

RF EXPOSURE Test Report

Product: USB-A Wireless Car Screen Projection
Adapter
Trade Mark: N/A
Model Number: CP02
FCC ID: 2BAUM-CP0001

Prepared for

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1 General Description

1.1 Description of EUT

Product name:	USB-A Wireless Car Screen Projection Adapter
Model name:	CP02
Series Model:	CP01, CP03, CP04, CP05, CP06, CP07, CP08, CP09, CP10
Different of series model:	All models are the same circuit and module, except for model number and color.
Operation frequency:	BT: 2402-2480MHz 2.4G WiFi: IEEE 802.11b/g/n20/ax20: 2412~2462 MHz IEEE 802.11n40/ax40: 2422~2452 MHz 5G WiFi: U-NII-1: 5180 MHz to 5240 MHz U-NII-3: 5745 MHz to 5825 MHz
Modulation type:	BT: GFSK, $\pi/4$ -DQPSK, 8DPSK 2.4G WiFi: IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ax: OFDMA (1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK) 5G WiFi: IEEE 802.11a/n: OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ac: OFDM(256QAM, 64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ax: OFDMA(1024QAM, 256QAM, 64QAM, 16QAM QPSK, BPSK)
Bit Rate of transmitter:	BT: 1Mbps, 2Mbps, 3Mbps 2.4G WiFi: IEEE 802.11b: Up to 11 Mbps IEEE 802.11g: Up to 54 Mbps IEEE 802.11n-HT20/HT40: Up to MCS15 IEEE 802.11ax-HE20/ HE40: Up to MCS11 5G WiFi: IEEE 802.11a: Up to 54 Mbps IEEE 802.11n-HT20/40: Up to MCS7 IEEE 802.11ac-VHT20/40: Up to MCS9 IEEE 802.11ax-HE20/HE40: Up to MCS11
Antenna type:	On board Antenna
Antenna gain:	BT: 0.02 dBi 2.4G WIFI: -0.27dBi 5G WIFI: -1.91dBi
Max. output power:	BT: 2.13dBm 2.4G WiFi: 17.73dBm 5G WiFi U-NII-1: 10.74dBm 5G WiFi U-NII-3: 11.48dBm
Hardware version:	V1.0
Software version:	V1.0

Battery:	N/A
Power supply:	DC 5V from the USB port of the car screen
Adapter information:	N/A

1.2 Test Mode

Pretest Test Mode	Description of Mode
1	TX
2	/
3	/

1.3 Test Setup

See photographs of the test setup in the report for the actual setup and connections between EUT and support equipment.

1.4 Ancillary Equipment

Equipment	Model	S/N	Manufacturer
/	/	/	/

2 Test Facilities and Accreditations

2.1 Test Laboratory

Test Site	Shenzhen HongBiao Certification& Testing Co., Ltd
Test Site Location	Room 102, 201, Building 2, Yuanwanggu RFID Industrial Park, Tongguan Road, Tianliao Community, Yutang Street, Guangming District, Shenzhen, China
Telephone:	(86-755) 2998 9321
Fax:	(86-755) 2998 5110
FCC Registration No.:	CN1341
A2LA Certificate No.:	6765.01

2.2 Environmental Conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15°C~35°C
Relative Humidity:	20%~75%
Air Pressure:	98kPa~101kPa

2.3 Measurement Uncertainty

The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

Measurement Frequency Range	U, (dB)	Note
RF frequency	2×10^{-5}	
RF power, conducted	± 0.57 dB	
Temperature	± 1 degree	
Humidity	± 5 %	

2.4 Test Software

Software name	Manufacturer	Model	Version
Conducted test system	MWRF-test	MTS 8310	2.0.0.0

3 RF Exposure

3.1 Standalone SAR test exclusion considerations

4.1.1. Limit

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).

Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) 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
300-1,500			f/300	6
1,500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	*180/f ²	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			1.0	30

f = frequency in MHz * = Plane-wave equivalent power density

MPE Calculation Method

Friis transmission formula: $P_d = (P_{out} * G) / (4 * \pi * R^2)$

Where

P_d = Power density in mW/cm²

P_{out} = output power to antenna in mW

G = Numeric gain of the antenna relative to isotropic antenna

π = 3.1415926

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.

4.1.2. Test Result

BT:

Operation Frequency: 2402-2480MHz,

Antenna Type: On board Antenna;

BT antenna gain: 0.02dBi

Power density limited: 1mW/ cm²

2.4GWifi:

Operation Frequency: IEEE 802.11b/g/n20/ax20: 2412~2462MHz,

IEEE 802.11n40/ax40: 2422~2452MHz,

Antenna Type: On board Antenna;

2.4G Wifi antenna gain: -0.27dBi

Power density limited: 1mW/ cm²

5GWiFi:

Operation Frequency: IEEE 802.11a/n-HT20/ac-VHT20/ax-HE20: 20MHz

IEEE 802.11n-HT40/ac-VHT40/ax-HE40: 40MHz,

U-NII-1: 5150 MHz to 5250 MHz,

U-NII-3: 5725 MHz to 5850 MHz

Antenna Type: On board Antenna;

5G WIFI antenna gain : -1.91 dBi

R=20cm

$mW=10^{(dBm/10)}$

BT: Antenna gain Numeric= $10^{(dBi/10)}=10^{(0.02/10)}=1.005$

2.4GWiFi: Antenna gain Numeric= $10^{(dBi/10)}=10^{(-0.27/10)}=0.94$

5GWiFi:

U-NII-1: Antenna gain Numeric= $10^{(dBi/10)}=10^{(-1.91/10)}=0.644$

U-NII-3: Antenna gain Numeric= $10^{(dBi/10)}=10^{(-1.91/10)}=0.644$

BR+EDR:(Worst)

Channel Freq. (MHz)	modulation	conducted power (dBm)	Tune-up power (dBm)	Max		Antenna		Evaluation result (mW/cm ²)	Power density Limits (mW/cm ²)
				tune-up power		Gain			
				(dBm)	(dBm)	(dBm)	(mW)	(dBi)	Numeric
2402	GFSK	2.13	2±1	3	1.995	0.02	1.005	0.00040	1

2.4G WiFi: (Worst)

Channel Freq. (MHz)	modulation	conducted power (dBm)	Tune-up power (dBm)	Max		Antenna		Evaluation result at 20cm Power density(mW/cm ²)	Power density Limits (mW/cm ²)
				tune-up power		Gain			
				(dBm)	(dBm)	(dBm)	(mW)	(dBi)	Numeric
2412	ax20	17.73	17±1	18	63.096	-0.27	0.94	0.01180	1

5G WiFi: (Worst)

Frequency (MHz)	Modulation	conducted power (dBm)	Tune-up power (dBm)	Max		Antenna		Evaluation result at 20cm Power density(mW/cm ²)	Power density Limits (mW/cm ²)
				tune-up power		Gain			
				(dBm)	(dBm)	(dBm)	(mW)	(dBi)	Numeric
5755	ax40	11.48	11±1	12	15.849	-1.91	0.644	0.00203	1

Conclusion:

NO	Maximum MPE Value			Limits (mW/cm ²)
	BT (mW/cm ²)	2.4GWiFi (mW/cm ²)	5GWiFi: (mW/cm ²)	
1	0.00040	0.01180	0.00203	1

Simultaneous transmit:

NO	Configurations	Maximum MPE Value			Limits
		BT	5GWiFi	Transmit simultaneously	
1	BT+5G	0.00040	0.00203	0.00243	1

Note:

According to KDB 447498 D01 General RF Exposure Guidance v06, At the transmit simultaneously calculation method is as follows:

Transmit simultaneously MPE = Σ of MPE ratios

MPE ratios = Field strengths or power density / MPE limit at the test frequency

For the max result: $0.00243 \leq 1.0$ SAR, No SAR is required.

***** END OF REPORT *****