SGS-CSTC Standards Technical Services Ltd.

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FCC REPORT

Application No:	SZEM1205002589IT (GZEM1205001588IT)
Applicant:	Montage
Manufacturer:	Montage Asia
Product Name:	Traxit X 2G GPS Module
Model No.(EUT):	GT2GM-M
FCC ID:	N69-715000
Standards:	FCC Title 47 Part 2: FCC Title 47 Part 22H subpart H FCC Title 47 Part 24E subpart E
Date of Receipt:	2012-05-16
Date of Test:	2012-05-31 to 2012-06-08
Date of Issue:	2012-07-18
Test Result:	**PASS ***

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Jack Zhang
EMC Laboratory Manager

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. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.
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 Test Summary

Test Item	FCC Requirement	Test method	Result
850			
Conducted output power	Part 2.1046(a)/Part 22.913(a)	ITA-603-D-2010	PASS
Effective Radiated Power of Transmitter(ERP)	Part 2.1046(a)/Part 22.913(a)	ITA-603-D-2010	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	PASS
Field strength of spurious radiation	Part 2.1051/ Part 2.1057/ Part 22.917(a)(b）	ITA-603-D-2010	PASS
Frequency stability	Part 2.1055/ Part 22.355	ITA-603-D-2010	PASS
1900			
Conducted output power	Part 2.1046(a) /Part 24.232(c)	ITA-603-D-2010	PASS
Effective Radiated Power of Transmitter(EIRP)	Part 2.1046(a) / Part 24.232(c)	ITA-603-D-2010	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	PASS
Field strength of spurious radiation	Part 2.1051 /Part 2.1057 / Part 24.238(a)(b)	ITA-603-D-2010	PASS
Frequency stability	Part 2.1055/Part 24.235	ITA-603-D-2010	PASS

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3 Contents

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4 General Information

4.1 Client Information

Applicant:	Montage
Address of Applicant:	NEO Enterprise Avenue, 6009 Shennan Mid Road, Futian
Manufacturer:	Montage Asia
Address of Manufacturer:	Flat J, 13/F, Tower C, NEO Enterprise Avenue, 6009 Shennan Mid Road, Futian, Shenzhen, CHINA

4.2 General Description of EUT

Name:	Traxit X 2G GPS Module
Model No.:	GT2GM-M
IMEI:	352165050216097
Frequency Band:	850: Tx:824.20 -848.80MHz;Rx: 869.20 - 893.80MHz 1900: Tx:1850.20 -1909.80MHz;Rx:1930.20 -1989.80MHz
Type of Emission:	GPRS(GMSK):300KGXW
Power Control Level:	850 PCL 5-19 maximum is PCL 5 1900 PCL 0-15 maximum is PCL 0
Modulation Type:	GPRS Mode with GMSK Modulation
GPRS Class:	12 (1 uplink slot mode is maximum power)
Sample Type:	Fixed production
Antenna Type and Gain:	Type: Integral Gain: 0dBi
Power Supply:	DC 12.0V
Test Voltage (Declared by client):	Normal: 12V lowest voltage: 6V highest voltage: 15V

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4.3 Test Environment and Mode

Operating Environment:	
Temperature:	26.0 °C
Humidity:	50 % RH
Atmospheric Pressure:	1006 mbar

4.4 Description of Support Units

The EUT has been tested with associated equipment below.

Description	Manufacturer	Model No.
DC power	Zhao Xin	RXN-305D

4.5 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch E&E Lab,
No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China. 518057.
Tel: +86 755 2601 2053 Fax: +86 755 2671 0594
No tests were sub-contracted.

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4.6 Test Facility

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

- **CNAS (No. CNAS L2929)**
  CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab 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.
- **VCCI**
  The 3m Semi-anechoic chamber, Full-anechoic Chamber and Shielded Room (7.5m x 4.0m x 3.0m) of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-2197, G-416, T-1153 and C-2383 respectively.
- **FCC – Registration No.: 556682**
  SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen 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. Registration No.: 556682.
- **Industry Canada (IC)**
  The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1.

4.7 Deviation from Standards

None.

4.8 Abnormalities from Standard Conditions

None.

4.9 Other Information Requested by the Customer

None.

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4.10 Test Instruments List

RE in Chamber					
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Due date (yyyy-mm-dd)**
1	3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEL0017	2013-06-10
2	EMI Test Receiver	Rohde & Schwarz	ESIB26	SEL0023	2013-05-17
3	EMI Test software	AUDIX	E3	SEL0050	N/A
4	BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEL0015	2012-10-29
5	Double-ridged horn (1-18GHz)	ETS-LINDGREN	3117	SEL0006	2012-10-29
6	Horn Antenna (18-26GHz)	ETS-LINDGREN	3160	SEL0076	2012-10-29
7	Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEL0053	2013-05-17
8	Pre-Amplifier (0.1-26.5GHz)	Compliance Directions Systems Inc.	PAP-0126	SEL0168	2012-10-26
9	Coaxial cable	SGS	N/A	SEL0027	2013-05-29
10	Coaxial cable	SGS	N/A	SEL0189	2013-05-29
11	Coaxial cable	SGS	N/A	SEL0121	2013-05-29
12	Coaxial cable	SGS	N/A	SEL0178	2013-05-29
13	Band filter	Amindeon	82346	SEL0094	2013-05-17
14	Barometer	ChangChun	DYM3	SEL0088	2013-05-17
15	Power Meter	Rohde & Schwarz	NRVD	SEL0069	2013-05-17
16	Spectrum Analyzer	Rohde & Schwarz	FSP 30	SEL0154	2012-10-23
17	Signal Generator	Rohde & Schwarz	SML03	SEL0068	2013-05-17
18	Power Divider(splitter)	Agilent Technologies	11636B	SEL0130	2013-05-17
19	Universal radio communication tester	Rohde & Schwarz	CMU200	SEL0091	2013-05-17
20	BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEL0015	2012-10-29
21	Double-ridged horn (1-18GHz)	ETS-LINDGREN	3117	SEL0006	2012-10-29
22	Horn Antenna (18-26GHz)	ETS-LINDGREN	3160	SEL0076	2012-10-29

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Conducted Emission					
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Due date (yyyy-mm-dd)**
1	Shielding Room	ZhongYu Electron	GB-88	SEL0042	2013-06-10
2	Two-Line V-Network	ETS-LINDGREN	3816/2	SEL0021	2013-05-17
3	LISN	Rohde & Schwarz	ENV216	SEL0152	2012-10-23
4	EMI Test Receiver	Rohde & Schwarz	ESCI	SEL0022	2013-05-17
5	Coaxial Cable	SGS	N/A	SEL0024	2013-05-29

RF conducted					
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Due date (yyyy-mm-dd)**
1	Spectrum Analyzer	Rohde & Schwarz	FSP 30	SEL0154	2012-10-23
2	Coaxial cable	SGS	N/A	SEL0028	2013-05-29

General used equipment					
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Due date (yyyy-mm-dd)**
1	Humidity/ Temperature Indicator	Shanghai	ZJ1-2B	SEL0102 to SEL0103	2012-10-27
2	Humidity/ Temperature Indicator	Shanghai	ZJ1-2B	SEL0101	2012-10-27
3	Barometer	ChangChun	DYM3	SEL0088	2013-05-17

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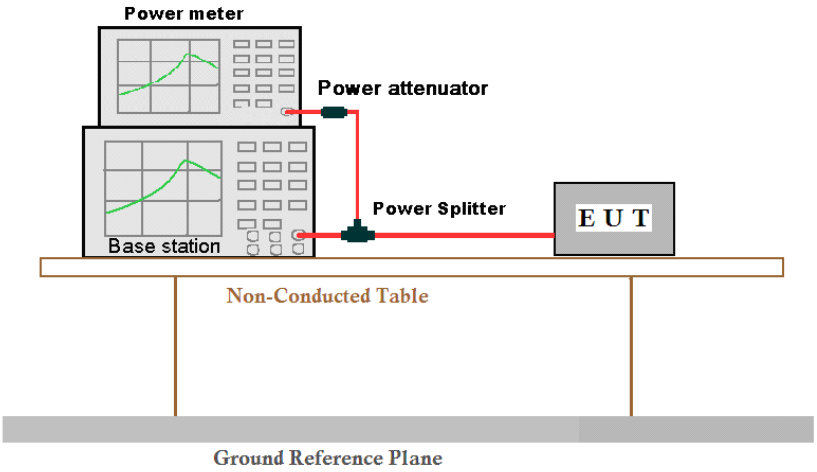
5 Test results and Measurement Data

5.1 Conducted Output Power

Test Requirement:	Part 2.1046(a)
Test Method:	ITA-603-D-2010
Test Setup:	
Limit:	Mode: GSM 850/WCDMA/HSDPA /HSUPA 850 Band V; GSM 1900/WCDMA/HSDPA /HSUPA 1900 Band V Frequency: 824 – 849MHz; 1850 – 1910MHz Limit: 38.45dBm(7W); 33.01dBm(2W)
Measurement Procedure:	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.
Instruments Used:	Refer to section 4.10 for details
Test Results:	Pass

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Measurement Data

850				
Channel/fc(MHz)	Peak power (dBm)	AV power (dBm)	Limit (dBm)	Result
128/824.2	32.57	32.50	38.45	Pass
189/836.6	32.08	32.01	38.45	Pass
251/848.8	32.05	32.02	38.45	Pass
1900				
Channel/fc(MHz)	Peak power (dBm)	AV power (dBm)	Limit (dBm)	Result
512/1850.2	29.50	29.35	33.01	Pass
661/1880.0	29.11	29.07	33.01	Pass
810/1909.8	29.14	29.04	33.01	Pass

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5.2 Effective Radiated Power of Transmitter (ERP/EIRP)

Test Requirement:	Part 2.1046(a)
Test Method:	ITA-603-D-2010
Receiver Setup:	

Frequency	Detector	RBW	VBW	Remark
30MHz-1GHz	Quasi-peak	100kHz	300kHz	Peak Value
Above 1GHz	Peak	1MHz	3MHz	Peak Value

Test Setup:

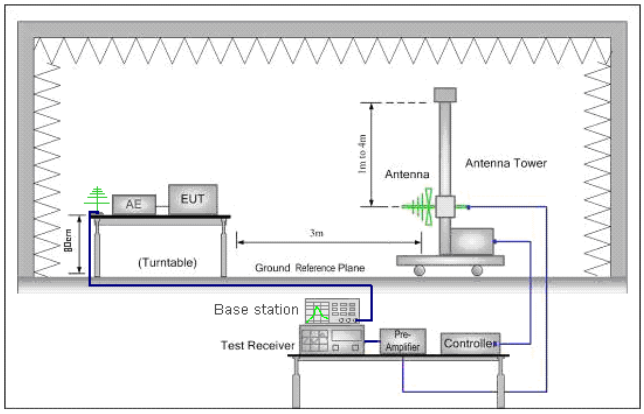

Figure 1. 30MHz to 1GHz

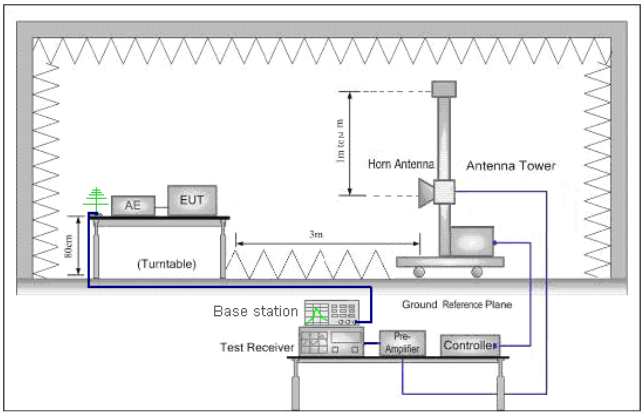

Figure 2. above 1GHz

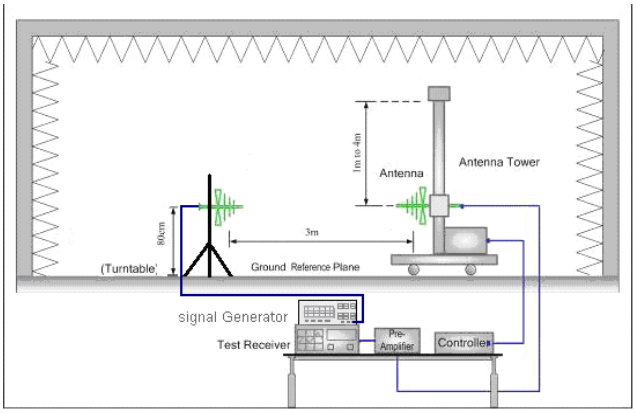

Figure 3. 30MHz to 1GHz

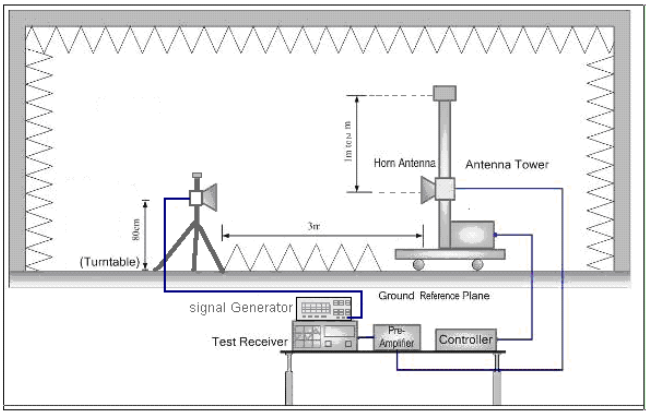

Figure 4. above 1GHz

Limit:

Mode	GSM 850/WCDMA/HSDPA /HSUPA 850 Band V	GSM 1900/WCDMA/HSDPA /HSUPA 1900 Band V
Frequency	824 – 849MHz	1850 – 1910MHz
Limit	38.45dBm(7W)	33.01dBm(2W)

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Measurement Procedure:	**Below 1GHz test procedure as below:** 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: ERP(dBm) = Pg(dBm) – cable loss (dB) + antenna gain (dBd) where: Pg is the generator output power into the substitution antenna. **Above 1GHz test procedure as below:** 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: EIRP(dBm) = Pg(dBm) – cable loss (dB) + antenna gain (dBi) EIRP=ERP+2.15dB 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.
Instruments Used:	Refer to section 4.10 for details
Test Results:	Pass

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Measurement Data

850									
CH	**Frequency (MHz)**	**S.G. Output (dBm)**	**Antenna Gain (dBi)**	**Cable loss (dB)**	**EUT polarize**	**Antenna polarize**	**ERP (dBm)**	**Limit (dBm)**	**Margin (dB)**
128	824.2	28.66	5.40	3.31	H	H	28.60	38.45	-9.85
		27.98	5.40	3.31		V	27.92	38.45	-10.53
189	836.4	28.06	4.60	3.35	H	H	27.16	38.45	-11.29
		28.78	4.60	3.35		V	27.88	38.45	-10.57
251	848.8	27.85	4.80	3.41	H	H	27.09	38.45	-11.36
		28.56	4.80	3.41		V	27.80	38.45	-10.65
1900									
CH	**Frequency (MHz)**	**S.G. Output (dBm)**	**Antenna Gain (dBi)**	**Cable loss (dB)**	**EUT polarize**	**Antenna polarize**	**EIRP (dBm)**	**Limit (dBm)**	**Margin (dB)**
512	1850.2	25.55	8.40	5.42	H	H	26.38	33.01	-6.63
		26.31	8.40	5.42		V	27.14	33.01	-5.87
661	1880	25.56	8.80	5.56	H	H	26.65	33.01	-6.36
		26.13	8.80	5.56		V	27.22	33.01	-5.79
810	1909.8	24.83	9.20	5.50	H	H	26.38	33.01	-6.63
		26.17	9.20	5.50		V	27.72	33.01	-5.29

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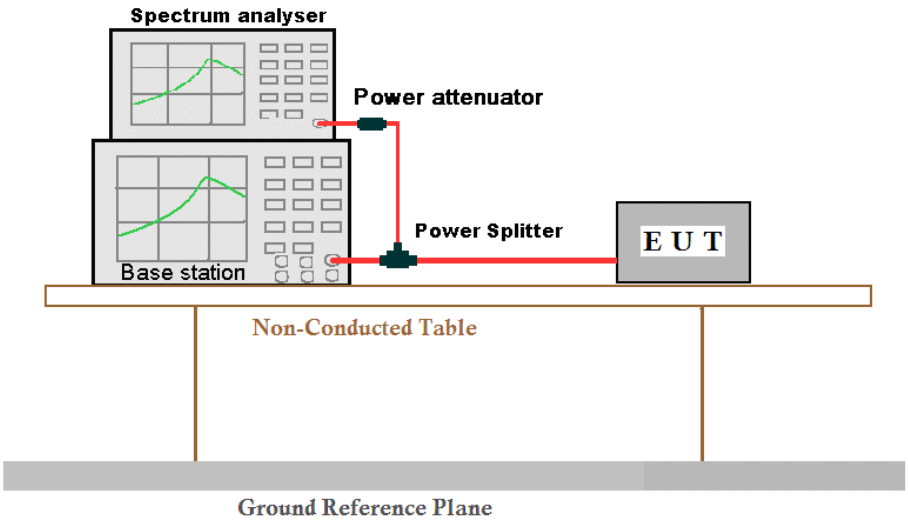
5.3 99%Occupied Bandwidth

Test Requirement:	Part 2.1049(h)
Test Method:	Part 22.917(b) and Part 24.238(b)
Test Setup:	
Limit:	N/A
Measurement Procedure:	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 mean or average power.
Instruments Used:	Refer to section 4.10 for details
Test Results:	Pass

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Measurement Data

850			
Test channel	Frequency (MHz)	99% Emission Bandwidth(kHz)	Result
Lowest/128	824.2	242	Pass
Middle/190	836.6	244	Pass
Highest/251	848.8	244	Pass
1900			
Test channel	Frequency (MHz)	99% occupied bandwidth(kHz)	Result
Lowest/512	1850.2	248	Pass
Middle/661	1880.0	246	Pass
Highest/810	1909.8	244	Pass

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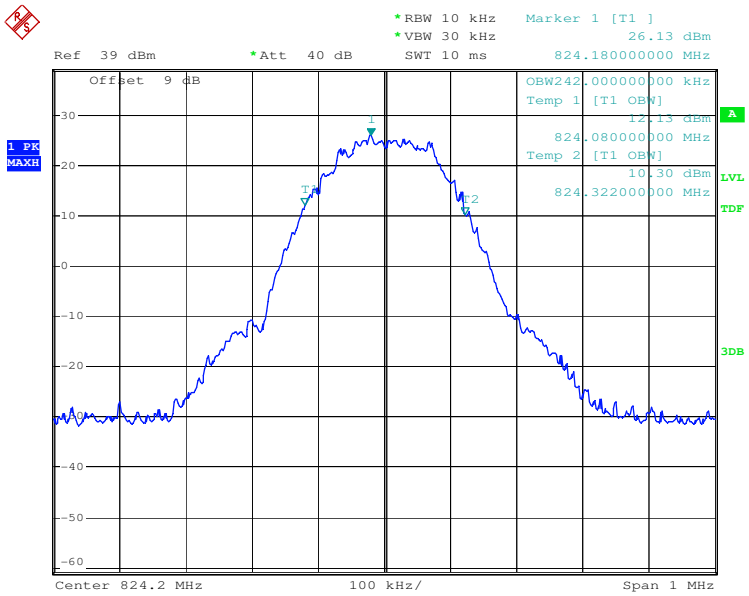
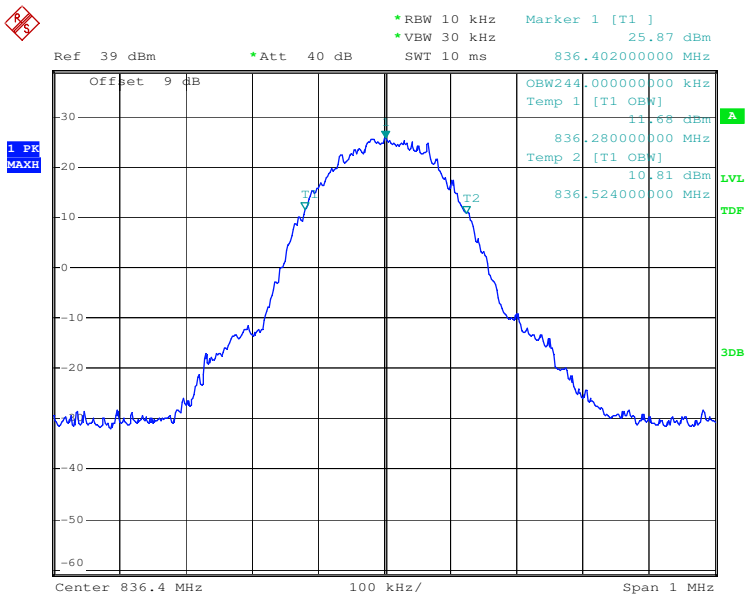
Test plot as follows:

Test mode:	850	Test channel:	Lowest/128	Operation Frequency	824.2MHz



Test mode:	850	Test channel:	Middle/189	Operation Frequency	836.6MHz



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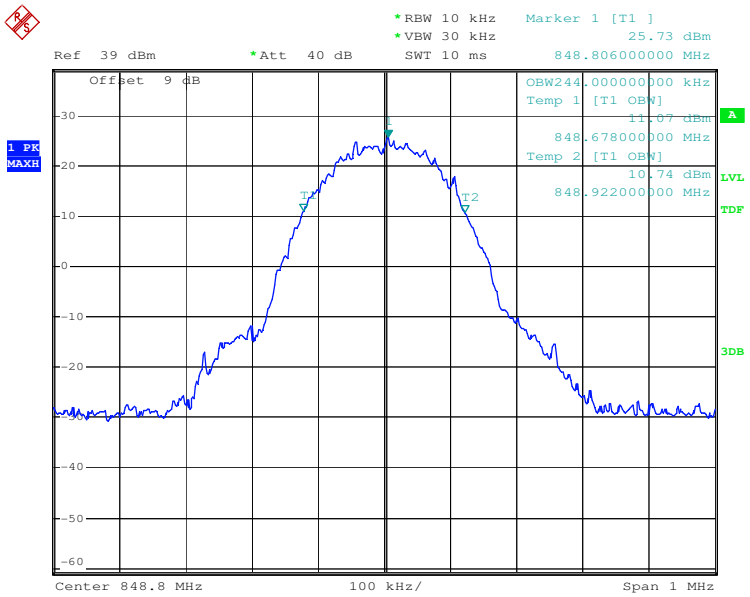
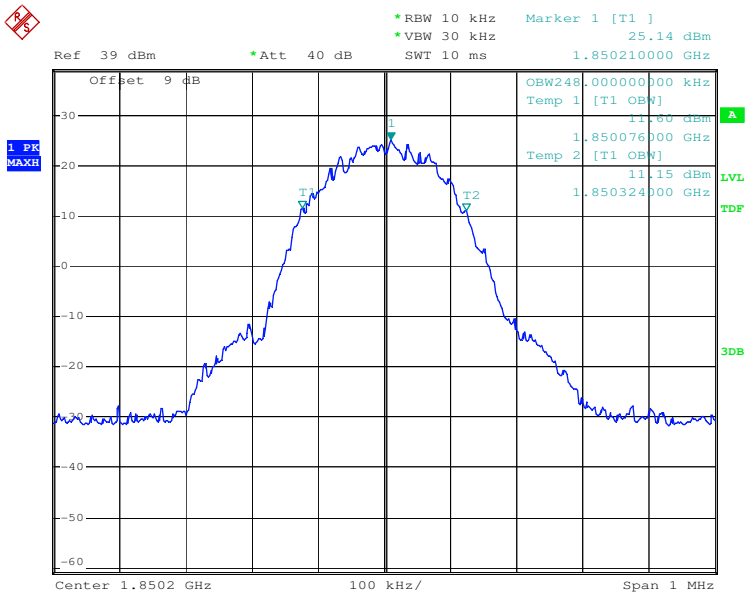
Test mode:	850	Test channel:	High/251	Operation Frequency	848.8MHz



Test mode:	1900	Test channel:	Lowest/512	Operation Frequency	1850.2MHz



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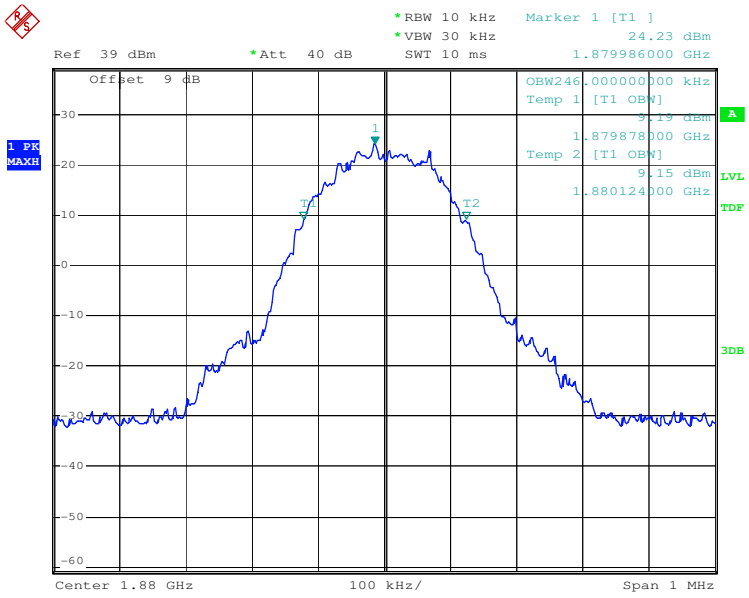
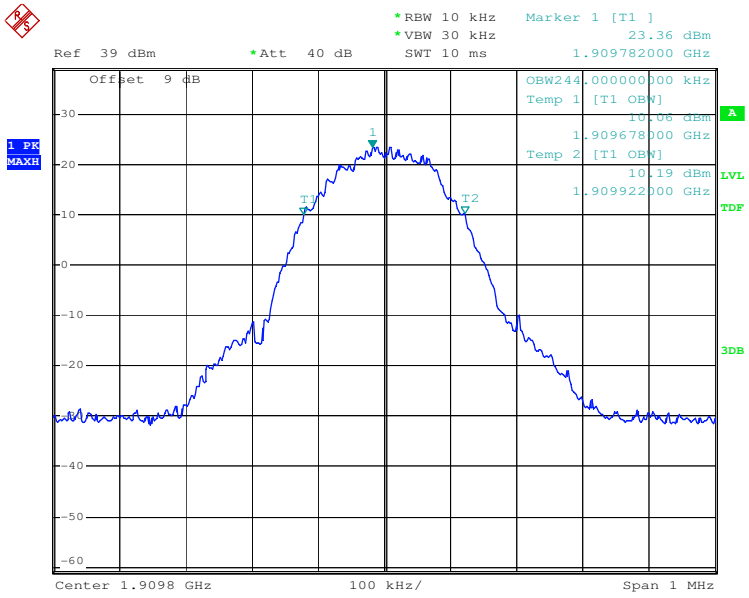
Test mode:	1900	Test channel:	Middle/661	Operation Frequency	1880.0MHz



Test mode:	1900	Test channel:	High/810	Operation Frequency	1909.8MHz



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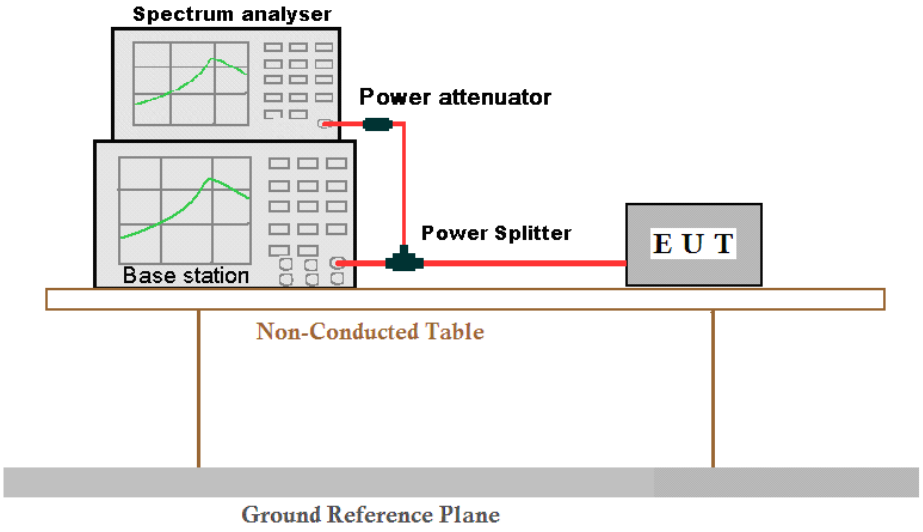
5.4 Band Edge at antenna terminals

Test Requirement:	Part 2.1051
Test Method:	Part 22.917(b) and Part 24.238(b)
Test Setup:	
Measurement Procedure:	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 mean or average power.
Limit:	Operation Band / Frequency Range (MHz) / Limit GSM/GPRS/EDGE/ WCDMA 850 / Below 824 and above 849 / Attenuated at least 43+10log(P) GSM/GPRS/EDGE/ WCDMA 1900 / Below 1850 and above 1910 / Attenuated at least 43+10log(P)
Instruments Used:	Refer to section 4.10 for details
Test Results:	Pass

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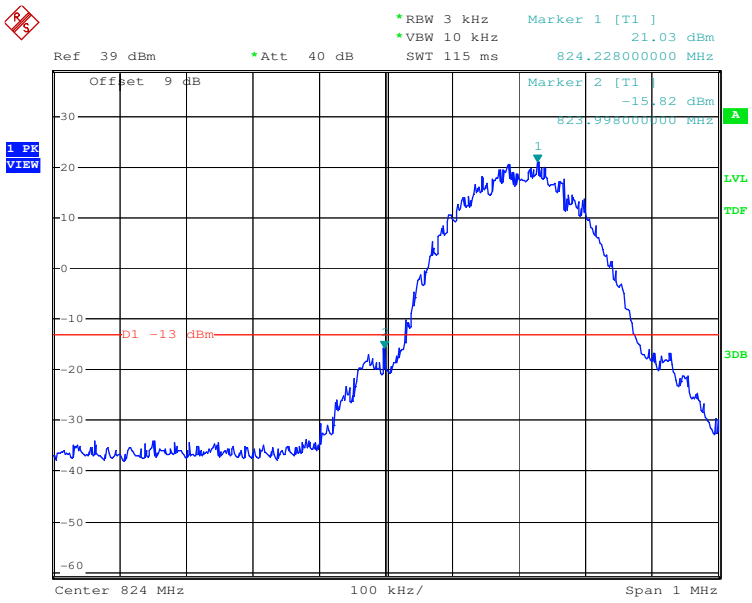
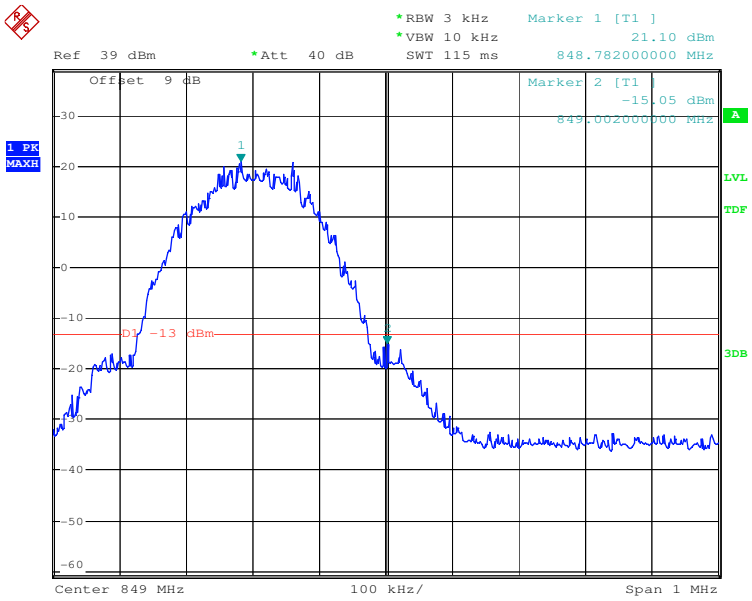
Test plot as follows:

850		
Test channel	Frequency (MHz)	Result
Lowest/128	824.2	Pass



Test channel	Frequency (MHz)	Result
Highest/251	848.8	Pass



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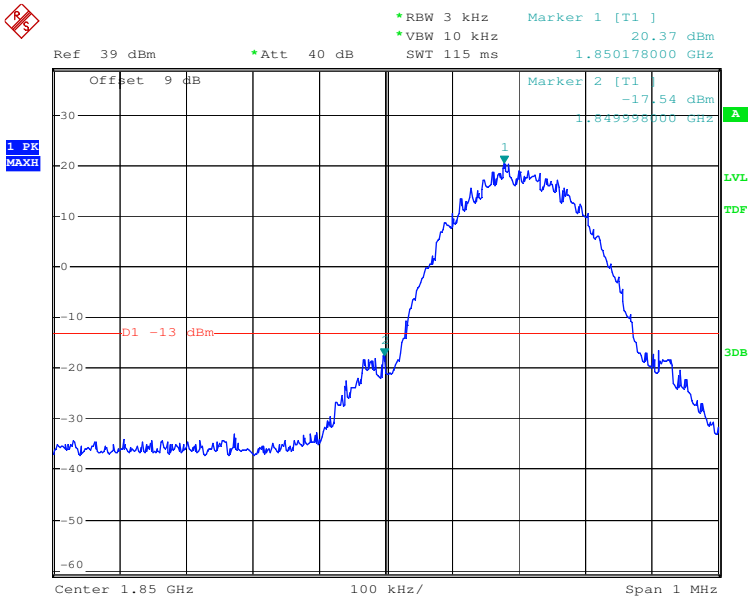
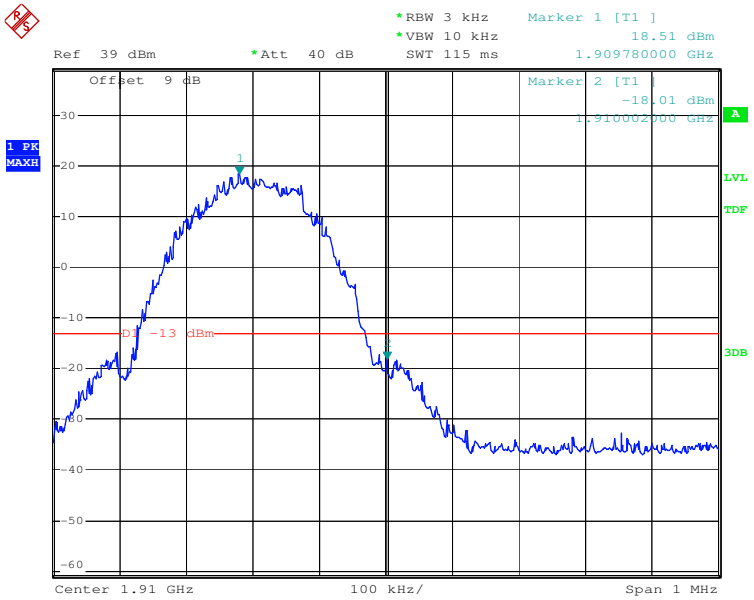
1900		
Test channel	Frequency (MHz)	Result
Lowest/512	1850.2	Pass



Test channel	Frequency (MHz)	Result
Highest/810	1909.8	Pass



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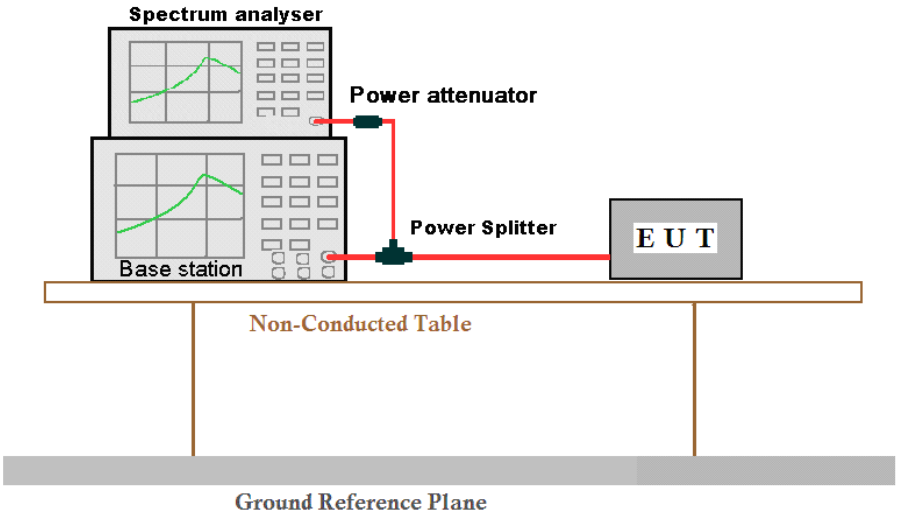
5.5 Spurious emissions at antenna terminals

Test Requirement:	Part 2.1051 and Part 2.1057
Test Method:	ITA-603-D-2010
Test Setup:	
Measurement Procedure:	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.
Instruments Used:	Refer to section 4.10 for details
Limit:	Attenuated at least 43+10log(P)
Test Results:	Pass

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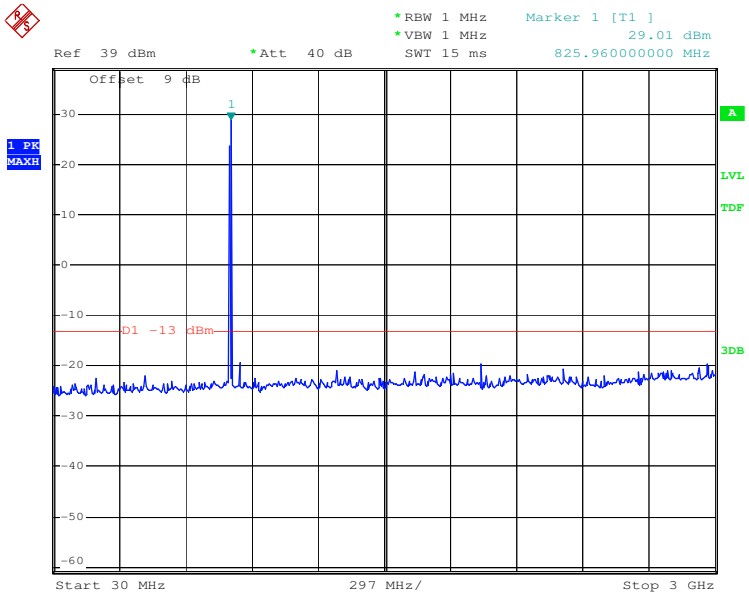
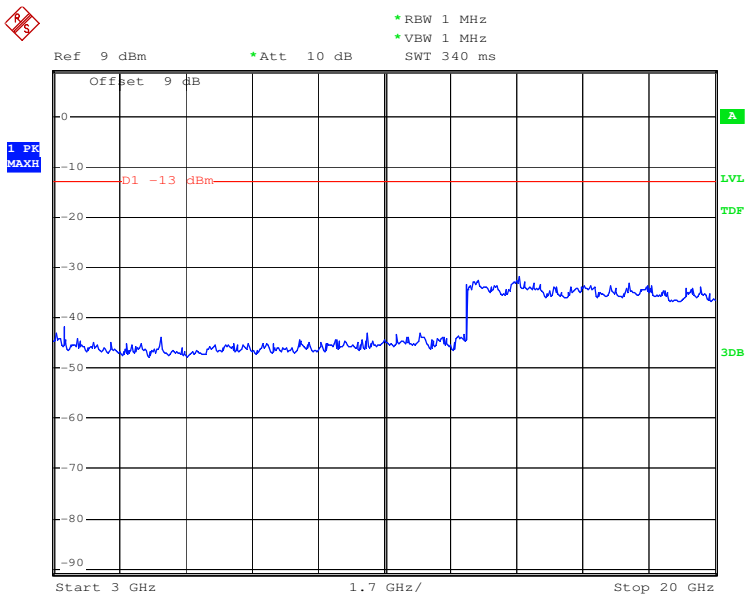
Test plot as follows:

Test mode:	850	Test channel:	Lowest/128	Operation Frequency	824.2MHz





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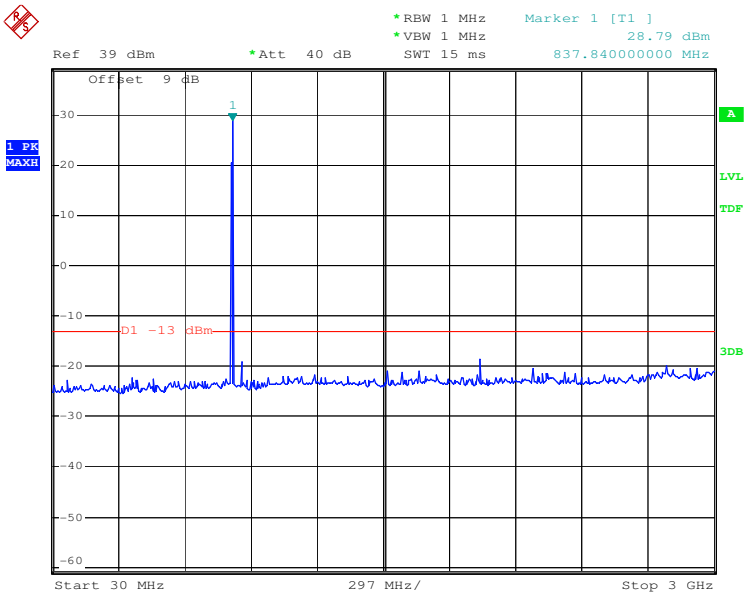
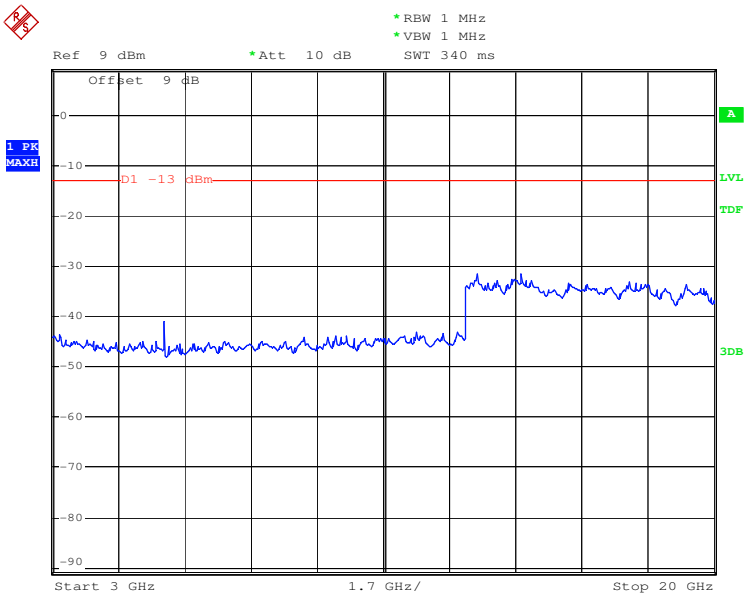
Test mode:	850	Test channel:	Middle/189	Operation Frequency	836.6MHz





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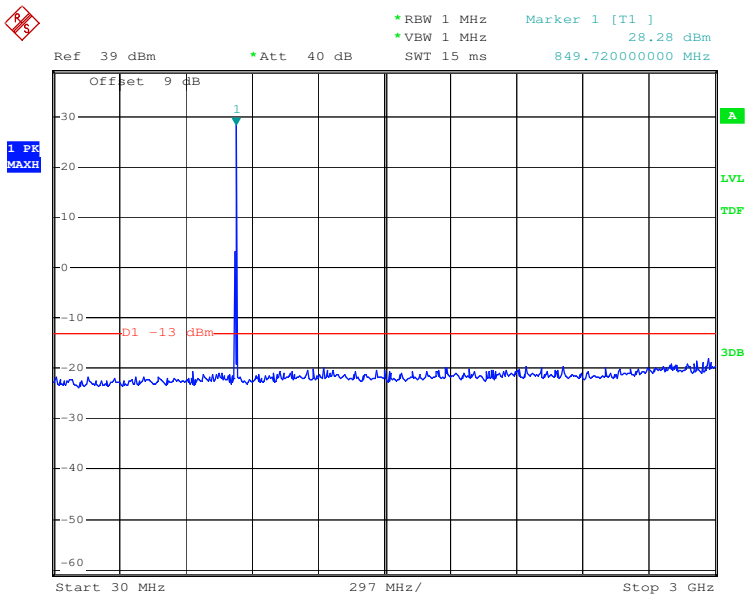
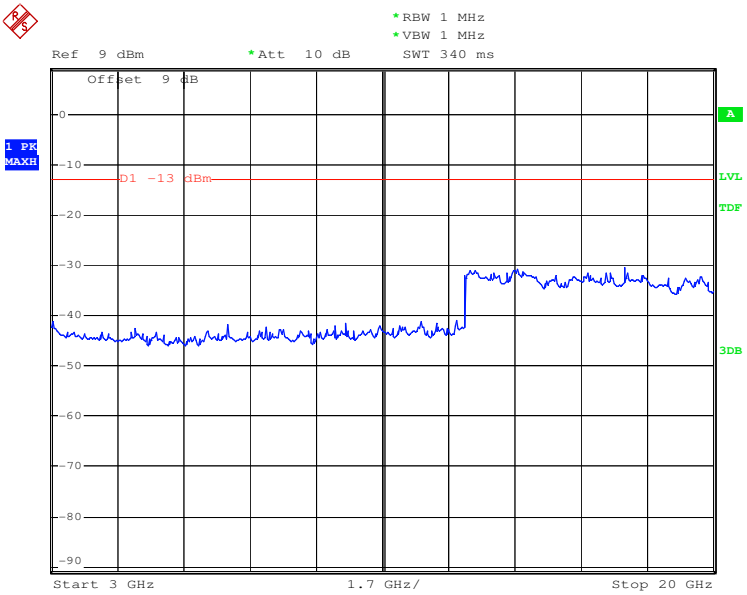
Test mode:	850	Test channel:	High/251	Operation Frequency	848.8MHz





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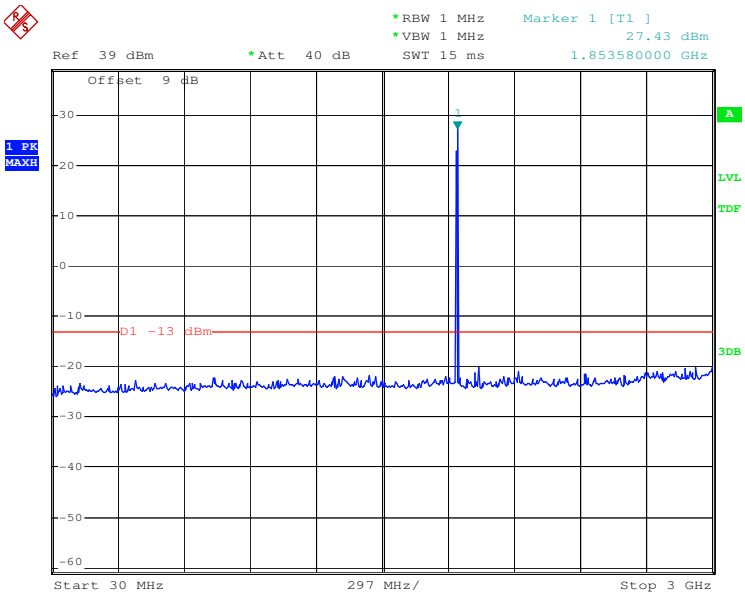
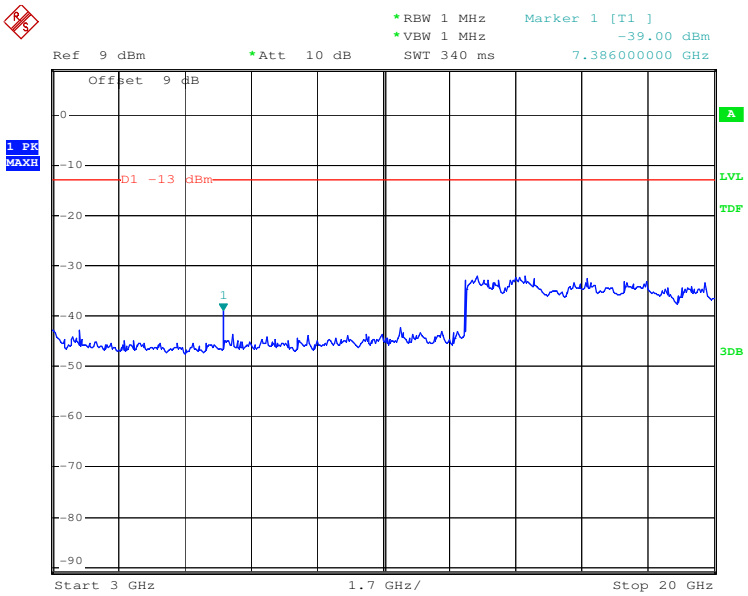
Test mode:	1900	Test channel:	Lowest/512	Operation Frequency	1850.2MHz





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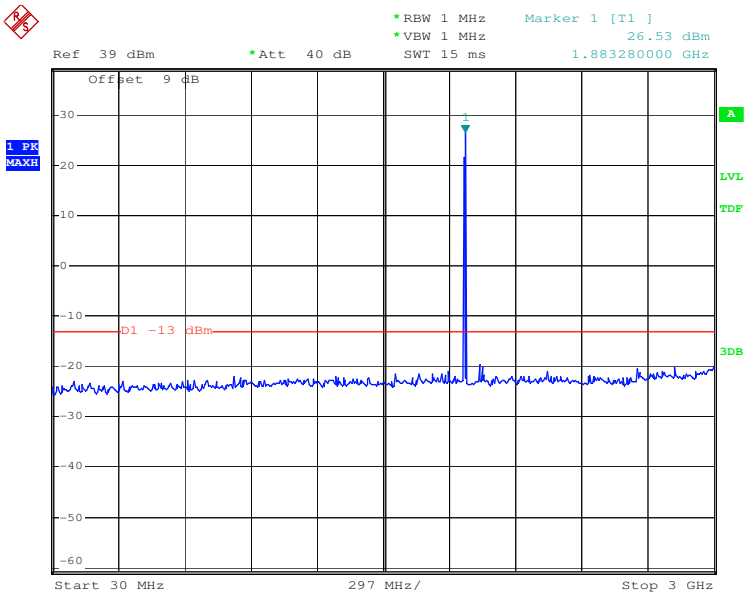
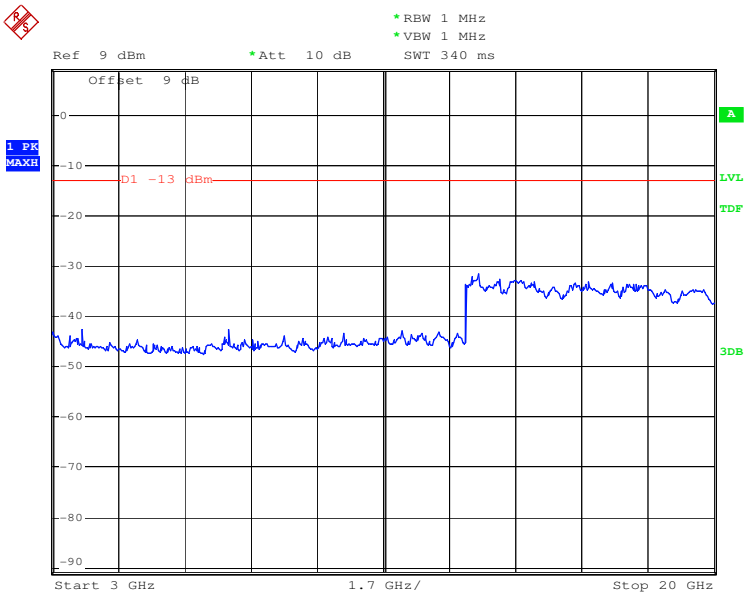
Test mode:	1900	Test channel:	Middle/661	Operation Frequency	1880.0MHz





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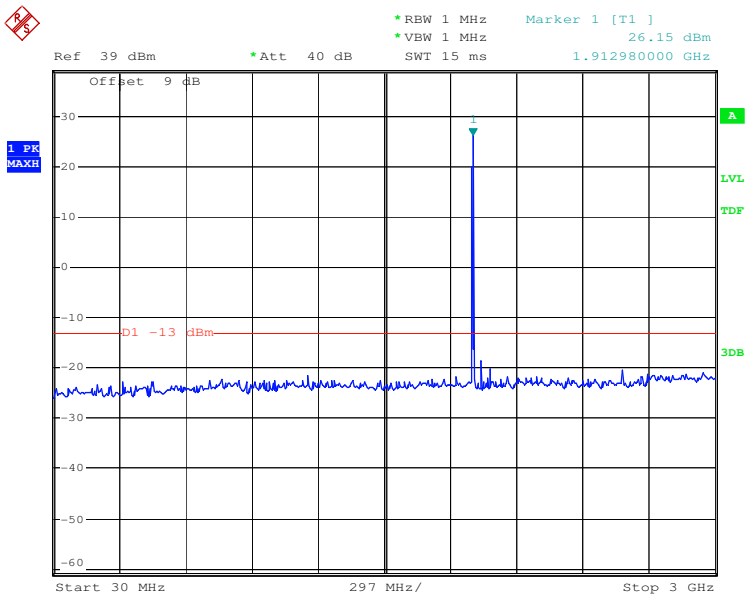
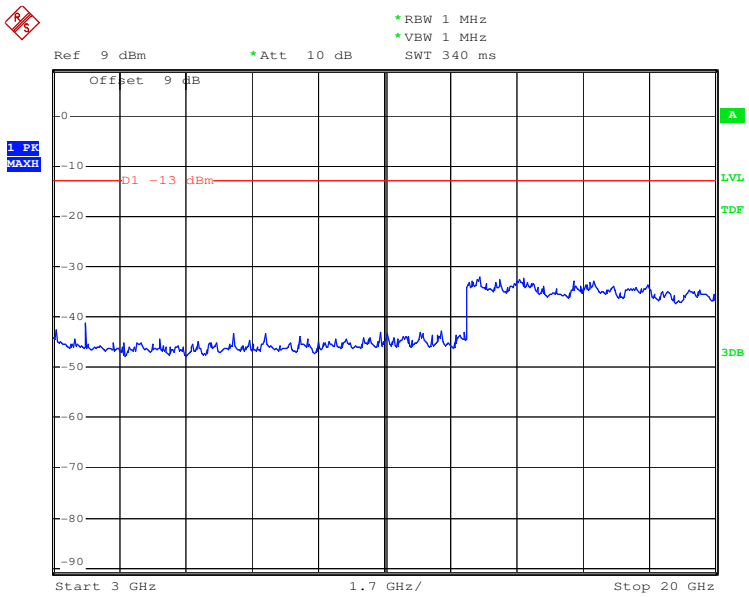
Test mode:	1900	Test channel:	High/810	Operation Frequency	1909.8MHz





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5.6 Field strength of spurious radiation

Test Requirement:	Part 2.1051 and Part 2.1057
Test Method:	ITA-603-D-2010
Receiver Setup:	

Frequency	Detector	RBW	VBW	Remark
30MHz-1GHz	Peak	100kHz	300kHz	Peak Value
Above 1GHz	Peak	1MHz	3MHz	Peak Value

Test Setup:

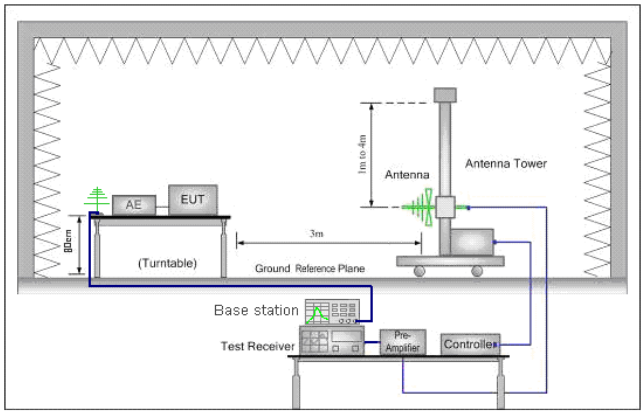

Figure 1. 30MHz to 1GHz

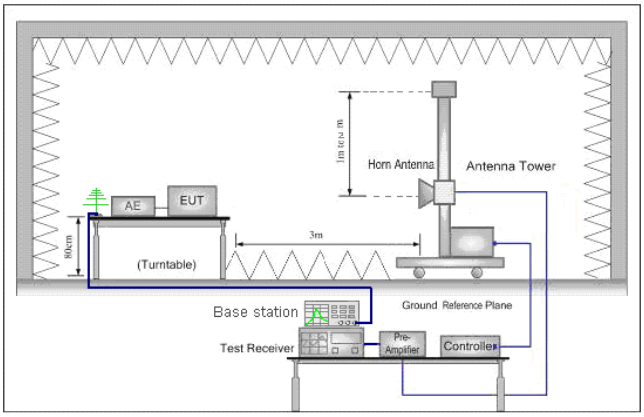

Figure 2. above 1GHz

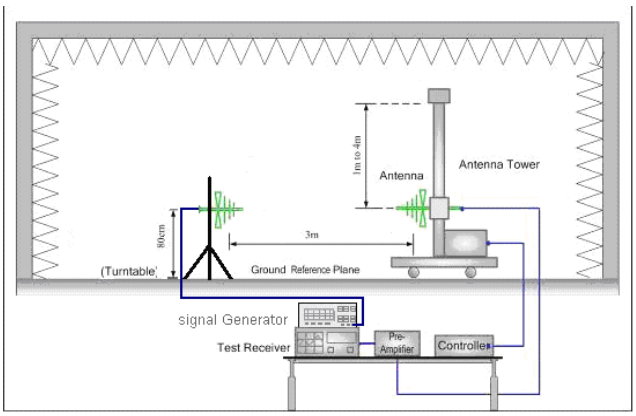

Figure 3. 30MHz to 1GHz

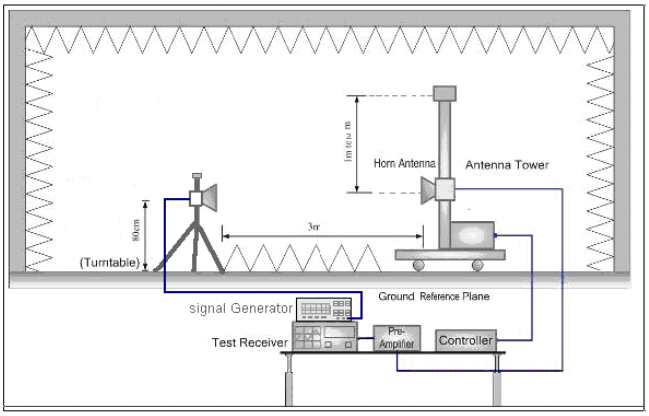

Figure 4. above 1GHz

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Measurement Procedure:	**Below 1GHz test procedure as below:** 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: ERP(dBm) = Pg(dBm) – cable loss (dB) + antenna gain (dBd) where: Pg is the generator output power into the substitution antenna. **Above 1GHz test procedure as below:** 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: EIRP(dBm) = Pg(dBm) – cable loss (dB) + antenna gain (dBi) EIRP=ERP+2.15dB 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.
Instruments Used:	Refer to section 4.10 for details
Limit:	Attenuated at least 43+10log(P)
Test Results:	Pass

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Below 1GHz

850							
128							
Frequency (MHz)	**S.G. Output (dBm)**	**Antenna Gain (dBi)**	**Cable loss (dB)**	**ERP (dBm)**	**Limit (dBm)**	**Antenna polarize**	**Margin (dB)**
47.46	-58.02	-4.60	0.74	-65.51	-13.00	H	-52.51
104.69	-64.92	2.70	1.21	-65.58	-13.00	H	-52.58
201.69	-58.91	8.20	1.40	-54.26	-13.00	H	-41.26
388.9	-53.88	6.00	2.17	-52.20	-13.00	H	-39.20
458.74	-57.65	7.40	2.44	-54.84	-13.00	H	-41.84
709	-55.23	4.20	2.93	-56.11	-13.00	H	-43.11
48.43	-57.19	-4.60	0.77	-64.71	-13.00	V	-51.71
87.23	-58.82	3.00	1.10	-59.07	-13.00	V	-46.07
122.15	-63.52	5.20	1.26	-61.73	-13.00	V	-48.73
175.5	-53.83	6.70	1.36	-50.64	-13.00	V	-37.64
388.9	-57.44	6.00	2.16	-55.75	-13.00	V	-42.75
708.03	-51.10	4.20	2.93	-51.98	-13.00	V	-38.98
189							
Frequency (MHz)	**S.G. Output (dBm)**	**Antenna Gain (dBi)**	**Cable loss (dB)**	**ERP (dBm)**	**Limit (dBm)**	**Antenna polarize**	**Margin (dB)**
47.46	-58.50	-4.60	0.74	-65.99	-13.00	H	-52.99
105.66	-61.64	2.70	1.21	-62.30	-13.00	H	-49.30
175.5	-57.90	6.70	1.36	-54.71	-13.00	H	-41.71
211.39	-59.94	8.60	1.46	-54.95	-13.00	H	-41.95
388.9	-53.42	6.00	2.17	-51.74	-13.00	H	-38.74
568.35	-56.28	3.80	2.67	-57.30	-13.00	H	-44.30
48.43	-59.26	-4.60	0.77	-66.78	-13.00	V	-53.78
102.75	-58.76	2.30	1.21	-59.82	-13.00	V	-46.82
174.53	-56.85	6.70	1.36	-53.66	-13.00	V	-40.66
215.27	-58.45	8.50	1.49	-53.59	-13.00	V	-40.59
378.23	-55.81	6.90	2.14	-53.20	-13.00	V	-40.20
602.3	-56.75	8.10	1.70	-52.50	-13.00	V	-39.50

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251							
Frequency (MHz)	**S.G. Output (dBm)**	**Antenna Gain (dBi)**	**Cable loss (dB)**	**ERP (dBm)**	**Limit (dBm)**	**Antenna polarize**	**Margin (dB)**
47.46	-59.22	-4.60	0.74	-66.71	-13.00	H	-53.71
175.5	-55.76	6.70	1.36	-52.57	-13.00	H	-39.57
191.99	-57.70	8.00	1.39	-53.24	-13.00	H	-40.24
213.33	-59.35	8.50	1.47	-54.47	-13.00	H	-41.47
370.47	-55.93	7.70	2.13	-52.51	-13.00	H	-39.51
459.71	-57.14	7.40	2.49	-54.38	-13.00	H	-41.38
47.46	-57.63	-4.60	0.74	-65.12	-13.00	V	-52.12
102.75	-56.84	2.30	1.21	-57.90	-13.00	V	-44.90
140.58	-60.97	5.50	1.30	-58.92	-13.00	V	-45.92
184.23	-53.58	7.60	1.37	-49.50	-13.00	V	-36.50
214.3	-57.08	8.50	1.49	-52.22	-13.00	V	-39.22
388.9	-55.07	6.00	2.17	-53.39	-13.00	V	-40.39

1900							
512							
Frequency (MHz)	**S.G. Output (dBm)**	**Antenna Gain (dBi)**	**Cable loss (dB)**	**ERP (dBm)**	**Limit (dBm)**	**Antenna polarize**	**Margin (dB)**
48.43	-58.47	-4.60	0.77	-65.99	-13.00	H	-52.99
102.75	-58.70	2.30	1.21	-59.76	-13.00	H	-46.76
140.58	-64.52	5.50	1.31	-62.48	-13.00	H	-49.48
180.35	-60.86	7.40	1.37	-56.98	-13.00	H	-43.98
322.94	-58.03	6.20	1.98	-55.96	-13.00	H	-42.96
459.71	-56.16	7.40	2.45	-53.36	-13.00	H	-40.36
47.46	-58.18	-4.60	0.74	-65.67	-13.00	V	-52.67
102.75	-58.38	2.30	1.21	-59.44	-13.00	V	-46.44
187.14	-61.12	7.60	1.38	-57.05	-13.00	V	-44.05
238.55	-62.47	7.00	1.62	-59.24	-13.00	V	-46.24
373.38	-54.97	7.70	2.13	-51.55	-13.00	V	-38.55
602.3	-54.89	8.10	2.70	-51.64	-13.00	V	-38.64

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661							
Frequency (MHz)	**S.G. Output (dBm)**	**Antenna Gain (dBi)**	**Cable loss (dB)**	**ERP (dBm)**	**Limit (dBm)**	**Antenna polarize**	**Margin (dB)**
47.46	-56.47	-4.60	0.74	-63.96	-13.00	H	-50.96
102.75	-57.38	2.30	1.20	-58.43	-13.00	H	-45.43
140.58	-61.64	5.50	1.30	-59.59	-13.00	H	-46.59
175.5	-56.28	6.70	1.36	-53.09	-13.00	H	-40.09
211.39	-59.76	8.60	1.46	-54.77	-13.00	H	-41.77
373.38	-55.98	7.70	2.13	-52.56	-13.00	H	-39.56
87.23	-61.32	3.00	1.10	-61.57	-13.00	V	-48.57
140.58	-60.44	5.50	1.30	-58.39	-13.00	V	-45.39
175.5	-55.18	6.70	1.36	-51.99	-13.00	V	-38.99
180.35	-55.38	7.40	1.37	-51.50	-13.00	V	-38.50
388.9	-54.67	6.00	2.17	-52.99	-13.00	V	-39.99
602.3	-55.40	8.10	2.70	-52.15	-13.00	V	-39.15
810							
Frequency (MHz)	**S.G. Output (dBm)**	**Antenna Gain (dBi)**	**Cable loss (dB)**	**ERP (dBm)**	**Limit (dBm)**	**Antenna polarize**	**Margin (dB)**
40.67	-54.05	-9.30	0.74	-66.24	-13.00	H	-53.24
102.75	-58.83	2.30	1.21	-59.89	-13.00	H	-46.89
175.5	-56.29	6.70	1.36	-53.10	-13.00	H	-40.10
388.9	-52.66	6.00	2.17	-50.98	-13.00	H	-37.98
459.71	-56.44	7.40	2.45	-53.64	-13.00	H	-40.64
909.79	-55.34	8.10	3.61	-53.00	-13.00	H	-40.00
51.34	-57.26	-3.50	0.80	-63.71	-13.00	V	-50.71
102.75	-58.86	2.30	1.21	-59.92	-13.00	V	-46.92
185.2	-56.74	7.60	1.38	-52.67	-13.00	V	-39.67
215.27	-59.14	8.50	1.49	-54.28	-13.00	V	-41.28
388.9	-55.28	6.00	2.17	-53.60	-13.00	V	-40.60
602.3	-54.86	8.10	2.70	-51.61	-13.00	V	-38.61

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Above 1GHz

850							
128							
Frequency (MHz)	**S.G. Output (dBm)**	**Antenna Gain (dBi)**	**Cable loss (dB)**	**EIRP (dBm)**	**Limit (dBm)**	**Antenna polarize**	**Margin (dB)**
1640.59	-45.63	8.40	5.13	-42.36	-13.00	H	-29.36
3147.748	-51.35	7.10	7.36	-51.61	-13.00	H	-38.61
3971.916	-48.47	6.60	7.89	-49.76	-13.00	H	-36.76
5236.004	-42.18	5.50	11.74	-48.42	-13.00	H	-35.42
6966.265	-43.30	9.70	13.69	-47.29	-13.00	H	-34.29
9332.543	-45.24	14.00	13.64	-44.88	-13.00	H	-31.88
1640.59	-48.05	8.40	5.13	-44.78	-13.00	V	-31.78
3126.079	-52.47	7.10	7.36	-52.73	-13.00	V	-39.73
4395.416	-49.64	6.60	8.96	-52.00	-13.00	V	-39.00
5847.901	-47.57	10.20	13.00	-50.37	-13.00	V	-37.37
6966.265	-45.71	9.70	13.69	-49.70	-13.00	V	-36.70
7550.922	-47.53	10.80	12.81	-49.54	-13.00	V	-36.54
189							
Frequency (MHz)	**S.G. Output (dBm)**	**Antenna Gain (dBi)**	**Cable loss (dB)**	**EIRP (dBm)**	**Limit (dBm)**	**Antenna polarize**	**Margin (dB)**
1671.091	-50.27	8.40	5.05	-46.92	-13.00	H	-33.92
3396.253	-50.82	7.80	7.22	-50.24	-13.00	H	-37.24
4159.106	-47.74	6.60	8.59	-49.73	-13.00	H	-36.73
5188	-41.24	5.50	11.71	-47.45	-13.00	H	-34.45
6966.265	-42.32	9.70	13.74	-46.36	-13.00	H	-33.36
9354.057	-45.81	14.00	13.92	-45.73	-13.00	H	-32.73
1671.091	-44.07	8.40	5.05	-40.72	-13.00	V	-27.72
3589.219	-49.52	7.80	8.44	-50.16	-13.00	V	-37.16
4466.836	-47.46	6.60	8.86	-49.72	-13.00	V	-36.72
5584.702	-42.02	6.60	12.72	-48.14	-13.00	V	-35.14
7430.191	-45.14	10.80	12.68	-47.02	-13.00	V	-34.02
8933.055	-46.65	13.80	13.30	-46.15	-13.00	V	-33.15

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251							
Frequency (MHz)	**S.G. Output (dBm)**	**Antenna Gain (dBi)**	**Cable loss (dB)**	**EIRP (dBm)**	**Limit (dBm)**	**Antenna polarize**	**Margin (dB)**
1698.244	-47.98	8.40	5.05	-44.63	-13.00	H	-31.63
3013.006	-52.74	7.10	6.68	-52.32	-13.00	H	-39.32
3890.451	-49.29	6.60	7.89	-50.58	-13.00	H	-37.58
5035.006	-45.61	5.50	9.80	-49.91	-13.00	H	-36.91
6516.284	-41.99	9.20	13.73	-46.52	-13.00	H	-33.52
7481.695	-44.55	10.80	12.77	-46.52	-13.00	H	-33.52
1185.769	-57.89	5.50	4.33	-56.72	-13.00	V	-43.72
1698.244	-45.99	8.40	5.05	-42.64	-13.00	V	-29.64
3715.352	-50.88	7.80	7.40	-50.48	-13.00	V	-37.48
5093.309	-43.49	5.50	10.83	-48.82	-13.00	V	-35.82
6397.348	-41.81	9.20	14.41	-47.02	-13.00	V	-34.02
8749.838	-46.55	13.30	13.10	-46.35	-13.00	V	-33.35

1900							
512							
Frequency (MHz)	**S.G. Output (dBm)**	**Antenna Gain (dBi)**	**Cable loss (dB)**	**EIRP (dBm)**	**Limit (dBm)**	**Antenna polarize**	**Margin (dB)**
2790.113	-48.70	6.80	6.42	-48.32	-13.00	H	-35.32
3757.637	-45.53	7.80	7.51	-45.24	-13.00	H	-32.24
5031.499	-39.40	5.50	9.80	-43.70	-13.00	H	-30.70
7454.429	-39.41	10.80	12.77	-41.38	-13.00	H	-28.38
9475.497	-40.50	14.00	13.66	-40.16	-13.00	H	-27.16
11533.48	-29.54	11.00	16.45	-34.99	-13.00	H	-21.99
3025.306	-47.49	7.10	6.68	-47.07	-13.00	V	-34.07
3714.443	-45.04	7.80	7.40	-44.64	-13.00	V	-31.64
5031.499	-39.83	5.50	9.80	-44.13	-13.00	V	-31.13
6698.373	-38.15	9.20	13.32	-42.27	-13.00	V	-29.27
8248.005	-41.42	12.60	12.33	-41.15	-13.00	V	-28.15
10068.45	-37.17	13.30	14.36	-38.23	-13.00	V	-25.23

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661							
Frequency (MHz)	**S.G. Output (dBm)**	**Antenna Gain (dBi)**	**Cable loss (dB)**	**EIRP (dBm)**	**Limit (dBm)**	**Antenna polarize**	**Margin (dB)**
1877.8	-54.20	9.20	5.50	-50.50	-13.00	H	-37.50
3598.203	-45.34	7.80	8.44	-45.98	-13.00	H	-32.98
5209.075	-36.94	5.50	11.71	-43.15	-13.00	H	-30.15
6698.373	-37.62	9.20	13.32	-41.74	-13.00	H	-28.74
8943.274	-40.31	13.80	13.30	-39.81	-13.00	H	-26.81
11975.1	-29.88	13.30	16.45	-33.03	-13.00	H	-20.03
1877.8	-53.24	9.20	5.50	-49.54	-13.00	V	-36.54
3096.075	-46.72	7.10	7.55	-47.17	-13.00	V	-34.17
4039.212	-43.27	6.60	8.11	-44.78	-13.00	V	-31.78
5519.072	-37.22	6.60	12.36	-42.98	-13.00	V	-29.98
7015.42	-38.08	9.70	13.74	-42.12	-13.00	V	-29.12
10885.67	-35.71	12.60	14.36	-37.47	-13.00	V	-24.47
810							
Frequency (MHz)	**S.G. Output (dBm)**	**Antenna Gain (dBi)**	**Cable loss (dB)**	**EIRP (dBm)**	**Limit (dBm)**	**Antenna polarize**	**Margin (dB)**
1883.236	-55.12	9.20	5.50	-51.42	-13.00	H	-38.42
3159.355	-47.16	7.10	7.03	-47.09	-13.00	H	-34.09
4469.214	-41.53	5.50	8.86	-44.89	-13.00	H	-31.89
6340.436	-36.09	9.20	14.44	-41.33	-13.00	H	-28.33
8368.069	-42.42	13.30	13.06	-42.18	-13.00	H	-29.18
10545.01	-34.78	12.60	15.16	-37.34	-13.00	H	-24.34
1390.276	-55.57	8.40	4.45	-51.62	-13.00	V	-38.62
3123.039	-46.42	7.10	7.55	-46.87	-13.00	V	-33.87
4133.699	-43.61	6.60	8.09	-45.10	-13.00	V	-32.10
5780.3	-35.12	6.60	12.97	-41.49	-13.00	V	-28.49
7454.429	-38.86	10.80	12.77	-40.83	-13.00	V	-27.83
9502.925	-39.11	14.00	13.66	-38.77	-13.00	V	-25.77

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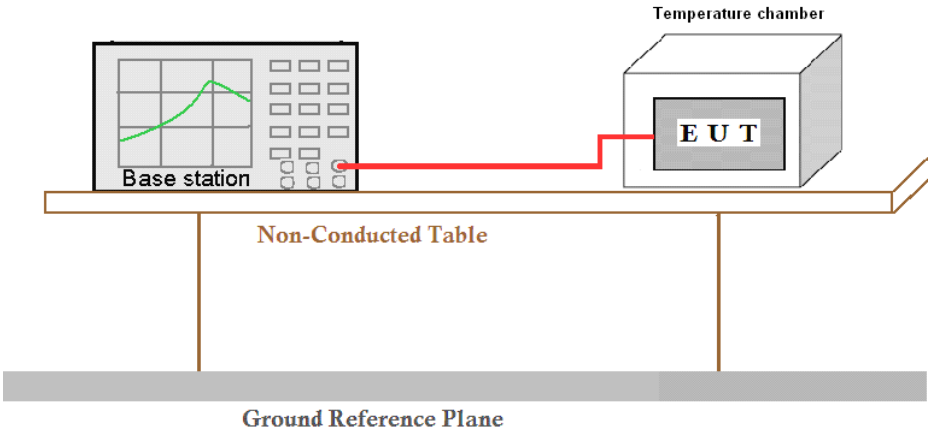
5.7 Frequency stability

Test Requirement:	Part 2.1055
Test Method:	ITA-603-D-2010
Test Setup:	
Measurement Procedure:	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 place in the temperature chamber, the DC leads and RF output cable exited the chamber though an opening made for that purpose. After Operate the equipment in standby conditions for 15 minutes before proceeding. The temperature was varied from -30℃ to +50℃ at intervals of not more than 10℃ The frequency stability was read from the base station at 25℃ the input voltage was varied +/-15%, the frequency stability and input voltage was record.
Instruments Used:	Refer to section 4.10 for details
Limit:	Operation Band: Frequency stability Limit(ppm) GSM/GPRS/EDGE/WCDMA 850: ±2.5ppm GSM/GPRS/EDGE/WCDMA 1900: ---
Test Results:	Pass

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Reference Frequency: Low channel 824.2MHz@ 25 degree

Limit: +/- 2.5ppm = +/-2060.5Hz

Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature(degree)	(MHz)		
12.0	-30	824.199954	46	+/-2060.5
12.0	-20	824.199936	64	+/-2060.5
12.0	-10	824.199958	42	+/-2060.5
12.0	10	824.199969	31	+/-2060.5
12.0	20	824.199973	27	+/-2060.5
12.0	30	824.199962	38	+/-2060.5
12.0	40	824.199943	57	+/-2060.5
12.0	50	824.199959	41	+/-2060.5

Reference Frequency: Mid channel 836.4MHz@ 25 degree

Limit: +/- 2.5ppm = +/-2091Hz

Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature(degree)	(MHz)		
12.0	-30	836.399951	49	+/-2091
12.0	-20	836.399946	54	+/-2091
12.0	-10	836.399952	48	+/-2091
12.0	10	836.399967	33	+/-2091
12.0	20	836.399950	50	+/-2091
12.0	30	836.399966	34	+/-2091
12.0	40	836.399929	71	+/-2091
12.0	50	836.399934	66	+/-2091

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Reference Frequency: High channel 848.8MHz@ 25 degree

Limit: +/- 2.5ppm = +/-2122Hz

Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature(degree)	(MHz)		
12.0	-30	848.799947	53	+/-2122
12.0	-20	848.799953	47	+/-2122
12.0	-10	848.799971	29	+/-2122
12.0	10	848.799952	48	+/-2122
12.0	20	848.799938	62	+/-2122
12.0	30	848.799962	38	+/-2122
12.0	40	848.799958	42	+/-2122
12.0	50	848.799939	61	+/-2122

Reference Frequency: Low channel 1850.2MHz@ 25 degree

Limit: N/A

Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature(degree)	(MHz)		
12.0	-30	1850.199961	39	N/A
12.0	-20	1850.199957	43	N/A
12.0	-10	1850.199955	45	N/A
12.0	10	1850.199962	38	N/A
12.0	20	1850.199954	46	N/A
12.0	30	1850.199942	52	N/A
12.0	40	1850.199958	42	N/A
12.0	50	1850.199935	65	N/A

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Reference Frequency: Mid channel 1880MHz@ 25 degree

Limit: N/A

Power Supply	Environment	Frequency	Delta	Limit
Vdc	Temperature(degree)	(MHz)	(Hz)	(Hz)
12.0	-30	1879.999966	34	N/A
12.0	-20	1879.999972	28	N/A
12.0	-10	1879.999944	56	N/A
12.0	10	1879.999962	38	N/A
12.0	20	1879.999973	27	N/A
12.0	30	1879.999969	31	N/A
12.0	40	1879.999981	19	N/A
12.0	50	1879.999946	54	N/A

Reference Frequency: High channel 1909.8MHz@ 25 degree

Limit: N/A

Power Supply	Environment	Frequency	Delta	Limit
Vdc	Temperature(degree)	(MHz)	(Hz)	(Hz)
12.0	-30	1909.799963	37	N/A
12.0	-20	1909.799977	23	N/A
12.0	-10	1909.799936	64	N/A
12.0	10	1909.799948	52	N/A
12.0	20	1909.799965	35	N/A
12.0	30	1909.799971	29	N/A
12.0	40	1909.799969	31	N/A
12.0	50	1909.799952	48	N/A

Reference Frequency: Low channel 824.2MHz

Limit: +/- 2.5ppm = +/-2060.5Hz

Power Supply	Environment	Frequency	Delta	Limit
Vdc	Temperature(degree)	(MHz)	(Hz)	(Hz)
15.0	25	824.200008	08	+/-2060.5
12.0	25	824.200053	53	+/-2060.5
6.0 (Endpoint)	25	824.200029	29	+/-2060.5

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Reference Frequency: Mid channel 836.4MHz				
Limit: +/- 2.5ppm = +/-2091Hz				
Power Supply	Environment	Frequency	Delta	Limit
Vdc	Temperature(degree)	(MHz)	(Hz)	(Hz)
15.0	25	836.400038	38	+/-2091
12.0	25	836.400057	57	+/-2091
6.0 (Endpoint)	25	836.400046	46	+/-2091
Reference Frequency: High channel 848.8MHz				
Limit: +/- 2.5ppm = +/-2122Hz				
Power Supply	Environment	Frequency	Delta	Limit
Vdc	Temperature(degree)	(MHz)	(Hz)	(Hz)
15.0	25	848.800072	72	+/-2122
12.0	25	848.800033	33	+/-2122
6.0 (Endpoint)	25	848.800046	46	+/-2122

Reference Frequency: Low channel 1850.2MHz				
Limit: N/A				
Power Supply	Environment	Frequency	Delta	Limit
Vdc	Temperature(degree)	(MHz)	(Hz)	(Hz)
15.0	25	1850.200015	15	N/A
12.0	25	1850.200062	62	N/A
6.0 (Endpoint)	25	1850.200048	48	N/A

Reference Frequency: Mid channel 1880MHz				
Limit: N/A				
Power Supply	Environment	Frequency	Delta	Limit
Vdc	Temperature(degree)	(MHz)	(Hz)	(Hz)
15.0	25	1880.000039	39	N/A
12.0	25	1880.000052	52	N/A
6.0 (Endpoint)	25	1880.000062	62	N/A

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Reference Frequency: High channel 1909.8MHz				
Limit: N/A				
Power Supply	Environment	Frequency	Delta	Limit
Vdc	Temperature(degree)	(MHz)	(Hz)	(Hz)
15.0	25	1909.800042	42	N/A
12.0	25	1909.800035	35	N/A
6.0 (Endpoint)	25	1909.800022	22	N/A

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