



A Test Lab Techno Corp.

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SAR Test Exclusion Evaluation



Test Report No.	: 1510FS21-01
Applicant	: Headwave GmbH
Manufacturer	: Headwave GmbH
Product Type	: Bluetooth Speaker
Trade Name	: HEADWAVE
Model Number	: TAG
Dates of Received	: Jul. 24, 2015
Dates of Test	: Jul. 24, 2015
Dates of Issued	: Nov. 09, 2015
Test Specification	: ANSI/IEEE C95.1-1999/ IEEE Std. 1528-2013 47 CFR § 2.1093 KDB 447498 D01 General RF Exposure Guidance v05r02 KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04 KDB 865664 D02 RF Exposure Reporting v01r01
Location of Test Lab.	: Chang-an Lab.

1. The test operations have to be performed with cautious behavior, the test results are as attached.
2. The test results are under chamber environment of A Test Lab Techno Corp. A Test Lab Techno Corp. does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples.
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1. **Description of Equipment under Test (EUT)**

Applicant	Headwave GmbH
Applicant Address	Marie-Elisabeth-von-Humboldt-Str. 35a ,Berlin,Germany 13057
Manufacturer	Headwave GmbH
Manufacturer Address	Marie-Elisabeth-von-Humboldt-Str. 35a ,Berlin,Germany 13057
Product Type	Bluetooth Speaker
Trade Name	HEADWAVE
Model Number	TAG
FCC ID	2AFD6HWCC1
Frequency Range	2402- 2480 MHz : Bluetooth BR/EDR
Transmit Power (conducted power)	0.001 W / 0.05 dBm
Antenna Type	Chip Antenna
Antenna Max. Gain	0.5 dBi

The above equipment was tested by A Test Lab Techno Corp. For compliance with the requirements set forth in 47 CFR § 2.1093. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.



2. SAR Test Exclusion

As RF exposure evaluation of portable device, SAR test is not required when the evaluation results .

According to KDB 447498 4.3.1, unless excluded by specific FCC test procedures, portable devices shall include SAR data for equipment approval. SAR test necessity will be based on the exclusion result.

The test exclusion refers KDB 447498 as below:

≤50mm:

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

≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR

>50mm and <200mm:

- a) [Power allowed at numeric threshold for 50 mm in step 1) + (test separation distance - 50 mm) · (f(MHz)/150)] mW, at 100 MHz to 1500 MHz
- b) [Power allowed at numeric threshold for 50 mm in step 1) + (test separation distance - 50 mm) · 10] mW at > 1500 MHz and ≤ 6 GHz



2.1 Conducted Power

Band	CH	Frequency (MHz)	Packet Type	Average Power (dBm)
Bluetooth BR GFSK	0	2402	DH1	-3.10
			DH3	-3.07
			DH5	-3.03
	39	2441	DH1	-0.76
			DH3	-0.71
			DH5	-0.68
	78	2480	DH1	-0.40
			DH3	-0.37
			DH5	-0.34
Bluetooth EDR $\pi/4$ -DQPSK	0	2402	2DH1	-4.87
			2DH3	-4.82
			2DH5	-4.78
	39	2441	2DH1	-2.60
			2DH3	-2.55
			2DH5	-2.49
	78	2480	2DH1	-2.31
			2DH3	-2.28
			2DH5	-2.24
Bluetooth EDR 8DPSK	0	2402	3DH1	-4.82
			3DH3	-4.79
			3DH5	-4.74
	39	2441	3DH1	-2.52
			3DH3	-2.49
			3DH5	-2.42
	78	2480	3DH1	-2.25
			3DH3	-2.22
			3DH5	-2.18



2.2 Evaluation Results

The evaluation of SAR test reduction according to KDB447498

SAR test is not required when the results showed “SAR is not required”.

Transmitter and antenna implementation as below:

Band	Bluetooth Antenna
Bluetooth BR/EDR	✓

SAR test reduction according to KDB

$\leq 50 \text{ mm}$									
Antenna	Band	Channel	Power-Tune up (dBm)	Frequency (GHz)	Distance (mm)	Power (mW)	Result	Limit	Exclusion Considerations SAR ^{1g}
Bluetooth Antenna	Bluetooth BR/EDR	39	0	2.48	5	1	0.3	3	SAR is not required

Note : The test reduction for distance less than 50mm. Use the max power to make sure minimum distance by evaluated for SAR testing.