



# **FCC Test Report**

Report No.: AGC01284220402FE10A

FCC ID : BB019MINI2

**APPLICATION PURPOSE**: Class II Permissive Change

**PRODUCT DESIGNATION**: CB Radio

**BRAND NAME** : COBRA

**MODEL NAME** : 19MINIAMFM

**APPLICANT** : Cobra Electronics Corporation

**DATE OF ISSUE** : Nov. 16, 2022

**STANDARD(S)** : FCC Part 95 Rules

**REPORT VERSION**: V 1.0

Attestation of Global Cymplianee (Shenzhen) Co., Ltd





Page 2 of 33

# REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Nov. 11, 2022	Valid	Initial Release

Note: The original test report Ref. No AGC01284220402FE10 (dated May. 25, 2022, tested Apr. 22, 2022 to May 25, 2022), was modified on Nov. 16, 2022 to include the following changes and additions for:

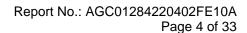
-The power tube and some resistor-capacitors have been changed

For above described change(s), updated Ratiated Spurious Emission, Spurious Emission on Antenna Port and MAXIMUMN TRANSMITTER POWER.



# **TABLE OF CONTENTS**

1. GENERAL INFORMATION	5
2. PRODUCT INFORMATION	6
2.1 PRODUCT TECHNICAL DESCRIPTION	6
2.2 TEST FREQUENCY LIST	7
2.3 RELATED SUBMITTAL(S) / GRANT (S)	8
2.4 TEST METHODOLOGY	8
2.5 CALCULATION OF EMISSION INDICATORS	8
2.6 STATEMENT - COMPLIANCE TO §95.977	g
2.7 SPECIAL ACCESSORIES	9
2.8 EQUIPMENT MODIFICATIONS	9
3. TEST ENVIRONMENT	10
3.1 ADDRESS OF THE TEST LABORATORY	10
3.2 TEST FACILITY	10
3.3 ENVIRONMENTAL CONDITIONS	11
3.4 MEASUREMENT UNCERTAINTY	11
3.5 LIST OF EQUIPMENTS USED	12
4.SYSTEM TEST CONFIGURATION	13
4.1 EUT CONFIGURATION	13
4.2 EUT EXERCISE	13
4.3 CONFIGURATION OF TESTED SYSTEM	13
4.4 EQUIPMENT USED IN TESTED SYSTEM	13
4.5 SUMMARY OF TEST RESULTS	14
5. DESCRIPTION OF TEST MODES	15
6. RATIATED SPURIOUS EMISSION	16
6.1 PROVISIONS APPLICABLE	16
6.2 MEASUREMENT PROCEDURE	16
6.3 MEASUREMENT SETUP	17
6.4 MEASUREMENT RESULTS	18
7. SPURIOUS EMISSION ON ANTENNA PORT	25
7.1 PROVISIONS APPLICABLE	25
7.2 MEASUREMENT METHOD	25
7.3 MEASUREMENT SETUP	25
7.4 MEASUREMENT RESULTS	26
8. MAXIMUMN TRANSMITTER POWER	30
8.1 PROVISIONS APPLICABLE	30





API	PENDIX II: PHOTOGRAPHS OF TEST EUT	33
API	PENDIX I: PHOTOGRAPHS OF TEST SETUP	33
	8.4 MEASUREMENT RESULTS	31
	8.3 MEASUREMENT SETUP	30
	8.2 MEASUREMENT METHOD	30



Page 5 of 33

# 1. GENERAL INFORMATION

Applicant	Cobra Electronics Corporation
Address	6500 West Cortland Street Chicago, IL 60707-4013 United States
Manufacturer	Cobra Electronics Corporation
Address	6500 West Cortland Street Chicago, IL 60707-4013 United States
Factory	Cobra Electronics Corporation
Address	6500 West Cortland Street Chicago, IL 60707-4013 United States
Product Designation	CB Radio
Brand Name	COBRA
Test Model	19MINIAMFM
Deviation from Standard	No any deviation from the test method
Date of receipt of test item	Oct. 18, 2022
Date of Test	Oct. 18, 2022~Nov. 16, 2022
Test Result	Pass

#### **WE HEREBY CERTIFY THAT:**

The above equipment was tested by Attestation of Global Compliance (Shenzhen) Co., Ltd. The data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI/TIA-382-A-1998. The sample tested as described in this report is in compliance with the FCC Rules Part 95. The test results of this report relate only to the tested sample identified in this report.

Prepared By	Bibo zhang			
	Bibo Zhang (Project Engineer)	Nov. 16, 2022		
Reviewed By	Calin	Lin		
	Calvin Liu (Reviewer)	Nov. 16, 2022		
Approved By	Max 21	ang		
•	Max Zhang Authorized Officer	Nov. 16, 2022		



Page 6 of 33

# 2. PRODUCT INFORMATION

# 2.1 PRODUCT TECHNICAL DESCRIPTION

Hardware Version	V1.0
Software Version	V1.02
Power Supply	DC 13.8V
Communication Type	Voice / Tone only
Operation Frequency Range	26.965MHz-27.405MHz
Modulation Type	AM/FM
Channel Separation	10 KHz
Emission Designator	AM: 8K00A3E FM: 8K00F3E
Number of Channels:	40 Channels
Rated Output Power	4W (It was fixed by the manufacturer, any individual can't arbitrarily change it.)
Maximum Transmitter Power	AM: 35.92dBm FM: 35.50dBm
Antenna Designation	Detachable
Antenna Type	External antenna
Antenna Gain	0dBi (Typical), 5dBi (Max)



Page 7 of 33

#### 2.2 TEST FREQUENCY LIST

According to ANSI C63.26 section 5.1.2.1:

Measurements of transmitters shall be performed and, if required, reported for each frequency band in which the EUT can be operated with the device transmitting at the number of frequencies in each band specified in Table 2.

Frequency range Over which EUT operates	Number of Frequencies	Location in frequency range of operation
1 MHz or less	1	Middle
1 MHz to 10 MHz	2	1 near top and 1 near bottom
More than 10 MHz	3	1 near top, 1 near middle, and 1 near bottom

Operation Frequency Each of Channel						
	CBRS	CBRS				
Channel	Frequency	Channel	Frequency			
1	26.965 MHz	21	27.215 MHz			
2	26.975 MHz	22	27.225 MHz			
3	26.985 MHz	23	27.255 MHz			
4	27.005 MHz	24	27.235 MHz			
5	27.015 MHz	25	27.245 MHz			
6	27.025 MHz	26	27.265 MHz			
7	27.035 MHz	27	27.275 MHz			
8	27.055 MHz	28	27.285 MHz			
9	27.065 MHz	29	27.295 MHz			
10	27.075 MHz	30	27.305 MHz			
11	27.085 MHz	31	27.315 MHz			
12	27.105 MHz	32	27.325 MHz			
13	27.115 MHz	33	27.335 MHz			
14	27.125 MHz	34	27.345 MHz			
15	27.135 MHz	35	27.355 MHz			
16	27.155 MHz	36	27.365 MHz			
17	27.165 MHz	37	27.375 MHz			
18	27.175 MHz	38	27.385 MHz			
19	27.185 MHz	39	27.395 MHz			
20	27.205 MHz	40	27.405 MHz			



Page 8 of 33

# 2.3 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for FCC ID: **BBO19MINI2**, filing to comply with Part 2, Part 95 of the Federal Communication Commission rules.

#### 2.4 TEST METHODOLOGY

The tests were performed according to following standards:

No.	Identity	ntity Document Title	
1	FCC 47 CFR Part 95	Personal Radio Services	
2	FCC 47 CFR Part 2	Frequency allocations and radio treaty matters; general rules and regulations	
3	ANSI C63.26-2015	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services	
4	ANSI EIA/TIA 382-A-1989	Minimum standards – Citizens band radio service amplitude modulated (AM) transceivers operating in the 27MHz band.	

#### 2.5 CALCULATION OF EMISSION INDICATORS

FCC Rules and Regulations Part 2.202: Necessary Bandwidth and Emission Bandwidth

# For AM Mode (ChannelSpacing: 10kHz)

Emission Designator 8K00A3E

Bn = 2M, M may vary between 4000 and 10000 depending on the quality desired.

Speech and music, M = 4000, Bandwidth: 8000 Hz= 8 kHz

A3E portion of the designator represents an AM voice transmission.

Therefore, the entire designator for 10 kHz channel spacing AM mode is 8K00A3E.

# For FM Mode (ChannelSpacing: 10kHz)

Emission Designator 8K00F3E

Bn = 2M, M may vary between 4000 and 10000 depending on the quality desired.

Speech and music, M = 4000, Bandwidth: 8000 Hz= 8 kHz

F3E portion of the designator represents an FM voice transmission.

Therefore, the entire designator for 10 kHz channel spacing FM mode is 8K00F3E.



Page 9 of 33

#### 2.6 STATEMENT - COMPLIANCE TO §95.977

§95.977 CBRS tone transmissions.

In addition to the tones permitted under §95.377, CBRS transmitter types may be designed to transmit brief tones to indicate the beginning or end of a transmission.

This device is capable of transmitting a brief (less than one second) audio tone, "Roger Beep", when the PTT button is released on the microphone indicating end of transmission. This function is user selectable and complies with the requirements of §95.377. See User's Manual .

.

#### 2.7 SPECIAL ACCESSORIES

Not available for this EUT intended for grant.

#### 2.8 EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.



Page 10 of 33

#### 3. TEST ENVIRONMENT

#### 3.1 ADDRESS OF THE TEST LABORATORY

Laboratory: Attestation of Global Compliance (Shenzhen) Co., Ltd.

Address: 1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

#### 3.2 TEST FACILITY

The test facility is recognized, certified, or accredited by the following organizations:

#### **CNAS-Lab Code: L5488**

Attestation of Global Compliance (Shenzhen) Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2017 General Requirements) for the Competence of Testing and Calibration Laboratories.

#### A2LA-Lab Cert. No.: 5054.02

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

#### FCC-Registration No.: 975832

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files with Registration 975832.

#### IC-Registration No.: 24842

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the Certification and Engineering Bureau of Industry Canada. The acceptance letter from the IC is maintained in our files with Registration 24842.



Page 11 of 33

#### 3.3 ENVIRONMENTAL CONDITIONS

	NORMAL CONDITIONS	EXTREME CONDITIONS		
Temperature range ( $^{\circ}\!\mathbb{C}$ )	15 - 35	-20 - 50		
Relative humidty range	20 % - 75 %	20 % - 75 %		
Pressure range (kPa)	86 - 106	86 - 106		
Power supply	DC13.8V	LV: DC 11.73V/HV:DC 15.87V		

Note: The Extreme Temperature and Extreme Voltages declared by the manufacturer.

#### 3.4 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement y ±U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.

Test Items	Measurement Uncertainty		
Frequency stability	±0.5%		
Transmitter power conducted	±0.8dB		
Transmitter power Radiated	±1.3dB		
Conducted spurious emission 9kHz-40 GHz	±2.7dB		
Conducted Emission	±3.2 dB		
Radiated Emission below 1GHz	±3.9 dB		
Radiated Emission above 1GHz	±4.8 dB		
Occupied Channel Bandwidth	±2 %		
FM deviation	±2 %		
Audio level	±0.98dB		
Low Pass Filter Response	±0.65dB		
Modulation Limiting	0.42 %		
Transient Frequency Behavior	6.8 %		



Report No.: AGC01284220402FE10A Page 12 of 33

#### 3.5 LIST OF EQUIPMENTS USED

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Mar. 28, 2022	R&S	ESCI	10096	Mar. 28, 2022	Mar. 27, 2023
EXA Signal Analyzer	Aglient	N9020A	W1312-60196	Aug. 16, 2022	Aug. 15, 2023
EXA Signal Analyzer	Aglient	N9020A	MY52090123	Aug. 04, 2022	Aug. 03, 2023
Horn antenna	SCHWARZBECK	BBHA 9170	#768	Oct. 31, 2021	Oct. 30, 2023
preamplifier	ChengYi	EMC184045SE	980508	Sep. 29, 2021	Sep. 28, 2023
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	Apr. 23, 2021	Apr. 22, 2023
Broadband Preamplifier	SCHWARZBECK	BBV 9718	9718-205	Jun. 05, 2022	Jun. 04, 2023
HORN ANTENNA	EM	EM-AH-10180	/	Feb. 24, 2022	Feb. 23, 2023
SIGNAL GENERATOR	AGILENT	E4421B	MY43351603	Mar. 04, 2022	Mar. 03, 2023
SIGNAL GENERATOR	R&S	SMT03	A0304261	Jun. 05, 2022	Jun. 04, 2023
ANTENNA	SCHWARZBECK	VULB9168	VULB9168-494	Jan. 08, 2021	Jan. 07, 2023
ANTENNA	SCHWARZBECK	VULB9168	D69250	Apr. 28, 2021	Apr. 27, 2023
Active loop antenna (9K-30MHz)	ZHINAN	ZN30900C	18051	Mar. 12, 2022	Mar. 11, 2023
Modulation Domain Analyzer	HP	53310A	3121A02467	Jun. 08, 2022	Jun. 07, 2023
Small environmental tester	ESPEC	SH-242		Aug. 03, 2022	Aug. 02, 2023
RF Communication Test Set	HP	8920B	US35010161	Aug. 03, 2022	Aug. 02, 2023
Attenuator	Weinachel Corp	58-30-33	ML030	Oct. 24, 2021	Oct. 23, 2022
Attenuator	Weinachel Corp	58-30-33	ML030	Oct. 22, 2022	Oct. 21, 2023
RF Cable	R&S	1#		Each time	N/A
RF Cable	R&S	2#		Each time	N/A
Fliter(50MHz-1GH z)	SCH	N30687F9		May 23, 2022	May 22, 2023



Report No.: AGC01284220402FE10A Page 13 of 33

**4.SYSTEM TEST CONFIGURATION** 

#### **4.1 EUT CONFIGURATION**

The EUT configuration for testing is installed on RF field strength measurement to meet the Commission's requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

#### **4.2 EUT EXERCISE**

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

#### **4.3 CONFIGURATION OF TESTED SYSTEM**

Fig. 2-1 Configuration of Tested System

EUT

Table 2-1 Equipment Used in Tested System

#### **4.4 EQUIPMENT USED IN TESTED SYSTEM**

The Following Peripheral Devices And Interface Cables Were Connected During The Measurement:

☐ Test Accessories Come From The Laboratory

Item	Equipment	Model No.	Identifier	Note
1	Load Antenna	HG-E10	Terminator DC -3G 50W	Accessories

#### 

Item	Equipment	Model No.	Identifier	Note
1	CB Radio	19MINIAMFM	FCC ID: BBO19MINI2	EUT
2	Hand microphone	N/A	N/A	Accessories
3	Car charger	N/A	N/A	Accessories



Page 14 of 33

#### **4.5 SUMMARY OF TEST RESULTS**

Item	FCC Rules	Description of Test	Result
1	§ 95.967& 2.1046(a)	Maximum Transmitter Power	Pass
2	§95.979& 2.1051	Spurious Emission on Antenna Port	Pass
3	§95.979& 2.1053	Ratiated Spurious Emission	Pass



Page 15 of 33

#### 5. DESCRIPTION OF TEST MODES

The EUT (CB Radio) has been tested under normal operating condition. (CBRS TX) are chosen for testing at each channel separation.

NO.	TEST MODE DESCRIPTION	CHANNEL SEPARATION
1	CBRS TX CHANNEL 1	10.0 kHz
2	CBRS TX CHANNEL 20	10.0 kHz
3	CBRS TX CHANNEL 40	10.0 kHz

#### Note:

- 1. Only the result of the worst case was recorded in the report, if no other cases.
- 2. For Radiated Emission, 3axis were chosen for testing for each applicable mode.
- Manufacturers use computer PC programming software to switch and operate frequency points, refer to the instructions for details



Page 16 of 33

#### 6. RATIATED SPURIOUS EMISSION

#### **6.1 PROVISIONS APPLICABLE**

FCC Part 95.979(a), FCC Part 2.1049

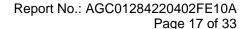
Each CBRS transmitter type must be designed to comply with the applicable unwanted emissions limits in this section. The power of unwanted emissions must be attenuated below the transmitter output power in Watts (P) as specified in the applicable paragraphs listed in the following table:

Emission type	Paragraph
A3E,F3E	(1), (3), (5), (6)
H3E, J3E, R3E	(2), (4), (5), (6)

- (1) 25 dB (decibels) in the frequency band 4 kHz to 8 kHz removed from the channel center frequency;
- (2) 25 dB in the frequency band 2 kHz to 6 kHz removed from the channel center frequency;
- (3) 35 dB in the frequency band 8 kHz to 20 kHz removed from the channel center frequency;
- (4) 35 dB in the frequency band 6 kHz to 10 kHz removed from the channel center frequency;
- (5) 53 + 10 log (P) dB in any frequency band removed from the channel center frequency by more than 250% of the authorized bandwidth.
- (6) 60 dB in any frequency band centered on a harmonic (i.e., an integer multiple of two or more times) of the carrier frequency.

#### **6.2 MEASUREMENT PROCEDURE**

- 1. EUT was placed on a 0.8 or 1.5meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The disturbance of the transmitter was maximized on the test receiver display by raising and lowering from 1m to 4m the receive antenna and by rotating through 360° the turntable. After the fundamental emission was maximized, a field strength measurement was made. The radiated emission measurements of all transmit frequencies in all channels were measured with peak detector.
- 2. A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
- 3. The EUT is then put into continuously transmitting mode at its maximum power level during the test. Set Test Receiver or Spectrum RBW=1MHz, VBW=3MHz for above 1GHz and RBW=100kHz, VBW=300kHz for 30MHz to 1GHz, And the maximum value of the receiver should be recorded as (Pr).
- 4. The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (PMea) is applied to the input of the





substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.

- 5. A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna. The cable loss (PcI) ,the Substitution Antenna Gain (Ga) and the Amplifier Gain (PAg) should be recorded after test
- 6. The measurement results are obtained as described below: Power(EIRP)=PMea- PAg Pcl Ga The measurement results are amend as described below:Power(EIRP)=PMea- Pcl Ga
- 7. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.
- 8. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP-2.15dBi.
- 9. Test the EUT in the lowest channel, the middle channel the Highest channel

#### **6.3 MEASUREMENT SETUP**

Radiated Emissions Below 30MHz Test Setup

9 m

Antenna Tower

Antenna Tower

Antenna Tower

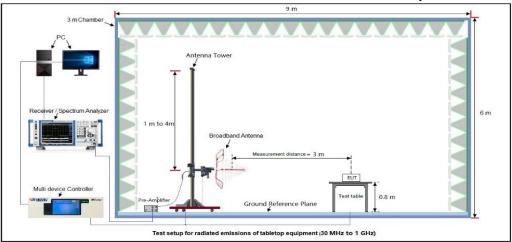
Artenna

Ground Reference Plane

Ground Reference Plane

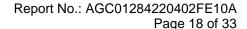
Ground Reference Plane

Radiated Emissions Below 30MHz-1GHz Test Setup



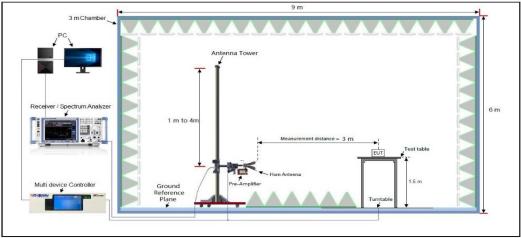
Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the "Dedicated Testing/Inspection Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the written authorization of AGC. The test results presented in the report apply only to the tested sample. Any objections to report issued by AGC should be submitted to AGC within 15days after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc01@agccert.com.

Tel: +86-755 2523 4088 E-mail: agc@agccert.com Web: http://www.agccert.com/





# Radiated Emissions Above 1GHz Test Setup

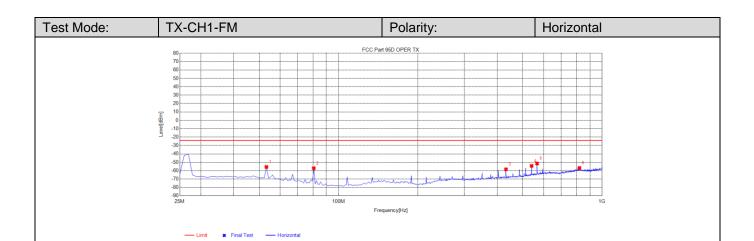


#### **6.4 MEASUREMENT RESULTS**

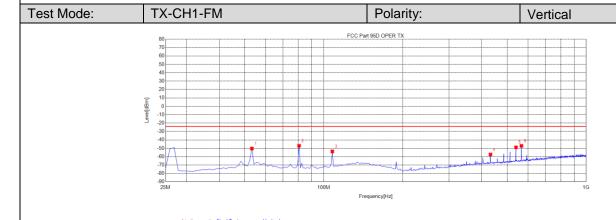
Preliminary calculation	Final Result
P(dBm)=30+10log 【P(W)】=36.02dBm	Limit= Preliminary calculation-60dB=-24dBm

- 1. Factor=Antenna Factor + Cable loss. (Below 1GHz)
- 2. Factor=Antenna Factor+ Cable loss -Pre-amplifier. (Above 1 GHz)
- 3. Margin=Limit- Level
- 4. the unwanted emission should be attenuated below TP by at least 60 dB.
- 5. In the frequency range of 9KHz-30MHz, in addition to displaying the Fundamental level, the radiated spurious emission level is much less than 60dB of the carrier power, so it is ignored.

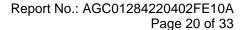




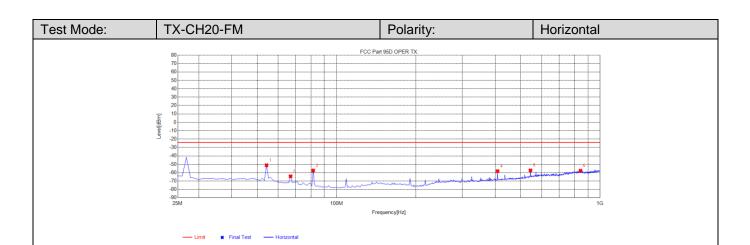
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	53.275	-88.35	-55.63	-24.00	31.63	32.72	202	Horizontal
2	80.575	-83.70	-57.08	-24.00	33.08	26.62	245	Horizontal
3	431.575	-93.44	-58.42	-24.00	34.42	35.02	329	Horizontal
4	539.8	-92.09	-54.36	-24.00	30.36	37.73	236	Horizontal
5	566.125	-90.10	-51.44	-24.00	27.44	38.66	169	Horizontal
6	819.625	-100.16	-56.83	-24.00	32.83	43.33	360	Horizontal



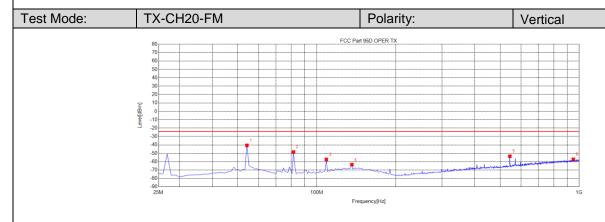
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	53.275	-80.68	-50.36	-24.00	26.36	30.32	317	Vertical
2	80.575	-75.64	-47.03	-24.00	23.03	28.61	309	Vertical
3	107.875	-84.48	-53.73	-24.00	29.73	30.75	309	Vertical
4	431.575	-92.85	-57.42	-24.00	33.42	35.43	82	Vertical
5	539.8	-86.24	-48.93	-24.00	24.93	37.31	267	Vertical
6	566.125	-85.04	-47.12	-24.00	23.12	37.92	292	Vertical



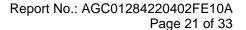




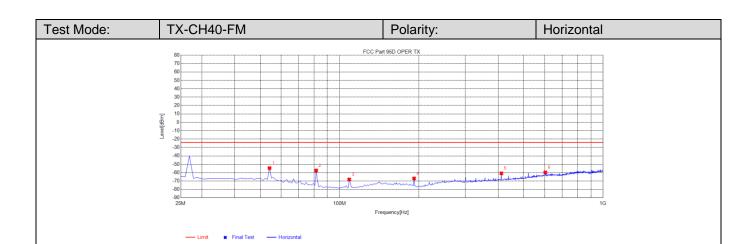
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	54.25	-83.61	-51.17	-24.00	27.17	32.44	207	Horizontal
2	66.925	-93.62	-64.36	-24.00	40.36	29.26	325	Horizontal
3	81.55	-83.89	-57.44	-24.00	33.44	26.45	240	Horizontal
4	408.175	-92.82	-58.24	-24.00	34.24	34.58	308	Horizontal
5	543.7	-95.19	-57.32	-24.00	33.32	37.87	248	Horizontal
6	842.05	-100.88	-57.66	-24.00	33.66	43.22	190	Horizontal



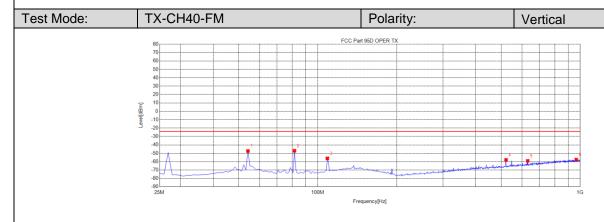
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	54.25	-71.08	-40.60	-24.00	16.60	30.48	144	Vertical
2	81.55	-77.07	-48.50	-24.00	24.50	28.57	9	Vertical
3	108.85	-88.31	-57.37	-24.00	33.37	30.94	9	Vertical
4	136.15	-97.72	-63.59	-24.00	39.59	34.13	102	Vertical
5	543.7	-90.96	-53.56	-24.00	29.56	37.40	118	Vertical
6	948.325	-101.07	-57.27	-24.00	33.27	43.80	354	Vertical





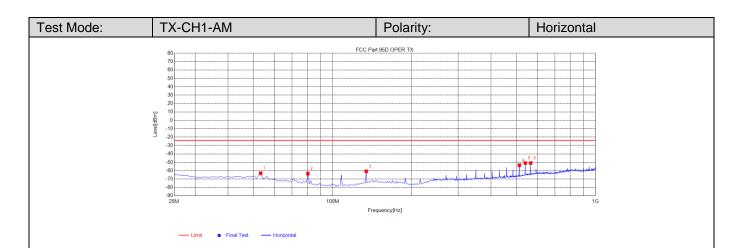


Level Reading Limit Margin Factor Angle Freq. NO. Polarity [MHz] [dBm] [dBm] [dBm] [dB] [dB] [°] 1 54.25 -87.06 -54.62 -24.00 30.62 32.44 191 Horizontal 2 81.55 -83.88 -57.43 -24.00 33.43 26.45 250 Horizontal -68.11 25.02 3 108.85 -93.13 -24.00 44.11 267 Horizontal 4 191.725 -94.92 -66.93 -24.00 42.93 27.99 191 Horizontal 411.1 -60.84 -24.00 34.63 318 -95.47 36.84 5 Horizontal 6 603.175 -99.56 -59.70 -24.00 35.70 39.86 158 Horizontal

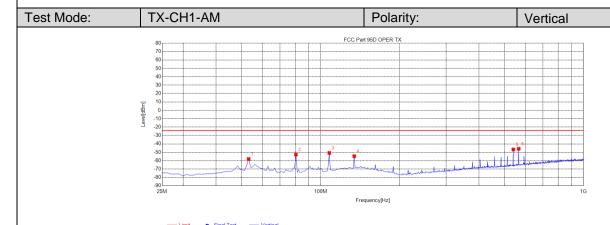


NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	54.25	-77.84	-47.36	-24.00	23.36	30.48	126	Vertical
2	81.55	-75.59	-47.02	-24.00	23.02	28.57	320	Vertical
3	108.85	-87.08	-56.14	-24.00	32.14	30.94	303	Vertical
4	521.275	-94.79	-57.91	-24.00	33.91	36.88	286	Vertical
5	630.475	-98.33	-59.08	-24.00	35.08	39.25	152	Vertical
6	964.9	-101.59	-57.62	-24.00	33.62	43.97	360	Vertical



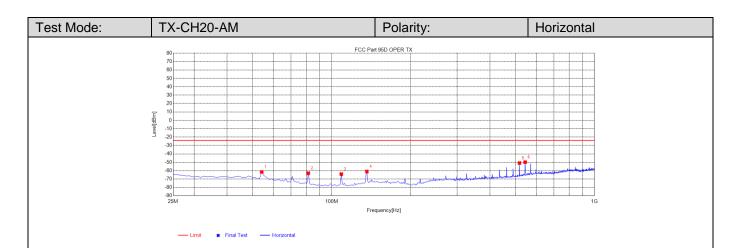


NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	53.275	-95.82	-63.10	-24.00	39.10	32.72	202	Horizontal
2	80.575	-90.10	-63.48	-24.00	39.48	26.62	253	Horizontal
3	134.2	-89.06	-60.80	-24.00	36.80	28.26	219	Horizontal
4	512.5	-90.34	-53.57	-24.00	29.57	36.77	176	Horizontal
5	539.8	-88.64	-50.91	-24.00	26.91	37.73	106	Horizontal
6	566.125	-89.63	-50.97	-24.00	26.97	38.66	312	Horizontal

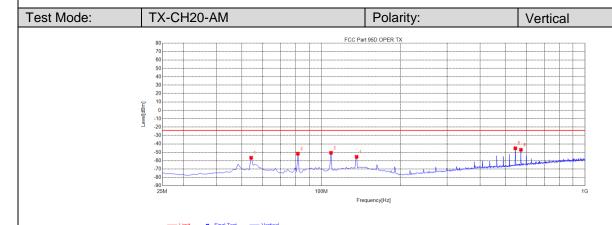


NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	53.275	-88.37	-58.05	-24.00	34.05	30.32	132	Vertical
2	80.575	-81.44	-52.83	-24.00	28.83	28.61	149	Vertical
3	107.875	-81.57	-50.82	-24.00	26.82	30.75	301	Vertical
4	134.2	-88.69	-54.69	-24.00	30.69	34.00	326	Vertical
5	539.8	-84.05	-46.74	-24.00	22.74	37.31	250	Vertical
6	566.125	-83.83	-45.91	-24.00	21.91	37.92	250	Vertical

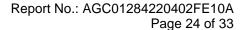




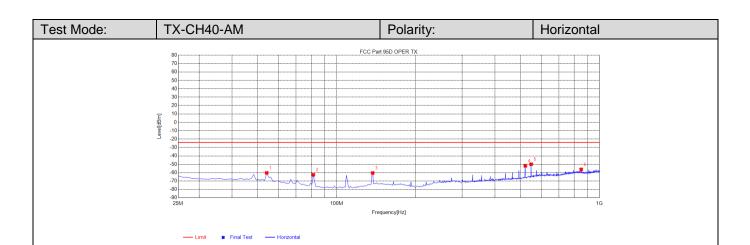
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	54.25	-94.09	-61.65	-24.00	37.65	32.44	1	Horizontal
2	81.55	-89.51	-63.06	-24.00	39.06	26.45	246	Horizontal
3	108.85	-89.10	-64.08	-24.00	40.08	25.02	229	Horizontal
4	136.15	-89.65	-61.01	-24.00	37.01	28.64	221	Horizontal
5	517.375	-87.87	-50.93	-24.00	26.93	36.94	169	Horizontal
6	543.7	-87.73	-49.86	-24.00	25.86	37.87	161	Horizontal



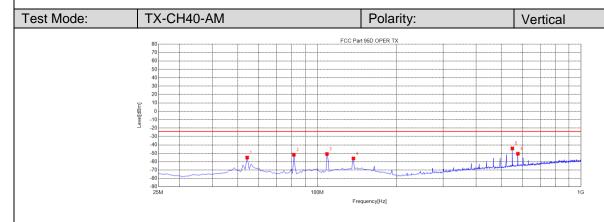
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	54.25	-87.06	-56.58	-24.00	32.58	30.48	114	Vertical
2	81.55	-80.31	-51.74	-24.00	27.74	28.57	132	Vertical
3	108.85	-81.66	-50.72	-24.00	26.72	30.94	300	Vertical
4	136.15	-89.61	-55.48	-24.00	31.48	34.13	309	Vertical
5	543.7	-82.69	-45.29	-24.00	21.29	37.40	242	Vertical
6	571	-85.12	-47.08	-24.00	23.08	38.04	250	Vertical







NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	54.25	-92.79	-60.35	-24.00	36.35	32.44	9	Horizontal
2	81.55	-89.06	-62.61	-24.00	38.61	26.45	211	Horizontal
3	137.125	-89.28	-60.45	-24.00	36.45	28.83	220	Horizontal
4	521.275	-88.91	-51.83	-24.00	27.83	37.08	169	Horizontal
5	548.575	-88.01	-49.97	-24.00	25.97	38.04	169	Horizontal
6	849.85	-99.33	-56.15	-24.00	32.15	43.18	211	Horizontal



NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Angle [°]	Polarity
1	54.25	-85.61	-55.13	-24.00	31.13	30.48	129	Vertical
2	81.55	-80.46	-51.89	-24.00	27.89	28.57	146	Vertical
3	108.85	-81.81	-50.87	-24.00	26.87	30.94	282	Vertical
4	137.125	-90.42	-56.22	-24.00	32.22	34.20	298	Vertical
5	548.575	-81.78	-44.26	-24.00	20.26	37.52	247	Vertical
6	575.875	-88.76	-50.61	-24.00	26.61	38.15	247	Vertical

Tel: +86-755 2523 4088 E-mail: agc@agccert.com Web: http://www.agccert.com/



Page 25 of 33

#### 7. SPURIOUS EMISSION ON ANTENNA PORT

#### 7.1 PROVISIONS APPLICABLE

Please refer to FCC 47 CFR 2.1051, 2.1057 & 95.979 for specification details.

Emissions shall be attenuated below the mean output power of the transmitter as follows:

FCC Rules	Attenuation Limit (dBc)
§ 95.979	At least 53 + 10 log (P) dB
§ 95.979	60 dB in any frequency band centered on a harmonic (i.e., an integer multiple of two or more times) of the carrier frequency.

 $53 + 10 \log (Pwatts)$ 

Calculation: Limit (dBm) =EL-53-10log10 (TP)

Notes: EL is the emission level of the Output Power expressed in dBm,

In this application, the EL is P(dBm).

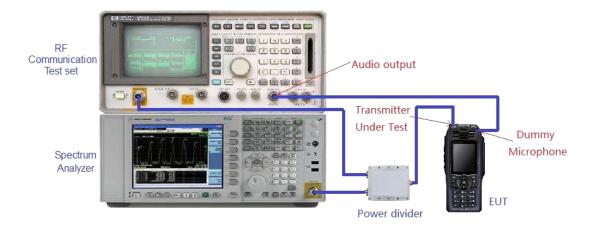
Limit (dBm) = P( dBm)-53-10 log (Pwatts) = -23 dBm

Note:Unwanted spurious limit is -23dBm, and the main wave frequency multiplication limit is -24dBm. After evaluat ion, a stricter limit of -24dBm is used to evaluate unwanted spurious and main wave frequency multiplication.

#### 7.2 MEASUREMENT METHOD

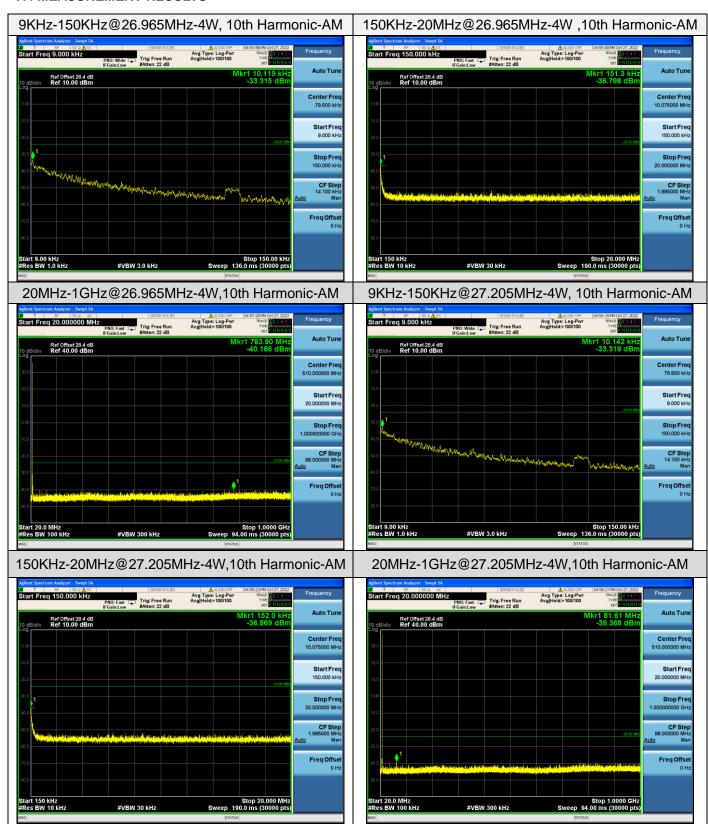
- 1. The RF output of the EUT was connected to a spectrum analyzer through appropriate attenuation.
- 2. The resolution bandwidth of the spectrum analyzer was set to 100 kHz. Sufficient scans were taken to
- 3. show any out of band emission up to 10th . Harmonic for the lower and the highest frequency range.
- 4. Set RBW 1 kHz, VBW 3 kHz in the frequency band 9KHz to 150KHz;
  - Set RBW 10 kHz, VBW 30 kHz in the frequency band 150KHz to 20MHz;
  - Set RBW 100 kHz, VBW 300 kHz in the frequency band 20MHz to 1GHz;
  - While set RBW=1MHz.VBW=3MHz from the 1GHz to 10th Harmonic.
- 5. The audio input was set the unmodulated carrier, the resulting picture is print out for each channel separation.

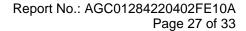
#### 7.3 MEASUREMENT SETUP





#### 7.4 MEASUREMENT RESULTS

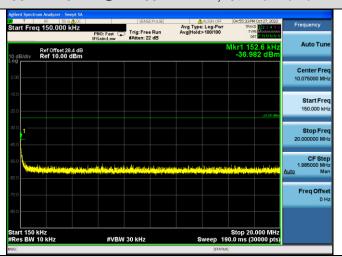






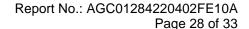


# 150KHz-20MHz@27.405MHz-4W ,10th Harmonic-AM

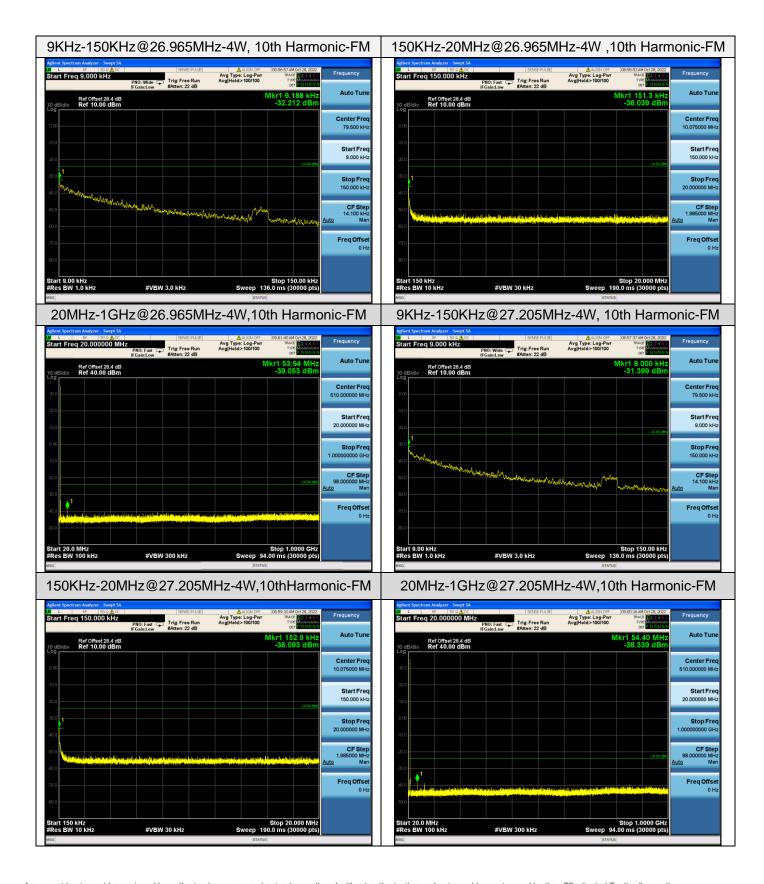


#### 20MHz-1GHz@27.405MHz-4W,10th Harmonic-AM

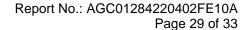




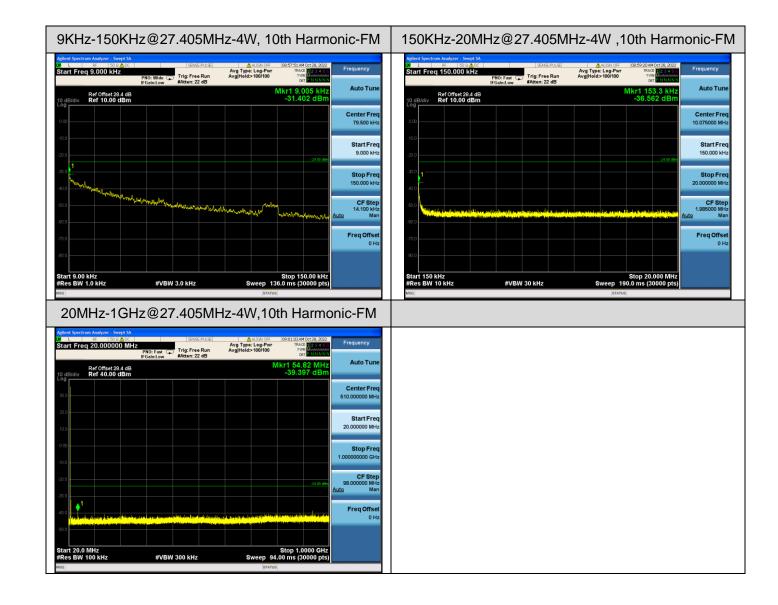


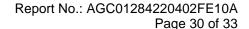


Tel: +86-755 2523 4088 E-mail: agc@agccert.com Web: http://www.agccert.com/











### 8. MAXIMUMN TRANSMITTER POWER

#### **8.1 PROVISIONS APPLICABLE**

FCC Part 95.967, FCC Part2.1046(a)

Each CBRS transmitter type must be designed such that the transmitter power can not exceed the following limits:

- (a) When transmitting amplitude modulated (AM) voice signals or frequency modulated (FM) voice signals, the mean carrier power must not exceed 4 Watts
- (b) When transmitting single sideband (SSB) voice signals, the peak envelope power must not exceed 12 Watts.

#### **8.2 MEASUREMENT METHOD**

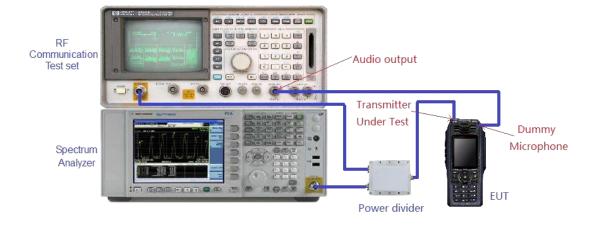
Conducted RF Output Power:

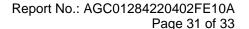
- The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.
- 2. The DUT was connected to a Spectrum Analyzer (SA) via a 30dB attenuator connected to the DUT's antenna port. The SA was configured as above using the Automatic 6dB Cursor Bandwidth measurement. The output power of the DUT was set to the manufacturer's highest output power setting at the Low, Mid and High frequency channels as permitted by the device. The DUT was set to transmit at its maximum Duty Cycle.
- 3. Spectrum set as follow:

Centre frequency = fundamental frequency, Span=50kHz , RBW=300Hz, VBW=3KHz ;

Sweep = auto, Detector function = peak, Trace = max hold

# **8.3 MEASUREMENT SETUP**



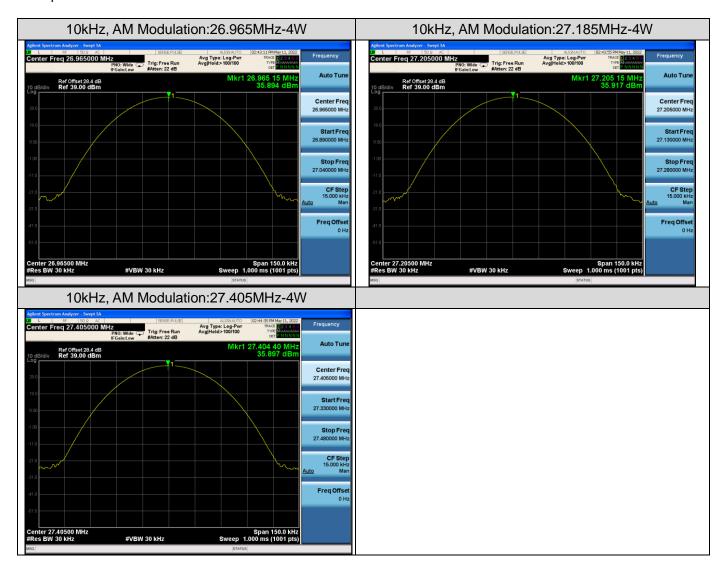


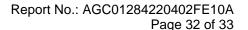


#### **8.4 MEASUREMENT RESULTS**

Conducted Power Measurement Results					
Mode	Channel Separation	Test Channel	Measurement Result (dBm)		
		26.965 MHz	35.89		
CBRS TX	10 kHz	27.205 MHz	35.92		
		27.405 MHz	35.90		

Test plot as follows:

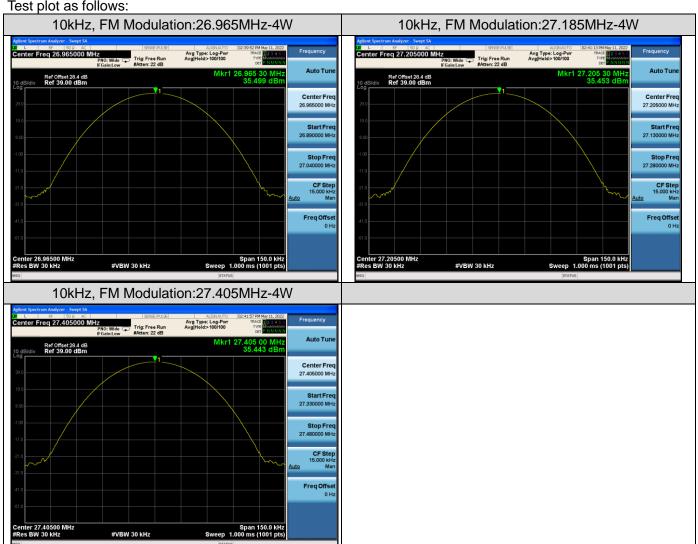






Conducted Power Measurement Results					
Mode	Channel Separation	Test Channel	Measurement Result (dBm)		
		26.965 MHz	35.50		
CBRS TX	10 kHz	27.205 MHz	35.45		
		27.405 MHz	35.44		

Test plot as follows:



Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the "Dedicated Testing/Inspection Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the written authorization of AGC. The test results presented in the report apply only to the tested sample. Any objections to report issued by AGC should be submitted to AGC within 15days after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc01@agccert.com.

Tel: +86-755 2523 4088 E-mail: agc@agccert.com Web: http://www.agccert.com/



Page 33 of 33

# **APPENDIX I: PHOTOGRAPHS OF TEST SETUP**

Refer to the Report No.: AGC01284220402AP01A

**APPENDIX II: PHOTOGRAPHS OF TEST EUT** 

Refer to the Report No.: AGC01284220402AP02A

----END OF REPORT----



# Conditions of Issuance of Test Reports

- 1. All samples and goods are accepted by the Attestation of Global Compliance (Shenzhen) Co., Ltd. (the "Company") solely for testing and reporting in accordance with the following terms and conditions. The company provides its services on the basis that such terms and conditions constitute express agreement between the company and any person, firm or company requesting its services (the "Clients").
- 2. Any report issued by Company as a result of this application for testing services (the "Report") shall be issued in confidence to the Clients and the Report will be strictly treated as such by the Company. It may not be reproduced either in its entirety or in part and it may not be used for advertising or other unauthorized purposes without the written consent of the Company. The Clients to whom the Report is issued may, however, show or send it, or a certified copy thereof prepared by the Company to its customer, supplier or other persons directly concerned. The Company will not, without the consent of the Clients, enter into any discussion or correspondence with any third party concerning the contents of the Report, unless required by the relevant governmental authorities, laws or court orders.
- 3. The Company shall not be called or be liable to be called to give evidence or testimony on the Report in a court of law without its prior written consent, unless required by the relevant governmental authorities, laws or court orders.
- 4. In the event of the improper use of the report as determined by the Company, the Company reserves the right to withdraw it, and to adopt any other additional remedies which may be appropriate.
- 5. Samples submitted for testing are accepted on the understanding that the Report issued cannot form the basis of, or be the instrument for, any legal action against the Company.
- 6. The Company will not be liable for or accept responsibility for any loss or damage however arising from the use of information contained in any of its Reports or in any communication whatsoever about its said tests or investigations.
- 7. Clients wishing to use the Report in court proceedings or arbitration shall inform the Company to that effect prior to submitting the sample for testing.
- 8. The Company is not responsible for recalling the electronic version of the original report when any revision is made to them. The Client assumes the responsibility to providing the revised version to any interested party who uses them.
- 9. Subject to the variable length of retention time for test data and report stored hereinto as otherwise specifically required by individual accreditation authorities, the Company will only keep the supporting test data and information of the test report for a period of six years. The data and information will be disposed of after the aforementioned retention period has elapsed. Under no circumstances shall we provide any data and information which has been disposed of after retention period. Under no circumstances shall we be liable for damage of any kind, including (but not limited to) compensatory damages, lost profits, lost data, or any form of special, incidental, indirect, consequential or punitive damages of any kind, whether based on breach of contract of warranty, tort (including negligence), product liability or otherwise, even if we are informed in advance of the possibility of such damages.