

# Deako Inc.

# TEST REPORT

**SCOPE OF WORK**  
FCC TESTING— DS2005

**REPORT NUMBER**  
211027051SZN-002

**ISSUE DATE** [REVISED DATE]  
20 May 2022 [-----]

**PAGES**  
35

**DOCUMENT CONTROL NUMBER**  
FCC ID 247\_b  
© 2017 INTERTEK



**Deako Inc.**

Application  
For  
Certification

**FCC ID: 2AK29-DS2005**

**Smart Switch**

**Model: DS2005**

**2.4GHz BLE Transceiver**

Report No.: 211027051SZN-002

We hereby certify that the sample of the above item is considered to comply with the requirements of FCC Part 15, Subpart C for Intentional Radiator, mention 47 CFR [10-1-20]

**Prepared and Checked by:**

**Karot Huang**  
**Assistant Engineer**

**Approved by:**

**Peter Kang**  
**Senior Technical Supervisor**  
**Date: 20 May 2022**

This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

**Intertek Testing Services Shenzhen Ltd. Longhua Branch**

101, 201, Building B, No. 308 Wuhe Avenue, Zhangkengjing Community, GuanHu Subdistrict, LongHua District, Shenzhen, P.R. China.  
Tel: (86 755) 8601 6288 Fax: (86 755) 8601 6751

**MEASUREMENT/TECHNICAL REPORT**

This report concerns (check one)      Original Grant \_\_\_\_\_      Class II Change  \_\_\_\_\_

Equipment Type: DTS - Part 15 Digital Transmission Systems (Bluetooth transmitter portion)

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)?      Yes \_\_\_\_\_      No  \_\_\_\_\_

If yes, defer until : \_\_\_\_\_  
date

Company Name agrees to notify the Commission by: \_\_\_\_\_  
date

of the intended date of announcement of the product so that the grant can be issued on that date.

Transition Rules Request per 15.37?      Yes \_\_\_\_\_      No  \_\_\_\_\_

If no, assumed Part 15, Subpart C for intentional radiator - the new 47 CFR [10-01-20] Edition] provision.

Report prepared by:

**Karot Huang**  
**Intertek Testing Services Shenzhen Ltd. Longhua Branch**  
101, 201, Building B, No. 308 Wuhe Avenue, Zhangkengjing Community,  
GuanHu Subdistrict, LongHua District, Shenzhen, P.R. China.  
Tel: (86 755) 8614 0684 Fax: (86 755) 8601 6661

## Table of Contents

<b>1.0</b>	<b>Summary of Test results</b>	<b>4</b>
<b>2.0</b>	<b><u>General Description</u></b>	<b>5</b>
2.1	Product Description .....	5
2.2	Related Submittal(s) Grants .....	5
2.3	Test Methodology .....	5
2.4	Test Facility .....	5
<b>3.0</b>	<b><u>System Test Configuration</u></b>	<b>6</b>
3.1	Justification .....	6
3.2	EUT Exercising Software .....	6
3.3	Special Accessories .....	6
3.4	Measurement Uncertainty .....	7
3.5	Equipment Modification .....	7
3.6	Support Equipment List and Description .....	7
<b>4.0</b>	<b><u>Measurement Results</u></b>	<b>8</b>
4.1	Maximum Conducted Output Power at Antenna Terminals .....	8
4.2	Minimum 6 dB RF Bandwidth .....	9
4.3	Maximum Power Density Reading .....	12
4.4	Out of Band Conducted Emissions .....	15
4.5	Out of Band Radiated Emissions .....	20
4.6	Transmitter Radiated Emissions in Restricted Bands .....	21
4.7	Field Strength Calculation .....	22
4.8	Radiated Spurious Emission .....	23
4.9	Conducted Emission .....	29
4.10	Radiated Emissions from Digital Section of Transceiver .....	32
4.11	Transmitter Duty Cycle Calculation and Measurements .....	33
<b>5.0</b>	<b><u>Equipment Photographs</u></b>	<b>34</b>
<b>6.0</b>	<b><u>Product Labelling</u></b>	<b>34</b>
<b>7.0</b>	<b><u>Technical Specifications</u></b>	<b>34</b>
<b>8.0</b>	<b><u>Instruction Manual</u></b>	<b>34</b>
<b>9.0</b>	<b><u>Confidentiality Request</u></b>	<b>34</b>
<b>10.0</b>	<b><u>Discussion of Pulse Desensitization</u></b>	<b>34</b>
<b>11.0</b>	<b><u>Test Equipment List</u></b>	<b>35</b>

**1.0 Summary of Test results**

Applicant: Deako Inc.  
Address: 4201 Roosevelt Way, Suite 100, Seattle, WA, 98105  
Manufacturer: Deako Inc.  
Address: 4201 Roosevelt Way, Suite 100, Seattle, WA, 98105

**Model: DS2005**  
**FCC ID: 2AK29-DS2005**

TEST ITEM	REFERENCE	RESULTS
Max. Output power	15.247(b)(3)	Pass
6 dB Bandwidth	15.247(a)(2)	Pass
Max. Power Density	15.247(e)	Pass
Out of Band Antenna Conducted Emission	15.247(d)	Pass
Radiated Emission in Restricted Bands	15.247(d), 15.209, FCC 15.205	Pass
AC Conducted Emission	15.207	Pass
Antenna Requirement	15.203	Pass (See Notes)

Notes: The EUT uses an Integral Antenna which in accordance to Section 15.203 is considered sufficient to comply with the provisions of this section.

## 2.0 General Description

### 2.1 Product Description

The Equipment Under Test (EUT) is a Smart Switch with Bluetooth function operating in 2402-2480MHz. The EUT is powered by AC120V/60Hz. For more detailed features description, please refer to the user's manual.

Type of Modulation: GFSK

Antenna Type: Integral Antenna

Antenna Gain: 3.74dBi

Bluetooth Version: 4.2 BLE

For electronic filing, the brief circuit description is saved with filename: descri.pdf.

This test report is issued to the Company indicated based on the request of the Applicant of the product mentioned in this report. Partial technical data is referred to previous report number 200611012SZN-002 dated 21 July 2020. (refer report used) Due to the change of the PCB (Please refer to Request letter for C2PC.Pdf), partial tests are required after evaluation.

### 2.2 Related Submittal(s) Grants

This is an application for certification of:

DTS- Part 15 Digital Transmission Systems (2.4GHz Bluetooth BLE transmitter portion).

Remaining portions are subject to the following procedures:

1. WIFI function: Subject to FCC Certification and record in the test report: 211027051SZN-003.
2. Other Digital Function: Subject to FCC Part 15B SDOC.

### 2.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.10 (2013) and KDB 558074 D01 v05r02. Radiated emission measurement was performed in semi-anechoic chamber and conducted emission measurement was performed in shield room. For radiated emission measurement, preliminary scans were performed in the semi-anechoic chamber only to determine the worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application.

### 2.4 Test Facility

The Semi-anechoic chamber and shielded room used to collect the radiated data and conducted data are **Intertek Testing Services Shenzhen Ltd. Longhua Branch** and located at 101, 201, Building B, No. 308 Wuhe Avenue, Zhangkengjing Community, GuanHu Subdistrict, LongHua District, Shenzhen, P.R. China. This test facility and site measurement data have been fully placed on file with File Number: CN1188.

### **3.0 System Test Configuration**

#### **3.1 Justification**

For emissions testing, the equipment under test (EUT) setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, all cables were manipulated to produce worst case emissions. The EUT was powered by AC120V/60Hz input during the test.

On BLE mode, only one antenna is used, and all data rate were tested and only the worst case data is shown in the report.

For maximizing emissions below 30 MHz, the EUT was rotated through 360°, the bottom of the loop antenna was placed 1 meter above the ground, and the antenna polarization was changed. For maximizing emissions, the EUT was rotated through 360°, the antenna height was varied from 1 meter to 4 meters above the ground plane, and the antenna polarization was changed. This step by step procedure for maximizing emissions led to the data reported in Section 4.

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000 MHz. The resolution is 1 MHz or greater for frequencies above 1000 MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

The EUT and transmitting antenna was centered on the turntable.

Radiated emission measurement were performed the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

#### **3.2 EUT Exercising Software**

The EUT exercise program (provided by client) used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The worst case configuration is used in all specified testing.

The parameters of test software setting:

During the test, Channel and power controlling software provided by the applicant was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the application and is going to be fixed on the firmware of the end product.

Test Software: espRFtool\_2.0. exe

#### **3.3 Special Accessories**

N/A.

### 3.4 Measurement Uncertainty

When determining of the test conclusion, the Measurement Uncertainty of test has been considered.

### 3.5 Equipment Modification

Any modifications installed previous to testing by Deako Inc. will be incorporated in each production model sold / leased in the United States.

No modifications were installed by Intertek Testing Services Shenzhen Ltd. Longhua Branch.

### 3.6 Support Equipment List and Description

Description	Manufacturer	Model No.
Incandescent lamp	/	150W
AC input line	/	Unshielded, 150cm
AC output line	/	Unshielded, 250cm
Laptop	DELL	Latitude 3410

Applicant: Deako Inc.

Date of Test: 24 February 2022

Model: DS2005

**4.0 Measurement Results****4.1 Maximum Conducted Output Power at Antenna Terminals, FCC Rules 15.247(b)(3):**

The antenna power of the EUT was connected to the input of a broadband peak RF power meter. The power meter have a video bandwidth that is greater than DTS bandwidth and utilize a fast-responding diode detector. Power was read directly at the EUT antenna terminals with cable loss added.

For antennas with gains of 6 dBi or less, maximum allowed Transmitter output is 1 watt (+30 dBm).

BT BLE (Antenna Gain = 3.74dBi) (GFSK, 1Mbps)		
Frequency (MHz)	Output in dBm (Peak Reading)	Output in mWatt
Low Channel: 2402	6.43	4.40
Middle Channel: 2440	6.72	4.70
High Channel: 2480	7.37	5.46

Cable loss: 0.5 dB    External Attenuation: 0 dB

Cable loss, external attenuation has been included in OFFSET function

EUT max. output level = 7.37dBm

EUT max. E.I.R.P = 7.37dBm + 3.74dBi = 11.11dBm = 12.91mW

For RF Exposure, the information is saved with filename: RF exposure.pdf.

Applicant: Deako Inc.

Date of Test: 20 June 2020

Model: DS2005

**4.2 Minimum 6 dB RF Bandwidth, FCC Rule 15.247(a) (2):**

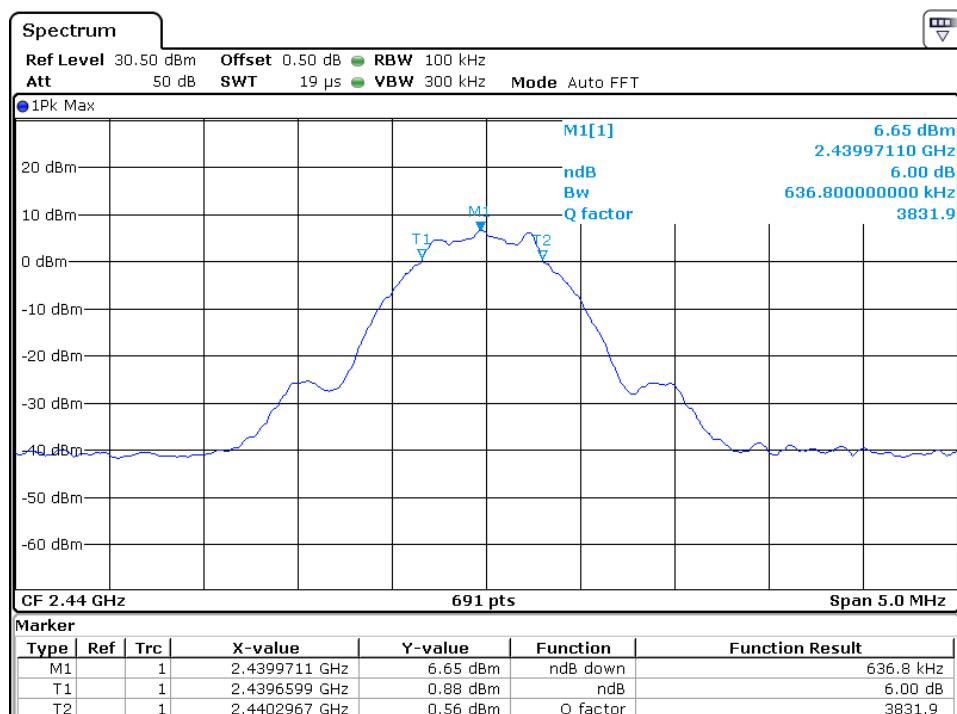
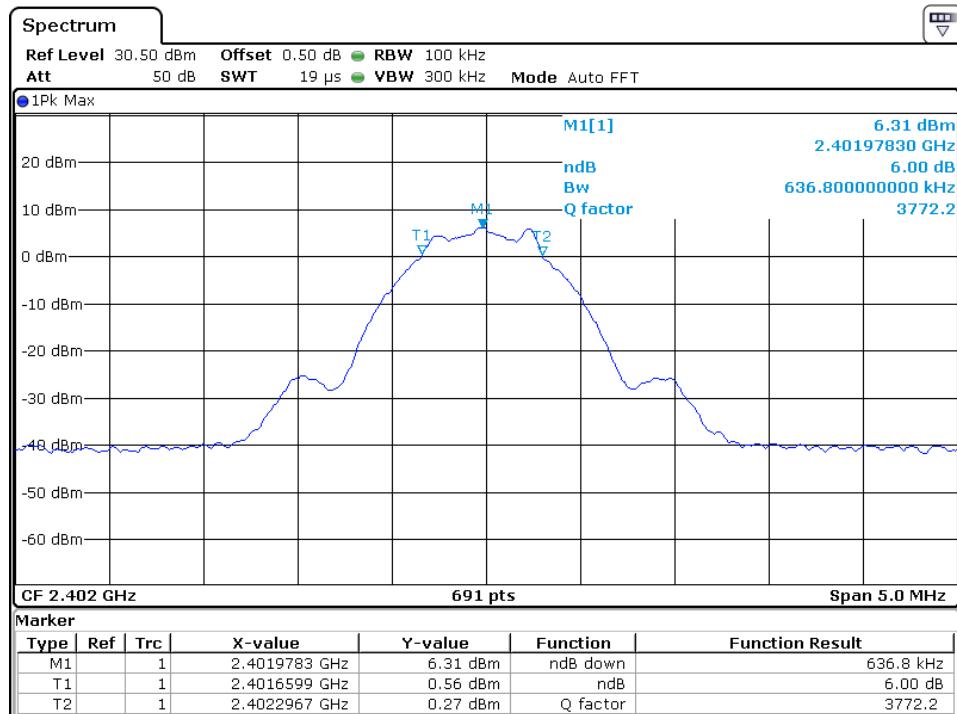
The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RES BW was set to 100 KHz according to FCC KDB 558074 D01 v05r02. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A PEAK output reading was taken, a DISPLAY line was drawn 6 dB lower than PEAK level. The 6dB bandwidth was determined from where the channel output spectrum intersected the display line.

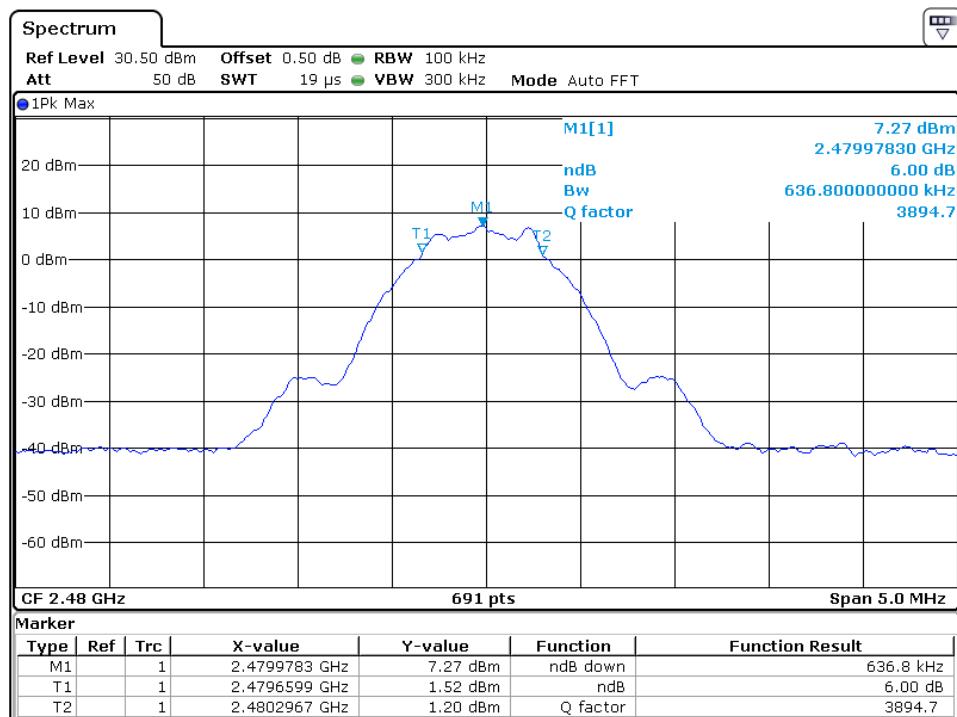
Limit: The 6 dB Bandwidth is at least 500 kHz.

BT BLE (GFSK, 1Mbps)	
Frequency (MHz)	6 dB Bandwidth (KHz)
2402	636.80
2440	636.80
2480	636.80

The test plots are attached as below.

## BT BLE





Applicant: Deako Inc.

Date of Test: 20 June 2020

Model: DS2005

**4.3 Maximum Power Density Reading, FCC Rule 15.247(e):**

The Measurement Procedure PKPSD was set according to the FCC KDB 558074 D01 v05r02.

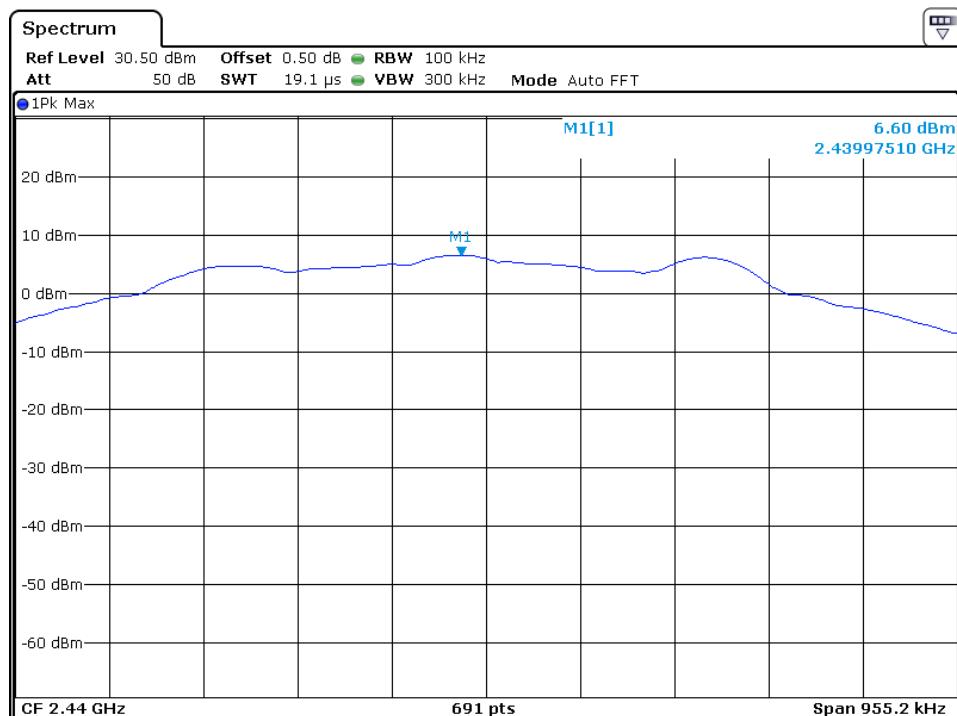
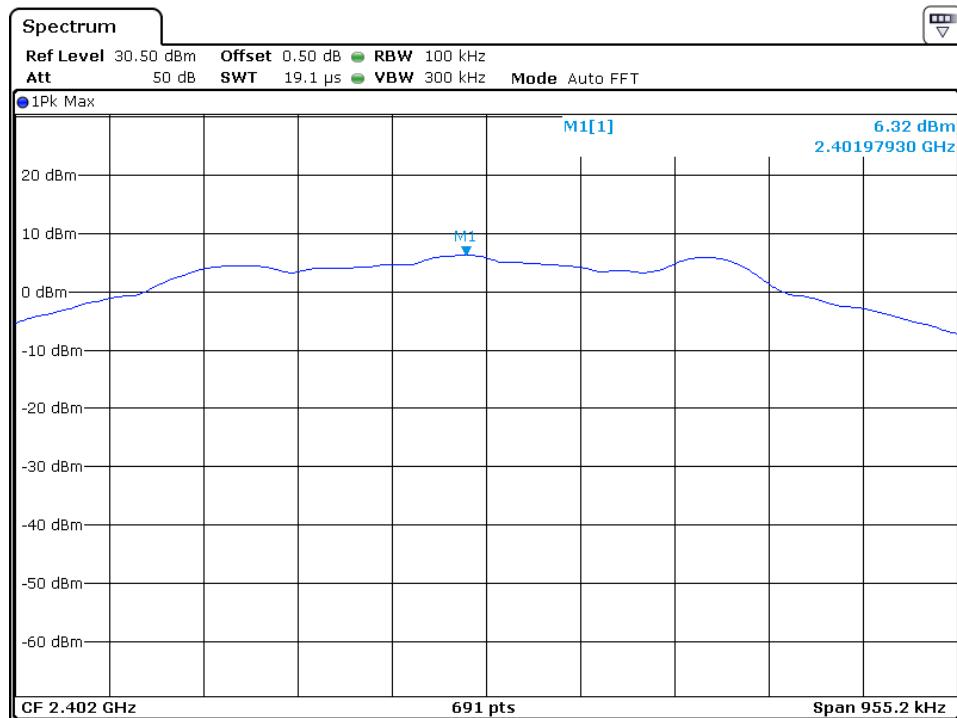
Antenna output of the EUT was coupled directly to spectrum analyzer; if an external attenuator and/or cable was used, these losses are compensated for with the analyzer OFFSET function.

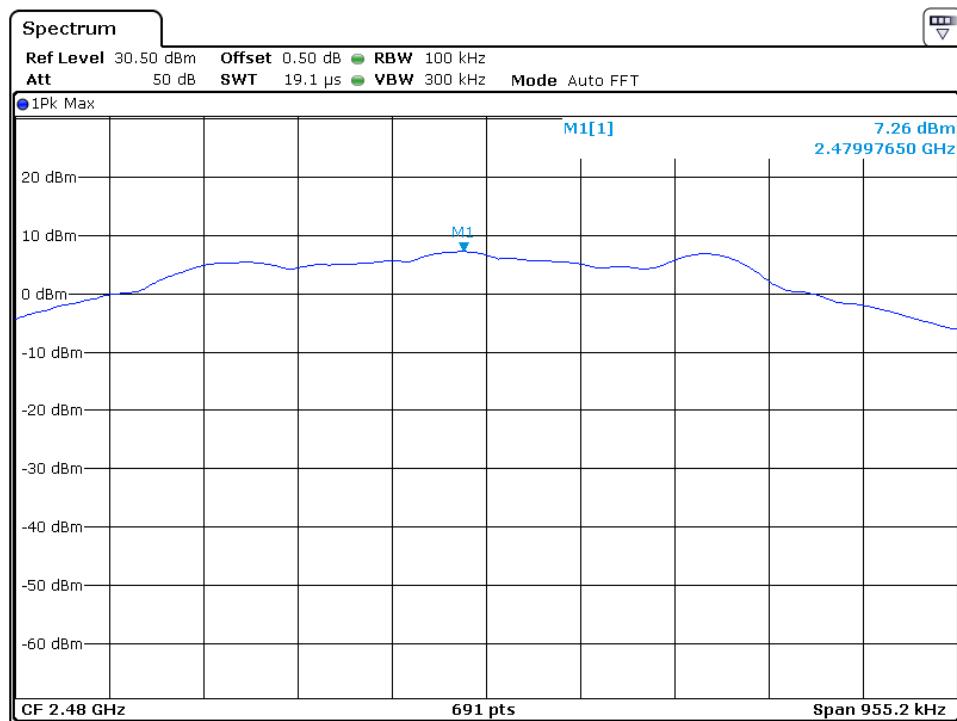
Limit: The Power Density does not exceed 8dBm/3 kHz.

BT BLE (GFSK, 1Mbps)	
Frequency (MHz)	Power Density with RBW 100KHz
2402	6.32
2440	6.60
2480	7.26

The test plots are attached as below.

## BT BLE





Applicant: Deako Inc.

Date of Test: 20 June 2020

Model: DS2005

#### 4.4 Out of Band Conducted Emissions, FCC Rule 15.247(d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. The Measurement Procedure was set according to the FCC KDB 558074 D01 v05r02.

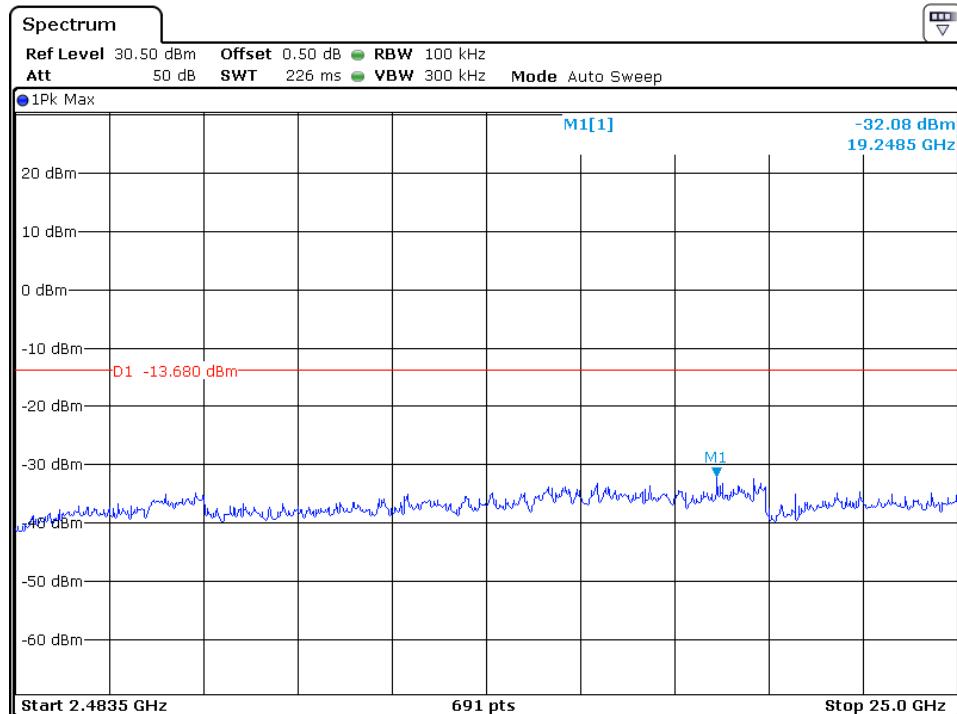
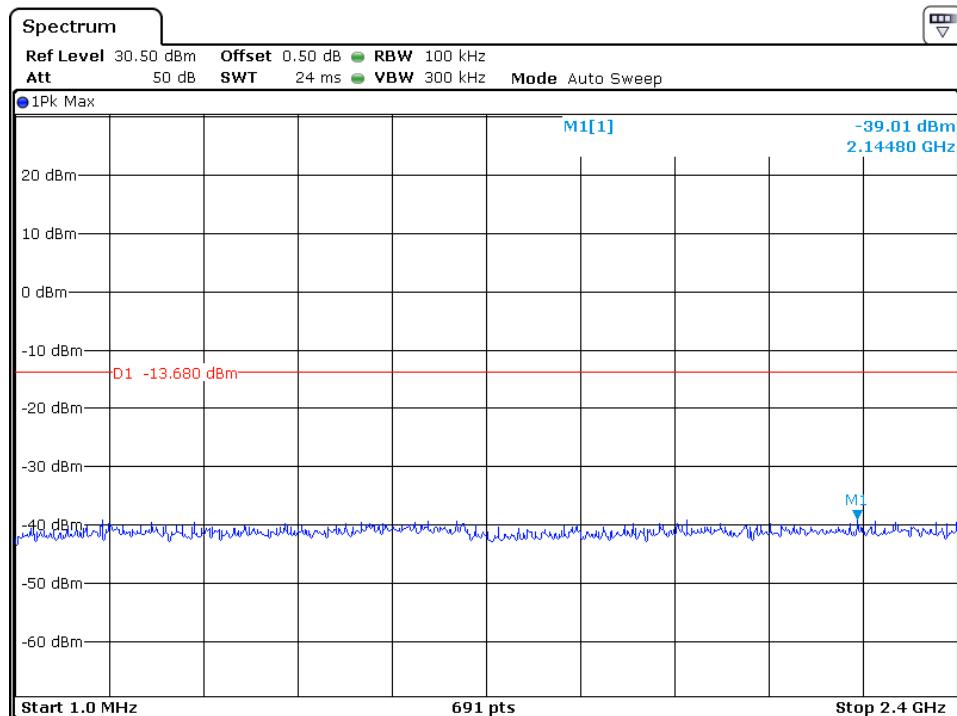
All other types of emissions from the EUT shall meet the general limits for radiated frequencies outside the passband.

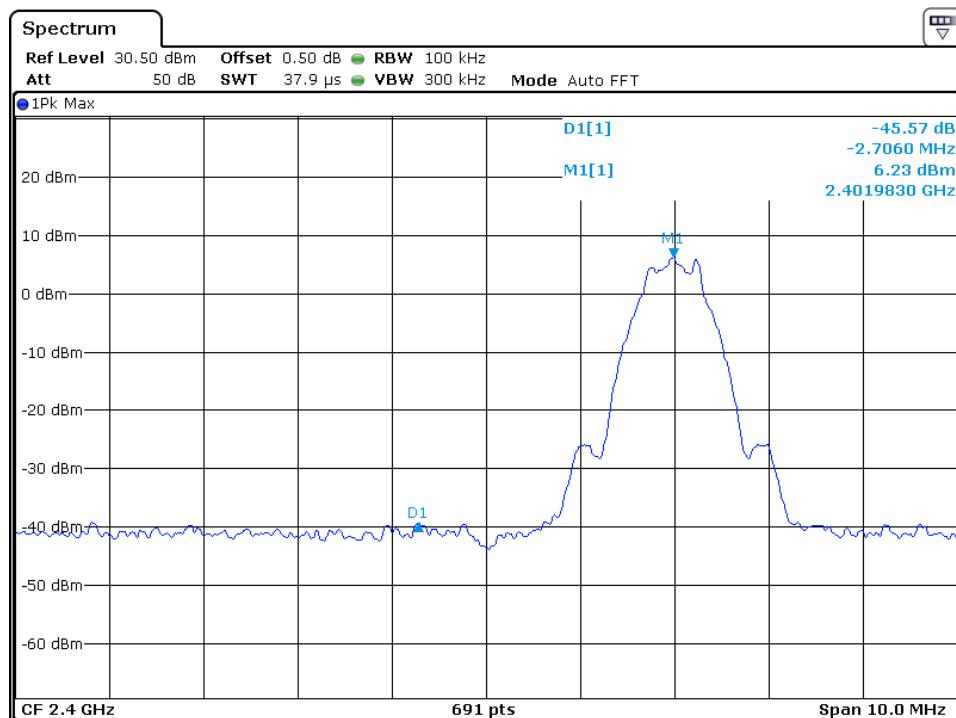
Refer to the attached test plots for out of band conducted emissions data with rate of 1Mbps for GFSK.

The test plots showed all spurious emission up to the tenth harmonic were measured and they were found to be at least 20 dB below the highest level of the desired power in the passband.

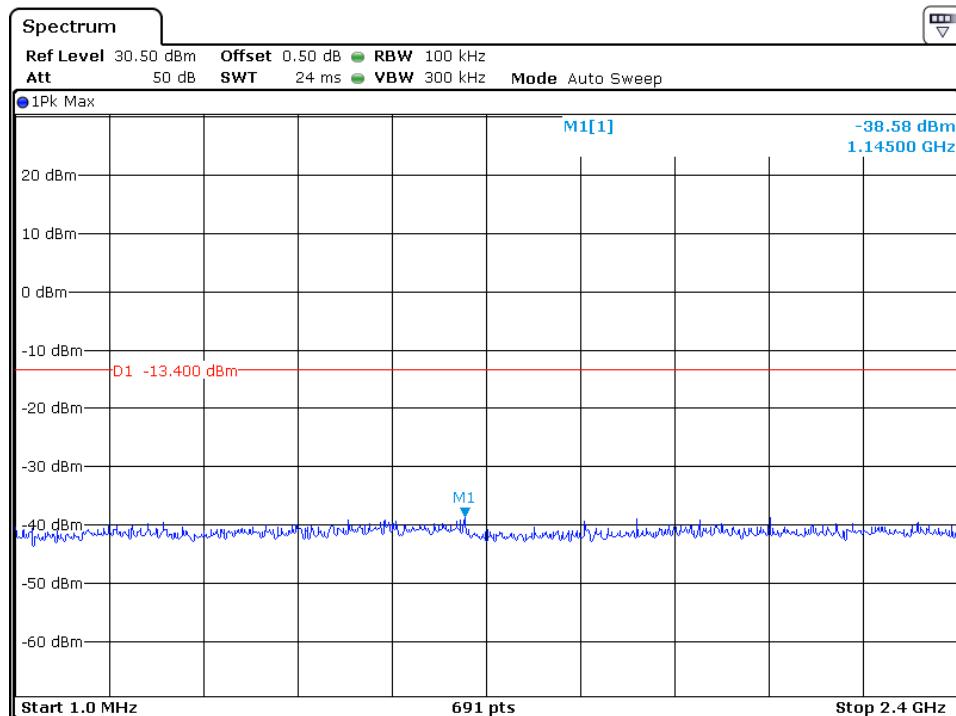
The test plots are attached as below.

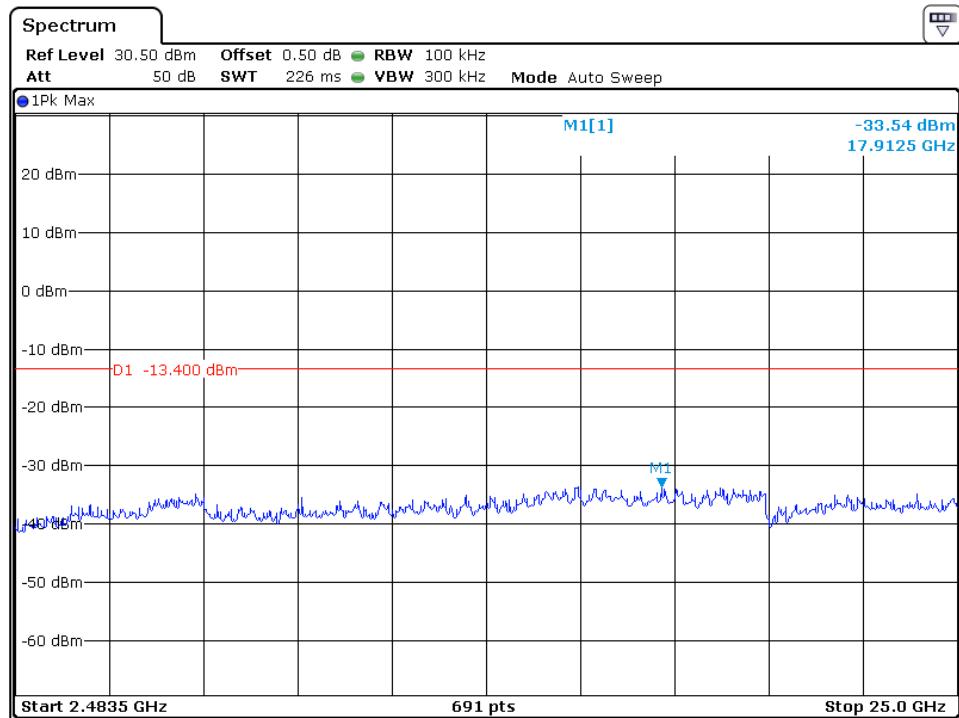
Channel 01 (2402MHz) Reference Level: 6.32dBm



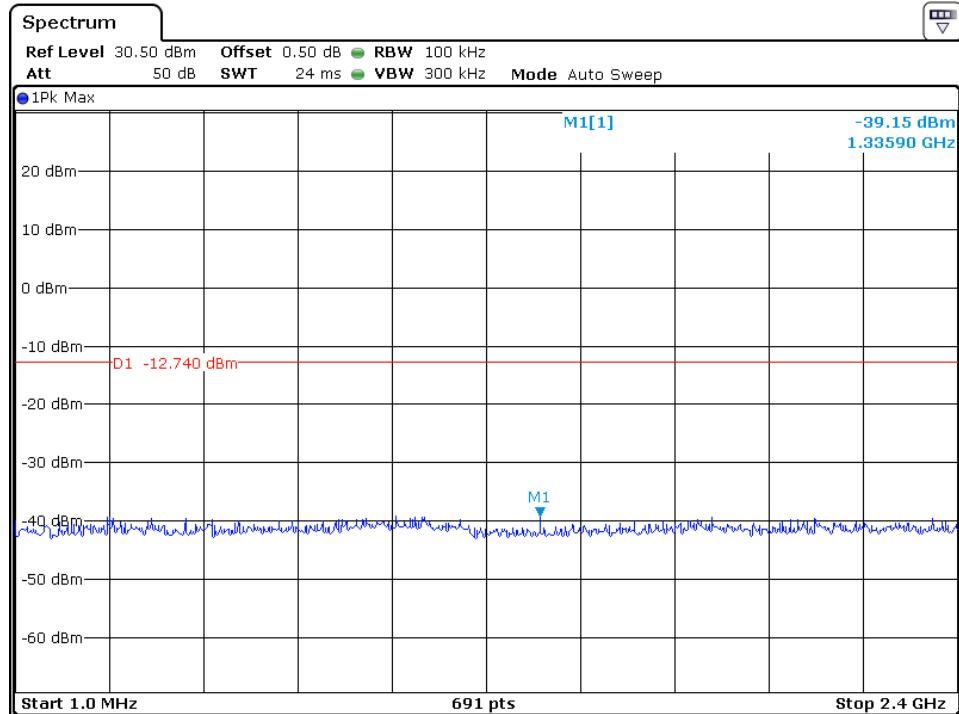


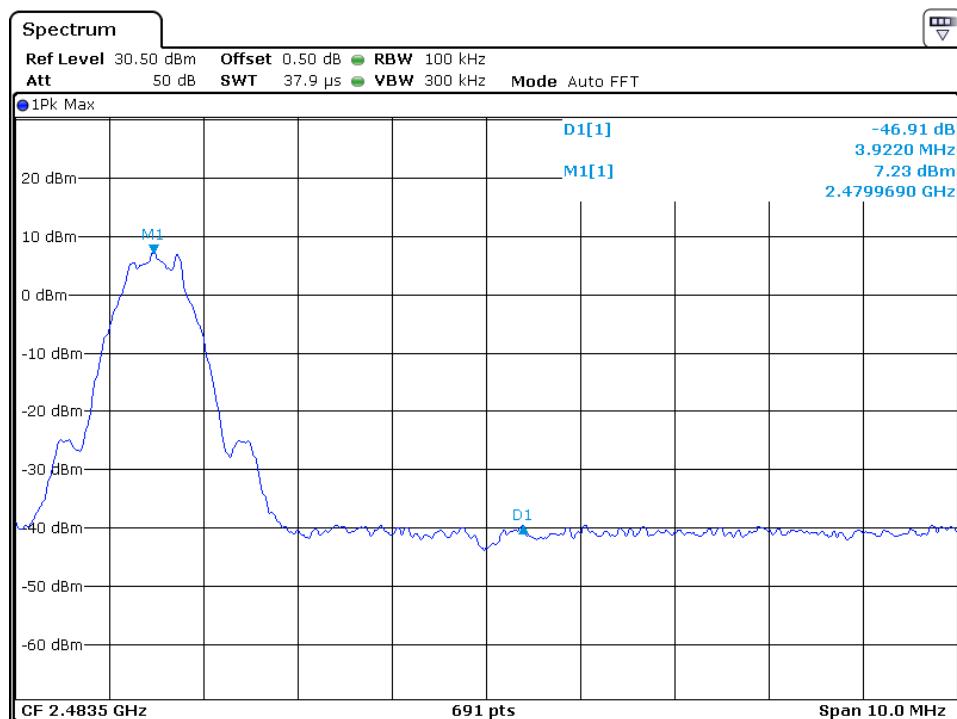
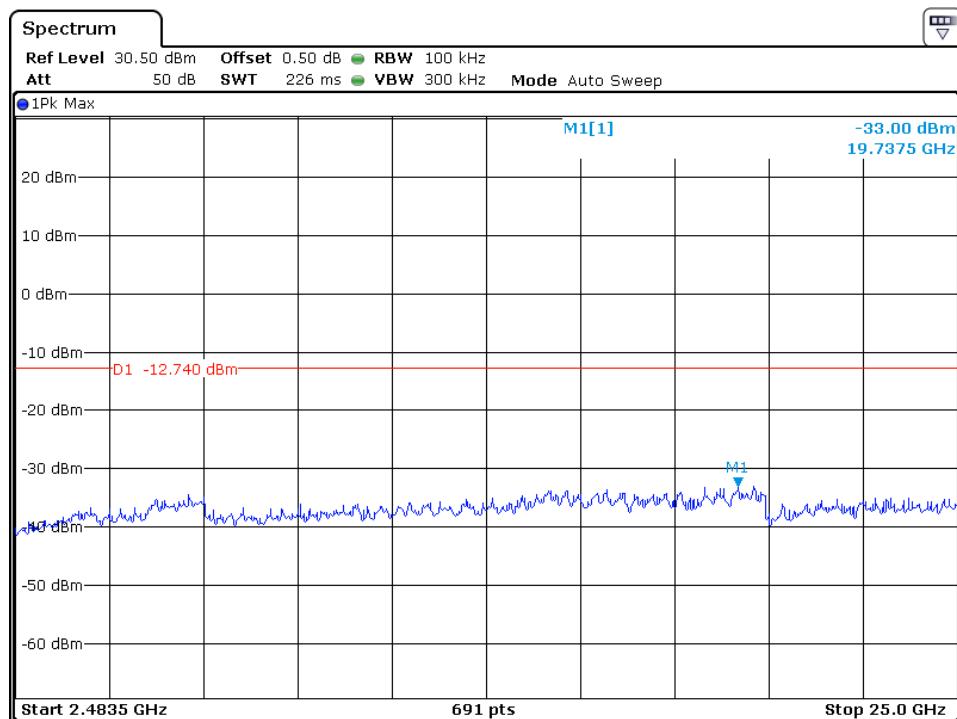
Channel 19 (2440MHz) Reference Level: 6.60dBm





Channel 40 (2480MHz) Reference Level: 7.26dBm





Applicant: Deako Inc.

Date of Test: 20 June 2020

Model: DS2005

4.5 Out of Band Radiated Emissions (for emissions in 4.4 above that are less than 20dB below carrier), FCC Rule 15.247(d):

For out of band emissions that are close to or that exceed the 20dB attenuation requirement described in the specification, radiated measurements were performed at a 3m separation distance to determine whether these emissions complied with the general radiated emission requirement.

- Not required, since all emissions are more than 20dB below fundamental
- See attached data sheet

Applicant: Deako Inc.

Date of Test: 25 February 2022

Model: DS2005

#### 4.6 Transmitter Radiated Emissions in Restricted Bands, FCC Rule 15.35(b) (c):

Data is included of the worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included. All measurements were performed with peak detection unless otherwise specified.

The data on the following pages list the significant emission frequencies, the limit and the margin of compliance.

Applicant: Deako Inc.

Date of Test: 25 February 2022

Model: DS2005

#### 4.7 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

$$FS = RA + AF + CF - AG + PD$$

Where

FS = Field Strength in  $\text{dB}\mu\text{V}/\text{m}$ RA = Receiver Amplitude (including preamplifier) in  $\text{dB}\mu\text{V}$ 

CF = Cable Attenuation Factor in dB

AF = Antenna Factor in dB

AG = Amplifier Gain in dB

PD = Pulse Desensitization in dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

$$FS = RA + AF + CF - AG + PD$$

Example

Assume a receiver reading of 62.0  $\text{dB}\mu\text{V}$  is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted. The pulse desensitization factor of the spectrum analyzer was 0 dB. The net field strength for comparison to the appropriate emission limit is 42  $\text{dB}\mu\text{V}/\text{m}$ . This value in  $\text{dB}\mu\text{V}/\text{m}$  was converted to its corresponding level in  $\mu\text{V}/\text{m}$ .

$$RA = 62.0 \text{ dB}\mu\text{V}$$

$$AF = 7.4 \text{ dB}$$

$$CF = 1.6 \text{ dB}$$

$$AG = 29.0 \text{ dB}$$

$$PD = 0 \text{ dB}$$

$$FS = 62 + 7.4 + 1.6 - 29 + 0 = 42 \text{ dB}\mu\text{V}/\text{m}$$

Level in  $\text{mV}/\text{m}$  = Common Antilogarithm  $[(42 \text{ dB}\mu\text{V}/\text{m})/20] = 125.9 \mu\text{V}/\text{m}$

Applicant: Deako Inc.

Date of Test: 25 February 2022

Model: DS2005

#### 4.8 Radiated Spurious Emission

Worst Case Radiated Spurious Emission  
at 7440.000000MHz  
is passed by 8.9dB margin.

For the electronic filing, the worst case radiated emission configuration photographs are saved with filename: radiated photos.pdf.

Applicant: Deako Inc.

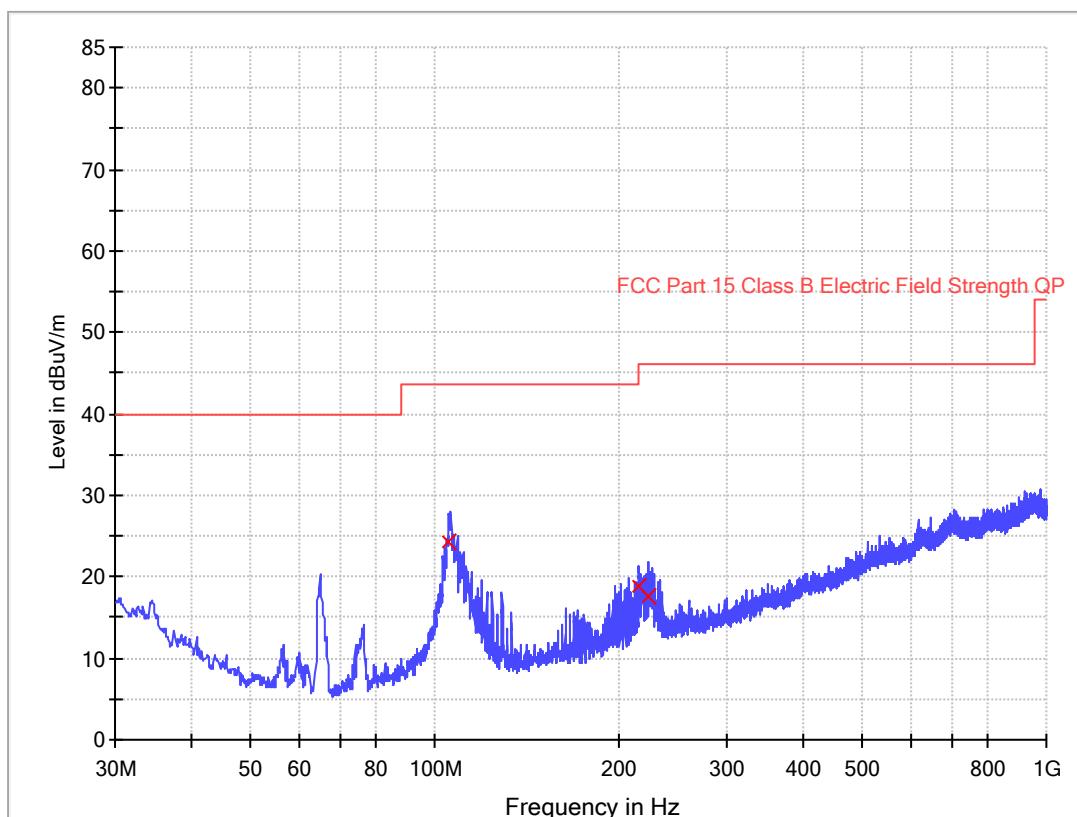
Date of Test: 25 February 2022

Worst Case Operating Mode:

Model: DS2005

Transmitting (2402MHz)

ANT Polarity: Horizontal



Frequency (MHz)	QuasiPeak (dBuV/m)	Meas. Time (ms)	Bandwidth (kHz)	Polarization	Corr. (dB/m)	Margin - QPK (dB)	Limit - QPK (dBuV/m)
105.538750	24.3	1000.0	120.000	H	10.5	19.2	43.5
215.997500	18.9	1000.0	120.000	H	13.1	24.6	43.5
224.000000	17.6	1000.0	120.000	H	13.5	28.4	46.0

## Remark:

1. Corr. = Antenna Factor (dB/m) + Cable Loss (dB)
2. QuasiPeak (dB $\mu$ V/m) = Corr. (dB/m) + Read Level (dB $\mu$ V)
3. Margin (dB) = Limit Line(dB $\mu$ V/m) – Level (dB $\mu$ V/m)

Applicant: Deako Inc.

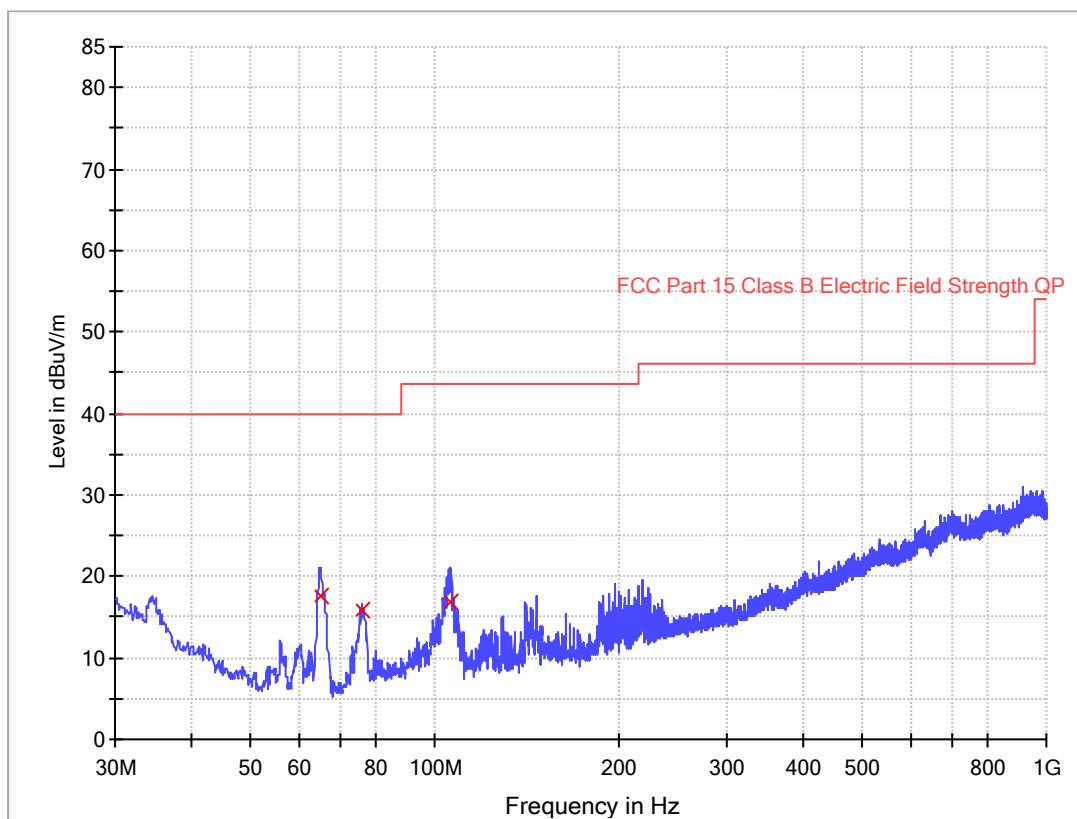
Date of Test: 25 February 2022

Worst Case Operating Mode:

Model: DS2005

Transmitting (2402MHz)

ANT Polarity: Vertical



Frequency (MHz)	QuasiPeak (dBuV/m)	Meas. Time (ms)	Bandwidth (kHz)	Polarization	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBuV/m)
65.041250	17.5	1000.0	120.000	V	8.1	22.5	40.0
75.953750	15.8	1000.0	120.000	V	8.7	24.2	40.0
105.660000	16.7	1000.0	120.000	V	10.5	26.8	43.5

Remark:

1. Corr. = Antenna Factor (dB/m) + Cable Loss (dB)
2. QuasiPeak (dB $\mu$ V/m) = Corr. (dB/m) + Read Level (dB $\mu$ V)
3. Margin (dB) = Limit Line(dB $\mu$ V/m) – Level (dB $\mu$ V/m)

Applicant: Deako Inc.

Date of Test: 25 February 2022

Worst Case Operating Mode:

Model: DS2005

Transmitting

**Radiated Emissions (above 1GHz)  
(2402MHz)**

Polarization	Frequency (MHz)	Reading (dB $\mu$ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB $\mu$ V/m)	Peak Limit at 3m (dB $\mu$ V/m)	Margin (dB)
Horizontal	*4804.000	51.5	36.8	33.5	48.2	74.0	-25.8
Horizontal	*2390.000	49.4	36.4	29.1	42.1	74.0	-31.9

Polarization	Frequency (MHz)	Reading (dB $\mu$ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB $\mu$ V/m)	Average Limit at 3m (dB $\mu$ V/m)	Margin (dB)
Horizontal	*4804.000	42.9	36.8	33.5	39.6	54.0	-14.4
Horizontal	*2390.000	41.4	36.4	29.1	34.1	54.0	-19.9

## NOTES:

1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz/VBW=10Hz for average value.
2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna used for the emission over 1000MHz.

\* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: Deako Inc.

Date of Test: 25 February 2022

Worst Case Operating Mode:

Model: DS2005

Transmitting

**Radiated Emissions (above 1GHz)  
(2440MHz)**

Polarization	Frequency (MHz)	Reading (dB $\mu$ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB $\mu$ V/m)	Peak Limit at 3m (dB $\mu$ V/m)	Margin (dB)
Horizontal	*4880.000	48.6	36.7	33.4	45.3	74.0	-28.7
Horizontal	*7320.000	54.9	36.6	35.8	54.1	74.0	-19.9

Polarization	Frequency (MHz)	Reading (dB $\mu$ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB $\mu$ V/m)	Average Limit at 3m (dB $\mu$ V/m)	Margin (dB)
Horizontal	*4880.000	39.7	36.7	33.4	36.4	54.0	-17.6
Horizontal	*7320.000	45.5	36.6	35.8	44.7	54.0	-9.3

## NOTES:

1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.
2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna used for the emission over 1000MHz.

\* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: Deako Inc.

Date of Test: 25 February 2022

Worst Case Operating Mode:

Model: DS2005

Transmitting

**Radiated Emissions (above 1GHz)  
(2480MHz)**

Polarization	Frequency (MHz)	Reading (dB $\mu$ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB $\mu$ V/m)	Peak Limit at 3m (dB $\mu$ V/m)	Margin (dB)
Horizontal	*4960.000	51.1	36.8	33.3	47.6	74.0	-26.4
Horizontal	*7440.000	62.5	36.5	29.3	55.3	74.0	-18.7

Polarization	Frequency (MHz)	Reading (dB $\mu$ V)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dB $\mu$ V/m)	Average Limit at 3m (dB $\mu$ V/m)	Margin (dB)
Horizontal	*4960.000	40.7	36.8	33.3	37.2	54.0	-16.8
Horizontal	*7440.000	52.3	36.5	29.3	45.1	54.0	-8.9

## NOTES:

1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.
2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna used for the emission over 1000MHz.
  - \* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: Deako Inc.

Date of Test: 16 July 2020

Model: DS2005

#### 4.9 Conducted Emission

Worst Case Conducted Emission  
at 0.162000MHz  
is passed by 9.3dB margin.

For the electronic filing, the worst case radiated emission configuration photographs are saved with filename: conducted photos.pdf.

Applicant: Deako Inc.

Date of Test: 16 July 2020

Model: DS2005

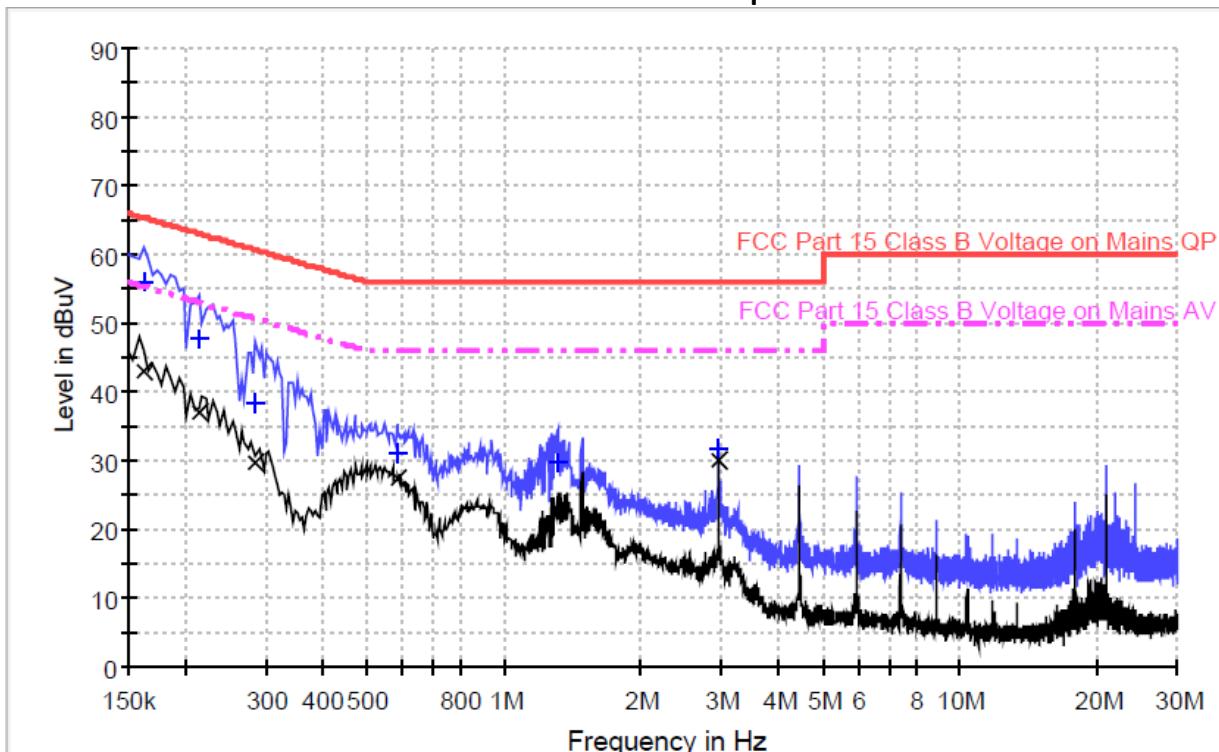
Worst Case Operating Mode: Transmitting (2402MHz)

Phase: Live

## Graphic / Data Table

### Conducted Emissions

#### Pursuant to FCC 15.207: Emissions Requirement



#### Limit and Margin QP

Frequency (MHz)	QuasiPeak (dB $\mu$ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
0.162000	56.1	9.000	L1	9.7	9.3	65.4
0.214000	47.5	9.000	L1	9.7	15.5	63.0
0.286000	38.3	9.000	L1	9.7	22.3	60.6
0.582000	31.0	9.000	L1	9.7	25.0	56.0
1.310000	29.5	9.000	L1	9.7	26.5	56.0
2.958000	31.6	9.000	L1	9.8	24.4	56.0

#### Limit and Margin AV

Frequency (MHz)	Average (dB $\mu$ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
0.162000	43.1	9.000	L1	9.7	12.3	55.4
0.214000	37.0	9.000	L1	9.7	16.0	53.0
0.286000	29.5	9.000	L1	9.7	21.1	50.6
0.582000	27.5	9.000	L1	9.7	18.5	46.0
1.310000	22.5	9.000	L1	9.7	23.5	46.0
2.958000	30.0	9.000	L1	9.8	16.0	46.0

Remark:

1. Corr. Factor (dB) = LISN Factor (dB) + Cable Loss (dB)

2. Margin (dB) = Limit (dB $\mu$ V) – Level (dB $\mu$ V)

Applicant: Deako Inc.

Date of Test: 16 July 2020

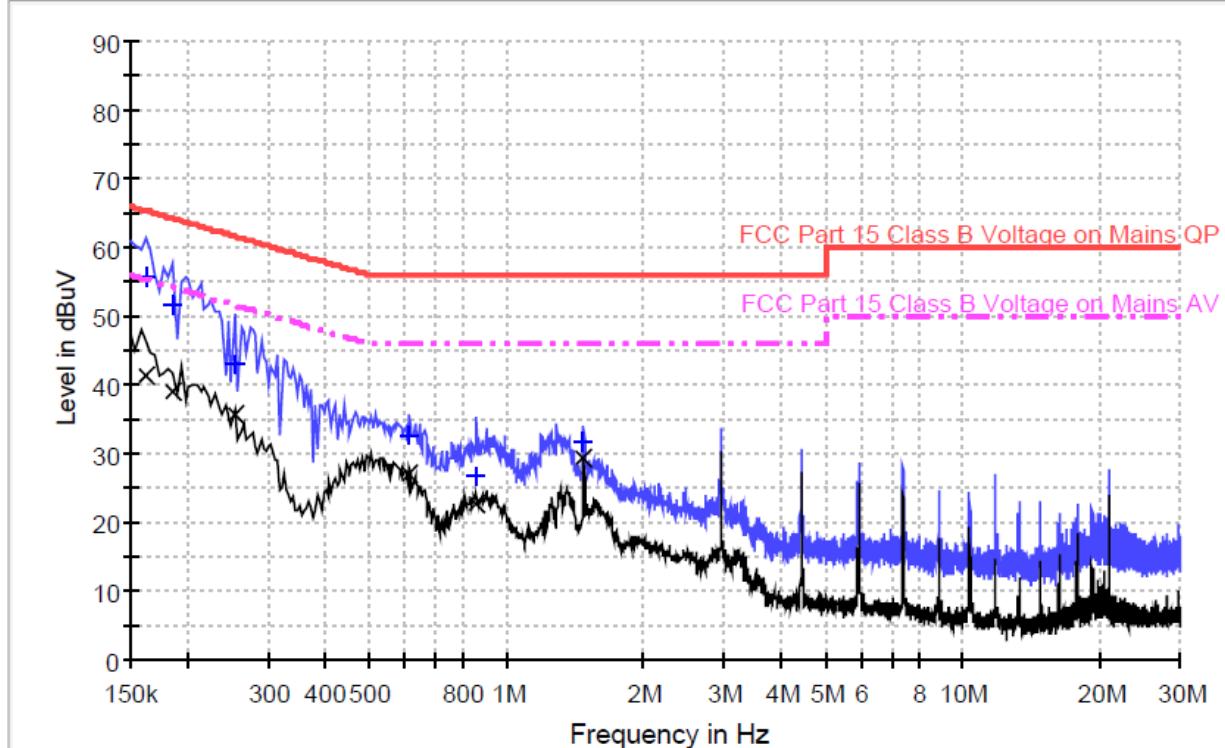
Model: DS2005

Worst Case Operating Mode: Transmitting (2402MHz)

Phase: Neutral

## Graphic / Data Table

### Conducted Emissions Pursuant to FCC 15.207: Emissions Requirement



### Limit and Margin QP

Frequency (MHz)	QuasiPeak (dB $\mu$ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
0.162000	55.8	9.000	N	9.7	9.6	65.4
0.186000	51.6	9.000	N	9.7	12.6	64.2
0.254000	43.0	9.000	N	9.7	18.6	61.6
0.614000	32.5	9.000	N	9.7	23.5	56.0
0.862000	26.6	9.000	N	9.7	29.4	56.0
1.478000	31.8	9.000	N	9.7	24.2	56.0

### Limit and Margin AV

Frequency (MHz)	Average (dB $\mu$ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
0.162000	41.4	9.000	N	9.7	14.0	55.4
0.186000	38.9	9.000	N	9.7	15.3	54.2
0.254000	35.8	9.000	N	9.7	15.8	51.6
0.614000	27.1	9.000	N	9.7	18.9	46.0
0.862000	22.7	9.000	N	9.7	23.3	46.0
1.478000	29.3	9.000	N	9.7	16.7	46.0

Remark:

1. Corr. Factor (dB) = LISN Factor (dB) + Cable Loss (dB)

2. Margin (dB) = Limit (dB $\mu$ V) – Level (dB $\mu$ V)

Applicant: Deako Inc.

Date of Test: 16 July 2020

Model: DS2005

#### 4.10 Radiated Emissions from Digital Section of Transceiver, FCC Ref: 15.109

- [ ] Not required - No digital part
- [ ] Test results are attached
- [ x ] Included in the separated report.

Applicant: Deako Inc.

Date of Test: 20 June 2020

Model: DS2005

#### 4.11 Transmitter Duty Cycle Calculation and Measurements, FCC Rule 15.35(b), (c)

The EUT antenna output port was connected to the input of the spectrum analyzer. The analyzer center frequency was set to EUT RF channel carrier. The SWEP function on the analyzer was set to ZERO SPAN. The Transmitter ON time was determined from the resultant time-amplitude display:

	See attached spectrum analyzer chart (s) for Transmitter timing
	See Transmitter timing diagram provided by manufacturer
x	Not applicable, duty cycle was not used.

## 5.0 Equipment Photographs

For electronic filing, the photographs are saved with filename: external photos.pdf & internal photos.pdf.

## 6.0 Product Labeling

For electronic filing, the FCC ID label artwork and location is saved with filename: label.pdf.

## 7.0 Technical Specifications

For electronic filing, the block diagram and circuit diagram are saved with filename: block.pdf and circuit.pdf respectively.

## 8.0 Instruction Manual

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf.

This manual will be provided to the end-user with each unit sold/leased in the United States.

## 9.0 Confidentiality Request

For electronic filing, the confidentiality request of the tested EUT is saved with filename: request.pdf.

## 10.0 Discussion of Pulse Desensitization

The determination of pulse desensitivity was made in accordance with Hewlett Packard Application Note 150-2, *Spectrum Analysis ... Pulsed RF*.

Pulse desensitivity is not applicable for this device since the transmitter transmits the RF signal continuously.

**11.0 Test Equipment List**

Equipment No.	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
SZ182-02	RF Power Meter	Anritsu	ML2496A	1302005	20-May-2021	20-May-2022
SZ182-02-01	Power Sensor	Anritsu	MA2411B	1207429	20-May-2021	20-May-2022
SZ061-12	BiConiLog Antenna	ETS	3142E	00166158	04-Dec-2021	04-Dec-2024
SZ185-01	EMI Receiver	R&S	ESCI	100547	24-Dec-2019	24-Dec-2020
SZ185-03	EMI Receiver	R&S	ESR7	101975	20-Oct-2021	20-Oct-2022
SZ061-08	Horn Antenna	ETS	3115	00092346	05-Sep-2021	05-Sep-2024
SZ061-06	Active Loop Antenna	Electro-Metrics	EM-6876	217	18-May-2021	18-May-2023
SZ056-03	Spectrum Analyzer	R&S	FSP 30	101148	20-May-2021	20-May-2022
SZ056-06	Signal Analyzer	R&S	FSV 40	101101	20-May-2021	20-May-2022
SZ181-04	Preamplifier	Agilent	8449B	3008A02474	20-May-2021	20-May-2022
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	4102	12-Dec-2021	12-Dec-2024
SZ062-02	RF Cable	RADIALL	RG 213U	--	26-Oct-2021	26-Apr-2022
SZ062-05	RF Cable	RADIALL	0.04-26.5GHz	--	26-Oct-2021	26-Apr-2022
SZ062-12	RF Cable	RADIALL	0.04-26.5GHz	--	26-Oct-2021	26-Apr-2022
SZ067-04	Notch Filter	Micro-Tronics	BRM50702-02	--	20-May-2021	20-May-2022
SZ185-02	EMI Test Receiver	R&S	ESCI	100692	29-Oct-2019	29-Oct-2020
SZ187-01	Two-Line V-Network	R&S	ENV216	100072	29-Oct-2019	29-Oct-2020
SZ187-02	Two-Line V-Network	R&S	ENV216	100072	27-May-2020	27-May-2021
SZ062-16	RF Cable	HUBER+SUHNER	CBL2-BN-1m	110127-2231000	30-Oct-2019	30-Oct-2020
SZ188-03	Shielding Room	ETS	RFD-100	4100	07-Jan-2020	07-Jan-2023

\*\*\*\* End of Report \*\*\*\*