

Guangzhou Xaircraft  
Technology CO.,LTD

# TEST REPORT

**SCOPE OF WORK**

FCC Testing – M3ARC3AH

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# FCC

# RF Test Report

*For*

**Guangzhou Xaircraft Technology CO.,LTD**

**Product Name: XAG Agricultural Remote Controller 3 Pro**

**Model Number: M3ARC3AH**

**FCC ID: 2A46G-M3ARC3AH**

**Report No: 230403080SZN-001**

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Date: 21 June 2023

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## 1. Summary of Test Result

Applicant:	Guangzhou Xaircraft Technology CO.,LTD
Address:	Block C, No.115, Gaopu Road, Tianhe District, Guangzhou City, Guangdong, P.R.China
Product name:	XAG Agricultural Remote Controller 3 Pro
Model Number:	M3ARC3AH
FCC ID:	2A46G-M3ARC3AH
Report number:	Z23040308-001
Date of Test	03 April 2023 to 10 May 2023

The above equipment was tested by Intertek Testing Services Shenzhen Ltd. Longhua Branch and located at 101, 201, Building B, No. 308 Wuhe Avenue, Zhangkengjing Community GuanHu Subdistrict, LongHua District, Shenzhen, People's Republic of China.. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI 63.26-2015 and KDB 971168 D01. This device is in compliance with FCC rules as following:

47 CFR FCC Part 02:2020  
47 CFR FCC Part 22:2020  
47 CFR FCC Part 24:2020  
47 CFR FCC Part 27:2020  
47 CFR FCC Part 90:2020

The test results of this report relate only to the tested sample identified in this report.

## 1.1 Cellular Band (824-849MHz paired with 869-894MHz)

Test Item	FCC Rule No.	Requirements	Test Result	Verdict (Note1)
Effective (Isotropic) Radiated Power Output Data	§2.1046, §22.913	FCC: ERP $\leq$ 7 W.	Appendix A	Pass
Peak-Average Ratio	--	--	Appendix B	Pass
Modulation Characteristics	§2.1047	Digital modulation	Appendix C	Pass
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Appendix D	Pass
Band Edges Compliance	§2.1051, §22.917	$\leq$ -13 dBm/1%*EBW, in 1 MHz bands immediately outside and adjacent to the frequency block.	Appendix E	Pass
Spurious Emission at Antenna Terminals	§2.1051, §22.917	FCC: $\leq$ -13 dBm/100 kHz, from 9 kHz to 10 <sup>th</sup> harmonics but outside authorized operating frequency ranges.	Appendix F	Pass
Field Strength of Spurious Radiation	§2.1053, §22.917	FCC: $\leq$ -13 dBm/100 kHz.	Chapter 6	Pass
Frequency Stability	§2.1055, §22.355	$\leq$ $\pm$ 2.5ppm.	Appendix H	Pass

Note1: For the verdict, the "N/A" denotes "not applicable", the "N/T" denotes "not tested".

## 1.2 PCS Band (1850-1910MHz paired with 1930-1990MHz)

Test Item	FCC Rule No.	Requirements	Test Result	Verdict (Note1)
Effective (Isotropic) Radiated Power Output Data	§2.1046, §24.232	EIRP $\leq$ 2 W	Appendix A	Pass
Peak-Average Ratio	§2.1046, §24.232	Limit $\leq$ 13 dB	Appendix B	Pass
Modulation Characteristics	§2.1047	Digital modulation	Appendix C	Pass
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Appendix D	Pass
Band Edges Compliance	§2.1051, §24.238	$\leq$ -13 dBm/1%*EBW, in 1 MHz bands immediately outside and adjacent to the frequency block.	Appendix E	Pass
Spurious Emission at Antenna Terminals	§2.1051, §24.238	$\leq$ -13 dBm/1 MHz, from 9 kHz to 10 <sup>th</sup> harmonics but outside authorized operating frequency ranges.	Appendix F	Pass
Field Strength of Spurious Radiation	§2.1053, §24.238	$\leq$ -13 dBm/1 MHz.	Chapter 6	Pass
Frequency Stability	§2.1055, §24.235	within the authorized frequency block	Appendix H	Pass

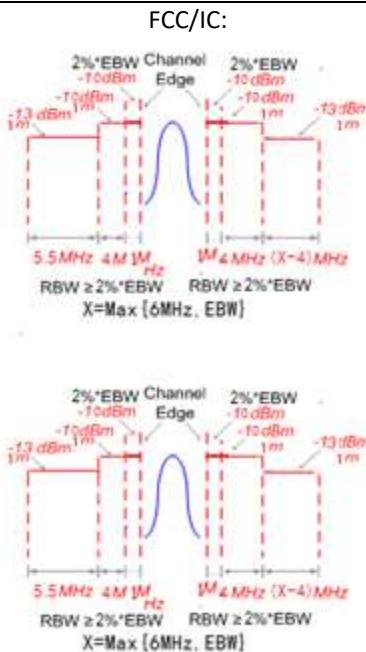
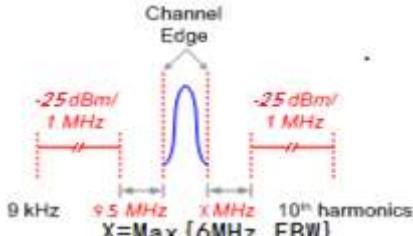
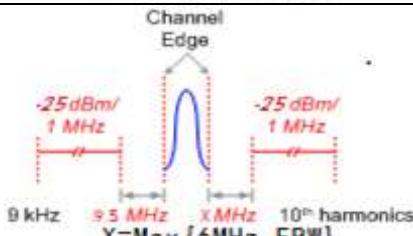
Note1: For the verdict, the "N/A" denotes "not applicable", the "N/T" denotes "not tested".

## 1.3 AWS Band (1710-1755MHz paired with 2110-2155MHz)

Test Item	FCC Rule No.	Requirements	Test Result	Verdict (Note1)
Effective (Isotropic) Radiated Power Output Data	§2.1046, §27.50(d)	EIRP ≤ 1 W	Appendix A	Pass
Peak-Average Ratio	§2.1046, §27.50(d)	Limit≤13 dB	Appendix B	Pass
Modulation Characteristics	§2.1047	Digital modulation	Appendix C	Pass
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Appendix D	Pass
Band Edges Compliance	§2.1051, §27.53(h)	≤ -13 dBm/1%*EBW, in 1 MHz bands immediately outside and adjacent to the frequency block.	Appendix E	Pass
Spurious Emission at Antenna Terminals	§2.1051, §27.53(h)	≤ -13 dBm/1 MHz, from 9 kHz to 10 <sup>th</sup> harmonics but outside authorized operating frequency ranges.	Appendix F	Pass
Field Strength of Spurious Radiation	§2.1053, §27.53(h)	≤ -13 dBm/1 MHz.	Chapter 6	Pass
Frequency Stability	§2.1055, §27.54	within the authorized frequency block	Appendix H	Pass

Note1: For the verdict, the "N/A" denotes "not applicable", the "N/T" denotes "not tested".

## 1.4 BRS&EBS Band (2500-2570 MHz paired with 2620-2690 MHz)

Test Item	FCC Rule No.	Requirements	Test Result	Verdict (Note1)
Effective (Isotropic) Radiated Power Output Data	§2.1046, §27.50(h)	EIRP ≤ 2W	Appendix A	Pass
Peak-Average Ratio	§27.50(a)	Limit≤13 dB	Appendix B	Pass
Modulation Characteristics	§2.1047	Digital modulation	Appendix C	Pass
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Appendix D	Pass
Band Edges Compliance	§2.1051, §27.53(m4)	<p>FCC/IC:</p>  <p>RBW ≥ 2%*EBW      RBW ≥ 2%*EBW X=Max {6MHz, EBW}</p>	Appendix E	Pass
Spurious Emission at Antenna Terminals	§2.1051, §27.53(m)	 <p>9 kHz      9.5 MHz      X MHz      10<sup>th</sup> harmonics X=Max {6MHz, EBW}</p>	Appendix F	Pass
Field Strength of Spurious Radiation	§2.1053, §27.53(m)	 <p>9 kHz      9.5 MHz      X MHz      10<sup>th</sup> harmonics X=Max {6MHz, EBW}</p>	Chapter 6	Pass
Frequency Stability	§2.1055, §27.54	Within authorized bands of operation/frequency block.	Appendix H	Pass

Note1: For the verdict, the "N/A" denotes "not applicable", the "NIT" denotes "not tested".

## 1.5 Band25 (1850-1915MHz paired with 1930-1995 MHz)

Test Item	FCC Rule No.	Requirements	Test Result	Verdict (Note1)
Effective (Isotropic) Radiated Power Output Data	§2.1046, §24.232	EIRP ≤ 2 W	Appendix A	Pass
Peak-Average Ratio	§2.1046, §24.232	Limit≤13 dB	Appendix B	Pass
Modulation Characteristics	§2.1047	Digital modulation	Appendix C	Pass
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Appendix D	Pass
Band Edges Compliance	§2.1051, §24.238	≤ -13 dBm/1%*EBW, in 1 MHz bands immediately outside and adjacent to the frequency block.	Appendix E	Pass
Spurious Emission at Antenna Terminals	§2.1051, §24.238	≤ -13 dBm/1 MHz, from 9 kHz to 10 <sup>th</sup> harmonics but outside authorized operating frequency ranges.	Appendix F	Pass
Field Strength of Spurious Radiation	§2.1053, §24.238	≤ -13 dBm/1 MHz.	Chapter 6	Pass
Frequency Stability	§2.1055, §24.235	within the authorized frequency block	Appendix H	Pass

Note1: For the verdict, the "N/A" denotes "not applicable", the "N/T" denotes "not tested".

## 1.6 Band26 (814-824MHz paired with 859-869 MHz)

Test Item	FCC Rule No.	Requirements	Test Result	Verdict (Note1)
Transmitter Conducted Power Output	§2.1046, §290.635	ERP ≤ 100 W	Appendix A	Pass
Peak-Average Ratio	--	Limits≤13 dB	Appendix B	Pass
Modulation Characteristics	§2.1047	Digital modulation	Appendix C	Pass
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Appendix D	Pass
Emission Mask	§2.1051, §90.691	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 $116 \text{ Log10}(f/6.1)$ decibels or $50+10\text{Log10}(P)$ 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.	Appendix E	Pass
Spurious Emission at Antenna Terminals	§2.1051, §90.691	< $43 + 10\text{Log10}(P[\text{Watts}])$ for all out-ofband emissions	Appendix F	Pass
Field Strength of Spurious Radiation	§2.1053, §90.691	< $43 + 10\text{Log10}(P[\text{Watts}])$ for all out-ofband emissions	Chapter 6	Pass
Frequency Stability	§2.1055, §90.213	< ±2.5ppm.	Appendix H	Pass

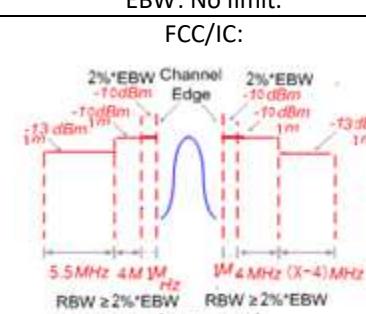
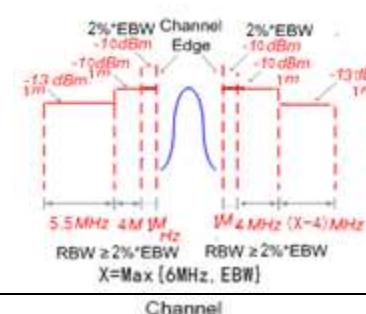
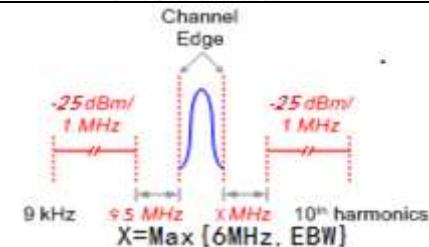
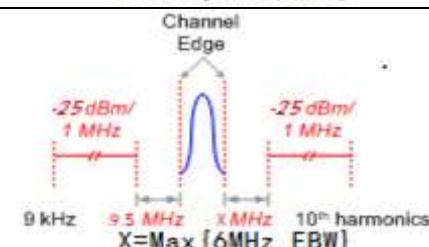
Note1: For the verdict, the "N/A" denotes "not applicable", the "N/T" denotes "not tested".

## 1.7 Band26 (824-849MHz paired with 869-894MHz)

Test Item	FCC Rule No.	Requirements	Test Result	Verdict (Note1)
Effective (Isotropic) Radiated Power Output Data	§2.1046, §22.913	FCC: ERP ≤ 7 W.	Appendix A	Pass
Peak-Average Ratio	--	--	Appendix B	Pass
Modulation Characteristics	§2.1047	Digital modulation	Appendix C	Pass
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Appendix D	Pass
Band Edges Compliance	§2.1051, §22.917	≤ -13 dBm/1%*EBW, in 1 MHz bands immediately outside and adjacent to the frequency block.	Appendix E	Pass
Spurious Emission at Antenna Terminals	§2.1051, §22.917	FCC: ≤ -13 dBm/100 kHz, from 9 kHz to 10 <sup>th</sup> harmonics but outside authorized operating frequency ranges.	Appendix F	Pass
Field Strength of Spurious Radiation	§2.1053, §22.917	FCC: ≤ -13 dBm/100 kHz.	Chapter 6	Pass
Frequency Stability	§2.1055, §22.355	≤ ±2.5ppm.	Appendix H	Pass

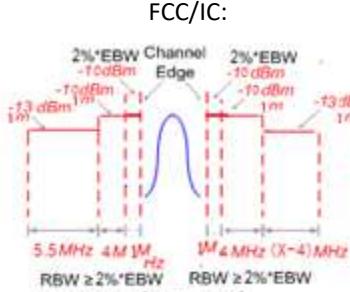
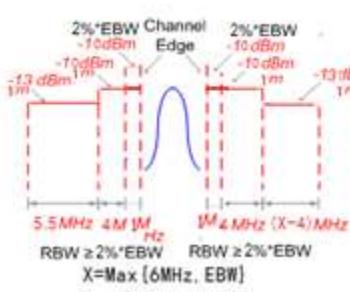
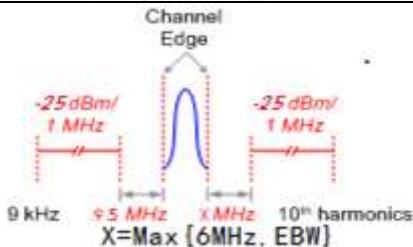
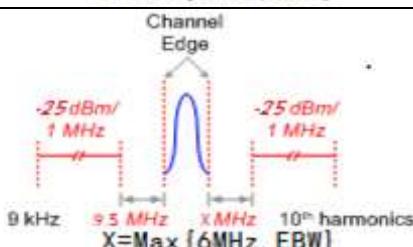
Note1: For the verdict, the "N/A" denotes "not applicable", the "N/T" denotes "not tested".

## 1.8 Band38 (2570-2620 MHz paired with 2570-2620 MHz)

Test Item	FCC Rule No.	Requirements	Test Result	Verdict (Note1)
Effective (Isotropic) Radiated Power Output Data	§2.1046, §27.50(h)	EIRP ≤ 2W	Appendix A	Pass
Peak-Average Ratio	§27.50(a)	Limit ≤ 13 dB	Appendix B	Pass
Modulation Characteristics	§2.1047	Digital modulation	Appendix C	Pass
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Appendix D	Pass
Band Edges Compliance	§2.1051, §27.53(m4)	<p>FCC/IC:</p>  <p>2%*EBW Channel Edge -10dBm -10dBm -10dBm -10dBm -13dBm 1m 1m 1m 1m 5.5 MHz 4 MHz 1 MHz 1 MHz (X-4) MHz RBW ≥ 2%*EBW RBW ≥ 2%*EBW X=Max {6MHz, EBW}</p>  <p>2%*EBW Channel Edge -10dBm -10dBm -10dBm -10dBm -13dBm 1m 1m 1m 1m 5.5 MHz 4 MHz 1 MHz 1 MHz (X-4) MHz RBW ≥ 2%*EBW RBW ≥ 2%*EBW X=Max {6MHz, EBW}</p>	Appendix E	Pass
Spurious Emission at Antenna Terminals	§2.1051, §27.53(m)	 <p>Channel Edge -25 dBm/ 1 MHz -25 dBm/ 1 MHz 9 kHz 9.5 MHz X MHz 10<sup>th</sup> harmonics X=Max {6MHz, EBW}</p>	Appendix F	Pass
Field Strength of Spurious Radiation	§2.1053, §27.53(m)	 <p>Channel Edge -25 dBm/ 1 MHz -25 dBm/ 1 MHz 9 kHz 9.5 MHz X MHz 10<sup>th</sup> harmonics X=Max {6MHz, EBW}</p>	Chapter 6	Pass
Frequency Stability	§2.1055, §27.54	Within authorized bands of operation/frequency block.	Appendix H	Pass

Note1: For the verdict, the "N/A" denotes "not applicable", the "NIT" denotes "not tested".

## 1.9 Band41 (2496-2690 MHz paired with 2496-2690 MHz)

Test Item	FCC Rule No.	Requirements	Test Result	Verdict (Note1)
Effective (Isotropic) Radiated Power Output Data	§2.1046, §27.50(h)	EIRP ≤ 2W	Appendix A	Pass
Peak-Average Ratio	§27.50(a)	Limit≤13 dB	Appendix B	Pass
Modulation Characteristics	§2.1047	Digital modulation	Appendix C	Pass
Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	Appendix D	Pass
Band Edges Compliance	§2.1051, §27.53(m4)	<p>FCC/IC:</p>  <p>RBW ≥ 2%*EBW X=Max {6MHz, EBW}</p>  <p>RBW ≥ 2%*EBW X=Max {6MHz, EBW}</p>	Appendix E	Pass
Spurious Emission at Antenna Terminals	§2.1051, §27.53(m)	 <p>-25 dBm/1 MHz 9 kHz 9.5 MHz X MHz 10<sup>th</sup> harmonics X=Max {6MHz, EBW}</p>	Appendix F	Pass
Field Strength of Spurious Radiation	§2.1053, §27.53(m)	 <p>-25 dBm/1 MHz 9 kHz 9.5 MHz X MHz 10<sup>th</sup> harmonics X=Max {6MHz, EBW}</p>	Chapter 6	Pass
Frequency Stability	§2.1055, §27.54	Within authorized bands of operation/frequency block.	Appendix H	Pass

Note1: For the verdict, the "N/A" denotes "not applicable", the "NIT" denotes "not tested".

## 2. General Description

### 2.1 Product Description

XAG Agricultural Remote Controller 3 Pro is subscriber equipment in the GSM/UMTS/LTE system. The GSM frequency band includes GSM850 and GSM900 and DCS1800 and PCS1900. but only GSM850/1900 test data included in this report. The UMTS frequency band are band I /II/IV/V/VI/VIII/XVIII, but only band II and Band IV test data included in this report. The LTE frequency band is Band I/II/III/IV/V/VII/VIII/XII/XIII/XVIII/XX/XXV/XXVI/XXVIII/XXXVIII/XXXVIII /XXXX/XXXXI, but only Band II/IV /V/VII/XXV/XXVI/XXXVIII/XXXXI test data included in this report. The XAG Agricultural Remote Controller 3 Pro implements such functions as RF signal receiving/transmitting, LTE/UMTS and GPRS/EDGE protocol. Externally it provides USIM card interface. The EUT is powered by DC 7.38V. For more detailed features description, please refer to the user's manual.

### 2.2 Test Facility

Company Name:	Intertek Testing Service Shenzhen Ltd. Longhua Branch
Address:	101, 201, Building B, No. 308 Wuhe Avenue, Zhangkengjing Community, GuanHu Subdistrict, LongHua District, Shenzhen, P.R. China
FCC Registration Number:	CN1188

### 2.3 Test Environment Condition

Ambient Temperature:	19.5 to 25 °C
Ambient Relative Humidity:	40 to 55 %
Atmospheric Pressure:	Not applicable

### 2.4 Sub-Assembly

Description	Manufacturer	Description
Power Adapter	Provided by applicant	Model: GS-551 Input: 100-240V~, 50/60Hz 0.5A Output: 5V=3A, 9V=2A, 12V=1.5A

## 2.5 Technical Specification

Characteristics	Description	
Radio System Type	GSM UMTS LTE	
Supported Frequency Range	GSM850	Transmission (TX): 824 to 849 MHz
		Receiving (RX): 869 to 894 MHz
	GSM1900/ WCDMA1900	Transmission (TX): 1850 to 1910 MHz
		Receiving (RX): 1930 to 1990 MHz
	WCDMA1700	Transmission (TX): 1710 to 1755 MHz
		Receiving (RX): 2110 to 2155 MHz
	LTE BAND2	Transmission (TX): 1850 to 1910 MHz
		Receiving (RX): 1930 to 1990 MHz
	LTE BAND4	Transmission (TX): 1710 to 1755 MHz
		Receiving (RX): 2110 to 2155 MHz
	LTE BAND5	Transmission (TX): 824 to 849 MHz
		Receiving (RX): 869 to 894 MHz
	LTE BAND7	Transmission (TX): 2500 to 2570 MHz
		Receiving (RX): 2620 to 2690 MHz
	LTE BAND25	Transmission (TX): 1850 to 1915 MHz
		Receiving (RX): 1930 to 1995 MHz
	LTE BAND26(814-824 MHz)	Transmission (TX): 814 to 824 MHz
		Receiving (RX): 859 to 869 MHz
	LTE BAND26(824-849 MHz)	Transmission (TX): 824 to 849 MHz
		Receiving (RX): 869 to 894 MHz
	LTE BAND38	Transmission (TX): 2570 to 2620 MHz
		Receiving (RX): 2570 to 2620 MHz
	LTE BAND41	Transmission (TX): 2496 to 2690 MHz
		Receiving (RX): 2496 to 2690 MHz
TX and RX Antenna Ports	TX & RX port:	1
	TX-only port:	0
	RX-only port:	0
Target TX Output Power	GSM850: 34.5dBm GSM1900: 30.5dBm UMTS1900: 24dBm UMTS1700: 24dBm LTE BAND2: 23.5dBm LTE BAND4: 23.5dBm LTE BAND5: 24dBm LTE BAND7: 24dBm LTE BAND25: 24dBm LTE BAND26(814-824MHz): 24dBm LTE BAND26(824-849MHz): 24dBm LTE BAND38: 24dBm LTE BAND41: 24dBm	
Antenna Gain:	GSM850: 0.5dBi GSM1900: 2.8dBi UMTS1900: 2.8dBi UMTS1700: 2.8dBi LTE BAND2: 2.8dBi LTE BAND4: 2.8dBi LTE BAND5: 0.5dBi LTE BAND7: 2.8dBi LTE BAND25: 2.8dBi LTE BAND26(814-849MHz):0.5 dBi LTE BAND38: 2.0dBi LTE BAND41: 2.0dBi	
Supported Channel Bandwidth	GSM system:	200 kHz
	UMTS system:	5 MHz
	LTE band 2	1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz
	LTE band 4	1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz

Characteristics	Description	
<b>Designation of Emissions</b>  <i>(Note: the necessary bandwidth of which is the worst value from the measured occupied bandwidths for each type of channel bandwidth configuration.)</i>	LTE band 5	1.4 MHz, 3 MHz, 5 MHz, 10 MHz
	LTE band 7	5MHz, 10MHz, 15MHz, 20MHz
	LTE band 25	1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz
	LTE BAND26(814-824 MHz)	1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15MHz
	LTE BAND26(824-849 MHz)	1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz,
	LTE BAND38	5MHz, 10MHz, 15MHz, 20MHz
	LTE BAND41	5MHz, 10MHz, 15MHz, 20MHz
<b>Designation of Emissions</b>  <i>(Note: the necessary bandwidth of which is the worst value from the measured occupied bandwidths for each type of channel bandwidth configuration.)</i>	GSM850:	248KGXW, 244KG7W
	GSM1900:	247KGXW, 248KG7W
	UMTS1900:	4M18F9W
	UMTS1700:	4M20F9W
	LTE BAND2:	1M09G7D (1.4 MHz QPSK modulation), 1M09W7D (1.4 MHz 16QAM modulation) 2M70G7D (3 MHz QPSK modulation), 2M70W7D (3 MHz 16QAM modulation) 4M51G7D (5 MHz QPSK modulation), 4M51W7D (5 MHz 16QAM modulation) 8M99G7D (10 MHz QPSK modulation), 8M95W7D (10 MHz 16QAM modulation) 13M5G7D (15 MHz QPSK modulation), 13M5W7D (15 MHz 16QAM modulation) 18M0G7D (20 MHz QPSK modulation), 18M0W7D (20 MHz 16QAM modulation)
	LTE BAND4:	1M09G7D (1.4 MHz QPSK modulation), 1M09W7D (1.4 MHz 16QAM modulation) 2M70G7D (3 MHz QPSK modulation), 2M70W7D (3 MHz 16QAM modulation) 4M51G7D (5 MHz QPSK modulation), 4M51W7D (5 MHz 16QAM modulation) 8M98G7D (10 MHz QPSK modulation), 8M95W7D (10 MHz 16QAM modulation) 13M4G7D (15 MHz QPSK modulation), 13M4W7D (15 MHz 16QAM modulation) 18M0G7D (20 MHz QPSK modulation), 18M0W7D (20 MHz 16QAM modulation)
	LTE BAND5:	1M09G7D (1.4 MHz QPSK modulation), 1M09W7D (1.4 MHz 16QAM modulation) 2M70G7D (3 MHz QPSK modulation), 2M70W7D (3 MHz 16QAM modulation) 4M50G7D (5 MHz QPSK modulation), 4M51W7D (5 MHz 16QAM modulation) 8M99G7D (10 MHz QPSK modulation), 8M95W7D (10 MHz 16QAM modulation)
	LTE BAND7:	4M50G7D (5 MHz QPSK modulation), 4M51W7D (5 MHz 16QAM modulation) 8M95G7D (10 MHz QPSK modulation), 8M95W7D (10 MHz 16QAM modulation) 13M5G7D (15 MHz QPSK modulation), 13M5W7D (15 MHz 16QAM modulation) 18M0G7D (20 MHz QPSK modulation), 18M0W7D (20 MHz 16QAM modulation)
	LTE BAND25:	1M09G7D (1.4 MHz QPSK modulation), 1M09W7D (1.4 MHz 16QAM modulation) 2M70G7D (3 MHz QPSK modulation), 2M70W7D (3 MHz 16QAM modulation) 4M51G7D (5 MHz QPSK modulation), 4M52W7D (5 MHz 16QAM modulation)

Characteristics	Description
	8M95G7D (10 MHz QPSK modulation), 8M99W7D (10 MHz 16QAM modulation) 13M4G7D (15 MHz QPSK modulation), 13M4W7D (15 MHz 16QAM modulation) 17M9G7D (20 MHz QPSK modulation), 17M9W7D (20 MHz 16QAM modulation)
LTE BAND26(814-824 MHz) :	1M09G7D (1.4 MHz QPSK modulation), 1M09W7D (1.4 MHz 16QAM modulation) 2M70G7D (3 MHz QPSK modulation), 2M70W7D (3 MHz 16QAM modulation) 4M51G7D (5 MHz QPSK modulation), 4M52W7D (5 MHz 16QAM modulation) 8M99G7D (10 MHz QPSK modulation), 8M99W7D (10 MHz 16QAM modulation) 13M5G7D (15 MHz QPSK modulation) 13M4W7D (15 MHz 16QAM modulation)
LTE BAND26(824-849 MHz) :	1M10G7D (1.4 MHz QPSK modulation), 1M09W7D (1.4 MHz 16QAM modulation) 2M70G7D (3 MHz QPSK modulation), 2M70W7D (3 MHz 16QAM modulation) 4M51G7D (5 MHz QPSK modulation), 4M51W7D (5 MHz 16QAM modulation) 8M99G7D (10 MHz QPSK modulation), 8M95W7D (10 MHz 16QAM modulation) 13M4G7D (15 MHz QPSK modulation), 13M4W7D (15 MHz 16QAM modulation)
LTE BAND38 :	4M51G7D (5 MHz QPSK modulation), 4M51W7D (5 MHz 16QAM modulation) 8M99G7D (10 MHz QPSK modulation), 8M99W7D (10 MHz 16QAM modulation) 13M5G7D (15 MHz QPSK modulation), 13M4W7D (15 MHz 16QAM modulation) 18M0G7D (20 MHz QPSK modulation), 18M0W7D (20 MHz 16QAM modulation)
LTE BAND41 :	4M51G7D (5 MHz QPSK modulation), 4M51W7D (5 MHz 16QAM modulation) 8M99G7D (10 MHz QPSK modulation), 8M99W7D (10 MHz 16QAM modulation) 13M4G7D (15 MHz QPSK modulation), 13M4W7D (15 MHz 16QAM modulation) 18M0G7D (20 MHz QPSK modulation), 18M0W7D (20 MHz 16QAM modulation)

### 3. General Test Conditions/Configuration

#### 3.1 Test Modes

Test Mode	Test Modes Description
GSM/TM1	GSM system, GPRS, GMSK modulation
GSM/TM2	GSM system, EDGE, 8PSK modulation
UMTS/TM1	WCDMA system, QPSK modulation
UMTS/TM2	HSDPA system, QPSK modulation
UMTS/TM3	HSUPA system, QPSK modulation
LTE/TM1	LTE system, QPSK modulation
LTE/TM2	LTE system, 16QAM modulation

#### 3.2 Test Environment

Environment Parameter	Selected Values During Tests	
Relative Humidity	Ambient	
Temperature	TN	Ambient
Voltage	VL	6.27V
	VN	7.38V
	VH	8.50V

NOTE: VL= lower extreme test voltage, VN= nominal voltage, VH= upper extreme test voltage

TN= normal temperature

#### 3.3 Test Frequency

Test Mode	TX / RX	RF Channel		
		Low (L)	Middle (M)	High (H)
GSM850	TX	Channel 128	Channel 190	Channel 251
		824.2MHz	836.6MHz	848.8MHz
	RX	Channel 128	Channel 190	Channel 251
		869.2MHz	881.6MHz	893.8MHz
Test Mode	TX / RX	RF Channel		
		Low (L)	Middle (M)	High (H)
GSM1900	TX	Channel 512	Channel 661	Channel 810
		1850.2MHz	1880.0MHz	1909.8MHz
	RX	Channel 512	Channel 661	Channel 810
		1930.2 MHz	1960.0 MHz	1989.8 MHz
WCDMA1900	TX	Channel 9262	Channel 9400	Channel 9538
		1852.4MHz	1880.0MHz	1907.6MHz
	RX	Channel 9662	Channel 9800	Channel 9938
		1932.4 MHz	1960.0 MHz	1987.6 MHz
Test Mode	TX / RX	RF Channel		
		Low (L)	Middle (M)	High (H)
WCDMA1700	TX	Channel 1312	Channel 1413	Channel 1513
		1712.4MHz	1732.6MHz	1752.6MHz

	RX	Channel 1537	Channel 1638	Channel 1738
		2112.4 MHz	2132.6 MHz	2152.6 MHz
Test Mode	TX / RX	RF Channel		
		Low (B)	Middle (M)	High (T)
LTE Band 2	TX(1.4M)	Channel 18607	Channel 18900	Channel 19193
		1850.7 MHz	1880 MHz	1909.3 MHz
	TX(3M)	Channel 18615	Channel 18900	Channel 19185
		1851.5 MHz	1880 MHz	1908.5 MHz
	TX(5M)	Channel 18625	Channel 18900	Channel 19175
		1852.5 MHz	1880 MHz	1907.5 MHz
	TX(10M)	Channel 18650	Channel 18900	Channel 19150
		1855 MHz	1880 MHz	1905 MHz
	TX(15M)	Channel 18675	Channel 18900	Channel 19125
		1857.5 MHz	1880 MHz	1902.5 MHz
	TX(20M)	Channel 18700	Channel 18900	Channel 19100
		1860 MHz	1880 MHz	1900 MHz
	RX(1.4M)	Channel 607	Channel 900	Channel 1193
		1930.7 MHz	1960 MHz	1989.3 MHz
	RX(3M)	Channel 615	Channel 900	Channel 1185
		1931.5 MHz	1960 MHz	1988.5 MHz
	RX(5M)	Channel 625	Channel 900	Channel 1175
		1932.5 MHz	1960 MHz	1987.5 MHz
	RX(10M)	Channel 650	Channel 900	Channel 1150
		1935 MHz	1960 MHz	1985 MHz
	RX(15M)	Channel 675	Channel 900	Channel 1125
		1937.5 MHz	1960 MHz	1982.5 MHz
	RX(20M)	Channel 700	Channel 900	Channel 1100
		1940 MHz	1960 MHz	1980 MHz
Test Mode	TX / RX	RF Channel		
		Low (B)	Middle (M)	High (T)
LTE Band 4	TX(1.4M)	Channel 19957	Channel 20175	Channel 20393
		1710.7 MHz	1732.5 MHz	1754.3 MHz
	TX(3M)	Channel 19965	Channel 20175	Channel 20385
		1711.5 MHz	1732.5 MHz	1753.5 MHz
	TX(5M)	Channel 19975	Channel 20175	Channel 20375
		1712.5 MHz	1732.5 MHz	1752.5 MHz
	TX(10M)	Channel 20000	Channel 20175	Channel 20350
		1715 MHz	1732.5 MHz	1750 MHz
	TX(15M)	Channel 20025	Channel 20175	Channel 20325
		1717.5 MHz	1732.5 MHz	1747.5 MHz
	TX(20M)	Channel 20050	Channel 20175	Channel 20300
		1720 MHz	1732.5 MHz	1745 MHz
	RX(1.4M)	Channel 1975	Channel 2175	Channel 2375
		2112.5 MHz	2132.5MHz	2152.5 MHz
	RX(3M)	Channel 2000	Channel 2175	Channel 2350
		2115 MHz	2132.5MHz	2150 MHz
	RX(5M)	Channel 1975	Channel 2175	Channel 2375

		2112.5 MHz	2132.5MHz	2152.5 MHz
		RX(10M)	Channel 2000	Channel 2175
			2115 MHz	2132.5MHz
		RX(15M)	Channel 2025	Channel 2175
			2117.5 MHz	2132.5MHz
		RX(20M)	Channel 2050	Channel 2175
			2120 MHz	2132.5MHz
Test Mode	TX / RX	RF Channel		
		Low (B)	Middle (M)	High (T)
LTE Band 5	TX(1.4M)	Channel 20407	Channel 20525	Channel 20643
		824.7 MHz	836.5 MHz	848.3 MHz
	TX(3M)	Channel 20415	Channel 20525	Channel 20635
		825.5 MHz	836.5 MHz	847.5 MHz
	TX(5M)	Channel 20425	Channel 20525	Channel 20625
		826.5 MHz	836.5 MHz	846.5 MHz
	TX(10M)	Channel 20450	Channel 20525	Channel 20600
		829 MHz	836.5 MHz	844 MHz
	RX(1.4M)	Channel 2407	Channel 2525	Channel 2643
		869.7 MHz	881.5 MHz	893.3 MHz
	RX (3M)	Channel 2415	Channel 2525	Channel 2635
		870.5 MHz	881.5 MHz	892.5 MHz
	RX(5M)	Channel 2425	Channel 2525	Channel 2625
		871.5 MHz	881.5 MHz	891.5 MHz
	RX (10M)	Channel 2450	Channel 2525	Channel 2600
		874 MHz	881.5 MHz	889 MHz
Test Mode	TX / RX	RF Channel		
		Low (B)	Middle (M)	High (T)
LTE Band 7	TX (5M)	Channel 20775	Channel 21100	Channel 21425
		2502.5 MHz	2535 MHz	2567.5 MHz
	TX (10M)	Channel 20800	Channel 21100	Channel 21400
		2505 MHz	2535 MHz	2565 MHz
	TX (15M)	Channel 20825	Channel 21100	Channel 21375
		2507.5 MHz	2535 MHz	2562.5 MHz
	TX (20M)	Channel 20850	Channel 21100	Channel 21350
		2510 MHz	2535 MHz	2560 MHz
	RX (5M)	Channel 2775	Channel 3100	Channel 3425
		2622.5 MHz	2655 MHz	2687.5 MHz
	RX (10M)	Channel 2800	Channel 3100	Channel 3400
		2625 MHz	2655 MHz	2685 MHz
	RX (15M)	Channel 2825	Channel 3100	Channel 3375
		2627.5 MHz	2655 MHz	2682.5 MHz
	RX (20M)	Channel 2850	Channel 3100	Channel 3350
		2630 MHz	2655 MHz	2680 MHz
Test Mode	TX / RX	RF Channel		
		Low (B)	Middle (M)	High (T)
LTE Band 25	TX(1.4M)	Channel 26047	Channel 26365	Channel 26683
		1850.7 MHz	1882.5 MHz	1914.3 MHz

	TX(3M)	Channel 26055	Channel 26365	Channel 26675	
		1851.5 MHz	1882.5 MHz	1913.5 MHz	
	TX(5M)	Channel 26065	Channel 26365	Channel 26665	
		1852.5 MHz	1882.5 MHz	1912.5 MHz	
	TX(10M)	Channel 26090	Channel 26365	Channel 26640	
		1855 MHz	1882.5 MHz	1910 MHz	
	TX(15M)	Channel 26115	Channel 26365	Channel 26615	
		1857.5 MHz	1882.5 MHz	1907.5 MHz	
	TX(20M)	Channel 26140	Channel 26365	Channel 26590	
		1860 MHz	1882.5 MHz	1905 MHz	
	RX(1.4M)	Channel 8046	Channel 8365	Channel 8683	
		1930.7 MHz	1962.5MHz	1994.3 MHz	
	RX(3M)	Channel 8055	Channel 8365	Channel 2675	
		1931.5 MHz	1962.5MHz	1993.5 MHz	
	RX(5M)	Channel 8065	Channel 8365	Channel 8665	
		1932.5 MHz	1962.5MHz	1992.5 MHz	
	RX(10M)	Channel 8090	Channel 8365	Channel 8640	
		1935 MHz	1962.5MHz	1990 MHz	
	RX(15M)	Channel 8115	Channel 8365	Channel 8615	
		1937.5 MHz	1962.5MHz	1987.5 MHz	
	RX(20M)	Channel 8140	Channel 8365	Channel 8590	
		1940 MHz	1962.5MHz	1985 MHz	
LTE Band 26 (814-824MHz)	Test Mode	TX / RX	RF Channel		
			Low (B)	Middle (M)	High (T)
	TX(1.4M)	Channel 26697	Channel 26740	Channel 26783	
		814.7 MHz	819 MHz	823.3 MHz	
	TX(3M)	Channel 26705	Channel 26740	Channel 26775	
		815.5 MHz	819 MHz	822.5 MHz	
	TX(5M)	Channel 26715	Channel 26740	Channel 26765	
		816.5 MHz	819 MHz	821.5 MHz	
	TX(10M)	Channel 26740	Channel 26740	Channel 26740	
		819 MHz	819 MHz	819 MHz	
	TX(15MHz)	Channel 26765			
		821.5MHz			
	RX(1.4M)	Channel 8697	Channel 8740	Channel 8783	
		859.7 MHz	864 MHz	868.3 MHz	
	RX (3M)	Channel 8705	Channel 8740	Channel 8775	
		860.5 MHz	864 MHz	867.5 MHz	
	RX(5M)	Channel 8715	Channel 8740	Channel 8755	
		861.5 MHz	864 MHz	866.5 MHz	
	RX (10M)	Channel 8740	Channel 8740	Channel 8740	
		864 MHz	864 MHz	864 MHz	
	RX(15MHz)	Channel 8765			
		866.5MHz			
	Test Mode	TX / RX	RF Channel		
			Low (B)	Middle (M)	High (T)
LTE Band 26	TX(1.4M)	Channel 26797	Channel 26915	Channel 27033	

(824-849MHz)		824.7 MHz	836.5 MHz	848.3 MHz
	TX(3M)	Channel 26805	Channel 26915	Channel 27025
		825.5 MHz	836.5 MHz	847.5 MHz
	TX(5M)	Channel 26815	Channel 26915	Channel 27015
		826.5 MHz	836.5 MHz	846.5 MHz
	TX(10M)	Channel 26840	Channel 26915	Channel 26990
		829 MHz	836.5 MHz	844 MHz
	TX(15M)	Channel 26865	Channel 26915	Channel 26965
		831.5 MHz	836.5 MHz	841.5 MHz
	RX(1.4M)	Channel 2407	Channel 8915	Channel 9033
		869.7 MHz	881.5 MHz	893.3 MHz
	RX (3M)	Channel 2415	Channel 8915	Channel 9025
		870.5 MHz	881.5 MHz	892.5 MHz
	RX(5M)	Channel 2425	Channel 8915	Channel 9015
		871.5 MHz	881.5 MHz	891.5 MHz
	RX (10M)	Channel 2450	Channel 8915	Channel 8990
		874 MHz	881.5 MHz	889 MHz
	RX (15M)	Channel 20450	Channel 8915	Channel 8965
		829 MHz	881.5 MHz	886.5 MHz
Test Mode	TX / RX	RF Channel		
		Low (B)	Middle (M)	High (T)
	LTE Band 38	TX/RX (5M)	Channel 37775	Channel 38000
			2572.5 MHz	2595 MHz
		TX/RX (10M)	Channel 37800	Channel 38200
			2575 MHz	2595 MHz
		TX/RX (15M)	Channel 37825	Channel 38000
			2577.5 MHz	2595 MHz
	TX/RX (20M)	Channel 37850	Channel 38000	Channel 38150
			2580 MHz	2595 MHz
Test Mode	TX / RX	RF Channel		
		Low (B)	Middle (M)	High (T)
	LTE Band 41	TX/RX (5M)	Channel 39675	Channel 40620
			2498.5 MHz	2593 MHz
		TX/RX (10M)	Channel 39700	Channel 40620
			2501 MHz	2593 MHz
		TX/RX (15M)	Channel 39725	Channel 40620
			2503.5 MHz	2593 MHz
	TX/RX (20M)	Channel 39750	Channel 40620	Channel 41490
			2506 MHz	2593 MHz

## 4. DESCRIPTION OF TESTS

### 4.1 Radiated Power and Radiated Spurious Emissions

Radiated spurious emissions are investigated indoors in a semi-anechoic chamber to determine the frequencies producing the worst case emissions. Final measurements for radiated power and radiated spurious emissions are performed on the 3 meter OATS per the guidelines of ANSI C63.26-2015. The equipment under test was transmitting while connected to its integral antenna and is placed on a wooden turntable 80cm above the ground plane and 3 meters from the receive antenna. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. The receive antenna height is adjusted between 1 and 4 meter height, the turntable is rotated through 360 degrees, and the EUT is manipulated through all orthogonal planes representative of its typical use to achieve the highest reading on the receive spectrum analyzer. Emissions are also investigated with the receive antenna horizontally and vertically polarized.

A portable or small unlicensed wireless device shall be placed on a non-metallic test fixture or other non-metallic support during testing. The supporting fixture shall permit orientation of the EUT in each of three orthogonal (x, y, z) axis positions such that emissions from the EUT are maximized. Measure the EUT maximum RF power and record the result.

A half-wave dipole is then substituted in place of the EUT. For emissions above 3GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator with the level of the signal generator being adjusted to obtain the same receive spectrum analyzer level previously recorded from the spurious emission from the EUT.

The power of the emission is calculated using the following formula:

$$P_d \text{ [dBm]} = P_g \text{ [dBm]} - \text{cable loss [dB]} + \text{antenna gain [dBd/dBi]}$$

Where,  $P_d$  is the dipole equivalent power,  $P_g$  is the generator output into the substitution antenna, and the antenna gain is the gain of the substitute antenna used relative to either a half-wave dipole (dBd) or an isotropic source (dBi). The substitute level is equal to  $P_g$  [dBm] – cable loss [dB].

The calculated  $P_d$  levels are then compared to the absolute spurious emission limit of -13dBm which is equivalent to the required minimum attenuation of  $43 + 10\log_{10}(\text{Power [Watts]})$ .

#### Test Procedures Used

971168 D01 v03r01 -Section 5.2 / 971168 D01 v03r01 -Section 5.8

ANSI C63.26 §5.2 / ANSI C63.26 §5.5/ ANSI C63.26 §6.4

Note: Reference test setup 3

## 4.2 Peak-Average Ratio

A peak to average ratio measurement is performed at the conducted port of the EUT. For WCDMA signals, the spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determine the largest deviation between the average and the peak power of the EUT in a given bandwidth. The CCDF curve shows how much time the peak waveform spends at or above a given average power level. The percent of time the signal spends at or above the level defines the probability for that particular power level. For GSM signals, an average and a peak trace are used on a spectrum analyzer to determine the largest deviation between the average and the peak power of the EUT in a bandwidth greater than the emission bandwidth. The traces are generated with the spectrum analyzer set to zero span mode.

### **Test Procedures Used**

971168 D01 v03r01 -Section 5.7

ANSI C63.26 §5.2

### **Test Settings**

1. The signal analyzer's CCDF measurement profile enabled
2. Frequency= carrier center frequency
3. Measurement BW > EBW of signal
4. for continuous transmissions, set to 1ms
5. Record the maximum PAPR level associated with a probability of 0.1%. Note: Reference test setup 1

## 4.3 Occupied Bandwidth

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts. The resolution bandwidth shall be set to as close to 1 percent of the selected span as is possible without being below 1 percent. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used since a peak or, peak hold, may produce a wider bandwidth than actual. The trace data points are recovered and are directly summed in linear terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 percent of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points. This frequency is recorded. The span between the two recorded frequencies is the occupied bandwidth.

### Test Procedures Used

971168 D01 v03r01 -Section 4.3

ANSI C63.26 §5.4

### Test Settings

1. SET RBW=1-5% of OBW
2. SET VBW  $\geq$  3\*RBW
3. Detector: Peak
4. Trace mode= max hold.
5. Sweep= auto couple
6. Steps 1-5 were repeated after it is stable

Note: Reference test setup 1.

## 4.4 Band Edge Compliance

the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission power must be attenuated below the transmitting power (P) by a factor of at least  $43+10\log_{10}P$  dB.

### Test Procedures Used

971168 D01 v03r01 -Section 6

ANSI C63.26 §5.7/ ANSI C63.26 §6.4

### Test Settings

1. SET RBW  $\geq$  1% of Emission BW.
2. SET VBW about three times of RBW
3. Detector: RMS
4. Trace mode= max hold.
5. Span= 2MHz

Note: Reference test setup 1.

## 4.5 Spurious and Harmonic Emissions at Antenna Terminal

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10<sup>th</sup> harmonic. On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least

$43 + 10 \log(P)$  dB. Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.

### Test Procedures Used

KDB 971168 v03r01-Section 6.0

### Test Settings

1. 9kHz~150kHz, RBW = 1KHz, VBW  $\geq 3 \times$  RBW,  
150kHz~30MHz, RBW = 10KHz, VBW  $\geq 3 \times$  RBW,  
30MHz~1GHz, RBW = 100 kHz, VBW = 300 kHz.  
Above 1GHz, RBW = 1 MHz, VBW = 3 MHz.
2. Detector: Peak
3. Trace mode= max hold.

Note: Reference test setup 1.

## 4.6 Frequency Stability / Temperature Variation

Frequency stability testing is performed in accordance with the guidelines of ANSI C63.26-2015. The frequency stability of the transmitter is measured by:

- a.) **Temperature:** The temperature is varied from -30°C to +60°C in 10°C increments using an environmental chamber.
- b.) **Primary Supply Voltage:** The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

Specification – The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within  $\pm 0.00025\%$  ( $\pm 2.5 \text{ ppm}$ ) of the center frequency.

### **Time Period and Procedure:**

1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
2. The equipment is turned on in a “standby” condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
3. Frequency measurements are made at 10°C intervals ranging from -30°C to +60°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

### **Test Procedures Used**

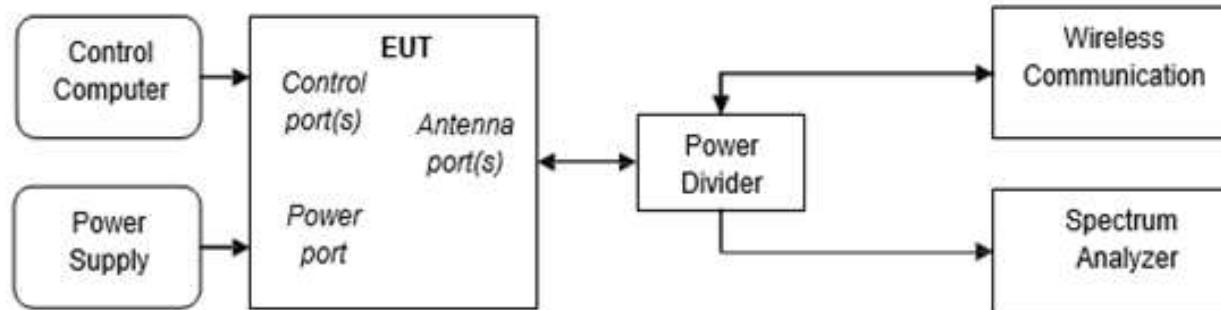
971168 D01 v03r01 -Section 9

ANSI C63.26 §5.6

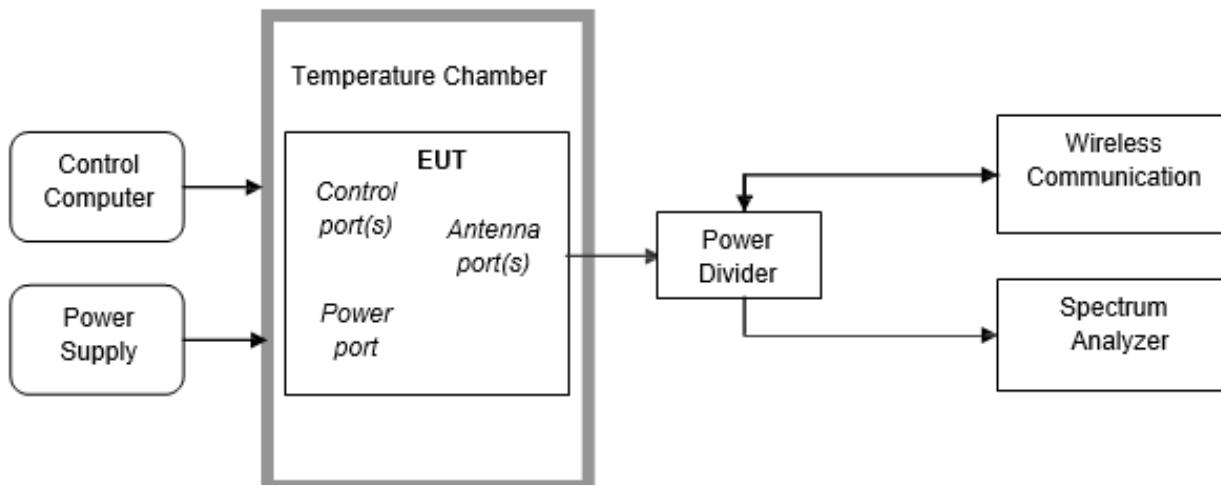
Note: Reference test setup 2.

## 5. Test Sets

### 5.1 Test Setup 1



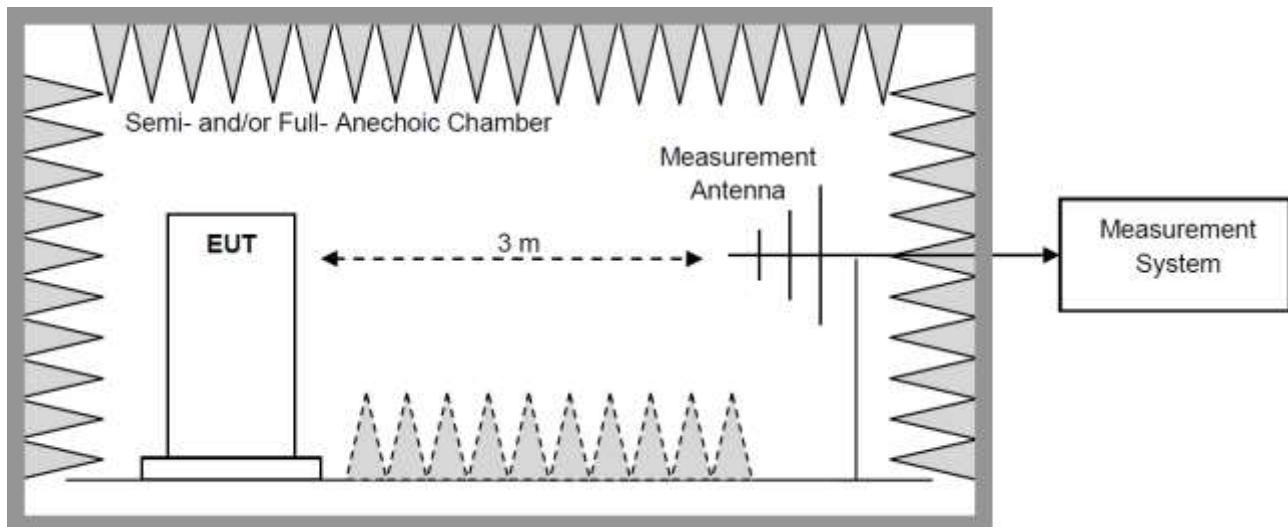
### 5.2 Test Setup 2



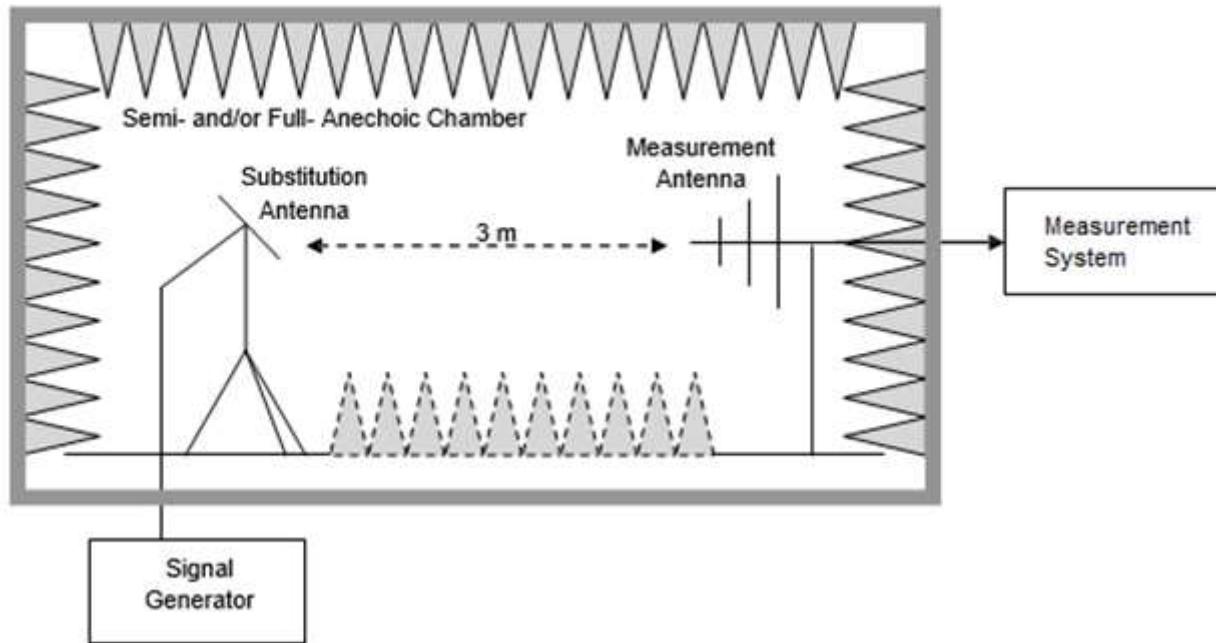
## 5.3 Test Setup 3

NOTE: Effective radiated power (ERP) and Equivalent Isotropic Radiated Power (EIRP) refers to the radiation power output of the EUT, assuming all emissions are radiated from half-wave dipole antennas.

### 5.3.1 Step 1: Pre-test



### 5.3.2 Step 2: Substitution method to verify the maximum ERP/EIRP



## 5.4 Test Conditions

Test Case		Test Conditions		
Transmit Output Power Data	Average Power, Total	Test Env.	Ambient Climate & Rated Voltage	
		Test Setup	Test Setup 1	
		RF Channels (TX)	L, M, H (L= low channel, M= middle channel, H= high channel)	
		Test Mode	GSM/TM1, GSM/TM2, UMTS/TM1, LTE/TM1, LTE/TM2	
	Average Power, Spectral Density (if required)	Test Env.	Ambient Climate & Rated Voltage	
		Test Setup	Test Setup 1	
		RF Channels (TX)	L, M, H (L= low channel, M= middle channel, H= high channel)	
		Test Mode	GSM/TM1, GSM/TM2, UMTS/TM1, LTE/TM1,LTE/TM2	
Peak-to-Average Ratio (if required)		Test Env.	Ambient Climate & Rated Voltage	
		Test Setup	Test Setup 1	
		RF Channels (TX)	L, M, H (L= low channel, M= middle channel, H= high channel)	
		Test Mode	GSM/TM1, GSM/TM2, UMTS/TM1, LTE/TM1,LTE/TM2	
Modulation Characteristics		Test Env.	Ambient Climate & Rated Voltage	
		Test Setup	Test Setup 1	
		RF Channels (TX)	M (L= low channel, M= middle channel, H= high channel)	
		Test Mode	GSM/TM1, GSM/TM2, UMTS/TM1, LTE/TM1,LTE/TM2	
Bandwidth	Occupied Bandwidth	Test Env.	Ambient Climate & Rated Voltage	
		Test Setup	Test Setup 1	
		RF Channels (TX)	L, M, H (L= low channel, M= middle channel, H= high channel)	
		Test Mode	GSM/TM1, GSM/TM2, UMTS/TM1, LTE/TM1,LTE/TM2	
	Emission Bandwidth (if required)	Test Env.	Ambient Climate & Rated Voltage	
		Test Setup	Test Setup 1	
		RF Channels (TX)	L, M, H (L= low channel, M= middle channel, H= high channel)	
		Test Mode	GSM/TM1,GSM/TM2,UMTS/TM1,LTE/TM1,LTE/TM2	
Band Edges Compliance		Test Env.	Ambient Climate & Rated Voltage	
		Test Setup	Test Setup 1	
		RF Channels (TX)	L, H (L= low channel, M= middle channel, H= high channel)	
		Test Mode	GSM/TM1,GSM/TM2,UMTS/TM1,LTE/TM1,LTE/TM2	
Spurious Emission at Antenna Terminals		Test Env.	Ambient Climate & Rated Voltage	
		Test Setup	Test Setup 1	
		RF Channels (TX)	L, M, H (L= low channel, M= middle channel, H= high channel)	
		Test Mode	GSM/TM1,GSM/TM2,UMTS/TM1,LTE/TM1,LTE/TM2	

Test Case	Test Conditions	
Field Strength of Spurious Radiation	Test Env.	Ambient Climate & Rated Voltage
	Test Setup	Test Setup 3
	Test Mode	GSM/TM1, GSM/TM2, UMTS/TM1/TM2/TM3, LTE/TM1, LTE/TM2 NOTE: If applicable, the EUT conf. that has maximum power density (based on the equivalent power level) is selected.
	RF Channels (TX)	L, M, H (L= low channel, M= middle channel, H= high channel)
Frequency Stability	Test Env.	(1) -30 °C to +60 °C with step 10 °C at Rated Voltage; (2) VL, VN and VH of Rated Voltage at Ambient Climate.
	Test Setup	Test Setup 2
	RF Channels (TX)	L, M, H (L= low channel, M= middle channel, H= high channel)
	Test Mode	GSM/TM1, GSM/TM2, UMTS/TM1, LTE/TM1, LTE/TM2

## 6. Field Strength of Spurious Radiation

Applicant: Guangzhou Xaircraft Technology CO.,LTD

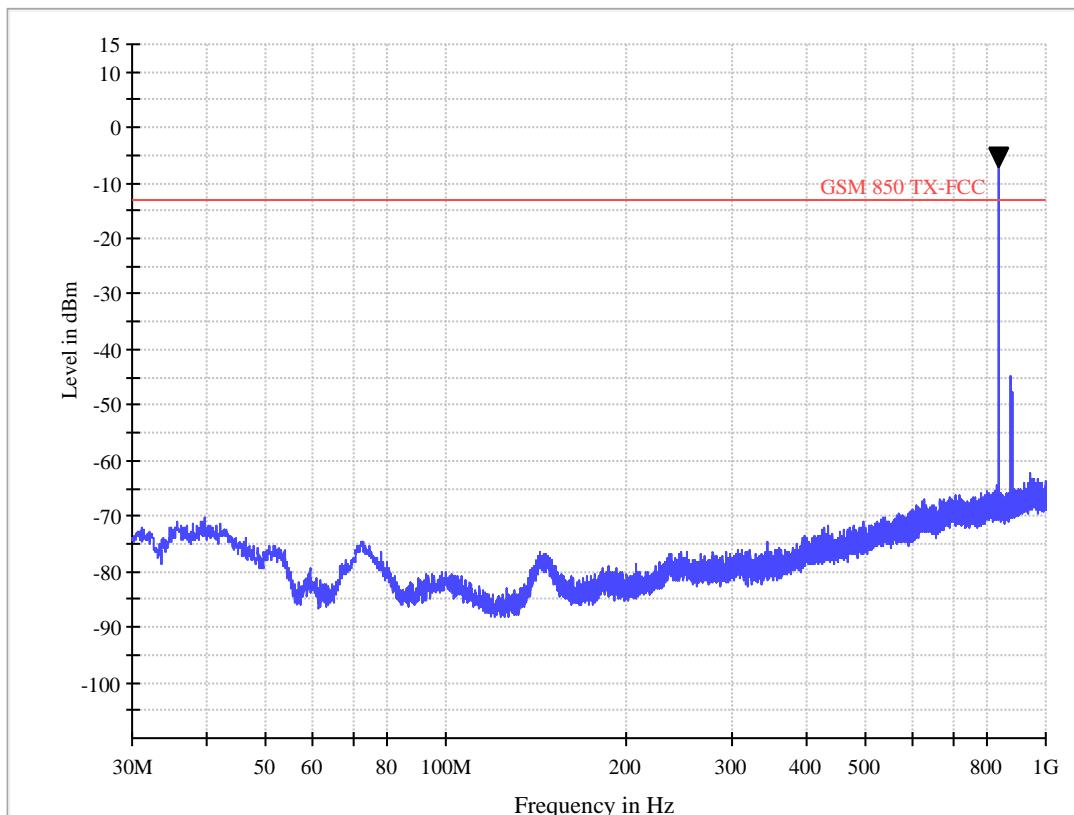
Model: M3ARC3AH

Date of Test: 26 April 2023

Worst Case Operating Mode: Transmitting (GSM/TM1 GSM850)

Worst Case ANT Polarity: Vertical

FCC 234G TX 30M-1GdBm



Remark: The emissions were very low against the limit in the frequency range 30 MHz ~ 1 GHz.

Applicant: Guangzhou Xaircraft Technology CO.,LTD

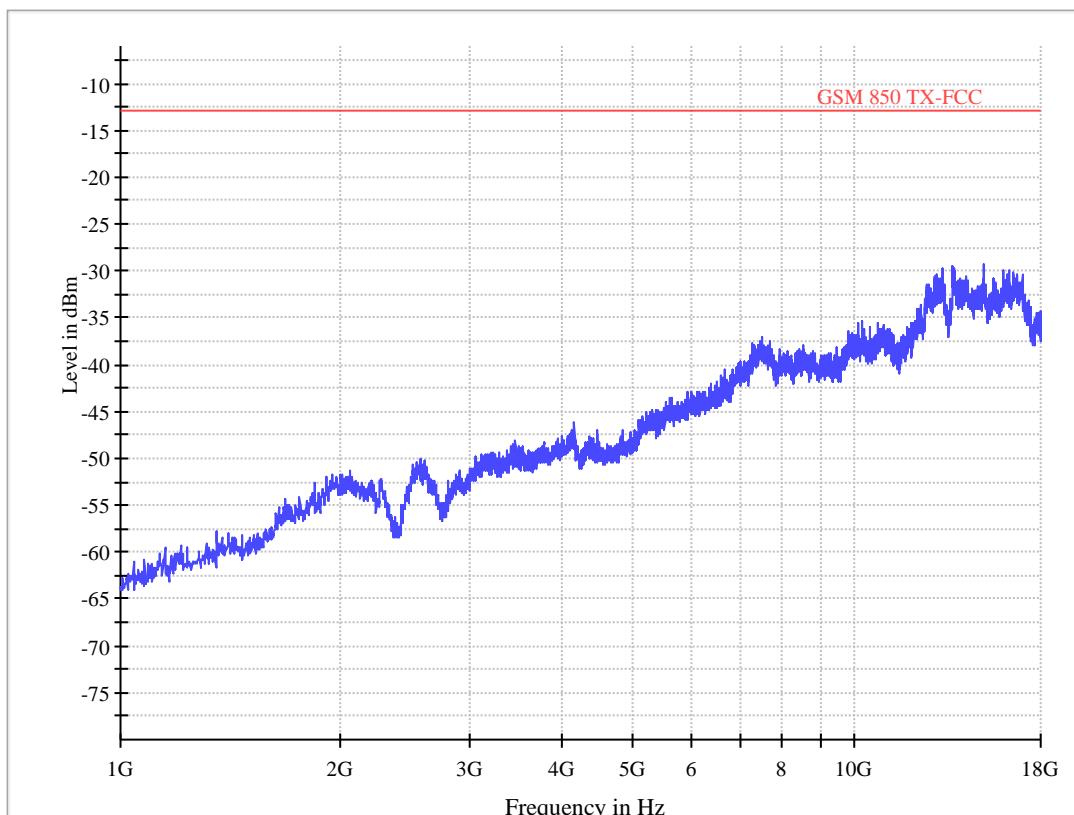
Model: M3ARC3AH

Date of Test: 26 April 2023

Worst Case Operating Mode: Transmitting (GSM/TM1 GSM850)

Worst Case ANT Polarity: Vertical

FCC 234G TX 1-12.75G dBm



Remark: The emissions were very low against the limit in the frequency above 1 GHz.

Applicant: Guangzhou Xaircraft Technology CO.,LTD

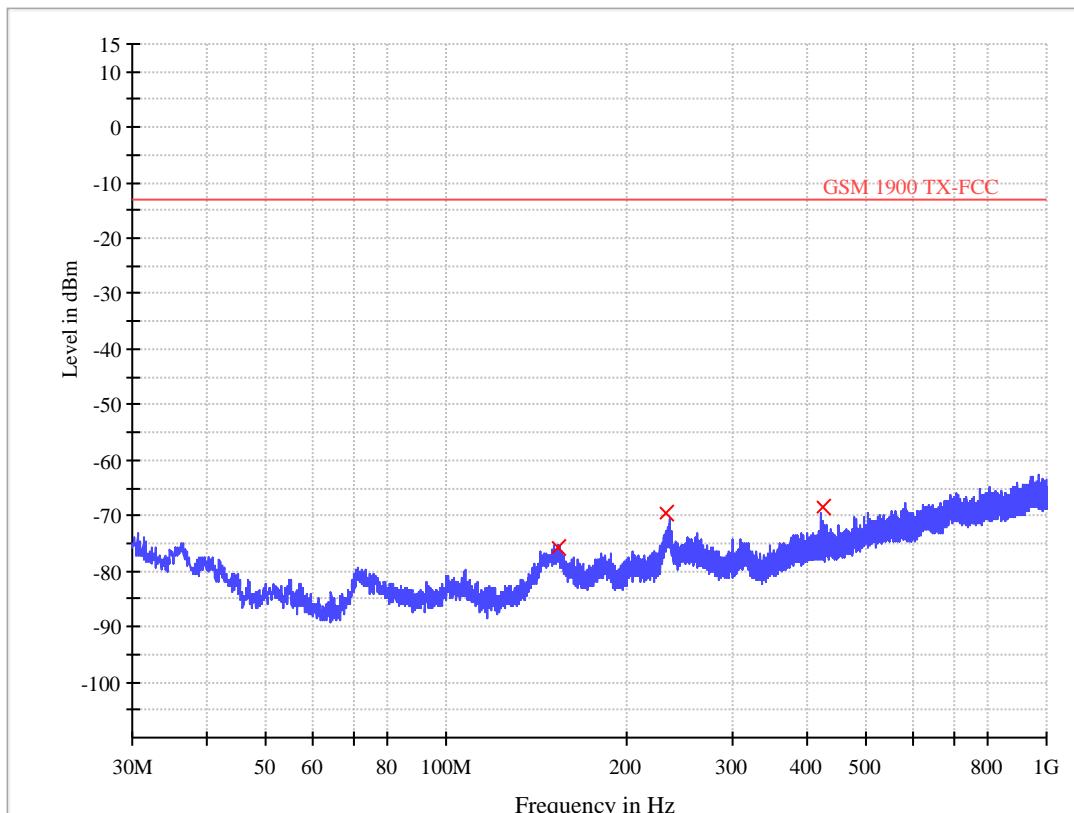
Model: M3ARC3AH

Date of Test: 26 April 2023

Worst Case Operating Mode: Transmitting (GSM/TM1 GSM1900)

Worst Case ANT Polarity: Vertical

FCC 234G TX 30M-1GdBm



Remark: The emissions were very low against the limit in the frequency range 30 MHz ~ 1 GHz.

Applicant: Guangzhou Xaircraft Technology CO.,LTD

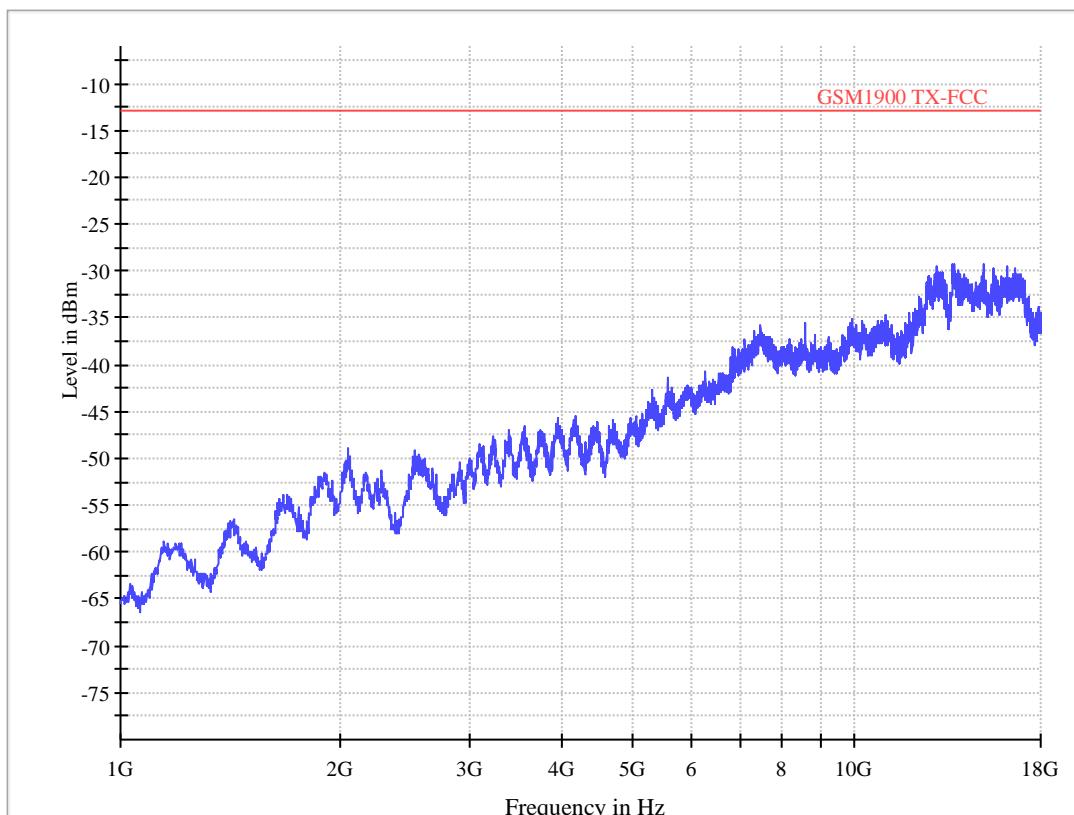
Model: M3ARC3AH

Date of Test: 26 April 2023

Worst Case Operating Mode: Transmitting (GSM/TM1 GSM1900)

Worst Case ANT Polarity: Vertical

FCC 234G TX 1-12.75G dBm



Remark: The emissions were very low against the limit in the frequency above 1 GHz.

Applicant: Guangzhou Xaircraft Technology CO.,LTD

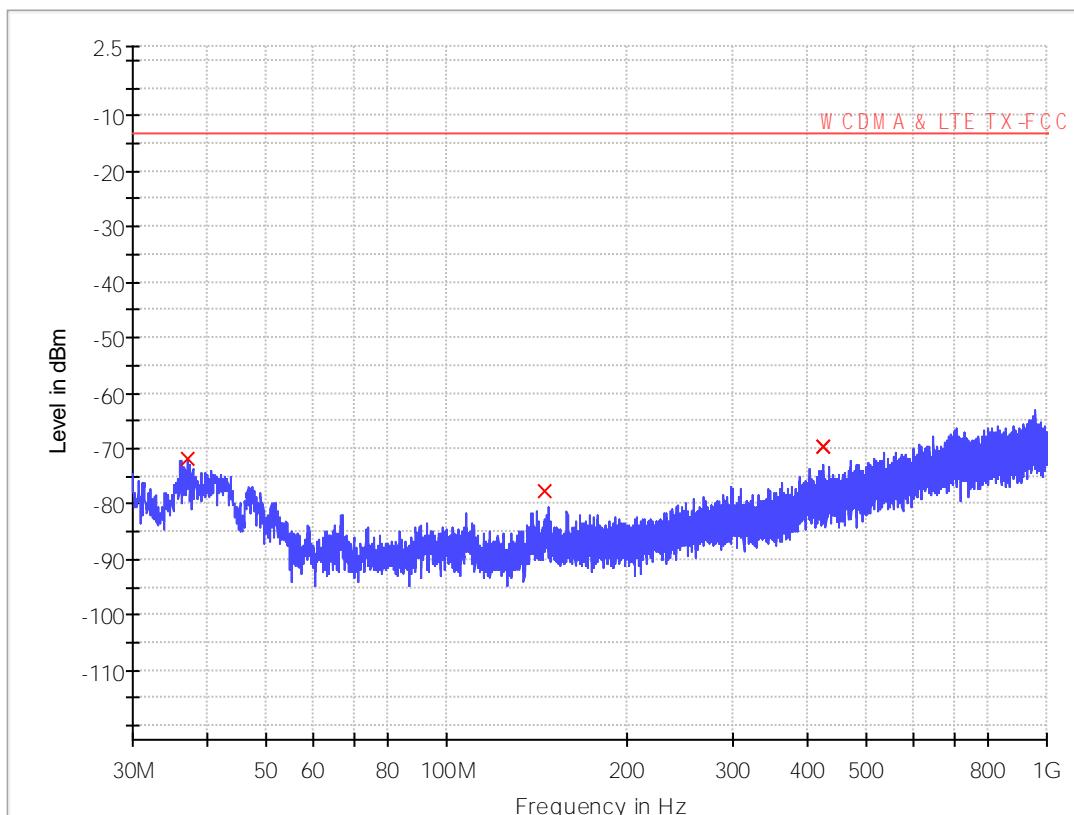
Model: M3ARC3AH

Date of Test: 26 April 2023

Worst Case Operating Mode: Transmitting (UMTS/TM1 WCDMA1900)

Worst Case ANT Polarity: Vertical

FCC 234G TX 30M-1GdBm



Remark: The emissions were very low against the limit in the frequency range 30 MHz ~ 1 GHz.

Applicant: Guangzhou Xaircraft Technology CO.,LTD

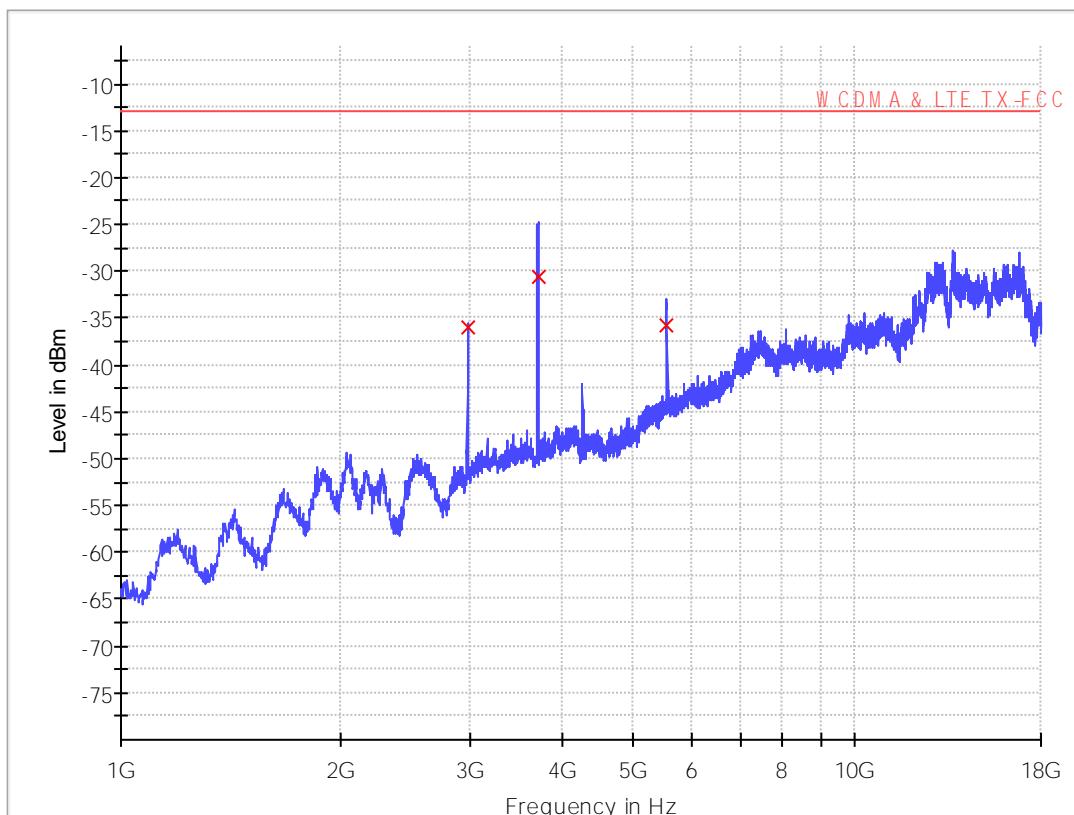
Model: M3ARC3AH

Date of Test: 26 April 2023

Worst Case Operating Mode: Transmitting (UMTS/TM1 WCDMA1900)

Worst Case ANT Polarity: Vertical

FCC 234G TX 1-12.75G dBm



Remark: The emissions were very low against the limit in the frequency above 1 GHz.

Applicant: Guangzhou Xaircraft Technology CO.,LTD

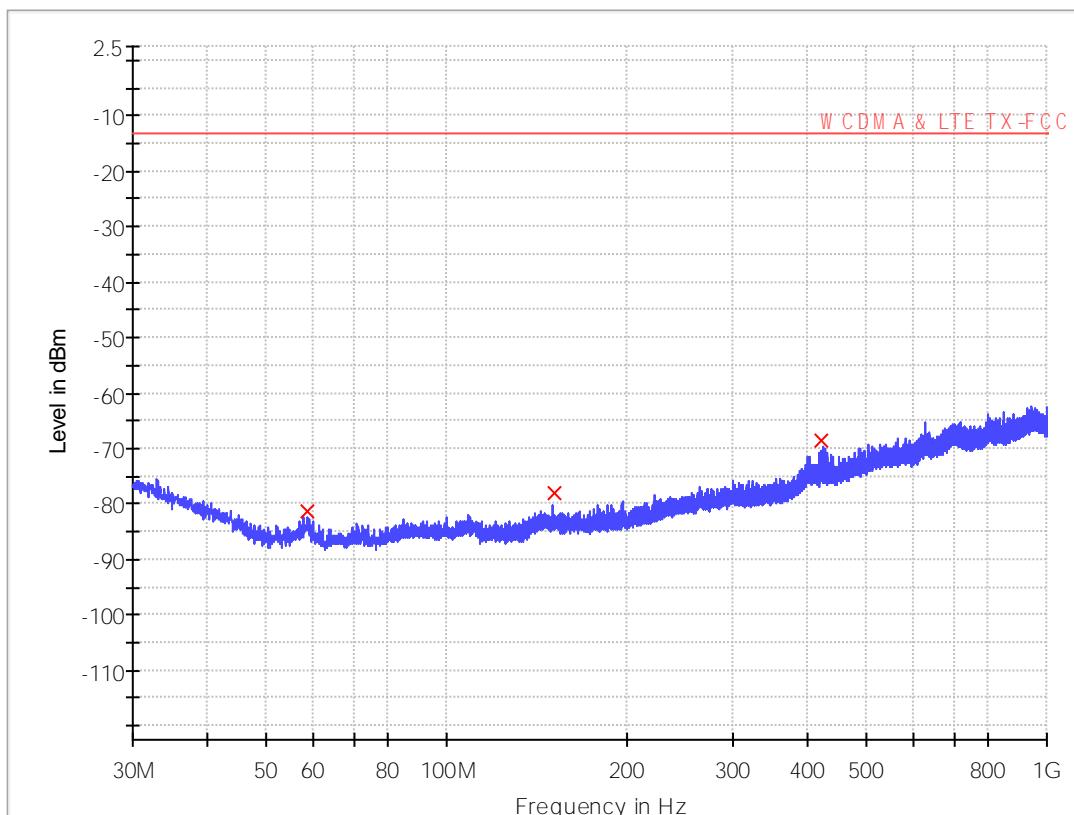
Model: M3ARC3AH

Date of Test: 26 April 2023

Worst Case Operating Mode: Transmitting (UMTS/TM1 WCDMA1700)

Worst Case ANT Polarity: Vertical

FCC 234G TX 30M-1GdBm



Remark: The emissions were very low against the limit in the frequency range 30 MHz ~ 1 GHz.

Applicant: Guangzhou Xaircraft Technology CO.,LTD

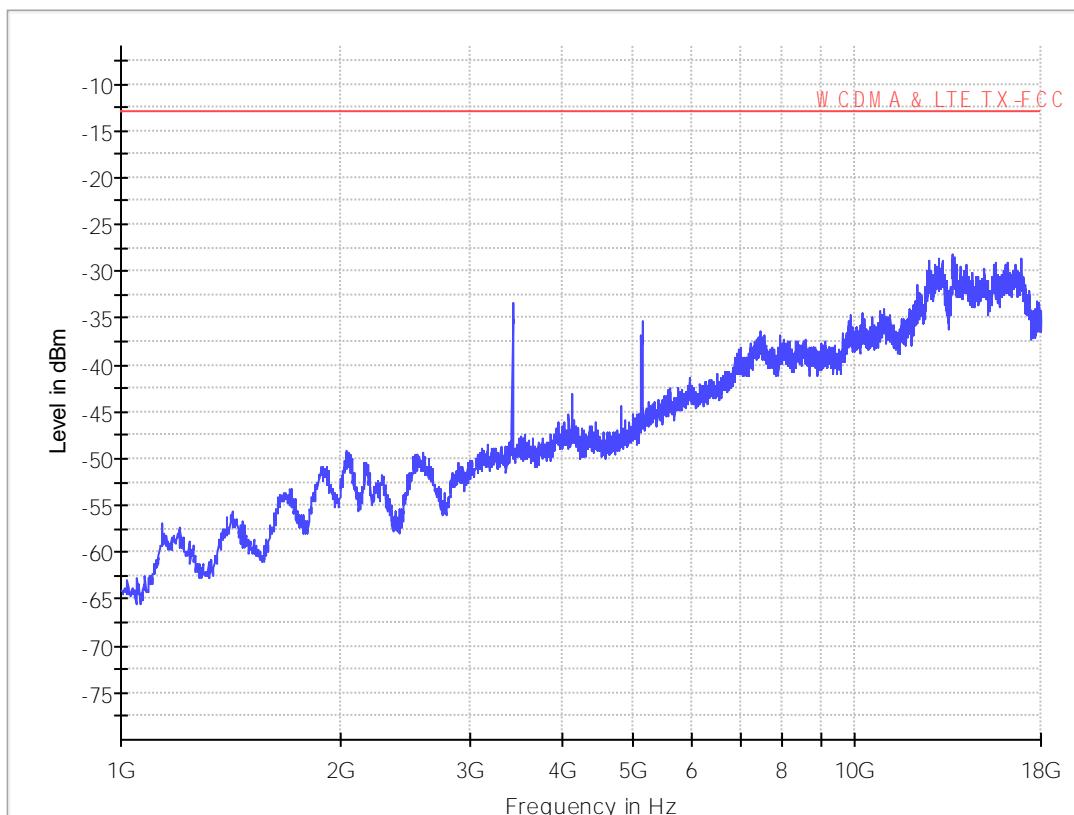
Model: M3ARC3AH

Date of Test: 26 April 2023

Worst Case Operating Mode: Transmitting (UMTS/TM1 WCDMA1700)

Worst Case ANT Polarity: Vertical

FCC 234G TX 1-12.75G dBm



Remark: The emissions were very low against the limit in the frequency above 1 GHz.

Applicant: Guangzhou Xaircraft Technology CO.,LTD

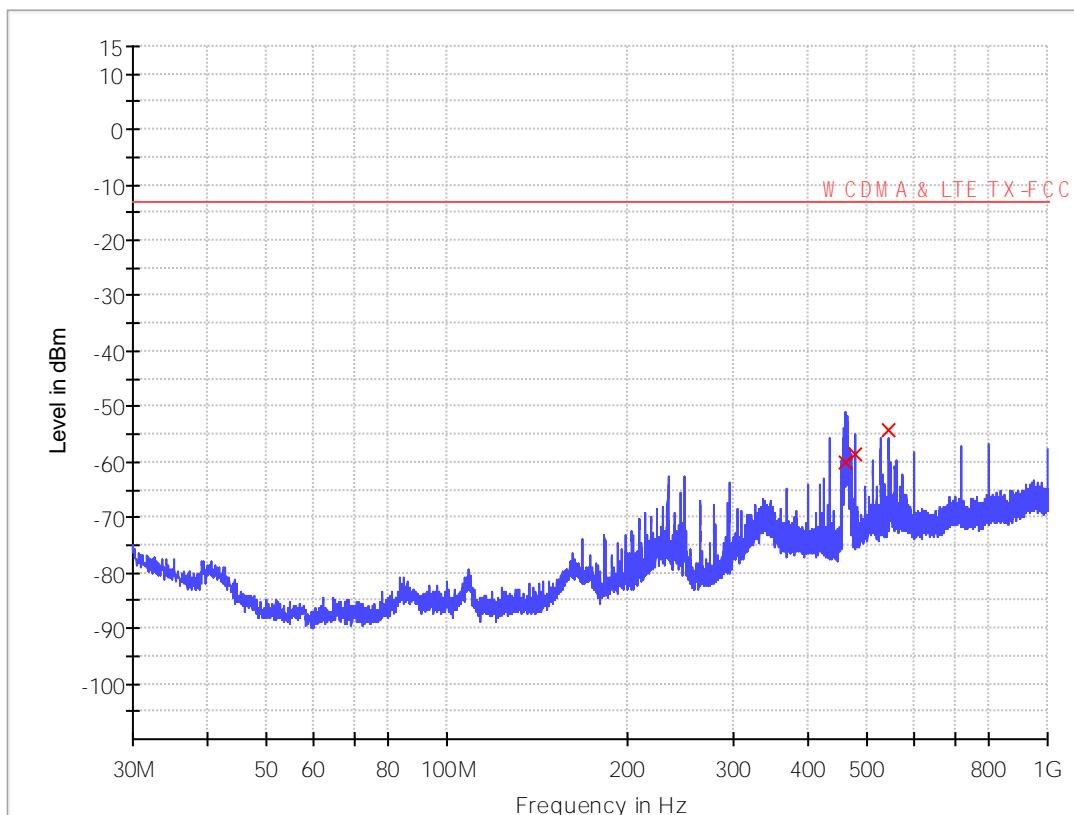
Model: M3ARC3AH

Date of Test: 26 April 2023

Worst Case Operating Mode: Transmitting (Band 2, 15MHz)

Worst Case ANT Polarity: Vertical

FCC 234G TX 30M-1GdBm



Remark: The emissions were very low against the limit in the frequency range 30 MHz ~ 1 GHz.

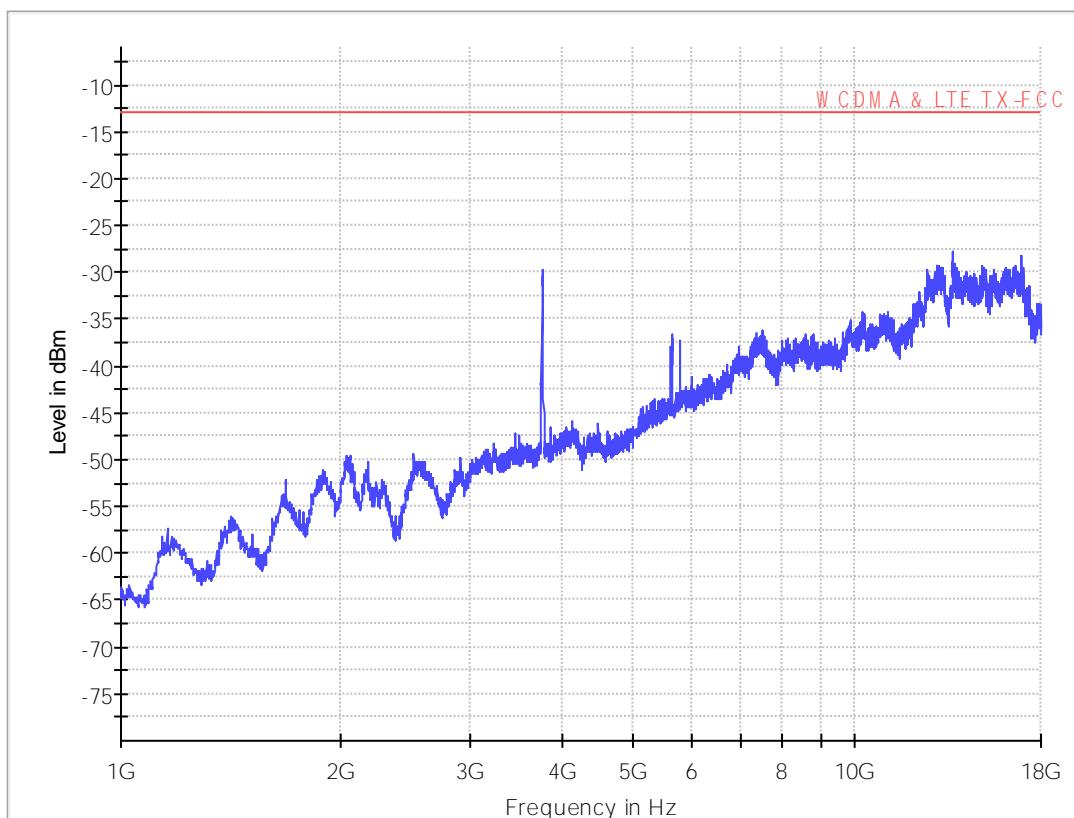
Applicant: Guangzhou Xaircraft Technology CO.,LTD

Model: M3ARC3AH

Date of Test: 26 April 2023

Worst Case Operating Mode: Transmitting (Band 2, 15MHz)

Worst Case ANT Polarity: Vertical



Remark: The emissions were very low against the limit in the frequency above 1 GHz.

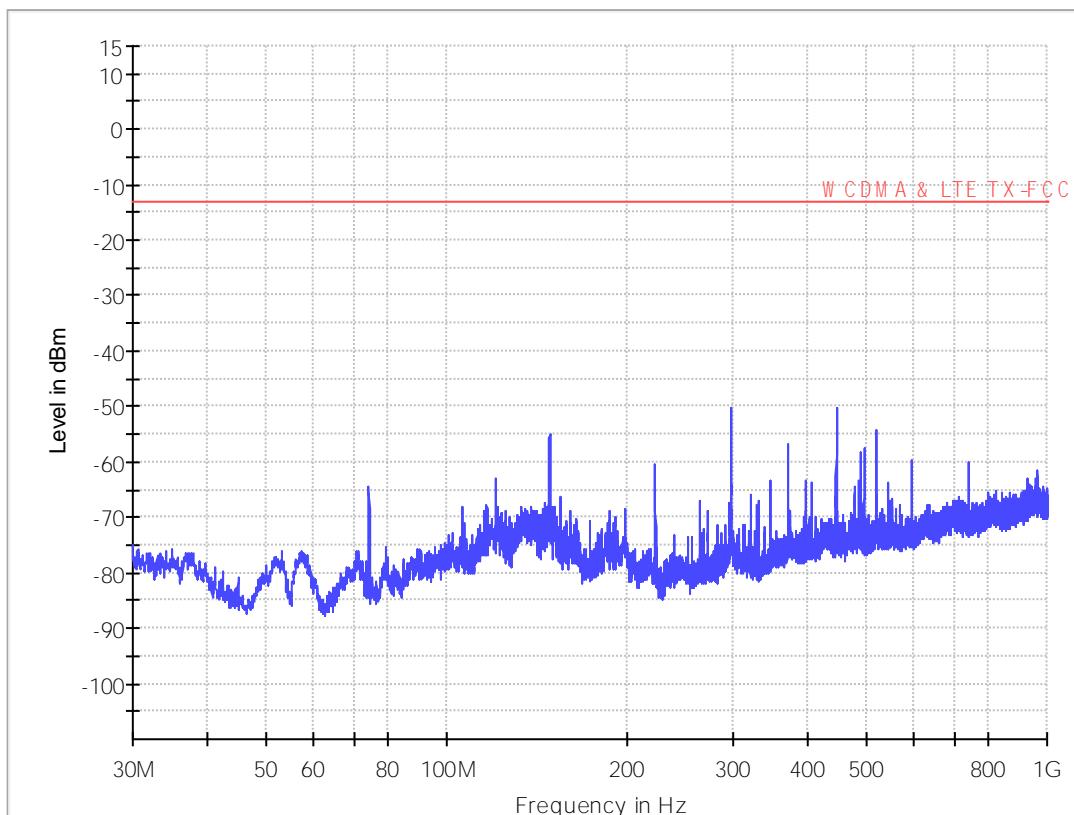
Applicant: Guangzhou Xaircraft Technology CO.,LTD

Model: M3ARC3AH

Date of Test: 26 April 2023

Worst Case Operating Mode: Transmitting (Band 4, 15MHz)

Worst Case ANT Polarity: Vertical



Remark: The emissions were very low against the limit in the frequency range 30 MHz ~ 1 GHz.

Applicant: Guangzhou Xaircraft Technology CO.,LTD

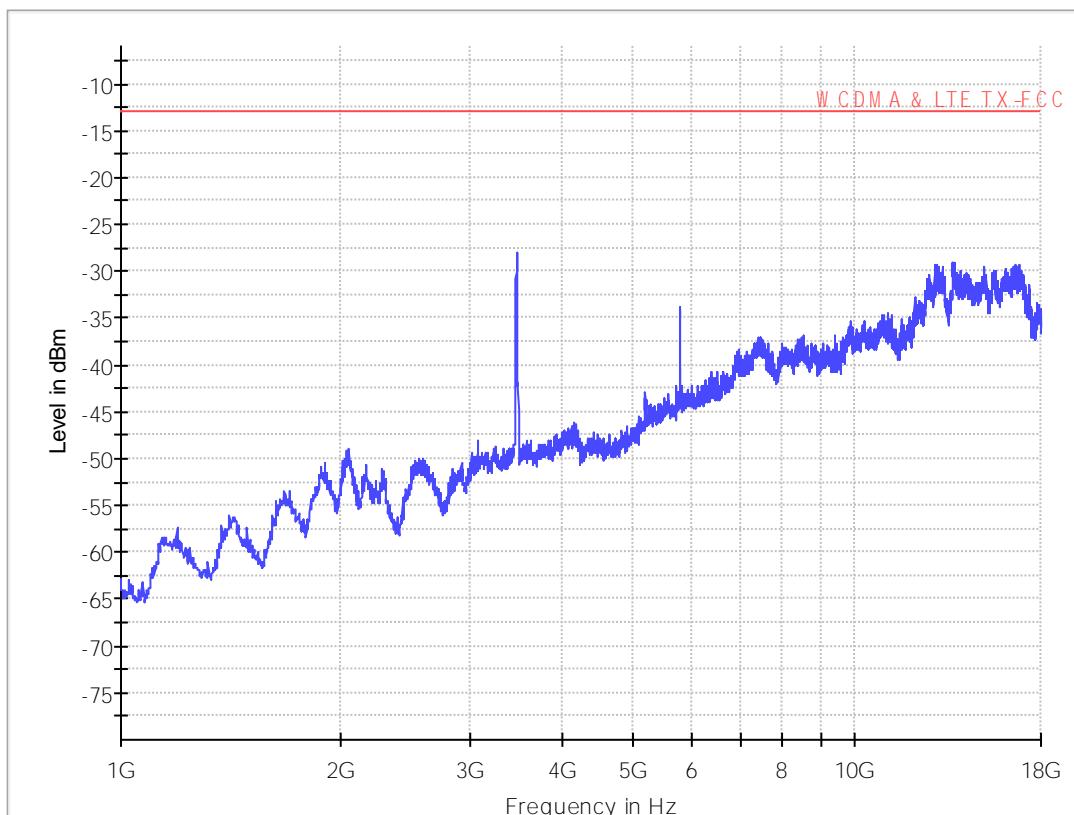
Model: M3ARC3AH

Date of Test: 26 April 2023

Worst Case Operating Mode: Transmitting (Band 4, 15MHz)

Worst Case ANT Polarity: Vertical

FCC 234G TX 1-12.75G dBm



Remark: The emissions were very low against the limit in the frequency above 1 GHz.

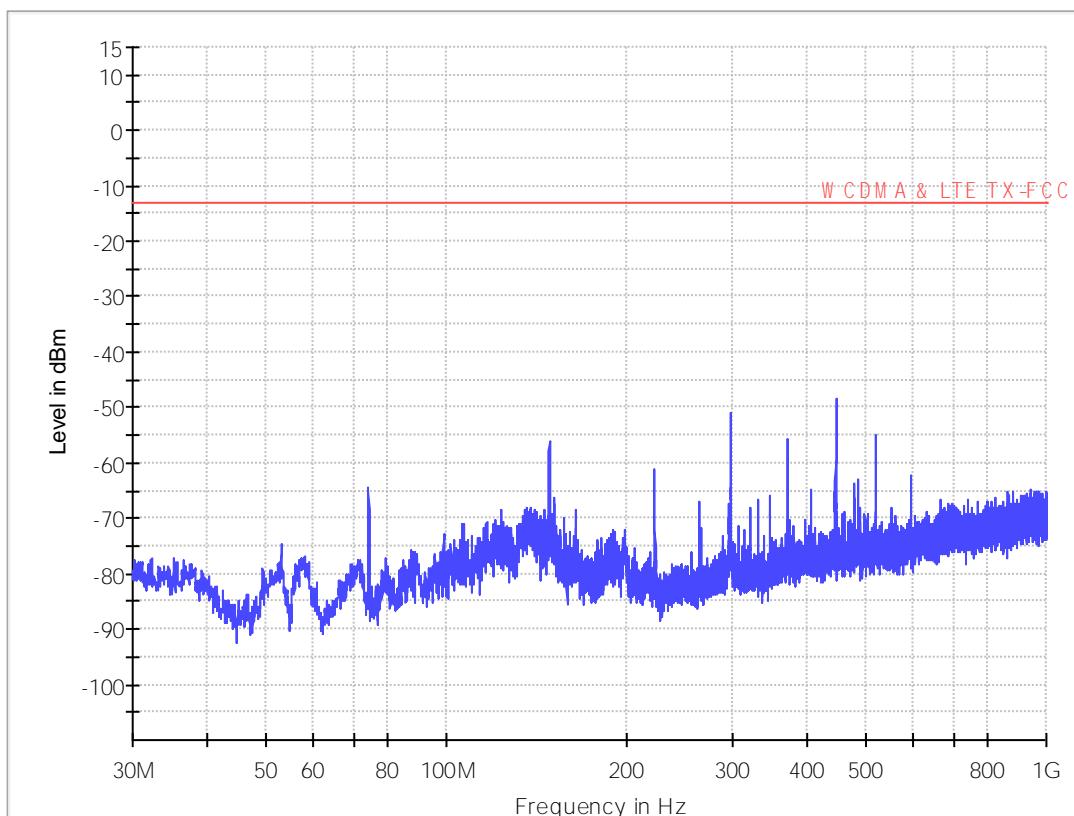
Applicant: Guangzhou Xaircraft Technology CO.,LTD

Model: M3ARC3AH

Date of Test: 26 April 2023

Worst Case Operating Mode: Transmitting (Band 5, 10MHz)

Worst Case ANT Polarity: Vertical



Remark: The emissions were very low against the limit in the frequency range 30 MHz ~ 1 GHz.

Applicant: Guangzhou Xaircraft Technology CO.,LTD

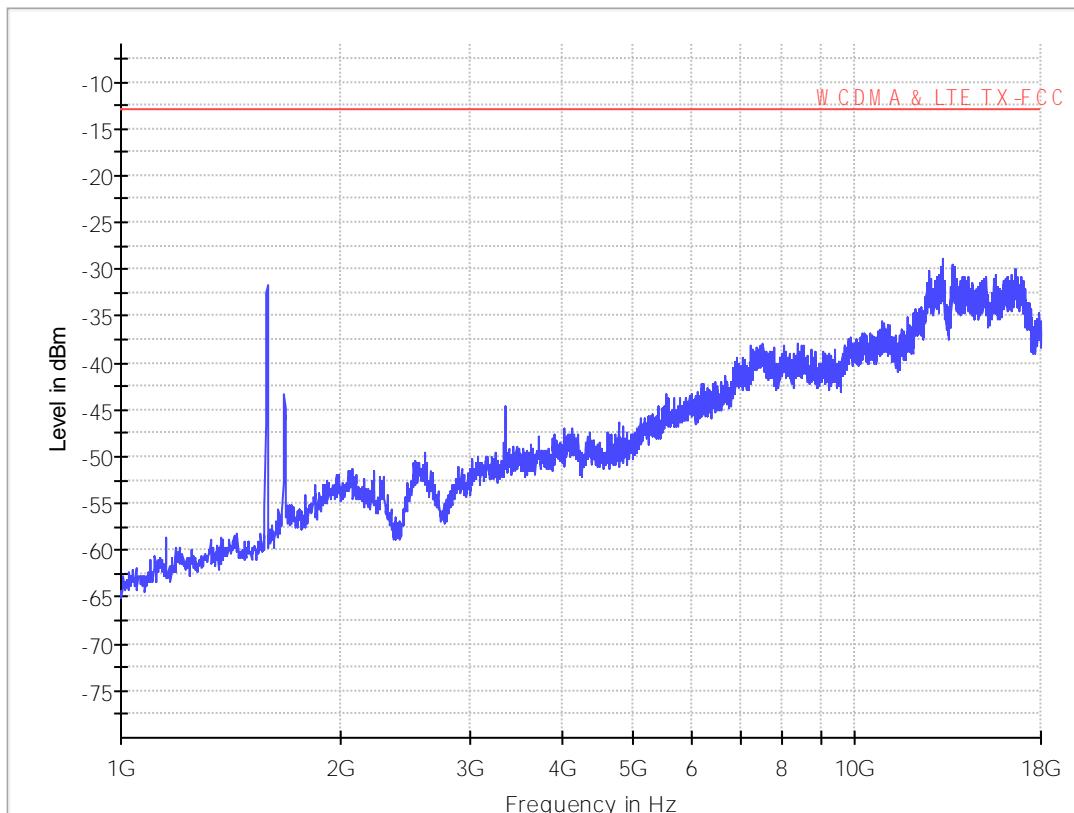
Model: M3ARC3AH

Date of Test: 26 April 2023

Worst Case Operating Mode: Transmitting (Band 5, 10MHz)

Worst-case ANT Polarity: Vertical

FCC 234G TX 1-12.75G dBm



Remark: The emissions were very low against the limit in the frequency above 1 GHz.

Applicant: Guangzhou Xaircraft Technology CO.,LTD

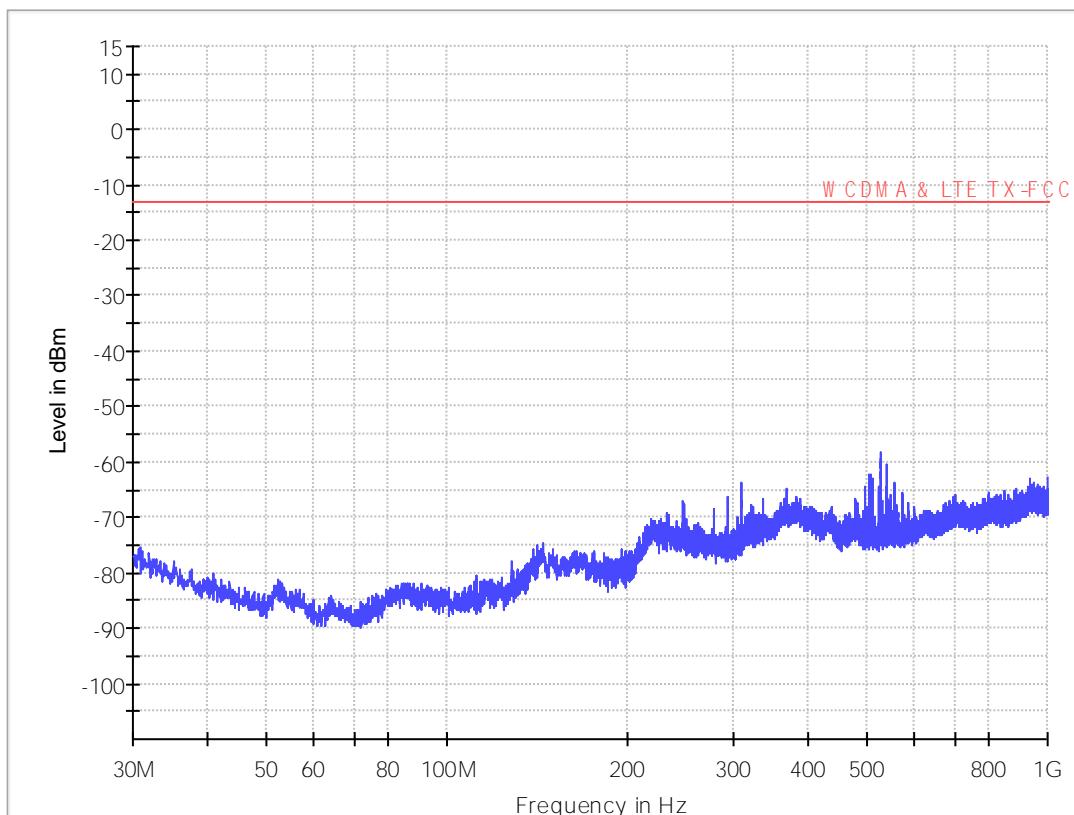
Model: M3ARC3AH

Date of Test: 26 April 2023

Worst Case Operating Mode: Transmitting (Band 7, 10MHz)

Worst Case ANT Polarity: Vertical

FCC 234G TX 30M-1GdBm



Remark: The emissions were very low against the limit in the frequency range 30 MHz ~ 1 GHz.

Applicant: Guangzhou Xaircraft Technology CO.,LTD

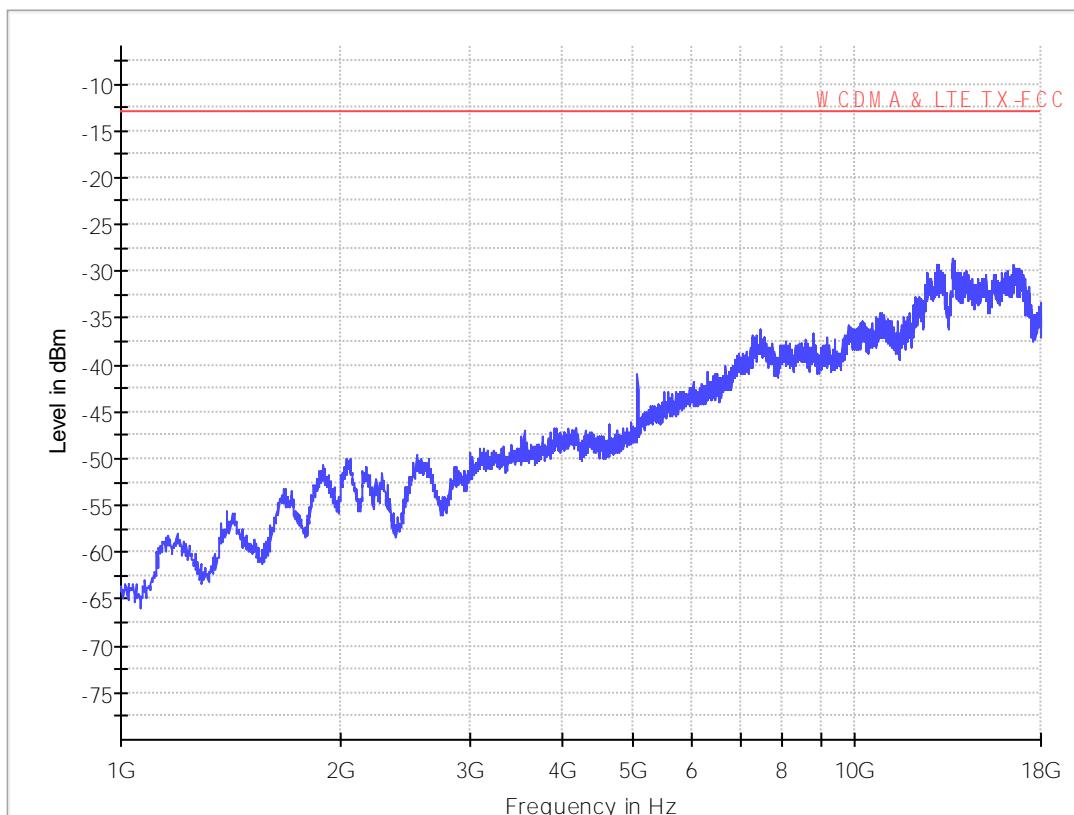
Model: M3ARC3AH

Date of Test: 26 April 2023

Worst Case Operating Mode: Transmitting (Band 7, 10MHz)

Worst-case ANT Polarity: Vertical

FCC 234G TX 1-12.75G dBm



Remark: The emissions were very low against the limit in the frequency above 1 GHz.

Applicant: Guangzhou Xaircraft Technology CO.,LTD

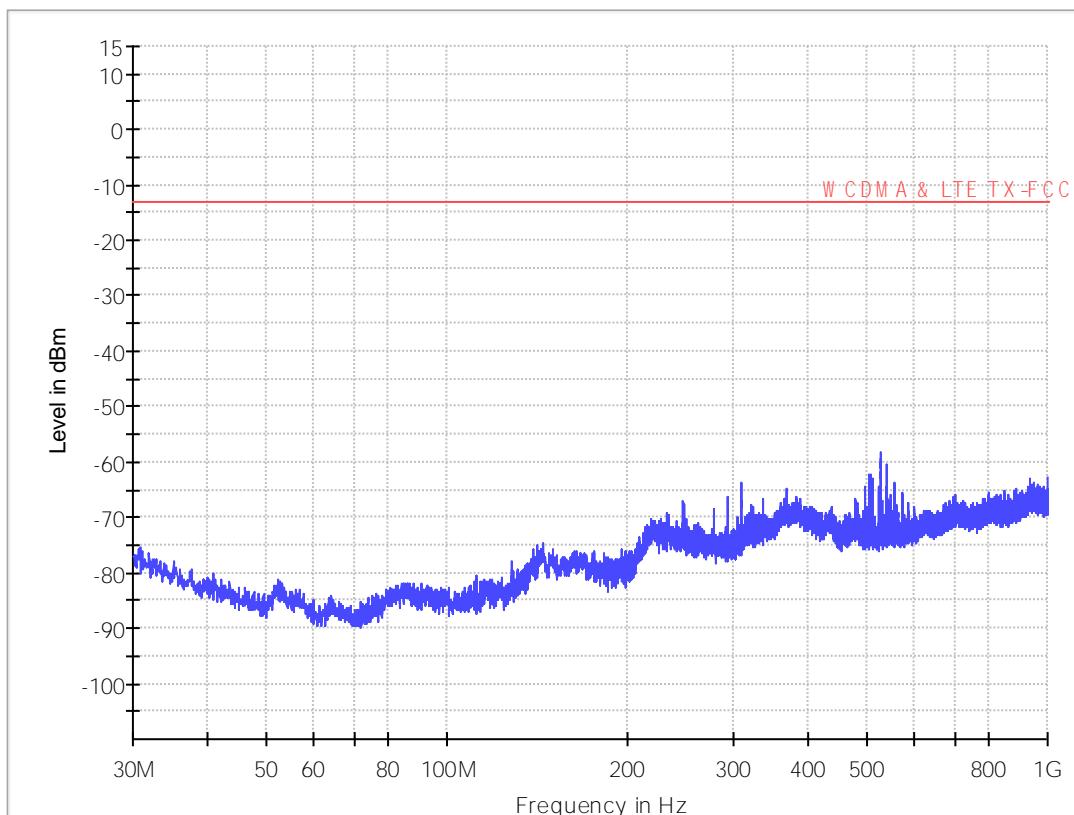
Model: M3ARC3AH

Date of Test: 26 April 2023

Worst Case Operating Mode: Transmitting (Band 25, 10MHz)

Worst Case ANT Polarity: Vertical

FCC 234G TX 30M-1GdBm



Remark: The emissions were very low against the limit in the frequency range 30 MHz ~ 1 GHz.

Applicant: Guangzhou Xaircraft Technology CO.,LTD

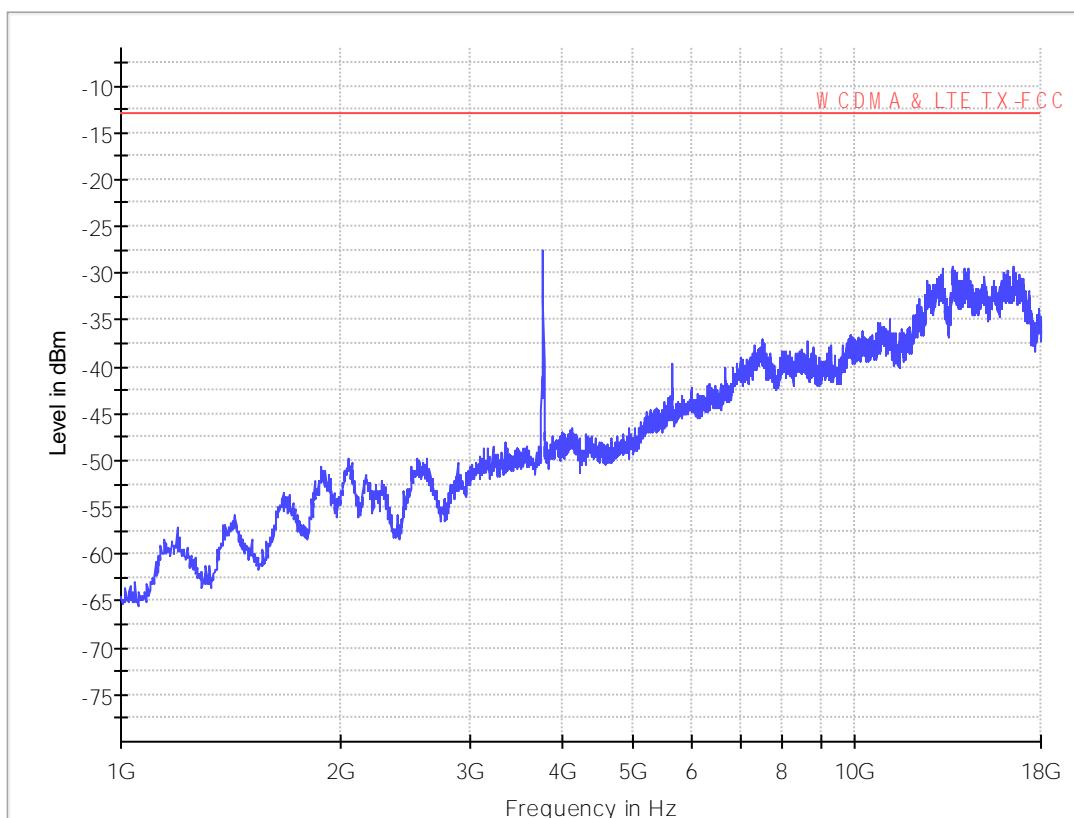
Model: M3ARC3AH

Date of Test: 26 April 2023

Worst Case Operating Mode: Transmitting (Band 25, 10MHz)

Worst-case ANT Polarity: Vertical

FCC 234G TX 1-12.75G dBm



Remark: The emissions were very low against the limit in the frequency above 1 GHz.

Applicant: Guangzhou Xaircraft Technology CO.,LTD

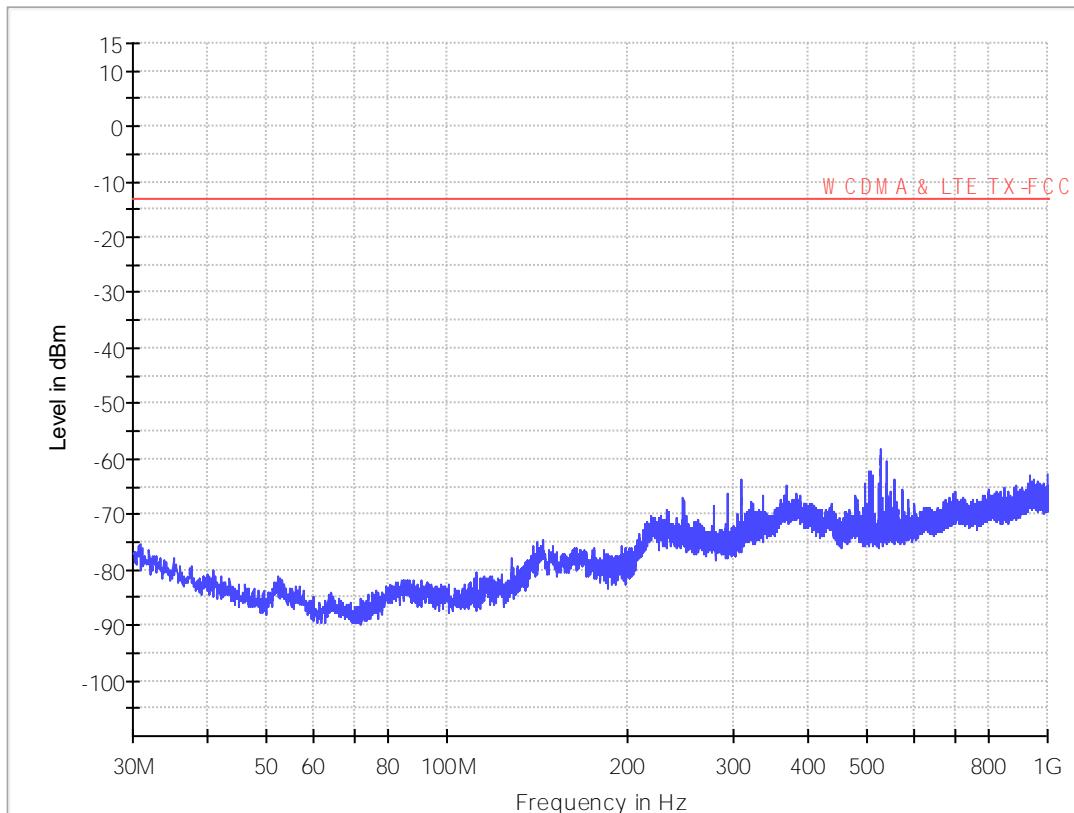
Model: M3ARC3AH

Date of Test: 26 April 2023

Worst Case Operating Mode: Transmitting (Band 26, 10MHz)

Worst Case ANT Polarity: Vertical

FCC 234G TX 30M-1GdBm



Remark: The emissions were very low against the limit in the frequency range 30 MHz ~ 1 GHz.

Applicant: Guangzhou Xaircraft Technology CO.,LTD

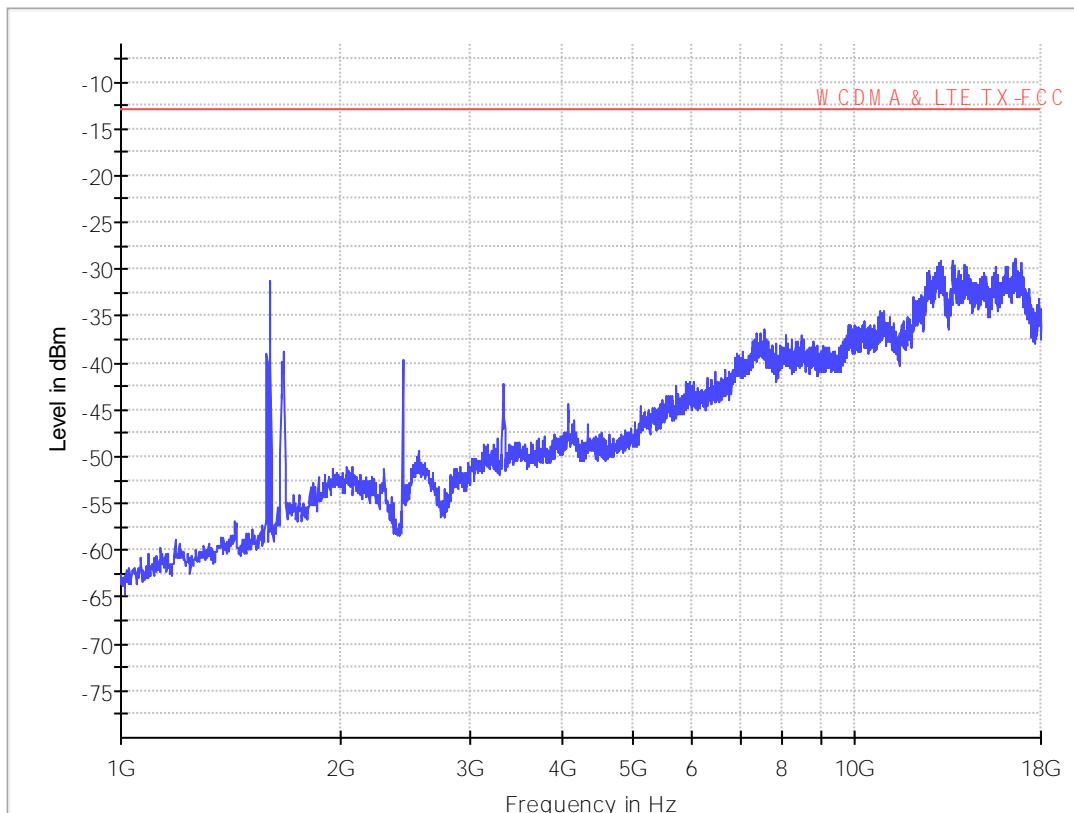
Model: M3ARC3AH

Date of Test: 26 April 2023

Worst Case Operating Mode: Transmitting (Band 26, 10MHz)

Worst-case ANT Polarity: Vertical

FCC 234G TX 1-12.75G dBm



Remark: The emissions were very low against the limit in the frequency above 1 GHz.

Applicant: Guangzhou Xaircraft Technology CO.,LTD

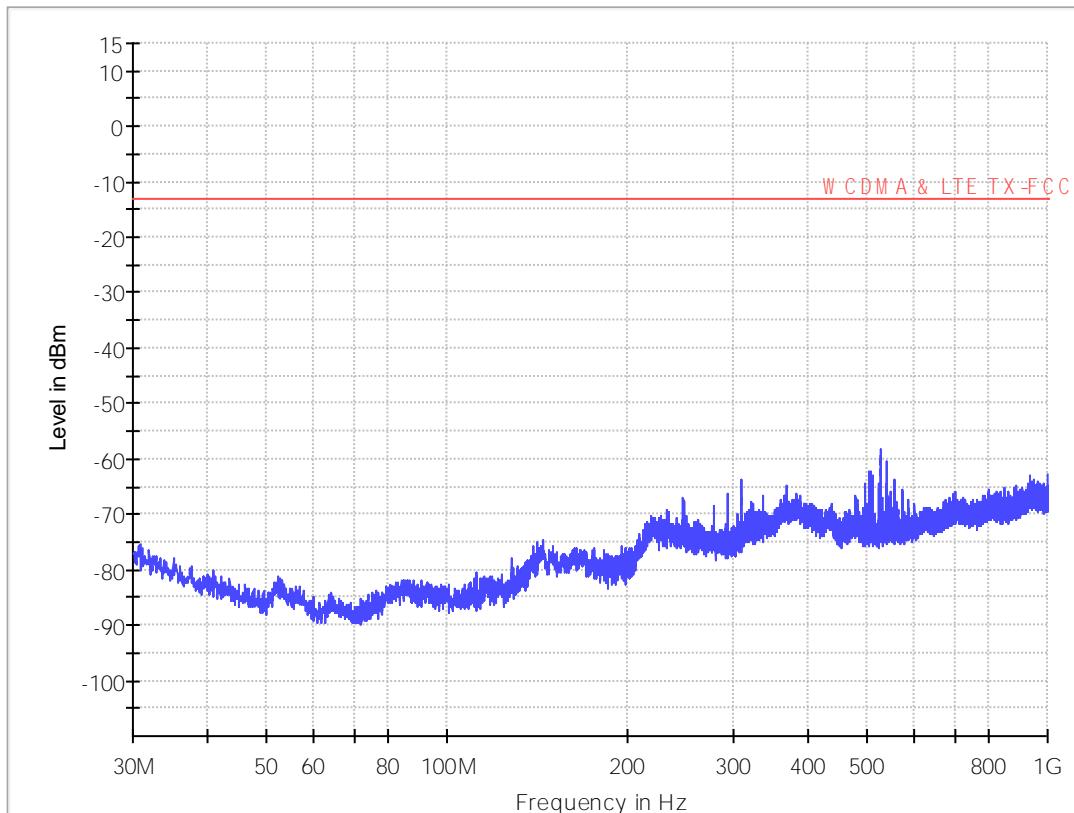
Model: M3ARC3AH

Date of Test: 26 April 2023

Worst Case Operating Mode: Transmitting (Band 38, 10MHz)

Worst Case ANT Polarity: Vertical

FCC 234G TX 30M-1GdBm



Remark: The emissions were very low against the limit in the frequency range 30 MHz ~ 1 GHz.

Applicant: Guangzhou Xaircraft Technology CO.,LTD

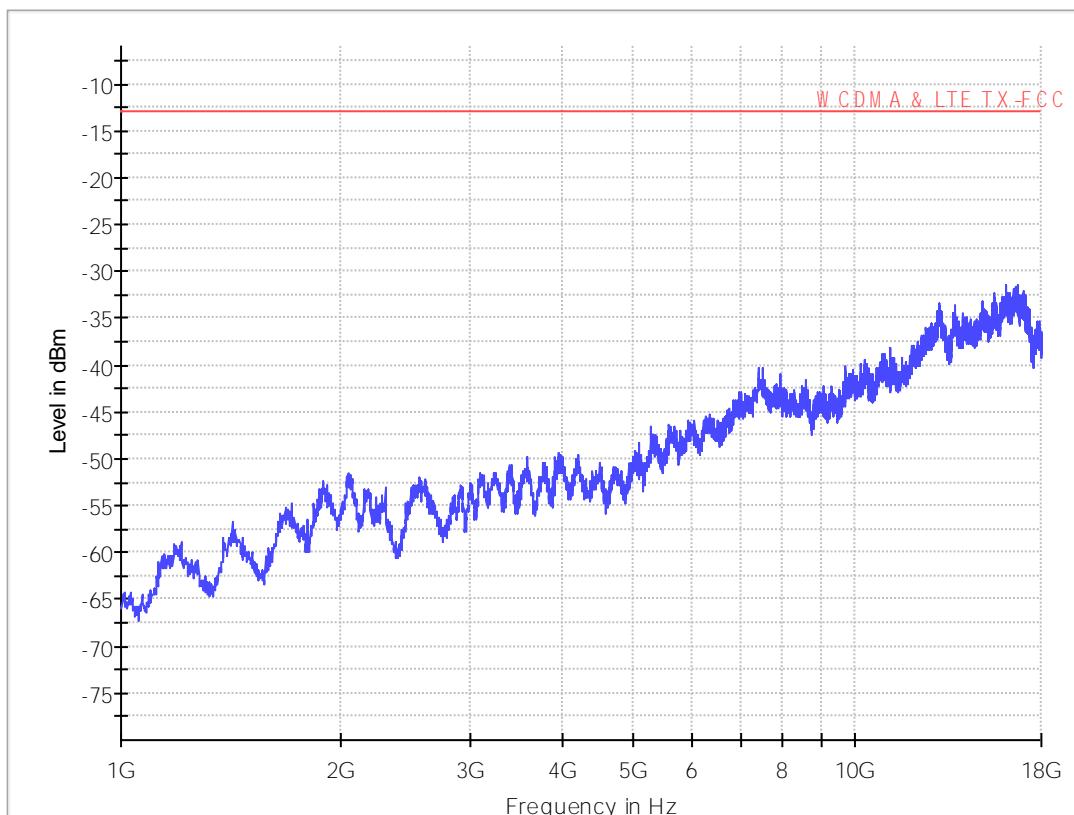
Model: M3ARC3AH

Date of Test: 26 April 2023

Worst Case Operating Mode: Transmitting (Band 38, 10MHz)

Worst-case ANT Polarity: Vertical

FCC 234G TX 1-12.75G dBm



Remark: The emissions were very low against the limit in the frequency above 1 GHz.

Applicant: Guangzhou Xaircraft Technology CO.,LTD

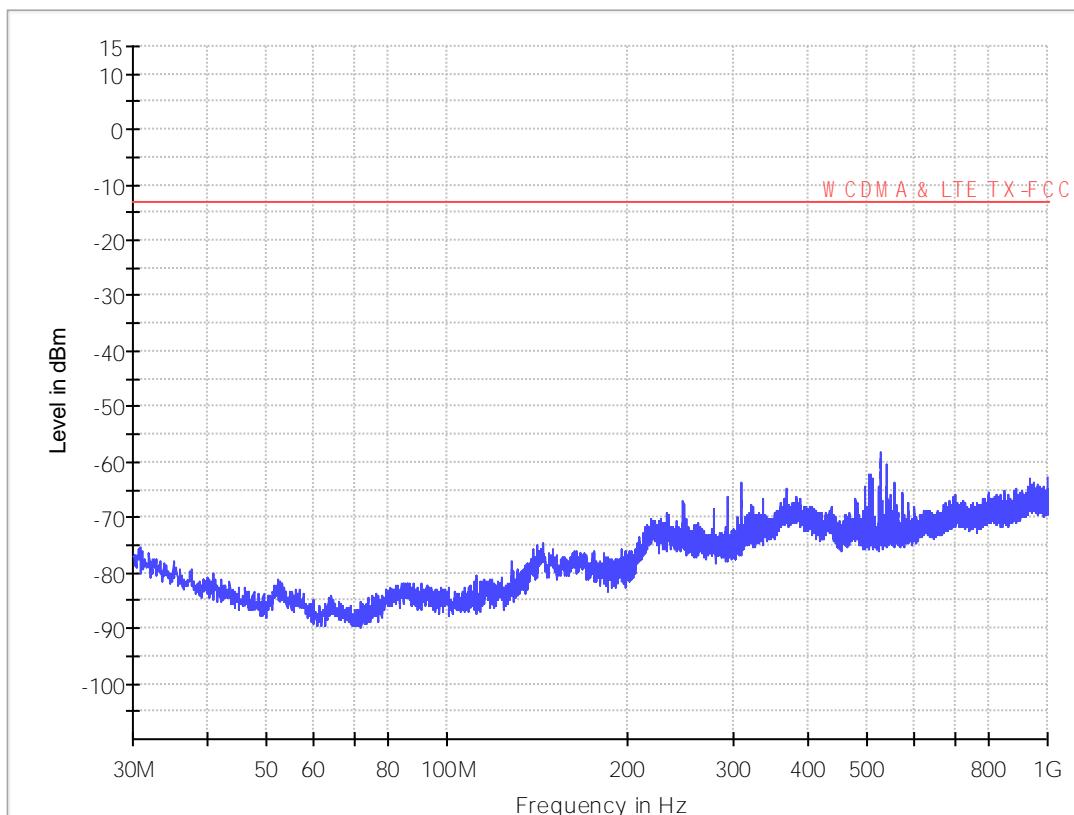
Model: M3ARC3AH

Date of Test: 26 April 2023

Worst Case Operating Mode: Transmitting (Band 41, 10MHz)

Worst Case ANT Polarity: Vertical

FCC 234G TX 30M-1GdBm



Remark: The emissions were very low against the limit in the frequency range 30 MHz ~ 1 GHz.

Applicant: Guangzhou Xaircraft Technology CO.,LTD

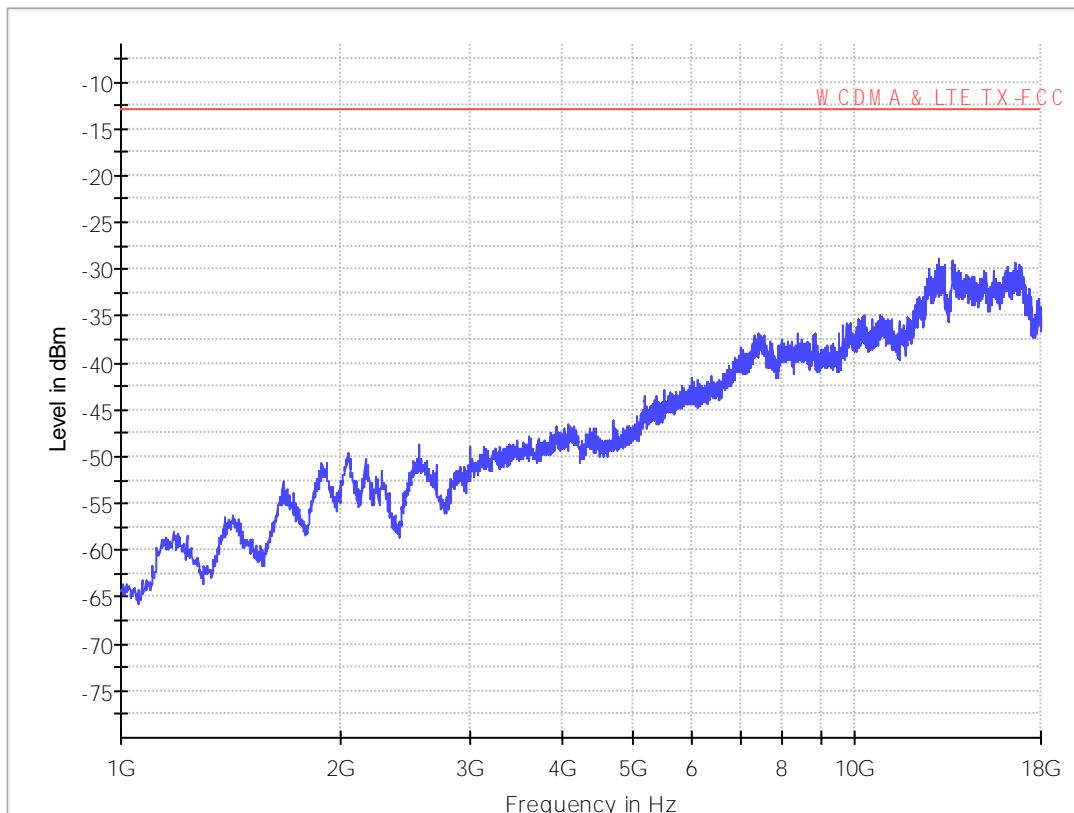
Model: M3ARC3AH

Date of Test: 26 April 2023

Worst Case Operating Mode: Transmitting (Band 41, 10MHz)

Worst-case ANT Polarity: Vertical

FCC 234G TX 1-12.75G dBm



Remark: The emissions were very low against the limit in the frequency above 1 GHz.

## 7. Main Test Instruments

Main Test Equipment					
Equip No.	Equipment Name	Manufacturer	Model	Cal Date	Cal- Due
SZ006-27	DC Power Supply	Keysight	E3648A	2022-12-20	2023-12-20
SZ065-08	Wideband Radio Communication Tester	R & S	CMW 500	2022-07-04	2023-07-04
SZ065-07	Wideband Radio Communication Tester	R & S	CMW 500	2022-04-27	2023-04-27
SZ056-07	Signal Analyzer	R&S	FSV40	2023-01-06	2024-01-06
SZ016-12	Programmable Temperature & Humidity Chamber	TaiLi	MHK-120NK	2022-12-23	2023-12-23
SZ047-35	Digital Temperature- Humidity Recorder	YiJie	RS210	2022-07-28	2023-07-28
SZ061-12	Biconilog Antenna	ETS	3142E	2021-08-04	2024-08-04
SZ061-06	Active Loop Antenna	Electro-Metrics	EM-6876	2021-05-18	2023-05-18
SZ061-08	Horn Antenna	ETS	3115	2021-09-05	2024-09-05
SZ061-07	Pyramidal Horn Antenna	ETS	3160-09	2022-08-21	2025-08-21
SZ056-03	Spectrum Analyzer	R&S	FSP30	2023-04-27	2024-04-27
SZ185-03	EMI Receiver	R & S	ESCI	2023-04-27	2024-04-27
SZ181-04	Preamplifier	Agilent	8449B	2022-05-16	2023-05-16
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	2021-12-12	2024-12-12
SZ062-24	RF Cable	RADIALL	RG 213U	2022-10-17	2023-10-17
SZ062-25	RF Cable	RADIALL	0.04-26.5GHz	2022-10-17	2023-10-17
SZ062-38	RF Cable	RADIALL	0.04-26.5GHz	2022-05-17	2023-05-17
SZ067-04	Notch Filter	Micro-Tronics	BRM50702-02	2022-05-16	2023-05-16

Software Information			
Test Item	Software Name	Manufacturer	Version
RSE	EMC32	R&S	V8.40.0
Conducted RF	JS1120 RF Test System	Shenzhen JS tonsend co., Ltd	2.6.9.0518

## 8. Measurement Uncertainty

For a 95% confidence level ( $k = 2$ ), the measurement expanded uncertainties for defined systems, in accordance with

the recommendations of ISO 17025 as following:

Test Item		Extended Uncertainty
Transmit Output Power Data	Power [dBm]	$U = 0.42 \text{ dB}$
Bandwidth	Magnitude [%]	$U = 0.12\%$
Band Edge Compliance	Disturbance Power [dBm]	$U = 1.24 \text{ dB}$
Spurious Emissions, Conducted	Disturbance Power [dBm]	$U = 1.78 \text{ dB}$
Field Strength of Spurious Radiation	ERP [dBm]	For 3 m Chamber: $U = 4.86 \text{ dB}$ (30 MHz to 26.5GHz)
Frequency Stability	Frequency Accuracy [ppm]	$U = 0.012 \text{ ppm}$

## 9. Appendixes

Appendix No.	Description
230403080SZN-001-Appendix A	Appendix for GSM
230403080SZN-001-Appendix B	Appendix for WCDMA
230403080SZN-001-Appendix C	Appendix for LTE

\*\*\*\*\*End of Report\*\*\*\*\*