

# RF Exposure evaluation

FCC ID	2BF19-DQ03A
Product Name	Security Camera
Model/Type reference	DQ03-4G
Listed Model(s)	DQ01-4G
Exposure category	General population/uncontrolled environment
EUT Type	Production Unit
Device Type	Mobile Device

## 1. Reference

ANSI C95.1–1999: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.

FCC KDB publication 447498 D01 General 1 RF Exposure Guidance v06: Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies.

FCC CFR 47 part1 1.1310: Radio frequency radiation exposure limits.

FCC CFR 47 part2 2.1091: Radio frequency radiation exposure evaluation: mobile devices

## 2. Limit

Limits for Maximum Permissible Exposure (MPE)/Controlled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm <sup>2</sup> )	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
0.3 – 3.0	614	1.63	(100) *	6
3.0 – 30	1842/f	4.89/f	(900/f <sup>2</sup> )*	6
30 – 300	61.4	0.163	1.0	6
300 – 1500	/	/	f/300	6
1500–100,000	/	/	5	6

Limits for Maximum Permissible Exposure (MPE)/Uncontrolled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm <sup>2</sup> )	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
0.3 – 3.0	614	1.63	(100) *	30
3.0 – 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

F=frequency in MHz

\*=Plane-wave equivalent power density

### 3. MPE 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

### 4. Antenna Information

Name	Type	Gain	Frequency range
LTE ANT	External Antenna	3.35dBi for Band 2 4.18dBi for Band 4 1.31dBi for Band 5 -3.68dBi for Band 12 -3.68dBi for Band 13 4.18dBi for Band 66	700M-2700MHz

### 5. Conducted Output Power

LTE :

BAND	Output Power (dBm)	Output Power (mW)
2	24.98	314.77
4	24.84	304.79
5	24.92	310.46
12	24.96	313.33
13	24.89	308.32
66	24.95	312.61

Manufacturing Tolerance

Channel	BAND 2	BAND 4	BAND 5	BAND 12	BAND 13	BAND 66
Target (dBm)	24	24	24	24	24	24
Tolerance ±(dB)	1.0	1.0	1.0	1.0	1.0	1.0

## 6. Standalone MPE Result

As declared by the Applicant, the EUT is a wireless device used in a fix application, at least 20 cm from any body part of the user or nearby persons; from the maximum EUT RF output power, the minimum separation distance,  $r = 20\text{cm}$ , the RF power density can be obtained.

### LTE

BAND/Mode		Tune Up (dBm)	Antenna Gain(dBi)	MPE (mW/cm <sup>2</sup> )	MPE Limits (mW/cm <sup>2</sup> )	Result
LTE	LTE Band 2	25	3.35	0.13606	1.0000	PASS
	LTE Band 4	25	4.18	0.16471	1.0000	PASS
	LTE Band 5	25	1.31	0.08506	0.558	PASS
	LTE Band 12	25	-3.68	0.02696	0.474	PASS
	LTE Band 13	25	-3.68	0.02696	0.521	PASS
	LTE Band 66	25	4.18	0.16471	1.0000	PASS

Remark:

1. Output power (Peak) including turn-up tolerance;
2. MPE evaluate distance is 20cm from user manual provide by manufacturer.

## 7. Conclusion

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

-----End of the report-----