



Shenzhen Huaxia Testing Technology Co., Ltd

1F., Block A of Tongsheng Technology Building, Huahui Road, Dalang Street, Longhua District, Shenzhen, China

Telephone: +86-755-26648640
Fax: +86-755-26648637
Website: www.cqa-cert.com

Report Template Version: V04
Report Template Revision Date: 2018-07-06

RF Exposure Evaluation Report

Report No.: CQASZ20201101368E-03
Applicant: Avantronics Limited
Address of Applicant: The 4th Floor, Yuepeng Building, No.1019 Jiabin Rd, Luohu District, Shenzhen
Equipment Under Test (EUT):
EUT Name: Avantree DG45
Model No.: BTDG-45
Brand Name: Avantree
FCC ID: WJ5-BTDG-45
Standards: 47 CFR Part 1.1307
47 CFR Part 2.1093
KDB447498D01 General RF Exposure Guidance v06
Date of Receipt: 2020-11-17
Date of Test: 2020-11-17 to 2020-12-10
Date of Issue: 2020-12-15
Test Result: **PASS***

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

Tested By: Jun Li
(Jun Li)

Reviewed By: Ares
(Ares)

Approved By: Sheek Luo
(Sheek Luo)



1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20201101368E-03	Rev.01	Initial report	2020-12-15

2 Contents

	Page
1 VERSION	2
2 CONTENTS	3
.....	3
3 GENERAL INFORMATION.....	4
3.1 CLIENT INFORMATION	4
3.2 GENERAL DESCRIPTION OF EUT	4
3.3 GENERAL DESCRIPTION OF BT	4
3.4 GENERAL DESCRIPTION OF BLE.....	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:	Avantronics Limited
Address of Applicant:	The 4th Floor, Yuepeng Building, No.1019 Jiabin Rd, Luohu District, Shenzhen
Manufacturer:	Avantronics Limited
Address of Manufacturer:	The 4th Floor, Yuepeng Building, No.1019 Jiabin Rd, Luohu District, Shenzhen

3.2 General Description of EUT

Product Name:	Avantree DG45
Test Model No.:	BTDG-45
Trade Mark:	Avantree
Hardware Version:	DG45-R8761-V1
Software Version:	BG45-RTL8761-20200310002-V1.0
Power Supply:	DC5V

3.3 General Description of BT

Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	Bluetooth 5.0
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)
Modulation Type:	GFSK, $\pi/4$ DQPSK, 8DPSK
Transfer Rate:	1Mbps/2Mbps/3Mbps
Number of Channel:	79
Hopping Channel Type:	Adaptive Frequency Hopping systems
Product Type:	<input type="checkbox"/> Mobile <input checked="" type="checkbox"/> Portable <input type="checkbox"/> Fix Location
Test Software of EUT:	RtiBluetoothMP.dll
Antenna Type:	PCB antenna
Antenna Gain:	2dBi

3.4 General Description of BLE

Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	Bluetooth 5.0
Modulation Type:	Frequency Hopping Spread Spectrum(FHSS)
Transfer Rate:	1Mbps, 2Mbps
Number of Channel:	40
Product Type:	<input type="checkbox"/> Mobile <input checked="" type="checkbox"/> Portable <input type="checkbox"/> Fix Location
Test Software of EUT:	RtiBluetoothMP.dll
Antenna Type:	PCB antenna
Antenna Gain:	2dBi

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:

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

f(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

1) For BT

Measurement Data

GFSK mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	-3.670	-5±1	-4.0	0.398
Middle(2441MHz)	-3.760	-5±1	-4.0	0.398
Highest(2480MHz)	-3.910	-5±1	-4.0	0.398
π/4DQPSK mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	-2.010	-3±1	-2	0.631
Middle(2441MHz)	-1.490	-2.5±1	-1.5	0.708
Highest(2480MHz)	-0.970	0±1	1	1.259
8DPSK mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	-1.390	-2.5±1	0.708	0.501
Middle(2441MHz)	-0.870	0±1	1.259	0.501
Highest(2480MHz)	-0.490	-1.5±1	0.891	0.501

Worst case: 8DPSK mode						
Channel	Maximum Peak Conducted Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power		Calculated value	Exclusion threshold
			(dBm)	(mW)		
Lowest (2402MHz)	-1.390	-2.5±1	-1.5	0.708	0.219	3.0
Middle (2441MHz)	-0.870	0±1	1	1.259	0.393	
Highest (2480MHz)	-0.490	-1.5±1	-0.5	0.891	0.281	

Conclusion: the calculated value ≤3.0, SAR is exempted.

Remark: The Max Conducted Peak Output Power data refer to report Report No.: CQASZ20201101368E-01

2) For BLE

Measurement Data

GFSK(1Mbps) mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	-3.72	-5±1	-4	0.398
Middle(2440MHz)	-3.63	-5±1	-4	0.398
Highest(2480MHz)	-3.4	-4.5±1	-3.5	0.447
GFSK(2Mbps) mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	-3.88	-5±1	-4	0.398
Middle(2440MHz)	-3.82	-5±1	-4	0.398
Highest(2480MHz)	-3.65	-5±1	-4	0.398

Worst case: GFSK(1Mbps) mode						
Channel	Maximum Peak Conducted Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power		Calculated value	Exclusion threshold
			(dBm)	(mW)		
Lowest (2402MHz)	-3.72	-5±1	-4	0.398	0.123	3.0
Middle (2440MHz)	-3.63	-5±1	-4	0.398	0.124	
Highest (2480MHz)	-3.4	-4.5±1	-3.5	0.447	0.141	
Conclusion: the calculated value ≤3.0, SAR is exempted.						

Remark: The Max Conducted Peak Output Power data refer to report Report No.: CQASZ20201101368E-02
BDR and BLE can not simultaneous transmitting at same time.