



FCC ID: 2A093-NM0824-I

FCC Test Report (Part 15 Subpart C)

Client Information:

Applicant: System Level Solutions (India) Pvt. Ltd.

Applicant add .: Plot no. 32, Zone-D4, Phase 1 GIDC Estate, V.U. Nagar, Anand – 388121,

Gujarat, India

Manufacturer: System Level Solutions (India) Pvt. Ltd.

Manufacturer add.: Plot no. 32, Zone-D4, Phase 1 GIDC Estate, V.U. Nagar, Anand - 388121,

Gujarat, India

Product Information:

Product Name: mPCIe LoRa Concentrator Board

Model No.: NM0824-I

Derivative model No .: N/A

Brand Name: SLS

<u>Applied Standard:</u> FCC Part 15 Subpart C 15.247 <u>Laboratory Details:</u> AA Electro Magnetic Test Laboratory Private Limited PlotNo174, Udyog Vihar-Phase4, Sector18, Gurgaon, Haryana, India

Date of Receipt: Aug. 17, 2022 Date of Issue: Dec. 08, 2022 Date of Test: Aug. 17, 2022 ~ Nov. 24, 2022 Test Result: In Compliance/Pass

This device has been tested and found to comply with the stated standard(s), which is (are) required by the council directive of 2014/53/EU and indicated in the test report and are applicable only to the tested sample identified in the report.

Note: This report shall not be reproduced except in full, without the written approval of AA Electro Magnetic Test Laboratory Private Limited, this document may be altered or revised by AA Electro Magnetic Test Laboratory Private Limited, personal only, and shall be noted in the revision of the document. This test report must not be used by the client to claim product endorsement.

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Dr. Lenin Raja (Authorized Representative) (/ lenin83/)

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2 Test Summary

2.1 Compliance with FCC Part 15 subpart C

Test	Test Requirement	Standard Paragraph	Result				
Antenna Requirement	FCC Part 15 C:2013	Section 15.247(c)	PASS				
Conduction Emissions	FCC Part 15 C:2013	Section 15.207(a)	PASS				
Radiated Emissions	FCC Part 15 C:2013	Section 15.247(d)	PASS				
Maximum conducted (Average) output power	FCC Part 15 C:2013	Section 15.247(b)	PASS				
Maximum Power Spectral Density	FCC Part 15 C:2013	Section 15.247(e)	PASS				
DTS Bandwidth	FCC Part 15 C:2013	Section 15.247 (a) (2)	PASS				
Band edge	FCC Part 15 C:2013	Section 15.247(d)	PASS				
Conducted Spurious Emissions	FCC Part 15 C:2013	Section 15.247(d)	PASS				
Note: N/A is an abbreviation for I Model description: N/A	Not Applicable.						
(1) Reference to the FCC	Reference to the FCC Public Notice DA 00-705						
(2) Reference to ANSI C6	Reference to ANSI C63.4:2013.						





2.2 Test Location

All tests were performed at:

AA Electro Magnetic Test Laboratory Private Limited Plot No 174, Udyog Vihar - Phase 4, Sector 18, Gurgaon, Haryana, India Tel.: +91-0124-4235350

2.3 Measurement Uncertainty

All measurements involve certain levels of uncertainties, The following measurements uncertainty Levels have estimated based on ANSI C63.4:2013, the maximum value of the uncertainty as below

No.	Item	Uncertainty
1	Conducted Emission Test	2.82dB
2	Radiated Emission Test	2.77dB





3 Test Facility

ILAC / NABL Accreditation No.: TC-8597

Three 3m Semi-Anechoic Chamber, 1 full-Anechoic chamber and 2 Shielding Rooms of AA Electro Magnetic Test Laboratory Private Limited have been registered by National Accreditation Board for Testing and Calibration Laboratories (NABL).

ILAC -A2LA Accreditation No.: 5593.01

Three 3m Semi-Anechoic Chamber, 1 full-Anechoic chamber and 2 Shielding Rooms of AA Electro Magnetic Test Laboratory Private Limited have been registered American Association of Laboratory Accreditation (A2LA.)

FCC- Recognition No.: 137777

Three 3m Semi-Anechoic Chamber, 1 full-Anechoic chamber and 2 Shielding Rooms of AA Electro Magnetic Test Laboratory Private Limited have been registered by Federal Communications Commission (FCC).

ISED Recognition No.: 26046

Three 3m Semi-Anechoic Chamber, 1 full-Anechoic chamber and 2 Shielding Rooms of AA Electro Magnetic Test Laboratory Private Limited have been registered by Institute for Social and Economic Development.(ISED)

VCCI- Registration No: 4053

Three 3m Semi-Anechoic Chamber, 1 full-Anechoic chamber and 2 Shielding Rooms of AA Electro Magnetic Test Laboratory Private Limited have been registered by Voluntary Control Council for Interference.(VCCI)

TEC Designation No.: IND063

Three 3m Semi-Anechoic Chamber, 1 full-Anechoic chamber and 2 Shielding Rooms of AA Electro Magnetic Test Laboratory Private Limited have been registered by Telecommunication Engineering (TEC) Center.

BIS Recognition No: 816586

BIS recognized as per CRS scheme for IT electronics, LED control gears, Lamp, Inverter / UPS are recognized as per LRS 2020.

3.1 Deviation from standard

None

3.2 Abnormalities from standard conditions

None





4 General Information

4.1 General Description of EUT

Manufacturer:	System Level Solutions (India) Pvt. Ltd.		
Manufacturer Address:	Plot no. 32, Zone-D4, Phase 1 GIDC Estate, V.U. Nagar, Anand – 388121, Gujarat, India		
EUT Name:	mPCIe LoRa Concentrator Board		
Model No:	NM0824-I		
Brand Name:	SLS		
Derivative model No.:	N/A		
Serial No:	1531221900004		
Operation frequency:	902.3MHz to 914.9MHz 903.0MHz to 927.5MHz		
Number Of Channel:	64+8+8		
Modulation Technology:	CSS		
Channel Spacing :	200kHz(DSS) 1.6MHz(DTS)		
Antenna Gain:	2.7 dBi		
H/W No.:	1A		
S/W No.:	V2.1.0		
Power Supply Range:	Input of EUT: Powered through Adapter Input for adapter: AC 100-240VAC,50/60Hz,0.8A Max Output: DC 5V, 6A Total (Each 2.4A Max)		
Condition of Sample on receipt:	Good		
Note:	 For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual. Antenna gain and antenna type provided by manufacturer. 		





-	
Description	of Channel/frequency:

Frequency Band (GHz)	Channel No.	Frequency (MHz)
	Low	903.0
Quite Cille	:	:
Sub-GHz	Mid	923.5
(903 MHz – 927.5 MHz)	:	
	High	927.5

Channel used for SubGHz testing

Channel Low : 903.0MHz Channel Mid : 923.5MHz Channel High : 927.5MHz





4.2 Description of Test conditions

(1) EUT was tested in normal configuration (Please See following Block diagram)

1. Block diagram of EUT configuration(TX Mode)							
	Laptop	EUT]	Spectrum			
Note: 1.The EUT was priis not less than	0	continuously tran	nsmitting mode and	the transmit duty cycle			

(2) E.U.T. test conditions:

15.31(e): For intentional radiators, measurements of the variation of the input power or the adiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery operated equipment, the equipment tests shall be performed using a new battery.

(3) Test frequencies:

According to the 15.31(m) Measurements on intentional radiators or receivers, other than TV broadcast receivers, shall be performed and. If required reported for each band in which the device can be operated with the device operating at the number of frequencies in each band specified in the following table:

Frequency range over	Number of	Location in
which device operates	frequencies	the range of operation
1 MHz or less	1	Middle
1 to 10 MHz	2	1 near top and 1 near bottom
More than 10 MHz	3	1 near top, 1 near middle and 1 near bottom

(4) Frequency range of radiated measurements:

According to the 15.33, the test range will be up to the tenth harmonic of the highest fundamental frequency.

(5) Pre-test the EUT in all transmitting mode at the lowest (2402 MHz), middle (2441 MHz) and highest (2480 MHz) channel with different data packet and conducted to determine the worst-case mode, only the worst-case results(1Mbps/2Mbps/3Mbps) are recorded in this report.





4.3 Test Peripheral List

No.	Equipment	Manufacturer	EMC Compliance	Model No.	Serial No.	Power cord	signal cable
1	Laptop	DELL	Latitude 3490	5M2Z1W 2	2m unshielded	N/A	1

4.4 EUT Peripheral List

No.	Equipment	Manufacturer	Model No.	Serial No.	Power cord	signal cable
1.	N/A	N/A	N/A	N/A	N/A	N/A





5 Equipments List for All Test Items

No	Test Equipment	Manufacturer	Model No	Serial No	Cal. Date	Cal.Due Date
1	Spectrum Analyzer	Rohde and Schwarz	FSP40	101163	2020/12/11	2022/12/10
2	Loop antenna	DAZE Beijing	ZN30900C	18052	2021/01/29	2023/01/28
3	Hi power horn antenna	DAZE Beijing	ZN30700	18012	2021/01/30	2023/01/29
4	Horn antenna	DAZE Beijing	ZN30702	18006	2021/01/30	2023/01/29
5	Horn antenna	DAZE Beijing	ZN30703	18005	2021/01/30	2023/01/29
6	Pre amplifier	KELIANDA	LNA-0009295	-	2021/01/13	2023/01/13
7	Pre amplifier	KELIANDA	CF-00218 -		2021/01/13	2023/01/13
8	Biconical Antenna	DAZE Beijing	ZN30505C	17038	2021/01/13	2023/01/13
9	EMI-RECEIVER	Schwarzbeck	ck FCKL 1528		2021/01/13	2023/01/13
10	Spectrum Analyzer	ADVANTEST	R3361	-	2021/01/13	2023/01/13
11	LISN	Kyoritsu	KNW-407	8-1789-5	2021/01/13	2023/01/13
12	Network-LISN	SCHWAR ZBECK	NNBM8125	81251314	2021/01/13	2023/01/13
13	Network-LISN	SCHWAR ZBECK	NNBM8125	81251315	2021/01/13	2023/01/13
14	PULSELIMITER	Rohde and Schwarz	ESH3-Z2	100681	2022/05/13	2023/05/12
15	50ΩCoaxialSwitch	DAIWA	1565157	-	2022/05/13	2023/05/12
16	50ΩCoaxialSwitch	-	-	-	2022/05/13	2023/05/12
17	Wireless signal power meter	DARE!!	RPR3006W	RFSW190220	2021/01/13	2023/01/13
18	Signal Generator	KEYSIGHT	N5181A	512071	2021/01/13	2023/01/13



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19	RF Vector Signal Generator	Keysight	N5182B	512094	2021/01/13	2023/01/13			
20	Spectrum analyzer	R&S	R&S FSV-40N		2021/01/13	2023/01/13			
21	Radio Communication Tester	cation R&S CMW 500		124589	2022/05/15	2023/05/14			
22	Signal Generator	enerator R&S SMP02		837017/004 836593/005	2022/05/15	2023/05/14			
23	DC Power Supply	Guanker	Guanker JK15040K		2021/02/02	2023/02/01			
24	Pro. Temp & Humi. Chamber	MENTEK MHP-150-1C		MAA081125 01	2021/02/02	2023/02/01			
25	Attenuators	AGILENT	8494B	-	-	-			
26	Attenuators	AGILENT	8495B	-	-	-			

Report No.: AAEMT/EMC/220817-01-04





6 Test Result

6.1 Antenna Requirement

6.1.1 Standard requirement

15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

15.247(c) (1)(i) requirement: (i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

6.1.2 EUT Antenna

The ANT-915-IPW1-RPS antenna is a hinged-whip IP67-rated dipole antenna designed for use in 915 MHz frequency bands for low-power, wide-area (LPWA) applications such as LoRaWAN® and WiFi HaLow[™] as well as ISM and remote control applications.

The ANT-915-IPW1-RPS provides a ground plane independent dipole antenna solution. The hinged design allows for the antenna to be positioned for optimum performance and reduces the potential for damage from impact compared to a fixed whip design. The antenna attaches with an RP-SMA plug (female socket) connector.





6.2 Conduction Emissions Measurement

6.2.1 Applied procedures / Limit

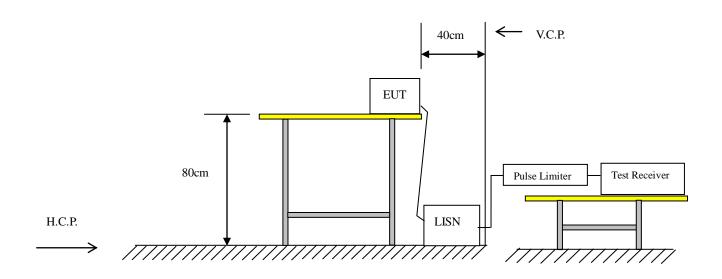
Frequency of Emission (MHz)	Conducted Limit (dBµV)				
	Quasi-peak	Average			
0.15-0.5	66 to 56 *	56 to 46 *			
0.5-5	56	46			
5-30	60	50			

Note: Decreases with the logarithm of the frequency.

6.2.2 Test procedure

EUT was placed upon a wooden test table 0.8m above the horizontal metal reference plane and 0.4m from the Vertical ground plane, and it was connected to an LISN/AMN. The closest distance between the boundary of the EUT and the surface of the LISN/AMN is 0.8m. All peripherals were connected to another LISN/AMN, and placed at a distance of 10cm from each other. A spectrum and receiver was connected to the RF output port of the LISN/AMN. Both average and quasi-peak value were detected.

6.2.3 Test setup







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Report No.: AAEMT/EMC/220817-01-04

EUT:		mPCIe LoRa Concentrator Board			Model Name	Model Name. : NM0824-I		
emper	ature:	24°C			Relative Hur	nidity:	52%	
ressure	:	1010hPa			Test Date :		2022-09-29	
est Mo	de:	TX (worst cas	e)		Phase :		Line	
est Vo	ltage :	110Vac,60Hz						
_		MHz	dBuV	dB	dBuV	dBu\	√ dB	Detector
_	1	0.1578	44.01	-10.01	34.00	65.5	7 -31.57	QP
_	2	0.1598	26.09	-10.00	16.09	55.4	7 -39.38	AVG
_	3	0.6180	37.11	-9.86	27.25	56.0	0 -28.75	QP
-	4	0.6297	22.36	-9.86	12.50	46.0	0 -33.50	AVG
-	5	1.2342	31.04	-9.82	21.22	56.0	0 -34.78	QP
_	6	1.2554	18.38	-9.82	8.56	46.0	0 -37.44	AVG
-	7	1.8426	34.33	-9.87	24.46	56.0	0 -31.54	QP
_	8	1.8680	16.96	-9.87	7.09	46.0	0 -38.91	AVG
-	9	13.8585	35.19	-9.86	25.33	60.0	0 -34.67	QP
-	10	14.0628	11.43	-9.86	1.57	50.0	0 -48.43	AVG
-	11 *	29.6067	34.14	8.51	42.65	60.0	0 -17.35	QP
_	12	29.6067	19.89	8.51	28.40	50.0	0 -21.60	AVG
nark: F		N factor + Cabl	e Loss + Pul	lse limiter fac	ctor.			
90								
90 80								
80								
80 70						FCC Par	t 15 C Conductio	n(QP)
80 70 60							t 15 C Conductio	
80 70								
80 70 60								

6.2.4 Test results

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20

10

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-10 -20

0.150

Plot No.174, UdyogVihar Phase 4, Sector -18, Gurgaon -122016, Haryana, India Contact: 0124-4235350, 4145343; e-mail: info @aaemtlabs.com; Website: <u>www.aaemtlabs.com</u>

(MHz)

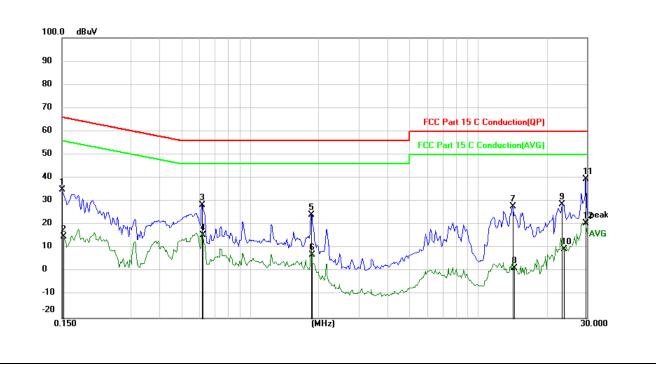




EUT:	mPCIe LoRa Concentrator Board	Model Name. :	NM0824-I
Temperature:	24°C	Relative Humidity:	52%
Pressure:	1010hPa	Test Date :	2022-09-29
Test Mode:	TX (worst case)	Phase :	Neutral
Test Voltage :	110Vac,60Hz		

No. M	lk. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1	0.1500	45.06	-10.05	35.01	65.99	-30.98	QP
2	0.1524	24.85	-10.04	14.81	55.86	-41.05	AVG
3	0.6141	38.36	-9.86	28.50	56.00	-27.50	QP
4	0.6238	25.53	-9.86	15.67	46.00	-30.33	AVG
5	1.8543	34.10	-9.87	24.23	56.00	-31.77	QP
6	1.8698	17.09	-9.87	7.22	46.00	-38.78	AVG
7	14.1939	37.85	-9.86	27.99	60.00	-32.01	QP
8	14.4403	11.20	-9. <mark>8</mark> 7	1.33	50.00	-48.67	AVG
9	23.3745	38.95	-10.08	28.87	60.00	-31.13	QP
10	23.7021	19.69	-10.08	9.61	50.00	-40.39	AVG
11 *	29.6222	31.04	8.57	39.61	60.00	-20.39	QP
12	29,6222	12.07	8.57	20.64	50.00	-29.36	AVG

Remark: Factor = LISN factor + Cable Loss + Pulse limiter factor.







6.3 Radiated Emissions Measurement

6.3.1 Applied procedures / Limit

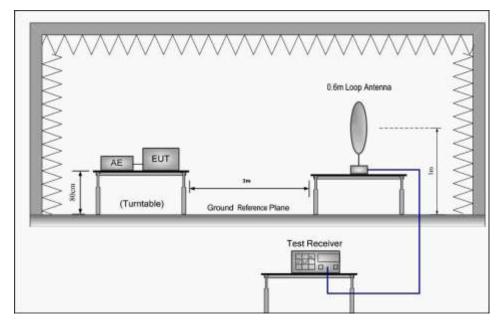
15.247(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.205(a).

	Field Stre	ength	Measurement Distance
Frequency of Emission (MHz)	μV/m	dBµV/m	(meters)
0.009-0.49	2400/F(kHz)		300
0.49-1.705	24000/F(kHz)		30
1.705-30	30		30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

6.3.2 Test setup

Test Configuration:

1) 9 kHz to 30 MHz emissions:

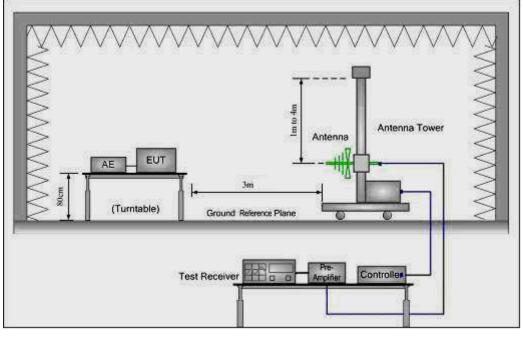




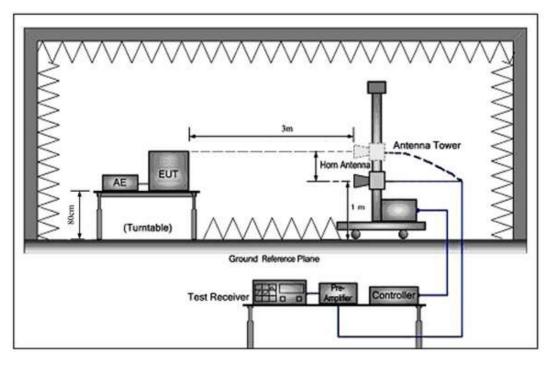


Report No.: AAEMT/EMC/220817-01-04

2) 30 MHz to 1 GHz emissions:



3) Above 1 GHz missions:







6.3.3 Test procedure

EUT was placed upon a wooden test table which was placed on the turn table 0.8m above the horizontal metal ground plane, and operating in the mode as mentioned above. A receiving antenna was placed 3m away from the EUT. During testing, turn around the turn table and move the antenna from 1m to 4m to find the maximum field-strength reading. All peripherals were placed at a distance of 10cm between each other. Both horizontal and Vertical antenna polarities were tested. The worst case emissions were reported.

For measurement at frequency above 1GHz

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.





6.3.4 Test Result

Radiated Emissions Test Data Below 30MHz

EUT:	mPCIe LoRa Concentrator Board	Model Name. :	NM0824-I		
Temperature:	24.5°C	Test Data	2022-08-17		
Pressure:	1010hPa	Relative Humidity:	51%		
Test Mode :	TX (worst case)	Test Voltage :	AC 110V, 60Hz		
Measurement Distance	3 m	Frequency Range	9KHz to 30MHz		
RBW/VBW	9KHz~150KHz/RB 200Hz for QP, 150KHz~30MHz/RB 9KHz for QP				

No emission found between lowest internal used/generated frequencies to 30MHz.





Radiated Emissions Test Data Below 1GHz

EUT:	mPCIe LoRa Concentrator Board	Model Name. :	NM0824-I		
Temperature:	24.5°C	Test Data	2022-08-17		
Pressure:	1010hPa	Relative Humidity:	51%		
Test Mode :	TX (worst case)	Test Voltage :	AC 110V, 60Hz		
Measurement Distance	3 m	Frequency Range	30MHz to 1GHz		
RBW/VBW	100KHz / 300KHz for spectrum, RBW=120KHz for receiver.				





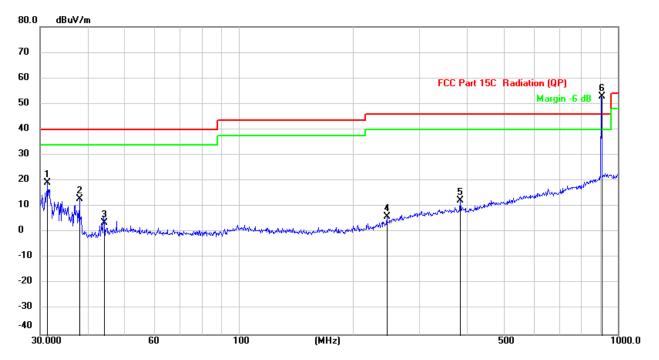
Test at Channel (903.0 MHz) in transmitting status

30 MHz~1 GHz Spurious Emissions .Quasi-Peak Measurement

Vertical:

Peak scan

Level (dBµV/m)



Quasi-peak measurement

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		31.3992	30.69	-11.33	19.36	40.00	-20.64	QP
2		38.0783	30.15	-17.05	13.10	40.00	-26.90	QP
3		44.2752	20.98	-17.35	3.63	40.00	-36.37	QP
4	:	245.9509	17.07	-10.91	6.16	46.00	-39.84	QP
5	;	383.9318	18.73	-6.37	12.36	46.00	-33.64	QP
6	* (903.3094	46.51	6.43	52.94	46.00	6.94	QP

Note: '*' means the worst case

Measurement Level = Reading Level + Factor

Factor= Ant Factor + Cable Loss - Pre-amplifier



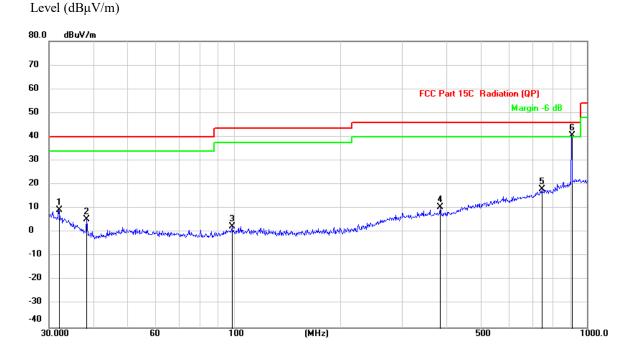


Test at Channel (903.0 MHz) in transmitting status

30 MHz~1 GHz Spurious Emissions .Quasi-Peak Measurement

Horizontal:

Peak scan



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		31.9546	20.98	-11.55	9.43	40.00	-30.57	QP
2		38.3462	22.65	-17.24	5.41	40.00	-34.59	QP
3		98.8326	16.43	-14.03	2.40	43.50	-41.10	QP
4		383.9318	16.40	-5.95	10.45	46.00	-35.55	QP
5		744.8661	15.84	2.18	18.02	46.00	-27.98	QP
6	*	903.3094	34.07	6.43	40.50	46.00	-5.50	QP

Note: '*' means the worst case

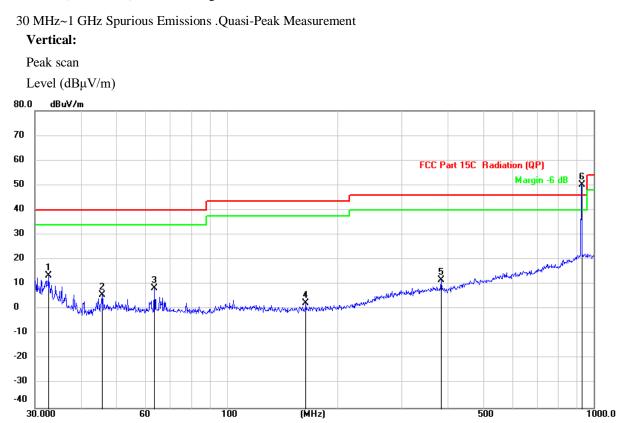
Measurement Level = Reading Level + Factor

Factor= Ant Factor + Cable Loss - Pre-amplifier





Test at Channel (923.5 MHz) in transmitting status



No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		32.6340	25.89	-12.36	13.53	40.00	-26.47	QP
2		45.6948	22.53	-16.88	5.65	40.00	-34.35	QP
3		63.5356	24.73	-16.20	8.53	40.00	-31.47	QP
4		164.3301	16.68	-14.30	2.38	43.50	-41.12	QP
5		383.9318	18.24	-6.37	11.87	46.00	-34.13	QP
6	*	925.7563	43.72	6.48	50.20	46.00	4.20	QP

Note: '*' means the worst case

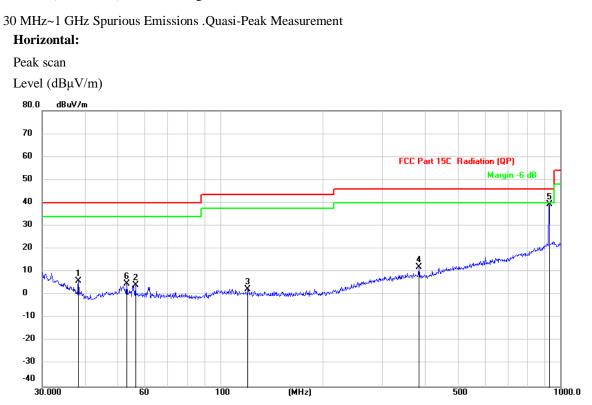
Measurement Level = Reading Level + Factor

Factor= Ant Factor + Cable Loss - Pre-amplifier





Test at Channel (923.5 MHz) in transmitting status



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		38.3462	23.38	-17.24	6.14	40.00	-33.86	QP
2		56.3948	19.90	-15.70	4.20	40.00	-35.80	QP
3		120.6991	17.23	-14.76	2.47	43.50	-41.03	QP
4		383.9318	17.88	-5.95	11.93	46.00	-34.07	QP
5	*	925.7563	32.74	6.48	39.22	46.00	-6.78	QP
6		53.1313	20.26	-15.48	4.78	40.00	-35.22	QP

Note: '*' means the worst case

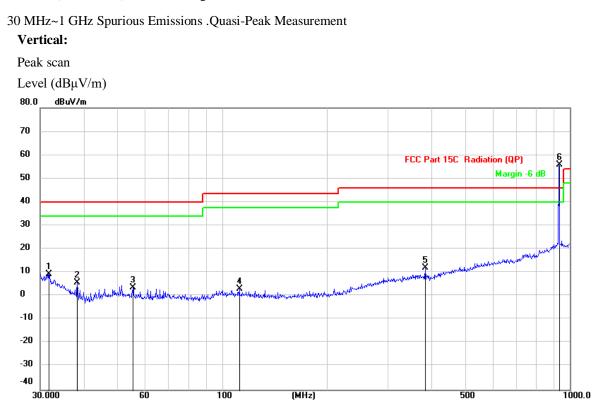
Measurement Level = Reading Level + Factor

Factor= Ant Factor + Cable Loss - Pre-amplifier





Test at Channel (927.5 MHz) in transmitting status



Quasi-peak measurement

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		31.6202	20.86	-11.52	9.34	40.00	-30.66	QP
2		38.3462	23.04	-17.28	5.76	40.00	-34.24	QP
3		55.4147	19.62	-15.83	3.79	40.00	-36.21	QP
4		112.1305	18.09	-15.15	2.94	43.50	-40.56	QP
5		383.9318	18.33	-6.37	11.96	46.00	-34.04	QP
6	*	929.0082	49.32	6.49	55.81	46.00	9.81	QP

Note: '*' means the worst case

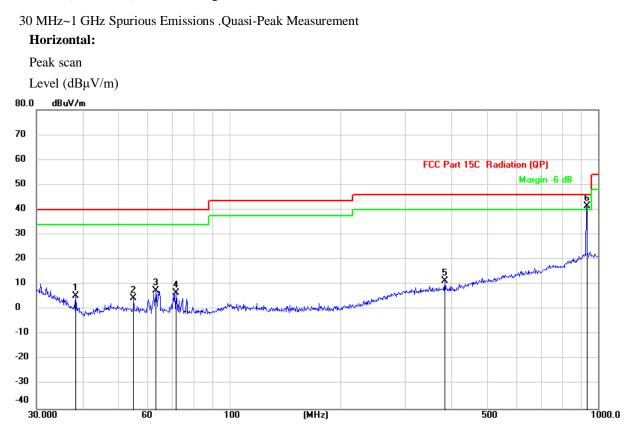
Measurement Level = Reading Level + Factor

Factor= Ant Factor + Cable Loss - Pre-amplifier





Test at Channel (927.5 MHz) in transmitting status



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		38.3462	22.72	-17.24	5.48	40.00	-34.52	QP
2		55.0274	20.10	-15.61	4.49	40.00	-35.51	QP
3		63.3132	23.62	-16.02	7.60	40.00	-32.40	QP
4		71.5806	22.73	-16.22	6.51	40.00	-33.49	QP
5	:	383.9318	17.53	-5.95	11.58	46.00	-34.42	QP
6	* (929.0082	34.97	6.49	41.46	46.00	-4.54	QP

Note: "" means the worst case

Measurement Level = Reading Level + Factor

Factor= Ant Factor + Cable Loss - Pre-amplifier

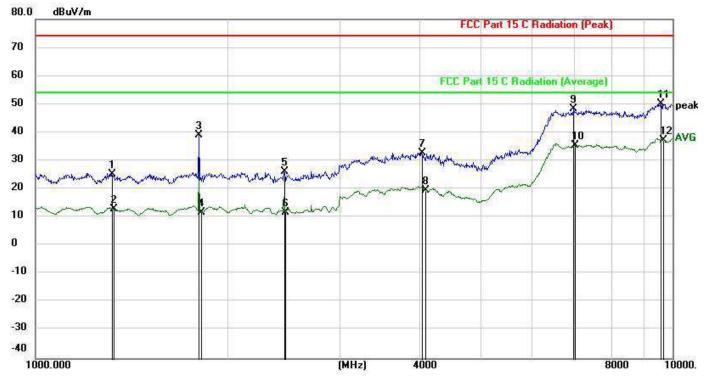




Radiated Emissions Test Data Above 1GHz

Radiated Emissions Test Da									
EUT:	mPCIe LoRa Concentrator Board	Model Name. :	NM0824-I						
Temperature:	24.5°C	Test Data	2022-08-17						
Pressure:	1010hPa	Relative Humidity:	51%						
Test Mode :	TX (903MHz)	Test Voltage :	AC 110V, 60Hz						
Measurement Distance	3 m	Frequency Range	1GHz to 25GHz						
RBW/VBW	Spurious emission: 1MHz/1MHz for Peak, 1MHz/10Hz for Average.								
	non-restricted band: 100KHz/300KHz	z for Peak.							

(a) Antenna polarization: Horizontal

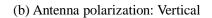


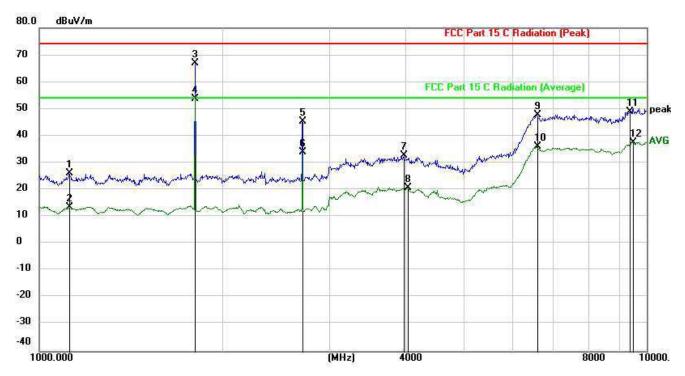
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∨	dB	dBuV/m	dBuV/m	dB	Detector
1	-	1315.225	33.31	-8.17	25.14	74.00	-48.86	peak
2	1	1324.342	21.26	-8.21	13.05	54.00	-40.95	AVG
3	1	1803.018	48.07	-8.93	39.14	74.00	-34.86	peak
4	1	1815.516	20.75	-8.93	11.82	54.00	-42.18	AVG
5	2	2454.709	35.74	-9.54	26.20	74.00	-47.80	peak
6	2	2471.724	21.42	-9.55	11.87	54.00	-42.13	AVG
7	4	4036.454	38.07	-5.37	32.70	74.00	-41.30	peak
8	4	4083.194	25.19	-5.54	19.65	54.00	-34.35	AVG
9	6	6982.324	37.60	10.83	48.43	74.00	-25.57	peak
10	7	7030.723	24.57	10.85	35.42	54.00	-18.58	AVG
11	9	9594.006	36.01	14.09	50.10	74.00	-23.90	peak
12	* 9	9660.509	23.27	14.09	37.36	54.00	-16.64	AVG

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No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1	1	119.438	33.59	-7.49	26.10	74.00	-47.90	peak
2	1	122.018	20.91	-7.50	13.41	54.00	-40.59	AVG
3	1	803.018	75.81	-8.93	66.88	74.00	-7.12	peak
4	* 1	803.018	62.73	-8.93	53.80	54.00	-0.20	AVG
5	2	710.192	54.88	-9.40	45.48	74.00	-28.52	peak
6	2	710.192	43.31	-9.40	33.91	54.00	-20.09	AVG
7	3	981.072	37.92	-5.29	32.63	74.00	-41.37	peak
8	4	036.454	26.27	-5.37	20.90	54.00	-33.10	AVG
9	6	591.739	37.15	10.65	47.80	74.00	-26.20	peak
10	6	591.739	25.36	10.65	36.01	54.00	-17.99	AVG
11	9	375.620	35.66	13.26	48.92	74.00	-25.08	peak
12	9	484.185	23.71	13.98	37.69	54.00	-16.31	AVG

Note:

10~25GHz at least have 20dB margin. No recording in the test report.

Measurement Level = Reading Level + Factor

Remark: Factor = Antenna Factor + Cable Loss–Pre-amplifier

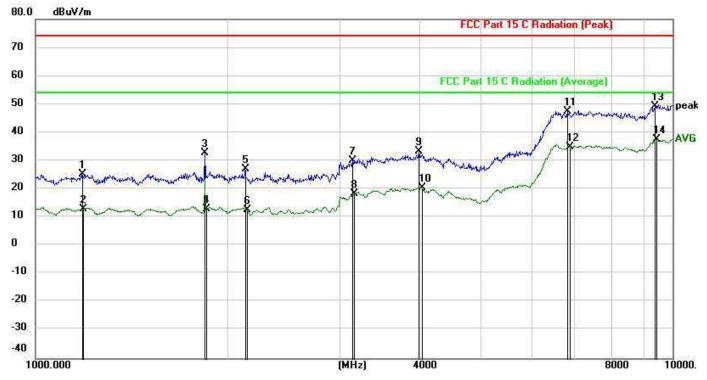
Highest channel: 903.0MHz





EUT:	mPCIe LoRa Concentrator Board	Model Name. :	NM0824-I			
Temperature:	24.5°C	Test Data	2022-08-17			
Pressure:	1010hPa	Relative Humidity:	51%			
Test Mode :	TX (923.5MHz)	Test Voltage :	AC 110V, 60Hz			
Measurement Distance	3 m Frequency Range		1GHz to 25GHz			
RBW/VBW	Spurious emission: 1MHz/1MHz for Peak, 1MHz/10Hz for Average.					
	non-restricted band: 100KHz/300KHz	z for Peak.				

(a) Antenna polarization: Horizontal



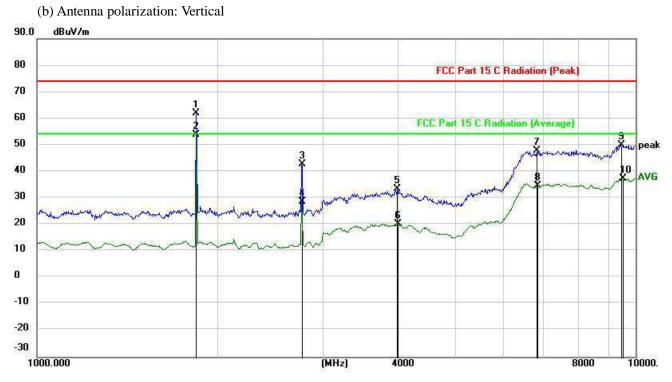
			Reading	Correct	Measure-			
No.	Mk.	Freq.	Level	Factor	ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1	11	83.042	32.95	-7.71	25.24	74.00	-48.76	peak
2	11	85.769	20.61	-7.72	12.89	54.00	-41.11	AVG
3	18	45.015	41.57	-8.94	32.63	74.00	-41.37	peak
4	18	57.804	22.00	-8.94	13.06	54.00	-40.94	AVG
5	21	33.045	36.09	-9.15	26.94	74.00	-47.06	peak
6	21	42.891	21.95	-9.17	12.78	54.00	-41.22	AVG
7	31	47.748	38.56	-8.38	30.18	74.00	-43.82	peak
8	31	69.567	26.75	-8.28	18.47	54.00	-35.53	AVG
9	39	99.447	38.58	-5.23	33.35	74.00	-40.65	peak
10	40	36.454	25.69	-5.37	20.32	54.00	-33.68	AVG
11	68	39.116	36.71	10.76	47.47	74.00	-26.53	peak
12	68	86.523	23.94	10.78	34.72	54.00	-19.28	AVG
13	93	97.233	35.98	13.41	49.39	74.00	-24.61	peak

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No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		1845.015	70.97	-8.94	62.03	74.00	-11.97	peak
2	*	1845.015	62.94	-8.94	54.00	54.00	0.00	AVG
3		2766.942	52.09	-9.35	42.74	74.00	-31.26	peak
4		2766.942	38.13	-9.35	28.78	54.00	-25.22	AVG
5		3999.447	38.58	-5.23	33.35	74.00	-40.65	peak
6		4008.667	25.55	-5.27	20.28	54.00	-33.72	AVG
7		6839.116	36.96	10.76	47.72	74.00	-26.28	peak
8		6870.684	24.02	10.77	34.79	54.00	-19.21	AVG
9	1	9440.609	36.20	13.70	49.90	74.00	-24.10	peak
10	1	9506.048	23.29	14.08	37.37	54.00	-16.63	AVG

Note:

10~25GHz at least have 20dB margin. No recording in the test report.

Measurement Level = Reading Level + Factor

Remark: Factor = Antenna Factor + Cable Loss-Pre-amplifier

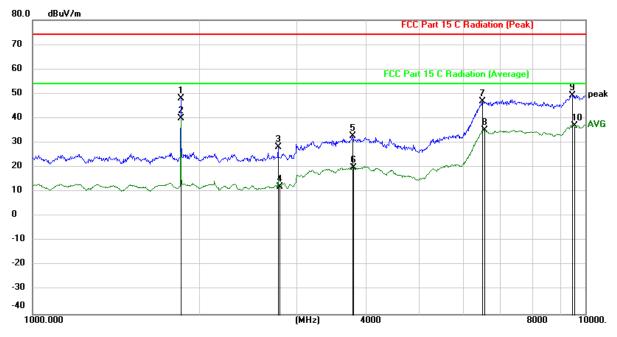
Highest channel: 923.5MHz





EUT:	mPCIe LoRa Concentrator Board	Model Name. :	NM0824-I		
Temperature:	24.5°C	Test Data	2022-08-17		
Pressure:	1010hPa	Relative Humidity:	51%		
Test Mode :	TX (927.5MHz)	Test Voltage :	AC 110V, 60Hz		
Measurement Distance	3 m	Frequency Range	1GHz to 25GHz		
RBW/VBW	Spurious emission: 1MHz/1MHz for Peak, 1MHz/10Hz for Average.				
	non-restricted band: 100KHz/300KHz for Peak.				

(a) Antenna polarization: Horizontal

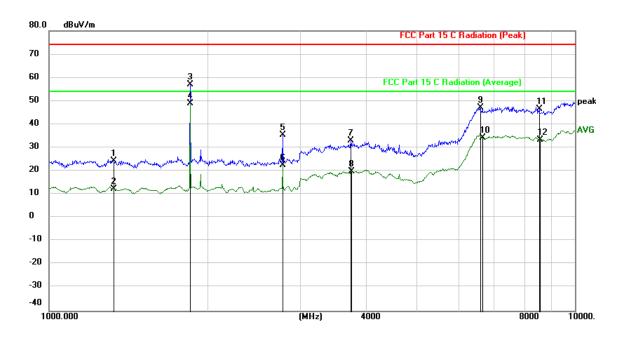


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit .	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1	18	353.532	57.13	-8.95	48.18	74.00	-25.82	peak
2	* 18	353.532	48.93	-8.95	39.98	54.00	-14.02	AVG
3	27	779.713	37.62	-9.33	28.29	74.00	-45.71	peak
4	27	798.981	21.30	-9.32	11.98	54.00	-42.02	AVG
5	37	784.426	38.55	-5.84	32.71	74.00	-41.29	peak
6	38	310.658	25.52	-5.77	19.75	54.00	-34.25	AVG
7	65	516.284	36.17	10.61	46.78	74.00	-27.22	peak
8	65	561.453	24.39	10.63	35.02	54.00	-18.98	AVG
9	94	440.609	35.70	13.70	49.40	74.00	-24.60	peak
10	95	527.962	22.86	14.09	36.95	54.00	-17.05	AVG





(b) Antenna polarization: Vertical



No.	Mk. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1	1324.342	32.66	-8.21	24.45	74.00	-49.55	peak
2	1327.394	20.63	-8.22	12.41	54.00	-41.59	AVG
3	1853.532	65.88	-8.95	56.93	74.00	-17.07	peak
4	* 1853.532	57.80	-8.95	48.85	54.00	-5.15	AVG
5	2779.713	44.81	-9.33	35.48	74.00	-38.52	peak
6	2779.713	31.78	-9.33	22.45	54.00	-31.55	AVG
7	3749.730	38.86	-5.93	32.93	74.00	-41.07	peak
8	3758.374	25.82	-5.91	19.91	54.00	-34.09	AVG
9	6591.739	36.45	10.65	47.10	74.00	-26.90	peak
10	6652.732	23.61	10.68	34.29	54.00	-19.71	AVG
11	8550.667	35.80	10.61	46.41	74.00	-27.59	peak
12	8590.135	22.85	10.62	33.47	54.00	-20.53	AVG

Note:

10~25GHz at least have 20dB margin. No recording in the test report.

Measurement Level = Reading Level + Factor Remark: Factor = Antenna Factor + Cable Loss–Pre-amplifier Highest channel: 927.5MHz





6.4 Occupied Bandwidth

6.4.1 Applied procedures / Limit

Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz..

6.4.2 Test procedure

- a) The testing follows FCC KDB publication No. 558074 D01 DTS Meas. Guidance v03r03
- b) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- c) Spectrum Setting: RBW= 10KHz, VBW≧3×RBW, Sweep time = Auto, Detector Function = Peak, Mark the peak frequency and -6 dB points bandwidth.

6.4.3 Deviation from standard

No deviation.

6.4.4 Test setup







6.4.5 Test results

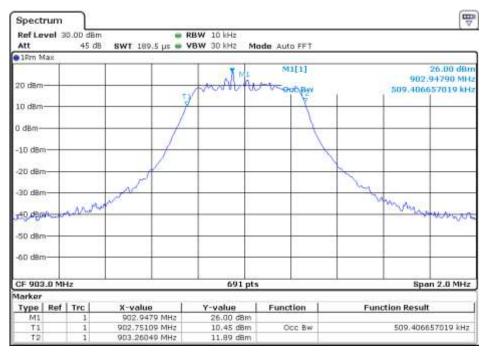
EUT:	mPCIe LoRa Concentrator Board	Model Name. :	NM0824-I
Temperature:	24.8 °C	Relative Humidity:	52%
Test Mode :	TX		

Channel	Channel frequency (MHz)	6dB bandwidth (KHz)	99% OBW (KHz)	Minimum 6dB Limit (KHz)	Conclusion
Low	903.0	671.50	509.40		Pass
Middle	923.5	564.40	503.61	≥500	Pass
High	927.5	593.30	526.77		Pass

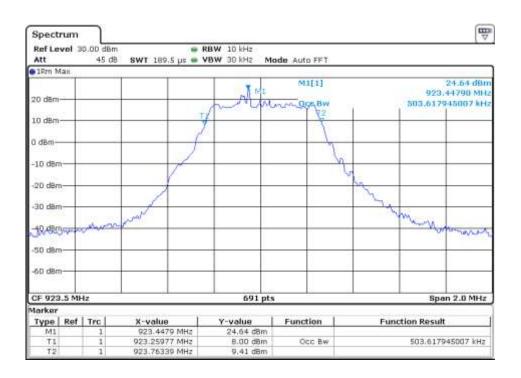




99% OBW @903.0MHz



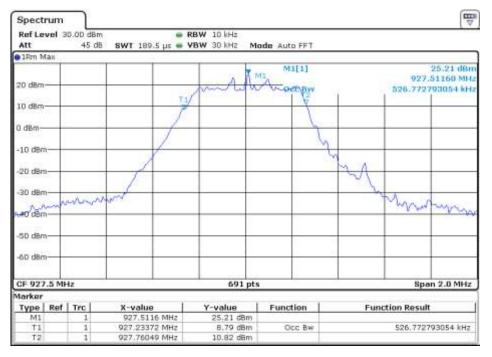
99% OBW @923.5MHz







99% OBW @927.5MHz



6dB Bandwidth @903.0MHz

Spect	rum							land the second
Ref Le	vel 3	0.00 dBm	SWT 18.9 µ		3W 100 kHz	ode Auto FFT		
PIPK M	3%	50 05	9441 T01A	5.00.00	344 300 KH2 M	OOB AULU PEI		
20 dBm	_			1		ndB	A ST	27.72 dBn 903.23730 MH 6.00 dt 671.500000000 kH
10 dBm						Q facto	"	1345.
0 dBm—	-	1					1	
-10 d8n	-	/						
-20 deri	-				+ +			~
-30 dBn	2						-	
-40 dBn	-				+ +			
-S0 d8n	-				+ +			
-60 dBn	+				+ +			
CF 903	.0 MH	łz	1		691 pt	-	N.	Span 2.0 MHz
larker			121		02 32 - N			
Type M1	Ref		X-value 903.2373		Y-value 27.72 dBm	Function ndB down		unction Result 671.5 kHz
M1 T1		1	903.2373		21.69 dBm	ndB down	2. Contraction of the second s	6.00 dB
T2		1	903.3184		21.98 dBm	Q factor		1345.1

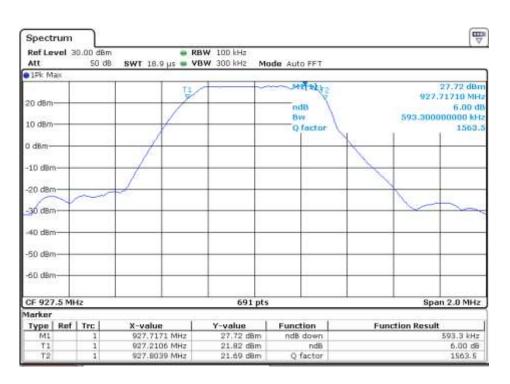




6dB Bandwidth @923.5MHz



6dB Bandwidth @927.5MHz







E

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6.5 **Power Spectral Density**

6.5.1 Applied procedures / Limit

15.247(a) (e) For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

6.5.2 Test procedure

- a. The testing follows Measurement procedure 10.2 Method PKPSD of FCC KDB publication No. 558074 D01 DTS Meas. Guidance v03r03
- b. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- c. Connected the antenna port to the Spectrum Analyzer, set the Spectrum Analyzer as center frequency to channel center frequency, span=1.5 times the bandwith, detector = peak 3kHz≤RBW≤100kHz, VBW≥3×RBW kHz, Sweep time=Auto.
- d. Trace mode = max hold. Mark the peak.
- e. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

6.5.3 Deviation from standard

No deviation.

6.5.4 Test setup







6.5.5 Test results

EUT:	mPCIe LoRa Concentrator Board	Model Name. :	NM0824-I
Temperature:	25.3 °C	Relative Humidity:	51%
Test Mode :	TX		

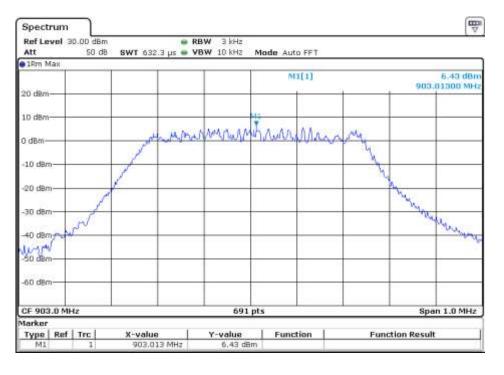
Test Mode	Channel frequency (MHz)	Power Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
	903.0	6.43	8	Pass
TX	923.5	7.10	8	Pass
	927.5	6.75	8	Pass

Note: The cable loss is 0.9dB

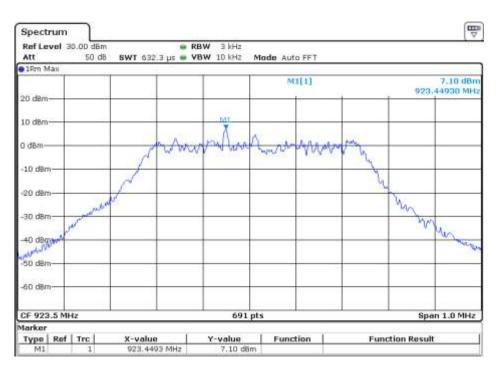




<u>@903.0MHz</u>



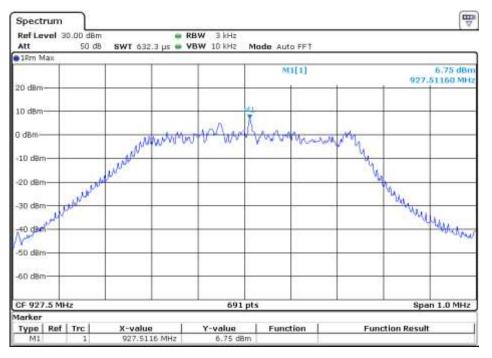
<u>@923.5MHz</u>







<u>@927.5MHz</u>







6.6 Maximum Average Conducted Output Power

6.6.1 Applied procedures / Limit

15.247(b) (3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode Requirement

Power $\leq 1 \text{ W} (30 \text{ dBm})$

6.6.2 Test procedure

- a. The testing follows FCC KDB publication No. 558074 D01 DTS Meas. Guidance v03r03
- b. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- ^{c.} Spectrum Setting: RBW≥Bandwidth, VBW≥3×RBW, Sweep time = Auto, Span≥3×RBW,
- d Detector = peak. Trace mode = max hold.
- e. Use peak marker function to determine the peak amplitude level.

6.6.3 Deviation from standard

No deviation.

6.6.4 Test setup







6.6.5 Test results

EUT:	mPCIe LoRa Concentrator Board	Model Name. :	NM0824-I
Temperature:	24.9°C	Relative Humidity:	51%
Test Mode :	TX		

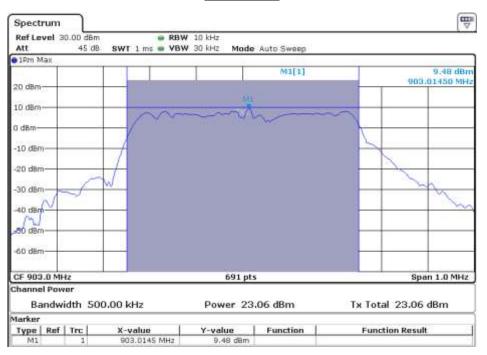
Channel	Channel frequency (MHz)	Measured Average Output Power (dBm)	Measured e.i.r.p (dBm)	Power Limit (dBm)	e.i.r.p Limit (dBm)	Result
Low	903.0	23.06	26.66	30	36	Pass
Middle	923.5	23.42	27.02	30	36	Pass
High	927.5	23.72	27.32	30	36	Pass
Cable loss =	0.9dBm					

Measured e.i.r.p (dBm)= Measured Average Output power (dBm) + Cable loss (0.9dB)+Antenna gain

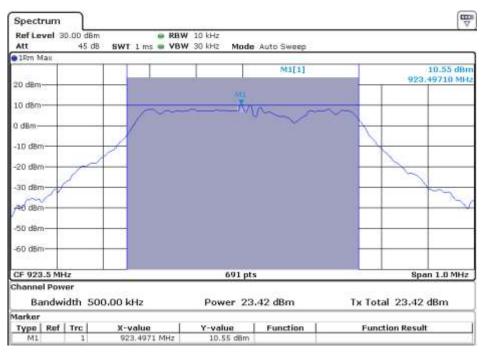




@903.0MHz

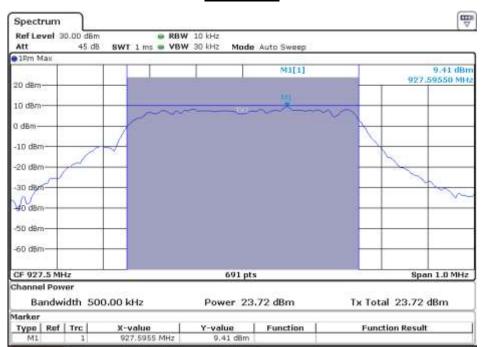


<u>@923.5MHz</u>









<u>@927.5MHz</u>





6.7 Band edge

6.7.1 Applied procedures / Limit

15.247(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.205(c)).

6.7.2 Test procedure

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- b. Span = wide enough to capture the peak level of the emission operating on the channel closest to the band edge, as well as any modulation products which fall outside of the authorized band of operation, RBW ≥ 1% of the span, VBW ≥ RBW, Sweep = auto, Detector function = peak, Trace = max hold

6.7.3 Deviation from standard

No deviation.

6.7.4 Test setup

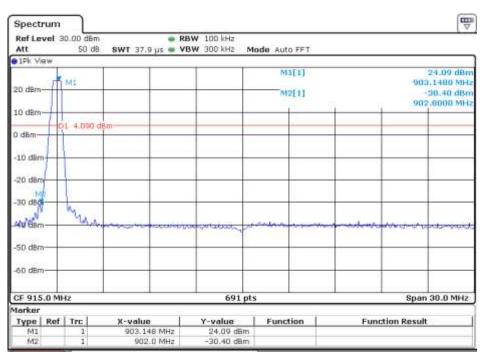






6.7.5 Test results

@903.0MHz



<u>@927.5MHz</u>

Spect	rum						E Station (Station (
Ref Le Att	vel 30	0.00 dBm S0 dB		8BW 100 kHz /BW 300 kHz Mc	de Auto FFT		
e 1Pk Vi	ew.			- 20			
20 dBm					M1[1] M2[1]		28.67 dBm 927.p370 MHz - 18.76 dBm
10 dBm	-			_	-	1 1	928/0000 MHz
0 dBm-	01	3.670 d	8m				
U uba-							
-10 dBm	n				-		142
-20 d8m	0	-					MZ
-30 dBm	ñ	-			-		
140 d80	-	man		and	Marching and Concerned	craderospectrospectrospectrospectrospectrospectrospectrospectrospectrospectrospectrospectrospectrospectrospectro	men my
-50 dBm	n						
-60 dBrr	n 	-		-		_	
Start 9	00.01	4Hz		691 pts			Stop 930.0 MHz
Marker		1.01				8	
Type	Ref	Trc	X-value	Y-value	Function	Functio	n Result
M1 M2		1	927.677 MHz 928.0 MHz	23,67 dBm -18,76 dBm			





6.8 Conducted Spurious Emissions

6.8.1 Applied procedures / Limit

15.247(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.205(c)).

6.8.2 Test procedure

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- b. Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic. Typically, several plots are required to cover this entire span. RBW = 100 kHz
 VBW ≥ RBW, Sweep = auto, Detector function = peak, Trace = max hold sweep points ≥ investigated frequency range/RBW.

6.8.3 Deviation from standard

No deviation.

6.8.4 Test setup







6.8.5 Test results

@903.0MHz

Spectrun	- T								E ⇒
Ref Level	30.00 dBm		RBW	100 kHz					
Att	50 dB	SWT 19.1 µs	VBW	300 kHz	Mode	Auto FFT			
1Pk Max									
						M3[1]			-36.16 dBm
20 dBm									124.550 kHz
20 UB/II						M1[1]			-25.85 dBm
10 dBm									31.490 kHz
	O1 4.750 de								
0 dBm	01 40/00 00								
-10 dBm					<u> </u>				
-20 dBm	M1					_			
					2				1 I
-30 dBm			_	_				M3	
							_	-	M
-40 dBm			_						
50 ID									1 I
-50 dBm									
-60 dBm									
-00 UBIII									
Start 9.0 k	Hz			691	pts			Sto	p 150.0 kHz
Marker									
Type Re	f Trc	X-value		Y-value		unction	Fu	nction Resu	ilt
M1	1	31.49 kł		-25.85 dB					
M2	1	79.85 kH		-31.48 dB					
M3	1	124.55 kH		-36.16 dB					
M4	1	150.0 kH	z	-37.98 dB	im				

Att	vel 3	0.00 dBm 50 dB		BW 100 kHz BW 300 kHz M	lode Auto FFT		107
1Pk M	献		2				
20 dBm	n e				M3[1] M1[1]		-42.71 dBn 26.4930 MH -39.31 dBn
10 d8m	-			+ +			593.0 kH
0 dBm-	0	1. 4,750 d	Bm				
-10 dBn	n				0		
-20 dBn	n						
-30 dBn	n						
1.6.1	~ h		1 1				
Lo dBr	0				Normonamon	South And And	Ma must
50 dBn		al-aver	when when when	athrantin	homecolamon	mound	and the most
-50 d8n	n <u></u>	ahaanna.	an the second	M. Marine	homeon	man	percentific manual
	n <u></u>	ahaanna.	an he was an end	ahnman	harminakamon	eromyczczał	and the mark
-50 d8n	n			ињатичка 691 р		escology, and the second	Btop 30.0 MHz
-50 d9n -60 d9n Start 1	50.0	kHz		691 p	5		Stop 30.0 MHz
-50 dBn -60 dBn Start 1 Marker Type	n	kHz Trc	X-value	691 p Y-value			
-50 dBn -60 dBn Start 1 Marker Type M1	50.0	kHz Trc	X-value 593.0 kHz	691 p Y-value -39.31 dBm	5		Stop 30.0 MHz
-50 dBn -60 dBn Start 1 Marker Type	50.0	kHz Trc	X-value	691 p Y-value	s Function		Stop 30.0 MHz





Ref Level 3			W 100 kHz			
Att 1Pk Max	50 di	8 SWT 9.7 ms 🗰 VB	W JUU KHZ MA	ode Auto Sweep	2	
20 dBm-				M4[1] M1(1)	10 sz	M24.75 dBn 902.40 MH -40.85 dBn 116.90 MH
and the second se	1 4.750	dBm				
0 dBm	+ 111.44					
-10 dBm						
-20 dBm						
Lo don						
-30 dBm			-			-
MS	P					l
HD (887)	Picken State		Dest Conference of the second	Address Water Barth	-b-stallout, all-sheets categority	CARRENT ROOM AND A
-50 d8m-						
0.0.00000000000000000000000000000000000						
-60 d8m						
Start 30.0 M	IHz		691 pt	5		Stop 1.0 GHz
larker						
Type Ref	Trc	X-value	Y-value	Function	Function	Result
M1	1	116.9 MHz	-40.85 dBm		C 0.014 (6.056 (0.10)	1.00.50.62705
.M2	1	214.2 MHz	-39.62 dBm			
MB	1	311.5 MHz	-40.76 dBm			
M4	1	902.4 MHz	24.75 dBm			

Spectrur	n					
Ref Level	30.00 dB	m 👄 RB1	W 100 kHz			
Att	50 0	18. SWT 90 ms 🖝 VB	W 300 kHz Mo	de Auto Sweep	5	
 1Pk Max 	an.	XL 30	10 W			
				M3[1]		-36.30 dBm
20 dBm			-			0.6120 GHz
			1 1	MI[1]		-38.71 dBm
10.dBm	-		-			1.8060 GHz
114203401	01 4.750	dBm				+ + +
0 dBm			-			
02320-						
-10 dBm			-			
-20 d8m-						
-10.0000						
-30 d8m						
M	1.12	In Me	internations	nour ware	May Anna	unshort of ensurem
48 d8/11	in the second				- and - and - and	or o
-50 dBm			1	-	-	
Sector Sector						
-60 d8m-						
Start 1.0	GHZ		691 pt	5		Stop 10.0 GHz
Marker						
Type Re	and the second se	X-value	Y-value	Function	Fui	nction Result
M1 M2	1	1.806 GHz 2.709 GHz	-38.71 d8m -36.87 d8m			
M3	1	3.612 GHz	-36.30 dBm			
M4	1	1.0 GHz	-40.48 dBm			
1.1.4		2.0 GHz	40.40 Guilt			





Stop 30.0 MHz

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<u>@923.5MHz</u>

	Ľ								[₩
Ref Level				N 100 kHz					
Att	50 dB	SWT 19.1	և µs 🖷 VBN	# 300 kHz	Mode Auto	FFT			
1Pk Max									
					M1	[1]			-24.39 dBm 33.180 kHz
20 dBm					A	[1]			-27.76 dBm
					1982	141			64.400 kHz
10 dBm								+	1
) dBm	D1 1.400 d	Bm							
-10 dBm									
-20 dBm	M1		M	2					
-30 dBm			-						
30 dBm									
40 dBm-									
TO GBIII									
-50 dBm									
60 dBm-									
Start 9.0 kl				691	nte			Chan	150.0 kHz
larker	n2			091	pts			ατυμ	130.0 KHz
Type Ref	E Tec	X-value		Y-value	Funct	ion I	Euro	ction Resul	
M1	1		18 kHz	-24.39 dB			1 411	can resu	
M2	1	64	.4 kHz	-27.76 dB					
M2	1	64	.4 kHz	-27.76 dB					
	_	64	.4 kHz	-27.76 dB					(EEE) ∀
Spectrum	- <u>-</u>	64		-27.76 dB					(⊞ ∀
Spectrum Ref Level	- <u>-</u>		e RBV		m	FFT			
Spectrum Ref Level Att	30.00 dBm		e RBV	₩ 100 kHz	m	FFT			[₩ ▼
Spectrum Ref Level Att	30.00 dBm		e RBV	₩ 100 kHz	Mode Auto	(FFT			-42.39 dBm
Spectrum Ref Level Att 1Pk Max	30.00 dBm		e RBV	₩ 100 kHz	Mode Auto	[1]		1	-42.39 dBm 0.0210 MHz
Spectrum Ref Level Att 1Pk Max	30.00 dBm		e RBV	₩ 100 kHz	Mode Auto			1	-42.39 dBm 0.0210 MHz -40.76 dBm
Spectrum Ref Level Att 1Pk: Max 20 dBm	30.00 dBm		e RBV	₩ 100 kHz	Mode Auto	[1]		1	-42.39 dBm 0.0210 MHz -40.76 dBm
Spectrum Ref Level Att IPk Max 20 dBm 10 dBm	30.00 dBm 50 dB	SWT 37.1	e RBV	₩ 100 kHz	Mode Auto	[1]	0	1	-42.39 dBm 0.0210 MHz -40.76 dBm
Spectrum Ref Level Att 1Pk Max 20 dBm 10 dBm	30.00 dBm	SWT 37.1	e RBV	₩ 100 kHz	Mode Auto	[1]		1	-42.39 dBm 0.0210 MHz -40.76 dBm
Spectrum Ref Level Att 1Pk Max 20 dBm 10 dBm	30.00 dBm 50 dB	SWT 37.1	e RBV	₩ 100 kHz	Mode Auto	[1]		1	-42.39 dBm 0.0210 MHz -40.76 dBm
Spectrum Ref Level Att 1Pk Max 20 dBm 10 dBm	30.00 dBm 50 dB	SWT 37.1	e RBV	₩ 100 kHz	Mode Auto	[1]		1	-42.39 dBm 0.0210 MHz -40.76 dBm
Spectrum Ref Level Att 1Pk Max 20 dBm 10 dBm 10 dBm -10 dBm	30.00 dBm 50 dB	SWT 37.1	e RBV	₩ 100 kHz	Mode Auto	[1]		1	-42.39 dBm 0.0210 MHz -40.76 dBm
Spectrum Ref Level Att 1Pk Max 20 dBm 10 dBm 0 dBm	30.00 dBm 50 dB	SWT 37.1	e RBV	₩ 100 kHz	Mode Auto	[1]		1	-42.39 dBm 0.0210 MHz -40.76 dBm
Spectrum Ref Level Att 1Pk Max 20 dBm 10 dBm -10 dBm -20 dBm	30.00 dBm 50 dB	SWT 37.1	e RBV	₩ 100 kHz	Mode Auto	[1]		1	-42.39 dBm 0.0210 MHz -40.76 dBm
Spectrum Ref Level Att 1Pk Max 20 dBm 10 dBm -10 dBm -20 dBm	30.00 dBm 50 dB	SWT 37.1	e RBV	₩ 100 kHz	Mode Auto	[1]		1	-42.39 dBm 0.0210 MHz -40.76 dBm 1.9440 MHz
Spectrum Ref Level Att 1Pk Max 20 dBm 10 dBm 10 dBm 20 dBm 20 dBm	30.00 dBm 50 dB	SWT 37.1	• RBV ps • VBV	W 100 kHz W 300 kHz	Mode Auto	[1]	M2	1	-42.39 dBm -40.76 dBm 1.9440 MHz
Spectrum Ref Level Att 1Pk Max 20 dBm 10 dBm 10 dBm 20 dBm	30.00 dBm 50 dB	SWT 37.1	• RBV ps • VBV	₩ 100 kHz	Mode Auto	[1]		1	-42.39 dBm -40.76 dBm 1.9440 MHz
Spectrum Ref Level Att 1Plk Max 20 dBm 10 dBm 10 dBm 20 dBm 30 dBm	30.00 dBm 50 dB	SWT 37.1	• RBV ps • VBV	W 100 kHz W 300 kHz	Mode Auto	[1]		1	-42.39 dBm -40.76 dBm 1.9440 MHz
Spectrum Ref Level Att IPk Max 20 dBm 10 dBm -10 dBm -20 dBm -20 dBm	30.00 dBm 50 dB	SWT 37.1	• RBV ps • VBV	W 100 kHz W 300 kHz	Mode Auto	[1]		1	

 Start 150.0 kHz
 691 pts
 Stop

 Marker
 Y-value
 Function
 Function Result

 M1
 1
 10.021 MHz
 -42.39 dBm
 Function
 Function Result

 M2
 1
 21.944 MHz
 -40.76 dBm
 Function
 Function Result

 M3
 1
 26.652 MHz
 -40.82 dBm
 Function
 Function Result

-6D dam-





rum						
				fode Auto Swee	p	(*
ax.		y	33 30		ίγ	
				M1[1]		23,40 dBm 927,50 MH -39,82 dBm
-			-			193.10 MHz
0	1 1.400	dBm				
n						
n			-			
n	8492		MA			
9 	- the state	www.wastersburg	and the state of the second	10		menandershim
2						
n			-			
0.0 M	Hz		691 p	ts		Stop 1.0 GHz
					y	
Ref					Fund	tion Result
	ax.	01 1.400 0	Well 30.00 dBm PRE S0 dB SWT 9.7 ms VI ax 01 1.400 dBm VI b1 1.400 dBm 01 0.00 dBm m 01 0.400 dBm 0.00 dBm m 00 0.00 dBm 0.00 dBm m 0.00 dBm 0.00 dBm 0.00 dBm m 0.00 dBm <td>Well 30.00 dBm RBW 100 kHz 50 dB SWT 9.7 ms VBW 300 kHz ax 0 0 0 01 1.400 dBm 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>weil 30.00 dBm e RBW 100 kHz S0 dB SWT 9.7 ms VBW 300 kHz Mode Auto Swee ax M1[1] M2[1] M2[1] 01 1.400 dBm M2[1] M2[1] 01 1.400 dBm M1[1] M2[1] 01 1.400 dBm M2[1] M2[1] 01 1.400 dBm M2[1] M2[1] 01 0.400 dBm M2[1] M2[1] 02 0.400 dBm M2[1] M2[1] 03 0.400 dBm M2[1] M2[1] 04 040 dBm M2[1] M2[1] 05 040 dBm M2[1] M2[1] 05 040 dB</td> <td>weil 30.00 dBm # RBW 100 kHz Mode Auto Sweep 30 dB SWT 9.7 ms VBW 300 kHz Mode Auto Sweep 30 M1[1] M2[1] 01 1.400 dBm M2[1] 02 1.400 dBm M2[1] 1 1.93.1 MHz 739.82 dBm 1 1.488.3 MHz -39.06 dBm</td>	Well 30.00 dBm RBW 100 kHz 50 dB SWT 9.7 ms VBW 300 kHz ax 0 0 0 01 1.400 dBm 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	weil 30.00 dBm e RBW 100 kHz S0 dB SWT 9.7 ms VBW 300 kHz Mode Auto Swee ax M1[1] M2[1] M2[1] 01 1.400 dBm M2[1] M2[1] 01 1.400 dBm M1[1] M2[1] 01 1.400 dBm M2[1] M2[1] 01 1.400 dBm M2[1] M2[1] 01 0.400 dBm M2[1] M2[1] 02 0.400 dBm M2[1] M2[1] 03 0.400 dBm M2[1] M2[1] 04 040 dBm M2[1] M2[1] 05 040 dBm M2[1] M2[1] 05 040 dB	weil 30.00 dBm # RBW 100 kHz Mode Auto Sweep 30 dB SWT 9.7 ms VBW 300 kHz Mode Auto Sweep 30 M1[1] M2[1] 01 1.400 dBm M2[1] 02 1.400 dBm M2[1] 1 1.93.1 MHz 739.82 dBm 1 1.488.3 MHz -39.06 dBm

opect	rum								-
Ref Le	vel 3	0.00 dBn 50 dB			W 100 kHz W 300 kHz Mor	de Auto Sweep	3		
1Pk M	âX								
20 dBm 10 dBm					M1[1] M2[1]		-39.83 dBm 1.8470 GHz -37.69 dBm 2,7700 GHz		
0 dBm-	04 ig	1 1,400	dBm						
-10 dBn		in a strange							
-20 dBr	n						-		
-30 dBn	n	site M	ME M	- Sin and	the norther	managertante	Autoro carneous		
40 dbh	ANSA.	requip	Andreamber	al construction	rtenistro	1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.	menument	- marine	a marine a
-50 dBn	n;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;					7		-	
-50 d8n -60 d8n	1 II.					11			
-60 d8n	n	z			691 pts	11 01 11 11		Sto	5 10.0 GHz
-60 d8n Start 1 Narker	.0 GH	8.			and access				
-60 d8n Start 1 Marker Type	.0 GH	Trc	X-value		Y-value	Function	Fu	Sto nction Result	
-60 d8n Start 1 Marker Type M1	.0 GH	Trc 1	1.8	47 GHz	Y-value -39.83 dBm		Fu		
-60 d8n Start 1 Marker Type	.0 GH	Trc	1.8		Y-value		Fu		





<u>@927.5.MHz</u>

Spectrun	,)					E
Ref Level Att	30.00 dBm 50 dB	e R SWT 19.1 μs e V	BW 100 kHz BW 300 kHz 1	Mode Auto FFT		,
1Pk Max						
20 dBm				M1[1]		-25.18 dBm 25.570 kHz -30.67 dBm
10 dBm						74.070 kHz
0 dBm	O1 3.170 d	Bm				
-10 dBm						
-20 dBm	MI					
-30 dBm			M12		M3	
-40 dBm						
-50 dBm						
-60 dBm						
Start 9.0 k	Hz		691 p	ts		Stop 150.0 kHz
Marker						
Type Re		X-value	Y-value	Function	Functio	on Result
M1 M2	1	25.57 kHz 74.07 kHz	-25.18 dBm -30.67 dBm			
m2	1	74.U7 KHZ	-30.67 dBm			

Spect	rum								
Ref Le	vel 3	0.00 dBm 50 dB		BW 100 kHz BW 300 kHz Mk	ode Auto FFT				
PIPk M	аж .								
20 dBm	-				M1[1] M2[1]		-40.08 dBm 583.0 kHz -42.38 dBm 12.1940 MHz		
10 dBm							12:1940 10112		
	D	1 3.170	dam						
0 d8m-									
-10 dBr	n+								
-20 dBr	n								
-30 dBr	n								
M1						13	564		
AD.dBr	Rent	A. 10. A.	manne	Maria and	and and the	A Marcara	Moundard A - white		
-50 dBr		a ny ita da					-		
-60 dBr	n								
Start 1	150.0	kHz		691 pts	8		Stop 30.0 MHz		
Marker	5						1.00		
Туре	Ref	Trc	X-value	Y-value	Function	Fun	ction Result		
M1		1	583.0 kHz	-40.08 dBm					
M2	_	1	12.194 MHz	-42.38 d8m					
M3		1	20.105 MHz	~40.47 dBm					
M4		1	29.209 MHz	-42.26 dBm					





Spectrum							_				V
Ref Level				10D kHz							
Att	50 dB	SWT 9.7 ms	: 🖷 VBW	300 kHz	Mode Au	ito Swee	p.				
1Pk Max					1	M1[1]				23(17)	40.
						orf 1				92770	
20 dBm					-	M2[1]				-41 60 0	
127124						1.00	63		15	373 70	
10 dBm-	. sound										
0 dBm	01 3.170 d	Bim				-	-		-		_
2-2300									I		
-10 d8m-						-			-		
2222									I		
-20 dBm									-		_
-30 d8m						-					_
SID CADIN	MB					_			-		
-60.dBm	denter Tort	convertigental	M2		-	-uniter	15.4	deads then	a connected	malles	her
1000102											
-50 dBm		-			-	-			-		_
10.40											
-60 dBm											
10	<u></u>				1				-		
Start 30.0	MHZ			691	pts				3	Stop 1.0 G	Hz
tarker	1 . 1	X-value	- T	S	1.0		-	2		4	
Type Ref M1	Ĩ	927.7	MHz	23.17 di		nction	-	Fun	ction Re	suit	-
M2	1	373.71		-41.60 di			-				
		193.1	MHz	-39.89 di							1
Spectrum Ref Level	30.00 dBm		e RBW	-39.89 di 100 kHz	ām						1
Spectrum Ref Level Att		193.1	e RBW	-39.89 di 100 kHz		to Sweep					1
Spectrum Ref Level Att	30.00 dBm		e RBW	-39.89 di 100 kHz	Am Mode Aut)			-20.14	
Spectrum Ref Level Att 1Pk Max	30.00 dBm		e RBW	-39.89 di 100 kHz	Am Mode Aut	o Sweep M1[1]	,			-39,14 (1,8550	381
Spectrum Ref Level Att 1Pk Max	30.00 dBm		e RBW	-39.89 di 100 kHz	Am Mode Aut		,			1.8550	dBr GH dBr
Spectrum Ref Level Att 1Pk Max 20 dBm	30.00 dBm		e RBW	-39.89 di 100 kHz	Am Mode Aut	M1[1]	2			1.8550	dBr GH dBr
Spectrum Ref Level Att 1Pk Max 20 dBm 10 dBm	30.00 dBm 50 dB	SWT 90 ms	e RBW	-39.89 di 100 kHz	Am Mode Aut	M1[1]	,			1.8550	dBr GH dBr
Spectrum Ref Level Att 1Pk Max 20 dBm- 10 dBm-	30.00 dBm	SWT 90 ms	e RBW	-39.89 di 100 kHz	Am Mode Aut	M1[1]				1.8550	dBr GH dBr
Spectrum Ref Level Att) IPk Max 20 dBm 10 dBm	30.00 dBm 50 dB	SWT 90 ms	e RBW	-39.89 di 100 kHz	Am Mode Aut	M1[1]				1.8550	dBr GH dBr
Spectrum Ref Level Att) IPk Max 20 dBm 10 dBm	30.00 dBm 50 dB	SWT 90 ms	e RBW	-39.89 di 100 kHz	Am Mode Aut	M1[1]	,			1.8550	dBr GH dBr
Spectrum Ref Level Att 1Pk Max 20 dBm 10 dBm 0 dBm -10 dBm	30.00 dBm 50 dB	SWT 90 ms	e RBW	-39.89 di 100 kHz	Am Mode Aut	M1[1]				1.8550	dBr GH dBr
Spectrum Ref Level Att 1Pk Max 20 dBm 10 dBm	30.00 dBm 50 dB	SWT 90 ms	e RBW	-39.89 di 100 kHz	Am Mode Aut	M1[1]				1.8550	GH JBr
Spectrum Ref Level Att 1Pk Max 20 dBm 10 dBm 0 dBm -10 dBm	30.00 dBm 50 dB	SWT 90 ms	e RBW	-39.89 d	Mode Aut	M1[1] M2[1]				1.8550	dBr GH dBr
Spectrum Ref Level Att 1Pk Max 20 dBm 10 dBm -10 dBm -10 dBm -30 dBm -30 dBm	30.00 dBm 50 dB 01 9.170 d	SWT 90 ms	e RBW	-39.89 d	Mode Aut	M1[1] M2[1]				1.8550	dBr GH GH
Spectrum Ref Level Att 1Pk Max 20 dBm 10 dBm -10 dBm -10 dBm -30 dBm -30 dBm	30.00 dBm 50 dB	SWT 90 ms	e RBW	-39.89 d	Mode Aut	M1[1] M2[1]				1.8550 -30.00 (2.7830	dBr GH GH
Spectrum Ref Level Att 1Pk Max 20 d8m 10 d8m -10 d8m -	30.00 dBm 50 dB 01 9.170 d	SWT 90 ms	e RBW	-39.89 d	Mode Aut	M1[1] M2[1]				1.8550 -30.00 (2.7830	dBr GH GH
Spectrum Ref Level Att 1Pk Max 20 d8m 10 d8m -10 d8m -	30.00 dBm 50 dB 01 9.170 d	SWT 90 ms	e RBW	-39.89 d	Mode Aut	M1[1] M2[1]				1.8550 -30.00 (2.7830	dBr GH GH
Spectrum Ref Level Att 1Pk Max 20 dBm 10 dBm 10 dBm 20 dBm 	30.00 dBm 50 dB 01 9.170 d	SWT 90 ms	e RBW	-39.89 d	Mode Aut	M1[1] M2[1]		پرواید زیراند را		1.8550 -30.00 (2.7830	dBr GH GH
Spectrum Ref Level Att 1Pk Max 20 dBm 0 dBm 10 dBm 20 dBm 30 dBm 30 dBm 50 dBm	30.00 dBm 50 dB 01 9.170 d	SWT 90 ms	e RBW	-39.89 d	Mode Aut	M1[1] M2[1]				1.8550 -30.00 (2.7830	dBr GH GH
Spectrum Ref Level Att 1Pk Max 20 dBm 10 dBm 10 dBm 20 dBm 30 dBm 30 dBm 50 dBm 60 dBm	30.00 dBm 50 dB	SWT 90 ms	e RBW	-39.89 d	Mode Aut	M1[1] M2[1]				1.8550 -30.00 (2.7830	dBr GH GH
Spectrum Ref Level Att 1Pk Max 20 dBm 10 dBm 10 dBm 20 dBm 20 dBm 30 dBm 50 dBm 50 dBm 50 dBm 50 dBm 50 dBm	30.00 dBm 50 dB	SWT 90 ms	e RBW	-39.89 d	Mode Aut	M1[1] M2[1]				1.8550	dBr GH GH
Spectrum Ref Level Att 1Pk Max 20 dBm 10 dBm -10 dBm -10 dBm -20 dBm -30 dBm -30 dBm -50 dBm -50 dBm -50 dBm -50 dBm	30.00 dBm 50 dB 01 9.170 d	SWT 90 ms	e RBW	-39.89 d	m Mode Aut	M1[1] M2[1]				1.8550 -38.00 (2.7830	dBr GH GH
Spectrum Ref Level Att 1Pk Max 20 dBm 10 dBm -10 dBm -10 dBm -20 dBm -30 dBm -50 dBm -50 dBm -50 dBm -50 dBm -50 dBm	30.00 dBm 50 dB 01 9.170 d	BWT 90 ms	MHz RBW VBW	-39.89 d	mode Aut	M1[1] M2[1]				1.8550 -38.00 (2.7830	dBr GH GH



End of Report