



FCC REPORT

(WCDMA)

Product Name : Vehicle Terminal

Trade mark :

inex

Model No. : 5213

6201 、 6202 、 6203 、 6207 、 6208 、

6209 、6210 、6211 、6213 、6215 、

6217 、 6218 、 6219 、 6223 、 6225 、

6227 、 6229 、 6231 、 6233 、 6236 、

6239 、6243 、6245 、6251 、6253 、

6256 、6257 、6258 、6261 、6263 、

6267 、 6268 、 6271 、 6273 、 6278 、

6283 、6288 、6293 、6502 、6503 、

Extension model : 6509 \, 6513 \, 6538 \, 6810 \, 6833 \,

6858 \ 6868 \ 5208 \ 5209 \ 5211 \

5215 \ 5217 \ 5218 \ 5219 \ 5224 \

5225 5227 5231 5236 5239 5

5243 、 5245 、 5251 、 5256 、 5257 、

5258 \ 5261 \ 5263 \ 5267 \ 5268 \

5271 、 5273 、 5278 、 5288 、 5293 、

5509 、5513 、5523 、5538 、5807 、

5810、5833、5858、5868

FCC ID : 2AZHT-AL-XXXX

Report Number : BLA-EMC-202103-A12304

Date of sample receipt : 2021/3/29

Date of Test : 2021/3/29 to 2021/5/7

Date of Issue : 2021/5/10

Test standard : FCC CFR Title 47 Part 2

FCC CFR Title 47 Part22 Subpart H FCC CFR Title 47 Part24 Subpart E

Test result : PASS

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Report No.: BLA-EMC-202103-A12304

Prepared for:

Shenzhen ALEX Electronics Co., Ltd.

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Compiled by:

Approved by:

Date: 2021/5/10 he/



1. Version

Version No.	Date	Description
00	2021/5/10	Original





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Test Item	Section in CFR 47	Result
	Part 1.1307	Pass
RF Exposure (SAR)	Part 2.1093	(Please refer to
	RSS102 Issue5	SAR Report)
	Part 2.1046	
RF Output Power	Part 22.913 (a)(2)	Pass
	Part 24.232 (c)	
Peak-to-Average Power Ratio	Part 24.232 (d)	Pass
Modulation Characteristics	Part 2.1047	Pass
	Part 2.1049	
99% & -26 dB Occupied Bandwidth	Part 22.917(b)	Pass
	Part 24.238(b) Part 2.1051 nna Terminal Part 22.917 (a)	
	Part 2.1051	
Spurious Emissions at Antenna Terminal	Part 22.917 (a)	Pass
	Part 24.238 (a)	
	Part 2.1053	
Field Strength of Spurious Radiation	Part 22.917 (a)	Pass
	Part 24.238 (a)	
Out of hand amission, Pand Edge	Part 22.917 (a)	Pass
Out of band emission, Band Edge	Part 24.238 (a)	Pass
	Part22.355	
Frequency stability vs. temperature	Part24.235	Pass
	Part 2.1055(a)(1)(b)	
	Part22.355	
Frequency stability vs. voltage	Part24.235	Pass
	Part 2.1055(d)(2)	



4. General Information

5.1 Client Information

Applicant:	Shenzhen ALEX Electronics Co., Ltd.
Address:	A & B Block, building 1, Jinshun Industrial Park, No.29, Anju Road, Anliang Community, Henggang Subdistrict, Longgang District, Shenzhen(No.6, 5F, A Block), China
Manufacturer	Shenzhen ALEX Electronics Co., Ltd.
Address:	A & B Block, building 1, Jinshun Industrial Park, No.29, Anju Road, Anliang Community, Henggang Subdistrict, Longgang District, Shenzhen(No.6, 5F, A Block), China
Factory	Shenzhen ALEX Electronics Co., Ltd.
Address	A & B Block, building 1, Jinshun Industrial Park, No.29, Anju Road, Anliang Community, Henggang Subdistrict, Longgang District, Shenzhen(No.6, 5F, A Block), China

5.2 General Description of E.U.T.

Product Name:	Vehicle Terminal		
Test Model No.:	5213		
Operation Frequency range:	WCDMA Band V:826.4MHz-846.6MHz WCDMA Band II:1852.4 MHz -1907.6 MHz WCDMA Band IV:1712.4 MHz -1752.6 MHz		
Modulation type:	GSM/GPRS:GMSK,EGPRS: 8PSK,UMTS:QPSK,		
Antenna type:	External Antenna		
Antenna gain:	WCDMA Band V:1.97 dBi WCDMA Band II:4.69 dBi WCDMA Band IV:4.69 dBi		
Power supply:	DC12V		
Remark:The Antenna Gain is supplied by the customer.BlueAsia is not responsible for this data			



Operation Frequency List:

Operation Frequency List:							
WCDM	A Band V	WCDMA Band II					
Channel:	Frequency (MHz)	Channel:	Frequency (MHz)				
4132	826.40	9262	1852.40				
4133	826.60	9263	1852.60				
4182	836.40	9399	1879.80				
4183	836.60	9400	1880.00				
4184	836.80	9401	1880.20				
4232	846.40	9537	1907.40				
4233	846.60	9538	1907.60				
WCDM/	A Band IV						
Channel:	Frequency (MHz)						
1312	1712.40						
1313	1712.60						
1449	1739.80						
1450	1740.00						
1451	1740.20						
1512	1752.40						
1513	1752.60						

Regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

WCDMA Band V			WCDMA Band II			
Channel		Frequency(MHz)	Channel		Frequency(MHz)	
Lowest channel	4132	826.40	Lowest channel 9262		1852.40	
Middle channel	4183	836.60	Middle channel	9400	1880.00	
Highest channel	4233	846.60	Highest channel 9538		1907.60	
1	WCDMA Band IV					
Channe	el	Frequency(MHz)				
Lowest channel	1312	1712.40				
Middle channel	1450	1740.00				
Highest channel	1513	1752.60				



5.3 Test modes

Operating Environment:			
Temperature:	Normal: 15℃~ 35℃, Extreme: -10℃ ~ +55℃		
Humidity:	20 % ~ 75 % RH		
Atmospheric Pressure:	1008 mbar		
Voltage:	age: Nominal: 12Vdc		
Test mode:			
RMC mode	Keep the EUT communication with simulated station in RMC mode		
HSDPA	Keep the EUT communication with simulated station in HSDPA mode		
HSUPA	Keep the EUT communication with simulated station in HSUPA mode		

Remark: The EUT has been tested undercontinuous transmitting mode. Channel Low, Mid and High for each type band with rated data rate were chosen for full testing. The field strength of spurious radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for these modes with power adaptor, earphone and Data cable. Just the worst case position (H mode) shown in report.

5.4 Description of Support Units

Test Equipment	Manufacturer	Model No.	Serial No.
Simulated Station	R&S	CMW500	1201.0002K50

5.5 Measurement Uncertainty

Parameters	Expanded Uncertainty
Radiated Emission (9kHz ~ 30MHz)	4.24 dB (k=2)
Radiated Emission (30MHz ~ 1000MHz)	4.35 dB (k=2)
Radiated Emission (1GHz ~ 18GHz)	4.44 dB (k=2)
Radiated Emission (18GHz ~ 26.5GHz)	4.56 dB (k=2)
Radiated Emission (18GHz ~ 26.5GHz)	4.56 dB (k=2)

5.6 Laboratory Facility

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

• FCC — Designation No.: CN1252

BlueAsia of Technical Services(Shenzhen) Co.,Ltd.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 files. DesignationCN1252.

•ISED — CAB identifier No.: CN0028

BlueAsia of Technical Services(Shenzhen) Co.,Ltd.has been registered by Certification and Engineering Bureau of ISED for radio equipment testing with CAB identifierCN0028.

CNAS - Registration No.: CNAS L9788

BlueAsia of Technical Services(Shenzhen) Co.,Ltd. is accredited to ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L9788

5.7 Laboratory Location

BlueAsia of Technical Services(Shenzhen) Co., Ltd.

Building C, No. 107, Shihuan Road, Shiyan Sub-District, Baoan District, Shenzhen, Guangdong Province, China

Telephone: TEL: +86-755-28682673 FAX: +86-755-28682673



5.8 Test Instruments list

Radi	Radiated Emission:							
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)		
1	Chamber	SKET	966	N/A	2020/11/10	2023/11/9		
2	Spectrum	R&S	FSP40	100817	2020/10/12	2021/10/11		
3	Receiver	R&S	ESR7	101199	2020/10/12	2021/10/11		
4	broadband Antenna	Schwarzbeck	VULB9168	00836 P:00227	2020/9/26	2022/9/25		
5	Horn Antenna	Schwarzbeck	9120D	01892 P:00331	2020/9/26	2022/9/25		
6	Amplifier	SKET	PA-000318G-45	N/A	2020/10/16	2021/10/15		
7	EMI software	EZ	EZ-EMC	EEMC- 3A1	N/A	N/A		
8	Loop antenna	SCHNARZBECK	FMZB1519B	00102	2020/9/26	2022/9/25		
9	Controller	SKET	N/A	N/A	N/A	N/A		
10	Coaxial Cable	BlueAsia	BLA-XC-02	N/A	N/A	N/A		
11	Coaxial Cable	BlueAsia	BLA-XC-03	N/A	N/A	N/A		
12	Coaxial Cable	BlueAsia	BLA-XC-01	N/A	N/A	N/A		



RF Cond	RF Conducted Test:							
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)		
1	Spectrum Analyzer	Agilent	N9030A	MY50510123	2020/10/12	2021/10/11		
2	Spectrum analyzer	Rohde & Schwarz	FSP40	100817	2020/10/12	2021/10/11		
3	Vector Signal Generator	Agilent	E4438C	MY45092582	2020/10/12	2021/10/11		
4	Signal Generator	Agilent	E8257D	MY44320250	2020/10/12	2021/10/11		
5	Power Sensor	D.A.R.E	RPR3006W	17I00015SNO27	2020/10/12	2021/10/11		
7	DC Power Supply	LODESTAR	LP305DE	N/A	2020/10/12	2021/10/11		
8	Temperature Humidity Chamber	Mingle	TH101B	N/A	2020/10/12	2021/10/11		



5. Test results

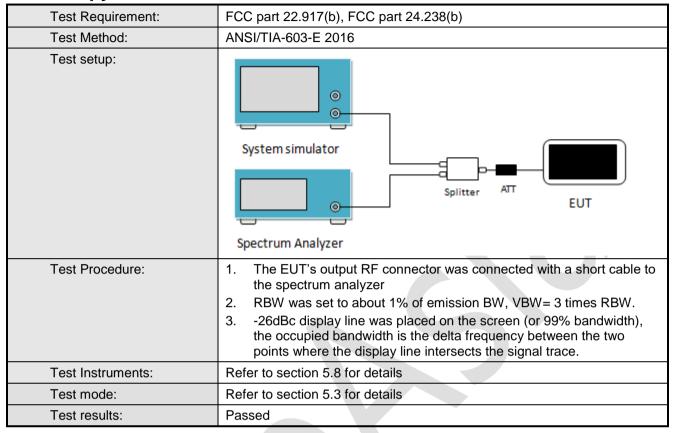
6.1 Conducted Output Power

Test Requirement:	FCC part 22.913(a)(2), FCC part24.232(c)			
Test Method:	ANSI/TIA-603-E 2016			
Limit:	WCDMA Band V: 7W, WCDMA Band II/IV: 2W			
Test setup:	System simulator ATT EUT			
Test Procedure:	The transmitter output was connected to a calibrated attenuator, the other end of which was connected to the simulated station. Transmitter output power was read off in dBm.			
Test Instruments:	Refer to section 5.8 for details			
Test mode:	Refer to section 5.3 for details			
Test results:	Passed			

Measurement Data:



6.2 Occupy Bandwidth



Measurement Data:



6.3 Peak-to-Average Power Ratio

Test Requirement:	FCC part 24.232(d)		
TestMethod	ANSI/TIA-603-E 2016		
Limit:	The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.		
Test setup:			
Test Procedure:	 The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. Set the CCDF option in spectrum analyzer, RBW ≥ OBW, Set the EUT working in highest power level, measured and recorded the 0.1% as PAPR level. Repeat step 1~3 at other frequency and modulations. 		
Test Instruments:	Refer to section 5.8 for details		
Test mode:	Refer to section 5.3 for details		
Test results:	Passed		

Measurement Data:



6.4 Modulation Characteristic

According to FCC § 2.1047(d), Part 22H & 24Ethere is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

6.5 Out of band emission at antenna terminals

Test Requirement:	FCC part22.917(a), FCC part24.238(a)			
Test Method:	ANSI/TIA-603-E 2016			
Limit:	-13dBm			
Test setup:	System simulator Spectrum Analyzer Spectrum Analyzer			
Test Procedure:	 The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 100 kHz when below 1GHz, 1MHz when above 1 GHz; sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic. For the out of band: Set the RBW=100 kHz, VBW=300 kHz when below 1 GHz, RBW =1 MHz, VBW=3 MHz when above 1 GHz, Start=30MHz, Stop= 10th harmonic. Band Edge Requirements: In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions. 			
Test Instruments:	Refer to section 5.8 for details			
Test mode:	Refer to section 5.3 for details			
Test results:	Passed			

Test plots as follows:

Spurious emission:

Please Refer To Appendix 1: WCDMA RF Test data

Band edge emission:



6.6 ERP, EIRP Measurement

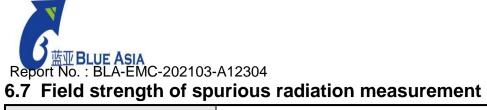
Test Requirement:	FCC part22.913(a)(2), FCC part24.232(c) and FCC part 27.50(d)				
Test Method:	ANSI/TIA-603-E 2016				
Limit:	UMTS 850: 7W ERP, UMTS1900: 2W EIRP, UMTS1700: 1W EIRP				
Test setup:	Below 1GHz Antenna Tower (Turntable) Ground Reference Plane				
	Above 1GHz				
	Horn Antenna Tower Ground Reference Plane Test Receiver Amptier Controller				
Test Procedure:	 The EUT was placed on an non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer. During the measurement, the EUT was communication with the station. The highest emission was recorded with the rotation of the turntable and the lowering of the test antenna from 4m to 1m. The reading was recorded and the field strength (E in dBuV/m) was calculated. ERP in frequency band 824.2 –848.80.8MHz were measured using a substitution method. The EUT was replaced by dipole antenna connected, the S.G. output was recorded and ERP was calculated asfollows: ERP = S.G. output (dBm) + Antenna Gain (dBd) – Cable Loss (dB) EIRP in frequency band 1850.2 –1909.8MHz were measured using a substitution method. The EUT was replaced by or horn antenna connected, the S.G. output was recorded and EIRP was calculated as follows: EIRP = S.G. output (dBm) + Antenna Gain (dBi) – Cable Loss (dB) The worse case was relating to the conducted output power. 				
Test Instruments:	Refer to section 5.8 for details				
Test mode:	Refer to section 5.3 for details				
Test results:	Passed				



RCM 12.2kbps

EUT mode	Channel	EUT Pol.	Antenna Pol.	ERP(dBm)	Limit (dBm)	Result
LIMTS OFO	4422	Н	V	22.01	20.45	Door
UMTS 850	MTS 850 4132		Н	19.36	38.45	Pass
EUT mode	Channel	EUT Pol.	Antenna Pol.	EIRP(dBm)	Limit (dBm)	Result
LIMTC 1700	LINATO 4700 4040	Н	V	23.01	20.00	Door
UIVITS 1700	UMTS 1700 1312		Н	21.45	30.00	Pass
LIMTS 1000	LIMTC 4000 0520		V	22.18	33.00	Dana
UMTS 1900	9538	Н	Н	19.50	33.00	Pass





Test Requirement:	FCC part22.917(a), FCC part24.238(a) and FCC part 27.53(h)		
Test Method:	ANSI/TIA-603-E 2016		
Limit:	-13dBm		
Test setup:	Below 1GHz		
	Above 1GHz Test Receiver		
Test Procedure:	 The EUT was placed on an non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations. The frequency range up to tenth harmonic was investigated for each of three fundamental frequency (low, middle and high channels). Once spurious emission was identified, the power of the emission was determined using the substitution method. The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency. ERP / EIRP = S.G. output (dBm) + Antenna Gain(dB/dBi) - Cable Loss (dB) 		
Test Instruments:	Refer to section 5.8 for details		
Test mode:	Refer to section 5.3 for details.		
Test results:	Passed		



Measurement Data (worst case):

Test mode:	WCDMA BANI	O V 12.2k RMC	Test channel:	Lowest	
Frequency (MHz)	Spurious	Emission	Limit (dBm)	Result	
Frequency (MITIZ)	Polarization	Level (dBm)			
1652.80	Vertical	-47.16	-13.00	Pass	
2479.20	V	-43.51	-13.00	Pass	
1652.80	Horizontal	-52.08	-13.00	Pass	
2479.20	Н	-49.16	-13.00	Pass	
Test mode:	WCDMA BANI	O V 12.2k RMC	Test channel:	Middle	
Fraguency (MUz)	Spurious	Emission	Limit (dRm)	Result	
Frequency (MHz)	Polarization	Level (dBm)	Limit (dBm)		
1673.20	Vertical	-54.12	-13.00	Pass	
2509.80	V	-52.03	-13.00		
1673.20	Horizontal	-51.19	-13.00	Page	
2509.80	Н	-49.18	-13.00	Pass	
Test mode:	WCDMA BANI	O V 12.2k RMC	Test channel:	Highest	
Frequency (MHz)	Spurious	Emission	Limit (dBm)	Result	
Frequency (MHZ)	Polarization	Level (dBm)		Result	
1693.20	Vertical	-54.01	-13.00	Pass	
2539.80	V	-45.19	-13.00	Fa55	
1693.20	Horizontal	-52.05	12.00	Pass	
2539.80	Н	-48.67	-13.00		

Remark:

1. The emission levels of below 1 GHz are very lower than the limit and not show in test report.



Test mode:	WCDMA Band	I II 12.2k RMC	Test channel:	Lowest	
Frequency (MHz)	Spurious	Emission	Limpit (alDum)	Dooult	
Frequency (MHZ)	Polarization	Level (dBm)	Limit (dBm)	Result	
3704.80	Vertical	-49.38		Pass	
5557.20	V	-36.71	-13.00		
3704.80	Horizontal	-51.03	-13.00	Pass	
5557.20	Н	-37.54			
Test mode:	WCDMA Band	II 12.2k RMC	Test channel:	Middle	
Frequency (MHz)	Spurious	Emission	Lineit (dDms)	Result	
Frequency (MHZ)	Polarization	Level (dBm)	Limit (dBm)		
3760.00	Vertical	-48.03		Pass	
5640.00	V	-37.49	-13.00		
3760.00	Horizontal	-45.13	-13.00		
5640.00	Н	-36.25			
Test mode:	WCDMA Band II 12.2k RMC		Test channel:	Highest	
	Spurious	Emission	Limit (dBm)		
Frequency (MHz)	Polarization	Level (dBm)		Result	
3815.20	Vertical	-48.26	-13.00	Pass	
5722.80	V	-41.41			
3815.20	Horizontal	-45.06			
5722.80	Н	-38.87			

Remark

1. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

EPORT No.: BLA-EMC-202103-A12304

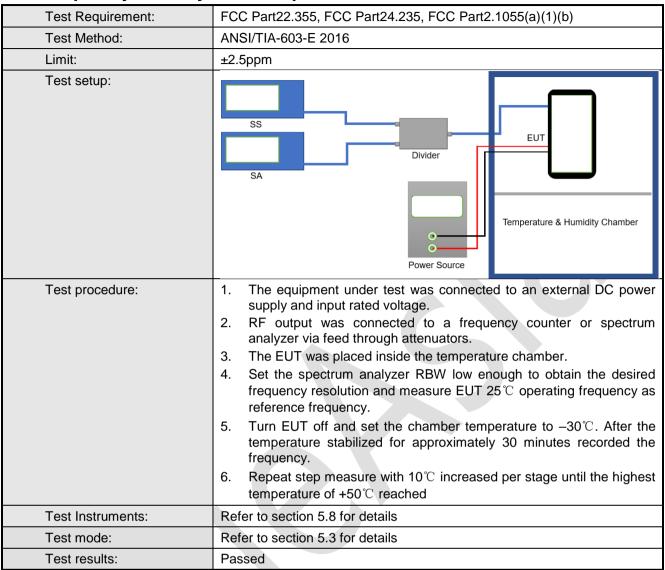
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Test mode:	WCDMA Band	IV 12.2k RMC	Test channel:	Lowest	
Frequency (MHz)	Spurious	Emission	Limit (dBm)	Result	
Frequency (MHZ)	Polarization	Level (dBm)			
3424.80	Vertical	-48.87		Pass	
5137.20	V	-38.85	-13.00		
3424.80	Horizontal	-47.74	-13.00	Fass	
5137.20	Н	-38.35			
Test mode:	WCDMA Band	II 12.2k RMC	Test channel:	Middle	
Fraguency (MUz)	Spurious	Emission	Line it (ADms)	Result	
Frequency (MHz)	Polarization	Level (dBm)	Limit (dBm)		
3480.00	Vertical	-43.47		Pass	
5220.00	V	-35.01	-13.00		
3480.00	Horizontal	-48.54	-13.00		
5220.00	Н	-35.04			
Test mode:	WCDMA Band	II 12.2k RMC	Test channel:	Highest	
_	Spurious	Emission	Limit (dBm)		
Frequency (MHz)	Polarization	Level (dBm)		Result	
3505.20	Vertical	-42.03	-13.00	Pass	
5257.80	V	-41.01			
3505.20	Horizontal	-47.44			
5257.80	Н	-42.08			

Remark: The emission levels of below 1 GHz are very lower than the limit and not show in test report.



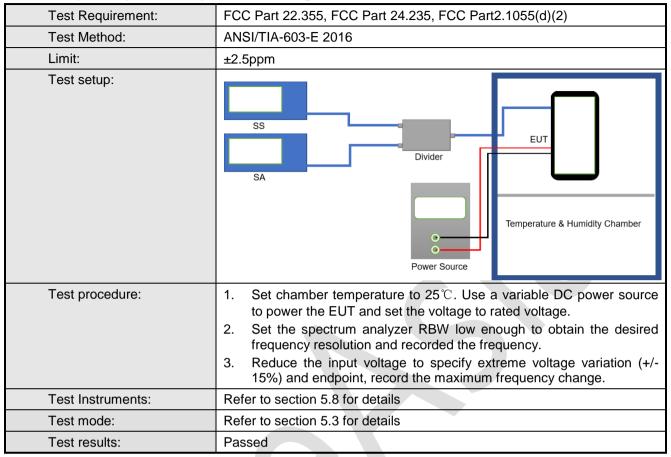
6.8 Frequency stability V.S. Temperature measurement



Measurement Data (the worst channel):



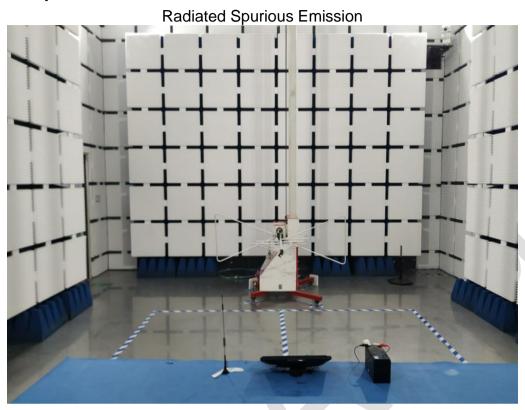
6.9 Frequency stability V.S. Voltage measurement



Measurement Data (the worst channel):



7 Test Setup Photo







Reference to the test report No. BLA-EMC-202103-A12301

-----End of report-----

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