RF EXPOSURE EVALUATION

EUT Specification

EUT	Baby Monitor Camera
Model Number	TL-BM501C
FCC ID	2BHDZTL-BM501C
Antenna Gain	4.4dBi
Operation Frequency	BLE: 2402 MHz to 2480 MHz WIFI: 2412 MHz to 2462 MHz
Modulation	BLE: GFSK 802.11b: DSSS(DBPSK/DQPSK/CCK) 802.11g/n: OFDM(BPSK/QPSK/16QAM/64QAM)
Power Supply	AC120V/60Hz
Max. output power	BLE: -1.03dBm Chip type: AB6031X IEEE 802.11b: 16.48 dBm IEEE 802.11g: 13.26 dBm IEEE 802.11n-HT20: 13.27 dBm Chip type: AB6032 IEEE 802.11b: 16.51 dBm IEEE 802.11g: 14.92 dBm IEEE 802.11n-HT20: 14.93 dBm

Test Requirement:

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency(RF) Radiation as specified in §1.1307(b)

Limits for Maximum Permissible Exposure (MPE)

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density(mW/cm^2)	Average Time
(A) Limits for Occupational/Control Exposures				
300-1500	**--**	**--**	**F/300**	**6**
1500-100000	**--**	**--**	**5**	**6**
(B) Limits for General Population/Uncontrol Exposures				
300-1500	**--**	**--**	**F/1500**	**6**
1500-100000	**--**	**--**	**1**	**30**

Friis transmission formula: Pd= (Pout*G)\ (4*pi*R^2)

Where

Pd= Power density in mW/cm^2

Pout=output power to antenna in mW

G= Numeric gain of the antenna relative to isotropic antenna

Pi=3.1416

R= distance between observation point and center of the radiator in cm=20cm

Pd the limit of MPE, 1mW/cm^2. If we know the maximum gain of the nd total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

For multiple RF sources: Multiple RF sources are exempt if:
in the case of fixed RF sources operating in the same time-averaging period, or of multiple mobile or portable RF sources within a device operating in the same time averaging period, if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation

$$\sum_{k=1}^{c} \frac{Evaluated_k}{Exposure\ Limit_k} \leq 1$$

$Evaluated_k$: the maximum reported SAR or MPE of fixed, mobile, or portable RF source k either in the device or at the transmitter site from an existing evaluation at the location of exposure.
$Exposure\ Limit_k$: either the general population/uncontrolled maximum permissible exposure (MPE) or specific Absorption rate (SAR) limit for each fixed, mobile, or portable RF source k.

Measurement Result
Antenna gain: 4.4dBi

BLE:
Chip type: AB6031X

Mode	Channel Freq. (MHz)	Measured power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Antenna Gain (Numeric)	Evaluation result (mW/cm^2)	Power density Limits (mW/cm^2)
GFSK (1M)	2402	-1.27	-1±1	0	2.75	0.000547	1
GFSK (1M)	2440	-1.78	-2±1	-1	2.75	0.000435	1
GFSK (1M)	2480	-2.61	-3±1	-2	2.75	0.000345	1
GFSK (2M)	2402	-1.03	-1±1	0	2.75	0.000547	1
GFSK (2M)	2440	-1.61	-2±1	-1	2.75	0.000435	1
GFSK (2M)	2480	-2.43	-2±1	-1	2.75	0.000435	1

WIFI:
Chip type: AB6031X

Mode	Channel Freq. (MHz)	Measured power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Antenna Gain (Numeric)	Evaluation result (mW/cm^2)	Power density Limits (mW/cm^2)
802.11b	2412	16.46	16±1	17	2.75	0.027420	1
	2437	16.46	16±1	17	2.75	0.027420	1
	2462	16.48	16±1	17	2.75	0.027420	1
802.11g	2412	13.26	13±1	14	2.75	0.008271	1
	2437	13.03	13±1	14	2.75	0.008271	1
	2462	13.01	13±1	14	2.75	0.008271	1
802.11n HT20	2412	13.27	13±1	14	2.75	0.008271	1
	2437	13.06	13±1	14	2.75	0.008271	1
	2462	12.96	14±1	15	2.75	0.017301	1

WIFI:
Chip type: AB6032

Mode	Channel Freq. (MHz)	Measured power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Antenna Gain (Numeric)	Evaluation result (mW/cm^2)	Power density Limits (mW/cm^2)
802.11b	2412	16.47	16±1	17	2.75	0.027420	1
	2437	16.19	16±1	17	2.75	0.027420	1
	2462	16.51	17±1	18	2.75	0.034519	1
802.11g	2412	14.85	15±1	16	2.75	0.021780	1
	2437	14.59	15±1	16	2.75	0.021780	1
	2462	14.92	15±1	16	2.75	0.021780	1
802.11n HT20	2412	14.81	15±1	16	2.75	0.021780	1
	2437	14.58	15±1	16	2.75	0.021780	1
	2462	14.93	15±1	16	2.75	0.021780	1

Maximum Simultaneous transmission MPE Ratio for Bluetooth & 2.4G WIFI & 2.4G WIFI

Maximum MPE ratio (Bluetooth)	Maximum MPE ratio (2.4G WIFI) (Chip type: AB6031X)	Maximum MPE ratio (2.4G WIFI) (Chip type: AB6032)	∑ MPE ratios	Limit	Results
0.000547	0.027420	0.034519	0.062486	1.000	Pass

Signature:

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