



Shenzhen Global Test Service Co.,Ltd.

No.7-101 and 8A-104,Building 7 and 8,DCC Cultural and Creative Garden No.98,Pingxin North Road,Shangmugu,Pinghu Street, Longgang District,Shenzhen,Guangdong,China

TEST REPORT

FCC Part 22 Subpart H / Part 24 Subpart E

Report Reference No.....: GTS20190726008-1-3-2

FCC ID.....: S8U-IDD-213LA

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Date of issue.....: Aug.12, 2019

Testing Laboratory Name **Shenzhen Global Test Service Co.,Ltd.**

Address No.7-101 and 8A-104,Building 7 and 8,DCC Cultural and Creative Garden No.98,Pingxin North Road,Shangmugu,Pinghu Street, Longgang District,Shenzhen,Guangdong,China

Applicant's name **Sinocastel Co.,Ltd.**

Address 5/F,5th Building,Software Park ,No. 2 Gaoxin C. 3rd RoadHi-Tech. Industrial Park,Shenzhen, China

Test specification

Standard **FCC CFR Title 47 Part 2, Part 22H, Part 24E**
ANSI/TIA-603-E-2016
KDB 971168 D01

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Test item description.....: OBD Vehicle Tracking Device

Trade Mark OBD-Smart

Manufacturer.....: **Sinocastel Co.,Ltd.**

Model/Type reference.....: IDD-213LA

Listed Models: IDD-213LA-L

Ratings: DC 9-36V

Modulation: QPSK

Hardware version: IDD-213L MAIN-V2.2

Software version: V1.0

Frequency.....: UMTS Band II, UMTS Band V

Result.....: **PASS**

TEST REPORT

Test Report No. :	GTS20190726008-1-3-2	Aug.12, 2019
		Date of issue

Equipment under Test : OBD Vehicle Tracking Device

Model /Type : IDD-213LA

Listed Models : IDD-213LA-L

Applicant : **Sinocastel Co.,Ltd.**

Address : 5/F,5th Building,Software Park ,No. 2 Gaoxin C. 3rd
RoadHi-Tech. Industrial Park,Shenzhen, China

Manufacturer : **Sinocastel Co.,Ltd.**

Address : 5/F,5th Building,Software Park ,No. 2 Gaoxin C. 3rd
RoadHi-Tech. Industrial Park,Shenzhen, China

Test result	Pass *
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* In the configuration tested, the EUT complied with the standards specified page 4.

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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1 SUMMARY

1.1 TEST STANDARDS

The tests were performed according to following standards:

[FCC Part 2](#): FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS

[FCC Part 22 Subpart H](#): PRIVATE LAND MOBILE RADIO SERVICES.

[FCC Part 24 Subpart E](#): PUBLIC MOBILE SERVICES

[ANSI/TIA-603-E-2016](#): Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.

[ANSI C63.26-2015](#): IEEE/ANSI Standard for Compliance Testing of Transmitters Used in Licensed Radio Services

[FCC KDB971168D01](#) Power Meas License Digital Systems

Test Description

Test Item	Section in CFR 47	Result
RF Output Power	Part 2.1046 Part 22.913 (a)(2) Part 24.232 (c)	Pass
Peak-to-Average Ratio	Part 24.232 (d)	Pass
99% & -26 dB Occupied Bandwidth	Part 2.1049 Part 22.917	Pass
Spurious Emissions at Antenna Terminal	Part 2.1051 Part 22.917 (a) Part 24.238 (a)	Pass
Field Strength of Spurious Radiation	Part 2.1053 Part 22.917 (a) Part 24.238 (a)	Pass
Out of band emission, Band Edge	Part 22.917 (a) Part 24.238 (a)	Pass
Frequency stability	Part 2.1055 Part 22.355 Part 24.235	Pass

1.2 Address of the test laboratory

Shenzhen Global Test Service Co.,Ltd.

No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong

The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.4:2014 and CISPR 16-1-4:2010 SVSWR requirement for radiated emission above 1GHz.

1.3 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

FCC-Registration No.: 165725

Shenzhen Global Test Service Co.,Ltd EMC Laborns Commission. The acceptance letter from the FCC is maintained in our files.

atory has been registered and fully described in a report filed with the (FCC) Federal Communicatio

A2LA-Lab Cert. No.: 4758.01

Shenzhen Global Test Service Co.,Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

CNAS-Lab Code: L8169

Shenzhen Global Test Service Co.,Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories. Date of Registration: Dec. 11, 2015. Valid time is until Dec. 10, 2024.

1.4 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01"Electromagnetic compatibilityand Radio spectrum Matters (ERM);Uncertainties in the measurementof mobile radio equipment characteristics;Part 1"and TR-100028-02 "Electromagnetic compatibilityand Radio spectrum Matters (ERM);Uncertainties in the measurementof mobile radio equipment characteristics;Part 2 " and is documented in the Shenzhen Global Test Service Co.,Ltd.quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen Global Test Service Co.,Ltd.is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	4.10 dB	(1)
Radiated Emission	1~18GHz	4.32 dB	(1)
Radiated Emission	18-40GHz	5.54 dB	(1)
Conducted Disturbance	0.15~30MHz	3.12 dB	(1)
Conducted Power	9KHz~18GHz	0.61 dB	(1)
Spurious RF Conducted Emission	9KHz~40GHz	1.22 dB	(1)
Band Edge Compliance of RF Emission	9KHz~40GHz	1.22 dB	(1)
Occupied Bandwidth	9KHz~40GHz	-	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

2 GENERAL INFORMATION

2.1 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Normal Temperature:	25°C
Relative Humidity:	55 %
Air Pressure:	101 kPa

2.2 General Description of EUT

Product Name:	OBD Vehicle Tracking Device
Model/Type reference:	IDD-213LA
Power supply:	DC 12.0V from battery
WCDMA	
Operation Band:	FDD Band II & Band V
Power Class:	Power Class 3
Modulation Type:	QPSK for WCDMA/HSUPA/HSDPA
WCDMA Release Version:	R99
HSDPA Release Version:	Release 7, CAT14
HSUPA Release Version:	Release 6, CAT6
Antenna type:	FPC antenna
Antenna gain:	FDD Band V:1.21dBi, FDD Band II:1.46dBi

Note: For more details, refer to the user's manual of the EUT.

2.3 Description of Test Modes and Test Frequency

The EUT has been tested under typical operating condition. The CUM200 used to control the EUT staying in continuous transmitting and receiving mode for testing. Regards to the frequency band operation: the lowest, middle and highest frequency of channel were selected to perform the test, then shown on this report.

Test Frequency:

FDD Band II		FDD Band IV		FDD Band V	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
9262	1852.4	1312	1712.4	4132	826.40
9400	1880.0	1413	1732.6	4182	836.60
9538	1907.6	1513	1752.6	4233	846.60

2.4 Test Modes

The test mode(s) are selected according to relevant radio technology specifications.

Test Mode	Test Modes Description
Mode 1	WCDMA system, QPSK modulation
Mode 2	HSDPA system, QPSK modulation
Mode 3	HSUPA system, QPSK modulation

Note:

- As WCDMA, HSDPA and HSUPA with the same emission designator, test result recorded in this report at the worst case Mode 1 only after exploratory scan.

2.5 Equipments Used during the Test

Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due Date
LISN	R&S	ENV216	3560.6550.08	2018/09/20	2019/09/19
LISN	R&S	ESH2-Z5	893606/008	2018/09/20	2019/09/19
Bilog Antenna	Schwarzbeck	VULB9163	976	2018/09/20	2019/09/19
Bilog Antenna	Schwarzbeck	VULB9163	979	2018/09/20	2019/09/19
EMI Test Receiver	R&S	ESCI7	101102	2018/09/20	2019/09/19
Spectrum Analyzer	Agilent	N9020A	MY48010425	2018/09/20	2019/09/19
Spectrum Analyzer	R&S	FSP40	100019	2018/06/05	2019/06/04
Controller	EM Electronics	Controller EM 1000	N/A	N/A	N/A
Horn Antenna	Schwarzbeck	BBHA 9120D	01622	2018/09/20	2019/09/19
Horn Antenna	Schwarzbeck	BBHA 9120D	01652	2018/09/20	2019/09/19
Active Loop Antenna	SCHWARZBECK	FMZB1519	1519-037	2018/09/20	2019/09/19
Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	971	2018/09/20	2019/09/19
Amplifier	Schwarzbeck	BBV 9743	#202	2018/09/20	2019/09/19
Amplifier	EMCI	EMC051845B	980355	2018/09/20	2019/09/19
Temperature/Humidity Meter	Gangxing	CTH-608	02	2018/09/20	2019/09/19
High-Pass Filter	K&L	9SH10-2700/X12750-O/O	KL142031	2018/09/20	2019/09/19
High-Pass Filter	K&L	41H10-1375/U12750-O/O	KL142032	2018/09/20	2019/09/19
RF Cable(below 1GHz)	HUBER+SUHNER	RG214	RE01	2018/09/20	2019/09/19
RF Cable(above 1GHz)	HUBER+SUHNER	RG214	RE02	2018/09/20	2019/09/19
Data acquisition card	Agilent	U2531A	TW53323507	2018/09/20	2019/09/19
Power Sensor	Agilent	U2021XA	MY5365004	2018/09/20	2019/09/19
EMI Test Software	R&S	ES-K1	V1.7.1	2018/09/20	2019/09/19
EMI Test Software	JS Tonscend	JS32-RE	2.0.1.5	2018/09/20	2019/09/19
EMI Test Software	Audix	E3	2..1.1	2018/09/20	2019/09/19

2.6 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: S8U-IDD-213LA filing to comply with of the FCC Part 22 and Part 24 Rules.

2.7 Modifications

No modifications were implemented to meet testing criteria.

3 TEST CONDITIONS AND RESULTS

3.1 Output Power

LIMIT

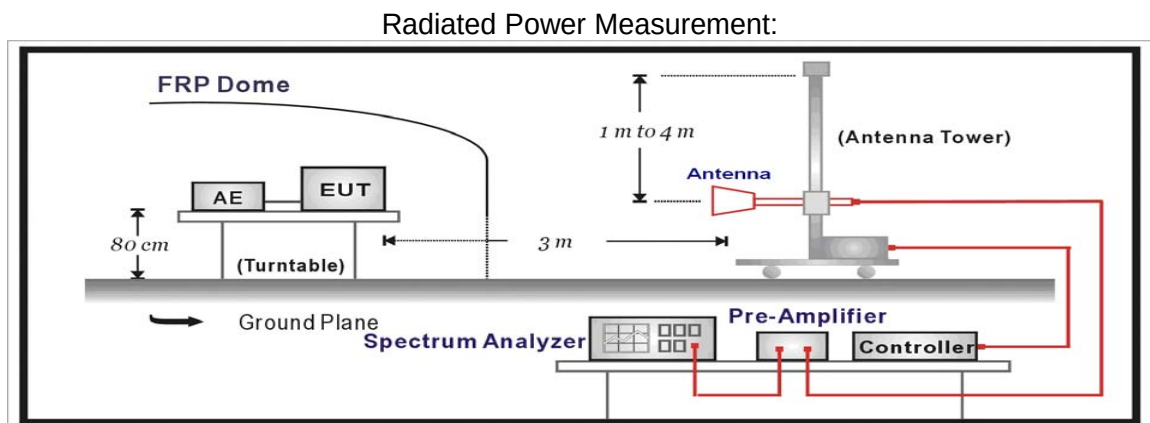
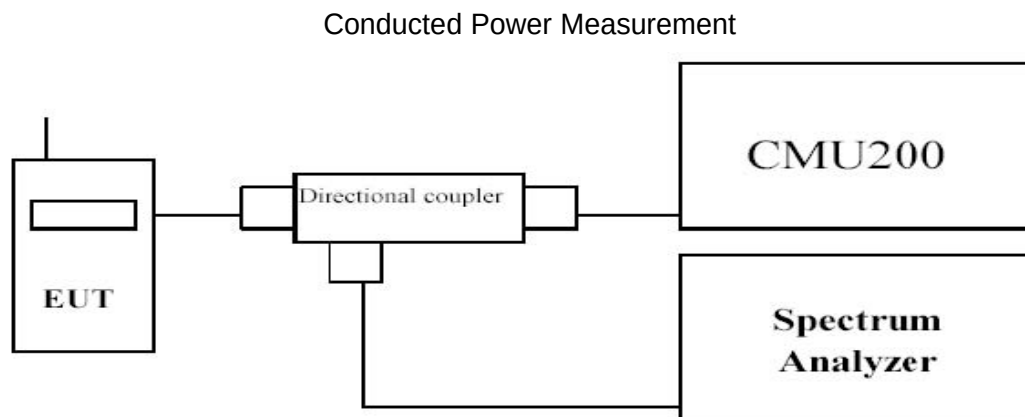
GSM850/WCDMA Band V: 7W

PCS1900/WCDMA Band II: 2W

WCDMA Band IV: 1W

The Peak-to-Average Ratio (PAR) of the transmission may not exceed 13 dB.

TEST CONFIGURATION



TEST PROCEDURE

The EUT was setup according to EIA/TIA 603C

Conducted Power Measurement:

- Place the EUT on a bench and set it in transmitting mode.
- Connect a low loss RF cable from the antenna port to a spectrum analyzer and CMU200 by a Directional Couple.
- EUT Communicate with CMU200 then selects a channel for testing.
- Add a correction factor to the display of spectrum, and then test.

Radiated Power Measurement:

- The EUT shall be placed at the specified height on a support, and in the position closest to normal use as declared by provider.
- The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter
- The output of the test antenna shall be connected to the measuring receiver.
- The transmitter shall be switched on and the measuring receiver shall be tuned to the frequency of the transmitter under test.

- e) The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.
- f) The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
- g) The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.
- h) The maximum signal level detected by the measuring receiver shall be noted.
- i) The transmitter shall be replaced by a substitution antenna.
- j) The substitution antenna shall be orientated for vertical polarization and the length of the substitution antenna shall be adjusted to correspond to the frequency of the transmitter.
- k) The substitution antenna shall be connected to a calibrated signal generator.
- l) If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
- m) The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
- n) The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuator setting of the measuring receiver.
- o) The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.
- p) The measure of the effective radiated power is the larger of the two levels recorded at the input to the substitution antenna, corrected for gain of the substitution antenna if necessary.

TEST RESULTS**Conducted Measurement:**

EUT Mode	Channel	Frequency (MHz)	Avg.Burst Power (dBm)	Peak-to-Average Ratio (dB)	Limit (dBm)	Result
WCDMA Band II (QPSK)	9262	1852.40	22.58	3.44	33.01	Pass
	9400	1880.00	22.69	3.75		
	9538	1907.60	22.46	3.68		
WCDMA Band V (QPSK)	4132	826.40	22.56	/	38.45	Pass
	4183	836.60	22.74	/		
	4233	846.60	22.65	/		

Note: 1. Peak-to-Average Ratio= maximum PK burst power-maximum Avg. burst power.

Radiated Measurement:

Note: 1. The field strength of radiation emission was measured in the following position: EUT stand-up position (Zaxis), lie-down position (X, Y axis). The data show in this report only with the worst case setup. After exploratory measurement the worst case of Z axis was reported.

Note: 2. We test the H direction and V direction and V direction is worse.

WCDMA BAND II

Channel	P _{Mea} (dBm)	P _{cl} (dB)	G _a Antenna Gain(dB)	P _{Ag} (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
9262	-17.32	3.41	10.24	33.60	23.11	33.01	9.90	V
9400	-17.10	3.49	10.24	33.60	23.25	33.01	9.76	V
9538	-17.19	3.55	10.23	33.60	23.09	33.01	9.92	V

WCDMA BAND V

Channel	P _{Mea} (dBm)	P _{cl} (dB)	G _a Antenna Gain(dB)	Correction (dB)	P _{Ag} (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
4132	-17.75	2.42	8.45	2.15	36.82	22.95	38.45	15.50	V
4183	-17.49	2.46	8.45	2.15	36.82	23.17	38.45	15.28	V
4233	-17.38	2.53	8.36	2.15	36.82	23.12	38.45	15.33	V

Remark:

1. $EIRP = P_{Mea}(dBm) - P_{cl}(dB) + P_{Ag}(dB) + G_a(dBi)$

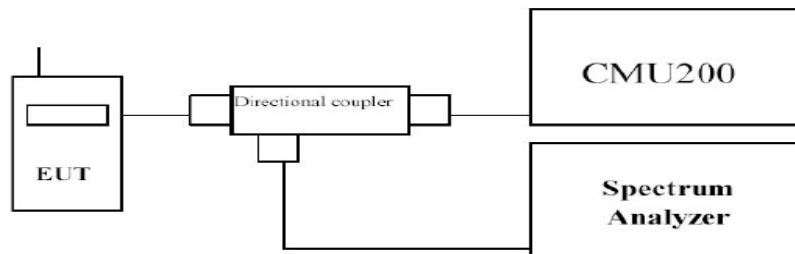
2. $ERP = EIRP - 2.15dBi$ as EIRP by subtracting the gain of the dipole.

3.2 Occupied Bandwidth

LIMIT

N/A

TEST CONFIGURATION



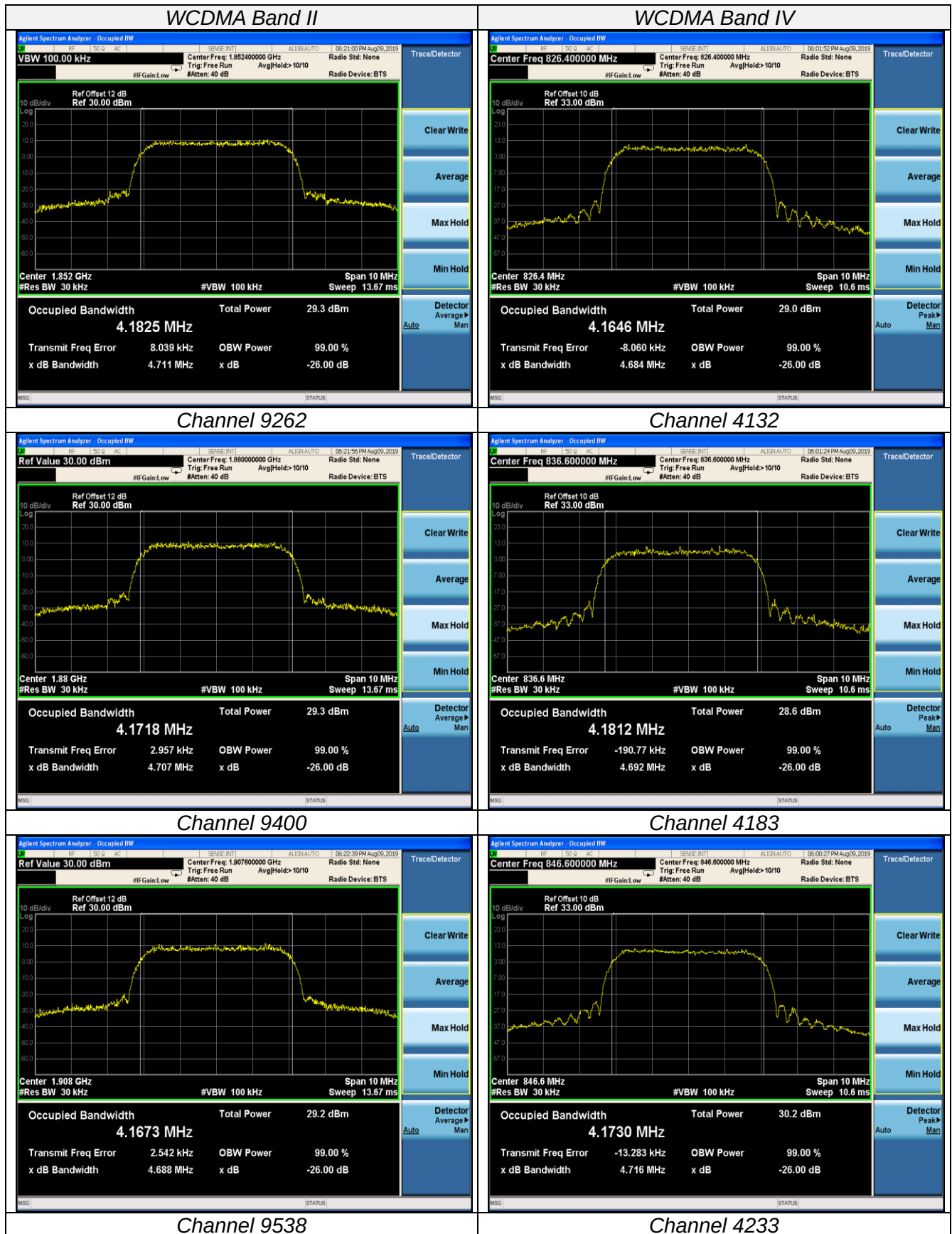
TEST PROCEDURE

1. The EUT's output RF connector was connected with a short cable to the spectrum analyzer
2. RBW was set to about 1% of emission BW, $VBW \geq 3$ times RBW.
3. -26dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace.

TEST RESULTS

EUT Mode	Channel	Frequency (MHz)	99% Occupy bandwidth (KHz)	-26dB bandwidth (KHz)
WCDMA Band II (QPSK)	9262	1852.4	4.1825	4.711
	9400	1880.0	4.1718	4.707
	9538	1907.6	4.1673	4.688
WCDMA Band V (QPSK)	4132	826.4	4.1646	4.684
	4183	836.6	4.1812	4.692
	4233	846.6	4.1730	4.716

Test plots as follow:

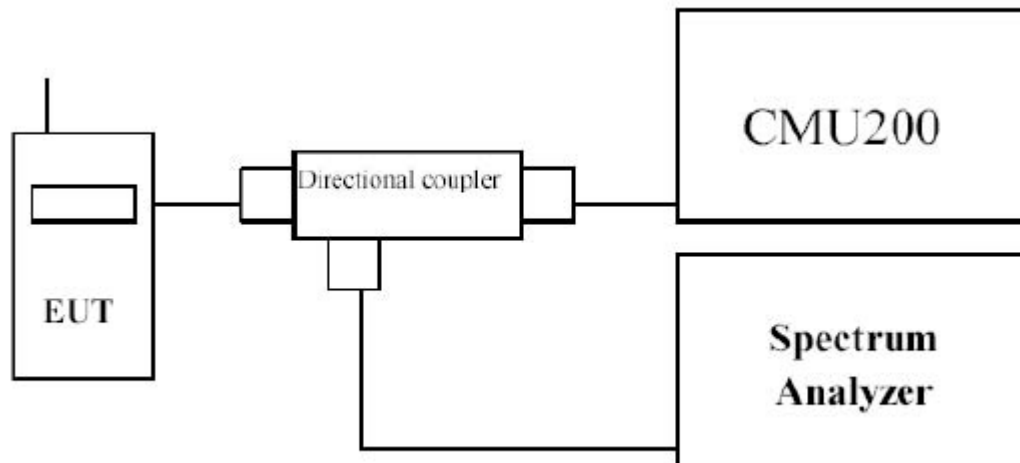


3.3 Band Edge compliance

LIMIT

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.

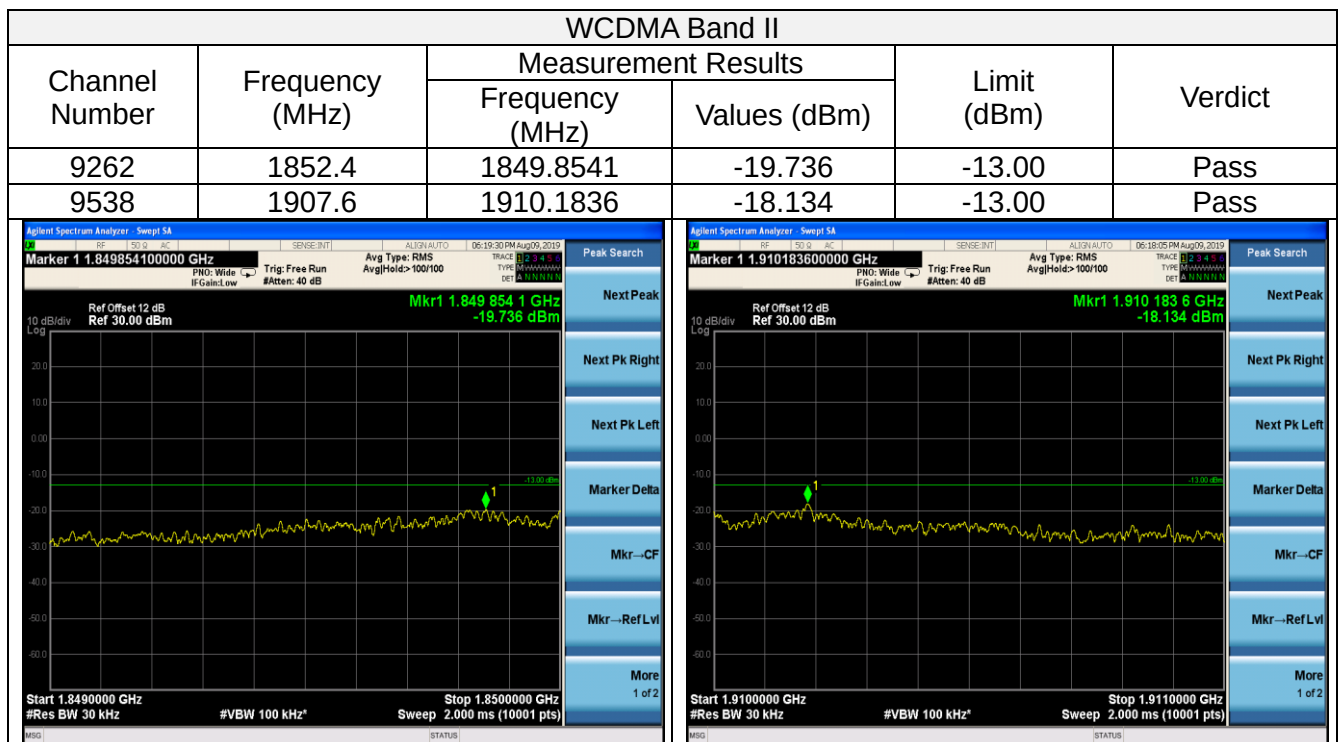
TEST CONFIGURATION

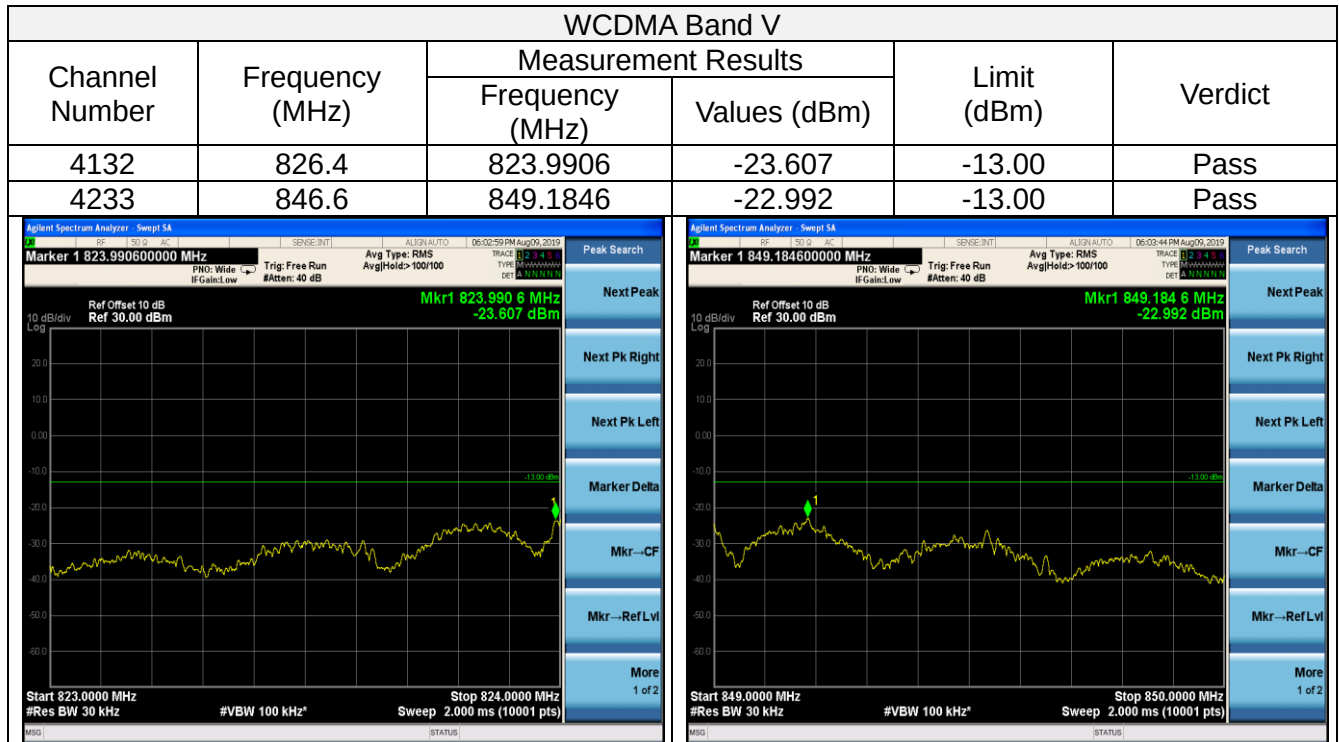


TEST PROCEDURE

In the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions.

TEST RESULTS





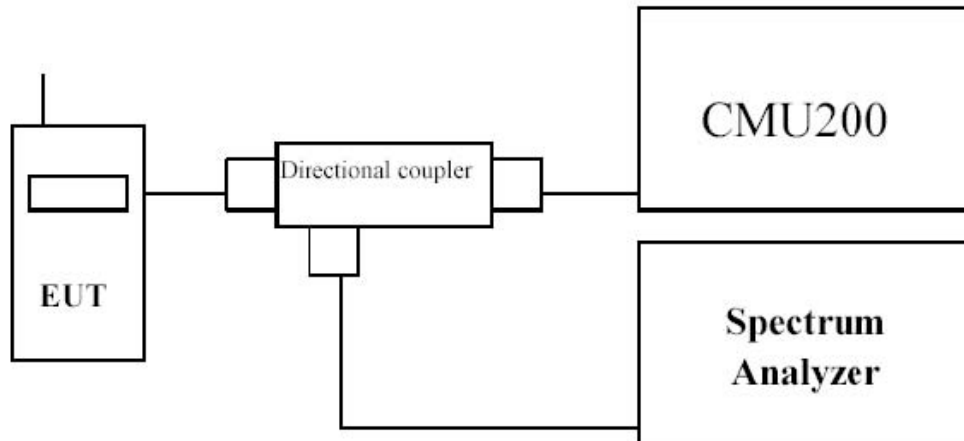
3.4 Spurious Emission

LIMIT

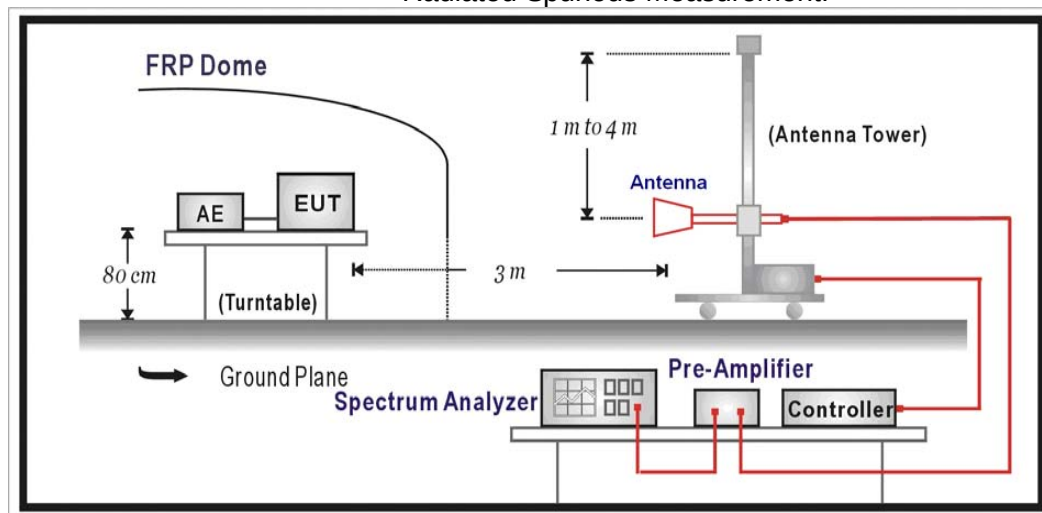
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10\log(P)$ dB.

TEST CONFIGURATION

Conducted Spurious Measurement:



Radiated Spurious Measurement:



TEST PROCEDURE

The EUT was setup according to EIA/TIA 603C

Conducted Spurious Measurement:

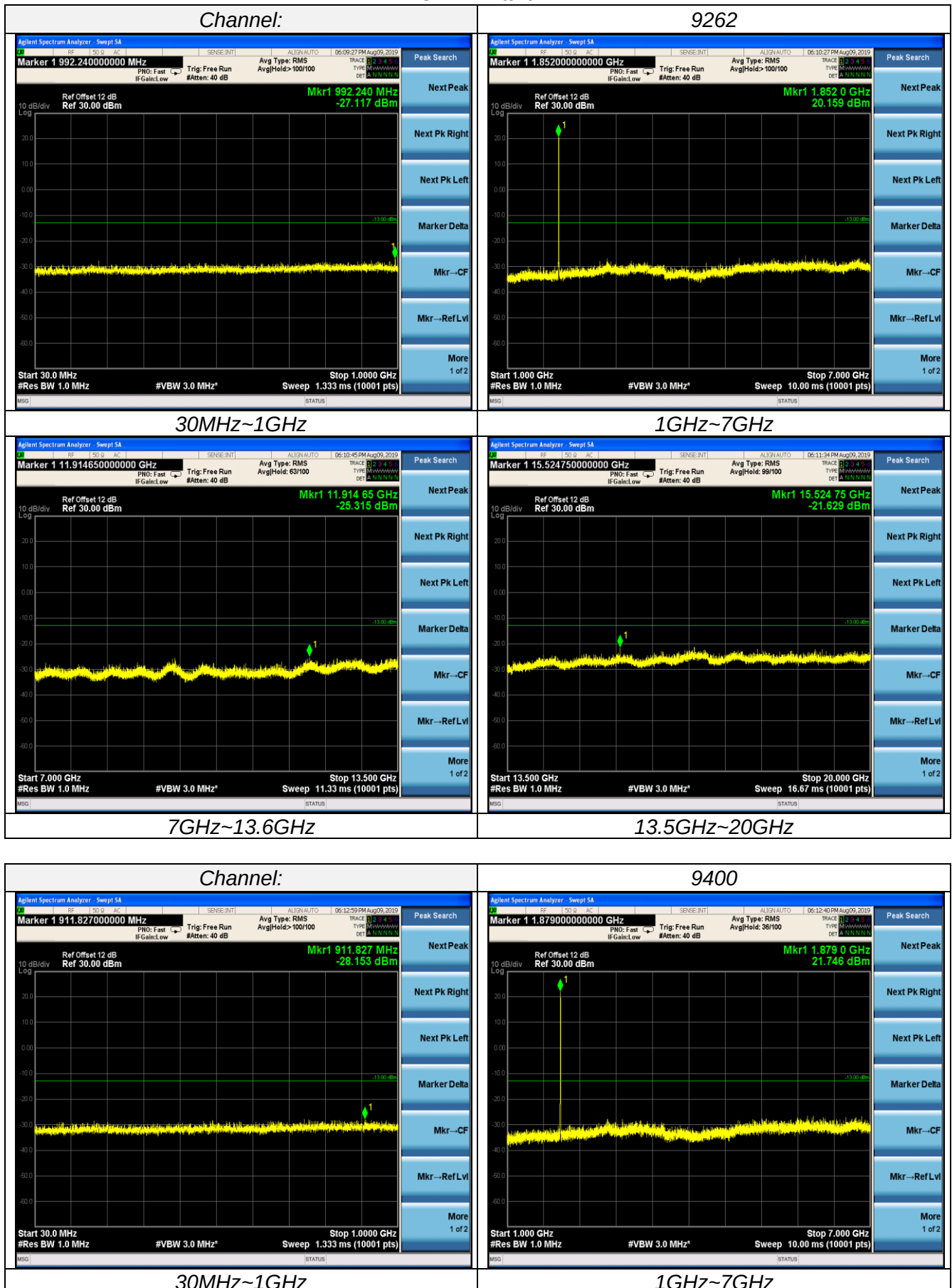
- Place the EUT on a bench and set it in transmitting mode.
- Connect a low loss RF cable from the antenna port to a spectrum analyzer and CMU200 by a Directional Couple.
- EUT Communicate with CMU200 then selects a channel for testing.
- Add a correction factor to the display of spectrum, and then test.
- The resolution bandwidth of the spectrum analyzer was set at 1MHz for Part 22 and 1MHz for Part 24, sufficient scans were taken to show the out of band Emission if any up to 10th harmonic.

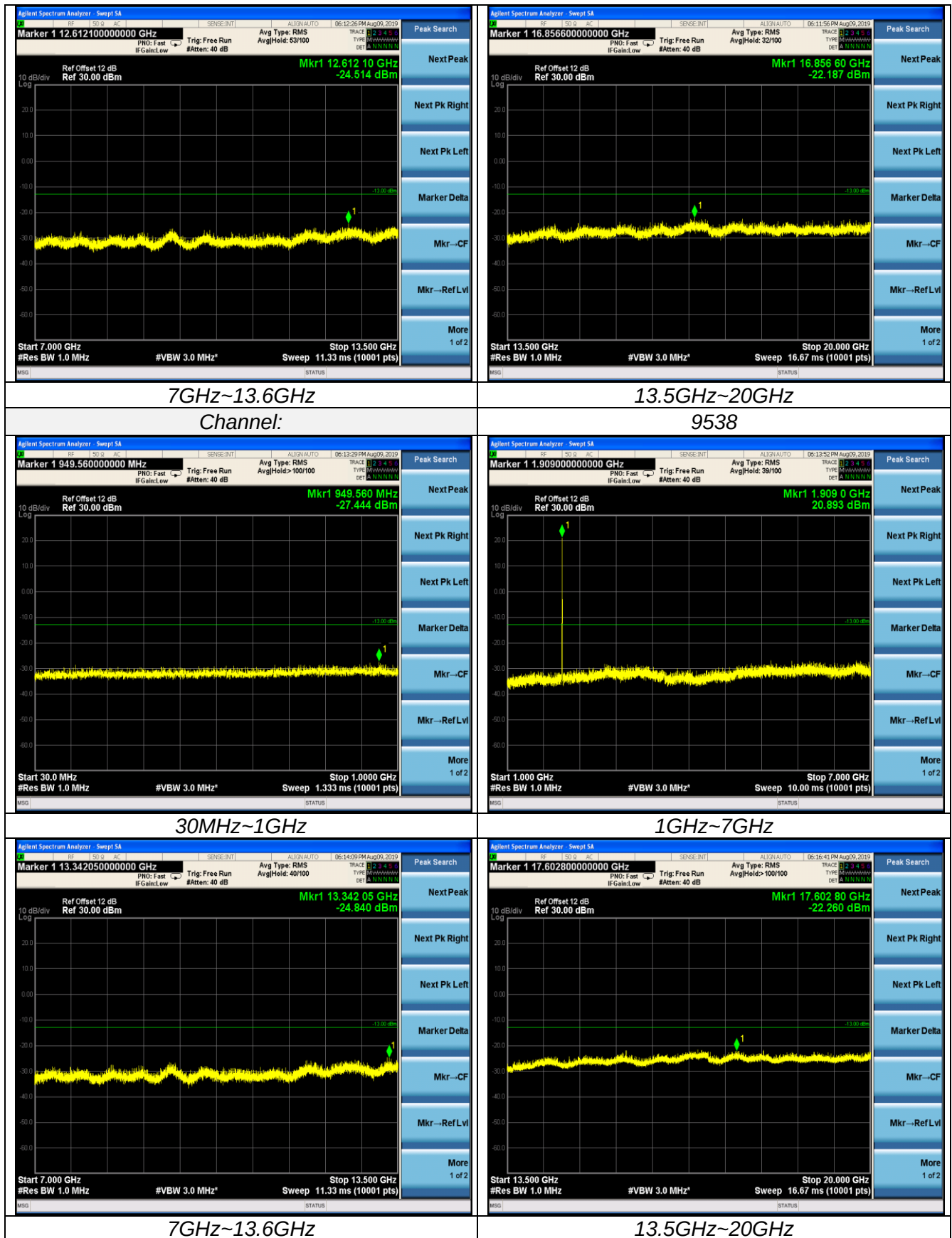
Radiated Spurious Measurement:

- a) The EUT shall be placed at the specified height on a support, and in the position closest to normal use as declared by provider.
- b) The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter
- c) The output of the test antenna shall be connected to the measuring receiver.
- d) The transmitter shall be switched on and the measuring receiver shall be tuned to the frequency of the transmitter under test.
- e) The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.
- f) The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
- g) The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.
- h) The maximum signal level detected by the measuring receiver shall be noted.
- i) The transmitter shall be replaced by a substitution antenna.
- j) The substitution antenna shall be orientated for vertical polarization and the length of the substitution antenna shall be adjusted to correspond to the frequency of the transmitter.
- k) The substitution antenna shall be connected to a calibrated signal generator.
- l) If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
- m) The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
- n) The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuator setting of the measuring receiver.
- o) The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.
- p) The measure of the effective radiated power is the larger of the two levels recorded at the input to the substitution antenna, corrected for gain of the substitution antenna if necessary.
- q) The resolution bandwidth of the spectrum analyzer was set at 100 kHz for Part 22 and 1MHz for Part 24. The frequency range was checked up to 10th harmonic.

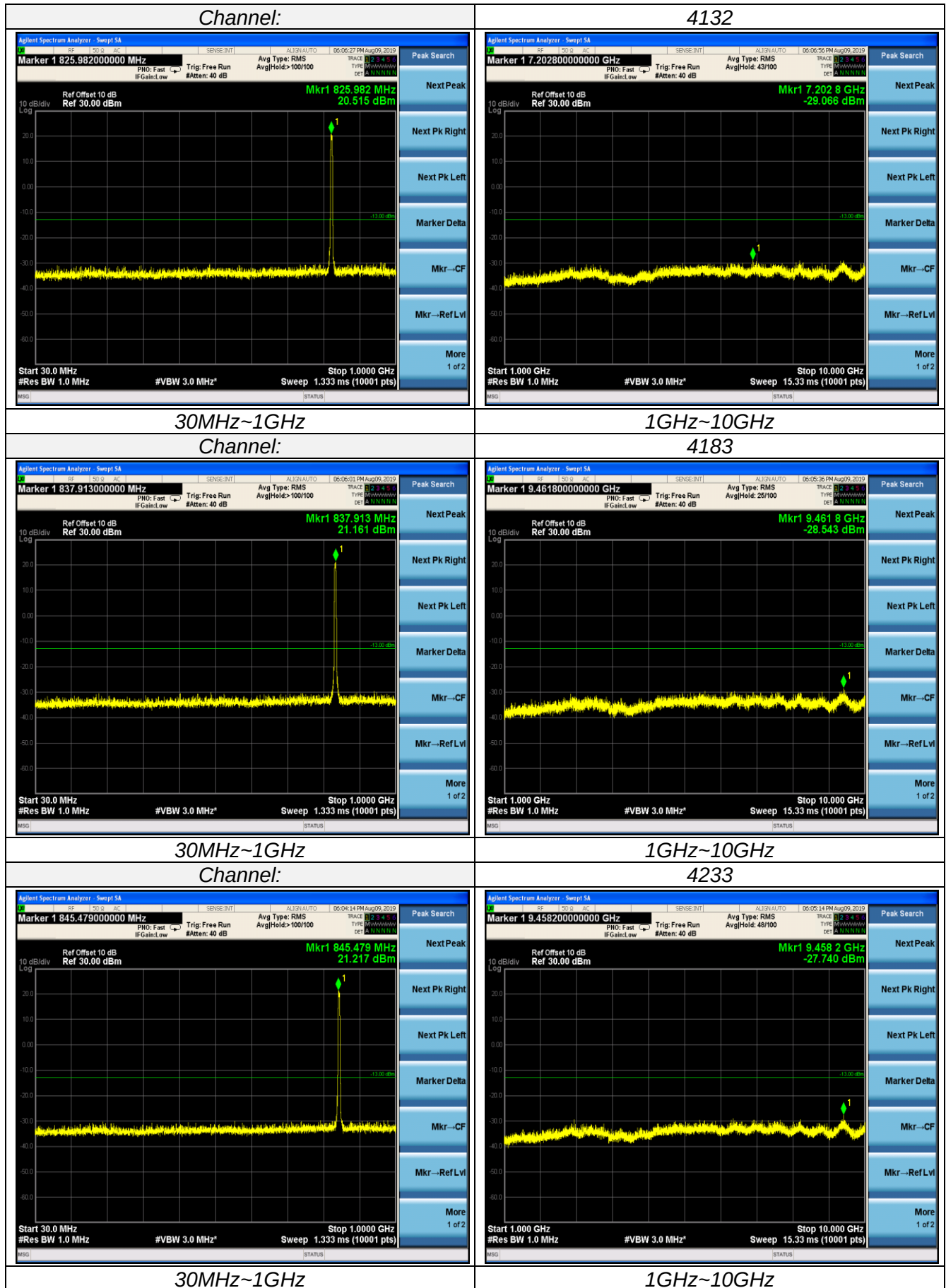
TEST RESULTS

Conducted Measurement:

WCDMA Band II



WCDMA Band V



Radiated Measurement:**WCDMA Band II**

Channel	Frequency (MHz)	P _{Mea} (dBm)	P _{cl} (dB)	Distance	G _a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
9262	3704.80	-36.49	4.27	3.00	12.34	-28.42	-13.00	15.42	H
	5557.20	-39.79	4.99	3.00	13.52	-31.26	-13.00	18.26	H
	3704.80	-35.29	4.27	3.00	12.34	-27.22	-13.00	14.22	V
	5557.20	-37.82	4.99	3.00	13.52	-29.29	-13.00	16.29	V
9400	3760.00	-37.83	4.38	3.00	12.34	-29.87	-13.00	16.87	H
	5640.00	-41.23	5.01	3.00	13.58	-32.66	-13.00	19.66	H
	3760.00	-36.83	4.38	3.00	12.34	-28.87	-13.00	15.87	V
	5640.00	-38.72	5.01	3.00	13.58	-30.15	-13.00	17.15	V
9538	3815.20	-35.37	4.47	3.00	12.45	-27.39	-13.00	14.39	H
	5722.80	-41.01	5.23	3.00	13.66	-32.58	-13.00	19.58	H
	3815.20	-34.85	4.47	3.00	12.45	-26.87	-13.00	13.87	V
	5722.80	-38.85	5.23	3.00	13.66	-30.42	-13.00	17.42	V

WCDMA Band V

Channel	Frequency (MHz)	P _{Mea} (dBm)	P _{cl} (dB)	Distance	G _a Antenna Gain(dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
9262	1652.80	-35.93	3.02	3.00	9.58	-29.37	-13.00	16.37	H
	2479.20	-39.65	3.51	3.00	10.72	-32.44	-13.00	19.44	H
	1652.80	-34.91	3.02	3.00	9.68	-28.25	-13.00	15.25	V
	2479.20	-37.89	3.51	3.00	10.72	-30.68	-13.00	17.68	V
9400	1673.20	-35.13	3.14	3.00	9.61	-28.66	-13.00	15.66	H
	2509.80	-38.06	3.59	3.00	10.77	-30.88	-13.00	17.88	H
	1673.20	-32.73	3.14	3.00	9.61	-26.26	-13.00	13.26	V
	2509.80	-36.16	3.59	3.00	10.77	-28.98	-13.00	15.98	V
9538	1693.20	-36.82	3.24	3.00	9.77	-30.29	-13.00	17.29	H
	2539.80	-40.78	3.65	3.00	10.89	-33.54	-13.00	20.54	H
	1693.20	-36.40	3.24	3.00	9.77	-29.87	-13.00	16.87	V
	2539.80	-38.81	3.65	3.00	10.89	-31.57	-13.00	18.57	V

Remark:

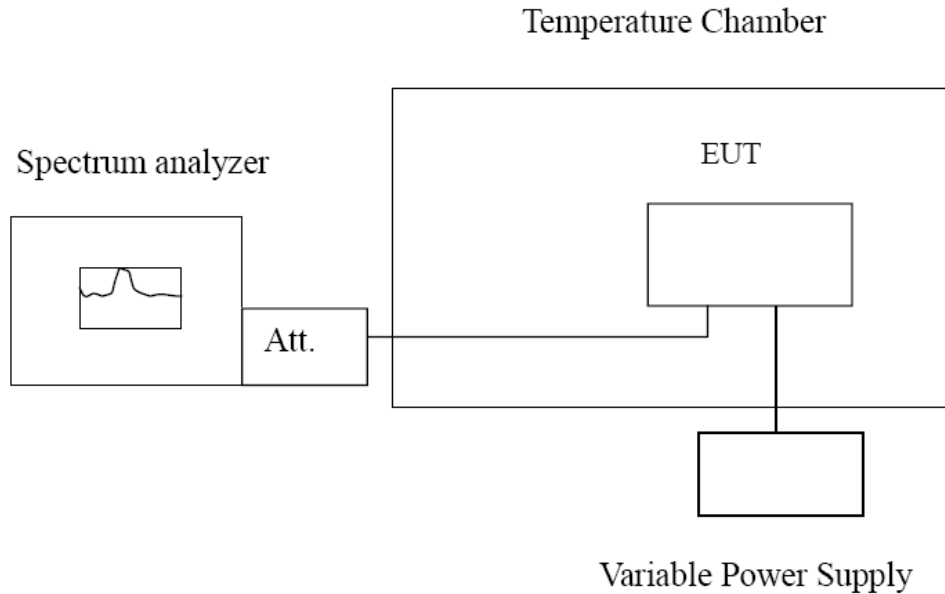
1. $EIRP = P_{Mea}(dBm) - P_{cl}(dB) + G_a(dBi)$
2. We were not recorded other points as values lower than limits.
3. $Margin = Limit - EIRP$

3.5 Frequency Stability under Temperature & Voltage Variations

LIMIT

Cellular Band: ± 2.5 ppm PCS Band: Within the authorized frequency block

TEST CONFIGURATION



TEST PROCEDURE

The EUT was setup according to EIA/TIA 603C

Frequency Stability under Temperature Variations:

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to -30°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.

Frequency Stability under Voltage Variations:

Set chamber temperature to 20°C. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.

Reduce the input voltage to specify extreme voltage variation ($\pm 15\%$) and endpoint, record the maximum frequency change.

TEST RESULTS

Reference Frequency: WCDMA Band II Middle channel=9400 channel=1880MHz					
Voltage (V)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
12.00	-30	84.65	0.045	Within the authorized frequency block	Pass
	-20	44.23	0.024		
	-10	87.56	0.047		
	0	47.19	0.025		
	10	39.39	0.021		
	20	65.40	0.035		
	30	36.38	0.019		
	40	43.92	0.023		
	50	57.21	0.030		
13.80	25	52.20	0.028	2.5	Pass
End point 10.20	25	63.09	0.034		

Reference Frequency: WCDMA Band V Middle channel=4182 channel=836.6MHz					
Voltage (V)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
12.00	-30	76.98	0.092	2.5	Pass
	-20	44.74	0.053		
	-10	33.38	0.040		
	0	63.03	0.075		
	10	41.69	0.050		
	20	55.91	0.067		
	30	41.77	0.050		
	40	91.75	0.110		
	50	84.25	0.101		
13.80	25	66.18	0.079	2.5	Pass
End point 10.20	25	87.63	0.105		

4 Test Setup Photos of the EUT



5 Photos of the EUT

Reference to the test report No. GTS20190726008-1-3-1

******* End of Report *******