

FCC PART 90

TEST REPORT

For

Hytera Communications Co., Ltd.

HYT Tower, Hi-Tech Industrial Park North, Nanshan District, Shenzhen, China

FCC ID: YAMPT580HF5

Report Type: **Product Type:** TETRA Portable Terminal Class II Permissive Change Rocky Kang Test Engineer: Rocky Kang **Report Number:** RSZ140918010-00A1 **Report Date:** 2014-09-29 Jimmy xiao Jimmy Xiao RF Engineer **Reviewed By:** Prepared By: Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008 www.baclcorp.com.cn

Note: This test report is prepared for the customer shown above and for the equipment described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp.

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| Bay Area Compliance Laboratories Corp. (Shenzhe | Bay | Area | Comp | liance | Lab | oratories | Corp. | (Shenzhen |
|---|-----|------|------|--------|-----|-----------|-------|-----------|
|---|-----|------|------|--------|-----|-----------|-------|-----------|

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Hytera Communications Co., Ltd.*'s product, model number: *PT580H F5 (FCC ID: YAMPT580HF5)* or the "EUT" in this report was a *TETRA Portable Terminal*, which was measured approximately: 127.5 mm (L) x 54.5 mm (W) x 35.5 mm (H), rated with input voltage: DC 7.4V.

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* All measurement and test data in this report was gathered from production sample serial number: 1409131 (Assigned by BACL, Shenzhen). The EUT supplied by the applicant was received on 2014-09-18.

Objective

This test report is prepared on behalf of *Hytera Communications Co.*, *Ltd.* in accordance with Part 2, and Part 90 of the Federal Communication Commission rules.

This is a CIIPC application of the device basing on the FCC ID: YAMPT580HF5 which was certified on 2012/04/27, the differences between the original device and the current one are as follows:

- 1. Changing the product name from "TETRA Digicom Portable Terminal" to "TETRA Portable Terminal";
- 2. The applicant request to extend the frequency band from 817~824 MHz/862~869 MHz to 806~824 MHz/851~869 MHz.

For the change made to the device, all the test items were performed.

Related Submittal(s)/Grant(s)

No related submittal.

Test Methodology

All tests and measurements indicated in this document were performed in accordance with the Code of federal Regulations Title 47 Part 2, Sub-part J as well as the following individual parts:

Part 90 – Private Land Mobile Radio Service

Applicable Standards: TIA 603-D and ANSI 63.4-2009.

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

Measurement uncertainty with radiated emission is 5.91 dB for 30MHz-1GHz.and 4.92 dB for above 1GHz, 1.95dB for conducted measurement.

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Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China.

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Test site at Bay Area Compliance Laboratories Corp. (Shenzhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on December 06, 2010. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2009.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

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SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in a test mode which has been done in the factory.

Equipment Modifications

No modification was made to the EUT tested.

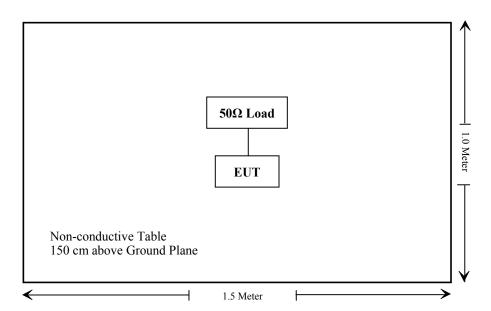
Support Equipment List and Details

| Manufacturer | Description | Model | Serial Number |
|--------------|-----------------------|--------|------------------------|
| Agolent | MXA Signal Analyzer | N9020A | ATO-97512SERMY50510262 |
| AEROFLEX | TETRA Signal Analyzer | 2310 | 2310011173 |

External I/O Cable

| Cable Description | Length (m) | From Port | То |
|-------------------|------------|-----------|----|
| / | / | / | / |

Block Diagram of Test Setup



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SUMMARY OF TEST RESULTS

| FCC Rules | Description of Test | Results |
|---|---------------------------------------|-----------------|
| §1.1307(b), §2.1093 | RF Exposure | Compliance |
| §2.1046; §90.205 | RF Output Power | Compliance |
| §90.210; §90.221 | Adjacent Channel Power | Compliance |
| §2.1047;§90.207 | Modulation Characteristic | Not Applicable* |
| \$2.1049; \$90.209; \$90.210; \$90.691 | Occupied Bandwidth & Emission Mask | Compliance |
| §2.1051; §90.210 | Spurious Emission at Antenna Terminal | Compliance |
| §2.1053; §90.210 | Spurious Radiated Emissions | Compliance |
| §2.1055; §90.213 | Frequency Stability | Compliance |
| §90.214 | Transient Frequency Behavior | Not Applicable |

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Not applicable*: Modulation Characteristic test item is not required for digital device

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FCC §1.1307(b) & §2.1093 - RF EXPOSURE

Applicable Standard

According to FCC §1.1307(b) and §2.1093, protable device operates Part 90 should be subjected to rountine environmental evaluation for RF exposure prior or equipment authorization or use.

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Result: Compliance.

Please refer to SAR Report Number: RSZ140918010-20A1.

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FCC §2.1046 & §90.205- RF OUTPUT POWER

Applicable Standard

FCC §2.1046 and §90.205

Test Procedure

Conducted RF Output Power:

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

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Spectrum Analyzer Setting:

R B/W Video B/W 100 kHz 300 kHz

Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Calibration Date | Calibration Due Date |
|-----------------|-----------------|--------|---------------|---------------------|-------------------------|
| Rohde & Schwarz | Signal Analyzer | FSIQ26 | 837405/023 | 2014-05-31 | 2015-05-31 |

^{*} Statement of Traceability: Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

| Temperature: | 25 ℃ | |
|--------------------|-----------|--|
| Relative Humidity: | 55 % | |
| ATM Pressure: | 101.0 kPa | |

The testing was performed by Rocky Kang on 2014-09-28.

Test Mode: Transmitting

Test Result: Compliance. Please refer to following table.

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| Frequency | Channel Spacing (kHz) | Conducted Output Power (dBm) | Conducted Output Power (W) |
|-----------|-----------------------|------------------------------------|----------------------------------|
| 806.05 | | 33.00 | 1.995 |
| 809.05 | 25 | 33.01 | 2.000 |
| 851.05 | | 33.03 | 2.009 |
| 854.05 | | 33.04 | 2.014 |

Note: The rated power is 1.8W. The limit is 1.44W-2.16W.

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FCC §2.1046, §90.210& §90.221- ADJACENT CHANNEL POWER

Applicable Standard

FCC §2.1046, §90.210& §90.221

According to FCC§90.221 (c) (1), Maximum adjacent power levels for frequencies in the 809-824/854-869 MHz band:

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| II ' - | , , | Maximum ACP (dBc) for devices 15 watts and above |
|--------|---------|--|
| 25 kHz | -55 dBc | -55 dBc |
| 50 kHz | -65 dBc | -65 dBc |
| 75 kHz | -65 dBc | -70 dBc |

(2) In any case, no requirement in excess of -36 dBm shall apply

Test Procedure

The EUT was connected to the TETRA signal analyzer



Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Calibration Date | Calibration Due Date |
|--------------|--------------------------|-------|---------------|---------------------|-------------------------|
| AEROFLEX | TETRA Signal Analyzer | 2310 | 231001/173 | 2014-03-11 | 2015-03-11 |

^{*} Statement of Traceability: Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

| Temperature: | 25 ℃ |
|--------------------|-----------|
| Relative Humidity: | 55 % |
| ATM Pressure: | 101.0 kPa |

The testing was performed by Rocky Kang on 2014-09-28.

Test Mode: Transmitting

Test Result: Compliance. Please refer to following table and plots.

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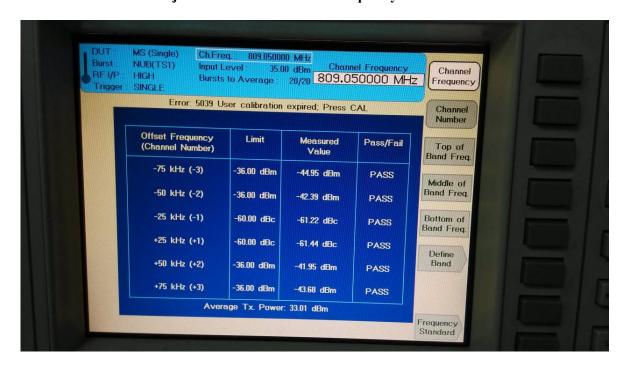
| Channel Frequency (MHz) | Channel Separation (kHz) | Adjacent Channel (kHz) | Adjacent Channel Ratio (dB) | FCC Part 90 Limit (dB) |
|-------------------------------|--------------------------------|------------------------------|-----------------------------------|------------------------------|
| | | -75 | -78.13 | -70 |
| | | -50 | -75.48 | -65 |
| 906.05 | 25 | -25 | -61.09 | -55 |
| 806.05 | 25 | +25 | -61.45 | -55 |
| | | +50 | -75.00 | -65 |
| | | +75 | -76.68 | -70 |
| | | -75 | -77.96 | -70 |
| | | -50 | -75.40 | -65 |
| 000.05 | 25 | -25 | -61.22 | -55 |
| 809.05 | | +25 | -61.44 | -55 |
| | | +50 | -74.96 | -65 |
| | | +75 | -76.68 | -70 |
| | 25 | -75 | -77.91 | -70 |
| | | -50 | -75.23 | -65 |
| 051.05 | | -25 | -60.43 | -55 |
| 851.05 | | +25 | -60.53 | -55 |
| | | +50 | -74.58 | -65 |
| | | +75 | -76.55 | -70 |
| | | -75 | -77.84 | -70 |
| | | -50 | -75.06 | -65 |
| 054.05 | 25 | -25 | -60.44 | -55 |
| 854.05 | 25 | +25 | -60.42 | -55 |
| | | +50 | -74.59 | -65 |
| | | +75 | -76.50 | -70 |

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MS (Single) NUB(TS1) Ch.Freq.: 806.050000 MHz Burst Bursts to Average Input Level: 35.00 dBm Bursts to RF I/P HIGH Bursts to Average: 20/20 20 Average Trigger SINGLE Error: 5039 User calibration expired; Press CAL Offset Frequency (Channel Number) Limit Measured Pass/Fail Modn./Freq. Accuracy -75 kHz (-3) -36.00 dBm -45.13 dBm **PASS** Tx. Power vs. Time -50 kHz (-2) -36.00 dBm -42.48 dBm PASS Non-Active -25 kHz (-1) -60 00 dBc -61.09 dBc PASS Slot Power +25 kHz (+1) -60.00 dBc -61.45 dBc PASS ACP due to Modulation +50 kHz (+2) -36.00 dBm -42.00 dBm PASS ACP due to +75 kHz (+3) -36.00 dBm -43.68 dBm PASS Switching Average Tx. Power: 33.00 dBm

Adjacent Channel Power for Frequency 806.05 MHz

Adjacent Channel Power for Frequency 809.05 MHz

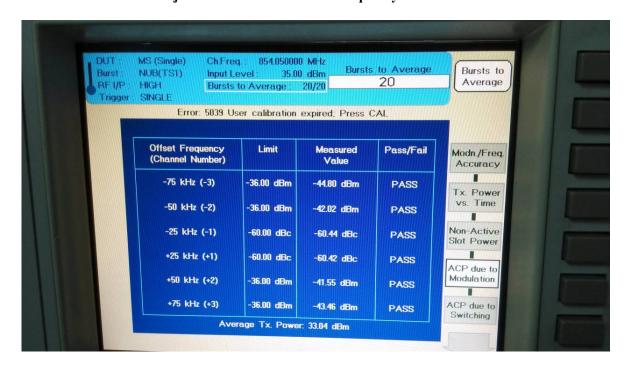


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Ch.Freq.: 851.050000 MHz Input Level: 35.00 dBm NUB(TS1) Input Level: 35.00 dBm Channel Frequency Bursts to Average: 20/20 851.050000 MHz RF I/P HIGH Frequency Error: 5039 User calibration expired; Press CAL Channel Number Offset Frequency (Channel Number) Limit Measured Value Pass/Fail Top of Band Freq. -75 kHz (-3) -36.00 dBm -44.88 dBm PASS Middle of Band Freq. -50 kHz (-2) -36.00 dBm -42.20 dBm **PASS** -25 kHz (-1) -60.00 dBc Bottom of -60.43 dBc PASS +25 kHz (+1) -60.00 dBc -60.53 dBc PASS Define +50 kHz (+2) -36.00 dBm -41.55 dBm PASS +75 kHz (+3) -36.00 dBm -43.52 dBm PASS Average Tx. Power: 33.03 dBm Frequency Standard

Adjacent Channel Power for Frequency 851.05 MHz

Adjacent Channel Power for Frequency 854.05 MHz



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FCC §2.1049 & §90.209, §90.210§90.691 – OCCUPIED BANDWIDTH & EMISSION MASK

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Applicable Standard

FCC §2.1049, §90.209, §90.210 and §90.691

Emission Mask B. For transmitters that are equipped with an audio low-pass filter, the power of any emission must be attenuated below the unmodulated carrier power (P) as follows:

- (1) On any frequency removed from the assigned frequency by more than 50 percent, but not more than 100 percent of the authorized bandwidth: At least 25 dB.
- (2) On any frequency removed from the assigned frequency by more than 100 percent, but not more than 250 percent of the authorized bandwidth: At least 35 dB.
- (3) On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least $43 + 10 \log (P) dB$.

Emission Mask I. For transmitters that are equipped with an audio low pass filter, the power of any emission must be attenuated below the unmodulated carrier power of the transmitter (P) as follows:

- (1) On any frequency removed from the center of the authorized bandwidth by a displacement frequency of more than 6.8 kHz, but no more than 9.0 kHz: At least 25 dB;
- (2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency of more than 9.0 kHz, but no more than 15 kHz: At least 35 dB;
- (3) On any frequency removed from the center of the authorized bandwidth by a displacement frequency of more than 15 kHz: At least 43 + 10 log (P) dB, or 70 dB, whichever is the lesser attenuation.

Emission mask requirements for EA-based systems.

- (a) Out-of-band emission requirement shall apply only to the "outer" channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:
- (1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 116 $Log_{10}(f/6.1)$ decibels or $50 + 10 Log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.
- (2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 43 + 10Log₁₀(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.
- (b) When an emission outside of the authorized bandwidth causes harmful interference, the Commission may, at its discretion, require greater attenuation than specified in this section.

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Test Procedure

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

The resolution bandwidth of the spectrum analyzer was set at 100 Hz and the spectrum was recorded in the frequency band ± 50 kHz from the carrier frequency.

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Test Equipment List and Details

| Manufacturer | Description | Model No. | Serial No. | Calibration Date | Calibration Due Date |
|--------------|---------------------|-----------|----------------------------|---------------------|-------------------------|
| Agilent | MAX Signal Analyzer | N9020A | AT0-97512SER MY50510262 | 2014-03-11 | 2015-03-11 |

^{*} Statement of Traceability: Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

| Temperature: | 20 ~ 25 °C |
|--------------------|------------|
| Relative Humidity: | 50 ~ 56 % |
| ATM Pressure: | 101.0 kPa |

The testing was performed by Rocky Kang from 2014-09-20 and 2014-09-28

| Frequency (MHz) | Channel Spacing (kHz) | 99% Occupied Bandwidth (kHz) | Limited (kHz) |
|--------------------|-----------------------|------------------------------------|------------------|
| 806.1 | 25.0 | 20.075 | 22 |
| 809.1 | 25.0 | 20.188 | 22 |
| 851.1 | 25.0 | 20.029 | 22 |
| 854.1 | 25.0 | 20.242 | 22 |

Note: Equipment meets the Adjacent Channel Power limits of §90.221, so emission mask is not tested.

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806.1 MHz: 99% Occupied Bandwidth



809.1 MHz: 99% Occupied Bandwidth



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851.1 MHz: 99% Occupied Bandwidth



854.1 MHz: 99% Occupied Bandwidth



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FCC §2.1051 & §90.210 - SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Applicable Standard

Emission Mask B. For transmitters that are equipped with an audio low-pass filter, the power of any emission must be attenuated below the unmodulated carrier power (P) as follows:

(1) On any frequency removed from the assigned frequency by more than 50 percent, but not more than 100 percent of the authorized bandwidth: At least 25 dB.

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- (2) On any frequency removed from the assigned frequency by more than 100 percent, but not more than 250 percent of the authorized bandwidth: At least 35 dB.
- (3) On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least $43 + 10 \log (P) dB$.

Test Procedure

The RF output of the EUT was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 100kHz for below 1GHz, and 1MHz for above 1GHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonic.

Test Equipment List and Details

| Manufacturer | Description | Model No. | Serial No. | Calibration Date | Calibration Due Date |
|--------------|---------------------|-----------|----------------------------|---------------------|-------------------------|
| Agilent | MAX Signal Analyzer | N9020A | AT0-97512SER MY50510262 | 2014-03-11 | 2015-03-11 |

^{*} Statement of Traceability: Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

| Temperature: | 25 ℃ | |
|--------------------|-----------|--|
| Relative Humidity: | 56 % | |
| ATM Pressure: | 101.0 kPa | |

The testing was performed by Rocky Kang on 2014-09-20.

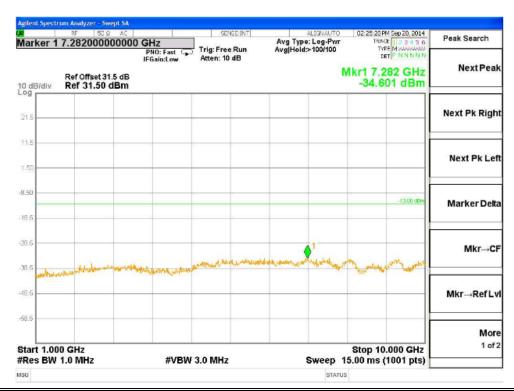
Test Mode: Transmitting

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809.05 MHz: 30 MHz~1 GHz, Spacing Channel 25 kHz

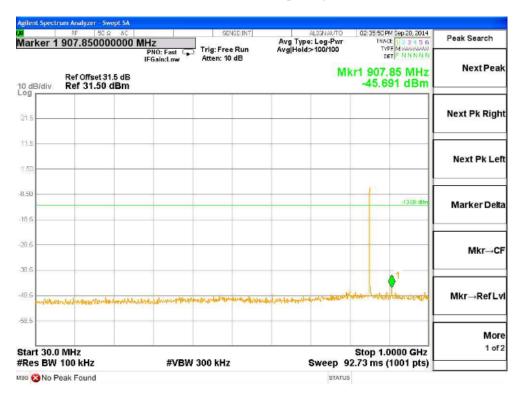


809.05 MHz: 1~10 GHz, Spacing Channel 25 kHz

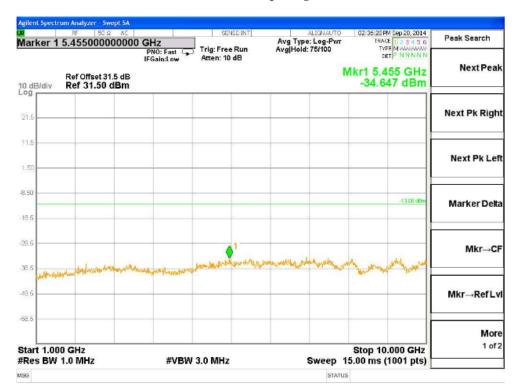


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854.05 MHz: 30 MHz~1 GHz, Spacing Channel 25 kHz



854.05 MHz: 1~10 GHz, Spacing Channel 25 kHz



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FCC §2.1053 & §90.210 - RADIATED SPURIOUS EMISSIONS

Applicable Standard

FCC §2.1053, §90.210

Test Procedure

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load, which was also placed on the turntable.

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The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to teeth harmonic of the fundamental frequency was investigated.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in dB = 10 1g (TXpwr in Watts/0.001)-the absolute level

Spurious attenuation limit in dB = $43+10 \text{ Log}_{10}$ (power out in Watts) for EUT with a 12.5 kHz channel bandwidth.

Test Equipment List and Details

| Manufacturer | Description | Model No. | Serial No. | Calibration Date | Calibration Due Date |
|-----------------|---------------------|-------------|------------|---------------------|-------------------------|
| Sunol Sciences | Horn Antenna | DRH-118 | A052304 | 2011-12-01 | 2014-11-30 |
| Sunol Sciences | Broadband Antenna | ЈВ1 | A040904-2 | 2011-11-28 | 2014-11-27 |
| Rohde & Schwarz | Signal Analyzer | FSIQ26 | 837405/023 | 2014-05-31 | 2015-05-31 |
| Rohde & Schwarz | EMI Test Receiver | ESCI | 101122 | 2013-09-25 | 2014-09-25 |
| HP | Amplifier | 8447E | 1937A01046 | 2014-05-06 | 2015-05-06 |
| Mini | Amplifier | ZVA-183-S+ | 5969001149 | 2014-04-23 | 2015-04-23 |
| HP | Signal Generator | 8657A | 3217A04699 | 2013-12-19 | 2014-12-18 |
| A.H. System | Horn Antenna | SAS-200/571 | 135 | 2012-02-11 | 2015-02-10 |
| НР | Synthesized Sweeper | 8341B | 2624A00116 | 2014-06-03 | 2015-06-03 |
| COM POWER | Dipole Antenna | AD-100 | 041000 | NCR | NCR |

^{*} Statement of Traceability: Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements, traceable to National Primary Standards and International System of Units (SI).

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Test Data

Environmental Conditions

| Temperature: | 25 ℃ |
|--------------------|-----------|
| Relative Humidity: | 56 % |
| ATM Pressure: | 101.0 kPa |

The testing was performed by Rocky Kang on 2014-09-29.

Test Mode: Transmitting

30MHz - 10GHz:

| | Receiver | Turntable | Rx An | tenna | | Substitut | ed | Absolute | FCC I | Part 90 |
|--------------------|----------------|-----------------|------------|----------------|----------------------|-----------------------|-------------------------|----------------|-------------|----------------|
| Frequency (MHz) | Reading (dBµV) | Angle Degree | Height (m) | Polar (H/V) | SG Level (dBm) | Cable Loss (dB) | Antenna Gain (dB) | Level (dBm) | Limit (dBm) | Margin (dB) |
| | | | 809.05 | 5MHz, Ch | annel Spa | cing 25 kl | Hz | | | |
| 321.3 | 35.12 | 115 | 1.5 | Н | -62.4 | 0.24 | 0.00 | -62.64 | -13 | 49.64 |
| 321.3 | 36.65 | 254 | 1.3 | V | -60.9 | 0.24 | 0.00 | -61.14 | -13 | 48.14 |
| 1618.1 | 52.36 | 335 | 2.5 | Н | -51.2 | 0.95 | 9.40 | -42.75 | -13 | 29.75 |
| 1618.1 | 53.05 | 228 | 1.3 | V | -49.0 | 0.95 | 9.40 | -40.55 | -13 | 27.55 |
| | | | 854.05 | MHz, Ch | annel Spa | cing 25 kl | Hz | | _ | |
| 321.3 | 34.53 | 125 | 1.5 | Н | -63.0 | 0.24 | 0.00 | -63.24 | -13 | 50.24 |
| 321.3 | 36.87 | 22 | 1.5 | V | -60.6 | 0.24 | 0.00 | -60.84 | -13 | 47.84 |
| 1708.10 | 58.89 | 246 | 1.3 | Н | -44.1 | 0.97 | 9.40 | -35.67 | -13 | 22.67 |
| 1708.10 | 59.00 | 168 | 1.2 | V | -41.5 | 0.97 | 9.40 | -33.07 | -13 | 20.07 |
| 2562.15 | 49.04 | 149 | 2.0 | Н | -49.5 | 1.47 | 10.80 | -40.17 | -13 | 27.17 |
| 2562.15 | 41.66 | 200 | 1.5 | V | -52.6 | 1.47 | 10.80 | -43.27 | -13 | 30.27 |

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Note:

Absolute Level = SG Level - Cable loss + Antenna Gain

Margin = Limit- Absolute Level

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Applicable Standard

FCC §2.1055, §90.213

Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to a frequency counter via feed-through attenuators. The EUT was placed inside the temperature chamber. The DC leads and RF output cable exited the chamber through an opening made for the purpose.

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

Test Equipment List and Details

| Manufacturer | Description | Model No. | Serial No. | Calibration Date | Calibration Due Date |
|-----------------|--------------------------------|-----------|------------|---------------------|-------------------------|
| Hewlett-Packard | Frequency Counter | 5343A | 2232A00827 | 2013-05-09 | 2016-05-08 |
| ESPEC | Temperature & Humidity Chamber | EL-10KA | 09107726 | 2013-11-01 | 2014-11-01 |

^{*} Statement of Traceability: Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

| Temperature: | 20 ~ 25 ℃ |
|--------------------|-----------|
| Relative Humidity: | 48 ~ 56 % |
| ATM Pressure: | 101.0 kPa |

The testing was performed by Rocky Kang from 2014-09-22.

Test Mode: Transmitting

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| Reference Frequency: 806.05 MHz, Limit: 1.5 ppm, Channel Spacing: 25 kHz | | | | | |
|--|-----------------------------------|-------------------------------------|--------------------------|--|--|
| Test Envi | ronment | Frequency Measure with Time Elapsed | | | |
| Temperature (°C) | Power Supplied (V _{DC}) | Measured Frequency error (Hz) | Frequency Error (ppm) | | |
| | Frequency Stability | y versus Input Temper | ature | | |
| 50 | 7.4 | 2 | 0.002 | | |
| 40 | 7.4 | 5 | 0.006 | | |
| 30 | 7.4 | 3 | 0.004 | | |
| 20 | 7.4 | 7 | 0.009 | | |
| 10 | 7.4 | 1 | 0.001 | | |
| 0 | 7.4 | 5 | 0.006 | | |
| -10 | 7.4 | 8 | 0.010 | | |
| -20 | 7.4 | 11 | 0.014 | | |
| -30 | 7.4 | 13 | 0.016 | | |
| Frequency Stability versus Input Voltage | | | | | |
| 20 | 6.3 | 6 | 0.007 | | |

| Reference Frequency: 809.05 MHz, Limit: 2.5 ppm, Channel Spacing: 25 kHz | | | | | |
|--|-----------------------------------|-------------------------------------|--------------------------|--|--|
| Test Env | ironment | Frequency Measure with Time Elapsed | | | |
| Temperature (°C) | Power Supplied (V _{DC}) | Measured Frequency error (Hz) | Frequency Error (ppm) | | |
| | Frequency Stability | y versus Input Temper | ature | | |
| 50 | 7.4 | -2.3 | -0.003 | | |
| 40 | 7.4 | -4.5 | -0.006 | | |
| 30 | 7.4 | -6.1 | -0.008 | | |
| 20 | 7.4 | -5.2 | -0.006 | | |
| 10 | 7.4 | -3.3 | -0.004 | | |
| 0 | 7.4 | -5.0 | -0.006 | | |
| -10 | 7.4 | -7.2 | -0.009 | | |
| -20 | 7.4 | -9.5 | -0.012 | | |
| -30 | 7.4 | -6.4 | -0.008 | | |
| Frequency Stability versus Input Voltage | | | | | |
| 20 | 6.3 | -11.2 | -0.014 | | |

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| Reference Frequency: 851.05 MHz, Limit: 1.5 ppm, Channel Spacing: 25 kHz | | | | |
|--|-----------------------------------|-------------------------------------|--------------------------|--|
| Test Environment | | Frequency Measure with Time Elapsed | | |
| Temperature (°C) | Power Supplied (V _{DC}) | Measured Frequency error (Hz) | Frequency Error (ppm) | |
| Frequency Stability versus Input Temperature | | | | |
| 50 | 7.4 | 2.7 | 0.003 | |
| 40 | 7.4 | 2.4 | 0.003 | |
| 30 | 7.4 | 2.5 | 0.003 | |
| 20 | 7.4 | 2.2 | 0.003 | |
| 10 | 7.4 | 2.6 | 0.003 | |
| 0 | 7.4 | 2.0 | 0.002 | |
| -10 | 7.4 | 2.2 | 0.003 | |
| -20 | 7.4 | 2.9 | 0.003 | |
| -30 | 7.4 | 3.4 | 0.004 | |
| Frequency Stability versus Input Voltage | | | | |
| 20 | 6.3 | 3.2 | 0.004 | |

| Reference Frequency: 854.05 MHz, Limit: 2.5 ppm, Channel Spacing: 25 kHz | | | | |
|--|-----------------------------------|-------------------------------------|--------------------------|--|
| Test Environment | | Frequency Measure with Time Elapsed | | |
| Temperature (°C) | Power Supplied (V _{DC}) | Measured Frequency error (Hz) | Frequency Error (ppm) | |
| Frequency Stability versus Input Temperature | | | | |
| 50 | 7.4 | -7.7 | -0.009 | |
| 40 | 7.4 | -7.6 | -0.009 | |
| 30 | 7.4 | -7.5 | -0.009 | |
| 20 | 7.4 | -7.8 | -0.009 | |
| 10 | 7.4 | -7.6 | -0.009 | |
| 0 | 7.4 | -7.0 | -0.008 | |
| -10 | 7.4 | -7.3 | -0.009 | |
| -20 | 7.4 | -7.7 | -0.009 | |
| -30 | 7.4 | -8.5 | -0.010 | |
| Frequency Stability versus Input Voltage | | | | |
| 20 | 6.3 | -9.3 | -0.011 | |

**** END OF REPORT ****

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