FCC RADIO EXPOSURE TEST REPORT

FCC ID	:	XIA-NTC224
Equipment	:	4G LTE Cat 1 Industrial IoT Router
Brand Name	:	NetCommWireless
Model Name	:	NTC-224
Applicant	:	NetComm Wireless Limited 18-20 Orion Road Lane Cove NSW 2066 Australia
Manufacturer	:	NetComm Wireless Limited 18-20 Orion Road Lane Cove NSW 2066 Australia
Standard	:	47 CFR Part 2.1091

The product was received on Sep. 20, 2018, and testing was started from Oct. 03, 2018 and completed on Oct. 22, 2018. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in 47 CFR Part 2.1091 and shown compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Approved by: Cliff Chang

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
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Photographs of EUT v01

History of this test report

Report No.	Version	Description	Issued Date
FA891425AB	01	Initial issue of report	Nov. 13, 2018

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3	-	Exposure evaluation	PASS	-

Reviewed by: Sam Chen

Report Producer: Wendy Pan

1 General Description

1.1 EUT General Information

RF General Information				
Evaluation Mode	**Bandwidth (MHz)**	**TX Frequency (MHz)**	**RX Frequency (MHz)**	**Modulation Type**
LTE Band 2	1.4	1850.7 ~ 1909.3	1930.7 ~ 1989.3	QPSK / 16QAM
	3	1851.5 ~ 1908.5	1931.5 ~ 1988.5	
	5	1852.5 ~ 1907.5	1932.5 ~ 1987.5	
	10	1855.0 ~ 1905.0	1935.0 ~ 1985.0	
	15	1857.5 ~ 1902.5	1937.5 ~ 1982.5	
	20	1860.0 ~ 1900.0	1940.0 ~ 1980.0	
LTE Band 4	1.4	1710.7 ~ 1754.3	2110.7 ~ 2154.3	
	3	1711.5 ~ 1753.5	2111.5 ~ 2153.5	
	5	1712.5 ~ 1752.5	2112.5 ~ 2152.5	
	10	1715.0 ~ 1750.0	2115.0 ~ 2150.0	
	15	1717.5 ~ 1747.5	2117.5 ~ 2147.5	
	20	1720.0 ~ 1745.0	2120.0 ~ 2145.0	
LTE Band 12	1.4	699.7 ~ 715.3	729.7 ~ 745.3	
	3	700.5 ~ 714.5	730.5 ~ 744.5	
	5	701.5 ~ 713.5	731.5 ~ 743.5	
	10	704.0 ~ 711.0	734.0 ~ 741.0	

1.2 Testing Location

Testing Location			
☐	HWA YA	ADD :	No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.
		TEL : 886-3-327-3456	FAX : 886-3-327-0973
☒	JHUBEI	ADD :	No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C.
		TEL : 886-3-656-9065	FAX : 886-3-656-9085

Test site Designation No. TW0006 with FCC.

Test site registered number IC 4086D with Industry Canada.

2 RF Exposure Limit Introduction

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm²)	Averaging Time $\|E\|^2$,$\|H\|^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842 / f	4.89 / f	(900 / f)*	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

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm²)	Averaging Time $\|E\|^2$,$\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

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

The MPE was calculated at 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

E (V/m) = $\frac{\sqrt{30 \times P \times G}}{d}$ Power Density: *Pd* (W/m²) = $\frac{E^2}{377}$

E = Electric field (V/m)

P = RF output power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

Pd = $\frac{30 \times P \times G}{377 \times d^2}$

3 Radio Frequency Radiation Exposure Evaluation

3.1 Power Density Calculation

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm^2)	S Limit (mW/cm^2)
Band 2_LTE_10MHz_Nss1,(QPSK)	3.42	22.46	25.88	0.50	26.38	0.43451	20	0.08644	1.00000
Band 4_LTE_20MHz_Nss1,(QPSK)	3.28	24.03	27.31	0.50	27.81	0.60395	20	0.12015	1.00000
Band 12_LTE_5MHz_Nss1,(QPSK)	4.71	23.21	27.92	0.50	28.42	0.69502	20	0.13827	0.46647

Note: For conservativeness, the lowest uplink frequency of each band is used to determine the MPE limit of that band.

Conclusion:

According to 47 CFR Part 2.1091, the RF exposure analysis concludes that the RF Exposure is compliant.

———THE END———