

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 ²)	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 ²)*	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 ²)	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 ²)*	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 ²)	MPE Limits (mW/cm ²)	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-----