

# 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.

# **TABLE OF CONTENTS**

GENERAL INFORMATION	4
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	4
Objective	
RELATED SUBMITTAL(S)/GRANT(S)	
TEST METHODOLOGY TEST FACILITY	
SYSTEM TEST CONFIGURATION	
DESCRIPTION OF TEST CONFIGURATION	
EQUIPMENT MODIFICATIONS	
Support Equipment List and Details External I/O Cable	b
BLOCK DIAGRAM OF TEST SETUP	
SUMMARY OF TEST RESULTS	
FCC §1.1307(b) & §2.1093 - RF EXPOSURE	8
APPLICABLE STANDARD	
FCC §2.1046 & §90.205- RF OUTPUT POWER	9
APPLICABLE STANDARD	9
TEST PROCEDURE	
TEST EQUIPMENT LIST AND DETAILS.	
TEST DATA	9
FCC §2.1046, §90.210& §90.221- ADJACENT CHANNEL POWER	11
APPLICABLE STANDARD	11
Test Procedure	11
TEST EQUIPMENT LIST AND DETAILS.	
TEST DATA	11
FCC §2.1049 & §90.209, §90.210§90.691 – OCCUPIED BANDWIDTH & EMISSION MASK	15
APPLICABLE STANDARD	15
Test Procedure	
TEST EQUIPMENT LIST AND DETAILS.	
TEST DATA	
FCC §2.1051 & §90.210 - SPURIOUS EMISSIONS AT ANTENNA TERMINALS	19
APPLICABLE STANDARD	
TEST PROCEDURE	
TEST EQUIPMENT LIST AND DETAILS	
TEST DATA	19
FCC §2.1053 & §90.210 - RADIATED SPURIOUS EMISSIONS	22
APPLICABLE STANDARD	
TEST PROCEDURE	
TEST EQUIPMENT LIST AND DETAILS	
Test Data	
FCC §2.1055 & §90.213- FREQUENCY STABILITY	24
Applicable Standard	
TEST PROCEDURE	24

Bay Area Compliance Laboratories Corp. (Shenzhe	Bay	Area	Compl	liance	Labor	atories	Corp.	(Shenzhei
---	-----	------	-------	--------	-------	---------	-------	-----------

TEST EQUIPMENT LIST AND DETAILS 24
TEST DATA 24

Report No.: RSZ140918010-00A1

FCC Part 90 Page 3 of 26

# **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.

Report No.: RSZ140918010-00A1

\* 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.

FCC Part 90 Page 4 of 26

# **Test Facility**

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

Report No.: RSZ140918010-00A1

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.

FCC Part 90 Page 5 of 26

# **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.

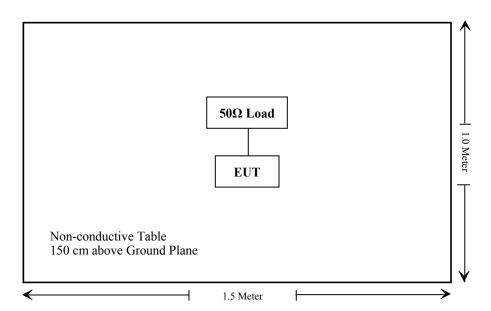
# **Support Equipment List and Details**

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**



FCC Part 90 Page 6 of 26

# 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

Report No.: RSZ140918010-00A1

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

FCC Part 90 Page 7 of 26

# 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.

Report No.: RSZ140918010-00A1

Result: Compliance.

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

FCC Part 90 Page 8 of 26

# 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.

Report No.: RSZ140918010-00A1

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

<sup>\*</sup> 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.

FCC Part 90 Page 9 of 26

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.

FCC Part 90 Page 10 of 26

# 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:

Report No.: RSZ140918010-00A1

	, ,	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

<sup>\*</sup> 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.

FCC Part 90 Page 11 of 26

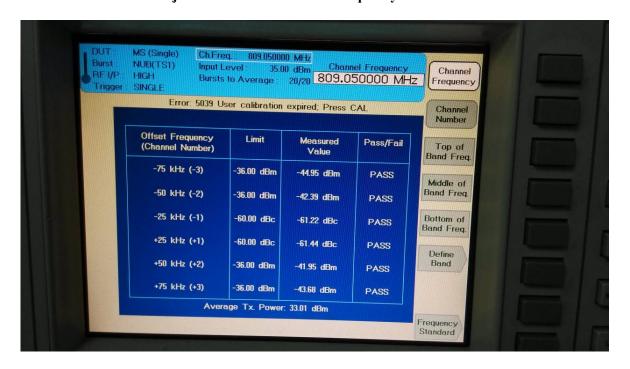
Channel Frequency (MHz)	Channel Separation (kHz)	Adjacent Channel (kHz)	Adjacent Channel Ratio (dB)	FCC Part 90 Limit (dB)
		-75	-78.13	-70
		-50	-75.48	-65
906.05	25	-25	-61.09	-55
806.05	25	+25	-61.45	-55
		+50	-75.00	-65
		+75	-76.68	-70
		-75	-77.96	-70
		-50	-75.40	-65
000.05	25	-25	-61.22	-55
809.05		+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

FCC Part 90 Page 12 of 26

#### 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

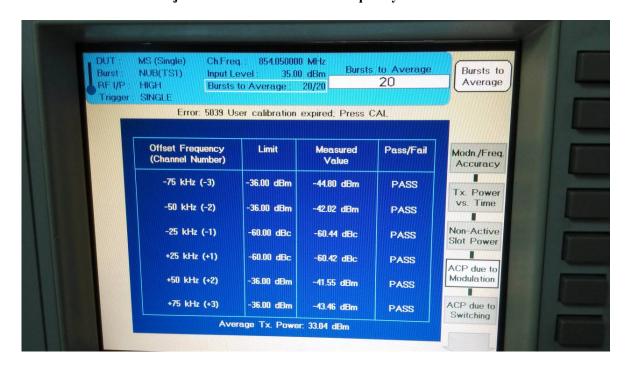


FCC Part 90 Page 13 of 26

#### 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



FCC Part 90 Page 14 of 26

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

Report No.: RSZ140918010-00A1

# **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 + 10Log<sub>10</sub>(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.

FCC Part 90 Page 15 of 26

# **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  $\pm 50$  kHz from the carrier frequency.

Report No.: RSZ140918010-00A1

# **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

<sup>\*</sup> 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.

FCC Part 90 Page 16 of 26

806.1 MHz: 99% Occupied Bandwidth



809.1 MHz: 99% Occupied Bandwidth



FCC Part 90 Page 17 of 26

# 851.1 MHz: 99% Occupied Bandwidth



# 854.1 MHz: 99% Occupied Bandwidth



FCC Part 90 Page 18 of 26

# 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.

Report No.: RSZ140918010-00A1

- (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 10<sup>th</sup> 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

<sup>\*</sup> 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**

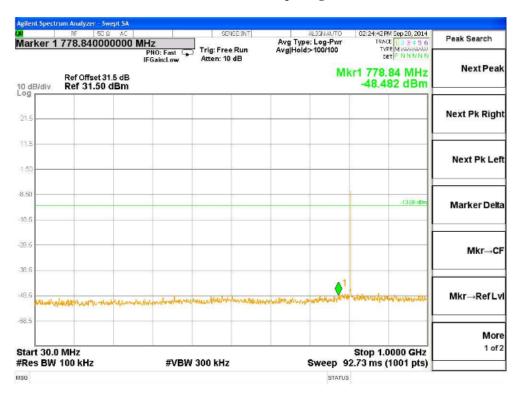
Temperature:	25 ℃	
Relative Humidity:	56 %	
ATM Pressure:	101.0 kPa	

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

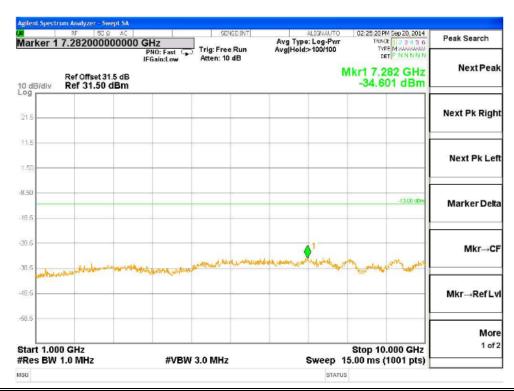
Test Mode: Transmitting

FCC Part 90 Page 19 of 26

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

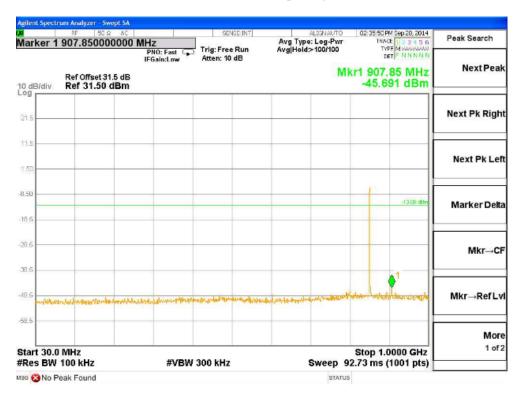


809.05 MHz: 1~10 GHz, Spacing Channel 25 kHz

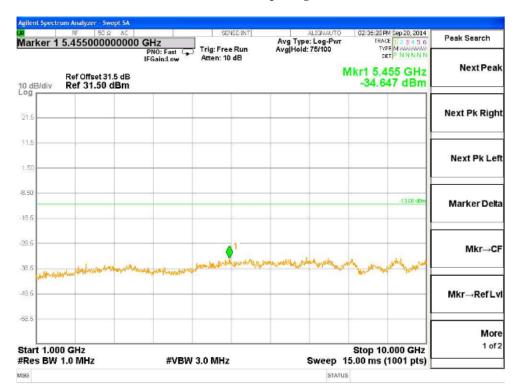


FCC Part 90 Page 20 of 26

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



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



FCC Part 90 Page 21 of 26

# 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.

Report No.: RSZ140918010-00A1

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

<sup>\*</sup> 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).

FCC Part 90 Page 22 of 26

# **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

Report No.: RSZ140918010-00A1

Note:

Absolute Level = SG Level - Cable loss + Antenna Gain

Margin = Limit- Absolute Level

FCC Part 90 Page 23 of 26

# **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.

Report No.: RSZ140918010-00A1

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

<sup>\*</sup> 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

FCC Part 90 Page 24 of 26

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 <sub>DC</sub> )	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 <sub>DC</sub> )	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		

FCC Part 90 Page 25 of 26

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 <sub>DC</sub> )	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 <sub>DC</sub> )	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 \*\*\*\*

FCC Part 90 Page 26 of 26