

FCC TEST REPORT

For

Anytrek Corporation

GPS Truck Tracker

Model No.: VT1611

Prepared For : Anytrek Corporation

Address : 4335 E Airport Dr, Suite 101, Ontario, CA 91761, USA

Prepared By : Shenzhen Anbotek Compliance Laboratory Limited

Address : 1/F., Building 1, SEC Industrial Park, No.0409 Qianhai Road, Nanshan District, Shenzhen, Guangdong, China

Tel: (86) 755-26066544 Fax: (86) 755-26014772

Report Number : R0217060001W

Date of Test : Jun. 02~Aug. 08, 2017

Date of Report : Aug. 08, 2017

CONTENTS

1. GENERAL INFORMATION.....	4
1.1. CLIENT INFORMATION.....	4
1.2. DESCRIPTION OF DEVICE (EUT).....	4
1.3. AUXILIARY EQUIPMENT USED DURING TEST.....	4
1.4. DESCRIPTION OF TEST MODES.....	4
1.5. DESCRIPTION OF TEST SETUP.....	5
1.6. TEST EQUIPMENT LIST.....	6
1.7. MEASUREMENT UNCERTAINTY.....	7
1.8. DESCRIPTION OF TEST FACILITY.....	7
2. SUMMARY OF TEST RESULTS.....	8
3. MEASUREMENTS, EXAMINATION AND DERIVED RESULTS.....	9
3.1 RF OUTPUT POWER.....	9
3.2 PEAK-AVERAGE RATIO.....	14
3.3 MODULATION CHARACTERISTIC.....	16
3.4 OCCUPIED BANDWIDTH.....	17
3.5 SPURIOUS EMISSIONS AT ANTENNA TERMINALS.....	21
3.6 SPURIOUS RADIATED EMISSIONS.....	34
3.7 BAND EDGE.....	39
3.8 FREQUENCY STABILITY.....	45
APPENDIX I -- TEST SETUP PHOTOGRAPH.....	48
APPENDIX II -- EXTERNAL PHOTOGRAPH.....	49
APPENDIX III -- INTERNAL PHOTOGRAPH.....	52

TEST REPORT

Applicant : Anytrek Corporation
Manufacturer : Shenzhen Anxingzhiyuan Technology Co., Ltd.
Product Name : GPS Truck Tracker
Model No. : VT1611
Trade Mark : ANYTREK
Rating(s) : Input DC 12V, 0.35A

Test Standard(s) : FCC PART 2, FCC Part 22(H), FCC Part 24(E), ANSI/TIAC603 D: 2010

The device described above is tested by Shenzhen Anbotek Compliance Laboratory Limited to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and Shenzhen Anbotek Compliance Laboratory Limited is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the FCC Part 22(H)&24(E) requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Shenzhen Anbotek Compliance Laboratory Limited.

Date of Test : May 18~July 03, 2017

Prepared by :



Winkey Wang

(Tested Engineer / Winkey Wang)

Reviewer :

Tangcy. T.

(Project Manager / Tangcy. T)

Approved & Authorized Signer :

Tom Chen

(Manager / Tom Chen)

1. General Information

1.1. Client Information

Applicant	:	Anytrek Corporation
Address	:	4335 E Airport Dr, Suite 101, Ontario, CA 91761, USA
Manufacturer	:	Shenzhen Anxingzhiyuan Technology Co., Ltd.
Address	:	Room 502, Building 3, Huayangnianmeinian Plaza, XingGong Road No.8, Nanshan, Shenzhen, China

1.2. Description of Device (EUT)

Product Name	:	GPS Truck Tracker
Model No.	:	VT1611
Trade Mark	:	ANYTREK
Test Power Supply	:	DC 12V by Battery inside
Product Description	:	Operation Frequency: GPRS 850: TX:824.2~848.8 MHz; RX:869.2~893.8 MHz GPRS 1900: TX:1850.2~1909.8 MHz; RX:1930.2~1989.8 MHz UMTS-FDD Band 5 TX: 826.4 ~ 846.6 MHz; RX: 871.4 ~ 891.6 MHz UMTS-FDD Band 2 TX:1852.4 ~ 1907.6 MHz; RX: 1932.4 ~ 1987.6 MHz
	:	Modulation Type: GPRS:GMSK UMTS-FDD: QPSK
	:	Antenna Type: Integrated Antenna
	:	Antenna Gain(Peak): 1.0dBi
Remark: 1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.		

1.3. Auxiliary Equipment Used During Test

N/A	:	
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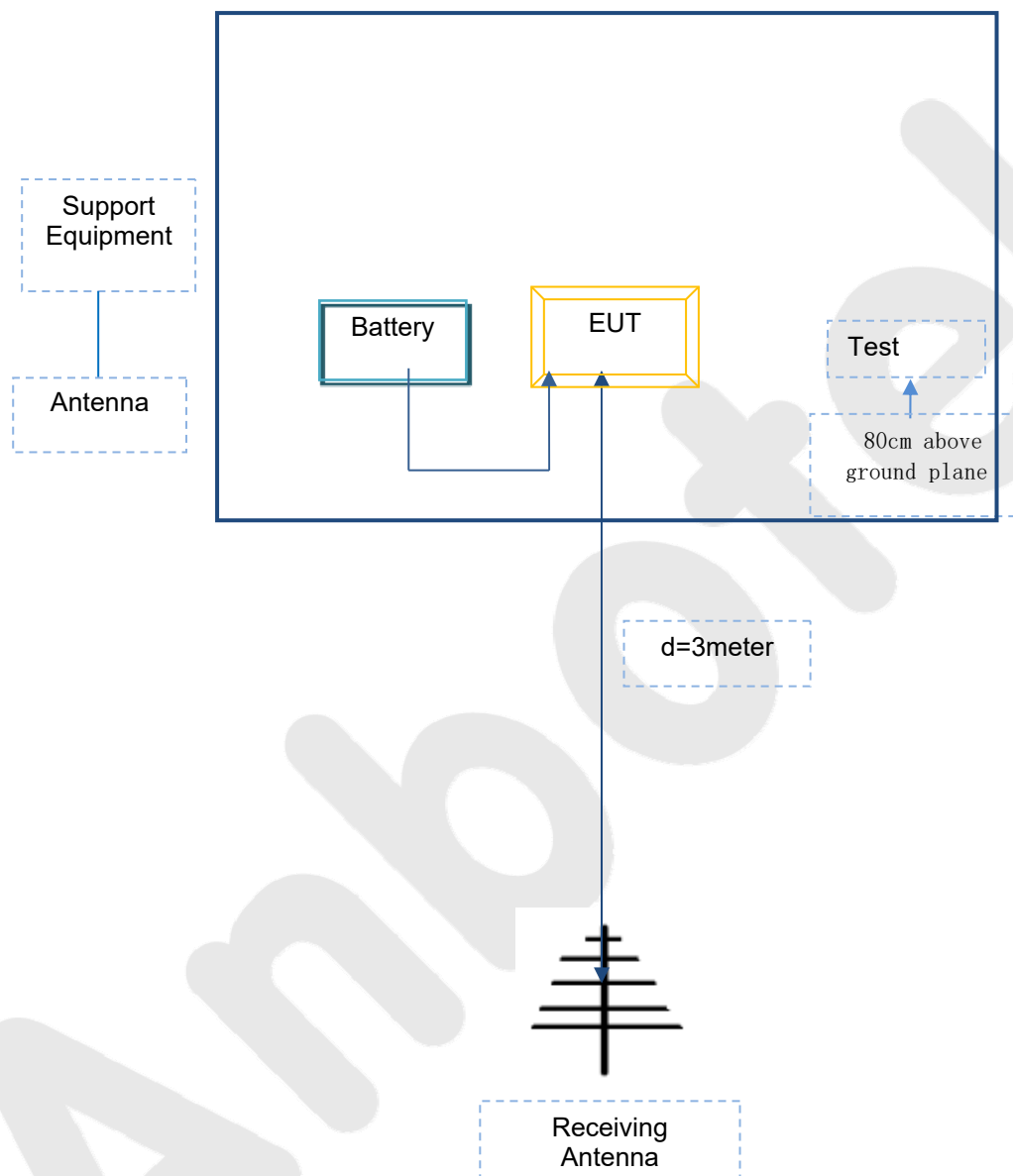
1.4. Description of Test Modes

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

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

1.5. Description Of Test Setup

Block Configuration Diagram for Radiated Emissions



1.6. Test Equipment List

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analysis	Agilent	E4407B	US39390582	May 27, 2017	1 Year
2.	Pre-amplifier	SKET Electronic	BK1G18G30 D	KD17503	May 27, 2017	1 Year
3.	EMI Test Receiver	Rohde & Schwarz	ESPI	101604	May 27, 2017	1 Year
4.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	May 31, 2017	1 Year
5.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	May 31, 2017	1 Year
6.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-387	May 31, 2017	1 Year
7.	Loop Antenna	Schwarzbeck	HFH2-Z2	100047	Apr. 03, 2017	1 Year
8.	Auxiliary antenna	Resenberger	SUCOFLEX 104	351520	May 27, 2017	1 Year
9.	Pre-amplifier	SONOMA	310N	186860	May 27, 2017	1 Year
10.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A
11.	MXA Spectrum Analysis	Agilent	N9020A	MY51170037	May 27, 2017	1 Year
12.	MXG RF Vector Signal Generator	Agilent	N5182A	MY48180656	May 27, 2017	1 Year
13.	DC Power supply	IVYTECH	IV6003	1601D6030007	May 26, 2017	1 Year
14.	TEMP&HUMI PROGRAMMABLE CHAMBER	Sertep	ZJ- HWHS80B	ZJ-17042804	Mar. 03, 2017	1 Year
15.	Universal Radio Communication Tester	Rohde & Schwarz	CMU 200	117888	May 27, 2017	1 Year
16.	Wideband Radio Communication Tester	Rohde & Schwarz	CMU 500	1201.0002K50- 104209-JC	May 27, 2017	1 Year
17.	High-Pass Filter	CDKMV	ZHPF- BM1100 -4000-0730	B2015094550	May 27, 2017	1 Year
18.	High-Pass Filter	CDKMV	ZHPF-M3.5 -18G-3834	1307006523	May 27, 2017	1 Year
19.	Auxiliary antenna	Schwarzbeck	SUCOFLEX 105	351530	May 27, 2017	1 Year

1.7. 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 %.

Maximum measurement uncertainty

Parameter	Uncertainty
Occupied Channel Bandwidth	$\pm 5 \%$
RF output power, conducted	$\pm 1,5 \text{ dB}$
Power Spectral Density, conducted	$\pm 3 \text{ dB}$
Unwanted Emissions, conducted	$\pm 3 \text{ dB}$
All emissions, radiated	$\pm 6 \text{ dB}$
Temperature	$\pm 1 \text{ }^{\circ}\text{C}$
Humidity	$\pm 5 \%$
DC and low frequency voltages	$\pm 3 \%$
Time	$\pm 5 \%$
Duty Cycle	$\pm 5 \%$

1.8. Description of Test Facility

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

FCC-Designation No.: CN5023

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Designation CN5023, July 31, 2017.

ISED-Registration No.: 8058A-1

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (ISED) Innovation, Science and Economic Development Canada. The acceptance letter from the ISED is maintained in our files. Registration 8058A-1, June 13, 2016.

Test Location

All Emissions tests were performed at
Shenzhen Anbotek Compliance Laboratory Limited, at 1/F., Building 1, SEC Industrial Park, No.0409 Qianhai Road,
Nanshan District, Shenzhen, Guangdong, China

2. Summary of Test Results

FCC Rules	Description of Test	Result
§2.1046; § 22.913(a); § 24.232(c);	RF Output Power	Compliance
§ 24.232 (d);	Peak-Average Ratio	Compliance
§ 2.1047	Modulation Characteristics	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

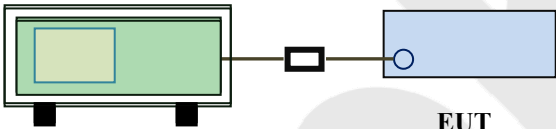
3. MEASUREMENTS, EXAMINATION AND DERIVED RESULTS

3.1 RF Output Power

Temperature	25°C
Relative Humidity	60%
Atmospheric Pressure	1011mbar

Requirement(s):

Spec	Item	Requirement	Applicable
§22.913 (a)	a)	ERP:38.45dBm	☒
§24.232 (c)	b)	EIRP:33dBm	☒

Test Setup	 Base Station EUT
Test Procedure	For Conducted Power: - 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. For ERP/EIRP: - 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. - 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 (TX power in Watts/0.001) – the absolute level - Spurious attenuation limit in dB = 43 + 10 Log10 (power out in Watts).
Remark	
Result	PASS

Conducted Power

GPRS Mode:

GPRS 850

Band/ Time Slot configuration	Channel	Frequency	Average power (dBm)
GPRS850(1 Slot)	128	824.2	32.25
	190	836.6	32.33
	251	848.8	32.47
GPRS850(2 Slot)	128	824.2	31.55
	190	836.6	31.42
	251	848.8	31.66

GPRS 1900

Band/ Time Slot configuration	Channel	Frequency	Average power (dBm)
GPRS1900(1 Slot)	512	1850.2	28.44
	661	1880.0	28.53
	810	1909.8	28.41
GPRS1900(2 Slot)	512	1850.2	27.36
	661	1880.0	27.05
	810	1909.8	27.70

UMTS Mode:

UMTS-FDD Band V

Band/ Time Slot configuration	Channel	Frequency	Average power (dBm)
RMC 12.2kbps	4132	826.4	22.26
	4183	836.6	22.29
	4233	846.6	22.12
HSDPA Subtest1	4132	826.4	21.35
	4183	836.6	21.32
	4233	846.6	21.30
HSDPA Subtest2	4132	826.4	21.47
	4183	836.6	21.45
	4233	846.6	21.38
HSDPA Subtest3	4132	826.4	21.30
	4183	836.6	21.36
	4233	846.6	21.33
HSDPA Subtest4	4132	826.4	21.47
	4183	836.6	21.48
	4233	846.6	21.36
HSUPA Subtest1	4132	826.4	21.35
	4183	836.6	21.35
	4233	846.6	21.39
HSUPA Subtest2	4132	826.4	21.31
	4183	836.6	21.38
	4233	846.6	21.44
HSUPA Subtest3	4132	826.4	21.37
	4183	836.6	21.31
	4233	846.6	21.46
HSUPA Subtest4	4132	826.4	21.33
	4183	836.6	21.37
	4233	846.6	21.36
HSUPA Subtest5	4132	826.4	21.39
	4183	836.6	21.42
	4233	846.6	21.48

UMTS-FDD Band II

Band/ Time Slot configuration	Channel	Frequency	Average power (dBm)
RMC 12.2kbps	9262	1852.4	21.86
	9400	1880.0	21.72
	9538	1907.6	21.74
HSDPA Subtest1	9262	1852.4	21.38
	9400	1880.0	21.33
	9538	1907.6	21.39
HSDPA Subtest2	9262	1852.4	21.49
	9400	1880.0	21.37
	9538	1907.6	21.46
HSDPA Subtest3	9262	1852.4	21.31
	9400	1880.0	21.32
	9538	1907.6	21.31
HSDPA Subtest4	9262	1852.4	21.33
	9400	1880.0	21.35
	9538	1907.6	21.40
HSUPA Subtest1	9262	1852.4	21.43
	9400	1880.0	21.33
	9538	1907.6	21.44
HSUPA Subtest2	9262	1852.4	21.42
	9400	1880.0	21.45
	9538	1907.6	21.41
HSUPA Subtest3	9262	1852.4	21.42
	9400	1880.0	21.49
	9538	1907.6	21.47
HSUPA Subtest4	9262	1852.4	21.35
	9400	1880.0	21.44
	9538	1907.6	21.48
HSUPA Subtest5	9262	1852.4	21.38
	9400	1880.0	21.41
	9538	1907.6	21.43

ERP & EIRP
ERP for GPRS850 (Part 22H)

Frequency (MHz)	Substituted level (dBm)	Antenna Polarization	Antenna Gain correction (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)
824.2	20.04	V	6.70	0.53	26.21	38.45
824.2	20.07	H	6.70	0.53	26.24	38.45
836.6	20.34	V	6.80	0.53	26.61	38.45
836.6	20.51	H	6.80	0.53	26.78	38.45
848.8	20.57	V	7.00	0.53	27.04	38.45
848.8	20.51	H	7.00	0.53	26.98	38.45

EIRP for GPRS1900 (Part 24E)

Frequency (MHz)	Substituted level (dBm)	Antenna Polarization	Antenna Gain correction (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)
1850.2	16.61	V	7.82	0.85	23.58	33
1850.2	16.63	H	7.82	0.85	23.60	33
1880.0	16.53	V	7.88	0.85	23.56	33
1880.0	16.82	H	7.88	0.85	23.85	33
1909.8	16.79	V	7.91	0.85	23.85	33
1909.8	16.83	H	7.91	0.85	23.89	33

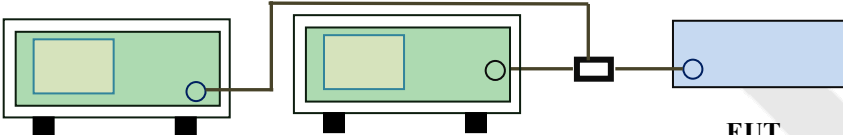
ERP & EIRP
ERP for UMTS-FDD Band V (Part 22H)

Frequency (MHz)	Substituted level (dBm)	Antenna Polarization	Antenna Gain correction (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)
826.4	11.24	V	6.8	0.53	17.51	38.45
826.4	11.61	H	6.8	0.53	17.88	38.45
836.6	11.03	V	6.8	0.53	17.30	38.45
836.6	11.65	H	6.8	0.53	17.92	38.45
846.6	11.33	V	6.9	0.53	17.70	38.45
846.6	11.63	H	6.9	0.53	18.00	38.45

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

Frequency (MHz)	Substituted level (dBm)	Antenna Polarization	Antenna Gain correction (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)
1852.4	11.32	V	7.88	0.85	18.35	33
1852.4	11.63	H	7.88	0.85	18.66	33
1880.0	11.08	V	7.88	0.85	18.11	33
1880.0	11.36	H	7.88	0.85	18.39	33
1907.6	11.48	V	7.86	0.85	18.49	33
1907.6	11.56	H	7.86	0.85	18.57	33

3.2 Peak-Average Ratio

Temperature	25°C		
Relative Humidity	60%		
Atmospheric Pressure	1011mbar		
Requirement(s):			
Spec	Item	Requirement	Applicable
§24.232(d)	a)	The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.	
Test Setup	 Base Station Spectrum Analyzer EUT		
Test Procedure	According with KDB 971168 1. The signal analyzer’s CCDF measurement profile is enabled 2. Frequency = carrier center frequency 3. Measurement BW > Emission bandwidth of signal 4. The signal analyzer was set to collect one million samples to generate the CCDF curve 5. The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms. For burst transmissions, the spectrum analyzer is set to use an internal “RF Burst” trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the “on time” of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power		
Remark	N/A		
Result	PASS		

WCDMA Band V

Frequency (MHz)	Peak-Average Ratio(PAR)
826.4	4.17
836.6	4.99
846.6	4.33

WCDMA Band II

Frequency (MHz)	Peak-Average Ratio(PAR)
1852.4	3.11
1880.0	3.65
1907.6	3.27



Test Mode: WCDMA850 - Middle Channel



Test Mode: WCDMA1900 - Middle Channel

3.3 Modulation Characteristic

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

3.4 Occupied Bandwidth

Temperature	25°C
Relative Humidity	60%
Atmospheric Pressure	1011mbar

Requirement(s):

Spec	Item	Requirement	Applicable
§2.1049, §22.917, §22.905 §24.238	a)	99% Occupied Bandwidth(kHz)	☒
	b)	26 dB Bandwidth(kHz)	☒
Test Setup	Base Station Spectrum Analyzer EUT		
Test Procedure	- 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	PASS		

GPRS 850 (Part 22H)

Channel	Frequency (MHz)	99% Occupied Bandwidth (KHz)	26 dB Bandwidth (KHz)
128	824.2	243.22	320.0
190	836.6	247.15	319.0
251	848.8	245.08	324.4

GPRS 1900 (Part 24E)

Channel	Frequency (MHz)	99% Occupied Bandwidth (KHz)	26 dB Bandwidth (KHz)
512	1850.2	246.34	313.7
661	1880.0	245.62	317.6
810	1909.8	247.36	319.0

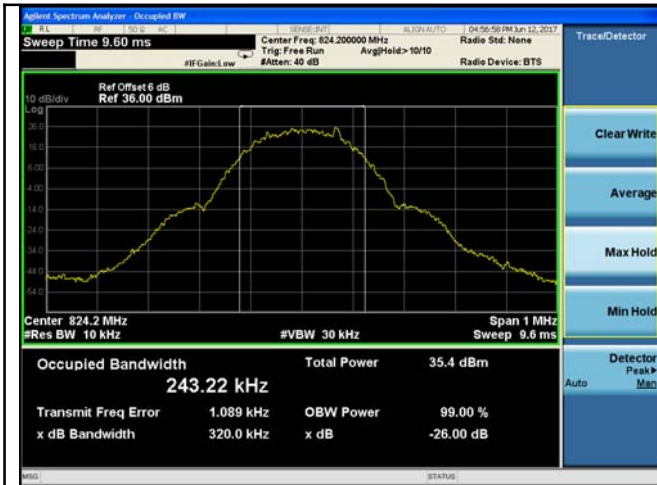
UMTS-FDD Band V (Part 22H)

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
4132	826.4	4.1565	4.686
4183	836.6	4.1526	4.693
4233	846.6	4.1456	4.698

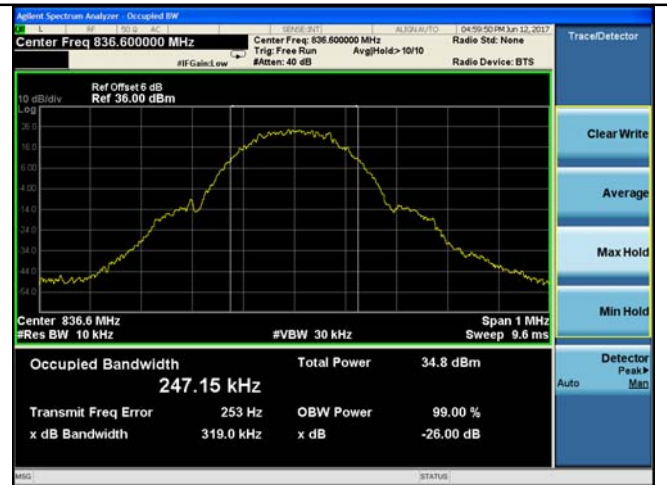
UMTS-FDD Band II (Part 24E)

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
9262	1852.4	4.1691	4.719
9400	1880.0	4.1521	4.684
9538	1907.6	4.1513	4.707

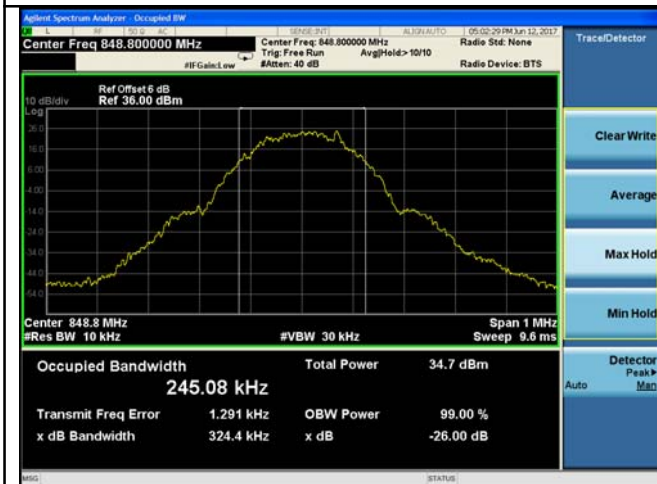
Test Plots



GPRS 850 BW - Low CH 824.2 MHz



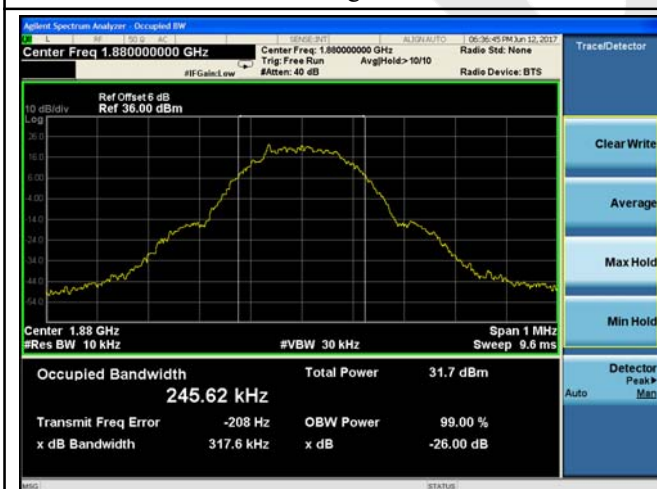
GPRS 850 BW - Mid CH 836.6 MHz



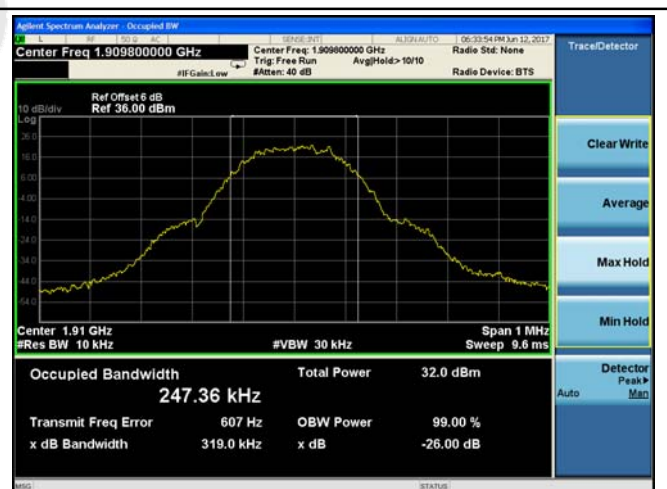
GPRS 850 BW - High CH 848.8 MHz



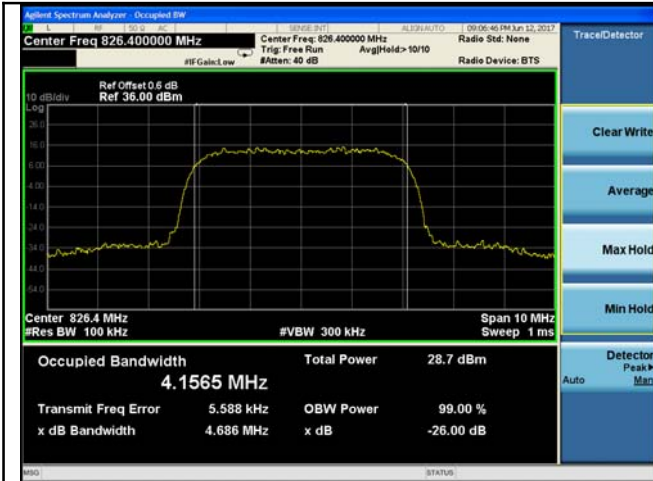
GPRS 1900 BW - Low CH 1850.2 MHz



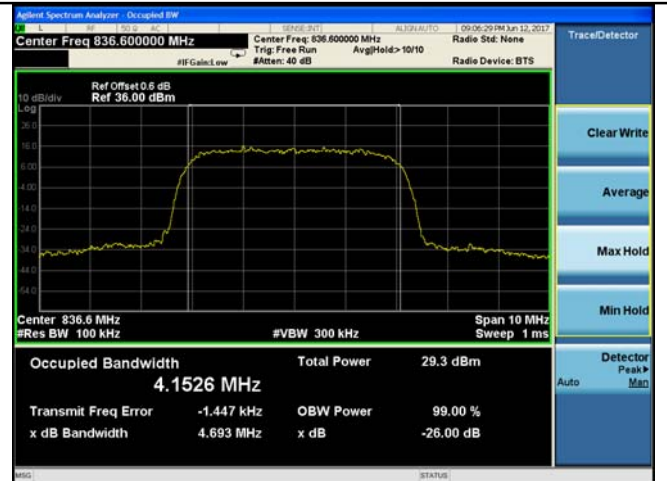
GPRS 1900 BW - Mid CH 1880.0 MHz



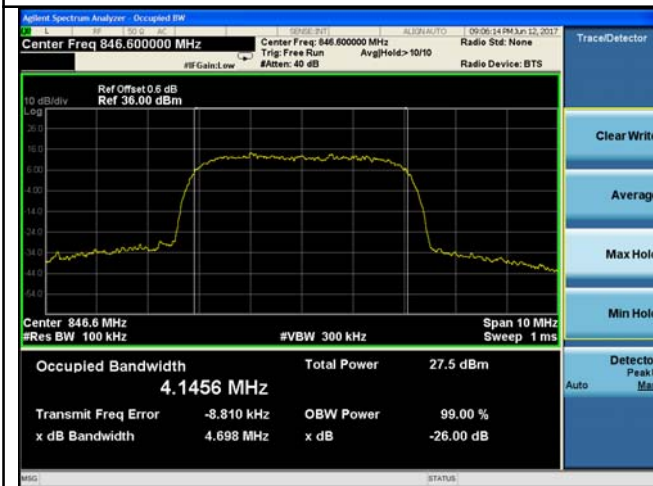
GPRS 1900 BW - High CH 1909.8 MHz



Band V BW - Low CH 826.4 MHz



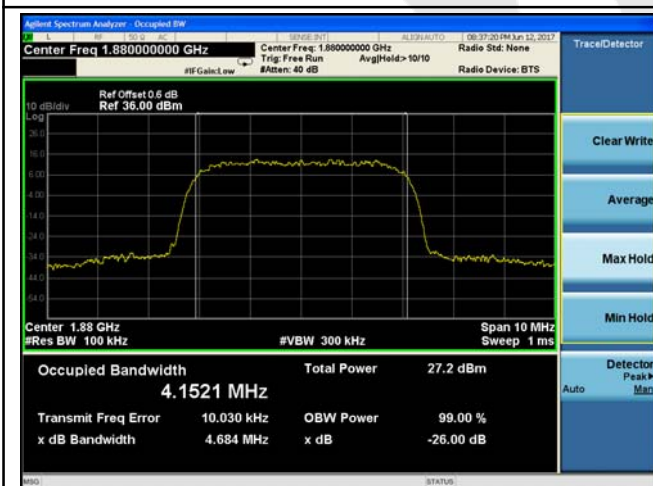
Band V BW - Mid CH 836.6 MHz



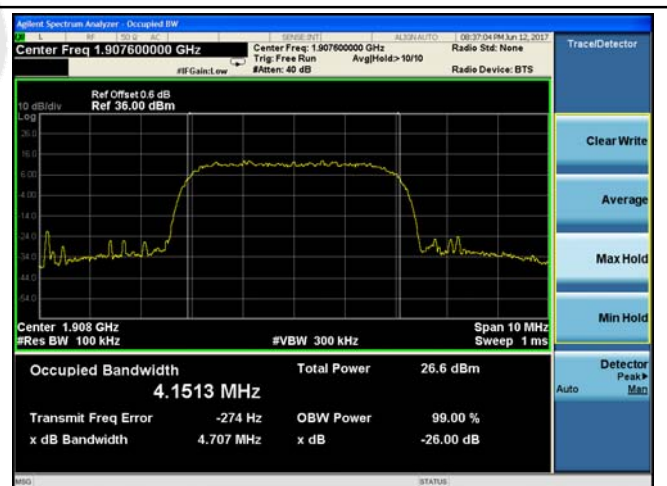
Band V BW - High CH 846.4 MHz



Band II BW - Low CH 1852.4MHz



Band II BW - Mid CH 1880MHz



Band II BW - High CH 1907.6MHz

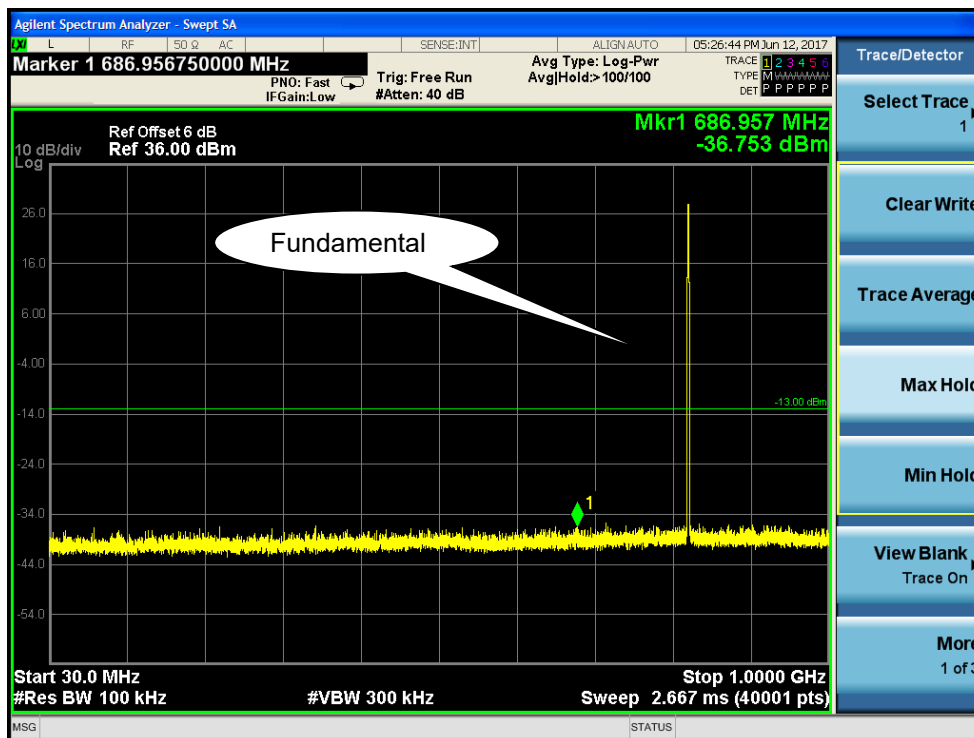
3.5 Spurious Emissions at Antenna Terminals

Temperature	25°C
Relative Humidity	60%
Atmospheric Pressure	1012mbar

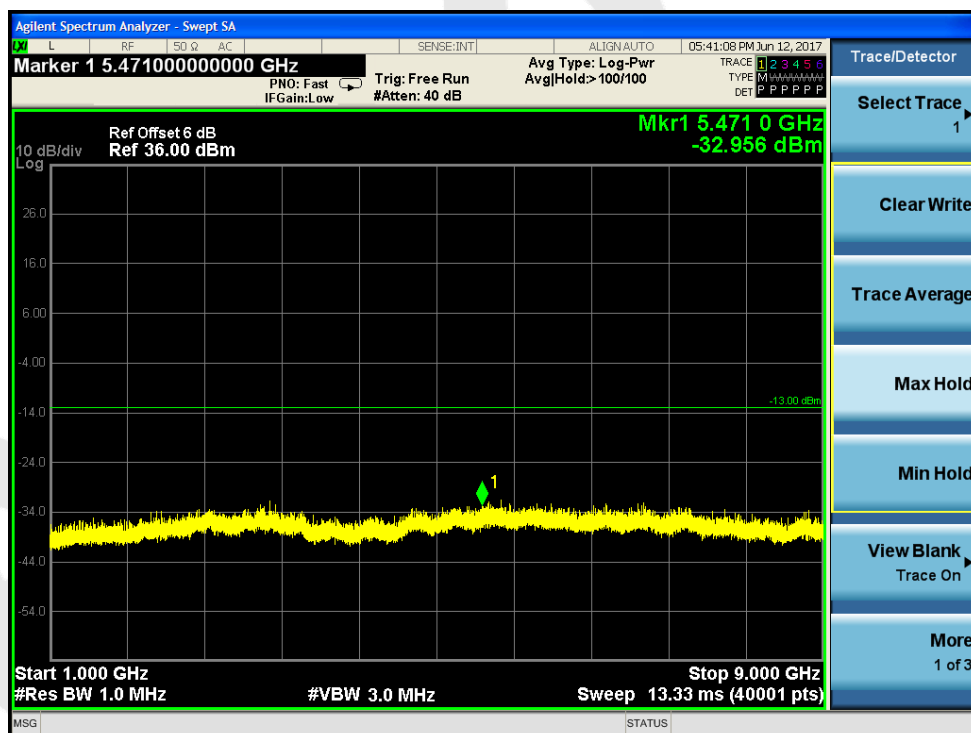
Requirement(s):

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	☒
Test Setup	Base Station Spectrum Analyzer EUT		
Test Procedure	- 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	PASS		

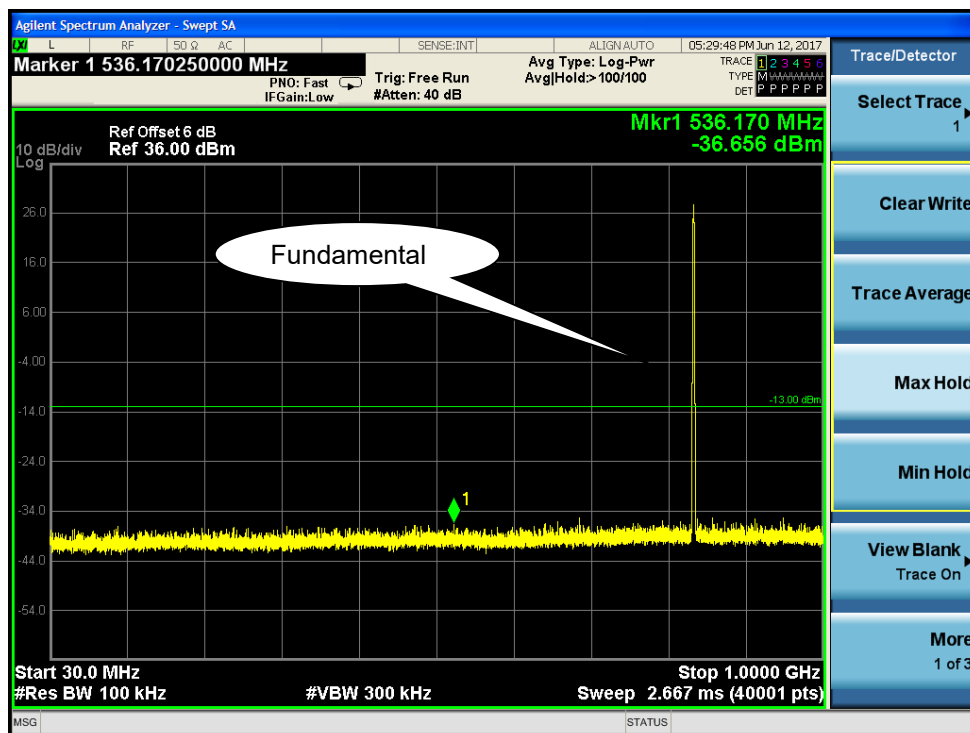
Test Plots GPRS 850 (Part 22H)



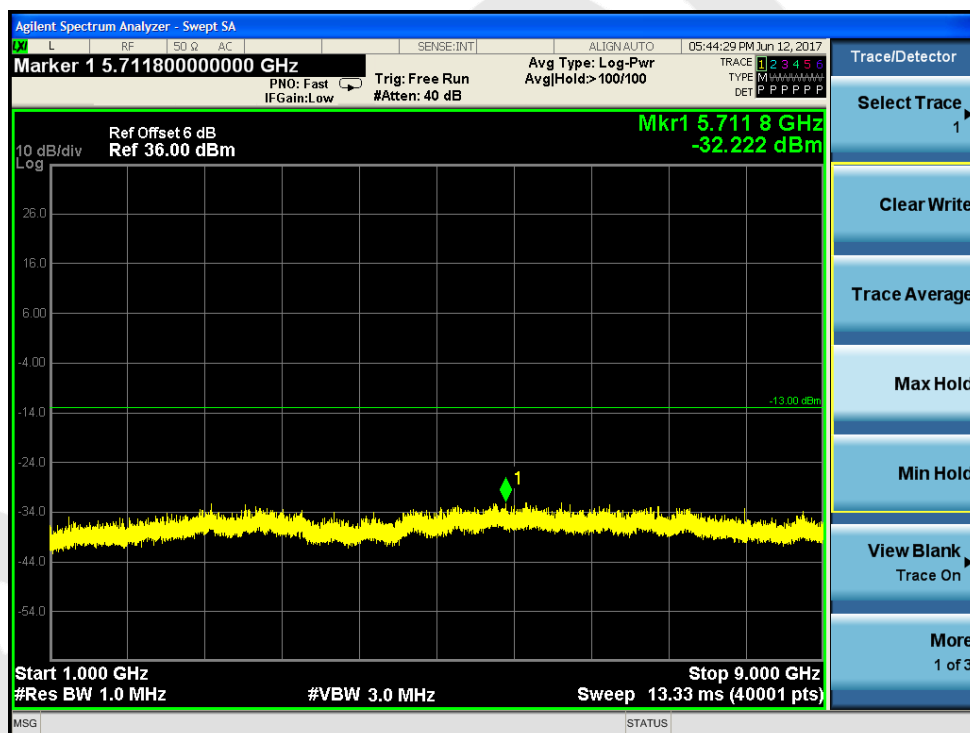
Test Mode: GPRS 850 - Low Channel 30M-1G



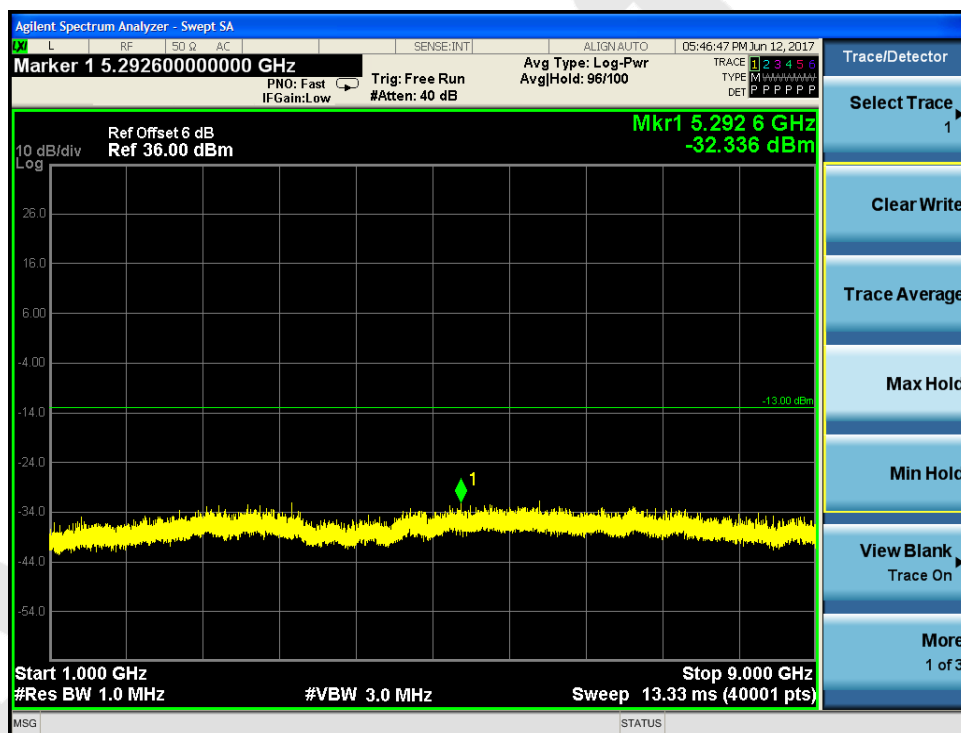
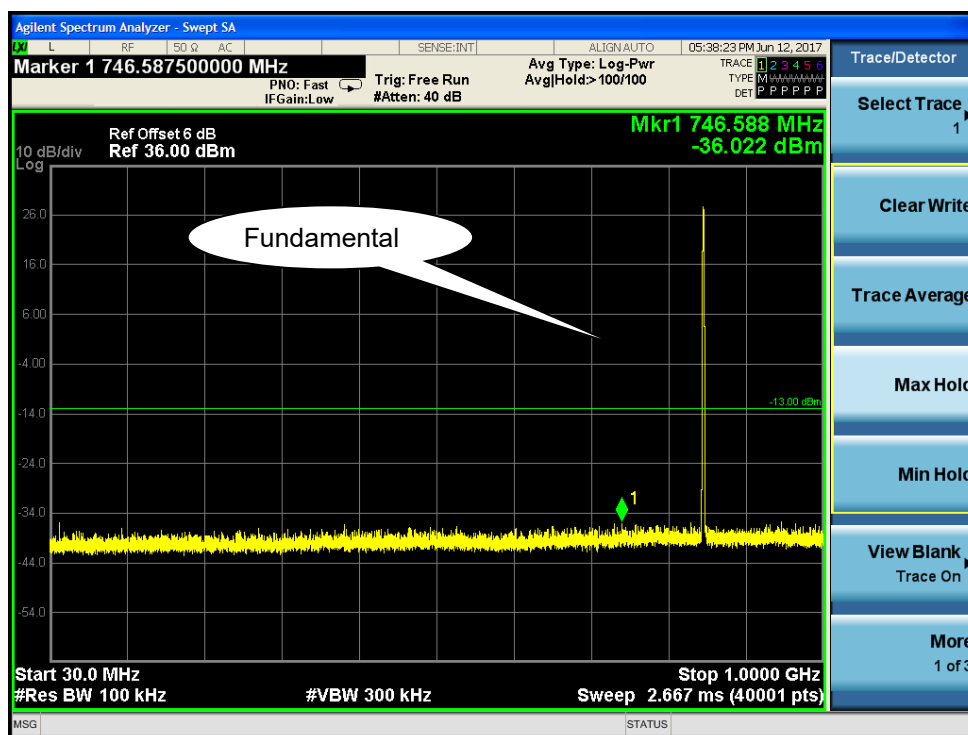
Test Mode: GPRS 850 -Low Channel 1G-9G



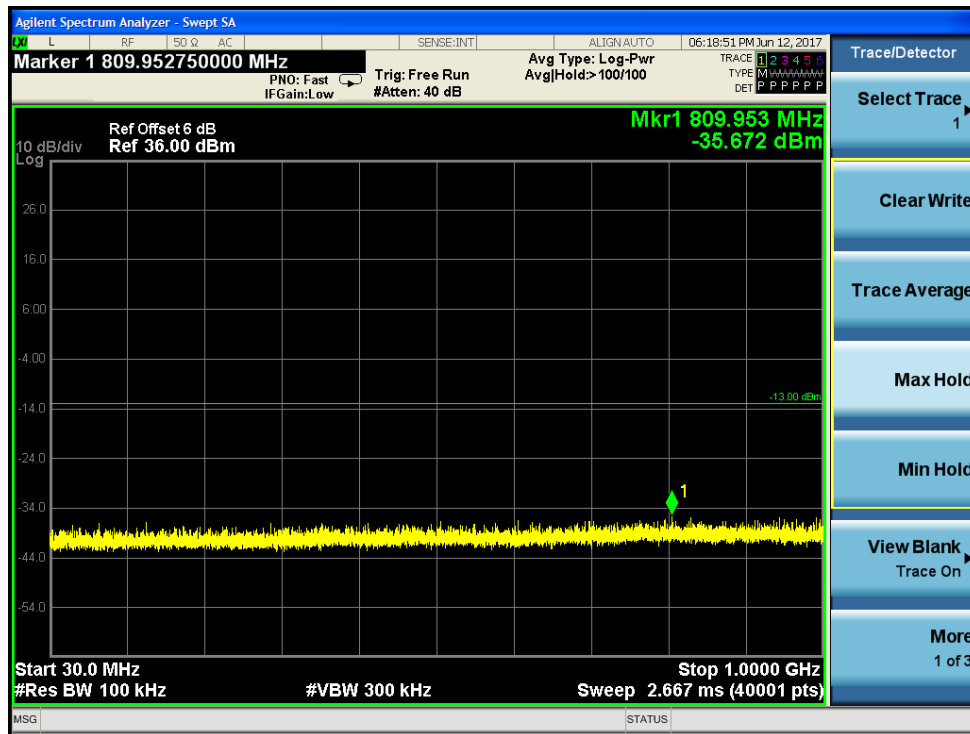
Test Mode: GPRS 850 - Middle Channel 30M-1G



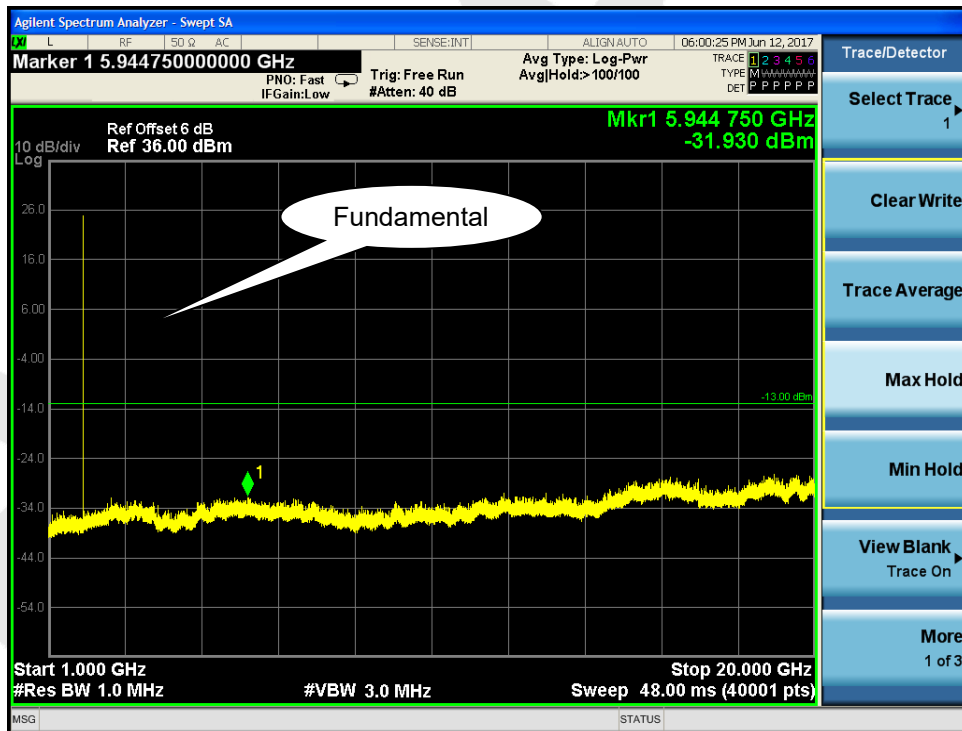
Test Mode: GPRS 850 - Middle Channel 1G-9G



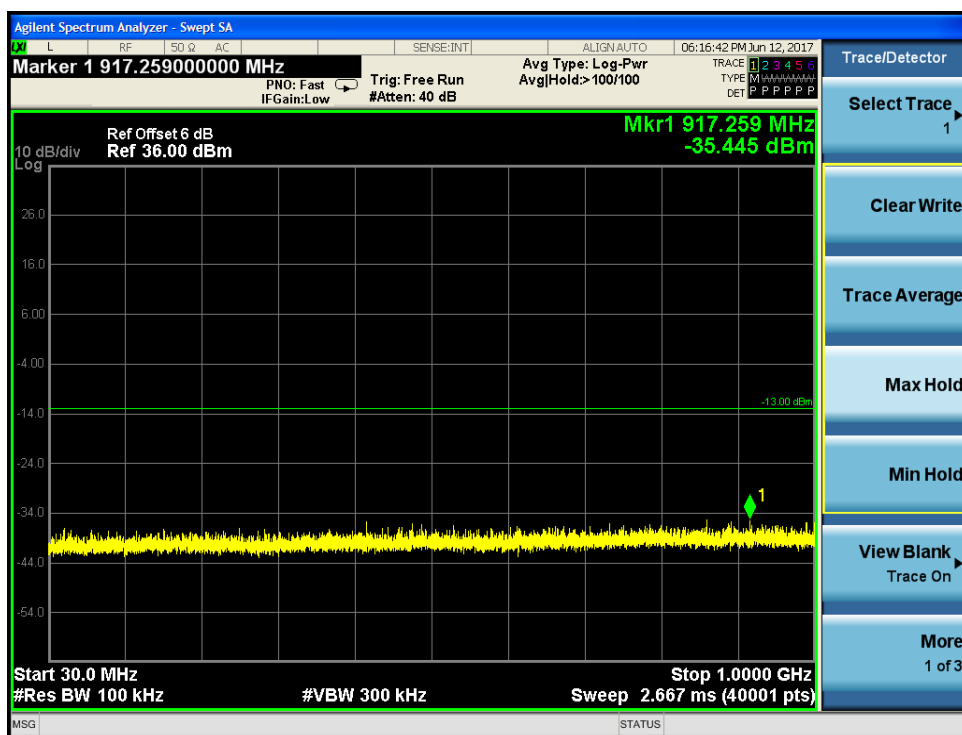
GPRS 1900 (Part 24E)



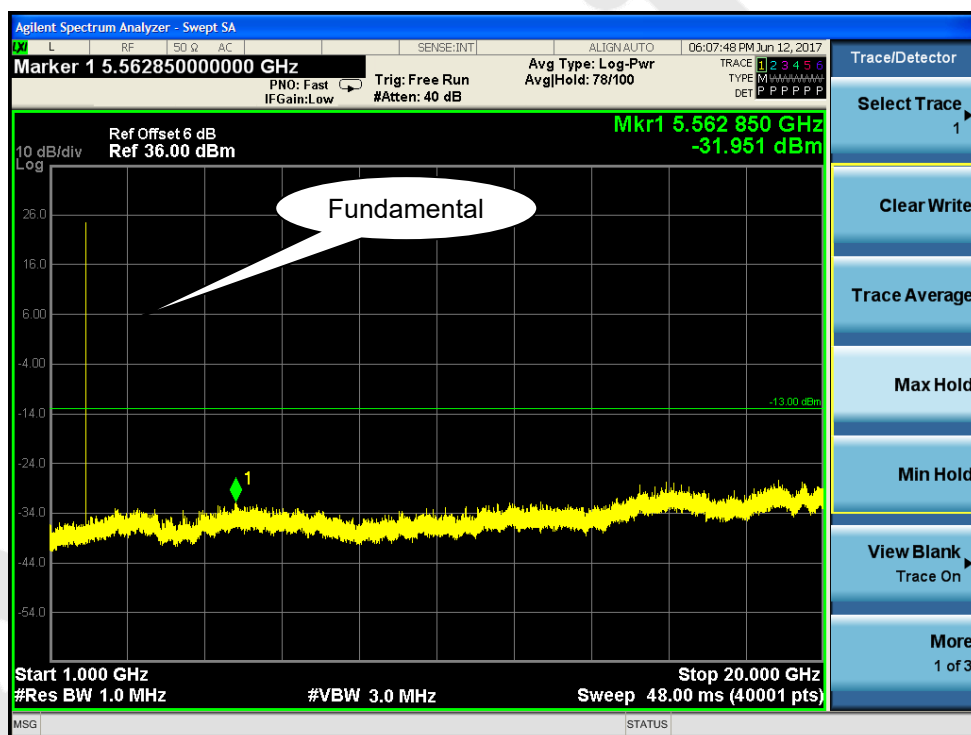
Test Mode: GPRS 1900 - Low Channel 30M-1G



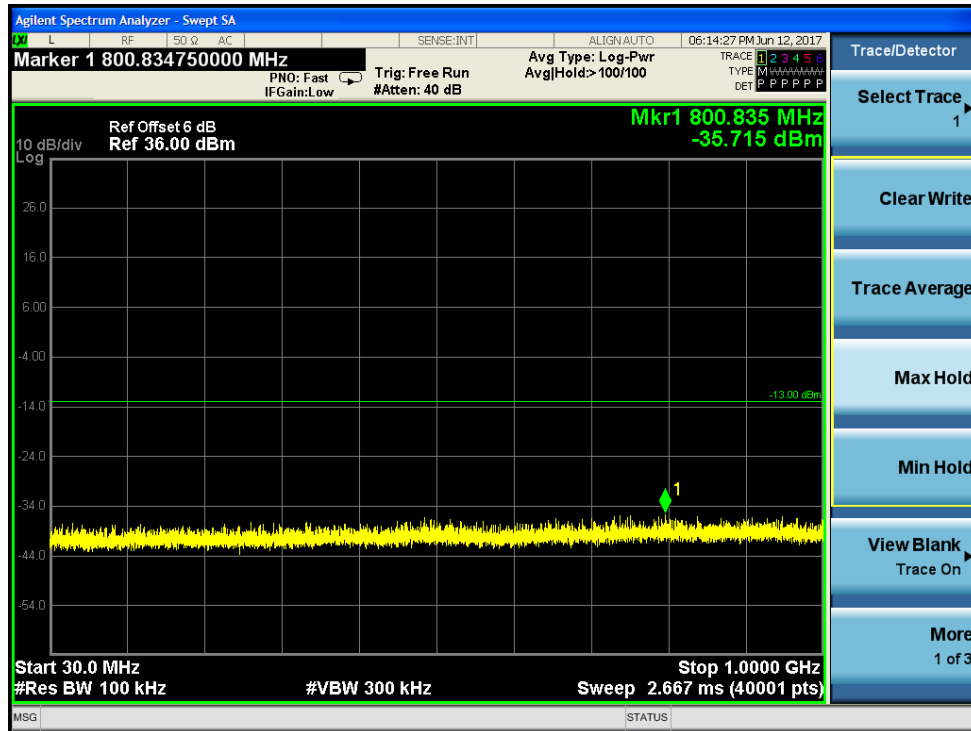
Test Mode: GPRS 1900 - Low Channel 1G-20G



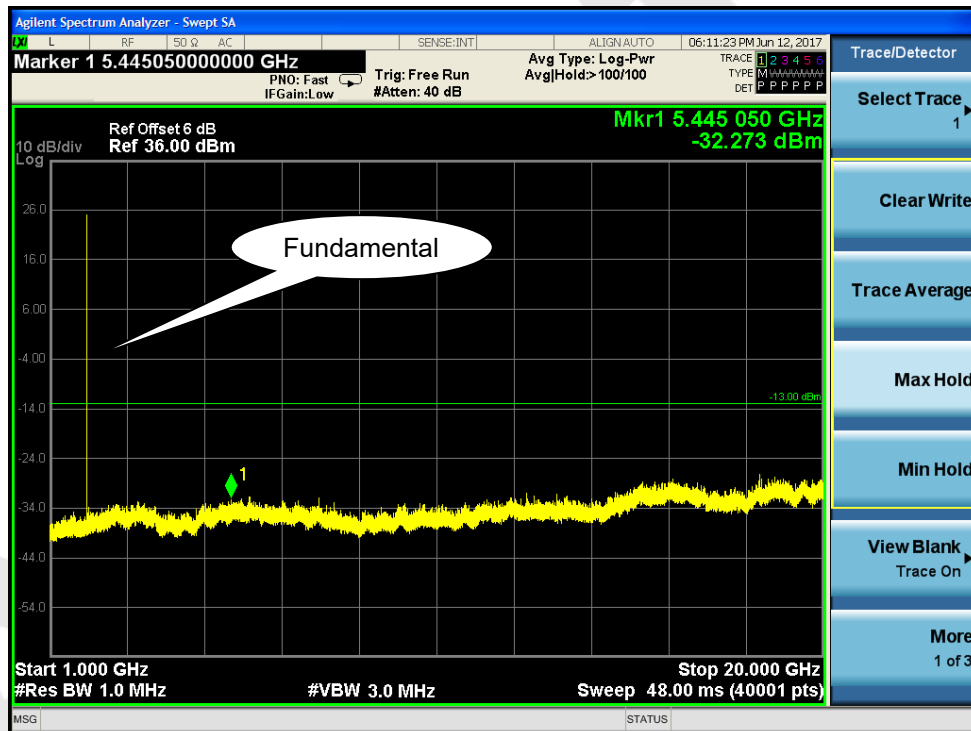
Test Mode: GPRS 1900 - Middle Channel 30M-1G



Test Mode: GPRS 1900 - Middle Channel 1G-20G



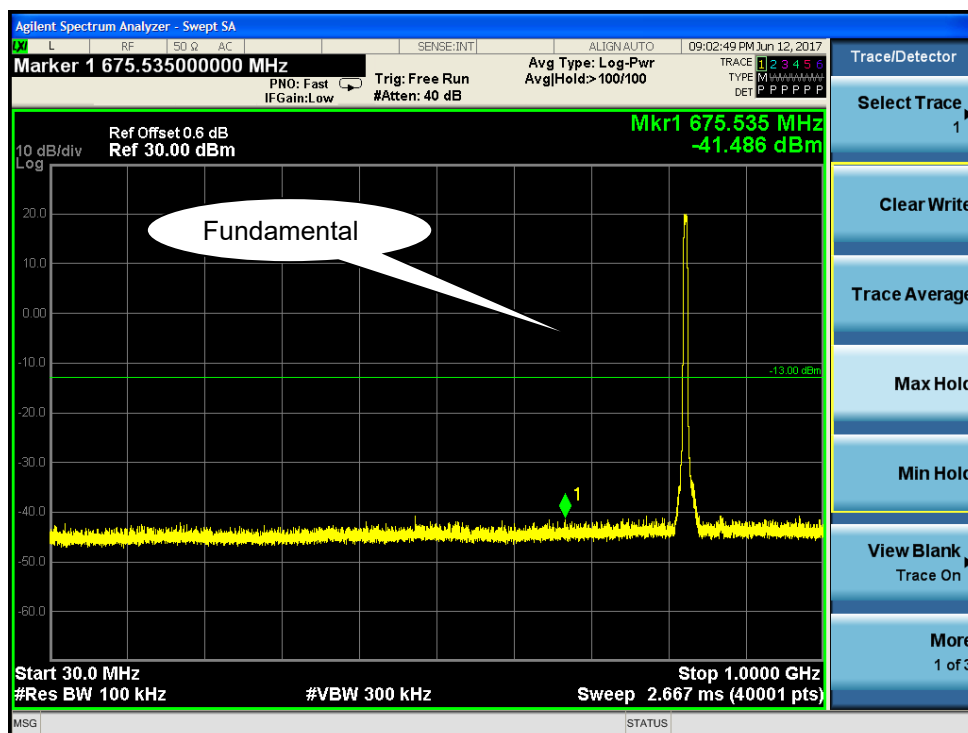
Test Mode: GPRS 1900 - High Channel 30M-1G



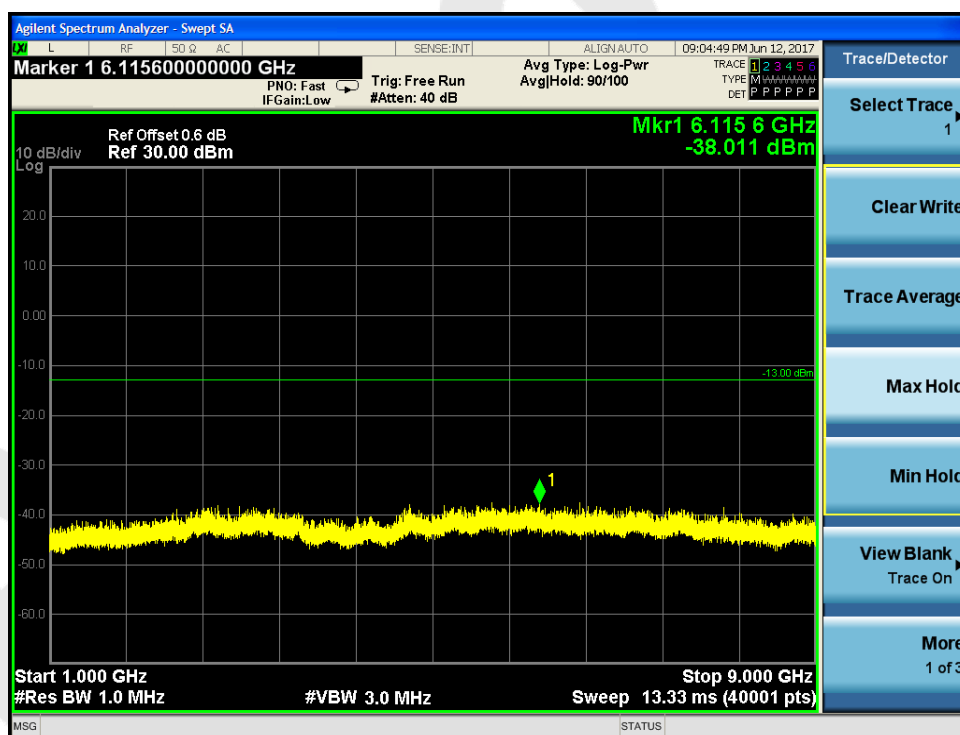
Test Mode: GPRS 1900 - High Channel 1G-20G

Test Plots

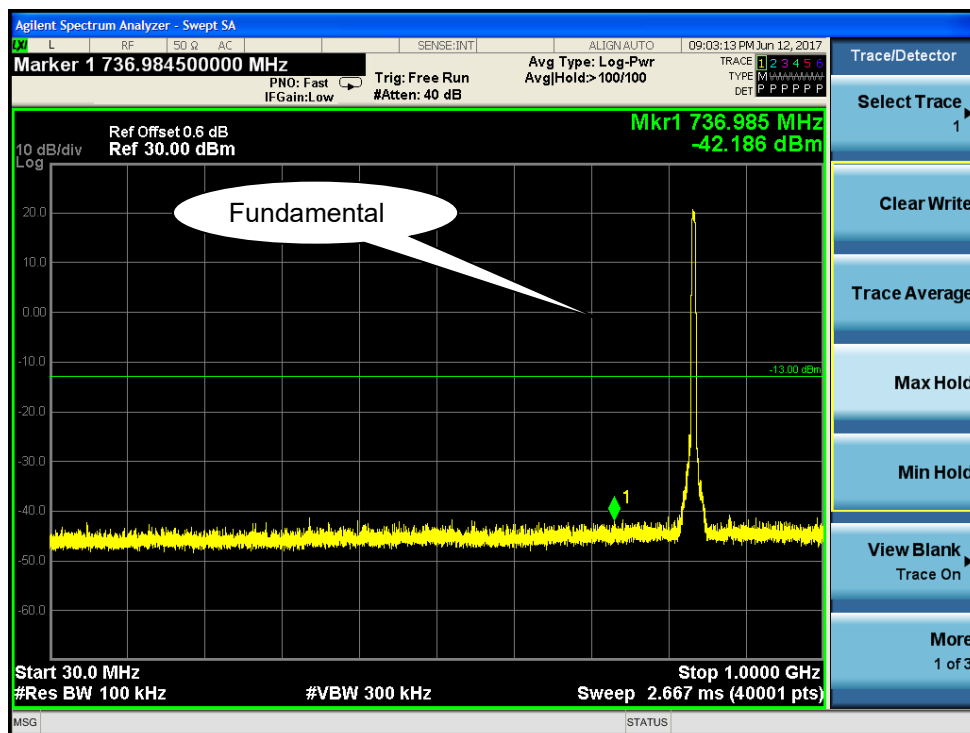
UMTS-FDD Band V (Part 22H)



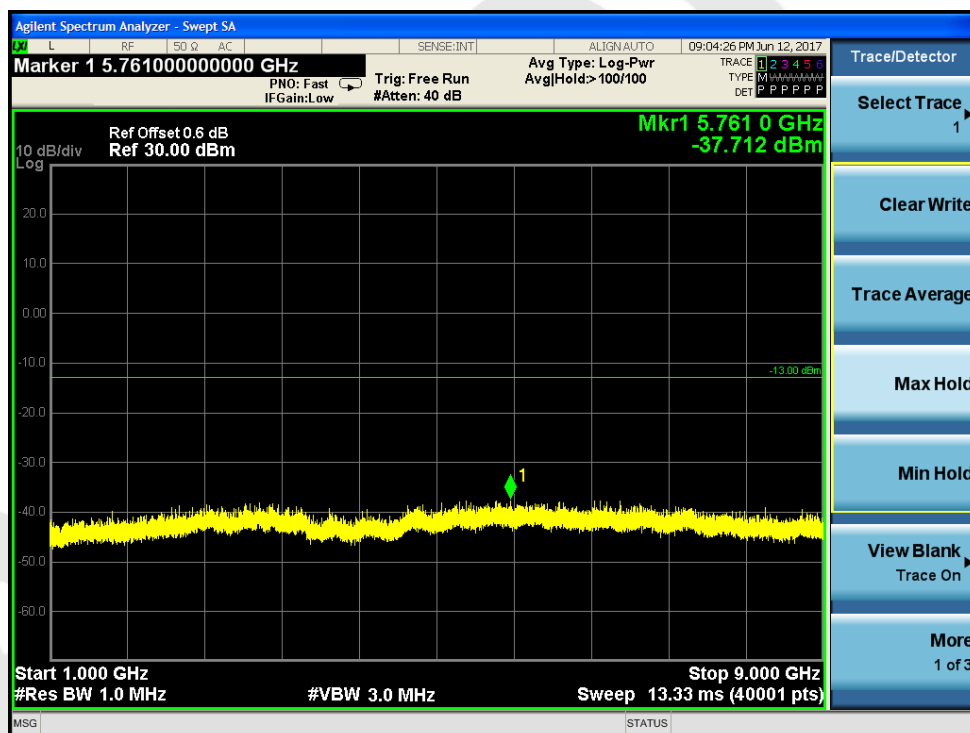
Test Mode: Band V - Low Channel 30M-1G



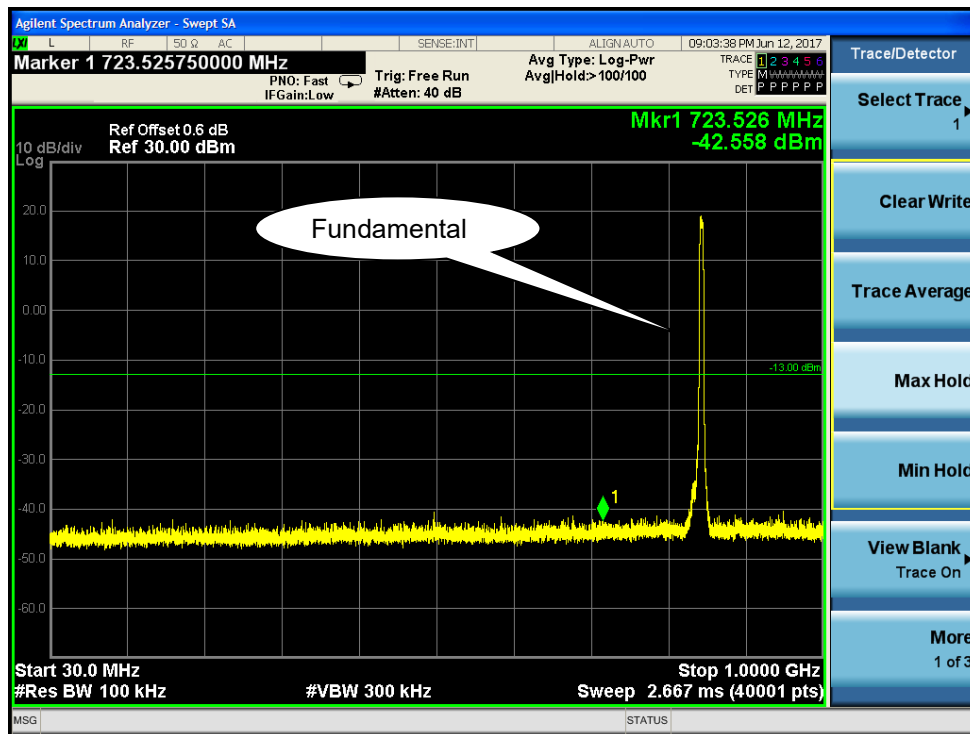
Test Mode: Band V - Middle Channel 1G-9G



Test Mode: Band V - Middle Channel 30M-1G



Test Mode: Band V - Middle Channel 1G-9G

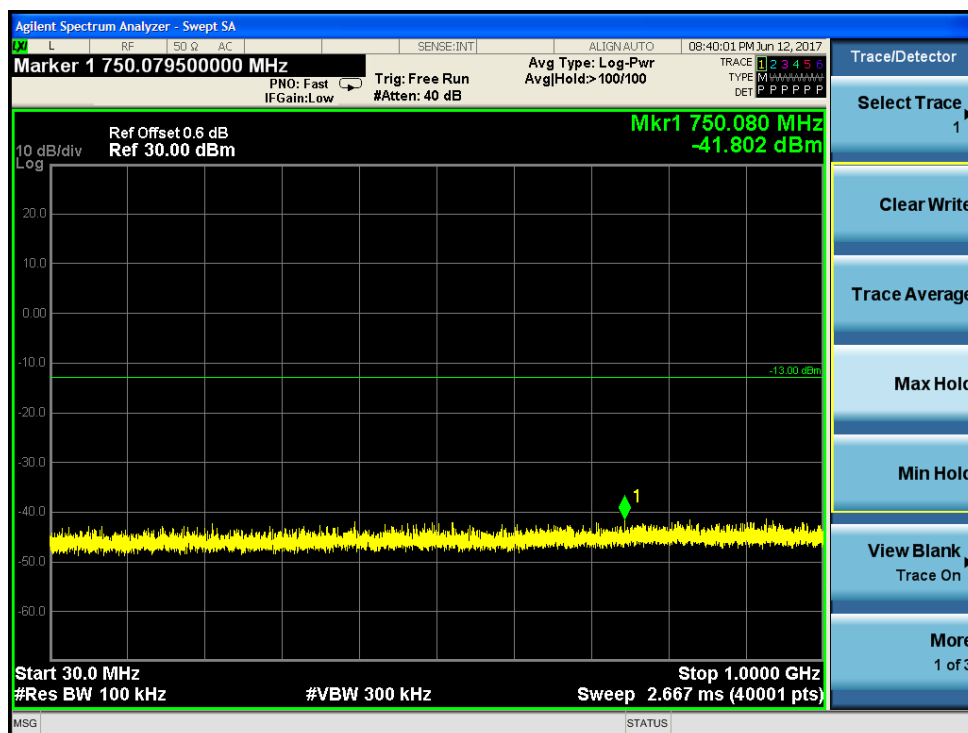


Test Mode: Band V - High Channel 30M-1G

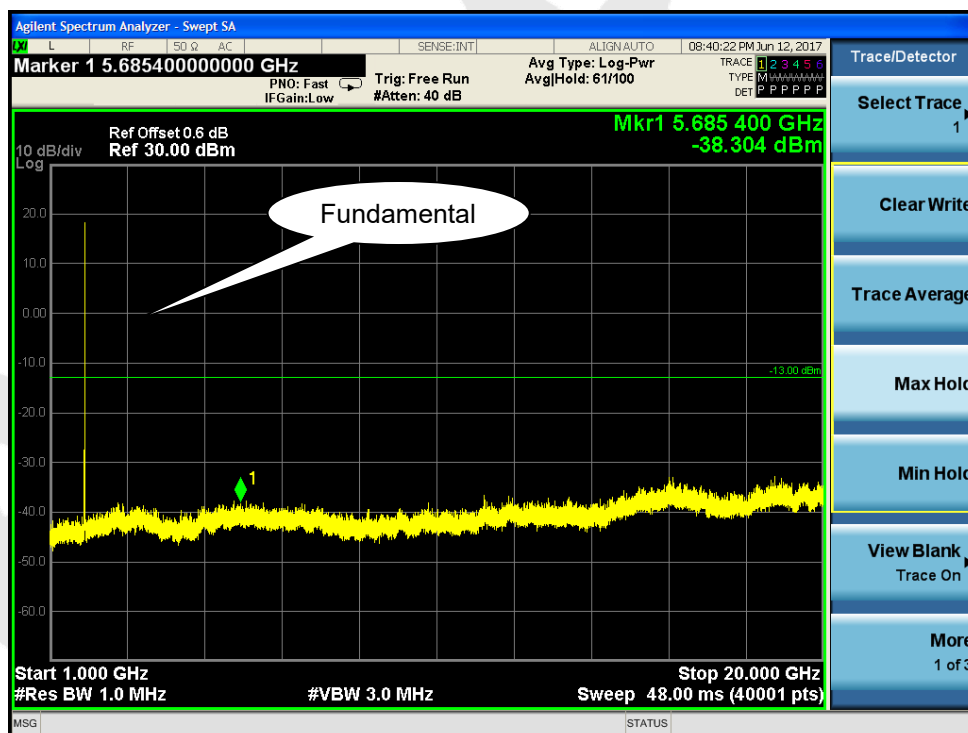


Test Mode: Band V - High Channel 1G-9G

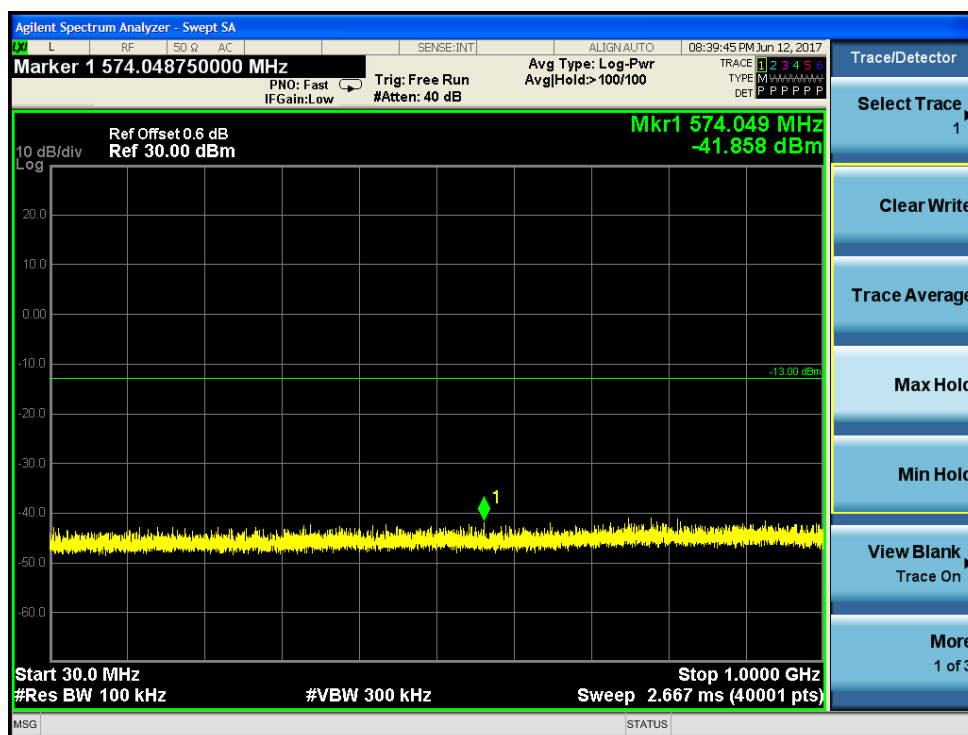
UMTS-FDD Band II (Part 24E)



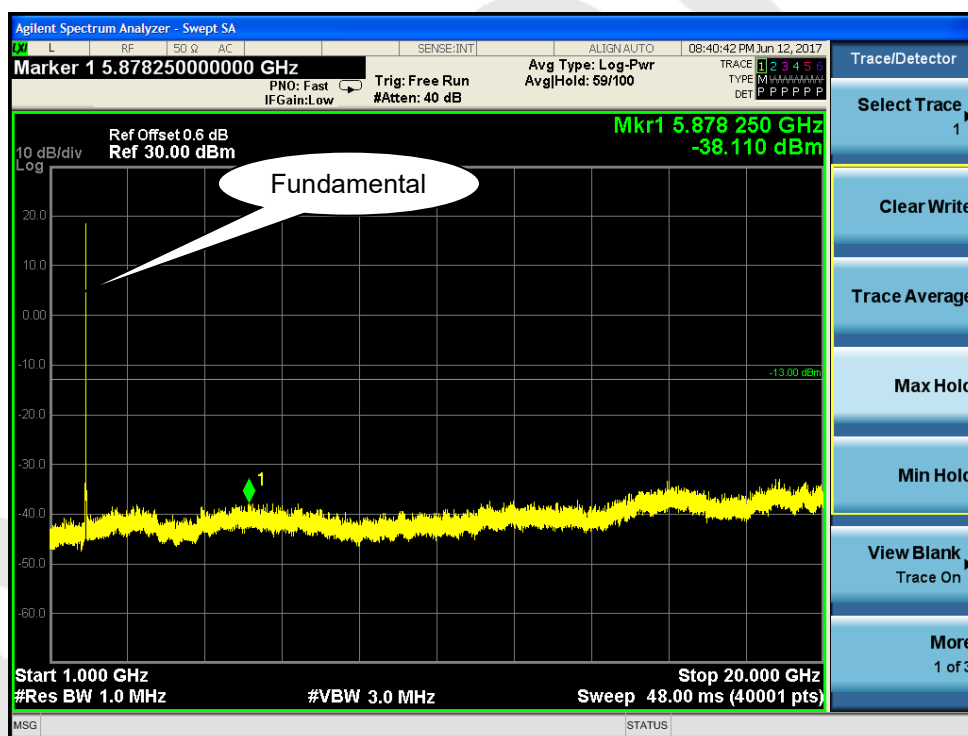
Test Mode: Band II - Low Channel 30M-1G



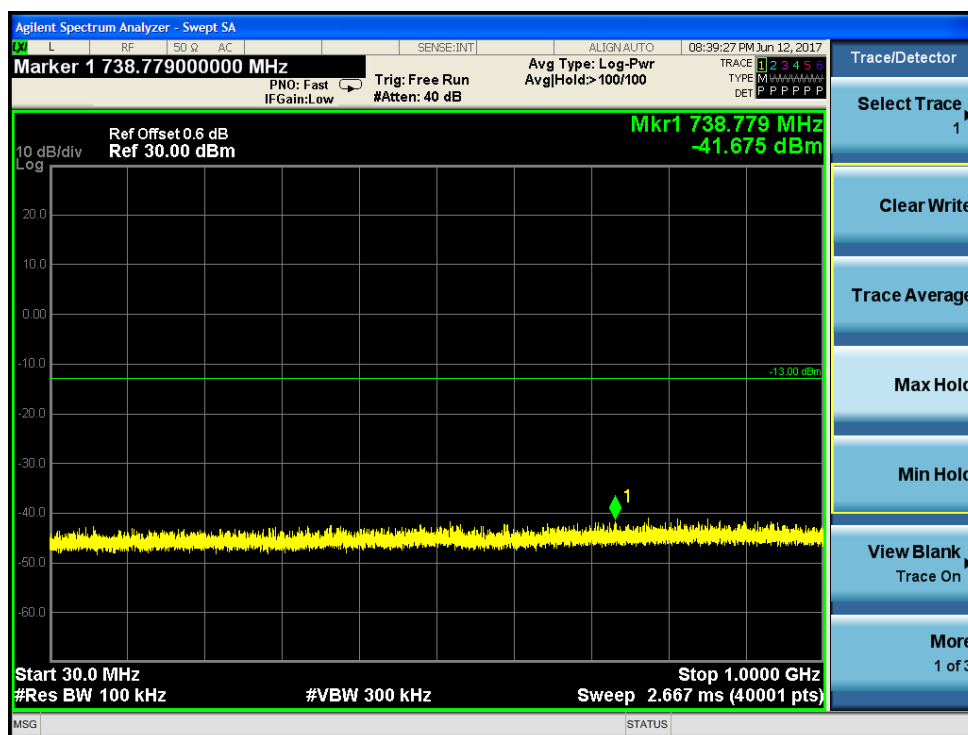
Test Mode: Band II - Middle Channel 1G-20G



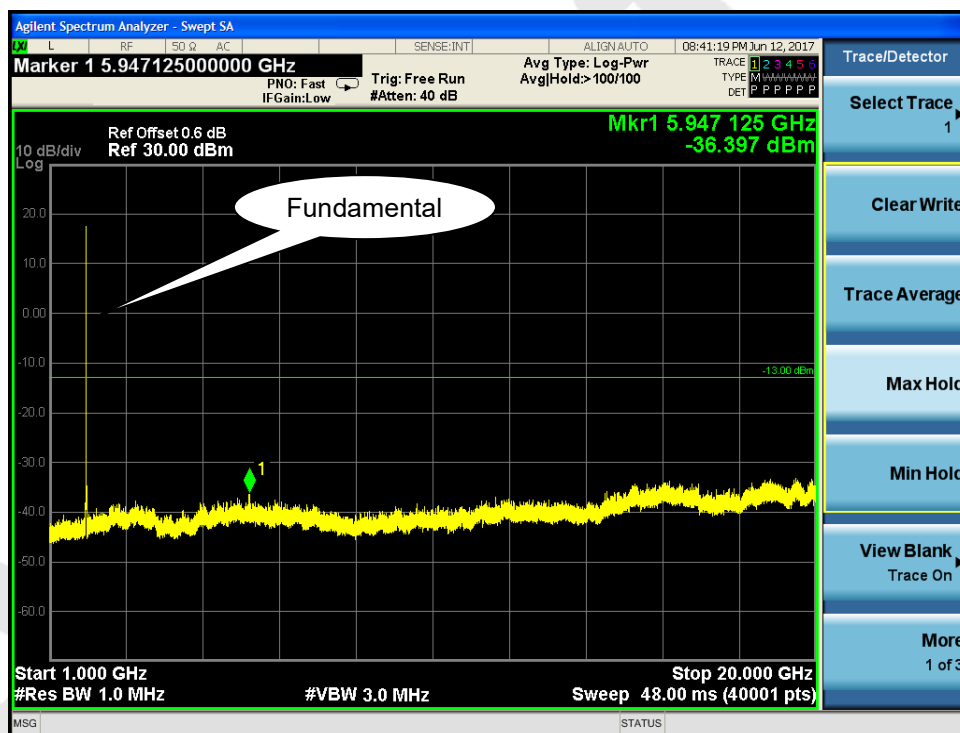
Test Mode: Band II - Middle Channel 30M-1G



Test Mode: Band II - Middle Channel 1G-20G



Test Mode: Band II - High Channel 30M-1G

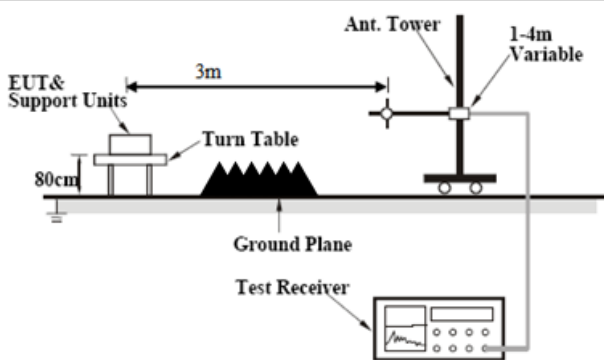


Test Mode: Band II - High Channel 1G-20G

3.6 Spurious Radiated Emissions

Temperature	23°C
Relative Humidity	56%
Atmospheric Pressure	1012mbar

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.	☒
Test setup			
Test Procedure		1. The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable. 2. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis. 3. Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution. Sample Calculation: EUT Field Strength = Raw Amplitude (dBμV/m) – Amplifier Gain (dB) + Antenna Factor (dB) + Cable Loss (dB) + Filter Attenuation (dB, if used)	
Remark			
Result		PASS	

GPRS 850 (Part 22H)

Low channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1648.4	-47.33	V	7.95	0.78	-40.16	-13.00	-27.16
1648.4	-46.89	H	7.95	0.78	-39.72	-13.00	-26.72
337.6	-56.74	V	6.10	0.31	-50.95	-13.00	-37.95
779.1	-53.28	H	7.30	0.42	-46.40	-13.00	-33.40

Middle channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1672.5	-48.69	V	7.95	0.78	-41.52	-13.00	-28.52
1672.5	-46.82	H	7.95	0.78	-39.65	-13.00	-26.65
337.8	-53.66	V	6.10	0.31	-47.87	-13.00	-34.87
779.5	-54.89	H	7.30	0.42	-48.01	-13.00	-35.01

High channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1697.0	-47.99	V	7.95	0.78	-40.82	-13.00	-27.82
1697.0	-47.02	H	7.95	0.78	-39.85	-13.00	-26.85
337.1	-54.11	V	6.10	0.31	-48.32	-13.00	-35.32
779.2	-53.69	H	7.30	0.42	-46.81	-13.00	-33.81

GPRS 1900 (Part 24E)

Low channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3701.1	-49.12	V	10.25	2.73	-41.60	-13.00	-28.60
3701.1	-51.07	H	10.25	2.73	-43.55	-13.00	-30.55
337.5	-54.22	V	6.10	0.31	-48.43	-13.00	-35.43
779.4	-51.37	H	7.30	0.42	-44.49	-13.00	-31.49

Middle channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3600.7	-49.37	V	10.25	2.73	-41.85	-13.00	-28.85
3600.7	-51.61	H	10.25	2.73	-44.09	-13.00	-31.09
336.7	-55.75	V	6.10	0.31	-49.96	-13.00	-36.96
778.5	-51.86	H	7.30	0.42	-44.98	-13.00	-31.98

High channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3819.2	-48.94	V	10.36	2.73	-41.42	-13.00	-28.42
3819.2	-51.60	H	10.36	2.73	-44.08	-13.00	-31.08
337.4	-55.88	V	6.10	0.31	-50.09	-13.00	-37.09
779.5	-51.63	H	7.30	0.42	-44.75	-13.00	-31.75

UMTS-FDD Band V (Part 22H)

Low channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1652.8	-47.89	V	7.95	0.78	-40.72	-13.00	-27.72
1652.8	-46.17	H	7.95	0.78	-39.00	-13.00	-26.00
336.5	-54.20	V	6.10	0.31	-48.41	-13.00	-35.41
778.9	-49.85	H	7.30	0.42	-42.97	-13.00	-29.97

Middle channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1670.0	-47.35	V	7.95	0.78	-40.18	-13.00	-27.18
1670.0	-45.86	H	7.95	0.78	-38.69	-13.00	-25.69
336.7	-54.53	V	6.10	0.31	-48.74	-13.00	-35.74
778.8	-51.06	H	7.30	0.42	-44.18	-13.00	-31.18

High channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1693.2	-47.22	V	7.95	0.78	-40.05	-13.00	-27.05
1693.2	-46.38	H	7.95	0.78	-39.21	-13.00	-26.21
336.9	-55.77	V	6.10	0.31	-49.98	-13.00	-36.98
778.4	-50.63	H	7.30	0.42	-43.75	-13.00	-30.75

UMTS-FDD Band II (Part 24E)

Low channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3704.8	-48.96	V	10.25	2.73	-41.44	-13.00	-28.44
3704.8	-58.33	H	10.25	2.73	-50.81	-13.00	-37.81
338.1	-56.71	V	6.10	0.31	-50.92	-13.00	-37.92
780.2	-50.14	H	7.30	0.42	-43.26	-13.00	-30.26

Middle channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3760	-49.87	V	10.25	2.73	-42.35	-13.00	-29.35
3760	-48.53	H	10.25	2.73	-41.01	-13.00	-28.01
338.0	-56.32	V	6.10	0.31	-50.53	-13.00	-37.53
780.4	-49.53	H	7.30	0.42	-42.65	-13.00	-29.65

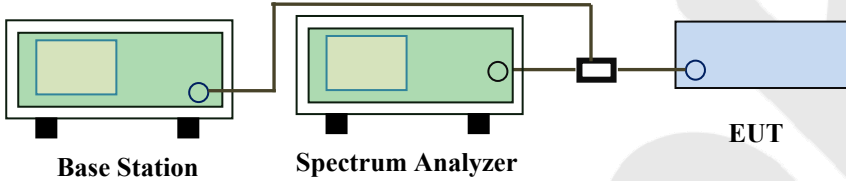
High channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3815.2	-49.66	V	10.36	2.73	-42.14	-13.00	-29.14
3815.2	-48.75	H	10.36	2.73	-41.23	-13.00	-28.23
337.9	-56.77	V	6.10	0.31	-50.98	-13.00	-37.98
780.0	-48.22	H	7.30	0.42	-41.34	-13.00	-28.34

3.7 Band Edge

Temperature	21°C
Relative Humidity	56%
Atmospheric Pressure	1010mbar

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.	☒
Test setup	 The diagram illustrates the test setup. On the left is a green box labeled 'Base Station'. A line connects it to a green box labeled 'Spectrum Analyzer'. From the Spectrum Analyzer, a line goes through a small black box (power divider) and then to a blue box labeled 'EUT'.		
Procedure	- 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	PASS		

GPRS 850 (Part 22H)

Frequency (MHz)	Emission (dBm)	Limit (dBm)
824	-17.528	-13
849	-18.557	-13

GPRS 1900 (Part 24E)

Frequency (MHz)	Emission (dBm)	Limit (dBm)
1850	-21.173	-13
1910	-21.928	-13

UMTS-FDD Band V (Part 22H)

Frequency (MHz)	Emission (dBm)	Limit (dBm)
824	-17.515	-13
849	-17.888	-13

UMTS-FDD Band II (Part 24E)

Frequency (MHz)	Emission (dBm)	Limit (dBm)
1850	-17.199	-13
1910	-17.927	-13

Test Plots

GPRS 850 (Part 22H)



Test Mode: GPRS 850 - Low Channel



Test Mode: GPRS 850 - High Channel

GPRS 1900 (Part 24E)



Test Mode: GPRS 1900 - Low Channel



Test Mode: GPRS 1900 - High Channel

UMTS-FDD Band V (Part 22H)



Test Mode: Band V - Low Channel



Test Mode: Band V - High Channel

UMTS-FDD Band II (Part 24E)



Test Mode: Band II - Low Channel

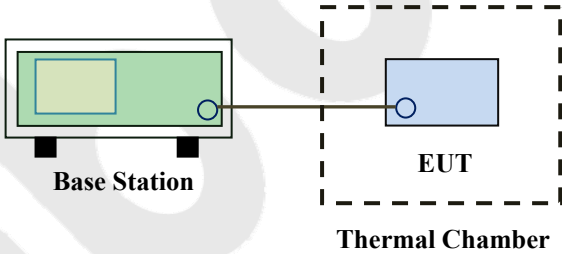


Test Mode: Band II - High Channel

3.8 Frequency Stability

Temperature	25°C
Relative Humidity	56%
Atmospheric Pressure	1010mbar

Requirement(s):

Spec	Item	Requirement	Applicable																																
§2.1055, §22.355 & §24.235	a)	According to §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table below: Frequency Tolerance for Transmitters in the Public Mobile Services <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 29.</td><td>.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> According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized frequency block.	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 29.	.0	N/A	N/A	929 to 960.	1.5	N/A	N/A	2110 to 2220	10.0	N/A	N/A	
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 29.	.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	 Base Station EUT Thermal Chamber																																		
Procedure	A communication link was established between EUT and base station. The frequency error was monitored and measured by base station under variation of ambient temperature and variation of primary supply voltage. Limit: The frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5ppm) of the center frequency.																																		
Remark																																			
Result	PASS																																		

GPRS 850 (Part 22H)

Middle Channel, $f_o = 835$ MHz				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10	3.7	20	0.0106	2.5
0		16	0.0085	2.5
10		17	0.0090	2.5
20		12	0.0064	2.5
30		16	0.0085	2.5
40		11	0.0059	2.5
50		23	0.0122	2.5
55		25	0.0133	2.5
25	4.2	16	0.0085	2.5
	3.5	15	0.0080	2.5

GPRS 1900 (Part 24E)

Middle Channel, $f_o = 1880$ MHz				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10	3.7	22	0.0117	2.5
0		19	0.0101	2.5
10		11	0.0059	2.5
20		17	0.0090	2.5
30		14	0.0074	2.5
40		16	0.0085	2.5
50		17	0.0090	2.5
55		23	0.0122	2.5
25	4.2	13	0.0069	2.5
	3.5	14	0.0074	2.5

UMTS-FDD Band V (Part 22H)

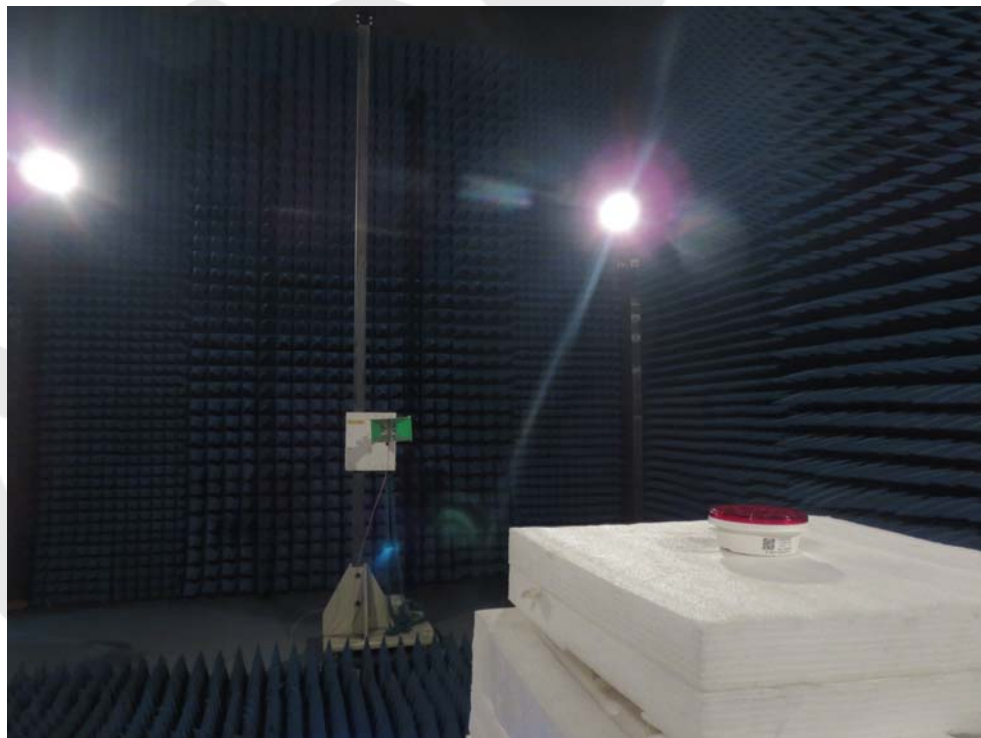
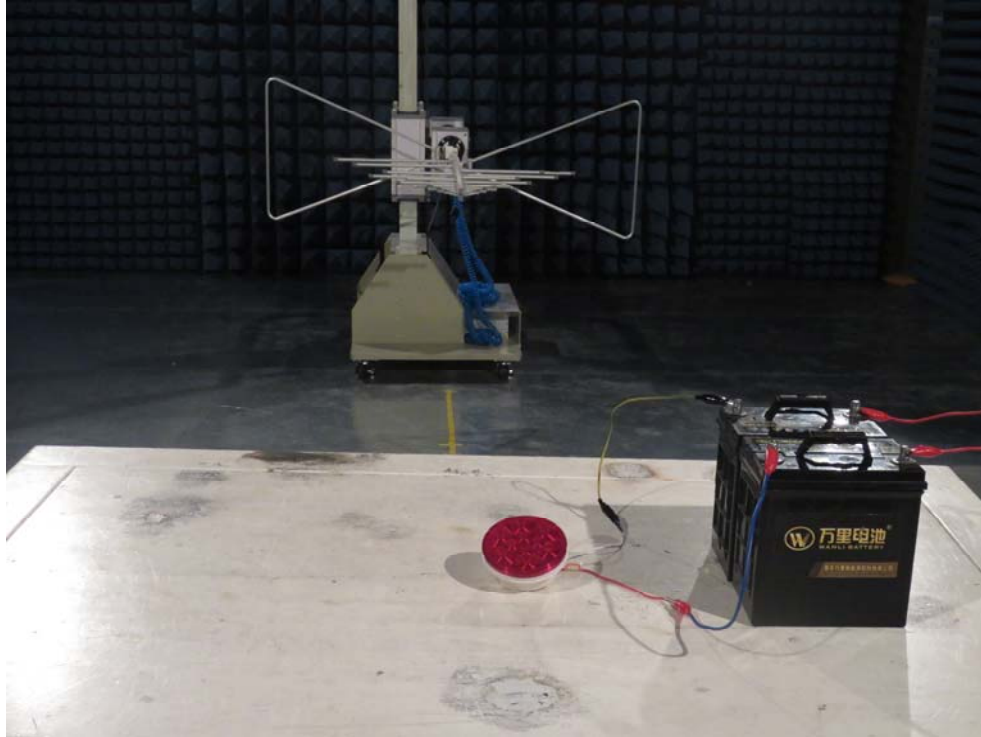
Middle Channel, $f_0 = 835$ MHz				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10	3.7	19	0.0101	2.5
0		16	0.0085	2.5
10		13	0.0069	2.5
20		18	0.0096	2.5
30		17	0.0090	2.5
40		11	0.0059	2.5
50		15	0.0080	2.5
55		21	0.0112	2.5
25	4.2	16	0.0085	2.5
	3.5	14	0.0074	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	18	0.0096	2.5
0		14	0.0074	2.5
10		13	0.0069	2.5
20		10	0.0053	2.5
30		12	0.0064	2.5
40		12	0.0064	2.5
50		17	0.0090	2.5
55		19	0.0101	2.5
25	4.2	11	0.0059	2.5
	3.5	14	0.0074	2.5

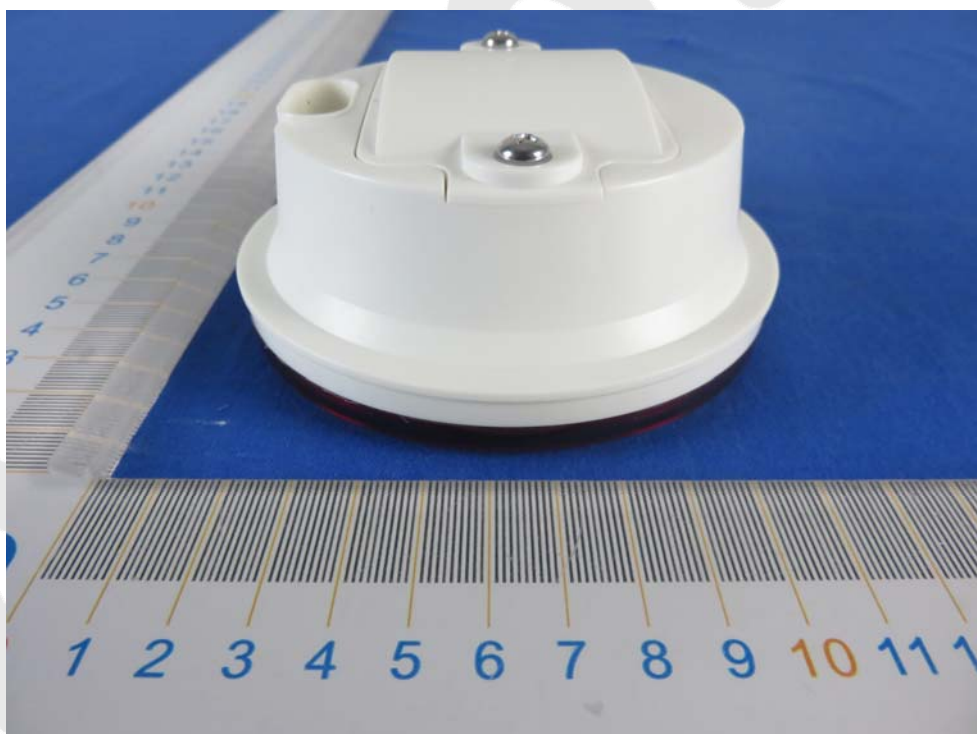
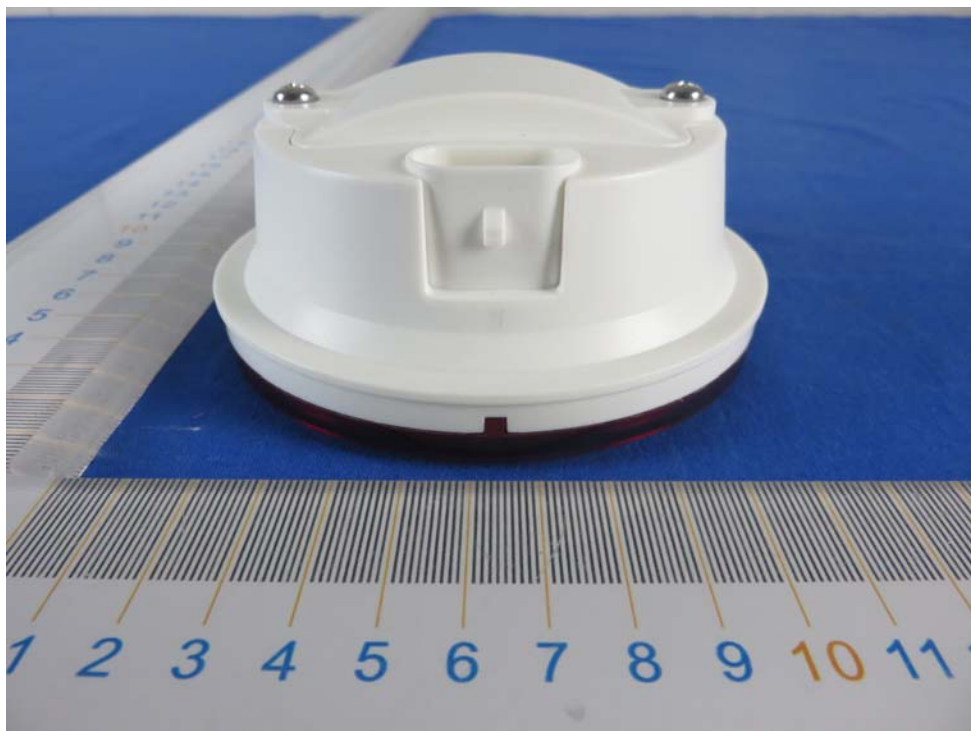
APPENDIX I -- TEST SETUP PHOTOGRAPH

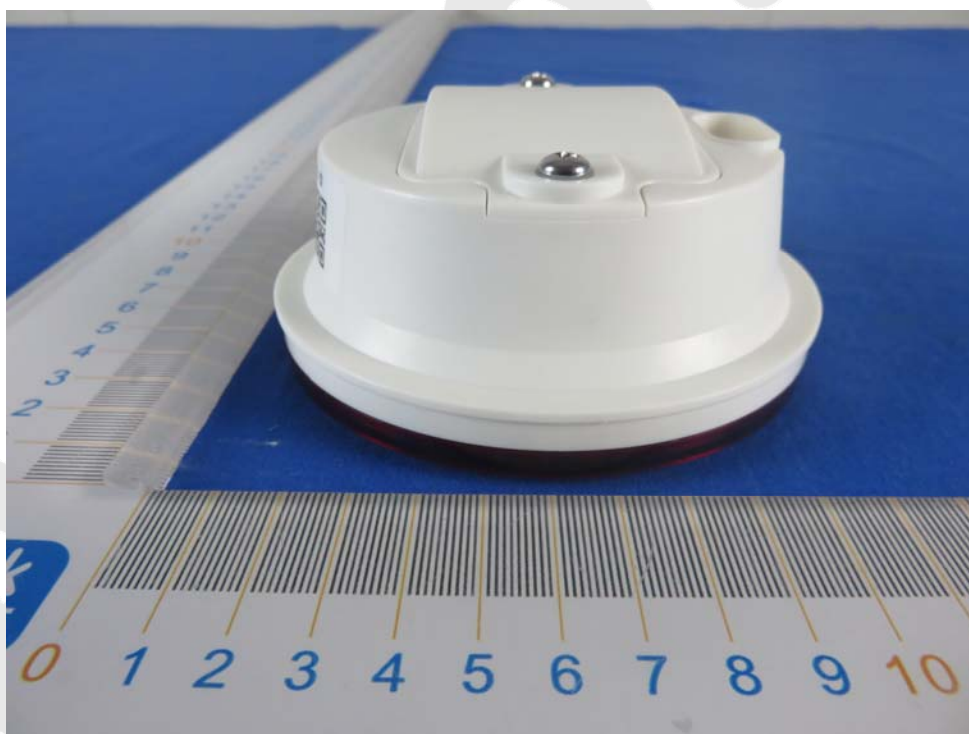
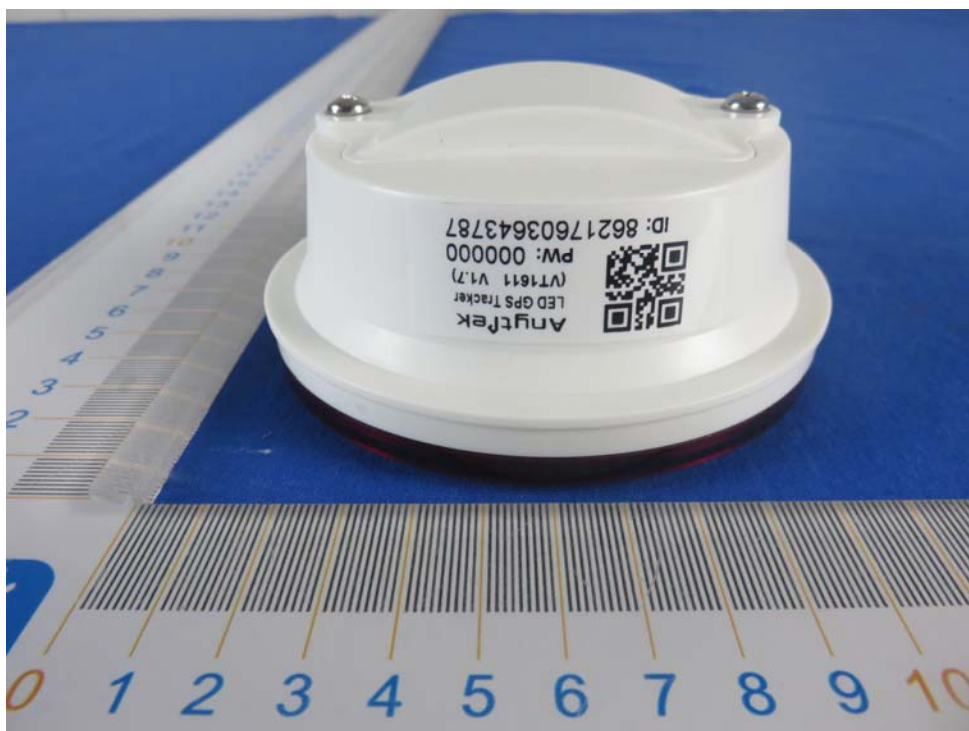
Photo of Radiation Emission Test



APPENDIX II -- EXTERNAL PHOTOGRAPH







APPENDIX III -- INTERNAL PHOTOGRAPH

