Maximum Permissible Exposure Evaluation
FCC ID: 2AZDN-SBCHAM

1. Client Information

Applicant	:	Launch Pad LLC
Address	:	358 Westside Drive, Shepherdsville KY 40165 USA
Manufacturer	:	Shenzhen Changkeshun Technology Co., Ltd
Address	:	FL.3-4, Blog.K, Jinchangda Tech Park, Guanlan St., Longhua Dist., Shenzhen, China

2. General Description of EUT

EUT Name	:	Chameleon	
Models No.	:	CH-23	
Model Difference	:	----	
Brand Name	:	SyncroB.it	
Product Description	:	Operation Frequency:	LoRa: 915MHz~916.4MHz Bluetooth V5.0(BT): 2402MHz~2480MHz Bluetooth 5.0(BLE): 2402MHz~2480MHz 802.11b/g/n(HT20): 2412MHz~2462MHz 802.11n(HT40): 2422MHz~2452MHz U-NII-1: 5180MHz~5240MHz U-NII-2A: 5260MHz~5320MHz U-NII-2C: 5500MHz~5700MHz U-NII-3: 5745MHz~5825MHz
Power Rating	:	Adapter (F012WB-120100u) Input: AC 100-240V, 50/60Hz 0.5A Output: DC 12V, 1A 12W	
Software Version	:	----	
Hardware Version	:	----	
Connecting I/O Port(S)	:	Please refer to the User's Manual	
Remark	:	the MPE report used the EUT-2(20210511-13-02#).	

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MPE Calculations

1. Antenna Gain:

Antenna	Brand	Model Name	Type	LoRa Antenna Gain(dBi)
Lora	N/A	N/A	External ANT 1	3.0
Lora	N/A	N/A	External ANT 2	6.0
Note:The External Ant 2 is an Optional Accessories antenna please refer to user manual.				

Antenna	Brand	Model Name	Type	BT&BLE Antenna Gain(dBi)
/	N/A	N/A	PCB	3.0

Antenna	Brand	Model Name	Type	2.4G WIFI&5G WIFI Antenna Gain(dBi)
/	N/A	N/A	PCB	2.0

2. EUT Operation Condition:

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

3. Exposure Evaluation:

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 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

4. Simultaneous transmission MPE Considerations

According to KDB447498 : All transmitters and antennas in the host must be either evaluated for MPE compliance, by measurement or computational modeling, or qualify for the standalone MPE test exclusion in section 7.1.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.

This means that:

∑ of MPE ratios ≤ 1.0

5. Standalone MPE Evaluation:

Mode	Ant	Freq. (MHz)	Field strength (max) (dBuV/m)	EIRP (max) (dBm)	Turn-up Power (dB)	Max tune up power (dBm) [P]	ANT Gain (dBi) [G]	Distance (cm) [R]	Power Density (mW/ cm2) [S]
LoRa	Ant 1	915.8	83.77	-11.488	-11±1	-10.0	3.0	20	0.00004
LoRa	Ant 2	916.4	90.27	-4.988	-5±1	-4.0	6.0	20	0.0003

Note:

$E = EIRP - 20\log D + 104.8$

where:

E = electric field strength in dBμV/m,
EIRP = equivalent isotropic radiated power in dBm
D = specified measurement distance in meters.

(1) EIRP=E-104.8+20logD, D=3

(2) N_{TX}= Number of Transmit Antennas

Modulation Type	Output power (Turn-up Procedure)		Antenna Gain (dBi)	Antenna Gain (Numeric)	Distance (cm) [R]	MPE (mW/cm^2)	MPE Limits (mW/cm^2)
	dBm	mW					
BT(BDR/EDR)	6.5	4.47	3.0	1.995	20	0.0018	1.0000

Modulation Type	Output power (Turn-up Procedure)		Antenna Gain (dBi)	Antenna Gain (Numeric)	Distance (cm) [R]	MPE (mW/cm^2)	MPE Limits (mW/cm^2)
	dBm	mW					
IEEE 802.11b	15.4	34.67	2.0	1.585	20	0.0109	1.0000

Modulation Type	Output power (Turn-up Procedure)		Antenna Gain (dBi)	Antenna Gain (Numeric)	Distance (cm) [R]	MPE (mW/cm^2)	MPE Limits (mW/cm^2)
	dBm	mW					
IEEE 802.11a	18.2	66.07	2.0	1.585	20	0.0208	1.0000

Remark:
1. Output power including turn-up tolerance;
2. Output power was adjust to duty cycle at 100% if measured duty cycle less than 98%;
3. MPE evaluate distance is 20cm from user manual provide by manufacturer.
4. Only the worst power was evaluated for each wireless function

6. Summary simultaneous transmission information

The sample supports two antennas for LoRa and BT/WLAN. The SRD and BT/WLAN can transmit simultaneous. The BT/WLAN are share the same antenna
According to KDB447498 for Transmitters used in mobile exposure conditions for simultaneous transmission operations;
∑ of MPE ratios ≤ 1.0

7. Summary simultaneous transmission results

ANT 1

LoRa BT(BDR/EDR) 2.4G Wifi and 5G Wifi Maximum Simultaneous transmission MPE Ratios is 0.00004+0.0208=0.02084 ⩽1.0.

ANT2

LoRa BT(BDR/EDR) 2.4G Wifi and 5G Wifi Maximum Simultaneous transmission MPE Ratios is 0.0003+0.0208=0.0211 ⩽1.0.

8. Conclusion:

The measurement results comply with the FCC Limit per 47 CFR 2.1091 for the uncontrolled RF Exposure of mobile device.

-----END OF REPORT-----