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Report On

RF Exposure Assessment of the
Cobham Tactical Communications and Surveillance
NETNode2x2W-5R-200250 IP Mesh Radio Phase 5

FCC ID: XRFNETNODE-5R

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Product Service

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SECTION 1

REPORT SUMMARY

RF Exposure Assessment of the
Cobham Tactical Communications and Surveillance
NETNode2x2W-5R-200250 IP Mesh Radio Phase 5

1.1 INTRODUCTION

The information contained in this report is intended to show verification of the RF Exposure Assessment of the Cobham Tactical Communications and Surveillance NETNode2x2W-5R-200250 IP Mesh Radio Phase 5 to the requirements of the applied test specifications.

Objective	To perform RF Exposure Assessment to determine the Equipment Under Test's (EUT's) compliance of the applied rules.
Applicant	Cobham Tactical Communications and Surveillance
Manufacturer	Cobham Tactical Communications and Surveillance
Manufacturing Description	NETNode IP Mesh Radio Phase 5
Model Number(s)	NETNODE2X2W-5R-200250
Test Specification/Issue/Date	CFR 47 Pt1.1310

1.2 REGIONAL REQUIREMENTS

The table below shows the regional requirements that are referenced in this test report. A full list of the requirements is shown in Annex A.

Report Reference	Regional Requirement
FCC	CFR 47 Pt1.1310

1.3 PRODUCT INFORMATION

1.3.1 Technical Description

The Equipment under test was a Cobham Tactical Communications and Surveillance NETNode2x2W-5R-200250 IP Mesh Radio Phase 5. A full technical description can be found in the manufacturer's documentation.

All reported calculations were carried out on the relevant information supplied for the NETNode2x2W-5R-200250 IP Mesh Radio Phase 5 to demonstrate compliance with the applied test specification(s). The sample assessed was found to comply with the requirements of the applied rules.

1.3.2 Supported Features

The following radio access technologies and frequency bands are supported by the equipment under test.

Radio Access Technology	Digital Modulation
	Digital Modulation - MIMO
Frequency Band	2000 MHz to 2500 MHz

1.3.3 Antennas

The following antennas are supported by the equipment under test.

No.	Model	Gain (dBi)
1	External	0

1.4 BRIEF SUMMARY OF RESULTS

The wireless device described within this report has been shown to be capable of compliance with the basic restrictions related to human exposure to electromagnetic fields for both General Public and Occupational. The calculations shown in this report were made in accordance the procedures specified in the applied test specification(s).

Required Compliance Boundary (m)	
Occupational	General Population
0.12	0.26

Table 1 – Compliance Boundary Results

Regional Requirement	Calculated RF exposure level at compliance boundary of 0.12 m					
	S Field (W/m^2)		E Field (V/m)		H Field (A/m)	
	Result	Limit	Result	Limit	Result	Limit
FCC*	4.4210	5.0000	N/A	N/A	N/A	N/A

* Requirement and Result in mW/cm^2

Table 2 – Occupational Results

The calculations show that the EUT complies with the occupational exposure levels described in the and CFR 47 Pt1.1310 at the point of investigation, 0.12 m.

Regional Requirement	Calculated RF exposure level at compliance boundary of 0.26 m					
	S Field (W/m^2)		E Field (V/m)		H Field (A/m)	
	Result	Limit	Result	Limit	Result	Limit
FCC*	0.9418	1.0000	N/A	N/A	N/A	N/A

* Requirement and Result in mW/cm^2

Table 3 – General Population Results

The calculations show that the EUT complies with the occupational exposure levels described in the and CFR 47 Pt1.1310 at the point of investigation, 0.26 m.

SECTION 2

TEST DETAILS

2.1 RATIONALE FOR ASSESSMENT OF THE RF EXPOSURE

The aim of the assessment report is to evaluate the compliance boundary for a set of given input power(s) according to the basic restrictions (directly or indirectly via compliance with reference levels) related to human exposure to radio frequency electromagnetic fields.
The chosen assessment method to establish the compliance boundary in the far-field region is the reference method as defined in the relevant specifications.

The RF exposure assessment is based upon the following criteria:

The NETNode2x2W-5R-200250 IP Mesh Radio Phase 5 operates with the following transmitters active on the antenna ports shown in Section 1.3.3. For each transmitter, the Radio Access Technology (RAT), EIRP inclusive of antenna gain and duty cycle, gain of the antenna and lowest frequency of operation are shown as they contribute to the calculation of S Field, E field and H field values according to the following formulas.

The power flux (S Field):

$$S = \frac{PG_{(\theta,\phi)}}{4\pi r^2}$$

The electric field strength (E Field):

$$E = \frac{\sqrt{30PG}_{(\theta,\phi)}}{r}$$

The magnetic field strength (H Field):

$$H = \frac{E}{\eta_o}$$

Where:

P = Average Power (W)
G = Antenna Gain (dBi)
r = Distance (cm) or (m)
η_o = 377

2.2 TEST RESULT DETAILS

The frequencies shown in the tables below have been chosen based on the lowest possible frequency that the EUT can transmit.

Antenna Port	Tx No.	Ant No.	RAT	EIRP (W)	Duty Cycle (%)	Gain (dBi)	Frequency (MHz)	RF Exposure Level at compliance boundary of 0.12 m		
								S Field (W/m^2)	E Field (V/m)	H Field (A/m)
1	1	1	Digital Modulation	2.000	100	0	2000	11.0517	64.5475	0.1712
2	1	1	Digital Modulation	2.000	100	0	2000	11.0517	64.5475	0.1712
1 & 2	1	1	Digital Modulation - MIMO	4.000	100	0	2000	22.1069	91.2913	0.2422

Table 4 – Occupational Transmitter Summary

Antenna Port	Tx No.	Ant No.	RAT	EIRP (W)	Duty Cycle (%)	Gain (dBi)	Frequency (MHz)	RF Exposure Level at compliance boundary of 0.26 m		
								S Field (W/m^2)	E Field (V/m)	H Field (A/m)
1	1	1	Digital Modulation	2.000	100	0	2000	2.3542	29.7911	0.0790
2	1	1	Digital Modulation	2.000	100	0	2000	2.3542	29.7911	0.0790
1 & 2	1	1	Digital Modulation - MIMO	4.000	100	0	2000	4.7092	42.1344	0.1118

Table 5 – General Population Transmitter Summary

The following tables show a summary of each antenna port and the summation of the RF exposure results and limit for each region.

Antenna Port	EIRP (W)	Regional Requirement	Calculated RF exposure level at compliance boundary of 0.12 m					
			S Field (W/m^2)		E Field (V/m)		H Field (A/m)	
			Result	Limit	Result	Limit	Result	Limit
1	2.000	FCC*	1.1052	5.0000	N/A	N/A	N/A	N/A
2	2.000	FCC*	1.1052	5.0000	N/A	N/A	N/A	N/A
1 & 2	4.000	FCC*	2.2107	5.0000	N/A	N/A	N/A	N/A

* Requirement and Result in mW/cm^2

Table 6 – Occupational Antenna Port Summary

Antenna Port	EIRP (W)	Regional Requirement	Calculated RF exposure level at compliance boundary of 0.26 m					
			S Field (W/m^2)		E Field (V/m)		H Field (A/m)	
			Result	Limit	Result	Limit	Result	Limit
1	2.000	FCC*	0.2354	1.0000	N/A	N/A	N/A	N/A
2	2.000	FCC*	0.2354	1.0000	N/A	N/A	N/A	N/A
1 & 2	4.000	FCC*	0.4709	1.0000	N/A	N/A	N/A	N/A

* Requirement and Result in mW/cm^2

Table 7 – General Population Antenna Port Summary

SECTION 3

DISCLAIMERS AND COPYRIGHT

3.1 DISCLAIMERS AND COPYRIGHT

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

ANNEX A

REGIONAL REQUIREMENTS

Frequency Range (MHz)	S Field (mW/cm^2)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)
0 - 0.3	-	-	-
0.3 - 3	100	614	1.63
3 - 30	900/f^2	1842/f	4.89/f
30 - 300	1	61.4	0.163
300 - 1500	f/300	-	-
1500 - 100000	5	-	-

Table A.1 – CFR 47 Pt1.1310 Occupational Limits

Frequency Range (MHz)	S Field (mW/cm^2)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)
0 - 0.3	-	-	-
0.3 - 3	100	614	1.63
3 - 30	180/f^2	824/f	2.19/f
30 - 300	0.2	27.5	0.073
300 - 1500	f/1500	-	-
1500 - 100000	1	-	-

Table A.2 – CFR 47 Pt1.1310 General Population Limits