RF EXPOSURE
Test Report

Report No.:	MTi230414004-01E4
Date of issue:	2023-05-08
Applicant:	Shenzhen Boyi Electronics Co., Ltd.
Product:	Wireless CarPlay Adapter
Model(s):	BY960
FCC ID:	2A5XO-BY960

Shenzhen Microtest Co., Ltd.

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Test Result Certification	
Applicant:	**Shenzhen Boyi Electronics Co., Ltd.**
Address:	5F, #Building 5, Longbi Industrial Zone, NO.27 Dafa Road, Bantian Street, Longgang District Shenzhen, China
Manufacturer:	**Shenzhen Boyi Electronics Co., Ltd.**
Address:	5F, #Building 5, Longbi Industrial Zone, NO.27 Dafa Road, Bantian Street, Longgang District Shenzhen, China
Product description	
Product name:	Wireless CarPlay Adapter
Trademark:	N/A
Model name:	BY960
Serial Model:	N/A
Standards:	N/A
Test procedure:	KDB 447498 D01 v06
Date of Test	
Date of test:	2023-04-27 ~ 2023-05-06
Test result:	Pass

Test Engineer : Yanice Xie

(Yanice Xie)

Reviewed By: Leon Chen

(Leon Chen)

Approved By: Tom Xue

(Tom Xue)

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)

Limits for 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: $Pd= (Pout*G)\ (4*pi*R^2)$

Where

Pd= Power density in mW/cm^2

Pout=output power to antenna in mW

G= Numeric gain of the antenna relative to isotropic antenna

Pi=3.1415926

R= distance between observation point and center of the radiator in cm(20cm)

Pd the limit of MPE, $1mW/cm^2$. 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.

Measurement Result

BT/BLE:

Operation Frequency: 2402-2480MHz,

Power density limited: 1mW/ cm^2

5GWiFi:

802.11a: 20 MHz

802.11n: 20 MHz, 40 MHz

802.11ac: 20 MHz, 40 MHz

802.11ax: 20 MHz, 40 MHz

Antenna Type: FPC Antenna;

BT/BLE antenna gain: 3.09dBi

5G WIFI antenna gain: 4.79dBi

R=20cm

mW=10^(dBm/10)

BT/BLE antenna gain Numeric=10^(dBi/10)= 10^(3.09/10)=2.04

5G WIFI antenna gain Numeric=10^(dBi/10)= 10^(4.79/10)=3.01

BR+EDR:

Channel Freq. (MHz)	modulation	conducted power	Tune-up power (dBm)	Max		Antenna		Evaluation result	Power density Limits
		(dBm)		tune-up power		Gain		(mW/cm^2)	(mW/cm^2)
				(dBm)	(mW)	(dBi)	Numeric		
2402	GFSK	4.64	4±1	5	3.162	3.09	2.04	0.0013	1
2441		4.03	4±1	5	3.162	3.09	2.04	0.0013	1
2480		4.61	4±1	5	3.162	3.09	2.04	0.0013	1
2402	π/4-DQPSK	1.98	1±1	2	1.585	3.09	2.04	0.0006	1
2441		1.39	1±1	2	1.585	3.09	2.04	0.0006	1
2480		1.97	1±1	2	1.585	3.09	2.04	0.0006	1
2402	8DPSK	2.19	2±1	3	1.995	3.09	2.04	0.0008	1
2441		1.51	2±1	3	1.995	3.09	2.04	0.0008	1
2480		2.19	2±1	3	1.995	3.09	2.04	0.0008	1

BLE:

Channel Freq. (MHz)	modulation	conducted power	Tune-up power (dBm)	Max		Antenna		Evaluation result	Power density Limits
		(dBm)		tune-up power		Gain		(mW/cm^2)	(mW/cm^2)
				(dBm)	(mW)	(dBi)	Numeric		
2402	BLE-1M	4.6	4±1	5	3.162	3.09	2.04	0.0013	1
2440		4.44	4±1	5	3.162	3.09	2.04	0.0013	1
2480		4.56	4±1	5	3.162	3.09	2.04	0.0013	1
2402	BLE-2M	4.63	4±1	5	3.162	3.09	2.04	0.0013	1
2440		4.43	4±1	5	3.162	3.09	2.04	0.0013	1
2480		4.57	4±1	5	3.162	3.09	2.04	0.0013	1

5G WiFi: UNII-1

Channel Freq. (MHz)	modulation	conducted power	Tune-up power	Max		Antenna	Evaluation result at 20cm	Power density Limits
		(dBm)	(dBm)	tune-up power		Gain	Power density(mW/cm^2)	(mW/cm^2)
				(dBm)	(mW)	Numeric		
5180	11a	7.20	7±1	8	6.310	3.01	0.00378	1
5200	11a	7.71	7±1	8	6.310	3.01	0.00378	1
5240	11a	7.04	7±1	8	6.310	3.01	0.00378	1
5180	11n (HT20)	7.49	7±1	8	6.310	3.01	0.00378	1
5200	11n (HT20)	7.88	7±1	8	6.310	3.01	0.00378	1
5240	11n (HT20)	7.43	7±1	8	6.310	3.01	0.00378	1
5190	11n (HT40)	7.5	7±1	8	6.310	3.01	0.00378	1
5230	11n (HT40)	8.17	8±1	9	7.943	3.01	0.00476	1
5180	11ac (HT20)	10.75	11±1	11	12.589	3.01	0.00755	1
5200	11ac (HT20)	10.69	11±1	11	12.589	3.01	0.00755	1
5240	11ac (HT20)	9.61	10±1	11	12.589	3.01	0.00755	1
5190	11ac (HT40)	10.41	11±1	11	12.589	3.01	0.00755	1
5230	11ac (HT40)	10.01	11±1	11	12.589	3.01	0.00755	1
5180	11ax (HT20)	10.9	11±1	11	12.589	3.01	0.00755	1
5200	11ax (HT20)	10.8	11±1	11	12.589	3.01	0.00755	1
5240	11ax (HT20)	9.7	10±1	11	12.589	3.01	0.00755	1
5190	11ax (HT40)	10.5	10±1	11	12.589	3.01	0.00755	1

5230	11ax (HT40)	10.52	10±1	11	12.589	3.01	0.00755	1

5G WiFi:UNII-3

Channel Freq. (MHz)	modulation	conducted power	Tune-up power	Max		Antenna	Evaluation result at 20cm	Power density Limits
		(dBm)	(dBm)	tune-up power		Gain	Power density(mW/cm^2)	(mW/cm^2)
				(dBm)	(mW)	Numeric		
5745	11a	8.28	8±1	9	7.943	3.01	0.00476	1
5785	11a	9.53	9±1	10	10.000	3.01	0.00599	1
5825	11a	10.67	10±1	11	12.589	3.01	0.00755	1
5745	11n (HT20)	8.69	9±1	10	10.000	3.01	0.00599	1
5785	11n (HT20)	9.86	9±1	10	10.000	3.01	0.00599	1
5825	11n (HT20)	10.75	10±1	11	12.589	3.01	0.00755	1
5755	11n (HT40)	9.02	10±1	11	12.589	3.01	0.00755	1
5795	11n (HT40)	10.77	10±1	11	12.589	3.01	0.00755	1
5745	11ac (HT20)	9.75	10±1	11	12.589	3.01	0.00755	1
5785	11ac (HT20)	10.32	10±1	11	12.589	3.01	0.00755	1
5825	11ac (HT20)	10.86	10±1	11	12.589	3.01	0.00755	1
5755	11ac (HT40)	10.02	10±1	11	12.589	3.01	0.00755	1
5795	11ac (HT40)	10.48	10±1	11	12.589	3.01	0.00755	1
5745	11ax (HT20)	9.54	10±1	11	12.589	3.01	0.00755	1
5785	11ax (HT20)	10.20	10±1	11	12.589	3.01	0.00755	1
5825	11ax (HT20)	11.01	11±1	12	15.849	3.01	0.00950	1
5755	11ax (HT40)	10.33	10±1	11	12.589	3.01	0.00755	1
5795	11ax (HT40)	10.59	10±1	11	12.589	3.01	0.00755	1

Conclusion:

Simultaneous transmit:

BR&EDR+5G WIFI UNII-1=0.0013+0.00755=0.00885

BR&EDR+5G WIFI UNII-3=0.0013+0.00950=0.0108

BLE+5G WIFI UNII-1=0.0013+0.00755=0.00885

BLE+5G WIFI UNII-3=0.0013+0.00950=0.0108

For the max result: 0.0108≤ 1.0 for 1g SAR, No SAR is required.

----END OF REPORT----