RF Exposure Evaluation Result

For the

NZN Labs, Inc.

LITPro

Model: LP003

FCC ID: 2AEQD-LP003

WLL REPORT# **15WB0304003F-M Rev 0**

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1. Requirement

Systems operating under the provisions of FCC 47 CFR section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as mobile device whereby a distance of 0.2m normally can be maintained between the user and the device, and below RF Permissible Exposure limit shall comply with.

In accordance with KDB447498D01 for Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneous transmitting antennas incorporated in a host device, based on the calculated/estimated, numerically modeled or measured field strengths or power density, is ≤ 1.0. The MPE ratio of each antenna is determined at the minimum test separation distance required by the operating configurations and exposure conditions of the host device, according to the ratio of field strengths or power density to MPE limit, at the test frequency. Either the maximum peak or spatially averaged results from measurements or numerical simulations may be used to determine the MPE ratios. Spatial averaging does not apply when MPE is estimated using simple calculations based on far-field plane-wave equivalent conditions. The antenna installation and operating requirements for the host device must meet the minimum test separation distances required by all antennas, in both standalone and simultaneous transmission operations, to satisfy compliance.

Limits for General Population/Uncontrolled Exposure

(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/ cm^2)	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

2. Calculation Method

Predication of MPE limit at a given distance
Equation from page 18 of OET Bulletin 65, Edition 97-01
$S=PG/4\pi R^2$
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

    From the peak EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the maximum gain of the used antenna is 5dBi, the RF power density can be obtained.

3. Estimation Result

3.1 Manufacturing tolerance

GFSK-BLE						
Channel	U3			U5		
	1	19	39	1	19	39
Target (dBm)	-3.457	-3.650	-5.861	-1.558	-1.524	-3.216
Tolerance ± (dB)	1.00	1.00	1.00	1.00	1.00	1.00

3.2 Measurement Results

As the product use three type antenna, we use maximum antenna gain to Evaluation, also refer to Operation description for transmit at antenna port;

Mode	U3	U5	Antenna 0 and Antenna 1 simultaneous transmission	MPE Evaluation Antenna Gain
GFSK-BLE	Yes	Yes	Yes	Chip Antenna Monopole 1.7dBi

Mode	Frequency (MHz)	Output power (Including tune-up tolerance) (dBm)	Output power (mW)	Antenna Gain (dBi)	Antenna Gain (linear)	MPE (mW/cm^2)
U3	2402	-2.457	0.57	1.7	1.48	0.00017
	2440	-2.650	0.54	1.7	1.48	0.00016
	2480	-4.861	0.33	1.7	1.48	0.00010
U5	2402	-0.558	0.88	1.7	1.48	0.00026
	2440	-0.524	0.89	1.7	1.48	0.00026
	2480	-2.216	0.60	1.7	1.48	0.00018

According to KDB447498 for Transmitters used in mobile exposure conditions for simultaneous transmission operations;

∑ of MPE ratios ≤ 1.0

Mode	Frequency (MHz)	∑ MPE ratios (mW/cm^2)	Limit	Results
	U3 and U5			
GFSK	2402	0.00043	1.000	Pass
	2440	0.00042	1.000	Pass
	2480	0.00028	1.000	Pass

Note: The estimation distance is 20cm

Conclusion: PASS