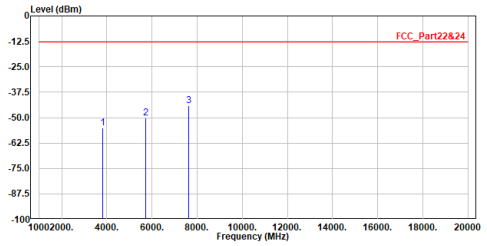
Site :HC-CB02
Condition :3m Horizontal
Mode :Cat-M1_B2_Ch19175
Test By :Cyril



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	3815.000	-54.86	-13.00	-41.86	-49.52	-5.34	Peak
2	5722.500	-50.47	-13.00	-37.47	-51.87	1.40	Peak
3	7630.000	-44.65	-13.00	-31.65	-51.87	7.22	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) – 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

Site :HC-CB02
Condition :3m Vertical
Mode :Cat-M1_B2_Ch19175
Test By :Cyril

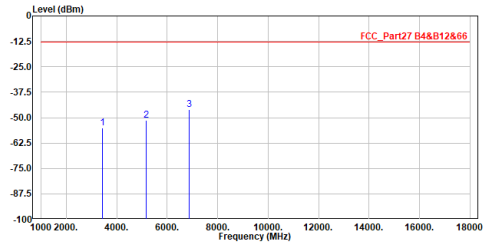


No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	3815.000	-55.19	-13.00	-42.19	-49.85	-5.34	Peak
2	5722.500	-50.04	-13.00	-37.04	-51.44	1.40	Peak
3	7630.000	-44.17	-13.00	-31.17	-51.39	7.22	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) – 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

Mode 6: Cat-M1 Band 4

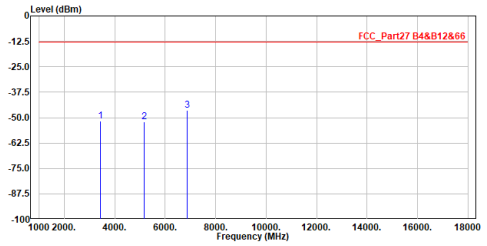
Site :HC-CB02
Condition :3m Horizontal
Mode :Cat-M1_B4_Ch20025
Test By :Cyril



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	3435.000	-55.23	-13.00	-42.23	-48.59	-6.64	Peak
2	5152.500	-51.50	-13.00	-38.50	-50.71	-0.79	Peak
3	6870.000	-46.21	-13.00	-33.21	-52.35	6.14	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) – 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

Site :HC-CB02
Condition :3m Vertical
Mode :Cat-M1_B4_Ch20025
Test By :Cyril

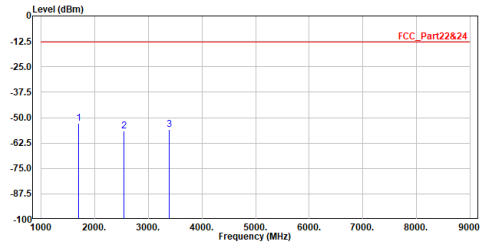


No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	3435.000	-51.67	-13.00	-38.67	-45.03	-6.64	Peak
2	5152.500	-52.20	-13.00	-39.20	-51.41	-0.79	Peak
3	6870.000	-46.55	-13.00	-33.55	-52.69	6.14	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) – 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

Mode 7: Cat-M1 Band 5

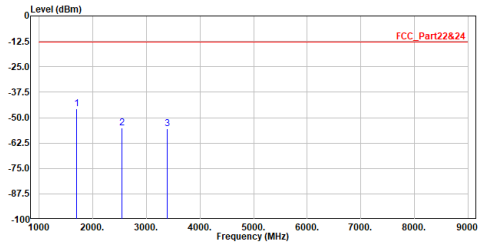
Site :HC-CB02
Condition :3m Horizontal
Mode :Cat-M1_B5_Ch20643
Test By :Cyril



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1696.600	-52.83	-13.00	-39.83	-40.20	-12.63	Peak
2	2544.900	-56.78	-13.00	-43.78	-47.67	-9.11	Peak
3	3393.200	-55.93	-13.00	-42.93	-49.23	-6.70	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) – 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

Site :HC-CB02
Condition :3m Vertical
Mode :Cat-M1_B5_Ch20643
Test By :Cyril

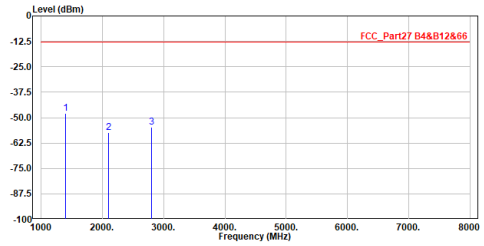


No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1696.600	-45.75	-13.00	-32.75	-33.12	-12.63	Peak
2	2544.900	-55.24	-13.00	-42.24	-46.13	-9.11	Peak
3	3393.200	-55.30	-13.00	-42.30	-48.60	-6.70	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) – 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

Mode 8: Cat-M1 Band 12

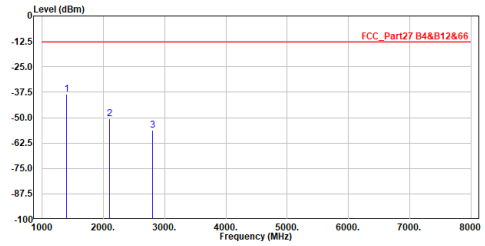
Site :HC-CB02
Condition :3m Horizontal
Mode :Cat-M1_B12_Ch23025
Test By :Cyril



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1401.000	-48.00	-13.00	-35.00	-34.37	-13.63	Peak
2	2101.500	-57.24	-13.00	-44.24	-46.12	-11.12	Peak
3	2802.000	-54.77	-13.00	-41.77	-46.74	-8.03	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) – 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

Site :HC-CB02
Condition :3m Vertical
Mode :Cat-M1_B12_Ch23025
Test By :Cyril

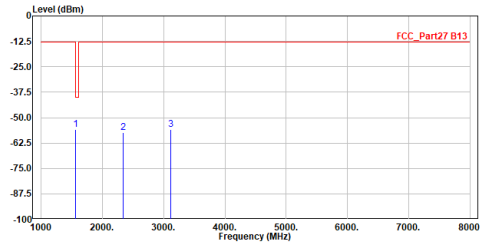


No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1401.000	-38.44	-13.00	-25.44	-24.81	-13.63	Peak
2	2101.500	-50.74	-13.00	-37.74	-39.62	-11.12	Peak
3	2802.000	-56.08	-13.00	-43.08	-48.05	-8.03	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) – 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

Mode 9: Cat-M1 Band 13

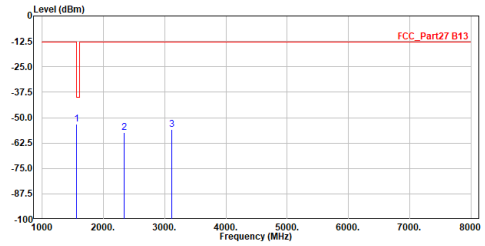
Site :HC-CB02
Condition :3m Horizontal
Mode :Cat-M1_B13_Ch23205
Test By :Cyril



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1559.000	-55.95	-40.00	-15.95	-42.84	-13.11	Peak
2	2338.500	-57.52	-13.00	-44.52	-47.49	-10.03	Peak
3	3118.000	-55.68	-13.00	-42.68	-48.63	-7.05	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) – 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

Site :HC-CB02
Condition :3m Vertical
Mode :Cat-M1_B13_Ch23205
Test By :Cyril

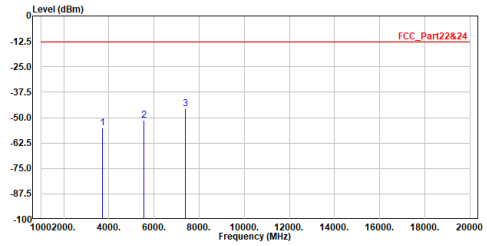


No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1559.000	-53.29	-40.00	-13.29	-40.18	-13.11	Peak
2	2338.500	-57.41	-13.00	-44.41	-47.38	-10.03	Peak
3	3118.000	-56.02	-13.00	-43.02	-48.97	-7.05	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) – 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

Mode 10: Cat-M1 Band 25

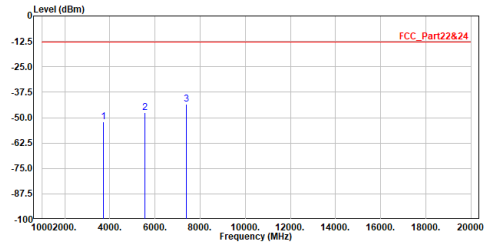
Site :HC-CB02
Condition :3m Horizontal
Mode :Cat-M1_B25_Ch26047
Test By :Cyril



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	3701.400	-55.03	-13.00	-42.03	-49.25	-5.78	Peak
2	5552.100	-51.28	-13.00	-38.28	-51.80	0.52	Peak
3	7402.800	-45.51	-13.00	-32.51	-52.83	7.32	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) – 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

Site :HC-CB02
Condition :3m Vertical
Mode :Cat-M1_B25_Ch26047
Test By :Cyril

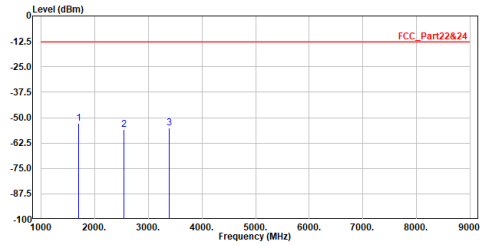


No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	3701.400	-52.10	-13.00	-39.10	-46.32	-5.78	Peak
2	5552.100	-47.69	-13.00	-34.69	-48.21	0.52	Peak
3	7402.800	-43.45	-13.00	-30.45	-50.77	7.32	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) – 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

Mode 11: Cat-M1 Band 26 (Part 22)

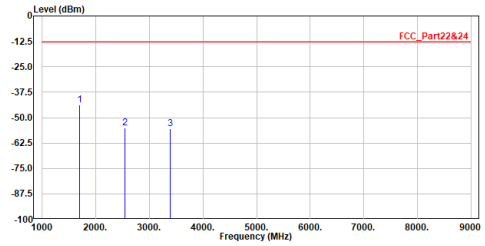
Site :HC-CB02
Condition :3m Horizontal
Mode :Cat-M1_B26(Part22)_Ch27033
Test By :Cyril



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1696.600	-52.65	-13.00	-39.65	-40.02	-12.63	Peak
2	2544.900	-55.76	-13.00	-42.76	-46.65	-9.11	Peak
3	3393.200	-55.24	-13.00	-42.24	-48.54	-6.70	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) – 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

Site :HC-CB02
Condition :3m Vertical
Mode :Cat-M1_B26(Part22)_Ch27033
Test By :Cyril

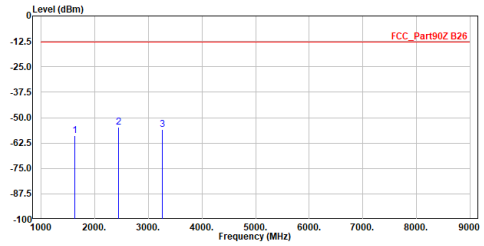


No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1696.600	-43.76	-13.00	-30.76	-31.13	-12.63	Peak
2	2544.900	-55.09	-13.00	-42.09	-45.98	-9.11	Peak
3	3393.200	-55.50	-13.00	-42.50	-48.80	-6.70	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) – 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

Mode 12: Cat-M1 Band 26 (Part 90)

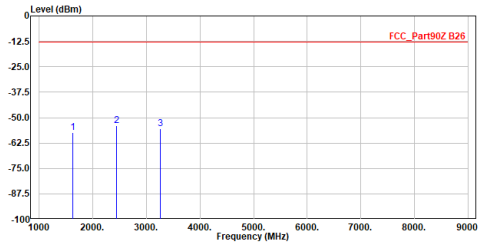
Site :HC-CB02
Condition :3m Horizontal
Mode :Cat-M1_B26(Part90)_Ch26705
Test By :Cyril



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1631.000	-58.99	-13.00	-45.99	-46.13	-12.86	Peak
2	2446.500	-54.87	-13.00	-41.87	-45.32	-9.55	Peak
3	3262.000	-55.76	-13.00	-42.76	-48.90	-6.86	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) – 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

Site :HC-CB02
Condition :3m Vertical
Mode :Cat-M1_B26(Part90)_Ch26705
Test By :Cyril

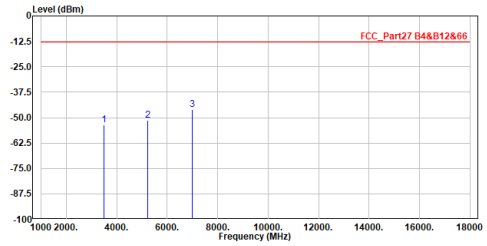


No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1631.000	-57.52	-13.00	-44.52	-44.66	-12.86	Peak
2	2446.500	-54.12	-13.00	-41.12	-44.57	-9.55	Peak
3	3262.000	-55.63	-13.00	-42.63	-48.77	-6.86	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) – 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

Mode 13: Cat-M1 Band 66

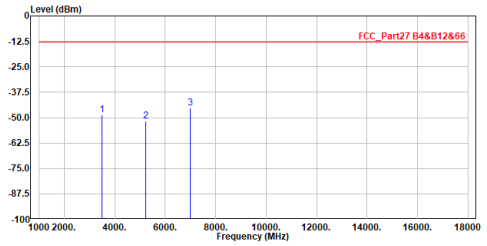
Site :HC-CB02
Condition :3m Horizontal
Mode :Cat-M1_B66_Ch132322
Test By :Cyril



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	3490.000	-53.72	-13.00	-40.72	-47.14	-6.58	Peak
2	5235.000	-51.43	-13.00	-38.43	-50.87	-0.56	Peak
3	6980.000	-46.15	-13.00	-33.15	-52.85	6.70	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) – 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

Site :HC-CB02
Condition :3m Vertical
Mode :Cat-M1_B66_Ch132322
Test By :Cyril

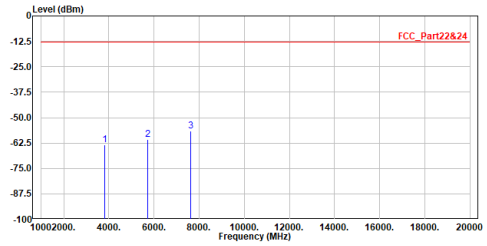


No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	3490.000	-48.84	-13.00	-35.84	-42.26	-6.58	Peak
2	5235.000	-51.75	-13.00	-38.75	-51.19	-0.56	Peak
3	6980.000	-45.13	-13.00	-32.13	-51.83	6.70	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) – 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

Mode 14: NB-IoT Band 2

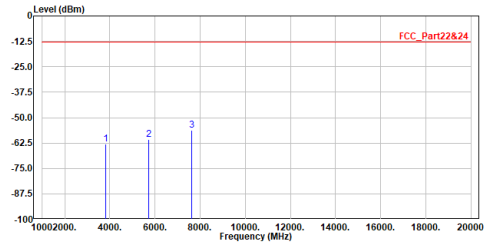
Site :HC-CB02
Condition :3m Horizontal
Mode :NB-IoT_B2_CH19198
Test by :Ling



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	3819.600	-63.40	-13.00	-50.40	-50.39	-13.01	Peak
2	5729.400	-60.69	-13.00	-47.69	-52.78	-7.91	Peak
3	7639.200	-56.72	-13.00	-43.72	-52.94	-3.78	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) – 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

Site :HC-CB02
Condition :3m Vertical
Mode :NB-IoT_B2_CH19198
Test by :Ling

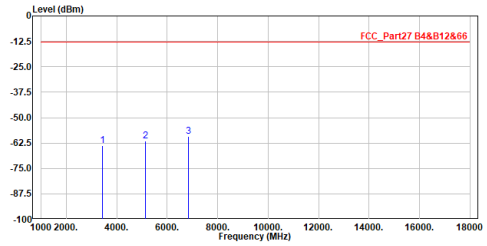


No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	3819.600	-63.17	-13.00	-50.17	-50.16	-13.01	Peak
2	5729.400	-60.74	-13.00	-47.74	-52.83	-7.91	Peak
3	7639.200	-56.29	-13.00	-43.29	-52.51	-3.78	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) – 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

Mode 15: NB-IoT Band 4

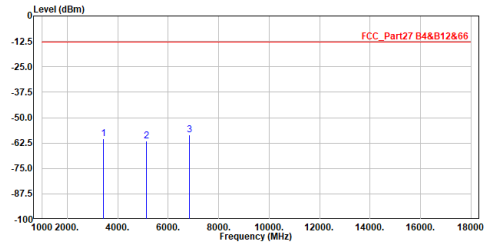
Site :HC-CB02
Condition :3m Horizontal
Mode :NB-IoT_B4_CH19952
Test by :Ling



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	3420.400	-63.73	-13.00	-50.73	-49.74	-13.99	Peak
2	5130.600	-61.48	-13.00	-48.48	-51.84	-9.64	Peak
3	6840.800	-59.19	-13.00	-46.19	-53.86	-5.33	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) – 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

Site :HC-CB02
Condition :3m Vertical
Mode :NB-IoT_B4_CH19952
Test by :Ling

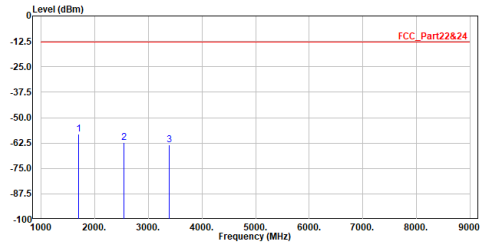


No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	3420.400	-60.46	-13.00	-47.46	-46.47	-13.99	Peak
2	5130.600	-61.48	-13.00	-48.48	-51.84	-9.64	Peak
3	6840.800	-58.32	-13.00	-45.32	-52.99	-5.33	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) – 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

Mode 16: NB-IoT Band 5

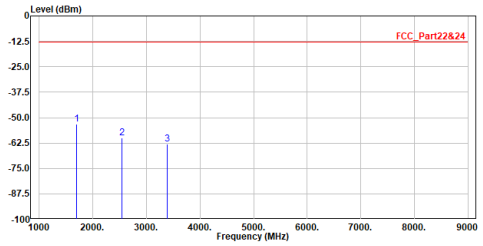
Site :HC-CB02
Condition :3m Horizontal
Mode :NB-IoT_B5_CH20648
Test by :Ling



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1697.600	-58.24	-13.00	-45.24	-40.43	-17.81	Peak
2	2546.400	-62.35	-13.00	-49.35	-46.82	-15.53	Peak
3	3395.200	-63.49	-13.00	-50.49	-49.49	-14.00	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) – 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

Site :HC-CB02
Condition :3m Vertical
Mode :NB-IoT_B5_CH20648
Test by :Ling

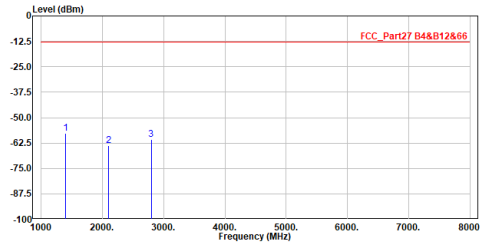


No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1697.600	-53.36	-13.00	-40.36	-35.55	-17.81	Peak
2	2546.400	-59.82	-13.00	-46.82	-44.29	-15.53	Peak
3	3395.200	-63.15	-13.00	-50.15	-49.15	-14.00	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) – 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

Mode 17: NB-IoT Band 12

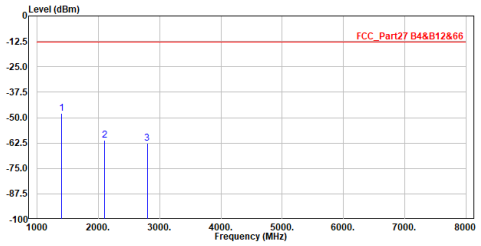
Site :HC-CB02
Condition :3m Horizontal
Mode :NB-IoT_B12_CH23011
Test by :Ling



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1398.200	-57.70	-13.00	-44.70	-39.37	-18.33	Peak
2	2097.300	-63.90	-13.00	-50.90	-46.97	-16.93	Peak
3	2796.400	-60.85	-13.00	-47.85	-46.09	-14.76	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) – 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

Site :HC-CB02
Condition :3m Vertical
Mode :NB-IoT_B12_CH23011
Test by :Ling

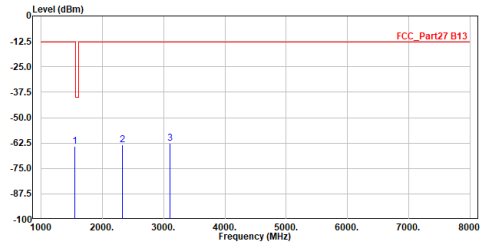


No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1398.200	-47.96	-13.00	-34.96	-29.63	-18.33	Peak
2	2097.300	-61.14	-13.00	-48.14	-44.21	-16.93	Peak
3	2796.400	-62.73	-13.00	-49.73	-47.97	-14.76	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) – 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

Mode 18: NB-IoT Band 13

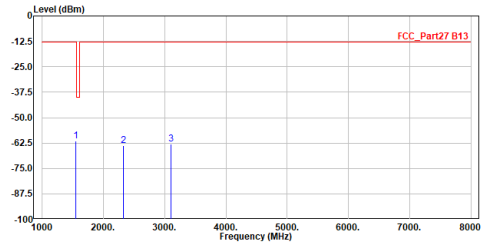
Site :HC-CB02
Condition :3m Horizontal
Mode :NB-IoT_B13_CH23182
Test by :Ling



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1554.400	-64.00	-13.00	-51.00	-45.92	-18.08	Peak
2	2331.600	-63.53	-13.00	-50.53	-47.33	-16.20	Peak
3	3108.800	-62.77	-13.00	-49.77	-48.68	-14.09	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) – 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

Site :HC-CB02
Condition :3m Vertical
Mode :NB-IoT_B13_CH23182
Test by :Ling

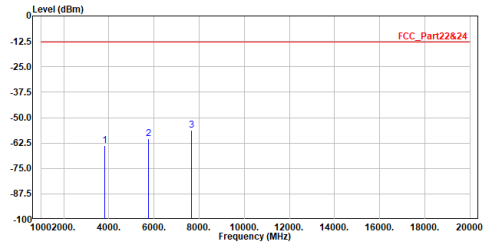


No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1554.400	-61.55	-13.00	-48.55	-43.47	-18.08	Peak
2	2331.600	-63.95	-13.00	-50.95	-47.75	-16.20	Peak
3	3108.800	-63.01	-13.00	-50.01	-48.92	-14.09	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) – 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

Mode 19: NB-IoT Band 25

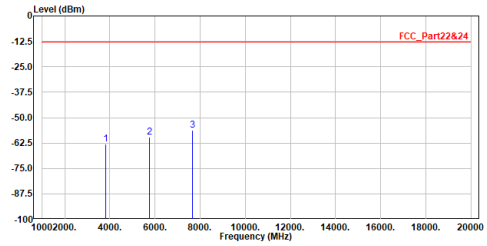
Site :HC-CB02
Condition :3m Horizontal
Mode :NB-IoT_B25_CH26688
Test by :Ling



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	3829.600	-63.86	-13.00	-50.86	-50.87	-12.99	Peak
2	5744.400	-60.32	-13.00	-47.32	-52.46	-7.86	Peak
3	7659.200	-56.22	-13.00	-43.22	-52.42	-3.80	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) – 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

Site :HC-CB02
Condition :3m Vertical
Mode :NB-IoT_B25_CH26688
Test by :Ling



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	3829.600	-63.09	-13.00	-50.09	-50.10	-12.99	Peak
2	5744.400	-59.69	-13.00	-46.69	-51.83	-7.86	Peak
3	7659.200	-56.26	-13.00	-43.26	-52.46	-3.80	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) – 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.