FCC Test Report

FCC ID: 2A3NM-F720A

Applicant:	Autotek Industrial Limited
Address:	1318-19, 13/F, Hollywood Plaza, 610 Nathan Road, Mongkok, Kowloon, Hong-Kong, China.
Manufacturer:	Autotek Industrial Limited
Address:	1318-19, 13/F, Hollywood Plaza, 610 Nathan Road, Mongkok, Kowloon, Hong-Kong, China.
EUT:	DOUBLE DIN ANDROID PLAYER
Trade Mark:	FIVE
Model Number:	F720A F730A, F740A, F750A, F760A, F770A, F780A, F790A, F600W, F610W, F620W, F630W, F640W, F650W, F660W, F670W, F680W, F690W, F910A ,F920A, F930A, F910W, F920W, F930W
Date of Receipt:	Dec. 18, 2021
Test Date:	Dec. 18, 2021 - Jan. 21, 2022
Date of Report:	Jan. 21, 2022
Prepared By:	Shenzhen DL Testing Technology Co., Ltd.
Address:	101-201, Building C, Shuanghuan, No.8, Baoqing Road, Baolong Industrial Zone, Baolong Street, Longgang District, Shenzhen, Guangdong, China
Applicable Standards:	FCC CFR Title 47 Part22 Subpart H FCC CFR Title 47 Part24 Subpart E FCC CFR Title 47 Part27 Subpart E ANSI/ TIA/ EIA-603-D-2010 FCC KDB 971168 D01 Power Meas. License Digital Systems v02v02 ANSI C63.4:2014
Test Result:	Pass
Report Number:	DL-20220118013E

Prepared (Test Engineer):	Pxing Huang
Reviewer (Supervisor):	Jack Bu
Approved (Manager):	Jade Yang

This test report is based on a single evaluation of one sample of above mentioned products. It is not permitted to be duplicated in extracts without written approval of Shenzhen DL Testing Technology Co., Ltd.

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1. TEST SUMMARY

Test Items	Test Requirement	Result
Conducted RF Output Power	2.1046	PASS
Peak to Average Radio	2.1055,22.355 24.235,27.54	PASS
99% & -26 dB Occupied Bandwidth	2.1049, 22.917 24.238,	PASS
Frequency Stability	2.1055, 22.355 24.235, 27.54	PASS
Conducted Out of Band Emissions	2.1051,2.1057 22.917, 24.238 27.53(h) /27.53(m)	PASS
Band Edge	2.1051,2.1057 22.917, 24.238 27.53(h) /27.53(m)	PASS
Transmitter Radiated Power (EIPR/ERP)	22.913, 24.232 27.50(d)(4)/27.50(h)(2)	PASS
Radiated Out of Band Emissions	2.1053,2.1057 22.917, 24.238 27.53(h) /27.53(m)	PASS

2. GENERAL PRODUCT INFORMATION

2.1. Description of Device (EUT)

Product Name:	DOUBLE DIN ANDROID PLAYER
Trademark	FIVE
Model No.:	F720A F730A, F740A, F750A, F760A, F770A, F780A, F790A, F600W, F610W, F620W, F630W, F640W, F650W, F660W, F670W, F680W, F690W, F910A ,F920A, F930A, F910W, F920W, F930W
Model Difference	The product's different for model name and outlook color.
Operation Frequency:	WCDMA Band 2: Tx: 1850.00 - 1910.00MHz; Rx: 1930.00 - 1990.00MHz WCDMA Band 5: Tx: 824.00 - 849.00MHz; Rx: 869.00 - 894.00MHz
Modulation technology:	WCDMA Mode with BPSK Modulation HSDPA Mode with QPSK, 16QAM Modulation HSUPA Mode with QPSK, 16QAM Modulation
Antenna Type:	External Antenna
Antenna gain:	0dBi
Power supply:	DC 12V from battery
LTE Category	/
Hardware Version	HV10
Software Version	SV10

2.2. Product Function

Refer to Technical Construction Form and User Manual.

2.3. Independent Operation Modes

During all testing, EUT is in link mode with base station emulator at maximum power level. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT is rotated on three test planes to find out the worst emission.

Test modes		
Band	Radiated	Conducted
WCDMA	RMC/ HSDPA/ HSUPA/ DC-HSDPA	RMC/ HSDPA/ HSUPA/ DC-HSDPA

Test Channel(MHz)			
Band	Low	Middle	High
WCDMA Band 2	1852.4	1880	1907.6
WCDMA Band 5	826.4	836.6	846.6

Note: for LTE mode, if the bandwidth is different, the test frequency is changed.

3. TEST SITES

3.1. Test Facilities

Site Description

Name of Firm	:	Shenzhen DL Testing Technology Co., Ltd.
Site Location	:	101-201, Building C, Shuanghuan, No.8, Baoqing Road, Baolong Industrial Zone, Baolong Street, Longgang District, Shenzhen, Guangdong, China

3.2. Measurement Uncertainty

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

No.	Item	Uncertainty
1	Conducted Emission Test	±1.38dB
2	RF powe ,conducted	±0.16dB
3	Spurious emissions,conducted	±0.21dB
4	All emissions,radiated(<1G)	±4.68dB
5	All emissions,radiated(>1G)	±4.89dB
6	Temperature	±0.5℃
7	Humidity	±2%

3.3. List of Test and Measurement Instruments

3.3.1. For conducted emission at the mains terminals test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
843 Shielded Room	ChengYu	843 Room	843	Nov. 25, 2019	Nov. 24, 2022
EMI Receiver	R&S	ESR	101421	Nov. 06, 2021	Nov. 05, 2022
LISN	R&S	ENV216	102417	Nov. 06, 2021	Nov. 05, 2022
843 Cable 1#	ChengYu	CE Cable	001	Nov. 06, 2021	Nov. 05, 2022
843 Cable 1#	FUJIKURA	843C1#	001	Nov. 06, 2021	Nov. 05, 2022

3.3.2. For radiated test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Spectrum Analyzer (9kHz-26.5GHz)	Agilent	E4408B	MY50140780	Nov. 06, 2021	Nov. 05, 2022
Test Receiver (9kHz-7GHz)	R&S	ESRP7	101393	Nov. 06, 2021	Nov. 05, 2022
Bilog Antenna (30MHz-1GHz)	R&S	VULB9162	00306	Nov. 06, 2021	Nov. 05, 2022
Horn Antenna (1GHz-18GHz)	Schwarzbeck	BBHA9120D	02139	Nov. 06, 2021	Nov. 05, 2022
Horn Antenna (18GHz-40GHz)	A.H. Systems	SAS-574	588	Nov. 06, 2021	Nov. 05, 2022
Amplifier (9KHz-6GHz)	Schwarzbeck	BBV9743B	00153	Nov. 06, 2021	Nov. 05, 2022
Amplifier (1GHz-18GHz)	EMEC	EM01G8GA	00270	Nov. 06, 2021	Nov. 05, 2022
Amplifier(18GHz-40GHz)	Quanjuda	DLE-161	97	Nov. 06, 2021	Nov. 05, 2022
Loop Antenna(9KHz-30MHz)	Schwarzbeck	FMZB1519B	00014	Nov. 06, 2021	Nov. 05, 2022
RF cables1 (9kHz-1GHz)	ChengYu	966	004	Nov. 06, 2021	Nov. 05, 2022
RF cables2 (1GHz-40GHz)	ChengYu	966	003	Nov. 06, 2021	Nov. 05, 2022
Antenna connector	Florida RF Labs	N/A	RF 01#	Nov. 06, 2021	Nov. 05, 2022
Power probe	KEYSIGHT	U2021XA	MY55210018	Nov. 06, 2021	Nov. 05, 2022
Signal Analyzer	Agilent	N9020A	MY55370280	Nov. 06, 2021	Nov. 05, 2022
Test Receiver	R&S	ESU 40	100376	Nov. 06, 2021	Nov. 05, 2022
D.C. Power Supply	LongWei	PS-305D	010964729	Nov. 06, 2021	Nov. 05, 2022
Signal Amplifier	DAZE	ZN3380B	11235	Nov. 06, 2021	Nov. 05, 2022
High Pass filter	KANGMAI	WHKX1.0/1.5G-10SS	40	Nov. 06, 2021	Nov. 05, 2022
Filter	COM-MW	ZBSF-C836.5-25-X	BCTC042	Nov. 06, 2021	Nov. 05, 2022
Filter	COM-MW	ZBSF-C1747.5-75-X2	BCTC045	Nov. 06, 2021	Nov. 05, 2022
Filter	COM-MW	ZBSF-C1880-60-X2	BCTC047	Nov. 06, 2021	Nov. 05, 2022
Splitter	Agilent	11435B	1125162	Nov. 06, 2021	Nov. 05, 2022
RF CONDUCTED TEST					
System Simulator	Agilent	E5515C	GB43130252	Nov. 06, 2021	Nov. 05, 2022
Spectrum Analyzer	Agilent	N9020A	MY45108040	Nov. 06, 2021	Nov. 05, 2022
DC Power Supply	LongWei	PS-305D	010965682	Nov. 06, 2021	Nov. 05, 2022
Constant temperature and humidity box	GF	GTH-800-40-2P	MAA9906-012	Nov. 06, 2021	Nov. 05, 2022
Universal radio communication tester	R&S	CMW500	115295	Nov. 06, 2021	Nov. 05, 2022

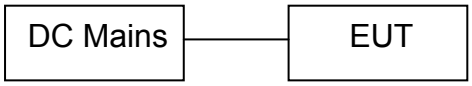
4. TEST SET-UP

4.1. Principle of Configuration Selection

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the Operating Instructions.

4.2. Block Diagram of Test Set-up

System Diagram of Connections between EUT and Simulators



4.3. Test Environment:

Ambient conditions in the test laboratory:

Items	Actual
Temperature (℃)	21~23
Humidity (%RH)	50~65

5. EMISSION TEST RESULTS

5.1. Conducted RF Output Power

5.1.1. Limit

According to FCC section 2.1046(a) , FCC part22.913(a) and FCC part 24.232(b) ,for transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in FCC section 2.1033(c)(8).

5.1.2. Test Setup

The EUT, which is powered by the adapter, is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power.

5.1.3. Test Result

Here the lowest, middle and highest channels are selected to perform testing to verify the conducted RF output power of the EUT.

Pass, the table and plot please see annex.

The conducted power tables are as follows:

Average Conducted Power						
Band	WCDMA Band 2. (dBm)			WCDMA Band 5. (dBm)		
Frequency	1852.4	1880.0	1907.6	826.4	836.6	846.6
RMC 12.2Kbps	24.47	24.14	23.91	22.22	22.56	22.58
RMC 64kbps	23.89	23.94	24.57	22.30	22.20	22.22
RMC 144kbps	24.44	24.19	24.38	22.00	22.08	22.37
RMC 384kbps	23.88	24.14	24.09	22.13	22.10	22.31
HSDPA Subtest-1	24.10	24.28	24.49	22.65	22.67	22.67
HSDPA Subtest-2	24.28	24.45	24.36	22.64	22.29	22.46
HSDPA Subtest-3	24.47	24.53	23.80	22.22	22.33	22.78
HSDPA Subtest-4	23.94	24.01	24.50	22.31	22.73	22.57
HSUPA Subtest-1	24.20	24.20	24.18	22.30	22.71	22.24
HSUPA Subtest-2	24.43	23.89	24.54	22.33	22.11	22.23
HSUPA Subtest-3	24.58	23.83	23.82	22.45	22.66	22.07
HSUPA Subtest-4	23.89	24.49	24.01	22.48	22.27	22.76

5.2. -26dB and 99% Occupied Bandwidth

5.2.1. Limit

According to FCC section 2.1049 and FCC part22.913(a) and FCC part24.232(b), the occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission.

Occupied bandwidth is also known as the 99% emission bandwidth,

5.2.2. Test Setup

The EUT, which is powered by the adapter, is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power.

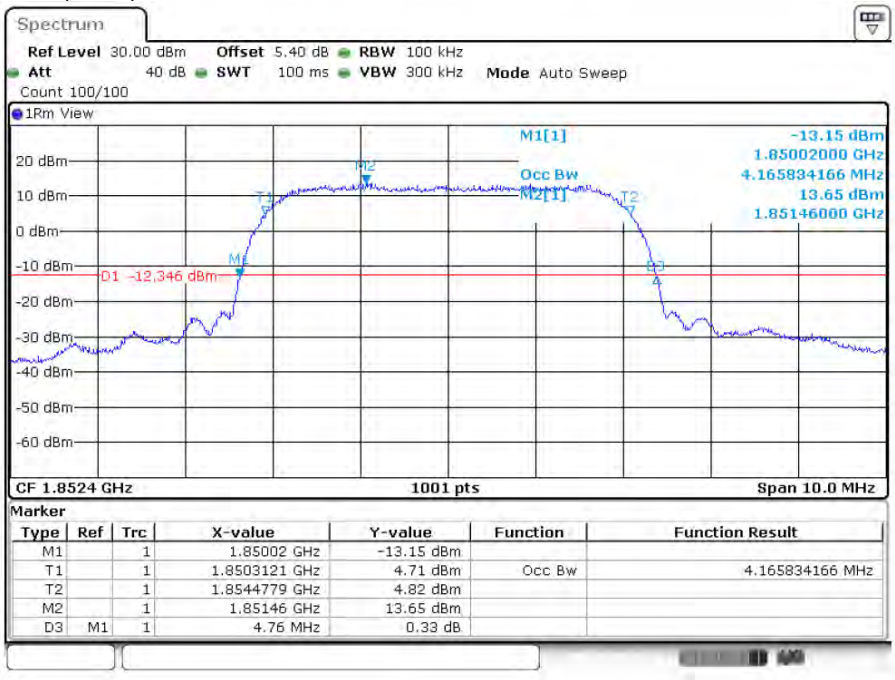
5.2.3. Test Result

EUT Mode	Channel	Frequency (MHz)	99% Occupy bandwidth (MHz)	-26dB bandwidth (MHz)
WCDMA Band 2 (RMC)	9262	1852.4	4.166	4.760
	9400	1880.0	4.166	4.760
	9538	1907.6	4.166	4.760

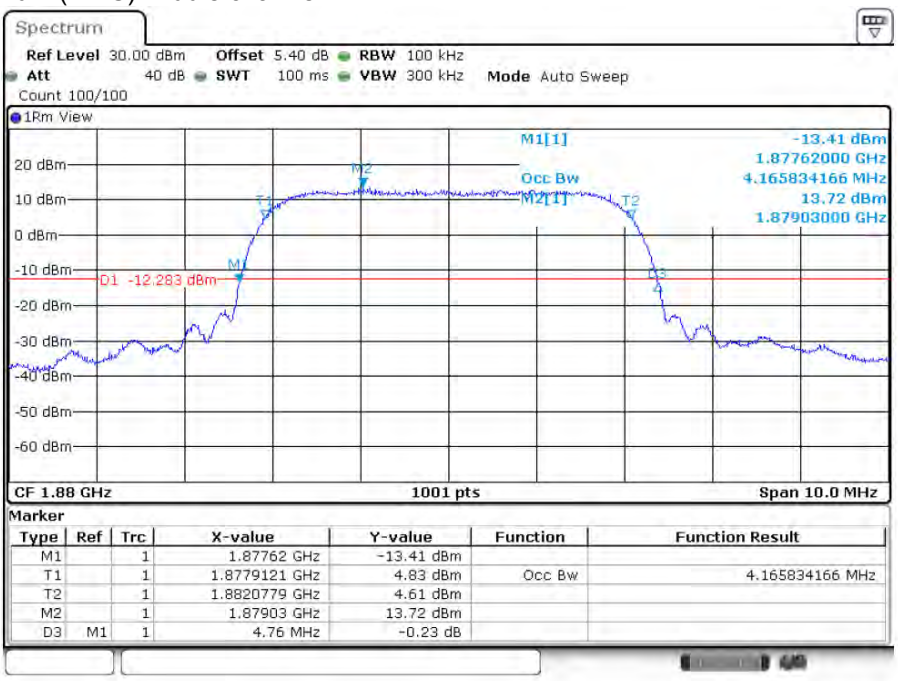
Note: Measurement Uncertainty: ±20Hz.

Test plot as follows:

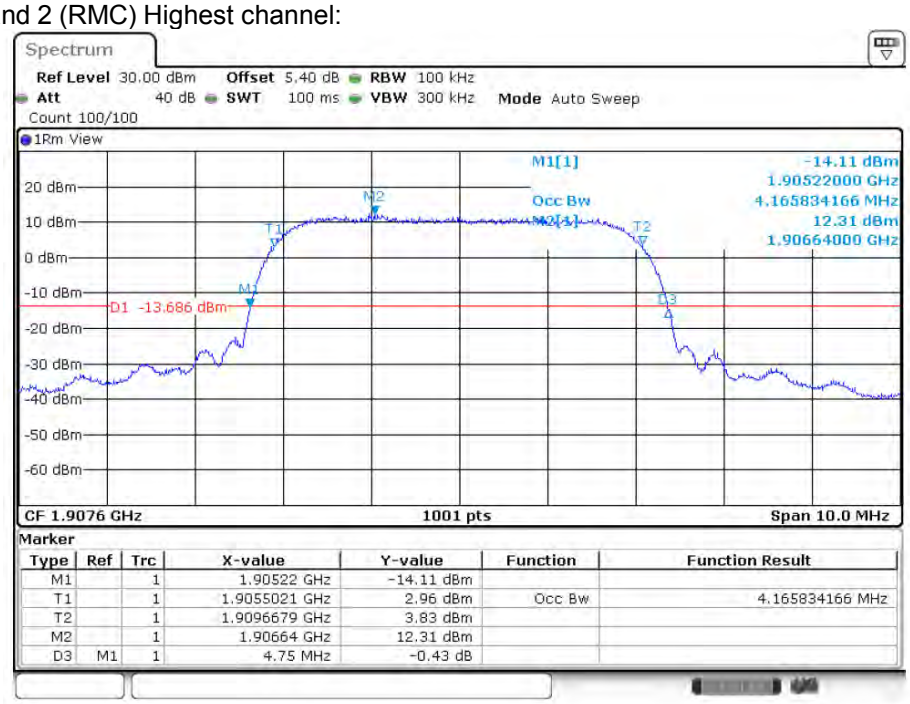
WCDMA Band 2 (RMC) Lowest channel



WCDMA Band 2 (RMC) Middle channel



WCDMA Band 2 (RMC) Highest channel:

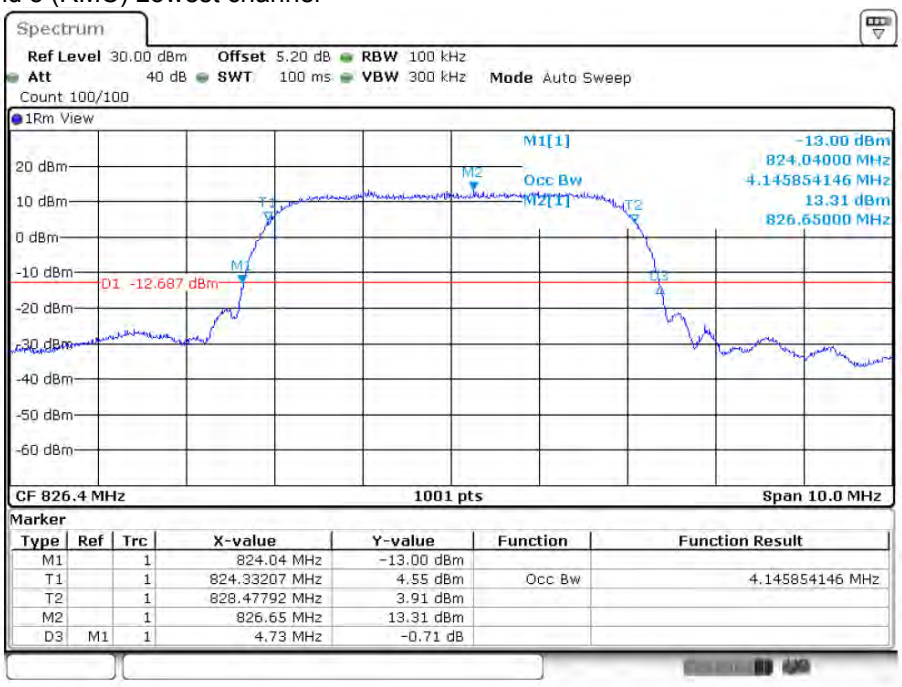


EUT Mode	Channel	Frequency (MHz)	99% Occupy bandwidth (MHz)	-26dB bandwidth (MHz)
WCDMA Band 5 (RMC)	4132	826.4	4.146	4.730
	4183	836.6	4.156	4.730
	4233	846.6	4.146	4.730

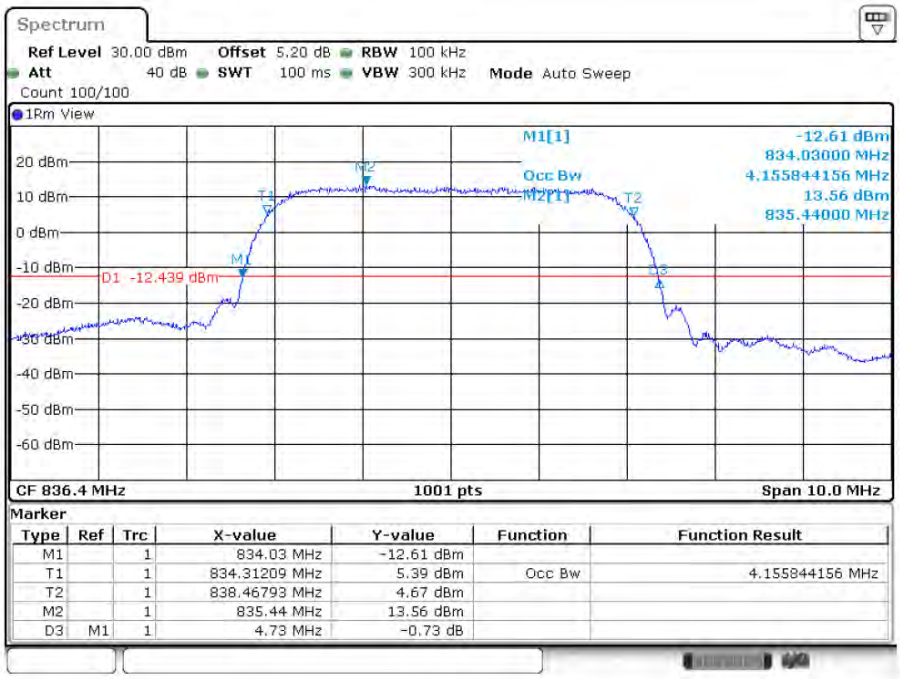
Note: Measurement Uncertainty: ±20Hz.

Test plot as follows:

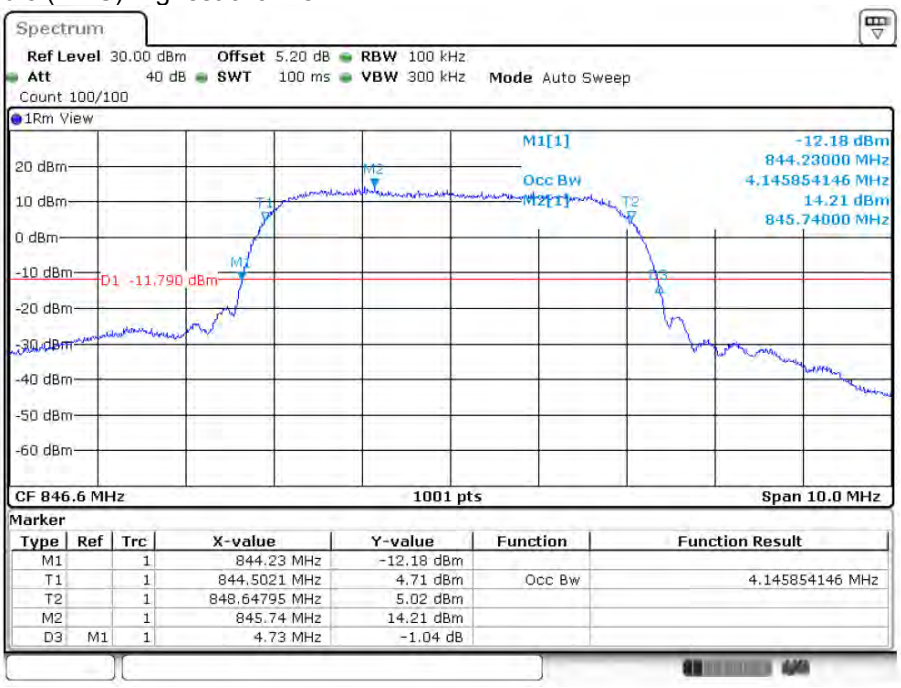
WCDMA Band 5 (RMC) Lowest channel



WCDMA Band 5 (RMC) Middle channel



WCDMA Band 5 (RMC) Highest channel:

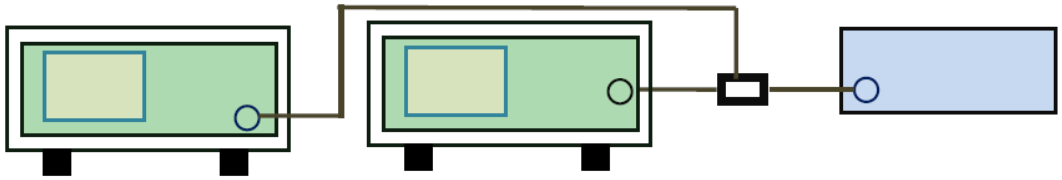


5.3. Peak to Average Radio

5.3.1. Limit

According to FCC section 27.50(d)(5) , the peak to average ratio(PAR) of the transmission may not exceed 13dB.

5.3.2. Test Setup



5.3.3. Test Procedure

According with KDB 971168 v02r02

1. The signal analyzer' s CCDF measurement profile is enabled

2. Frequency = carrier center frequency

3. Measurement BW > Emission bandwidth of signal

4. The signal analyzer was set to collect one million samples to generate the CCDF curve

5. The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms. For burst transmissions, the spectrum analyzer is set to use an internal " RF Burst" trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the " on time" of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power

5.3.4. Test Result

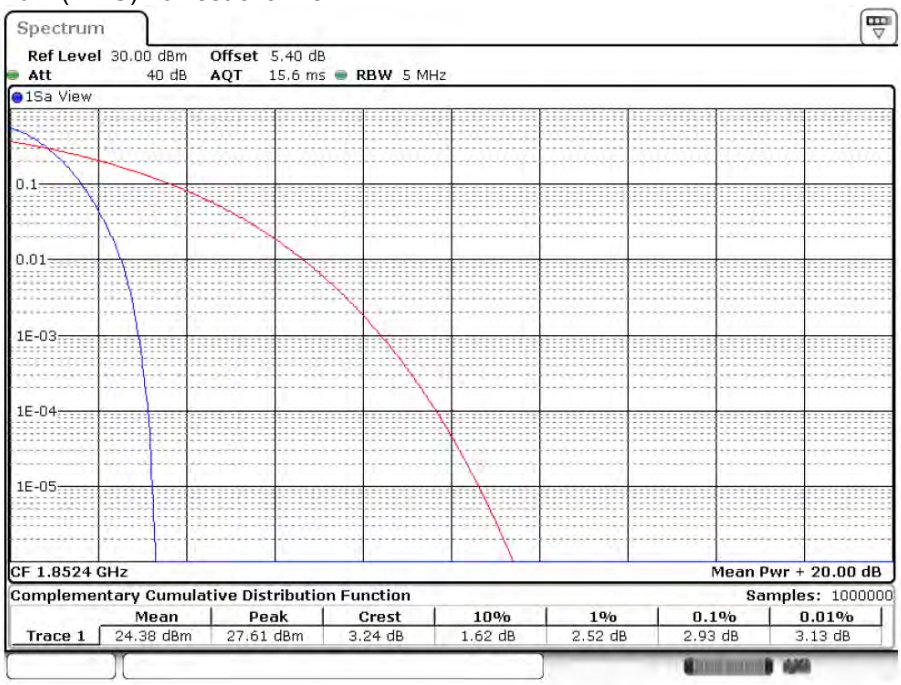
Pass, the table and plot please see annex.

Measurement data as follows:

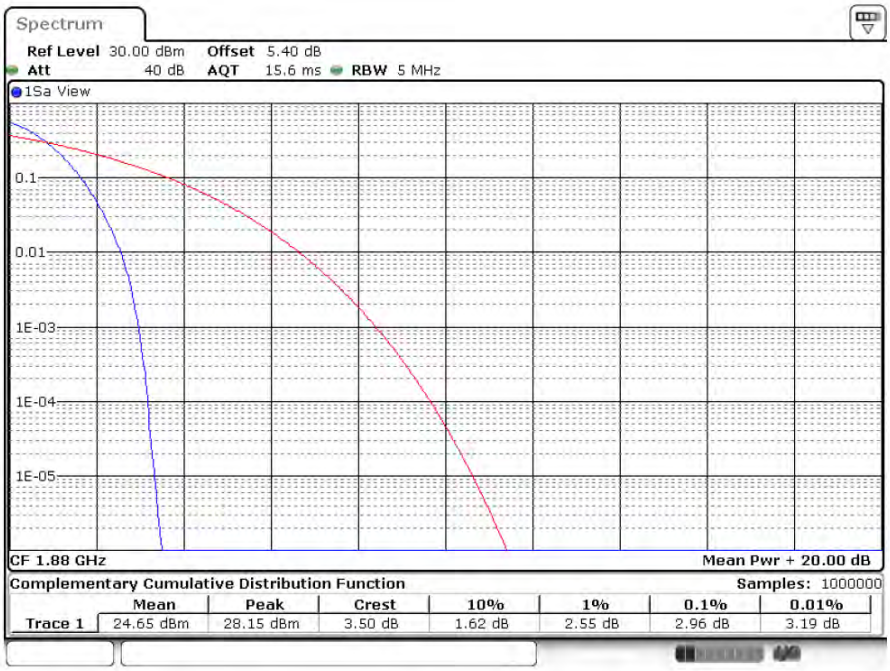
Band	Channel	Peak-Average Ratio(PAR)	Limit (dB)	Result
WCDMA Band 2 (RMC)	Low	2.93	≤13	Pass
	Middle	2.96	≤13	Pass
	High	2.87	≤13	Pass
WCDMA Band 5 (RMC)	Low	3.16	≤13	Pass
	Middle	3.19	≤13	Pass
	High	3.13	≤13	Pass

Note: Measurement Uncertainty: ±0.2 dB.

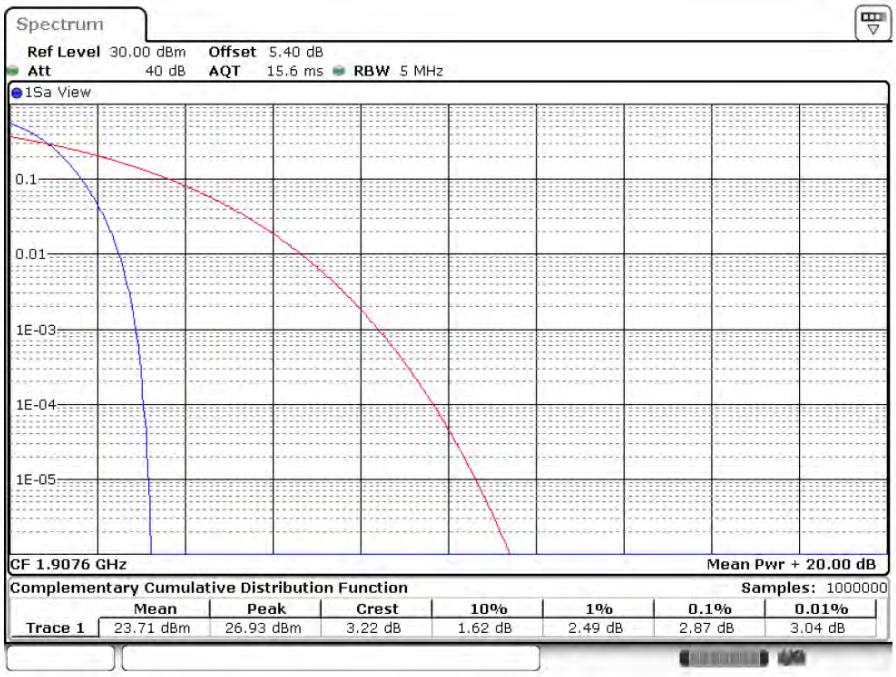
WCDMA Band 2 (RMC) Lowest channel



WCDMA Band 2 (RMC) Middle channel

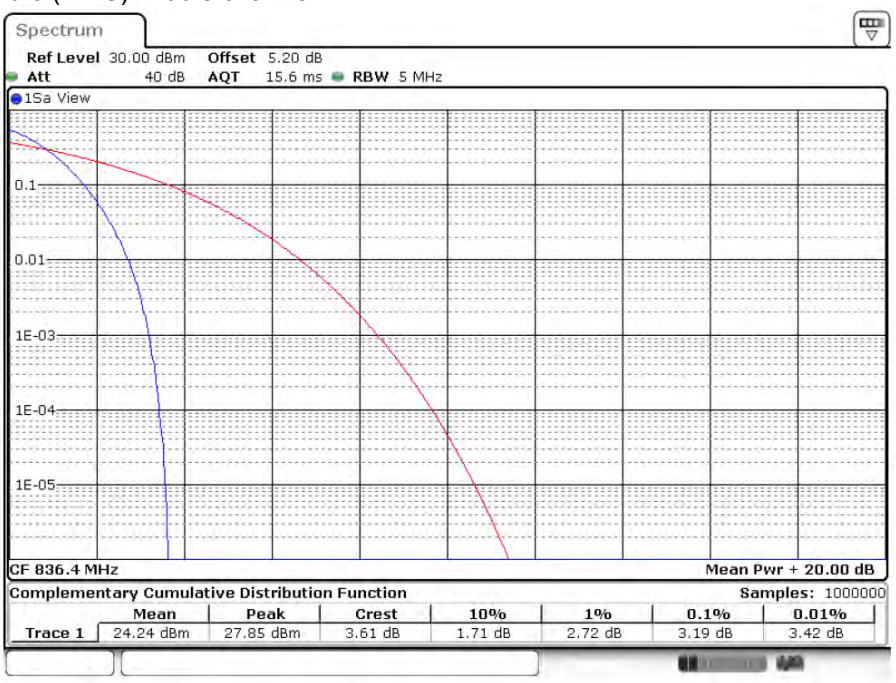


WCDMA Band 2 (RMC) Highest channel:

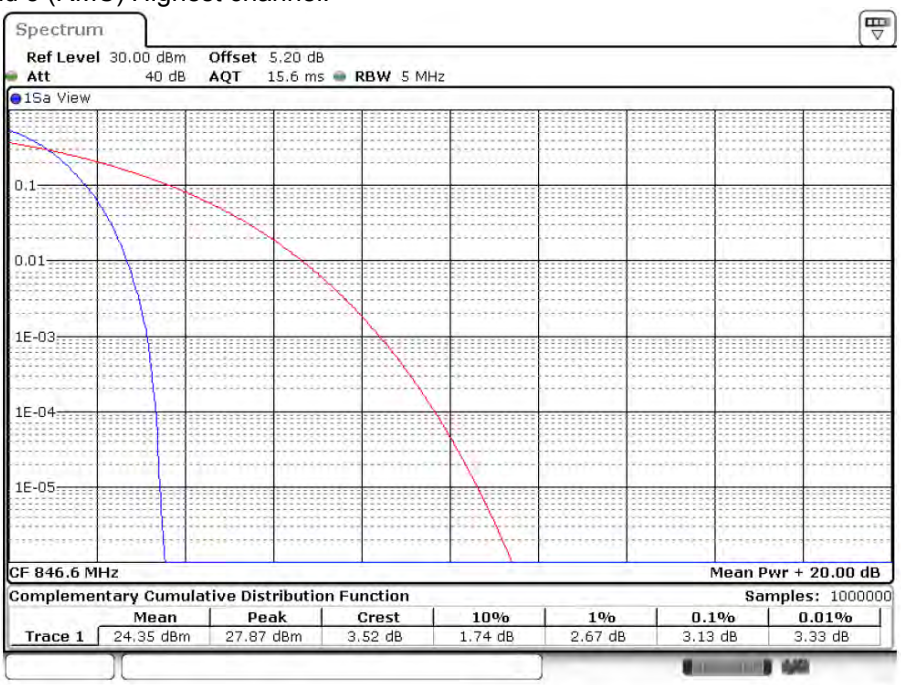


WCDMA Band 5 (RMC) Lowest channel

WCDMA Band 5 (RMC) Middle channel



WCDMA Band 5 (RMC) Highest channel:



5.4. Frequency Stability

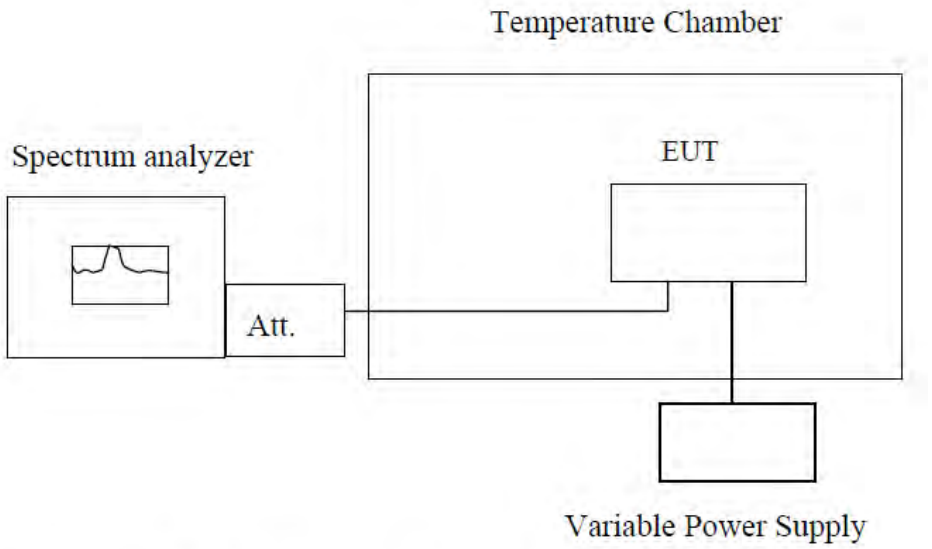
5.4.1. Limit

According to FCC section 22.355 and FCC section 24.235, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. According to FCC section 2.1055, the test conditions are:

(a) The temperature is varied from -40℃ to +80℃ at intervals of not more than 10℃.

(b) For hand carried battery powered equipment, the primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacture. The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided.

5.4.2. Test Setup



Note : Measurement setup for testing on Antenna connector

The EUT, which is powered by the DC Power Supply directly, is located in the Temperature Chamber.

The EUT is commanded by the System Simulator (SS) to operate at the maximum output power

5.4.3. Test Result

The nominal, highest and lowest extreme voltages are separately 3.7VDC, 4.25VDC and 3.34VDC which are specified by the applicant; the normal temperature here used is 25℃. The frequency deviation limit of 850MHz band is ±2.5ppm, and 1900MHz is ±1ppm

For LTE mode, only test the max bandwidth.

The table and plot please see annex.

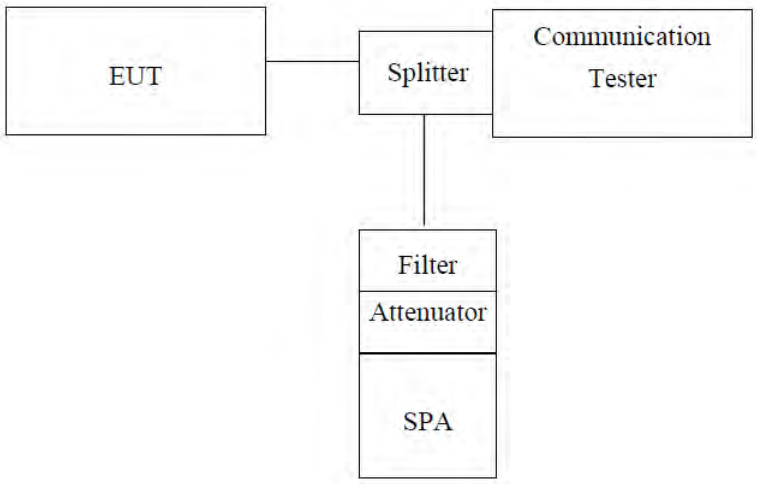
Test Conditions			Frequency Deviation			Result
Band	Power(Vdc)	Temperature(℃)	Frequency Error(Hz)	ppm	Limit	
WCDMA Band 2 Middle channel 1880MHz	3.7	-40	54	0.0287	±1	PASS
	3.7	-30	41	0.0218		
	3.7	-20	35	0.0186		
	3.7	-10	43	0.0229		
	3.7	0	26	0.0138		
	3.7	10	21	0.0112		
	3.7	20	23	0.0122		
	3.7	30	56	0.0298		
	3.7	40	65	0.0346		
	3.7	50	57	0.0303		
	3.7	60	75	0.0399		
	3.7	70	53	0.0282		
	3.7	80	67	0.0356		
	4.25	25	61	0.0324		
	3.70	25	54	0.0287		
	3.33	25	49	0.0261		
WCDMA Band 5 Middle channel 836.6MHz	3.7	-40	64	0.0765	±1	PASS
	3.7	-30	73	0.0873		
	3.7	-20	43	0.0514		
	3.7	-10	65	0.0777		
	3.7	0	74	0.0885		
	3.7	10	53	0.0634		
	3.7	20	24	0.0287		
	3.7	30	66	0.0789		
	3.7	40	57	0.0681		
	3.7	50	64	0.0765		
	3.7	60	61	0.0729		
	3.7	70	58	0.0693		
	3.7	80	39	0.0466		
	4.25	25	63	0.0753		
	3.70	25	53	0.0634		
	3.33	25	76	0.0908		

5.5. Conducted Spurious Emissions

5.5.1. Limit

According to FCC section 22.917(a) and FCC section 24.238(a), 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. This calculated to be -13dBm.

5.5.2. Test Setup



Note: *Measurement setup for testing on Antenna connector*

5.5.3. Measurement Procedure

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 1MHz, sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.

For the out of band: Set the RBW, VBW = 100KHz, Start=30MHz, Stop= 10th harmonic.

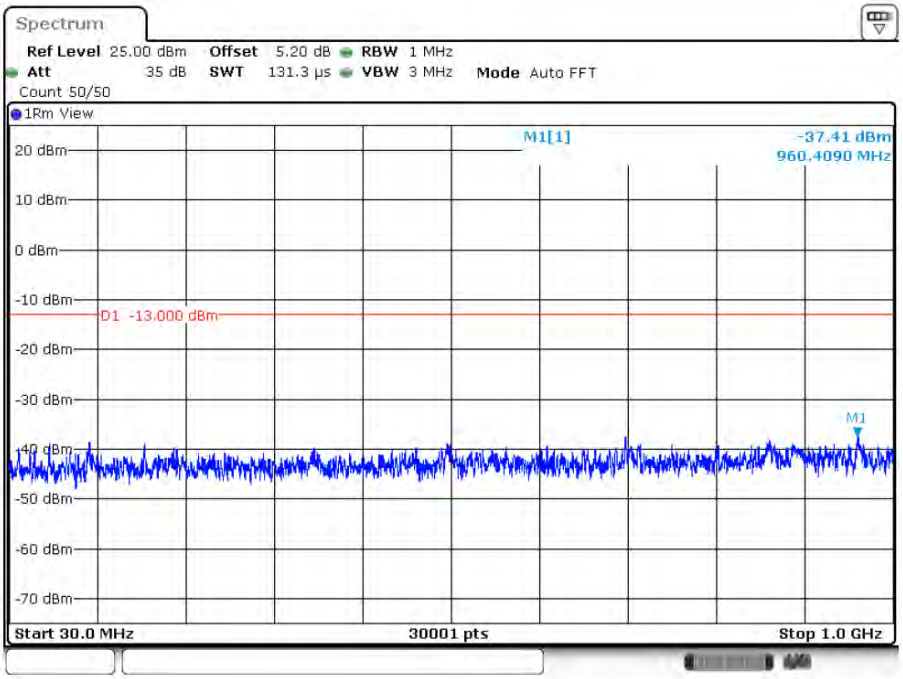
Limit = -13dBm

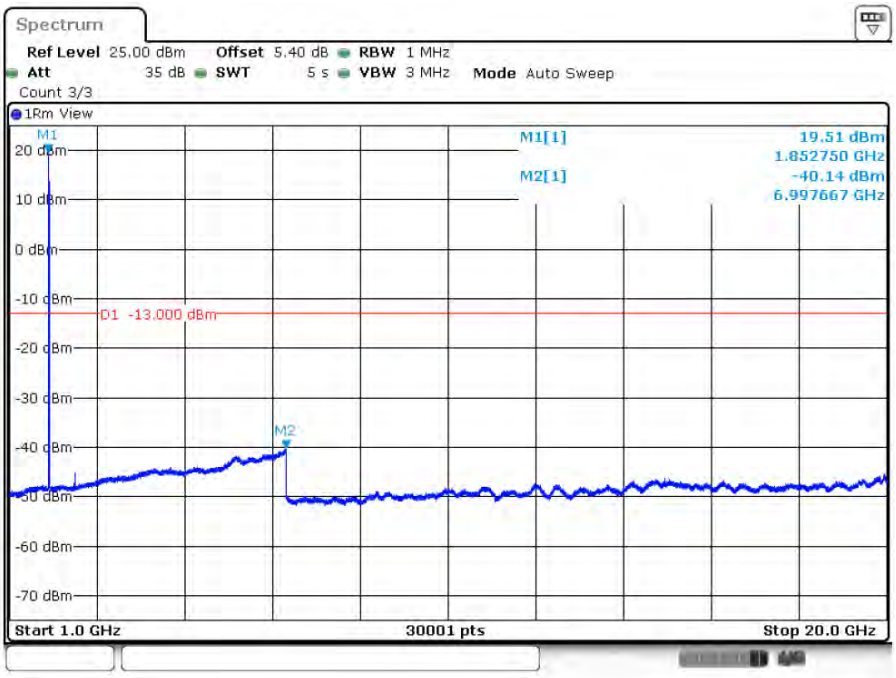
5.5.4. Test Result

The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the out of band emissions.

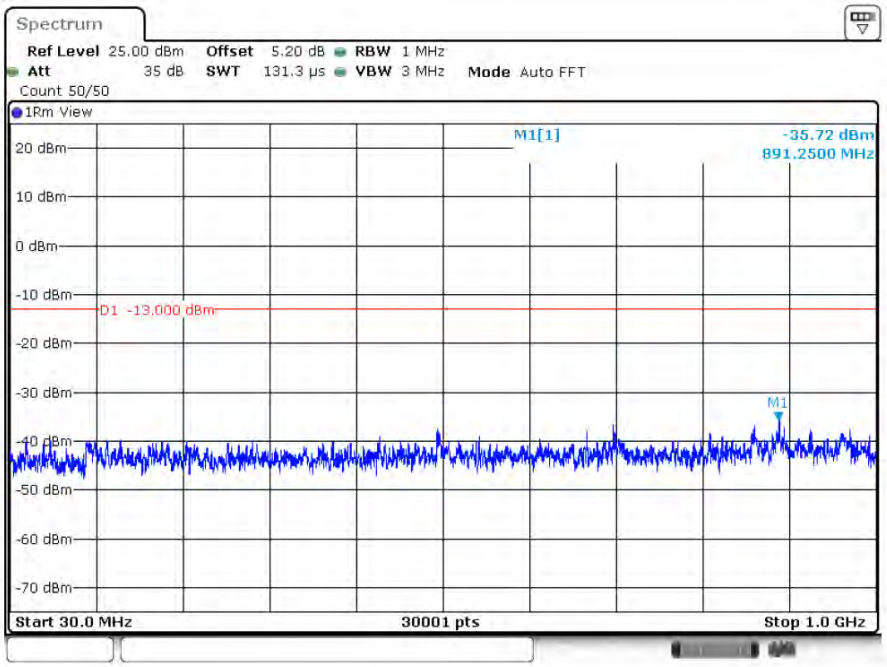
Pass,

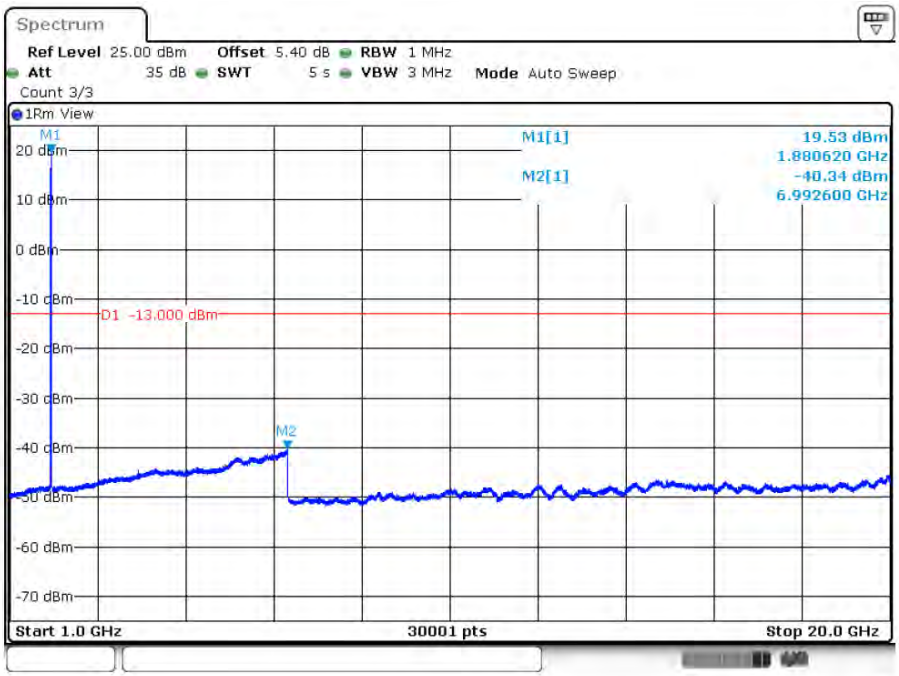
WCDMA Band 2 Lowest channel



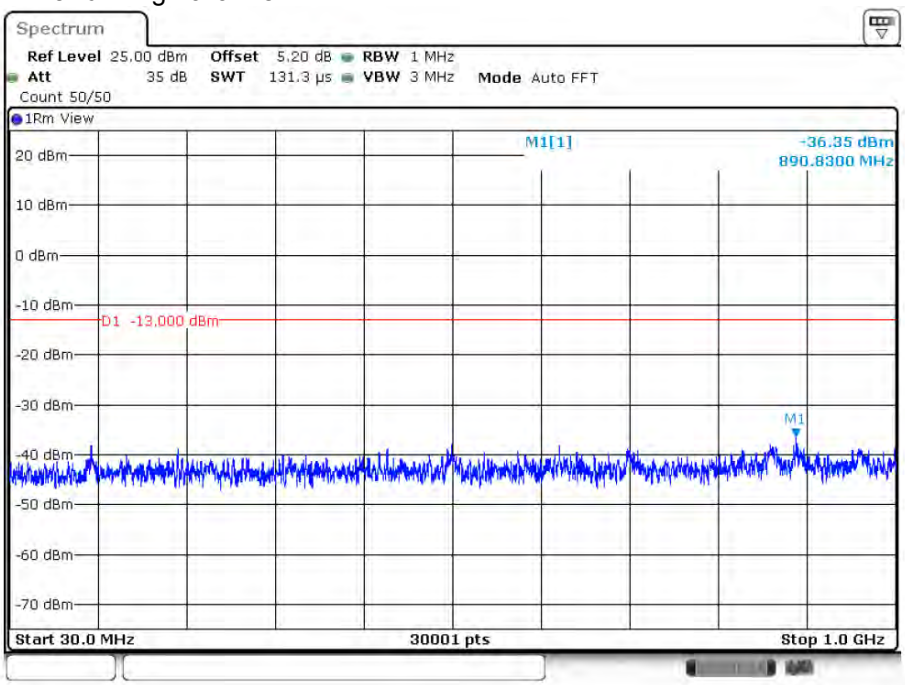


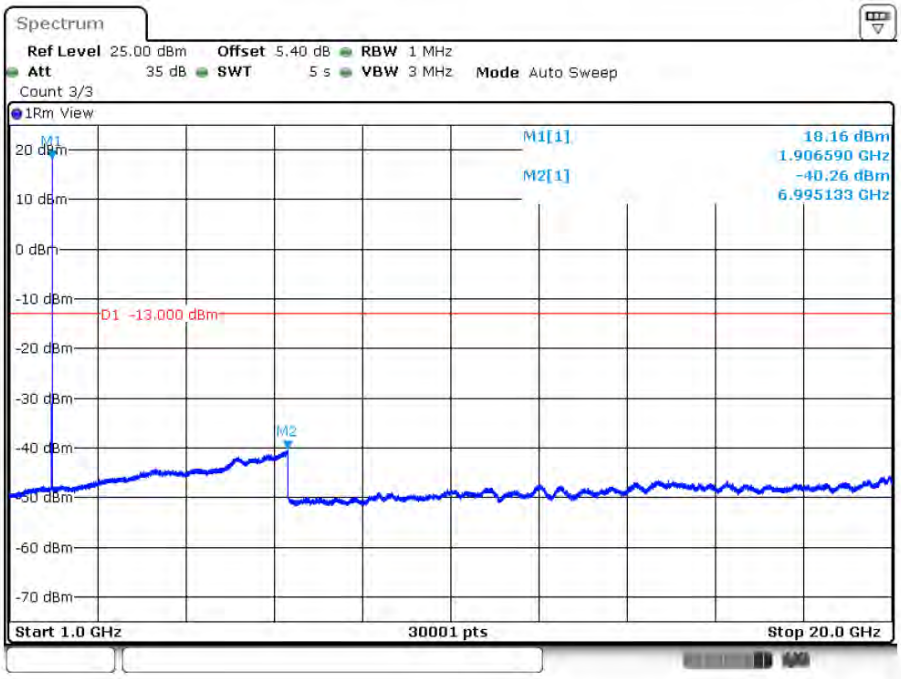
WCDMA Band 2 middle channel



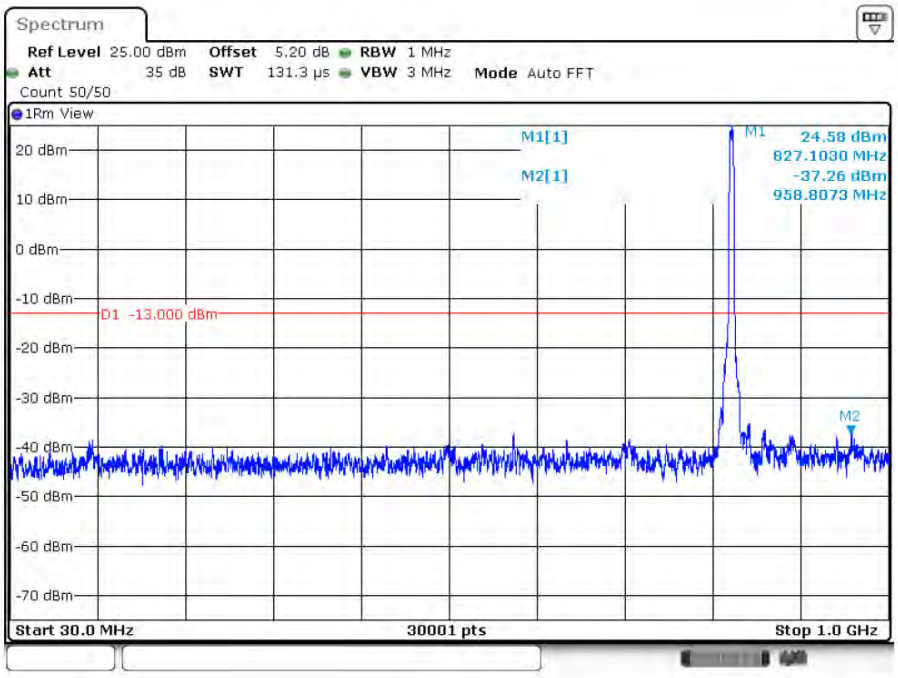


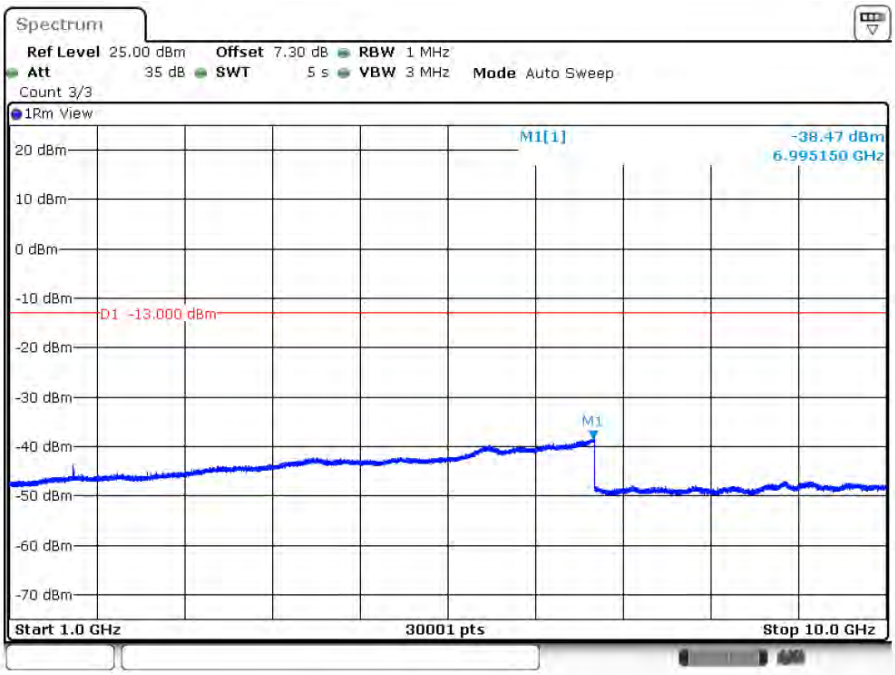
WCDMA Band 2 high channel



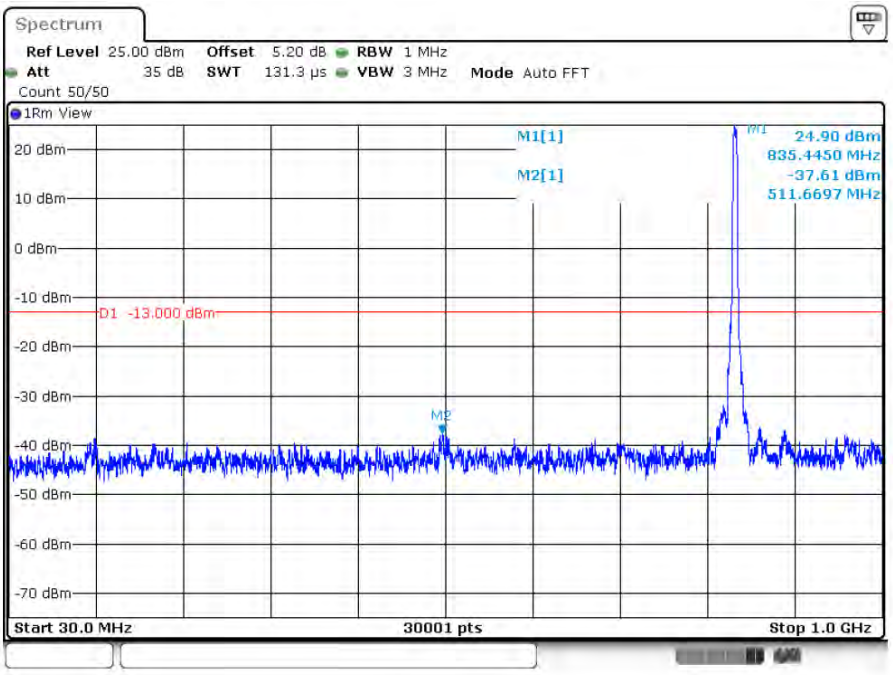


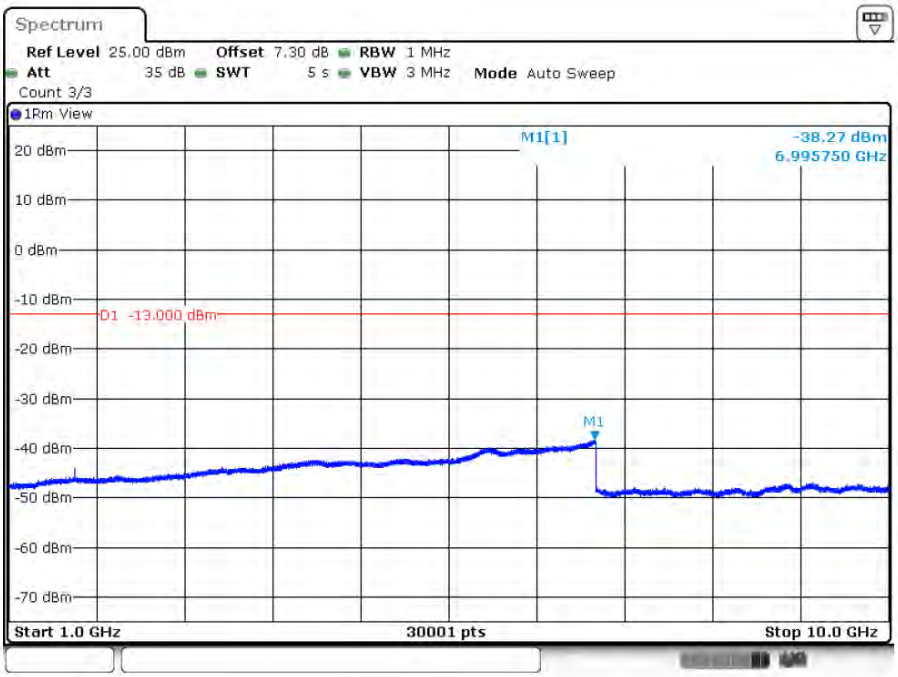
WCDMA Band 5 Lowest channel



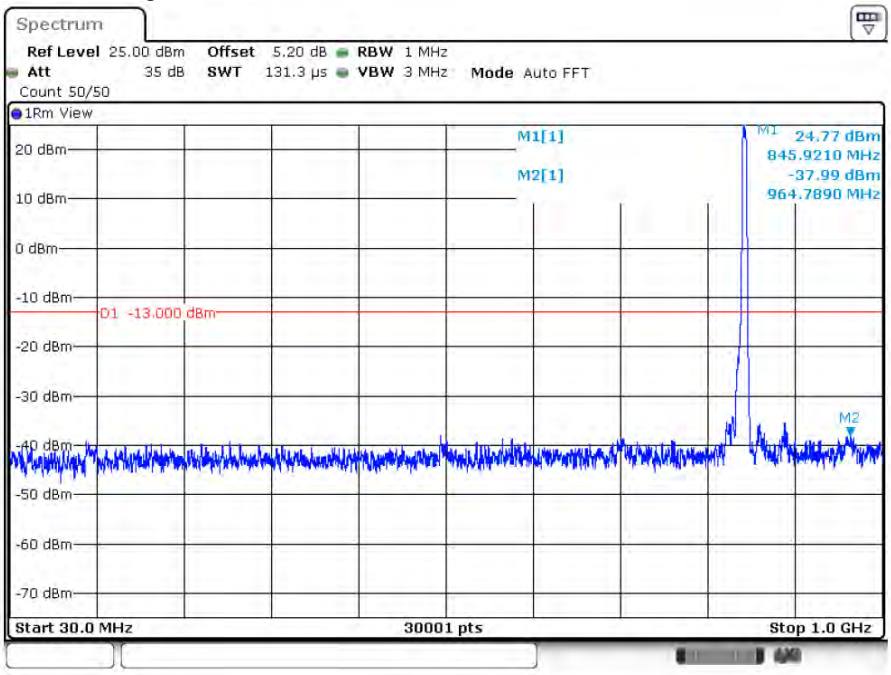


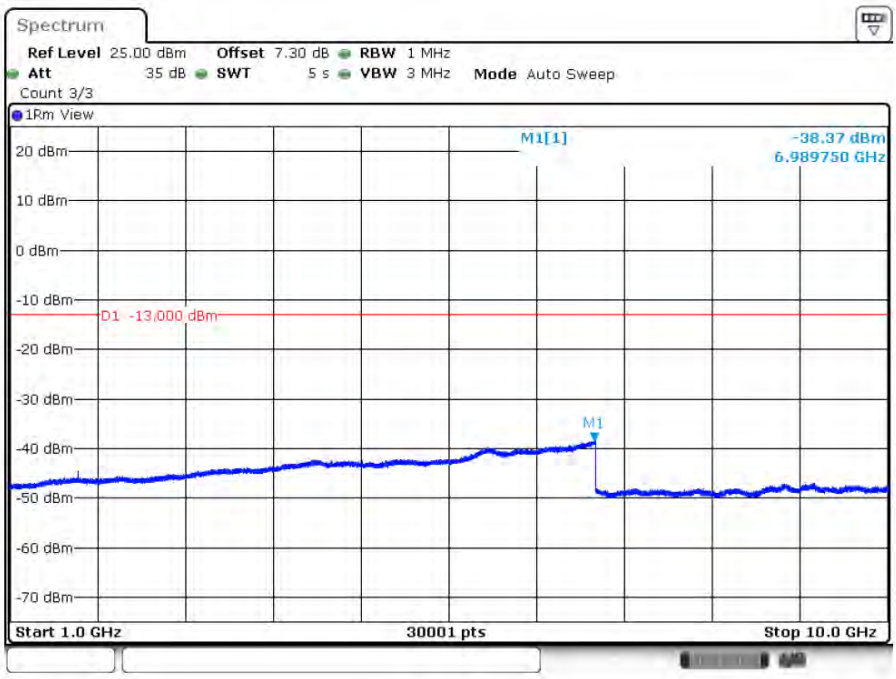
WCDMA Band 5 middle channel





WCDMA Band 5 high channel



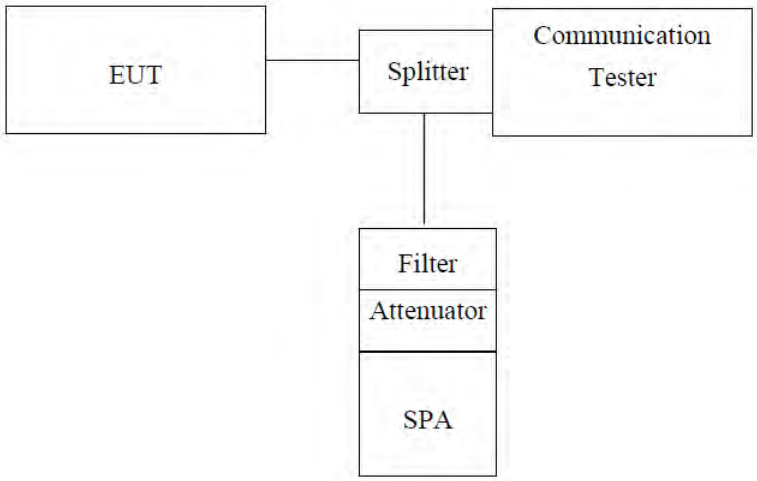


5.6. Conducted Out of Band Emissions

5.6.1. Limit

According to FCC section 22.917(b) and FCC section 24.238(b), 27.53(g)(h) in the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth (26dB emission bandwidth) of the fundamental emission of the transmitter may be employed.

5.6.2. Test Setup



Note: *Measurement setup for testing on Antenna connector*

5.6.3. Measurement Procedure

The EUT, which is powered by the adapter, is coupled to the Spectrum Analyzer and the System Simulator with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the System Simulator to operate at the maximum output power i.e. Power Control Level (PCL) = 5 and Power Class = 4. A call is established between the EUT and the System Simulator.

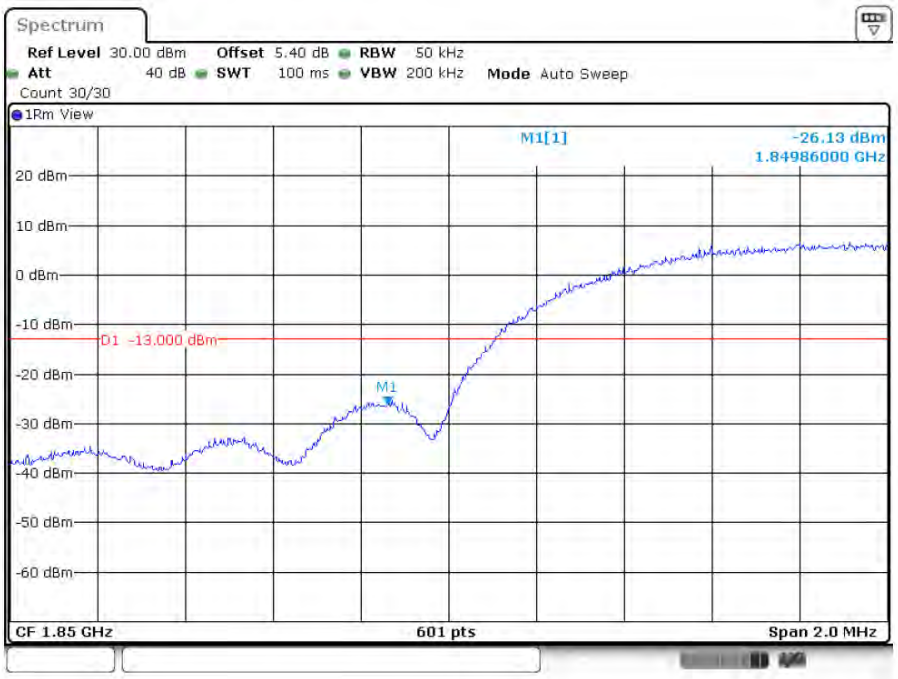
RBW is set to 3kHz,VBW is set to 10kHz for GSM 850, GSM 1900
RBW is set to 51kHz,VBW is set to 160kHz for WCDMA Band 5, WCDMA Band 2
RBW is set to 15 kHz, VBW is set to 51 kHz for LTE Band 2, LTE Band 4,LTE Band 5 (1.4MHz),
RBW is set to 30 kHz, VBW is set to 100 kHz for LTE Band 2, LTE Band 4,LTE Band 5 (3MHz),
RBW is set to 51 kHz, VBW is set to 160 kHz for LTE Band 2, LTE Band 4,LTE Band 5 (5MHz),
RBW is set to 100 kHz, VBW is set to 300 kHz for LTE Band 2, LTE Band 4,LTE Band 5 (10MHz),
RBW is set to 150 kHz, VBW is set to 510 kHz for LTE Band 2, LTE Band 4 (15MHz).
RBW is set to 200 kHz, VBW is set to 620 kHz for LTE Band 2, LTE Band 4 (20MHz)
RBW is set to 50 kHz, VBW is set to 200 kHz for LTE Band 7 (5MHz).
RBW is set to 100 kHz, VBW is set to 300kHz for LTE Band 7 (10MHz).
RBW is set to 200 kHz, VBW is set to 1MHz for LTE Band 7 (15MHz/20MHz)

5.6.4. Test Result

The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the out of band emissions.

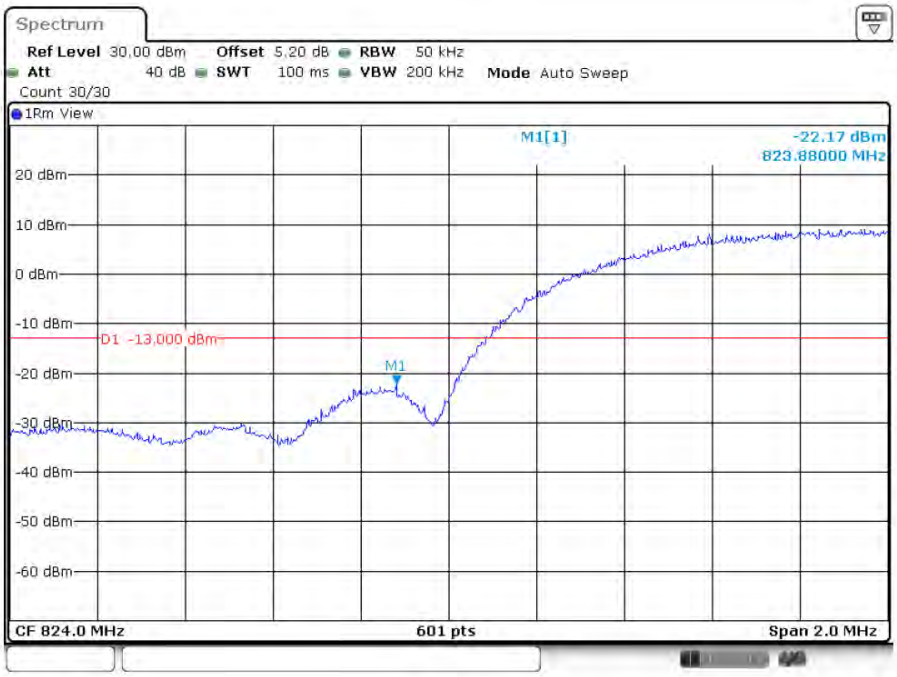
Pass.

WCDMA Band 2 RMC Lowest channel



WCDMA Band 2 RMC Highest channel:

WCDMA Band 5 RMC Lowest channel



WCDMA Band 5 RMC Highest channel:

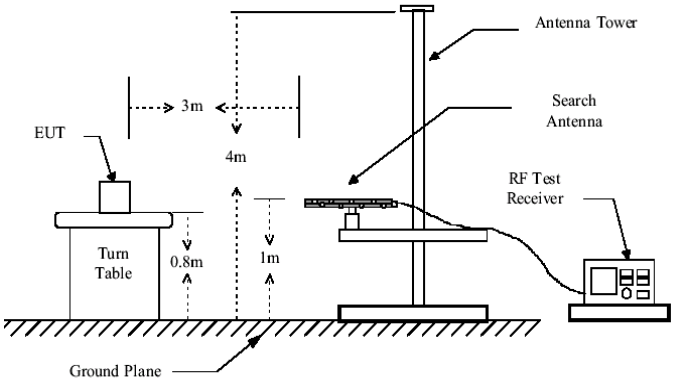
5.7. Transmitter Radiated Power (EIRP/ERP)

5.7.1. Limit

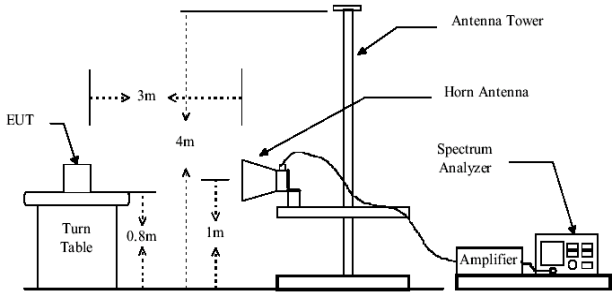
According to FCC section 22.913, the Effective Radiated Power (ERP) of mobile transmitters and auxiliary test transmitters must not exceed 7Watts, and FCC section 24.232, the broadband PCS mobile station is limited to 2 Watts e.i.r.p. peak power.

5.7.2. Test Setup

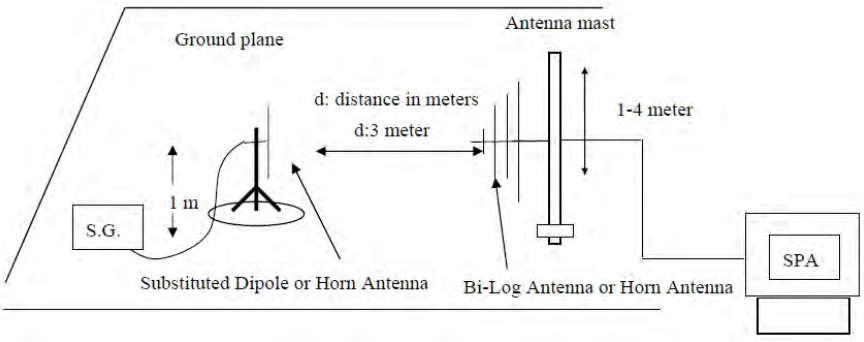
Below 1GHz



Above 1GHz



Substituted method:



5.7.3. Measurement Procedure

The EUT was placed on an non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer. all test in Full-Anechoic Chamber.

During the measurement, the EUT was communication with the station. The highest emission was recorded with the rotation of the turntable and the lowering of the test antenna from 4m to 1m. The reading was recorded and the field strength (E in dBuV/m) was calculated.

ERP in frequency band 824.2 –848.80.8MHz were measured using a substitution method. The EUT was replaced by dipole antenna connected, the S.G. output was recorded and ERP was calculated as follows:

EIRP in frequency band 1850.2 –1909.8MHz were measured using a substitution method. The EUT was replaced by or horn antenna connected, the S.G. output was recorded and EIRP was calculated as follows:

ERP = S.G. output (dBm) + Antenna Gain (dBi) – Cable Loss (dB)

EIRP = S.G. output (dBm) + Antenna Gain (dBi) – Cable Loss (dB)

5.7.4. Test Result

Pass, the table and plot please see annex.

EUT mode	Channel	Antenna Pol.	S.G. output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)	Result
WCDMA Band 2	Lowest	V	7.06	19.33	2.52	23.87	33.00	Pass
		H	7.22	19.33	2.52	24.03		
	Middle	V	7.48	19.50	2.60	24.38	33.00	Pass
		H	**7.31**	**19.50**	**2.60**	**24.21**		
	Highest	V	6.76	19.94	2.71	23.99	33.00	Pass
		H	6.69	19.94	2.71	23.92		

EUT mode	Channel	Antenna Pol.	S.G. output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)	Result
WCDMA Band 5	Lowest	V	6.89	15.68	1.65	20.92	38.45	Pass
		H	5.94	15.68	1.65	19.97		
	Middle	V	7.45	15.70	1.67	21.48	38.45	Pass
		H	6.34	15.70	1.67	20.37		
	Highest	V	**8.11**	**15.70**	**1.71**	**22.10**	38.45	Pass

5.8. Radiated Out of Band Emissions

5.8.1. Limit

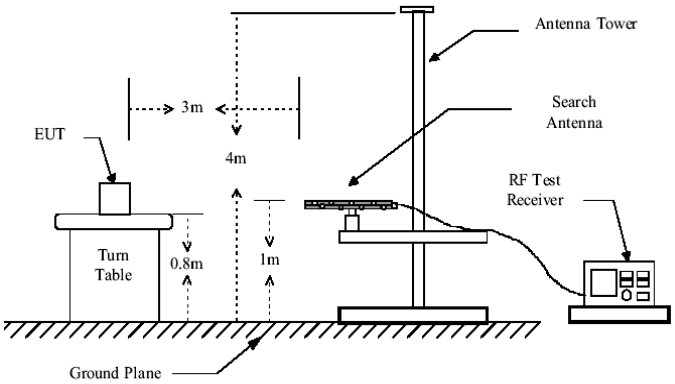
According to FCC section 22.917(a) and section 24.238(a), 27.53(g) the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power

(P) by a factor of at least 43+10*log(P)dB. This calculated to be -13dBm.

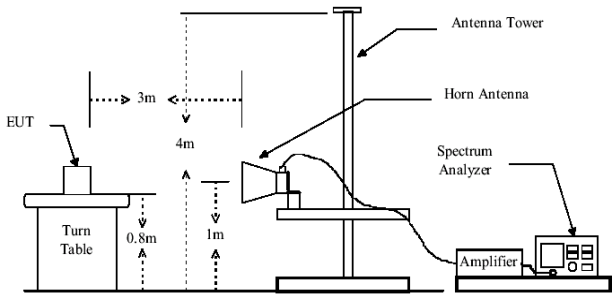
The spurious emission with frequency band 1900 according to FCC section 2.1057.

5.8.2. Test Setup

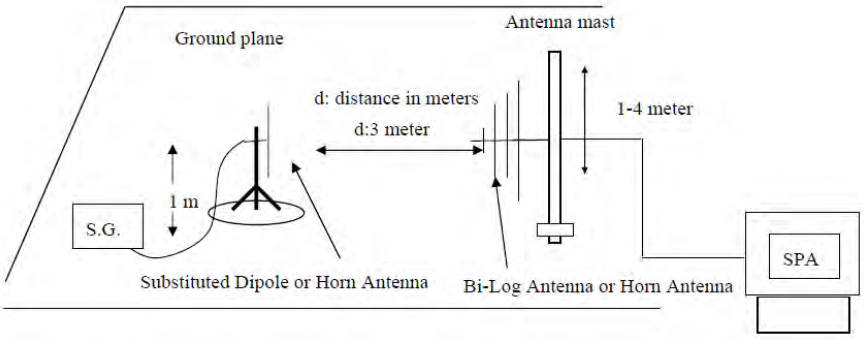
Below 1GHz



Above 1GHz



Substituted method:



5.8.3. Measurement Procedure

The EUT was placed on a non-conductive, The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations. all test in Full-Anechoic Chamber.

The frequency range up to tenth harmonic was investigated for each of three fundamental frequency (low, middle and high channels). Once spurious emission was identified, the power of the emission was determined using the substitution method.

The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency.

EIRP (Level)= S.G. output (dBm) + Antenna Gain(dBi) – Cable Loss (dB)

Note: Measurement Uncertainty: ±3.6 dB.

The data show only the worst results, and the other results are very low and not shown in the report.

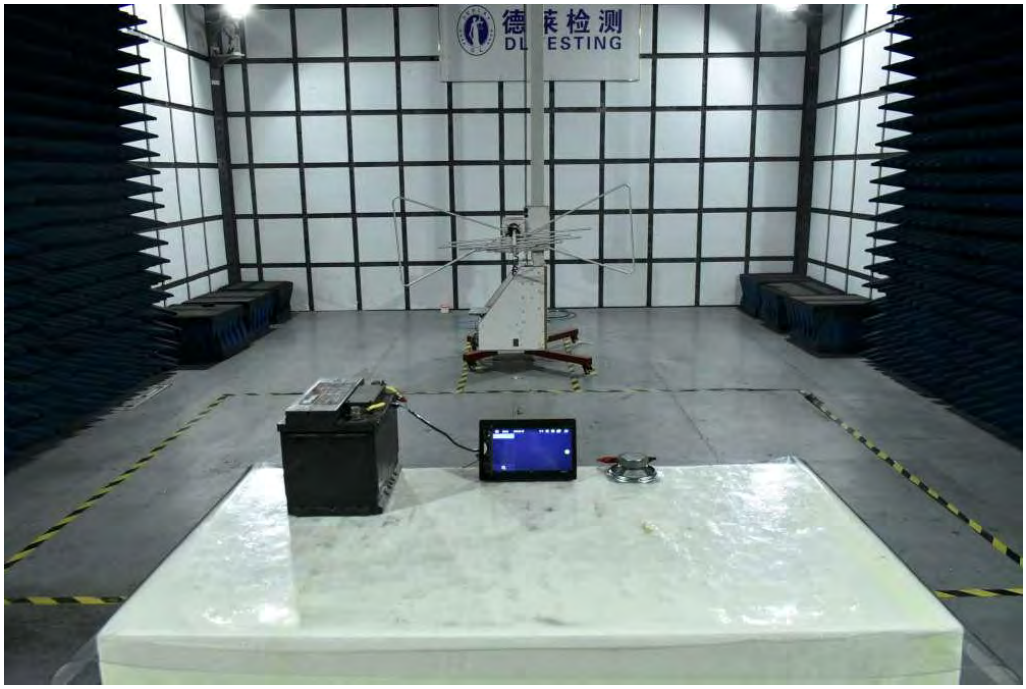
5.8.4. Test Result

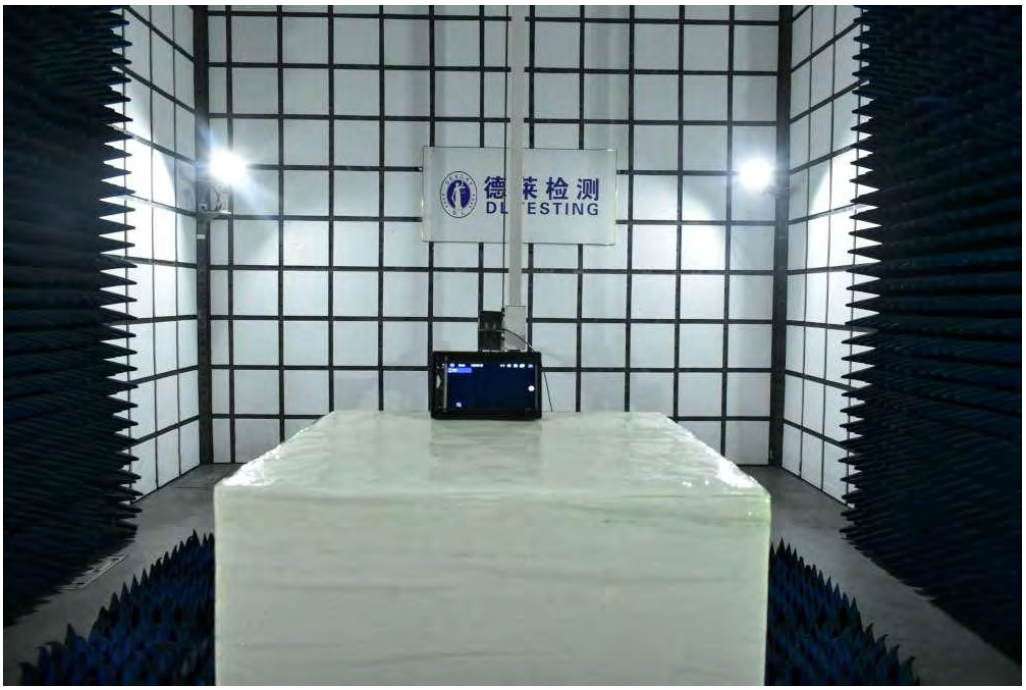
Band	Frequency (MHz)	Spurious Emission					Limit (dBm)	Result
		Polarization	S.G. output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Level (dBm)		
WCDMA Band 2 Lowest	156.44	Vertical	-74.43	3.35	0.38	-71.46	-13	PASS
	3704.80	Vertical	-45.56	7.76	3.75	-41.55		
	5557.20	Vertical	-46.65	9.84	4.94	-41.75		
	7409.60	Vertical	-39.19	10.21	5.32	-34.30		
	9262.00	Vertical	-42.52	11.36	6.02	-37.18		
	11114.40	Vertical	-44.04	14.52	6.68	-36.20		
WCDMA Band 2 Middle	154.38	Vertical	-74.43	3.35	0.38	-71.46	-13	PASS
	3760.00	Vertical	-46.86	7.76	3.75	-42.85		
	5640.00	Vertical	-46.46	9.84	4.94	-41.56		
	7520.00	Vertical	-42.14	10.21	5.32	-37.25		
	9400.00	Vertical	-41.56	11.36	6.02	-36.22		
	11280.00	Vertical	-45.46	14.52	6.68	-37.62		
WCDMA Band 2 Highest	155.21	Vertical	-74.39	3.35	0.38	-71.42	-13	PASS
	3819.60	Vertical	-46.46	7.79	3.53	-42.20		
	5729.40	Vertical	-41.00	9.88	5.02	-36.14		
	7639.20	Vertical	-37.25	10.25	5.54	-32.54		
	9549.00	Vertical	-44.01	11.38	6.16	-38.79		
	11458.80	Vertical	-46.41	14.56	6.72	-38.57		

Band	Frequency (MHz)	Spurious Emission					Limit (dBm)	Result
		Polarization	S.G. output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	Level (dBm)		
WCDMA Band 5 Lowest	96.56	Vertical	-75.13	3.35	0.38	-72.16	-13	PASS
	1652.80	Vertical	-29.08	6.51	1.35	-23.92		
	2479.20	Vertical	-35.23	6.88	2.53	-30.88		
	3305.60	Vertical	-37.08	7.61	3.67	-33.14		
	4132.00	Vertical	-45.14	8.67	4.06	-40.53		
	4958.40	Vertical	-39.72	9.35	4.38	-34.75		
WCDMA Band 5 Lowest	98.67	Vertical	-75.08	3.35	0.38	-72.11	-13	PASS
	1670.00	Vertical	-32.01	6.58	1.38	-26.81		
	2505.00	Vertical	-32.55	6.92	2.57	-28.20		
	3340.00	Vertical	-39.98	7.67	3.72	-36.03		
	4175.00	Vertical	-47.49	8.75	4.19	-42.93		
	5010.00	Vertical	-43.03	9.48	4.45	-38.00		
WCDMA Band 5 Lowest	99.45	Vertical	-74.76	3.35	0.38	-71.79	-13	PASS
	1693.20	Vertical	-30.90	6.57	1.48	-25.81		
	2539.80	Vertical	-32.81	6.96	2.67	-28.52		
	3386.40	Vertical	-35.94	7.68	3.78	-32.04		
	4233.00	Vertical	-41.23	8.76	4.24	-36.71		
	5079.60	Vertical	-46.61	9.47	4.63	-41.77		

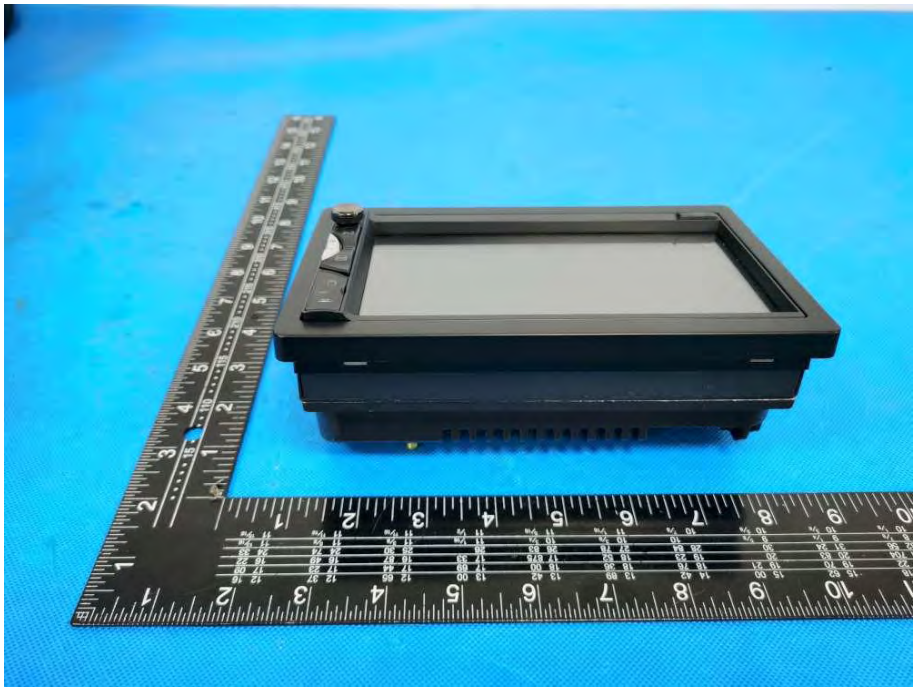
6. PHOTOGRAPHS OF TEST SET-UP

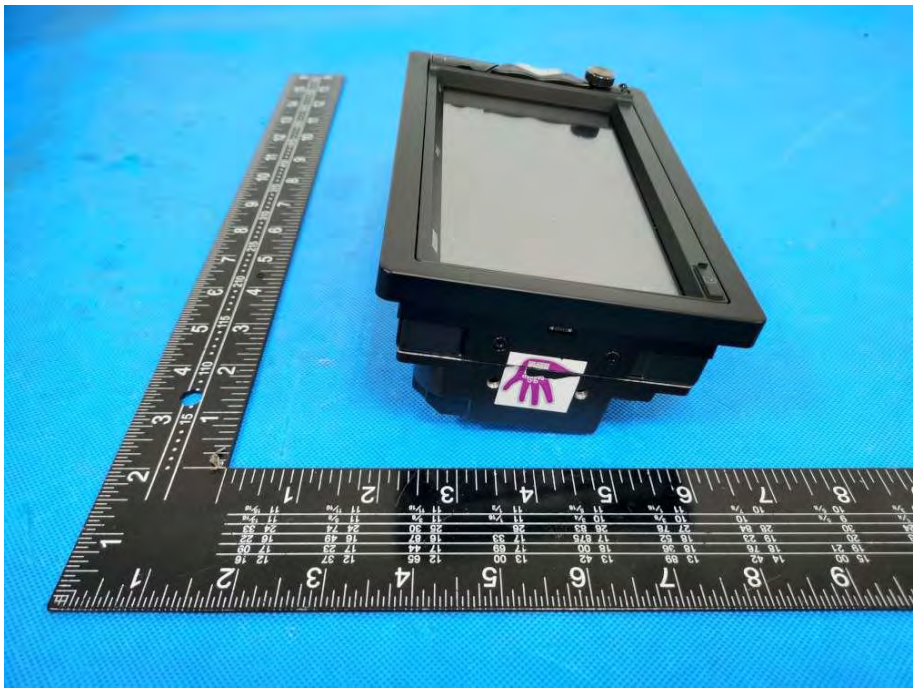
RE

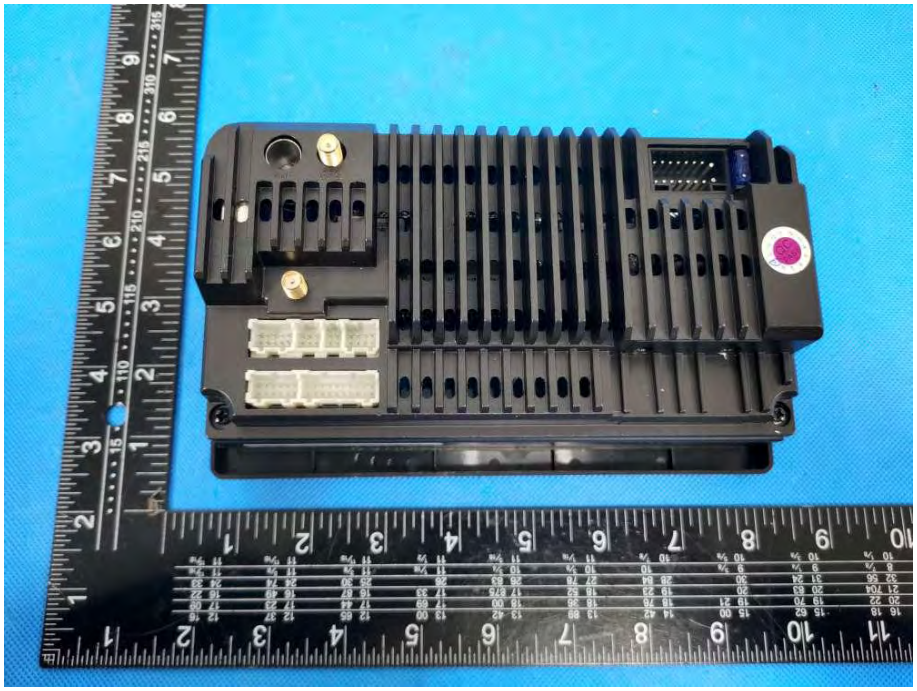


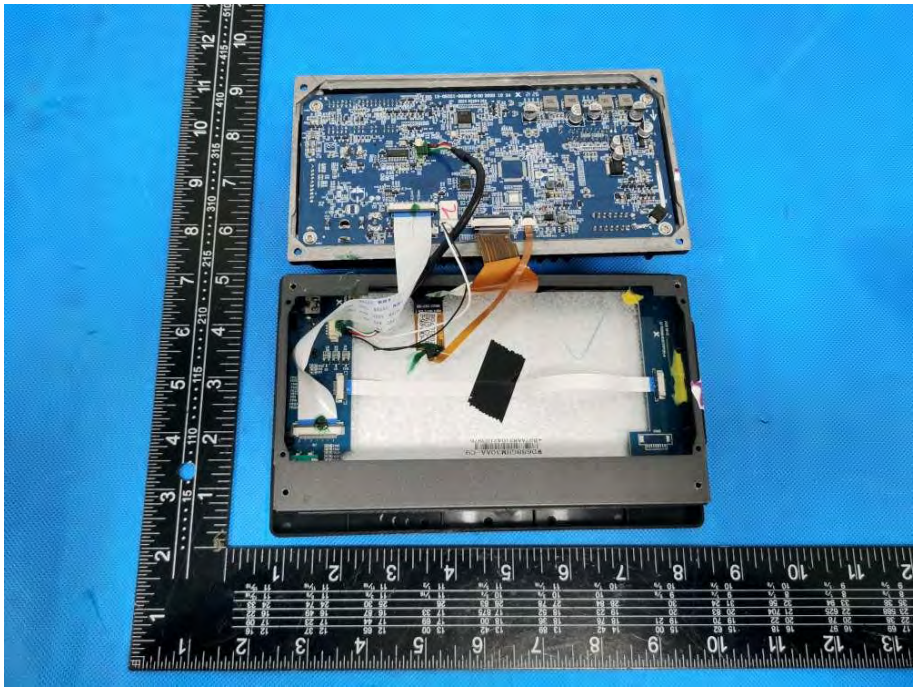


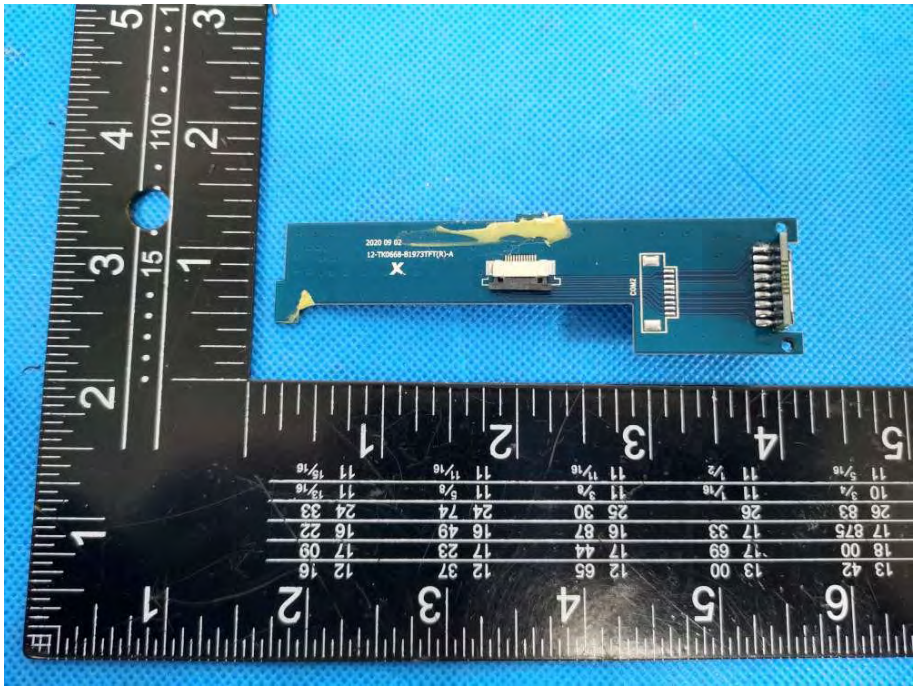
7. PHOTOGRAPHS OF THE EUT

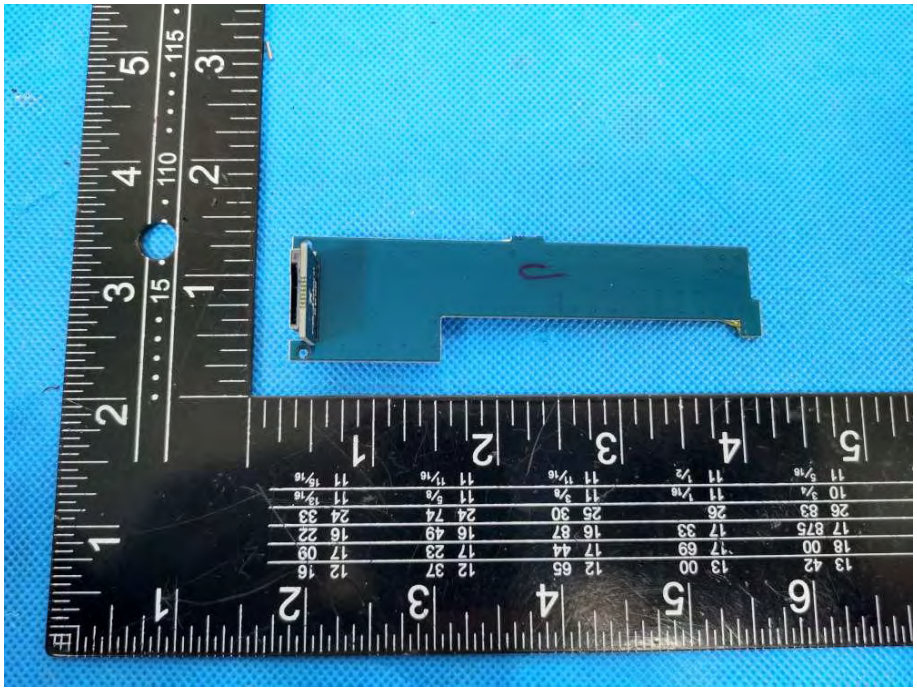


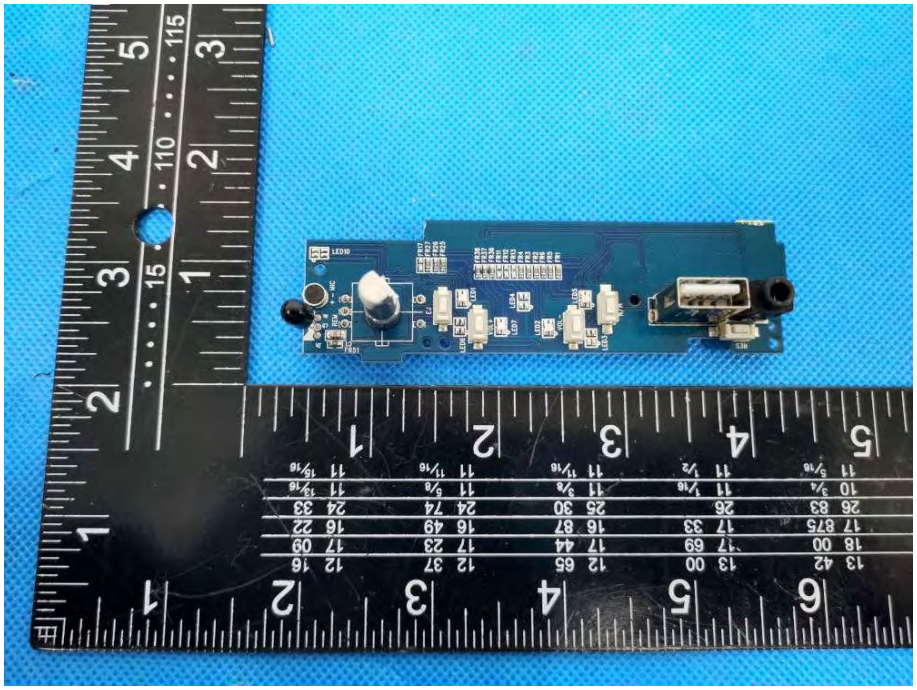


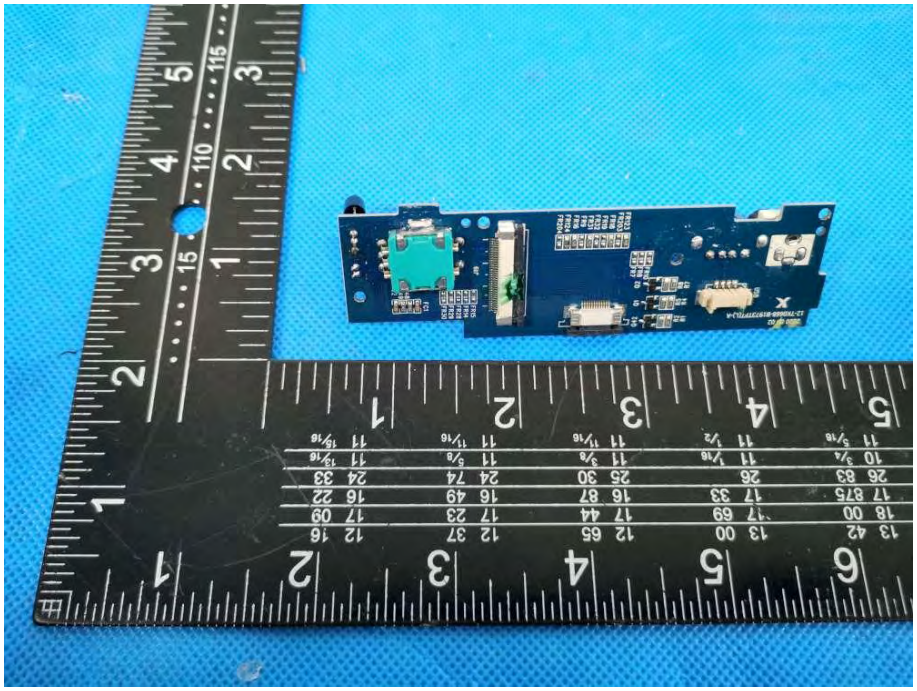


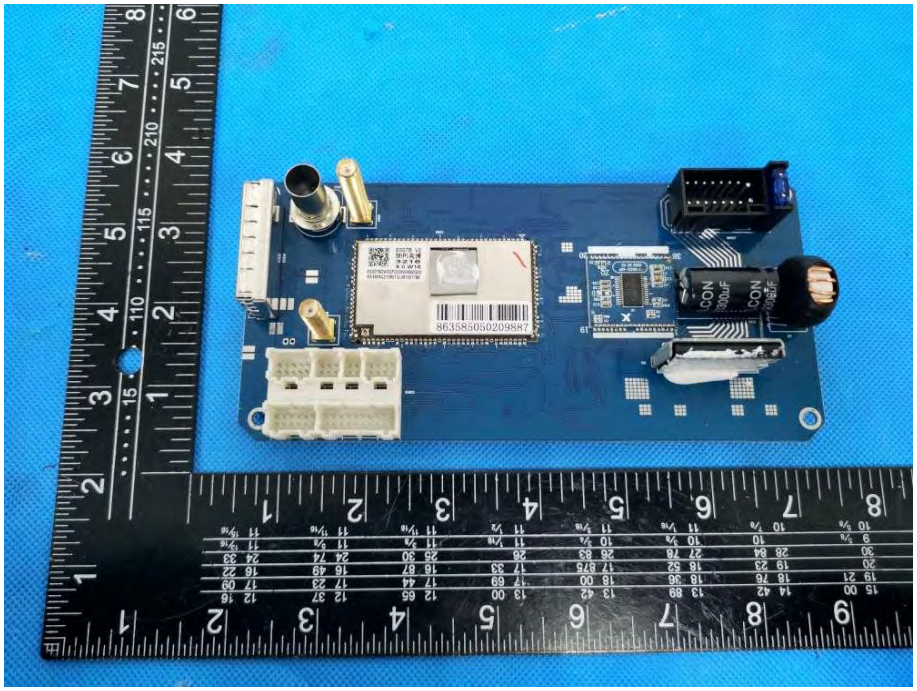


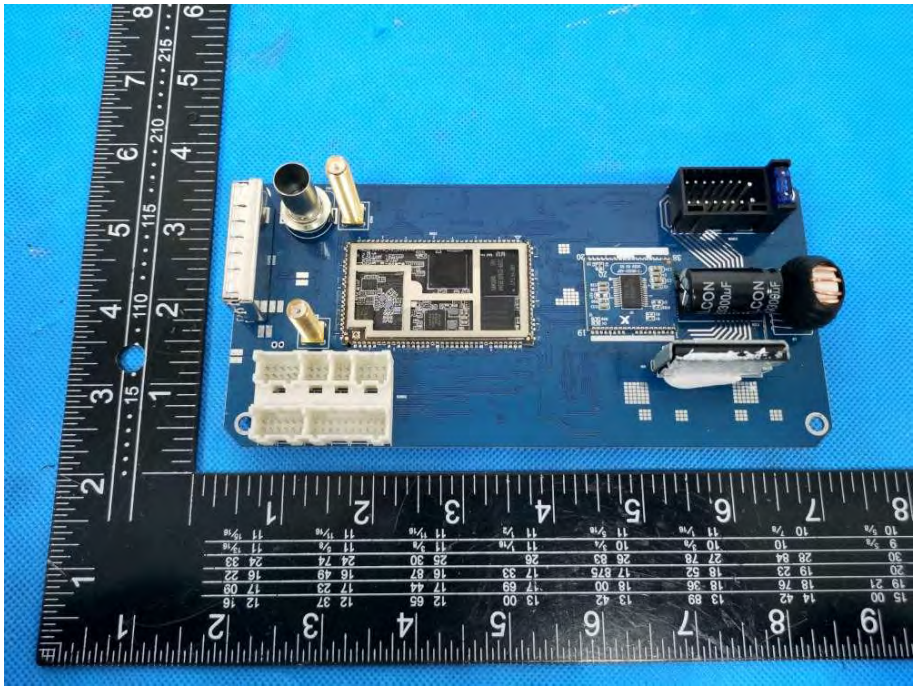


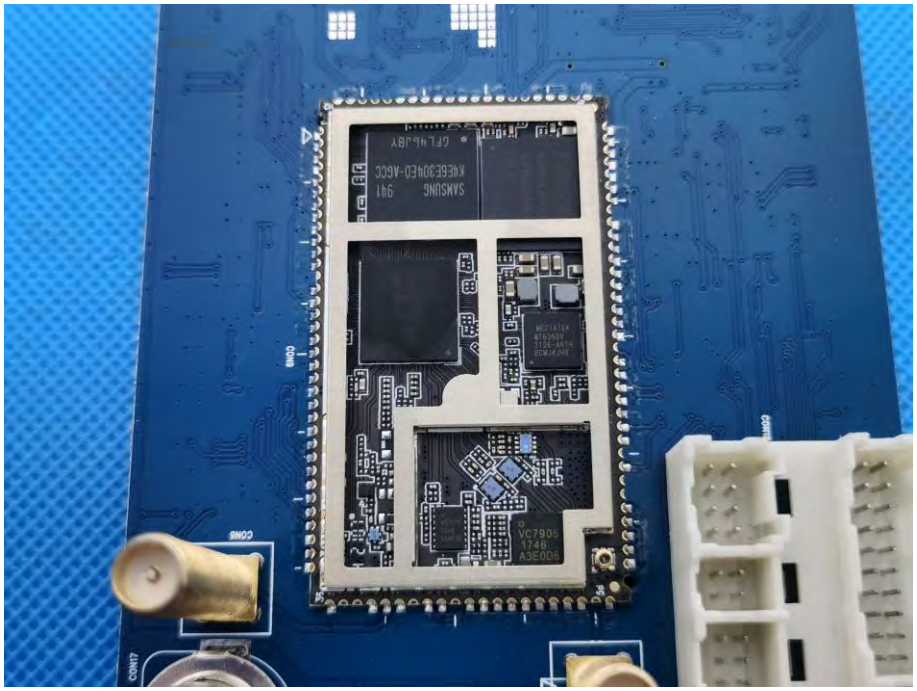












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