

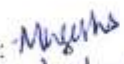

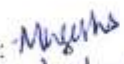

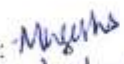

Wireless Display Driver

Model No.: W-DIS-D

Date: 24-Apr-2017

Report Prepared By:
Magesh.S

EMC Test Report

| | | | |
|---|---|--|---|
| Report Number | EMC0181-1 | | |
| EUT Nomenclature | Wireless Display Driver | | |
| Sample Identification | Model No :W-DIS-D | | |
| | SL. No :MEL-122 | | |
| | Software Version :5.83 | | |
| | Hardware Version :Rev A | | |
| Number of Samples | 1 | | |
| Date of receipt of Sample | 28-Nov-2016 | | |
| Condition of Sample on receipt | Good | | |
| Client name | Honeywell International Inc | | |
| Client Address | Honeywell Life Safety, 12,Clintonville Road, Northford, Connecticut, USA -06472 | | |
| Testing Laboratory | Honeywell Technology Solutions Lab Pvt Ltd | | |
| Address | RMZ ECOWORLD INFRASTRUCTURE PVT Ltd, (Formerly Adarsh Prime Projects Pvt Ltd.,SEZ) Survey # 19/2,Devarabisanahalli Village, Varthur Hobli, Bangalore East Taluk ,Bangalore -560103 | | |
| Test Dates | 05-Dec-2016 to 22-Apr-2017 | | |
| Applicable Standard | FCC Part 15:2010,ANSI C63.10:2013 | | |
| Test Results | PASS | | |
| <table border="1"> <tr> <td> Prepared By: Test Engineer Name : Magesh.S Signature:  Date : 21/06/2017 </td> <td> Reviewed & Authorized By: Technical Manager Name : Prasanna Kumar BT Signature:  Date : 21/6/17 </td> </tr> </table> | | Prepared By: Test Engineer Name : Magesh.S Signature:  Date : 21/06/2017 | Reviewed & Authorized By: Technical Manager Name : Prasanna Kumar BT Signature:  Date : 21/6/17 |
| Prepared By: Test Engineer Name : Magesh.S Signature:  Date : 21/06/2017 | Reviewed & Authorized By: Technical Manager Name : Prasanna Kumar BT Signature:  Date : 21/6/17 | | |
| This Report relates to the above mentioned test sample only. Without the approval of Lab manager, this report shall not be reproduced except in full. | | | |

| TEST SUMMARY | | | | | |
|--|------------------------------------|---|----------------------------------|-------------------------------------|--------------------------|
| Test Performed | Name | Specification | Test Method | Pass | Fail |
| FHSS | | | | | |
| <input type="checkbox"/> | 20dB Bandwidth | FCC Part 15.247 | DA 00-705 | Note 1 | <input type="checkbox"/> |
| <input type="checkbox"/> | Maximum Peak Output Power | FCC Part 15.247 | DA 00-705 | Note 1 | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> | Carrier Frequency Separation | FCC Part 15.247 | DA 00-705 | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> | Number of Hopping Frequencies | FCC Part 15.247 | DA 00-705 | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | Band Edge compliance | FCC Part 15.247 | DA 00-705 | Note 1 | <input type="checkbox"/> |
| <input type="checkbox"/> | Time of Occupancy (Dwell Time) | FCC Part 15.247 | DA 00-705 | Note 1 | <input type="checkbox"/> |
| <input type="checkbox"/> | Spurious RF Conducted Emissions | FCC Part 15.247 | DA 00-705 | Note 1 | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> | Effective Isotropic Radiated Power | FCC Part 15.247 : 2010 and 15.209 : 2010 | KDB 412172 | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> | Spurious Radiated Emissions | FCC Part 15.247 : 2010 and 15.209 : 2010 | DA 00-705 ANSI C63.10 - 2013 | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| DTS | | | | | |
| <input type="checkbox"/> | DTS 6dB Bandwidth | FCC Part 15.247 | KDB 558074 | Note 1 | <input type="checkbox"/> |
| <input type="checkbox"/> | Maximum Peak Output Power | FCC Part 15.247 | KDB 558074 | Note 1 | <input type="checkbox"/> |
| <input type="checkbox"/> | Maximum Power Spectral Density | FCC Part 15.247 | KDB 558074 | Note 1 | <input type="checkbox"/> |
| <input type="checkbox"/> | Band Edge Conducted Emissions | FCC Part 15.247 | KDB 558074 | Note 1 | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> | Effective Isotropic Radiated Power | FCC Part 15.247 : 2010 and 15.209 : 2010 | KDB 412172 | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> | Radiated Spurious Emissions | FCC Part 15.247 : 2010 and 15.209 : 2010 | KDB 558074 ANSI C63.10 - 2013 | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Note 1: Testing performed by Honeywell, Melville, USA. Data/results are part of Test Report Number 20292-1 | | | | | |

| MEASUREMENT UNCERTAINTY | | |
|---|--|--------|
| Where relevant, the following measurement uncertainty levels has been estimated for tests performed on the EUT as specified in CISPR 16-4 | | |
| The Expanded measurement uncertainty (K=2) is provided below | | |
| # | Name | Value |
| 1 | 20dB & 6dB Occupied Bandwidth | 1.08dB |
| 2 | Maximum Peak Output Power Level & Band Edge Conducted Emission | 1.37dB |
| 3 | Power Spectral Density | 1.36dB |
| 4 | Spurious RF Conducted Emission | 1.4dB |
| 5 | Radiated Spurious Emission < 1GHz | 4.9dB |
| 6 | Radiated Spurious Emission > 1GHz | 6.05dB |

1 PRODUCT DETAILS

PRODUCT OPERATION AND INTENDED USE

The W-DIS-D is a part of the wireless network and has a specific SLC module address. The WDIS-D and ANN-80 display the wireless specific events that cannot be displayed on the FACP. These wireless events are related to the trouble and supervisory conditions that are specific to the Wireless Gateway and devices.

W-DIS-D is powered by external 24Vdc interface from Fire Panel. It uses proprietary wireless protocol to communicate with wireless fire devices.

RATINGS AND SYSTEM DETAILS

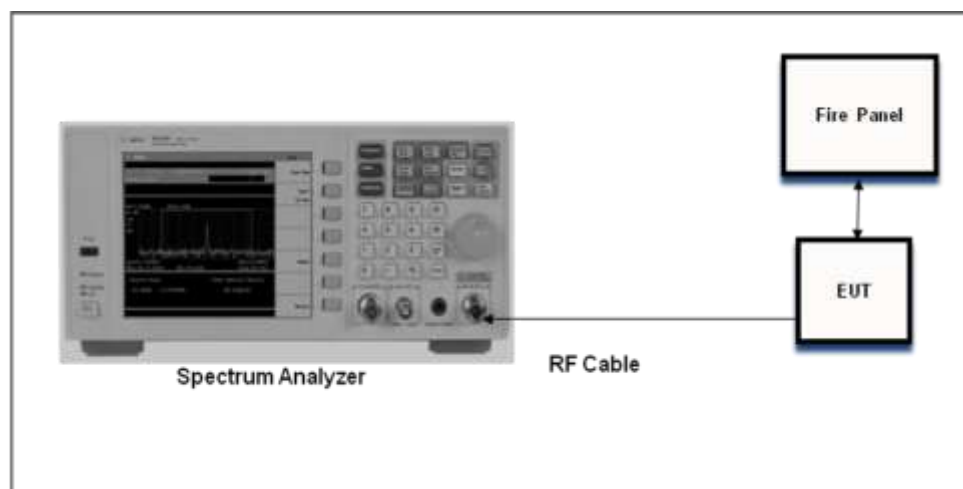
| | | | |
|---------------------------------------|--------------------------|---|-------------|
| Operating Frequency | 902MHz to 928MHz | | |
| Number of Channels | DTS | : | 6 |
| | FHSS | : | 55 |
| Channel Bandwidth (20dB) | DTS | : | 1MHz |
| | FHSS | : | 320KHz |
| Transmitted Power | DTS | : | 12dBm |
| | FHSS | : | 17dBm |
| Modulation Type | FSK | | |
| Data Rate | DTS | : | 300Kbps |
| | FHSS | : | 150Kbps |
| Antenna Type | Inverter F Patch Antenna | | |
| No. of Antenna | 4 | | |
| Antenna Gain | ANT1 | : | 6.88dBi |
| | ANT2 | : | 5.88dBi |
| | ANT3 | : | 3.78dBi |
| | ANT4 | : | 4.55dBi |
| Supply Voltage and Current | 24V, 30mA | | |
| Dimensions (Diameter x Height) | 193mm x 46mm | | |
| Environmental Conditions | Operating Temperature | : | 0 to 49°C |
| | Storage Temperature | : | -10 to 60°C |
| | Humidity | : | 10 to 93%RH |

| TEST CONFIGURATION | |
|--------------------|---|
| Config # | Description |
| Conducted Test | EUT is Powered by 24Vdc line from Fire Panel. EUT Debug port (UART) is connected to Laptop through USB to UART converter cable. EUT is configured to the respective operating mode through HyperTerminal. Antenna 1 is selected for the test as this is the high gain antenna. Post configuration, the USB to UART converter cable is removed for all Radiated Measurements |
| Radiated Test | EUT is Powered by SLC interface line from Fire Panel. EUT Debug port (UART) is connected to Laptop through USB to UART converter cable. EUT is configured to the respective operating mode through HyperTerminal. Test is performed at all 4 Antennas. Post configuration, the USB to UART converter cable is removed for all Radiated Measurements |

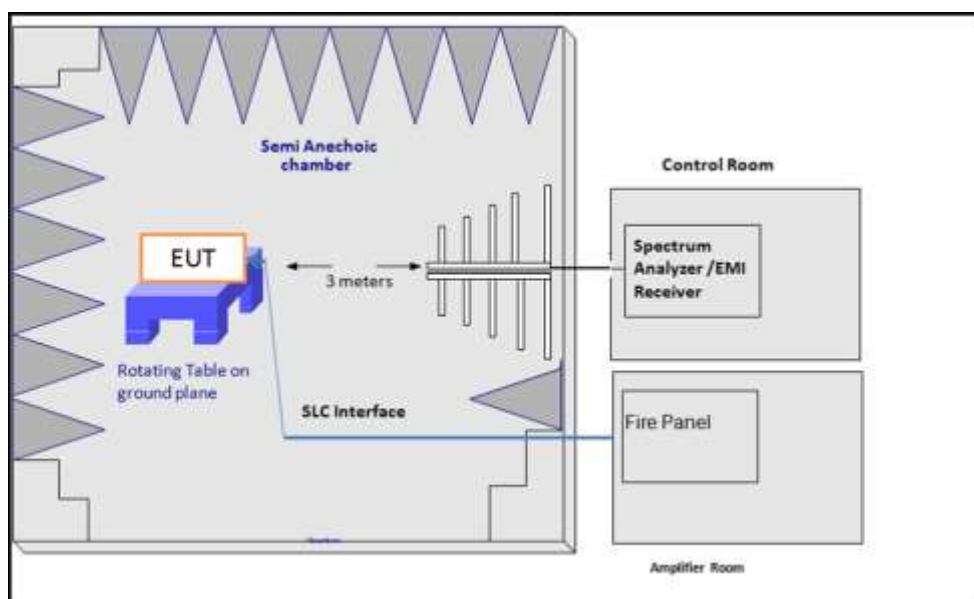
| OPERATING MODES | |
|-----------------|--|
| Mode # | Description |
| DTS | Following DTS channels have been used for Conducted (Continuous Transmission) and Radiated (Pulsed Transmission) Tests Channel 1 : 902.875MHz Channel 3 : 914.325MHz Channel 6 : 927.125MHz |
| FHSS | Following FHSS channels have been used for Conducted (Continuous Transmission) and Radiated (Continuous Transmission) Tests Channel 1 : 903.55MHz Channel 28 : 916.00MHz Channel 55 : 926.45MHz |

| INPUT AND OUTPUT CABLES | | | | | |
|---|------------------------------------|-----------|--------------|---------------------------------|----------|
| Port # | Name | Port Type | Cable Length | Cable type Shielded/ Unshielded | Comments |
| 1 | External 24V Power Interface Cable | Input | 5m | Unshielded | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| *Note : AC = AC Power Port DC = DC Power Port TP = Telecommunication Ports (E.g. Ethernet) DI / DO = Digital Input / Output N / E = Non Electrical AI / AO = Analog Input / Output | | | | | |

| SUPPORT EQUIPMENTS AND ACCESSORIES USED | | | | | |
|---|-------------------|----------|----------------------|-------------------|--------------|
| # | Item Description | Make | Model | Part No. / Sl. No | Cal Due Date |
| 1 | Laptop | Dell | CORPMDTW10X64IMAGEV2 | 339YSC2 | NA |
| 2 | USB to UART Cable | FTDI | NA | TTL-232R-3V3 | NA |
| 3 | Fire Panel | Notifier | NFS-3030 | NA | NA |

CONNECTION DIAGRAM AND SETUP DIAGRAM

Conducted RF Test Setup



Radiated Emission Test Setup

2 FHSS CHANNELS

2.1 CARRIER FREQUENCY SEPERATION

| | | | |
|-----------------------------|---|-----------------------------|-----------|
| EUT Nomenclature | Wireless Display Driver | Test Report No. | EMC0181-1 |
| Model No. | W-DIS-D | Serial No. | MEL-122 |
| Test Start Date | 25-Apr-2017 | Temperature (°C) | 23.9 |
| Test End Date | 25-Apr-2017 | Humidity RH (%) | 57.5 |
| Tested By | Sasikala | Pressure (mbar) | NR |
| Input Voltage / Freq | 24Vdc | | |
| Operating Mode | Refer Page 5 Operating Mode #2 | | |
| Test configuration | Refer Page 5 Test Configuration #1 | | |
| Deviation from Std | NA | | |
| Applicable standard | FCC Part 15.247:2010 | | |
| Test Method | DA 00-705 | | |
| Comment | NA | | |
| TEST DETAILS | | | |
| Method | <input checked="" type="checkbox"/> Conducted <input type="checkbox"/> Radiated | | |
| TEST PARAMETERS | | | |
| Antenna Height | NA | Turntable Rotation | NA |
| Equipment Class | NA | Measurement Distance | NA |

TEST EQUIPMENT

| Y/N | Equipment | Make | Model | Sl. No. | Cal Due Date |
|-----|-------------------|---------------|----------------------|------------|--------------|
| Y | Spectrum Analyzer | Agilent | N9010A | MY48031005 | 22-Feb-2018 |
| Y | RF Cable | Huber- Suhner | SF104/2X11PC3542/500 | NA | NA |

TEST GRAPHS



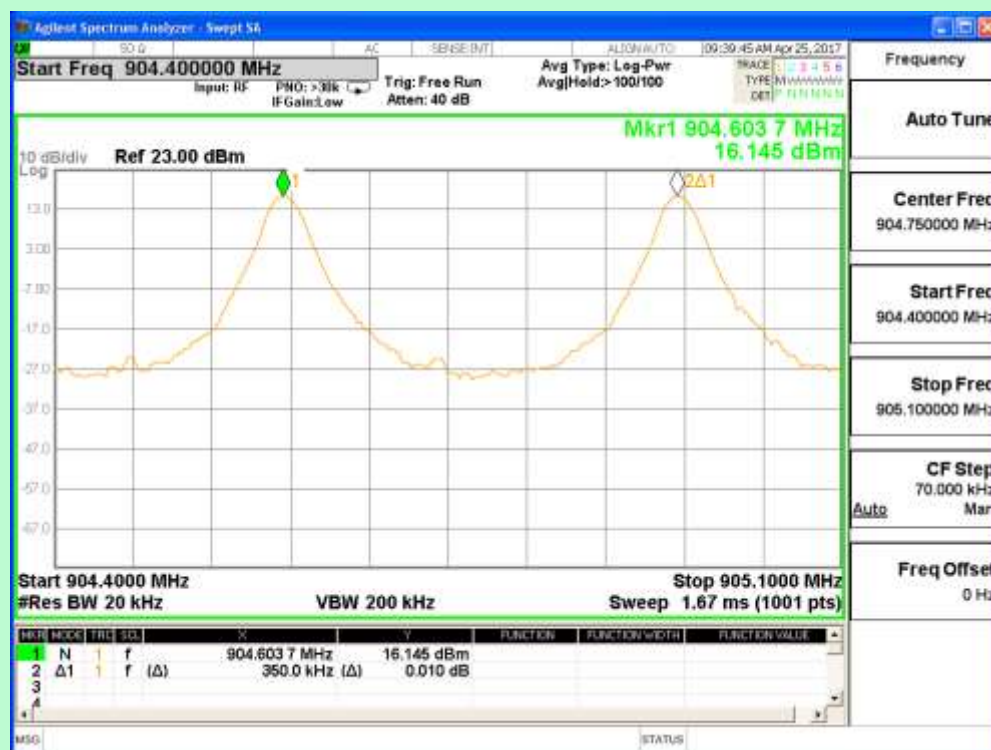
Channel 1 and 2



Channel 2 and 3



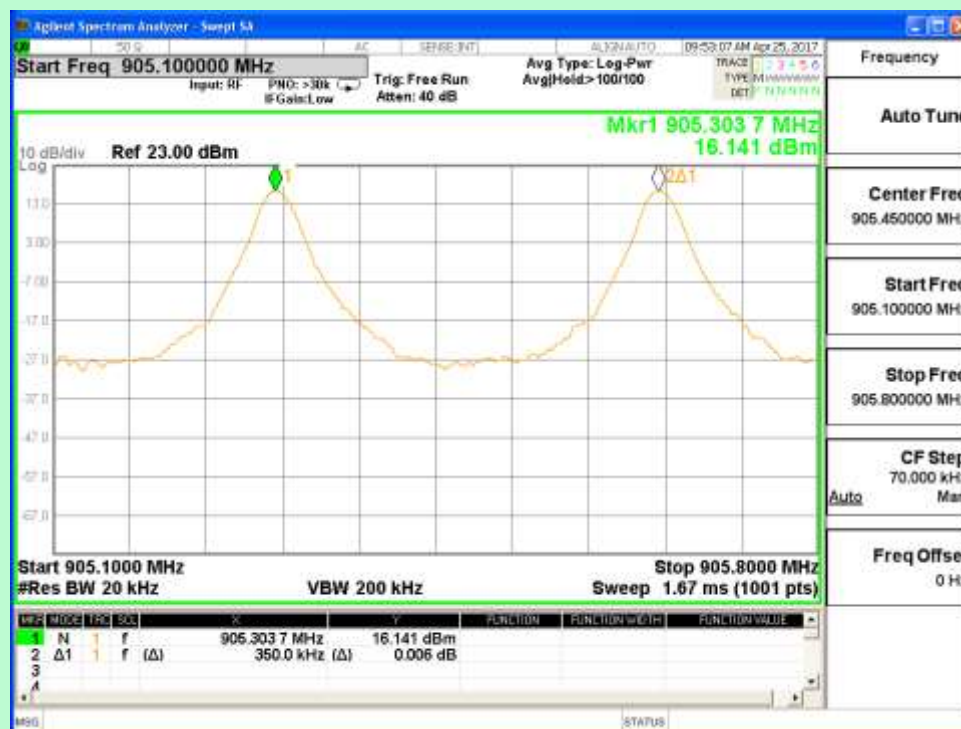
Channel 3 and 4



Channel 4 and 5



Channel 5 and 6



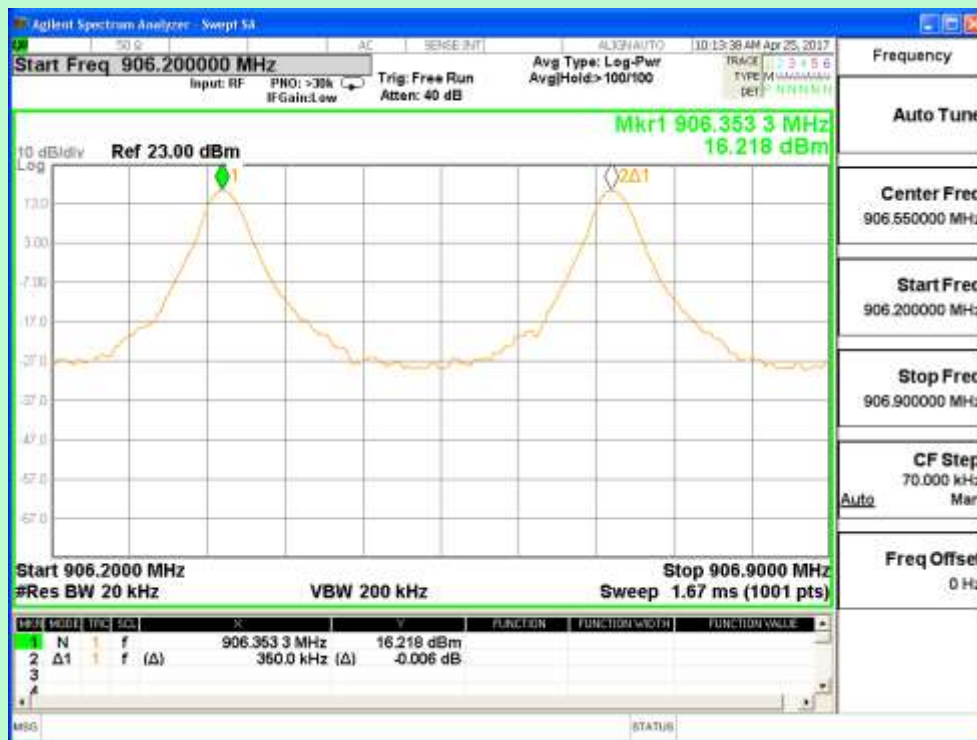
Channel 6 and 7



Channel 7 and 8



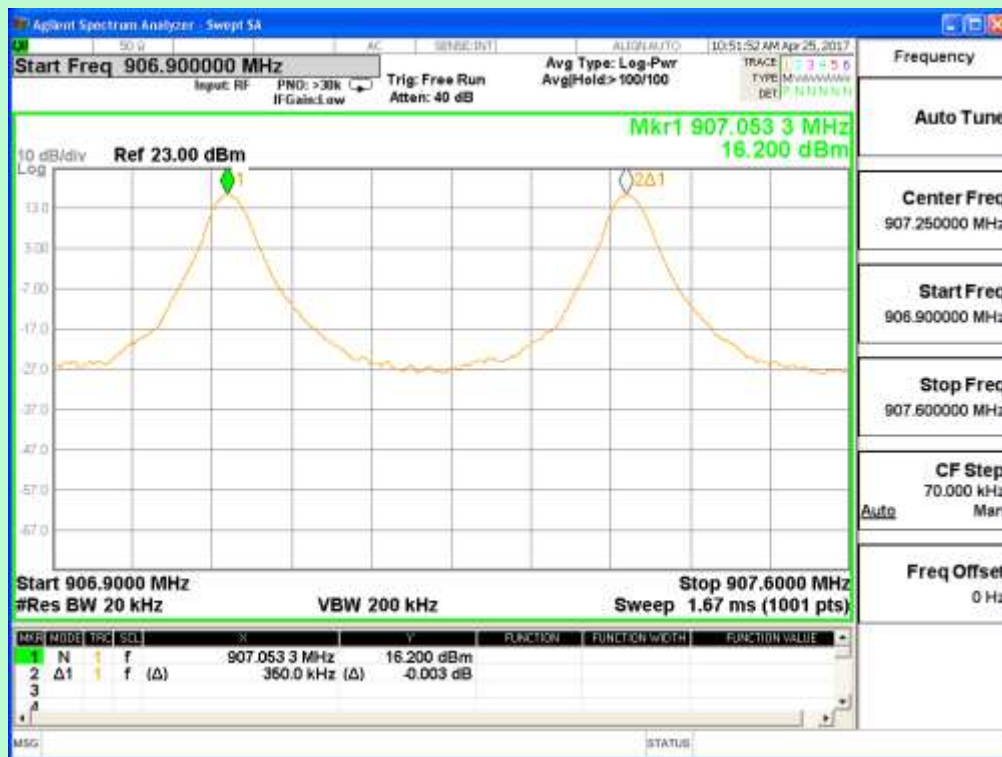
Channel 8 and 9



Channel 9 and 10



Channel 10 and 11



Channel 11 and 12



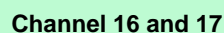
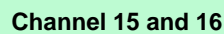
Channel 12 and 13



Channel 13 and 14



Channel 14 and 42

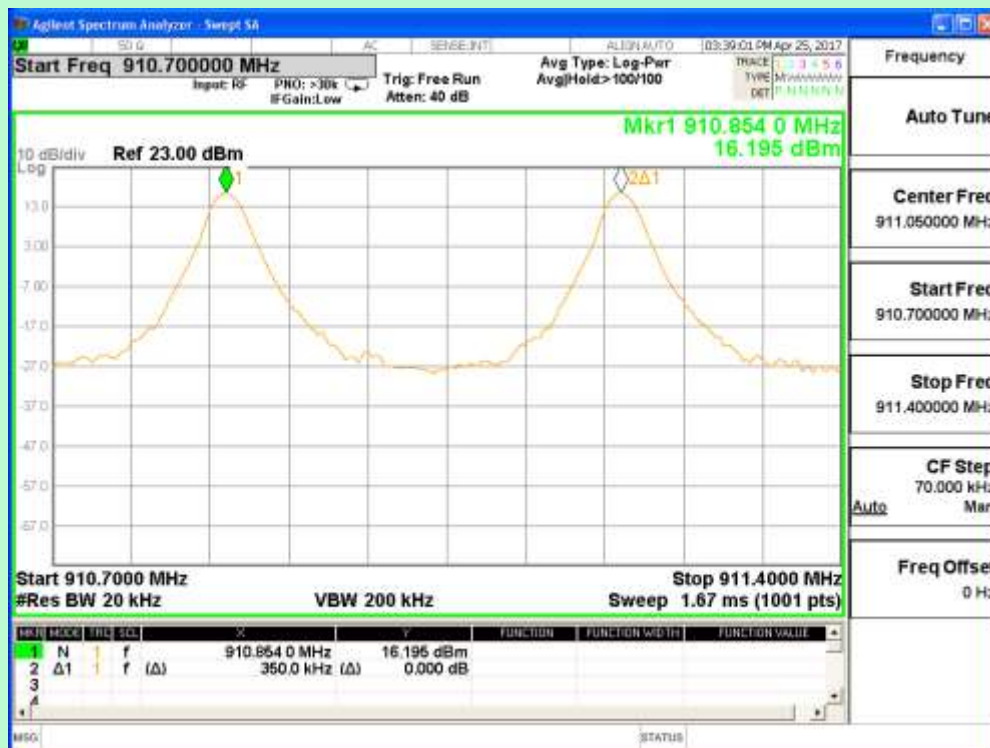




Channel 17 and 18



Channel 18 and 19



Channel 19 and 20



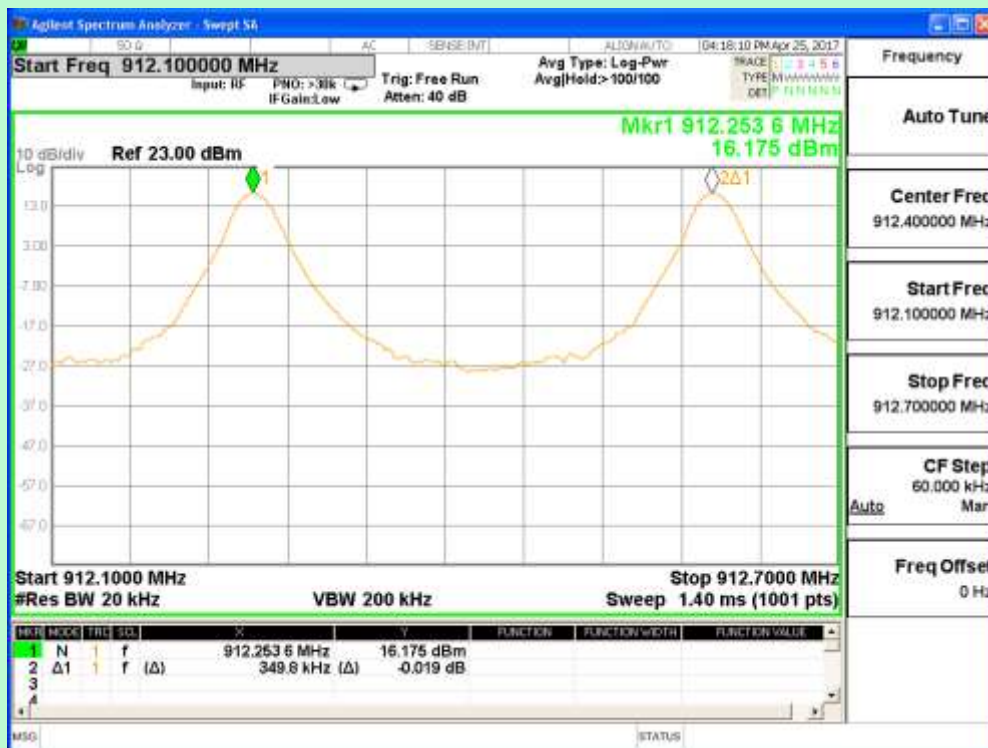
Channel 20 and 21



Channel 21 and 22



Channel 22 and 23



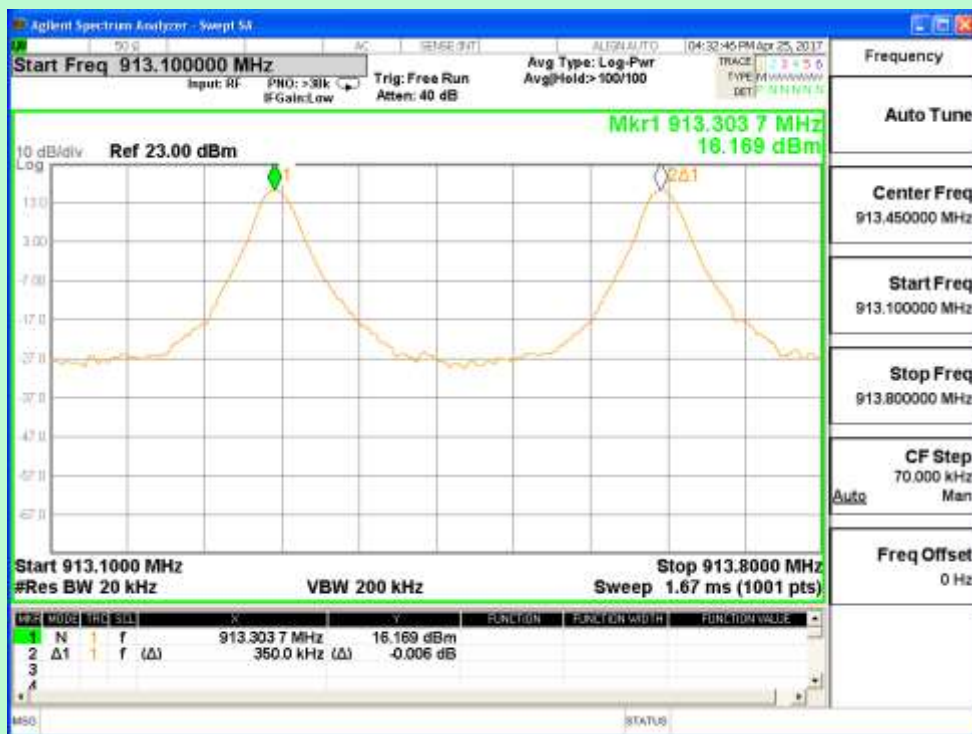
Channel 23 and 24



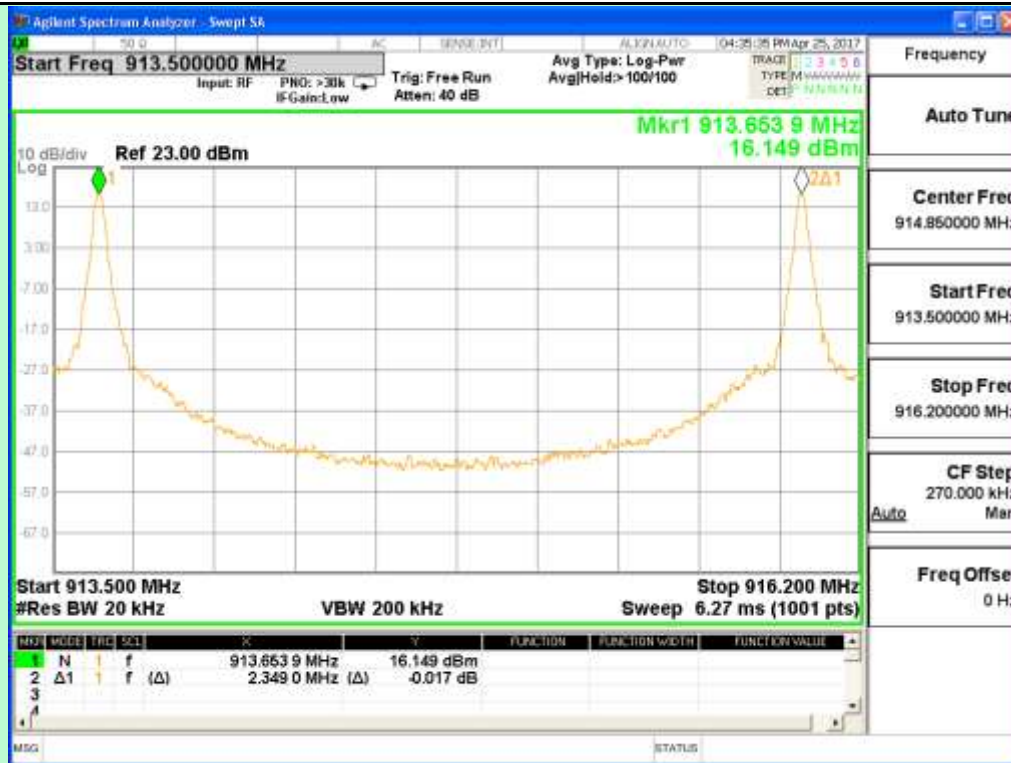
Channel 24 and 25



Channel 25 and 26



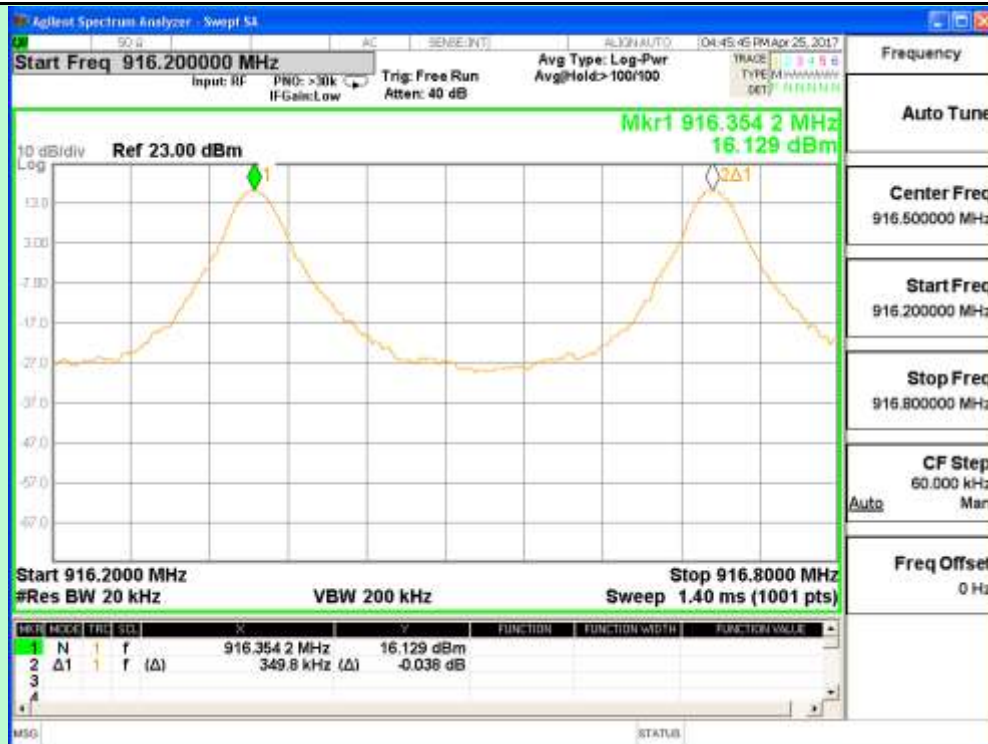
Channel 26 and 27



Channel 27 and 28



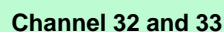
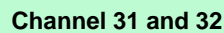
Channel 28 and 29

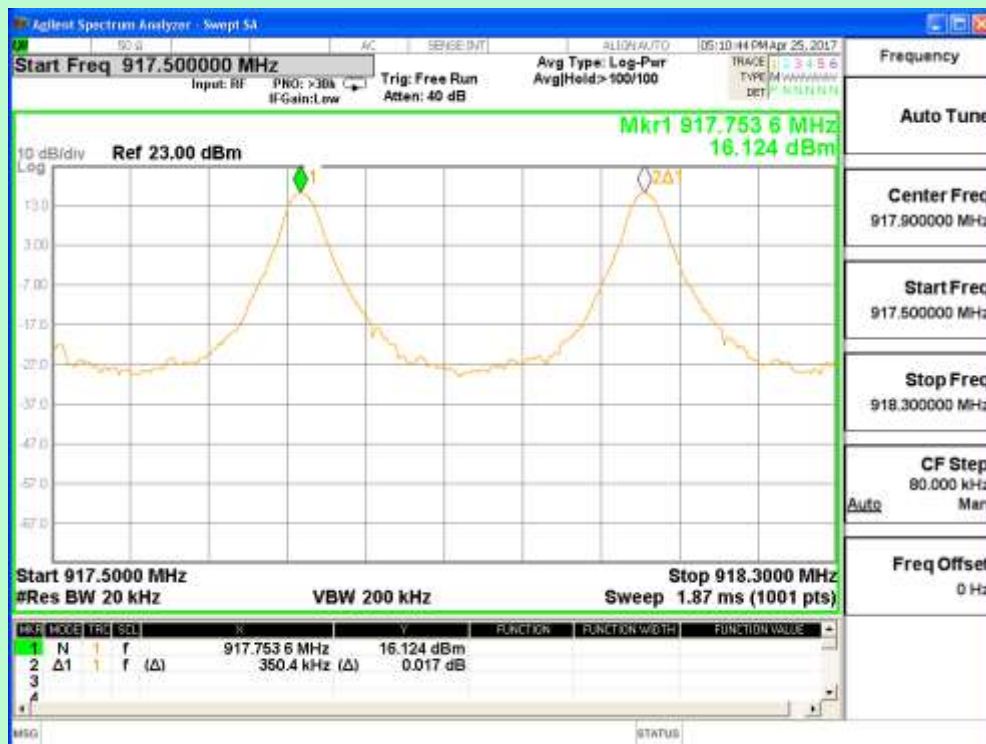


Channel 29 and 30

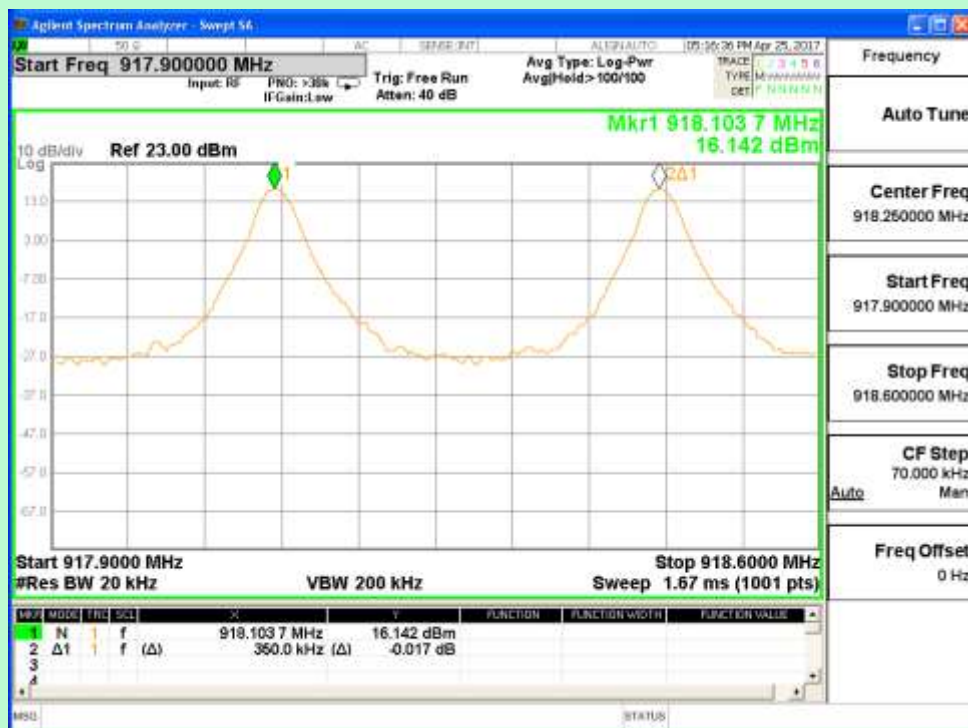


Channel 30 and 31





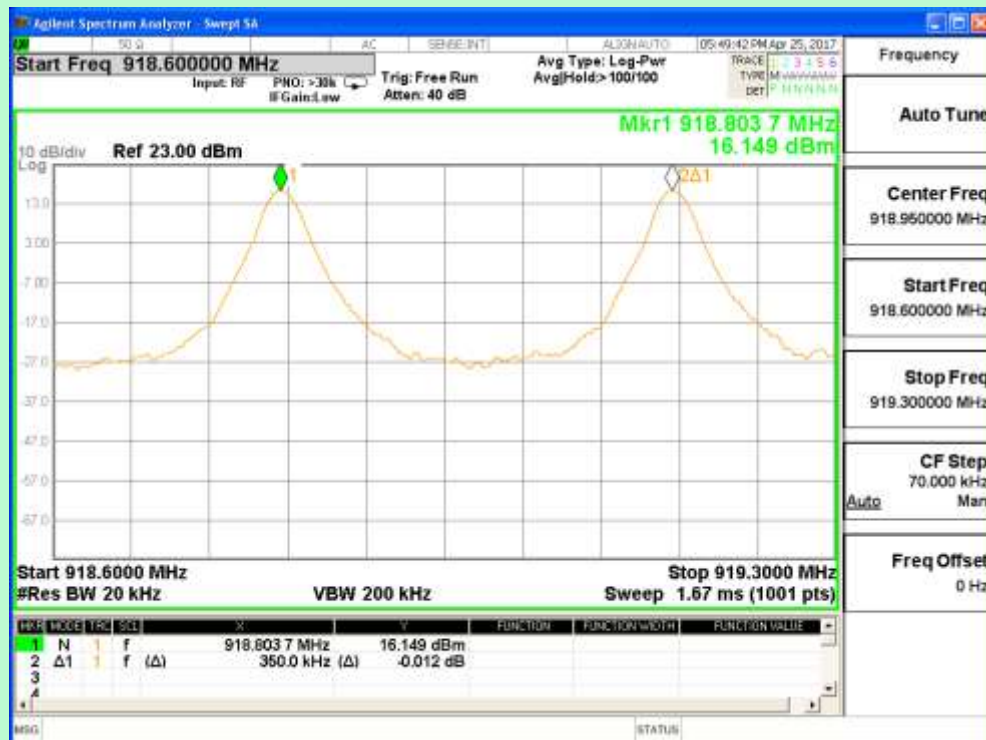
Channel 33 and 34



Channel 34 and 35



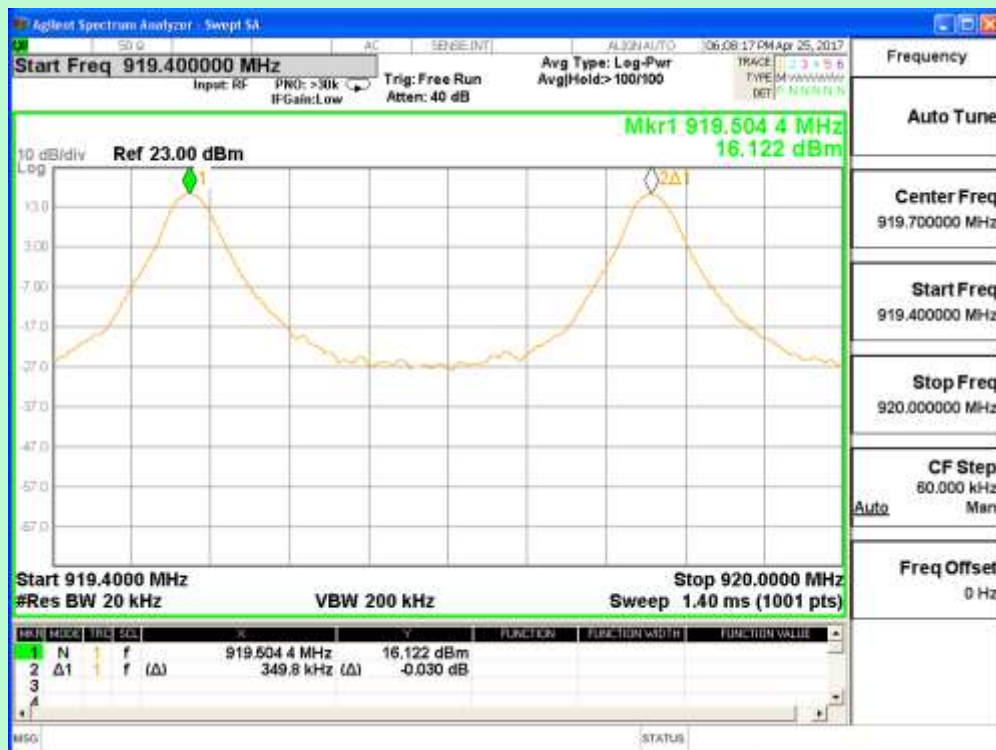
Channel 35 and 36



Channel 36 and 37



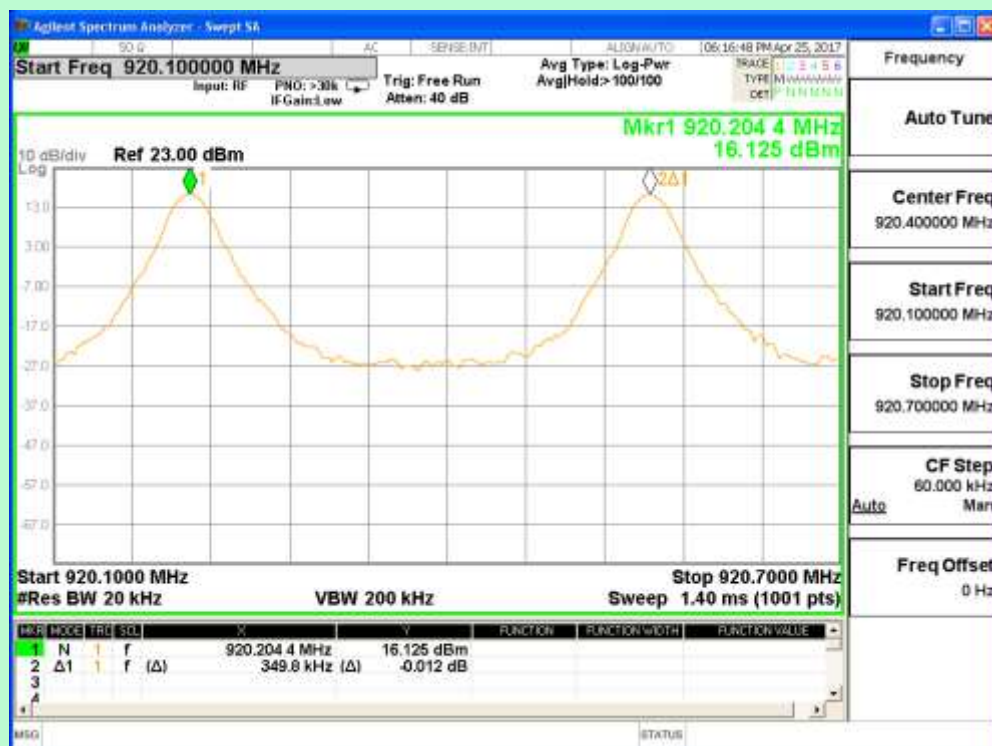
Channel 37 and 38



Channel 38 and 39



Channel 39 and 40



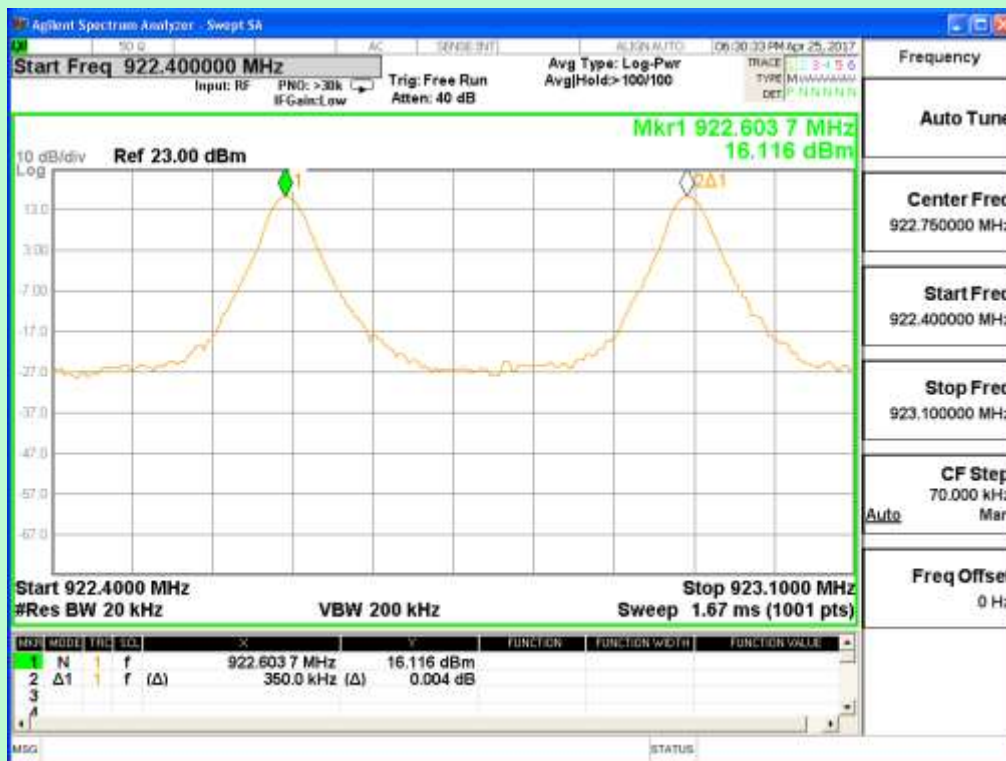
Channel 40 and 41



Channel 42 and 43



Channel 43 and 44



Channel 44 and 45



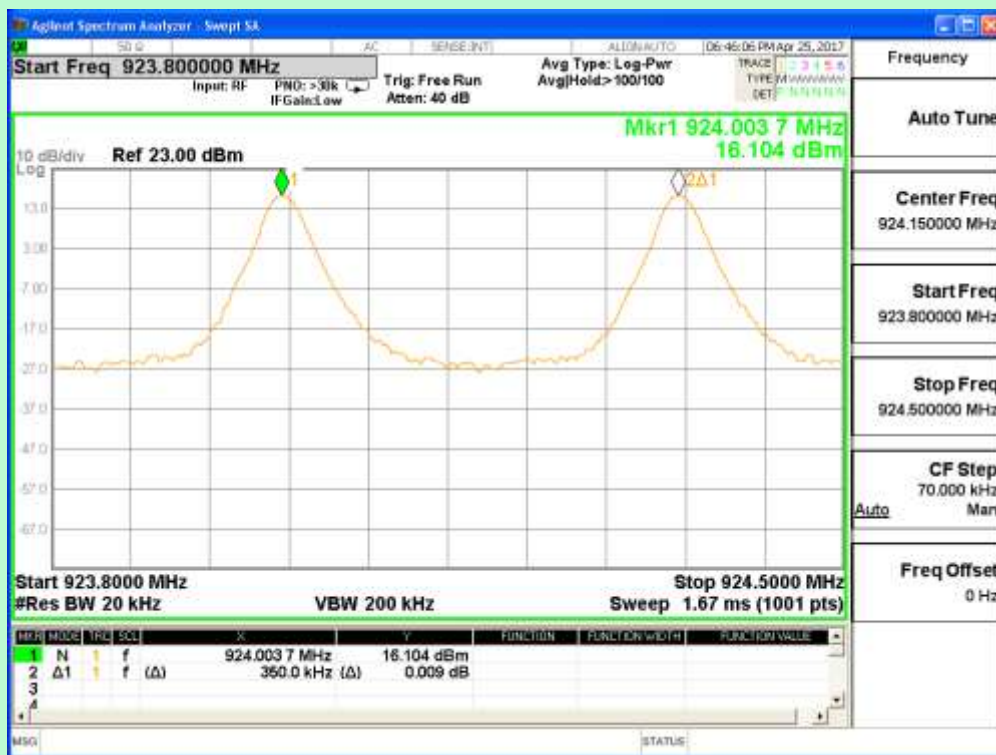
Channel 45 and 46



Channel 46 and 47



Channel 47 and 48



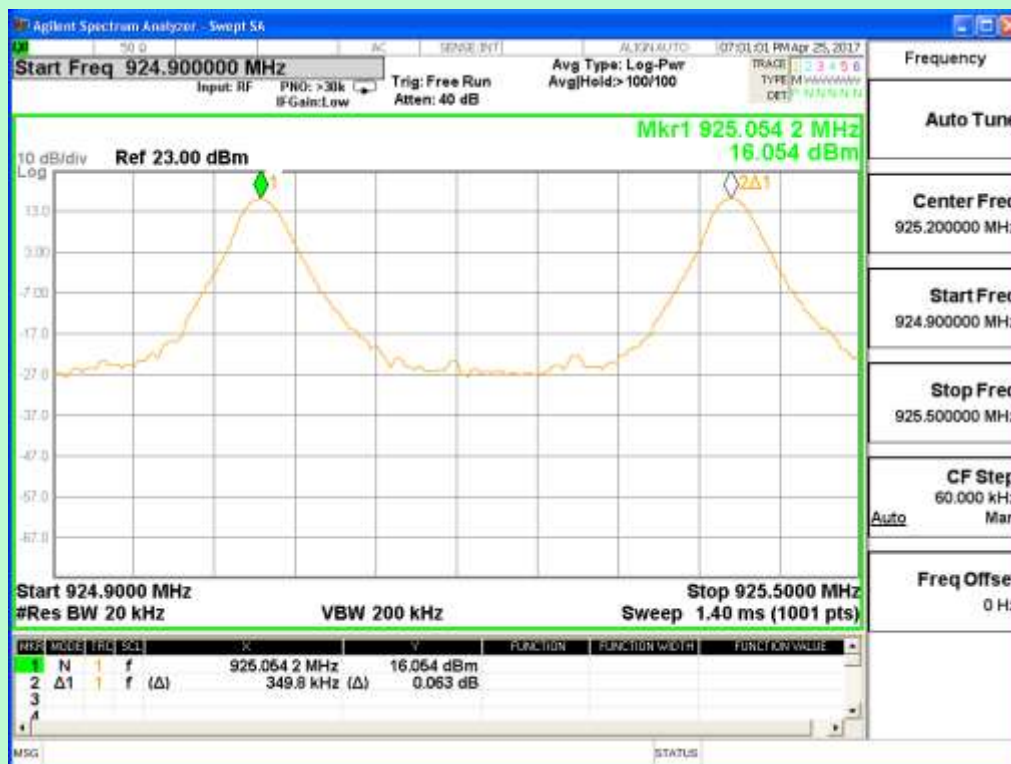
Channel 48 and 49



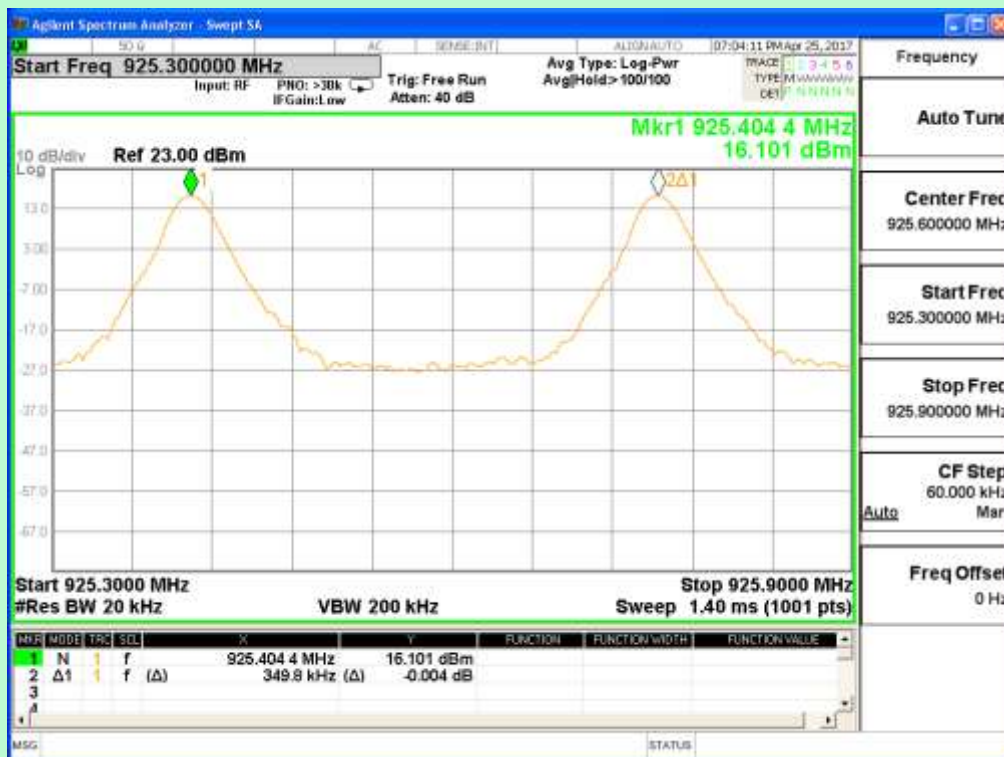
Channel 49 and 50



Channel 50 and 51



Channel 51 and 52



Channel 52 and 53



Channel 53 and 54



Channel 54 and 55

TEST SETUP PHOTOGRAPHS

Refer Annexure -1

| TEST RESULTS | | | |
|--------------|----------------|------------------|--------------|
| Channel No | Measured Value | Limit | Test Results |
| # | KHz | | |
| 1 and 2 | 350.7 | >20dB BW(320KHz) | PASS |
| 2 and 3 | 350 | >20dB BW(320KHz) | PASS |
| 3 and 4 | 350 | >20dB BW(320KHz) | PASS |
| 4 and 5 | 350 | >20dB BW(320KHz) | PASS |
| 5 and 6 | 350.4 | >20dB BW(320KHz) | PASS |
| 6 and 7 | 350 | >20dB BW(320KHz) | PASS |
| 7 and 8 | 350 | >20dB BW(320KHz) | PASS |
| 8 and 9 | 350 | >20dB BW(320KHz) | PASS |
| 9 and 10 | 350 | >20dB BW(320KHz) | PASS |
| 10 and 11 | 350 | >20dB BW(320KHz) | PASS |
| 11 and 12 | 350 | >20dB BW(320KHz) | PASS |
| 12 and 13 | 35.35 | >20dB BW(320KHz) | PASS |
| 13 and 14 | 1.35 | >20dB BW(320KHz) | PASS |
| 14 and 42 | 11.799 | >20dB BW(320KHz) | PASS |
| 15 and 16 | 350 | >20dB BW(320KHz) | PASS |
| 16 and 17 | 350 | >20dB BW(320KHz) | PASS |
| 17 and 18 | 350 | >20dB BW(320KHz) | PASS |
| 18 and 19 | 349.8 | >20dB BW(320KHz) | PASS |
| 19 and 20 | 350 | >20dB BW(320KHz) | PASS |
| 20 and 21 | 350 | >20dB BW(320KHz) | PASS |
| 21 and 22 | 350.4 | >20dB BW(320KHz) | PASS |
| 22 and 23 | 349.8 | >20dB BW(320KHz) | PASS |
| 23 and 24 | 349.8 | >20dB BW(320KHz) | PASS |
| 24 and 25 | 350.35 | >20dB BW(320KHz) | PASS |
| 25 and 26 | 349.8 | >20dB BW(320KHz) | PASS |
| 26 and 27 | 350 | >20dB BW(320KHz) | PASS |
| 27 and 28 | 2.349 | >20dB BW(320KHz) | PASS |
| 28 and 29 | 350 | >20dB BW(320KHz) | PASS |
| 29 and 30 | 349.8 | >20dB BW(320KHz) | PASS |
| 30 and 31 | 350 | >20dB BW(320KHz) | PASS |
| 31 and 32 | 350 | >20dB BW(320KHz) | PASS |
| 32 and 33 | 350 | >20dB BW(320KHz) | PASS |
| 33 and 34 | 350.4 | >20dB BW(320KHz) | PASS |
| 34 and 35 | 350 | >20dB BW(320KHz) | PASS |
| 35 and 36 | 349.6 | >20dB BW(320KHz) | PASS |
| 36 and 37 | 350 | >20dB BW(320KHz) | PASS |
| 37 and 38 | 349.8 | >20dB BW(320KHz) | PASS |
| 38 and 39 | 349.8 | >20dB BW(320KHz) | PASS |
| 39 and 40 | 349.8 | >20dB BW(320KHz) | PASS |
| 40 and 41 | 349.8 | >20dB BW(320KHz) | PASS |
| 42 and 43 | 1.349 | >20dB BW(320KHz) | PASS |
| 43 and 44 | 349.8 | >20dB BW(320KHz) | PASS |
| 44 and 45 | 350 | >20dB BW(320KHz) | PASS |
| 45 and 46 | 350.4 | >20dB BW(320KHz) | PASS |
| 46 and 47 | 350.7 | >20dB BW(320KHz) | PASS |
| 47 and 48 | 349.8 | >20dB BW(320KHz) | PASS |
| 48 and 49 | 350 | >20dB BW(320KHz) | PASS |
| 49 and 50 | 349.8 | >20dB BW(320KHz) | PASS |
| 50 and 51 | 349.8 | >20dB BW(320KHz) | PASS |
| 51 and 52 | 349.8 | >20dB BW(320KHz) | PASS |
| 52 and 53 | 349.8 | >20dB BW(320KHz) | PASS |
| 53 and 54 | 349.8 | >20dB BW(320KHz) | PASS |
| 54 and 55 | 349.8 | >20dB BW(320KHz) | PASS |

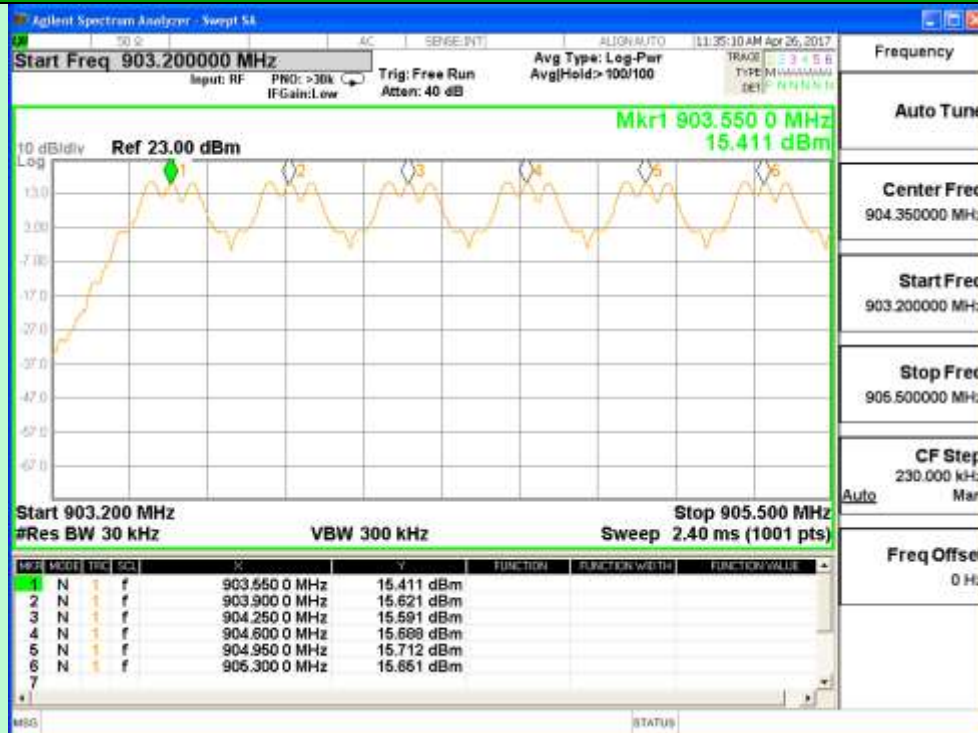
2.2 NUMBER OF HOPPING FREQUENCIES

| | | | |
|-----------------------------|---|-----------------------------|-----------|
| EUT Nomenclature | Wireless Display Driver | Test Report No. | EMC0181-1 |
| Model No. | W-DIS-D | Serial No. | MEL-122 |
| Test Start Date | 26-Apr-2017 | Temperature (°C) | 24.2 |
| Test End Date | 26-Apr-2017 | Humidity RH (%) | 56.9 |
| Tested By | Sasikala | Pressure (mbar) | NR |
| Input Voltage / Freq | 24Vdc | | |
| Operating Mode | Refer Page 5 Operating Mode #2 | | |
| Test configuration | Refer Page 5 Test Configuration Mode #1 | | |
| Deviation from Std | NA | | |
| Applicable standard | FCC Part 15.247:2010 | | |
| Test Method | DA 00-705 | | |
| Comment | NA | | |
| TEST DETAILS | | | |
| Method | <input checked="" type="checkbox"/> Conducted <input type="checkbox"/> Radiated | | |
| TEST PARAMETERS | | | |
| Antenna Height | NA | Turntable Rotation | NA |
| Equipment Class | NA | Measurement Distance | NA |

TEST EQUIPMENT

| Y/N | Equipment | Make | Model | Sl. No. | Cal Due Date |
|-----|-------------------|---------------|----------------------|------------|--------------|
| Y | Spectrum Analyzer | Agilent | N9010A | MY48031005 | 28-Feb-2018 |
| Y | RF Cable | Huber- Suhner | SF104/2X11PC3542/500 | NA | NA |

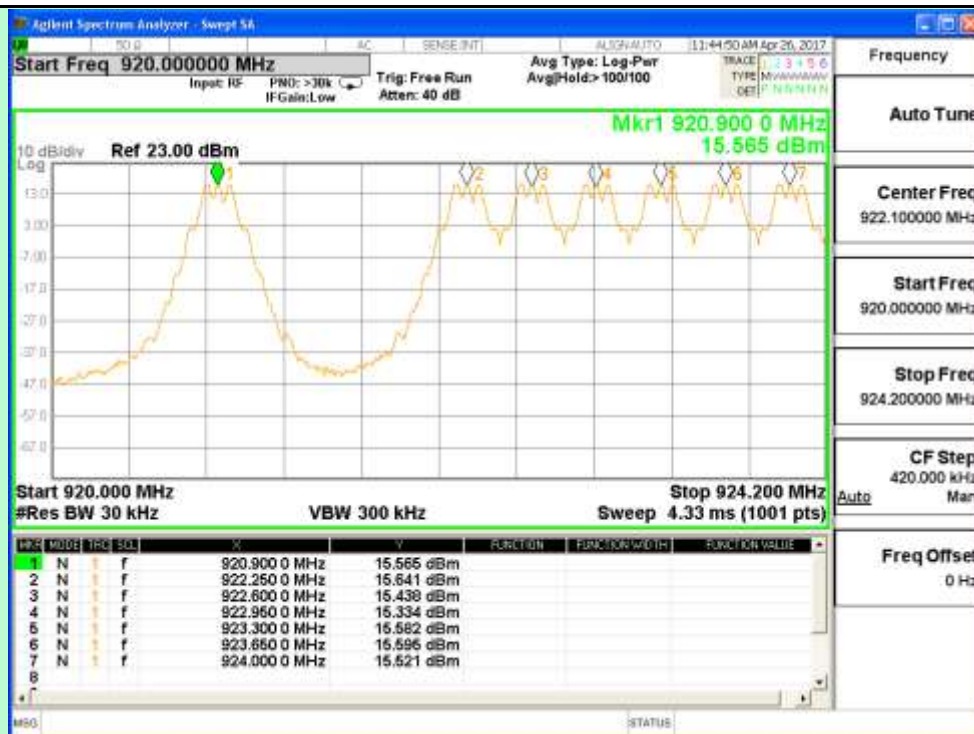
TEST GRAPHS



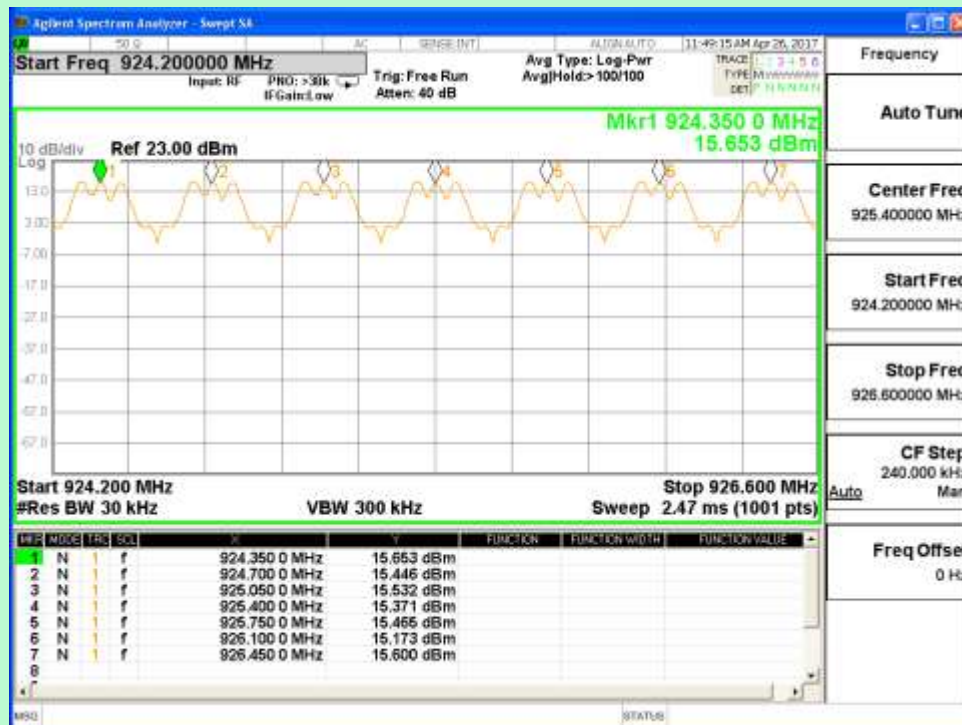
Channel 1 – 6 (Walkie-Talkie Mode)



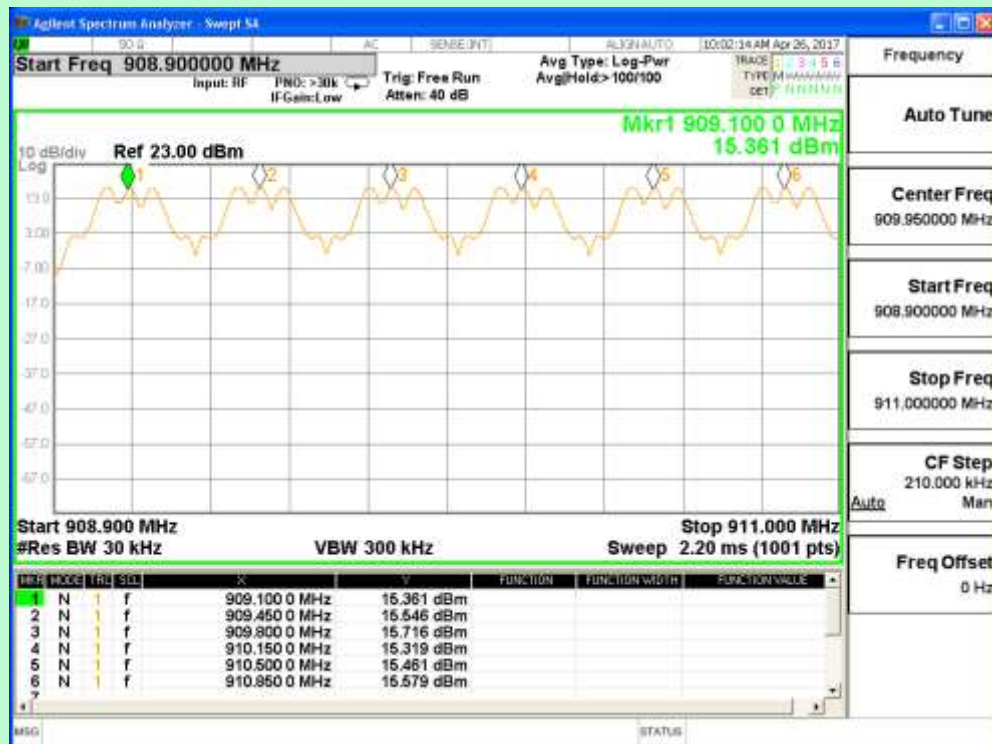
Channel 7 – 13 (Walkie-Talkie Mode)



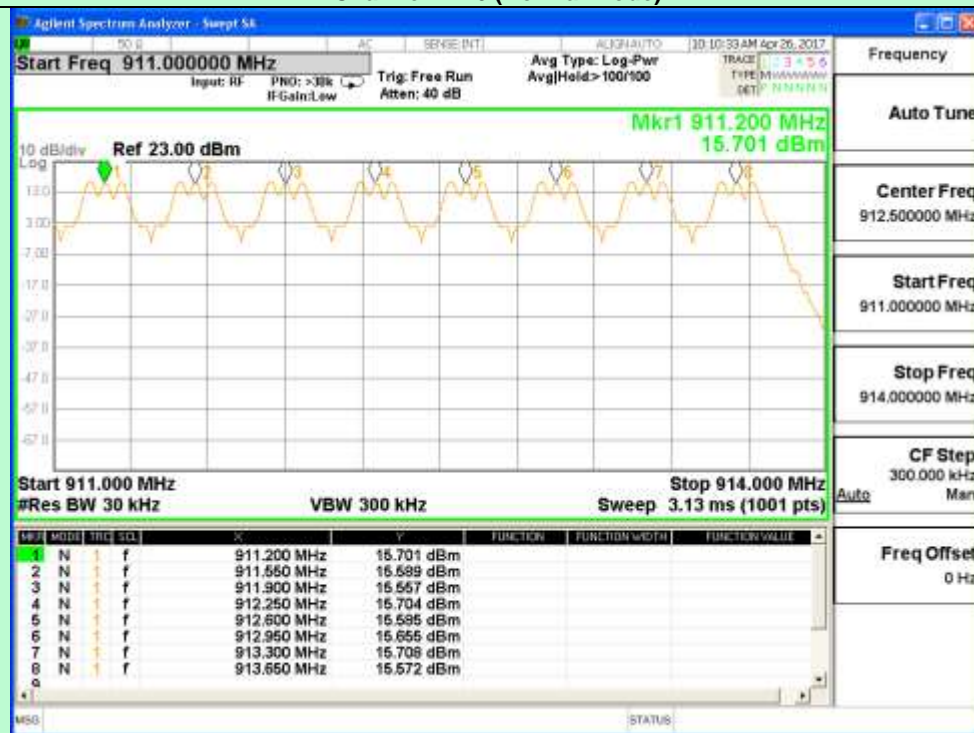
Channel 14 – 20 (Walkie-Talkie Mode)



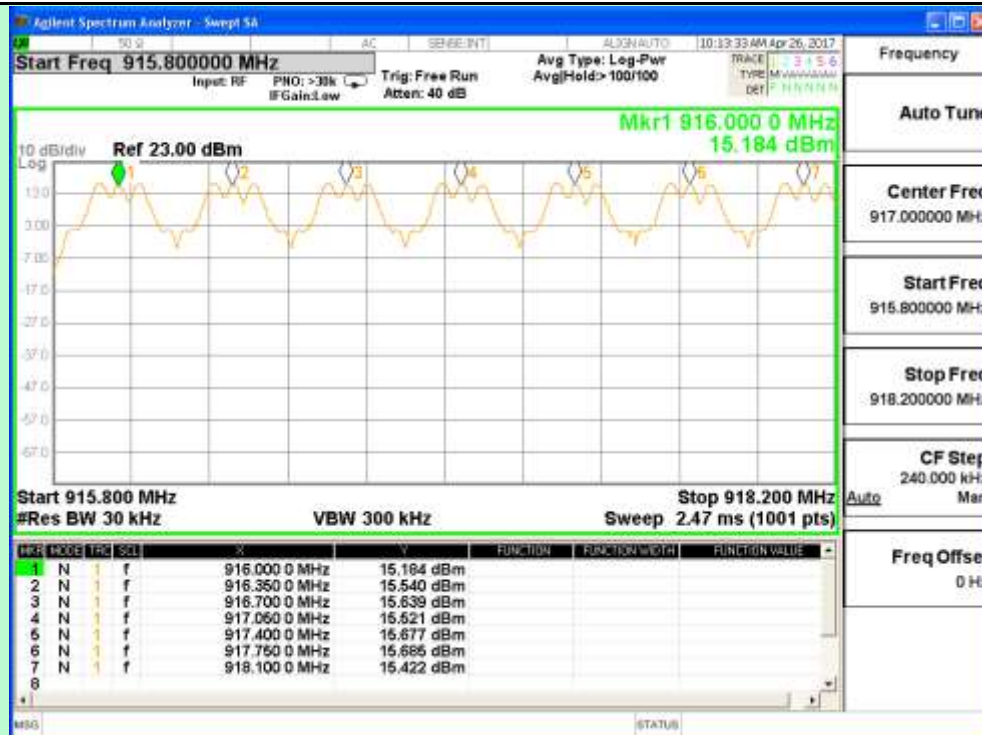
Channel 21 – 27 (Walkie-Talkie Mode)



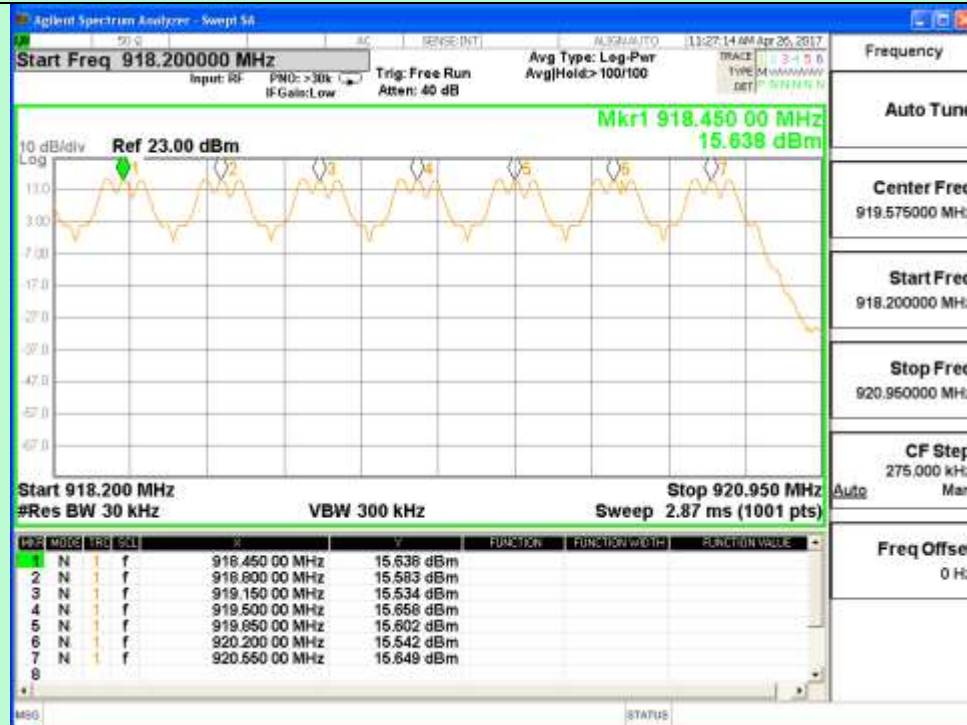
Channel 1 – 6 (Normal Mode)



Channel 7 – 14 (Normal Mode)



Channel 15 – 21 (Normal Mode)



Channel 22 – 28 (Normal Mode)