

# FCC RF EXPOSURE REPORT

## FCC ID: RYK-WNFQ258ACNBT

**Project No.** : 1708083  
**Equipment** : 802.11ac/b/g/n WiFi + Bluetooth M.2 Card  
**Model** : WNFQ-258ACN(BT)  
**Series Model** : N/A  
**Applicant** : SparkLAN Communications, Inc.  
**Address** : 8F.,No.257,Sec.2,Tiding-Blvd.,Neihu  
District,Taipei City 11493,Taiwan (R.O.C.)

**According:** : FCC Guidelines for Human Exposure IEEE  
C95.1

# **B T L I N C .**

No.18, Ln. 171, Sec. 2, Jiuzong Rd.,  
Neihu Dist., Taipei City, Taiwan (R.O.C.)  
TEL:+886-2-2657-3299 FAX: +886-2-2657-3331



## MPE CALCULATION METHOD:

Calculation Method of RF Safety Distance:

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

where:

S = power density

P = power input to the antenna

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna

Table for Filed Antenna:

Ant.	Brand	Model	Type	Connector	Gain (dBi)				
					2.4 GHz	Band 1	Band 2	Band 3	Band 4
1	Wanshin	R3410110203 WSS003	Dipole	RP-SMA	2.02	1.93	1.93	2.03	2.03
2	Long Cheng	FDE_ACBSMA-BGP	Dipole	RP-SMA	3.27	5.436	5.436	5.436	5.96

Operating Mode / TX Mode	2TX
802.11b	V (ANT 1+ANT 2)
802.11g	V (ANT 1+ANT 2)
802.11n(20MHz)	V (ANT 1+ANT 2)
802.11n(40MHz)	V (ANT 1+ANT 2)
IEEE 802.11a	V (ANT 1+ANT 2)
IEEE 802.11n (20 MHz)	V (ANT 1+ANT 2)
IEEE 802.11n (40 MHz)	V (ANT 1+ANT 2)
IEEE 802.11ac (20 MHz)	V (ANT 1+ANT 2)
IEEE 802.11ac (40 MHz)	V (ANT 1+ANT 2)
IEEE 802.11ac (80 MHz)	V (ANT 1+ANT 2)

## CACULATION:

### Bluetooth EDR:

Test Mode :	TX Mode _1Mbps
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Frequency (MHz)	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
2402	3.27	2.1232	5.02	3.1769	0.00134261	1	Complies
2440	3.27	2.1232	5.36	3.4356	0.00145195	1	Complies
2480	3.27	2.1232	5.29	3.3806	0.00142873	1	Complies

Test Mode :	TX Mode _3Mbps
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Frequency (MHz)	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
2402	3.27	2.1232	5.47	3.5237	0.00148919	1	Complies
2440	3.27	2.1232	5.81	3.8107	0.00161046	1	Complies
2480	3.27	2.1232	5.74	3.7497	0.00158471	1	Complies

### Bluetooth LE:

Test Mode :	CH00, CH19 , CH39
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Frequency (MHz)	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
2402	3.27	2.1232	-0.4	0.9120	0.00038543	1	Complies
2440	3.27	2.1232	-0.16	0.9638	0.00040733	1	Complies
2480	3.27	2.1232	0.32	1.0765	0.00045494	1	Complies

**2.4G:**

Test Mode : TX B Mode Total / CH01, CH06, CH11, CH12, CH13

Frequency (MHz)	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
2412	6.28	4.2462	24.09	256.4484	0.21674564	1	Complies
2437	6.28	4.2462	24.61	289.0680	0.24431513	1	Complies
2462	6.28	4.2462	24.19	262.4219	0.22179429	1	Complies
2467	6.28	4.2462	19.08	80.9096	0.06838335	1	Complies
2472	6.28	4.2462	15.29	33.8065	0.02857264	1	Complies

Test Mode : TX G Mode Total / CH01, CH06, CH11, CH12, CH13

Frequency (MHz)	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
2412	6.28	4.2462	25.62	364.7539	0.30828356	1	Complies
2437	6.28	4.2462	26.97	497.7371	0.42067855	1	Complies
2462	6.28	4.2462	25.57	360.5786	0.30475467	1	Complies
2467	6.28	4.2462	22.27	168.6553	0.14254447	1	Complies
2472	6.28	4.2462	10.95	12.4451	0.01051842	1	Complies

Test Mode : TX N-20M Mode Total / CH01, CH06, CH11, CH12, CH13

Frequency (MHz)	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
2412	6.28	4.2462	24.51	282.4880	0.23875384	1	Complies
2437	6.28	4.2462	26.93	493.1738	0.41682175	1	Complies
2462	6.28	4.2462	24.15	260.0160	0.21976087	1	Complies
2467	6.28	4.2462	22.53	179.0606	0.15133883	1	Complies
2472	6.28	4.2462	9.61	9.1411	0.00772592	1	Complies

Test Mode : TX N-40M Mode Total / CH03, CH06, CH09, CH10, CH11

Frequency (MHz)	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
2422	6.28	4.2462	21.16	130.6171	0.11039525	1	Complies
2437	6.28	4.2462	26.74	472.0630	0.39897930	1	Complies
2452	6.28	4.2462	19.35	86.0994	0.07276966	1	Complies
2457	6.28	4.2462	19.64	92.0450	0.07779476	1	Complies
2462	6.28	4.2462	11	12.5893	0.01064021	1	Complies

**5G:**

Test Mode : UNII-1/TX A Mode Total /CH36, CH40, CH48

Frequency (MHz)	Antenna Gain (dBi)	Antenna Gain (numeric)	AVG. Output Power (dBm)	AVG. Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
5180	8.45	6.9984	16.46	44.2588	0.06165245	1	Complies
5200	8.45	6.9984	18.38	68.8652	0.09592910	1	Complies
5240	8.45	6.9984	18.25	66.8344	0.09310015	1	Complies

Test Mode : UNII-1/TX N20 Mode Total /CH36, CH40, CH48

Frequency (MHz)	Antenna Gain (dBi)	Antenna Gain (numeric)	AVG. Output Power (dBm)	AVG. Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
5180	8.45	6.9984	16.43	43.9542	0.06122804	1	Complies
5200	8.45	6.9984	18.27	67.1429	0.09352988	1	Complies
5240	8.45	6.9984	17.93	62.0869	0.08648691	1	Complies

Test Mode : UNII-1/TX N40 Mode Total / CH38, CH46

Frequency (MHz)	Antenna Gain (dBi)	Antenna Gain (numeric)	AVG. Output Power (dBm)	AVG. Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
5190	8.45	6.9984	12.2	16.5959	0.02311801	1	Complies
5230	8.45	6.9984	17.28	53.4564	0.07446469	1	Complies

Test Mode : UNII-1/TX AC80 Mode Total / CH42

Frequency (MHz)	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
5210	8.45	6.9984	11.16	13.0617	0.01819493	1	Complies

Test Mode : UNII-2A/TX A Mode Total / CH52, CH60, CH64

Frequency (MHz)	Antenna Gain (dBi)	Antenna Gain (numeric)	AVG. Output Power (dBm)	AVG. Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
5260	8.45	6.9984	17.95	62.3735	0.08688611	1	Complies
5300	8.45	6.9984	17.7	58.8844	0.08202578	1	Complies
5320	8.45	6.9984	16.97	49.7737	0.06933466	1	Complies

Test Mode : UNII-2A/TX N20 Mode Total / CH52, CH60, CH64

Frequency (MHz)	Antenna Gain (dBi)	Antenna Gain (numeric)	AVG. Output Power (dBm)	AVG. Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
5260	8.45	6.9984	17.89	61.5177	0.08569399	1	Complies
5300	8.45	6.9984	17.64	58.0764	0.08090034	1	Complies
5320	8.45	6.9984	17.15	51.8800	0.07226872	1	Complies

Test Mode : UNII-2A/TX N40 Mode Total / CH54, CH62

Frequency (MHz)	Antenna Gain (dBi)	Antenna Gain (numeric)	AVG. Output Power (dBm)	AVG. Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
5270	8.45	6.9984	17.45	55.5904	0.07743733	1	Complies
5310	8.45	6.9984	14.62	28.9734	0.04035993	1	Complies

Test Mode : UNII-2A/TX AC80 Mode Total / CH58

Frequency (MHz)	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
5290	8.45	6.9984	12.89	19.4536	0.02709882	1	Complies

Test Mode : UNII-2C/TX A Mode Total / CH100, CH120, CH140

Frequency (MHz)	Antenna Gain (dBi)	Antenna Gain (numeric)	AVG. Output Power (dBm)	AVG. Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
5500	8.45	6.9984	16.53	44.9780	0.06265423	1	Complies
5600	8.45	6.9984	18.07	64.1210	0.08932034	1	Complies
5700	8.45	6.9984	16.74	47.2063	0.06575827	1	Complies

Test Mode : UNII-2C/TX N20 Mode Total / CH100, CH120, CH140

Frequency (MHz)	Antenna Gain (dBi)	Antenna Gain (numeric)	AVG. Output Power (dBm)	AVG. Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
5500	8.45	6.9984	16.26	42.2669	0.05887764	1	Complies
5600	8.45	6.9984	18.36	68.5488	0.09548835	1	Complies
5700	8.45	6.9984	16.65	46.2381	0.06440957	1	Complies

Test Mode : UNII-2C/TX N40 Mode Total / CH102, CH118, CH134

Frequency (MHz)	Antenna Gain (dBi)	Antenna Gain (numeric)	AVG. Output Power (dBm)	AVG. Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
5510	8.45	6.9984	12.09	16.1808	0.02253982	1	Complies
5590	8.45	6.9984	17.29	53.5797	0.07463635	1	Complies
5670	8.45	6.9984	16.35	43.1519	0.06011050	1	Complies

Test Mode : UNII-2C/TX AC80 Mode Total / CH106, CH122

Frequency (MHz)	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
5530	8.45	6.9984	12.4	17.3780	0.02420752	1	Complies
5610	8.45	6.9984	16.65	46.2381	0.06440957	1	Complies



Test Mode : UNII-3/TX A Mode Total / CH149, CH157, CH165

Frequency (MHz)	Antenna Gain (dBi)	Antenna Gain (numeric)	AVG. Output Power (dBm)	AVG. Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
5745	8.97	7.8886	16.22	41.8794	0.06575827	1	Complies
5785	8.97	7.8886	18.66	73.4514	0.11533214	1	Complies
5825	8.97	7.8886	17.9	61.6595	0.09681672	1	Complies

Test Mode : UNII-3/TX N20 Mode Total / CH149, CH157, CH165

Frequency (MHz)	Antenna Gain (dBi)	Antenna Gain (numeric)	AVG. Output Power (dBm)	AVG. Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
5745	8.97	7.8886	15.45	35.0752	0.05507448	1	Complies
5785	8.97	7.8886	18.77	75.3356	0.11829064	1	Complies
5825	8.97	7.8886	17.46	55.7186	0.08748838	1	Complies

Test Mode : UNII-3/TX N40 Mode Total / CH151, CH159

Frequency (MHz)	Antenna Gain (dBi)	Antenna Gain (numeric)	AVG. Output Power (dBm)	AVG. Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
5755	8.97	7.8886	12.58	18.1134	0.02844136	1	Complies
5795	8.97	7.8886	17.93	62.0869	0.09748782	1	Complies

Test Mode : UNII-3/TX AC80 Mode Total / CH155

Frequency (MHz)	Antenna Gain (dBi)	Antenna Gain (numeric)	AVG. Output Power (dBm)	AVG. Output Power (mW)	Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
5775	8.97	7.8886	11.27	13.3968	0.02103538	1	Complies

Note: the calculated distance is 20 cm.