

# RF TEST REPORT



Report No.: 17070248-FCC-R1

Supersede Report No.: N/A

Applicant	Verykool USA Inc	
Product Name	Mobile Phone	
Model No.	s4009	
Serial No.	N/A	
Test Standard	FCC Part 22(H):2016 ;FCC Part 24(E):2016; ANSI/TIA-603-D: 2010	
Test Date	April 01 to 20, 2017	
Issue Date	April 21, 2017	
Test Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail	
Equipment complied with the specification		<input checked="" type="checkbox"/>
Equipment did not comply with the specification		<input type="checkbox"/>
Leen Yang Test Engineer	David Huang Checked By	
This test report may be reproduced in full only Test result presented in this test report is applicable to the tested sample only		

Issued by:

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## Laboratories Introduction

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### Accreditations for Conformity Assessment

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

Test Report	17070248-FCC-R1
Page	3 of 88

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## CONTENTS

1. REPORT REVISION HISTORY .....	5
2. CUSTOMER INFORMATION.....	5
3. TEST SITE INFORMATION.....	5
4. EQUIPMENT UNDER TEST (EUT) INFORMATION.....	6
5. TEST SUMMARY .....	9
6. MEASUREMENTS, EXAMINATION AND DERIVED RESULTS.....	10
6.1 RF EXPOSURE (SAR).....	10
6.2 RF OUTPUT POWER.....	11
6.3 PEAK-AVERAGE RATIO .....	23
6.4 OCCUPIED BANDWIDTH .....	27
6.5 SPURIOUS EMISSIONS AT ANTENNA TERMINALS.....	38
6.6 SPURIOUS RADIATED EMISSIONS .....	51
6.7 BAND EDGE .....	57
6.8 FREQUENCY STABILITY.....	67
ANNEX A. TEST INSTRUMENT .....	71
ANNEX B. EUT AND TEST SETUP PHOTOGRAPHS .....	73
ANNEX C. TEST SETUP AND SUPPORTING EQUIPMENT.....	84
ANNEX C.II. EUT OPERATING CONDITIONS.....	86
ANNEX D. USER MANUAL / BLOCK DIAGRAM / SCHEMATICS / PARTLIST .....	87
ANNEX E. DECLARATION OF SIMILARITY .....	88

## 1. Report Revision History

Report No.	Report Version	Description	Issue Date
17070248-FCC-R1	NONE	Original	April 21, 2017

## 2. Customer information

Applicant Name	Verykool USA Inc
Applicant Add	3636 Nobel Drive, Suite 325, San Diego, California 92122 United States
Manufacturer	TEM MOBILE LIMITED
Manufacturer Add	No 1708, Cangsong Building, Tairan 6 Road, Futian ShenZhen, China

## 3. Test site information

Lab performing tests	SIEMIC (Shenzhen-China) LABORATORIES
Lab Address	Zone A, Floor 1, Building 2 Wan Ye Long Technology Park South Side of Zhoushi Road, Bao' an District, Shenzhen, Guangdong China 518108
FCC Test Site No.	718246
IC Test Site No.	4842E-1
Test Software	Radiated Emission Program-To Shenzhen(ICP-03A1)

## 4. Equipment under Test (EUT) Information

Description of EUT: Mobile Phone

Main Model: s4009

Serial Model: N/A

Date EUT received: March 31, 2017

Test Date(s): April 01 to 20, 2017

Equipment Category : PCE

Antenna Gain:  
GSM850:1.5dBi  
PCS1900:1.55dBi  
UMTS-FDD Band V: 1.58dBi  
UMTS-FDD Band II: 1.56dBi  
WIFI: 1.35dBi  
Bluetooth/BLE: 1.35dBi  
GPS: 1.8dBi

Antenna Type: PIFA antenna

Type of Modulation:  
GSM / GPRS: GMSK  
EGPRS: GMSK,8PSK  
UMTS-FDD: QPSK  
802.11b/g/n: DSSS, OFDM  
Bluetooth: GFSK, π /4DQPSK, 8DPSK  
BLE: GFSK  
GPS:BPSK

Test Report	17070248-FCC-R1
Page	7 of 88

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 V TX: 826.4 ~ 846.6 MHz; RX: 871.4 ~ 891.6 MHz  
 UMTS-FDD Band II TX: 1852.4 ~ 1907.6 MHz;

RF Operating Frequency (ies):  
 RX: 1932.4 ~ 1987.6 MHz  
 WIFI: 802.11b/g/n(20M): 2412-2462 MHz  
 WIFI: 802.11n(40M): 2422-2452 MHz  
 Bluetooth& BLE: 2402-2480 MHz  
 GPS: 1575.42 MHz

GSM Vioce:GSM850: 31.20 dBm

PCS1900: 29.69 dBm

GPRS:GSM850: 32.19dBm

PCS1900: 29.71dBm

EGPRS(MCS5):GSM850: 27.61dBm

PCS1900: 25.61 dBm

Maximum Conducted

AV Power to Antenna:

UMTS-FDD Band II: 22.53 dBm

HSUPA:UMTS-FDD Band V: 21.50dBm

UMTS-FDD Band II: 21.36dBm

HSDPA:UMTS-FDD Band V: 21.46dBm

UMTS-FDD Band II: 21.32 dBm

GSM Vioce:GSM850: 30.50dBm / ERP

PCS1900: 31.17dBm / EIRP

GPRS:GSM850: 31.49dBm / ERP

PCS1900: 31.36 dBm / EIRP

EGPRS(MCS5):GSM850: 26.91 dBm / ERP

PCS1900: 27.16dBm / EIRP

ERP/EIRP:

RMC:UMTS-FDD Band V: 22.37 dBm / ERP

UMTS-FDD Band II: 24.13 dBm / EIRP

HSDPA:UMTS-FDD Band V: 21.00 dBm / ERP

UMTS-FDD Band II: 22.95 dBm / EIRP

HSUPA:UMTS-FDD Band V: 20.99 dBm / ERP

UMTS-FDD Band II: 22.81 dBm / EIRP

Test Report	17070248-FCC-R1
Page	8 of 88

GSM 850: 124CH  
PCS1900: 299CH  
UMTS-FDD Band V : 102CH  
UMTS-FDD Band II : 277CH  
Number of Channels: WIFI :802.11b/g/n(20M): 11CH  
WIFI :802.11n(40M): 7CH  
Bluetooth: 79CH  
BLE: 40CH  
GPS:1CH

Port: USB Port, Earphone Port

Adapter:  
Model: s4009  
Input: AC100-240V~50/60Hz,0.2A  
Output: DC 5.0V,550mA  
Input Power:  
Battery :  
Model: s4009  
Spec: 3.7V,1200mAh(4.44Wh)  
Limited charger voltage: 4.2V

Trade Name : Verykool

GPRS/ EGPRS Multi-slot class 8/10/12

FCC ID: WA6S4009

## 5. Test Summary

The product was tested in accordance with the following specifications.

All testing has been performed according to below product classification:

FCC Rules	Description of Test	Result
§ 1.1307; § 2.1093	RF Exposure (SAR)	Compliance
§2.1046; § 22.913(a); § 24.232(c); § 27.50(c.10) ;	RF Output Power	Compliance
§ 24.232 (d) ;	Peak-Average Ratio	Compliance
§ 2.1049; § 22.905; § 22.917; § 24.238;	99% & -26 dB Occupied Bandwidth	Compliance
§ 2.1051; § 22.917(a); § 24.238(a);	Spurious Emissions at Antenna Terminal	Compliance
§ 2.1053; § 22.917(a); § 24.238(a);	Field Strength of Spurious Radiation	Compliance
§ 22.917(a); § 24.238(a);	Out of band emission, Band Edge	Compliance
§ 2.1055; § 22.355; § 24.235;	Frequency stability vs. temperature Frequency stability vs. voltage	Compliance

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

### Measurement Uncertainty

Emissions		
Test Item	Description	Uncertainty
Band Edge and Radiated Spurious Emissions	Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 (for EUTs < 0.5m X 0.5m X 0.5m)	+5.6dB/-4.5dB
-	-	-

## 6. MEASUREMENTS, EXAMINATION AND DERIVED RESULTS

### 6.1 RF Exposure (SAR)

Test Result: Pass

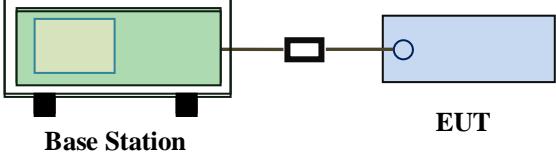
The EUT is a portable device, thus requires SAR evaluation;

Please refer to RF Exposure Evaluation Report: 17070248-FCC-H.

## 6.2 RF Output Power

Temperature	24°C
Relative Humidity	55%
Atmospheric Pressure	1010mbar
Test date :	April 17, 2017
Tested By :	Leen Yang

### Requirement(s):

Spec	Item	Requirement	Applicable
§22.913 (a)	a)	ERP:38.45dBm	<input checked="" type="checkbox"/>
§24.232 (c)	b)	EIRP:33dBm	<input checked="" type="checkbox"/>
Test Setup	 <p>The diagram illustrates the test setup. A green rectangular box labeled "Base Station" is connected to a blue rectangular box labeled "EUT" by a horizontal line representing a cable. Below the "Base Station" box, there are two black squares representing antenna ports.</p>		
Test Procedure	<p>For Conducted Power:</p> <ul style="list-style-type: none"> <li>- The transmitter output port was connected to base station.</li> <li>- Set EUT at maximum power through base station.</li> <li>- Select lowest, middle, and highest channels for each band and different test mode.</li> </ul> <p>For ERP/EIRP:</p> <p>According with KDB 971168 v02r02</p> <ul style="list-style-type: none"> <li>- The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.</li> <li>- 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.</li> <li>- The frequency range up to tenth harmonic of the fundamental frequency was investigated.</li> </ul>		

	<ul style="list-style-type: none"> <li>- 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.</li> <li>- Spurious emissions in dB = <math>10 \log (\text{TX power in Watts}/0.001)</math> – the absolute level</li> <li>- Spurious attenuation limit in dB = <math>43 + 10 \log_{10} (\text{power out in Watts})</math>.</li> </ul>
Remark	
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail

Test Data     Yes       N/A

Test Plot     Yes (See below)       N/A

## Conducted Power

### GSM Mode:

Burst Average Power (dBm);								
Band	GSM850				PCS1900			
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	<b>31.20</b>	31.13	31.05	31±1	29.35	29.49	<b>29.69</b>	29±1
GPRS Multi-Slot Class 8 (1 uplink),GMSK	<b>32.19</b>	31.12	31.03	32±1	29.28	29.50	<b>29.71</b>	29±1
GPRS Multi-Slot Class 10 (2 uplink) GMSK	30.75	30.68	30.59	30±1	28.70	25.63	28.52	28±1
GPRS Multi-Slot Class 12 (4 uplink) GMSK	28.15	28.18	28.12	28±1	25.62	25.63	25.65	25±1
EGPRS Multi-Slot Class 8 (1 uplink) GMSK MCS1	<b>31.16</b>	31.09	31.02	31±1	29.30	29.63	<b>29.70</b>	29±1
EGPRS Multi-Slot Class 10 (2 uplink) GMSK MCS1	30.71	30.65	30.58	30±1	28.65	28.83	28.68	28±1
EGPRS Multi-Slot Class 12 (4 uplink) GMSK MCS1	28.19	28.2	28.19	28±1	26.26	26.56	26.85	26±1
EGPRS Multi-Slot Class 8 (1 uplink) 8PSK MCS5	<b>27.61</b>	27.57	27.59	27±1	25.52	25.30	<b>25.61</b>	25±1
EGPRS Multi-Slot Class 10 (2 uplink) 8PSK MCS5	25.49	25.61	25.62	25±1	24.45	24.51	24.39	24±1
EGPRS Multi-Slot Class 12 (4 uplink) 8PSK MCS5	22.44	22.57	22.48	22±1	22.01	22.21	22.36	22±1

Remark :

GPRS, CS1 coding scheme.

EGPRS, MCS1 coding scheme.

EGPRS, MCS5 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

## UMTS Mode:

### UMTS-FDD Band V

Band/ Time Slot configuration	Channel	Frequency	Average power (dBm)	Tune up Power tolerant
RMC 12.2kbps	4132	826.4	22.67	22±1
	4175	835	<b>22.87</b>	22±1
	4233	846.6	22.48	22±1
HSDPA Subtest1	4132	826.4	21.45	21.3±1
	4175	835	21.49	21.3±1
	4233	846.6	21.46	21.3±1
HSDPA Subtest2	4132	826.4	21.43	21.3±1
	4175	835	21.40	21.3±1
	4233	846.6	21.47	21.3±1
HSDPA Subtest3	4132	826.4	21.48	21.3±1
	4175	835	<b>21.50</b>	21.3±1
	4233	846.6	21.42	21.3±1
HSDPA Subtest4	4132	826.4	21.43	21.3±1
	4175	835	21.41	21.3±1
	4233	846.6	21.40	21.3±1
HSUPA Subtest1	4132	826.4	21.46	21.3±1
	4175	835	<b>21.46</b>	21.3±1
	4233	846.6	21.46	21.3±1
HSUPA Subtest2	4132	826.4	21.41	21.3±1
	4175	835	21.42	21.3±1
	4233	846.6	21.46	21.3±1
HSUPA Subtest3	4132	826.4	21.43	21.3±1
	4175	835	21.41	21.3±1
	4233	846.6	21.43	21.3±1
HSUPA Subtest4	4132	826.4	21.49	21.3±1
	4175	835	21.44	21.3±1
	4233	846.6	21.46	21.3±1
HSUPA Subtest5	4132	826.4	21.40	21.3±1
	4175	835	21.42	21.3±1
	4233	846.6	21.43	21.3±1

## UMTS-FDD Band II

Band/ Time Slot configuration	Channel	Frequency	Average power (dBm)	Tune up Power tolerant
RMC 12.2kbps	9262	1852.4	22.18	22±1
	9400	1880	22.51	22±1
	9538	1907.6	<b>22.53</b>	22±1
HSDPA Subtest1	9262	1852.4	21.23	21.3±1
	9400	1880	21.26	21.3±1
	9538	1907.6	21.33	21.3±1
HSDPA Subtest2	9262	1852.4	21.33	21.3±1
	9400	1880	21.34	21.3±1
	9538	1907.6	<b>21.36</b>	21.3±1
HSDPA Subtest3	9262	1852.4	21.35	21.3±1
	9400	1880	21.34	21.3±1
	9538	1907.6	21.25	21.3±1
HSDPA Subtest4	9262	1852.4	21.22	21.3±1
	9400	1880	21.26	21.3±1
	9538	1907.6	21.25	21.3±1
HSUPA Subtest1	9262	1852.4	21.25	21.3±1
	9400	1880	21.24	21.3±1
	9538	1907.6	21.22	21.3±1
HSUPA Subtest2	9262	1852.4	21.24	21.3±1
	9400	1880	21.25	21.3±1
	9538	1907.6	21.26	21.3±1
HSUPA Subtest3	9262	1852.4	21.28	21.3±1
	9400	1880	21.26	21.3±1
	9538	1907.6	21.25	21.3±1
HSUPA Subtest4	9262	1852.4	21.28	21.3±1
	9400	1880	21.26	21.3±1
	9538	1907.6	<b>21.32</b>	21.3±1
HSUPA Subtest5	9262	1852.4	21.29	21.3±1
	9400	1880	21.25	21.3±1
	9538	1907.6	21.31	21.3±1

## ERP & EIRP

### GSM Voice

#### 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	24.23	V	6.8	0.53	<b>30.50</b>	38.45
824.2	22.49	H	6.8	0.53	28.76	38.45
836.6	24.2	V	6.8	0.53	30.47	38.45
836.6	22.46	H	6.8	0.53	28.73	38.45
848.8	23.98	V	6.9	0.53	30.35	38.45
848.8	22.17	H	6.9	0.53	28.54	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	23.87	V	7.88	0.85	30.90	33
1850.2	22.31	H	7.88	0.85	29.34	33
1880	24.01	V	7.88	0.85	31.04	33
1880	22.45	H	7.88	0.85	29.48	33
1909.8	24.16	V	7.86	0.85	<b>31.17</b>	33
1909.8	22.62	H	7.86	0.85	29.63	33

## GPRS:

### 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	25.22	V	6.8	0.53	<b>31.49</b>	38.45
824.2	23.59	H	6.8	0.53	29.86	38.45
836.6	24.15	V	6.8	0.53	30.42	38.45
836.6	22.48	H	6.8	0.53	28.75	38.45
848.8	23.96	V	6.9	0.53	30.33	38.45
848.8	22.24	H	6.9	0.53	28.61	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	23.8	V	7.88	0.85	30.83	33
1850.2	22.24	H	7.88	0.85	29.27	33
1880	24.02	V	7.88	0.85	31.05	33
1880	22.43	H	7.88	0.85	29.46	33
1909.8	24.35	V	7.86	0.85	<b>31.36</b>	33
1909.8	22.73	H	7.86	0.85	29.74	33

### EGPRS (MCS5):

#### 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	20.64	V	6.8	0.53	<b>26.91</b>	38.45
824.2	18.96	H	6.8	0.53	25.23	38.45
836.6	20.56	V	6.8	0.53	26.83	38.45
836.6	18.91	H	6.8	0.53	25.18	38.45
848.8	20.52	V	6.9	0.53	26.89	38.45
848.8	18.8	H	6.9	0.53	25.17	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	20.13	V	7.88	0.85	<b>27.16</b>	33
1850.2	18.46	H	7.88	0.85	25.49	33
1880	19.82	V	7.88	0.85	26.85	33
1880	18.28	H	7.88	0.85	25.31	33
1909.8	20.06	V	7.86	0.85	27.07	33
1909.8	18.28	H	7.86	0.85	25.29	33

## RMC

### 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	15.9	V	6.8	0.53	22.17	38.45
826.4	14.96	H	6.8	0.53	21.23	38.45
835	16.1	V	6.8	0.53	<b>22.37</b>	38.45
835	15.18	H	6.8	0.53	21.45	38.45
846.6	15.61	V	6.9	0.53	21.98	38.45
846.6	14.69	H	6.9	0.53	21.06	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	16.75	V	7.88	0.85	23.78	33
1852.4	15.81	H	7.88	0.85	22.84	33
1880	17.08	V	7.88	0.85	24.11	33
1880	16.13	H	7.88	0.85	23.16	33
1907.6	17.12	V	7.86	0.85	<b>24.13</b>	33
1907.6	16.2	H	7.86	0.85	23.21	33

## HSDPA

### 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	14.71	V	6.8	0.53	20.98	38.45
826.4	13.81	H	6.8	0.53	20.08	38.45
835	14.73	V	6.8	0.53	<b>21.00</b>	38.45
835	13.87	H	6.8	0.53	20.14	38.45
846.6	14.6	V	6.9	0.53	20.97	38.45
846.6	13.66	H	6.9	0.53	20.03	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	15.92	V	7.88	0.85	<b>22.95</b>	33
1852.4	15	H	7.88	0.85	22.03	33
1880	15.81	V	7.88	0.85	22.84	33
1880	14.91	H	7.88	0.85	21.94	33
1907.6	15.85	V	7.86	0.85	22.86	33
1907.6	14.96	H	7.86	0.85	21.97	33

## HSUPA

### 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	14.72	V	6.8	0.53	<b>20.99</b>	38.45
826.4	13.78	H	6.8	0.53	20.05	38.45
835	14.69	V	6.8	0.53	20.96	38.45
835	13.74	H	6.8	0.53	20.01	38.45
846.6	14.57	V	6.9	0.53	20.94	38.45
846.6	13.61	H	6.9	0.53	19.98	38.45

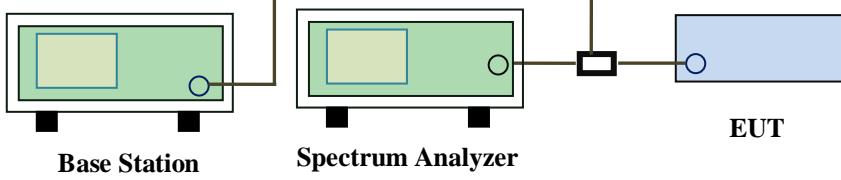
### EIRP for UMTS-FDD Band II (Part 24E)

Frequency (MHz)	Substituted level (dBm)	Antenna Polarization	Antenna Gain correction (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)
1852.4	15.76	V	7.88	0.85	22.79	33
1852.4	14.83	H	7.88	0.85	21.86	33
1880	15.78	V	7.88	0.85	<b>22.81</b>	33
1880	14.93	H	7.88	0.85	21.96	33
1907.6	15.74	V	7.86	0.85	22.75	33
1907.6	14.84	H	7.86	0.85	21.85	33

## 6.3 Peak-Average Ratio

Temperature	24°C
Relative Humidity	55%
Atmospheric Pressure	1010mbar
Test date :	April 17, 2017
Tested By :	Leen Yang

Requirement(s):

Spec	Item	Requirement	Applicable
§24.232(d)	a)	The peak-to-average ratio (PAR) of the transmission may not exceed 13dB.	<input checked="" type="checkbox"/>
Test Setup	 <p style="text-align: center;"><b>EUT</b></p> <p><b>Base Station</b>      <b>Spectrum Analyzer</b></p>		
Test Procedure	<p>According with KDB 971168 v02r02</p> <p><b>5.7.2 Alternate procedure for PAPR</b></p> <p><b>5.1.2 Peak power measurements with a peak power meter</b></p> <p>The total peak output power may be measured using a broadband peak RF power meter. The power meter must have a video bandwidth that is greater than or equal to the emission bandwidth and utilize a fast-responding diode detector.</p> <p><b>5.2.3 Average power measurement with average power meter</b></p> <p>As an alternative to the use of a spectrum/signal analyzer or EMI receiver to perform a measurement of the total in-band average output power, a wideband RF average power meter with a thermocouple detector or equivalent can be used under certain conditions</p> <p>If the EUT can be configured to transmit continuously (i.e., the burst duty cycle <math>\geq</math> 98%) and at all times the EUT is transmitting at its maximum output</p>		

	<p>power level, then a conventional wide-band RF power meter can be used.</p> <p>If the EUT cannot be configured to transmit continuously (i.e., the burst duty cycle &lt; 98%), then there are two options for the use of an average power meter. First, a gated average power meter can be used to perform the measurement if the gating parameters can be adjusted such that the power is measured only over active transmission bursts at maximum output power levels. A conventional average power meter can also be used if the measured burst duty cycle is constant (i.e., duty cycle variations are less than <math>\pm 2</math> percent) by performing the measurement over the on/off burst cycles and then correcting (increasing) the measured level by a factor equal to <math>10\log(1/\text{duty cycle})</math></p>
Remark	
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail

**Test Data**     Yes       N/A

**Test Plot**     Yes (See below)       N/A

### GSM : GSM 1900 PK-AV POWER (PART 24E)

Frequency (MHz)	Conducted power(dBm)		Peak-Average Ratio(PAR)
	Peak	Average	
1850.2	30.39	29.35	1.04
1880	30.41	29.49	0.92
1909.8	30.63	29.69	0.94

### GPRS 1900 PK-AV POWER (PART 24E)

Frequency (MHz)	Conducted power(dBm)		Peak-Average Ratio(PAR)
	Peak	Average	
1850.2	30.25	29.28	0.97
1880	30.59	29.50	1.09
1909.8	30.74	29.71	1.03

### EGPRS (MSC5) 1900 PK-AV POWER (PART 24E)

Frequency (MHz)	Conducted power(dBm)		Peak-Average Ratio(PAR)
	Peak	Average	
1850.2	26.66	25.61	1.05
1880	26.42	25.30	1.12
1909.8	26.63	25.52	1.11

### RMC : UMTS-FDD Band 2 PK-AV POWER (PART 24E)

Frequency (MHz)	Conducted power(dBm)		Peak-Average Ratio(PAR)
	Peak	Average	
1852.4	25.66	22.98	2.68
1880	25.61	22.68	2.93
1907.6	25.69	22.53	3.16

### HSDPA : UMTS-FDD Band 2 PK-AV POWER (PART 24E)

Frequency (MHz)	Conducted power(dBm)		Peak-Average Ratio(PAR)
	Peak	Average	
1852.4	23.36	21.25	2.11
1880	23.33	21.24	2.09
1907.6	23.39	21.22	2.17

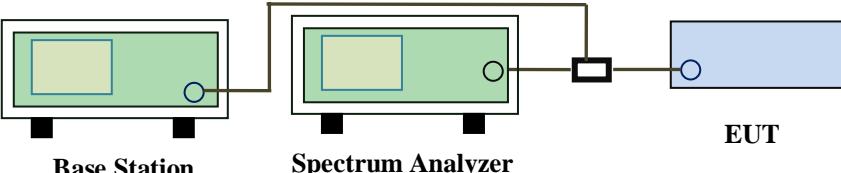
#### HSUPA : UMTS-FDD Band 2 PK-AV POWER (PART 24E)

Frequency (MHz)	Conducted power(dBm)		Peak-Average Ratio(PAR)
	Peak	Average	
1852.4	23.35	21.23	2.12
1880	23.31	21.26	2.05
1907.6	23.38	21.33	2.05

## 6.4 Occupied Bandwidth

Temperature	22°C
Relative Humidity	55%
Atmospheric Pressure	1015mbar
Test date :	April 18, 2017
Tested By :	Leen Yang

### Requirement(s):

Spec	Item	Requirement	Applicable
§2.1049, §22.917, §22.905 §24.238	a)	99% Occupied Bandwidth(kHz)	<input checked="" type="checkbox"/>
	b)	26 dB Bandwidth(kHz)	<input checked="" type="checkbox"/>
Test Setup	 <p style="text-align: center;"> <b>Base Station</b>      <b>Spectrum Analyzer</b>      <b>EUT</b> </p>		
Test Procedure	<ul style="list-style-type: none"> <li>- The EUT was connected to Spectrum Analyzer and Base Station via power divider.</li> <li>- The 99% and 26 dB occupied bandwidth (BW) of the middle channel for the highest RF powers.</li> </ul>		
Remark			
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail		

Test Data  Yes  N/A

Test Plot  Yes (See below)  N/A

### GSM Voice:

#### Cellular Band (Part 22H) result

Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Bandwidth (kHz)
128	824.2	242.4488	319.182
190	836.6	243.5640	318.668
251	848.8	247.0206	320.230

#### PCS Band (Part 24E) result

Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Bandwidth (kHz)
512	1850	243.5680	318.041
661	1880	244.2307	317.660
810	1910	242.1123	319.783

### GPRS:

#### Cellular Band (Part 22H) result

Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Bandwidth (kHz)
128	824.2	250.6824	318.220
190	836.6	243.7862	316.788
251	848.8	252.6224	319.311

#### PCS Band (Part 24E) result

Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Bandwidth (kHz)
512	1850	247.7191	316.478
661	1880	246.8020	319.685
810	1910	246.4638	318.868

### EGPRS (MCS 5):

#### Cellular Band (Part 22H) result

Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Bandwidth (kHz)
128	824.2	247.1156	319.922
190	836.6	245.2354	318.902
251	848.8	248.8799	319.208

#### PCS Band (Part 24E) result

Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Bandwidth (kHz)
512	1850	250.1170	319.417
661	1880	244.9056	320.250
810	1910	244.1826	320.332

**RMC:**

**UMTS-FDD Band V (Part 22H)**

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
4132	826.6	4.1478	4.715
4175	835.0	4.1526	4.727
4233	846.4	4.1527	4.694

**UMTS-FDD Band II (Part 24E)**

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
9262	1853	4.1573	4.728
9400	1880	4.1641	4.743
9538	1907	4.1513	4.729

**HSDPA:**

**UMTS-FDD Band V (Part 22H)**

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
4132	826.6	4.1578	4.719
4175	835.0	4.1519	4.693
4233	846.4	4.1427	4.703

**UMTS-FDD Band II (Part 24E)**

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
9262	1853	4.1500	4.698
9400	1880	4.1647	4.721
9538	1907	4.1478	4.731

**HSUPA:**

**UMTS-FDD Band V (Part 22H)**

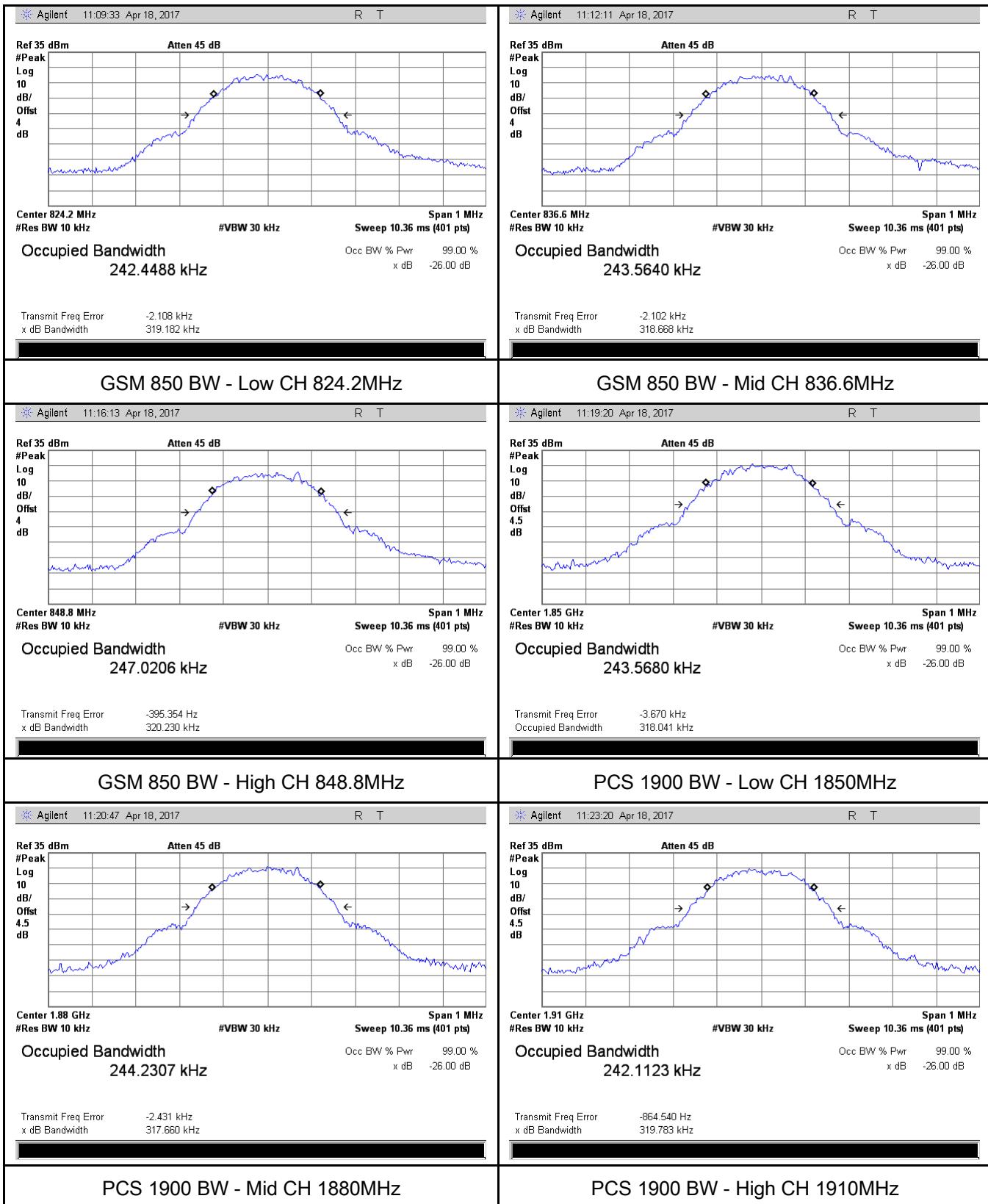
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
4132	826.6	4.1543	4.692
4175	835.0	4.1473	4.712
4233	846.4	4.1480	4.709

**UMTS-FDD Band II (Part 24E)**

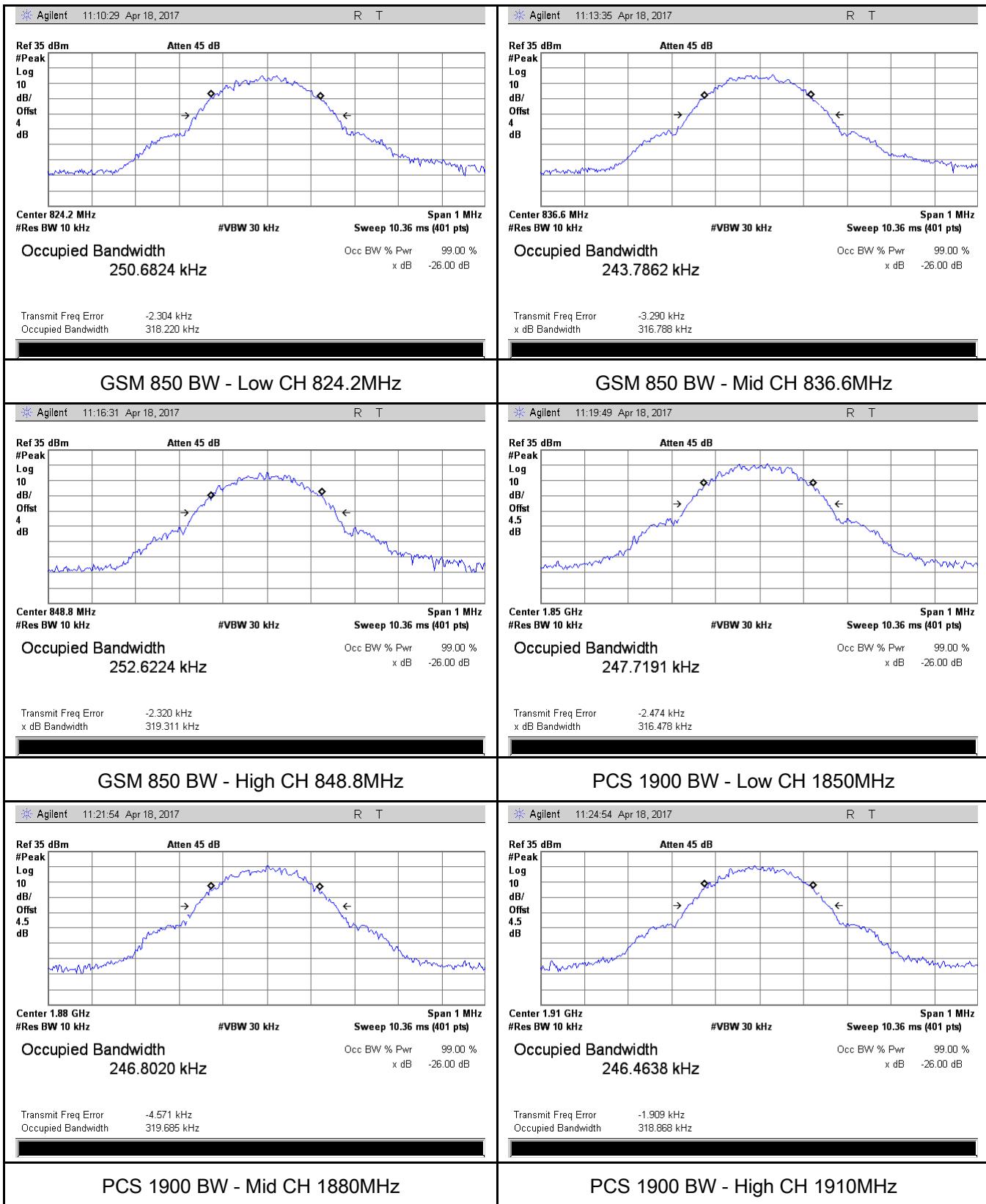
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
9262	1853	4.1688	4.726
9400	1880	4.1648	4.727
9538	1907	4.1475	4.731

## Test Plots

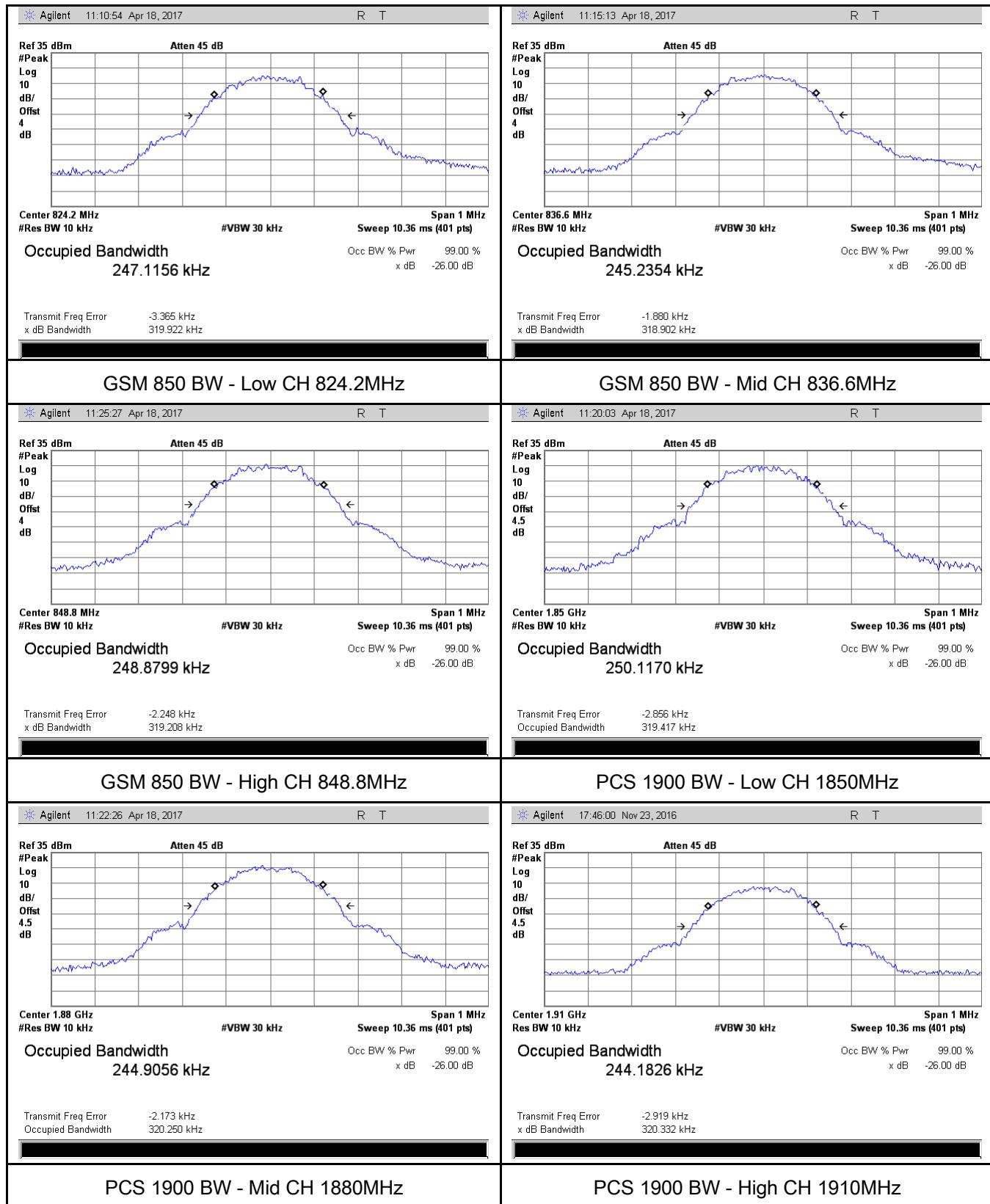
### GSM Voice:



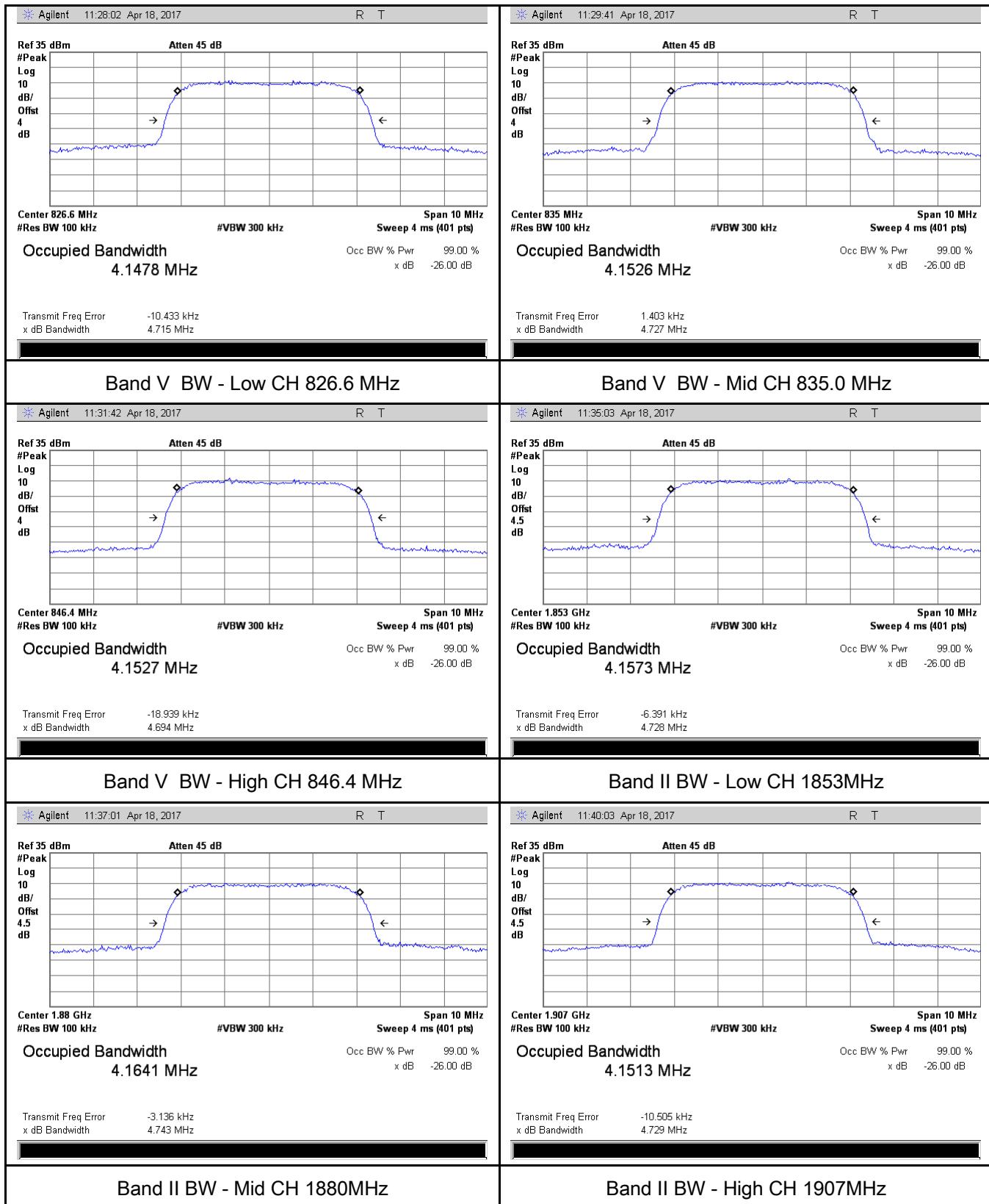
## GPRS:



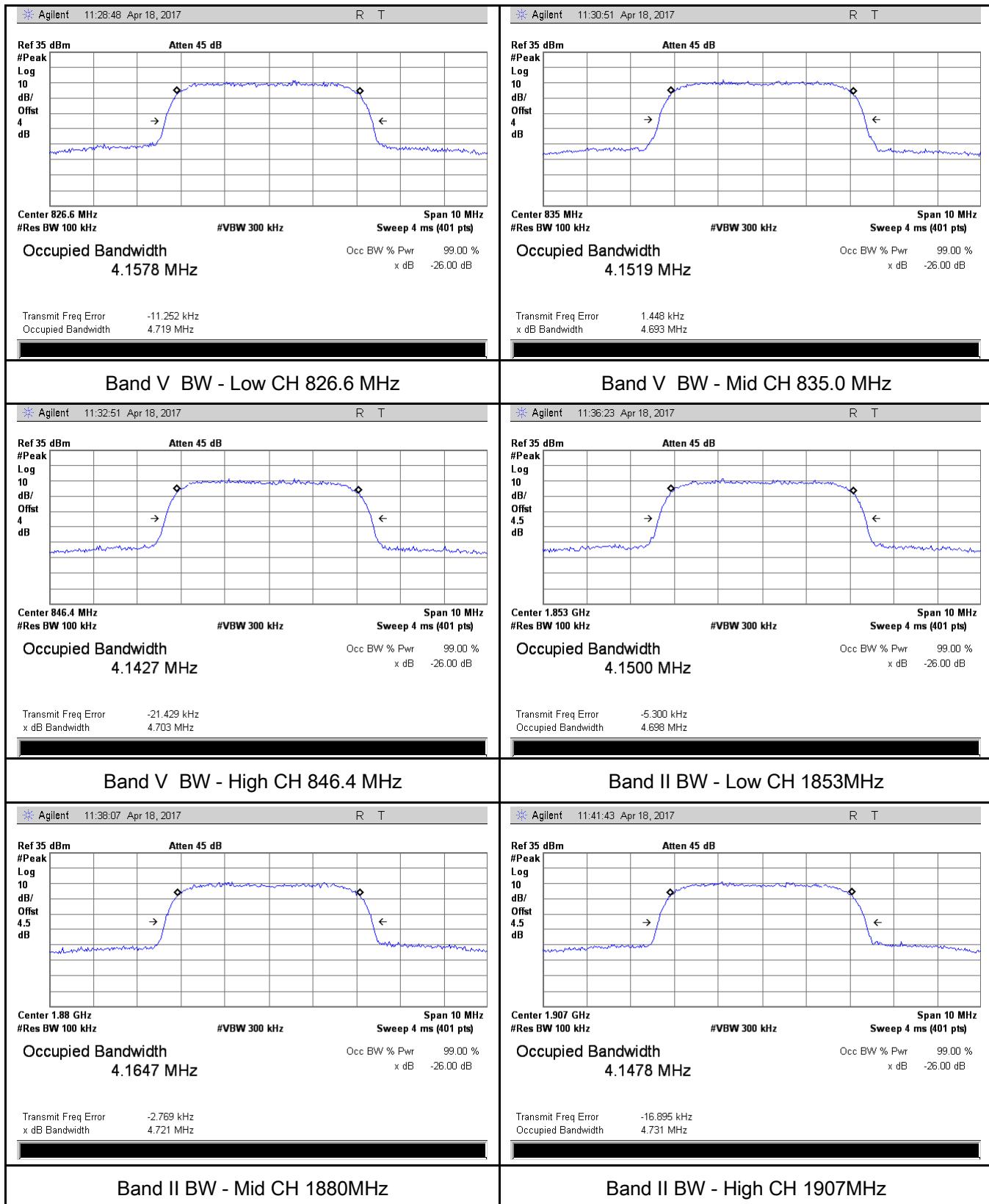
## EGPRS (MCS5):



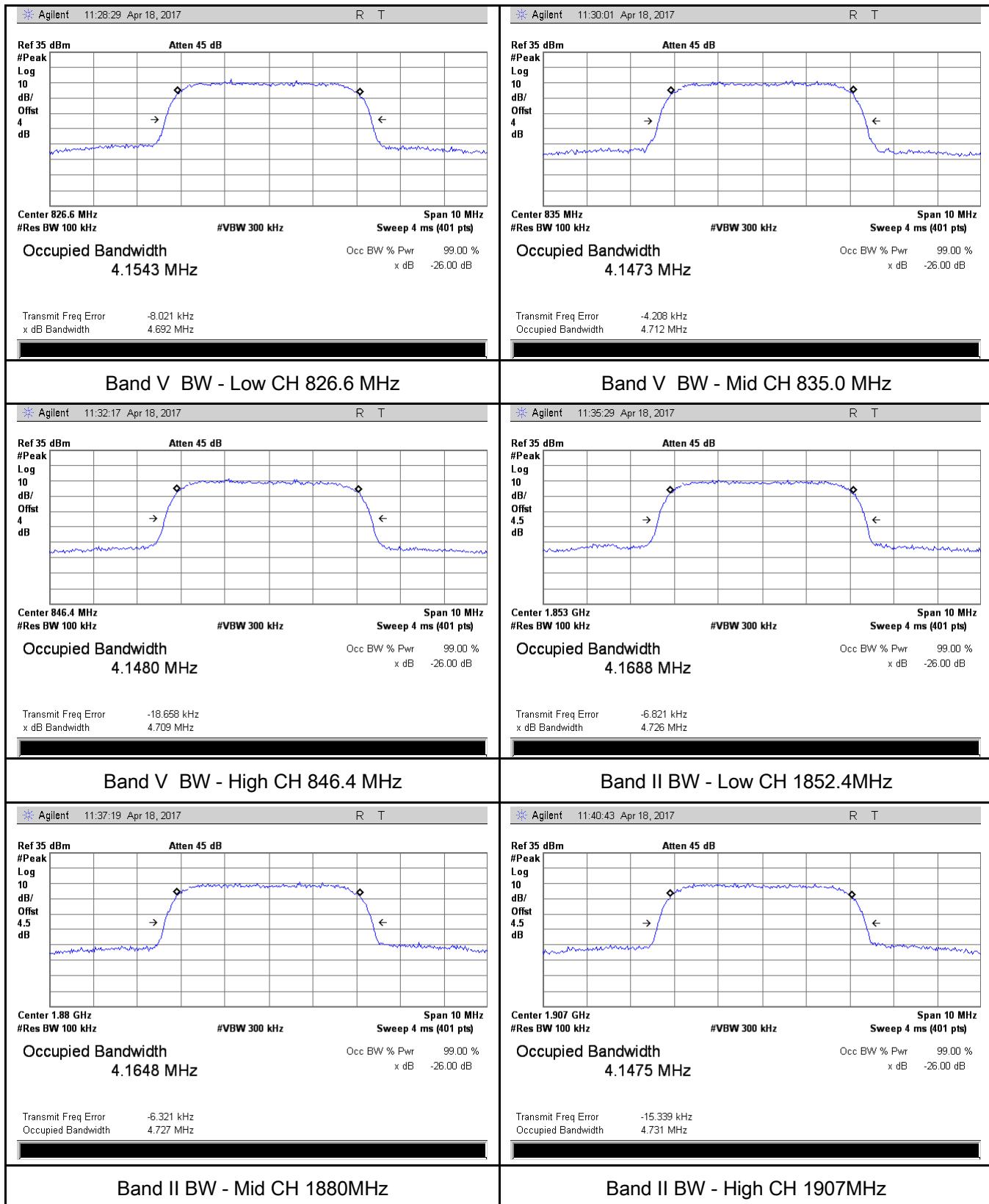
RMC:



## HSDPA:



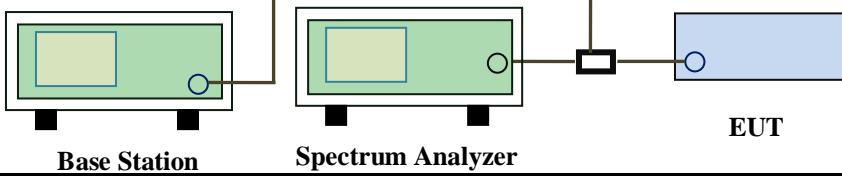
## HSUPA:



## 6.5 Spurious Emissions at Antenna Terminals

Temperature	22°C
Relative Humidity	55%
Atmospheric Pressure	1015mbar
Test date :	April 18, 2017
Tested By :	Leen Yang

### Requirement(s):

Spec	Item	Requirement	Applicable
§2.1051, §22.917(a)& §24.238(a)	a)	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	<input checked="" type="checkbox"/>
Test Setup		 <p style="text-align: center;"><b>Base Station</b>      <b>Spectrum Analyzer</b>      <b>EUT</b></p>	
Test Procedure		<ul style="list-style-type: none"> <li>- The EUT was connected to Spectrum Analyzer and Base Station via power divider.</li> <li>- The Band Edges of low and high channels for the highest RF powers were measured.</li> <li>- Setting RBW as roughly BW/100.</li> </ul>	
Remark			
Result		<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail	

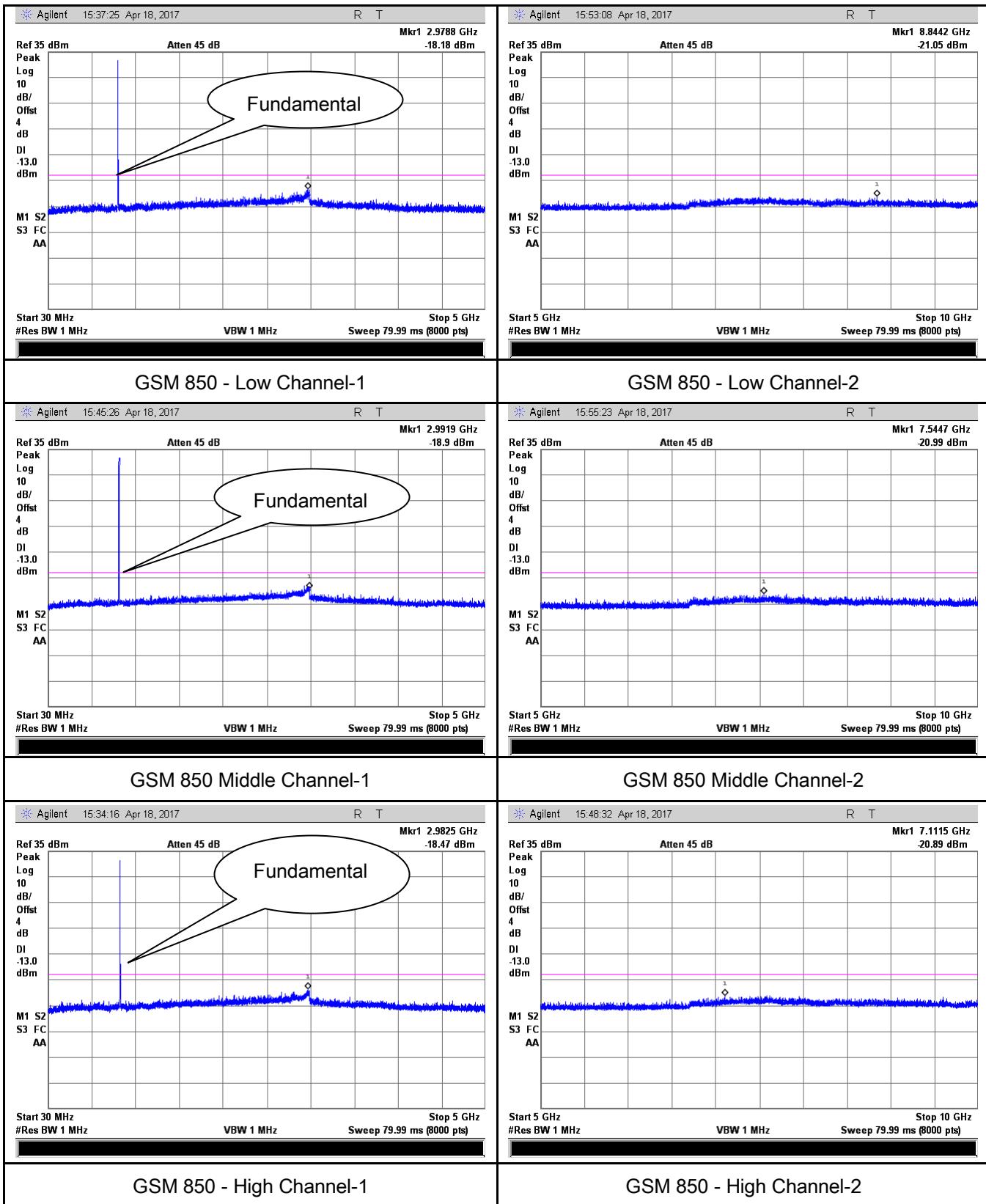
Test Data     Yes       N/A

Test Plot     Yes (See below)       N/A

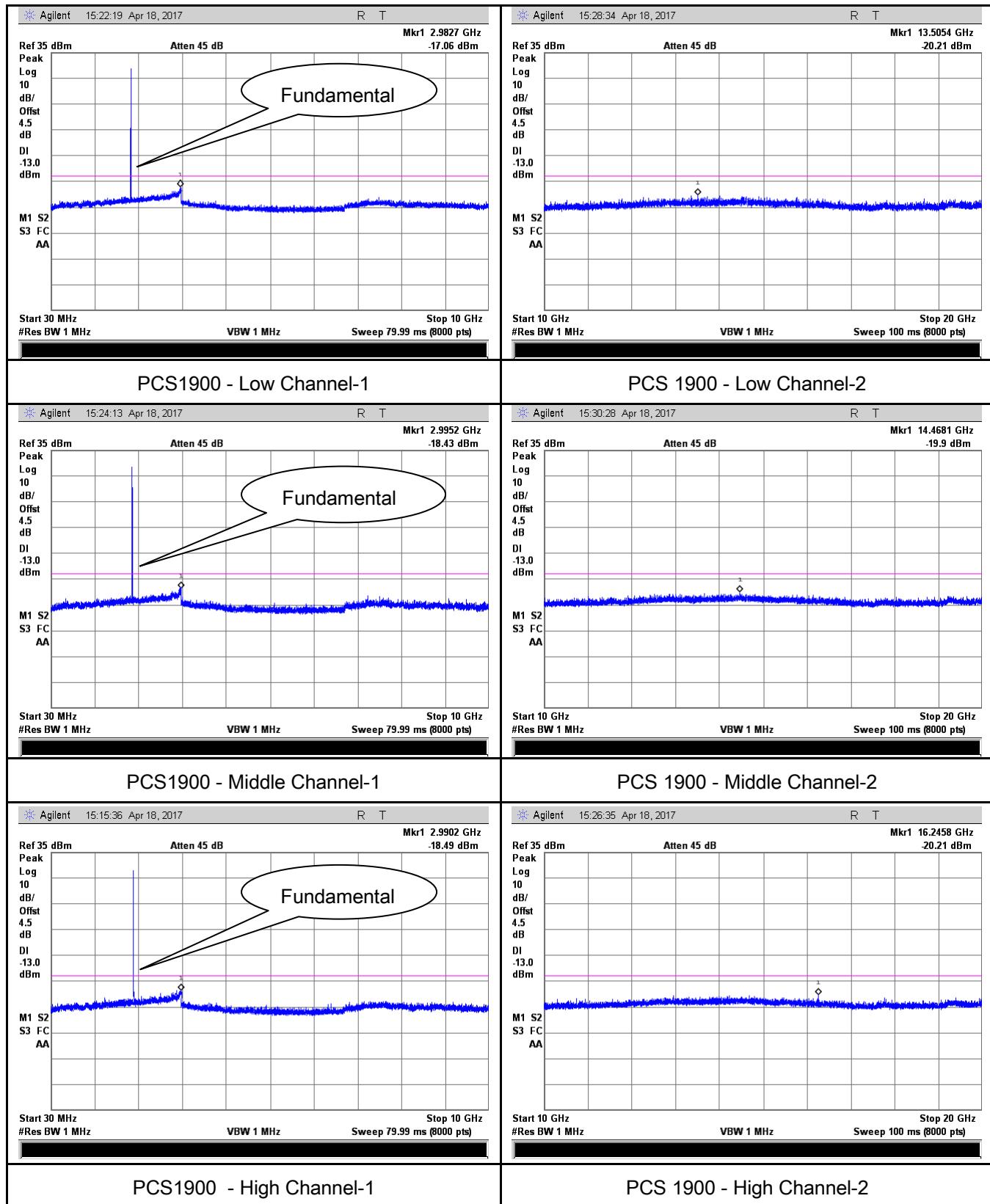
## Test Plots

GSM Voice:

Cellular Band (Part 22H) result

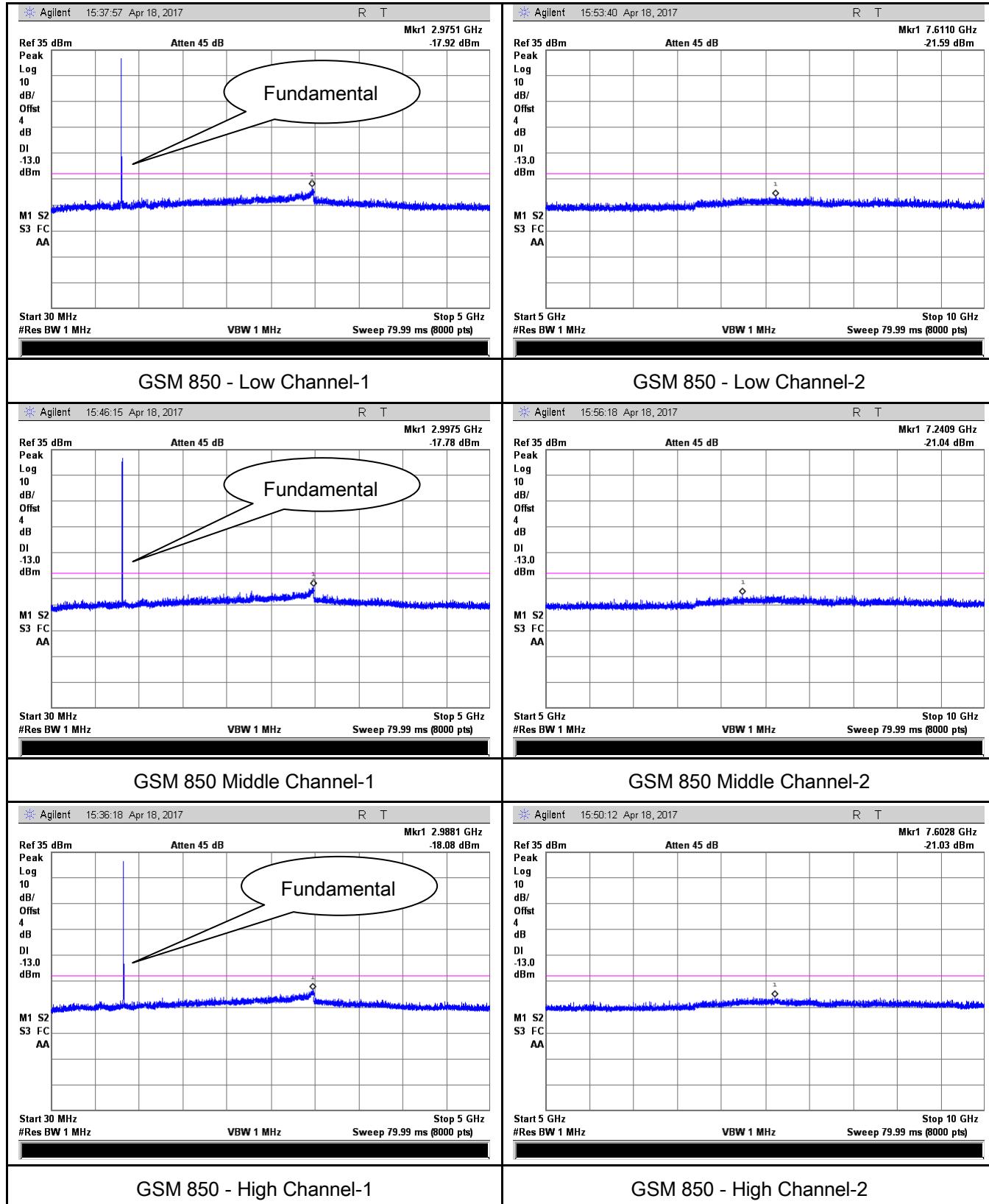


## PCS Band (Part24E) result

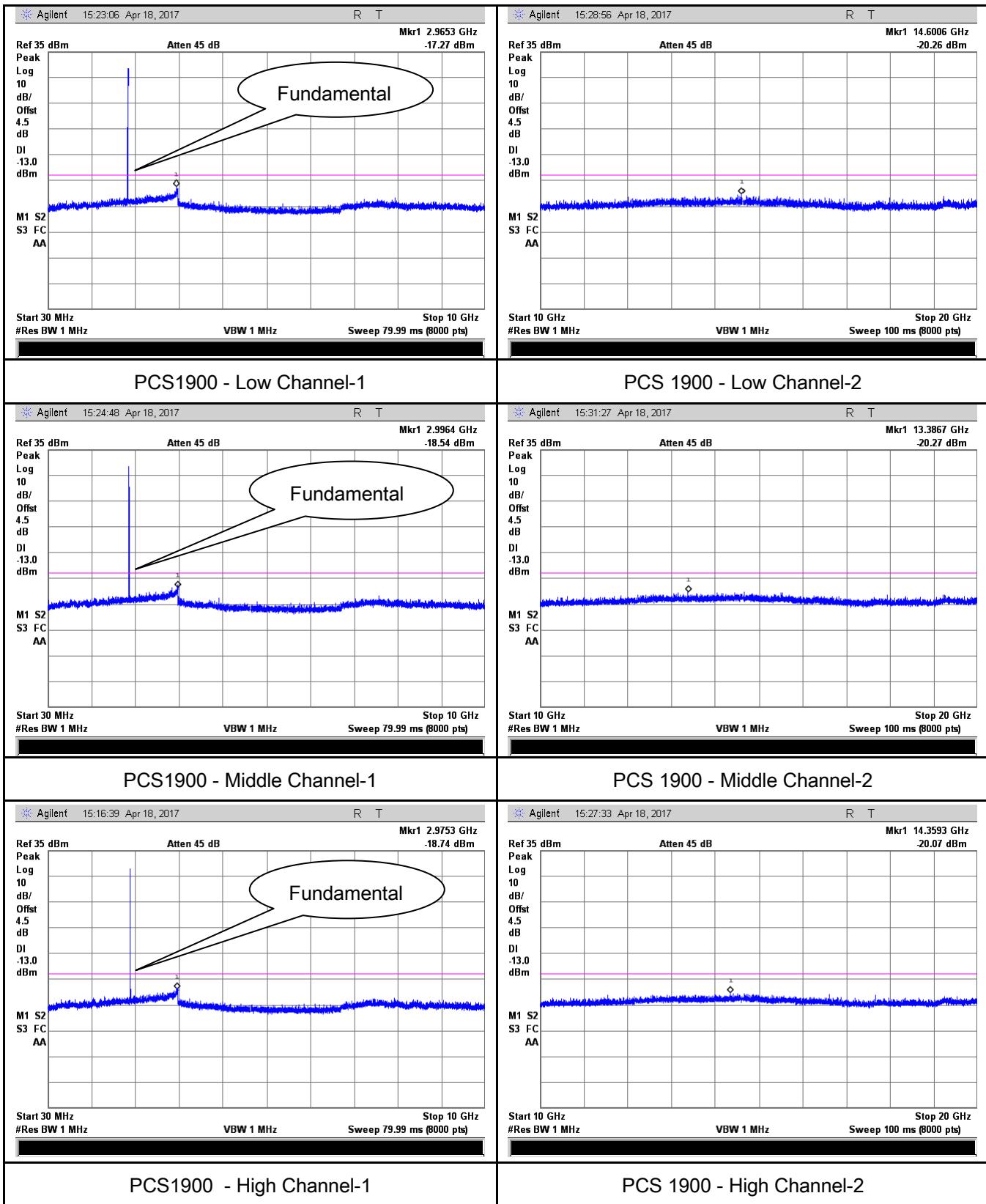


## GPRS:

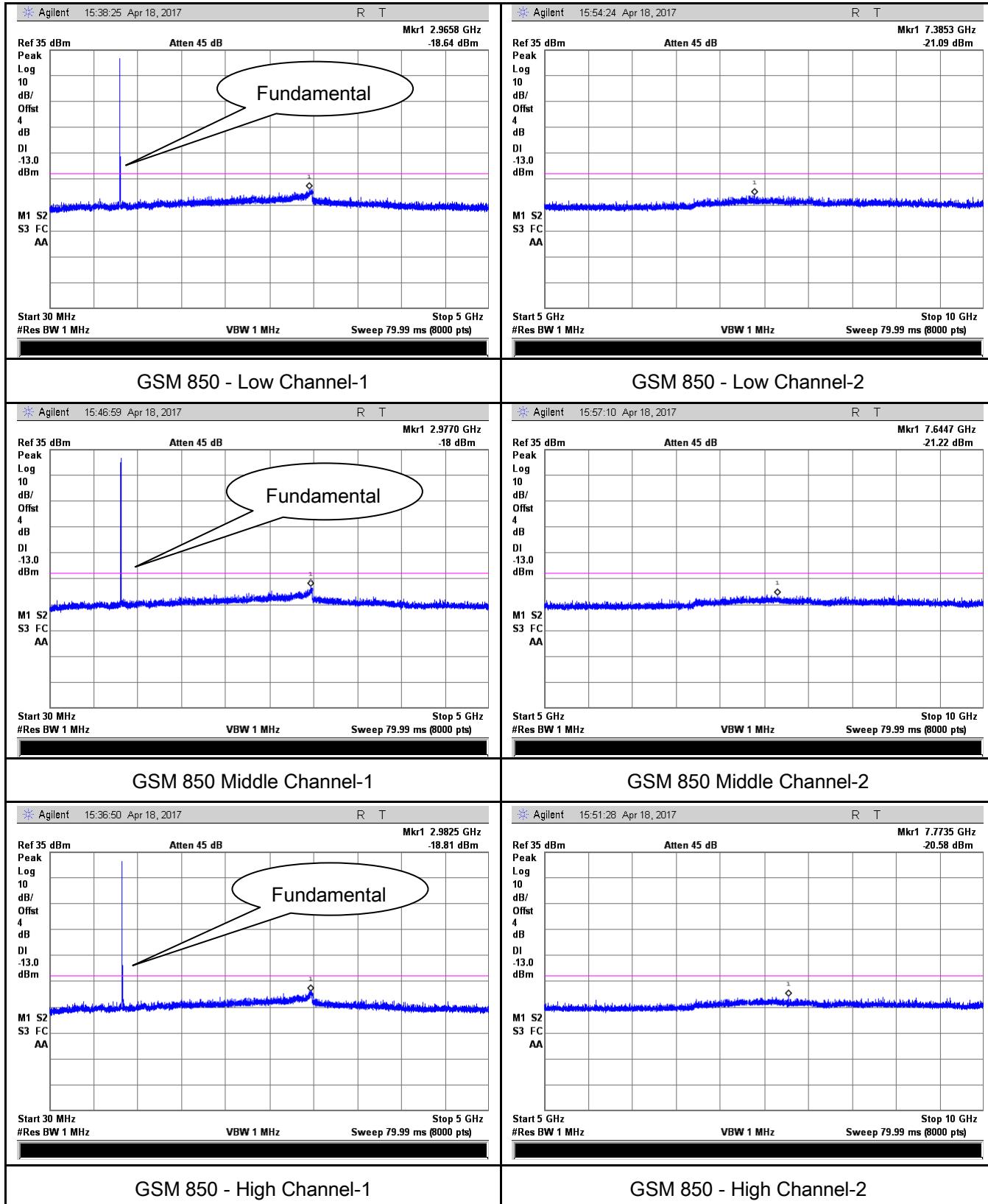
### Cellular Band (Part 22H) result



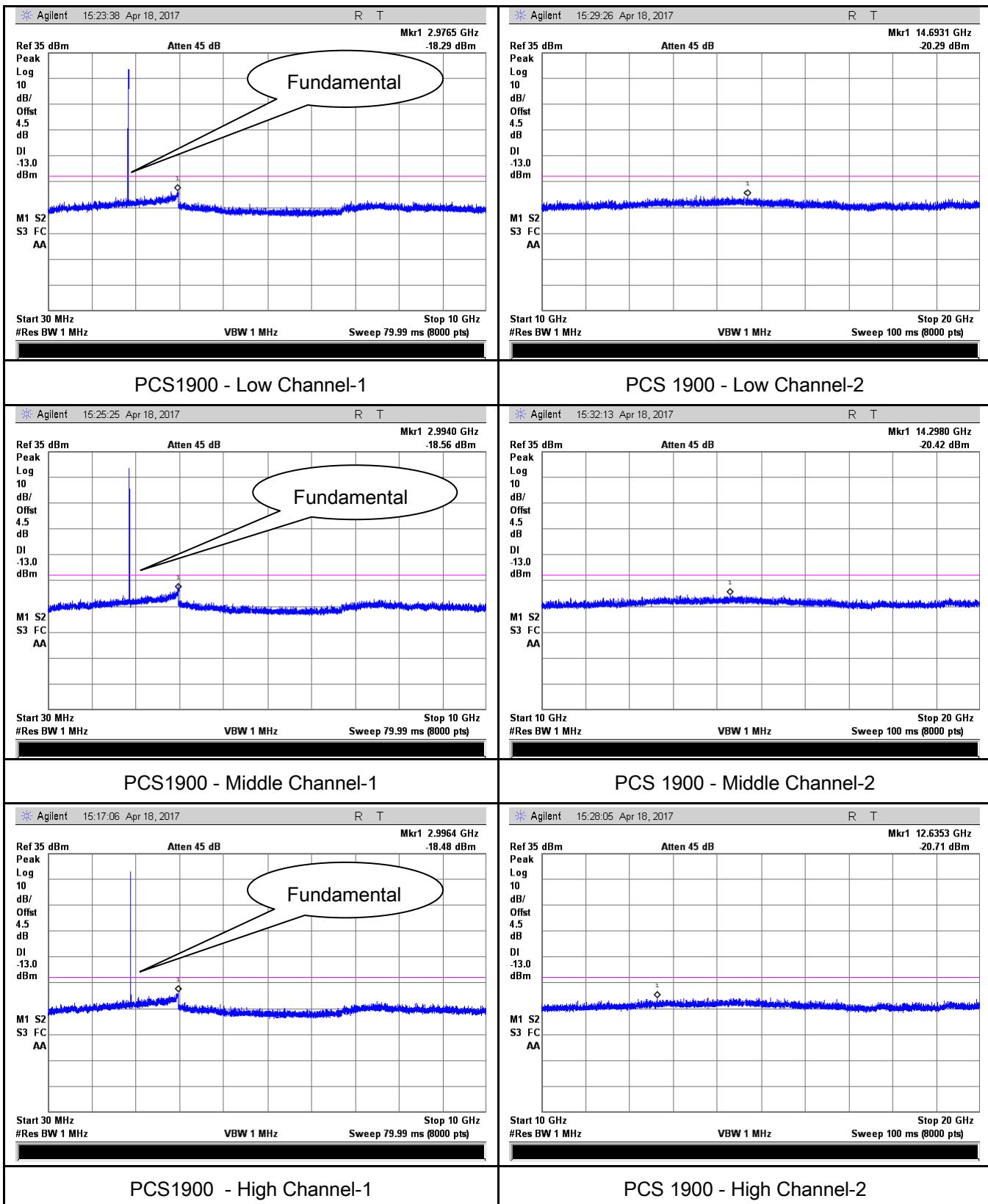
## PCS Band (Part24E) result



## EGPRS (MCS 5): Cellular Band (Part 22H) result

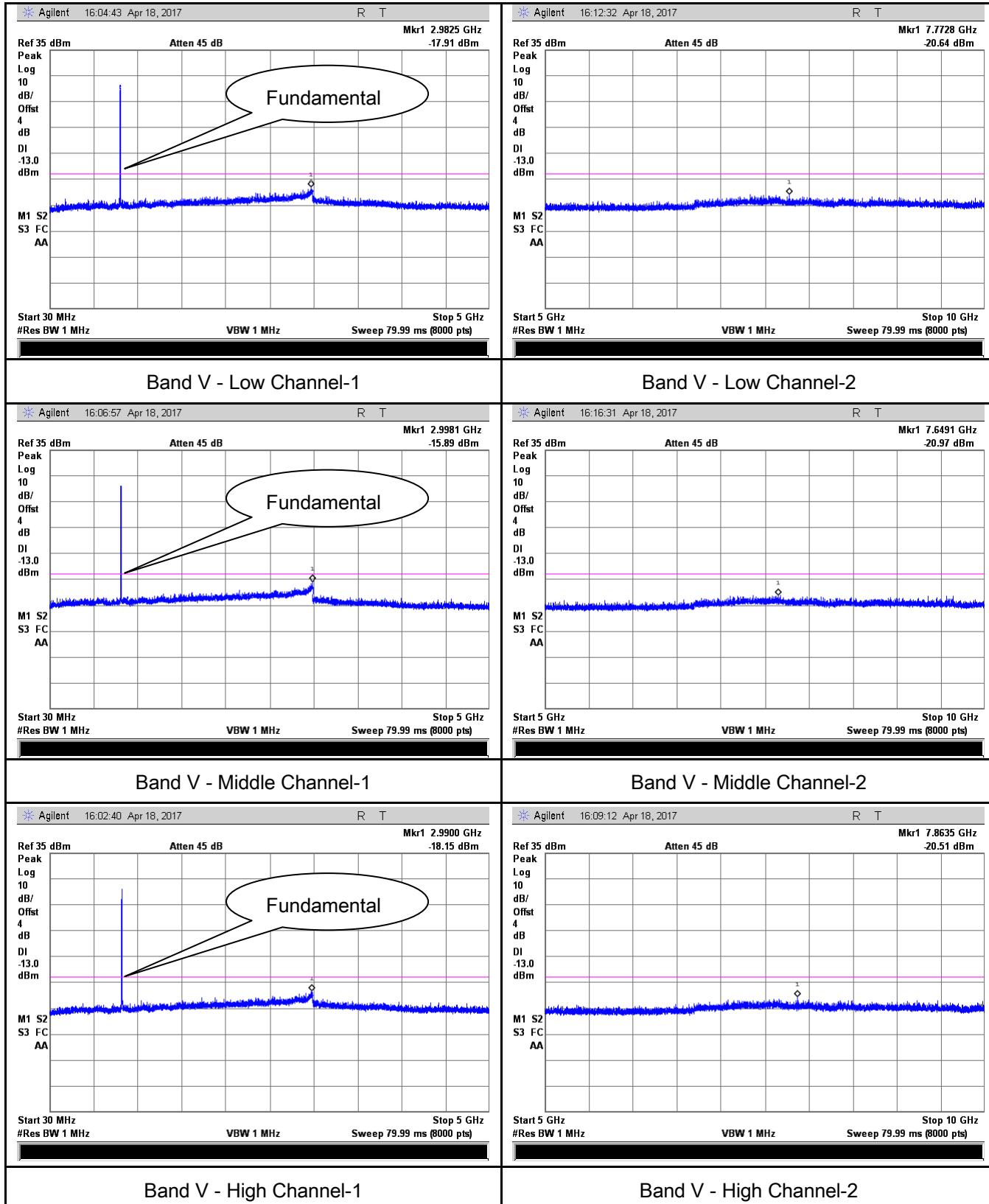


## PCS Band (Part24E) result

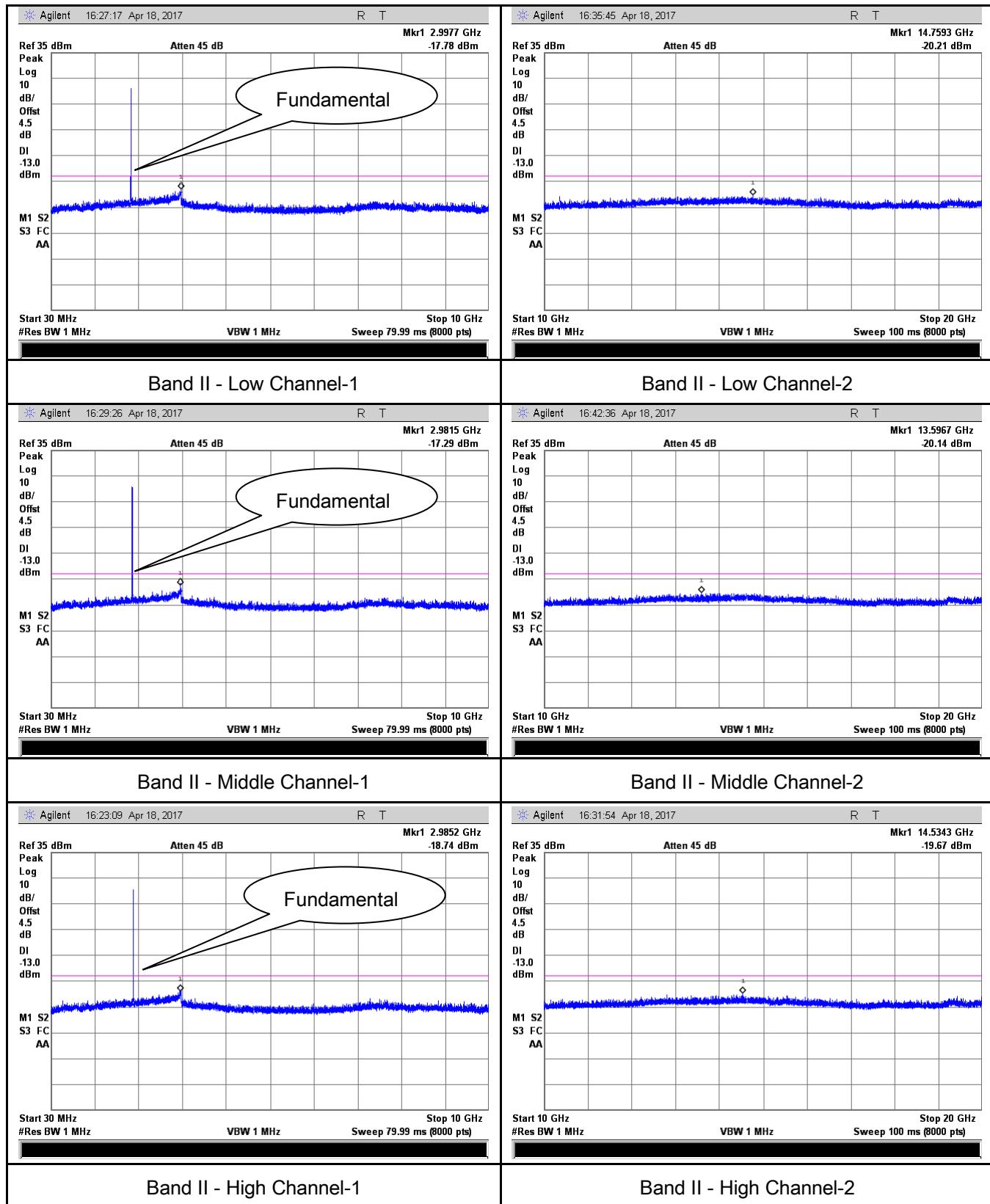


## RMC

### UMTS-FDD Band V (Part 22H)

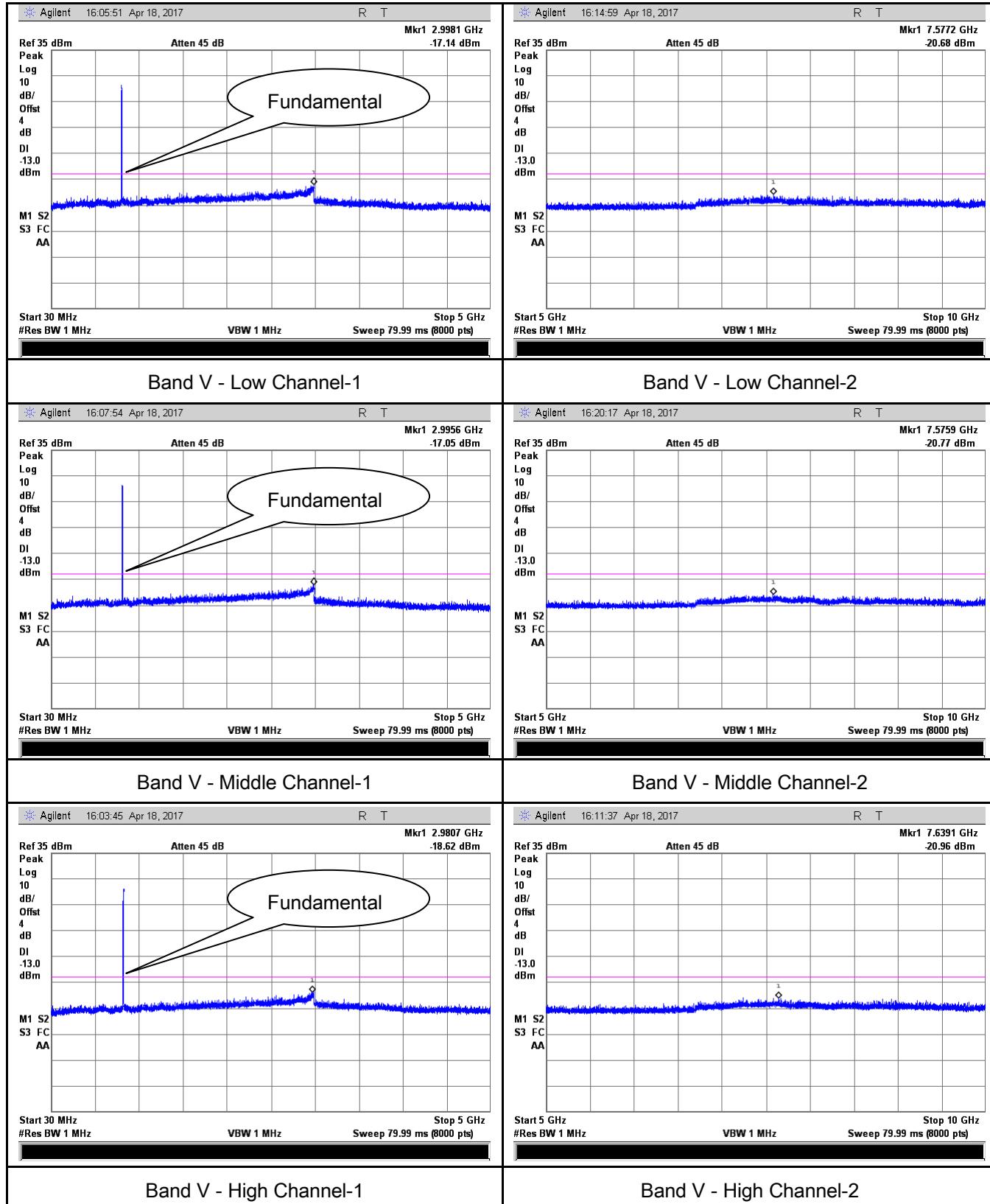


## UMTS-FDD Band II (Part 24E)

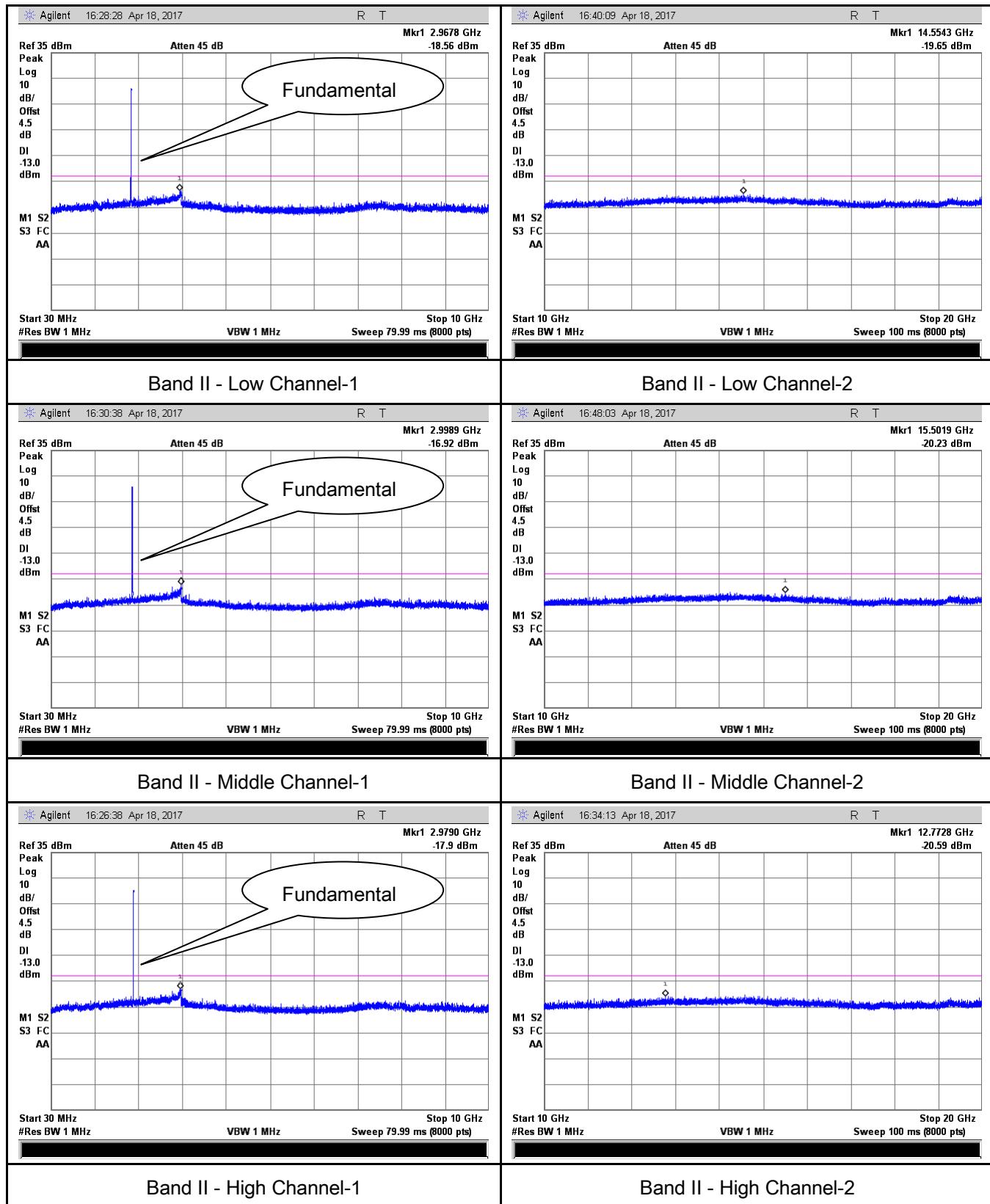


## HSDPA:

### UMTS-FDD Band V (Part 22H)

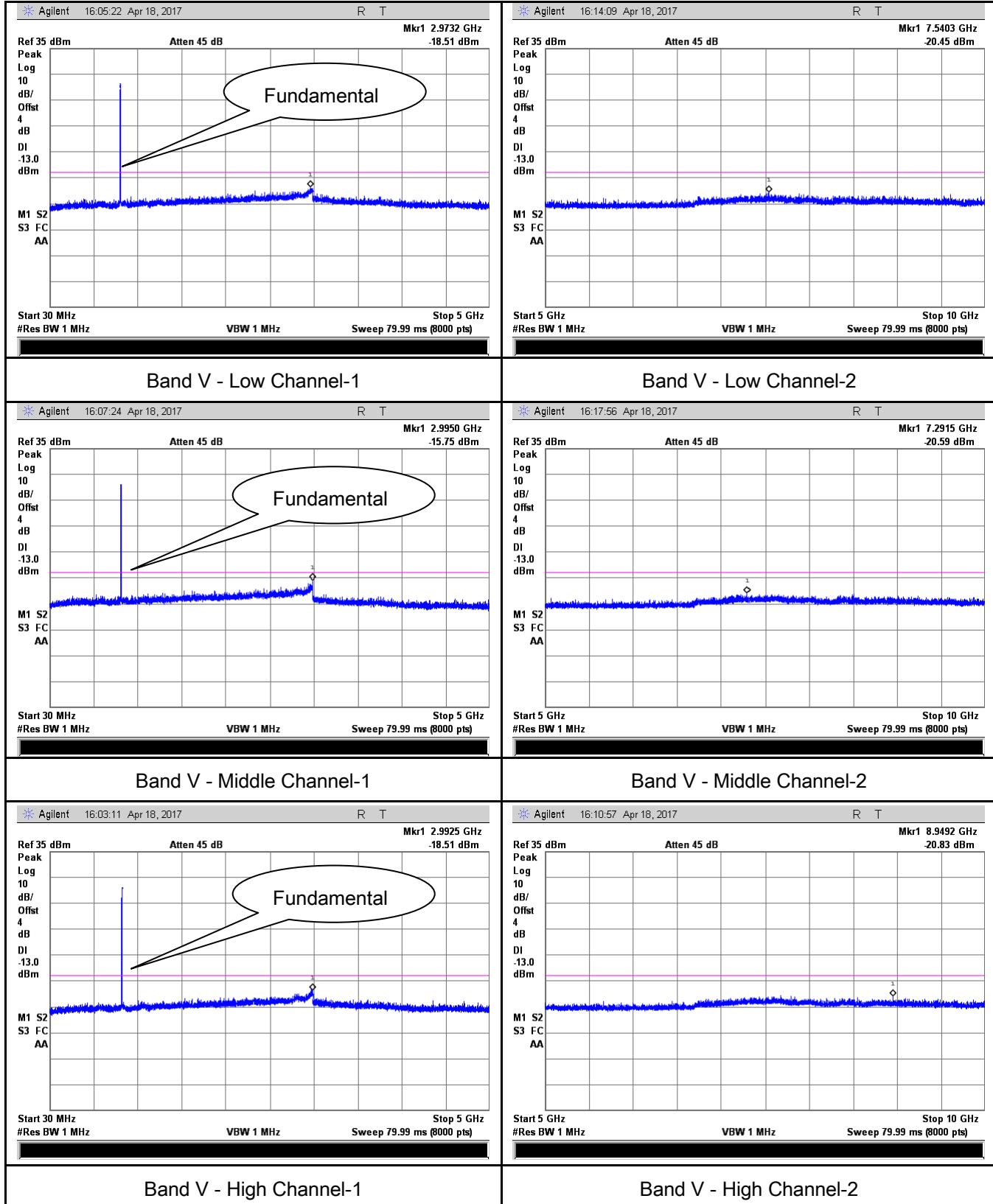


## UMTS-FDD Band II (Part 24E)

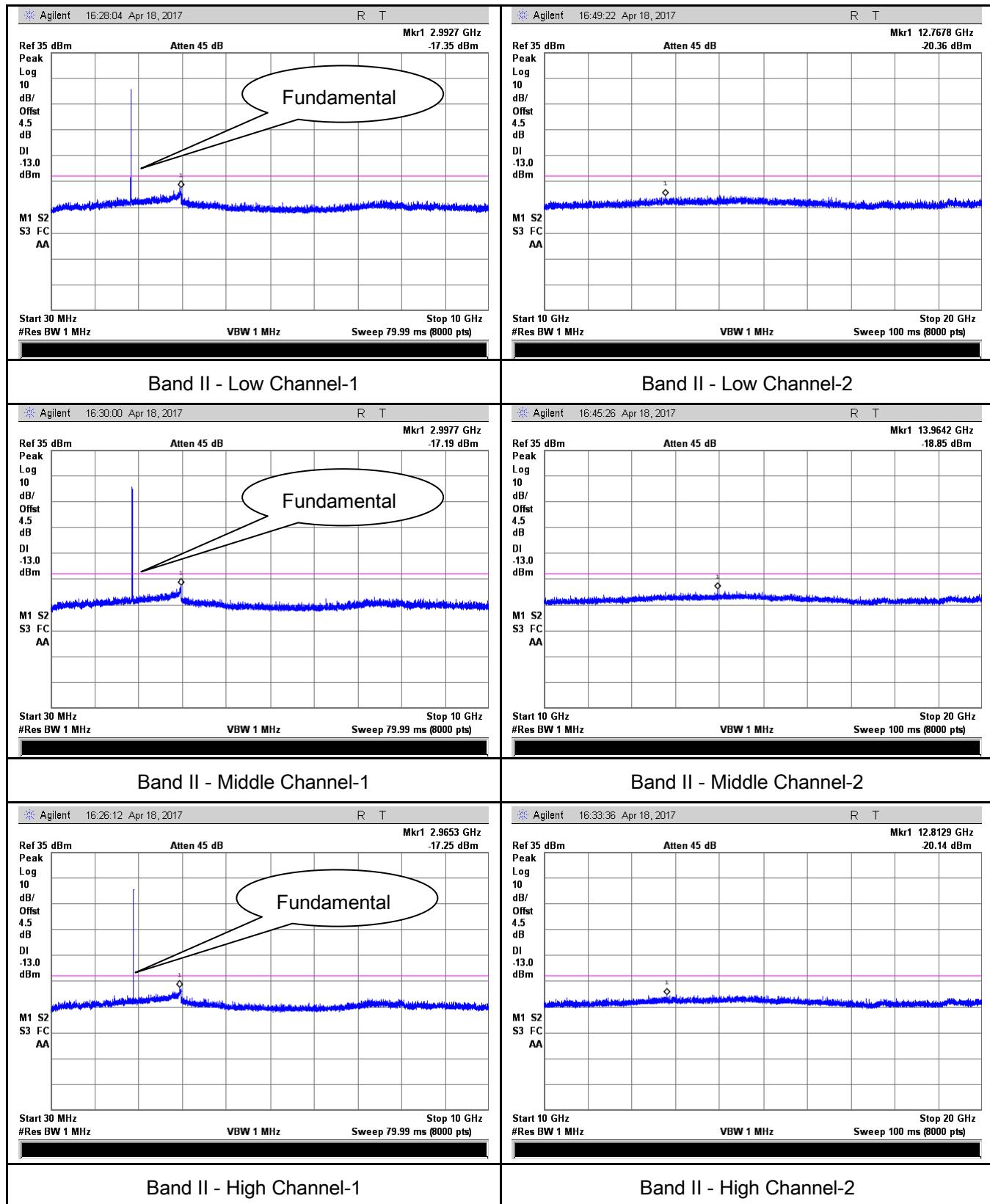


## HSUPA:

### UMTS-FDD Band V (Part 22H)



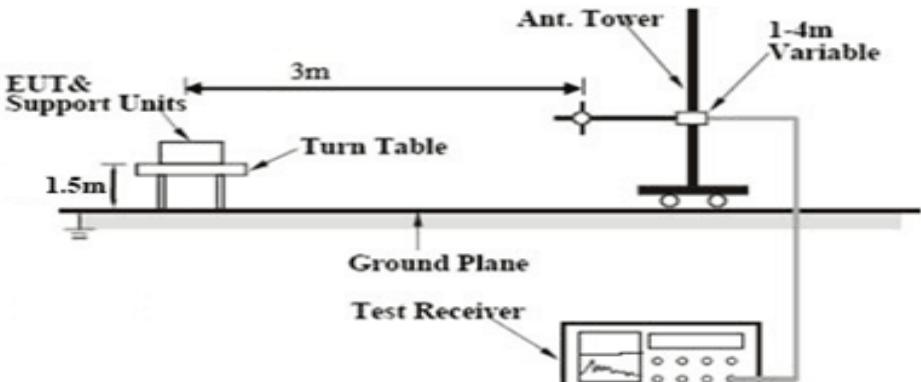
## UMTS-FDD Band II (Part 24E)



## 6.6 Spurious Radiated Emissions

Temperature	24°C
Relative Humidity	55%
Atmospheric Pressure	1010mbar
Test date :	April 17, 2017
Tested By :	Leen Yang

### Requirement(s):

Spec	Item	Requirement	Applicable
§2.1053, §22.917 & §24.238	a)	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.	<input checked="" type="checkbox"/>
Test setup			
Test Procedure	<ol style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>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.</li> </ol> <p>Sample Calculation:</p> <p>EUT Field Strength = Raw Amplitude (dB<math>\mu</math>V/m) – Amplifier Gain (dB) + Antenna Factor (dB) + Cable Loss (dB) + Filter Attenuation (dB, if used)</p>		

Remark		
Result	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail

**Test Data**  Yes  N/A

**Test Plot**  Yes (See below)  N/A

## Cellular Band (Part 22H) result

### 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	-43.65	V	7.95	0.78	-36.48	-13	-23.48
1648.4	-44.28	H	7.95	0.78	-37.11	-13	-24.11
325.4	-52.79	V	6.4	0.26	-46.65	-13	-33.65
609.7	-53.12	H	6.8	0.37	-46.69	-13	-33.69

### 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	-43.16	V	7.95	0.78	-35.99	-13	-22.99
1673.2	-43.87	H	7.95	0.78	-36.7	-13	-23.7
324.1	-52.46	V	6.4	0.26	-46.32	-13	-33.32
605.3	-52.89	H	6.8	0.37	-46.46	-13	-33.46

### 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	-43.69	V	7.95	0.78	-36.52	-13	-23.52
1697.6	-44.21	H	7.95	0.78	-37.04	-13	-24.04
326.9	-53.76	V	6.4	0.26	-47.62	-13	-34.62
606.7	-51.89	H	6.8	0.37	-45.46	-13	-32.46

#### Note:

- 1, The testing has been conformed to 10\*848.8MHz=8,488MHz
- 2, All other emissions more than 30 dB below the limit
- 3, GSM voice , GPRS and EGPRS mode were investigated. The results above show only the worse cases
- 4, X-Axis, Y-Axis and Z-Axis were investigated. The results above show only the worst case.

## PCS Band (Part24E) result

### 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	-49.57	V	10.25	2.73	-42.05	-13	-29.05
3700.4	-49.03	H	10.25	2.73	-41.51	-13	-28.51
327.4	-53.16	V	6.4	0.26	-47.02	-13	-34.02
601.5	-52.87	H	6.8	0.37	-46.44	-13	-33.44

### 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	-48.75	V	10.25	2.73	-41.23	-13	-28.23
3760	-49.51	H	10.25	2.73	-41.99	-13	-28.99
326.5	-53.64	V	6.4	0.26	-47.5	-13	-34.5
609.2	-53.97	H	6.8	0.37	-47.54	-13	-34.54

### 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	-49.11	V	10.36	2.73	-41.48	-13	-28.48
3819.6	-49.44	H	10.36	2.73	-41.81	-13	-28.81
322.5	-53.67	V	6.4	0.26	-47.53	-13	-34.53
601.8	-52.48	H	6.8	0.37	-46.05	-13	-33.05

#### Note:

- 1, The testing has been conformed to  $10 * 1909.8 \text{ MHz} = 19,098 \text{ MHz}$
- 2, All other emissions more than 30 dB below the limit
- 3, GSM voice , GPRS and EGPRS mode were investigated. The results above show only the worse cases
- 4, X-Axis, Y-Axis and Z-Axis were investigated. The results above show only the worst case.

### 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	-47.13	V	7.95	0.78	-39.96	-13	-26.96
1652.8	-46.85	H	7.95	0.78	-39.68	-13	-26.68
329.7	-53.29	V	6.4	0.26	-47.15	-13	-34.15
603.2	-53.78	H	6.8	0.37	-47.35	-13	-34.35

#### 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	-48.79	V	7.95	0.78	-41.62	-13	-28.62
1670	-46.21	H	7.95	0.78	-39.04	-13	-26.04
324.7	-53.49	V	6.4	0.26	-47.35	-13	-34.35
605.2	-53.28	H	6.8	0.37	-46.85	-13	-33.85

#### 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	-46.77	V	7.95	0.78	-39.6	-13	-26.60
1693.2	-45.31	H	7.95	0.78	-38.14	-13	-25.14
326.8	-52.98	V	6.4	0.26	-46.84	-13	-33.84
600.2	-53.24	H	6.8	0.37	-46.81	-13	-33.81

#### Note:

- 1, The testing has been conformed to  $10 \times 846.6\text{MHz} = 8,466\text{MHz}$
- 2, All other emissions more than 30 dB below the limit
- 3, RMC, HSUPA and HSDPA mode were investigated. The results above show only the worse cases
- 4, X-Axis, Y-Axis and Z-Axis were investigated. The results above show only the worst case.

### 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	-49.78	V	10.25	2.73	-42.26	-13	-29.26
3704.8	-50.32	H	10.25	2.73	-42.8	-13	-29.80
324.7	-53.64	V	6.4	0.26	-47.5	-13	-34.50
605.3	-53.98	H	6.8	0.37	-47.55	-13	-34.55

#### 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	-49.56	V	10.25	2.73	-42.04	-13	-29.04
3760	-49.78	H	10.25	2.73	-42.26	-13	-29.26
324.1	-53.64	V	6.4	0.26	-47.5	-13	-34.50
609.5	-54.13	H	6.8	0.37	-47.7	-13	-34.70

#### 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	-50.26	V	10.36	2.73	-42.63	-13	-29.63
3815.2	-49.87	H	10.36	2.73	-42.24	-13	-29.24
325.8	-54.31	V	6.4	0.26	-48.17	-13	-35.17
608.3	-53.96	H	6.8	0.37	-47.53	-13	-34.53

#### Note:

- 1, The testing has been conformed to  $10 \times 1907.6\text{MHz} = 19,076\text{MHz}$
- 2, All other emissions more than 30 dB below the limit
- 3, RMC, HSUPA and HSDPA mode were investigated. The results above show only the worse cases
- 4, X-Axis, Y-Axis and Z-Axis were investigated. The results above show only the worst case

## 6.7 Band Edge

Temperature	22°C
Relative Humidity	55%
Atmospheric Pressure	1015mbar
Test date :	April 18, 2017
Tested By :	Leen Yang

### Requirement(s):

Spec	Item	Requirement	Applicable
§22.917(a) §24.238(a)	a)	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.	<input checked="" type="checkbox"/>
Test setup		<p style="text-align: center;">Base Station      Spectrum Analyzer      EUT</p>	
Procedure		<ul style="list-style-type: none"> <li>- The EUT was connected to Spectrum Analyzer and Base Station via power divider.</li> <li>- The Band Edges of low and high channels for the highest RF powers were measured. Setting RBW as roughly BW/100.</li> </ul>	
Remark			
Result		<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail	

**Test Data**     Yes       N/A  
**Test Plot**     Yes (See below)       N/A

**GSM Voice:**

**Cellular Band (Part 22H) result**

Frequency (MHz)	Emission (dBm)	Limit (dBm)
823.9975	-14.88	-13
849.0225	-16.47	-13

**PCS Band (Part24E) result**

Frequency (MHz)	Emission (dBm)	Limit (dBm)
1849.9975	-14.07	-13
1910.0025	-13.96	-13

**GPRS:**

**Cellular Band (Part 22H) result**

Frequency (MHz)	Emission (dBm)	Limit (dBm)
823.9975	-15.40	-13
849.0200	-14.84	-13

**PCS Band (Part24E) result**

Frequency (MHz)	Emission (dBm)	Limit (dBm)
1849.9975	-14.56	-13
1910.0175	-14.29	-13

### EGPRS (MCS5):

#### Cellular Band (Part 22H) result

Frequency (MHz)	Emission (dBm)	Limit (dBm)
823.9975	-16.39	-13
849.0025	-16.05	-13

#### PCS Band (Part24E) result

Frequency (MHz)	Emission (dBm)	Limit (dBm)
1849.9975	-14.79	-13
1910.0200	-15.48	-13

### RMC:

#### UMTS-FDD Band V (Part 22H)

Frequency (MHz)	Emission (dBm)	Limit (dBm)
823.800	-22.60	-13
849.025	-28.49	-13

#### UMTS-FDD Band II (Part 24E)

Frequency (MHz)	Emission (dBm)	Limit (dBm)
1849.900	-28.90	-13
1910.075	-22.92	-13

### HSDPA:

#### UMTS-FDD Band V (Part 22H)

Frequency (MHz)	Emission (dBm)	Limit (dBm)
823.975	-22.69	-13
849.025	-28.12	-13

#### UMTS-FDD Band II (Part 24E)

Frequency (MHz)	Emission (dBm)	Limit (dBm)
1849.925	-29.41	-13
1910.025	-24.22	-13

### HSUPA:

#### UMTS-FDD Band V (Part 22H)

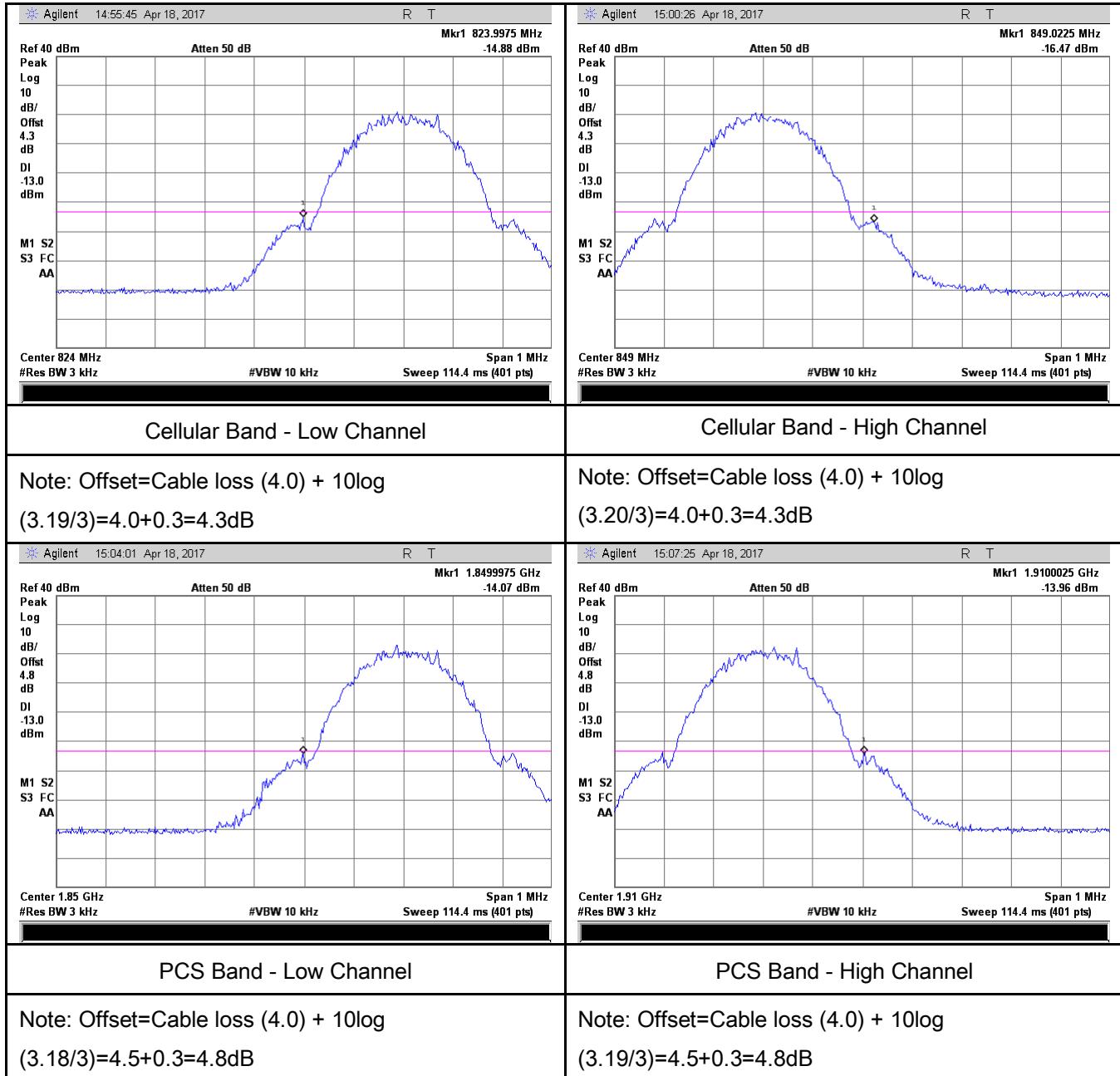
Frequency (MHz)	Emission (dBm)	Limit (dBm)
823.950	-21.85	-13
849.125	-28.82	-13

#### UMTS-FDD Band II (Part 24E)

Frequency (MHz)	Emission (dBm)	Limit (dBm)
1849.900	-27.68	-13
1910.050	-23.33	-13

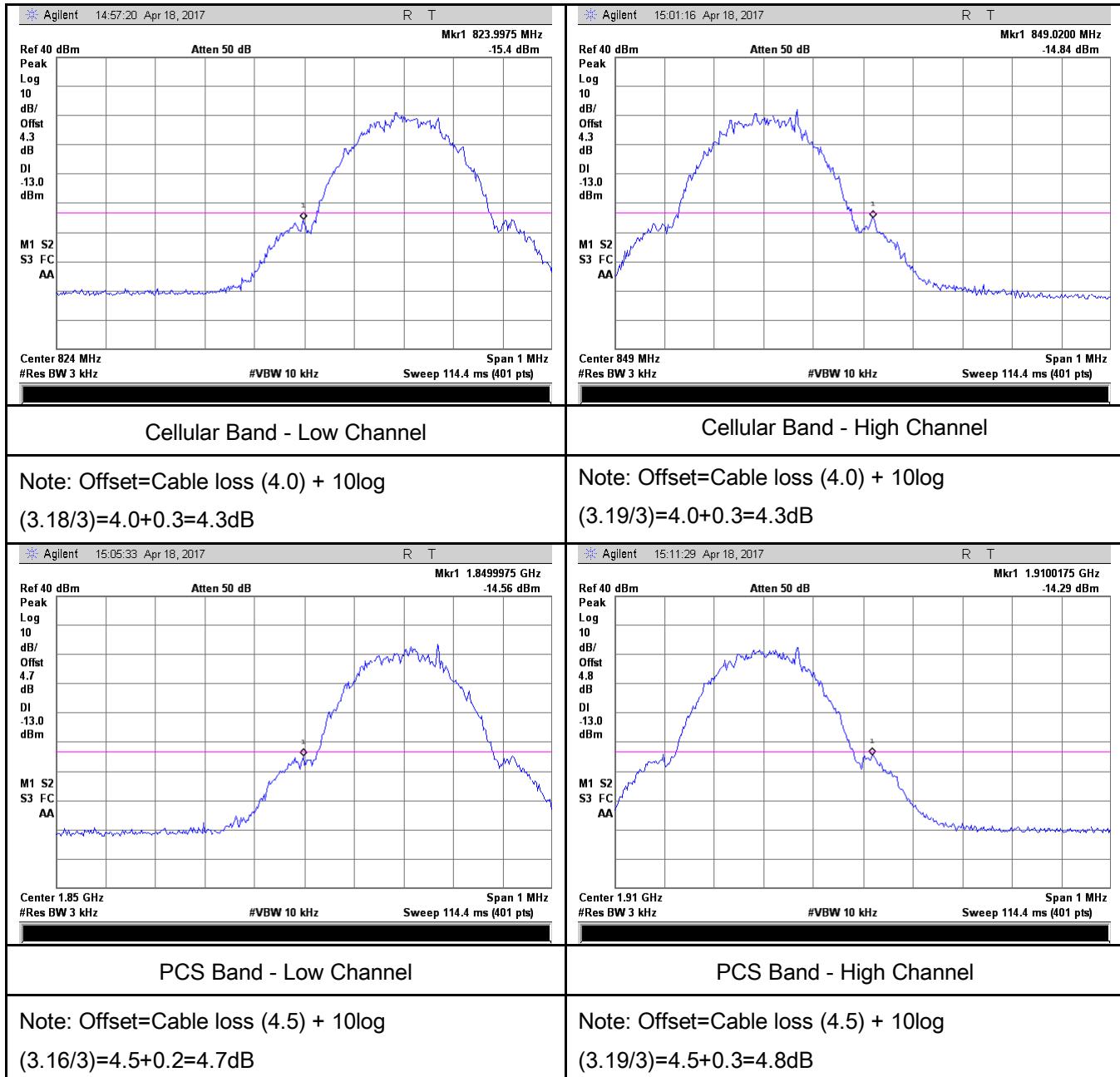
## GSM Voice:

### Test Plots



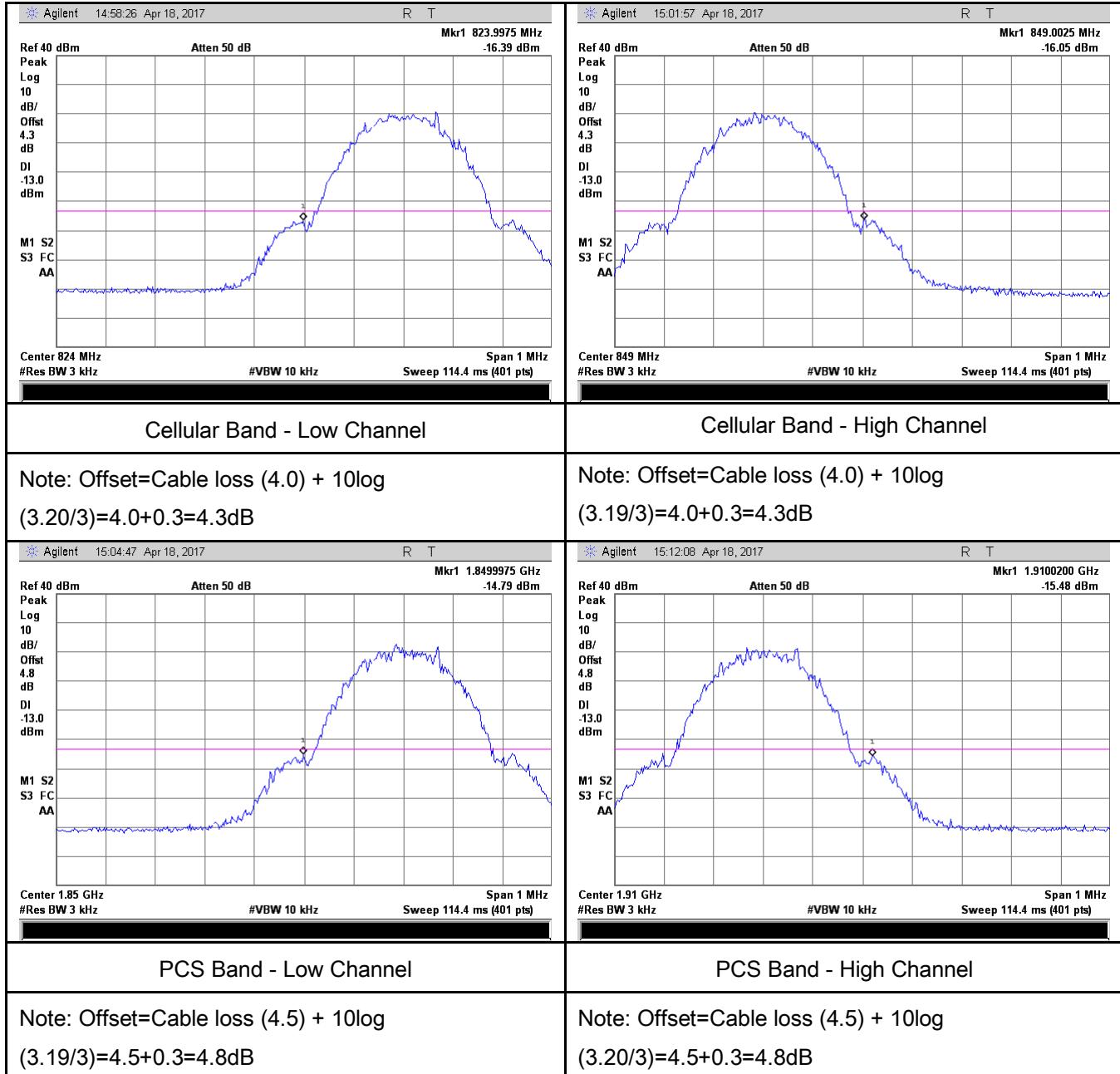
## GPRS:

### Test Plots

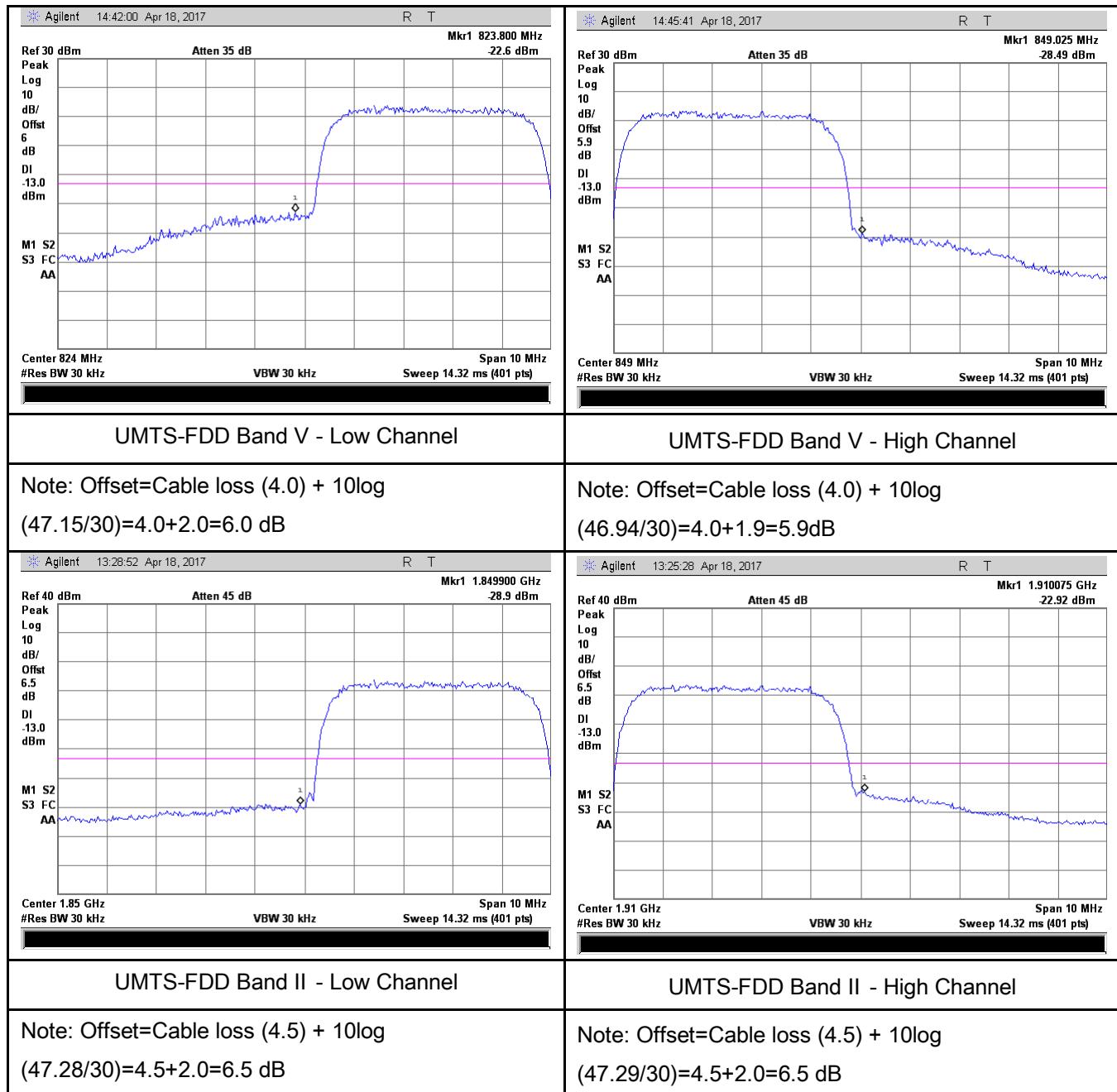


## EGPRS (MCS5):

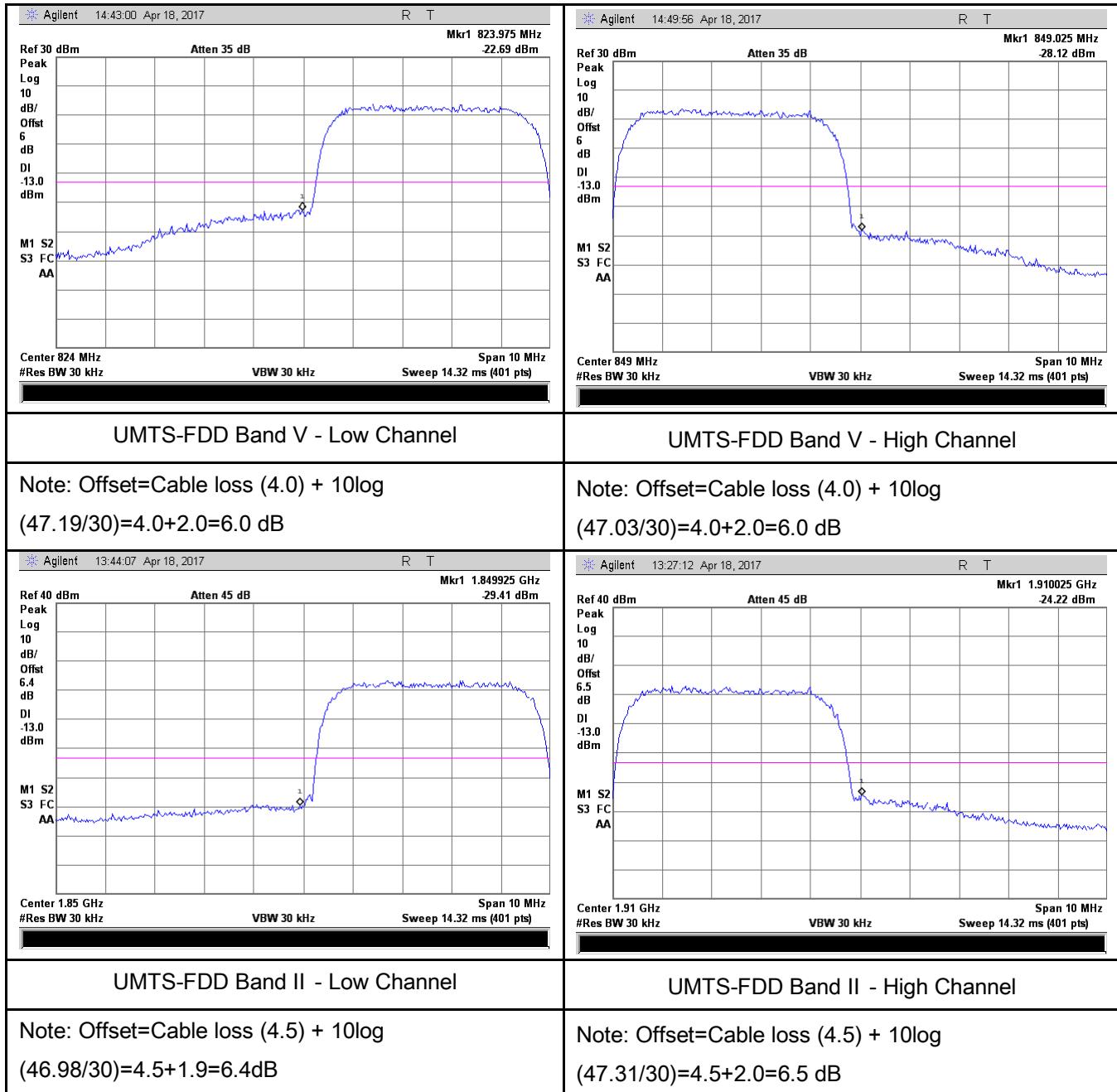
### Test Plots



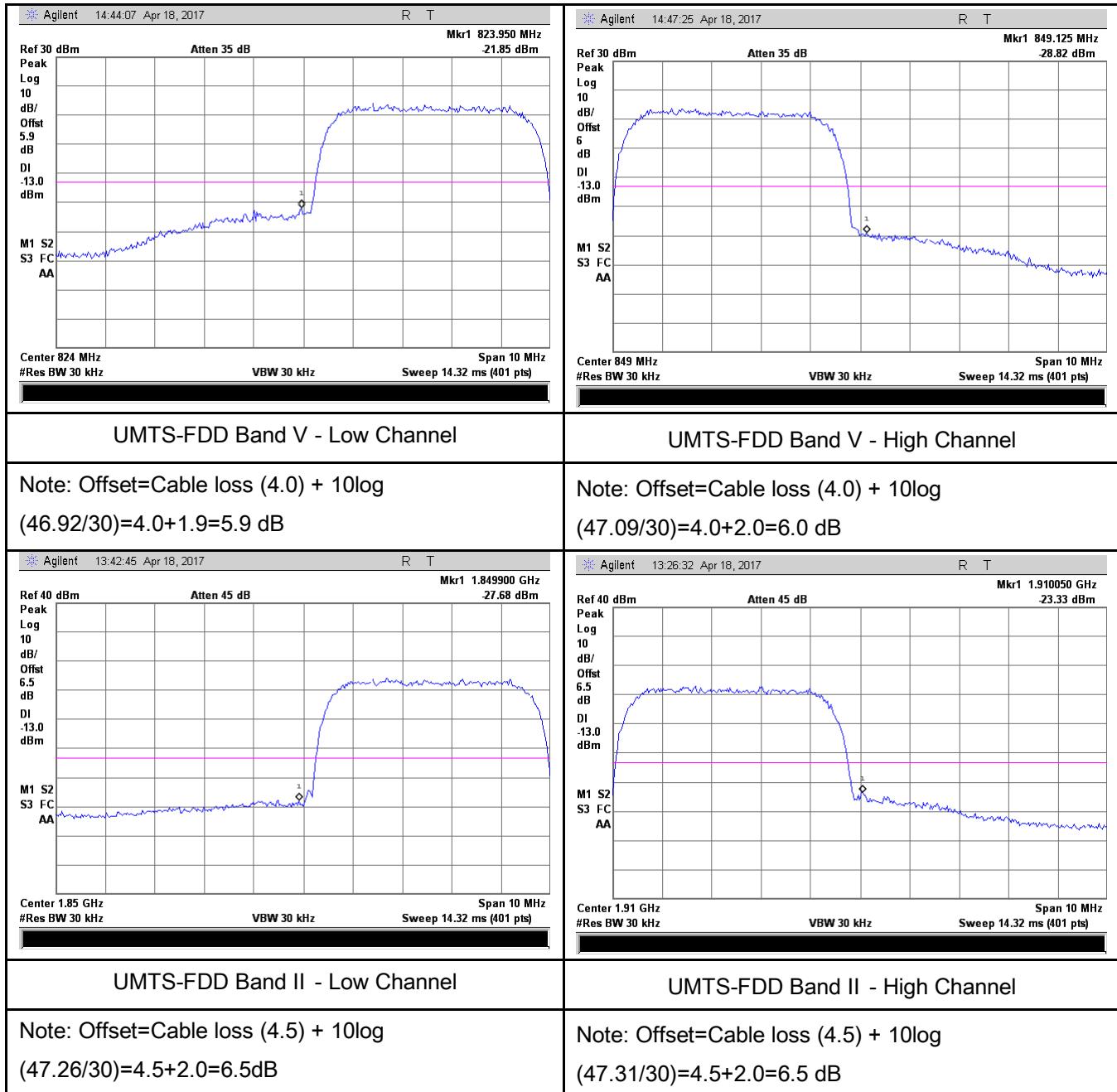
## RMC:



### HSDPA:



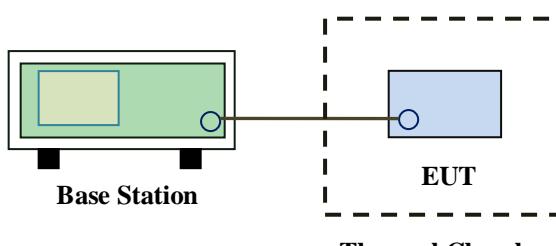
## HSUPA:



## 6.8 Frequency Stability

Temperature	24°C
Relative Humidity	55%
Atmospheric Pressure	1010mbar
Test date :	April 17, 2017
Tested By :	Leen Yang

### Requirement(s):

Spec	Item	Requirement	Applicable																																
§2.1055, §22.355 & §24.235	a)	<p>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:</p> <p>Frequency Tolerance for Transmitters in the Public Mobile Services</p> <table border="1"> <thead> <tr> <th>Frequency Range (MHz)</th> <th>Base, fixed (ppm)</th> <th>Mobile <math>\geq</math> 3 watts (ppm )</th> <th>Mobile <math>\leq</math> 3 watts (ppm)</th> </tr> </thead> <tbody> <tr> <td>25 to 50</td> <td>20.0</td> <td>20.0</td> <td>50.0</td> </tr> <tr> <td>50 to 450</td> <td>5.0</td> <td>5.0</td> <td>50.0</td> </tr> <tr> <td>45□to 512</td> <td>2.5</td> <td>5.0</td> <td>5.0</td> </tr> <tr> <td>821 to 896</td> <td>1.5</td> <td>2.5</td> <td>2.5</td> </tr> <tr> <td>928 to 929</td> <td>5.0</td> <td>N/A</td> <td>N/A</td> </tr> <tr> <td>929 to 960.</td> <td>1.5</td> <td>N/A</td> <td>N/A</td> </tr> <tr> <td>2110 to 2220</td> <td>10.0</td> <td>N/A</td> <td>N/A</td> </tr> </tbody> </table> <p>According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized frequency block.</p>	Frequency Range (MHz)	Base, fixed (ppm)	Mobile $\geq$ 3 watts (ppm )	Mobile $\leq$ 3 watts (ppm)	25 to 50	20.0	20.0	50.0	50 to 450	5.0	5.0	50.0	45□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	<input checked="" type="checkbox"/>
Frequency Range (MHz)	Base, fixed (ppm)	Mobile $\geq$ 3 watts (ppm )	Mobile $\leq$ 3 watts (ppm)																																
25 to 50	20.0	20.0	50.0																																
50 to 450	5.0	5.0	50.0																																
45□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																																
Test setup																																			

Procedure	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% ( $\pm 2.5\text{ppm}$ ) of the center frequency.
Remark	
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail

Test Data  Yes  N/A

Test Plot  Yes (See below)  N/A

GSM Voice:

**Cellular Band (Part 22H) result**

Middle Channel, $f_0 = 836.6$ MHz				
Temperature (°C)	Power Supplied (V <sub>DC</sub> )	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10	3.7	15	0.0179	2.5
0		16	0.0191	2.5
10		14	0.0167	2.5
20		18	0.0215	2.5
30		19	0.0227	2.5
40		17	0.0203	2.5
50		13	0.0155	2.5
55		15	0.0179	2.5
25		17	0.0203	2.5
	4.2	13	0.0155	2.5
	3.2			

**PCS Band (Part 24E) result**

Middle Channel, $f_0 = 1880$ MHz				
Temperature (°C)	Power Supplied (V <sub>DC</sub> )	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10	3.7	18	0.0096	2.5
0		16	0.0085	2.5
10		14	0.0074	2.5
20		13	0.0069	2.5
30		19	0.0101	2.5
40		17	0.0090	2.5
50		15	0.0080	2.5
55		16	0.0085	2.5
25		14	0.0074	2.5
	4.2	12	0.0064	2.5
	3.2			

RMC:

**UMTS-FDD Band V (Part 22H)**

Middle Channel, $f_0 = 835$ MHz				
Temperature (°C)	Power Supplied (V <sub>DC</sub> )	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10	3.7	154	0.1844	2.5
0		13	0.0156	2.5
10		14	0.0168	2.5
20		17	0.0204	2.5
30		19	0.0228	2.5
40		15	0.0180	2.5
50		14	0.0168	2.5
55		15	0.0180	2.5
25		4.2	0.0156	2.5
	3.2	14	0.0168	2.5

**UMTS-FDD Band II (Part 24E)**

Middle Channel, $f_0 = 1880$ MHz				
Temperature (°C)	Power Supplied (V <sub>DC</sub> )	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10	3.7	15	0.0080	2.5
0		12	0.0064	2.5
10		16	0.0085	2.5
20		14	0.0074	2.5
30		15	0.0080	2.5
40		15	0.0080	2.5
50		13	0.0069	2.5
55		14	0.0074	2.5
25		4.2	0.0090	2.5
	3.2	17	0.0074	2.5

## Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Due	In use
<b>RF Conducted Test</b>					
Agilent ESA-E SERIES SPECTRUM ANALYZER	E4407B	MY45108319	09/15/2016	09/14/2017	<input checked="" type="checkbox"/>
Power Splitter	1#	1#	08/31/2016	08/30/2017	<input checked="" type="checkbox"/>
Universal Radio Communication Tester	CMU200	121393	09/24/2016	09/23/2017	<input checked="" type="checkbox"/>
Temperature/Humidity Chamber	UHL-270	001	10/08/2016	10/07/2017	<input checked="" type="checkbox"/>
DC Power Supply	E3640A	MY40004013	09/16/2016	09/15/2017	<input checked="" type="checkbox"/>
RF Power Sensor	Dare RPR3006C/P/W	AY554013	09/16/2016	09/15/2017	<input checked="" type="checkbox"/>
<b>Radiated Emissions</b>					
EMI test receiver	ESL6	100262	09/16/2016	09/15/2017	<input checked="" type="checkbox"/>
OPT 010 AMPLIFIER (0.1-1300MHz)	8447E	2727A02430	08/31/2016	08/30/2017	<input checked="" type="checkbox"/>
Microwave Preamplifier (1 ~ 26.5GHz)	8449B	3008A02402	03/23/2017	03/22/2018	<input checked="" type="checkbox"/>
Bilog Antenna (30MHz~6GHz)	JB6	A110712	09/20/2016	09/19/2017	<input checked="" type="checkbox"/>
Bilog Antenna (30MHz~2GHz)	JB1	A112017	09/20/2016	09/19/2017	<input checked="" type="checkbox"/>
Double Ridge Horn Antenna (1 ~18GHz)	AH-118	71259	09/23/2016	09/22/2017	<input checked="" type="checkbox"/>
Double Ridge Horn Antenna (1 ~18GHz)	AH-118	71283	09/23/2016	09/22/2017	<input checked="" type="checkbox"/>
SYNTHESIZED SIGNAL GENERATOR	8665B	3744A01293	09/16/2016	09/15/2017	<input checked="" type="checkbox"/>
Power Amplifier	SMC150D	R1553-0313	03/08/2017	03/07/2018	<input checked="" type="checkbox"/>
Power Amplifier	S41-25D	R1553-0314	05/27/2016	05/26/2017	<input checked="" type="checkbox"/>
Tunable Notch Filter	3NF-800/1000-S	AA4	08/31/2016	08/30/2017	<input checked="" type="checkbox"/>



Test Report	17070248-FCC-R1
Page	72 of 88

Tunable Notch Filter	3NF- 1000/2000-S	AM 4	08/31/2016	08/30/2017	<input checked="" type="checkbox"/>
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## Annex B. EUT And Test Setup Photographs

### Annex B.i. Photograph: EUT External Photo

Whole Package View



Adapter - Label View



EUT - Front View



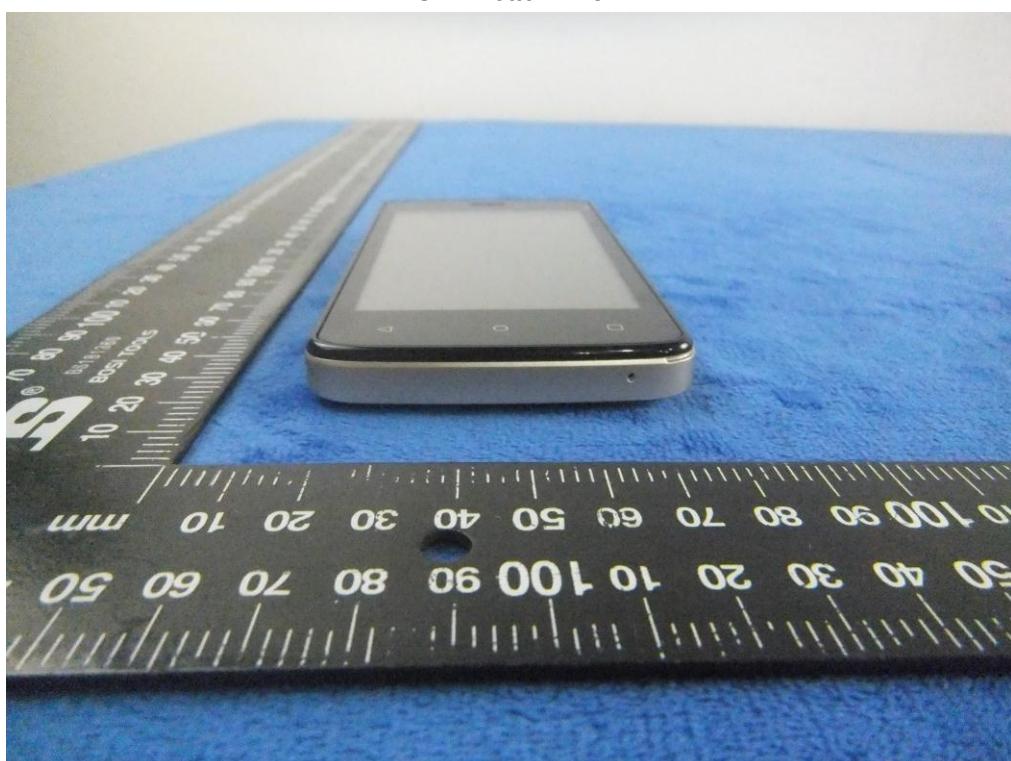
EUT - Rear View



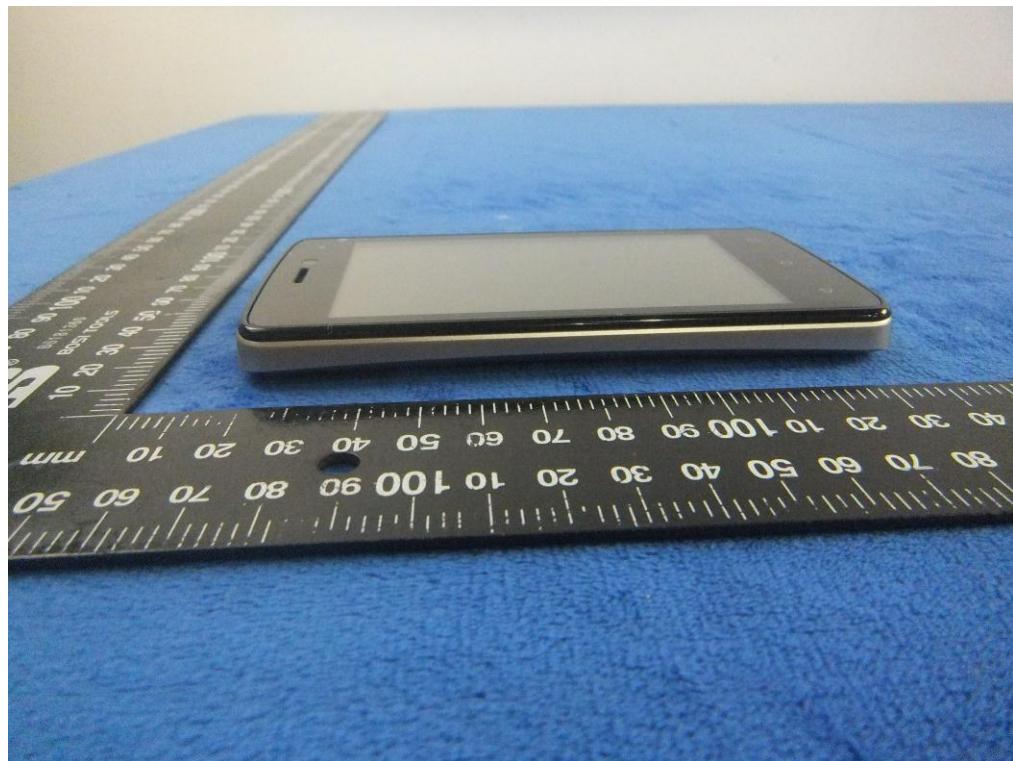
EUT - Top View



EUT - Bottom View



EUT - Left View



EUT - Right View

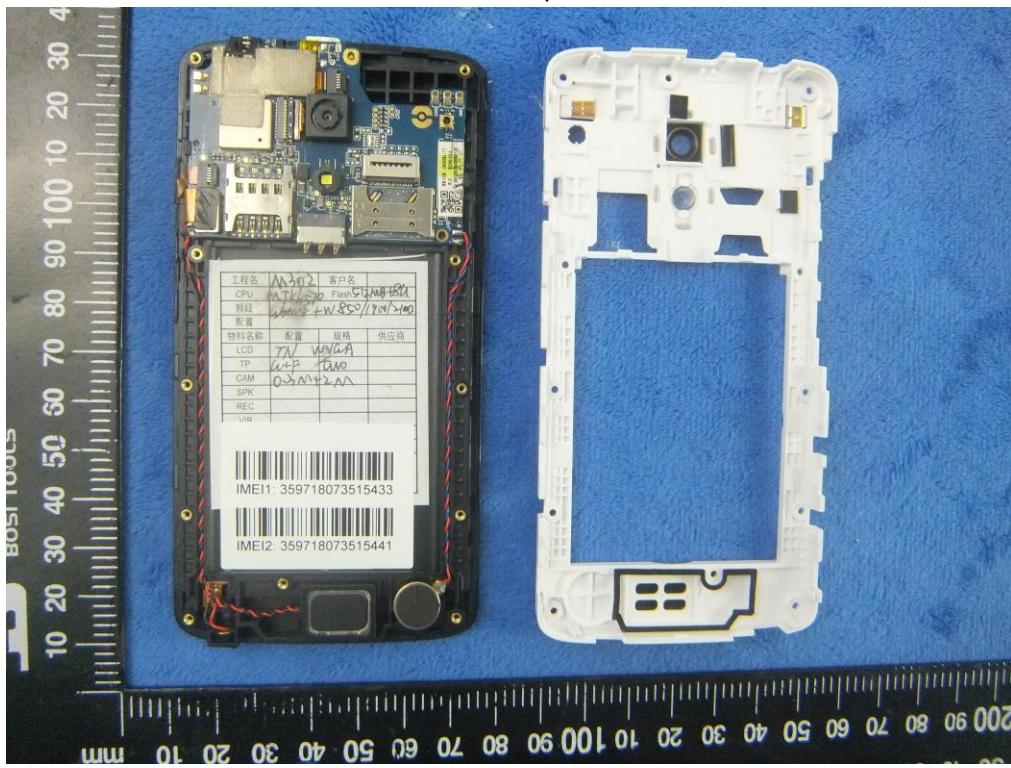


### Annex B.ii. Photograph: EUT Internal Photo

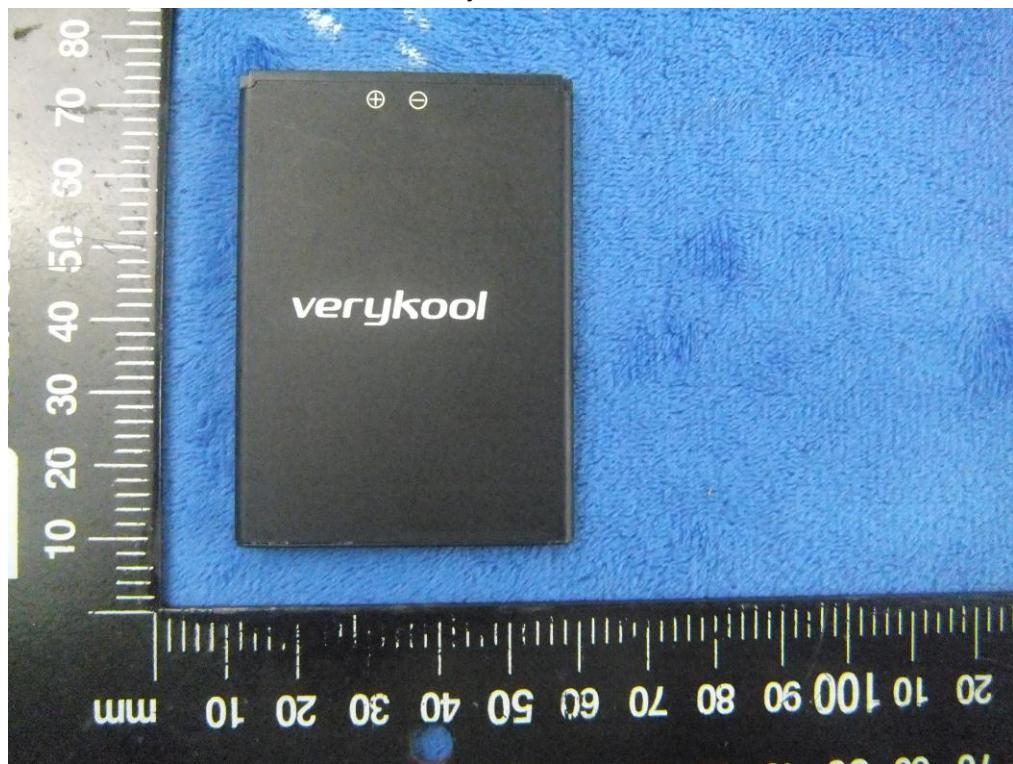
Cover Off - Top View 1



Cover Off - Top View 2



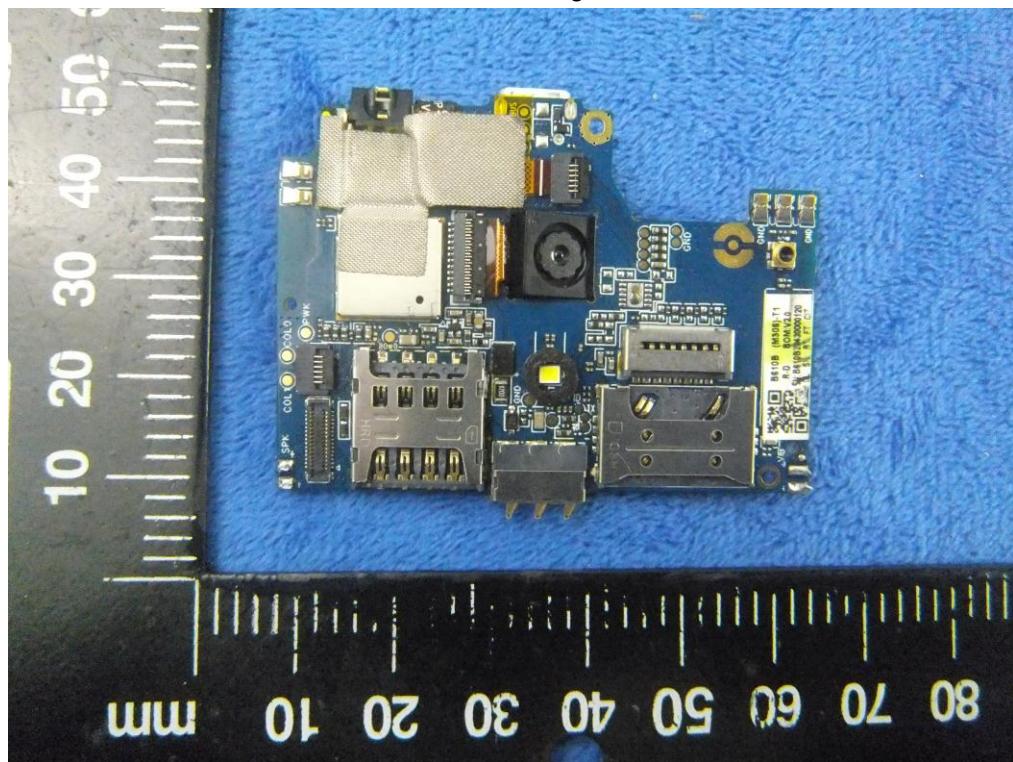
Battery - Front View



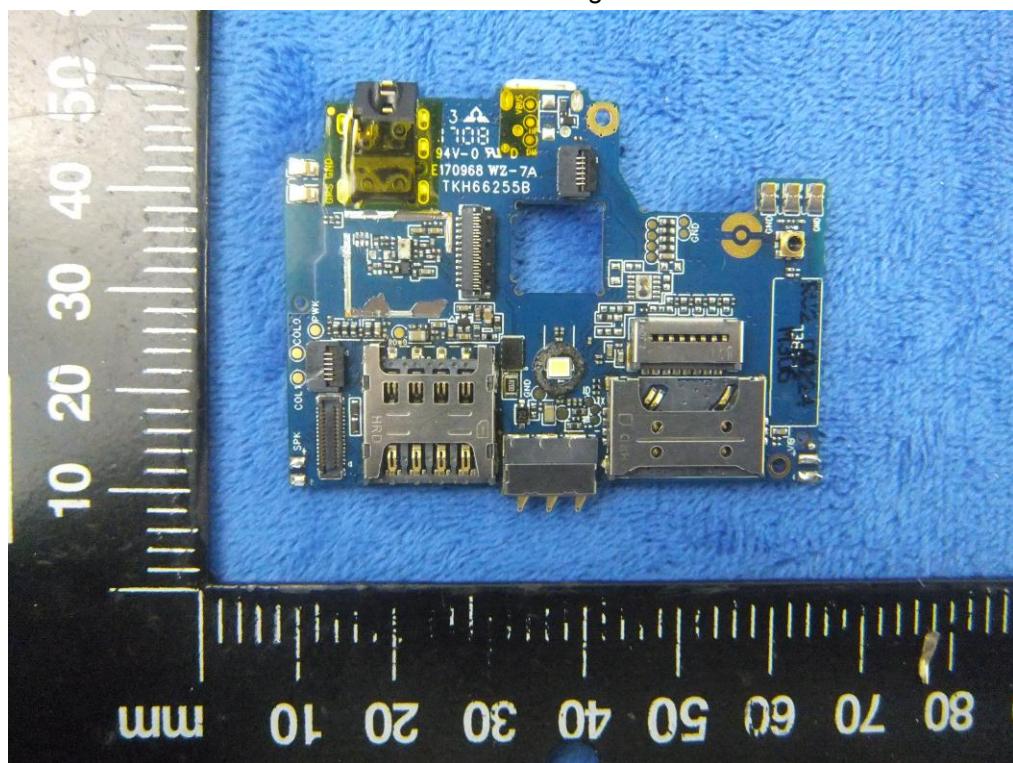
Battery - Rear View(Label)



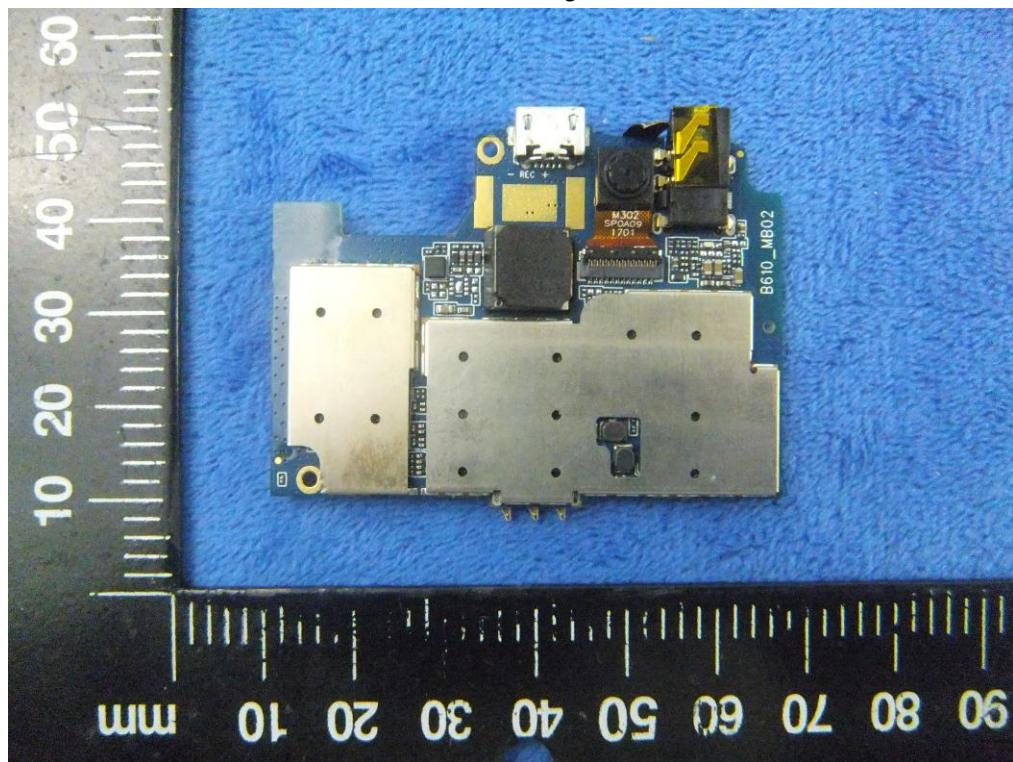
Mainboard with Shielding - Front View



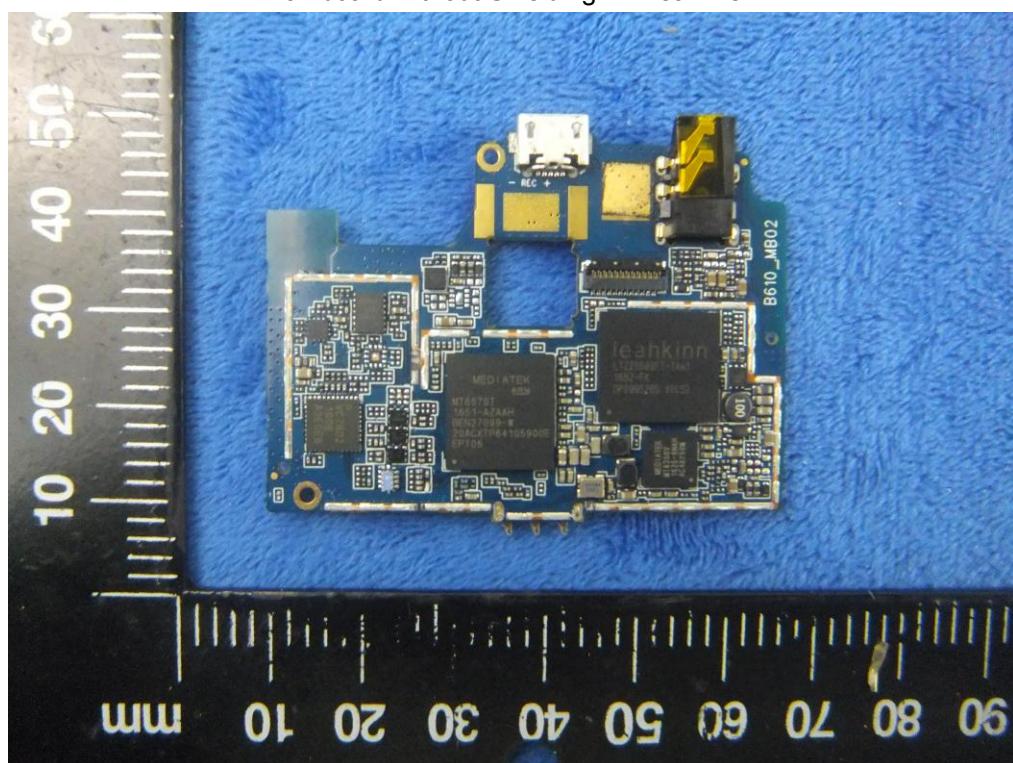
Mainboard without Shielding - Front View



Mainboard with Shielding – Rear View



Mainboard without Shielding – Rear View



LCD – Front View



LCD – Rear View



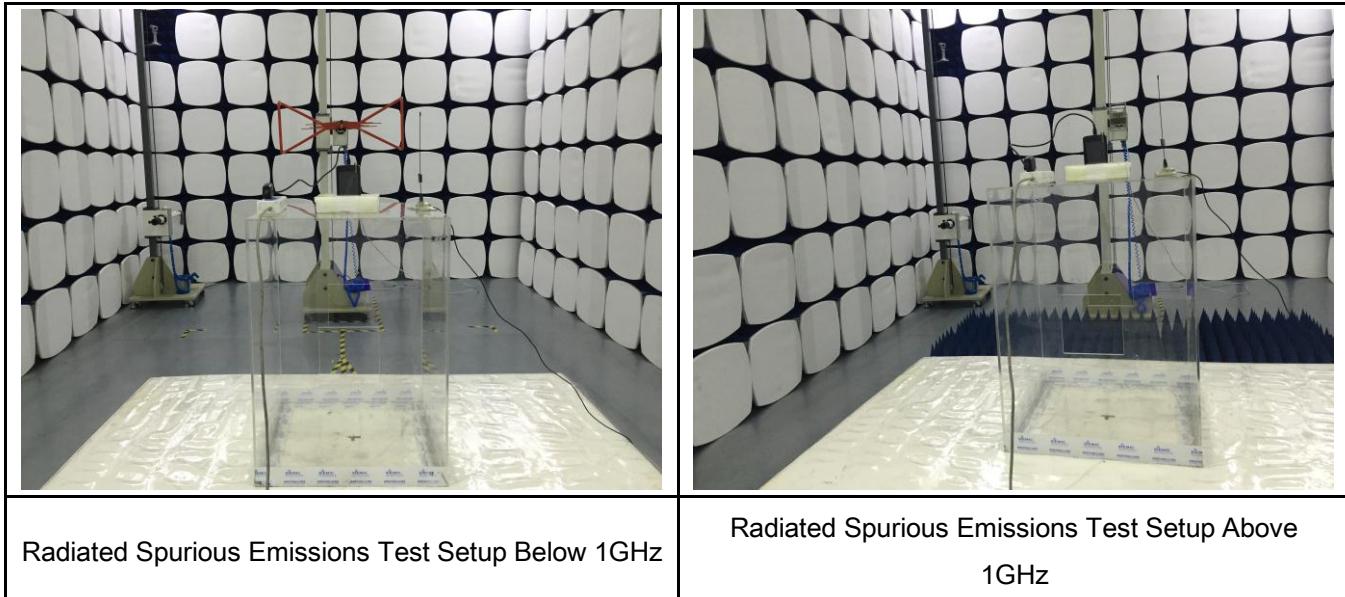
GSM/PCS/UMTS-FDD Antenna View



WIFI/BT/BLE/GPS - Antenna View



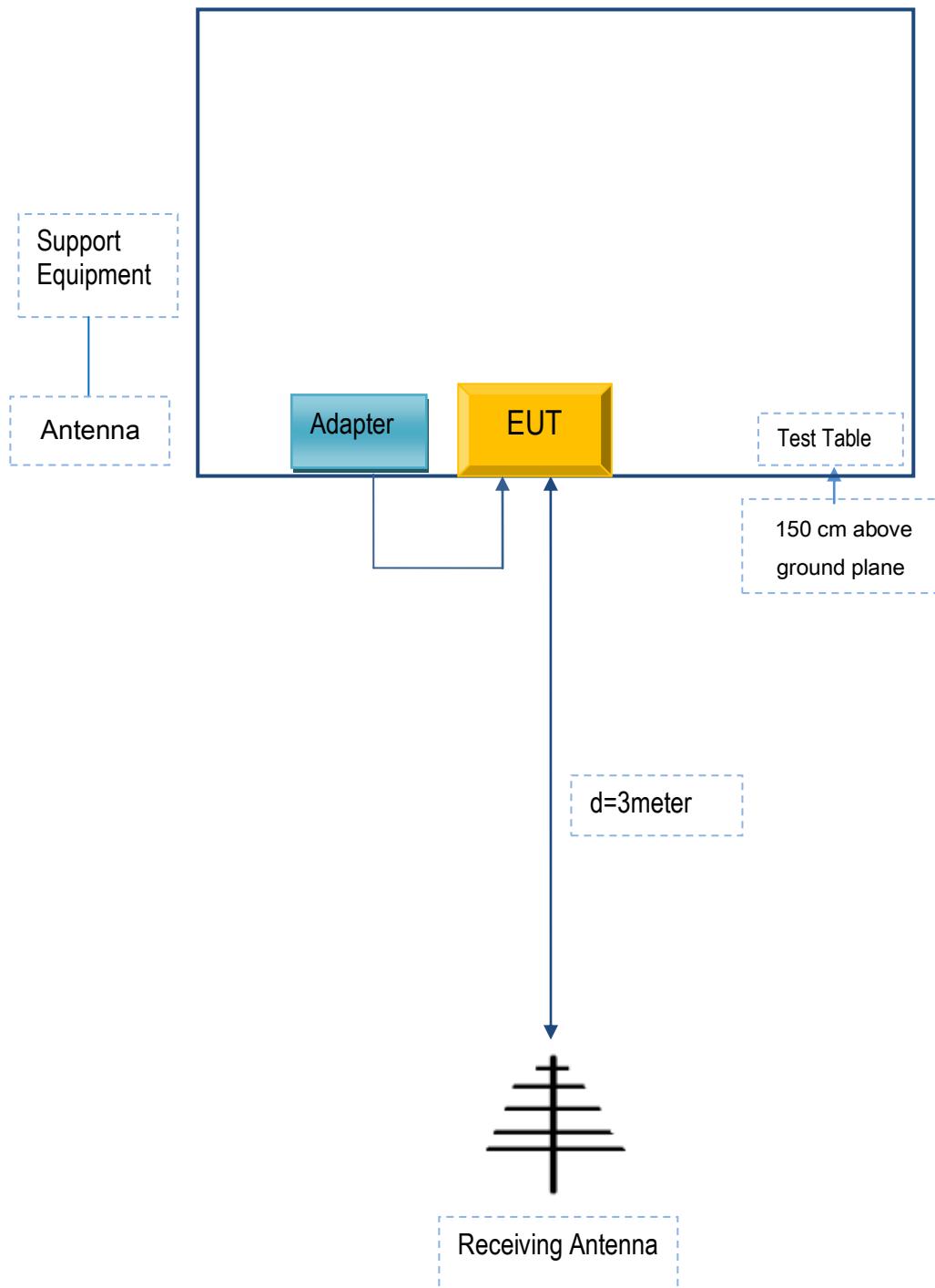
**Annex B.iii. Photograph: Test Setup Photo**



## Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

### Annex C.ii. TEST SET UP BLOCK

Block Configuration Diagram for Radiated Emissions



## Annex C. ii. SUPPORTING EQUIPMENT DESCRIPTION

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

### Supporting Equipment:

Manufacturer	Equipment Description	Model	Serial No
Verykool USA Inc	Adapter	s4009	X20170305

### Supporting Cable:

Cable type	Shield Type	Ferrite Core	Length	Serial No
USB Cable	Un-shielding	No	0.8m	X20170305

## Annex C.ii. EUT OPERATING CONDITIONS

N/A

## Annex D. User Manual / Block Diagram / Schematics / Partlist

Please see the attachment

## Annex E. DECLARATION OF SIMILARITY

N/A