

FCC Part 22H 24E Test Report

FCC ID: 2AL7V-2002A

Product Name:	IP Camera
Trademark:	
Model Name:	Reolink Go PT
Prepared For:	Shenzhen Reo-link Digital Technology Co., Ltd
Address:	11th Floor, Building C, Unisplendour Information Harbour, North High-Tech Zone, Nanshan District, Shenzhen, China, 518057
Prepared By:	Shenzhen BCTC Testing Co., Ltd.
Address:	BCTC Building & 1-2F, East of B Building, Pengzhou Industrial, Fuyuan 1st Road, Qiaotou Community, Fuyong Street, Bao'an District, Shenzhen, China
Test Date:	May 06, 2020 – May 15, 2019
Date of Report:	May 15, 2019
Report No.:	BCTC2004001893E

VERIFICATION OF COMPLIANCE

Applicant's**name**..... Shenzhen Reo-link Digital Technology Co., LtdAddress..... 11th Floor, Building C, Unisplendour Information Harbour, North High-Tech
Zone, Nanshan District, Shenzhen, China, 518057**Manufacture's
Name**

SHENZHEN BAICHUAN SECURITY TECHNOLOGY CO., LTD.

Address..... 2-4th Floor, Building 2, YuanLing Industrial Park, ShangWu, Shiyan Street, B
ao'an District, Shenzhen, China**Product
description**

Product name..... IP Camera

Trademark:



Model Name: Reolink Go PT

Test procedure FCC Part 22H & 24E

This device described above has been tested by BCTC, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

This report shall not be reproduced except in full, without the written approval of BCTC, this document may be altered or revised by BCTC, personal only, and shall be noted in the revision of the document.

Test Result Pass

Prepared by(Engineer):

Cai Fang Zhong



Reviewer(Supervisor):

Eric Yang



Approved(Manager):

Zero Zhou



TABLE OF CONTENTS

	Page
Test Report Declaration	
1. TEST SUMMARY	4
2. GENERAL PRODUCT INFORMATION	5
2.1. Description of Device (EUT)	5
2.2. Product Function	6
2.3. Independent Operation Modes	6
3. TEST SITES	7
3.1. Test Facilities	7
3.2. List of Test and Measurement Instruments	9
4. TEST SET-UP	11
4.1. Principle of Configuration Selection	11
4.2. Block Diagram of Test Set-up	11
4.3. Test Environment:	11
5. EMISSION TEST RESULTS	12
5.1. Conducted RF Output Power	12
5.2. Peak-to-average Ratio of Transmitter	14
5.3. -26dB and 99% Occupied Bandwidth	20
5.4. Frequency Stability	25
5.5. Conducted Spurious Emissions	27
5.6. Conducted Out of Band Emissions	34
5.7. Transmitter Radiated Power (EIRP/ERP)	41
5.8. Radiated Out of Band Emissions	44
6. PHOTOGRAPHS OF TEST SET-UP	52
7. PHOTOGRAPHS OF THE EUT	53

1.TEST SUMMARY

Test Items	Test Requirement	Result
RF Exposure (SAR)	Part 1.1307,Part 2.1091	Passed*
Conducted RF Output Power	2.1046,22.913(a),24.323(c)	PASS
Peak to Average Ratio	2.1055,22.355 24.235	PASS
Occupied Bandwidth	2.1049,22.905,22.917,24.238,	PASS
Frequency Stability	2.1055,22.355,24.235,	PASS
Conducted Out of Band Emissions	2.1051,22.917(a),24.238(a)	PASS
Band Edge	22.917(a),24.238(a)	PASS
Transmitter Radiated Power (EIPR/ERP)	22.913,24.232	PASS
Radiated Out of Band Emissions	2.1051, 22.917(a),24.238(a)	PASS

2.GENERAL PRODUCT INFORMATION

2.1. Description of Device (EUT)

Product Name:	IP Camera
Trademark	
Model No.:	Reolink Go PT
Model Difference	N/A.
Operation Frequency:	WCDMA Band II: Tx: 1852.40 - 1907.60MHz; Rx: 1932.60 – 1987.40MHz WCDMA Band V: Tx: 826.40 - 846.60MHz; Rx: 871.40 – 891.60MHz
Modulation technology:	WCDMA Mode with BPSK Modulation HSDPA Mode with QPSK, 16QAM Modulation HSUPA Mode with QPSK, 16QAM Modulation
Antenna Type:	External Antenna
Antenna gain:	WCDMA BAND II: 1.12dBi WCDMA BAND V: 2.45dBi
Power supply:	DC 3.6V

Note:

For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2.2. Product Function

Refer to Technical Construction Form and User Manual.

2.3. Independent Operation Modes

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

Test modes		
Band	Radiated	Conducted
WCDMA Band II	■ RMC 12.2Kbps link	■ RMC 12.2Kbps link
WCDMA Band V	■ RMC 12.2Kbps link	■ RMC 12.2Kbps link

The conducted average power tables are as follows:

Band	WCDMA Band II.			WCDMA Band V.		
Frequency	1852.4	1880.0	1907.6	826.4	836.6	846.6
RMC 12.2Kbps	22.52	23.24	22.45	22.49	22.64	22.63

3. TEST SITES

3.1. Test Facilities

Site Description

Name of Firm	: Shenzhen BCTC Testing Co., Ltd.
Site Location	: BCTC Building & 1-2F, East of B Building, Pengzhou Industrial, Fuyuan 1st Road, Qiaotou Community, Fuyong Street, Bao'an District, Shenzhen, China
Lab Qualifications	: FCC Test Firm Registration Number: 712850 IC Registered No.: 23583

3.1.1. Measurement Uncertainty

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

No.	Item	Uncertainty
1	3m chamber Radiated spurious emission(30MHz-1GHz)	U=4.3dB
2	3m chamber Radiated spurious emission(1GHz-18GHz)	U=4.5dB
3	3m chamber Radiated spurious emission(18GHz-40GHz)	U=3.34dB
4	Conducted Adjacent channel power	U=1.38dB
5	Conducted output power uncertainty Above 1G	U=1.576dB
6	Conducted output power uncertainty below 1G	U=1.28dB
7	humidity uncertainty	U=5.3%
8	Temperature uncertainty	U=0.59°C

3.2. List of Test and Measurement Instruments

3.2.1. For conducted emission at the mains terminals test

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Test Receiver	R&S	ESR3	102075	Jun. 13, 2019	Jun. 12, 2020
2	LISN	SCHWARZBECK	NSLK8127	8127739	Jun. 13, 2019	Jun. 12, 2020
3	LISN	R&S	ENV216	101375	Jun. 13, 2019	Jun. 12, 2020
4	RF cables	Huber+Suhnar	9kHz-30MHz	B1702988-0008	Jun. 25, 2019	Jun. 24, 2020
5	Software	Frad	EZ-EMC	EMC-CON 3A1	\	\

3.2.2. For radiated test

tem	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Spectrum Analyzer	Agilent	E4407B	MY45109572	Jun. 13, 2019	Jun. 12, 2020
2	Test Receiver	R&S	ESR7	101154	Jun. 13, 2019	Jun. 12, 2020
3	Bilog Antenna	SCHWARZBEC K	VULB9163	VULB9163-942	Jun. 22, 2019	Jun. 21, 2020
4	Horn Antenna	SCHWARZBEC K	BBHA9120D	1541	Jun. 22, 2019	Jun. 21, 2020
5	Horn Antenna	SCHWARZBEC K	BBHA9170	822	Jun. 22, 2019	Jun. 21, 2020
6	Karaoke Microphone	SCHWARZBEC K	BBV9744	9744-0037	Jun. 25, 2019	Jun. 24, 2020
7	Karaoke Microphone	SCHWARZBEC K	BBV9718	9718-309	Jun. 25, 2019	Jun. 24, 2020
8	Karaoke Microphone	MITEQ	TTA1840-35-H G	2034381	Jun. 17, 2019	Jun. 16, 2020
9	Loop Antenna	SCHWARZBEC K	FMZB1519B	014	Jul. 02, 2019	Jul. 01, 2020
10	RF cables1	Huber+Suhnar	9kHz-30MHz	B1702988-0008	Jun. 25, 2019	Jun. 24, 2020
11	RF cables2	Huber+Suhnar	30MHz-1GHz	1486150	Jun. 25, 2019	Jun. 24, 2020
12	RF cables3	Huber+Suhnar	1GHz-40GHz	1607106	Jun. 25, 2019	Jun. 24, 2020
13	Power Metter	Keysight	E4419B	\	Jun. 17, 2019	Jun. 16, 2020
14	Power Sensor (AV)	Keysight	E9 300A	\	Jun. 17, 2019	Jun. 16, 2020
15	Signal Analyzer	KEYSIGHT	N9020A	MY49100060	Jun. 13, 2019	Jun. 12, 2020
16	Spectrum Analyzer	Aglient	FSP40	100363	Jun. 13, 2019	Jun. 12, 2020
17	D.C. Power Supply	LongWei	TPR-6405D	\	\	\
18	Software	Frad	EZ-EMC	FA-03A2 RE	\	\
19	Spectrum Analyzer	KEYSIGHT	N5182B	MY56200519	Jun. 13, 2019	Jun. 12, 2020
20	Bilog Antenna	Schwarz beck	VULB9163	9163-333	Jun. 13, 2019	Jun. 12, 2020

3.2.3. RF Conducted Test

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Signal Analyzer	KEYSIGHT	N9020A	MY49100060	Jun. 13, 2019	Jun. 12, 2020
2	Universal Radio Communi cation Tester	R&S	CMU200	119435	Jun. 13, 2019	Jun. 12, 2020
3	RF cables	Huber+Suhnar	30MHz-1GHz	F02-170707-010	\	\
4	RF cables	Huber+Suhnar	1GHz-40GHz	SFL402-105FLEX		
5	D.C. Power Supply	LongWei	TPR-6405D	\	\	\

4. TEST SET-UP

4.1. Principle of Configuration Selection

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

4.2. Block Diagram of Test Set-up

System Diagram of Connections between EUT and Simulators



4.3. Test Environment:

Ambient conditions in the test laboratory:

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

5. EMISSION TEST RESULTS

5.1. Conducted RF Output Power

5.1.1. Limit

According to FCC section 2.1046(a) , FCC part 22.913(a), FCC part 24.232(b), for transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in FCC section 2.1033(c)(8).

5.1.2. Test Setup

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

5.1.3. Test Result

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

Measurement data

The conducted power tables are as follows:

Band	WCDMA Band II.			WCDMA Band V.		
Frequency	1852.4	1880.0	1907.6	826.4	836.6	846.6
RMC 12.2Kbps	22.52	23.24	22.45	22.49	22.64	22.63
RMC 64kbps	22.43	23.17	22.00	22.13	22.42	22.37
RMC 144kbps	22.39	22.99	21.72	21.98	22.39	21.87
RMC 384kbps	22.06	22.54	21.23	21.59	22.38	21.38
HSDPA Subtest-1	22.32	22.57	22.27	22.69	22.84	22.79
HSDPA Subtest-2	22.23	22.53	22.19	22.23	22.43	22.77
HSDPA Subtest-3	21.85	22.19	21.71	21.94	22.35	22.62
HSDPA Subtest-4	21.56	21.76	21.69	21.73	21.85	22.61
HSUPA Subtest-1	20.88	21.39	20.87	20.93	21.40	22.15
HSUPA Subtest-2	20.42	21.32	20.83	20.72	21.16	22.02
HSUPA Subtest-3	20.29	21.24	20.77	20.41	21.15	21.97
HSUPA Subtest-4	20.11	20.87	20.67	19.98	20.67	21.54

Note: Measurement Uncertainty: ± 2.6 dB.

5.2. Peak-to-average Ratio of Transmitter

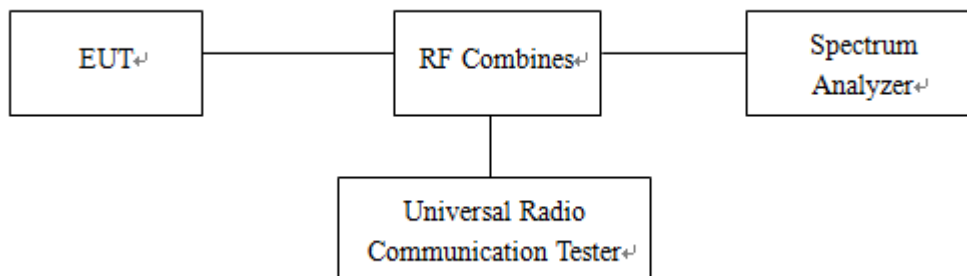
5.2.1. Limit

According to §24.232(d), Power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (e) of this section. In both instances, equipment employed must be authorized in accordance with the provisions of §24.51. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

5.2.2. Test Setup

The RF output terminal of the transmitter was connected to the input of the spectrum analyzer via a suitable attenuation. The RBW of the spectrum analyzer was set to 30kHz and the peak-to-average ratio (PAR) of the transmission was recorded. Record the maximum PAPR level associated with a probability of 0.1%.

Test Configuration for the emission bandwidth testing:



5.2.3. Test Result

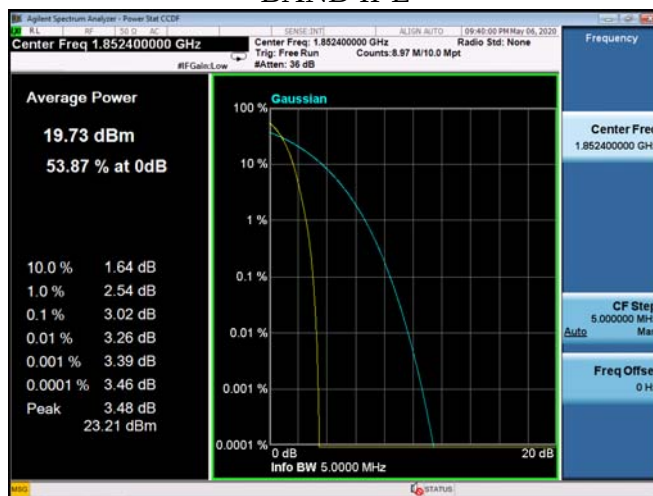
For WCDMA Band II

Test Mode	Channel	Frequency (MHz)	PAR(dB)	Limited (dB)
WCDMA	9262	1852.4	3.39	13
	9400	1880.0	3.62	13
	9538	1907.6	3.52	13
HSDPA	9262	1852.4	4.37	13
	9400	1880.0	4.67	13
	9538	1907.6	4.52	13
HSUPA	9262	1852.4	4.22	13
	9400	1880.0	4.61	13
	9538	1907.6	4.59	13

For WCDMA Band V

Test Mode	Channel	Frequency (MHz)	PAR(dB)	Limited (dB)
WCDMA	4132	826.4	3.15	13
	4175	836.6	3.34	13
	4233	846.6	3.38	13
HSDPA	4132	826.4	4.11	13
	4175	836.6	4.31	13
	4233	846.6	4.38	13
HSUPA	4132	826.4	4.11	13
	4175	836.6	4.20	13
	4233	846.6	4.30	13

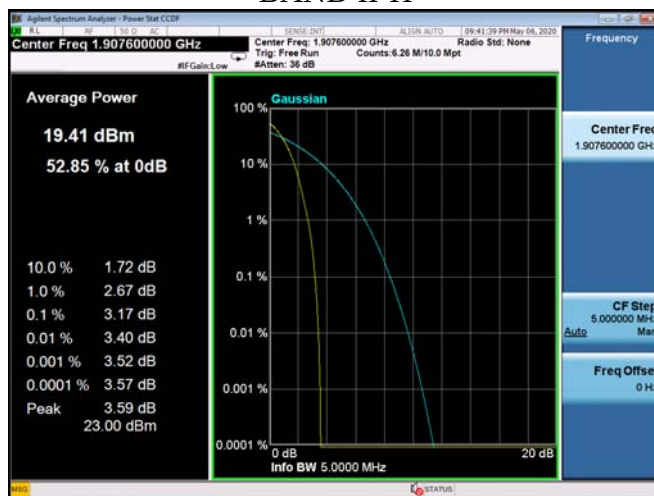
BAND II-L



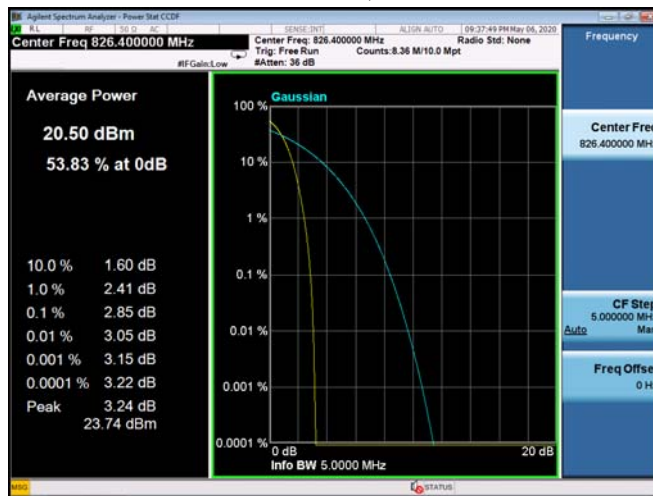
BAND II-M



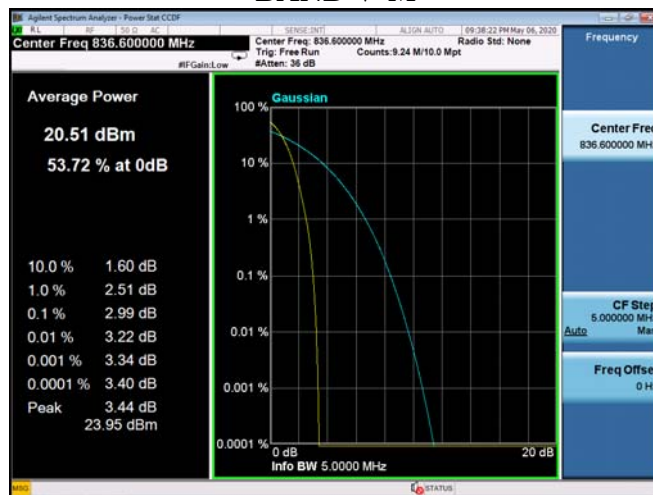
BAND II-H



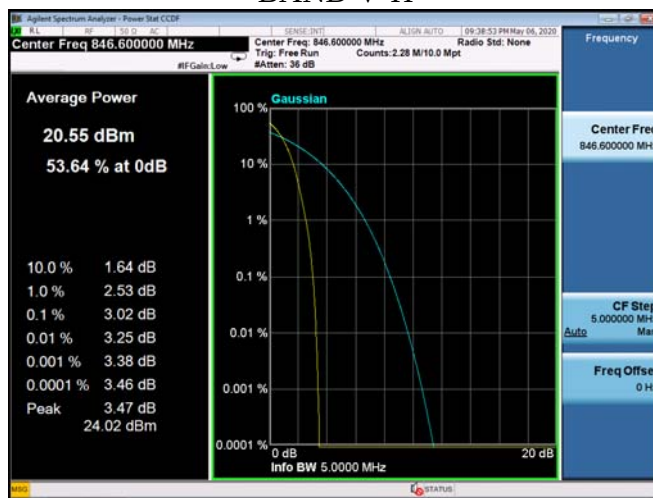
BAND V-L



BAND V-M



BAND V-H



5.3. -26dB and 99% Occupied Bandwidth

5.3.1. Limit

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

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

5.3.2. Test Setup

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

5.3.3. Test Result

Measurement Data

EUT Mode	Channel	Frequency (MHz)	99% Occupy bandwidth (KHz)	-26dB bandwidth (KHz)
WCDMA Band V	4132	826.4	4155	4756
	4175	836.6	4140	4735
	4233	846.6	4154	4750
WCDMA Band II	9262	1852.4	4148	4732
	9400	1880.0	4140	4723
	9538	1907.6	4144	4734

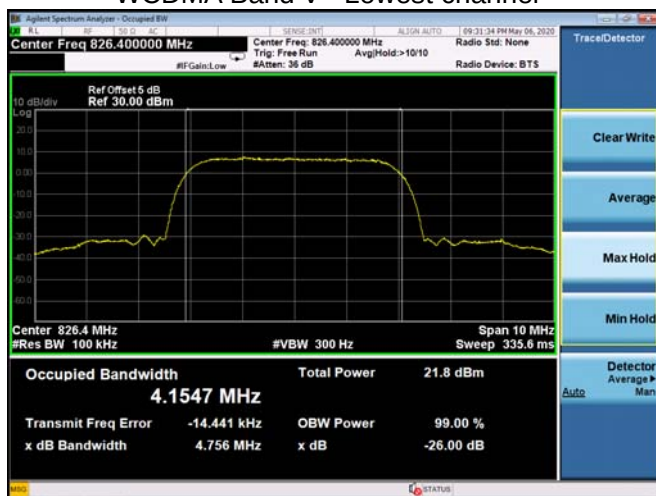
EUT Mode	Channel	Frequency (MHz)	99% Occupy bandwidth (KHz)	-26dB bandwidth (KHz)
HSDPA Band V	4132	826.4	4152	4735
	4175	836.6	4129	4703
	4233	846.6	4145	4724
HSDPA Band II	9262	1852.4	4142	4712
	9400	1880.0	4118	4700
	9538	1907.6	4134	4708

EUT Mode	Channel	Frequency (MHz)	99% Occupy bandwidth (KHz)	-26dB bandwidth (KHz)
HSUPA Band V	4132	826.4	4159	4731
	4175	836.6	4133	4695
	4233	846.6	4147	4700
HSUPA Band II	9262	1852.4	4128	4739
	9400	1880.0	4126	4717
	9538	1907.6	4147	4713

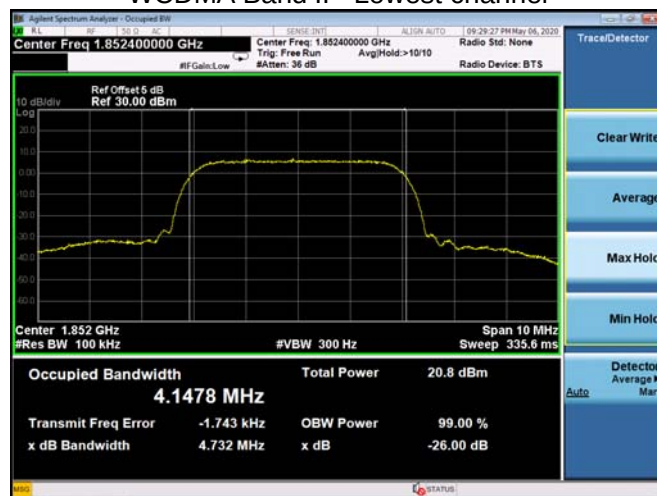
Note: Measurement Uncertainty: $\pm 20\text{Hz}$.

Test plot as follows:

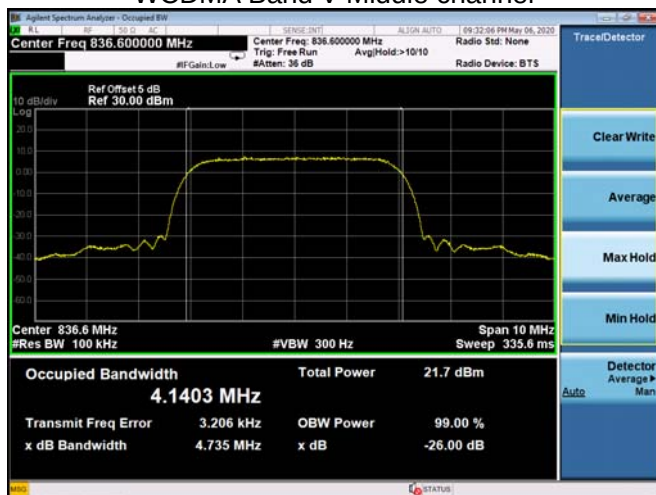
WCDMA Band V Lowest channel



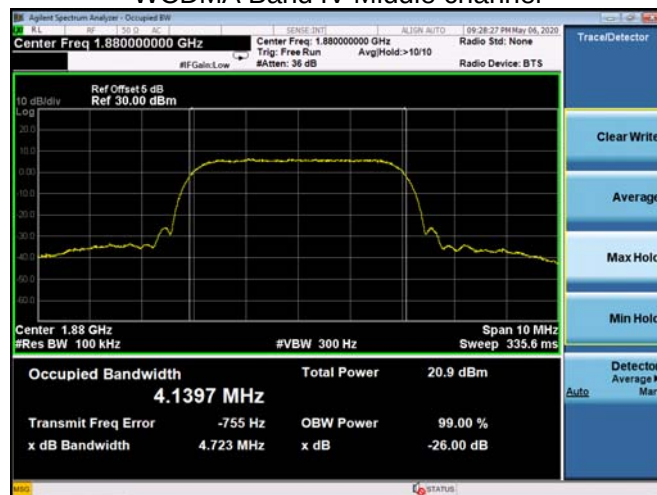
WCDMA Band II Lowest channel



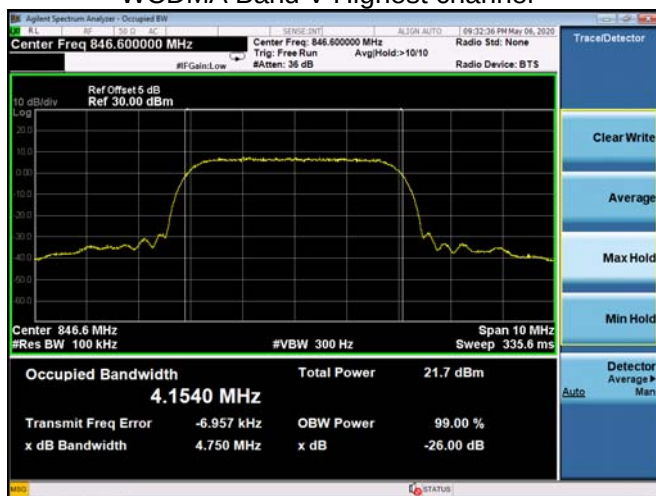
WCDMA Band V Middle channel



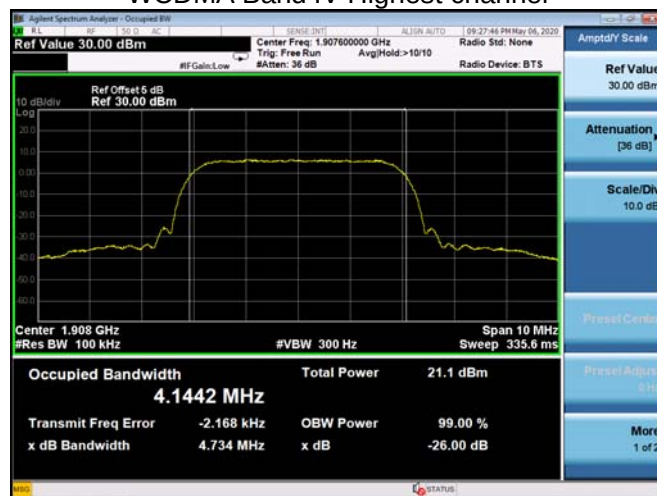
WCDMA Band IV Middle channel



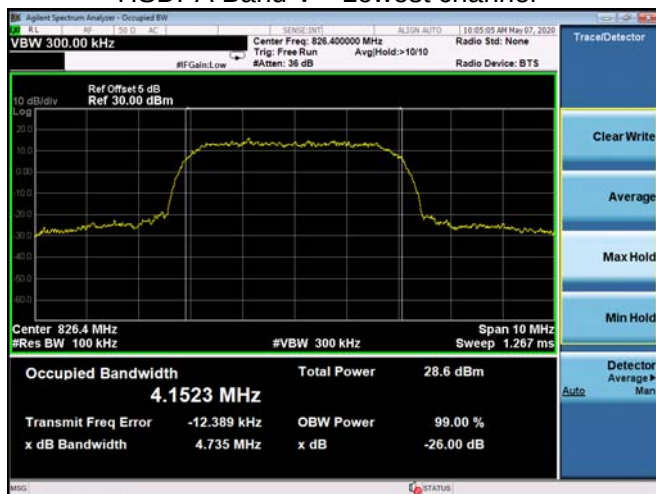
WCDMA Band V Highest channel



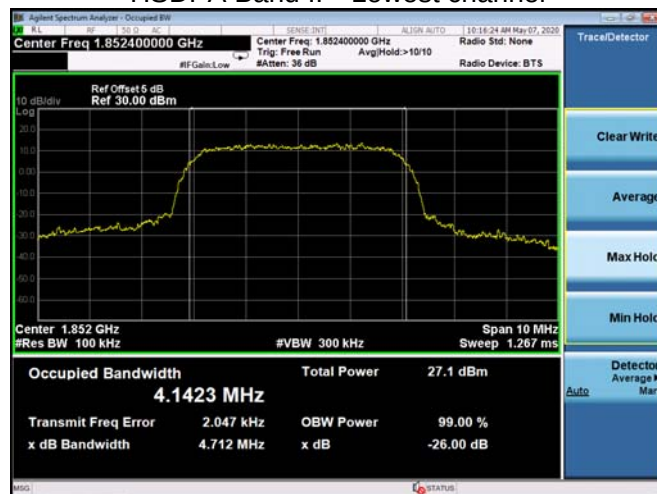
WCDMA Band IV Highest channel



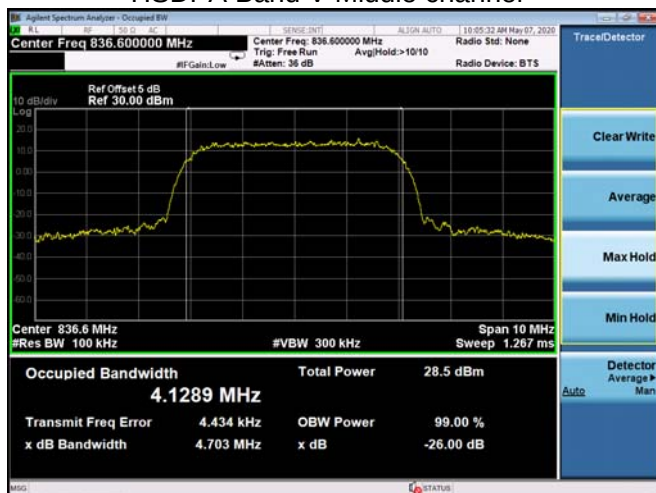
HSDPA Band V Lowest channel



HSDPA Band II Lowest channel



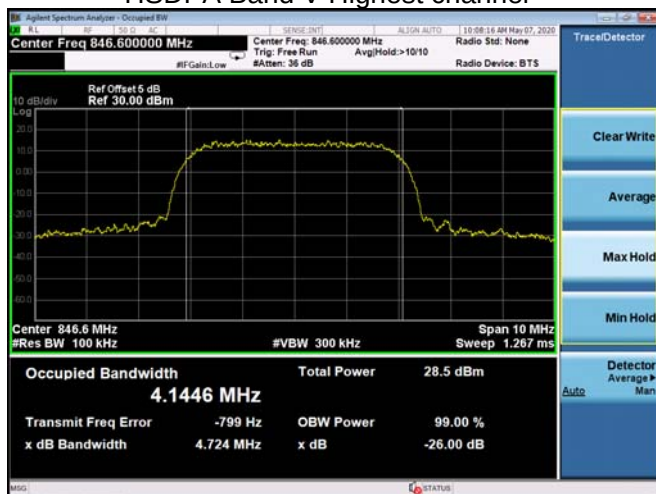
HSDPA Band V Middle channel



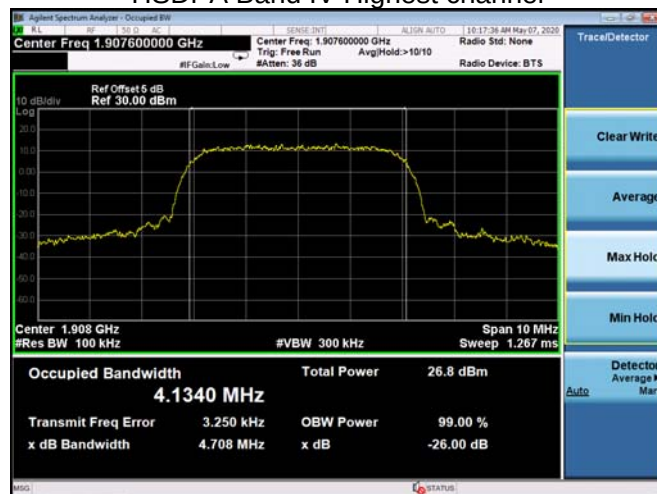
HSDPA Band IV Middle channel



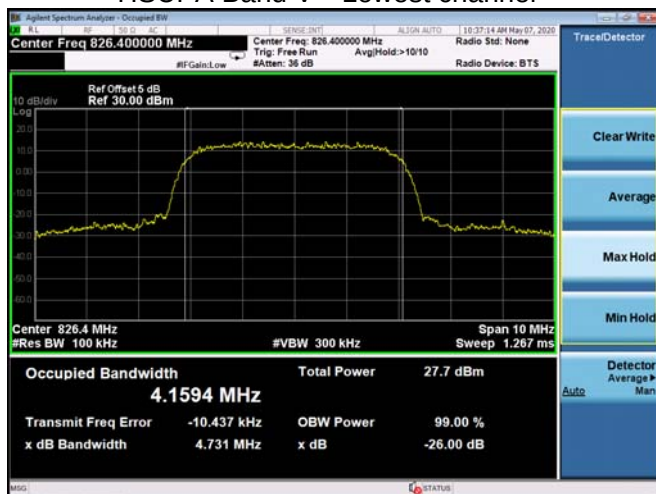
HSDPA Band V Highest channel



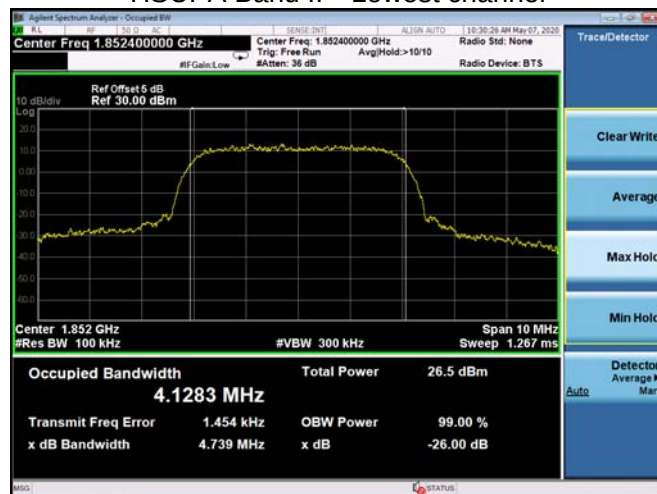
HSDPA Band IV Highest channel



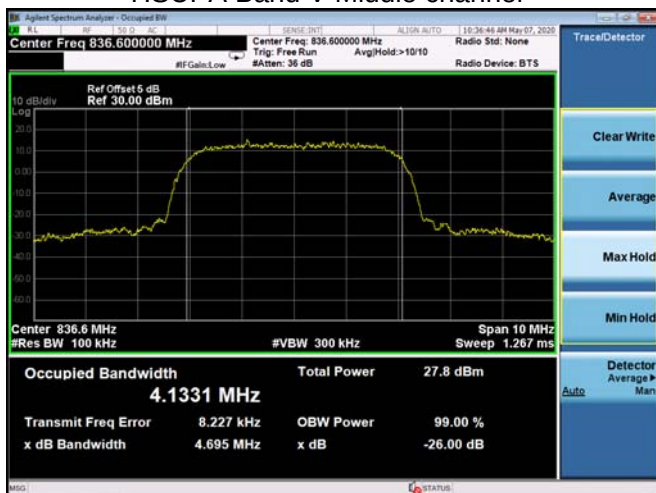
HSUPA Band V Lowest channel



HSUPA Band II Lowest channel



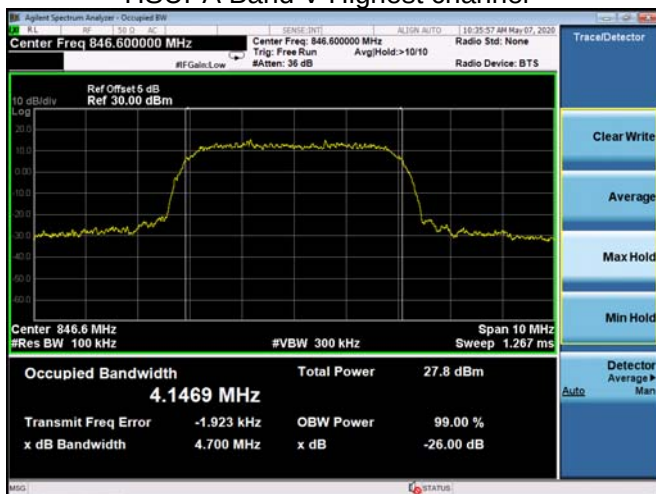
HSUPA Band V Middle channel



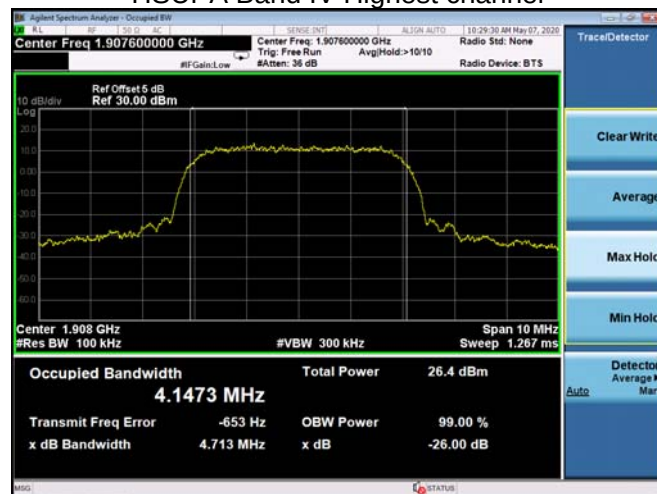
HSUPA Band IV Middle channel



HSUPA Band V Highest channel



HSUPA Band IV Highest channel



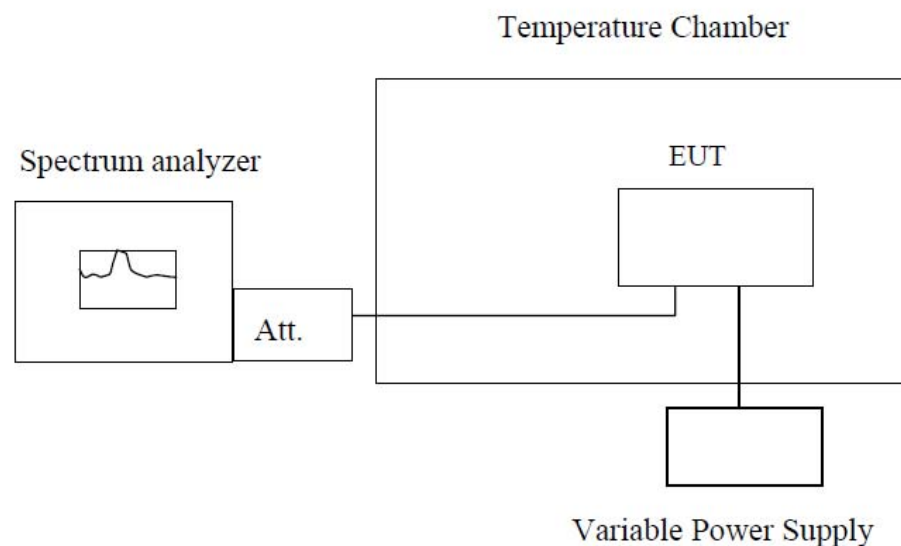
5.4. Frequency Stability

5.4.1. Limit

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

- (a) The temperature is varied from -30°C to $+50^{\circ}\text{C}$ at intervals of not more than 10°C .
- (b) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

5.4.2. Test Setup



Note : Measurement setup for testing on Antenna connector

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

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

5.4.3. Test Result

The nominal, highest and lowest extreme voltages are separately 3.6VDC, 4.2VDC and 3.3VDC which are specified by the applicant; the normal temperature here used is 25°C . The frequency deviation limit of 850MHz band is $\pm 2.5\text{ppm}$, and 1900MHz is $\pm 2.5\text{ppm}$

Test Conditions			Frequency Deviation			Result
Band	Power(Vdc)	Temperature(°C)	Frequency Error(Hz)	ppm	Limit	
WCDMA Band II Middle channel=188 0.0MHz	3.6	-30	1	0.000532	±2.5	PASS
	3.6	-20	-3	-0.001596		
	3.6	-10	-5	-0.002660		
	3.6	0	-2	-0.001064		
	3.6	10	-6	-0.003191		
	3.6	20	-8	-0.004255		
	3.6	30	-4	-0.002128		
	3.6	40	-9	-0.004787		
	3.6	50	-11	-0.005851		
	4.2	25	-7	-0.003723		
	3.6	25	-12	-0.006383		
	3.3	25	-14	-0.007447		
WCDMA Band V Middle channel=836. 6MHz	3.6	-30	0	0.000124	±2.5	PASS
	3.6	-20	0	0.000101		
	3.6	-10	-1	-0.001195		
	3.6	0	-2	-0.002391		
	3.6	10	-3	-0.003586		
	3.6	20	-4	-0.004781		
	3.6	30	-5	-0.005972		
	3.6	40	-7	-0.008367		
	3.6	50	-9	-0.010758		
	4.2	25	-8	-0.009563		
	3.6	25	-10	-0.011953		
	3.3	25	-12	-0.014344		

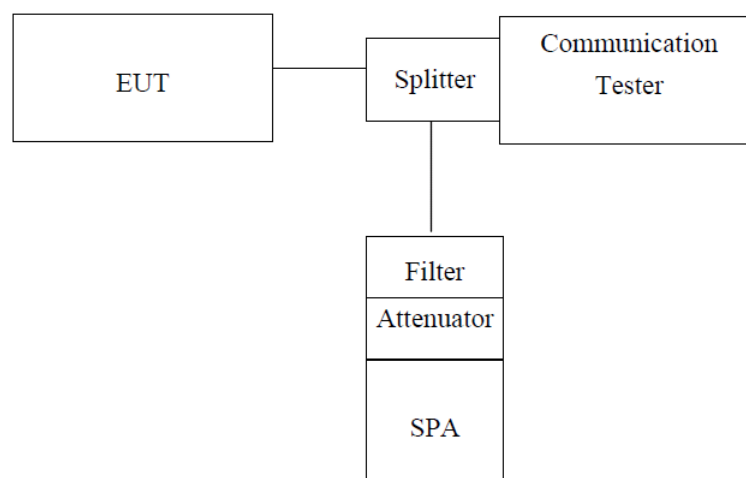
Note: Measurement Uncertainty: ±20Hz.

5.5. Conducted Spurious Emissions

5.5.1. Limit

According to FCC section 22.917(a), FCC section 24.238(a), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43+10\log(P)$ dB. This calculated to be -13dBm.

5.5.2. Test Setup



Note: Measurement setup for testing on Antenna connector

5.5.3. Measurement Procedure

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

For the out of band: Set the RBW/VBW = 100/300KHz, Start=30MHz, Stop= 1GHz

RBW/VBW=1/3MHz, Start=1GHz, Stop=26.5GHz.

Limit = -13dBm

5.5.4. Test Result

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

Test plot as follows:

WCDMA Band II Lowest channel



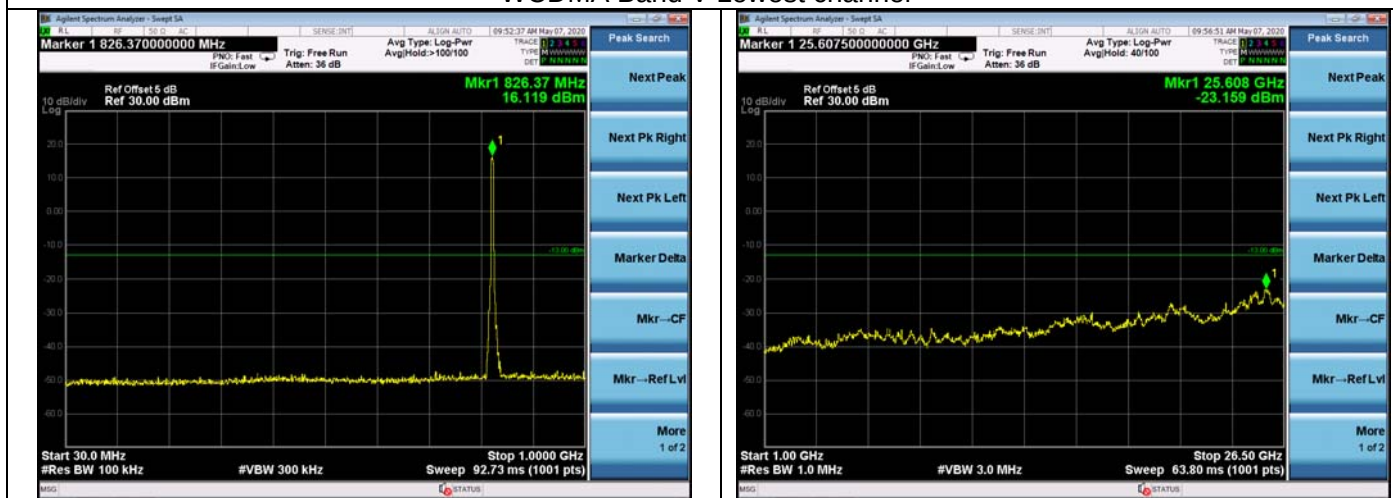
WCDMA Band II Middle channel



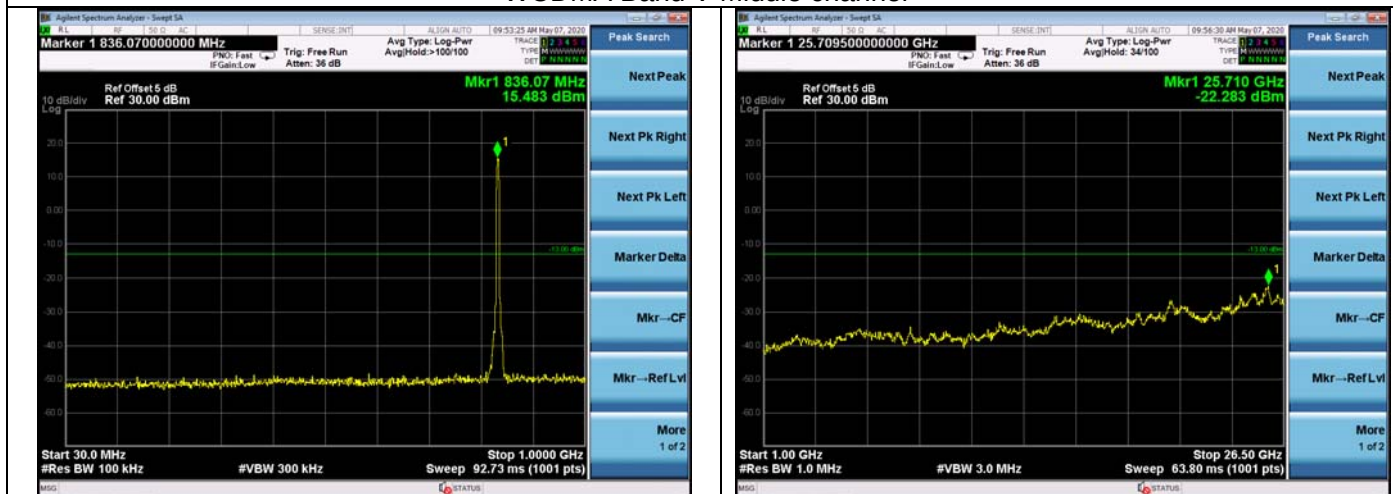
WCDMA Band II Highest channel



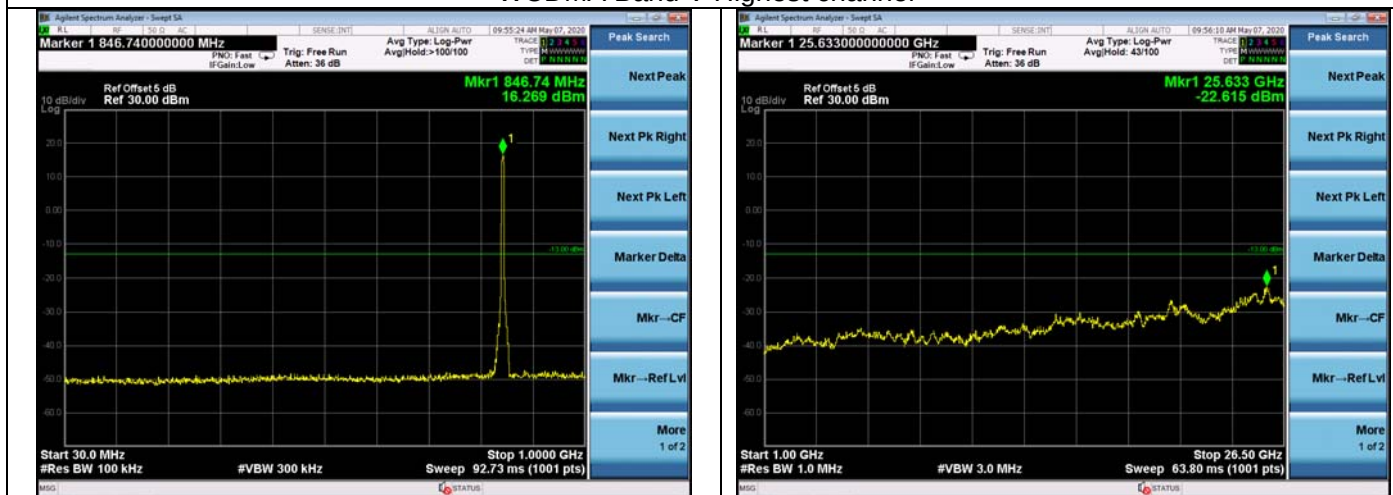
WCDMA Band V Lowest channel



WCDMA Band V Middle channel



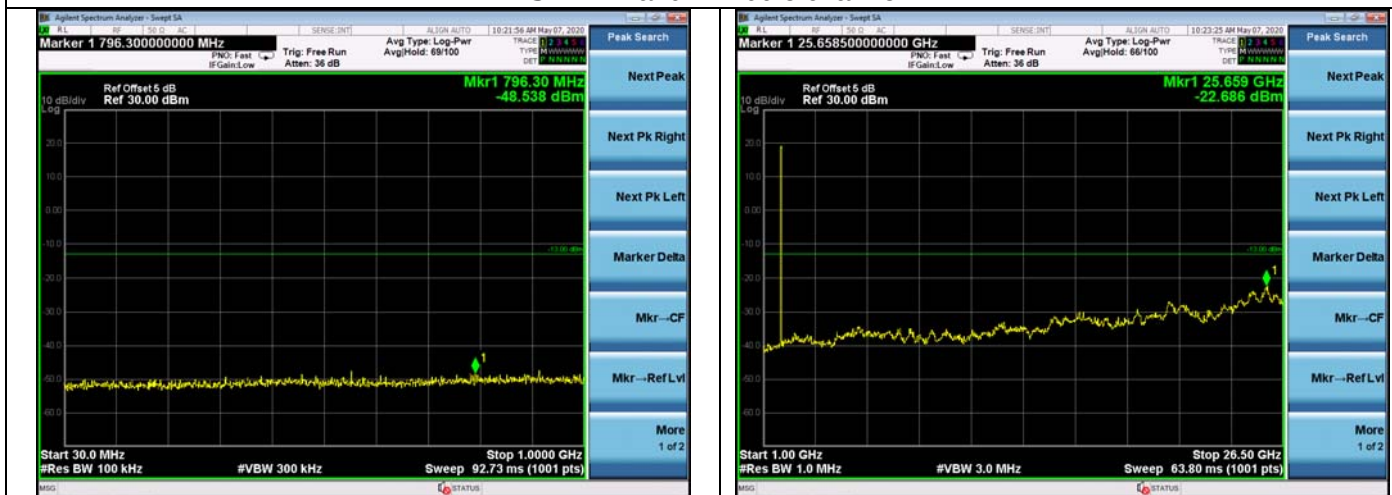
WCDMA Band V Highest channel



HSDPA Band II Lowest channel



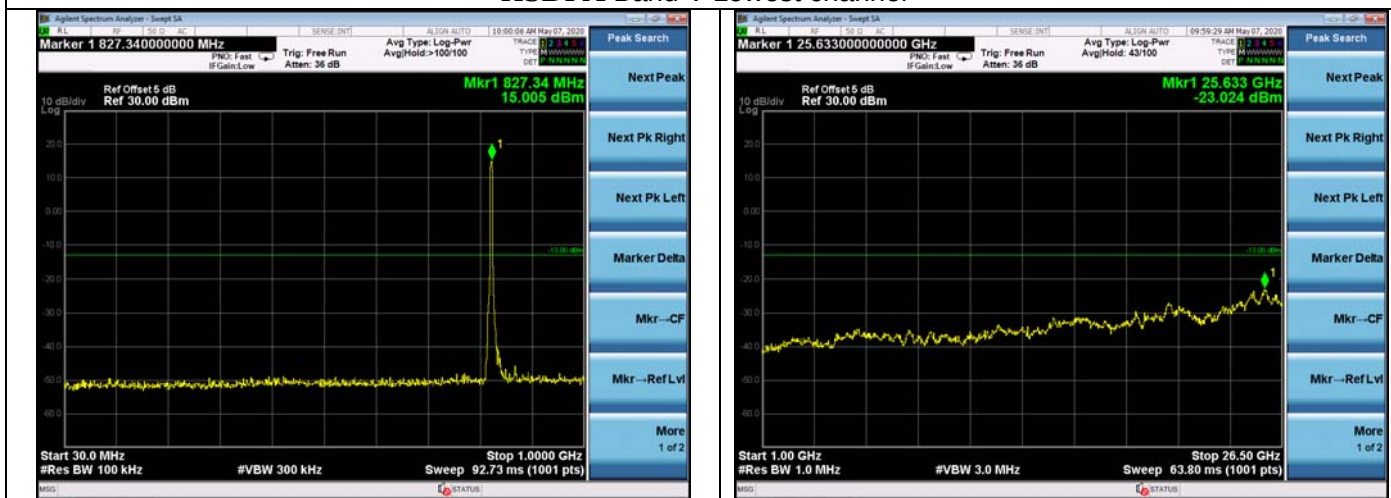
HSDPA Band II Middle channel



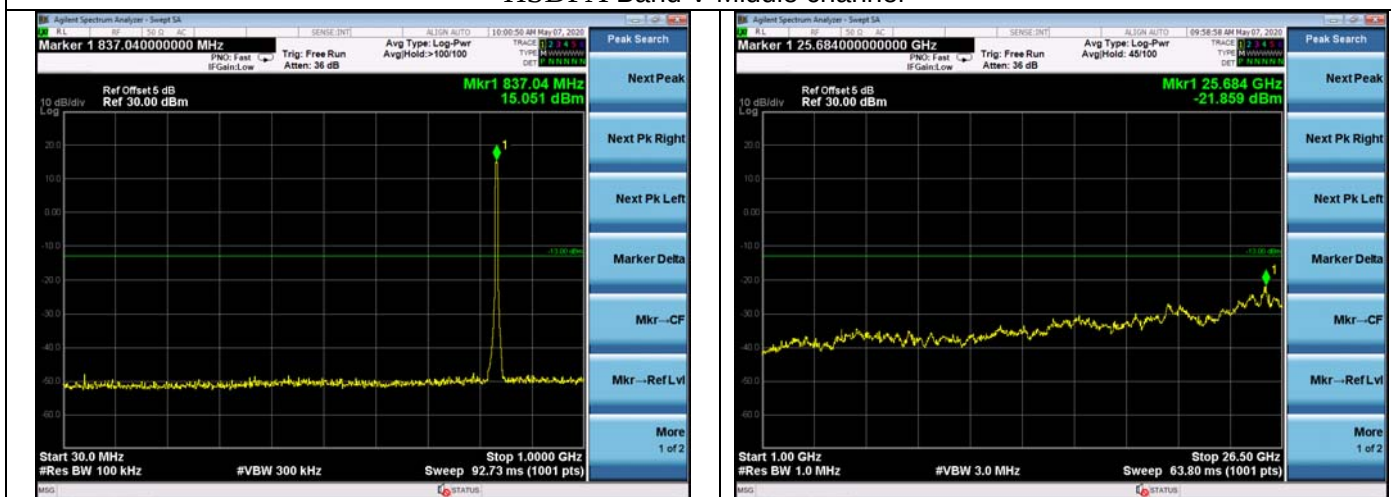
HSDPA Band II Highest channel



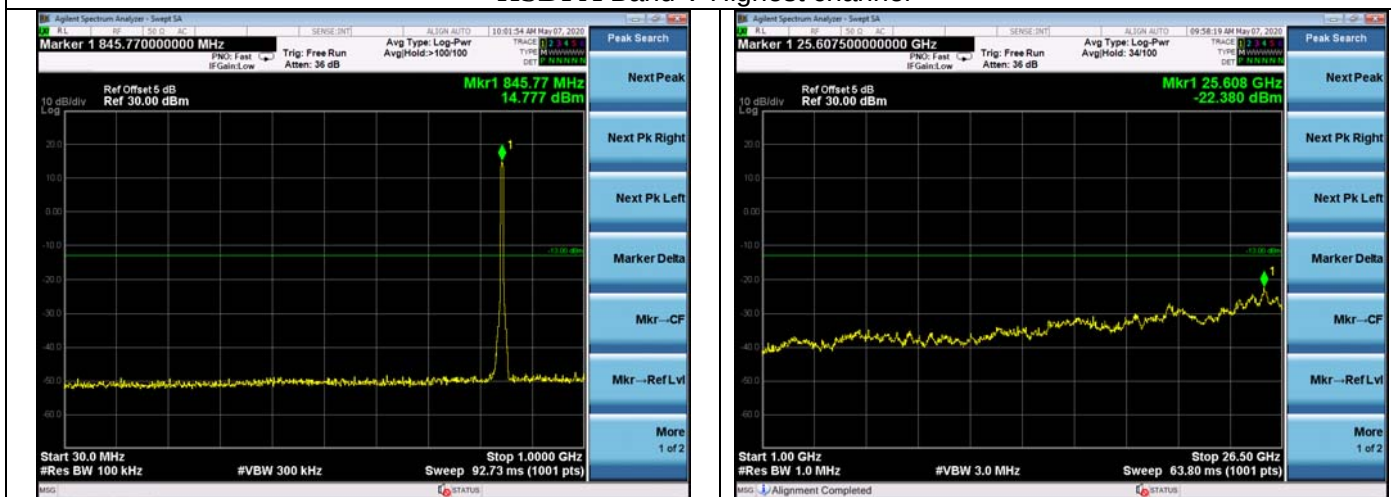
HSDPA Band V Lowest channel



HSDPA Band V Middle channel



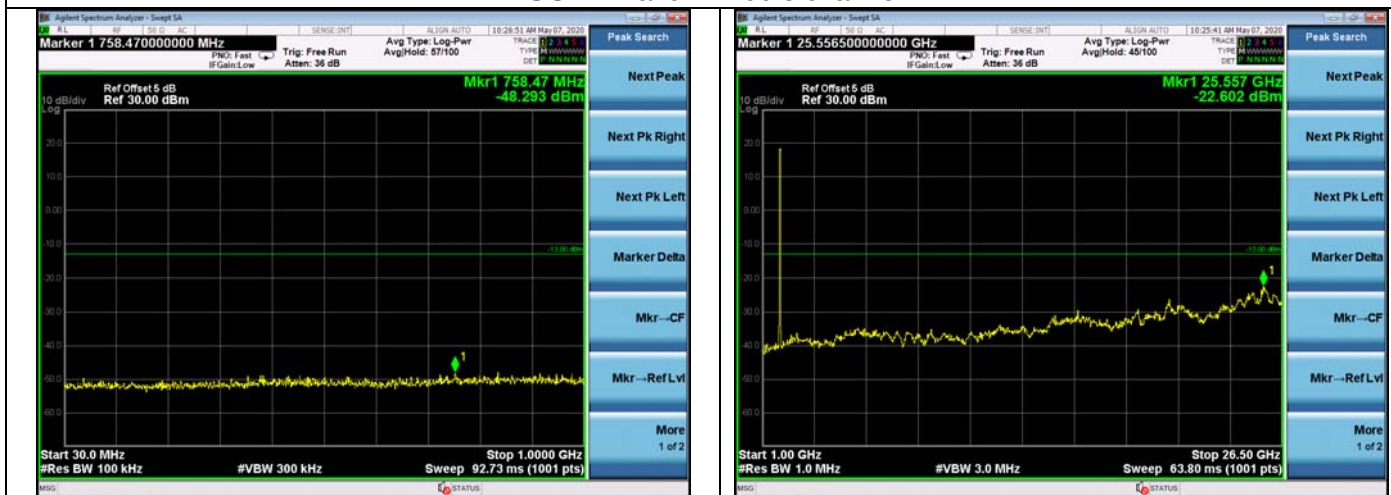
HSDPA Band V Highest channel



HSUPA Band II Lowest channel



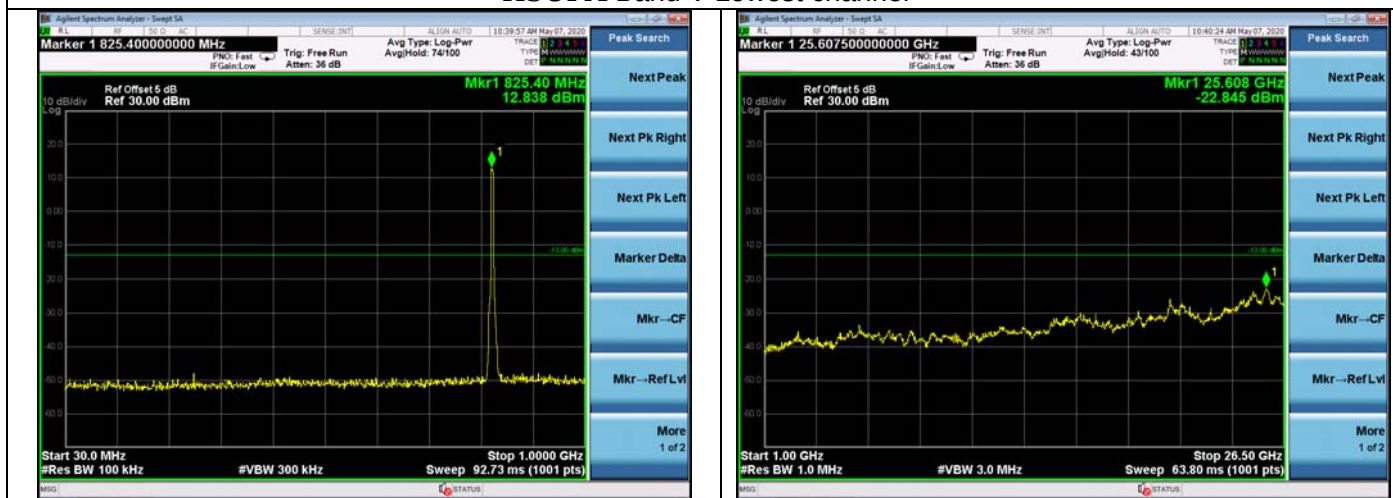
HSUPA Band II Middle channel



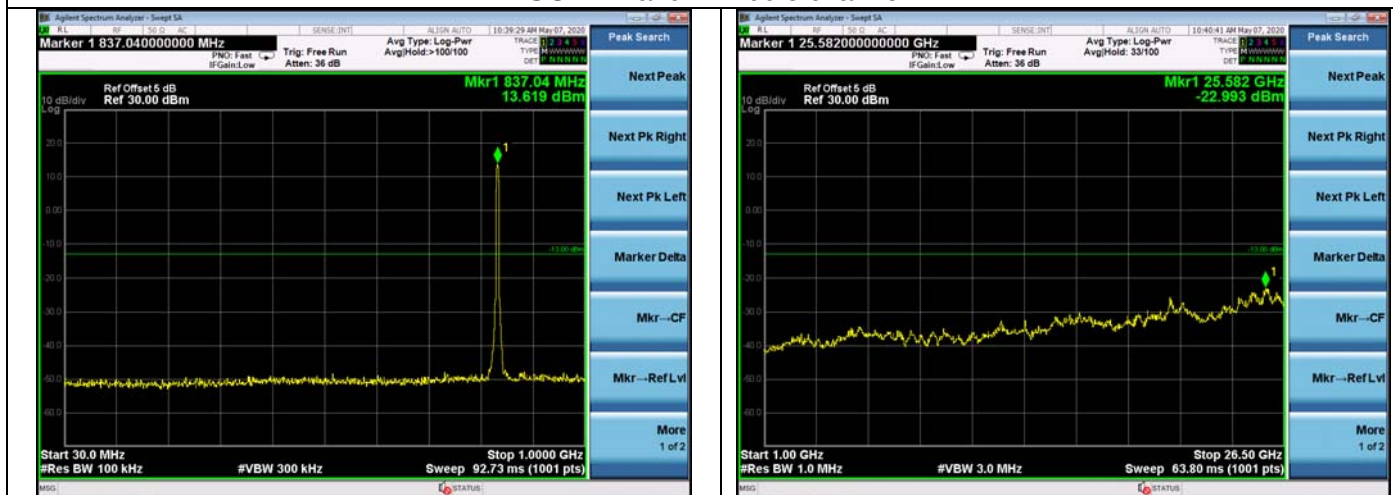
HSUPA Band II Highest channel



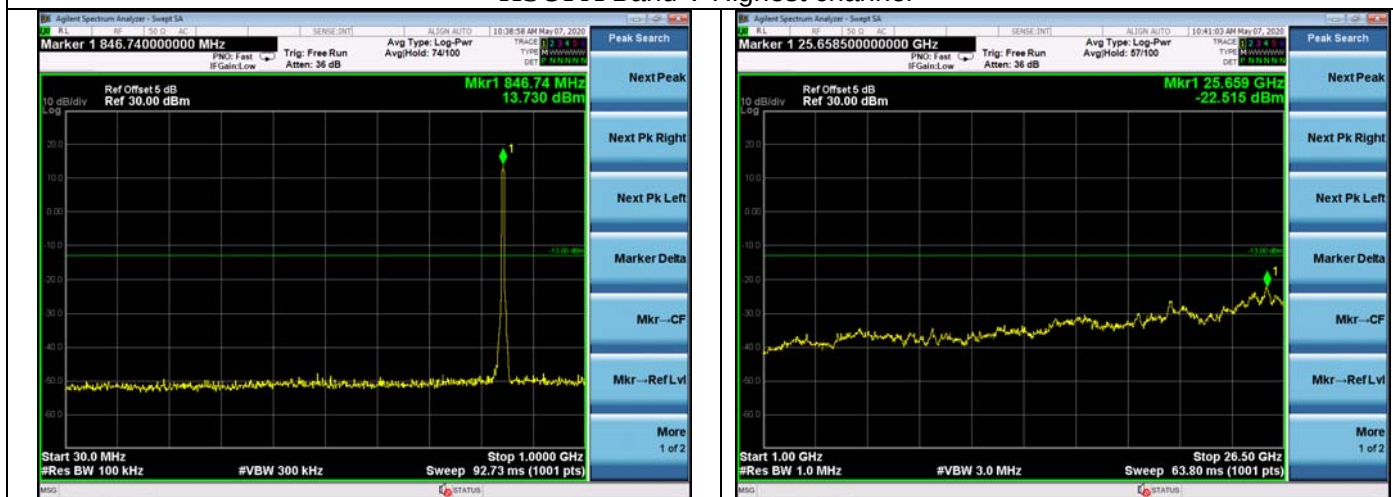
HSUPA Band V Lowest channel



HSUPA Band V Middle channel



HSUPA Band V Highest channel

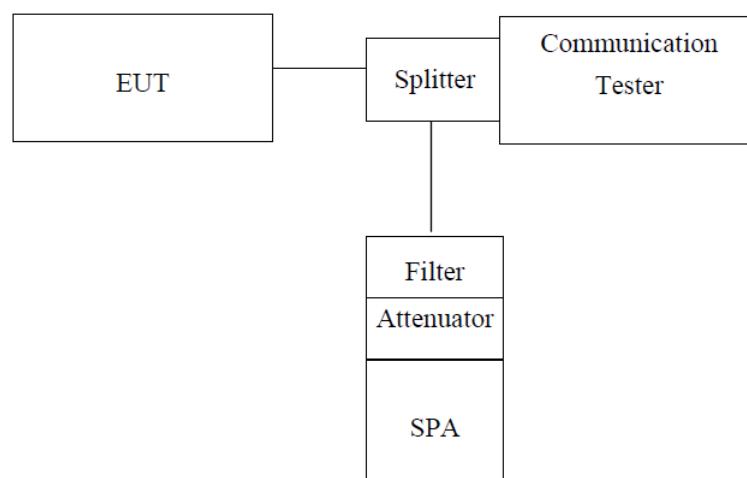


5.6. Conducted Out of Band Emissions

5.6.1. Limit

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

5.6.2. Test Setup



Note: Measurement setup for testing on Antenna connector

5.6.3. Measurement Procedure

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

and reference KDB 971168 D01 Power Meas. License Digital Systems v02v02

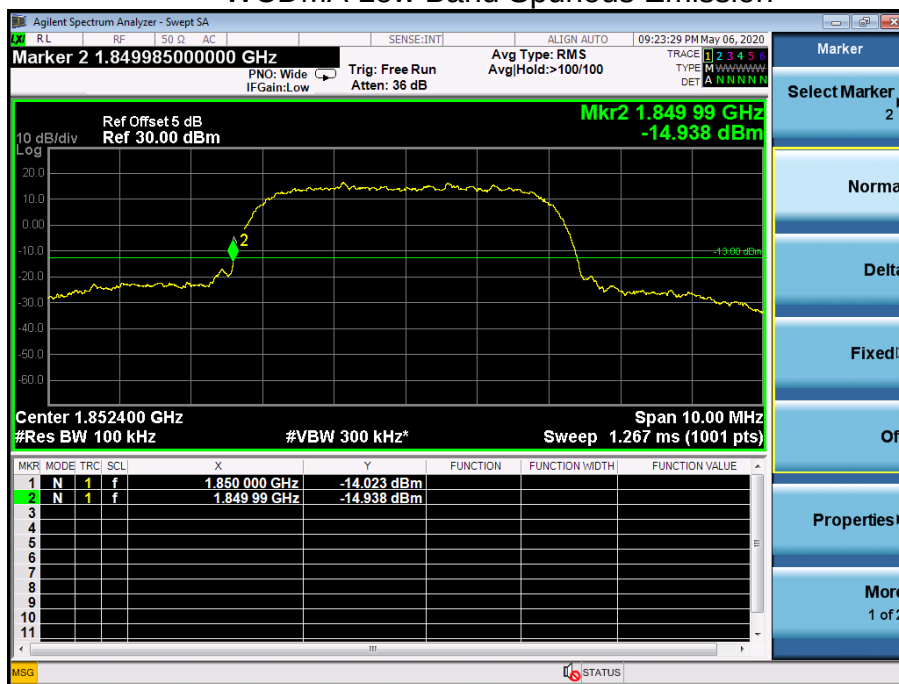
5.6.4. Test Result

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

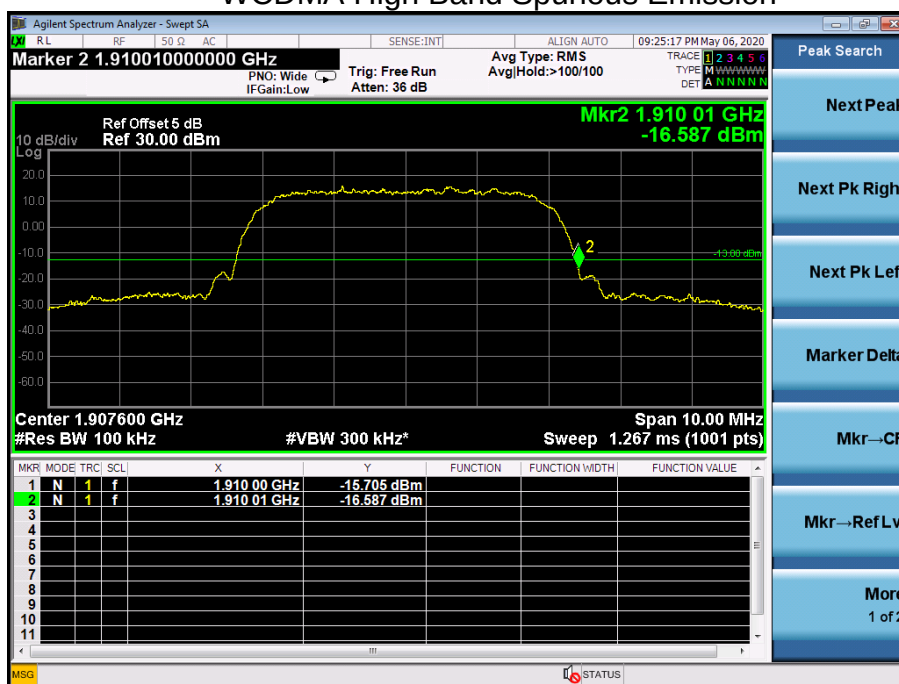
Note: Offset=Cable loss+ 10log((-26dB bandwidth/100)/RBW)

Test plot as follows:

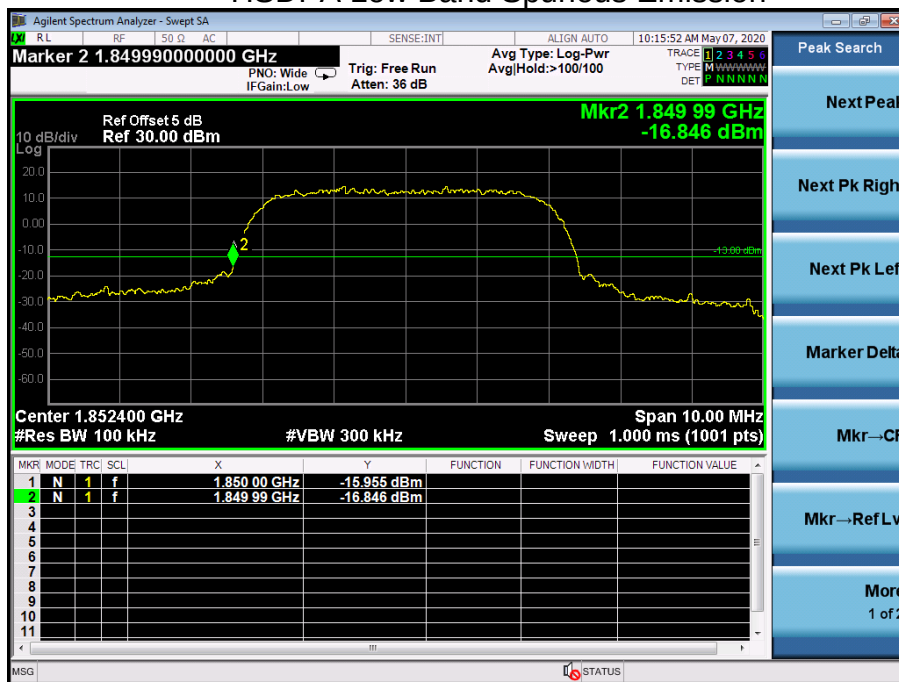
WCDMA Low Band Spurious Emission



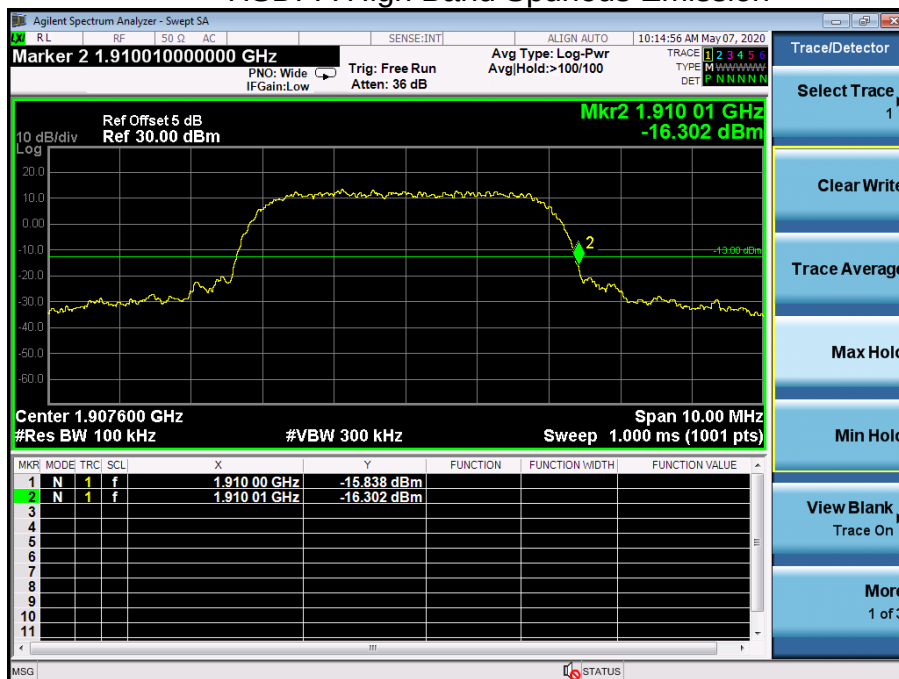
WCDMA High Band Spurious Emission



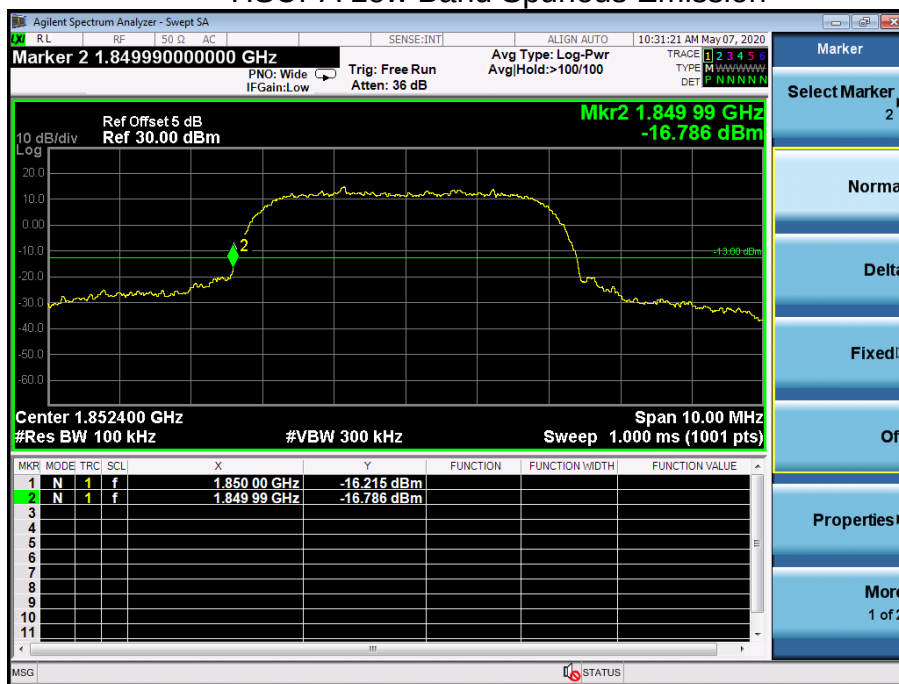
HSDPA Low Band Spurious Emission



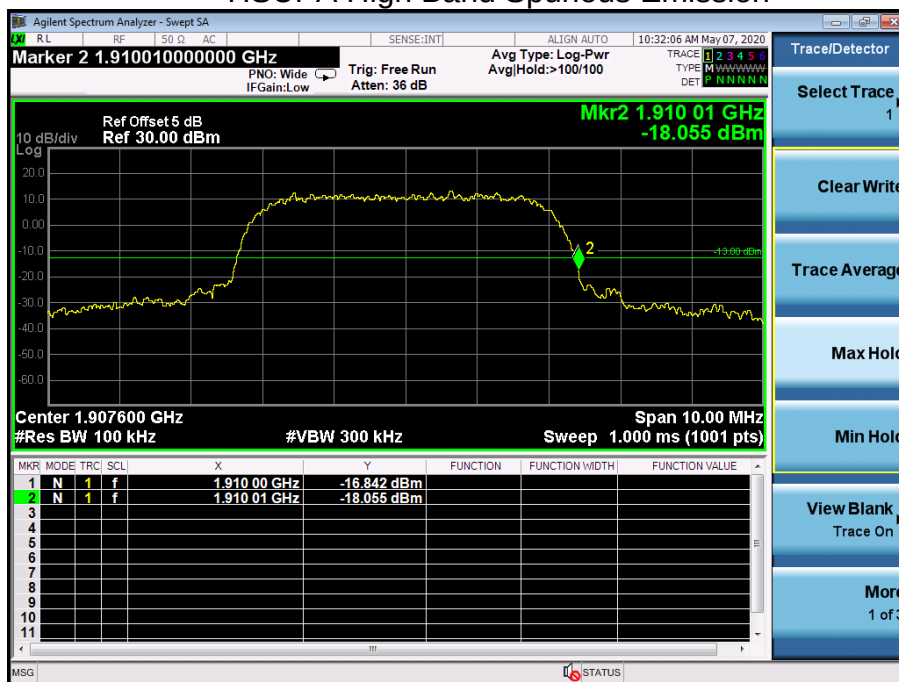
HSDPA High Band Spurious Emission



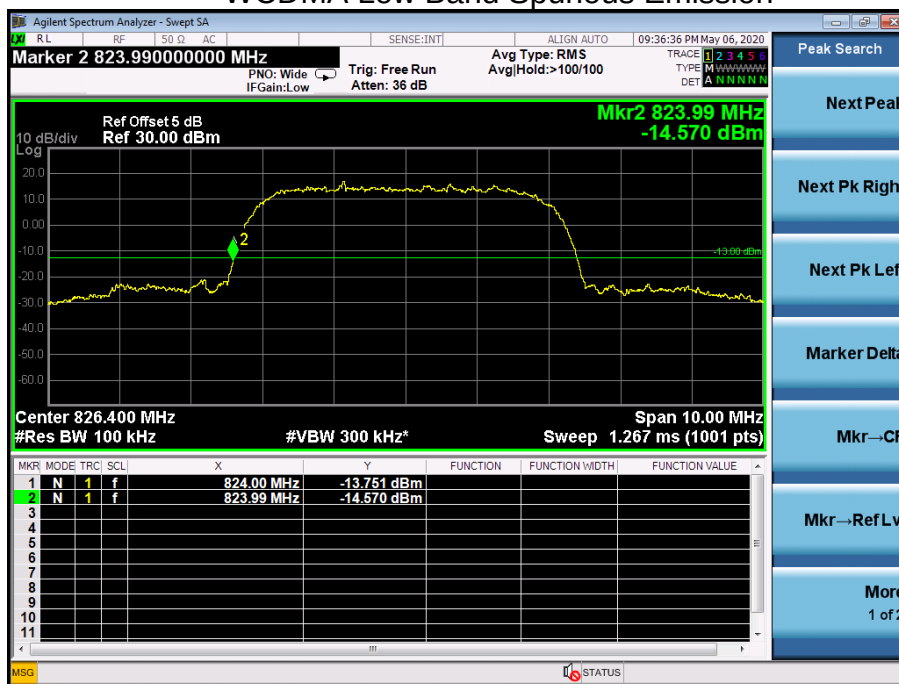
HSUPA Low Band Spurious Emission



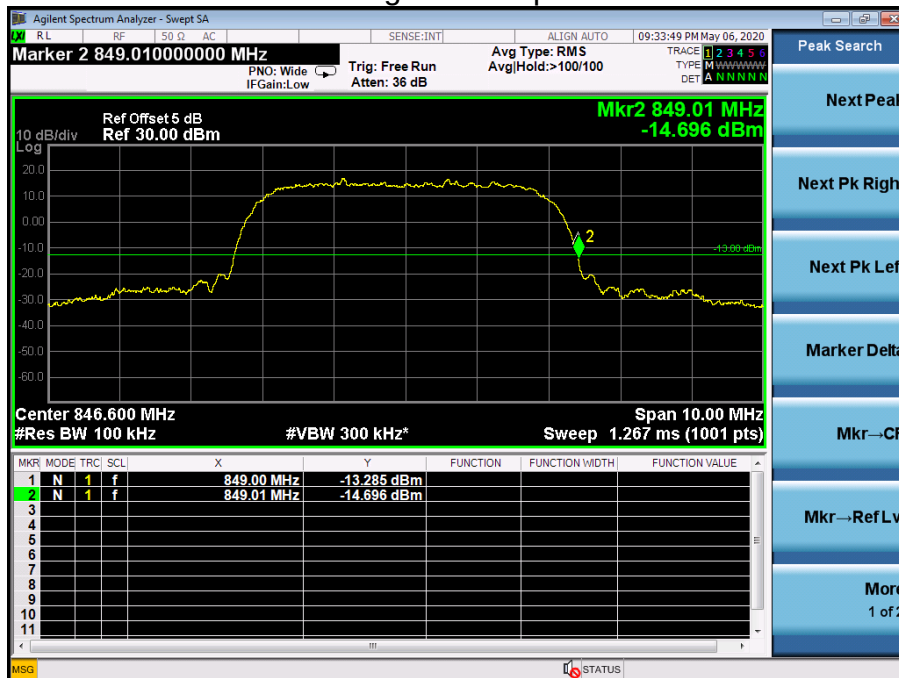
HSUPA High Band Spurious Emission



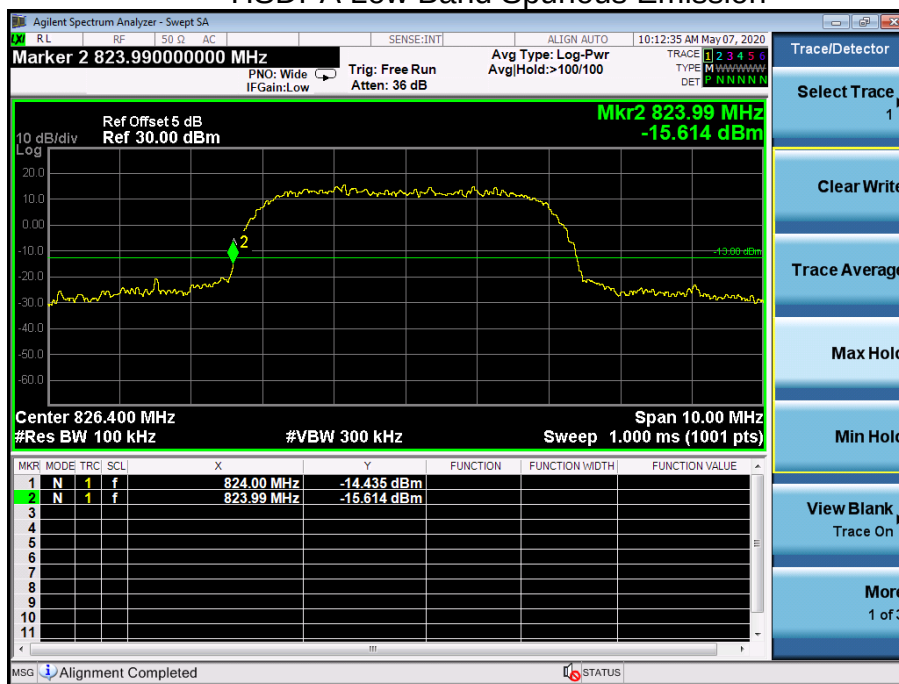
WCDMA Low Band Spurious Emission



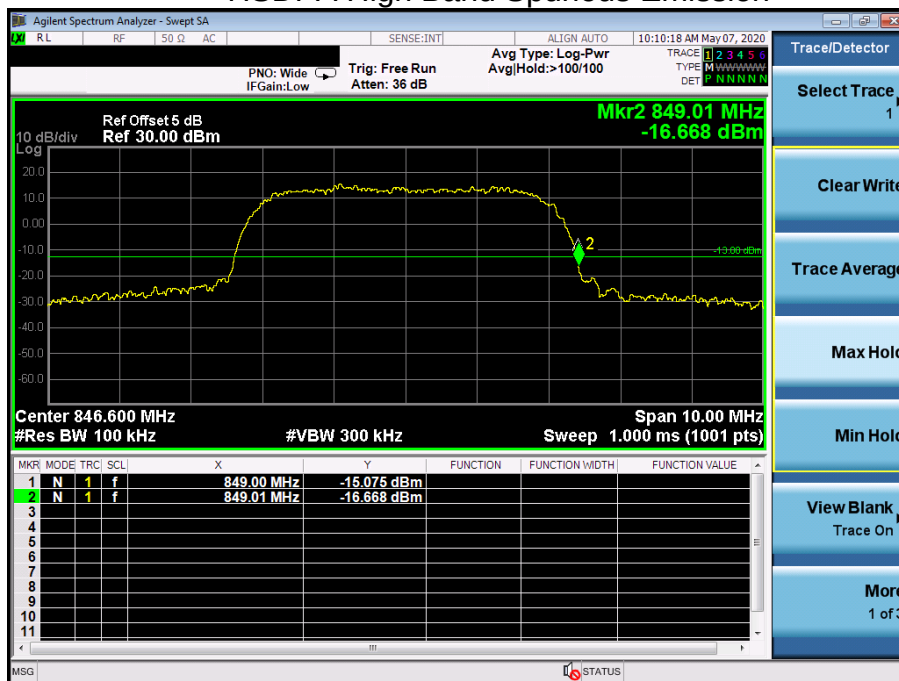
WCDMA High Band Spurious Emission



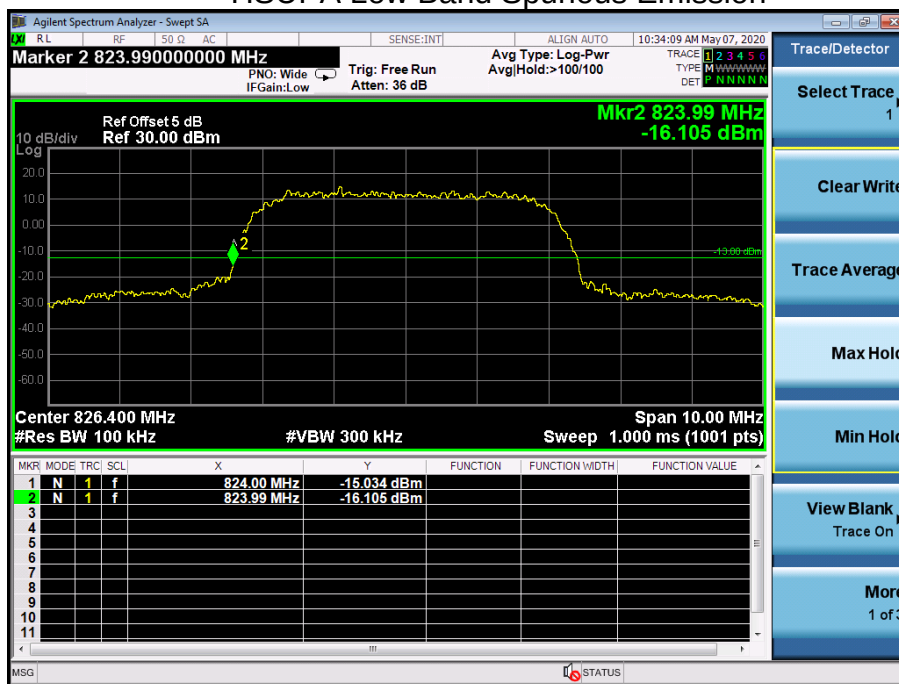
HSDPA Low Band Spurious Emission



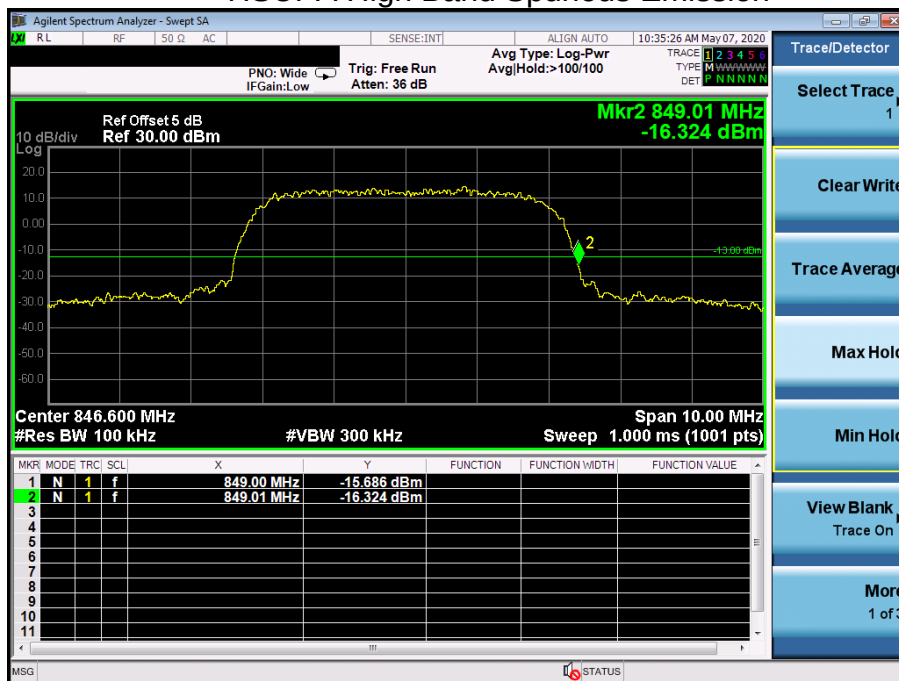
HSDPA High Band Spurious Emission



HSUPA Low Band Spurious Emission



HSUPA High Band Spurious Emission



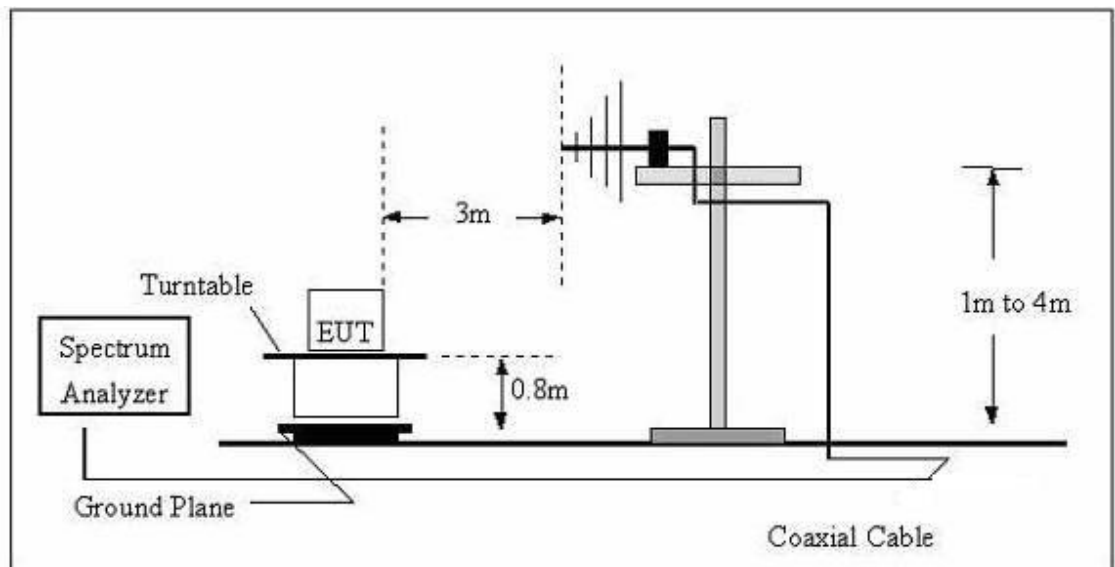
5.7. Transmitter Radiated Power (EIRP/ERP)

5.7.1. Limit

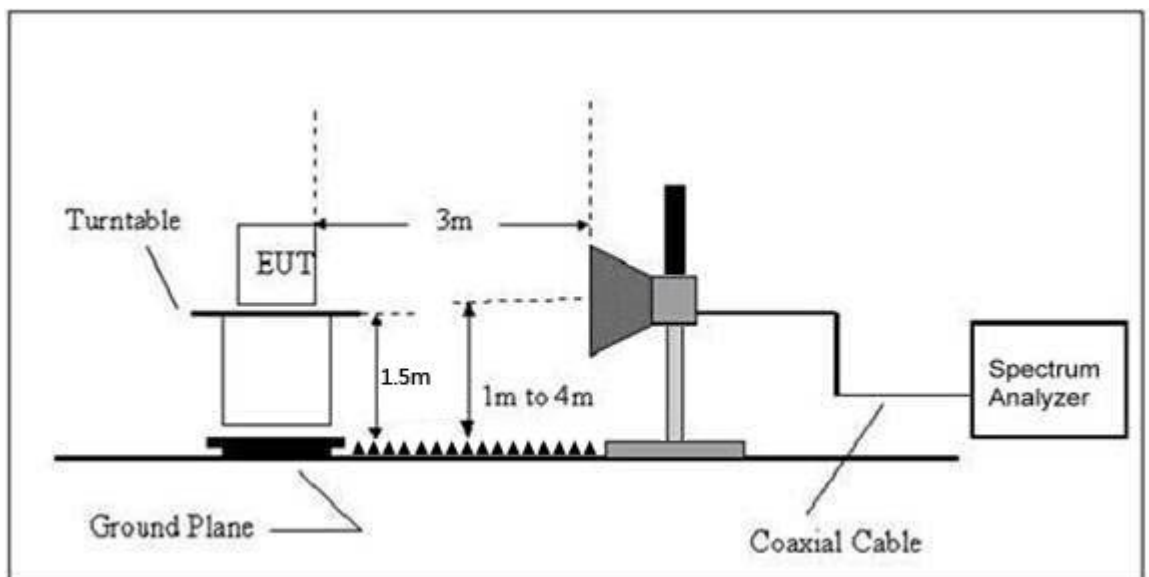
According to FCC section 22.913, the Effective Radiated Power (ERP) of mobile transmitters and auxiliary test transmitters must not exceed 7Watts, and FCC section 24.232, the broadband PCS mobile station is limited to 2 Watts e.i.r.p. peak power.

5.7.2. Test Setup

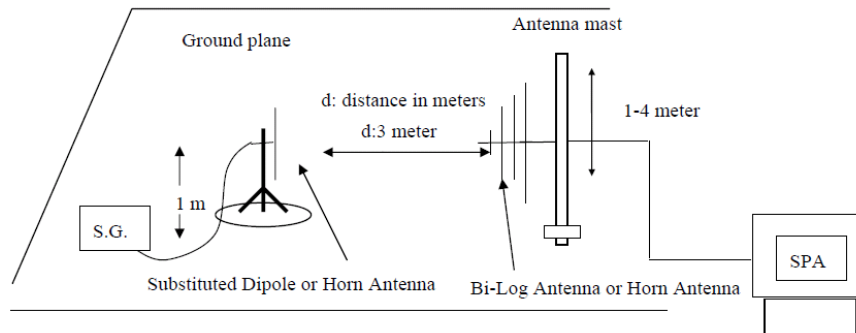
Below 1GHz



Above 1GHz



Substituted method:



5.7.3. Measurement Procedure

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

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

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

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

EIRP in frequency band 1712.4 – 1752.6 MHz were measured using a substitution method. The EUT was replaced by a horn antenna connected to the S.G. output; the output was recorded and EIRP was calculated as follows:

For BAND II: $ERP = \text{S.G. output (dBm)} + \text{Antenna Gain (dBd)} - \text{Cable Loss (dB)}$

For BAND V: $EIRP = \text{S.G. output (dBm)} + \text{Antenna Gain (dBi)} - \text{Cable Loss (dB)}$

5.7.4. Test Result

EUT mode	Channel	Antenna Pol.	S.G. output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)	Result
----------	---------	--------------	-------------------	--------------------	-----------------	------------	-------------	--------

WCDMA Band II	Lowest	V	6.12	19.33	2.52	22.93	33.00	Pass
		H	5.35	19.33	2.52	22.16		
	Middle	V	5.57	19.5	2.6	22.47	33.00	Pass
		H	5.43	19.5	2.6	22.33		
	Highest	V	4.88	19.94	2.71	22.11	33.00	Pass
		H	4.84	19.94	2.71	22.07		

EUT mode	Channel	Antenna Pol.	S.G. output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)	Result
----------	---------	--------------	-------------------	--------------------	-----------------	-----------	-------------	--------

WCDMA Band V	Lowest	V	6.87	15.68	1.65	20.90	38.45	Pass
		H	6.94	15.68	1.65	20.97		
	Middle	V	5.46	15.7	1.67	19.49	38.45	Pass
		H	4.32	15.7	1.67	18.35		
	Highest	V	7.38	15.7	1.71	21.37	38.45	Pass
		H	7.94	15.7	1.71	21.93		

5.8. Radiated Out of Band Emissions

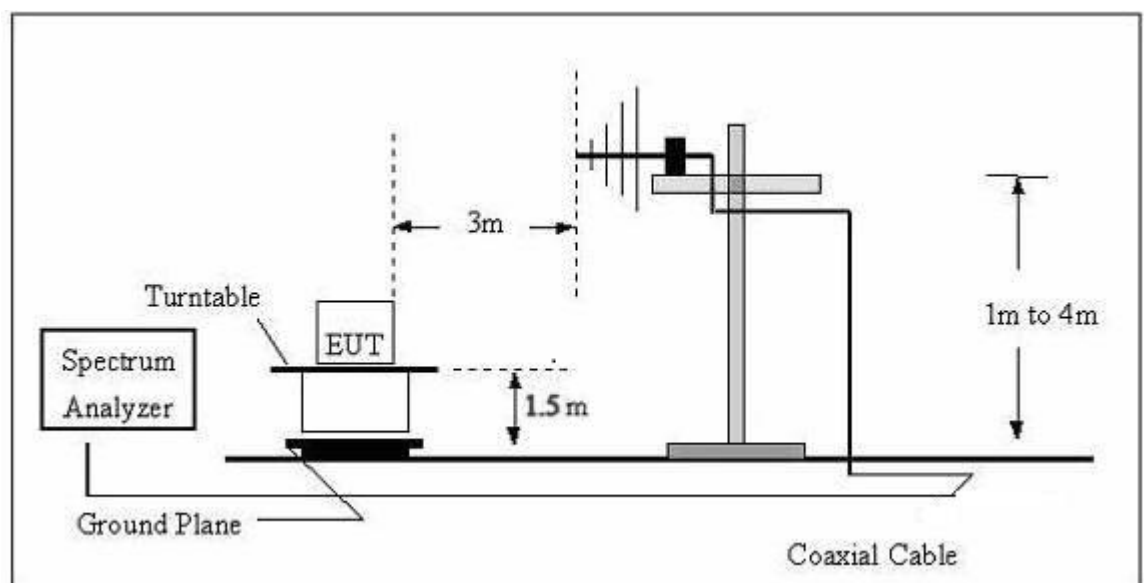
5.8.1. Limit

According to FCC section 22.917(a) and section 24.238(a) the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43+10\log(P)$ dB. This calculated to be -13dBm.

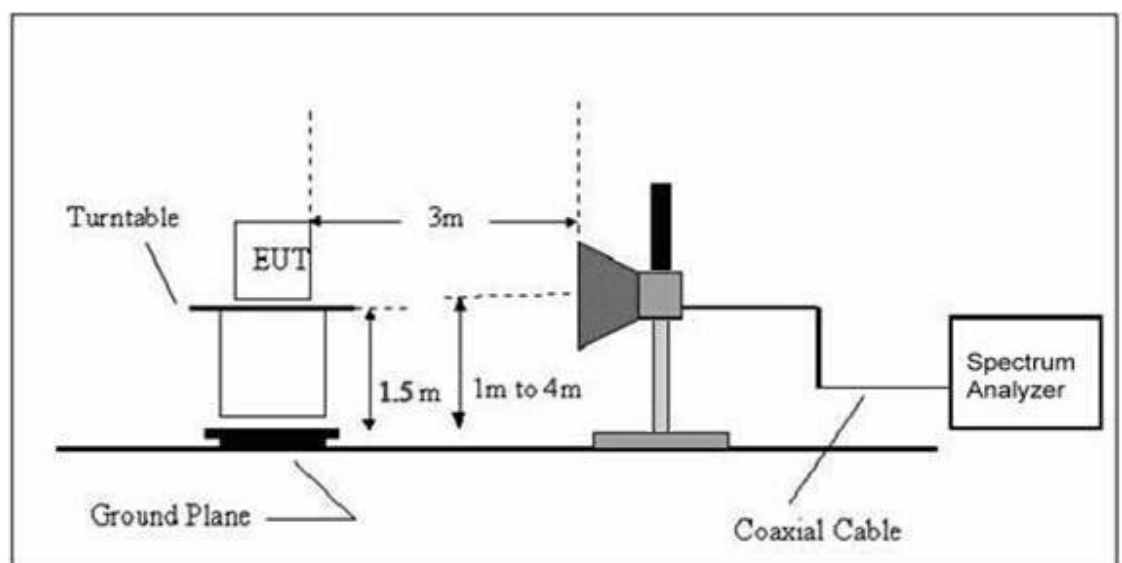
The spurious emission with frequency band 1900 according to FCC section 2.1057.

5.8.2. Test Setup

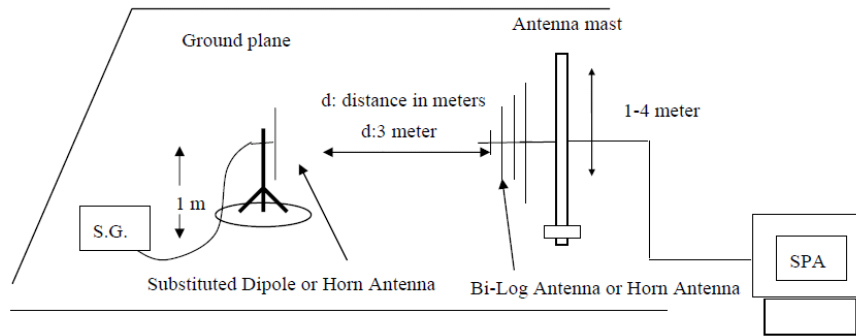
Below 1GHz



Above 1GHz



Substituted method:



5.8.3. Measurement Procedure

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

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

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

$EIRP \text{ (Level)} = S.G. \text{ output (dBm)} + \text{Antenna Gain(dBi)} - \text{Cable Loss (dB)}$

Note: Measurement Uncertainty: $\pm 3.6 \text{ dB}$.

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

Band	Frequency (MHz)	Spurious Emission					Limit (dBm)	Result
		Polarization	S.G. output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Level (dBm)		
WCDMA Band II Lowest	87.21	Vertical	-75.45	3.35	0.38	-72.48	-13	PASS
	3700.40	Vertical	-46.16	7.76	3.75	-42.15		
	5550.60	Vertical	-47.33	9.84	4.94	-42.43		
	7400.80	Vertical	-39.75	10.21	5.32	-34.86		
	9251.00	Vertical	-43.14	11.36	6.02	-37.80		
	11101.20	Vertical	-44.62	14.52	6.68	-36.78		
	137.26	Horizontal	-75.56	4.12	0.51	-71.95		
	3700.40	Horizontal	-48.47	7.76	3.75	-44.46		
	5550.60	Horizontal	-47.66	9.84	4.94	-42.76		
	7400.80	Horizontal	-42.34	10.21	5.32	-37.45		
	9251.00	Horizontal	-47.52	11.36	6.02	-42.18		
	11101.20	Horizontal	-47.38	14.52	6.68	-39.54		

Band	Frequency (MHz)	Spurious Emission					Limit (dBm)	Result
		Polarization	S.G. output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Level (dBm)		
WCDMA Band II Middle	88.39	Vertical	-75.43	3.35	0.38	-72.49	-13	PASS
	3760.00	Vertical	-47.54	7.76	3.75	-43.50		
	5640.00	Vertical	-47.15	9.84	4.94	-42.21		
	7520.00	Vertical	-42.77	10.21	5.32	-37.84		
	9400.00	Vertical	-42.13	11.36	6.02	-36.79		
	11280.00	Vertical	-46.02	14.52	6.68	-38.24		
	137.43	Horizontal	-75.53	4.12	0.51	-71.97		
	3760.00	Horizontal	-45.63	7.76	3.75	-41.92		
	5640.00	Horizontal	-46.62	9.84	4.94	-41.77		
	7520.00	Horizontal	-39.36	10.21	5.32	-34.44		
	9400.00	Horizontal	-43.21	11.36	6.02	-37.88		
	11280.00	Horizontal	-45.02	14.52	6.68	-37.25		

Band	Frequency (MHz)	Spurious Emission					Limit (dBm)	Result
		Polarization	S.G. output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Level (dBm)		
WCDMA Band II Highest	88.24	Vertical	-75.45	3.35	0.38	-72.48	-13	PASS
	3819.60	Vertical	-47.16	7.79	3.53	-42.90		
	5729.40	Vertical	-41.53	9.88	5.02	-36.67		
	7639.20	Vertical	-37.77	10.25	5.54	-33.06		
	9549.00	Vertical	-44.65	11.38	6.16	-39.43		
	11458.80	Vertical	-47.08	14.56	6.72	-39.24		
	139.04	Horizontal	-75.54	4.12	0.51	-71.93		
	3819.60	Horizontal	-45.47	7.79	3.53	-41.21		
	5729.40	Horizontal	-41.43	9.88	5.02	-36.57		
	7639.20	Horizontal	-37.15	10.25	5.54	-32.44		
	9549.00	Horizontal	-42.77	11.38	6.16	-37.55		
	11458.80	Horizontal	-44.63	14.56	6.72	-36.79		

Band	Frequency (MHz)	Spurious Emission					Limit (dBm)	Result
		Polarization	S.G. output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	Level (dBm)		
WCDMA Band V Lowest	87.48	Vertical	-75.66	3.35	0.38	-72.69	-13	PASS
	1652.80	Vertical	-29.24	6.51	1.35	-24.08		
	2479.20	Vertical	-35.22	6.88	2.53	-30.87		
	3305.60	Vertical	-37.39	7.61	3.67	-33.45		
	4132.00	Vertical	-45.53	8.67	4.06	-40.92		
	4958.40	Vertical	-40.23	9.35	4.38	-35.26		
	138.21	Horizontal	-75.71	4.12	0.51	-72.10		
	1652.80	Horizontal	-34.11	6.51	1.35	-28.95		
	2479.20	Horizontal	-37.28	6.88	2.53	-32.93		
	3305.60	Horizontal	-45.93	7.61	3.67	-41.99		
	4132.00	Horizontal	-49.23	8.67	4.06	-44.62		
	4958.40	Horizontal	-43.47	9.35	4.38	-38.50		

Band	Frequency (MHz)	Spurious Emission					Limit (dBm)	Result
		Polarization	S.G. output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	Level (dBm)		
WCDMA Band V Middle	87.69	Vertical	-75.44	3.35	0.38	-72.47	-13	PASS
	1670.00	Vertical	-32.26	6.58	1.38	-27.06		
	2505.00	Vertical	-32.34	6.92	2.57	-27.99		
	3340.00	Vertical	-40.27	7.67	3.72	-36.32		
	4175.00	Vertical	-47.85	8.75	4.19	-43.29		
	5010.00	Vertical	-43.67	9.48	4.45	-38.64		
	139.86	Horizontal	-76.15	4.12	0.51	-72.54		
	1670.00	Horizontal	-29.58	6.58	1.38	-24.38		
	2505.00	Horizontal	-32.25	6.92	2.57	-27.90		
	3340.00	Horizontal	-48.53	7.67	3.72	-44.58		
	4175.00	Horizontal	-49.97	8.75	4.19	-45.41		
	5010.00	Horizontal	-39.55	9.48	4.45	-34.52		

Band	Frequency (MHz)	Spurious Emission					Limit (dBm)	Result
		Polarization	S.G. output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	Level (dBm)		
WCDMA Band V Highest	88.26	Vertical	-75.24	3.35	0.38	-72.27	-13	PASS
	1693.20	Vertical	-31.16	6.57	1.48	-26.07		
	2539.80	Vertical	-33.08	6.96	2.67	-28.79		
	3386.40	Vertical	-36.24	7.68	3.78	-32.34		
	4233.00	Vertical	-41.37	8.76	4.24	-36.85		
	5079.60	Vertical	-46.73	9.47	4.63	-41.89		
	137.65	Horizontal	-76.36	4.12	0.51	-72.75		
	1693.20	Horizontal	-29.75	6.57	1.48	-24.66		
	2539.80	Horizontal	-32.48	6.96	2.67	-28.19		
	3386.40	Horizontal	-38.54	7.68	3.78	-34.64		
	4233.00	Horizontal	-47.27	8.76	4.24	-42.75		
	5079.60	Horizontal	-53.46	9.47	4.63	-48.62		

6. PHOTOGRAPHS OF TEST SET-UP



7. PHOTOGRAPHS OF THE EUT



***** END OF REPORT *****