



SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

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Report No.: SHEM130600102001
 Page 1 of 39

1 Cover Page

FCC REPORT

Application No. :	SHEM1306001020RF
Applicant:	Queclink Wireless Solutions Co., Ltd
FCC ID:	YQD-GL300
Equipment Under Test (EUT):	
NOTE: The following sample(s) submitted was/were identified on behalf of the client as	
Product Name:	GPS Locator
Brand Name:	Queclink
Model:	GL300
Added Model:	N/A
Standards:	47 CFR Part 22 subpart H (2012) 47 CFR Part 24 subpart E (2012)
Date of Receipt:	June 06, 2013
Date of Test:	June 20, 2013 to June 26, 2013
Date of Issue:	July 03, 2013
Test Result:	PASS *

*In the configuration tested, the EUT (Equipment under test) complied with the standards specified above.



Tony Wu
E&E Section Manager

SGS-CSTC (Shanghai) Co., Ltd.

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

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2 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
00	/	July 03, 2013	/	Original

Authorized for issue by:				
Engineer		Zenger Zhang _____ Print Name		<i>Zenger Zhang</i> _____
Clerk		Susie Liu _____ Print Name		<i>Susie Liu</i> _____
Reviewer		Keny Xu _____ Print Name		<i>Keny Xu</i> _____

3 Test Summary

Test Item	FCC Requirement	Test method	Result
GSM 850			
Conducted output power	Part 2.1046(a)/Part 22.913(a)	ITA-603-D-2010 Clause 2.2.1	PASS
Effective Radiated Power of Transmitter(ERP)	Part 2.1046(a)/Part 22.913(a)	ITA-603-D-2010 Clause 2.2.17	PASS
99% Occupied Bandwidth	Part 2.1049(h)	Part 22.917(b)	PASS
Band Edge at antenna terminals	Part 2.1051/Part 22.917(a)	Part 22.917(b)	PASS
Spurious emissions at antenna terminals	Part 2.1051/ Part 2.1057/ Part 22.917(a)(b)	ITA-603-D-2010 Clause 2.2.13	PASS
Field strength of spurious radiation	Part 2.1053/ Part 2.1057/ Part 22.917(a)(b)	ITA-603-D-2010 Clause 2.2.12	PASS
Frequency stability	Part 2.1055/ Part 22.355	ITA-603-D-2010 Clause 2.2.2	PASS
PCS1900			
Conducted output power	Part 2.1046(a) /Part 24.232(c)	ITA-603-D-2010 Clause 2.2.1	PASS
Peak-to-Average Ratio	Part24.232(d)	ITA-603-D-2010	PASS
Effective Radiated Power of Transmitter(EIRP)	Part 2.1046(a) / Part 24.232(c)	ITA-603-D-2010 Clause 2.2.17	PASS
99% Occupied Bandwidth	Part 2.1049(h)	Part 24.238(b)	PASS
Band Edge at antenna terminals	Part 2.1051/ Part 24.238(a)	Part 24.238(b)	PASS
Spurious emissions at antenna terminals	Part 2.1051/ Part 2.1057/ Part 24.238(a)(b)	ITA-603-D-2010 Clause 2.2.13	PASS
Field strength of spurious radiation	Part 2.1053 /Part 2.1057 / Part 24.238(a)(b)	ITA-603-D-2010 Clause 2.2.12	PASS
Frequency stability	Part 2.1055/Part 24.235	ITA-603-D-2010 Clause 2.2.2	PASS

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5 General Information

5.1 Client Information

Applicant:	Quealink Wireless Solutions Co., Ltd
Address of Applicant:	Room 501, Building 9, No 99, TianZhou Road, Shanghai, China
Manufacturer:	Quealink Wireless Solutions Co., Ltd
Address of Manufacturer:	Room 501, Building 9, No 99, TianZhou Road, Shanghai, China

5.2 General Description of E.U.T.

Product Name	GPS Locator
Brand Name:	Quealink
Model No:	GL300
Added Model:	N/A
Product Description:	N/A

5.3 Technical Specifications:

Operation Frequency:	GSM850 and PCS1900
GPRS Operation mode:	Class B
GPRS Class:	Multislot Class 12
Power Supply:	3.7V DC Battery 5V DC (For Charger)
Antenna Type	Integral
Antenna Gain:	0dBi

5.4 Accessories of Product:

Battery:	Battery Type:	DC 3.7V	
	Model No.:	RCL-050500UL	
Adapter:	Rated Input:	AC 100V-240V 47/63Hz 0.35A	
	Rated Output:	DC 5.0V 500mA	
	Cable length:	DC port:	180cm (2 wires)

5.5 Support equipments for Testing

The EUT has been tested independently.

5.6 Details of Test Mode

Test Mode	Description of Test Mode
GPRS mode	Keep the EUT connected to the simulate station by GPRS mode.

5.7 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. E&E Lab

No.588 West Jindu Road, Songjiang District, Shanghai, China. 201612.

Tel: +86 21 6191 5666

Fax: +86 21 6191 5678

No tests were sub-contracted.

5.8 Test Facility

- **CNAS (No. CNAS L0599)**

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing. Date of expiry: 2014-07-26.

- **FCC – Registration No.: 402683**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered and fully described in a report filed with the Federal Communications Commission (FCC). The acceptance letter from the FCC is maintained in our files. Registration No.: 402683, Expiry Date: 2015-02-22.

- **Industry Canada (IC) – IC Assigned Code: 8617A**

The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 8617A. Expiry Date: 2014-09-20.

- **VCCI (Member No.: 3061)**

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-3868 and C-4336 respectively. Date of Registration: 2012-05-29. Date of Expiry: 2015-05-28.

6 Equipments Used during Test

Conducted Emission

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal.Due date
1	EMI test receiver	Rohde & Schwarz	ESCS30	100086	2013-02-23	2014-02-22
2	Line impedance stabilization network	SCHWARZBE CK	NSLK8127	8127-490	2013-02-23	2014-02-22
3	Line impedance stabilization network	ETS	3816/2	00034161	2013-02-23	2014-02-22

RF Conducted Test

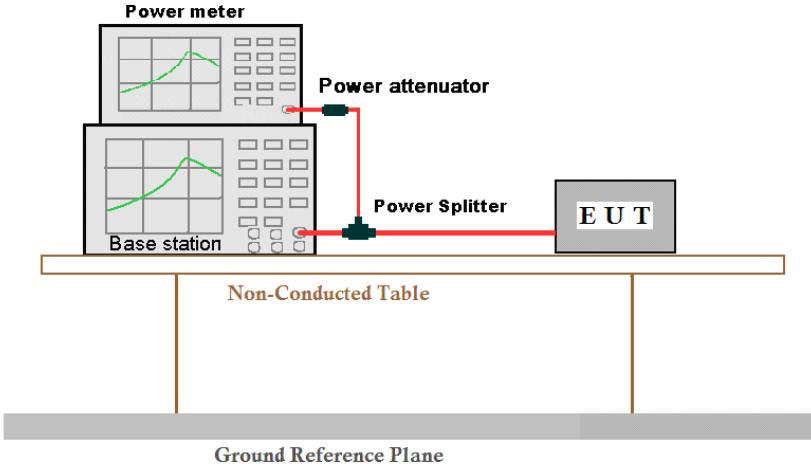
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due date
1	EMI test receiver	Rohde & Schwarz	ESU40	100109	2013-02-23	2014-02-22
2	Horn Antenna	SCHWARZBE CK	BBHA9120 D	9120D-679	2013-03-07	2014-03-06
3	Horn Antenna	Rohde & Schwarz	HF906	100284	2013-06-03	2014-06-01
4	ANTENNA	SCHWARZBE CK	VULB9168	9168-313	2013-03-07	2014-03-06
5	Horn Antenna	SCHWARZBE CK	BBHA 9170	BBHA9170 373	2013-03-07	2014-03-06
6	Ultra broadband antenna	Rohde & Schwarz	HL562	100227	2012-10-09	2013-10-08
7	Atmosphere pressure meter	Shanghai ZhongXuan Electronic Co;Ltd	BY 2009P	--	2012-10-09	2013-10-08
8	CLAMP METER	FLUKE	316	86080010	2013-06-03	2014-06-01

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9	Thermo-Hygrometer	ZHICHEN	ZC1-2	01050033	2012-10-09	2013-10-08
11	High-low temperature cabinet	Shanghai YuanZhen	GW2050	--	2013-06-03	2014-06-01
12	Tunable Notch Filter	Wainwright instruments Gmbh	WRCT180 0.0/ 2000.0- 0.2/40- 5SSK	11	2013-06-03	2014-06-01
13	Tunable Notch Filter	Wainwright instruments Gmbh	WRCT800. 0/880.0- 0.2/40- 5SSK	9	2013-06-03	2014-06-01
14	High pass Filter	FSCW	HP 12/2800- 5AA2	19A45-02	2013-06-03	2014-06-01
15	Low noise amplifier	TESEQ	LNA6900	70133	2013-02-23	2014-02-22
16	EMI test receiver	Rohde & Schwarz	ESCS30	100086	2013-02-23	2014-02-22
17	Line impedance stabilization network	SCHWARZBECK	NSLK8127	8127-490	2013-02-23	2014-02-22

7 Test results and Measurement Data

7.1 Conducted Output Power

Test Requirement:	Part 2.1046(a)										
Test Method:	ITA-603-D-2010 Clause 2.2.1										
Test Setup:											
Limit:	<table border="1"> <thead> <tr> <th>Mode</th> <th>GSM 850</th> <th>PCS1900</th> </tr> </thead> <tbody> <tr> <td>Frequency</td> <td>824 – 849MHz</td> <td>1850 – 1910MHz</td> </tr> <tr> <td>Limit</td> <td>33dBm(2W)</td> <td>30dBm (1W)</td> </tr> </tbody> </table>	Mode	GSM 850	PCS1900	Frequency	824 – 849MHz	1850 – 1910MHz	Limit	33dBm(2W)	30dBm (1W)	
Mode	GSM 850	PCS1900									
Frequency	824 – 849MHz	1850 – 1910MHz									
Limit	33dBm(2W)	30dBm (1W)									
Measurement Procedure:	<p>The transmitter output was connected to a calibrated coaxial cable, attenuator and power meter, the other end of which was connected to a Base Station Simulator. The Base Station Simulator was set to force the EUT to its maximum power setting. The power output at the transmitter antenna port was determined by adding the value of the cable insertion loss to the power reading. The tests were performed at three frequencies (low channel, middle channel and high channel) and on the highest power levels, which can be setup on the transmitters.</p>										
Instruments Used:	Refer to section 6 for details										
Test Results:	Pass										

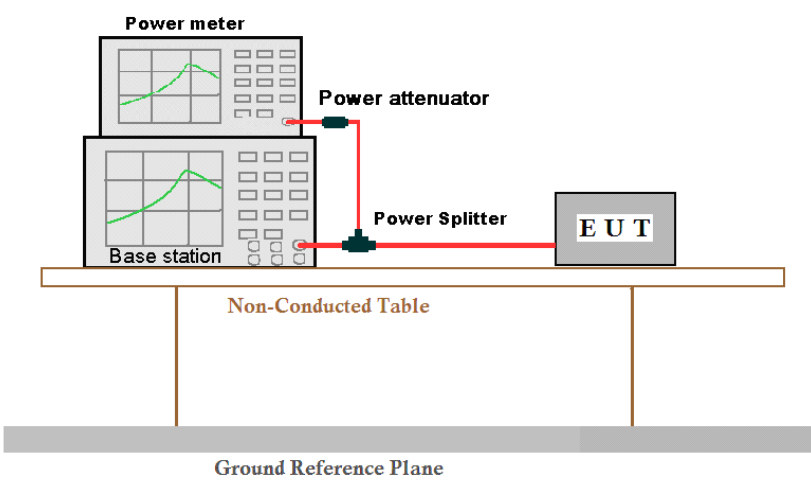


Measurement results:

Test Mode	Channel	Frequency	1Slots	2Slots	3Slots	4Slots	
GSM 850	Low	128	824.2	31.5	31.4	31.3	27.9
	Mid	190	836.6	31.4	31.3	31.2	28.0
	High	251	848.8	31.6	31.5	31.4	28.1
GSM1900	Low	512	1850.2	28.3	28.4	28.2	25.6
	Mid	661	1880.0	28.1	28.1	28.0	25.2
	High	810	1909.8	27.8	27.7	27.9	25.1

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7.2 Peak-to-Average Ratio

Test Requirement:	Part 24.232(d)
Test Method:	KDB 971168 D01
Test Setup:	
Limit:	<13dB
Instruments Used:	Refer to section 6 for details
Test Results:	Pass

Measurement results:

GSM850			
Center Frequency (MHz)	Channel No.	Test Mode	Peak-to-Average Ratio dB
824.20	128	1 Slots	1.50
		2 Slots	2.12
		3 Slots	1.53
		4 Slots	1.27
836.60	190	1 Slots	2.34
		2 Slots	1.42
		3 Slots	2.18
		4 Slots	1.66
848.80	251	1 Slots	2.44
		2 Slots	2.61
		3 Slots	2.06
		4 Slots	1.61



PCS1900			
Center Frequency (MHz)	Channel No.	Test Mode	Peak-to-Average Ratio dB
1850.20	512	1 Slots	3.50
		2 Slots	3.21
		3 Slots	2.36
		4 Slots	1.25
1880.00	661	1 Slots	3.50
		2 Slots	3.21
		3 Slots	2.36
		4 Slots	1.25
1908.80	810	1 Slots	3.50
		2 Slots	3.21
		3 Slots	2.36
		4 Slots	1.25

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7.3 Effective Radiated Power of Transmitter (ERP/EIRP)

Test Requirement:	Part 2.1046(a)				
Test Method:	ITA-603-D-2010 Clause 2.2.17				
Receiver Setup:	Frequency	Detector	RBW	VBW	Remark
	30MHz-1GHz	peak	100 kHz	300kHz	Peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
Test Setup:					

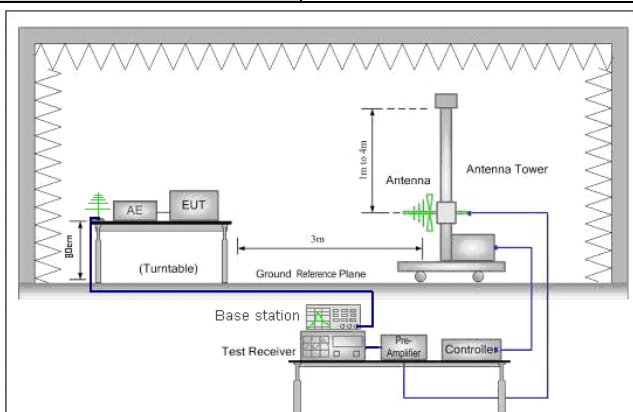


Figure 1. 30MHz to 1GHz

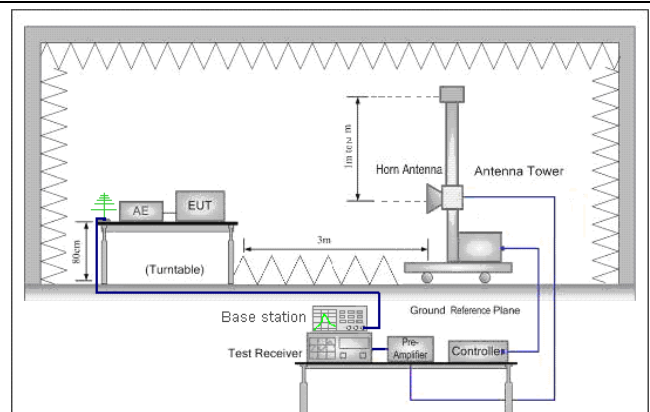


Figure 2. above 1GHz

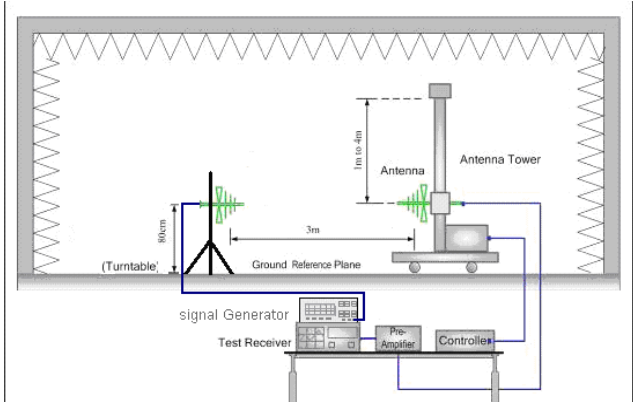


Figure 1. 30MHz to 1GHz

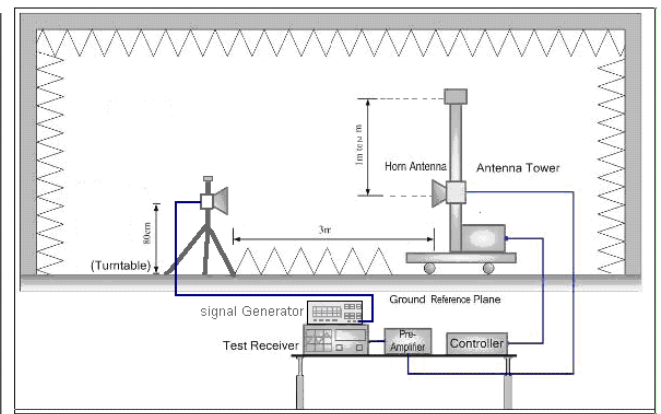


Figure 2. above 1GHz

Limit:	Mode	GSM 850	PCS1900
	Frequency	824 – 849MHz	1850 – 1910MHz
	Limit	38.45dBm (7W)	33.01dBm (2W)

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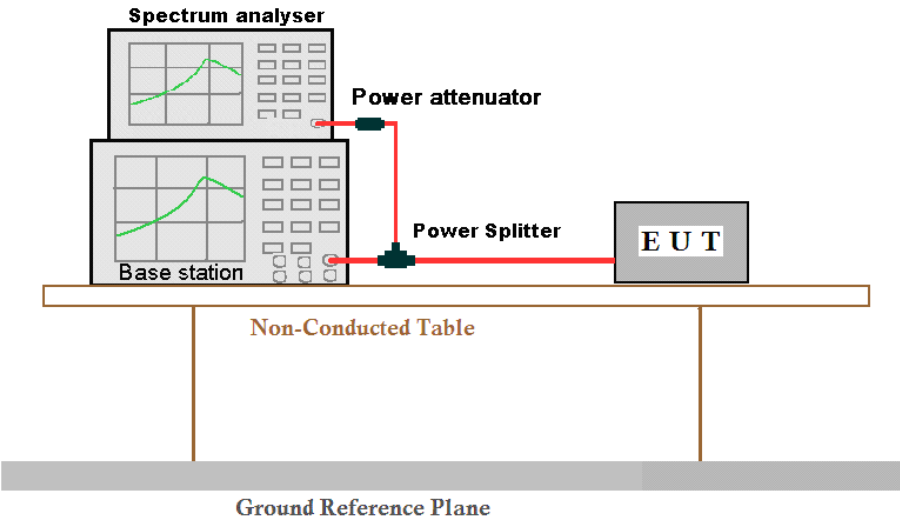
<p>Measurement Procedure:</p>	<p>Below 1GHz test procedure as below:</p> <ol style="list-style-type: none"> 1). The EUT was powered ON and placed on a 0.8m high table in the chamber. The antenna of the transmitter was extended to its maximum length. 2). The disturbance of the transmitter was maximized on the test receiver display by raising and lowering from 1m to 4m the receive antenna and by rotating through 360° the turntable. After the fundamental emission was maximized, a field strength measurement was made. 3). Steps 1) and 2) were performed with the EUT and the receive antenna in both vertical and horizontal polarization. 4). The transmitter was then removed and replaced with another antenna. The center of the antenna was approximately at the same location as the center of the transmitter. 5). A signal at the disturbance was fed to the substitution antenna by means of a non-radiating cable. With both the substitution and the receive antennas horizontally polarized, the receive antenna was raised and lowered to obtain a maximum reading at the test receiver. The level of the signal generator was adjusted until the measured field strength level in step 2) is obtained for this set of conditions. 6). The output power into the substitution antenna was then measured. 7). Steps 5) and 6) were repeated with both antennas polarized. 8). Calculate power in dBm by the following formula: $\text{ERP(dBm)} = \text{Pg(dBm)} - \text{cable loss (dB)} + \text{antenna gain (dBd)}$ where: Pg is the generator output power into the substitution antenna. <p>Above 1GHz test procedure as below:</p> <ol style="list-style-type: none"> 1). Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber 2). Calculate power in dBm by the following formula: $\text{EIRP(dBm)} = \text{Pg(dBm)} - \text{cable loss (dB)} + \text{antenna gain (dBi)}$ $\text{EIRP} = \text{ERP} + 2.15\text{dB}$ where: Pg is the generator output power into the substitution antenna. 3). Test the EUT in the lowest channel, the middle channel the Highest channel 4). The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, Only the test worst case mode is recorded in the report. 5). Repeat above procedures until all frequencies measured was complete.
<p>Instruments Used:</p>	<p>Refer to section 6 for details</p>
<p>Test Results:</p>	<p>Pass</p>

Measurement Data

EUT mode	Frequency (MHz)	CH	EUT Pol.	Antenna Pol.	S.G. output (dBm)	Antenna Gain (dBd)	Cable loss (dB)	ERP (dBm)	Limit (dBm)
GSM 850	824.20	128	V	V	25.24	8.40	3.32	30.32	38.45
				H	24.73	8.40	3.32	29.81	38.45
	836.60	190	V	V	25.24	8.42	3.40	30.26	38.45
				H	23.78	8.42	3.40	28.80	38.45
	848.80	251	V	V	25.63	8.47	3.43	30.67	38.45
				H	24.89	8.47	3.43	29.93	38.45
EUT mode	Frequency (MHz)	CH	EUT Pol.	Antenna Pol.	S.G. output (dBm)	Antenna Gain (dBi)	Cable loss (dB)	EIRP (dBm)	Limit (dBm)
PCS 1900	1850.20	512	V	V	22.36	9.15	4.15	27.36	33
				H	21.08	9.15	4.15	26.08	33
	1880.00	661	V	V	22.39	9.22	4.28	27.33	33
				H	21.86	9.22	4.28	26.80	33
	1908.80	810	V	V	22.58	9.25	4.41	27.42	33
				H	21.92	9.25	4.41	26.76	33

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7.4 99%Occupied Bandwidth

Test Requirement:	Part 2.1049(h)
Test Method:	Part 22.917(b) and Part 24.238(b)
Test Setup:	 <p>The diagram illustrates the test setup. A Spectrum analyser and a Base station are connected to a Power attenuator and a Power Splitter. The Power Splitter is connected to the Base station and an EUT (Equipment Under Test). The entire setup is on a Non-Conducted Table above a Ground Reference Plane.</p>
Limit:	N/A
Measurement Procedure:	<p>The transmitter output was connected to a calibrated coaxial cable, attenuator and Spectrum analyser, the other end of which was connected to a Base Station Simulator. The Base Station Simulator was set to force the EUT to its maximum power setting. The tests were performed at three frequencies (low channel, middle channel and high channel).the resolution bandwidth of the analyser is set to 100kHz or 1% of the emission bandwidth, the EUT emission bandwidth is measured as the width of the signal between two points, outside of which all emission are attenuated at least 26dB below the transmitter power. The video bandwidth of the spectrum analyzer was set at thrice the resolution bandwidth. Detector Mode was set to peak or peak hold power.</p>
Instruments Used:	Refer to section 6 for details
Test Results:	Pass



Measurement Data

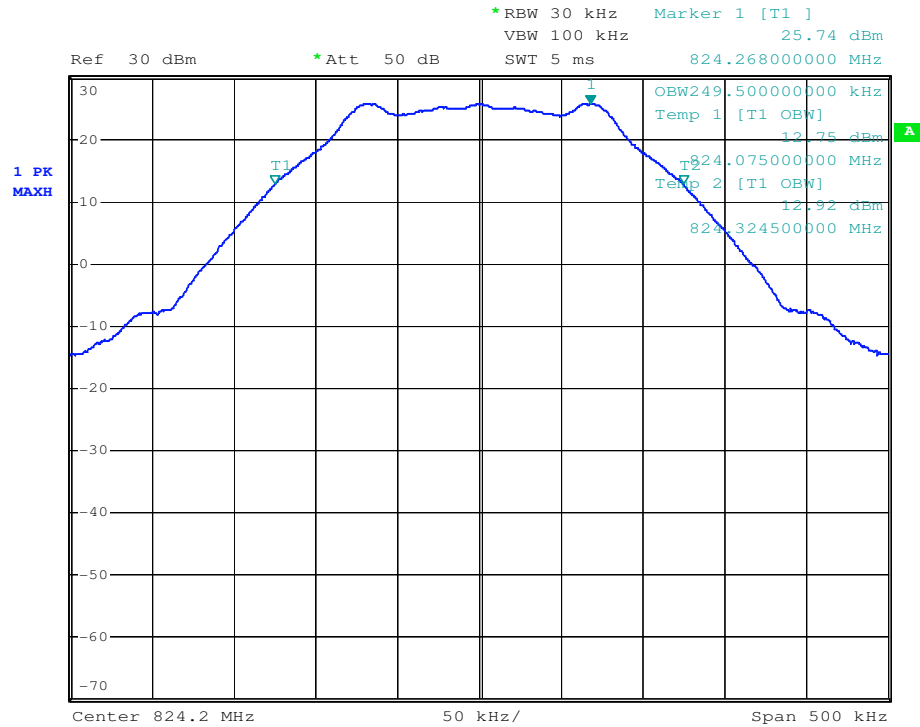
GSM 850			
Test channel	Frequency (MHz)	99% Emission Bandwidth (kHz)	Result
Lowest/128	824.20	249.50	Pass
Middle/190	836.60	250.00	Pass
Highest/251	848.80	249.00	Pass
PCS 1900			
Test channel	Frequency (MHz)	99% Emission Bandwidth (kHz)	Result
Lowest/512	1850.20	252.00	Pass
Middle/661	1880.00	251.50	Pass
Highest/810	1908.80	251.00	Pass

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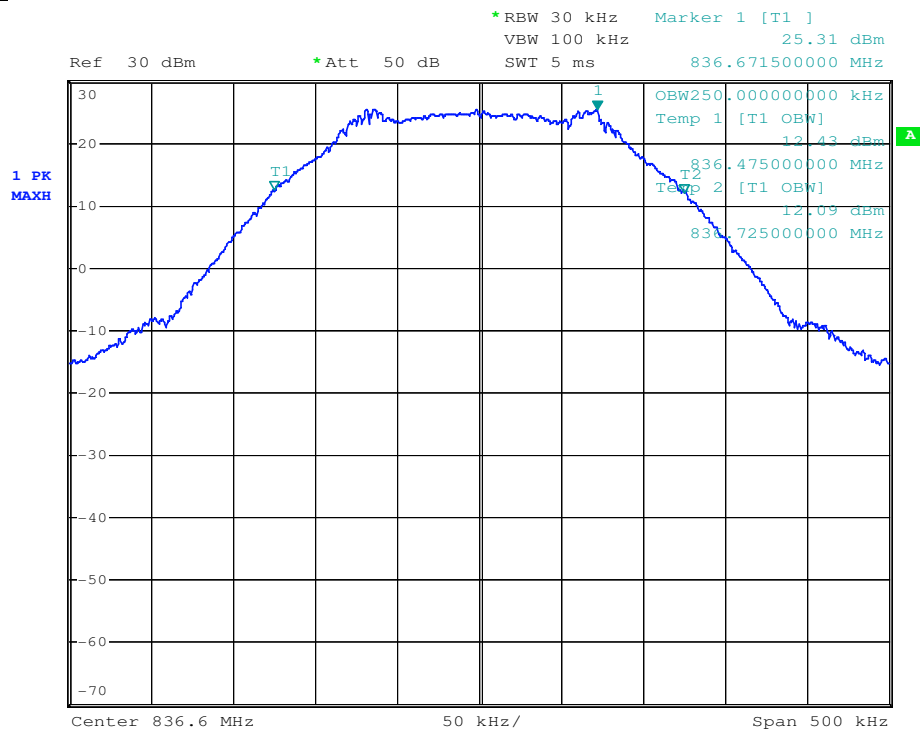


Test plot as follows:

Test mode:	GSM 850	Test channel:	Lowest/128	Operation Frequency	824.20MHz
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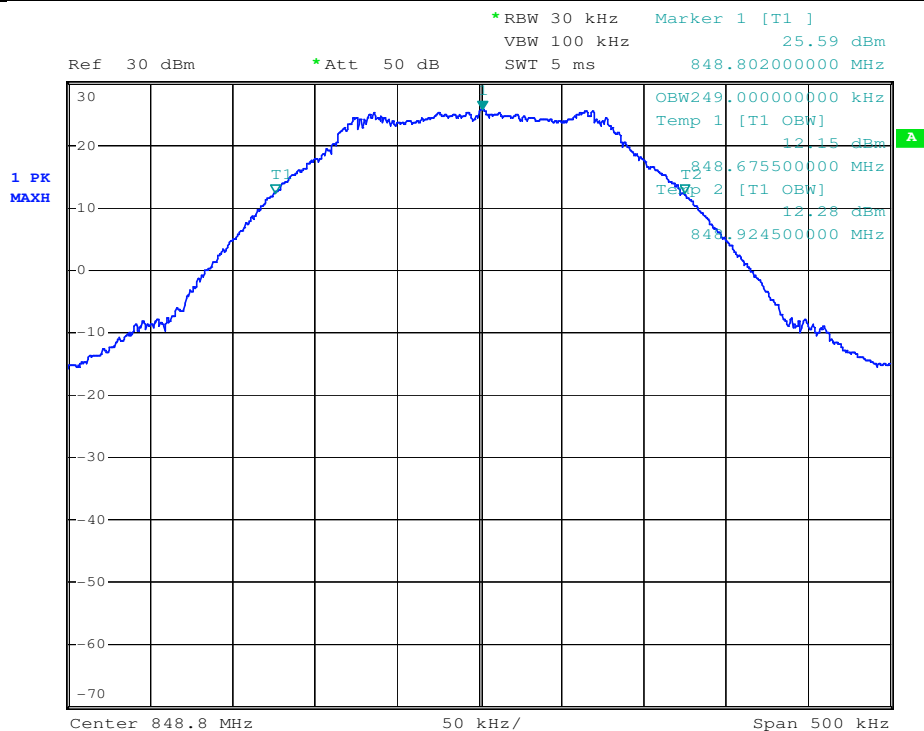
Test mode:	GSM 850	Test channel:	Middle/190	Operation Frequency	836.60MHz
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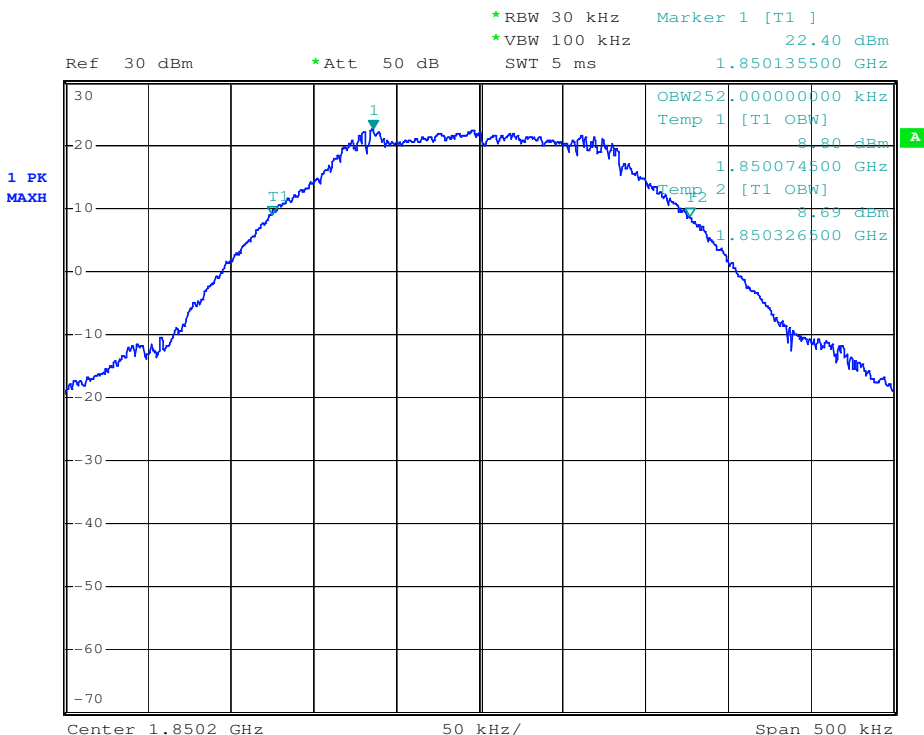
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Test mode:	GSM 850	Test channel:	High/251	Operation Frequency	848.80MHz
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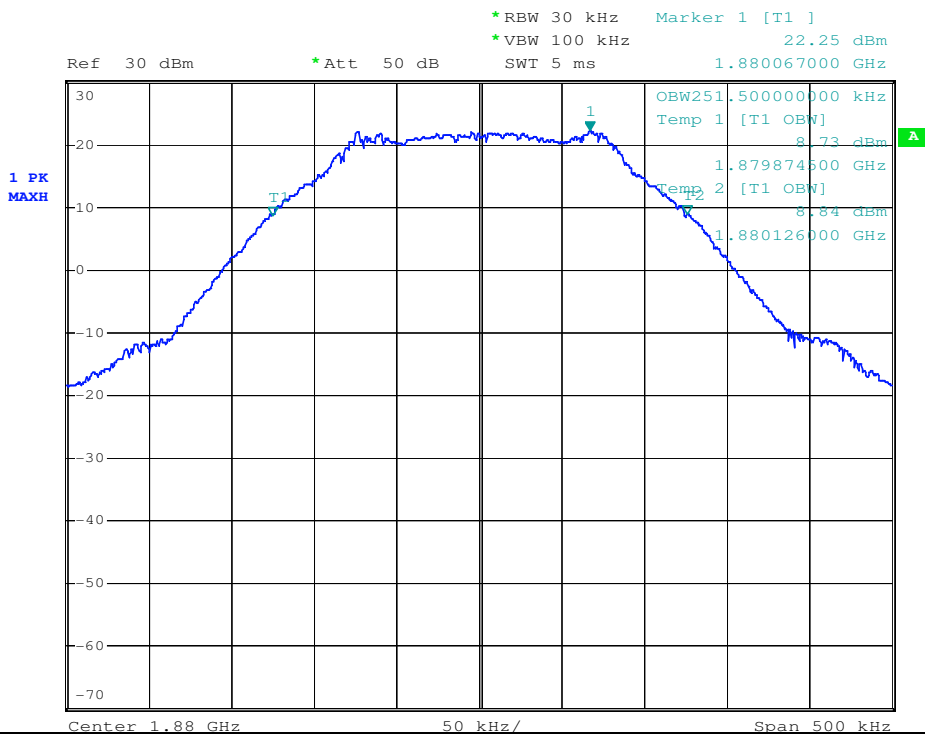
Test mode:	PCS1900	Test channel:	Lowest/512	Operation Frequency	1850.20MHz
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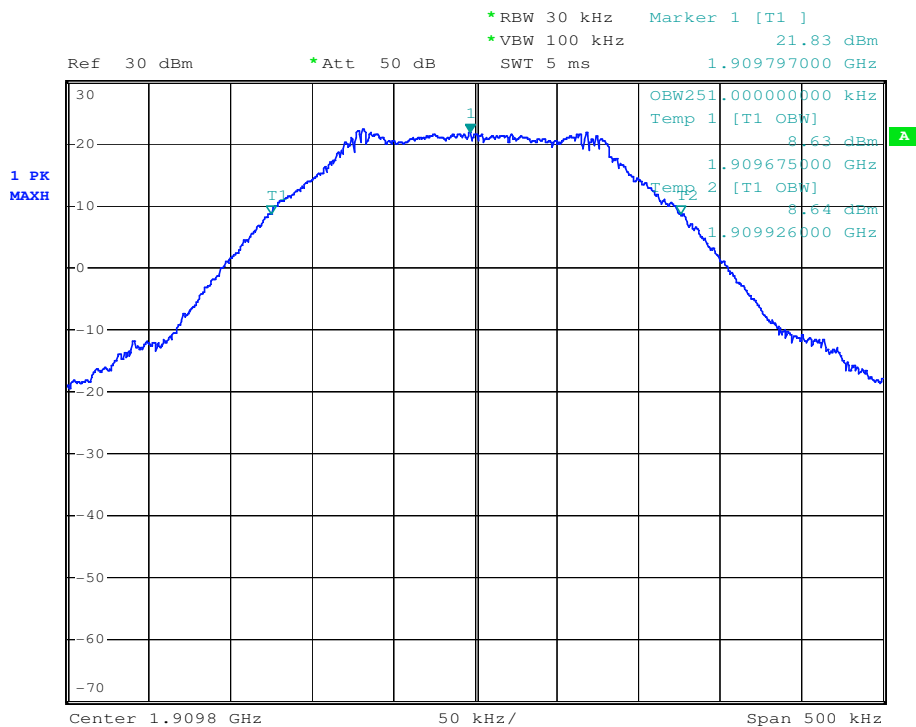
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Test mode:	PCS1900	Test channel:	Middle/661	Operation Frequency	1880.00MHz
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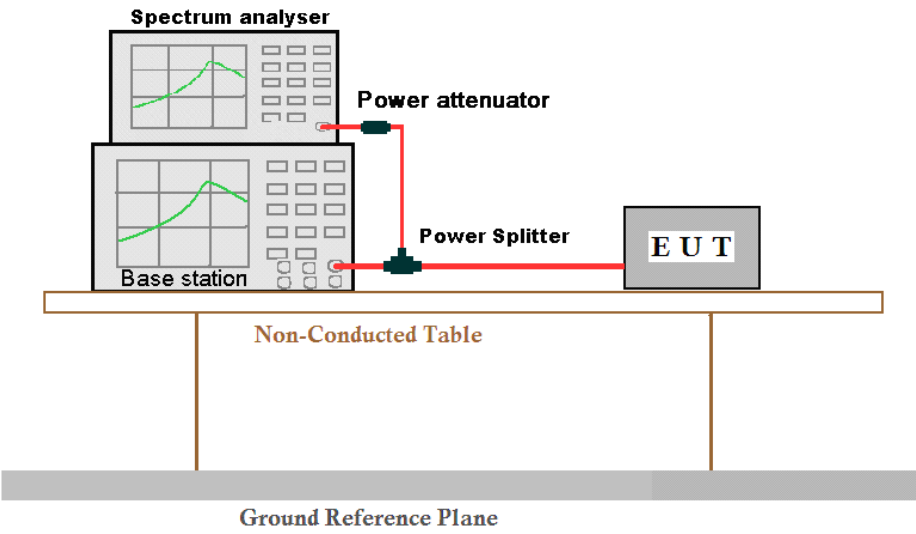


Test mode:	PCS1900	Test channel:	High/810	Operation Frequency	1908.80MHz
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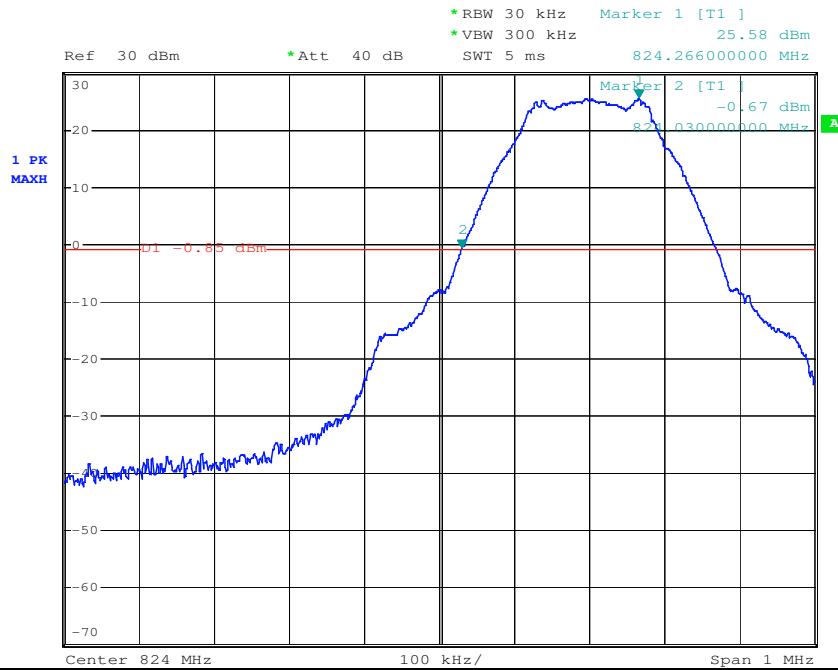
7.5 Band Edge at antenna terminals

Test Requirement:	Part 2.1051		
Test Method:	Part 22.917(b) and Part 24.238(b)		
Test Setup:			
Measurement Procedure:	<p>The transmitter output was connected to a calibrated coaxial cable, attenuator and Spectrum analyser, the other end of which was connected to a Base Station Simulator. The Base Station Simulator was set to force the EUT to its maximum power setting. The tests were performed at three frequencies (low channel and high channel).in the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of 100kHz or 1% of the emission bandwidth of the fundamental emission of the transmitter may be employed. The EUT emission bandwidth is measured as the width of the signal between two points, outside of which all emission are attenuated at least 26dB below the transmitter power. The video bandwidth of the spectrum analyzer was set at thrice the resolution bandwidth. Detector Mode was set to peak or peak hold power.</p>		
Limit:	Operation Band	Frequency Range (MHz)	Limit
	GSM 850	Below 824 and above 849	Attenuated at least $43+10\log(P)$
	PCS1900	Below 1850 and above 1910	Attenuated at least $43+10\log(P)$
Instruments Used:	Refer to section 6 for details		
Test Results:	Pass		

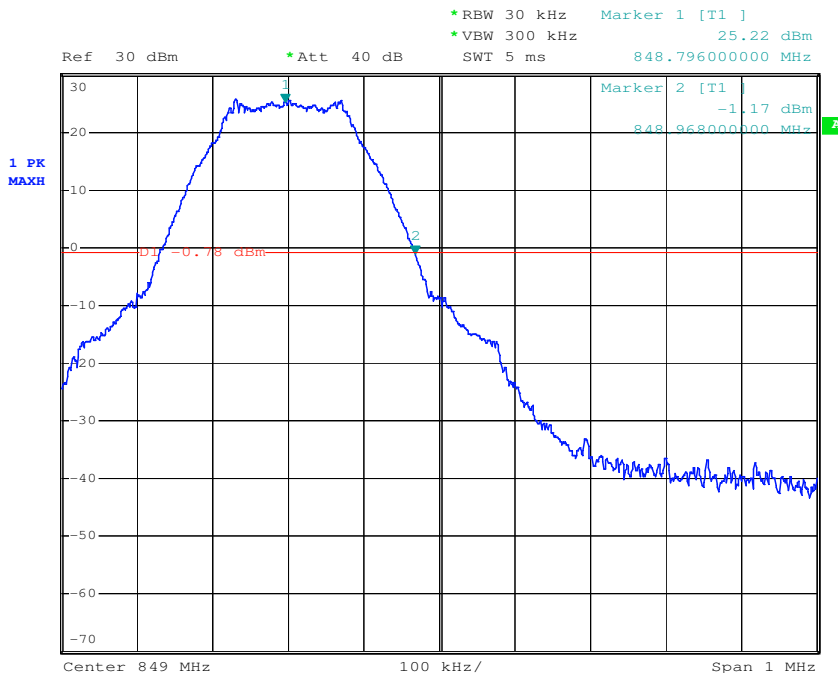


Measurement Data

GSM850		
Test channel	Frequency (MHz)	Result
Lowest/128	824.030	Pass



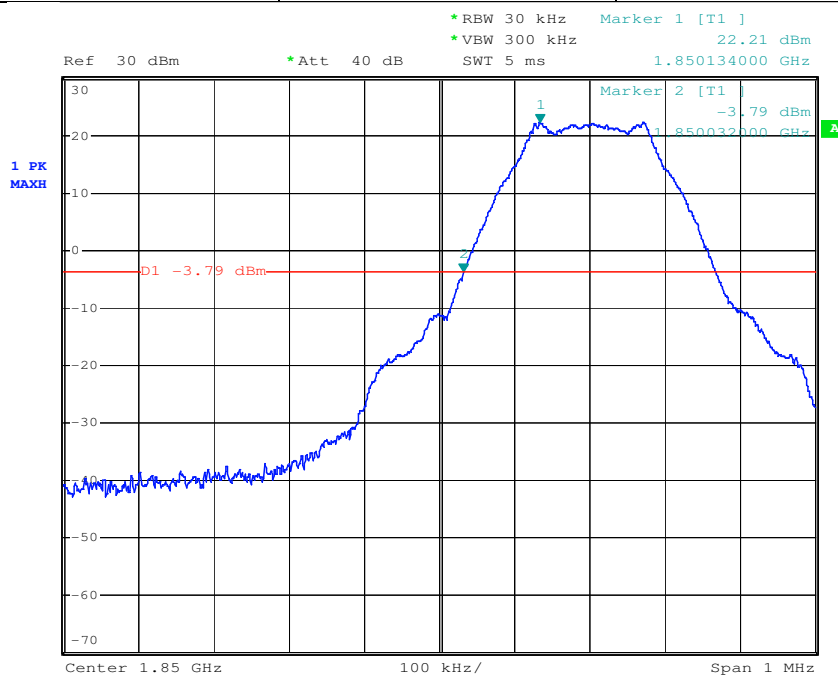
Test channel	Frequency (MHz)	Result
Highest/251	848.968	Pass



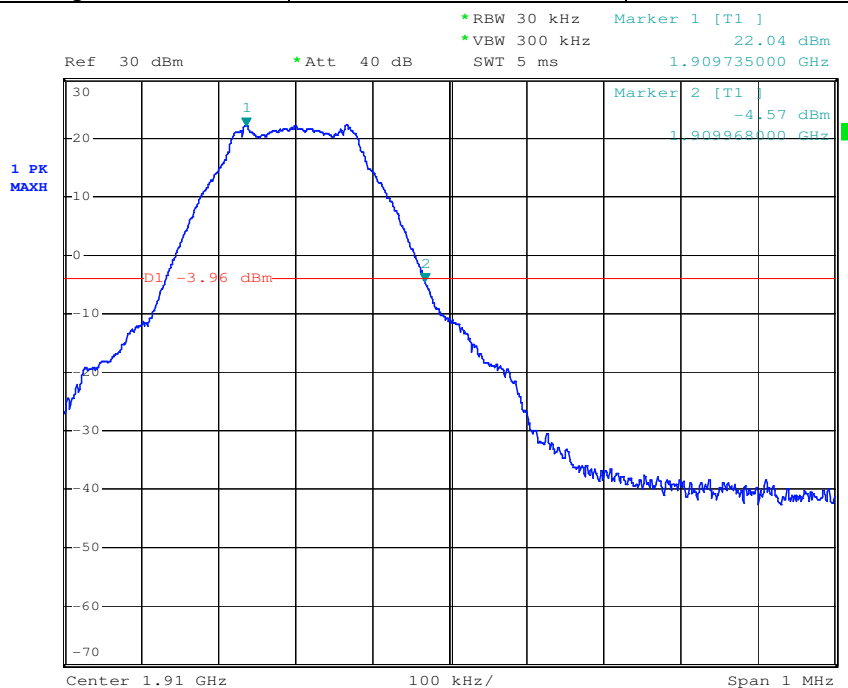
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PCS1900		
Test channel	Frequency (MHz)	Result
Lowest/512	1850.032	Pass

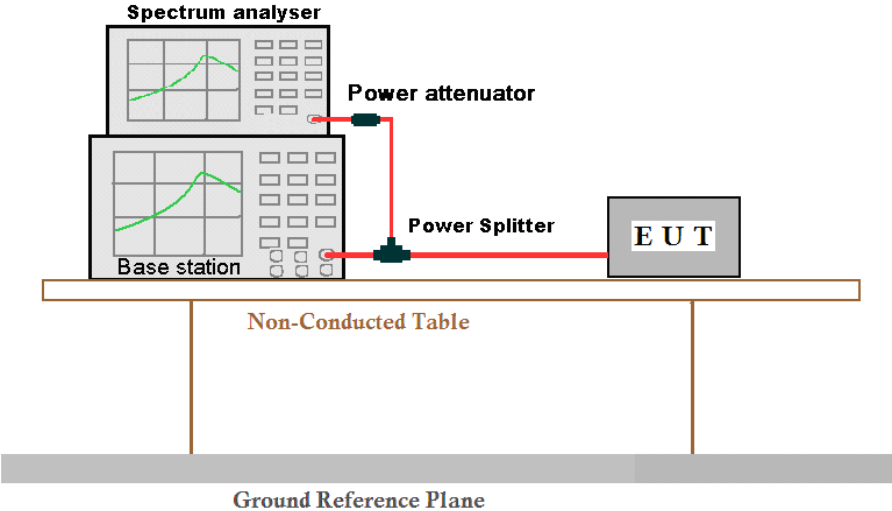


Test channel	Frequency (MHz)	Result
Highest/1175	1909.968	Pass



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7.6 Spurious emissions at antenna terminals

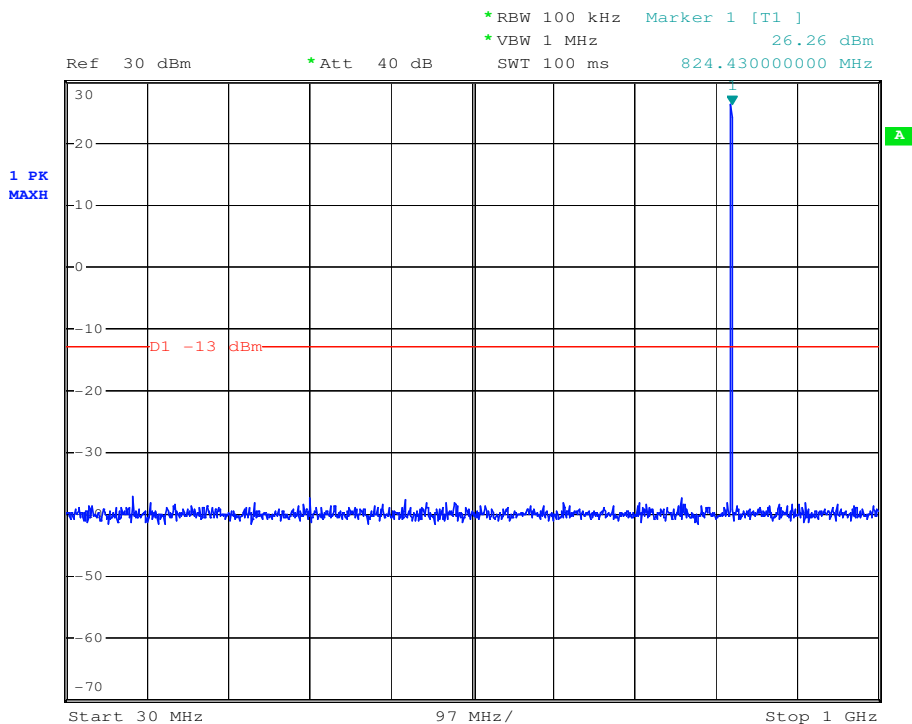
Test Requirement:	Part 2.1051 and Part 2.1057
Test Method:	ITA-603-D-2010 Clause 2.2.13
Test Setup:	
Measurement Procedure:	<p>The transmitter output was connected to a calibrated coaxial cable, attenuator and Spectrum analyzer, the other end of which was connected to a Base Station Simulator. The Base Station Simulator was set to force the EUT to its maximum power setting. The tests were performed at three frequencies (low channel and high channel).the equipment operates below 10GHz: to the tenth harmonic of the highest fundamental frequency or to 40GHz.whichever is lower, the resolution bandwidth of the spectrum analyzer was set at 100kHz for spurious emissions below 1 GHz, and 1 MHz for spurious emissions above 1GHz.the video bandwidth of the spectrum analyzer was set at thrice the resolution bandwidth. Detector Mode was set to mean or average power.</p>
Instruments Used:	Refer to section 6 for details
Limit:	Attenuated at least $43+10\log(P)$
Test Results:	Pass



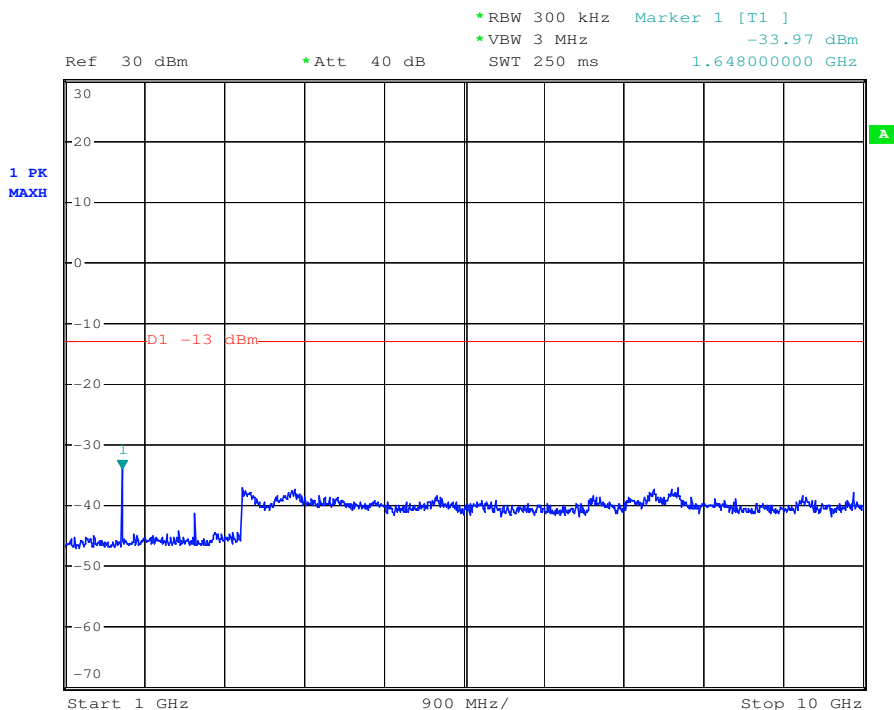
Test plot as follows:

Test mode:	GSM 850	Test channel:	Lowest/128	Operation Frequency	824.20MHz
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For 30MHz-1GHz:



For 1GHz-10GHz:

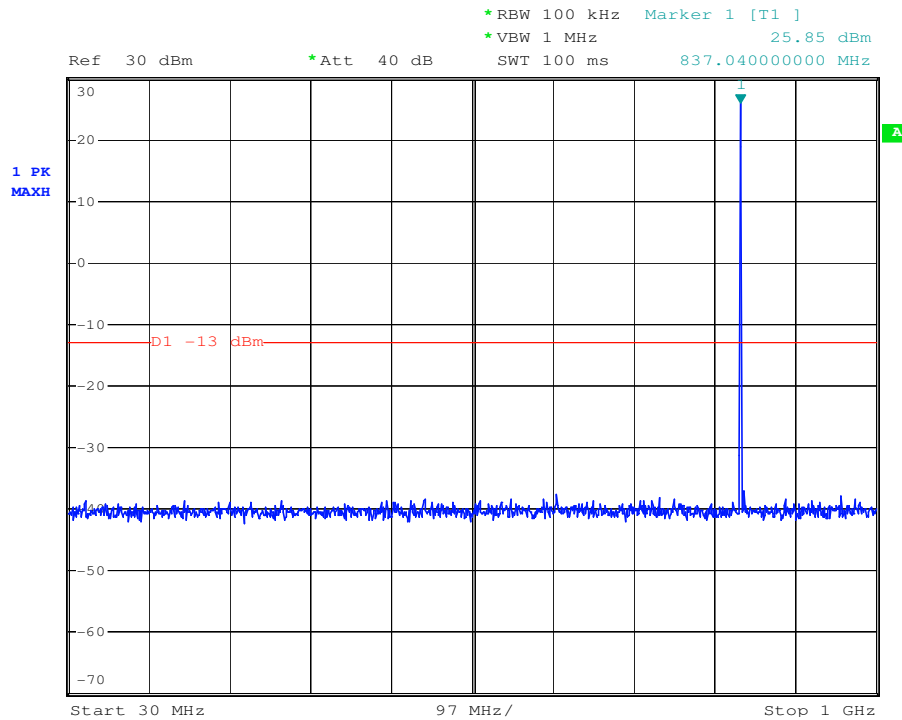


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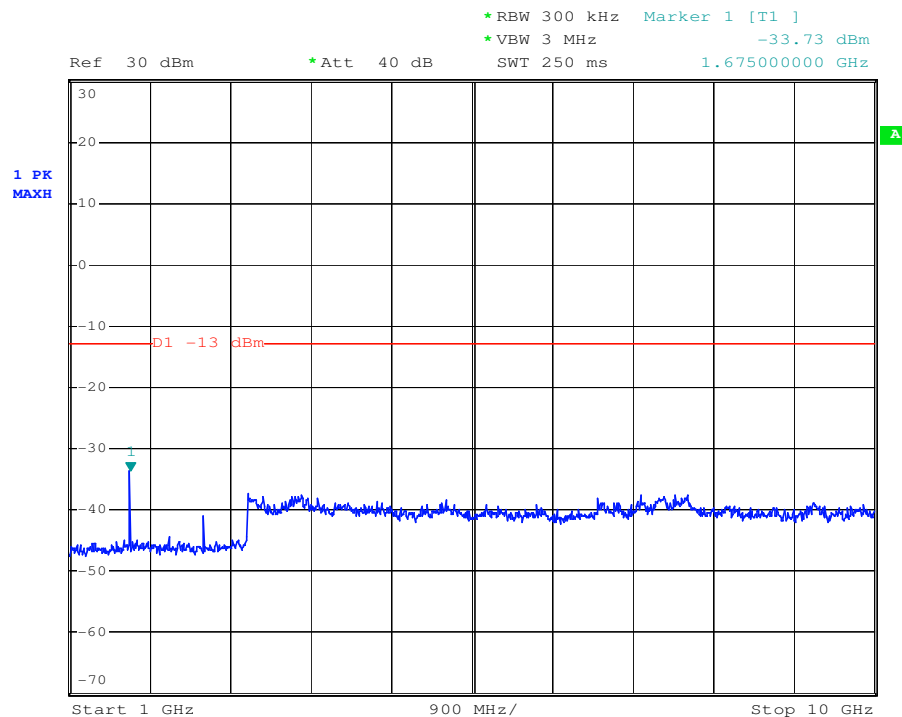


Test mode:	GSM 850	Test channel:	Middle/190	Operation Frequency	836.60MHz
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For 30MHz-1GHz:



For 1GHz-10GHz:

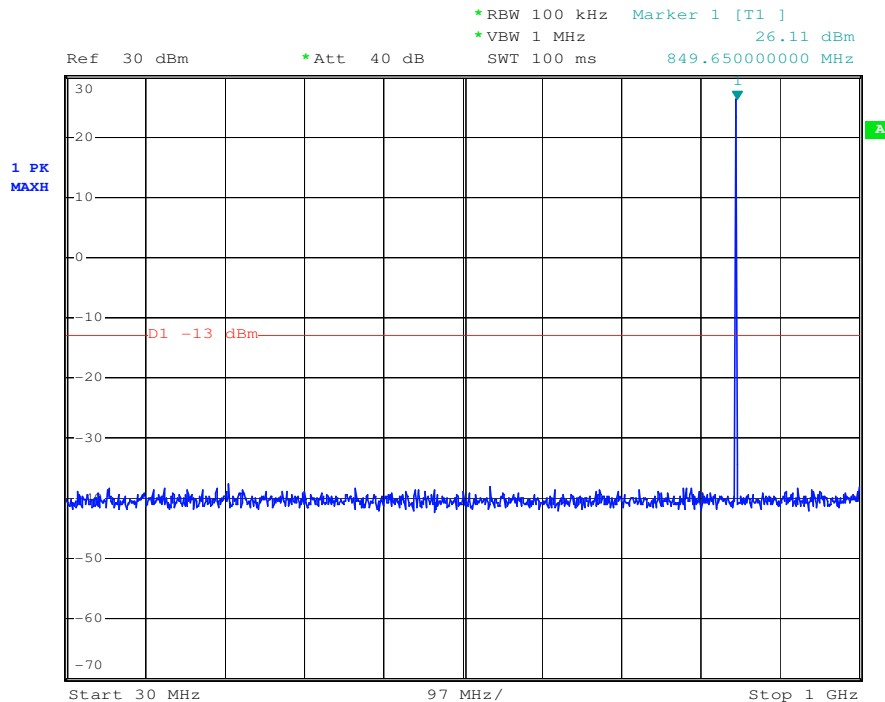


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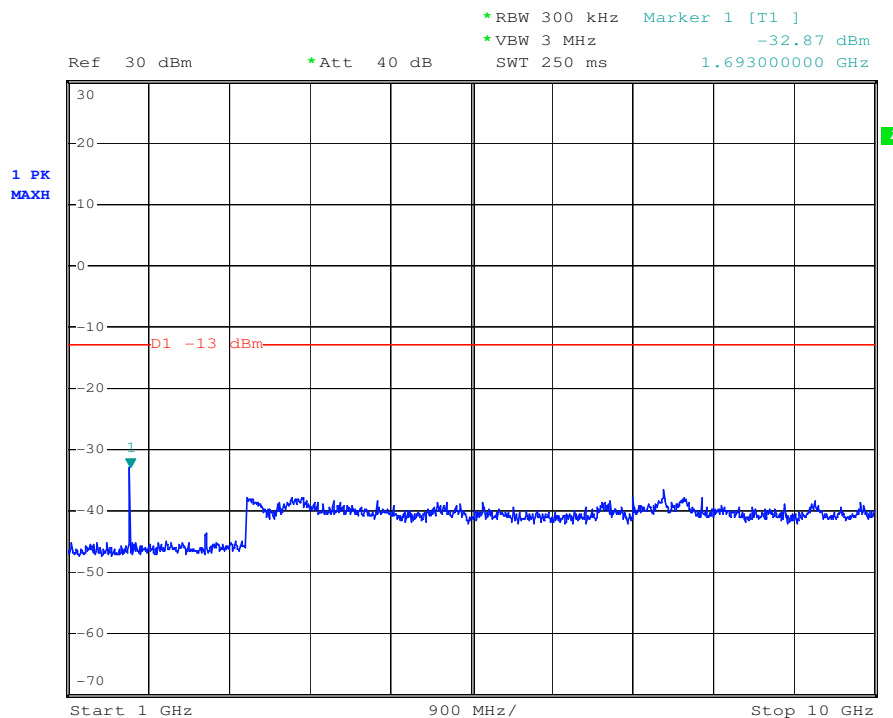


Test mode:	GSM 850	Test channel:	High/251	Operation Frequency	848.80MHz
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For 30MHz-1GHz:



For 1GHz-10GHz:

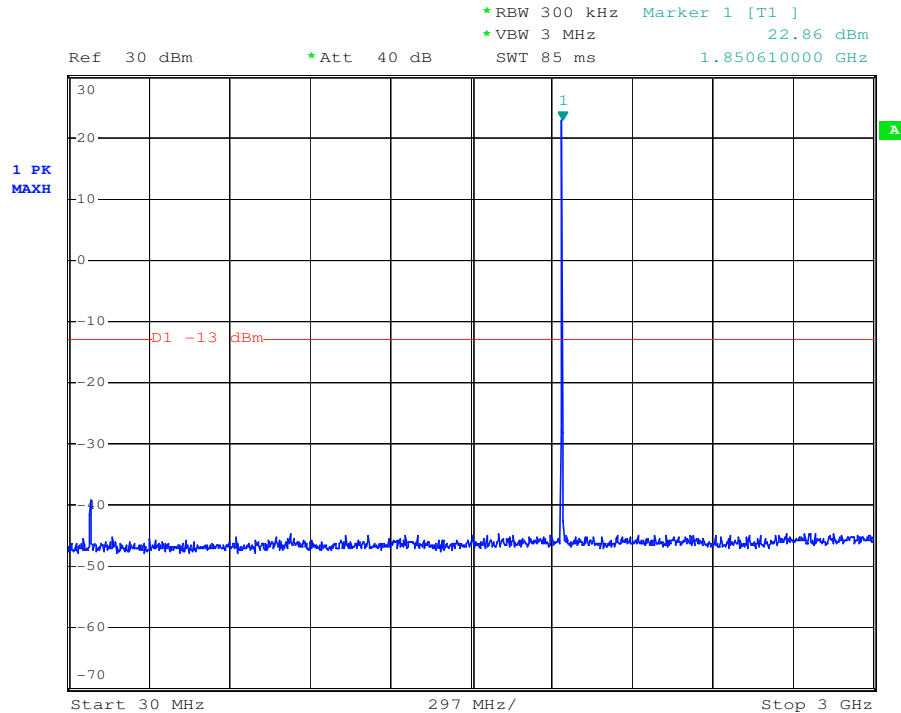


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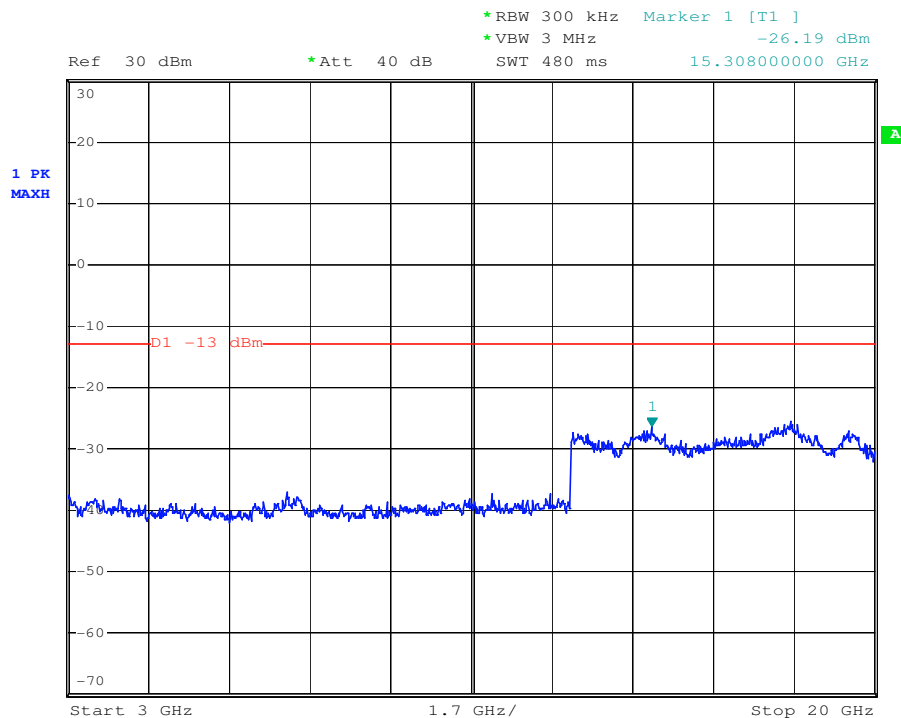


Test mode:	PCS 1900	Test channel:	Lowest/512	Operation Frequency	1850.20MHz
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For 30MHz-3GHz:



For 3GHz-20GHz:

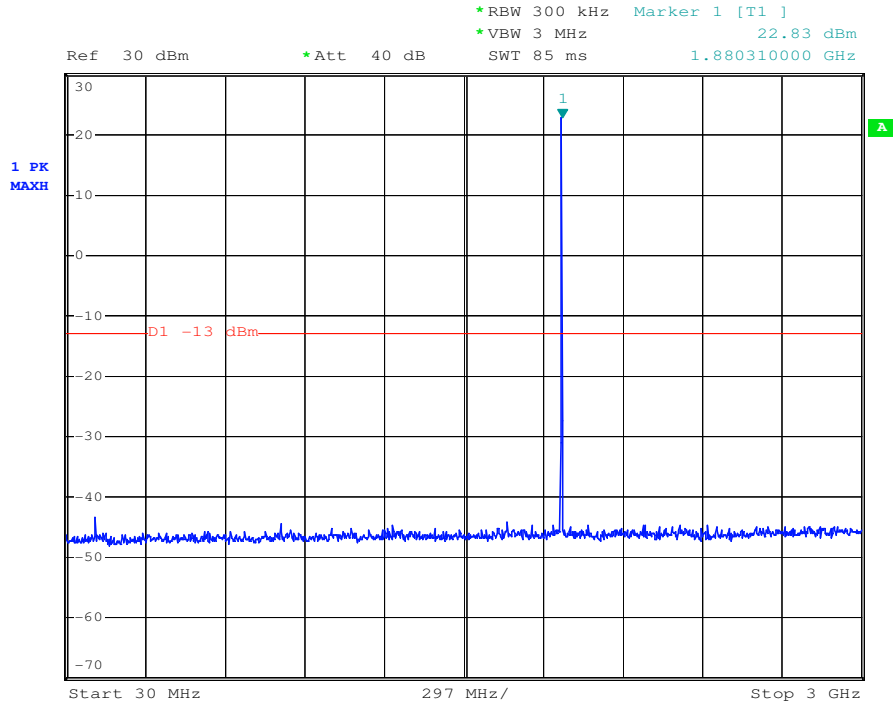


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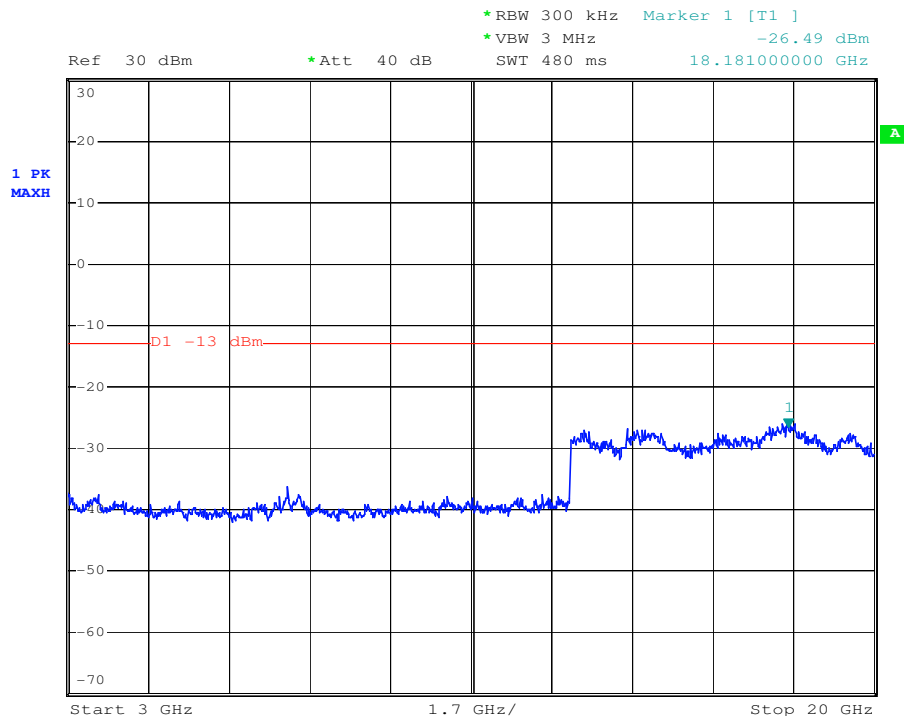


Test mode:	PCS 1900	Test channel:	Middle/661	Operation Frequency	1880.00MHz
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For 30MHz-3GHz:



For 3GHz-20GHz:

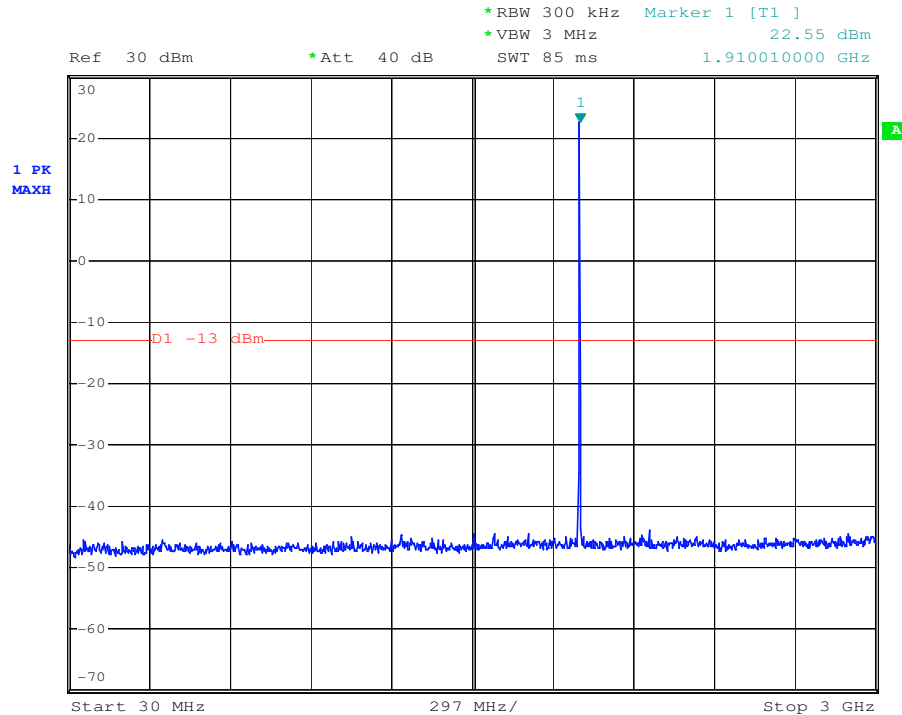


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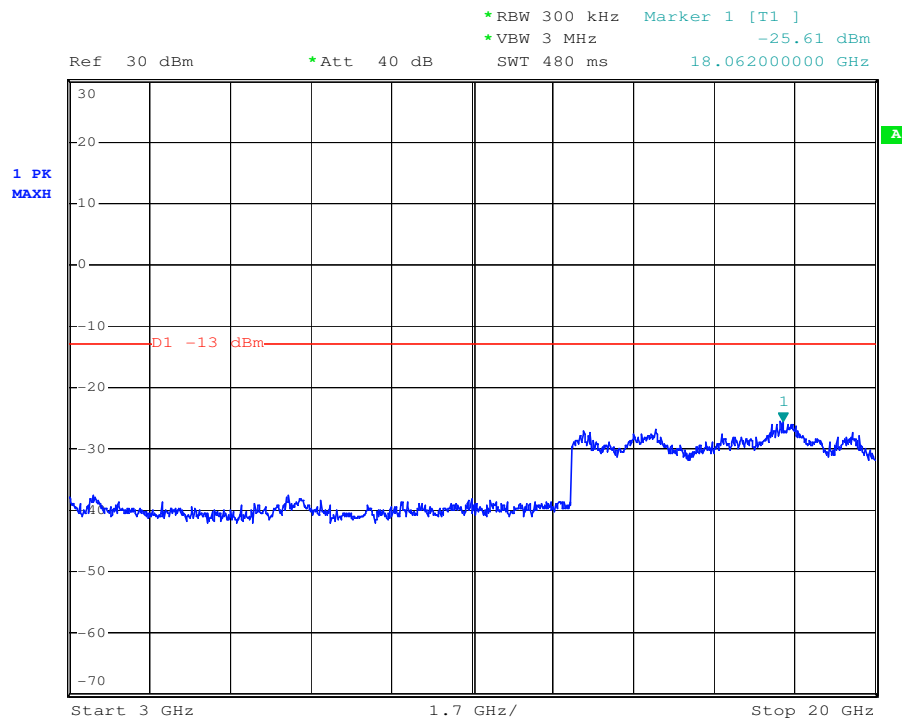


Test mode:	PCS 1900	Test channel:	High/810	Operation Frequency	1908.80MHz
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For 30MHz-3GHz:



For 3GHz-20GHz:



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7.7 Field strength of spurious radiation

Test Requirement:	Part 2.1053 and Part 2.1057				
Test Method:	ITA-603-D-2010 Clause 2.2.12				
Receiver Setup:	Frequency	Detector	RBW	VBW	Remark
	30MHz-1GHz	Peak	100 kHz	300kHz	Peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
Test Setup:					

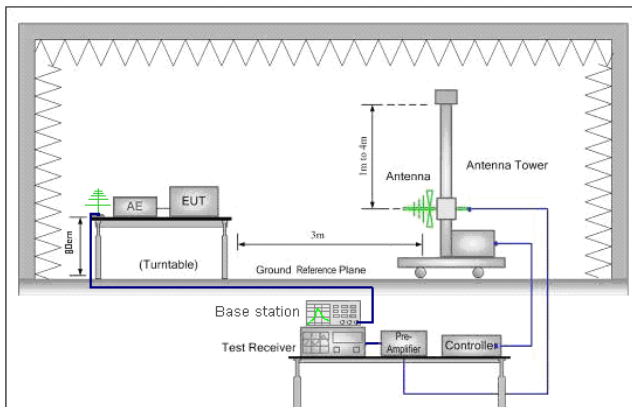


Figure 2. 30MHz to 1GHz

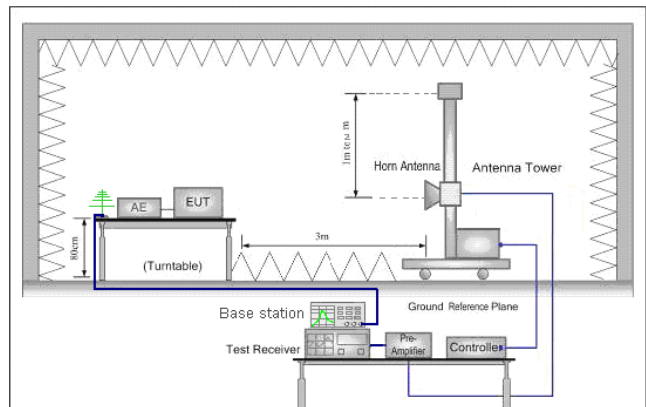


Figure 3. above 1GHz

Measurement Procedure:

Below 1GHz test procedure as below:

- 1). The EUT was powered ON and placed on a 1.70m high table in the chamber. The antenna of the transmitter was extended to its maximum length.
- 2). The disturbance of the transmitter was maximized on the test receiver display by raising and lowering from 1m to 4m (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) the receive antenna and by rotating through 360° the turntable. After the fundamental emission was maximized, a field strength measurement was made.
- 3). Steps 1) and 2) were performed with the EUT and the receive antenna in both vertical and horizontal polarization.
- 4). The transmitter was then removed and replaced with another antenna. The center of the antenna was approximately at the same location as the center of the transmitter.
- 5). A signal at the disturbance was fed to the substitution antenna by means of a non-radiating cable. With both the substitution and the receive antennas horizontally polarized, the receive antenna was raised and lowered to obtain a maximum reading at the test receiver. The level of the signal generator was adjusted until the measured field strength level in



	<p>step 2) is obtained for this set of conditions.</p> <p>6). The output power into the substitution antenna was then measured.</p> <p>7). Steps 5) and 6) were repeated with both antennas polarized.</p> <p>8) Calculate power in dBm by the following formula: $\text{ERP(dBm)} = \text{Pg(dBm)} - \text{cable loss (dB)} + \text{antenna gain (dBd)}$where: Pg is the generator output power into the substitution antenna.</p> <p>Above 1GHz test procedure as below:</p> <p>1) Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber</p> <p>2) Calculate power in dBm by the following formula: $\text{EIRP(dBm)} = \text{Pg(dBm)} - \text{cable loss (dB)} + \text{antenna gain (dBi)}$$\text{EIRP} = \text{ERP} + 2.15\text{dB}$where: Pg is the generator output power into the substitution antenna.</p> <p>3. Test the EUT in the lowest channel, the middle channel the Highest channel</p> <p>4. The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, Only the test worst case mode is recorded in the report.</p> <p>5. Repeat above procedures until all frequencies measured was complete.</p>
Instruments Used:	Refer to section 6 for details
Limit:	Attenuated at least $43 + 10\log(P)$
Test Results:	Pass

Test mode:	GSM 850	Test channel:	Lowest/128	Operation Frequency	824.20MHz
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Frequency (MHz)	Ant.Pol. H/V	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dB)
1666.00	H	-31.20	-13.	-18.20
3340.00	H	-41.77	-13	-28.77
5806.00	H	-41.29	-13	-28.29
1648.00	V	-28.79	-13	-15.79
2467.00	V	-40.30	-13	-27.30
5824.00	V	-43.18	-13	-30.18

Test mode:	GSM 850	Test channel:	Middle/190	Operation Frequency	836.60MHz
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Frequency (MHz)	Ant.Pol. H/V	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dB)
1666.00	H	-31.20	-13.	-18.20
3340.00	H	-41.77	-13	-28.77
5806.00	H	-41.29	-13	-28.29
1666.00	V	-27.24	-13	-14.24
3340.00	V	-43.08	-13	-30.08
5635.00	V	-43.18	-13	-30.18

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Test mode:	GSM 850	Test channel:	High/251	Operation Frequency	848.80MHz
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Frequency (MHz)	Ant.Pol. H/V	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dB)
1693.00	H	-32.77	-13.	-19.77
5752.00	H	-41.79	-13	-28.79
1693.00	V	-28.12	-13	-15.12
5815.00	V	-43.05	-13	-30.05

Test mode:	PCS 1900	Test channel:	Lowest/512	Operation Frequency	1850.20MHz
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Frequency (MHz)	Ant.Pol. H/V	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dB)
1850.00	H	-36.04	-13.	-23.04
5539.00	H	-41.75	-13	-28.79
13852.00	H	-39.99	-13	-26.99
1850.00	V	-34.78	-13	-21.78
3703.00	V	-38.92	-13	-25.92
15399.00	V	-39.58	-13	-26.58

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Test mode:	PCS 1900	Test channel:	Middle/661	Operation Frequency	1880.00MHz
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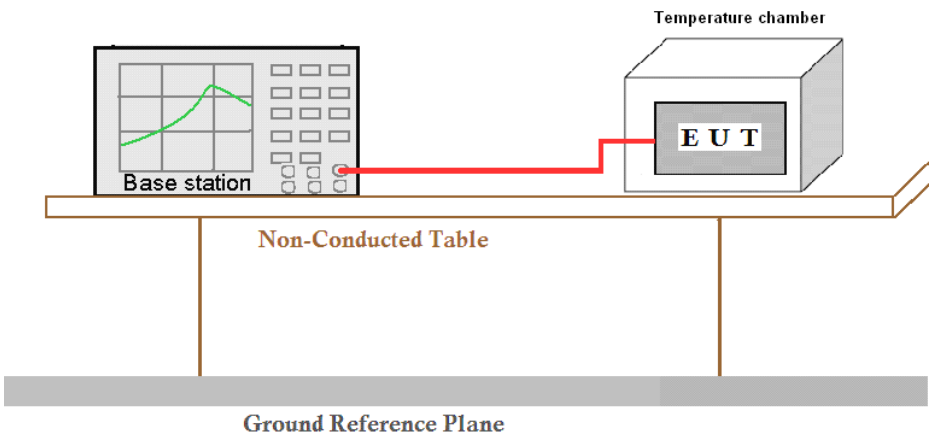
Frequency (MHz)	Ant.Pol. H/V	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dB)
1867.00	H	-33.08	-13.	-20.08
3754.00	H	-38.98	-13	-25.98
15263.00	H	-40.20	-13	-27.20
1867.00	V	-31.47	-13	-18.47
3754.00	V	-38.21	-13	-25.21
15025.00	V	-40.02	-13	-27.02

Test mode:	PCS 1900	Test channel:	High/810	Operation Frequency	1908.80MHz
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Frequency (MHz)	Ant.Pol. H/V	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dB)
1901.00	H	-34.99	-13.	-21.99
3822.00	H	-39.07	-13	-26.07
13852.00	H	-39.64	-13	-26.64
1901.00	V	-30.91	-13	-17.91
3822.00	V	-40.95	-13	-27.95
15025.00	V	-39.55	-13	-26.55

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7.8 Frequency stability

Test Requirement:	Part 2.1055							
Test Method:	ITA-603-D-2010 Clause 2.2.2							
Test Setup:								
Measurement Procedure:	<p>The transmitter output was connected to a calibrated coaxial cable and a Base Station Simulator. The Base Station Simulator was set to force the EUT to its maximum power setting. The tests were performed at three frequencies (low channel and high channel). The EUT was placed in the temperature chamber, the DC leads and RF output cable exited the chamber through an opening made for that purpose. After operating the equipment in standby conditions for 15 minutes before proceeding. The temperature was varied from -30°C to +50°C at intervals of not more than 10°C. The frequency stability was read from the base station at 25°C. The input voltage was varied +/-15%, the frequency stability and input voltage were recorded.</p>							
Instruments Used:	Refer to section 4.10 for details							
Limit:	<table border="1"> <thead> <tr> <th>Operation Band</th> <th>Frequency stability Limit(ppm)</th> </tr> </thead> <tbody> <tr> <td>GSM 850</td> <td>±2.5ppm</td> </tr> <tr> <td>PCS 1900</td> <td>---</td> </tr> </tbody> </table>	Operation Band	Frequency stability Limit(ppm)	GSM 850	±2.5ppm	PCS 1900	---	
Operation Band	Frequency stability Limit(ppm)							
GSM 850	±2.5ppm							
PCS 1900	---							
Test Results:	Pass							

GSM 850						
Power Supply	Environment	Test Channel		Freq Delta	Freq Dev	Limit
Vdc	Temperature (°C)	Channel No.	Frequency (MHz)	(Hz)	(ppm)	(ppm)
120	-20	1013	824.70	35	0.42	±2.5
120	-20	777	848.31	48	0.57	±2.5
120	-10	1013	824.70	20	0.24	±2.5
120	-10	777	848.31	15	0.18	±2.5
120	0	1013	824.70	-17	-0.21	±2.5
120	0	777	848.31	42	0.50	±2.5
120	10	1013	824.70	18	0.22	±2.5
120	10	777	848.31	32	0.38	±2.5
120	20	1013	824.70	11	0.13	±2.5
120	20	777	848.31	10	0.12	±2.5
120	30	1013	824.70	-25	-0.30	±2.5
120	30	777	848.31	25	0.29	±2.5
120	40	1013	824.70	16	0.19	±2.5
120	40	777	848.31	31	0.37	±2.5
120	50	1013	824.70	41	0.50	±2.5
120	50	777	848.31	-30	-0.35	±2.5
138	20	1013	824.70	12	0.15	±2.5
138	20	777	848.31	22	0.26	±2.5
102	20	1013	824.70	33	0.40	±2.5
102	20	777	848.31	-16	-0.19	±2.5

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PCS 1900						
Power Supply	Environment	Test Channel		Freq Delta	Freq Dev	Limit
Vdc	Temperature (°C)	Channel No.	Frequency (MHz)	(Hz)	(ppm)	(ppm)
120	-20	25	1851.25	37	0.20	±2.5
120	-20	1175	1908.75	23	0.12	±2.5
120	-10	25	1851.25	-19	-0.10	±2.5
120	-10	1175	1908.75	-35	-0.18	±2.5
120	0	25	1851.25	26	0.14	±2.5
120	0	1175	1908.75	-17	-0.09	±2.5
120	10	25	1851.25	-44	-0.24	±2.5
120	10	1175	1908.75	33	0.17	±2.5
120	20	25	1851.25	-27	-0.16	±2.5
120	20	1175	1908.75	48	0.25	±2.5
120	30	25	1851.25	23	0.12	±2.5
120	30	1175	1908.75	-41	-0.21	±2.5
120	40	25	1851.25	33	0.18	±2.5
120	40	1175	1908.75	26	0.14	±2.5
120	50	25	1851.25	18	0.10	±2.5
120	50	1175	1908.75	43	0.23	±2.5
138	20	25	1851.25	-33	-0.19	±2.5
138	20	1175	1908.75	24	0.13	±2.5
102	20	25	1851.25	30	0.16	±2.5
102	20	1175	1908.75	27	0.14	±2.5

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8 Photographs - EUT Test Setup

Refer to the < GL300_Test Setup photos>.

9 Photographs - EUT Constructional Details

Refer to the < GL300_External Photos > & < GL300_Internal Photos >.