FCC RADIO TEST REPORT
FCC ID: AJYSLC

Product：	SLC GNSS Receiver
Trade Name：	SATLAB GEOSOLUTIONS
Model Name：	SLC
Serial Model：	N/A
Report No.：	STUEMO016061404320RF1

Prepared for

GEOSOLUTION I GOTEBORG AB

Datavagen 21B 43632 ASKIM SWEDEN

Prepared by

BZT Testing Technology Co., Ltd.

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TEST RESULT CERTIFICATION

Applicant's name ..... :	GEOSOLUTION I GOTEBORG AB
Address ..... :	Datavagen 21B 43632 ASKIM SWEDEN
Manufacture's Name ..... :	GEOSOLUTION I GOTEBORG AB
Address ..... :	Datavagen 21B 43632 ASKIM SWEDEN

Product description

Product name ..... :	GNSS Receiver
Model and/or type reference ..... :	SLC
Serial Model ..... :	N/A
Standards ..... :	FCC Part 22H and 24E
Test procedure	ANSI/TIAC603 D: 2010

This device described above has been tested by BZT, 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.

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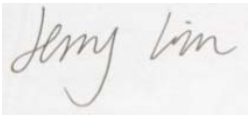
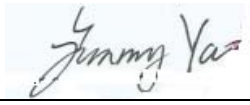
Date of Test ..... :	
Date (s) of performance of tests ..... :	7 Jul. 2016 ~17 Jul. 2016
Date of Issue ..... :	17 Jul. 2016
Test Result ..... :	**Pass**

Testing Engineer : 

(Jerry Lin)

Technical Manager : 

(Jimmy Yao)

Authorized Signatory : 

(Terry Yang)

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1. Report Revision History

Report No.	Report Version	Description	Issue Date
STUEMO016061404320RF1	NONE	Original	Jul 17, 2016

2. Customer information

Applicant Name	GEOSOLUTION I GOTEBORG AB
Applicant Add	Datavagen 21B 43632 ASKIM SWEDEN
Manufacturer	GEOSOLUTION I GOTEBORG AB
Manufacturer Add	Datavagen 21B 43632 ASKIM SWEDEN

3. Test site information

Lab performing tests	BZT Testing Technology Co., Ltd.
Lab Address	Buliding 17, Xinghua Road Xingwei industrial Park Fuyong, Baoan District, Shenzhen, Guangdong, China
FCC Test Site No.	701733

4. Equipment under Test (EUT) Information

Description of EUT:	SLC GNSS Receiver
Main Model:	SLC
Serial Model:	N/A
Equipment Category：	PCT
Antenna Gain:	GSM850: 2.14dBi PCS1900: 2.14dBi UMTS-FDD Band 2: 2.14dBi BT: 2dBi
Type of Modulation:	GSM / GPRS: GMSK UMTS-FDD: QPSK Bluetooth: GFSK, π /4DQPSK, 8DPSK
RF Operating Frequency (ies):	GSM850 TX: 824.2 ~ 848.8 MHz; RX: 869.2 ~ 893.8 MHz PCS1900 TX: 1850.2 ~ 1909.8 MHz; RX: 1930.2 ~ 1989.8 MHz UMTS-FDD Band 2 TX:1852.4 ~ 1907.6 MHz; RX: 1932.4 ~ 1987.6 MHz Bluetooth: 2402-2480 MHz
ERP/EIRP:	GSM850: 29.49 dBm / ERP PCS1900: 29.75 dBm / EIRP UMTS-FDD Band 2: 24.49 dBm / EIRP
Number of Channels:	GSM 850: 124CH PCS1900: 299CH UMTS-FDD Band 2: 277CH Bluetooth: 79CH
Port:	Power Port, Earphone Port, USB Port

Input Power:	DC 3.7V
Trade Name :	
GPRS Multi-slot class	8/10/12

5. Test Summary

The product was tested in accordance with the following specifications.

All testing has been performed according to below product classification:

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

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

Measurement Uncertainty

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

6. MEASUREMENTS, EXAMINATION AND DERIVED RESULTS

6.1 RF Exposure (SAR)

Test Result: Pass

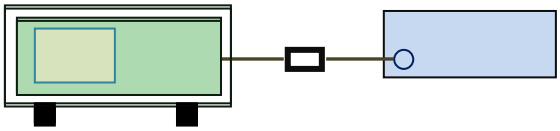
The EUT is a portable device, thus requires SAR evaluation;

Please refer to RF Exposure Evaluation Report: STUEMO016061404320RFH

6.2 RF Output Power

Temperature	25℃
Relative Humidity	54%
Atmospheric Pressure	1002mbar

Requirement(s):

Spec	Item	Requirement	Applicable
§22.913 (a)	a)	ERP:38.45dBm	☑
§24.232 (c)	b)	EIRP:33dBm	☑
Test Setup			
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: According with KDB 971168 v02r02 - 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 ☐Fail

Test Data ☑Yes ☐N/A

Test Plot ☐Yes (See below) ☑N/A

Conducted Power

GSM Mode:

GSM 850		Burst Conducted power (dBm) Channel/Frequency(MHz)			/	Average power (dBm) Channel/Frequency(MHz)		
		128/824.2	190/836.6	251/848.8		128/824.2	190/836.6	251/848.8
GPRS (GMSK)	1TX slot	32.25	32.22	32.21	-9.03dB	23.22	23.19	23.18
	2TX slot	31.81	31.82	31.84	-6.02dB	25.79	25.80	25.82
	3TX slot	30.17	30.12	30.06	-4.26dB	25.91	25.86	25.80
	4TX slot	29.64	29.06	29.58	-3.01dB	**26.63**	26.05	26.57
GSM 1900		**Burst Conducted power (dBm) Channel/Frequency(MHz)**			**/**	**Average power (dBm) Channel/Frequency(MHz)**		
		512/ 1850.2	**661/ 1880**	**810/ 1909.8**		**512/ 1850.2**	**661/ 1880**	**810/ 1909.8**
GPRS (GMSK)	1TX slot	29.90	29.82	29.81	-9.03dB	20.87	20.79	20.78
	2TX slot	28.93	28.93	29.05	-6.02dB	22.91	22.91	23.03
	3TX slot	27.47	27.61	27.48	-4.26dB	23.21	23.35	23.22
	4TX slot	26.48	26.52	26.64	-3.01dB	23.47	23.51	**23.63**

UMTS Mode:

UMTS-FDD Band II

Item	band	WCDMA Band II result (dBm)		
		Channel/Frequency(MHz)		
	ARFCN	9262/1852.4	9400/1880.0	9538/1907.6
RMC	12.2kbps	**23.77**	**23.64**	**23.70**
	64kbps	23.75	23.62	23.69
	144kbps	23.73	23.61	23.67
	384kbps	23.73	23.60	23.67
AMR	12.2kbps	23.74	23.61	23.68
HSDPA	Sub - Test 1	22.13	22.03	21.91
	Sub - Test 2	22.25	21.35	22.12
	Sub - Test 3	22.21	21.16	22.35
	Sub - Test 4	21.21	21.54	21.14
HSUPA	Sub - Test 1	20.12	21.16	20.15
	Sub - Test 2	20.21	20.13	20.06
	Sub - Test 3	21.00	21.21	21.02
	Sub - Test 4	19.91	20.05	20.16
	Sub - Test 5	20.21	21.26	20.17

ERP & EIRP

GSM:

ERP for Cellular Band (Part 22H)

Frequency (MHz)	Substituted level (dBm)	Antenna Polarization	Antenna Gain correction (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)
824.2	23.22	V	6.8	0.53	**29.49**	38.45
824.2	22.56	H	6.8	0.53	28.83	38.45
836.6	23.17	V	6.8	0.53	29.44	38.45
836.6	22.74	H	6.8	0.53	29.01	38.45
848.8	23.09	V	6.9	0.53	29.46	38.45
848.8	22.43	H	6.9	0.53	28.80	38.45

EIRP for PCS Band (Part 24E)

Frequency (MHz)	Substituted level (dBm)	Antenna Polarization	Antenna Gain correction (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)
1850.2	22.58	V	7.88	0.85	29.61	33
1850.2	21.79	H	7.88	0.85	28.82	33
1880	22.62	V	7.88	0.85	29.65	33
1880	21.89	H	7.88	0.85	28.92	33
1909.8	22.74	V	7.86	0.85	**29.75**	33
1909.8	21.96	H	7.86	0.85	28.97	33

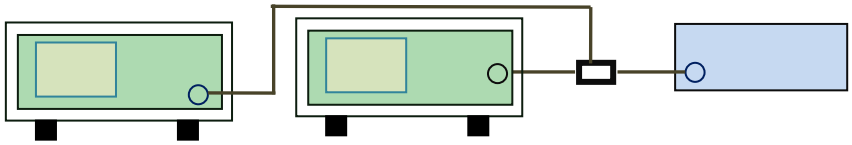
EIRP for UMTS-FDD Band II (Part 24E)

Frequency (MHz)	Substituted level (dBm)	Antenna Polarization	Antenna Gain correction (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)
1852.4	17.46	V	7.88	0.85	**24.49**	33
1852.4	16.76	H	7.88	0.85	23.79	33
1880	17.38	V	7.88	0.85	24.41	33
1880	16.63	H	7.88	0.85	23.66	33
1907.6	17.43	V	7.86	0.85	24.44	33
1907.6	16.97	H	7.86	0.85	23.98	33

6.3 Peak-Average Ratio

Temperature	25℃
Relative Humidity	54%
Atmospheric Pressure	1002mbar

Requirement(s):

Spec	Item	Requirement	Applicable
§24.232(d)	a)	The peak-to-average ratio (PAR) of the transmission may not exceed 13dB.	☑
Test Setup			
Test Procedure	According with KDB 971168 v02r02 5.7.2 Alternate procedure for PAPR 5.1.2 Peak power measurements with a peak power meter The total peak output power may be measured using a broadband peak RF power meter. The power meter must have a video bandwidth that is greater than or equal to the emission bandwidth and utilize a fast-responding diode detector. 5.2.3 Average power measurement with average power meter As an alternative to the use of a spectrum/signal analyzer or EMI receiver to perform a measurement of the total in-band average output power, a wideband RF average power meter with a thermocouple detector or equivalent can be used under certain conditions If the EUT can be configured to transmit continuously (i.e., the burst duty cycle ≥ 98%) and at all times the EUT is transmitting at is maximum output power level, then a conventional wide-band RF power meter can be used. If the EUT cannot be configured to transmit continuously (i.e., the burst duty cycle < 98%), then there are two options for the use of an average power meter. First, a gated average power meter can be used to perform the		

	measurement if the gating parameters can be adjusted such that the power is measured only over active transmission bursts at maximum output power levels. A conventional average power meter can also be used if the measured burst duty cycle is constant (i.e., duty cycle variations are less than ± 2 percent) by performing the measurement over the on/off burst cycles and then correcting (increasing) the measured level by a factor equal to 10log(1/duty cycle)
Remark	
Result	☑ Pass ☐ Fail

Test Data ☑ Yes ☐ N/A

Test Plot ☐ Yes (See below) ☑ N/A

GPRS 1900 PK-AV POWER (PART 24E)

Frequency (MHz)	Conducted power(dBm)		Peak-Average Ratio(PAR)
	Peak	Average	
1850.2	30.29	29.90	0.39
1880	30.58	29.82	0.76
1909.8	30.69	29.81	0.88

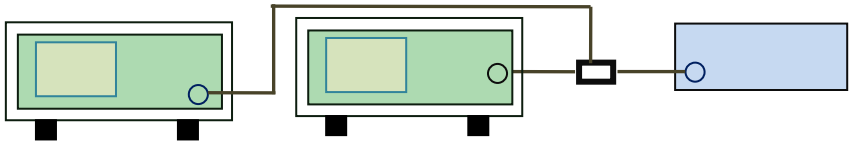
UMTS-FDD Band 2 PK-AV POWER (PART 24E)

Frequency (MHz)	Conducted power(dBm)		Peak-Average Ratio(PAR)
	Peak	Average	
1852.4	24.64	23.77	0.87
1880	24.48	23.64	0.84
1907.6	24.31	23.70	0.61

6.4 Occupied Bandwidth

Temperature	24℃
Relative Humidity	53%
Atmospheric Pressure	1001mbar
Test date :	June 01&12, 2016
Tested By :	Loren Luo

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			
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 ☐ Fail		

Test Data ☑ Yes ☐ N/A

Test Plot ☑ Yes (See below) ☐ N/A

GSM :

Cellular Band (Part 22H) result

Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Bandwidth (kHz)
128	824.2	245.2996	315.586
190	836.6	244.7215	315.430
251	848.8	243.7506	312.608

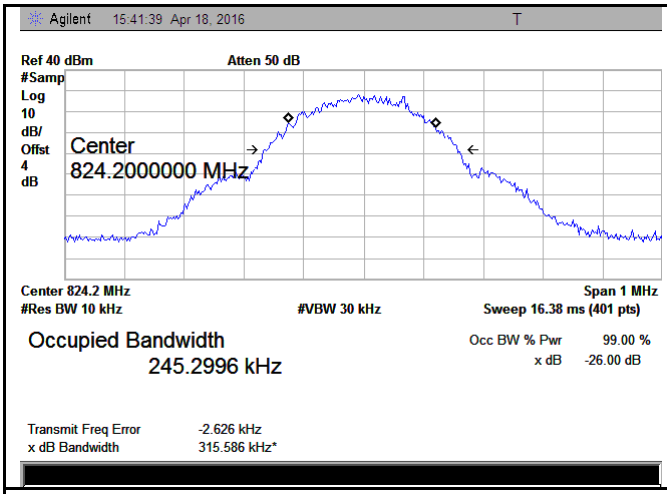
PCS Band (Part 24E) result

Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Bandwidth (kHz)
512	1850.2	241.7208	320.423
661	1880.0	247.7999	317.165
810	1909.8	247.0860	317.710

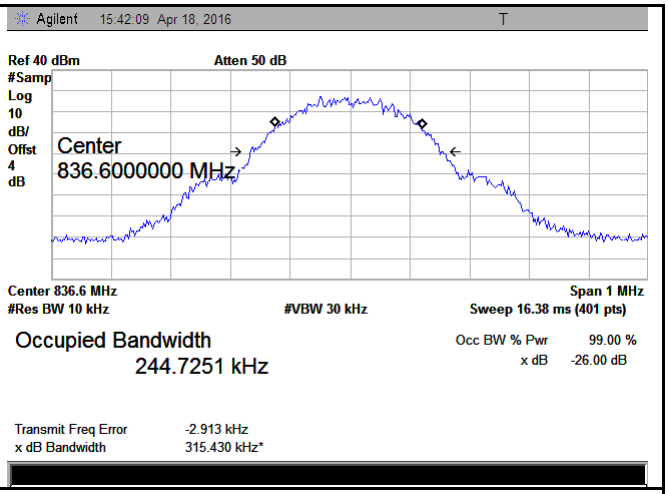
UMTS-FDD Band II (Part 24E)

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
9262	1852.4	4.1532	4.702
9400	1880.0	4.1596	4.705
9538	1907.6	4.1654	4.706

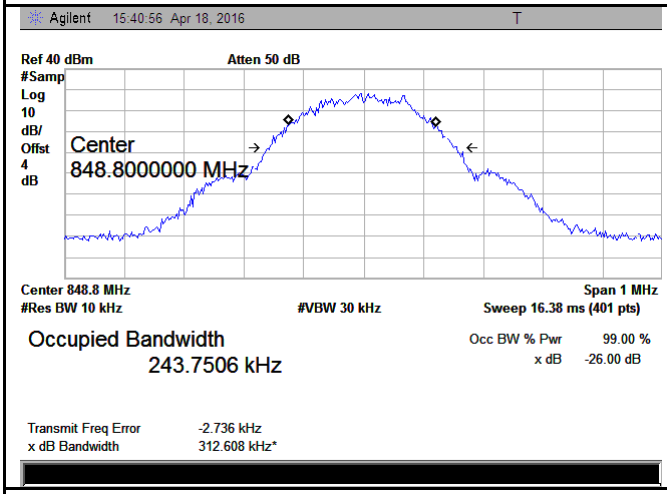
Test Plots



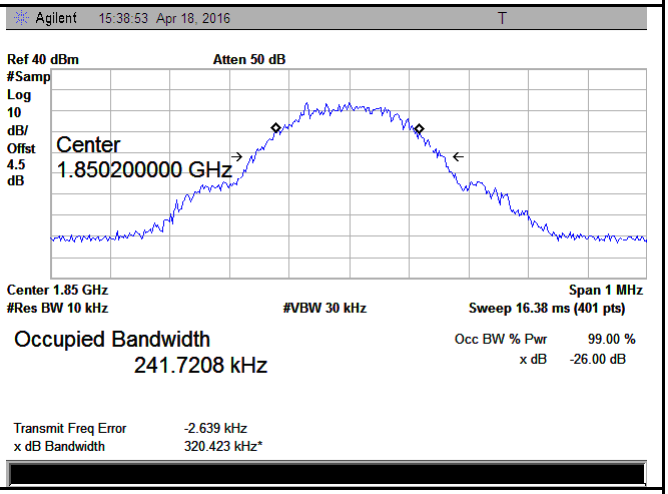
GSM 850 BW - Low CH 824.2MHz



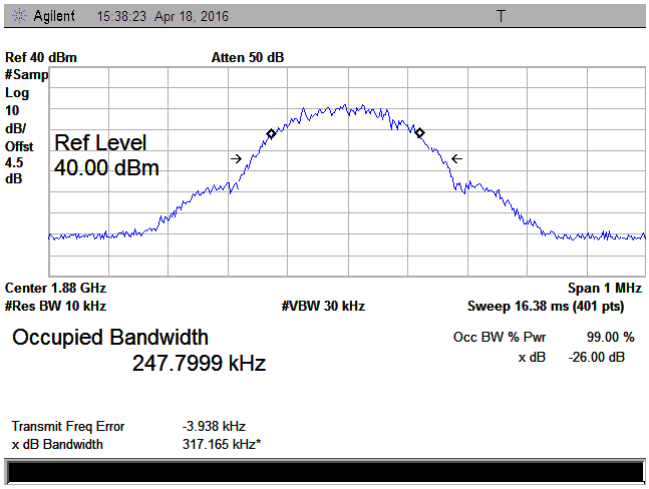
GSM 850 BW - Mid CH 836.6MHz



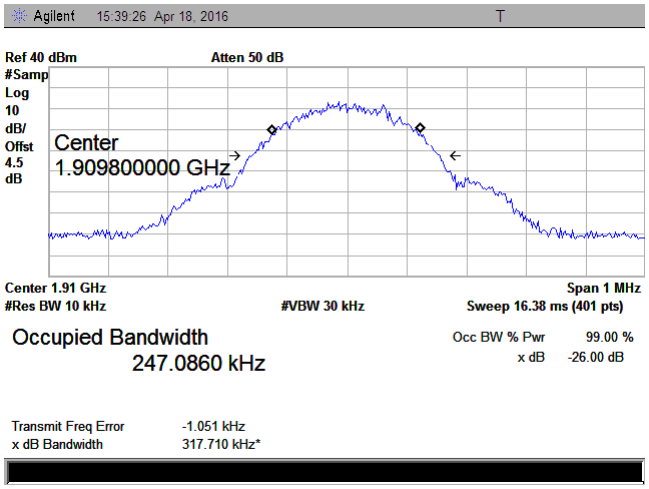
GSM 850 BW - High CH 848.8MHz



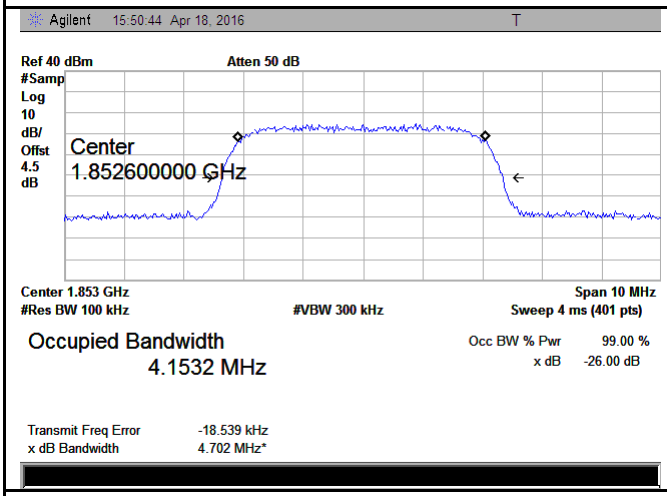
PCS 1900 BW - Low CH 1850.2MHz



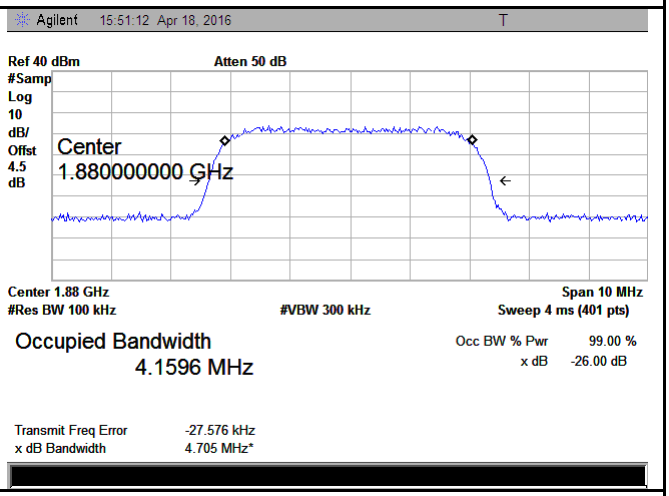
PCS 1900 BW - Mid CH 1880MHz



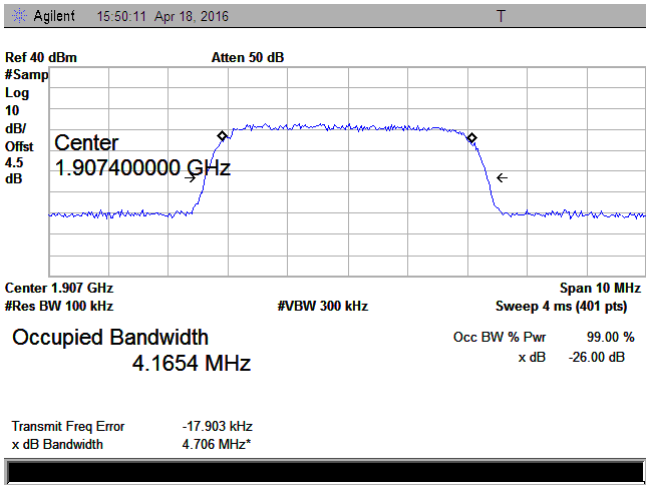
PCS 1900 BW - High CH 1909.8MHz



Band II BW - Low CH 1852.4MHz



Band II BW - Mid CH 1880MHz

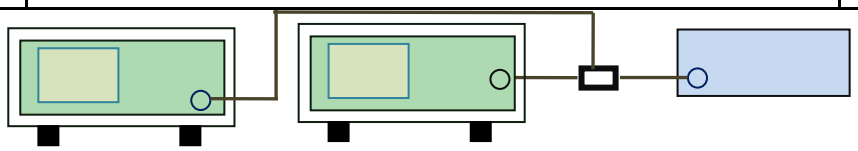


Band II BW - High CH 1907.6MHz

6.5 Spurious Emissions at Antenna Terminals

Temperature	25℃
Relative Humidity	54%
Atmospheric Pressure	1002mbar

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			
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 ☐ Fail		

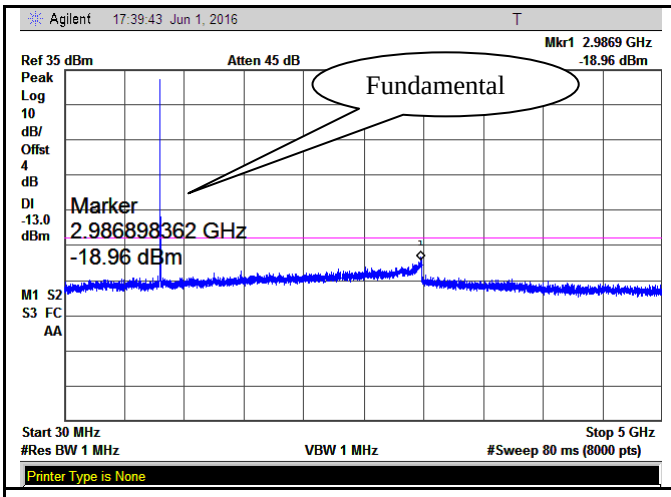
Test Data ☑ Yes ☐ N/A

Test Plot ☑ Yes (See below) ☐ N/A

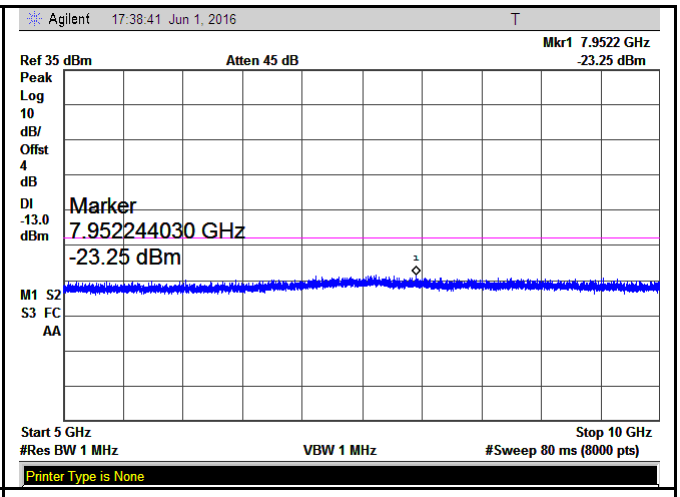
Test Plots

GSM :

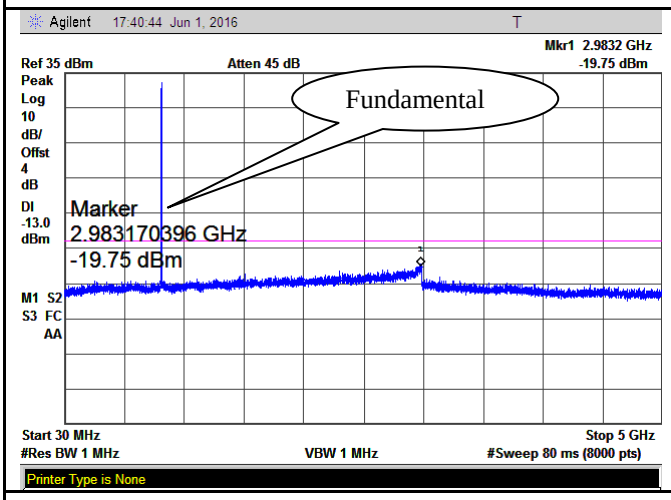
Cellular Band (Part 22H) result



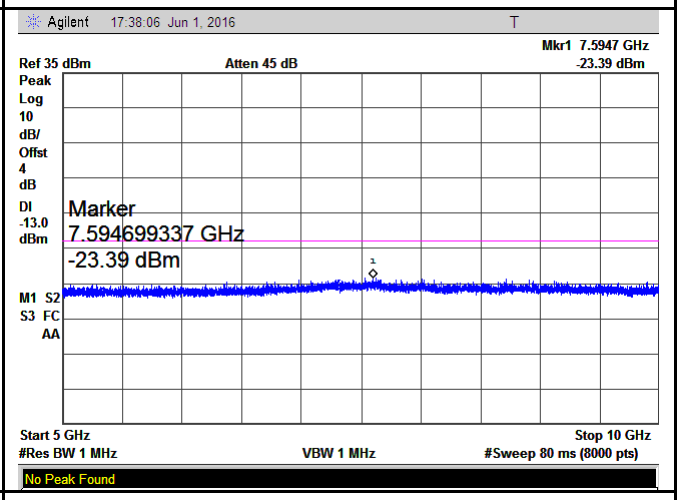
GSM 850 - Low Channel-1



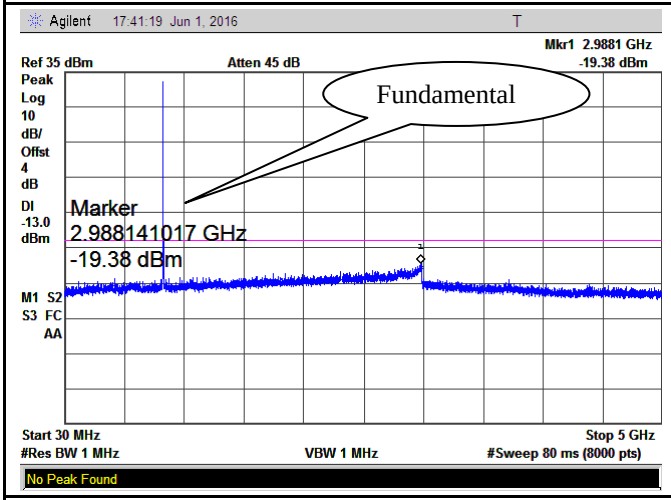
GSM 850 - Low Channel-2



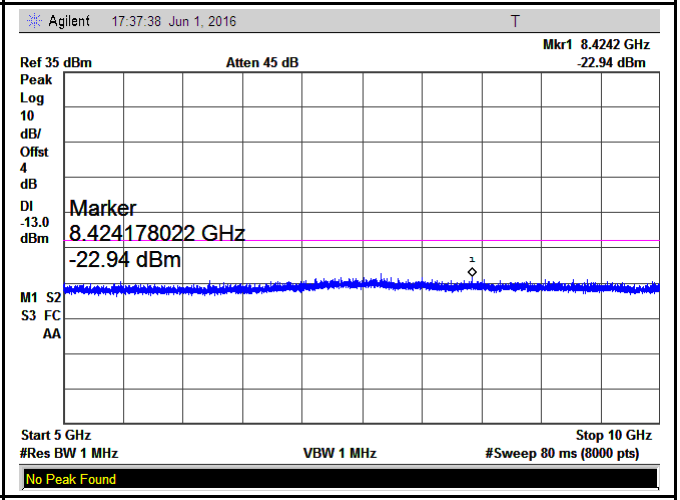
GSM 850 Middle Channel-1



GSM 850 Middle Channel-2

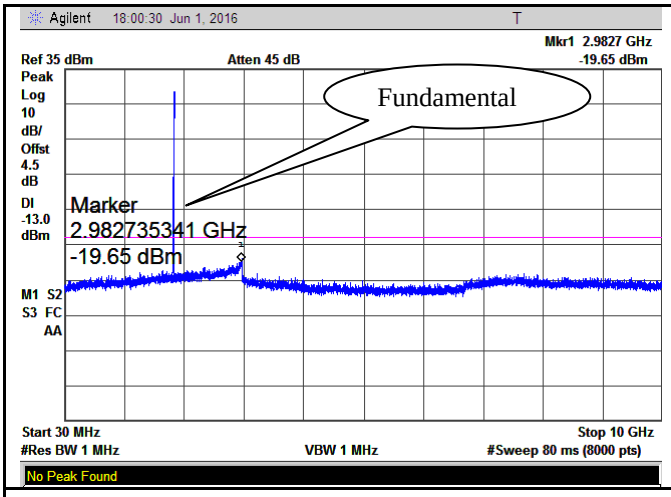


GSM 850 - High Channel-1

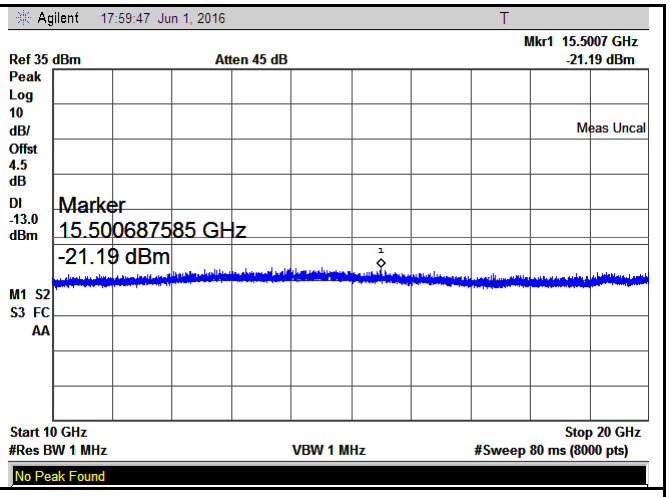


GSM 850 - High Channel-2

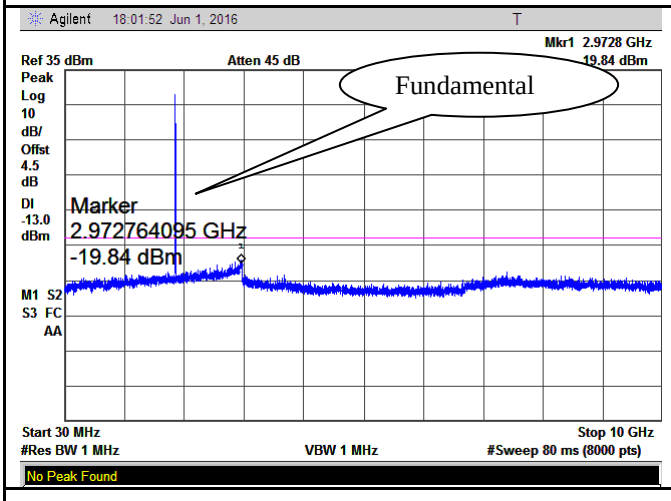
PCS Band (Part24E) result



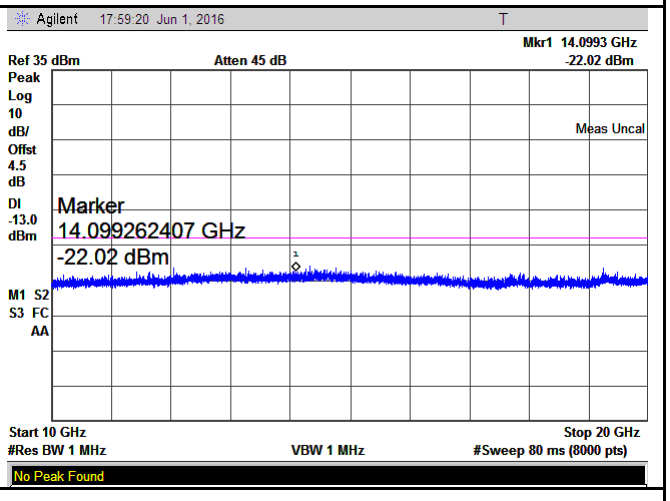
PCS1900 - Low Channel-1



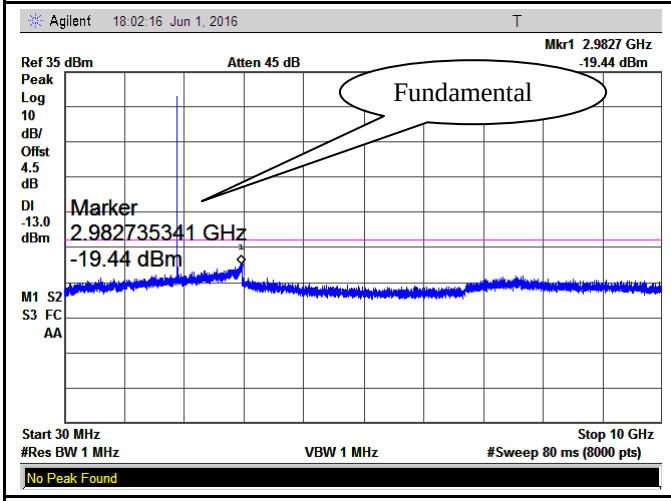
PCS 1900 - Low Channel-2



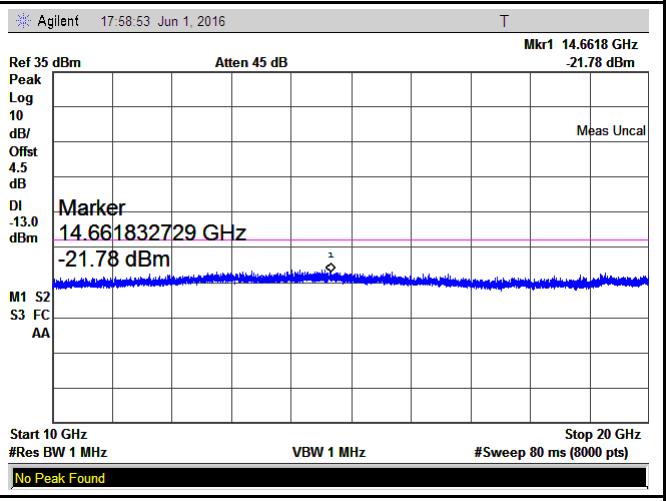
PCS1900 - Middle Channel-1



PCS 1900 - Middle Channel-2

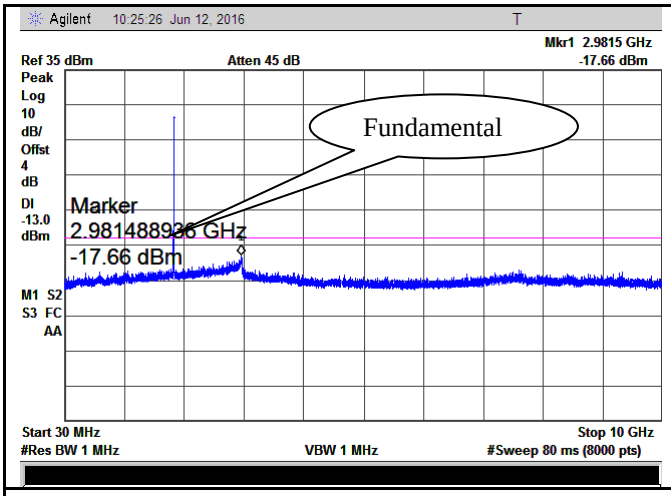


PCS1900 - High Channel-1

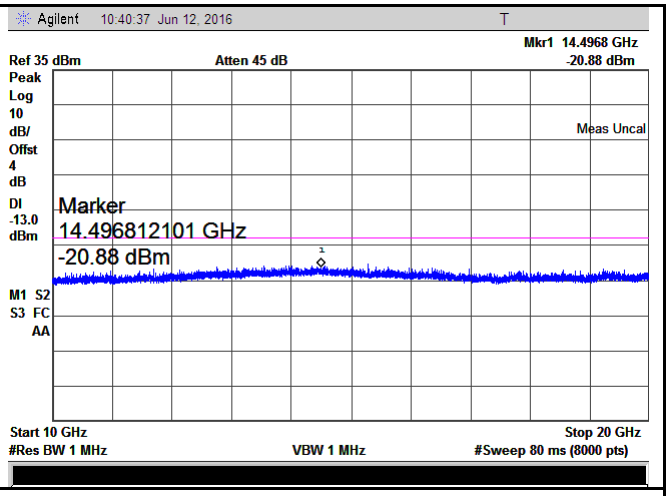


PCS 1900 - High Channel-2

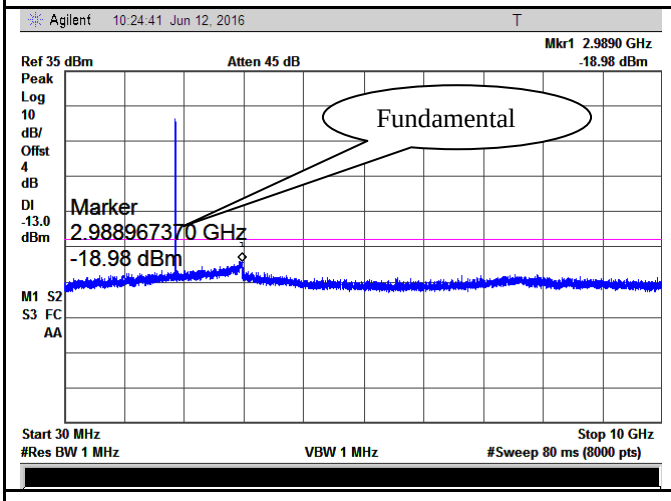
UMTS-FDD Band II (Part 24E)



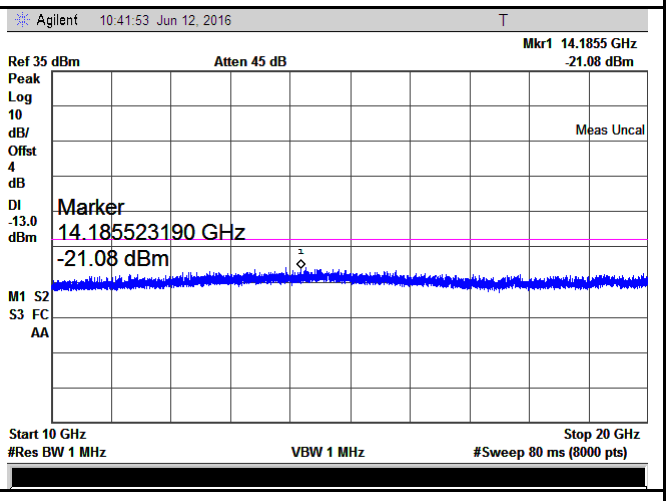
Band II - Low Channel-1



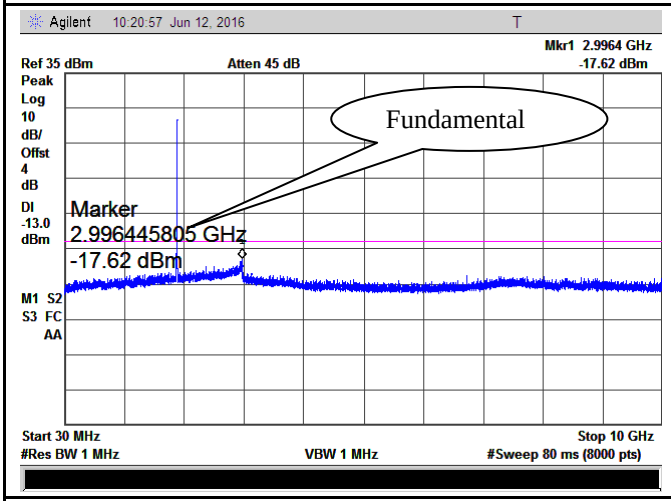
Band II - Low Channel-2



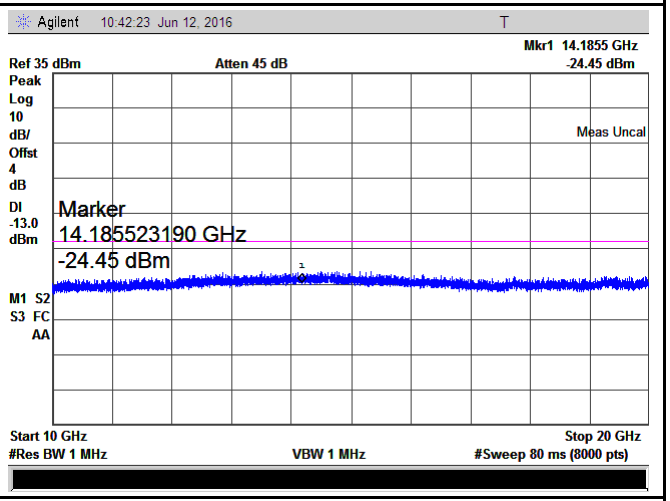
Band II - Middle Channel-1



Band II - Middle Channel-2



Band II - High Channel-1

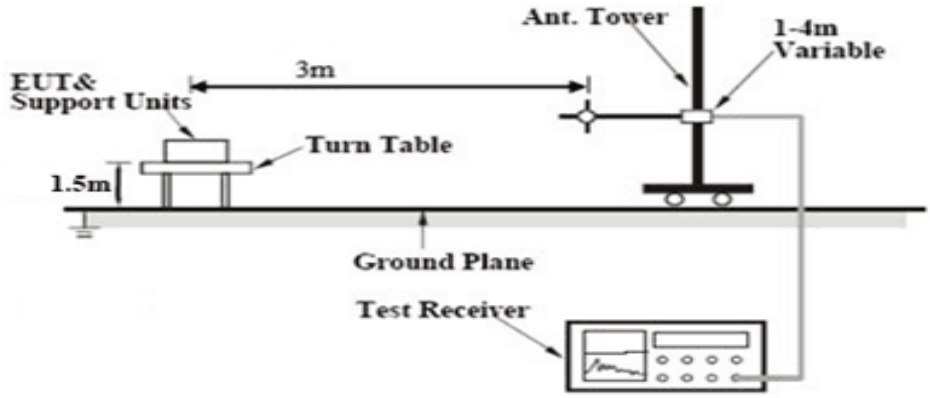


Band II - High Channel-2

6.6 Spurious Radiated Emissions

Temperature	24℃
Relative Humidity	53%
Atmospheric Pressure	1001mbar

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 ☐ Fail		

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

Cellular Band (Part 22H) result

Low channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1648.4	-43.51	V	7.95	0.78	-36.34	-13	-23.34
1648.4	-44.08	H	7.95	0.78	-36.91	-13	-23.91
328.9	-52.66	V	6.4	0.26	-46.52	-13	-33.52
603.6	-51.79	H	6.8	0.37	-45.36	-13	-32.36

Middle channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1673.2	-43.42	V	7.95	0.78	-36.25	-13	-23.25
1673.2	-43.95	H	7.95	0.78	-36.78	-13	-23.78
328.6	-52.58	V	6.4	0.26	-46.44	-13	-33.44
603.7	-52.61	H	6.8	0.37	-46.18	-13	-33.18

High channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1697.6	-43.37	V	7.95	0.78	-36.2	-13	-23.20
1697.6	-43.88	H	7.95	0.78	-36.71	-13	-23.71
328.1	-52.63	V	6.4	0.26	-46.49	-13	-33.49
603.9	-51.96	H	6.8	0.37	-45.53	-13	-32.53

Note:

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

PCS Band (Part24E) result

Low channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3700.4	-48.63	V	10.25	2.73	-41.11	-13	-28.11
3700.4	-49.17	H	10.25	2.73	-41.65	-13	-28.65
327.8	-53.22	V	6.4	0.26	-47.08	-13	-34.08
603.5	-52.74	H	6.8	0.37	-46.31	-13	-33.31

Middle channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3760	-48.58	V	10.25	2.73	-41.06	-13	-28.06
3760	-49.23	H	10.25	2.73	-41.71	-13	-28.71
327.6	-53.16	V	6.4	0.26	-47.02	-13	-34.02
602.9	-52.62	H	6.8	0.37	-46.19	-13	-33.19

High channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3819.6	-48.51	V	10.36	2.73	-40.88	-13	-27.88
3819.6	-49.37	H	10.36	2.73	-41.74	-13	-28.74
327.1	-53.34	V	6.4	0.26	-47.2	-13	-34.20
602.8	-52.89	H	6.8	0.37	-46.46	-13	-33.46

Note:

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

UMTS-FDD Band II (Part 24E)

Low channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3704.8	-49.33	V	10.25	2.73	-41.81	-13	-28.81
3704.8	-49.81	H	10.25	2.73	-42.29	-13	-29.29
329.1	-53.49	V	6.4	0.26	-47.35	-13	-34.35
602.5	-53.24	H	6.8	0.37	-46.81	-13	-33.81

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	-49.26	V	10.25	2.73	-41.74	-13	-28.74
3760	-49.61	H	10.25	2.73	-42.09	-13	-29.09
329.6	-53.55	V	6.4	0.26	-47.41	-13	-34.41
602.2	-53.38	H	6.8	0.37	-46.95	-13	-33.95

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	-49.28	V	10.36	2.73	-41.65	-13	-28.65
3815.2	-49.45	H	10.36	2.73	-41.82	-13	-28.82
329.4	-53.41	V	6.4	0.26	-47.27	-13	-34.27
603.8	-52.77	H	6.8	0.37	-46.34	-13	-33.34

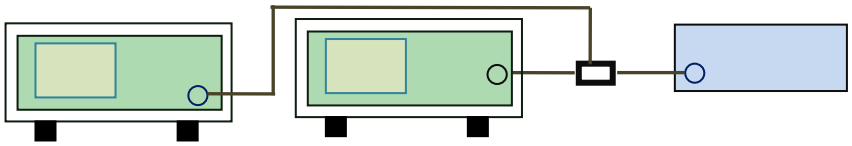
Note:

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

6.7 Band Edge

Temperature	24℃
Relative Humidity	53%
Atmospheric Pressure	1001mbar

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			
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 ☐ Fail		

Test Data ☑ Yes ☐ N/A

Test Plot ☑ Yes (See below) ☐ N/A

GSM :

Cellular Band (Part 22H) result

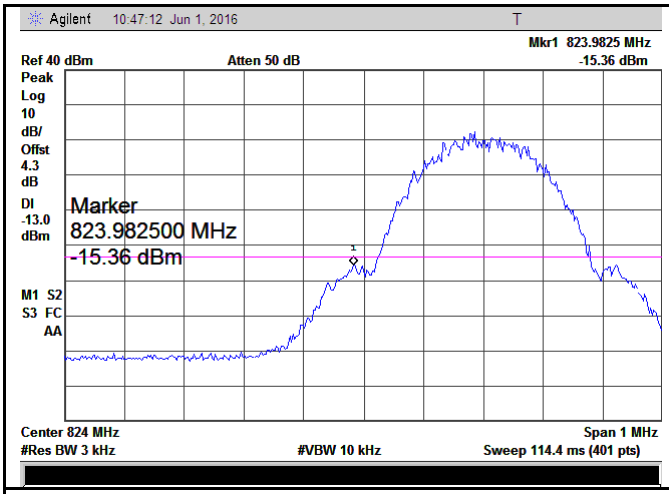
Frequency (MHz)	Emission (dBm)	Limit (dBm)
823.9825	-15.36	-13
849.0250	-15.84	-13

PCS Band (Part24E) result

Frequency (MHz)	Emission (dBm)	Limit (dBm)
1849.9775	-16.22	-13
1910.0275	-16.60	-13

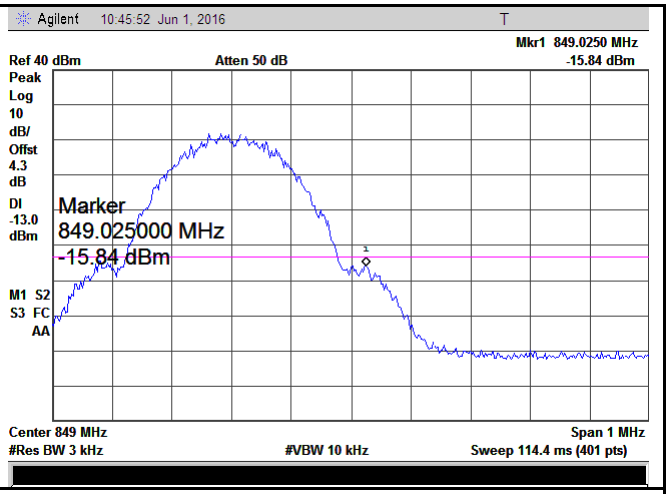
GSM :

Test Plots



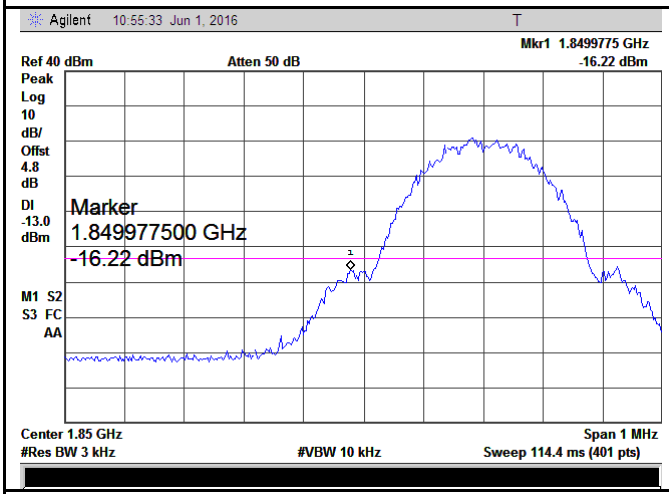
Cellular Band - Low Channel

Note: Offset=Cable loss (4.0) + 10log (3.17/3)=4.0+0.3=4.3dB



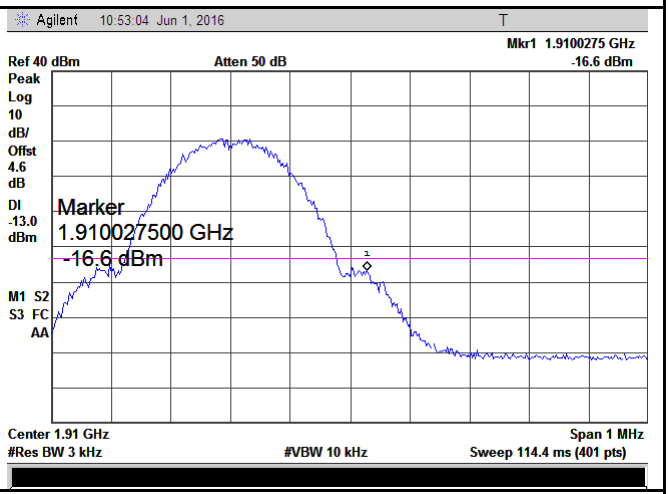
Cellular Band - High Channel

Note: Offset=Cable loss (4.0) + 10log (3.23/3)=4.0+0.3=4.3dB



PCS Band - Low Channel

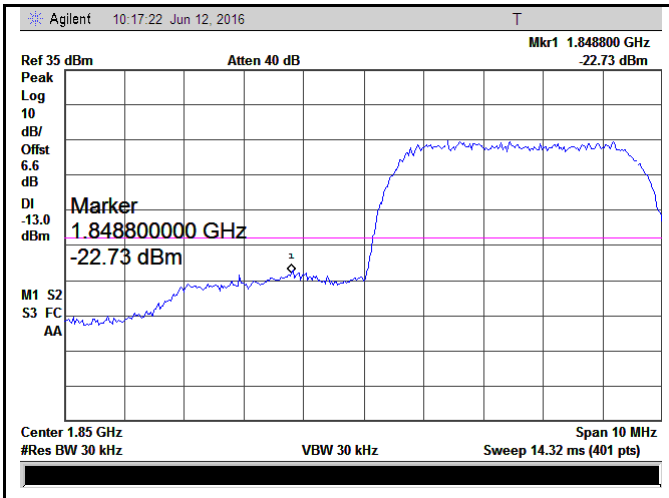
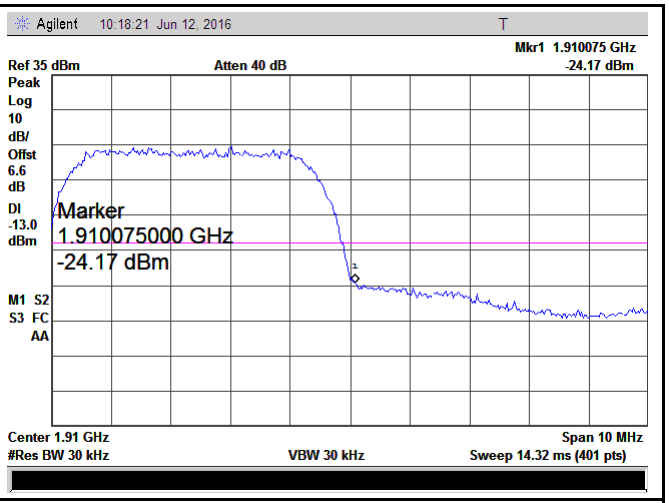
Note: Offset=Cable loss (4.5) + 10log (3.24/3)=4.5+0.3=4.8dB



PCS Band - High Channel

Note: Offset=Cable loss (4.5) + 10log (3.19/3)=4.5+0.1=4.6dB

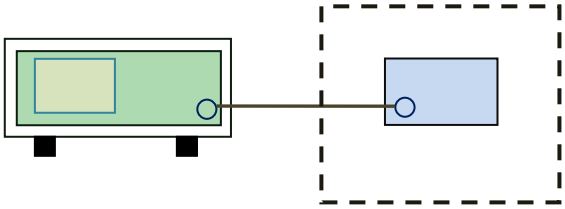
WCDMA:

	
UMTS-FDD Band II - Low Channel	UMTS-FDD Band II - High Channel
Note: Offset=Cable loss (4.5) + 10log (48.93/30)=4.5+2.1=6.6 dB	Note: Offset=Cable loss (4.5) + 10log (49.37/30)=4.5+2.1=6.6 dB

6.8 Frequency Stability

Temperature	24℃
Relative Humidity	53%
Atmospheric Pressure	1001mbar

Requirement(s):

<table>
<tr><th>Spec</th><th>Item</th><th>Requirement</th><th>Applicable</th></tr>
<tr><td>§2.1055, §22.355 & §24.235</td><td>a)</td><td>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>
<tr><th>Frequency Range (MHz)</th><th>Base, fixed (ppm)</th><th>Mobile ≤ 3 watts (ppm)</th><th>Mobile ≤ 3 watts (ppm)</th></tr>
<tr><td>25 to 50</td><td>20.0</td><td>20.0</td><td>50.0</td></tr>
<tr><td>50 to 450</td><td>5.0</td><td>5.0</td><td>50.0</td></tr>
<tr><td>45 to 512</td><td>2.5</td><td>5.0</td><td>.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>5.0</td><td>N/A</td><td>N/A</td></tr>
<tr><td>929 to 960.</td><td>1.5</td><td>N/A</td><td>N/A</td></tr>
<tr><td>2110 to 2220</td><td>10.0</td><td>N/A</td><td>N/A</td></tr>
</table>
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized frequency block.</td><td>☑</td></tr>
<tr><td>Test setup</td><td colspan="3">  </td></tr>
<tr><td>Procedure</td><td colspan="3">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.</td></tr>
</table>

	Limit: The frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5ppm) of the center frequency.
Remark	
Result	☑ Pass ☐ Fail

Test Data ☑ Yes ☐ N/A

Test Plot ☐ Yes (See below) ☑ N/A

GSM :

Cellular Band (Part 22H) result

Middle Channel, f_o = 836.6 MHz				
Temperature (℃)	Power Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10	3.7	19	0.0227	2.5
0		18	0.0215	2.5
10		16	0.0191	2.5
20		10	0.0120	2.5
30		12	0.0143	2.5
40		15	0.0179	2.5
50		17	0.0203	2.5
55		20	0.0239	2.5
25	4.2	17	0.0203	2.5
	3.5	20	0.0239	2.5

PCS Band (Part 24E) result

Middle Channel, f_o = 1880 MHz				
Temperature (℃)	Power Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10	3.7	20	0.0106	2.5
0		18	0.0096	2.5
10		11	0.0059	2.5
20		9	0.0048	2.5
30		10	0.0053	2.5
40		16	0.0085	2.5
50		17	0.0090	2.5
55		20	0.0106	2.5
25	4.2	19	0.0101	2.5
	3.5	15	0.0080	2.5

Band II:

UMTS-FDD Band II (Part 24E)

Middle Channel, f_o = 1880 MHz				
Temperature (℃)	Power Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10	3.7	14	0.0074	2.5
0		13	0.0069	2.5
10		9	0.0048	2.5
20		6	0.0032	2.5
30		9	0.0048	2.5
40		7	0.0037	2.5
50		10	0.0053	2.5
55		13	0.0069	2.5
25	4.2	11	0.0059	2.5
	3.5	14	0.0074	2.5

NOTE：The manufacturer stated that the operating voltage of the product was DC 3.7-4.2V

The manufacturer stated that the operating temperature of the product was -10-55℃

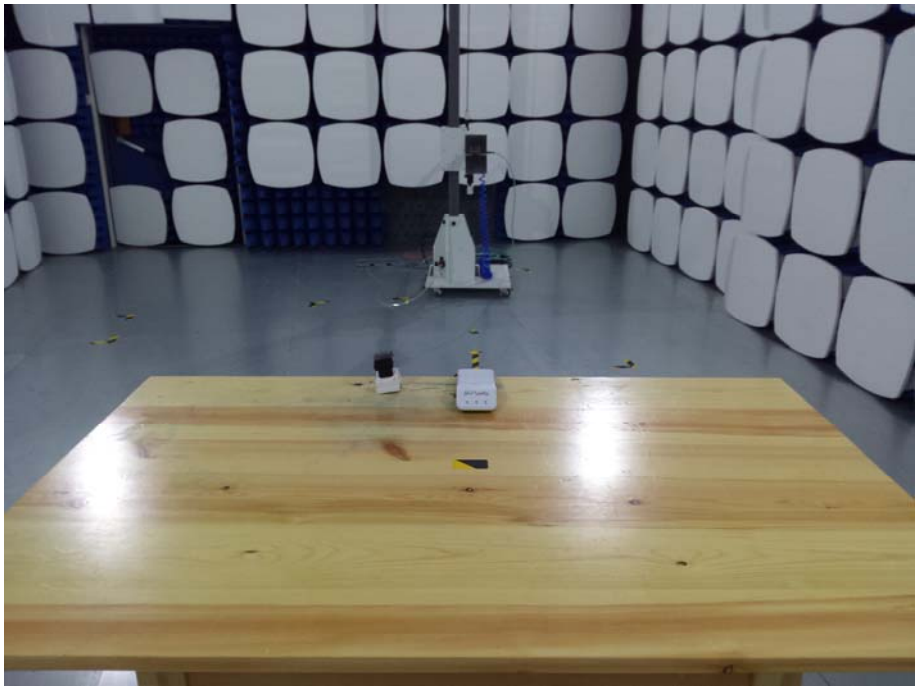
Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Due	In use
RF Conducted Test					
Agilent ESA-E SERIES SPECTRUM ANALYZER	E4407B	MY45108319	09/16/2015	09/15/2016	☑
Power Splitter	1#	1#	09/01/2015	08/31/2016	☑
Universal Radio Communication Tester	CMU200	121393	09/25/2015	09/24/2016	☑
Temperature/Humidity Chamber	UHL-270	001	10/09/2015	10/08/2016	☑
DC Power Supply	E3640A	MY40004013	09/17/2015	09/16/2016	☑
RF Power Sensor	Dare RPR3006C/P/W	AY554013	09/17/2015	09/16/2016	☑
Radiated Emissions					
EMI test receiver	ESL6	100262	09/17/2015	09/16/2016	☑
OPT 010 AMPLIFIER (0.1-1300MHz)	8447E	2727A02430	09/01/2015	08/31/2016	☑
Microwave Preamplifier (1 ~ 26.5GHz)	8449B	3008A02402	03/24/2016	03/23/2017	☑
Bilog Antenna (30MHz~6GHz)	JB6	A110712	09/21/2015	09/20/2016	☑
Bilog Antenna (30MHz~2GHz)	JB1	A112017	09/21/2015	09/20/2016	☑
Double Ridge Horn Antenna (1 ~18GHz)	AH-118	71259	09/24/2015	09/23/2016	☑
Double Ridge Horn Antenna (1 ~18GHz)	AH-118	71283	09/24/2015	09/23/2016	☑
SYNTHESIZED SIGNAL GENERATOR	8665B	3744A01293	09/17/2015	09/16/2016	☑
Power Amplifier	SMC150D	R1553-0313	03/09/2016	03/08/2017	☑
Power Amplifier	S41-25D	R1553-0314	05/27/2016	05/26/2017	☑
Tunable Notch Filter	3NF-800/1000-S	AA4	09/01/2015	08/31/2016	☑

Tunable Notch Filter	3NF-1000/2000-S	AM 4	09/01/2015	08/31/2016	☑

Annex B. EUT And Test Setup Photographs

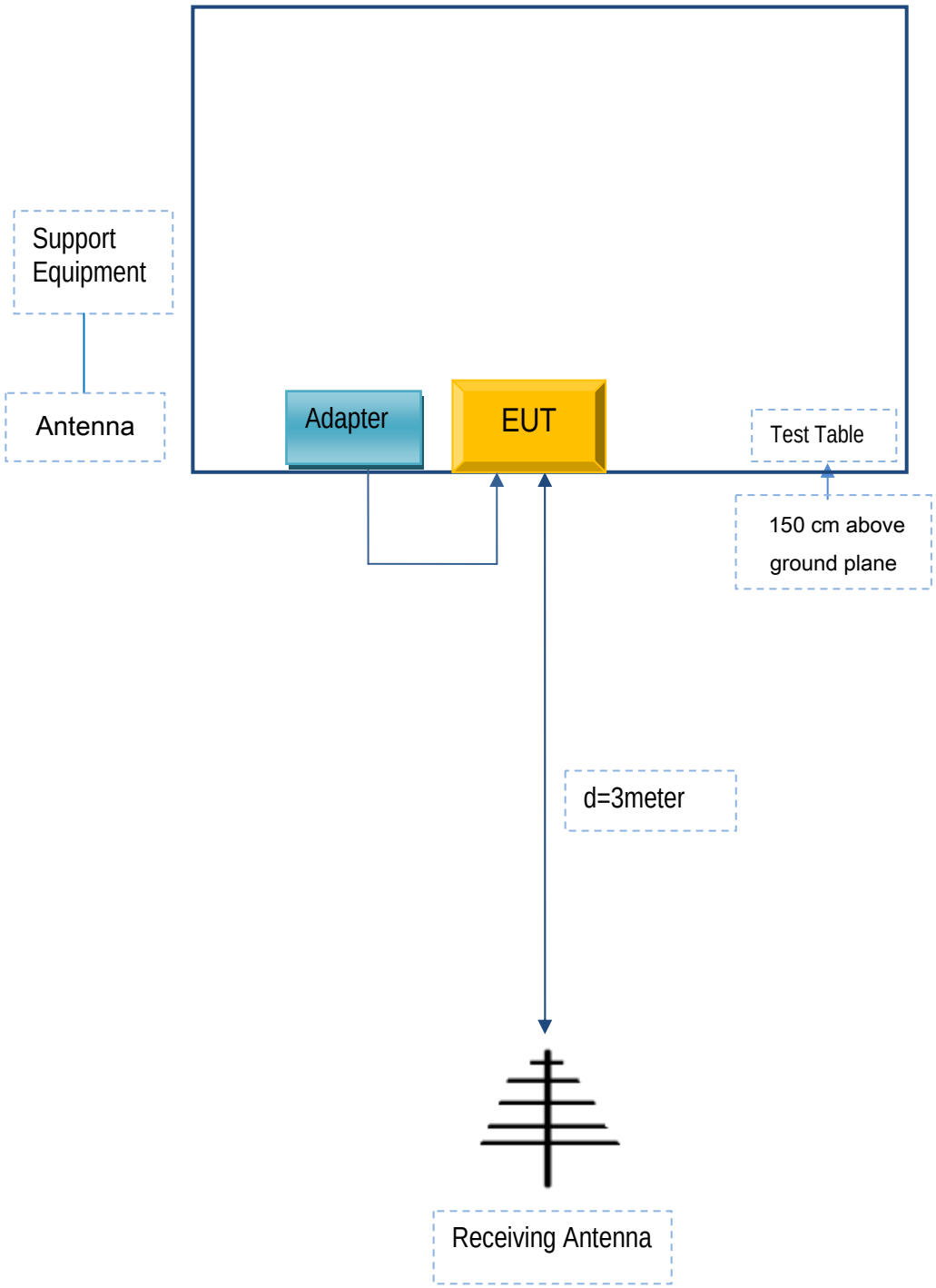
Annex B.iii. Photograph: Test Setup Photo



Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

Annex C.ii. TEST SET UP BLOCK

Block Configuration Diagram for Radiated Emissions



Annex C. il. SUPPORTING EQUIPMENT DESCRIPTION

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

Supporting Equipment:

Manufacturer	Equipment Description	Model	Serial No
GEOSOLUTION I GOTEBORG AB	Adapter	PSAI10R-050Q	N/A

Supporting Cable:

Cable type	Shield Type	Ferrite Core	Length	Serial No
Adapter cable	No	No	1.3m	N/A