# APPLICATION FOR CERTIFICATION On Behalf of Philips Lighting(China) Investment Co., Ltd. LED Lamp

 Model No.
 :
 9290012577

 Brand
 :
 Philips

 FCC ID
 :
 2AGBW9290012577X

Prepared for

**Philips Lighting(China) Investment Co., Ltd.** Building 9, Lane 888, Tian Lin Road, Minhang district, Shanghai, China

Prepared by

Audix Technology (Wujiang) Co., Ltd. EMC Dept. No. 1289 Jiangxing East Road, the Part of Wujiang Economic Development Zone Jiangsu China 215200

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Report NumberACWE-F1605008Date of TestMar.21~Apr.14, 2016Date of ReportMay.19, 2016

## **TABLE OF CONTENTS**

| De | escription                                                                                          | Page |
|----|-----------------------------------------------------------------------------------------------------|------|
| TE | ST REPORT CERTIFICATION                                                                             | 4    |
| 1. | SUMMARY OF MEASUREMENTS AND RESULTS                                                                 | 5    |
| 2. | GENERAL INFORMATION                                                                                 | 6    |
|    | 2.1. Description of Device (EUT)                                                                    |      |
|    | 2.2. Description of Test Facility                                                                   |      |
|    | 2.3. Measurement Uncertainty                                                                        |      |
| 3. | CONDUCTED EMISSION MEASUREMET                                                                       |      |
|    | 3.1. Test Equipment                                                                                 |      |
|    | <ul><li>3.2. Block Diagram of Test Setup</li><li>3.3. Power line Conducted Emission Limit</li></ul> |      |
|    | 3.4. Test Procedure                                                                                 |      |
|    | 3.5. Conducted Emission Measurement Results                                                         |      |
| 4. | RADIATED EMISSION MEASUREMENT                                                                       | 17   |
|    | 4.1. Test Equipment                                                                                 | 17   |
|    | 4.2. Block Diagram of Test Setup                                                                    |      |
|    | 4.3. Radiated Emission Limits                                                                       |      |
|    | 4.4. Test Procedure                                                                                 |      |
|    | 4.5. Measurement Results (For Below 1GHz)                                                           |      |
|    | 4.7. Restricted Bands Measurement Results (For Above 1GHz)                                          |      |
|    | 4.8. Spurious Emission Measurement Results in Band Edge Emission (FCC Part 15, 15.205)              |      |
| 5. | 6 DB BANDWIDTH MEASUREMENT                                                                          | 45   |
|    | 5.1. Test Equipment                                                                                 | 45   |
|    | 5.2. Block Diagram of Test Setup                                                                    |      |
|    | 5.3. Specification Limits (§15.247(a)(2))                                                           |      |
|    | 5.4. Test Procedure                                                                                 |      |
| 6. | OUTPUT POWER MEASUREMENT                                                                            |      |
| 0. | 6.1. Test Equipment                                                                                 |      |
|    | 6.2. Block Diagram of Test Setup                                                                    |      |
|    | 6.3. Specification Limits (§15.247(b)(3))                                                           |      |
|    | 6.4. Test Procedure                                                                                 | 49   |
|    | 6.5. Test Results                                                                                   |      |
| 7. | BAND EDGES MEASUREMENT                                                                              |      |
|    | 7.1. Test Equipment                                                                                 |      |
|    | 7.2. Block Diagram of Test Setup                                                                    |      |
|    | <ul><li>7.3. Specification Limits (§15.247(d)).</li><li>7.4. Test Procedure</li></ul>               |      |
|    | 7.5. Test Results                                                                                   |      |
| 8. | POWER SPECTRAL DENSITY MEASUREMENT                                                                  | 52   |
|    | 8.1. Test Equipment                                                                                 |      |
|    | 8.2.Block Diagram of Test Setup                                                                     |      |
|    | 8.3. Specification Limits (§15.247(e))                                                              |      |
|    | 8.4. Test Results                                                                                   |      |
| 9. | EMISSION LIMITATIONS MEASUREMENT                                                                    |      |
|    | 9.1. Test Equipment                                                                                 |      |
|    | <ul><li>9.2. Block Diagram of Test Setup.</li><li>9.3. Specification Limits (§15.247(d)).</li></ul> |      |
|    | 9.4. Test Procedure                                                                                 |      |
|    | 9.5. Test Results                                                                                   |      |

| 10. | DUTY CYCLE                       | 79 |
|-----|----------------------------------|----|
|     | 10.1. Test Equipment             | 79 |
|     | 10.2. Test Results               |    |
| 11. | DEVIATION TO TEST SPECIFICATIONS | 80 |

### **TEST REPORT CERTIFICATION**

| Applicant        | :                       | Philips Lighting(China) Investment Co., Ltd. |
|------------------|-------------------------|----------------------------------------------|
| Manufacturer     | ):                      | Philips Lighting(China) Investment Co., Ltd. |
| EUT Description  | :                       | LED Lamp                                     |
| FCC ID           |                         | 2AGBW9290012577X                             |
| (A) Model No.    | :                       | 9290012577                                   |
| (B) Brand        | : <                     | Philips                                      |
| (C) Power Supply | $\langle \cdot \rangle$ | AC 110-130V, 60Hz                            |
| (D) Test Voltage |                         | AC 120V, 60Hz                                |
|                  |                         |                                              |

Applicable Standards:

### FCC RULES AND REGULATIONS PART 15 SUBPART C, Oct. 2015 ANSI C63.10: 2013 KDB 558074 D01 DTS Meas Guidance v03r05

The device described above was tested by Audix Technology (Wujiang) Co., Ltd. EMC Dept. to determine the maximum emission levels emanating from the device. The maximum emission levels were compared to the FCC Part 15 subpart C section 15.207, 15.209&15.247 limits.

The measurement results are contained in this test report and Audix Technology (Wujiang) Co., Ltd. EMC Dept. is assumed full responsibility for the accuracy and completeness of these measurements. Also, this test report shows that the EUT to be technically compliant with the FCC limits.

This test report applies to above tested sample only. This test report shall not be reproduced in part without written approval of Audix Technology (Wujiang) Co., Ltd. EMC Dept.

Date of Test: Mar.21~Apr.14, 2016

Prepared by

Reviewer

Date of Report: May.19, 2016

lu

(Emma Hu/Assistant Administrator)

(Danny Sun/ Section Manager)

Approved & Authorized Signer

(Ken Lu/Assistant General Manager)

Audix Technology (Wujiang )Co., Ltd. EMC Dept. Report No.: ACWE-F1605008

### 1. SUMMARY OF MEASUREMENTS AND RESULTS

The EUT has been tested according to the applicable standards and test results are referred as below.

| Description of Test Item  | Standard                                                                                                                                  | Results | Remark                                                |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|---------|-------------------------------------------------------|
| CONDUCTED<br>EMISSION     | FCC 47 CFR Part 15 Subpart C/<br>Section 15.207<br>And ANSI C63.10:2013<br>And KDB 558074 D01 DTS Meas<br>Guidance v03r05                 | PASS    | Minimum passing<br>margin is 13.40 dB<br>at 0.15 MHz  |
| RADIATED EMISSION         | FCC 47 CFR Part 15 Subpart C/<br>Section 15.209& Section 15.205<br>And ANSI C63.10:2013<br>And KDB 558074 D01 DTS Meas<br>Guidance v03r05 | PASS    | Minimum passing<br>margin is 13.83 dB<br>at 31.94 MHz |
| 6 dB BANDWIDTH            | FCC 47 CFR Part 15 Subpart C/<br>Section 15.247(a)(2)<br>And ANSI C63.10:2013<br>And KDB 558074 D01 DTS Meas<br>Guidance v03r05           | PASS    | > 500kHz                                              |
| OUTPUT POWER              | FCC 47 CFR Part 15 Subpart C/<br>Section 15.247(b)(3)<br>And ANSI C63.10:2013<br>And KDB 558074 D01 DTS Meas<br>Guidance v03r05           | PASS    | Minimum passing<br>margin is 26.81 dB<br>at CH 11     |
| BAND EDGES                | FCC 47 CFR Part 15 Subpart C/<br>Section 15.247(d)<br>And ANSI C63.10:2013<br>And KDB 558074 D01 DTS Meas<br>Guidance v03r05              | PASS    |                                                       |
| POWER SPECTRAL<br>DENSITY | FCC 47 CFR Part 15 Subpart C/<br>Section 15.247(e)<br>And ANSI C63.10:2013<br>And KDB 558074 D01 DTS Meas<br>Guidance v03r05              | PASS    | Minimum passing<br>margin is 13.794 dB<br>at CH 11    |
| EMISSION<br>LIMITATIONS   | FCC 47 CFR Part 15 Subpart C/<br>Section 15.247(d)<br>And ANSI C63.10:2013<br>And KDB 558074 D01 DTS Meas<br>Guidance v03r05              | PASS    |                                                       |

# 2. GENERAL INFORMATION

2.1. Description of Device (EUT)

| Description                  | : | LED Lamp                                                                                                                  |
|------------------------------|---|---------------------------------------------------------------------------------------------------------------------------|
| Model No.                    | : | 9290012577                                                                                                                |
| FCC ID                       | : | 2AGBW9290012577X                                                                                                          |
| Brand                        | : | Philips                                                                                                                   |
| Applicant                    | : | Philips Lighting(China) Investment Co., Ltd.<br>Building 9, Lane 888, Tian Lin Road, Minhang district,<br>Shanghai, China |
| Manufacturer                 | : | Philips Lighting(China) Investment Co., Ltd.<br>Building 9, Lane 888, Tian Lin Road, Minhang district,<br>Shanghai, China |
| Radio Technology             | : | IEEE 802.15.4 (ZigBee®)                                                                                                   |
| Antenna Gain                 | : | 1.9dBi                                                                                                                    |
| Fundamental Range            | : | 2405 MHz -2475MHz                                                                                                         |
| Tested Frequency             | : | 2405MHz (CH11)<br>2450MHz (CH20)<br>2475MHz (CH25)<br>2480MHz (CH26)                                                      |
| Channel Setting Method       | : | Channel is changed according to EUT's power on or power off.                                                              |
| Highest Working<br>Frequency | : | 2.4GHz                                                                                                                    |
| Power Rating                 | : | 5.5W                                                                                                                      |
| Modulation type              | : | O-QPSK                                                                                                                    |
| Date of Receipt of Sample    | : | Mar.15, 2016                                                                                                              |
| Date of Test                 | : | Mar.21~Apr.14, 2016                                                                                                       |

# 2.2. Description of Test Facility

| Name of Firm    | Audix Technology (Wujiang) Co., Ltd. EMC Dept.                                                                                                                                                                                            |  |  |  |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|
| Site Location   | No. 1289 Jiangxing East Road, the Eastern Part of Wujiang Economic Development Zone Jiangsu China 215200                                                                                                                                  |  |  |  |
| Test Facilities | No.1 Conducted Shielding Enclosure                                                                                                                                                                                                        |  |  |  |
|                 | No.1 3m Semi-anechoic Chamber<br>Date of Validity: Mar.30, 2018<br>FCC Registration No.: 897661<br>IC Registration No.:5183D-2<br>RF Fully Chamber                                                                                        |  |  |  |
| NVLAP Lab Code  | 200786-0<br>Valid until on Sep.30, 2016<br>(NVLAP is a signatory member of ILAC MRA)<br>Remark: This report shall not be imply endorsement,<br>certification or approval by NVLAP, NIST, or any agency<br>of the U.S. Federal Government. |  |  |  |

### 2.3. Measurement Uncertainty

| Test Item                                 | Range Frequency                       | Uncertainty |  |
|-------------------------------------------|---------------------------------------|-------------|--|
| No.1 Conducted Disturbance<br>Measurement | $0.15 MHz \sim 30 MHz$                | ± 2.65dB    |  |
| Radiated Disturbance Measurement          | $30 MHz \sim 300 MHz$                 | ± 3.18dB    |  |
| (At 3m Chamber)                           | $300 \text{MHz} \sim 1 \text{GHz}$    | ± 3.12dB    |  |
| Radiated Disturbance Measurement          | 1GHz ~ 6GHz                           | ± 4.56dB    |  |
| (At 3m Chamber)                           | $6 \mathrm{GHz} \sim 18 \mathrm{GHz}$ | ± 5.03dB    |  |

Remark: Uncertainty =  $ku_c(y)$ 

| Test Item                 | Uncertainty            |
|---------------------------|------------------------|
| 6 dB Bandwidth            | $\pm 0.16  \text{MHz}$ |
| Maximum Peak Output Power | ± 0.12dB               |
| Band Edges                | ± 0.38dB               |
| Power Spectral Density    | $\pm 0.38 dB$          |
| Emission Limitations      | ± 0.38dB               |

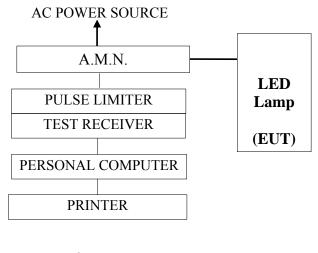
Remark: Uncertainty =  $ku_c(y)$ 

# 3. CONDUCTED EMISSION MEASUREMET

### 3.1. Test Equipment

| Item | Туре          | Manufacturer          | Model No. | Serial No. | Last Cal.  | Next Cal.  |
|------|---------------|-----------------------|-----------|------------|------------|------------|
| 1.   | Test Receiver | R & S                 | ESCI      | 100839     | 2016-01-05 | 2017-01-04 |
| 2.   | A.M.N         | R&S                   | ESH2-Z5   | 100153     | 2015-05-15 | 2016-05-14 |
| 3.   | Pulse Limiter | R&S                   | ESH3-Z2   | 100605     | 2015-07-03 | 2016-07-02 |
| 4.   | RF Cable      | Harbour<br>Industries | RG400     | 002        | 2016-01-05 | 2017-01-04 |
| 5.   | Software      | Audix/e3(6.7.0313)    |           |            |            |            |

### 3.2. Block Diagram of Test Setup



- : POWER LINE - : SIGNAL LINE

### 3.3. Power line Conducted Emission Limit

(FCC Part 15, Section 15.207, Class B)

| Frequency                                | Maximum RF Line Voltage |                          |  |
|------------------------------------------|-------------------------|--------------------------|--|
|                                          | Quasi-Peak Level        | Average Level            |  |
| $150 \mathrm{kHz} \sim 500 \mathrm{kHz}$ | $66 \sim 56 \ dB\mu V$  | $56 \sim 46 \; dB \mu V$ |  |
| 500kHz~5MHz                              | 56 dBµV                 | 46 dBµV                  |  |
| 5MHz ~ 30MHz                             | 60 dBµV                 | 50 dBµV                  |  |

Remark1: If the average limit is met when using a Quasi-Peak detector, the EUT shall be deemed to meet both limits and measurement with the average detector is unnecessary.

2: The lower limit applies at the band edges.

57

#### 3.4. Test Procedure

The measuring process is according to ANSI C63.10-2013 and laboratory internal procedure TKC-301-004. (For FCC Part15 Subpart C)

In the conducted emission measurement, the EUT and all peripheral devices were set up on a non-metallic table which was 0.8 meter height above the ground plane, and 0.4 meter far away from the vertical plane. The mains cable of the EUT connected to one Artificial Main Network(AMN). All other unit of the EUT and AE connected to a second Line Impedance Stabilization Network(L.I.S.N.). The telecommunication cable connected to the AE through a Impedance Stabilization Network(ISN) which terminated a 50 $\Omega$  resistor. For the measurement, the A.M.N measuring port was terminated by a 50 $\Omega$  measuring equipment and the second L.I.S.N measuring port was terminated by a 50 $\Omega$  terminator. All measurements were done between the phase lead and the reference ground, and between the neutral lead and the reference ground. All cables or wires placement were verified to find out the maximum emission.

The bandwidth of measuring receiver was set at 9 kHz.

The required frequency band  $(0.15 \text{ MHz} \sim 30 \text{ MHz})$  was pre-scanned with peak detector; the final measurement was measured with quasi-peak detector and average detector. (If the average limit is met when using a quasi-peak detector, the average detector is unnecessary).

The emission level is calculated automatically by the test system which uses the following equation:

Emission level  $(dB\mu V)$  = Reading  $(dB\mu V)$  + A.M.N factor (dB) + Cable loss (dB). (Cable loss includes pulse limiter loss)

3.5. Conducted Emission Measurement Results

For FCC Part15 Subpart C **PASSED**.

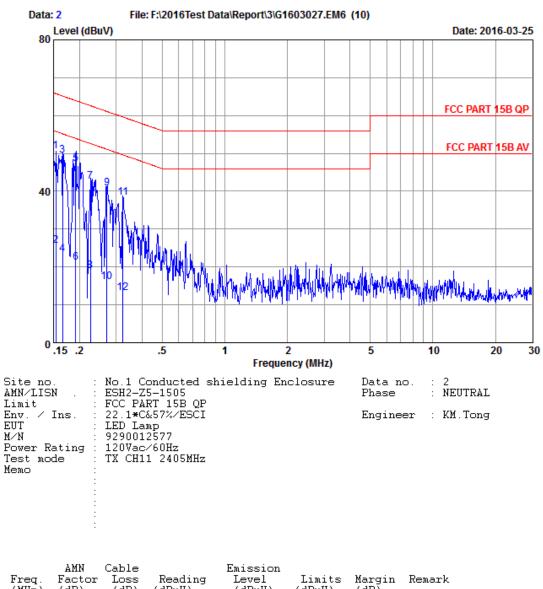
EUT was performed during this section testing and all the test results are attached in next pages.

| Test Dat | e Mar.25, 2016  | Temperature | 22.1      | Hum         | idity |
|----------|-----------------|-------------|-----------|-------------|-------|
| Mada     | Test Canditian  | Refe        | erence Te | st Data No. |       |
| Mode     | Test Condition  | Ne          | utral     | Line        |       |
| 1        | TX CH11 2405MHz | #           | 2         | # 1         |       |
| 2        | TX CH20 2450MHz | #           | 4         | # 3         |       |
| 3        | TX CH25 2475MHz | I           | #6        | # 5         |       |

NOTE 1 ' 'means the worst test mode.

NOTE 2- The worst emission is detected at 0.15 MHz with emission level of 52.54 dB ( $\mu$ V) and with QP detector (Limit is 65.94 dB ( $\mu$ V)), when the Neutral of the EUT is connected to AMN.

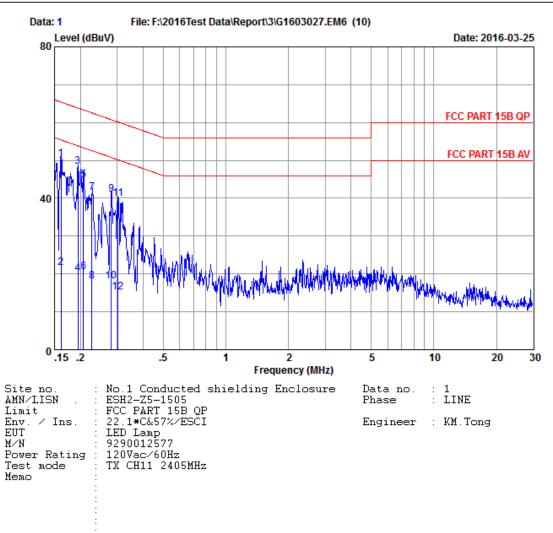




|                                                             | Freq.<br>(MHz)                                                                                                            | Factor<br>(dB)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Loss<br>(dB)                                                 | Reading<br>(dBuV)                                                                                                           | Level<br>(dBuV)                                                                                          | Limits<br>(dBu∛)                                                                                         | Margin<br>(dB)                                                                                                                 | Remark                                                                                             |
|-------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| 1<br>2<br>3<br>4<br>5<br>6<br>7<br>8<br>9<br>10<br>11<br>12 | $\begin{array}{c} 0.15\\ 0.15\\ 0.17\\ 0.17\\ 0.19\\ 0.19\\ 0.23\\ 0.23\\ 0.27\\ 0.27\\ 0.32\\ 0.32\\ 0.32\\ \end{array}$ | $\begin{array}{c} 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\$ | 9.89<br>9.89<br>9.89<br>9.89<br>9.89<br>9.89<br>9.89<br>9.89 | $\begin{array}{c} 40.50\\ 15.60\\ 39.50\\ 13.30\\ 37.30\\ 11.20\\ 32.50\\ 9.00\\ 30.71\\ 6.01\\ 28.30\\ 3.00\\ \end{array}$ | 50.54<br>25.64<br>49.54<br>23.34<br>47.34<br>21.24<br>42.54<br>19.04<br>40.75<br>16.05<br>38.35<br>13.05 | 65.78<br>55.78<br>65.16<br>55.16<br>53.95<br>62.60<br>52.60<br>52.60<br>51.09<br>51.09<br>59.63<br>49.63 | $\begin{array}{c} 15.24\\ 30.14\\ 15.62\\ 31.82\\ 16.61\\ 32.71\\ 20.06\\ 33.56\\ 20.34\\ 35.04\\ 21.28\\ 36.58\\ \end{array}$ | QP<br>Average<br>QP<br>Average<br>QP<br>Average<br>QP<br>Average<br>QP<br>Average<br>QP<br>Average |

Remarks:

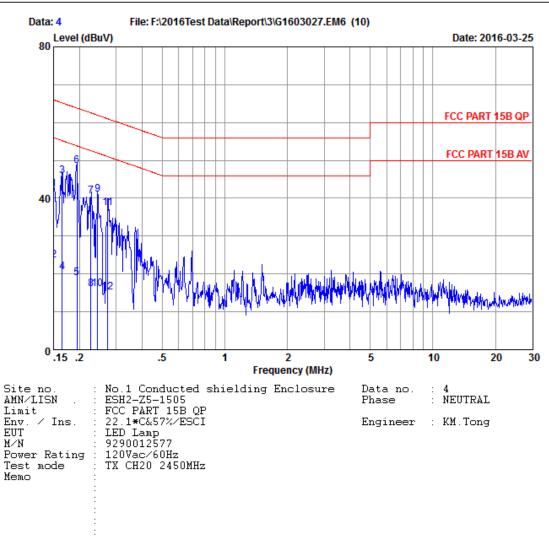




|                                                       | Freq.<br>(MHz)                                                               | AMN<br>Factor<br>(dB)                                                                                                            | Cable<br>Loss<br>(dB)                                        | Reading<br>(dBuV)                                                                             | Emission<br>Level<br>(dBuV)                                                                                            | Limits<br>(dBuV)                                                                       | Margin<br>(dB)                                                                                                         | Remark                                                                                  |
|-------------------------------------------------------|------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1<br>2<br>3<br>4<br>5<br>6<br>7<br>8<br>9<br>10<br>11 | 0.16<br>0.19<br>0.19<br>0.21<br>0.23<br>0.23<br>0.23<br>0.28<br>0.28<br>0.30 | $\begin{array}{c} 0.16\\ 0.16\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.16\\ 0.16\\ 0.16\\ 0.16\\ 0.16\\ \end{array}$ | 9.89<br>9.89<br>9.89<br>9.89<br>9.89<br>9.89<br>9.89<br>9.89 | 40.30<br>11.50<br>38.30<br>10.00<br>34.80<br>10.40<br>31.50<br>8.00<br>31.00<br>8.00<br>29.79 | $\begin{array}{c} 50.35\\ 21.55\\ 48.34\\ 20.04\\ 44.84\\ 20.44\\ 41.54\\ 18.04\\ 41.05\\ 18.05\\ 39.85\\ \end{array}$ | 65.41<br>55.41<br>63.86<br>53.32<br>53.32<br>62.56<br>52.56<br>60.79<br>50.79<br>60.16 | $\begin{array}{c} 15.06\\ 33.86\\ 15.52\\ 33.82\\ 18.48\\ 32.88\\ 21.02\\ 34.52\\ 19.74\\ 32.74\\ 20.31\\ \end{array}$ | QP<br>Average<br>QP<br>Average<br>QP<br>Average<br>QP<br>Average<br>QP<br>Average<br>QP |
| 12                                                    | 0.30                                                                         | 0.16                                                                                                                             | 9.90                                                         | 4.99                                                                                          | 15.05                                                                                                                  | 50.16                                                                                  | 35.11                                                                                                                  | Average                                                                                 |

Remarks:

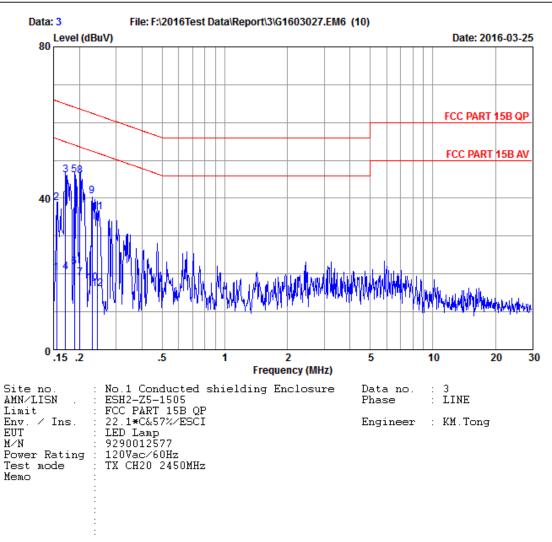




|                                                  |                                             | Freq.<br>(MHz)                                                               | AMN<br>Factor<br>(dB)                                        | Cable<br>Loss<br>(dB)                                        | Reading<br>(dBuV)                                                                   | Emission<br>Level<br>(dBuV)                                                            | Limits<br>(dBuV)                                                              | Margin<br>(dB)                                                                         | Remark                                                                                  |
|--------------------------------------------------|---------------------------------------------|------------------------------------------------------------------------------|--------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 10 0.27 0.10 7.07 0.01 10.00 01.00 00.70 MODINGO | 3<br>4<br>5<br>6<br>7<br>8<br>9<br>10<br>11 | 0.15<br>0.17<br>0.17<br>0.19<br>0.23<br>0.23<br>0.23<br>0.24<br>0.24<br>0.24 | 0.15<br>0.15<br>0.15<br>0.15<br>0.15<br>0.15<br>0.15<br>0.15 | 9.89<br>9.89<br>9.89<br>9.89<br>9.89<br>9.89<br>9.89<br>9.89 | 13.50<br>35.80<br>10.50<br>9.00<br>38.50<br>30.50<br>6.00<br>31.01<br>6.01<br>27.51 | 23.54<br>45.84<br>20.54<br>19.04<br>48.54<br>40.54<br>16.04<br>41.05<br>16.05<br>37.55 | 56.00<br>65.21<br>55.21<br>53.86<br>62.56<br>52.56<br>61.96<br>51.96<br>61.00 | 32.46<br>19.37<br>34.67<br>34.82<br>15.32<br>22.02<br>36.52<br>20.91<br>35.91<br>23.45 | Average<br>OP<br>Average<br>OP<br>OP<br>Average<br>OP<br>Average<br>OP<br>Average<br>OP |

Remarks:

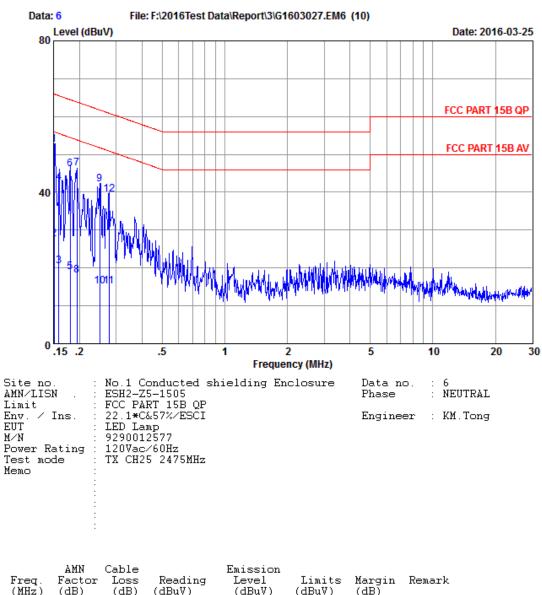




|         | Freq.<br>(MHz) | AMN<br>Factor<br>(dB) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV) | Limits<br>(dBuV) | Margin<br>(dB) | Remark        |
|---------|----------------|-----------------------|-----------------------|-------------------|-----------------------------|------------------|----------------|---------------|
| 1       | 0.16           | 0.16                  | 9.89<br>9.89          | 10.30<br>28.80    | 20.35<br>38.85              | 55.73<br>65.73   | 35.38<br>26.88 | Average<br>QP |
| 3       | 0.17           | 0.16                  | 9.89                  | 36.10             | 46.15                       | 64.91            | 18.76          | QP            |
| 4       | 0.17           | 0.16                  | 9.89                  | 10.50             | 20.55                       | 54.91            | 34.36          | Average       |
| 5       | 0.19<br>0.19   | 0.15<br>0.15          | 9.89<br>9.89          | 36.00<br>11.80    | 46.04<br>21.84              | 64.08<br>54.08   | 18.04<br>32.24 | QP<br>Average |
| 7       | 0.20           | 0.15                  | 9.89                  | 9.00              | 19.04                       | 53.57            | 34.53          | Average       |
| 8       | 0.20           | 0.15                  | 9.89                  | 35.80             | 45.84                       | 63.57            | 17.73          | QP -          |
| 9<br>10 | 0.23<br>0.23   | 0.15<br>0.15          | 9.89<br>9.89          | 30.50<br>7.50     | 40.54<br>17.54              | 62.45<br>52.45   | 21.91<br>34.91 | QP            |
| 11      | 0.23           | 0.15                  | 9.89                  | 26.31             | 36.35                       | 52.45<br>61.96   | 25.61          | Average<br>QP |
| 12      | 0.24           | 0.15                  | 9.89                  | 6.01              | 16.05                       | 51.96            | 35.91          | Äverage       |

Remarks:

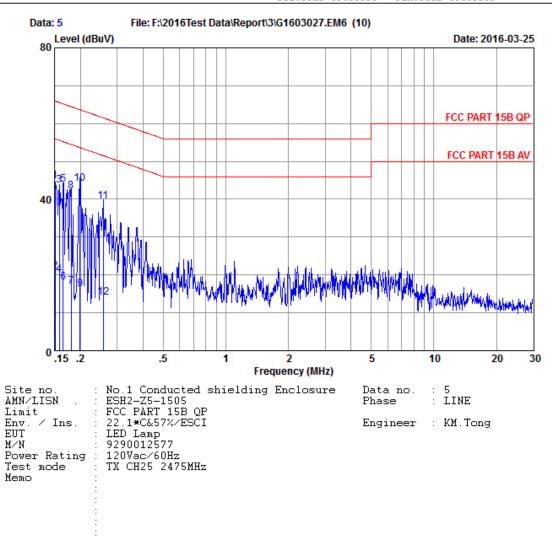




|                                                                  | Freq.<br>(MHz)                                                       | Factor<br>(dB)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Loss<br>(dB)                                                 | Reading<br>(dBuV)                                                                                                        | Level<br>(dBuV)                                                                                                                | Limits<br>(dBuV)                                                                                | Margin<br>(dB)                                                                                                              | Remark                                                                                  |
|------------------------------------------------------------------|----------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| -<br>1<br>2<br>3<br>4<br>5<br>6<br>7<br>8<br>9<br>10<br>11<br>12 | 0.16<br>0.16<br>0.18<br>0.18<br>0.19<br>0.19<br>0.25<br>0.25<br>0.25 | $\begin{array}{c} 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\ 0.15\\$ | 9.89<br>9.89<br>9.89<br>9.89<br>9.89<br>9.89<br>9.89<br>9.89 | $\begin{array}{c} 42.50\\ 17.50\\ 10.50\\ 32.50\\ 9.00\\ 36.00\\ 36.30\\ 8.00\\ 32.01\\ 5.01\\ 5.01\\ 29.31 \end{array}$ | $\begin{array}{c} 52.54\\ 27.54\\ 20.54\\ 42.54\\ 19.04\\ 46.04\\ 46.34\\ 18.04\\ 42.05\\ 15.05\\ 15.05\\ 39.35\\ \end{array}$ | 65.94<br>55.94<br>55.52<br>65.52<br>54.49<br>63.86<br>53.86<br>61.76<br>51.76<br>50.91<br>60.91 | $\begin{array}{c} 13.40\\ 28.40\\ 34.98\\ 22.98\\ 35.45\\ 18.45\\ 17.52\\ 35.82\\ 19.71\\ 36.71\\ 35.86\\ 21.56\end{array}$ | QP<br>Average<br>QP<br>Average<br>QP<br>QP<br>Average<br>QP<br>Average<br>Average<br>QP |

Remarks:





|          | Freq.<br>(MHz) | AMN<br>Factor<br>(dB) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV) | Limits<br>(dBuV) | Margin<br>(dB) | Remark             |
|----------|----------------|-----------------------|-----------------------|-------------------|-----------------------------|------------------|----------------|--------------------|
| 1        | 0.15<br>0.15   | 0.16<br>0.16          | 9.89<br>9.89          | 34.70<br>11.00    | 44.75<br>21.05              | 65.94<br>55.94   | 21.19<br>34.89 | QP<br>Average      |
| 3        | 0.16           | 0.16                  | 9.89                  | 33.60             | 43.65                       | 65.57            | 21.92          | QP                 |
| 4        | 0.16           | 0.16                  | 9.89                  | 10.00             | 20.05                       | 55.57            | 35.52          | Average            |
| 5        | $0.17 \\ 0.17$ | 0.16<br>0.16          | 9.89<br>9.89          | 33.80<br>8.00     | 43.85<br>18.05              | 65.21<br>55.21   | 21.36<br>37.16 | QP                 |
| 7        | 0.17           | 0.16                  | 9.89                  | 7.00              | 17.04                       | 54.49            | 37.45          | Average<br>Average |
| 8        | 0.18           | 0.15                  | 9.89                  | 32.00             | 42.04                       | 64.49            | 22.45          | QP                 |
| 9        | 0.20           | 0.15                  | 9.89                  | 6.20              | 16.24                       | 53.65            | 37.41          | Average            |
| 10       | 0.20           | 0.15                  | 9.89                  | 34.10             | 44.14                       | 63.65            | 19.51          | QP                 |
| 11<br>12 | 0.26<br>0.26   | 0.15<br>0.15          | 9.89<br>9.89          | 29.41<br>4.01     | 39.45<br>14.05              | 61.53<br>51.53   | 22.08<br>37.48 | QP<br>Average      |

Remarks:

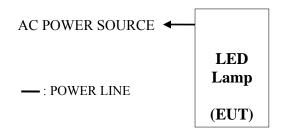
# 4. RADIATED EMISSION MEASUREMENT

### 4.1. Test Equipment

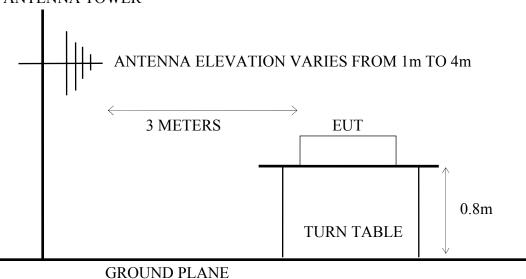
The following test equipment was used during the radiated emission measurement: At 3m Semi-Anechoic Chamber

| Item | Туре                | Manufacturer       | Model No. | Serial No. | Last Cal.  | Next Cal.  |  |
|------|---------------------|--------------------|-----------|------------|------------|------------|--|
| 1.   | Preamplifier        | Agilent            | 8449B     | 3008A02233 | 2016-01-05 | 2017-01-04 |  |
| 2.   | Preamplifier        | Agilent            | 8447D     | 2944A10921 | 2015-07-03 | 2016-07-02 |  |
| 3.   | PXA Signal Analyzer | Agilent            | N9030A    | MY53120367 | 2015-06-23 | 2016-06-22 |  |
| 4.   | Test Receiver       | R&S                | ESCI      | 100361     | 2016-01-05 | 2017-01-04 |  |
| 5.   | Bi-log Antenna      | Schaffner          | CBL6112D  | 22250      | 2015-09-02 | 2016-09-01 |  |
| 6.   | Horn Antenna        | EMCO               | 3115      | 62960      | 2015-06-30 | 2016-05-29 |  |
| 7.   | RF Cable #1         | Yuhang CSYH        | cable-3m  | 001(0.5m)  | 2016-01-05 | 2017-01-04 |  |
| 8.   | RF Cable #2         | Yuhang CSYH        | cable-3m  | 002(0.5m)  | 2016-01-05 | 2017-01-04 |  |
| 9.   | RF Cable #3         | Yuhang CSYH        | cable-3m  | 003(3.0m)  | 2016-01-05 | 2017-01-04 |  |
| 10.  | Software            | Audix/e3(6.7.0313) |           |            |            |            |  |

- 4.2. Block Diagram of Test Setup
- 4.2.1. Block Diagram of Test Setup between EUT and simulators

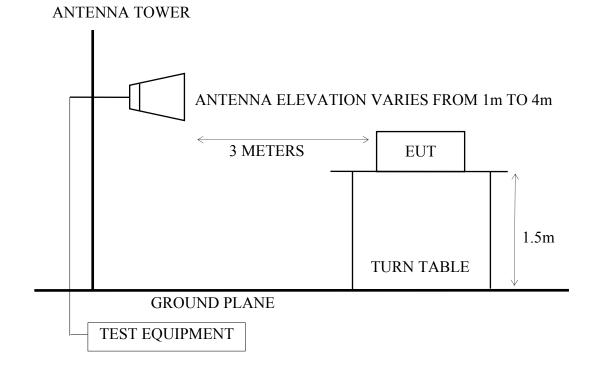


4.2.2. No. 1 3m Semi-Anechoic Chamber Setup Diagram (Test distance:3m) for 30-1000MHz





### 4.2.3. No. 1 3m Semi-Anechoic Chamber Setup Diagram (Test distance: 3m) for above 1GHz



#### 4.3. Radiated Emission Limits

Radiated Emission Limits (FCC Part15 C, section 15.209, CISPR22)

| Frequency  | Distance Materia | Field Strengths Limits |  |  |
|------------|------------------|------------------------|--|--|
| MHz        | Distance Meters  | dBµV/m                 |  |  |
| 30 ~ 88    | 3                | 40                     |  |  |
| 88~216     | 3                | 43.5                   |  |  |
| 216~960    | 3                | 46                     |  |  |
| Above 960  | 3                | 54                     |  |  |
| Above 1000 | 2                | 74 (Peak)              |  |  |
| A00ve 1000 | 5                | 54 (Average)           |  |  |

Remark (1) Emission level  $(dB\mu V/m) = 20 \log Emission level (\mu V/m)$ 

(2)The tighter limit applies at the edge between two frequency bands.

### 4.4. Test Procedure

The measuring process is according to ANSI C63.10-2013 and laboratory internal procedure TKC-301-001. (For FCC Part15 Subpart C)

In the radiated disturbance measurement, the EUT and all simulators were set up on a non-metallic turn table which was 0.8 meter above the ground plane. Measurement distance between EUT and receiving antennas was set at 10 meters at  $30MHz\sim1GHz$  and 3 meters at  $1GHz\sim6GHz$ . The measurement distance is the shortest horizontal distance between an imaginary circular periphery which consists of EUT periphery and cables and the reference point of the antenna. During the radiated measurement, the EUT was rotated  $360^\circ$  and receiving antennas were used for both horizontal and vertical polarization detection for  $30MHz\sim1GHz$ , One receiving antennas was used for both horizontal and vertical polarization detection for  $1GHz\sim6GHz$  (the absorbing material was added when testing of  $1GHz\sim6GHz$  was done). All cables or wires placement were verified to find out the maximum emission.

The bandwidth of measuring receiver (or spectrum analyzer) was set to:

RBW (120 kHz), VBW (300 kHz) for QP detector below 1GHz RBW (1 MHz), VBW (1MHz) for Peak detector above 1GHz RBW (1 MHz), VBW (10Hz) for AV detector above 1GHz

The frequency range from 30MHz to 10<sup>th</sup> harmonic(25GHz) are checked, and no any emissions were found from 18GHz to 25GHz.

The emission level is calculated automatically by the test system which uses the following equation

- 1. For 30MHz-1GHz measurement: Emission Level (dBµV/m) = Reading (dBµV)+Antenna Factor (dB/m)+Cable Loss (dB)
- 2. For Above 1GHz measurement: Emission Level  $(dB\mu V/m) = \text{Reading } (dB\mu V)+\text{Antenna Factor } (dB/m)+\text{Cable Loss}(dB)$ -Pre-amplifier factor (dB)

The three orthogonal planes have been all tested, and the data of the worst mode XZ plan(in Horizontal) & YZ plan(in Vertical) is shown in the report.

### 4.5. Measurement Results

### PASSED

4.5.1. For Restricted Bands:

The EUT was tested in restricted bands and all the test results are listed in section 5.7 & 5.8. (The restricted bands defined in part 15.205(a))

For Frequency range : below 1GHz

| Na  | Teat Mada a  | Reference Test Data No. |     |     |  |  |
|-----|--------------|-------------------------|-----|-----|--|--|
| No. | l est Mode a | Test Mode and Frequency |     |     |  |  |
| 1.  |              | 2405MHz (Channel 11)    | # 1 | # 2 |  |  |
| 2.  | Transmitting | 2450MHz (Channel 20)    | # 3 | # 4 |  |  |
| 3.  |              | 2475MHz (Channel 25)    | # 5 | # 6 |  |  |

### For Frequency range : above 1GHz

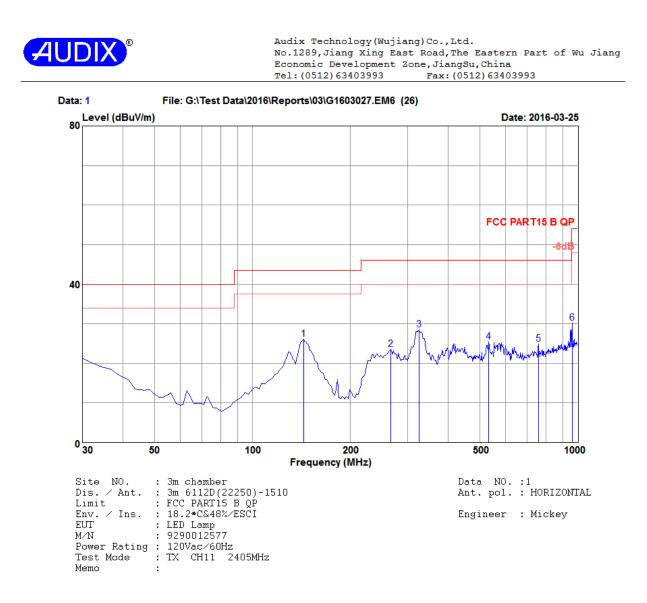
| Na  |              | Reference Test Data No. |            |          |
|-----|--------------|-------------------------|------------|----------|
| No. | Test Mode a  | nd Frequency            | Horizontal | Vertical |
| 1.  |              | 2405MHz (Channel 11)    | # 7        | # 8      |
| 2.  | Transmitting | 2450MHz (Channel 20)    | # 9        | # 10     |
| 3.  |              | 2475MHz (Channel 25)    | # 11       | # 12     |

### 4.5.2. For Band Edge Emission

The EUT was tested in restricted bands and all the test results are listed in section 5.9. The restricted bands defined in part 15.205(a)

| No. |             | Reference Test Data No. |            |            |
|-----|-------------|-------------------------|------------|------------|
|     | Test Mode a | Horizontal              | Vertical   |            |
| 1.  |             | 2405MHz (Channel 11)    | # 13, # 15 | # 14, # 16 |
| 2.  |             | 2475MHz (Channel 25)    | # 17, # 19 | # 18, # 20 |
| 3.  |             | 2480MHz (Channel 26)    | # 27, # 29 | # 28, # 30 |

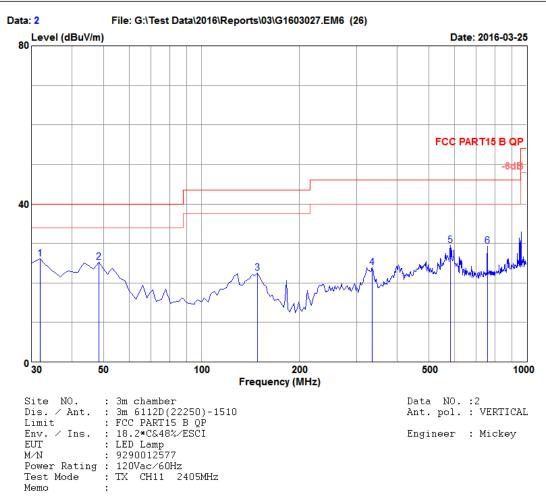
#### 4.6. Restricted Bands Measurement Results (For Below 1GHz)



|                            | Freq.<br>(MHz)                                                                                                                      | Ant.<br>Factor<br>(dB∕m)                           | Cable<br>Loss<br>(dB)                        | Reading<br>(dBuV)                                  | Emission<br>Level<br>(dBuV/m)                      | Limits<br>(dBuV/m)                                          | Margin<br>(dB)                                     | Remark                                 |  |  |  |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|----------------------------------------------|----------------------------------------------------|----------------------------------------------------|-------------------------------------------------------------|----------------------------------------------------|----------------------------------------|--|--|--|
| 1<br>2<br>3<br>4<br>5<br>6 | 143.49<br>266.68<br>324.88<br>533.43<br>756.53<br>961.20                                                                            | 12.62<br>13.80<br>14.63<br>18.63<br>20.51<br>22.13 | 1.03<br>1.48<br>1.66<br>2.21<br>2.72<br>3.23 | 39.43<br>34.89<br>39.04<br>32.41<br>29.43<br>31.75 | 26.05<br>23.50<br>28.56<br>25.42<br>24.86<br>30.15 | 43.50<br>46.00<br>46.00<br>46.00<br>46.00<br>46.00<br>54.00 | 17.45<br>22.50<br>17.44<br>20.58<br>21.14<br>23.85 | QP<br>QP<br>QP<br>QP<br>QP<br>QP<br>QP |  |  |  |
| Re                         | Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.<br>2. The emission levels that are 20dB below the official limit |                                                    |                                              |                                                    |                                                    |                                                             |                                                    |                                        |  |  |  |

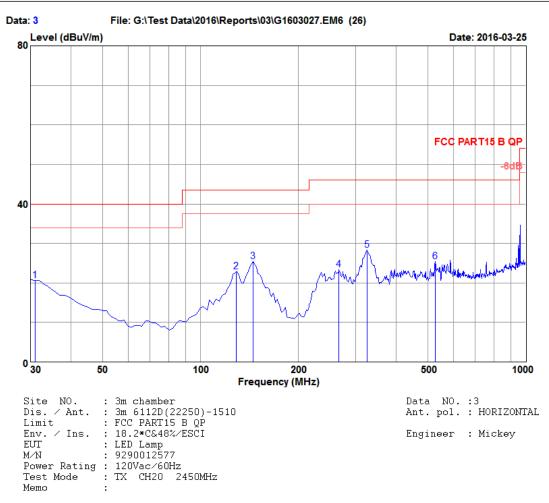
are not reported.





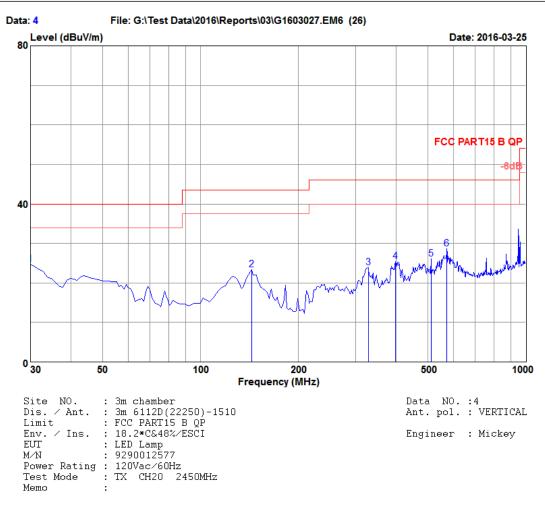
|        | Freq.<br>(MHz)   | Ant.<br>Factor<br>(dB∕m) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark   |
|--------|------------------|--------------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|----------|
| 1<br>2 | 31.94<br>48.43   | 20.20<br>11.63           | 0.48<br>0.60          | 32.84<br>40.34    | 26.17<br>25.27                | 40.00<br>40.00     | 13.83<br>14.73 | QP<br>QP |
| 3<br>4 | 148.34<br>334.58 | 12.14                    | 1.05                  | 36.26<br>34.21    | 22.44                         | 43.50<br>46.00     | 21.06          | QP<br>QP |
| 5<br>6 | 581.93<br>756.53 | 19.26                    | 2.33                  | 35.84<br>33.96    | 29.55<br>29.39                | 46.00              | 16.45<br>16.61 | QP<br>OP |
|        | /                | 20.31                    |                       | JJ.90<br>         | 29.39                         | 40.00              | 10.01          | ۷r<br>   |





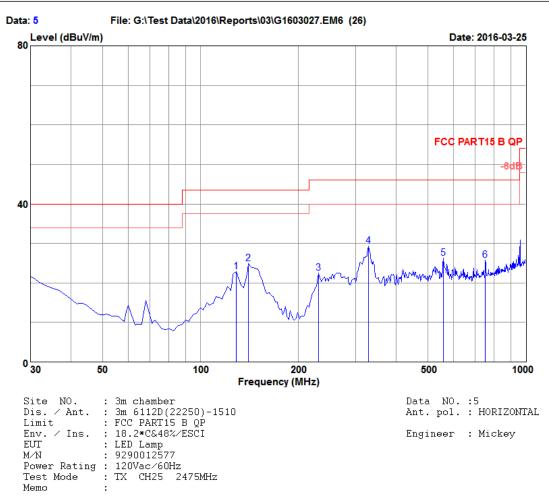
| Freq.<br>(MHz)                                                                                                    | Ant.<br>Factor<br>(dB⁄m) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark |
|-------------------------------------------------------------------------------------------------------------------|--------------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| $\begin{array}{rrrr} 1 & 30.97 \\ 2 & 128.94 \\ 3 & 145.43 \\ 4 & 266.68 \\ 5 & 324.88 \\ 6 & 526.64 \end{array}$ | 20.75                    | 0.48                  | 26.84             | 20.72                         | 40.00              | 19.28          | QP     |
|                                                                                                                   | 13.16                    | 0.98                  | 35.80             | 22.86                         | 43.50              | 20.64          | QP     |
|                                                                                                                   | 12.43                    | 1.04                  | 38.92             | 25.37                         | 43.50              | 18.13          | QP     |
|                                                                                                                   | 13.80                    | 1.48                  | 34.84             | 23.45                         | 46.00              | 22.55          | QP     |
|                                                                                                                   | 14.63                    | 1.66                  | 38.75             | 28.27                         | 46.00              | 17.73          | QP     |
|                                                                                                                   | 18.54                    | 2.19                  | 32.60             | 25.50                         | 46.00              | 20.50          | OP     |





| Freq.<br>(MHz) | Ant.<br>Factor<br>(dB∕m) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark |
|----------------|--------------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 30.00        | 21.30                    | 0.47                  | 30.30             | 24.72                         | 40.00              | 15.28          | QP     |
| 2 143.49       | 12.62                    | 1.03                  | 36.75             | 23.37                         | 43.50              | 20.13          | QP     |
| 3 327.79       | 14.72                    | 1.67                  | 34.25             | 23.85                         | 46.00              | 22.15          | QP     |
| 4 397.63       | 16.74                    | 1.86                  | 34.07             | 25.39                         | 46.00              | 20.61          | QP     |
| 5 512.09       | 18.35                    | 2.16                  | 33.40             | 26.10                         | 46.00              | 19.90          | QP     |
| 6 572.23       | 19.13                    | 2.30                  | 35.06             | 28.62                         | 46.00              | 17.38          | OP     |



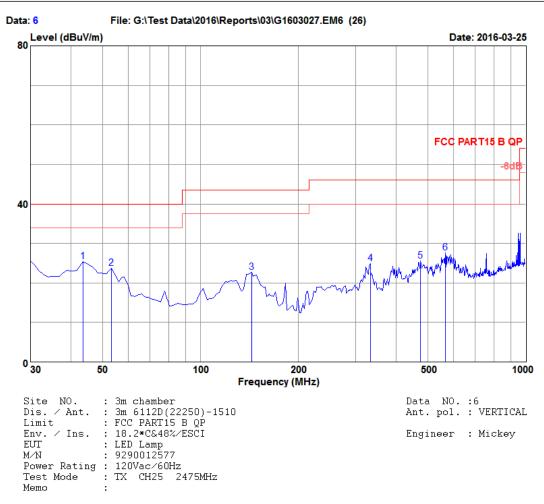


| Freq.<br>(MHz)                                                                                                     | Ant.<br>Factor<br>(dB∕m) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Remark |
|--------------------------------------------------------------------------------------------------------------------|--------------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| $\begin{array}{rrrr} 1 & 128.94 \\ 2 & 140.58 \\ 3 & 230.79 \\ 4 & 327.79 \\ 5 & 557.68 \\ 6 & 751.68 \end{array}$ | 13.16                    | 0.98                  | 35.75             | 22.81                         | 43.50              | 20.69          | QP     |
|                                                                                                                    | 12.90                    | 1.02                  | 37.96             | 24.84                         | 43.50              | 18.66          | QP     |
|                                                                                                                    | 11.58                    | 1.36                  | 36.27             | 22.47                         | 46.00              | 23.53          | QP     |
|                                                                                                                    | 14.72                    | 1.67                  | 39.80             | 29.40                         | 46.00              | 16.60          | QP     |
|                                                                                                                    | 18.94                    | 2.27                  | 32.93             | 26.28                         | 46.00              | 19.72          | QP     |
|                                                                                                                    | 20.46                    | 2.70                  | 30.37             | 25.73                         | 46.00              | 20.27          | QP     |

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading. 2. The emission levels that are 20dB below the official limit

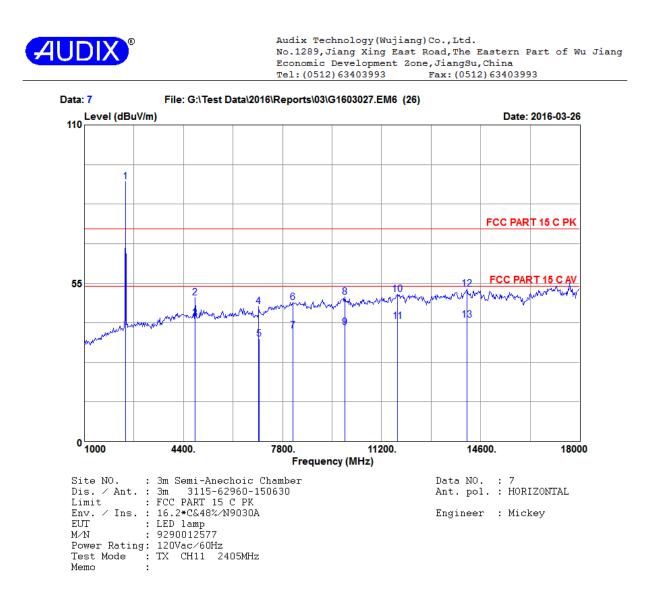
are not reported.





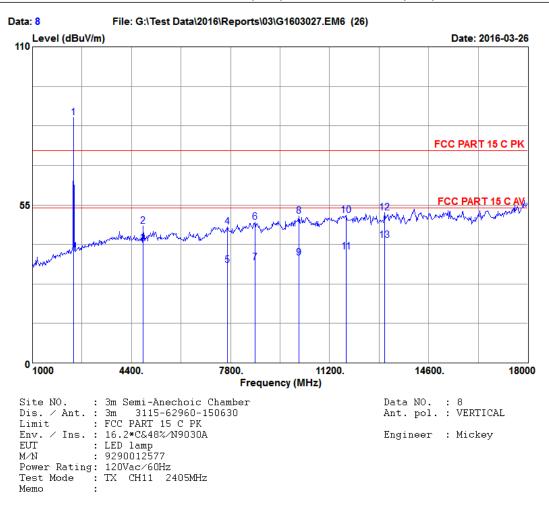
|   | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB∕m) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV⁄m) | Margin<br>(dB) | Remark |
|---|----------------|--------------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 43.58          | 13.95                    | 0.56                  | 38.26             | 25.45                         | 40.00              | 14.55          | QP     |
| 2 | 53.28          | 9.86                     | 0.63                  | 40.47             | 23.67                         | 40.00              | 16.33          | QP     |
| 3 | 143.49         | 12.62                    | 1.03                  | 36.02             | 22.64                         | 43.50              | 20.86          | QP     |
| 4 | 332.64         | 14.86                    | 1.68                  | 35.13             | 24.84                         | 46.00              | 21.16          | QP     |
| 5 | 475.23         | 17.85                    | 2.07                  | 33.33             | 25.57                         | 46.00              | 20.43          | QP     |
| 6 | 567.38         | 19.07                    | 2.29                  | 34.10             | 27.59                         | 46.00              | 18.41          | QP     |

#### 4.7. Restricted Bands Measurement Results (For Above 1GHz)



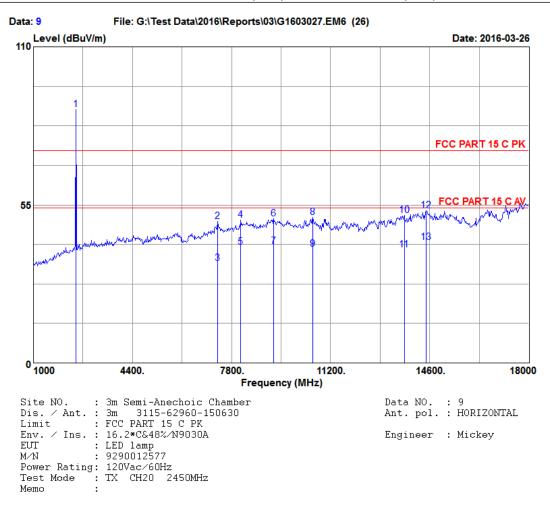
|                                           | Freq.<br>(MHz)                                                                                              | Ant.<br>Factor<br>(dB)                                                        | Cable<br>Loss<br>(dB)                                                           | Reading<br>(dBuV)                                                                      | Preamp<br>Factor<br>(dB)                                                               |                                                                                        | on<br>Limits<br>(dBuV∕m)                                                                        | Margin<br>(dB)                                                                          | Remark                                                                                   |
|-------------------------------------------|-------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|---------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| 1<br>2<br>3<br>4<br>5<br>6<br>7<br>8<br>9 | 2407.00<br>4801.00<br>4802.16<br>6985.00<br>6986.15<br>8161.00<br>8162.16<br>9946.00<br>9947.18<br>11752.00 | 28.49<br>32.86<br>35.56<br>35.56<br>37.19<br>37.19<br>38.73<br>38.73<br>39.26 | 5.09<br>7.32<br>7.32<br>8.83<br>8.83<br>9.65<br>9.65<br>10.81<br>10.81<br>11.47 | 91.17<br>43.63<br>36.50<br>36.53<br>25.40<br>35.66<br>25.80<br>35.09<br>24.60<br>34.20 | 34.50<br>33.95<br>33.95<br>34.02<br>34.02<br>34.16<br>34.16<br>34.47<br>34.47<br>33.77 | 90.25<br>49.86<br>42.73<br>46.90<br>35.77<br>48.34<br>38.48<br>50.16<br>39.67<br>51.16 | 74.00<br>74.00<br>54.00<br>54.00<br>74.00<br>54.00<br>74.00<br>54.00<br>74.00<br>54.00<br>74.00 | -16.25<br>24.14<br>11.27<br>27.10<br>18.23<br>25.66<br>15.52<br>23.84<br>14.33<br>22.84 | Peak<br>Peak<br>Average<br>Peak<br>Average<br>Peak<br>Average<br>Peak<br>Average<br>Peak |
| 10<br>11<br>12<br>13                      | 11753.15<br>14125.00                                                                                        | 39.28<br>39.24<br>42.30<br>42.30                                              | 11.47<br>11.47<br>12.89<br>12.89                                                | 24.80<br>29.53<br>18.70                                                                | 33.77<br>33.77<br>31.77<br>31.77                                                       | 41.74<br>52.95<br>42.12                                                                | 74.00<br>54.00<br>74.00<br>54.00                                                                | 22.84<br>12.26<br>21.05<br>11.88                                                        | Feak<br>Average<br>Peak<br>Average                                                       |
|                                           | Remarks:                                                                                                    |                                                                               |                                                                                 |                                                                                        |                                                                                        |                                                                                        | oss + Readin<br>ow the off:                                                                     |                                                                                         | amp.Factor.                                                                              |





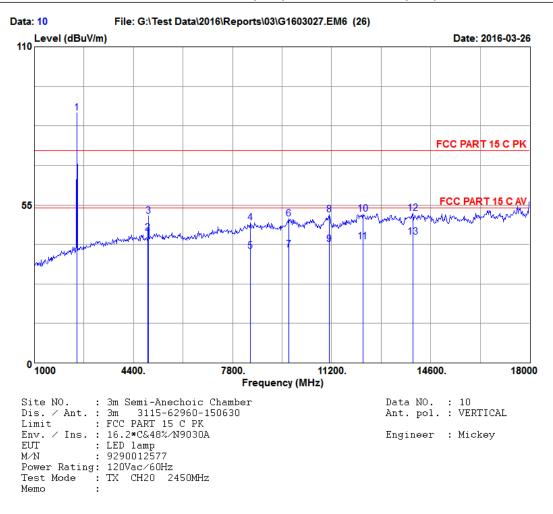
|     | Freq.<br>(MHz)     | Ant.<br>Factor<br>(dB) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Preamp<br>Factor<br>(dB) |                | on<br>Limits<br>(dBuV∕m)   | Margin<br>(dB) | Remark          |
|-----|--------------------|------------------------|-----------------------|-------------------|--------------------------|----------------|----------------------------|----------------|-----------------|
| 1   | 2407.00            | 28.49                  | 5.09<br>7.32          | 86.28<br>41.30    | 34.50<br>33.95           | 85.36<br>47.53 | 74.00                      | -11.36         | Peak            |
| 3   | 4801.00<br>4802.14 | 32.86<br>32.86         | 7.32                  | 41.30<br>35.30    | 33.95<br>33.95           | 47.53          | 74.00<br>54.00             | 26.47<br>12.47 | Peak<br>Average |
| 4   | 7699.00            | 36.88                  | 9.36                  | 35.29             | 34.08                    | 47.45          | 74.00                      | 26.55          | Peak            |
| 5   | 7701.18            | 36.88                  | 9.36                  | 21.90             | 34.08                    | 34.06          | 54.00                      | 19.94          | Average         |
| 6   | 8644.00            | 37.72                  | 9.85                  | 35.77             | 34.31                    | 49.03          | 74.00                      | 24.97          | Peak            |
| - 7 | 8645.18            | 37.72                  | 9.85                  | 21.80             | 34.31                    | 35.06          | 54.00                      | 18.94          | Average         |
| 8   | 10156.00           | 39.07                  | 10.93                 | 35.58             | 34.34                    | 51.24          | 74.00                      | 22.76          | Peak            |
| - 9 | 10157.18           | 39.07                  | 10.93                 | 20.89             | 34.34                    | 36.55          | 54.00                      | 17.45          | Average         |
| 10  | 11773.00           | 39.23                  | 11.47                 | 34.44             | 33.77                    | 51.37          | 74.00                      | 22.63          | Peak            |
| 11  | 11774.18           | 39.23                  | 11.48                 | 21.80             | 33.78                    | 38.73          | 54.00                      | 15.27          | Average         |
| 12  | 13096.00           | 40.15                  | 12.35                 | 32.16             | 32.39                    | 52.27          | 74.00                      | 21.73          | Peak            |
| 13  | 13097.18           | 40.15                  | 12.35                 | 22.60             | 32.39                    | 42.71          | 54.00                      | 11.29          | Average         |
|     | Remarks:           | 2. The e               | mission               |                   | hat are                  |                | oss + Readi<br>low the off |                | amp.Factor.     |





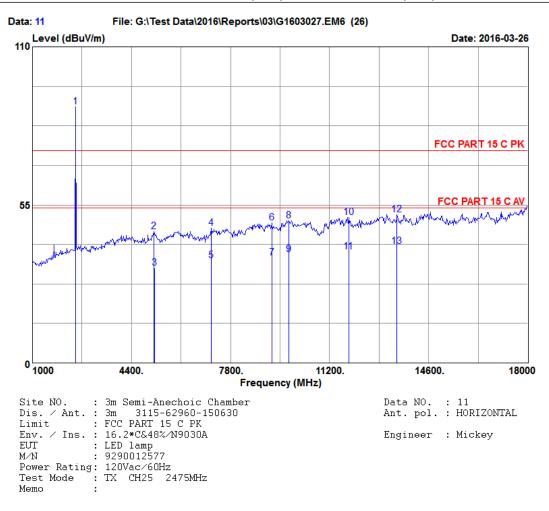
|    | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB) | Cable<br>Loss<br>(dB)                        | Reading<br>(dBuV) | Preamp<br>Factor<br>(dB) |       | on<br>Limits<br>(dBuV∕m)   | Margin<br>(dB) | Remark      |
|----|----------------|------------------------|----------------------------------------------|-------------------|--------------------------|-------|----------------------------|----------------|-------------|
| 1  | 2449.00        | 28.58                  | 5.15                                         | 88.91             | 34.50                    | 88.14 | 74.00                      | -14.14         | Peak        |
| 2  | 7321.00        | 36.39                  | 9.08                                         | 37.73             | 34.05                    | 49.15 | 74.00                      | 24.85          | Peak        |
| 3  | 7322.25        | 36.39                  | 9.08                                         | 23.24             | 34.05                    | 34.66 | 54.00                      | 19.34          | Average     |
| 4  | 8119.00        | 37.14                  | 9.63                                         | 37.17             | 34.14                    | 49.80 | 74.00                      | 24.20          | Peak        |
| 5  | 8120.25        | 37.14                  | 9.63                                         | 27.70             | 34.14                    | 40.33 | 54.00                      | 13.67          | Average     |
| 6  | 9253.00        | 38.05                  | 10.21                                        | 36.31             | 34.43                    | 50.14 | 74.00                      | 23.86          | Peak        |
| 7  | 9254.19        | 38.05                  | 10.21                                        | 26.80             | 34.43                    | 40.63 | 54.00                      | 13.37          | Average     |
| 8  | 10597.00       | 39.50                  | $\begin{array}{c} 11.14\\ 11.14 \end{array}$ | 34.04             | 33.98                    | 50.70 | 74.00                      | 23.30          | Peak        |
| 9  | 10598.18       | 39.50                  |                                              | 22.90             | 33.98                    | 39.56 | 54.00                      | 14.44          | Average     |
| 10 | 13726.00       | $41.61 \\ 41.61$       | 12.70                                        | 28.95             | 31.84                    | 51.42 | 74.00                      | 22.58          | Peak        |
| 11 | 13727.18       |                        | 12.70                                        | 16.91             | 31.84                    | 39.38 | 54.00                      | 14.62          | Average     |
| 12 | 14482.00       | 42.59                  | 13.01                                        | 29.65             | 32.28                    | 52.97 | 74.00                      | 21.03          | Peak        |
| 13 | 14483.16       | 42.59                  | 13.01                                        | 18.70             | 32.28                    | 42.02 | 54.00                      | 11.98          | Average     |
| 10 |                |                        |                                              |                   |                          |       |                            |                |             |
|    | Remarks:       | 2. The e               | mission                                      |                   | hat are                  |       | oss + Readi<br>low the off |                | amp.Factor. |





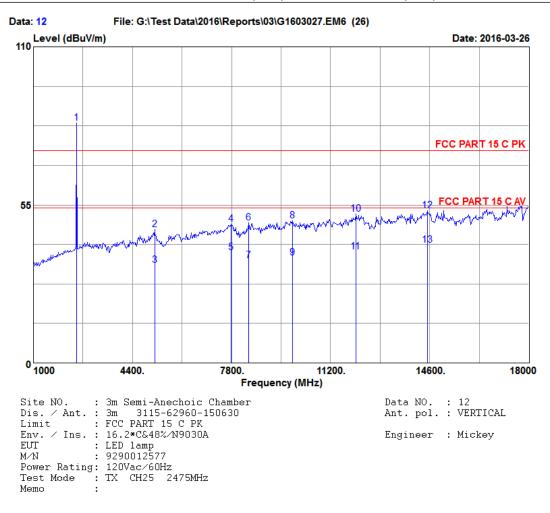
|     | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Preamp<br>Factor<br>(dB) |       | on<br>Limits<br>(dBuV∕m)   | Margin<br>(dB) | Remark      |
|-----|----------------|------------------------|-----------------------|-------------------|--------------------------|-------|----------------------------|----------------|-------------|
| 1   | 2449.00        | 28.58                  | 5.15                  | 87.79             | 34.50                    | 87.02 | 74.00                      | -13.02         | Peak        |
| 2   | 4900.84        | 33.01                  | 7.37                  | 38.80             | 33.94                    | 45.24 | 54.00                      | 8.76           | Average     |
| 3   | 4906.00        | 33.04                  | 7.37                  | 44.62             | 33.94                    | 51.09 | 74.00                      | 22.91          | Peak        |
| 4   | 8413.00        | 37.50                  | 9.75                  | 35.75             | 34.24                    | 48.76 | 74.00                      | 25.24          | Peak        |
| - 5 | 8414.25        | 37.50                  | 9.75                  | 25.90             | 34.24                    | 38.91 | 54.00                      | 15.09          | Average     |
| 6   | 9736.00        | 38.44                  | 10.63                 | 35.51             | 34.46                    | 50.12 | 74.00                      | 23.88          | Peak        |
| - 7 | 9737.25        | 38.44                  | 10.63                 | 24.90             | 34.46                    | 39.51 | 54.00                      | 14.49          | Average     |
| 8   | 11122.00       | 39.17                  | 11.36                 | 34.72             | 33.66                    | 51.59 | 74.00                      | 22.41          | Peak        |
| 9   | 11123.68       | 39.18                  | 11.36                 | 24.50             | 33.66                    | 41.38 | 54.00                      | 12.62          | Average     |
| 10  | 12277.00       | 38.93                  | 11.73                 | 34.60             | 33.44                    | 51.82 | 74.00                      | 22.18          | Peak        |
| 11  | 12278.18       | 38.93                  | 11.73                 | 24.91             | 33.44                    | 42.13 | 54.00                      | 11.87          | Average     |
| 12  | 13999.00       | 42.20                  | 12.85                 | 28.54             | 31.59                    | 52.00 | 74.00                      | 22.00          | Peak        |
| 13  | 14001.12       | 42.20                  | 12.85                 | 20.30             | 31.59                    | 43.76 | 54.00                      | 10.24          | Average     |
| 10  | 14001.12       | 72.20                  | 12.00                 | 20.30             | 51.57                    | 43.70 | 54.00                      | 10.24          | Average     |
|     | Remarks:       | 2. The e               | mission               |                   | that are                 |       | oss + Readi<br>low the off |                | amp.Factor. |





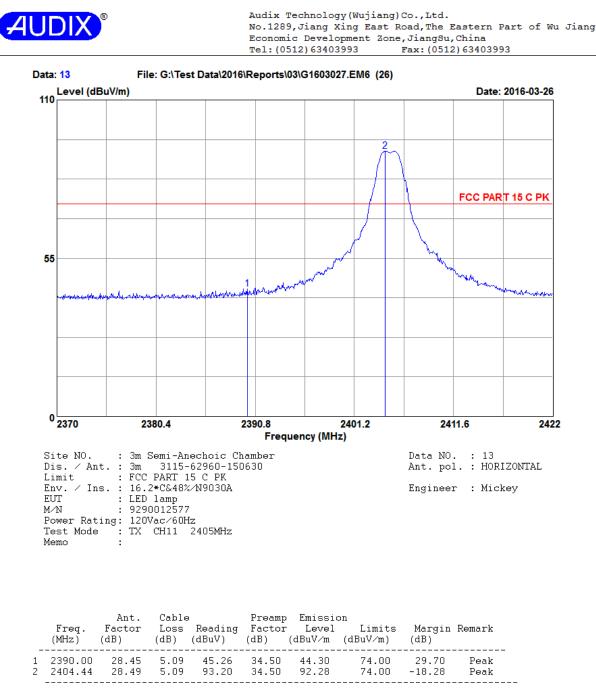
|     | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Preamp<br>Factor<br>(dB) |       | on<br>Limits<br>(dBuV∕m)   | Margin<br>(dB) | Remark      |
|-----|----------------|------------------------|-----------------------|-------------------|--------------------------|-------|----------------------------|----------------|-------------|
| 1   | 2470.00        | 28.62                  | 5.18                  | 89.75             | 34.49                    | 89.06 | 74.00                      | -15.06         | Peak        |
| 2   | 5179.00        | 33.49                  | 7.62                  | 38.54             | 33.91                    | 45.74 | 74.00                      | 28.26          | Peak        |
| 3   | 5180.19        | 33.49                  | 7.62                  | 25.90             | 33.91                    | 33.10 | 54.00                      | 20.90          | Average     |
| 4   | 7132.00        | 35.93                  | 8.93                  | 36.15             | 34.03                    | 46.98 | 74.00                      | 27.02          | Peak        |
| 5   | 7133.18        | 35.93                  | 8.94                  | 24.80             | 34.03                    | 35.64 | 54.00                      | 18.36          | Average     |
| 6   | 9211.00        | 38.04                  | 10.17                 | 35.00             | 34.43                    | 48.78 | 74.00                      | 25.22          | Peak        |
| 7   | 9212.18        | 38.04                  | 10.17                 | 22.90             | 34.43                    | 36.68 | 54.00                      | 17.32          | Average     |
| 8   | 9799.00        | 38.53                  | 10.67                 | 34.83             | 34.46                    | 49.57 | 74.00                      | 24.43          | Peak        |
| - 9 | 9801.19        | 38.53                  | 10.67                 | 23.11             | 34.46                    | 37.85 | 54.00                      | 16.15          | Average     |
| 10  | 11857.00       | 39.18                  | 11.49                 | 33.81             | 33.79                    | 50.69 | 74.00                      | 23.31          | Peak        |
| 11  | 11858.18       | 39.18                  | 11.49                 | 21.90             | 33.79                    | 38.78 | 54.00                      | 15.22          | Average     |
| 12  | 13516.00       | 41.14                  | 12.59                 | 29.89             | 32.01                    | 51.61 | 74.00                      | 22.39          | Peak        |
| 13  | 13517.18       | 41.14                  | 12.59                 | 18.89             | 32.01                    | 40.61 | 54.00                      | 13.39          | Average     |
|     | Remarks:       | 2. The e               | mission               |                   | hat are                  |       | oss + Readi<br>low the off | 0              | amp.Factor. |



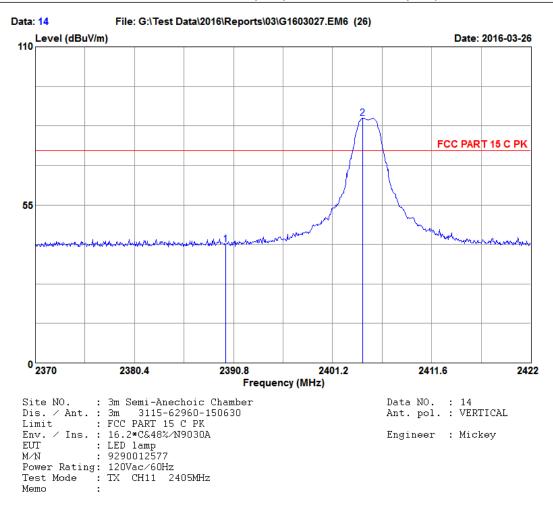


|        | Freq.<br>(MHz)                                                                                                                            | Ant.<br>Factor<br>(dB) | Cable<br>Loss<br>(dB) | Reading<br>(dBuV) | Preamp<br>Factor<br>(dB) |                | on<br>Limits<br>(dBuV∕m) | Margin<br>(dB) | Remark       |  |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-----------------------|-------------------|--------------------------|----------------|--------------------------|----------------|--------------|--|
| 1<br>2 | 2470.00<br>5158.00                                                                                                                        | 28.62<br>33.47         | 5.18                  | 84.10<br>39.38    | 34.49<br>33.92           | 83.41<br>46.52 | 74.00<br>74.00           | -9.41<br>27.48 | Peak<br>Peak |  |
| - 3    | 5150.00                                                                                                                                   | 33.47                  | 7.59                  | 26.91             | 33.92                    | 40.52<br>34.05 | 74.00<br>54.00           | 27.40          | Average      |  |
| 4      | 7783.00                                                                                                                                   | 36.91                  | 9.42                  | 35.97             | 34.09                    | 48.21          | 74.00                    | 25.79          | Peak         |  |
| 5      | 7784.28                                                                                                                                   | 36.91                  | 9.42                  | 26.20             | 34.09                    | 38.44          | 54.00                    | 15.56          | Average      |  |
| 6      | 8392.00                                                                                                                                   | 37.48                  | 9.74                  | 35.74             | 34.23                    | 48.73          | 74.00                    | 25.27          | Peak         |  |
| - 7    | 8393.15                                                                                                                                   | 37.48                  | 9.74                  | 22.60             | 34.23                    | 35.59          | 54.00                    | 18.41          | Average      |  |
| 8      | 9883.00                                                                                                                                   | 38.66                  | 10.74                 | 34.62             | 34.46                    | 49.56          | 74.00                    | 24.44          | Peak         |  |
| - 9    | 9884.18                                                                                                                                   | 38.66                  | 10.74                 | 21.69             | 34.46                    | 36.63          | 54.00                    | 17.37          | Average      |  |
| 10     | 12067.00                                                                                                                                  | 39.06                  | 11.57                 | 35.02             | 33.71                    | 51.94          | 74.00                    | 22.06          | Peak         |  |
| 11     | 12068.14                                                                                                                                  | 39.06                  | 11.57                 | 21.70             | 33.71                    | 38.62          | 54.00                    | 15.38          | Average      |  |
| 12     | 14524.00                                                                                                                                  | 42.49                  | 13.01                 | 29.87             | 32.31                    | 53.06          | 74.00                    | 20.94          | Peak         |  |
| 13     | 14525.15                                                                                                                                  | 42.49                  | 13.01                 | 17.80             | 32.31                    | 40.99          | 54.00                    | 13.01          | Average      |  |
|        | Remarks: 1. Emission Level= Ant.Factor + Cable Loss + Reading - Preamp.Factor.<br>2. The emission levels that are 20dB below the official |                        |                       |                   |                          |                |                          |                |              |  |

#### 4.8. Spurious Emission Measurement Results in Band Edge Emission (FCC Part 15, 15.205)

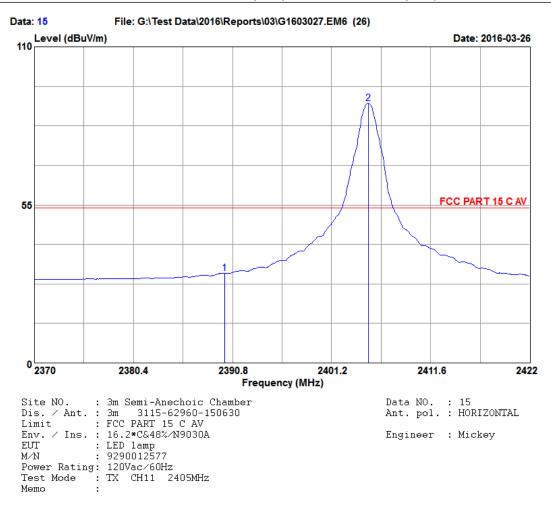






|   | Freq.<br>(MHz)     | Ant.<br>Factor<br>(dB) |              | Reading        | Factor         | Emissic<br>Level<br>(dBuV/m | Limits | Margin<br>(dB)  | Remark       |
|---|--------------------|------------------------|--------------|----------------|----------------|-----------------------------|--------|-----------------|--------------|
| - | 2390.00<br>2404.38 | 28.45<br>28.49         | 5.09<br>5.09 | 42.36<br>86.09 | 34.50<br>34.50 | 41.40<br>85.17              |        | 32.60<br>-11.17 | Peak<br>Peak |





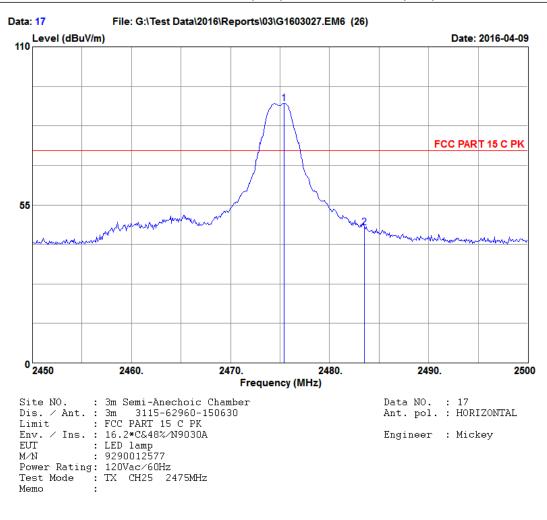
|   | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB) | Cable<br>Loss<br>(dB) |       | Factor |       | on<br>Limits<br>(dBuV∕m) | Margin<br>(dB) | Remark  |
|---|----------------|------------------------|-----------------------|-------|--------|-------|--------------------------|----------------|---------|
| 1 | 2390.00        | 28.45                  | 5.09                  | 32.22 | 34.50  | 31.26 | 54.00                    | 22.74          | Average |
| 2 | 2405.04        | 28.49                  | 5.09                  | 91.35 | 34.50  | 90.43 | 54.00                    | -36.43         | Average |





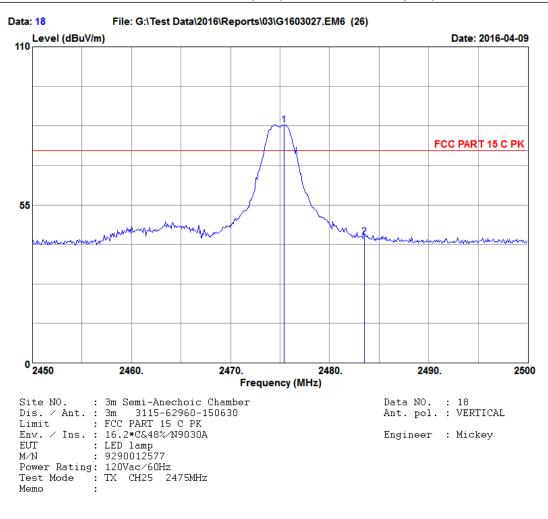
|   | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB) | Cable<br>Loss<br>(dB) |       | Factor |       | on<br>Limits<br>(dBuV∕m) | Margin<br>(dB) | Remark  |
|---|----------------|------------------------|-----------------------|-------|--------|-------|--------------------------|----------------|---------|
| _ | 2390.00        | 28.45                  | 5.09                  | 30.45 | 34.50  | 29.49 | 54.00                    | 24.51          | Average |
|   | 2405.04        | 28.49                  | 5.09                  | 83.78 | 34.50  | 82.86 | 54.00                    | -28.86         | Average |





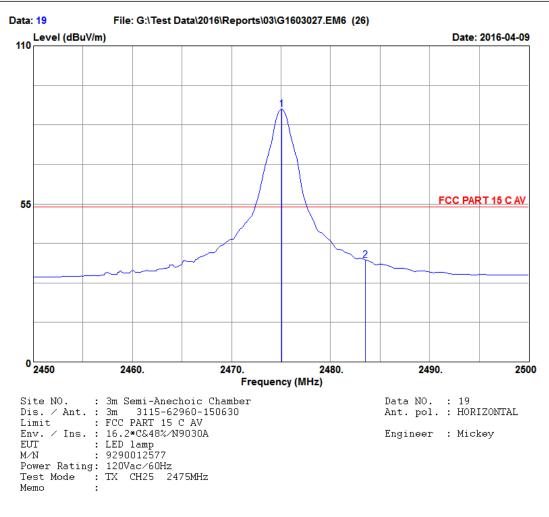
|   | Freq.<br>(MHz)     |      | Reading        | Factor |                | on<br>Limits<br>(dBuV∕m) |                 | Remark               |
|---|--------------------|------|----------------|--------|----------------|--------------------------|-----------------|----------------------|
| - | 2475.41<br>2483.50 | <br> | 90.96<br>47.88 |        | 90.31<br>47.23 |                          | -16.31<br>26.77 | Peak<br>Peak<br>Peak |





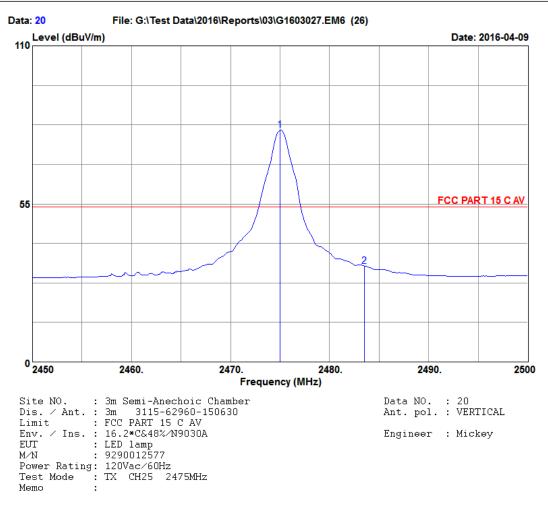
|   | Freq.<br>(MHz)     | Loss             | Reading        | Factor         |                | on<br>Limits<br>(dBuV∕m) | Margin<br>(dB) | Remark       |
|---|--------------------|------------------|----------------|----------------|----------------|--------------------------|----------------|--------------|
| _ | 2475.41<br>2483.50 | <br>5.18<br>5.18 | 83.53<br>44.47 | 34.49<br>34.49 | 82.88<br>43.82 | 74.00<br>74.00           | -8.88<br>30.18 | Peak<br>Peak |





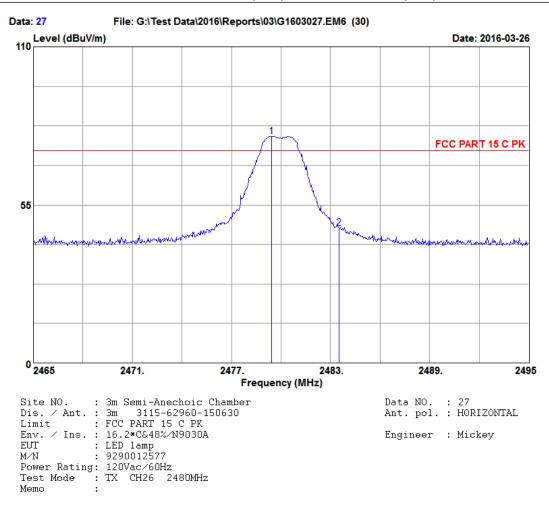
|   | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB) |      |       | Factor | Emissic<br>Level<br>(dBuV/m | Limits | Margin<br>(dB) | Remark  |
|---|----------------|------------------------|------|-------|--------|-----------------------------|--------|----------------|---------|
| 1 | 2475.06        | 28.66                  | 5.18 | 88.57 | 34.49  | 87.92                       | 54.00  | -33.92         | Average |
| 2 | 2483.50        | 28.66                  | 5.18 | 36.16 | 34.49  | 35.51                       | 54.00  | 18.49          | Average |





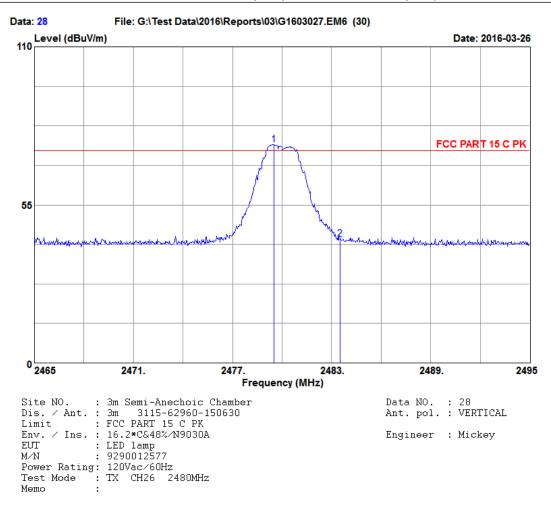
|   | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB) |      | e<br>Reading<br>(dBuV) | Factor | Emissic<br>Level<br>(dBuV/m | Limits | Margin<br>(dB) | Remark  |
|---|----------------|------------------------|------|------------------------|--------|-----------------------------|--------|----------------|---------|
| _ | 2474.99        | 28.66                  | 5.18 | 81.26                  | 34.49  | 80.61                       | 54.00  | -26.61         | Average |
|   | 2483.50        | 28.66                  | 5.18 | 34.06                  | 34.49  | 33.41                       | 54.00  | 20.59          | Average |





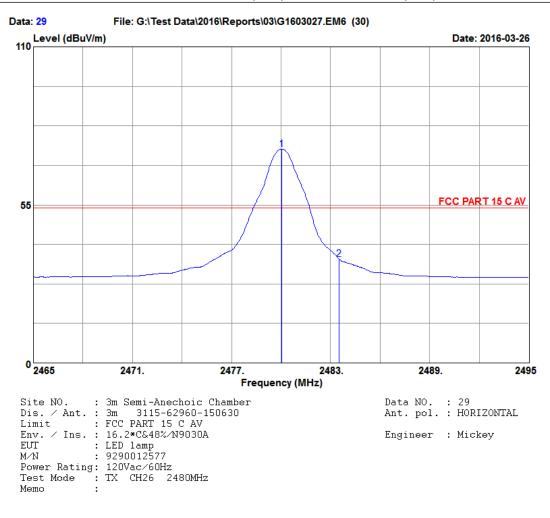
|   | Freq.<br>(MHz)     |                | Reading            | Factor         |                | on<br>Limits<br>(dBuV∕m) |                | Remark       |
|---|--------------------|----------------|--------------------|----------------|----------------|--------------------------|----------------|--------------|
| - | 2479.42<br>2483.50 | 28.66<br>28.66 | <br>79.56<br>47.63 | 34.49<br>34.49 | 78.91<br>46.98 | 74.00<br>74.00           | -4.91<br>27.02 | Peak<br>Peak |





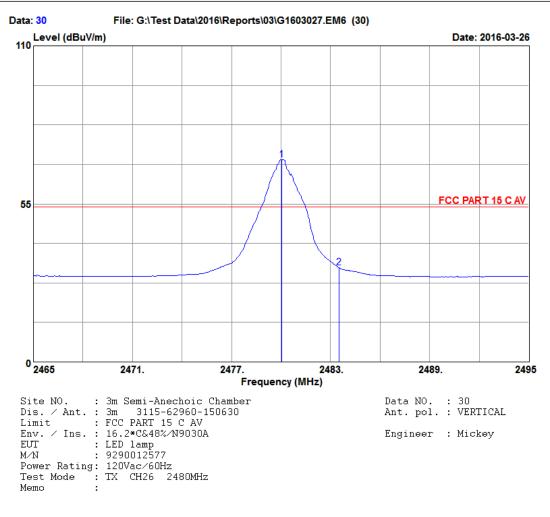
|   | Freq.<br>(MHz)     | Ant.<br>Factor<br>(dB) | Loss         | Reading        | Factor         |                | on<br>Limits<br>(dBuV∕m) | Margin<br>(dB) | Remark               |
|---|--------------------|------------------------|--------------|----------------|----------------|----------------|--------------------------|----------------|----------------------|
| _ | 2479.49<br>2483.50 | 28.66<br>28.66         | 5.18<br>5.18 | 76.71<br>43.90 | 34.49<br>34.49 | 76.06<br>43.25 | 74.00<br>74.00           | -2.06<br>30.75 | Peak<br>Peak<br>Peak |





|   | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB) |      | Reading<br>(dBuV) | Factor | Emissic<br>Level<br>(dBuV/m | Limits | Margin<br>(dB) | Remark  |
|---|----------------|------------------------|------|-------------------|--------|-----------------------------|--------|----------------|---------|
| - | 2480.05        | 28.66                  | 5.18 | 75.08             | 34.49  | 74.43                       | 54.00  | -20.43         | Average |
|   | 2483.50        | 28.66                  | 5.18 | 36.79             | 34.49  | 36.14                       | 54.00  | 17.86          | Average |





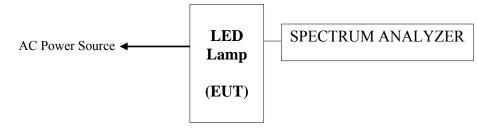
|   | Freq.<br>(MHz) | Ant.<br>Factor<br>(dB) |      |       | Factor |       | on<br>Limits<br>(dBuV∕m) | Margin<br>(dB) | Remark  |
|---|----------------|------------------------|------|-------|--------|-------|--------------------------|----------------|---------|
| _ | 2480.05        | 28.66                  | 5.18 | 71.05 | 34.49  | 70.40 | 54.00                    | -16.40         | Average |
|   | 2483.50        | 28.66                  | 5.18 | 33.41 | 34.49  | 32.76 | 54.00                    | 21.24          | Average |

# 5. 6 dB BANDWIDTH MEASUREMENT

### 5.1. Test Equipment

| Item | Туре                   | Manufacturer | Model No. | Serial No. | Last Cal.  | Next Cal.  |
|------|------------------------|--------------|-----------|------------|------------|------------|
| 1.   | PXA Signal<br>Analyzer | Agilent      | N9030A    | MY53120367 | 2015-06-23 | 2016-06-22 |

5.2. Block Diagram of Test Setup



5.3. Specification Limits (\$15.247(a)(2))

Systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500kHz.

5.4. Test Procedure

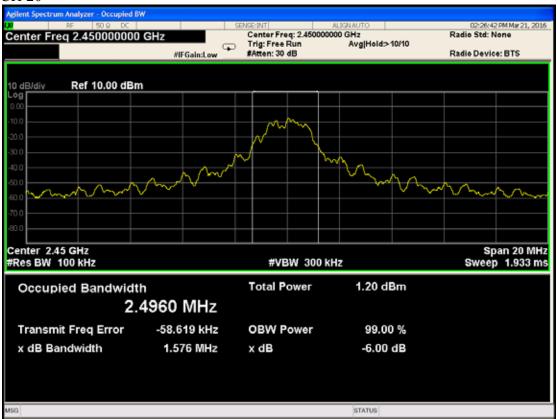
The transmitter output was connected to the test receiver / spectrum analyzer. The bandwidth of the fundamental frequency was measure by spectrum analyzer. The 6 dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6 dB. The measurement guideline was according to KDB558074 v03r05.

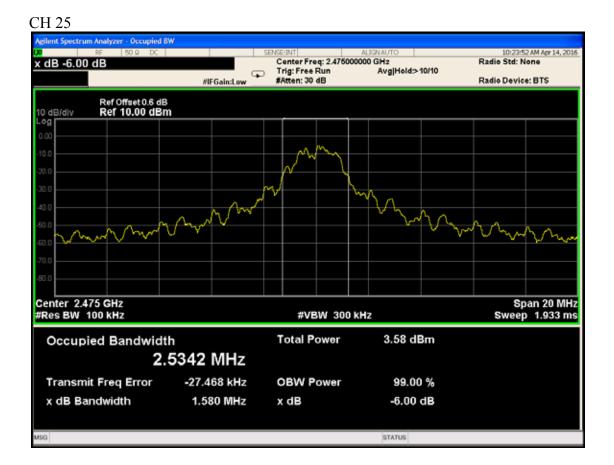
### 5.5. Test Results

| Channel | Center Frequency(MHz) | 6 dB Bandwidth(MHz) |
|---------|-----------------------|---------------------|
| 11      | 2405                  | 1.525               |
| 20      | 2450                  | 1.576               |
| 25      | 2475                  | 1.580               |

**PASSED.** All the test results are attached in next pages.





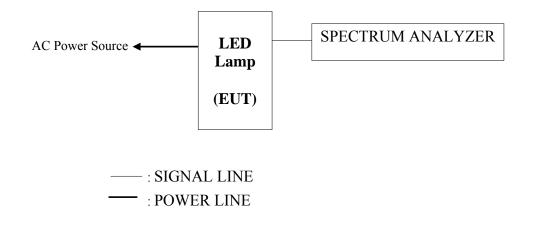


## 6. OUTPUT POWER MEASUREMENT

#### 6.1. Test Equipment

| Item | Туре                   | Manufacturer | Model No. | Serial No. | Last Cal.  | Next Cal.  |
|------|------------------------|--------------|-----------|------------|------------|------------|
| 1.   | PXA Signal<br>Analyzer | Agilent      | N9030A    | MY53120367 | 2015-06-23 | 2016-06-22 |

#### 6.2. Block Diagram of Test Setup



### 6.3. Specification Limits (§15.247(b)(3))

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

#### 6.4. Test Procedure

- a) Set span to at least 1.5 times the OBW.
- b) Set RBW = 1-5% of the OBW, not to exceed 1 MHz.
- c) Set VBW  $\geq$  3 x RBW.
- d) Number of points in sweep  $\geq 2 \times \text{span} / \text{RBW}$ . (This gives bin-to-bin spacing  $\leq \text{RBW}/2$ , so that narrowband signals are not lost between frequency bins.)
- e) Sweep time = auto.
- f) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
- g) If transmit duty cycle < 98 %, use a sweep trigger with the level set to enable triggering only on full power pulses. The transmitter shall operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle  $\ge$  98 %, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to "free run".
- h) Trace average at least 100 traces in power averaging (i.e., RMS) mode.
- i) Compute power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function, with band limits set equal to the OBW band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.

### 6.5. Test Results

**PASSED.** All the test results are attached in next pages.

| Channel | Frequency | Power(dBm) | Limit(dBm |
|---------|-----------|------------|-----------|
| 11      | 2405      | 3.19       | 30        |
| 20      | 2450      | 2.35       | 30        |
| 25      | 2475      | 2.98       | 30        |
| 26      | 2480      | -7.65      | 30        |

## 7. BAND EDGES MEASUREMENT

#### 7.1. Test Equipment

| Item | Туре                   | Manufacturer | Model No. | Serial No. | Last Cal.  | Next Cal.  |
|------|------------------------|--------------|-----------|------------|------------|------------|
| 1.   | PXA Signal<br>Analyzer | Agilent      | N9030A    | MY53120367 | 2015-06-23 | 2016-06-22 |

#### 7.2. Block Diagram of Test Setup

The same as section 5.2.

#### 7.3. Specification Limits (§15.247(d))

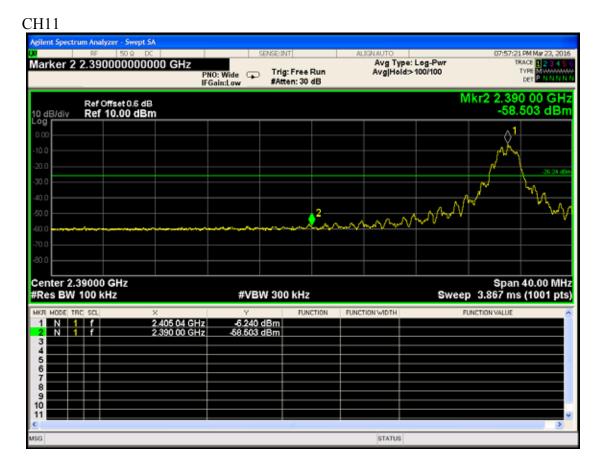
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

7.4. Test Procedure

The transmitter output was connected to the test receiver / spectrum analyzer. Set RBW of spectrum analyzer to 100kHz and VBW to 300kHz with suitable frequency span including 100kHz bandwidth from band edge.

7.5. Test Results

**PASSED.** The testing data was attached in the next pages.





## 8. POWER SPECTRAL DENSITY MEASUREMENT

## 8.1. Test Equipment

| Item | Туре                   | Manufacturer | Model No. | Serial No. | Last Cal.  | Next Cal.  |
|------|------------------------|--------------|-----------|------------|------------|------------|
| 1.   | PXA Signal<br>Analyzer | Agilent      | N9030A    | MY53120367 | 2015-06-23 | 2016-06-22 |

8.2. Block Diagram of Test Setup

The same as section 5.2.

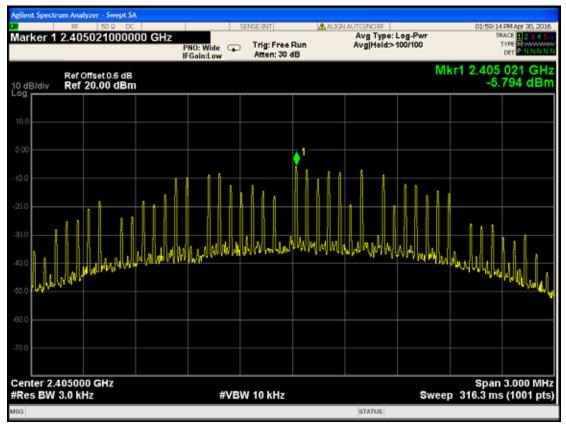
8.3. Specification Limits (§15.247(e))

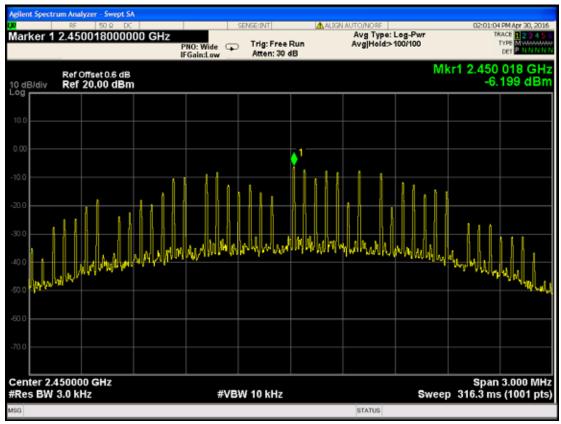
For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

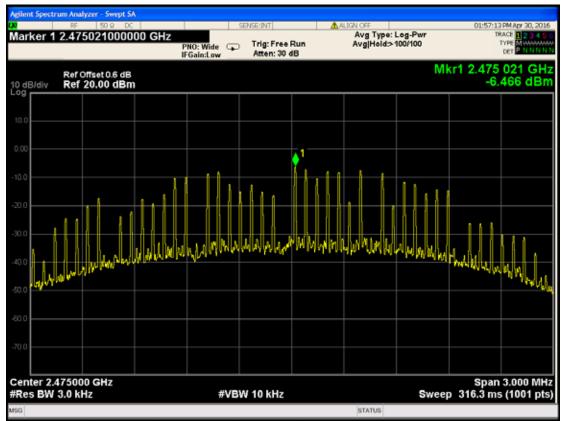
#### 8.4. Test Results

**PASSED.** All the test results are attached in next page.

| Channel | Frequency(GHz) | Value(dBm/3kHz) |  |  |  |  |
|---------|----------------|-----------------|--|--|--|--|
| 11      | 2.405          | -5.794          |  |  |  |  |
| 20      | 2.450          | -6.199          |  |  |  |  |
| 25      | 2.475          | -6.466          |  |  |  |  |







## 9. EMISSION LIMITATIONS MEASUREMENT

### 9.1. Test Equipment

| Item | Туре                   | Manufacturer | Model No. | Serial No. | Last Cal.  | Next Cal.  |
|------|------------------------|--------------|-----------|------------|------------|------------|
| 1.   | PXA Signal<br>Analyzer | Agilent      | N9030A    | MY53120367 | 2015-06-23 | 2016-06-22 |

9.2. Block Diagram of Test Setup

The same as section 5.2.

### 9.3. Specification Limits (§15.247(d))

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

9.4. Test Procedure

The transmitter output was connected to the spectrum analyzer. Set RBW = 100kHz, VBW  $\ge 300$  kHz, scan up through 10th harmonic. All harmonics/spurs must be at least 30 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW. The measurement guideline was according to KDB558074 v03r05.

## 9.5. Test Results

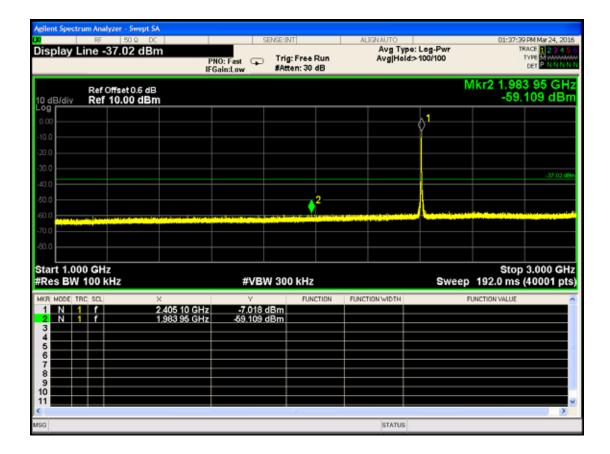
| Channel | Frequency(MHz) | Amplitude(dBm) |  |  |
|---------|----------------|----------------|--|--|
|         | 959.84         | -50.308        |  |  |
|         | 327.31         | -62.613        |  |  |
|         | 2405.10        | -7.018         |  |  |
|         | 1983.95        | -59.109        |  |  |
|         | 3709.20        | -55.169        |  |  |
|         | 4629.75        | -55.807        |  |  |
|         | 5150.10        | -54.823        |  |  |
|         | 5954.65        | -55.132        |  |  |
|         | 7257.45        | -56.184        |  |  |
|         | 7976.55        | -56.397        |  |  |
|         | 10801.40       | -55.928        |  |  |
|         | 9311.25        | -55.983        |  |  |
| 11      | 11894.75       | -55.834        |  |  |
| 11      | 12111.70       | -55.907        |  |  |
|         | 14145.25       | -54.801        |  |  |
|         | 13627.85       | -55.310        |  |  |
|         | 1545.55        | -56.044        |  |  |
|         | 15801.35       | -56.104        |  |  |
|         | 18766.00       | -53.870        |  |  |
|         | 18003.70       | -54.976        |  |  |
|         | 19182.80       | -53.026        |  |  |
|         | 20367.50       | -55.143        |  |  |
|         | 22367.10       | -52.612        |  |  |
|         | 21121.30       | -54.839        |  |  |
|         | 23675.70       | -52.358        |  |  |
|         | 24209.80       | -52.588        |  |  |
|         | 950.48         | -54.025        |  |  |
|         | 422.07         | -61.859        |  |  |
| 20      | 2450.05        | -7.966         |  |  |
| 20      | 1727.60        | -55.178        |  |  |
|         | 3755.10        | -54.355        |  |  |
|         | 4262.60        | -56.206        |  |  |

**PASSED.** All the test results are attached in next pages.

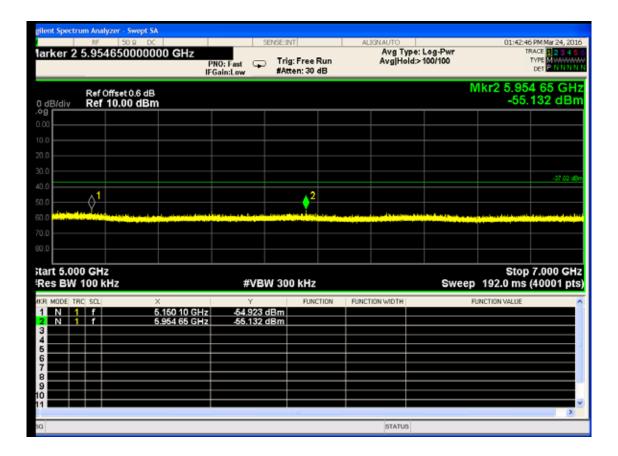
|    | 5097.90  | -56.065 |
|----|----------|---------|
|    | 6353.15  | -56.457 |
|    | 7348.35  | -55.180 |
|    | 8810.20  | -57.110 |
|    | 9785.35  | -56.406 |
|    | 10617.60 | -56.552 |
|    | 11228.60 | -55.792 |
|    | 11957.80 | -56.350 |
|    | 14851.70 | -55.440 |
|    | 14370.65 | -55.622 |
|    | 16468.15 | -55.366 |
|    | 15448.50 | -55.899 |
|    | 18471.90 | -54.105 |
|    | 17705.85 | -55.073 |
|    | 19064.35 | -52.697 |
|    | 19646.45 | -53.639 |
|    | 22070.45 | -52.310 |
|    | 22844.80 | -52.688 |
|    | 23824.75 | -52.770 |
|    | 24125.40 | -52.975 |
|    | 955.623  | -48.358 |
|    | 516.12   | -63.141 |
|    | 2475.10  | -5.871  |
|    | 1936.65  | -58.777 |
|    | 3824.35  | -54.262 |
|    | 4975.85  | -56.349 |
|    | 5053.75  | -55.053 |
|    | 6949.70  | -56.015 |
| 25 | 8917.20  | -55.210 |
|    | 7423.25  | -55.980 |
|    | 10609.65 | -55.653 |
|    | 9773.95  | -56.100 |
|    | 12359.65 | -56.235 |
|    | 11584.70 | -56.456 |
|    | 14370.55 | -55.231 |
|    | 13163.95 | -57.050 |
|    | 15441.95 | -55.790 |
|    |          |         |

| 16286.25 | -56.094 |
|----------|---------|
| 18500.30 | -54.708 |
| 17902.40 | -56.019 |
| 19338.15 | -53.966 |
| 20099.70 | -54.783 |
| 22003.15 | -52.981 |
| 22615.05 | -53.074 |
| 24985.40 | -52.015 |
| 23516.10 | -52.782 |
|          |         |

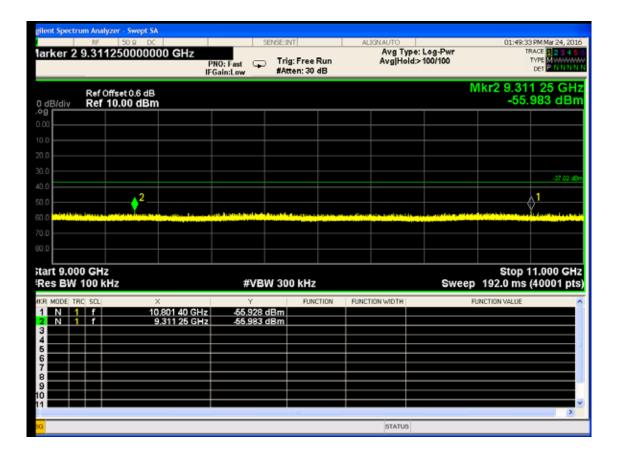
|          |              | er - Swept SA<br>50 Ω DC                  |                | SEF           | NSE:INT                   |                  | ALIGN AUT    | 0                  |                     | 04:40:1             | 9 PM Mar 24, 20                     |
|----------|--------------|-------------------------------------------|----------------|---------------|---------------------------|------------------|--------------|--------------------|---------------------|---------------------|-------------------------------------|
| arker 2  | 327.30       | 05000000 MHz                              | PNO:<br>IFGair | Fast 😱        | Trig: Free<br>#Atten: 30  |                  | Avg<br>Avg   | Type:L<br> Hold>10 | og-Pwr<br>00/100    | т                   | RACE 234<br>TYPE MUMMUM<br>DET PNNN |
| dB/div   |              | fset 0.6 dB<br>0.00 dBm                   |                |               |                           |                  |              |                    |                     | Mkr2 32<br>-62      | 7.31 MH<br>613 dB                   |
|          |              |                                           |                |               |                           |                  |              |                    |                     |                     |                                     |
| .00      |              |                                           |                |               |                           |                  |              |                    |                     |                     |                                     |
| 0.0      |              |                                           |                |               |                           |                  |              |                    |                     |                     |                                     |
| 1.0      |              |                                           |                |               |                           |                  |              |                    |                     |                     |                                     |
| ).0      |              |                                           |                |               |                           |                  |              |                    |                     |                     | -37.02 (                            |
| 0.0      |              |                                           |                |               |                           |                  |              |                    |                     |                     | 0                                   |
| ).0      |              |                                           | _2             |               |                           |                  |              |                    |                     |                     | l li                                |
|          | and a second | te la la de la la companya de carbonal de | ater dan       | dinduda filma | inte de la classica de la | <b>Result</b> er |              | a heine eine       | <u>diturnetinte</u> | alter automotion de | dan sekiling                        |
|          |              |                                           |                |               |                           |                  |              |                    |                     |                     |                                     |
|          |              |                                           |                |               |                           |                  |              |                    |                     |                     |                                     |
| art 30.0 |              | _                                         |                | 40 (B) (4)    | 000 1411-                 |                  |              |                    | •                   | Stop                | 1.0000 GI                           |
|          | 100 kH       |                                           |                |               | 300 kHz                   |                  |              |                    |                     | 93.33 ms            | (20001 p                            |
| I NODE T | RC SCL       | ×<br>959.84 N                             | Hz             |               |                           | CTION            | FUNCTION WIE | TH                 | F                   | UNCTION VALUE       |                                     |
| 2 N 1    | Î Î          | 327.31 N                                  |                | -62.613 dl    | Bm                        |                  |              |                    |                     |                     |                                     |
|          |              |                                           |                |               |                           |                  |              |                    |                     |                     |                                     |
| 5        |              |                                           |                |               |                           |                  |              |                    |                     |                     |                                     |
| 7        |              |                                           |                |               |                           |                  |              |                    |                     |                     |                                     |
|          |              |                                           |                |               |                           |                  |              |                    |                     |                     |                                     |
|          |              |                                           |                |               |                           |                  |              |                    |                     |                     |                                     |



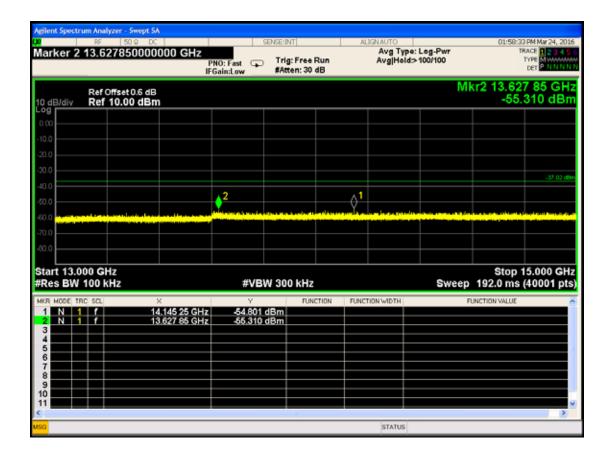
| rker 2           |                  | 50 0 DC<br>50000000 GH | Z<br>PNO: Fast<br>IFGain:Low |              | g: Free Run<br>tten: 30 dB | ALK      | Avg Type: L<br>Avg Hold>1 |       | П                 | LPM Mar 24, 2<br>RACE |
|------------------|------------------|------------------------|------------------------------|--------------|----------------------------|----------|---------------------------|-------|-------------------|-----------------------|
| B/div            |                  | set 0.6 dB<br>0.00 dBm |                              |              |                            |          |                           | N     | lkr2 4.62<br>-55. | 9 75 G<br>807 dE      |
|                  |                  |                        |                              |              |                            |          |                           |       |                   |                       |
|                  |                  |                        |                              |              |                            |          |                           |       |                   |                       |
|                  |                  |                        |                              |              |                            |          |                           |       |                   | -37.02                |
| 0                |                  |                        |                              | 1            | -                          |          |                           |       | ¢ <sup>2</sup>    |                       |
|                  |                  |                        |                              |              |                            |          |                           |       |                   |                       |
| -                |                  |                        |                              |              |                            |          |                           |       |                   |                       |
| rt 3.00<br>es BW | 0 GHz<br>100 kHz | 2                      |                              | #VBW 30      | 0 kHz                      |          |                           | Sweep | Stop<br>192.0 ms  | 5.000 G<br>(40001 p   |
| MODE TF          | RC SCL           | ×<br>3,709.2           | 0 GHz -55                    | ⊻<br>169 dBm | FUNCTION                   | FUNCTION | ON WIDTH                  | FL    | NCTION VALUE      |                       |
| N 1              | 1                | 4.629 71               | 5 GHz -55                    | .807 dBm     |                            |          |                           |       |                   |                       |
|                  |                  |                        |                              |              |                            |          |                           |       |                   |                       |
|                  |                  |                        |                              |              |                            |          |                           |       |                   |                       |
|                  | +                |                        |                              |              |                            |          |                           |       |                   |                       |
|                  |                  |                        |                              |              |                            |          |                           |       |                   |                       |



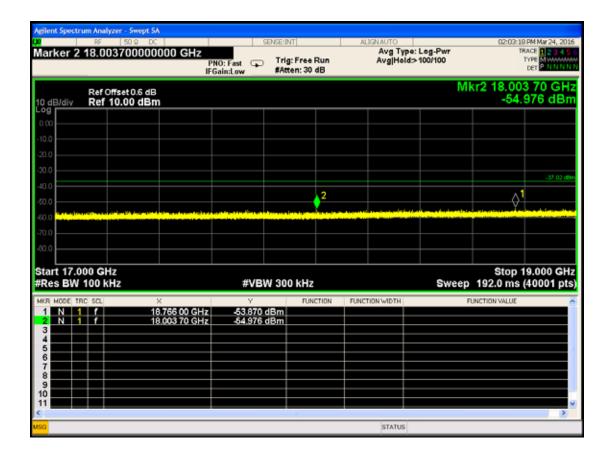
|                    | rum Ana | lyzer - Swept SA           |                                   |                    |                          |      |                                  |                         |                      |                                                                  |
|--------------------|---------|----------------------------|-----------------------------------|--------------------|--------------------------|------|----------------------------------|-------------------------|----------------------|------------------------------------------------------------------|
| arker 2            | 27.97   | 50 g DC<br>65500000        | 00 GHz                            | NO: Fast Gain:Low  | Trig: Free<br>#Atten: 30 |      | ALIGNAUTO<br>Avg Typ<br>Avg Hole | be:Log-Pwr<br>d>100/100 |                      | 7 PM Mar 24, 20:<br>RACE 2 3 4 1<br>TYPE MUNICIPAL OFT P N N N 1 |
| dB/div             |         | Offset 0.6 dB<br>10.00 dBn |                                   |                    |                          |      |                                  | N                       | /kr2 7.97<br>-56.    | 6 55 GH<br>397 dBi                                               |
| 00<br>00           |         |                            |                                   |                    |                          |      | _                                |                         |                      |                                                                  |
| .0                 |         |                            |                                   |                    |                          |      |                                  |                         |                      |                                                                  |
| 0                  |         |                            |                                   |                    |                          |      |                                  |                         |                      |                                                                  |
| 0                  |         |                            |                                   |                    |                          |      |                                  |                         |                      | -37.02 d                                                         |
| .0                 |         | -0 <sup>1</sup>            |                                   |                    |                          | 2    |                                  |                         |                      |                                                                  |
| .0                 |         | a Maining and An Andrews   |                                   | na kinda kain a    |                          |      |                                  |                         | elinensi (den jai) d |                                                                  |
| .0                 |         |                            |                                   |                    |                          |      |                                  |                         |                      |                                                                  |
| art 7.00<br>les BW |         |                            |                                   | #VB                | W 300 kHz                |      |                                  | Sweep                   | Stop<br>192.0 ms     | 9.000 GH                                                         |
| <b>CO D</b> 11     | 1001    |                            |                                   |                    |                          |      |                                  | oncep                   | 192101113            | (10001 p)                                                        |
| R MODE T           | RC SCL  | 1                          | ×                                 | Y                  |                          | TION | FUNCTION WIDTH                   | F                       | UNCTION VALUE        |                                                                  |
| N<br>N             | RC SCL  |                            | ×<br>7.257 45 GHz<br>7.976 55 GHz | -56.184<br>-56.397 | dBm                      | TION | FUNCTION WIDTH                   | F                       | UNCTION VALUE        |                                                                  |
| ZZ                 | RC SCL  |                            | 7.257 45 GHz                      | -56.184            | dBm                      | TION | FUNCTION WIDTH                   | P                       | UNCTION VALUE        |                                                                  |
| N                  | RC SOL  |                            | 7.257 45 GHz                      | -56.184            | dBm                      | TION | FUNCTION WIDTH                   | R                       | UNCTION VALUE        |                                                                  |
| N 1                | RC SCL  |                            | 7.257 45 GHz                      | -56.184            | dBm                      |      | FUNCTION WIDTH                   | F                       | UNCTION VALUE        |                                                                  |
|                    | RC SCL  |                            | 7.257 45 GHz                      | -56.184            | dBm                      |      | FUNCTION WIDTH                   | F                       | UNCTION VALUE        |                                                                  |



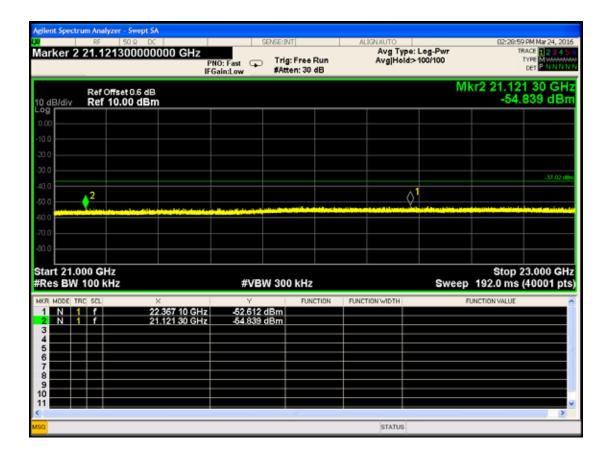
|                     |                            | DC                               |                          | ENSE:INT                   | A         | JGN AUTO                  |                    |                    | PM Mar 24, 20           |
|---------------------|----------------------------|----------------------------------|--------------------------|----------------------------|-----------|---------------------------|--------------------|--------------------|-------------------------|
| arker 2             | 12.111700                  | 000000 GHz                       | PNO: Fast 😱<br>FGain:Low | Trig: Free i<br>#Atten: 30 |           | Avg Type: I<br>Avg Hold>1 | Log-Pwr<br>100/100 |                    | TYPE MORAN<br>DET P NNN |
| dB/div              | Ref Offset 0.<br>Ref 10.00 |                                  |                          |                            |           |                           | MI                 | (r2 12.11<br>-55.  | 1 70 GH<br>907 dB       |
| a<br>               |                            |                                  |                          |                            |           |                           |                    |                    |                         |
|                     |                            |                                  |                          |                            |           |                           |                    |                    |                         |
|                     |                            |                                  |                          |                            |           |                           |                    |                    |                         |
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| .0                  |                            |                                  |                          |                            | <b>2</b>  |                           |                    |                    |                         |
|                     | and the second second      | and the first state of the state |                          |                            |           | the subscription of       | a for the second   |                    |                         |
|                     |                            |                                  |                          |                            |           |                           |                    |                    |                         |
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|                     |                            |                                  |                          |                            |           |                           |                    |                    |                         |
| art 11.00<br>Res BW |                            |                                  | #VB                      | W 300 kHz                  |           |                           | Sweep              | Stop 1<br>192.0 ms | (40001 pi               |
| R HODE TRI          | C SCL                      | ×                                | Y                        |                            | TION FUNC | TION WIDTH                | P                  | UNCTION VALUE      |                         |
| N 1                 | f                          | 11.894 75 GHz<br>12.111 70 GHz   | -55.834<br>-55.907       |                            |           |                           |                    |                    |                         |
|                     |                            |                                  |                          |                            |           |                           |                    |                    |                         |
|                     |                            |                                  |                          |                            |           |                           |                    |                    |                         |
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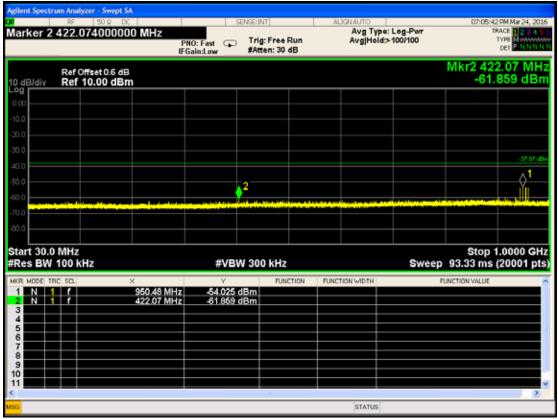
|           |                       | 50 Q DC                 |                                            | SENSE:INT             |                 | ALIGN AUT    |                              |           | 02:01:12 PM Mar 24, 20                 |
|-----------|-----------------------|-------------------------|--------------------------------------------|-----------------------|-----------------|--------------|------------------------------|-----------|----------------------------------------|
| arker 2   | 15.8013               | 50000000 GI             | IZ<br>PNO: Fast G<br>IFGain:Low            | D Trig: Fr<br>#Atten: |                 | Avg<br>Avg   | Type:Log-Pv<br> Hold>100/100 | vr<br>)   | TRACE 1 2 3 4<br>TYPE M<br>DET P N N N |
| dB/div    | Ref Offse<br>Ref 10.0 |                         |                                            |                       |                 |              |                              | Mkr2 1    | 5.801 35 GH<br>-56.104 dB              |
| a         |                       |                         |                                            |                       |                 |              |                              |           |                                        |
|           |                       |                         |                                            |                       |                 |              |                              |           |                                        |
|           |                       |                         |                                            |                       |                 |              |                              |           |                                        |
|           |                       |                         |                                            |                       |                 |              |                              |           |                                        |
|           |                       |                         |                                            |                       |                 |              |                              |           | -37.02                                 |
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|           |                       |                         |                                            |                       |                 |              |                              |           |                                        |
|           | 00 GHz<br>100 kHz     |                         | #V                                         | BW 300 kl             | lz              |              | S                            | weep 192. | Stop 17.000 Gi<br>0 ms (40001 pi       |
| R NODE TP | nc scl                | ×                       | Y                                          |                       | UNCTION         | FUNCTION WID | тн                           | FUNCTION  | VALUE                                  |
| N 1       | f                     | 15.145 55<br>15.801 35  | GHz -56.04<br>GHz -56.10                   | 4 dBm<br>4 dBm        |                 |              |                              |           |                                        |
|           |                       |                         |                                            |                       |                 |              |                              |           |                                        |
|           |                       |                         |                                            |                       |                 |              |                              |           |                                        |
|           |                       |                         |                                            |                       |                 |              |                              |           |                                        |
|           |                       |                         |                                            |                       |                 |              |                              |           |                                        |
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|           |                       |                         |                                            |                       |                 |              |                              |           |                                        |



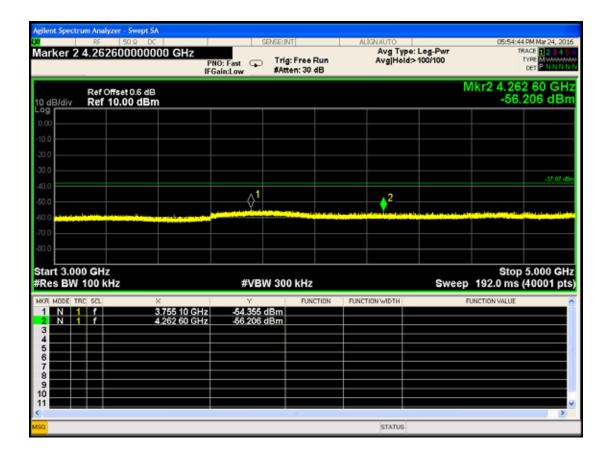
|                     | um Analyzer - S           | Q DC                           |                                    | ENSE:INT                        | ALIGNAUTO      |                               | 02070210                   | M Mar 24, 201                 |
|---------------------|---------------------------|--------------------------------|------------------------------------|---------------------------------|----------------|-------------------------------|----------------------------|-------------------------------|
| arker 2             |                           | 0000000 GHz                    | PNO: Fast 😱<br>FGain:Low           | Trig: Free Run<br>#Atten: 30 dB | Avg T          | 'ype: Log-Pwr<br>old:>100/100 | TRA                        | CE 12345<br>PE M<br>DET PNNNN |
| ) dB/div            | Ref Offset 0<br>Ref 10.00 |                                |                                    |                                 |                | M                             | kr2 20.367<br>-55.1        | 50 GH<br>43 dBr               |
| .00                 |                           |                                |                                    |                                 |                |                               |                            |                               |
| 0.0                 |                           |                                |                                    |                                 |                |                               |                            |                               |
|                     |                           |                                |                                    |                                 |                |                               |                            |                               |
| .0                  |                           |                                |                                    |                                 |                |                               |                            | -37.02.6                      |
|                     | 1                         |                                |                                    |                                 |                | <b>2</b>                      |                            |                               |
|                     |                           | uludes de thuis antificada     | and all the strength of the second | the second state of a st        |                |                               | an ann ailtean Maria de at | - Caller of Aller             |
|                     |                           |                                |                                    |                                 |                |                               |                            |                               |
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|                     |                           |                                |                                    |                                 |                |                               | <b>6</b> (a) 2(            | 000 01                        |
| tart 19.0<br>Res BW | 100 GH2                   |                                | #VBV                               | V 300 kHz                       |                | Sweep                         | 5 192.0 ms (4              | .000 GH<br>0001 pt            |
| R HODE TP           |                           | ×                              | -53.026 d                          | FUNCTIO                         | FUNCTION WIDTH | 1                             | FUNCTION VALUE             |                               |
| I N 1<br>2 N 1      |                           | 19.182 80 GHz<br>20.367 50 GHz |                                    |                                 |                |                               |                            |                               |
|                     |                           |                                |                                    |                                 |                |                               |                            |                               |
|                     |                           |                                |                                    |                                 |                |                               |                            |                               |
|                     |                           |                                |                                    |                                 |                |                               |                            |                               |
|                     |                           |                                |                                    |                                 |                |                               |                            |                               |
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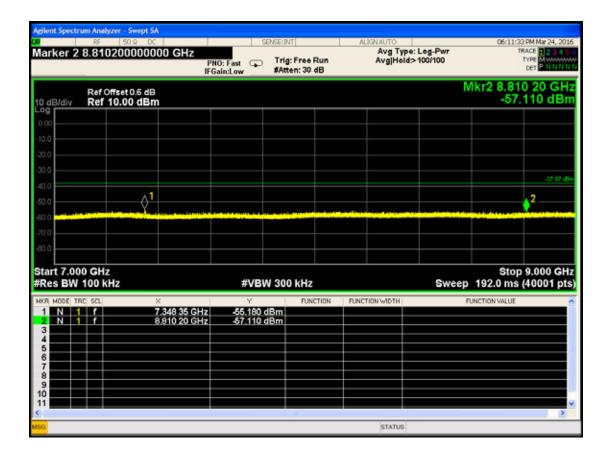
| filent Spectr       | um Analyzer - Swept               |                    |                        |                              |            |                                    |       |                        |                                                                  |
|---------------------|-----------------------------------|--------------------|------------------------|------------------------------|------------|------------------------------------|-------|------------------------|------------------------------------------------------------------|
| larker 2            | 24.20980000                       | 0000 GHz           | NO: Fast 😱<br>Gain:Low | Trig: Free F<br>#Atten: 30 d |            | ALIGNAUTO<br>Avg Type<br>Avg Helda |       |                        | 4 PM Mar 24, 201<br>RACE 1 2 3 4 5<br>TYPE MULTINE<br>DET PINNIN |
| 0 dB/div            | Ref Offset 0.6 di<br>Ref 10.00 dB |                    |                        |                              |            |                                    | M     | (r2 24.20<br>-52.      | 9 80 GH<br>588 dBn                                               |
| 0.00                |                                   |                    |                        |                              |            |                                    |       |                        |                                                                  |
| 20.0                |                                   |                    |                        |                              |            |                                    |       |                        |                                                                  |
| 0.0                 |                                   |                    |                        |                              |            |                                    |       |                        | 37.02.08                                                         |
| 0.0                 |                                   |                    | ^1                     |                              |            | 2                                  |       |                        |                                                                  |
| 0.0                 | teres de la de esta social d      |                    |                        | t-Ritinistiati               | ut de Eini |                                    |       | ala da se estado de da |                                                                  |
| 0.0                 |                                   |                    |                        |                              |            |                                    |       |                        |                                                                  |
| tart 23.0<br>Res BW |                                   |                    | #VB\                   | W 300 kHz                    |            |                                    | Sweep | Stop 2<br>192.0 ms     | 25.000 GH<br>(40001 pt:                                          |
|                     | 1                                 | ×<br>23.675 70 GHz | -52.358                |                              | TION F     | UNCTION WIDTH                      | ŗ     | UNCTION VALUE          |                                                                  |
| 2 N 1<br>3          | f                                 | 24.209 80 GHz      | -52,588                | dBm                          |            |                                    |       |                        |                                                                  |
| 5                   |                                   |                    |                        |                              |            |                                    |       |                        |                                                                  |
| 8<br>9              |                                   |                    |                        |                              |            |                                    |       |                        |                                                                  |
| 1                   |                                   |                    |                        |                              |            |                                    |       |                        |                                                                  |
| · · · · · ·         |                                   |                    |                        |                              | _          | STATUS                             |       |                        |                                                                  |



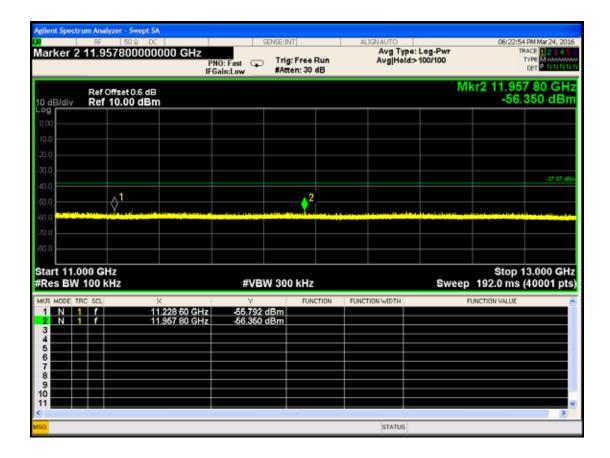
| Agilent Spectr        | um Analyzer -          | Swept SA                        |                       |                              |          |                                  |                        | 05.40.00          | 20110-21-2016                                                   |
|-----------------------|------------------------|---------------------------------|-----------------------|------------------------------|----------|----------------------------------|------------------------|-------------------|-----------------------------------------------------------------|
| Display L             |                        |                                 | PNO: Fast 🖵           | Trig: Free F<br>#Atten: 30 c | lun      | AUGNAUTO<br>Avg Type<br>Avg Hold | :: Log-Pwr<br>>100/100 | T                 | DPM Mar 24, 2016<br>RACE 1 2 3 4 5 6<br>TYPE M<br>DET P N N N N |
| 10 dB/div             | Ref Offset<br>Ref 10.0 |                                 |                       |                              |          |                                  | N                      | 1kr2 1.72<br>-55. | 7 60 GHz<br>178 dBm                                             |
| 0.00                  |                        |                                 |                       |                              |          |                                  | \$ <sup>1</sup>        |                   |                                                                 |
| -20.0                 |                        |                                 |                       |                              |          |                                  |                        |                   |                                                                 |
| -40.0                 |                        |                                 | 2                     |                              |          |                                  |                        |                   | -37.97 dBm                                                      |
| -60.0                 |                        |                                 |                       |                              |          |                                  | A                      | wane anti-        |                                                                 |
| -80.0                 |                        |                                 |                       |                              |          |                                  |                        |                   |                                                                 |
| Start 1.00<br>#Res BW | 0 GHz<br>100 kHz       |                                 | #VB                   | W 300 kHz                    |          |                                  | Sweep                  | Stop<br>192.0 ms  | 3.000 GHz<br>(40001 pts)                                        |
| MKR HODE TR           | 1                      | ×<br>2.450 05 GH<br>1.727 60 GH | z -7.966<br>z -55.178 |                              | TION FUR | NCTION WIDTH                     | P                      | UNCTION VALUE     |                                                                 |
| 3 4 5                 |                        |                                 |                       |                              |          |                                  |                        |                   | _                                                               |
| 6<br>7<br>8<br>9      |                        |                                 |                       |                              |          |                                  |                        |                   |                                                                 |
| 10<br>11              |                        |                                 |                       |                              |          |                                  |                        |                   | >                                                               |
| MSG                   |                        |                                 |                       |                              |          | STATUS                           |                        |                   |                                                                 |



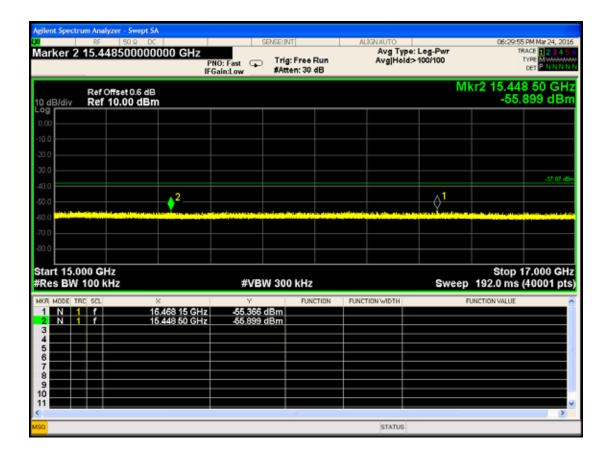
|                                  | 50 Ω DC                      | SENS                                 | INT                           | ALIGNAUTO                 |                       |                     | PM Mar 24, 20                      |
|----------------------------------|------------------------------|--------------------------------------|-------------------------------|---------------------------|-----------------------|---------------------|------------------------------------|
| arker 2 6.35315                  |                              |                                      | rig: Free Run<br>Atten: 30 dB | Avg Type:<br>Avg Hold⊃    | Log-Pwr<br>100/100    | т                   | ACE 234<br>YPE Moderna<br>DET PNNN |
| dB/div Ref Offse                 |                              |                                      |                               |                           | N                     | 1kr2 6.353<br>-56.4 | 3 15 GH<br>157 dB                  |
| 9                                |                              |                                      |                               |                           |                       |                     |                                    |
|                                  |                              |                                      |                               |                           |                       |                     |                                    |
|                                  |                              |                                      |                               |                           |                       |                     |                                    |
|                                  |                              |                                      |                               |                           |                       |                     |                                    |
|                                  |                              |                                      |                               |                           |                       |                     | -37.97                             |
| ۰ <b>۱</b>                       |                              |                                      |                               | <b>_</b> 2                |                       |                     |                                    |
| o <b>serie de la serie de la</b> | discourse section discussion | to destruction of a state of a state | telephone de la com           | a construction of the log | ant faite first state |                     | interest and                       |
| .0                               |                              |                                      |                               |                           |                       |                     |                                    |
| .0                               |                              |                                      |                               |                           |                       |                     |                                    |
| art 5.000 GHz                    |                              |                                      |                               |                           |                       | Stop                | 7.000 GI                           |
| es BW 100 kHz                    |                              | #VBW 3                               | 00 kHz                        |                           | Sweep                 | 192.0 ms (          | 40001 p                            |
| R MODE TRC SCL                   | ×                            | Y                                    | FUNCTION                      | FUNCTION WIDTH            | P                     | UNCTION VALUE       |                                    |
|                                  | 5.097 90 GH;<br>6.353 15 GH; | z -56.065 dBn<br>z -56.457 dBn       |                               |                           |                       |                     |                                    |
| N 1 F                            |                              |                                      |                               |                           |                       |                     |                                    |
|                                  |                              |                                      |                               |                           |                       |                     |                                    |
|                                  |                              |                                      |                               |                           |                       |                     |                                    |
|                                  |                              |                                      |                               |                           |                       |                     |                                    |
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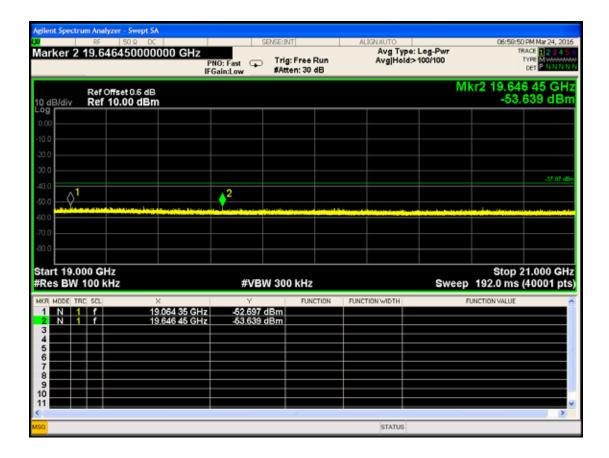
|                       | RF 50 Q                       |                               |                          | SENSE:INT                  |               | ALIGNAUTO              |                    |                  | 0 PM Mar 24, 20       |
|-----------------------|-------------------------------|-------------------------------|--------------------------|----------------------------|---------------|------------------------|--------------------|------------------|-----------------------|
| arker 2               | 10.6176000                    | 000000 GHz                    | PNO: Fast 😱<br>FGain:Low | Trig: Free i<br>#Atten: 30 |               | Avg Type:<br>Avg Hold> | Log-Pwr<br>100/100 | T                | TYPE MONTH            |
| dB/div                | Ref Offset 0.6<br>Ref 10.00 d |                               |                          |                            |               |                        | M                  | kr2 10.61<br>-56 | 7 60 GH<br>552 dB     |
| 9<br>                 |                               |                               |                          |                            |               |                        |                    |                  |                       |
|                       |                               |                               |                          |                            |               |                        |                    |                  |                       |
|                       |                               |                               |                          |                            |               |                        |                    |                  |                       |
|                       |                               |                               |                          |                            |               |                        |                    |                  |                       |
|                       |                               |                               |                          |                            |               |                        |                    |                  | -37.97                |
|                       |                               |                               | 0                        | 1                          |               |                        |                    | <mark>↓</mark> 2 |                       |
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| .0                    |                               |                               |                          |                            |               |                        |                    |                  |                       |
| art 9.000<br>tes BW 1 |                               |                               | #VB                      | W 300 kHz                  |               |                        | Sweep              | Stop<br>192.0 ms | 11.000 GI<br>(40001 p |
| R HODE TRO            | C SCL                         | ×                             | Y                        |                            | TION FUN      | ICTION WIDTH           | ſ                  | UNCTION VALUE    |                       |
| N 1                   | f                             | 9.785 35 GHz<br>10.617 60 GHz | -56.406<br>-56.552       |                            |               |                        |                    |                  |                       |
|                       |                               |                               |                          |                            |               |                        |                    |                  |                       |
|                       |                               |                               |                          |                            |               |                        |                    |                  |                       |
|                       |                               |                               |                          |                            |               |                        |                    |                  |                       |
|                       |                               |                               |                          |                            |               |                        |                    |                  |                       |
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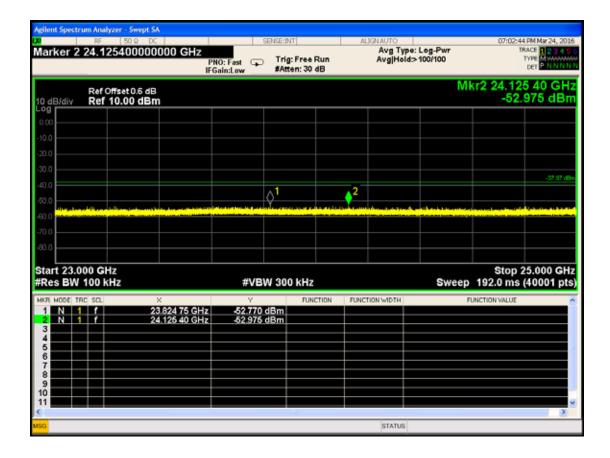
| RF                            | 50 Q DC                   | SE                             | NSEINT                          | ALIGNAUTO              |                    | 06:24:41 PM N             | far 24, 201          |
|-------------------------------|---------------------------|--------------------------------|---------------------------------|------------------------|--------------------|---------------------------|----------------------|
| arker 2 14.37                 | /0650000000 G             | PNO: Fast F<br>IFGain:Low      | Trig: Free Run<br>#Atten: 30 dB | Avg Type:<br>Avg Held> | Log-Pwr<br>100/100 | TYPE                      | 1234<br>M<br>P N N N |
|                               | ffset 0.6 dB<br>10.00 dBm |                                |                                 |                        | M                  | (r2 14.370 6<br>-55.62    | 5 GH<br>2 dBi        |
| 9<br>00                       |                           |                                |                                 |                        |                    |                           |                      |
| .0                            |                           |                                |                                 |                        |                    |                           |                      |
| .0                            |                           |                                |                                 |                        |                    |                           |                      |
| .0                            |                           |                                |                                 |                        |                    |                           | -37.97 c             |
| .0                            |                           |                                |                                 |                        | 2                  |                           |                      |
| .0                            |                           |                                |                                 |                        | <b>-</b>           | Ś                         | 1                    |
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| .0                            |                           |                                |                                 |                        |                    |                           |                      |
|                               |                           |                                |                                 |                        |                    |                           |                      |
| art 13.000 GH<br>Res BW 100 k |                           | #VBN                           | / 300 kHz                       |                        | Sweep              | Stop 15.0<br>192.0 ms (40 | 00 GH<br>001 pi      |
| R HODE TRC SCL                | ×                         | ALL                            | FUNCTION                        | FUNCTION WIDTH         | PL PL              | INCTION VALUE             |                      |
| N 1 f                         | 14.851 70<br>14.370 65    | GHz -55.440 d<br>GHz -55.622 d |                                 |                        |                    |                           |                      |
|                               |                           |                                |                                 |                        |                    |                           |                      |
|                               |                           |                                |                                 |                        |                    |                           |                      |
|                               |                           |                                |                                 |                        |                    |                           |                      |
|                               |                           |                                |                                 |                        |                    |                           |                      |
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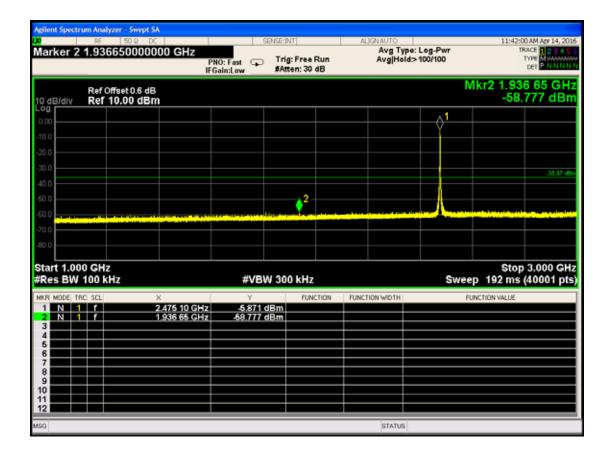
| gilent Spectr       | um Analyzer - Swe             |                                     |                                 |                               |                |                         |                        |                      |
|---------------------|-------------------------------|-------------------------------------|---------------------------------|-------------------------------|----------------|-------------------------|------------------------|----------------------|
| larker 2            | ™ 50 Ω<br>17.7058500          | 00000 GHz                           |                                 | rig: Free Run<br>Atten: 30 dB |                | be:Log-Pwr<br>d≫100/100 | TRJ                    | M Mar 24, 2016       |
| 0 dB/div            | Ref Offset 0.6<br>Ref 10.00 d |                                     |                                 |                               |                | M                       | kr2 17.705<br>-55.0    | 85 GH:<br>73 dBn     |
| 10.0                |                               |                                     |                                 |                               |                |                         |                        |                      |
| 20.0                |                               |                                     |                                 |                               |                |                         |                        |                      |
| 40.0                |                               |                                     | 2                               |                               |                |                         |                        | -37.97 66            |
| 50.0<br>70.0        |                               |                                     |                                 |                               |                |                         |                        |                      |
| 0.0                 |                               |                                     |                                 |                               |                |                         |                        |                      |
| tart 17.0<br>Res BW | 00 GHz<br>100 kHz             |                                     | #VBW 3                          | 00 kHz                        |                | Sweep                   | Stop 19<br>192.0 ms (4 | 9.000 GH<br>10001 pt |
| KR HODE TR          | 1                             | ×<br>18.471 90 GHz<br>17.705 85 GHz | y<br>-54,105 dBn<br>-55,073 dBn |                               | FUNCTION WIDTH |                         | FUNCTION VALUE         |                      |
| 4 5<br>6 7<br>8 8   |                               |                                     |                                 |                               |                |                         |                        |                      |
| 9                   |                               |                                     |                                 |                               |                |                         |                        | )                    |
|                     |                               |                                     |                                 |                               |                |                         |                        |                      |



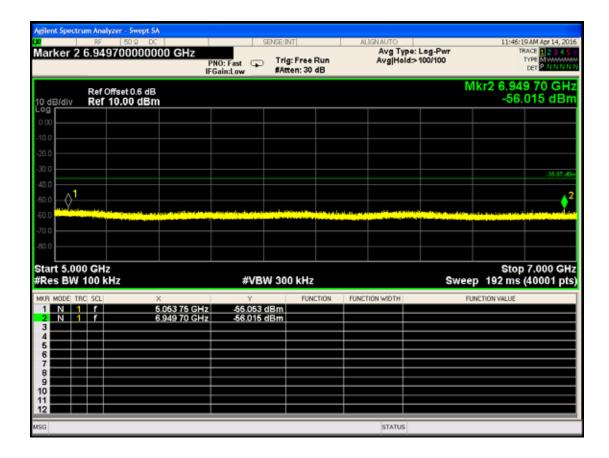
|                       | RF 50 Q                           | DC                             | S                      | ENSE:INT                    |               | ALIGN AUTO           |                        | 07:01:12          | PM Mar 24, 20                        |
|-----------------------|-----------------------------------|--------------------------------|------------------------|-----------------------------|---------------|----------------------|------------------------|-------------------|--------------------------------------|
| arker 22              | 22.8448000                        | Р                              | NO: Fast 😱<br>Gain:Low | Trig: Free F<br>#Atten: 30  |               | Avg Type<br>Avg Hold | :: Log-Pwr<br>>100/100 |                   | RACE 1234<br>TYPE MULAU<br>DET PININ |
| ) dB/div              | Ref Offset 0.6 of<br>Ref 10.00 di |                                |                        |                             |               |                      | М                      | kr2 22.84<br>-52. | 4 80 GH<br>688 dBi                   |
| .00                   |                                   |                                |                        |                             |               |                      |                        |                   |                                      |
|                       |                                   |                                |                        |                             |               |                      |                        |                   |                                      |
|                       |                                   |                                |                        |                             |               |                      |                        |                   |                                      |
|                       |                                   |                                |                        |                             |               |                      |                        |                   |                                      |
|                       |                                   |                                |                        |                             |               |                      |                        |                   | -37.97 c                             |
|                       |                                   |                                |                        |                             | _\\$ <b>'</b> |                      |                        |                   | _ <b>∮</b> <sup>2</sup>              |
| .0                    | and the second second             |                                |                        | la de la dela dela dela del | ter starte in |                      |                        |                   |                                      |
|                       |                                   |                                |                        |                             |               |                      |                        |                   |                                      |
|                       |                                   |                                |                        |                             |               |                      | _                      |                   |                                      |
|                       |                                   |                                |                        |                             |               |                      |                        | <b>8</b> 1 a.u. ( | 0.000.01                             |
| art 21.00<br>Res BW 1 |                                   |                                | #VBV                   | V 300 kHz                   |               |                      | Sweep                  | 192.0 ms          | 23.000 GH<br>(40001 pt               |
| R NODE TRO            |                                   | ×                              | Y                      | FUNC                        | TION          | FUNCTION WIDTH       | 1                      | FUNCTION VALUE    |                                      |
| N 1                   | f                                 | 22.070 45 GHz<br>22.844 80 GHz | -52.310 c              |                             |               |                      |                        |                   |                                      |
|                       |                                   |                                |                        |                             |               |                      |                        |                   |                                      |
|                       |                                   |                                |                        |                             |               |                      |                        |                   |                                      |
|                       |                                   |                                |                        |                             |               |                      |                        |                   |                                      |
|                       |                                   |                                |                        |                             |               |                      |                        |                   |                                      |
|                       |                                   |                                |                        |                             |               |                      |                        |                   |                                      |
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|                       |                                   |                                |                        |                             |               |                      |                        |                   |                                      |



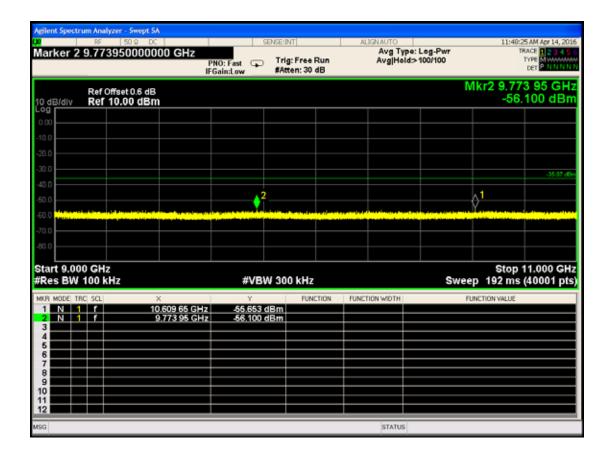
| arker       |                            | 50 Ω DC<br>5500000 MHz          | 1                                  | ENSE:INT                       | ALIGNAUTO<br>Avg                                                                                                | Type: Log-Pwr          | 12:01:59 PM Apr 14, 2<br>TRACE 12:34 |
|-------------|----------------------------|---------------------------------|------------------------------------|--------------------------------|-----------------------------------------------------------------------------------------------------------------|------------------------|--------------------------------------|
|             |                            |                                 | PNO: Fast 🖵<br>IFGain:Low          | Trig: Free Ru<br>#Atten: 30 dB | n Avg F                                                                                                         | loid>100/100           | DET P N N N                          |
|             |                            | et 0.6 dB                       |                                    |                                |                                                                                                                 |                        | Mkr2 516.12 MH<br>-63.141 dB         |
| ) dB/div    | Ref 10                     | .00 dBm                         | _                                  |                                |                                                                                                                 |                        | -03.141 UB                           |
| .00         |                            |                                 |                                    |                                |                                                                                                                 |                        |                                      |
| 1.0         |                            |                                 |                                    |                                |                                                                                                                 |                        |                                      |
| 1.0         |                            |                                 |                                    |                                |                                                                                                                 |                        |                                      |
| 1.0         |                            |                                 |                                    |                                |                                                                                                                 |                        | -35.07                               |
| 1.0         |                            |                                 |                                    |                                |                                                                                                                 |                        | <u>م</u> 1                           |
| 1.0         |                            |                                 |                                    | 2                              |                                                                                                                 |                        |                                      |
| 1.0         | and the state of the state | and because to an advect set of | and the second state of the second |                                | Marina de la completa |                        | an and a state of the local distance |
| 1.0         |                            |                                 |                                    |                                |                                                                                                                 | أنفاه بالمتنافق فقنتنا |                                      |
| 1.0         |                            |                                 |                                    |                                |                                                                                                                 |                        |                                      |
| art 30.     | 0 MHz                      |                                 |                                    |                                |                                                                                                                 |                        | Stop 1.0000 G                        |
|             | / 100 kHz                  |                                 | #VB                                | W 300 kHz                      |                                                                                                                 | Swee                   | p 93.3 ms (20001 p                   |
|             |                            | ×                               | Y                                  | FUNCTION                       | N FUNCTION WIDT                                                                                                 | 4 J                    | UNCTION VALUE                        |
| -           | 1 r                        | 955.623 MH<br>516.12 MH         |                                    |                                |                                                                                                                 |                        |                                      |
| R MODE      | 1   f                      |                                 |                                    |                                |                                                                                                                 |                        |                                      |
| N<br>N<br>B | 1 f                        |                                 |                                    |                                |                                                                                                                 |                        |                                      |
| N<br>N      | 1 f                        |                                 |                                    |                                |                                                                                                                 |                        |                                      |
| -           | 1 f                        |                                 |                                    |                                |                                                                                                                 |                        |                                      |
|             |                            |                                 |                                    |                                |                                                                                                                 |                        |                                      |



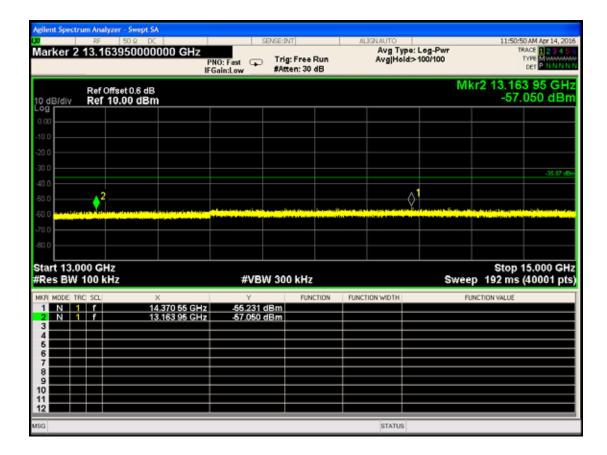
|                    | RF 50 Q          | DC           | SENS            | ie:INT                         | ALIGN AUTO            |                        | 11:44:58 AM Apr 14, 2                           |
|--------------------|------------------|--------------|-----------------|--------------------------------|-----------------------|------------------------|-------------------------------------------------|
| arker 2            | 4.97585000       | Р            |                 | Trig: Free Run<br>Atten: 30 dB | Avg Type<br>Avg Hold: | :: Log-Pwr<br>>100/100 | TRACE 1 2 3 4<br>TYPE MUNICIPAL DET P N N N     |
|                    | Ref Offset 0.6   | 5 dB         |                 |                                |                       | M                      | kr2 4.975 85 GH                                 |
| dB/div             | Ref 10.00 (      |              |                 |                                |                       |                        | -56.349 dB                                      |
|                    |                  |              |                 |                                |                       |                        |                                                 |
| .0                 |                  |              |                 |                                |                       |                        |                                                 |
|                    |                  |              |                 |                                |                       |                        |                                                 |
|                    |                  |              |                 |                                |                       |                        |                                                 |
| 1.0                |                  |              |                 |                                |                       |                        | -35.97                                          |
| .0                 |                  |              | <u>ئ</u>        |                                |                       |                        |                                                 |
|                    |                  |              | Ý               |                                |                       |                        |                                                 |
| I.O accented       |                  |              |                 |                                |                       |                        |                                                 |
| 1.0                |                  |              |                 |                                |                       | ++                     |                                                 |
| 1.0                |                  |              |                 |                                |                       |                        |                                                 |
|                    |                  |              |                 |                                |                       |                        |                                                 |
| art 2.00           |                  |              |                 |                                |                       |                        | Stop 5 000 Cl                                   |
| art 3.00<br>Res BW | 0 GHz<br>100 kHz |              | #VBW :          | 300 kHz                        |                       | Sweep                  | Stop 5.000 Gi<br>192 ms (40001 pi               |
| Res BW             | 100 kHz          | X            | Y               | FUNCTION                       | FUNCTION WIDTH        |                        | Stop 5.000 Gl<br>192 ms (40001 p<br>CTION VALUE |
| Res BW             | 100 kHz          | 3.824 35 GHz | ۲<br>54.262 dBı | FUNCTION                       | FUNCTION WIDTH        |                        | 192 ms (40001 p                                 |
| R MODE TR          | 100 kHz          |              | Y               | FUNCTION                       | FUNCTION WIDTH        |                        | 192 ms (40001 p                                 |
| Res BW             | 100 kHz          | 3.824 35 GHz | ۲<br>54.262 dBı | FUNCTION                       | FUNCTION WIDTH        |                        | 192 ms (40001 p                                 |
|                    | 100 kHz          | 3.824 35 GHz | ۲<br>54.262 dBı | FUNCTION                       | FUNCTION WIDTH        |                        | 192 ms (40001 p                                 |
|                    | 100 kHz          | 3.824 35 GHz | ۲<br>54.262 dBı | FUNCTION                       | PUNCTION WIDTH        |                        | 192 ms (40001 p                                 |
|                    | 100 kHz          | 3.824 35 GHz | ۲<br>54.262 dBı | FUNCTION                       | FUNCTION WIDTH        |                        | 192 ms (40001 p                                 |
| Res BW             | 100 kHz          | 3.824 35 GHz | ۲<br>54.262 dBı | FUNCTION                       | PUNCTION WIDTH        |                        | 192 ms (40001 p                                 |



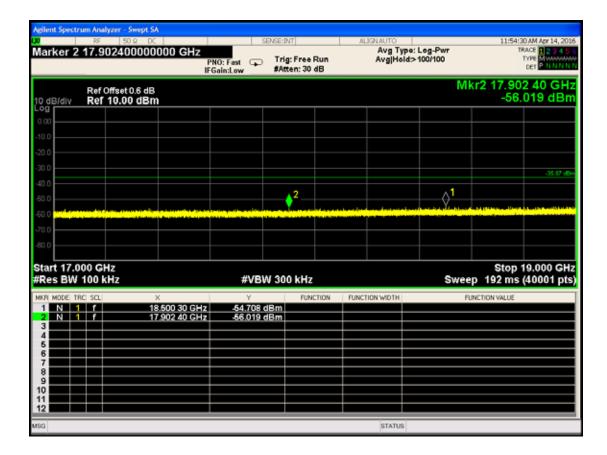
| arker 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | RF              | 50 Q DC           |                |                        | SENSE:0                   | TI                       | AL    | JGN AUTO              |                      | 11:47:2          | 2 AM Apr 14, 20      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-------------------|----------------|------------------------|---------------------------|--------------------------|-------|-----------------------|----------------------|------------------|----------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 7.423           | 325000000         |                | PNO: Fast<br>FGain:Low |                           | : Free Run<br>ten: 30 dB |       | Avg Type<br>Avg Holdo | : Log-Pwr<br>100/100 |                  | TYPE MULTURE         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | RefO            | ffset 0.6 dB      |                |                        |                           |                          |       |                       | M                    | kr2 7.42         | 3 25 GH              |
| dB/div                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                 | 10.00 dBm         |                |                        |                           |                          |       |                       |                      | -55.             | 980 dB               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                 |                   |                |                        |                           |                          |       |                       |                      |                  |                      |
| 1.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                 |                   |                |                        |                           |                          |       |                       |                      |                  |                      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                 |                   |                |                        |                           |                          |       |                       |                      |                  |                      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                 |                   |                |                        |                           |                          |       |                       |                      |                  |                      |
| 1.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                 |                   |                |                        |                           |                          |       |                       |                      |                  | -35.97               |
| 1.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                 |                   | <u>^</u> 2     |                        |                           |                          |       |                       |                      |                  | . 1                  |
| 1.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                 |                   | ¢ <sup>2</sup> |                        |                           |                          |       |                       |                      |                  | 0                    |
| 3.0 <b>11.010</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <u>kinaikin</u> | Ribelson and Mark | Contractions   |                        | Ch. United and the second |                          |       | <u>tenikkins</u> i    |                      |                  |                      |
| 1.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                 |                   |                |                        |                           |                          |       |                       |                      |                  |                      |
| 1.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                 |                   |                |                        |                           |                          |       |                       |                      |                  |                      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                 |                   |                |                        |                           |                          |       |                       |                      | -                |                      |
| art 7.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                 |                   |                | 4                      | WBW 30                    | 0 kHz                    |       |                       | Swee                 | Stop<br>p 192 ms | 9.000 GI<br>(40001 p |
| Res BW                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 100 k           | HZ                |                |                        |                           |                          |       |                       |                      |                  |                      |
| Res BW                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | RC  SCL         | X                 |                |                        | Y                         | FUNCTION                 | FUNCT | TION WIDTH            | FU                   | NCTION VALUE     |                      |
| R MODE TF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | RC SCL          | X<br>8.           | 917 20 GHz     | -65                    | 210 dBm                   | FUNCTION                 | FUNCT | TION WIDTH            | FU                   | NCTION VALUE     |                      |
| R MODE TH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | RC  SCL         | X<br>8.           |                | -65                    |                           | FUNCTION                 | FUNC  | TION WIDTH            | FU                   | NCTION VALUE     |                      |
| R MODE TP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | RC SCL          | X<br>8.           | 917 20 GHz     | -65                    | 210 dBm                   | FUNCTION                 | FUNC  | TION WIDTH            | Fu                   | NCTION VALUE     |                      |
| R MODE TR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | RC SCL          | X<br>8.           | 917 20 GHz     | -65                    | 210 dBm                   | FUNCTION                 | FUNC  | FION WIDTH            | FU                   | NCTION VALUE     |                      |
| P MODE TP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | RC SCL          | X<br>8.           | 917 20 GHz     | -65                    | 210 dBm                   | FUNCTION                 | FUNC  | TION WIDTH            | FU                   | NCTION VALUE     |                      |
| P( MODE) TP<br>1 N 1<br>2 N 1<br>3 4 5<br>5 2 1<br>5 2 1<br>7 2 1 1<br>7 1 1<br>7 1 1<br>7 1 1<br>7 1 1<br>7 1<br>7 1 1<br>7 1<br>7 | RC SCL          | X<br>8.           | 917 20 GHz     | -65                    | 210 dBm                   | FUNCTION                 | FUNC  | TION WID TH           | FU                   | NCTION VALUE     |                      |
| R MODE TR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | RC SCL          | X<br>8.           | 917 20 GHz     | -65                    | 210 dBm                   | FUNCTION                 | FUNC  | ION WIDTH             | FU                   | NCTION VALUE     |                      |



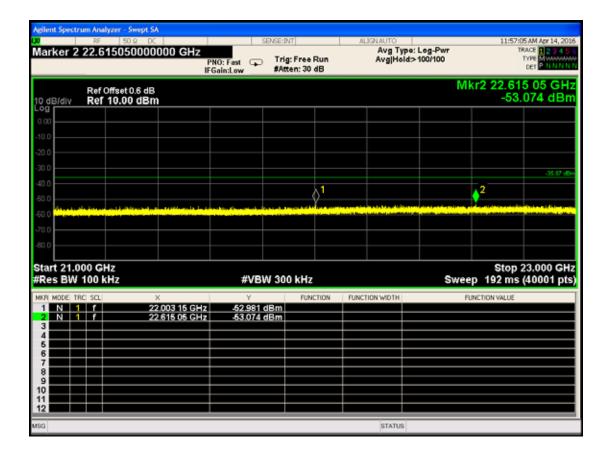
|                                                                                                                                            | RF    | 50 Q DC                    |             |                        | SENS           | E:INT                    |            | ALIGNAUTO               |                           |                   | 11:49:32 M                | M Apr 14, 20      |
|--------------------------------------------------------------------------------------------------------------------------------------------|-------|----------------------------|-------------|------------------------|----------------|--------------------------|------------|-------------------------|---------------------------|-------------------|---------------------------|-------------------|
| arker 2                                                                                                                                    | 11.5  | 84700000                   |             | PNO: Fast<br>FGain:Lov |                | rig: Free I<br>Atten: 30 |            | Avg Ty<br>Avg Ho        | pe: Log-Pwr<br>Id>100/100 |                   | TYP                       |                   |
| dB/div                                                                                                                                     |       | Offset 0.6 dB<br>10.00 dBm |             |                        |                |                          |            |                         |                           | Mkr2 <sup>-</sup> | 11.584<br>-56.4           | 70 GH             |
| <sup>2</sup>                                                                                                                               | - Nor |                            |             |                        |                |                          |            |                         |                           |                   |                           |                   |
| .00                                                                                                                                        |       |                            |             |                        |                |                          |            |                         |                           |                   |                           |                   |
| .0                                                                                                                                         |       |                            |             |                        |                |                          |            |                         |                           |                   |                           |                   |
| 1.0                                                                                                                                        |       |                            |             |                        |                |                          |            |                         |                           |                   |                           |                   |
| .0                                                                                                                                         |       |                            |             |                        |                |                          |            |                         |                           |                   |                           | -35.97 c          |
| .0                                                                                                                                         |       |                            |             |                        |                |                          |            |                         |                           |                   |                           |                   |
| .0                                                                                                                                         |       |                            |             | 2                      |                |                          |            |                         | 0 <sup>1</sup>            |                   |                           |                   |
| .0                                                                                                                                         |       |                            |             | a second data          |                | data sin na i            | alles e le | atte en familie fin fin |                           | in the state      | and the local division of | designed a        |
|                                                                                                                                            |       |                            |             |                        |                |                          |            |                         |                           |                   |                           |                   |
|                                                                                                                                            |       |                            |             |                        |                |                          |            |                         |                           |                   |                           |                   |
| 1.0                                                                                                                                        |       |                            |             |                        |                |                          |            |                         |                           |                   |                           |                   |
| 0.0                                                                                                                                        |       |                            |             |                        |                |                          |            |                         |                           |                   |                           |                   |
| art 11.0                                                                                                                                   |       |                            |             |                        | #VBW 3         | 00 kHz                   |            |                         | Sv                        | veep 1            | Stop 13.<br>92 ms (4)     | 000 GI<br>0001 p  |
| art 11.0<br>Res BW                                                                                                                         |       | (Hz                        |             | 1                      | Y              | FUNC                     | TION       | FUNCTION WIDTH          | Sv                        | veep 19           | 92 ms (4                  | 000 GI<br>0001 pi |
| art 11.00<br>tes BW                                                                                                                        | 100 k | (Hz<br>)<br>12             | .359 65 GHz | -54                    | Y<br>5.235 dBr | FUNC                     | TION       | FUNCTION WIDTH          | Sv                        |                   | 92 ms (4                  | 000 GI<br>0001 pi |
| art 11.00<br>tes BW                                                                                                                        | 100 k | (Hz<br>)<br>12             |             | -54                    | Y              | FUNC                     | TION       | FUNCTION WIDTH,         | Sv                        |                   | 92 ms (4                  | 000 GI<br>0001 p  |
| art 11.00<br>Res BW<br>N 1<br>N 1                                                                                                          | 100 k | (Hz<br>)<br>12             | .359 65 GHz | -54                    | Y<br>5.235 dBr | FUNC                     | TIÓN       | FUNCTION WIDTH          | Sv                        |                   | 92 ms (4                  | 000 GI<br>0001 p  |
| art 11.00<br>Res BW<br>R MODE TRI<br>N 1                                                                                                   | 100 k | (Hz<br>)<br>12             | .359 65 GHz | -54                    | Y<br>5.235 dBr | FUNC                     | TION       | FUNCTION WIDTH          | Sv                        |                   | 92 ms (4                  | 000 GI<br>0001 p  |
| art 11.00<br>Res BW<br>R MODE TR<br>N 1<br>2 N 1<br>3                       | 100 k | (Hz<br>)<br>12             | .359 65 GHz | -54                    | Y<br>5.235 dBr | FUNC                     | TION       | FUNCTION WIDTH          | Sv                        |                   | 92 ms (4                  | 000 GI<br>0001 pi |
| art 11.00<br>Res BW                                                                                                                        | 100 k | (Hz<br>)<br>12             | .359 65 GHz | -54                    | Y<br>5.235 dBr | FUNC                     | TION       | PUNCTION WIDTH          | Sv                        |                   | 92 ms (4                  | 000 GI<br>0001 p  |
| art 11.0<br>Res BW<br>R MODE TR<br>N 1<br>3<br>3<br>4<br>5<br>5<br>5<br>5<br>5<br>5<br>5<br>5<br>5<br>5<br>5<br>5<br>5<br>5<br>5<br>5<br>5 | 100 k | (Hz<br>)<br>12             | .359 65 GHz | -54                    | Y<br>5.235 dBr | FUNC                     | TION       | PUNCTION WIDTH          | Sv                        |                   | 92 ms (4                  | 000 GI<br>0001 pi |



|                                                                                                                                      | RF    | 50 Q DC        |                                 |                         | SENSE                    | INT                    |       | ALIGN      | IAUTO                  |                          | 11:52            | :36 AM Apr 14, 20          |
|--------------------------------------------------------------------------------------------------------------------------------------|-------|----------------|---------------------------------|-------------------------|--------------------------|------------------------|-------|------------|------------------------|--------------------------|------------------|----------------------------|
| arker 2                                                                                                                              | 16.2  | 86250000       |                                 | PNO: Fast<br>IFGain:Low |                          | ig: Free i<br>tten: 30 |       |            | Avg Type:<br>Avg Hold> | Log-Pwr<br>100/100       |                  | TYPE MUMMUM<br>DET P N N N |
|                                                                                                                                      |       | Offset 0.6 dB  |                                 |                         |                          |                        |       |            |                        | M                        | kr2 16.28        | 36 25 GH                   |
| dB/div                                                                                                                               | Ref   | 10.00 dBm      |                                 |                         |                          |                        |       | _          |                        |                          | -56              | .094 dB                    |
|                                                                                                                                      |       |                |                                 |                         |                          |                        |       |            |                        |                          |                  |                            |
| 1.0                                                                                                                                  |       |                |                                 |                         |                          |                        |       |            |                        |                          |                  |                            |
|                                                                                                                                      |       |                |                                 |                         |                          |                        |       |            |                        |                          |                  |                            |
| 1.0                                                                                                                                  |       |                |                                 |                         |                          |                        |       |            |                        |                          |                  |                            |
| 1.0                                                                                                                                  |       |                |                                 |                         |                          |                        |       |            |                        |                          |                  | -35.97 (                   |
| 1.0                                                                                                                                  |       |                |                                 |                         |                          |                        |       |            |                        |                          |                  |                            |
| 1.0                                                                                                                                  |       |                | -0 <sup>1</sup>                 |                         |                          |                        |       |            | <sup>2</sup>           |                          |                  |                            |
| 1.0                                                                                                                                  |       |                | an la sur sub sur               | 1                       |                          |                        |       | adapate at | e hadronia i ha        | day de stabilitar en ser | Alter of the La  |                            |
| 1.0                                                                                                                                  |       |                |                                 |                         |                          |                        |       |            |                        |                          |                  |                            |
| 1.0                                                                                                                                  |       |                |                                 |                         |                          |                        |       |            |                        |                          |                  |                            |
|                                                                                                                                      |       |                |                                 |                         |                          |                        |       |            |                        |                          |                  |                            |
|                                                                                                                                      |       |                |                                 |                         |                          |                        |       |            |                        |                          |                  |                            |
|                                                                                                                                      |       |                |                                 |                         | #VBW 3                   | 10 VH2                 |       |            |                        | Swaa                     | Stop             | 17.000 G                   |
| tes BW                                                                                                                               | 100 k | Hz             | ,                               | ;                       | #VBW 30                  |                        | TION  | RUNCTION   |                        |                          | ep 192 ms        | 17.000 GI<br>(40001 p      |
| art 15.0<br>Res BW                                                                                                                   |       | (Hz<br>><br>15 | 441 95 GHz                      | 55                      | #VBW 30<br>Y<br>.790 dBm | FUNC                   | CTION | FUNCTION   | WIDTH                  |                          | Stop<br>p 192 ms | 17.000 Gi<br>(40001 pi     |
| Res BW                                                                                                                               | 100 k | (Hz<br>><br>15 | (<br>.441 95 GHz<br>.286 25 GHz | 55                      | Y                        | FUNC                   | CTION | FUNCTION   | IWDTH                  |                          | ep 192 ms        | 17.000 GI<br>(40001 pi     |
| Res BW                                                                                                                               | 100 k | (Hz<br>><br>15 | 441 95 GHz                      | 55                      | Y<br>.790 dBm            | FUNC                   | CTION | FUNCTION   | IWDTH                  |                          | ep 192 ms        | 17.000 Gi<br>(40001 pi     |
|                                                                                                                                      | 100 k | (Hz<br>><br>15 | 441 95 GHz                      | 55                      | Y<br>.790 dBm            | FUNC                   | TION  | FUNCTION   | IWDTH                  |                          | ep 192 ms        | 17.000 GI<br>(40001 pi     |
|                                                                                                                                      | 100 k | (Hz<br>><br>15 | 441 95 GHz                      | 55                      | Y<br>.790 dBm            | FUNC                   | CTION | FUNCTION   | IWIDTH                 |                          | ep 192 ms        | 17.000 Gi<br>(40001 pi     |
| Res BW<br>R MODE TR<br>1 N 1<br>2 N 1<br>3<br>4<br>5<br>5<br>5<br>5<br>5<br>5<br>7<br>7<br>8<br>8<br>7<br>7<br>8<br>7<br>7<br>8<br>8 | 100 k | (Hz<br>><br>15 | 441 95 GHz                      | 55                      | Y<br>.790 dBm            | FUNC                   | CTION | FUNCTION   | IWDTH                  |                          | ep 192 ms        | 17.000 Gi<br>(40001 pi     |
| Res BW                                                                                                                               | 100 k | (Hz<br>><br>15 | 441 95 GHz                      | 55                      | Y<br>.790 dBm            | FUNC                   | CTION | FUNCTION   | IWIDTH                 |                          | ep 192 ms        | 17.000 Gi<br>(40001 pi     |
| Res BW (A) MODE TR 1 N 1 2 N 1 3 4 5 5 5 6 7 7 8 9 9                                                                                 | 100 k | (Hz<br>><br>15 | 441 95 GHz                      | 55                      | Y<br>.790 dBm            | FUNC                   | CTION | FUNCTION   | WDTH .                 |                          | ep 192 ms        | 17.000 GF                  |



|                    | RF    | 50 Q DC           |                            |                          | SENSE:0                  | IT                      | A               | JGN AUTO               |                                | 11:55:4              | 5 AM Apr 14, 20                       |
|--------------------|-------|-------------------|----------------------------|--------------------------|--------------------------|-------------------------|-----------------|------------------------|--------------------------------|----------------------|---------------------------------------|
| arker 2            | 20.0  | 997000000         |                            | PNO: Fast G<br>FGain:Low |                          | : Free Ru<br>ten: 30 dB |                 | Avg Type:<br>Avg Hold⊃ | Log-Pwr<br>100/100             |                      | RACE 2345<br>TYPE MULLIN<br>DET PNNNN |
|                    | Ref   | Offset 0.6 dB     |                            |                          |                          |                         |                 |                        | Mk                             | r2 20.09             | 9 70 GH                               |
| odB/div            |       | 10.00 dBm         |                            |                          |                          |                         |                 |                        |                                | -54.                 | 783 dBi                               |
|                    |       |                   |                            |                          |                          |                         |                 |                        |                                |                      |                                       |
| 1.0                |       |                   |                            |                          |                          |                         |                 |                        |                                |                      |                                       |
|                    |       |                   |                            |                          |                          |                         |                 |                        |                                |                      |                                       |
| 1.0                |       |                   |                            |                          |                          |                         |                 |                        |                                |                      |                                       |
| 1.0                |       |                   |                            |                          |                          |                         |                 |                        |                                |                      | -35.97 d                              |
|                    |       | 0 <sup>1</sup>    |                            |                          |                          |                         | <mark></mark> 2 |                        |                                |                      |                                       |
| .0                 |       | in a start of the | - luce to child the sec    | turnen hat               |                          | and the second second   | ales dequés es  | lost an ellet a la bar | the state of the second states | and the second sheet | alls and said                         |
| 1.0                |       |                   |                            |                          |                          |                         |                 |                        |                                |                      |                                       |
| .0                 |       |                   |                            |                          |                          |                         |                 |                        |                                |                      |                                       |
|                    |       |                   |                            |                          |                          |                         |                 |                        |                                |                      |                                       |
|                    |       |                   |                            |                          |                          |                         |                 |                        |                                | Stop                 | 21.000 G                              |
| art 19.0<br>Res BW |       |                   |                            | #V                       | BW 30                    | 0 kHz                   |                 |                        | Sweep                          | o 192 ms             | (40001 p                              |
| Res BW             | 100 k | <b>KHz</b>        |                            | Y                        |                          | D kHz<br>Functio        | ON FUNC         | TION WIDTH             |                                | D 192 ms             | (40001 p                              |
| Res BW             | 100   | (Hz<br>×<br>19    | .338 15 GHz<br>.099 70 GHz | Y<br>-63.96              | BW 300<br>6 dBm<br>3 dBm |                         | ON FUNC         | TION WIDTH             |                                |                      | (40001 pi                             |
| R MODE TH          | 100 k | (Hz<br>×<br>19    | .338 15 GHz                | Y<br>-63.96              | 6 dBm                    |                         | DN PUNC         | TION WIDTH             |                                |                      | (40001 pi                             |
| R MODE TP          | 100 k | (Hz<br>×<br>19    | .338 15 GHz                | Y<br>-63.96              | 6 dBm                    |                         | ON FUNC         | TION WIDTH             |                                |                      | (40001 pi                             |
| Res BW             | 100 k | (Hz<br>×<br>19    | .338 15 GHz                | Y<br>-63.96              | 6 dBm                    |                         | ON FUNC         | TION WIDTH             |                                |                      | (40001 pi                             |
| Res BW             | 100 k | (Hz<br>×<br>19    | .338 15 GHz                | Y<br>-63.96              | 6 dBm                    |                         | ON FUNC         | TION WIDTH             |                                |                      | (40001 pi                             |
|                    | 100 k | (Hz<br>×<br>19    | .338 15 GHz                | Y<br>-63.96              | 6 dBm                    |                         | ON FUNC         | TION WIDTH             |                                |                      | (40001 p                              |
|                    | 100 k | (Hz<br>×<br>19    | .338 15 GHz                | Y<br>-63.96              | 6 dBm                    |                         | ON FUNC         | TION WIDTH             |                                |                      | (40001 pi                             |



| art Fre            | ⊮<br>q 23.     | 50 Q DC<br>00000000        | ) GHz          | PNO: Fast<br>FGain:Low |              | g: Free F<br>tten: 30 ( |      | AL    |           | e: Log-Pwr<br> >100/100 |      |                         | 17 PM Age 14, 2<br>RACE 1 2 3 4<br>TYPE MUSER<br>DET P. N.N.N |
|--------------------|----------------|----------------------------|----------------|------------------------|--------------|-------------------------|------|-------|-----------|-------------------------|------|-------------------------|---------------------------------------------------------------|
| dB/div             | Ref (          | Offset 0.6 dB<br>10.00 dBm |                |                        |              |                         |      |       |           |                         | Mk   | r2 23.51<br>-52         | 6 10 GH<br>782 dB                                             |
|                    |                | 10.00 0.011                |                |                        |              |                         |      |       |           |                         |      |                         |                                                               |
| .0                 |                |                            |                |                        |              |                         |      |       |           |                         |      |                         |                                                               |
| .0                 |                |                            |                |                        |              |                         |      |       |           |                         |      |                         |                                                               |
| .0                 |                |                            |                |                        |              |                         |      |       |           |                         |      |                         | -35.97                                                        |
| 1.0                |                | an talenta an an           | ¢ <sup>2</sup> |                        |              | u batan                 |      |       |           | An and the second       |      | at a first second state |                                                               |
|                    |                |                            |                |                        |              |                         |      |       |           |                         |      | and a second second     |                                                               |
| .0                 |                |                            |                |                        |              |                         |      |       |           |                         |      |                         |                                                               |
| art 23.0<br>tes BW |                |                            |                | #                      | VBW 30       | 0 kHz                   |      |       |           | s                       | weep | Stop<br>192 ms          | 25.000 G<br>(40001 p                                          |
| R MODE TR          | IC SCL         | >                          | .985 40 GHz    |                        | r<br>015 dBm | FUNC                    | TIÓN | FUNCT | ION WIDTH |                         | FUR  | NCTION VALUE            |                                                               |
| N 1                | 1              |                            | 516 10 GHz     |                        | 782 dBm      |                         |      |       |           |                         |      |                         |                                                               |
|                    |                |                            |                |                        |              |                         |      |       |           |                         |      |                         |                                                               |
|                    | $\pm$          |                            |                |                        |              |                         |      |       |           |                         |      |                         |                                                               |
|                    | $\blacksquare$ |                            |                |                        |              |                         |      |       |           |                         |      |                         |                                                               |
|                    |                |                            |                |                        |              |                         |      |       |           |                         |      |                         |                                                               |
|                    |                |                            |                |                        |              |                         |      |       | STATUS    |                         |      |                         |                                                               |

# **10.DUTY CYCLE**

## 10.1. Test Equipment

| Item | Туре                   | Manufacturer | Model No. | Serial No. | Last Cal.  | Next Cal.  |
|------|------------------------|--------------|-----------|------------|------------|------------|
| 1.   | PXA Signal<br>Analyzer | Agilent      | N9030A    | MY53120367 | 2015-06-23 | 2016-06-22 |

## 10.2. Test Results

The measurement of duty cycle is 100%.

| SENSE INT                                            | ALIGNAUTO                | 02:17:16 PM Mar 21, 2016                                                         |
|------------------------------------------------------|--------------------------|----------------------------------------------------------------------------------|
| PNO: Wide Trig: Free Run<br>IFGain:Low #Atten: 30 dB | Avg Type: Log-Pwr        | TRACE 12 14<br>TYPE WWWWWW<br>DET PINNINN                                        |
|                                                      |                          | Mkr1 5.900 m<br>-4.27 dBn                                                        |
|                                                      |                          |                                                                                  |
|                                                      |                          |                                                                                  |
|                                                      |                          |                                                                                  |
|                                                      |                          |                                                                                  |
|                                                      |                          |                                                                                  |
|                                                      |                          |                                                                                  |
|                                                      |                          |                                                                                  |
|                                                      |                          |                                                                                  |
|                                                      |                          |                                                                                  |
| VBW 1.0 MHz                                          | Swee                     | Span 0 H<br>p 50.00 ms (1001 pt                                                  |
|                                                      | IFGain:Low #Atten: 30 dB | IFGain:Low         #Atten: 30 dB           IIII IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII |

# **11.DEVIATION TO TEST SPECIFICATIONS**

# NONE