COMMSCOPE TECHNOLOGIES, LLC

TEST REPORT

SCOPE OF WORK
MPE Calculation – n77 C Band with 5G W/ RP5200 Host

REPORT NUMBER
105382536BOX-001b

ISSUE DATE	**[REVISED DATE]**
April 18, 2023	Original Issue

DOCUMENT CONTROL NUMBER
Non-Specific Radio Report Shell Rev. October 2022

MPE CALCULATION TEST REPORT

(FULL COMPLIANCE)

Report Number: 105382536BOX-001b
Project Number: G105382536

Report Issue Date: April 18, 2023

Model(s) Tested: n77 C Band with 5G W/ RP5200 Host
Model(s) Partially Tested: None
Model(s) Not Tested but declared equivalent by the client: None

Standards: FCC Part 1.1310: 04/23 Limits for Maximum Permissible Exposure (MPE) (General Population / Uncontrolled Exposure)

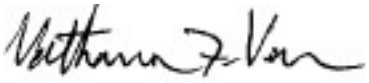
Tested by:
Intertek
70 Codman Hill Road
Boxborough, MA 01719
USA

Client:
CommScope Technologies, LLC
900 Chelmsford St.
Lowell, MA 01851
USA

Report prepared by Reviewer

Kouma Sinn / Sr. EMC Staff Engineer

Report reviewed by Reviewer



Vathana Ven / Sr. EMC Staff Engineer

Table of Contents

1 Introduction and Conclusion

The tests indicated in section 2.0 were performed on the product constructed as described in section 4.0. The remaining test sections are the verbatim text from the actual data sheets used during the investigation. These test sections include the test name, the specified test Method, a list of the actual Test Equipment Used, documentation Photos, Results and raw Data. No additions, deviations, or exclusions have been made from the standard(s) unless specifically noted.

Based on the results of our investigation, we have concluded the product tested **complies** with the requirements of the standard(s) indicated. The results obtained in this test report pertain only to the item(s) tested. Intertek does not make any claims of compliance for samples or variants which were not tested.

2 Test Summary

Section	Test full name	Result
3	Client Information	--
4	Description of Equipment Under Test and Variant Models	--
5	FCC MPE Calculation FCC Part 1.1310: 04/23 (General Population / Uncontrolled Exposure)	Pass
6	Revision History	--

3 Client Information

This EUT was tested at the request of:

Client: CommScope Technologies, LLC
900 Chelmsford St.
Lowell, MA 01851
USA

Contact: Zac Johnson
Telephone: None
Fax: None
Email: zac.johnson@commscope.com

4 Description of Equipment Under Test and Variant Models

Manufacturer: CommScope Technologies, LLC
900 Chelmsford St.
Lowell, MA 01851
USA

Equipment Under Test			
Description	Manufacturer	Model Number	Serial Number
n77 C Band with 5G W/ RP5200 Host base station	CommScope Technologies, LLC	n77 C Band	1912050018

Receive Date:	03/27/2023
Received Condition:	Good
Type:	Production

Description of Equipment Under Test (provided by client)
n77 C Band with 5G W/ RP5200 Host base station with four antenna outputs

Radio Characteristics	
Frequency Band(s)	3720-3960 MHz
Modulation Type(s)	QPSK, 16-QAM, 64-QAM, 256-QAM
Maximum Output Power	24.65 dBm (Worst-case Conducted Output Power)
Test Channels	Low – 3720 MHz, Mid – 3840 MHz, High – 3960 MHz
Occupied Bandwidth	37.984 MHz (Worst-case)
MIMO Information (# of Transmit and Receive antenna ports)	Four Antenna Ports
Equipment Type	Plug-in Radio Module
Antenna Type and Gain	Detachable Antenna: +4 dBi (as provided by the client. Intertek takes no responsibility for the accuracy of this information. Actual antenna gain will be determined at the time of licensing)

Variant Models:

The following variant models were not tested as part of this evaluation and are not eligible for certification; but have been identified by the manufacturer as being electrically identical models, depopulated models, or with reasonable similarity to the model(s) tested. Intertek does not make any claims of compliance for samples or variants which were not tested.

None

5 FCC MPE Calculation

5.1 Limits

§ 1.1310: The criteria listed in table 1 shall be used to evaluate the environmental impact of human exposure to radiofrequency (RF) radiation as specified in §1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of §2.1093 of this chapter.

Part 1.1310 Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3–3.0	614	1.63	*(100)	6
3.0–30	1842/f	4.89/f	*(900/f^2)	6
30–300	61.4	0.163	1.0	6
300–1500	.....	.....	f/300	6
1500–100,000	.....	.....	5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f^2)	30
30–300	27.5	0.073	0.2	30
300–1500	.....	.....	f/1500	30
1500–100,000	.....	.....	1.0	30

f = frequency in MHz
* = Plane-wave equivalent power density

NOTE 1 TO TABLE 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

NOTE 2 TO TABLE 1: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

5.2 Test Procedure

An MPE evaluation for was performed in order to show that the device was compliant with the general population exposure limits from FCC §2.1091. The maximum power density was calculated for each transmitter band at a separation distance of 20cm using the maximum declared output power including tune up tolerance.

For each transmitter the maximum RF exposure at a 20 cm distance using the formula:

$$ConductedPower_{mW} = 10^{ConductedBwer(dBm)/10}$$

$$PowerDensity = \frac{ConductedPower_{mW} \times Ant.Gain}{4\pi \times (20_{cm})^2}$$

5.3 Results:

The calculated maximum power density at 20 cm distance was equal to or less than the required Maximum Permissible Exposure (MPE) for General Population / Uncontrolled Exposure environment. The sample was found to comply.

Modulations	Channels	Channel Power dBm, mW				Combined Power	Antenna Gain	EIRP	MPE Value	MPE Limit	MPE Margin
		Port 1	Port 2	Port 3	Port 4	dBm, mW	dBi	dBm, mW	mW/cm2	mW/cm2	mW/cm2
QPSK	Low	23.96	23.89	23.35	23.95	29.82	4.00	33.82	0.479	1.00	-0.521
	3720 MHz	248.89	244.91	216.27	248.31	958.38		2407.33			
	Mid	24.12	24.18	24.31	24.51	30.30	4.00	34.30	0.536	1.00	-0.464
	3840 MHz	258.23	261.82	269.77	282.49	1072.31		2693.51			
	High	24.12	24.55	24.41	24.34	30.38	4.00	34.38	0.545	1.00	-0.455
	3960 MHz	258.23	285.10	276.06	271.64	1091.03		2740.54			
16QAM	Low	23.97	23.86	23.43	24.19	29.89	4.00	33.89	0.488	1.00	-0.512
	3720 MHz	249.46	243.22	220.29	262.42	975.39		2450.08			
	Mid	24.19	24.65	24.33	24.26	30.38	4.00	34.38	0.546	1.00	-0.454
	3840 MHz	262.42	291.74	271.02	266.69	1091.87		2742.65			
	High	24.35	24.64	24.65	24.39	30.53	4.00	34.53	0.565	1.00	-0.435
	3960 MHz	272.27	291.07	291.74	274.79	1129.87		2838.12			
64QAM	Low	23.70	23.85	23.26	23.93	29.71	4.00	33.71	0.468	1.00	-0.532
	3720 MHz	234.42	242.66	211.84	247.17	936.09		2351.36			
	Mid	24.14	24.29	24.23	24.41	30.29	4.00	34.29	0.534	1.00	-0.466
	3840 MHz	259.42	268.53	264.85	276.06	1068.86		2684.86			
	High	24.12	24.18	24.60	24.42	30.35	4.00	34.35	0.543	1.00	-0.457
	3960 MHz	258.23	261.82	288.40	276.69	1085.14		2725.75			
256QAM	Low	23.97	23.91	23.35	23.97	29.83	4.00	33.83	0.481	1.00	-0.519
	3720 MHz	249.46	246.04	216.27	249.46	961.23		2414.49			
	Mid	24.23	24.34	24.34	24.39	30.35	4.00	34.35	0.541	1.00	-0.459
	3840 MHz	264.85	271.64	271.64	274.79	1082.93		2720.19			
	High	24.08	24.56	24.51	24.31	30.39	4.00	34.39	0.547	1.00	-0.453
	3960 MHz	255.86	285.76	282.49	269.77	1093.88		2747.70			

Notes: The EIRP power used for MPE calculation was taken from Report # 105382536BOX-001.

6 Revision History

Revision Level	Date	Report Number	Prepared By	Reviewed By	Notes
0	04/18/2023	105382536BOX-001b	KPS	VFV	Original Issue