

## RF EXPOSURE EVALUATION

### 1. PRODUCT INFORMATION

Product Description	CHIP Pro
Model Name	CHIP-PRO
FCC ID	2AF9F-1337R

### 2. EVALUATION METHOD AND LIMIT

Human exposure to RF emissions from mobile devices (47 CFR §2.1091) may be evaluated based on the MPE limits adopted by the FCC for electric and magnetic field strength and/or power density, as appropriate, since exposures are assumed to occur at distances of 20 cm or more from persons.

#### LIMITS FOR GENERAL POPULATION / UNCONTROLLED EXPOSURE

Frequency Range (MHz)	E-field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Time  E  <sup>2</sup> ,  H  <sup>2</sup> or S (Minutes)
0.3 -- 1.34	614	1.63	(100)*	30
1.34 -- 30	824/f	2.19/f	(180/f <sup>2</sup> )*	30
30 -- 300	27.5	0.073	0.2	30
300 -- 1500	--	--	f/1500	30
1500 -- 100,000	--	--	1.0	30

\*Note:

1. f= Frequency in MHz \* Plane-wave Equivalent Power Density
2. The averaging time for General Population/Uncontrolled exposure to fixed transmitters is not applicable for mobile and portable transmitters. See 47 CFR §§2.1091 and 2.1093 on source-based time-averaging requirement for mobile and portable transmitters.

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

Where:

S=power density

P=power input to 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

### 3. CALCULATION

A minimum test separation distance  $\geq 20$  cm is required between the antenna and radiating structures of the device and nearby persons to apply mobile device exposure limits. The distance must be at least 20 cm and fully supported by the operating and installation configurations of the transmitter and its antenna(s), according to the source-based time-averaged maximum power requirements of § 2.1091(d)(2). In cases where cable losses or other attenuations are applied to determine compliance, the most conservative operating configurations and exposure conditions must be evaluated.

#### BT 4.2

Test Mode	Frequency ( MHz)	Output Power ( dBm)	Output Power ( mW)	Antenna Gain (dBi)	Antenna Gain (Linear)	Power Density ( mW/cm <sup>2</sup> )
GFSK	2402	5.341	3.42	3.3	2.14	0.0015
	2441	5.559	3.60	3.3	2.14	0.0015
	2480	4.862	3.06	3.3	2.14	0.0013
π/4 DQPSK	2402	5.436	3.50	3.3	2.14	0.0015
	2441	5.629	3.66	3.3	2.14	0.0016
	2480	5.988	3.97	3.3	2.14	0.0017
8DPSK	2402	4.994	3.16	3.3	2.14	0.0013
	2441	5.193	3.31	3.3	2.14	0.0014
	2480	5.680	3.70	3.3	2.14	0.0016

#### BLE

Test Mode	Frequency ( MHz)	Output Power ( dBm)	Output Power ( mW)	Antenna Gain (dBi)	Antenna Gain (Linear)	Power Density ( mW/cm <sup>2</sup> )
GFSK	2402	5.175	3.29	3.3	2.14	0.0014
	2441	5.252	3.35	3.3	2.14	0.0014
	2480	6.277	4.24	3.3	2.14	0.0018

**WIFI 2.4G**

Test Mode	Frequency ( MHz)	Output Power ( dBm)	Output Power ( mW)	Antenna Gain (dBi)	Antenna Gain (Linear)	Power Density ( mW/cm <sup>2</sup> )
11b	2412	14.29	26.85	3.3	2.14	0.0114
	2437	14.24	26.55	3.3	2.14	0.0113
	2462	15.49	35.40	3.3	2.14	0.0151
11g	2412	10.60	11.48	3.3	2.14	0.0049
	2437	10.97	12.50	3.3	2.14	0.0053
	2462	10.58	11.43	3.3	2.14	0.0049
11nHT 20	2412	10.96	12.47	3.3	2.14	0.0053
	2437	9.31	8.53	3.3	2.14	0.0036
	2462	10.26	10.62	3.3	2.14	0.0045
11nHT 40	2422	9.89	9.75	3.3	2.14	0.0041
	2437	10.80	12.02	3.3	2.14	0.0051
	2452	9.23	8.38	3.3	2.14	0.0036

**Note:** The WIFI and BT can transmit simultaneously and  
MPE ratio ( Bluetooth + WIFI ) =  $0.0018 / 1.0 + 0.0151 / 1.0 = 0.0169 < 1$   
and it satisfy the RF exposure requirements for simultaneous transmission that the sum of the MPE ratios  $< 1$