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RF Exposure Evaluation Report

Report No. : CQASZ20180700036E-02

Applicant: Hopwell Electronics

Address of Applicant: RM 1507, Tower A, Viking Technology & Business Centre, 93 Ta Chuen Ping St, Kwai Chung, Hong Kong, China

Manufacturer: Hopwell Electronics

Address of Manufacturer: RM 1507, Tower A, Viking Technology & Business Centre, 93 Ta Chuen Ping St, Kwai Chung, Hong Kong, China

Equipment Under Test (EUT):

Product: Car Entertainment System

Model No.: HW-6216BN, HW-6216, 6002, 6060, 6165, 8300, 8301, 8302, 8303, 8305, 9646, 7010, 7012, 7018, 9601, 6301, 6505, K801, K802, K803, K805, K806

Test Model No.: HW-6216BN

Brand Name: N/A

FCC ID: 2ABQZ-HW

Standards: 47 CFR Part 1.1307
47 CFR Part 2.1093
KDB447498D01 General RF Exposure Guidance v06

Date of Test: 2018-07-11 to 2018-07-30

Date of Issue: 2018-07-30

Test Result : PASS*

Tested By:

Martin Lee

Martin Lee

Reviewed By:

Jack Ai

(Jack Ai)

Approved By:

Jack Ai

(Jack Ai)



* In the configuration tested, the EUT complied with the standards specified above.

The test report is effective only with both signature and specialized stamp, The result(s) shown in this report refer only to the sample(s) tested. Without written approval of CQA, this report can't be reproduced except in full.

1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20180700036E-02	Rev.01	Initial report	2018-07-30

2 Contents

	Page
1 VERSION	2
2 CONTENTS	3
3 GENERAL INFORMATION.....	4
3.1 CLIENT INFORMATION.....	4
3.2 GENERAL DESCRIPTION OF EUT	4
4 SAR EVALUATION	5
4.1 RF EXPOSURE COMPLIANCE REQUIREMENT	5
4.1.1 <i>Standard Requirement</i>	5
4.1.2 <i>Limits</i>	5
4.1.3 <i>EUT RF Exposure</i>	6

3 General Information

3.1 Client Information

Applicant:	Hopwell Electronics
Address of Applicant:	RM 1507, Tower A, Viking Technology & Business Centre, 93 Ta Chuen Ping St, Kwai Chung, Hong Kong, China
Manufacturer:	Hopwell Electronics
Address of Manufacturer:	RM 1507, Tower A, Viking Technology & Business Centre, 93 Ta Chuen Ping St, Kwai Chung, Hong Kong, China

3.2 General Description of EUT

Product Name:	Car Entertainment System
Model No.:	HW-6216BN, HW-6216, 6002, 6060, 6165, 8300, 8301, 8302, 8303, 8305, 9646, 7010, 7012, 7018, 9601, 6301, 6505, K801, K802, K803, K805, K806
Test Model No.:	HW-6216BN
Trade Mark:	N/A
Hardware Version:	RDA5876A_MOD_V1.1
Software Version:	V1.1
Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	V2.1
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)
Modulation Type:	GFSK, $\pi/4$ DQPSK, 8DPSK
Number of Channel:	79
Hopping Channel Type:	Adaptive Frequency Hopping systems
Sample Type:	fix production
Test Software of EUT:	FCCAssist V1.6 (manufacturer declare)
Antenna Type:	PCB antenna
Antenna Gain:	2.0dBi
Power Supply:	DC12V

Note:

All model: HW-6216BN, HW-6216, 6002, 6060, 6165, 8300, 8301, 8302, 8303, 8305, 9646, 7010, 7012, 7018, 9601, 6301, 6505, K801, K802, K803, K805, K806

Only the model HW-6216BN was tested, since the electrical circuit design, layout, components used and internal wiring were identical for the above models, with difference being color of appearance and model name.

4 SAR Evaluation

4.1 RF Exposure Compliance Requirement

4.1.1 Standard Requirement

According to KDB447498D01 General RF Exposure Guidance v06

4.3.1. Standalone SAR test exclusion considerations

Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied.

4.1.2 Limits

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$$\left[\frac{\text{max. power of channel, including tune-up tolerance, mW}}{\text{min. test separation distance, mm}} \right] \cdot \sqrt{f(\text{GHz})} \leq 3.0 \text{ for 1-g SAR and } \leq 7.5 \text{ for 10-g extremity SAR, where}$$

$f(\text{GHz})$ is the RF channel transmit frequency in GHz

Power and distance are rounded to the nearest mW and mm before calculation¹⁷

The result is rounded to one decimal place for comparison

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion

4.1.3 EUT RF Exposure

For BT:

Measurement Data

GFSK mode	
Test channel	Peak Output Power (dBm)
Lowest	3.390
Middle	4.290
Highest	4.740
π/4DQPSK mode	
Test channel	Peak Output Power (dBm)
Lowest	0.800
Middle	1.690
Highest	2.190
8DPSK mode	
Test channel	Peak Output Power (dBm)
Lowest	1.270
Middle	2.120
Highest	2.630

The Max Conducted Peak Output Power is 4.740dBm in lowest channel(2.480GHz);

The best case gain of the antenna is 2.0dBi.

EIRP= 4.740dBm + 2.0dBi = 6.740dBm

6.740dBm logarithmic terms convert to numeric result is nearly 4.72mW

According to the formula. calculate the EIRP test result:

$$\frac{[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f}(\text{GHz})]}$$

General RF Exposure = $(4.72\text{mW} / 5 \text{ mm}) \times \sqrt{2.480\text{GHz}} = 1.487$ ①

SAR requirement:

S= 3.0 ② ;

① < ②.

So the SAR report is not required.

Remark: The Max Conducted Peak Output Power data refer to report Report No.: CQASZ20180700036E-01