



Shenzhen Global Test Service Co.,Ltd.

No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong

FCC TEST REPORT

FCC Part 22H/24E/27

Report Reference No......: **GTS20191018017-1-7**

FCC ID.....: **2AV3I-MP130**

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Date of issue.....: Jun. 01, 2020

Representative Laboratory Name ..: **Shenzhen Global Test Service Co.,Ltd.**

Address.....: No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong

Applicant's name: **Guangzhou Chengzhi Intelligent Machinery Technology Co., Ltd.**

Address: No. 500 Guangshan Road, Tianhe District, Guangzhou City, Guangdong Province, China

Test specification

Standard: **FCC CFR Title 47 Part 2, Part 22H, Part 24E, Part 27**
EIA/TIA 603-D: 2010
KDB 971168 D01

TRF Originator.....: Shenzhen Global Test Service Co.,Ltd..

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Test item description: **digital voice broadcasting system**

Trade Mark



Manufacturer: Guangzhou Chengzhi Intelligent Machinery Technology Co., Ltd.

Model/Type reference.....: MP130

Listed Models: MP140, MP140 LTE, MP130 LTE, MP120, MP120 LTE, MP118, MP118 LTE

Modulation Type.....: QPSK, 16QAM

Rating: Input: 12V $\Rightarrow$ 2.1A

Result.....: **PASS**

TEST REPORT

Test Report No. :	GTS20191018017-1-7	Jun. 01, 2020
		Date of issue

Equipment under Test : digital voice broadcasting system

Model /Type : MP130

Listed model : MP140,MP140 LTE,MP130 LTE,MP120,MP120 LTE,MP118,MP118 LTE

Applicant : **Guangzhou Chengzhi Intelligent Machinery Technology Co., Ltd.**

Address : No. 500 Guangshan Road, Tianhe District, Guangzhou City, Guangdong Province, China

Manufacturer : **Guangzhou Chengzhi Intelligent Machinery Technology Co., Ltd.**

Address : No. 500 Guangshan Road, Tianhe District, Guangzhou City, Guangdong Province, China

Test result	Pass *
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* In the configuration tested, the EUT complied with the standards specified page 4.

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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1 SUMMARY

1.1 TEST STANDARDS

The tests were performed according to following standards:

[FCC Part 22](#) : PUBLIC MOBILE SERVICES

[FCC Part 24](#) : PERSONAL COMMUNICATIONS SERVICES

[FCC Part 27](#) : MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES

[TIA/EIA 603 D June 2010](#):Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.

47 CFR FCC Part 15 Subpart B: - Unintentional Radiators

[FCC Part 2](#): FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS

[KDB971168 D01: v02r02](#) MEASUREMENT GUIDANCE FOR CERTIFICATION OF LICENSED DIGITAL TRANSMITTERS

[ANSI C63.4:2009](#): Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

1.2 Test Description

Test Item	Section in CFR 47	Test Sample	Result
RF Output Power	Part 2.1046 Part 22.913(a) Part 24.232(c) Part 27.50	GTS20191018017-1-1#	Pass
Peak-to-Average Ratio	n/a	GTS20191018017-1-1#	Pass
99% & -26 dB Occupied Bandwidth	Part 2.1049	GTS20191018017-1-1#	Pass
Spurious Emissions at Antenna Terminal	Part 2.1051 Part 22.917 Part 24.238 Part 27.53	GTS20191018017-1-1#	Pass
Field Strength of Spurious Radiation	Part 2.1053 Part 22.917(b) Part 24.238 Part 27.53	GTS20191018017-1-1#	Pass
Out of band emission, Band Edge	Part 2.1051 Part 22.917(b) Part 22.917(b) Part 24.238 Part 27.53	GTS20191018017-1-1#	Pass
Frequency stability	Part 2.1055 Part 22.355 Part 24.235 Part 27.54	GTS20191018017-1-1#	Pass

1.3 Test Facility

1.3.1 Address of the test laboratory

Shenzhen Global Test Service Co.,Ltd.

No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong

1.3.2 Laboratory accreditation

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

CNAS (No. CNAS L8169)

Shenzhen Global Test Service Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2019 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA (Certificate No. 4758.01)

Shenzhen Global Test Service Co., Ltd. has been assessed by the American Association for Laboratory Accreditation (A2LA). Certificate No. 4758.01.

1.4 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen Global Test Service Co.,Ltd.. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen Global Test Service Co.,Ltd. is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	4.10dB	(1)
Radiated Emission	Above 1GHz	4.32dB	(1)
Conducted Disturbance	0.15~30MHz	3.20dB	(1)

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

2 GENERAL INFORMATION

2.1 General Remarks

Date of receipt of test sample	:	Apr. 28, 2020
Testing commenced on	:	Apr. 28, 2020
Testing concluded on	:	Jun. 01, 2020

2.2 Product Description

Product Name	digital voice broadcasting system
Trade Mark	
Model/Type reference	MP130
List Model	MP140,MP140 LTE,MP130 LTE,MP120,MP120 LTE,MP118,MP118 LTE
Model Declaration	PCB board, structure and internal of these model(s) are the same, So no additional models were tested.
Hardware version	V1.0
Software version	V1.0
Power supply:	Input: 12V $\overline{\text{---}}$ 2.1A
Sample ID	GTS20191018017-1-1#
3G	
UMTS Operation Frequency Band	UMTS FDD Band 2, 4, 5
WCDMA Release Version	R6
HSDPA Release Version	Release 6
Modulation Type	QPSK for UMTS
Antenna Description	FPC Antenna; 3.0dBi (max.) For WCDMA Band 2, 4; 0.8dBi (max.) For WCDMA Band 5
LTE	
LTE Operation Frequency Band	LTE Band 2, 4, 5, 7, 12, 17
LTE Release Version	R9
Type Of Modulation	QPSK/16QAM
Antenna Description	FPC Antenna; 3.0dBi (max.) For LTE Band 2, 4, 7; 0.8dBi (max.) For LTE Band 5, 12, 17

2.3 Equipment Under Test

Power supply system utilised

Power supply voltage	:	☐ 230V / 50 Hz	☐ 120V / 60Hz
		☒ 12 V DC	☐ 24 V DC
		☐ Other (specified in blank below)	

2.4 Short description of the Equipment under Test (EUT)

This is a WCDMA+LTE Control and Navigation System. For more details, refer to the user's manual of the EUT.

2.5 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Normal Temperature:	25°C
Relative Humidity:	55 %
Air Pressure:	101 kPa

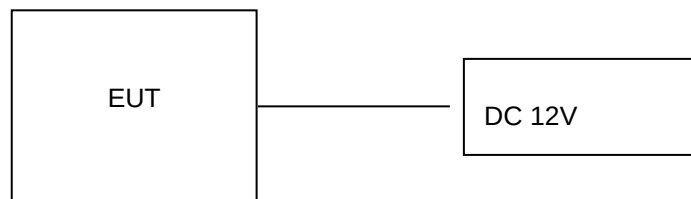
2.6 Description of Test Modes

The EUT has been tested under typical operating condition. The CMW500 used to control the EUT staying in continuous transmitting and receiving mode for testing. Regards to the frequency band operation: the lowest, middle and highest frequency of channel were selected to perform the test, then shown on this report.

Note:

1. For the ERP/EIRP and radiated emission test, every axis (X, Y, Z) was verified, and show the worst result on this report.
2. Test method and refer to 3GPP TS136521.

2.7 Block Diagram of Test Setup



2.8 Special Accessories

Manufacturer	Description	Model	Serial Number	Certificate
/	/	/	/	/

2.9 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is filing to comply with of the FCC Part 22, Part 24, Part 27 Rules.

2.10 Modifications

No modifications were implemented to meet testing criteria.

2.11 Equipments Used during the Test

Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due Date
LISN	R&S	ENV216	3560.6550.08	2019/09/20	2020/09/19
LISN	R&S	ESH2-Z5	893606/008	2019/09/20	2020/09/19
EMI Test Receiver	R&S	ESPI3	101841-cd	2019/09/20	2020/09/19
EMI Test Receiver	R&S	ESCI7	101102	2019/09/20	2020/09/19
Spectrum Analyzer	Agilent	N9020A	MY48010425	2019/09/20	2020/09/19
Spectrum Analyzer	R&S	FSV40	100019	2019/09/20	2020/09/19
Vector Signal generator	Agilent	N5181A	MY49060502	2019/09/20	2020/09/19
Signal generator	Agilent	E4421B	3610AO1069	2019/09/20	2020/09/19
Climate Chamber	ESPEC	EL-10KA	A20120523	2019/09/20	2020/09/19
Controller	EM Electronics	Controller EM 1000	N/A	N/A	N/A
Horn Antenna	Schwarzbeck	BBHA 9120D	01622	2019/09/23	2020/09/22
Active Loop Antenna	Beijing Da Ze Technology Co.,Ltd.	ZN30900C	15006	2019/10/12	2020/10/11
Bilog Antenna	Schwarzbeck	VULB9163	000976	2020/05/25	2021/05/24
Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	791	2019/09/20	2020/09/19
Amplifier	Schwarzbeck	BBV 9743	#202	2019/09/20	2020/09/19
Amplifier	Schwarzbeck	BBV9179	9719-025	2019/09/20	2020/09/19
Amplifier	EMCI	EMC051845B	980355	2019/09/20	2020/09/19
Temperature/Humidity Meter	Gangxing	CTH-608	02	2019/09/20	2020/09/19
High-Pass Filter	K&L	9SH10-2700/X12750-O/O	KL142031	2019/09/20	2020/09/19
High-Pass Filter	K&L	41H10-1375/U12750-O/O	KL142032	2019/09/20	2020/09/19
RF Cable(below 1GHz)	HUBER+SUHNER	RG214	RE01	2019/09/20	2020/09/19
RF Cable(above 1GHz)	HUBER+SUHNER	RG214	RE02	2019/09/20	2020/09/19
Data acquisition card	Agilent	U2531A	TW53323507	2019/09/20	2020/09/19
Power Sensor	Agilent	U2021XA	MY5365004	2019/09/20	2020/09/19
Test Control Unit	Tonscend	JS0806-1	178060067	2019/06/20	2020/06/19
Automated filter bank	Tonscend	JS0806-F	19F8060177	2019/06/20	2020/06/19
Universal Radio Communication	R&S	CMU200	114353	2019/09/20	2020/09/19
Wireless Communication Tester	R&S	CMW500	125408	2019/09/20	2020/09/19
EMI Test Software	Tonscend	JS1120-1	Ver 2.6.8.0518	/	/
EMI Test Software	Tonscend	JS1120-3	Ver 2.5.77.0418	/	/
EMI Test Software	Tonscend	JS32-CE	Ver 2.5	/	/
EMI Test Software	Tonscend	JS32-RE	Ver 2.5.1.8	/	/

3 TEST CONDITIONS AND RESULTS

3.1 Output Power

LIMIT

According to § 22.913(a) specifies " The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts."

The ERP of mobile transmitters must not exceed 7 Watts for LTE Band 5.

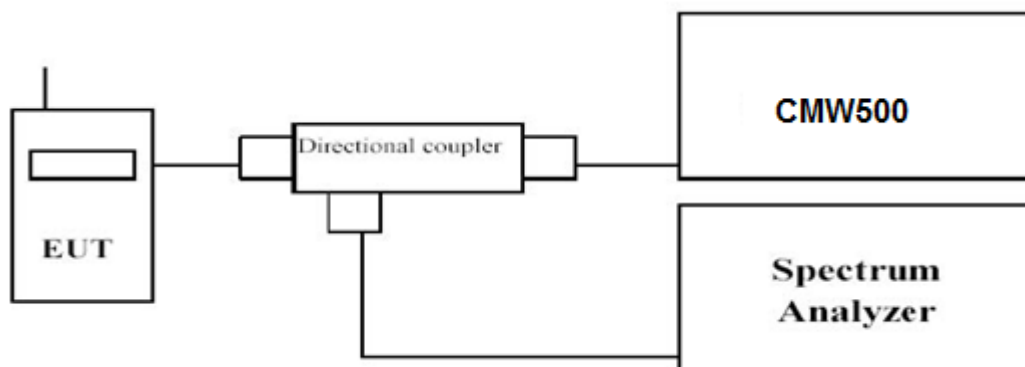
The ERP of mobile transmitters must not exceed 3 Watts for LTE Band 12 and Band 17.

The EIRP of mobile transmitters must not exceed 2 Watts for LTE Band 2 and Band 7.

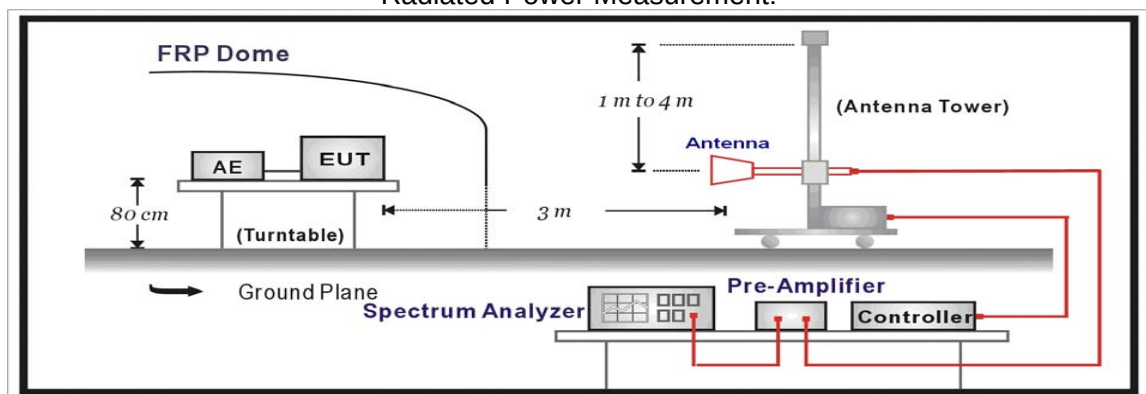
The EIRP of mobile transmitters must not exceed 1 Watts for LTE Band 4 .

TEST CONFIGURATION

Conducted Power Measurement



Radiated Power Measurement:



TEST PROCEDURE

The EUT was setup according to EIA/TIA 603D

Conducted Power Measurement:

- Place the EUT on a bench and set it in transmitting mode.
- Connect a low loss RF cable from the antenna port to a spectrum analyzer and CMW500 by a Directional Couple.
- EUT Communicate with CMW500, then select a channel for testing.
- Add a correction factor to the display of spectrum, and then test.

Radiated Power Measurement:

- The EUT shall be placed at the specified height on a support, and in the position closest to normal use as declared by provider.
- The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter
- The output of the test antenna shall be connected to the measuring receiver.

- d. The transmitter shall be switched on and the measuring receiver shall be tuned to the frequency of the transmitter under test.
- e. The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.
- f. The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
- g. The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.
- h. The maximum signal level detected by the measuring receiver shall be noted.
- i. The transmitter shall be replaced by a substitution antenna.
- j. The substitution antenna shall be orientated for vertical polarization and the length of the substitution antenna shall be adjusted to correspond to the frequency of the transmitter.
- k. The substitution antenna shall be connected to a calibrated signal generator.
- l. If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
- m. The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
- n. The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuator setting of the measuring receiver.
- o. The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.
- p. The measure of the effective radiated power is the larger of the two levels recorded at the input to the substitution antenna, corrected for gain of the substitution antenna if necessary.
- q. Test site anechoic chamber refer to ANSI C63.26.

TEST RESULTS

Temperature	24.5°C	Humidity	53.7%
Test Engineer	Moon Tan	Configurations	WCDMA/LTE

Conducted Measurement:

WCDMA Band II

Mode	3GPP Sub Test	Low Channel	Middle Channel	High Channel
		Ave.Power (dBm)	Ave.Power (dBm)	Ave. Power (dBm)
Rel 99	1	22.01	21.17	21.74
HSDPA	1	21.11	21.84	22.18
	2	22.13	20.71	21.71
	3	21.47	22.03	21.76
	4	21.92	22.38	21.66
HSUPA	1	21.10	21.84	21.63
	2	22.02	21.25	20.96
	3	20.98	21.62	21.12
	4	21.45	22.28	21.13
	5	21.49	21.99	21.48
HSPA+	1	20.73	21.34	22.24

WCDMA Band IV

Mode	3GPP Sub Test	Low Channel	Middle Channel	High Channel
		Ave.Power (dBm)	Ave.Power (dBm)	Ave. Power (dBm)
Rel 99	1	21.35	22.01	21.11
HSDPA	1	22.04	20.99	21.15
	2	22.03	22.60	21.36
	3	21.26	22.39	22.11
	4	22.53	21.05	21.69
HSUPA	1	21.62	20.97	20.91
	2	21.53	21.75	21.70
	3	21.34	22.29	22.64
	4	22.05	21.10	21.19
	5	20.95	21.86	22.70
HSPA+	1	21.66	21.55	22.16

WCDMA Band V

Mode	3GPP Sub Test	Low Channel	Middle Channel	High Channel
		Ave.Power (dBm)	Ave.Power (dBm)	Ave. Power (dBm)
Rel 99	1	22.03	22.44	21.95
HSDPA	1	21.49	22.51	21.30
	2	21.29	22.81	21.15
	3	21.36	21.51	21.16
	4	21.84	21.37	21.52
HSUPA	1	21.78	21.00	21.96
	2	21.62	22.15	21.56
	3	21.55	22.01	21.64
	4	21.11	22.45	21.41
	5	21.94	21.69	20.74
HSPA+	1	22.34	21.53	22.62

LTE FDD Band 2				
TX Channel Bandwidth	RB Size/Offset	Frequency (MHz)	Average Power [dBm]	
			QPSK	16QAM
1.4 MHz	1 RB low	1850.7	21.94	21.44
		1880	20.75	21.79
		1909.3	22.07	22.29
	1 RB high	1850.7	21.43	21.68
		1880	21.99	21.21
		1909.3	22.42	21.98
	50% RB mid	1850.7	21.64	21.51
		1880	21.82	22.31
		1909.3	22.01	21.78
	100% RB	1850.7	20.97	22.40
		1880	21.48	21.03
		1909.3	22.23	21.69
3 MHz	1 RB low	1851.5	21.30	21.96
		1880	22.30	22.06
		1908.5	21.27	22.02
	1 RB high	1851.5	21.22	22.47
		1880	22.55	22.00
		1908.5	21.61	22.08
	50% RB mid	1851.5	21.83	21.37
		1880	21.51	22.26
		1908.5	22.11	21.29
	100% RB	1851.5	21.47	21.44
		1880	21.63	20.57
		1908.5	22.21	22.79
5 MHz	1 RB low	1852.5	21.41	21.84
		1880	22.28	21.34
		1907.5	21.41	21.75
	1 RB high	1852.5	21.47	21.59
		1880	21.38	21.53
		1907.5	22.56	22.27
	50% RB mid	1852.5	21.43	21.11
		1880	21.84	21.68
		1907.5	21.51	22.25
	100% RB	1852.5	22.45	21.97
		1880	20.62	21.51
		1907.5	20.87	20.71
10 MHz	1 RB low	1855	22.25	20.91
		1880	21.48	21.47
		1905	21.40	22.07
	1 RB high	1855	22.05	21.60
		1880	21.25	22.35
		1905	22.23	21.90
	50% RB mid	1855	21.49	21.68
		1880	21.26	21.40
		1905	20.68	21.81
	100% RB	1855	21.37	22.23
		1880	22.25	21.22
		1905	21.16	21.34
15 MHz	1 RB low	1857.5	22.21	21.60
		1880	20.91	22.20
		1902.5	21.80	22.54
	1 RB high	1857.5	21.75	21.67
		1880	21.59	22.29
		1902.5	21.15	21.57
	50% RB mid	1857.5	21.56	21.68
		1880	21.36	21.69
		1902.5	21.46	21.15
	100% RB	1857.5	21.45	21.75
		1880	21.28	21.77

		1902.5	22.14	21.76
20 MHz	1 RB low	1860	22.16	21.92
		1880	21.62	22.51
		1900	21.88	21.52
	1 RB high	1860	21.92	21.92
		1880	22.08	21.50
		1900	21.62	22.31
	50% RB mid	1860	22.16	21.75
		1880	21.95	20.70
		1900	21.18	21.54
	100% RB	1860	22.44	22.13
		1880	22.08	21.59
		1900	21.44	21.95

LTE FDD Band 4				
TX Channel Bandwidth	RB Size/Offset	Frequency (MHz)	Average Power [dBm]	
			QPSK	16QAM
1.4 MHz	1 RB low	1710.7	21.75	20.99
		1732.5	22.46	22.64
		1754.3	21.93	21.88
	1 RB high	1710.7	21.79	21.45
		1732.5	21.82	21.38
		1754.3	21.46	22.04
	50% RB mid	1710.7	21.41	22.24
		1732.5	21.46	21.56
		1754.3	21.52	22.05
	100% RB	1710.7	21.49	21.08
		1732.5	21.83	21.51
		1754.3	20.81	22.39
3 MHz	1 RB low	1711.5	22.17	22.34
		1732.5	22.27	22.28
		1753.5	22.06	21.90
	1 RB high	1711.5	22.01	21.35
		1732.5	21.34	22.21
		1753.5	21.35	22.42
	50% RB mid	1711.5	21.67	21.84
		1732.5	21.49	22.53
		1753.5	22.07	22.46
	100% RB	1711.5	22.02	21.27
		1732.5	20.91	21.80
		1753.5	21.98	21.57
5 MHz	1 RB low	1712.5	21.43	21.94
		1732.5	21.63	21.77
		1752.5	21.87	21.67
	1 RB high	1712.5	21.18	22.32
		1732.5	21.55	20.97
		1752.5	21.77	21.84
	50% RB mid	1712.5	22.40	22.04
		1732.5	21.48	21.40
		1752.5	21.53	21.34
	100% RB	1712.5	22.10	22.12
		1732.5	22.42	22.77
		1752.5	22.24	22.14
10 MHz	1 RB low	1715	22.35	21.76
		1732.5	22.26	22.19
		1750	21.76	22.60
	1 RB high	1715	21.22	21.18
		1732.5	20.94	22.05
		1750	21.75	21.73
	50% RB mid	1715	22.70	21.46
		1732.5	22.80	21.60
		1750	21.05	21.41

	100% RB	1715	22.02	20.89
		1732.5	22.62	21.26
		1750	21.22	20.89
15 MHz	1 RB low	1707.5	21.31	22.42
		1732.5	22.49	21.84
		1747.5	21.79	21.74
	1 RB high	1707.5	21.16	21.65
		1732.5	22.65	22.22
		1747.5	21.08	21.79
	50% RB mid	1707.5	20.83	21.69
		1732.5	21.78	22.47
		1747.5	22.24	21.09
	100% RB	1707.5	21.71	22.60
		1732.5	20.58	22.73
		1747.5	21.00	22.50
20 MHz	1 RB low	1720	22.05	21.28
		1732.5	21.01	21.33
		1745	22.19	21.37
	1 RB high	1720	21.99	21.70
		1732.5	20.92	21.52
		1745	20.57	22.33
	50% RB mid	1720	21.17	22.08
		1732.5	21.73	21.34
		1745	21.94	21.23
	100% RB	1720	21.95	21.96
		1732.5	21.83	21.54
		1745	22.12	21.43

LTE FDD Band 5				
TX Channel Bandwidth	RB Size/Offset	Frequency (MHz)	Average Power [dBm]	
			QPSK	16QAM
1.4 MHz	1 RB low	824.7	21.18	21.35
		836.5	21.65	22.37
		848.3	22.58	21.99
	1 RB high	824.7	22.17	20.99
		836.5	22.10	22.80
		848.3	20.66	21.12
	50% RB mid	824.7	21.90	21.72
		836.5	21.97	22.52
		848.3	22.28	21.59
	100% RB	824.7	21.40	21.75
		836.5	21.97	21.64
		848.3	22.48	21.79
3 MHz	1 RB low	825.5	22.09	21.97
		836.5	21.29	22.14
		847.5	21.72	21.83
	1 RB high	825.5	21.51	21.86
		836.5	21.90	21.99
		847.5	21.10	21.91
	50% RB mid	825.5	22.60	21.27
		836.5	22.21	20.93
		847.5	21.22	21.42
	100% RB	825.5	20.78	21.62
		836.5	22.29	21.17
		847.5	21.40	22.22
5 MHz	1 RB low	826.5	21.12	21.51
		836.5	21.69	22.44
		846.5	21.80	20.69
	1 RB high	826.5	21.71	20.91
		836.5	22.21	21.02

	50% RB mid	846.5	20.81	21.66
		826.5	21.87	22.26
		836.5	21.74	21.93
		846.5	21.62	22.76
	100% RB	826.5	21.44	21.98
		836.5	21.09	22.22
		846.5	21.86	21.36
10 MHz	1 RB low	829	20.87	22.00
		836.5	21.38	20.94
		844	21.90	22.23
	1 RB high	829	22.73	22.02
		836.5	20.79	22.52
		844	21.36	22.13
	50% RB mid	829	21.24	21.72
		836.5	22.22	21.18
		844	21.12	21.45
	100% RB	829	22.21	22.53
		836.5	21.92	21.77
		844	21.11	22.35

LTE FDD Band 7				
TX Channel Bandwidth	RB Size/Offset	Frequency (MHz)	Average Power [dBm]	
			QPSK	16QAM
5 MHz	1 RB low	2502.5	21.55	22.48
		2535	21.86	22.74
		2567.5	22.29	21.27
	1 RB high	2502.5	22.12	22.43
		2535	22.19	21.12
		2567.5	21.70	22.26
	50% RB mid	2502.5	22.17	21.82
		2535	21.53	21.63
		2567.5	21.33	21.09
	100% RB	2502.5	21.83	21.01
		2535	21.20	21.53
		2567.5	20.83	21.36
10 MHz	1 RB low	2505	21.33	22.12
		2535	21.93	22.37
		2565	21.61	20.83
	1 RB high	2505	22.30	21.01
		2535	21.70	21.36
		2565	21.71	21.31
	50% RB mid	2505	21.96	21.27
		2535	22.28	22.22
		2565	22.43	21.82
	100% RB	2505	21.11	22.05
		2535	22.33	21.18
		2565	21.58	21.57
15 MHz	1 RB low	2507.5	22.54	21.79
		2535	21.14	22.61
		2562.5	21.15	21.50
	1 RB high	2507.5	22.05	22.07
		2535	21.35	20.64
		2562.5	21.86	20.76
	50% RB mid	2507.5	21.66	21.97
		2535	21.20	22.11
		2562.5	22.01	20.98
	100% RB	2507.5	21.86	22.05
		2535	21.86	21.03
		2562.5	22.23	21.45
20 MHz	1 RB low	2510	22.09	21.41

		2532.5	22.00	22.14
		2560	21.98	21.58
		2510	21.91	21.35
	1 RB high	2532.5	21.87	20.82
		2560	21.58	21.13
		2510	21.77	21.10
	50% RB mid	2532.5	21.03	21.11
		2560	22.38	21.46
		2510	21.69	20.79
	100% RB	2532.5	21.68	21.71
		2560	22.24	21.57

LTE FDD Band 12				
TX Channel Bandwidth	RB Size/Offset	Frequency (MHz)	Average Power [dBm]	
			QPSK	16QAM
1.4 MHz	1 RB low	699.7	21.61	21.62
		707.5	20.79	21.37
		715.3	21.53	21.42
	1 RB high	699.7	21.66	22.66
		707.5	20.78	21.72
		715.3	21.98	22.37
	50% RB mid	699.7	22.20	20.84
		707.5	21.04	22.03
		715.3	20.57	21.67
	100% RB	699.7	22.08	21.60
		707.5	21.87	22.15
		715.3	22.35	21.56
3 MHz	1 RB low	700.5	21.76	21.96
		707.5	20.89	21.82
		715.3	21.28	21.99
	1 RB high	700.5	21.40	21.68
		707.5	22.76	21.45
		715.3	21.97	22.41
	50% RB mid	700.5	22.60	22.17
		707.5	20.65	21.16
		715.3	22.13	22.61
	100% RB	700.5	22.16	21.98
		707.5	22.55	21.58
		715.3	21.05	21.55
5 MHz	1 RB low	701.5	22.09	21.90
		707.5	22.17	22.29
		713.5	21.06	21.46
	1 RB high	701.5	21.20	22.47
		707.5	21.00	22.70
		713.5	21.96	22.12
	50% RB mid	701.5	20.77	21.00
		707.5	21.23	21.02
		713.5	22.10	22.54
	100% RB	701.5	21.56	21.39
		707.5	21.73	21.80
		713.5	21.19	21.63
10 MHz	1 RB low	704	21.76	22.01
		707.5	22.12	21.59
		711	21.74	21.96
	1 RB high	704	20.95	21.33
		707.5	22.22	21.59
		711	21.28	20.90
	50% RB mid	704	22.03	21.54
		707.5	22.70	22.06

	100% RB	711	21.81	21.86
		704	21.64	21.34
		707.5	22.15	22.63
		711	21.41	20.90

LTE FDD Band 17				
TX Channel Bandwidth	RB Size/Offset	Frequency (MHz)	Average Power [dBm]	
			QPSK	16QAM
5 MHz	1 RB low	706.5	21.76	21.77
		710	21.45	21.91
		713.5	21.49	21.22
	1 RB high	706.5	21.18	21.49
		710	21.18	21.66
		713.5	22.07	21.10
	50% RB mid	706.5	22.16	21.68
		710	21.32	21.96
		713.5	20.78	21.36
	100% RB	706.5	22.48	22.05
		710	22.10	21.31
		713.5	22.45	22.23
10 MHz	1 RB low	709	21.09	22.00
		710	21.49	22.01
		711	22.37	22.07
	1 RB high	709	20.80	22.54
		710	21.03	21.01
		711	21.52	20.63
	50% RB mid	709	22.46	21.60
		710	21.17	22.54
		711	21.95	21.01
	100% RB	709	21.10	21.99
		710	20.75	21.56
		711	22.21	21.99

Radiated Measurement:

Remark:

1. We were tested all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of LTE FDD Band 5; recorded worst case for each Channel Bandwidth of LTE FDD Band 5.
2. ERP = EIRP – 2.15dBi as EIRP by subtracting the gain of the dipole.

nnelFrequ ency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss(dB)			
WCDMA Band II Middle Channel								
1880.00	H	81.37	8.17	11.66	2.66	17.17	33	15.83
1880.00	V	85.49	12.29	11.66	2.66	21.29	33	11.71
WCDMA Band IV Middle Channel								
1732.60	H	82.71	8.41	10.9	2.51	16.8	30	13.2
1732.60	V	87.59	13.29	10.9	2.51	21.68	30	8.32
WCDMA Band V Middle Channel								
836.60	H	81.71	20.78	0	0.97	19.81	38.45	18.64
836.60	V	94.34	22.56	0	0.97	21.59	38.45	16.86

LTE Band 2

Frequency (MHz)	BW (MHz)	Modulation	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
					Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
1880.000	1.4	QPSK	H	87.7	15.1	11.66	2.66	24.1	33	8.9
1880.000			V	81.67	11.2	11.66	2.66	20.2	33	12.8
1880.000	3		H	87.35	14.75	11.66	2.66	23.75	33	9.25
1880.000			V	81.77	11.3	11.66	2.66	20.3	33	12.7
1880.000	5		H	88.26	15.66	11.66	2.66	24.66	33	8.34
1880.000			V	82.47	12	11.66	2.66	21	33	12
1880.000	10		H	87.57	14.97	11.66	2.66	23.97	33	9.03
1880.000			V	82.08	11.61	11.66	2.66	20.61	33	12.39
1880.000	15		H	87.47	14.87	11.66	2.66	23.87	33	9.13
1880.000			V	81.82	11.35	11.66	2.66	20.35	33	12.65
1880.000	20		H	87.7	15.1	11.66	2.66	24.1	33	8.9
1880.000			V	81.67	11.2	11.66	2.66	20.2	33	12.8
1880.000	1.4	16QAM	H	87.68	15.08	11.66	2.66	24.08	33	8.92
1880.000			V	81.9	11.43	11.66	2.66	20.43	33	12.57
1880.000	3		H	87.37	14.77	11.66	2.66	23.77	33	9.23
1880.000			V	82.57	12.1	11.66	2.66	21.1	33	11.9
1880.000	5		H	88.4	15.8	11.66	2.66	24.8	33	8.2
1880.000			V	81.93	11.46	11.66	2.66	20.46	33	12.54
1880.000	10		H	88.01	15.41	11.66	2.66	24.41	33	8.59
1880.000			V	82.02	11.55	11.66	2.66	20.55	33	12.45
1880.000	15		H	87.78	15.18	11.66	2.66	24.18	33	8.82
1880.000			V	82.05	11.58	11.66	2.66	20.58	33	12.42
1880.000	20		H	87.68	15.08	11.66	2.66	24.08	33	8.92
1880.000			V	81.9	11.43	11.66	2.66	20.43	33	12.57

LTE Band 4

Frequency (MHz)	BW (MHz)	Modulation	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
					Substituted L evel (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
1732.500	1.4	QPSK	H	89.31	16.71	10.9	2.51	25.1	30	4.9
1732.500			V	82.2	11.73	10.9	2.51	20.12	30	9.88
1732.500	3		H	87.92	15.32	10.9	2.51	23.71	30	6.29
1732.500			V	81.31	10.84	10.9	2.51	19.23	30	10.77
1732.500	5		H	87.79	15.19	10.9	2.51	23.58	30	6.42
1732.500			V	82.39	11.92	10.9	2.51	20.31	30	9.69
1732.500	10		H	87.56	14.96	10.9	2.51	23.35	30	6.65
1732.500			V	82.76	12.29	10.9	2.51	20.68	30	9.32
1732.500	15		H	88.42	15.82	10.9	2.51	24.21	30	5.79
1732.500			V	81.94	11.47	10.9	2.51	19.86	30	10.14
1732.500	20		H	88.24	15.64	10.9	2.51	24.03	30	5.97
1732.500			V	82.47	12.00	10.9	2.51	20.39	30	9.61
1732.500	1.4	16QAM	H	88.29	15.69	10.9	2.51	24.08	30	5.92
1732.500			V	81.97	11.5	10.9	2.51	19.89	30	10.11
1732.500	3		H	88.68	16.08	10.9	2.51	24.47	30	5.53
1732.500			V	81.45	10.98	10.9	2.51	19.37	30	10.63
1732.500	5		H	87.89	15.29	10.9	2.51	23.68	30	6.32
1732.500			V	82.54	12.07	10.9	2.51	20.46	30	9.54
1732.500	10		H	88.13	15.53	10.9	2.51	23.92	30	6.08
1732.500			V	83.16	12.69	10.9	2.51	21.08	30	8.92
1732.500	15		H	88.3	15.7	10.9	2.51	24.09	30	5.91
1732.500			V	81.96	11.49	10.9	2.51	19.88	30	10.12
1732.500	20		H	88.6	16	10.9	2.51	24.39	30	5.61
1732.500			V	82.1	11.63	10.9	2.51	20.02	30	9.98

LTE Band 5

Frequency (MHz)	BW (MHz)	Modulation	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
					Substituted Level (dBm)	Antenna G ain (dBd/dBi)	Cable Loss (dB)			
836.50	1.4	QPSK	H	79.46	18.53	0	0.97	17.56	38.45	20.89
836.50			V	92.58	20.8	0	0.97	19.83	38.45	18.62
836.50	3		H	80.26	19.33	0	0.97	18.36	38.45	20.09
836.50			V	92.96	21.18	0	0.97	20.21	38.45	18.24
836.50	5		H	80.16	19.23	0	0.97	18.26	38.45	20.19
836.50			V	92.07	20.29	0	0.97	19.32	38.45	19.13
836.50	10		H	80.3	19.37	0	0.97	18.4	38.45	20.05
836.50			V	90.75	18.97	0	0.97	18	38.45	20.45
836.50	1.4	16QAM	H	79.31	18.38	0	0.97	17.41	38.45	21.04
836.50			V	89.38	17.6	0	0.97	16.63	38.45	21.82
836.50	3		H	80.24	19.31	0	0.97	18.34	38.45	20.11
836.50			V	91.47	19.69	0	0.97	18.72	38.45	19.73
836.50	5		H	80.14	19.21	0	0.97	18.24	38.45	20.21
836.50			V	91.56	19.78	0	0.97	18.81	38.45	19.64
836.50	10		H	80.36	19.43	0	0.97	18.46	38.45	19.99
836.50			V	91.39	19.61	0	0.97	18.64	38.45	19.81

LTE Band 7

Frequency (MHz)	BW (MHz)	Modulation	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
					Substituted Level (dBm)	Antenna G ain (dBd/d Bi)	Cable Loss (dB)			
2535.00	5	QPSK	H	88.72	16.12	13.14	3.1	26.16	33	6.84
2535.00			V	81.16	10.69	13.14	3.1	20.73	33	12.27
2535.00	10		H	88.28	15.68	13.14	3.1	25.72	33	7.28
2535.00			V	81.13	10.66	13.14	3.1	20.7	33	12.3
2535.00	15		H	88.74	16.14	13.14	3.1	26.18	33	6.82
2535.00			V	81.23	10.76	13.14	3.1	20.8	33	12.2
2535.00	20		H	88	15.4	13.14	3.1	25.44	33	7.56
2535.00			V	80.99	10.52	13.14	3.1	20.56	33	12.44
2535.00	5	16QAM	H	88.12	15.52	13.14	3.1	25.56	33	7.44
2535.00			V	82.08	11.61	13.14	3.1	21.65	33	11.35
2535.00	10		H	87.28	14.68	13.14	3.1	24.72	33	8.28
2535.00			V	82.9	12.43	13.14	3.1	22.47	33	10.53
2535.00	15		H	87.62	15.02	13.14	3.1	25.06	33	7.94
2535.00			V	81.25	10.78	13.14	3.1	20.82	33	12.18
2535.00	20		H	88.26	15.66	13.14	3.1	25.7	33	7.3
2535.00			V	80.85	10.38	13.14	3.1	20.42	33	12.58

LTE Band 12

Frequency (MHz)	BW (MHz)	Modulation	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
					Substituted Level (dBm)	Antenna G ain (dBd/d Bi)	Cable Loss (dB)			
707.50	1.4	QPSK	H	79.97	19.04	0	0.94	18.1	34.77	16.67
707.50			V	92.33	20.55	0	0.94	19.61	34.77	15.16
707.50	3		H	79.5	18.57	0	0.94	17.63	34.77	17.14
707.50			V	91.8	20.02	0	0.94	19.08	34.77	15.69
707.50	5		H	80.39	19.46	0	0.94	18.52	34.77	16.25
707.50			V	92.55	20.77	0	0.94	19.83	34.77	14.94
707.50	10		H	79.66	18.73	0	0.94	17.79	34.77	16.98
707.50			V	90.26	18.48	0	0.94	17.54	34.77	17.23
707.50	1.4	16QAM	H	80.56	19.63	0	0.94	18.69	34.77	16.08
707.50			V	92.25	20.47	0	0.94	19.53	34.77	15.24
707.50	3		H	79.5	18.57	0	0.94	17.63	34.77	17.14
707.50			V	89.92	18.14	0	0.94	17.2	34.77	17.57
707.50	5		H	79.92	18.99	0	0.94	18.05	34.77	16.72
707.50			V	90.1	18.32	0	0.94	17.38	34.77	17.39
707.50	10		H	79.78	18.85	0	0.94	17.91	34.77	16.86
707.50			V	89.41	17.63	0	0.94	16.69	34.77	18.08

LTE Band 17

Frequency (MHz)	BW (MHz)	Modulation	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
					Substituted Level (dBm)	Antenna G ain (dBd/d Bi)	Cable Loss (dB)			
710.00	5	QPSK	H	79.8	18.87	0	0.94	17.93	34.77	16.84
710.00			V	91.61	19.83	0	0.94	18.89	34.77	15.88
710.00	10		H	79.64	18.71	0	0.94	17.77	34.77	17
710.00			V	92.11	20.33	0	0.94	19.39	34.77	15.38
710.00	5	16QAM	H	79.49	18.56	0	0.94	17.62	34.77	17.15
710.00			V	91.61	19.83	0	0.94	18.89	34.77	15.88
710.00	10		H	79.68	18.75	0	0.94	17.81	34.77	16.96
710.00			V	92.55	20.77	0	0.94	19.83	34.77	14.94

Note:

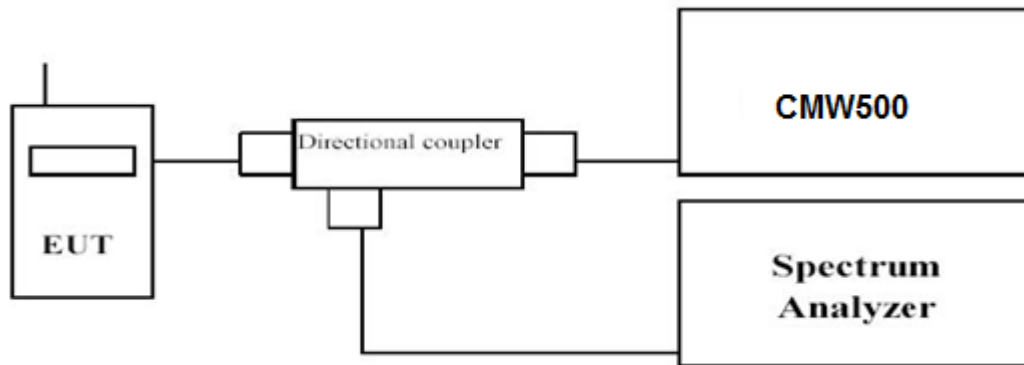
- (1) The unit of Antenna Gain is dBd for frequency below 1GHz, and the unit of Antenna Gain is dBi for frequency above 1GHz.
- (2) Absolute Level = Substituted Level - Cable loss + Antenna Gain
- (3) Margin = Limit-Absolute Level

3.2 Peak-to-Average Ratio (PAR)

LIMIT

The Peak-to-Average Ratio (PAR) of the transmission may not exceed 13 dB.

TEST CONFIGURATION



TEST PROCEDURE

1. Refer to instrument's analyzer instruction manual for details on how to use the power statistics/CCDF function;
2. Set resolution/measurement bandwidth $\geq$ signal's occupied bandwidth;
3. Set the number of counts to a value that stabilizes the measured CCDF curve;
4. Set the measurement interval as follows:
 - 1). for continuous transmissions, set to 1 ms,
 - 2). for burst transmissions, employ an external trigger that is synchronized with the EUT burst timing sequence, or use the internal burst trigger with a trigger level that allows the burst to stabilize and set the measurement interval to a time that is less than or equal to the burst duration.
5. Record the maximum PAPR level associated with a probability of 0.1%.

TEST RESULTS

Temperature	24.5°C	Humidity	53.7%
Test Engineer	Moon Tan	Configurations	WCDMA/LTE

Remark:

We were tested all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of WCDMA Band II , WCDMA Band IV ,WCDMA Band V , LTE FDD Band 2, LTE FDD Band 4, LTE FDD Band 5, LTE FDD Band 7, LTE FDD Band 12, LTE FDD Band 17; recorded worst case for each Channel Bandwidth of WCDMA Band II , WCDMA Band IV ,WCDMA Band V ,LTE FDD Band 2, LTE FDD Band 4, LTE FDD Band 5, LTE FDD Band 7, LTE FDD Band 12, LTE FDD Band 17.

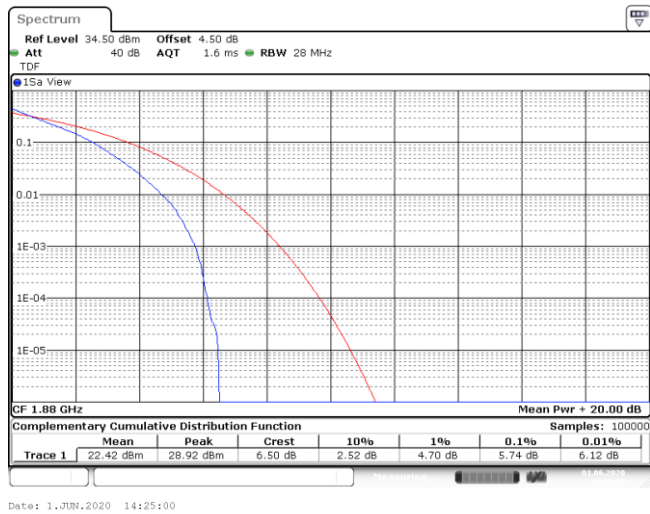
1. For E-UTRA Band 2, please refer to Appendix Band 2: Section A;
2. For E-UTRA Band 4, please refer to Appendix Band 4: Section A;
3. For E-UTRA Band 5, please refer to Appendix Band 5: Section A;
4. For E-UTRA Band 7, please refer to Appendix Band 7: Section A;
5. For E-UTRA Band 12, please refer to Appendix Band 12: Section A;
6. For E-UTRA Band 17, please refer to Appendix Band 17: Section A;

WCDMA :

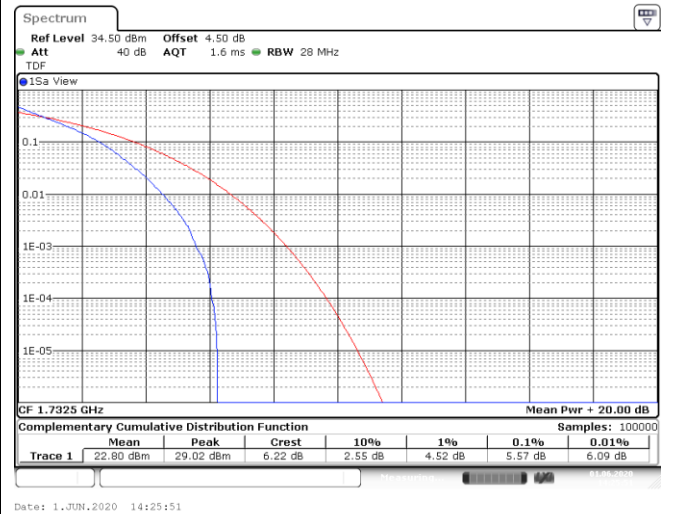
Test Mode	Channel	Frequency (MHz)	PAPR Value (dB)	Limits (dB)	Verdict
UMTS/TM1/ WCDMA Band II	9400	1880	5.74	13.0	PASS
UMTS/TM1/ WCDMA Band IV	8662	1732.6	5.57	13.0	PASS
UMTS/TM1/ WCDMA Band V	4183	836.6	5.77	13.0	PASS

Peak-to-Average Ratio (PAR)

UMTS/TM1/ WCDMA Band II



UMTS/TM1/ WCDMA Band IV

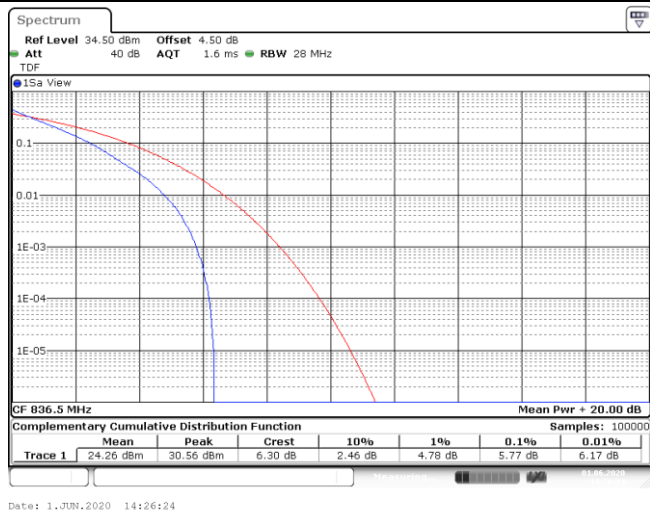


Channel 9400 / 1880 MHz

Channel 8662 / 1732.6 MHz

Peak-to-Average Ratio (PAR)

UMTS/TM1/ WCDMA Band V



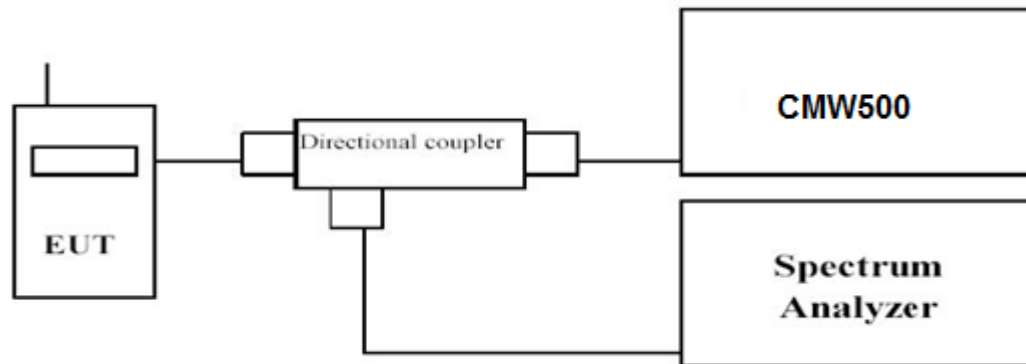
Channel 4183 / 836.6 MHz

3.3 Occupied Bandwidth and Emission Bandwidth

LIMIT

FCC §2.1049, §22.917, §22.905, §24.238, §27.53 and §90.209

TEST CONFIGURATION



TEST PROCEDURE

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at low, middle and high channel in each band. The -26dBc Emission bandwidth was also measured and recorded.

Set RBW was set to about 1% of emission BW, VBW≥3 times RBW.

-26dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace.

TEST RESULTS

Temperature	24.5°C	Humidity	53.7%
Test Engineer	Moon Tan	Configurations	WCDMA/LTE

Remark:

We were tested all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of WCDMA Band II , WCDMA Band IV ,WCDMA Band V ,LTE FDD Band 2, LTE FDD Band 4, LTE FDD Band 5, LTE FDD Band 7, LTE FDD Band 12, LTE FDD Band 17; recorded worst case for each Channel Bandwidth of WCDMA Band II , WCDMA Band IV ,WCDMA Band V ,LTE FDD Band 2, LTE FDD Band 4, LTE FDD Band 5, LTE FDD Band 7, LTE FDD Band 12, LTE FDD Band 17.

1. For E-UTRA Band 2, please refer to Appendix Band 2: Section B;
2. For E-UTRA Band 4, please refer to Appendix Band 4: Section B;
3. For E-UTRA Band 5, please refer to Appendix Band 5: Section B;
4. For E-UTRA Band 7, please refer to Appendix Band 7: Section B;
5. For E-UTRA Band 12, please refer to Appendix Band 12: Section B;
6. For E-UTRA Band 17, please refer to Appendix Band 17: Section B.

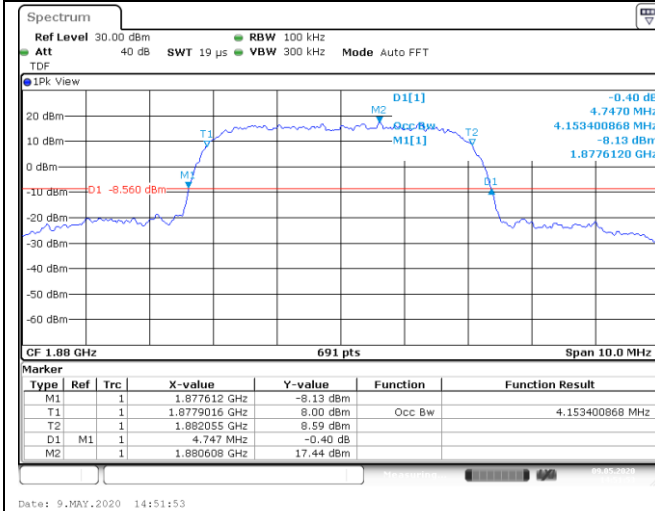
Test Mode	Channel	Frequency (MHz)	Occupied Bandwidth (99% BW) (MHz)	Emission Bandwidth (-26 dBc BW) (MHz)	Verdict
UMTS/TM1/ WCDMA Band II	9400	1880.00	4.15	4.747	PASS
UMTS/TM1/ WCDMA Band IV	8662	836.40	4.15	4.747	PASS
UMTS/TM1/ WCDMA Band V	4182	836.40	4.15	4.747	PASS

Remark:

1. Test results including cable loss;
2. Please refer to following plots;

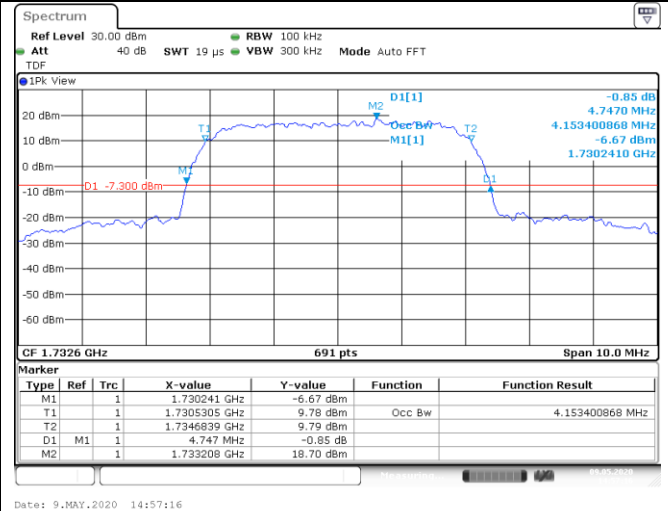
Occupied Bandwidth and Emission Bandwidth

UMTS/TM1/ WCDMA Band II



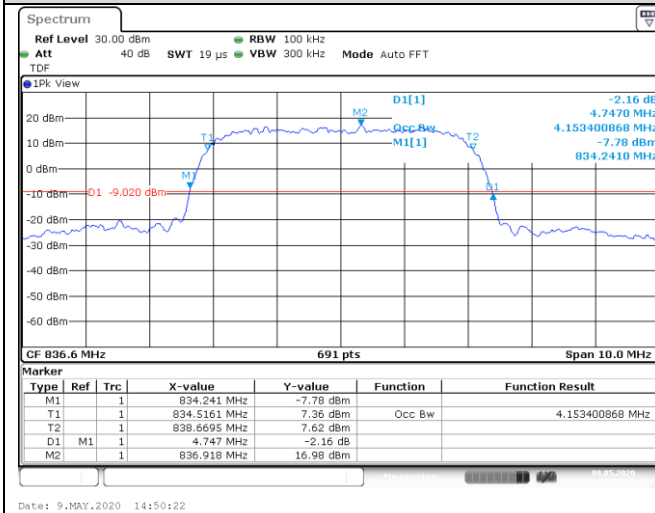
Channel 9400 / 1880.0 MHz

UMTS/TM1/ WCDMA Band IV



Channel 8662/ 1732.6 MHz

UMTS/TM1/ WCDMA Band V



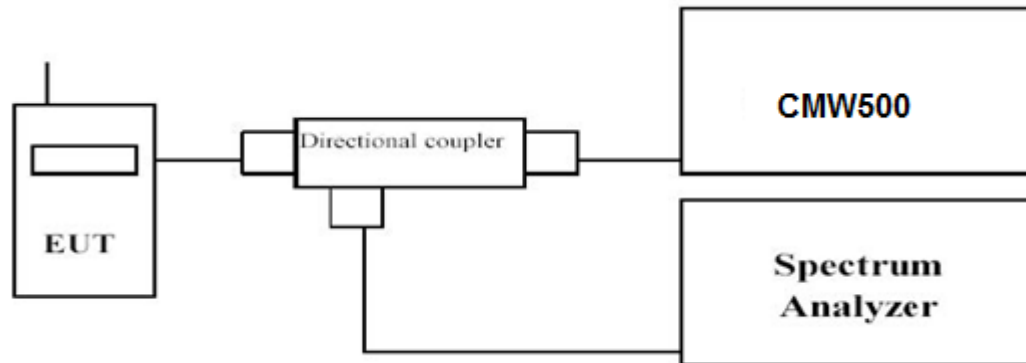
Channel 4183 / 836.6 MHz

3.4 Band Edge compliance

LIMIT

FCC § 2.1053, §22.917, § 24.238 and § 27.53& §90.691.

TEST CONFIGURATION



TEST PROCEDURE

1. The transmitter output port was connected to base station.
2. The RF output of EUT was connected to the power meter by RF cable and attenuator, the path loss was compensated to the results for each measurement.
3. Set EUT at maximum power through base station.
4. Select lowest and highest channels for each band and different modulation.
5. Measure Band edge using RMS (Average) detector by spectrum

TEST RESULTS

Temperature	24.5°C	Humidity	53.7%
Test Engineer	Moon Tan	Configurations	WCDMA/LTE

Remark:

We were tested all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of WCDMA Band II , WCDMA Band IV ,WCDMA Band V ,LTE FDD Band 2, LTE FDD Band 4, LTE FDD Band 5, LTE FDD Band 7, LTE FDD Band 12, LTE FDD Band 17; recorded worst case for each Channel Bandwidth of WCDMA Band II , WCDMA Band IV ,WCDMA Band V ,LTE FDD Band 2, LTE FDD Band 4, LTE FDD Band 5, LTE FDD Band 7, LTE FDD Band 12, LTE FDD Band 17.

1. For E-UTRA Band 2, please refer to Appendix Band 2: Section C;
2. For E-UTRA Band 4, please refer to Appendix Band 4: Section C;
3. For E-UTRA Band 5, please refer to Appendix Band 5: Section C;
4. For E-UTRA Band 7, please refer to Appendix Band 7: Section C;
5. For E-UTRA Band 12, please refer to Appendix Band 12: Section C;
6. For E-UTRA Band 17, please refer to Appendix Band 17: Section C;

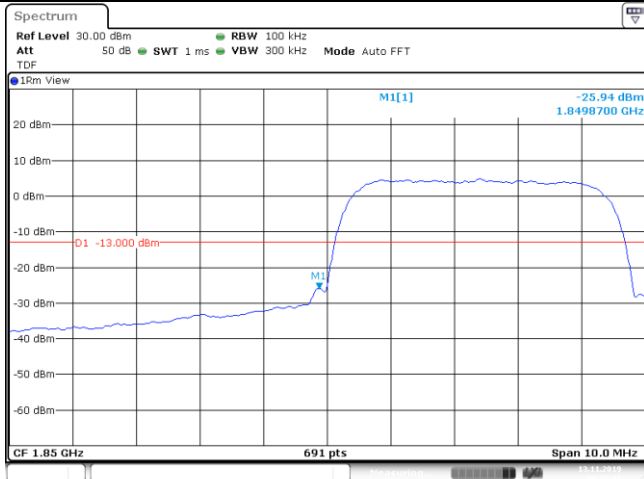
Test Mode	Channel	Frequency (MHz)	Band Edg Compliance (dBm)	Limits (dBm)	Verdict
UMTS/TM1/WCDMA Band II	9262	1852.40	<-13dBm	-13dBm	PASS
	9538	1907.60	<-13dBm	-13dBm	
UMTS/TM1/WCDMA Band IV	8562	1712.4	<-13dBm	-13dBm	PASS
	8763	1752.6	<-13dBm	-13dBm	
UMTS/TM1/WCDMA Band V	4132	826.40	<-13dBm	-13dBm	PASS
	4233	846.60	<-13dBm	-13dBm	

Remark:

1. Test results including cable loss;
2. Please refer to following plots;

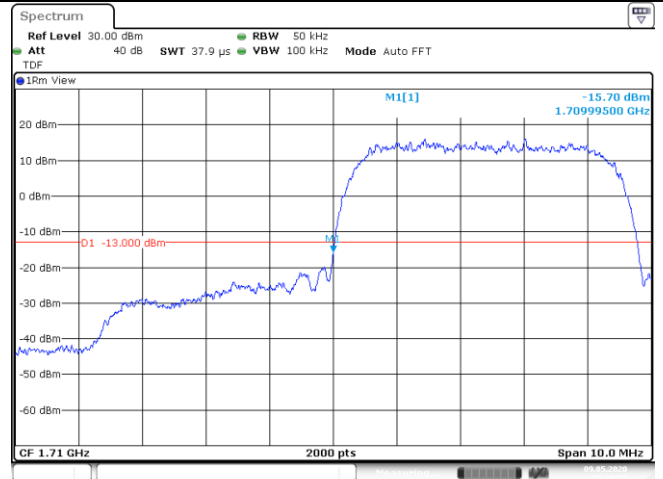
Band-edge Compliance

UMTS/TM1/WCDMA Band II



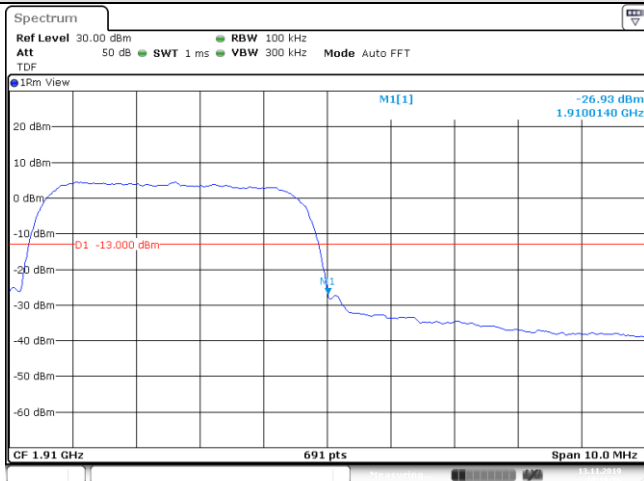
Date: 13.NOV.2019 10:16:40

UMTS/TM1/WCDMA Band IV



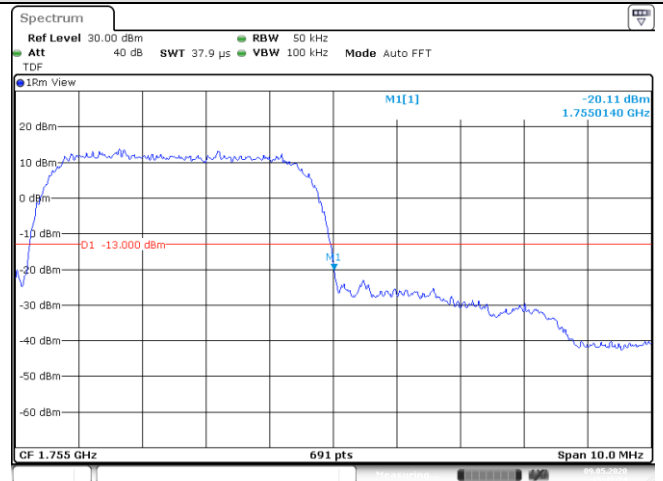
Date: 9.MAY.2020 15:39:29

Channel 9262 / 1852.4 MHz



Date: 13.NOV.2019 10:19:16

Channel 8562 / 1712.4 MHz



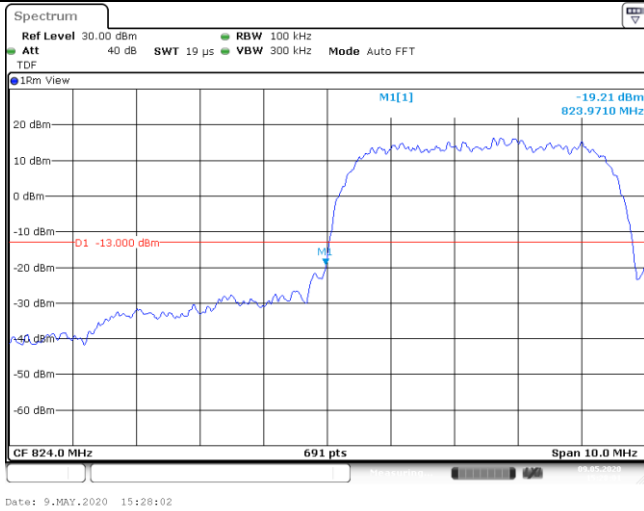
Date: 9.MAY.2020 15:42:23

Channel 9538 / 1907.6 MHz

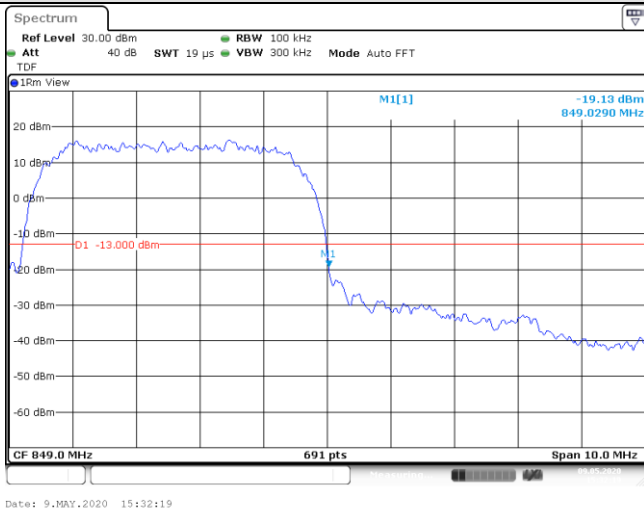
Channel 8763 / 1752.6 MHz

Band-edge Compliance

UMTS/TM1/WCDMA Band V



Channel 4132 / 826.4 MHz



Channel 4233 / 846.6 MHz

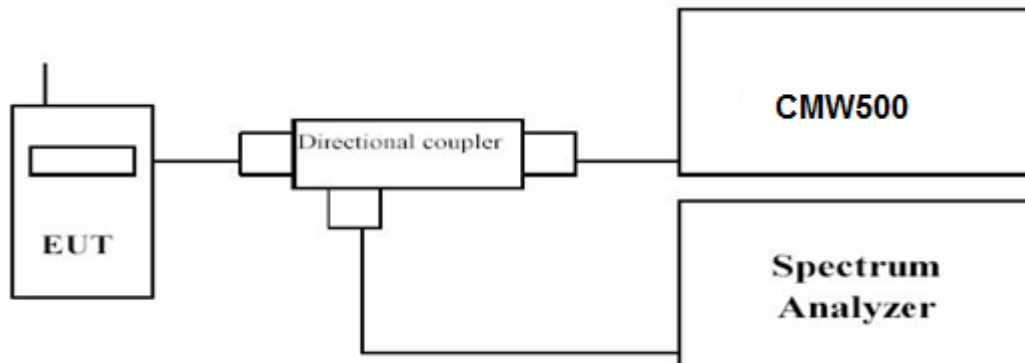
3.5 Spurious Emission

LIMIT

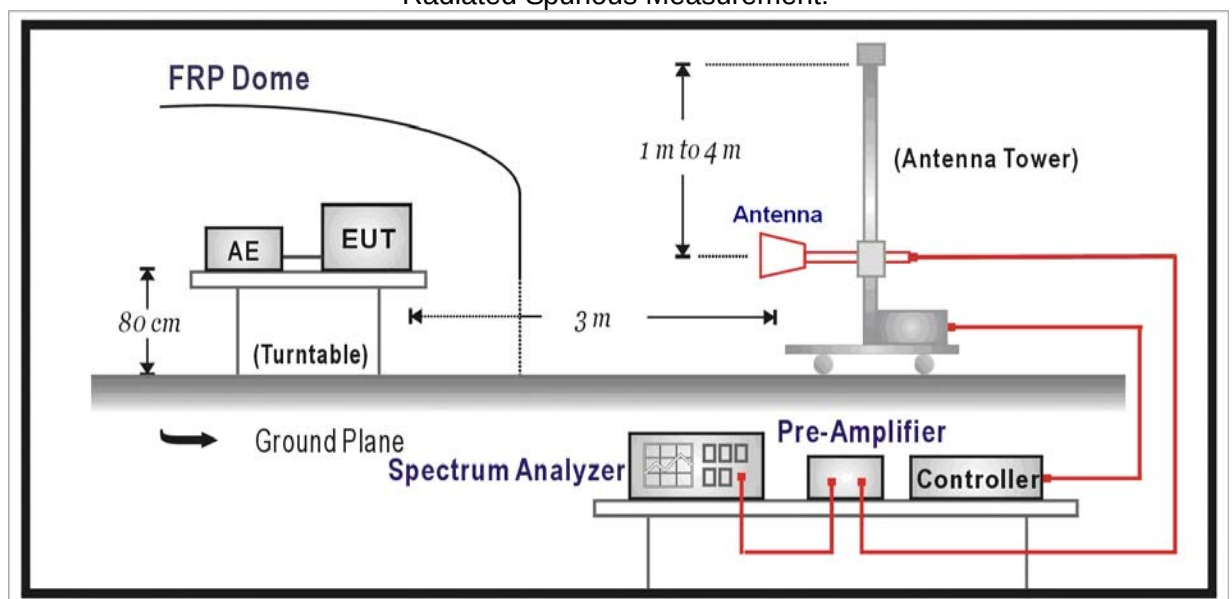
FCC § 2.1053, §22.917, § 24.238 and § 27.53&§90.691.

TEST CONFIGURATION

Conducted Spurious Measurement:



Radiated Spurious Measurement:



TEST PROCEDURE

The EUT was setup according to EIA/TIA 603D

Conducted Spurious Measurement:

- Place the EUT on a bench and set it in transmitting mode.
- Connect a low loss RF cable from the antenna port to a spectrum analyzer and CMW500 by a Directional Coupler.
- EUT Communicate with CMW500, then select a channel for testing.
- Add a correction factor to the display of spectrum, and then test.
- The resolution bandwidth of the spectrum analyzer was set sufficient scans were taken to show the out of band Emission if any up to 10th harmonic.
- Please refer to following tables for test antenna conducted emissions.

Test Mode	Channel	Frequency (MHz)	Spurious RF Conducted Emission (dBm)	Limits (dBm)	Verdict
UMTS/TM1/WCDMA Band II	9400	1880.00	<-13dBm	-13dBm	PASS
UMTS/TM1/WCDMA Band IV	8662	836.40	<-13dBm	-13dBm	PASS
UMTS/TM1/WCDMA Band V	4183	836.60	<-13dBm	-13dBm	PASS

Working Frequency	Sub range (GHz)	RBW	VBW	Sweep time (s)
LTE FDD Band 2	0.000009~0.000015	1KHz	3KHz	Auto
	0.000015~0.03	10KHz	30KHz	Auto
	0.03~26	1 MHz	3 MHz	Auto
LTE FDD Band 4	0.000009~0.000015	1KHz	3KHz	Auto
	0.000015~0.03	10KHz	30KHz	Auto
	0.03~26	1 MHz	3 MHz	Auto
LTE FDD Band 5	0.000009~0.000015	1KHz	3KHz	Auto
	0.000015~0.03	10KHz	30KHz	Auto
	0.03~26	1 MHz	3 MHz	Auto
LTE FDD Band 7	0.000009~0.000015	1KHz	3KHz	Auto
	0.000015~0.03	10KHz	30KHz	Auto
	0.03~26	1 MHz	3 MHz	Auto
LTE FDD Band 12	0.000009~0.000015	1KHz	3KHz	Auto
	0.000015~0.03	10KHz	30KHz	Auto
	0.03~26	1 MHz	3 MHz	Auto
LTE FDD Band 17	0.000009~0.000015	1KHz	3KHz	Auto
	0.000015~0.03	10KHz	30KHz	Auto
	0.03~26	1 MHz	3 MHz	Auto

Remark:

1. Test results including cable loss;
2. Please refer to following plots;
3. Not reorded test plots from 9 KHz to 30 MHz as emission levels 20dB lower than emission limit;

Radiated Spurious Measurement:

- a. The EUT shall be placed at the specified height on a support, and in the position closest to normal use as declared by provider.
- b. The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter
- c. The output of the test antenna shall be connected to the measuring receiver.
- d. The transmitter shall be switched on and the measuring receiver shall be tuned to the frequency of the transmitter under test.
- e. The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.
- f. The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
- g. The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.
- h. The maximum signal level detected by the measuring receiver shall be noted.
- i. The transmitter shall be replaced by a substitution antenna.
- j. The substitution antenna shall be orientated for vertical polarization and the length of the substitution antenna shall be adjusted to correspond to the frequency of the transmitter.
- k. The substitution antenna shall be connected to a calibrated signal generator.
- l. If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
- m. The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
- n. The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuator setting of the measuring receiver.

- o. The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.
- p. The measure of the effective radiated power is the larger of the two levels recorded at the input to the substitution antenna, corrected for gain of the substitution antenna if necessary.
- q. The resolution bandwidth of the spectrum analyzer was set at 100 kHz for Part 22 and 1MHz for Part 24. The frequency range was checked up to 10th harmonic.
- r. Test site anechoic chamber refer to ANSI C63.

TEST RESULTS

Temperature	24.5°C	Humidity	53.7%
Test Engineer	Moon Tan	Configurations	WCDMA/LTE

Conducted Measurement:

Remark:

We were tested all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of WCDMA Band II , WCDMA Band IV , WCDMA Band V , LTE FDD Band 2, LTE FDD Band 4, LTE FDD Band 5, LTE FDD Band 7, LTE FDD Band 12, LTE FDD Band 17; recorded worst case for each Channel Bandwidth of WCDMA Band II , WCDMA Band IV , WCDMA Band V , LTE FDD Band 2, LTE FDD Band 4, LTE FDD Band 5, LTE FDD Band 7, LTE FDD Band 12, LTE FDD Band 17.

- For E-UTRA Band 2, please refer to Appendix Band 2: Section D;
- For E-UTRA Band 4, please refer to Appendix Band 4: Section D;
- For E-UTRA Band 5, please refer to Appendix Band 5: Section D;
- For E-UTRA Band 7, please refer to Appendix Band 7: Section D;
- For E-UTRA Band 12, please refer to Appendix Band 12: Section D;
- For E-UTRA Band 17, please refer to Appendix Band 17: Section D;

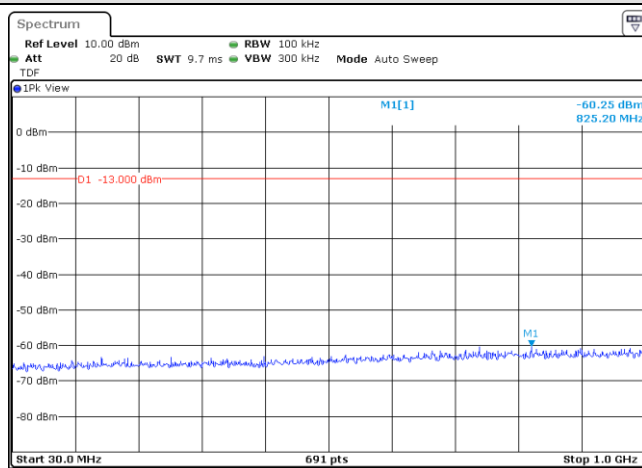
WCDMA:

Test Mode	Channel	Frequency (MHz)	Spurious RF Conducted Emission (dBm)	Limits (dBm)	Verdict
UMTS/TM1/WCDMA Band II	9400	1880.00	<-13dBm	-13dBm	PASS
UMTS/TM1/WCDMA Band IV	8662	836.40	<-13dBm	-13dBm	PASS
UMTS/TM1/WCDMA Band V	4183	836.60	<-13dBm	-13dBm	PASS

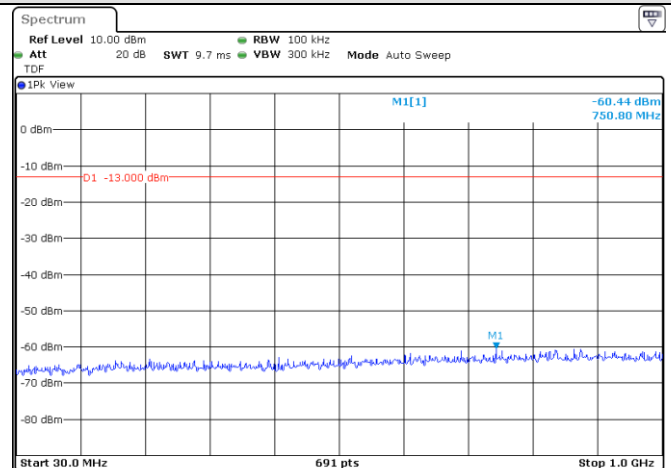
Remark:

- Test results including cable loss;
- Please refer to following plots;

Spurious Emission on Antenna Port

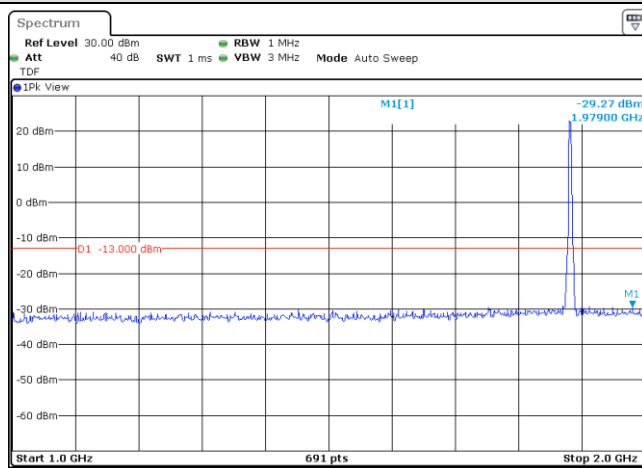
UMTS/TM1/WCDMA Band II
Channel 9400 / 1880 MHz

Date: 9.MAY.2020 15:12:29

UMTS/TM1/WCDMA Band IV
Channel 8662 / 1732.6 MHz

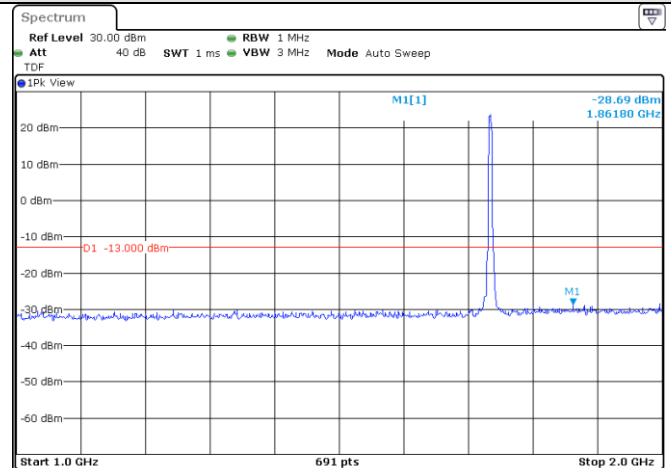
Date: 9.MAY.2020 15:04:33

30 MHz – 1000 MHz



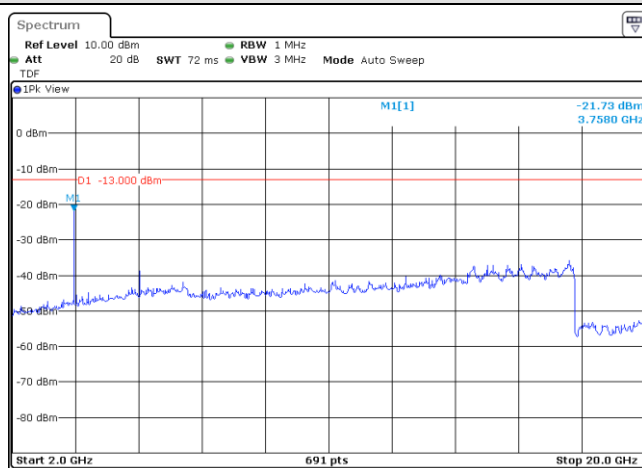
Date: 9.MAY.2020 15:11:30

30 MHz – 1000 MHz



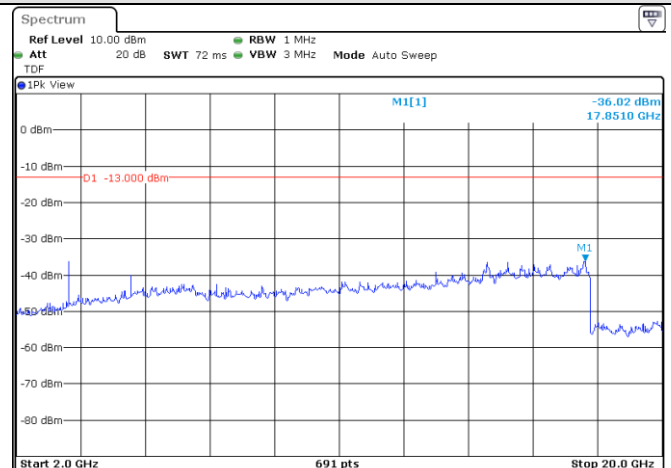
Date: 9.MAY.2020 15:07:17

1 GHz – 2 GHz



Date: 9.MAY.2020 15:10:33

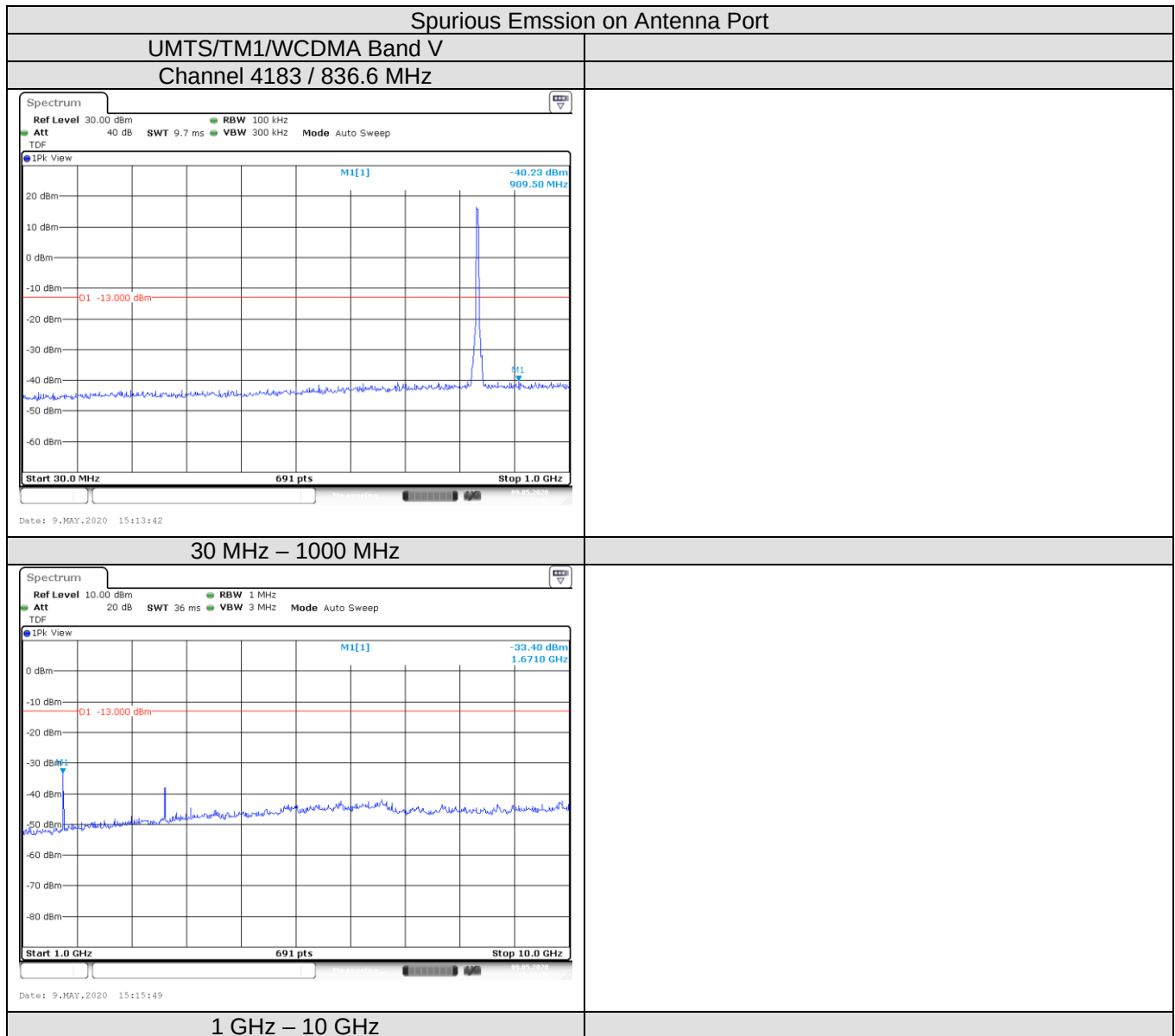
1 GHz – 2 GHz



Date: 9.MAY.2020 15:08:47

2 GHz – 20 GHz

2 GHz – 20 GHz



Radiated Measurement:

30-10G:

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/d Bi)	Cable Loss (dB)			
WCDMA Band V R99,Frequency:836.600 MHz								
1673.200	H	44.28	-62.72	10.6	0.73	-52.85	-13	39.85
1673.200	V	43.86	-61.14	10.6	0.73	-51.27	-13	38.27
2509.800	H	48.11	-64.89	13.1	1.25	-53.04	-13	40.04
2509.800	V	45.97	-67.03	13.1	1.25	-55.18	-13	42.18
3346.400	H	42.71	-67.29	13.8	1.61	-55.1	-13	42.1
3346.400	V	44.61	-65.39	13.8	1.61	-53.2	-13	40.2
355.000	H	45.77	-61.73	0	0.55	-62.28	-13	49.28
355.000	V	46.49	-61.01	0	0.55	-61.56	-13	48.56

30-20G:

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/ dBi)	Cable Loss (dB)			
WCDMA Band II, R99, Frequency:1880.000 MHz								
3760	H	45.94	-61.06	13.8	1.63	-48.89	-13	35.89
3760	V	53.48	-51.52	13.8	1.63	-39.35	-13	26.35
5640	H	49.22	-63.78	14	1.31	-51.09	-13	38.09
5640	V	45.8	-67.2	14	1.31	-54.51	-13	41.51
293.86	H	46.32	-61.18	0	0.56	-61.74	-13	48.74
293.86	V	44.29	-63.21	0	0.56	-63.77	-13	50.77
WCDMA Band IV, R99, Frequency: 1732.600 MHz								
3465	H	44.41	-62.59	13.9	1.62	-50.31	-13	37.31
3465	V	55.27	-49.73	13.9	1.62	-37.45	-13	24.45
5197.5	H	48.54	-64.46	14	1.52	-51.98	-13	38.98
5197.5	V	46.95	-66.05	14	1.52	-53.57	-13	40.57
302.47	H	48.24	-59.26	0	0.56	-59.82	-13	46.82
302.47	V	44.98	-62.52	0	0.56	-63.08	-13	50.08

LTE Band 2 (30MHz-20GHz):

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/ dBi)	Cable Loss (dB)			
QPSK,Frequency:1880.000 MHz								
3760	H	45.9	-61.1	13.8	1.63	-48.93	-13	35.93
3760	V	55.19	-49.81	13.8	1.63	-37.64	-13	24.64
5640	H	48.36	-64.64	14	1.31	-51.95	-13	38.95
5640	V	45.35	-67.65	14	1.31	-54.96	-13	41.96
300.56	H	45.89	-61.61	0	0.56	-62.17	-13	49.17
300.56	V	44.3	-63.2	0	0.56	-63.76	-13	50.76

LTE Band 4 (30MHz-20GHz):

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/ dBi)	Cable Loss (dB)			
QPSK,Frequency:1732.500 MHz								
3465	H	45.97	-61.03	13.9	1.62	-48.75	-13	35.75
3465	V	54.41	-50.59	13.9	1.62	-38.31	-13	25.31
5197.5	H	46.87	-66.13	14	1.52	-53.65	-13	40.65
5197.5	V	44.78	-68.22	14	1.52	-55.74	-13	42.74
299.34	H	48.31	-59.19	0	0.56	-59.75	-13	46.75
299.34	V	45.19	-62.31	0	0.56	-62.87	-13	49.87

LTE Band 5 (30MHz-10GHz):

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/ dBi)	Cable Loss (dB)			
QPSK,Frequency: 836.500 MHz								
1673.2	H	43.66	-63.34	10.6	0.73	-53.47	-13	40.47
1673.2	V	44.53	-60.47	10.6	0.73	-50.6	-13	37.6
2509.8	H	47.47	-65.53	13.1	1.25	-53.68	-13	40.68
2509.8	V	45.1	-67.9	13.1	1.25	-56.05	-13	43.05
3346.4	H	44.25	-65.75	13.8	1.61	-53.56	-13	40.56
3346.4	V	44.74	-65.26	13.8	1.61	-53.07	-13	40.07
289	H	46.52	-60.98	0	0.55	-61.53	-13	48.53
289	V	44.36	-63.14	0	0.55	-63.69	-13	50.69

LTE Band 7 (30MHz-26.5GHz):

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/ dBi)	Cable Loss (dB)			
QPSK,Frequency:2535.000 MHz								
5070	H	50.9	-57.1	13.93	1.34	-44.51	-25	19.51
5070	V	48.36	-57.64	13.93	1.34	-45.05	-25	20.05
7605	H	51.79	-60.21	13.21	1.4	-48.4	-25	23.4
7605	V	52.4	-59.6	13.21	1.4	-47.79	-25	22.79
411	H	47.41	-60.09	0	0.65	-60.74	-25	35.74
411	V	45.89	-61.61	0	0.65	-62.26	-25	37.26

LTE Band 12 (30MHz-10GHz):

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/ dBi)	Cable Loss (dB)			
QPSK,Frequency:707.500 MHz								
1415	H	43.91	-63.09	9.08	1.22	-55.23	-13	42.23
1415	V	45.6	-59.4	9.08	1.22	-51.54	-13	38.54
2122.5	H	48.24	-64.76	11.27	1.11	-54.6	-13	41.6
2122.5	V	45.63	-67.37	11.27	1.11	-57.21	-13	44.21
2830	H	42.29	-67.71	13.34	1.36	-55.73	-13	42.73
2830	V	46.72	-63.28	13.34	1.36	-51.3	-13	38.3
305	H	48.56	-58.94	0	0.36	-59.3	-13	46.3
305	V	44.94	-62.56	0	0.35	-62.91	-13	49.91

LTE Band 17 (30MHz-10GHz)

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/ dBi)	Cable Loss (dB)			
QPSK,Frequency:710.000 MHz								
1420	H	45.56	-61.44	9.1	1.23	-53.57	-13	40.57
1420	V	45.02	-59.98	9.1	1.23	-52.11	-13	39.11
2130	H	48.24	-64.76	11.22	1.11	-54.65	-13	41.65
2130	V	46.15	-66.85	11.22	1.11	-56.74	-13	43.74
2840	H	43.78	-66.22	13.42	1.36	-54.16	-13	41.16
2840	V	46.51	-63.49	13.42	1.36	-51.43	-13	38.43
466	H	45.92	-61.58	0	0.62	-62.2	-13	49.2
466	V	44.1	-63.4	0	0.62	-64.02	-13	51.02

Note:

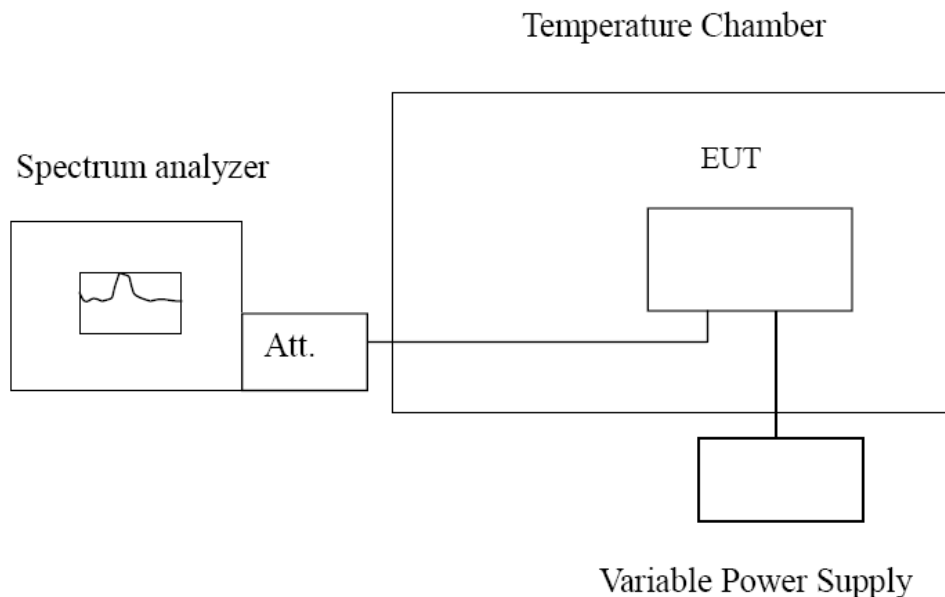
- 1) The unit of Antenna Gain is dBd for frequency below 1GHz, and the unit of Antenna Gain is dBi for frequency above 1GHz.
- 2) Absolute Level = Substituted Level - Cable loss + Antenna Gain
- 3) Margin = Limit-Absolute Level

3.6 Frequency Stability under Temperature & Voltage Variations

LIMIT

FCC § 2.1055 (a), § 2.1055 (d), §22.355, §24.235, §27.54 & §90.213

TEST CONFIGURATION



TEST PROCEDURE

The EUT was setup according to EIA/TIA 603D

Frequency Stability Under Temperature Variations:

In order to measure the carrier frequency under the condition of AFC lock, it is necessary to make measurements with the EUT in a "call mode". This is accomplished with the use of R&S CMW500 DIGITAL RADIO COMMUNICATION TESTER.

1. Measure the carrier frequency at room temperature.
2. Subject the EUT to overnight soak at -30°C.
3. With the EUT, powered via nominal voltage, connected to the CMW500 and in a simulated call on middle channel for LTE band 5, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
4. Repeat the above measurements at 10°C increments from -30°C to +50°C. Allow at least 1.5 hours at each temperature, unpowered, before making measurements.
5. Re-measure carrier frequency at room temperature with nominal voltage. Vary supply voltage from minimum voltage to maximum voltage, in 0.1V increments re-measuring carrier frequency at each voltage. Pause at nominal voltage for 1.5 hours unpowered, to allow any self-heating to stabilize, before continuing.
6. Subject the EUT to overnight soak at +50°C.
7. With the EUT, powered via nominal voltage, connected to the CMW500 and in a simulated call on the centre channel, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
8. Repeat the above measurements at 10 °C increments from +50°C to -30°C. Allow at least 1.5 hours at each temperature, unpowered, before making measurements
9. At all temperature levels hold the temperature to +/- 0.5°C during the measurement procedure.

Frequency Stability Under Voltage Variations:

Set chamber temperature to 20°C. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.

Reduce the input voltage to specify extreme voltage variation (±15%) and endpoint, record the maximum frequency change.

TEST RESULTS

Temperature	24.5°C	Humidity	53.7%
Test Engineer	Moon Tan	Configurations	WCDMA/LTE

WCDMA Band II: R99

Middle Channel, fc = 1880.0 MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Results
°C	VDC	Hz	ppm	
-30	12	-9	-0.004787	Pass
-20		2	0.001064	
-10		10	0.005319	
0		3	0.001596	
10		1	0.000532	
20		-6	-0.003191	
30		-14	-0.007447	
40		10	0.005319	
50		5	0.002660	
20	10.2	-8	-0.004255	
20	13.8	-1	-0.000532	

WCDMA Band IV: R99

Middle Channel, fc = 1732.5 MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Results
°C	VDC	Hz	ppm	
-30	12	7	0.004040	Pass
-20		12	0.006926	
-10		6	0.003463	
0		9	0.005195	
10		-1	-0.000577	
20		5	0.002886	
30		-1	-0.000577	
40		-2	-0.001154	
50		-1	-0.000577	
20	10.2	-8	-0.004618	
20	13.8	2	0.001154	

WCDMA Band V: R99

Middle Channel, fc = 836.6 MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
°C	VDC	Hz	ppm	ppm
-30	12	2	0.002391	2.5
-20		19	0.022714	
-10		4	0.004782	
0		8	0.009564	
10		-3	-0.003586	
20		0	0.000000	
30		2	0.002391	
40		-8	-0.009564	
50		-7	-0.008368	
25	10.2	9	0.010759	
25	13.8	0	0.000000	

LTE Band 2:

QPSK, Channel Bandwidth:10MHz Middle Channel, fc = 1880 MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Results
°C	VDC	Hz	ppm	
-30	12	13.10	0.006968	Pass
-20		-6.86	-0.003649	
-10		-3.76	-0.002000	
0		8.71	0.004633	
10		-6.37	-0.003388	
20		7.33	0.003899	
30		14.51	0.007718	
40		-1.74	-0.000926	
50		-18.38	-0.009777	
20	10.2	2.03	0.001080	
20	13.8	0.60	0.000319	

16QAM, Channel Bandwidth:10MHz Middle Channel, fc =1880 MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Results
°C	VDC	Hz	ppm	
-30	12	-5.43	-0.002888	Pass
-20		4.16	0.002213	
-10		-5.88	-0.003128	
0		-1.65	-0.000878	
10		0.25	0.000133	
20		-8.88	-0.004723	
30		-9.85	-0.005239	
40		-11.46	-0.006096	
50		-1.84	-0.000979	
20	10.2	-5.48	-0.002915	
20	13.8	9.00	0.004787	

LTE Band 4:

QPSK, Channel Bandwidth:10MHz Middle Channel, fc = 1732.5 MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
°C	VDC	Hz	ppm	
-30	12	16.64	0.009605	Pass
-20		2.79	0.001610	
-10		-10.99	-0.006343	
0		-14.86	-0.008577	
10		-2.51	-0.001449	
20		-5.80	-0.003348	
30		-1.13	-0.000652	
40		10.51	0.006066	
50		10.22	0.005899	
20	10.2	-18.62	-0.010747	
20	13.8	-13.07	-0.007544	

16QAM, Channel Bandwidth:10MHz Middle Channel, fc =1732.5 MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
°C	VDC	Hz	ppm	
-30	12	9.67	0.005582	Pass
-20		8.51	0.004912	
-10		6.06	0.003498	
0		-6.88	-0.003971	
10		4.63	0.002672	
20		-3.82	-0.002205	
30		-9.31	-0.005374	
40		-0.40	-0.000231	
50		6.59	0.003804	
20	10.2	10.21	0.005893	
20	13.8	2.66	0.001535	

LTE Band 5:

QPSK, Channel Bandwidth:10MHz Middle Channel, fc = 836.5 MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
°C	VDC	Hz	ppm	ppm
-30	12	2.64	0.003156	2.5
-20		-4.47	-0.005344	
-10		-2.73	-0.003264	
0		-9.26	-0.011070	
10		4.73	0.005655	
20		6.13	0.007328	
30		10.71	0.012803	
40		2.16	0.002582	
50		-7.04	-0.008416	
20	10.2	-0.01	-0.000012	
20	13.8	12.70	0.015182	

16QAM, Channel Bandwidth:10MHz Middle Channel, $f_c = 836.5$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
°C	VDC	Hz	ppm	ppm
-30	12	-4.41	-0.005272	2.5
-20		-6.49	-0.007759	
-10		1.37	0.001638	
0		-16.12	-0.019271	
10		-3.19	-0.003814	
20		-2.20	-0.002630	
30		9.15	0.010938	
40		1.10	0.001315	
50		8.91	0.010652	
20	10.2	10.84	0.012959	2.5
20	13.8	7.84	0.009372	

LTE Band 7:

QPSK, Channel Bandwidth:10MHz Middle Channel, $f_c = 2535.0$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
°C	VDC	Hz	ppm	ppm
-30	12	9.87	0.003893	2.5
-20		-4.68	-0.001846	
-10		-3.15	-0.001243	
0		-11.77	-0.004643	
10		12.94	0.005105	
20		11.99	0.004730	
30		7.91	0.003120	
40		5.64	0.002225	
50		-0.58	-0.000229	
20	10.2	7.43	0.002931	2.5
20	13.8	3.38	0.001333	

16QAM, Channel Bandwidth:10MHz Middle Channel, fc =2535.0 MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
°C	VDC	Hz	ppm	ppm
-30	12	-9.05	-0.003570	2.5
-20		-2.69	-0.001061	
-10		10.26	0.004047	
0		13.00	0.005128	
10		-6.08	-0.002398	
20		5.60	0.002209	
30		-7.78	-0.003069	
40		10.95	0.004320	
50		-14.80	-0.005838	
20	10.2	2.00	0.000789	
20	13.8	3.55	0.001400	

LTE Band 12:

QPSK, Channel Bandwidth:10MHz Middle Channel, fc = 707.5 MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
°C	VDC	Hz	ppm	ppm
-30	12	9.17	0.012961	2.5
-20		-4.16	-0.005880	
-10		-2.70	-0.003816	
0		-0.81	-0.001145	
10		-2.53	-0.003576	
20		-6.75	-0.009541	
30		-10.27	-0.014516	
40		15.14	0.021399	
50		-11.85	-0.016749	
20	10.2	12.09	0.017088	
20	13.8	3.75	0.005300	

16QAM, Channel Bandwidth:10MHz Middle Channel, fc =707.5 MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
°C	VDC	Hz	ppm	ppm
-30	12	-10.35	-0.014629	2.5
-20		-9.15	-0.012933	
-10		9.59	0.013555	
0		-14.09	-0.019915	
10		-10.27	-0.014516	
20		-16.42	-0.023208	
30		-3.14	-0.004438	
40		6.95	0.009823	
50		-1.48	-0.002092	
20	10.2	-9.29	-0.013131	
20	13.8	6.89	0.009739	

LTE Band 17:

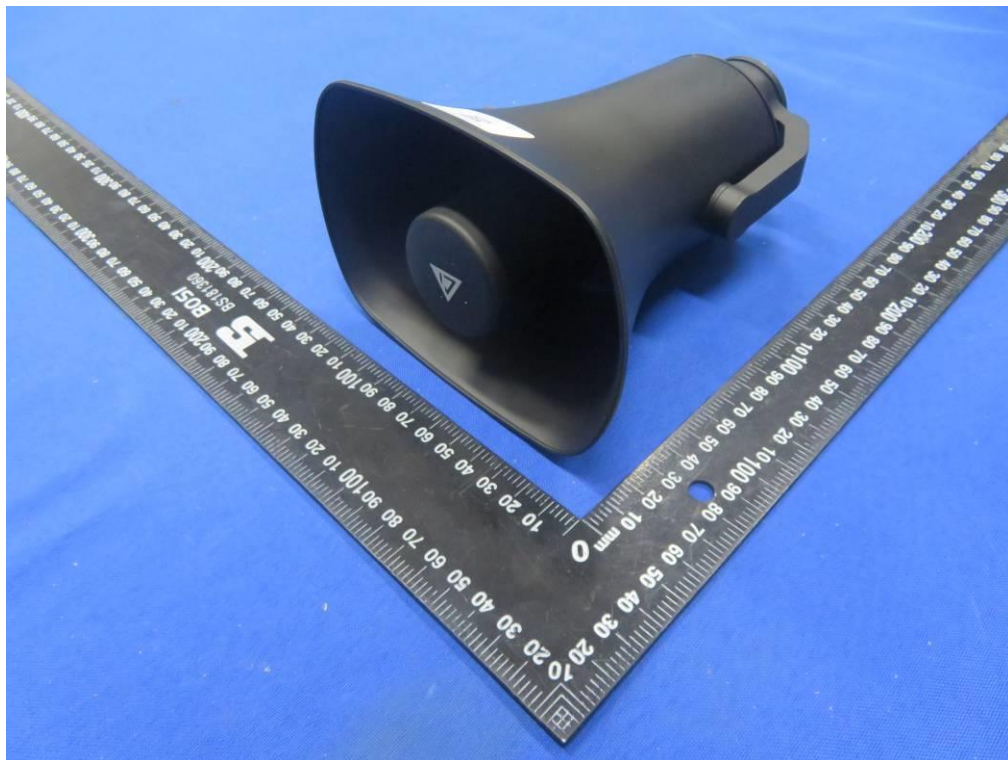
QPSK, Channel Bandwidth:10MHz Middle Channel, fc = 710.0 MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
°C	VDC	Hz	ppm	ppm
-30	12	6.88	0.009690	2.5
-20		2.34	0.003296	
-10		-10.57	-0.014887	
0		-7.91	-0.011141	
10		-7.15	-0.010070	
20		-12.12	-0.017070	
30		2.07	0.002915	
40		2.54	0.003577	
50		4.28	0.006028	
20	10.2	2.64	0.003718	
20	13.8	8.39	0.011817	

16QAM, Channel Bandwidth:10MHz Middle Channel, $f_c = 710.0$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
°C	VDC	Hz	ppm	ppm
-30	12	2.44	0.003437	2.5
-20		7.92	0.011155	
-10		-13.16	-0.018535	
0		11.85	0.016690	
10		-1.51	-0.002127	
20		-13.65	-0.019225	
30		-5.80	-0.008169	
40		-3.67	-0.005169	
50		-0.14	-0.000197	
20	10.2	-9.06	-0.012761	2.5
20	13.8	9.79	0.013789	

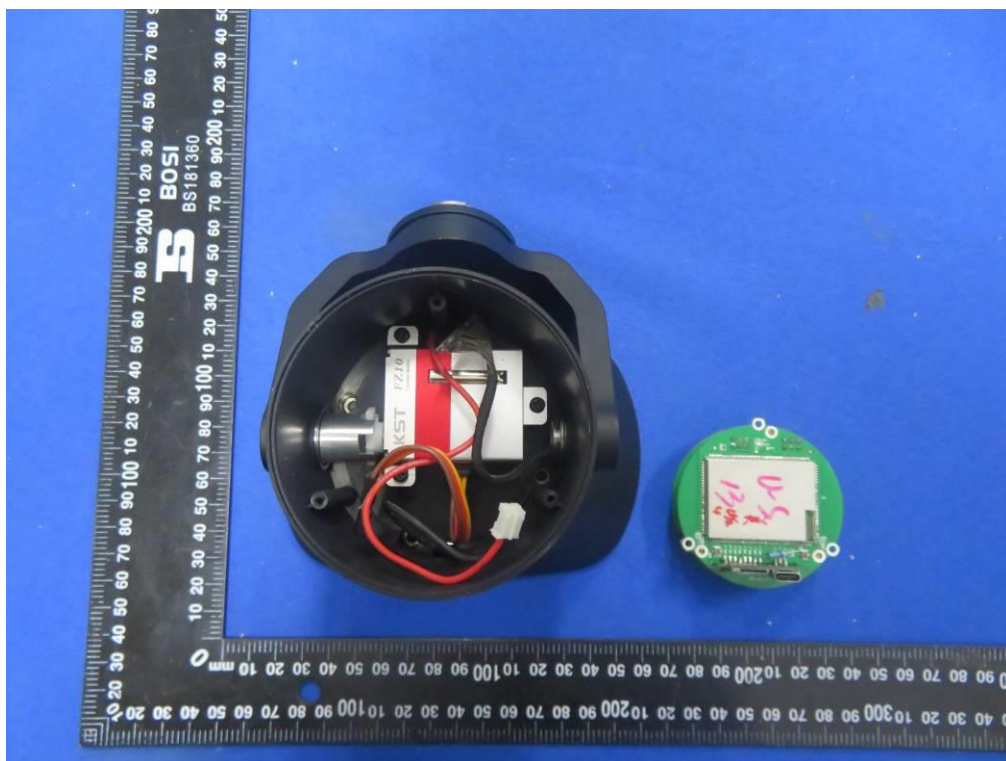
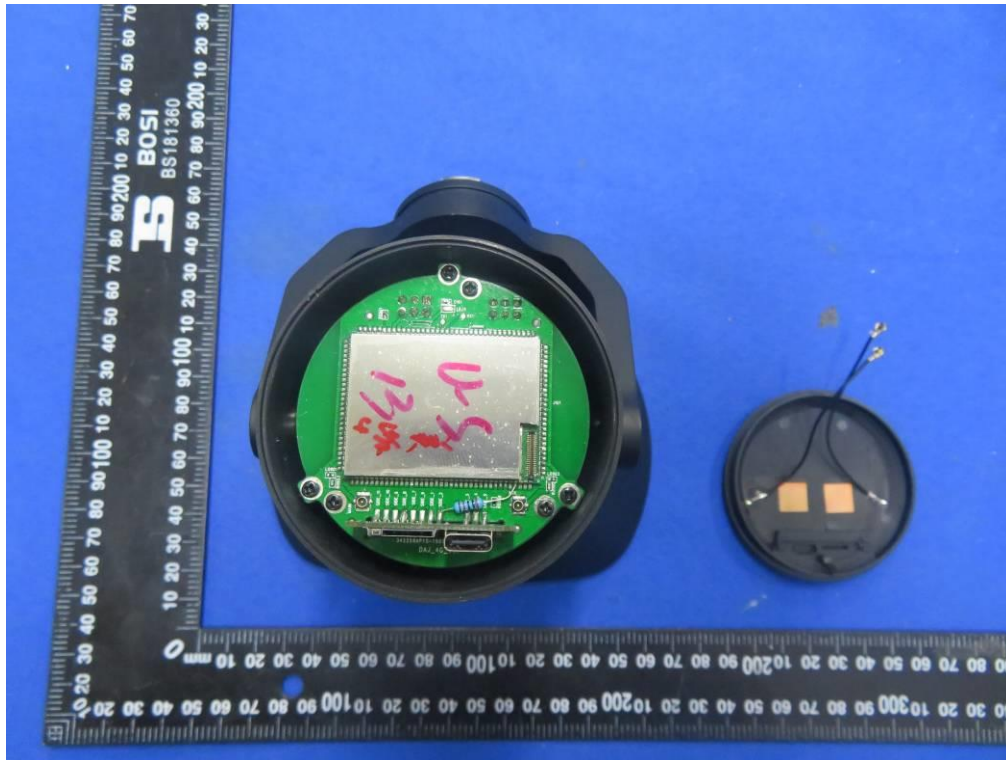
4 TEST SETUP PHOTOS OF THE EUT

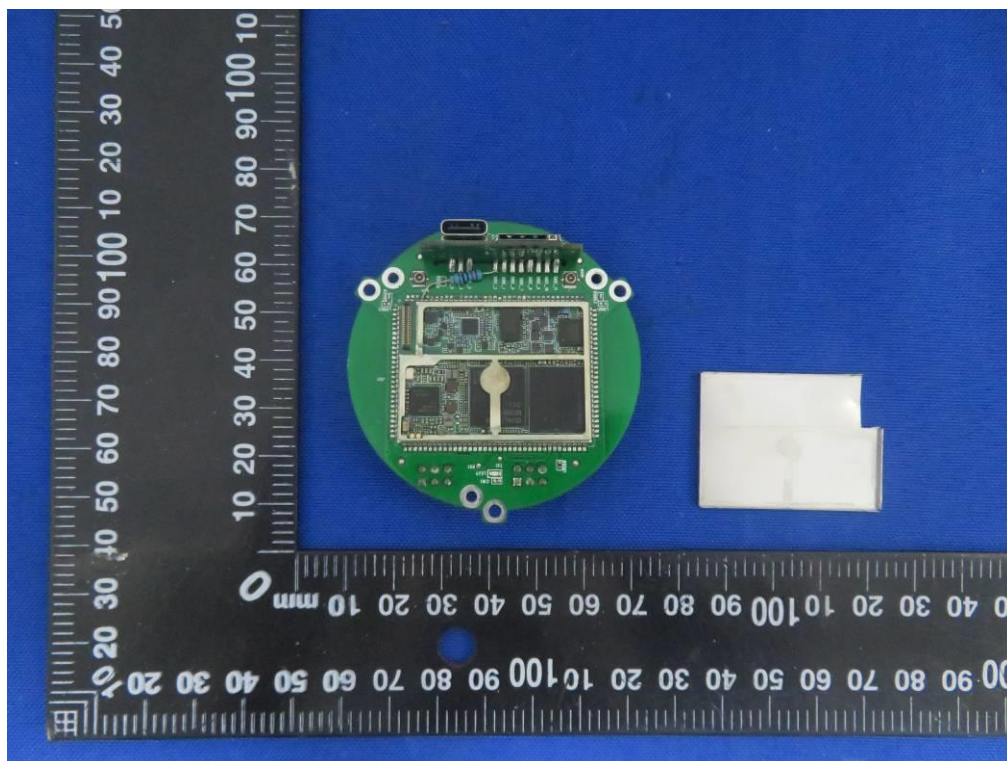
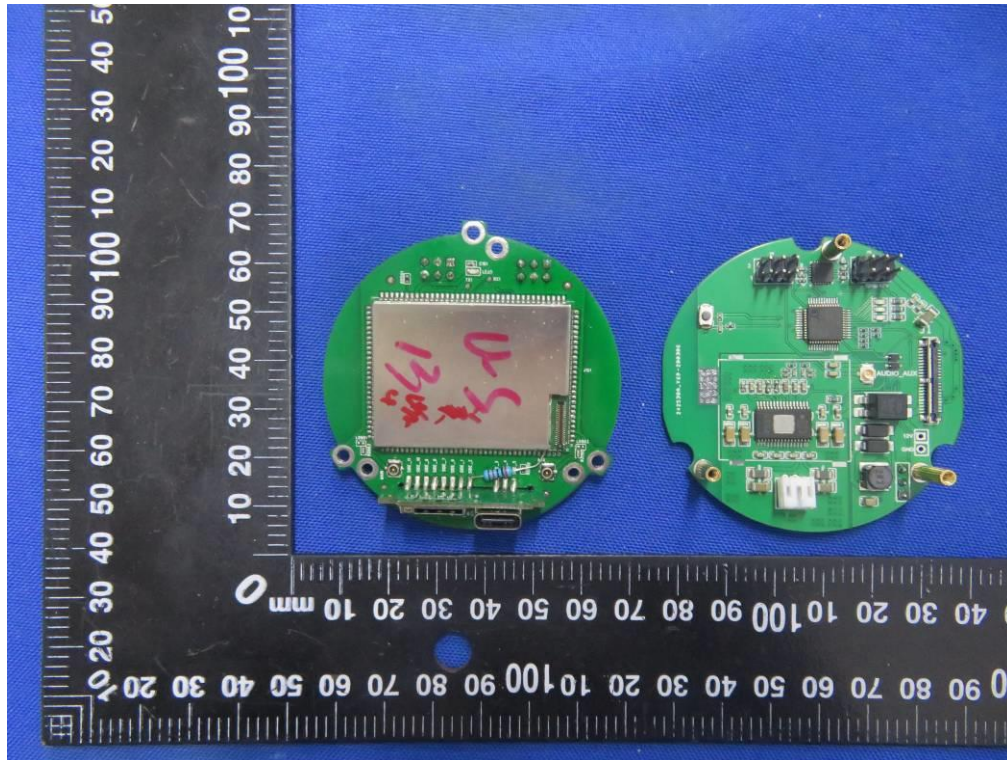


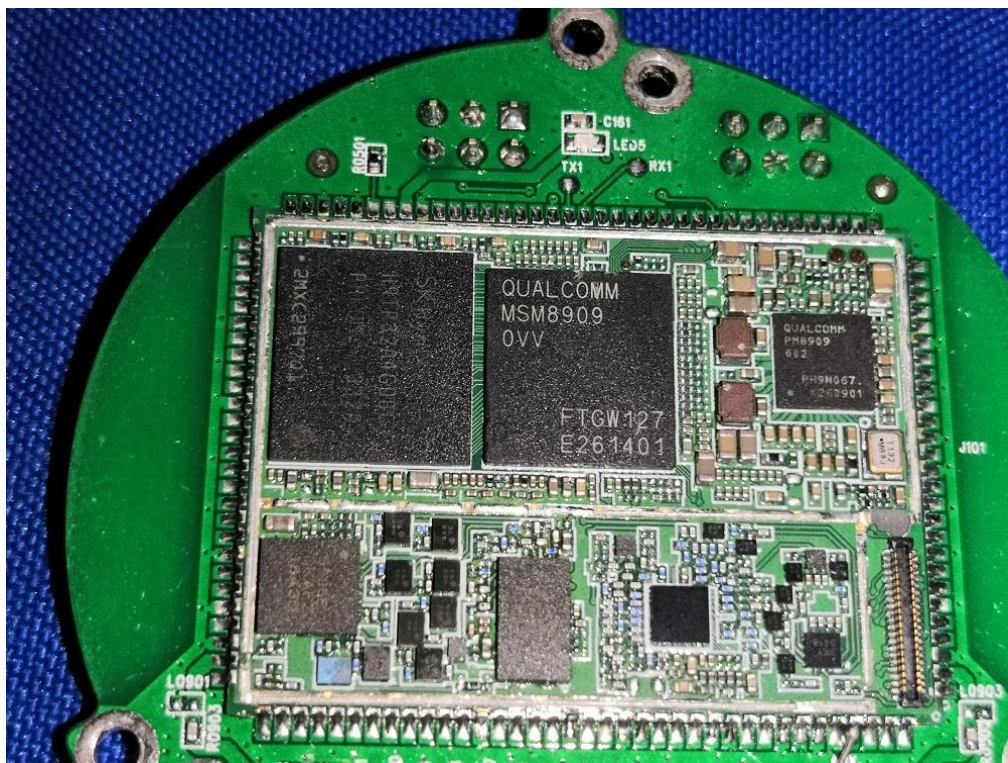
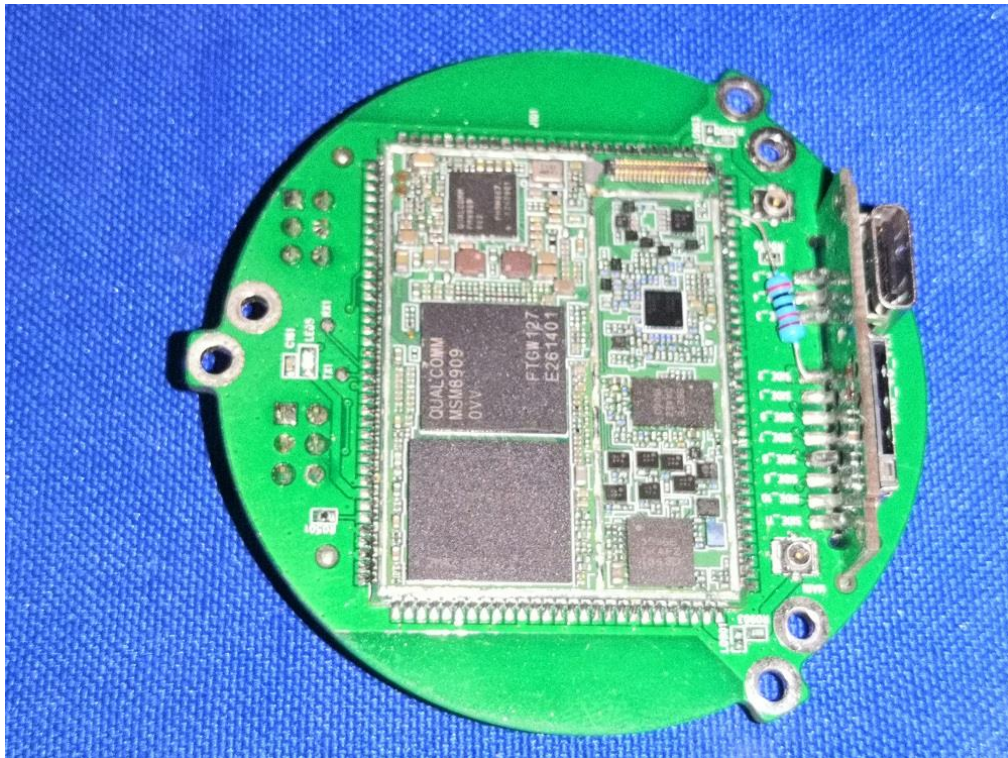
5 EXTERNAL AND INTERNAL PHOTOS OF THE EUT

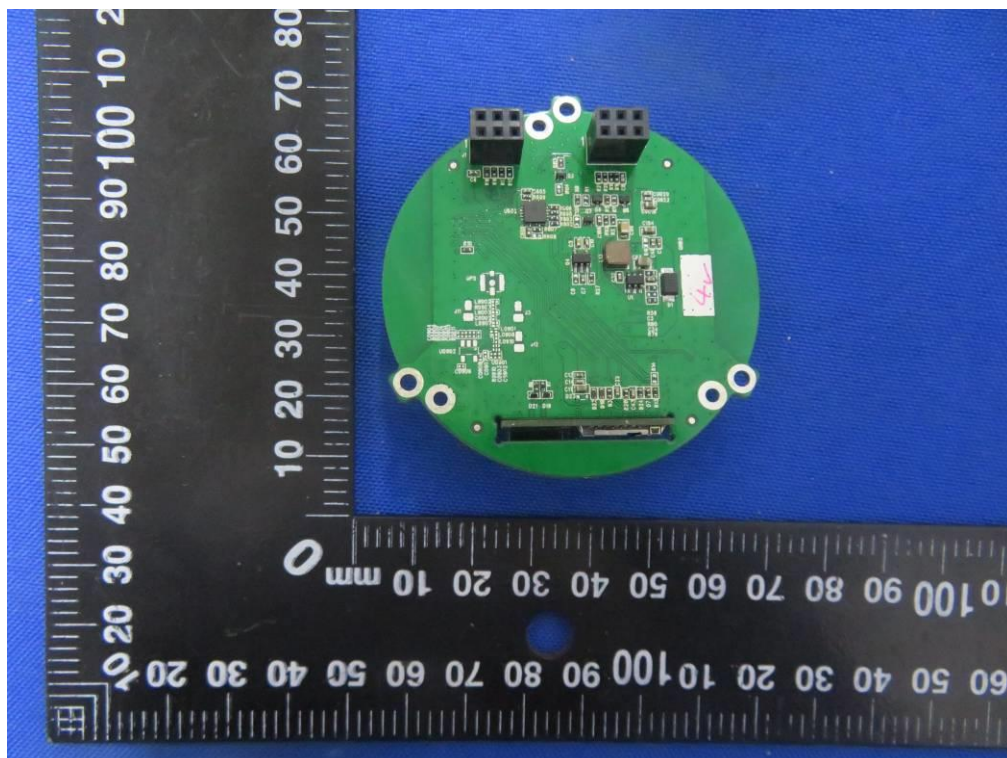
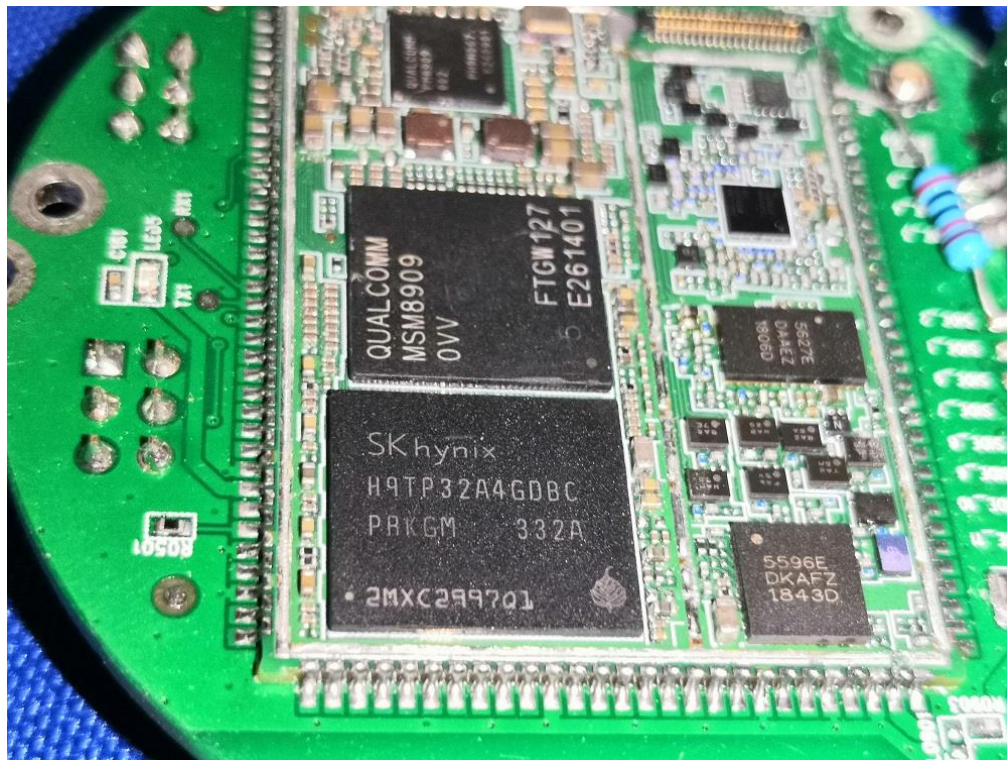


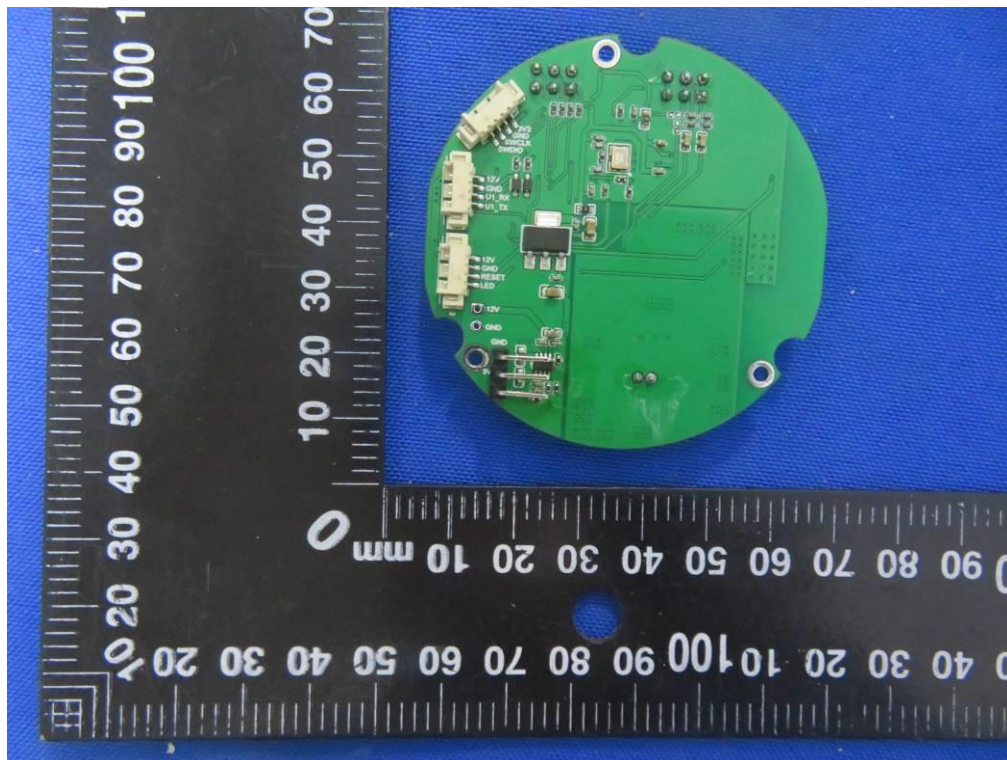
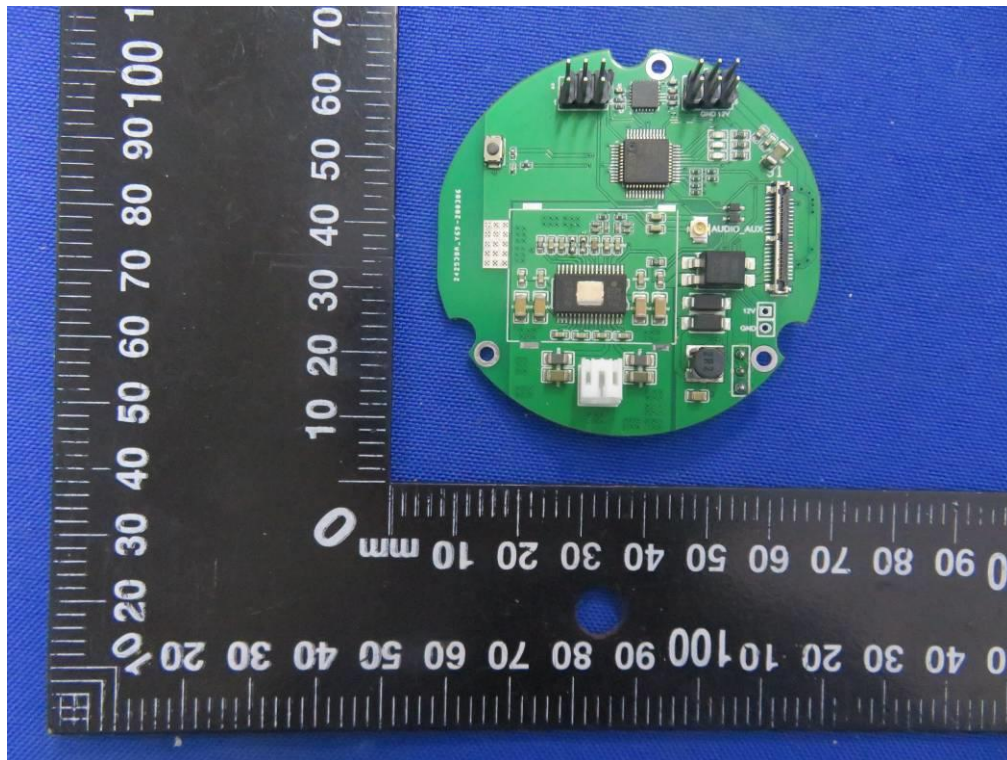


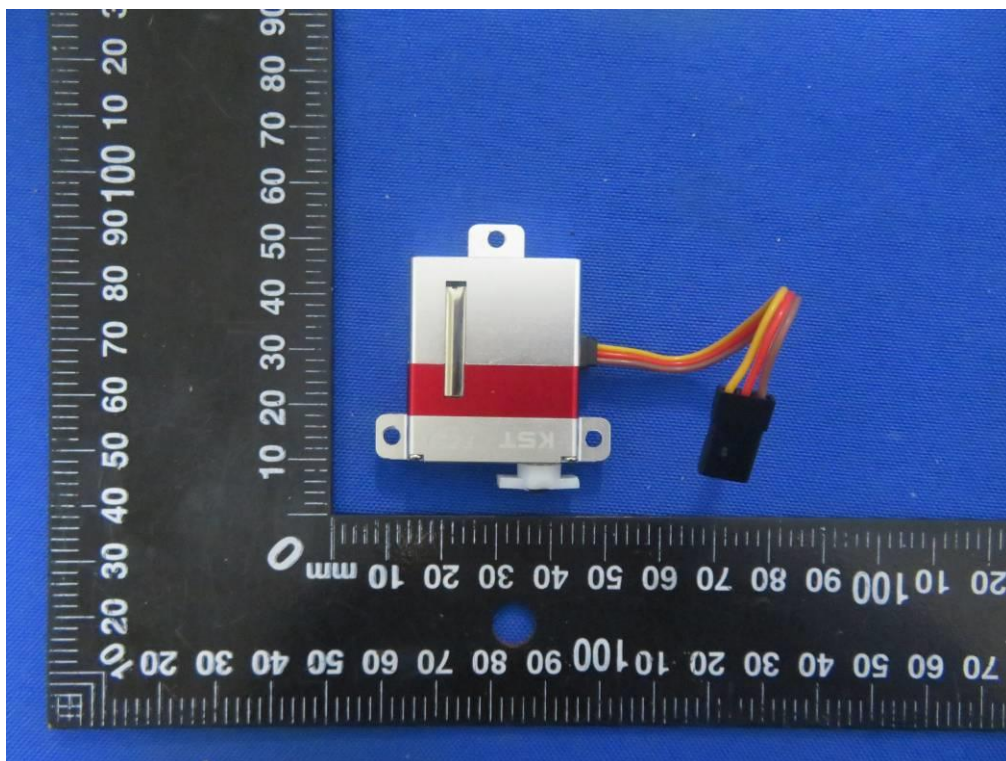
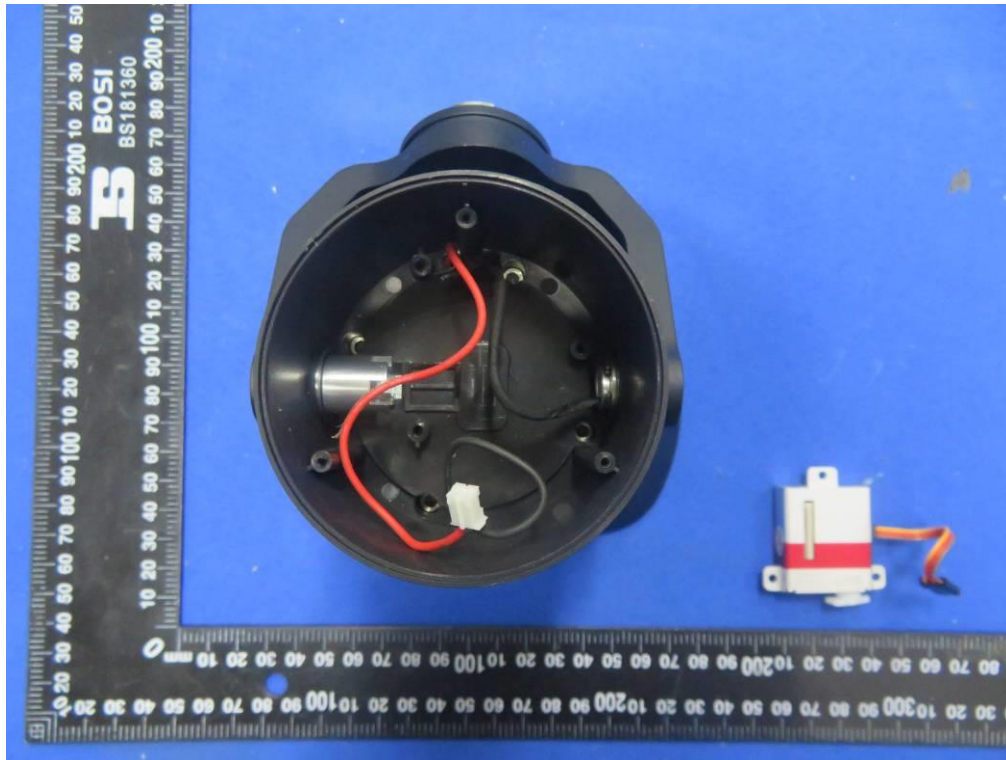




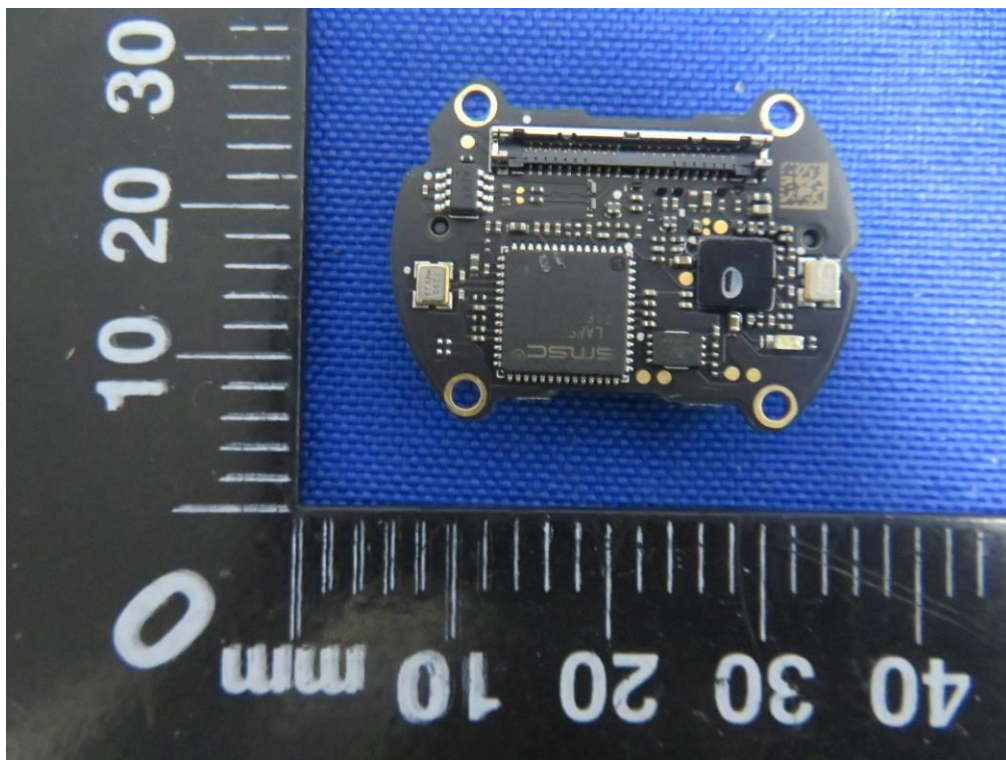
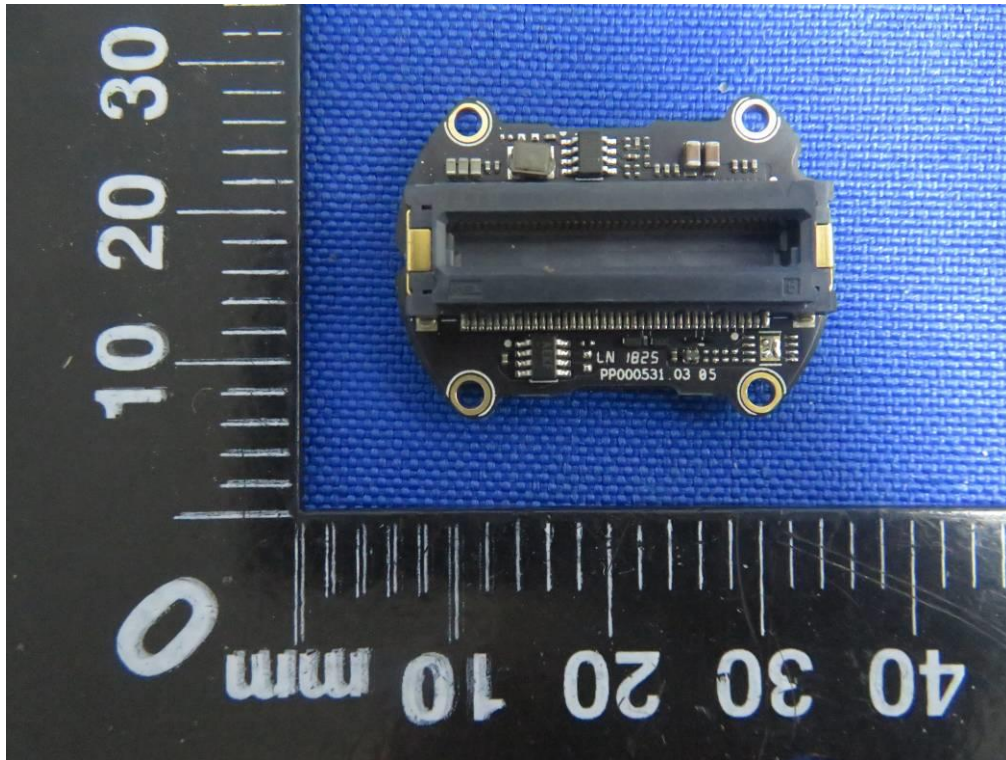












.....End of Report.....