



RF EXPOSURE EVALUATION

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)

FCC ID: 2APN5-CAMPT2

EUT Specification

EUT	Wi-Fi Smart Security Camera			
Frequency band	BLE: 2.402GHz ~ 2.480GHz			
(Operating)	WIFI: 2.412GHz ~ 2.462GHz			
Device category	□Portable (<20cm separation)			
	⊠Mobile (>20cm separation)			
Exposure classification	Occupational/Controlled exposure (S = 5mW/cm ²)			
	General Population/Uncontrolled exposure (S=1mW/cm ²)			
Antenna diversity	⊠Single antenna			
ners.	☐Multiple antennas			
	□Tx diversity			
	□Rx diversity			
	□Tx/Rx diversity			
Max. output power	BLE			
	BLE 1M: 6.83 dBm			
	BLE 2M: 6.88 dBm			
	2.4G WIFI			
	802.11b: 20.34 dBm			
	802.11g: 22.48 dBm			
	802.11n HT20: 22.39 dBm			
Antenna gain (Max)	BLE: -1.04 dBi			
	2.4G WIFI			
	-1.04 dBi for antenna 1			
Evaluation applied	⊠MPE Evaluation			
	SAR Evaluation			

Limits for Maximum Permissible Exposure(MPE)

Frequency	Electric Field	Magnetic Field	Power	Average				
Range(MHz)	Strength(V/m)	Strength(A/m)	Density(mW/cm ²)	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: P_d=(P_{out}*G)\(4*pi*R²)

Where

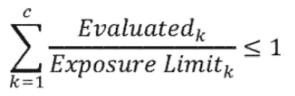
Pd= Power density in mW/cm², Pout=output power to antenna in mW.

G= gain of antenna in linear scale, Pi=3.1416

R= distance between observation point and center of the radiator in cm=20cm P_d the limit of MPE, 1mW/cm². If we know the maximum gain of the antenna and 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



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

BLE:								
Mode	Max	Tune up	Max tune	Output	Ant.	Ant. Gain	Power	Power
	Measured	tolerance	up	Peak	Gain	(numeric)	density at	density
	Power	(dBm)	conducted	power	(dBi)		20cm	Limits
	(dBm)		power(dBm)	(mW)			(mW/ cm ²)	(mW/
								cm²)
BLE 1M	6.83	6±1	7	5.012	-1.04	0.787	0.00078	1
BLE 2M	6.88	6±1	7	5.012	-1.04	0.787	0.00078	1



2.4G WIFI:

Mode	Max	Tune up	Max tune	Output	Ant.	Ant. Gain	Power	Power
	Measured	tolerance	up	Peak	Gain	(numeric)	density	density
	Power	(dBm)	conducted	power	(dBi)		at 20cm	Limits
	(dBm)		power(dBm)	(mW)			(mW/	(mW/
							cm²)	cm²)
802.11b	20.34	20 ± 1	21	125.893	-1.04	0.787	0.01971	1
802.11g	22.48	22±1	23	199.526	-1.04	0.787	0.03124	1
802.11								
n	22.39	22 ± 1	23	199.526	-1.04	0.787	0.03124	1
HT20								

Maximum Simultaneous transmission MPE Ratio for Bluetooth & 2.4G WIFI

Maximum MPE ratio (Bluetooth)	Maximum MPE ratio (2.4G WIFI)	∑ MPE ratios	Limit	Results
0.00078	0.03124	0.03202	1.000	Pass

Signature:

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