

FCC PART 15C  
RSS-GEN ISSUE 4, NOVEMBER 2014  
RSS-210, ISSUE 9, AUGUST 2016

TEST REPORT

For

**Fujian LANDI Commercial Equipment Co., Ltd.**

Building 17, Section A, Software Park, No. 89 Software Road, Gulou District, Fuzhou  
Municipality, Fujian Province, P.R. China.

**FCC ID: 2AG6N-APOSA8-BLWF**  
**IC: 23725-APOSA8BLWF**

<b>Report Type:</b> Original Report	<b>Product Name:</b> APOS A8
<b>Report Number:</b> RXM171225055-00A	
<b>Report Date:</b> 2018-04-13	
<b>Reviewed By:</b>	Jerry Zhang EMC Manager <i>Jerry Zhang</i>
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## GENERAL INFORMATION

### Product Description for Equipment Under Test (EUT)

<b>EUT Name:</b>		APOS A8
<b>EUT Model:</b>		APOS A8-I94A4
<b>FCC ID:</b>		2AG6N-APOSA8-BLWF
<b>IC:</b>		23725-APOSA8BLWF
<b>Rated Input Voltage:</b>		DC7.2V from battery or DC 5V from USB port
<b>Adapter #1 Information</b>	<b>Model:</b>	HKA00505010-XA
	<b>Input:</b>	AC 100-240V, 50/60Hz, 0.2A
	<b>Output:</b>	DC 5V, 1.0A
<b>Adapter #2 Information</b>	<b>Model:</b>	HKC0115021-2D
	<b>Input:</b>	AC 100-240V, 50/60Hz, 0.5A
	<b>Output:</b>	DC 5V, 2A
<b>The Highest Operating Frequency:</b>		5825MHz
<b>External Dimension:</b>		Length (183mm)*Width (84mm)*High (64mm)
<b>Serial Number:</b>		171225055
<b>EUT Received Date:</b>		2018.1.26

### Objective

This type approval report is prepared on behalf of *Fujian LANDI Commercial Equipment Co., Ltd.* in accordance with Part 2, Subpart J, and Part 15, Subparts A and C of the Federal Communications Commission's rules and RSS-210, Issue 9, August 2016 of the Innovation, Science and Economic Development Canada.

The objective is to determine the compliance of the EUT with FCC rules, sec 15.203, 15.205, 15.207, 15.209 and 15.225, and RSS-Gen, Issue 4, November 2014, General Requirements for Compliance of Radio Apparatus.

### Related Submittal(s)/Grant(s)

FCC Part 15C DTS submissions with FCC ID: 2AG6N-APOSA8-BLWF.  
FCC Part 15C DSS submissions with FCC ID: 2AG6N-APOSA8-BLWF.  
FCC Part 15E NII submissions with FCC ID: 2AG6N-APOSA8-BLWF.  
RSS-247 DSSs, RSS-247 DTSSs, RSS-247 LE-LAN, submissions with IC: 23725-APOSA8BLWF.

## Test Methodology

All measurements detailed in this Test Report were performed in accordance with ANSI C63.10-2013 “American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices”, and the RSS-210, Issue 9, August 2016. Applicable Standard: Licence-Exempt Radio Apparatus: Category I Equipment. And RSS-Gen, Issue 4, November 2014, General Requirements for Compliance of Radio Apparatus.

All emissions measurement was performed and Bay Area Compliance Laboratories Corp. (Dongguan). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

## Measurement Uncertainty

Parameter	Measurement Uncertainty
Occupied Channel Bandwidth	±5 %
radiated Emissions	9kHz~30MHz: 4.12dB 30M~200MHz: 4.58 dB for Horizontal, 4.59 dB for Vertical 200M~1GHz: 4.83 dB for Horizontal, 5.85 dB for Vertical
Temperature	±1℃
Humidity	±5%
DC and low frequency voltages	±0.4%
Duty Cycle	1%
AC Power Lines Conducted Emission	3.12 dB (150 kHz to 30 MHz)

## Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.69 Pulongcun, Puxinhu Industry Area, Tangxia, Dongguan, Guangdong, China.

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 897218, the FCC Designation No. : CN1220.

The test site has been registered with ISED Canada under ISED Canada Registration Number 3062D.

## SYSTEM TEST CONFIGURATION

### Justification

The system was configured for testing in a test mode.

### EUT Exercise Software

No software used in test.

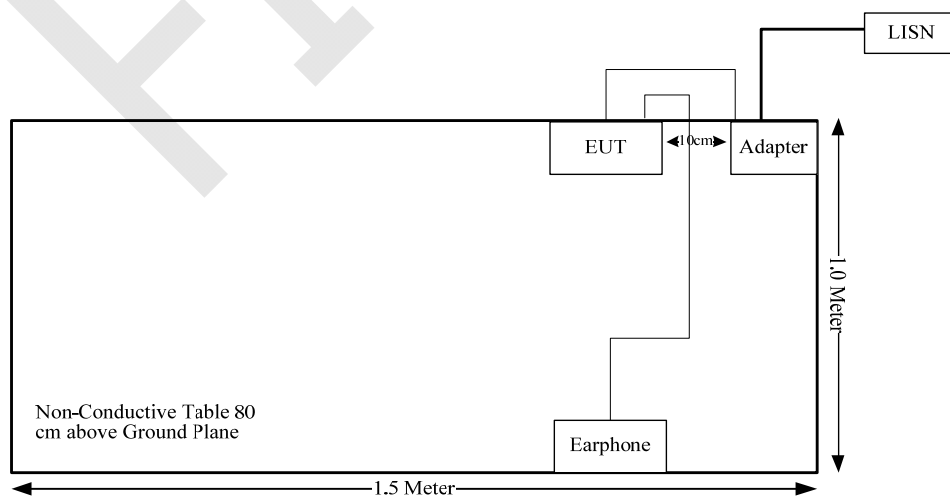
### Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
HUAWEI	Earphone	/	/

### External Cable

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
USB cable	yes	No	0.8	Adapter	EUT

### Block Diagram of Test Setup



**Test Equipment List**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCS 30	830245/006	2017-12-11	2018-12-11
N/A	Coaxial Cable	C-NJNJ-50	C-0200-01	2017-9-5	2018-9-5
R&S	Test Software	EMC32	Version8.53.0	N/A	N/A
R&S	Two-line V-network	ENV 216	101614	2017-12-8	2018-12-8
R&S	L.I.S.N	ESH2-Z5	892107/021	2017-9-25	2018-9-25
R&S	EMI Test Receiver	ESCI	100224	2017-12-11	2018-12-11
SONAMA	Amplifier	310	US43180214	2017-9-5	2018-9-5
HP	Amplifier	8447D	2727A05902	2017-9-5	2018-9-5
N/A	Coaxial Cable	C-NJNJ-50	C-0400-01	2017-9-5	2018-9-5
N/A	Coaxial Cable	C-NJNJ-50	C-0075-01	2017-9-5	2018-9-5
N/A	Coaxial Cable	C-NJNJ-50	C-1000-01	2017-9-5	2018-9-5
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A
EMCO	Passive Loop	6512	9706-1206	2017-3-5	2020-3-4
Sunol Sciences	Antenna	JB3	A060611-1	2017-11-10	2020-11-10

\* Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

**SUMMARY OF TEST RESULTS**

FCC Rules	Description of Test	Result
§15.203 RSS-Gen§8.3	Antenna Requirement	Compliance
§15.207 RSS-Gen Clause 8.8	AC Line Conducted Emission	Compliance
§15.225 §15.209 §15.205 RSS-210 Clause B.6 RSS-Gen Clause 8.9	Radiated Emission Test	Compliance
§15.225(e) RSS- Gen§8.11 &RSS-210§B.6	Frequency Stability	Compliance
§15.215(c) RSS- Gen§6.6	20 dB Emission Bandwidth & 99% Occupied Bandwidth	Compliance

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**FCC§15.203 & RSS-GEN §8.3 - ANTENNA REQUIREMENT**

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**Applicable Standard**

According to FCC § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

According to RSS-Gen §8.3, The applicant for equipment certification, as per RSP-100, must provide a list of all antenna types that may be used with the licence-exempt transmitter, indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna.

Licence-exempt transmitters that have received equipment certification may operate with different types of antennas. However, it is not permissible to exceed the maximum equivalent isotropically radiated power (e.i.r.p.) limits specified in the applicable standard (RSS) for the licence-exempt apparatus.

Testing shall be performed using the highest gain antenna of each combination of licence-exempt transmitter and antenna type, with the transmitter output power set at the maximum level. When a measurement at the antenna connector is used to determine RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna manufacturer.

User manuals for transmitters equipped with detachable antennas shall also contain the following notice in a conspicuous location:

This radio transmitter (identify the device by certification number or model number if Category II) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Immediately following the above notice, the manufacturer shall provide a list of all antenna types approved for use with the transmitter, indicating the maximum permissible antenna gain (in dBi).

**Antenna Connected Construction**

The EUT has one integral antenna arrangement, which was permanently attached and fulfill the requirement of this section. Please refer to the EUT photos.

**Result:** Compliance.



## FCC §15.207 & RSS-GEN §8.8 – AC LINE CONDUCTED EMISSION

### Applicable Standard

A radio apparatus that is designed to be connected to the public utility (AC) power line shall ensure that the radio frequency voltage, which is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz-30 MHz, shall not exceed the limits in Table 3.

Unless the requirements applicable to a given device state otherwise, for any radio apparatus equipped to operate from the public utility AC power supply either directly or indirectly (such as with a battery charger), the radio frequency voltage of emissions conducted back onto the AC power lines in the frequency range of 0.15 MHz to 30 MHz shall not exceed the limits shown in Table 3 below. The more stringent limit applies at the frequency range boundaries.

The conducted emissions shall be measured in accordance with the reference publication mentioned in Section 3.

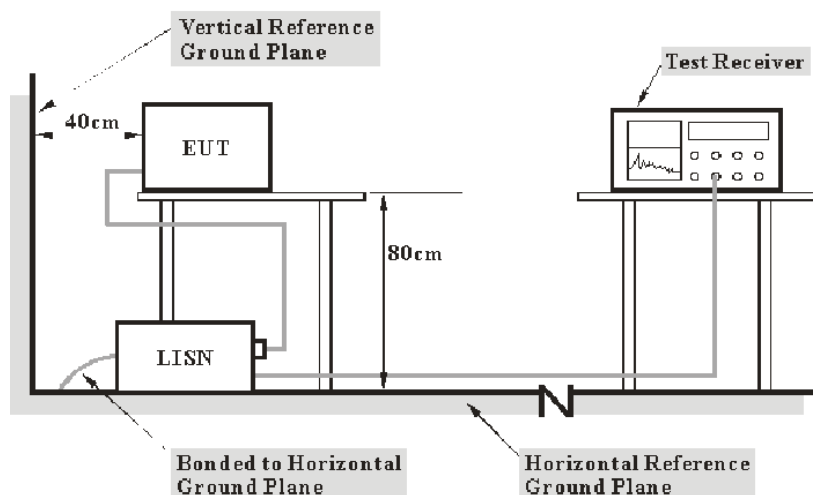
Table 3 - AC Power Lines Conducted Emission Limits		
Frequency range (MHz)	Conducted limit (dBμV)	
	Quasi-Peak	Average**
0.15 – 0.5	66 to 56*	56 to 46*
0.5 – 5	56	46
5 – 30	60	50

Note:

\* The level decreases linearly with the logarithm of the frequency.

\*\* A linear average detector is required.

### EUT Setup



Note: 1. Support units were connected to second LISN.

2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

The adapter was connected to the main LISN with an AC 120V/60Hz power source.

### EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

### Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

According FCC publication number 174176, for a device with a permanent antenna operating at or below 30 MHz, the measurements done with a suitable dummy load, in lieu of the permanent antenna under the following conditions: (1) perform the AC line conducted tests with the permanent antenna to determine compliance with the Section 15.207 limits outside the transmitter's fundamental emission band; (2) retest with a dummy load in lieu of the permanent antenna to determine compliance with the Section 15.207 limits within the transmitter's fundamental emission band.

### Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$$V_C = V_R + A_C + VDF$$

Herein,

$V_C$ : corrected voltage amplitude

$V_R$ : reading voltage amplitude

$A_C$ : attenuation caused by cable loss

VDF: voltage division factor of AMN or ISN

The “**Margin**” column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

### Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.207.

### Test Data

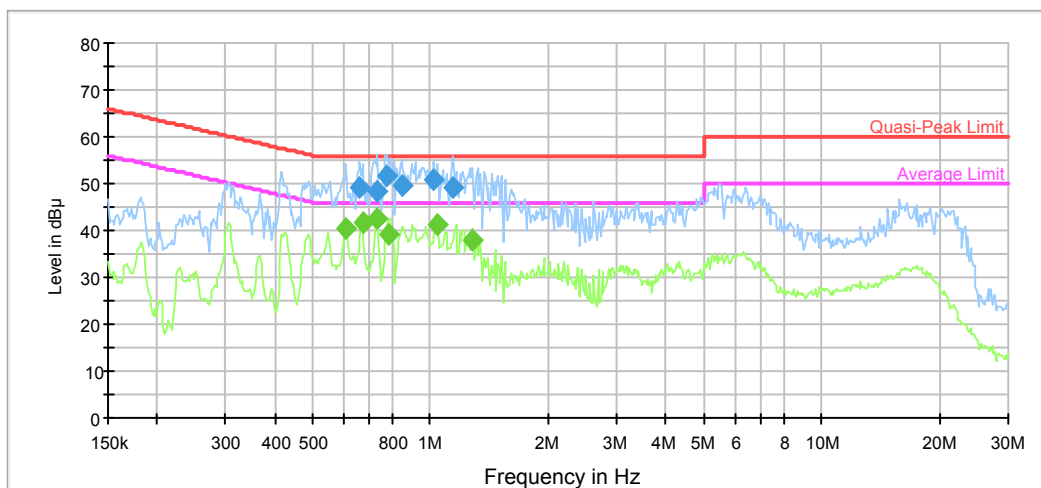
#### Environmental Conditions

<b>Temperature:</b>	19.4 °C
<b>Relative Humidity:</b>	26 %
<b>ATM Pressure:</b>	102.1 kPa

*The testing was performed by Alex You on 2018-02-06.*

**Result:** Compliance.

Model Number: APOS A8-I94A4  
 Port: L  
 Test Mode: Transmitting  
 Power Source: AC 120V/60Hz  
 Note: Adapter #1



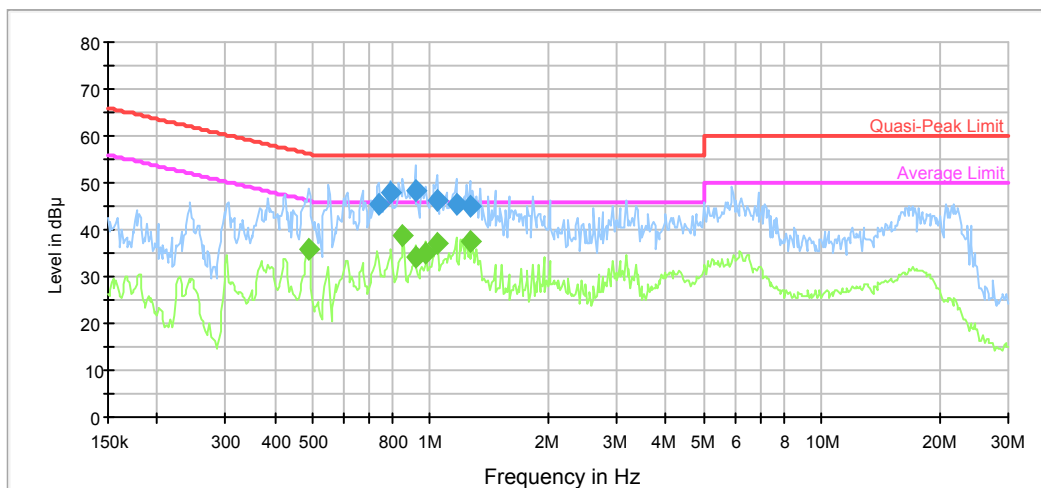
## Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.660314	49.0	9.000	L1	9.8	7.0	56.0
0.732382	48.5	9.000	L1	9.8	7.5	56.0
0.774393	51.9	9.000	L1	9.8	4.1	56.0
0.845331	49.8	9.000	L1	9.8	6.2	56.0
1.023481	50.7	9.000	L1	9.8	5.3	56.0
1.144267	49.0	9.000	L1	9.8	7.0	56.0

## Final Result 2

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.609741	40.5	9.000	L1	9.8	5.5	46.0
0.670921	41.6	9.000	L1	9.8	4.4	46.0
0.732382	42.4	9.000	L1	9.8	3.6	46.0
0.780588	39.3	9.000	L1	9.8	6.7	46.0
1.039922	41.3	9.000	L1	9.8	4.7	46.0
1.279307	38.1	9.000	L1	9.8	7.9	46.0

Model Number: APOS A8-I94A4  
 Port: N  
 Test Mode: Transmitting  
 Power Source: AC 120V/60Hz  
 Note: Adapter #1



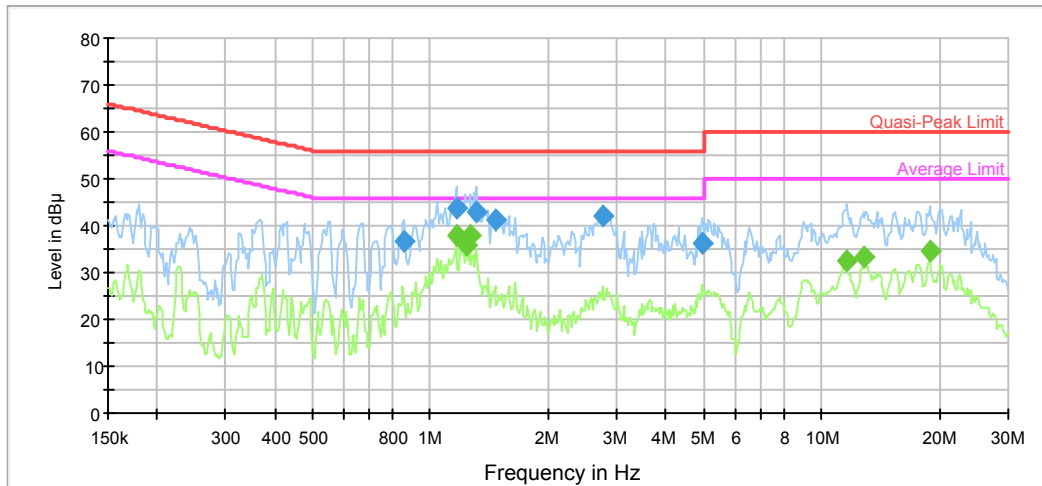
## Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.738241	45.4	9.000	N	9.8	10.6	56.0
0.793127	47.8	9.000	N	9.8	8.2	56.0
0.915445	48.3	9.000	N	9.8	7.7	56.0
1.039922	46.1	9.000	N	9.8	9.9	56.0
1.162648	45.4	9.000	N	9.8	10.6	56.0
1.259081	45.1	9.000	N	9.8	10.9	56.0

## Final Result 2

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.487810	35.9	9.000	N	9.9	10.3	46.2
0.852094	38.7	9.000	N	9.8	7.3	46.0
0.915445	34.0	9.000	N	9.8	12.0	46.0
0.975701	34.9	9.000	N	9.8	11.1	46.0
1.039922	37.3	9.000	N	9.8	8.7	46.0
1.259081	37.5	9.000	N	9.8	8.5	46.0

Model Number: APOS A8-I94A4  
Port: L  
Test Mode: Transmitting  
Power Source: AC 120V/60Hz  
Note: Adapter #2



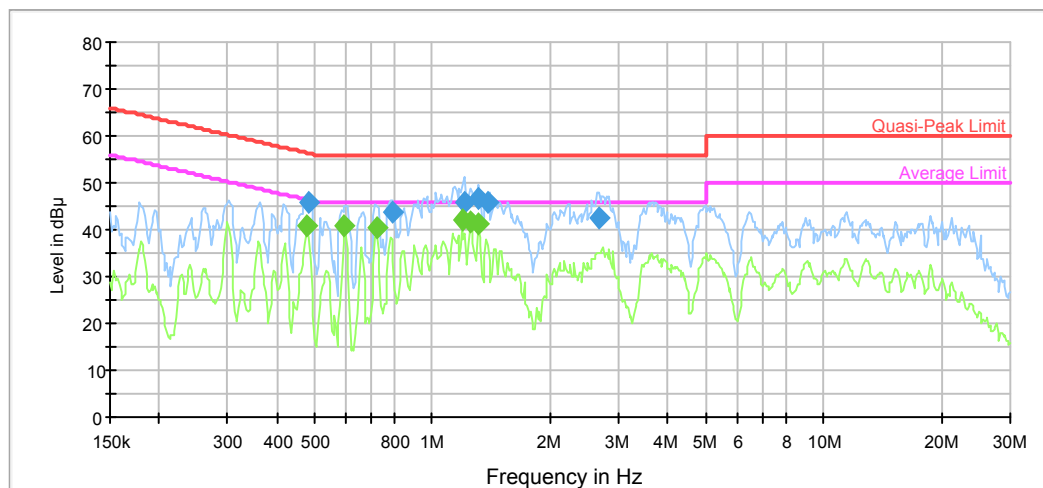
### Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.858911	36.6	9.000	L1	9.8	19.4	56.0
1.162648	43.7	9.000	L1	9.8	12.3	56.0
1.310256	43.0	9.000	L1	9.8	13.0	56.0
1.464886	41.4	9.000	L1	9.7	14.6	56.0
2.749070	42.2	9.000	L1	9.8	13.8	56.0
4.957528	36.1	9.000	L1	9.8	19.9	56.0

### Final Result 2

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
1.162648	37.9	9.000	L1	9.8	8.1	46.0
1.239175	35.7	9.000	L1	9.8	10.3	46.0
1.259081	38.1	9.000	L1	9.8	7.9	46.0
11.536699	32.5	9.000	L1	9.9	17.5	50.0
12.795830	33.3	9.000	L1	9.9	16.7	50.0
18.907519	34.7	9.000	L1	10.1	15.3	50.0

Model Number: APOS A8-I94A4  
Port: N  
Test Mode: Transmitting  
Power Source: AC 120V/60Hz  
Note: Adapter #2



### Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.483938	45.7	9.000	N	9.9	10.6	56.3
0.786832	43.9	9.000	N	9.8	12.1	56.0
1.209904	45.8	9.000	N	9.8	10.2	56.0
1.310256	46.9	9.000	N	9.8	9.1	56.0
1.385415	45.8	9.000	N	9.7	10.2	56.0
2.662831	42.7	9.000	N	9.8	13.3	56.0

### Final Result 2

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.480097	40.8	9.000	N	9.9	5.5	46.3
0.595338	40.7	9.000	N	9.8	5.3	46.0
0.720803	40.3	9.000	N	9.8	5.7	46.0
1.190776	41.9	9.000	N	9.8	4.1	46.0
1.249088	41.5	9.000	N	9.8	4.5	46.0
1.310256	41.2	9.000	N	9.8	4.8	46.0

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**FCC§15.225, §15.205 & §15.209&RSS-210§B.6, RSS-Gen§8.9- RADIATED EMISSIONS**

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**Applicable Standard**

As per FCC Part 15.225:

- (a) The field strength of any emissions within the band 13.553–13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.
- (b) Within the bands 13.410–13.553 MHz and 13.567–13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.
- (c) Within the bands 13.110–13.410 MHz and 13.710–14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.
- (d) The field strength of any emissions appearing outside of the 13.110–14.010 MHz band shall not exceed the general radiated emission limits in §15.209.

According to RSS-210 §4.1,4.3 & B.6:

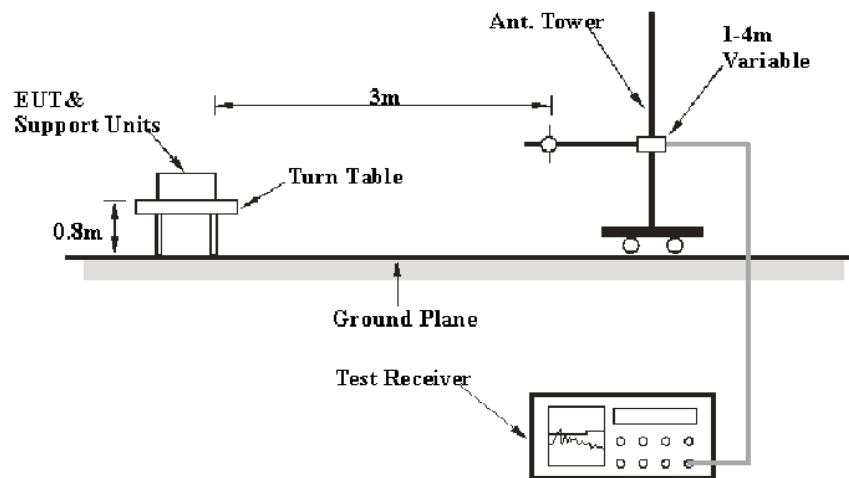
**B.6 Band 13.110-14.010 MHz**

The field strength of any emission shall not exceed the following limits:

- a. 15.848 mV/m (84 dBμV/m) at 30 m, within the band 13.553-13.567 MHz;
- b. 334 μV/m (50.5 dBμV/m) at 30 m, within the bands 13.410-13.553 MHz and 13.567-13.710 MHz;
- c. 106 μV/m (40.5 dBμV/m) at 30 m, within the bands 13.110-13.410 MHz and 13.710-14.010 MHz;  
and
- d. RSS-Gen general field strength limits for frequencies outside the band 13.110-14.010 MHz.



## EUT Setup



The radiated emission tests were performed in the 3-meter chamber test site, using the setup accordance with the ANSI C63.10-2013 and RSS-Gen. The specification used was the FCC Part Subpart C and the RSS-210 and RSS-Gen limits.

The spacing between the peripherals was 10 cm.

## EMI Test Receiver Setup

The system was investigated from 9 kHz to 1 GHz.

During the radiated emission test, the EMI test Receiver was set with the following configurations:

Frequency Range	RBW	Video B/W	Measurement
9 kHz – 150 kHz	200 Hz	1 kHz	QP
150 kHz – 30 MHz	9 kHz	30 kHz	QP
30 MHz – 1000 MHz	120 kHz	300 kHz	QP

If the maximized peak measured value complies with the limit, then it is unnecessary to perform an QP measurement

## Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corr. Ampl.}$$

**Test Results Summary**

According to the data in the following table, the EUT complied with the FCC Part 15.209&15.225,RSS-210 and RSS-Gen.

**Test Data****Environmental Conditions**

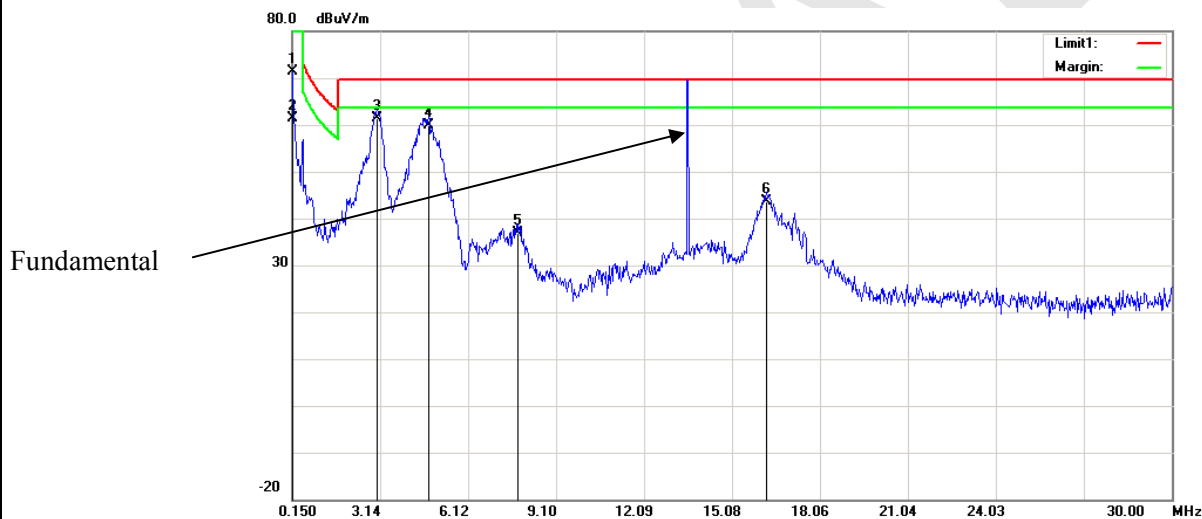
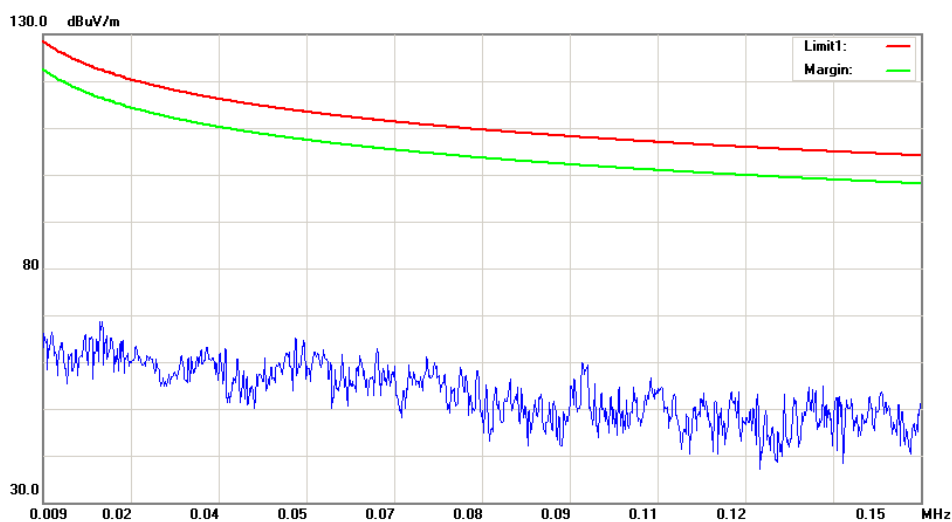
<b>Temperature:</b>	16.7 °C
<b>Relative Humidity:</b>	30 %
<b>ATM Pressure:</b>	102.1 kPa

*\* The testing was performed by Blake Yang on 2018-02-06.*

**Result:** Compliance.

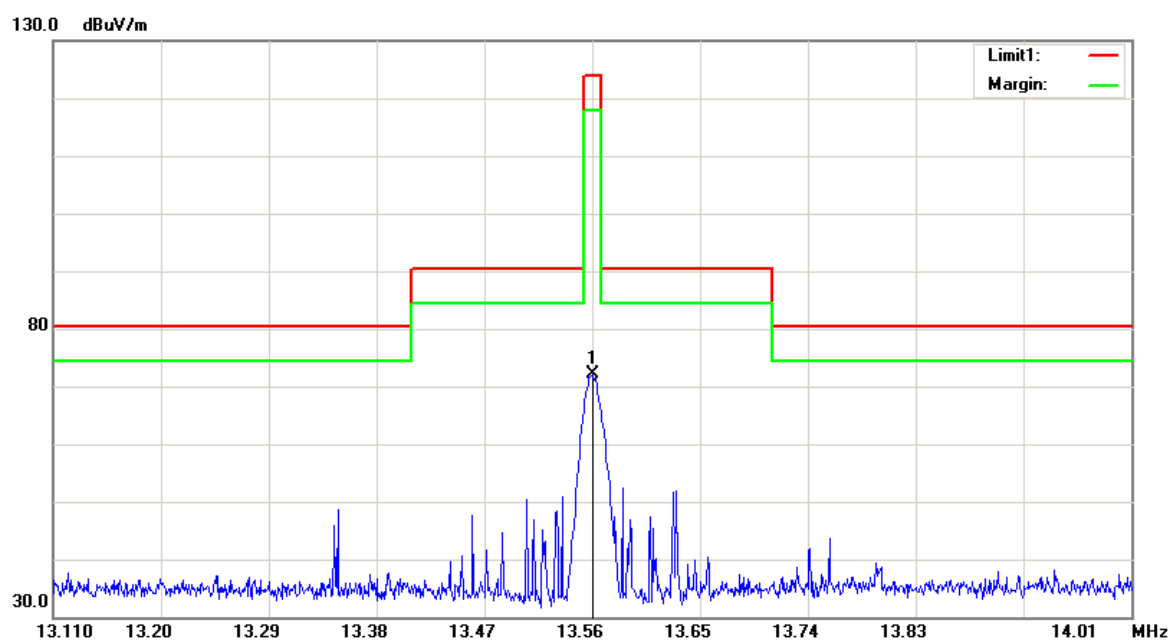
*Test mode: Transmitting*

1) 9 kHz~30MHz:



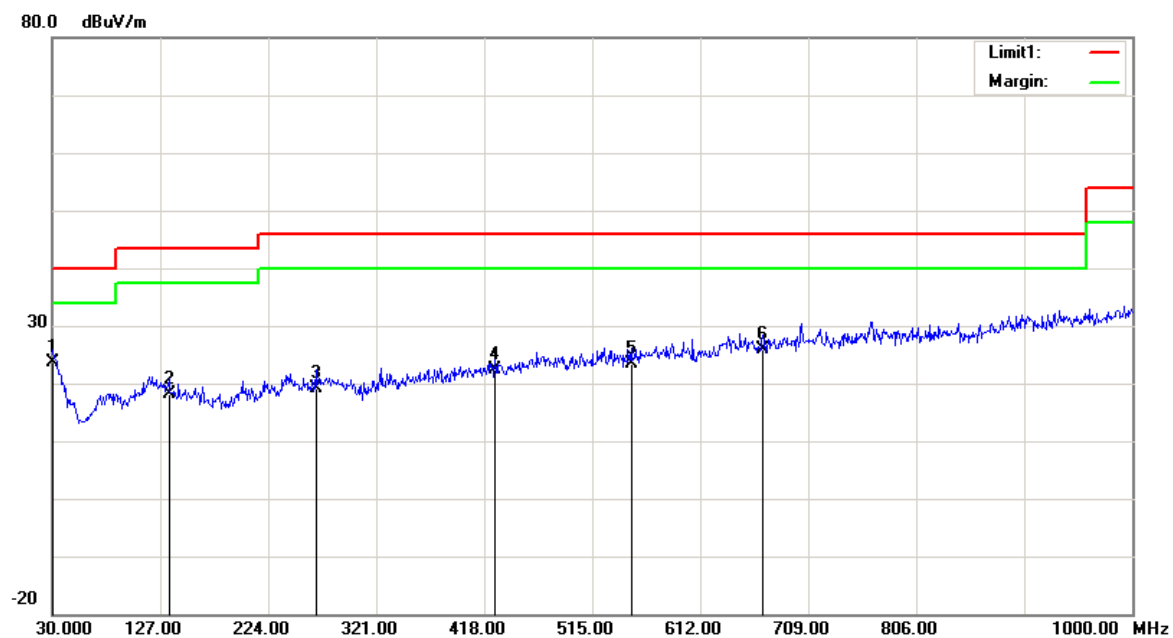
No.	Frequency (MHz)	Receiver Reading (dBμV)	Detector	Correction Factor (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1	0.1500	28.93	peak	42.47	71.40	104.08	32.68
3	3.0455	44.17	peak	17.23	61.40	69.54	8.14
4	4.7767	45.36	peak	14.44	59.80	69.54	9.74
5	7.7915	24.79	peak	12.11	36.90	69.54	32.64
6	16.2392	32.36	peak	11.24	43.60	69.54	25.94

Fundamental:

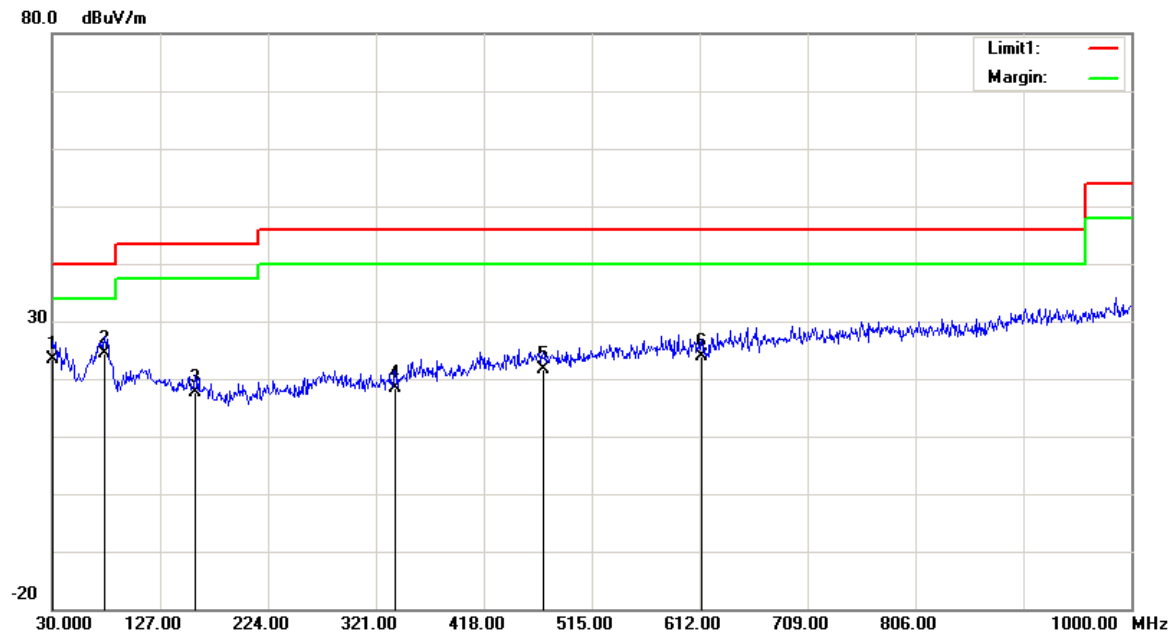


No.	Frequency (MHz)	Receiver Reading (dB $\mu$ V)	Detector	Correction Factor (dB)	Cord. Amp. (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
1	13.5610	40.04	peak	32.08	72.12	124.00	51.88

30 MHz-1GHz:

**Horizontal**

No.	Frequency (MHz)	Receiver Reading (dBμV)	Detector	Correction Factor (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1	30.9700	23.35	QP	0.35	23.70	40.00	16.30
2	134.7600	23.70	QP	-5.50	18.20	43.50	25.30
3	266.6800	23.50	QP	-4.30	19.20	46.00	26.80
4	427.7000	24.21	QP	-1.91	22.30	46.00	23.70
5	549.9200	23.95	QP	-0.45	23.50	46.00	22.50
6	668.2600	24.26	QP	1.64	25.90	46.00	20.10

**Vertical**

No.	Frequency (MHz)	Receiver Reading (dBμV)	Detector	Correction Factor (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1	30.0000	22.42	QP	1.08	23.50	40.00	16.50
2	76.5600	35.37	QP	-11.07	24.30	40.00	15.70
3	159.0100	24.16	QP	-6.56	17.60	43.50	25.90
4	338.4600	21.86	QP	-3.56	18.30	46.00	27.70
5	471.3500	22.49	QP	-0.89	21.60	46.00	24.40
6	613.9400	23.48	QP	0.32	23.80	46.00	22.20

**FCC§15.225(e)& RSS-210§B.6 - FREQUENCY STABILITY****Applicable Standard**

As per FCC Part 15.225:

The frequency tolerance of the carrier signal shall be maintained within  $\pm 0.01\%$  of the operating frequency over a temperature variation of  $-20$  degrees to  $+50$  degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

According to RSS-210§B.6:

Carrier frequency stability shall be maintained to  $\pm 0.01\%$  ( $\pm 100$  ppm).

**Test Procedure**

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power.

The EUT was placed inside the temperature chamber.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the Spectrum Analyzer.

Frequency Stability vs. Voltage: An external variable DC power supply Source. The voltage was set to the end point of the battery. The output frequency was recorded for each voltage.

**Test Data****Environmental Conditions**

<b>Temperature:</b>	16.7 °C
<b>Relative Humidity:</b>	30 %
<b>ATM Pressure:</b>	102.1 kPa

*\* The testing was performed by Blake Yang on 2018-02-06.*

**Result:** Compliance.

*Test Mode: Transmitting*

$f_0 = 13.56 \text{ MHz}$				
Temperature	Voltage	Measured frequency	Frequency Error	Limit
°C	V <sub>DC</sub>	MHz	Hz	Hz
-20	7.2	13.5606	600	±1356
-10		13.5611	1100	±1356
0		13.5605	500	±1356
10		13.5608	800	±1356
20		13.5607	700	±1356
25		13.5606	600	±1356
30		13.5604	400	±1356
40		13.5608	800	±1356
50		13.5606	600	±1356
25	6.6	13.5609	900	±1356
25	8.4	13.5605	500	±1356



## **FCC §15.215(c) & RSS- Gen§6.6 – 20 dB EMISSION BANDWIDTH & 99% Occupied Bandwidth**

### **Applicable Standard**

As per FCC Part 15.21(c):

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §15.217 through § 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of band operation.

According to RSS- Gen§6.6:

### **6.6 Occupied Bandwidth**

The emission bandwidth (×dB) is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated × dB below the maximum in-band spectral density of the modulated signal. Spectral density (power per unit bandwidth) is to be measured with a detector of resolution bandwidth in the range of 1% to 5% of the anticipated emission bandwidth, and a video bandwidth at least 3× the resolution bandwidth.

When the occupied bandwidth limit is not stated in the applicable RSS or reference measurement method, the transmitted signal bandwidth shall be reported as the 99% emission bandwidth, as calculated or measured.

- The transmitter shall be operated at its maximum carrier power measured under normal test conditions.
- The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.
- The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the occupied bandwidth (OBW) and video bandwidth (VBW) shall be approximately 3×RBW.

### **Test Procedure**

Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.

## Test Data

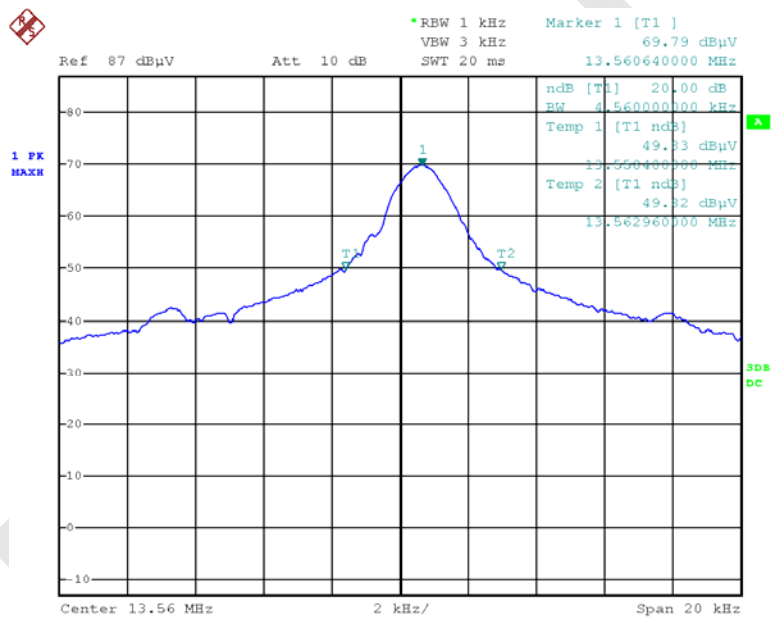
### Environmental Conditions

Temperature:	20.7 ~ 26.5 °C
Relative Humidity:	28 ~ 61 %
ATM Pressure:	100.6 ~ 102.1 kPa

\* The testing was performed by Blake Yang on 2018-02-06 and 2018-03-19.

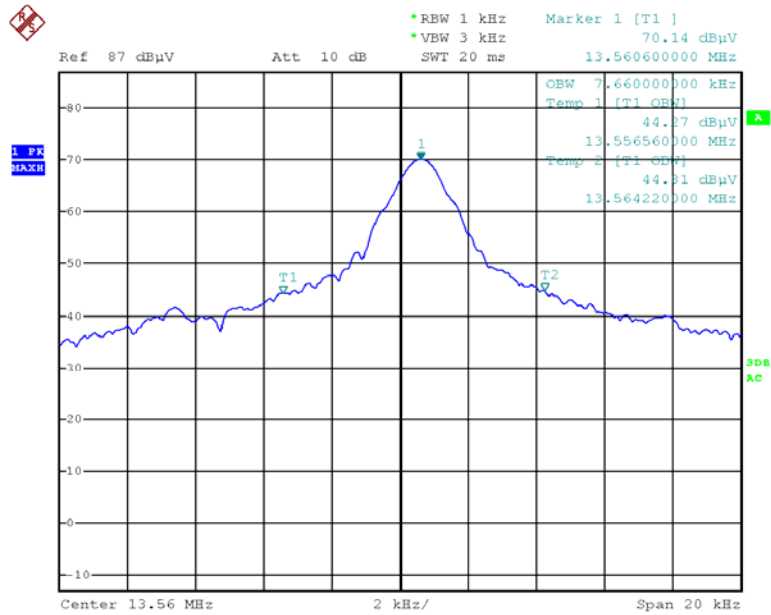
Test Mode: Transmitting

### 20 dB Emission Bandwidth(4.56 kHz)



Date: 6.FEB.2018 16:56:26

### 99% Occupied Bandwidth(7.66 kHz)



Date: 19.MAR.2018 15:38:02

\*\*\*\*\* END OF REPORT \*\*\*\*\*