

September 1, 2015

WLL Report #13970-02 Rev 1

Etymotic Research

61 Martin Lane

Elk Grove Village, IL 60007

Model: Etymotic Research's Companion Mic Product

FCC ID: RWT-ER84, IC ID: 6648A-ER84

Washington Laboratories, Ltd. performed a SAR Evaluation on the on Etymotic Research's Companion Mic Product. This product is a portable transmitter, operating between 2404MHz and 2480MHz. It is designed to be worn by the user with a separation distance ≤ 5 mm and therefore SAR must be considered.

FCC Exclusion Results:

The EUT was tested under FCC Part 15.247 as a DTS device and the maximum measured power was determined as 2.04mW(3.1dBm) conducted at antenna port with a 0dBi chip antenna. The manufacture allows for a maximum power of 2.5mW due to manufacturing variance. Documentation of the measurement technique used can be found in Washington Laboratory Report 13970-01.

Referring to the FCC Document, 447498 D01 General RF Exposure Guidance v05r01, Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies, section 4.1 allows for the exclusion of SAR Testing if the device meets the following requirements:

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

Where,

- $f(\text{GHz})$ is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison
- When the minimum *test separation distance* is < 5 mm, a distance of 5 mm is used

Using the above formula and test data for the highest power channel:

$$(3 \div 5) \times \sqrt{2.404} = 0.930 < \leq 3.0$$

$$(3 \div 5) \times \sqrt{2.440} = 0.937 < \leq 3.0$$

$$(3 \div 5) \times \sqrt{2.480} = 0.945 < \leq 3.0$$

Exemption Limits for Routine Evaluation – SAR Evaluation

SAR evaluation is required if the separation distance between the user and/or bystander and the antenna and/or radiating element of the device is less than or equal to 20 cm, except when the device operates at or below the applicable output power level (adjusted for tune-up tolerance) for the specified separation distance defined in Table 1.

Table 1: SAR evaluation – Exemption limits for routine evaluation based on frequency and separation distance^{4,5}

Frequency (MHz)	Exemption Limits (mW)				
	At separation distance of ≤5 mm	At separation distance of 10 mm	At separation distance of 15 mm	At separation distance of 20 mm	At separation distance of 25 mm
≤300	71 mW	101 mW	132 mW	162 mW	193 mW
450	52 mW	70 mW	88 mW	106 mW	123 mW
835	17 mW	30 mW	42 mW	55 mW	67 mW
1900	7 mW	10 mW	18 mW	34 mW	60 mW
2450	4 mW	7 mW	15 mW	30 mW	52 mW
3500	2 mW	6 mW	16 mW	32 mW	55 mW
5800	1 mW	6 mW	15 mW	27 mW	41 mW

If the frequency falls between two levels a linear interpolation shall be used:

For the EUT frequencies in question the Limits are as follows:

Frequency	Limit	EUT Levels
2.404GHz	4.2mW	2.5mW
2.440GHZ	4.0mW	2.5mW
2.480GHz	3.9mW	2.5mW

The EUT fulfills the exclusion requirements for both FCC and Industry Canada.

Therefore, the EUT does not require SAR Testing.

Testing was performed on an Open Area Test Site (OATS) of Washington Laboratories, Ltd, 7560 Lindbergh Drive, Gaithersburg, MD 20879. Site description and site attenuation data have been placed on file with the FCC's Sampling and Measurements Branch at the FCC laboratory in Columbia, MD. Washington Laboratories, Ltd. has been accepted by the FCC and approved by ACLASS under Certificate AT-1448 as an independent FCC test laboratory.

These tests are accredited and meet the requirements of ISO/IEC 17025 as verified by the ANSI-ASQ National Accreditation Board/ACLASS. Refer to certificate and scope of accreditation AT-1448.

Should you have any questions, please do not hesitate to contact us.

Sincerely,

A handwritten signature in blue ink, appearing to read "James Ritter".

James Ritter
Compliance Engineer

A handwritten signature in blue ink, appearing to read "Steven D. Koster".

Steven D. Koster
Vice President