



Sverige



Accred. no. 10363
Testing
ISO/IEC 17025

Report On

FCC and ISED Testing of the Ericsson RRUS 32A B2,NR NB-IoT IB, KRC 161 418/1 (1900 MHz) Base Station in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 24, ISED RSS-GEN: and Industry Canada RSS-133

COMMERCIAL-IN-CONFIDENCE

FCC: TA8AKRC161418-1
IC: 287AB-AS1614181

PREPARED BY

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Maggie Whiting
Key Account Manager

APPROVED BY

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Steve Scarfe
Authorised Signatory

DATED

25 August 2021

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SECTION 1

REPORT INFORMATION



1.1 REPORT DETAILS

Manufacturer	Ericsson
Address	Torshamnsgatan 23 Kista SE-16480 Stockholm Sweden
Product Name & Product Number	RRUS 32A B2 - KRC 161 418/1
Serial Number(s)	D16V513692
Software Version	CXP 901 3268/12 Revision R82CM
Hardware Version	R1E
Test Specification/Issue/Date	FCC CFR 47 Part 2: 2019 FCC CFR 47 Part 24: 2020 ISED RSS-GEN: Issue 5: 2018 and Amendment 1 2019, Amendment 2 2021 Industry Canada RSS-133: Issue 6: 2013 and Amendment 1 2018
Test Plan	Q1 FCC_IC test plan for MR7602-1 NR-IoT V 0.9 Reduced Scope
Start of Test	24 June 2021
Finish of Test	25 June 2021
Name of Engineer(s)	Ashok Kumar Hector Eric Moreno Trujillo
Related Document(s)	KDB 971168 D01 v02r02 KDB 662911 D01 v02r01 KDB 716230 ANSI C63.26-2015

ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate compliance with FCC CFR 47 Part 2: 2019, FCC CFR 47 Part 24: 2020. ISED RSS-GEN: Issue 5: 2018 and Amendment 1 2019, Amendment 2 2021 and Industry Canada RSS-133: Issue 6: 2013 and Amendment 1 2018..The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s);

Ashok Kumar

Hector Trujillo



1.2 BRIEF SUMMARY OF RESULTS

A brief summary of results for each configuration, in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 24, ISED RSS-GEN and Industry Canada RSS-133 is shown below.

Section	Specification Clause				Test Description	Result
	FCC CFR 47 Part 2	FCC CFR 47 Part 24	RSS-GEN	RSS-133		
2.1	2.1046	24.232	-	6.4	Maximum Peak Output Power and Peak to Average Ratio - Conducted	Pass
2.2	2.1049	24.238 (b)	6.7	-	Occupied Bandwidth	Pass
2.3	2.1051	24.238 (b)	-	6.5	Band Edge	Pass
2.4	2.1051	24.238 (a)	6.13	6.5	Transmitter Spurious Emissions	Pass

Testing in this Report covers only B2A (1900MHz).

For additional configurations and test cases not contained within this test report, refer to the following reports:

Testing for Radiated Spurious Emissions are recorded in the following report:
2104108STO-106 RRUS32AB2 FCC24 NRIoT



1.3 TEST RATIONALE

The tests that have been selected are detailed in the customer Test Plan as defined in section 1.1 of this report. The Test Plan is based on the TÜV SÜD FCC Test Plan Rationale, available on request.




1.4 CONFIGURATION DESCRIPTION

Configuration	RAT	No. Of carriers	Pout (W)	Carrier Bandwidth	Carrier Frequency Configuration (MHz)		
					Bottom	Middle	Top
1	NR in NR/ESS Setup (NB-IoT)	1	30	10 MHz- SCS 15kHz	1935.0	1960.0	1985.0
				15 MHz- SCS 15kHz	1937.50	1960.0	1982.5
				20 MHz- SCS 15kHz	1940.0	1960.0	1980.0



1.5 DECLARATION OF BUILD STATUS

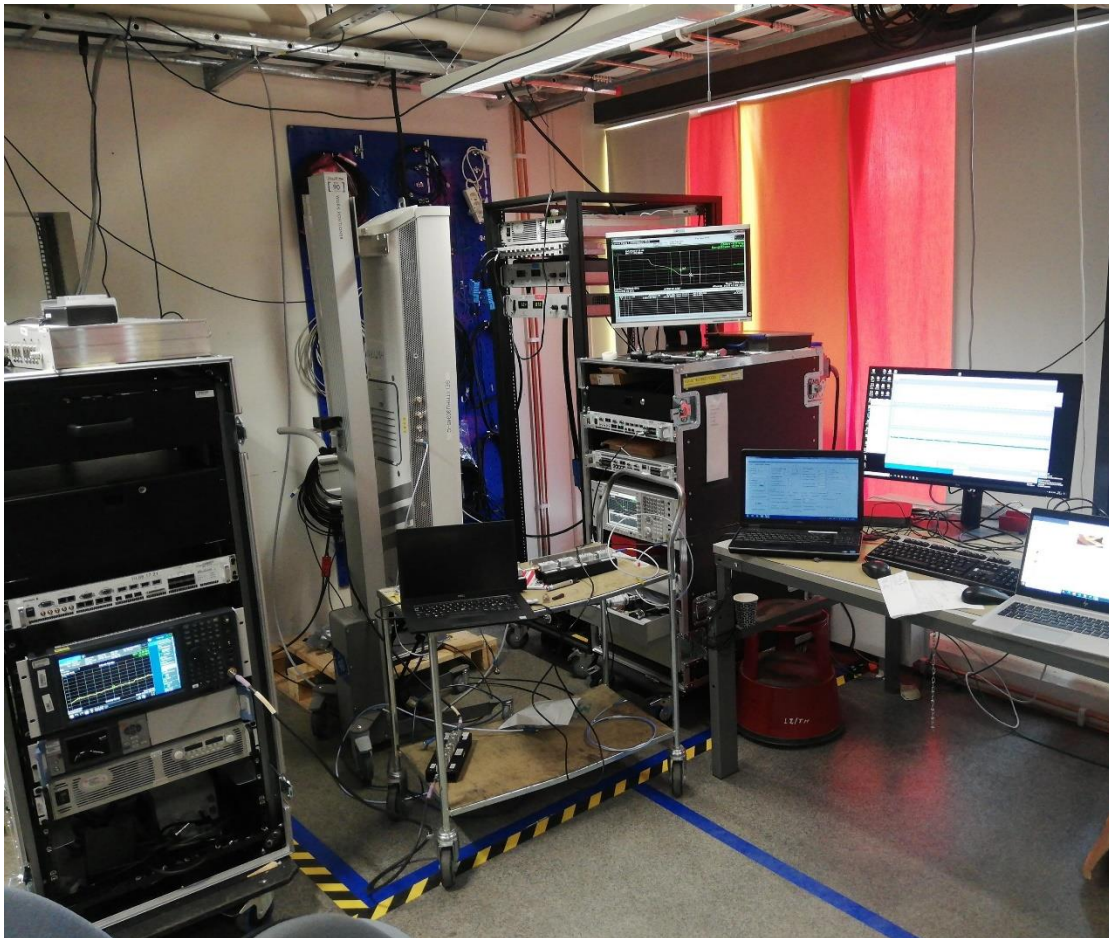
Equipment Description						
Technical Description: (Please provide a brief description of the intended use of the equipment including the technologies the product supports)		Multi-standard remote radio unit				
Manufacturer:		Ericsson AB				
Model:		RRUS 32A B2				
Part Number:		KRC 161 418/1				
Hardware Version:		R1E				
Software Version:		CXP 901 326B/12 R82CM				
FCC ID of the product under test		TA8AKRC161418-1				
IC ID of the product under test		287AB-AS1614181				
Intentional Radiators						
FDD, TDD		FDD				
Frequency Range (MHz to MHz)		1930MHz - 1990MHz DL 1850MHz - 1910MHz UL				
FDD / TDD		FDD				
Conducted Declared Output Power (dBm)		30W per antenna connector (NB IoT SA carrier max 20W)				
RAT		GSM				
Supported Bandwidth(s) (MHz)		WCDMA				
		NB IoT SA				
		LTE (incl. NB IoT IB, GB)				
		NR (incl NB IoT IB)				
		5,10,15,20MHz 15MHz scs				
Modulation Scheme(s) DL		GMSK, 8PSK, AQPSK				
		GMSK				
		QPSK, 16QAM, 64QAM				
		QPSK, 16QAM, 64QAM				
		QPSK, 16QAM, 64QAM, 256QAM				
ITU Emission Designator		245KGXW				
		245KG7W				
		5M00F9W				
		210KW7D				
		1M40W7D				
		3M00W7D				
		10M0W7D				
		15M0W7D				
		20M0W7D				
IBW		20MHz				
		90MHz				
		20MHz				
		1.4 & 3MHz: 40MHz				
		5,10,15,20MHz:110MHz				
		60MHz				
Maximum number of carriers		6				
		3				
		8				
Unintentional Radiators						
Highest frequency generated or used in the device or on which the device operates or tunes		9.8 Gbit/s				
Lowest frequency generated or used in the device or on which the device operates or tunes if <30MHz		-				
Class A Digital Device (Use in commercial, industrial or business environment) or Class B Digital Device (Use in residential environment)		Class B				
DC Power Supply (Delete if Not Applicable)						
Nominal voltage:		-48V				
Extreme upper voltage:		-38V				
Extreme lower voltage:		-58.5V				
Max current:		20A				
Temperature						
Minimum temperature:		-40°C				
Maximum temperature:		55°C				
I hereby declare that I am entitled to sign on behalf of the manufacturer and that the information supplied is correct and complete.						
						
Name:		Faysal Pirmohamed				
Position held:		Regulatory Engineer				
Date:		2021-08-24				

1.6 PRODUCT INFORMATION

1.6.1 Technical Description

The Equipment Under Test (EUT) RRUS 32A B2 - KRC 161 418/1 is an Ericsson AB Radio Unit working in the public mobile service 1900MHz band which provides communication connections to 1900MHz network. The EUT operates from a -48V DC supply.

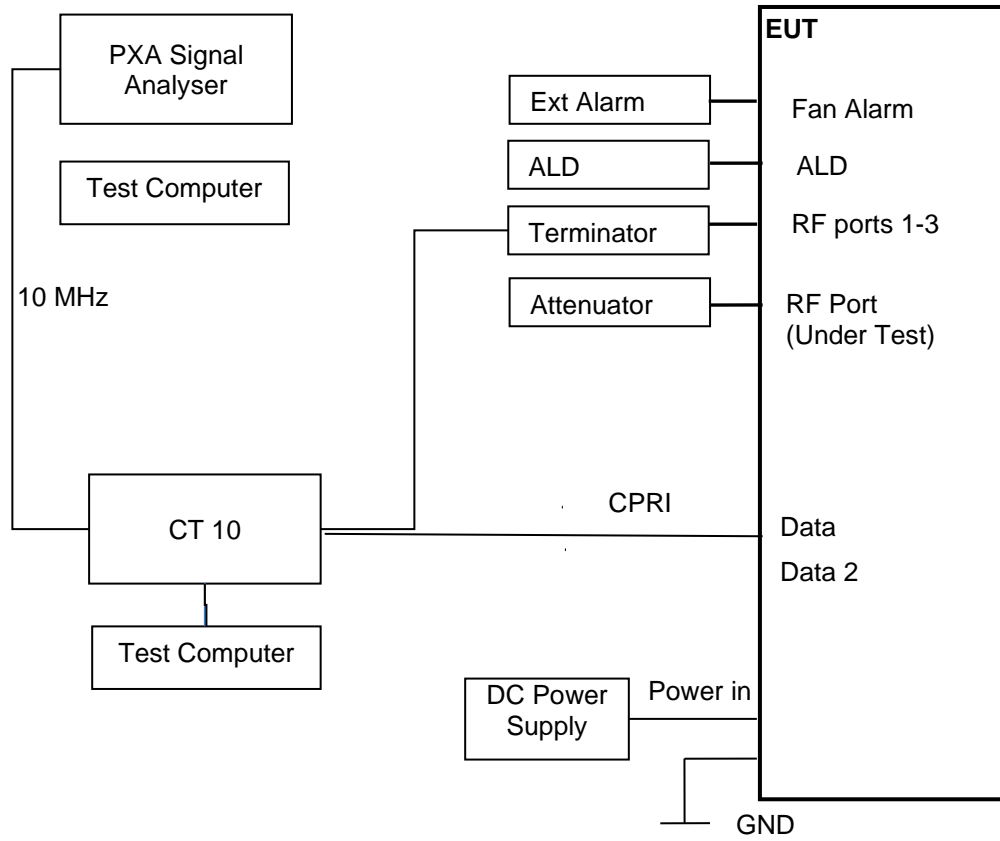
The Equipment Under Test (EUT) is shown in the photograph below. A full technical description can be found in the Manufacturer's documentation.



Equipment Under Test



1.7 TEST SETUP





1.8 TEST CONDITIONS

For all tests the EUT was set up in accordance with the relevant test standard and to represent typical operating conditions. Tests were applied with the EUT situated as described in the Test Method for each Test.

The EUT was powered from a -48V DC supply.

FCC Measurement Facility Registration Number
563983 Ericsson Test Laboratory, Kista
Postal Address: Ericsson AB, Isafjordsgatan 10, Stockholm, SE-16 440, Sweden

ISED Accreditation
IC#26170 Ericsson Test Laboratory, Kista
Postal Address: Ericsson AB, Isafjordsgatan 10, Stockholm, SE-164 40, Sweden

Test Name	Name of Engineer(s)
Maximum Peak Output Power and Peak to Average Ratio - Conducted	Ashok Kumar, Hector Eric Moreno Trujillo
Occupied Bandwidth	Ashok Kumar, Hector Eric Moreno Trujillo
Band Edge	Ashok Kumar, Hector Eric Moreno Trujillo
Transmitter Spurious Emissions	Ashok Kumar, Hector Eric Moreno Trujillo

1.9 DEVIATION FROM THE STANDARD

No deviations from the applicable test standards or test plan were made during testing.

1.10 MODIFICATION RECORD

No modifications were made to the EUT during testing.

1.11 ADDITIONAL INFORMATION

This filing is for a Class 2 Permissive change to add ESS, NR in ESS and LTE in ESS modulations to a previously certified Radio for use in the USA and Canada under the following ID's:

FCC ID: TA8AKRC161418-1
IC: 287AB-AS1614181

This device is electrically identical as originally certified as no hardware changes have been made.

Frequency Stability has been verified at time of original certification.

The Test Plan is based on the TUV SUD Document FCC and ISED Test Plan Rationale for Base Station Equipment.

This TX and RX share the same port and therefore Rx Spurious Emissions have not been performed.



SECTION 2

TEST DETAILS



2.1 MAXIMUM PEAK OUTPUT POWER AND PEAK TO AVERAGE RATIO - CONDUCTED

2.1.1 Specification Reference

FCC CFR 47 Part 24, Clause 24.232
 FCC CFR 47 Part 2, Clause 2.1046
 Industry Canada RSS-133, Clause 6.4

2.1.2 Date of Test and Modification State

24 June 2021 - Modification State 0

2.1.3 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.1.4 Environmental Conditions

Ambient Temperature 22.2°C
 Relative Humidity 43.9%

2.1.5 Test Method

All measurements were made in accordance with FCC KDB 971168 D01, clause 5.2.1 and summed in accordance with FCC KDB 662911 D01.

Calculations

Total Power = Measured PSD (Total Power Port A) + 10log (N_{ANT}), where N_{ANT} =4

Maximum Total Power (EIRP) = Total Power (as above) + Declared Antenna Gain

2.1.6 Test Results

Configuration 1

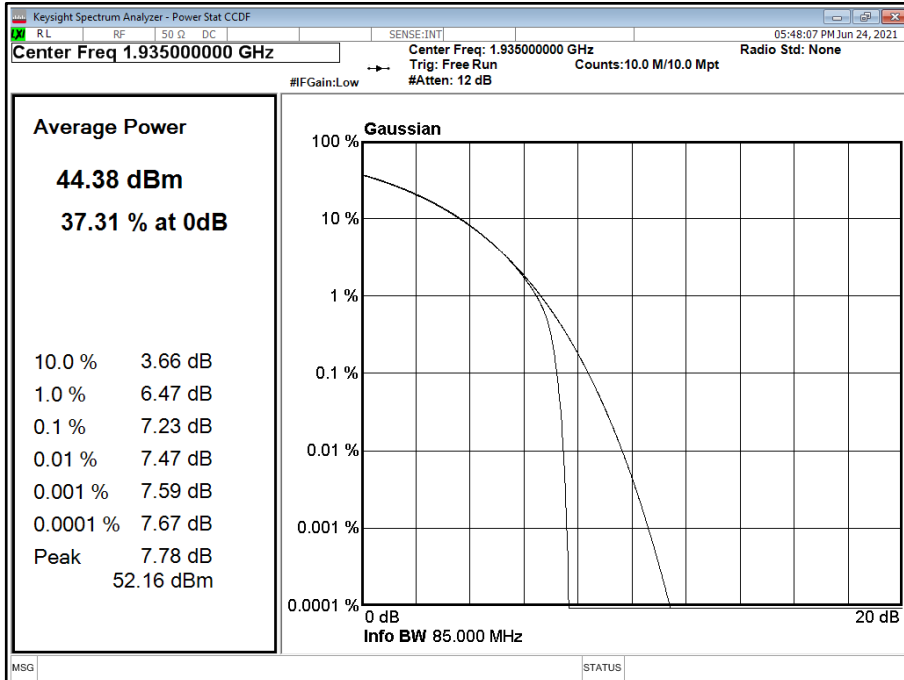
Maximum Output Power 44.80 dBm

Antenna	NB-IoT IB Modulation	NB-IoT IB Carrier Bandwidth	Peak to Average Ratio (PAR) / Output Power / PSD				
			Channel Position B				
			PAR (dB)	Average Power/PSD		Total Power Port A + B + C +D	
dBm	dBm/MHz	dBm		dBm/MHz			
A	QPSK	10.0 MHz	7.23	44.39	35.75	50.41	41.77
A	QPSK	15.0 MHz	7.38	44.41	35.41	50.43	41.43
A	QPSK	20.0 MHz	7.46	44.39	35.35	50.41	41.37

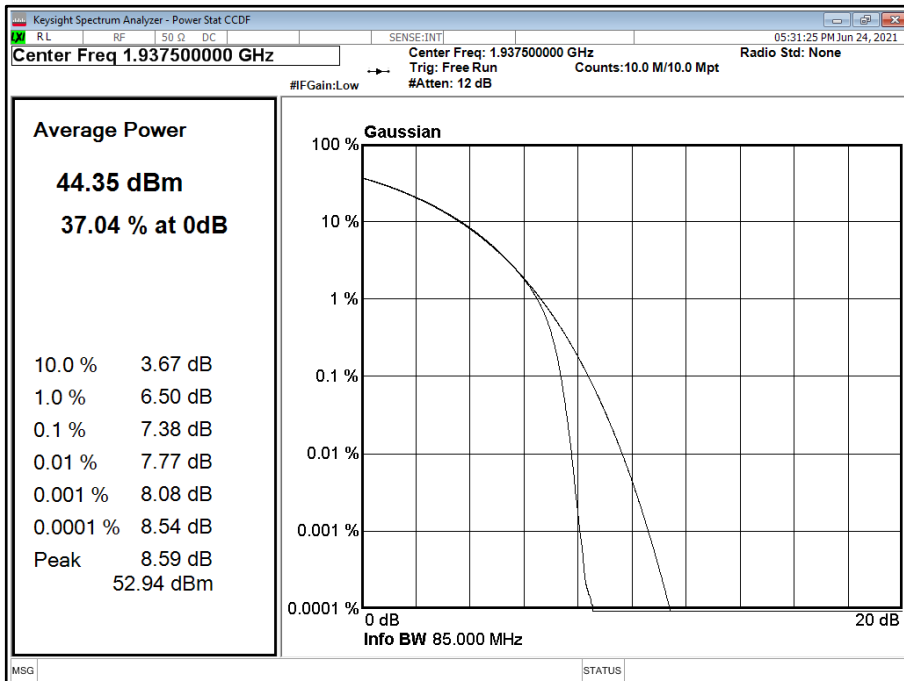
NB-IoT IB Carrier Bandwidth	Total Power PSD	EIRP Limit	EIRP Limit
	(dBm/MHz)	(W/MHz)	(dBm/MHz)
10.0 MHz	41.77	1640	62.15
15.0 MHz	41.43	1640	62.15
20.0 MHz	41.37	1640	62.15



Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 10.0 MHz - Channel Position B

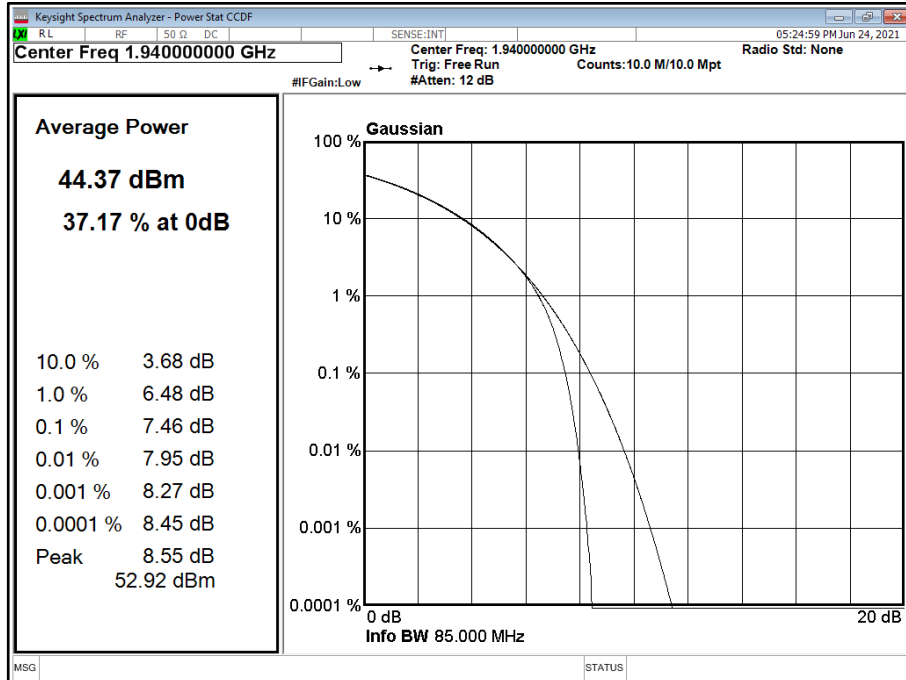


Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 15.0 MHz - Channel Position B





Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 20.0 MHz - Channel Position B



Configuration 1

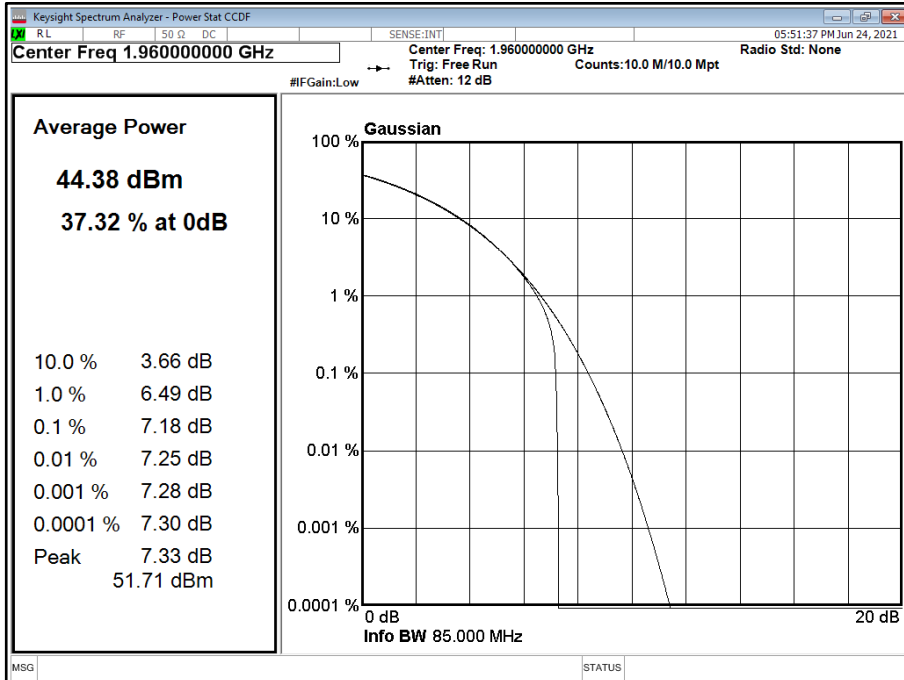
Maximum Output Power 44.80 dBm

Antenna	NB-IoT IB Modulation	NB-IoT IB Carrier Bandwidth	Peak to Average Ratio (PAR) / Output Power / PSD				
			Channel Position M				
			PAR (dB)	Average Power/PSD		Total Power Port A + B + C + D	
			dBm	dBm/MHz	dBm	dBm/MHz	
A	QPSK	10.0 MHz	7.18	44.40	35.56	50.42	41.58
A	QPSK	15.0 MHz	7.21	44.42	35.56	50.44	41.58
A	QPSK	20.0 MHz	7.22	44.43	35.56	50.45	41.58

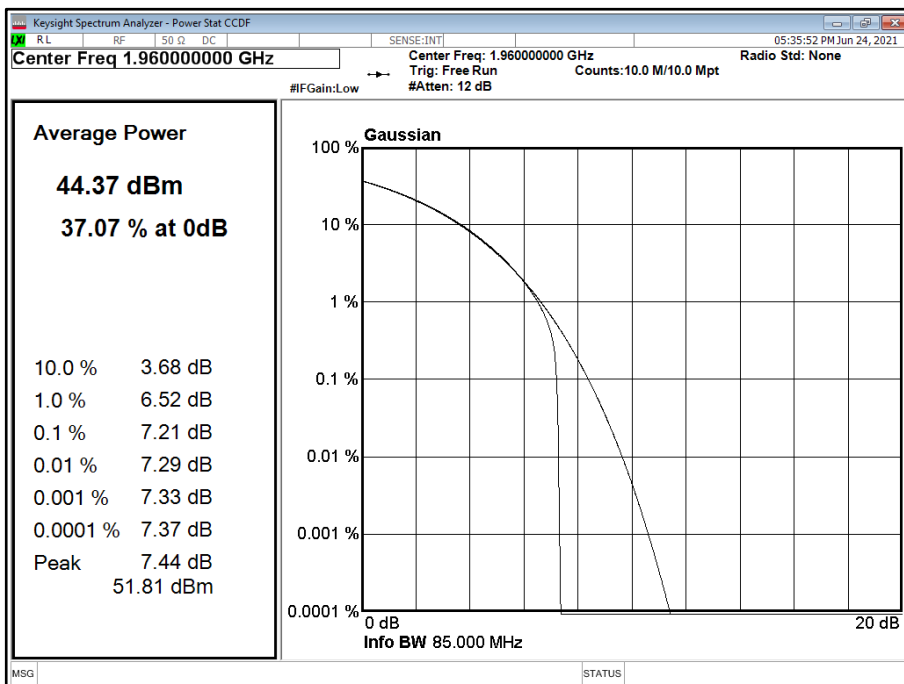
NB-IoT IB Carrier Bandwidth	Total Power PSD	EIRP Limit	EIRP Limit
	(dBm/MHz)	(W/MHz)	(dBm/MHz)
10.0 MHz	41.58	1640	62.15
15.0 MHz	41.58	1640	62.15
20.0 MHz	41.58	1640	62.15



Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 10.0 MHz - Channel Position M

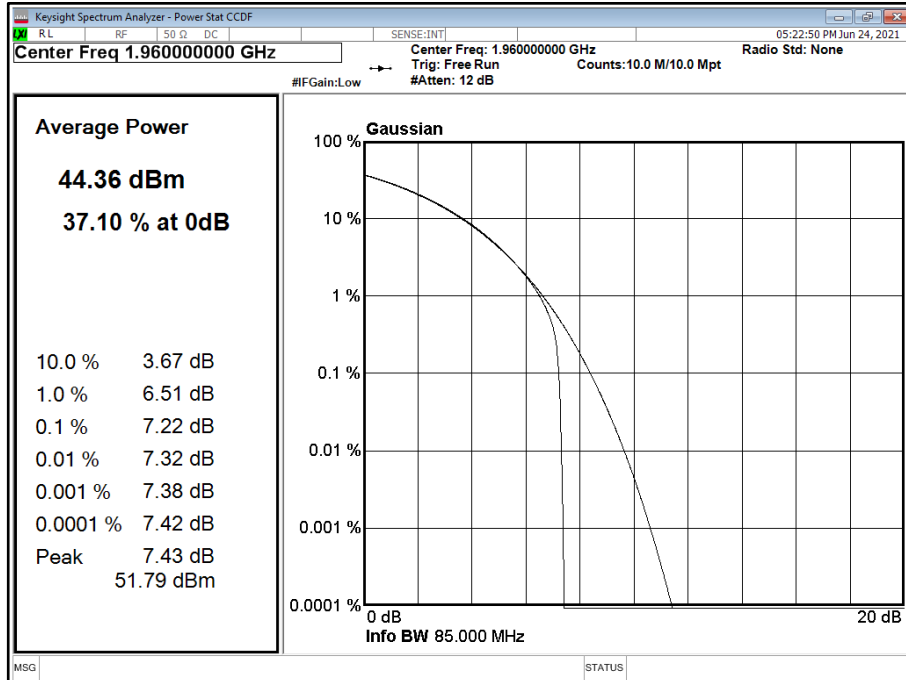


Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 15.0 MHz - Channel Position M





Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 20.0 MHz - Channel Position M



Configuration 1

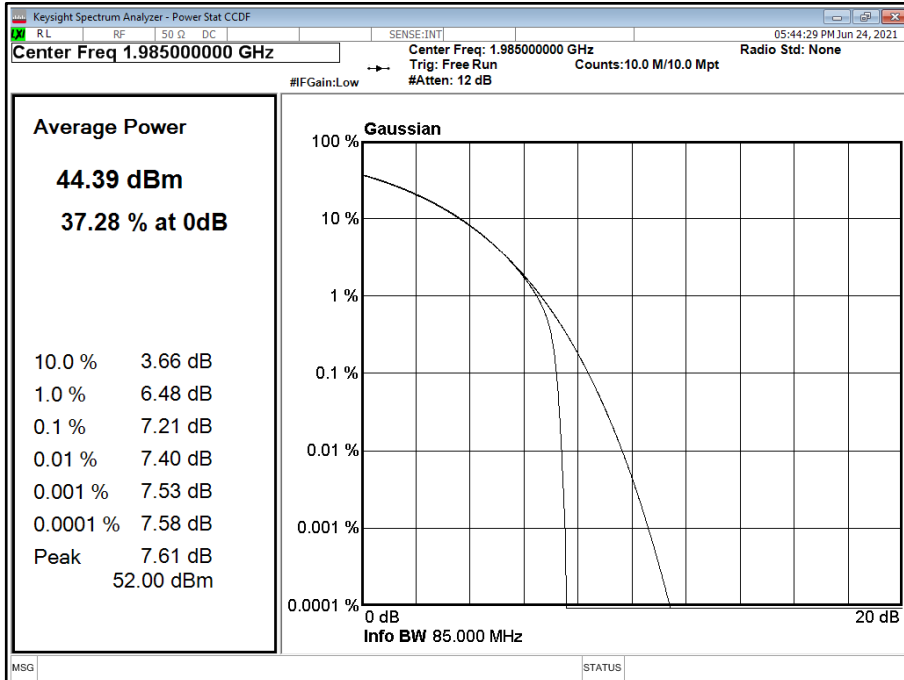
Maximum Output Power 44.80 dBm

Antenna	NB-IoT IB Modulation	NB-IoT IB Carrier Bandwidth	Peak to Average Ratio (PAR) / Output Power / PSD				
			Channel Position T				
			PAR (dB)	Average Power/PSD		Total Power Port A + B + C + D	
			dBm	dBm/MHz	dBm	dBm/MHz	
A	QPSK	10.0 MHz	7.21	44.40	35.89	50.42	41.91
A	QPSK	15.0 MHz	7.28	44.47	35.51	50.49	41.53
A	QPSK	20.0 MHz	7.31	44.44	35.18	50.46	41.20

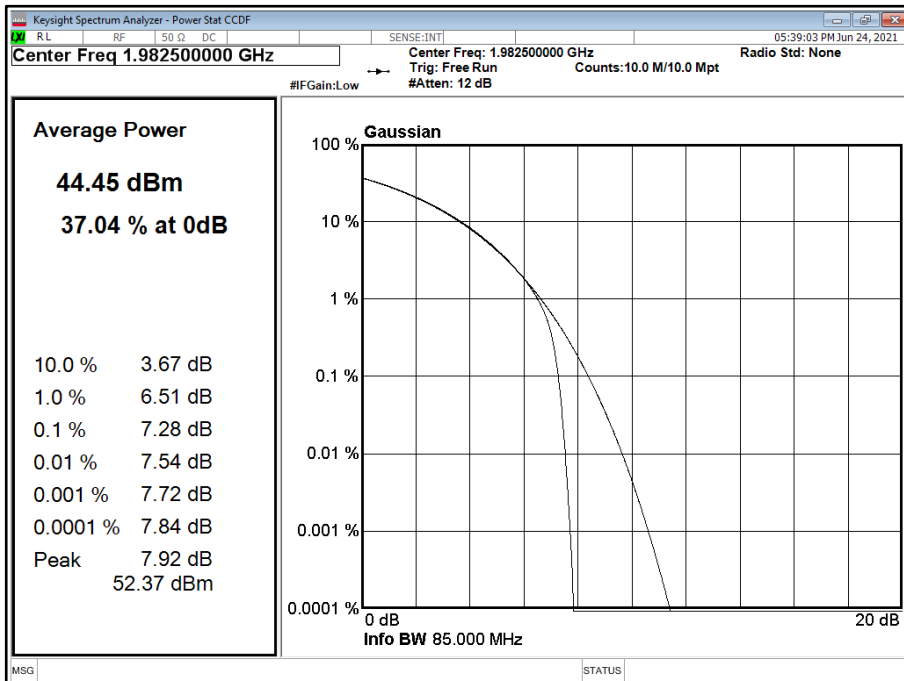
NB-IoT IB Carrier Bandwidth	Total Power PSD	EIRP Limit (W/MHz)	EIRP Limit (dBm/MHz)
	(dBm/MHz)		
10.0 MHz	41.91	1640	62.15
15.0 MHz	41.53	1640	62.15
20.0 MHz	41.20	1640	62.15



Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 10.0 MHz - Channel Position T

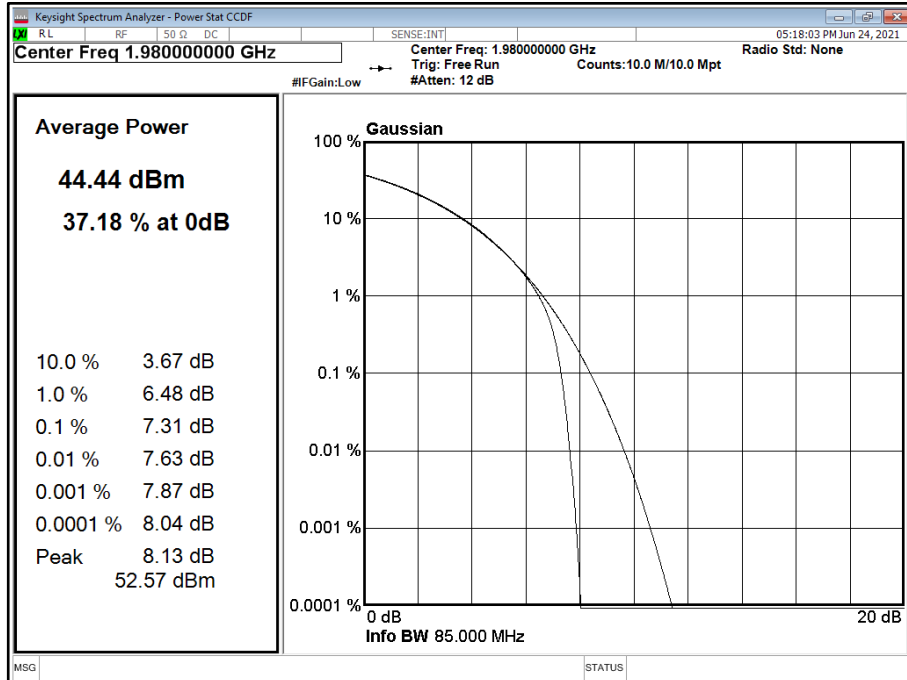


Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 15.0 MHz - Channel Position T





Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 20.0 MHz - Channel Position T





2.2 OCCUPIED BANDWIDTH

2.2.1 Specification Reference

FCC CFR 47 Part 24, Clause 24.238 (b)
 FCC CFR 47 Part 2, Clause 2.1049
 ISED RSS-GEN, Clause 6.7

2.2.2 Date of Test and Modification State

24 June 2021 - Modification State 0

2.2.3 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.2.4 Environmental Conditions

Ambient Temperature 22.2°C
 Relative Humidity 43.9%

2.2.5 Test Method

All measurements were made in accordance with FCC KDB 971168 D01, Clause 4.3. The Spectrum Analyser RBW was configured to be at least 1% of the channel bandwidth of the carrier to be measured.

For 26 dB Bandwidth, in accordance with KDB 971168 D01, a peak detector and a trace setting of Max Hold were used. The trace was allowed to stabilise and using the Spectrum Analyser function, the 26dB measurement result was obtained.

4.3 Occupied bandwidth – power bandwidth (99 %) measurement procedure
 Subclause 5.4.4 of ANSI C63.26-2015 is applicable (wherein the recommendation is to use the 99 % power bandwidth function of a spectrum analyser).

2.2.6 Test Results

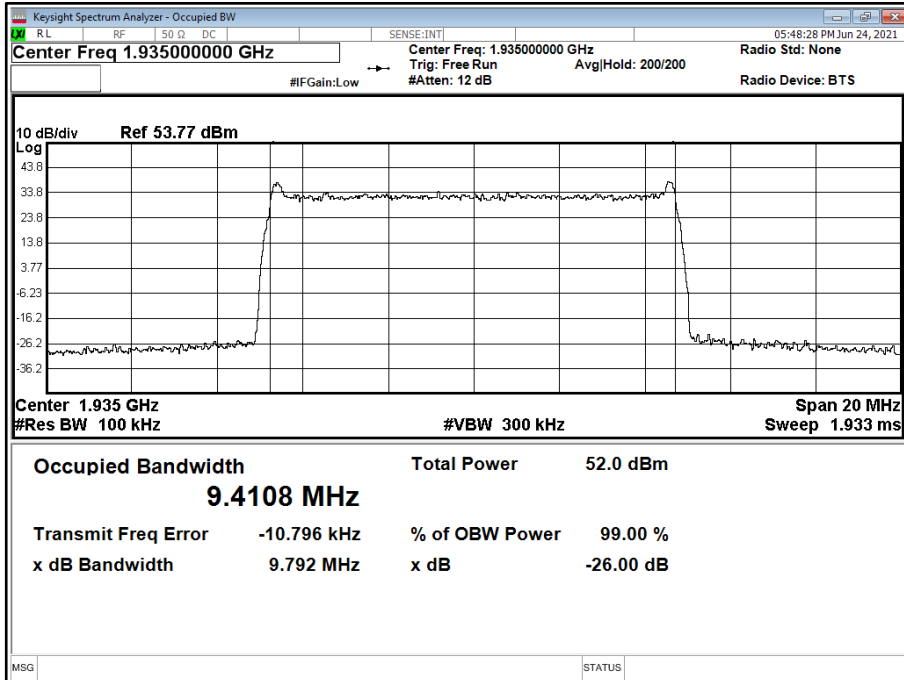
Configuration 1

Maximum Output Power 44.80 dBm

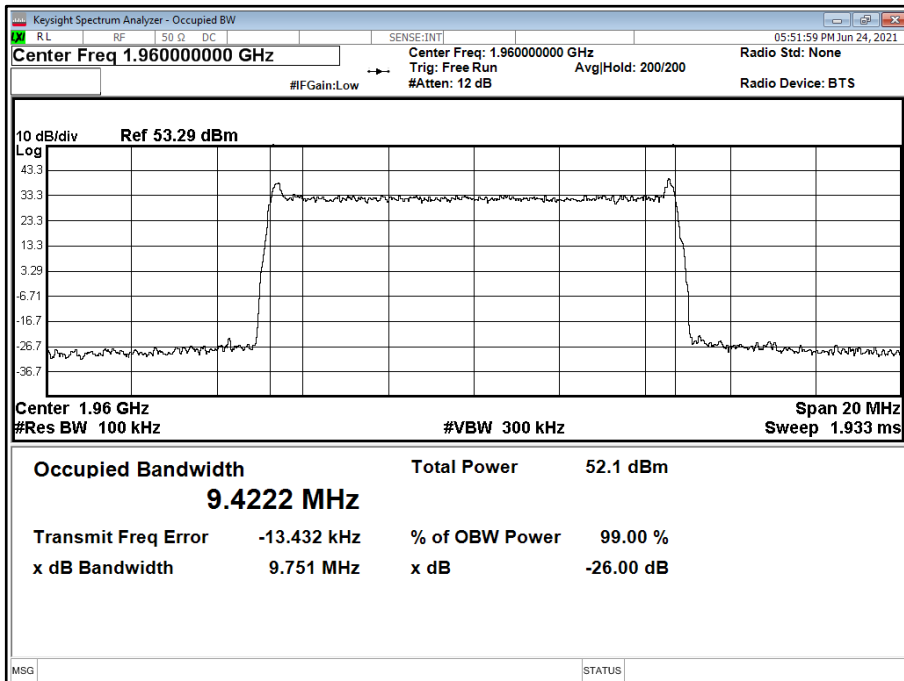
Antenna	NB-IoT IB Modulation	NB-IoT IB Carrier Bandwidth	Result (MHz)					
			Channel Position B		Channel Position M		Channel Position T	
			Occupied Bandwidth	-26 dB Bandwidth	Occupied Bandwidth	-26 dB Bandwidth	Occupied Bandwidth	-26 dB Bandwidth
A	QPSK	10.0 MHz	9410.84	9791.90	9422.23	9751.18	9420.41	9802.78
A	QPSK	15.0 MHz	14372.93	14775.72	14363.14	14756.75	14375.26	14807.84
A	QPSK	20.0 MHz	19182.27	19755.49	19171.97	19763.36	19183.98	19712.22



Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 10.0 MHz - Channel Position B

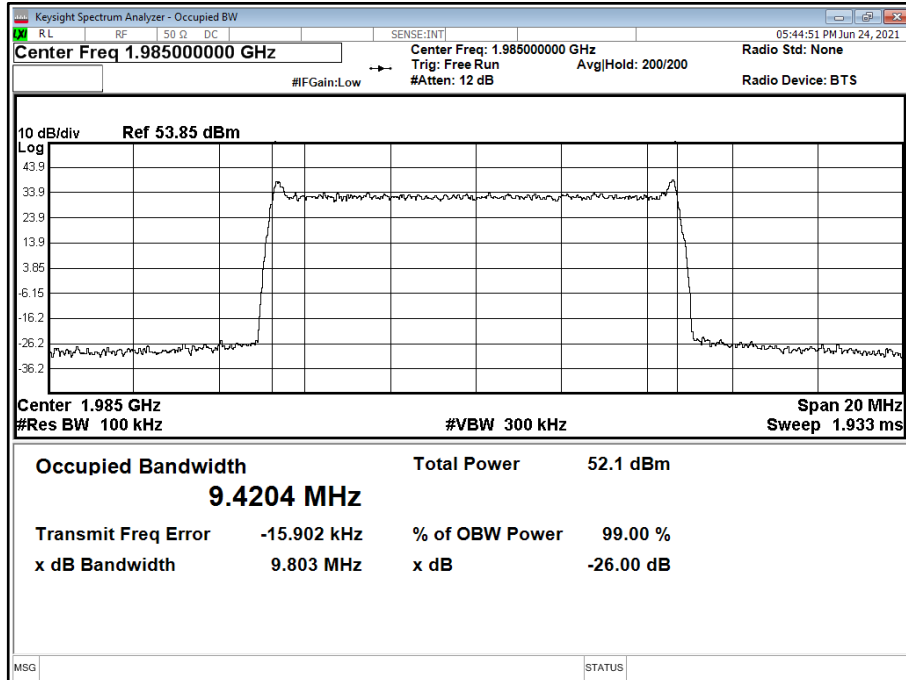


Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 10.0 MHz - Channel Position M

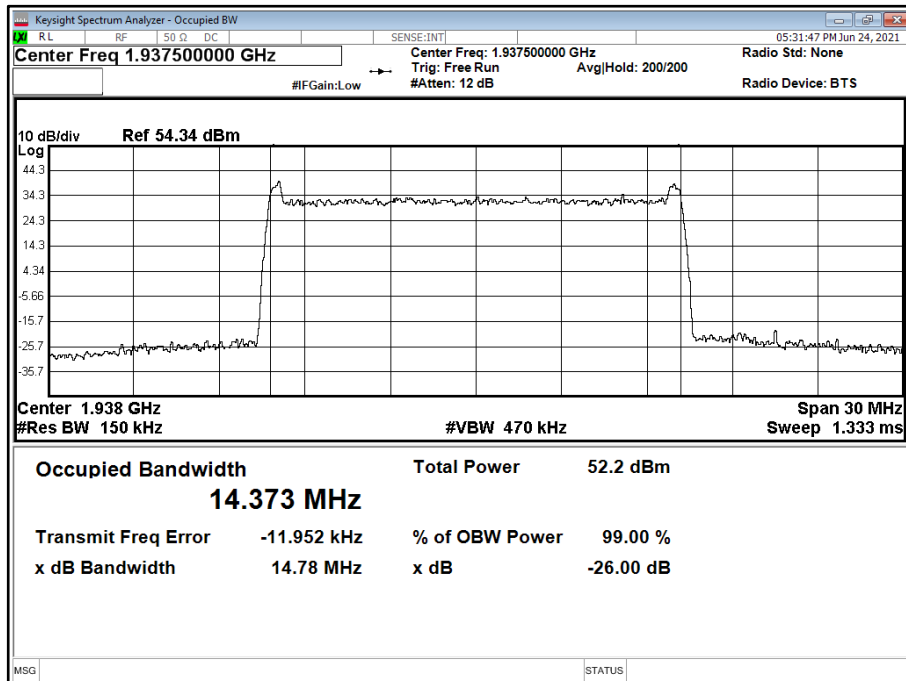




Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 10.0 MHz - Channel Position T

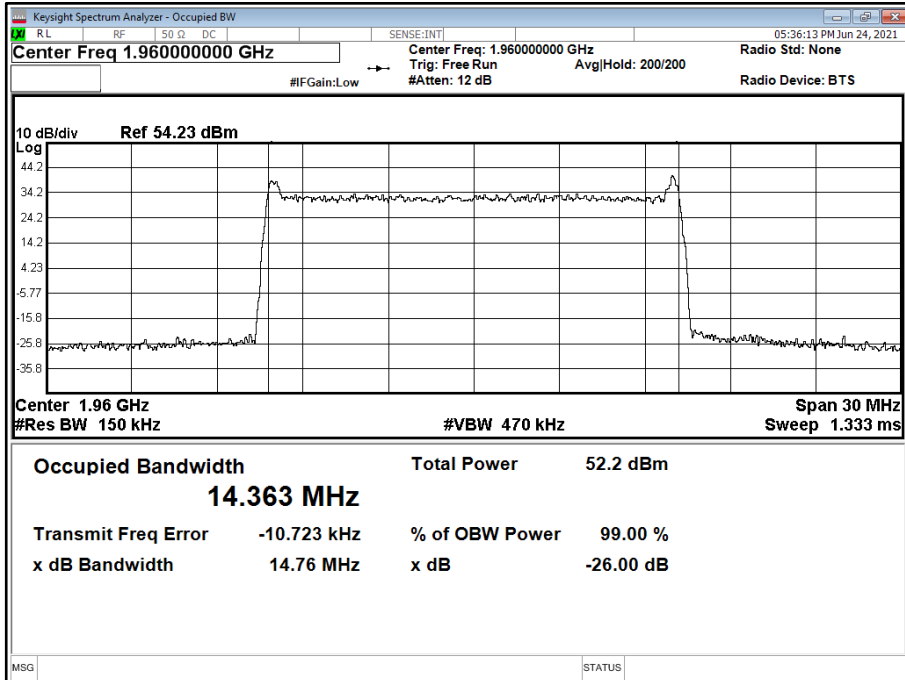


Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 15.0 MHz - Channel Position B

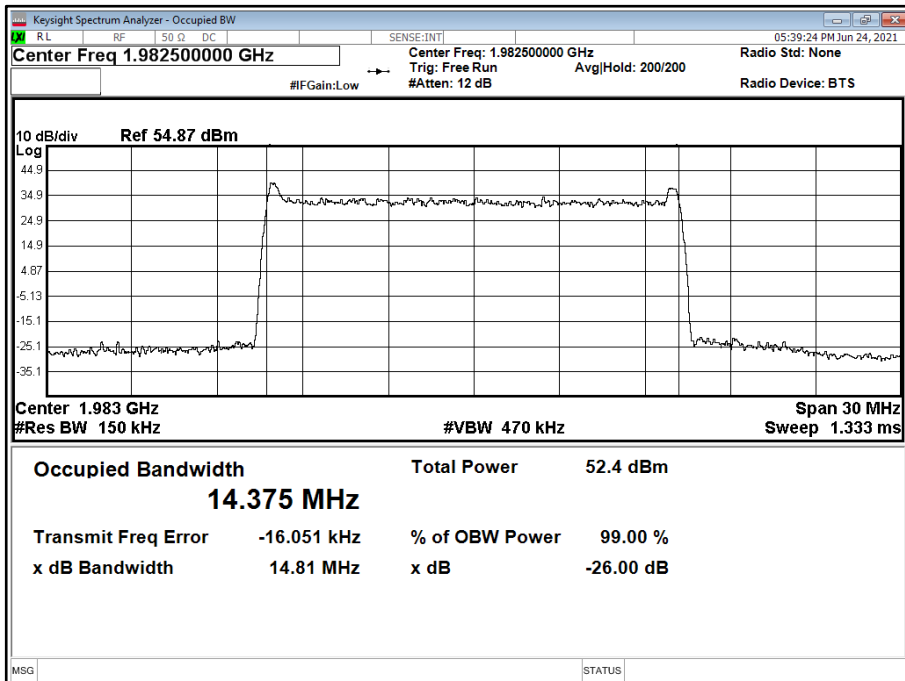




Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 15.0 MHz - Channel Position M

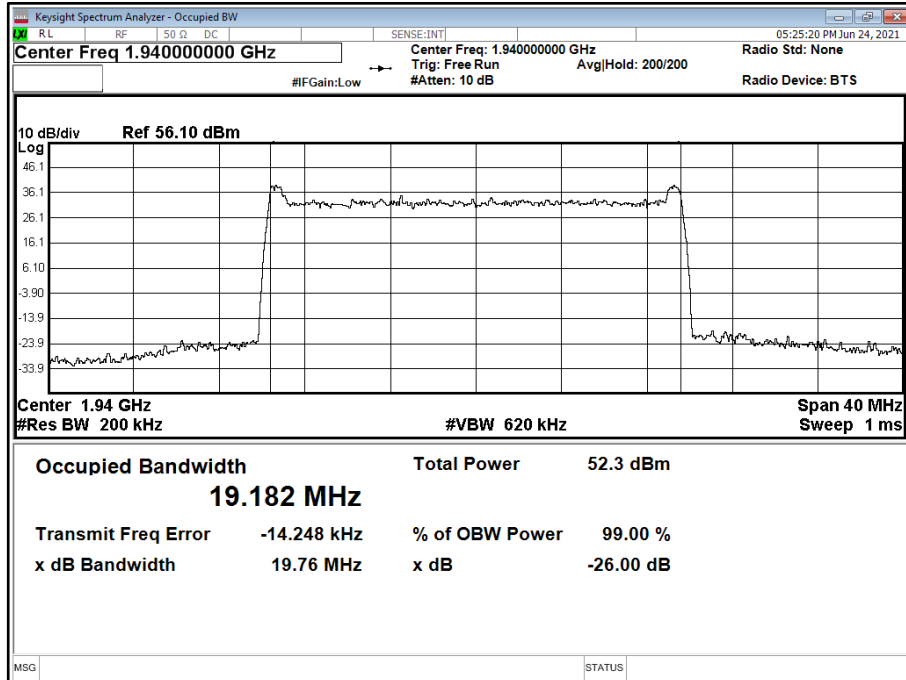


Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 15.0 MHz - Channel Position T

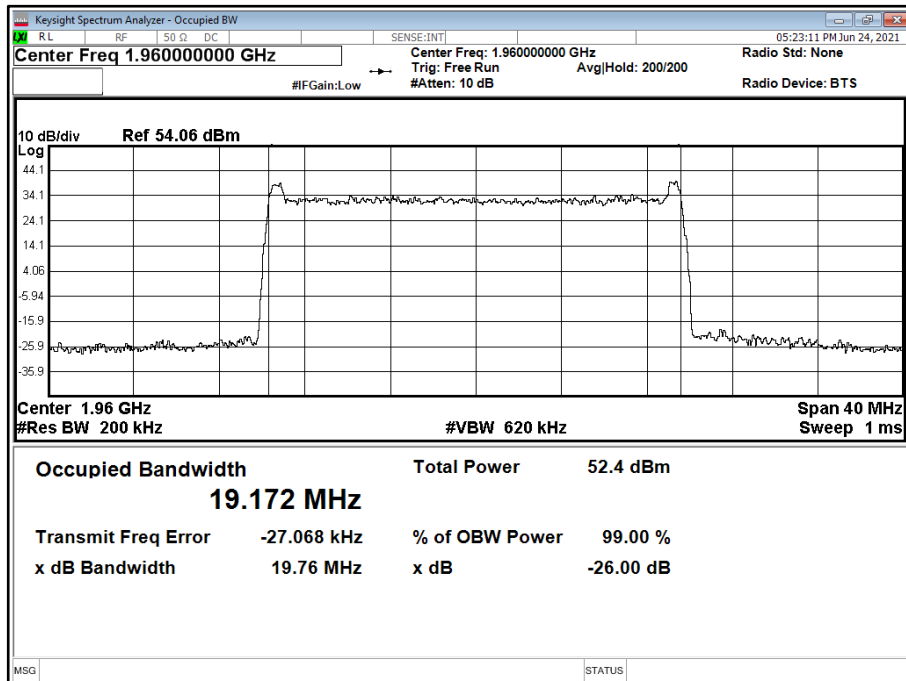




Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 20.0 MHz - Channel Position B

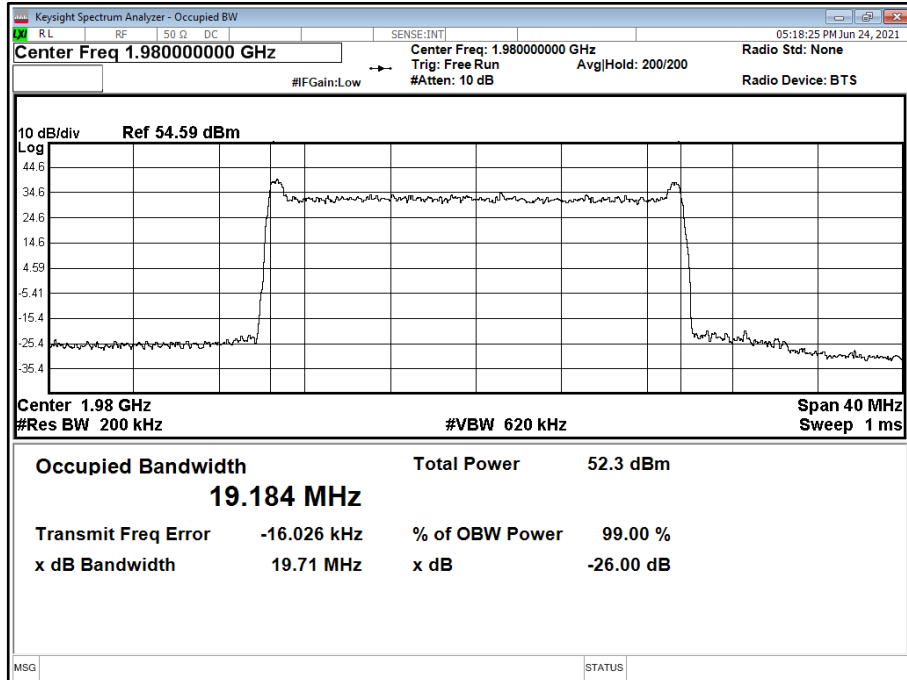


Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 20.0 MHz - Channel Position M





Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 20.0 MHz - Channel Position T





2.3 BAND EDGE

2.3.1 Specification Reference

FCC CFR 47 Part 24, Clause 24.238 (b)
FCC CFR 47 Part 2, Clause 2.1051
Industry Canada RSS-133, Clause 6.5

2.3.2 Date of Test and Modification State

24 June 2021 - Modification State 0

2.3.3 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.3.4 Environmental Conditions

Ambient Temperature 22.2°C
Relative Humidity 43.9%

2.3.5 Test Method

All measurements were made in accordance with FCC KDB 971168 D01, Clause 6.0.

Band Edge measurements were used an Integration Bandwidth of at least 1% of the measured 26dB Bandwidth.

Each antenna port has been declared as being equivalent, therefore measurements were made on one antenna port only. To account for this, the limit was tightened by $10 * \text{Log}(N)$, where N is equal to the number of MIMO antenna ports.

For 4 ports, the limit was calculated as being $-13 \text{ dBm} - 10 * \text{Log}(4) = -19 \text{ dBm}$.

2.3.6 Test Results

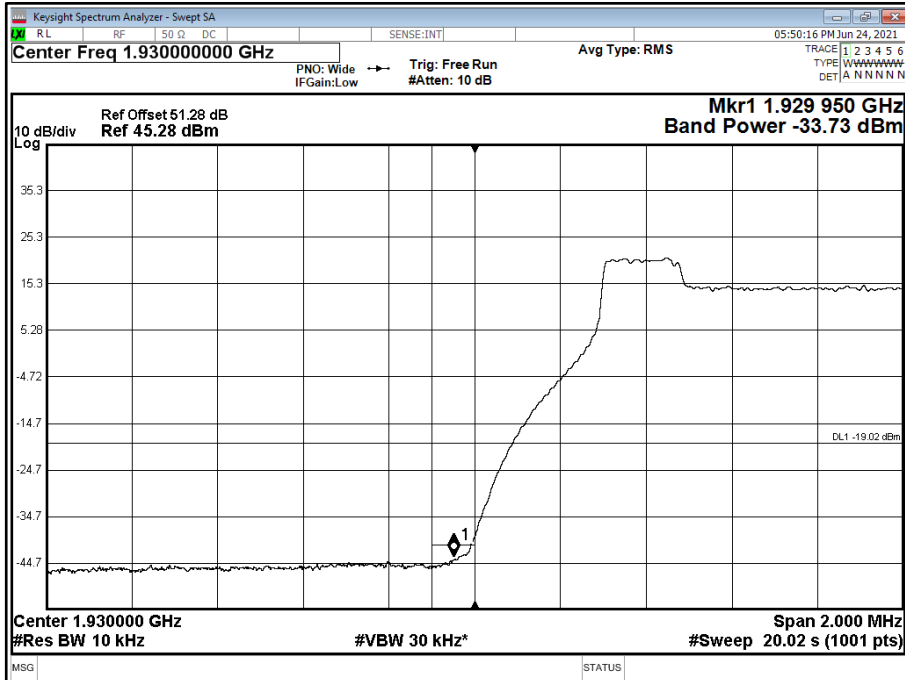
Configuration 1

Maximum Output Power 44.80 dBm

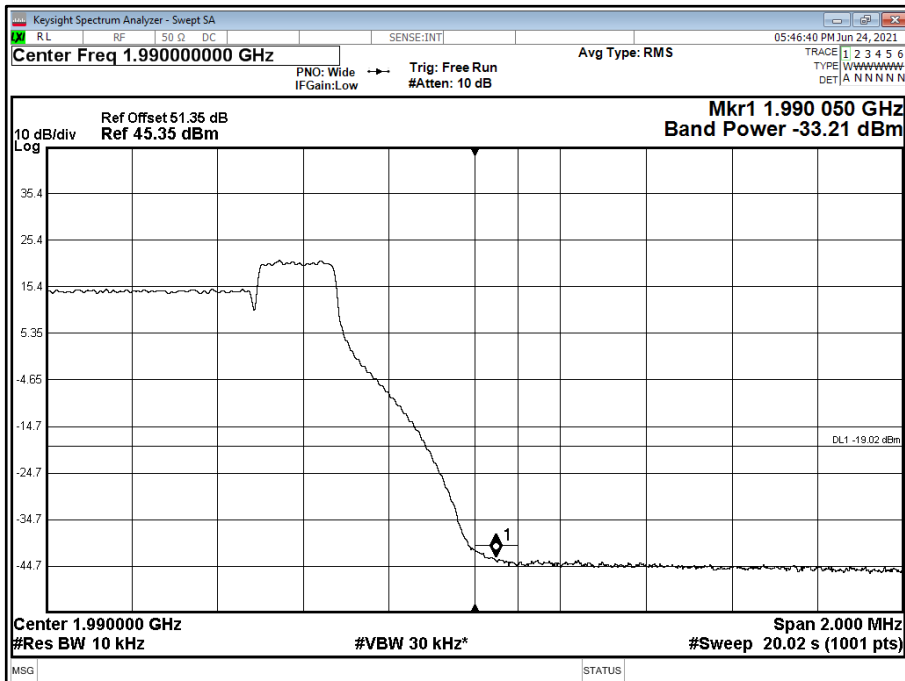
Antenna	NB-IoT IB Modulation	NB-IoT IB Carrier Bandwidth	Band Edge (MHz)	
			Channel Position B	Channel Position T
A	QPSK	10.0 MHz	1,935.0	1,985.0
A	QPSK	15.0 MHz	1,937.5	1,982.5
A	QPSK	20.0 MHz	1,940.0	1,980.0



Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 10.0 MHz - Channel Position B

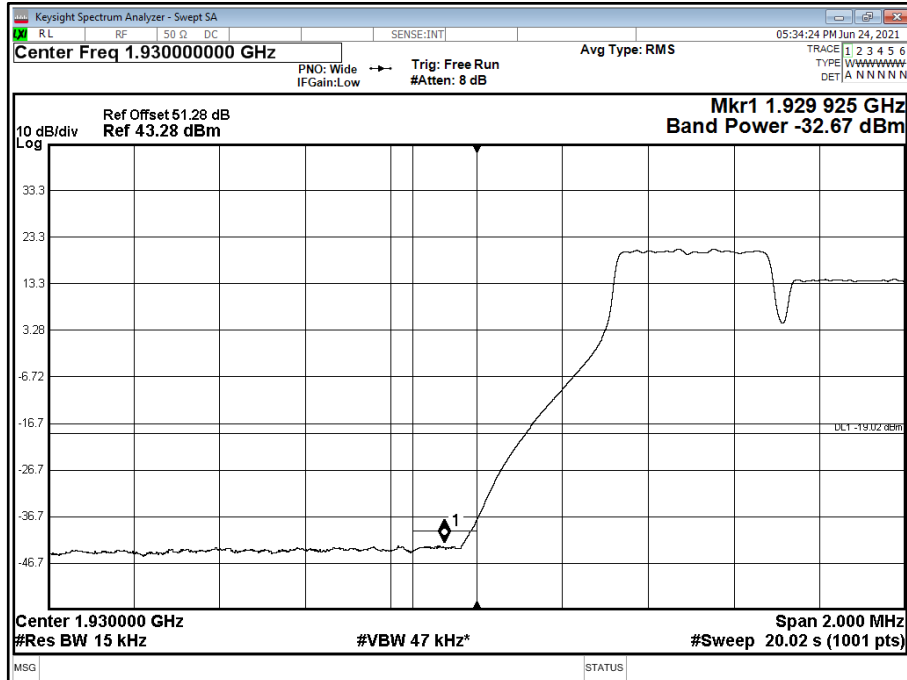


Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 10.0 MHz - Channel Position T

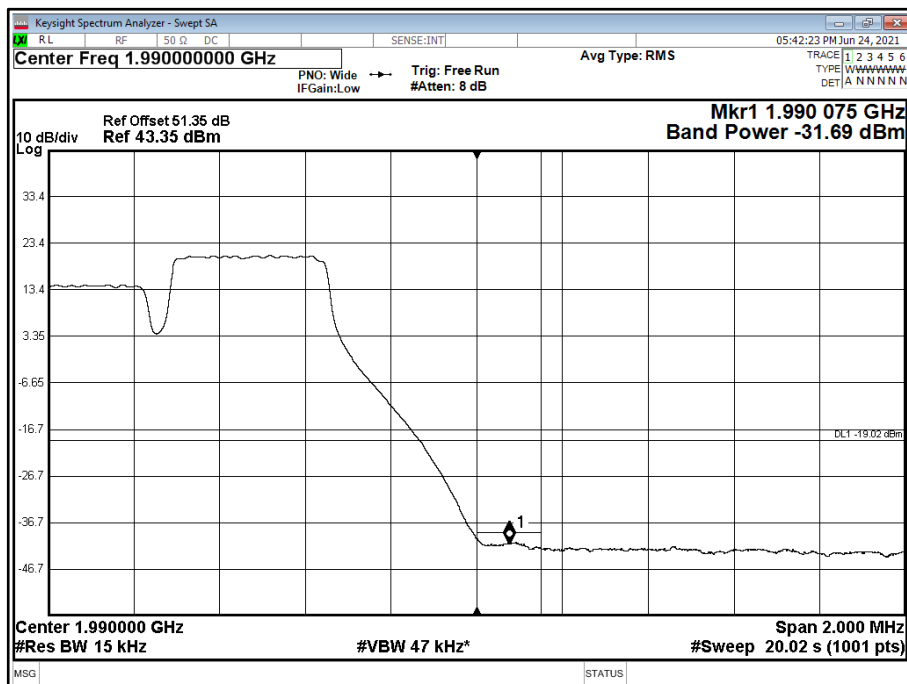




Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 15.0 MHz - Channel Position B

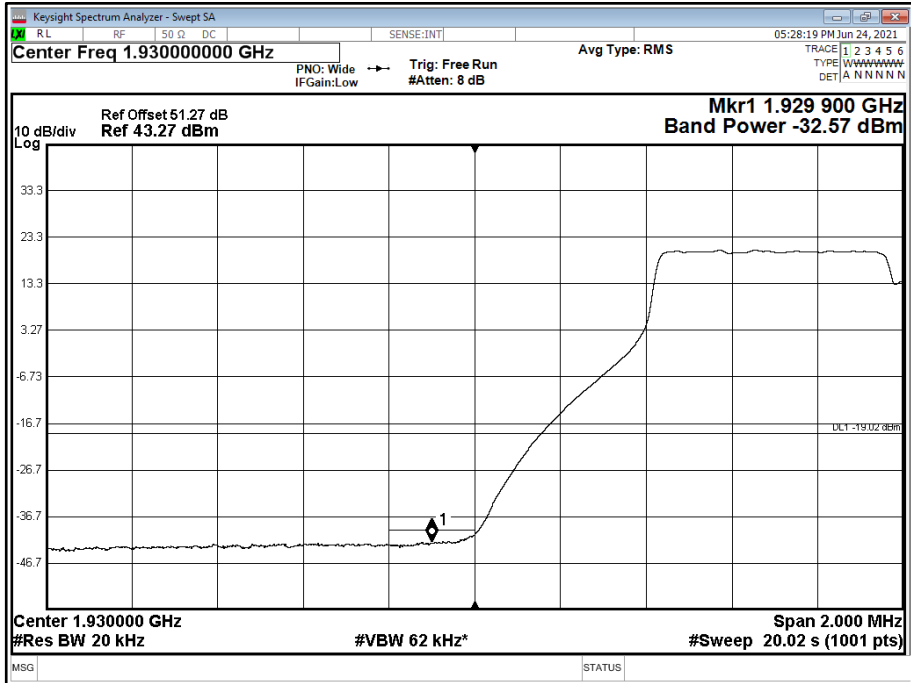


Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 15.0 MHz - Channel Position T

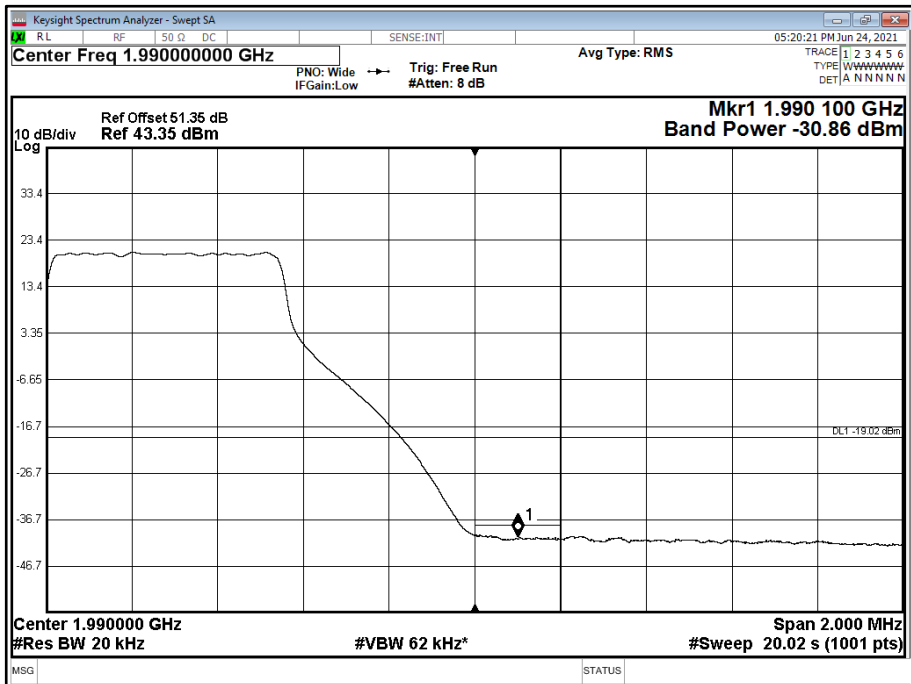




Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 20.0 MHz - Channel Position B



Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 20.0 MHz - Channel Position T



Limit	-19 dBm
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2.4 TRANSMITTER SPURIOUS EMISSIONS

2.4.1 Specification Reference

FCC CFR 47 Part 24, Clause 24.238 (a)
FCC CFR 47 Part 2, Clause 2.1051
ISED RSS-GEN, Clause 6.13
Industry Canada RSS-133, Clause 6.5

2.4.2 Date of Test and Modification State

24 June 2021 - Modification State 0

2.4.3 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.4.4 Environmental Conditions

Ambient Temperature	22.2°C
Relative Humidity	43.9%

2.4.5 Test Method

All measurements were made in accordance with FCC KDB 971168 D01, Clause 6.1.

Each antenna port has been declared as being equivalent, therefore measurements were made on one antenna port only. To account for this, the limit was tightened by $10 * \text{Log}(N)$, where N is equal to the number of MIMO antenna ports.

For 4 ports, the limit was calculated as being $-13 \text{ dBm} - 10 * \text{Log}(4) = -19 \text{ dBm}$.

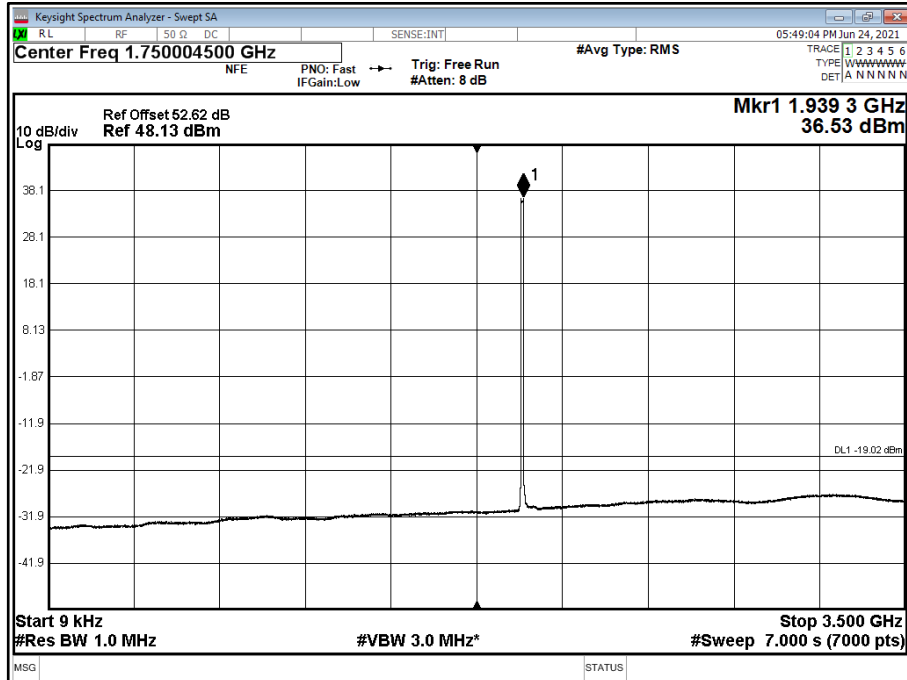
2.4.6 Test Results

Configuration 1

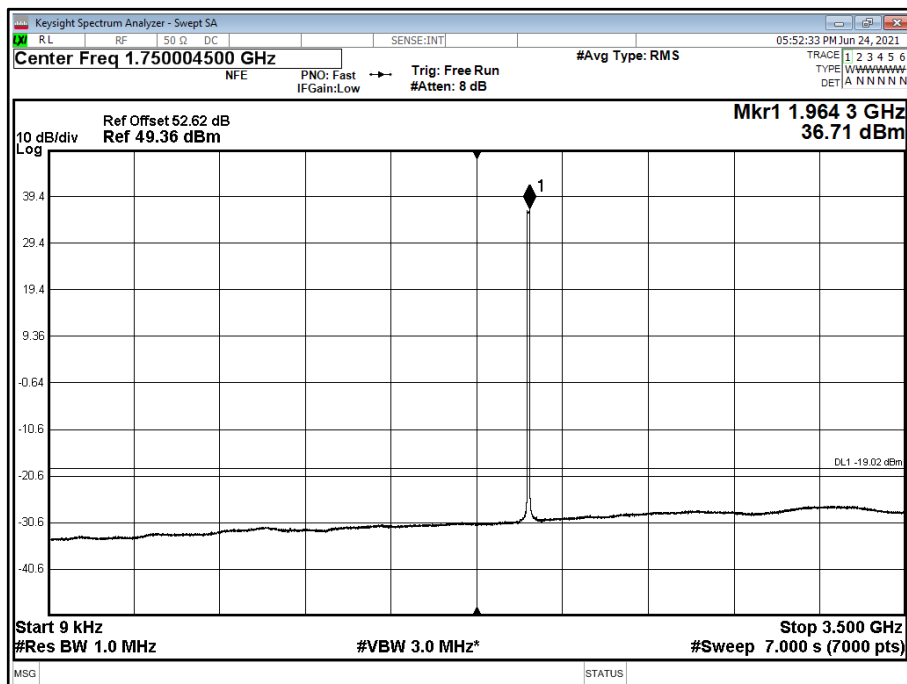
Maximum Output Power 44.80 dBm



Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 10.0 MHz - Channel Position B - Band 1 - Range 0.009 to 3500 MHz

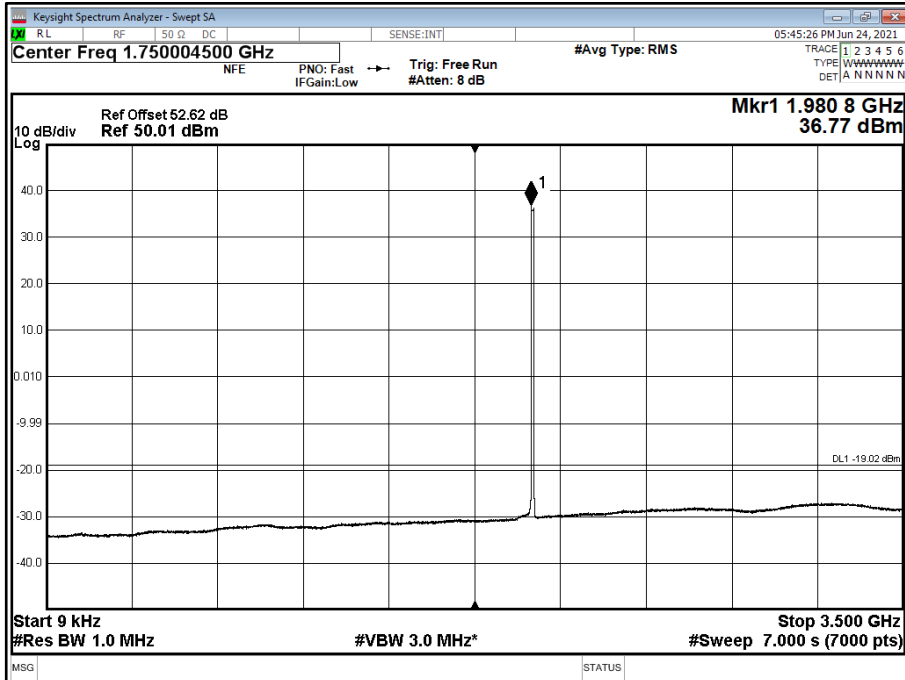


Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 10.0 MHz - Channel Position M - Band 1 - Range 0.009 to 3500 MHz

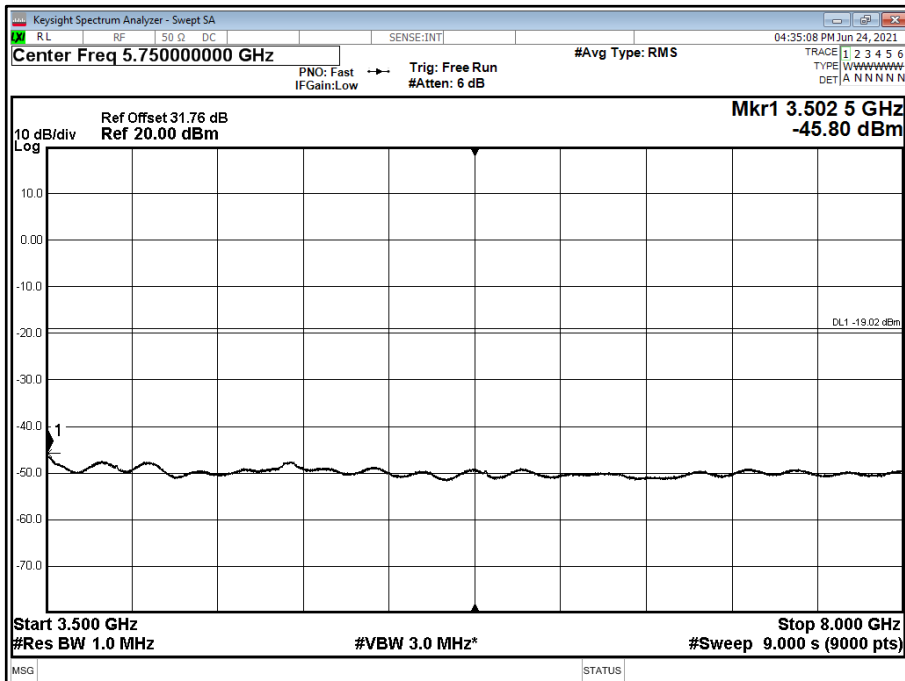




Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 10.0 MHz - Channel Position T - Band 1 - Range 0.009 to 3500 MHz

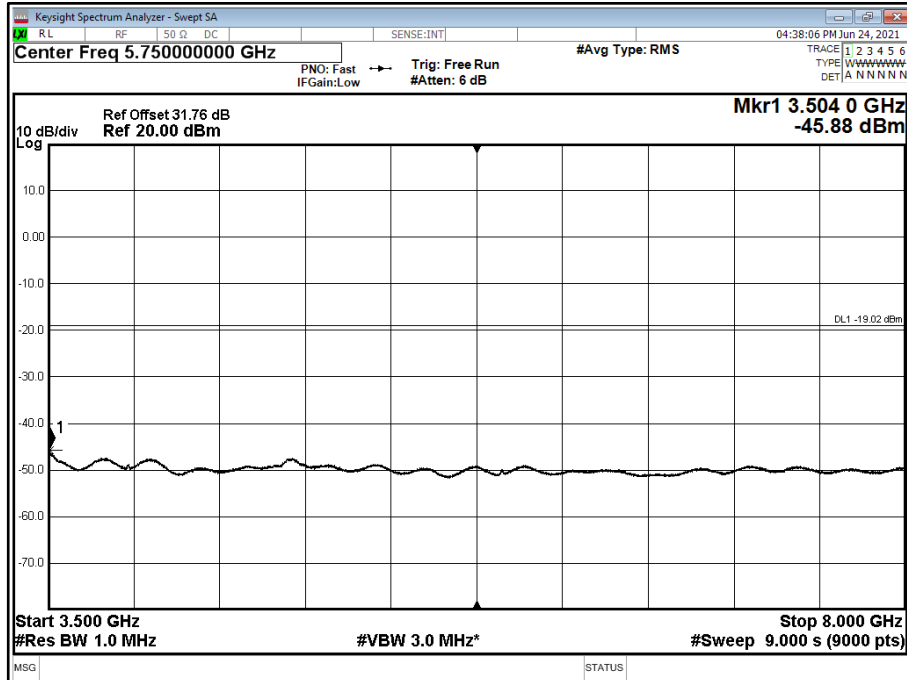


Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 10.0 MHz - Channel Position B - Band 2 - Range 3500 to 8000 MHz

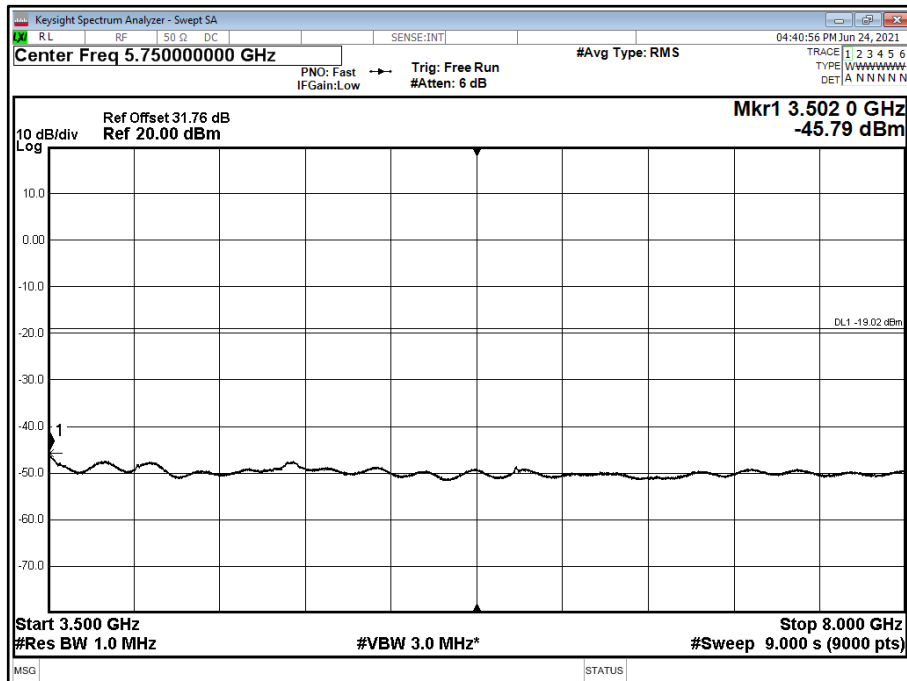




Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 10.0 MHz - Channel Position M - Band 2 - Range 3500 to 8000 MHz

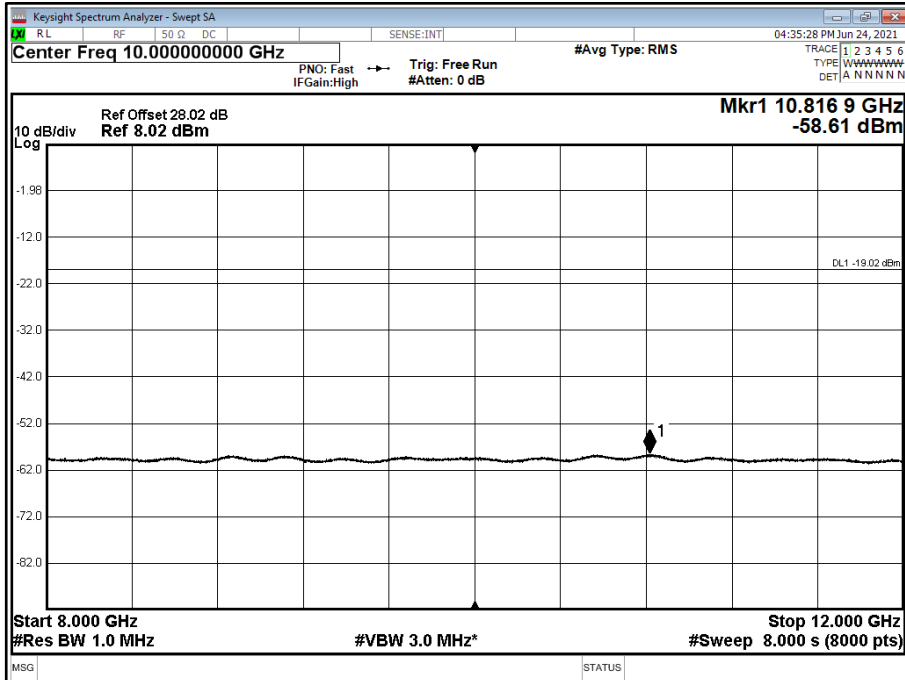


Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 10.0 MHz - Channel Position T - Band 2 - Range 3500 to 8000 MHz

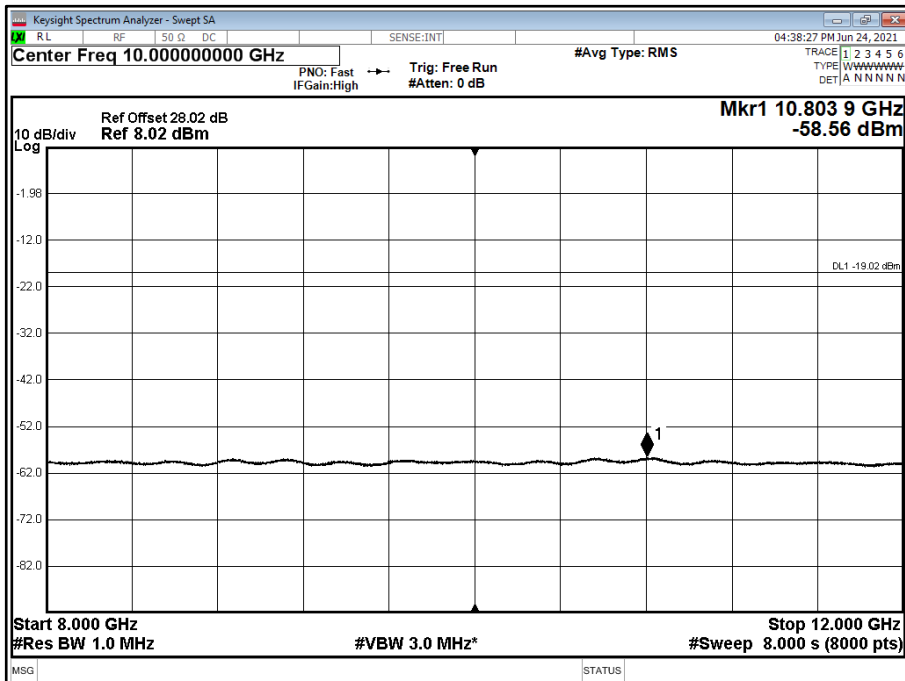




Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 10.0 MHz - Channel Position B - Band 3 - Range 8000 to 12000 MHz

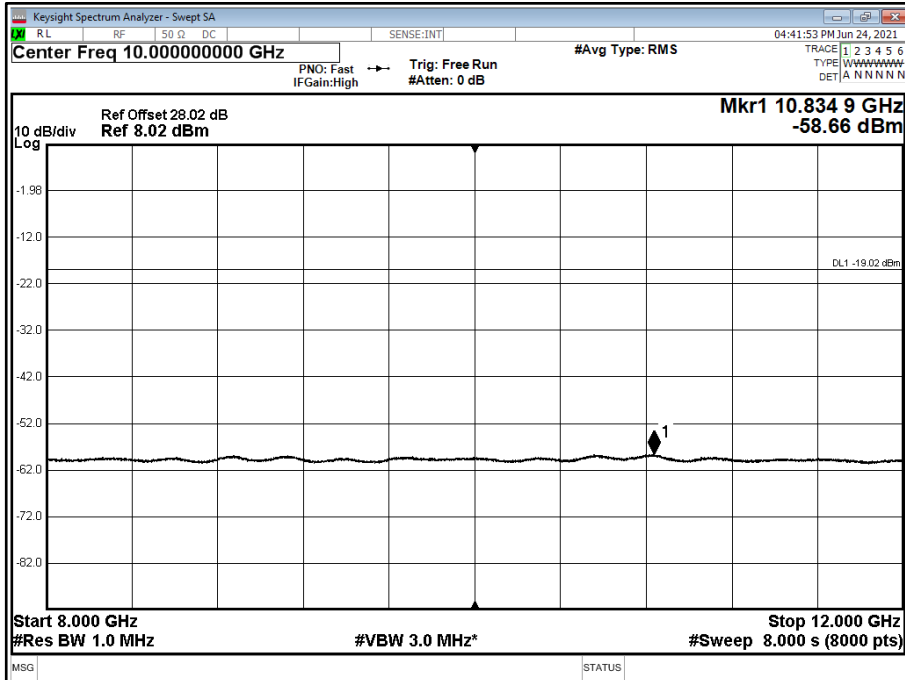


Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 10.0 MHz - Channel Position M - Band 3 - Range 8000 to 12000 MHz

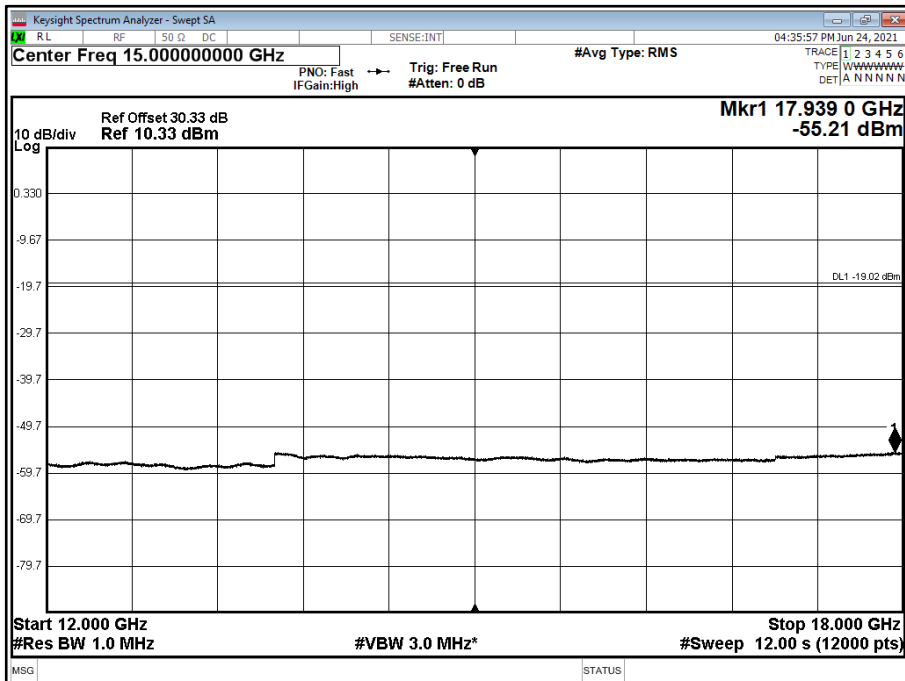




Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 10.0 MHz - Channel Position T - Band 3 - Range 8000 to 12000 MHz

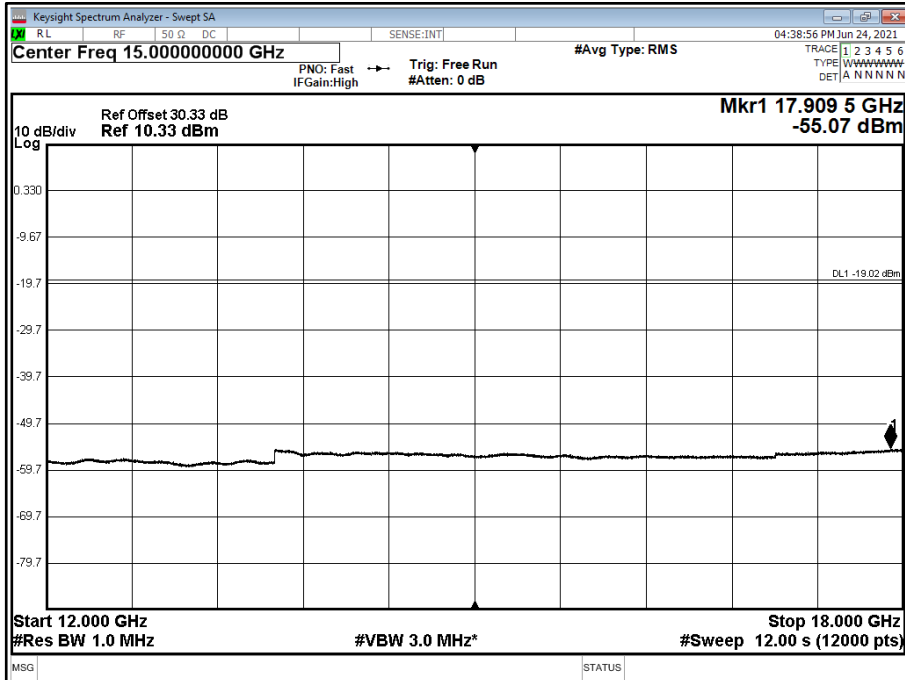


Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 10.0 MHz - Channel Position B - Band 4 - Range 12000 to 18000 MHz

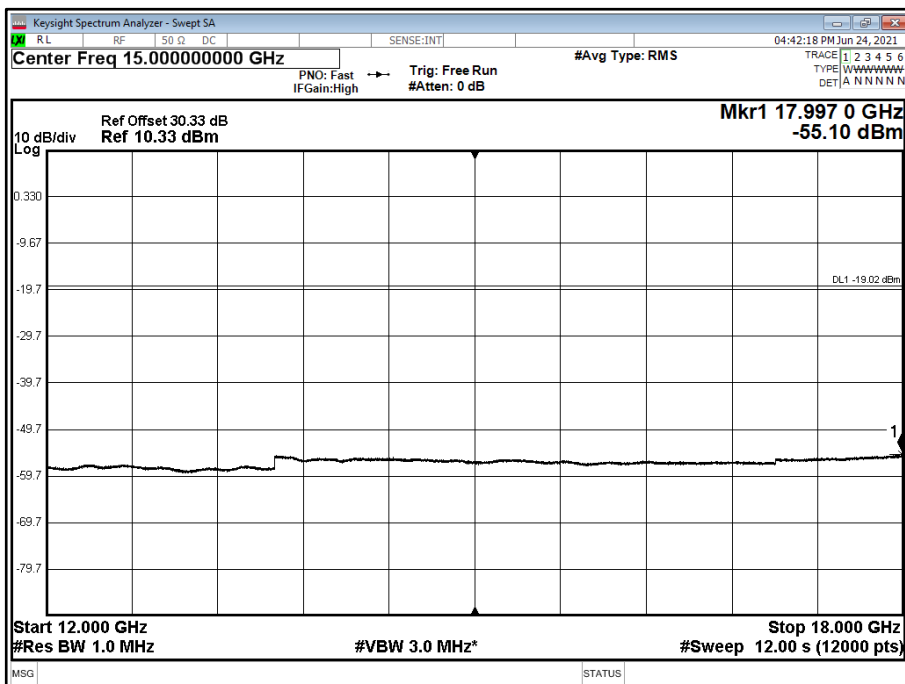




Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 10.0 MHz - Channel Position M - Band 4 - Range 12000 to 18000 MHz

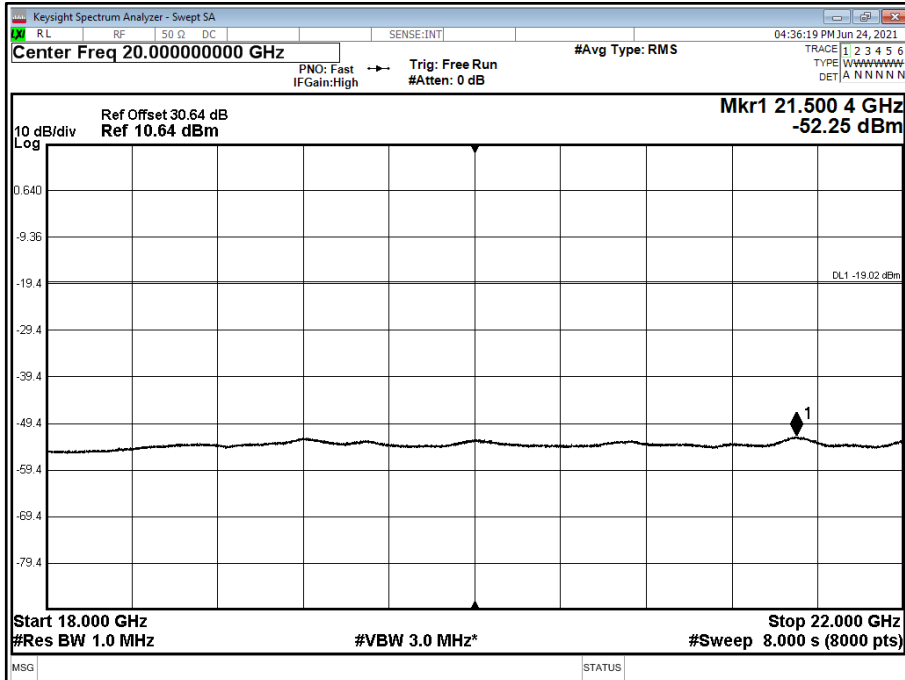


Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 10.0 MHz - Channel Position T - Band 4 - Range 12000 to 18000 MHz

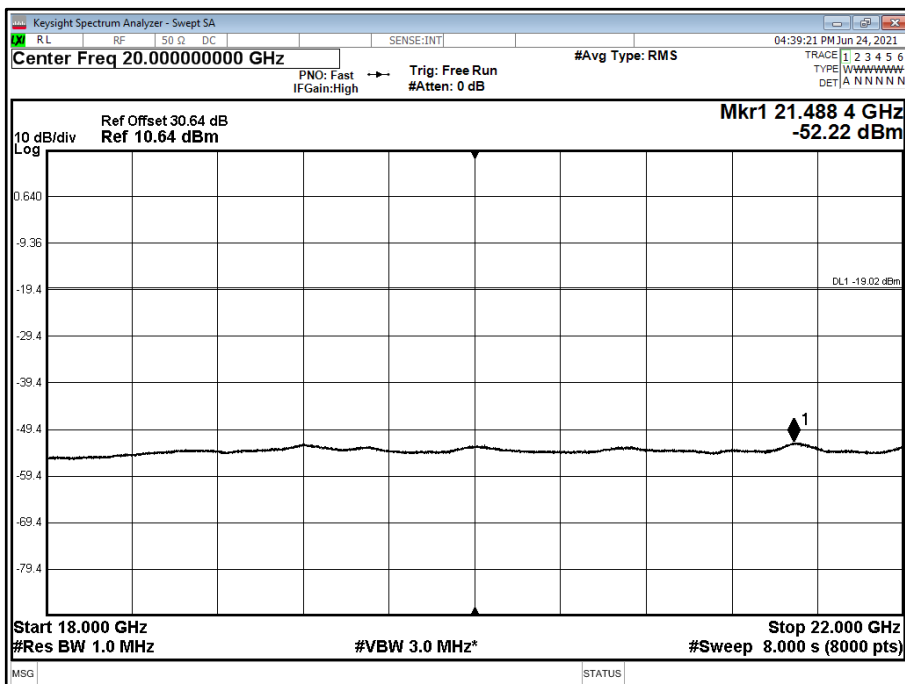




Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 10.0 MHz - Channel Position B - Band 5 - Range 18000 to 22000 MHz

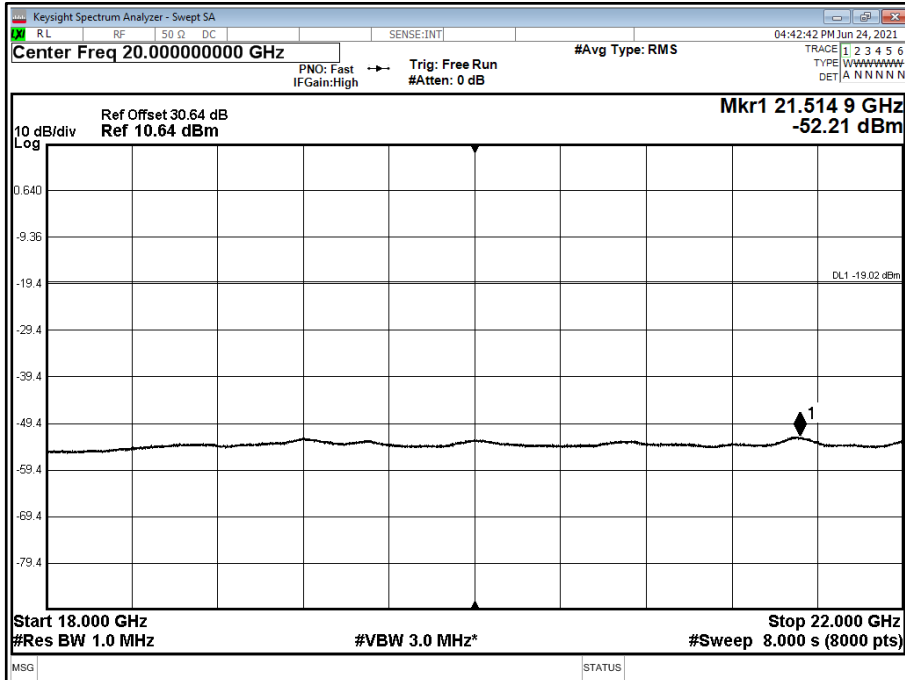


Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 10.0 MHz - Channel Position M - Band 5 - Range 18000 to 22000 MHz

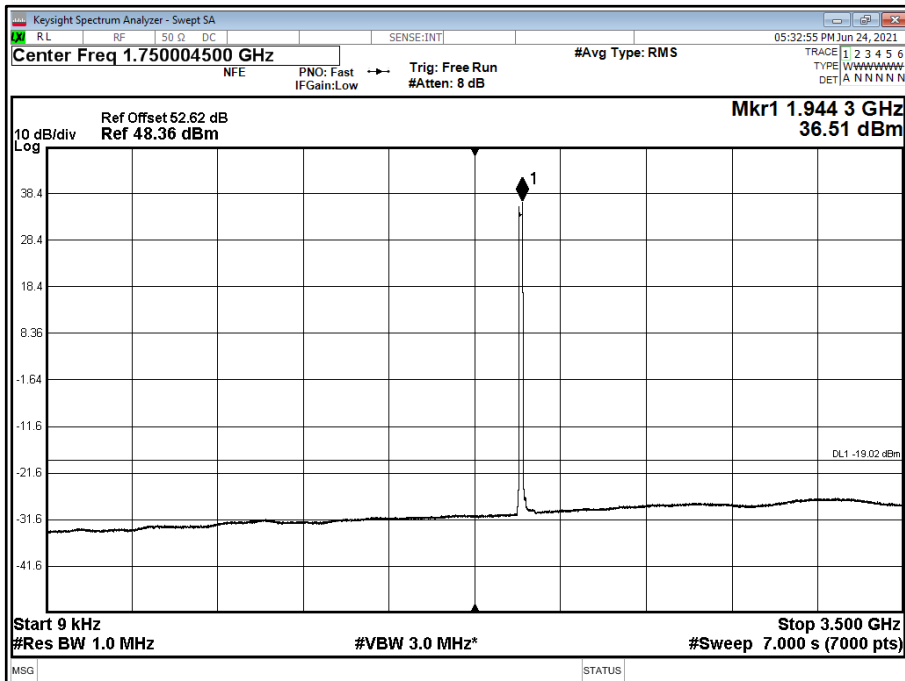




Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 10.0 MHz - Channel Position T - Band 5 - Range 18000 to 22000 MHz

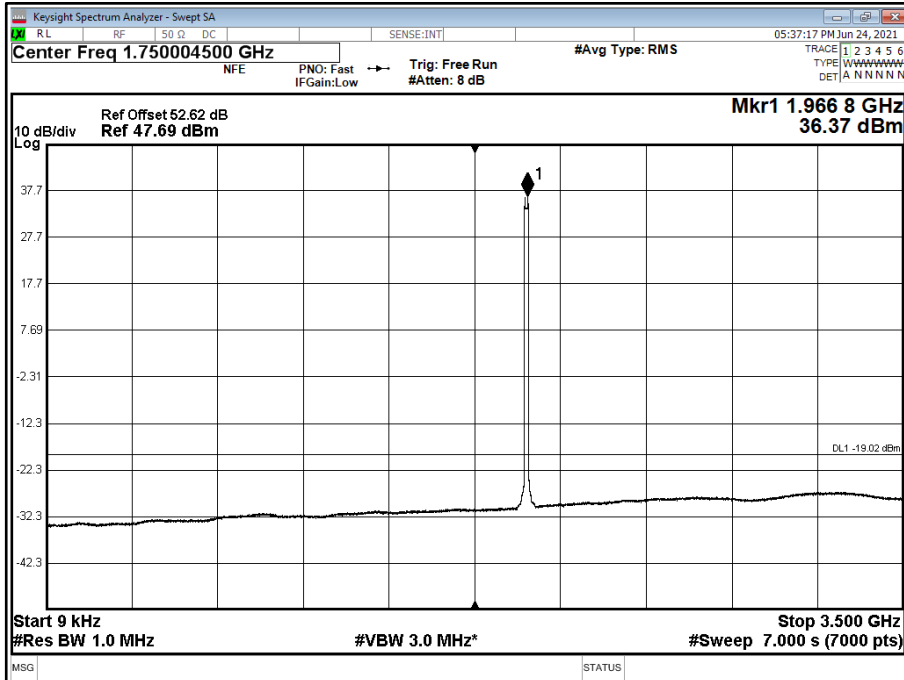


Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 15.0 MHz - Channel Position B - Band 1 - Range 0.009 to 3500 MHz

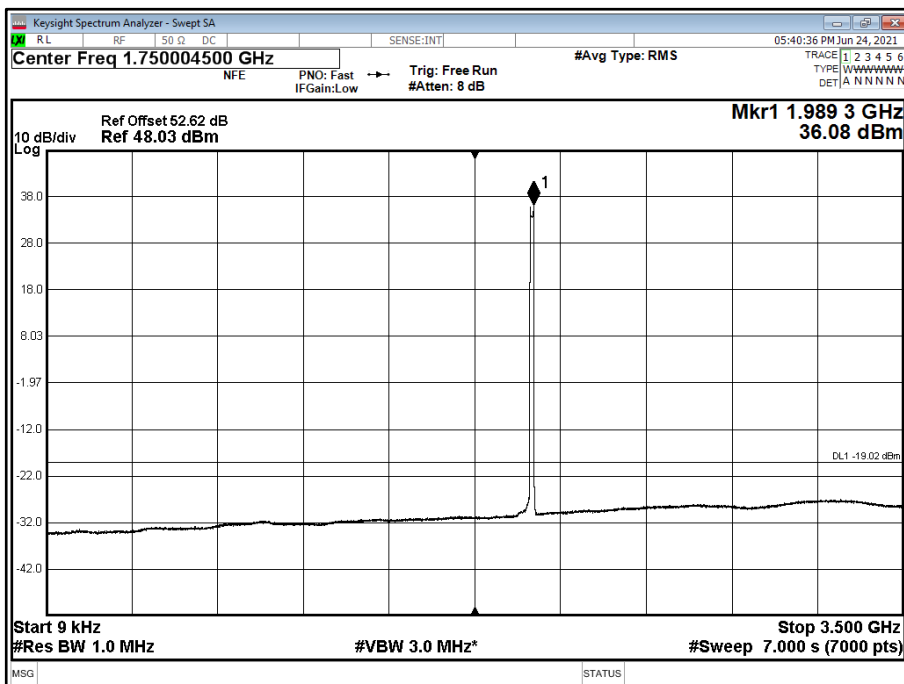




Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 15.0 MHz - Channel Position M - Band 1 - Range 0.009 to 3500 MHz

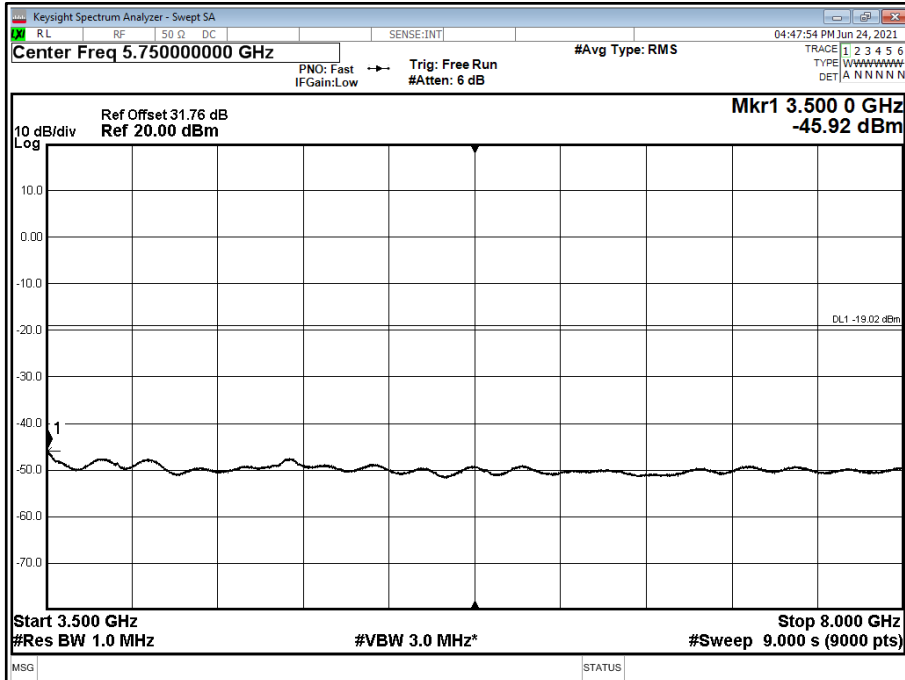


Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 15.0 MHz - Channel Position T - Band 1 - Range 0.009 to 3500 MHz

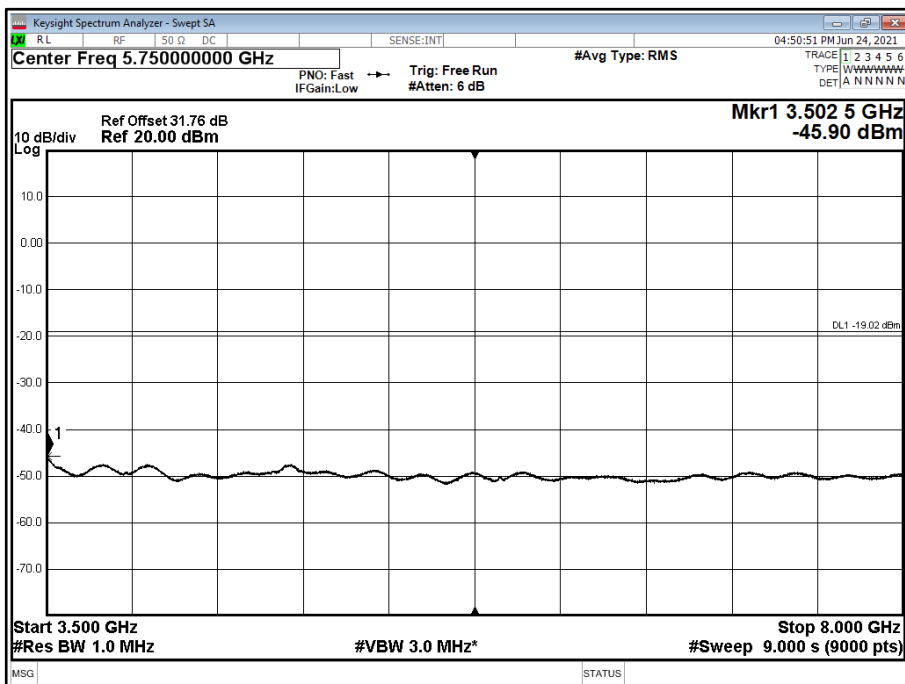




Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 15.0 MHz - Channel Position B - Band 2 - Range 3500 to 8000 MHz

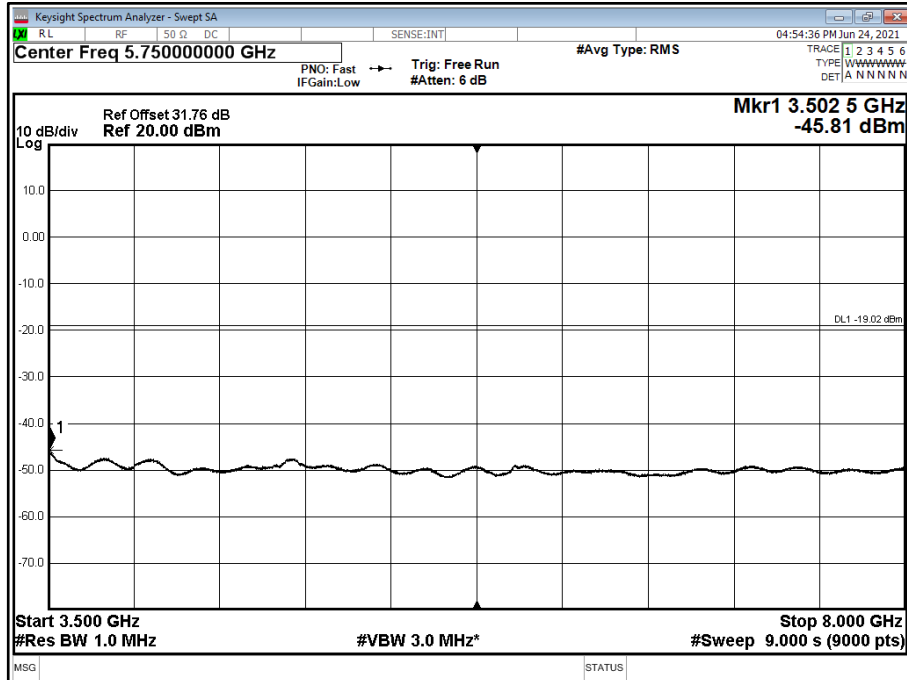


Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 15.0 MHz - Channel Position M - Band 2 - Range 3500 to 8000 MHz

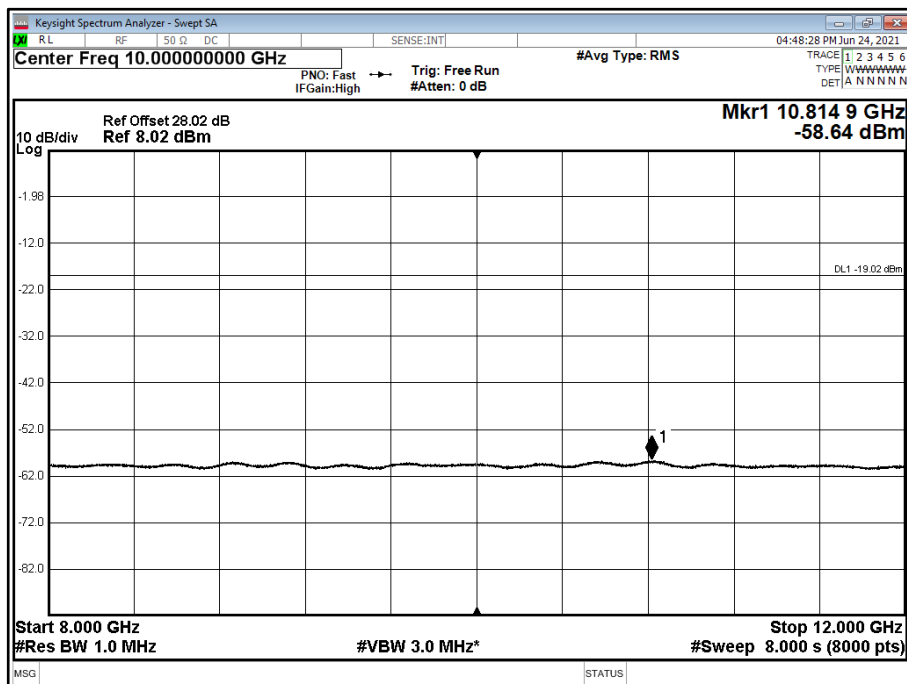




Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 15.0 MHz - Channel Position T - Band 2 - Range 3500 to 8000 MHz

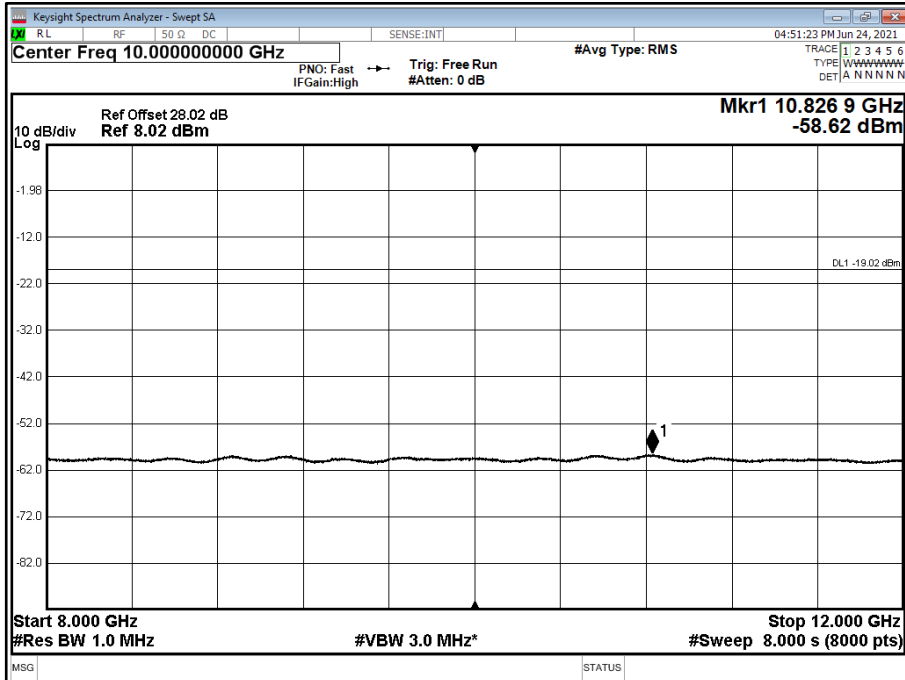


Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 15.0 MHz - Channel Position B - Band 3 - Range 8000 to 12000 MHz

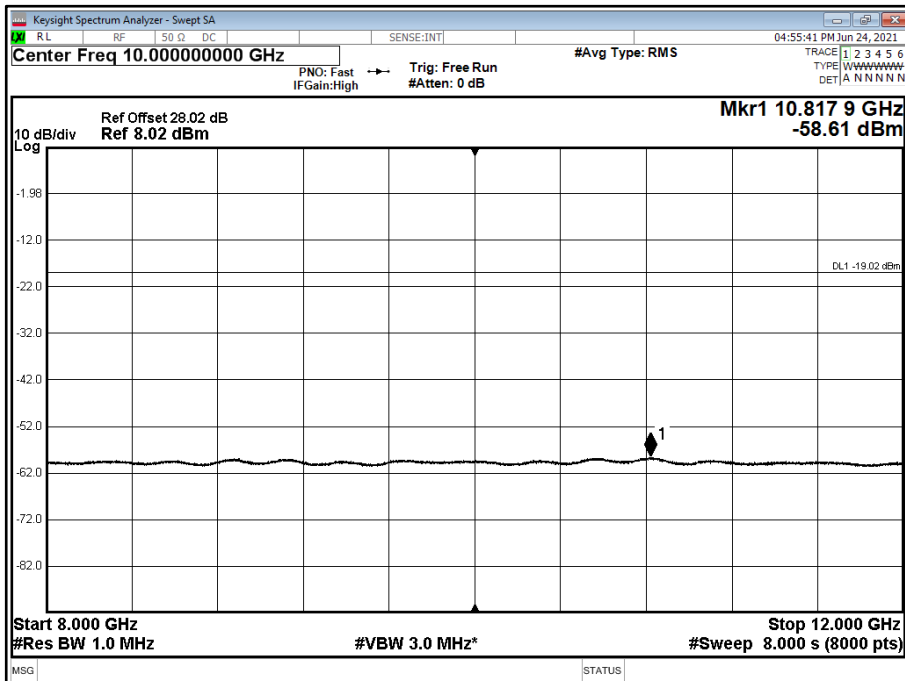




Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 15.0 MHz - Channel Position M - Band 3 - Range 8000 to 12000 MHz

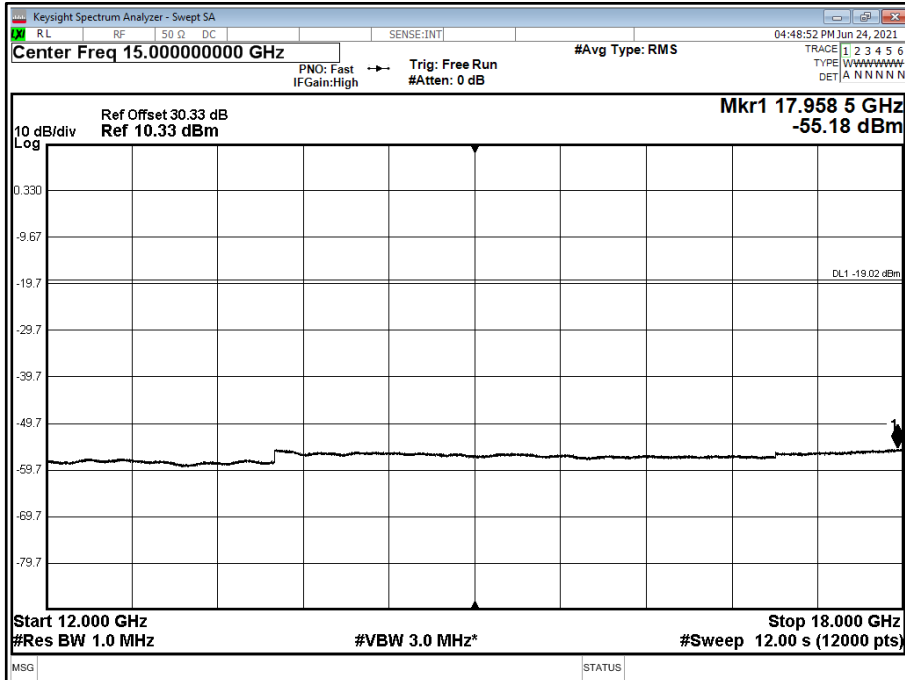


Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 15.0 MHz - Channel Position T - Band 3 - Range 8000 to 12000 MHz

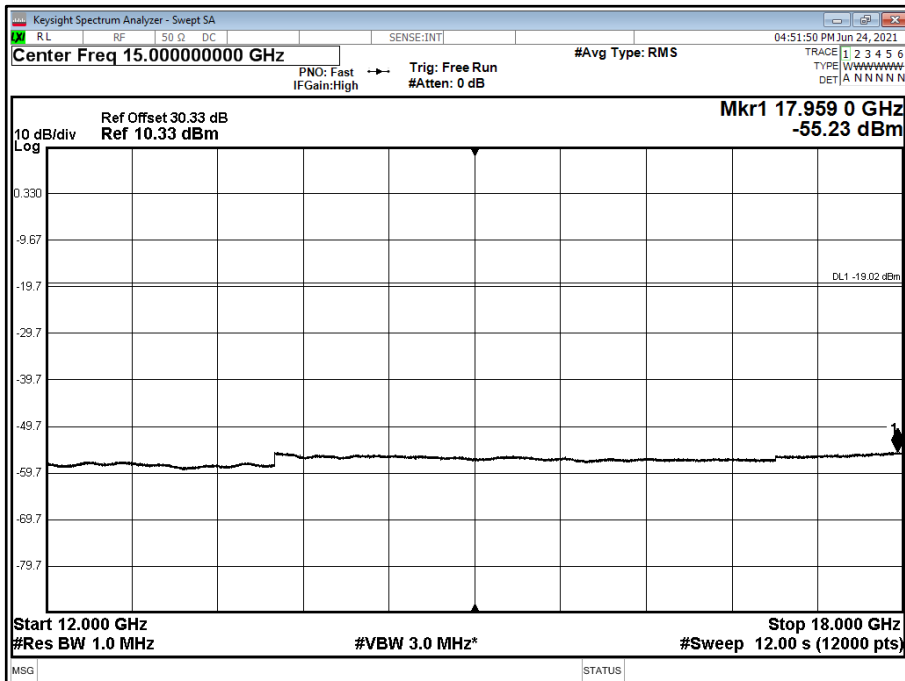




Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 15.0 MHz - Channel Position B - Band 4 - Range 12000 to 18000 MHz

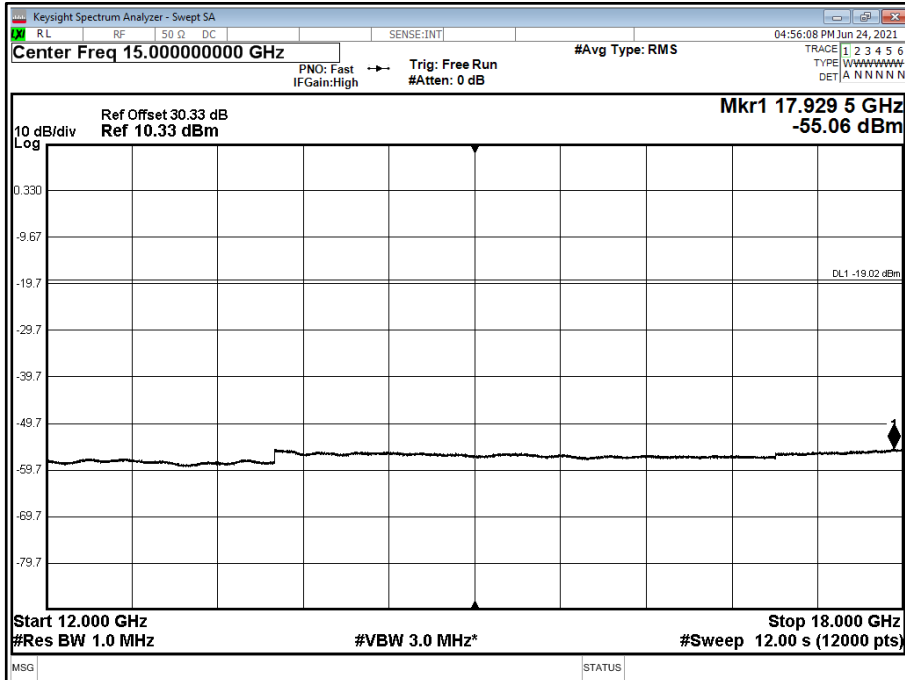


Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 15.0 MHz - Channel Position M - Band 4 - Range 12000 to 18000 MHz

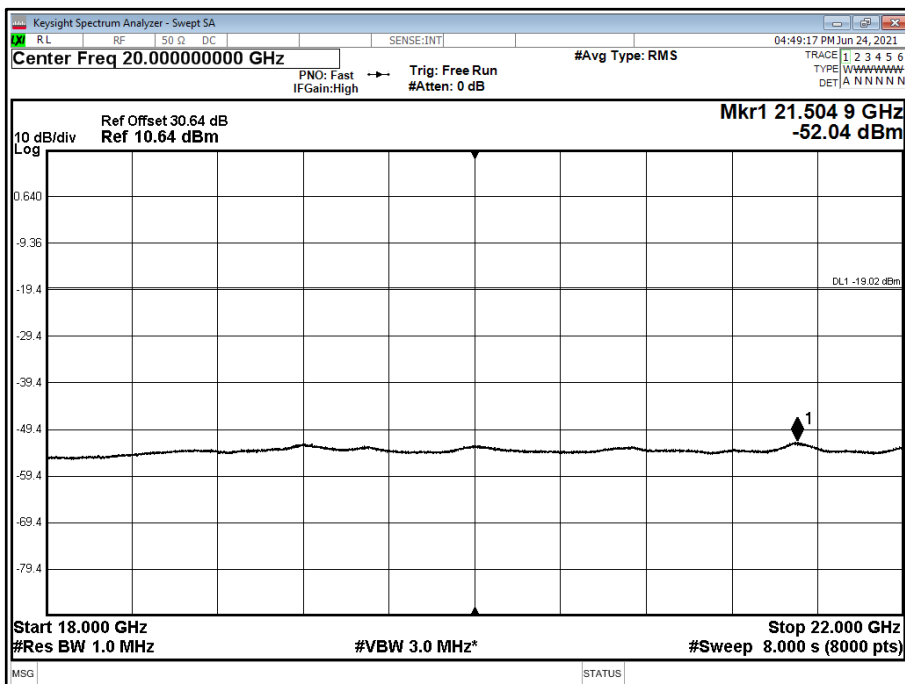




Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 15.0 MHz - Channel Position T - Band 4 - Range 12000 to 18000 MHz

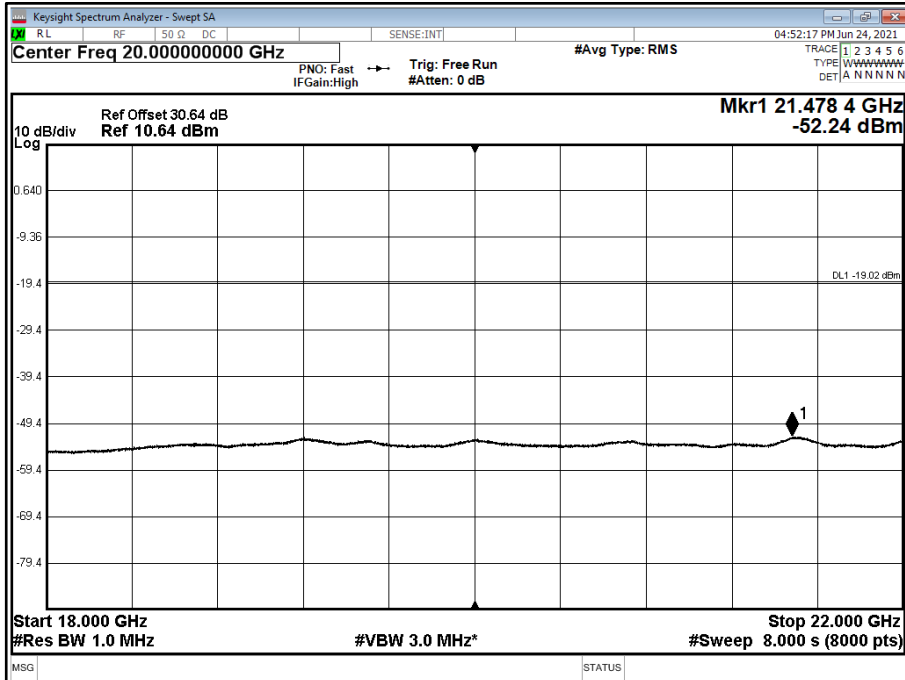


Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 15.0 MHz - Channel Position B - Band 5 - Range 18000 to 22000 MHz

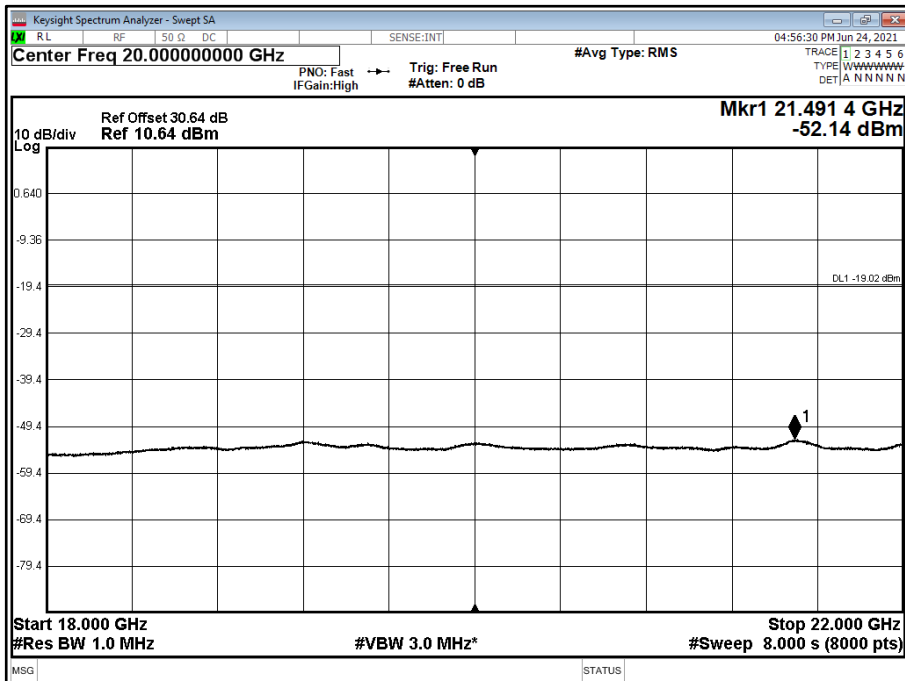




Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 15.0 MHz - Channel Position M - Band 5 - Range 18000 to 22000 MHz

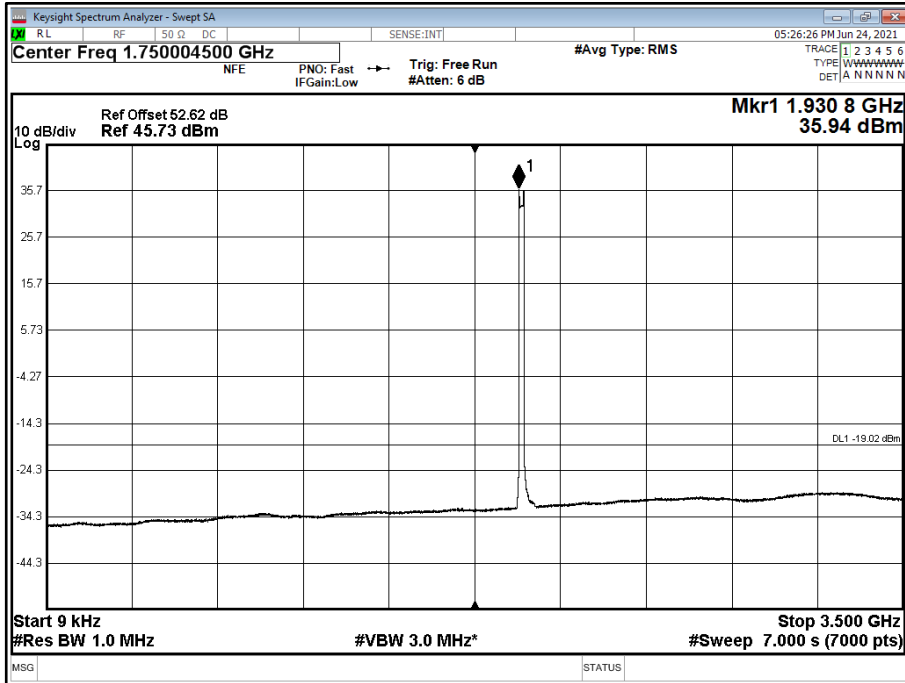


Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 15.0 MHz - Channel Position T - Band 5 - Range 18000 to 22000 MHz

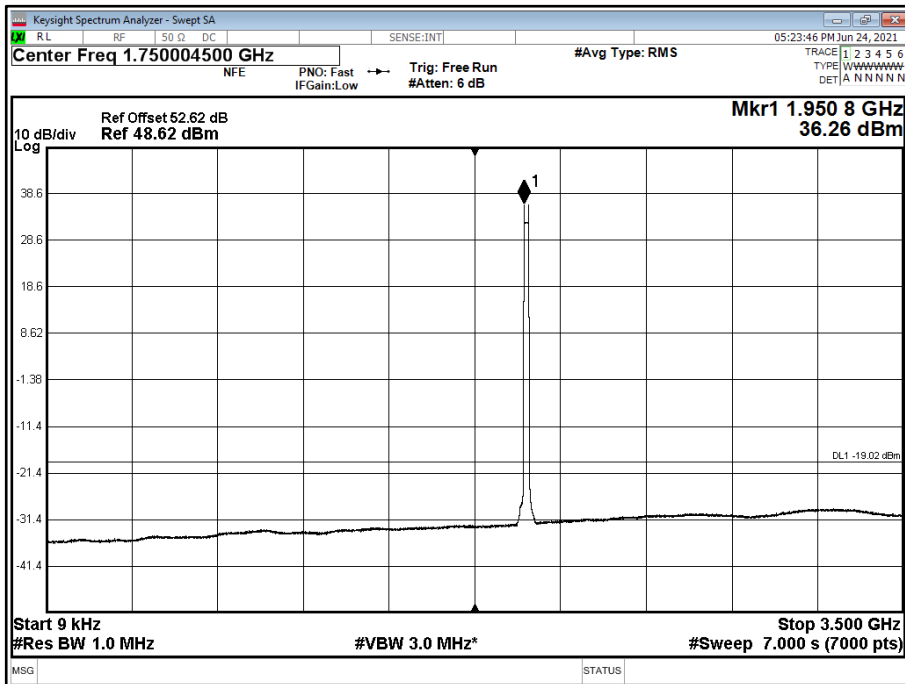




Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 20.0 MHz - Channel Position B - Band 1 - Range 0.009 to 3500 MHz

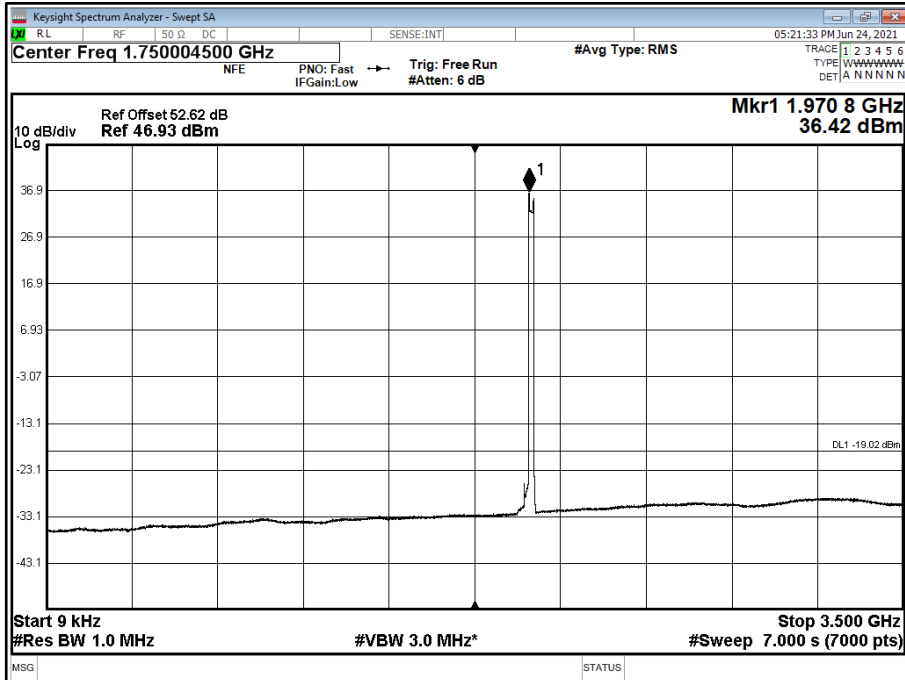


Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 20.0 MHz - Channel Position M - Band 1 - Range 0.009 to 3500 MHz

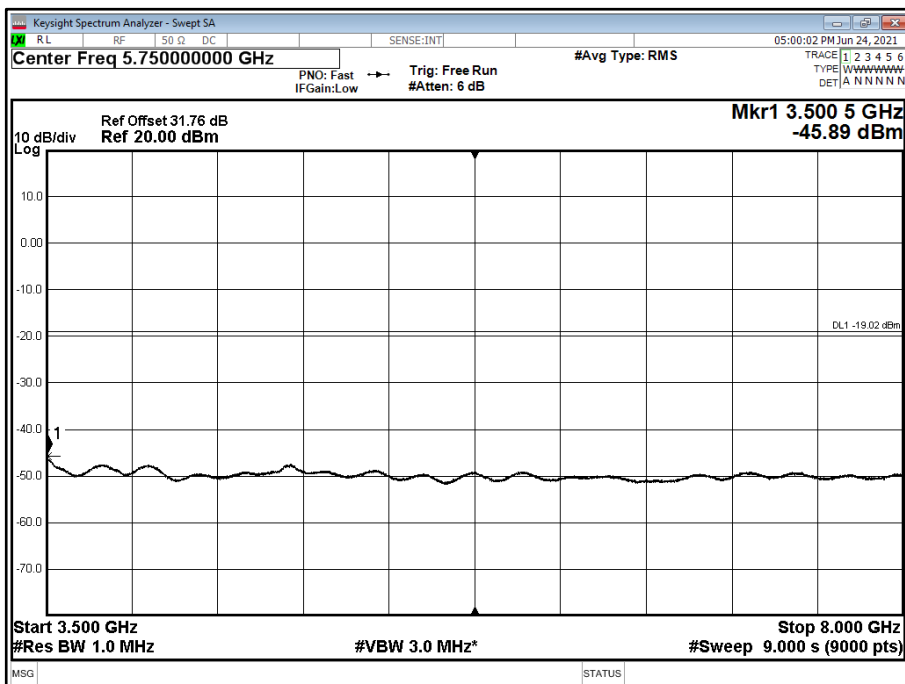




Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 20.0 MHz - Channel Position T - Band 1 - Range 0.009 to 3500 MHz

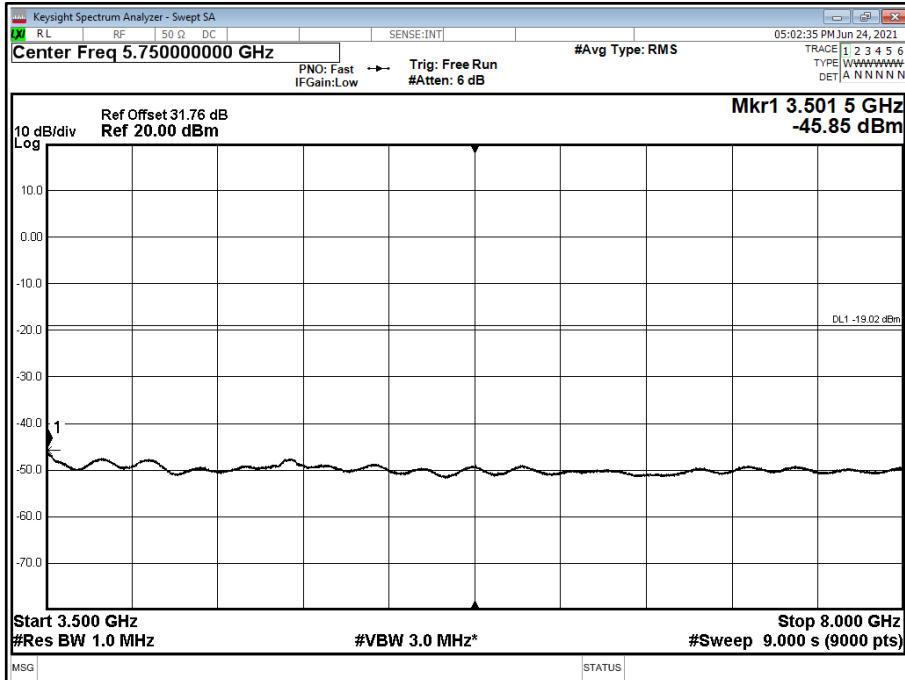


Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 20.0 MHz - Channel Position B - Band 2 - Range 3500 to 8000 MHz

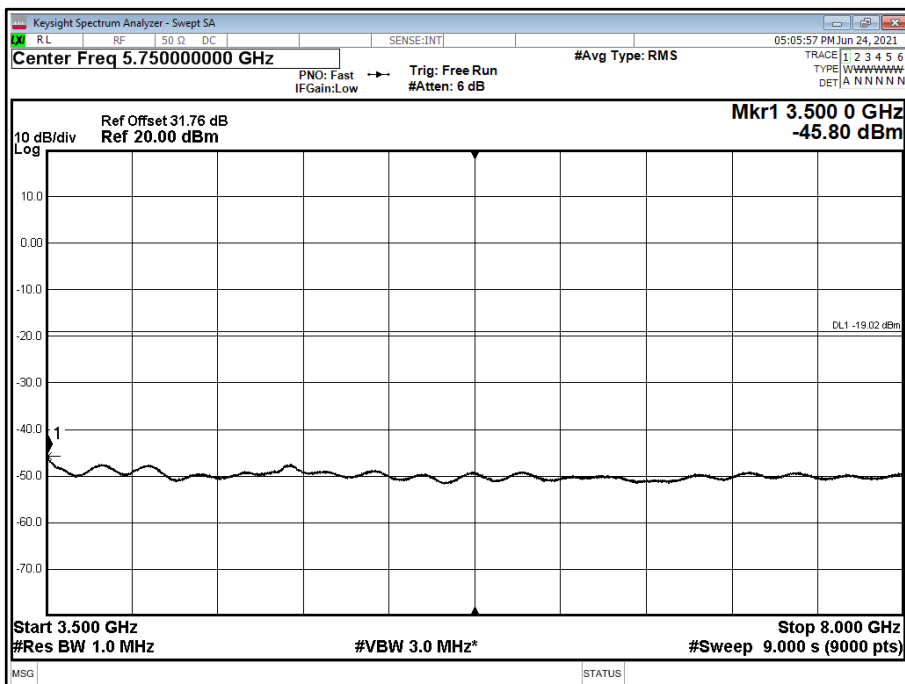




Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 20.0 MHz - Channel Position M - Band 2 - Range 3500 to 8000 MHz

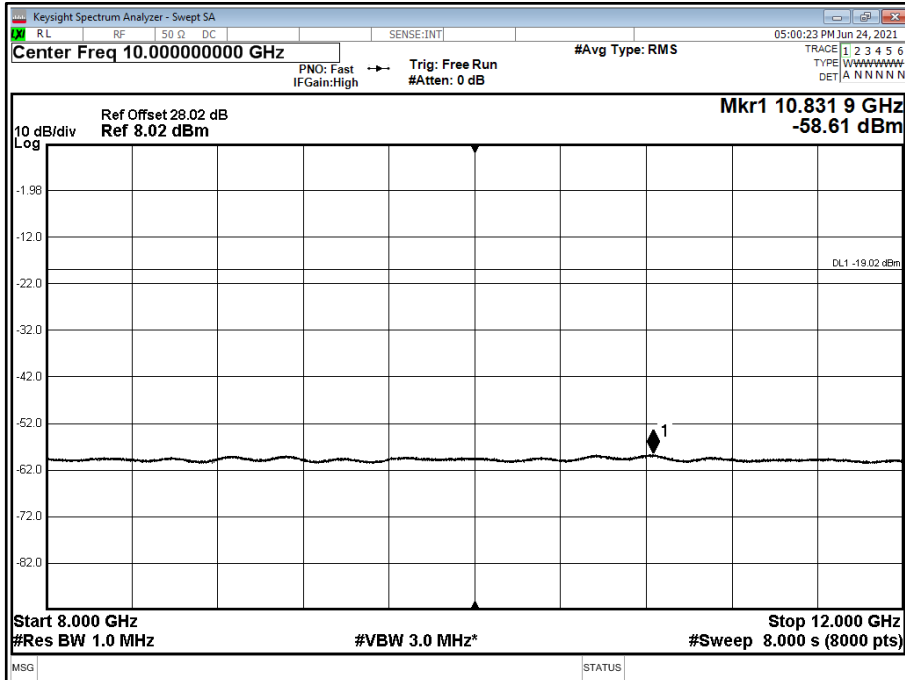


Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 20.0 MHz - Channel Position T - Band 2 - Range 3500 to 8000 MHz

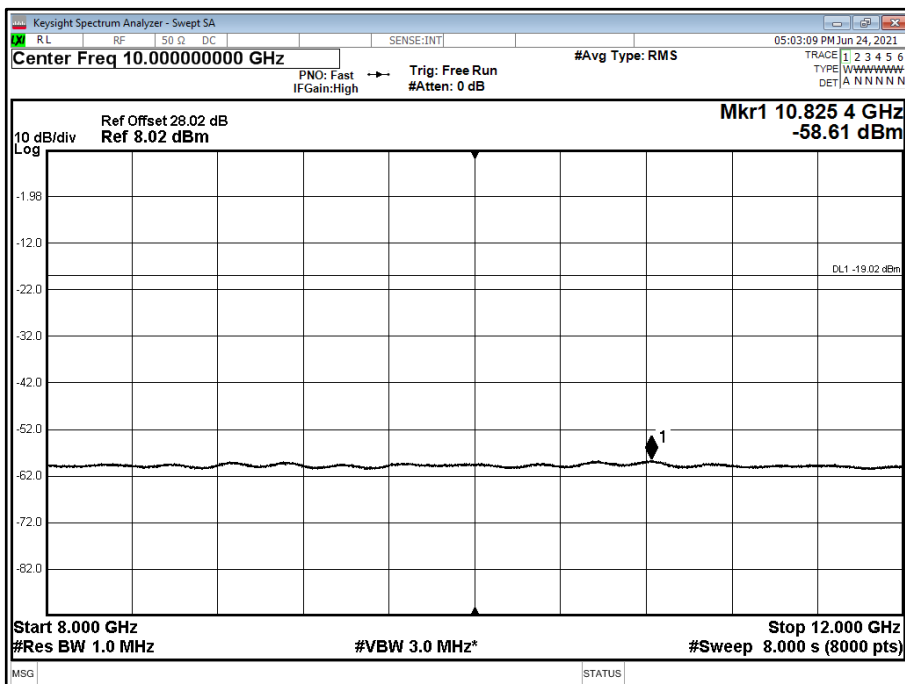




Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 20.0 MHz - Channel Position B - Band 3 - Range 8000 to 12000 MHz

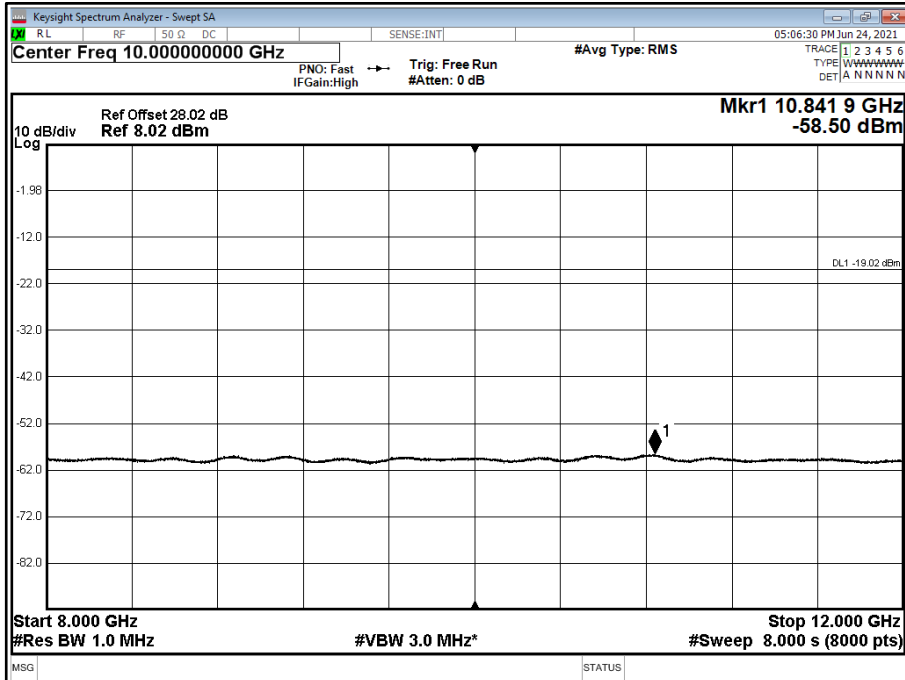


Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 20.0 MHz - Channel Position M - Band 3 - Range 8000 to 12000 MHz

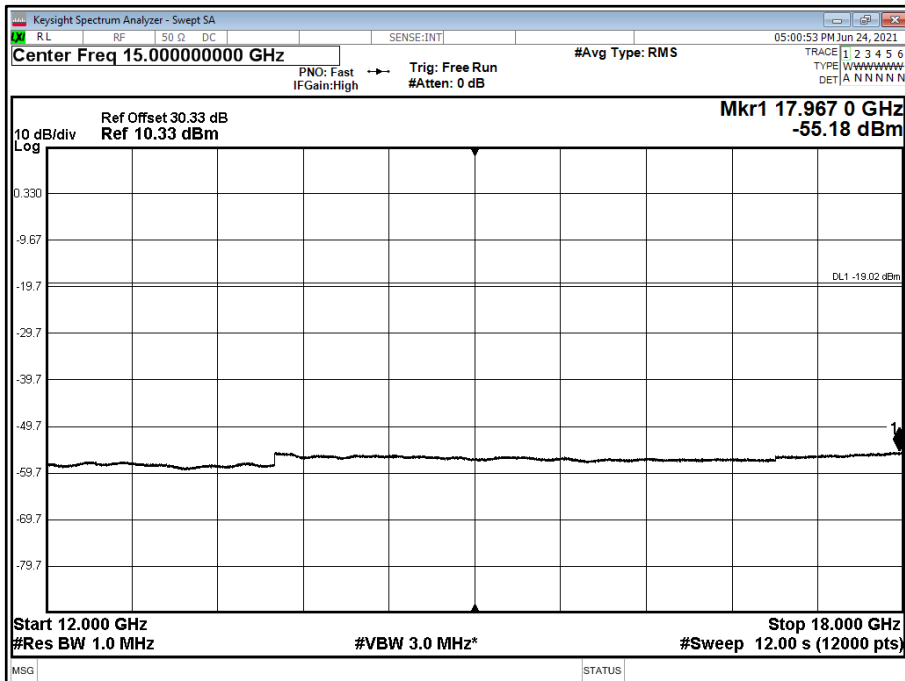




Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 20.0 MHz - Channel Position T - Band 3 - Range 8000 to 12000 MHz

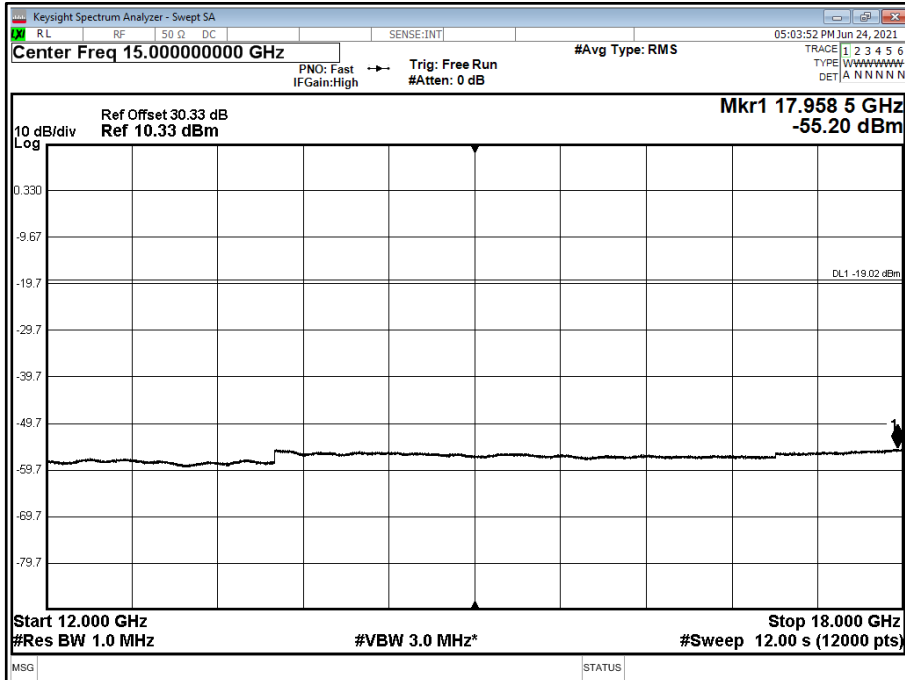


Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 20.0 MHz - Channel Position B - Band 4 - Range 12000 to 18000 MHz

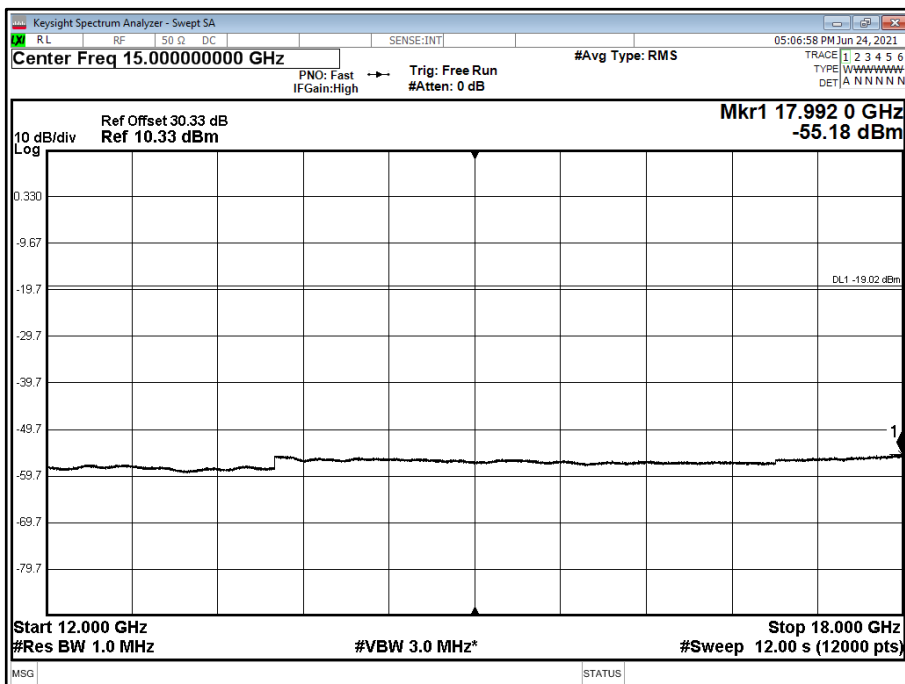




Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 20.0 MHz - Channel Position M - Band 4 - Range 12000 to 18000 MHz

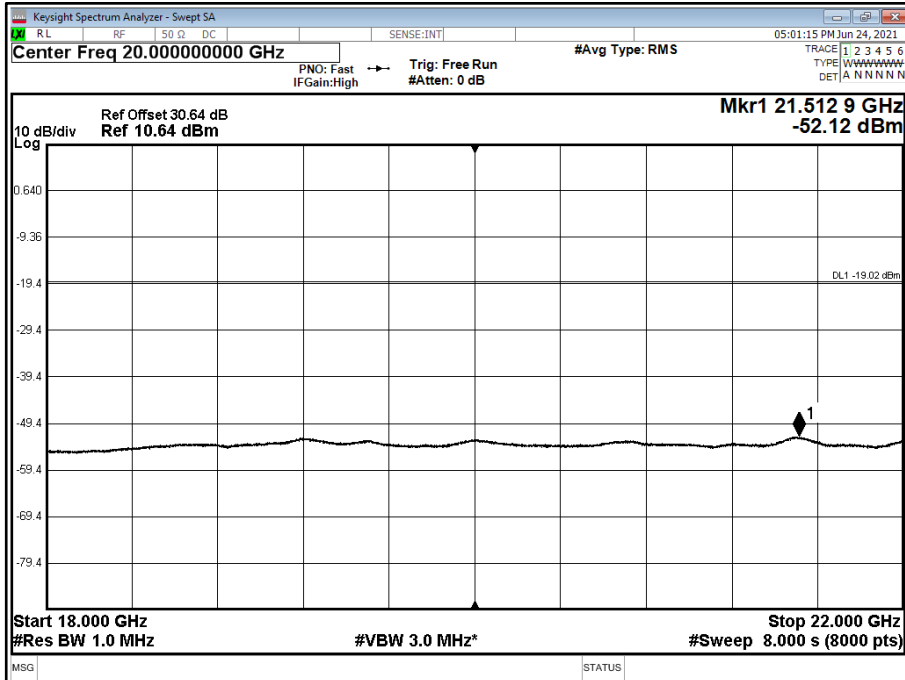


Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 20.0 MHz - Channel Position T - Band 4 - Range 12000 to 18000 MHz

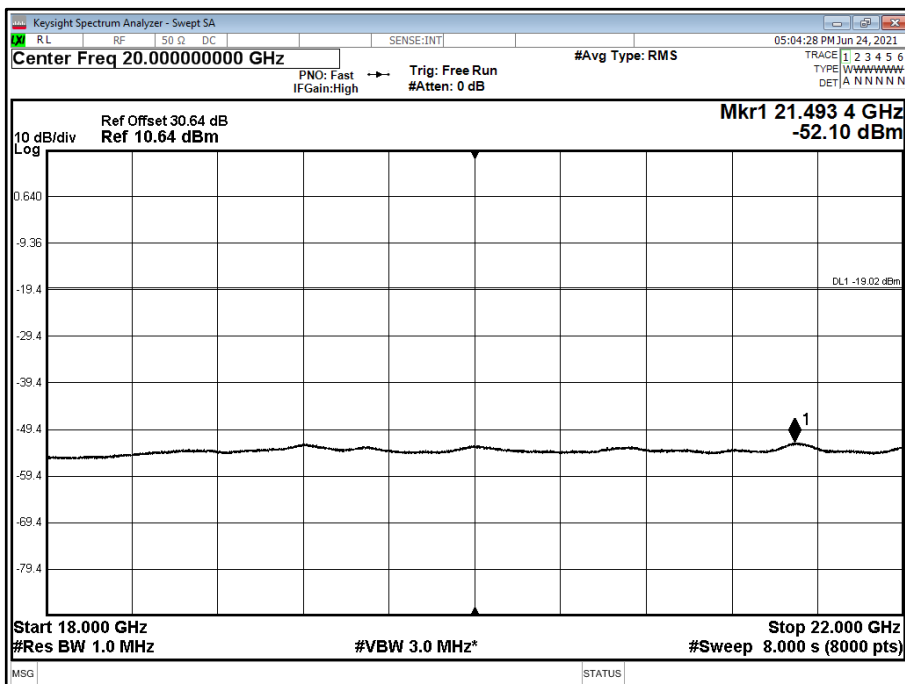




Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 20.0 MHz - Channel Position B - Band 5 - Range 18000 to 22000 MHz

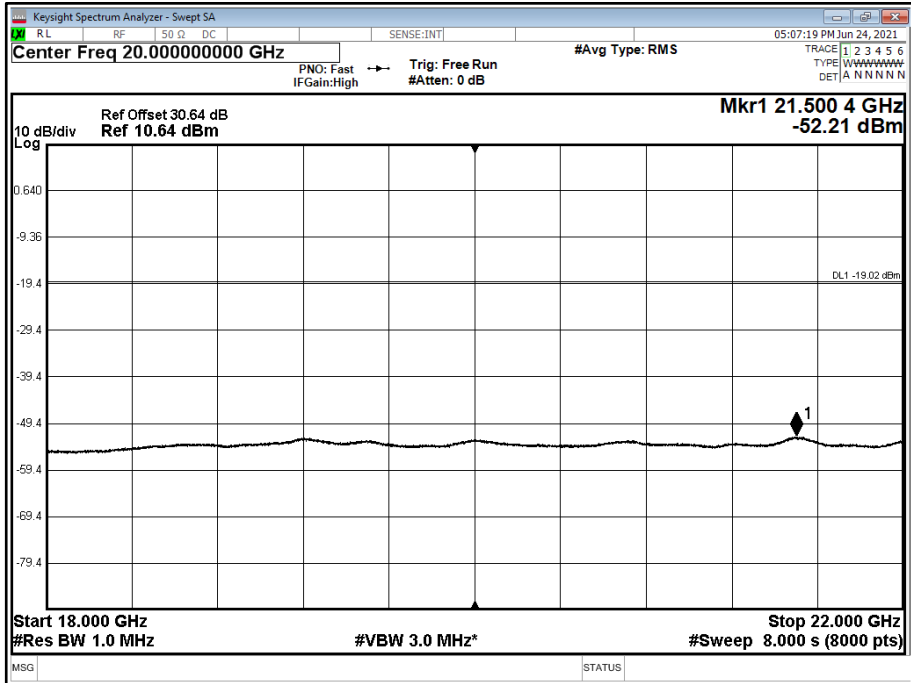


Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 20.0 MHz - Channel Position M - Band 5 - Range 18000 to 22000 MHz





Antenna A - NB-IoT IB Modulation QPSK - NB-IoT IB Carrier Bandwidth 20.0 MHz - Channel Position T - Band 5 - Range 18000 to 22000 MHz



Limit	-19dBm
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SECTION 3

TEST EQUIPMENT USED



3.1 TEST EQUIPMENT USED

List of absolute measuring and other principal items of test equipment.

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Carrier Power					
PXA Signal Analyzer	Keysight	N9030A	BAMS-1001562403	12	14-Jan-2022
Network Analyzer (10MHz to 40 GHz)	Agilent Technologies	N5230A	BAMS-1000635869	12	07-Apr-2022
Ecal Module	Agilent	N4690-60006	BAMS-1000235612	12	30-Jun-2021
Network Analyzer (10MHz to 20GHz)	Agilent Technologies	N5230A	S/N: MY45000737	12	13-Apr-2022
Hygrometer	Rotronic	A1	TE2760	12	12-Jun-2022
Power Supply	Delta Elektronika	SM 52-30	BAMS-1000077230	-	O/P Mon
Attenuator 20 dB	Aeroflex / Weinschel	6834-20-11	QM935	-	O/P Mon
Attenuator 20 dB	Aeroflex / Weinschel	6834-20-11	QC181	-	O/P Mon
Attenuator 20 dB	Aeroflex / Weinschel	6834-20-11	004	-	O/P Mon
Attenuator 10 dB	Wainwright	56-10	T3515	-	O/P Mon
High Pass Filter	Wainwright Instruments	WHNX3.8/26.5G	D-82346	-	O/P Mon
CCDF - PAR					
PXA Signal Analyzer	Keysight	N9030A	BAMS-1001562403	12	14-Jan-2022
Network Analyzer (10MHz to 40 GHz)	Agilent Technologies	N5230A	BAMS-1000635869	12	07-Apr-2022
Ecal Module	Agilent	N4690-60006	BAMS-1000235612	12	30-Jun-2021
Network Analyzer (10MHz to 20GHz)	Agilent Technologies	N5230A	S/N: MY45000737	12	13-Apr-2022
Hygrometer	Rotronic	A1	TE2760	12	12-Jun-2022
Power Supply	Delta Elektronika	SM 52-30	BAMS-1000077230	-	O/P Mon
Attenuator 20 dB	Aeroflex / Weinschel	6834-20-11	QM935	-	O/P Mon
Attenuator 20 dB	Aeroflex / Weinschel	6834-20-11	QC181	-	O/P Mon
Attenuator 20 dB	Aeroflex / Weinschel	6834-20-11	004	-	O/P Mon
Attenuator 10 dB	Wainwright	56-10	T3515	-	O/P Mon
High Pass Filter	Wainwright Instruments	WHNX3.8/26.5G	D-82346	-	O/P Mon
PSD - Av					
PXA Signal Analyzer	Keysight	N9030A	BAMS-1001562403	12	14-Jan-2022
Network Analyzer (10MHz to 40 GHz)	Agilent Technologies	N5230A	BAMS-1000635869	12	07-Apr-2022
Ecal Module	Agilent	N4690-60006	BAMS-1000235612	12	30-Jun-2021
Network Analyzer (10MHz to 20GHz)	Agilent Technologies	N5230A	S/N: MY45000737	12	13-Apr-2022
Hygrometer	Rotronic	A1	TE2760	12	12-Jun-2022



Power Supply	Delta Elektronika	SM 52-30	BAMS-1000077230	-	O/P Mon
Attenuator 20 dB	Aeroflex / Weinschel	6834-20-11	QM935	-	O/P Mon
Attenuator 20 dB	Aeroflex / Weinschel	6834-20-11	QC181	-	O/P Mon
Attenuator 20 dB	Aeroflex / Weinschel	6834-20-11	004	-	O/P Mon
Attenuator 10 dB	Wainwright	56-10	T3515	-	O/P Mon
High Pass Filter	Wainwright Instruments	WHNX3.8/26.5G	D-82346	-	O/P Mon
OBW / 99% resp 26dB BW - Pk					
PXA Signal Analyzer	Keysight	N9030A	BAMS-1001562403	12	14-Jan-2022
Network Analyzer (10MHz to 40 GHz)	Agilent Technologies	N5230A	BAMS-1000635869	12	07-Apr-2022
Ecal Module	Agilent	N4690-60006	BAMS-1000235612	12	30-Jun-2021
Network Analyzer (10MHz to 20GHz)	Agilent Technologies	N5230A	S/N: MY45000737	12	13-Apr-2022
Hygrometer	Rotronic	A1	TE2760	12	12-Jun-2022
Power Supply	Delta Elektronika	SM 52-30	BAMS-1000077230	-	O/P Mon
Attenuator 20 dB	Aeroflex / Weinschel	6834-20-11	QM935	-	O/P Mon
Attenuator 20 dB	Aeroflex / Weinschel	6834-20-11	QC181	-	O/P Mon
Attenuator 20 dB	Aeroflex / Weinschel	6834-20-11	004	-	O/P Mon
Attenuator 10 dB	Wainwright	56-10	T3515	-	O/P Mon
High Pass Filter	Wainwright Instruments	WHNX3.8/26.5G	D-82346	-	O/P Mon
Band Edge					
PXA Signal Analyzer	Keysight	N9030A	BAMS-1001562403	12	14-Jan-2022
Network Analyzer (10MHz to 40 GHz)	Agilent Technologies	N5230A	BAMS-1000635869	12	07-Apr-2022
Ecal Module	Agilent	N4690-60006	BAMS-1000235612	12	30-Jun-2021
Network Analyzer (10MHz to 20GHz)	Agilent Technologies	N5230A	S/N: MY45000737	12	13-Apr-2022
Hygrometer	Rotronic	A1	TE2760	12	12-Jun-2022
Power Supply	Delta Elektronika	SM 52-30	BAMS-1000077230	-	O/P Mon
Attenuator 20 dB	Aeroflex / Weinschel	6834-20-11	QM935	-	O/P Mon
Attenuator 20 dB	Aeroflex / Weinschel	6834-20-11	QC181	-	O/P Mon
Attenuator 20 dB	Aeroflex / Weinschel	6834-20-11	004	-	O/P Mon
Attenuator 10 dB	Wainwright	56-10	T3515	-	O/P Mon
High Pass Filter	Wainwright Instruments	WHNX3.8/26.5G	D-82346	-	O/P Mon
Spurious Emissions					
PXA Signal Analyzer	Keysight	N9030A	BAMS-1001562403	12	14-Jan-2022
Network Analyzer (10MHz to 40 GHz)	Agilent Technologies	N5230A	BAMS-1000635869	12	07-Apr-2022
Ecal Module	Agilent	N4690-60006	BAMS-1000235612	12	30-Jun-2021
Network Analyzer (10MHz to 20GHz)	Agilent Technologies	N5230A	S/N: MY45000737	12	13-Apr-2022



Hygrometer	Rotronic	A1	TE2760	12	12-Jun-2022
Power Supply	Delta Elektronika	SM 52-30	BAMS-1000077230	-	O/P Mon
Attenuator 20 dB	Aeroflex / Weinschel	6834-20-11	QM935	-	O/P Mon
Attenuator 20 dB	Aeroflex / Weinschel	6834-20-11	QC181	-	O/P Mon
Attenuator 20 dB	Aeroflex / Weinschel	6834-20-11	004	-	O/P Mon
Attenuator 10 dB	Wainwright	56-10	T3515	-	O/P Mon
High Pass Filter	Wainwright Instruments	WHNX3.8/26.5G	D-82346	-	O/P Mon

N/A – Not Applicable

O/P Mon – Output Monitored with Calibrated Equipment

List of measurement software versions used for testing.

Instrument	Manufacturer	Type No.	TE No.	Software Version
PXA Signal Analyser	Keysight	N9030A	BAMS1001562403	A.19.05
HP-VEE Software	TUV SUD	HP_VEE	N/A	V3.27



3.2 MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement uncertainties for defined systems are:-

Test Discipline	Frequency / Parameter		MU
Conducted Maximum Peak Output Power	30 MHz to 22 GHz		± 0.89 dB
Conducted Emissions	30 MHz to 22 GHz		± 1.81dB
Occupied Bandwidth	Up to 20 MHz Bandwidth	10 MHz Bandwidth	±67172 Hz
		15MHz Bandwidth	±353784 Hz
		20 MHz Bandwidth	±145903 Hz
Band Edge	1935 MHz to 1980 MHz Amplitude		±0.89dB

Measurement Uncertainty Decision Rule

Determination of conformity with the specification limits is based on the decision rule according to IEC Guide 115: 2007, clause 4.4.3 and 4.5.1.



SECTION 5

ACCREDITATION, DISCLAIMERS AND COPYRIGHT



4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT



Accred. no. 10363
Testing
ISO/IEC 17025

This report relates only to the actual item/items tested.

Our Swedac Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our Swedac Accreditation.

Results of tests not covered by our Swedac Accreditation Schedule are marked NSA (Not Swedac Accredited).

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ANNEX A

MODULE LIST



Configuration 1			
Product	Product No	R-State	Serial No
CT10	LPC102487/1	R1C	T01F307250
RRUS 32A B2	KRC 161 418/1	R1E	D16V513692
Software Version:	CXP9013268/12	Revision:	R82CM