

# RF Exposure Evaluation Report

## 1 RF EXPOSURE

Product Name: carplay /carplay dash camera

Model No.: C001P, C002P, C003P, C004P, C005P, C006P, C007P, C008P, C009P, C010P, C011P, C012P, C013P, C014P, C015P

FCC ID: 2BM84-C001P

## 2. RF Exposure Evaluation

FCC KDB447498 D01 General RF Exposure Guidance v06: Mobile and Portable Device, RF Exposure, Equipment Authorization Procedures.

FCC CFR 47 part1 1.1310: Radiofrequency radiation exposure limits.

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

### 2.1 LIMITS

According to FCC Part1.1310: 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 part1.1307(b)

Table 1 to § 1.1310(e)(1)—Limits for Maximum Permissible Exposure (MPE)				
Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm <sup>2</sup> )	Averaging time (minutes)
(i) 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
300–1,500			f/300	<6
1,500–100,000			5	<6
(ii) 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 <sup>2</sup> )	<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 Friis Formula

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

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

$G$  = gain of antenna in linear scale

$P_i = 3.1416$

$R$  = distance between observation point and center of the radiator in cm

$P_d$  is the limit of MPE. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance  $r$  where the MPE limit is reached.

## 2.2 EUT RF EXPOSURE EVALUATION

WIFI/BT ANT :2.16dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.0 in linear scale.

The Max Conducted Peak Output Power data refer to report No.: DACE241216001RF001

worst mode and channel:

Test channel (MHz)	Conducted Power (dBm)	Maximum tune-up Power (dbm)	Maximum tune-up Power (dbm)	Maximum tune-up Power (mW)	Calculated value (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
802.11n -2412MHz	20.94	20.0±1.0	21.0	125.893	0.04118	1.0
802.11n -2437MHz	20.53	20.0±1.0	21.0	125.893	0.04118	1.0
802.11n -2462MHz	20.91	20.0±1.0	21.0	125.893	0.04118	1.0
DH5-2441.00	7.22	8±1.0	9.0	7.943	0.0026	1.0

Remark:  $P_d = (P_{out} * G) / (4 * P_i * R^2) = (125.893 * 1.6444) / (4 * 3.1415 * 20^2) = 0.04118$ ,  $G = 10^{gain/10} = 1.6444$

EUT RF Exposure Evaluation simultaneous transmission operations

According to 865664D02 2.2 d) 1):

The sum of the ratios of the spatially averaged results to the applicable frequency dependent MPE limits :

Simultaneous transmission mode	The sum of the ratios	SUM	Limit
2.4G WIFI + BT	0.04118+0.0026	≈0.044	1.0
Conclusion: 0.044 < 1.0, So there is no sar requirement			

NOTE:1. EUT RF module is more than 20cm away from the human body.

2. The sum of the ratios(2.4GWIFI +BT) is less than the limit value of 1.0, so there is no sar requirement.