
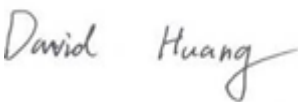



RF TEST REPORT



Report No.: 18070342-FCC-R1

Supersede Report No.: N/A

Applicant	G-TOUCH LLC.	
Product Name	Mobile phone	
Model No.	Stella X	
Serial No.	N/A	
Test Standard	FCC Part 22(H) ;FCC Part 24(E); ANSI/TIA-603-D: 2010	
Test Date	April 12 to May 11, 2018	
Issue Date	May 11, 2018	
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"/>		
		
Aaron Liang 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:

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 518108

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Laboratories Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.



In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

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

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1. Report Revision History

Report No.	Report Version	Description	Issue Date
18070342-FCC-R1	NONE	Original	May 11, 2018

2. Customer information

Applicant Name	G-TOUCH LLC.
Applicant Add	1750 NW 107TH Avenue, STE P-411, Miami,Florida, United States
Manufacturer	G-TOUCH LLC.
Manufacturer Add	1750 NW 107TH Avenue, STE P-411, Miami,Florida, United States

3. Test site information

Test Lab A:

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.	535293
IC Test Site No.	4842E-1
Test Software	Radiated Emission Program-To Shenzhen v2.0

Test Lab B:

Lab performing tests	SIEMIC (Nanjing-China) Laboratories
Lab Address	2-1 Longcang Avenue Yuhua Economic and Technology Development Park, Nanjing, China
FCC Test Site No.	694825
IC Test Site No.	4842B-1
Test Software	EZ_EMG(ver.lcp-03A1)

Note: We just perform Radiated Spurious Emission above 18GHz in the test Lab. B.

4. Equipment under Test (EUT) Information

Description of EUT:	Mobile phone
Main Model:	Stella X
Serial Model:	N/A
Date EUT received:	April 11, 2018
Test Date(s):	April 12 to May 11, 2018
Equipment Category :	PCE
Antenna Gain:	GSM850: -3.64dBi PCS1900: -2.18dBi UMTS-FDD Band V: -3.64dBi UMTS-FDD Band II: -2.18dBi WIFI: 2.9dBi Bluetooth/BLE: 3dBi GPS: 1.6dBi
Antenna Type:	PIFA antenna
Type of Modulation:	GSM / GPRS: GMSK EGPRS: GMSK UMTS-FDD: QPSK 802.11b/g/n: DSSS, OFDM Bluetooth: GFSK, π /4DQPSK, 8DPSK BLE: GFSK GPS: BPSK

	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 Voice:GSM850: 32.31 dBm
	PCS1900: 29.44 dBm
	GPRS:GSM850: 32.33 dBm
	PCS1900: 29.36 dBm
	EGPRS(MSC1):GSM850: 32.39 dBm
Maximum Conducted	PCS1900: 29.33 dBm
AV Power to Antenna:	RMC:UMTS-FDD Band V: 21.46 dBm
	UMTS-FDD Band II: 21.63 dBm
	HSUPA:UMTS-FDD Band V: 20.82 dBm
	UMTS-FDD Band II: 20.94 dBm
	HSDPA:UMTS-FDD Band V: 20.93 dBm
	UMTS-FDD Band II: 20.91 dBm
	GSM Voice:GSM850: 26.52 dBm / ERP
	PCS1900: 27.26 dBm / EIRP
	GPRS:GSM850: 26.54 dBm / ERP
	PCS1900: 27.18 dBm / EIRP
	EGPRS(MCS1):GSM850: 26.60 dBm / ERP
ERP/EIRP:	PCS1900: 27.15 dBm / EIRP
	RMC:UMTS-FDD Band V: 15.67 dBm / ERP
	UMTS-FDD Band II: 19.45 dBm / EIRP
	HSDPA:UMTS-FDD Band V: 15.01 dBm / ERP
	UMTS-FDD Band II: 18.89 dBm / EIRP
	HSUPA:UMTS-FDD Band V: 14.99 dBm / ERP
	UMTS-FDD Band II: 18.73 dBm / EIRP

Number of Channels:	<p>GSM 850: 124CH</p> <p>PCS1900: 299CH</p> <p>UMTS-FDD Band V: 102CH</p> <p>UMTS-FDD Band II: 277CH</p> <p>WIFI :802.11b/g/n(20M): 11CH</p> <p>WIFI :802.11n(40M): 7CH</p> <p>Bluetooth: 79CH</p> <p>BLE: 40CH</p> <p>GPS:1CH</p>
Port:	<p>USB Port, Earphone Port</p> <p>Adapter(Trade name: GTOUCH):</p> <p>Model: Stella X</p> <p>Input: AC100-220V~50/60Hz,0.15A</p> <p>Output: DC 5.0V, 1000mA</p> <p>Adapter(Trade name: TuCEL):</p> <p>Model: TC504B-CHR</p> <p>Input: AC100-240V~50/60Hz,0.15A</p> <p>Output: DC 5.0V, 1A</p>
Input Power:	<p>Battery(Trade name: GTOUCH):</p> <p>Model: Stella X</p> <p>Spec: 3.7V, 2200mAh</p> <p>Charging Limited Voltage: 4.2V</p> <p>Battery(Trade name: TuCEL):</p> <p>Model: TC504B-BAT</p> <p>Spec: 3.8V, 2200mAh</p> <p>Charging Limited Voltage: 4.35V</p>
Trade Name :	N/A
GPRS/ EGPRS Multi-slot class	8/10/11/12
FCC ID:	2AJDZSTELLAX

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

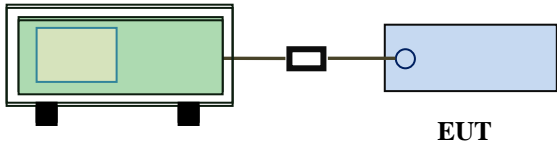
The EUT is a portable device, thus requires SAR evaluation;
Please refer to RF Exposure Evaluation Report: 18070342-FCC-H.

6.2 RF Output Power

Temperature	23 °C
Relative Humidity	52%
Atmospheric Pressure	1020mbar
Test date :	April 26, 2018
Tested By :	Aaron Liang

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 style="text-align: center;">Base Station EUT</p>
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Test Procedure	<p>For Conducted Power:</p> <ul style="list-style-type: none"> - The transmitter output port was connected to base station. - Set EUT at maximum power through base station. - Select lowest, middle, and highest channels for each band and different test mode. <p>For ERP/EIRP:</p> <p>According with KDB 971168 v02r02</p> <ul style="list-style-type: none"> - The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable. - 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. - The frequency range up to tenth harmonic of the fundamental frequency was investigated.
----------------	---

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

Test Data ☒ Yes ☐ N/A

Test Plot ☐ Yes (See below) ☒ N/A

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	32.31	32.19	32.25	32±1	29.30	29.31	29.44	30±1
GPRS Multi-Slot Class 8 (1 uplink),GMSK	32.33	32.25	32.18	32±1	29.31	29.33	29.36	29±1
GPRS Multi-Slot Class 10 (2 uplink) GMSK	32.00	32.01	32.1	32±1	28.50	28.49	28.66	28±1
GPRS Multi-Slot Class 11 (3 uplink) GMSK	31.01	31.06	31.09	31±1	27.46	27.41	27.5	27±1
GPRS Multi-Slot Class 12 (4 uplink) GMSK	30.09	30.13	30.2	30±1	26.5	26.42	26.33	26±1
EGPRS Multi-Slot Class 8 (1 uplink) GMSK MCS1	32.39	32.33	32.31	32±1	29.20	29.24	29.33	29±1
EGPRS Multi-Slot Class 10 (2 uplink) GMSK MCS1	32.05	32.11	32.16	32±1	28.46	28.51	28.61	28±1
EGPRS Multi-Slot Class 11 (3 uplink) GMSK MCS1	31.00	31.16	31.11	31±1	27.41	27.43	27.5	27±1
EGPRS Multi-Slot Class 12 (4 uplink) GMSK MCS1	30.02	30.12	30.2	30±1	26.5	26.51	26.66	26±1

Remark :

GPRS, CS1 coding scheme.

EGPRS, MCS1 coding scheme.

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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 11 , 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	21.43	22±1
	4175	835	21.33	22±1
	4233	846.6	21.46	22±1
HSDPA Subtest1	4132	826.4	20.82	21±1
	4175	835	20.70	21±1
	4233	846.6	20.79	21±1
HSDPA Subtest2	4132	826.4	20.80	21±1
	4175	835	20.73	21±1
	4233	846.6	20.80	21±1
HSDPA Subtest3	4132	826.4	20.77	21±1
	4175	835	20.63	21±1
	4233	846.6	20.68	21±1
HSDPA Subtest4	4132	826.4	20.69	21±1
	4175	835	20.67	21±1
	4233	846.6	20.77	21±1
HSUPA Subtest1	4132	826.4	20.65	21±1
	4175	835	20.59	21±1
	4233	846.6	20.78	21±1
HSUPA Subtest2	4132	826.4	20.78	21±1
	4175	835	20.65	21±1
	4233	846.6	20.68	21±1
HSUPA Subtest3	4132	826.4	20.71	21±1
	4175	835	20.69	21±1
	4233	846.6	20.67	21±1
HSUPA Subtest4	4132	826.4	20.63	21±1
	4175	835	20.46	21±1
	4233	846.6	20.67	21±1
HSUPA Subtest5	4132	826.4	20.89	21±1
	4175	835	20.56	21±1
	4233	846.6	20.93	21±1

UMTS-FDD Band II

Band/ Time Slot configuration	Channel	Frequency	Average power (dBm)	Tune up Power tolerant
RMC 12.2kbps	9262	1852.4	21.33	21±1
	9400	1880	21.23	21±1
	9538	1907.6	21.63	21±1
HSDPA Subtest1	9262	1852.4	20.73	20±1
	9400	1880	20.58	20±1
	9538	1907.6	20.84	20±1
HSDPA Subtest2	9262	1852.4	20.79	20±1
	9400	1880	20.64	20±1
	9538	1907.6	21.07	20±1
HSDPA Subtest3	9262	1852.4	20.53	20±1
	9400	1880	20.50	20±1
	9538	1907.6	20.89	20±1
HSDPA Subtest4	9262	1852.4	20.67	20±1
	9400	1880	20.56	20±1
	9538	1907.6	20.94	20±1
HSUPA Subtest1	9262	1852.4	20.66	20±1
	9400	1880	20.54	20±1
	9538	1907.6	20.88	20±1
HSUPA Subtest2	9262	1852.4	20.61	20±1
	9400	1880	20.39	20±1
	9538	1907.6	20.89	20±1
HSUPA Subtest3	9262	1852.4	20.73	20±1
	9400	1880	20.53	20±1
	9538	1907.6	20.91	20±1
HSUPA Subtest4	9262	1852.4	20.63	20±1
	9400	1880	20.52	20±1
	9538	1907.6	20.81	20±1
HSUPA Subtest5	9262	1852.4	20.54	20±1
	9400	1880	20.68	20±1
	9538	1907.6	20.91	20±1

ERP & EIRP

GSM Voice

ERP for Cellular Band (Part 22H)

Frequency (MHz)	Antenna Polarization (H/V)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
824.2	V	26.52	38.45	-11.93
824.2	H	24.58	38.45	-13.87
836.6	V	26.40	38.45	-12.05
836.6	H	24.84	38.45	-13.61
848.8	V	26.46	38.45	-11.99
848.8	H	24.73	38.45	-13.72

EIRP for PCS Band (Part 24E)

Frequency (MHz)	Antenna Polarization (H/V)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
1850.2	V	27.12	33	-5.88
1850.2	H	26.07	33	-6.93
1880	V	27.13	33	-5.87
1880	H	25.59	33	-7.41
1909.8	V	27.26	33	-5.74
1909.8	H	25.81	33	-7.19

GPRS:

ERP for Cellular Band (Part 22H)

Frequency (MHz)	Antenna Polarization (H/V)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
824.2	V	26.39	38.45	-12.06
824.2	H	25.69	38.45	-12.76
836.6	V	26.46	38.45	-11.99
836.6	H	24.66	38.45	-13.79
848.8	V	26.54	38.45	-11.91
848.8	H	24.68	38.45	-13.77

EIRP for PCS Band (Part 24E)

Frequency (MHz)	Antenna Polarization (H/V)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
1850.2	V	27.13	33	-5.87
1850.2	H	25.76	33	-7.24
1880	V	27.15	33	-5.85
1880	H	26.25	33	-6.75
1909.8	V	27.18	33	-5.82
1909.8	H	25.78	33	-7.22

EGPRS (MCS1):

ERP for Cellular Band (Part 22H)

Frequency (MHz)	Antenna Polarization (H/V)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
824.2	V	26.52	38.45	-11.93
824.2	H	24.85	38.45	-13.6
836.6	V	26.54	38.45	-11.91
836.6	H	25.20	38.45	-13.25
848.8	V	26.60	38.45	-11.85
848.8	H	25.87	38.45	-12.58

EIRP for PCS Band (Part 24E)

Frequency (MHz)	Antenna Polarization (H/V)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
1850.2	V	27.15	33	-5.85
1850.2	H	26.27	33	-6.73
1880	V	27.06	33	-5.94
1880	H	25.35	33	-7.65
1909.8	V	27.02	33	-5.98
1909.8	H	25.36	33	-7.64

RMC

ERP for UMTS-FDD Band V (Part 22H)

Frequency (MHz)	Antenna Polarization (H/V)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
826.4	V	15.64	38.45	-22.81
826.4	H	14.61	38.45	-23.84
835	V	15.54	38.45	-22.91
835	H	13.97	38.45	-24.48
846.6	V	15.67	38.45	-22.78
846.6	H	14.60	38.45	-23.85

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

Frequency (MHz)	Antenna Polarization (H/V)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
1852.4	V	19.15	33	-13.85
1852.4	H	17.86	33	-15.14
1880	V	19.05	33	-13.95
1880	H	18.07	33	-14.93
1907.6	V	19.45	33	-13.55
1907.6	H	18.61	33	-14.39

HSDPA

ERP for UMTS-FDD Band V (Part 22H)

Frequency (MHz)	Antenna Polarization (H/V)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
826.4	V	14.91	38.45	-23.54
826.4	H	13.81	38.45	-24.64
835	V	15.01	38.45	-23.44
835	H	13.87	38.45	-24.58
846.6	V	15.01	38.45	-23.44
846.6	H	14.18	38.45	-24.27

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

Frequency (MHz)	Antenna Polarization (H/V)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
1852.4	V	18.61	33	-14.39
1852.4	H	16.86	33	-16.14
1880	V	18.89	33	-14.11
1880	H	17.63	33	-15.37
1907.6	V	18.32	33	-14.68
1907.6	H	16.93	33	-16.07

HSUPA

ERP for UMTS-FDD Band V (Part 22H)

Frequency (MHz)	Antenna Polarization (H/V)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
826.4	V	14.99	38.45	-23.46
826.4	H	13.74	38.45	-24.71
835	V	14.86	38.45	-23.59
835	H	13.84	38.45	-24.61
846.6	V	14.92	38.45	-23.53
846.6	H	13.86	38.45	-24.59

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

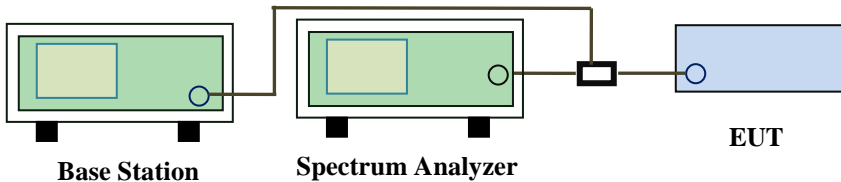
Frequency (MHz)	Antenna Polarization (H/V)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
1852.4	V	18.21	33	-14.79
1852.4	H	16.72	33	-16.28
1880	V	18.55	33	-14.45
1880	H	16.59	33	-16.41
1907.6	V	18.73	33	-14.27
1907.6	H	18.02	33	-14.98

6.3 Peak-Average Ratio

Temperature	23 °C
Relative Humidity	52%
Atmospheric Pressure	1020mbar
Test date :	April 26, 2018
Tested By :	Aaron Liang

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;">Base Station Spectrum Analyzer EUT</p>
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Test Procedure	<p>According with KDB 971168 v02r02</p> <p>5.7.2 Alternate procedure for PAPR</p> <p>5.1.2 Peak power measurements with a peak power meter</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>5.2.3 Average power measurement with average power meter</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 $\geq 98\%$) and at all times the EUT is transmitting at its maximum output</p>
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	<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 < 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 ± 2 percent) by performing the measurement over the on/off burst cycles and then correcting (increasing) the measured level by a factor equal to $10\log(1/\text{duty cycle})$</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	30.11	29.3	0.81
1880	30.39	29.31	1.08
1909.8	30.23	29.44	0.79

GPRS 1900 PK-AV POWER (PART 24E)

Frequency (MHz)	Conducted power(dBm)		Peak-Average Ratio(PAR)
	Peak	Average	
1850.2	30.43	29.31	1.12
1880	30.14	29.33	0.81
1909.8	30.44	29.36	1.08

EGPRS (MSC1) 1900 PK-AV POWER (PART 24E)

Frequency (MHz)	Conducted power(dBm)		Peak-Average Ratio(PAR)
	Peak	Average	
1850.2	22.55	21.33	1.22
1880	22.15	21.23	0.92
1909.8	22.71	21.63	1.08

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

Frequency (MHz)	Conducted power(dBm)		Peak-Average Ratio(PAR)
	Peak	Average	
1852.4	24.27	21.43	2.84
1880	24.16	21.33	2.83
1907.6	24.66	21.46	3.20

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

Frequency (MHz)	Conducted power(dBm)		Peak-Average Ratio(PAR)
	Peak	Average	
1852.4	21.53	20.73	0.8
1880	21.66	20.58	1.08
1907.6	21.92	20.84	1.08

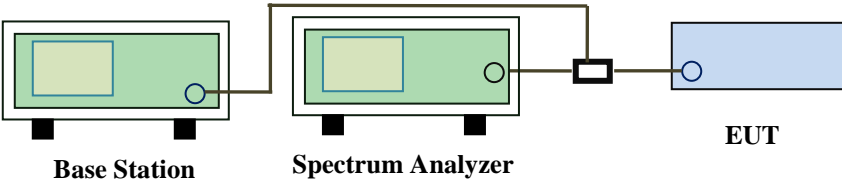
HSUPA : UMTS-FDD Band 2 PK-AV POWER (PART 24E)

Frequency (MHz)	Conducted power(dBm)		Peak-Average Ratio(PAR)
	Peak	Average	
1852.4	21.74	20.66	1.08
1880	21.32	20.54	0.78
1907.6	21.7	20.88	0.82

6.4 Occupied Bandwidth

Temperature	23 °C
Relative Humidity	52%
Atmospheric Pressure	1020mbar
Test date :	April 26, 2018
Tested By :	Aaron Liang

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			
Test Procedure	<ul style="list-style-type: none"> - The EUT was connected to Spectrum Analyzer and Base Station via power divider. - The 99% and 26 dB occupied bandwidth (BW) of the middle channel for the highest RF powers. 		
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	246.2620	318.918
190	836.6	244.3453	310.032
251	848.8	246.4713	319.614

PCS Band (Part 24E) result

Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Bandwidth (kHz)
512	1850	247.9944	318.527
661	1880	246.0002	314.955
810	1910	244.4932	319.576

GPRS:

Cellular Band (Part 22H) result

Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Bandwidth (kHz)
128	824.2	251.3547	322.627
190	836.6	247.7461	314.621
251	848.8	244.7466	319.653

PCS Band (Part 24E) result

Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Bandwidth (kHz)
512	1850	248.4186	325.824
661	1880	248.0170	319.608
810	1910	246.7657	319.532

EGPRS (MSC 1):

Cellular Band (Part 22H) result

Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Bandwidth (kHz)
128	824.2	246.2318	321.553
190	836.6	245.0885	314.621
251	848.8	246.5141	318.884

PCS Band (Part 24E) result

Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Bandwidth (kHz)
512	1850	248.2744	321.785
661	1880	246.9327	322.877
810	1910	246.1202	318.856

RMC:

UMTS-FDD Band V (Part 22H)

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
4132	826.6	4.1645	4.663
4175	835.0	4.1538	4.662
4233	846.4	4.1549	4.649

UMTS-FDD Band II (Part 24E)

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
9262	1853	4.1853	4.766
9400	1880	4.1845	4.750
9538	1907	4.1690	4.697

HSDPA:

UMTS-FDD Band V (Part 22H)

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
4132	826.6	4.1595	4.672
4175	835.0	4.1755	4.672
4233	846.4	4.1501	4.653

UMTS-FDD Band II (Part 24E)

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
9262	1853	4.1957	4.727
9400	1880	4.1840	4.741
9538	1907	4.1699	4.697

HSUPA:

UMTS-FDD Band V (Part 22H)

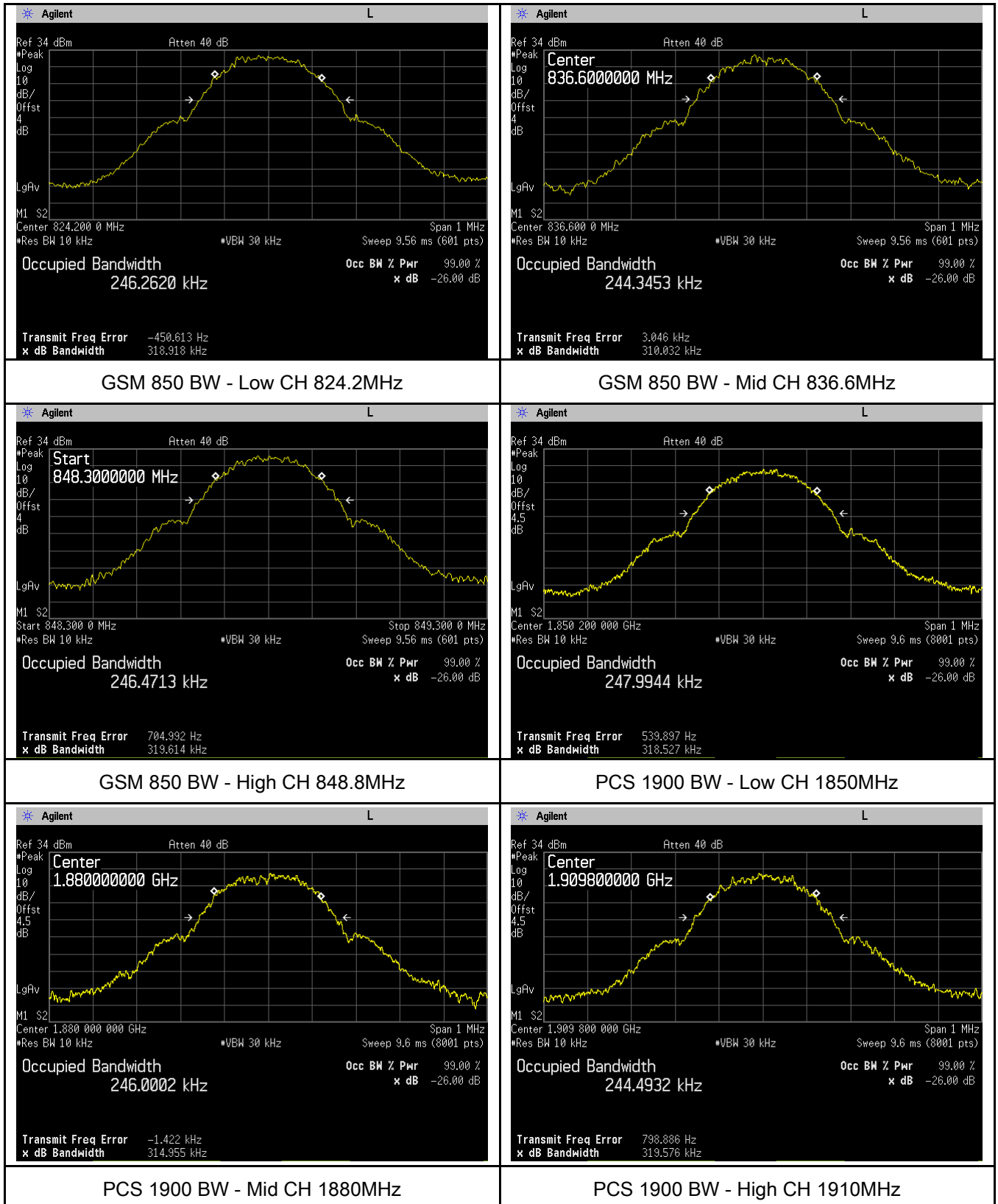
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
4132	826.6	4.1643	4.689
4175	835.0	4.1542	4.673
4233	846.4	4.1562	4.649

UMTS-FDD Band II (Part 24E)

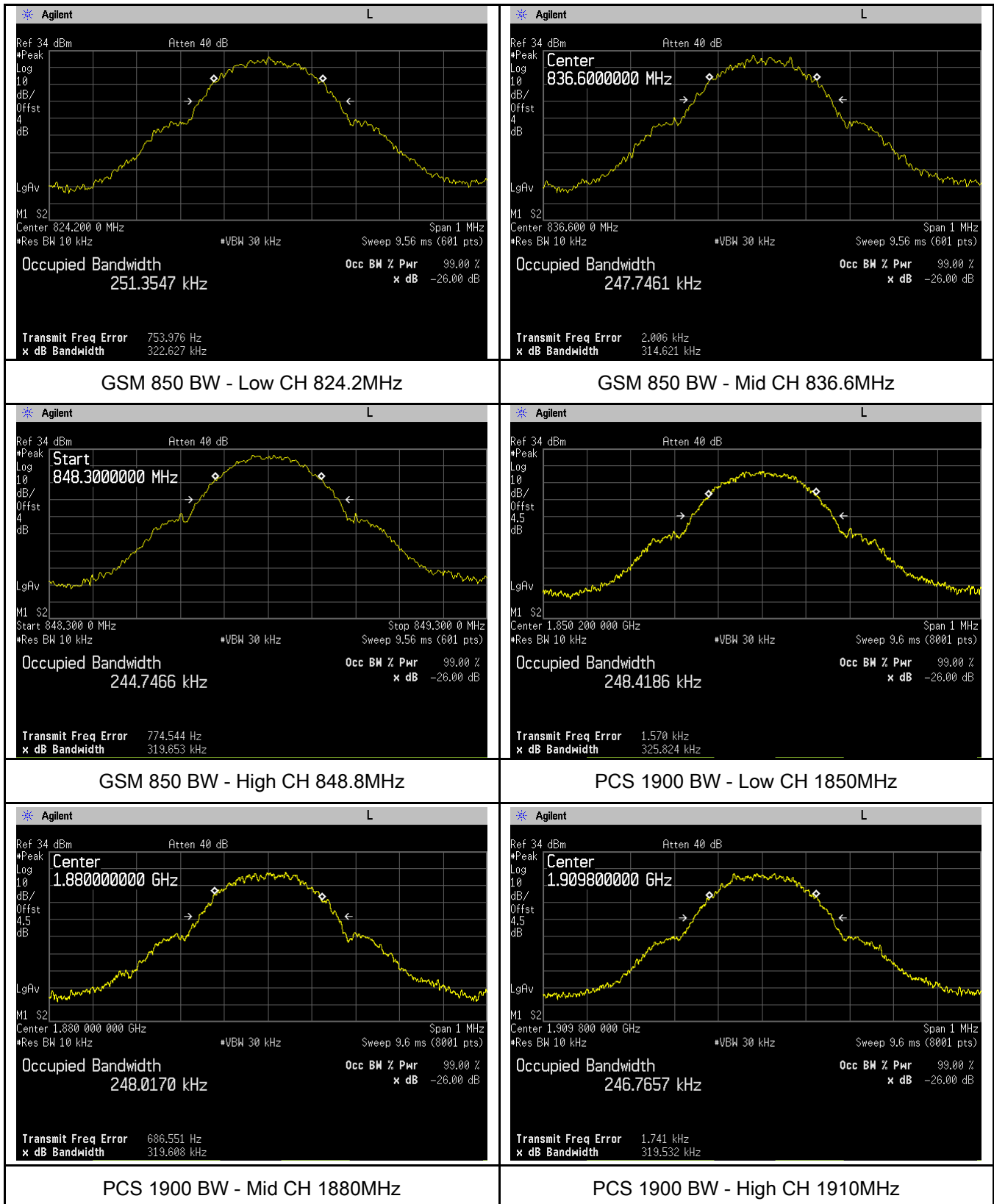
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
9262	1853	4.1848	4.763
9400	1880	4.1828	4.739
9538	1907	4.1700	4.701

Test Plots

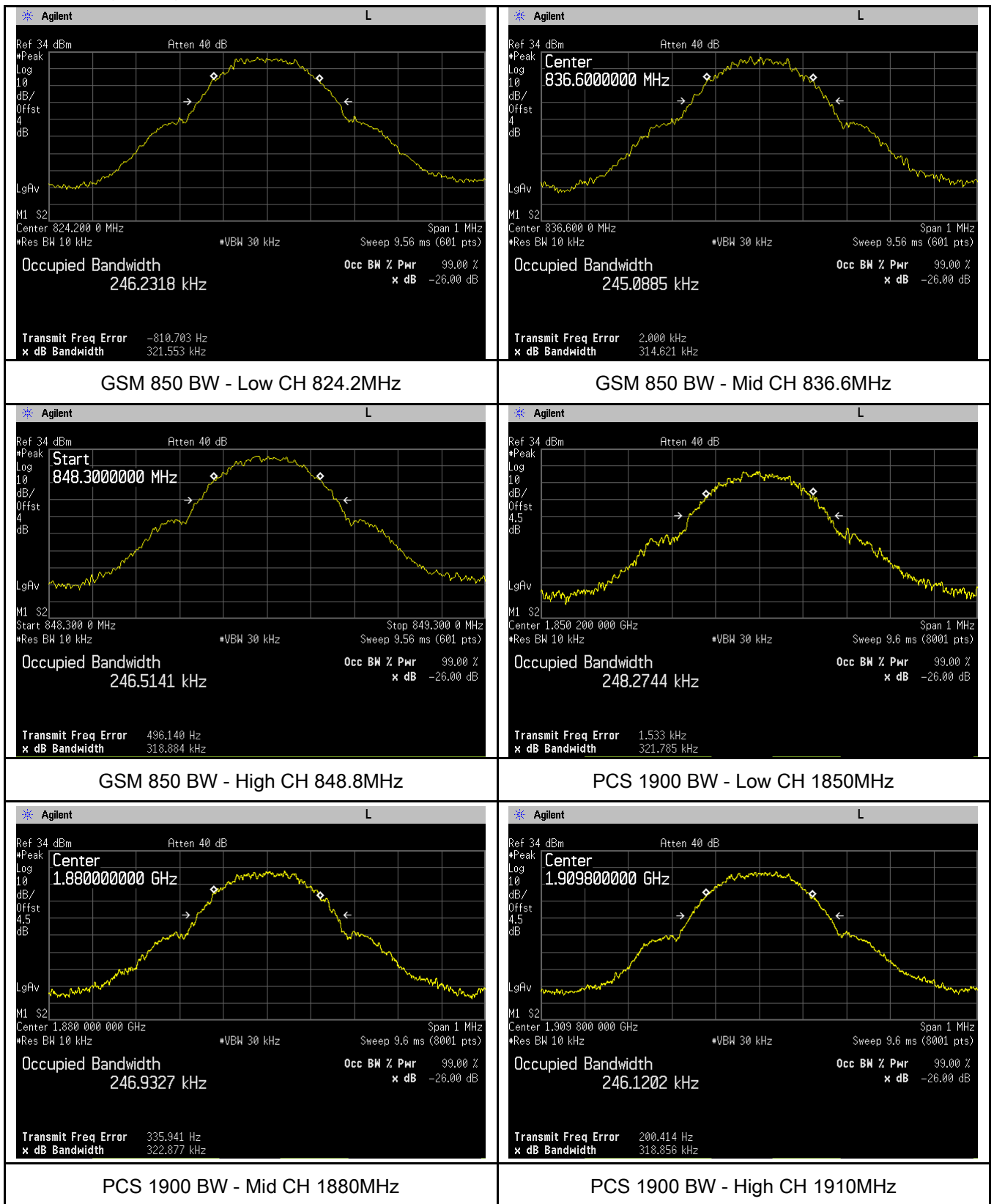
GSM Voice:



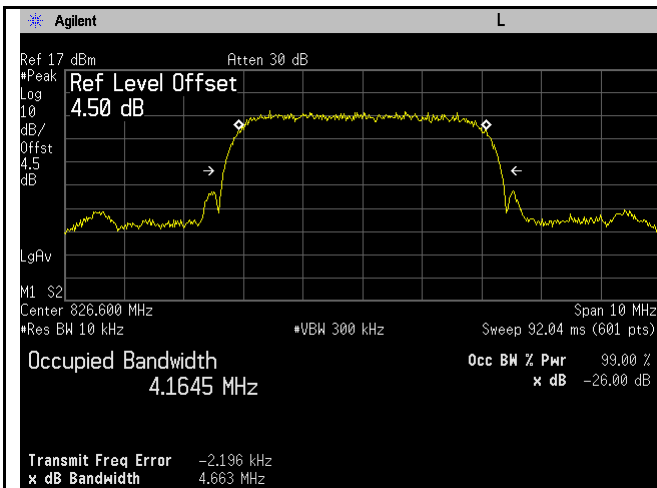
GPRS:



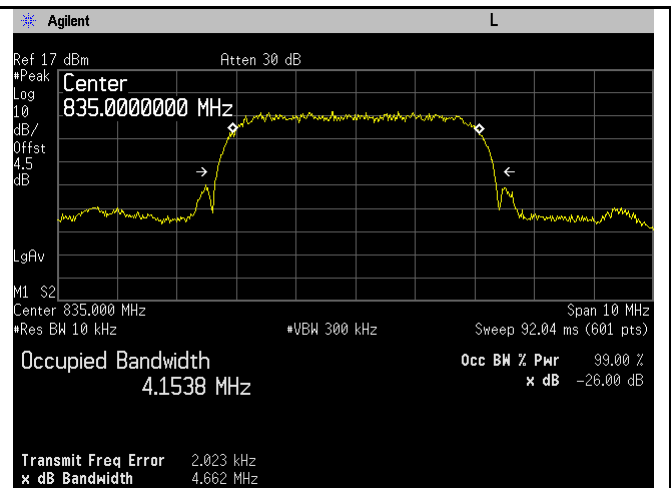
EGPRS (MCS1):



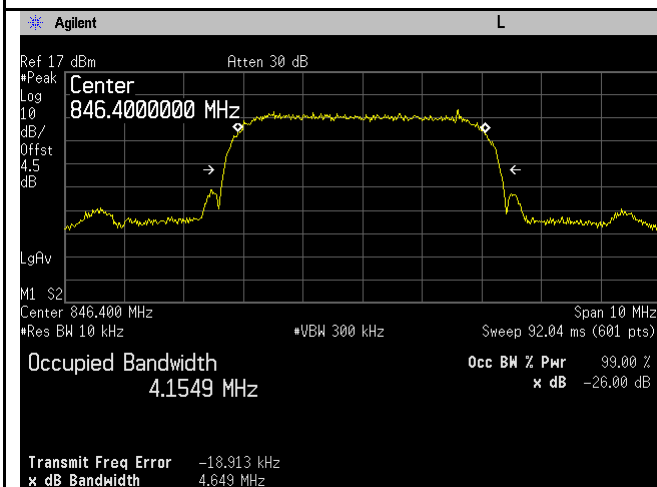
RMC:



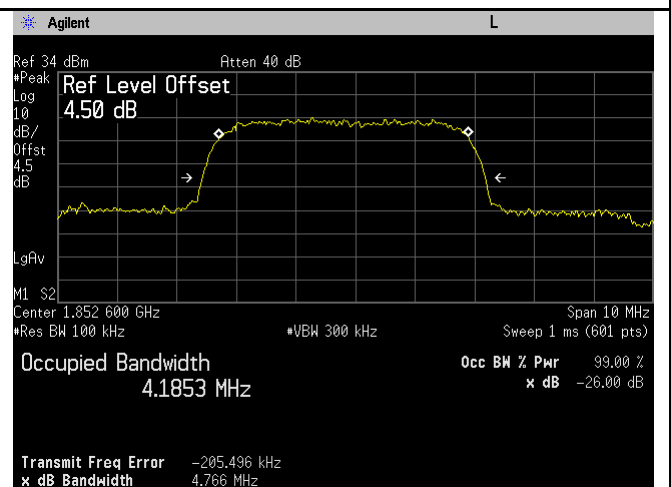
Band V BW - Low CH 826.6 MHz



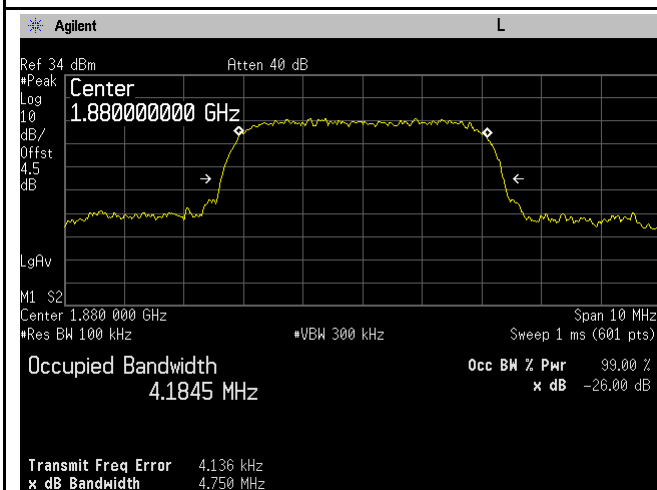
Band V BW - Mid CH 835.0 MHz



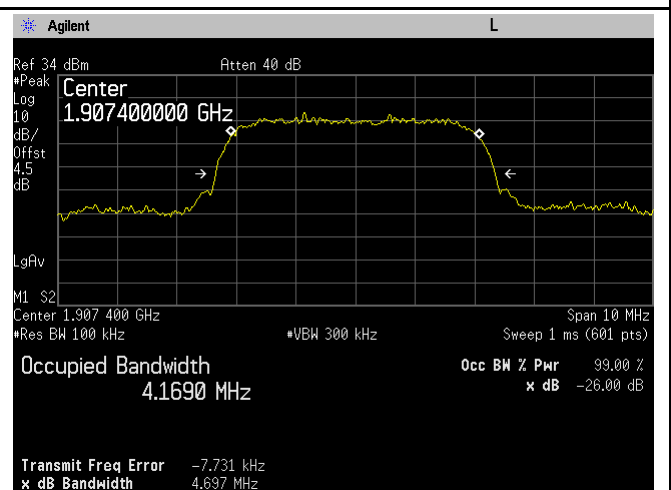
Band V BW - High CH 846.4 MHz



Band II BW - Low CH 1853MHz

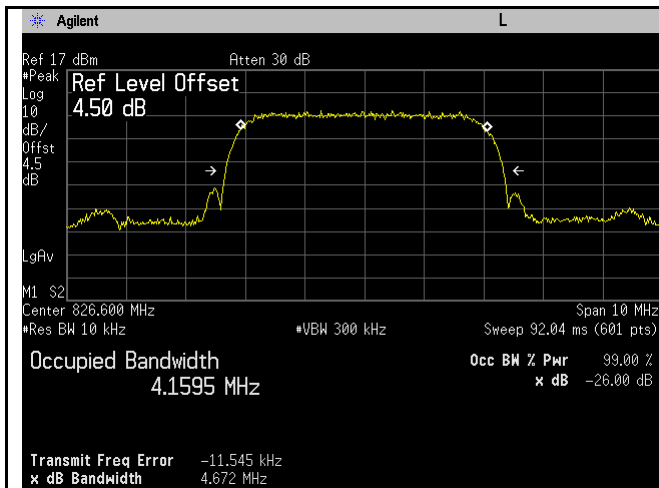


Band II BW - Mid CH 1880MHz

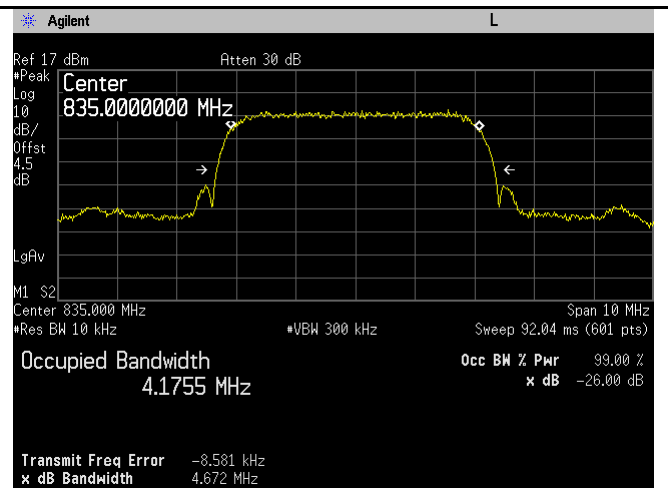


Band II BW - High CH 1907MHz

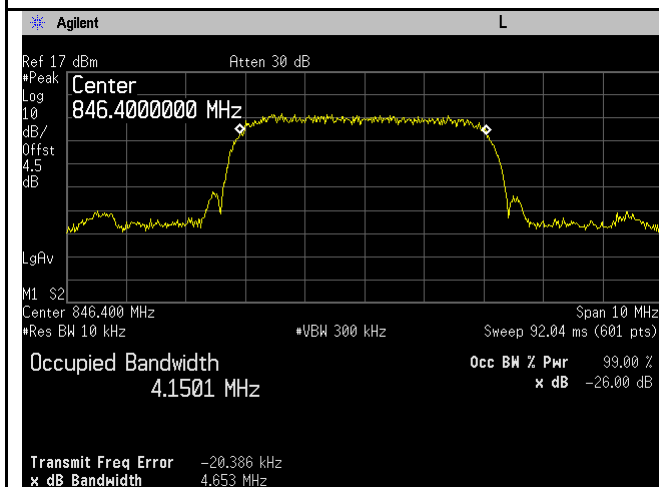
HSDPA:



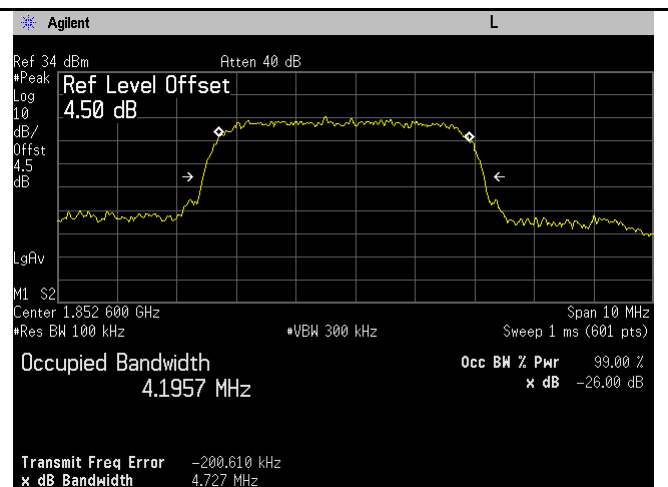
Band V BW - Low CH 826.6 MHz



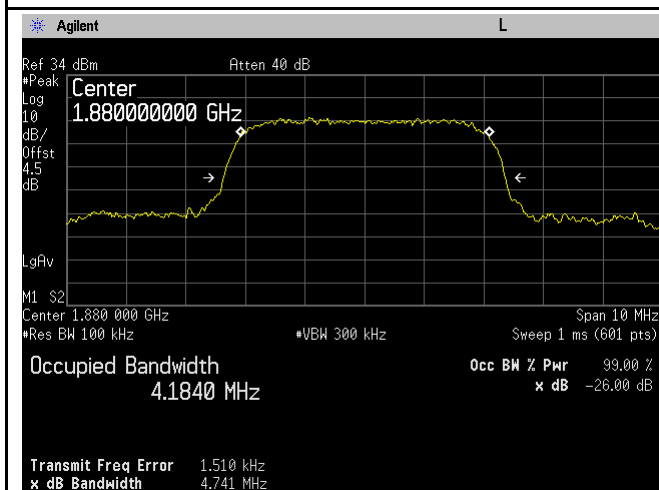
Band V BW - Mid CH 835.0 MHz



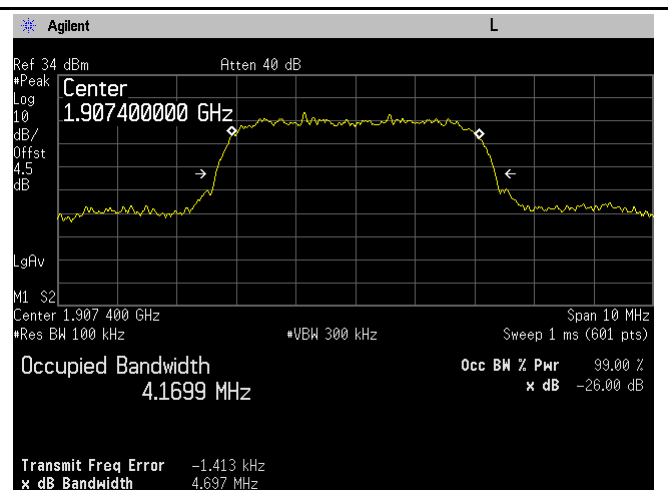
Band V BW - High CH 846.4 MHz



Band II BW - Low CH 1853MHz

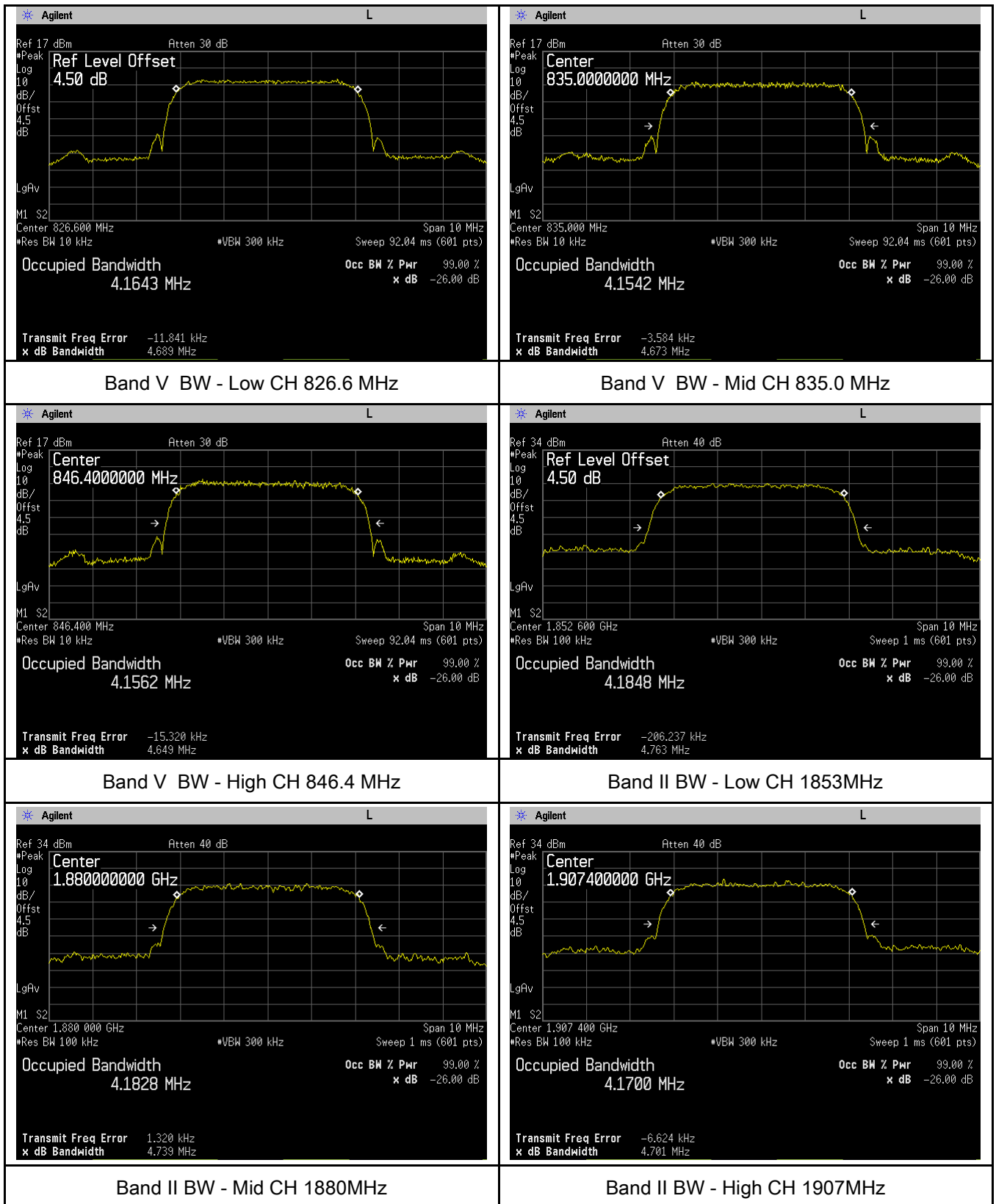


Band II BW - Mid CH 1880MHz



Band II BW - High CH 1907MHz

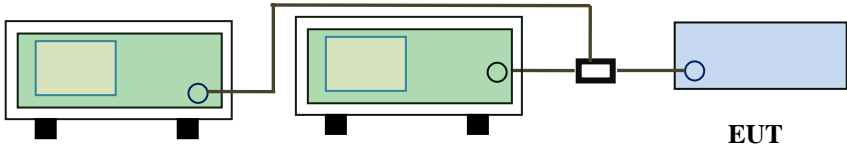
HSUPA:



6.5 Spurious Emissions at Antenna Terminals

Temperature	23 °C
Relative Humidity	52%
Atmospheric Pressure	1020mbar
Test date :	April 26, 2018
Tested By :	Aaron Liang

Requirement(s):

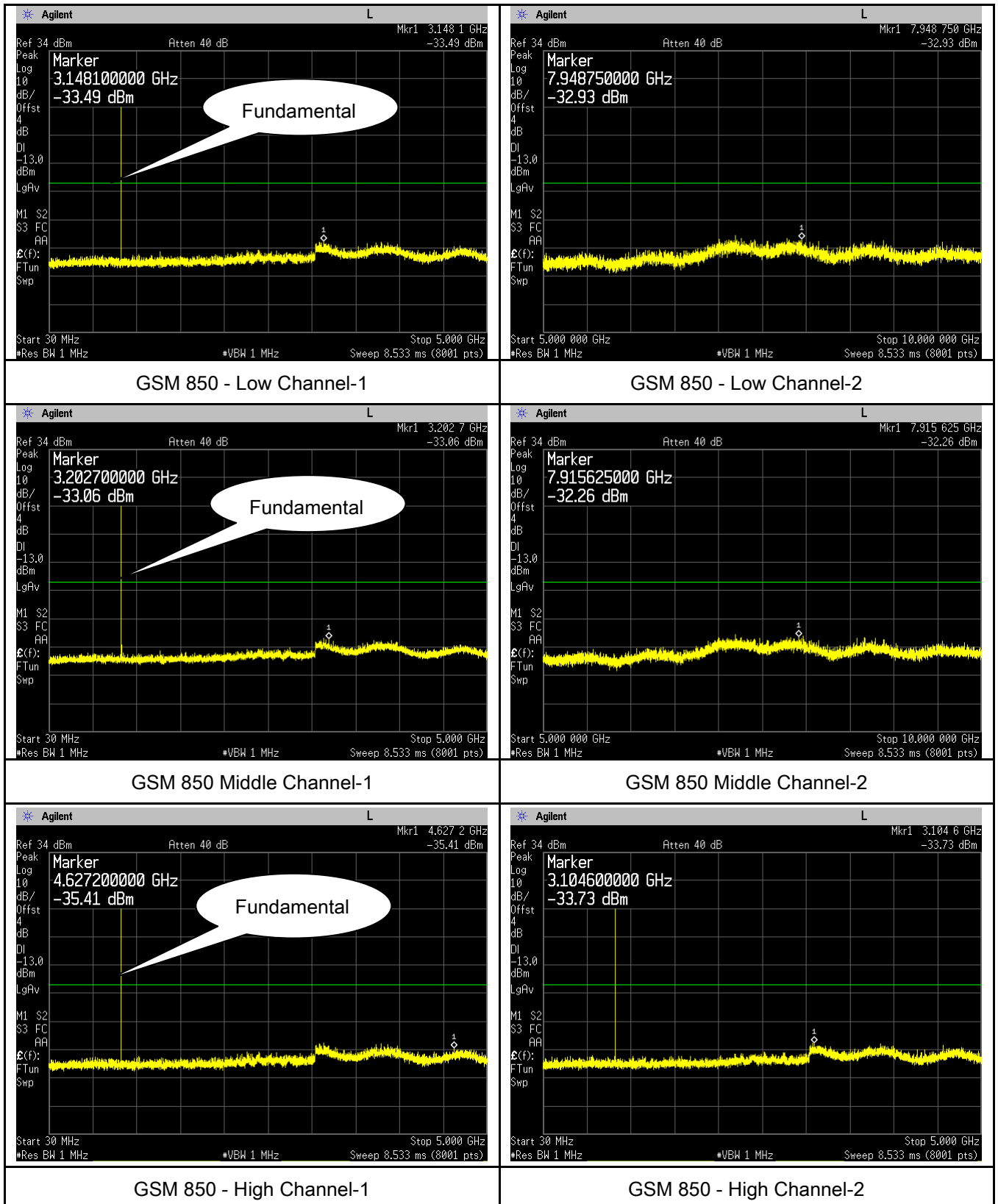
Spec	Item	Requirement	Applicable
§2.1051, §22.917(a)& §24.238(a)	a)	The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB	<input checked="" type="checkbox"/>
Test Setup	 <p style="text-align: center;">Base Station Spectrum Analyzer EUT</p>		
Test Procedure	<ul style="list-style-type: none"> - The EUT was connected to Spectrum Analyzer and Base Station via power divider. - The Band Edges of low and high channels for the highest RF powers were measured. - Setting RBW as roughly BW/100. 		
Remark			
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail		

Test Data ☒ Yes ☐ N/A
 Test Plot ☒ Yes (See below) ☐ N/A

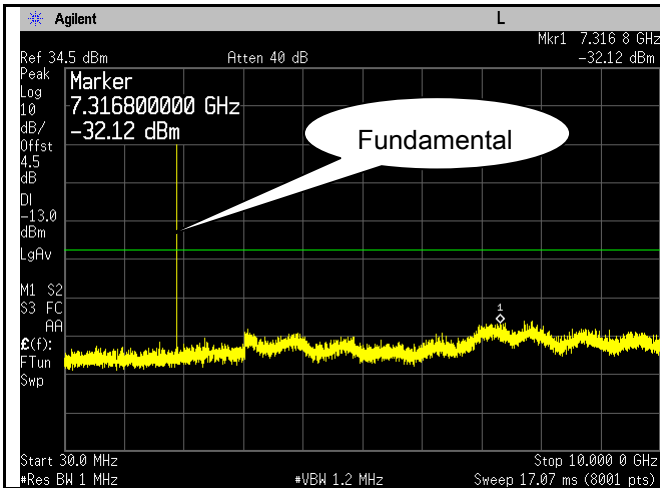
Test Plots

GSM Voice:

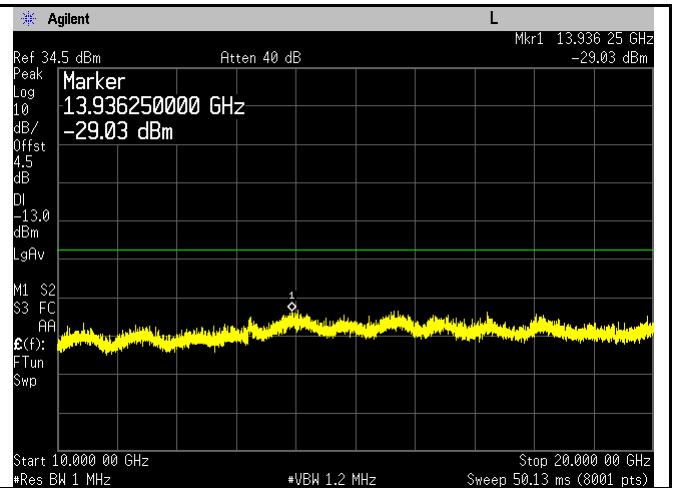
Cellular Band (Part 22H) result



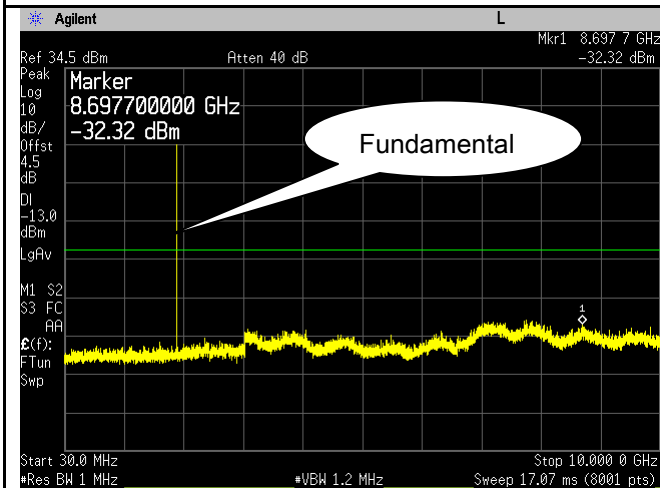
PCS Band (Part24E) result



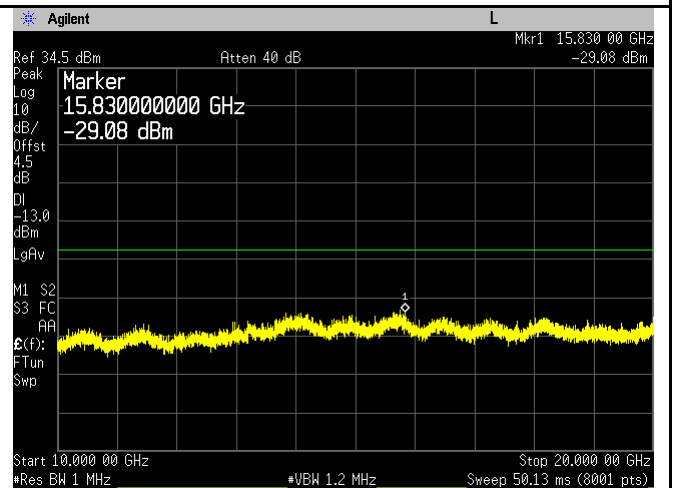
PCS1900 - Low Channel-1



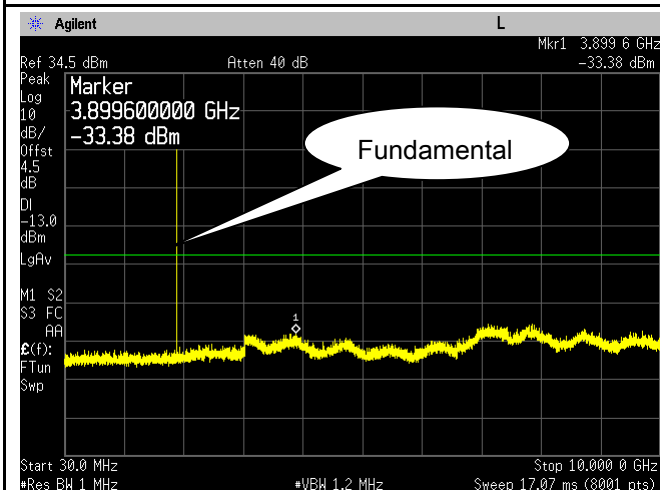
PCS 1900 - Low Channel-2



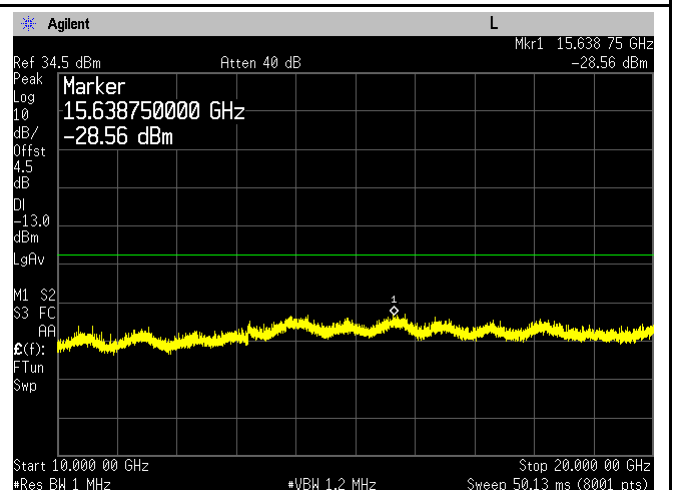
PCS1900 - Middle Channel-1



PCS 1900 - Middle Channel-2



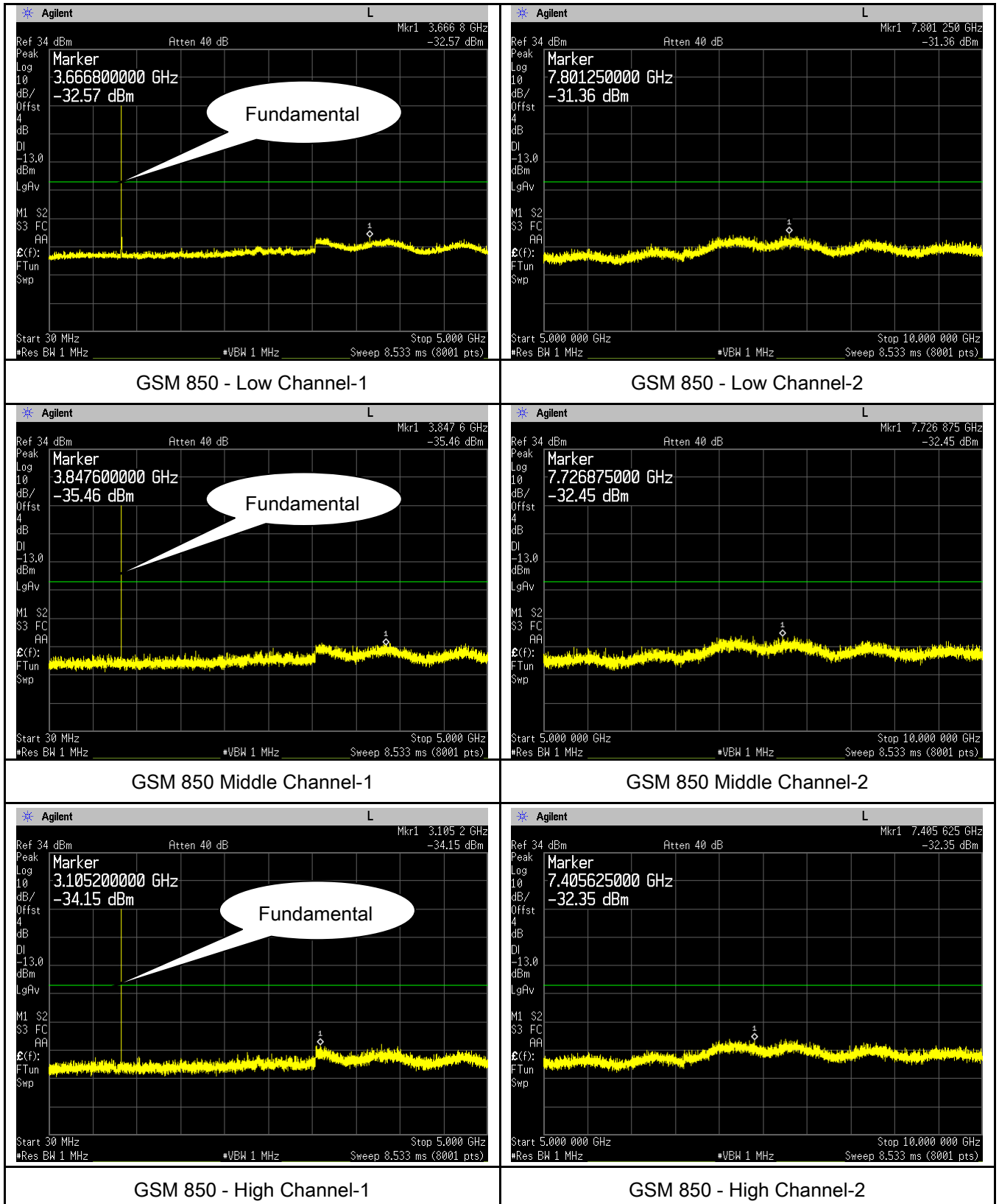
PCS1900 - High Channel-1



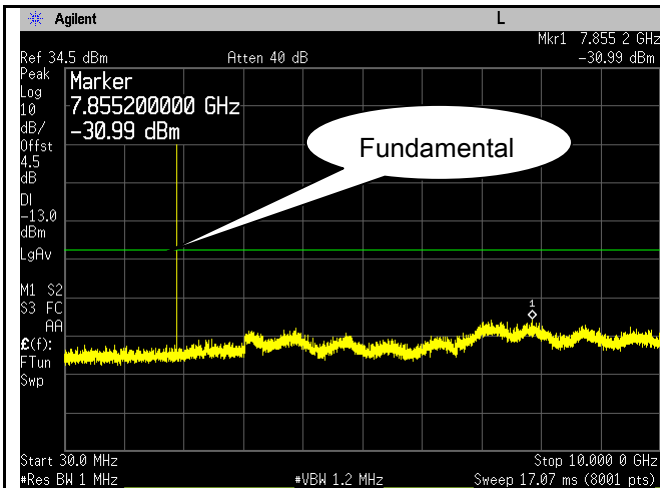
PCS 1900 - High Channel-2

GPRS:

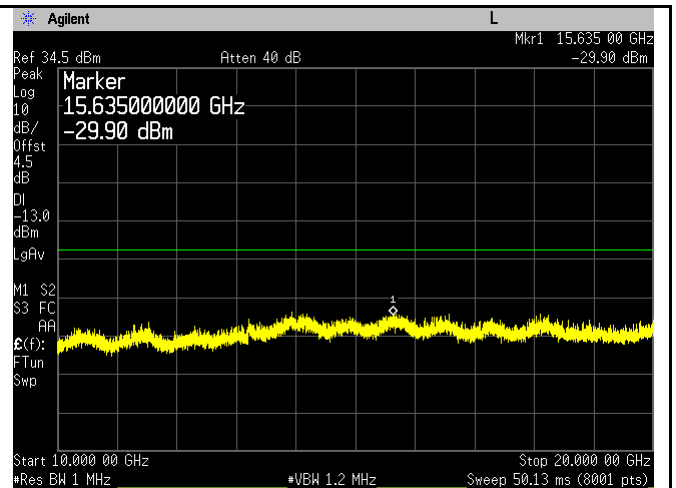
Cellular Band (Part 22H) result



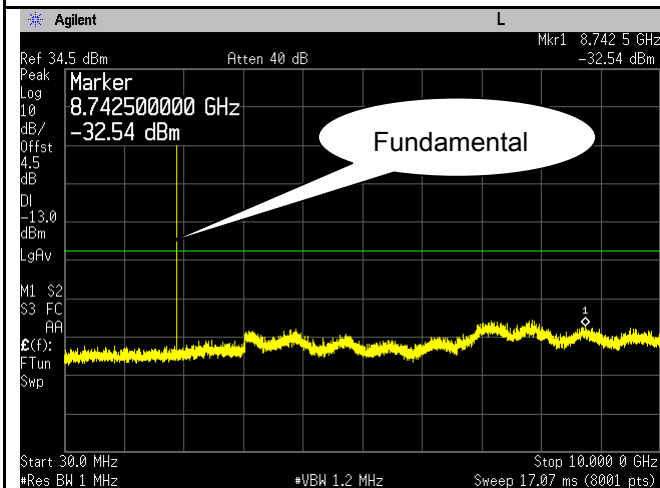
PCS Band (Part24E) result



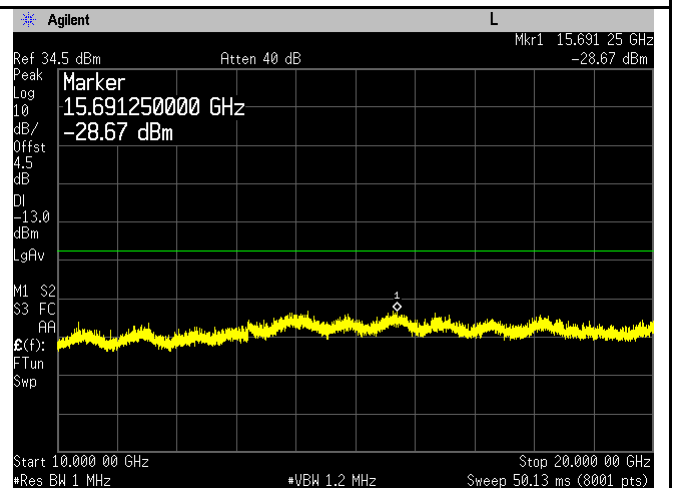
PCS1900 - Low Channel-1



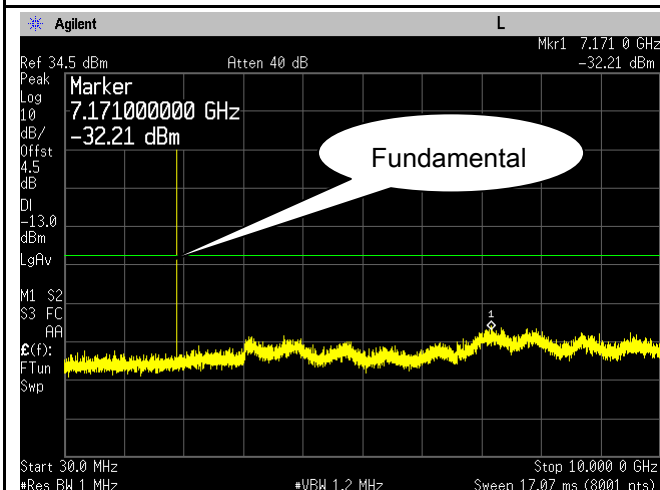
PCS 1900 - Low Channel-2



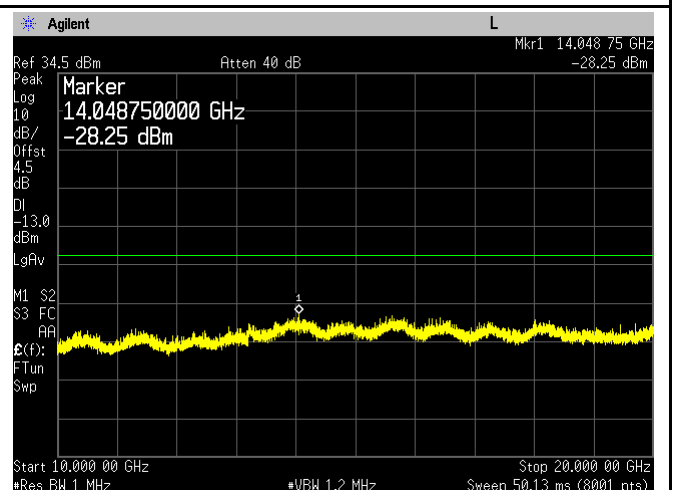
PCS1900 - Middle Channel-1



PCS 1900 - Middle Channel-2



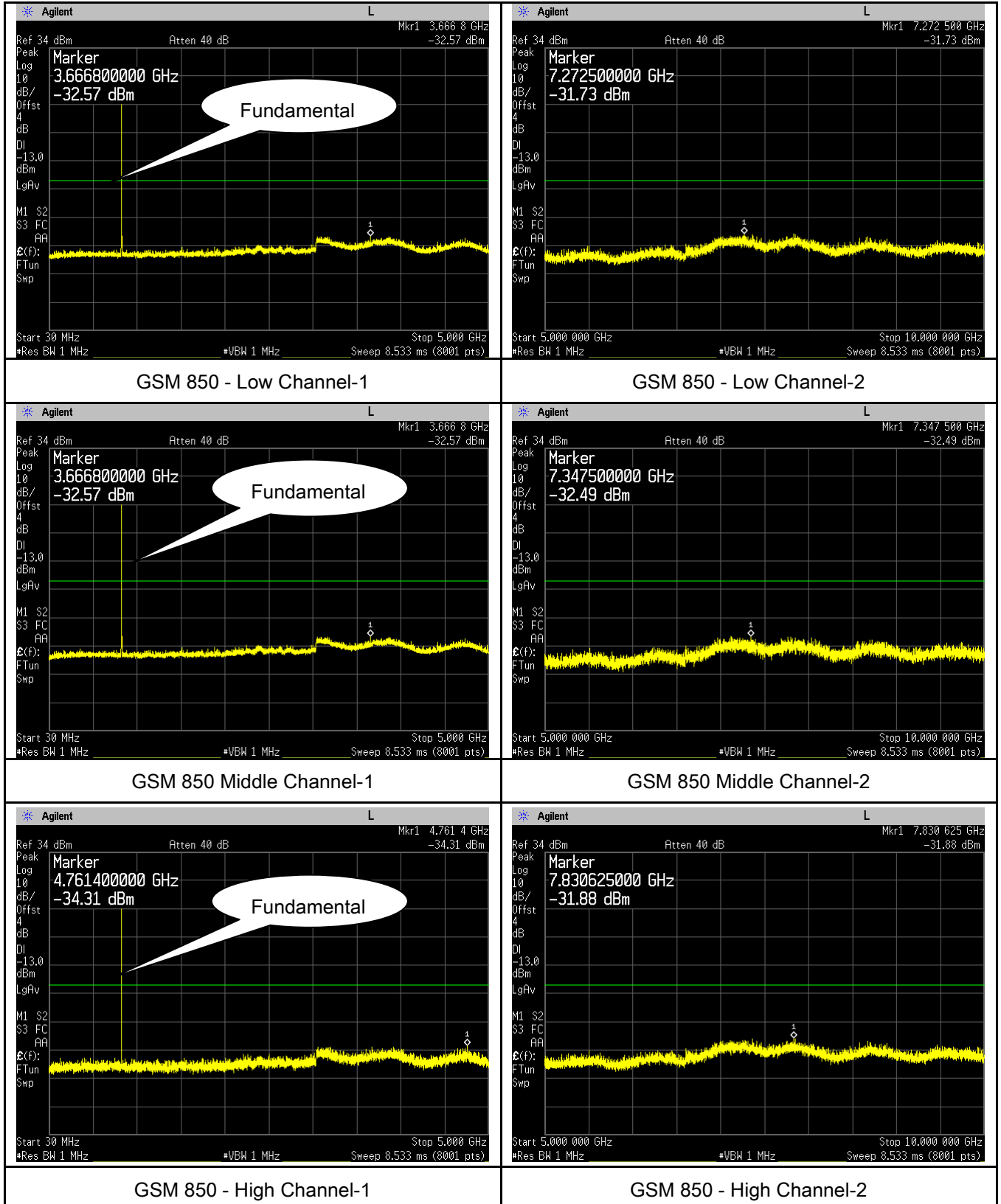
PCS1900 - High Channel-1



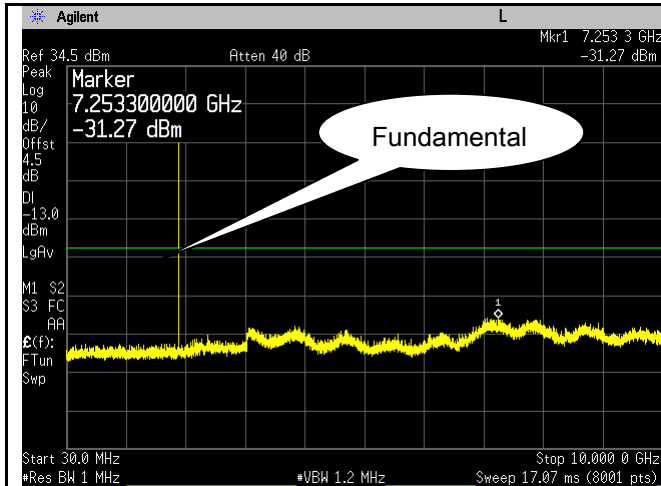
PCS 1900 - High Channel-2

EGPRS (MSC 1):

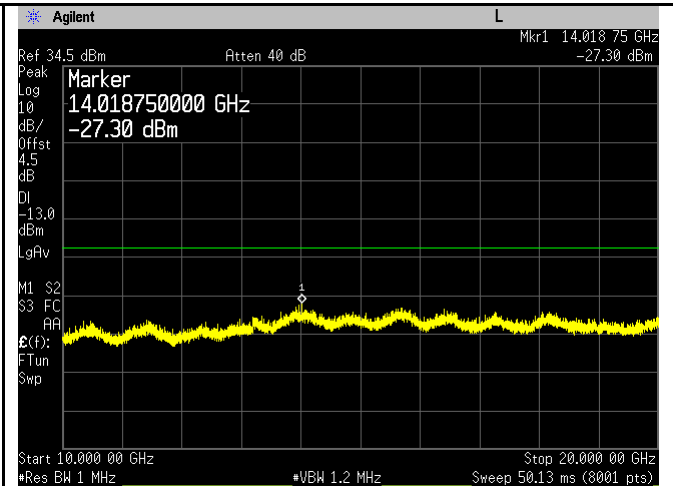
Cellular Band (Part 22H) result



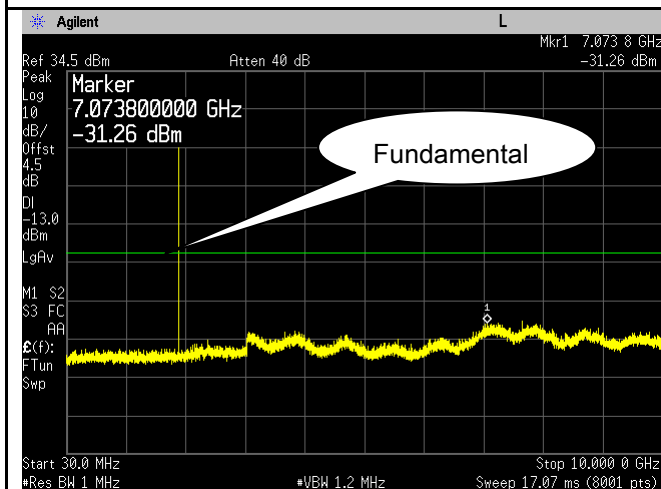
PCS Band (Part24E) result



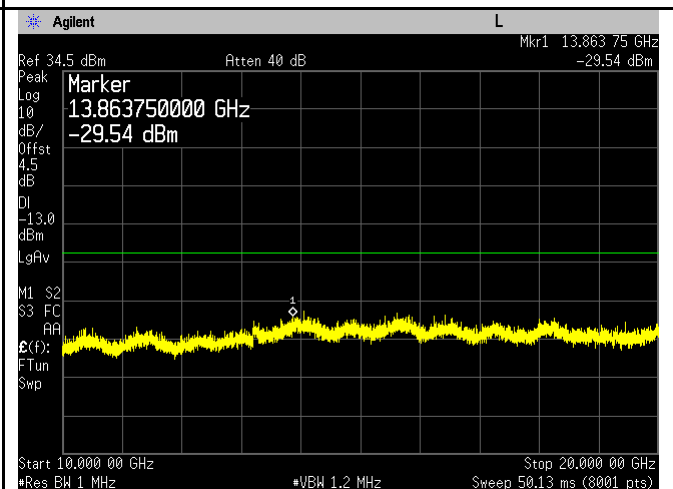
PCS1900 - Low Channel-1



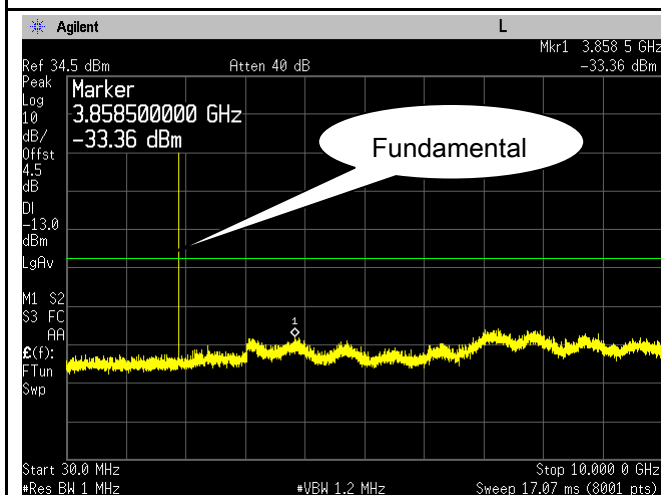
PCS 1900 - Low Channel-2



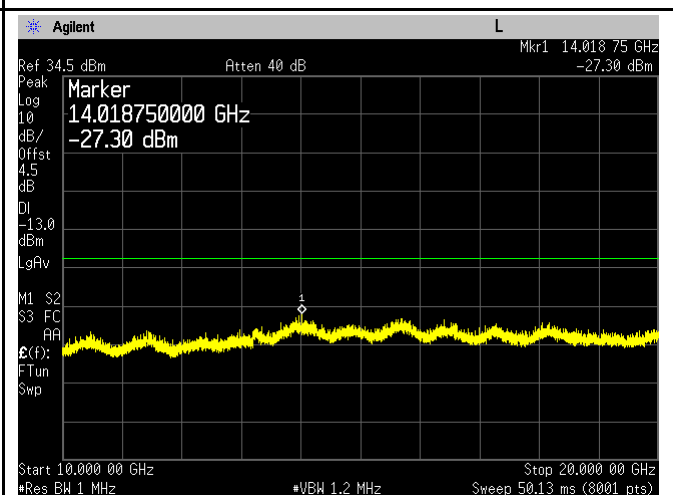
PCS1900 - Middle Channel-1



PCS 1900 - Middle Channel-2



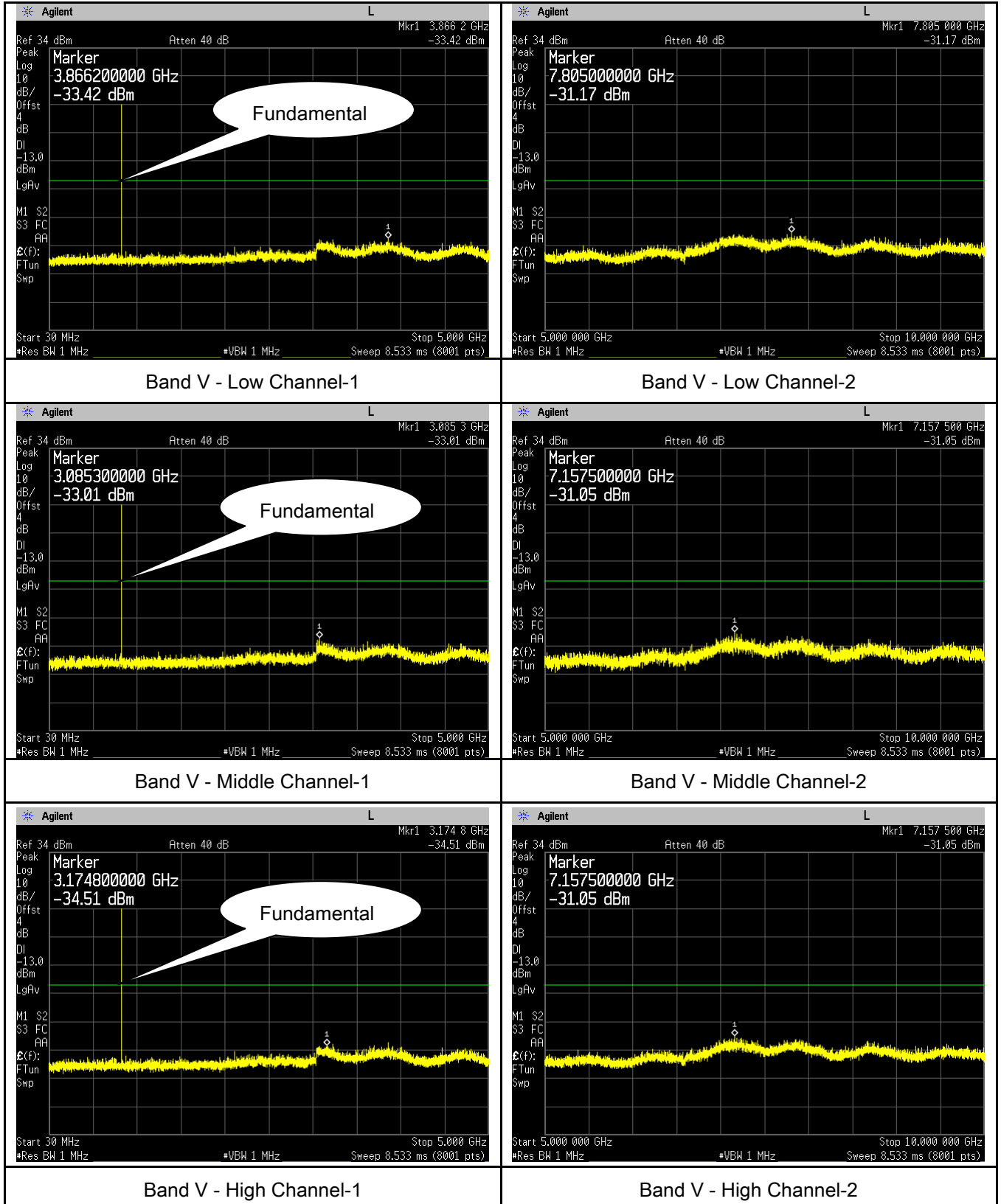
PCS1900 - High Channel-1



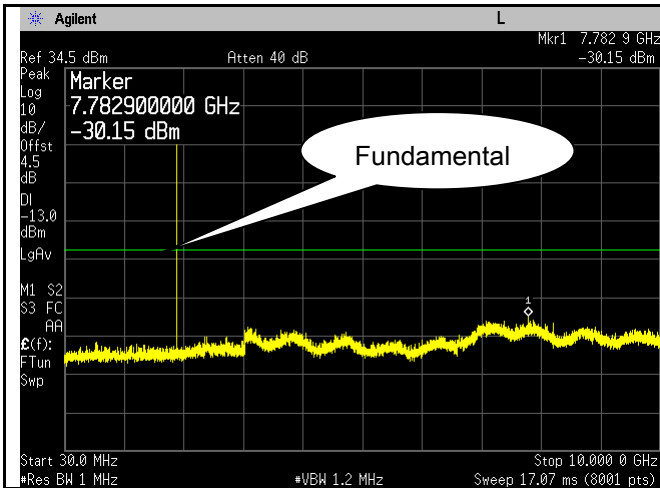
PCS 1900 - High Channel-2

RMC

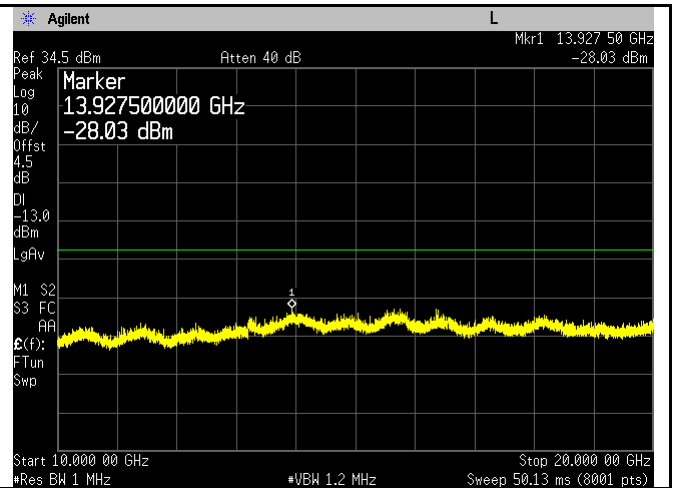
UMTS-FDD Band V (Part 22H)



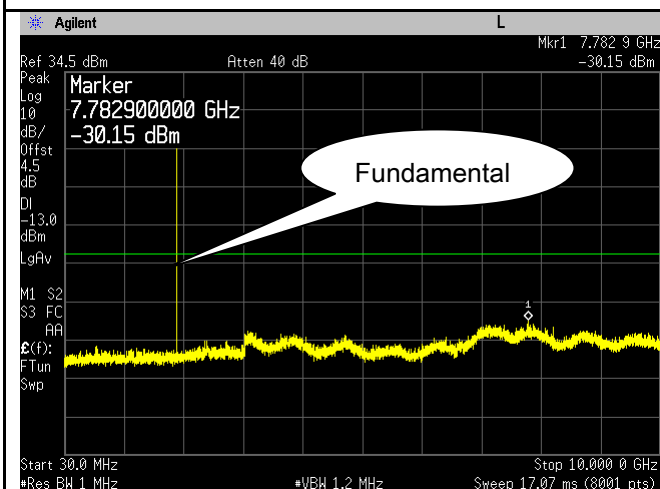
UMTS-FDD Band II (Part 24E)



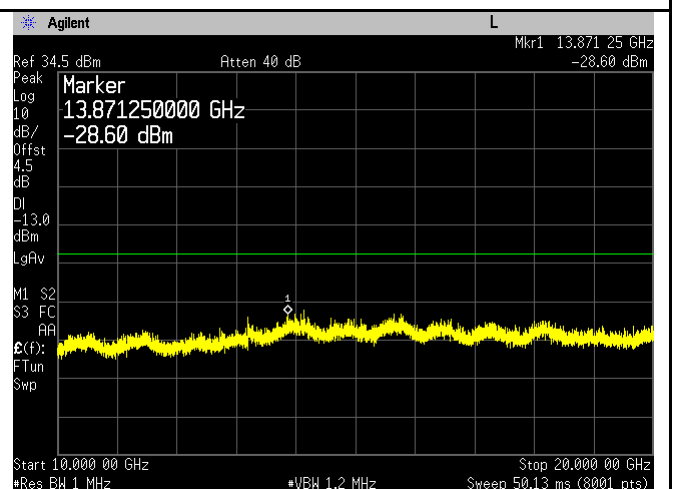
Band II - Low Channel-1



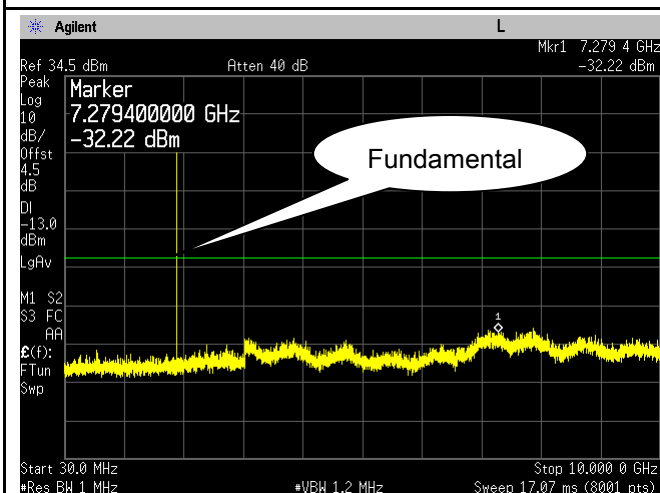
Band II - Low Channel-2



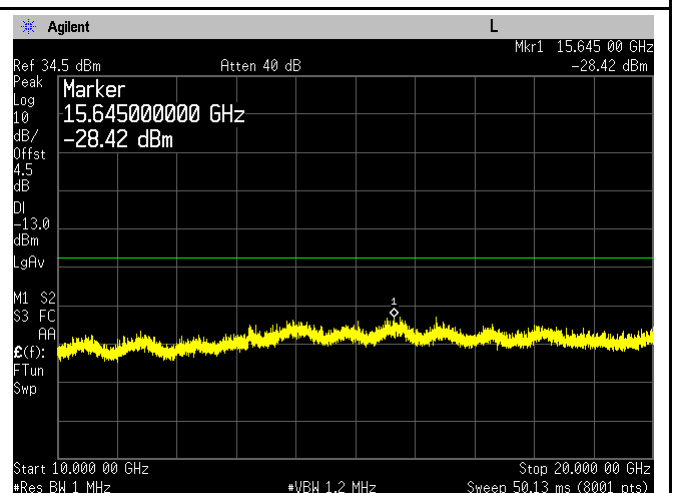
Band II - Middle Channel-1



Band II - Middle Channel-2



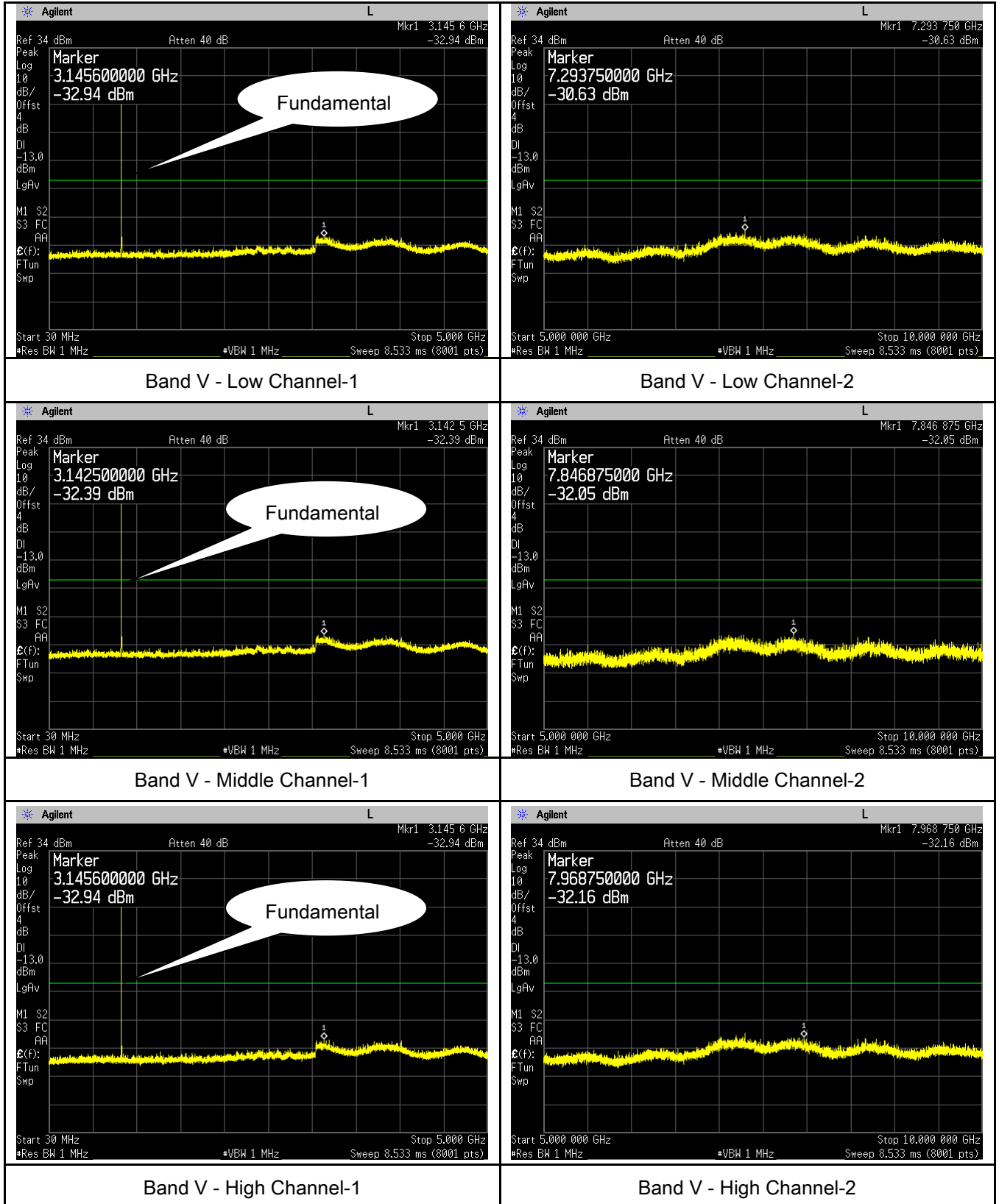
Band II - High Channel-1



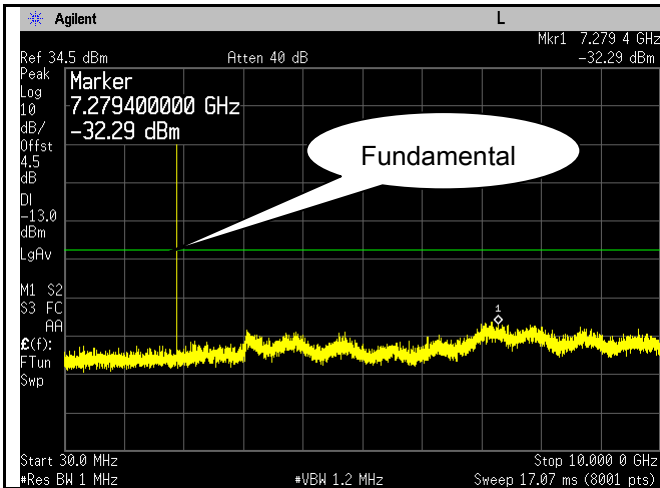
Band II - High Channel-2

HSDPA:

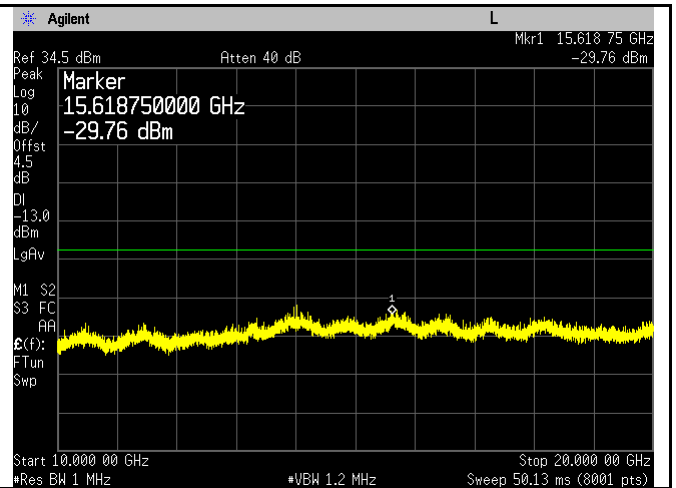
UMTS-FDD Band V (Part 22H)



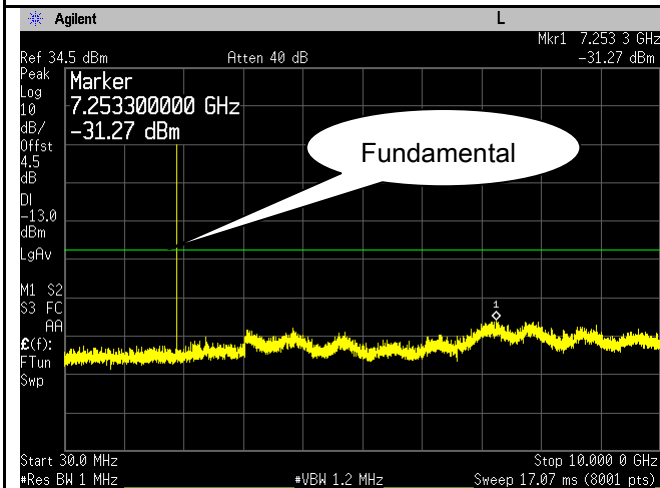
UMTS-FDD Band II (Part 24E)



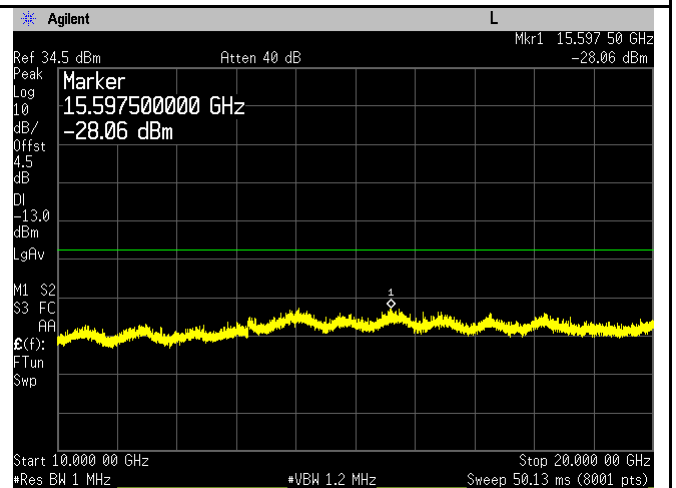
Band II - Low Channel-1



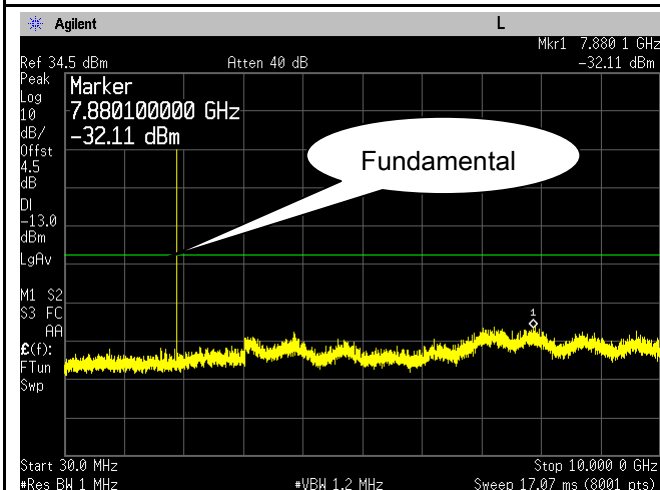
Band II - Low Channel-2



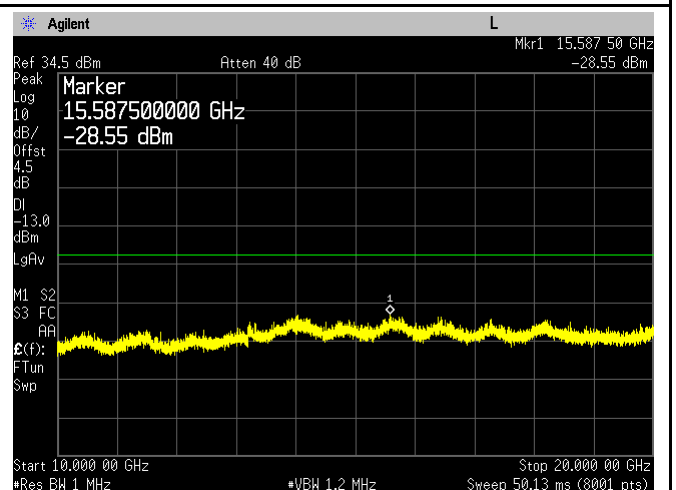
Band II - Middle Channel-1



Band II - Middle Channel-2



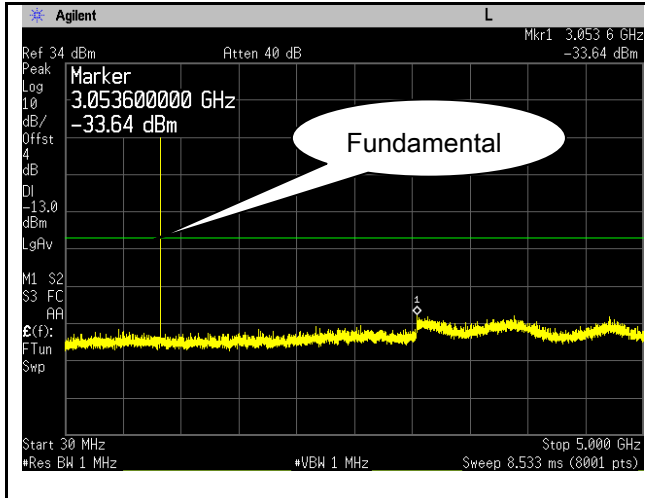
Band II - High Channel-1



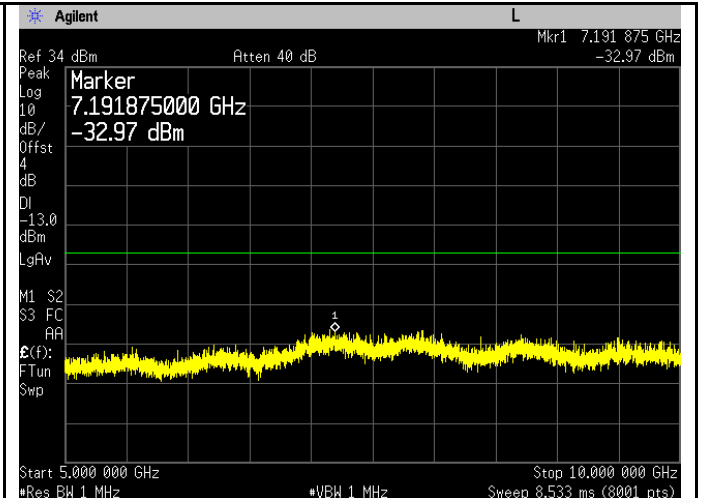
Band II - High Channel-2

HSUPA:

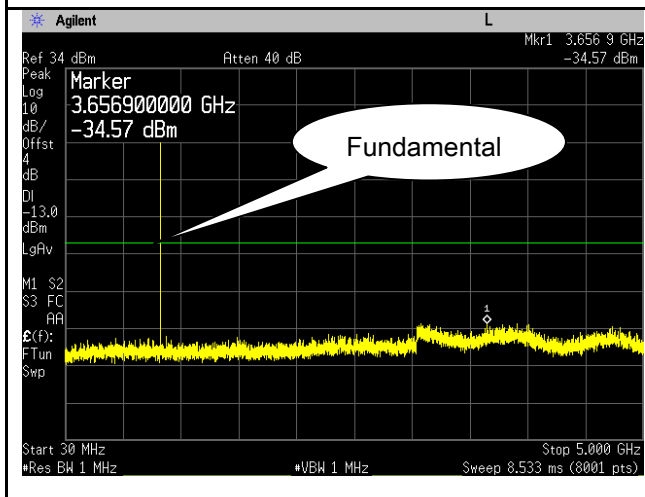
UMTS-FDD Band V (Part 22H)



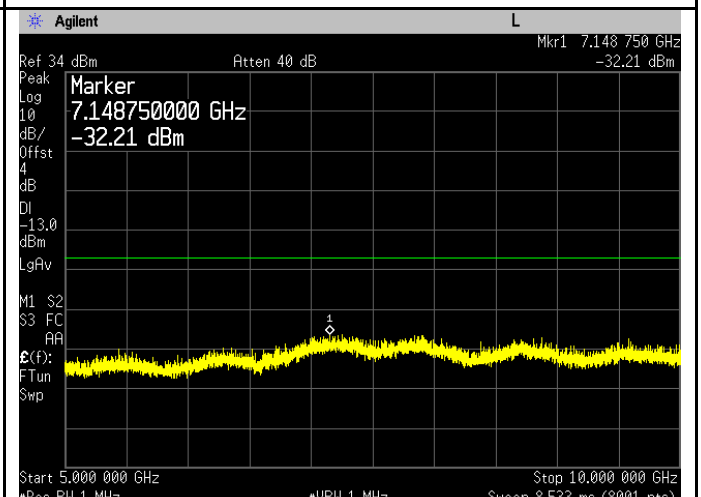
Band V - Low Channel-1



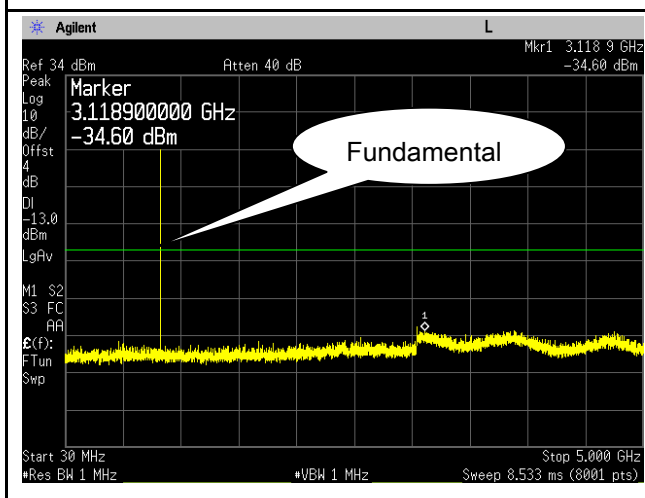
Band V - Low Channel-2



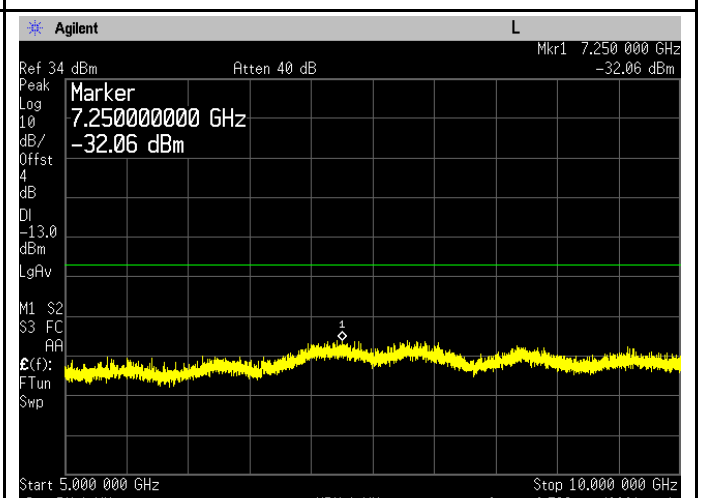
Band V - Middle Channel-1



Band V - Middle Channel-2

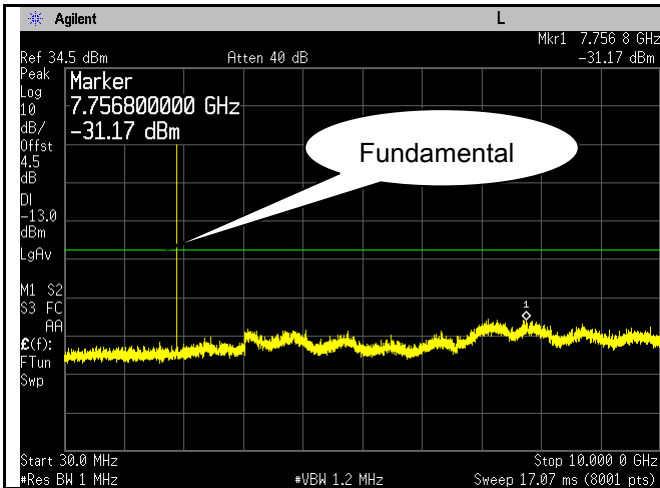


Band V - High Channel-1

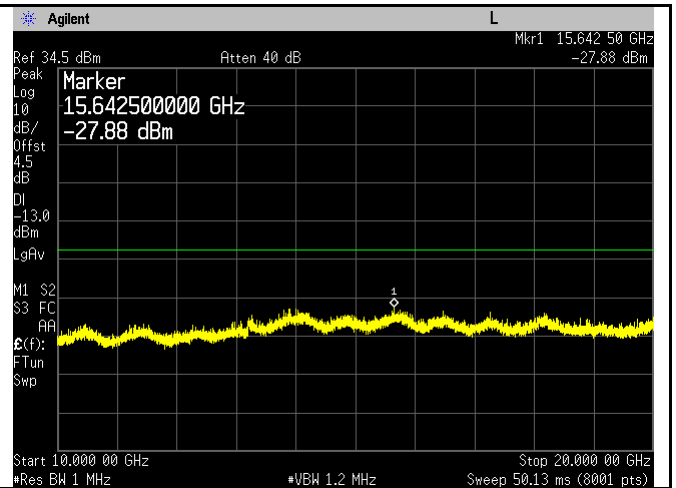


Band V - High Channel-2

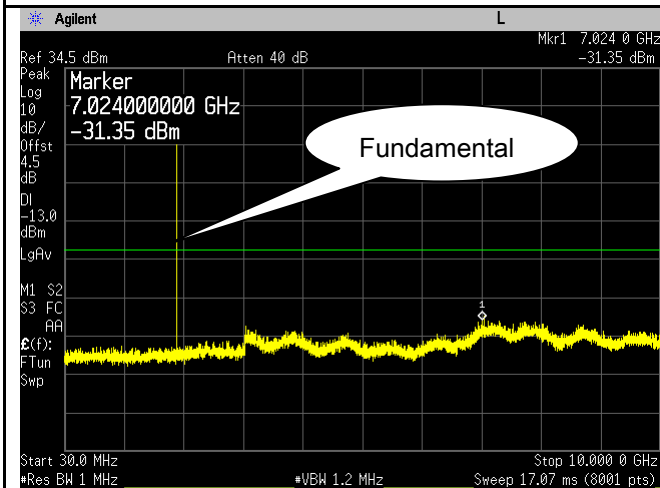
UMTS-FDD Band II (Part 24E)



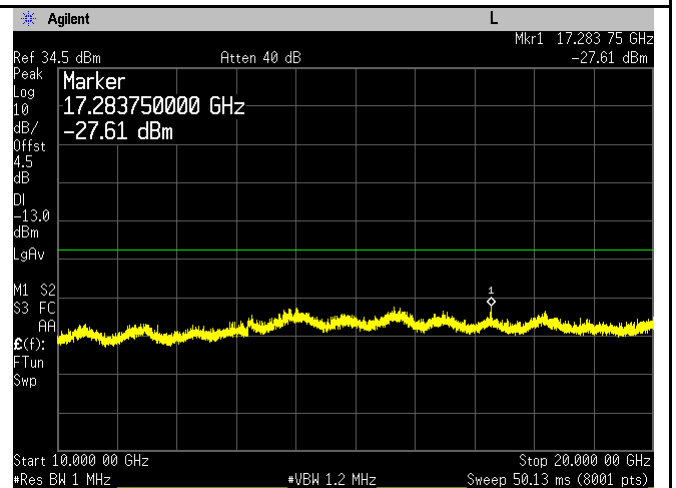
Band II - Low Channel-1



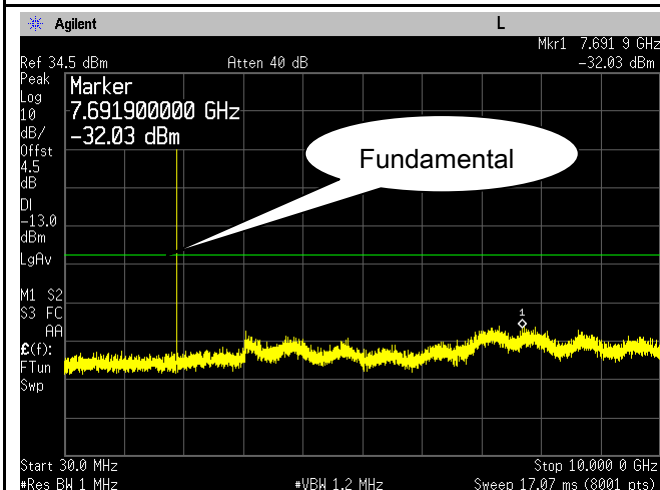
Band II - Low Channel-2



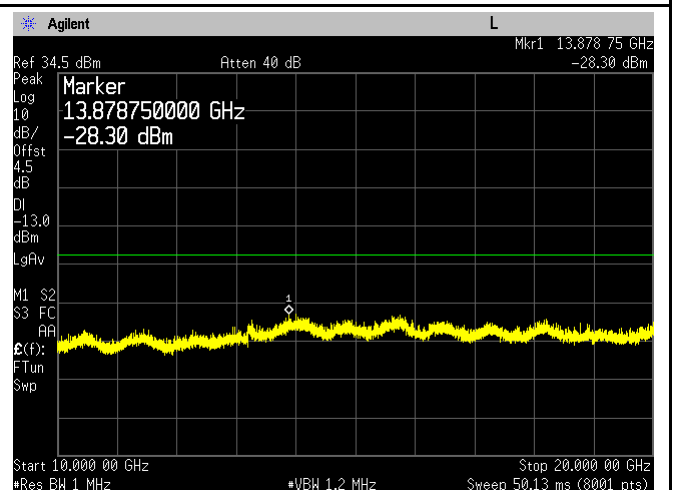
Band II - Middle Channel-1



Band II - Middle Channel-2



Band II - High Channel-1



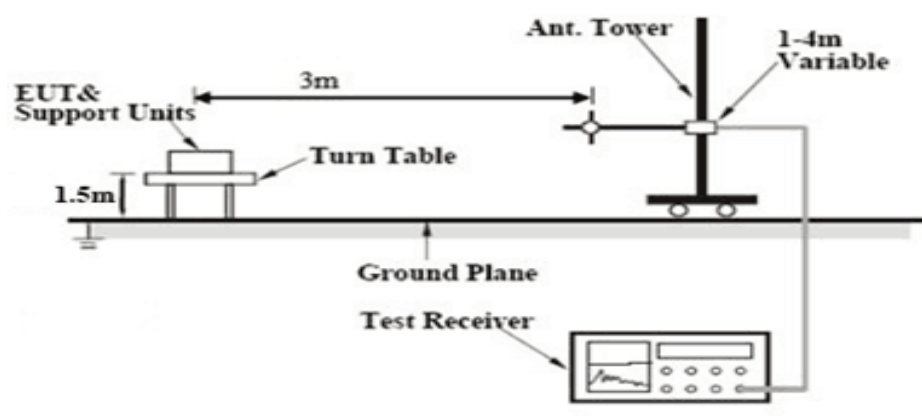
Band II - High Channel-2

6.6 Spurious Radiated Emissions

Temperature	23 °C
Relative Humidity	52%
Atmospheric Pressure	1020mbar
Test date :	April 26, 2018
Tested By :	Aaron Liang

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	
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Test Procedure	<ol style="list-style-type: none"> The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable. 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. 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. <p>Sample Calculation:</p> <p>EUT Field Strength = Raw Amplitude (dBμV/m) – Amplifier Gain (dB) + Antenna Factor (dB) + Cable Loss (dB) + Filter Attenuation (dB, if used)</p>
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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)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1648.4	V	-23.91	-13	-10.91
1648.4	H	-31.67	-13	-18.67
624.41	V	-38.88	-13	-25.88
316.45	H	-37.87	-13	-24.87

Middle channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1673.2	V	-28.53	-13	-15.53
1673.2	H	-32.79	-13	-19.79
757.88	V	-35.96	-13	-22.96
812.9	H	-39.71	-13	-26.71

High channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1697.6	V	-26.44	-13	-13.44
1697.6	H	-25.09	-13	-12.09
685.51	V	-39.98	-13	-26.98
267.87	H	-34.23	-13	-21.23

Note:

1, The testing has been conformed to $10 \times 848.8 \text{ MHz} = 8,488 \text{ MHz}$

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.

5, The radiated spurious test above 18GHz is subcontracted to SIEMIC (Nanjing-China) Laboratories. and found 30dB below the limit at least.

PCS Band (Part24E) result

Low channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3700.4	V	-30.44	-13	-17.44
3700.4	H	-34.82	-13	-21.82
784.56	V	-40.81	-13	-27.81
601.51	H	-39.27	-13	-26.27

Middle channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3760	V	-37.17	-13	-24.17
3760	H	-36.92	-13	-23.92
218.27	V	-33.81	-13	-20.81
634.56	H	-37.78	-13	-24.78

High channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3819.6	V	-32	-13	-19
3819.6	H	-33.75	-13	-20.75
418.54	V	-38.76	-13	-25.76
738.77	H	-41.68	-13	-28.68

Note:

1, The testing has been conformed to $10 \times 1909.8 \text{ MHz} = 19,098 \text{ MHz}$

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.

5, The radiated spurious test above 18GHz is subcontracted to SIEMIC (Nanjing-China) Laboratories. and found 30dB below the limit at least.

UMTS-FDD Band V (Part 22H)

Low channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1652.8	V	-33.45	-13	-20.45
1652.8	H	-30.74	-13	-17.74
796.7	V	-36.33	-13	-23.33
778.27	H	-35.88	-13	-22.88

Middle channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1670	V	-27.89	-13	-14.89
1670	H	-29.73	-13	-16.73
678.19	V	-38.6	-13	-25.6
693.09	H	-38.84	-13	-25.84

High channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1693.2	V	-27.71	-13	-14.71
1693.2	H	-32.05	-13	-19.05
406.42	V	-39.9	-13	-26.9
451.64	H	-34.28	-13	-21.28

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.

5, The radiated spurious test above 18GHz is subcontracted to SIEMIC (Nanjing-China) Laboratories. and found 30dB below the limit at least.

UMTS-FDD Band II (Part 24E)

Low channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3704.8	V	-37.78	-13	-24.78
3704.8	H	-39.03	-13	-26.03
723.41	V	-40.17	-13	-27.17
637.7	H	-41.93	-13	-28.93

Middle channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3760	V	-30.41	-13	-17.41
3760	H	-29.67	-13	-16.67
274.17	V	-34.15	-13	-21.15
578.4	H	-38.24	-13	-25.24

High channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3815.2	V	-30.58	-13	-17.58
3815.2	H	-33.86	-13	-20.86
606.89	V	-34.18	-13	-21.18
631.67	H	-36.06	-13	-23.06

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

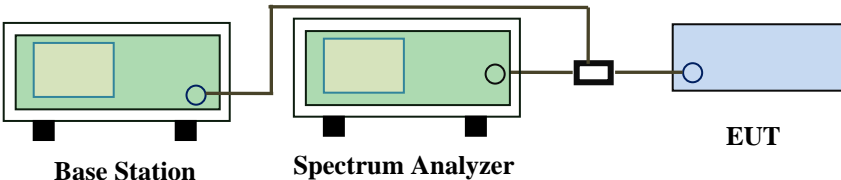
4, X-Axis, Y-Axis and Z-Axis were investigated. The results above show only the worst case

5, The radiated spurious test above 18GHz is subcontracted to SIEMIC (Nanjing-China) Laboratories. and found 30dB below the limit at least.

6.7 Band Edge

Temperature	23 °C
Relative Humidity	52%
Atmospheric Pressure	1020mbar
Test date :	April 26, 2018
Tested By :	Aaron Liang

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>Base Station Spectrum Analyzer EUT</p>		
Procedure	<ul style="list-style-type: none"> - The EUT was connected to Spectrum Analyzer and Base Station via power divider. - The Band Edges of low and high channels for the highest RF powers were measured. Setting RBW as roughly BW/100. 		
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)
823.984	-15.86	-13
849.003	-16.19	-13

PCS Band (Part24E) result

Frequency (MHz)	Emission (dBm)	Limit (dBm)
1849.989	-15.82	-13
1910.003	-15.80	-13

GPRS:

Cellular Band (Part 22H) result

Frequency (MHz)	Emission (dBm)	Limit (dBm)
823.988	-14.67	-13
849.005	-20.71	-13

PCS Band (Part24E) result

Frequency (MHz)	Emission (dBm)	Limit (dBm)
1849.992	-14.33	-13
1910.005	-15.52	-13

EGPRS (MSC1):

Cellular Band (Part 22H) result

Frequency (MHz)	Emission (dBm)	Limit (dBm)
823.995	-15.81	-13
849.002	-17.52	-13

PCS Band (Part24E) result

Frequency (MHz)	Emission (dBm)	Limit (dBm)
1849.990	-15.21	-13
1910.005	-15.52	-13

RMC:

UMTS-FDD Band V (Part 22H)

Frequency (MHz)	Emission (dBm)	Limit (dBm)
822.200	-27.50	-13
849.083	-24.59	-13

UMTS-FDD Band II (Part 24E)

Frequency (MHz)	Emission (dBm)	Limit (dBm)
1849.967	-26.53	-13
1910.017	-20.52	-13

HSDPA:

UMTS-FDD Band V (Part 22H)

Frequency (MHz)	Emission (dBm)	Limit (dBm)
822.200	-28.60	-13
849.017	-21.02	-13

UMTS-FDD Band II (Part 24E)

Frequency (MHz)	Emission (dBm)	Limit (dBm)
1849.967	-26.53	-13
1910.000	-19.37	-13

HSUPA:

UMTS-FDD Band V (Part 22H)

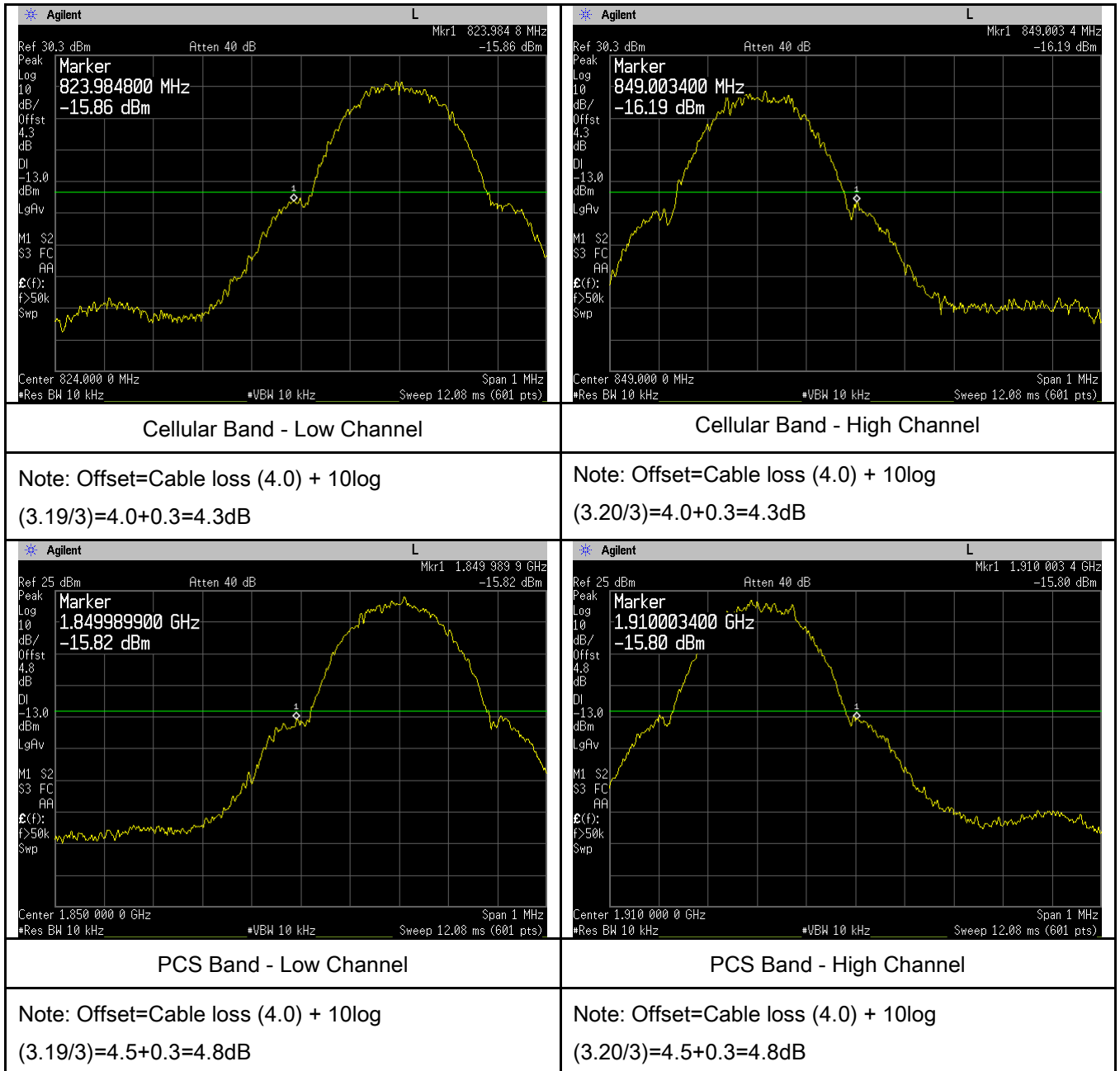
Frequency (MHz)	Emission (dBm)	Limit (dBm)
822.183	-29.83	-13
849.050	-22.87	-13

UMTS-FDD Band II (Part 24E)

Frequency (MHz)	Emission (dBm)	Limit (dBm)
1849.950	-27.29	-13
1910.033	-21.94	-13

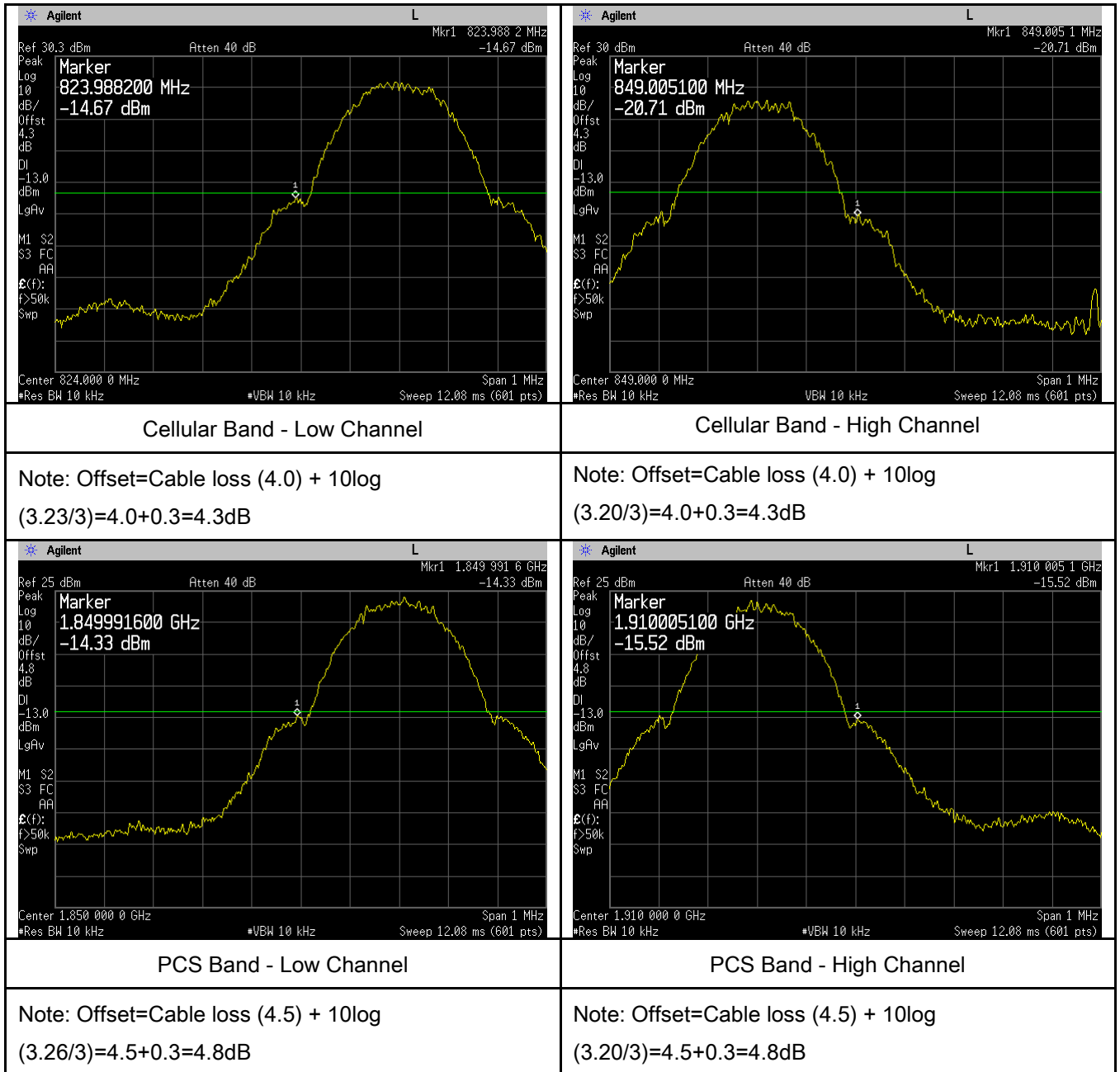
GSM Voice:

Test Plots



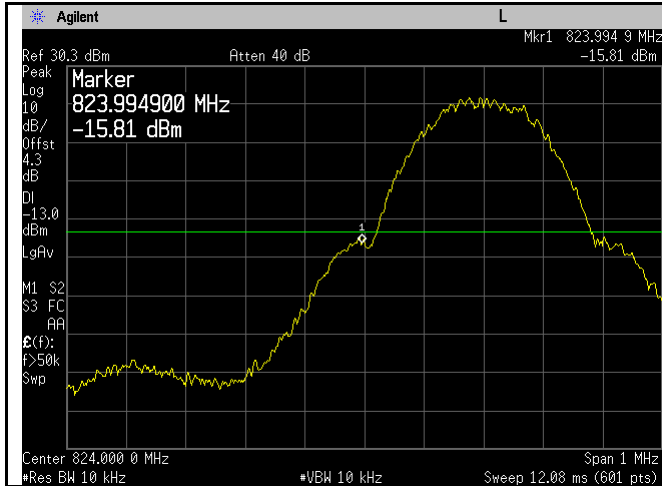
GPRS:

Test Plots



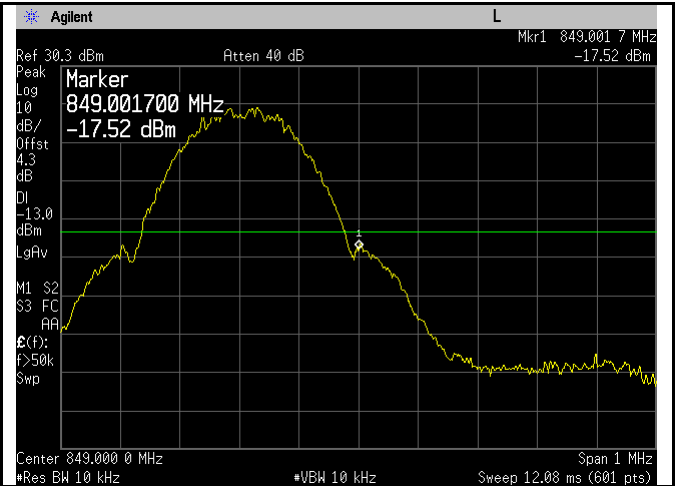
EGPRS (MSC1):

Test Plots



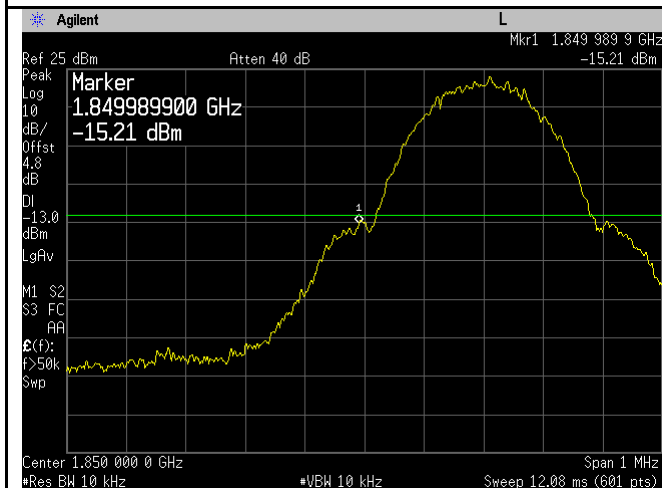
Cellular Band - Low Channel

Note: Offset=Cable loss (4.0) + 10log
(3.22/3)=4.0+0.3=4.3dB



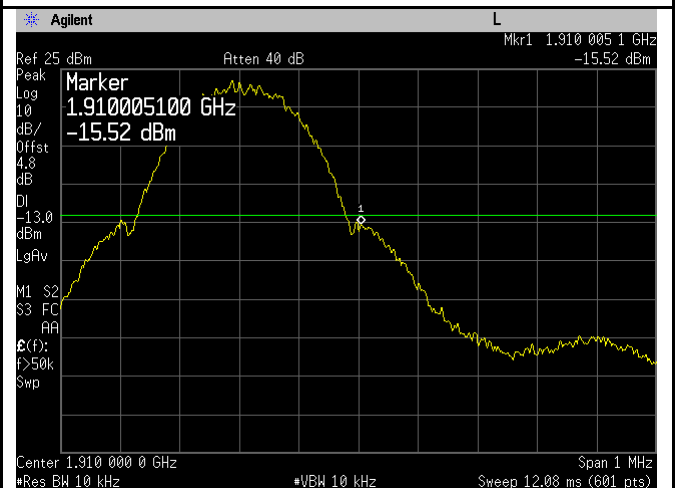
Cellular Band - High Channel

Note: Offset=Cable loss (4.0) + 10log
(3.19/3)=4.0+0.3=4.3dB



PCS Band - Low Channel

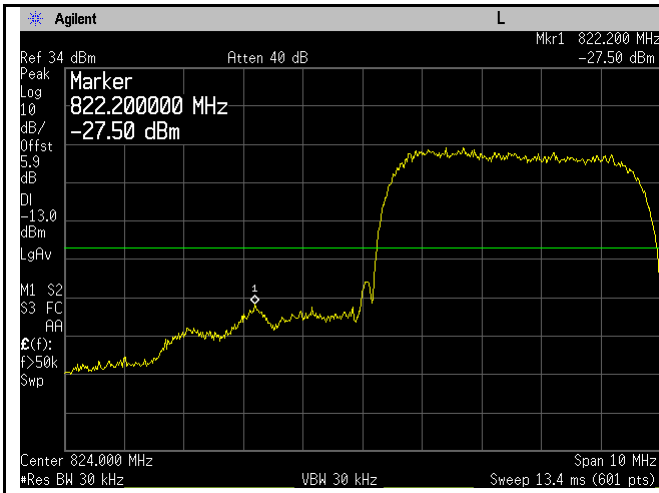
Note: Offset=Cable loss (4.5) + 10log
(3.22/3)=4.5+0.3=4.8dB



PCS Band - High Channel

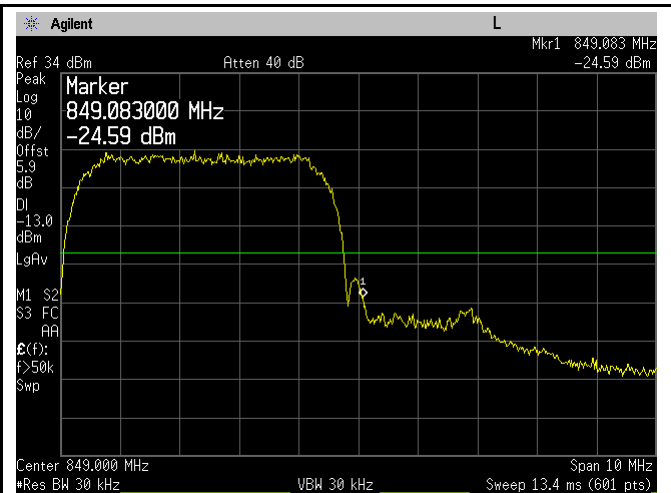
Note: Offset=Cable loss (4.5) + 10log
(3.19/3)=4.5+0.3=4.8dB

RMC:



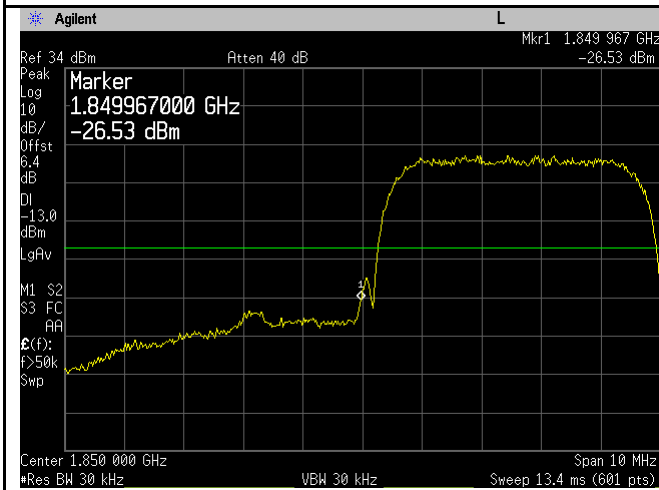
UMTS-FDD Band V - Low Channel

Note: Offset=Cable loss (4.0) + 10log
(46.6/30)=4.0+1.9=5.9dB



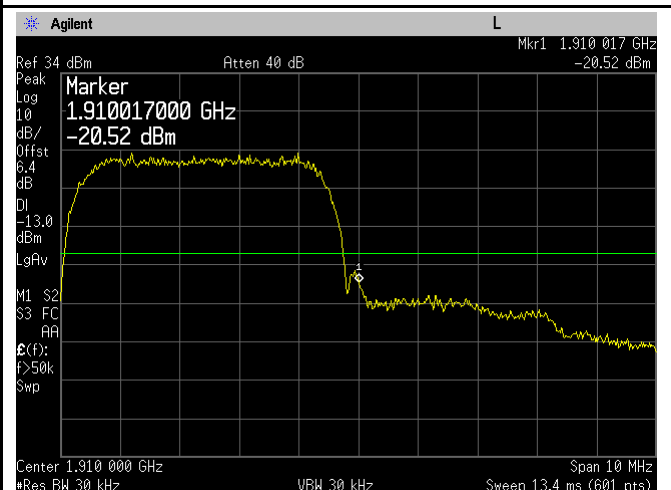
UMTS-FDD Band V - High Channel

Note: Offset=Cable loss (4.0) + 10log
(46.5/30)=4.0+1.9=5.9dB



UMTS-FDD Band II - Low Channel

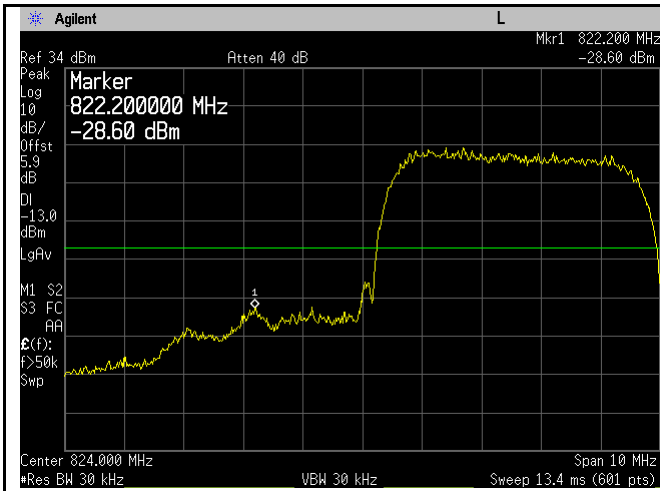
Note: Offset=Cable loss (4.5) + 10log
(47.77/30)=4.5+1.9=6.4dB



UMTS-FDD Band II - High Channel

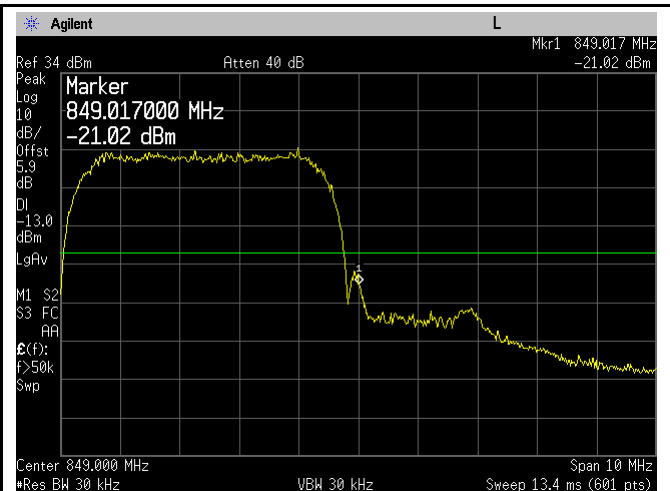
Note: Offset=Cable loss (4.5) + 10log
(46.90/30)=4.5+1.9=6.4dB

HSDPA:



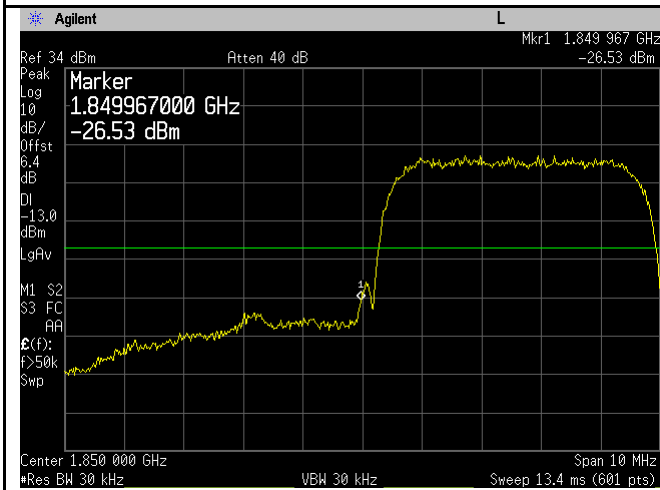
UMTS-FDD Band V - Low Channel

Note: Offset=Cable loss (4.0) + 10log
(46.72/30)=4.0+1.9=5.9dB



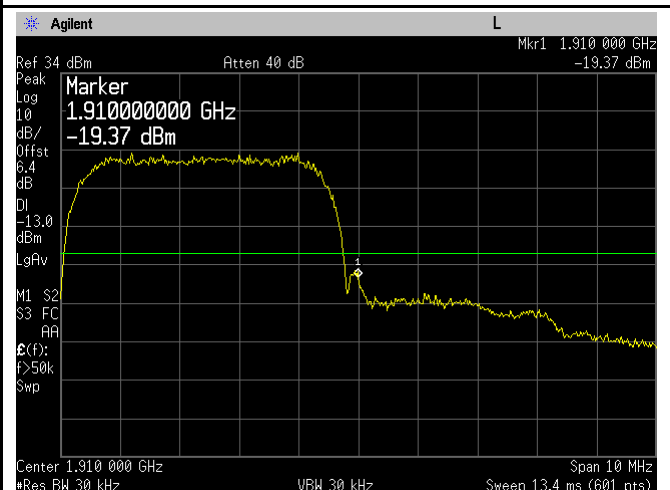
UMTS-FDD Band V - High Channel

Note: Offset=Cable loss (4.0) + 10log
(46.53/30)=4.0+1.9=5.9dB



UMTS-FDD Band II - Low Channel

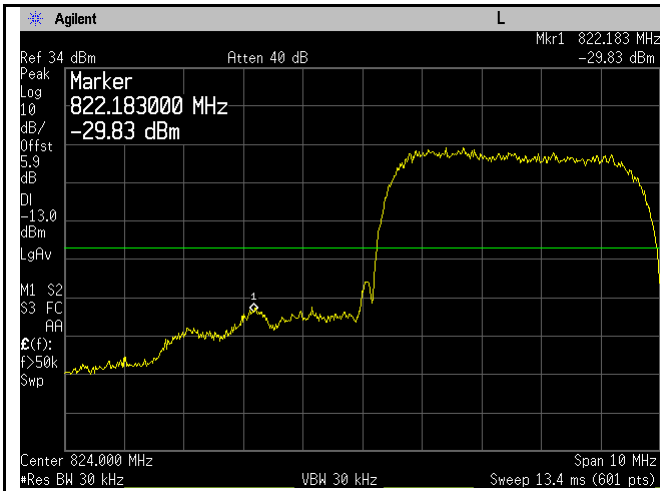
Note: Offset=Cable loss (4.5) + 10log
(47.27/30)=4.5+1.9=6.4dB



UMTS-FDD Band II - High Channel

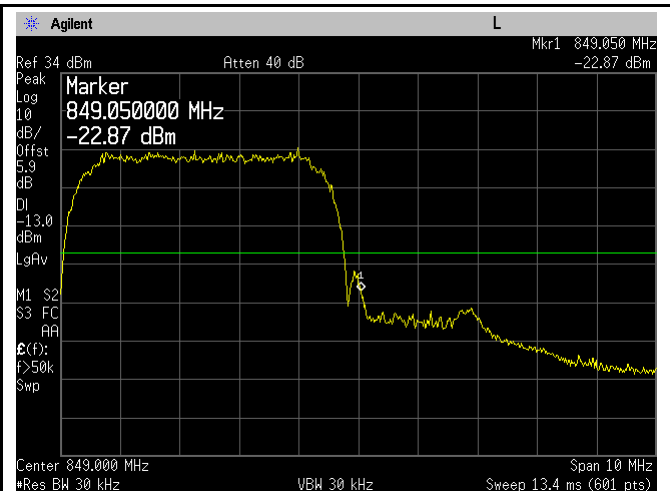
Note: Offset=Cable loss (4.5) + 10log
(46.97/30)=4.5+1.9=6.4dB

HSUPA:



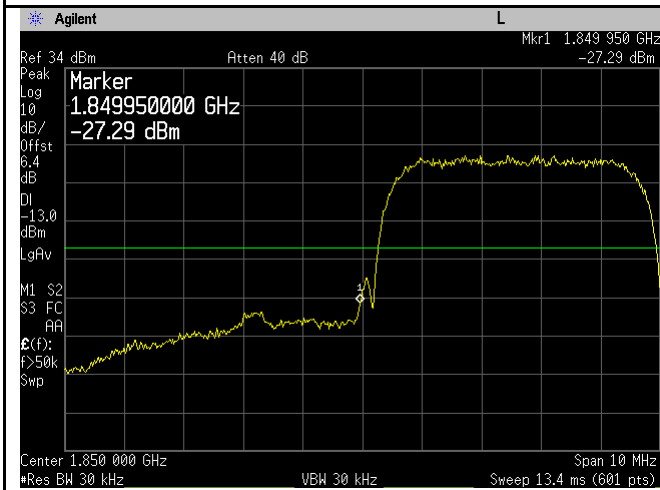
UMTS-FDD Band V - Low Channel

Note: Offset=Cable loss (4.0) + 10log
(46.89/30)=4.0+1.9=5.9dB



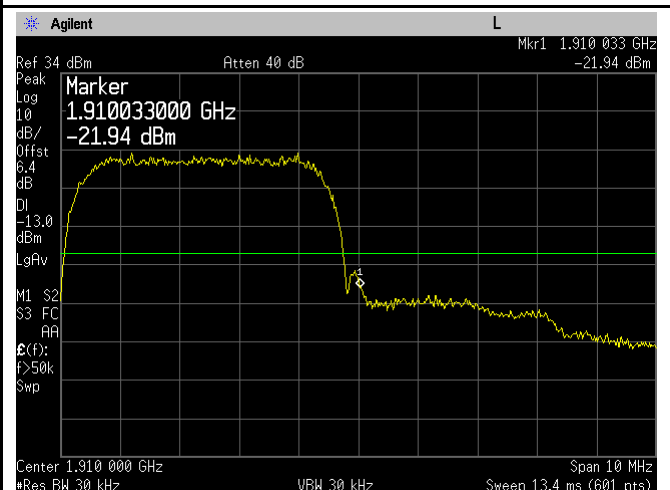
UMTS-FDD Band V - High Channel

Note: Offset=Cable loss (4.0) + 10log
(46.49/30)=4.0+1.9=5.9dB



UMTS-FDD Band II - Low Channel

Note: Offset=Cable loss (4.5) + 10log
(47.63/30)=4.5+1.9=6.4dB



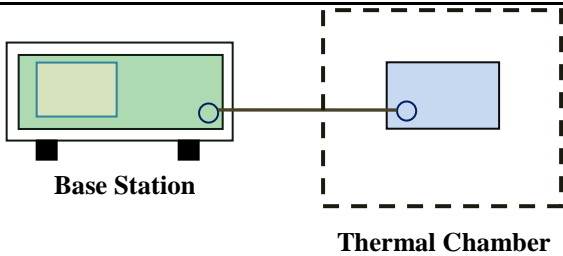
UMTS-FDD Band II - High Channel

Note: Offset=Cable loss (4.5) + 10log
(47.01/30)=4.5+1.9=6.4dB

6.8 Frequency Stability

Temperature	23 °C
Relative Humidity	52%
Atmospheric Pressure	1020mbar
Test date :	April 26, 2018
Tested By :	Aaron Liang

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 ≥ 3 watts (ppm)</th><th>Mobile ≤ 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>450 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 ≥ 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	<input checked="" type="checkbox"/>
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																																
Test setup	 <p>The diagram illustrates the test setup. On the left, a green rectangular box represents the 'Base Station'. A horizontal line connects a small circle on the right side of the Base Station to another small circle on the left side of a blue rectangular box. This blue box is enclosed within a dashed-line rectangle representing the 'Thermal Chamber'.</p>																																		

Procedure	<p>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.</p> <p>Limit: The frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ ($\pm 2.5\text{ppm}$) of the center frequency.</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 Voice:

Cellular Band (Part 22H) result

Middle Channel, $f_0 = 836.6$ MHz				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10	3.7	18	0.0215	2.5
0		16	0.0191	2.5
10		14	0.0167	2.5
20		15	0.0179	2.5
30		14	0.0167	2.5
40		15	0.0179	2.5
50		22	0.0263	2.5
55		19	0.0227	2.5
25	4.2	21	0.0251	2.5
	3.5	16	0.0191	2.5

PCS Band (Part 24E) result

Middle Channel, $f_0 = 1880$ MHz				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10	3.7	18	0.0096	2.5
0		18	0.0096	2.5
10		16	0.0085	2.5
20		16	0.0085	2.5
30		14	0.0074	2.5
40		13	0.0069	2.5
50		22	0.0117	2.5
55		18	0.0096	2.5
25	4.2	20	0.0106	2.5
	3.5	20	0.0106	2.5

RMC:

UMTS-FDD Band V (Part 22H)

Middle Channel, $f_0 = 835$ MHz				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10	3.7	16	0.0192	2.5
0		15	0.0180	2.5
10		17	0.0204	2.5
20		15	0.0180	2.5
30		13	0.0156	2.5
40		10	0.0120	2.5
50		21	0.0251	2.5
55		17	0.0204	2.5
25	4.2	16	0.0192	2.5
	3.5	15	0.0180	2.5

UMTS-FDD Band II (Part 24E)

Middle Channel, $f_0 = 1880$ MHz				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10	3.7	15	0.0080	2.5
0		15	0.0080	2.5
10		11	0.0059	2.5
20		14	0.0074	2.5
30		13	0.0069	2.5
40		15	0.0080	2.5
50		18	0.0096	2.5
55		17	0.0090	2.5
25	4.2	18	0.0096	2.5
	3.5	21	0.0112	2.5

Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Due	In use
RF Conducted Test					
Agilent ESA-E SERIES SPECTRUM ANALYZER	E4407B	MY45108319	09/14/2017	09/13/2018	<input checked="" type="checkbox"/>
Power Splitter	1#	1#	08/30/2017	08/29/2018	<input checked="" type="checkbox"/>
Universal Radio Communication Tester	CMU200	121393	09/23/2017	09/22/2018	<input checked="" type="checkbox"/>
Temperature/Humidity Chamber	UHL-270	001	10/07/2017	10/06/2018	<input checked="" type="checkbox"/>
DC Power Supply	E3640A	MY40004013	09/15/2017	09/14/2018	<input checked="" type="checkbox"/>
RF Power Sensor	Dare RPR3006C/P/W	AY554013	09/15/2017	09/14/2018	<input checked="" type="checkbox"/>
Radiated Emissions					
EMI test receiver	ESL6	100262	09/15/2017	09/14/2018	<input checked="" type="checkbox"/>
OPT 010 AMPLIFIER (0.1-1300MHz)	8447E	2727A02430	08/30/2017	08/29/2018	<input checked="" type="checkbox"/>
Microwave Preamplifier (1 ~ 26.5GHz)	8449B	3008A02402	03/22/2018	03/21/2019	<input checked="" type="checkbox"/>
Bilog Antenna (30MHz~6GHz)	JB6	A110712	09/19/2017	09/18/2018	<input checked="" type="checkbox"/>
Bilog Antenna (30MHz~2GHz)	JB1	A112017	09/19/2017	09/18/2018	<input checked="" type="checkbox"/>
Double Ridge Horn Antenna (1 ~18GHz)	AH-118	71259	09/22/2017	09/21/2018	<input checked="" type="checkbox"/>
Double Ridge Horn Antenna (1 ~18GHz)	AH-118	71283	09/22/2017	09/21/2018	<input checked="" type="checkbox"/>
SYNTHESIZED SIGNAL GENERATOR	8665B	3744A01293	09/15/2017	09/14/2018	<input checked="" type="checkbox"/>
Power Amplifier	SMC150D	R1553-0313	03/07/2018	03/06/2019	<input checked="" type="checkbox"/>
Power Amplifier	S41-25D	R1553-0314	05/26/2017	05/25/2018	<input checked="" type="checkbox"/>
Tunable Notch Filter	3NF-800/1000-S	AA4	08/30/2017	08/29/2018	<input checked="" type="checkbox"/>

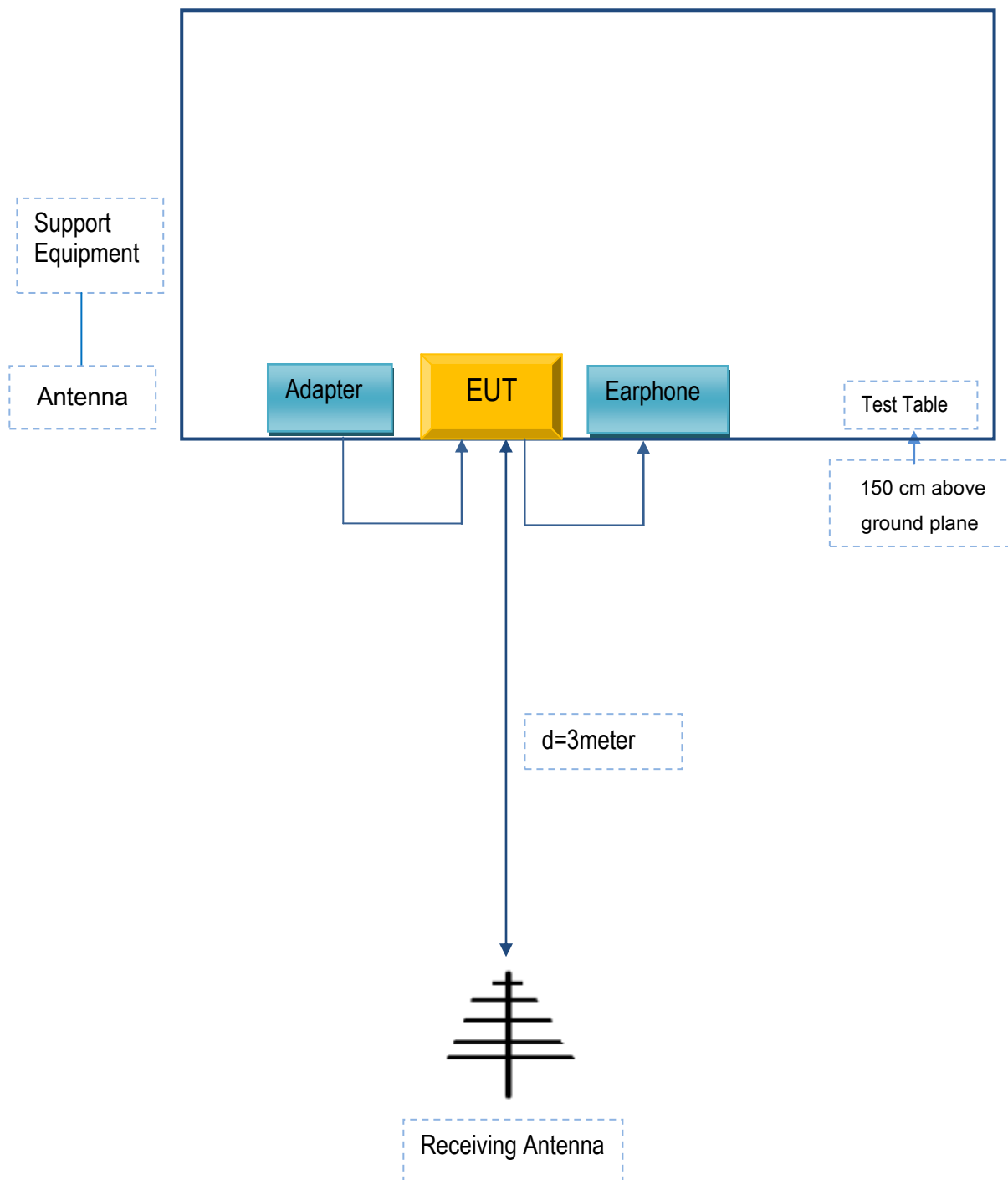
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Tunable Notch Filter	3NF- 1000/2000-S	AM 4	08/30/2017	08/29/2018	<input checked="" type="checkbox"/>
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Annex B. TEST SETUP AND SUPPORTING EQUIPMENT

Annex B.i. TEST SET UP BLOCK

Block Configuration Diagram for Radiated Emissions



Annex B. 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
G-TOUCH LLC.	Adapter	Stella X	N/A
N/A	Earphone	N/A	N/A
Agilent	Wireless Connectivity Test Set	N4010A	N/A
OEM	omnidirectional antenna	AntSuck	N/A

Supporting Cable:

Cable type	Shield Type	Ferrite Core	Length	Serial No
USB Cable	Un-shielding	No	0.8m	N/A

**Annex C. User Manual / Block Diagram / Schematics / Partlist/
DECLARATION OF SIMILARITY**

Please see the attachment