


RF EXPOSURE EVALUATION REPORT

FCC ID : XIA-IFWA40
Equipment : Wireless Home Internet
Brand Name : Netcomm
Model Name : IFWA-40
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

We, SPORTON INTERNATIONAL INC has been evaluated in accordance with 47 CFR Part 2.1091 for the device and pass the limit.

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

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Approved by: Cona Huang / Deputy Manager

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History of this test report

Report No.	Version	Description	Issued Date
FA8O1751	Rev. 01	Initial issue of report	Apr. 01, 2019

**1. Description of Equipment Under Test (EUT)**

Product Feature & Specification	
EUT Type	Wireless Home Internet
Brand Name	Netcomm
Model Name	IFWA-40
FCC ID	XIA-IFWA40
Wireless Technology and Frequency Range	WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz WCDMA Band V: 826.4 MHz ~ 846.6 MHz LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 29: 717 MHz ~ 728 MHz (downlink only) LTE Band 30: 2305 MHz ~ 2315 MHz LTE Band 66: 1710 MHz ~ 1780 MHz WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz
Mode	RMC 12.2Kbps HSDPA HSUPA LTE: QPSK, 16QAM, 64QAM, 256QAM(Rx Only) 802.11a/b/g/n/ac HT20/HT40/VHT20/VHT40/VHT80
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

Reviewed by: Jason Wang

Report Producer: Wan Liu

2. Maximum RF average output power among production units

Mode		Maximum Average power(dBm)
WCDMA	Band II	25.7
	Band V	25.7
LTE	Band 2	25.7
	Band 4	25.7
	Band 5	25.7
	Band 12	25.7
	Band 30	24.2
	Band 66	25.7

Band / Channel / Frequency (MHz)			IEEE 802.11 Average Power (dBm)			
			ANT0+1			
			11b	11g	VHT20	VHT40
2.4GHz WLAN	Ch 1	2412	23.5	20	19.5	
	Ch 2	2417		22.5	21	
	Ch 3	2422				17.5
	Ch 6	2437	23.5	22.5	21	19
	Ch 8	2447				17
	Ch 9	2452				16
	Ch 10	2457	23.5	22	21	
	Ch 11	2462	23.5	18	17.5	

Band / Channel / Frequency (MHz)			IEEE 802.11 Average Power (dBm)			
			ANT 0+1			
			11a	VHT20	VHT40	VHT80
5.2GHz WLAN (U-NII-1)	Ch 36	5180	20	20		
	Ch 38	5190			17.5	
	Ch 40	5200	20.5	20.5		
	Ch 42	5210				17
	Ch 44	5220				
	Ch 46	5230			20.5	
	Ch 48	5240	20.5	20.5		
5.8GHz WLAN (U-NII-3)	Ch 149	5745	20	20		
	Ch 151	5755			20	
	Ch 155	5775				19.5
	Ch 157	5785	20.5	20.5		
	Ch 159	5795			20.5	
	Ch 165	5825	20.5	20.5		

3. RF Exposure Limit Introduction

According to ANSI/IEEE C95.1-1992, the criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §1.1310.

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

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:

$$S = \frac{PG}{4\pi R^2}$$

Where:

S = Power Density

P = Output Power at Antenna Terminals

G = Gain of Transmit Antenna (linear gain)

R = Distance from Transmitting Antenna

4. Radio Frequency Radiation Exposure Evaluation

4.1. Standalone Power Density Calculation

Band	Frequency (MHz)	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum EIRP (dBm)	Maximum EIRP (W)	Average EIRP (mW)	Power Density at 20cm (mW/cm ²)	Limit (mW/cm ²)	Power Density / Limit
WCDMA Band 2	1852.4	3.00	25.70	28.700	0.741	741.310	0.148	1.000	0.148
WCDMA Band 5	826.4	1.90	25.70	27.600	0.575	575.440	0.115	0.551	0.208
LTE Band 2	1850.7	3.00	25.70	28.700	0.741	741.310	0.148	1.000	0.148
LTE Band 4	1710.7	3.60	25.70	29.300	0.851	851.138	0.169	1.000	0.169
LTE Band 5	824.7	1.90	25.70	27.600	0.575	575.440	0.115	0.550	0.208
LTE Band 12	699.7	2.50	25.70	28.200	0.661	660.693	0.132	0.466	0.282
LTE Band 30	2307.5	2.40	24.20	26.600	0.457	457.088	0.091	1.000	0.091
LTE Band 66	1710.7	3.50	25.70	29.200	0.832	831.764	0.166	1.000	0.166
2.4GHz WLAN	2412.0	5.17	23.50	28.670	0.736	736.207	0.147	1.000	0.147
5GHz WLAN	5180.0	5.79	20.50	26.290	0.426	425.598	0.085	1.000	0.085

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

4.2. Collocated Power Density Calculation

WWAN Power Density / Limit	WLAN Power Density / Limit	Σ (Power Density / Limit) of WWAN+WLAN
0.282	0.147	0.429

Note:

1. Σ (Power Density / Limit): This is a summation of [(power density for each transmitter/antenna included in the simultaneous transmission)/ (corresponding MPE limit)], for WWAN + WLAN.
2. Considering the WWAN module collocation with the WLAN transmitter of the EIRP performance listed in the table above, the aggregated (power density /limit) is smaller than 1, and MPE of 2 collocated transmitters is compliant

Conclusion:

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