



FCC PART 15, SUBPART B and C; and FCC SECTION 15.247; RSS-247 and RSS-GEN
TEST REPORT

for
BLUETOOTH SENSOR
MODEL: SENSOR-005

Prepared for

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GENERAL REPORT SUMMARY

This electromagnetic emission test report is generated by Compatible Electronics Inc., which is an independent testing and consulting firm. The test report is based on testing performed by Compatible Electronics personnel according to the measurement procedures described in the test specifications given below and in the "Test Procedures" section of this report.

The measurement data and conclusions appearing herein relate only to the sample tested and this report may not be reproduced without the written permission of Compatible Electronics, unless done so in full.

This report must not be used to claim product certification, approval or endorsement by NVLAP, NIST or any agency of the U.S. Government.

Device Tested: Bluetooth Sensor
Model: Sensor-005
S/N: N/A

Product Description: The Bluetooth Weight sensor measures the amount of liquid a user drinks out of a Hidrate makes water bottle. Water bottle has different types and sizes.

Modifications: The EUT was not modified in order to meet the specifications.

Customer: Hidrate, Inc.
1400 Van Buren Street, STE 135
Minneapolis, Minnesota 55413

Test Dates: September 13 and 14, 2021

Test Specifications covered by accreditation:

Emissions requirements

CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.207, 15.209, and 15.247;
RSS-247 and RSS-GEN

Test Procedure: ANSI C63.4 and ANSI C63.10





SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Conducted RF Emissions, 150 kHz – 30 MHz	The EUT complies with the Class B limits of CFR Title 47, Part 15 Subpart B; the limits of CFR Title 47, Part 15, Subpart C, section 15.207; RSS-247 and RSS-GEN See section 6.3 for Measurement Uncertainty
2	Spurious Radiated RF Emissions, 30 MHz – 1000 MHz	The EUT complies with the Class B limits of CFR Title 47, Part 15 Subpart B; the limits of CFR Title 47, Part 15, Subpart C, section 15.209; RSS-247 and RSS-GEN See section 6.3 for Measurement Uncertainty
3	Spurious Radiated RF Emissions, 9 kHz – 30 MHz and 1000 MHz – 25000 MHz	The EUT complies with the Class B limits of CFR Title 47, Part 15, Subpart B; CFR Title 47, Part 15, Subpart C, section 15.247(d); RSS-247 and RSS-GEN See section 6.3 for Measurement Uncertainty
4	Fundamental and Emissions produced by the intentional radiator in non-restricted bands, 9 kHz – 25 GHz	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247(d); RSS-247 and RSS-GEN
5	Emissions produced by the intentional radiator in restricted bands, 9 kHz – 25 GHz	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.205, 15.209, section 15.247 (d); RSS-247 and RSS-GEN
6	DTS Bandwidth	Complies with the relevant requirements of FCC Title 47, Part 15, Subpart C, section 15.247 (a)(2); RSS-247
7	Maximum Conducted Output Power	Complies with the relevant requirements of FCC Title 47, Part 15, Subpart C, section 15.247 (b)(3); RSS-247
8	RF Conducted Antenna Test	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247 (d); RSS-247
9	Power Spectral Density from the Intentional Radiator to the Antenna	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247 (e); RSS-247



1. PURPOSE

This document is a qualification test report based on the emissions tests performed on the Bluetooth Sensor, Model: Sensor-005. The emissions measurements were performed according to the measurement procedure described in ANSI C63.4 and ANSI C63.10. The tests were performed in order to determine whether the electromagnetic emissions from the equipment under test, referred to as EUT hereafter, are within the Class B specification limits defined by CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.207, 15.209, and 15.247; RSS-247 and RSS-Gen.

1.1 Decision Rule & Risk

If a measured value exceeds a specification limit it implies non-compliance. If the value is below a specification limit it implies compliance. Measurement uncertainty of the laboratory is reported with all measurement results but generally not taken into consideration unless a standard, rule or law requires it to be considered.

Qualification test reports are only produced for products that are in compliance with the test requirements, therefore results are always in conformity. Otherwise, an engineering report or just the data is provided to the customer.

When performing a measurement and making a statement of conformity, in or out-of-specification to manufacturer's specifications or Pass/Fail against a requirement, there are two possible outcomes:

- The result is reported as conforming with the specification
- The result is reported as not conforming with the specification

The decision rule is defined below.

When the test result is found to be below the limit but within our measurement uncertainty of the limit, it is our policy that the final acceptance decision is left to the customer, after discussing the implications and potential risks of the decision.

When the test result is found to be exactly on the specification, it is our policy, in the case of unwanted emissions measurements to consider the result non-compliant, however, the final decision is left to the customer, after discussing the implications and potential risks of the decision.

When the test result is found to be over the specification limit under any condition, it is our policy to consider the result non-compliant.

In terms of uncertainty of measurement, the laboratory is a calibrated and tightly controlled environment and generally exceptionally stable, the measurement uncertainties are evaluated without the considering of the test sample. When it comes to the test sample however, as most testing is performed on a single sample rather than a sample population, and that sample is often a pre-production representation of the final product, that test sample represents a significantly higher source of measurement uncertainty. We advise our customers of this and that when in doubt (small test to limit margins), they may wish to perform statistical sampling on a population to gain a higher confidence in the results. All lab reported results are that of a single sample in any event.



2. ADMINISTRATIVE DATA

2.1 Location of Testing

The emissions tests described herein were performed at the test facility of Compatible Electronics, 114 Olinda Drive, Brea, California 92823.

2.2 Traceability Statement

The calibration certificates of all test equipment used during the test are on file at the location of the test. The calibration is traceable to the National Institute of Standards and Technology (NIST).

2.3 Cognizant Personnel

Hidrate, Inc.

Jatin Bhatt
Susan Jiao

Senior Electrical Engineer
Regulation & Compliance Specialist

Compatible Electronics Inc.

Kyle Fujimoto Test Engineer
James Ross Test Engineer

2.4 Date Test Sample was Received

The test sample was received on prior to the initial test date.

2.5 Disposition of the Test Sample

The test sample has not been returned to Hidrate, Inc. as of the date of this test report.

2.6 Abbreviations and Acronyms

The following abbreviations and acronyms may be used in this document.

dB	Decibel
RF	Radio Frequency
EMI	Electromagnetic Interference
EUT	Equipment Under Test
P/N	Part Number
S/N	Serial Number
AC	Alternating Current
ITE	Information Technology Equipment
LISN	Line Impedance Stabilization Network
N/A	Not Applicable
Tx	Transmit
Rx	Receive
BLE	Bluetooth Low Energy
DC	Direct Current
FCC	Federal Communications Commission
RSS	Radio Standards Specifications



3. APPLICABLE DOCUMENTS

The following documents are referenced or used in the preparation of this emissions Test Report.

SPEC	TITLE
FCC Title 47, Part 15 Subpart C	FCC Rules – Radio frequency devices (including digital devices) – Intentional Radiators
FCC Title 47, Part 15 Subpart B	FCC Rules – Radio frequency devices (including digital devices) – Unintentional Radiators
558074 D01 DTS Meas Guidance v05 r02	Guidance for Performing Compliance Measurements on Digital Transmissions Systems (DTS) Operating Under Section 15.247
EN 50147-2: 1997	Anechoic chambers. Alternative test site suitability with respect to site attenuation
ANSI C63.4 2014	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
ANSI C63.10 2013	American National Standard for Testing Unlicensed Wireless Devices
RSS-Gen Issue 5 April 2019 Amendment 1	General Requirements for Compliance of Radio Apparatus
RSS-247 Issue 2 February 2017	Digital Transmissions Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices



4. DESCRIPTION OF TEST CONFIGURATION

Normal Operation: The Bluetooth Sensor, Model: Sensor-005 (EUT) was directly connected to a water bottle and transmitting BLE on a continuous basis.

Charging Mode: The Bluetooth Sensor, Model: Sensor-005 (EUT) was connected to an ITE power supply via a special USB charging cable that connected to the EUT. The EUT was continuously charging the battery. Note: The EUT does not operate in this mode except to charge the battery.

The EUT was tested for emissions while in the X, Y and Z axis. The X orientation is when the EUT is parallel to the ground. The Y orientation is when the EUT is perpendicular to the ground mounted vertically. The Z orientation is when the EUT is perpendicular to the ground mounted horizontally.

The firmware on the laptop allowed the EUT to continuously transmit at 2402 MHz, 2440 MHz, or 2480 MHz.

The firmware is stored on the company's servers.

The final radiated as well as the conducted emissions data for the EUT was taken in the configuration described above. Please see Appendix E for the data sheets.

4.1.1 Cable Construction and Termination

Cable 1 (Charging Mode Only)

This is a 48-centimeter braid shielded cable connecting the EUT to cable #2. The cable has a 2-pin connector at the EUT end and a USB type 'A' connector at the other end. This cable was bundled with cable #2 to a length of 1-meter. The shield of the cable was grounded to the chassis via the connectors.

Cable 2 (Charging Mode Only)

This is a 3-meter braid shielded cable connecting the ITE Power Supply to cable #1. The cable has a USB type 'A' connector at each end. This cable was bundled with cable #1 to a length of 1-meter. The shield of the cable was grounded to the chassis via the connectors.

Cable 3** This is a 8-centimeter unshielded cable connecting the EUT to cable #4. The cable has a 4-pin connector at each end.

Cable 4** This is a 23-centimeter unshielded cable connecting the USB to TTL to cable #3. The cable has a 4-pin connector at the cable #3 end and an 8-pin connector at the USB to TTL end.

Cable 5** This is a 3-meter braid shielded cable connecting the USB to TTL to the laptop. The cable has a USB type 'A' connector at each end. The shield of the cable was grounded to the chassis via the connectors.

**These cables were used to program the EUT only and were removed during the testing.



5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT

5.1 EUT and Accessory List

EQUIPMENT	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID
BLUETOOTH SENSOR (EUT)	HIDRATE, INC.	SENSOR-005	N/A	2AURK005 IC: 25893-005
LAPTOP**	DELL	INSPIRION 5593	3L68803	N/A
PRODUCT TEST FIRMWARE**	NORTIC	25893-005	N/A	N/A
ITE POWER SUPPLY*	APPLE	A1385	N/A	N/A
USB TO TTL**	WAVESHARE	N/A	N/A	N/A

*Used for Charging Mode Only

**Used to program the EUT only



5.2 Emissions Test Equipment

EQUIPMENT TYPE	MANU-FACTURER	MODEL NUMBER	SERIAL NUMBER	CALIBRATION DATE	CAL. CYCLE
RADIATED EMISSIONS TEST EQUIPMENT					
TDK TestLab	TDK RF Solutions, Inc.	9.22	700145	N/A	N/A
MXE EMI Receiver, 3 Hz – 44 GHz	Keysight Technologies, Inc.	N9038A	MY59050117	October 5, 2020	1 Year
Loop Antenna	Com-Power	AL-130R	121090	February 5, 2019	3 Year
CombiLog Antenna	Com-Power	AC-220	10030004	January 14, 2020	2 Year
Horn Antenna	Com-Power	AH-118	10050113	February 4, 2020	2 Year
Preamplifier	Com-Power	PA-118	181653	March 3, 2021	1 Year
High Pass Filter	Microwave Circuits	H3G020G4	481459	October 9, 2019	2 Year
System Controller	Sunol Sciences Corporation	SC110V	112213-1	N/A	N/A
Turntable	Sunol Sciences Corporation	2011VS	N/A	N/A	N/A
Antenna-Mast	Sunol Sciences Corporation	TWR95-4	112213-3	N/A	N/A
Computer	Hewlett Packard	p6716f	MXX1030PX0	N/A	N/A
LCD Monitor	Hewlett Packard	52031a	3CQ046N3MG	N/A	N/A
Preamplifier	Com-Power	PA-840	711013	April 9, 2020	2 Year
Horn Antenna	Com-Power	AH-826	71957	N/A	N/A



6. TEST SITE DESCRIPTION

6.1 Test Facility Description

Please refer to section 2.1 of this report for emissions test location.

6.2 EUT Mounting, Bonding and Grounding

For frequencies 1 GHz and below: The EUT was mounted on a 0.6 by 1.2 meter non-conductive table 0.8 meters above the ground plane.

For frequencies above 1 GHz: The EUT was mounted on a 0.6 by 1.2 meter non-conductive table 1.5 meters above the ground plane.

The EUT was not grounded.

6.3 Measurement Uncertainty

Compatible Electronics' U_{lab} value is less than U_{cisprr} , thus based on this – compliance is deemed to occur if no measured disturbance exceeds the disturbance limit

$$u_c(y) = \sqrt{\sum_i c_i^2 u^2(x_i)}$$

Measurement		U_{cisprr}	$U_{lab} = 2 u_c(y)$
Conducted disturbance (mains port)	(150 kHz – 30 MHz)	3.4 dB	2.73 dB
Radiated disturbance (electric field strength on an open area test site or alternative test site)	(30 MHz – 1 000 MHz)	6.3 dB	3.27 dB (Vertical) 3.19 dB (Horizontal)
Radiated disturbance (electric field strength on an open area test site or alternative test site)	(1 GHz - 6 GHz)	5.2 dB	3.95 dB
Radiated disturbance (electric field strength on an open area test site or alternative test site)	(6 GHz – 18 GHz)	5.5 dB	3.95 dB
Radiated disturbance (electric field strength on an open area test site or alternative test site)	(18 GHz – 26.5 GHz)	N/A	4.69 dB
Radiated disturbance (electric field strength on an open area test site or alternative test site)	(26.5 GHz – 40 GHz)	N/A	4.55 dB



7. CHARACTERISTICS OF THE TRANSMITTER

7.1 Channel Description and Frequencies

The EUT operates on forty channels using BLE. The channel and frequencies are shown below. The channels are spaced 2 MHz apart. Below is the channel and frequencies of the low, middle, and high channels.

Channel 0 – 2402 MHz
Channel 20 – 2442 MHz
Channel 39 – 2480 MHz

7.2 Antenna Gain

The gain of the printed circuit PIFA antenna is -4.086 dBi.



8. TEST PROCEDURES

The following sections describe the test methods and the specifications for the tests. Test results are also included in this section.

8.1 RF Emissions

8.1.1 Conducted Emissions Test

The EMI Receiver was used as a measuring meter. A quasi-peak and/or average reading was taken only where indicated in the data sheets. A 10 dB attenuator was used for the protection of the EMI Receiver input stage, and the offset was adjusted accordingly to read the actual data measured. The LISN output was measured using the EMI Receiver. The output of the second LISN was terminated by a 50-ohm termination. The effective measurement bandwidth used for this test was 9 kHz.

Please see section 6.2 of this report for mounting, bonding, and grounding of the EUT. The EUT was powered through the LISN, which was bonded to the ground plane. The LISN power was filtered and the filter was bonded to the ground plane. The EUT was set up with the minimum distances from any conductive surfaces as specified in ANSI 63:4. The excess power cord was wrapped in a figure eight pattern to form a bundle not exceeding 0.4 meters in length.

The conducted emissions from the EUT were maximized for operating mode as well as cable placement. The final data was collected under program control by computer software. The final qualification data is located in Appendix E.

The six highest emissions are listed in Table 2.0.

Test Results:

The EUT complies with the **Class B** limits of CFR Title 47, Part 15 Subpart B; the limits of CFR Title 47, Part 15, Subpart C, Section 15.207; and RSS-Gen for conducted emissions.

8.1.2 Radiated Emissions Test

The EMI Receiver was used as the measuring meter. An internal preamplifier was used to increase the sensitivity of the instrument during emissions tests up to 1000 MHz, and an external preamplifier was used to increase the sensitivity of the instrument during emissions tests above 1 GHz. The EMI Receiver was initially used with the Analyzer mode feature activated. In this mode, the EMI receiver can then record the actual frequency to be measured. This final reading is then taken accurately in the EMI Receiver mode, which considers the cable loss, amplifier gain and antenna factors, so that a true reading is compared to the true limit. The effective measurement bandwidth used for the radiated emissions test was according to the frequency measured.

The frequencies below 1 GHz were quasi-peaked using the quasi-peak detector of the EMI Receiver.

The frequencies above 1 GHz were averaged using the average detector of the EMI Receiver.

The EMI test chamber of Compatible Electronics, Inc. was used for radiated emissions testing. This test site is in full compliance with ANSI C63.4. Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The turntable supporting the EUT is remote controlled using a motor. The turntable permits EUT rotation of 360 degrees to maximize emissions. Also, the antenna mast allows height variation of the antenna from 1 meter to 4 meters. Data was collected in the worst case (highest emission) configuration of the EUT. At each reading, the EUT was rotated 360 degrees and the antenna height was varied from 1 to 4 meters (for E field radiated field strength). The gunsight method was used when measuring with the horn antenna to ensure accurate results.

The EUT was tested at a 3-meter test distance. The six highest emissions are listed in Table 1.0.



Radiated Emissions Test (Continued)

The measurement bandwidths and transducers used for the radiated emissions test were:

FREQUENCY RANGE	EFFECTIVE MEASUREMENT BANDWIDTH	TRANSDUCER
9 kHz to 150 kHz	200 Hz	Loop Antenna
150 kHz to 30 MHz	9 kHz	Loop Antenna
30 MHz to 1 GHz	120 kHz	CombiLog Antenna
1 GHz to 25 GHz	1 MHz	Horn Antenna

Test Results:

The EUT complies with the **Class B** limits of CFR Title 47, Part 15, Subpart B; the limits of CFR Title 47, Part 15, Subpart C sections 15.205, 15.209 and 15.247; and the limits of RSS-247 and RSS-Gen for radiated emissions.



8.1.3 RF Emissions Test Results

Table 1.0 RADIATED EMISSION RESULTS
Bluetooth Sensor
Model: Sensor-005

Frequency MHz	EMI Reading (dBuV/m)	Specification Limit (dBuV/m)	Delta (Cor. Reading – Spec. Limit) dB
4880.00 (H) (X-Axis)	49.62 (Avg)	53.97	-4.35
4960.00 (H) (X-Axis)	47.34 (Avg)	53.97	-6.63
4804.00 (H) (X-Axis)	46.84 (Avg)	53.97	-7.13
4880.00 (H) (Z-Axis)	46.64 (Avg)	53.97	-7.33
4880.00 (V) (X-Axis)	46.50 (Avg)	53.97	-7.47
4804.00 (H) (Z-Axis)	46.29 (Avg)	53.97	-7.68

Notes:

(Avg) Average
(QP) Quasi -Peak
(H) Horizontal
(V) Vertical

Table 2.0 CONDUCTED EMISSION RESULTS
Bluetooth Sensor
Model: Sensor-005

Frequency MHz	EMI Reading (dBuV/m)	Specification Limit (dBuV/m)	Delta (Cor. Reading – Spec. Limit) dB
0.750 (BL)	34.49 (Avg)	46.00	-11.51
0.766 (WL)	33.86 (Avg)	46.00	-12.14
0.762 (WL)	33.60 (Avg)	46.00	-12.40
0.742 (WL)	32.86 (Avg)	46.00	-13.14
0.738 (WL)	32.95 (Avg)	46.00	-13.05
0.162 (BL)	38.82 (Avg)	54.81	-16.00

Notes:

(BL) Black Lead
(WL) White Lead
(Avg) Average
(QP) Quasi-Peak

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**8.1.4****Sample Calculations**

A correction factor for the antenna, cable, and a distance factor (if any) must be applied to the meter reading before a true field strength reading can be obtained. This Corrected Meter Reading is then compared to the specification limit in order to determine compliance with the limits.

Conversion to logarithmic terms: Specification limit ($\mu\text{V}/\text{m}$) $\log \times 20$ = Specification Limit in $\text{dB}\mu\text{V}/\text{m}$

To correct for distance when measuring at a distance other than the specification

For measurements below 30 MHz: (Specification distance / test distance) $\log \times 40$ = distance factor

For measurements above 30 MHz: (Specification distance / test distance) $\log \times 20$ = distance factor

Note: When using an Active Antenna, the Antenna factor shall be subtracted due to the combination of the internal amplification and antenna loss.

Corrected Meter Reading = meter reading + F – A + C

where: F = antenna factor
A = amplifier gain
C = cable loss

The correction factors for the antenna and the amplifier gain are attached in Appendix D of this report. The data sheets are attached in Appendix E.

The distance factor D is 0 when the test is performed at the required specification distance.

When the limit is in terms of magnetic field, the following equation applies:

$$H[\text{dB}(\mu\text{A}/\text{m})] = V[\text{dB}(\mu\text{V})] + L_C [\text{dB}] - G_{PA} [\text{dB}] + AF^H [\text{dB}(\text{S}/\text{m})]$$

where: H is the magnetic field strength (to be compared with the limit),
V is the voltage level measured by the receiver or spectrum analyzer,
 L_C is the cable loss,
 G_{PA} is the gain of the preamplifier (if used), and
 AF^H is the magnetic antenna factor.

The G_{PA} term is only included in the equation when an external preamplifier is used in the measurement chain, in front of the receiver or spectrum analyzer. An external preamplifier is not usually necessary (or even advisable, due to risk of saturating the input mixer of the receiver) when an active loop antenna is used. In that case, the antenna factor of the loop already includes the gain of its built-in preamplifier.



Sample Calculations (Continued)

If the “electrical” antenna factor is used instead, the above equation becomes:

$$H[\text{dB}(\mu\text{A/m})] = V[\text{dB}(\mu\text{V})] + L_C[\text{dB}] - G_{PA}[\text{dB}] + AF^E[\text{dB}(\text{m}^{-1})] - 51.5[\text{dB}\Omega]$$

where: AF^E is the “electric” antenna factor, as provided by the antenna calibration laboratory.

When the limit is in terms of electric field, the following equation applies:

$$E[\text{dB}(\mu\text{V/m})] = V[\text{dB}(\mu\text{V})] + L_C[\text{dB}] - G_{PA}[\text{dB}] + AF^E[\text{dB}(\text{m}^{-1})]$$

or, if the magnetic antenna factor is used:

$$E[\text{dB}(\mu\text{V/m})] = V[\text{dB}(\mu\text{V})] + L_C[\text{dB}] - G_{PA}[\text{dB}] + AF^H[\text{dB}(\text{S/m})] + 51.5[\text{dB}\Omega]$$

The display of the receiver (or spectrum analyzer) **shall not** be configured in units of current, e.g. μA or $\text{dB}(\mu\text{A})$. That conversion is calculated inside the receiver (or spectrum analyzer) using its input impedance, which is $50\ \Omega$, while the magnetic field calculation is based on the free-space impedance of $377\ \Omega$.



8.2 DTS Bandwidth

The DTS Bandwidth was measured using the EMI Receiver. The bandwidth was measured using a direct connection from the EUT. The following steps were performed for measuring the DTS Bandwidth.

1. Set RBW = 100 kHz
2. Set the video bandwidth (VBW) to equal or greater than 3 times the RBW
3. Detector = Peak
4. Trace Mode = Max Hold
5. Sweep = Auto Couple
6. Allow the trace to stabilize
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (a)(2); and RSS-247.

8.3 Maximum Peak Conducted Output Power

The maximum peak conducted output power was measured using the EMI Receiver. The following steps were performed for measuring the maximum peak conducted output power.

1. Set the RBW $\geq$ DTS Bandwidth
2. Set the VBW $\geq$ [3 X RBW]
3. Set span $\geq$ [3 X RBW]
4. Sweep time = auto couple
5. Detector = peak
6. Trace mode = max hold
7. Allow trace to fully stabilize
8. Use the peak marker function to determine the peak amplitude level

Test Results:

The EUT complies with the relevant requirements of CFR Title 47, Part 15, Subpart C Section 15.247 (b)(3); and RSS-247.



8.4 Emissions in Non-Restricted Bands

The emissions in the non-restricted frequency bands measurements were performed using the EMI receiver directly connected to the EUT. The reference level was established by setting the instrument center frequency to DTS channel center frequency. The span was set to ≥ 1.5 times the DTS bandwidth. The RBW was set to 100 kHz and the VBW was set to 300 kHz. A peak detector was used with sweep set to auto. A max hold trace was used and allowed to fully stabilize. The peak marker function was used to determine the level and 20 dB below that was the reference level. For emission level measurement, the center frequency and span were set to encompass the frequency range to be measured. The RBW was set to 100 kHz and the VBW was set to 300 kHz. A peak detector was used with a sweep time set to auto. The number of measurement points were greater than the span/RBW. A max hold trace was used and allowed to fully stabilize. The peak marker function was used to determine the maximum amplitude level. The final qualification data sheets are located in Appendix E.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (d); and RSS-247.

8.5**RF Band Edges**

The RF band edges were measured using the EMI Receiver. The RF band edges were measured using a direct connection from the RF out on the EUT into the input of the EMI Receiver. The following steps were performed for measuring the spectral density.

The RF band edges were taken at 2390 MHz when the EUT was on the low channel and 2483.5 MHz when the EUT was on the high channel using the EMI Receiver. A preamplifier was used to boost the signal level, with the plots being taken at a 3 meter test distance. The radiated emissions test procedure as describe in section 8.1.2 of this test report was used to maximize the emission.

The RF band edge was also taken at 2400 MHz when the EUT was on the low channel. The following steps were performed for measuring the band edge at 2400 MHz:

1. Set analyzer center frequency to DTS channel center frequency
2. Set the span wide enough to cover the band edges.
3. Set the RBW to 100 kHz
4. Set the VBW $\geq 3 \times$ RBW
5. Detector = Peak
6. Sweep time = auto couple
7. Allow the trace to stabilize
8. Use the peak marker function to determine the maximum amplitude level

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (d) for band edges; and RSS-247. Please see the data sheets located in Appendix E.



8.6

Spectral Density Test

The spectrum density output was measured using the EMI Receiver. The spectral density output was measured using a direct connection from the RF out on the EUT into the input of the EMI Receiver. The following steps were performed for measuring the spectral density.

1. Set analyzer center frequency to DTS channel center frequency
2. Set the span to at least 1.5 times the OBW.
3. Set the RBW to $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$
4. Set the VBW $\geq [3 \times \text{RBW}]$
5. Detector = peak
6. Sweep time = auto couple
7. Trace mode = max hold
8. Allow trace to fully stabilize
9. Use the peak marker function to determine the maximum amplitude level within the RBW
10. If measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (e); and RSS-247.

8.7

Variation of the Input Power

The variation of the input power test was performed using the EMI Receiver. The EUT input power was varied between 85% and 115% of the nominal rated supply voltage. The carrier frequency was monitored for any change in amplitude.

Test Results:

This test was not performed because the EUT does not transmit when powered by the AC public mains. The EUT only is charging a battery when in that mode.



8.8

99 % Bandwidth

The 99 % bandwidth was measured using an EMI Receiver.

The following steps were performed for measuring the 99 % bandwidth per RSS-GEN, Issue 5, clause 6.7:

1. Set RBW to 1 % to 5 % of the actual occupied bandwidth.
2. Set VBW to greater than 3 times the RBW.
3. Set the EMI Receiver to the occupied bandwidth Function set at 99 %
4. Set the peak detector to max hold.
5. Set the sweep time to auto
6. Allow the trace to stabilize.

Please note that this was only used to determine the emission bandwidth and that there are no limits or pass/fail criteria for this test. Please see the data sheets located in Appendix E.

**9. CONCLUSIONS**

The Bluetooth Sensor, Model: Sensor-005, as tested, meets all of the specification limits defined in FCC Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.207, 15.209, and 15.247; RSS-GEN and RSS-247.





APPENDIX A

LABORATORY ACCREDITATIONS AND RECOGNITIONS



LABORATORY ACCREDITATIONS AND RECOGNITIONS



For US, Canada, Australia/New Zealand, Japan, Taiwan, Korea, and the European Union, Compatible Electronics is currently accredited by NVLAP to ISO/IEC 17025.

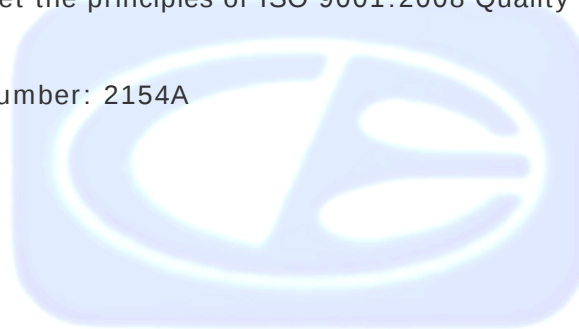
For the most up-to-date version of our scopes and certificates please visit

<http://celectronics.com/quality/scope/>

Quote from ISO-ILAC-IAF Communiqué on 17025:

"A laboratory's fulfilment of the requirements of ISO/IEC 17025:2005 means the laboratory meets both the technical competence requirements and management system requirements that are necessary for it to consistently deliver technically valid test results and calibrations. The management system requirements in ISO/IEC 17025:2005 (Section 4) are written in language relevant to laboratory operations and meet the principles of ISO 9001:2008 Quality Management Systems — Requirements."

ISED Test Site Registration Number: 2154A





**COMPATIBLE
ELECTRONICS**

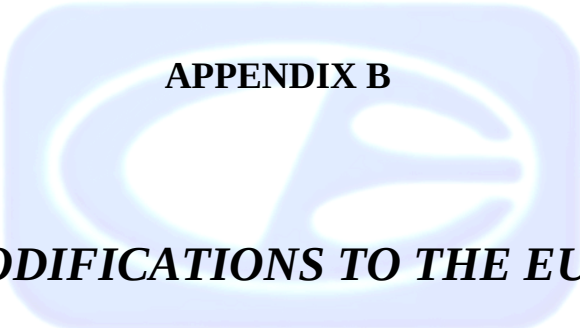
FCC Part 15 Subpart B and C; FCC Section 15.247; RSS-247; and RSS-GEN Test Report

Bluetooth Sensor

Model: Sensor-005

Report Number: **B10914D1**

Page B1



APPENDIX B

MODIFICATIONS TO THE EUT

Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

Newbury Park Division
1050 Lawrence Drive
Newbury Park, CA 91320
(805) 480-4044



MODIFICATIONS TO THE EUT

The modifications listed below were made to the EUT to pass FCC Subpart B and FCC 15.247; RSS-GEN and RSS-210 specifications.

All the rework described below was implemented during the test in a method that could be reproduced in all the units by the manufacturer.

No modifications were made to the EUT during the testing.





APPENDIX C

***MODELS COVERED
UNDER THIS REPORT***



MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST

Bluetooth Sensor
Model: Sensor-005
S/N: N/A

There are no additional models covered under this report.



APPENDIX D***DIAGRAMS AND CHARTS***

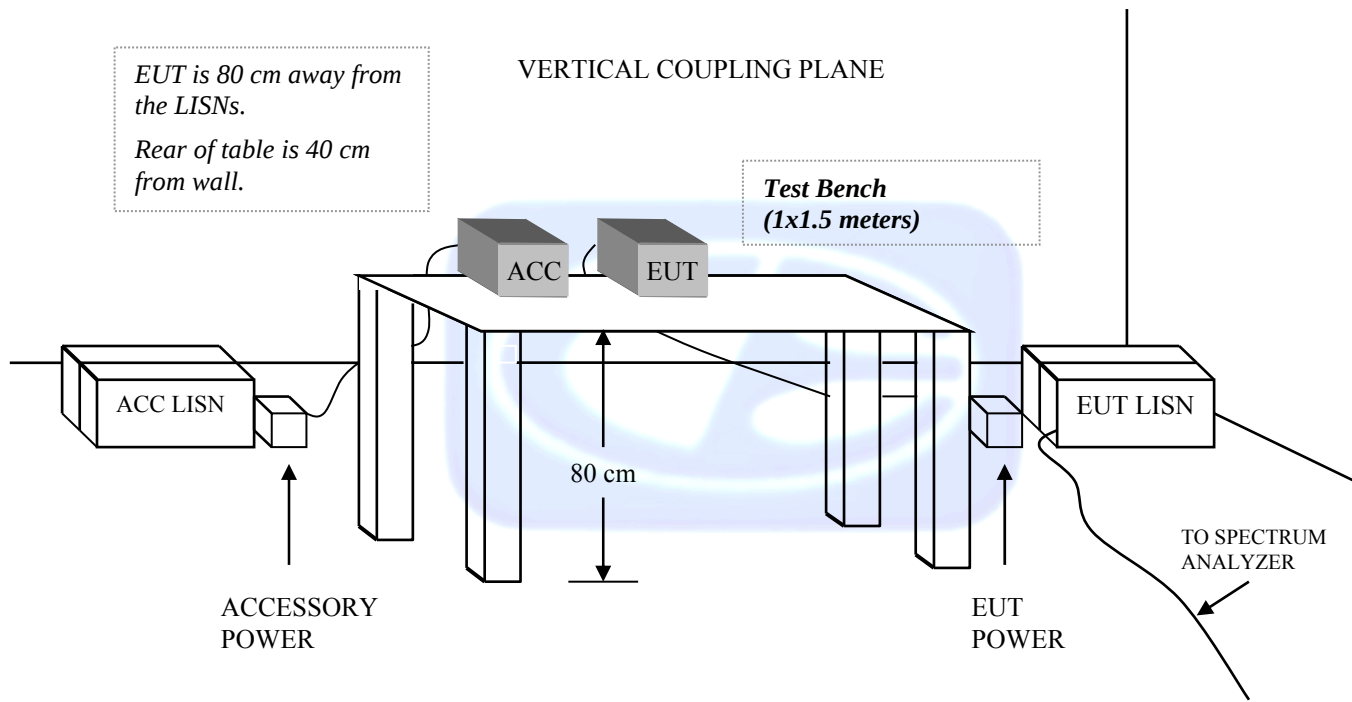
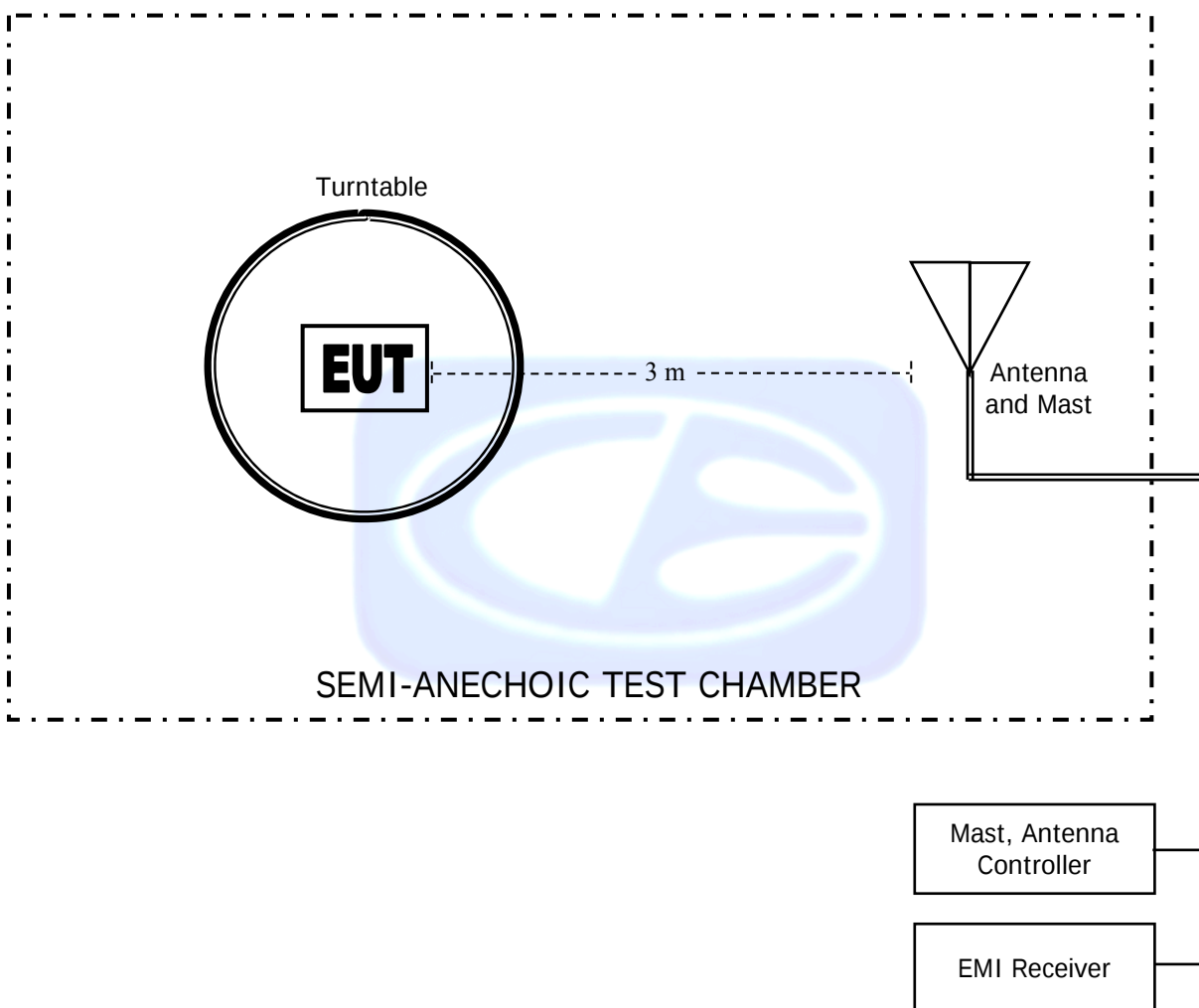
**FIGURE 1: CONDUCTED EMISSIONS TEST SETUP**

FIGURE 2: LAYOUT OF THE SEMI-ANECHOIC TEST CHAMBER




**COMPATIBLE
ELECTRONICS**

FCC Part 15 Subpart B and C; FCC Section 15.247; RSS-247; and RSS-GEN Test Report

*Bluetooth Sensor**Model: Sensor-005***COM-POWER AL-130R****LOOP ANTENNA****S/N: 121090****CALIBRATION DATE: FEBRUARY 5, 2019**

FREQUENCY (MHz)	MAGNETIC (dB/m)	ELECTRIC (dB/m)
0.009	16.1	-35.4
0.01	15.6	-35.9
0.02	14.8	-36.7
0.03	15.6	-35.9
0.04	15.1	-36.4
0.05	14.4	-37.0
0.06	14.6	-36.9
0.07	14.4	-37.1
0.08	14.3	-37.1
0.09	14.5	-36.9
0.10	14.1	-37.3
0.20	14.1	-37.3
0.30	14.0	-37.4
0.40	14.0	-37.4
0.50	14.2	-37.2
0.60	14.2	-37.2
0.70	14.2	-37.2
0.80	14.2	-37.3
0.90	14.3	-37.2
1.00	14.5	-37.0
2.00	14.5	-36.9
3.00	14.5	-36.9
4.00	14.7	-36.8
5.00	14.6	-36.9
6.00	14.6	-36.9
7.00	14.6	-36.9
8.00	14.6	-36.9
9.00	14.6	-36.9
10.00	14.8	-36.6
11.00	14.9	-36.6
12.00	14.8	-36.6
13.00	14.8	-36.7
14.00	14.6	-36.8
15.00	14.5	-36.9
16.00	14.5	-37.0
17.00	14.6	-36.9
18.00	14.7	-36.7
19.00	14.8	-36.6
20.00	14.9	-36.6
21.00	14.6	-36.8
22.00	14.2	-37.2
23.00	13.7	-37.7
24.00	13.3	-38.2
25.00	13.0	-38.5
26.00	12.9	-38.6
27.00	13.0	-38.5
28.00	13.1	-38.4
29.00	13.1	-38.4
30.00	12.9	-38.5

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114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

Newbury Park Division
1050 Lawrence Drive
Newbury Park, CA 91320
(805) 480-4044

COM-POWER AC-220**COMBILOG ANTENNA****S/N: 10030004****CALIBRATION DATE: JANUARY 14, 2020**

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	22.5	200	15.1
35	21.2	250	16.7
40	20.2	300	18.2
45	19.2	350	19.2
50	18.1	400	20.7
60	14.5	450	21.2
70	11.7	500	22.0
80	11.5	550	22.6
90	13.2	600	24.1
100	14.3	650	24.2
120	15.1	700	24.3
125	15.0	750	25.6
140	13.6	800	25.9
150	13.6	850	26.1
160	13.9	900	27.0
175	14.8	950	28.0
180	14.5	1000	27.6

COM POWER AH-118**HORN ANTENNA****S/N: 10050113****CALIBRATION DATE: FEBRUARY 4, 2020**

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	24.343	10.0	38.826
1.5	25.419	10.5	39.102
2.0	28.838	11.0	38.259
2.5	28.971	11.5	39.920
3.0	29.919	12.0	40.149
3.5	30.674	12.5	40.576
4.0	31.670	13.0	40.264
4.5	32.437	13.5	40.364
5.0	33.414	14.0	40.424
5.5	34.003	14.5	41.677
6.0	34.799	15.0	43.010
6.5	35.381	15.5	39.799
7.0	37.024	16.0	40.187
7.5	37.403	16.5	40.155
8.0	37.445	17.0	40.507
8.5	37.390	17.5	41.963
9.0	38.076	18.0	43.196
9.5	38.809		

COM-POWER PA-118**PREAMPLIFIER****S/N: 181653****CALIBRATION DATE: MARCH 3, 2021**

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	40.18	6.0	39.04
1.1	39.92	6.5	39.16
1.2	39.99	7.0	39.70
1.3	40.19	7.5	39.70
1.4	40.07	8.0	39.56
1.5	40.22	8.5	38.69
1.6	40.23	9.0	39.16
1.7	40.35	9.5	39.70
1.8	40.24	10.0	39.69
1.9	40.29	11.0	38.64
2.0	40.31	12.0	40.41
2.5	40.41	13.0	39.49
3.0	40.59	14.0	39.46
3.5	40.91	15.0	40.38
4.0	40.42	16.0	38.02
4.5	39.92	17.0	39.34
5.0	40.35	18.0	39.86
5.5	39.13		

COM-POWER PA-840**MICROWAVE PREAMPLIFIER**

S/N: 711013

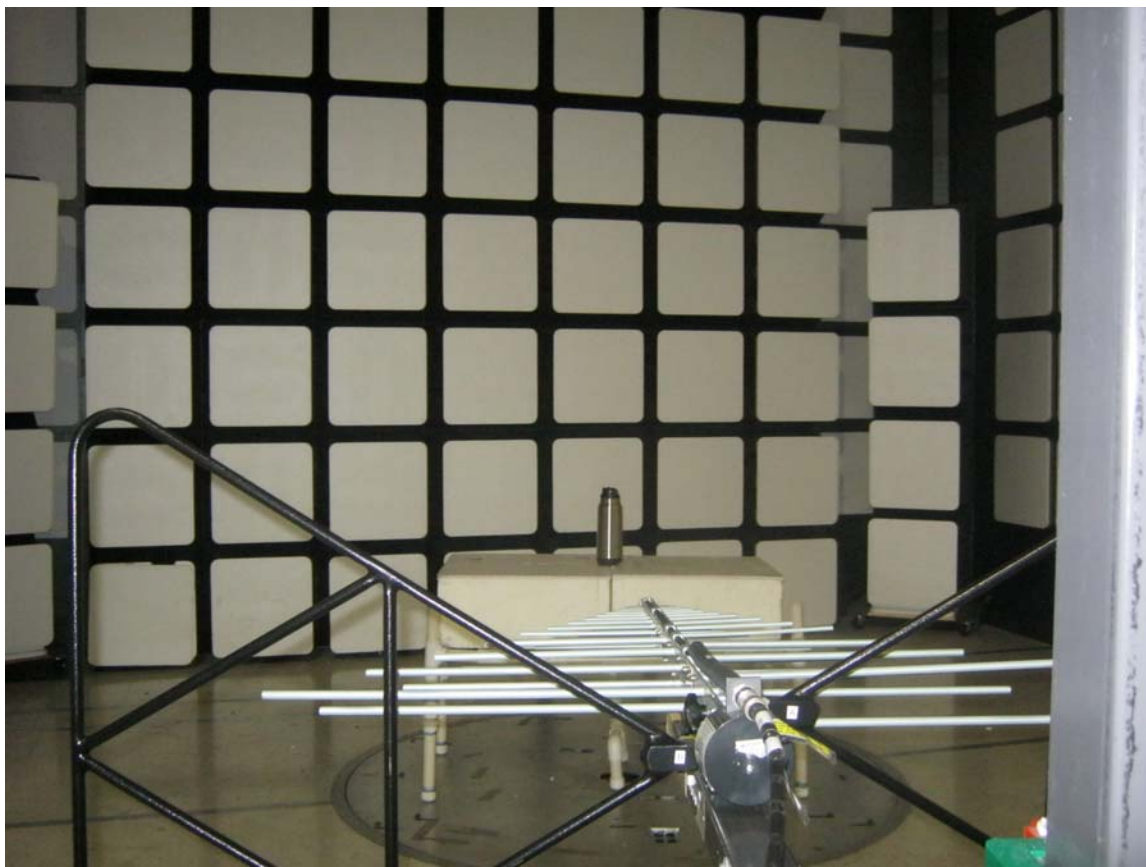
CALIBRATION DATE: APRIL 9, 2020

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
18.0	26.88	31.0	24.65
19.0	25.52	31.5	25.92
20.0	26.26	32.0	24.83
21.0	24.96	32.5	26.90
22.0	24.74	33.0	26.27
23.0	25.45	33.5	25.18
24.0	26.65	34.0	23.14
25.0	26.02	34.5	25.81
26.0	27.16	35.0	27.63
26.5	28.08	35.5	26.35
27.0	25.99	36.0	24.41
27.5	25.35	36.5	27.02
28.0	25.77	37.0	25.42
28.5	27.22	37.5	24.71
29.0	28.38	38.0	24.36
29.5	25.63	38.5	23.16
30.0	27.08	39.0	21.44
30.5	26.10	39.5	21.15
		40.0	21.20

COM-POWER AH-826**HORN ANTENNA**

S/N: 71957

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
18.0	33.5	22.5	35.5
18.5	33.5	23.0	35.9
19.0	34.0	23.5	35.7
19.5	34.0	24.0	35.6
20.0	34.3	24.5	36.0
20.5	34.9	25.0	36.2
21.0	34.7	25.5	36.1
21.5	35.0	26.0	36.2
22.0	35.0	26.5	35.7

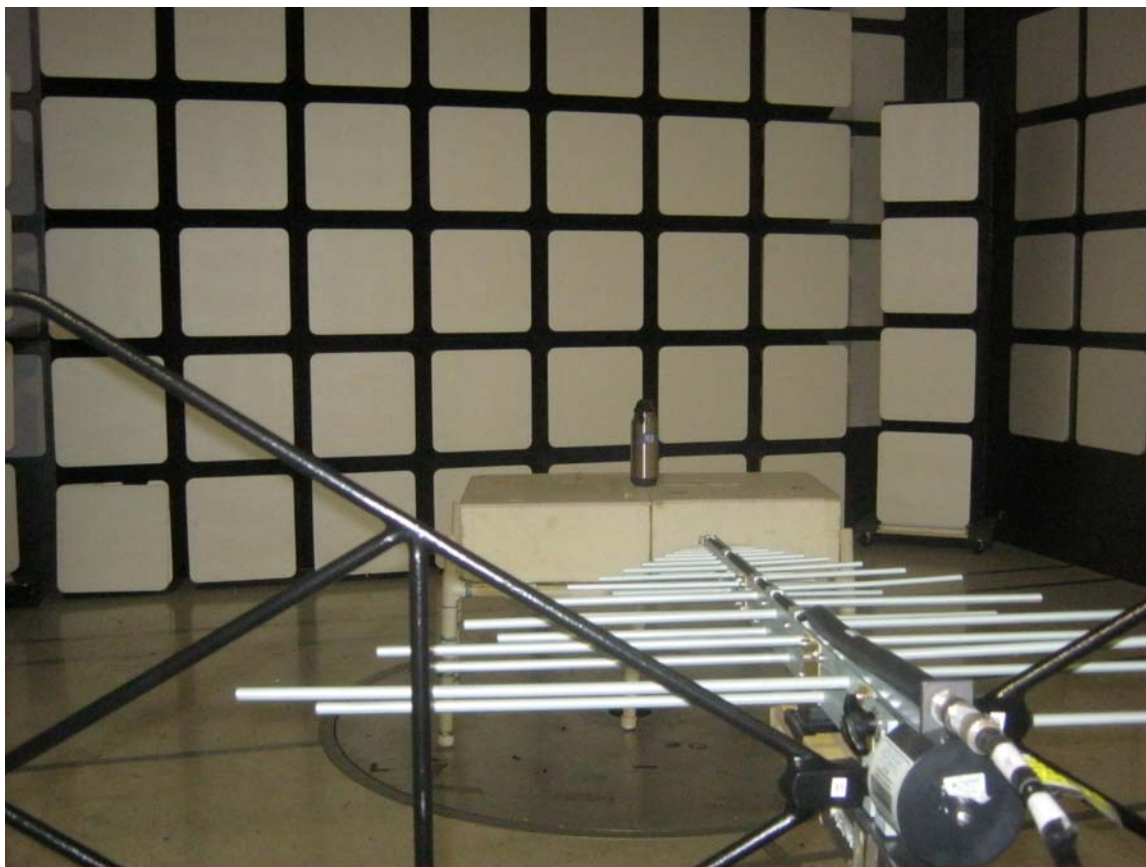


FRONT VIEW

HIDRATE, INC.
BLUETOOTH SENSOR
MODEL: SENSOR-005

FCC SUBPART B AND C; RSS-GEN and RSS-247 – RADIATED EMISSIONS – 30 MHz to 1000 MHz
NORMAL OPERATION

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**

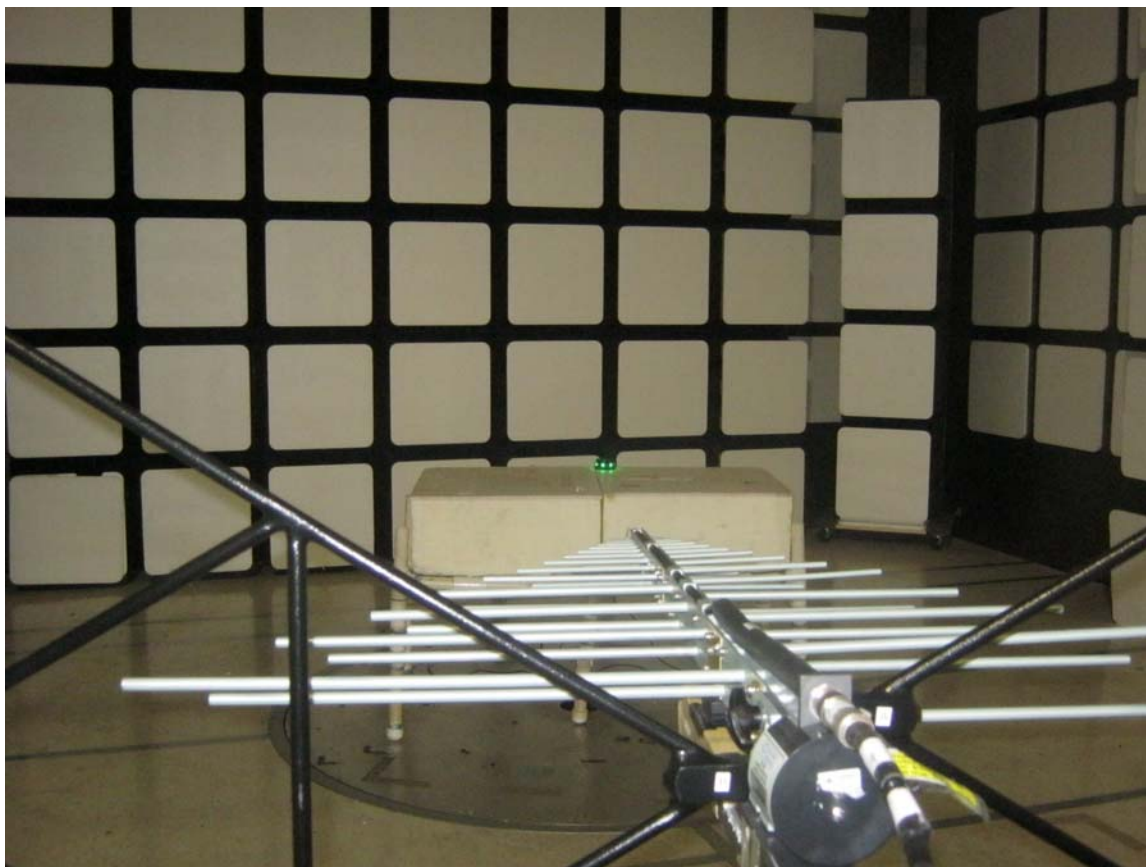


REAR VIEW

HIDRATE, INC.
BLUETOOTH SENSOR
MODEL: SENSOR-005

FCC SUBPART B AND C; RSS-GEN and RSS-247 – RADIATED EMISSIONS – 30 MHz to 1000 MHz
NORMAL OPERATION

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**

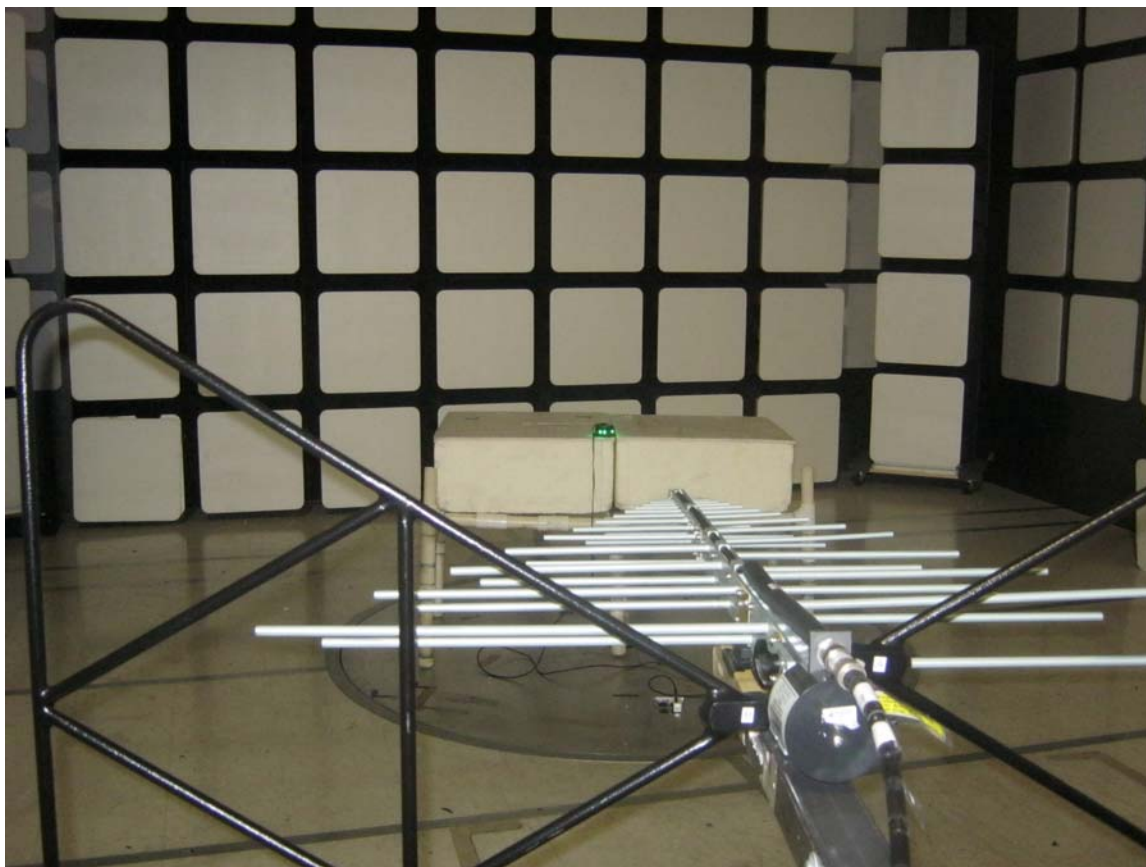


FRONT VIEW

HIDRATE, INC.
BLUETOOTH SENSOR
MODEL: SENSOR-005

FCC SUBPART B AND C; RSS-GEN and RSS-247 – RADIATED EMISSIONS – 30 MHz to 1000 MHz
CHARGING MODE

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**



REAR VIEW

HIDRATE, INC.
BLUETOOTH SENSOR
MODEL: SENSOR-005

FCC SUBPART B AND C; RSS-GEN and RSS-247 – RADIATED EMISSIONS – 30 MHz to 1000 MHz
CHARGING MODE

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**

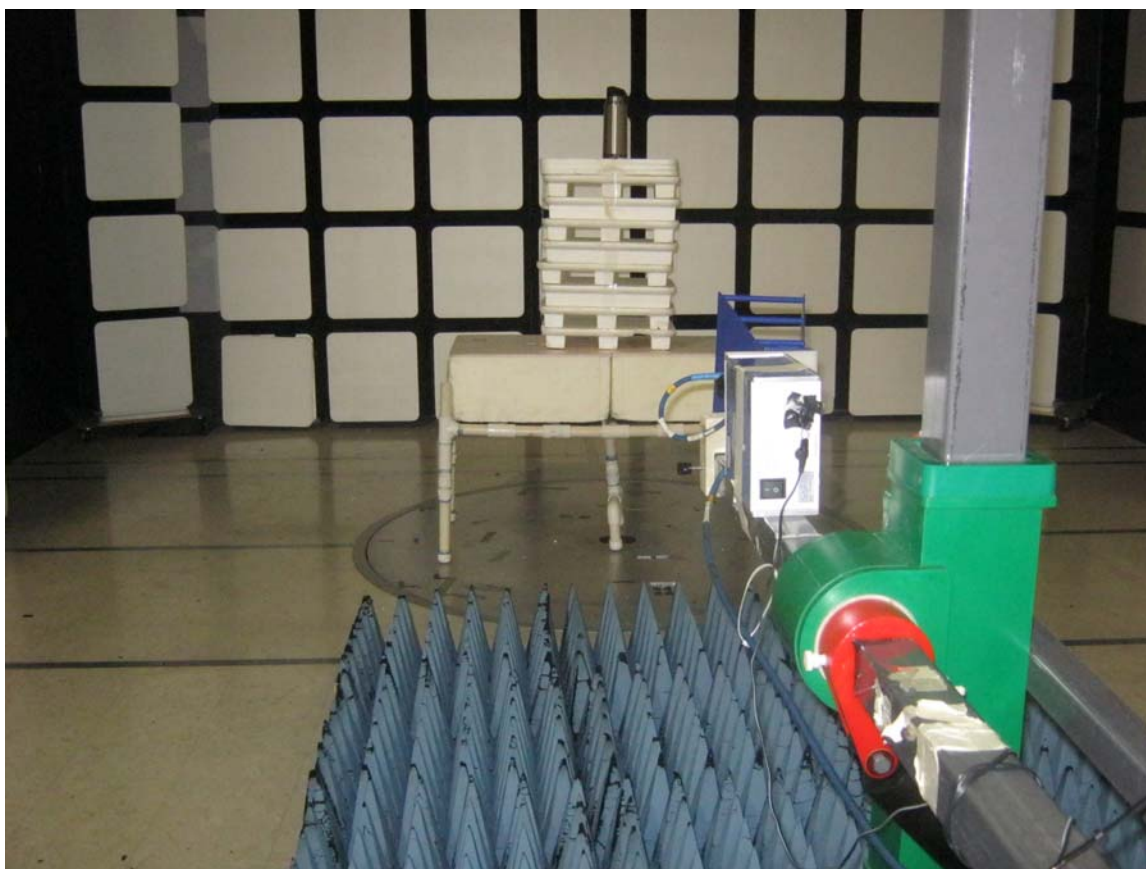


FRONT VIEW

HIDRATE, INC.
BLUETOOTH SENSOR
MODEL: SENSOR-005

FCC SUBPART B AND C; RSS-GEN and RSS-247 – RADIATED EMISSIONS – ABOVE 1 GHz
NORMAL OPERATION

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**

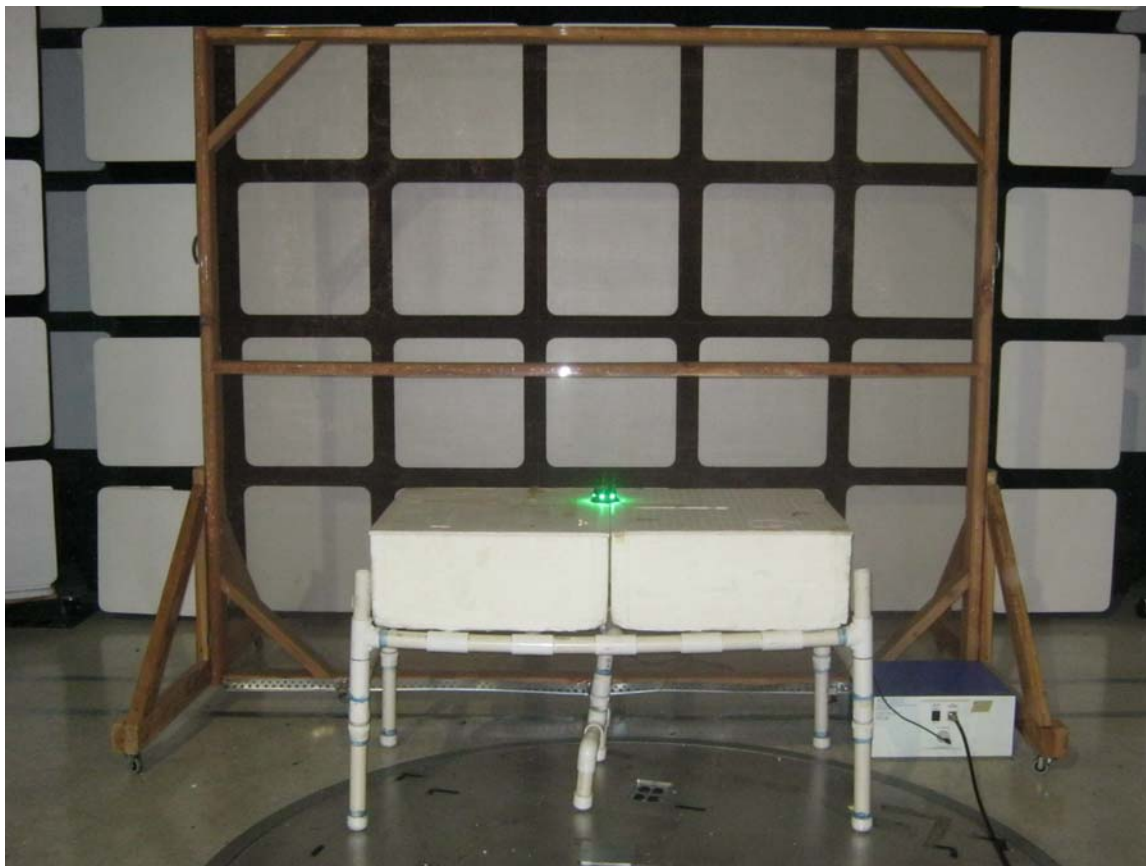


REAR VIEW

HIDRATE, INC.
BLUETOOTH SENSOR
MODEL: SENSOR-005

FCC SUBPART B AND C; RSS-GEN and RSS-247 – RADIATED EMISSIONS – ABOVE 1 GHz
NORMAL OPERATION

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**



FRONT VIEW

HIDRATE, INC.
BLUETOOTH SENSOR
MODEL: SENSOR-005
FCC SUBPART B AND C; and RSS-GEN – CONDUCTED EMISSIONS
CHARGING MODE

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**



REAR VIEW

HIDRATE, INC.
BLUETOOTH SENSOR
MODEL: SENSOR-005
FCC SUBPART B AND C; and RSS-GEN – CONDUCTED EMISSIONS
CHARGING MODE

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**



APPENDIX E

DATA SHEETS



***RADIATED EMISSIONS
DATA SHEETS***

**FCC 15.247**

Hidrate, Inc.
Bluetooth Sensor
Model: Sensor-005

Date: 9/13/2021
Lab: D
Tested By: Kyle Fujimoto

Harmonics - Low Channel
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4804.00	46.75	V	73.97	-27.22	Peak	327.00	118.14	
4804.00	40.04	V	53.97	-13.93	Avg	327.00	118.14	
7206.00								Not in Restricted Band
7206.00								Done Via Conducted
9608.00								Not in Restricted Band
9608.00								Done Via Conducted
12010.00	47.50	V	73.97	-26.47	Peak	60.00	125.37	
12010.00	32.84	V	53.97	-21.13	Avg	60.00	125.37	
14412.00								Not in Restricted Band
14412.00								Done Via Conducted
16814.00								Not in Restricted Band
16814.00								Done Via Conducted
19216.00								No Emission
19216.00								Detected
21618.00								No Emission
21618.00								Detected
24020.00								No Emission
24020.00								Detected


**COMPATIBLE
ELECTRONICS**

FCC Part 15 Subpart B and C; FCC Section 15.247; RSS-247; and RSS-GEN Test Report

Bluetooth Sensor

Model: Sensor-005

FCC 15.247

Hidrate, Inc.

Bluetooth Sensor

Model: Sensor-005

Date: 9/13/2021

Lab: D

Tested By: Kyle Fujimoto

Harmonics - Low Channel**Transmit Mode - Y-Axis**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4804.00	49.51	V	73.97	-24.46	Peak	282.25	128.77	
4804.00	43.33	V	53.97	-10.64	Avg	282.25	128.77	
7206.00								Not in Restricted Band
7206.00								Done Via Conducted
9608.00								Not in Restricted Band
9608.00								Done Via Conducted
12010.00	51.10	V	73.97	-22.87	Peak	344.50	123.34	
12010.00	41.49	V	53.97	-12.48	Avg	344.50	123.34	
14412.00								Not in Restricted Band
14412.00								Done Via Conducted
16814.00								Not in Restricted Band
16814.00								Done Via Conducted
19216.00								No Emission
19216.00								Detected
21618.00								No Emission
21618.00								Detected
24020.00								No Emission
24020.00								Detected

Brea Division
114 Olinda Drive
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Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
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Newbury Park Division
1050 Lawrence Drive
Newbury Park, CA 91320
(805) 480-4044



FCC Part 15 Subpart B and C; FCC Section 15.247; RSS-247; and RSS-GEN Test Report
**COMPATIBLE
ELECTRONICS**
 Bluetooth Sensor
 Model: Sensor-005

FCC 15.247

Hidrate, Inc.
 Bluetooth Sensor
 Model: Sensor-005

Date: 9/13/2021

Lab: D

Tested By: Kyle Fujimoto

Harmonics - Low Channel
Transmit Mode - Z-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4804.00	50.45	V	73.97	-23.52	Peak	161.25	100.77	
4804.00	44.86	V	53.97	-9.11	Avg	161.25	100.77	
7206.00								Not in Restricted Band
7206.00								Done Via Conducted
9608.00								Not in Restricted Band
9608.00								Done Via Conducted
12010.00	48.36	V	73.97	-25.61	Peak	128.00	100.00	
12010.00	36.57	V	53.97	-17.40	Avg	128.00	100.00	
14412.00								Not in Restricted Band
14412.00								Done Via Conducted
16814.00								Not in Restricted Band
16814.00								Done Via Conducted
19216.00								No Emission
19216.00								Detected
21618.00								No Emission
21618.00								Detected
24020.00								No Emission
24020.00								Detected

**FCC 15.247**

Hidrate, Inc.
Bluetooth Sensor
Model: Sensor-005

Date: 9/13/2021
Lab: D
Tested By: Kyle Fujimoto

Harmonics - Low Channel
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4804.00	51.60	H	73.97	-22.37	Peak	197.75	180.00	
4804.00	46.84	H	53.97	-7.13	Avg	197.75	180.00	
7206.00								Not in Restricted Band
7206.00								Done Via Conducted
9608.00								Not in Restricted Band
9608.00								Done Via Conducted
12010.00	48.19	H	73.97	-25.78	Peak	135.50	100.00	
12010.00	35.64	H	53.97	-18.33	Avg	135.50	100.00	
14412.00								Not in Restricted Band
14412.00								Done Via Conducted
16814.00								Not in Restricted Band
16814.00								Done Via Conducted
19216.00								No Emission
19216.00								Detected
21618.00								No Emission
21618.00								Detected
24020.00								No Emission
24020.00								Detected


**COMPATIBLE
ELECTRONICS**

FCC Part 15 Subpart B and C; FCC Section 15.247; RSS-247; and RSS-GEN Test Report

Bluetooth Sensor

Model: Sensor-005

FCC 15.247

Hidrate, Inc.

Bluetooth Sensor

Model: Sensor-005

Date: 9/13/2021

Lab: D

Tested By: Kyle Fujimoto

Harmonics - Low Channel**Transmit Mode - Y-Axis**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4804.00	47.41	H	73.97	-26.56	Peak	237.00	122.14	
4804.00	41.34	H	53.97	-12.63	Avg	237.00	122.14	
7206.00								Not in Restricted Band
7206.00								Done Via Conducted
9608.00								Not in Restricted Band
9608.00								Done Via Conducted
12010.00	48.13	H	73.97	-25.85	Peak	278.50	100.00	
12010.00	35.21	H	53.97	-18.76	Avg	278.50	100.00	
14412.00								Not in Restricted Band
14412.00								Done Via Conducted
16814.00								Not in Restricted Band
16814.00								Done Via Conducted
19216.00								No Emission
19216.00								Detected
21618.00								No Emission
21618.00								Detected
24020.00								No Emission
24020.00								Detected

Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

Newbury Park Division
1050 Lawrence Drive
Newbury Park, CA 91320
(805) 480-4044

**FCC 15.247**

Hidrate, Inc.
Bluetooth Sensor
Model: Sensor-005

Date: 9/13/2021

Lab: D

Tested By: Kyle Fujimoto

Harmonics - Low Channel
Transmit Mode - Z-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4804.00	51.43	H	73.97	-22.54	Peak	324.75	162.74	
4804.00	46.29	H	53.97	-7.68	Avg	324.75	162.74	
7206.00								Not in Restricted Band
7206.00								Done Via Conducted
9608.00								Not in Restricted Band
9608.00								Done Via Conducted
12010.00	48.36	H	73.97	-25.61	Peak	121.00	100.00	
12010.00	34.14	H	53.97	-19.83	Avg	121.00	100.00	
14412.00								Not in Restricted Band
14412.00								Done Via Conducted
16814.00								Not in Restricted Band
16814.00								Done Via Conducted
19216.00								No Emission
19216.00								Detected
21618.00								No Emission
21618.00								Detected
24020.00								No Emission
24020.00								Detected


**COMPATIBLE
ELECTRONICS**

FCC Part 15 Subpart B and C; FCC Section 15.247; RSS-247; and RSS-GEN Test Report

Bluetooth Sensor

Model: Sensor-005

FCC 15.247

Hidrate, Inc.

Bluetooth Sensor

Model: Sensor-005

Date: 9/13/2021

Lab: D

Tested By: Kyle Fujimoto

Harmonics - Middle Channel**Transmit Mode - X-Axis**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880.00	51.55	V	73.97	-22.42	Peak	158.75	225.55	
4880.00	46.50	V	53.97	-7.47	Avg	158.75	225.55	
7320.00	48.45	V	73.97	-25.52	Peak	171.25	100.00	
7320.00	39.41	V	53.97	-14.57	Avg	171.25	100.00	
9760.00								Not in Restricted Band
9760.00								Done Via Conducted
12200.00	48.81	V	73.97	-25.16	Peak	102.75	100.00	
12200.00	36.64	V	53.97	-17.33	Avg	102.75	100.00	
14640.00								Not in Restricted Band
14640.00								Done Via Conducted
17080.00								Not in Restricted Band
17080.00								Done Via Conducted
19520.00								No Emission
19520.00								Detected
21960.00								No Emission
21960.00								Detected
24400.00								No Emission
24400.00								Detected

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Newbury Park, CA 91320
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**COMPATIBLE
ELECTRONICS**

FCC Part 15 Subpart B and C; FCC Section 15.247; RSS-247; and RSS-GEN Test Report

Bluetooth Sensor

Model: Sensor-005

FCC 15.247

Hidrate, Inc.

Bluetooth Sensor

Model: Sensor-005

Date: 9/13/2021

Lab: D

Tested By: Kyle Fujimoto

Harmonics - Middle Channel**Transmit Mode - Y-Axis**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880.00	51.36	V	73.97	-22.61	Peak	216.75	150.50	
4880.00	45.65	V	53.97	-8.32	Avg	216.75	150.50	
7320.00	50.03	V	73.97	-23.94	Peak	316.50	100.00	
7320.00	41.68	V	53.97	-12.29	Avg	316.50	100.00	
9760.00								Not in Restricted Band
9760.00								Done Via Conducted
12200.00	51.77	V	73.97	-22.21	Peak	275.75	100.00	
12200.00	40.39	V	53.97	-13.58	Avg	275.75	100.00	
14640.00								Not in Restricted Band
14640.00								Done Via Conducted
17080.00								Not in Restricted Band
17080.00								Done Via Conducted
19520.00								No Emission
19520.00								Detected
21960.00								No Emission
21960.00								Detected
24400.00								No Emission
24400.00								Detected

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**COMPATIBLE
ELECTRONICS**

FCC Part 15 Subpart B and C; FCC Section 15.247; RSS-247; and RSS-GEN Test Report

Bluetooth Sensor

Model: Sensor-005

FCC 15.247

Hidrate, Inc.

Bluetooth Sensor

Model: Sensor-005

Date: 9/13/2021

Lab: D

Tested By: Kyle Fujimoto

Harmonics - Middle Channel**Transmit Mode - Z-Axis**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880.00	50.33	V	73.97	-23.65	Peak	165.00	100.00	
4880.00	45.47	V	53.97	-8.50	Avg	165.00	100.00	
7320.00	48.16	V	73.97	-25.81	Peak	155.25	100.00	
7320.00	38.63	V	53.97	-15.34	Avg	155.25	100.00	
9760.00								Not in Restricted Band
9760.00								Done Via Conducted
12200.00	48.43	V	73.97	-25.54	Peak	0.00	100.00	
12200.00	32.96	V	53.97	-21.01	Avg	0.00	100.00	
14640.00								Not in Restricted Band
14640.00								Done Via Conducted
17080.00								Not in Restricted Band
17080.00								Done Via Conducted
19520.00								No Emission
19520.00								Detected
21960.00								No Emission
21960.00								Detected
24400.00								No Emission
24400.00								Detected

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**COMPATIBLE
ELECTRONICS**

FCC Part 15 Subpart B and C; FCC Section 15.247; RSS-247; and RSS-GEN Test Report

Bluetooth Sensor

Model: Sensor-005

FCC 15.247

Hidrate, Inc.

Bluetooth Sensor

Model: Sensor-005

Date: 9/13/2021

Lab: D

Tested By: Kyle Fujimoto

Harmonics - Middle Channel**Transmit Mode - X-Axis**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880.00	54.36	H	73.97	-19.61	Peak	178.00	169.61	
4880.00	49.62	H	53.97	-4.35	Avg	178.00	169.61	
7320.00	49.23	H	73.97	-24.74	Peak	223.25	100.00	
7320.00	40.56	H	53.97	-13.41	Avg	223.25	100.00	
9760.00								Not in Restricted Band
9760.00								Done Via Conducted
12200.00	49.09	H	73.97	-24.88	Peak	233.50	100.00	
12200.00	36.67	H	53.97	-17.31	Avg	233.50	100.00	
14640.00								Not in Restricted Band
14640.00								Done Via Conducted
17080.00								Not in Restricted Band
17080.00								Done Via Conducted
19520.00								No Emission
19520.00								Detected
21960.00								No Emission
21960.00								Detected
24400.00								No Emission
24400.00								Detected

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**COMPATIBLE
ELECTRONICS**

FCC Part 15 Subpart B and C; FCC Section 15.247; RSS-247; and RSS-GEN Test Report

Bluetooth Sensor

Model: Sensor-005

FCC 15.247

Hidrate, Inc.

Bluetooth Sensor

Model: Sensor-005

Date: 9/13/2021

Lab: D

Tested By: Kyle Fujimoto

Harmonics - Middle Channel**Transmit Mode - Y-Axis**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880.00	47.64	H	73.97	-26.33	Peak	175.25	100.00	
4880.00	41.24	H	53.97	-12.73	Avg	175.25	100.00	
7320.00	46.43	H	73.97	-27.54	Peak	135.75	100.00	
7320.00	34.65	H	53.97	-19.33	Avg	135.75	100.00	
9760.00								Not in Restricted Band
9760.00								Done Via Conducted
12200.00	49.02	H	73.97	-24.95	Peak	0.00	100.00	
12200.00	36.72	H	53.97	-17.25	Avg	0.00	100.00	
14640.00								Not in Restricted Band
14640.00								Done Via Conducted
17080.00								Not in Restricted Band
17080.00								Done Via Conducted
19520.00								No Emission
19520.00								Detected
21960.00								No Emission
21960.00								Detected
24400.00								No Emission
24400.00								Detected

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**COMPATIBLE
ELECTRONICS**

FCC Part 15 Subpart B and C; FCC Section 15.247; RSS-247; and RSS-GEN Test Report

Bluetooth Sensor

Model: Sensor-005

FCC 15.247

Hidrate, Inc.

Bluetooth Sensor

Model: Sensor-005

Date: 9/13/2021

Lab: D

Tested By: Kyle Fujimoto

Harmonics - Middle Channel**Transmit Mode - Z-Axis**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880.00	51.61	H	73.97	-22.36	Peak	321.00	167.10	
4880.00	46.64	H	53.97	-7.33	Avg	321.00	167.10	
7320.00	49.58	H	73.97	-24.39	Peak	91.00	99.82	
7320.00	41.15	H	53.97	-12.82	Avg	91.00	99.82	
9760.00								Not in Restricted Band
9760.00								Done Via Conducted
12200.00	47.62	H	73.97	-26.35	Peak	0.00	100.00	
12200.00	34.07	H	53.97	-19.90	Avg	0.00	100.00	
14640.00								Not in Restricted Band
14640.00								Done Via Conducted
17080.00								Not in Restricted Band
17080.00								Done Via Conducted
19520.00								No Emission
19520.00								Detected
21960.00								No Emission
21960.00								Detected
24400.00								No Emission
24400.00								Detected

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**FCC 15.247**

Hidrate, Inc.

Bluetooth Sensor

Model: Sensor-005

Date: 9/13/2021

Lab: D

Tested By: Kyle Fujimoto

Harmonics - High Channel**Transmit Mode - X-Axis**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4960.00	48.82	V	73.97	-25.15	Peak	316.75	112.89	
4960.00	43.11	V	53.97	-10.86	Avg	316.75	112.89	
7440.00	50.66	V	73.97	-23.31	Peak	164.75	102.68	
7440.00	43.56	V	53.97	-10.41	Avg	164.75	102.68	
9920.00								Not in Restricted Band
9920.00								Done Via Conducted
12400.00	50.24	V	73.97	-23.73	Peak	193.50	100.00	
12400.00	38.20	V	53.97	-15.77	Avg	193.50	100.00	
14880.00								Not in Restricted Band
14880.00								Done Via Conducted
17360.00								Not in Restricted Band
17360.00								Done Via Conducted
19840.00								No Emission
19840.00								Detected
22320.00								No Emission
22320.00								Detected
24800.00								No Emission
24800.00								Detected

**FCC 15.247**

Hidrate, Inc.

Bluetooth Sensor

Model: Sensor-005

Date: 9/13/2021

Lab: D

Tested By: Kyle Fujimoto

Harmonics - High Channel**Transmit Mode - Y-Axis**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4960.00	49.31	V	73.97	-24.67	Peak	208.50	109.61	
4960.00	44.00	V	53.97	-9.98	Avg	208.50	109.61	
7440.00	49.40	V	73.97	-24.57	Peak	304.75	117.78	
7440.00	40.96	V	53.97	-13.01	Avg	304.75	117.78	
9920.00								Not in Restricted Band
9920.00								Done Via Conducted
12400.00	52.33	V	73.97	-21.64	Peak	263.00	100.00	
12400.00	41.37	V	53.97	-12.60	Avg	263.00	100.00	
14880.00								Not in Restricted Band
14880.00								Done Via Conducted
17360.00								Not in Restricted Band
17360.00								Done Via Conducted
19840.00								No Emission
19840.00								Detected
22320.00								No Emission
22320.00								Detected
24800.00								No Emission
24800.00								Detected

**FCC 15.247**

Hidrate, Inc.

Bluetooth Sensor

Model: Sensor-005

Date: 9/13/2021

Lab: D

Tested By: Kyle Fujimoto

Harmonics - High Channel**Transmit Mode - Z-Axis**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4960.00	50.66	V	73.97	-23.31	Peak	157.25	100.00	
4960.00	45.43	V	53.97	-8.54	Avg	157.25	100.00	
7440.00	48.16	V	73.97	-25.81	Peak	196.25	100.00	
7440.00	39.23	V	53.97	-14.75	Avg	196.25	100.00	
9920.00								Not in Restricted Band
9920.00								Done Via Conducted
12400.00	49.07	V	73.97	-24.91	Peak	0.00	100.00	
12400.00	36.10	V	53.97	-17.87	Avg	0.00	100.00	
14880.00								Not in Restricted Band
14880.00								Done Via Conducted
17360.00								Not in Restricted Band
17360.00								Done Via Conducted
19840.00								No Emission
19840.00								Detected
22320.00								No Emission
22320.00								Detected
24800.00								No Emission
24800.00								Detected



FCC Part 15 Subpart B and C; FCC Section 15.247; RSS-247; and RSS-GEN Test Report
COMPATIBLE ELECTRONICS
 Bluetooth Sensor
 Model: Sensor-005

FCC 15.247

Hidrate, Inc.
 Bluetooth Sensor
 Model: Sensor-005

Date: 9/13/2021

Lab: D

Tested By: Kyle Fujimoto

Harmonics - High Channel
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4960.00	52.12	H	73.97	-21.85	Peak	176.25	137.85	
4960.00	47.34	H	53.97	-6.63	Avg	176.25	137.85	
7440.00	48.62	H	73.97	-25.35	Peak	269.00	100.00	
7440.00	40.08	H	53.97	-13.89	Avg	269.00	100.00	
9920.00								Not in Restricted Band
9920.00								Done Via Conducted
12400.00	51.70	H	73.97	-22.28	Peak	183.25	100.00	
12400.00	40.59	H	53.97	-13.39	Avg	183.25	100.00	
14880.00								Not in Restricted Band
14880.00								Done Via Conducted
17360.00								Not in Restricted Band
17360.00								Done Via Conducted
19840.00								No Emission
19840.00								Detected
22320.00								No Emission
22320.00								Detected
24800.00								No Emission
24800.00								Detected



FCC Part 15 Subpart B and C; FCC Section 15.247; RSS-247; and RSS-GEN Test Report
**COMPATIBLE
ELECTRONICS**
 Bluetooth Sensor
 Model: Sensor-005

FCC 15.247

Hidrate, Inc.
 Bluetooth Sensor
 Model: Sensor-005

Date: 9/13/2021
 Lab: D
 Tested By: Kyle Fujimoto

Harmonics - High Channel
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4960.00	46.79	H	73.97	-27.18	Peak	166.00	100.00	
4960.00	39.98	H	53.97	-13.99	Avg	166.00	100.00	
7440.00	46.64	H	73.97	-27.33	Peak	159.25	100.00	
7440.00	34.79	H	53.97	-19.18	Avg	159.25	100.00	
9920.00								Not in Restricted Band
9920.00								Done Via Conducted
12400.00	51.14	H	73.97	-22.83	Peak	285.50	100.00	
12400.00	39.85	H	53.97	-14.12	Avg	285.50	100.00	
14880.00								Not in Restricted Band
14880.00								Done Via Conducted
17360.00								Not in Restricted Band
17360.00								Done Via Conducted
19840.00								No Emission
19840.00								Detected
22320.00								No Emission
22320.00								Detected
24800.00								No Emission
24800.00								Detected


**COMPATIBLE
ELECTRONICS**

FCC Part 15 Subpart B and C; FCC Section 15.247; RSS-247; and RSS-GEN Test Report

Bluetooth Sensor

Model: Sensor-005

FCC 15.247

Hidrate, Inc.

Bluetooth Sensor

Model: Sensor-005

Date: 9/13/2021

Lab: D

Tested By: Kyle Fujimoto

Harmonics - High Channel**Transmit Mode - Z-Axis**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4960.00	49.65	H	73.97	-24.32	Peak	146.50	100.00	
4960.00	44.23	H	53.97	-9.74	Avg	146.50	100.00	
7440.00	49.92	H	73.97	-24.05	Peak	186.00	100.00	
7440.00	41.18	H	53.97	-12.79	Avg	186.00	100.00	
9920.00								Not in Restricted Band
9920.00								Done Via Conducted
12400.00	50.26	H	73.97	-23.71	Peak	214.50	100.00	
12400.00	37.55	H	53.97	-16.42	Avg	214.50	100.00	
14880.00								Not in Restricted Band
14880.00								Done Via Conducted
17360.00								Not in Restricted Band
17360.00								Done Via Conducted
19840.00								No Emission
19840.00								Detected
22320.00								No Emission
22320.00								Detected
24800.00								No Emission
24800.00								Detected

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**COMPATIBLE
ELECTRONICS**

FCC Part 15 Subpart B and C; FCC Section 15.247; RSS-247; and RSS-GEN Test Report

Bluetooth Sensor

Model: Sensor-005

FCC Class B and FCC 15.247

Hidrate, Inc.

Bluetooth Sensor

Model: Sensor-005

Date: 9/13/2021

Lab: D

Tested By: Kyle Fujimoto

Non Harmonic Emissions from the Tx and Digital Portion - 9 kHz to 30 MHz**Non Harmonic Emissions from the Tx and Digital Portion - 1 GHz to 25 GHz**

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
								No Emissions Detected
								from 9 kHz to 30 MHz
								for the digital portion
								of the EUT
								No Emissions Detected
								from 9 kHz to 30 MHz
								for the Non-Harmonic Emissions
								No Emissions Detected
								from 1 GHz to 25 GHz
								for the digital portion
								of the EUT
								No Emissions Detected
								from 1 GHz to 25 GHz
								for the Non-Harmonic Emissions
								of the Transmitter for the EUT
								Investigated in the X-Axis,
								Y-Axis, and Z-Axis

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(949) 587-0400

Newbury Park Division
1050 Lawrence Drive
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(805) 480-4044



FCC Part 15 Subpart B and C; FCC Section 15.247; RSS-247; and RSS-GEN Test Report

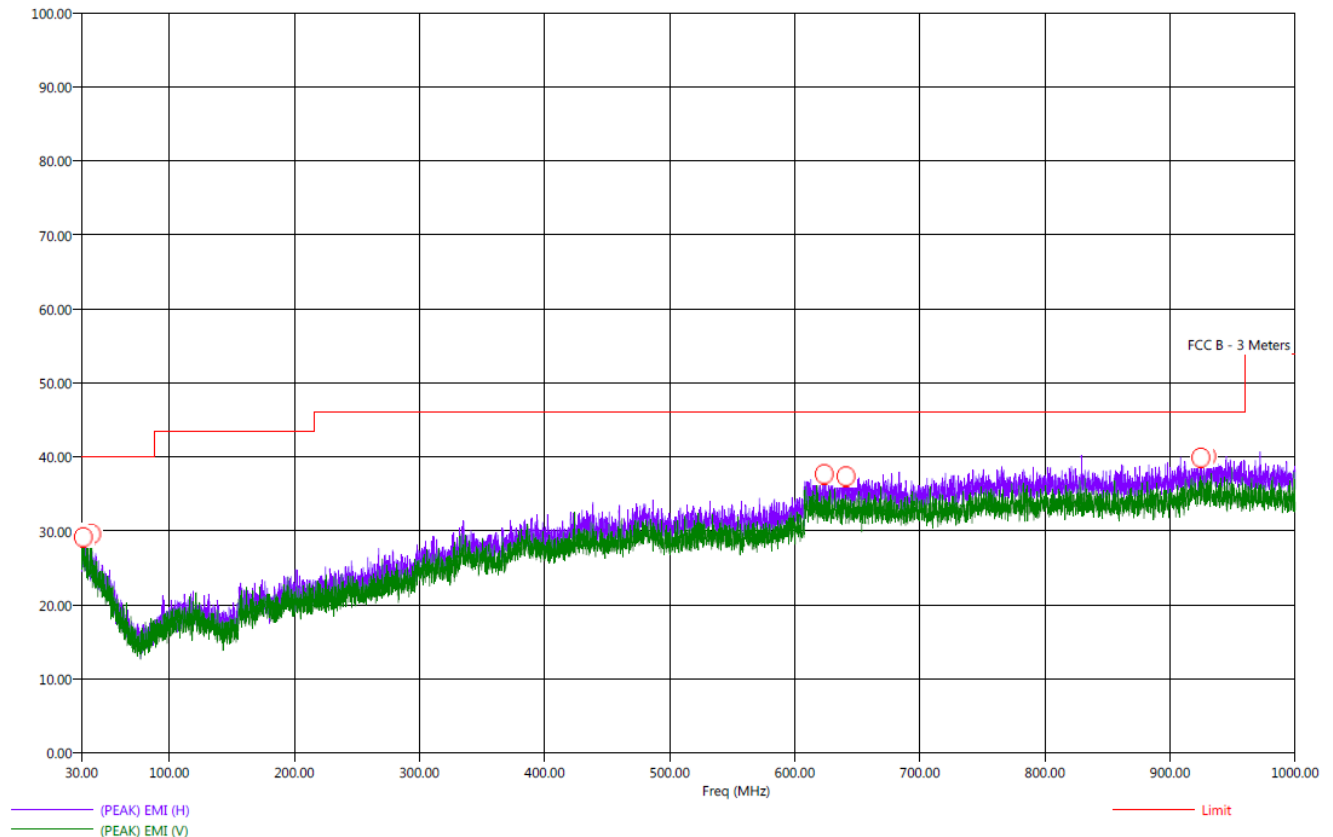
Bluetooth Sensor

Model: Sensor-005

Title: Pre-Scan - FCC Class B
File: Keysight - Pre-Scan - FCC Class B - 30 MHz to 1000 MHz - 09-14-21.set
Operator: Tae Hyun Kim
EUT Type: Bluetooth Sensor
EUT Condition: EUT is transmitting at 2402 MHz
Company: Hidrate, Inc.
Model: Sensor-005
S/N: N/A

9/14/2021 9:06:14 AM
Sequence: Preliminary Scan

FCC Class B

Electric Field Strength (dB μ V/m)

Brea Division
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**COMPATIBLE
ELECTRONICS**
FCC Part 15 Subpart B and C; FCC Section 15.247; RSS-247; and RSS-GEN Test Report
Bluetooth Sensor
Model: Sensor-005

Title: Radiated Final - FCC Class B
 File: Keysight - Final Scan - FCC Class B - 30 MHz to 1000 MHz - 09-14-21.set
 Operator: Tae Hyun Kim
 EUT Type: Bluetooth Sensor
 EUT Condition: EUT is transmitting at 2402 MHz
 Company: Hidrate, Inc.
 Model: Sensor-005
 S/N: N/A

9/14/2021 9:15:25 AM
 Sequence: Final Measurements

FCC Class B

Freq (MHz)	Pol	(PEAK) EMI (dBμV/m)	(QP) EMI (dBμV/m)	(PEAK) Margin (dB)	(QP) Margin (dB)	Limit (dBμV/m)	Transducer (dB)	Cable (dB)	Ttbl Aql (deg)	Twr Ht (cm)
31.40	V	29.44	23.88	-10.56	-16.12	40.00	22.09	0.43	248.75	302.26
38.00	V	27.17	22.13	-12.83	-17.87	40.00	20.62	0.45	108.75	127.16
623.70	H	36.88	31.50	-9.12	-14.50	46.00	24.00	2.09	202.25	142.86
641.00	H	36.97	31.51	-9.03	-14.49	46.00	24.10	2.12	304.75	350.20
924.70	H	39.57	34.26	-6.43	-11.74	46.00	28.07	2.69	122.25	269.07
929.30	H	39.62	34.39	-6.38	-11.61	46.00	28.12	2.70	329.75	382.44



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Title: Pre-Scan - FCC Class B

File: Keysight - Pre-Scan - AC Charging Mode - FCC Class B - 30 MHz to 1000 MHz - 09-14-21.set

Operator: Tae Hyun Kim

EUT Type: Bluetooth Sensor

EUT Condition: EUT is constantly charging a battery

Company: Hidrate, Inc.

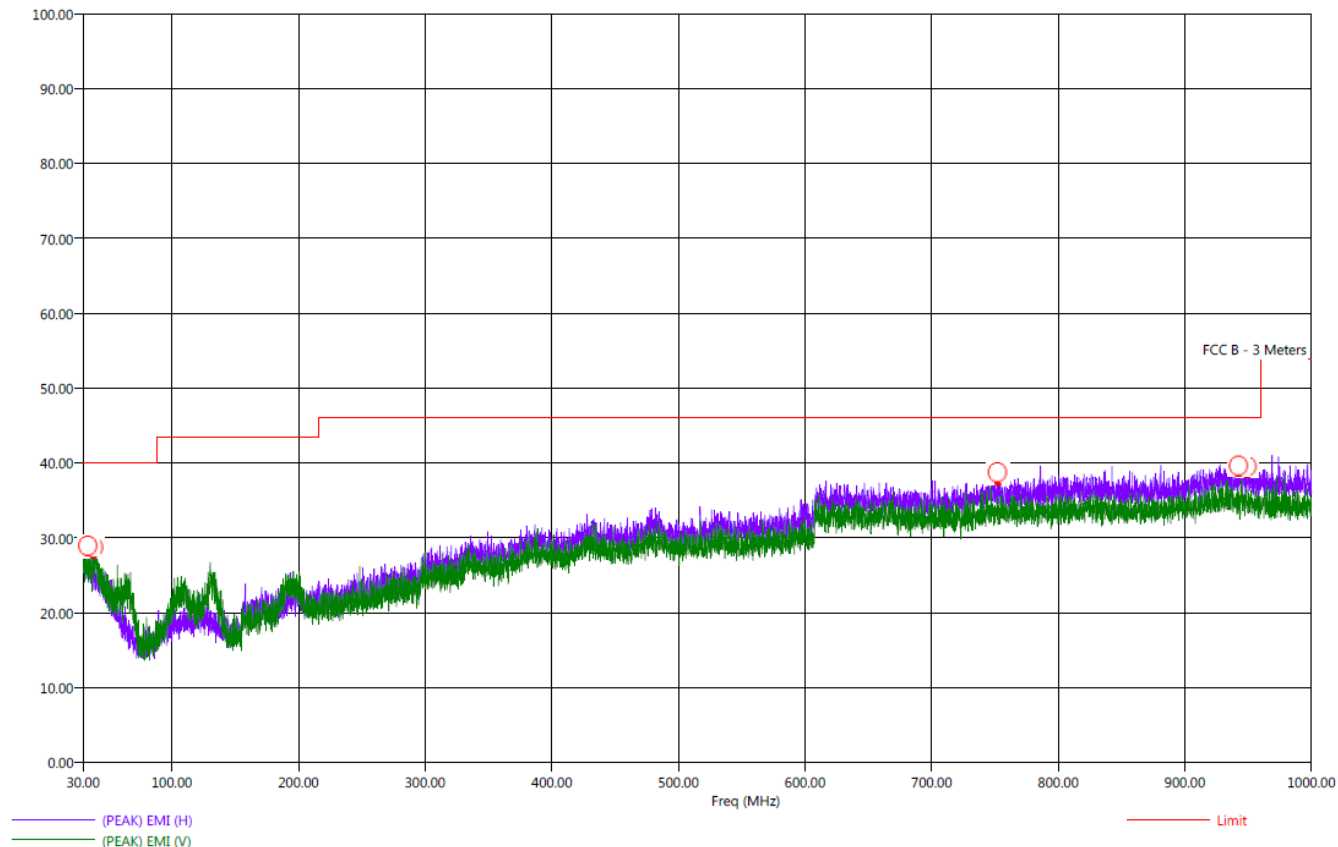
Model: Sensor-005

S/N: N/A

9/14/2021 9:47:29 AM
Sequence: Preliminary Scan

FCC Class B

Electric Field Strength (dBμV/m)





COMPATIBLE ELECTRONICS

FCC Part 15 Subpart B and C; FCC Section 15.247; RSS-247; and RSS-GEN Test Report
Bluetooth Sensor
Model: Sensor-005

Title: Radiated Final - FCC Class B

File: Keysight - Final-Scan - AC Charging Mode - FCC Class B - 30 MHz to 1000 MHz - 09-14-21.set

Operator: Tae Hyun Kim

EUT Type: Bluetooth Sensor

EUT Condition: EUT is constantly charging a battery

Company: Hidrate, Inc.

Model: Sensor-005

S/N: N/A

9/14/2021 9:56:33 AM

Sequence: Final Measurements

FCC Class B

Freq (MHz)	Pol	(PEAK) EMI (dBμV/m)	(QP) EMI (dBμV/m)	(PEAK) Margin (dB)	(QP) Margin (dB)	Limit (dBμV/m)	Transducer (dB)	Cable (dB)	Ttbl Agl (deg)	Twr Ht (cm)
33.60	V	28.75	23.55	-11.25	-16.45	40.00	21.51	0.44	26.75	254.80
38.20	V	29.45	23.41	-10.55	-16.59	40.00	20.57	0.45	360.00	238.86
752.00	H	37.45	32.50	-8.55	-13.50	46.00	25.60	2.35	4.25	254.62
752.50	H	38.03	32.53	-7.97	-13.47	46.00	25.60	2.35	180.75	206.98
942.40	H	39.37	34.04	-6.63	-11.96	46.00	27.90	2.75	232.25	398.08
949.20	H	39.83	34.19	-6.17	-11.81	46.00	28.00	2.77	82.75	126.86



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***CONDUCTED EMISSIONS
DATA SHEETS***

**COMPATIBLE
ELECTRONICS**

FCC Part 15 Subpart B and C; FCC Section 15.247; RSS-247; and RSS-GEN Test Report

Bluetooth Sensor**Model: Sensor-005**

Title: FCC Class B - Black Lead

File: Keysight - Pre-Scan - AC Charging Mode - Black Lead - FCC Class B - 09-14-21.set

Operator: Tae Hyun Kim

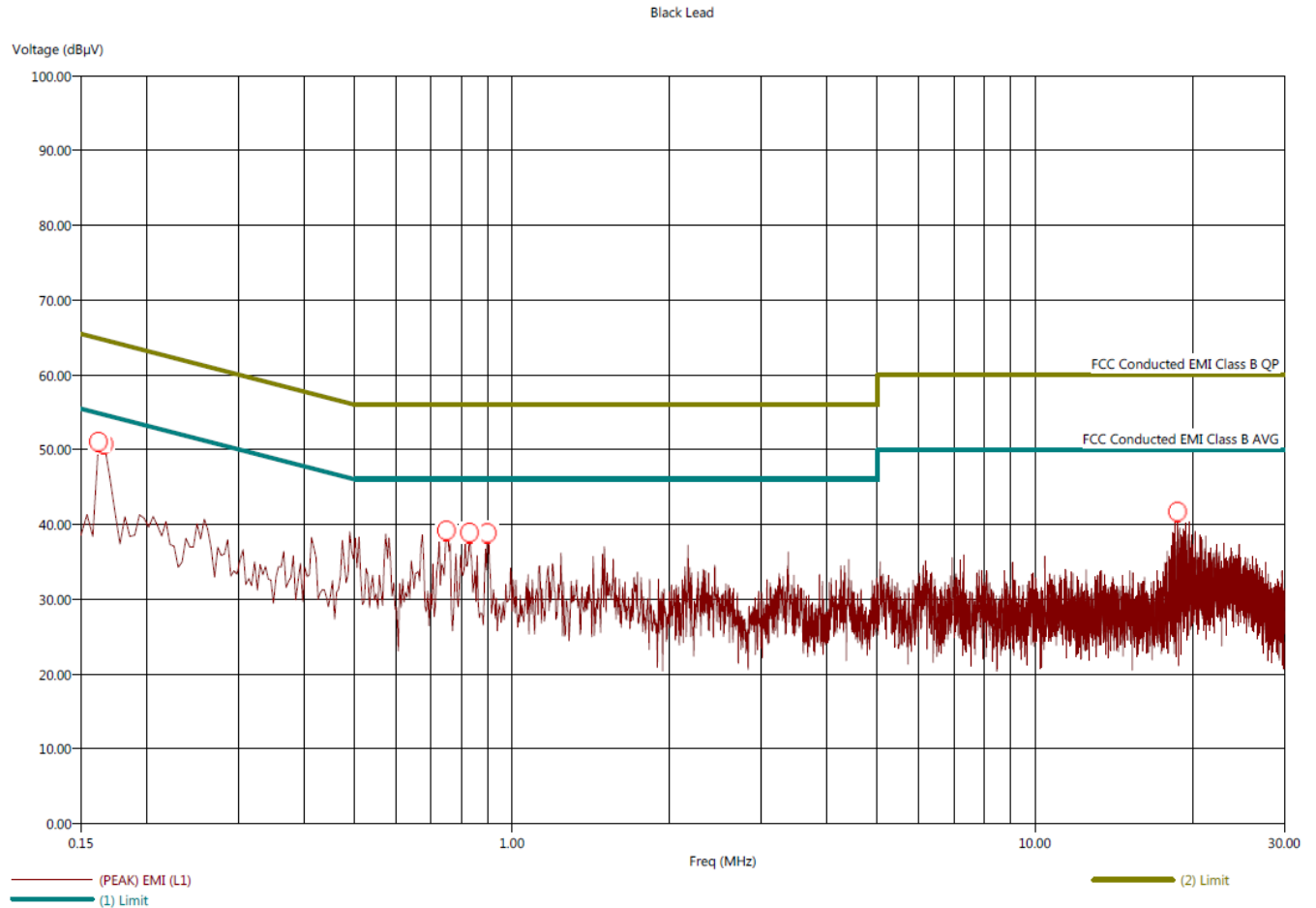
EUT Type: Bluetooth Sensor

EUT Condition: The EUT is constantly charging a battery

Company: Hidrate, Inc.

M/N: Oslo32

S/N: N/A

9/14/2021 1:09:36 PM
Sequence: Preliminary Scan

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1050 Lawrence Drive
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(805) 480-4044


**COMPATIBLE
ELECTRONICS**
FCC Part 15 Subpart B and C; FCC Section 15.247; RSS-247; and RSS-GEN Test Report
Bluetooth Sensor
Model: Sensor-005

Title: FCC Class B - Black Lead

File: Keysight - Final Scan - AC Charging Mode - Black Lead - FCC Class B - 09-14-21.set

Operator: Tae Hyun Kim

EUT Type: Bluetooth Sensor

EUT Condition: The EUT is constantly charging a battery

Company: Hidrate, Inc.

Model: Oslo32

S/N: N/A

9/14/2021 1:17:14 PM

Sequence: Final Measurements

Black Lead									
Freq (MHz)	(PEAK) EMI (dBμV)	(AVG) EMI (dBμV)	(PEAK) Margin (AVG) (dB)	(AVG) Margin (AVG) (dB)	(AVG) Limit (dBμV)	Cable (dB)	Transducer (dB)	Filter (dB)	
0.162	49.61	38.82	-5.21	-16.00	54.81	0.13	0.14		9.70
0.166	49.02	37.27	-5.87	-17.62	54.89	0.13	0.14		9.70
0.750	48.15	34.49	2.15	-11.51	46.00	0.16	0.09		9.64
0.830	42.37	28.04	-3.63	-17.96	46.00	0.16	0.09		9.63
0.898	37.73	23.95	-8.27	-22.05	46.00	0.17	0.09		9.61
0.902	37.31	24.12	-8.69	-21.88	46.00	0.17	0.09		9.62
18.738	38.81	23.15	-11.19	-26.85	50.00	0.59	0.04		9.68



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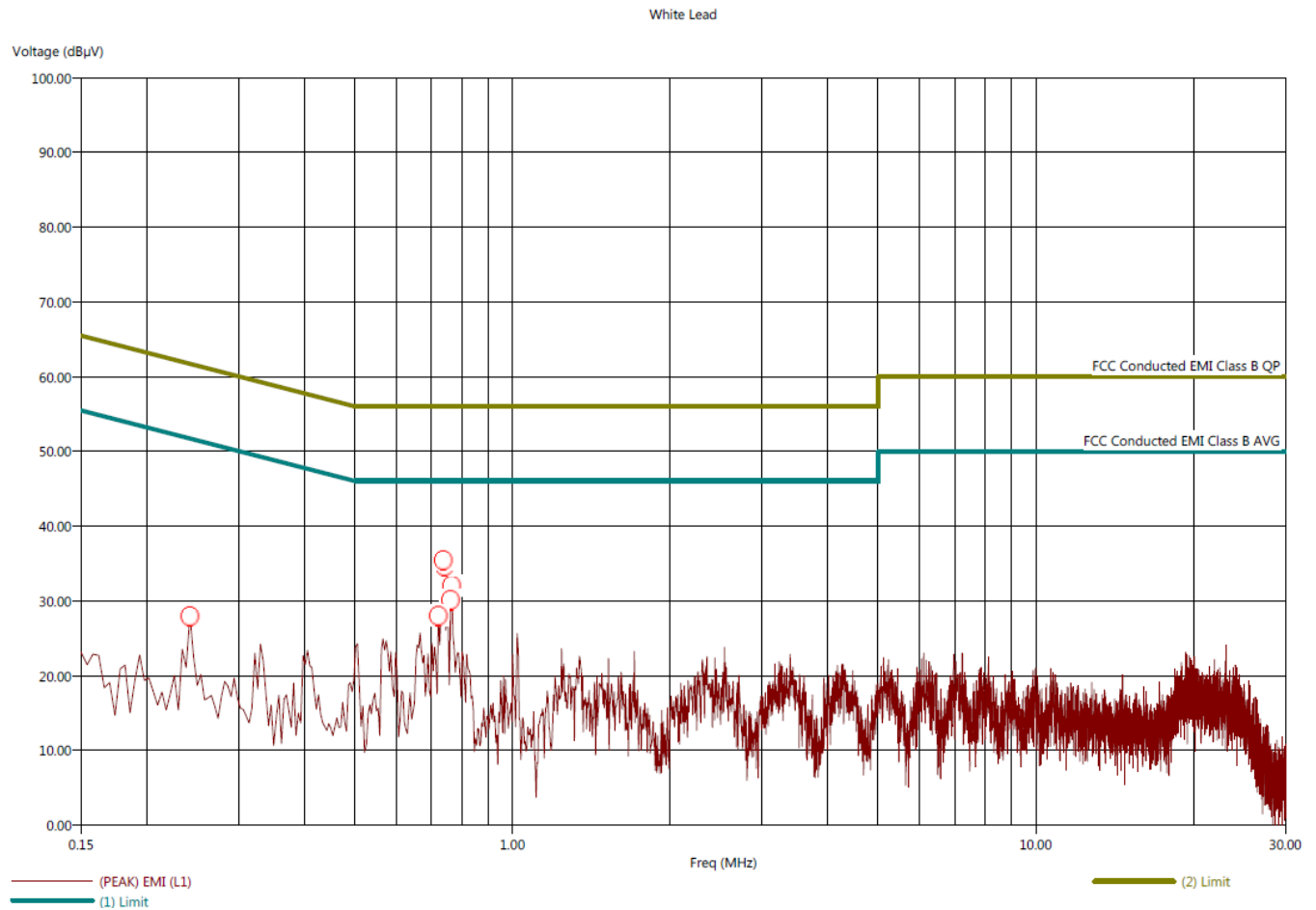
Newbury Park Division
 1050 Lawrence Drive
 Newbury Park, CA 91320
 (805) 480-4044



FCC Part 15 Subpart B and C; FCC Section 15.247; RSS-247; and RSS-GEN Test Report
Bluetooth Sensor
Model: Sensor-005

Title: FCC Class B - White Lead
File: Keysight - Pre-Scan - AC Charging Mode - White Lead - FCC Class B - 09-14-21.set
Operator: Tae Hyun Kim
EUT Type: Bluetooth Sensor
EUT Condition: The EUT is constantly charging a battery
Company: Hidrate, Inc.
M/N: Oslo32
S/N: N/A

9/14/2021 1:26:18 PM
Sequence: Preliminary Scan



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COMPATIBLE ELECTRONICS

FCC Part 15 Subpart B and C; FCC Section 15.247; RSS-247; and RSS-GEN Test Report

Bluetooth Sensor

Model: Sensor-005

Title: FCC Class B - White Lead

File: Keysight - Final Scan - AC Charging Mode - White Lead - FCC Class B - 09-14-21.set

Operator: Tae Hyun Kim

EUT Type: Bluetooth Sensor

EUT Condition: The EUT is constantly charging a battery

Company: Hidrate, Inc.

Model: Oslo32

S/N: N/A

9/14/2021 1:28:20 PM

Sequence: Final Measurements

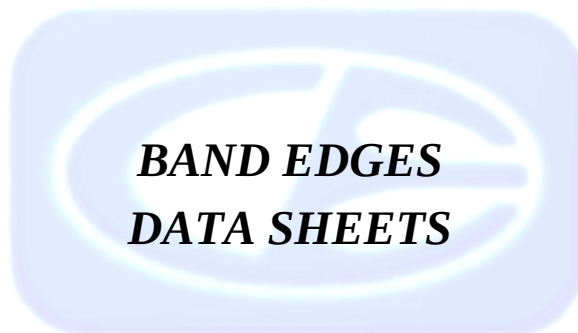
White Lead									
Freq (MHz)	(PEAK) EMI (dBμV)	(AVG) EMI (dBμV)	(PEAK) Margin (AVG) (dB)	(AVG) Margin (AVG) (dB)	(AVG) Limit (dBμV)	Cable (dB)	Transducer (dB)	Filter (dB)	
0.242	40.38	26.97	-11.08	-24.49	51.46	0.12	0.10	9.70	
0.722	42.97	26.71	-3.03	-19.29	46.00	0.16	0.08	9.65	
0.738	50.43	32.95	4.43	-13.05	46.00	0.16	0.08	9.64	
0.742	50.74	32.86	4.74	-13.14	46.00	0.16	0.08	9.64	
0.762	51.71	33.60	5.71	-12.40	46.00	0.16	0.08	9.64	
0.766	50.00	33.86	4.00	-12.14	46.00	0.16	0.08	9.64	



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FCC 15.247

Hidrate, Inc.

Bluetooth Sensor

Model: Sensor-005

Date: 9/14/2021

Lab: D

Tested By: Kyle Fujimoto

Band Edges

[illegible]



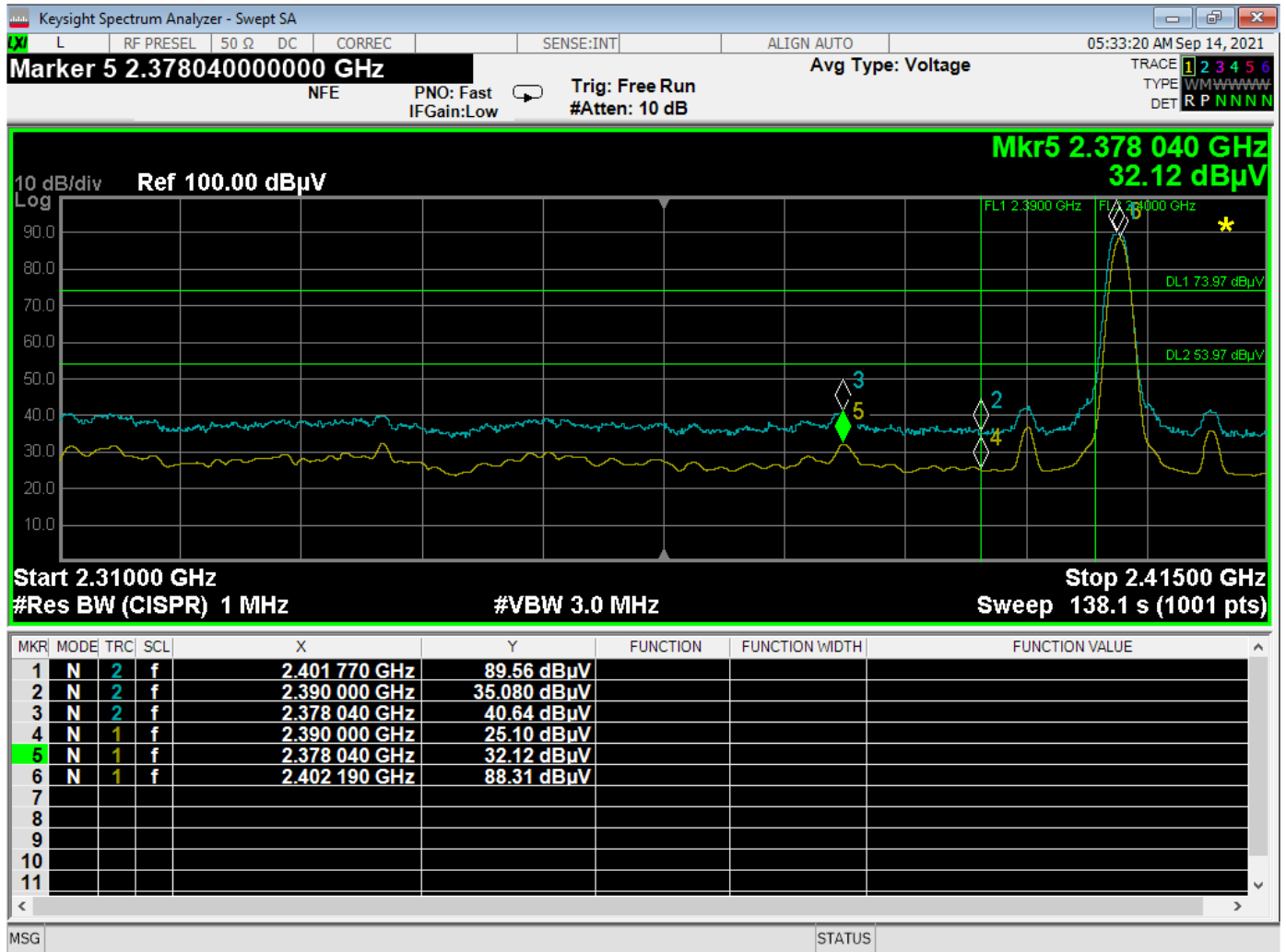
FCC 15.247

Hidrate, Inc.
Bluetooth Sensor
Model: Sensor-005

Date: 9/14/2021
Lab: D
Tested By: Kyle Fujimoto

Band Edges

[illegible]


**COMPATIBLE
ELECTRONICS**
*Bluetooth Sensor
Model: Sensor-005*


Band Edge – Low Channel – Vertical Polarization – Y-Axis

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1050 Lawrence Drive
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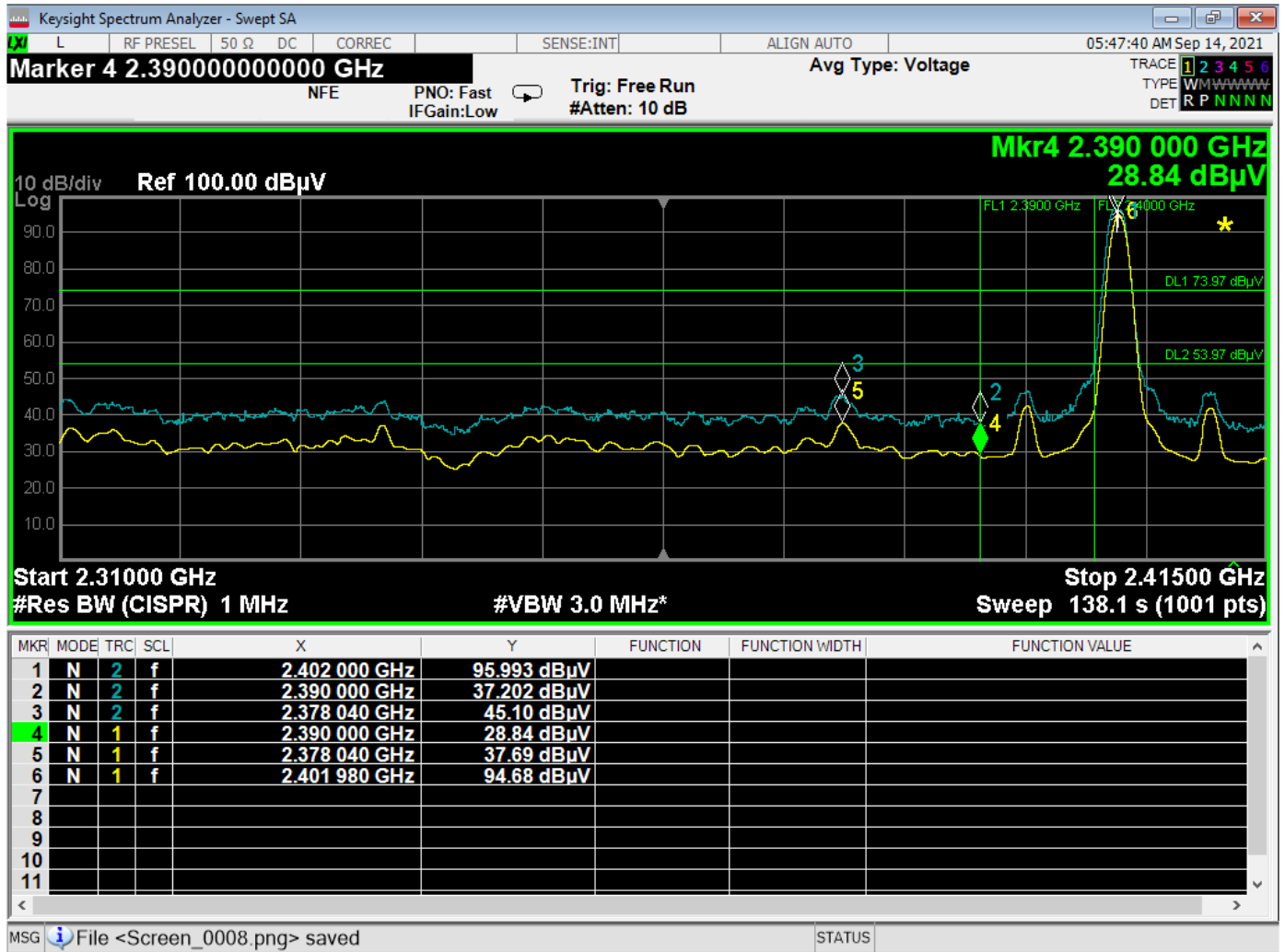


**COMPATIBLE
ELECTRONICS**

FCC Part 15 Subpart B and C; FCC Section 15.247; RSS-247; and RSS-GEN Test Report

Bluetooth Sensor

Model: Sensor-005



Band Edge – Low Channel – Horizontal Polarization – Y-Axis

Brea Division
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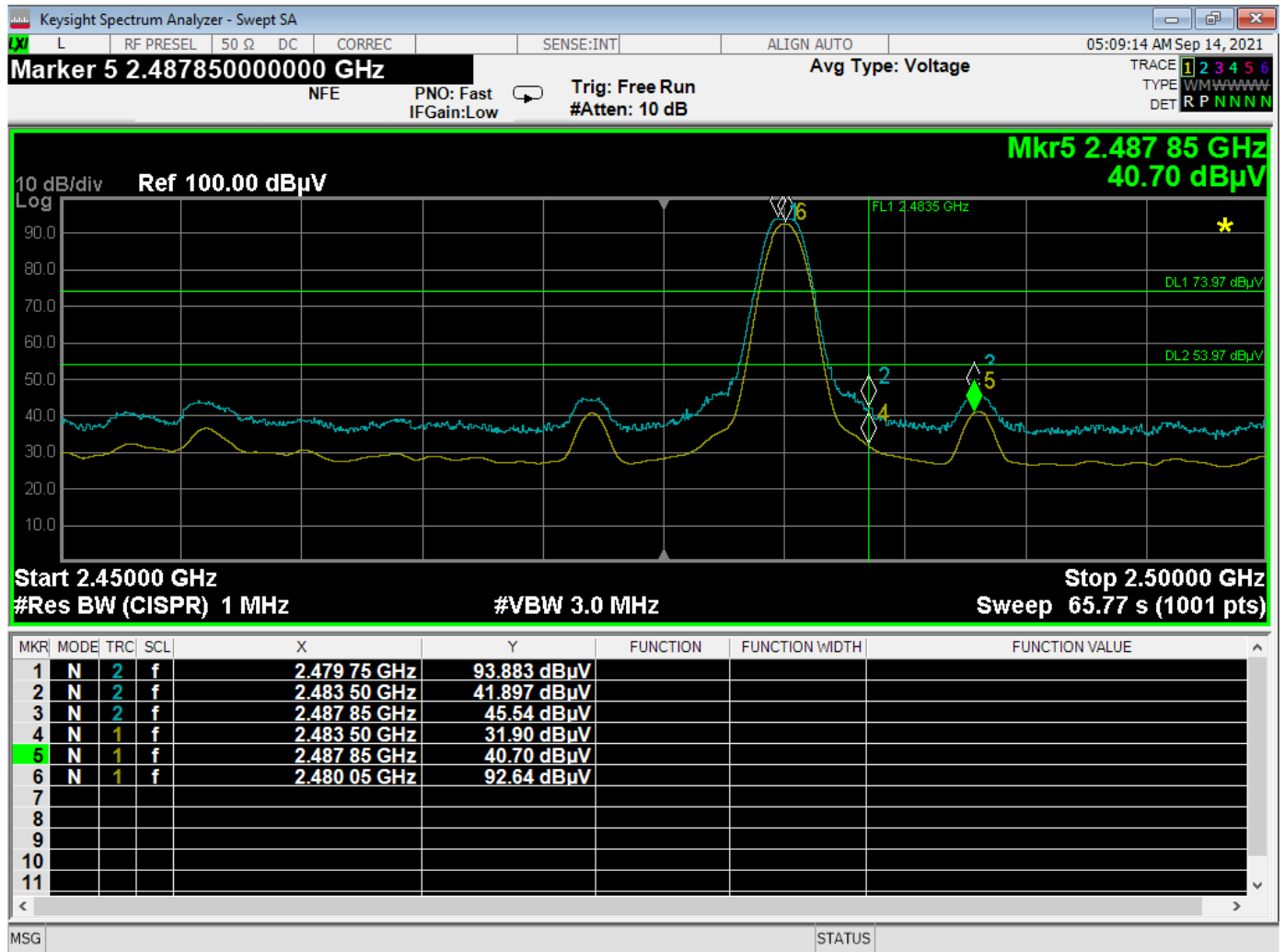
Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

Newbury Park Division
1050 Lawrence Drive
Newbury Park, CA 91320
(805) 480-4044



**COMPATIBLE
ELECTRONICS**

FCC Part 15 Subpart B and C; FCC Section 15.247; RSS-247; and RSS-GEN Test Report
Bluetooth Sensor
Model: Sensor-005

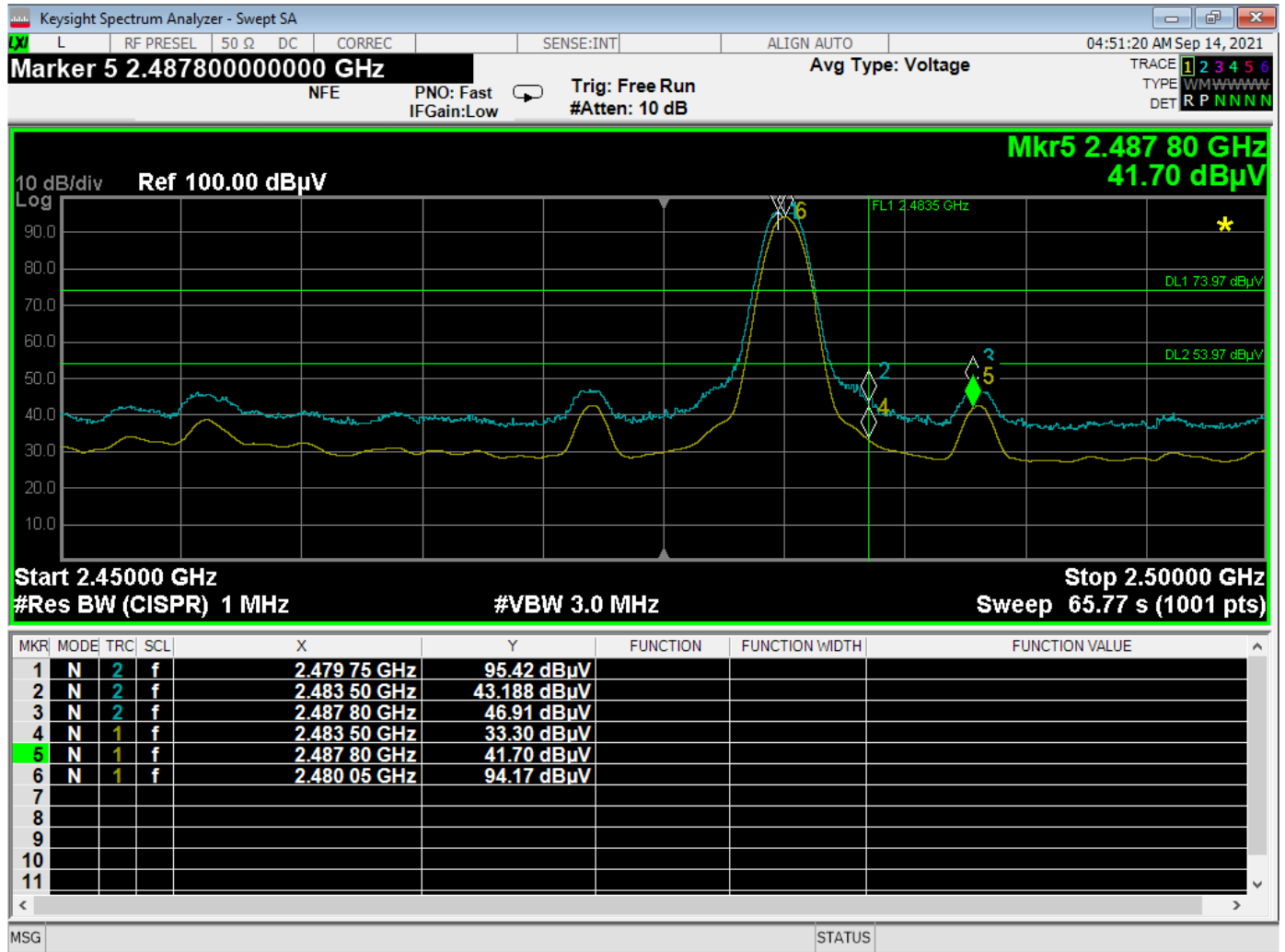


Band Edge – High Channel – Vertical Polarization – Z-Axis

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Brea, CA 92823
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20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

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1050 Lawrence Drive
Newbury Park, CA 91320
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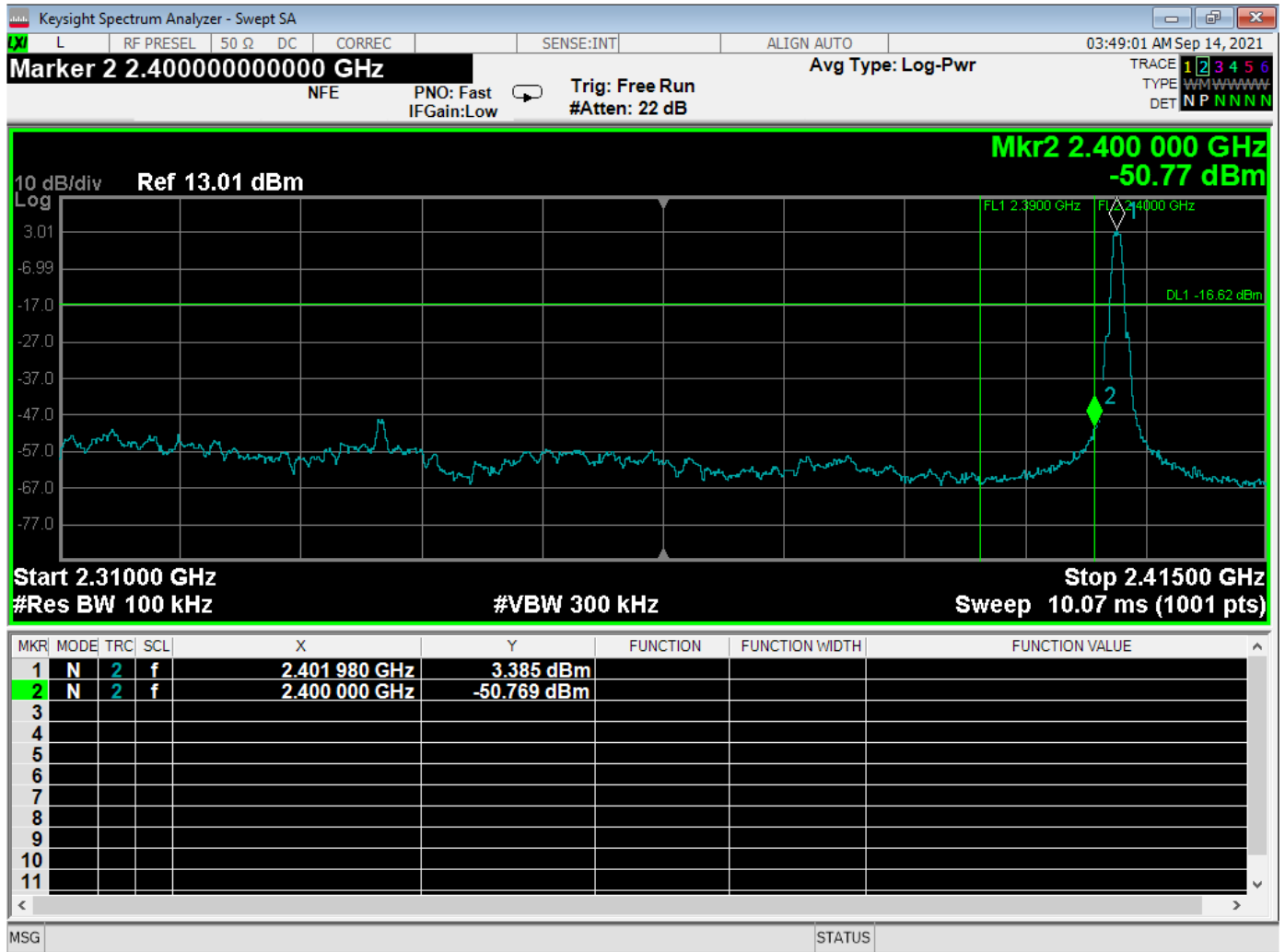

**COMPATIBLE
ELECTRONICS**
**Bluetooth Sensor
Model: Sensor-005**


Band Edge – High Channel – Horizontal Polarization – X-Axis

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114 Olinda Drive
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**COMPATIBLE
ELECTRONICS**
*Bluetooth Sensor
Model: Sensor-005*


Band Edge – Low Channel – at 2400 MHz – Conducted Measurement

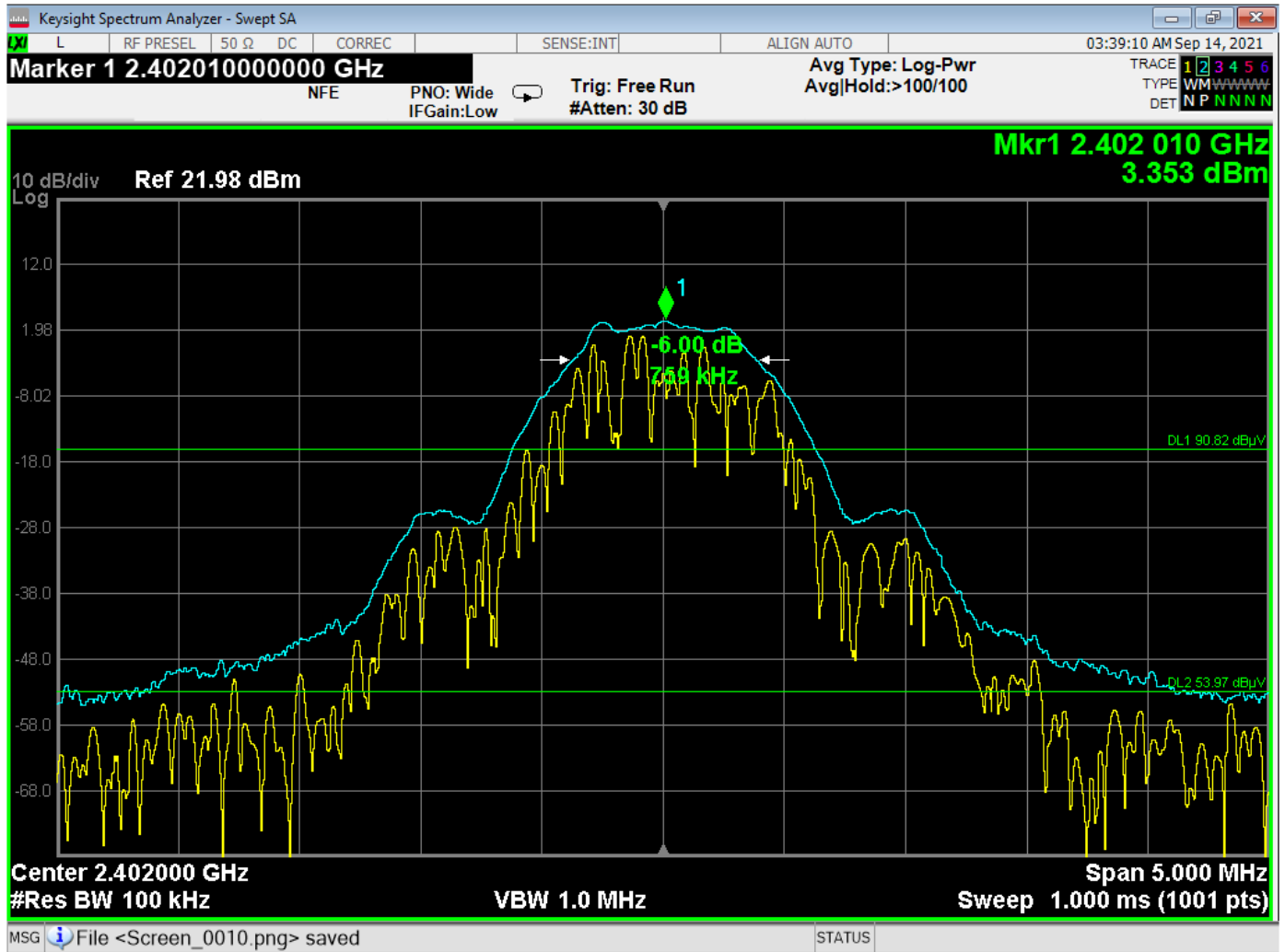
Brea Division
114 Olinda Drive
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***-6 dB BANDWIDTH
DATA SHEETS***



-6 dB Bandwidth – Low Channel

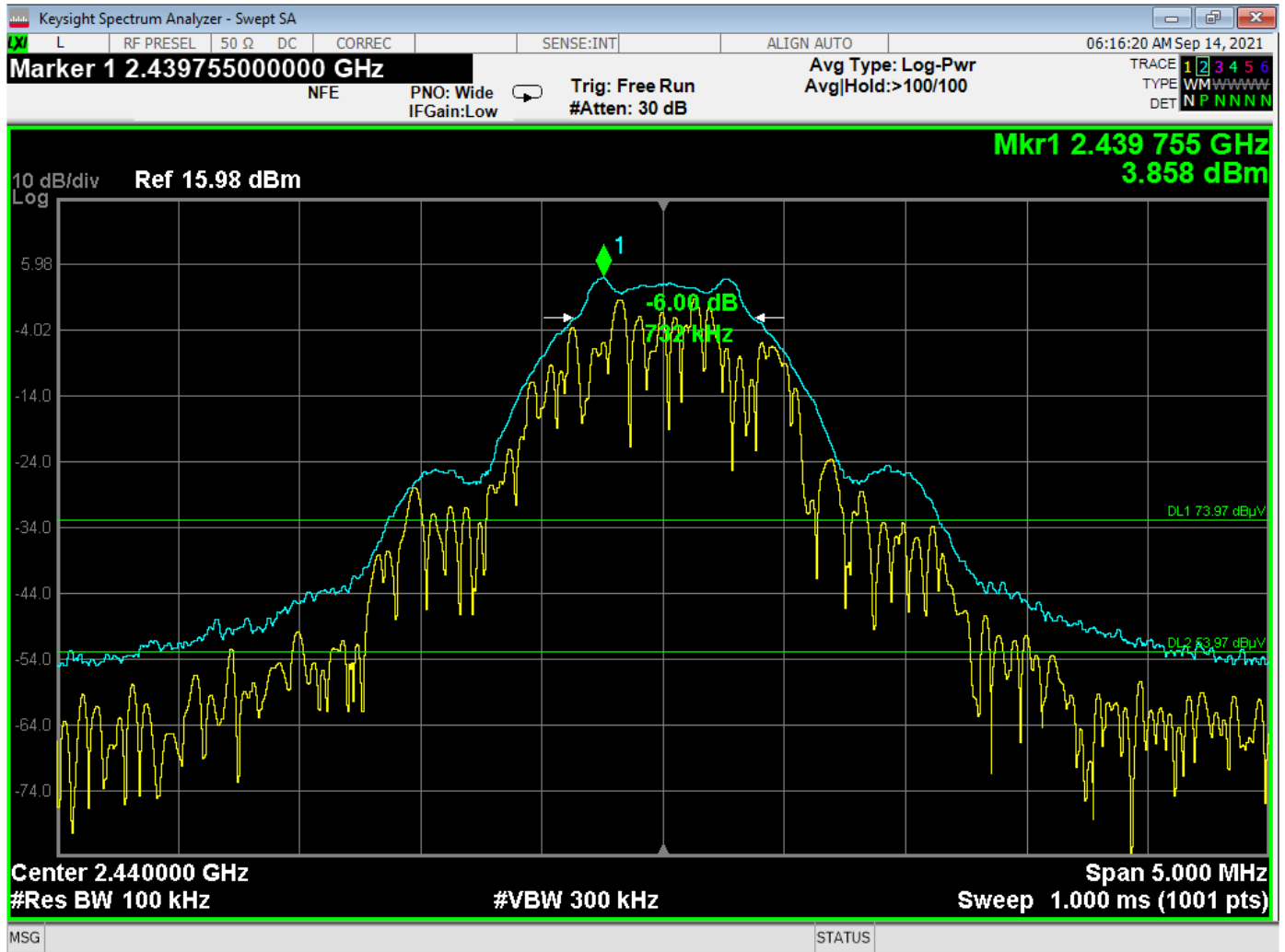


**COMPATIBLE
ELECTRONICS**

FCC Part 15 Subpart B and C; FCC Section 15.247; RSS-247; and RSS-GEN Test Report

Bluetooth Sensor

Model: Sensor-005



-6 dB Bandwidth – Middle Channel

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(949) 587-0400

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1050 Lawrence Drive
Newbury Park, CA 91320
(805) 480-4044

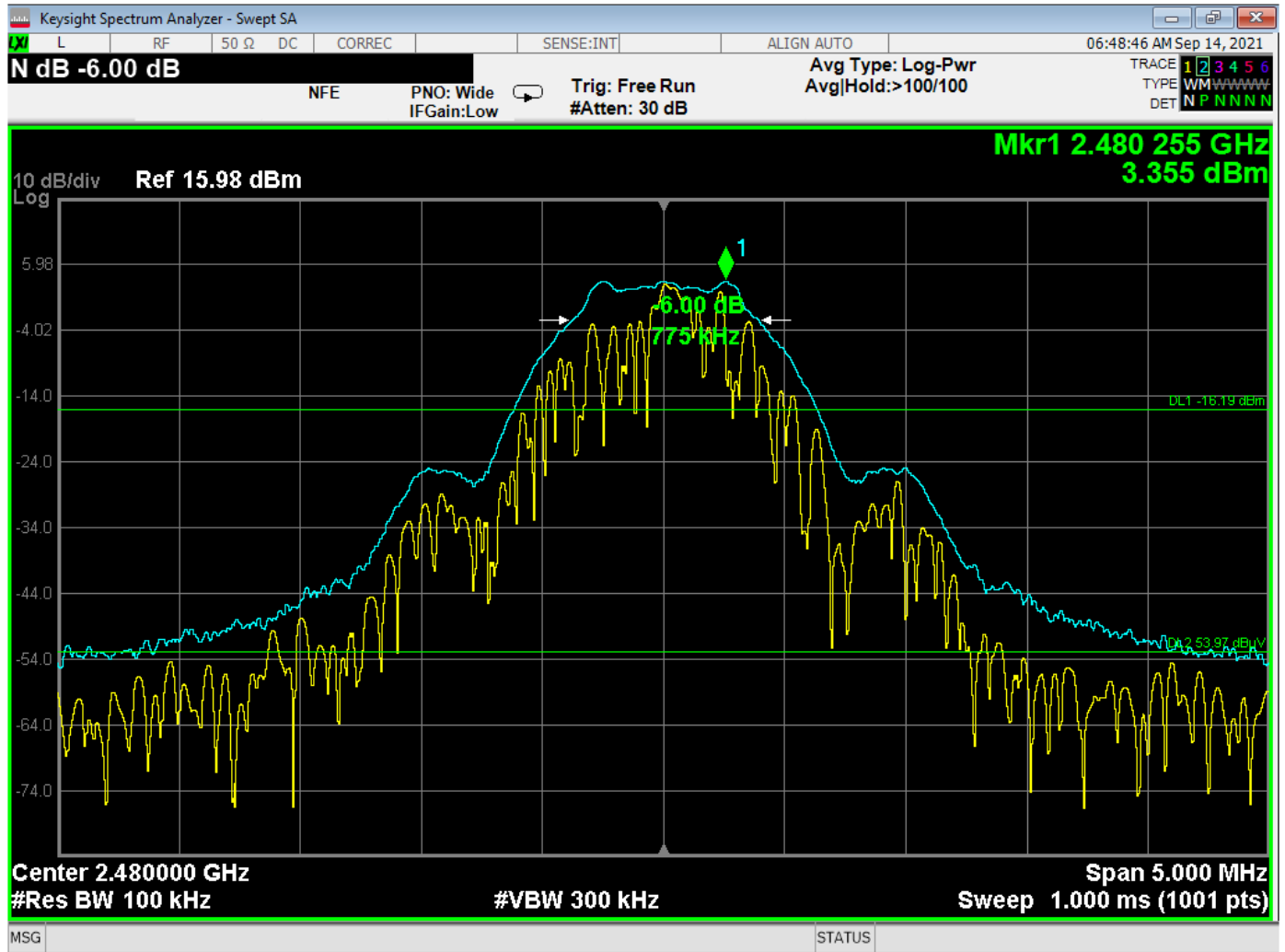


**COMPATIBLE
ELECTRONICS**

FCC Part 15 Subpart B and C; FCC Section 15.247; RSS-247; and RSS-GEN Test Report

Bluetooth Sensor

Model: Sensor-005



-6 dB Bandwidth – High Channel

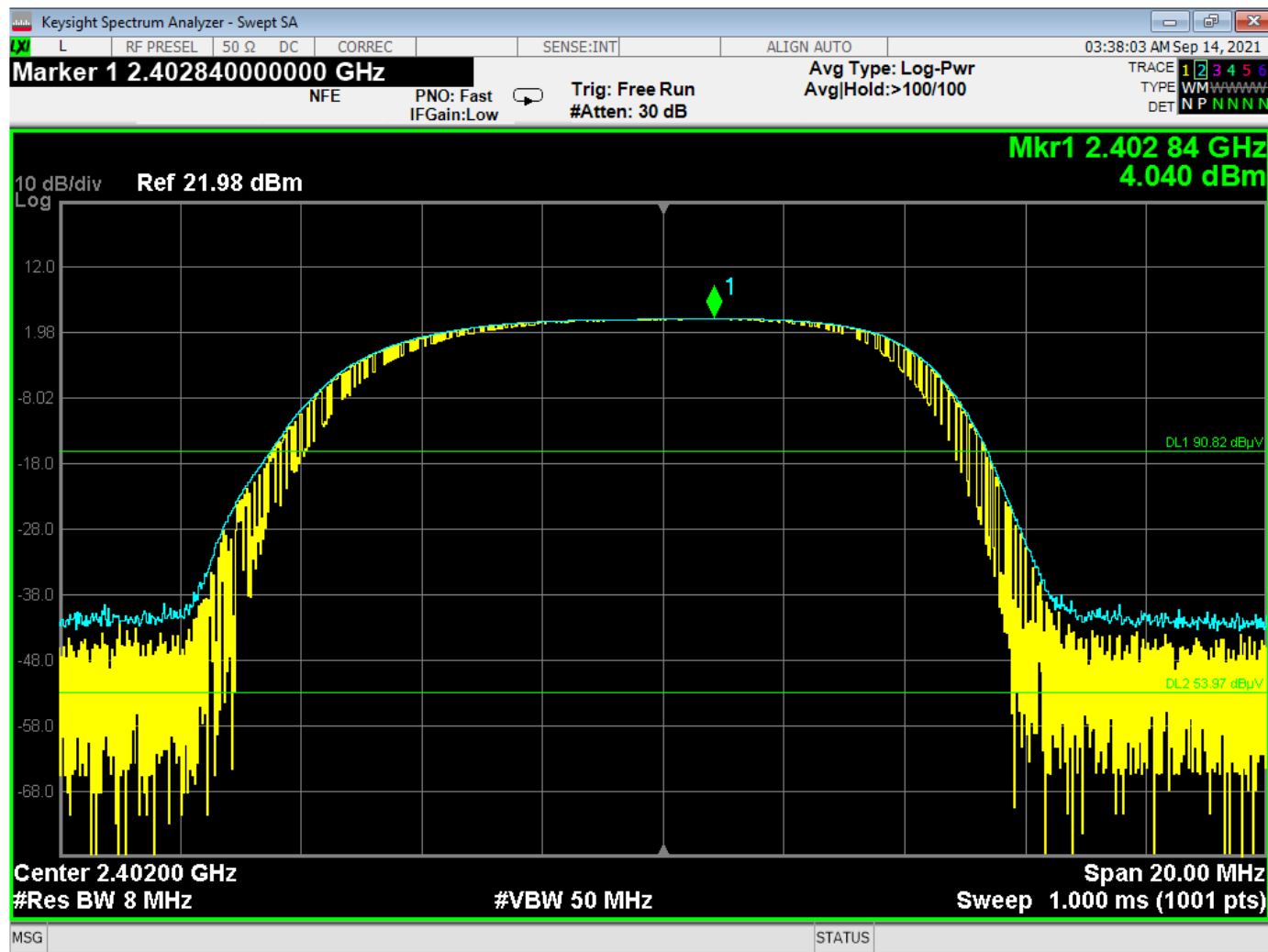
Brea Division
114 Olinda Drive
Brea, CA 92823
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Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

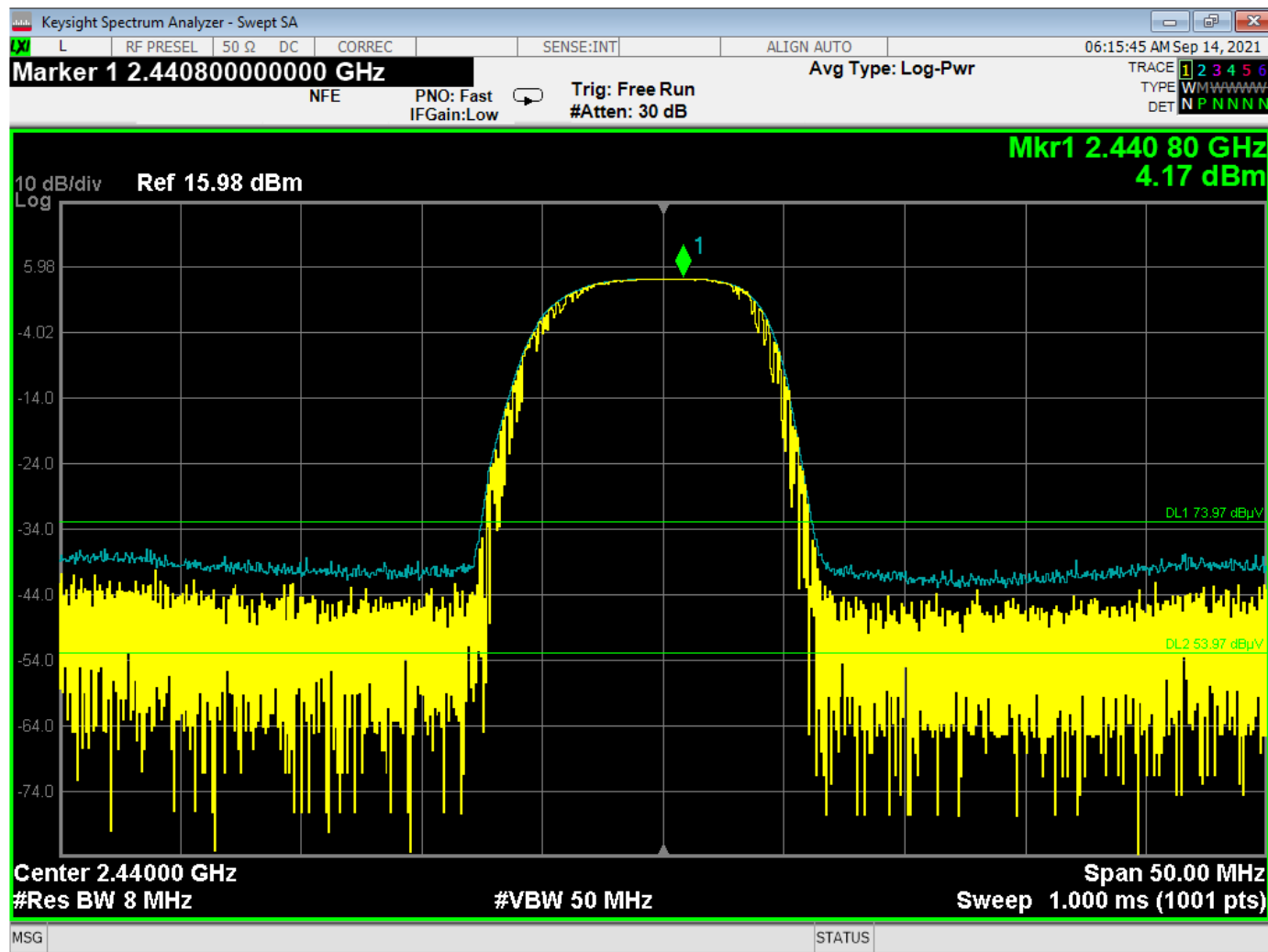
Newbury Park Division
1050 Lawrence Drive
Newbury Park, CA 91320
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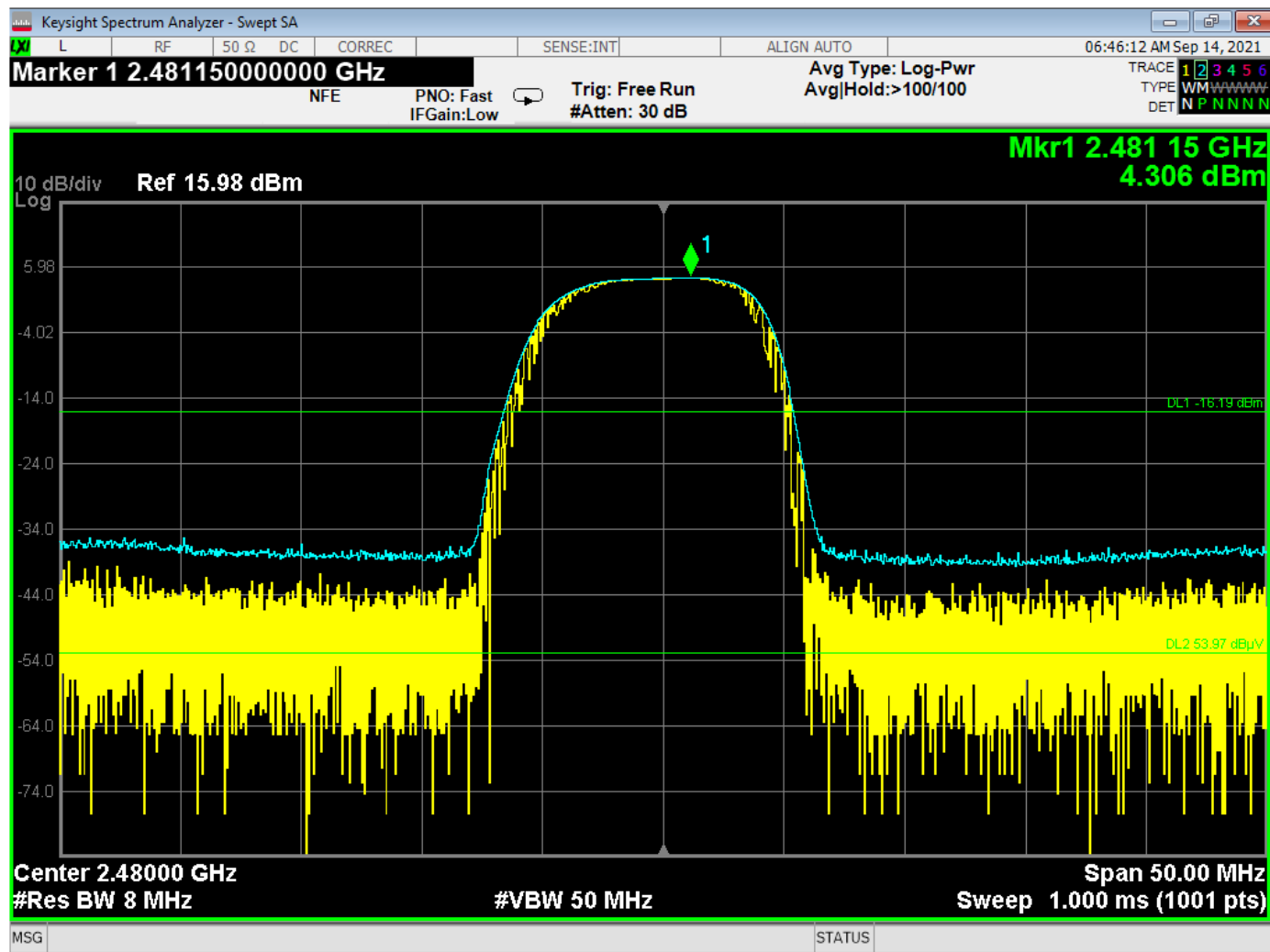
***PEAK POWER OUTPUT
DATA SHEETS***



Peak Power Output – Low Channel



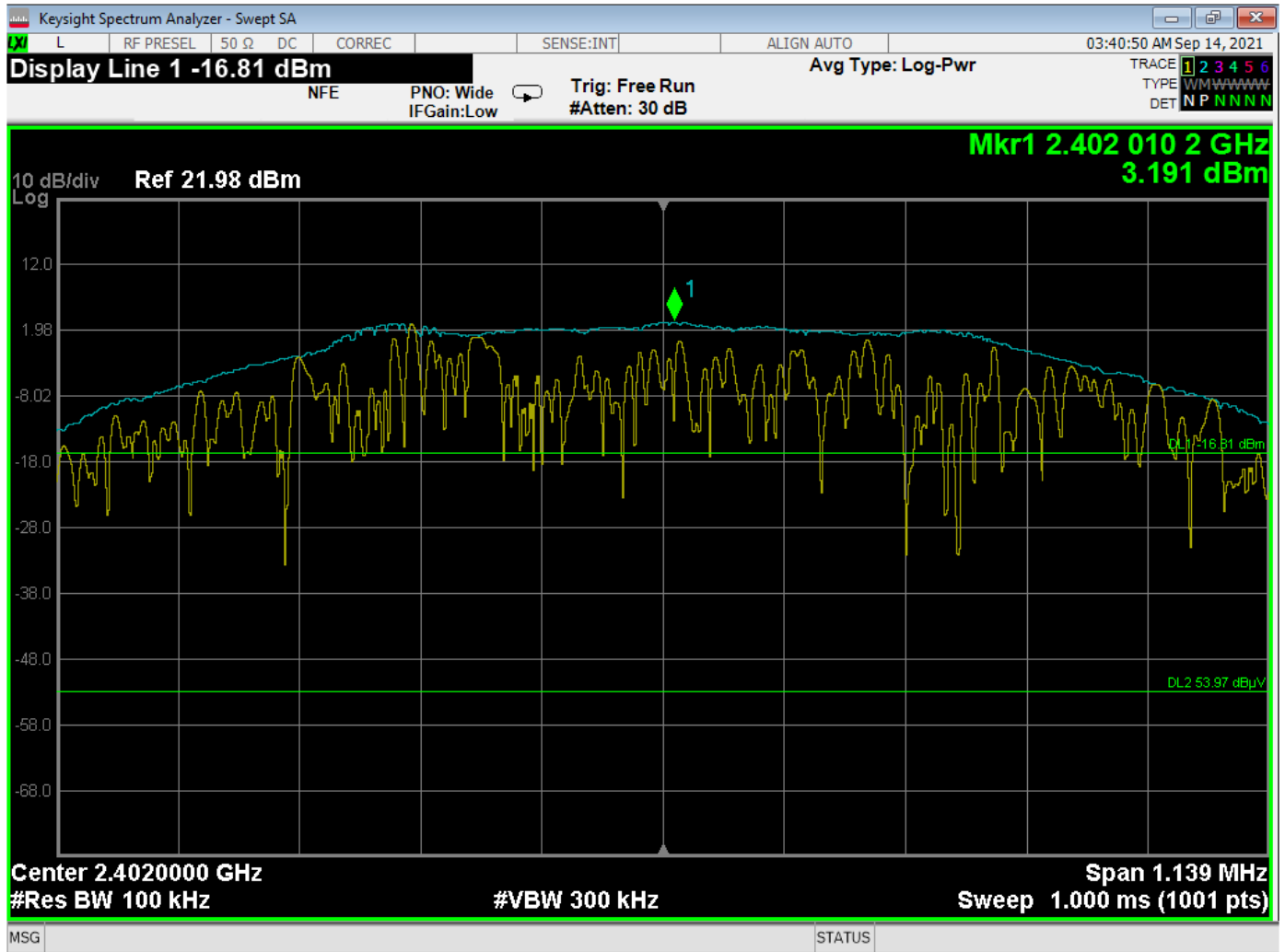
Peak Power Output – Middle Channel



Peak Power Output – High Channel



***RF ANTENNA CONDUCTED
DATA SHEETS***

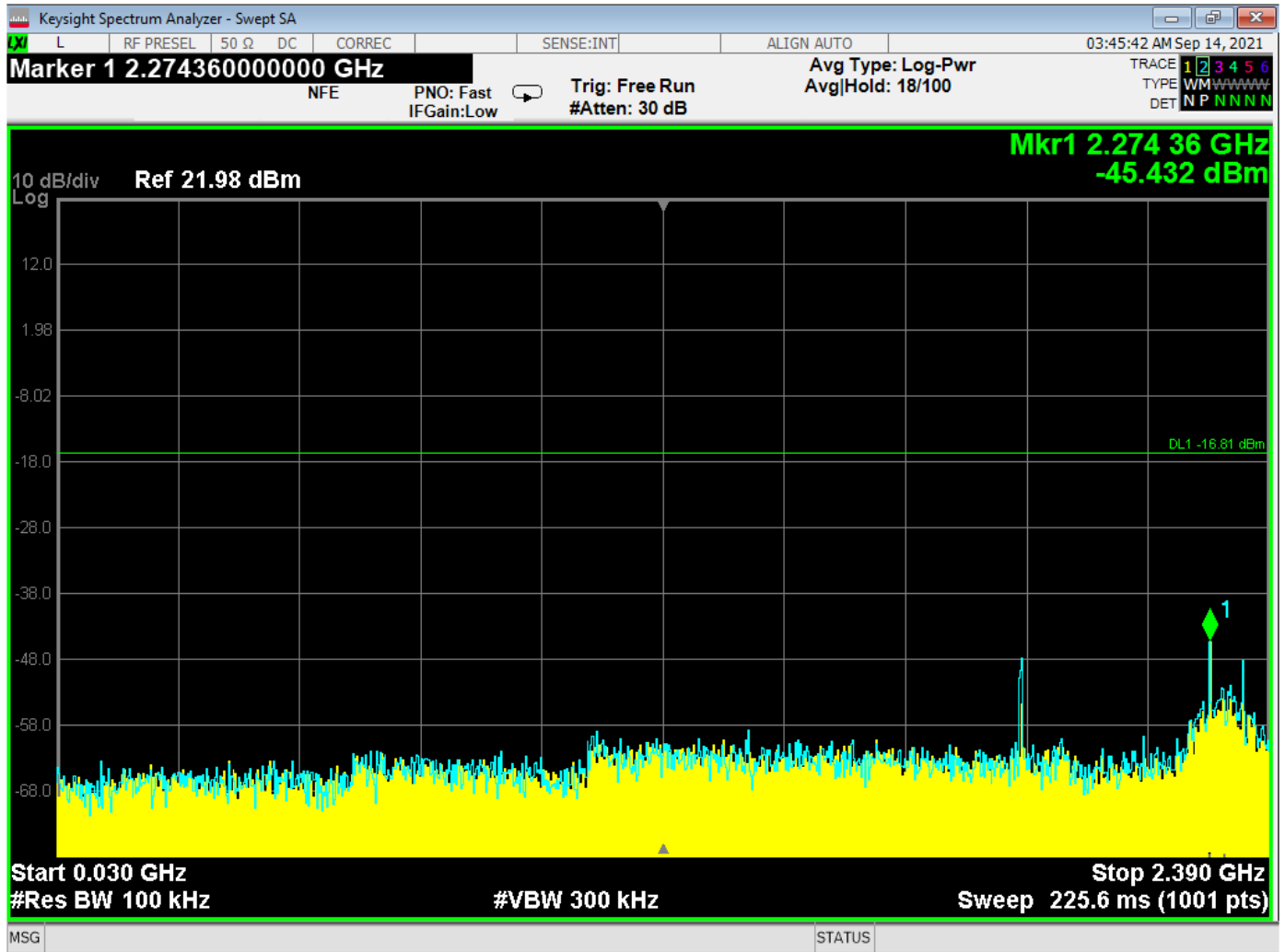

**COMPATIBLE
ELECTRONICS**
**Bluetooth Sensor
Model: Sensor-005**


RF Antenna Conducted – Low Channel – Reference Level

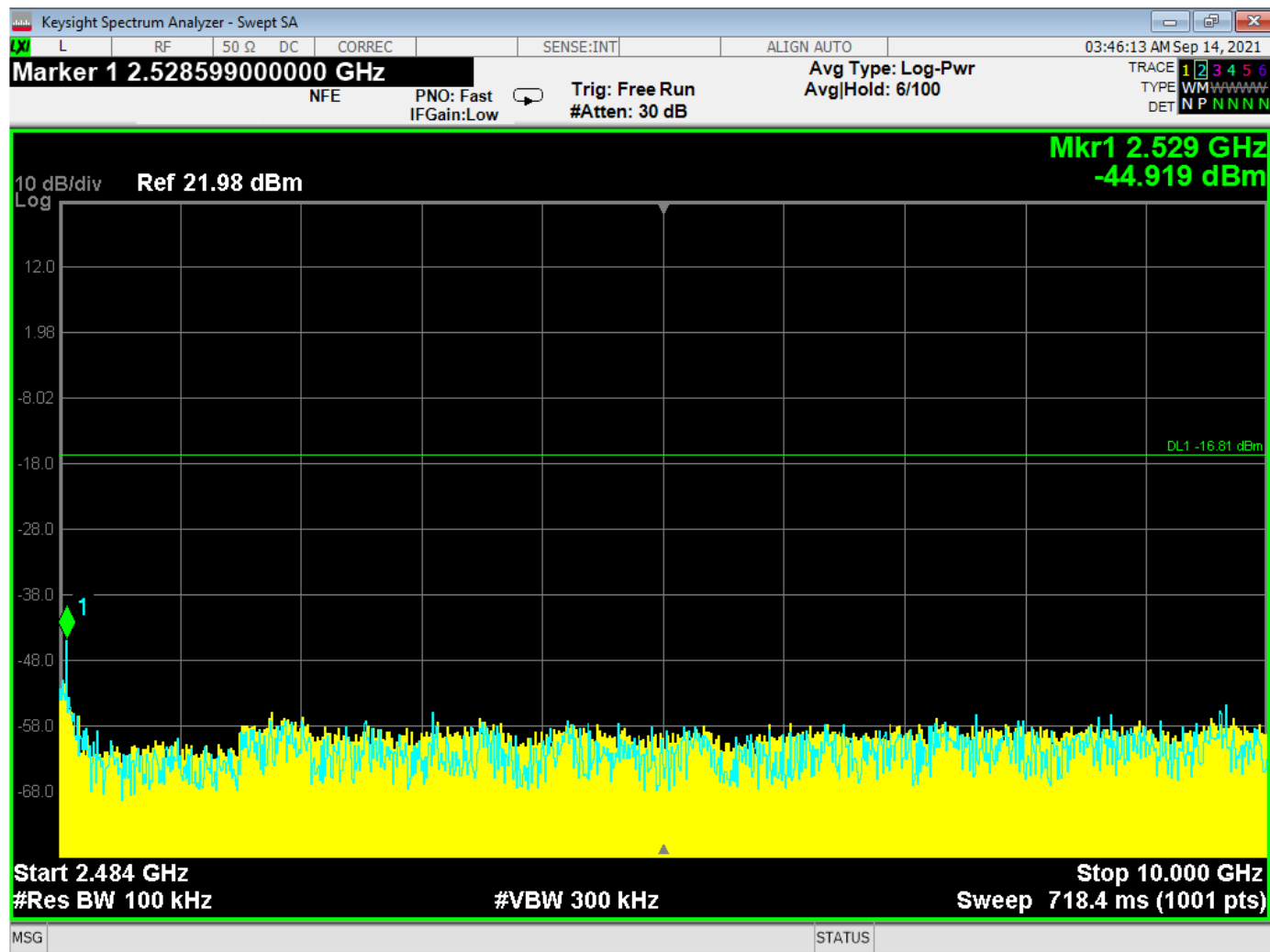
Brea Division
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Lake Forest Division
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Lake Forest, CA 92630
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Newbury Park, CA 91320
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RF Antenna Conducted – Low Channel – 30 MHz to 2.390 GHz



RF Antenna Conducted – Low Channel – 2484 MHz to 10 GHz

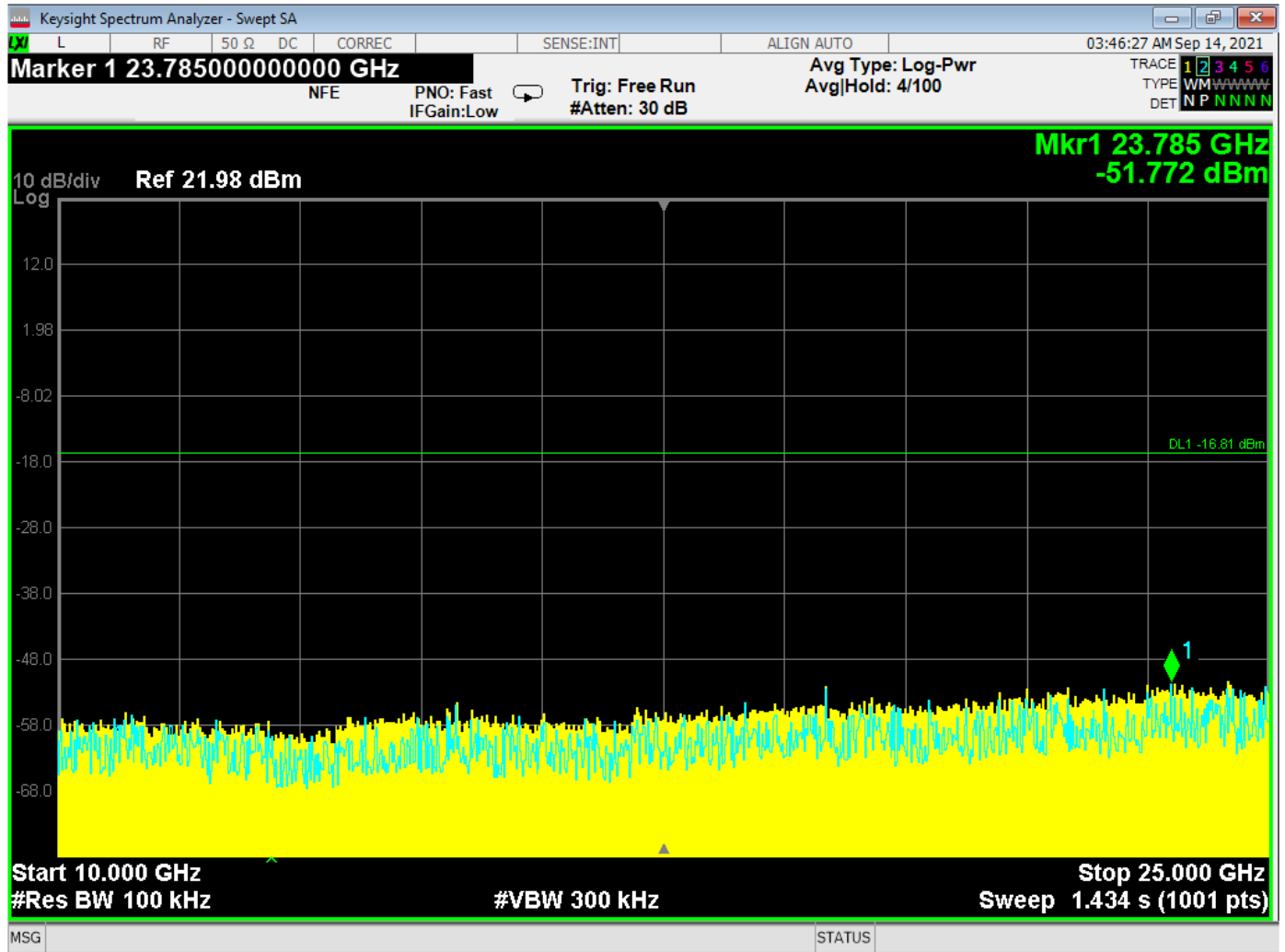


**COMPATIBLE
ELECTRONICS**

FCC Part 15 Subpart B and C; FCC Section 15.247; RSS-247; and RSS-GEN Test Report

Bluetooth Sensor

Model: Sensor-005

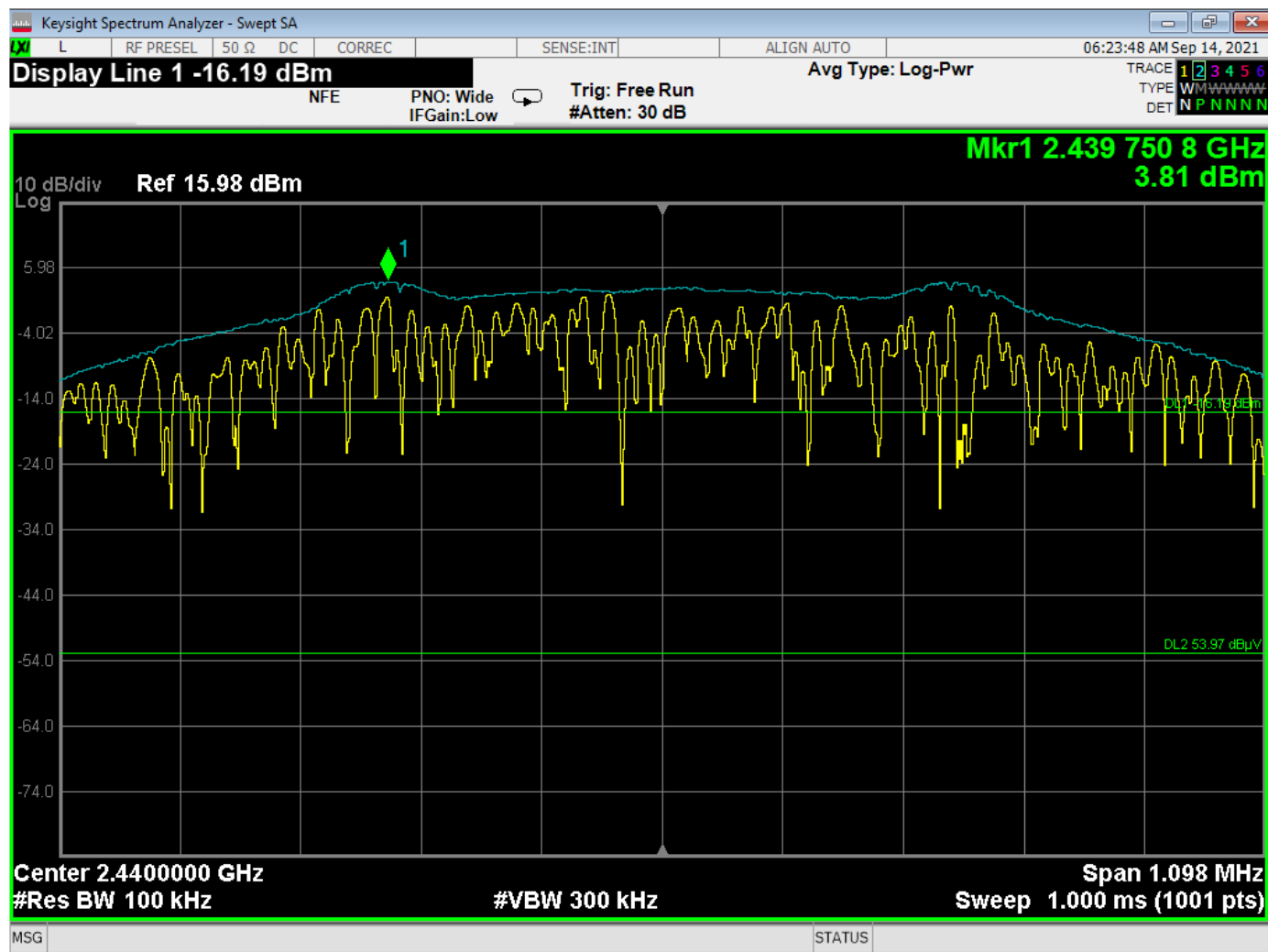


RF Antenna Conducted – Low Channel – 10 GHz to 25 GHz

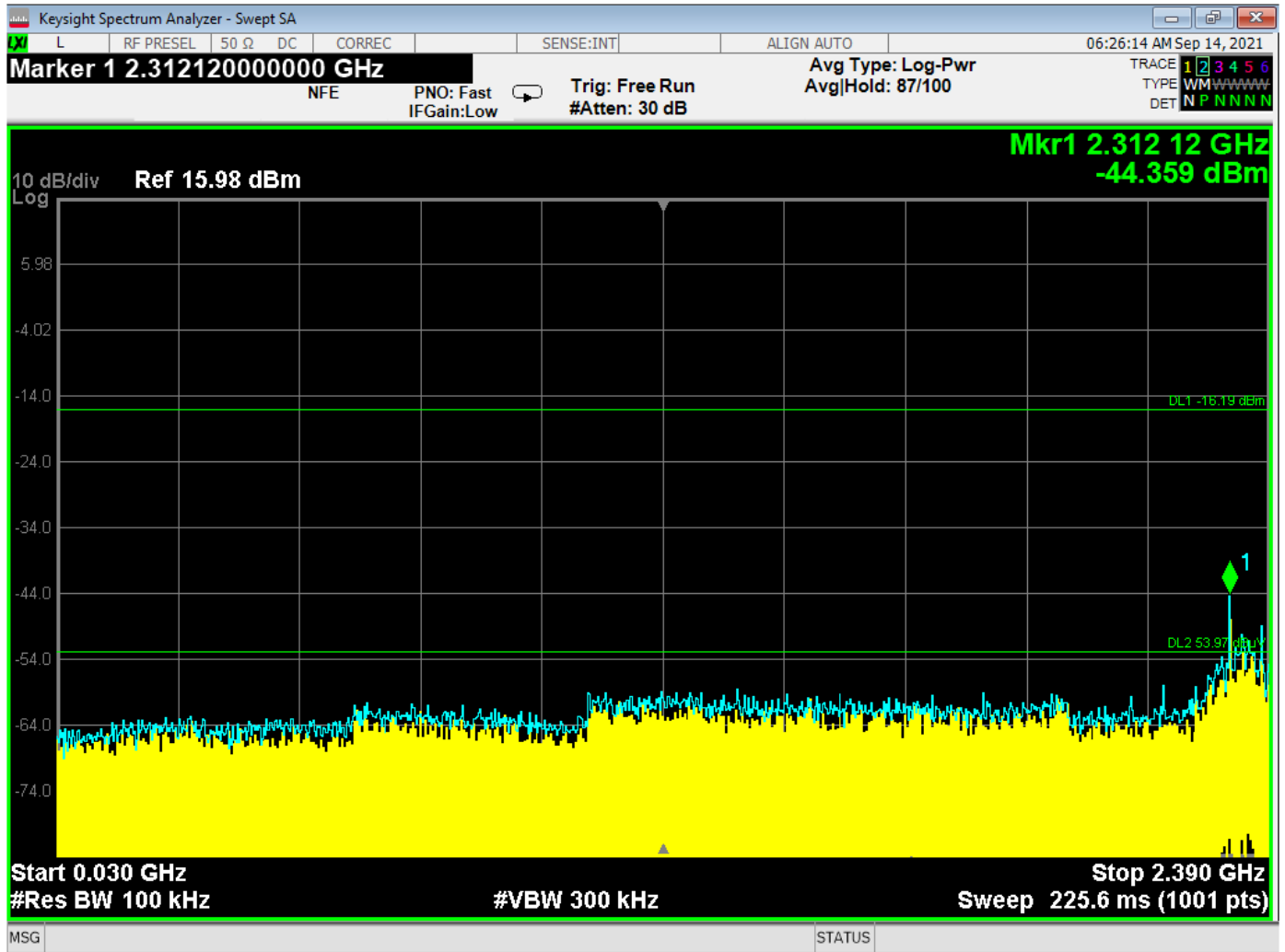
Brea Division
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Brea, CA 92823
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RF Antenna Conducted – Middle Channel – Reference Level

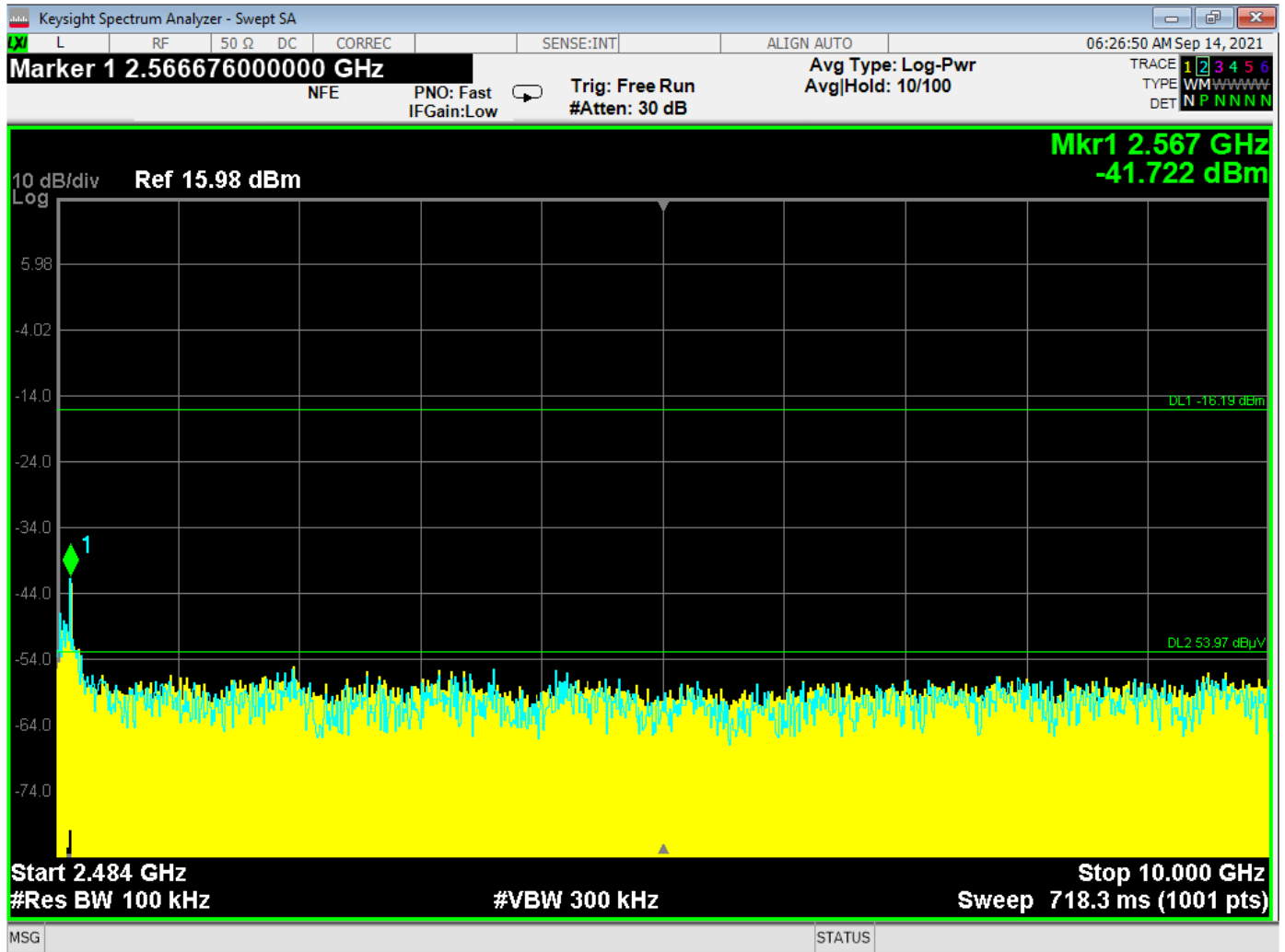

**COMPATIBLE
ELECTRONICS**
**Bluetooth Sensor
Model: Sensor-005**


RF Antenna Conducted – Middle Channel – 30 MHz to 2.390 GHz

Brea Division
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RF Antenna Conducted – Middle Channel – 2484 MHz to 10 GHz

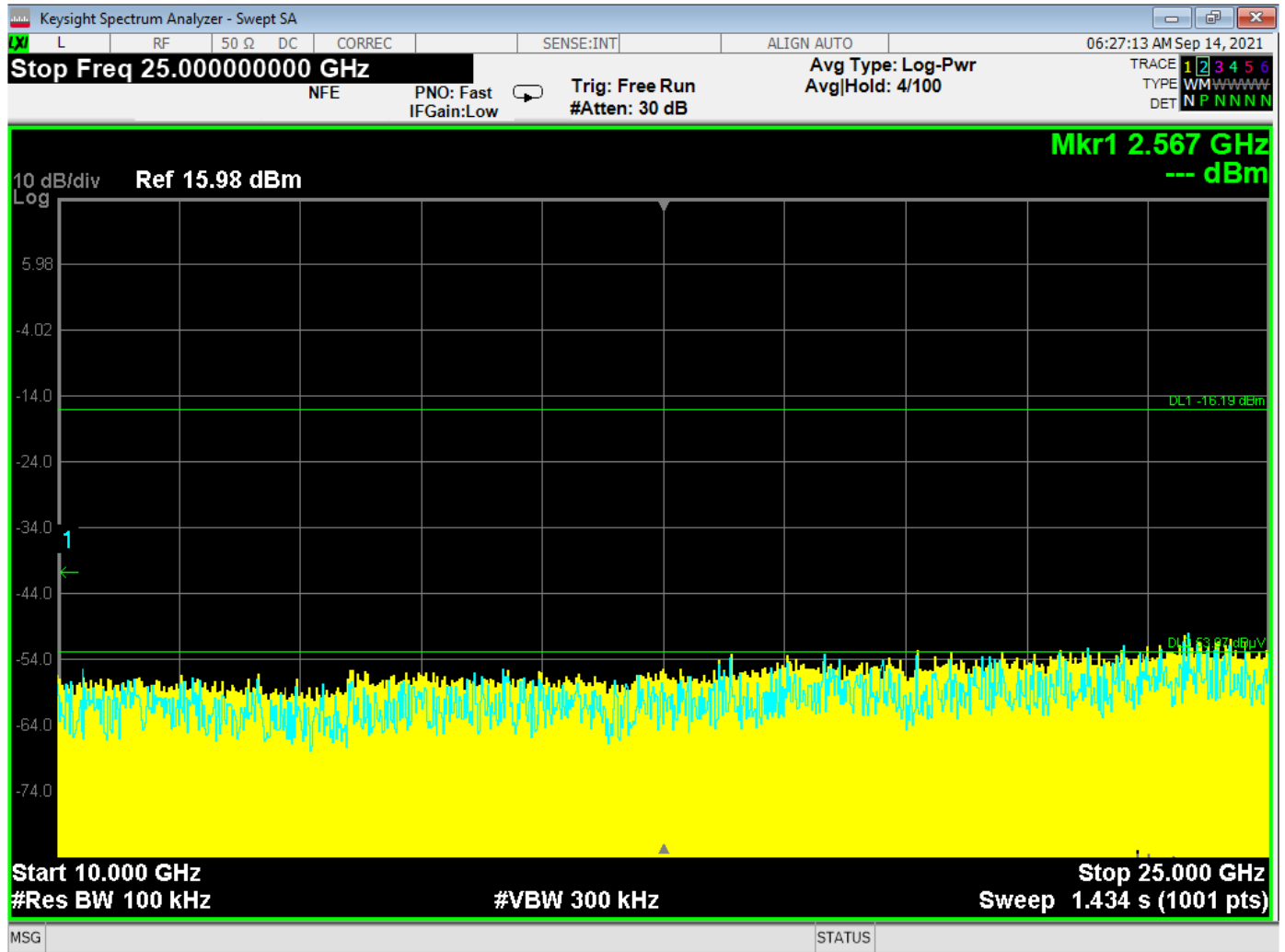


**COMPATIBLE
ELECTRONICS**

FCC Part 15 Subpart B and C; FCC Section 15.247; RSS-247; and RSS-GEN Test Report

Bluetooth Sensor

Model: Sensor-005

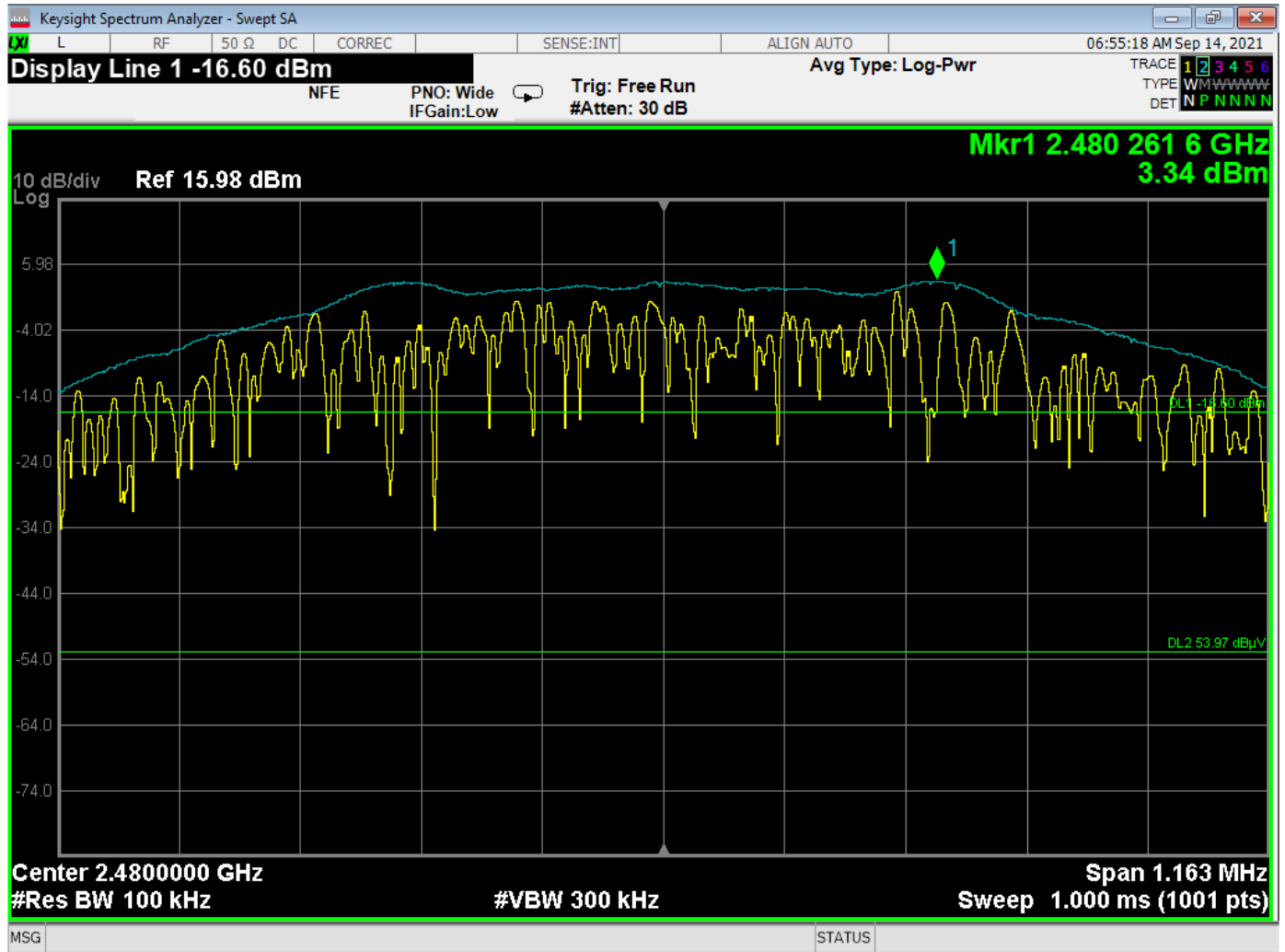


RF Antenna Conducted – Middle Channel – 10 GHz to 25 GHz

Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

Newbury Park Division
1050 Lawrence Drive
Newbury Park, CA 91320
(805) 480-4044

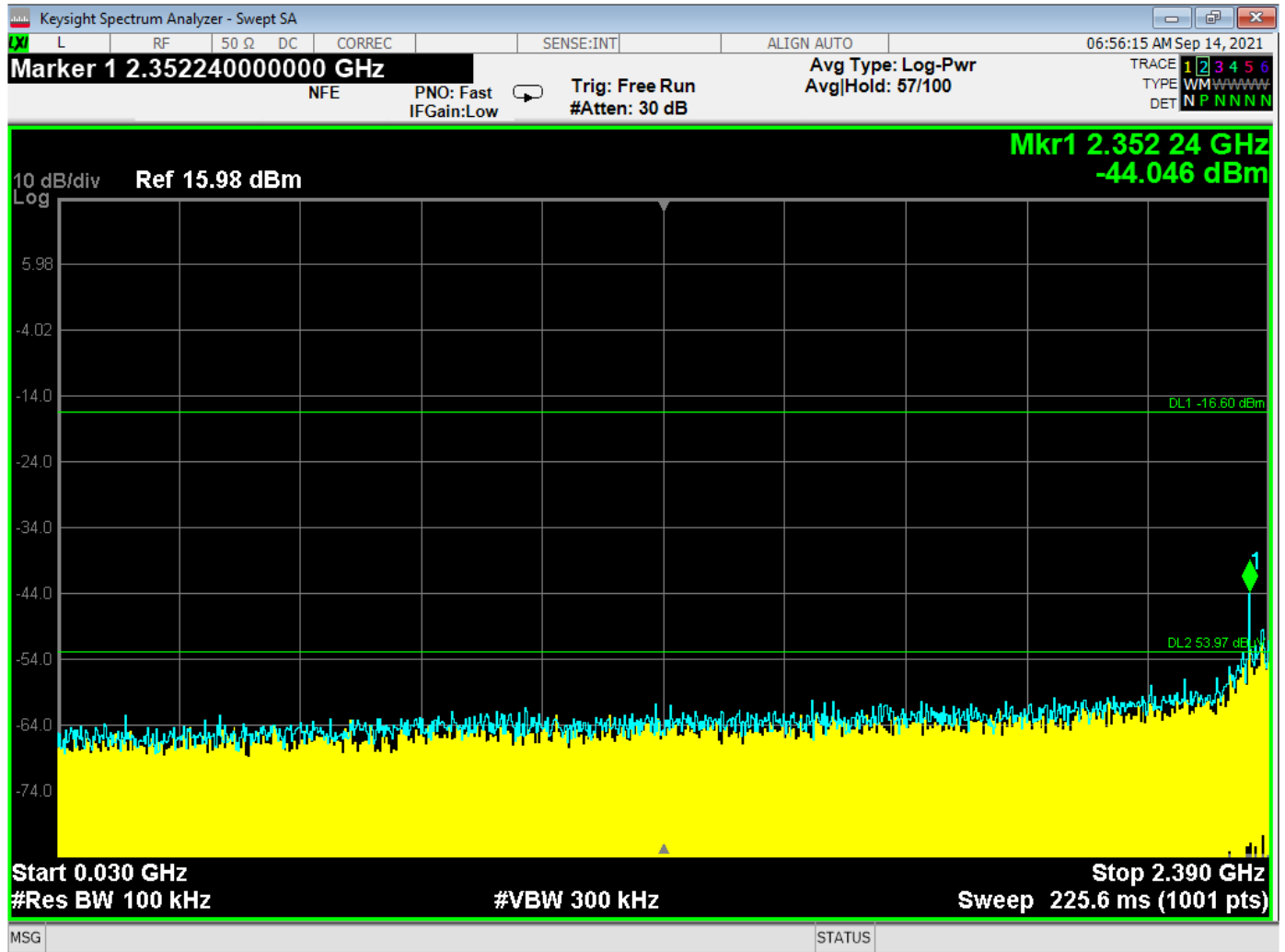

**COMPATIBLE
ELECTRONICS**
**Bluetooth Sensor
Model: Sensor-005**


RF Antenna Conducted – High Channel – Reference Level

Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Lake Forest Division
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(949) 587-0400

Newbury Park Division
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Newbury Park, CA 91320
(805) 480-4044


**COMPATIBLE
ELECTRONICS**
*Bluetooth Sensor
Model: Sensor-005*


RF Antenna Conducted – High Channel – 30 MHz to 2.390 GHz

Brea Division
114 Olinda Drive
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20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

Newbury Park Division
1050 Lawrence Drive
Newbury Park, CA 91320
(805) 480-4044

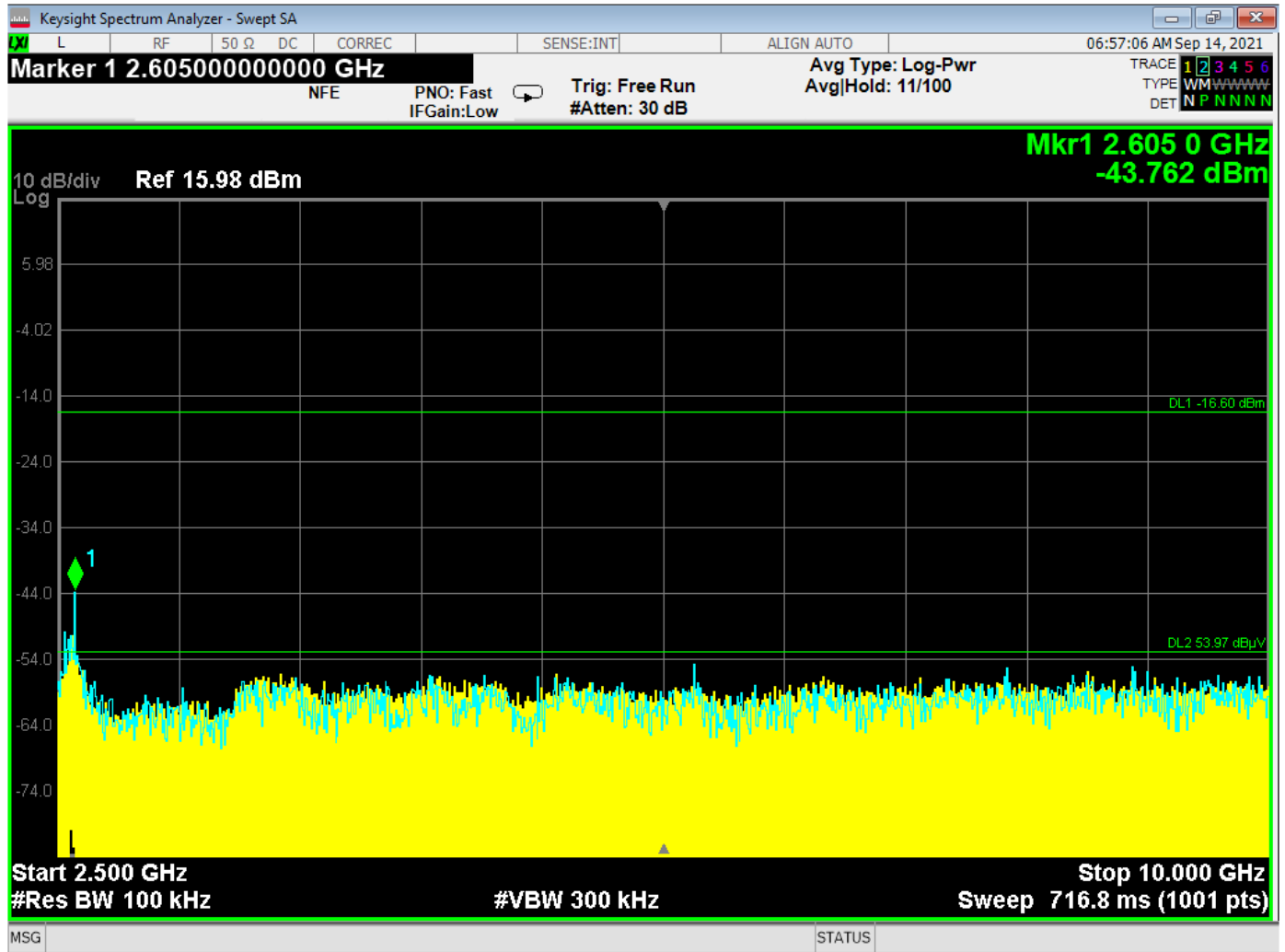


**COMPATIBLE
ELECTRONICS**

FCC Part 15 Subpart B and C; FCC Section 15.247; RSS-247; and RSS-GEN Test Report

Bluetooth Sensor

Model: Sensor-005

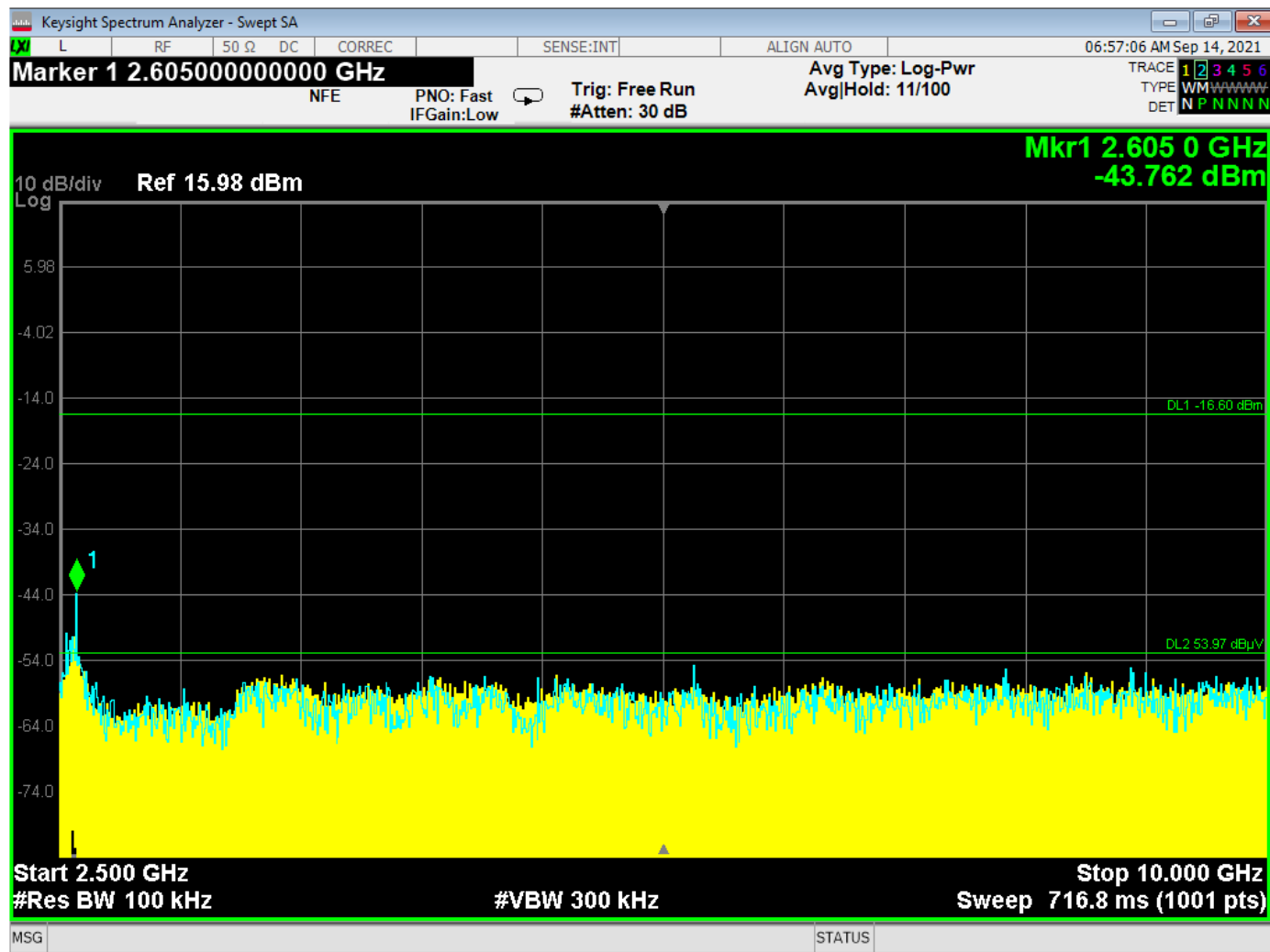


RF Antenna Conducted – High Channel – 2500 MHz to 10 GHz

Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

Newbury Park Division
1050 Lawrence Drive
Newbury Park, CA 91320
(805) 480-4044



RF Antenna Conducted – High Channel – 2.5 GHz to 10 GHz

HIDRATE, INC.

BLUETOOTH SENSOR

MODEL: SENSOR-005

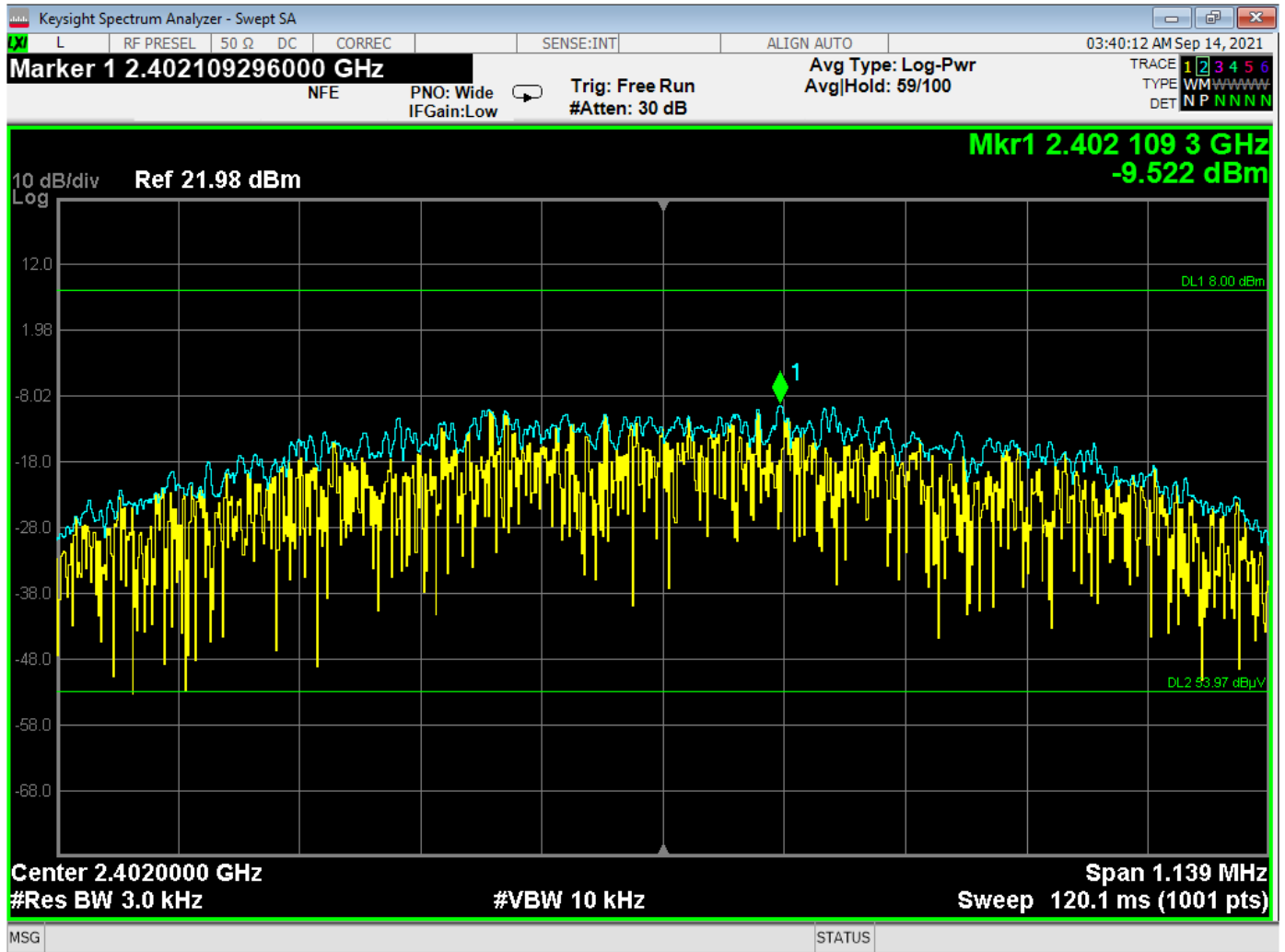
EMISSIONS IN NON-RESTRICTED BANDS

FREQUENCY (MHz)	LEVEL (dBm)	Limit* (dBm)	Margin (dB)
2529	-44.919	-16.19	-28.729
2567	-41.722	-16.19	-25.532
2605	-43.762	-16.19	-27.572

*The Limit is based on 20 dB below the highest reference level obtained on the previous pages per section 11.11.2 of ANSI C63.10.



***PEAK POWER SPECTRAL DENSITY
DATA SHEETS***


**COMPATIBLE
ELECTRONICS**
*Bluetooth Sensor
Model: Sensor-005*


Peak Power Spectral Density – Low Channel

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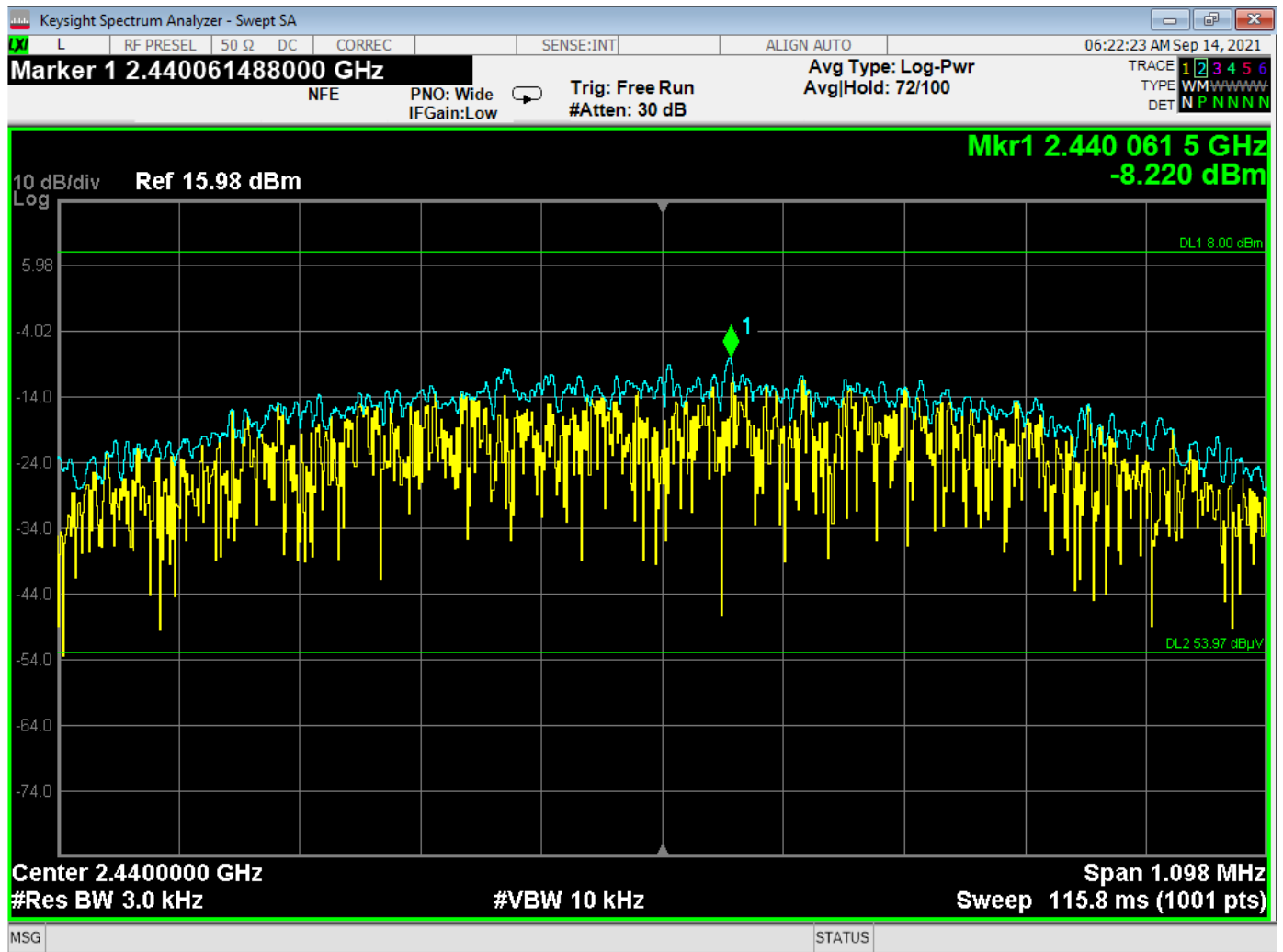


**COMPATIBLE
ELECTRONICS**

FCC Part 15 Subpart B and C; FCC Section 15.247; RSS-247; and RSS-GEN Test Report

Bluetooth Sensor

Model: Sensor-005

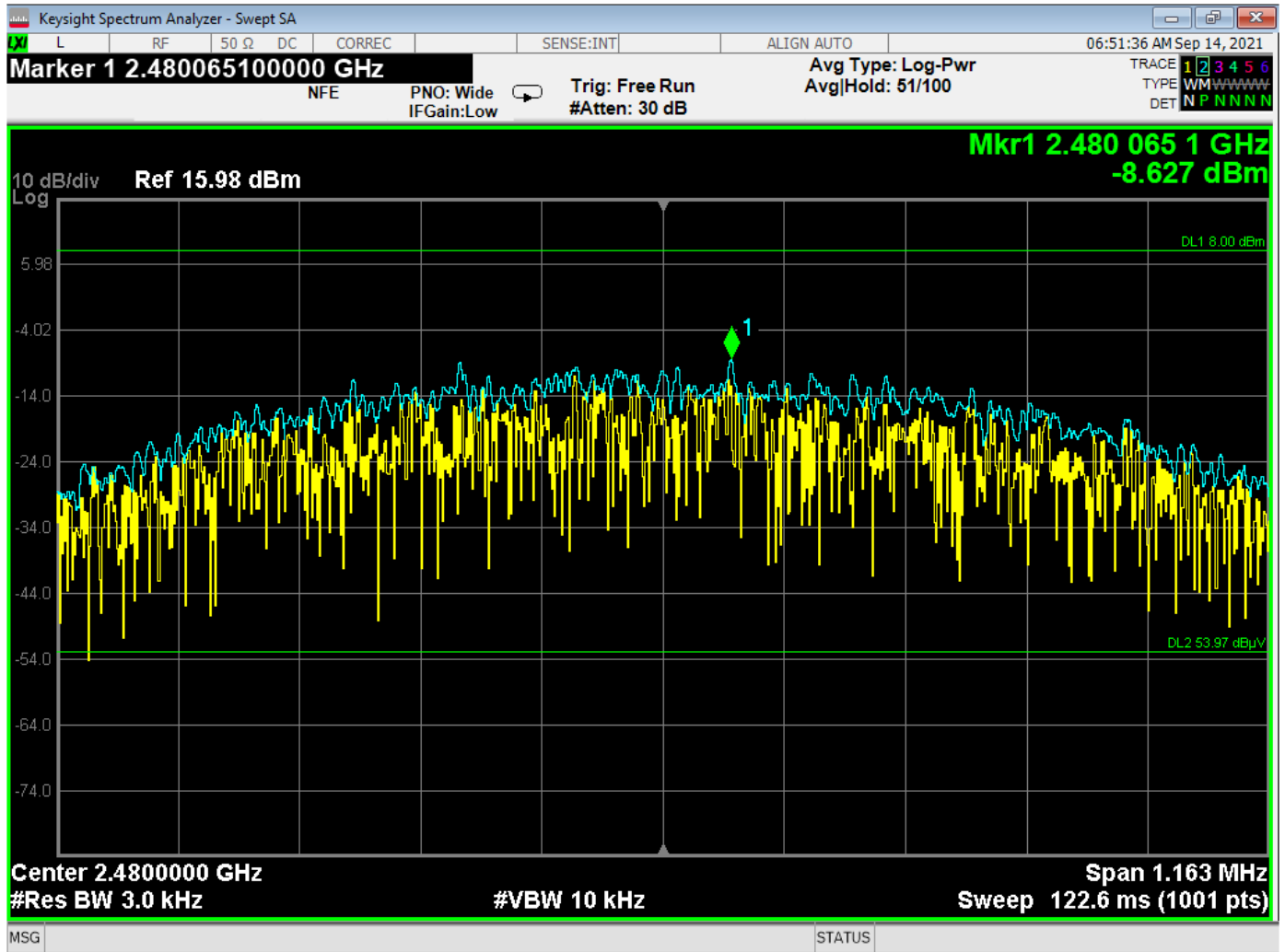


Peak Power Spectral Density – Middle Channel

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**COMPATIBLE
ELECTRONICS**
**Bluetooth Sensor
Model: Sensor-005**


Peak Power Spectral Density – High Channel

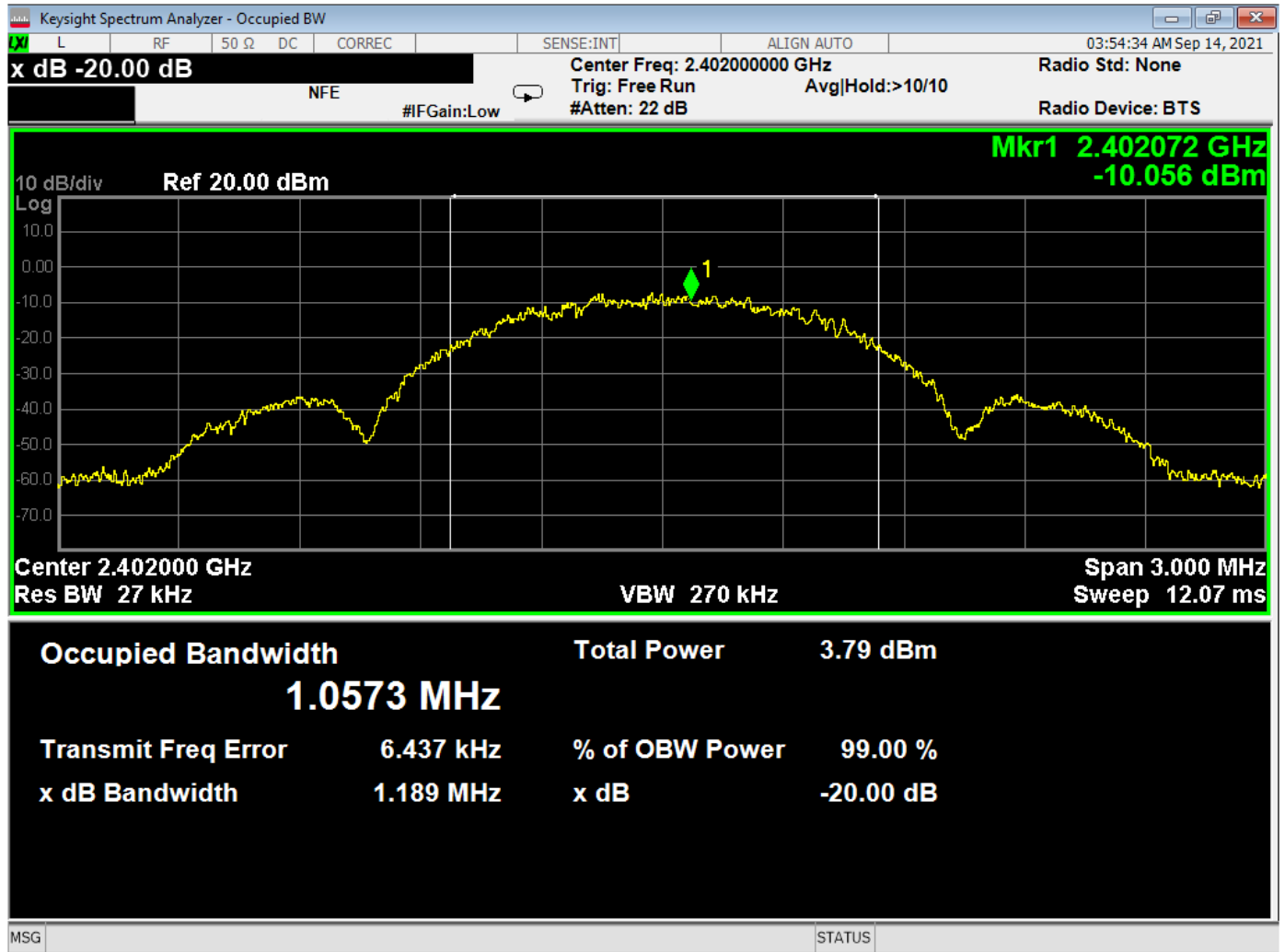
Brea Division
114 Olinda Drive
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***99% BANDWIDTH
DATA SHEETS***

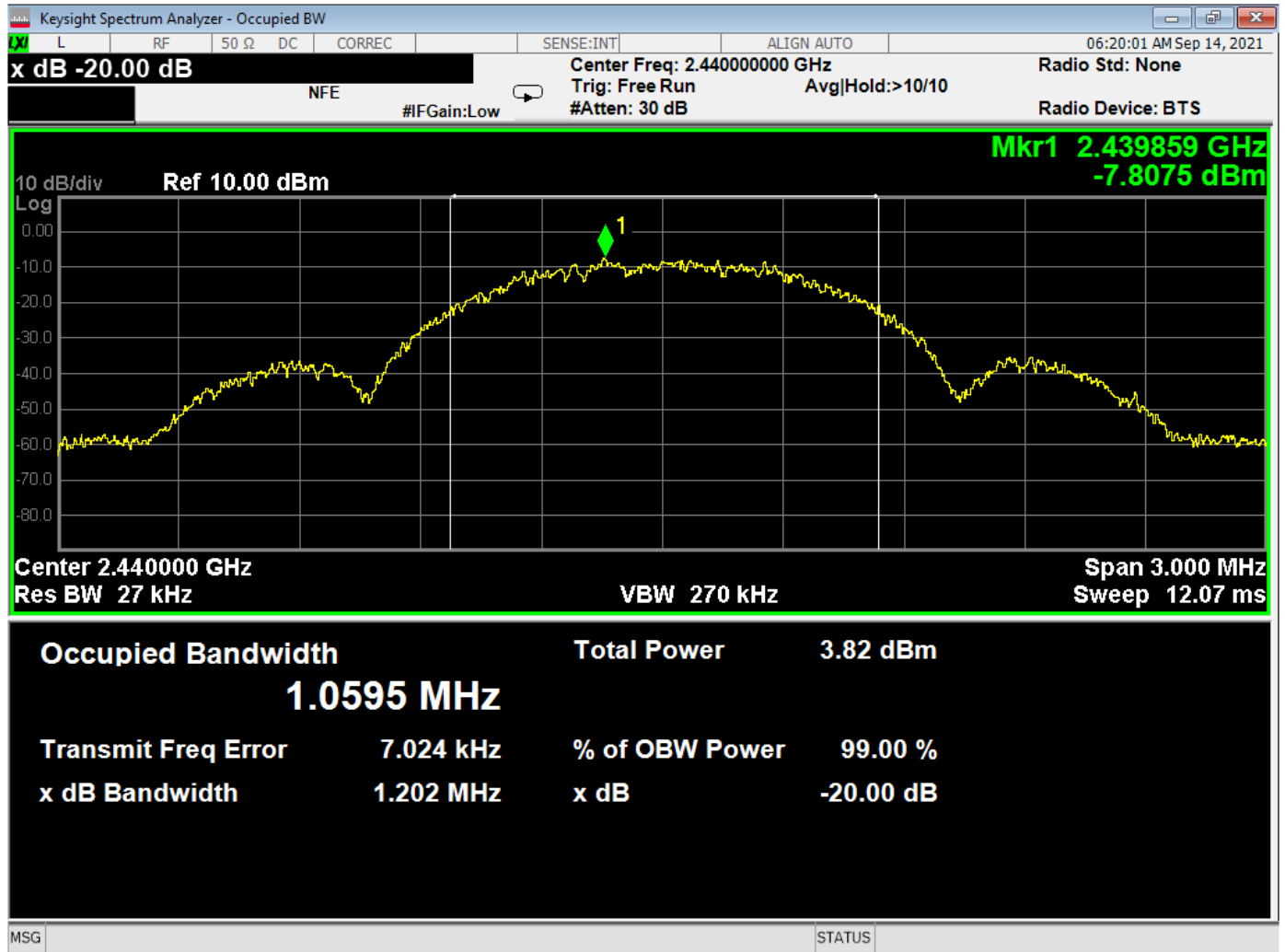

**COMPATIBLE
ELECTRONICS**
*Bluetooth Sensor
Model: Sensor-005*


99% Bandwidth – Low Channel

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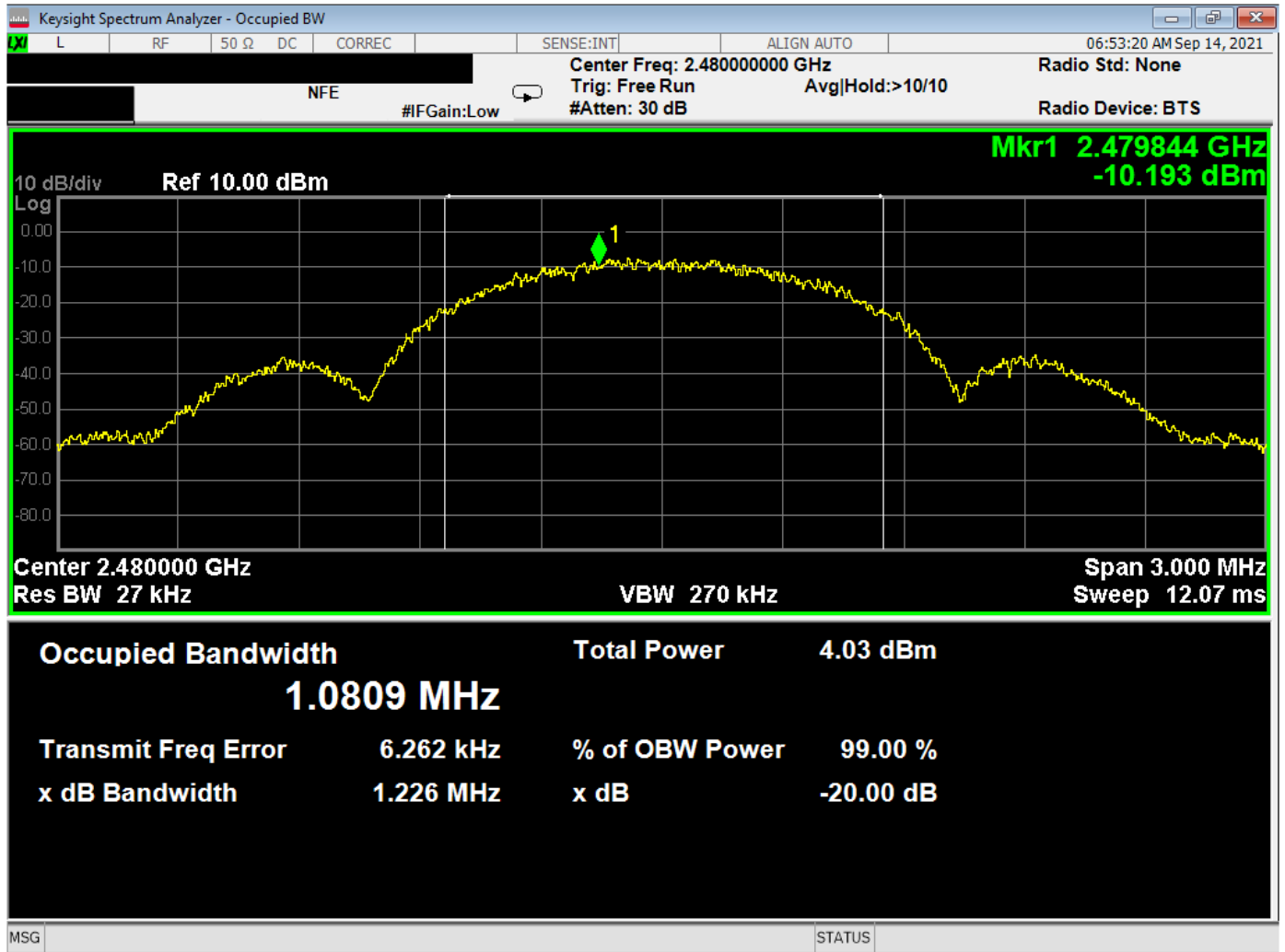

**COMPATIBLE
ELECTRONICS**
*Bluetooth Sensor
Model: Sensor-005*


99% Bandwidth – Middle Channel

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**COMPATIBLE
ELECTRONICS**
*Bluetooth Sensor
Model: Sensor-005*


99% Bandwidth – High Channel

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