



FCC 47 CFR PART 22H and 24E

Test Report

Product Type : Media Gateway
Applicant : MobiRoam Pty Ltd
Address : 5 Learoyd Street, Mt Lawley, Perth, Australia
Trade Name : SmartBox
Model Number : PMG-005
Test Specification : FCC 47 CFR PART 22H: Oct, 2012
FCC 47 CFR PART 24E: Oct, 2012
ANSI/TIA-603-C-2004

Application Purpose : Original
Receive Date : December 09, 2014
Test Period : December 15, 2014 to January 19, 2015
Issue Date : January 27, 2015

Issue by

A Test Lab Techno Corp.
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Taiwan Accreditation Foundation accreditation number: 1330

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Revision History

Rev.	Issue Date	Revisions	Revised By
00	January 27, 2015	Initial Issue	



Verification of Compliance

Issued Date: 01/27/2015

Product Type : Media Gateway
Applicant : MobiRoam Pty Ltd
Address : 5 Learoyd Street, Mt Lawley, Perth, Australia
Trade Name : SmartBox
Model Number : PMG-005
FCC ID : 2ADXTPMG-005
EUT Rated Voltage : DC 5.0V, 2.0A
Test Voltage : 120 Vac / 60 Hz
Applicable Standard : FCC 47 CFR PART 22H: Oct, 2012
FCC 47 CFR PART 24E: Oct, 2012
ANSI/TIA-603-C-2004
Application Purpose : Original
Test Result : Complied
Performing Lab. : A Test Lab Techno Corp.
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Taiwan Accreditation Foundation accreditation number: 1330
<http://www.atl-lab.com.tw/e-index.htm>



The above equipment was tested by A Test Lab Techno Corp. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4: 2009 and the energy emitted by the sample tested as described in this report is in compliance with the requirements of FCC Rules Part 22H, Part 24E.

The test results of this report relate only to the tested sample identified in this report.

Approved By

(Manager)

(Murphy Wang)

Reviewed By

(Testing Engineer)

(Fly Lu)



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1 General Information

1.1. EUT Description

Applicant	MobiRoam Pty Ltd			
Applicant Address	5 Learoyd Street, Mt Lawley, Perth, Australia			
Manufacturer	Dongguan Branch of Shenzhen StrongRising Electronics Co.,Ltd			
Manufacturer Address	Qingping Road No.2 Qinghutou Village Tangxia Town,Dongguan city,Guangdong Province, China			
Product Type	Media Gateway			
Trade Name	SmartBox			
Model Number	PMG-005			
FCC ID	2ADXTPMG-005			
IMEI No.	359769022304908			
GPRS/EGPRS	Band	UL Frequency (MHz)	DL Frequency (MHz)	Modulation
	850	824.2 ~ 848.8	869.2 ~ 893.8	GMSK/8PSK
	1900	1850.2 ~ 1909.8	1930.2 ~ 1989.8	GMSK/8PSK
Channel Control	Auto			
Type of Antenna	PIFA Antenan			
Max. RF Output power	GPRS 850	:	32.93 dBm /	1.963 W
	EGPRS 850	:	29.94 dBm /	0.986 W
	GPRS 1900	:	29.49 dBm /	0.889 W
	EGPRS 1900	:	30.02 dBm /	1.005 W
Max. ERP/EIRP	GPRS 850	:	29.40 dBm /	0.871 W
	EGPRS 850	:	26.74 dBm /	0.472 W
	GPRS 1900	:	27.30 dBm /	0.537 W
	EGPRS 1900	:	25.52 dBm /	0.356 W
Emission Designator	GPRS 850	:	247KGXW	
	EGPRS 850	:	249KG7W	
	GPRS 1900	:	244KGXW	
	EGPRS 1900	:	249KG7W	



1.2. Mode of Operation

ATL has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Test Mode
Mode 1: GPRS 850 Link Mode
Mode 2: GPRS 1900 Link Mode
Mode 3: EGPRS 850 Link Mode
Mode 4: EGPRS 1900 Link Mode
--

Note: Regards to the frequency band operation: the lowest, middle and highest frequency of channel were selected to perform the test, then shown on this report.

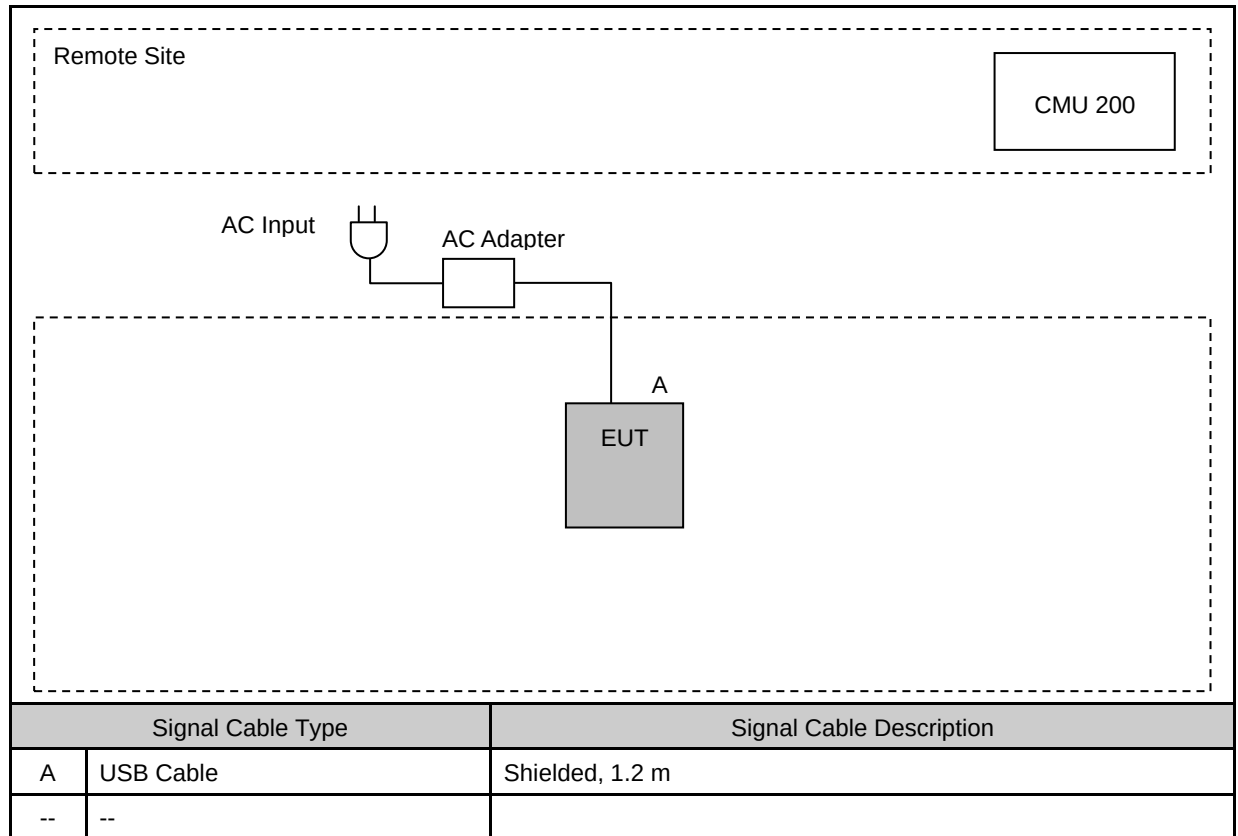
By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that "X axis" position was the worst, then the final test was executed the worst condition and test data were recorded in this report.

1.3. EUT Exercise Software

1	Setup the EUT and Base Station (CMU200) as shown on 1.4.
2	Turn on the power of all equipment.



1.4. Configuration of Test System Details



Devices Description				
Product	Manufacturer	Model Number	Serial Number	Power Cord
1.	-----	-----	-----	-----

1.5. Test Site Environment

Items	Required (IEC 60068-1)	Actual
Temperature (°C)	15-35	26
Humidity (%RH)	25-75	60
Barometric pressure (mbar)	860-1060	950



1.6. Summary of Test Result

Description	FCC Rule	Limit	Result
Conducted Output Power	§2.1046	N/A	Pass
Effective Radiated Power	§22.913(a)(2)	< 7 Watts for FCC (<6.3 Watts for IC)	Pass
Equivalent Isotropic Radiated Power	§24.232(c)	< 2 Watts	Pass
Emission Bandwidth & Occupied Bandwidth	§2.1049 §22.917(a) §24.238(a)	N/A	Pass
Band Edge Measurement	§2.1051 §22.917(a) §24.238(a)	$< 43 + 10\log_{10}(P[\text{Watts}])$	Pass
Conducted Spurious Emission	§2.1051 §22.917(a) §24.238(a)	$< 43 + 10\log_{10}(P[\text{Watts}])$	Pass
Field Strength of Spurious Radiation	§2.1053 §22.917(a) §24.238(a)	$< 43 + 10\log_{10}(P[\text{Watts}])$	Pass
Frequency Stability for Temperature & Voltage	§2.1055 §22.355 §24.235	< 2.5 ppm	Pass



2 RF Output Power Test

2.1. Limit

N/A

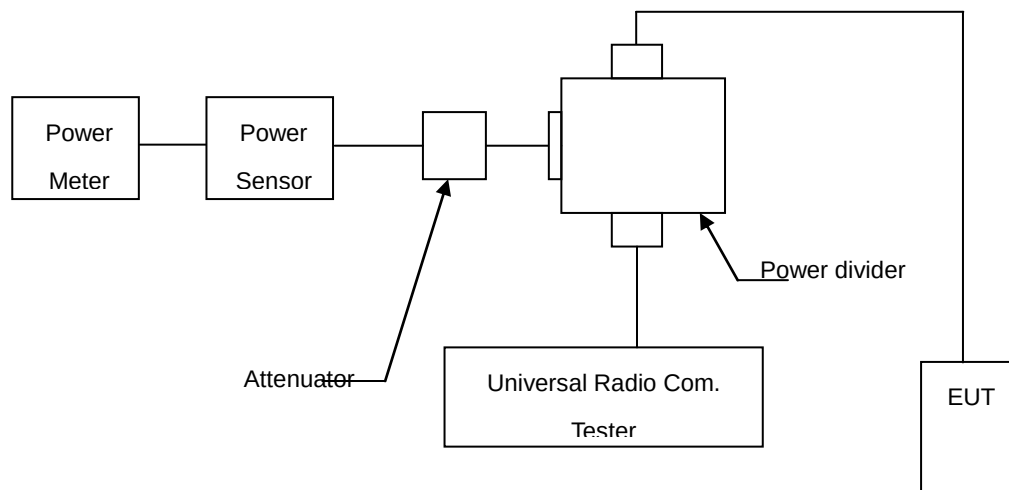
2.2. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Universal Radio Communication Tester	R & S	CMU200	109369	08/07/2014	(1)
Single Channel PK Power Sensor	Agilent	N1911A	MY45101619	12/21/2014	(1)
Wideband Power Meter	Agilent	N1921A	MY45241957	12/21/2014	(1)
RF cable	WOKEN	--	S02-140512-011	07/14/2014	(1)
RF cable	WOKEN	--	S02-140512-018	07/14/2014	(1)
RF cable	WOKEN	--	S02-140428-045	07/14/2014	(1)
RF cable	WOKEN	--	S02-140428-049	07/14/2014	(1)
RF cable	WOKEN	--	S02-140428-041	07/14/2014	(1)
Test Site	ATL	TE05	TE05	N.C.R.	-----

Remark: ⁽¹⁾ Calibration period 1 year. ⁽²⁾ Calibration period 2 years.

Note: N.C.R. = No Calibration Request.

2.3. Test Setup



2.4. Test Procedure

The measurement is made according to ANSI/TIA-603-C-2004 as follows:

1. The transmitter output was connected to power meter and base station through Power Divider.
2. Set base station for EUT at GSM 850: PCL=5 and PCS 1900: PCL=0.



3. Set base station for EUT at WCDMA Band V and WCDMA Band II, power level was set to maximum.
4. Select lowest, middle, and highest channels for each band.

2.5. Uncertainty

The measurement uncertainty is defined as for RF output power measurement is 1.2 dB.

2.6. Test Result

Model Number	PMG-005						
Test Item	RF Output Power						
Date of Test	01/09/2015			Test Site		TE05	
Bands	Modulation Type	Data Rate	Frequency (MHz)	Burst Average Power		Peak Power	
				(dBm)	(W)	(dBm)	(W)
GRRS 850 Multi Class :33 Max Up:4 Max Down:5 Sum:6	GMSK	4Down1Up (Duty Factor 1/8)	824.2	32.53	1.791	32.73	1.875
			836.6	32.74	1.879	32.93	1.963
			848.8	32.61	1.824	32.79	1.901
		3Down2Up (Duty Factor 2/8)	824.2	31.01	1.262	31.21	1.321
			836.6	31.22	1.324	31.41	1.384
			848.8	31.09	1.285	31.27	1.340
		2Down3Up (Duty Factor 3/8)	824.2	29.53	0.897	29.73	0.940
			836.6	29.74	0.942	29.93	0.984
			848.8	29.61	0.914	29.79	0.953
		1Down4Up (Duty Factor 4/8)	824.2	27.94	0.622	28.14	0.652
			836.6	28.15	0.653	28.34	0.682
			848.8	28.02	0.634	28.2	0.661
EGPRS 850 Multi Class :33 Max Up:4 Max Down:5 Sum:6	8PSK	4Down1Up (Duty Factor 1/8)	824.2	26.68	0.466	29.86	0.968
			836.6	26.73	0.471	29.94	0.986
			848.8	26.58	0.455	29.74	0.942
		3Down2Up (Duty Factor 2/8)	824.2	24.65	0.292	27.83	0.607
			836.6	24.70	0.295	27.91	0.618
			848.8	24.55	0.285	27.71	0.590
		2Down3Up (Duty Factor 3/8)	824.2	22.99	0.199	26.17	0.414
			836.6	23.04	0.201	26.25	0.422
			848.8	22.89	0.195	26.05	0.403
		1Down4Up (Duty Factor 4/8)	824.2	21.34	0.136	24.52	0.283
			836.6	21.39	0.138	24.6	0.288
			848.8	21.24	0.133	24.4	0.275

Note: The peak power testing result was used peak detector.



Model Number	PMG-005						
Test Item	RF Output Power						
Date of Test	01/09/2015			Test Site		TE05	
Bands	Modulation Type	Data Rate	Frequency (MHz)	Burst Average Power		Peak Power	
				(dBm)	(W)	(dBm)	(W)
GRRS 1900 Multi Class :33 Max Up:4 Max Down:5 Sum:6	GMSK	4Down1Up (Duty Factor 1/8)	1850.20	29.31	0.853	29.49	0.889
			1880.00	29.16	0.824	29.31	0.853
			1909.80	29.08	0.809	29.22	0.836
		3Down2Up (Duty Factor 2/8)	1850.20	27.94	0.622	28.12	0.649
			1880.00	27.79	0.601	27.94	0.622
			1909.80	27.72	0.592	27.86	0.611
		2Down3Up (Duty Factor 3/8)	1850.20	26.31	0.428	26.49	0.446
			1880.00	26.22	0.419	26.37	0.434
			1909.80	26.09	0.406	26.23	0.420
		1Down4Up (Duty Factor 4/8)	1850.20	24.98	0.315	25.16	0.328
			1880.00	24.85	0.305	25.00	0.316
			1909.80	24.68	0.294	24.82	0.303
EGPRS 1900 Multi Class :33 Max Up:4 Max Down:5 Sum:6	8PSK	4Down1Up (Duty Factor 1/8)	1850.20	26.75	0.473	29.93	0.984
			1880.00	26.83	0.482	30.02	1.005
			1909.80	26.58	0.455	29.72	0.938
		3Down2Up (Duty Factor 2/8)	1850.20	24.69	0.294	27.87	0.612
			1880.00	24.78	0.301	27.97	0.627
			1909.80	24.58	0.287	27.72	0.592
		2Down3Up (Duty Factor 3/8)	1850.20	23.34	0.216	26.52	0.449
			1880.00	23.51	0.224	26.7	0.468
			1909.80	23.16	0.207	26.3	0.427
		1Down4Up (Duty Factor 4/8)	1850.20	22.35	0.172	25.53	0.357
			1880.00	22.46	0.176	25.65	0.367
			1909.80	22.17	0.165	25.31	0.340

Note: The peak power testing result was used peak detector.



3 Effective Radiated Power / Equivalent Isotropic Radiated Power Test

3.1. Limit

For FCC Part 22.913(a)(2): The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

For FCC Part 24.232(b): The EIRP of mobile transmitters and auxiliary test transmitters must not exceed 2 Watts.

3.2. Test Instruments

3 Meter Chamber (966-A)					
Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
RF Pre-selector	Agilent	N9039A	MY46520256	01/10/2015	(1)
Spectrum Analyzer	Agilent	E4446A	MY46180578	01/10/2015	(1)
Pre Amplifier	Agilent	8449B	3008A02237	02/21/2014	(1)
Pre Amplifier	Agilent	8447D	2944A10961	02/21/2014	(1)
Broadband Antenna (30MHz~1GHz)	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	9163-270	07/16/2014	(1)
Horn Antenna (1~18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	9120D-550	06/10/2014	(1)
Horn Antenna (18~40GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9170	9170-320	06/13/2014	(1)
RF cable	WOKEN	--	S02-140409-026	07/14/2014	(1)
RF cable	WOKEN	--	S02-140409-027	07/14/2014	(1)
RF cable	WOKEN	--	S02-140409-028	07/14/2014	(1)
RF cable	WOKEN	--	S02-140409-052	07/14/2014	(1)
Test Site	ATL	TE01	888001	08/28/2014	(1)

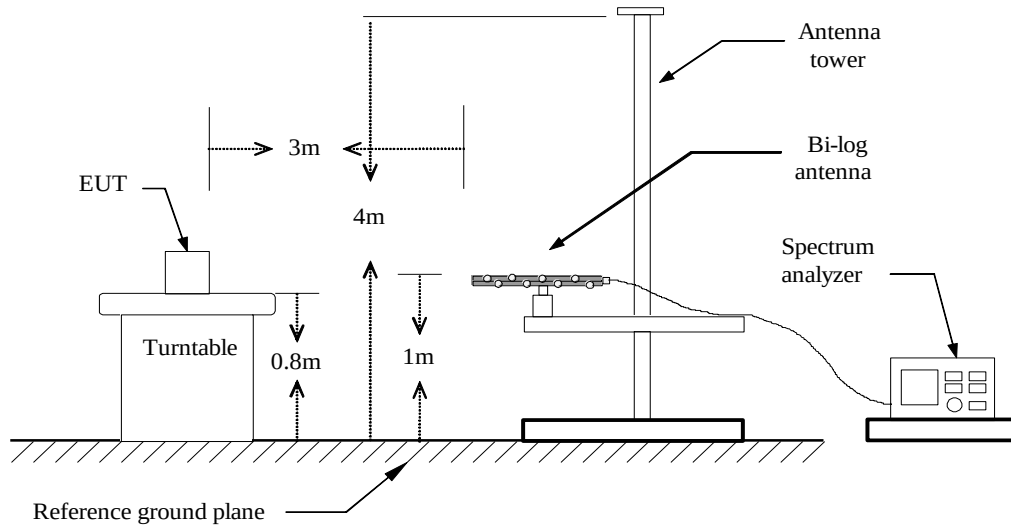
3 Meter Chamber (966-B)					
Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY46181986	05/16/2014	(1)
Amplifier	Mini-Circuits	ZKL-1R5+	N/A	05/29/2014	(1)
Amplifier	Mini-Circuits	ZVA-213-S+	N/A	05/29/2014	(1)
RF Pre-selector	Agilent	N9039A	MY46520255	05/10/2014	(1)
Trilog-Broadband Antenna	SCHWARZBECK MESS-ELEKTRONIK	SB AC VULB	9168-419	05/16/2014	(1)
Double-Ridged Waveguide Horn	ETS-Lindgren	3117	00128055	08/09/2014	(1)
RF cable	WOKEN	--	S02-140512-09	07/14/2014	(1)
RF cable	WOKEN	--	S02-140512-021	07/14/2014	(1)
RF cable	WOKEN	--	S02-140512-022	07/14/2014	(1)
Test Site	ATL	TE09	TE09	05/11/2014	(1)

Remark: ⁽¹⁾ Calibration period 1 year. ⁽²⁾ Calibration period 2 years.

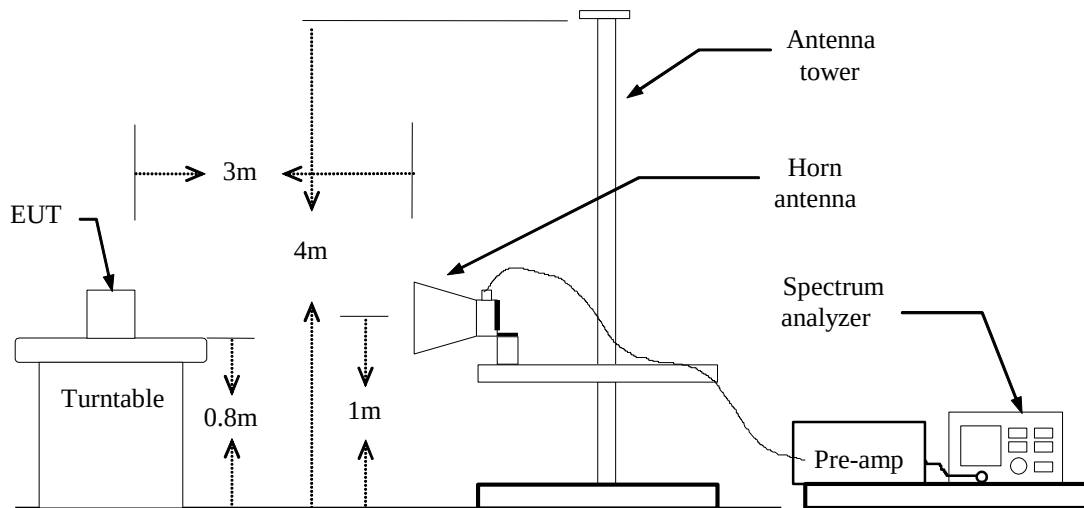
Note: N.C.R. = No Calibration Request.

3.3. Setup

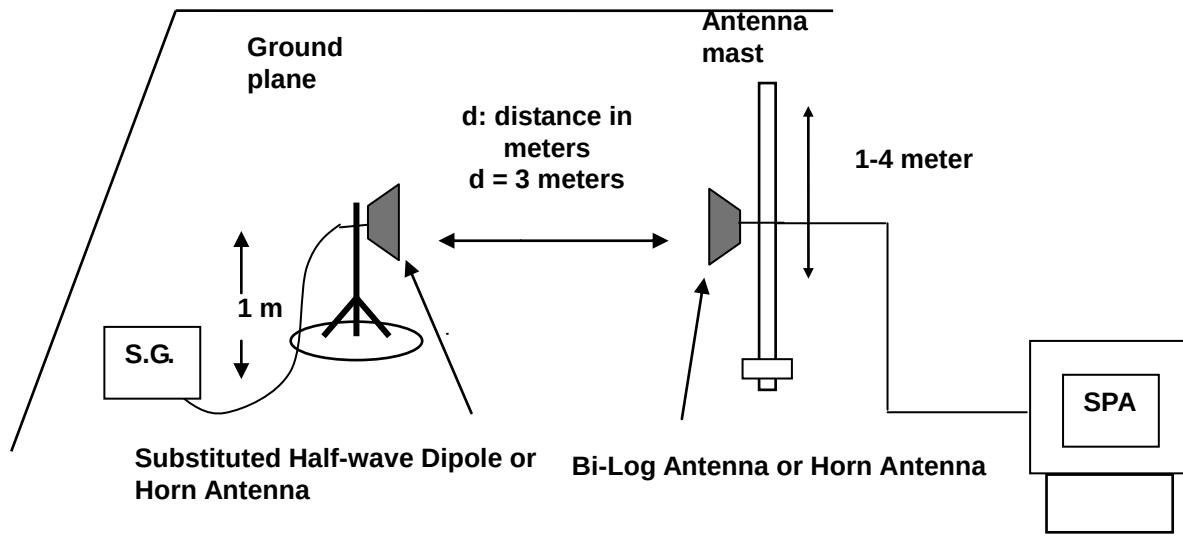
Below 1 GHz



Above 1 GHz



For Substituted Method Test Set-UP



3.4. Test Procedure

The measurement is made according to ANSI/TIA-603-C-2004 as follows:

The EUT was placed on a non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer.

During the measurement of the EUT, the resolution bandwidth was set to 3MHz and the average bandwidth was set to 3MHz. The highest emission was recorded with the rotation of the turntable and the lowering of the test antenna. The reading was recorded and the field strength (E in dBuV/m) was calculated.

ERP in frequency band 824-849MHz, and EIRP in frequency band 1851.25 –1910MHz were measured using a substitution method. The EUT was replaced by half-wave dipole (824-849MHz) or horn antenna (1851.25-1910MHz) connected to a signal generator. The spectrum analyzer reading was recorded and ERP/EIRP was calculated as follows:

$$\text{ERP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBd)} - \text{Cable (dB)}$$

$$\text{EIRP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBi)} - \text{Cable (dB)}$$

3.5. Uncertainty

The measurement uncertainty is defined as for Field Strength of Spurious Radiation measurement is ± 3.072 dB.



3.6. Test Result

Model Number	PMG-005							
Test Item	ERP/EIRP							
Date of Test	01/16/2015					Test Site	TE01	
Bands	Modulation Type	Frequency (MHz)	Ant. Polar.	Read Level (dBm)	Correction Factor (dBm)	ERP		Limit
						(dBm)	(W)	
GPRS 850	GMSK	824.2	H	14.31	11.46	25.77	0.378	< 7W
			V	18.61	10.79	29.40	0.871	< 7W
		836.6	H	13.51	11.54	25.05	0.320	< 7W
			V	18.44	10.81	29.25	0.841	< 7W
		848.8	H	14.00	11.92	25.92	0.391	< 7W
			V	18.17	10.89	29.06	0.805	< 7W
EGPRS 850	8PSK	824.2	H	14.69	10.79	25.48	0.353	< 7W
			V	15.95	10.79	26.74	0.472	< 7W
		836.6	H	13.86	10.80	24.66	0.292	< 7W
			V	15.60	10.80	26.40	0.437	< 7W
		848.8	H	14.39	10.89	25.28	0.337	< 7W
			V	15.47	10.89	26.36	0.433	< 7W

Model Number	PMG-005							
Test Item	ERP/EIRP							
Date of Test	01/16/2015					Test Site	TE01	
Bands	Modulation Type	Frequency (MHz)	Ant. Polar.	Read Level (dBm)	Correction Factor (dBm)	EIRP		Limit
						(dBm)	(W)	
GPRS 1900	GMSK	1850.20	H	19.07	8.23	27.30	0.537	< 2W
			V	17.39	6.07	23.46	0.222	< 2W
		1880.00	H	19.01	8.22	27.23	0.528	< 2W
			V	17.09	6.28	23.37	0.217	< 2W
		1909.80	H	18.93	8.23	27.16	0.520	< 2W
			V	16.60	6.52	23.12	0.205	< 2W
EGPRS 1900	8PSK	1850.20	H	17.29	8.23	25.52	0.356	< 2W
			V	15.80	6.07	21.87	0.154	< 2W
		1880.00	H	16.65	8.22	24.87	0.307	< 2W
			V	15.40	6.28	21.68	0.147	< 2W
		1909.80	H	16.69	8.22	24.91	0.310	< 2W
			V	14.85	6.51	21.36	0.137	< 2W

Note: 1. ERP/EIRP = Read Level + Correction factor.

2. For WCDMA signals, a peak detector is used with RBW = VBW = 5MHz.

3. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz.



4 Emission Bandwidth & Occupied Bandwidth Test

4.1. Limit

The Occupied Bandwidth Limit:

N/A.

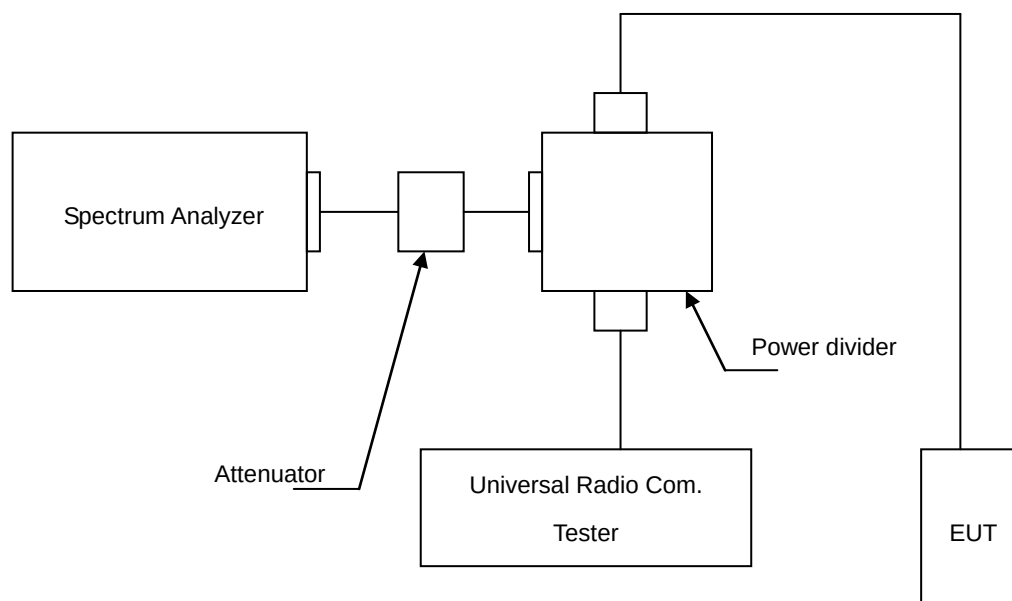
4.2. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Universal Radio Communication Tester	R & S	CMU200	109369	08/07/2014	(1)
Spectrum Analyzer	Agilent	E4445A	MY46181986	05/16/2014	(1)
Attenuator	RADIALL	R41572000	0603033073	N.C.R.	-----
Power Divider	Agilent	87302C	3239A00760	N.C.R.	-----
RF cable	WOKEN	--	S02-140512-011	07/14/2014	(1)
RF cable	WOKEN	--	S02-140512-018	07/14/2014	(1)
RF cable	WOKEN	--	S02-140428-045	07/14/2014	(1)
RF cable	WOKEN	--	S02-140428-049	07/14/2014	(1)
RF cable	WOKEN	--	S02-140428-041	07/14/2014	(1)
Test Site	ATL	TE05	TE05	N.C.R.	-----

Remark: ⁽¹⁾ Calibration period 1 year. ⁽²⁾ Calibration period 2 years.

Note: N.C.R. = No Calibration Request.

4.3. Setup





4.4. Test Procedure

The measurement is made according to FCC rules part 22 and 24:

1. The EUT was connected to Spectrum Analyzer and Base Station via Power Divider.
2. The occupied bandwidth of middle channel for the highest and lowest RF powers was measured.

4.5. Uncertainty

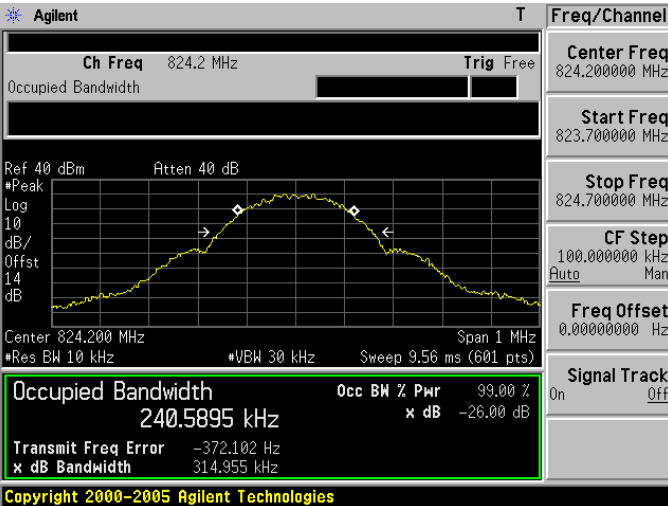
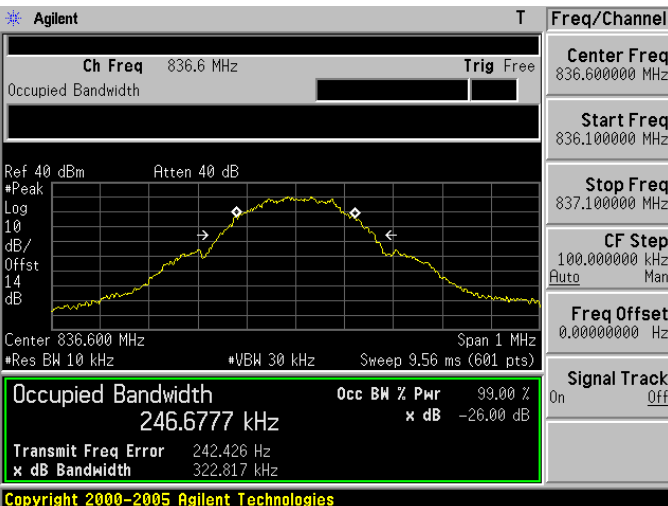
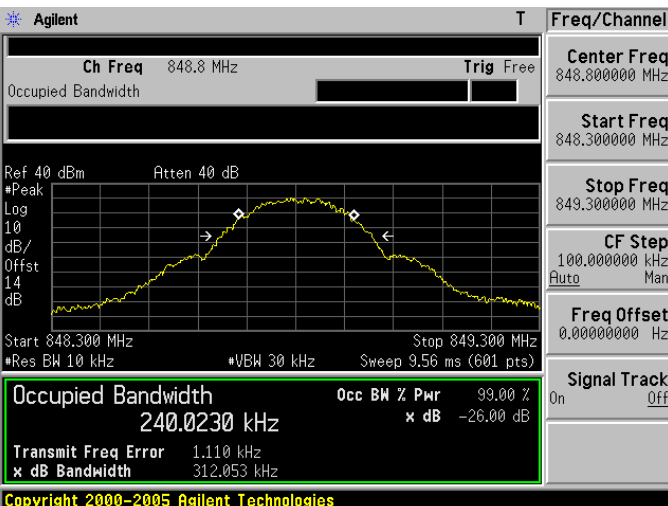
The measurement uncertainty is defined as $\pm 10\text{Hz}$

4.6. Test Result

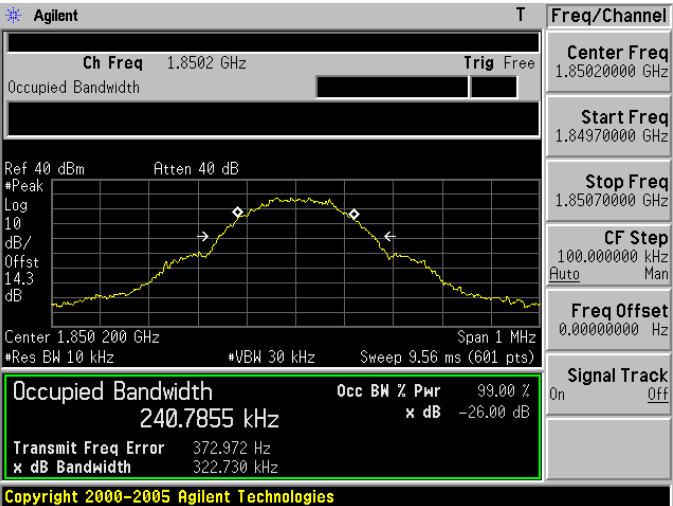
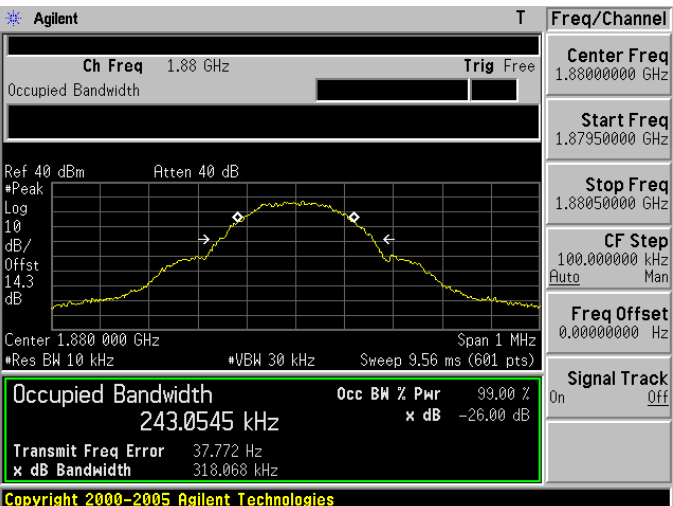
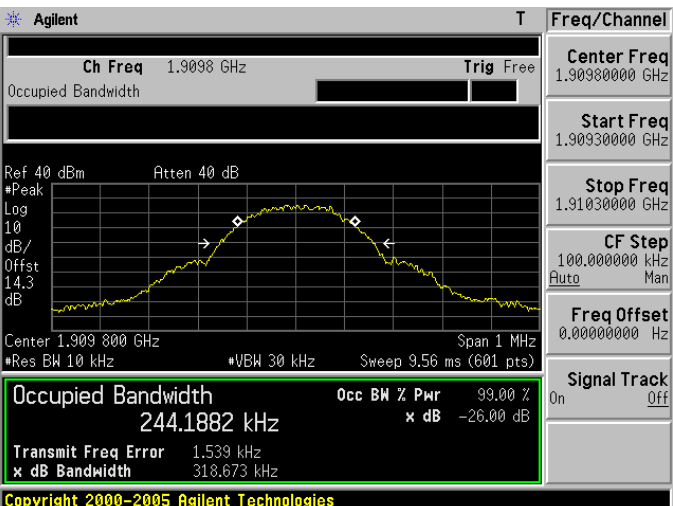
Model Number	PMG-005				
Test Item	Emission Bandwidth & Occupied Bandwidth				
Date of Test	01/16/2015			Test Site	TE05
Bands	Channel	Frequency (MHz)	-26dB Bandwidth (kHz)	99% Bandwidth (kHz)	Note
GPRS 850	128	824.2	314.955	240.590	RBW:10KHz , VBW:30KHz
	190	836.6	322.817	246.678	RBW:10KHz , VBW:30KHz
	251	848.8	312.053	240.023	RBW:10KHz , VBW:30KHz
GPRS 1900	512	1850.20	322.730	240.786	RBW:10KHz , VBW:30KHz
	661	1880.00	318.068	243.055	RBW:10KHz , VBW:30KHz
	810	1909.80	318.673	244.188	RBW:10KHz , VBW:30KHz
EGPRS 850	128	824.2	319.509	248.848	RBW:10KHz , VBW:30KHz
	190	836.6	317.193	239.374	RBW:10KHz , VBW:30KHz
	251	848.8	308.452	243.616	RBW:10KHz , VBW:30KHz
EGPRS 1900	512	1850.20	319.011	244.857	RBW:10KHz , VBW:30KHz
	661	1880.00	322.523	247.631	RBW:10KHz , VBW:30KHz
	810	1909.80	322.671	248.647	RBW:10KHz , VBW:30KHz



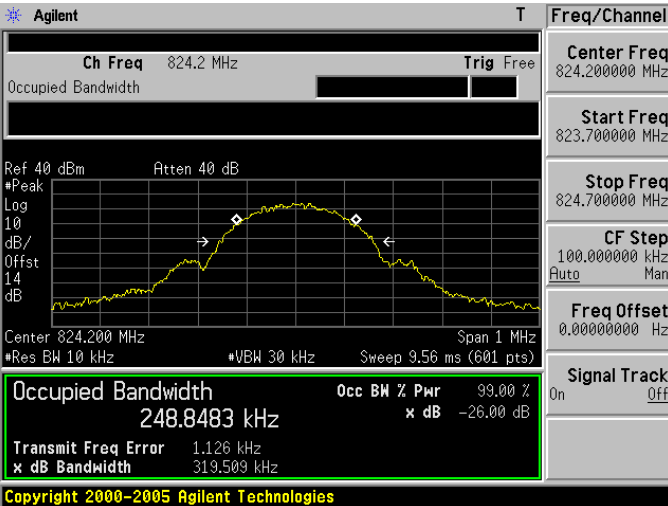
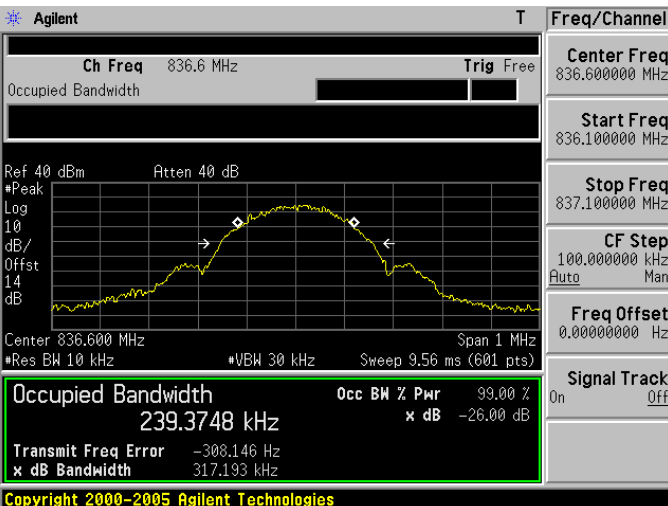
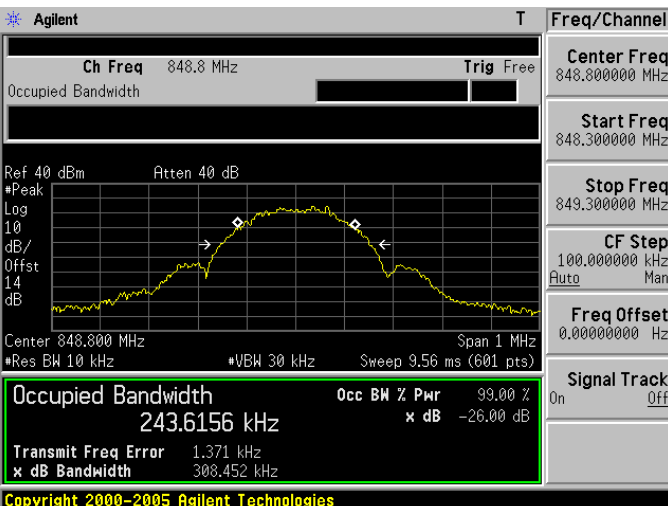
4.7. Test Graphs

Mode 1: GPRS 850 Link Mode	
824.2 MHz	 Agilent T Ch Freq 824.2 MHz Trig Free Occupied Bandwidth Ref 40 dBm Atten 40 dB Peak 10 dB/Offst 14 dB Center 824.200 MHz Span 1 MHz Res BW 10 kHz VBW 30 kHz Sweep 9.56 ms (601 pts) Occupied Bandwidth 240.5895 kHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error -372.102 Hz x dB Bandwidth 314.955 kHz Copyright 2000-2005 Agilent Technologies Freq/Channel Center Freq 824.200000 MHz Start Freq 823.700000 MHz Stop Freq 824.700000 MHz CF Step 100.000000 kHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off
836.6 MHz	 Agilent T Ch Freq 836.6 MHz Trig Free Occupied Bandwidth Ref 40 dBm Atten 40 dB Peak 10 dB/Offst 14 dB Center 836.600 MHz Span 1 MHz Res BW 10 kHz VBW 30 kHz Sweep 9.56 ms (601 pts) Occupied Bandwidth 246.6777 kHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error 242.426 Hz x dB Bandwidth 322.817 kHz Copyright 2000-2005 Agilent Technologies Freq/Channel Center Freq 836.600000 MHz Start Freq 836.100000 MHz Stop Freq 837.100000 MHz CF Step 100.000000 kHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off
848.8 MHz	 Agilent T Ch Freq 848.8 MHz Trig Free Occupied Bandwidth Ref 40 dBm Atten 40 dB Peak 10 dB/Offst 14 dB Start 848.300 MHz Stop 849.300 MHz Res BW 10 kHz VBW 30 kHz Sweep 9.56 ms (601 pts) Occupied Bandwidth 240.0230 kHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error 1.110 kHz x dB Bandwidth 312.053 kHz Copyright 2000-2005 Agilent Technologies Freq/Channel Center Freq 848.800000 MHz Start Freq 848.300000 MHz Stop Freq 849.300000 MHz CF Step 100.000000 kHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off

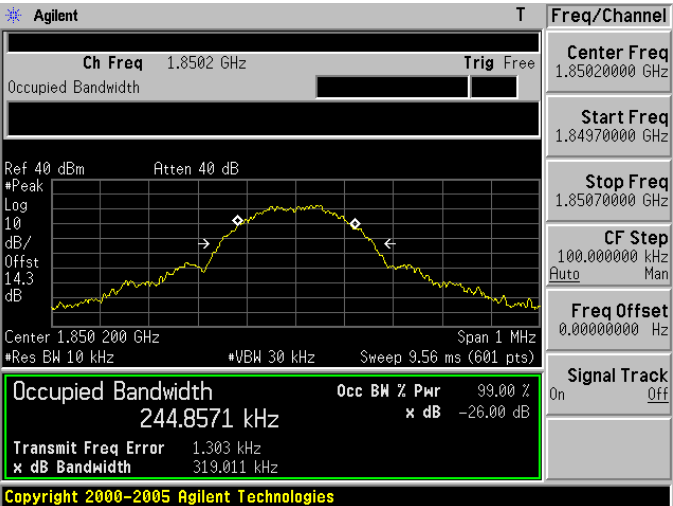
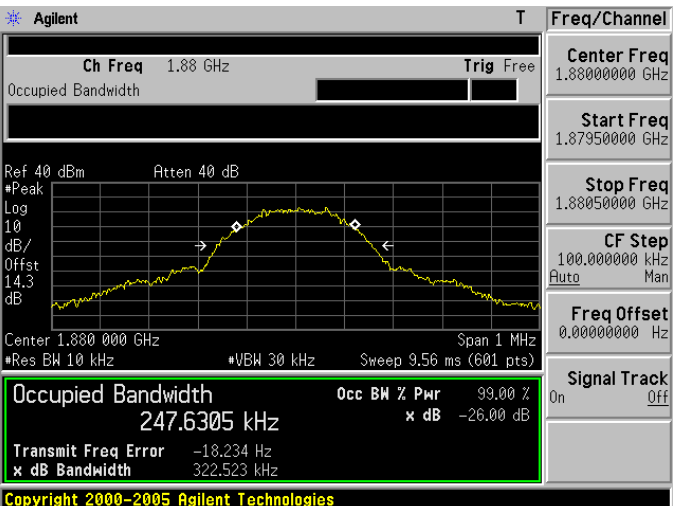
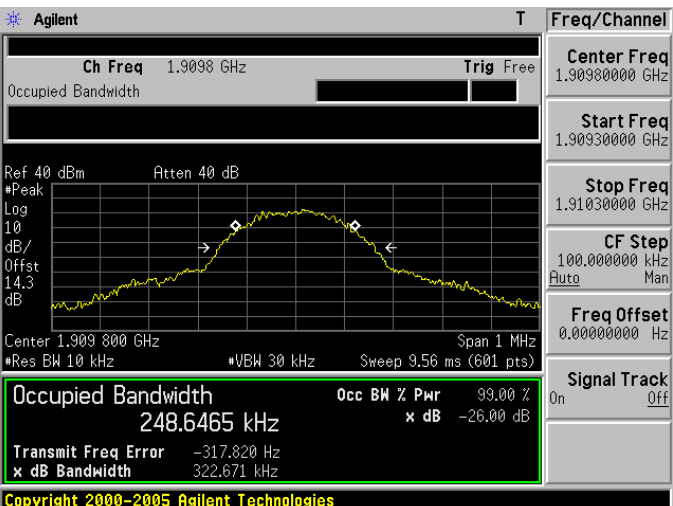


Mode 2: GPRS 1900 Link Mode	
1850.20 MHz	 Copyright 2000-2005 Agilent Technologies
1880.00 MHz	 Copyright 2000-2005 Agilent Technologies
1909.80 MHz	 Copyright 2000-2005 Agilent Technologies



Mode 3: EGPRS 850 Link Mode	
824.2 MHz	 Agilent T Freq/Channel Ch Freq 824.2 MHz Trig Free Occupied Bandwidth Ref 40 dBm Atten 40 dB Peak 10 dB/Offst 14 dB Center 824.200 MHz Span 1 MHz Res BW 10 kHz VBW 30 kHz Sweep 9.56 ms (601 pts) Occupied Bandwidth 248.8483 kHz Transmit Freq Error 1.126 kHz x dB Bandwidth 319.509 kHz Occ BW % Pwr 99.00 % x dB -26.00 dB Copyright 2000-2005 Agilent Technologies Freq/Channel Center Freq 824.200000 MHz Start Freq 823.700000 MHz Stop Freq 824.700000 MHz CF Step 100.000000 kHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off
836.6 MHz	 Agilent T Freq/Channel Ch Freq 836.6 MHz Trig Free Occupied Bandwidth Ref 40 dBm Atten 40 dB Peak 10 dB/Offst 14 dB Center 836.600 MHz Span 1 MHz Res BW 10 kHz VBW 30 kHz Sweep 9.56 ms (601 pts) Occupied Bandwidth 239.3748 kHz Transmit Freq Error -308.146 Hz x dB Bandwidth 317.193 kHz Occ BW % Pwr 99.00 % x dB -26.00 dB Copyright 2000-2005 Agilent Technologies Freq/Channel Center Freq 836.600000 MHz Start Freq 836.100000 MHz Stop Freq 837.100000 MHz CF Step 100.000000 kHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off
848.8 MHz	 Agilent T Freq/Channel Ch Freq 848.8 MHz Trig Free Occupied Bandwidth Ref 40 dBm Atten 40 dB Peak 10 dB/Offst 14 dB Center 848.800 MHz Span 1 MHz Res BW 10 kHz VBW 30 kHz Sweep 9.56 ms (601 pts) Occupied Bandwidth 243.6156 kHz Transmit Freq Error 1.371 kHz x dB Bandwidth 308.452 kHz Occ BW % Pwr 99.00 % x dB -26.00 dB Copyright 2000-2005 Agilent Technologies Freq/Channel Center Freq 848.800000 MHz Start Freq 848.300000 MHz Stop Freq 849.300000 MHz CF Step 100.000000 kHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off



Mode 4: EGPRS 1900 Link Mode	
1850.20 MHz	 Copyright 2000-2005 Agilent Technologies
1880.00 MHz	 Copyright 2000-2005 Agilent Technologies
1909.80 MHz	 Copyright 2000-2005 Agilent Technologies

5 Band Edge Test

5.1. Limit

The Band Edge Limit:

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

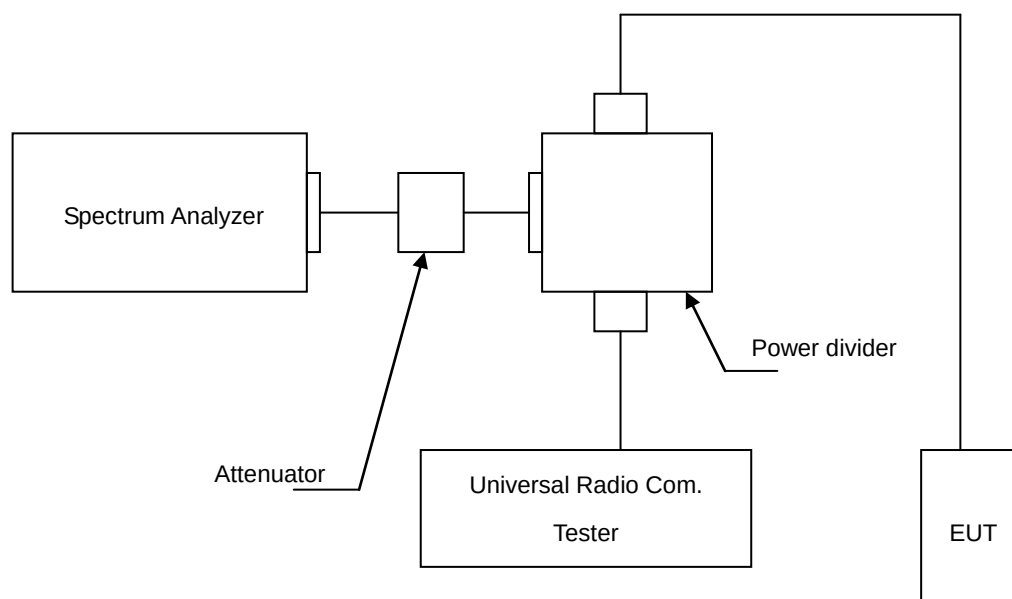
5.2. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Universal Radio Communication Tester	R & S	CMU200	109369	08/07/2014	(1)
Spectrum Analyzer	Agilent	E4445A	MY46181986	05/16/2014	(1)
Attenuator	RADIALL	R41572000	0603033073	N.C.R.	-----
Power Divider	Agilent	87302C	3239A00760	N.C.R.	-----
RF cable	WOKEN	--	S02-140512-011	07/14/2014	(1)
RF cable	WOKEN	--	S02-140512-018	07/14/2014	(1)
RF cable	WOKEN	--	S02-140428-045	07/14/2014	(1)
RF cable	WOKEN	--	S02-140428-049	07/14/2014	(1)
RF cable	WOKEN	--	S02-140428-041	07/14/2014	(1)
Test Site	ATL	TE05	TE05	N.C.R.	-----

Remark: ⁽¹⁾ Calibration period 1 year. ⁽²⁾ Calibration period 2 years.

Note: N.C.R. = No Calibration Request.

5.3. Setup





5.4. Test Procedure

The measurement is made according to FCC rules part 22 and 24:

1. The EUT was connected to Spectrum Analyzer and Base Station via Power Divider.
2. The band edge of low and high channels for the highest RF powers within the transmitting frequency band were measured. Setting RBW as roughly BW/100.
3. The band edge setting:
 - a. RB=10 kHz; VB=30 kHz for GSM 850 and PCS 1900.
 - b. RB=100 kHz; VB=300 kHz for WCDMA Band V and WCDMA Band II.

5.5. Uncertainty

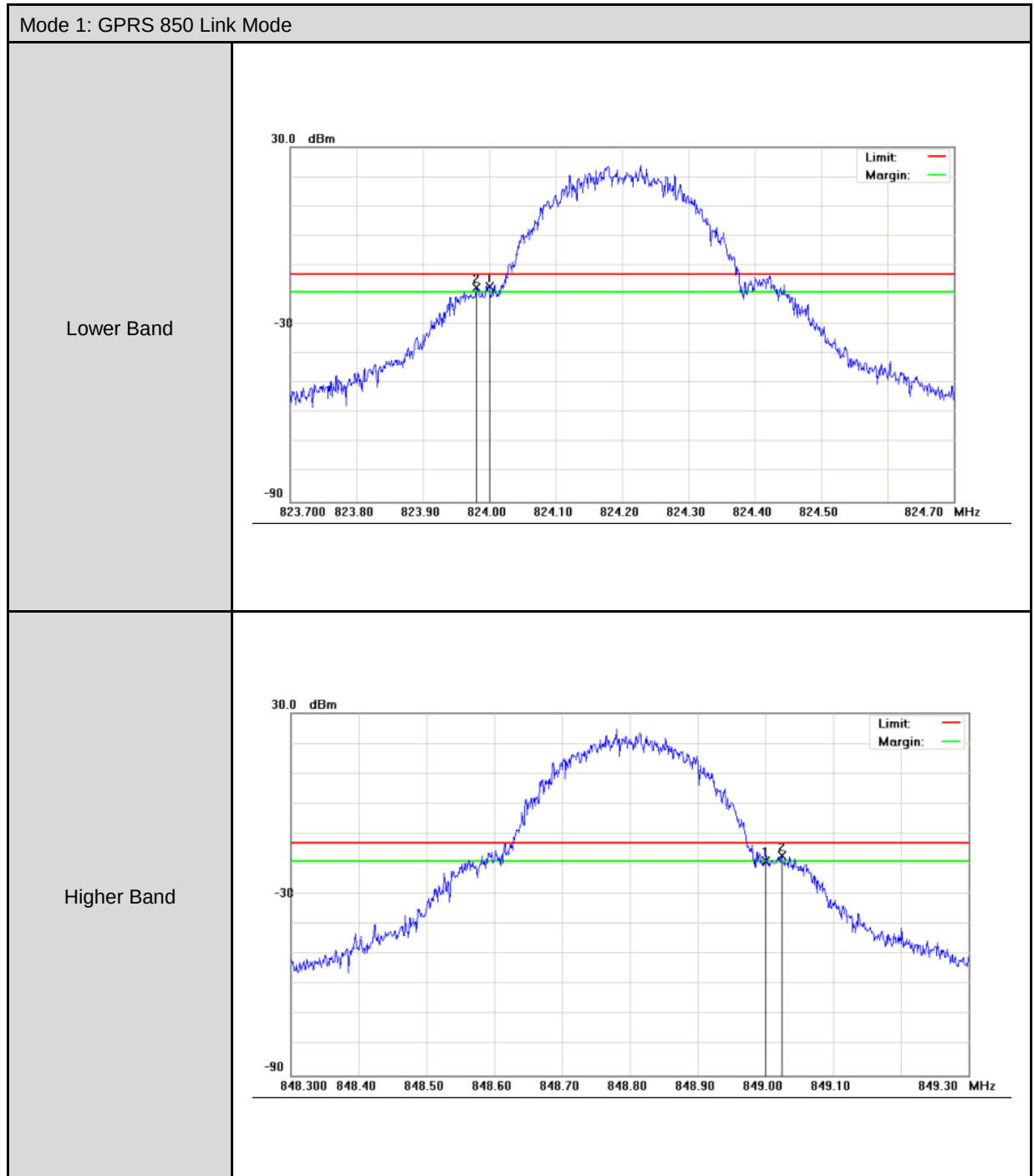
The measurement uncertainty is defined as $\pm 10\text{Hz}$

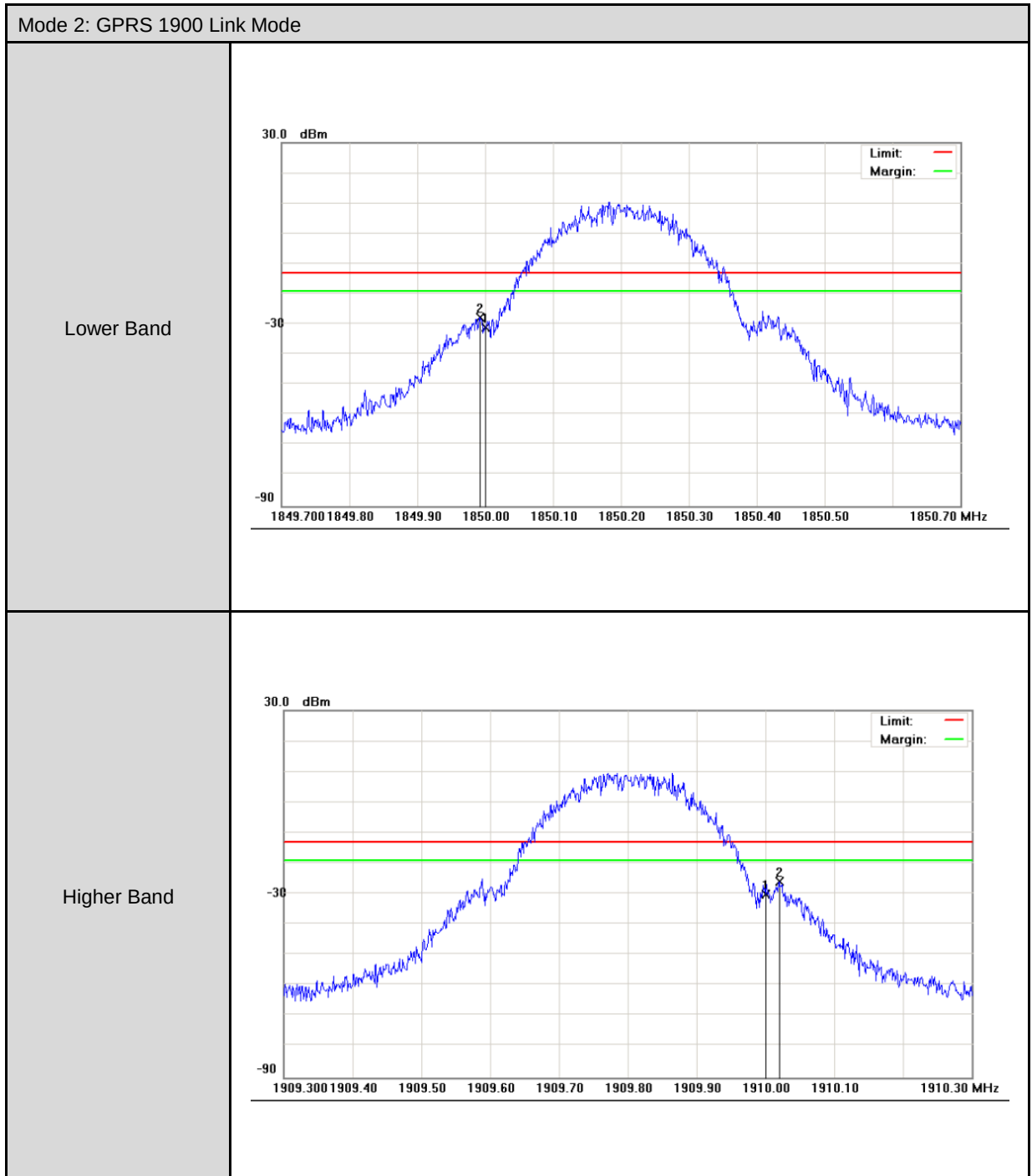
5.6. Test Result

Model Number		PMG-005				
Test Item		Band Edge				
Date of Test		01/16/2015			Test Site	TE05
Bands		Channel	Frequency (MHz)	Bandedge (dBm)	Limit (dBm)	Result
GPRS 850	Lower	128	824.0000	-17.36	-13	Pass
	Higher	251	849.0000	-17.17	-13	Pass
GPRS 1900	Lower	512	1850.000	-27.82	-13	Pass
	Higher	810	1910.000	-25.88	-13	Pass



5.7. Test Graphs





6 Conducted Spurious Emission Test

6.1. Limit

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

6.2. Test Instruments

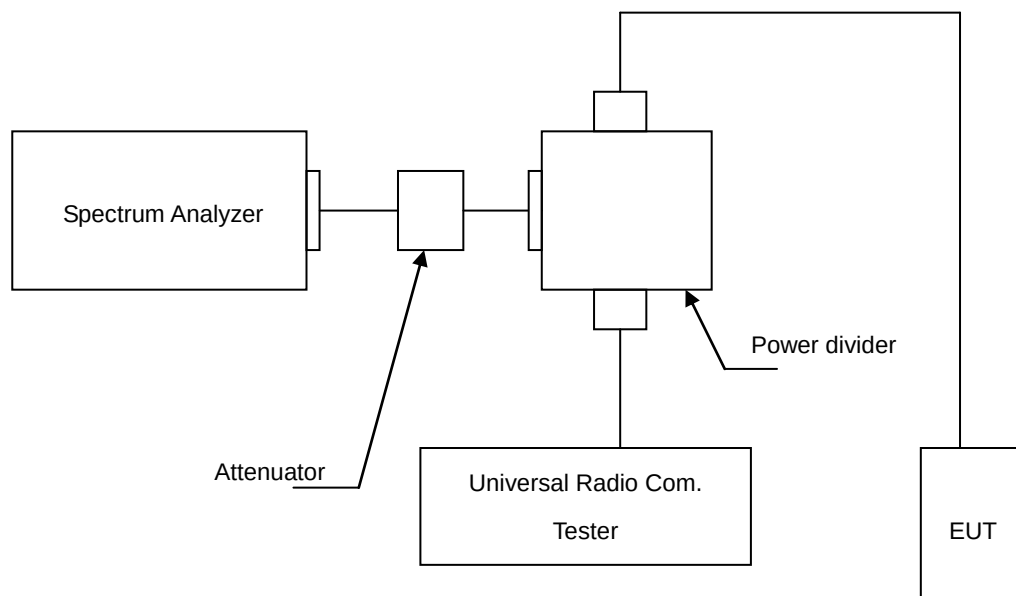
Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Universal Radio Communication Tester	R & S	CMU200	109369	08/07/2014	(1)
Spectrum Analyzer	Agilent	E4445A	MY46181986	05/16/2014	(1)
Attenuator	RADIALL	R41572000	0603033073	N.C.R.	-----
Power Divider	Agilent	87302C	3239A00760	N.C.R.	-----
RF cable	WOKEN	--	S02-140512-011	07/14/2014	(1)
RF cable	WOKEN	--	S02-140512-018	07/14/2014	(1)
RF cable	WOKEN	--	S02-140428-045	07/14/2014	(1)
RF cable	WOKEN	--	S02-140428-049	07/14/2014	(1)
RF cable	WOKEN	--	S02-140428-041	07/14/2014	(1)
Test Site	ATL	TE05	TE05	N.C.R.	-----

Remark: ⁽¹⁾ Calibration period 1 year. ⁽²⁾ Calibration period 2 years.

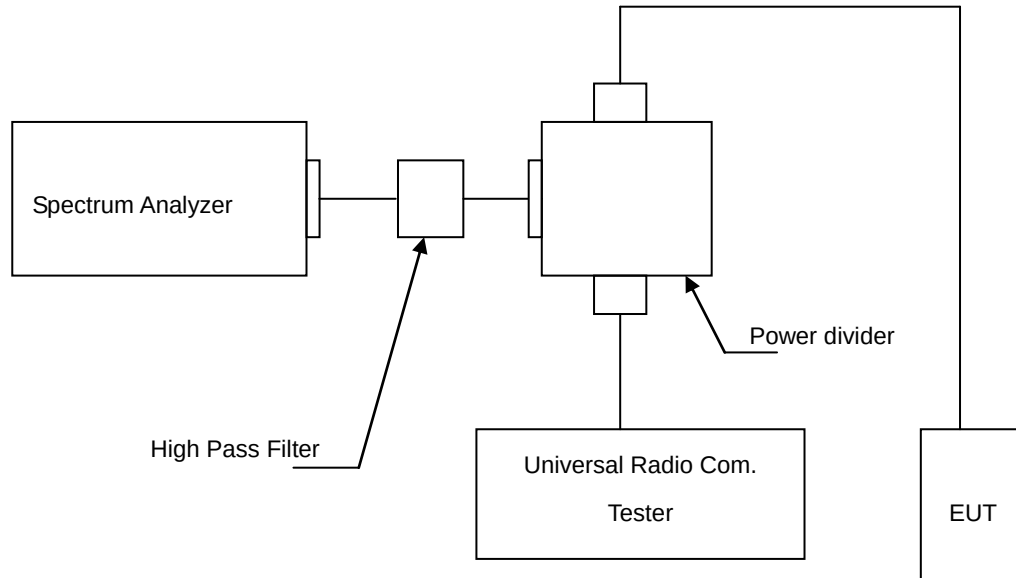
Note: N.C.R. = No Calibration Request.

6.3. Setup

Below 2.8GHz



Above 2.8GHz



6.4. Test Procedure

1. The EUT was connected to Spectrum Analyzer and Base Station via Power Divider.
2. The middle channel for the highest RF power within the transmitting frequency was measured.
3. The conducted spurious emission for the whole frequency range was taken.
4. Test setting at GSM 850 RB>100 kHz, VB>100 kHz; PCS 1900 RB>1MHz, VB>1MHz.

6.5. Uncertainty

The measurement uncertainty is evaluated as ± 2.24 dB.

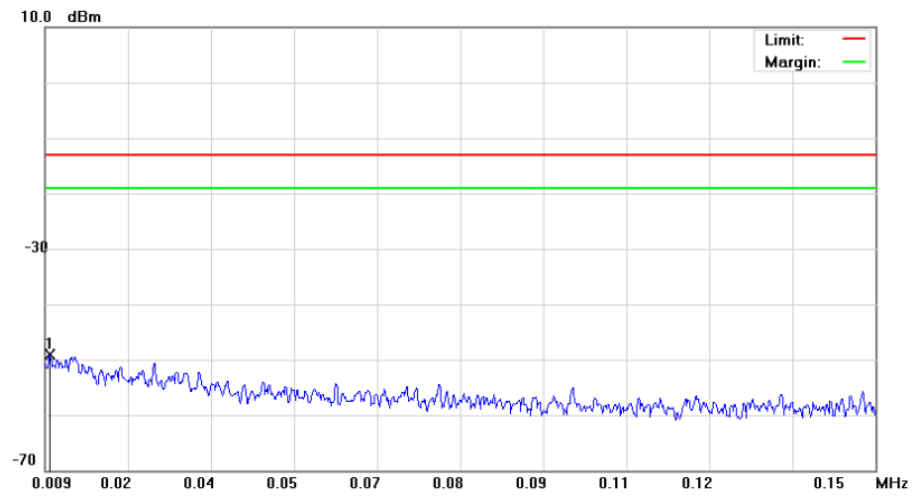
6.6. Test Result

Model Number	PMG-005		
Test Item	Conducted Spurious Emission		
Test Mode	Mode 1 / Mode 2		
Date of Test	01/16/2015	Test Site	TE05

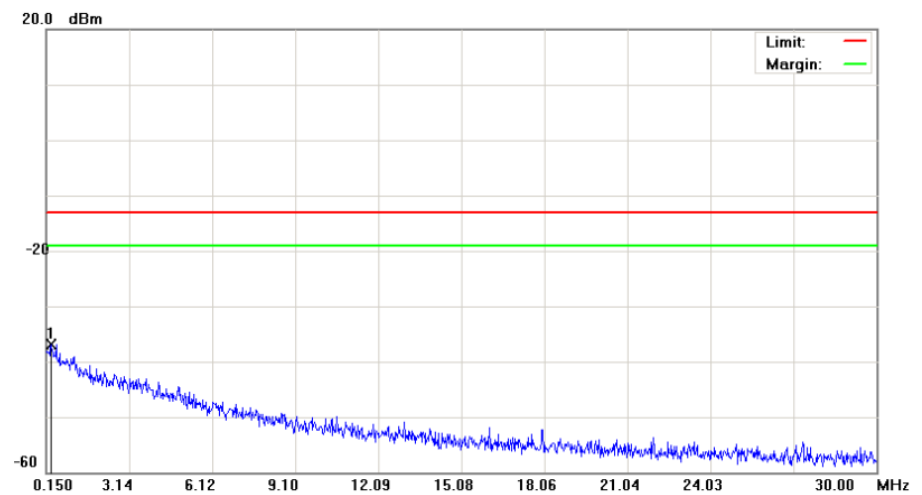


Mode 1: GPRS 850 Link Mode(CH128)

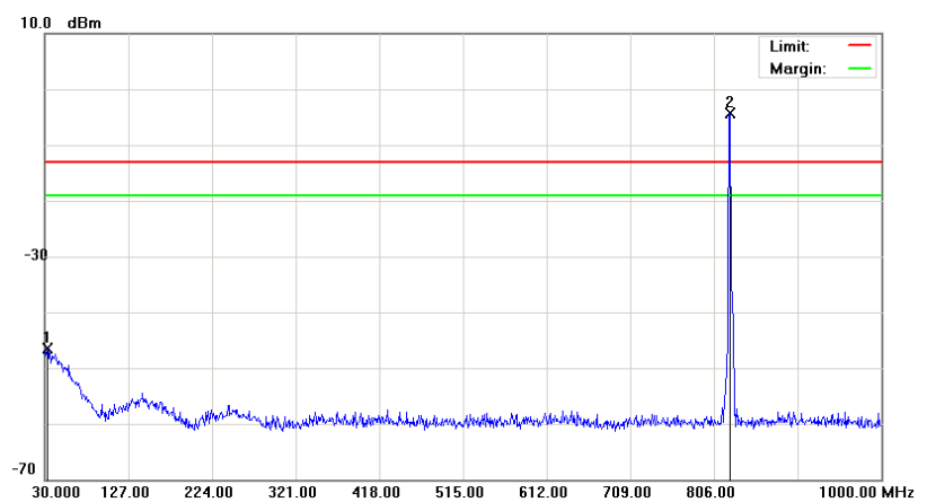
9kHz-15MHz

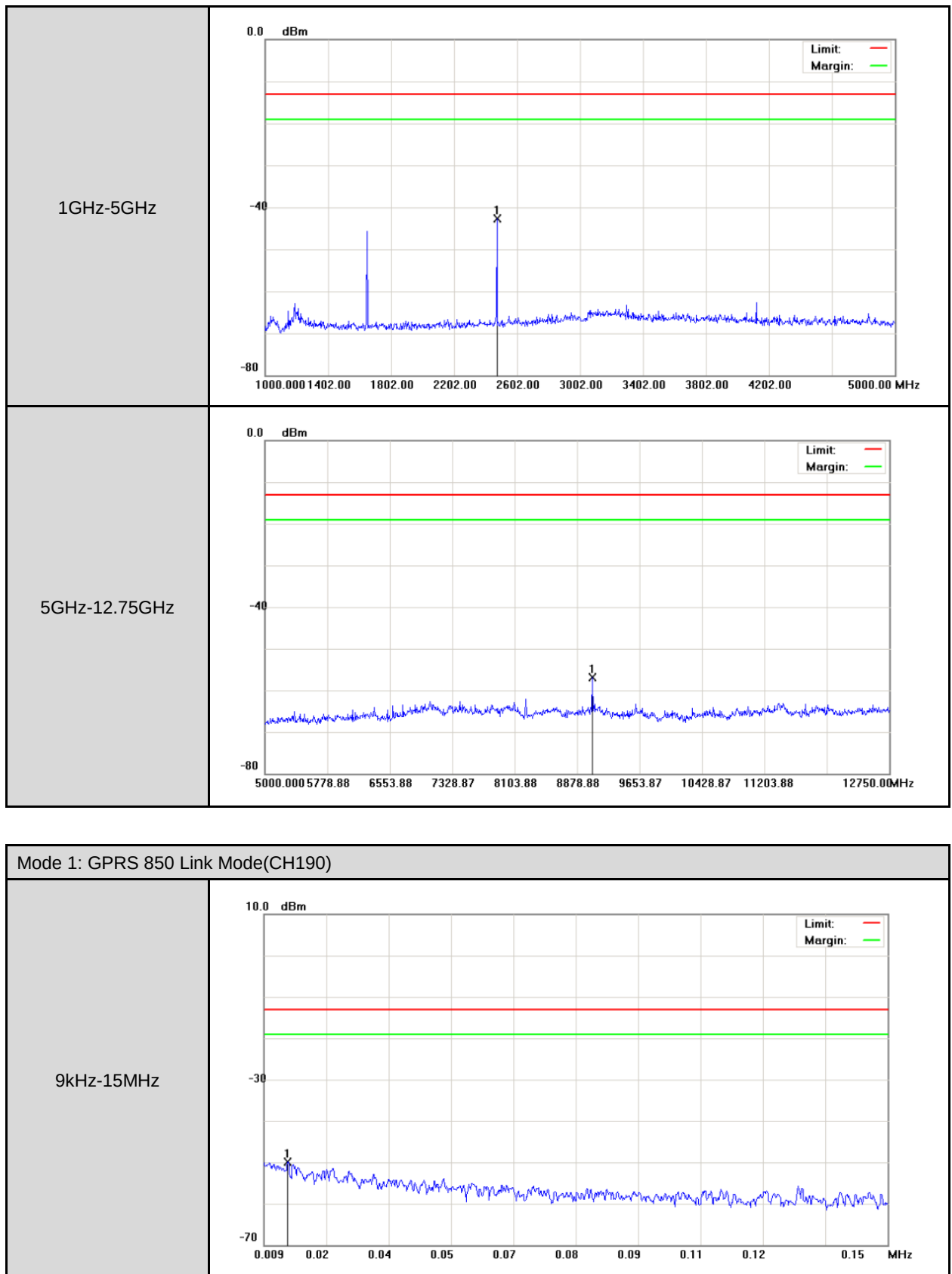


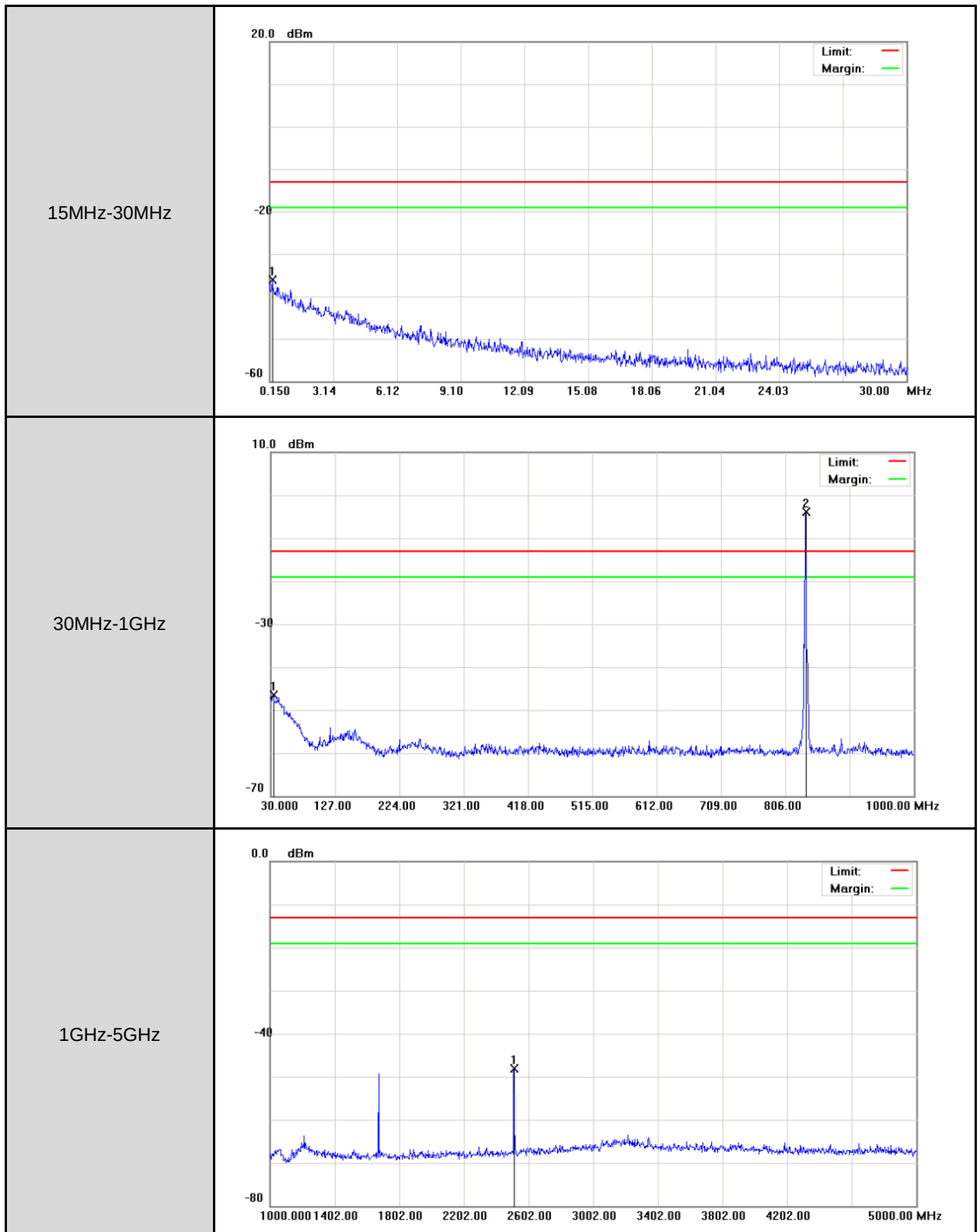
15MHz-30MHz

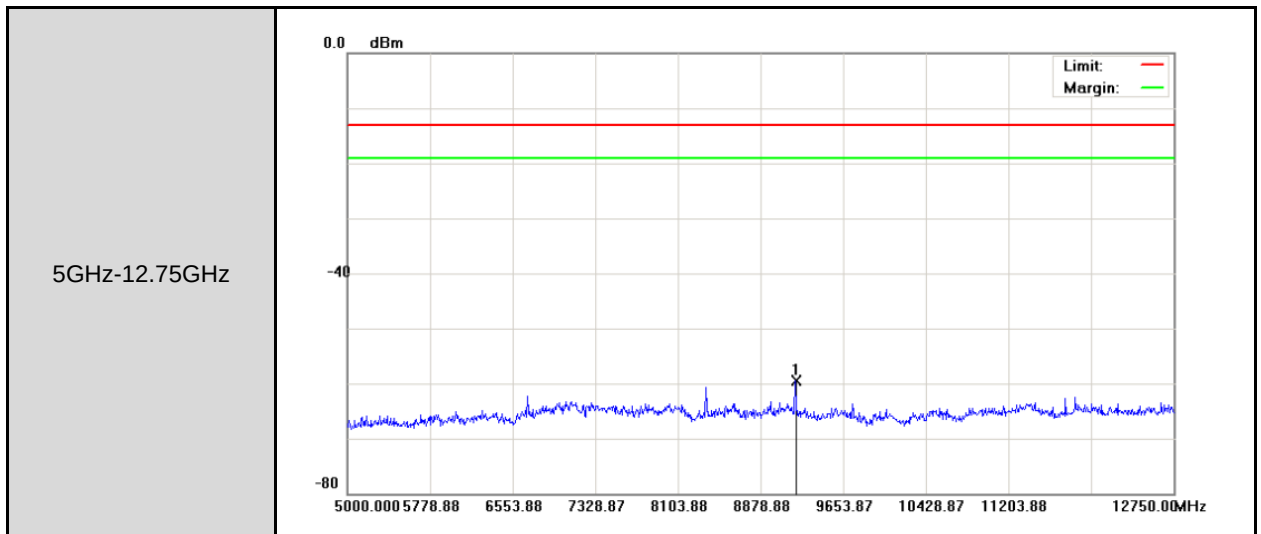


30MHz-1GHz

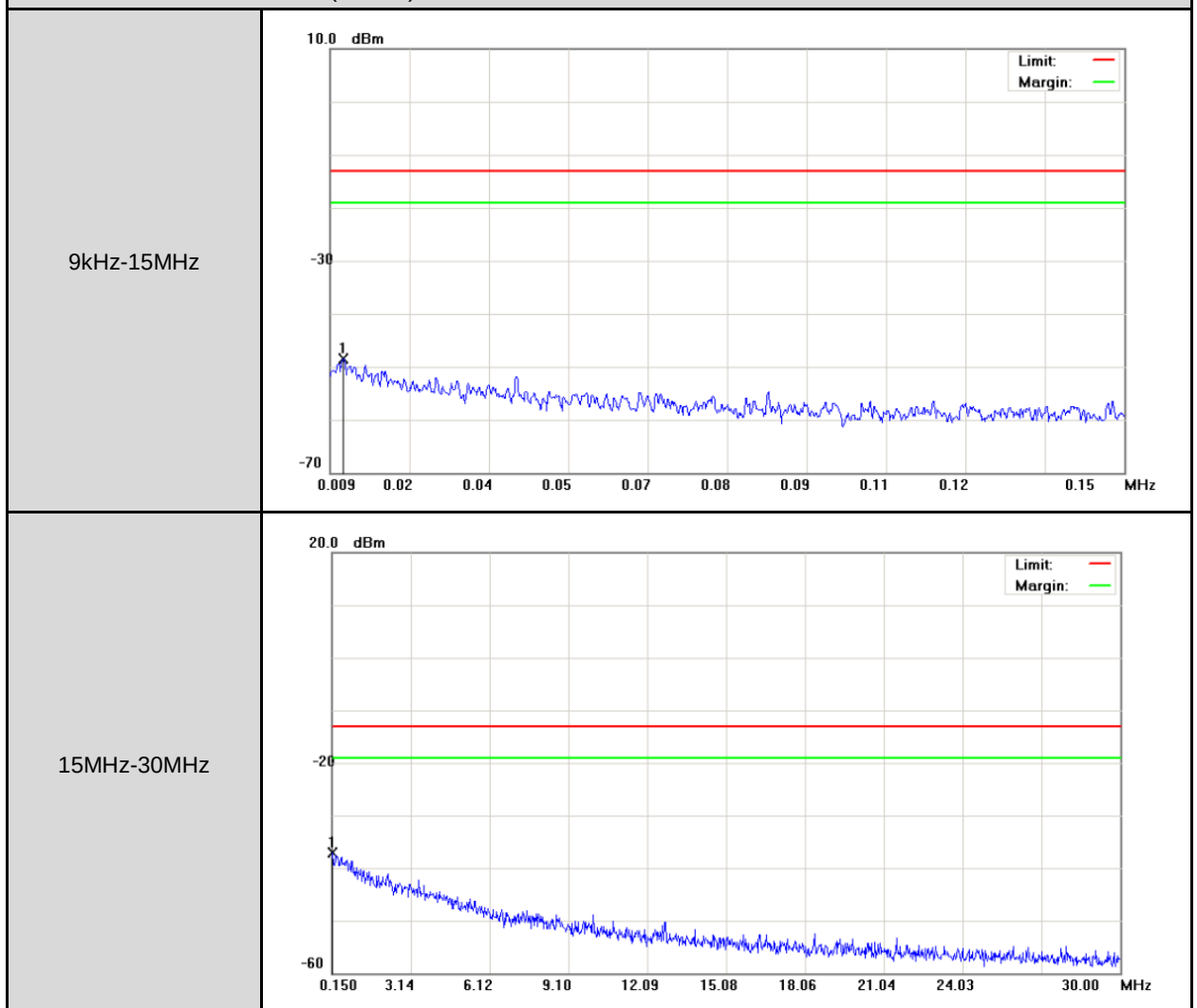


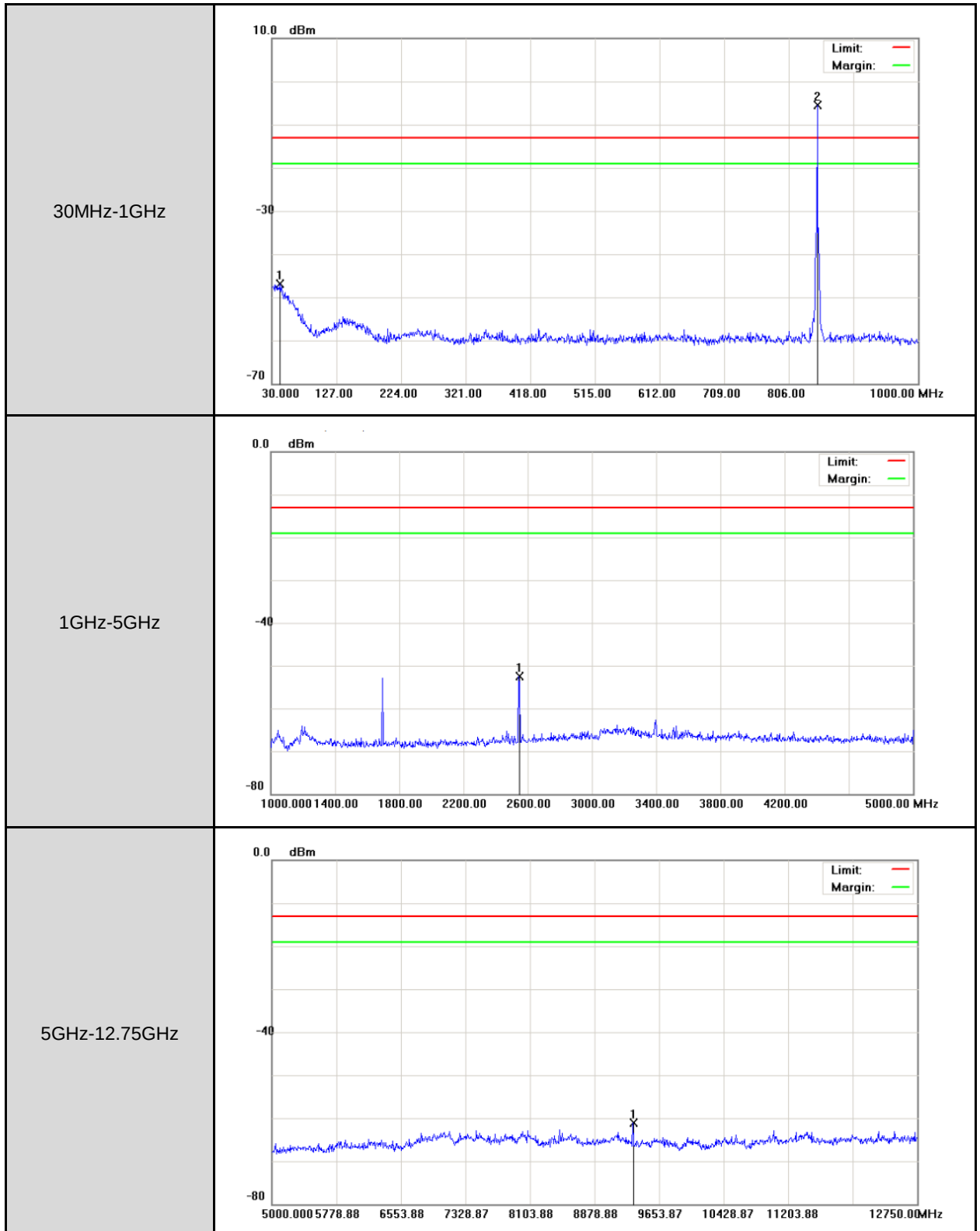






Mode 1: GPRS 850 Link Mode(CH251)

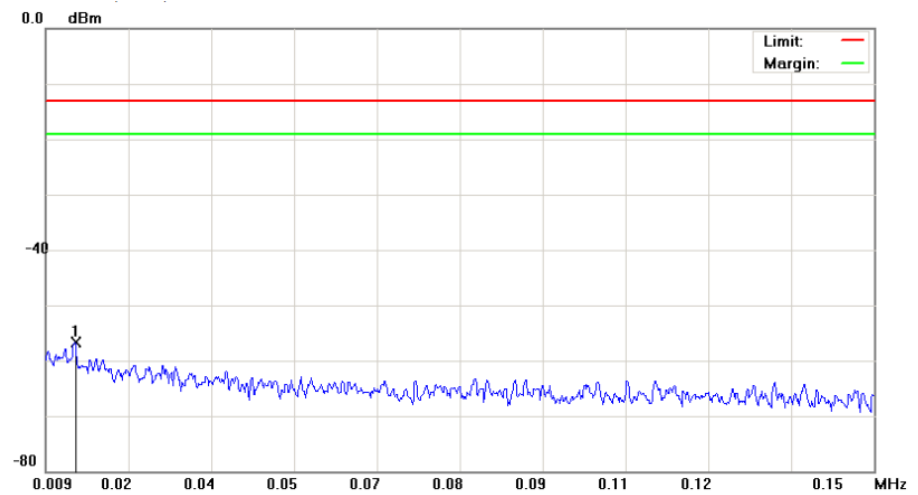




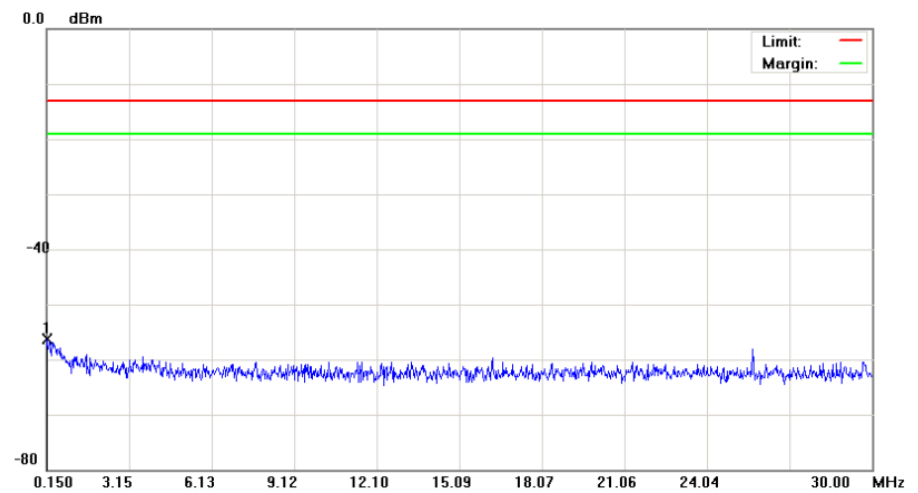


Mode 2: GPRS 1900 Link Mode(CH512)

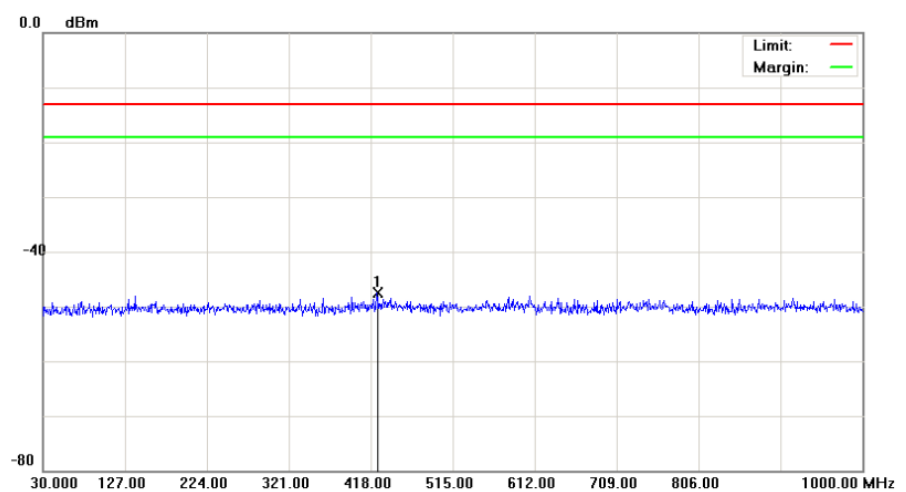
9kHz-15MHz

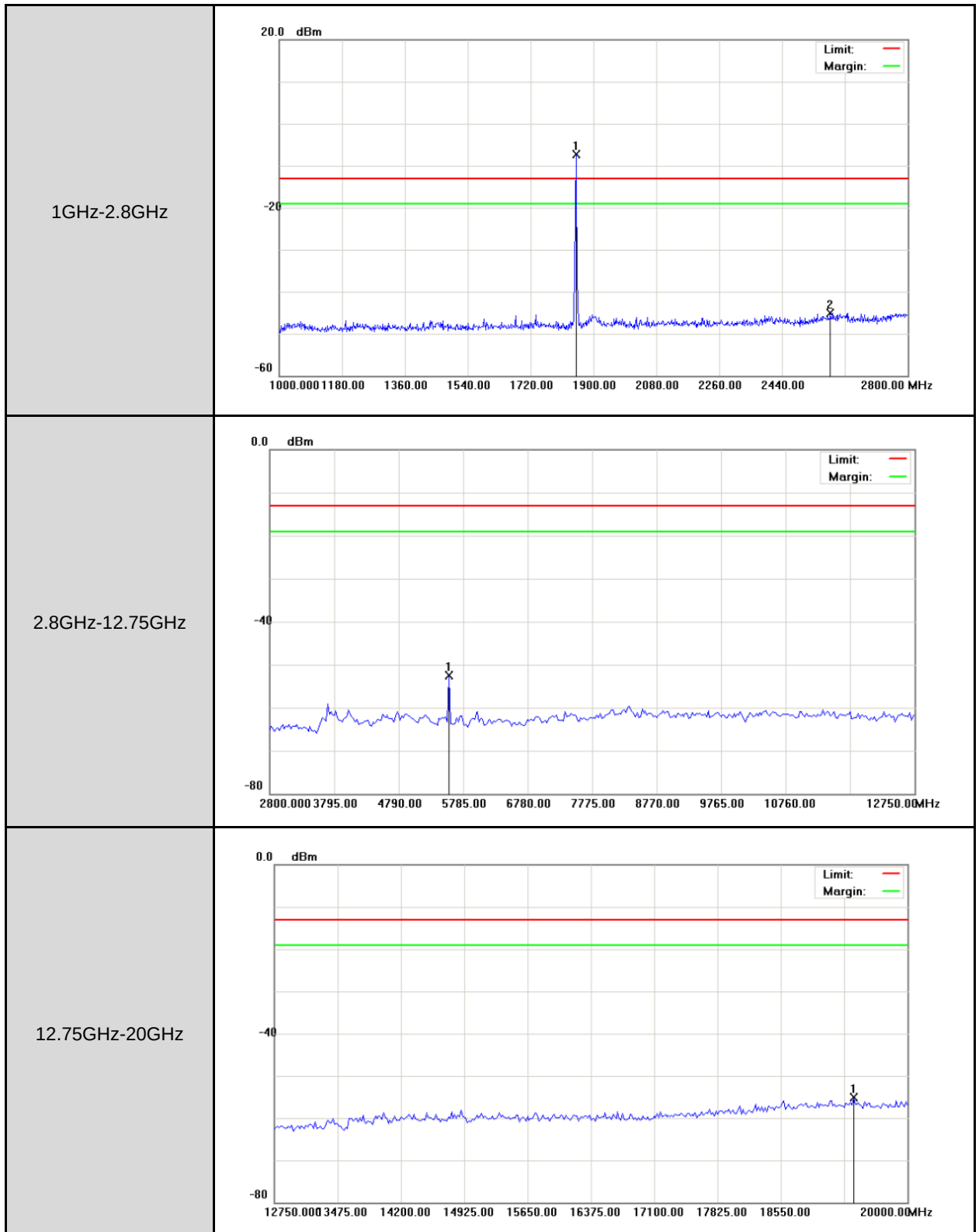


15MHz-30MHz



30MHz-1GHz

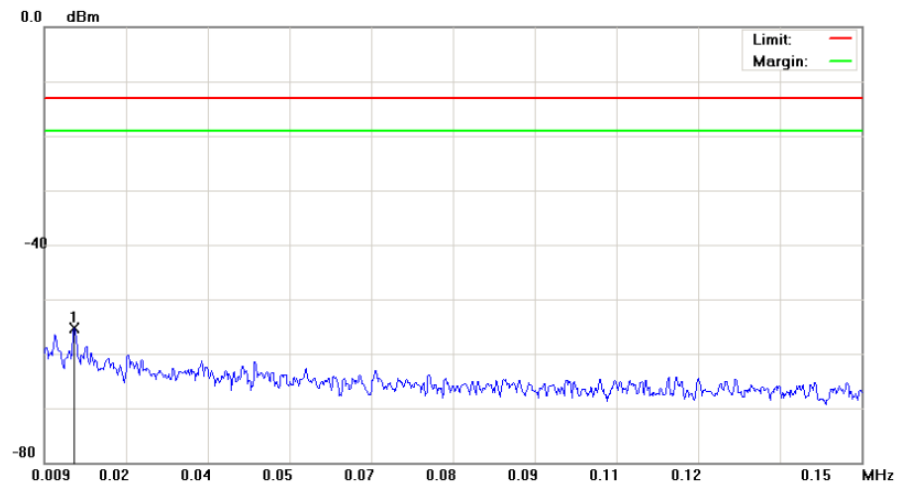




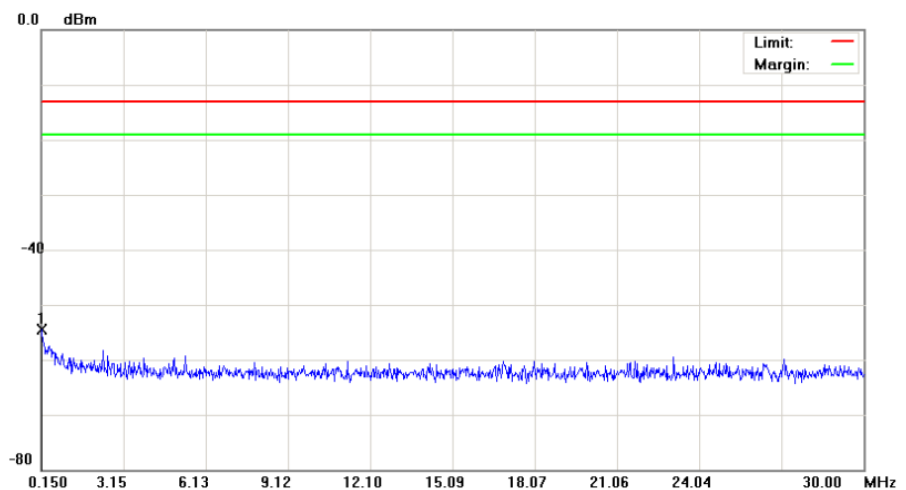


Mode 2: GPRS 1900 Link Mode(CH661)

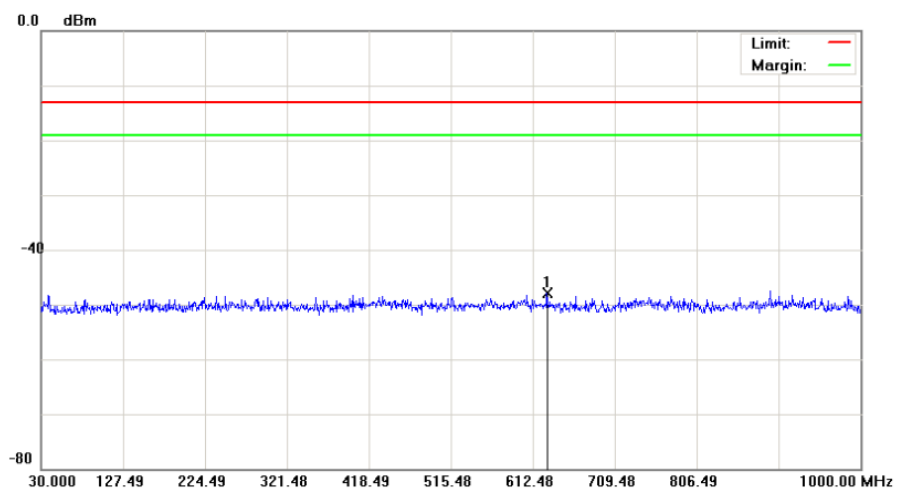
9kHz-15MHz

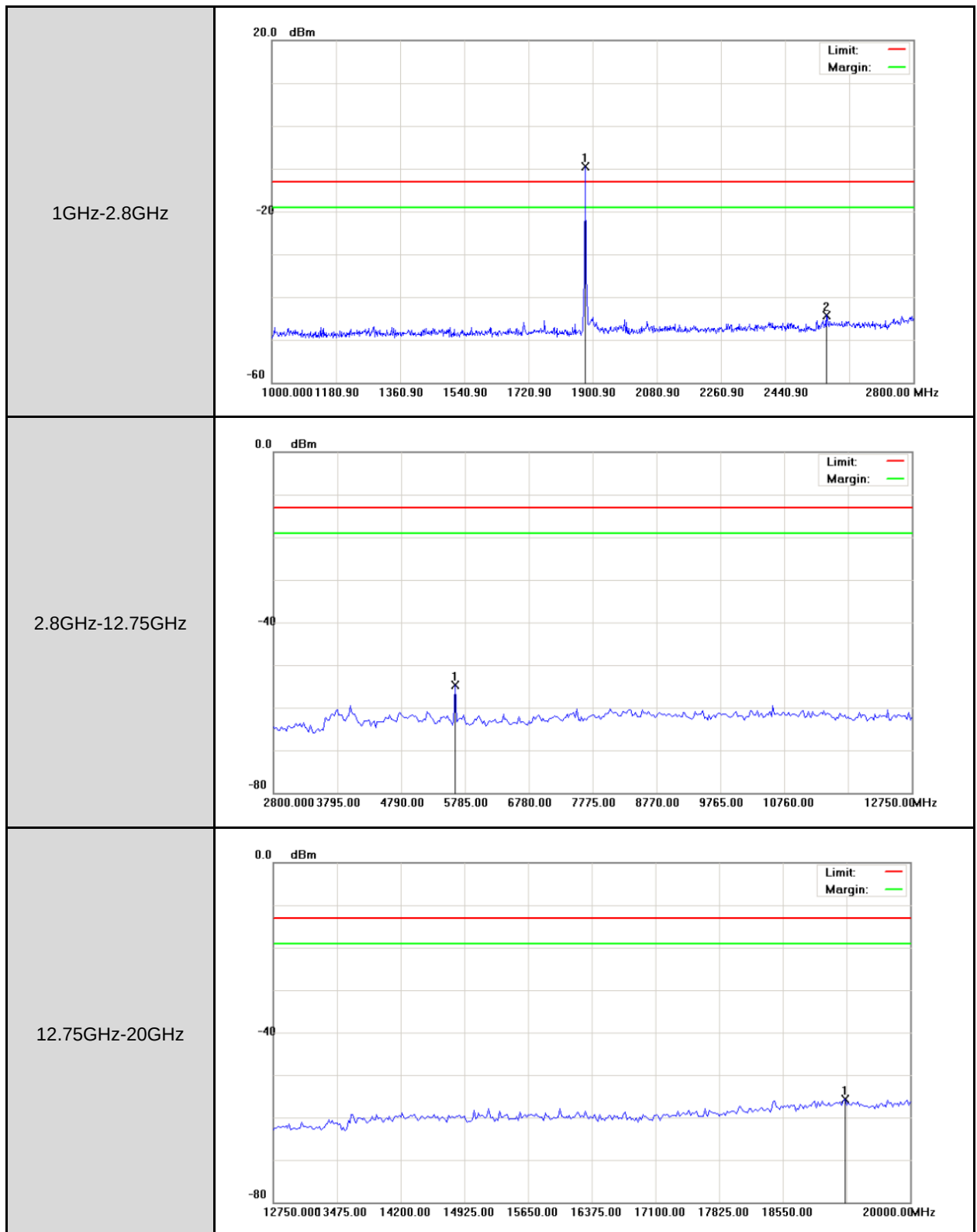


15MHz-30MHz



30MHz-1GHz

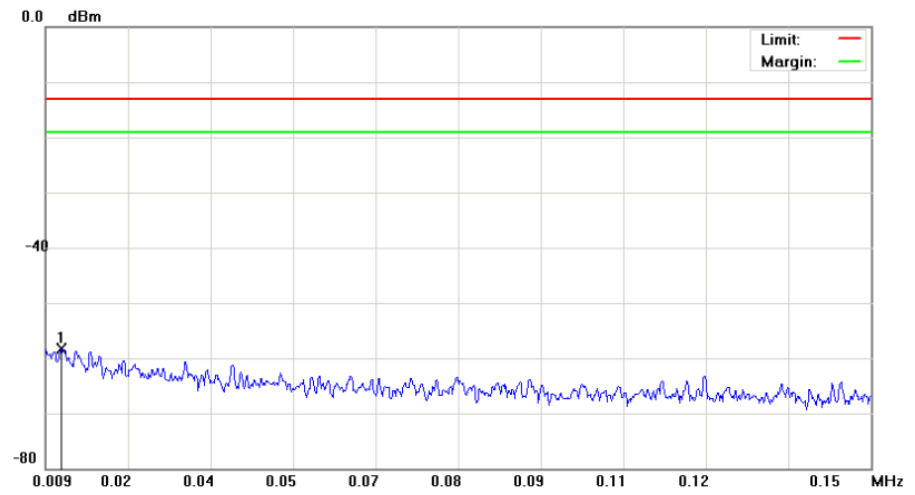




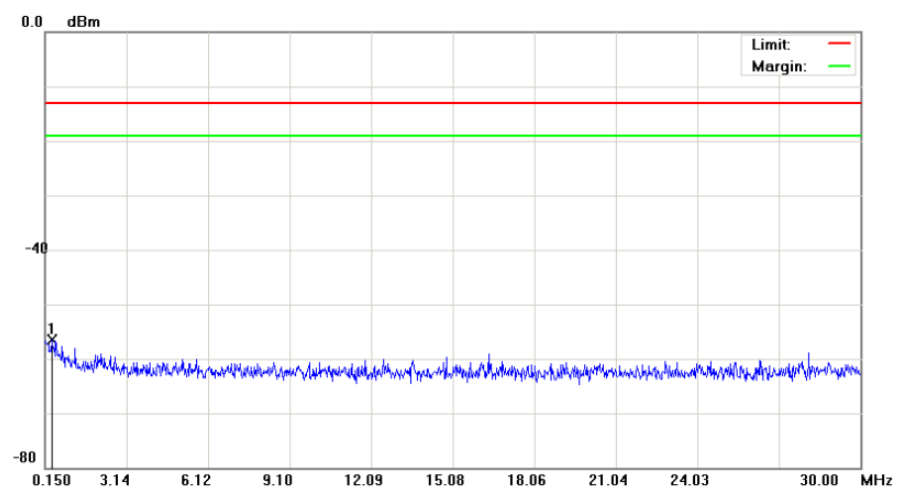


Mode 2: GPRS 1900 Link Mode(CH810)

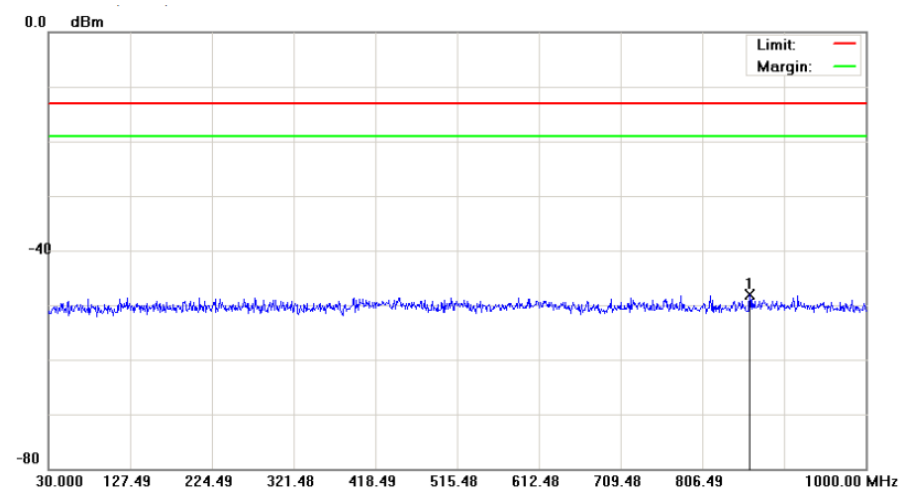
9kHz-15MHz

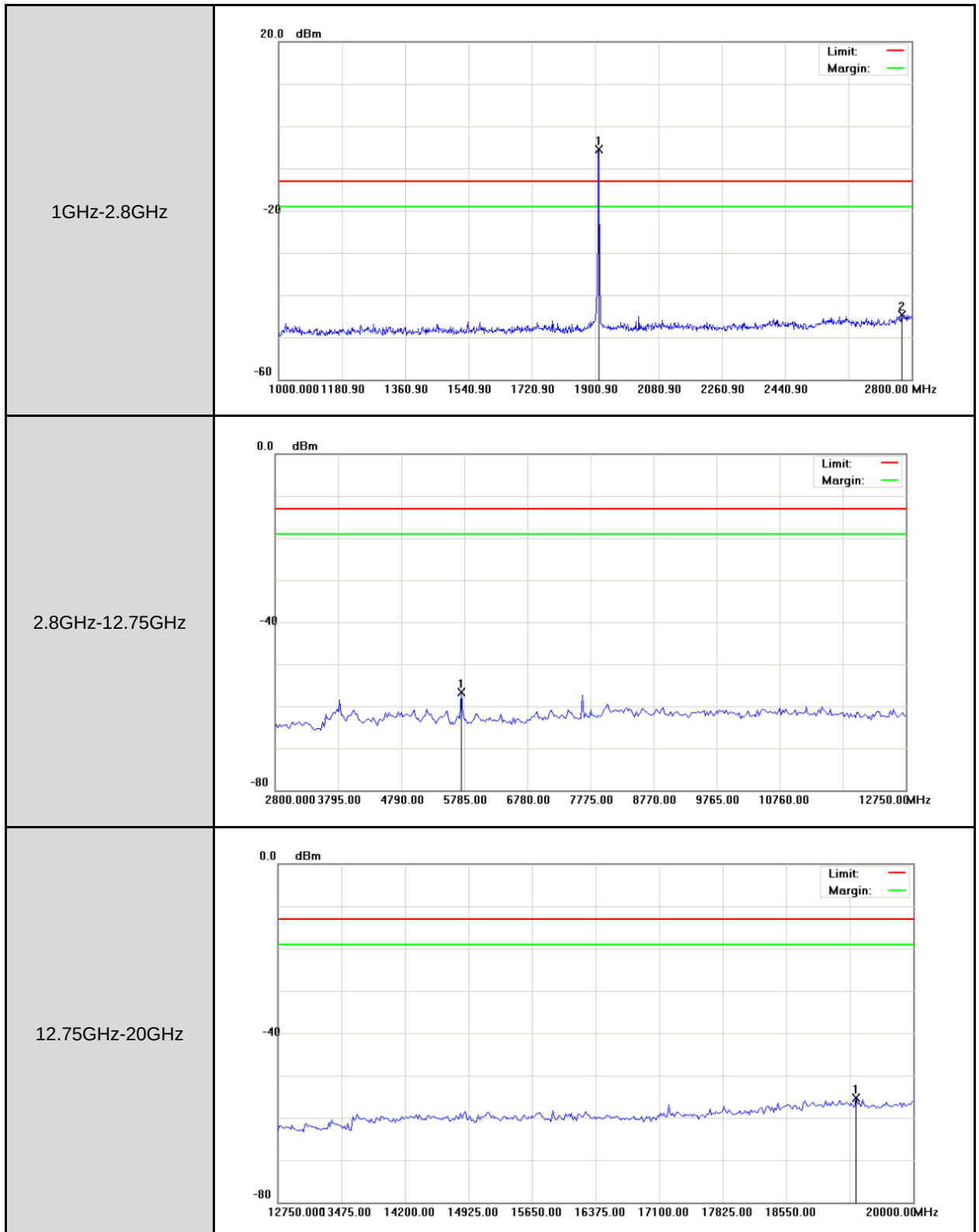


15MHz-30MHz



30MHz-1GHz







7 Field Strength of Spurious Radiation Test

7.1. Limit

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

It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10th harmonic.

7.2. Test Instruments

3 Meter Chamber (966-A)					
Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
RF Pre-selector	Agilent	N9039A	MY46520256	01/10/2015	(1)
Spectrum Analyzer	Agilent	E4446A	MY46180578	01/10/2015	(1)
Pre Amplifier	Agilent	8449B	3008A02237	02/21/2014	(1)
Pre Amplifier	Agilent	8447D	2944A10961	02/21/2014	(1)
Broadband Antenna (30MHz~1GHz)	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	9163-270	07/16/2014	(1)
Horn Antenna (1~18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	9120D-550	06/10/2014	(1)
Horn Antenna (18~40GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9170	9170-320	06/13/2014	(1)
RF cable	WOKEN	--	S02-140409-026	07/14/2014	(1)
RF cable	WOKEN	--	S02-140409-027	07/14/2014	(1)
RF cable	WOKEN	--	S02-140409-028	07/14/2014	(1)
RF cable	WOKEN	--	S02-140409-052	07/14/2014	(1)
Test Site	ATL	TE01	888001	08/28/2014	(1)

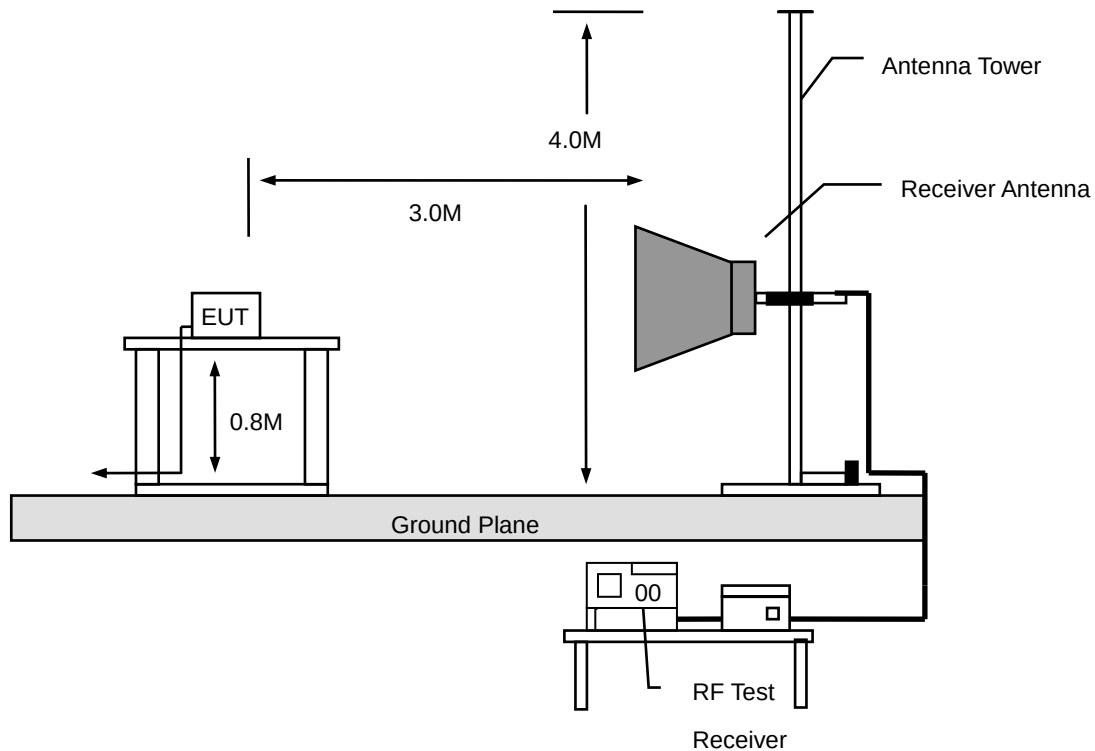
3 Meter Chamber (966-B)					
Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY46181986	05/16/2014	(1)
Amplifier	Mini-Circuits	ZKL-1R5+	N/A	05/29/2014	(1)
Amplifier	Mini-Circuits	ZVA-213-S+	N/A	05/29/2014	(1)
RF Pre-selector	Agilent	N9039A	MY46520255	05/10/2014	(1)
Trilog-Broadband Antenna	SCHWARZBECK MESS-ELEKTRONIK	SB AC VULB	9168-419	05/16/2014	(1)
Double-Ridged Waveguide Horn	ETS-Lindgren	3117	00128055	08/09/2014	(1)
RF cable	WOKEN	--	S02-140512-09	07/14/2014	(1)
RF cable	WOKEN	--	S02-140512-021	07/14/2014	(1)

RF cable	WOKEN	--	S02-140512-022	07/14/2014	(1)
Test Site	ATL	TE09	TE09	05/11/2014	(1)

Remark: ⁽¹⁾ Calibration period 1 year. ⁽²⁾ Calibration period 2 years.

Note: N.C.R. = No Calibration Request.

7.3. Setup



7.4. Test Procedure

Final radiation measurements were made on a three-meter, Semi Anechoic Chamber. The EUT system was placed on a nonconductive turntable which is 0.8 meters height, top surface 1.0 x 1.5 meter. The spectrum was examined from 250 MHz to 2.5 GHz in order to cover the whole spectrum below 10th harmonic which could generate from the EUT. During the test, EUT was set to transmit continuously & Measurements spectrum range from 30 MHz to 26.5 GHz is investigated.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, and then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

A nonconductive material surrounded the EUT to supporting the EUT for standing on three orthogonal planes. At each condition, the EUT was rotated 360 degrees, and the antenna was raised and lowered from one to four meters to find the maximum emission levels. Measurements were taken using both horizontal and vertical antenna polarization.

SCHWARZBECK MESS-ELEKTRONIK Biconilog Antenna (mode VULB9163) at 3 Meter and the SCHWARZBECK Double Ridged Guide Antenna (model BBHA9120D&9170) was used in frequencies 1 – 26.5 GHz at a distance of 1 meter. All test results were extrapolated to equivalent signal at 3 meters utilizing an inverse linear distance



extrapolation Factor (20dB/decade).

For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

Appropriate preamplifiers were used for improving sensitivity and precautions were taken to avoid overloading or desensitizing the spectrum analyzer. No post – detector video filters were used in the test.

The spectrum analyzer's 6 dB bandwidth was set to 1 MHz, and the analyzer was operated in the peak detection mode, for frequencies both below and up 1 GHz. The average levels were obtained by subtracting the duty cycle correction factor from the peak readings.

The following procedures were used to convert the emission levels measured in decibels referenced to 1 microvolt (dBuV) into field intensity in micro volts per meter (uV/m).

The actual field intensity in decibels referenced to 1 microvolt in to field intensity in micro volts per meter (dBuV/m). The actual field intensity in referenced to 1 microvolt per meter (dBuV/m) is determined by algebraically adding the measured reading in dBuV, the antenna factor (dB), and cable loss (dB) and Subtracting the gain of preamplifier (dB) is auto calculate in spectrum analyzer.

$$(1) \text{ Amplitude (dBuV/m) = FI (dBuV) + AF (dBuV) + CL (dBuV) - Gain (dB)}$$

FI= Reading of the field intensity.

AF= Antenna factor.

CL= Cable loss.

P.S Amplitude is auto calculate in spectrum analyzer.

$$(2) \text{ Actual Amplitude (dBuV/m) = Amplitude (dBuV) - Dis(dB)}$$

The FCC specified emission limits were calculated according the EUT operating frequency and by following linear interpolation equations:

(a) For fundamental frequency : Transmitter Output < +30dBm

(b) For spurious frequency : Spurious emission limits = fundamental emission limit /10

7.5. Uncertainty

The measurement uncertainty is defined as for Field Strength of Spurious Radiation measurement is ± 3.072 dB.



7.6. Test Result

Standard:	FCC Part 22	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	PMG-005	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	1	Date:	01/16/2015
Frequency:	824.2 MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark	Ant.Polar. H / V
160.0000	-78.27	7.78	-70.49	-13.00	-57.49	peak	H
212.0000	-62.28	-0.17	-62.45	-13.00	-49.45	peak	H
350.0000	-76.09	-1.03	-77.12	-13.00	-64.12	peak	H
434.0000	-76.44	3.07	-73.37	-13.00	-60.37	peak	H
558.0000	-80.70	6.92	-73.78	-13.00	-60.78	peak	H
650.0000	-78.61	6.61	-72.00	-13.00	-59.00	peak	H
3280.000	-70.34	11.96	-58.38	-13.00	-45.38	peak	H
4756.000	-74.13	14.96	-59.17	-13.00	-46.17	peak	H
7180.000	-74.13	23.52	-50.61	-13.00	-37.61	peak	H
120.0000	-59.52	7.88	-51.64	-13.00	-38.64	peak	V
199.5000	-63.95	9.41	-54.54	-13.00	-41.54	peak	V
260.0000	-67.94	-3.31	-71.25	-13.00	-58.25	peak	V
400.0000	-66.81	0.41	-66.40	-13.00	-53.40	peak	V
463.0000	-75.30	1.17	-74.13	-13.00	-61.13	peak	V
609.5000	-79.99	7.30	-72.69	-13.00	-59.69	peak	V
3268.000	-72.28	15.23	-57.05	-13.00	-44.05	peak	V
4732.000	-74.05	19.13	-54.92	-13.00	-41.92	peak	V
7132.000	-75.02	21.13	-53.89	-13.00	-40.89	peak	V



Standard:	FCC Part 22	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	PMG-005	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	1	Date:	01/16/2015
Frequency:	836.6 MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark	Ant.Polar. H / V
60.5000	-69.14	5.80	-63.34	-13.00	-50.34	peak	H
212.0000	-61.62	-0.17	-61.79	-13.00	-48.79	peak	H
267.0000	-73.73	-5.26	-78.99	-13.00	-65.99	peak	H
410.0000	-74.94	2.15	-72.79	-13.00	-59.79	peak	H
554.0000	-80.12	7.02	-73.10	-13.00	-60.10	peak	H
650.0000	-78.58	6.61	-71.97	-13.00	-58.97	peak	H
3292.000	-71.91	12.00	-59.91	-13.00	-46.91	peak	H
4720.000	-74.47	14.77	-59.70	-13.00	-46.70	peak	H
7132.000	-74.65	23.37	-51.28	-13.00	-38.28	peak	H
120.0000	-56.97	7.88	-49.09	-13.00	-36.09	peak	V
199.5000	-64.12	9.41	-54.71	-13.00	-41.71	peak	V
260.0000	-67.32	-3.31	-70.63	-13.00	-57.63	peak	V
404.5000	-65.59	0.44	-65.15	-13.00	-52.15	peak	V
464.0000	-77.01	1.19	-75.82	-13.00	-62.82	peak	V
630.0000	-79.13	8.20	-70.93	-13.00	-57.93	peak	V
3280.000	-71.44	15.30	-56.14	-13.00	-43.14	peak	V
4732.000	-73.11	19.13	-53.98	-13.00	-40.98	peak	V
7132.000	-73.88	21.13	-52.75	-13.00	-39.75	peak	V



Standard:	FCC Part 22	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	PMG-005	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	1	Date:	01/16/2015
Frequency:	848.8 MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark	Ant.Polar. H / V
60.0000	-71.11	6.03	-65.08	-13.00	-52.08	peak	H
212.0000	-60.17	-0.17	-60.34	-13.00	-47.34	peak	H
390.0000	-76.01	0.76	-75.25	-13.00	-62.25	peak	H
511.5000	-79.91	6.57	-73.34	-13.00	-60.34	peak	H
638.0000	-79.83	6.43	-73.40	-13.00	-60.40	peak	H
708.0000	-76.69	7.07	-69.62	-13.00	-56.62	peak	H
3328.000	-71.97	12.11	-59.86	-13.00	-46.86	peak	H
4756.000	-74.68	14.96	-59.72	-13.00	-46.72	peak	H
7108.000	-75.31	23.32	-51.99	-13.00	-38.99	peak	H
120.0000	-57.64	7.88	-49.76	-13.00	-36.76	peak	V
199.5000	-63.82	9.41	-54.41	-13.00	-41.41	peak	V
260.0000	-67.17	-3.31	-70.48	-13.00	-57.48	peak	V
400.0000	-65.96	0.41	-65.55	-13.00	-52.55	peak	V
506.5000	-79.48	2.09	-77.39	-13.00	-64.39	peak	V
630.0000	-79.52	8.20	-71.32	-13.00	-58.32	peak	V
3292.000	-70.46	15.38	-55.08	-13.00	-42.08	peak	V
4720.000	-73.85	19.11	-54.74	-13.00	-41.74	peak	V
7204.000	-75.55	21.24	-54.31	-13.00	-41.31	peak	V



Standard:	FCC Part 24	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	PMG-005	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	2	Date:	01/16/2015
Frequency:	1850.2 MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark	Ant.Polar. H / V
77.0000	-68.09	-1.75	-69.84	-13.00	-56.84	peak	H
212.0000	-61.92	-0.17	-62.09	-13.00	-49.09	peak	H
320.0000	-79.82	-1.45	-81.27	-13.00	-68.27	peak	H
456.0000	-79.59	3.87	-75.72	-13.00	-62.72	peak	H
608.0000	-81.18	6.98	-74.20	-13.00	-61.20	peak	H
699.0000	-80.24	6.85	-73.39	-13.00	-60.39	peak	H
3328.000	-70.71	12.11	-58.60	-13.00	-45.60	peak	H
4684.000	-73.65	14.58	-59.07	-13.00	-46.07	peak	H
7132.000	-75.17	23.37	-51.80	-13.00	-38.80	peak	H
129.0000	-73.43	18.44	-54.99	-13.00	-41.99	peak	V
199.5000	-65.35	9.41	-55.94	-13.00	-42.94	peak	V
267.5000	-71.41	-1.48	-72.89	-13.00	-59.89	peak	V
390.0000	-70.94	0.59	-70.35	-13.00	-57.35	peak	V
520.0000	-79.75	2.29	-77.46	-13.00	-64.46	peak	V
728.0000	-80.34	10.60	-69.74	-13.00	-56.74	peak	V
3280.000	-70.76	15.30	-55.46	-13.00	-42.46	peak	V
4720.000	-74.39	19.11	-55.28	-13.00	-42.28	peak	V
7120.000	-73.53	21.11	-52.42	-13.00	-39.42	peak	V



Standard:	FCC Part 24	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	PMG-005	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	2	Date:	01/16/2015
Frequency:	1880.0 MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark	Ant.Polar. H / V
58.5000	-71.06	6.53	-64.53	-13.00	-51.53	peak	H
212.0000	-62.42	-0.17	-62.59	-13.00	-49.59	peak	H
350.0000	-75.47	-1.03	-76.50	-13.00	-63.50	peak	H
466.5000	-79.66	4.30	-75.36	-13.00	-62.36	peak	H
545.5000	-79.61	7.21	-72.40	-13.00	-59.40	peak	H
734.0000	-79.83	7.86	-71.97	-13.00	-58.97	peak	H
3280.000	-71.32	11.96	-59.36	-13.00	-46.36	peak	H
4732.000	-75.08	14.83	-60.25	-13.00	-47.25	peak	H
7156.000	-75.83	23.45	-52.38	-13.00	-39.38	peak	H
132.5000	-72.83	18.60	-54.23	-13.00	-41.23	peak	V
199.5000	-63.51	9.41	-54.10	-13.00	-41.10	peak	V
280.0000	-73.73	0.36	-73.37	-13.00	-60.37	peak	V
390.0000	-72.11	0.59	-71.52	-13.00	-58.52	peak	V
538.5000	-79.93	3.26	-76.67	-13.00	-63.67	peak	V
659.0000	-81.20	9.05	-72.15	-13.00	-59.15	peak	V
3280.000	-71.52	15.30	-56.22	-13.00	-43.22	peak	V
4732.000	-74.05	19.13	-54.92	-13.00	-41.92	peak	V
7120.000	-73.75	21.11	-52.64	-13.00	-39.64	peak	V



Standard:	FCC Part 24	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	PMG-005	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	2	Date:	01/16/2015
Frequency:	1909.8 MHz	Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark	Ant.Polar. H / V
59.5000	-70.15	6.19	-63.96	-13.00	-50.96	peak	H
212.0000	-62.16	-0.17	-62.33	-13.00	-49.33	peak	H
350.0000	-76.62	-1.03	-77.65	-13.00	-64.65	peak	H
502.0000	-79.37	6.28	-73.09	-13.00	-60.09	peak	H
612.5000	-80.23	7.00	-73.23	-13.00	-60.23	peak	H
784.5000	-81.22	10.11	-71.11	-13.00	-58.11	peak	H
3292.000	-72.77	12.00	-60.77	-13.00	-47.77	peak	H
4732.000	-74.78	14.83	-59.95	-13.00	-46.95	peak	H
7180.000	-75.28	23.52	-51.76	-13.00	-38.76	peak	H
120.0000	-54.27	7.88	-46.39	-13.00	-33.39	peak	V
199.5000	-64.94	9.41	-55.53	-13.00	-42.53	peak	V
267.5000	-70.12	-1.48	-71.60	-13.00	-58.60	peak	V
370.0000	-71.66	1.20	-70.46	-13.00	-57.46	peak	V
521.5000	-79.32	2.38	-76.94	-13.00	-63.94	peak	V
660.5000	-79.88	9.09	-70.79	-13.00	-57.79	peak	V
3328.000	-70.82	15.61	-55.21	-13.00	-42.21	peak	V
4768.000	-73.30	19.19	-54.11	-13.00	-41.11	peak	V
7168.000	-75.03	21.20	-53.83	-13.00	-40.83	peak	V

8 Frequency Stability (Temperature & Voltage Variation) Test

8.1. Limit

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ ($\pm 2.5\text{ppm}$) of the center frequency.

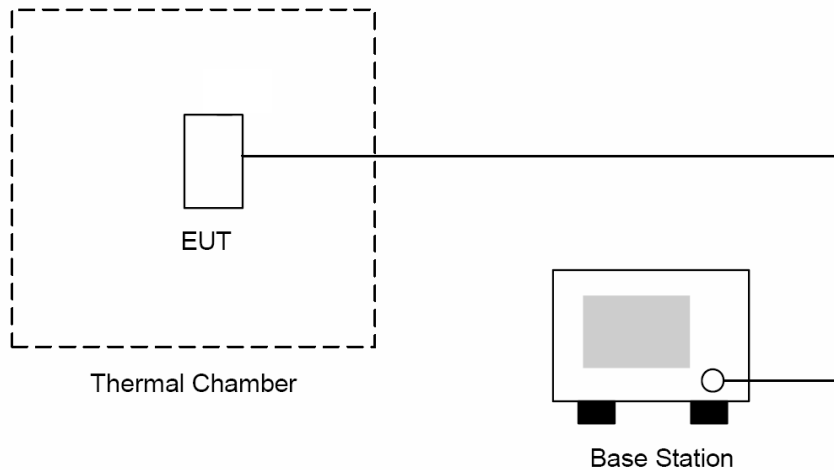
8.2. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Universal Radio Communication Tester	R & S	CMU200	109369	08/07/2014	(1)
Temperature & Humidity Chamber	TAICHY	MHU-225LA	980729	08/07/2014	(1)
RF cable	WOKEN	--	S02-140428-045	07/14/2014	(1)
Test Site	ATL	TE05	TE05	N.C.R.	-----

Remark: ⁽¹⁾ Calibration period 1 year. ⁽²⁾ Calibration period 2 years.

Note: N.C.R. = No Calibration Request.

8.3. Setup





8.4. Test Procedure

The measurement is made according to FCC rules part 22 and 24:

1. The EUT and test equipment were set up as shown on the following section.
2. With all power removed, the temperature was decreased to -30°C and permitted to stabilize for three hours. Power was applied and the maximum change in frequency was noted within one minute.
3. With power OFF, the temperature was raised in 10°C steps. The sample was permitted to stabilize at each step for at least one-half hour. Power was applied and the maximum frequency change was noted within one minute.
4. The EUT was placed in a temperature chamber at $25 \pm 5^{\circ}\text{C}$ and connected as the following section.
5. The power supply voltage to the EUT was varied from BEP to 115% of the nominal value measured at the input to the EUT.
6. The temperature tests were performed for the worst case.
7. Test data was recorded.

8.5. Uncertainty

The measurement uncertainty is defined as for Frequency Stability (Temperature Variation) measurement is $\pm 10\text{Hz}$.



8.6. Test Result

Model Number	PMG-005					
Test Item	Frequency Stability (Temperature & Voltage Variation)					
Test Mode	Mode 1					
Date of Test	01/15/2015				Test Site	TE05
Level	Voltage [Vac]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Result
Normal	120	-30	12.52	0.015	±2.5	Pass
Normal	120	-20	13.01	0.016	±2.5	Pass
Normal	120	-10	12.62	0.015	±2.5	Pass
Normal	120	0	11.65	0.014	±2.5	Pass
Normal	120	10	7.93	0.009	±2.5	Pass
High	132	20	5.16	0.006	±2.5	Pass
Normal	120	20	11.02	0.013	±2.5	Pass
Low	108	20	7.40	0.009	±2.5	Pass
Normal	120	30	7.09	0.008	±2.5	Pass
Normal	120	40	4.67	0.006	±2.5	Pass
Normal	120	50	1.68	0.002	±2.5	Pass

Model Number	PMG-005					
Test Item	Frequency Stability (Temperature & Voltage Variation)					
Test Mode	Mode 2					
Date of Test	01/15/2015				Test Site	TE05
Level	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Result
Normal	120	-30	-26.39	-0.014	±2.5	Pass
Normal	120	-20	-25.63	-0.014	±2.5	Pass
Normal	120	-10	-26.68	-0.014	±2.5	Pass
Normal	120	0	-28.34	-0.015	±2.5	Pass
Normal	120	10	-29.36	-0.016	±2.5	Pass
Power full point	132	20	-27.94	-0.015	±2.5	Pass
Normal	120	20	-25.10	-0.013	±2.5	Pass
Power cut-off point	108	20	-25.06	-0.013	±2.5	Pass
Normal	120	30	-24.40	-0.013	±2.5	Pass
Normal	120	40	-21.11	-0.011	±2.5	Pass
Normal	120	50	-23.29	-0.012	±2.5	Pass



Model Number	PMG-005					
Test Item	Frequency Stability (Temperature & Voltage Variation)					
Test Mode	Mode 3					
Date of Test	01/15/2015				Test Site	TE05
Level	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Result
Normal	120	-30	11.86	0.014	±2.5	Pass
Normal	120	-20	7.62	0.009	±2.5	Pass
Normal	120	-10	6.45	0.008	±2.5	Pass
Normal	120	0	5.30	0.006	±2.5	Pass
Normal	120	10	5.93	0.007	±2.5	Pass
Power full point	132	20	8.86	0.011	±2.5	Pass
Normal	120	20	13.20	0.016	±2.5	Pass
Power cut-off point	108	20	10.49	0.013	±2.5	Pass
Normal	120	30	12.47	0.015	±2.5	Pass
Normal	120	40	12.19	0.015	±2.5	Pass
Normal	120	50	15.07	0.018	±2.5	Pass

Model Number	PMG-005					
Test Item	Frequency Stability (Temperature & Voltage Variation)					
Test Mode	Mode 4					
Date of Test	01/15/2015				Test Site	TE05
Level	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Result
Normal	120	-30	-22.74	-0.012	±2.5	Pass
Normal	120	-20	-26.86	-0.014	±2.5	Pass
Normal	120	-10	-24.28	-0.013	±2.5	Pass
Normal	120	0	-28.63	-0.015	±2.5	Pass
Normal	120	10	-25.02	-0.013	±2.5	Pass
Power full point	132	20	-24.11	-0.013	±2.5	Pass
Normal	120	20	-26.32	-0.014	±2.5	Pass
Power cut-off point	108	20	-23.87	-0.013	±2.5	Pass
Normal	120	30	-24.81	-0.013	±2.5	Pass
Normal	120	40	-22.90	-0.012	±2.5	Pass
Normal	120	50	-22.78	-0.012	±2.5	Pass