

MPE REPORT

FCC ID: 2AYC2-CPC200

Date of issue: Nov. 20, 2020

Report number:	MTi20091717-2E5
Sample description:	Car OEM Wired CarPlay to Wireless CarPlay
Model(s):	CPC200-AutoKit, CPC200-CCPW, CPC200-C2W, CPC200-U2W, CPC200-U2W Plus, CPC200-CCPA, CPC200-CP2A
Applicant:	Huizhou Veelink Technology Co., Ltd.
Address:	1504-1506, Finance Building, 23 Xiapu Road, Huicheng District, Huizhou City, Guangdong Province China.
Date of test:	Oct. 19, 2020 to Nov. 11, 2020

Shenzhen Microtest Co., Ltd.

<http://www.mtitest.com>

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TEST RESULT CERTIFICATION	
Applicant's name:	Huizhou Veelink Technology Co., Ltd.
Address:	1504-1506, Finance Building, 23 Xiapu Road, Huicheng District, Huizhou City, Guangdong Province China.
Manufacture's name:	Huizhou Veelink Technology Co., Ltd.
Address:	1504-1506, Finance Building, 23 Xiapu Road, Huicheng District, Huizhou City, Guangdong Province China.
Product name:	Car OEM Wired CarPlay to Wireless CarPlay
Trademark:	CalinKit
Model and/or type reference:	CPC200-AutoKit
Serial model:	CPC200-CCPW, CPC200-C2W, CPC200-U2W, CPC200-U2W Plus, CPC200-CCPA, CPC200-CP2A
RF exposure procedures:	KDB 447498 D01 v06

This device described above has been tested by Shenzhen Microtest Co., Ltd and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

Tested by:

Demi Mu

Nov. 11, 2020

Reviewed by:

Leo Su

Nov. 20, 2020

Approved by:

Tom Xue

Nov. 20, 2020



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: $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2)$

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.



Measurement Result

BT/BLE:

Operation Frequency: 2402-2480MHz,

Power density limited: 1mW/ cm²

R=20cm

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

antenna gain Numeric= $10^{(dBi/10)}=10^{(0/10)}=1$

2.4GWiFi:

Operation Frequency: WIFI 802.11b/g/n HT20: 2412-2462MHz,

802.11n HT40: 2422-2452MHz,

Power density limited: 1mW/ cm²

R=20cm

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

antenna gain Numeric= $10^{(dBi/10)}=10^{(1/10)}=1.26$ (SISO)

antenna gain Numeric= $10^{(dBi/10)}=10^{(4.01/10)}=2.52$ (MIMO)

5GWiFi:

802.11a: 20 MHz

802.11n: 20 MHz, 40 MHz

802.11ac: 20 MHz, 40 MHz, 80MHz

Antenna Type: FPC Antenna;

WIFI antenna gain: 3dBi

R=20cm

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

antenna gain Numeric= $10^{(dBi/10)}=10^{(3/10)}=2$ (SISO)

antenna gain Numeric= $10^{(dBi/10)}=10^{(6.01/10)}=3.99$ (MIMO)



BR+EDR:

Channel Freq. (MHz)	modulation n	conducte d power	Tune- up powe r (dBm)	Max		Antenna		Evaluation result	Power density Limits
		(dBm)		tune-up power		Gain		(mW/cm2)	(mW/cm 2)
				(dBm)	(mW)	(dBi)	Nume ric		
2402	GFSK	5.555	5±1	6	3.981	0.00	1.00	0.0008	1
2441		5.020	5±1	6	3.981	0.00	1.00	0.0008	1
2480		5.745	5±1	6	3.981	0.00	1.00	0.0008	1
2402	π/4- DQPSK	4.828	4±1	5	3.162	0.00	1.00	0.0006	1
2441		4.240	4±1	5	3.162	0.00	1.00	0.0006	1
2480		4.818	4±1	5	3.162	0.00	1.00	0.0006	1
2402	8DPSK	4.932	4±1	5	3.162	0.00	1.00	0.0006	1
2441		4.299	4±1	5	3.162	0.00	1.00	0.0006	1
2480		4.915	4±1	5	3.162	0.00	1.00	0.0006	1

BLE:

Channel Freq. (MHz)	modulation n	conducte d power	Tune- up power (dBm)	Max		Antenna		Evaluation result	Power density Limits
		(dBm)		tune-up power		Gain		(mW/cm2)	(mW/cm 2)
				(dBm)	(mW)	(dBi)	Num eric		
2402	GFSK	3.320	4±1	5	3.162	0.00	1.00	0.0006	1
2440		4.762	4±1	5	3.162	0.00	1.00	0.0006	1
2480		4.909	4±1	5	3.162	0.00	1.00	0.0006	1

2.4GWiFi :

Chan nel Freq. (MHz)	modulati on	conducted power		Tune-up power		Max				Antenna		Evaluation result at 20cm			Power density Limits
		(dBm)		(dBm)		tune-up power				Gain		Power density(mW/cm2)			(mW/c m2)
						(dBm)		(mW)		Numeric					
		Ant A	Ant B	Ant A	Ant B	Ant A	Ant B	Ant A	Ant B	Ant A	Ant B	Ant A	Ant B	Sum	
2412	802.11b	12.61	12.18	13±1	13±1	14	14	25.1189	25.119	1.26	1.26	0.0063	0.0063	/	
2437		12.91	12.77	13±1	13±1	14	14	25.1189	25.119	1.26	1.26	0.0063	0.0063	/	1
2462		12.52	12.54	13±1	13±1	14	14	25.1189	25.119	1.26	1.26	0.0063	0.0063	/	1
2412	802.11g	11.68	10.10	11±1	10±1	12	11	15.8489	12.589	1.26	1.26	0.0040	0.0032	/	1
2437		11.96	10.27	11±1	10±1	12	11	15.8489	12.589	1.26	1.26	0.0040	0.0032	/	1
2462		11.67	10.31	11±1	10±1	12	11	15.8489	12.589	1.26	1.26	0.0040	0.0032	/	1
2412	802.11n H20	11.72	9.27	10±1	10±1	11	11	12.5893	12.589	2.52	2.52	0.0063	0.0063	0.0126	1
2437		10.12	9.54	10±1	10±1	11	11	12.5893	12.589	2.52	2.52	0.0063	0.0063	0.0126	1
2462		9.8	11.68	10±1	10±1	11	11	12.5893	12.589	2.52	2.52	0.0063	0.0063	0.0126	1
2422	802.11n H40	11.63	11.71	11±1	11±1	12	12	15.8489	15.849	2.52	2.52	0.0079	0.0079	0.0159	1
2437		11.82	11.87	11±1	11±1	12	12	15.8489	15.849	2.52	2.52	0.0079	0.0079	0.0159	1
2452		11.72	11.51	11±1	11±1	12	12	15.8489	15.849	2.52	2.52	0.0079	0.0079	0.0159	1



5GWiFi : 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/cm2)			(mW/cm2)
		Ant A	Ant B	Ant A	Ant B	Ant A	Ant B	Ant A	Ant B	Ant A	Ant B	Ant A	Ant B	Sum	
5180	11a	10.76	10	10±1	10±1	11	11	12.5893	12.589	2	2	0.0050	0.0050	/	1
5200	11a	9.64	9.53	10±1	10±1	11	11	12.5893	12.589	2	2	0.0050	0.0050	/	1
5240	11a	10.06	9.29	10±1	10±1	11	11	12.5893	12.589	2	2	0.0050	0.0050	/	1
5180	11n (HT20)	7.86	8.12	8±1	8±1	9	9	7.9433	7.943	3.99	3.99	0.0063	0.0063	0.0126	1
5200	11n (HT20)	8.71	8.03	8±1	8±1	9	9	7.9433	7.943	3.99	3.99	0.0063	0.0063	0.0126	1
5240	11n (HT20)	8.52	7.87	8±1	8±1	9	9	7.9433	7.943	3.99	3.99	0.0063	0.0063	0.0126	1
5190	11n (HT40)	6.81	6.85	6±1	6±1	7	7	5.0119	5.012	3.99	3.99	0.0040	0.0040	0.0080	1
5230	11n (HT40)	6.64	6.64	6±1	6±1	7	7	5.0119	5.012	3.99	3.99	0.0040	0.0040	0.0080	1
5180	11ac (HT20)	8.5	7.57	8±1	7±1	9	8	7.9433	6.310	3.99	3.99	0.0063	0.0050	0.0113	1
5200	11ac (HT20)	8.21	7.45	8±1	7±1	9	8	7.9433	6.310	3.99	3.99	0.0063	0.0050	0.0113	1
5240	11ac (HT20)	8.74	7.17	8±1	7±1	9	8	7.9433	6.310	3.99	3.99	0.0063	0.0050	0.0113	1
5190	11ac (HT40)	6.89	6.53	6±1	7±1	7	7	5.0119	5.012	3.99	3.99	0.0040	0.0040	0.0080	1
5230	11ac (HT40)	6.81	6.99	6±1	7±1	7	8	5.0119	6.310	3.99	3.99	0.0040	0.0050	0.0090	1
5210	11ac (HT80)	6.78	7.1	6±1	7±1	7	8	5.0119	6.310	3.99	3.99	0.0040	0.0050	0.0090	1

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/cm2)			(mW/cm2)
		Ant A	Ant B	Ant A	Ant B	Ant A	Ant B	Ant A	Ant B	Ant A	Ant B	Ant A	Ant B	Sum	
5745	11a	10.08	11.57	10±1	11±1	11	12	12.5893	15.849	2	2	0.0050	0.0063	/	1
5785	11a	10.07	11.2	10±1	11±1	11	12	12.5893	15.849	2	2	0.0050	0.0063	/	1
5825	11a	9.43	10.7	10±1	11±1	11	12	12.5893	15.849	2	2	0.0050	0.0063	/	1
5745	11n (HT20)	4.82	4.58	4±1	4±1	5	5	3.1623	3.162	3.99	3.99	0.0025	0.0025	0.0050	1
5785	11n (HT20)	4.5	4.12	4±1	4±1	5	5	3.1623	3.162	3.99	3.99	0.0025	0.0025	0.0050	1
5825	11n (HT20)	3.98	4.48	4±1	4±1	5	5	3.1623	3.162	3.99	3.99	0.0025	0.0025	0.0050	1



5755	11n (HT40)	4.79	4.71	4±1	4±1	5	5	3.1623	3.162	3.99	3.99	0.0025	0.0025	0.0050	1
5795	11n (HT40)	4.65	4.21	4±1	4±1	5	5	3.1623	3.162	3.99	3.99	0.0025	0.0025	0.0050	1
5745	11ac (HT20)	4.68	4.78	4±1	4±1	5	5	3.1623	3.162	3.99	3.99	0.0025	0.0025	0.0050	1
5785	11ac (HT20)	4.55	4.61	4±1	4±1	5	5	3.1623	3.162	3.99	3.99	0.0025	0.0025	0.0050	1
5825	11ac (HT20)	4.18	4.03	4±1	4±1	5	5	3.1623	3.162	3.99	3.99	0.0025	0.0025	0.0050	1
5755	11ac (HT40)	4.68	4.41	4±1	4±1	5	5	3.1623	3.162	3.99	3.99	0.0025	0.0025	0.0050	1
5795	11ac (HT40)	3.93	4.05	4±1	4±1	5	5	3.1623	3.162	3.99	3.99	0.0025	0.0025	0.0050	1
5775	11ac (HT80)	3.76	4.98	4±1	4±1	5	5	3.1623	3.162	3.99	3.99	0.0025	0.0025	0.0050	1

Conclusion:

Simultaneous transmit: $0.0008+0.0006+0.0159+0.0126+0.0050=0.0349$

For the max result: $0.0349 \leq 1.0$ for 1g SAR, No SAR is required.

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