

## RF EXPOSURE EVALUATION

### 1. PRODUCT INFORMATION

Product	LTE Security Camera System
Main Model	GB-213H/K/XV
FCC ID	2BAA8-GB213HKXV

### 2. EVALUATION METHOD AND LIMIT

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

According to §1.1310 and §2.1091 RF exposure is calculated.

KDB447498 v06: Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies.

Systems operating under the provisions of FCC 47 CFR section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as mobile device whereby a distance of 0.2m normally can be maintained between the user and the device, and below RF Permissible Exposure limit shall comply with.

In accordance with KDB447498D01 for 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  $\leq 1.0$ . The MPE ratio of each antenna is determined at the minimum test separation distance required by the operating configurations and exposure conditions of the host device, according to the ratio of field strengths or power density to MPE limit, at the test frequency. Either the maximum peak or spatially averaged results from measurements or numerical simulations may be used to determine the MPE ratios. Spatial averaging does not apply when MPE is estimated using simple calculations based on far-field plane-wave equivalent conditions. The antenna installation and operating requirements for the host device must meet the minimum test separation distances required by all antennas, in both standalone and simultaneous transmission operations, to satisfy compliance.

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

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

### 3. CALCULATION

A minimum test separation distance  $\geq 20$  cm is required between the antenna and radiating structures of the device and nearby persons to apply mobile device exposure limits. The distance must be at least 20 cm and fully supported by the operating and installation configurations of the transmitter and its antenna(s), according to the source-based time-averaged maximum power requirements of § 2.1091(d)(2). In cases where cable losses or other attenuations are applied to determine compliance, the most conservative operating configurations and exposure conditions must be evaluated.

Mode	Frequency (MHz)	Output Power (Turn-up Procedure)		Antenna Gain (Numeric)	Power Density At 20 cm (mW/cm <sup>2</sup> )	Power Density Limit (mW/cm <sup>2</sup> )	Test Results
		dBm	mW				
LTE Band 2	1880.0	23.96	248.886	1.6672	0.08255	1.000	PASS
LTE Band 4	1732.5	25.09	322.849	0.4446	0.02856	1.000	PASS
LTE Band 5	836.5	24.17	261.216	1.1455	0.05953	0.550	PASS
LTE Band 12	707.5	24.64	291.072	0.8318	0.04817	0.466	PASS
LTE Band 13	779.5	24.65	291.743	0.8318	0.04828	0.520	PASS
LTE Band 17	710.0	25.13	325.837	0.8318	0.05392	0.471	PASS
LTE Band 66	1745.0	25.08	322.107	0.4446	0.02849	1.000	PASS
Note: The estimation distance is 20cm. Band 2: Antenna Gain=2.22dBi, Band 4: Antenna Gain=-3.52dBi, Band 5: Antenna Gain=0.59dBi, Band 12: Antenna Gain=-0.8dBi, Band 13: Antenna Gain=-0.8dBi, Band 17: Antenna Gain=-0.8dBi, Band 66: Antenna Gain=-3.52dBi, $\pi=3.14$							
Note: Output power=conducted power. Conducted power see the test report UNIA23021713ER-61							

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