APPLICATION CERTIFICATION FCC Part 22&24
On Behalf of
IMC INTERNATIONAL INC.

4 inch 3G TABLET
Model No.: ICE

FCC ID: 2ACI7-ICE

Prepared for	:	IMC INTERNATIONAL INC.
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Prepared by	:	ACCURATE TECHNOLOGY CO., LTD
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Report No.	:	ATE20141086
Date of Test	:	Jun 18, 2014- July 11, 2014
Date of Report	:	July 11, 2014

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Test Report Certification

Applicant : IMC INTERNATIONAL INC.

Manufacturer : IMC INTERNATIONAL INC.

EUT Description : 4 inch 3G TABLET

(A) MODEL NO.: ICE

(B) Trade Name.: /

(C) POWER SUPPLY: DC 3.7V (Powered by battery) or AC 120V/60Hz (Powered by adapter)

Measurement Procedure Used:

FCC Rules and Regulations Part 22 Subpart H - Public Mobile Services
Part 24 Subpart E - Personal Communication Services
TIA 603-D

The device described above is tested by ACCURATE TECHNOLOGY CO. LTD to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 22H&24E limits. The measurement results are contained in this test report and ACCURATE TECHNOLOGY CO. LTD is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of ACCURATE TECHNOLOGY CO. LTD.

Date of Test : Jun 18, 2014-July 11, 2014

Prepared by : Tim Zhang
(Tim.zhang, Engineer)

Approved & Authorized Signer :
(Sean Liu, Manager)

1. GENERAL INFORMATION

1.1.Description of Device (EUT)

EUT	:	4 inch 3G TABLET
Model Number	:	ICE
Number of channels	:	FDD V: 826.4-846.6 MHz 278 Channels FDD II : 1852.4-1907.6 MHz 103 Channels
Frequency	:	UMTS FDD Bands:II/V, HSDPA, HSUPA
Antenna Gain	:	1.5dBi
Type of Antenna	:	Integral Antenna
Power Supply	:	DC 3.7V (Powered by Battery) AC 120V/60Hz (Powered by Adapter)
Adapter	:	Model:UBP-A806-051000 Input: AC 100-240VAC 50/60Hz Output: 5.0V 1.0A
Applicant	:	IMC INTERNATIONAL INC.
Address	:	28E Jingang, xixiang,Bao an District, Shenzhen, Guangdong Province, China
Manufacturer	:	IMC INTERNATIONAL INC.
Address	:	28E Jingang, xixiang,Bao an District, Shenzhen, Guangdong Province, China
Date of sample received	:	Jun 18, 2014
Date of Test	:	Jun 18, 2014-July 11, 2014

1.2.Description of Test Facility

EMC Lab	:	Accredited by TUV Rheinland Shenzhen Listed by FCC The Registration Number is 752051 Listed by Industry Canada The Registration Number is 5077A-2 Accredited by China National Accreditation Committee for Laboratories The Certificate Registration Number is L3193
Name of Firm	:	ACCURATE TECHNOLOGY CO. LTD
Site Location	:	F1, Bldg. A, Changyuan New Material Port, Keyuan Rd. Science & Industry Park, Nanshan, Shenzhen, Guangdong P.R. China

1.3.Measurement Uncertainty

Conducted Emission Expanded Uncertainty	=	2.23dB, k=2
Radiated emission expanded uncertainty (9kHz-30MHz)	=	3.08dB, k=2
Radiated emission expanded uncertainty (30MHz-1000MHz)	=	4.42dB, k=2
Radiated emission expanded uncertainty (Above 1GHz)	=	4.06dB, k=2

2. MEASURING DEVICE AND TEST EQUIPMENT

Table 1: List of Test and Measurement Equipment

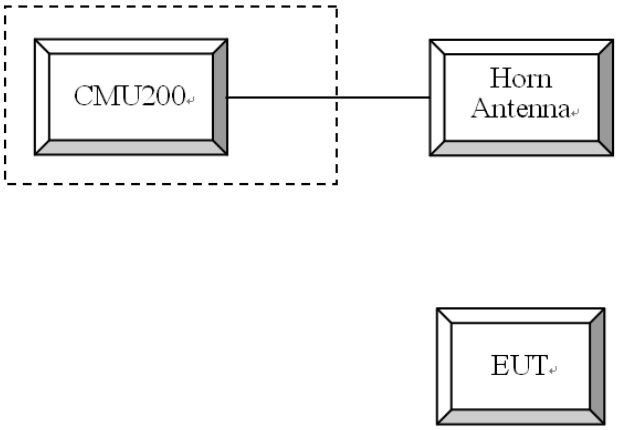
Kind of equipment	Manufacturer	Type	S/N	Calibrated dates	Calibrated until
EMI Test Receiver	Rohde&Schwarz	ESCS30	100307	Jan. 11, 2014	Jan. 10, 2015
EMI Test Receiver	Rohde&Schwarz	ESPI3	101526/003	Jan. 11, 2014	Jan. 10, 2015
Spectrum Analyzer	Agilent	E7405A	MY45115511	Jan. 11, 2014	Jan. 10, 2015
Pre-Amplifier	Rohde&Schwarz	CBLU1183540-01	3791	Jan. 11, 2014	Jan. 10, 2015
Loop Antenna	Schwarzbeck	FMZB1516	1516131	Jan. 15, 2014	Jan. 14, 2015
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Jan. 15, 2014	Jan. 14, 2015
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Jan. 15, 2014	Jan. 14, 2015
Horn Antenna	Schwarzbeck	BBHA9170	9170-359	Jan. 15, 2014	Jan. 14, 2015
LISN	Rohde&Schwarz	ESH3-Z5	100305	Jan. 11, 2014	Jan. 10, 2015
LISN	Schwarzbeck	NSLK8126	8126431	Jan. 11, 2014	Jan. 10, 2015
Highpass Filter	Wainwright Instruments	WHKX3.6/18G-10SS	N/A	Jan. 11, 2014	Jan. 10, 2015
Band Reject Filter	Wainwright Instruments	WRCG2400/2485-2375/2510-60/11SS	N/A	Jan. 11, 2014	Jan. 10, 2015
Universal radio communication tester	Rohde&Schwarz	CMU200	100308	Jan. 11, 2014	Jan. 10, 2015

3. SYSTEM TEST CONFIGURATION

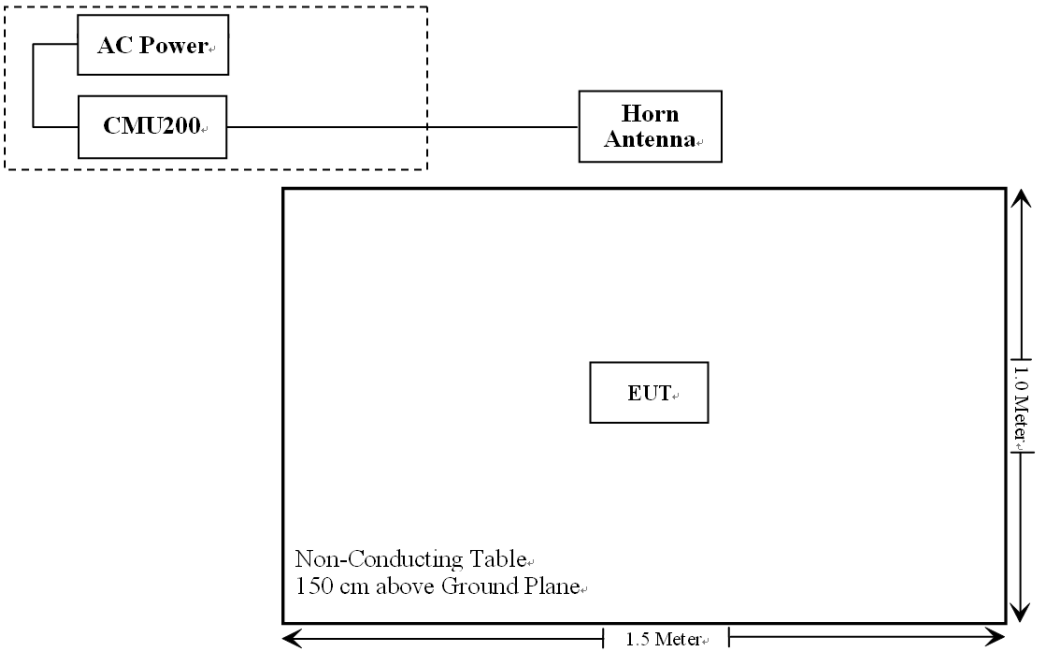
3.1.Justification

The EUT was configured for testing according to TIA/EIA-603-D.
The final qualification test was performed with the EUT operating at normal mode.

3.2.Configuration of Test Setup



3.3.Block Diagram of Test Setup

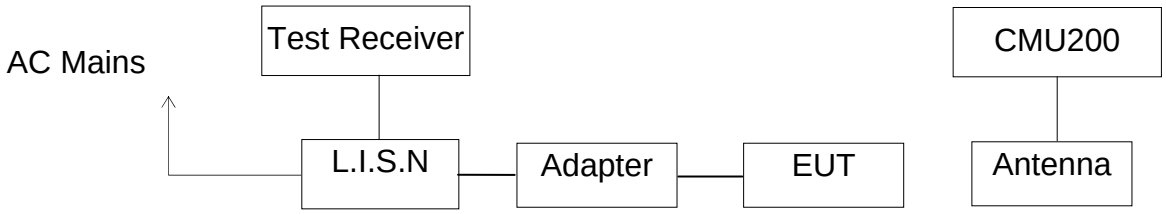


4. TEST PROCEDURES AND RESULTS

FCC Rules	Description of Test	Result
Section 15.207	Power Line Conducted Emission	Compliant
§2.1046; § 22.913 (a); § 24.232 (c)	RF Output Power	Compliant
§ 2.1049; § 22.905 § 22.917; § 24.238	99% & -26 dB Occupied Bandwidth	Compliant
§ 2.1051, § 22.917 (a); § 24.238 (a)	Spurious Emissions at Antenna Terminal	Compliant
§ 2.1053 § 22.917 (a); § 24.238 (a)	Field Strength of Spurious Radiation	Compliant
§ 22.917 (a); § 24.238 (a)	Out of band emission, Band Edge	Compliant
§ 2.1055 § 22.355; § 24.235	Frequency stability vs. temperature Frequency stability vs. voltage	Compliant

5. POWER LINE CONDUCTED MEASUREMENT

5.1.Block Diagram of Test Setup



(EUT: 4 inch 3G TABLET)

5.2.Power Line Conducted Emission Measurement Limits

Frequency (MHz)	Limit dB(μV)	
	Quasi-peak Level	Average Level
0.15 - 0.50	66.0 – 56.0 *	56.0 – 46.0 *
0.50 - 5.00	56.0	46.0
5.00 - 30.00	60.0	50.0
NOTE1: The lower limit shall apply at the transition frequencies. NOTE2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.		

5.3.Configuration of EUT on Measurement

The following equipments are installed on Power Line Conducted Emission Measurement to meet the commission requirement and operating regulations in a manner, which tends to maximize its emission characteristics in a normal application.

5.4.Operating Condition of EUT

5.4.1.Setup the EUT and simulator as shown as Section 5.1.

5.4.2.Turn on the power of all equipment.

5.4.3.Let the EUT work in test mode and measure it.

5.5. Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC lines are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.4: 2009 on Conducted Emission Measurement.
The bandwidth of test receiver (R & S ESCS30) is set at 9kHz.

The frequency range from 150kHz to 30MHz is checked.

5.6. Power Line Conducted Emission Measurement Results

PASS.

The frequency range from 150kHz to 30MHz is checked.

Test mode : Charging&WCDMA communicating

MEASUREMENT RESULT: "IMC-3G-V001_fin"

2014-6-27 9:21

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	56.80	10.5	66	9.2	QP	L1	GND
0.215783	56.20	10.7	63	6.8	QP	L1	GND
0.431634	38.80	10.9	57	18.4	QP	L1	GND

MEASUREMENT RESULT: "IMC-3G-V001_fin2"

2014-6-27 9:21

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.216214	45.40	10.7	53	7.6	AV	L1	GND
0.288294	39.10	10.8	51	11.5	AV	L1	GND
0.647535	33.20	11.0	46	12.8	AV	L1	GND

MEASUREMENT RESULT: "IMC-3G-V002_fin"

2014-6-27 9:26

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	56.50	10.5	66	9.5	QP	N	GND
0.216214	55.60	10.7	63	7.4	QP	N	GND
0.290028	46.10	10.8	61	14.4	QP	N	GND

MEASUREMENT RESULT: "IMC-3G-V002_fin2"

2014-6-27 9:26

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.216214	43.40	10.7	53	9.6	AV	N	GND
0.359876	36.70	10.9	49	12.0	AV	N	GND
0.503420	32.80	11.0	46	13.2	AV	N	GND

Emissions attenuated more than 20 dB below the permissible value are not reported.

The spectral diagrams are attached as below.

ACCURATE TECHNOLOGY CO.,LTD

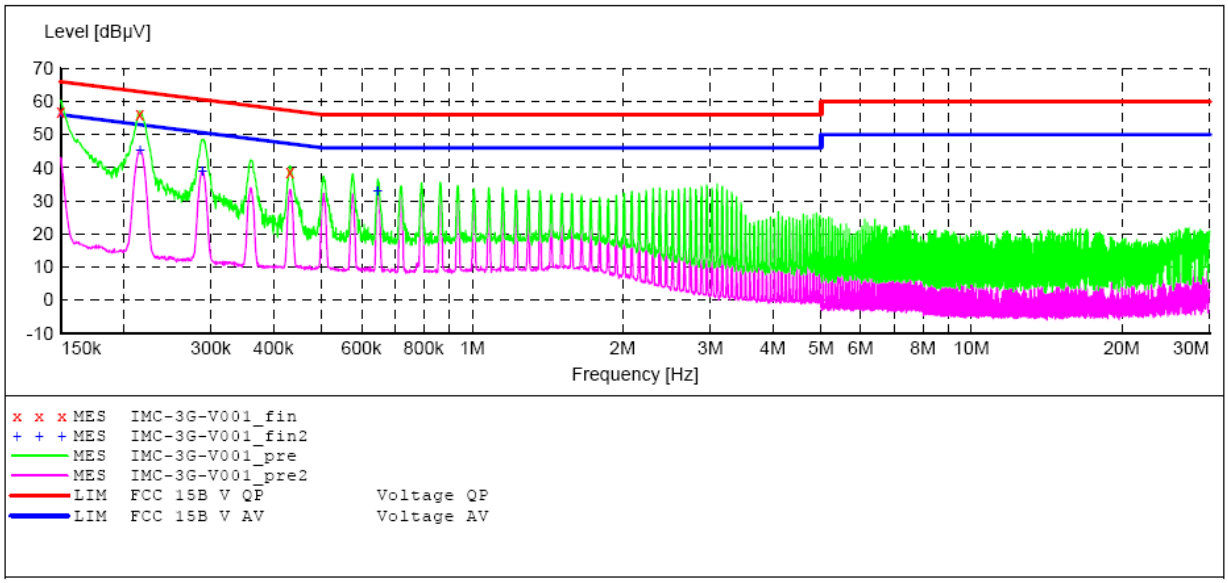
CONDUCTED EMISSION STANDARD FCC PART 15B

```
EUT:                  4"3G TABLET  M/N:ICE
Manufacturer:         IMC
Operating Condition:  WCDMA/Charging
Test Site:            1#Shielding Room
Operator:             Alen
Test Specification:   L  120V/60Hz
Comment:              Report No:ATE20141086
Start of Test:        2014-6-27 / 9:20:06
```

SCAN TABLE: "V 150K-30MHz fin"

Short Description: _SUB_STD_VTERM2 1.70

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	30.0 MHz	4.5 kHz	QuasiPeak Average	1.0 s	9 kHz	LISN(ESH3-Z5)



MEASUREMENT RESULT: "IMC-3G-V001_fin"

2014-6-27 9:21

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	56.80	10.5	66	9.2	QP	L1	GND
0.215783	56.20	10.7	63	6.8	QP	L1	GND
0.431634	38.80	10.9	57	18.4	QP	L1	GND

MEASUREMENT RESULT: "IMC-3G-V001_fin2"

2014-6-27 9:21

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.216214	45.40	10.7	53	7.6	AV	L1	GND
0.288294	39.10	10.8	51	11.5	AV	L1	GND
0.647535	33.20	11.0	46	12.8	AV	L1	GND

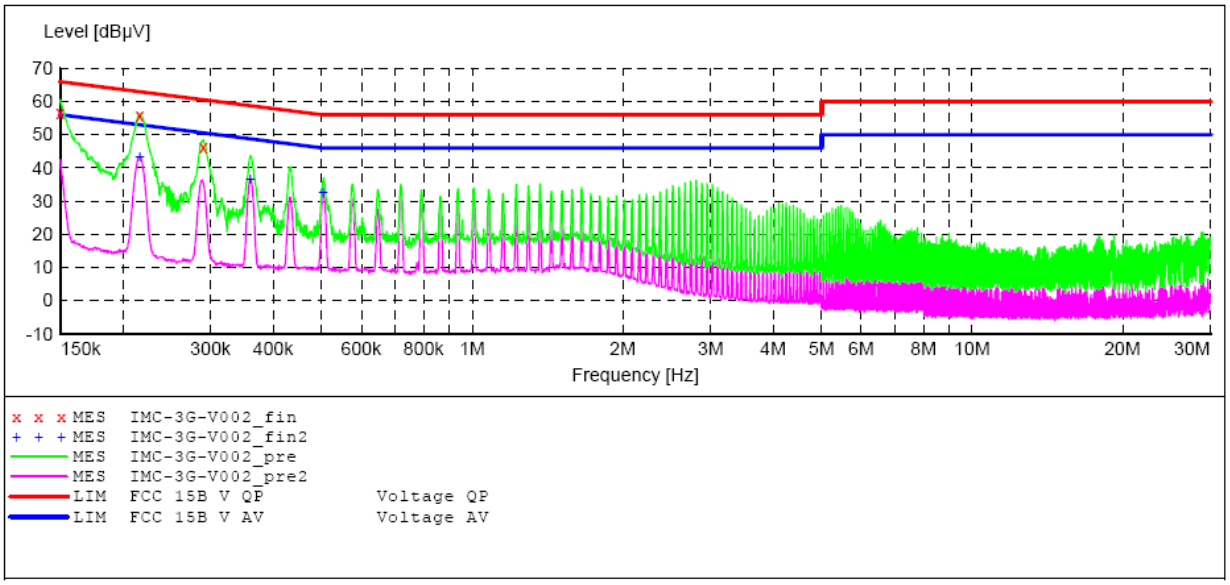
ACCURATE TECHNOLOGY CO.,LTD

CONDUCTED EMISSION STANDARD FCC PART 15B

```
EUT:                  4"3G TABLET  M/N:ICE
Manufacturer:         IMC
Operating Condition:  WCDMA/Charging
Test Site:            1#Shielding Room
Operator:             Alen
Test Specification:   N  120V/60Hz
Comment:              Report No:ATE20141086
Start of Test:        2014-6-27 / 9:24:31
```

SCAN TABLE: "V 150K-30MHz fin"

```
  Short Description:              _SUB_STD_VTERM2 1.70
  Start      Stop       Step      Detector  Meas.     IF       Transducer
  Frequency  Frequency  Width               Time      Bandw.
  150.0 kHz  30.0 MHz   4.5 kHz   QuasiPeak 1.0 s     9 kHz    LISN(ESH3-Z5)
                                  Average
```



MEASUREMENT RESULT: "IMC-3G-V002_fin"

```
2014-6-27  9:26
   Frequency     Level  Transd  Limit  Margin  Detector  Line   PE
         MHz      dBµV      dB   dBµV      dB

    0.150000     56.50    10.5     66     9.5  QP        N      GND
    0.216214     55.60    10.7     63     7.4  QP        N      GND
    0.290028     46.10    10.8     61    14.4  QP        N      GND
```

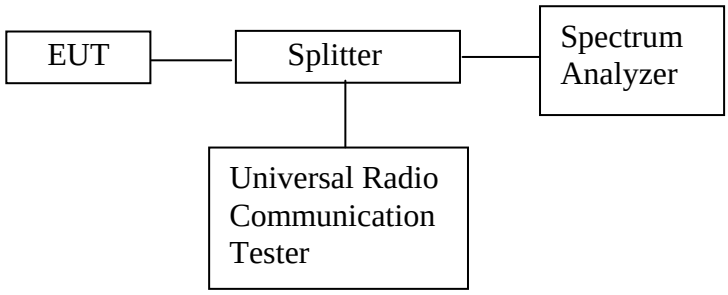
MEASUREMENT RESULT: "IMC-3G-V002_fin2"

```
2014-6-27  9:26
   Frequency     Level  Transd  Limit  Margin  Detector  Line   PE
         MHz      dBµV      dB   dBµV      dB

    0.216214     43.40    10.7     53     9.6  AV        N      GND
    0.359876     36.70    10.9     49    12.0  AV        N      GND
    0.503420     32.80    11.0     46    13.2  AV        N      GND
```

6. BANDWIDTH MEASUREMENT

6.1.Block Diagram of Test Setup



6.2.Applicable Standard

FCC § 2.1049

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured under the following conditions as applicable.

(h) Transmitters employing digital modulation techniques-when modulated by an input signal such that its amplitude and symbol rate represent the maximum rated conditions under which the equipment will be operated.

6.3.Operating Condition of EUT

6.3.1.Setup the EUT and simulator as shown as Section 6.1.

6.3.2.Turn on the power of all equipment.

6.3.3.Let the EUT work in TX modes measure it. The transmit frequency are 826.4-846.6MHz and 1852.4-1907.6MHz. We select 826.4MHz, 836.6MHz, 846.6MHz and 1852.4MHz, 1880.0MHz, 1907.6MHz TX frequency to transmit.

6.4.Test Procedure

99% occupied bandwidth&-26dB occupied bandwidth test:

1. Set resolution bandwidth (RBW) = 50 kHz.
2. Set the video bandwidth (VBW) = 100 kHz.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measurements are to be performed with the EUT set to the low, middle and high channel of each frequency band.

6.5.Test Result

WCDMA BAND V		
Frequency (MHz)	99% Occupied Bandwidth (MHz)	-26 dBc Bandwidth (MHz)
826.4	4.1147	4.613
836.6	4.1233	4.622
846.6	4.1307	4.627

WCDMA BAND II		
Frequency (MHz)	99% Occupied Bandwidth (MHz)	-26 dBc Bandwidth (MHz)
1852.4	4.1563	4.637
1880.0	4.1370	4.618
1907.6	4.1280	4.606

WCDMA BAND V HSDPA		
Frequency (MHz)	99% Occupied Bandwidth (MHz)	-26 dBc Bandwidth (MHz)
826.4	4.1242	4.633
836.6	4.1228	4.624
846.6	4.1319	4.628

WCDMA BAND II HSDPA		
Frequency (MHz)	99% Occupied Bandwidth (MHz)	-26 dBc Bandwidth (MHz)
1852.4	4.1549	4.648
1880.0	4.1582	4.641
1907.6	4.1351	4.630

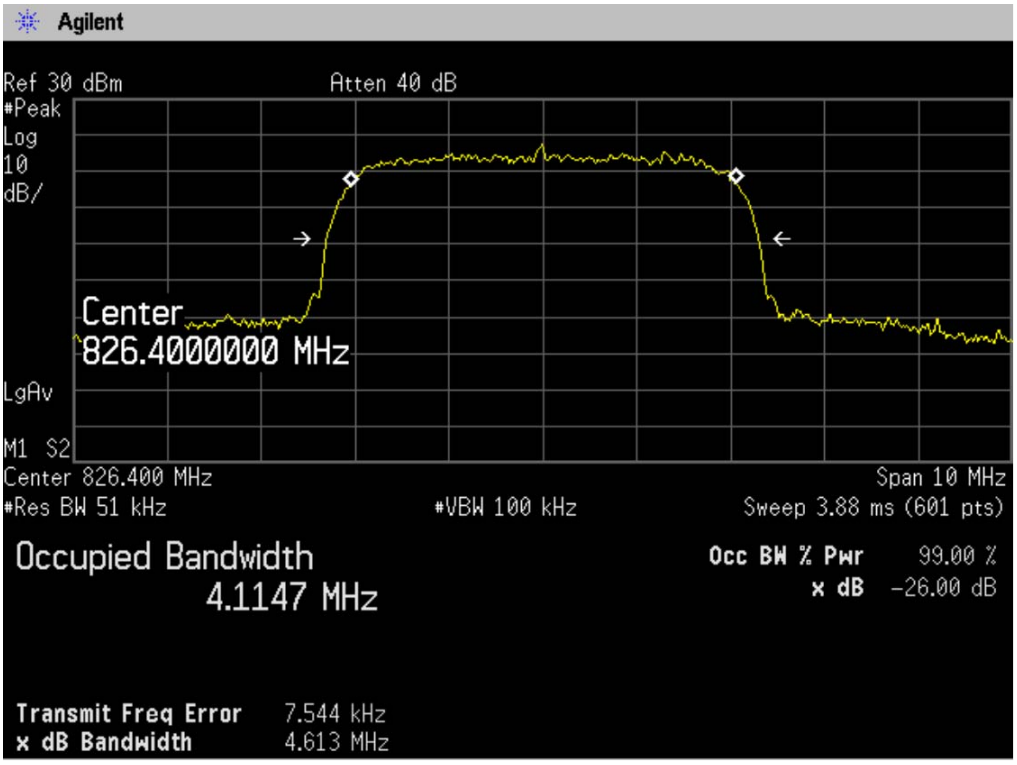
WCDMA BAND V HSUPA		
Frequency (MHz)	99% Occupied Bandwidth (MHz)	-26 dBc Bandwidth (MHz)
826.4	4.1206	4.614
836.6	4.1211	4.627
846.6	4.1353	4.637

WCDMA BAND II HSUPA		
Frequency (MHz)	99% Occupied Bandwidth (MHz)	-26 dBc Bandwidth (MHz)
1852.4	4.1492	4.640
1880.0	4.1489	4.657
1907.6	4.1405	4.650

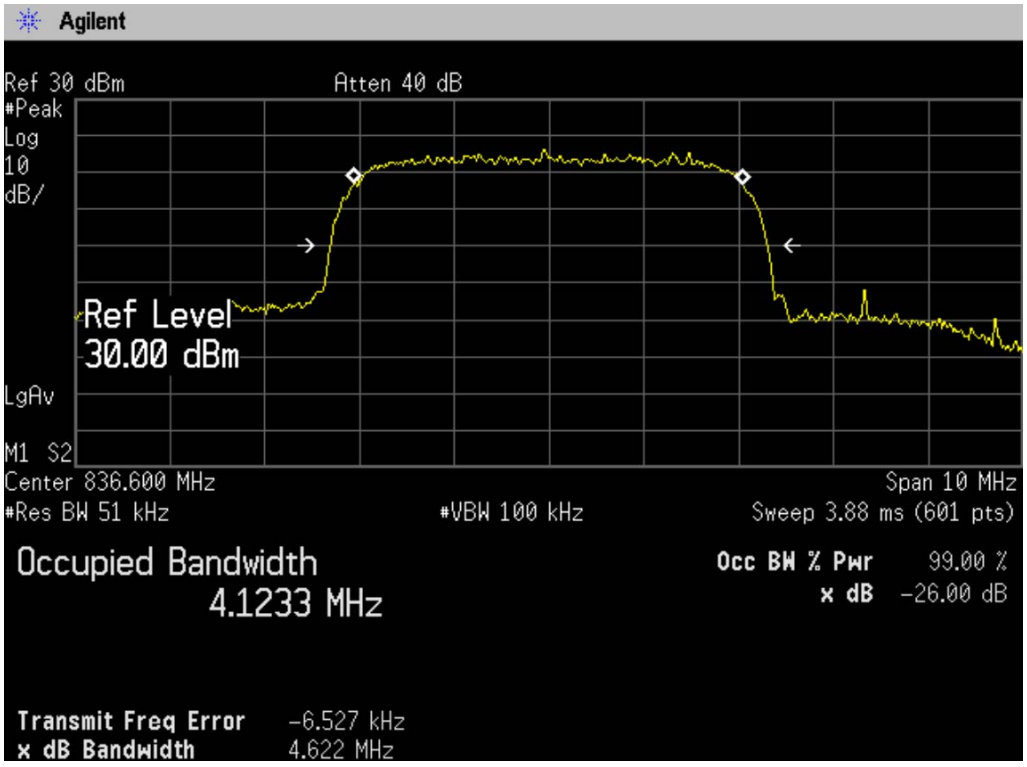
The spectrum analyzer plots are attached as below.

WCDMA BAND V

Channel 4132



Channel 4183



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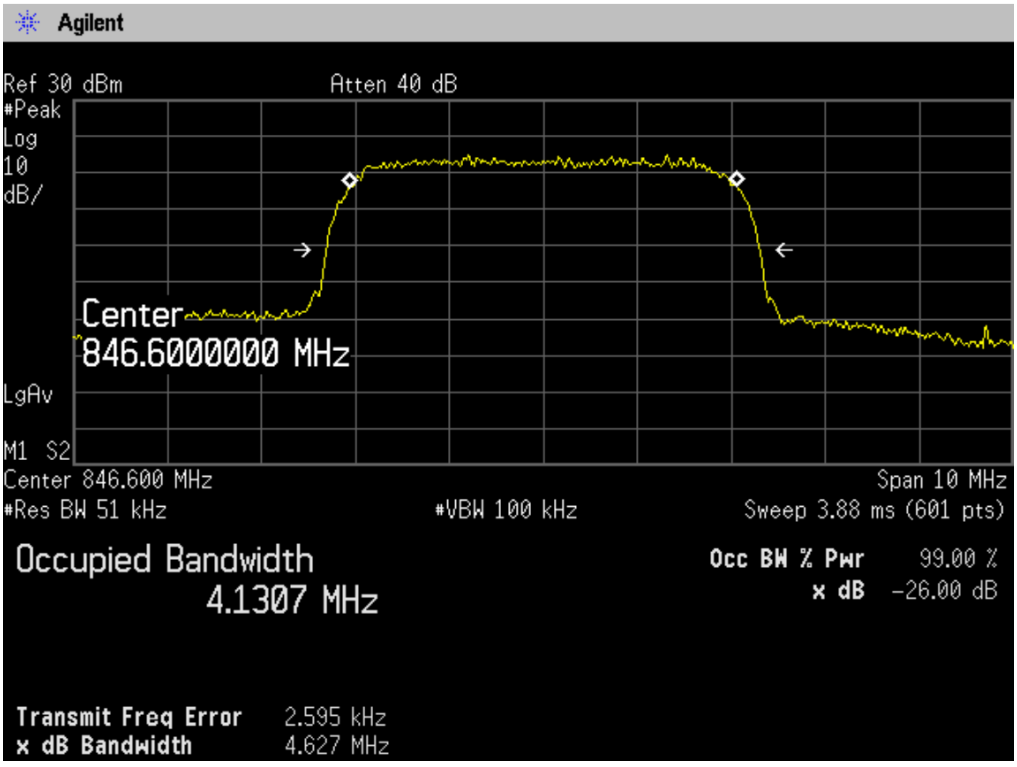
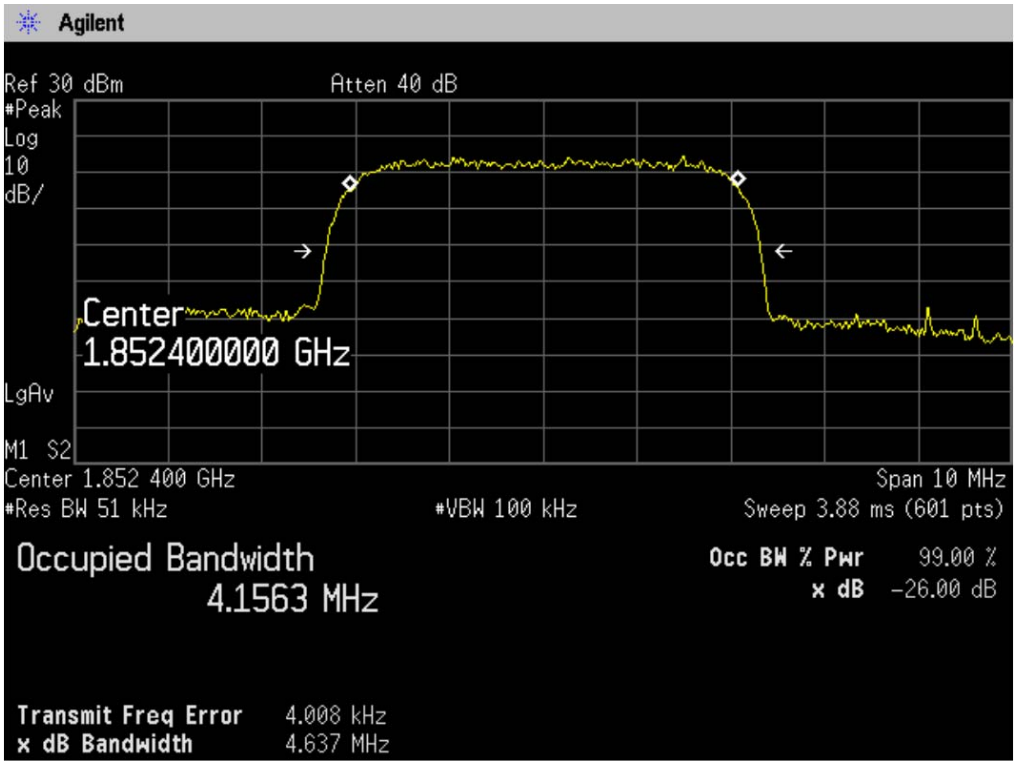


WCDMA BAND II

Channel 9262



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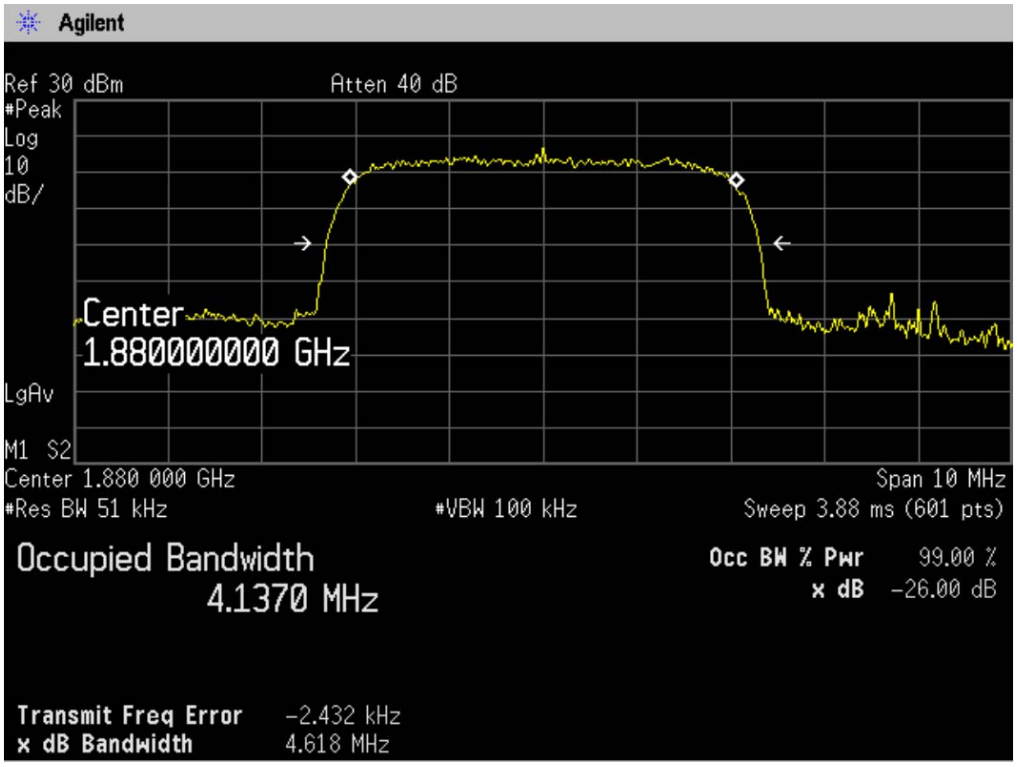
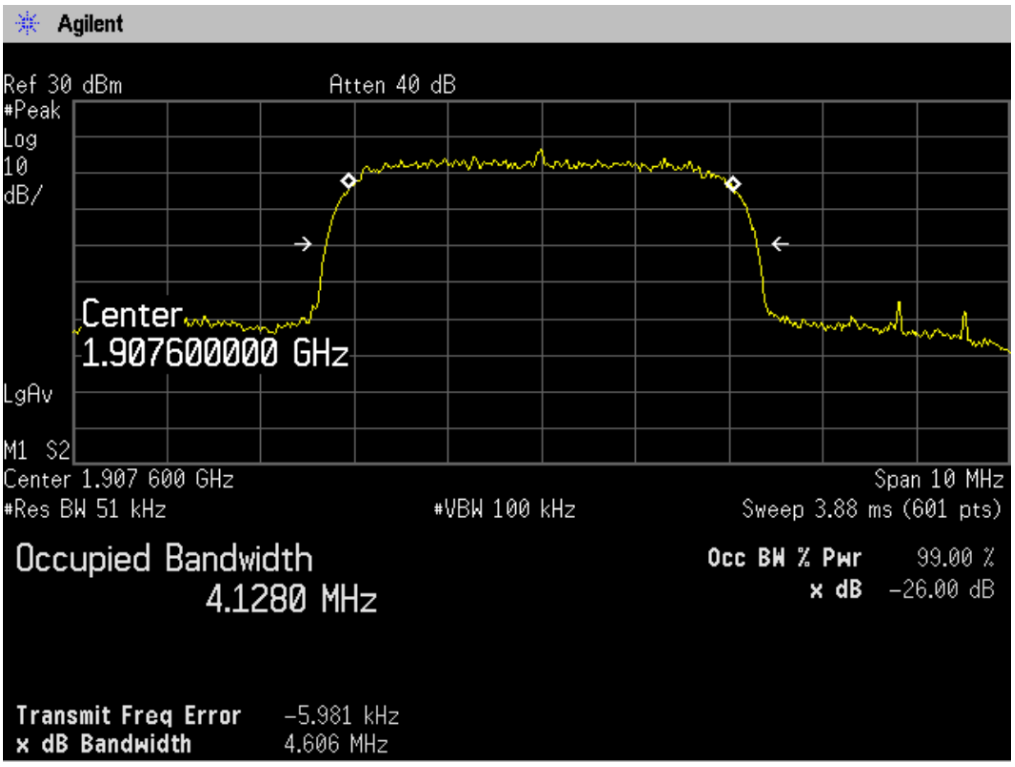
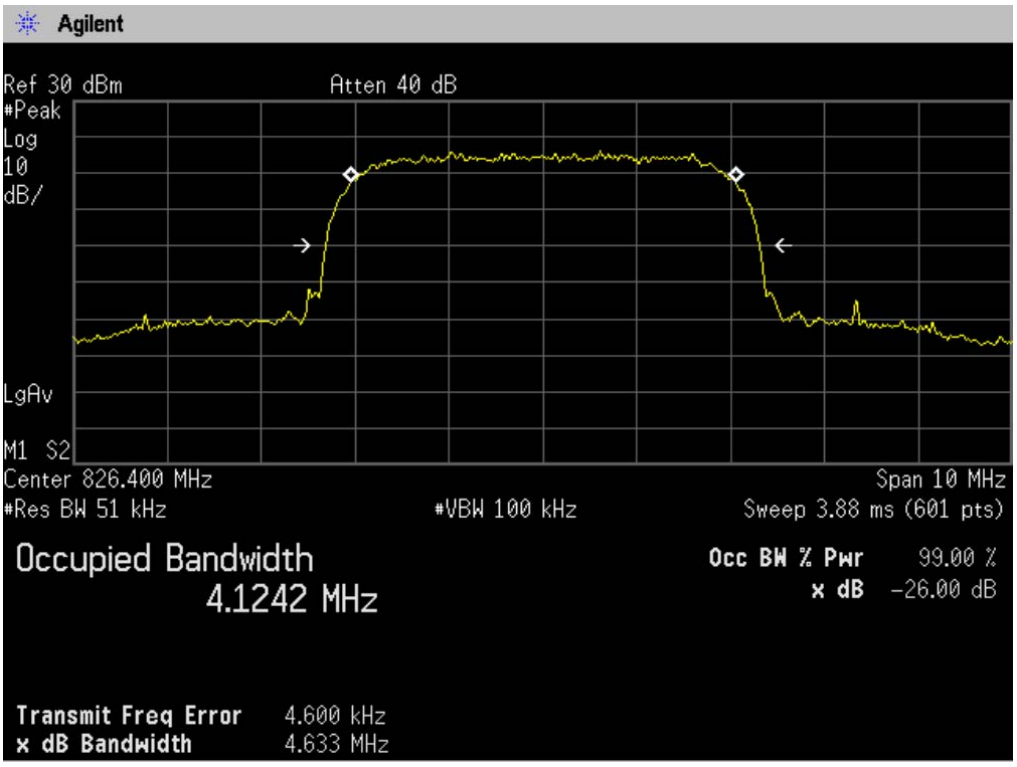


Channel 9538



WCDMA BAND V HSDPA

Channel 4132



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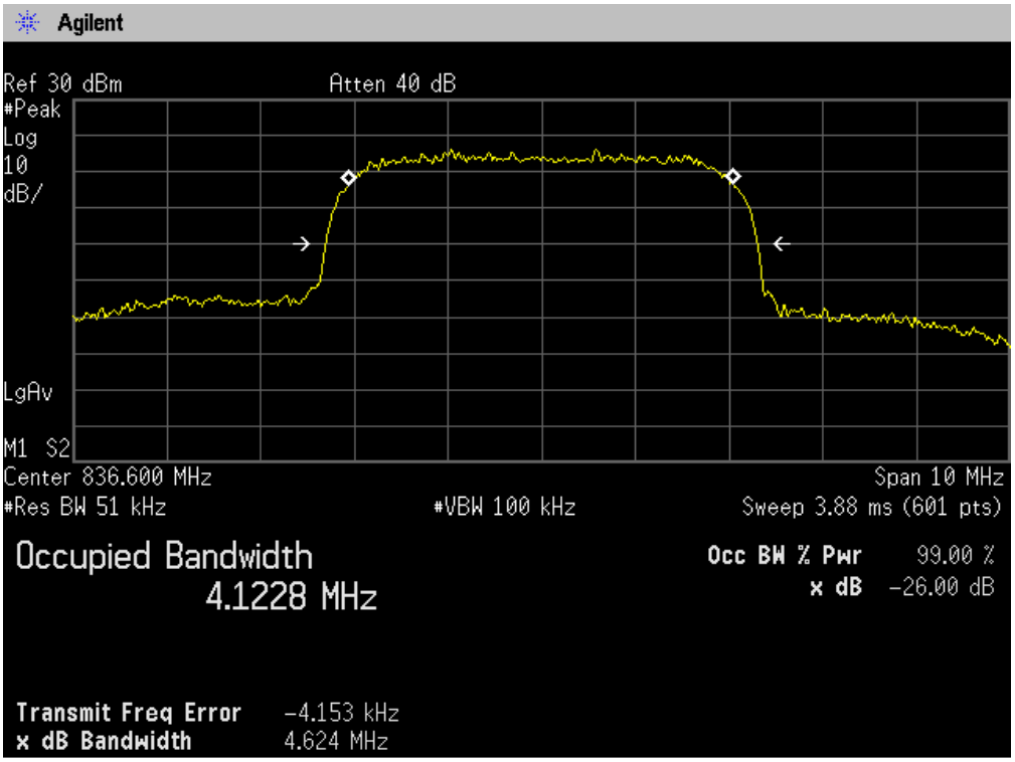

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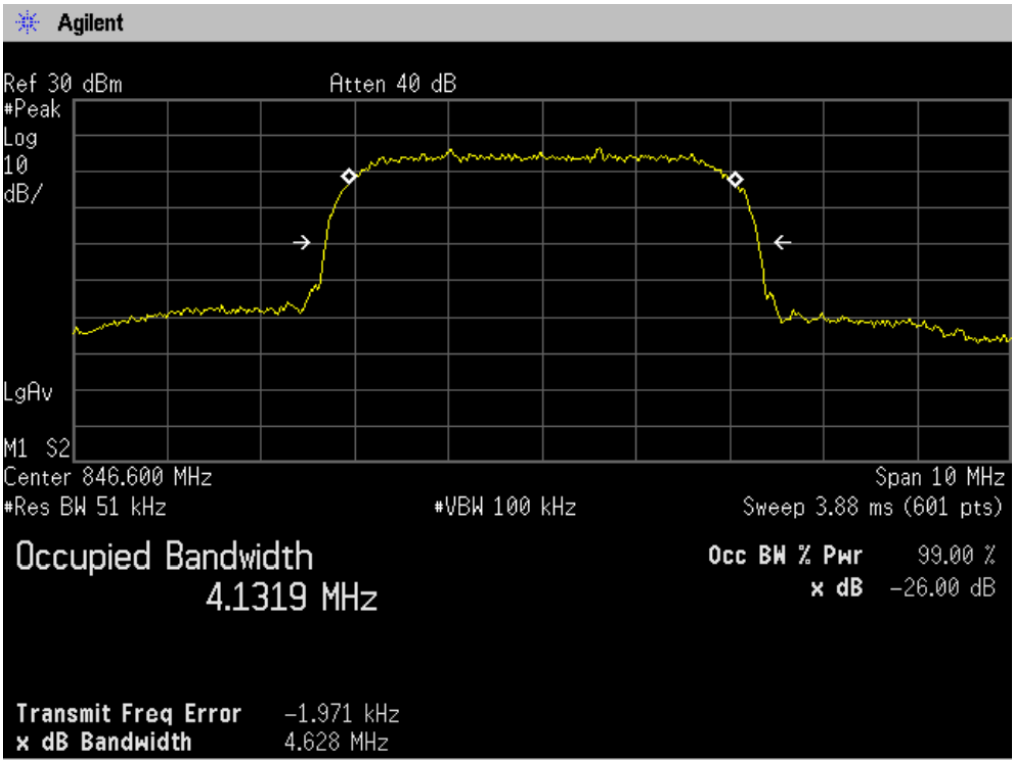

WCDMA BAND II HSDPA

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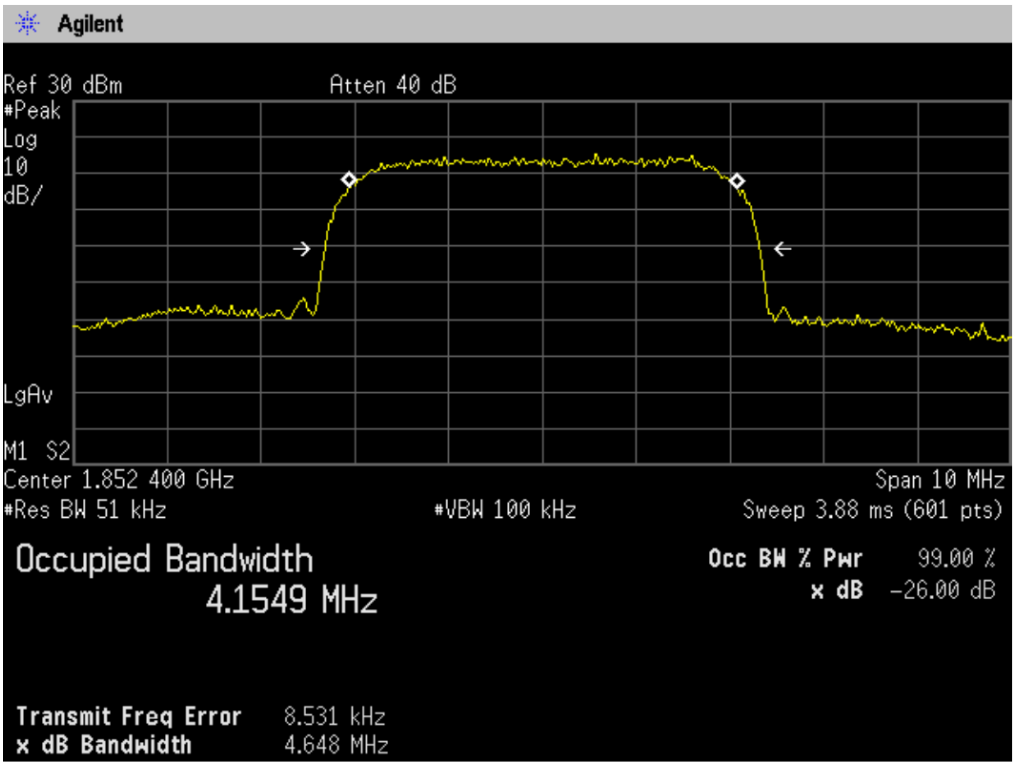

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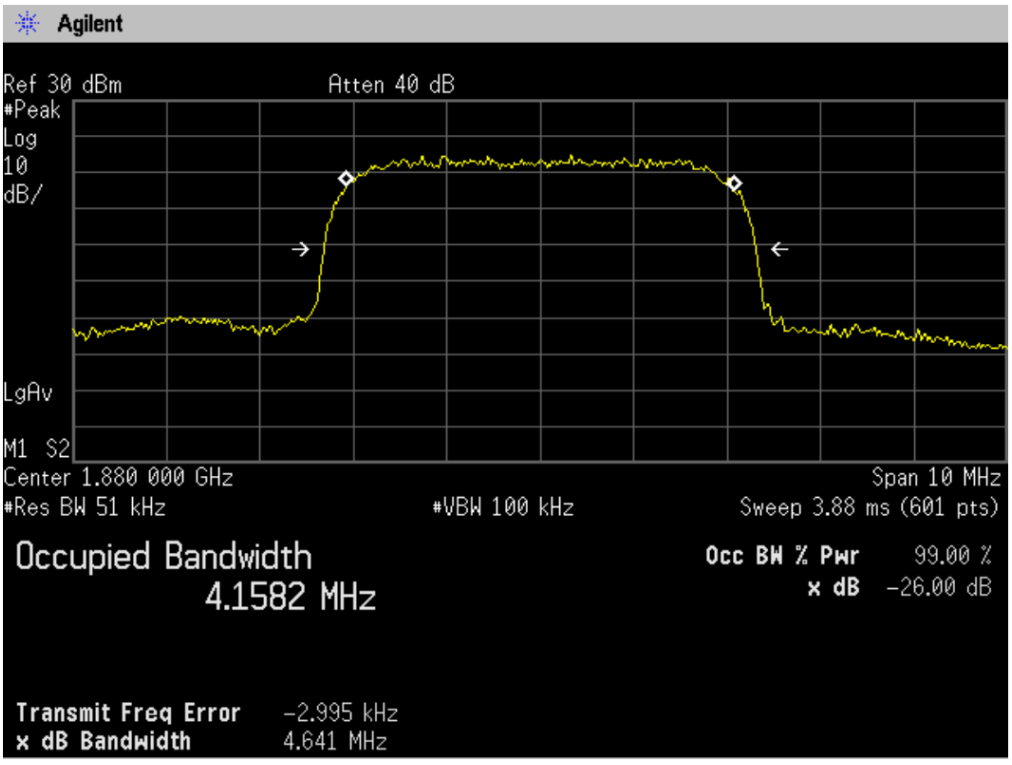
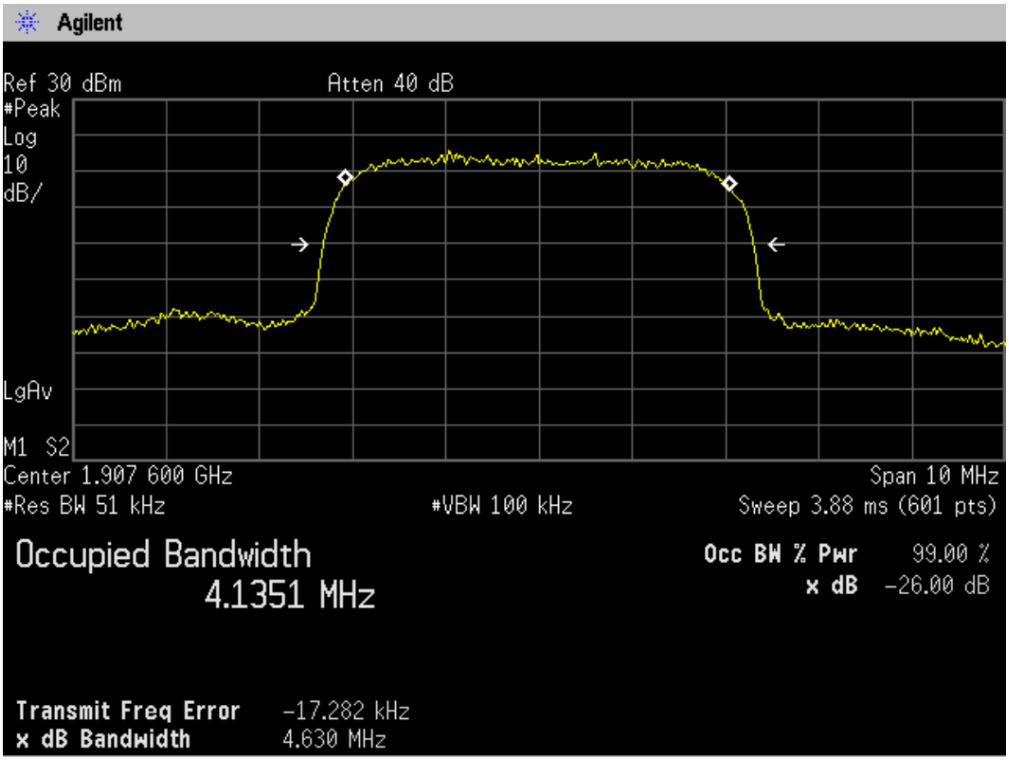
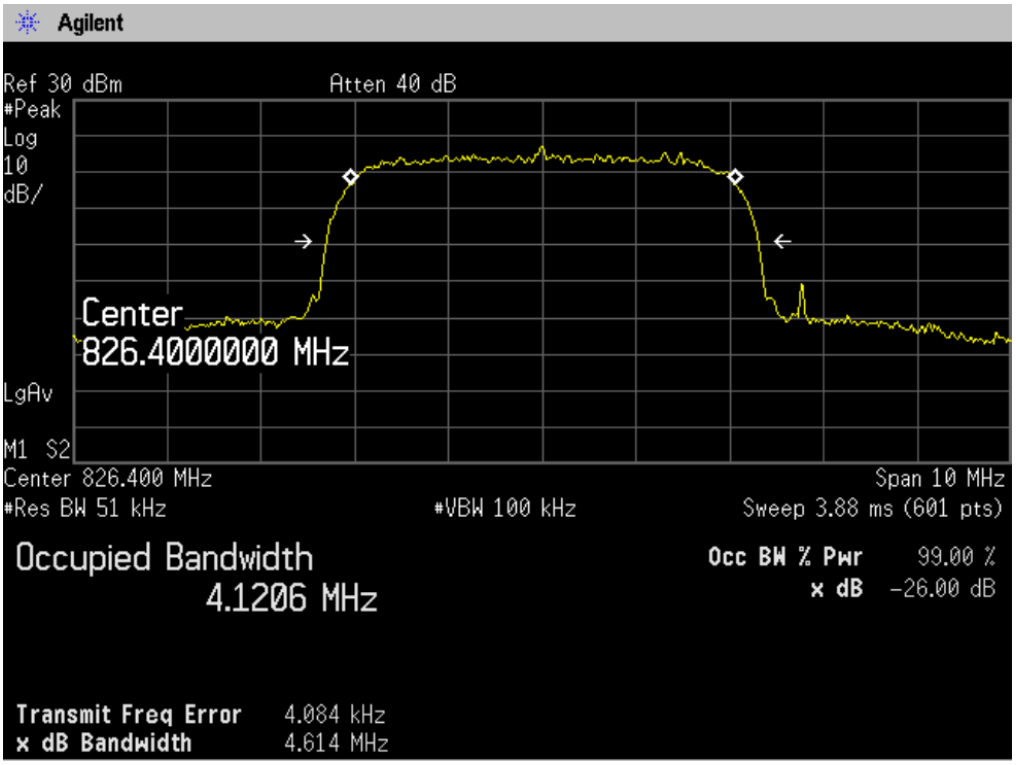


Channel 9538

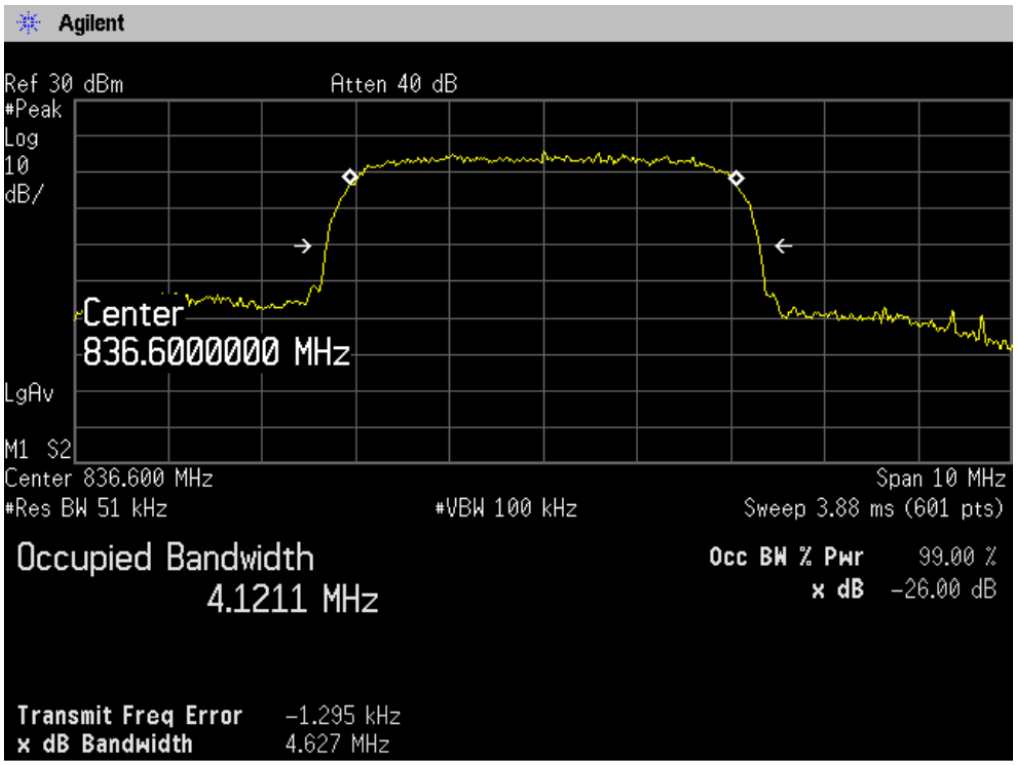


WCDMA BAND V HSUPA

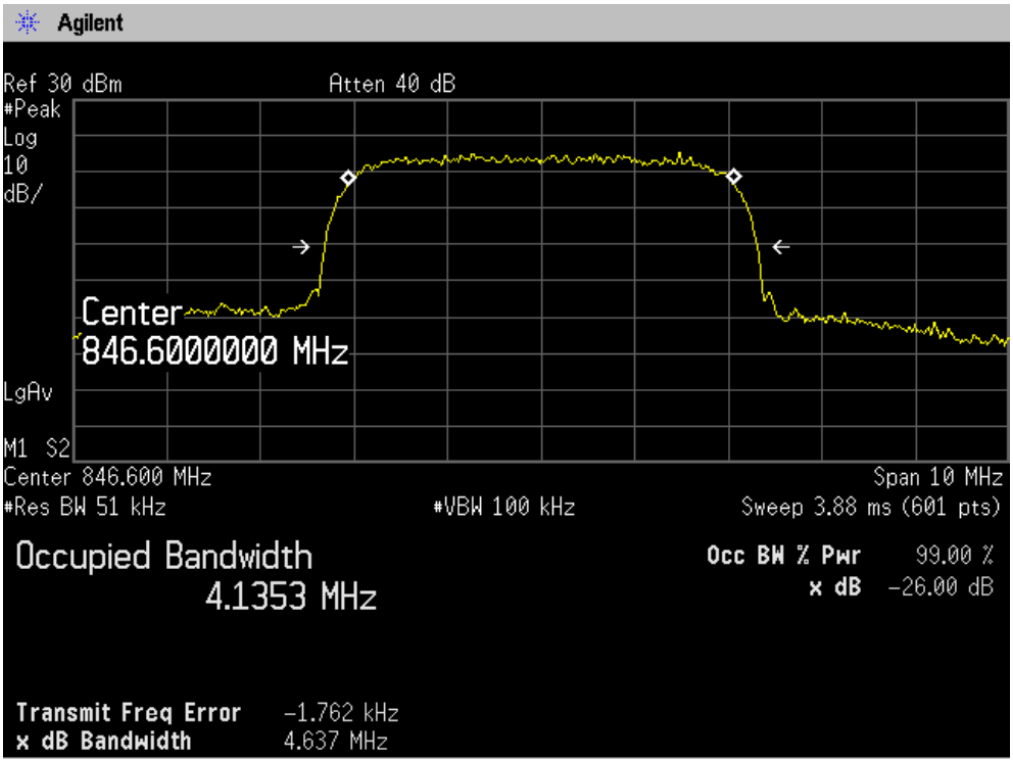
Channel 4132



Channel 4183

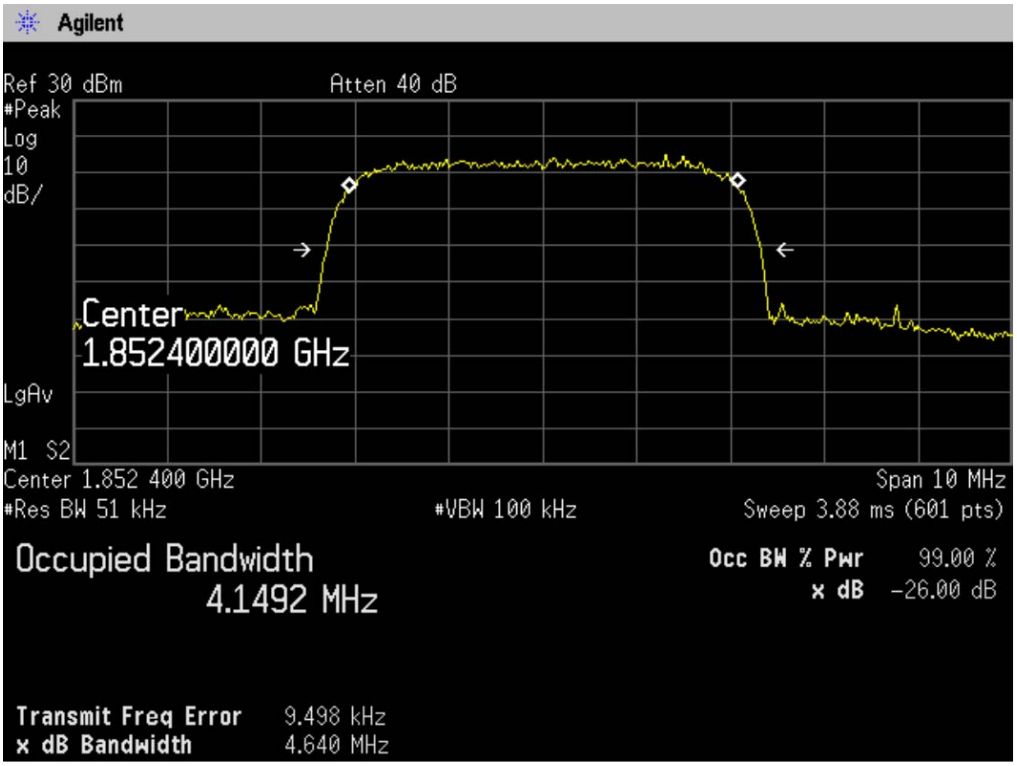


Channel 4233

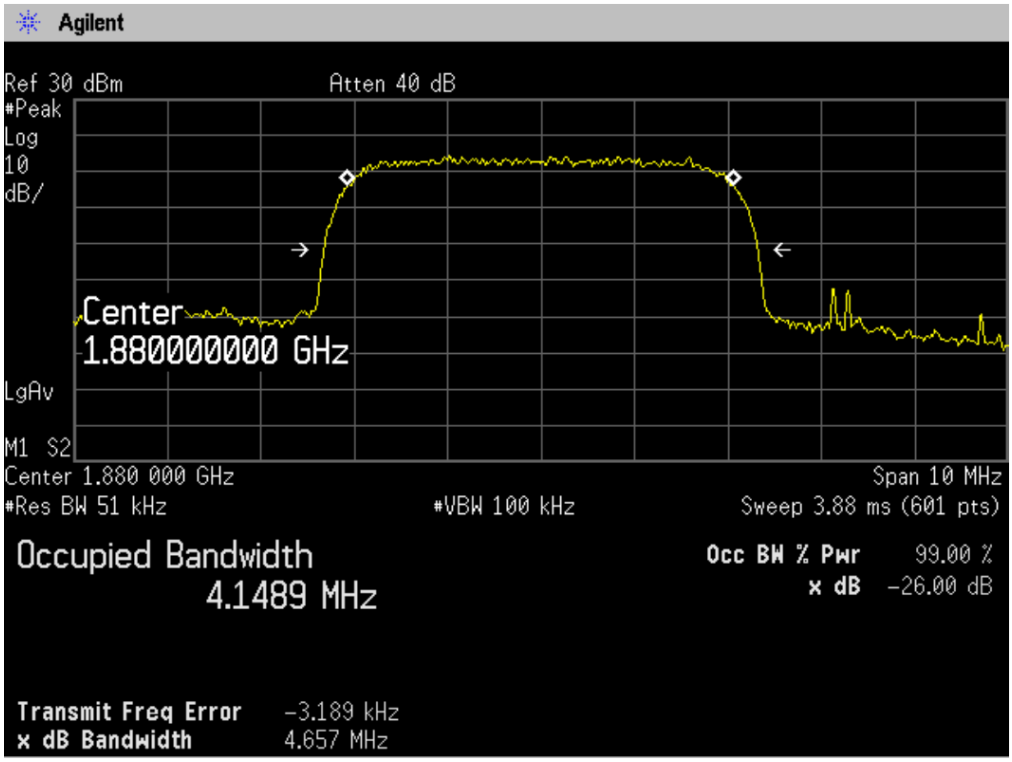


WCDMA BAND II HSUPA

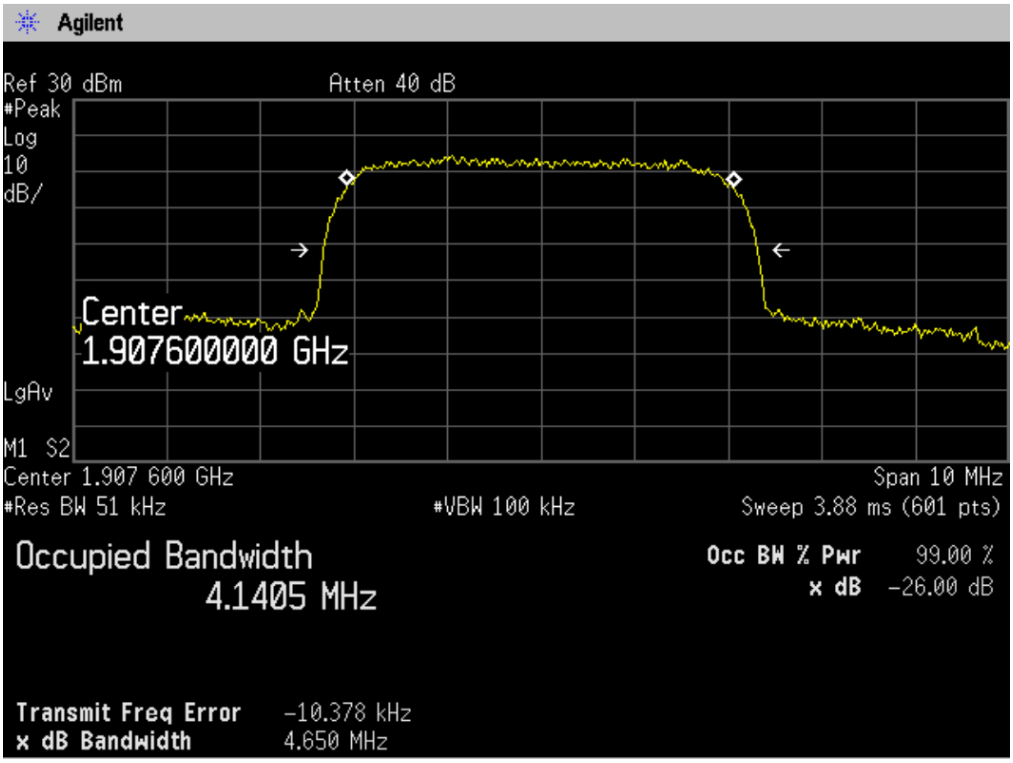
Channel 9262



Channel 9400



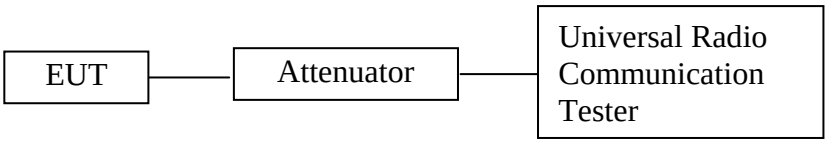
Channel 9538



7. RF OUTPUT POWER

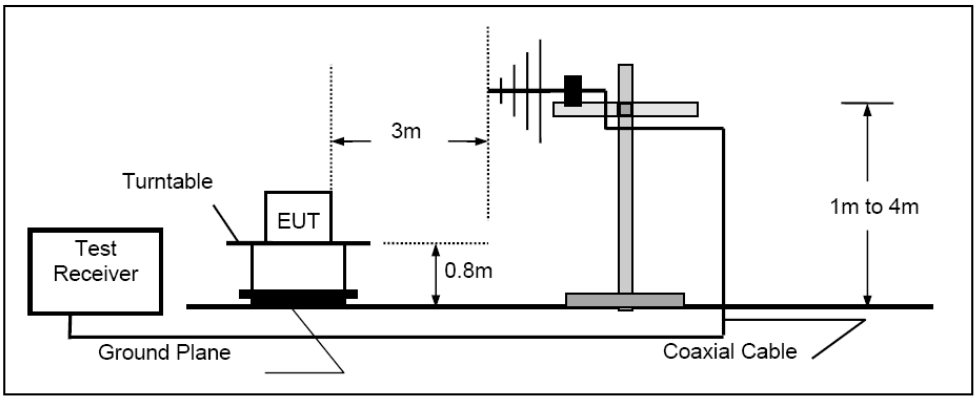
7.1.Block Diagram of Test Setup

Conducted method:

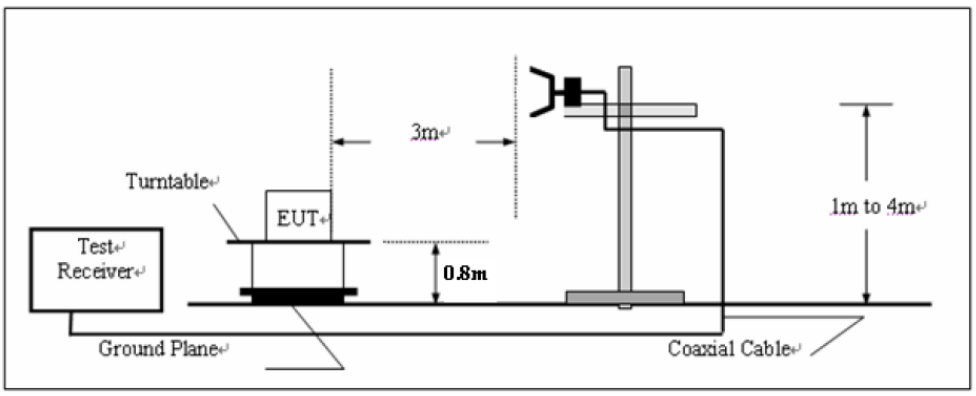


Radiated method:

Frequency range 30MHz – 1000MHz



Frequency range above 1GHz-25GHz



7.2.Applicable Standard

FCC § 22.913(a), § 24.232(b).

7.3.Operating Condition of EUT

7.3.1.Setup the EUT and simulator as shown as Section 7.1.

7.3.2.Turn on the power of all equipment.

7.3.3.Let the EUT work in TX modes measure it. The transmit frequency are 826.4-846.6MHz and 1852.4-1907.6MHz. We select 826.4MHz, 836.6MHz, 846.6MHz and 1852.4MHz, 1880.0MHz, 1907.6MHz TX frequency to transmit.

7.4.Test Procedure

Conducted method:
The RF output of the transmitter was connected to the wireless test set and the spectrum analyzer through sufficient attenuation.

Radiated method(For ERP&EIRP):

1. The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.
2. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.
3. The frequency range up to tenth harmonic of the fundamental frequency was investigated.
4. Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

7.5.Test Result

PASS

Conducted Power

Mode	Channel	Frequency (MHz)	Conducted Power (dBm)PEAK Power
UMTS FDD V(WCDMA)	4132	826.4	24.6
	4183	836.6	24.2
	4233	846.6	24.1

Mode	Channel	Frequency (MHz)	Conducted Power (dBm)PEAK Power
UMTS FDD II(WCDMA)	9262	1852.4	23.6
	9400	1880.0	23.8
	9538	1907.6	23.4

Radiated Power

ERP for UMTS FDD V(WCDMA)

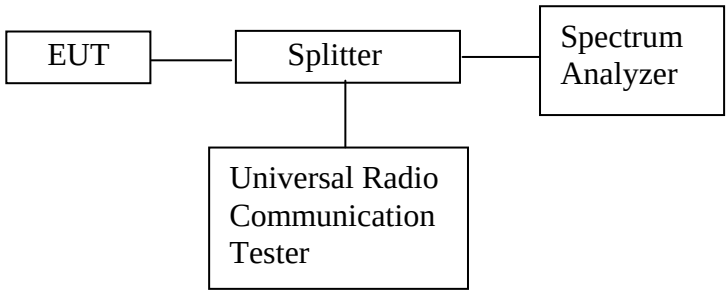
Indicated		Table Angle Degree	Test Antenna		Substituted			Antenna Gain Correction (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Part 27
Frequency (MHz)	S.A. Reading (dBμV/m)		Height (m)	Polar (H/V)	Frequency (MHz)	S.G. Level (dBm)	Polar (H/V)				Limit (dBm)
Low Channel											
826.4	92.06	220	1.0	V	826.4	24.1	V	0	0.9	23.2	38.45
826.4	80.53	207	1.5	H	826.4	16.2	H	0	0.9	15.3	38.45
Middle Channel											
836.6	92.23	50	1.2	V	836.6	24.0	V	0	0.9	23.1	38.45
836.6	80.01	358	1.3	H	836.6	15.8	H	0	0.9	14.9	38.45
High Channel											
846.6	91.75	16	1.0	V	846.6	23.9	V	0	0.9	23.0	38.45
846.6	79.86	109	1.2	H	846.6	15.6	H	0	0.9	14.7	38.45

EIRP for UMTS FDD II(WCDMA)

Indicated		Table Angle Degree	Test Antenna		Substituted			Antenna Gain Correction (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Part 27
Frequency (MHz)	S.A. Reading (dBμV/m)		Height (m)	Polar (H/V)	Frequency (MHz)	S.G. Level (dBm)	Polar (H/V)				Limit (dBm)
Low Channel											
1852.4	89.29	154	1.0	V	1852.4	18.0	V	6.2	1.1	23.1	33
1852.4	80.89	275	1.3	H	1852.4	12.1	H	6.2	1.1	17.2	33
Middle Channel											
1880.0	88.34	25	1.5	V	1880.0	17.2	V	6.2	1.1	22.3	33
1880.0	80.37	147	1.3	H	1880.0	11.6	H	6.2	1.1	16.7	33
High Channel											
1907.6	89.40	275	1.4	V	1907.6	18.2	V	6.2	1.1	23.3	33
1907.6	80.52	180	1.2	H	1907.6	12.3	H	6.2	1.1	17.4	33

8. SPURIOUS EMISSIONS AT ANTENNA TERMINALS

8.1.Block Diagram of Test Setup



8.2.Applicable Standard

FCC §2.1051, §22.917, §24.238.

8.3.EUT Configuration on Measurement

The equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

8.4.Operating Condition of EUT

8.4.1.Setup the EUT and simulator as shown as Section 8.1.

8.4.2.Turn on the power of all equipment.

8.4.3.Let the EUT work in TX modes measure it. The transmit frequency are 826.4-846.6MHz and 1852.4-1907.6MHz. We select 826.4MHz, 836.6MHz, 846.6MHz and 1852.4MHz, 1880.0MHz, 1907.6MHz TX frequency to transmit.

8.5.Test Procedure

8.5.1. Set the EUT to its maximum power at the required channel.

8.5.2. Measurements are to be performed with the EUT set to the low, middle and high channel of each frequency band. Measure and record all spurious emissions up to the tenth harmonic of the carrier frequency.

8.5.3. Set the RBW=100 kHz , VBW=300 kHz below 1GHz and the RBW=1MHz , VBW=3MHz above 1GHz.

8.5.4. Detector = peak-Max hold.

8.5.5. Sweep time = auto.

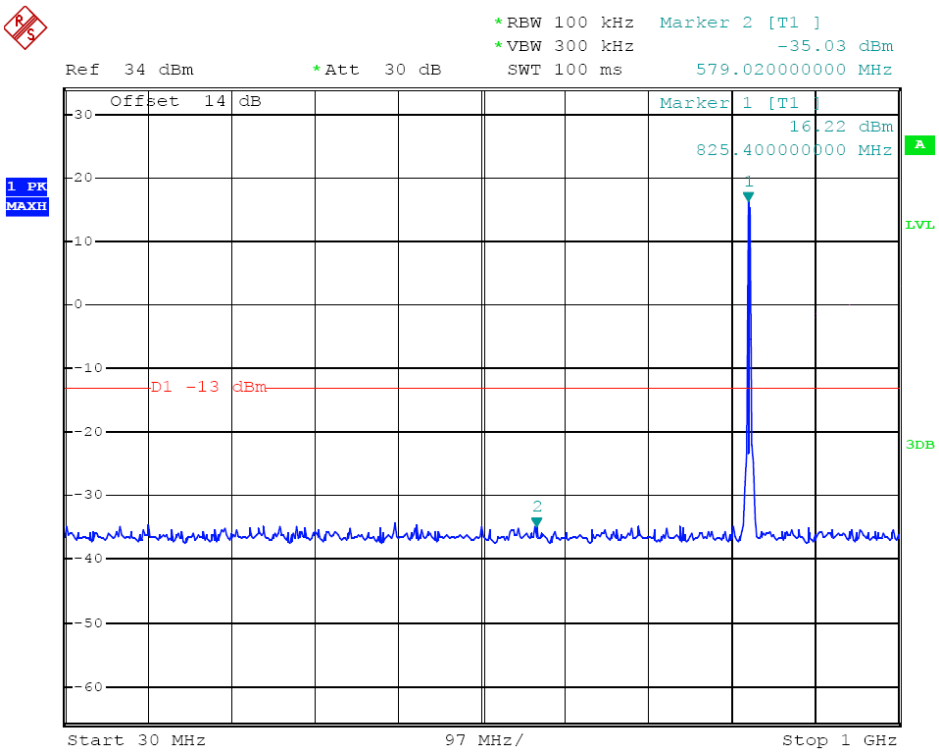
8.5.6. Allow trace to fully stabilize.

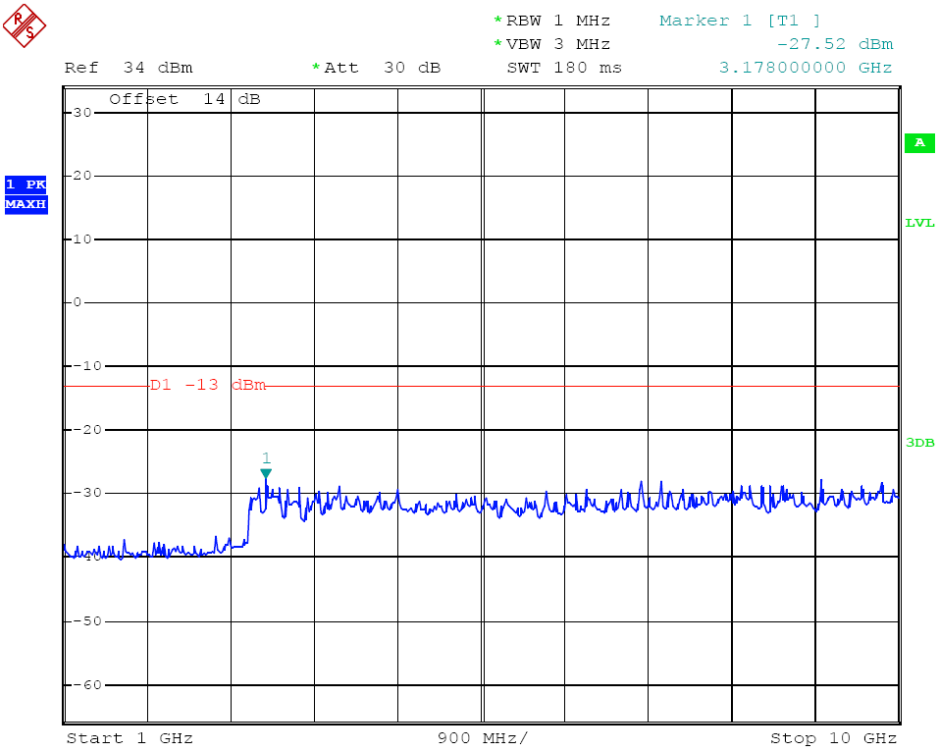
8.6. Test Result

The spectrum analyzer plots are attached as below.

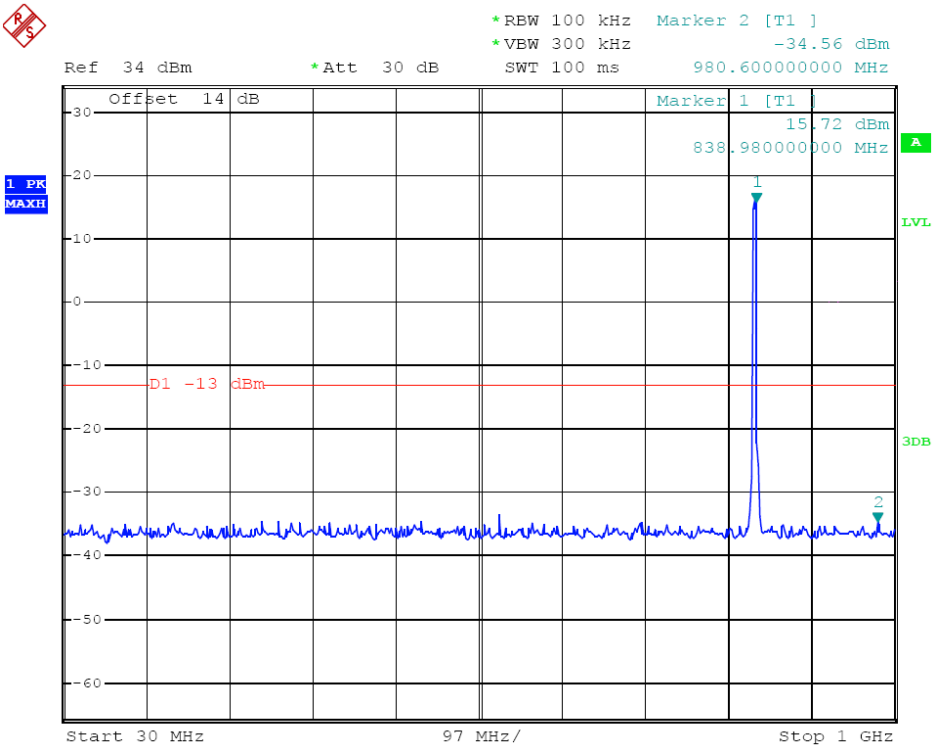
UMTS FDD V

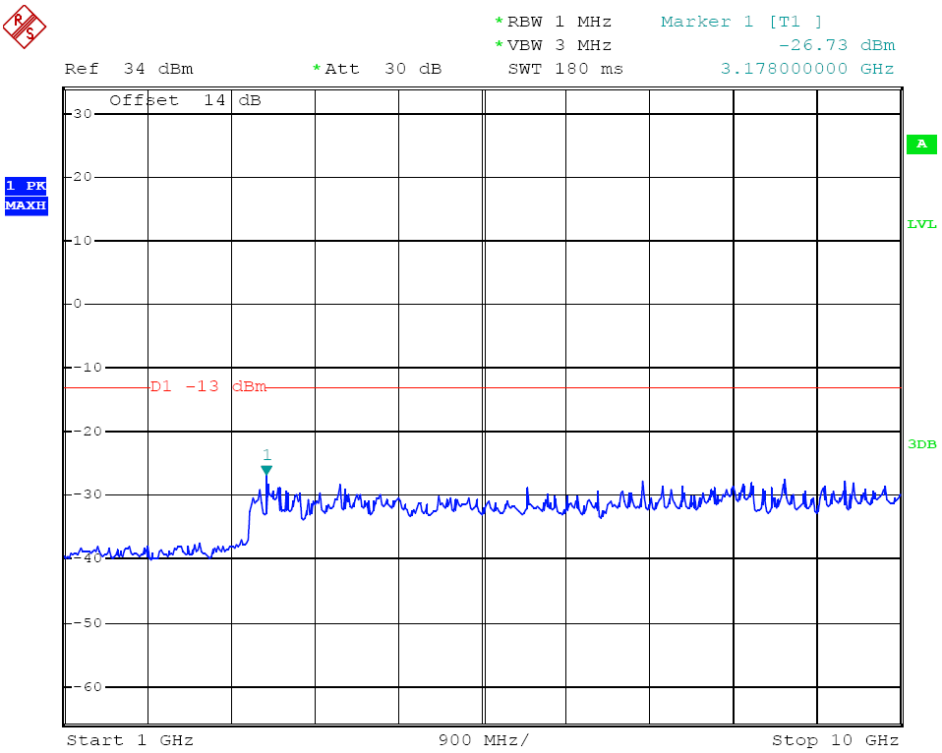
30MHz – 9GHz (Channel 4132)



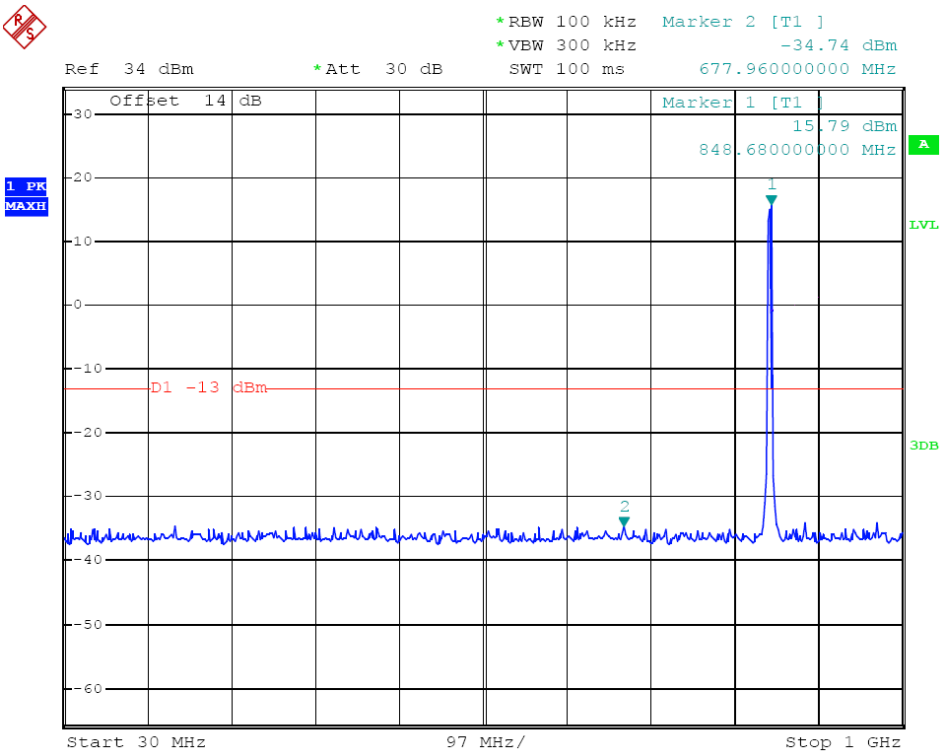


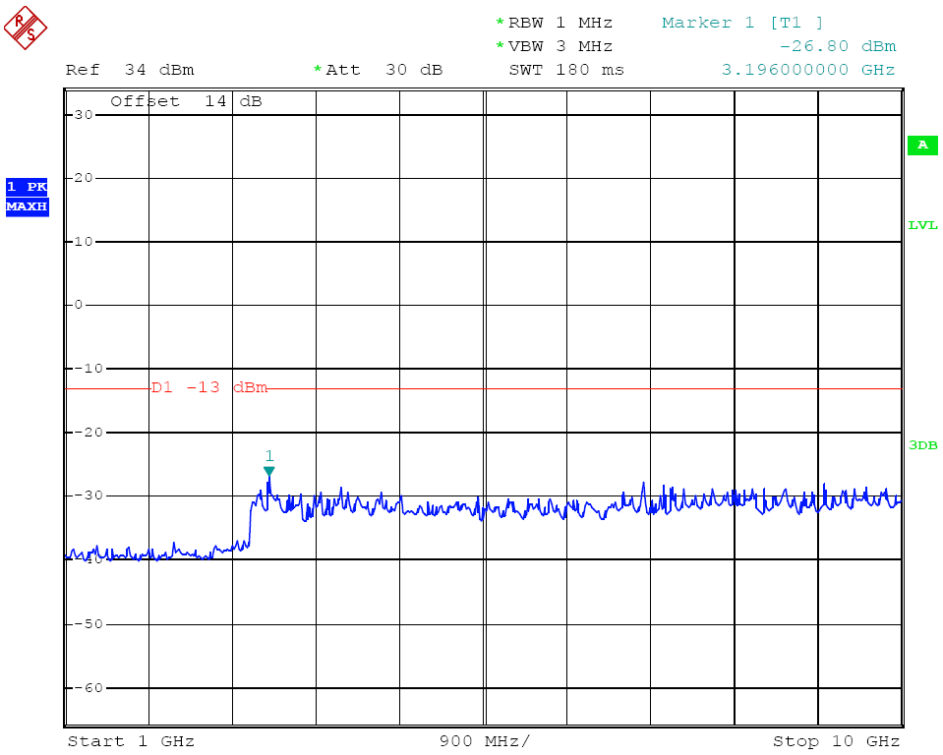
30MHz – 9GHz (Channel 4183)





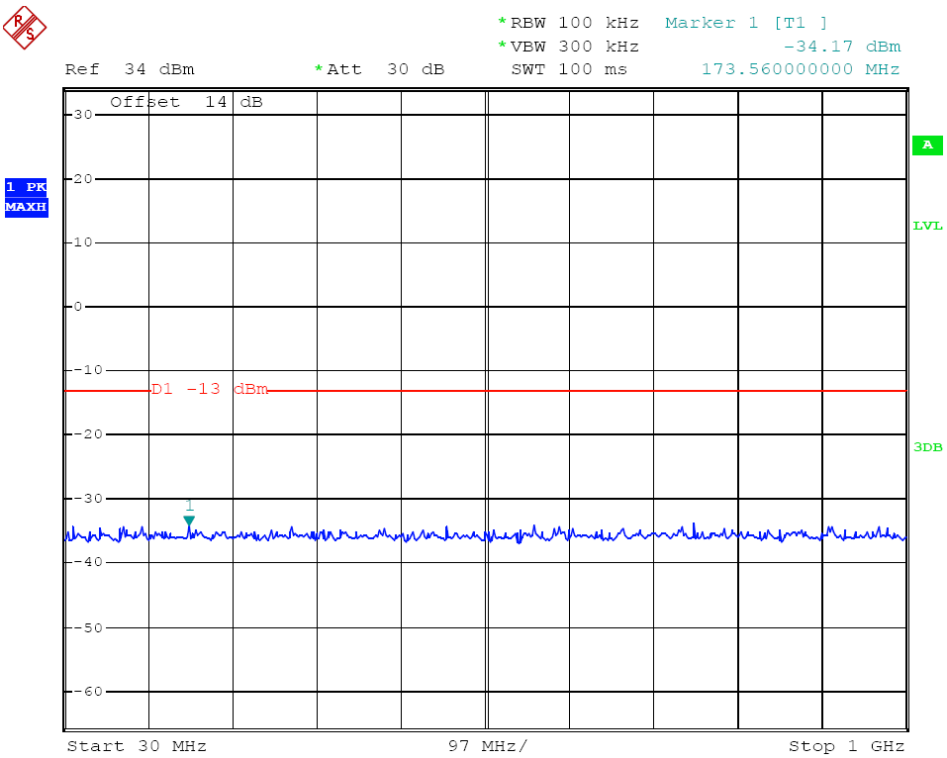
30MHz – 9GHz (Channel 4233)

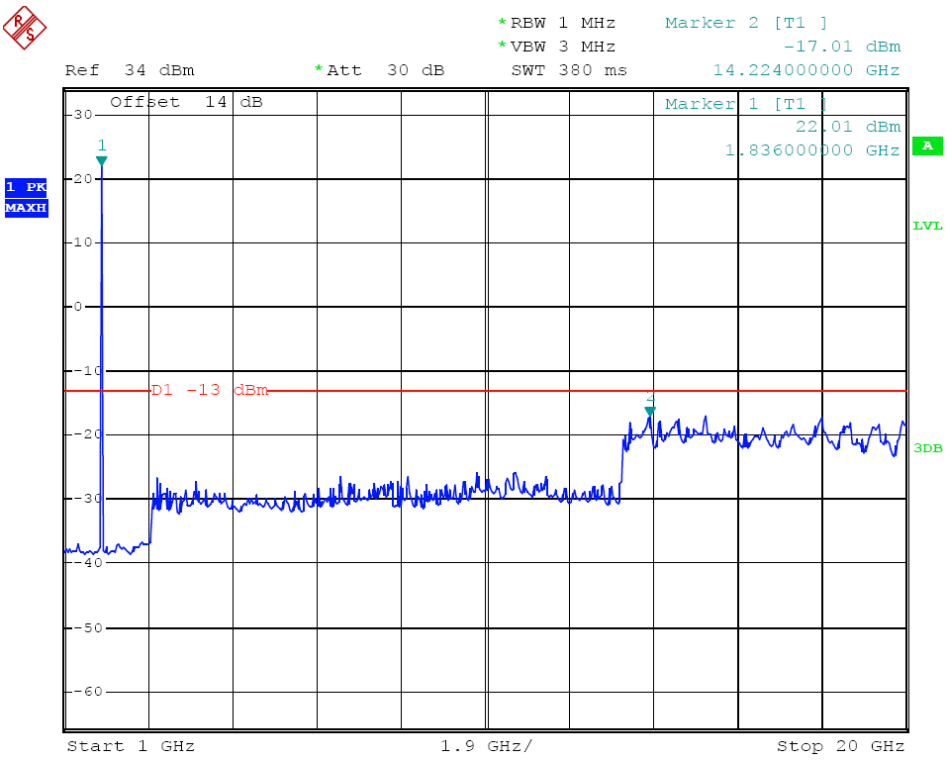




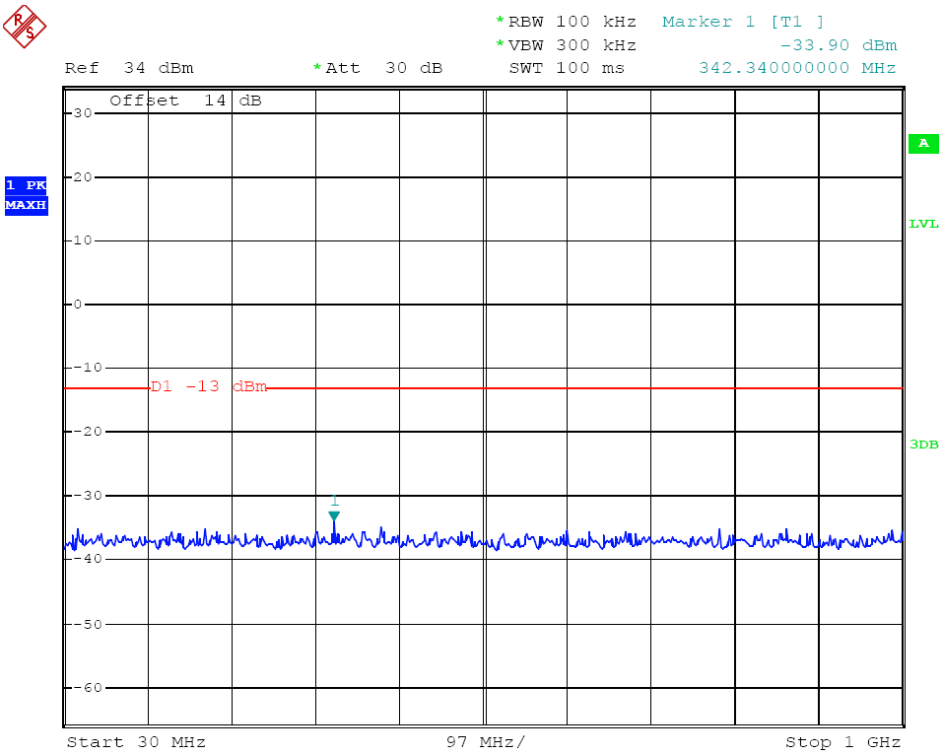
UMTS FDD II

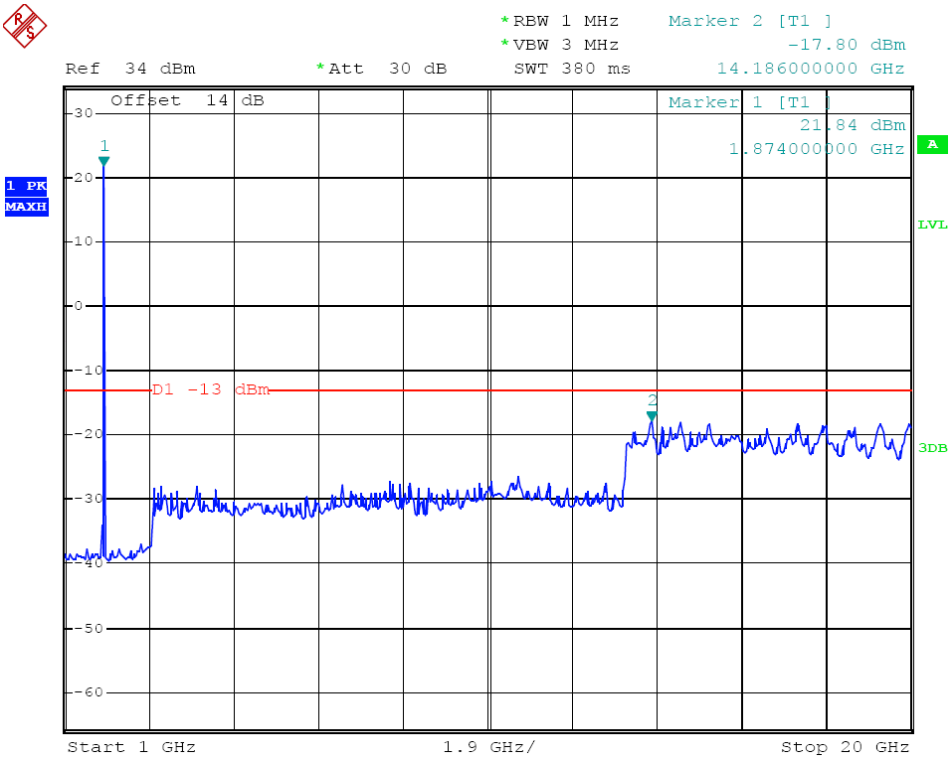
30MHz – 20GHz (Low Channel)



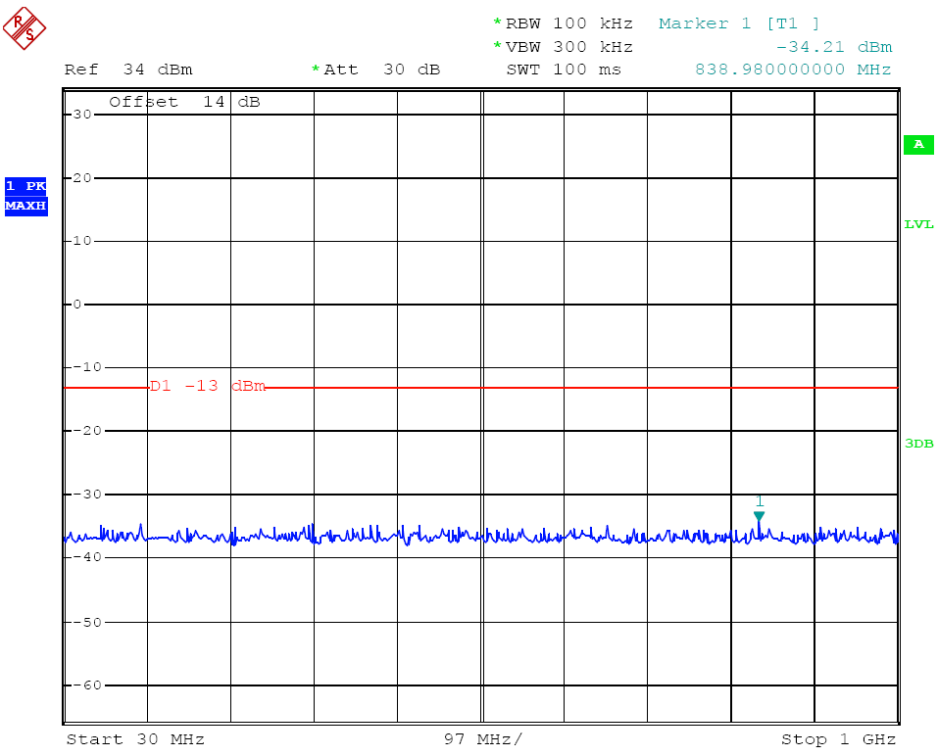


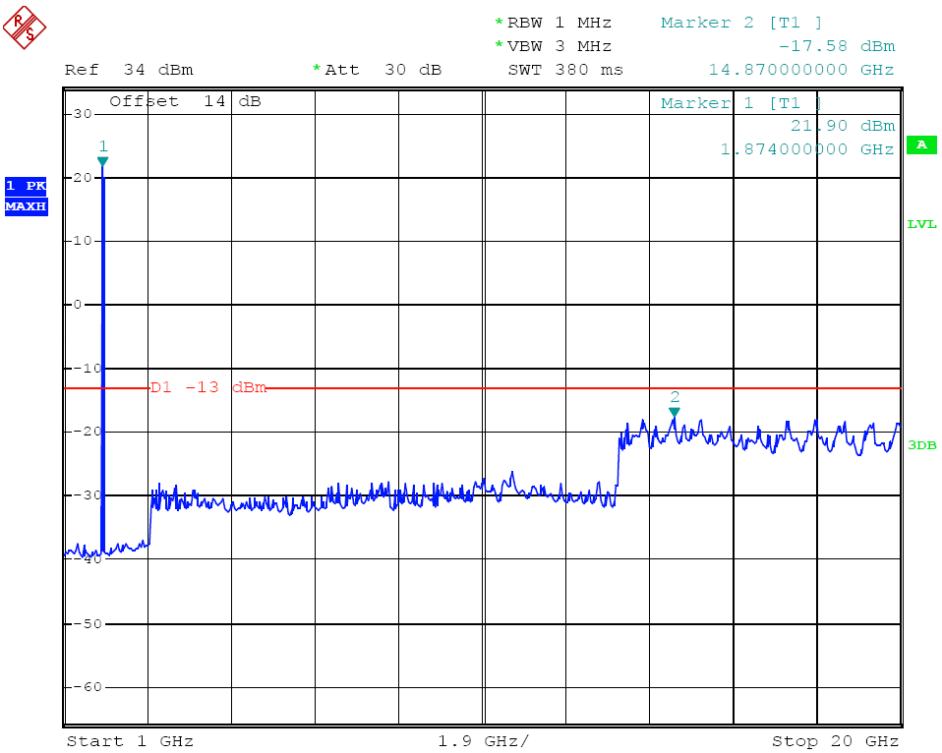
30MHz – 20GHz (Middle Channel)





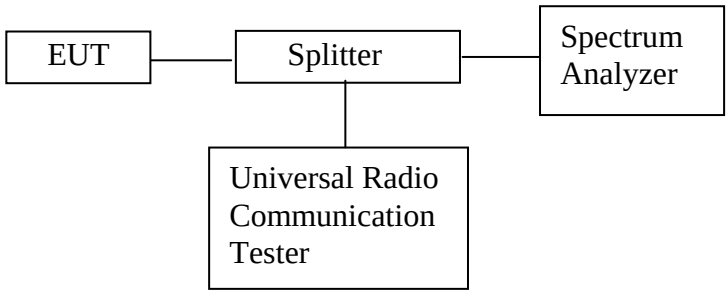
30MHz – 20GHz (High Channel)




*RBW 1 MHz
*VBW 3 MHz
Ref 34 dBm
*Att 30 dB
SWT 380 ms
Marker 2 [T1]
-17.58 dBm
14.870000000 GHz
Offset 14 dB
Marker 1 [T1]
21.90 dBm
1.874000000 GHz
1 PK
MAXH
A
LVL
3DB
D1 -13 dBm
Start 1 GHz
1.9 GHz/
Stop 20 GHz

9. BAND EDGE COMPLIANCE TEST

9.1.Block Diagram of Test Setup



9.2.Applicable Standard

FCC §2.1051, §22.917, §24.238.

9.3.Operating Condition of EUT

9.3.1.Setup the EUT and simulator as shown as Section 9.1.

9.3.2.Turn on the power of all equipment.

9.3.3.Let the EUT work in TX modes measure it. The transmit frequency are 826.4-846.6MHz and 1852.4-1907.6MHz. We select 826.4MHz, 846.6MHz and 1852.4MHz, 1907.6MHz TX frequency to transmit.

9.4.Test Procedure

Conducted Band Edge:

9.4.1.Set the EUT to its maximum power at the required channel.

9.4.2. Measurements are to be performed with the EUT set to the low and high channel of each frequency band.

9.4.3. Set the RBW=50 kHz , VBW=100 kHz below 1GHz and above 1GHz.

9.4.4. Detector = AV.

9.4.5. Sweep time = auto.

9.4.6. Allow trace to fully stabilize.

9.5.Test Result

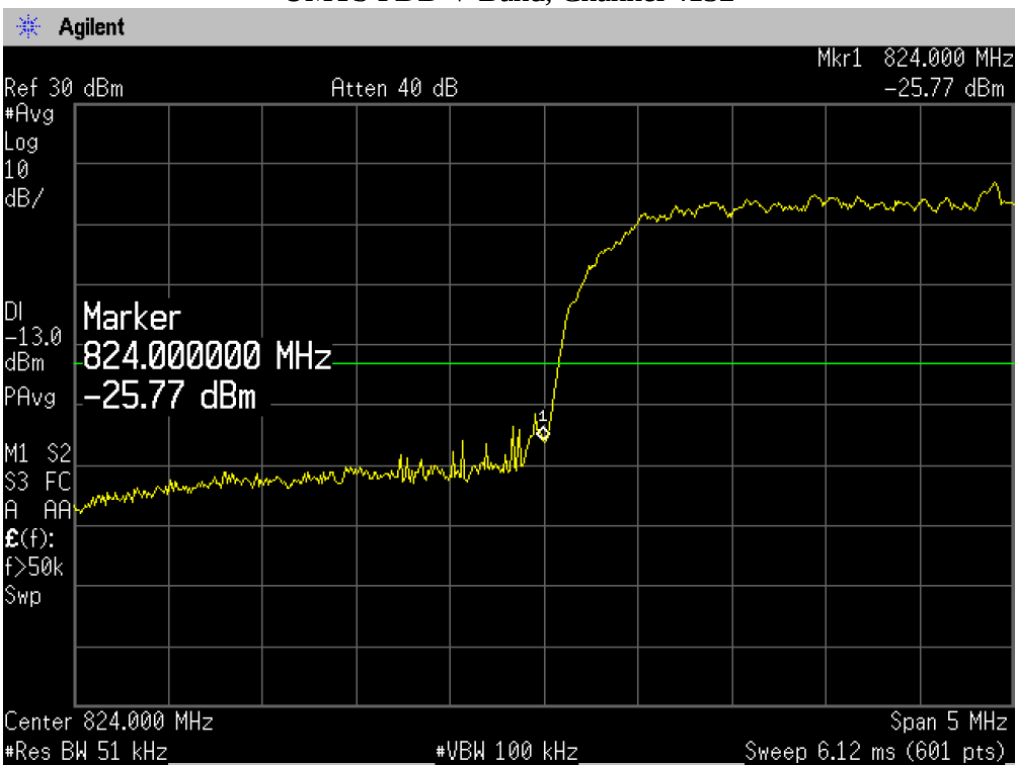
UMTS FDD V

Frequency (MHz)	Emission (dBm)	Limit (dBm)
824.00	-25.77	-13
849.00	-20.15	-13

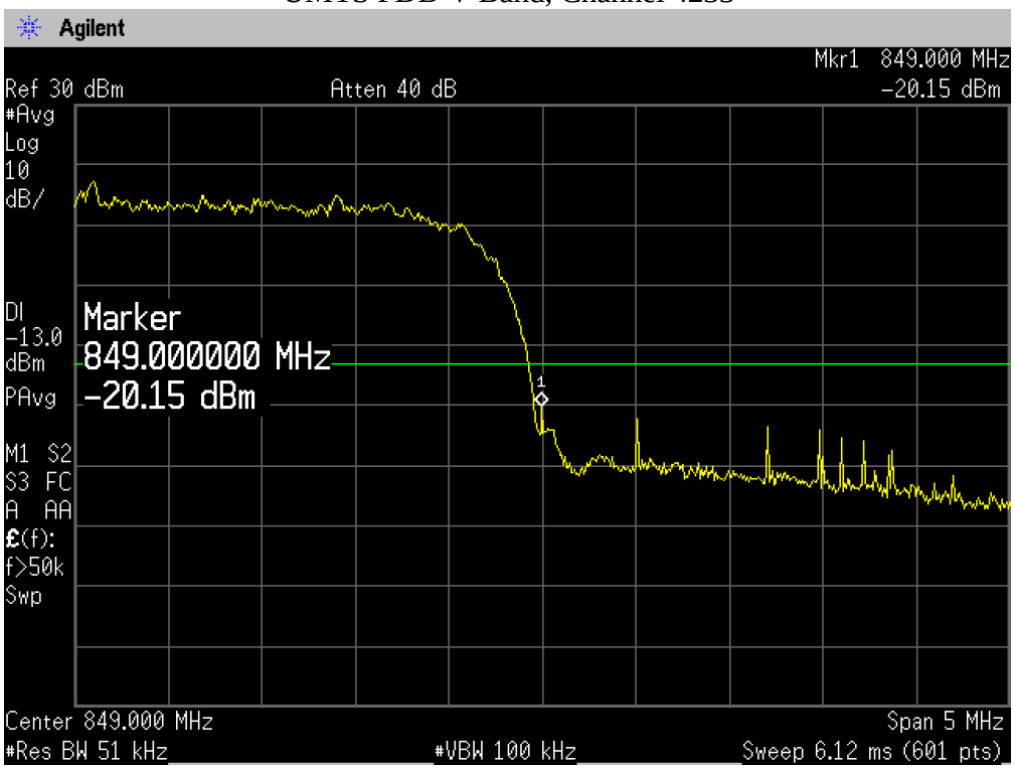
UMTS FDD II

Frequency (MHz)	Emission (dBm)	Limit (dBm)
1850.00	-25.36	-13
1910.00	-28.07	-13

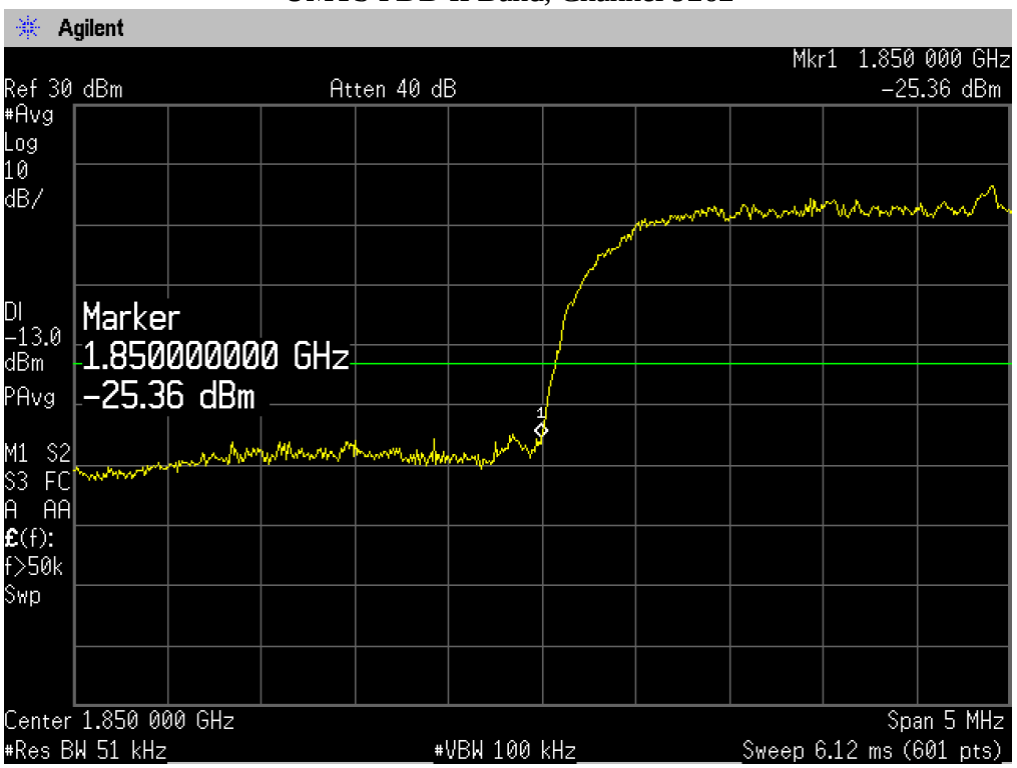
UMTS FDD V Band, Channel 4132



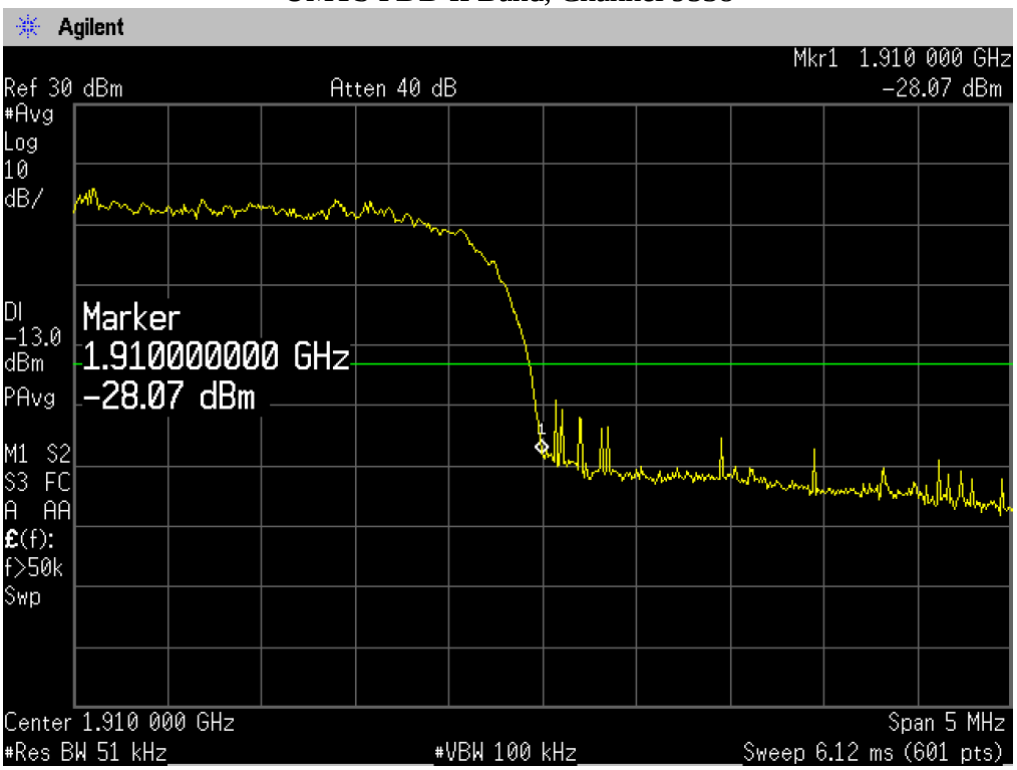
UMTS FDD V Band, Channel 4233



UMTS FDD II Band, Channel 9262

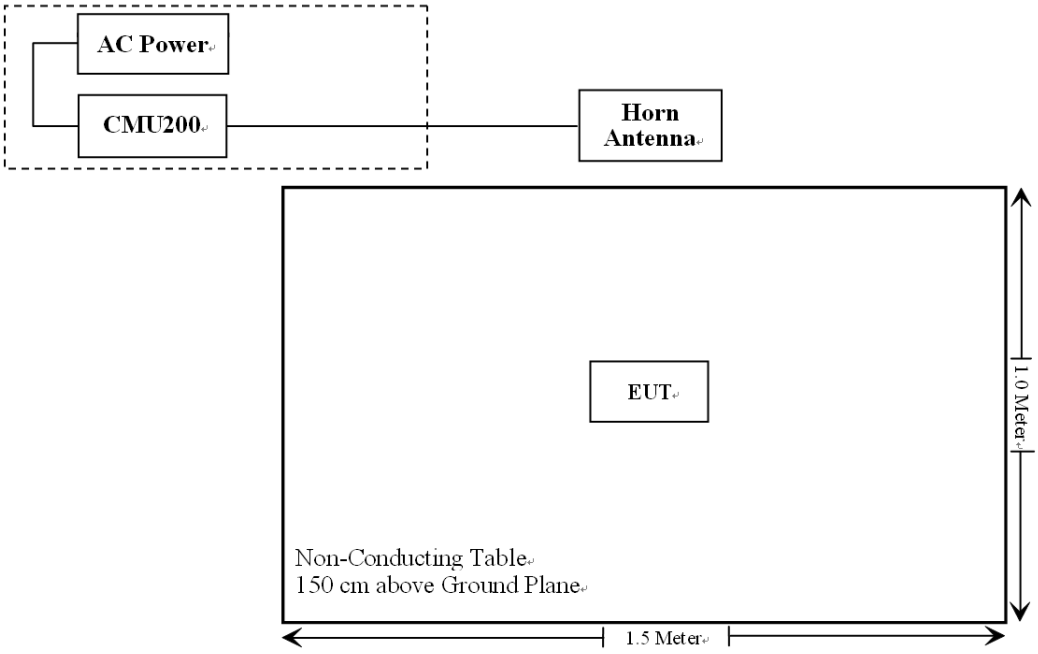


UMTS FDD II Band, Channel 9538

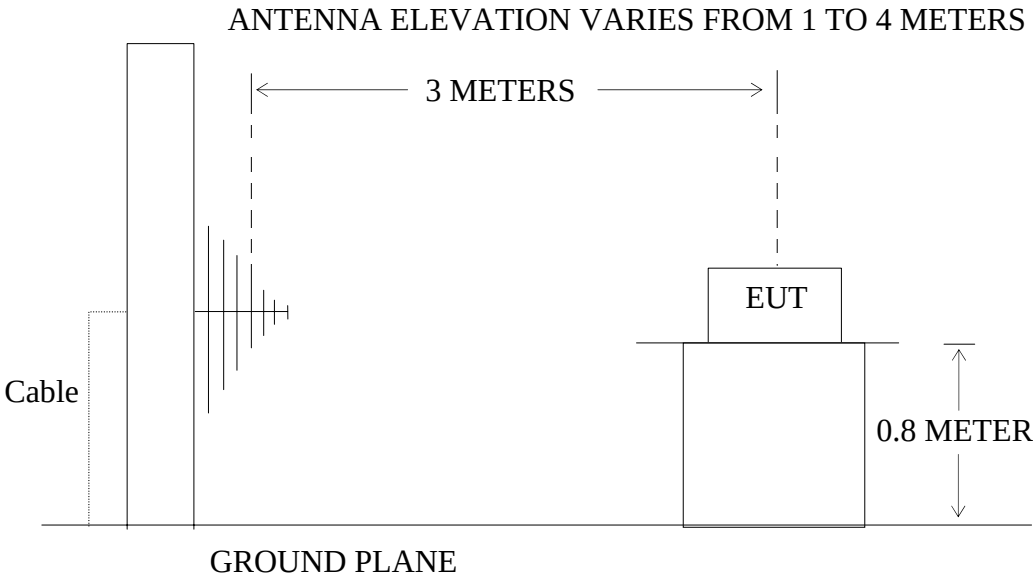


10.RADIATED SPURIOUS EMISSION TEST

10.1.Block Diagram of Test Setup



10.1.1.Semi-Anechoic Chamber Test Setup Diagram



10.2.Applicable Standard

FCC §2.1051, §22.917(a) , §24.238(a)

10.3.Restricted bands of operation

10.3.1.FCC Part 15.205 Restricted bands of operation

(a) Except as shown in paragraph (d) of this section, Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
[1]0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	([2])
13.36-13.41			

[1]Until February 1, 1999, this restricted band shall be 0.490-0.510
[2]Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emission appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000MHz, Compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000MHz, compliance with the emission limits in Section15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

10.4.Configuration of EUT on Measurement

The equipment are installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

10.5.Operating Condition of EUT

10.5.1.Setup the EUT and simulator as shown as Section 10.1.

10.5.2.Turn on the power of all equipment.

10.5.3.Let the EUT work in TX modes measure it. The transmit frequency are 826.4-846.6MHz and 1852.4-1907.6MHz. We select 826.4MHz, 836.6MHz, 846.6MHz and 1852.4MHz, 1880.0MHz, 1907.6MHz TX frequency to transmit.

10.6.Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bilog antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to TIA 603-D on radiated emission measurement. The EUT was tested in 3 orthogonal planes.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Sample Calculation:
EUT Field Strength (dBm)= Reading(Signal generator)+ Antenna Gain(substitution antenna)-Cable loss(From signal Generator to substitution antenna)

The bandwidth of test receiver is set at 9kHz in below 30MHz. and set at 120kHz in 30-1000MHz, and 1MHz in above 1000MHz.

The frequency range from 9kHz to 20GHz is checked.

The final measurement in band 9-90kHz, 110-490kHz and above 1000MHz is performed with Average detector. Except those frequency bands mention above, the final measurement for frequencies below 1000MHz is performed with Quasi Peak detector.

10.7.Standard Requirement

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power(P)by a factor of at least 43 + 10Log $_{10}$ (power out in Watts).The spectrum is scanned from 30MHz up to a frequency including its 10th harmonic.

10.8.The Field Strength of Radiation Emission Measurement Results

Note: 1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. The EUT is tested radiation emission at each test mode in three axes. The worst emissions are reported in all test mode and channels.

UMTS FDD V Band (WCDMA850)

Indicated		Table Angle Degree	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Reading (dBμV/m)		Height (m)	Polar (H/V)	Frequency (MHz)	Level (dBm)	Ant. Gain (dBi)	Cable Loss (dB)			
Low Channel(826.4MHz)											
1652.2	52.06	109	1.4	V	1652.2	-46.0	9.4	0.95	-37.55	-13	24.55
1652.2	47.33	25	1.5	H	1652.2	-56.2	9.4	0.95	-47.75	-13	34.75
3305.8	44.91	123	1.6	V	3305.8	-48.6	10.1	2.08	-40.58	-13	27.58
3305.8	41.36	305	1.7	H	3305.8	-53.1	10.1	2.08	-45.08	-13	32.08
78.14	45.45	108	1.0	V	78.14	-50.1	0	0.32	-50.42	-13	37.42
170.19	48.06	102	1.0	H	170.19	-46.9	0	0.53	-47.43	-13	34.43

UMTS FDD V Band (WCDMA850)

Indicated		Table Angle Degree	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Reading (dBμV/m)		Height (m)	Polar (H/V)	Frequency (MHz)	Level (dBm)	Ant. Gain (dBi)	Cable Loss (dB)			
Middle Channel (836.6MHz)											
1673.2	52.63	18	1.5	V	1673.2	-49.4	9.4	0.98	-40.98	-13	27.98
1673.2	43.90	256	1.4	H	1673.2	-59.6	9.4	0.98	-51.18	-13	38.18
3346.8	45.48	203	1.7	V	3346.8	-48.0	10.2	2.10	-39.90	-13	26.90
3346.8	41.93	109	1.8	H	3346.8	-52.5	10.2	2.10	-44.40	-13	31.40
78.14	46.02	213	1.0	V	78.14	-49.5	0	0.32	-49.82	-13	36.82
170.19	48.63	307	1.0	H	170.19	-46.3	0	0.53	-46.83	-13	33.83

UMTS FDD V Band (WCDMA850)

Indicated		Table Angle Degree	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Reading (dBμV/m)		Height (m)	Polar (H/V)	Frequency (MHz)	Level (dBm)	Ant. Gain (dBi)	Cable Loss (dB)			
High Channel(846.6MHz)											
1693.2	54.79	10	1.3	V	1693.2	-47.3	9.4	1.00	-38.90	-13	25.90
1693.2	46.06	226	1.4	H	1693.2	-57.5	9.4	1.00	-49.10	-13	36.10
3386.4	43.64	329	1.5	V	3386.4	-49.9	10.2	2.10	-41.80	-13	28.80
3386.4	40.09	155	1.6	H	3386.4	-54.4	10.2	2.10	-46.30	-13	33.30
78.14	44.18	237	1.0	V	78.14	-51.4	0	0.32	-51.72	-13	38.72
170.19	46.79	289	1.0	H	170.19	-48.2	0	0.53	-48.73	-13	35.73

UMTS FDD II Band (WCDMA1900)

Indicated		Table Angle Degree	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Reading (dBμV/m)		Height (m)	Polar (H/V)	Frequency (MHz)	Level (dBm)	Ant. Gain (dBi)	Cable Loss (dB)			
Low Channel(1852.4MHz)											
3704.8	51.55	167	1.9	V	3704.8	-44.96	10.3	2.58	-37.24	-13	24.24
3704.8	46.69	201	1.4	H	3704.8	-50.56	10.3	2.58	-42.84	-13	29.84
5557.2	39.02	65	1.5	V	5557.2	-52.16	11.6	3.93	-44.49	-13	31.49
5557.2	39.34	73	1.6	H	5557.2	-53.06	11.6	3.93	-45.39	-13	32.39
78.14	44.96	286	1.0	V	78.14	-50.56	0	0.32	-50.88	-13	37.88
170.19	47.05	102	1.0	H	170.19	-48.36	0	0.53	-48.89	-13	35.89

UMTS FDD II Band (WCDMA1900)

Indicated		Table Angle Degree	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Reading (dBμV/m)		Height (m)	Polar (H/V)	Frequency (MHz)	Level (dBm)	Ant. Gain (dBi)	Cable Loss (dB)			
Middle Channel(1880.0MHz)											
3760	50.98	64	1.9	V	3760	-45.53	10.3	2.59	-37.72	-13	24.72
3760	46.12	258	1.8	H	3760	-51.13	10.3	2.59	-43.32	-13	30.32
5640	38.45	169	1.3	V	5640	-52.73	11.7	3.94	-44.97	-13	31.97
5640	38.77	275	1.6	H	5640	-53.63	11.7	3.94	-45.87	-13	32.87
78.14	44.39	86	1.0	V	78.14	-51.13	0	0.32	-50.81	-13	37.81
170.19	46.48	303	1.0	H	170.19	-48.93	0	0.53	-49.46	-13	36.46

UMTS FDD II Band (WCDMA1900)

Indicated		Table Angle Degree	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	S.A. Reading (dBμV/m)		Height (m)	Polar (H/V)	Frequency (MHz)	Level (dBm)	Ant. Gain (dBi)	Cable Loss (dB)			
High Channel(1907.6MHz)											
3815.2	49.71	267	2.0	V	3815.2	-46.80	10.4	2.60	-39.00	-13	26.00
3815.2	44.85	101	1.6	H	3815.2	-52.40	10.4	2.60	-44.60	-13	31.6
5722.8	37.18	305	1.3	V	5722.8	-54.00	11.8	3.95	-46.15	-13	33.15
5722.8	37.50	173	1.8	H	5722.8	-54.90	11.8	3.95	-47.05	-13	34.05
78.14	43.12	189	1.0	V	78.14	-52.40	0	0.32	-52.72	-13	39.72
170.19	45.21	202	1.0	H	170.19	-50.20	0	0.53	-50.73	-13	37.73

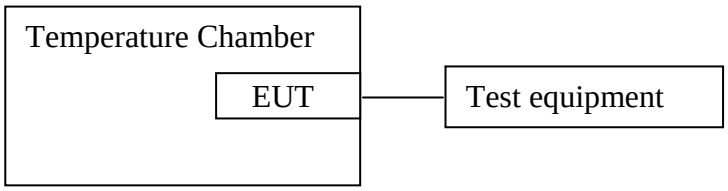
Note:

Absolute Level=SG Level- Cable loss + Antenna Gain

Margin=Limit- Absolute Level

11.FREQUENCY STABILITY

11.1.Block Diagram of Test Setup



11.2.Limits

For Hand carried battery powered equipment:

According to the JTC standard the frequency stability of the carrier shall be accurate to within 0.1 ppm of the received frequency from the base station. This accuracy is sufficient to meet Sec. 24.235/22.355 Frequency Stability. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.
As this transceiver is considered "Hand carried, battery powered equipment" Section 2.1055(d)(2) applies. This requires that the lower voltage for frequency stability testing be specified by the manufacturer. This transceiver is specified to operate with an input voltage of between 3.4VDC and 4.2VDC, with a nominal voltage of 3.8VDC. Operation above or below these voltage limits is prohibited by transceiver software in order to prevent improper operation as well as to protect components from overstress. These voltages represent a tolerance of –10% and +10%. For the purposes of measuring frequency stability these voltage limits are to be used.

For equipment powered by primary supply voltage:

According to the JTC standard the frequency stability of the carrier shall be accurate to within 0.1 ppm of the received frequency from the base station. This accuracy is sufficient to meet Sec. 24.235/22.355 Frequency Stability. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.
For this EUT section 2.1055(d)(1) applies. This requires to vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

11.3.Operating Condition of EUT

11.3.1.Setup the EUT and simulator as shown as Section 11.1.

11.3.2.Turn on the power of all equipment.

11.3.3.Let the EUT work in Test modes measure it. The test frequency are 836.6MHz and 1880MHz.

11.4.Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to communication test set via feed-through attenuators. The EUT was placed inside the temperature chamber.

The DC leads and RF output cable exited the chamber through an opening made for the purpose.
After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the communication test set.
Frequency Stability vs. Voltage: An external variable DC power supply was connected to the battery terminals of the equipment under test. The voltage was set to 115% of the nominal value and was then decreased until the transmitter light no longer illuminated; i.e., the battery end point. The output frequency was recorded for each battery voltage.

11.5.Test Result

Pass.

UMTS FDD V Band Middle Channel, fo = 836.6 MHz

Temperature (OC)	Power Supplied (VDC)	Frequency Error (Hz)	Frequency Error (ppm)
-30	3.7	5	0.005
-20		-7	0.008
-10		-8	0.009
0		-6	0.007
10		-1	0.002
20		-7	0.009
30		14	0.017
40		-5	0.006
50		-7	0.009
25	3.5	-6	0.007
	4.2	3	0.003

UMTS FDD II Band Middle Channel, fo = 1880 MHz

Temperature (OC)	Power Supplied (VDC)	Frequency Error (Hz)	Frequency Error (ppm)
-30	3.7	-2	-0.001
-20		-1	-0.001
-10		3	0.002
0		0	0.000
10		2	0.001
20		0	0.000
30		1	0.001
40		1	0.001
50		3	0.002
25	3.5	-1	-0.001
	4.2	2	0.001

12. ANTENNA REQUIREMENT

12.1. The Requirement

According to Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

12.2. Antenna Construction

Device is equipped with Integral antenna, which isn't displaced by other antenna. Therefore, the equipment complies with the antenna requirement of Section 15.203.