

Test Report No.:
FCC2021-0005-4

RF Test Report

EUT : **Pet Tracker**
MODEL : **EV-206M**
BRAND NAME : **N/A**
CLIENT : **Shenzhen Eview GPS
Technology**
Classification Of Test : **Commission Test**

Vkan Certification & Testing Co., Ltd.



Vkan Certification & Testing Co., Ltd.

Test Report No.: FCC2021-0005-4		Page 2 of 29	
Client		Name : Shenzhen Evview GPS Technology Address : Rm 201, building 1-A, Nankechuang Yuangu, Dalang, Longhua District, Shenzhen, China	
Manufacturer		Name : Shenzhen Evview GPS Technology Address : Rm 201, building 1-A, Nankechuang Yuangu, Dalang, Longhua District, Shenzhen, China	
Equipment Under Test		Name : Pet Tracker Model/Type: EV-206M Trade mark :N/A SerialNO.:N/A Sampe NO.:1-1	
Date of Receipt.	2021.03.24	Date of Receipt.	2021.03.24~2021.05.11
Test Specification		Test Result	
FCC Part 24, Subpart E FCC Part 2 ANSI C63.26-2015		PASS	
Evaluation of Test Result		The equipment under test was found to comply with the requirements of the standards applied. Issue Date: 2021.05.11	
Tested by: <u>Zhu Yulin</u> _____ Name Signature	Reviewed by: <u>Cheng Xiaochuan</u> _____ Name Signature	Approved by: <u>Dong Sanbi</u> _____ Name Signature	
Other Aspects: NONE.			
Abbreviations:OK, Pass= passed Fail = failed N/A= not applicable EUT= equipment, sample(s) under tested			
This test report relates only to the EUT, and shall not be reproduced except in full, without written approval of CVC.			



TABLE OF CONTENTS

RELEASE CONTROL RECORD.....	5
1 SUMMARY OF TEST RESULTS.....	6
1.1 MEASUREMENT UNCERTAINTY.....	6
1.2 TEST SITE AND INSTRUMENTS.....	7
2 GENERAL INFORMATION.....	8
2.1 GENERAL DESCRIPTION OF EUT.....	8
2.2 DESCRIPTION OF SUPPORT UNITS.....	10
2.3 TEST CONFIGURATION.....	10
2.4 EUT OPERATING CONDITIONS.....	11
2.5 GENERAL DESCRIPTION OF APPLIED STANDARDS.....	11
3 TEST TYPES AND RESULTS.....	12
3.1 OUTPUT POWER MEASUREMENT.....	12
3.1.1 LIMITS OF OUTPUT POWER MEASUREMENT.....	12
3.1.2 TEST PROCEDURES.....	12
3.1.3 TEST SETUP.....	12
3.1.4 TEST RESULTS.....	13
3.2 FREQUENCY STABILITY MEASUREMENT.....	16
3.2.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT.....	16
3.2.2 TEST PROCEDURE.....	16
3.2.3 TEST SETUP.....	16
3.2.4 TEST RESULTS.....	16
3.3 OCCUPIED BANDWIDTH MEASUREMENT.....	17
3.3.1 TEST PROCEDURES.....	17
3.3.2 TEST SETUP.....	17
3.3.3 TEST RESULTS.....	17
3.4 BAND EDGE MEASUREMENT.....	18
3.4.1 LIMITS OF BAND EDGE MEASUREMENT.....	18
3.4.2 TEST SETUP.....	18
3.4.3 TEST PROCEDURES.....	18
3.4.4 TEST RESULTS.....	19
3.5 CONDUCTED SPURIOUS EMISSIONS.....	20
3.5.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT.....	20
3.5.2 TEST PROCEDURE.....	20
3.5.3 TEST SETUP.....	20
3.1.1 TEST RESULTS.....	20
3.6 RADIATED EMISSION MEASUREMENT.....	21
3.6.1 LIMITS OF RADIATED EMISSION MEASUREMENT.....	21
3.6.2 TEST PROCEDURES.....	21
3.6.3 DEVIATION FROM TEST STANDARD.....	21
3.6.4 TEST SETUP.....	22
3.6.5 TEST RESULTS.....	24
3.7 PEAK TO AVERAGE RATIO.....	25
3.7.1 LIMITS OF PEAK TO AVERAGE RATIO MEASUREMENT.....	25
3.7.2 TEST SETUP.....	25
3.7.3 TEST PROCEDURES.....	25
3.7.4 TEST RESULTS.....	25
4 PHOTOGRAPHS OF THE TEST CONFIGURATION.....	26



**5 MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE
LAB..... 27**



RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
FCC2021-0005-4	Original release	2021.05.11



1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 24 & Part 2			
STANDARD SECTION	TEST TYPE	RESULT	REMARK
2.1046 24.232	Equivalent Isotropic Radiated Power	PASS	Meet the requirement of limit.
2.1055 24.235	Frequency Stability	PASS	Meet the requirement of limit.
2.1049 24.238(b)	Occupied Bandwidth	PASS	Meet the requirement of limit.
24.232(d)	Peak to average ratio	PASS	Meet the requirement of limit.
24.238(b)	Band Edge Measurements	PASS	Meet the requirement of limit.
2.1051 24.238	Conducted Spurious Emissions	PASS	Meet the requirement of limit.
2.1053 24.238	Radiated Spurious Emissions	PASS	Meet the requirement of limit.

1.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

MEASUREMENT	UNCERTAINTY
Effective Radiated Power	$\pm 1.19\text{dB}$
Frequency Stability	$\pm 39.27\text{Hz}$
Radiated emissions	$\pm 3.55\text{dB}$
Conducted emissions	$\pm 1.407\text{ dB}$
Occupied Channel Bandwidth	$\pm 0.624\text{KHz}$
Band Edge Measurements	$\pm 0.684\text{dB}$
Peak to average ratio	$\pm 0.4\text{dB}$

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

Test Firm:

CVC Testing Technology Co., Ltd.

No.3, Tiantaiyi Road, Kaitai Avenue, Science City, Guangdong, China

Test Firm Registration Number: 937273



1.2 TEST SITE AND INSTRUMENTS

Test Equipment	Type/Mode	SERIAL NO.	Manufacturer	Cal. Due
EMI Test Receiver	ESCI	100857	R&S	2021-12-08
EMI Test Receiver	ESR3	102394	R&S	2022-03-05
LISN	NSLK 8127	8127644	SCHWARZBECK	2021-09-04
LISN	NSLK 8128	8128-316	SCHWARZBECK	2021-09-04
LISN	NSLK 8129	8129-268	SCHWARZBECK	2022-03-05
Plus Limiter (#1)	VTSD 9561 F-N	00515	SCHWARZBECK	2022-03-05
Plus Limiter (#2)	VTSD 9561	9561-F017	SCHWARZBECK	2021-10-09
Impedance Stabilization Network	ISN T800	27095	TESEQ	2021-09-04
Impedance Stabilization Network	NTFM8158	8158-0092	SCHWARZBECK	2021-06-09
ImpedanceStabilizationNetwork	NTFM8131	#184	SCHWARZBECK	2021-06-09
Voltage Probe	TK9420	9420-499	SCHWARZBECK	2022-03-05
Power Divider	4901.17.B	22643830	HUBER+SUHNER	2021-11-08
Video Signal Generator	GV-798+	151064920001	PROMAX	2021-07-21
AudioSignalGenerator	GAG-810	EK871591	GW	2021-12-11
Shielding Room(#1)	GP1A	002	LEINING	2024-08-08
Shielding Room(#2)	GP1A	/	LEINING	2024-08-08
EMI Test Receiver	N9038A-508	MY532290079	Agilent	2022-03-05
EMI Test Receiver	ESR7	102235	R&S	2022-03-05
EMI Test Receiver	N9038A-508	MY53290078	Agilent	2022-03-05
Spectrum Analyzer	N9010B	MY57470323	KEYSIGHT	2022-03-05
Radio Communication Test	CMW500	156686	R&S	2021-12-25
Broadband Antenna(3m)	VULB 9163	9163-530	SCHWARZBECK	2021-07-11
Loop Antenna	HLA 6121	540046	TESEQ	2021-06-28
Loop Antenna	FMZB1513	1513-170	SCHWARZBECK	2022-03-05
Monopole antenna	HFH2-Z6E	101317	R&S	2021-12-11
Waveguide Horn Antenna	BBHA9120B	602	SCHWARZBECK	2022-03-05
Waveguide Horn Antenna	HF906	360306/008	R&S	2022-03-05
Semi-Anechoic Chamber(3m)	FACT-4	ST08035	ETS	2024-12-12
Preamplifier	SCU-01F	100298	Rohde&Schwarz	2021.5.19
Preamplifier	SCU-18F	100799	Rohde&Schwarz	2021.5.19
Signal&Spectrum Analyzer	FSV 40	101898	Rohde&Schwarz	2021.5.19
Signal&Spectrum Analyzer	FSVA 3044	101013	Rohde&Schwarz	2021.5.19



2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Pet Tracker
MODEL NAME	EV-206M
ADDITIONAL MODEL	N/A
FCC ID	2AUMJEV206MA21
POWER SUPPLY	DC 3.7V From Li-ion Battery or DC 5 V From DS Charger
OPERATED MODES	eMTC, NB-IoT
ANTENNA TYPE	PIFA Antenna, -3.1dBi Gain For Band2
HW VERSION	EV206_V1.0
SW VERSION	EV206M V1.1.0.23
I/O PORTS	Refer to user's manual
CABLE	USB Line, 1.2m, Detachable, Unshielded

NOTE:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.
3. Please refer to the EUT photo document (Reference No.: FCC2021-0005) for detailed product photo.

Operating Frequency Range and Channel Bandwidth of EUT

eMTC:

Frequency Band(s)	Frequency Range		Channel Bandwidth (MHz)
	Transmitting f_{UL} (MHz)	Receiving f_{DL} (MHz)	
Band 2	1850 ~ 1910	1930 ~ 1990	1.4, 3, 5, 10, 15, 20

NB-IOT:

Frequency Band(s)	Frequency Range		Channel Bandwidth (MHz)	Subcarrier Spacing (kHz)
	Transmitting f_{UL} (MHz)	Receiving f_{DL} (MHz)		
Band 2	1850 ~ 1910	1930 ~ 1990	1.4, 3, 5, 10, 15, 20	3.75, 15



List of Frequencies under Test

EMTC:

Operation bands	Mode	Channel Bandwidth (MHz)	Frequencies under Test					
			EARFCN	CH _{Low} (MHz)	EARFCN	CH _{Mid} (MHz)	EARFCN	CH _{High} (MHz)
2	TX	1.4	18607	1850.7	18900	1880	19193	1909.3
		3	18615	1851.5	18900	1880	19185	1908.5
		5	18625	1852.5	18900	1880	19175	1907.5
		10	18650	1855	18900	1880	19150	1905
		15	18675	1857.5	18900	1880	19125	1902.5
		20	18700	1860	18900	1880	19100	1900
	RX	1.4	607	1930.7	900	1960	1193	1989.3
		3	615	1931.5	900	1960	1185	1988.5
		5	625	1932.5	900	1960	1175	1987.5
		10	650	1935	900	1960	1150	1985
		15	675	1937.5	900	1960	1125	1982.5
		20	700	1940	900	1960	1100	1980

NB-IOT:

Operation bands	Mode	Frequencies under Test					
		Uplink			Downlink		
		Range	EARFCN	Frequencies (MHz)	Range	EARFCN	Frequencies (MHz)
2	Standalone	Low	18601	1850.1000	Low	601	1930.1000
		Mid	18900	1880.0000	Mid	900	1960.0000
		High	19199	1909.9000	High	1199	1989.9000



2.2 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Support Equipment							
NO	Description	Brand		Model No.	Serial Number		Supplied by
1	Adapter	Apple		A1443	101290		Lab
Support Cable							
NO	Description	Quantity (Number)	Length (cm)	Detachable (Yes/ No)	Shielded (Yes/ No)	Cores (Number)	Supplied by
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

2.3 TEST CONFIGURATION

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports

The worst case in ERP and radiated emission was found when positioned on X-plane. Following channel(s) was (were) selected for the final test as listed below:

EUT CONFIGURE MODE	DESCRIPTION
A	EUT + Adaptor + EMTC link
B	EUT + Adaptor + NB-IOT link

EMTC:

Frequency Bands	Bandwidths (MHz)						Modulation	
	1.4	3	5	10	15	20	QPSK	16QAM
2	√	√	√	√	√	√	√	√

NB-IOT:

Frequency Bands	Bandwidths (MHz)						Modulation		Subcarrier Spacing (kHz)	
	1.4	3	5	10	15	20	BPSK	QPSK	3.75	15
2	√	√	√	√	√	√	√	√	√	√

Note: This device was tested under all bandwidths, RB configurations and modulations. Only the worst case was shown in test report.



2.4 EUT OPERATING CONDITIONS

The EUT makes a link to the communication simulator. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency

2.5 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC 47 CFR Part 2

FCC 47 CFR Part 24

KDB 971168 D01 Power Meas License Digital Systems v03

ANSI C63.26-2015

NOTE: All test items have been performed and recorded as per the above standards.

3 TEST TYPES AND RESULTS

3.1 OUTPUT POWER MEASUREMENT

3.1.1 LIMITS OF OUTPUT POWER MEASUREMENT

Mobile and portable stations are limited to 2 watts EIRP.

3.1.2 TEST PROCEDURES

EIRP MEASUREMENT:

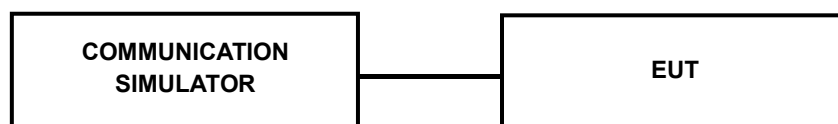
- a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 1MHz for GSM & GPRS, 5MHz for WCDMA mode and 10MHz for LTE mode.
- b. $EIRP = \text{Reading (dBm)} + \text{RF cable loss (dB)} + \text{Antenna Gain (dBi)}$

CONDUCTED POWER MEASUREMENT:

The EUT was set up for the maximum power with GSM, GPRS, EDGE & WCDMA link data modulation and link up with simulator. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

3.1.3 TEST SETUP

EIRP / ERP Measurement / Conducted Power Measurement





3.1.4 TEST RESULTS

EMTC:

Band	Bandwidth h	Modulation	Channel	RB Size	RB Start	NBIndex	Conducted Power(dBm)	EIRP(dB m)	Verdict
Band2	1.4MHz	18607	QPSK	1	0	Low	21.49	18.39	PASS
Band2	1.4MHz	18607	QPSK	1	5	Low	21.42	18.32	PASS
Band2	1.4MHz	18607	QPSK	6	0	Low	19.03	15.93	PASS
Band2	1.4MHz	18900	QPSK	1	0	Low	21.80	18.7	PASS
Band2	1.4MHz	18900	QPSK	1	5	Low	22.19	19.09	PASS
Band2	1.4MHz	18900	QPSK	6	0	Low	19.13	16.03	PASS
Band2	1.4MHz	19193	QPSK	1	0	High	22.11	19.01	PASS
Band2	1.4MHz	19193	QPSK	1	5	High	21.62	18.52	PASS
Band2	1.4MHz	19193	QPSK	6	0	High	19.20	16.1	PASS
Band2	1.4MHz	18607	16QAM	1	0	Low	20.47	17.37	PASS
Band2	1.4MHz	18607	16QAM	1	5	Low	20.18	17.08	PASS
Band2	1.4MHz	18607	16QAM	6	0	Low	19.04	15.94	PASS
Band2	1.4MHz	18900	16QAM	1	0	Low	20.75	17.65	PASS
Band2	1.4MHz	18900	16QAM	1	5	Low	20.33	17.23	PASS
Band2	1.4MHz	18900	16QAM	6	0	Low	19.14	16.04	PASS
Band2	1.4MHz	19193	16QAM	1	0	High	20.73	17.63	PASS
Band2	1.4MHz	19193	16QAM	1	5	High	20.49	17.39	PASS
Band2	1.4MHz	19193	16QAM	6	0	High	19.21	16.11	PASS
Band2	3MHz	18615	QPSK	1	0	Low	21.68	18.58	PASS
Band2	3MHz	18615	QPSK	1	5	Low	21.21	18.11	PASS
Band2	3MHz	18615	QPSK	6	0	Low	19.02	15.92	PASS
Band2	3MHz	18900	QPSK	1	0	Low	21.68	18.58	PASS
Band2	3MHz	18900	QPSK	1	5	Low	21.48	18.38	PASS
Band2	3MHz	18900	QPSK	6	0	Low	19.12	16.02	PASS
Band2	3MHz	19185	QPSK	1	0	High	22.08	18.98	PASS
Band2	3MHz	19185	QPSK	1	5	High	21.50	18.4	PASS
Band2	3MHz	19185	QPSK	6	0	High	19.19	16.09	PASS
Band2	3MHz	18615	16QAM	1	0	Low	20.39	17.29	PASS
Band2	3MHz	18615	16QAM	1	5	Low	20.19	17.09	PASS
Band2	3MHz	18615	16QAM	6	0	Low	19.02	15.92	PASS
Band2	3MHz	18900	16QAM	1	0	Low	20.54	17.44	PASS
Band2	3MHz	18900	16QAM	1	5	Low	20.33	17.23	PASS
Band2	3MHz	18900	16QAM	6	0	Low	19.13	16.03	PASS
Band2	3MHz	19185	16QAM	1	0	High	20.82	17.72	PASS
Band2	3MHz	19185	16QAM	1	5	High	20.48	17.38	PASS
Band2	3MHz	19185	16QAM	6	0	High	19.19	16.09	PASS
Band2	5MHz	18625	QPSK	1	0	Low	21.34	18.24	PASS
Band2	5MHz	18625	QPSK	1	5	Low	21.13	18.03	PASS
Band2	5MHz	18625	QPSK	6	0	Low	20.00	16.9	PASS
Band2	5MHz	18900	QPSK	1	0	Low	21.77	18.67	PASS
Band2	5MHz	18900	QPSK	1	5	Low	21.48	18.38	PASS
Band2	5MHz	18900	QPSK	6	0	Low	20.29	17.19	PASS
Band2	5MHz	19175	QPSK	1	0	High	22.01	18.91	PASS
Band2	5MHz	19175	QPSK	1	5	High	21.25	18.15	PASS
Band2	5MHz	19175	QPSK	6	0	High	19.93	16.83	PASS



Vkan Certification & Testing Co., Ltd.

Test Report No.: FCC2021-0005-4

Page 14 of 29

Band2	5MHz	18625	16QAM	1	0	Low	21.72	18.62	PASS
Band2	5MHz	18625	16QAM	1	5	Low	21.58	18.48	PASS
Band2	5MHz	18625	16QAM	6	0	Low	20.01	16.91	PASS
Band2	5MHz	18900	16QAM	1	0	Low	21.88	18.78	PASS
Band2	5MHz	18900	16QAM	1	5	Low	21.67	18.57	PASS
Band2	5MHz	18900	16QAM	6	0	Low	20.30	17.2	PASS
Band2	5MHz	19175	16QAM	1	0	High	22.32	19.22	PASS
Band2	5MHz	19175	16QAM	1	5	High	21.40	18.3	PASS
Band2	5MHz	19175	16QAM	6	0	High	20.31	17.21	PASS
Band2	10MHz	18650	QPSK	1	0	Low	21.54	18.44	PASS
Band2	10MHz	18650	QPSK	1	5	Low	21.05	17.95	PASS
Band2	10MHz	18650	QPSK	6	0	Low	20.09	16.99	PASS
Band2	10MHz	18900	QPSK	1	0	Low	21.82	18.72	PASS
Band2	10MHz	18900	QPSK	1	5	Low	21.33	18.23	PASS
Band2	10MHz	18900	QPSK	6	0	Low	20.04	16.94	PASS
Band2	10MHz	19150	QPSK	1	0	High	21.94	18.84	PASS
Band2	10MHz	19150	QPSK	1	5	High	21.20	18.1	PASS
Band2	10MHz	19150	QPSK	6	0	High	20.26	17.16	PASS
Band2	10MHz	18650	16QAM	1	0	Low	21.71	18.61	PASS
Band2	10MHz	18650	16QAM	1	5	Low	21.47	18.37	PASS
Band2	10MHz	18650	16QAM	6	0	Low	20.00	16.9	PASS
Band2	10MHz	18900	16QAM	1	0	Low	22.29	19.19	PASS
Band2	10MHz	18900	16QAM	1	5	Low	21.54	18.44	PASS
Band2	10MHz	18900	16QAM	6	0	Low	20.04	16.94	PASS
Band2	10MHz	19150	16QAM	1	0	High	22.22	19.12	PASS
Band2	10MHz	19150	16QAM	1	5	High	21.33	18.23	PASS
Band2	10MHz	19150	16QAM	6	0	High	20.27	17.17	PASS
Band2	15MHz	18675	QPSK	1	0	Low	21.36	18.26	PASS
Band2	15MHz	18675	QPSK	1	5	Low	21.17	18.07	PASS
Band2	15MHz	18675	QPSK	6	0	Low	20.95	17.85	PASS
Band2	15MHz	18900	QPSK	1	0	Low	21.67	18.57	PASS
Band2	15MHz	18900	QPSK	1	5	Low	21.30	18.2	PASS
Band2	15MHz	18900	QPSK	6	0	Low	21.41	18.31	PASS
Band2	15MHz	19125	QPSK	1	0	High	22.12	19.02	PASS
Band2	15MHz	19125	QPSK	1	5	High	21.00	17.9	PASS
Band2	15MHz	19125	QPSK	6	0	High	21.19	18.09	PASS
Band2	15MHz	18675	16QAM	1	0	Low	21.77	18.67	PASS
Band2	15MHz	18675	16QAM	1	5	Low	21.48	18.38	PASS
Band2	15MHz	18675	16QAM	6	0	Low	20.29	17.19	PASS
Band2	15MHz	18900	16QAM	1	0	Low	22.21	19.11	PASS
Band2	15MHz	18900	16QAM	1	5	Low	21.53	18.43	PASS
Band2	15MHz	18900	16QAM	6	0	Low	21.41	18.31	PASS
Band2	15MHz	19125	16QAM	1	0	High	22.82	19.72	PASS
Band2	15MHz	19125	16QAM	1	5	High	21.73	18.63	PASS
Band2	15MHz	19125	16QAM	6	0	High	21.36	18.26	PASS
Band2	20MHz	18700	QPSK	1	0	Low	21.17	18.07	PASS
Band2	20MHz	18700	QPSK	1	5	Low	20.95	17.85	PASS
Band2	20MHz	18700	QPSK	6	0	Low	21.02	17.92	PASS
Band2	20MHz	18900	QPSK	1	0	Low	21.75	18.65	PASS
Band2	20MHz	18900	QPSK	1	5	Low	21.38	18.28	PASS
Band2	20MHz	18900	QPSK	6	0	Low	21.45	18.35	PASS



Vkan Certification & Testing Co., Ltd.

Test Report No.: FCC2021-0005-4

Page 15 of 29

Band2	20MHz	19100	QPSK	1	0	High	22.09	18.99	PASS
Band2	20MHz	19100	QPSK	1	5	High	21.33	18.23	PASS
Band2	20MHz	19100	QPSK	6	0	High	20.67	17.57	PASS
Band2	20MHz	18700	16QAM	1	0	Low	21.54	18.44	PASS
Band2	20MHz	18700	16QAM	1	5	Low	22.00	18.9	PASS
Band2	20MHz	18700	16QAM	6	0	Low	21.02	17.92	PASS
Band2	20MHz	18900	16QAM	1	0	Low	22.23	19.13	PASS
Band2	20MHz	18900	16QAM	1	5	Low	21.94	18.84	PASS
Band2	20MHz	18900	16QAM	6	0	Low	21.44	18.34	PASS
Band2	20MHz	19100	16QAM	1	0	High	22.91	19.81	PASS
Band2	20MHz	19100	16QAM	1	5	High	21.73	18.63	PASS
Band2	20MHz	19100	16QAM	6	0	High	21.34	18.24	PASS

NB-IOT:

Band	OpMode	SCS	Modu	Chann el	Tones	Conduct ed Power (dBm)	EIRP (dBm)	Verdict
Band2	Stand-Alone	3.75kHz	BPSK	18601	1@0	22.78	19.68	PASS
Band2	Stand-Alone	3.75kHz	BPSK	18601	1@47	22.71	19.61	PASS
Band2	Stand-Alone	3.75kHz	BPSK	18876	1@0	22.78	19.68	PASS
Band2	Stand-Alone	3.75kHz	BPSK	18876	1@47	22.76	19.66	PASS
Band2	Stand-Alone	3.75kHz	BPSK	19199	1@0	23.00	19.9	PASS
Band2	Stand-Alone	3.75kHz	BPSK	19199	1@47	22.89	19.79	PASS
Band2	Stand-Alone	3.75kHz	QPSK	18601	1@0	22.55	19.45	PASS
Band2	Stand-Alone	3.75kHz	QPSK	18601	1@47	22.57	19.47	PASS
Band2	Stand-Alone	3.75kHz	QPSK	18876	1@0	22.65	19.55	PASS
Band2	Stand-Alone	3.75kHz	QPSK	18876	1@47	22.60	19.5	PASS
Band2	Stand-Alone	3.75kHz	QPSK	19199	1@0	22.83	19.73	PASS
Band2	Stand-Alone	3.75kHz	QPSK	19199	1@47	22.99	19.89	PASS
Band2	Stand-Alone	15kHz	BPSK	18601	1@0	22.92	19.82	PASS
Band2	Stand-Alone	15kHz	BPSK	18601	1@11	22.55	19.45	PASS
Band2	Stand-Alone	15kHz	BPSK	18601	3@3	22.04	18.94	PASS
Band2	Stand-Alone	15kHz	BPSK	18876	1@0	22.65	19.55	PASS
Band2	Stand-Alone	15kHz	BPSK	18876	1@11	22.56	19.46	PASS
Band2	Stand-Alone	15kHz	BPSK	18876	3@3	22.18	19.08	PASS
Band2	Stand-Alone	15kHz	BPSK	19199	1@0	22.55	19.45	PASS
Band2	Stand-Alone	15kHz	BPSK	19199	1@11	22.61	19.51	PASS
Band2	Stand-Alone	15kHz	BPSK	19199	3@3	22.15	19.05	PASS
Band2	Stand-Alone	15kHz	QPSK	18601	1@0	22.46	19.36	PASS
Band2	Stand-Alone	15kHz	QPSK	18601	1@11	22.38	19.28	PASS
Band2	Stand-Alone	15kHz	QPSK	18601	3@3	22.10	19	PASS
Band2	Stand-Alone	15kHz	QPSK	18876	1@0	22.13	19.03	PASS
Band2	Stand-Alone	15kHz	QPSK	18876	1@11	22.20	19.1	PASS
Band2	Stand-Alone	15kHz	QPSK	18876	3@3	22.21	19.11	PASS
Band2	Stand-Alone	15kHz	QPSK	19199	1@0	22.72	19.62	PASS
Band2	Stand-Alone	15kHz	QPSK	19199	1@11	22.66	19.56	PASS
Band2	Stand-Alone	15kHz	QPSK	19199	3@3	22.18	19.08	PASS

3.2 FREQUENCY STABILITY MEASUREMENT

3.2.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

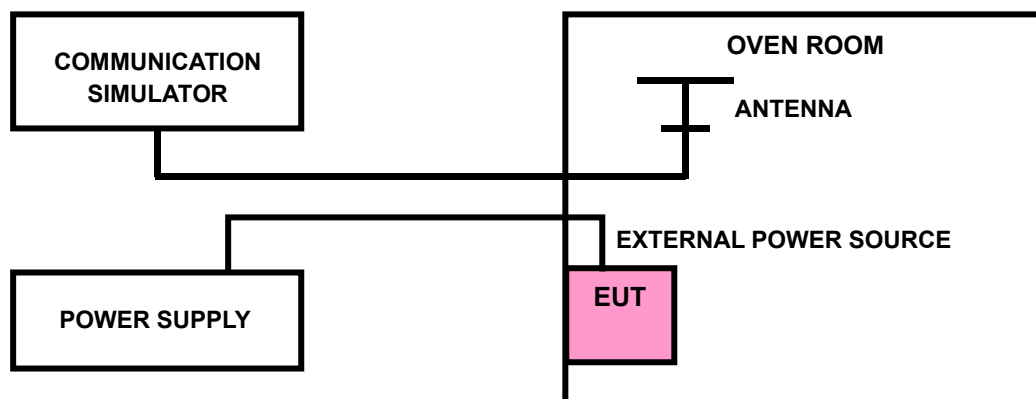
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

3.2.2 TEST PROCEDURE

- Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.
- EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.
- The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the $\pm 0.5^{\circ}\text{C}$ during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

NOTE: The frequency error was recorded frequency error from the communication simulator.

3.2.3 TEST SETUP



3.2.4 TEST RESULTS

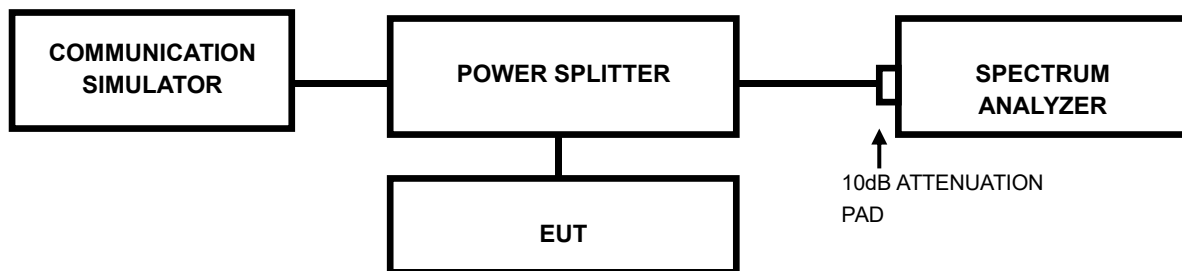
Refer to the report of module.

3.3 OCCUPIED BANDWIDTH MEASUREMENT

3.3.1 TEST PROCEDURES

The EUT makes a call to the communication simulator. All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

3.3.2 TEST SETUP



3.3.3 TEST RESULTS

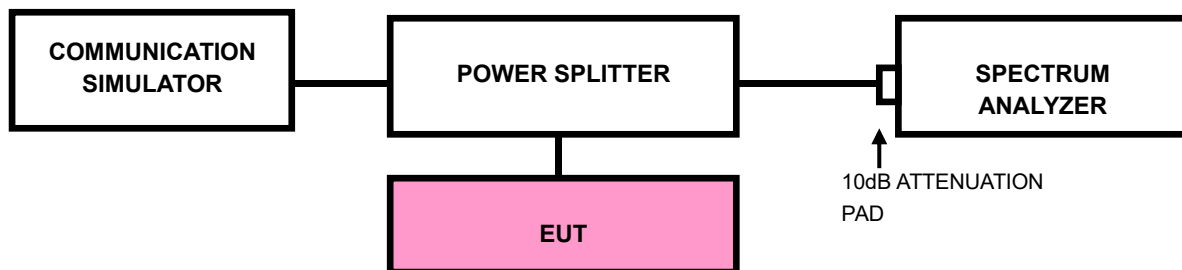
Refer to the report of module.

3.4 BAND EDGE MEASUREMENT

3.4.1 LIMITS OF BAND EDGE MEASUREMENT

Power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB. 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.

3.4.2 TEST SETUP



3.4.3 TEST PROCEDURES

- All measurements were done at low and high operational frequency range.
- The center frequency of spectrum is the band edge frequency and span is 1.5 MHz. RBW of the spectrum is 10kHz and VBW of the spectrum is 30kHz (GSM/GPRS/ EDGE).
- The center frequency of spectrum is the band edge frequency and span is 10MHz. RBW of the spectrum is 100kHz and VBW of the spectrum is 300kHz (WCDMA).
- The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 30kHz and VBW of the spectrum is 100 kHz. (LTE bandwidth 1.4MHz)
- The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 30kHz and VBW of the spectrum is 100kHz. (LTE bandwidth 3MHz)



- f. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 100kHz and VBW of the spectrum is 300kHz. (LTE bandwidth 5MHz)
- g. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 200kHz and VBW of the spectrum is 1MHz. (LTE bandwidth 10MHz)
- h. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 300kHz and VBW of the spectrum is 1MHz. (LTE bandwidth 15MHz)
- i. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 200kHz and VBW of the spectrum is 1MHz. (LTE bandwidth 20MHz)
- j. Record the max trace plot into the test report.

3.4.4. TEST RESULTS

Refer to the report of module.

3.5 CONDUCTED SPURIOUS EMISSIONS

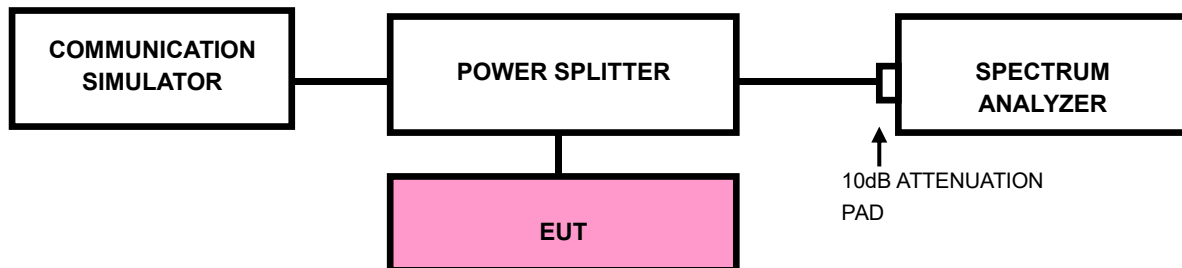
3.5.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB. The emission limit equal to -13dBm .

3.5.2 TEST PROCEDURE

- a. The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.
- b. Measuring frequency range is from 9 kHz to 19.1GHz. 10dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz is used for conducted emission measurement.

3.5.3 TEST SETUP



3.1.1 TEST RESULTS

Refer to the report of module.



3.6 RADIATED EMISSION MEASUREMENT

3.6.1 LIMITS OF RADIATED EMISSION MEASUREMENT

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB. The emission limit equal to -13dBm .

3.6.2 TEST PROCEDURES

- a. Substitution method is used for Radiated Spurious Emissions Measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- b. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value" of step a. Record the power level of S.G
- c. $RSE = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}.$

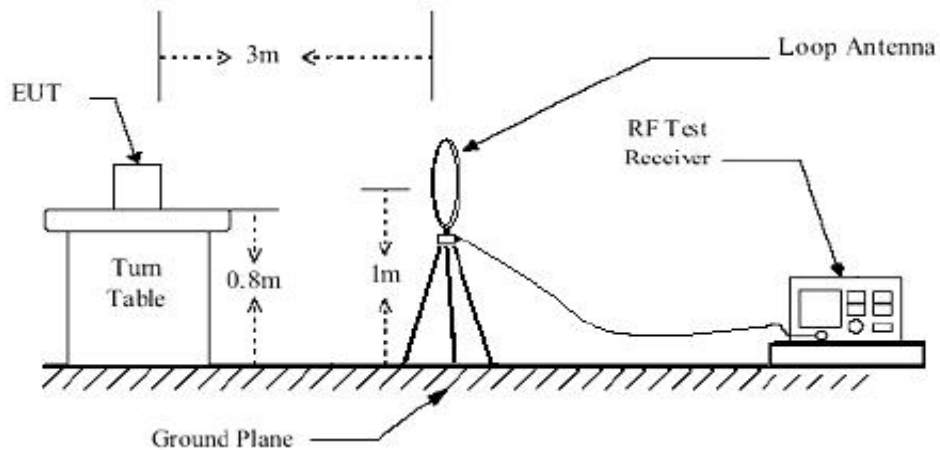
NOTE: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

3.6.3 DEVIATION FROM TEST STANDARD

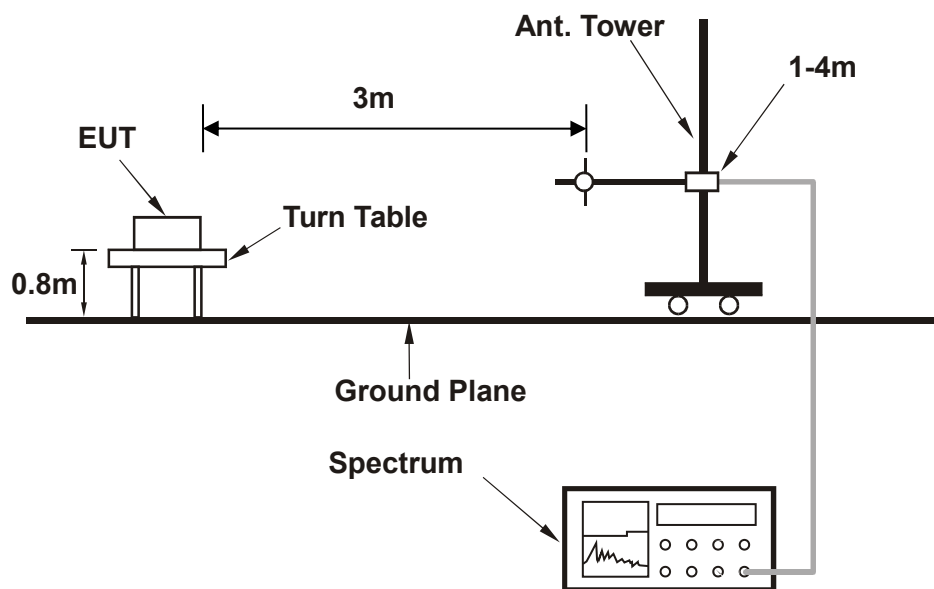
No deviation

3.6.4 TEST SETUP

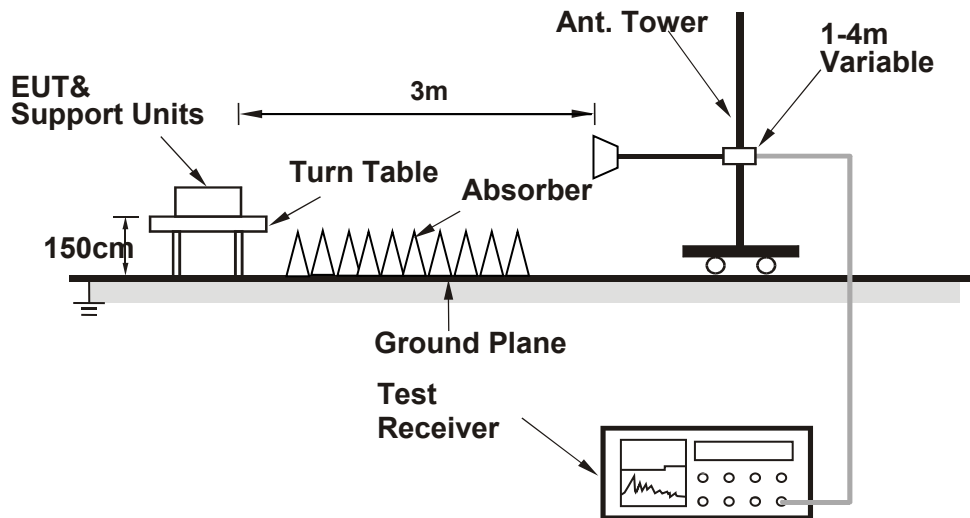
<Below 30MHz>



< Frequency Range 30MHz~1GHz >



< Frequency Range above 1GHz >



For the actual test configuration, please refer to the attached file (Test Setup Photo).



3.6.5 TEST RESULTS

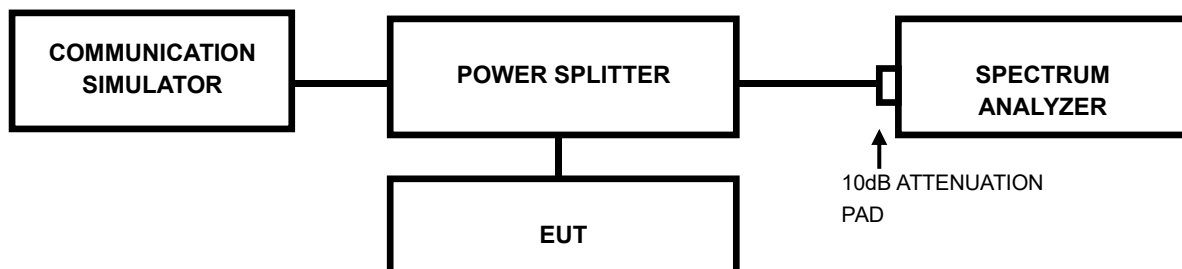
Refer to attached Part 24 radiated emission Test Data.

3.7 PEAK TO AVERAGE RATIO

3.7.1 LIMITS OF peak to average ratio MEASUREMENT

In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB

3.7.2 TEST SETUP



3.7.3 TEST PROCEDURES

1. Set resolution/measurement bandwidth $\geq$ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1%.

3.7.4 TEST RESULTS

Refer to the report of module.



4 PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).



5 MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.



Important

- (1) The test report is valid with the official seal of the laboratory and the signatures of Test engineer, Author and Reviewer simultaneously.
- (2) The test report is invalid if altered.
- (3) Any photocopies or part photocopies in the test report are forbidden without the written permission from the laboratory.
- (4) Objections to the test report must be submitted to the laboratory within 15 days.
- (5) Generally, commission test is responsible for the tested samples only.

Address of the laboratory:

Vkan Certification & Testing Co., Ltd.

Address:

No.3, Tiantaiyi Road, Kaitai Avenue, Science City, Guangzhou, China

Post Code : 510663

Tel : 020-32293888

FAX : 020-32293889

E-mail : office@cvc.org.cn

---END---