

**iDevices, LLC**

Application  
For  
Certification

**FCC ID: 2ABDJ-SWITCH4**

**OUTDOOR SWITCH**

**Model: IDEV0004**

**2.4GHz Transceiver**

Report No.: 150729018SZN-001

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 [10-1-13]

Prepared and Checked by:

Approved by:

Sign on file

Leo Lai  
Project Engineer

---

Andy Yan  
Senior Project Engineer  
Date: August 28, 2015

- The test results reported in this test report shall refer only to the sample actually tested and shall not refer or be deemed to refer to bulk from which such a sample may be said to have been obtained.
- 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 copy or distribute this report. 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 referenced from 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.
- For Terms And Conditions of the services, it can be provided upon request.
- The evaluation data of the report will be kept for 3 years from the date of issuance.

TRF no.: FCC 15C\_Tx\_b

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

6F, D Block, Huahan Building, Langshan Road, Nanshan District, Shenzhen, P. R. China  
Tel: (86 755) 8601 6288 Fax: (86 755) 8601 6751 Website: [www.china.intertek-etlsemko.com](http://www.china.intertek-etlsemko.com)

## LIST OF EXHIBITS

### *INTRODUCTION*

<i>EXHIBIT 1:</i>	Summary of Tests
<i>EXHIBIT 2:</i>	General Description
<i>EXHIBIT 3:</i>	System Test Configuration
<i>EXHIBIT 4:</i>	Measurement Results
<i>EXHIBIT 5:</i>	Equipment Photographs
<i>EXHIBIT 6:</i>	Product Labeling
<i>EXHIBIT 7:</i>	Technical Specifications
<i>EXHIBIT 8:</i>	Instruction Manual
<i>EXHIBIT 9:</i>	Miscellaneous Information
<i>EXHIBIT 10:</i>	Test Equipment List

# INTERTEK TESTING SERVICES

## MEASUREMENT/TECHNICAL REPORT

**iDevices, LLC - MODEL: IDEV0004**

**FCC ID: 2ABDJ-SWITCH4**

This report concerns (check one) Original Grant ☒ Class II Change ☐

Equipment Type: DTS - Part 15 Digital Transmission Systems (Bluetooth LE 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 [10-01-13 Edition] provision.

Report prepared by:

Leo Lai  
Intertek Testing Services Shenzhen Ltd.  
Kejiyuan Branch  
6F, Block D, Huahan Building, Langshan Road,  
Nanshan District, Shenzhen, P. R. China  
Phone: (86 755) 8601 6288  
Fax: (86 755) 8614 6751

# INTERTEK TESTING SERVICES

---

## Table of Contents

1.0	<b><u>Summary of Test results</u></b> .....	2
2.0	<b><u>General Description</u></b> .....	4
1.1	Product Description .....	4
1.3	Test Methodology .....	5
1.3	Test Facility .....	5
3.0	<b><u>System Test Configuration</u></b> .....	7
3.1	Justification .....	7
3.2	EUT Exercising Software .....	7
3.3	Special Accessories .....	7
3.4	Measurement Uncertainty .....	8
2.4	Equipment Modification .....	8
2.6	Support Equipment List and Description .....	8
4.0	<b><u>Measurement Results</u></b> .....	10
4.1	Maximum Conducted Output Power at Antenna Terminals .....	10
4.2	Minimum 6 dB RF Bandwidth .....	11
4.3	Maximum Power Density Reading .....	14
4.4	Out of Band Conducted Emissions .....	17
4.5	Out of Band Radiated Emissions .....	23
4.6	Transmitter Radiated Emissions in Restricted Bands .....	24
4.7	Field Strength Calculation .....	25
4.8	Radiated Spurious Emission .....	26
4.9	Conducted Emission .....	31
4.10	Radiated Emission from Digital Section of Transceiver .....	34
4.11	Transmitter Duty Cycle Calculation and Measurements .....	35
5.0	<b><u>Equipment Photographs</u></b> .....	37
6.0	<b><u>Product Labelling</u></b> .....	39
7.0	<b><u>Technical Specifications</u></b> .....	41
8.0	<b><u>Instruction Manual</u></b> .....	43
9.0	<b><u>Discussion of Pulse Desensitization</u></b> .....	45
10.0	<b><u>Test Equipment List</u></b> .....	47

## INTERTEK TESTING SERVICES

---

### List of attached file

Exhibit Type	File Description	Filename
Cover Letter	Letter of Agency	agency.pdf
Test Report	Test Report	report.pdf
Test Setup Photo	Radiated Emission	radiated photos.pdf
Test Setup Photo	Conducted Emission	conducted photos.pdf
External Photo	External Photo	external photos.pdf
Internal Photo	Internal Photo	internal photos.pdf
Block Diagram	Block Diagram	block.pdf
Schematics	Circuit Diagram	circuit.pdf
Operation Description	Technical Description	descri.pdf
ID Label/Location	Label Artwork and Location	label.pdf
User Manual	User Manual	manual.pdf
Cover Letter	Confidentiality Letter	request.pdf

**EXHIBIT 1**

**SUMMARY OF TEST RESULTS**

## INTERTEK TESTING SERVICES

---

### 1.0 Summary of Test result

**iDevices, LLC - MODEL: IDEV0004**

**FCC ID: 2ABDJ-SWITCH4**

TEST	REFERENCE	RESULTS
Max. Output power	15.247(b)	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
Antenna Requirement	15.203	Pass (See Notes)

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

**EXHIBIT 2**

**GENERAL DESCRIPTION**



## INTERTEK TESTING SERVICES

---

### 2.0 **General Description**

#### 2.1 Product Description

The Equipment Under Test (EUT) is a OUTDOOR SWITCH Model: IDEV0004 with Bluetooth LE technology. The EUT was powered by 125VAC 60Hz. For more detailed features description, please refer to the user's manual.

Type of Modulation: GFSK.

Bluetooth Version: 4.0 BLE

Antenna Type: Integral Antenna.

Max antenna Gain: 2.0 dBi

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

#### 2.2 Related Submittal(s) Grants

This is an application for certification of:

DTS- Part 15 Digital Transmission Systems (Bluetooth LE portion)

Remaining portions are subject to the following procedures:

1. WiFi Transceiver (2.4G band): 150729018SZN-002

### 2.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (2009) and KDB 558074. 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. All other measurements were made in accordance with the procedures in part 2 of CFR 47.

### 2.4 Test Facility

The Semi-Anechoic chamber and shield room used to collect the radiated data and conducted data are **Intertek Testing Services Shenzhen Ltd. Kejiyuan Branch** and located at 6F, Block D, Huahan Building, Langshan Road, Nanshan District, Shenzhen, P. R. China. This test facility and site measurement data have been fully placed on file with the FCC (Registration Number: 242492).

**EXHIBIT 3**  
**SYSTEM TEST CONFIGURATION**

## INTERTEK TESTING SERVICES

---

### 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 125VAC 60Hz, All packets mode in modulation type GFSK with different accessories listed in next page were tested, and only the worst case data was recorded in this report.

The simultaneous transmission spurious was tested, only the worst case data was recorded in this report.

The signal is maximized through rotation and placement in the three orthogonal axes. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters. Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance.

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.

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.

#### 3.3 Special Accessories

N/A.

## INTERTEK TESTING SERVICES

---

### 3.4 Measurement Uncertainty

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

Uncertainty and Compliance – Unless the standard specifically states that measured values are to be extended by the measurement uncertainty in determining compliance, all compliance determinations are based on the actual measured value.

### 3.5 Equipment Modification

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

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

### 3.6 Support Equipment List and Description

N/A.

**EXHIBIT 4**

**MEASUREMENT RESULTS**

## INTERTEK TESTING SERVICES

---

Applicant: iDevices, LLC  
Date of Test: August 18, 2015  
Model: IDEV0004

### 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 (+30dBm).

Packet: DH1

Frequency (MHz)	Output in dBm	Output in mWatt
Low Channel: 2402	2.13	1.63
Middle Channel: 2440	2.49	1.77
High Channel: 2480	2.78	1.90

Cable loss: 0.5 dB    External Attenuation: 0 dB

Cable loss, external attenuation has been included in OFFSET function

EUT dBm max. output level = 2.78dBm

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

## INTERTEK TESTING SERVICES

---

Applicant: iDevices, LLC  
Date of Test: August 18, 2015  
Model: IDEV0004

### 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 RBW was set to 100 KHz according to FCC KDB 558074. 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.

Packet: DH1

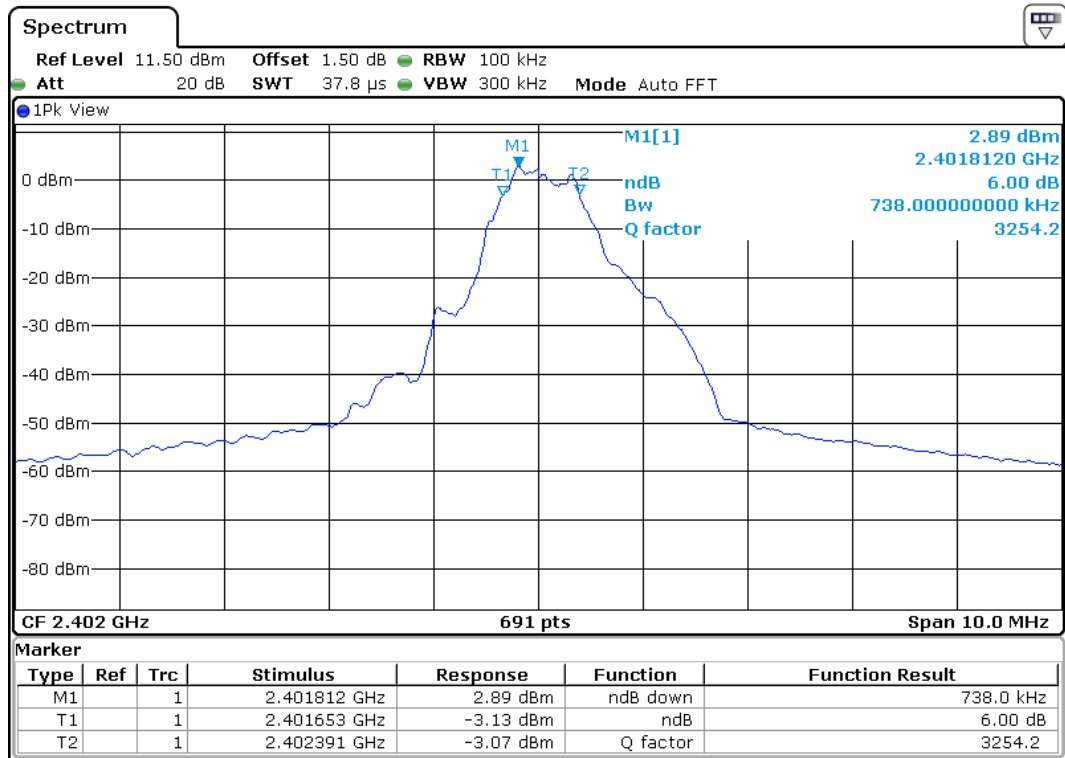
Frequency (MHz)	6 dB Bandwidth (KHz)
2402	738
2440	738
2480	709

The test plots are attached as below.

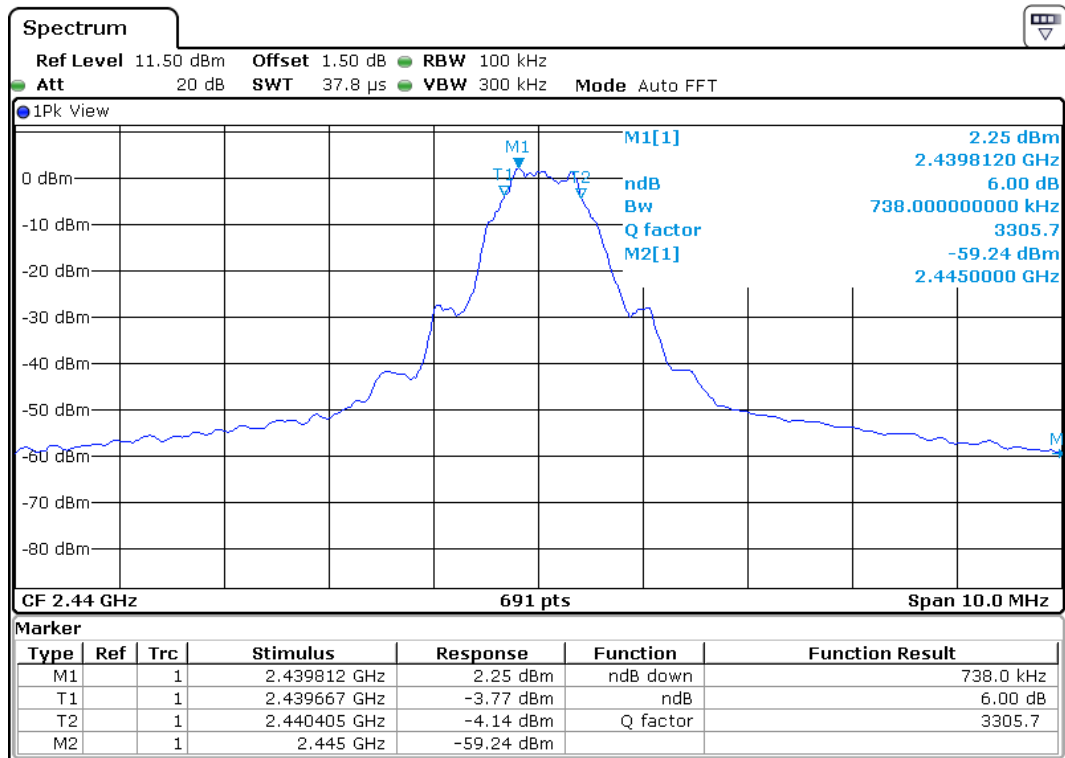


# INTERTEK TESTING SERVICES

## Low Channel

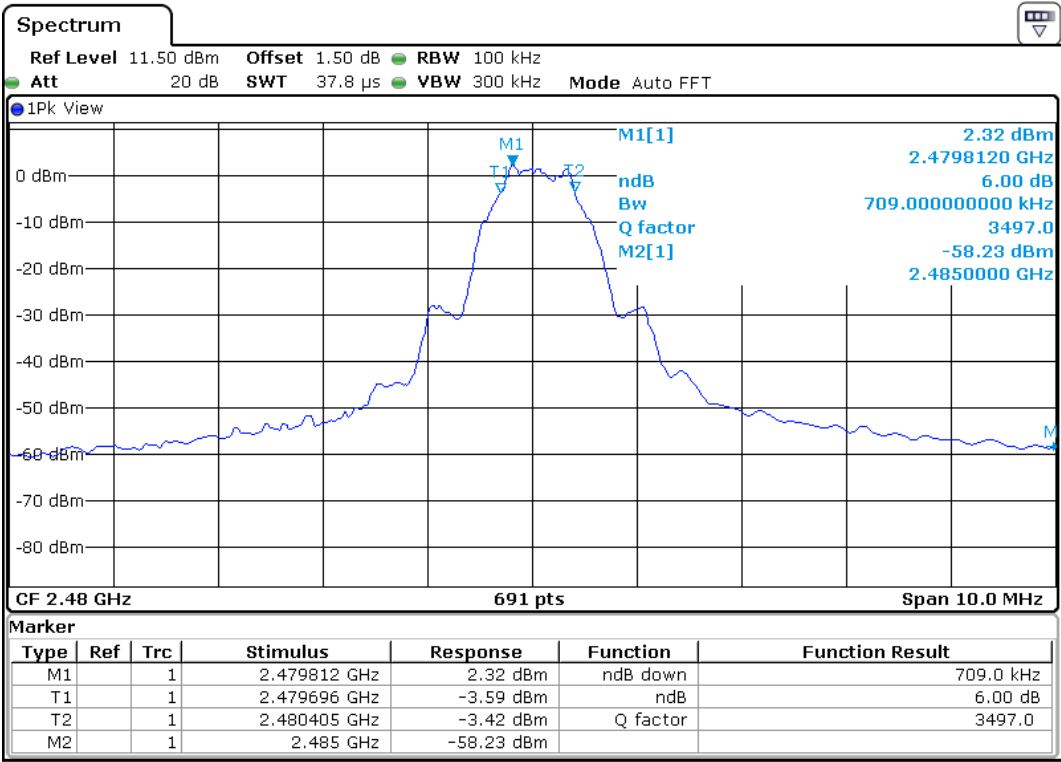


## Middle Channel



INTERTEK TESTING SERVICES

High Channel



## INTERTEK TESTING SERVICES

---

Applicant: iDevices, LLC  
Date of Test: August 18, 2015  
Model: IDEV0004

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

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

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.

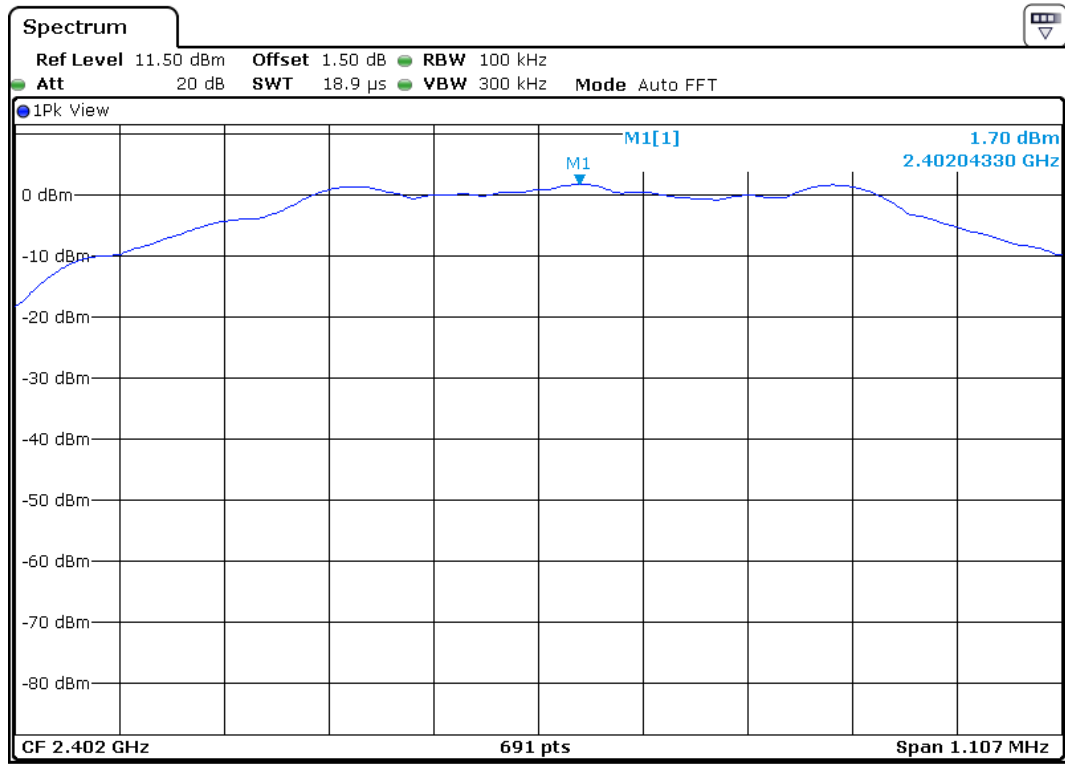
Packet: DH1

Frequency (MHz)	Power Density with RBW 100KHz
2402	1.70
2440	2.07
2480	2.18

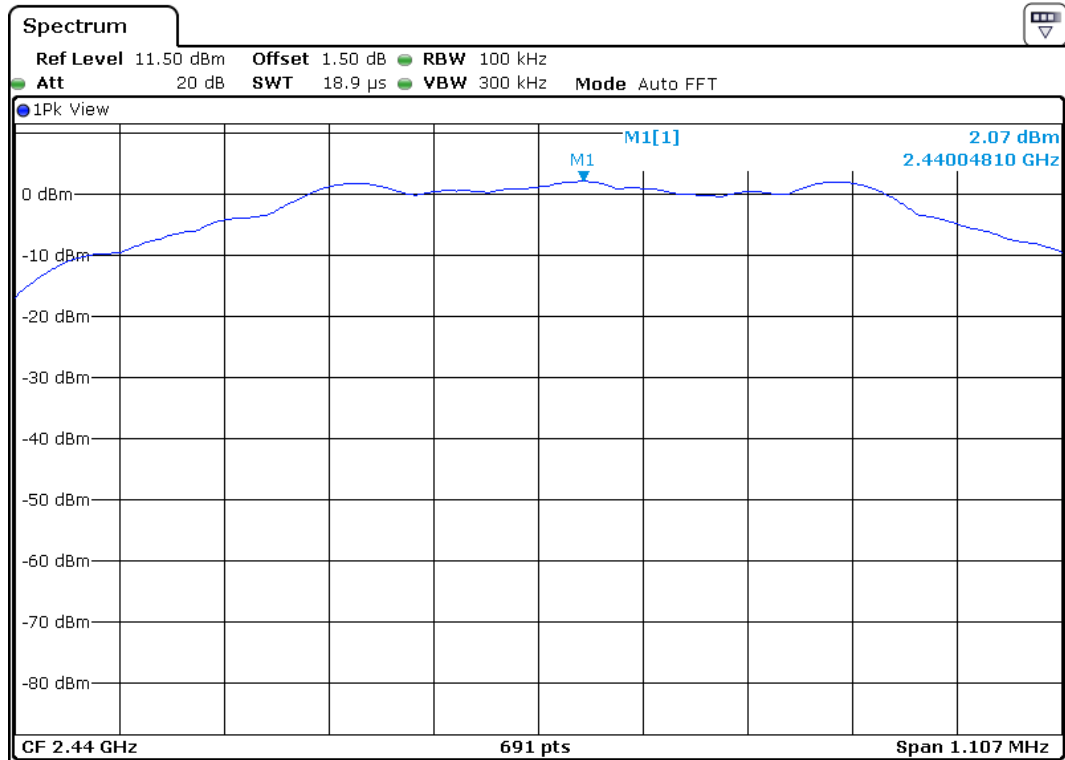
The test plots are attached as below.

## INTERTEK TESTING SERVICES

### Low Channel

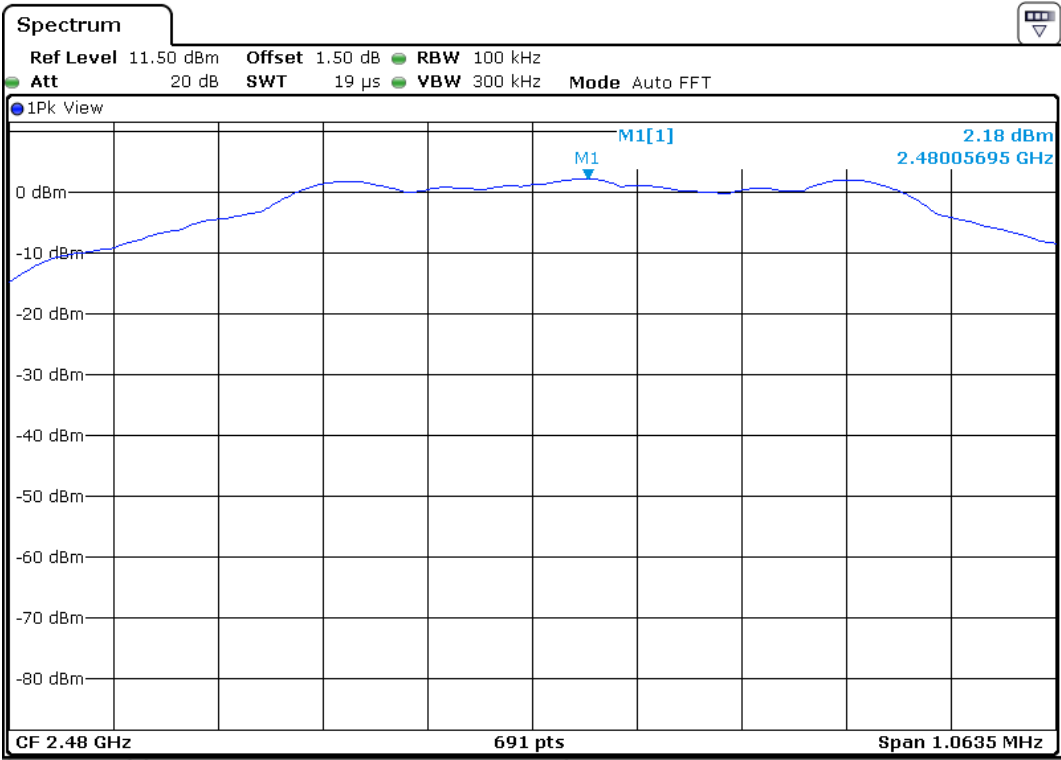


### Middle Channel



INTERTEK TESTING SERVICES

High Channel



## INTERTEK TESTING SERVICES

---

Applicant: iDevices, LLC  
Date of Test: August 18, 2015  
Model: IDEV0004

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

In any 100 kHz bandwidth outside the EUT passband, the RF power produced by the modulation products of the spreading sequence, the information sequence, and the carrier frequency shall be at least 20dB below that of the maximum in-band 100 kHz emission, or else shall meet the general limits for radiated emissions at frequencies outside the passband, whichever results in lower attenuation. The Measurement Procedure was set according to the FCC KDB 558074.

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

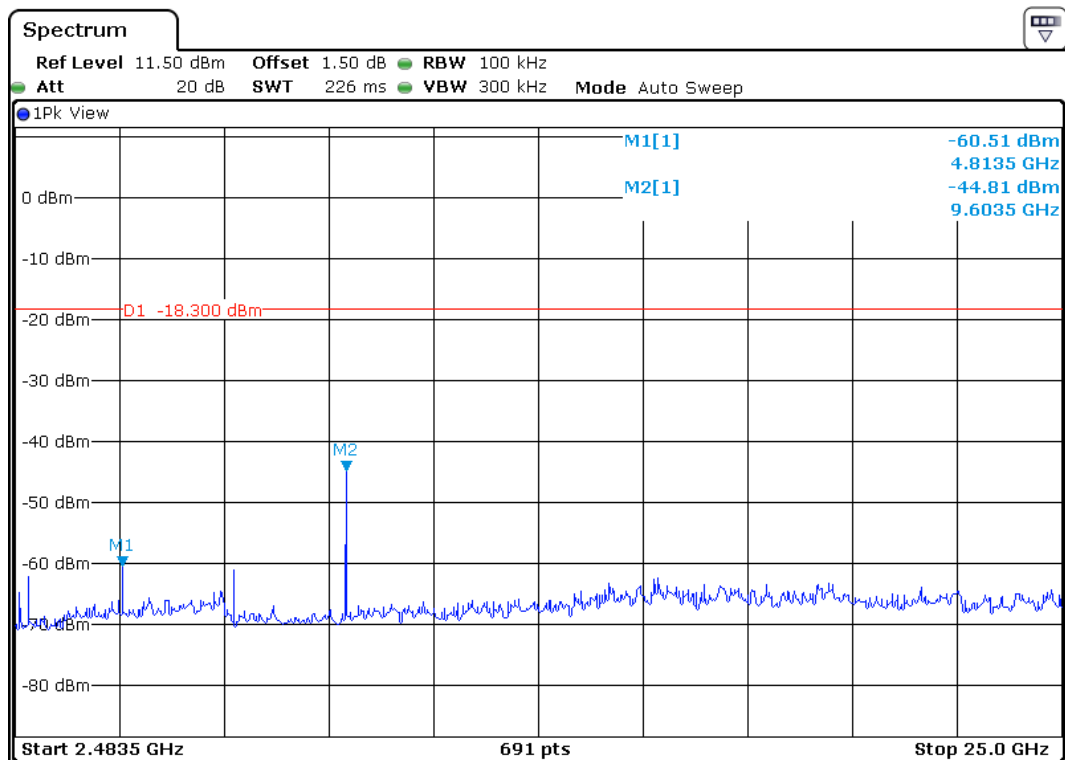
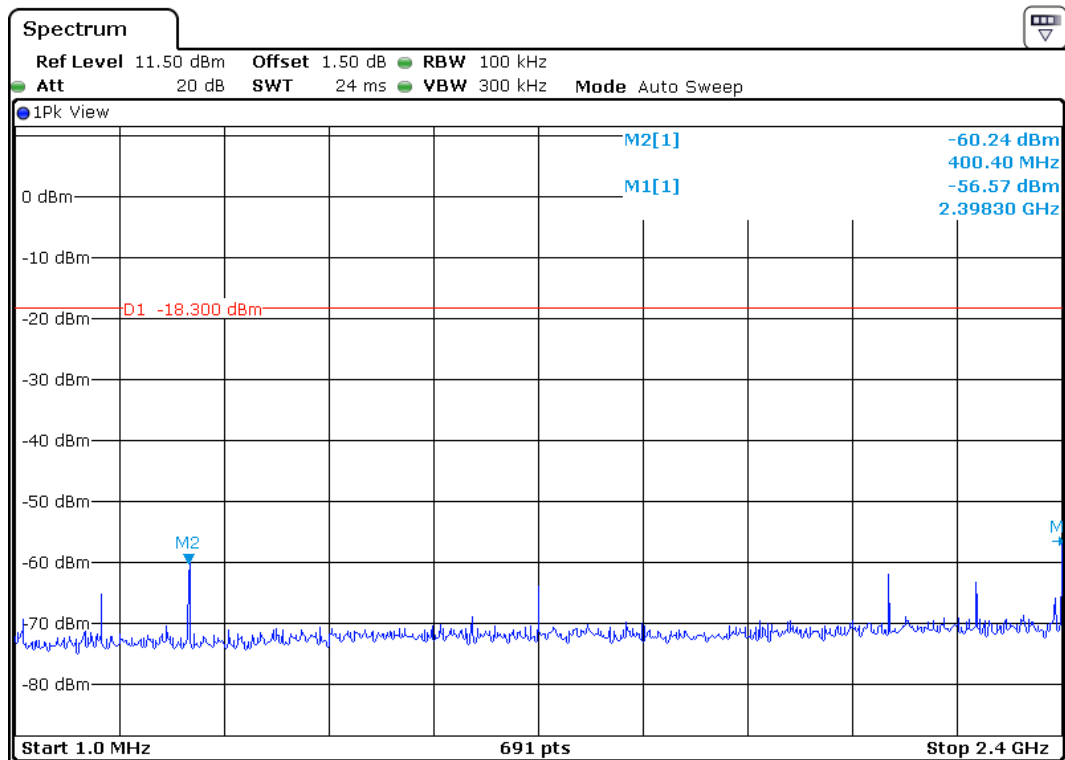
Refer to the attached test plot for out of band conducted emissions data with Packet: DH1

The test plots showed all spurious emission and 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.

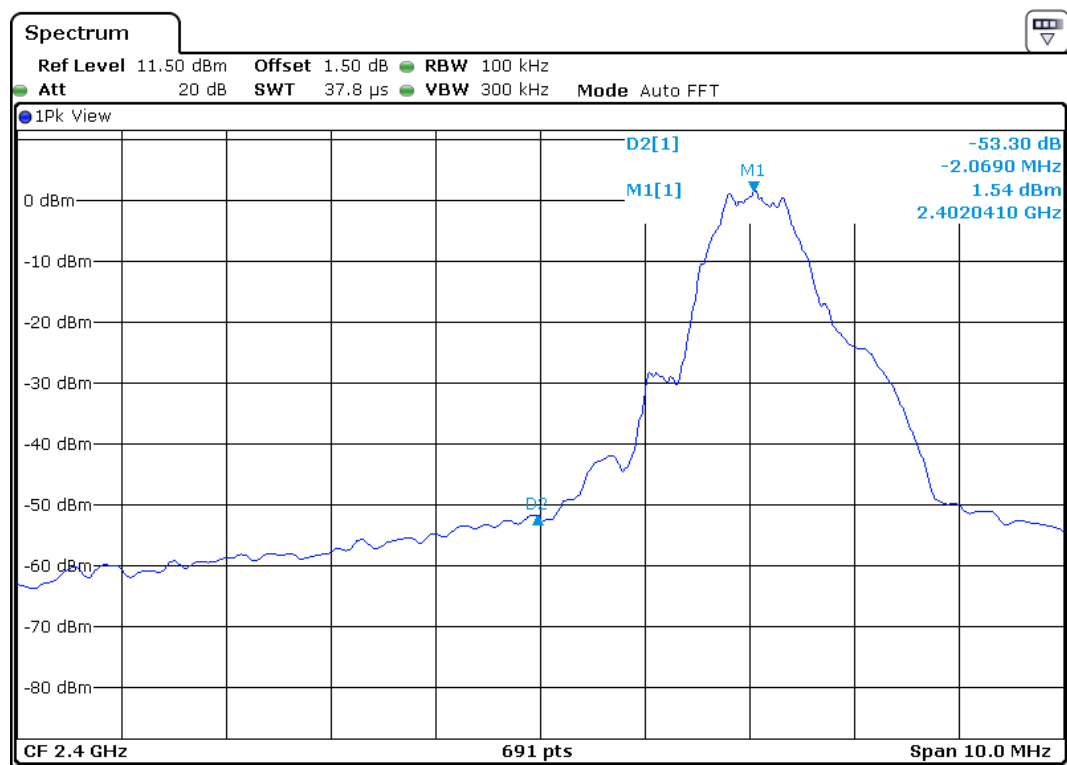
## INTERTEK TESTING SERVICES

Low Channel Reference Level: 1.70dBm



TRF no.: FCC 15C\_TX\_b  
FCC ID: 2ABDJ-SWITCH4  
Report No.: 150729018SZN-001

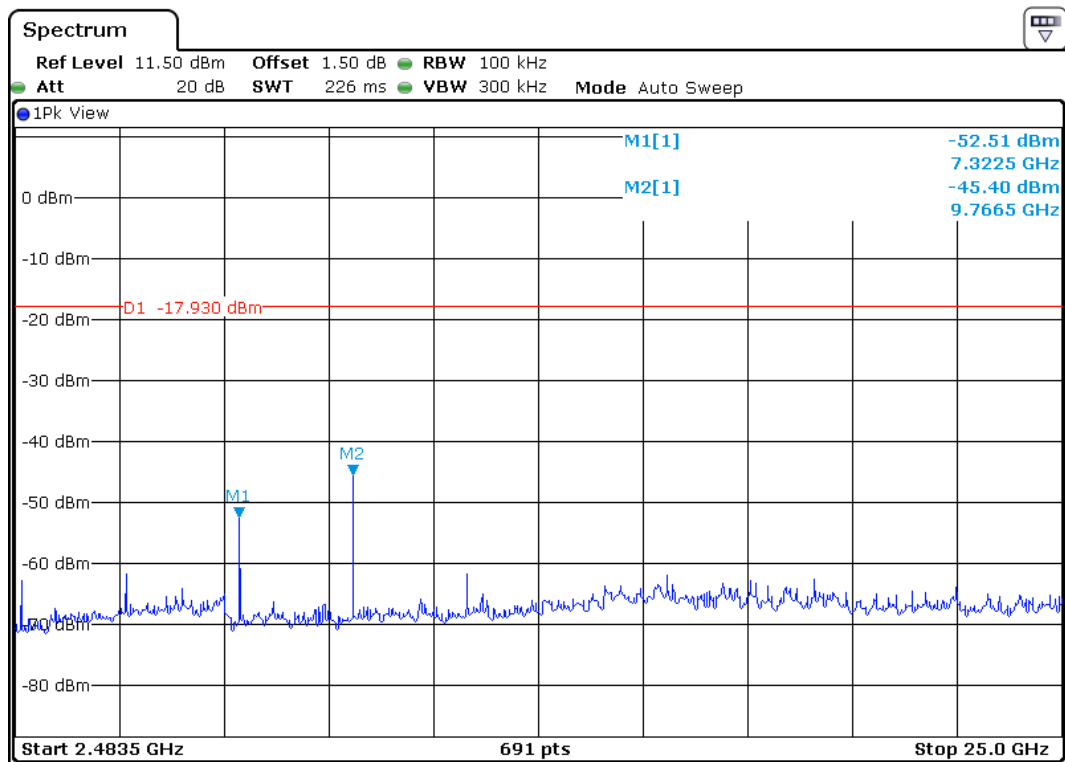
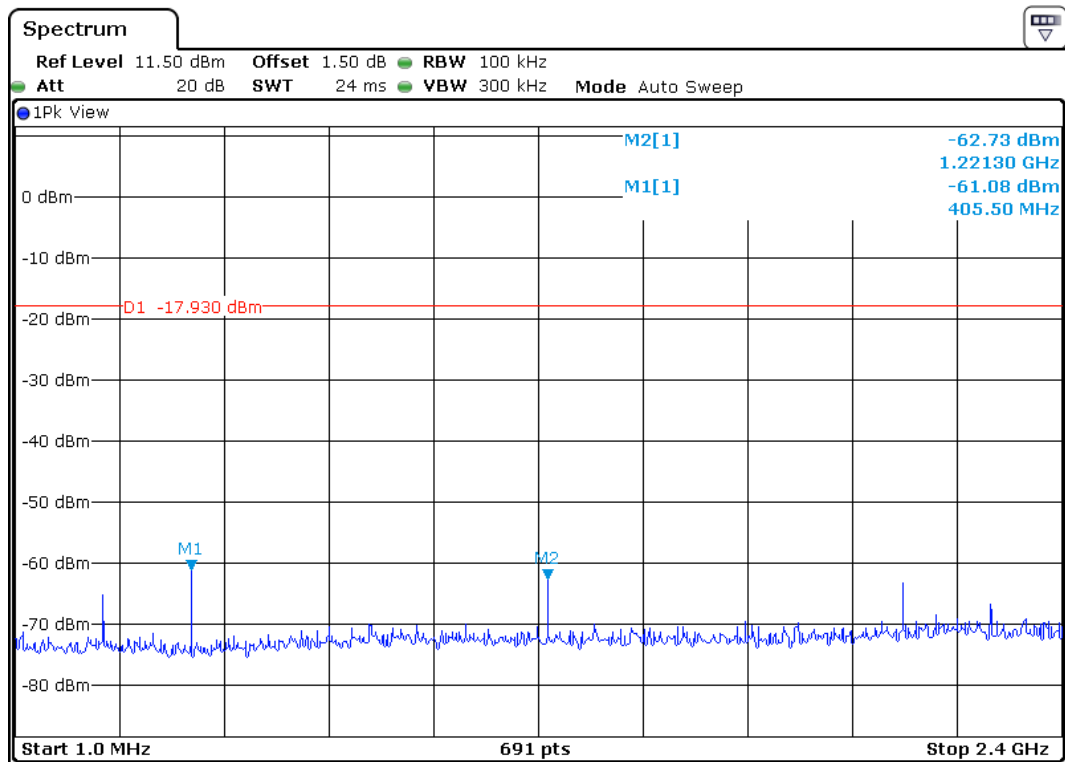
## INTERTEK TESTING SERVICES





## INTERTEK TESTING SERVICES

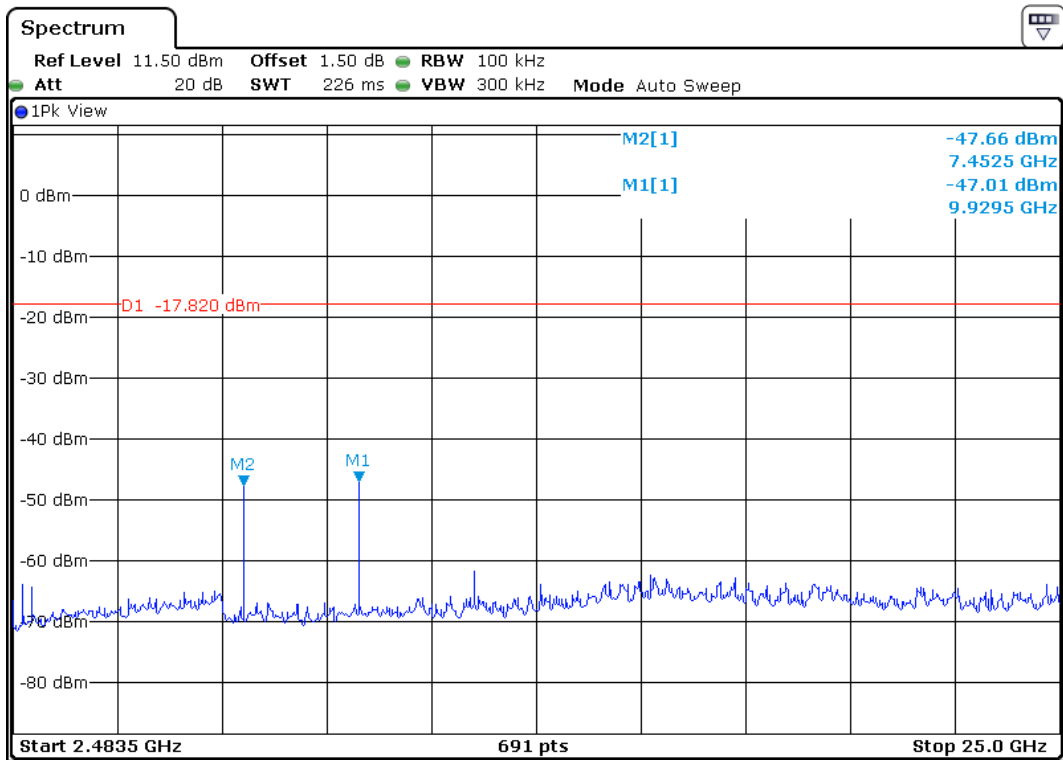
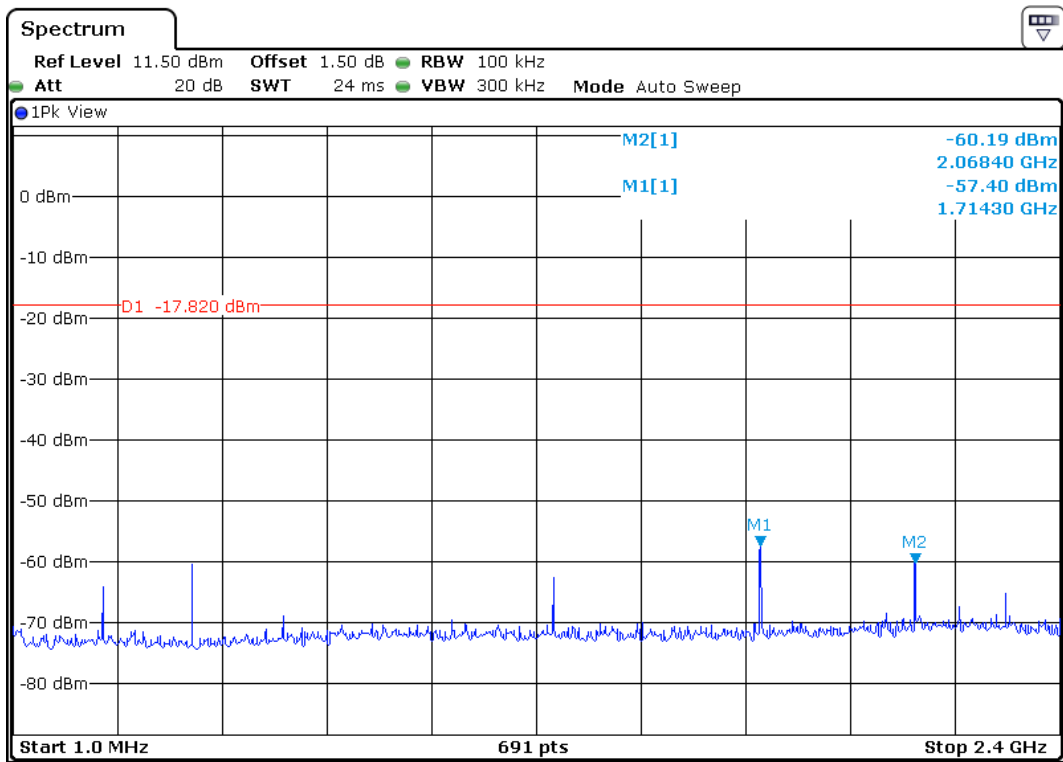
Middle Channel Reference Level: 2.07dBm



TRF no.: FCC 15C\_TX\_b  
FCC ID: 2ABDJ-SWITCH4  
Report No.: 150729018SZN-001

## INTERTEK TESTING SERVICES

High Channel Reference Level: 2.18dBm



TRF no.: FCC 15C\_TX\_b  
FCC ID: 2ABDJ-SWITCH4  
Report No.: 150729018SZN-001

INTERTEK TESTING SERVICES



## INTERTEK TESTING SERVICES

---

Applicant: iDevices, LLC  
Date of Test: August 18, 2015  
Model: IDEV0004

### 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

## INTERTEK TESTING SERVICES

---

### 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.

## INTERTEK TESTING SERVICES

---

Applicant: iDevices, LLC  
Date of Test: August 18, 2015  
Model: IDEV0004

### 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 dB $\mu$ V/m  
              RA = Receiver Amplitude (including preamplifier) in dB $\mu$ 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 dB $\mu$ 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 32 dB $\mu$ V/m. This value in dB $\mu$ V/m was converted to its corresponding level in  $\mu$ V/m.

$$\begin{aligned} RA &= 62.0 \text{ dB}\mu\text{V} \\ AF &= 7.4 \text{ dB} \\ CF &= 1.6 \text{ dB} \\ AG &= 29.0 \text{ dB} \\ PD &= 0 \text{ dB} \\ FS &= 62 + 7.4 + 1.6 - 29 + 0 = 42 \text{ dB}\mu\text{V/m} \end{aligned}$$

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

## INTERTEK TESTING SERVICES

---

Applicant: iDevices, LLC  
Date of Test: August 18, 2015  
Model: IDEV0004

### 4.8 Radiated Spurious Emission

Worst Case Radiated Spurious Emission at 2483.680MHz is passed by 9.4dB margin.

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

## INTERTEK TESTING SERVICES

Applicant: iDevices, LLC

Date of Test: August 18, 2015

Model: IDEV0004

Worst Case Operating Mode: RF on

### Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	159.214	28.2	20.0	18.9	27.1	43.5	-16.4
Horizontal	191.682	34.4	20.0	10.6	25.0	43.5	-18.5
Horizontal	359.475	34.0	20.0	14.7	28.7	46.0	-17.3
Vertical	31.288	23.2	20.0	18.9	22.1	40.0	-17.9
Vertical	143.985	25.7	20.0	14.1	19.8	43.5	-23.7
Vertical	432.984	36.6	20.0	10.0	26.6	46.0	-19.4

NOTES: 1. Quasi-Peak detector is used except for others stated.

2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances 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 harmonic 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. All emissions are below the QP limit.



## INTERTEK TESTING SERVICES

Applicant: iDevices, LLC

Date of Test: August 18, 2015

Model: IDEV0004

Mode: Packet DH1 (TX-Channel 2402MHz)

### Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
*Horizontal	4804.000	58.9	36.7	35.5	57.7	74.0	-16.3
*Horizontal	2389.480	62.0	36.7	28.1	53.4	74.0	-20.6

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
*Horizontal	4804.000	43.8	36.7	35.5	42.6	54.0	-11.4
*Horizontal	2389.480	51.1	36.7	28.1	42.5	54.0	-11.5

- NOTES:
1. Peak detector is used for the emission measurement (RBW=1MHz, VBW=3MHz for Peak data; RBW=1MHz, VBW=10Hz for Average data).
  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.

## INTERTEK TESTING SERVICES

Applicant: iDevices, LLC

Date of Test: August 18, 2015

Model: IDEV0004

Mode: Packet DH1 (TX-Channel 2440MHz)

### Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
*Horizontal	4880.000	56.4	36.7	35.5	55.2	74.0	-18.8
*Horizontal	7320.000	57.3	36.1	37.2	58.4	74.0	-15.6

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
*Horizontal	4880.000	41.1	36.7	35.5	39.9	54.0	-14.1
*Horizontal	7320.000	43.0	36.1	37.2	44.1	54.0	-9.9

- NOTES:
1. Peak detector is used for the emission measurement (RBW=1MHz, VBW=3MHz for Peak data; RBW=1MHz, VBW=10Hz for Average data).
  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.

TRF no.: FCC 15C\_TX\_b

FCC ID: 2ABDJ-SWITCH4

Report No.: 150729018SZN-001

## INTERTEK TESTING SERVICES

Applicant: iDevices, LLC

Date of Test: August 18, 2015

Model: IDEV0004

Mode: Packet DH1 (TX-Channel 2480MHz)

### Radiated Emissions

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	56.3	36.7	35.5	55.1	74.0	-18.9
*Horizontal	7440.000	58.5	36.1	37.2	59.6	74.0	-14.4
*Horizontal	2483.680	62.9	36.7	28.1	54.3	74.0	-19.7

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	36.7	35.5	39.5	54.0	-14.5
*Horizontal	7440.000	43.3	36.1	37.2	44.4	54.0	-9.6
*Horizontal	2483.680	53.2	36.7	28.1	44.6	54.0	-9.4

- NOTES: 1. Peak detector is used for the emission measurement (RBW=1MHz, VBW=3MHz for Peak data; RBW=1MHz, VBW=10Hz for Average data).
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.

TRF no.: FCC 15C\_TX\_b

FCC ID: 2ABDJ-SWITCH4

Report No.: 150729018SZN-001

## INTERTEK TESTING SERVICES

---

### 4.9 Conducted Emission

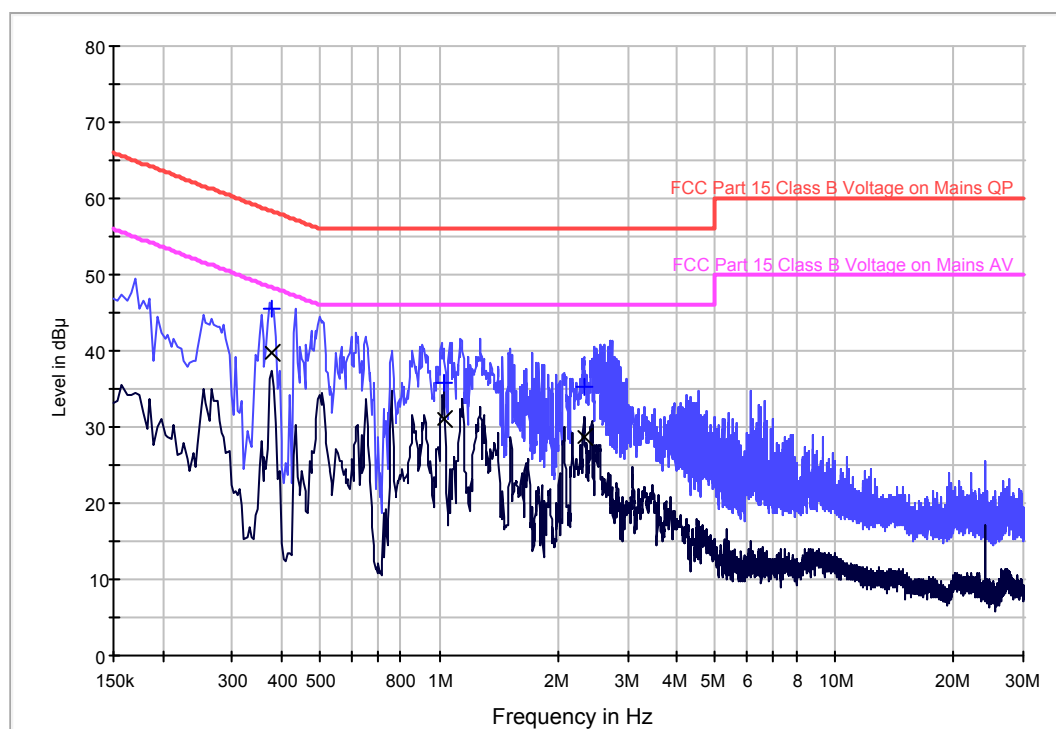
Worst Case Conducted emission at 0.378MHz is Passed by 8.5 dB margin

For electronic filing, the worst case conducted emission configuration photograph is saved with filename: conducted photos.pdf.

## INTERTEK TESTING SERVICES

Company: iDevices, LLC  
Date of Test: August 18, 2015  
Model: IDEV0004  
Worst Case Operating Mode: RF on

### Conducted Emission Test - FCC



### Limit and Margin QP

Frequency (MHz)	QuasiPeak (dBuV)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.378000	45.5	L1	9.9	12.8	58.3
1.030000	35.9	L1	9.9	20.1	56.0
2.326000	35.2	L1	10.0	20.8	56.0

### Limit and Margin AV

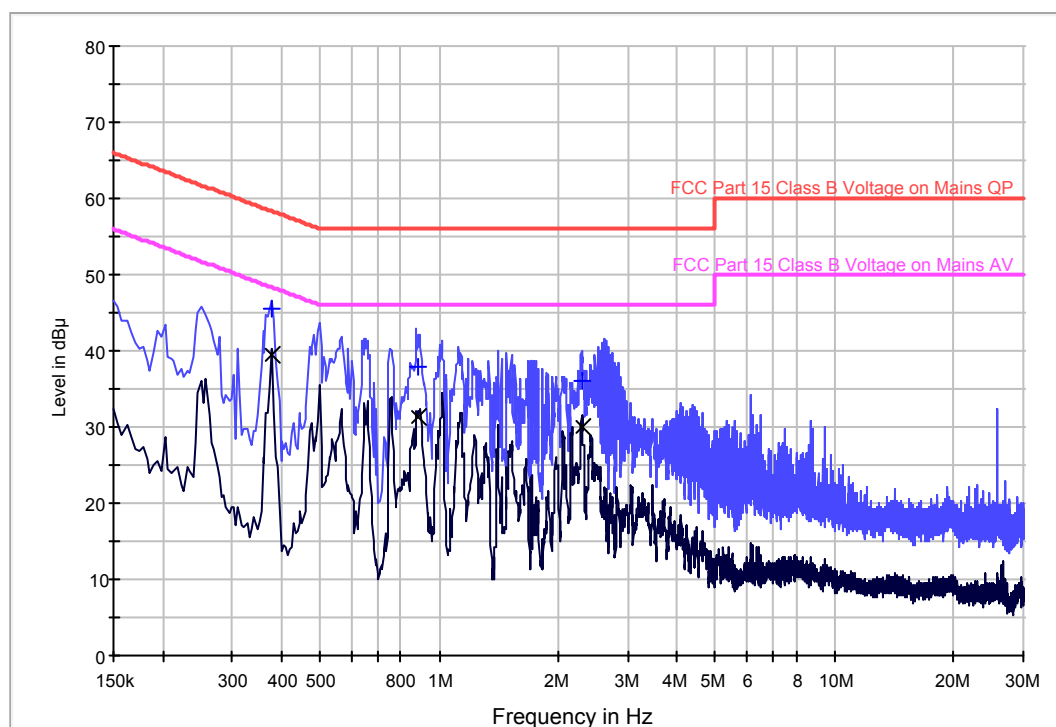
Frequency (MHz)	Average (dBuV)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.378000	39.8	L1	9.9	8.5	48.3
1.030000	31.1	L1	9.9	14.9	46.0
2.326000	28.7	L1	10.0	17.3	46.0

TRF no.: FCC 15C\_TX\_b  
FCC ID: 2ABDJ-SWITCH4  
Report No.: 150729018SZN-001

## INTERTEK TESTING SERVICES

Company: iDevices, LLC  
 Date of Test: August 18, 2015  
 Model: IDEV0004  
 Worst Case Operating Mode: RF on

### Conducted Emission Test - FCC



### Limit and Margin QP

Frequency (MHz)	QuasiPeak (dBuV)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.378000	45.6	N	10.2	12.7	58.3
0.886000	37.8	N	10.3	18.2	56.0
2.290000	36.2	N	10.3	19.8	56.0

### Limit and Margin AV

Frequency (MHz)	Average (dBuV)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.378000	39.4	N	10.2	8.9	48.3
0.886000	31.3	N	10.3	14.7	46.0
2.290000	30.0	N	10.3	16.0	46.0

TRF no.: FCC 15C\_TX\_b  
 FCC ID: 2ABDJ-SWITCH4  
 Report No.: 150729018SZN-001

## INTERTEK TESTING SERVICES

---

Applicant: iDevices, LLC  
Date of Test: August 18, 2015  
Model: IDEV0004

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

☒ Not required - No digital part

☐ Test results are attached

☐ Included in the separated report.

## INTERTEK TESTING SERVICES

---

Applicant: iDevices, LLC  
Date of Test: August 18, 2015  
Model: IDEV0004

### 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.



**EXHIBIT 5**  
**EQUIPMENT PHOTOGRAPHS**

### 5.0 **Equipment Photographs**

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

**EXHIBIT 6**

**PRODUCT LABELLING**

### 6.0 **Product Labelling**

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

**EXHIBIT 7**

**TECHNICAL SPECIFICATIONS**

### 7.0 **Technical Specifications**

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

**EXHIBIT 8**  
**INSTRUCTION MANUAL**

### 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.



**EXHIBIT 9**

**MISCELLANEOUS INFORMATION**

### 9.0 **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.

**EXHIBIT 10**

**TEST EQUIPMENT LIST**

## INTERTEK TESTING SERVICES

### 10.0 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-2015	20-May-2016
SZ182-02-01	Power Sensor	Anritsu	MA2411B	1207429	20-May-2015	20-May-2016
SZ061-12	BiConiLog Antenna	ETS	3142E	00166158	02-Sep-2014	02-Sep-2015
SZ185-01	EMI Receiver	R&S	ESCI	100547	07-Feb-2015	07-Feb-2016
SZ061-09	Horn Antenna	ETS	3115	00092346	01-Nov-2014	01-Nov-2015
SZ061-07	Pyramidal Horn Antenna	ETS	3160-09	00083067	03-Sep-2014	03-Sep-2015
SZ061-06	Active Loop Antenna	Electro-Metrics	EM-6876	217	29-Apr-2015	29-Apr-2016
SZ056-06	Signal Analyzer	R&S	FSV40	Oct-76	08-Jul-2015	08-Jul-2016
SZ181-04	Preamplifier	Agilent	8449B	3008A02474	07-Feb-2015	07-Feb-2016
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	4102	19-Apr-2015	19-Apr-2016
SZ062-02	RF Cable	RADIAL	RG 213U	0	27-Jun-2015	27-Dec-2015
SZ062-05	RF Cable	RADIAL	0.04-26.5GHz	0833254	07-Apr-2015	07-Oct-2015
SZ062-12	RF Cable	RADIAL	0.04-26.5GHz	083387	07-Apr-2015	07-Oct-2015
SZ067-04	Notch Filter	Micro-Tronics	BRM50702-02	--	20-May-2015	20-May-2016
SZ185-02	EMI Test Receiver	R&S	ESCI	100692	01-Nov-2014	01-Nov-2015
SZ187-01	Two-Line V-Network	R&S	ENV216	100072	01-Nov-2014	01-Nov-2015
SZ188-03	Shielding Room	ETS	RFD-100	4100	23-Aug-2014	23-Aug-2016