



ISO/IEC17025Accredited Lab.

| Report No.:<br>File reference No.: | FCC 1505148<br>2015-06-03   |               |
|------------------------------------|---|---------------|
| Applicant:                         | TESONIC INTERNATIONAL (HK) LTD.   |               |
| Product:                           | selfie sticks   |               |
| Model No.:                         | PCA3200, SS2-1000, SS2-1020, SS2-1040, SS2-1<br>SS2-1088, SS2-1080  | 050,          |
| Trademark:                         | N/A   |               |
| Test Standards:                    | FCC Part 15 Subpart C, Paragraph 15.247   |               |
| Test result:                       | It is herewith confirmed and found to com<br>requirements set up by ANSI C63.10&FCC Part<br>Paragraph 15.247 regulations for the e<br>electromagnetic compatibility | 15 Subpart C, |
| Approved By                        |   |               |

Jack Chung

Jack Chung Manager

Dated:

June 03, 2015

Results appearing herein relate only to the sample tested The technical reports is issued errors and omissions exempt and is subject to withdrawal at

# SHENZHEN TIMEWAY TESTING LABORATORIES

Room 512-519, 5/F., East Tower, Building 4, Anhua Industrial Zone, Futian District, Shenzhen, Guangdong, China Tel (755) 83448688, Fax (755) 83442996, E-Mail:info@timewaytech.com



# **Special Statement:**

The testing quality ability of our laboratory meet with "Quality Law of People's Republic of China" Clause 19.

The testing quality system of our laboratory meets with ISO/IEC-17025 requirements, which is approved by CNAS. This approval result is accepted by MRA of APLAC.

Our test facility is recognized, certified, or accredited by the following organizations:

# CNAS-LAB Code: L2292

The EMC Laboratory has been assessed and in compliance with CNAS-CL01 accreditation criteria for testing Laboratories (identical to ISO/IEC 17025:1999 General Requirements) for the Competence of testing Laboratories.

# FCC-Registration No.: 899988

The EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications commission. The acceptance letter from the FCC is maintained in our files. Registration No.:899988.

# IC- Registration No.: IC5205A-02

The EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada. The acceptance letter from the IC is maintained in our files. Registration No.: IC 5205A-02.

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## 1.0 General Details

#### Test Lab Details 1.1

Name : SHENZHEN TIMEWAY TESTING LABORATORIES. Address: Room 512-519,5/F., East Tower, Building 4, Anhua Industrial Zone, Futian District, Shenzhen, Guangdong China Telephone: (755) 83448688 Fax: (755) 83442996

Site on File with the Federal Communications Commission - United Sates Registration Number: 899988 For 3m & 10 m OATS Site Listed with Industry Canada of Ottawa, Canada Registration Number: IC: 5205A-02 For 3m & 10 m OATS

### 1.2 Applicant Details

Applicant: TESONIC INTERNATIONAL (HK) LTD. Address: Room 2801, the 28th Office Tower, 6007 Shennan Avenue, Shenzhen, China 13590410958 Telephone: Fax:

## 1.3 Description of EUT

| 1                        |  |
|--------------------------|--|
| Product:                 | selfie sticks  |
| Manufacturer:            | TESONIC INTERNATIONAL (HK) LTD.  |
| Address:                 | Room 2801, the 28th Office Tower, 6007 Shennan Avenue, Shenzhen, China |
| Model Number:            | PCA3200  |
| Additional Model Number: | SS2-1000, SS2-1020, SS2-1040, SS2-1050, SS2-1088, SS2-1080             |
| Brand Name:              | N/A  |
| Additional Brand Name:   | N/A  |
| Type of Modulation       | GFSK, <i>J</i> /4DQPSK, 8DPSK  |
| Frequency range          | 2402-2480MHz   |
| Number of Channel        | 79   |
| Frequency Selection      | By software  |
| Antenna type             | PCB Antenna used, the antenna gain is 0dBi                             |
|                          |  |

#### 1.4 Submitted Sample: 1 Sample

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- Test Duration: 1.5 2015-05-25 to 2015-06-03
- 1.6 Test Uncertainty Conducted Emissions Uncertainty =3.6dB Radiated Emissions Uncertainty =4.7dB
- 1.7 Test Engineer

Terry lang

The sample tested by

Print Name: Terry Tang

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| 2.0 Test Equipments    |              |              |                   |              |            |
|------------------------|--------------|--------------|-------------------|--------------|------------|
| Instrument Type        | Manufacturer | Model        | Serial No.        | Date of Cal. | Due Date   |
| ESPI Test Receiver     | R&S          | ESPI 3       | 100379            | 2014-08-21   | 2015-08-20 |
| TWO<br>Line-V-NETW     | R&S          | EZH3-Z5      | 100294            | 2014-08-22   | 2015-08-21 |
| TWO<br>Line-V-NETW     | R&S          | EZH3-Z5      | EZH3-Z5 100253    |              | 2015-08-21 |
| Ultra Broadband<br>ANT | R&S          | HL562 100157 |                   | 2014-08-23   | 2015-08-22 |
| ESDV Test Receiver     | R&S          | ESDV         | 100008            | 2014-08-22   | 2015-08-21 |
| Impuls-Begrenzer       | R&S          | ESH3-Z2      | 100281            | 2014-08-21   | 2015-08-20 |
| System Controller      | СТ           | SC100        | -                 |              |            |
| Printer                | EPSON        | РНОТО ЕХЗ    | CFNH234850        |              |            |
| Computer               | IBM          | 8434         | 1S8434KCE99BLXLO* | -            | -          |
| Loop Antenna           | EMCO         | 6502         | 00042960          | 2014-08-22   | 2015-08-21 |
| ESPI Test Receiver     | R&S          | ESI26        | 838786/013        | 2014-08-22   | 2015-08-21 |
| 3m OATS                |              |              | N/A               | 2014-08-21   | 2015-08-20 |
| Horn Antenna           | R&S          | BBHA 9170    | BBHA9170265       | 2014-08-23   | 2015-08-22 |
| Horn Antenna           | R&S          | BBHA 9120D   | 9120D-631         | 2014-08-23   | 2015-08-22 |
| Power meter            | Anritsu      | ML2487A      | 6K00003613        | 2014-08-22   | 2015-08-21 |
| Power sensor           | Anritsu      | MA2491A      | 32263             | 2014-08-22   | 2015-08-21 |
| Bilog Antenna          | Schwarebeck  | VULB9163     | 9163/340          | 2014-08-23   | 2015-08-22 |
| LISN                   | AFJ          | LS16C        | 10010947251       | 2014-08-21   | 2015-08-20 |
| LISN (Three Phase)     | Schwarebeck  | NSLK 8126    | 8126453           | 2014-08-22   | 2015-08-21 |
| 9*6*6 Anechoic         |              |              | N/A               | 2014-08-21   | 2015-08-20 |
| EMI Test Receiver      | RS           | ESCS30       | 100139            | 2014-08-22   | 2015-08-21 |

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#### 3.0 **Technical Details**

#### 3.1 Summary of test results

| Requirement                         | CFR 47 Section               | Result | Notes    |
|-------------------------------------|------------------------------|--------|----------|
| Antenna Requirement                 | 15.203, 15.247(b)(4)         | PASS   | Complies |
| Maximum Peak Out Power              | 15.247 (b)(1), (4)           | PASS   | Complies |
| <b>Carrier Frequency Separation</b> | 15.247(a)(1)                 | PASS   | Complies |
| 20dB Channel Bandwidth              | 15.247 (a)(1)                | PASS   | Complies |
| Number of Hopping Channels          | 15.247(a)(iii), 15.247(b)(1) | PASS   | Complies |
| Time of Occupancy (Dwell Time)      | 15.247(a)(iii)               | PASS   | Complies |
| Spurious Emission, Band Edge, and   | 15.247(d),15.205(a),         | PASS   | Complies |
| <b>Restricted bands</b>             | 15.209 (a),15.109            |        |          |
| <b>Conducted Emissions</b>          | 15.207(a), 15.107            | PASS   | Complies |
| <b>RF Exposure</b>                  | 15.247(i), 1.1307(b)(1)      | PASS   | Complies |

#### 3.2 **Test Standards**

FCC Part 15 Subpart & Subpart C, Paragraph 15.247, ANSI 63.4:2009 and ANSI 63.10:2009

#### 4.0 **EUT Modification**

No modification by Shenzhen Timeway Technology Consulting Co., Ltd

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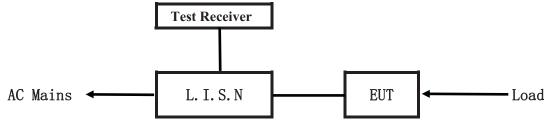
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#### 5. **Power Line Conducted Emission Test**

5.1 Schematics of the test

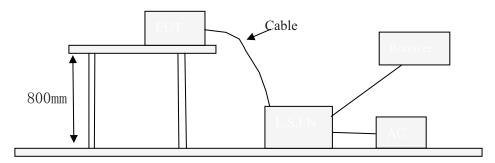


EUT: Equipment Under Test

5.2 Test Method and test Procedure

> The EUT was tested according to ANSI C63.4-2009 The Frequency spectrum From 0.15MHz to 30MHz was investigated. The LISN used was 50ohm/50uH as specified by section 5.1 of ANSI C63.4-2009 Test Voltage: 120V~60Hz

Block diagram of Test setup



5.3 Configuration of The EUT

> The EUT was configured according to ANSI C63.10-2009. All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below. 79 channels are provided to the EUT

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## A. EUT

| Device        | Manufacturer          | Model                               | FCC ID       |
|---------------|-----------------------|-------------------------------------|--------------|
| selfie sticks | TESONIC INTERNATIONAL | PCA3200,SS2-1000,SS2-1020,SS2-1040, | 2AEW6TES001  |
| serile sticks | (HK) LTD.             | SS2-1050,SS2-1088,SS2-1080          | ZAL WOIESOUI |

## B. Internal Device

| Device | Manufacturer | Model | FCC ID/DOC |
|--------|--------------|-------|------------|
| N/A    |              |       |            |

## C. Peripherals

| Device | Manufacturer | Model                | FCC ID/DOC | Raring                   |
|--------|--------------|----------------------|------------|--------------------------|
| Power  | Jihongda     | JHD-AP012U-0501150AB | VOC        | Input: 100-240V~,        |
| Supply |              |                      |            | 50/60Hz, 0.35A; Out Put: |
|        |              |                      |            | DC5V, 1.5A               |

## 5.4 EUT Operating Condition

Operating condition is according to ANSI C63.10-2009.

- A Setup the EUT and simulators as shown on follow
- B Enable AF signal and confirm EUT active to normal condition

## 5.5 Power line conducted Emission Limit according to Paragraph 15.107,15.207

| Frequency         | Class A Lim      | its (dB µ V)  | Class B Limits (dB µ V) |               |  |  |
|-------------------|------------------|---------------|-------------------------|---------------|--|--|
| (MHz)             | Quasi-peak Level | Average Level | Quasi-peak Level        | Average Level |  |  |
| $0.15~\sim~0.50$  | 79.0             | 66.0          | 66.0~56.0*              | 56.0~46.0*    |  |  |
| $0.50~\sim~5.00$  | 73.0             | 60.0          | 56.0                    | 46.0          |  |  |
| $5.00 \sim 30.00$ | 73.0             | 60.0          | 60.0                    | 50.0          |  |  |

Notes: 1. \*Decreasing linearly with logarithm of frequency.

2. The tighter limit shall apply at the transition frequencies

## 5.6 Test Results

The frequency spectrum from 0.15MHz to 30MHz was investigated. All reading are quasi-peak values with a resolution bandwidth of 9kHz.

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 A:
 Conducted Emission on Live Terminal (150kHz to 30MHz)

 EUT Operating Environment
 Europerature: 26°C

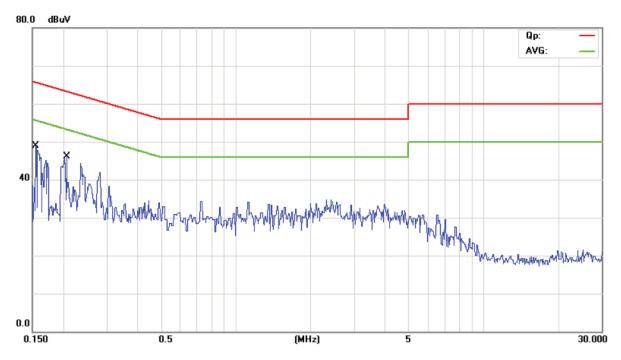
 Humidity: 65%RH
 Atmospheric Pressure: 101 KPa

 EUT set Condition: Charging and Keep Bluetooth Transmitting

 Equipment Level: Class B

 Results: PASS

 Please refer to following diagram for individual



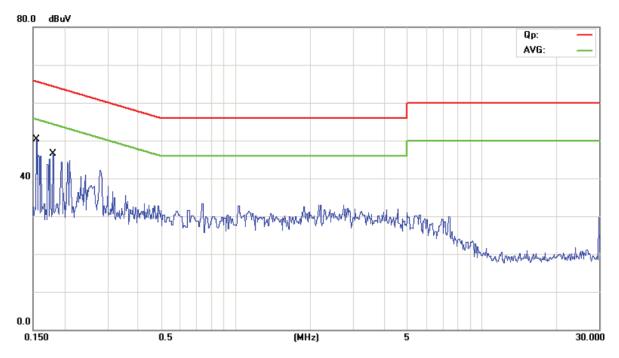
| No. Mk. | Freq.  | Reading<br>Level | Correct<br>Factor | Measure-<br>ment | Limit | Over   |          |         |
|---------|--------|------------------|-------------------|------------------|-------|--------|----------|---------|
|         | MHz    | dBuV             | dB                | dBuV             | dBuV  | dB     | Detector | Comment |
| 1       | 0.1550 | 26.00            | 11.01             | 37.01            | 65.73 | -28.72 | QP       |         |
| 2       | 0.1550 | -21.30           | 11.01             | -10.29           | 55.73 | -66.02 | AVG      |         |
| 3 *     | 0.2060 | 24.20            | 11.06             | 35.26            | 63.37 | -28.11 | QP       |         |
| 4       | 0.2060 | -13.70           | 11.06             | -2.64            | 53.37 | -56.01 | AVG      |         |

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B: Conducted Emission on Neutral Terminal (150kHz to 30MHz) EUT Operating Environment Temperature: 26°C Humidity: 65%RH Atmospheric Pressure: 101 KPa EUT set Condition: Charging and Keep Bluetooth Transmitting Equipment Level: Class B Results: Pass Please refer to following diagram for individual



| No. | Mk. | Freq.  | Reading<br>Level | Correct<br>Factor | Measure-<br>ment | Limit | Over   |          |         |
|-----|-----|--------|------------------|-------------------|------------------|-------|--------|----------|---------|
|     |     | MHz    | dBuV             | dB                | dBuV             | dBuV  | dB     | Detector | Comment |
| 1   | *   | 0.1548 | 28.20            | 11.01             | 39.21            | 65.74 | -26.53 | QP       |         |
| 2   |     | 0.1548 | -23.00           | 11.01             | -11.99           | 55.74 | -67.73 | AVG      |         |
| 3   |     | 0.1802 | 23.70            | 11.03             | 34.73            | 64.48 | -29.75 | QP       |         |
| 4   |     | 0.1802 | -19.00           | 11.03             | -7.97            | 54.48 | -62.45 | AVG      |         |

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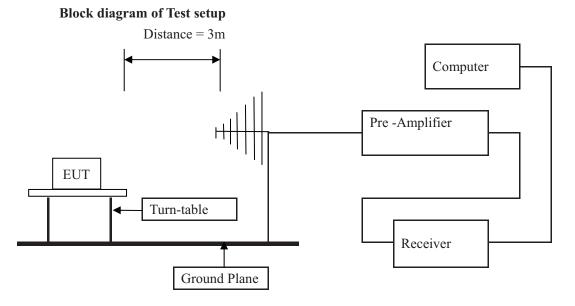
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### 6 Radiated Emission Test

## 6.1 Test Method and test Procedure:

- The EUT was tested according to ANSI C63.4-2009. The radiated test was performed at Timeway Laboratory. This site is on file with the FCC laboratory division, Registration No.899988
- (2) The EUT, peripherals were put on the turntable which table size is 1m x 1.5 m, table high 0.8 m. All set up is according to ANSI C63.4-2009
- (3) The frequency spectrum from 30 MHz to 1 GHz was investigated. All readings from 30 MHz to 1 GHz are quasi-peak values with a resolution bandwidth of 120 kHz. For measurement above 1GHz, peak values with RBW=VBW=1MHz and PK detector. AV value with RBW=1MHz, VBW=10Hz and PK detector. Measurements were made at 3 meters.
- (4) The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.
- (5) Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance is with all installation combinations. All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dB of specification limit), and are distinguished with a "QP" in the data table.
- (6) The antenna polarization: Vertical polarization and Horizontal polarization.



- 6.2 Configuration of The EUT Same as section 5.3 of this report
- 6.3 EUT Operating Condition

Same as section 5.4 of this report.

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## 6.4 Radiated Emission Limit

All emission from a digital device, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strength specified below:

| Frequency Range (MHz) | Distance (m) | Field strength (dB $\mu$ V/m) |
|-----------------------|--------------|-------------------------------|
| 30-88                 | 3            | 40.0                          |
| 88-216                | 3            | 43.5                          |
| 216-960               | 3            | 46.0                          |
| Above 960             | 3            | 54.0                          |

Note: 1. RF Voltage  $(dBuV) = 20 \log RF$  Voltage (uV)

2. In the Above Table, the higher limit applies at the band edges.

3. Distance refers to the distance in meters between the measuring instrument antenna and the EUT

4. This is a handhold device. The radiated emissions should be tested under 3-axes position (Lying, Side, and Stand), After pre-test. It was found that the worse radiated emission was get at the lying position.
5. After pre-scanning, **8DPSK** was the worse case. The test data of this mode was recorded.

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## Test result General Radiated Emission Data and Harmonics Radiated Emission Data

## Radiated Emission In Horizontal/ In Vertical (30MHz----1000MHz)

EUT set Condition: Charging and Keep Bluetooth Transmitting

**Results:** 

Pass

| Frequency (MHz) | Level@3m (dB $\mu$ V/m) | Antenna Polarity | Limit@3m (dB µ V/m) |
|-----------------|-------------------------|------------------|---------------------|
| 30.480          | 30.74                   | Н                | 40.00               |
| 947.200         | 41.37                   | Н                | 46.00               |
|                 |                         |                  |                     |
| 958.200         | 41.52                   | V                | 46.00               |
| 73.840          | 36.33                   | V                | 40.00               |
| 243.440         | 30.14                   | V                | 46.00               |

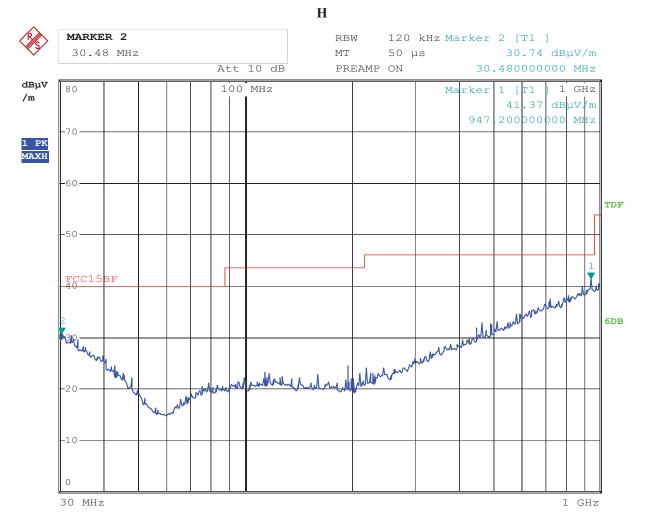
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Test Figure:



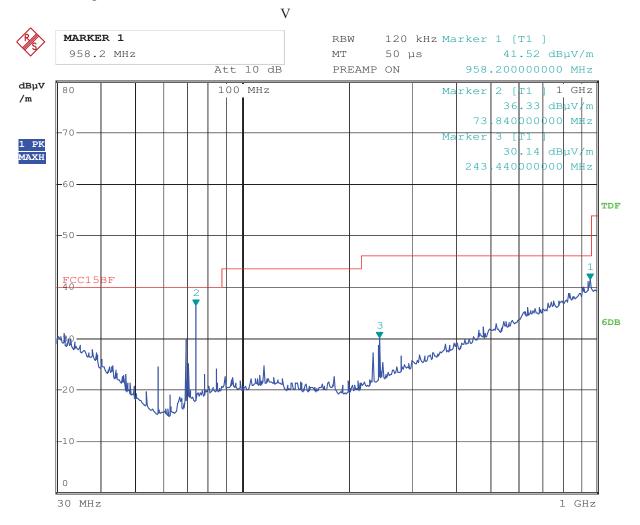
26.MAY.2015 09:42:56 Date:

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Test Figure:



Date: 26.MAY.2015 09:53:33

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| Frequency (MHz) | Level@3m (dB µ V/m) | Antenna Polarity | Limit@3m (dB µ V/m) |
|-----------------|---------------------|------------------|---------------------|
| 4804            |                     | Н                | 74(Peak)/ 54(AV)    |
| 4804            |                     | V                | 74(Peak)/ 54(AV)    |
| 7206            |                     | H/V              | 74(Peak)/ 54(AV)    |
| 9608            |                     | H/V              | 74(Peak)/ 54(AV)    |
| 12010           |                     | H/V              | 74(Peak)/ 54(AV)    |
| 14412           |                     | H/V              | 74(Peak)/ 54(AV)    |
| 16814           |                     | H/V              | 74(Peak)/ 54(AV)    |
| 19216           |                     | H/V              | 74(Peak)/ 54(AV)    |
| 21618           |                     | H/V              | 74(Peak)/ 54(AV)    |
| 24020           |                     | H/V              | 74(Peak)/ 54(AV)    |

#### **Operation Mode: Transmitting under Low Channel (2402MHz)**

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

2. Remark "---" means that the emissions level is too low to be measured

| Frequency (MHz) | Level@3m (dB $\mu$ V/m) | Antenna Polarity | Limit@3m (dB $\mu$ V/m) |
|-----------------|-------------------------|------------------|-------------------------|
| 4882            |                         | Н                | 74(Peak)/ 54(AV)        |
| 4882            |                         | V                | 74(Peak)/ 54(AV)        |
| 7323            |                         | H/V              | 74(Peak)/ 54(AV)        |
| 9764            |                         | H/V              | 74(Peak)/ 54(AV)        |
| 12205           |                         | H/V              | 74(Peak)/ 54(AV)        |
| 14646           |                         | H/V              | 74(Peak)/ 54(AV)        |
| 17087           |                         | H/V              | 74(Peak)/ 54(AV)        |
| 19528           |                         | H/V              | 74(Peak)/ 54(AV)        |
| 21969           |                         | H/V              | 74(Peak)/ 54(AV)        |
| 24410           |                         | H/V              | 74(Peak)/ 54(AV)        |

#### **Operation Mode: Transmitting g under Middle Channel (2441MHz)**

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

2. Remark "---" means that the emissions level is too low to be measured

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#### Level(a)3m (dB $\mu$ V/m) Limit@3m (dB $\mu$ V/m) Frequency (MHz) Antenna Polarity 4960. 74(Peak)/ 54(AV) \_\_\_ Η 4960. V 74(Peak)/ 54(AV) ---H/V 7440 74(Peak)/ 54(AV) ---74(Peak)/ 54(AV) 9920 H/V ---12400 H/V 74(Peak)/ 54(AV) ---14880 H/V 74(Peak)/ 54(AV) \_\_\_ 17360 H/V 74(Peak)/ 54(AV) --19840 H/V 74(Peak)/ 54(AV) --22320 H/V --74(Peak)/ 54(AV) 24800 H/V 74(Peak)/ 54(AV) --

**Operation Mode: Transmitting under High Channel (2480MHz)** 

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit 2. Remark "---" means that the emissions level is too low to be measured

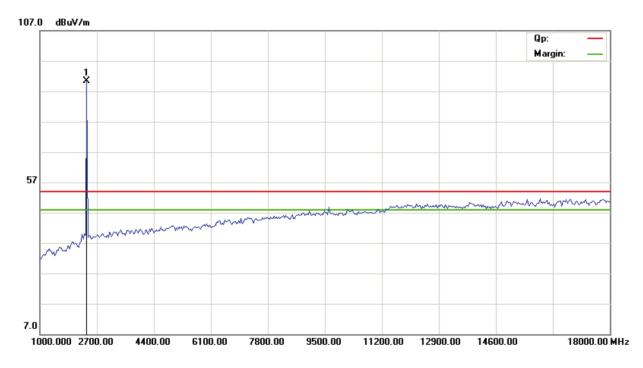
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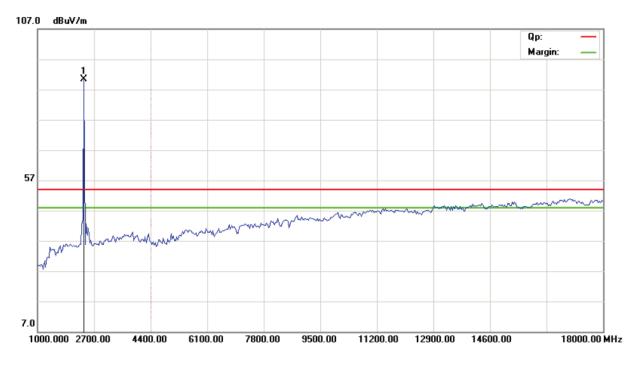
adopt any other remedies which may be appropriate.



Please refer to the following test plots for details: Low Channel: Horizontal



Low Channel : Vertical



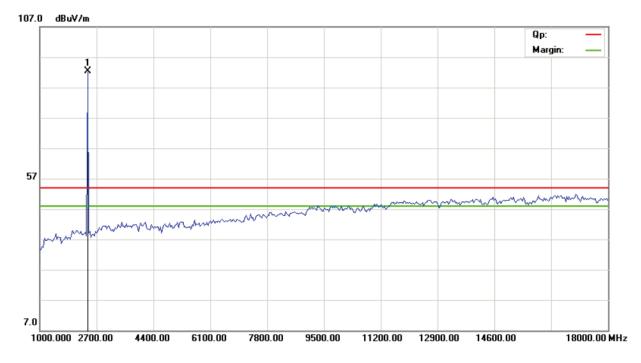
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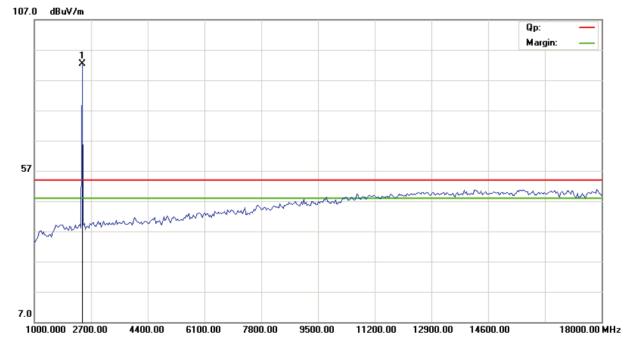
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#### Middle Channel : Horizontal



#### Middle Channel : Vertical



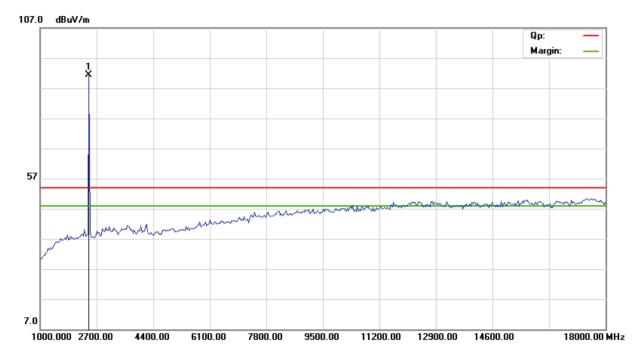
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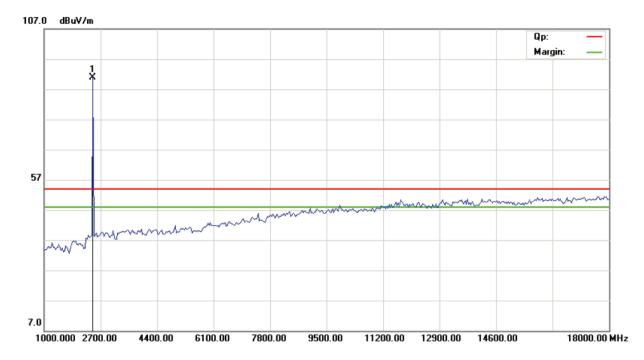
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#### **High Channel : Horizontal**



#### **High Channel : Vertical**



## Note: for the radiated emissions above 18G, it is the floor noise.

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# 7.0 20dB Bandwidth Measurement

## 7.1 Regulation

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

## 7.2 Limits of 20dB Bandwidth Measurement

N/A

## 7.3 Test Procedure.

1. Check the calibration of the measuring instrument (spectrum analyzer) using either an internal calibrator or a known signal from an external generator.

2. Set the spectrum analyzer as follows: Span =3MHz, RBW =30 kHz, VBW=100 kHz, Sweep = auto Detector function = peak, Trace = max hold

3. Measure the highest amplitude appearing on spectral display and record the level to calculate results. 6. Repeat above procedures until all frequencies measured were complete.

# 7.4 Test Result

## **Type of Modulation: GFSK**

| EUT      |                            | selfie sticks            |                        | PCA3200    |
|----------|----------------------------|--------------------------|------------------------|------------|
| Mode     | Ke                         | Keep Transmitting        |                        | DC3.7V     |
| Temperat | ure                        | 24 deg. C,               | Humidity               | 56% RH     |
| Channel  | Channel Frequency<br>(MHz) | 20 dB Bandwidth<br>(kHz) | Maximum Limit<br>(kHz) | Pass/ Fail |
| Low      | 2402                       | 763.53                   |                        | Pass       |
| Middle   | 2441                       | 763.53                   |                        | Pass       |
| High     | 2480                       | 757.52                   |                        | Pass       |

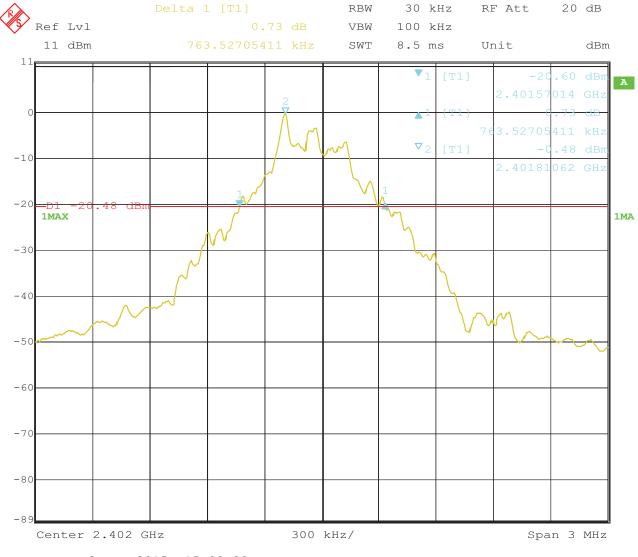
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## Test Figure:

## 1. Condition: Low Channel



Date:

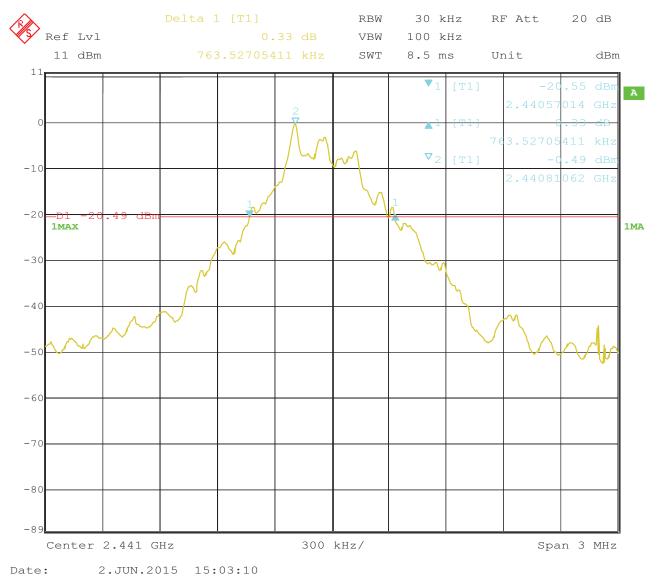
2.JUN.2015 15:08:28

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### 2. Condition: Middle Channel

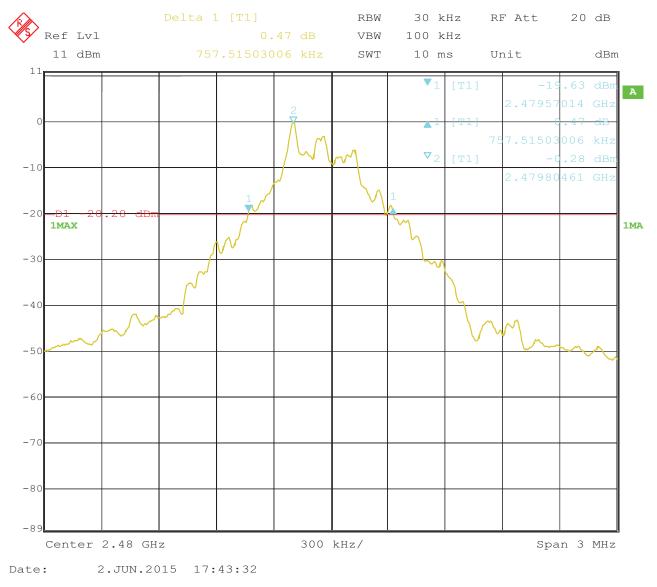


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### 3. High Channel



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## **Test Result Type of Modulation:** Л/4DQPSK

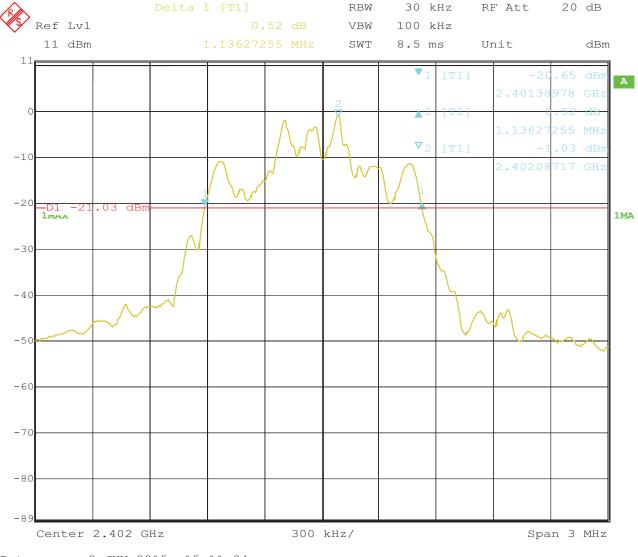
| EUT      |                            | selfie sticks Model           |                        | PCA3200    |
|----------|----------------------------|-------------------------------|------------------------|------------|
| Mode     | K                          | ep Transmitting Input Voltage |                        | DC3.7V     |
| Temperat | ure                        | 24 deg. C,                    | Humidity               | 56% RH     |
| Channel  | Channel Frequency<br>(MHz) | 20 dB Bandwidth<br>(kHz)      | Maximum Limit<br>(kHz) | Pass/ Fail |
| Low      | 2402                       | 1136.27                       |                        | Pass       |
| Middle   | 2441                       | 1136.27                       |                        | Pass       |
| High     | 2480                       | 1136.27                       |                        | Pass       |

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## Test Figure:

## 1. Condition: Low Channel



Date:

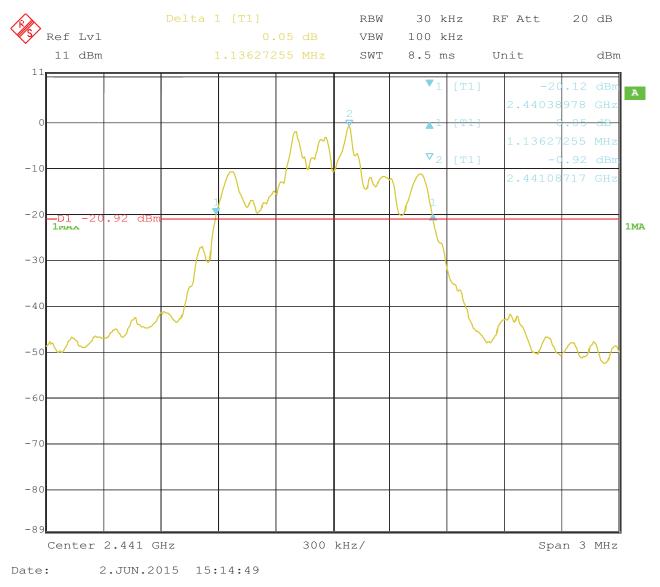
2.JUN.2015 15:11:34

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### 2. Condition: Middle Channel

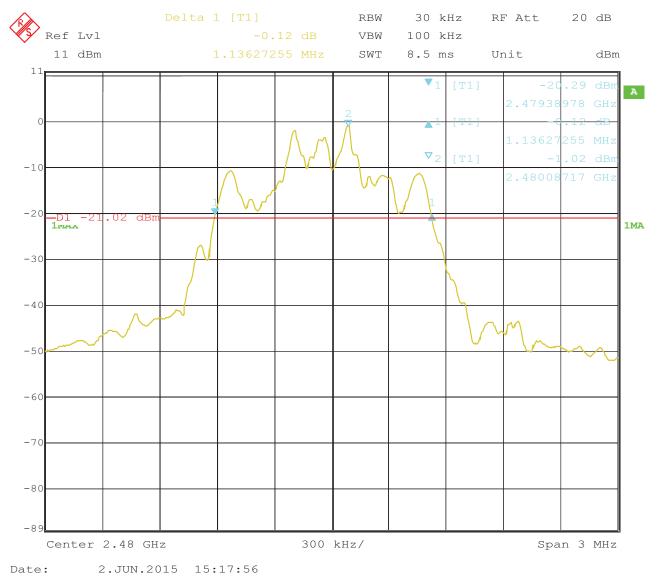


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3. High Channel



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## **Test Result Type of Modulation: 8DPSK**

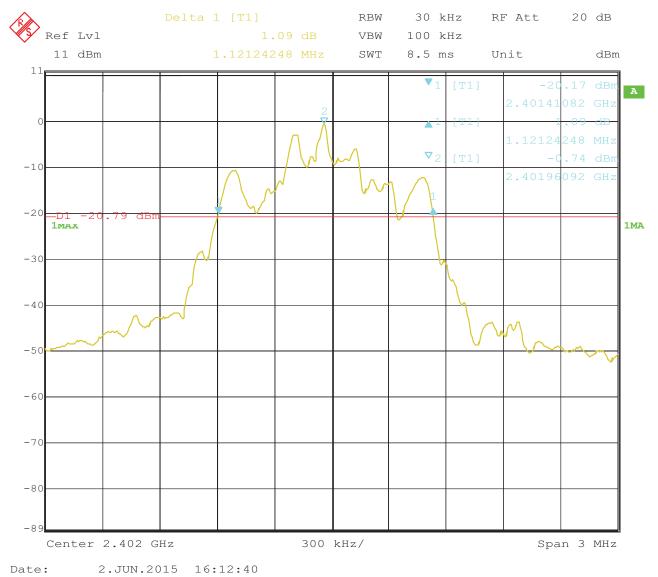
| EUT      |                            | selfie sticks Model           |                        | PCA3200    |
|----------|----------------------------|-------------------------------|------------------------|------------|
| Mode     | Ke                         | ep Transmitting Input Voltage |                        | DC3.7V     |
| Temperat | ure                        | 24 deg. C,                    | Humidity               | 56% RH     |
| Channel  | Channel Frequency<br>(MHz) | 20 dB Bandwidth<br>(kHz)      | Maximum Limit<br>(kHz) | Pass/ Fail |
| Low      | 2402                       | 1121.24                       |                        | Pass       |
| Middle   | 2441                       | 1130.26                       |                        | Pass       |
| High     | 2480                       | 1142.28                       |                        | Pass       |

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## Test Figure:

## 1. Condition: Low Channel

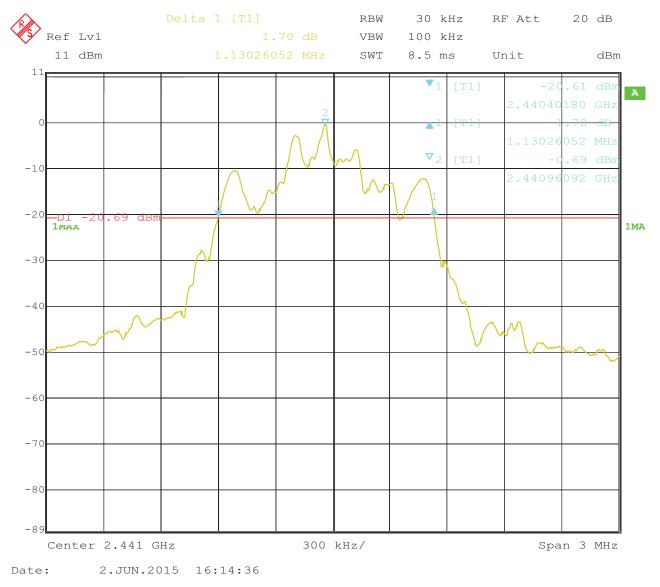


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### 2. Condition: Middle Channel

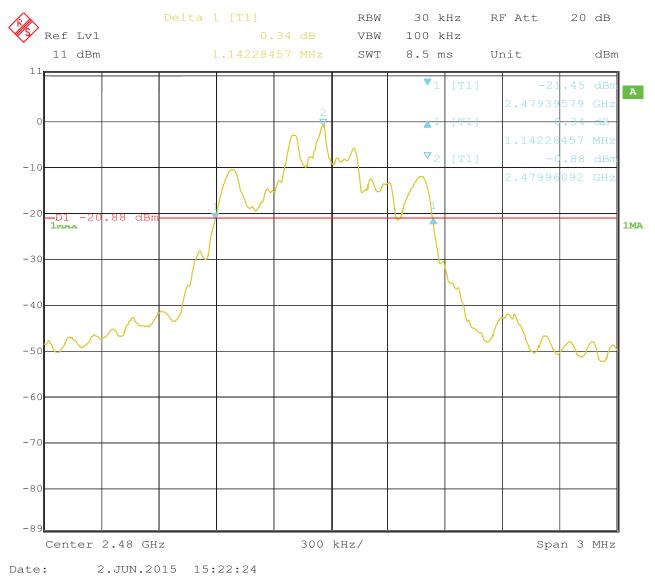


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3. High Channel



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# 8. Maximum Peak Output Power

## 8.1 Regulation

According to \$15.247(b)(1), for frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5MHz band:0.125 watts. According to \$15.247(b)(4), the conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

## 8.2 Limits of Maximum Peak Output Power

The Maximum Peak Output Power Measurement is 30dBm.

## **8.3 Test Procedure**

1. Check the calibration of the measuring instrument (spectrum analyzer) using either an internal calibrator or a known signal from an external generator.

2. Set the spectrum analyzer as follows: Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel; RBW > the 20 dB bandwidth of the emission being measured; VBW = RBW=3MHz; Sweep = auto; Detector function = peak; Trace = max hold

3. Measure the highest amplitude appearing on spectral display and record the level to calculate results.

4. Repeat above procedures until all frequencies measured were complete.

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## **8.4Test Results Type of Modulation: GFSK**

| EUT       |                   | selfie sticks     |                         | Model                        | PCA3200    |
|-----------|-------------------|-------------------|-------------------------|------------------------------|------------|
| Mode      |                   | Keep Transmitting |                         | Input Voltage                | DC3.7V     |
| Temperatu | re                | 24 deg. C,        |                         | Humidity                     | 56% RH     |
| Channel   | Channel Fi<br>(MH | 1 0               | Peak Power Output (dBm) | Peak Power<br>Limit<br>(dBm) | Pass/ Fail |
| Low       | 240               | 2                 | -0.31                   | 30                           | Pass       |
| Middle    | 244               | 1                 | -0.18                   | 30                           | Pass       |
| High      | 248               | 0                 | -0.18                   | 30                           | Pass       |

Note: 1. the result basic equation calculation as follow:

Peak Power Output = Peak Power Reading + Cable loss + Attenuator

2. Worse case was recorded

## Type of Modulation: $\pi/4DQPSK$

| EUT        |                            | selfie sticks           |                         | PCA3200        |
|------------|----------------------------|-------------------------|-------------------------|----------------|
| Mode       | Ke                         | eep Transmitting        | Input Voltage           | DC3.7V         |
| Temperatur | re                         | 24 deg. C,              | Humidity                | 56% RH         |
| Channel    | Channel Frequency<br>(MHz) | Peak Power Output (dBm) | Peak Power Lin<br>(dBm) | nit Pass/ Fail |
| Low        | 2402                       | 1.68                    | 30                      | Pass           |
| Middle     | 2441                       | 1.68                    | 30                      | Pass           |
| High       | 2480                       | 1.81                    | 30                      | Pass           |

Note: 1. the result basic equation calculation as follow:

Peak Power Output = Peak Power Reading + Cable loss + Attenuator

2. Worse case was recorded

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## **Type of Modulation: 8DPSK**

| EUT       |                            | selfie sticks           |                           | PCA3200    |
|-----------|----------------------------|-------------------------|---------------------------|------------|
| Mode      | Ke                         | Keep Transmitting       |                           | DC3.7V     |
| Temperatu | re                         | 24 deg. C, Humidity     |                           | 56% RH     |
| Channel   | Channel Frequency<br>(MHz) | Peak Power Output (dBm) | Peak Power Limit<br>(dBm) | Pass/ Fail |
| Low       | 2402                       | 2.33                    | 30                        | Pass       |
| Middle    | 2441                       | 2.45                    | 30                        | Pass       |
| High      | 2480                       | 2.45                    | 30                        | Pass       |

Note: 1. the result basic equation calculation as follow:

Peak Power Output = Peak Power Reading + Cable loss + Attenuator

2. Worse case was recorded

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# 9. Carrier Frequency Separation

# 9.1 Regulation

According to §15.247(a)(1), frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

# 9.2 Limits of Carrier Frequency Separation

The Maximum Power Spectral Density Measurement is 25kHz or two-thirds of the 20dB bandwidth of the hopping Channel which is great.

# 9.3 Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.

2. Set the spectrum analyzer as follows: Span = wide enough to capture the peaks of two adjacent channels: Resolution (or IF) Bandwidth (RBW)  $\geq 1\%$  of the span; Video (or Average) Bandwidth (VBW)  $\geq$  RBW; Sweep = auto; Detector function = peak; Trace = max hold

3. Measure the separation between the peaks of the adjacent channels using the marker-delta function.

4. Repeat above procedures until all frequencies measured were complete.

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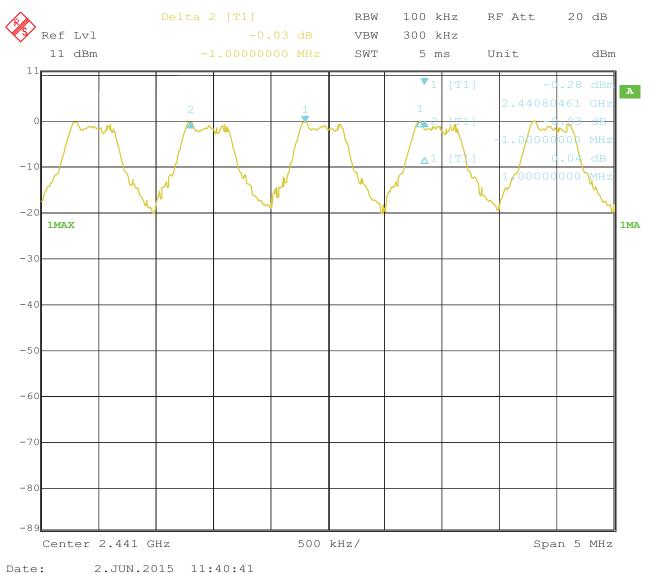


# 9.4Test Result

### **Type of Modulation: GFSK**

| EUT                          | selfie stick | Model              |                    | PCA3200 |            |
|------------------------------|--------------|--------------------|--------------------|---------|------------|
| Mode                         | Hopping O    | Input Voltage      |                    | DC3.7V  |            |
| Temperature                  | 24 deg. C,   | Humidity           |                    | 56% RH  |            |
| Carrier Frequency Separation |              | Limit              |                    |         | Pass/ Fail |
|                              | 1000kHz      | $\geq 25$ kHz or 2 | 2/3 of 20 dB bandy | width   | Pass       |

# **Test Plots**



The report refers only to the sample tested and does not apply to the bulk.

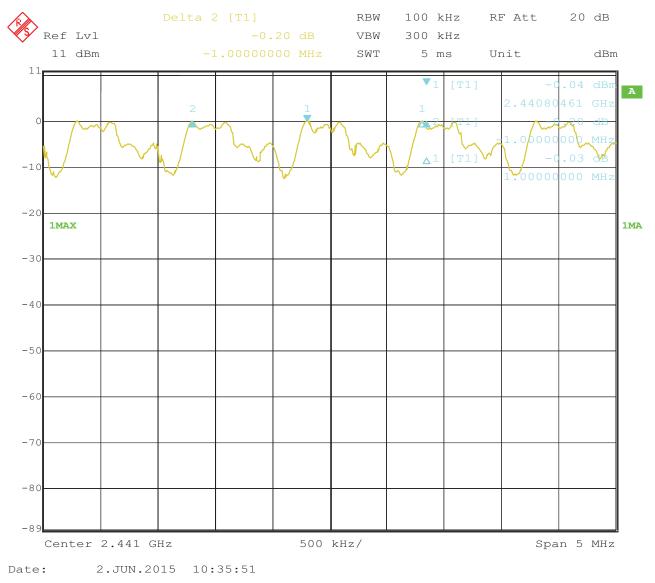
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# **Type of Modulation:** Л/4DQPSK

| EUT                          | selfie stick | Model         |                    | PCA3200 |            |
|------------------------------|--------------|---------------|--------------------|---------|------------|
| Mode                         | Hopping O    | Input Voltage |                    | DC3.7V  |            |
| Temperature                  | 24 deg. C,   | Humidity      |                    | 56% RH  |            |
| Carrier Frequency Separation |              |               | Limit              |         | Pass/ Fail |
| 1000 kHz > 25                |              |               | 2/3 of 20 dB bandy | width   | Pass       |

# **Test Plots**



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# **Type of Modulation: 8DPSK**

| EUT                          | selfie stick | Model         |                    | PCA3200 |            |
|------------------------------|--------------|---------------|--------------------|---------|------------|
| Mode                         | Hopping O    | Input Voltage |                    | DC3.7V  |            |
| Temperature                  | 24 deg. C,   | Humidity      |                    | 56% RH  |            |
| Carrier Frequency Separation |              |               | Limit              |         | Pass/ Fail |
| 1000 kHz ≥ 25                |              |               | 2/3 of 20 dB bandy | width   | Pass       |

# **Test Plots**



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# **10. Number of Hopping Channels**

# **10.1 Regulation**

According to §15.247(a)(1)(iii), frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used. According to §15.247(b)(1), for frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

# 10.2 Limits of Number of Hopping Channels

The frequency hopping systems in the 2400-2483.5MHz band shall use at least 15 channels.

# **10.3 Test Procedure**

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.

2. Set the spectrum analyzer as follows: Span = the frequency band of operation; RBW=100 kHz, VBW= 300 kHz;

Sweep = auto; Detector function = peak; Trace = max hold

3. Record the number of hopping channels.

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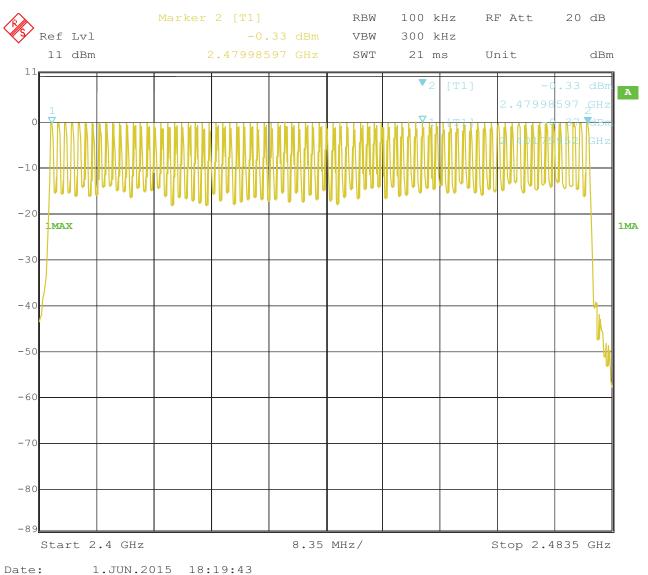


# **10.4Test Result**

### **Type of Modulation: GFSK**

| EUT             | selfie sticks                      |    | М        | odel    |        | PCA3200    |
|-----------------|------------------------------------|----|----------|---------|--------|------------|
| Mode            | Hopping On                         |    | Input    | Voltage |        | DC3.7V     |
| Temperature     | 24 deg. C,                         |    | Humidity |         | 56% RH |            |
| Operating Frequ | equency Number of hopp<br>channels |    | ing      | Lin     | nit    | Pass/ Fail |
| 2402-2480MHz    |                                    | 79 |          | ≥ 1     | 5      | Pass       |

# **Test Plot**



The report refers only to the sample tested and does not apply to the bulk.

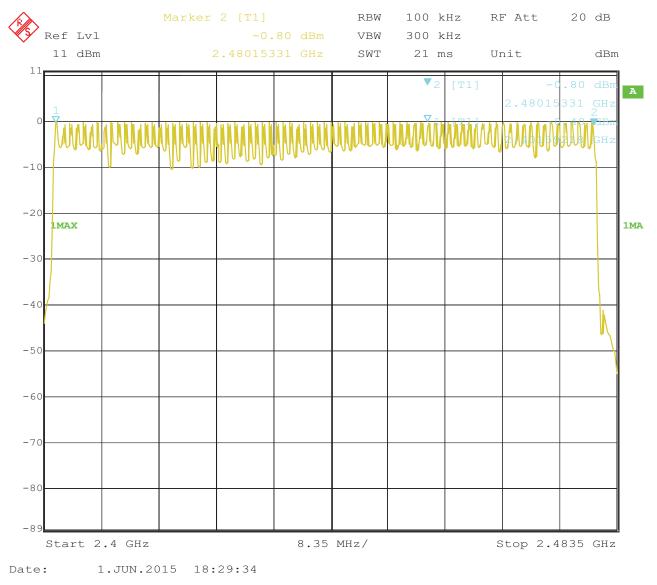
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# **Type of Modulation:** Л/4DQPSK

| EUT             | selfie sticks |                            | Model         |     | PCA3200 |            |  |
|-----------------|---------------|----------------------------|---------------|-----|---------|------------|--|
| Mode            | Hopping On    |                            | Input Voltage |     |         | DC3.7V     |  |
| Temperature     | 24 deg. C,    |                            | Humidity      |     | 56% RH  |            |  |
| Operating Frequ | iency         | Number of hopp<br>channels | ing           | Lin | nit     | Pass/ Fail |  |
| 2402-2480M      | Hz            | 79                         |               | ≥ 1 | 5       | Pass       |  |

# **Test Plot**



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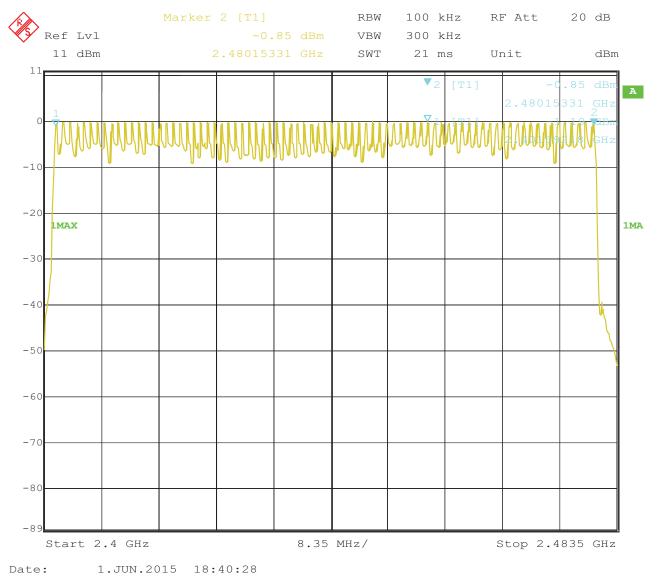
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# **Type of Modulation: 8DPSK**

| EUT             | selfie sticks                    |  | Model         |     | PCA3200 |            |  |
|-----------------|----------------------------------|--|---------------|-----|---------|------------|--|
| Mode            | Hopping On                       |  | Input Voltage |     |         | DC3.7V     |  |
| Temperature     | 24 deg. C,                       |  | Humidity      |     | 56% RH  |            |  |
| Operating Frequ | uency Number of hopp<br>channels |  | ing           | Lin | nit     | Pass/ Fail |  |
| 2402-2480M      | IHz 79                           |  |               | ≥ 1 | 5       | Pass       |  |

# **Test Plot**



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# 11. Time of Occupancy (Dwell Time)

# 11.1 Regulation

According to §15.247(a)(1)(iii), frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

# 11.2 Limits of Carrier Frequency Separation

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed

# **11.3 Test Procedure**

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.

2. Set the spectrum analyzer as follows: Span = zero span, centered on a hopping channel; RBW = 1 MHz; VBW

≥ RBW; Sweep = as necessary to capture the entire dwell time per hopping channel; Detector function = peak; Trace = max hold

3. Measure the dwell time using the marker-delta function.

4. Repeat above procedures until all frequencies measured were complete.

5. Repeat this test for different modes of operation (e.g., data rate, modulation format, etc.), if applicable.

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# **11.4 Test Result**

### **Type of Modulation: GFSK**

| EUT         |   | selfie sticks     |            | Model         |        | PCA3200 |
|-------------|---|-------------------|------------|---------------|--------|---------|
| Mode        |   | Keep Transmitting |            | Input Voltage |        | DC3.7V  |
| Temperature | e | 24 deg. C,        |            | Humidity      |        | 56% RH  |
| Channel     |   | Reading           | Hoping Ra  | ate           | Actual | Limit   |
| Low         |   | 2.99ms            | 266.667 hc | p/s           | 0.319s | 0.4s    |
| Middle      |   | 3.01ms            | 266.667 hc | p/s           | 0.321s | 0.4s    |
| High        |   | 2.99ms            | 266.667 hc | p/s           | 0.319s | 0.4s    |

Actual = Reading  $\times$  (Hopping rate / Number of channels)  $\times$  Test period, Test period = 0.4 [seconds / channel]  $\times$  79 [channel] = 31.6 [seconds] NOTE: The EUT makes worst case 1600 hops per second or 1 time slot has a length of 625µs with 79 channels. A DH5 Packet needs 5 time slot for transmitting and 1 time slot for receiving. Then the EUT makes worst case 266.667 hops per second with 79 channels.

### Note: DH5 was the worse case

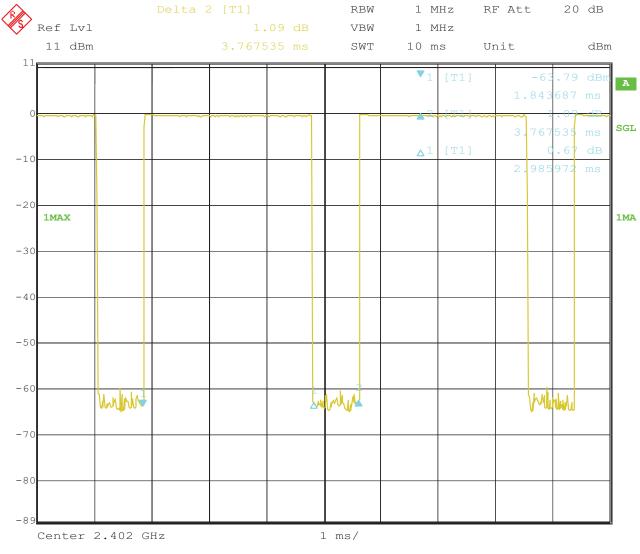
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Test Plots: Low Channel:



Date:

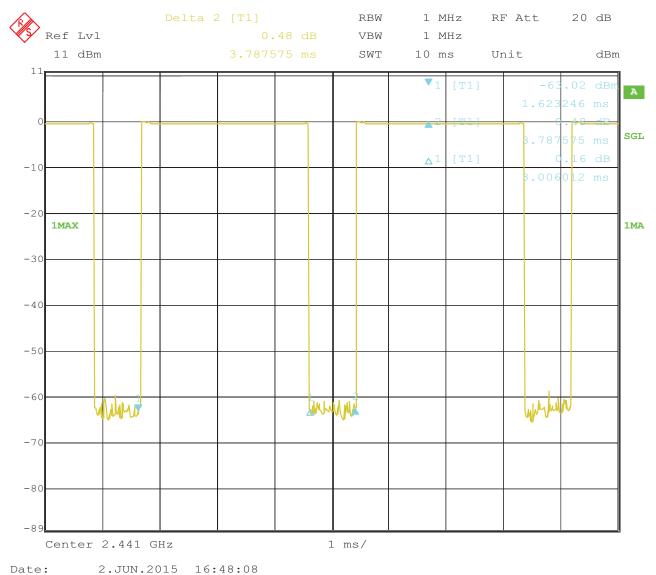
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Middle Channel:



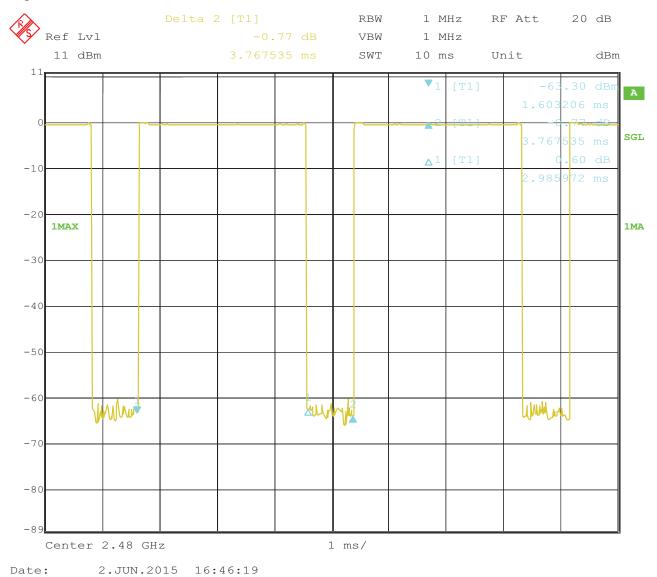
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High Channel



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# Test Result Type of Modulation: *J*7/4DQPSK

| EUT         |   | selfie sticks     |             | Model         |        | PCA3200 |
|-------------|---|-------------------|-------------|---------------|--------|---------|
| Mode        |   | Keep Transmitting |             | Input Voltage |        | DC3.7V  |
| Temperature | e | 24 deg. C,        |             | Humidity      |        | 56% RH  |
| Channel     |   | Reading           | Hoping Rate |               | Actual | Limit   |
| Low         |   | 3.05ms            | 266.667 hc  | p/s           | 0.325s | 0.4s    |
| Middle      |   | 3.01ms 266.66     |             | p/s           | 0.321s | 0.4s    |
| High        |   | 2.97ms            | 266.667 hc  | p/s           | 0.317s | 0.4s    |

Actual = Reading × (Hopping rate / Number of channels) × Test period, Test period = 0.4 [seconds / channel] × 79 [channel] = 31.6 [seconds] NOTE: The EUT makes worst case 1600 hops per second or 1 time slot has a length of 625 $\mu$ s with 79 channels. A DH5 Packet needs 5 time slot for transmitting and 1 time slot for receiving. Then the EUT makes worst case 266.667 hops per second with 79 channels.

# Note: DH5 was the worse case

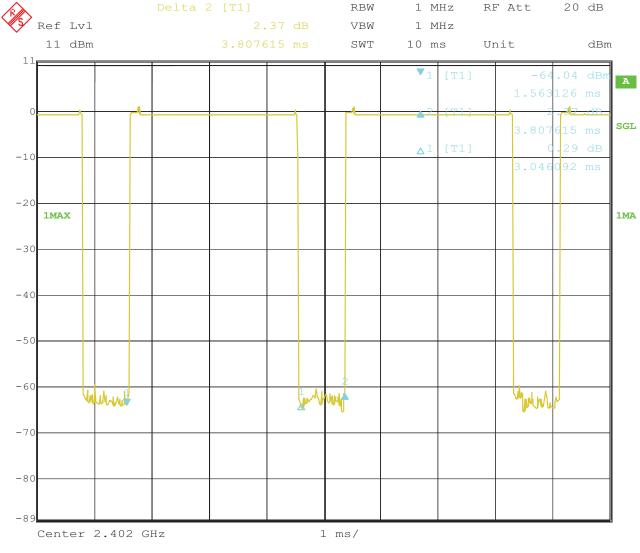
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Test Plots: Low Channel:



Date:

2.JUN.2015 16:38:46

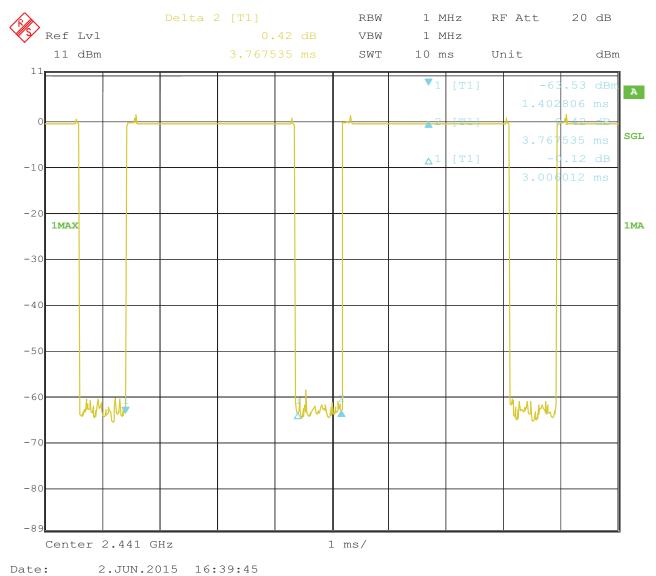
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Middle Channel:



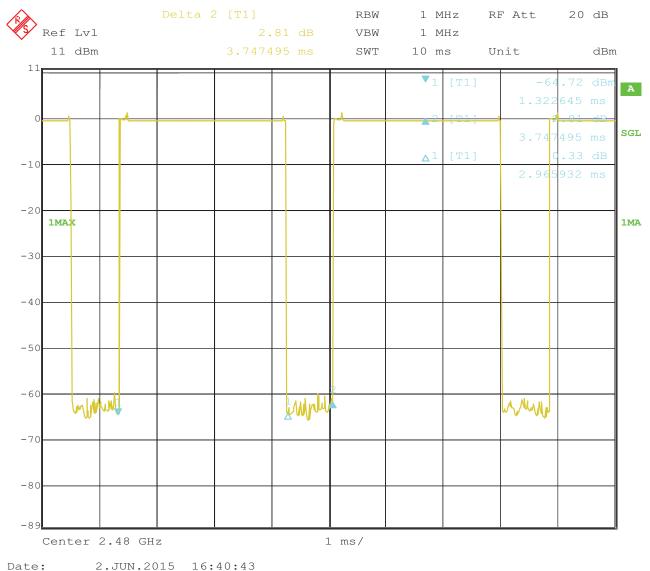
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High Channel



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# **Type of Modulation: 8DPSK**

| EUT         |   | selfie sticks     |            | M             | odel   | PCA3200 |
|-------------|---|-------------------|------------|---------------|--------|---------|
| Mode        |   | Keep Transmitting |            | Input Voltage |        | DC3.7V  |
| Temperature | e | 24 deg. C,        |            | Humidity      |        | 56% RH  |
| Channel     | R | eading            | Hoping Ra  | ate           | Actual | Limit   |
| Low         | 3 | .01ms             | 266.667 ho | p/s           | 0.321s | 0.4s    |
| Middle      | 3 | .03ms             | 266.667 ho | p/s           | 0.323s | 0.4s    |
| High        | 3 | .05ms             | 266.667 ho | p/s           | 0.325s | 0.4s    |

Actual = Reading  $\times$  (Hopping rate / Number of channels)  $\times$  Test period, Test period = 0.4 [seconds / channel]  $\times$  79 [channel] = 31.6 [seconds] NOTE: The EUT makes worst case 1600 hops per second or 1 time slot has a length of 625µs with 79 channels. A DH5 Packet needs 5 time slot for transmitting and 1 time slot for receiving. Then the EUT makes worst case 266.667 hops per second with 79 channels.

### Note: DH5 was the worse case

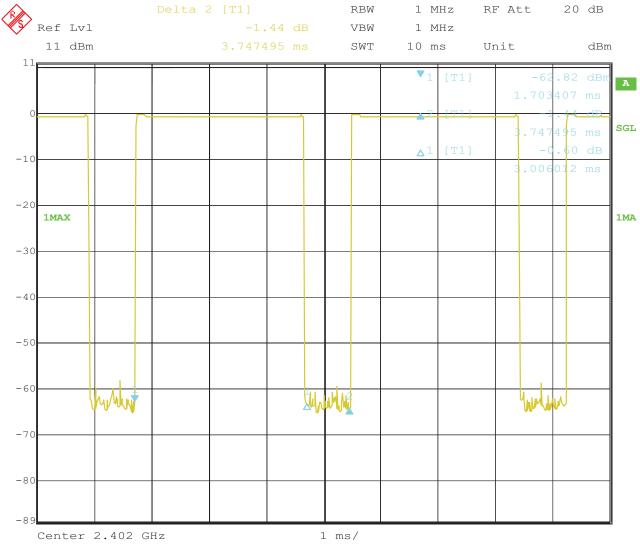
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Test Plots: Low Channel:



Date:

2.JUN.2015 16:29:28

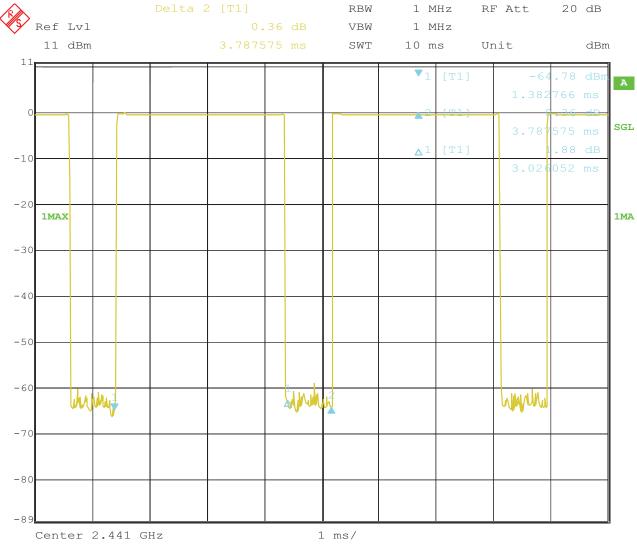
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Middle Channel:



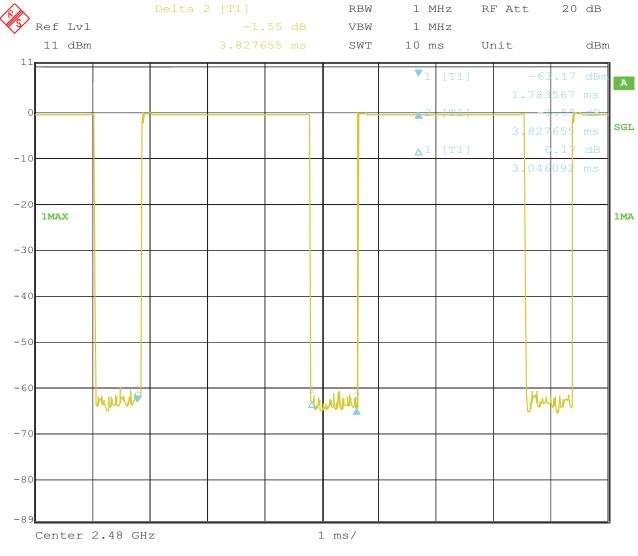
2.JUN.2015 16:28:36 Date:

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High Channel



2.JUN.2015 16:27:35 Date:

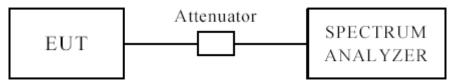
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# 12 Out of Band Measurement

12.1 Test Setup



The restricted band requirement based on radiated emission test; please see the clause 6 for the test setup

# 12.2 Limits of Out of Band Emissions Measurement

- 1. Below –20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).
- 2. Fall in the restricted bands listed in section 15.205. The maximum permitted average field strength is listed in section 15.209.

# **12.3 Test Procedure**

For signals in the restricted bands above and below the 2.4-2.483GHz allocated band a measurement was made of Radiated emission test. Peak values with RBW=VBW=1MHz and PK detector. For bandage test, the spectrum set as follows: RBW=100 kHz, VBW=300 kHz. A conducted measurement used

Note: 1. For band-edge measurement, the frequency from 30MHz-25GHz was tested. And It met the FCC rule.

2. This is a handhold device. The radiated emissions should be tested under 3-axes position (Lying, Side, and Stand), After pre-test. It was found that the worse radiated emission was get at the lying position.

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**Type of Modulation: GFSK** 



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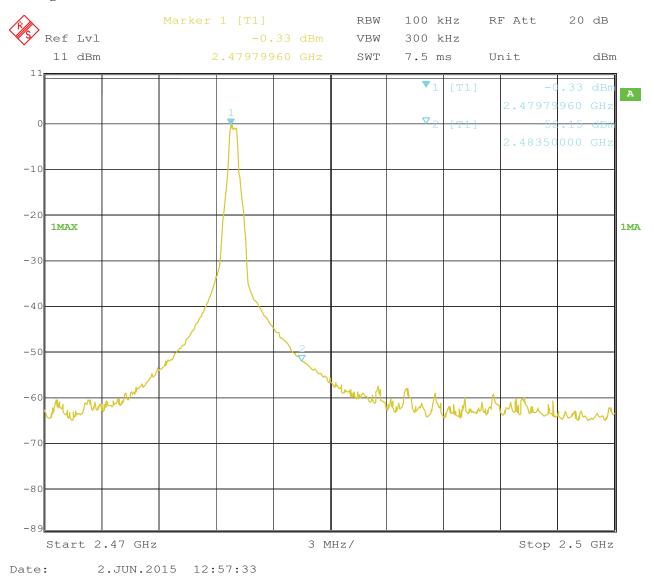


**Type of Modulation: GFSK** 

#### Out of Band Test Result 12.4

| Product:       |             | selfie sticks     | Test Mode:    | High Channel |
|----------------|-------------|-------------------|---------------|--------------|
| Mode           | Keej        | ping Transmitting | Input Voltage | DC3.7V       |
| Temperature    |             | 24 deg. C,        | Humidity      | 56% RH       |
| Test Result:   |             | Pass              | Detector      | РК           |
| The Max. FS in | PK (dBµV/m) | 42.6              |               | 74(dBµV/m)   |
| Restrict Band  | AV(dBμV/m)  |                   | Limit         | 54(dBµV/m)   |
| 2483.5MHz      |             |                   |               |              |

### **Test Figure:**



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**Type of Modulation: GFSK** 

#### Out of Band Test Result 12.4

| Product:          |             | selfie sticks             | Test Mode: | Hopping mode          |               |  |
|-------------------|-------------|---------------------------|------------|-----------------------|---------------|--|
| Mode              |             | Hopping On                |            | Input Voltage         | DC3.7V        |  |
| Temperature       |             | 24 deg. C,                |            | Humidity              | 56% RH        |  |
| Test Result:      |             | Pass                      |            | Detector              | РК            |  |
| The Max. FS in    | PK (dBµV/m) | 40.8                      |            |                       | 74(dBµV/m)    |  |
| Restrict Band     | AV(dBµV/m)  |                           |            | Limit                 | 54(dBµV/m)    |  |
| 2390MHz           |             |                           |            |                       |               |  |
| est Figure:       |             |                           |            |                       |               |  |
|                   | Marker 1    |                           |            | 100 kHz RF A          | Att 20 dB     |  |
| Ref Lvl<br>11 dBm | 2           | -0.34 dBm<br>40182365 GHz | VBW<br>SWT | 300 kHz<br>15 ms Unit | dBm           |  |
| 11 aBm<br>11      |             | 40182383 GHZ              | SWI        |                       |               |  |
|                   |             |                           |            | ▼1 [T1]               | -0.34 dBm     |  |
| 0                 |             |                           |            | 2.                    | 40182365 GHz  |  |
| 0                 |             |                           |            | 2 [11]                | 400000000 GHz |  |
|                   |             |                           |            | ▼ <sub>3 [T1]</sub>   | -6ü.60 dBm    |  |
| -10               |             |                           |            | 2.                    | 39000000 GHz  |  |
|                   |             |                           |            |                       | 0000000       |  |
| -20<br>1MAX       |             |                           |            |                       | 1M            |  |
|                   |             |                           |            |                       |               |  |
| -30               |             |                           |            |                       |               |  |
|                   |             |                           |            |                       | N             |  |
| -40               |             |                           |            |                       | 2             |  |
|                   |             |                           |            |                       |               |  |
| -50               |             |                           |            |                       |               |  |
|                   |             |                           |            |                       |               |  |
| -60 NI 100 MI     | month       | m.h.m.m.                  | mound      | minime III            | J             |  |
|                   |             |                           |            |                       |               |  |
| -70               |             |                           |            |                       |               |  |
|                   |             |                           |            |                       |               |  |
| -80               |             |                           |            |                       |               |  |
|                   |             |                           |            |                       |               |  |
| -89               |             |                           |            |                       |               |  |
| Start 2.3         | 5 GHz       | 6 M                       | Hz/        | S                     | top 2.41 GHz  |  |

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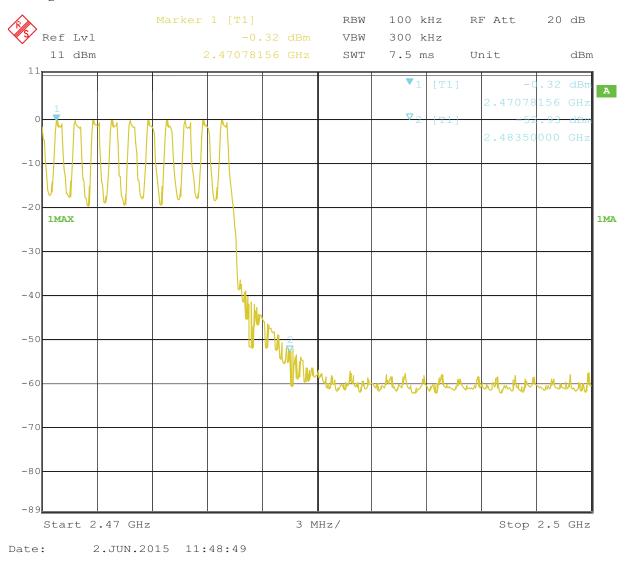


**Type of Modulation: GFSK** 

#### Out of Band Test Result 12.4

| Product:       |             | selfie sticks | Test Mode:    | Hopping mode |
|----------------|-------------|---------------|---------------|--------------|
| Mode           |             | Hopping On    | Input Voltage | DC3.7V       |
| Temperature    |             | 24 deg. C,    | Humidity      | 56% RH       |
| Test Result:   |             | Pass          | Detector      | РК           |
| The Max. FS in | PK (dBµV/m) | 41.9          |               | 74(dBµV/m)   |
| Restrict Band  | AV(dBµV/m)  |               | Limit         | 54(dBµV/m)   |
| 2483.5MHz      |             |               |               |              |

### **Test Figure:**



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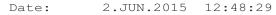
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**Type of Modulation:** Л/4DQPSK

#### Out of Band Test Result 12.4

| Product:            |                 | selfie sticks            | Test Mode:                  | Low Channel                           |  |
|---------------------|-----------------|--------------------------|-----------------------------|---------------------------------------|--|
| Mode                | Keej            | oing Transmitting        | Input Voltage               | DC3.7V                                |  |
| Femperature         | 24 deg. C       |                          | Humidity                    | 56% RH                                |  |
| Fest Result:        |                 | Pass                     | Detector                    | РК                                    |  |
| The Max. FS in      | PK (dBµV/m)     | 43.4                     |                             | 74(dBµV/m)                            |  |
| Restrict Band       | $AV(dB\mu V/m)$ |                          | Limit                       | 54(dBµV/m)                            |  |
| 2390MHz             |                 |                          |                             |                                       |  |
| <b>Fest Figure:</b> |                 |                          |                             |                                       |  |
|                     | Marker 1        |                          |                             | FAtt 20 dB                            |  |
| Ref Lvl             |                 | -0.39 dBm VBW            |                             |                                       |  |
| 11 dBm              | 2.              | 40182365 GHz SWT         | 15 ms U                     | nit dBm                               |  |
|                     |                 |                          | ▼1 [T1]                     | -0.39 dBm                             |  |
|                     |                 |                          |                             | 2.40182365 GHz                        |  |
| 0                   |                 |                          | ▼2 [T1]                     | -4-4.27 dBm                           |  |
|                     |                 |                          |                             | 2.40000000 GHz                        |  |
| -10                 |                 |                          | ▼ <sub>3</sub> [T1]         | -64.22 dBm                            |  |
|                     |                 |                          |                             | 2.39000000 GHz                        |  |
| 2.0                 |                 |                          |                             |                                       |  |
| -20<br>1MAX         |                 |                          |                             | 11                                    |  |
|                     |                 |                          |                             |                                       |  |
| -30                 |                 |                          |                             |                                       |  |
|                     |                 |                          |                             |                                       |  |
| -40                 |                 |                          |                             |                                       |  |
|                     |                 |                          |                             | v v v v v v v v v v v v v v v v v v v |  |
| -50                 |                 |                          |                             |                                       |  |
|                     |                 |                          |                             |                                       |  |
|                     |                 |                          | - Contraction of the second | <u> </u>                              |  |
| -60                 | MUNAMURI MALA   | m my man male and        | And 3 while                 |                                       |  |
|                     |                 | m Muniphan and and and a | www.www.w                   |                                       |  |
| -70                 |                 |                          |                             |                                       |  |
|                     |                 |                          |                             |                                       |  |
| -80                 |                 |                          |                             |                                       |  |
|                     |                 |                          |                             |                                       |  |
|                     |                 |                          |                             |                                       |  |



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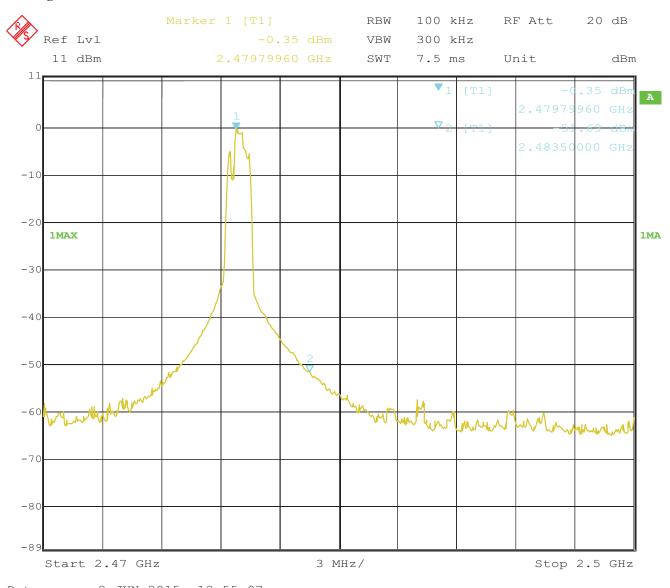


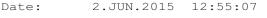
**Type of Modulation:** Л/4DQPSK

#### Out of Band Test Result 12.4

| Product:       | selfie sticks        |  | Test Mode:    | High Channel |
|----------------|----------------------|--|---------------|--------------|
| Mode           | Keeping Transmitting |  | Input Voltage | DC3.7V       |
| Temperature    | 24 deg. C,           |  | Humidity      | 56% RH       |
| Test Result:   | Pass                 |  | Detector      | РК           |
| The Max. FS in | PK (dBµV/m) 42.6     |  |               | 74(dBµV/m)   |
| Restrict Band  | AV(dBµV/m)           |  | Limit         | 54(dBµV/m)   |
| 2483.5MHz      |                      |  |               |              |

### **Test Figure:**





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# **Type of Modulation:** Л/4DQPSK

#### Out of Band Test Result 12.4

| Product:       | selfie sticks |              | Test Mode:    | Hopping mode        |                           |
|----------------|---------------|--------------|---------------|---------------------|---------------------------|
| Mode           | Hopping On    |              | Input Voltage | DC3.7V              |                           |
| Temperature    | 24 deg. C,    |              |               | Humidity            | 56% RH                    |
| Test Result:   |               | Pass         |               | Detector            | РК                        |
| The Max. FS in | PK (dBµV/m)   | 43.3         |               |                     | 74(dBµV/m)                |
| Restrict Band  | AV(dBµV/m)    |              |               | Limit               | 54(dBµV/m)                |
| 2390MHz        |               |              |               |                     |                           |
| est Figure:    |               |              |               | ·                   |                           |
|                | Marker 1      | [T1]         | RBW 1         | .00 kHz RF A        | tt 20 dB                  |
| S Ref Lvl      |               | -0.39 dBm    | VBW 3         | 800 kHz             |                           |
| 11 dBm         | 2.            | 40482966 GHz | SWT           | 15 ms Unit          | dBm                       |
| 11             |               |              |               | ▼1 [T1]             | -0.39 dBm                 |
|                |               |              |               | 2.4                 | 10482966 GHz              |
| 0              |               |              |               | ▼2 [T1]             | -55 <del>-</del> 81 - 10m |
|                |               |              |               | 2.4                 |                           |
| -10            |               |              |               | ♥ <sub>3 [T1]</sub> | -61.60 blam               |
|                |               |              |               | 2.3                 | 39000000 GHz              |
| -20            |               |              |               |                     |                           |
| 1MAX           |               |              |               |                     | 1M                        |
|                |               |              |               |                     |                           |
| -30            |               |              |               |                     |                           |
|                |               |              |               |                     |                           |
| -40            |               |              |               |                     |                           |
|                |               |              |               |                     |                           |
| -50            |               |              |               |                     |                           |
|                |               |              |               |                     |                           |
| -60            |               |              |               | 3                   |                           |
| whenter        | Man Man Mille | un man men M | www.          | Marrin Mr. 10-0     |                           |
| -70            |               |              |               |                     |                           |
| - , 0          |               |              |               |                     |                           |
|                |               |              |               |                     |                           |
| -80            |               |              |               |                     |                           |
|                |               |              |               |                     |                           |
| -89            | 5             | 6 MH         |               |                     | op 2.41 GHz               |

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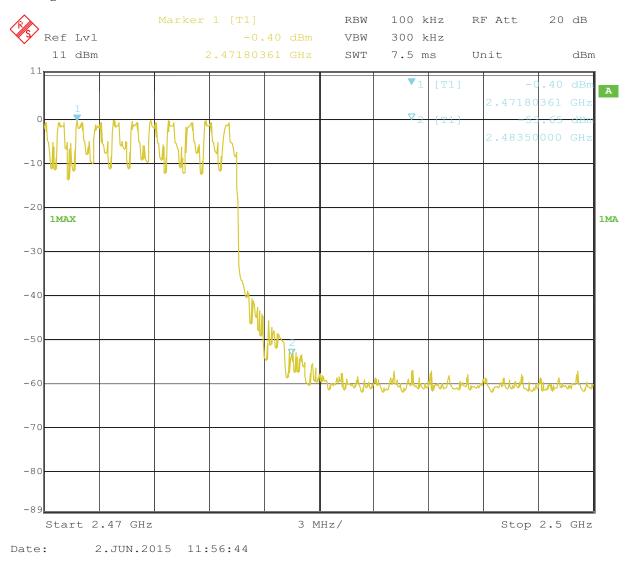


**Type of Modulation:** Л/4DQPSK

#### Out of Band Test Result 12.4

| Product:       |                  | selfie sticks | Test Mode:    | Hopping mode |
|----------------|------------------|---------------|---------------|--------------|
| Mode           | Hopping On       |               | Input Voltage | DC3.7V       |
| Temperature    | 24 deg. C,       |               | Humidity      | 56% RH       |
| Test Result:   | Pass             |               | Detector      | РК           |
| The Max. FS in | PK (dBμV/m) 42.4 |               |               | 74(dBµV/m)   |
| Restrict Band  | AV(dBµV/m)       |               | Limit         | 54(dBµV/m)   |
| 2483.5MHz      |                  |               |               |              |

### **Test Figure:**



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**Type of Modulation: 8DPSK** 



| Product:       |                     |                          | Test Mode:          | Low Channel     |  |
|----------------|---------------------|--------------------------|---------------------|-----------------|--|
| Mode           |                     |                          | Input Voltage       | DC3.7V          |  |
| Temperature    | 24 deg. C           |                          | Humidity            | 56% RH          |  |
| Test Result:   |                     | Pass                     | Detector            | РК              |  |
| The Max. FS in | PK (dBµV/m)         | 45.7                     |                     | 74(dBµV/m)      |  |
| Restrict Band  | $AV(dB\mu V/m)$     |                          | Limit               | 54(dBµV/m)      |  |
| 2390MHz        |                     |                          |                     |                 |  |
| Fest Figure:   |                     |                          |                     |                 |  |
| R              | Marker              |                          |                     | FAtt 20 dB      |  |
| Ref Lvl        |                     | -0.38 dBm VBW            |                     |                 |  |
| 11 dBm         | 2                   | .40182365 GHz SWT        | 15 ms U             | init dBm        |  |
| 11             |                     |                          | ▼1 [T1]             | -0.38 dBm       |  |
|                |                     |                          |                     | 2.40182365 GHz  |  |
| 0              |                     |                          | ▼2 [ 11]            | 1<br>           |  |
|                |                     |                          |                     | 2.40,000000 GHz |  |
|                |                     |                          | ▼ <sub>3</sub> [T1] | -65.50 dBm      |  |
| -10            |                     |                          |                     | 2.39000000 GHz  |  |
|                |                     |                          |                     |                 |  |
| -20            |                     |                          |                     |                 |  |
| 1MAX           |                     |                          |                     | 11              |  |
| 2.0            |                     |                          |                     |                 |  |
| -30            |                     |                          |                     |                 |  |
|                |                     |                          |                     |                 |  |
| -40            |                     |                          |                     |                 |  |
|                |                     |                          |                     | 7               |  |
| -50            |                     |                          |                     |                 |  |
|                |                     |                          |                     |                 |  |
|                |                     |                          | <u>س</u>            |                 |  |
| -60 MILLAN     | Martin to the state |                          |                     |                 |  |
|                | man mining when     | unhurman or have me land | www.                |                 |  |
| -70            |                     |                          |                     |                 |  |
|                |                     |                          |                     |                 |  |
|                |                     |                          |                     |                 |  |
| -80            |                     |                          |                     |                 |  |
|                |                     |                          |                     |                 |  |
| -89            |                     |                          |                     |                 |  |



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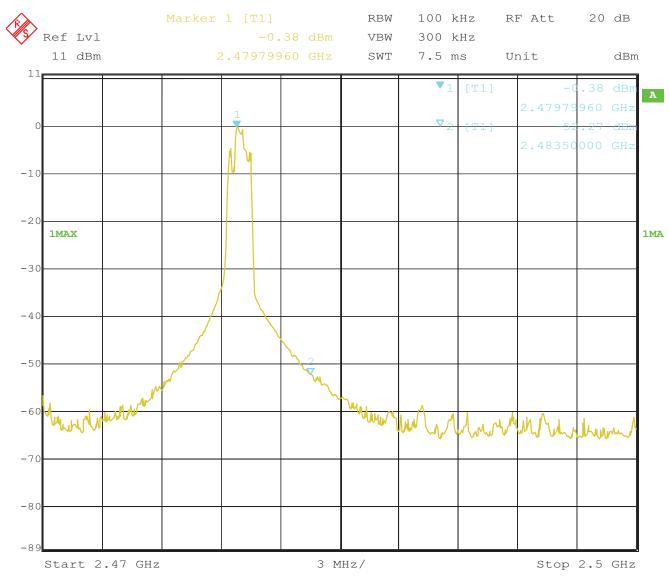


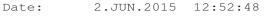
**Type of Modulation: 8DPSK** 

#### Out of Band Test Result 12.4

| Product:       | selfie sticks        |  | Test Mode:    | High Channel |
|----------------|----------------------|--|---------------|--------------|
| Mode           | Keeping Transmitting |  | Input Voltage | DC3.7V       |
| Temperature    | 24 deg. C,           |  | Humidity      | 56% RH       |
| Test Result:   | Pass                 |  | Detector      | РК           |
| The Max. FS in | PK (dBμV/m) 44.6     |  |               | 74(dBµV/m)   |
| Restrict Band  | AV(dBµV/m)           |  | Limit         | 54(dBµV/m)   |
| 2483.5MHz      |                      |  |               |              |

### **Test Figure:**





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**Type of Modulation: 8DPSK** 

#### Out of Band Test Result 12.4

| Product:       |                                  | selfie sticks |   | Test Mode:          | Hopping mode  |
|----------------|----------------------------------|---------------|---|---------------------|---------------|
| Mode           | Hopping On                       |               |   | Input Voltage       | DC3.7V        |
| Temperature    | 24 deg. C,                       |               |   | Humidity            | 56% RH        |
| Test Result:   |                                  | Pass          |   | Detector            | РК            |
| The Max. FS in | PK (dBµV/m)                      | 44.1          |   |                     | 74(dBµV/m)    |
| Restrict Band  | AV(dBµV/m)                       |               |   | Limit               | 54(dBµV/m)    |
| 2390MHz        |                                  |               |   |                     |               |
| est Figure:    |                                  |               |   |                     |               |
|                | Marker 1                         |               |   | 100 kHz RF 2        | Att 20 dB     |
| Ref Lvl        |                                  | -0.40 dBm     |   | 300 kHz             |               |
| 11 dBm         | 2.                               | 40591182 GHz  | SWT                                       | 15 ms Uni           | t dBm         |
|                |                                  |               |   | ▼1 [T1]             | -0.40 dBm     |
|                |                                  |               |   | <b>∇</b> 2 [m1]     | 40591182 GHz  |
| 0              |                                  |               |   |                     | 4000000 GHz   |
|                |                                  |               |   | ▼ <sub>3</sub> [T1] |               |
| -10            |                                  |               |   |                     | 39000000 GHz  |
|                |                                  |               |   |                     |               |
| -20<br>1MAX    |                                  |               |   |                     | 1M            |
|                |                                  |               |   |                     |               |
| -30            |                                  |               |   |                     |               |
|                |                                  |               |   |                     |               |
| -40            |                                  |               |   |                     |               |
|                |                                  |               |   |                     | 7             |
| -50            |                                  |               |   |                     |               |
|                |                                  |               |   |                     |               |
| -60            | and a survey of the state of the | 1.1.1.1       | rollin lind                               |                     |               |
| mulling        | Whymertrank                      | nannanna      | un an | mannan              |               |
| -70            |                                  |               |   |                     |               |
|                |                                  |               |   |                     |               |
| -80            |                                  |               |   |                     |               |
|                |                                  |               |   |                     |               |
| -89            |                                  |               |   |                     |               |
| Start 2.3      | 5 GHz                            | 6 MH          | Iz/                                       |                     | Stop 2.41 GHz |

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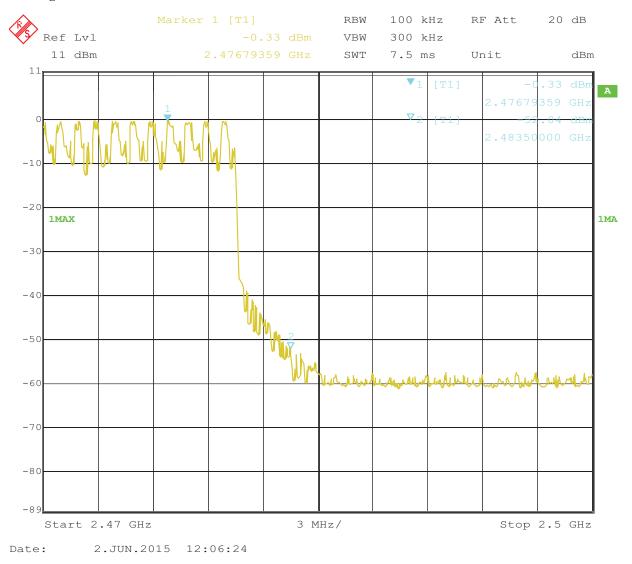


**Type of Modulation: 8DPSK** 

#### Out of Band Test Result 12.4

| Product:       |                  | selfie sticks | Test Mode:    | Hopping mode |
|----------------|------------------|---------------|---------------|--------------|
| Mode           | Hopping On       |               | Input Voltage | DC3.7V       |
| Temperature    | 24 deg. C,       |               | Humidity      | 56% RH       |
| Test Result:   | Pass             |               | Detector      | РК           |
| The Max. FS in | PK (dBμV/m) 43.8 |               |               | 74(dBµV/m)   |
| Restrict Band  | AV(dBµV/m)       |               | Limit         | 54(dBµV/m)   |
| 2483.5MHz      |                  |               |               |              |

### **Test Figure:**



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# 13.0 Antenna Requirement

# 13.1 Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitter antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the mount in dB that the directional gain of the antenna exceeds 6 dBi.

13.2 Antenna Connected constructions

PCB Antenna used. The maximum Gain of this antenna is 0 dBi

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### 14.0 FCC ID Label

# FCC ID: 2AEW6TES001

The label must not be a stick-on paper label. The label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

# **Mark Location:**



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#### 15.0 Photo of testing

Conducted Emission Test Setup:



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Radiated Emission Test Setup:



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# **Photographs – EUT**

Outside view



2

90 100 110 1a

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0 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 310 320 330 340 350 360 370 380 390 400 410



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Outside view



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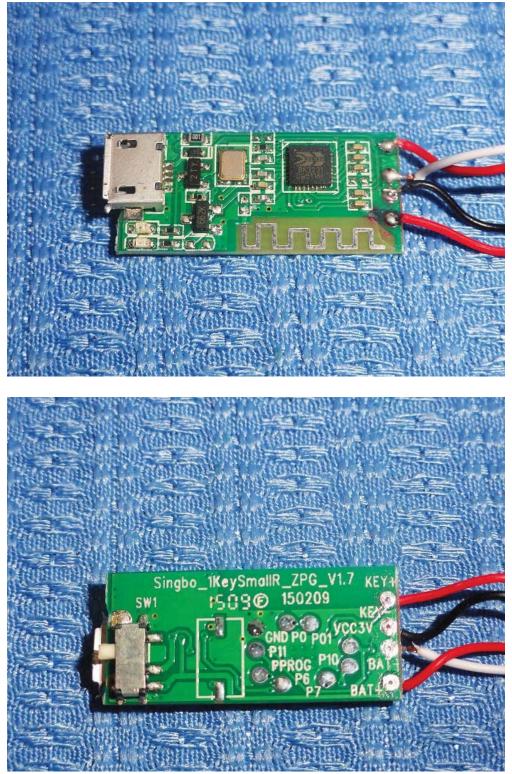
Inside view



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Inside view



End of the report

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