Verykool USA Inc

Mobile phone

Main Model:SL5000
Serial Model: N/A

August 01, 2014

Report No.: 14070215-FCC-R1
(This report supersedes NONE)

Modifications made to the product : None

This Test Report is Issued Under the Authority of:		
Herith shi	Alex Liu	
Herith Shi **Compliance Engineer**	**Alex Liu** **Technical Manager**	

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Test result presented in this test report is applicable to the representative sample only.

RF Test Report

To: FCC Part 22(H); FCC Part 24(E); Part 27: 2013

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Laboratory Introduction

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Country/Region	Scope
USA	EMC , RF/Wireless , Telecom
Canada	EMC, RF/Wireless , Telecom
Taiwan	EMC, RF, Telecom , Safety
Hong Kong	RF/Wireless ,Telecom
Australia	EMC, RF, Telecom , Safety
Korea	EMI, EMS, RF , Telecom, Safety
Japan	EMI, RF/Wireless, Telecom
Singapore	EMC , RF , Telecom
Europe	EMC, RF, Telecom , Safety

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1. EXECUTIVE SUMMARY & EUT INFORMATION

The purpose of this test programmed was to demonstrate compliance of the Verykool USA Inc, Mobile phone and model: SL5000 against the current Stipulated Standards. The Mobile phone has demonstrated compliance with the FCC Part 22(H); FCC Part 24(E); Part 27: 2013.

EUT Information		
EUT Description	:	**Mobile phone**
Main Model	:	**SL5000**
Serial Model		**N/A**
Antenna Gain	:	**GSM850/ UMTS-FDD Band 5: -1.1 dBi** **PCS1900/ UMTS-FDD Band 2: -0.8 dBi** **UMTS-FDD Band 4: -0.8 dBi** **LTE Band 2/ Band 4: -0.8 dBi** **LTE Band 12/ Band 17: -2.5 dBi** **WIFI/ Bluetooth/ BLE: 0.8 dBi**
Input Power	:	**Battery:** **Model: SL5000** **Spec: 3.7V 2000mAh** **Limited charger voltage: 4.2V** **Adapter:** **Model: DSA-5PFK-05 FUS 050100a** **Input: AC 100-240V; 50/60Hz 0.2A** **Output: DC 5.0V; 1A**
Maximum Conducted AV Power to Antenna	:	**GSM850: 32.14 dBm** **PCS1900: 29.87 dBm** **UMTS-FDD Band 5: 22.43 dBm** **UMTS-FDD Band 2: 23.04 dBm** **UMTS-FDD Band 4: 21.71 dBm**
Maximum Radiated ERP/EIRP	:	**GSM850: 25.93 dBm / ERP** **PCS1900:23.25 dBm / EIRP** **UMTS-FDD Band 5: 19.30dBm / ERP** **UMTS-FDD Band 2: 18.86 dBm / EIRP** **UMTS-FDD Band 4: 18.98 dBm / EIRP**

Classification Per Stipulated Test Standard : **FCC Part 22(H); FCC Part 24(E); Part 27: 2013**

2. TECHNICAL DETAILS

Purpose	**Compliance testing of Mobile phone with stipulated standard**
Applicant / Client	**Verykool USA Inc 3636 Nobel Drive, Suite 325, San Diego, CA 92122 USA**
Manufacturer	**Shenzhen Coship Electronics CO., LTD Rainbow Bldg., North, Hi-Tech Industrial Park, Nanshan District, Shenzhen, China, P.C.**
Laboratory performing the tests	**SIEMIC (Shenzhen - China) Laboratories Zone A, Floor 1, Building 2, Wan Ye Long Technology Park, South Side of Zhoushi Road, Bao'an District, Shenzhen, Guangdong, China Tel: +86-0755-2601 4629 / 2601 4953 Fax: +86-0755-2601 4953-810 Email: China@siemic.com.cn**
Test report reference number	**14070215-FCC-R1**
Date EUT received	**June 10, 2014**
Standard applied	**FCC Part 22(H); FCC Part 24(E); Part 27: 2013**
Dates of test	**July 14 to July 30, 2014**
No of Units	**#1**
Equipment Category	**PCE**
Trade Name	**verykool**
RF Operating Frequency (ies)	**GSM850 TX : 824.2 ~ 848.8 MHz; RX : 869.2 ~ 893.8 MHz PCS1900 TX : 1850.2 ~ 1909.8 MHz; RX : 1930.2 ~ 1989.8 MHz UMTS-FDD Band 5 TX : 826.4 ~ 846.6 MHz; RX : 871.4 ~ 891.6 MHz UMTS-FDD Band 2 TX :1852.4 ~ 1907.6 MHz; RX : 1932.4 ~ 1987.6 MHz UMTS-FDD Band 4 TX :1712.4 ~ 1752.6 MHz; RX : 2112.4 ~ 2152.6 MHz LTE Band 2 TX: 1852.5 ~ 1907.5 MHz; RX : 1932.5 ~ 1987.5 MHz LTE Band 4: 1712.5 ~ 1752.5 MHz; RX : 2112.5 ~ 2152.5 MHz LTE Band 12 TX: 701.5 ~ 713.5 MHz; RX : 731.5 ~ 743.5 MHz LTE Band 17 TX: 706.5 ~ 713.5 MHz; RX : 736.5 ~ 743.5 MHz 802.11b/g/n: 2412-2462 MHz Bluetooth& BLE: 2402-2480 MHz**
Modulation	**GSM / GPRS: GMSK EGPRS: 8PSK UMTS-FDD: QPSK LTE: QPSK& 16QAM 802.11b/g/n: DSSS/OFDM Bluetooth: GFSK& π/4DQPSK&8DPSK BLE: GFSK**
GPRS/EGPRS Multi-slot class	**8/10/12**
FCC ID	**WA6SL5000**

3 MODIFICATION

NONE

3. TEST SUMMARY

The product was tested in accordance with the following specifications.
All testing has been performed according to below product classification:

PCE

Test Results Summary

Test Standard	Description	Product Class	Pass / Fail
§ 1.1307, § 2.1093	RF Exposure (SAR)	See Above	Pass
§2.1046; § 22.913 (a); § 24.232 (c) § 27.50(c.10); § 27.50(d.4)	RF Output Power	See Above	Pass
§ 24.232(d) § 27.50(d)	PK-Average Ratio	See Above	Pass
§ 2.1049; § 22.905 § 22.917; § 24.238 § 27.53(a.5)	99% & -26 dB Occupied Bandwidth	See Above	Pass
§ 2.1051, § 22.917 (a); § 24.238 (a) § 27.53(h)	Spurious Emissions at Antenna Terminal	See Above	Pass
§ 2.1053 § 22.917 (a); § 24.238 (a) § 27.53(h)	Field Strength of Spurious Radiation	See Above	Pass
§ 22.917 (a); § 24.238 (a) § 27.53(h)	Out of band emission, Band Edge	See Above	Pass
§ 2.1055 § 22.355; § 24.235 § 27.5(h); § 27.54	Frequency stability vs. temperature Frequency stability vs. voltage	See Above	Pass

Note: Testing was performed by configuring EUT to maximum output power status, the declared output power class for different.

4. MEASUREMENTS, EXAMINATION AND DERIVED RESULTS

5.1 §1.1307, §2.1093- RF Exposure (SAR)

Test Result: Pass

The EUT is a portable device, thus requires SAR evaluation;
Please refer to SIEMIC SAR Report: 14070215-FCC-H

5.2 §2.1046; §22.913 (a); §24.232 (c); § 27.50(c.10); § 27.50(d.4) - RF Output Power

1. Conducted Measurement
   EUT was set for low, mid, high channel with modulated mode and highest RF output power.
   The spectrum analyzer was connected to the antenna terminal.
2. Conducted Emissions Measurement Uncertainty
   All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 30MHz – 40GHz is ±1.5dB.
3. Environmental Conditions

Temperature	23°C
Relative Humidity	52%
Atmospheric Pressure	1012mbar

4. Test date : July 14, 2014
   Tested By : Herith Shi

Procedures: (According with KDB 971168)

For Conducted Power:

1. The transmitter output port was connected to base station.
2. Set EUT at maximum power through base station.
3. Select lowest, middle, and highest channels for each band and different test mode.
4. The instrument must have an available measurement/resolution bandwidth that is equal to or exceeds the OBW. If this capability is available, then the following procedure can be used to determine the total peak output power.
   a) Set the RBW ⩾ OBW.
   b) Set VBW ⩾ 3 × RBW.
   c) Set span ⩾ 2 x RBW
   d) Sweep time = auto couple.
   e) Detector = peak.
   f) Ensure that the number of measurement points ⩾ span/RBW.
   g) Trace mode = max hold.
   h) Allow trace to fully stabilize.
   1) Use the peak marker function to determine the peak amplitude level.

For ERP/EIRP: (According with TIA 603D)

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. 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)

Test Result: Pass

Remark: Conducted Burst Average power for reporting purposes only

Conducted Power

GSM Mode:

Burst Average Power (dBm);								
Band	GSM850				GSM1900			
Channel	128	190	251	Tune up Power tolerant	512	661	810	Tune up Power tolerant
Frequency (MHz)	824.2	836.6	848.8	/	1850.2	1880	1909.8	/
GSM Voice (1 uplink),GMSK	**32.14**	31.94	31.87	32±1	**29.87**	29.84	29.79	29±1
GPRS Multi-Slot Class 8 (1 uplink),GMSK	32.04	32.01	31.97	32±1	29.86	29.83	29.75	29±1
GPRS Multi-Slot Class 10 (2 uplink),GMSK	31.75	31.64	31.48	31±1	29.58	29.57	29.52	29±1
GPRS Multi-Slot Class 12 (4 uplink),GMSK	30.69	30.54	30.51	30±1	28.84	28.87	28.83	28±1
EGPRS Multi-Slot Class 8 (1 uplink), 8-PSK	24.83	25.03	24.58	25±1	24.30	24.47	24.45	24±1
EGPRS Multi-Slot Class 10 (2 uplink), 8-PSK	24.73	24.07	24.45	24±1	24.15	24.27	24.29	24±1
EGPRS Multi-Slot Class 12 (4 uplink),8-PSK	24.08	24.03	24.05	24±1	23.73	23.90	23.77	24±1
Remark : GPRS, CS1 coding scheme. Multi-Slot Class 8 , Support Max 4 downlink, 1 uplink , 5 working link Multi-Slot Class 10 , Support Max 4 downlink, 2 uplink , 5 working link Multi-Slot Class 12 , Support Max 4 downlink, 4 uplink , 5 working link								

Note: Since GSM mode has higher power, so the test items below were not performed to GPRS mode.

UMTS Mode:

UMTS-FDD Band V

Band/ Time Slot configuration	Channel	Frequency	Average power (dBm)
RMC 12.2kbps	4132	826.4	22.22
	4175	835.0	21.89
	4233	846.6	**22.43**
HSDPA Subtest1	4132	826.4	22.19
	4175	835.0	21.90
	4233	846.6	22.38
HSDPA Subtest2	4132	826.4	21.58
	4175	835.0	21.21
	4233	846.6	21.67
HSDPA Subtest3	4132	826.4	21.72
	4175	835.0	21.42
	4233	846.6	21.85
HSDPA Subtest4	4132	826.4	21.90
	4175	835.0	21.51
	4233	846.6	22.05
HSUPA Subtest1	4132	826.4	22.12
	4175	835.0	21.92
	4233	846.6	22.33
HSUPA Subtest2	4132	826.4	21.67
	4175	835.0	21.32
	4233	846.6	21.76
HSUPA Subtest3	4132	826.4	21.88
	4175	835.0	21.39
	4233	846.6	21.99
HSUPA Subtest4	4132	826.4	21.78
	4175	835.0	21.43
	4233	846.6	21.87
HSUPA Subtest5	4132	826.4	22.09
	4175	835.0	21.81
	4233	846.6	22.35

UMTS-FDD Band Ⅱ

Band/ Time Slot configuration	Channel	Frequency	Average power (dBm)
RMC 12.2kbps	9262	1852.4	22.45
	9400	1880.0	**23.04**
	9538	1907.6	22.24
HSDPA Subtest1	9262	1852.4	22.23
	9400	1880.0	22.52
	9538	1907.6	22.10
HSDPA Subtest2	9262	1852.4	22.33
	9400	1880.0	22.86
	9538	1907.6	22.18
HSDPA Subtest3	9262	1852.4	21.56
	9400	1880.0	21.85
	9538	1907.6	21.35
HSDPA Subtest4	9262	1852.4	21.75
	9400	1880.0	22.13
	9538	1907.6	21.60
HSUPA Subtest1	9262	1852.4	21.83
	9400	1880.0	22.15
	9538	1907.6	21.68
HSUPA Subtest2	9262	1852.4	21.56
	9400	1880.0	22.02
	9538	1907.6	21.45
HSUPA Subtest3	9262	1852.4	21.29
	9400	1880.0	21.74
	9538	1907.6	21.12
HSUPA Subtest4	9262	1852.4	21.49
	9400	1880.0	21.86
	9538	1907.6	21.30
HSUPA Subtest5	9262	1852.4	21.37
	9400	1880.0	21.79
	9538	1907.6	21.25

UMTS-FDD Band Ⅳ

Band/ Time Slot configuration	Channel	Frequency	Average power (dBm)
RMC 12.2kbps	1313	1712.6	21.66
	1413	1732.6	**21.71**
	1512	1752.4	21.56
HSDPA Subtest1	1313	1712.6	21.23
	1413	1732.6	21.35
	1512	1752.4	21.30
HSDPA Subtest2	1313	1712.6	21.52
	1413	1732.6	21.62
	1512	1752.4	21.54
HSDPA Subtest3	1313	1712.6	21.35
	1413	1732.6	21.47
	1512	1752.4	21.39
HSDPA Subtest4	1313	1712.6	21.20
	1413	1732.6	21.33
	1512	1752.4	21.27
HSUPA Subtest1	1313	1712.6	21.72
	1413	1732.6	21.85
	1512	1752.4	21.74
HSUPA Subtest2	1313	1712.6	21.60
	1413	1732.6	21.77
	1512	1752.4	21.64
HSUPA Subtest3	1313	1712.6	21.40
	1413	1732.6	21.55
	1512	1752.4	21.46
HSUPA Subtest4	1313	1712.6	21.37
	1413	1732.6	21.51
	1512	1752.4	21.38
HSUPA Subtest5	1313	1712.6	21.10
	1413	1732.6	21.36
	1512	1752.4	21.15

ERP & EIRP (worst case)

ERP for Cellular Band (Part 22H)

Frequency (MHz)	Substituted level (dBm)	Antenna Polarization	Antenna Gain correction (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)
824.2	17.82	V	6.8	0.53	24.09	38.45
824.2	19.66	H	6.8	0.53	**25.93**	38.45
836.6	17.73	V	6.8	0.53	24.0	38.45
836.6	19.59	H	6.8	0.53	25.86	38.45
848.8	17.68	V	6.9	0.53	24.05	38.45
848.8	19.52	H	6.9	0.53	25.89	38.45

EIRP for PCS Band (Part 24E)

Frequency (MHz)	Substituted level (dBm)	Antenna Polarization	Antenna Gain correction (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)
1850.2	15.46	V	7.88	0.85	22.49	33
1850.2	16.22	H	7.88	0.85	**23.25**	33
1880	15.55	V	7.88	0.85	22.58	33
1880	16.17	H	7.88	0.85	23.20	33
1909.8	15.47	V	7.86	0.85	22.48	33
1909.8	16.23	H	7.86	0.85	23.24	33

ERP for UMTS-FDD Band Ⅴ (Part 22H)

Frequency (MHz)	Substituted level (dBm)	Antenna Polarization	Antenna Gain correction (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)
826.4	12.46	V	6.8	0.53	18.73	38.45
826.4	12.72	H	6.8	0.53	18.99	38.45
835	12.55	V	6.8	0.53	18.82	38.45
835	12.89	H	6.8	0.53	19.16	38.45
846.6	12.63	V	6.9	0.53	19.0	38.45
846.6	12.93	H	6.9	0.53	**19.30**	38.45

EIRP for UMTS-FDD Band Ⅱ (Part 24E)

Frequency (MHz)	Substituted level (dBm)	Antenna Polarization	Antenna Gain correction (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)
1852.4	10.92	V	7.88	0.85	17.95	33
1852.4	11.72	H	7.88	0.85	18.75	33
1880	11.01	V	7.88	0.85	18.04	33
1880	11.83	H	7.88	0.85	**18.86**	33
1907.6	10.88	V	7.86	0.85	17.89	33
1907.6	11.23	H	7.86	0.85	18.24	33

EIRP for UMTS-FDD Band Ⅳ (Part 27)

Frequency (MHz)	Substituted level (dBm)	Antenna Polarization	Antenna Gain correction (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)
1712.4	12.04	V	7.76	0.82	**18.98**	38.45
1712.4	11.46	H	7.76	0.82	18.4	38.45
1740	10.08	V	7.76	0.82	17.02	38.45
1740	11.82	H	7.76	0.82	18.76	38.45
1752.6	11.31	V	7.74	0.82	18.23	38.45
1752.6	10.95	H	7.74	0.82	17.87	38.45

5.3 §2.1047 - Modulation Characteristic

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

5.4 §2.1049, §22.917, §22.905 & §24.238, §27.53(a.5) - Occupied Bandwidth

1. Conducted Measurement
   EUT was set for low, mid, high channel with modulated mode and highest RF output power.
   The spectrum analyser was connected to the antenna terminal.
2. Environmental Conditions — Temperature 23°C; Relative Humidity 52%; Atmospheric Pressure 1010mbar
3. Conducted Emissions Measurement Uncertainty
   All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 30MHz – 40GHz is ±1.5dB.
4. Test date : July 21, 2014
   Tested By : Herith Shi

Procedures:

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.

2. The 99% and 26 dB occupied bandwidth (BW) of the middle channel for the highest RF powers.

3. Details according with KDB 971168 section 4.1 & 4.2.

Test Results: Pass

Cellular Band (Part 22H)

Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Bandwidth (kHz)
128	824.2	242.6775	315.099
190	836.6	243.9156	316.169
251	848.8	245.8200	313.583

PCS Band (Part 24E)

Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Bandwidth (kHz)
512	1850.2	248.5887	315.506
661	1880.0	249.2485	315.865
810	1909.8	244.1069	314.999

UMTS-FDD Band Ⅴ (Part 22H)

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
4132	826.4	4.1467	4.697
4175	835.0	4.1532	4.691
4233	846.6	4.1579	4.676

UMTS-FDD Band Ⅱ (Part 24E)

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
9262	1852.4	4.1430	4.711
9400	1880.0	4.2004	4.727
9538	1907.6	4.1499	4.690

UMTS-FDD Band Ⅳ (Part 27)

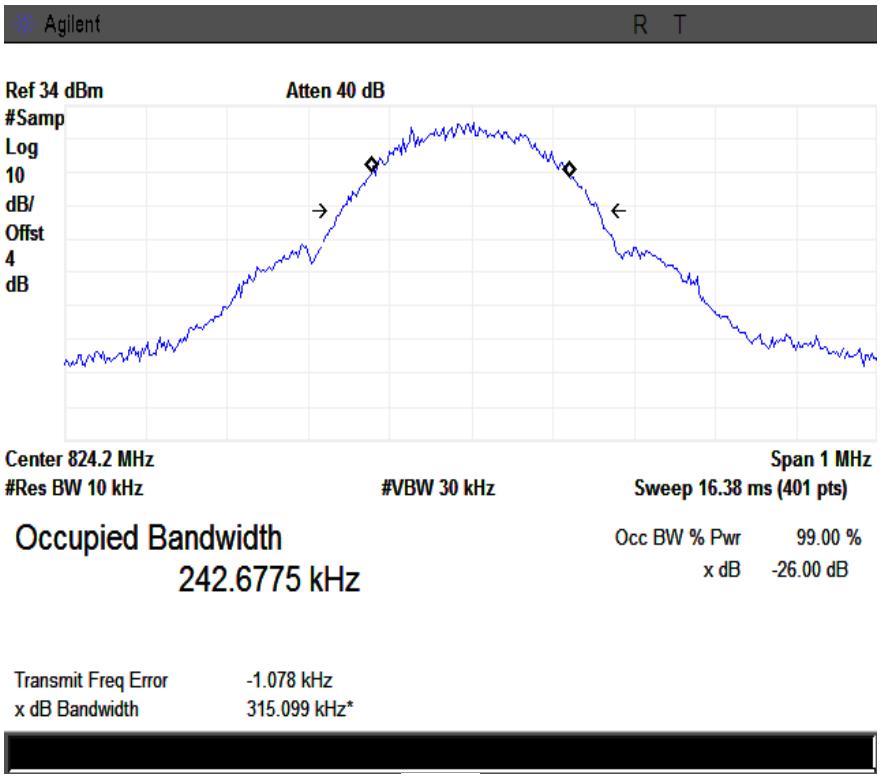
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
1313	1712.4	4.1600	4.689
1413	1732.6	4.1671	4.697
1512	1752.6	4.1666	4.672

Please refer to the following plots.

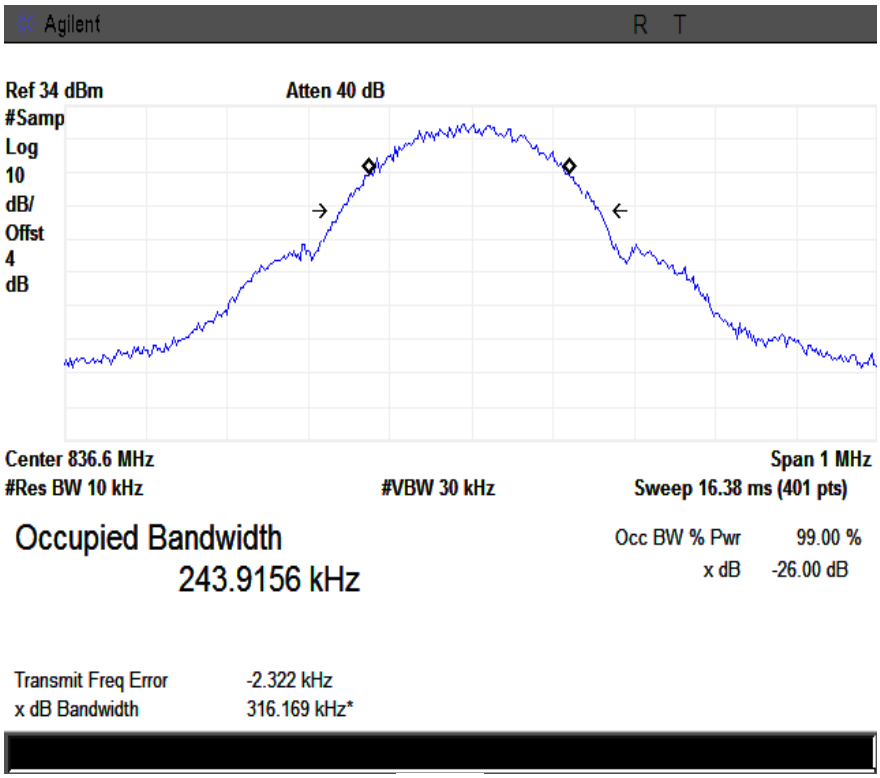
Note:
850: Cellular Band
PCS: PCS Band
W850: UMTS-FDD Band Ⅴ
W1900: UMTS-FDD Band Ⅱ
W1700: UMTS-FDD Band Ⅳ

L: Low Channel
M: Middle Channel
H: High Channel

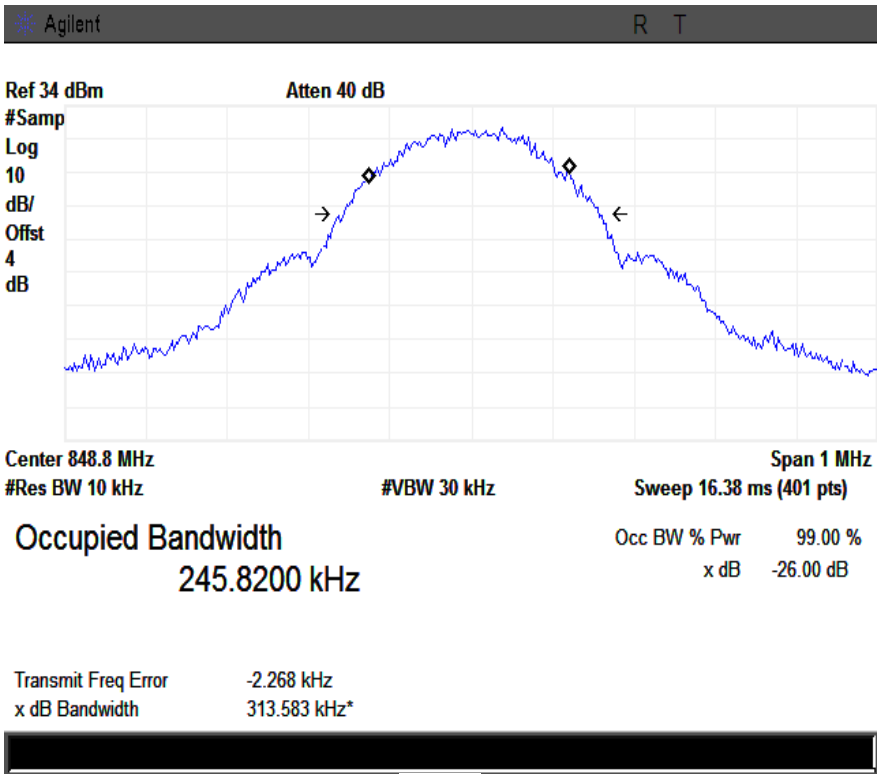
99% Occupied Bandwidth & 26 dB Bandwidth



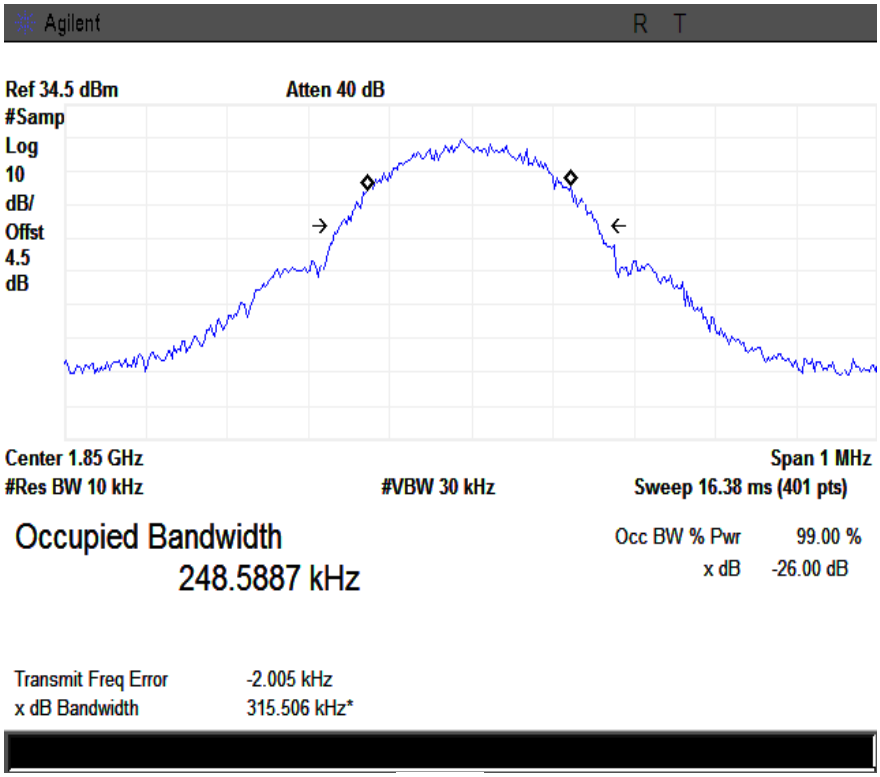
850-L



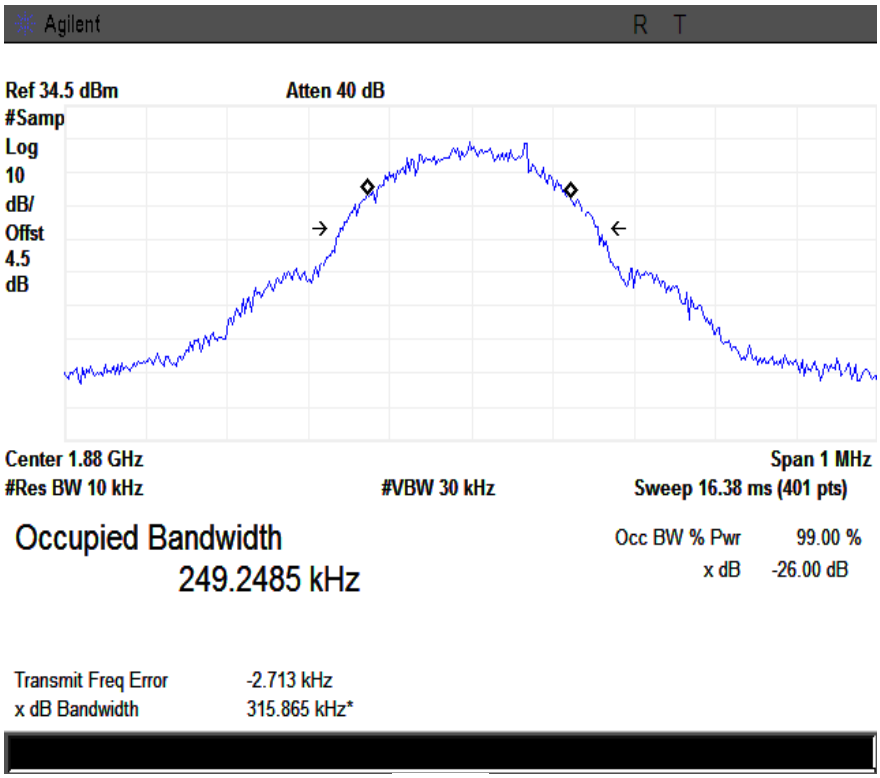
850-M


Agilent
R T
Ref 34 dBm
Atten 40 dB
#Samp
Log
10
dB/
Offst
4
dB
Center 848.8 MHz
#Res BW 10 kHz
#VBW 30 kHz
Span 1 MHz
Sweep 16.38 ms (401 pts)
Occupied Bandwidth
245.8200 kHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -2.268 kHz
x dB Bandwidth 313.583 kHz*

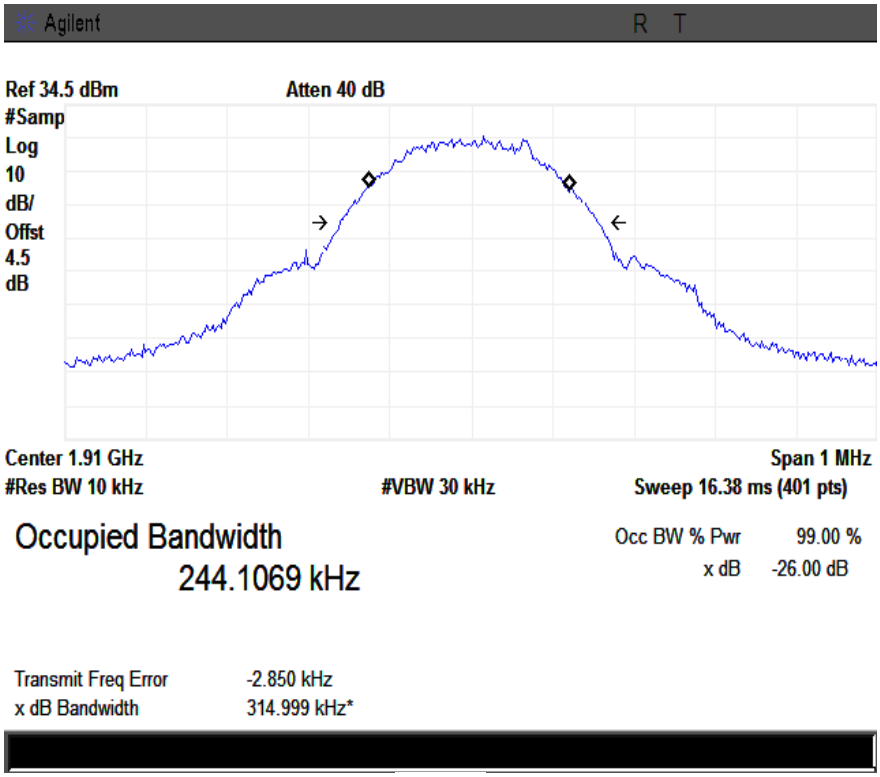
850-H


Agilent
R T
Ref 34.5 dBm
Atten 40 dB
#Samp
Log
10
dB/
Offst
4.5
dB
Center 1.85 GHz
#Res BW 10 kHz
#VBW 30 kHz
Span 1 MHz
Sweep 16.38 ms (401 pts)
Occupied Bandwidth
248.5887 kHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -2.005 kHz
x dB Bandwidth 315.506 kHz*

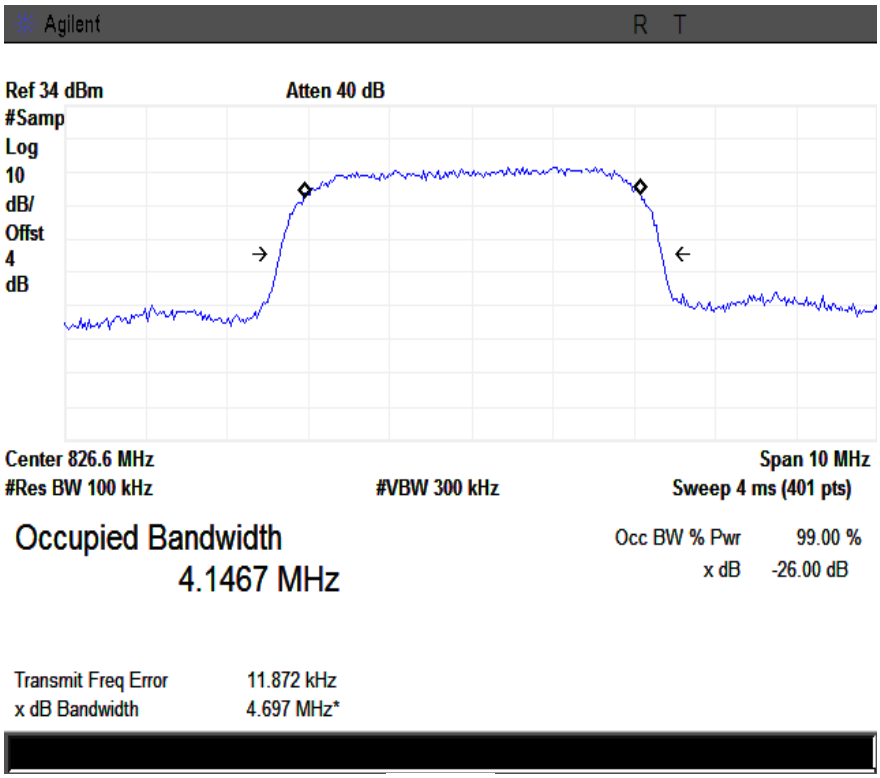
PCS-L


Agilent
R T
Ref 34.5 dBm
Atten 40 dB
#Samp
Log
10
dB/
Offst
4.5
dB
Center 1.88 GHz
Span 1 MHz
#Res BW 10 kHz
#VBW 30 kHz
Sweep 16.38 ms (401 pts)
Occupied Bandwidth
249.2485 kHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -2.713 kHz
x dB Bandwidth 315.865 kHz*

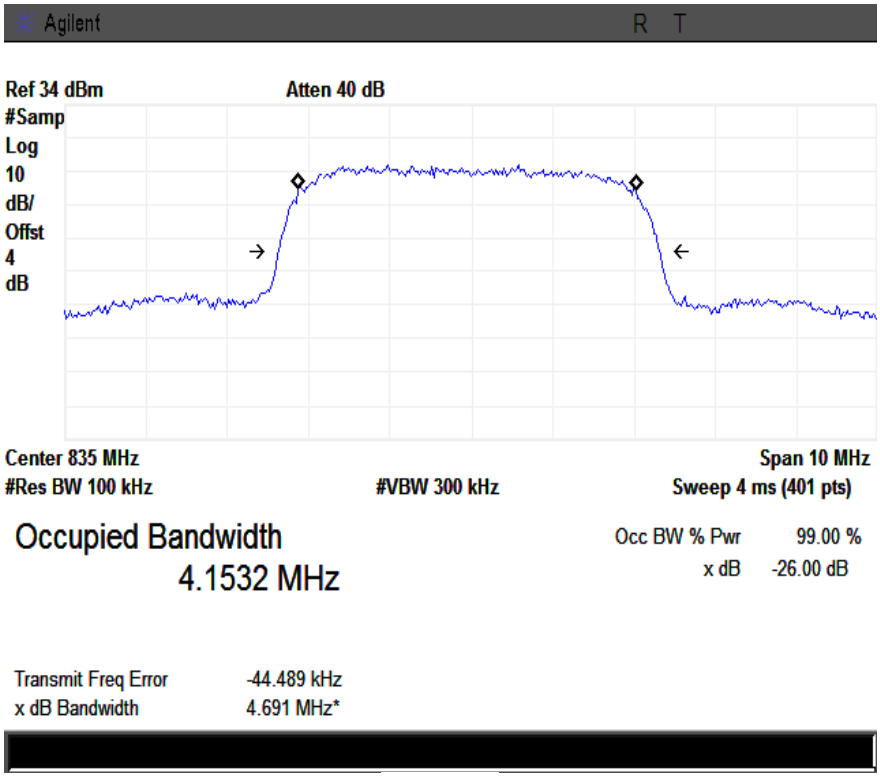
PCS-M


Agilent
R T
Ref 34.5 dBm
Atten 40 dB
#Samp
Log
10
dB/
Offst
4.5
dB
Center 1.91 GHz
Span 1 MHz
#Res BW 10 kHz
#VBW 30 kHz
Sweep 16.38 ms (401 pts)
Occupied Bandwidth
244.1069 kHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -2.850 kHz
x dB Bandwidth 314.999 kHz*

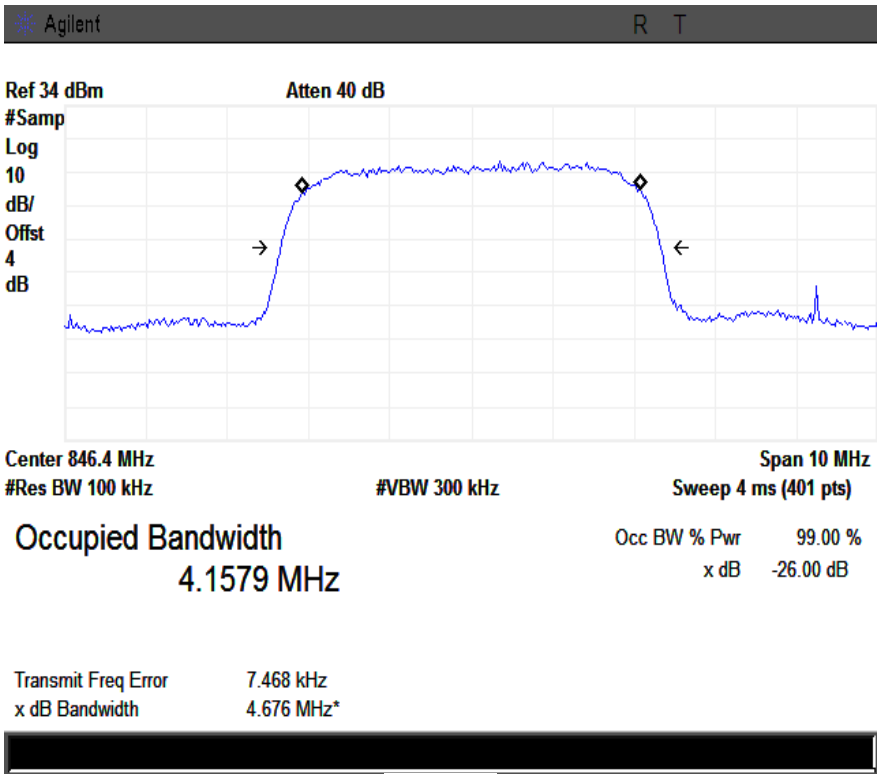
PCS-H


Agilent
R T
Ref 34 dBm
Atten 40 dB
#Samp
Log
10
dB/
Offst
4
dB
Center 826.6 MHz
#Res BW 100 kHz
#VBW 300 kHz
Span 10 MHz
Sweep 4 ms (401 pts)
Occupied Bandwidth
4.1467 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error 11.872 kHz
x dB Bandwidth 4.697 MHz*

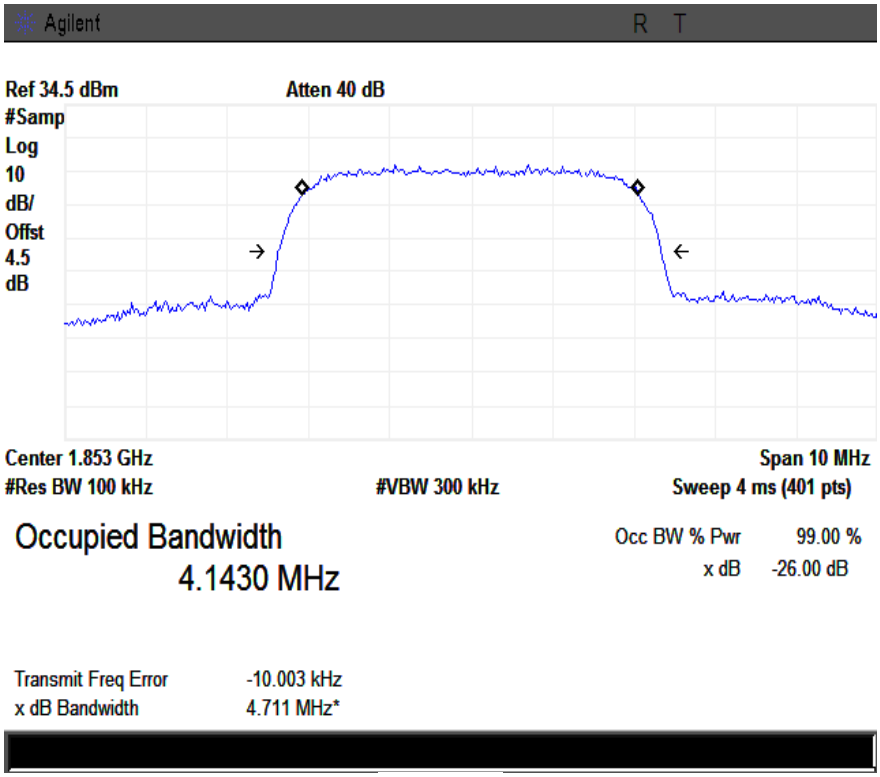
W850-L


Agilent
R T
Ref 34 dBm
Atten 40 dB
#Samp
Log
10
dB/
Offst
4
dB
Center 835 MHz
#Res BW 100 kHz
#VBW 300 kHz
Span 10 MHz
Sweep 4 ms (401 pts)
Occupied Bandwidth
4.1532 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -44.489 kHz
x dB Bandwidth 4.691 MHz*

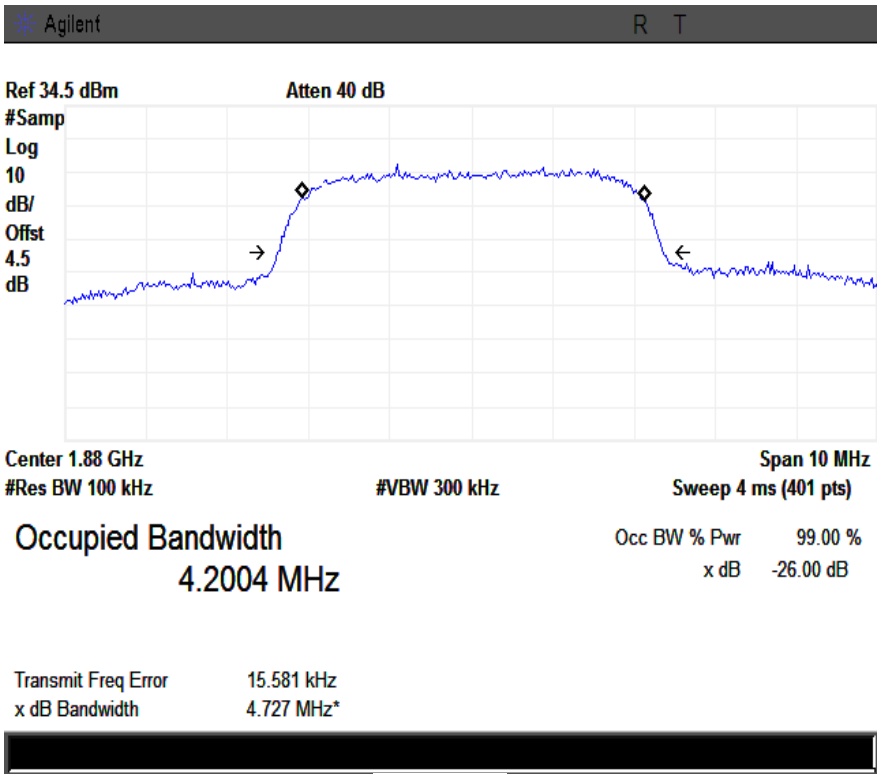
W850-M



W850-H

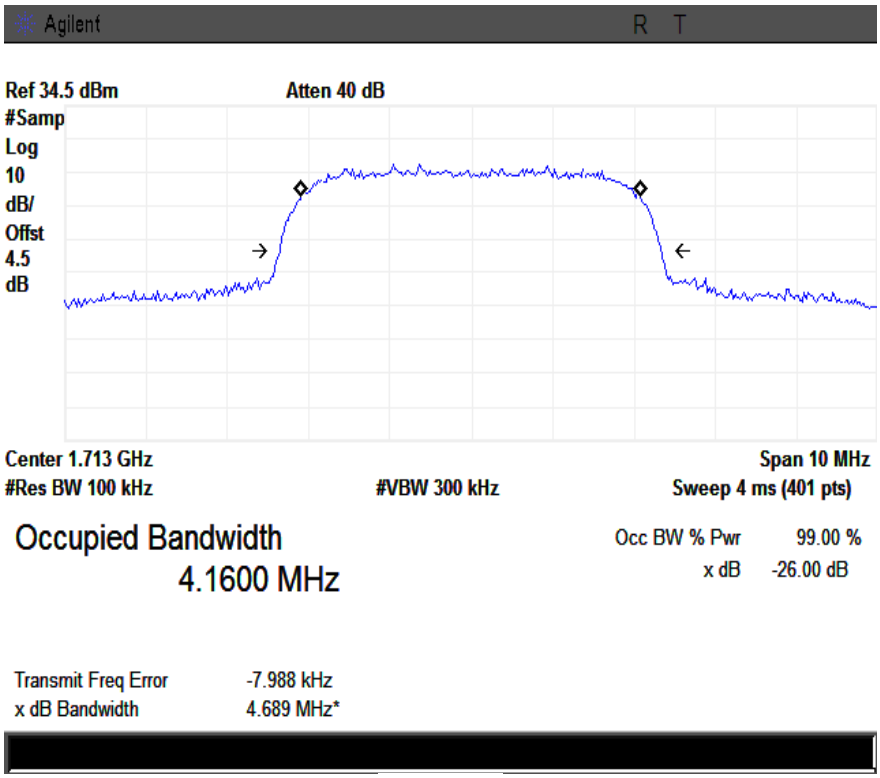


W1900-L

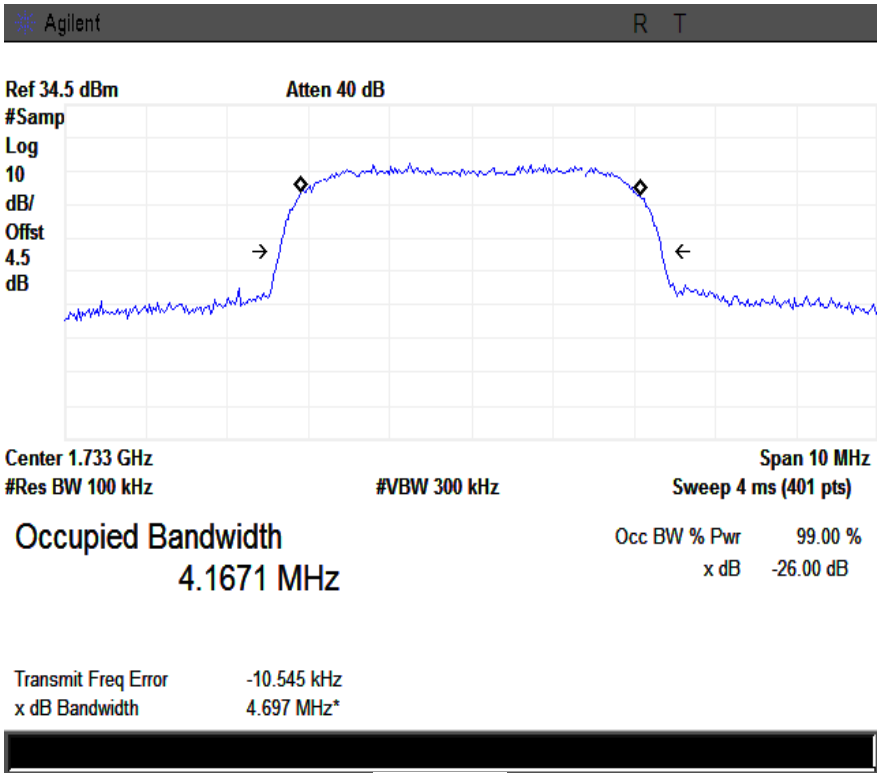


W1900-M

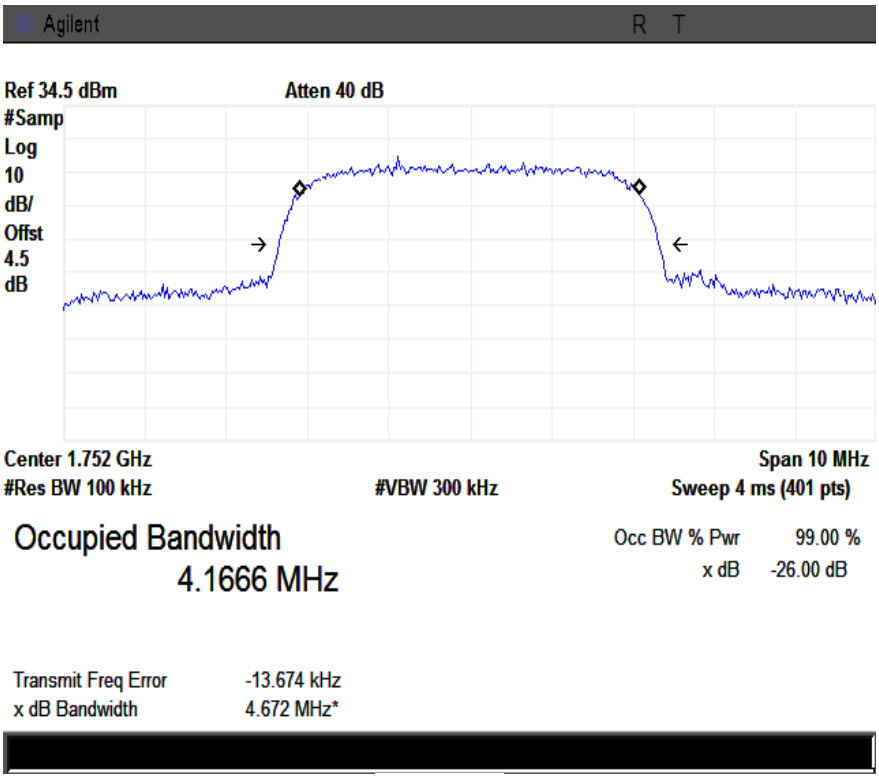
W1900-H



W1700-L



W1700-M


Agilent
R T
Ref 34.5 dBm
Atten 40 dB
#Samp
Log
10
dB/
Offst
4.5
dB
Center 1.752 GHz
Span 10 MHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 4 ms (401 pts)
Occupied Bandwidth
4.1666 MHz
Occ BW % Pwr 99.00 %
x dB -26.00 dB
Transmit Freq Error -13.674 kHz
x dB Bandwidth 4.672 MHz*

W1700-H

5.5 §2.1051, §22.917(a), §24.238(a), §27.53(h) - Spurious Emissions at Antenna Terminals

1. Conducted Measurement
   EUT was set for low, mid, high channel with modulated mode and highest RF output power.
   The spectrum analyzer was connected to the antenna terminal.
2. Conducted Emissions Measurement Uncertainty
   All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 30MHz – 40GHz is ±1.5dB.
3. Environmental Conditions

Temperature	23°C
Relative Humidity	52%
Atmospheric Pressure	1020mbar

4. Test date : July 17, 2014
   Tested By : Herith Shi

Standard Requirement:

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 43 + 10 log (P) dB.

Procedures:

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The Band Edges of low and high channels for the highest RF powers were measured. Setting RBW as roughly BW/100.
3. Details according with KDB 971168 section 6.0.

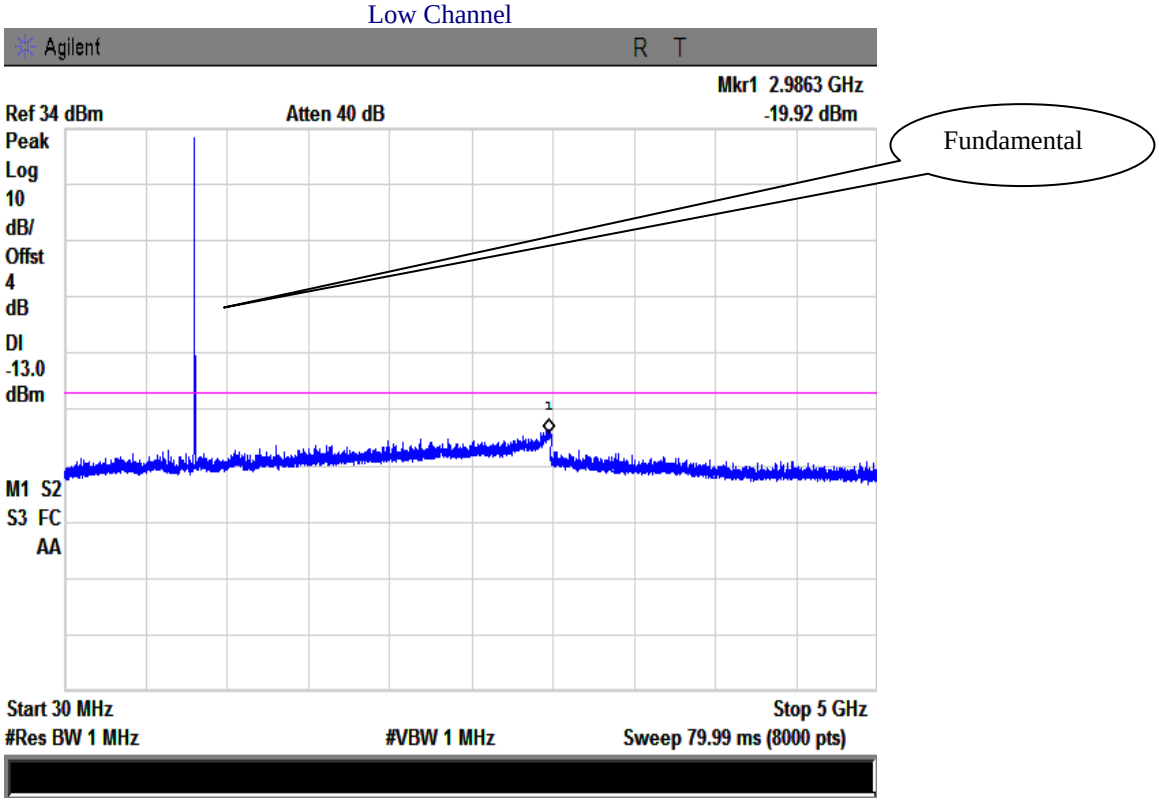
Test Result: Pass

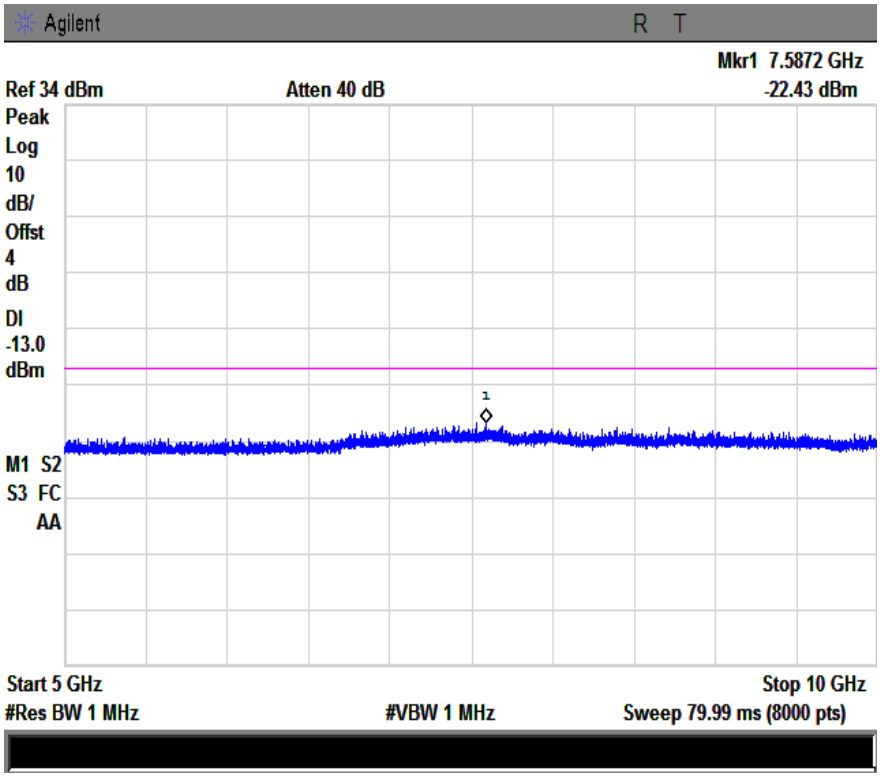
Refer to the attached plots.

Cellular Band (Part 22H)

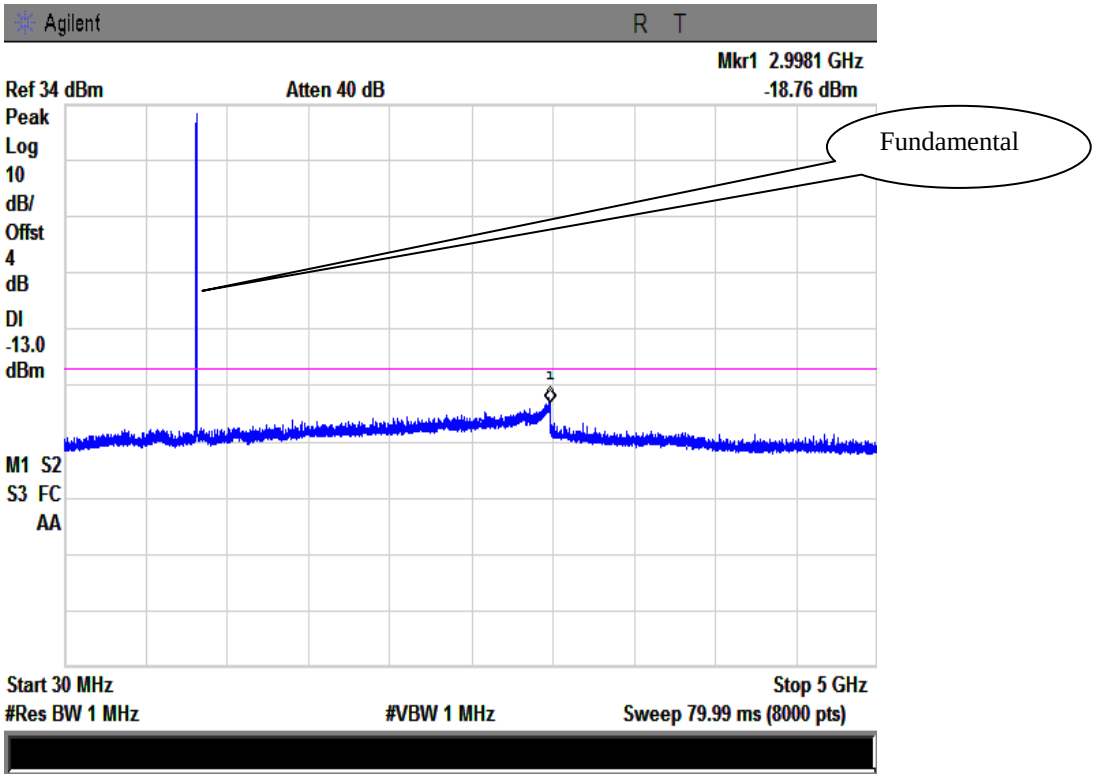
30MHz -10G – GSM850

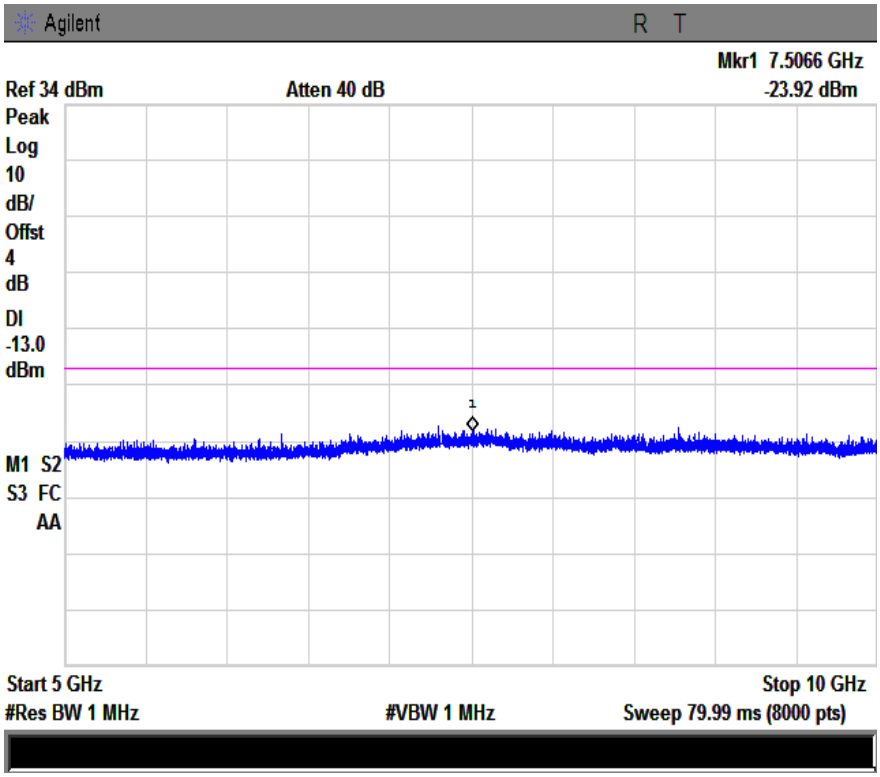
Low Channel



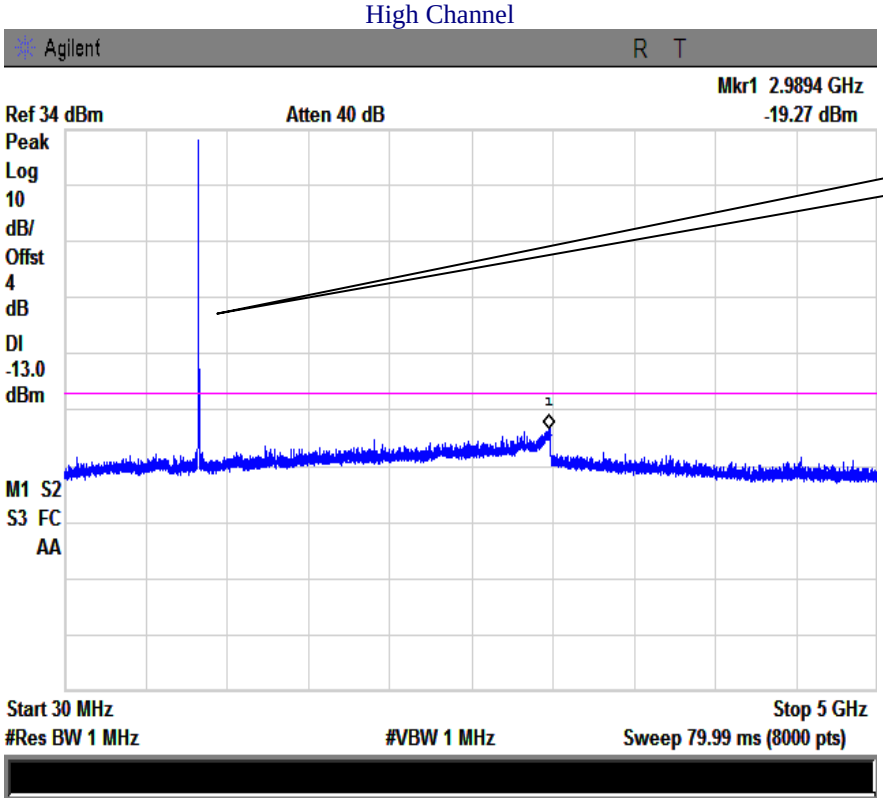


Middle Channel

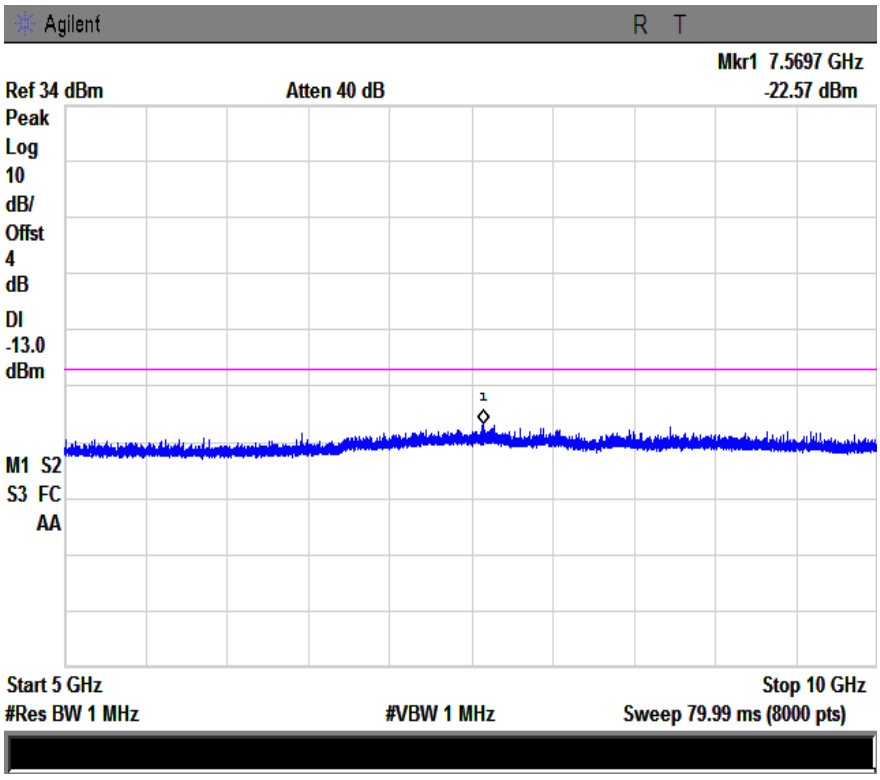




High Channel



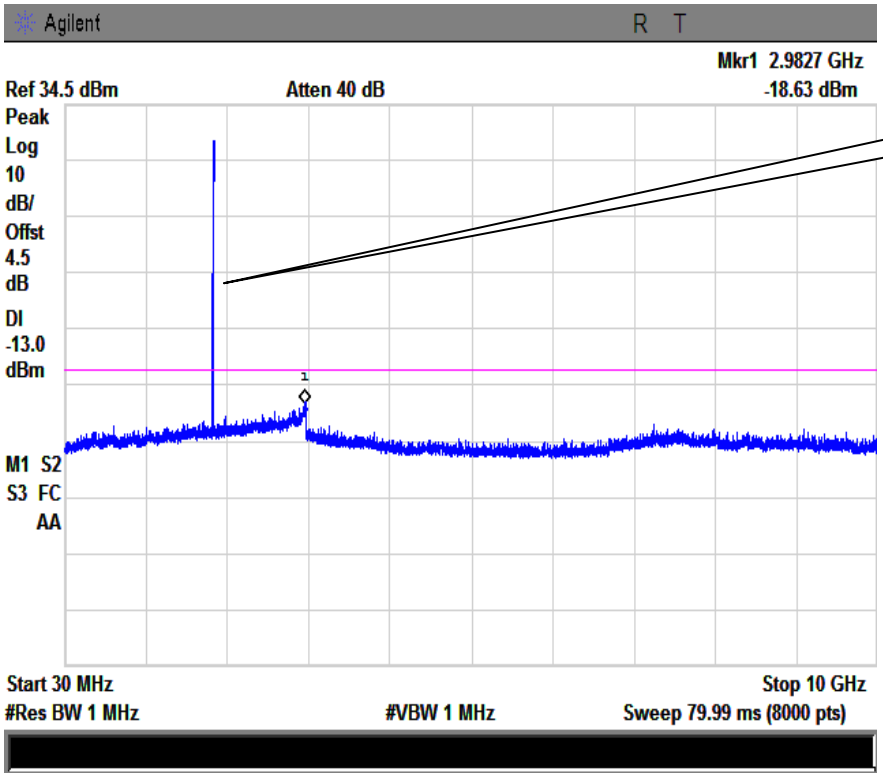
Fundamental



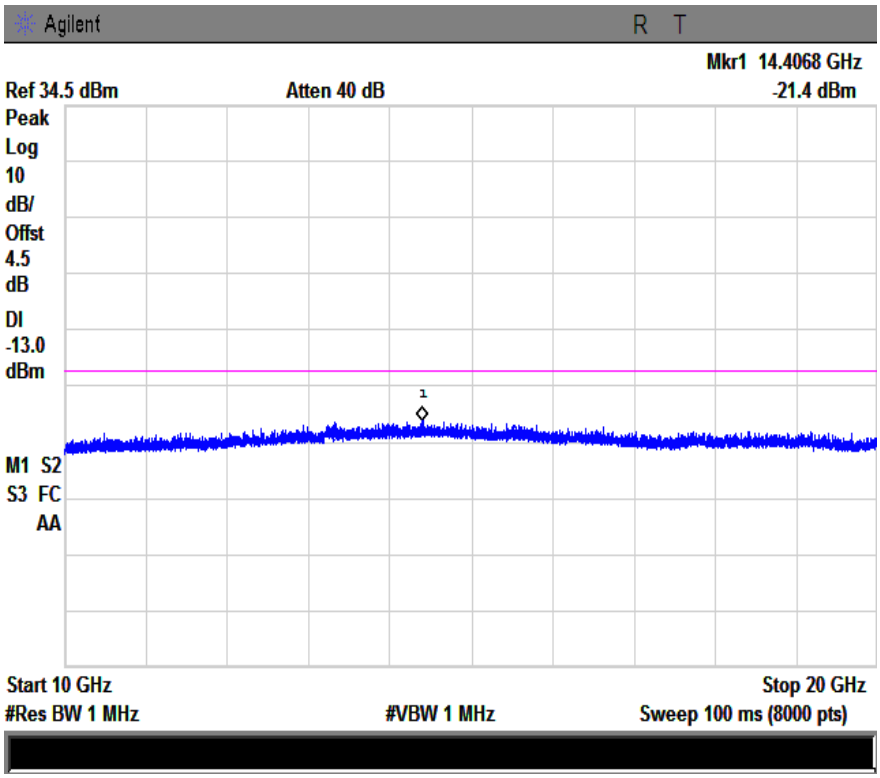
PCS Band (Part24E)

30MHz -20G – PCS1900

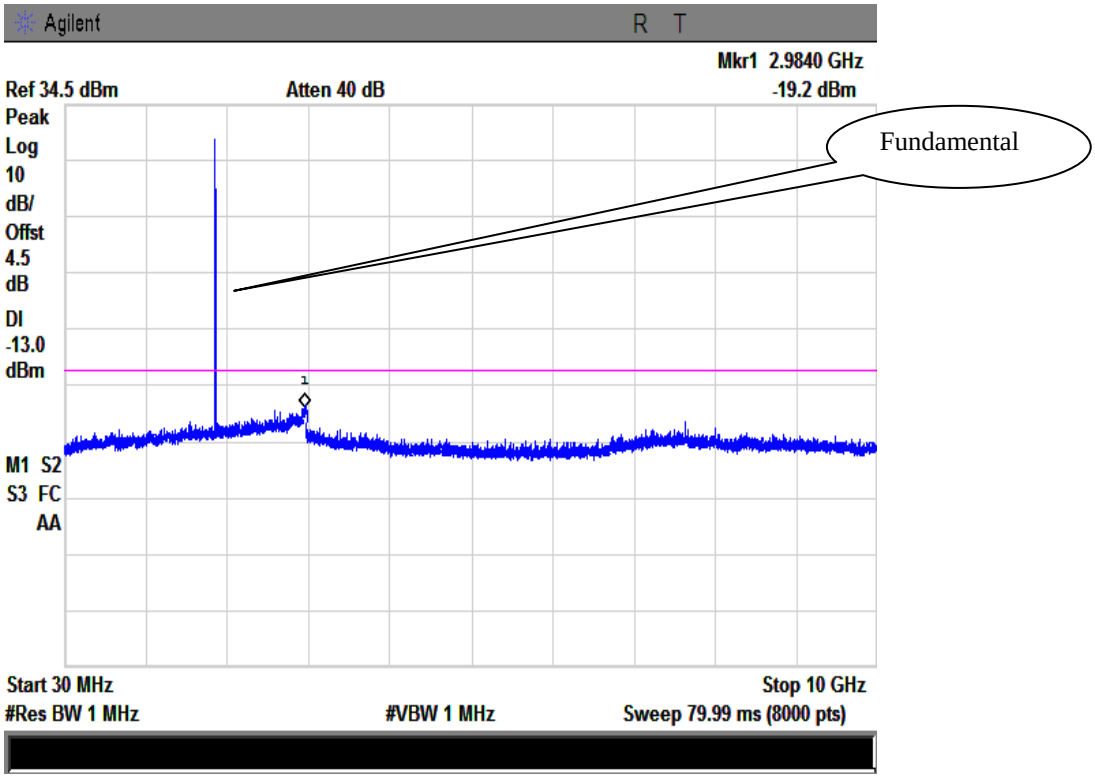
Low Channel

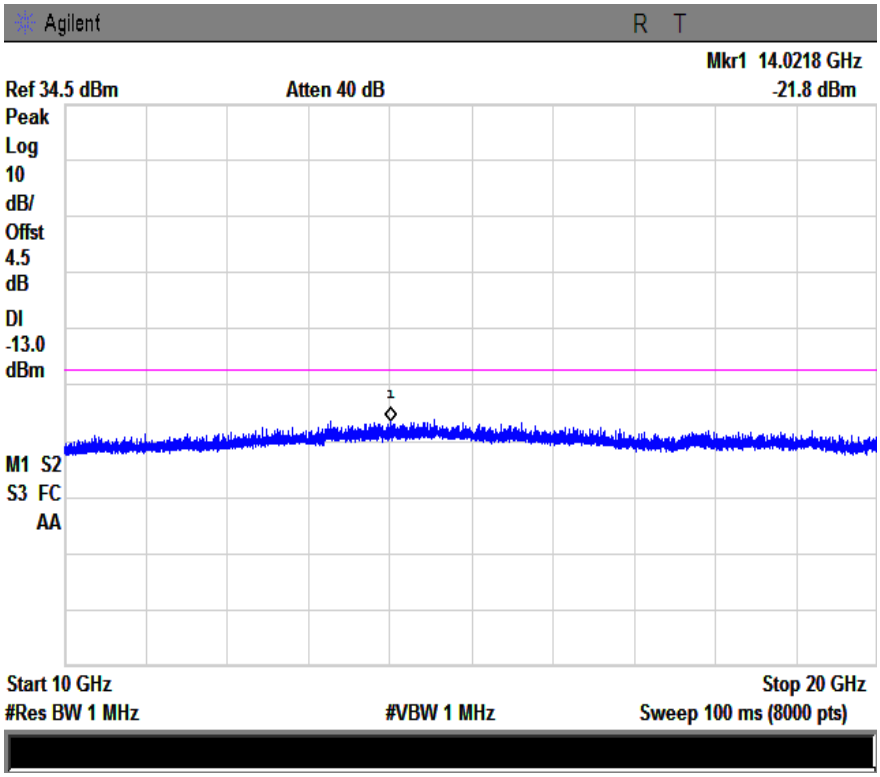


Fundamental

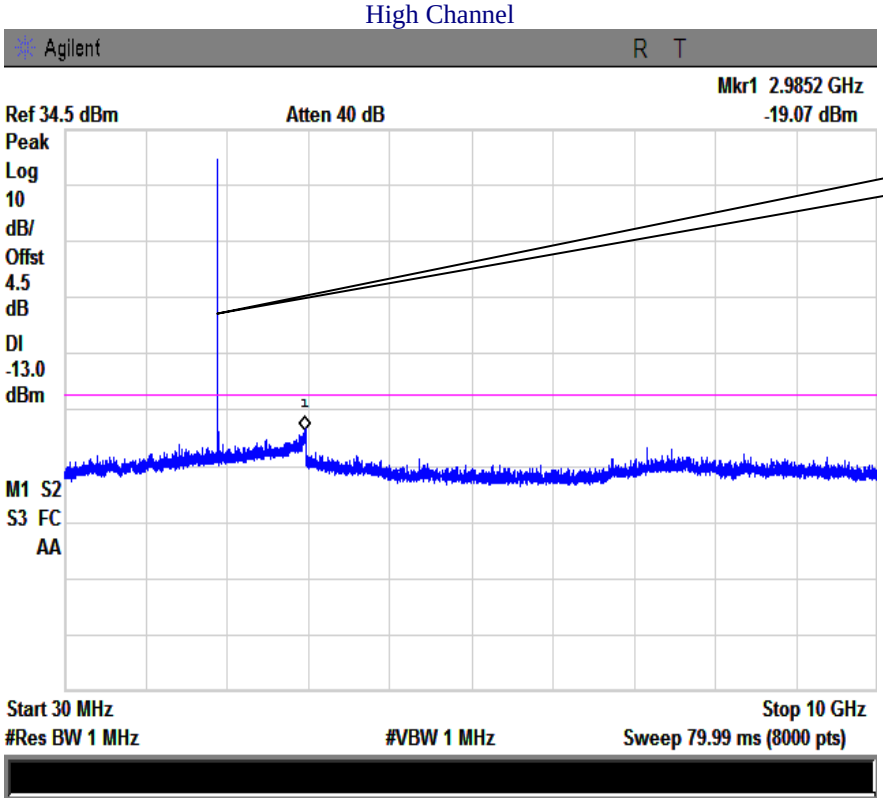


Middle Channel

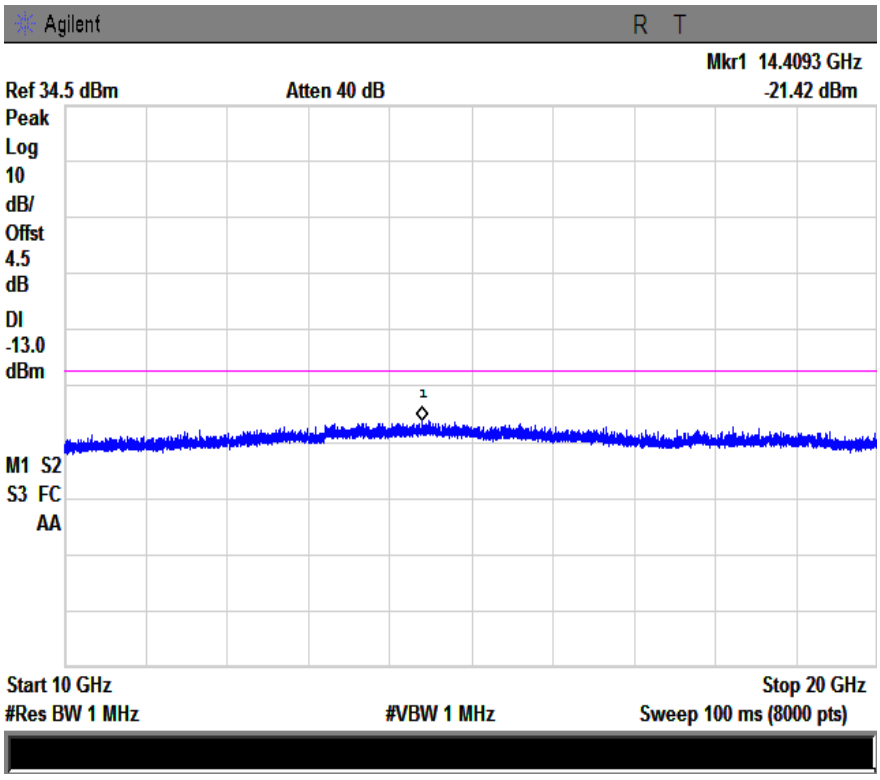




High Channel



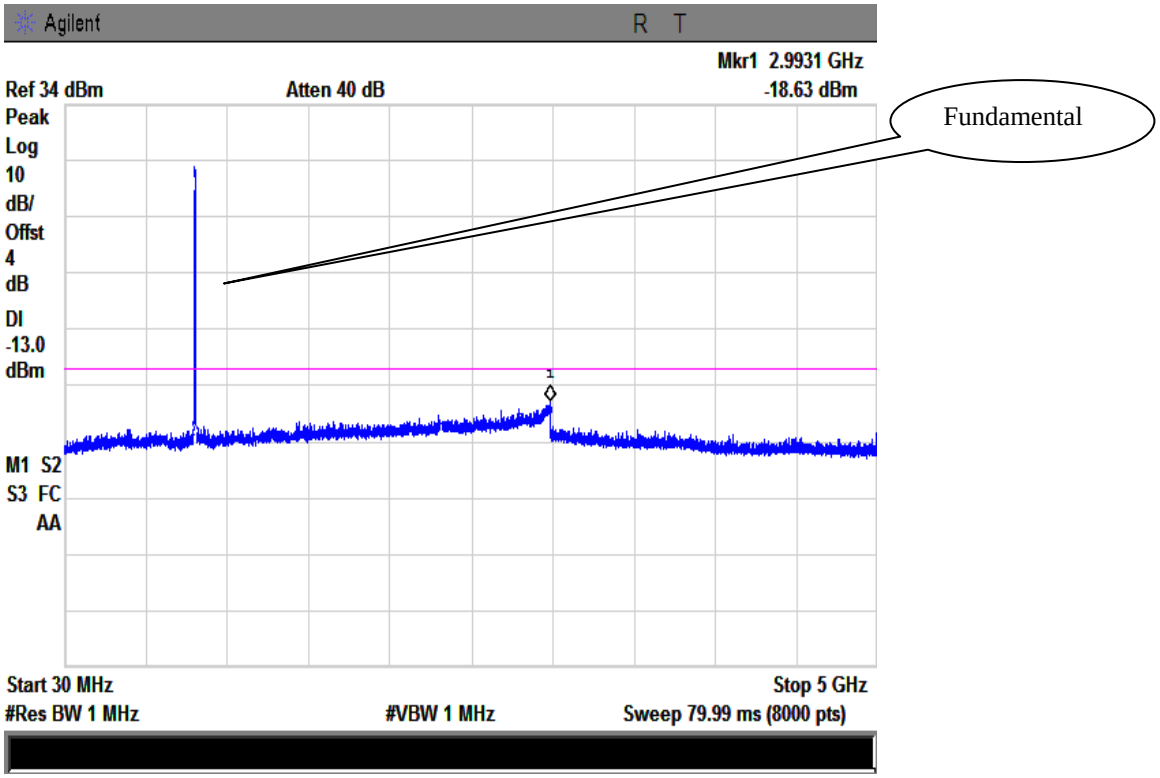
Fundamental

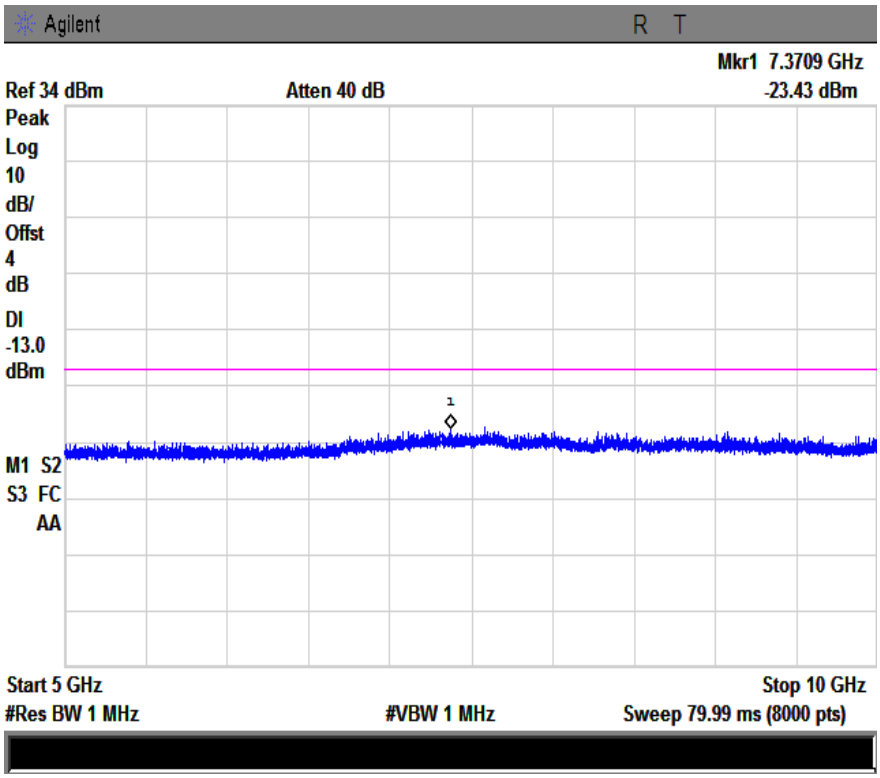


UMTS-FDD Band Ⅴ (Part 22H)

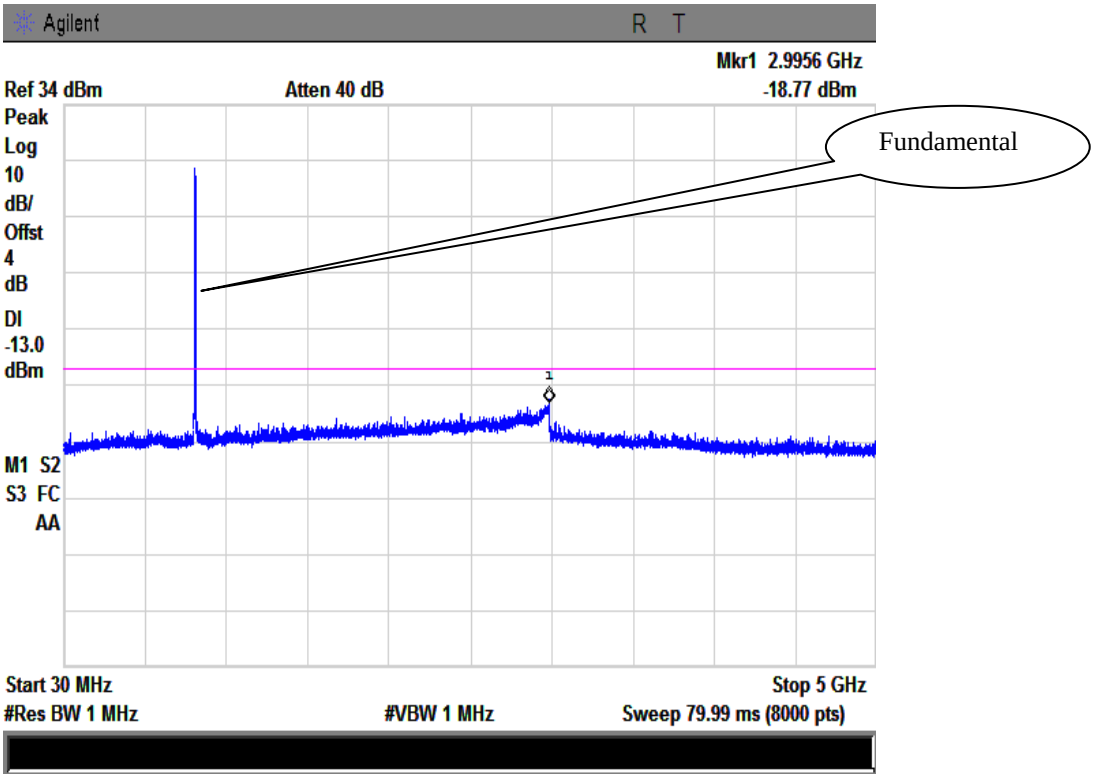
30MHz -10G – WCDMA 850

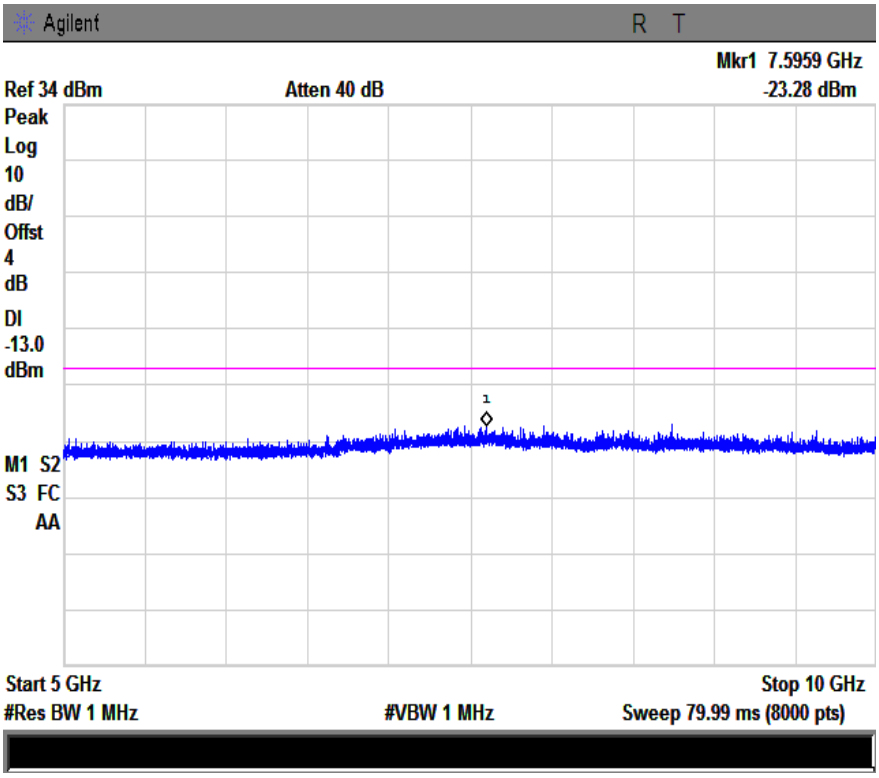
Low Channel



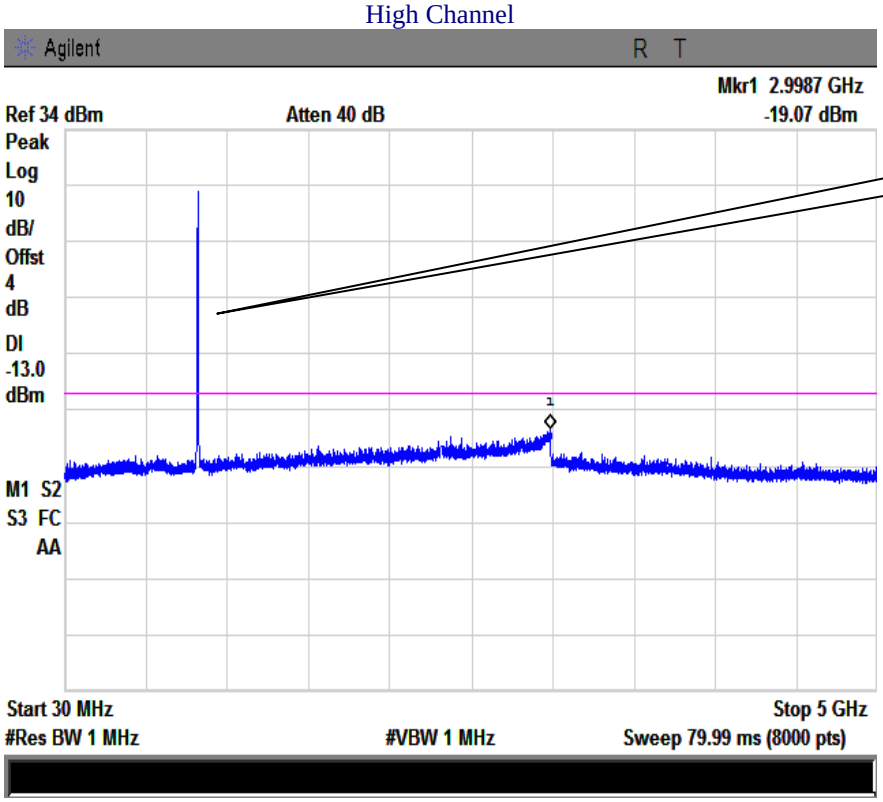


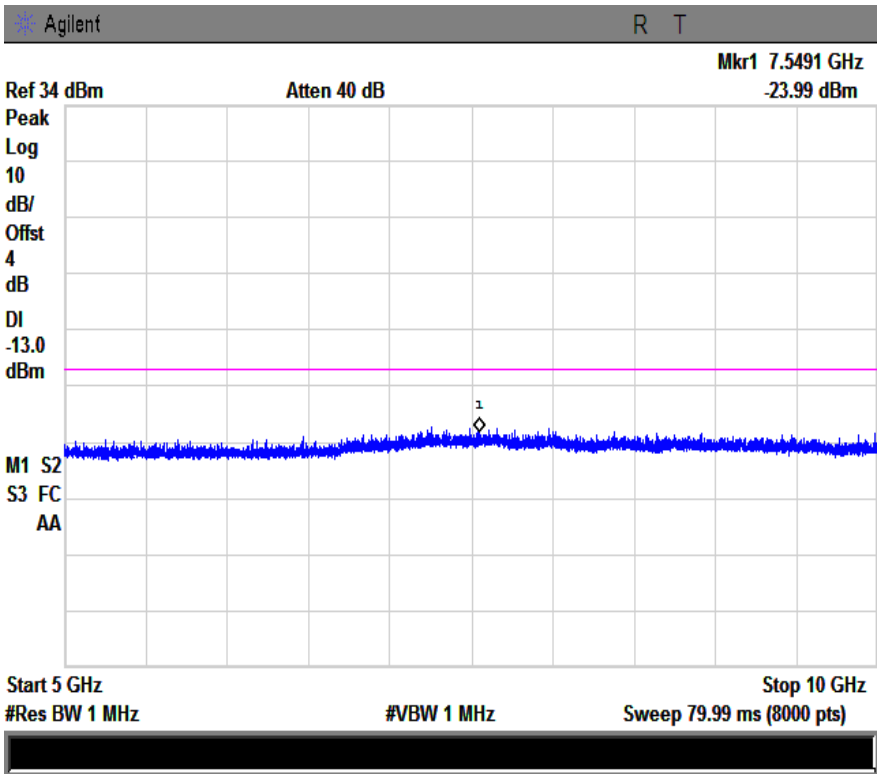
Middle Channel





High Channel

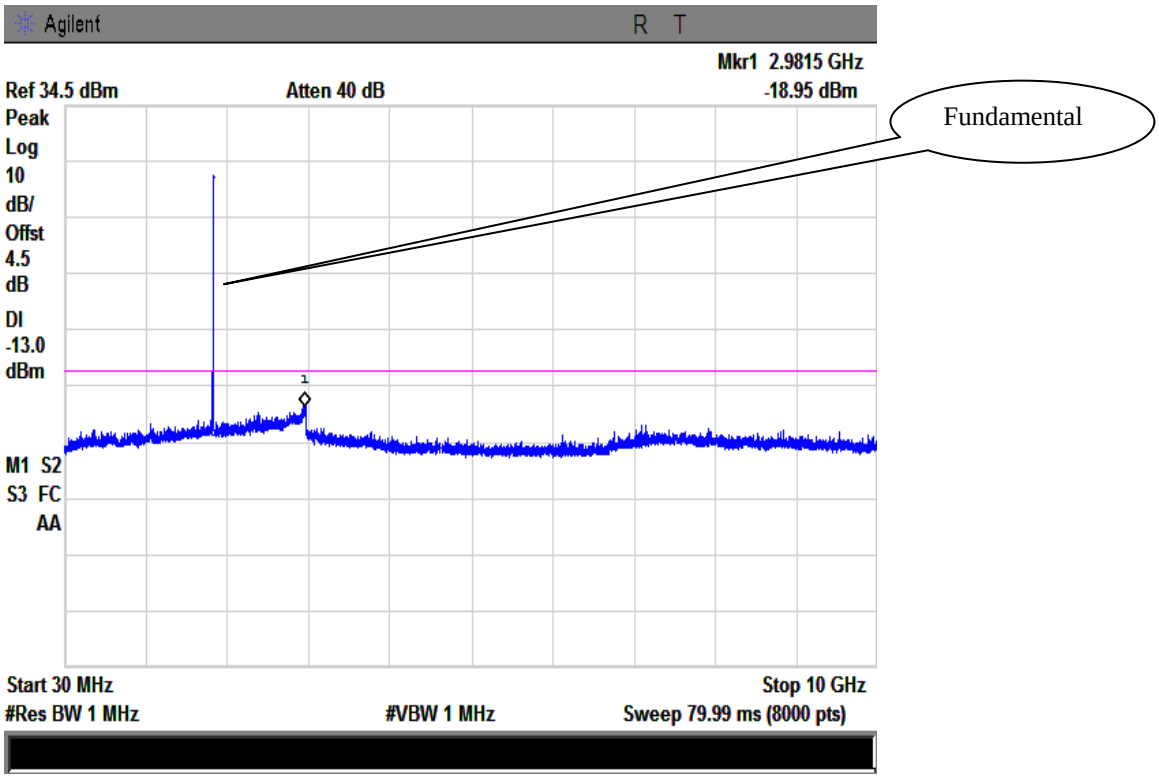


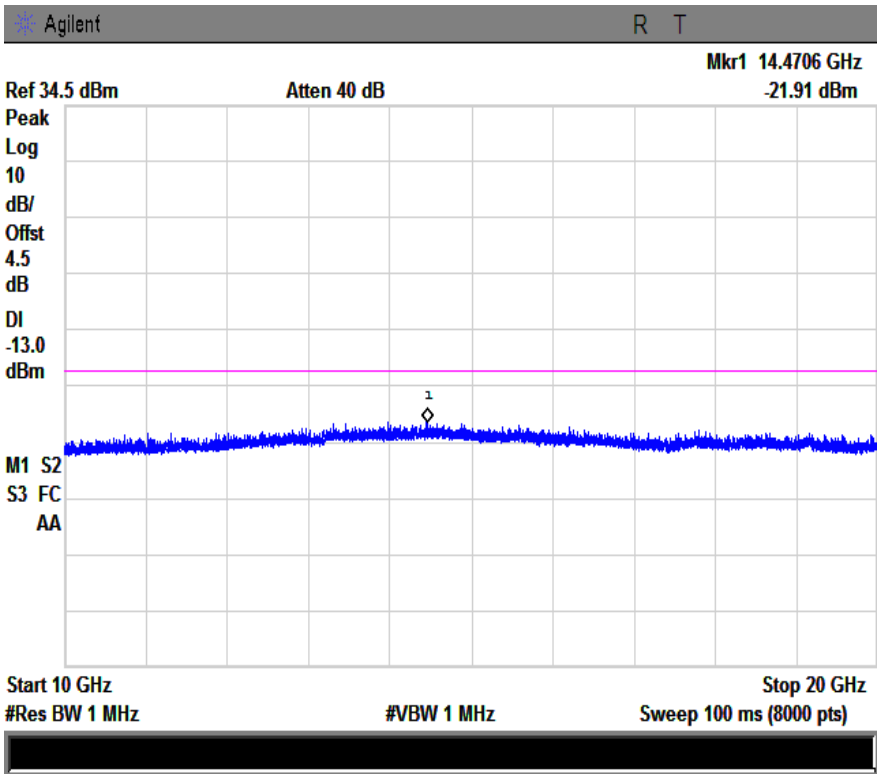


UMTS-FDD Band Ⅱ (Part24E)

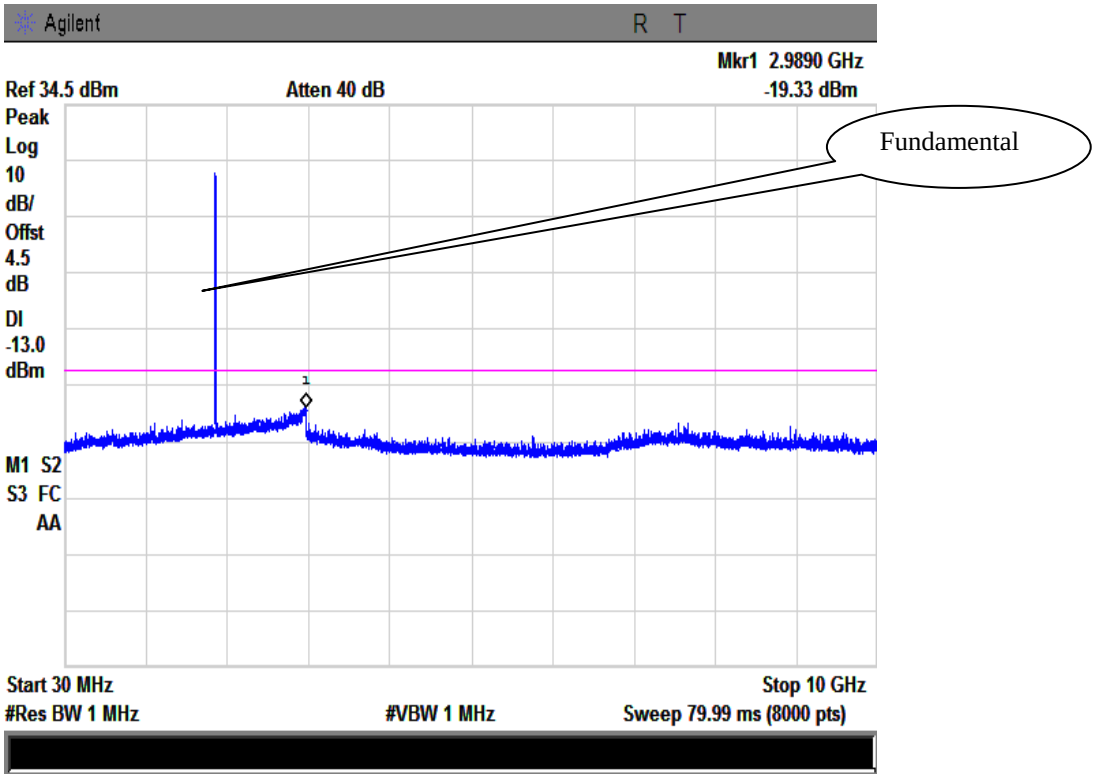
30MHz -20G – WCDMA1900

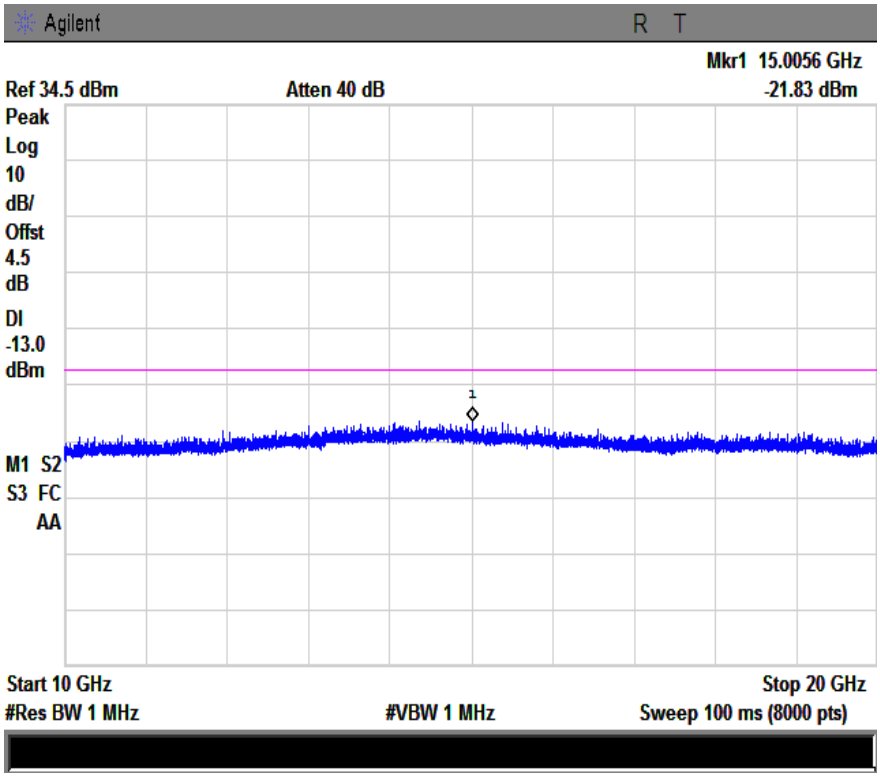
Low Channel



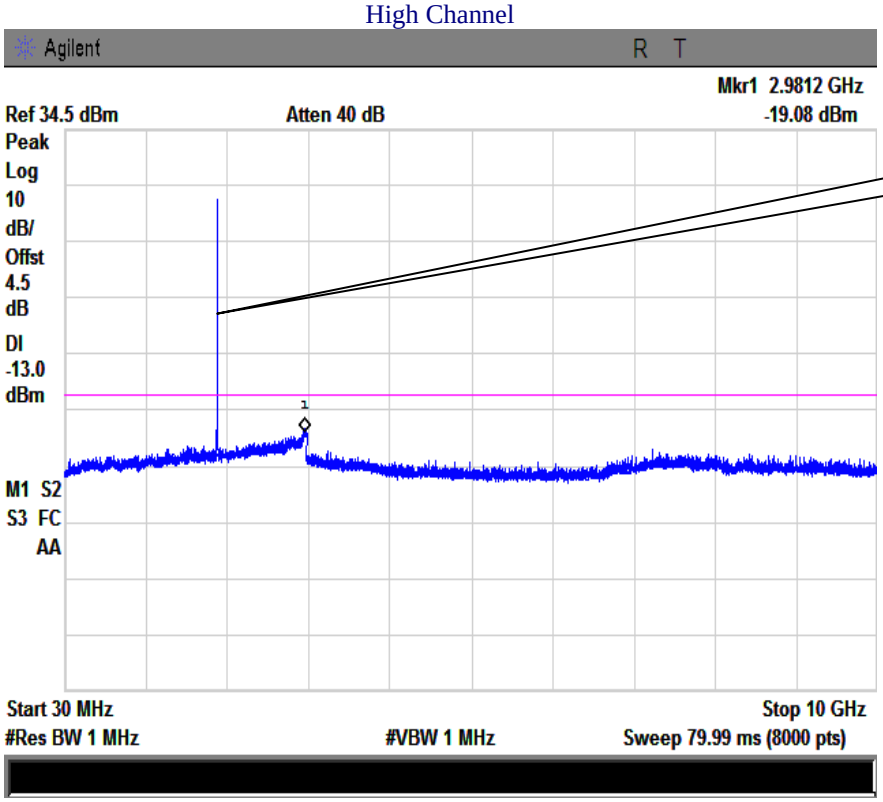


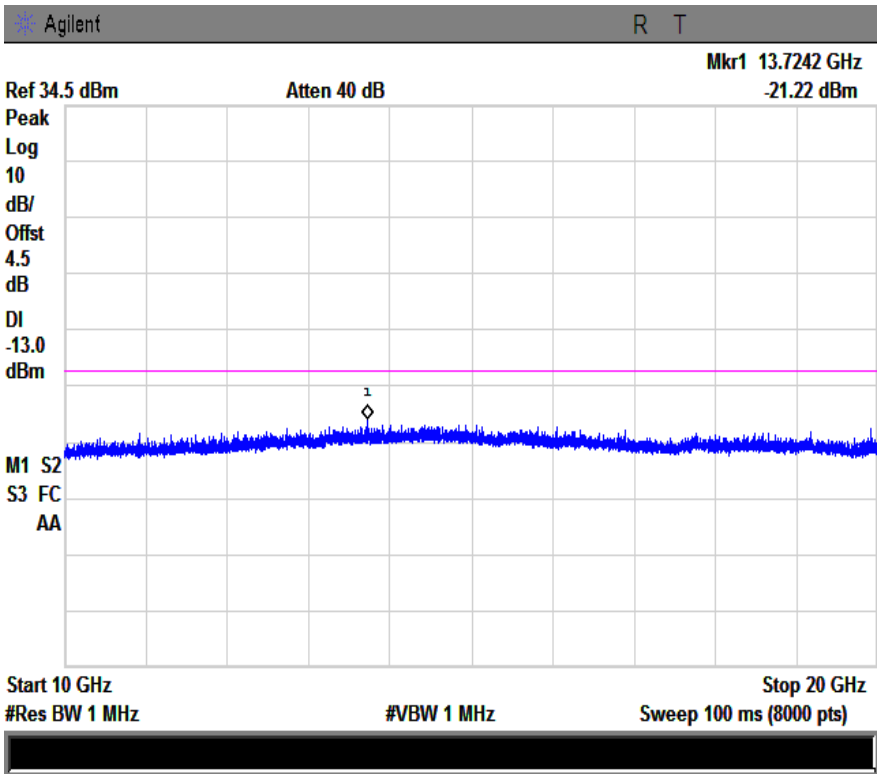
Middle Channel





High Channel

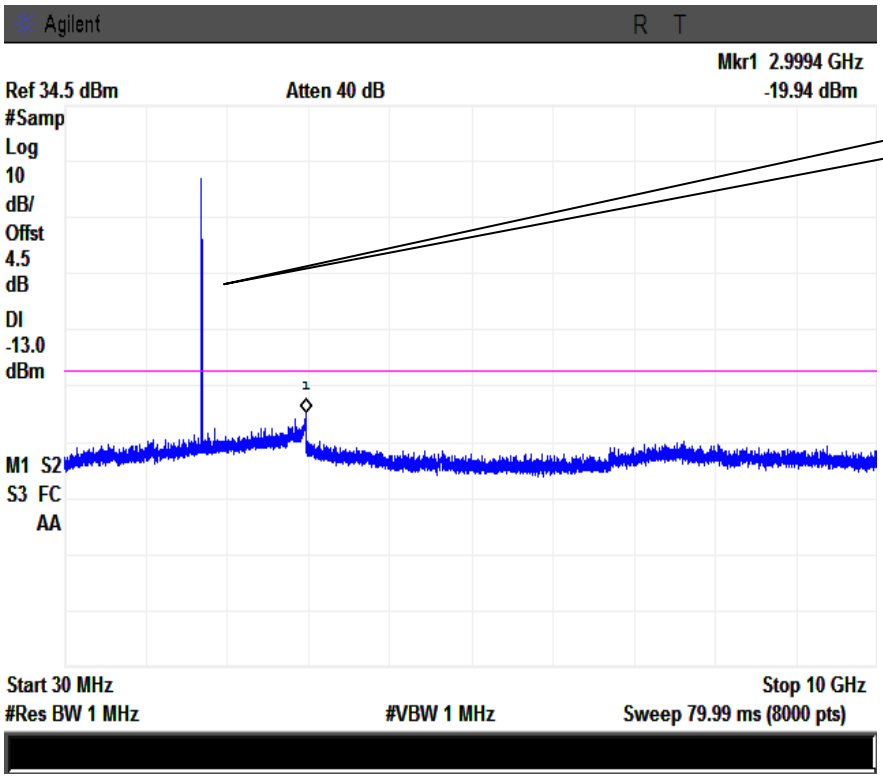


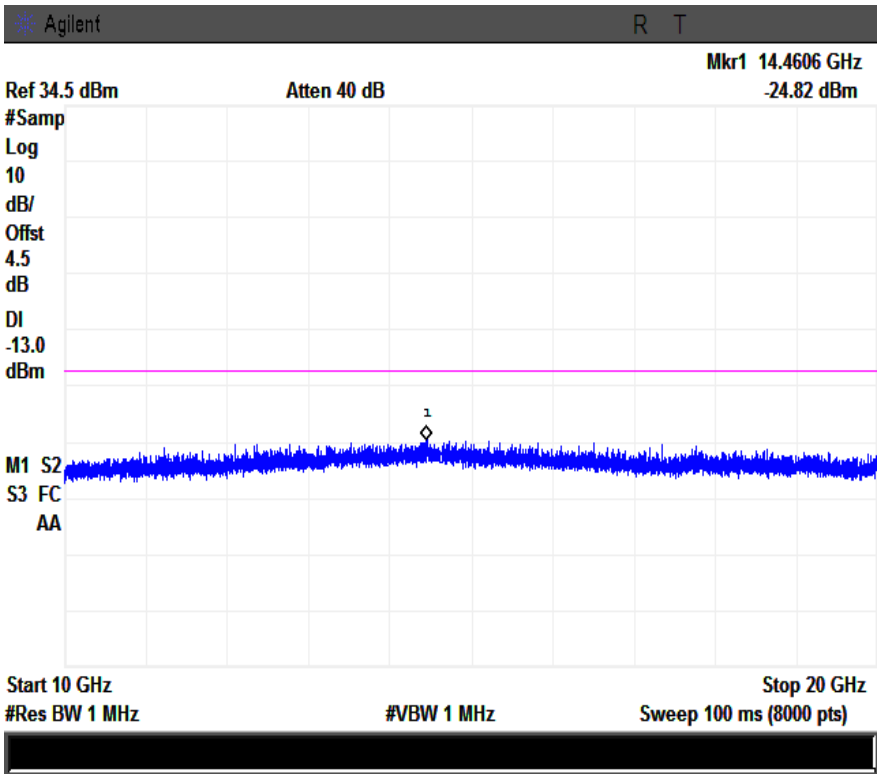


UMTS-FDD Band Ⅳ (Part27)

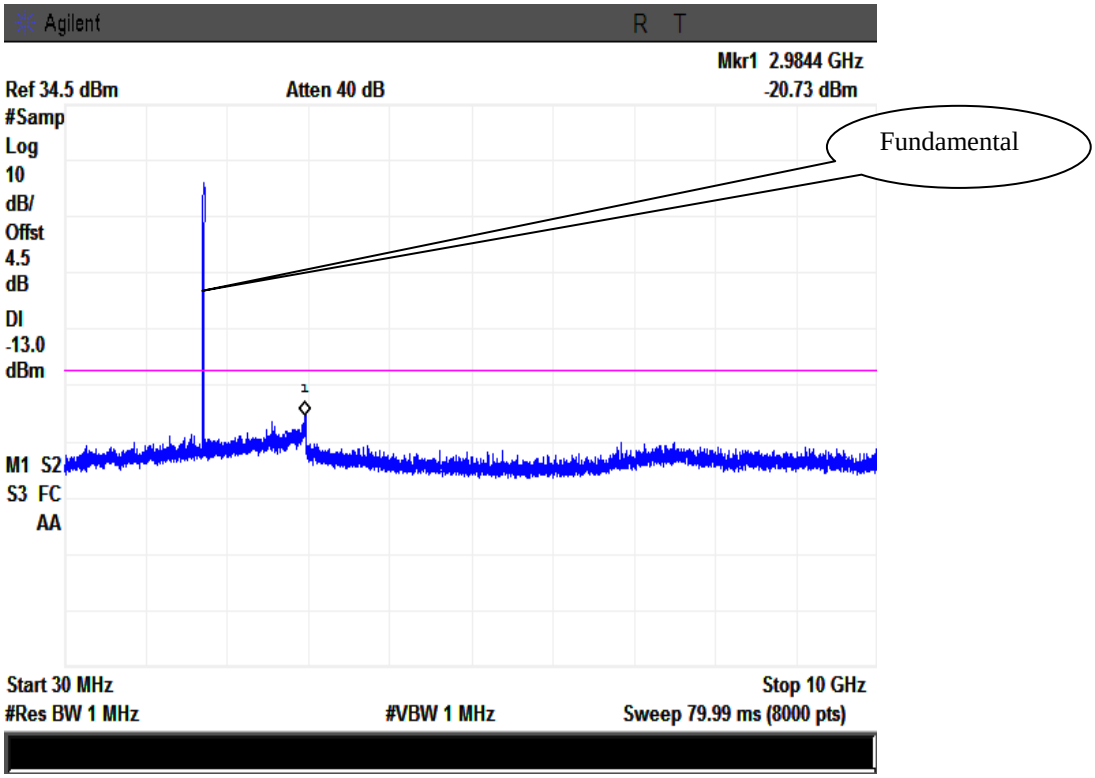
30MHz -20G – AWS 1700

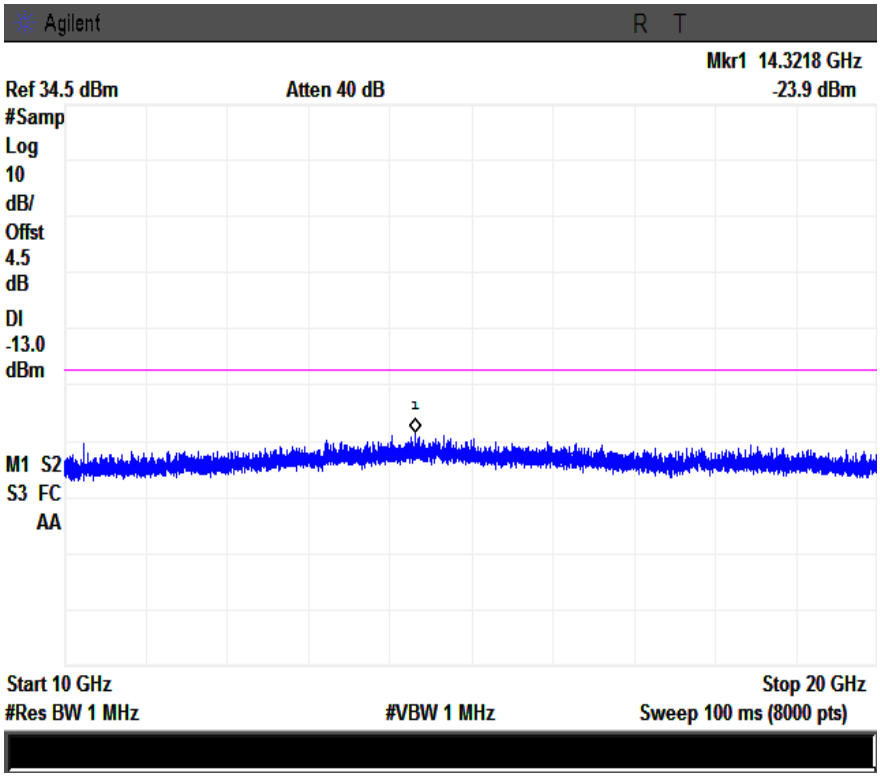
Low Channel



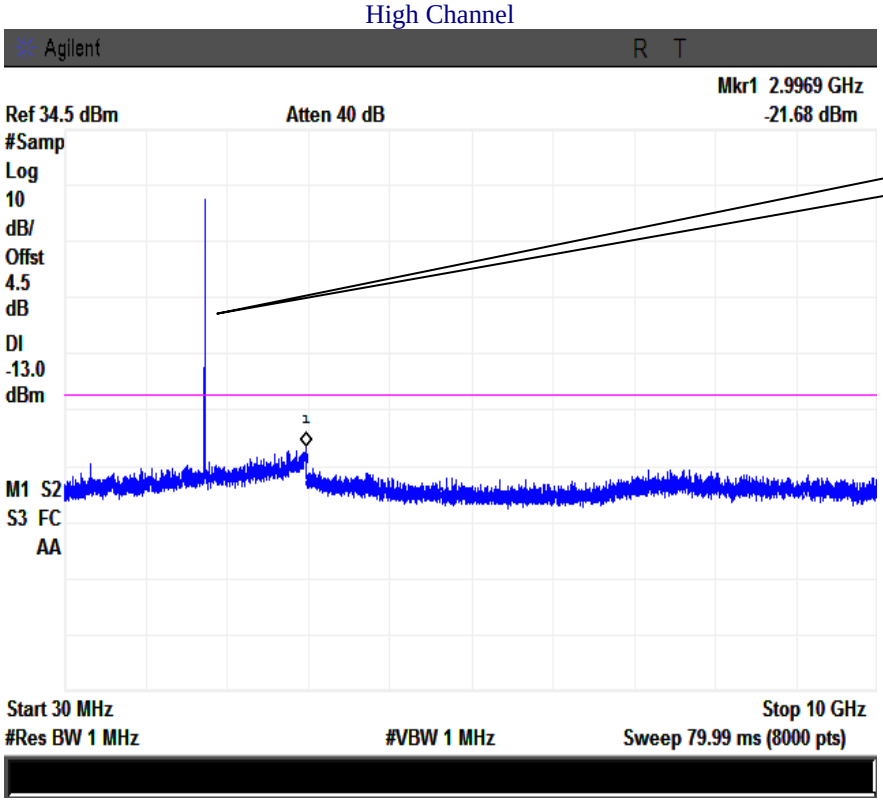


Middle Channel

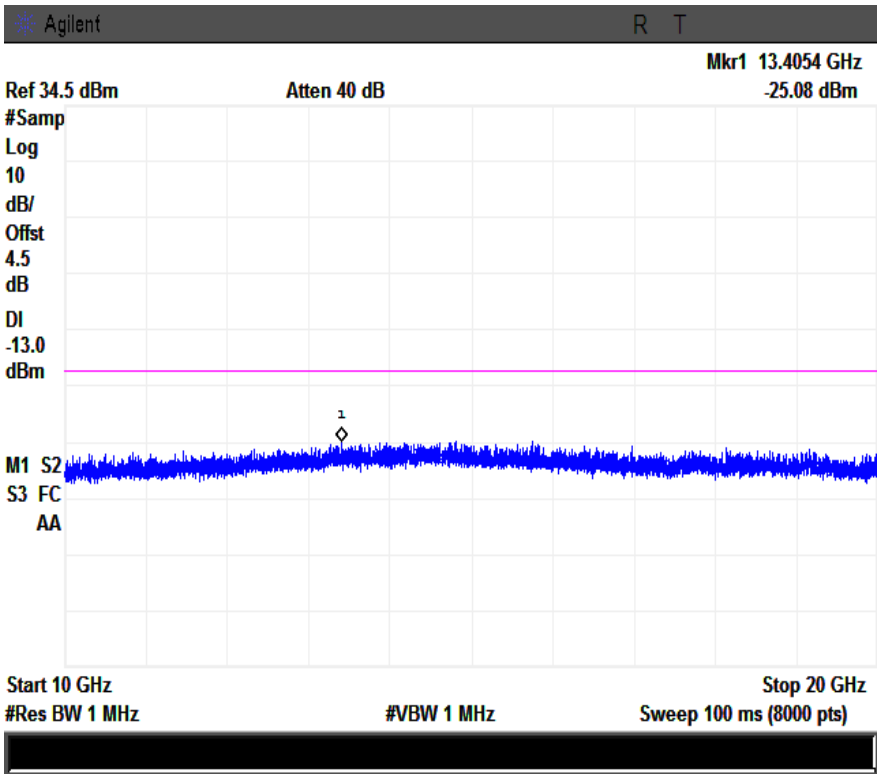




High Channel



Fundamental



5.6 §2.1053, §22.917 & §24.238, §27.53(h) - Spurious Radiated Emissions

1. All possible modes of operation were investigated. Only the 6 worst case emissions measured, using the correct CISPR detectors, are reported. All other emissions were relatively insignificant.
2. A "-ve" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency.
3. Radiated Emissions Measurement Uncertainty
   All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 1GHz – 40GH is ±6.0dB (for EUTs < 0.5m X 0.5m X 0.5m).
4. Environmental Conditions

Temperature	24°C
Relative Humidity	50%
Atmospheric Pressure	1019mbar

5. Test date : July 25, 2014
   Tested By : Herith Shi

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 + 10 log (P) dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

Procedures: (According with TIA 603D)

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. 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)

Test Result: Pass

Cellular Band (Part 22H)

Low channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1648.4	-45.88	V	7.95	0.78	-38.71	-13	-25.71
1648.4	-44.13	H	7.95	0.78	-36.96	-13	-23.96
263.4	-53.99	V	5.7	0.24	-48.53	-13	-35.53
643.7	-50.43	H	6.6	0.39	-44.22	-13	-31.22

Middle channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1673.2	-46.12	V	7.95	0.78	-38.95	-13	-25.95
1673.2	-43.96	H	7.95	0.78	-36.79	-13	-23.79
262.2	-54.35	V	5.7	0.24	-48.89	-13	-35.89
642.8	-51.13	H	6.6	0.39	-44.92	-13	-31.92

High channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1697.6	-45.77	V	7.95	0.78	-38.6	-13	-25.60
1697.6	-43.82	H	7.95	0.78	-36.65	-13	-23.65
264.7	-54.19	V	5.7	0.24	-48.73	-13	-35.73
644.2	-51.02	H	6.6	0.39	-44.81	-13	-31.81

PCS Band (Part 24E)

Low channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3700.4	-50.13	V	10.25	2.73	-42.61	-13	-29.61
3700.4	-47.87	H	10.25	2.73	-40.35	-13	-27.35
261.9	-54.55	V	5.7	0.24	-49.09	-13	-36.09
643.7	-51.72	H	6.6	0.39	-45.51	-13	-32.51

Middle channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3760	-49.86	V	10.25	2.73	-42.34	-13	-29.34
3760	-48.12	H	10.25	2.73	-40.6	-13	-27.60
264.3	-55.09	V	5.7	0.24	-49.63	-13	-36.63
644.4	-52.11	H	6.6	0.39	-45.9	-13	-32.9

High channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3819.6	-49.89	V	10.36	2.73	-42.26	-13	-29.26
3819.6	-47.77	H	10.36	2.73	-40.14	-13	-27.14
263.8	-54.83	V	5.7	0.24	-49.37	-13	-36.37
642.9	-52.16	H	6.6	0.39	-45.95	-13	-32.95

UMTS-FDD Band Ⅴ (Part 22H)

Low channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1652.8	-45.26	V	7.95	0.78	-38.09	-13	-25.09
1652.8	-40.64	H	7.95	0.78	-33.47	-13	-20.47
263.1	-55.19	V	5.7	0.24	-49.73	-13	-36.73
641.7	-51.42	H	6.6	0.39	-45.21	-13	-32.21

Middle channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1670	-45.17	V	7.95	0.78	-38	-13	-25.0
1670	-41.33	H	7.95	0.78	-34.16	-13	-21.16
264.2	-54.76	V	5.7	0.24	-49.3	-13	-36.30
642.8	-52.13	H	6.6	0.39	-45.92	-13	-32.92

High channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1693.2	-44.76	V	7.95	0.78	-37.59	-13	-24.59
1693.2	-41.27	H	7.95	0.78	-34.1	-13	-21.10
264.3	-54.83	V	5.7	0.24	-49.37	-13	-36.37
642.8	-51.46	H	6.6	0.39	-45.25	-13	-32.25

UMTS-FDD Band Ⅱ (Part 24E)

Low channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3704.8	-47.86	V	10.25	2.73	-40.34	-13	-27.34
3704.8	-49.53	H	10.25	2.73	-42.01	-13	-29.01
263.8	-55.12	V	5.7	0.24	-49.66	-13	-36.66
642.7	-52.04	H	6.6	0.39	-45.83	-13	-32.83

Middle channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3760	-48.16	V	10.25	2.73	-40.64	-13	-27.64
3760	-50.17	H	10.25	2.73	-42.65	-13	-29.65
265.3	-54.77	V	5.7	0.24	-49.31	-13	-36.31
645.2	-51.46	H	6.6	0.39	-45.25	-13	-32.25

High channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3815.2	-47.95	V	10.36	2.73	-40.32	-13	-27.32
3815.2	-50.14	H	10.36	2.73	-42.51	-13	-29.51
264.7	-54.88	V	5.7	0.24	-49.42	-13	-36.42
644.2	-51.28	H	6.6	0.39	-45.07	-13	-32.07

UMTS-FDD BandⅣ (Part 27)

Low channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3424.8	-45.66	V	10.07	2.52	-38.11	-13	-25.11
3424.8	-44.89	H	10.07	2.52	-37.34	-13	-24.34
322.7	-55.02	V	6.3	0.26	-48.98	-13	-35.98
694.2	-51.35	H	6.9	0.4	-44.85	-13	-31.85

Middle channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3480	-48.36	V	10.09	2.52	-40.79	-13	-27.79
3480	-49.07	H	10.09	2.52	-41.50	-13	-28.50
319.4	-53.78	V	6.3	0.26	-47.74	-13	-34.74
696.5	-52.23	H	6.9	0.4	-45.73	-13	-32.73

High channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3505.2	-45.95	V	10.09	2.52	-38.38	-13	-25.38
3505.2	-46.58	H	10.09	2.52	-39.01	-13	-26.01
321.6	-54.62	V	6.3	0.26	-48.58	-13	-35.58
695.7	-52.01	H	6.9	0.4	-45.51	-13	-32.51

5.7 §22.917(a), §24.238(a), §27.53(h) - Band Edge

1. Conducted Measurement
   EUT was set for low, mid, high channel with modulated mode and highest RF output power.
   The spectrum analyzer was connected to the antenna terminal.
2. Conducted Emissions Measurement Uncertainty
   All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 30MHz – 40GHz is ±1.5dB.
3. Environmental Conditions

Temperature	24°C
Relative Humidity	53%
Atmospheric Pressure	1010 mbar

4. Test date : July 28, 2014
   Tested By : Herith Shi

Standard Requirement:

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 43 + 10 log (P) dB.

Procedures:

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The Band Edges of low and high channels for the highest RF powers were measured. Setting RBW as roughly BW/100.
3. Details according with KDB 971168 section 6.0.

Test Result: Pass

Refer to the attached plots.

Cellular Band (Part 22H)

Frequency (MHz)	Emission (dBm)	Limit (dBm)
823.9800	-13.64	-13
849.0150	-13.15	-13

PCS Band (Part 24E)

Frequency (MHz)	Emission (dBm)	Limit (dBm)
1849.9775	-14.66	-13
1910.0200	-14.57	-13

UMTS-FDD Band Ⅴ (Part 22H)

Frequency (MHz)	Emission (dBm)	Limit (dBm)
824.000	-29.58	-13
849.000	-28.06	-13

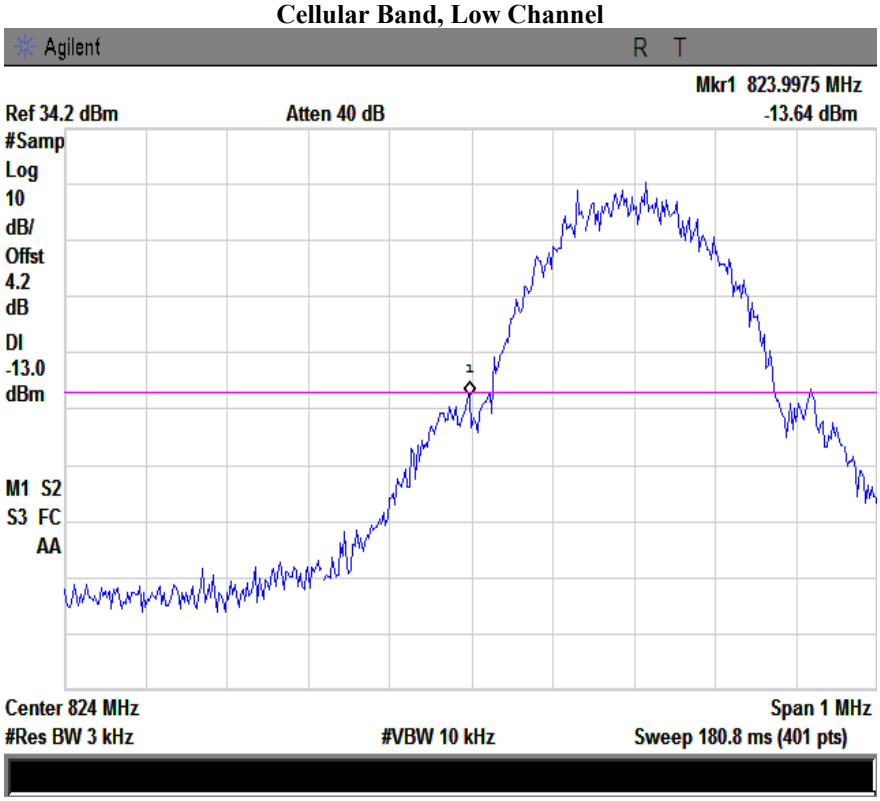
UMTS-FDD Band Ⅱ (Part 24E)

Frequency (MHz)	Emission (dBm)	Limit (dBm)
1850.000	-27.25	-13
1910.000	-27.58	-13

UMTS-FDD BandⅣ (Part 27)

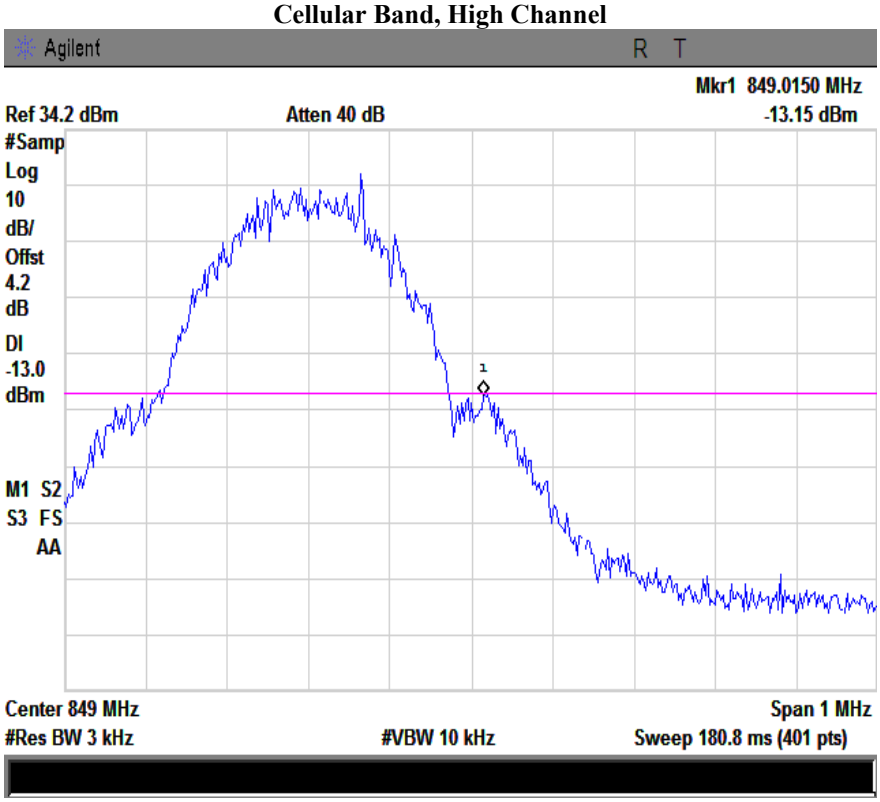
Frequency (MHz)	Emission (dBm)	Limit (dBm)
1710.000	-20.61	-13
1755.000	-18.36	-13

Cellular Band, Low Channel



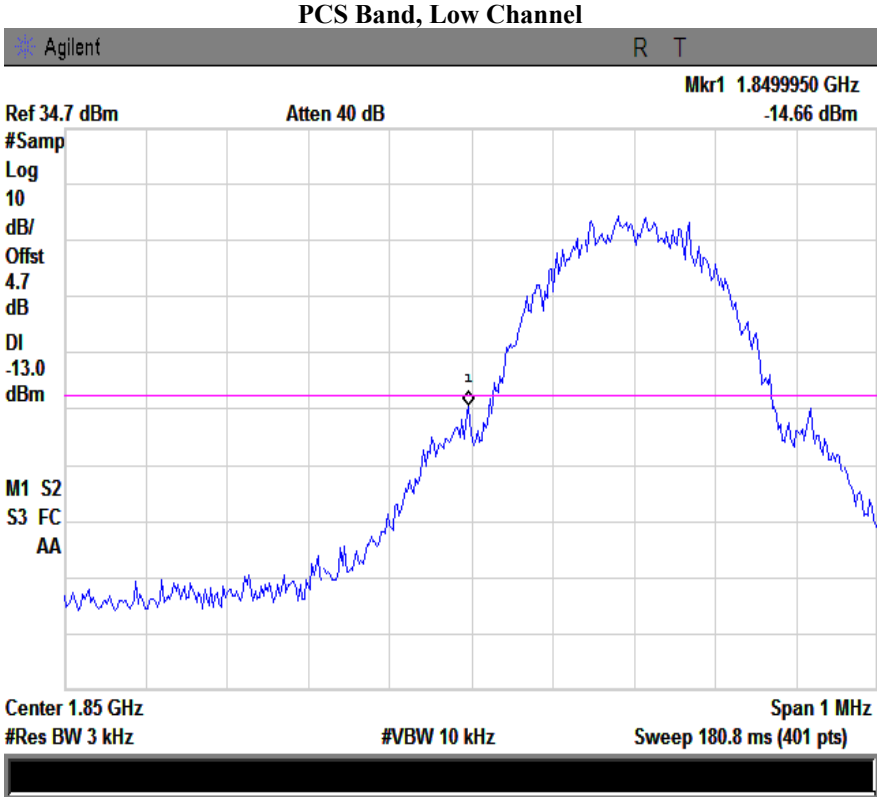
Note: Offset=Cable loss (4.0) + 10log (3.15/3)=4.0+0.2=4.2 dB

Cellular Band, High Channel



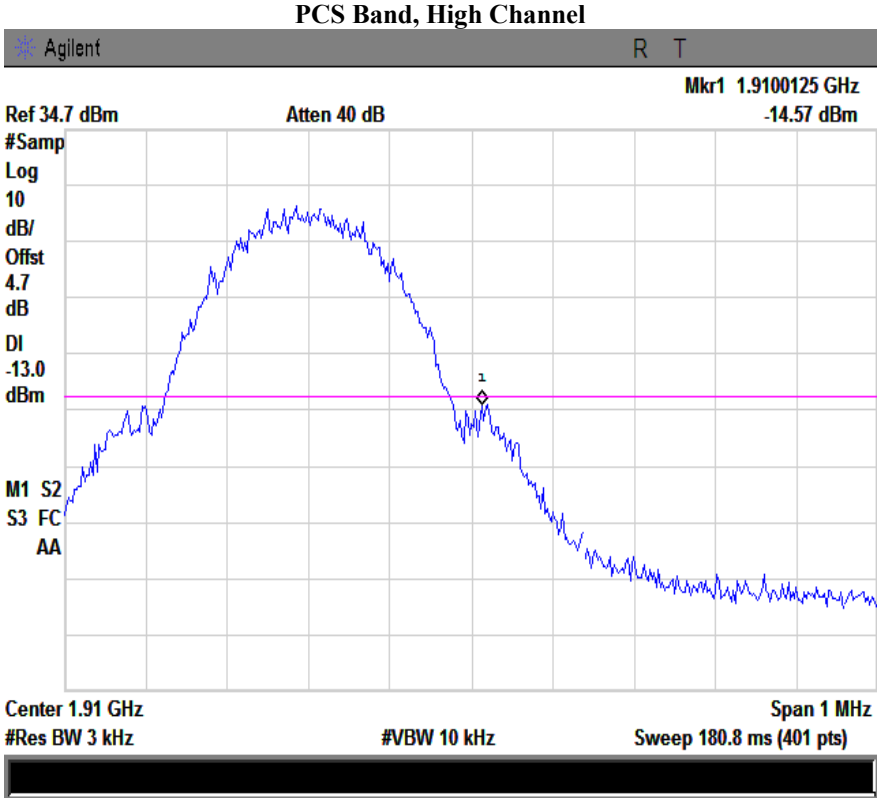
Note: Offset=Cable loss (4.0) + 10log (3.14/3)=4.0+0.2=4.2 dB

PCS Band, Low Channel



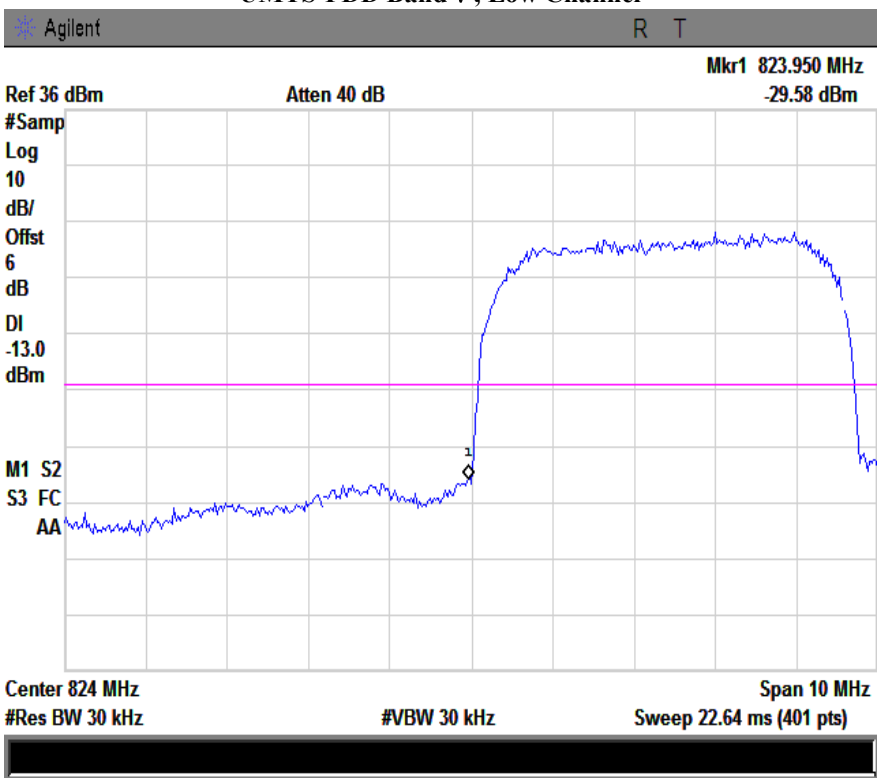
Note: Offset=Cable loss (4.5) + 10log (3.16/3)=4.5+0.2=4.7 dB

PCS Band, High Channel



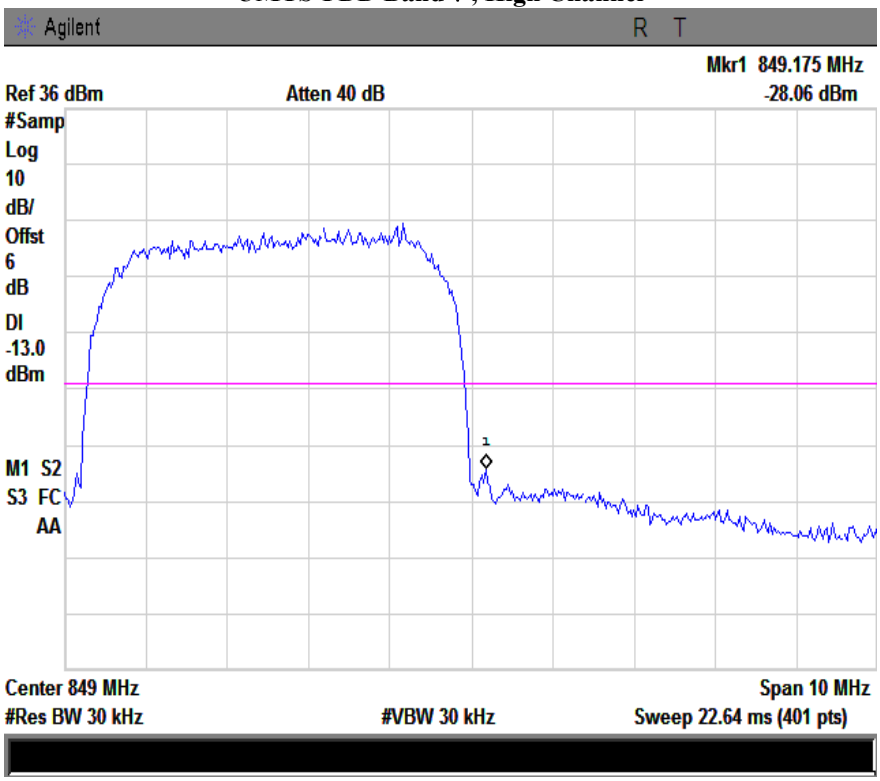
Note: Offset=Cable loss (4.5) + 10log (3.15/3)=4.5+0.2=4.7 dB

UMTS-FDD Band Ⅴ, Low Channel



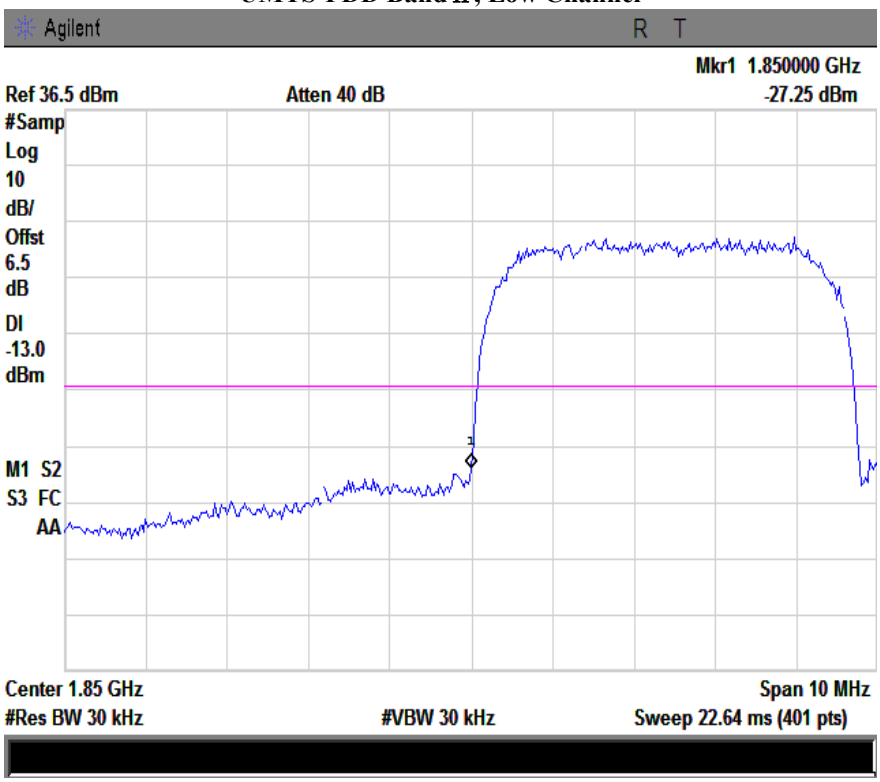
Note: Offset=Cable loss (4.0) + 10log (47/30) =4+2=6 dB

UMTS-FDD Band Ⅴ, High Channel



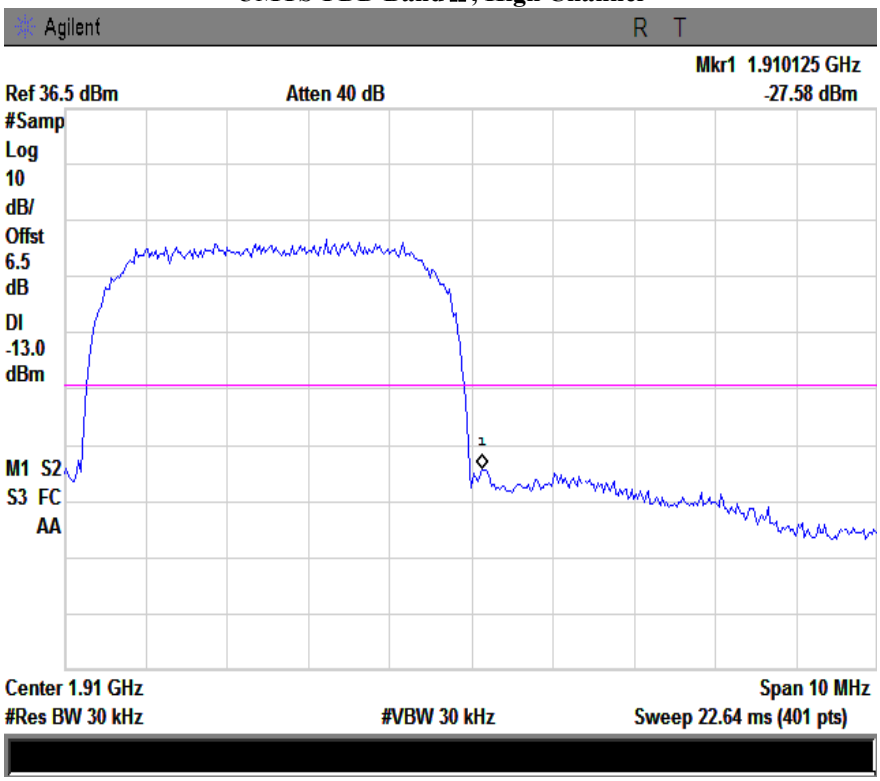
Note: Offset=Cable loss (4.0) + 10log (47/30)=4+2=6 dB

UMTS-FDD Band Ⅱ, Low Channel



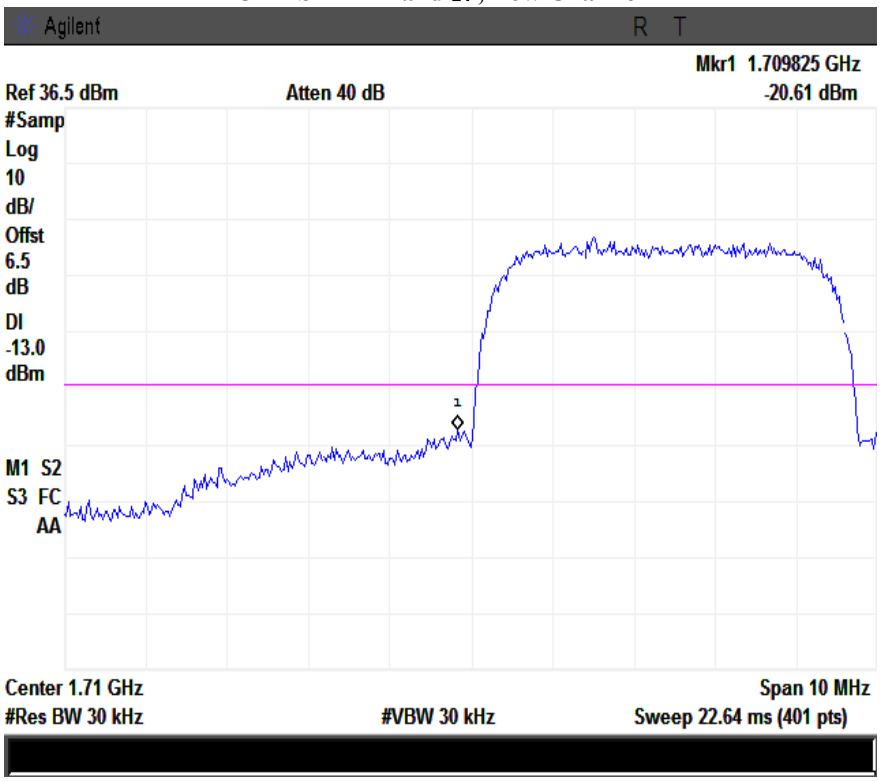
Note: Offset=Cable loss (4.5) + 10log (47/30)=4.5+2=6.5 dB

UMTS-FDD Band Ⅱ, High Channel



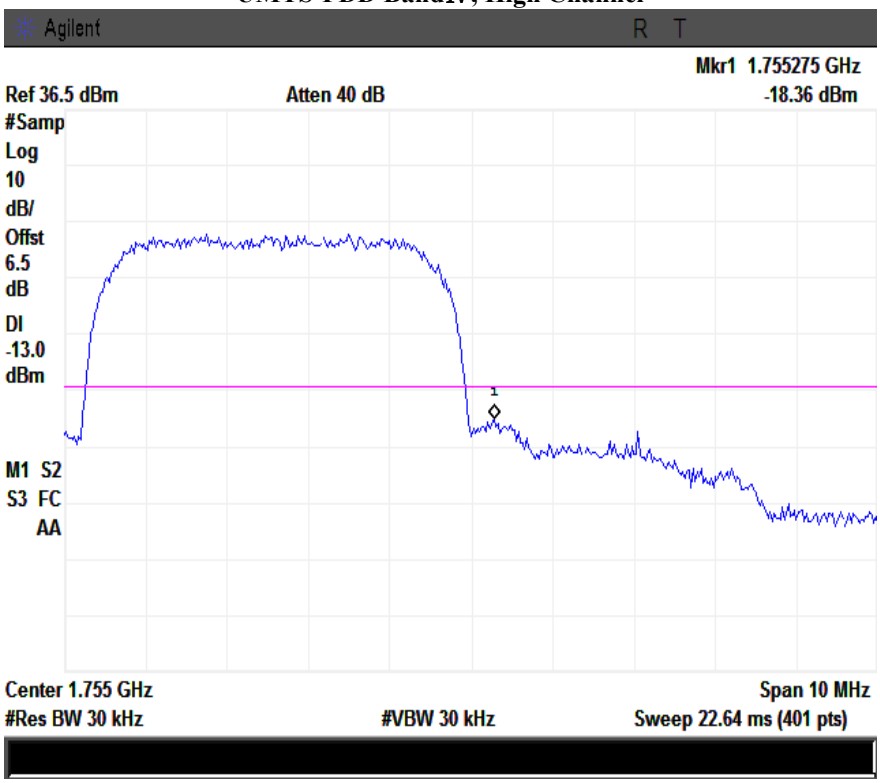
Note: Offset=Cable loss (4.5) + 10log (47/30)=4.5+2=6.5 dB

UMTS-FDD Band Ⅳ, Low Channel



Note: Offset=Cable loss (4.5) + 10log (47/30)=4.5+2=6.5 dB

UMTS-FDD BandⅣ, High Channel



Note: Offset=Cable loss (4.5) + 10log (47/30)=4.5+2=6.5 dB

5.8 §2.1055; §22.355 & §24.235; §27.5(h) & §27.54 - Frequency Stability

1.	Environmental Conditions	Temperature	24°C
		Relative Humidity	50%
		Atmospheric Pressure	1011 mbar
2.	Test date : July 30, 2014 Tested By : Herith Shi		

Standard Requirement:

According to §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table below:

Frequency Tolerance for Transmitters in the Public Mobile Services

Frequency Range (MHz)	Base, fixed (ppm)	Mobile ≤ 3 watts (ppm)	Mobile ≤ 3 watts (ppm)
25 to 50	20.0	20.0	50.0
50 to 450	5.0	5.0	50.0
450 to 512	2.5	5.0	5.0
821 to 896	1.5	2.5	2.5
928 to 929.	5.0	N/A	N/A
929 to 960.	1.5	N/A	N/A
2110 to 2220	10.0	N/A	N/A

According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized frequency block.

According to §27.54, The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

Procedures:

A communication link was established between EUT and base station. The frequency error was monitored and measured by base station under variation of ambient temperature and variation of primary supply voltage.

Limit: The frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5ppm) of the center frequency.

Test Results: Pass

Frequency Stability versus Temperature: The Frequency tolerance of the carrier signal shall be maintained within 2.5ppm of the operating frequency over a temperature variation of -10ºC to +55ºC at normal supply voltage.

Cellular Band (Part 22H)

Middle Channel, f_o = 836.6 MHz				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-10	3.7	-12	0.0143	2.5
0		-19	0.0227	2.5
10		-15	0.0179	2.5
20		-10	0.0120	2.5
30		-9	0.0108	2.5
40		-13	0.0155	2.5
50		-20	0.0239	2.5
55		-18	0.0215	2.5
25	4.2	-19	0.0227	2.5
	3.5	-16	0.0191	2.5

PCS Band (Part 24E)

Middle Channel, f_o = 1880 MHz				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-10	3.7	-17	0.0090	2.5
0		-16	0.0085	2.5
10		-21	0.0112	2.5
20		-29	0.0154	2.5
30		-21	0.0112	2.5
40		-23	0.0122	2.5
50		-25	0.0133	2.5
55		-10	0.0053	2.5
25	4.2	-12	0.0064	2.5
	3.5	-23	0.0122	2.5

UMTS-FDD Band Ⅴ (Part 22H)

Middle Channel, f_o = 835 MHz				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-10	3.7	-2	0.0024	2.5
0		6	0.0072	2.5
10		6	0.0072	2.5
20		2	0.0024	2.5
30		-4	0.0048	2.5
40		-5	0.0060	2.5
50		5	0.0060	2.5
55		7	0.0084	2.5
25	4.2	-3	0.0036	2.5
	3.5	-2	0.0024	2.5

UMTS-FDD Band Ⅱ (Part 24E)

Middle Channel, f_o = 1880 MHz				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-10	3.7	-7	0.0037	2.5
0		4	0.0021	2.5
10		-3	0.0016	2.5
20		2	0.0011	2.5
30		-5	0.0027	2.5
40		-4	0.0021	2.5
50		2	0.0011	2.5
55		4	0.0021	2.5
25	4.2	5	0.0027	2.5
	3.5	-6	0.0032	2.5

UMTS-FDD BandⅣ (Part 27)

Middle Channel, f_o = 1732.5 MHz				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-10	3.7	-10	0.0058	2.5
0		-6	0.0035	2.5
10		-8	0.0046	2.5
20		-5	0.0029	2.5
30		-7	0.0040	2.5
40		-12	0.0069	2.5
50		-9	0.0052	2.5
55		-10	0.0058	2.5
25	4.2	-12	0.0069	2.5
	3.5	-11	0.0063	2.5

Annex A. TEST INSTRUMENT & METHOD

Annex A.i. TEST INSTRUMENTATION & GENERAL PROCEDURES

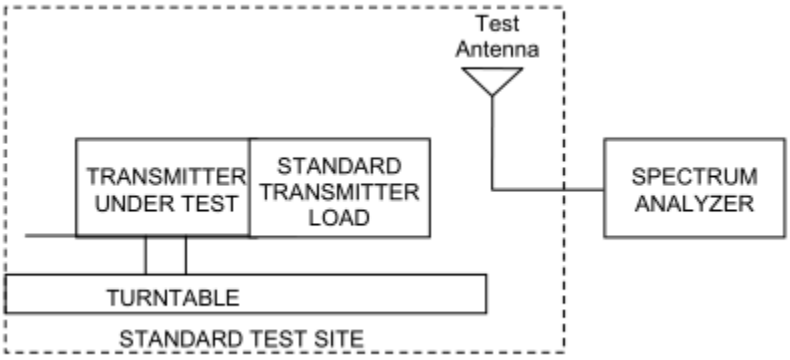
Instrument	Model	Serial #	Calibration Date	Calibration Due Date
RF conducted test				
Agilent ESA-E SERIES SPECTRUM ANALYZER	E4407B	MY45108319	09/17/2013	09/16/2014
Power Splitter	1#	1#	09/02/2013	09/01/2014
Universal Radio Communication Tester	CMU200	121393	09/17/2013	09/16/2014
Temperature/Humidity Chamber	UHL-270	001	10/22/2013	10/21/2014
DC Power Supply	E3640A	MY40004013	09/17/2013	09/16/2014
Radiated Emissions				
EMI test receiver	ESL6	100262	11/23/2013	11/22/2014
OPT 010 AMPLIFIER (0.1-1300MHz)	8447E	2727A02430	09/02/2013	09/01/2014
Microwave Preamplifier (0.5～18GHz)	PAM-118	443008	09/02/2013	09/01/2014
Bilog Antenna (30MHz~6GHz)	JB6	A110712	09/23/2013	09/22/2014
Bilog Antenna (30MHz~2GHz)	JB1	A112017	09/23/2013	09/22/2014
Double Ridge Horn Antenna	AH-118	71259	11/20/2013	11/19/2014
(1 ~18GHz)				
Double Ridge Horn Antenna	AH-118	71283	11/20/2013	11/19/2014
(1 ~18GHz)				
SYNTHESIZED SIGNAL GENERATOR	8665B	3744A01293	09/17/2013	09/16/2014
Tunable Notch Filter	3NF-800/1000-S	AA4	09/02/2013	09/01/2014
Tunable Notch Filter	3NF-1000/2000-S	AM 4	09/02/2013	09/01/2014

Annex A. ii. RADIATED EMISSIONS TEST DESCRIPTION

Definition

Radiated spurious emissions are emissions from the equipment when transmitting into a nonradiating load on a frequency or frequencies that are outside an occupied band sufficient to ensure transmission of information of required quality for the class of communications desired.

Test Set-up



a) Connect the equipment as illustrated.

b) Adjust the spectrum analyzer for the following settings:
1) Resolution Bandwidth = 10 kHz for spurious emissions below 1 GHz, and 1 MHz for spurious emissions above 1GHz.
2) Video Bandwidth = 300 kHz for spurious emissions below 1 GHz, and 3 MHz for spurious emissions above 1 GHz.
3) Sweep Speed slow enough to maintain measurement calibration.
4) Detector Mode = Positive Peak.

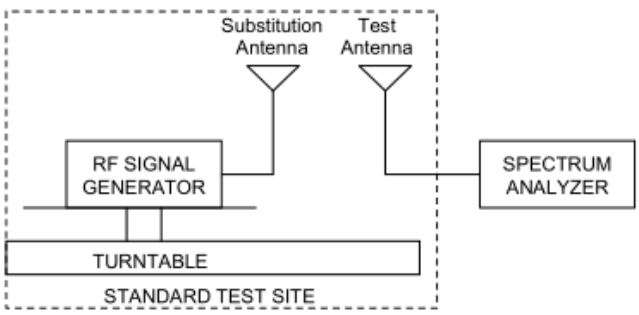
c) Place the transmitter to be tested on the turntable in the standard test site, or an FCC listed site compliant with ANSI C63.4-2001 clause 5.4. The transmitter is transmitting into a nonradiating load that is placed on the turntable. The RF cable to this load should be of minimum length. Fortransmitters with integral antennas, the tests are to be run with the unit operating into the integral antenna.

d) For each spurious measurement the test antenna should be adjusted to the correct length for the frequency involved. This length may be determined from a calibration ruler supplied with the equipment. Measurements shall be made from the lowest radio frequency generated in the equipment to the tenth harmonic of the carrier, except for the region close to the carrier equal to ± the test bandwidth (see 1.3.4.4).

e) Key the transmitter.

f) For each spurious frequency, raise and lower the test antenna from 1 m to 4 m to obtain a maximum reading on the spectrum analyzer with the test antenna at horizontal polarity. Then the turntable should be rotated 360° to determine the maximum reading. Repeat this procedure to obtain the highest possible reading. Record this maximum reading.

g) Repeat step f) for each spurious frequency with the test antenna polarized vertically.



h) Reconnect the equipment as illustrated.

i) Keep the spectrum analyzer adjusted as in step b).

j) Remove the transmitter and replace it with a substitution antenna (the antenna should be half-wavelength for each frequency involved). The center of the substitution antenna should be approximately at the same location as the center of the transmitter. At the lower frequencies, where the substitution antenna is very long, this will be impossible to achieve when the antenna is polarized vertically. In such case the lower end of the antenna should be 0.3 m above the ground.

k) Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a nonradiating cable. With the antennas at both ends horizontally polarized, and with the signal generator tuned to a particular spurious frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output until the previously recorded maximum reading for this set of conditions is obtained. This should be done carefully repeating the adjustment of the test antenna and generator output.

l) Repeat step k) with both antennas vertically polarized for each spurious frequency. m) Calculate power in dBm into a reference ideal half-wave dipole antenna by reducing the readings obtained in steps k) and l) by the power loss in the cable between the generator and the antenna, and further corrected for the gain of the substitution antenna used relative to an ideal half-wave dipole antenna by the following formula:
P d (dBm) = P g (dBm) – cable loss (dB) + antenna gain (dB)
where:
P d is the dipole equivalent power and
P g is the generator output power into the substitution antenna.

n) The P d levels record in step m) are the absolute levels of radiated spurious emissions in dBm. The radiated spurious emissions in dB can be calculated by the following:

$$\text{Radiated spurious emissions (dB)} =$$

$$10\ \log_{10}\left(\frac{TX\ power\ in\ watts}{0.001}\right) - the\ levels\ in\ step\ m)$$

NOTE: It is permissible to use other antennas provided they can be referenced to a dipole.

Annex B. EUT AND TEST SETUP PHOTOGRAPHS

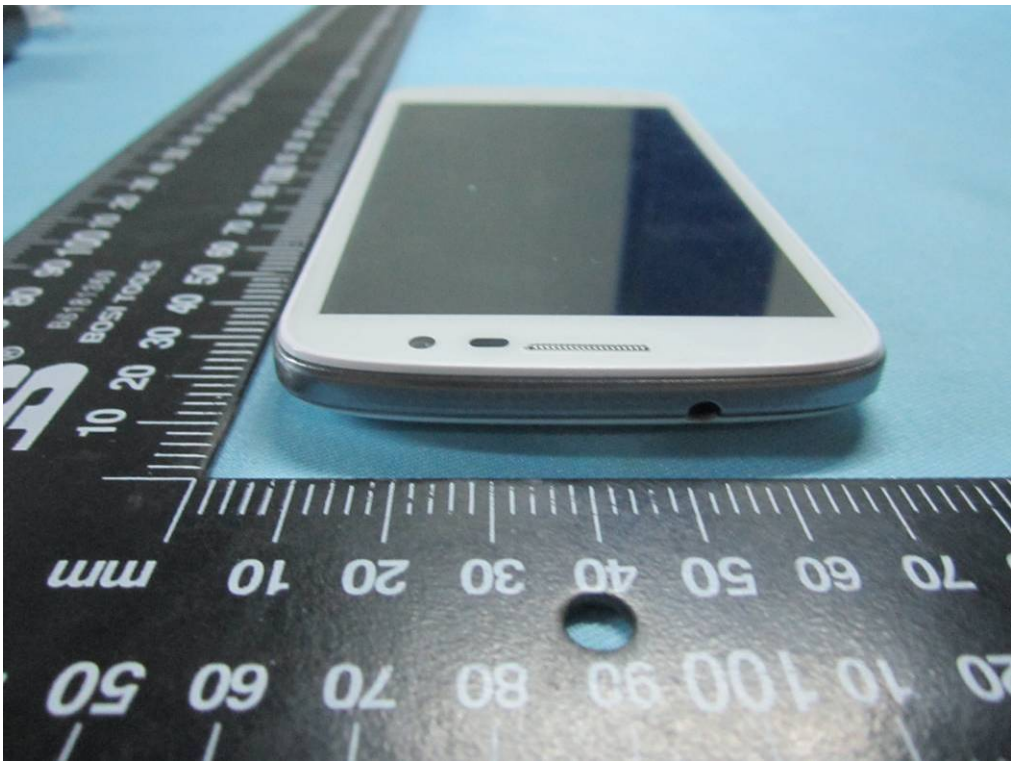
Annex B.i. Photograph 1: EUT External Photo

Whole Package - Top View

Adapter – Front View

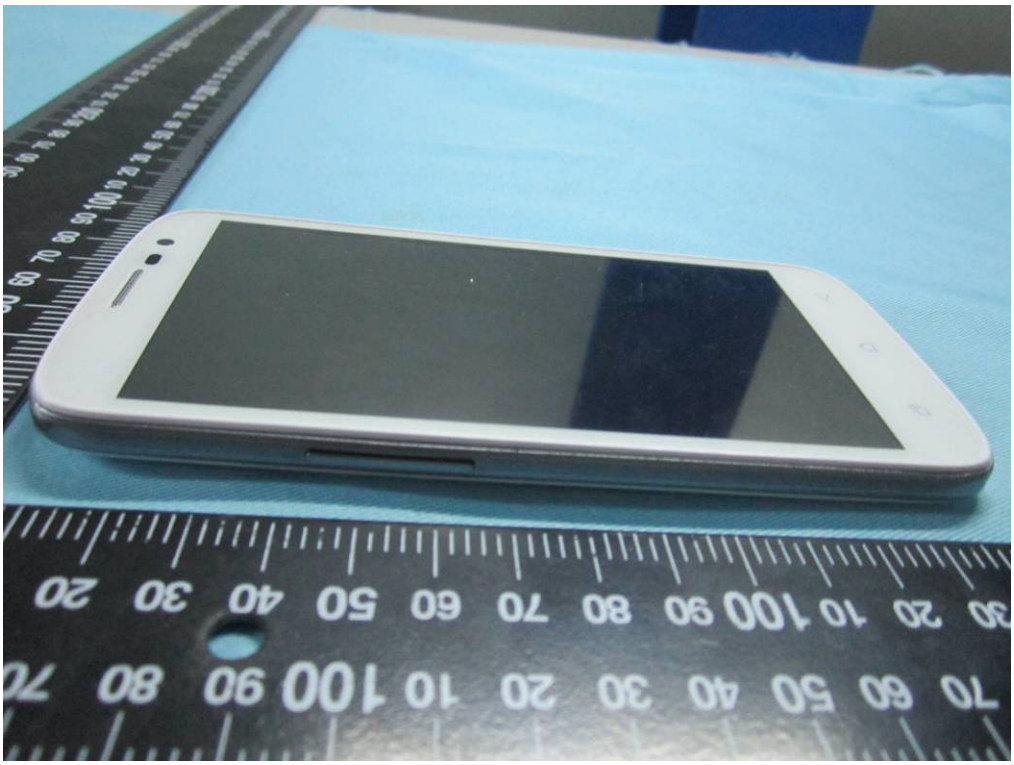
EUT - Front View

EUT - Rear View

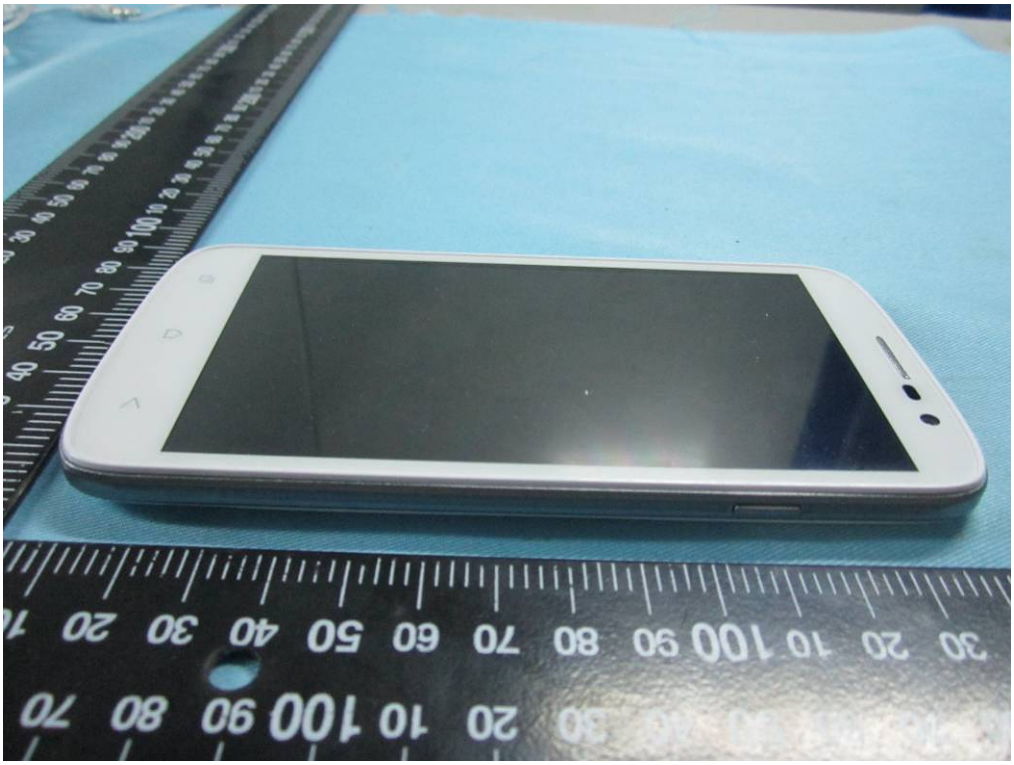


EUT - Top View

EUT - Bottom View



EUT - Left View



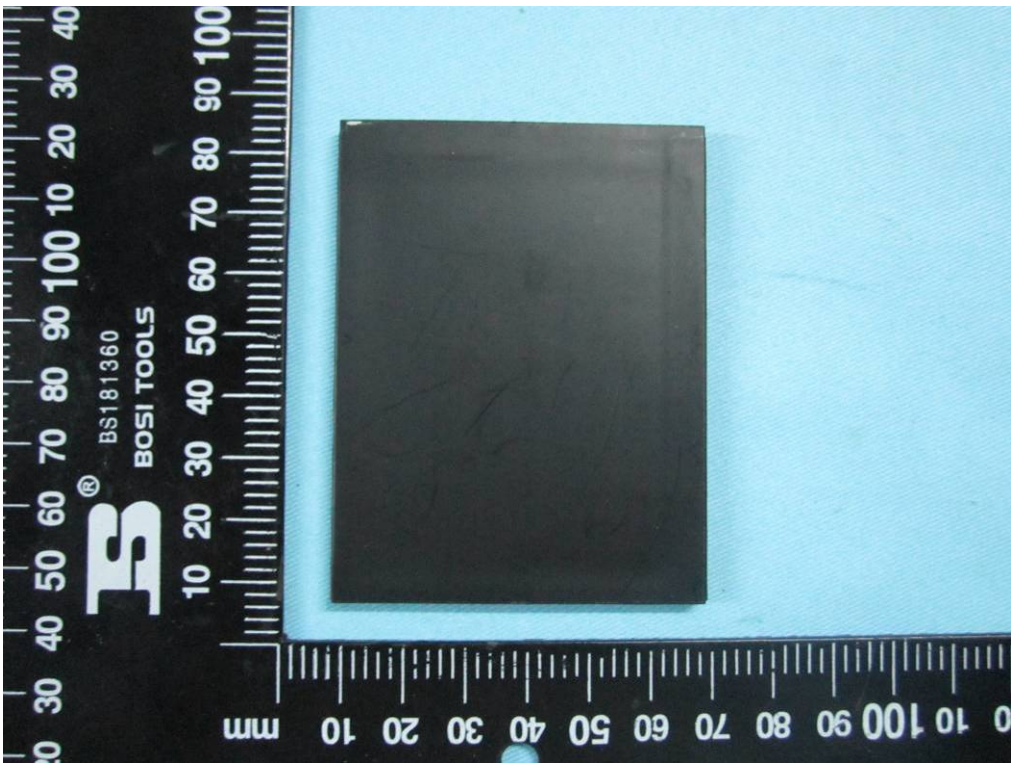
EUT - Right View

Annex B.ii. Photograph 2: EUT Internal Photo

Cover Off - Top View 1

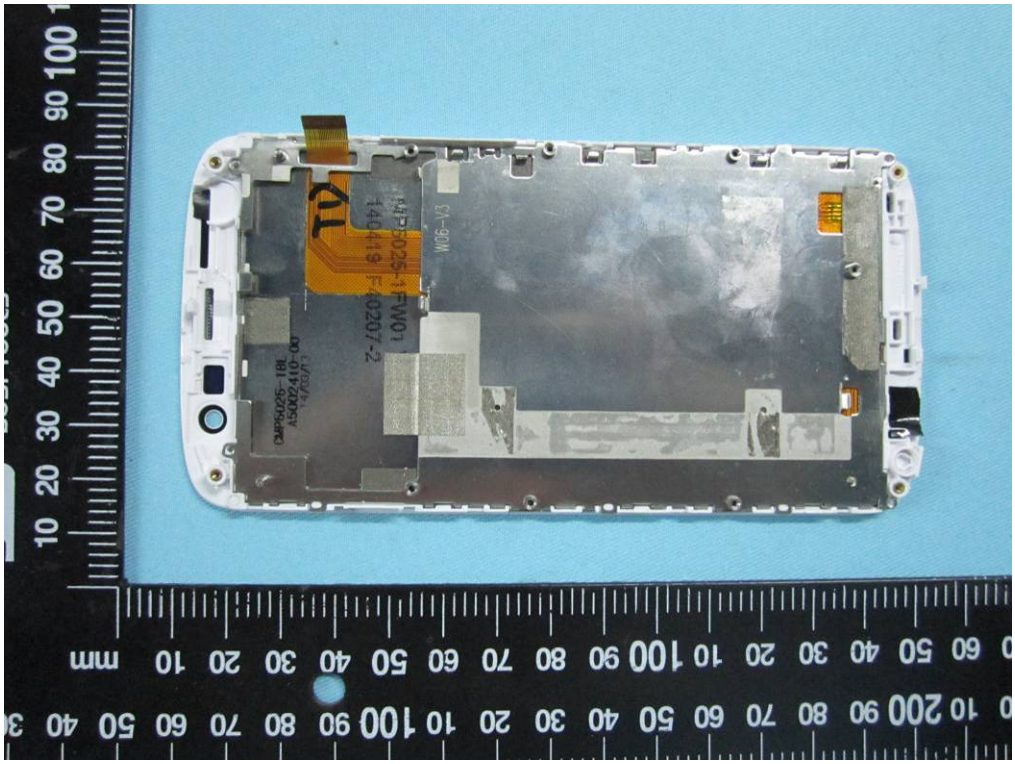
Cover Off - Top View 2

Battery - Top View

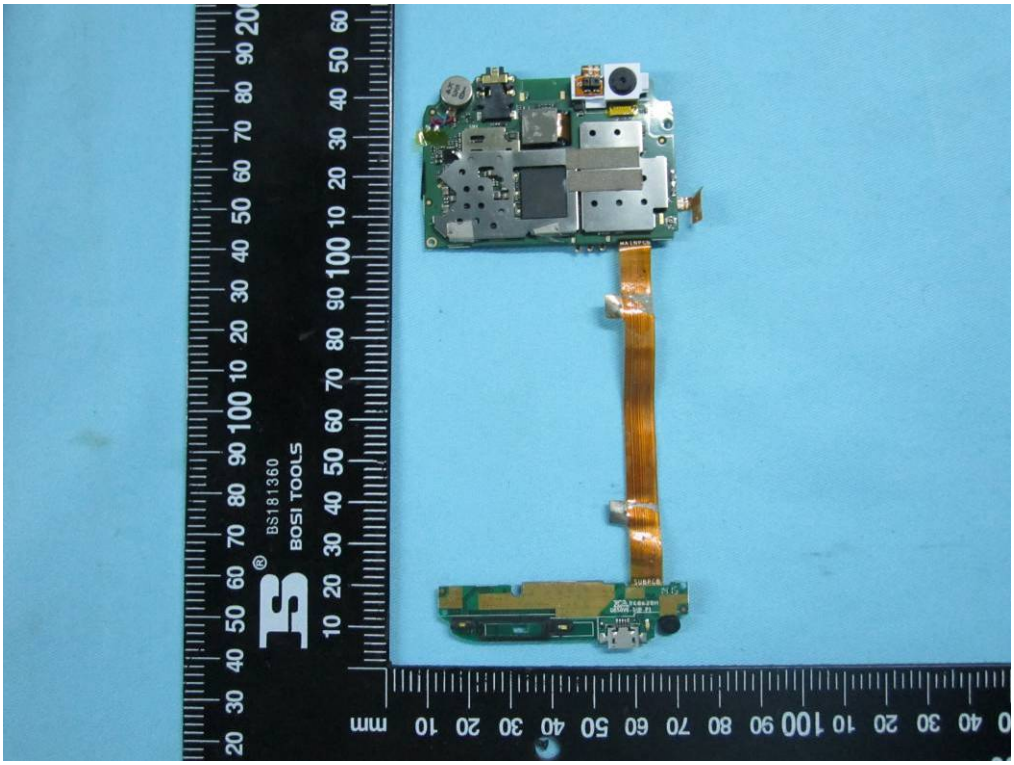


Battery - Bottom View

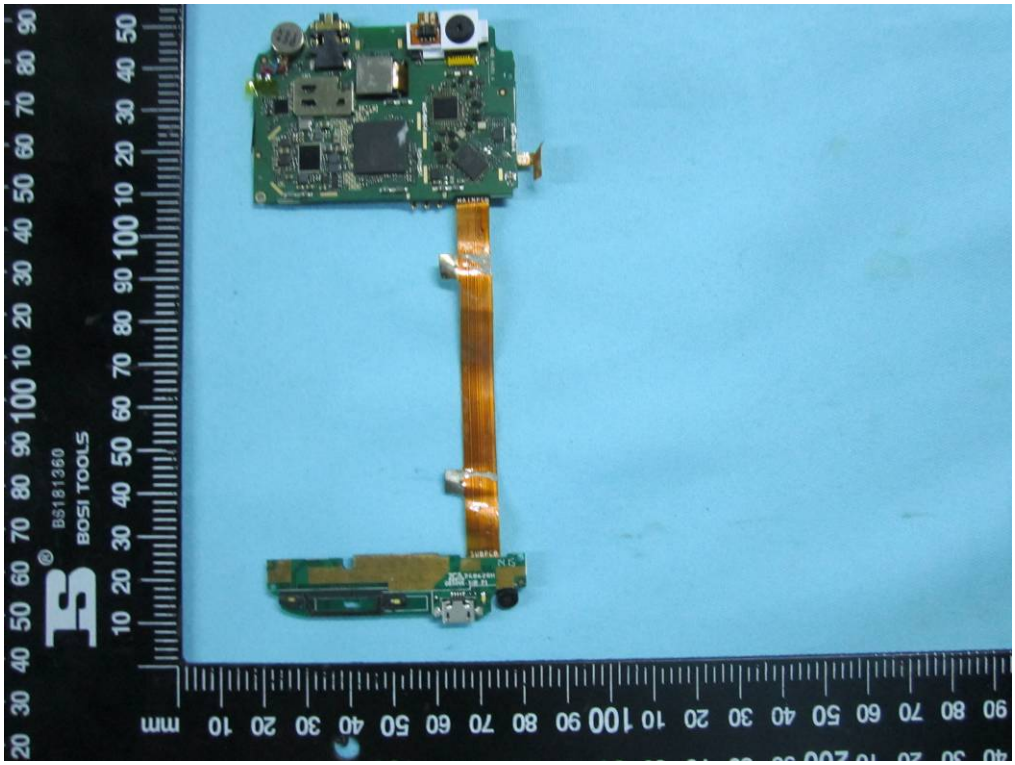
LCD – Front View



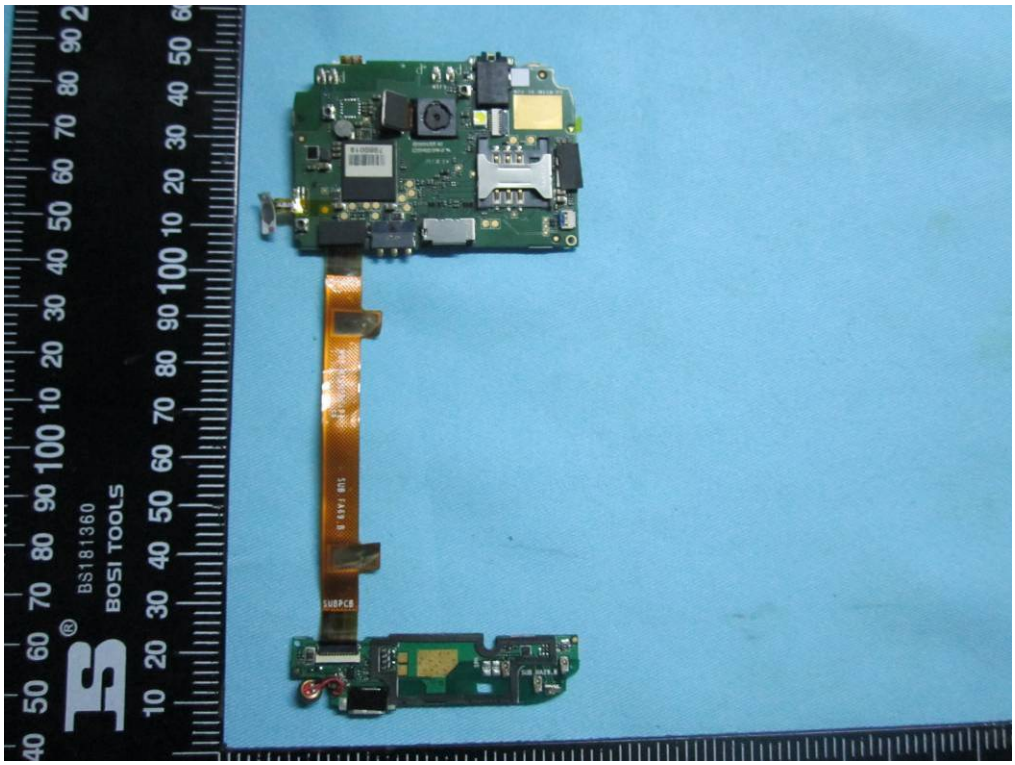
LCD – Rear View



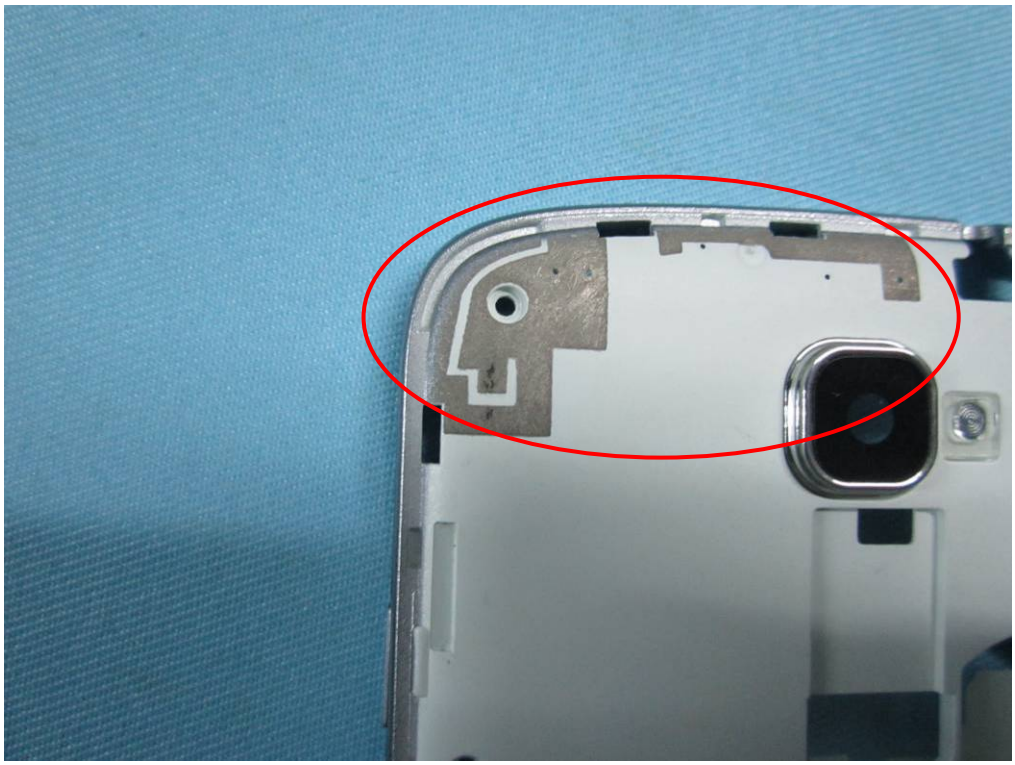
Mainborad With Shielding - Front View



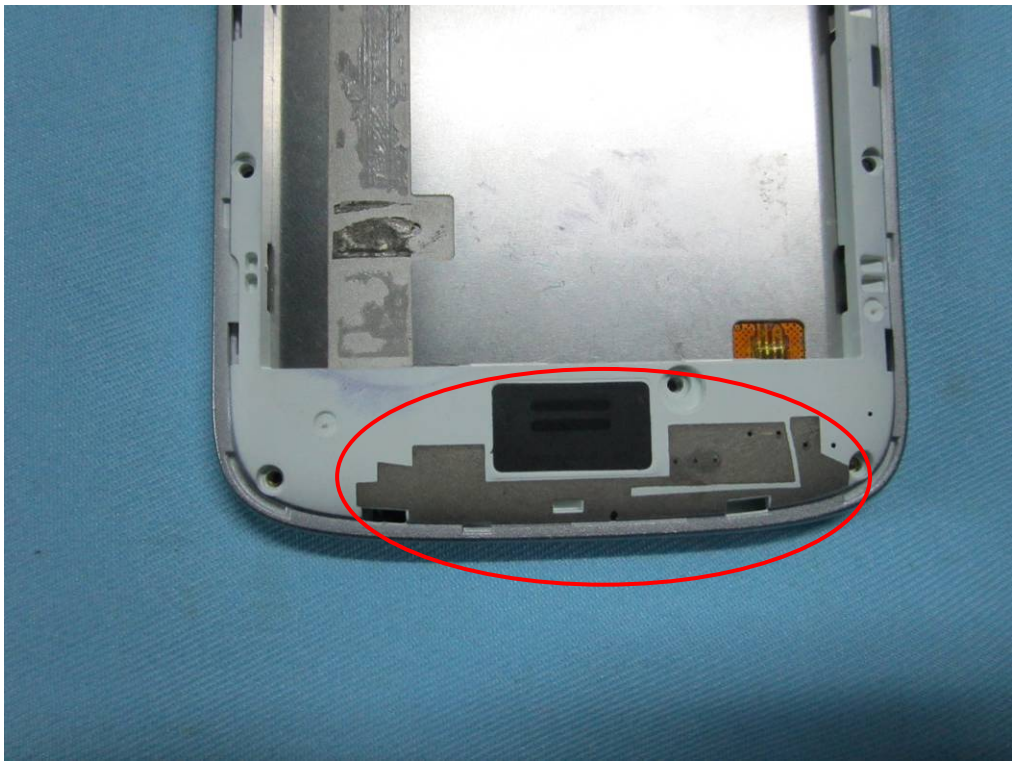
Mainborad Without Shielding - Front View



Mainborad– Rear View

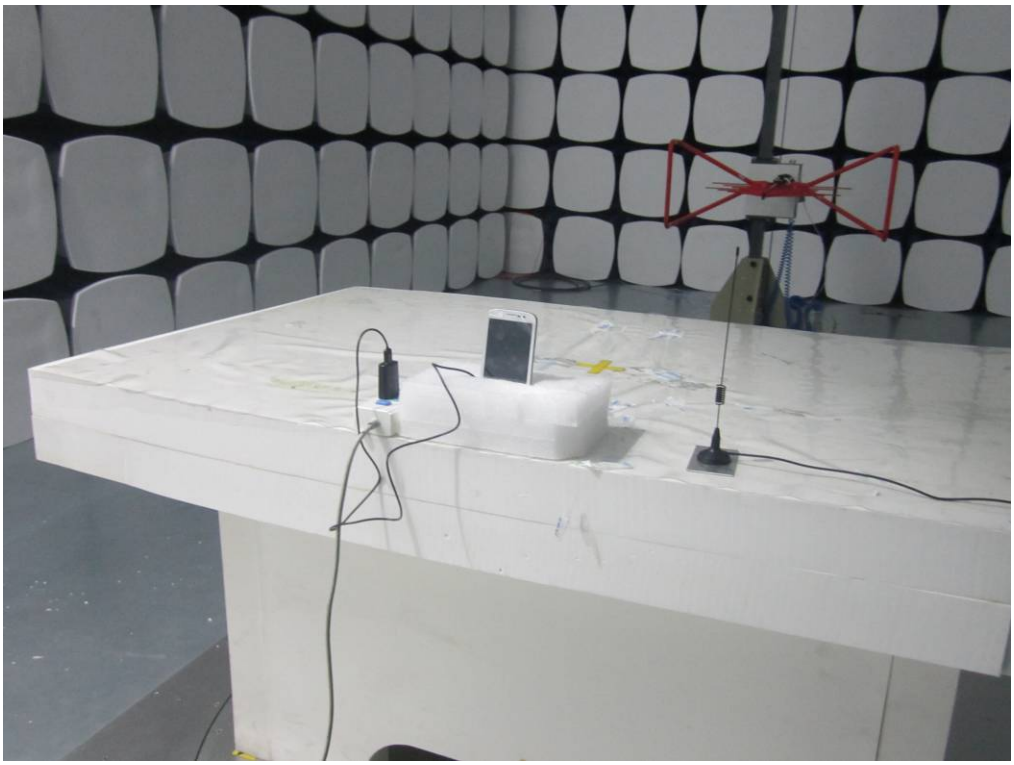


BT/BLE/WIFI Antenna View

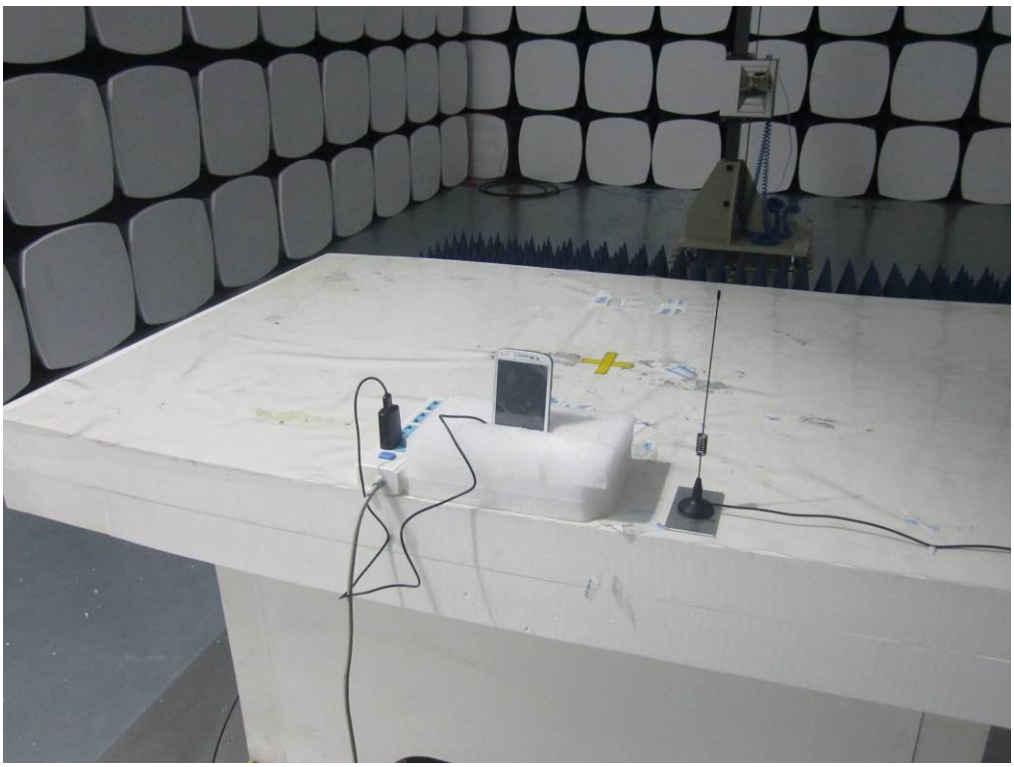


GSM/PCS/UMTS-FDD/LTE Antenna View

Annex B.iii. Photograph 3: Test Setup Photo



Radiated Spurious Emissions Test Setup Below 1GHz - Front View



Radiated Spurious Emissions Test Setup Above 1GHz –Front View

Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

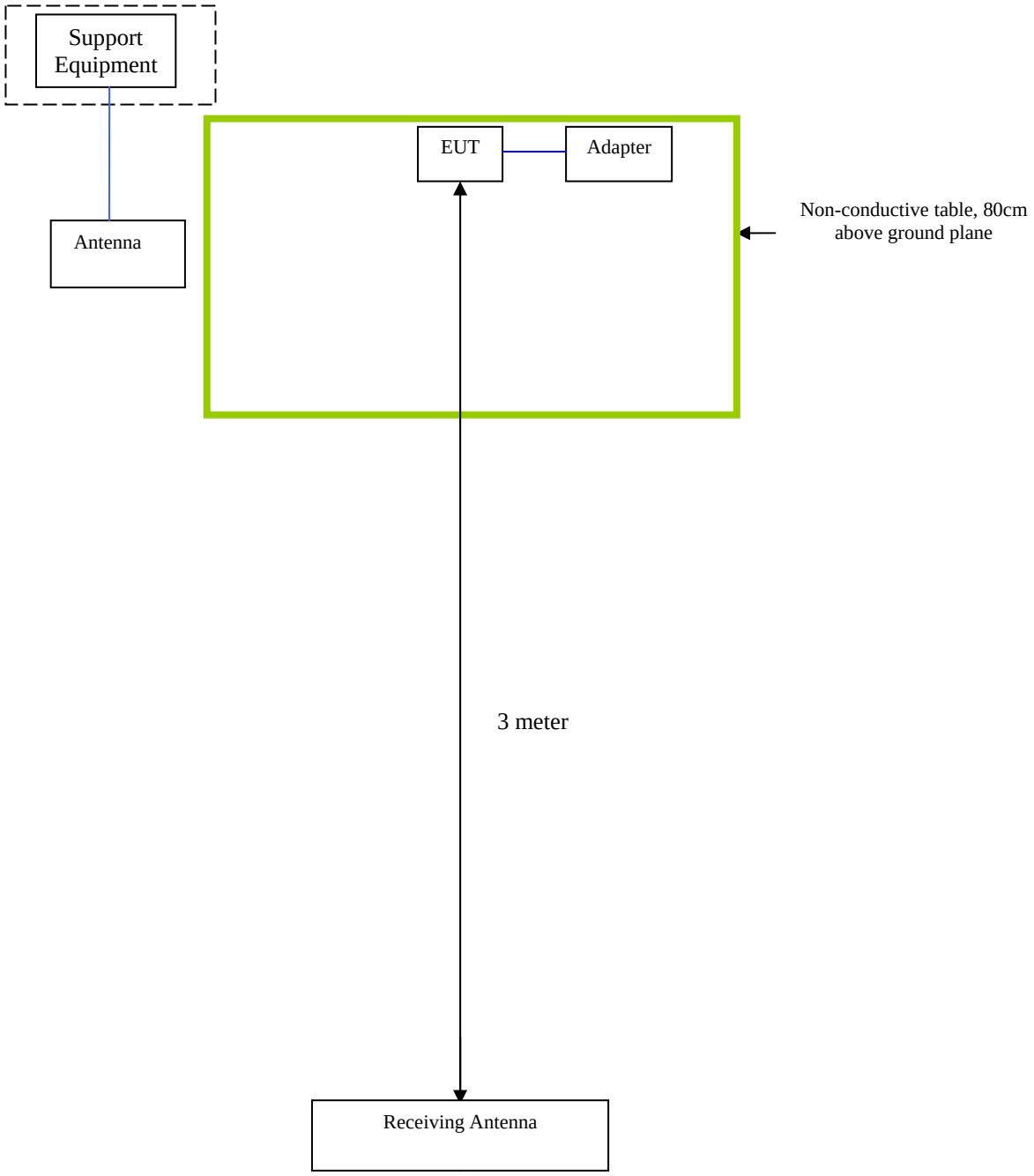
EUT TEST CONDITIONS

Annex C. i. SUPPORTING EQUIPMENT DESCRIPTION

The following is a description of supporting equipment and details of cables used with the EUT.

Manufacturer	Equipment Description (Including Brand Name)	Model	Calibration Date	Calibration Due Date
N/A	N/A	N/A	N/A	N/A

Block Configuration Diagram for Radiated Emissions



Annex C.ii. EUT OPERATING CONDITIONS

The following is the description of how the EUT is exercised during testing.

Test	Description Of Operation
Emissions Testing	The EUT was communicating with base station and set to work at maximum output power.
Others Testing	The EUT was communicating with base station and set to work at maximum output power.

Annex D.USER MANUAL / BLOCK DIAGRAM / SCHEMATICS / PART LIST

Please see attachment

Annex E. DECLARATION OF SIMILARITY

N/A