TEST REPORT

No. I22Z60940-EMC02

for

TCL Communication Ltd.

Mobile Hot Spot

Model Name: MW513U

FCC ID: 2ACCJB183

with

Hardware Version:06

Software Version: MW513U_ZZ_02.00_06

Issued Date: 2022-08-25

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of CTTL.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the US.Government.

Test Laboratory:

CTTL, Telecommunication Technology Labs, CAICT

No. 52, Huayuan North Road, Haidian District, Beijing, P. R. China 100191.

Tel: +86(0)10-62304633-2512, Fax: +86(0)10-62304633-2504

Email: cttl_terminals@caict.ac.cn, website: www.caict.ac.cn

©Copyright. All rights reserved by CTTL

naREPORT HISTORY

Revision	Description	Issue Date
Rev.0	1st edition	2022-07-19
Rev.1	2nd edition. Editorial revision for the last 3 lines of bandedge data on page 40. Editorial revision for the low channel 1RB power data on page 21. More Power plots, Occupied Bandwidth plots and Bandedge plots were supplied in the Annex D.	2022-07-29
Rev.2	3st edition. Delete the results of NR FR2 n257 and add the description “NR FR2 Band 261 overlaps the entire frequency range of NR FR2 Band 257. Therefore, test data provided in this report covers NR FR2 Band 257 as well as NR FR2 Band 261” in P9	2022-08-25

Note: the latest revision of the test report supersedes all previous version.

©Copyright. All rights reserved by CTTL.

CONTENTS

©Copyright. All rights reserved by CTTL.

1. Test Laboratory

1.1. Introduction & Accreditation

Telecommunication Technology Labs, CAICT is an ISO/IEC 17025:2017 accredited test laboratory under NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM (NVLAP) with lab code 600118-0 and is also an FCC accredited test laboratory (CN5017), and ISED accredited test laboratory (ISED#:24849). The detail accreditation scope can be found on NVLAP website.

1.2. Testing Location

Location 1: CTTL (huayuan North Road)

Address: No. 52, Huayuan North Road, Haidian District, Beijing, P. R. China 100191

1.3. Testing Environment

Normal Temperature: 15-35℃

Relative Humidity: 20-75%

1.4. Project Data

Testing Start Date: 2022-05-26

Testing End Date: 2022-07-15

1.5. Signature

Zhang Xia

(Prepared this test report)

Zhang Ying

(Reviewed this test report)

Zang Qi

(Approved this test report)

©Copyright. All rights reserved by CTTL.

2. Client Information

2.1. Applicant Information

Company Name:	TCL Communication Ltd.
Address /Post:	5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong
Contact:	Peter.Yang
Email:	peter.yang@tcl.com
Telephone:	+86075536645759
Fax:	/

2.2. Manufacturer Information

Company Name:	TCL Communication Ltd.
Address /Post:	5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong
Contact:	Peter.Yang
Email:	peter.yang@tcl.com
Telephone:	+86075536645759
Fax:	/

©Copyright. All rights reserved by CTTL.

3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

Description	Mobile Hot Spot
Model Name	MW513U
FCC ID	2ACCJB183
Antenna	Embedded
Output power	18.71dBm maximum EIRP measured for n261G
Extreme vol. Limits	3.4VDC to 4.4VDC (nominal: 3.8VDC)
Extreme temp. Tolerance	-10°C to +55°C

Note: Components list, please refer to documents of the manufacturer; it is also included in the original test record of CTTL.

The EUT supports n257 band with 100MHz bandwidth for 1CC, SCS 120kHz. And supports n260 and n261 bands, 50MHz and 100MHz bandwidth for 1CC, 100MHz+100MHz for 2CC, SCS 120kHz.

For uplink modulation, in CP-OFDM, the EUT supports QPSK, 16QAM, 64QAM, and in DFT-s-OFDM, the EUT supports PI/2 BPSK, QPSK, 16QAM, 64QAM.

The EUT has two antenna modules. Each antenna module has two chains, and supports 2x2 MIMO working mode under CP-OFDM. The two modules did not support transmitting simultaneously.

3.2. Internal Identification of EUT used during the test

EUT ID*	IMEI / Serial Number	HW Version	SW Version
UT50a	352950940201148	06	MW513U_ZZ_02.00_06
UT33a	352950940201270	06	MW513U_ZZ_02.00_06

*EUT ID: is used to identify the test sample in the lab internally.

The HW and SW version information were provided by the applicant. All test cases were performed on UT50a. Only one 261 2cc case was repeated on UT33a.

3.3. Internal Identification of AE used during the test

AE ID*	Description	SN	Remarks
AE1	Battery	/	inbuilt

AE1

Model	TLi044A7
Manufacturer	veken
Capacity	4400 mAh
Voltage	3.85V

©Copyright. All rights reserved by CTTL.

4. Reference Documents

The following documents listed in this section are referred for testing.

Reference	Title	Version
FCC Part 30	UPPER MICROWAVE FLEXIBLE USE SERVICE	10-1-20 Edition
ANSI C63.26	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services	2015
KDB 842590	Upper Microwave Flexible Use Service v01r02	April 20, 2021

©Copyright. All rights reserved by CTTL.

5. Laboratory Environment

Semi/Full-anechoic chamber SAC-1 (23 meters × 17meters × 10meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ˚C, Max. = 35 ˚C
Relative humidity	Min. = 15 %, Max. = 75 %
Shielding effectiveness	0.014MHz - 1MHz, >60dB; 1MHz - 1000MHz, >90dB.
Electrical insulation	> 2 M
Ground system resistance	< 4
Normalised site attenuation (NSA)	< ± 4 dB, 3m/10m distance, from 30 to 1000 MHz
Site voltage standing-wave ratio (SVSWR)	Between 0 and 6 dB, from 1GHz to 18GHz

©Copyright. All rights reserved by CTTL.

6. Summary Of Test Result

NR FR2 n257/260/261

Items	Test Name	Clause in FCC rules	limit	Verdict
1	Output Power	2.1046 30.202	+43dBm	P
2	Unwanted Emission	30.203	-13dBm/MHz	P
3	Frequency Stability	2.1055	Fundamental emissions stay within authorized frequency block	P
4	Occupied Bandwidth	2.1049	Not Applicable	Reporting only
5	Band Edge Compliance	2.1051 30.203	-5dBm/MHz from the band edge up to 10% of the channel BW	P

Terms used in Verdict column

P	Pass. The EUT complies with the essential requirements in the standard.
NP	Not Performed. The test was not performed by CTTL.
NA	Not Applicable.The test was not applicable.
BR	Re-use test data from basic model report.
F	Fail. The EUT does not comply with the essential requirements in the standard.
Reporting only	No limit. Just report the measurement.

NR FR2 Band 261 overlaps the entire frequency range of NR FR2 Band 257. Therefore, test data provided in this report covers NR FR2 Band 257 as well as NR FR2 Band 261.

Explanation of worst-case configuration

The worst-case scenario for all measurements is based on the output power, occupied bandwidth, band edge emission measurement investigation results. The test results shown in the following sections represent the worst case measurement results. For each frequency only the maximum measurement results of Beam ID were represent in the report. The Beam ID of maximum results for low, center and high frequency of different chains maybe vary.

©Copyright. All rights reserved by CTTL.

©Copyright. All rights reserved by CTTL.

7. Measurement Uncertainty

Measurement Uncertainty:

Frequency Range	Uncertainty(dB) (k=2)
30MHz-1GHz	5.18
1GHz-18GHz	5.54
Above 18GHz	5.26

Note: Uncertainty of the above 18GHz, giving only the worst case.

©Copyright. All rights reserved by CTTL.

8. Test Equipment Utilized

NO.	NAME	TYPE	SERIES NUMBER	PRODUCER	CAL. DUE DATE	CAL. INTERVAL
1	Antenna	3116	2663	ETS-Lindgren	2022-08-11	1 year
2	Spectrum Analyzer	FSW67	104039	R&S	2023-05-26	1 year
3	Antenna	VULB 9163	302	SCHWARZBECK	2022-12-28	1 year
4	(downconverter)Harmonic Mixer(60GHz-90GHz)	FS-Z90	101655	R&S	2024-01-14	3 year
5	(downconverter)Harmonic Mixer(75GHz-110GHz)	FS-Z110	101463	R&S	2024-01-14	3 year
6	(downconverter)Harmonic Mixer(110GHz-170GHz)/	FS-Z170	101008	R&S	2024-02-17	3 year
7	(downconverter)Harmonic Mixer(170GHz-220GHz)/	FS-Z220	101054	R&S	2023-12-14	3 year
8	Standard Gain Horn Antenna （40GHz-60GHz）	LB-19-25	J202024086	A-INFO	2024-01-14	3 year
9	Standard Gain Horn Antenna （60GHz-90GHz）	LB-12-25	J202062912	A-INFO	2024-02-17	3 year
10	Standard Gain Horn Antenna （75GHz-110GHz）	LB-10-25	J202023232	A-INFO	2024-01-27	3 year
11	Standard Gain Horn Antenna （110GHz-170GHz）	LB-6-25-A	J202061245	A-INFO	2024-01-27	3 year
12	Standard Gain Horn Antenna （170GHz-200GHz）	LB-5-25-A	J202067630	A-INFO	2024-01-27	3 year
13	DC power supply	PAS20-18	UH000695	Kikusui	2022-08-14	1 year
14	Incubator	SH-641	92009470	ESPEC	2024-02-16	2 year
15	Antenna	3116	2661	ETS-Lindgren	2023-02-08	1 year

©Copyright. All rights reserved by CTTL.

Annex A: Radiated Test Setup

The radiated test facilities consisted of an indoor 3m/10m semi-anechoic chamber used for final measurements and exploratory measurements from 30MHz-18GHz, when necessary for radiated emissions measurements in the spurious domain. According to Clause 5 in ANSI C63.4-2014, absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections for measurements above 1GHz(Figure A.2). For measurements below 1GHz, the absorbers are removed (Figure A.1).

Radiated measurement test sites shall conform to the site validation criteria called out in CISPR 16-1-4:2019 above 18 GHz. The test object is mounted on a positioner (Figure A.3). The positioner is used to move the test object according to the sampling grid. A measurement antenna is placed in the chamber at a suitable measurement antenna far-field distance.

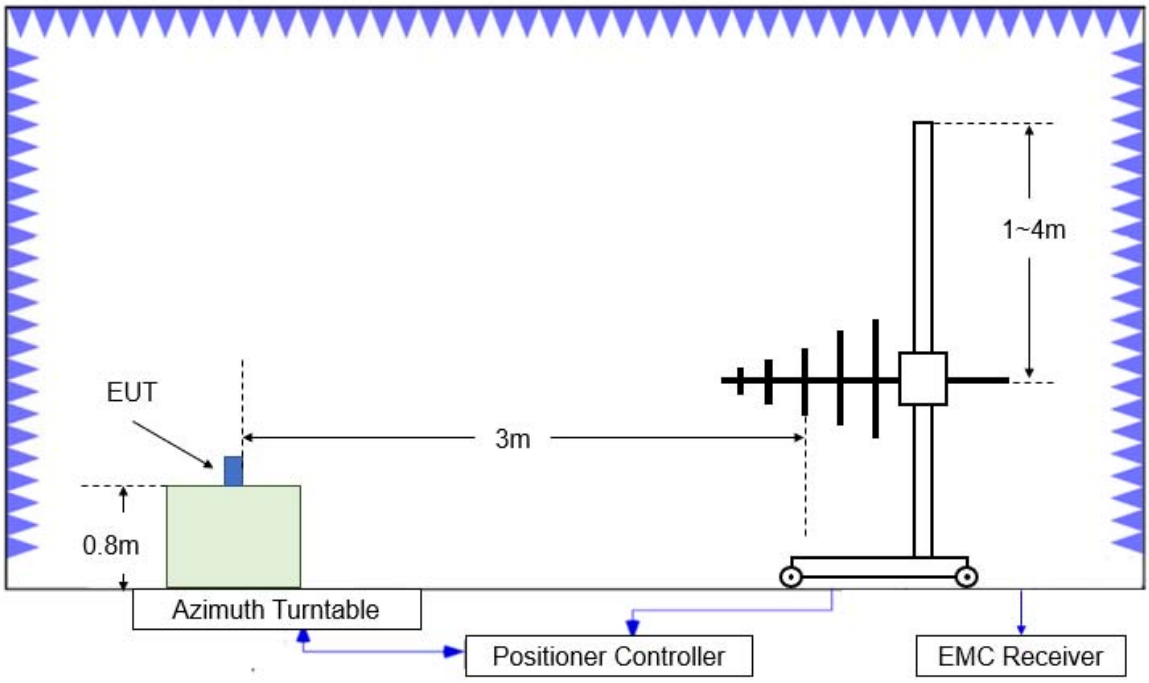


Figure A.1. Test Site Diagram (30MHz-1GHz)

©Copyright. All rights reserved by CTTL.

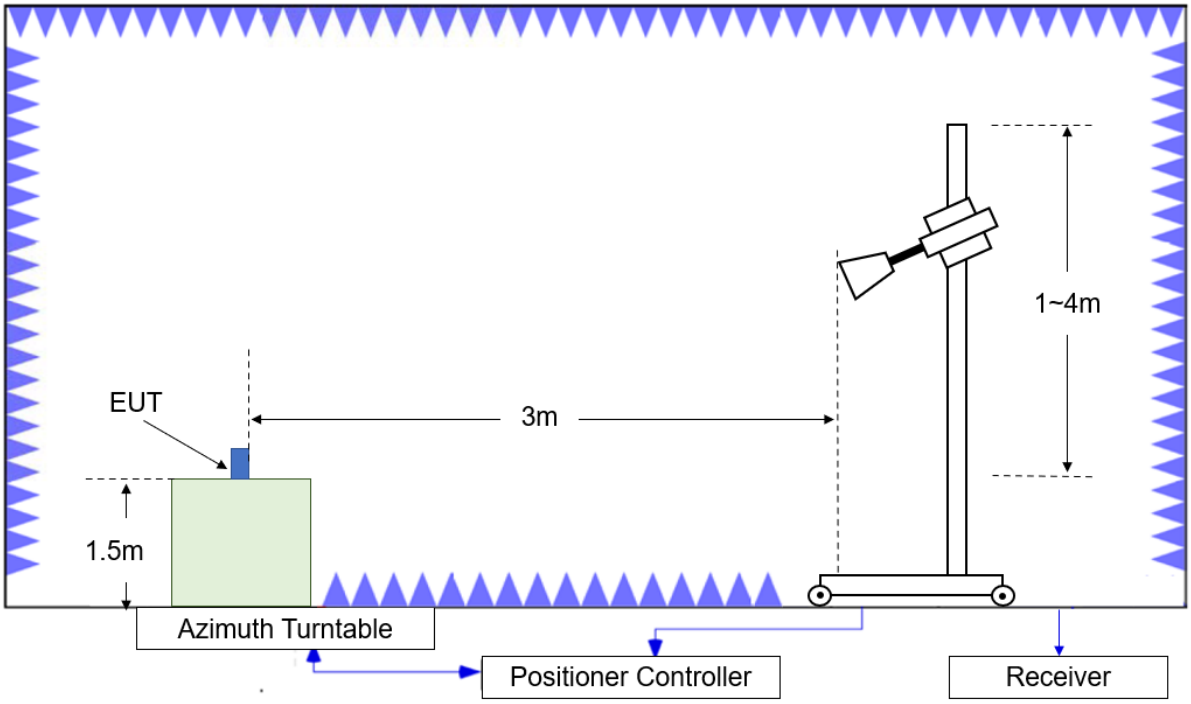


Figure A.2. Test Site Diagram (1GHz-18GHz)

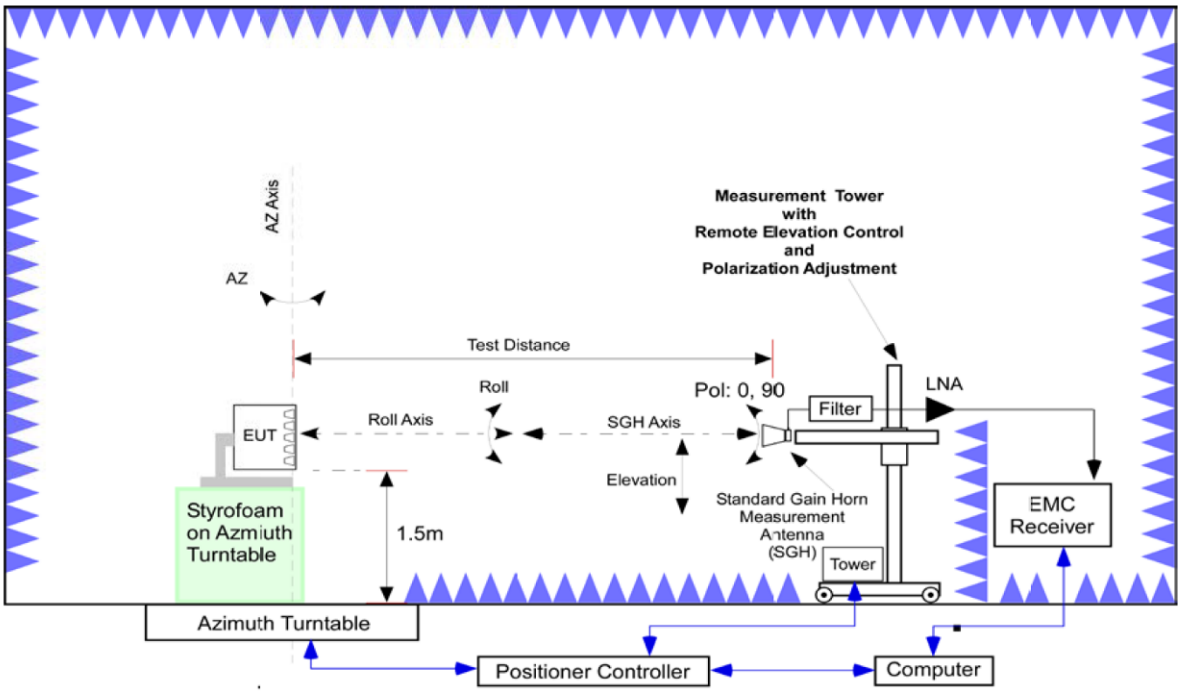


Figure A.3. Test Site Diagram (above18GHz)

©Copyright. All rights reserved by CTTL.

Annex B: Measurement Results

B.1 Radiated Output Power

B.1.1 Summary

In all cases, output power is within the specified limits.

30.202 (b) For mobile stations, the average power of the sum of all antenna elements is limited to a maximum EIRP of +43 dBm.

B.1.2 Minimum Measurement Distance Evaluation

According to KDB 842590 D01, the measurements of the fundamental emission, out of band, harmonics and spurious emissions shall be made in the far field of the measurement antenna. The far-field boundary for mmW antennas is greater than or equal to $2D^2/\lambda$ (with D being the largest dimension of the antenna, and λ the wavelength of the emission). We calculate the far-field boundary and the test distance meet the requirement of standard.

B.1.3 Method of Measurements

NASI C63.26 chapter 5.5.2.1: Such radiated measurements shall use substitution methods unless a test site validated to ANSI C63.4 requirements is utilized, in which case, radiated fundamental and/or unwanted emissions can be measured using the direct radiated field strength method.

The EUT was set up for the max output power with pseudo random data modulation.

These measurements were done at 3 frequencies (bottom, middle and top of operational frequency range) for each bandwidth.

An spectrum analyzer is used to perform RF output power measurements, the fundamental condition that measurements be performed only over durations of active transmissions at maximum output power level applies. Thus, a spectrum analyzer can always be used to perform the measurement when the EUT can be configured to transmit continuously.

B.1.4 Test Procedure

According to Clause 5.2.4.4 in ANSI C63.26-2015 and Clause 4.2 in KDB 842590 D01 v01r02

1. Set EUT at maximum output power
2. Select channels for each band and proper modulation
3. Enable channel power measurement function of spectrum analyzer
4. Set RBW = 1% to 5% of the OBW, not to exceed 1MHz
5. Set VBW ≥ 3×RBW
6. Set span to 2× to 3× the OBW
7. Set number of measurement points in sweep ≥ 2×span/RBW
8. Set Detector = RMS (power averaging)
9. Set Sweep time = auto-couple
10. Trace average at least 100 traces in power averaging (rms) mode
11. Compute the power by integrating the spectrum across the OBW of the signal for signals with continuous operation

©Copyright. All rights reserved by CTTL.

Test Note:

EIRP was calculated from measuring field strength by the following formula:

EIRP (dBm) = E (dBμV/m) + 20log(D) – 104.8

where

E (dBμV/m) = Measured amplitude level (dBm) + 107 + Cable Loss (dB) + Antenna Factor (dB/m)

where

Antenna Factor（dB/m) = 20log(F)-Antenna Gain(dBi)-29.76

Then the average EIRP reported below is calculated by:

EIRP (dBm) = Measured amplitude level (dBm) - Antenna Gain(dBi) + Cable Loss(dB) + 20log(F) + 20log(D) - 27.56

Where:

F: frequency (MHz)

D: Distance(m) = 3m

B.1.5 Measurement Result

Note: We choose the worst modulation by the EIRP of low channel, the middle channel and high channel measure the EIRP only with the worst modulation.

The plots are showed in Annex D.1.

Note: We choose the worst modulation by the EIRP of low channel, the middle channel and high channel measure the EIRP only with the worst modulation.

n260, Module0, SCS=120kHz, CP-OFDM					
Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
50MHz	100% RB	37025.04	17.62	18.15	15.04
		38499.96	/	15.17	/
		39975	/	13.03	/
	1RB	37025.04	/	17.56	/
		39975	/	12.22	/
100MHz	100% RB	37050	18.04	17.93	15.52
		38499.96	14.88	/	/
		39949.92	13.98	/	/
	1RB	37050	18.29	/	/
		39949.92	12.10	/	/

n260, Module0, SCS=120kHz,PUSCH DFT						
Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)			
			PI/2 BPSK	QPSK	16QAM	64QAM
50MHz	100% RB	37025.04	17.67	17.65	17.69	17.58

©Copyright. All rights reserved by CTTL.

		38499.96	/	/	14.17	/
		39975	/	/	12.33	/
	1RB	37025.04	/	/	17.95	/
		39975	/	/	17.74	/
100MHz	100% RB	37050	18.22	18.25	17.99	18.06
		38499.96	/	15.24	/	/
		39949.92	/	14.63	/	/
	1RB	37050	/	18.51	/	/
		39949.92	/	13.91	/	/

©Copyright. All rights reserved by CTTL.

Note: The worst modulation is PUSCH DFT - QPSK, and we test follow setups used PUSCH DFT - QPSK.

n260, Module1, SCS=120kHz,PUSCH DFT						
Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)			
			PI/2 BPSK	QPSK	16QAM	64QAM
50MHz	100% RB	37025.04	/	15.95	/	/
		38499.96	/	14.53	/	/
		39975	/	12.67	/	/
	1RB	37025.04	/	16.14	/	/
		39975	/	11.74	/	/
100MHz	100% RB	37050	/	16.13	/	/
		38499.96	/	14.12	/	/
		39949.92	/	13.15	/	/
	1RB	37050	/	15.96	/	/
		39949.92	/	12.93	/	/

Note: The worse cases were chose and measured under MIMO, CP-OFDM.

n260, Module1, SCS=120kHz, CP-OFDM					
Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
50MHz	1RB	37025.04	16.63	/	/
100MHz	100% RB	37050	17.39	/	/

Note: The maximum power cases of n260 1CC was chose and measured for n261G 2CC.

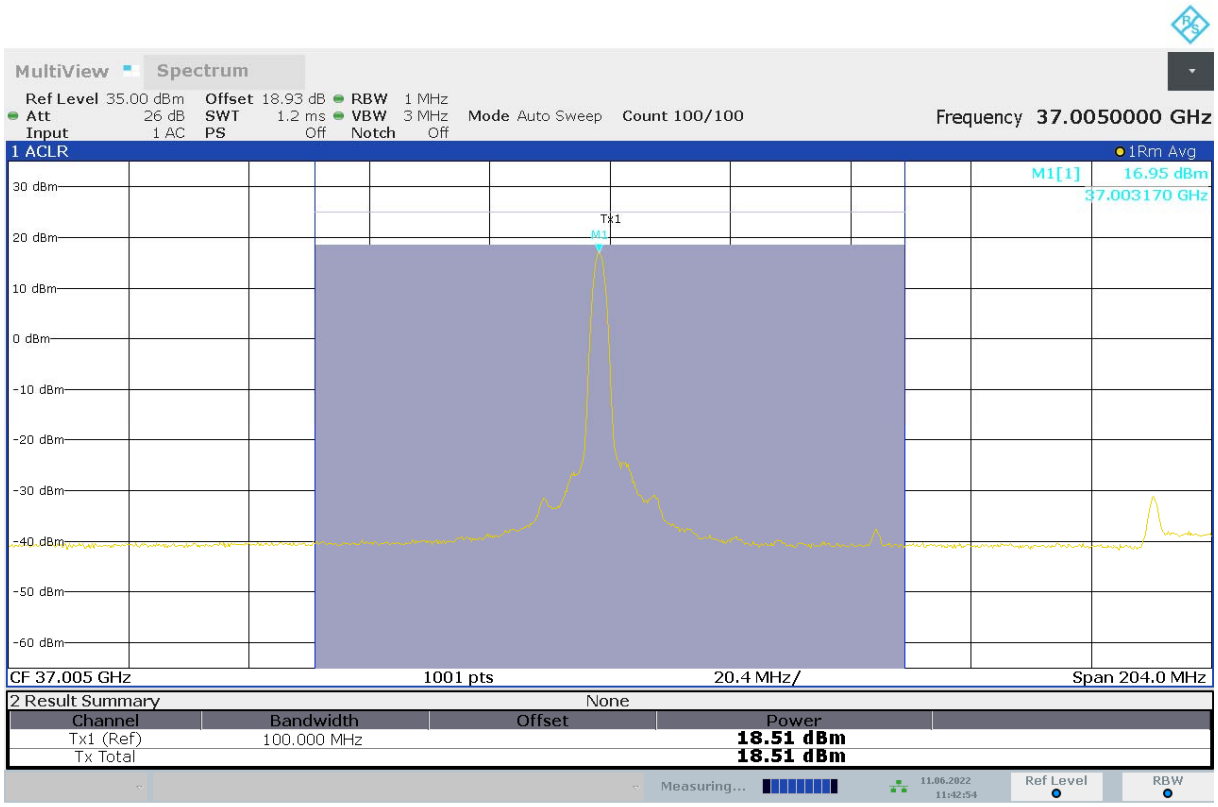
n260G, Module0, SCS=120kHz,PUSCH DFT					
Bandwidth	Modulation	RB size	Frequency (MHz)		Power (dBm)
			CC1	CC2	
100MHz + 100MHz	QPSK	100% RB	37050	37150	14.64
	QPSK	100% RB	38450	38550	13.73
	QPSK	100% RB	39850	39949.9	12.00

n260G, Module1, SCS=120kHz, CP-OFDM					
Bandwidth	Modulation	RB size	Centre Frequency (MHz)		Power (dBm)
			CC1	CC2	
100MHz + 100MHz	QPSK	100% RB	37050	37150	18.28
	QPSK	100% RB	38450	38550	13.98
	QPSK	100% RB	39850	39949.9	13.27

The maximum Power figure was showed in the following page.

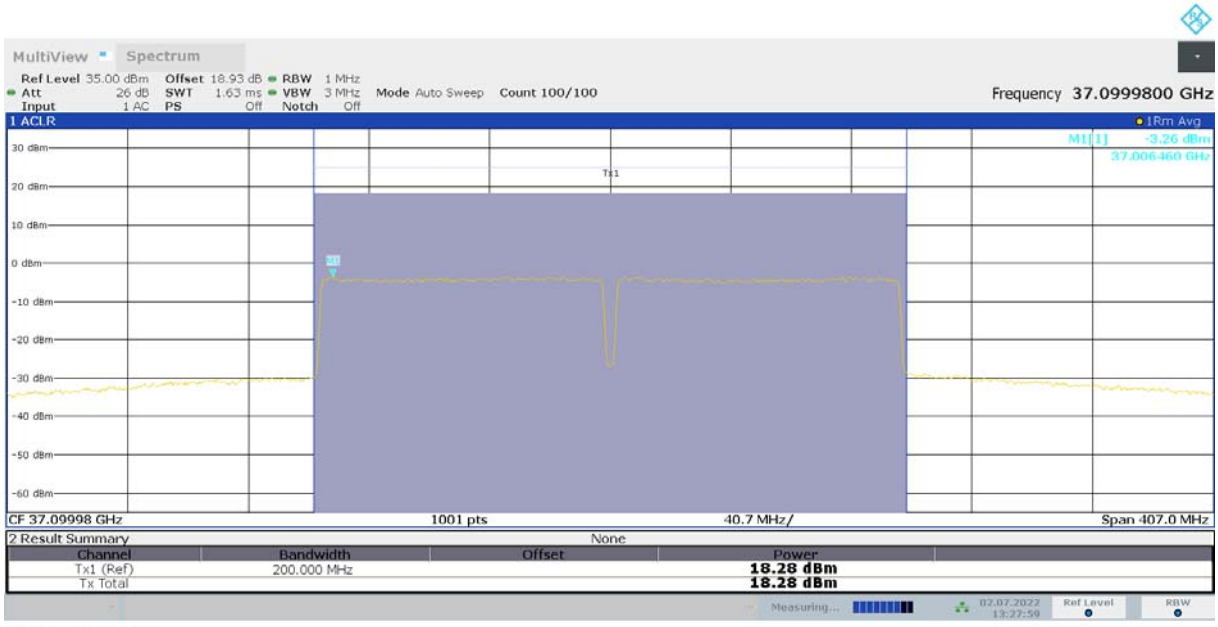
©Copyright. All rights reserved by CTTL.

n260, Module 0, 100MHz Bandwidth, PUSCH DFT, Low Channel, 37050MHz, QPSK, 1 RB, 1CC, 18.51dBm, 1CC



11:42:55 11.06.2022

n260G, Module 1, 100MHz+100MHz Bandwidth, CP-OFDM, Low Channel, QPSK, Full RB, 37050MHz+37150MHz, 18.28dBm, 2CC



13:28:00 02.07.2022

©Copyright. All rights reserved by CTTL.

Note: We choose the worst modulation by the EIRP of low channel, the middle channel and high channel measure the EIRP only with the worst modulation.

n261, Module0, SCS=120kHz,CP-OFDM					
Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
50MHz	100% RB	27525	14.86	14.98	13.71
		27924.96	/	16.01	/
		28324.92	/	14.19	/
	1RB	27525	/	15.02	/
		28324.92	/	14.10	/
100MHz	100% RB	27550.08	17.29	17.18	16.09
		27924.96	16.66	/	/
		28299.96	14.87	/	/
	1RB	27550.08	18.36	/	/
		28299.96	14.79	/	/

Note: We choose the worst modulation by the EIRP of low channel, the middle channel and high channel measure the EIRP only with the worst modulation.

n261, Module0, SCS=120kHz,PUSCH DFT						
Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)			
			PI/2 BPSK	QPSK	16QAM	64QAM
50MHz	100% RB	27525	15.40	16.44	16.28	15.90
		27924.96	/	17.74	/	/
		28324.92	/	15.48	/	/
	1RB	27525	/	17.64	/	/
		28324.92	/	15.92	/	/
100MHz	100% RB	27550.08	17.05	17.03	16.88	16.81
		27924.96	16.31	/	/	/
		28299.96	14.46	/	/	/
	1RB	27550.08	17.01	/	/	/
		28299.96	14.70	/	/	/

©Copyright. All rights reserved by CTTL.

Note: The worst modulation is CP-OFDM - QPSK, and we test follow setups used CP-OFDM – QPSK。

n261, Module1, SCS=120kHz, CP-OFDM					
Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
50MHz	100% RB	27525	12.95	/	/
		27924.96	16.60	/	/
		28324.92	11.28	/	/
	1RB	27525	16.89	/	/
		28324.92	11.38	/	/
100MHz	100% RB	27550.08	14.01	/	/
		27924.96	14.25	/	/
		28299.96	12.48	/	/
	1RB	27550.08	14.68	/	/
		28299.96	11.24	/	/

The maximum power cases of n261 1CC was chose and measured for n261G 2CC.

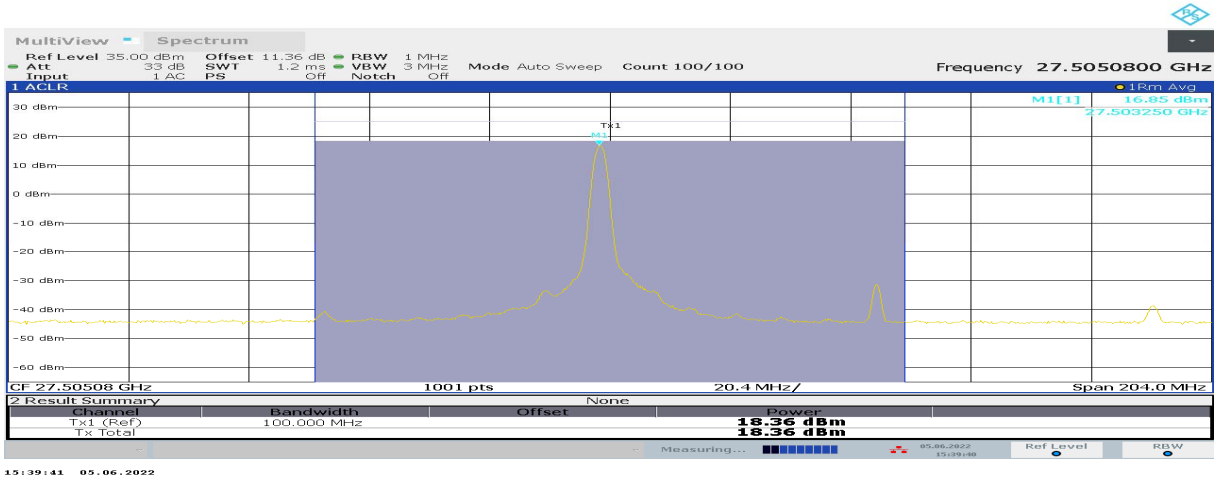
n261G, Module0, SCS=120kHz,CP-OFDM					
Bandwidth	Modulation	RB size	Centre Frequency (MHz)		Power (dBm)
			CC1	CC2	
100MHz + 100MHz	QPSK	100% RB	27550.08	27650.08	**18.71**
	QPSK	100% RB	27875.04	27975	16.69
	QPSK	100% RB	28200.02	28299.96	15.23

n261G, Module1, SCS=120kHz,PUSCH DFT					
Bandwidth	Modulation	RB size	Centre Frequency (MHz)		Power (dBm)
			CC1	CC2	
100MHz + 100MHz	QPSK	100% RB	27550.08	27650.08	16.78
	QPSK	100% RB	27875.04	27975	14.81
	QPSK	100% RB	28200.02	28299.96	12.33

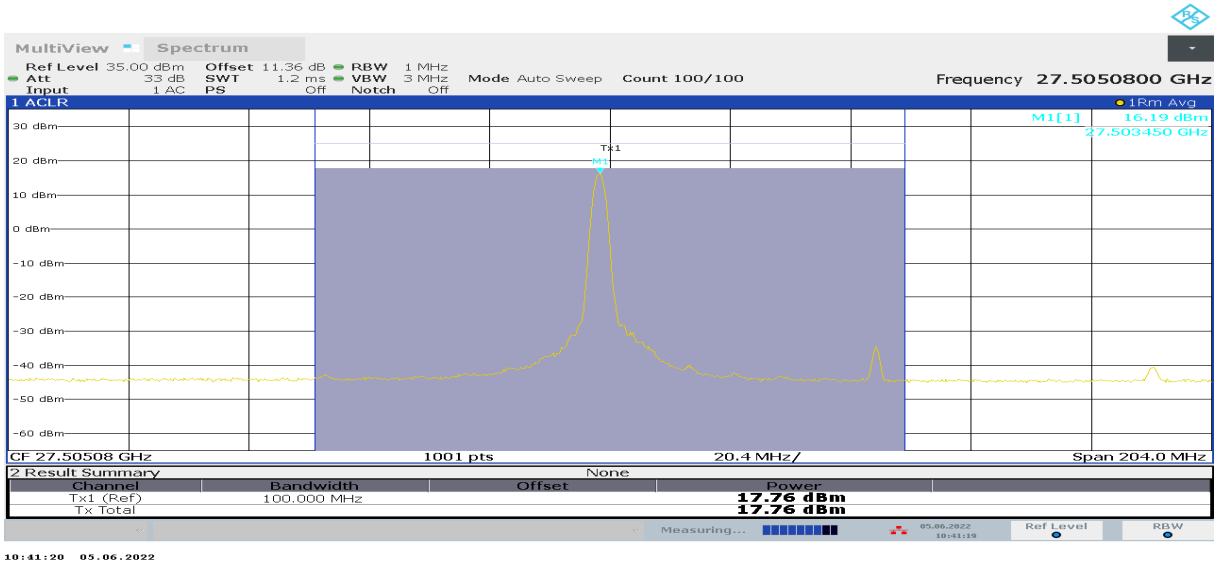
The maximum Power figure was showed in the following page.

©Copyright. All rights reserved by CTTL.

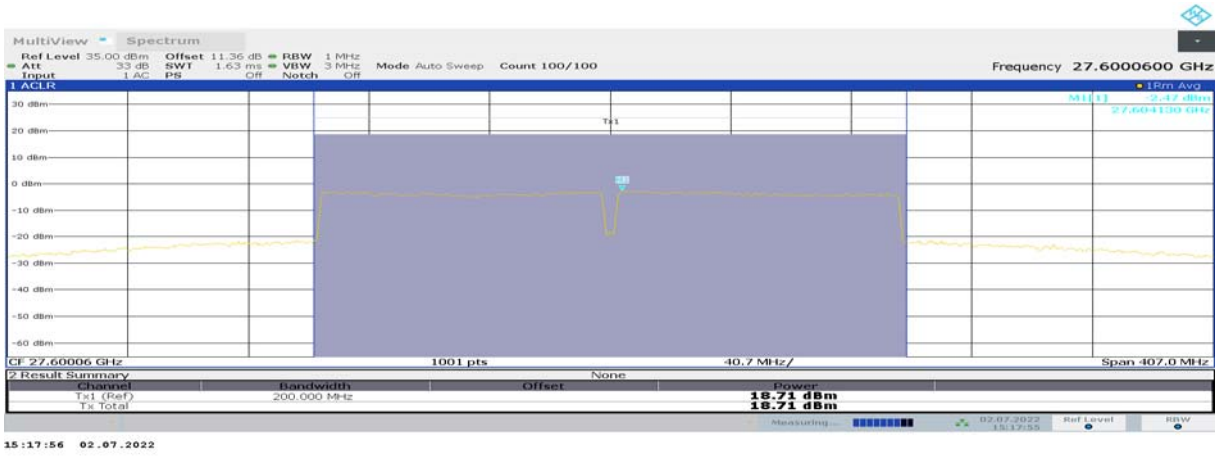
n261, Module 0, 100MHz Bandwidth, CP-OFDM, Low Channel, 27550.08MHz, QPSK, 1RB, 1CC



n261, Module 0, 100MHz Bandwidth, CP-OFDM, Low Channel, 27550.08MHz, QPSK, 1RB, 1CC



n261G, Module 0, 100MHz+100MHz Bandwidth, CP-OFDM, Low Channel, QPSK, Full RB, 2CC



©Copyright. All rights reserved by CTTL.

B.2 Emission Limit

B.2.1 Summary

The spectrum of FR2 n260 was scanned from 30 MHz to 200GHz, the spectrum of FR2 n261 was scanned from 30 MHz to 100GHz. All modes of operation were investigated and the worst case configuration results are reported in this section.

30.203 (a) The conductive power or the total radiated power of any emission outside a licensee's frequency block shall be −13dBm/MHz or lower. However, in the bands immediately outside and adjacent to the licensee's frequency block, having a bandwidth equal to 10 percent of the channel bandwidth, the conductive power or the total radiated power of any emission shall be −5 dBm/MHz or lower.

B.2.2 Minimum Measurement Distance Evaluation

According to KDB842590 D01, the measurements of the fundamental emission, out of band, harmonics and spurious emissions shall be made in the far field of the measurement antenna. The far-field boundary for mmW antennas is greater than or equal to $2D^2/\lambda$ (with D being the largest dimension of the antenna, and λ the wavelength of the emission). We calculate the far-field boundary and the test distance meet the requirement of standard.

B.2.3 Measurement Method

The measurement procedures in ANSI C63.26 are used.

The spectrum was scanned from 30 MHz to the 5th harmonic of the highest frequency generated within the equipment. The resolution bandwidth is set as outlined in Part 30.203.

The spectrum is scanned with the mobile station transmitting at carrier frequencies that pertain to low, mid and high channels of FR2 n260 and FR2 n261.

NASI C63.26 chapter 5.5.2.1: Such radiated measurements shall use substitution methods unless a test site validated to ANSI C63.4 requirements is utilized, in which case, radiated fundamental and/or unwanted emissions can be measured using the direct radiated field strength method.

B.2.4 Test Procedure

According to Clause 5.5 in ANSI C63.26-2015, 30.203 (b)and Clause 4.4 in KDB 842590 D01 v01r02

1. Set EUT at maximum output power
2. Select channels for each band and proper modulation
3. Set RBW=1MHz, VBW=3MHz
4. Set number of measurement points in sweep ≥ 2×span/RBW
5. Set Detector = RMS
6. Set Sweep time = auto-couple
7. The trace was allowed to stabilize

©Copyright. All rights reserved by CTTL.

Test Note:

1. The average EIRP reported below is calculated by:

30M-18GHz: EIRP (dBm) = Spectrum Analyzer Level (dBm) + Path Loss(dB)

18GHz-60GHz: EIRP (dBm) = Spectrum Analyzer Level (dBm) - Antenna Gain (dBi) + Cable Loss (dB) + 20log (F) + 20log(D) - 27.56

60GHz-110GHz: EIRP (dBm) = Spectrum Analyzer Level (dBm) - Antenna Gain (dBi) + converter Loss (dB) + 20log(F) + 20log(D) - 27.56

Where: F: frequency (MHz), D: Distance(m), the distance for different frequency range as shown in table.

Frequency Range	Distance(m)	Frequency Range	Distance(m)
30MHz-1GHz	3	60GHz-75GHz	3
1GHz-18GHz	3	75GHz-110GHz	3
18GHz-40GHz	3	110GHz-170GHz	1
40GHz-60GHz	3	170GHz-200GHz	0.5

2. The TRP method refers to the Clause 4.4 of KDB 842590 D01 v01r02. If EIRP measurement results exceed the emission limit, then TRP measurement will be used as an alternative method.

B.2.5 Measurement Results Table (worse case of the power measured)

The plots are showed in Annex D.2.

Band	Antenna	Modulation	Band-width	Channel	Frequency Range	Result
n261	Module 0	CP-OFDM QPSK DFT PI/2 BPSK	100MHz	Low	30MHz-100GHz	Pass
				Middle		Pass
				High		Pass
n260	Module 0 Module 1	QPSK	100MHz	Low	30MHz-200GHz	Pass
				Middle		Pass
				High		Pass

©Copyright. All rights reserved by CTTL.

B.3 Frequency Stability

B.3.1 Summary

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block.

B.3.2 Test Procedure

According to Clause 5.6 in ANSI C63.26-2015 and 2.1055

For temperature variation

1. Measure the carrier frequency at room temperature (20 °C to provide a reference)
2. At 10 °C intervals of temperatures between −30 °C and +50 °C
3. While maintaining a constant temperature inside the environmental chamber, turn on the EUT and allow sufficient time for the EUT temperature to stabilize

For supply voltage variation

1. The EUT was placed in a temperature chamber at 20 °C
2. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value measured at the input to the EUT.

B.3.3 Measurement results

n261, CP-OFDM QPSK, 1RB

Frequency Error vs Temperature

OPERATING FREQUENCY: 27924960000Hz

POWER （VDC）	TEMP (℃)	FREQUENCY (Hz)	Freq. Dev (Hz)	Deviation (%)
3.8	+20(REF)	27924189800	/	/
	-30	/	/	/
	-20	/	/	/
	-10	27924110700	-79100	-0.0002833%
	+0	27924156000	-33800	-0.0001210%
	+10	27924106000	-83800	-0.0003001%
	+20	27924165000	-24800	-0.0000888%
	+30	27924239000	49200	0.0001762%
	+40	27924180800	-9000	-0.0000322%
	+50	27924215800	26000	0.0000931%
	+55	27924175600	-14200	-0.0000509%
3.4	+20	27924144800	-45000	-0.0001612%
4.4	+20	27924154800	-35000	-0.0001253%

©Copyright. All rights reserved by CTTL.

n260, PUSCH DFT QPSK, 1RB

Frequency Error vs Temperature

OPERATING FREQUENCY: 38499960000Hz

POWER （VDC）	TEMP (℃)	FREQUENCY (Hz)	Freq. Dev (Hz)	Deviation (%)
3.8	+20(REF)	38499190700	/	/
	-30	/	/	/
	-20	/	/	/
	-10	38499133500	-57200	-0.0001486%
	+0	38499171000	-19700	-0.0000512%
	+10	38499179900	-10800	-0.0000281%
	+20	38499145000	-45700	-0.0001187%
	+30	38499041000	-149700	-0.0003888%
	+40	38499135900	-54800	-0.0001423%
	+50	38499150800	-39900	-0.0001036%
	+55	38499162400	-28300	-0.0000735%
3.4	+20	38499190800	100	0.0000003%
4.4	+20	38499220800	30100	0.0000782%

©Copyright. All rights reserved by CTTL.

B.4 Occupied Bandwidth

B.4.1 Summary

occupied bandwidth (OBW) as the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean power is equal to 0.5% of the total mean power radiated by a given emission shall be measured.

No limit is applicable, the results are for reporting only.

B.4.2 Minimum Measurement Distance Evaluation

According to KDB842590 D01, the measurements of the fundamental emission, out of band, harmonics and spurious emissions shall be made in the far field of the measurement antenna. The far-field boundary for mmW antennas is greater than or equal to $2D^2/\lambda$ (with D being the largest dimension of the antenna, and λ the wavelength of the emission). We calculate the far-field boundary and the test distance meet the requirement of standard.

B.4.3 Test Procedure

According to Clause 5.4 in ANSI C63.26-2015 and 2.1049

1. The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be set wide enough to capture all modulation products including the emission skirts (typically a span of 1.5 × OBW is sufficient).
2. Set RBW = 1% to 5% of the anticipated OBW
3. Set VBW ≥ 3×RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. The trace was allowed to stabilize

Test Note:

The average EIRP reported below is calculated by:

EIRP (dBm) = Spectrum Analyzer Channel Power Level(dBm) - Antenna Gain(dBi) + Cable Loss(dB) + 20log(F) + 20log(D) - 27.56

Where:

F: frequency (MHz)

D: Distance(m) = 3m

©Copyright. All rights reserved by CTTL.

B.4.4 Measurement results

Note: We choose the worst modulation by the output power of low channel, the middle channel and high channel measure the OBW only with the worst modulation. The OBW worse case close to the bandwidth which was less than 3MHz was also considered during the test.

n260, Module0, SCS=120kHz, CP-OFDM					
Bandwidth	RB size/offset	Frequency (MHz)	OBW (MHz)		
			QPSK	16QAM	64QAM
50MHz	100% RB	37025.04	46.23	46.12	45.98
		38499.96	/	46.52	/
		39975	/	46.22	/
100MHz	100% RB	37050	91.55	91.62	91.39
		38499.96	91.44	/	/
		39949.92	91.45	/	/

Note: We choose the worst modulation by the OBW and power of low channel, the middle channel and high channel measure the OBW only with the worst modulation.

n260, Module0, SCS=120kHz,PUSCH DFT						
Bandwidth	RB size/offset	Frequency (MHz)	OBW (MHz)			
			PI/2 BPSK	QPSK	16QAM	64QAM
50MHz	100% RB	37025.04	46.04	46.06	46.04	45.88
		38499.96	/	/	46.23	/
		39975	/	/	46.20	/
100MHz	100% RB	37050	91.53	91.50	91.59	91.45
		38499.96	/	91.80	/	/
		39949.92	/	91.61	/	/

Note: The max EIRP modulation is DFT QPSK, and we test follow setups used DFT QPSK.

n260, Module1, SCS=120kHz,PUSCH DFT						
Bandwidth	RB size/offset	Frequency (MHz)	OBW (MHz)			
			PI/2 BPSK	QPSK	16QAM	64QAM
50MHz	100% RB	37025.04	/	46.06	/	/
		38499.96	/	45.94	/	/
		39975	/	45.99	/	/
100MHz	100% RB	37050	/	91.59	/	/
		38499.96	/	91.46	/	/
		39949.92	/	91.39	/	/

©Copyright. All rights reserved by CTTL.

Note: The maximum OBW channel was measured and measured for MIMO under CP-OFDM.

n260, MIMO, SCS=120kHz,CP-OFDM					
Bandwidth	RB size/offset	Frequency (MHz)	OBW (MHz)		
			QPSK	16QAM	64QAM
100MHz Module 0	100% RB	37050	94.36	/	/
100MHz Module 1	100% RB	37050	94.57	/	/

Note: The maximum power cases of n260 1CC was chose and measured for n261G 2CC.

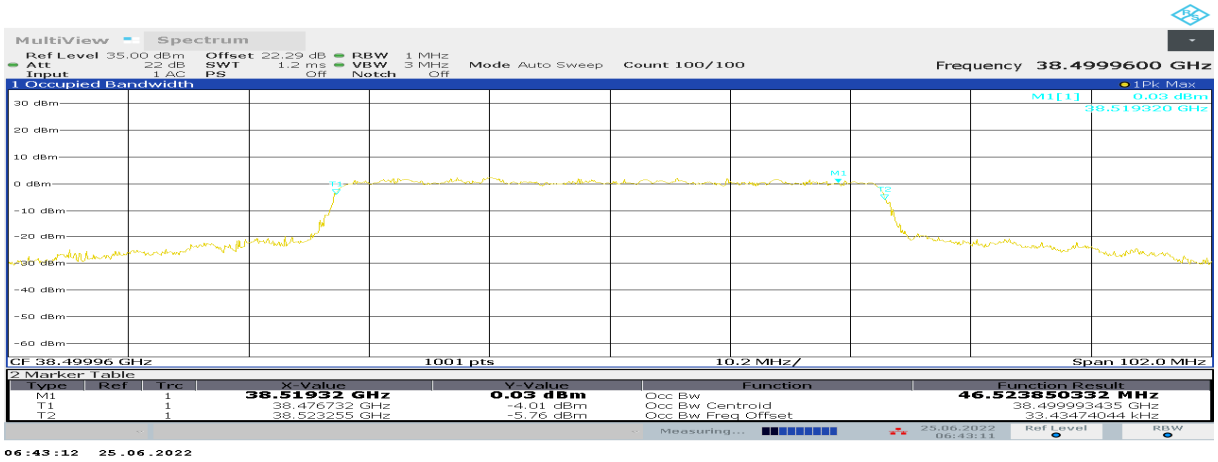
n260G, Module0, SCS=120kHz,PUSCH DFT					
Bandwidth	Modulation	RB size	Frequency (MHz)		OBW (MHz)
			CC1	CC2	
100MHz + 100MHz	QPSK	100% RB	37050	37150	190.96
	QPSK	100% RB	38450	38550	190.52
	QPSK	100% RB	39850	39949.9	190.49

n260G, Module1, SCS=120kHz, CP-OFDM					
Bandwidth	Modulation	RB size	Centre Frequency (MHz)		OBW (MHz)
			CC1	CC2	
100MHz + 100MHz	QPSK	100% RB	37050	37150	193.71
	QPSK	100% RB	38450	38550	193.53
	QPSK	100% RB	39850	39949.9	193.41

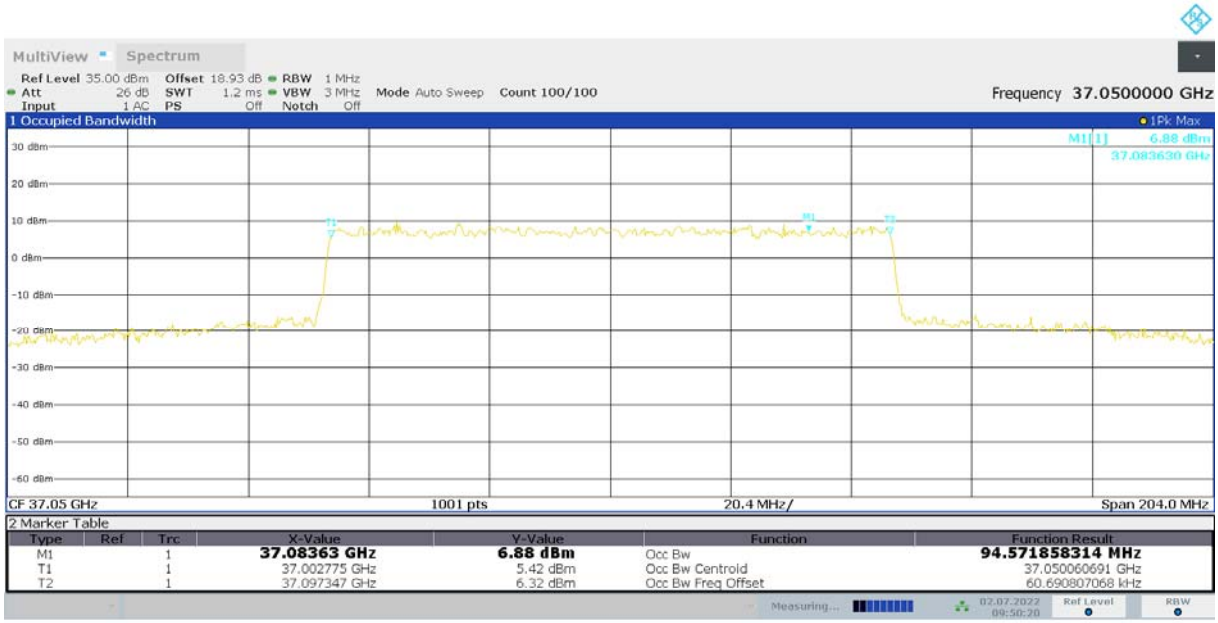
The maximum occupied bandwidth figures were showed in the following page.

©Copyright. All rights reserved by CTTL.

n260, Module 0, 50MHz Bandwidth, CP-OFDM, Mid Channel, 38499.96MHz, 16QAM (99% BW)



n260, Module 1, 100MHz Bandwidth, CP-OFDM, Low Channel, 37050MHz, QPSK (99% BW)



n260G, Module 1, 100MHz+100MHz Bandwidth, CP-OFDM, Low Channel, QPSK (99% BW)

©Copyright. All rights reserved by CTTL.

Note: We choose the worst modulation by the power of low channel, the middle channel and high channel measure the OBW only with the worst modulation. The OBW worse case close to the bandwidth which was less than 3MHz were also considered during the test.

n261, Module0, SCS=120kHz,CP-OFDM					
Bandwidth	RB size/offset	Frequency (MHz)	OBW (MHz)		
			QPSK	16QAM	64QAM
50MHz	100% RB	27525	46.41	46.35	46.23
		27924.96	/	46.25	/
		28324.92	/	46.17	/
100MHz	100% RB	27550.08	98.20	95.60	94.97
		27924.96	94.92	/	/
		28299.96	94.77	/	/

n261, Module0, SCS=120kHz,PUSCH DFT						
Bandwidth	RB size/offset	Frequency (MHz)	OBW (MHz)			
			PI/2 BPSK	QPSK	16QAM	64QAM
50MHz	100% RB	27525	46.02	46.15	46.32	46.11
		27924.96	/	46.28	/	/
		28324.92	/	45.98	/	/
100MHz	100% RB	27550.08	91.66	91.84	91.88	92.00
		27924.96	91.51	/	/	/
		28299.96	91.64	/	/	/

Note: The max EIRP and OBW modulation is QPSK, and we test follow setups used QPSK.

n261, Module1, CP-OFDM					
Bandwidth	RB size/offset	Frequency (MHz)	OBW (MHz)		
			QPSK	16QAM	64QAM
50MHz	100% RB	27525	46.32	/	/
		27924.96	46.52	/	/
		28324.92	46.09	/	/
100MHz	100% RB	27550.08	94.47	/	/
		27924.96	94.56	/	/
		28299.96	94.71	/	/

©Copyright. All rights reserved by CTTL.

The maximum power and OBW cases of n261 1CC was chose and measured for n261G 2CC.

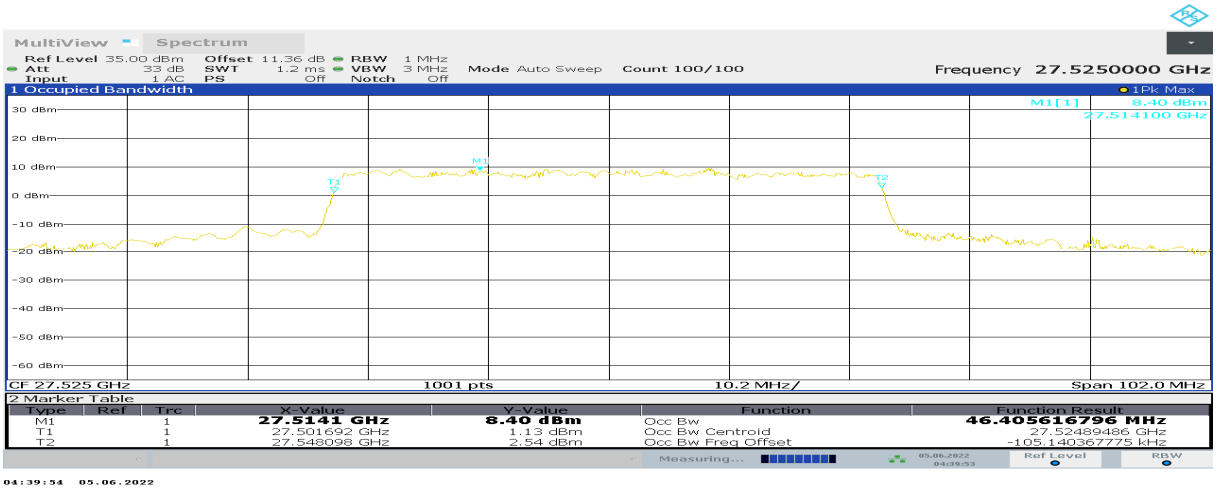
n261G, Module0, SCS=120kHz,CP-OFDM					
Bandwidth	Modulation	RB size	Centre Frequency (MHz)		OBW (MHz)
			CC1	CC2	
100MHz + 100MHz	QPSK	100% RB	27550.08	27650.08	217.98
	QPSK	100% RB	27875.04	27975	194.32
	QPSK	100% RB	28200.02	28299.96	194.24

n261G, Module1, SCS=120kHz,PUSCH DFT					
Bandwidth	Modulation	RB size	Centre Frequency (MHz)		OBW (MHz)
			CC1	CC2	
100MHz + 100MHz	QPSK	100% RB	27550.08	27650.08	194.65
	QPSK	100% RB	27875.04	27975	194.11
	QPSK	100% RB	28200.02	28299.96	193.54

The maximum occupied bandwidth figures were showed in the following page.

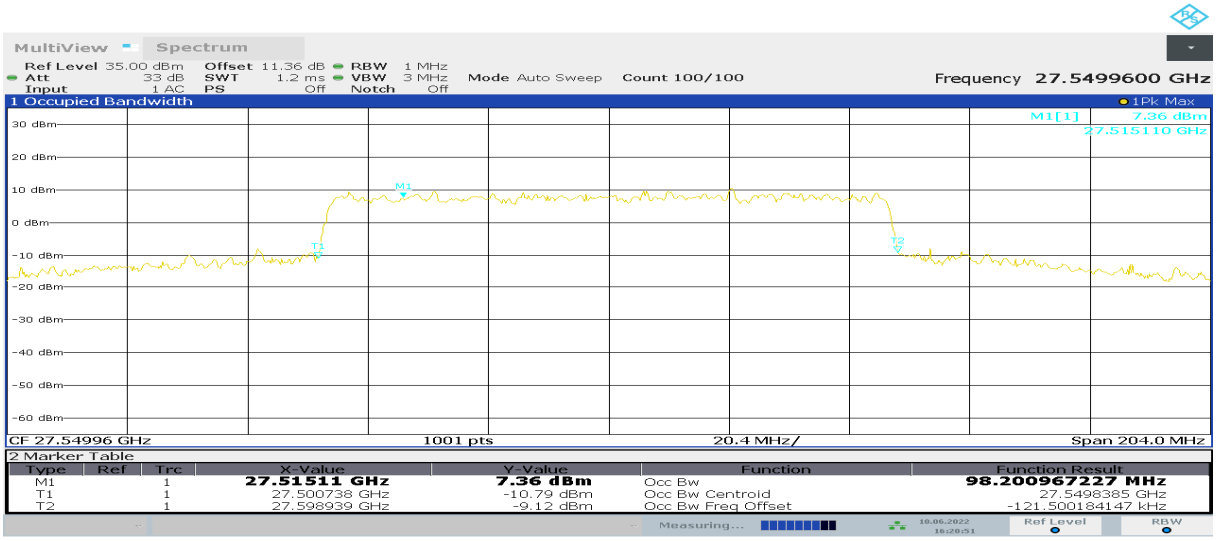
©Copyright. All rights reserved by CTTL.

n261, Module 0, 50MHz Bandwidth, CP-OFDM, Low Channel, 27525MHz, QPSK (99% BW)



04:39:54 05.06.2022

n261, Module 0, 100MHz Bandwidth, CP-OFDM, Low Channel, 27550.08MHz, QPSK (99% BW)



16:20:52 10.06.2022

n261G, Module 0, 100MHz+100MHz Bandwidth, CP-OFDM, Low Channel, QPSK (99% BW)

15:18:09 02.07.2022

©Copyright. All rights reserved by CTTL.

B.5 Band Edge Compliance

B.5.1 Summary

All modes of operation were investigated and the worst case configuration results are reported in this section.

30.203 (a) The conductive power or the total radiated power of any emission outside a licensee's frequency block shall be −13dBm/MHz or lower. However, in the bands immediately outside and adjacent to the licensee's frequency block, having a bandwidth equal to 10 percent of the channel bandwidth, the conductive power or the total radiated power of any emission shall be −5 dBm/MHz or lower.

B.5.2 Minimum Measurement Distance Evaluation

According to KDB842590 D01, the measurements of the fundamental emission, out of band, harmonics and spurious emissions shall be made in the far field of the measurement antenna. The far-field boundary for mmW antennas is greater than or equal to $2D^2/\lambda$ (with D being the largest dimension of the antenna, and λ the wavelength of the emission). We calculate the far-field boundary and the test distance meet the requirement of standard.

B.5.3 Test Procedure

According to Clause 5.7 in ANSI C63.26-2015 and Clause 4.4 in KDB 842590 D01 v01r02

1. Start and stop frequency were set such that both upper and lower band edges are measured.
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. Set RBW=1MHz, VBW=3MHz
4. Set number of measurement points in sweep ≥ 2×span/RBW
5. Set Detector = RMS
6. Set Sweep time = auto-couple
7. Trace average at least 100 traces in power averaging (rms) mode
8. The trace was allowed to stabilize

Test Note:

The average EIRP reported below is calculated by:

EIRP (dBm) = Spectrum Analyzer Level (dBm) - Antenna Gain (dBi) + Cable Loss (dB) + 20log (F) + 20log(D) - 27.56

Where: F: frequency (MHz), D: Distance(m)

©Copyright. All rights reserved by CTTL.

B.5.4 Measurement result

n260

Module0, SCS=120kHz, CP-OFDM

Note: The channel with the maximum power and OBW was chose.

Bandwidth	Modulation	RB size	Frequency Range	Beam ID	Peak (dBm)	
					Limit: -5dBm	Limit: -13dBm
50MHz	QPSK	100% RB	Low	40	-24.51	-26.65
	16QAM	100% RB	High	40	-33.50	-36.17
	16QAM	100% RB	High	163	-37.52	-39.04
	16QAM	1 RB	Low	40	-26.48	-34.61
		1 RB	High	40	-30.71	-38.78
100MHz	QPSK	100% RB	Low	40	-27.82	-27.60
		100% RB	Low	40+163	-29.24	-31.18
		100% RB	High	40	-35.12	-36.04
	QPSK	1 RB	Low	40	-27.40	-37.58
		1 RB	Low	40+163	-27.66	-38.47
		1 RB	High	40	-36.61	-41.68

Module0, SCS=120kHz, PUSCH DFT

Note: The channel with the maximum OBW was chose.

Bandwidth	Modulation	RB size	Frequency Range	Beam ID	Peak (dBm)	
					Limit: -5dBm	Limit: -13dBm
50MHz	QPSK	100% RB	Low	40	-27.51	-28.93
	16QAM	100% RB	High	40	-36.04	-39.94
	16QAM	1 RB	Low	40	-26.03	-33.75
	16QAM	1 RB	Low	163	-32.36	-40.69
	16QAM	1 RB	High	40	-30.77	-38.87
100MHz	QPSK	100% RB	Low	40	-30.41	-32.50
		100% RB	High	40	-39.12	-40.29
	QPSK	1 RB	Low	40	-26.06	-38.04
		1 RB	Low	163	-32.74	-40.9
		1 RB	High	40	-35.56	-41.71
		1 RB	High	163	-40.02	-40.39

©Copyright. All rights reserved by CTTL.

n260

Module1, SCS=120kHz

Note: The channel with the maximum EIRP was chose.

Bandwidth	Modulation	RB size	Frequency Range	Beam ID	Peak (dBm)	
					Limit: -5dBm	Limit: -13dBm
50MHz	DFT,QPSK	100% RB	Low	35	-29.68	-31.25
		100% RB	High	35	-36.57	-39.26
	DFT,QPSK	1 RB	Low	35	-25.91	-34.31
		1 RB	Low	159	-27.70	-36.12
		1 RB	High	35	-29.72	-37.93
		1 RB	High	159	-36.27	-40.23
	CP,16QAM	1 RB	Low	35+163	-24.79	-33.75
100MHz	DFT QPSK	100% RB	Low	35	-31.85	-33.58
		100% RB	Low	163	-37.98	-39.07
		100% RB	High	35	-41.23	-41.97
		100% RB	High	163	-39.53	-40.80
	DFT QPSK	1 RB	Low	35	-27.78	-38.67
		1 RB	High	35	-36.63	-42.07
	CP,16QAM	100% RB	Low	35+163	-27.43	-29.12

n260G, SCS=120kHz

Note: The channel with the maximum EIRP was chose.

Bandwidth	Modulation	RB size	Frequency Range	Beam ID	Peak (dBm)	
					Limit: -5dBm	Limit: -13dBm
100MHz + 100MHz	DFT QPSK	100% RB	Low	40	-34.96	-35.31
		100% RB	High	40	-39.60	-40.07
	CP-OFDM QPSK	100% RB	Low	35+163	-30.05	-30.09
		100% RB	High	35	-39.03	-40.76

©Copyright. All rights reserved by CTTL.

n261

Module0, SCS=120kHz, CP-OFDM

Note: The channel with the maximum power and OBW was chose.

Bandwidth	Modulation	RB size	Frequency Range	Beam ID	Peak (dBm)	
					Limit: -5dBm	Limit: -13dBm
50MHz	QPSK	100% RB	Low	31	-25.48	-26.17
	QPSK	100% RB	Low	39	-26.73	-27.22
	16QAM	100% RB	Low	31	-25.91	-27.57
	64QAM	100% RB	Low	31	-29.09	-30.37
	16QAM	100% RB	High	31	-27.22	-28.50
	16QAM	1 RB	Low	31	-29.99	-39.37
	16QAM	1 RB	High	31	-30.92	-39.10
100MHz	QPSK	100% RB	Low	31	-23.52	-23.89
	QPSK	100% RB	Low	39	-29.20	-31.26
	QPSK	100% RB	Low	31+159	-21.38	-22.29
	16QAM	100% RB	Low	31	-23.82	-24.29
	64QAM	100% RB	Low	31	-26.53	-26.94
	QPSK	100% RB	High	31	-27.85	-29.70
	QPSK	1 RB	Low	31	-28.25	-41.71
		1 RB	Low	159	-29.50	-41.13
		1 RB	Low	39	-31.90	-42.50
		1 RB	High	31	-30.03	-42.13
		1 RB	High	159	-30.10	-30.93

n261

Module0, SCS=120kHz, PUSCH DFT

Note: The channel with the maximum power and OBW was chose.

Bandwidth	Modulation	RB size	Frequency Range	Beam ID	Peak (dBm)	
					Limit: -5dBm	Limit: -13dBm
50MHz	QPSK	100% RB	Low	31	-24.38	-26.98
		100% RB	High	31	-27.22	-28.79
	QPSK	1 RB	Low	31	-27.87	-37.75
		1 RB	Low	159	-26.06	-37.26
		1 RB	High	31	-28.73	-38.31
		1 RB	High	159	-30.45	-39.13
100MHz	QPSK	100% RB	Low	31	-26.45	-28.37
	PI/2 BPSK	100% RB	High	31	-34.96	-38.97
	PI/2 BPSK	1 RB	Low	31	-28.37	-41.61
		1 RB	High	31	-37.26	-43.29

©Copyright. All rights reserved by CTTL.

n261

Module1, SCS=120kHz

Note: The channel with the maximum EIRP was chose.

Bandwidth	Modulation	RB size	Frequency Range	Beam ID	Peak (dBm)	
					Limit: -5dBm	Limit: -13dBm
50MHz	CP-OFDM QPSK	100% RB	Low	35	-30.05	-31.25
		100% RB	High	35	-31.73	-33.04
	CP-OFDM QPSK	1 RB	Low	35	-31.14	-40.88
		1 RB	High	35	-34.75	-42.95
100MHz	CP-OFDM QPSK	100% RB	Low	35	-32.76	-34.28
		100% RB	High	35	-34.29	-35.93
	CP-OFDM QPSK	1 RB	Low	35	-32.49	-43.1
		1 RB	High	35	-35.32	-44.09

Bandwidth	Modulation	RB size	Frequency Range	Beam ID	Peak (dBm)	
					Limit: -5dBm	Limit: -13dBm
50MHz	CP-OFDM QPSK	1 RB	Low	163	-29.39	-40.29
		1 RB	Low	35+163	-30.12	-36.28
		1 RB	High	163	-32.53	-40.23
100MHz	CP-OFDM QPSK	1 RB	Low	163	-29.09	-45.14
		100% RB	High	163	-32.39	-33.36

n261G, SCS=120kHz

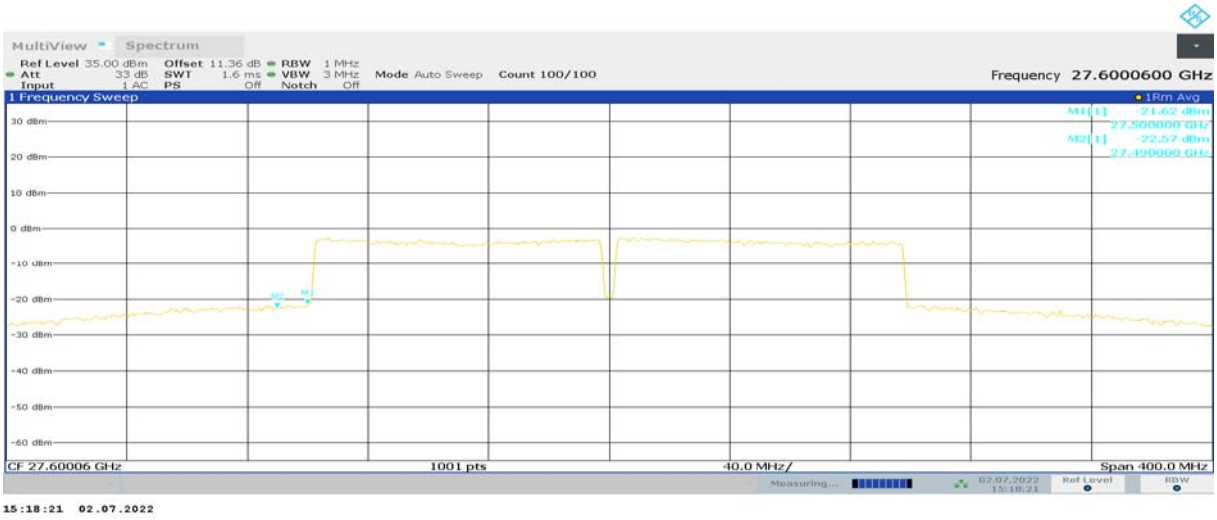
Note: The channel with the maximum EIRP was chose.

Bandwidth	Modulation	RB size	Frequency Range	Beam ID	Peak (dBm)	
					Limit: -5dBm	Limit: -13dBm
100MHz + 100MHz	CP-OFDM QPSK	100% RB	Low	31+159	-21.62	-22.57
		100% RB	High	31	-29.34	-29.61
	CP-OFDM QPSK	100% RB	Low	35+163	-27.40	-27.04
		100% RB	High	163	-34.72	-36.46

©Copyright. All rights reserved by CTTL.

The left band edge worse case figure:

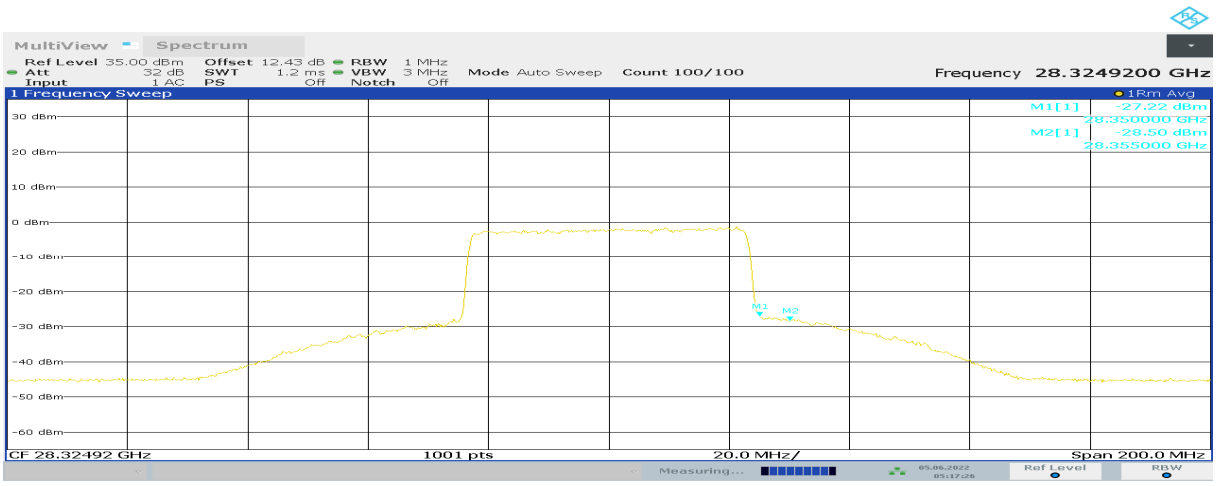
n261G, Module0, SCS=120kHz, CP-OFDM, 100MHz+100MHz, 100% RB, Low Channel, left band edge



15:18:21 02.07.2022

The right band edge worse case figure:

n261, Module0,SCS=120kHz, CP-OFDM, 50MHz, 100% RB, High Channel, right band edge



05:17:26 05.06.2022

©Copyright. All rights reserved by CTTL.

Annex C: Calibration Certificates List

Antenna	3116	2663	ETS-Lindgren	2022-08-11	1 year

中国计量科学研究院

校 准 证 书

证书编号 XDgp2021-10238

客户名称 中国泰尔实验室

器具名称 信号源倍频器

型号/规格 82406C

出厂编号 ZEI00164

生产厂商 中电科仪器仪表有限公司

联络信息 北京市海淀区花园北路 52 号

校准日期 2021 年 02 月 05 日

接收日期 2021 年 01 月 08 日

批准人：

中国计量科学研究院 校准专用章

发布日期： 2021 年 02 月 08 日

地址：北京北三环东路 18 号 邮编：100029

电话：010-64525569/74 传真：010-64271948

网址：http://www.nim.ac.cn 电子邮箱：kehufuwu@nim.ac.cn

2019-jz-R0520

第1页共5页

©Copyright. All rights reserved by CTTL.

Spectrum Analyzer	FSW67	104039	R&S	2023-05-26	1 year

校 准 证 书

证书编号： J22X03731

客 户 名 称	中国泰尔实验室
客 户 地 址	北京市海淀区花园北路 52 号
器 具 名 称	频谱分析仪
型 号/规 格	FSW67
出 厂 编 号	104039
制 造 单 位	ROHDE&SCHWARZ 公司
校 准 日 期	2022 年 05 月 27 日

所测数据符合该仪表说明书技术指标要求。

批准人:

核验员:

校准员:

地址：北京海淀区花园北路 52 号通信计量中心　　电话：+86-10-62301383
邮编：100191　　传真：+86-10-62304104
网址：www. chinattl.com　　电子邮件：cal@caict.ac.cn

©Copyright. All rights reserved by CTTL.

(downconverter)Harmonic Mixer(60GHz-90GHz)	FS-Z90	101655	R&S	2024-01-14	3 years

中国计量科学研究院

校 准 证 书

证书编号 XDxh2021-10057

客户名称 中国泰尔实验室

器具名称 FS-Z90 混频器

型号/规格 FS-Z90

出厂编号 101655

生产厂商 Rohde & Schwarz

联络信息 北京市海淀区花园北路 52 号

校准日期 2021-01-15

接收日期 2021-01-08

批准人：

中国计量科学研究院 校准专用章

发布日期： 2021 年 01 月 20 日

地址：北京北三环东路 18 号 邮编：100029

电话：010-64525569/74 传真：010-64271948

网址：http://www.nim.ac.cn 电子邮箱：kehufuwu@nim.ac.cn

2019-jz-R0520

第1页共4页

©Copyright. All rights reserved by CTTL.

(downconverter)Harmonic Mixer(75GHz-110GHz)	FS-Z110	101463	R&S	2024-01-14	3 years

中国计量科学研究院

校 准 证 书

证书编号 XDxh2021-10058

客户名称 中国泰尔实验室

器具名称 FS-Z110 混频器

型号/规格 FS-Z110

出厂编号 101463

生产厂商 Rohde & Schwarz

联络信息 北京市海淀区花园北路 52 号

校准日期 2021-01-15

接收日期 2021-01-08

批准人：

中国计量科学研究院 校准专用章

发布日期： 2021 年 01 月 20 日

地址：北京北三环东路 18 号 邮编：100029

电话：010-64525569/74 传真：010-64271948

网址：http://www.nim.ac.cn 电子邮箱：kehufuwu@nim.ac.cn

2019-jz-R0520

第1页共4页

©Copyright. All rights reserved by CTTL.

(downconverter)Harmonic Mixer(110GHz-170GHz)/	FS-Z170	101008	R&S	2024-02-17	3 years

Radiometer Physics
A Rohde & Schwarz Company

Calibration Certificate
Kalibrierschein

Certificate Number 24-0170-101008-01
Zertifikatsnummer

Unit Data

Item Gegenstand: Harmonic Mixer, 110 GHz to 170 GHz

Manufacturer Hersteller: RPG Radiometer-Physics GmbH

Type Typ: RPG FS-Z170

Material Number Materialnummer: 3622.0714.02 **Serial Number** Seriennummer: 101008

Asset Number Inventarnummer

Order Data

Customer Auftraggeber

Order Number Bestellnummer

Date of Receipt Eingangsdatum

Performance

Place and Date of Calibration Ort und Datum der Kalibrierung: Meckenheim, 2021-02-18

Scope of Calibration Umfang der Kalibrierung: Standard Calibration

Statement of Compliance (Incoming) Konformitätsaussage (Anlieferung): New device

Statement of Compliance (Outgoing) Konformitätsaussage (Auslieferung): All measured values are within the data sheet specifications.

Extend of Calibration Documents Umfang des Kalibrierdokuments: 2 pages Calibration Certificate
4 pages Outgoing Results

This calibration certificate documents, that the named item is tested and measured against defined specifications. Measurement results are located usually in the corresponding interval with a probability of approx. 95% (coverage factor k = 2). Calibration is performed with test equipment and standards directly or indirectly traceable by means of approved calibration techniques to the PTB/DKD or other national/international standards, which realize the physical units of measurement according to the International System of Units (SI). In all cases where no standards are available, measurements are referenced to standards of the R&S laboratories. Principles and methods of calibration correspond with EN ISO/IEC 17025. This calibration certificate may not be reproduced other than in full. Calibration certificates without signatures are not valid. The user is obliged to have the object recalibrated at appropriate intervals.

Dieser Kalibrierschein dokumentiert, dass der genannte Gegenstand nach festgelegten Vorgaben geprüft und gemessen wurde. Die Messwerte lagen im Regelfall mit einer Wahrscheinlichkeit von annähernd 95% im zugeordneten Werteintervall (Erweiterte Messunsicherheit mit k = 2). Die Kalibrierung erfolgte mit Messmitteln und Normalen, die direkt oder indirekt durch Ableitung mittels anerkannter Kalibriertechniken rückgeführt sind auf Normale der PTB/DKD oder anderer nationaler/internationaler Standards zur Darstellung der physikalischen Einheiten in Übereinstimmung mit dem Internationalen Einheitensystem (SI). Wenn keine Normale existieren, erfolgt die Rückführung auf Bezugsnormale der R&S-Laboratorien. Grundsätze und Verfahren der Kalibrierung beziehen sich auf EN ISO/IEC 17025. Dieser Kalibrierschein darf nur vollständig und unverändert weiterverbreitet werden. Kalibrierscheine ohne Unterschriften sind ungültig. Für die Einhaltung einer angemessenen Frist zur Wiederholung der Kalibrierung ist der Benutzer verantwortlich.

RPG Radiometer-Physics GmbH; Meckenheim

Date of Issue Ausstellungsdatum	Head of Laboratory Laborleitung	Person Responsible Bearbeiter
2021-02-22	Schulze	Heinze

Page (Seite) 1/2
Vers2010-05-05/
RPG2014-02-28

RPG Radiometer-Physics GmbH • Werner-von-Siemens-Str. 4 • 53340 Meckenheim • Telephone national: 02225/99981-0 international: 0049 2225-99981-0
Fax: 02225/99981-99 • Managing Director: Achim Walber • Company's Place of Business: Meckenheim
Commercial Register No.: Bonn, HRB 10291 • VAT Identification No.: DE 123 377 395

©Copyright. All rights reserved by CTTL.

(downconverter)Harmonic Mixer(170GHz-220GHz)/	FS-Z220	101054	R&S	2023-12-14	3 years

Radiometer Physics
A Rohde & Schwarz Company

Calibration Certificate
Kalibrierschein

Certificate Number 24-0220-101054-01
Zertifikatsnummer

Unit Data

Item / Gegenstand: Harmonic Mixer, 140 GHz to 220 GHz

Manufacturer / Hersteller: RPG Radiometer-Physics GmbH

Type / Typ: RPG FS-Z220

Material Number / Materialnummer: 3593.3250.02 **Serial Number** / Seriennummer: 101054

Asset Number / Inventarnummer:

Order Data

Customer / Auftraggeber:

Order Number / Bestellnummer:

Date of Receipt / Eingangsdatum:

This calibration certificate documents, that the named item is tested and measured against defined specifications. Measurement results are located usually in the corresponding interval with a probability of approx. 95% (coverage factor k = 2). Calibration is performed with test equipment and standards directly or indirectly traceable by means of approved calibration techniques to the PTB/DKD or other national/international standards, which realize the physical units of measurement according to the International System of Units (SI). In all cases where no standards are available, measurements are referenced to standards of the R&S laboratories. Principles and methods of calibration correspond with EN ISO/IEC 17025. This calibration certificate may not be reproduced other than in full. Calibration certificates without signatures are not valid. The user is obliged to have the object recalibrated at appropriate intervals.

Performance

Place and Date of Calibration / Ort und Datum der Kalibrierung: Meckenheim, 2020-12-15

Scope of Calibration / Umfang der Kalibrierung: Standard Calibration

Statement of Compliance (Incoming) / Konformitätsaussage (Anlieferung): New device

Statement of Compliance (Outgoing) / Konformitätsaussage (Auslieferung): All measured values are within the data sheet specifications.

Extend of Calibration Documents / Umfang des Kalibrierdokuments: 2 pages Calibration Certificate
4 pages Outgoing Results

Dieser Kalibrierschein dokumentiert, dass der genannte Gegenstand nach festgelegten Vorgaben geprüft und gemessen wurde. Die Messwerte lagen im Regelfall mit einer Wahrscheinlichkeit von annähernd 95% im zugeordneten Werteintervall (Erweiterte Messunsicherheit mit k = 2). Die Kalibrierung erfolgte mit Messmitteln und Normalen, die direkt oder indirekt durch Ableitung mittels anerkannter Kalibriertechniken rückgeführt sind auf Normale der PTB/DKD oder anderer nationaler/internationaler Standards zur Darstellung der physikalischen Einheiten in Übereinstimmung mit dem Internationalen Einheitensystem (SI). Wenn keine Normale existieren, erfolgt die Rückführung auf Bezugsnormale der R&S-Laboratorien. Grundsätze und Verfahren der Kalibrierung beziehen sich auf EN ISO/IEC 17025. Dieser Kalibrierschein darf nur vollständig und unverändert weiterverbreitet werden. Kalibrierscheine ohne Unterschriften sind ungültig. Für die Einhaltung einer angemessenen Frist zur Wiederholung der Kalibrierung ist der Benutzer verantwortlich.

RPG Radiometer-Physics GmbH; Meckenheim

Date of Issue / Ausstellungsdatum	Head of Laboratory / Laborleitung	Person Responsible / Bearbeiter
2020-12-17	Schulze	Dick

Page (Seite) 1/2
Vers2010-05-05/
RPG2014-02-28

RPG Radiometer-Physics GmbH • Werner-von-Siemens-Str. 4 • 53340 Meckenheim • Telephone national: 02225/99981-0 international: 0049 2225-99981-0
Fax: 02225/99981-99 • Managing Director: Achim Walber • Company's Place of Business: Meckenheim
Commercial Register No.: Bonn, HRB 10291 • VAT Identification No.: DE 123 377 395

©Copyright. All rights reserved by CTTL.

Standard Gain Horn （40GHz-60GHz）	LB-19-25	J202024086	A-INFO	2024-01-14	3 years

A-INFO 英联微波

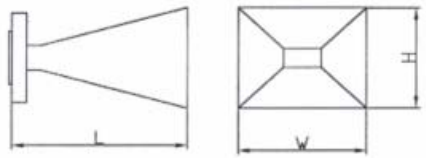
LB-19-25
40.0 - 60.0GHz 标准增益喇叭天线

技术指标

频率(GHz)	A 型, 波导输出	40.0 - 60.0
	C 型, 2.4mm-50K 输出	40.0 - 50.0
	C 型, 1.85mm-50K 输出	40.0 - 60.0
增益(dB)	25 典型值	
驻波	1.6 最大值	
3dB 波束宽度(°)	10 典型值	
波导型号	BJ500(WR19)	
材料	铜	
输出形式	A 型 FUGP500	
	C 型 2.4mm-50K 或 1.85mm-50K	
尺寸(mm) 宽 x 高 x 长	A 型, 波导输出	49x41x130
	C 型, 2.4mm-50K 输出	49x41x155
	C 型, 1.85mm-50K 输出	49x41x157
净重(Kg)	A 型, 波导输出	约 0.15
	C 型, 2.4mm-50K 输出	约 0.18
	C 型, 1.85mm-50K 输出	约 0.18

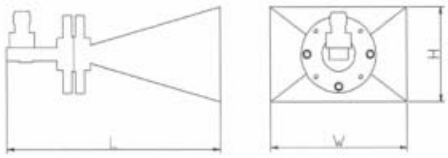
外形图 (尺寸: mm)

A 型



宽 x 高 x 长: 49x41x130

C 型

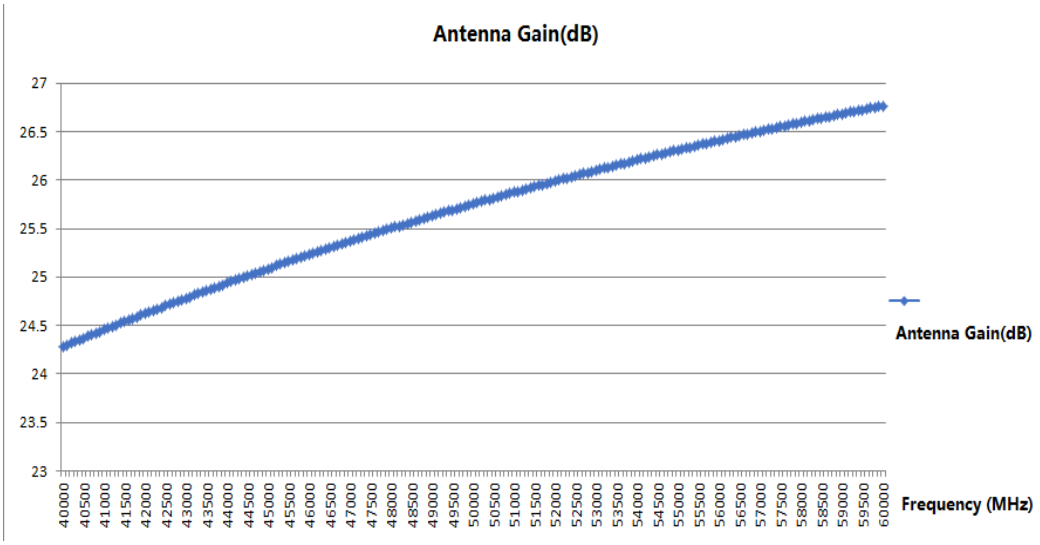


宽 x 高 x 长: 49x41x157

英联微波
北京 电话: 010-6266-7326 或 010-6266-7327 传真: 010-6266-7379 网址:www.ainfoinc.com
成都 电话: 028-8519-2786 或 028-8519-3047 传真: 028-8519-3068 www.ainfoinc.cn

测试报告仅供参考。详情请咨询: Sales@ainfoinc.com

©Copyright. All rights reserved by CTTL.



©Copyright. All rights reserved by CTTL.

Standard Gain Horn （60GHz-90GHz）	LB-12-25	J202062912	A-INFO	2024-02-17	3 years

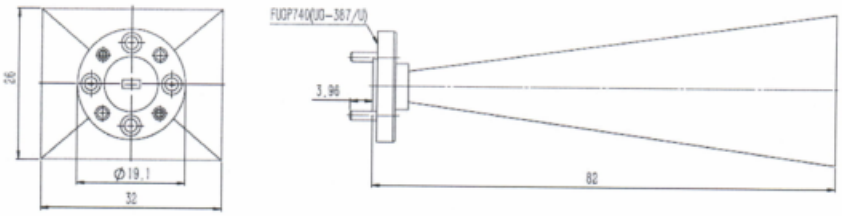
A-INFO 英联微波

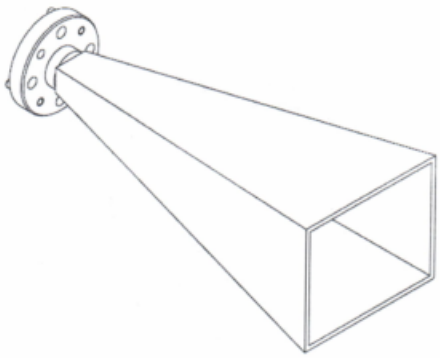
LB-12-25
60.0 - 90.0GHz 标准增益喇叭天线

技术指标

频率(GHz)	60.0 - 90.0
增益(dBi)	25 典型值
驻波	1.6 最大值
3dB 波束宽度(°)	10 典型值
波导型号	BJ740(WR12)
材料	铜
输出形式	A 型: FUGP740
尺寸(mm) 宽 x 高 x 长	A 型: 32x26x82
净重(Kg)	A 型: 约 0.05

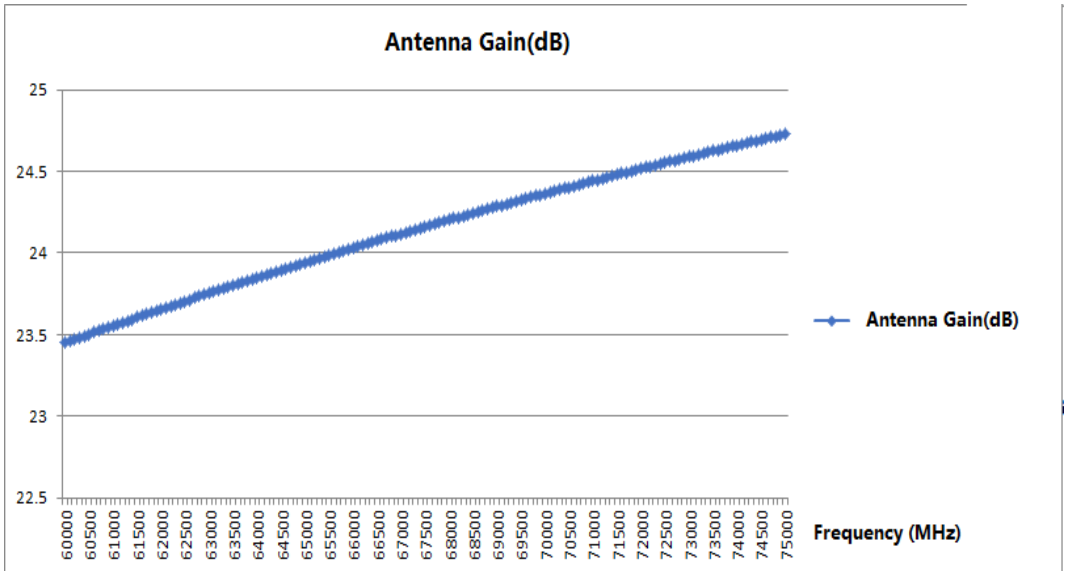
外形图 (尺寸: mm)





英联微波
北京 电话: 010-6266-7326 或 010-6266-7327 传真: 010-6266-7379 网址:www.ainfoinc.com
成都 电话: 028-8519-2786 或 028-8519-3047 传真: 028-8519-3068 www.ainfoinc.cn
测试报告仅供参考，详情请咨询: Sales@ainfoinc.com

©Copyright. All rights reserved by CTTL.



©Copyright. All rights reserved by CTTL.

Standard Gain Horn （75GHz-110GHz）	LB-10-25	J202023232	A-INFO	2024-01-27	3 years

A-INFO 英联微波

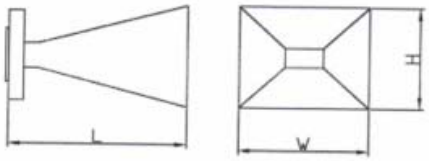
LB-10-25
75.0 - 110.0GHz 标准增益喇叭天线

技术指标

频率(GHz)	75.0 - 110.0
增益(dB)	25 典型值
驻波	1.6 最大值
3dB 波束宽度(°)	10 典型值
波导型号	BJ900(WR10)
材料	铜
输出形式	A 型: FUGP900
尺寸(mm) 宽 x 高 x 长	A 型: 28x22x70
净重(Kg)	A 型: 约 0.05

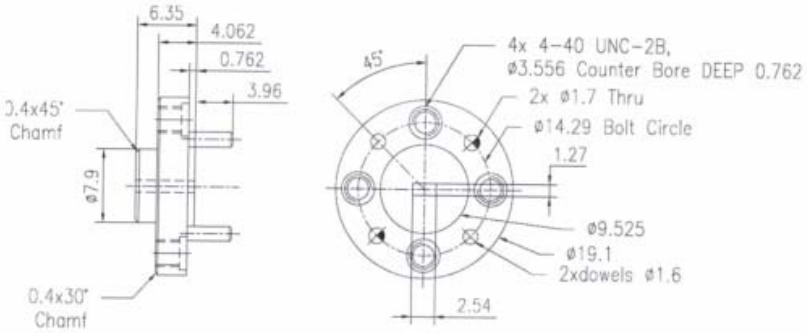
外形图 (尺寸: mm)

A 型



宽 x 高 x 长: 28x22x70

法兰外形图 (尺寸: mm)



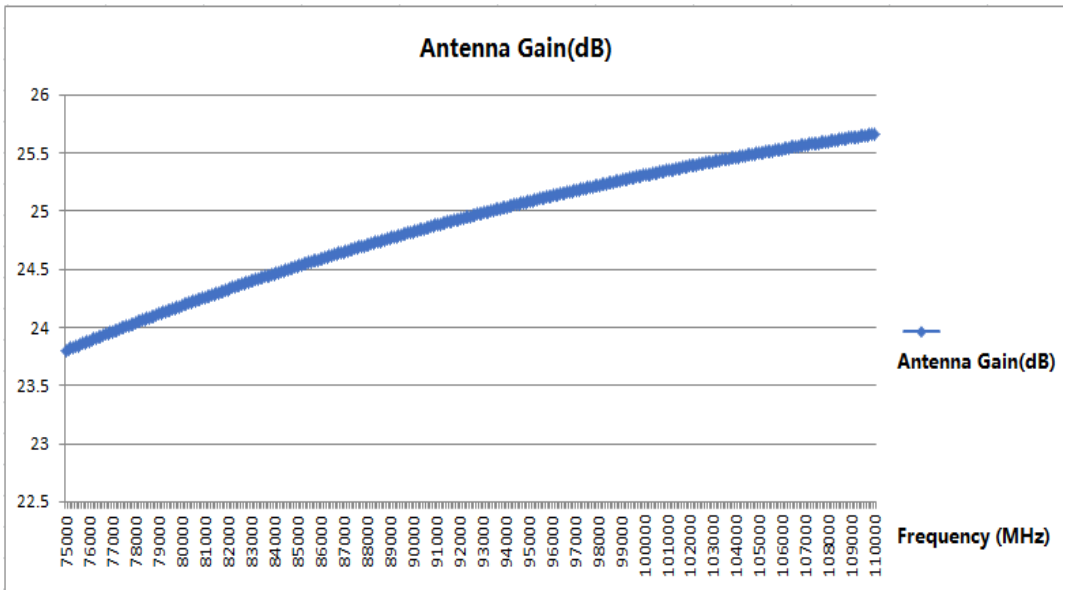
FUGP900
(equivalent to UG-387/U modified)

英联微波

北京 电话: 010-6266-7326 或 010-6266-7327 传真: 010-6266-7379 网址:www.ainfoinc.com
成都 电话: 028-8519-2786 或 028-8519-3047 传真: 028-8519-3068 www.ainfoinc.cn

测试报告仅供参考，详情请咨询: Sales@ainfoinc.com

©Copyright. All rights reserved by CTTL.



©Copyright. All rights reserved by CTTL.

Standard Gain Horn Antenna （110GHz-170GHz）	LB-6-25-A	J2020612 45	A-INFO	2024-01-27	3 year

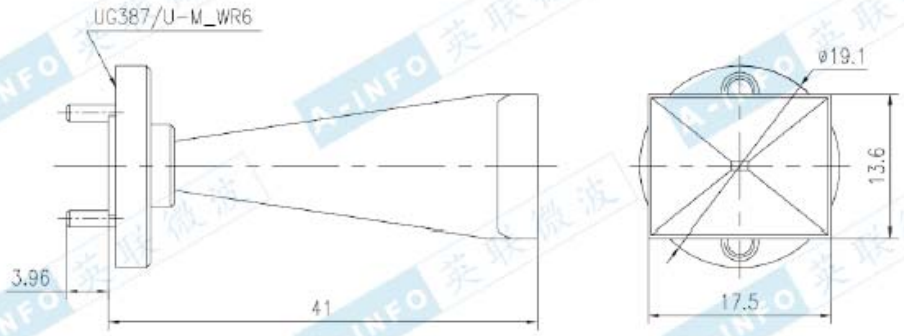
A-INFO 英联微波

LB-6-25
110.0 - 170.0GHz 标准增益喇叭天线

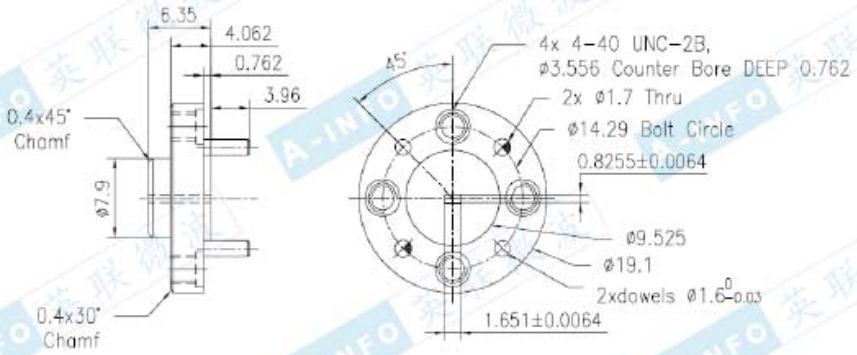
技术指标

频率(GHz)	110.0 - 170.0
增益(dB)	25 典型值
3dB 波束宽度(°)	10 典型值
波导型号	BJ1400(WR6)
材料	铜
输出形式	A 型: UG387/U-M_WR6
尺寸(mm) 宽 x 高 x 长	A 型: 17.5x13.6x41.0
净重(Kg)	A 型: 约 0.02

外形图 (尺寸: mm)



法兰外形图 (尺寸: mm)

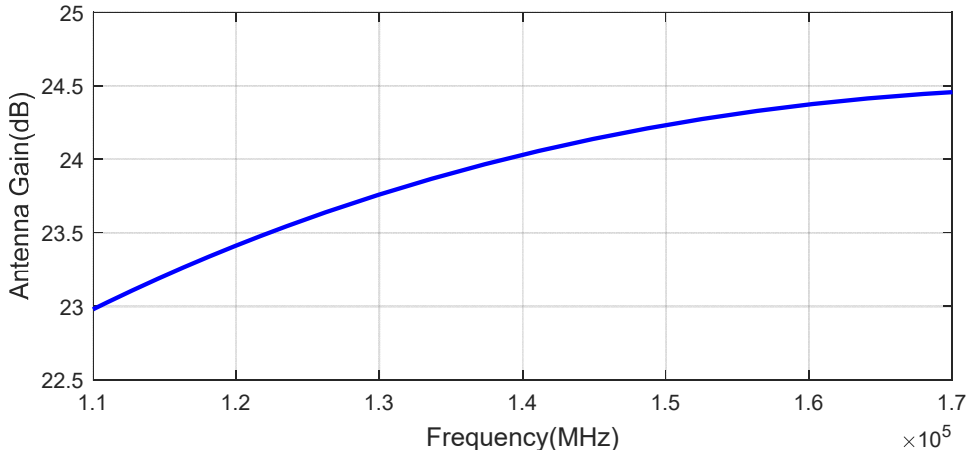


UG387/U-M_WR6

英联微波
电话: 028-8519-2786 或 028-8519-3047 传真: 028-8519-3068 网址: www.ainfoinc.com

测试报告仅供参考。详情请咨询: Sales@ainfoinc.com

©Copyright. All rights reserved by CTTL.



©Copyright. All rights reserved by CTTL.

Standard Gain Horn Antenna （170GHz-200GHz）	LB-5-25-A	J2020676 30	A-INFO	2024-01-27	3 year

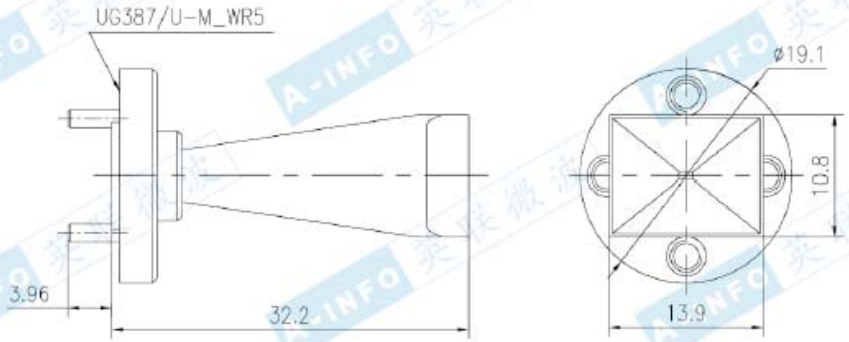
A-INFO 英联微波

LB-5-25
140.0 - 220.0GHz 标准增益喇叭天线

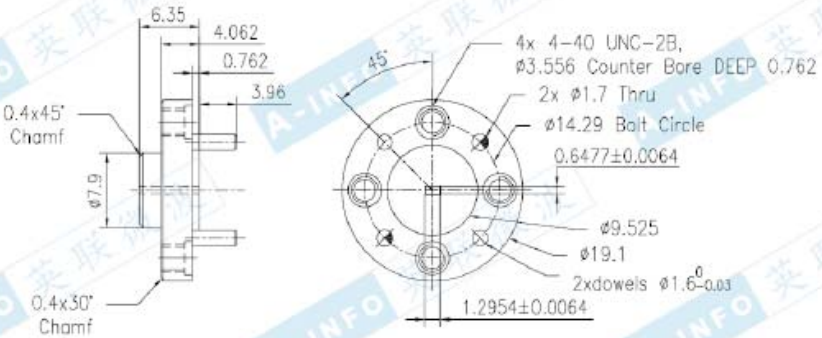
技术指标

频率(GHz)	140.0 - 220.0
增益(dB)	25 典型值
3dB 波束宽度(°)	10 典型值
波导型号	BJ1800(WR5)
材料	铜
输出形式	A 型: UG387/U-M_WR5
尺寸(mm) 宽 x 高 x 长	A 型:13.9x10.8x32.2
净重(Kg)	A 型: 约 0.015

外形图 (尺寸: mm)



法兰外形图 (尺寸: mm)

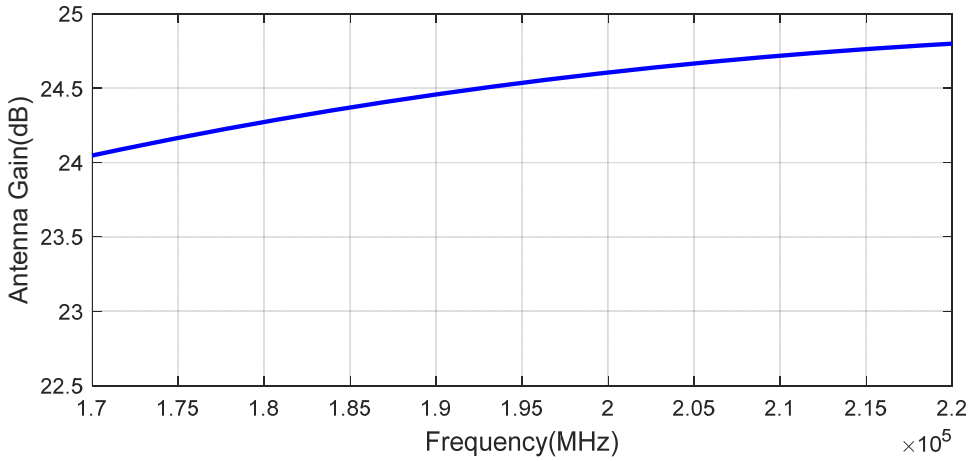


UG387/U-M_WR5

英联微波
电话: 028-8519-2786 或 028-8519-3047 传真: 028-8519-3068 网址: www.ainfoinc.com

测试报告仅供参考。详情请咨询: Sales@ainfoinc.com

©Copyright. All rights reserved by CTTL.



©Copyright. All rights reserved by CTTL.

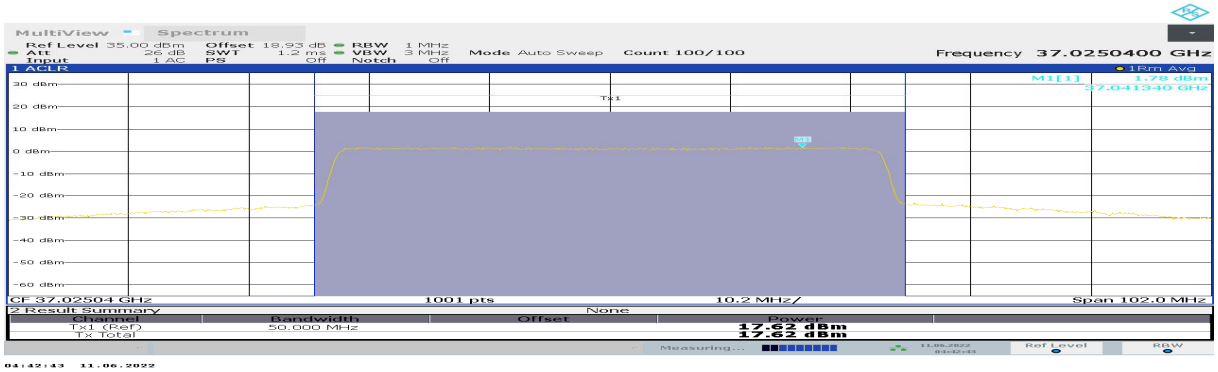
Annex D: Measurement Plots

D.1 Radiated Output Power Plots

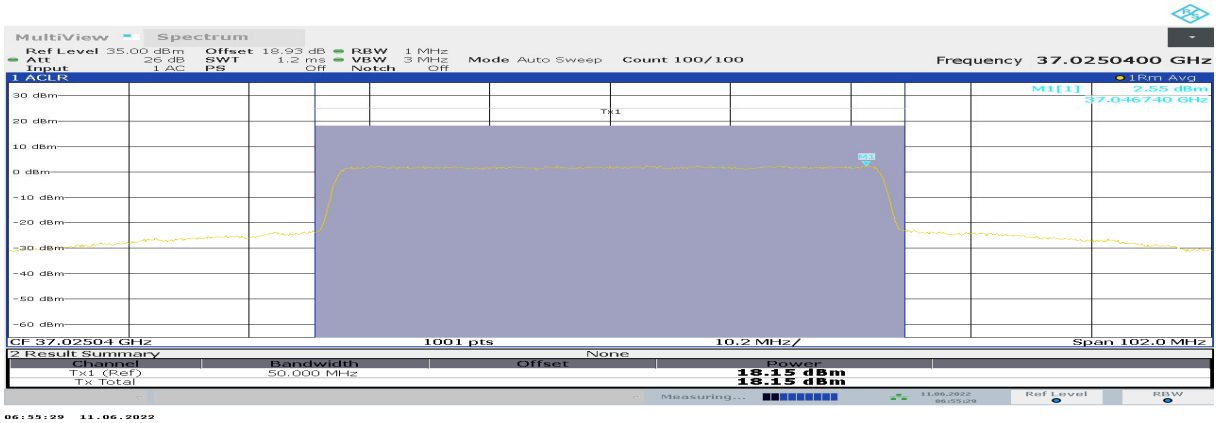
n260, Module0, SCS=120kHz, CP-OFDM					
Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
50MHz	100% RB	37025.04	17.62	18.15	15.04

n260, Module0, 50MHz Bandwidth, 100% RB, Low CHANNEL

QPSK

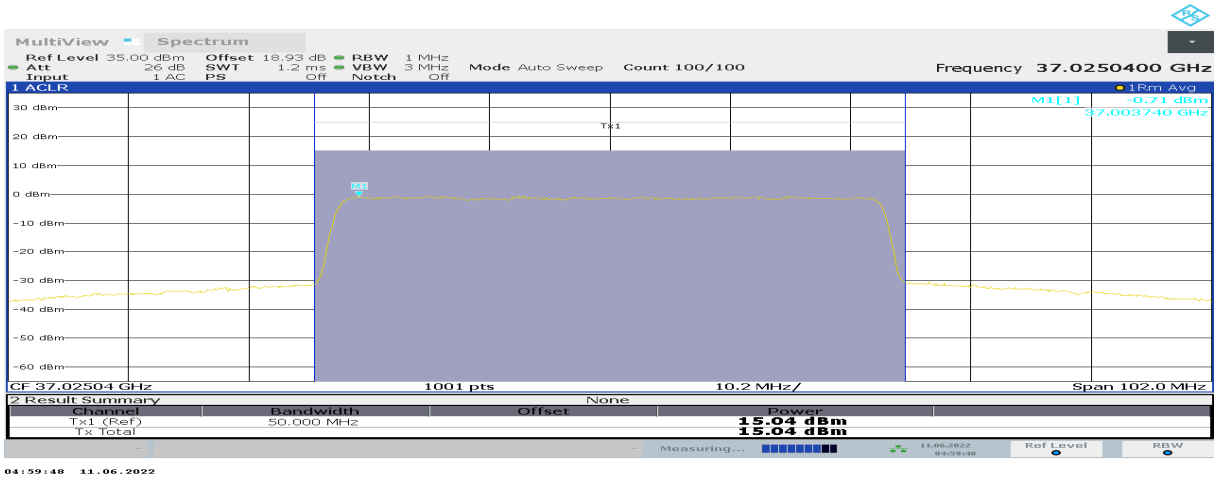


16QAM



64QAM

©Copyright. All rights reserved by CTTL.

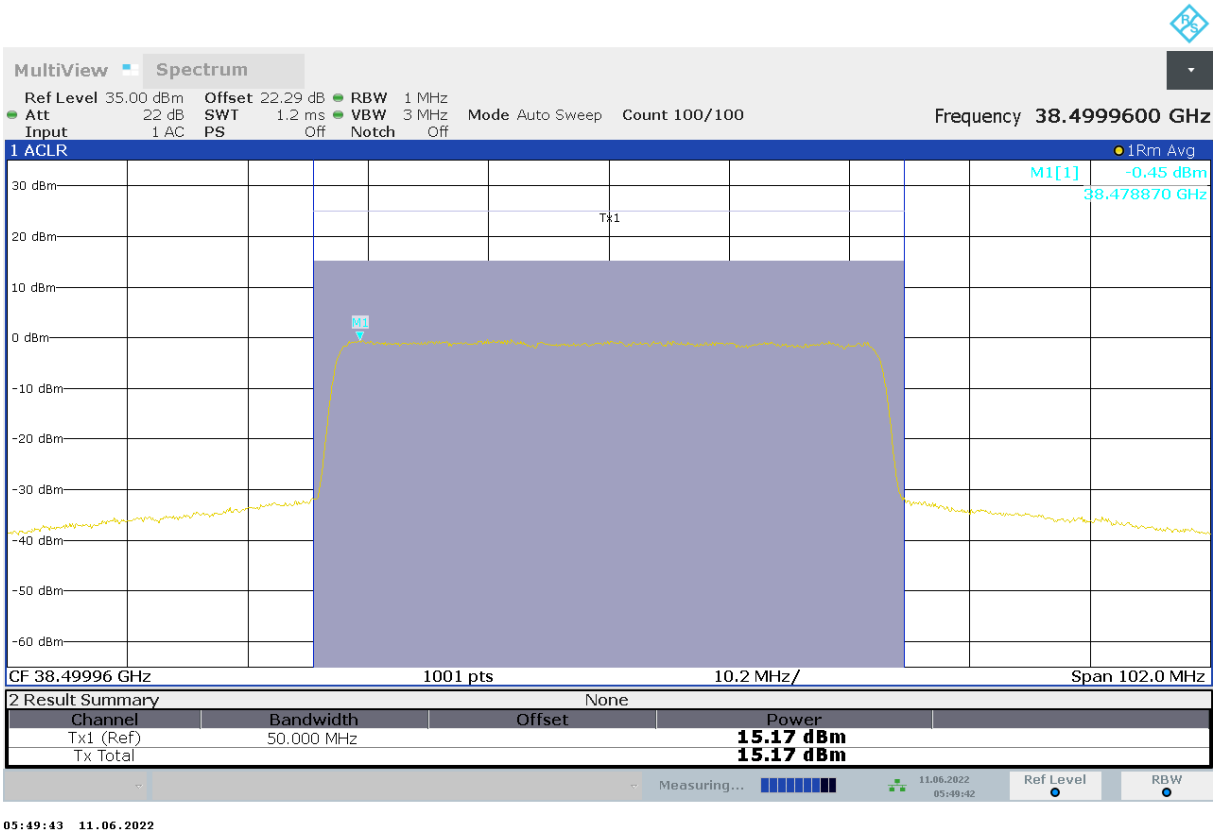


04:59:48 11.06.2022

©Copyright. All rights reserved by CTTL.

n260, Module0, SCS=120kHz, CP-OFDM					
Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
50MHz	100% RB	38499.96	/	15.17	/

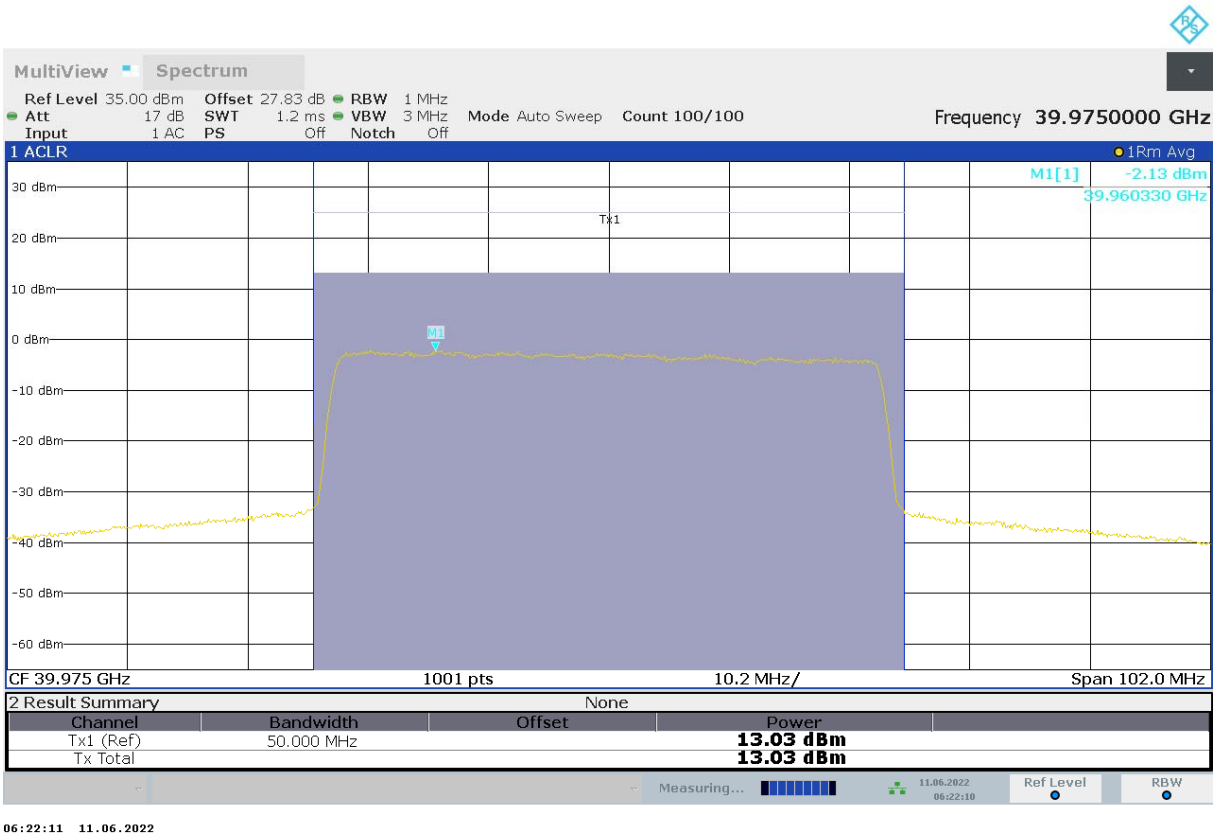
n260, Module0, 50MHz Bandwidth, 100% RB, Mid CHANNEL, 16QAM



©Copyright. All rights reserved by CTTL.

n260, Module0, SCS=120kHz, CP-OFDM					
Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
50MHz	100% RB	39975	/	13.03	/

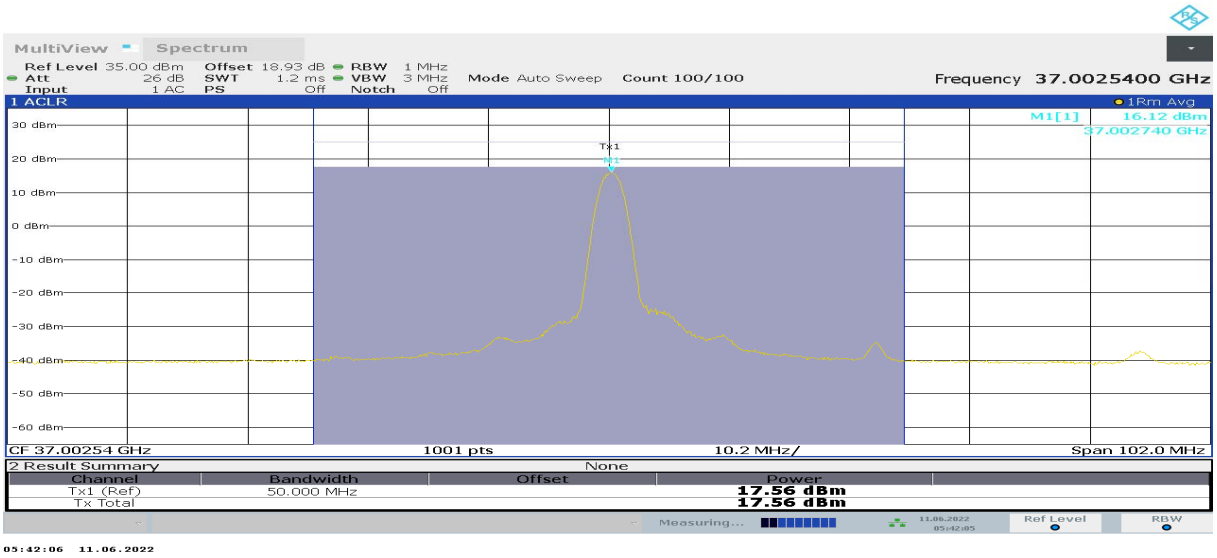
n260, Module0, 50MHz Bandwidth, 100% RB, HIGH CHANNEL, 16QAM



©Copyright. All rights reserved by CTTL.

n260, Module0, SCS=120kHz, CP-OFDM					
Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
50MHz	1 RB	37025.04	/	17.56	/

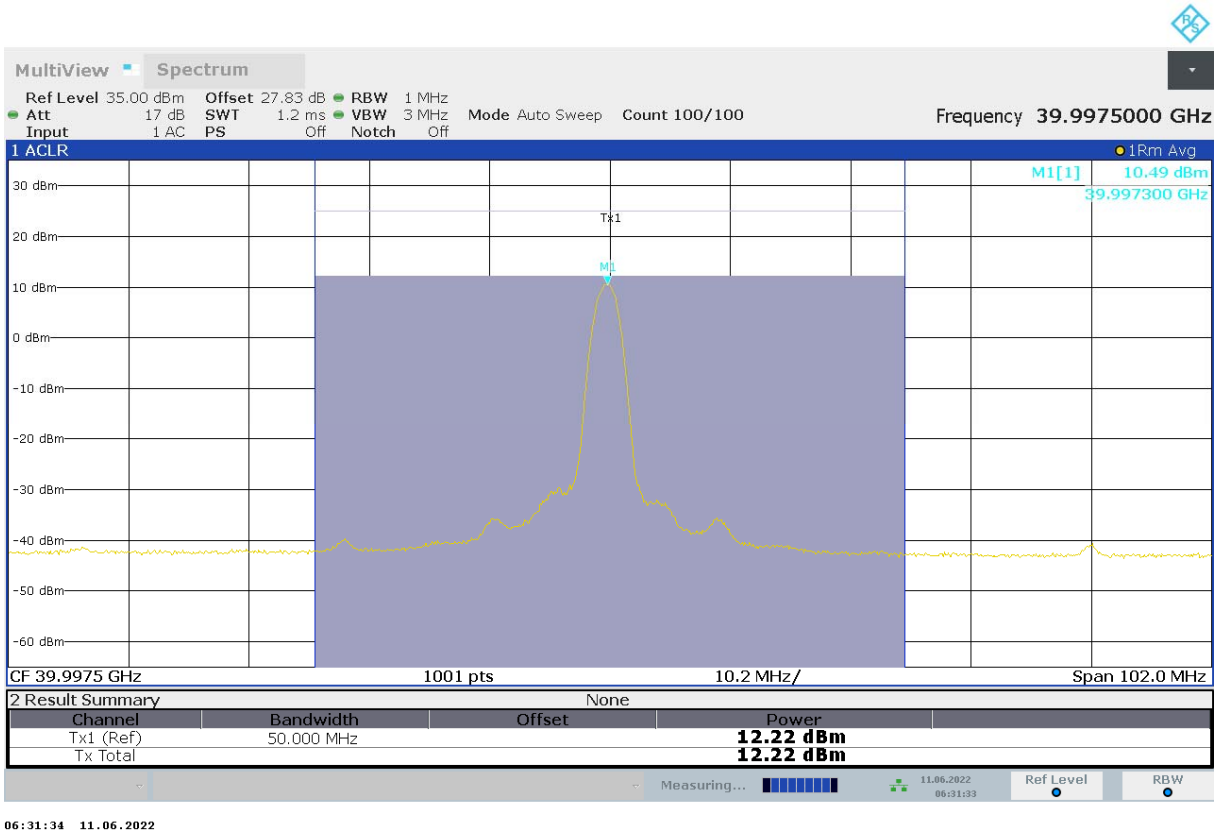
n260, Module0, 50MHz Bandwidth, 1RB, LOW CHANNEL, 16QAM



©Copyright. All rights reserved by CTTL.

n260, Module0, SCS=120kHz, CP-OFDM					
Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
50MHz	1 RB	39975	/	12.22	/

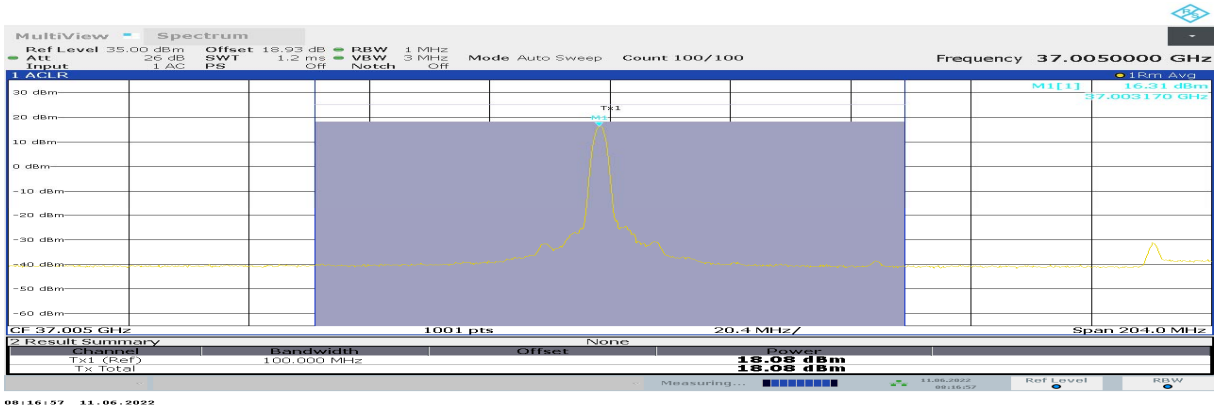
n260, Module0, 50MHz Bandwidth, 1 RB, HIGH CHANNEL, 16QAM



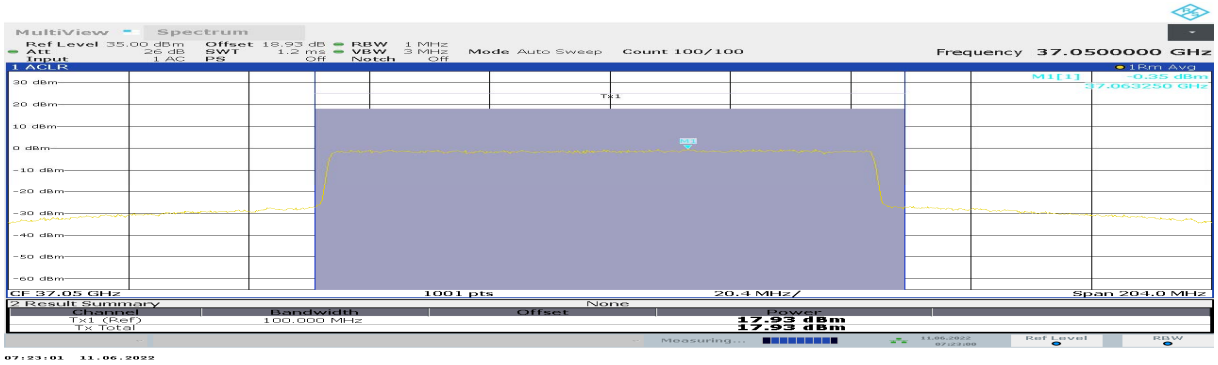
©Copyright. All rights reserved by CTTL.

n260, Module0, SCS=120kHz, CP-OFDM					
Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
100MHz	100% RB	37050	18.04	17.93	15.52

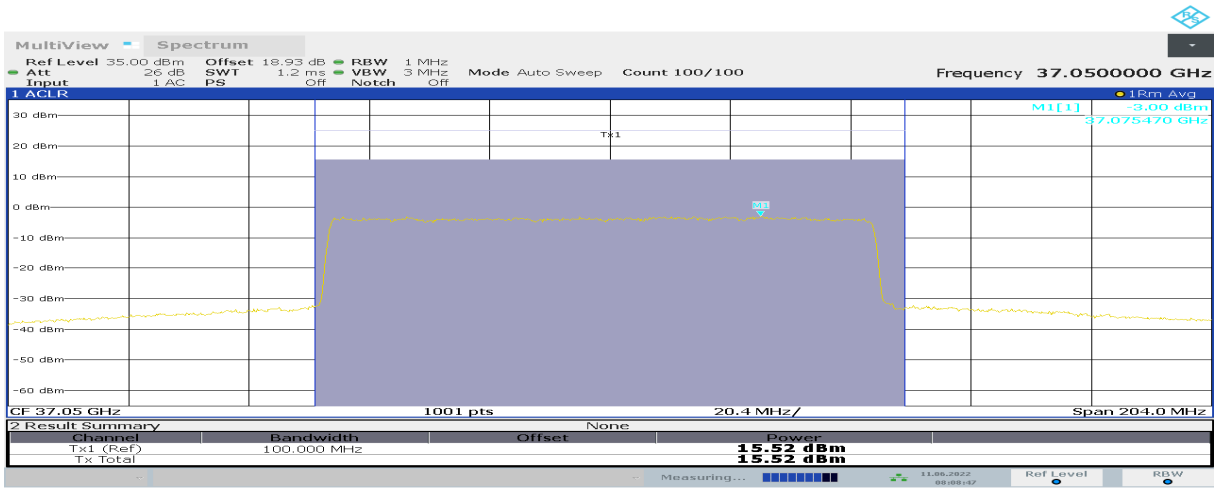
n260, Module0, 100MHz Bandwidth, 100% RB, LOW CHANNEL, QPSK



n260, Module0, 100MHz Bandwidth, 100% RB, LOW CHANNEL, 16QAM



n260, Module0, 100MHz Bandwidth, 100% RB, LOW CHANNEL, 64QAM



©Copyright. All rights reserved by CTTL.

n260, Module0, SCS=120kHz, CP-OFDM					
Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
100MHz	100% RB	38499.96	14.88	/	/

n260, Module0, 100MHz Bandwidth, 100% RB, MID CHANNEL, QPSK

©Copyright. All rights reserved by CTTL.

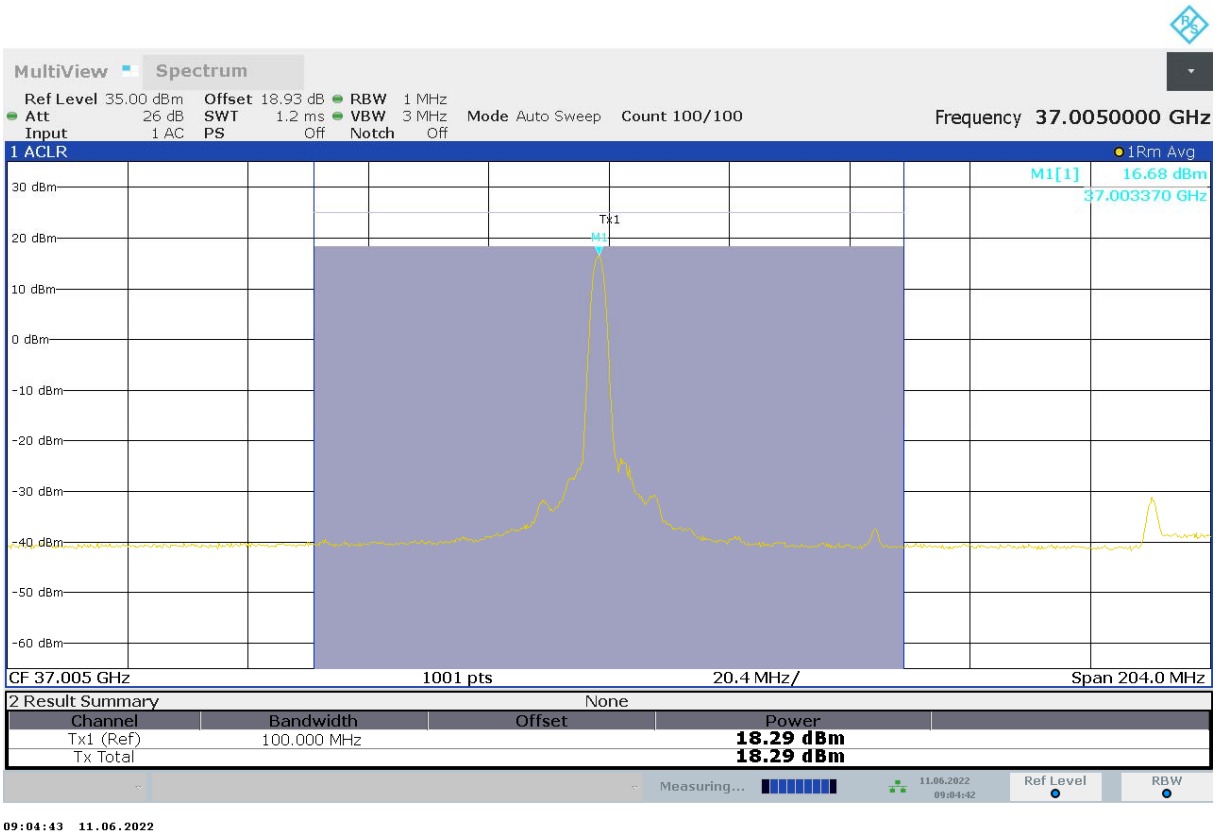
n260, Module0, SCS=120kHz, CP-OFDM					
Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
100MHz	100% RB	39949.92	13.98	/	/

n260, Module0, 100MHz Bandwidth, 100% RB, HIGH CHANNEL, QPSK

©Copyright. All rights reserved by CTTL.

n260, Module0, SCS=120kHz, CP-OFDM					
Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
100MHz	1 RB	37050	18.29	/	/

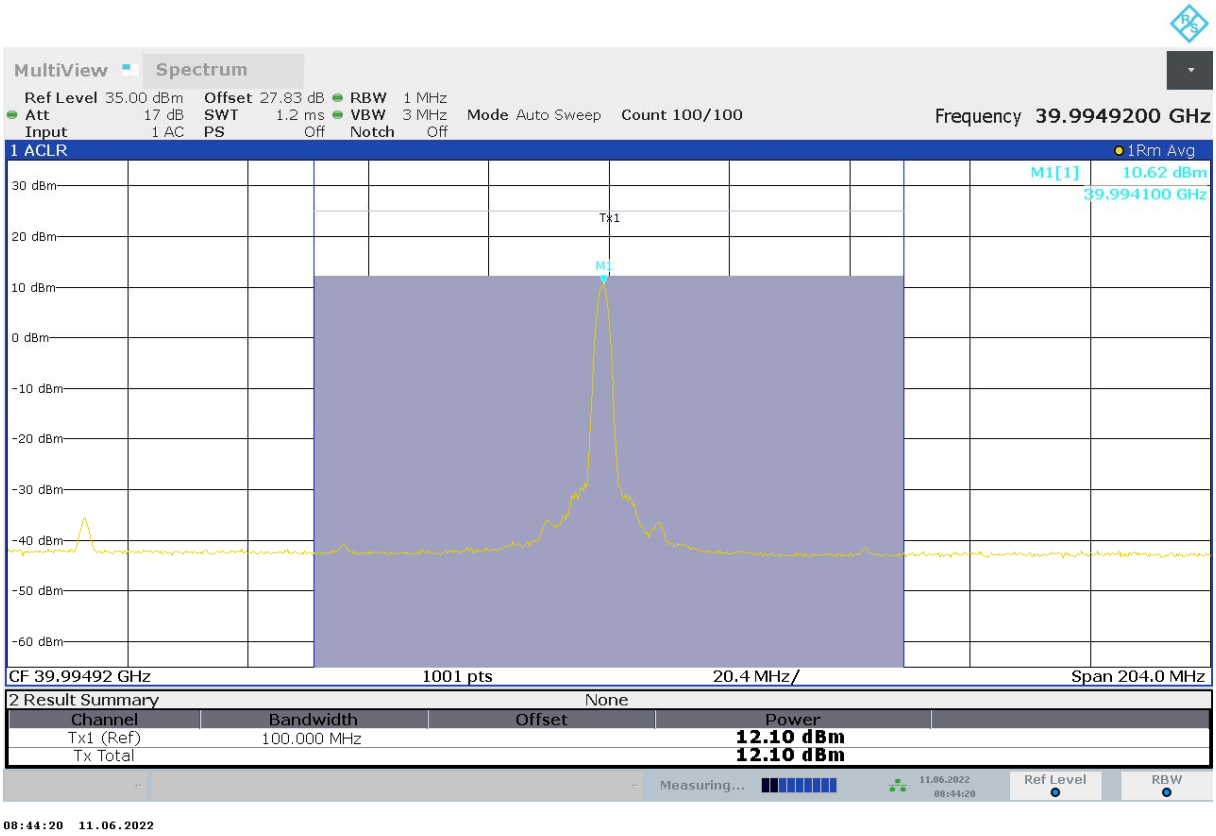
n260, Module0, 100MHz Bandwidth, 1RB, LOW CHANNEL, QPSK



©Copyright. All rights reserved by CTTL.

n260, Module0, SCS=120kHz, CP-OFDM					
Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
100MHz	1 RB	39949.92	12.10	/	/

n260, Module0, 100MHz Bandwidth, 1 RB, HIGH CHANNEL, QPSK

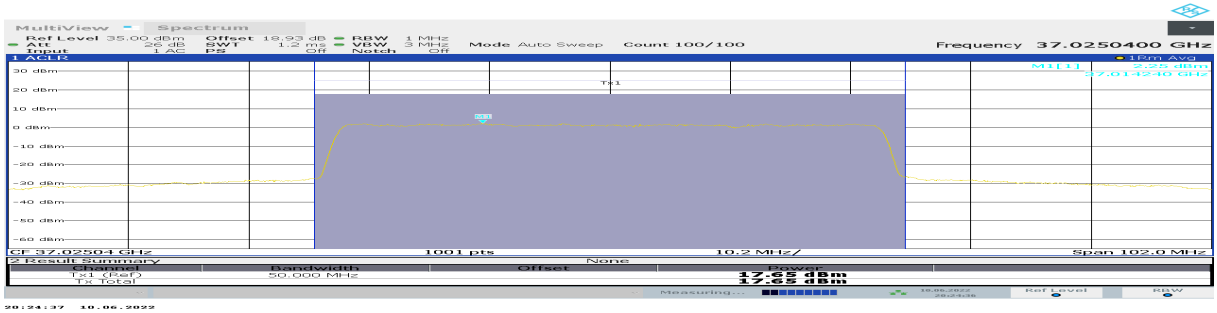


©Copyright. All rights reserved by CTTL.

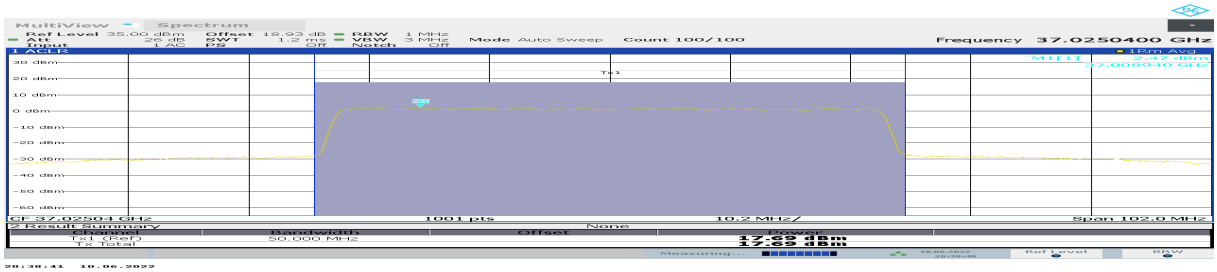
n260, Module0, SCS=120kHz,PUSCH DFT						
Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)			
			PI/2 BPSK	QPSK	16QAM	64QAM
50MHz	100% RB	37025.04	17.67	17.65	17.69	17.58

n260, Module0, 50MHz Bandwidth, 100% RB, LOW CHANNEL, PI/2 BPSK

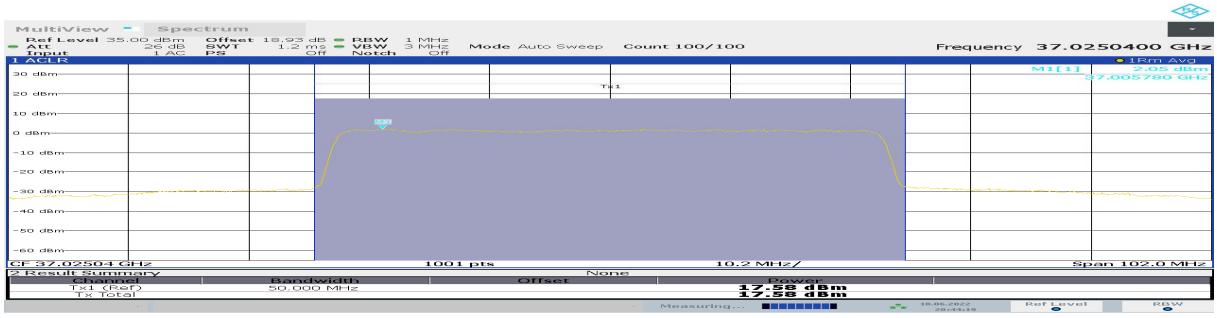
n260, Module0, 50MHz Bandwidth, 100% RB, LOW CHANNEL, QPSK



n260, Module0, 50MHz Bandwidth, 100% RB, LOW CHANNEL, 16QAM



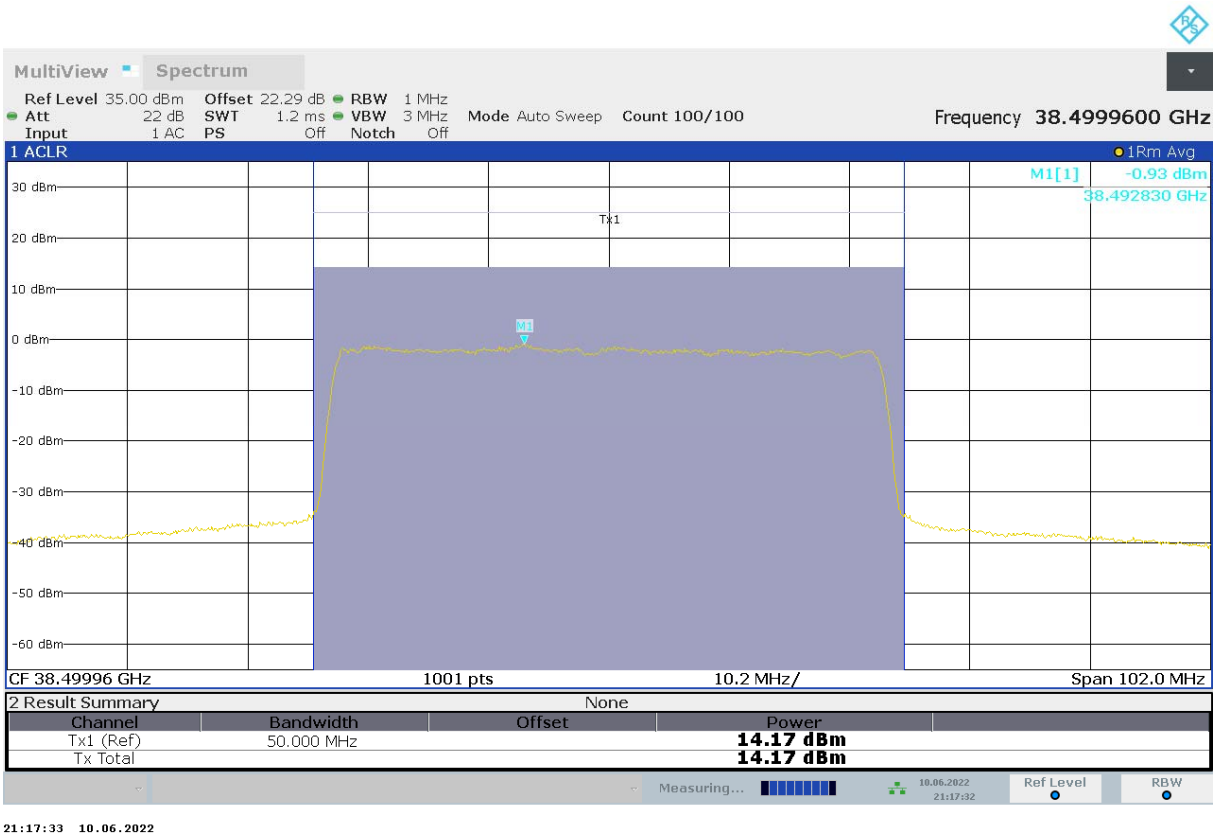
n260, Module0, 50MHz Bandwidth, 100% RB, LOW CHANNEL, 64QAM



©Copyright. All rights reserved by CTTL.

n260, Module0, SCS=120kHz,PUSCH DFT						
Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)			
			PI/2 BPSK	QPSK	16QAM	64QAM
50MHz	100% RB	38499.96	/	/	14.17	/

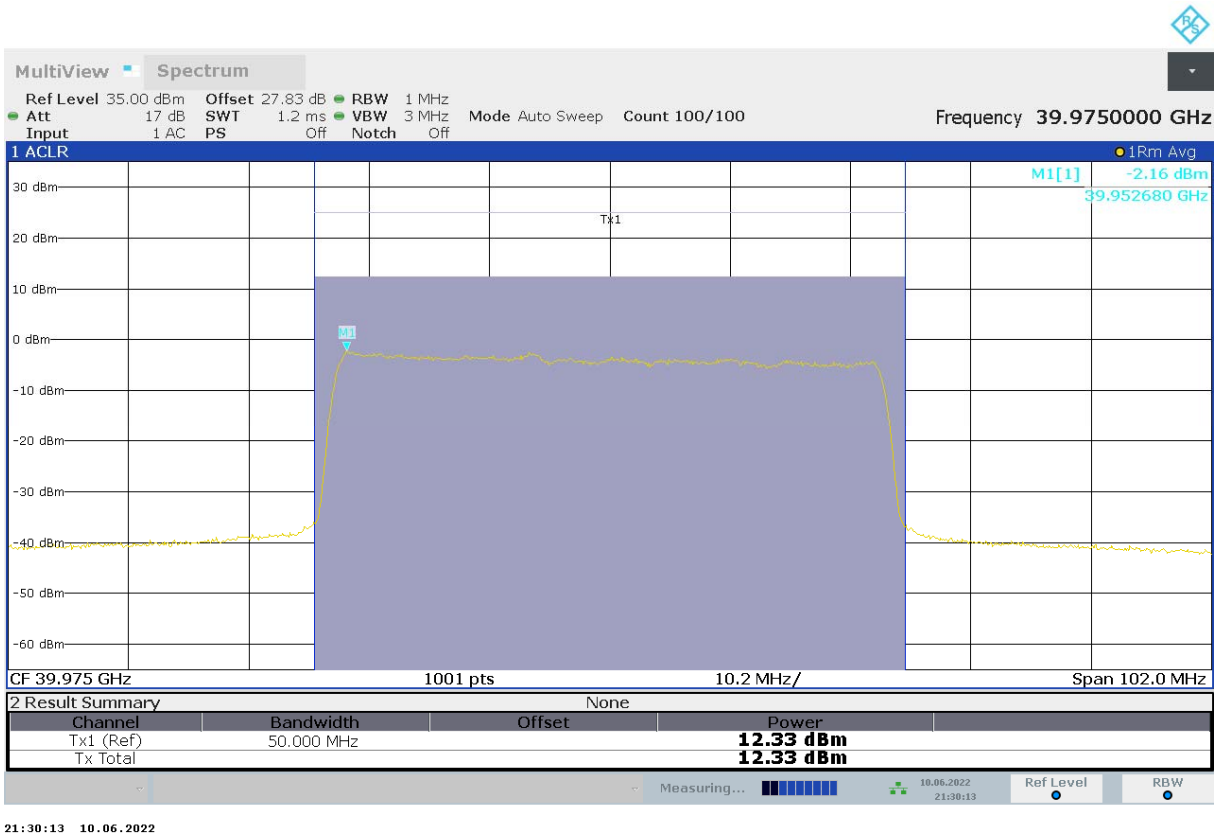
n260, Module0, 50MHz Bandwidth, 100% RB, MID CHANNEL, 16QAM



©Copyright. All rights reserved by CTTL.

n260, Module0, SCS=120kHz,PUSCH DFT						
Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)			
			PI/2 BPSK	QPSK	16QAM	64QAM
50MHz	100% RB	39975	/	/	12.33	/

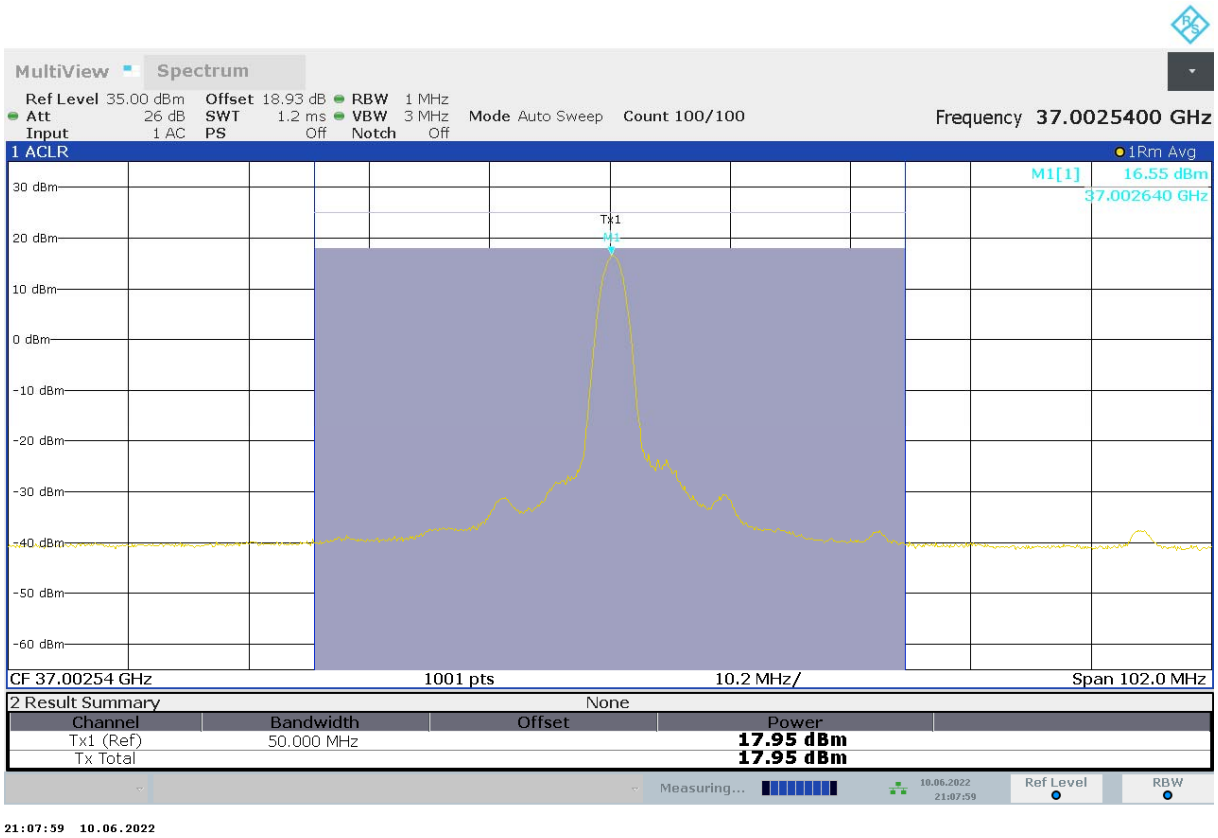
n260, Module0, 50MHz Bandwidth, 100% RB, HIGH CHANNEL, 16QAM



©Copyright. All rights reserved by CTTL.

n260, Module0, SCS=120kHz,PUSCH DFT						
Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)			
			PI/2 BPSK	QPSK	16QAM	64QAM
50MHz	1 RB	37025.04	/	/	17.95	/

n260, Module0, 50MHz Bandwidth, 100% RB, LOW CHANNEL, 16QAM

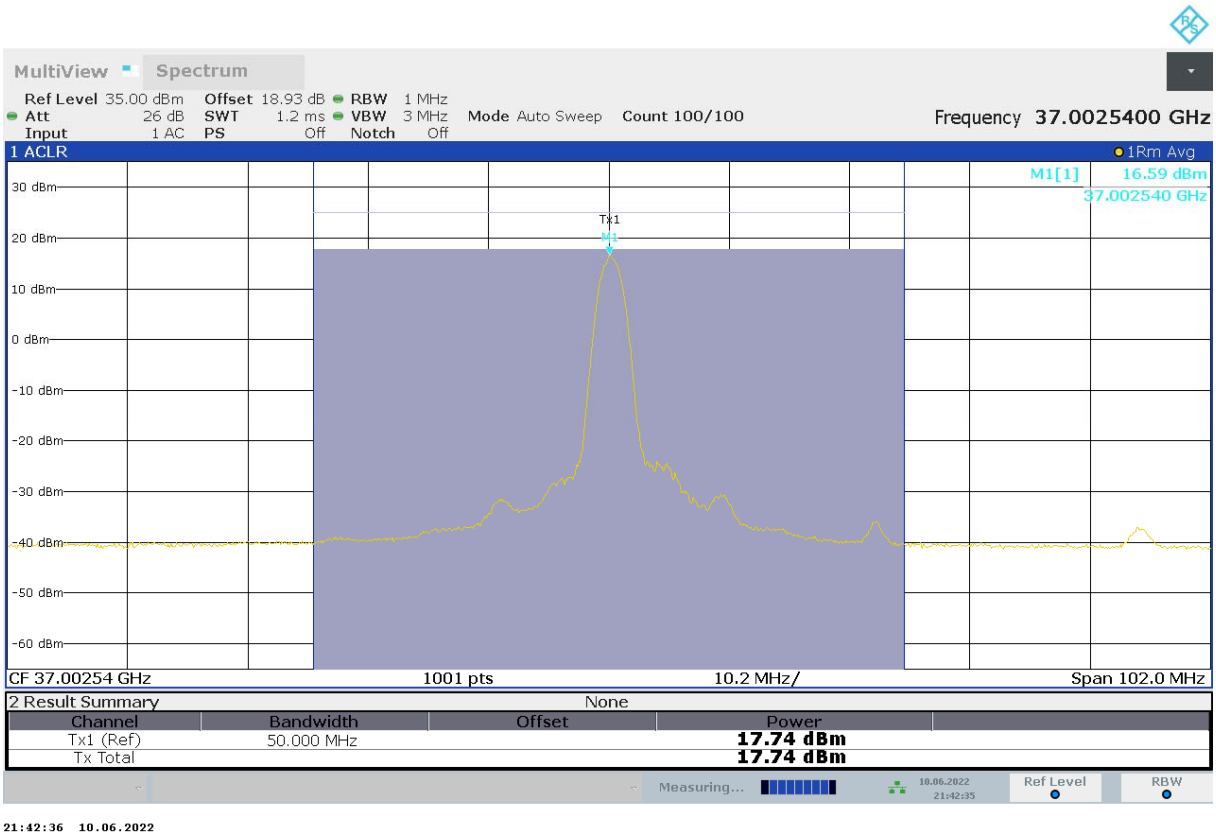


21:07:59 10.06.2022

©Copyright. All rights reserved by CTTL.

n260, Module0, SCS=120kHz,PUSCH DFT						
Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)			
			PI/2 BPSK	QPSK	16QAM	64QAM
50MHz	1 RB	39975	/	/	17.74	/

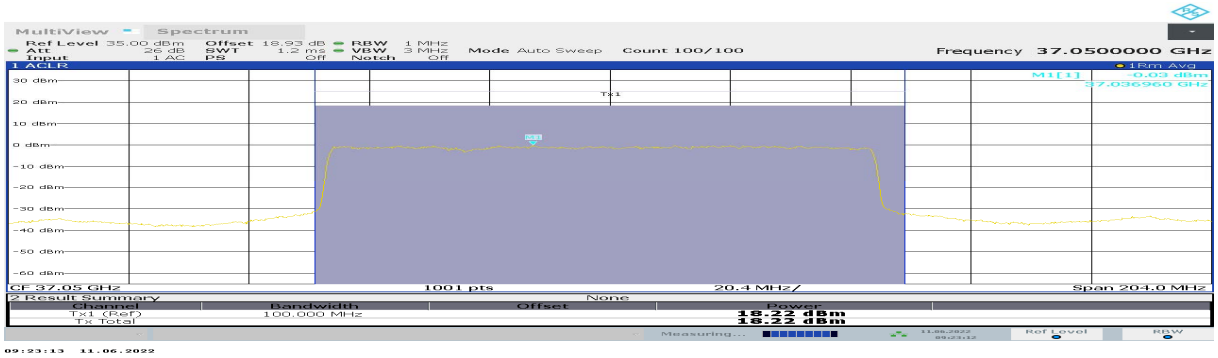
n260, Module0, 50MHz Bandwidth, 100% RB, HIGH CHANNEL, 16QAM



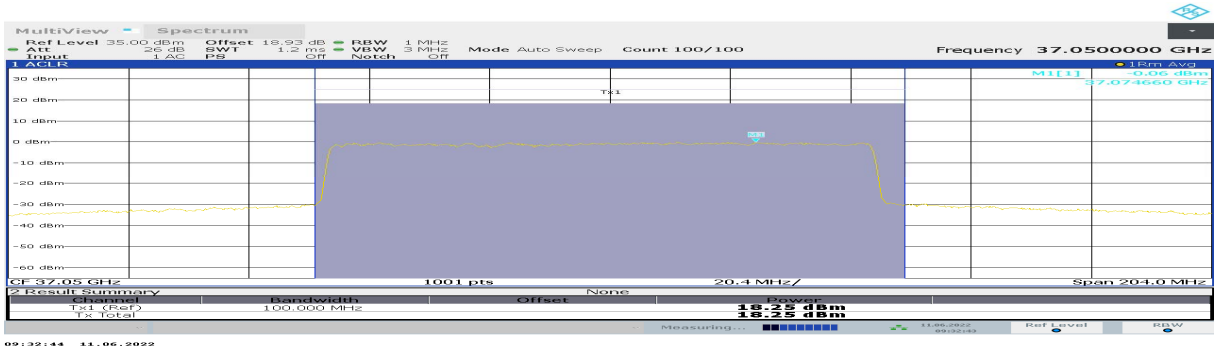
©Copyright. All rights reserved by CTTL.

n260, Module0, SCS=120kHz,PUSCH DFT						
Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)			
			PI/2 BPSK	QPSK	16QAM	64QAM
100MHz	100% RB	37050	18.22	18.25	17.99	18.06

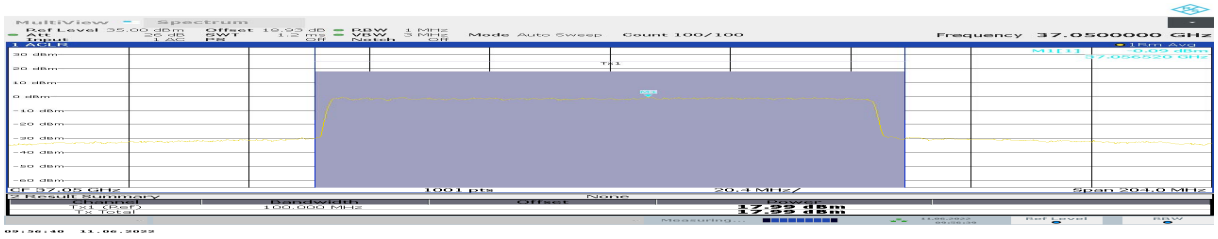
n260, Module0, 100MHz Bandwidth, 100% RB, LOW CHANNEL, PI/2 PSK



n260, Module0, 100MHz Bandwidth, 100% RB, LOW CHANNEL, QPSK



n260, Module0, 100MHz Bandwidth, 100% RB, LOW CHANNEL, 16QAM

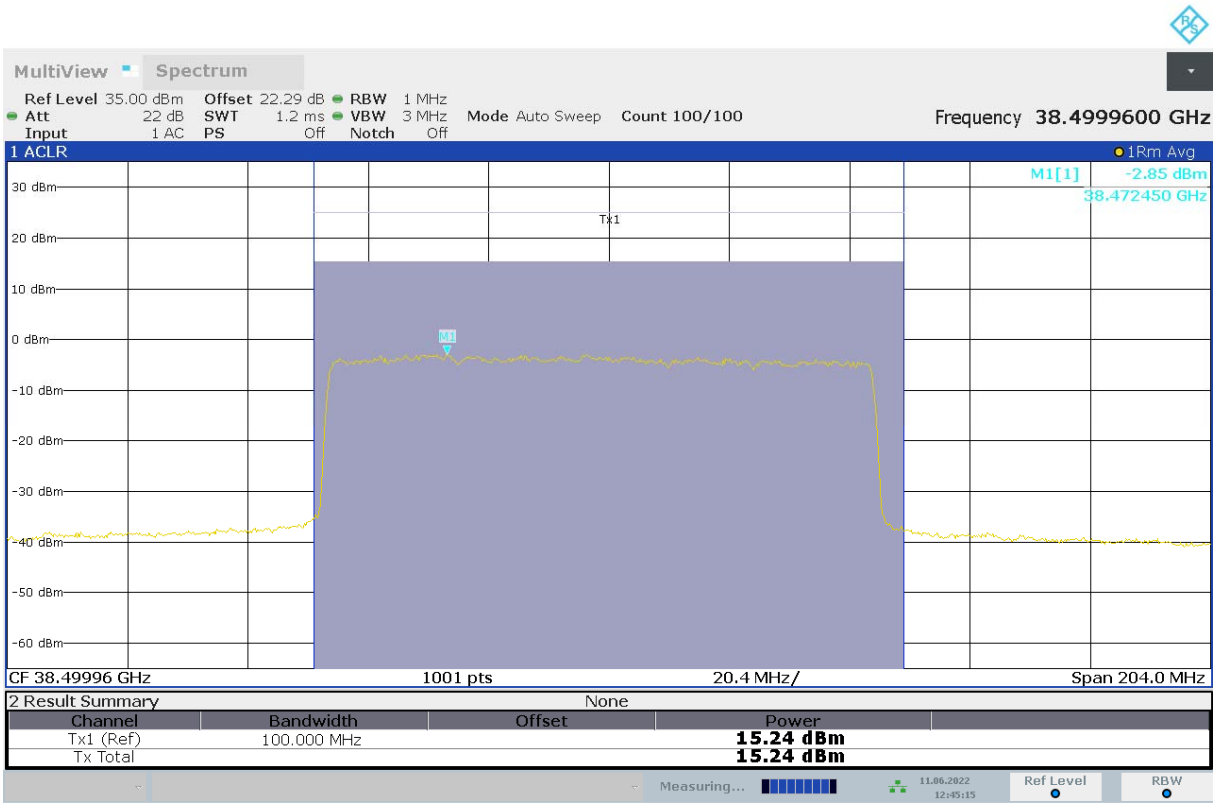


n260, Module0, 100MHz Bandwidth, 100% RB, LOW CHANNEL, 64QAM

©Copyright. All rights reserved by CTTL.

n260, Module0, SCS=120kHz,PUSCH DFT						
Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)			
			PI/2 BPSK	QPSK	16QAM	64QAM
100MHz	100% RB	38499.96	/	15.24	/	/

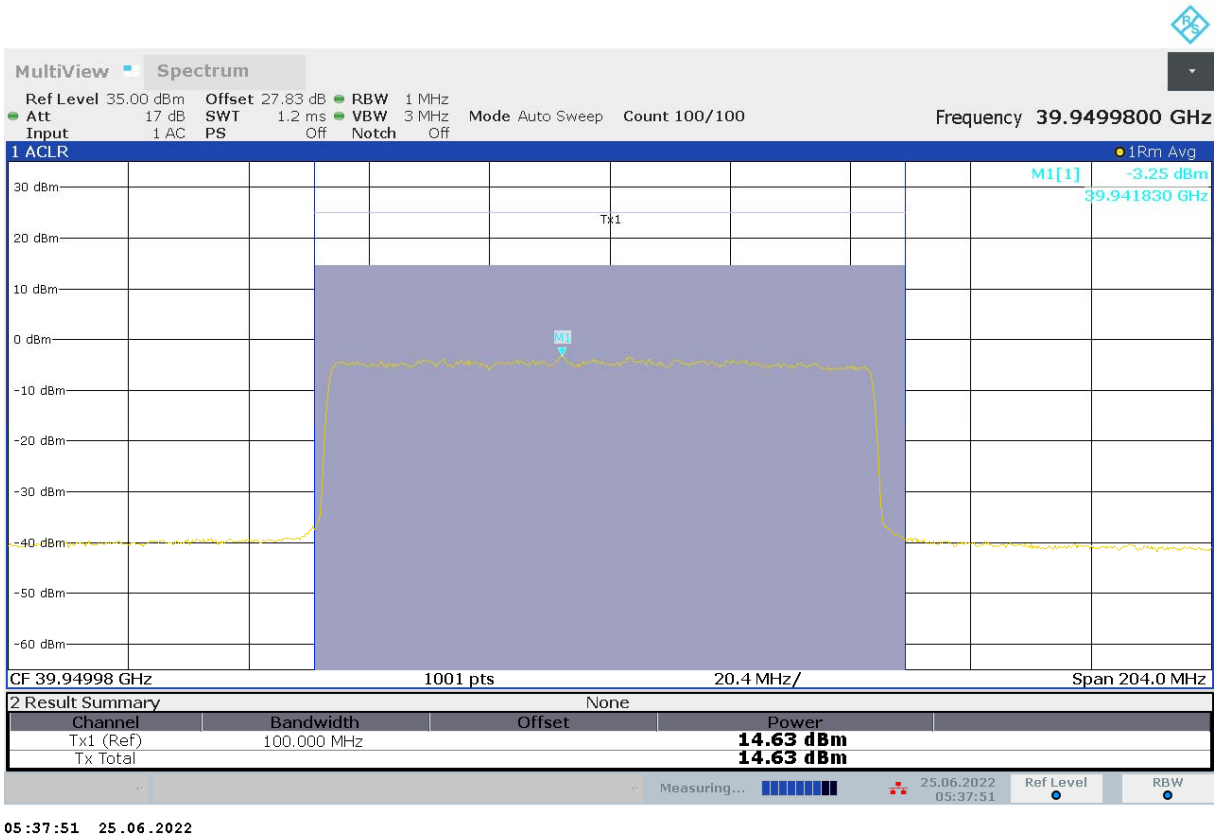
n260, Module0, 100MHz Bandwidth, 100% RB, LOW CHANNEL, QPSK



©Copyright. All rights reserved by CTTL.

n260, Module0, SCS=120kHz,PUSCH DFT						
Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)			
			PI/2 BPSK	QPSK	16QAM	64QAM
100MHz	100% RB	39949.92	/	14.63	/	/

n260, Module0, 100MHz Bandwidth, 100% RB, HIGH CHANNEL, QPSK

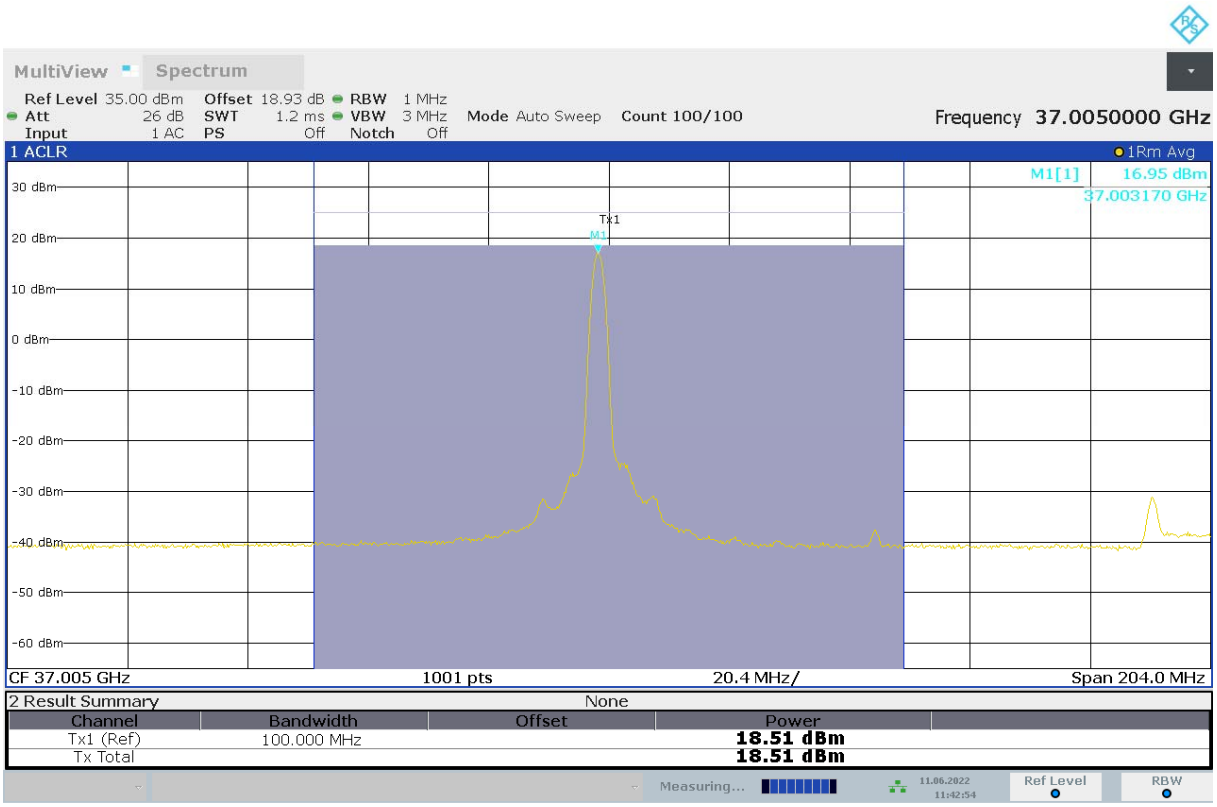


05:37:51 25.06.2022

©Copyright. All rights reserved by CTTL.

n260, Module0, SCS=120kHz,PUSCH DFT						
Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)			
			PI/2 BPSK	QPSK	16QAM	64QAM
100MHz	1 RB	37050	/	18.51	/	/

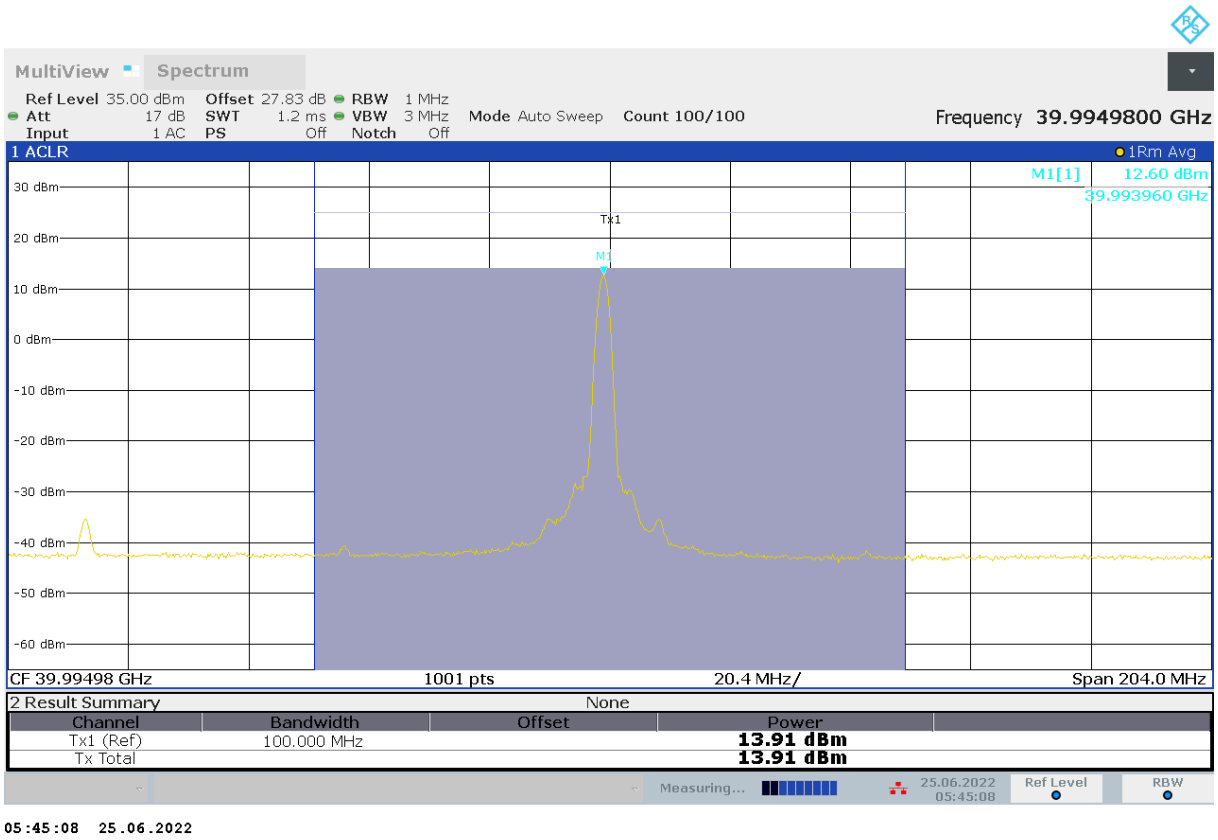
n260, Module0, 100MHz Bandwidth, 1 RB, LOW CHANNEL, QPSK



©Copyright. All rights reserved by CTTL.

n260, Module0, SCS=120kHz,PUSCH DFT						
Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)			
			PI/2 BPSK	QPSK	16QAM	64QAM
100MHz	1 RB	39949.92	/	13.91	/	/

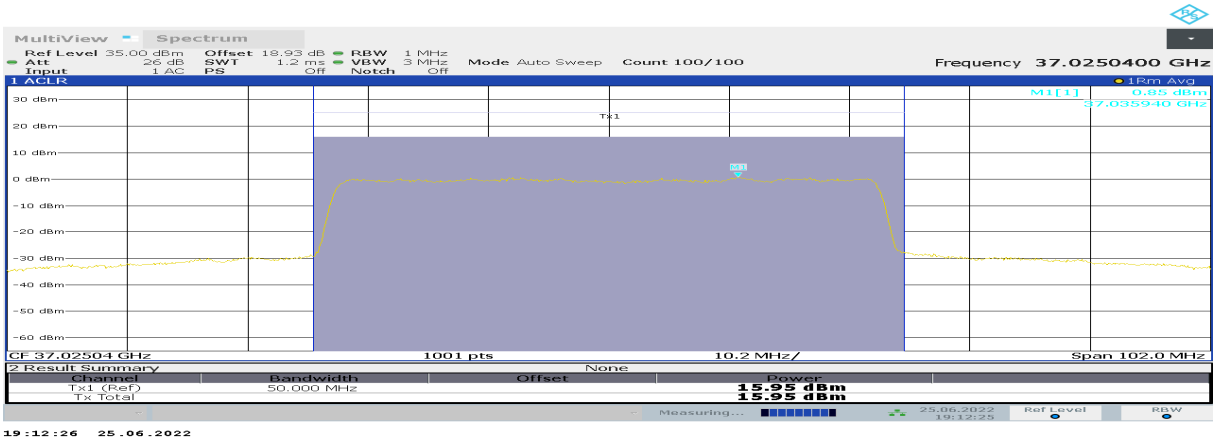
n260, Module0, 100MHz Bandwidth, 1 RB, HIGH CHANNEL, QPSK



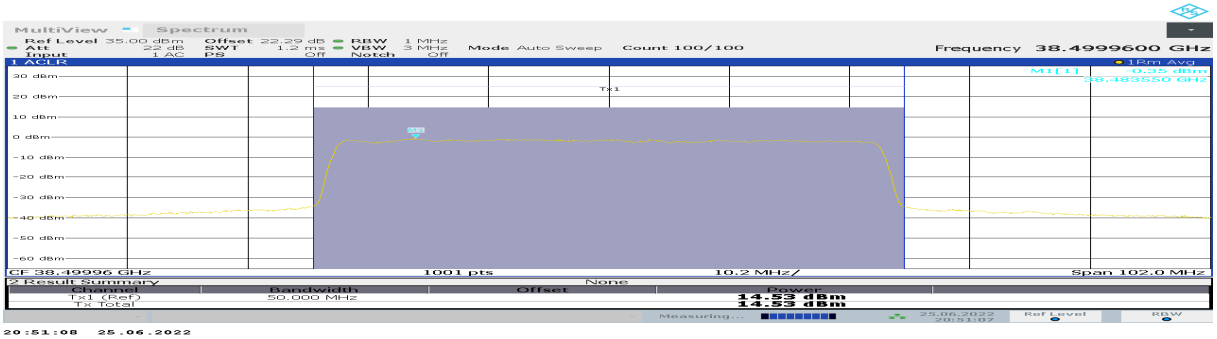
©Copyright. All rights reserved by CTTL.

n260, Module1, SCS=120kHz,PUSCH DFT						
Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)			
			PI/2 BPSK	QPSK	16QAM	64QAM
50MHz	100% RB	37025.04	/	15.95	/	/
		38499.96	/	14.53	/	/
		39975	/	12.67	/	/

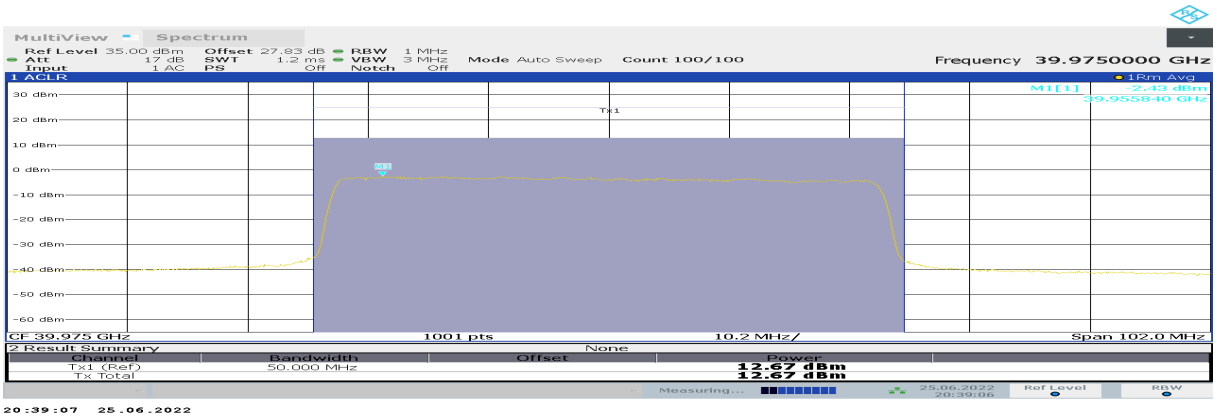
n260, Module1, 50MHz Bandwidth, 100% RB, LOW CHANNEL, QPSK



n260, Module1, 50MHz Bandwidth, 100% RB, MID CHANNEL, QPSK



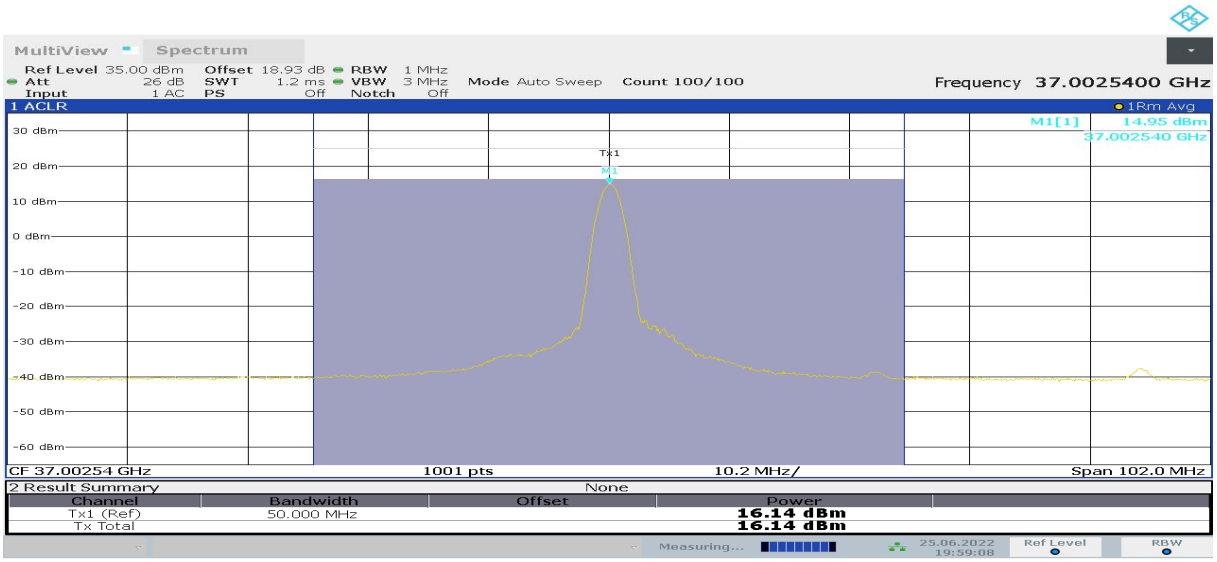
n260, Module1, 50MHz Bandwidth, 100% RB, HIGH CHANNEL, QPSK



©Copyright. All rights reserved by CTTL.

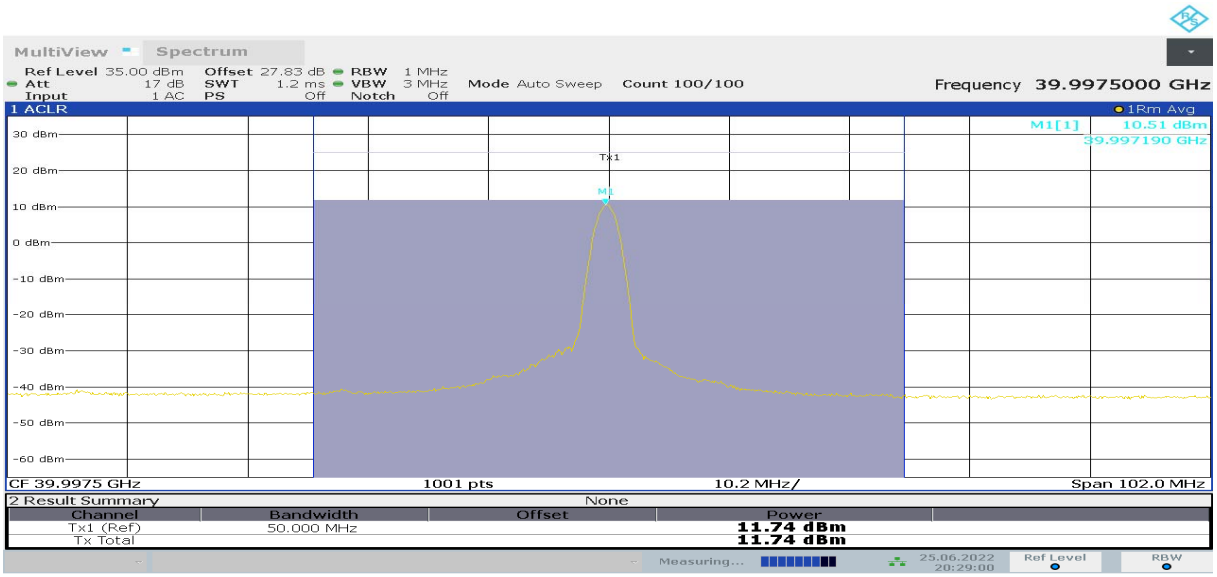
n260, Module1, SCS=120kHz,PUSCH DFT						
Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)			
			PI/2 BPSK	QPSK	16QAM	64QAM
50MHz	1 RB	37025.04	/	16.14	/	/
		39975	/	11.74	/	/

n260, Module1, 50MHz Bandwidth, 1 RB, LOW CHANNEL, QPSK



19:59:09 25.06.2022

n260, Module1, 50MHz Bandwidth, 1 RB, HIGH CHANNEL, QPSK

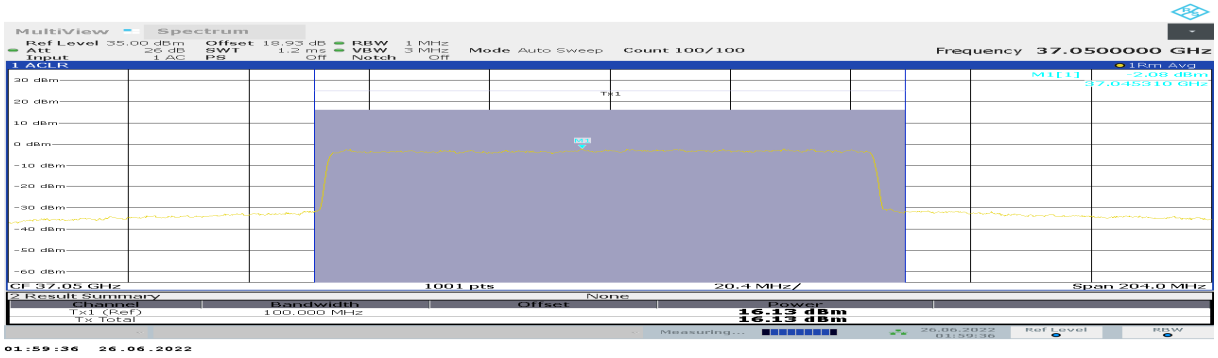


20:29:01 25.06.2022

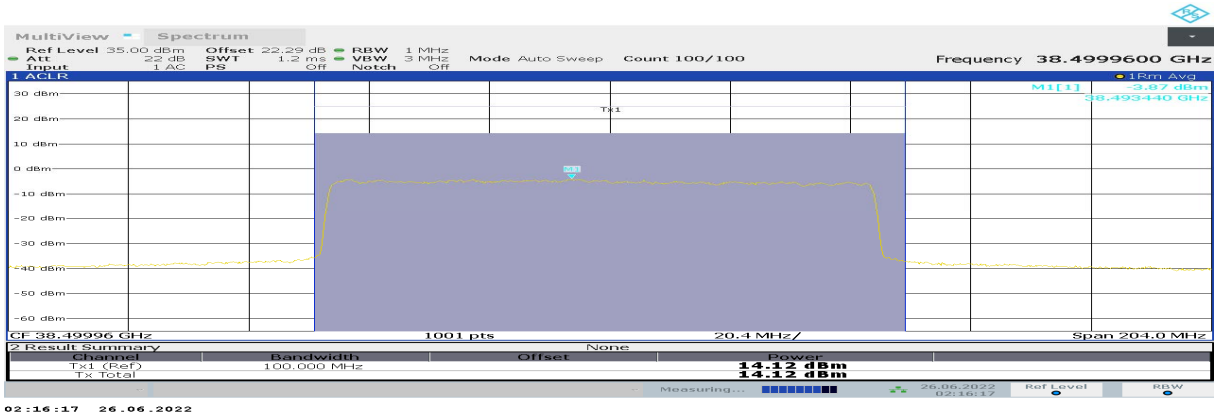
©Copyright. All rights reserved by CTTL.

n260, Module1, SCS=120kHz,PUSCH DFT						
Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)			
			PI/2 BPSK	QPSK	16QAM	64QAM
100MHz	100% RB	37050	/	16.13	/	/
		38499.96	/	14.12	/	/
		39949.92	/	13.15	/	/

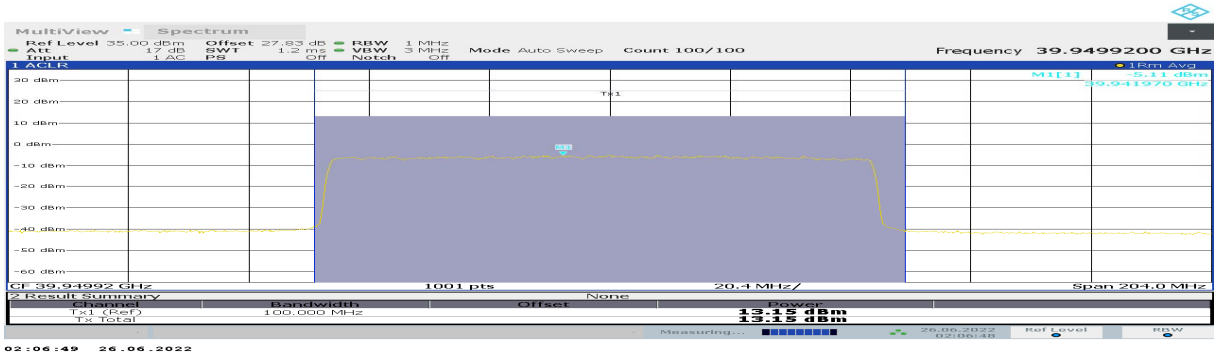
n260, Module1, 100MHz Bandwidth, 100% RB, LOW CHANNEL, QPSK



n260, Module1, 100MHz Bandwidth, 100% RB, MID CHANNEL, QPSK



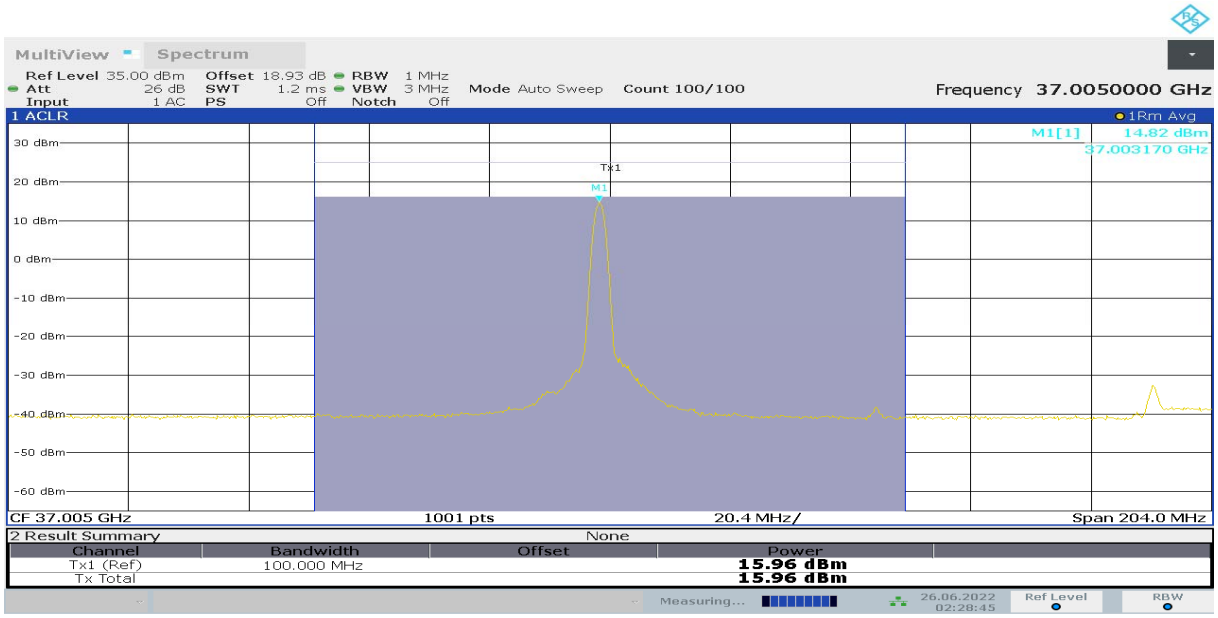
n260, Module1, 100MHz Bandwidth, 100% RB, HIGH CHANNEL, QPSK



©Copyright. All rights reserved by CTTL.

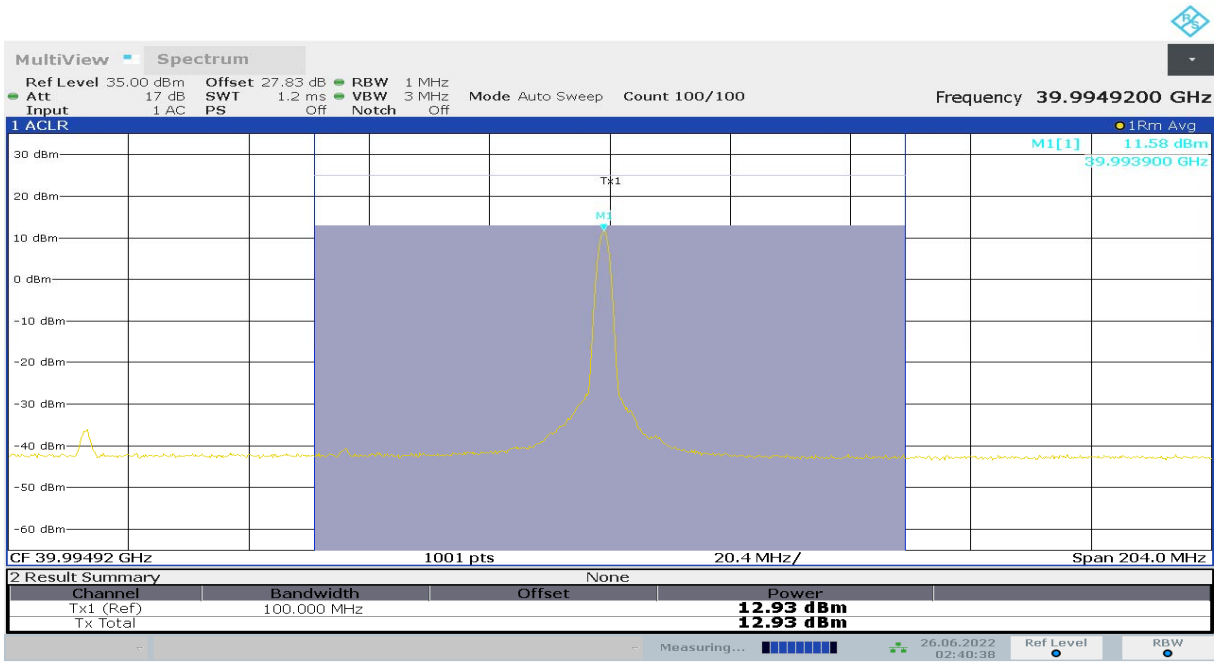
n260, Module1, SCS=120kHz,PUSCH DFT						
Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)			
			PI/2 BPSK	QPSK	16QAM	64QAM
100MHz	1 RB	37050	/	15.96	/	/
		39949.92	/	12.93	/	/

n260, Module1, 100MHz Bandwidth, 1 RB, LOW CHANNEL, QPSK



02:28:46 26.06.2022

n260, Module1, 100MHz Bandwidth, 1 RB, HIGH CHANNEL, QPSK

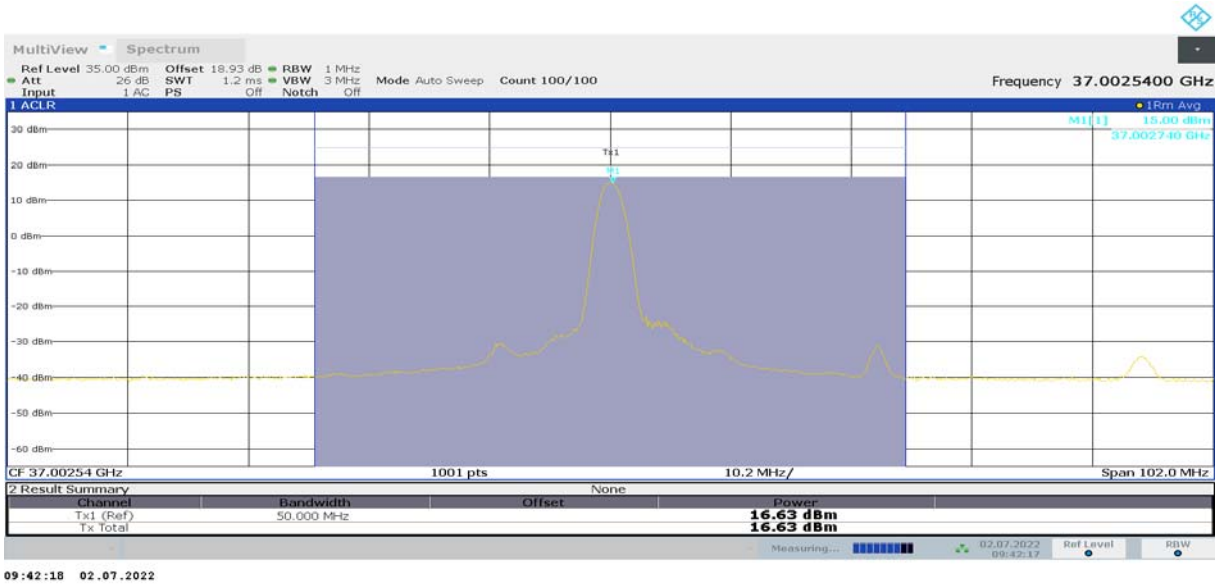


02:40:39 26.06.2022

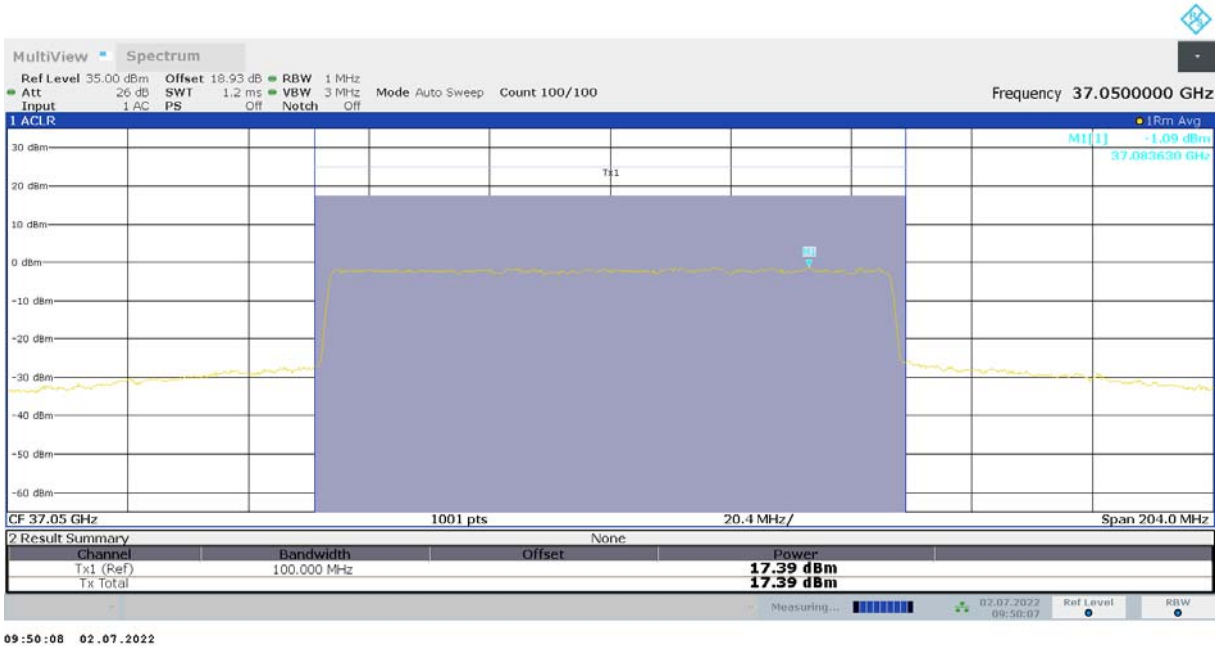
©Copyright. All rights reserved by CTTL.

n260, Module1, SCS=120kHz, CP-OFDM					
Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
50MHz	1RB	37025.04	16.63	/	/
100MHz	100% RB	37050	17.39	/	/

n260, Module1, 50MHz Bandwidth, 1 RB, LOW CHANNEL, QPSK



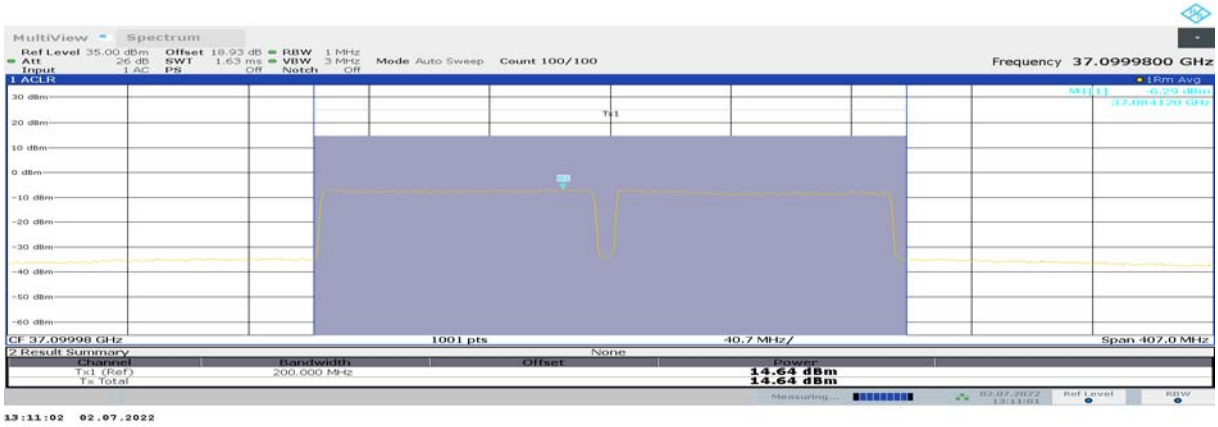
n260, Module1, 100MHz Bandwidth, 100% RB, LOW CHANNEL, QPSK



©Copyright. All rights reserved by CTTL.

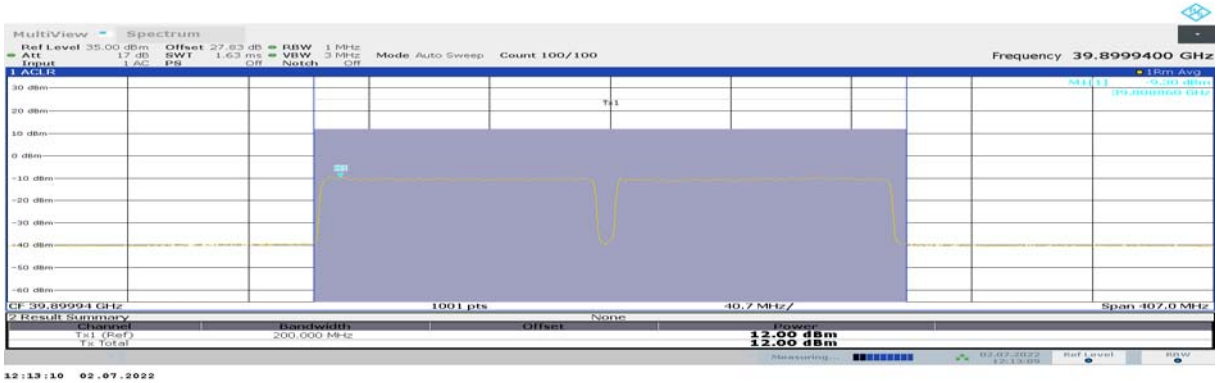
n260G, Module0, SCS=120kHz,PUSCH DFT					
Bandwidth	Modulation	RB size	Frequency (MHz)		Power (dBm)
			CC1	CC2	
100MHz + 100MHz	QPSK	100% RB	37050	37150	14.64
	QPSK	100% RB	38450	38550	13.73
	QPSK	100% RB	39850	39949.9	12.00

n260, Module0, 100MHz+100MHz Bandwidth, 100% RB, LOW CHANNEL, QPSK



n260, Module0, 100MHz+100MHz Bandwidth, 100% RB, MID CHANNEL, QPSK

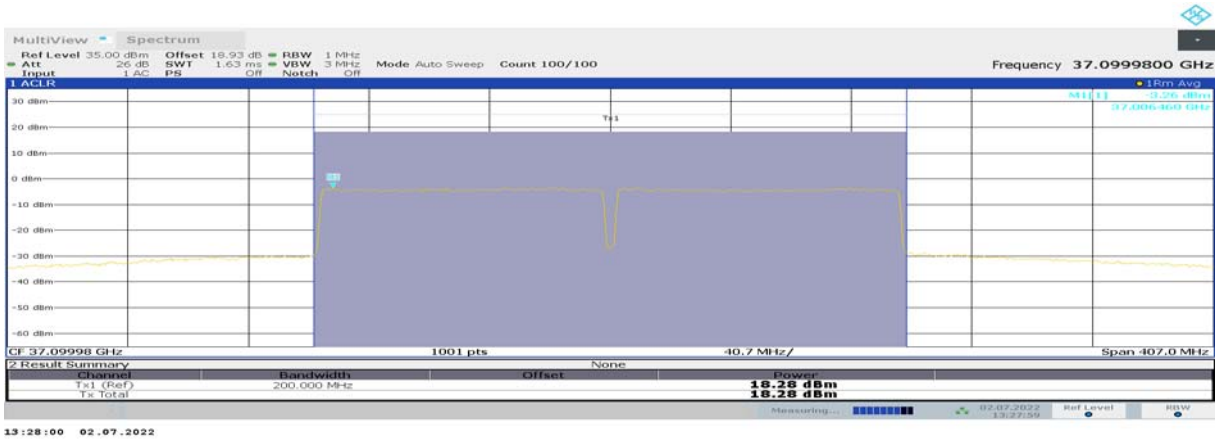
n260, Module0, 100MHz+100MHz Bandwidth, 100% RB, HIGH CHANNEL, QPSK



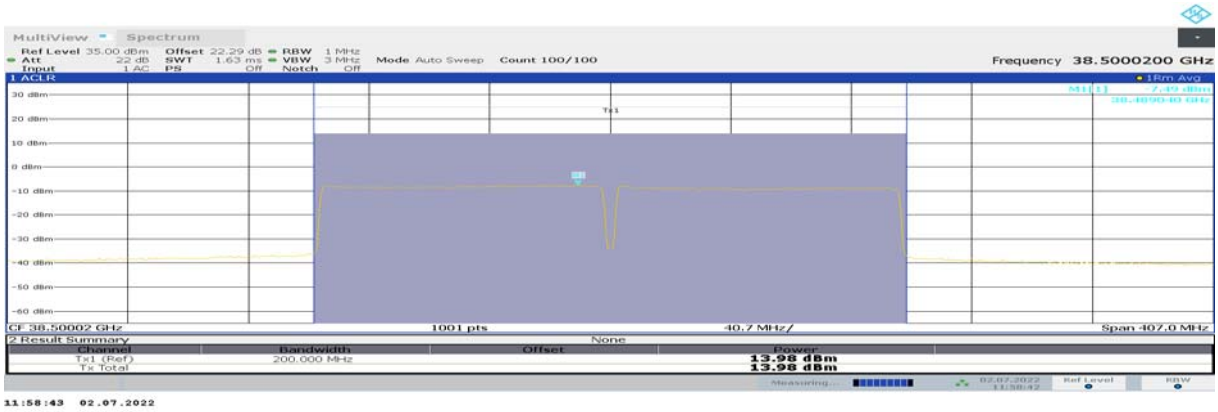
©Copyright. All rights reserved by CTTL.

n260G, Module1, SCS=120kHz, CP-OFDM					
Bandwidth	Modulation	RB size	Centre Frequency (MHz)		Power (dBm)
			CC1	CC2	
100MHz + 100MHz	QPSK	100% RB	37050	37150	18.28
	QPSK	100% RB	38450	38550	13.98
	QPSK	100% RB	39850	39949.9	13.27

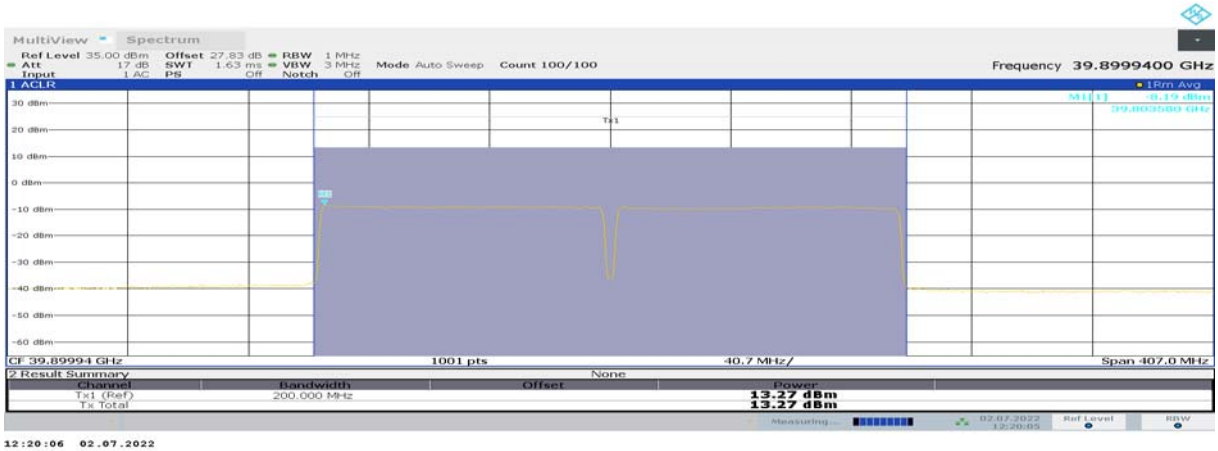
n260, Module1, 100MHz+100MHz Bandwidth, 100% RB, LOW CHANNEL, QPSK



n260, Module1, 100MHz+100MHz Bandwidth, 100% RB, MID CHANNEL, QPSK



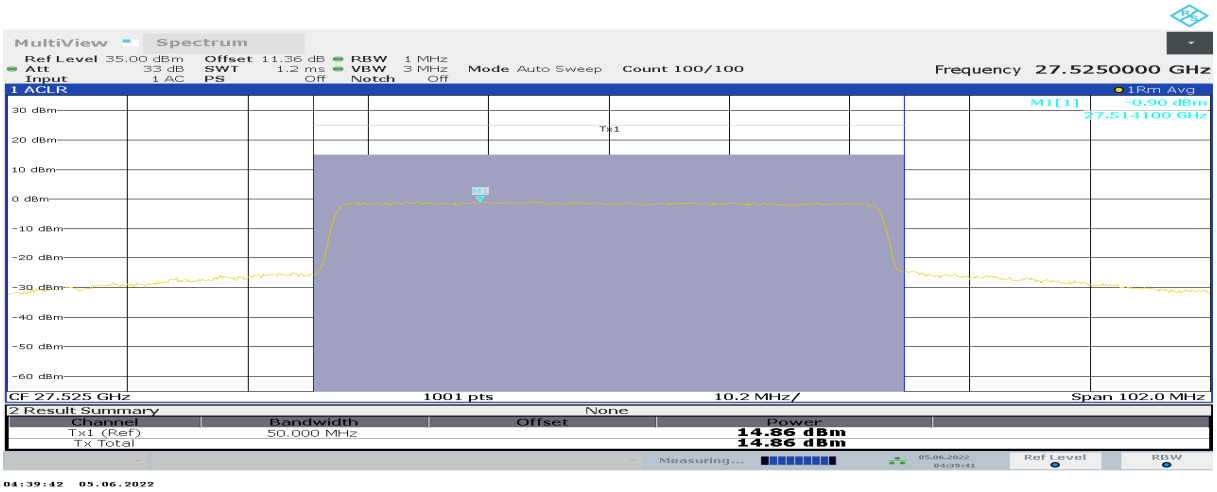
n260, Module1, 100MHz+100MHz Bandwidth, 100% RB, HIGH CHANNEL, QPSK



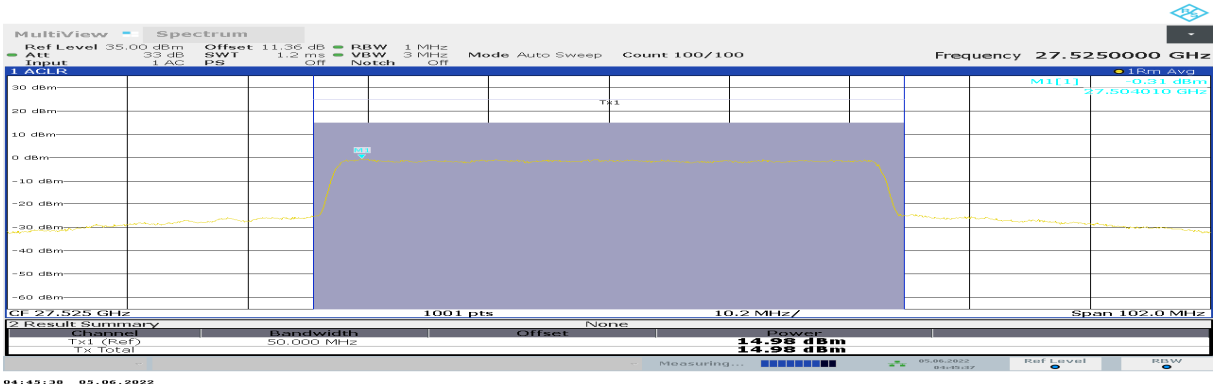
©Copyright. All rights reserved by CTTL.

n261, Module0, SCS=120kHz, CP-OFDM					
Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
50MHz	100% RB	27525	14.86	14.98	13.71

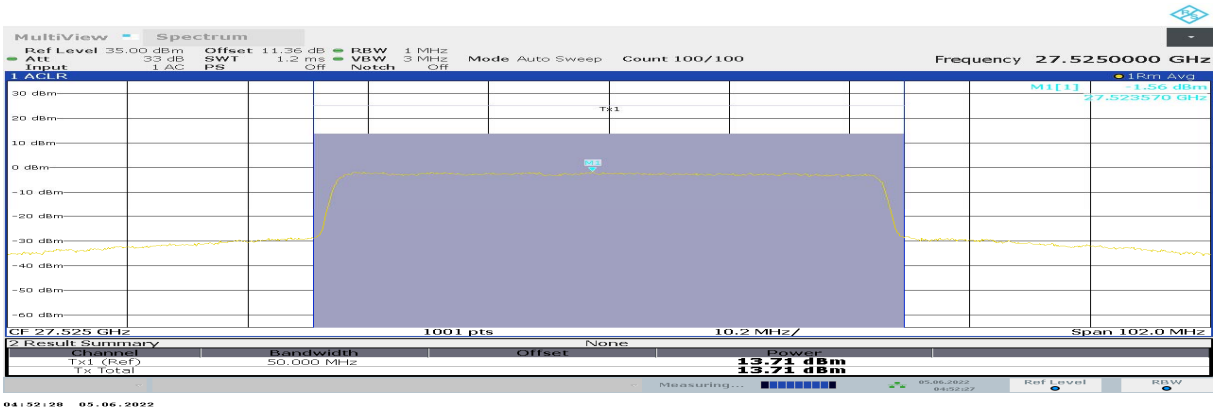
n261, Module0, 50MHz Bandwidth, 100% RB, LOW CHANNEL, QPSK



n261, Module0, 50MHz Bandwidth, 100% RB, LOW CHANNEL, 16QAM



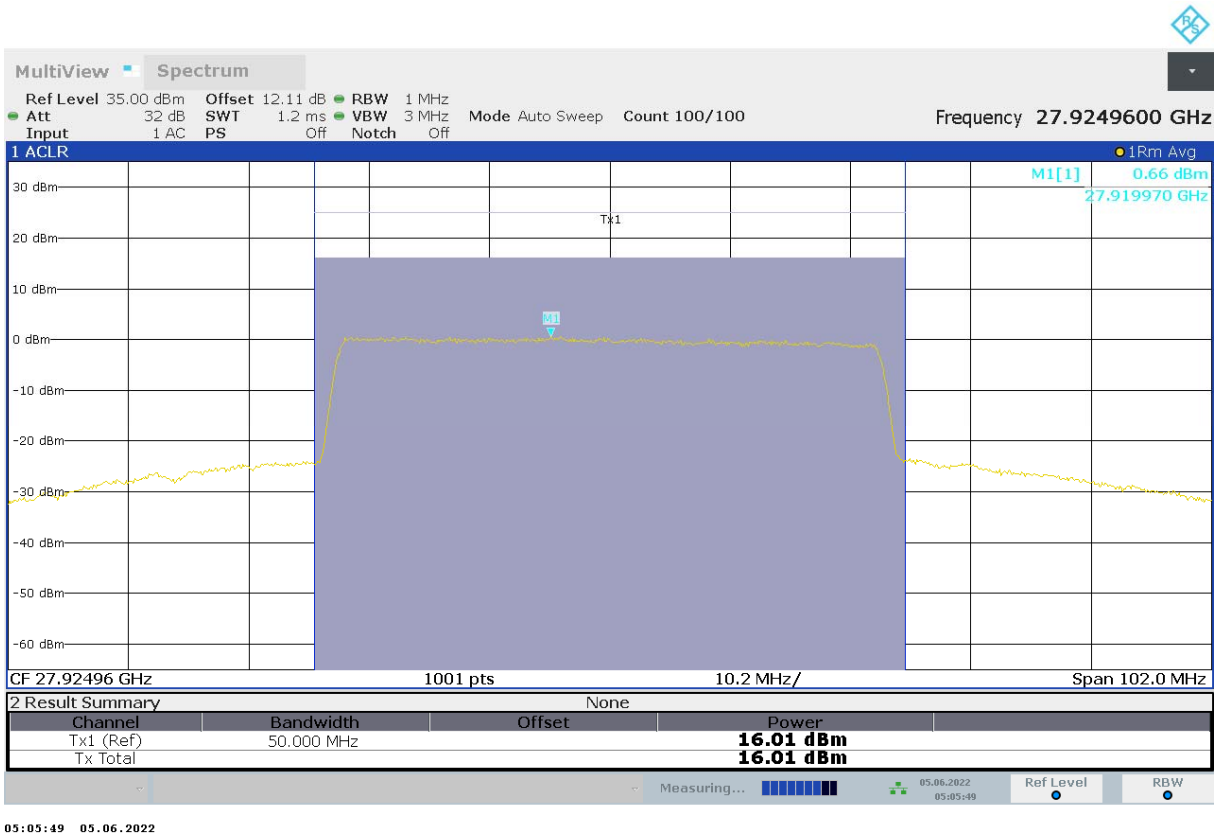
n261, Module0, 50MHz Bandwidth, 100% RB, LOW CHANNEL, 64QAM



©Copyright. All rights reserved by CTTL.

n261, Module0, SCS=120kHz, CP-OFDM					
Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
50MHz	100% RB	27924.96	/	16.01	/

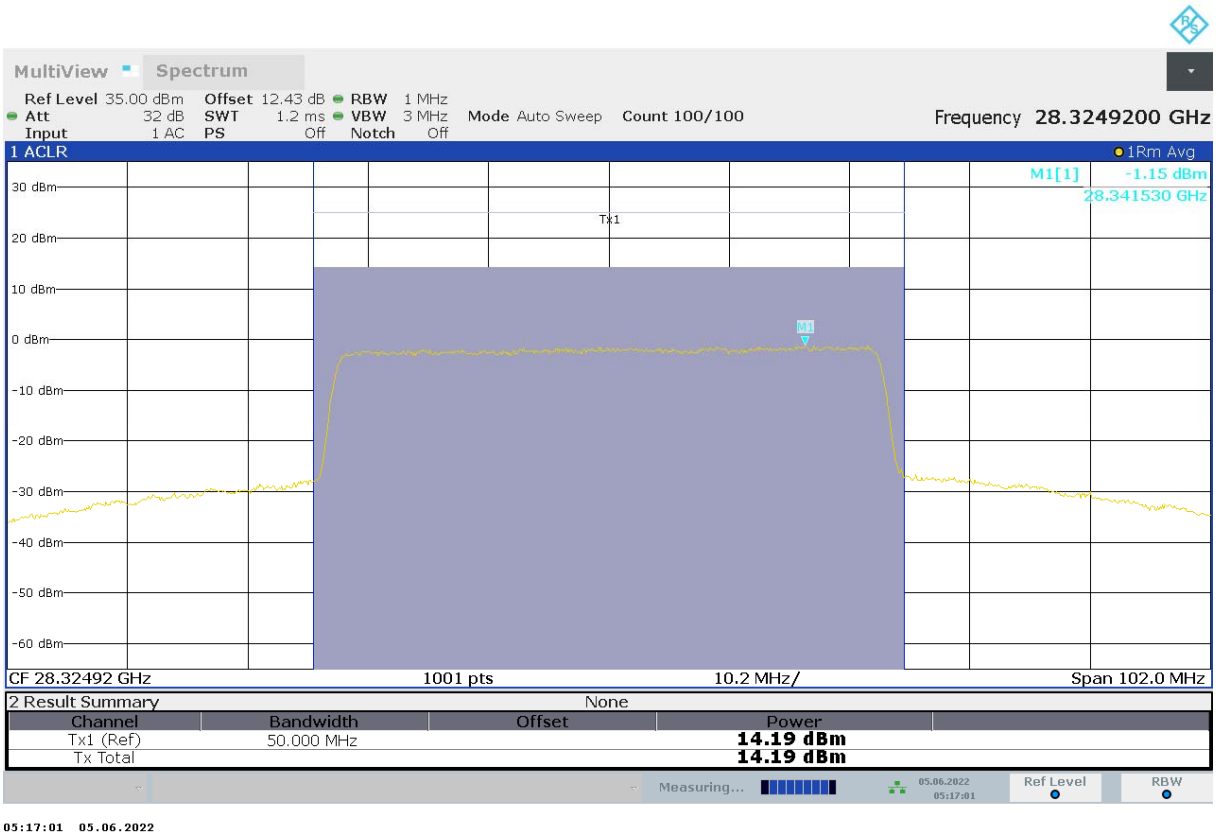
n261, Module0, 50MHz Bandwidth, 100% RB, MID CHANNEL, 16QAM



©Copyright. All rights reserved by CTTL.

n261, Module0, SCS=120kHz, CP-OFDM					
Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
50MHz	100% RB	28324.92	/	14.19	/

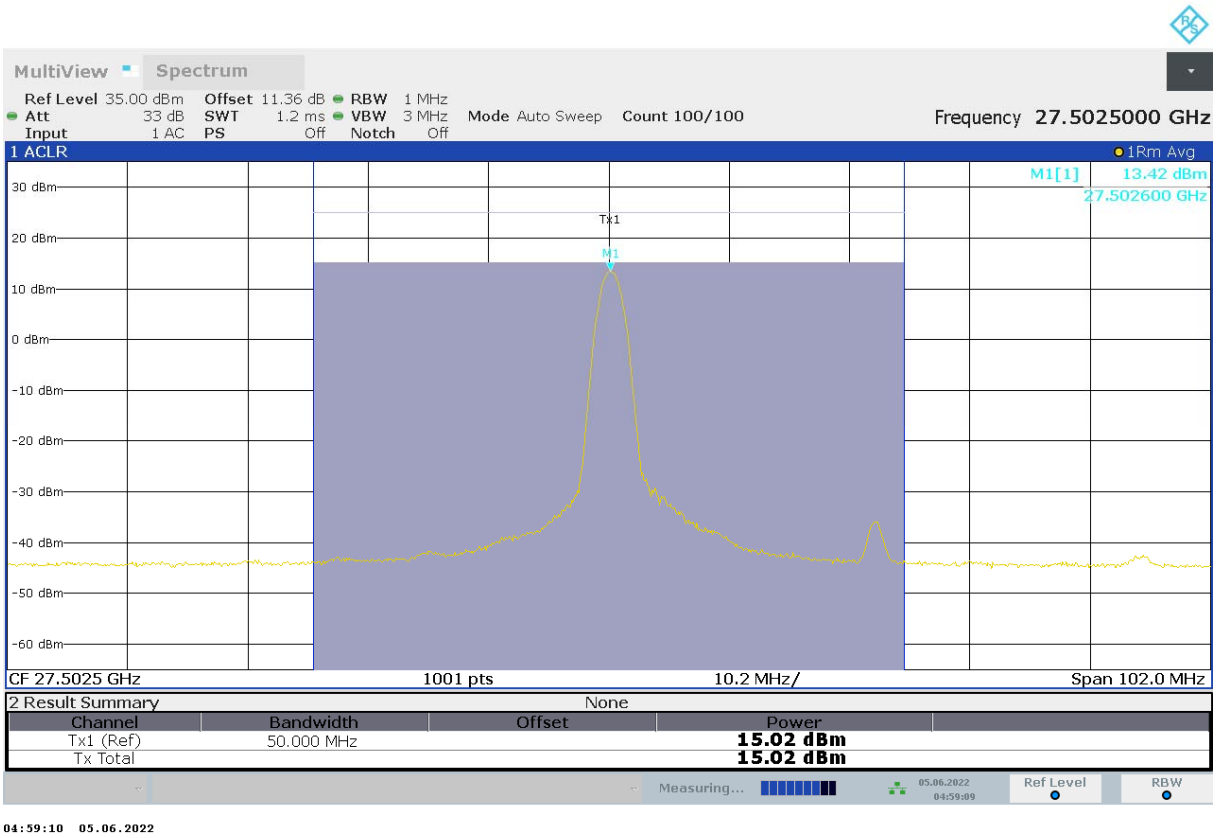
n261, Module0, 50MHz Bandwidth, 100% RB, HIGH CHANNEL, 16QAM



©Copyright. All rights reserved by CTTL.

n261, Module0, SCS=120kHz, CP-OFDM					
Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
50MHz	1 RB	27525	/	15.02	/

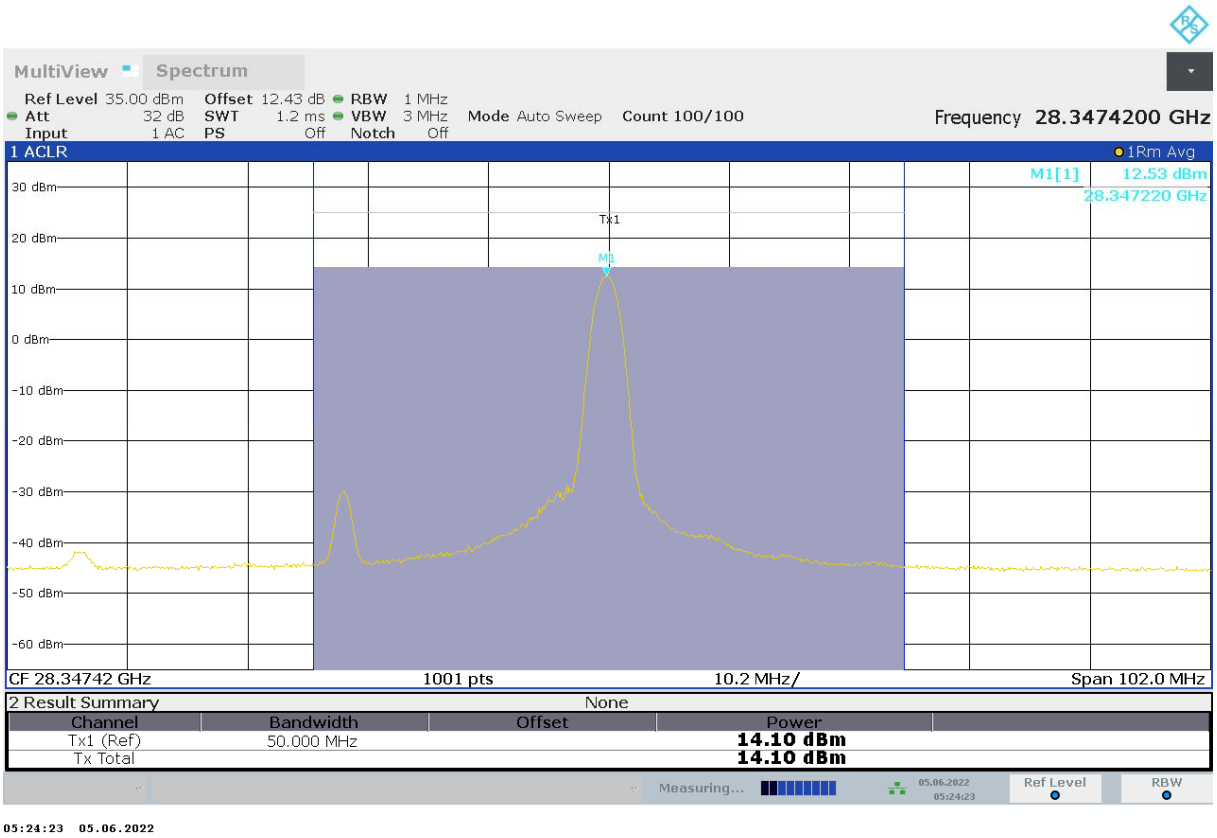
n261, Module0, 50MHz Bandwidth, 1 RB, LOW CHANNEL, 16QAM



©Copyright. All rights reserved by CTTL.

n261, Module0, SCS=120kHz, CP-OFDM					
Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
50MHz	1 RB	28324.92	/	14.10	/

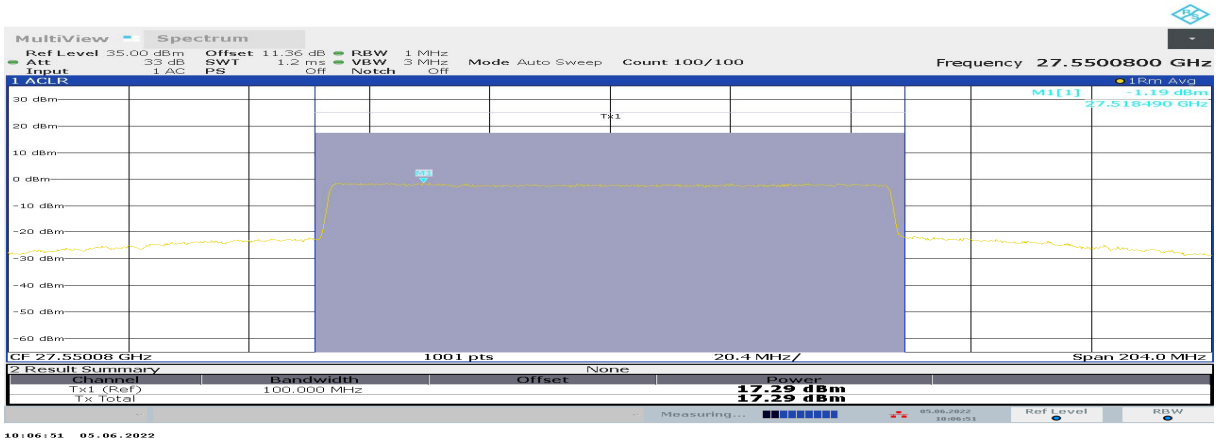
n261, Module0, 50MHz Bandwidth, 1 RB, HIGH CHANNEL, 16QAM



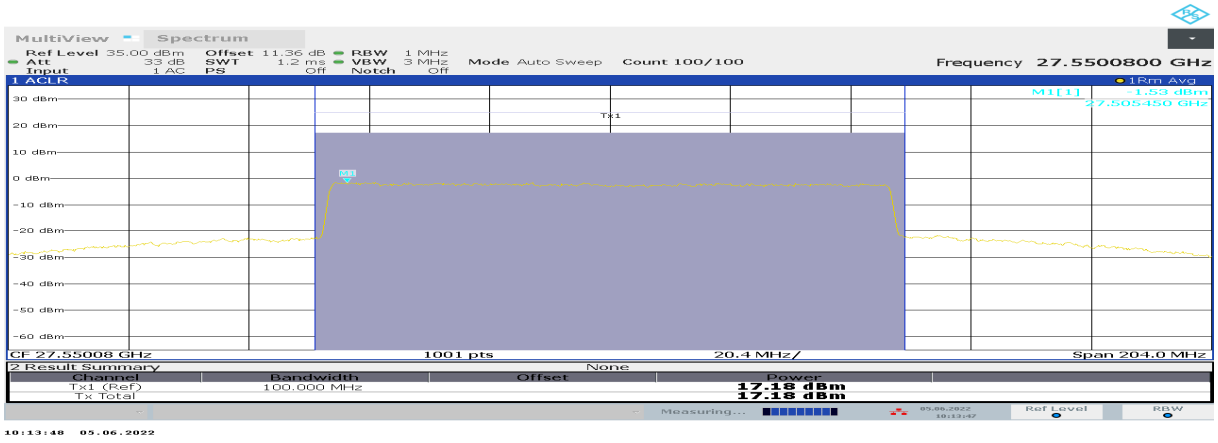
©Copyright. All rights reserved by CTTL.

n261, Module0, SCS=120kHz, CP-OFDM					
Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
100MHz	100% RB	27550.08	17.29	17.18	16.09

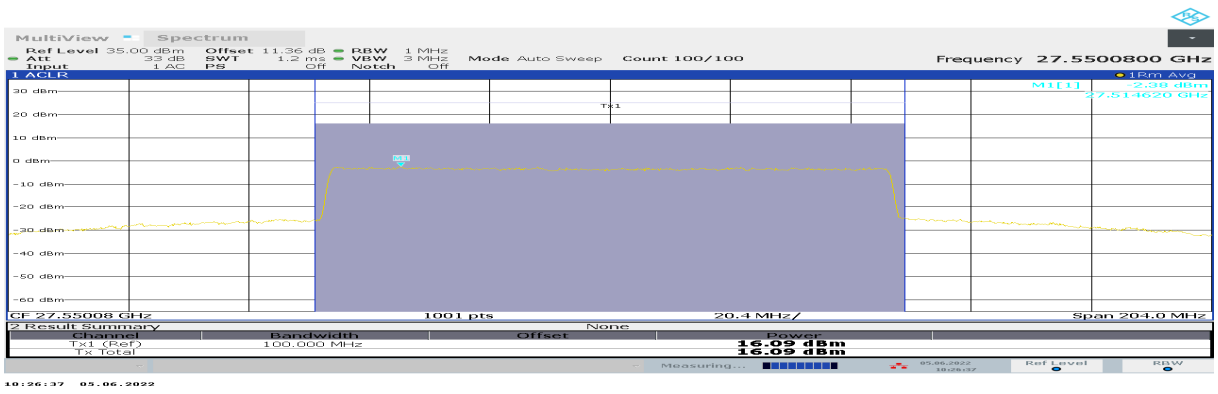
n261, Module0, 100MHz Bandwidth, 100% RB, LOW CHANNEL, QPSK



n261, Module0, 100MHz Bandwidth, 100% RB, LOW CHANNEL, 16QAM



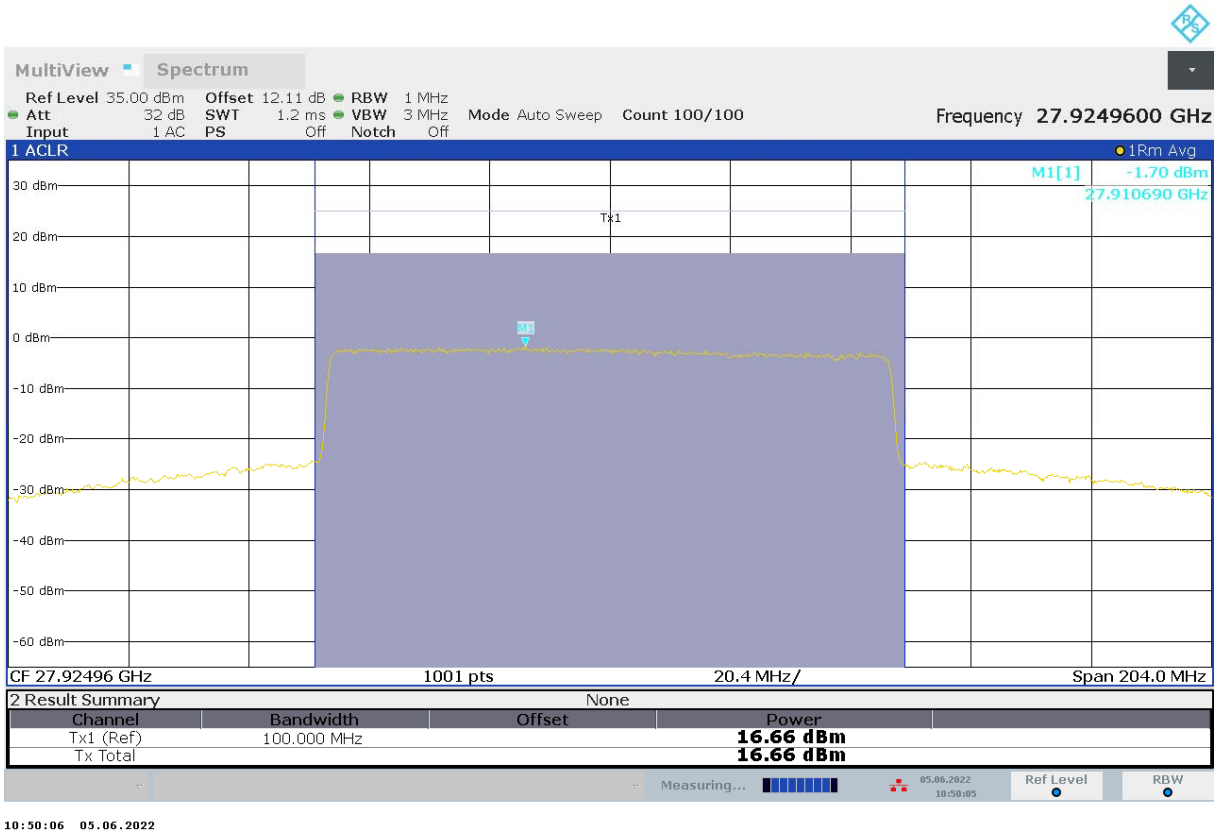
n261, Module0, 100MHz Bandwidth, 100% RB, LOW CHANNEL, 64QAM



©Copyright. All rights reserved by CTTL.

n261, Module0, SCS=120kHz, CP-OFDM					
Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
100MHz	100% RB	27924.96	16.66	/	/

n261, Module0, 100MHz Bandwidth, 100% RB, MID CHANNEL, QPSK



©Copyright. All rights reserved by CTTL.

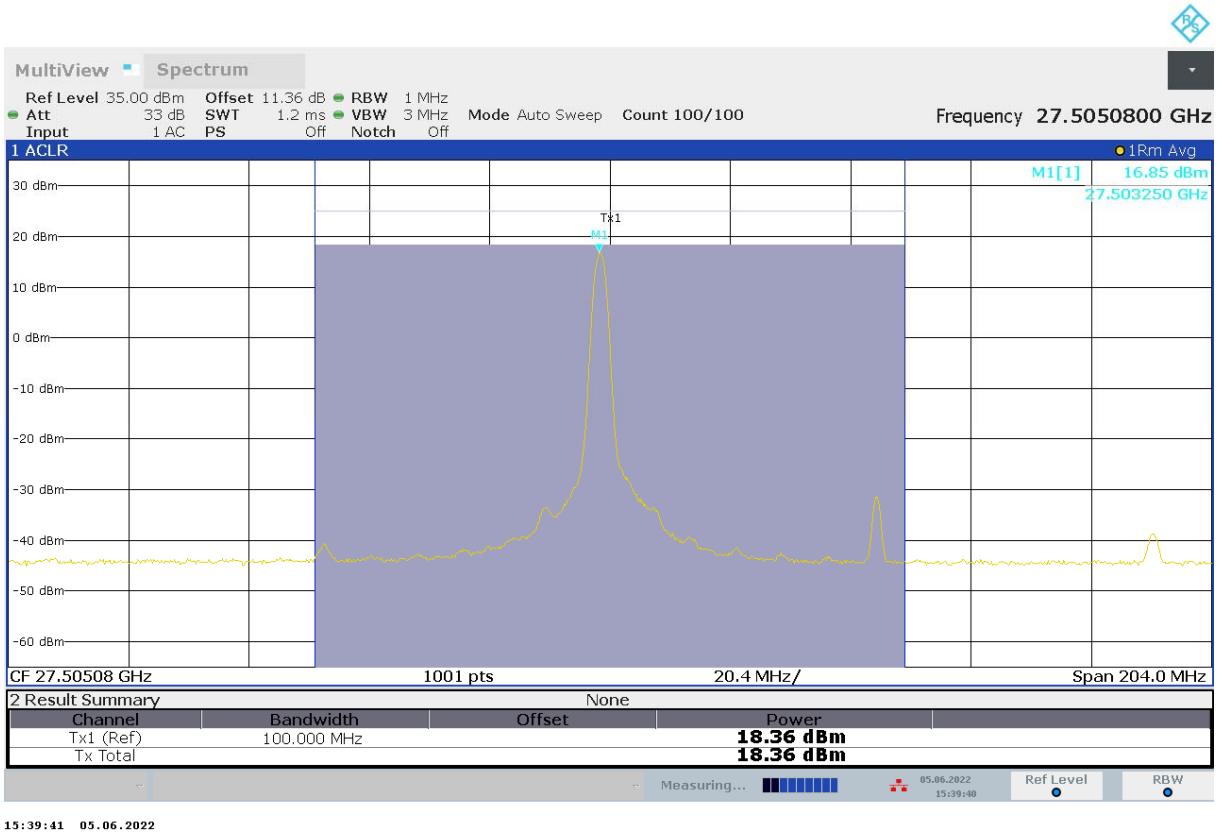
n261, Module0, SCS=120kHz, CP-OFDM					
Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
100MHz	100% RB	28299.96	14.87	/	/

n261, Module0, 100MHz Bandwidth, 100% RB, HIGH CHANNEL, QPSK

©Copyright. All rights reserved by CTTL.

n261, Module0, SCS=120kHz, CP-OFDM					
Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
100MHz	1 RB	27550.08	18.36	/	/

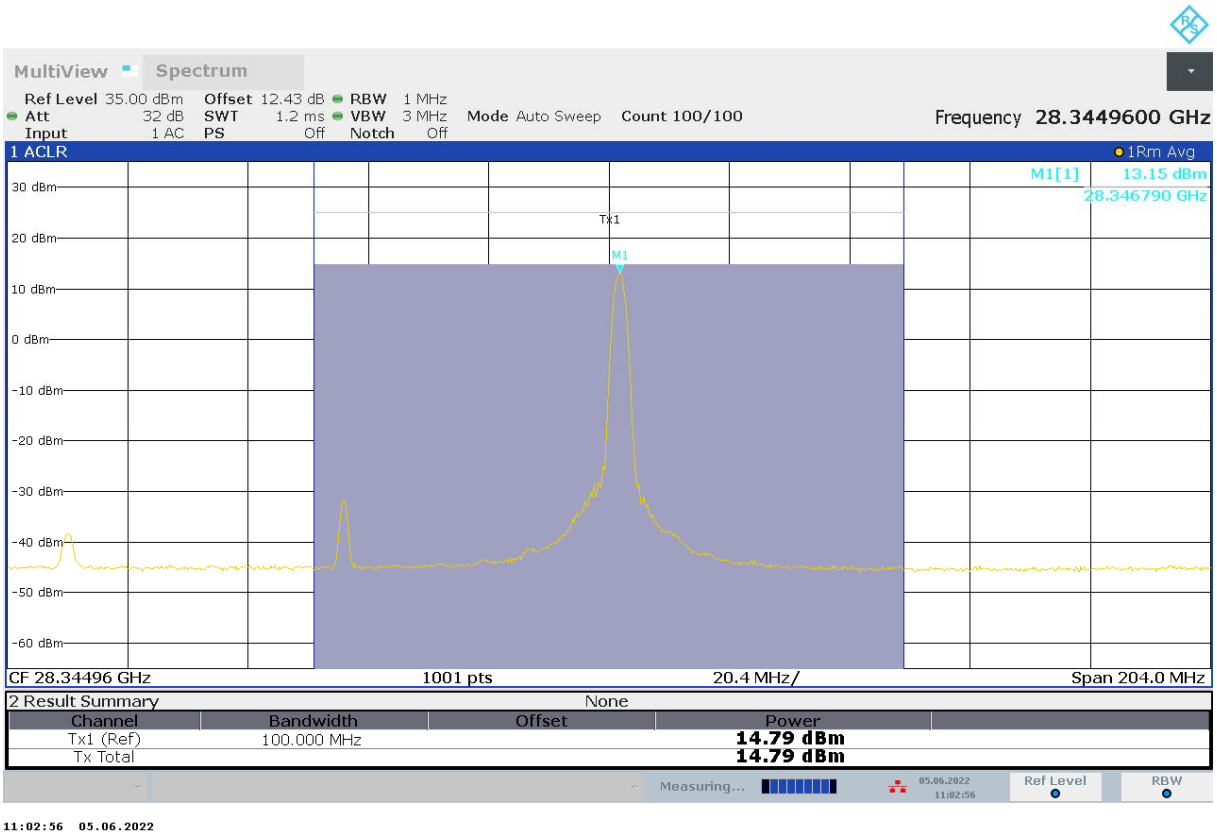
n261, Module0, 100MHz Bandwidth, 1 RB, LOW CHANNEL, QPSK



©Copyright. All rights reserved by CTTL.

n261, Module0, SCS=120kHz, CP-OFDM					
Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
100MHz	1 RB	28299.96	14.79	/	/

n261, Module0, 100MHz Bandwidth, 1 RB, HIGH CHANNEL, QPSK



©Copyright. All rights reserved by CTTL.