



A Test Lab Techno Corp.

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SAR Test Exclusion Evaluation



Test Report No.	: 1307FS14
Applicant	: Garmin International Inc.
Manufacturer	: Garmin Corporation
Product Type	: VIRB
Trade Name	: Garmin
Model Numbers	: O3AHGT00
Dates of Received	: May 08, 2013
Dates of Test	: Jul. 02, 2013
Dates of Issued	: Aug. 01, 2013
Test Specification	: 47 CFR § 2.1093 KDB 447498 D01 General RF Exposure Guidance v05r01 KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r01 RSS-102 Issue 4
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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Approved By : Yung-Tan Tsai Tested By : Bill Hu
(Yung Tan Tsai) (Bill Hu)



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1. Description of Equipment under Test (EUT)

Applicant	Garmin International Inc.
Applicant Address	1200 E., 151st. Street, Olathe, Kansas, United States, 66062
Manufacturer	Garmin Corporation
Manufacturer Address	No.68, Zhangshu 2nd Rd., Xizhi Dist., New Taipei City 221, Taiwan
Product Type	VIRB
Trade Name	Garmin
Model Numbers	O3AHGT00
FCC ID	IPH-01088
Frequency Range	2402 - 2479 MHz 2.4GHz ANT
Transmit Power (conducted power)	0.004 W / 5.71 dBm (2.4G Hz ANT)
Antenna Specification	2.4GHz ANT: 2.22 dBi
Antenna Designation	chip antenna
Temperature Range	-30 ~ +70°C

The above equipment was tested by A Test Lab Techno Corp. For compliance with the requirements set forth in 47 CFR § 2.1093 & OET65 Supplement C. 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:

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

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

>50mm and <200mm:

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

2.1 Antenna Distance

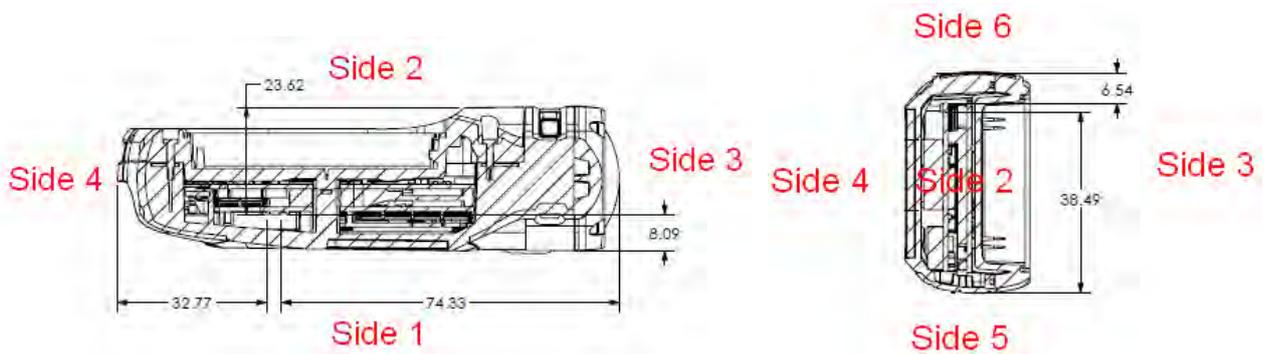
Antenna to Side (The evaluated distance available extremity SAR as below):

Distance of Antenna to edge		
Antenna	Side	Distance (mm)
2.4GHz ANT+	Side 1	8.09
2.4GHz ANT+	Side 2	23.62
2.4GHz ANT+	Side 3	74.33
2.4GHz ANT+	Side 4	32.77
2.4GHz ANT+	Side 5	38.49
2.4GHz ANT+	Side 6	6.54

Antenna to Body (The evaluated distance available body SAR as below)

Distance of Antenna to edge		
Antenna	Side	Distance (mm)
2.4GHz ANT+	Side 1	23.09
2.4GHz ANT+	Side 2	38.62
2.4GHz ANT+	Side 3	89.33
2.4GHz ANT+	Side 4	47.77
2.4GHz ANT+	Side 5	53.49
2.4GHz ANT+	Side 6	21.54

Note: The use distance more than 1.5cm, therefore distance of antenna to body should be increased 1.5cm (from antenna to side).





2.2 Conducted Power

Band	Frequency (MHz)	Average Power (dBm)
2.4GHz ANT	2402.0	5.71
	2457.0	5.68
	2479.0	5.57

2.3 Evaluation Results

The evaluation of SAR test reduction according to KDB447498

SAR test is not required when the results showed "SAR is not required".

Extremity SAR:

≤ 50 mm									
Side	Band	Channel	Power (dBm)	Frequency (GHz)	distance (mm)	Power (mW)	Result	Limit	exclusion considerations
									SAR _{10g}
1	2.4GHz ANT	---	5.71	2.402	8.09	4	0.8	7.5	SAR is not required
2	2.4GHz ANT	---	5.71	2.402	23.62	4	0.3	7.5	SAR is not required
4	2.4GHz ANT	---	5.71	2.402	32.77	4	0.2	7.5	SAR is not required
5	2.4GHz ANT	---	5.71	2.402	38.49	4	0.2	7.5	SAR is not required
6	2.4GHz ANT	---	5.71	2.402	6.54	4	0.9	7.5	SAR is not required

> 50 mm and <200mm									
Side	Band	Channel	Power (dBm)	Frequency (GHz)	distance (mm)	Power (mW)	Power thresholds SAR _{10g} (mW)	exclusion considerations	
								SAR _{10g}	
3	2.4GHz ANT	---	5.71	2.402	74.33	4	485	SAR is not required	



Body SAR:

≤ 50 mm									
Side	Band	Channel	Power (dBm)	Frequency (GHz)	distance (mm)	Power (mW)	Result	Limit	exclusion considerations
									SAR _{1g}
1	2.4GHz ANT	---	5.71	2.402	23.09	4	0.3	3	SAR is not required
2	2.4GHz ANT	---	5.71	2.402	38.62	4	0.2	3	SAR is not required
4	2.4GHz ANT	---	5.71	2.402	47.77	4	0.1	3	SAR is not required
6	2.4GHz ANT	---	5.71	2.402	21.54	4	0.3	3	SAR is not required

> 50 mm and <200mm									
Side	Band	Channel	Power (dBm)	Frequency (GHz)	distance (mm)	Power (mW)	Power thresholds SAR _{1g} (mW)	exclusion considerations	
								SAR _{1g}	
3	2.4GHz ANT	---	5.71	2.402	89.33	4	490	SAR is not required	
5	2.4GHz ANT	---	5.71	2.402	53.49	4	132	SAR is not required	