Maximum Permissible Exposure Report

Product Information

EUT : Multimedia Car players

CPAA-70D,VRCPAA-7D,VRCPAA-106,HDHU Model Number

14+.MPHU-3.NA6605

Model Difference Declaration : All the same except for the model name

Test Model : CPAA-70D

Power Supply : DC 16V by DC Source

Hardware version : NA6605_Vr3.2_2019_06_27

Software version : V1.0

Bluetooth

Bluetooth Version : V2.1 +EDR

Frequency Range : 2402-2480MHz

Channel Number : 79 Channels

Modulation Technology : GFSK, π/4-DQPSK, 8-DPSK

Data Rates : 1~3Mbps

Antenna Type And Gain : Internal Antenna 0.0dBi

Note: Antenna position refer to EUT Photos.

2. Evaluation Method

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 modelled or measured field strengths or power density, is ≤ 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.

3. Method and Limit

3. 1 Refer evaluation method

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: Radiofrequency radiation exposure limits.

FCC CFR 47 part2 2.1091: Radiofrequency radiation exposure evaluation: mobile devices

3. 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/cm²)	Averaging Time (minute)	
rtange(ivii iz)	0 \	cupational/Control	led Exposure	(minute)	
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	Electric Field	Magnetic Field	Power Density	Averaging Time		
Range(MHz)	Strength(V/m)	Strength(A/m)	(mW/cm²)	(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

4. MPE Calculation Method

Predication of MPE limit at a given distance Equation from page 18 of OET Bulletin 65, Edition 97-01

S=PG/4πR²

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

5. Antenna Information

This Product can only use antennas certificated as follows provided by manufacturer;

	Internal	Antenna	Antenna type and	Operate frequency	Maximum
	Identification	Description	antenna number	band	antenna gain
ſ	Antenna 1	BT Antenna	Internal Antenna	2400 MHz – 2500 MHz	0.0 dBi

^{*=}Plane-wave equivalent power density

6. Conducted Power

Bluetooth(BDR+EDR)

Test Mode	Channel	Frequency (MHz)	Measured Peak Output Power (dBm)		
	00	2402	2.364		
GFSK	39	2441	3.282		
	78	2480	3.937		
	00	2402	3.437		
π/4-DQPSK	39	2441	4.24		
	78	2480	4.875		
	00	2402	3.748		
8-DPSK	PSK 39	2441	4.619		
	78	2480	5.256		

7. Manufacturing Tolerance

Bluetooth(BDR+EDR)

I(DDIX+EDIX)							
GFSK (Peak)							
Channel	Channel 0	Channel 39	Channel 78				
Target (dBm)	2.0	3.0	3.5				
Tolerance ±(dB)	1.0	1.0	1.0				
π/4-DQPSK (Peak)							
Channel	Channel 0	Channel 39	Channel 78				
Target (dBm)	3.0	4.0	4.5				
Tolerance ±(dB)	1.0	1.0	1.0				
	8-DPSK (Peak)						
Channel	Channel 0	Channel 39	Channel 78				
Target (dBm)	3.5	4.5	5.0				
Tolerance ±(dB)	1.0	1.0	1.0				

8. Measurement Results

8.1 Standalone MPE

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 =20cm, as well as the gain of the used antenna refer to antenna information, the RF power density can be obtained.

Bluetooth(BDR+EDR)

	Output power		Antenna	Antenna	Duty	MPE	MPE
Modulation Type	dBm	mW	Gain (dBi)	Gain (linear)	Cycle	(mW/cm ²)	Limits (mW/cm ²)
GFSK	4.50	2.8184	0.00	1.0000	100%	0.0006	1.0000
π/4-DQPSK	5.50	3.5481	0.00	1.0000	100%	0.0007	1.0000
8-DPSK	6.00	3.9811	0.00	1.0000	100%	0.0008	1.0000

Remark:

- 1. Output power including tune-up tolerance;
- 2. MPE evaluate distance is 20cm from user manual provide by manufacturer;

8.2 Simultaneous Transmission MPE

N/A

9. Conclusion

The measurement results comply with the FCC Limit per 47 CFR 2.1091 for the uncontrolled RF Exposure of mobile device.

-----THE END OF REPORT-----