

FCC TEST REPORT**For****SPECTRA Technologies Holdings Co. Ltd****EFTPOS****Model No. : SPECTRA T1000**

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Report Number : 201109701F
Date of Test : May 03~18, 2012
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TEST REPORT

Applicant : SPECTRA Technologies Holdings Co.Ltd
Manufacture SPECTRA Technologies Holdings Co.Ltd
EUT EFTPOS
Model No. : SPECTRA T1000
Rating : DC 9V Via Adapter
DC 7.4V Via Battery
Trade Mark : SPECTRA

Measurement Procedure Used: TIA/EIA 603-C, ANSI C63.4-2003.
FCC Rules and Regulations FCC part 22H & FCC part 24E

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

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

Date of Test :

May 03~18, 2012

Prepared by :



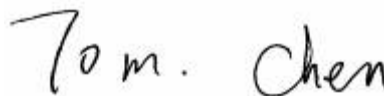
(Engineer/ Andy Chen)

Reviewer :



(Project Manager/ Jerry Du)

Approved & Authorized Signer :



(Manager/ Tom Chen)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Product:	EFTPOS
Manufacturer:	SPECTRA Technologies Holdings Co. Ltd
Brand Name:	SPECTRA
Model Number:	SPECTRA T1000
Additional Model Name	N.A.
Emission Designator:	252KGXW 250KGXW
Power Supply	DC 9V Via Adapter DC 7.4V Via Battery
Type of Modulation	GMS/GPRS
Frequency range	824.2-848.8MHz 1850.2-1909.8MHz
Antenna type	Internal
Submitted Sample:	2 Sample

1.2. Description of Test Facility

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

CNAS - LAB Code: L3503

Anbotek Compliance Laboratory Limited., Laboratory has been assessed and in compliance with CNAS/CL01: 2006 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2005 General Requirements) for the Competence of Testing Laboratories.

FCC-Registration No.: 752021

Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 752021, August 20, 2010

IC-Registration No.: 8058A-1

Anbotek Compliance Laboratory Limited., EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada. The acceptance letter from the IC is maintained in our files. Registration 8058A-1, August 30, 2010

Test Location

All Emissions tests were performed

Anbotek Compliance Laboratory Limited. at 1/F, 1 /Build, SEC Industrial Park, No. 4 Qianhai Road, Nanshan District, Shenzhen, 518054, China

1.3. Measurement Uncertainty

Radiation Uncertainty : Ur = 4.3dB

Conduction Uncertainty : Uc = 3.4dB

Test Equipments					
Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
ESPI Test Receiver	ROHDE&SCHWARZ	ESPI 3	100379	2012-04-25	2013-04-25
Absorbing Clamp	ROHDE&SCHWARZ	MDS-21	100126	2012-04-25	2013-04-25
TWO Line-V-NETW	ROHDE&SCHWARZ	EZH3-Z5	100294	2012-04-25	2013-04-25
TWO Line-V-NETW	ROHDE&SCHWARZ	EZH3-Z5	100253	2012-04-25	2013-04-25
Ultra Broadband ANT	ROHDE&SCHWARZ	HL562	100157	2012-04-25	2013-04-25
ESDV Test Receiver	ROHDE&SCHWARZ	ESDV	100008	2012-04-25	2013-04-25
4-WIRE ISN	ROHDE&SCHWARZ	ENY 41	830663/044	2012-04-25	2013-04-25
GG ENY22 Double 2-Wire ISN	ROHDE&SCHWARZ	ENY22	83066/016	2012-04-25	2013-04-25
Impuls-Begrenzer	ROHDE&SCHWARZ	ESH3-Z2	100281	2012-04-25	2013-04-25
System Controller	CT	SC100	-	2012-04-25	2013-04-25
Printer	EPSON	PHOTO EX3	CFNH234850	2012-04-25	2013-04-25
FM-AM Signal Generator	JUNGJIN	SG-150M	389911177	2012-04-25	2013-04-25
Color TV Pattern Generator	PHILIPS	PM5418	LO621747	2012-04-25	2013-04-25
Computer	IBM	8434	1S8434KCE99BLX LO*	-	-
Oscillator	KENWOOD	AG-203D	3070002	2012-04-25	2013-04-25
Power meter	Anritsu	ML2487A	6K00003613	2012-04-25	2013-04-25
Power sensor	Anritsu	MA2491A	32263	2012-04-25	2013-04-25
Spectrum Analyzer	HAMEG	HM5012	-	2012-04-25	2013-04-25
Power Supply	LW	APS1502	-	-	-
5K VA AC Power Source	California Instruments	5001iX	56060	2012-04-25	2013-04-25
CDN	EM TEST	CDN M2/M3	-	2012-04-25	2013-04-25
Attenuation	EM TEST	ATT6/75	-	2012-04-25	2013-04-25
Resistance	EM TEST	R100	-	2012-04-25	2013-04-25
Electromagnetic Injection Clamp	LITTHI	EM101	35708	2012-04-25	2013-04-25
Signal Generator	ROHDE&SCHWARZ	SMT03	100029	2012-04-25	2013-04-25
Power Amplifier	AR	150W1000	300999	2012-04-25	2013-04-25
Field probe	Holiday	HI-6005	105152	2012-04-25	2013-04-25
Bilog Antenna	Chase	CBL6111C	2576	2012-04-25	2013-04-25

ESPI Test Receiver	ROHDE&SCHWARZ	ESI26	838786/013	2012-04-25	2013-04-25
3m OATS	--	--	N/A	2012-04-25	2013-04-25
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170265	2012-04-25	2013-04-25
Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-631	2012-04-25	2013-04-25
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	1100.0008.02	2012-04-25	2013-04-25

3.0 Technical Details

3.1 Summary of test results

FCC RULE	DESCRIPTION OF TEST	Result
§1.1037, §2.1091	RF Exposure (SAR)	Compliant
§2.1046; § 22.913 (a) § 24.232 (c)	RF Output Power	Compliant
§ 2.1047	Modulation Characteristics	N/A
§ 2.1049 § 22.905 § 22.917 § 24.238	99% & -26 dB Occupied Bandwidth	Compliant
§ 2.1051, § 22.917 (a) § 24.238 (a)	Spurious Emissions t Antenna Terminal	Compliant
§ 2.1053 § 22.917 (a) § 24.238 (a)	Field Strength of Spurious Radiation	Compliant
§ 22.917 (a) § 24.238 (a)	Out of band emission, Band Edge	Compliant
§ 2.1055 § 22.355 § 24.235	Frequency stability vs. temperature Frequency stability vs. voltage	Compliant

3.2 Test Standards

FCC Part 2 Subpart J & Part 22 Subpart H & Part 24 Subpart E

4.0 EUT Modification

No modification by Shenzhen Anbotek Co.,Ltd

5.0 RF EXPOSURE

The EUT is a portable device, so should meet the SAR limit.

SAR Report please refer to SEMIC SAR Report No.:11021209-FCC-H-V1

6.0 MODULATION CHARACTERISTIC

6.1 Applicable Standards:

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

7.0 RF OUTPUT POWER

7.1 Applicable Standards

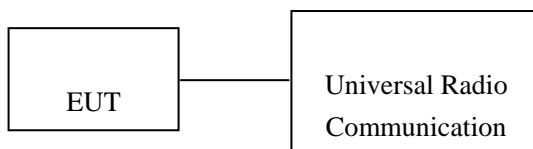
According to FCC §2.1046 and §22.913 (a), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

According to FCC §2.1046 and §24.232 (C), in no case may the peak output power of a base station transmitter exceed 2 watt EIRP.

7.2 Test Procedure

Conducted method:

The RF output of the transmitter was connected to the wireless test set and the spectrum analyzer through sufficient attenuation.



Radiated method:

Please refer to TIA 603-C section 2.2.17

7.3 Test Data:

Environmental conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0kPa

Conducted Power

Cellular Band Part 22H

GSM

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)
Low	824.2	32.42	38.45
Middle	836.6	32.12	38.45
High	848.8	31.96	38.45

GPRS

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)
Low	824.2	32.38	38.45
Middle	836.6	32.10	38.45
High	848.8	31.98	38.45

Note: GPRS only show Slot 1 mode, and Slot 1 mode is the worst mode.

PCS Band Part 24E

GSM

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)
Low	1850.2	29.01	33
Middle	1880.0	29.42	33
High	1909.8	29.03	33

GPRS

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)
Low	1850.2	29.02	33
Middle	1880.0	29.38	33
High	1909.8	28.98	33

Note: GPRS only show Slot 1 mode, and Slot 1 mode is the worst mode.

Radiated Power (ERP and EIRP)

Cellular Band Part 22H

GSM:

Indicated		Table Angle Degree	Test Antenna		Substituted			Antenna Gain Correction (dBi)	Cable Loss (dB)	Absolute Level	FCC Part 22H
Frequency (MHz)	Receiver Reading (dBμV)		Height (m)	Polar (H/V)	Frequency (MHz)	Level (dBm)	Polar (H/V)			(dBm)	Limit (dBm)
Frequency in Low Channel											
824.2	115.03	120	1.0	H	824.2	25.75	H	0	0.9	24.85	38.45
824.2	117.50	80	1.5	V	824.2	28.46	V	0	0.9	27.56	38.45
Frequency in Middle Channel											
836.6	117.36	120	125	H	836.6	28.39	H	0	0.9	27.49	38.45
836.6	117.56	88	155	V	836.6	28.64	V	0	0.9	27.74	38.45
Frequency in High Channel											
848.8	117.71	120	1.0	H	850	28.81	H	0	0.9	27.91	38.45
848.8	117.74	82	1.54	V	850	28.99	V	0	0.9	28.09	38.45

GPRS:

Indicated		Table Angle Degree	Test Antenna		Substituted			Antenna Gain Correction (dBi)	Cable Loss (dB)	Absolute Level	FCC Part 22H
Frequency (MHz)	Receiver Reading (dBμV)		Height (m)	Polar (H/V)	Frequency (MHz)	Level (dBm)	Polar (H/V)			(dBm)	Limit (dBm)
Frequency in Low Channel											
824.2	115.14	120	1.0	H	824.2	25.86	H	0	0.90	24.96	38.45
824.2	117.48	80	1.5	V	824.2	28.44	V	0	0.90	27.54	38.45
Frequency in Middle Channel											
836.6	117.41	120	125	H	836.6	28.44	H	0	0.9	27.54	38.45
836.6	117.53	88	155	V	836.6	28.61	V	0	0.9	27.71	38.45
Frequency in High Channel											
848.8	117.56	120	1.0	H	850	28.66	H	0	0.9	27.76	38.45
848.8	117.69	82	1.54	V	850	28.94	V	0	0.9	28.04	38.45

Note: GPRS only show Slot 1 mode, and Slot 1 mode is the worst mode.

PCS Band Part 24E

GSM:

Indicated		Table Angle Degree	Test Antenna		Substituted			Antenna Gain Correction (dBi)	Cable Loss (dB)	Absolute Level	FCC Part 22H
Frequency (MHz)	Receiver Reading (dBµV)		Height (m)	Polar (H/V)	Frequency (MHz)	Level (dBm)	Polar (H/V)			(dBm)	Limit (dBm)
Frequency in Low Channel											
1850.2	118.63	240	1.8	H	1850.2	17.45	H	6.2	1.02	22.63	33
1850.2	124.45	80	1.0	V	1850.2	24.61	V	6.2	1.02	29.79	33
Frequency in Middle Channel											
1880	119.0/	230	1.85	H	1880	17.78	H	6.2	1.03	22.95	33
1880	125.38	82	1.0	V	1880	24.38	V	6.2	1.03	29.55	33
Frequency in High Channel											
1909.8	119.40	240	1.9	H	1909.8	19.66	H	6.2	1.03	24.83	33
1909.8	124.79	82	1.04	V	1909.8	24.59	V	6.2	1.03	29.76	33

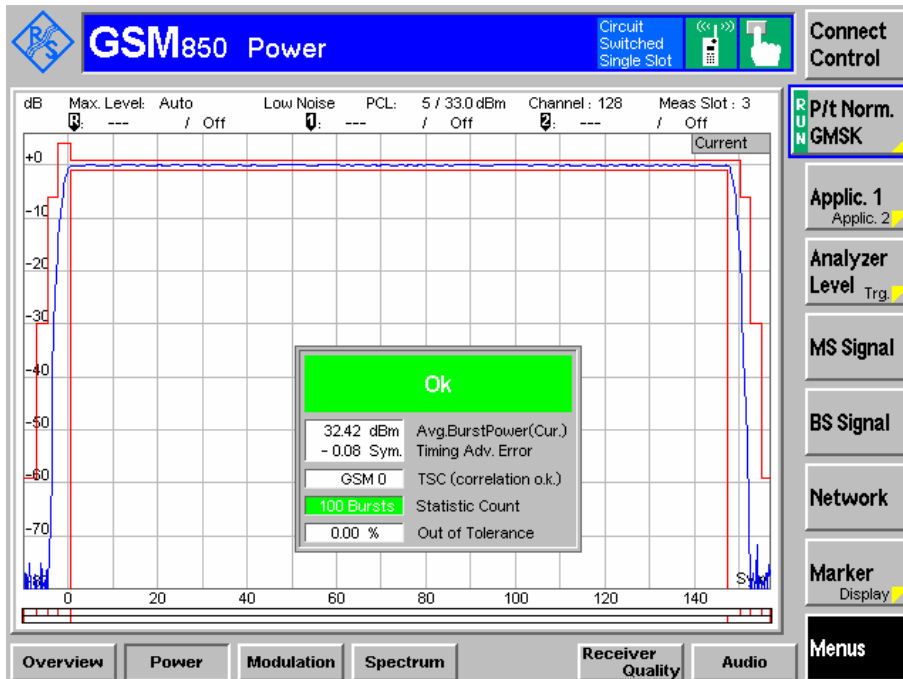
GPRS:

Indicated		Table Angle Degree	Test Antenna		Substituted			Antenna Gain Correction (dBi)	Cable Loss (dB)	Absolute Level	FCC Part 22H
Frequency (MHz)	Receiver Reading (dBµV)		Height (m)	Polar (H/V)	Frequency (MHz)	Level (dBm)	Polar (H/V)			(dBm)	Limit (dBm)
Frequency in Low Channel											
1850.2	117.90	240	1.8	H	1850.2	16.72	H	6.2	1.02	21.90	33
1850.2	122.96	80	1.0	V	1850.2	23.12	V	6.2	1.02	28.30	33
Frequency in Middle Channel											
1880	120.09	230	1.85	H	1880	18.87	H	6.2	1.03	24.04	33
1880	122.60	82	1.0	V	1880	21.6	V	6.2	1.03	26.77	33
Frequency in High Channel											
1909.8	116.89	240	1.9	H	1909.8	17.15	H	6.2	1.03	22.32	33
1909.8	122.37	82	1.04	V	1909.8	22.17	V	6.2	1.03	27.34	33

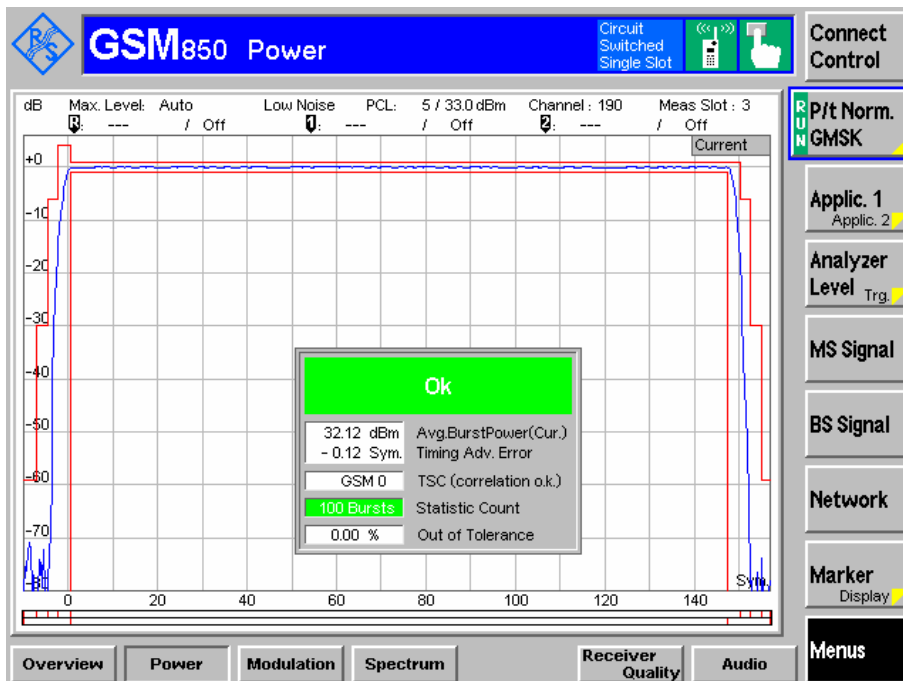
Note: GPRS only show Slot 1 mode, and Slot 1 mode is the worst mode.

Plots of Conducted Output Power for Cellular Band (GSM):

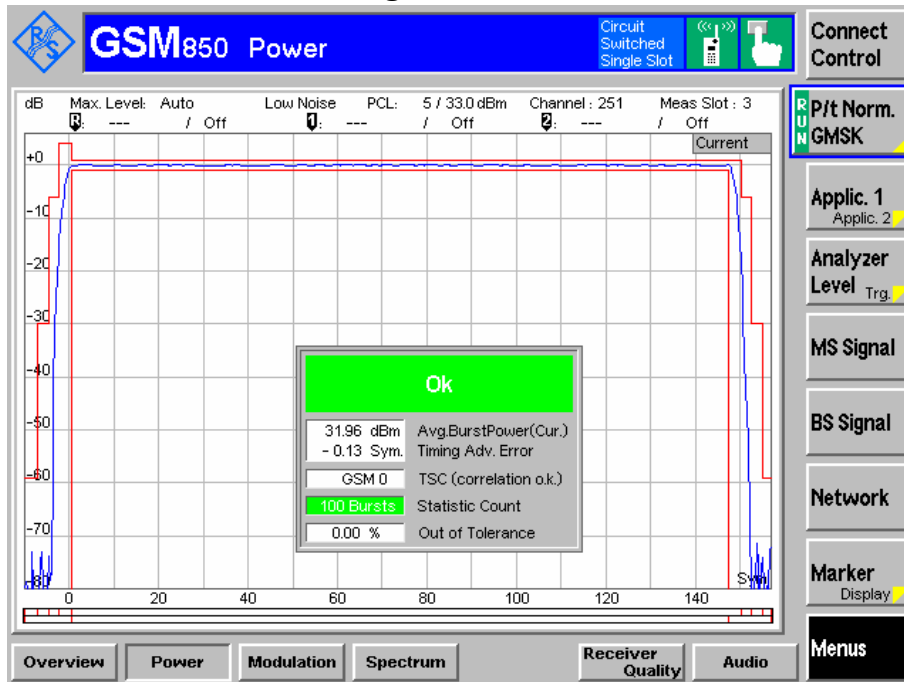
Low Channel



Middle Channel

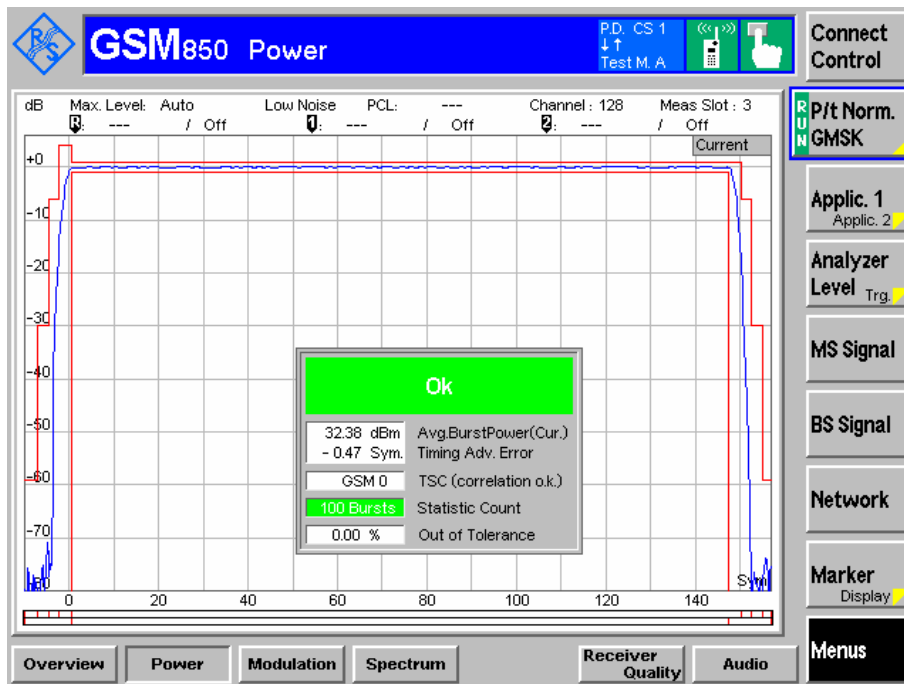


High Channel

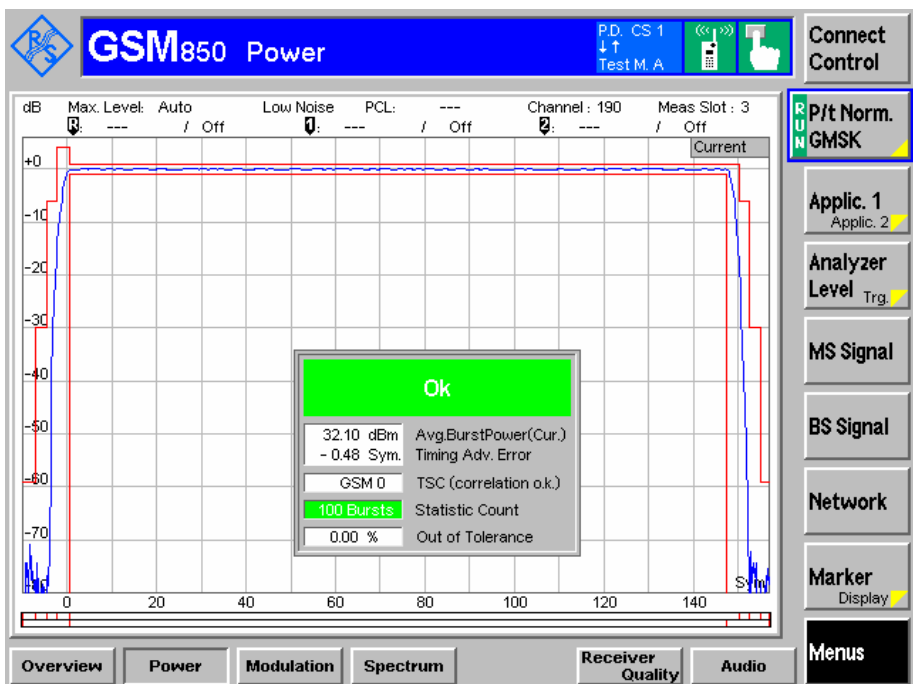


Plots of Conducted Output Power for Cellular Band (GPRS) Slot 1:

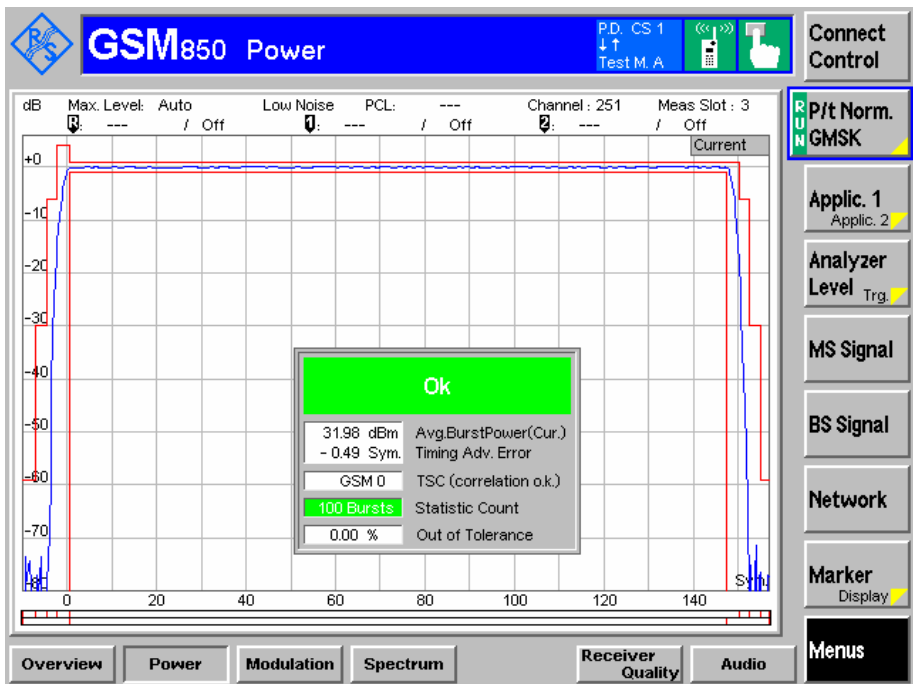
Low Channel



Middle channel

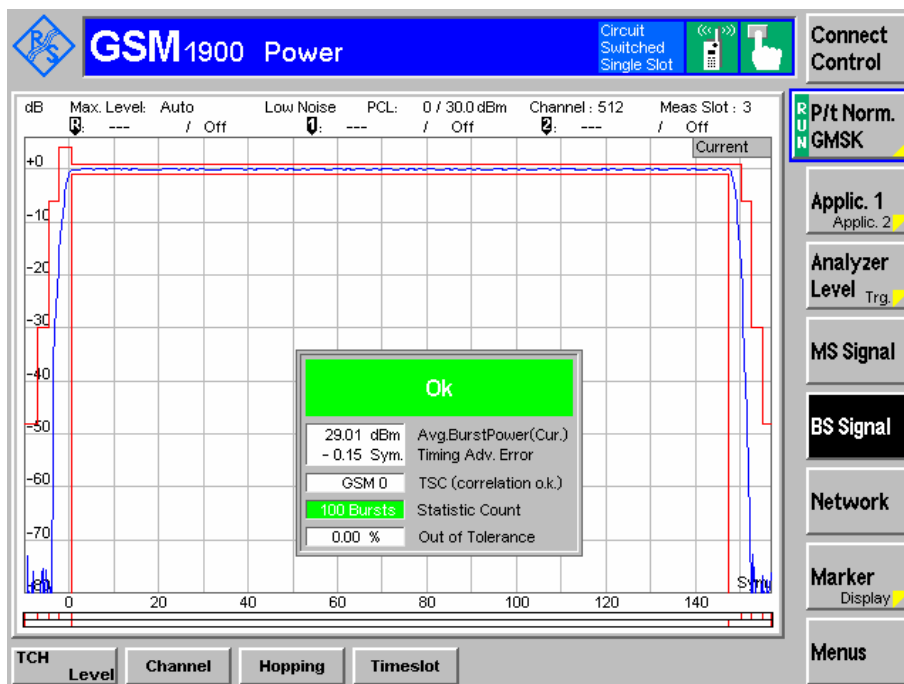


High channel

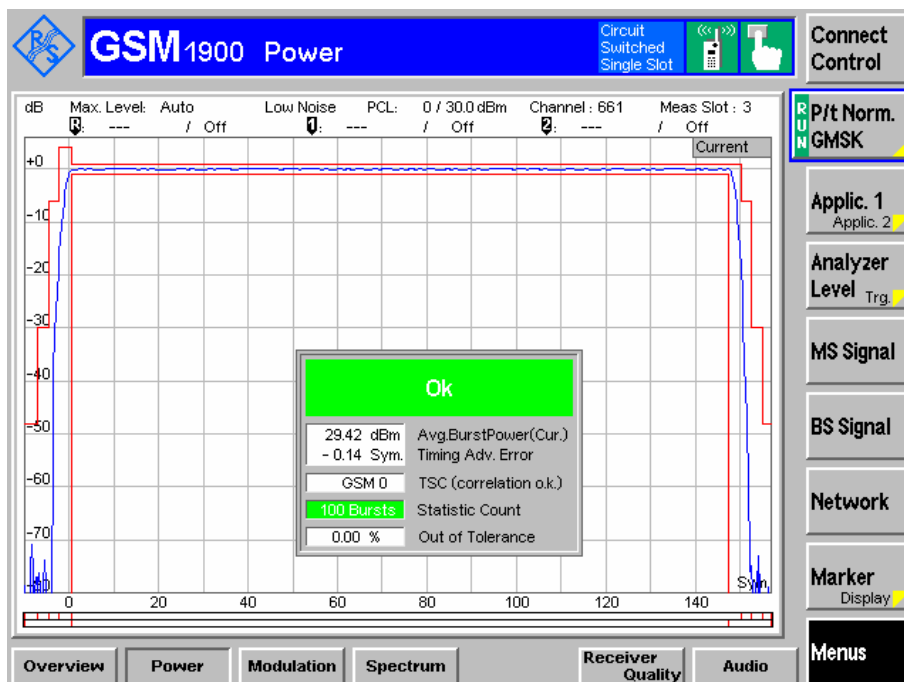


Plots of Conducted Output Power for PCS Band (GSM):

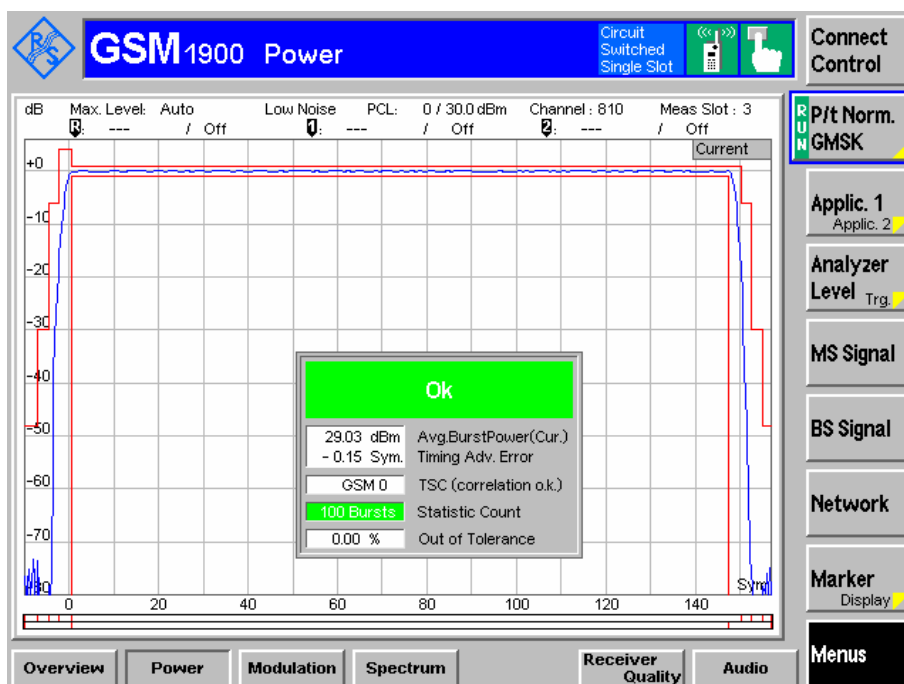
Low Channel



Middle Channel

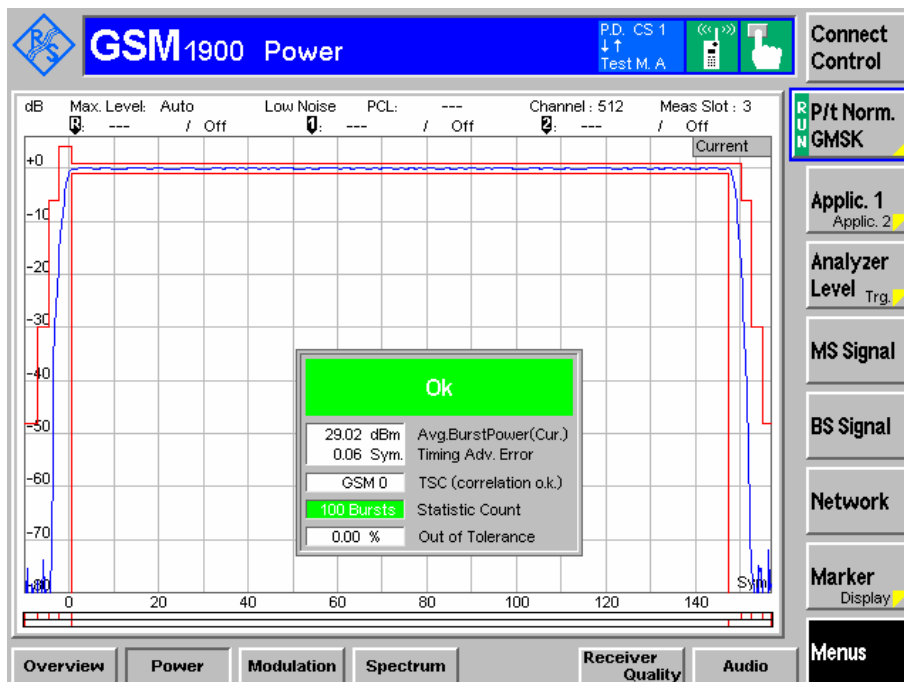


High channel

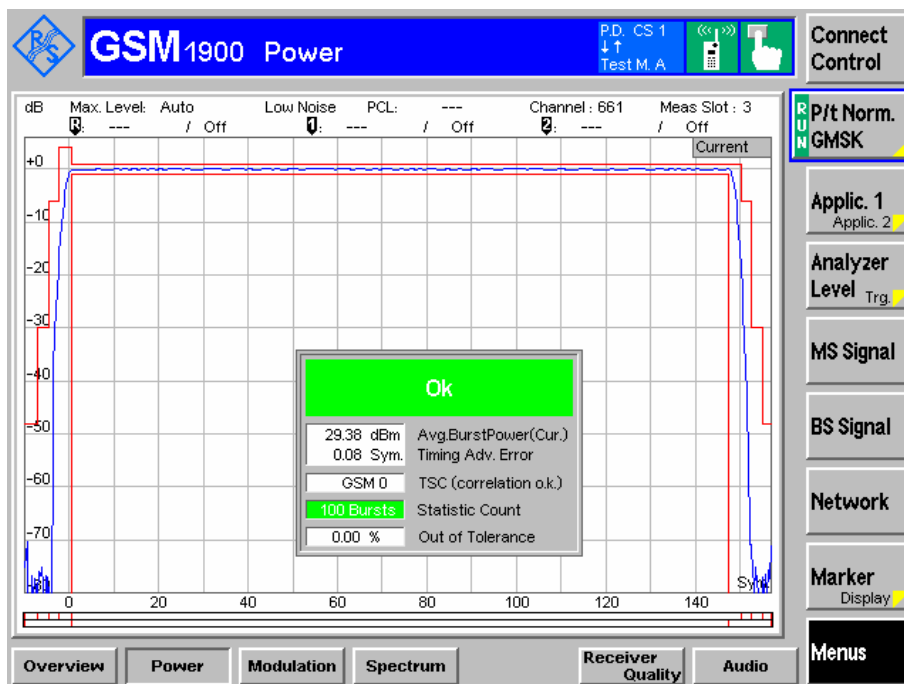


Plots of Conducted Output Power for PCS Band (GPRS) Slot 1:

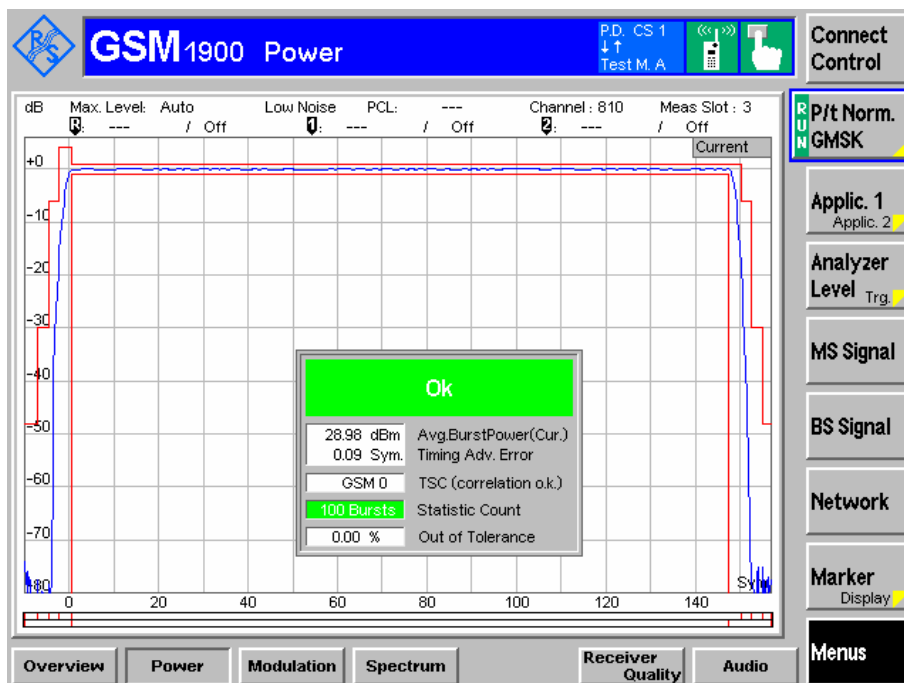
Low Channel



Middle channel



High channel



8.0 Occupied Bandwidth

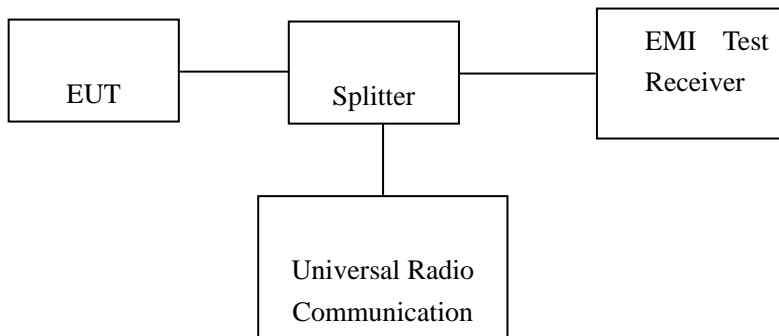
8.1 Applicable Standards:

CFR 47 §2.1049, §22.917, §22.905 and §24.238.

8.2 Test Procedure

The RF output of the transmitter was connected to the simulator and the spectrum analyzer through sufficient attenuation.

The resolution bandwidth of the spectrum analyzer was set at 30 kHz (Cellular /PCS) and the 26 dB & 99% bandwidth was recorded.



8.3 Test Data:

Environmental conditions:

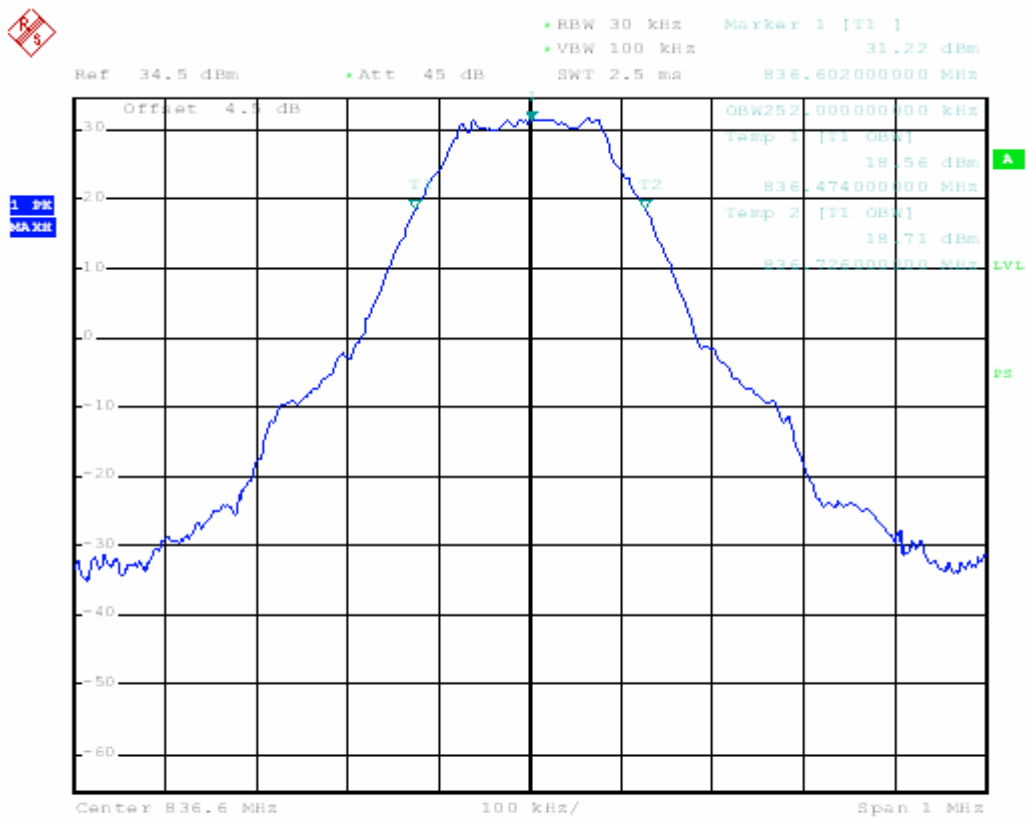
Temperature:	25 ° C
Relative Humidity:	56%
ATM Pressure:	100.0kPa

For GSM 850

Channel	Channel frequency (MHz)	99% Power Bandwidth (kHz)	26 dB Bandwidth (kHz)
Channel 190	836.6	252.0	336.0

Please refer to the following plots.

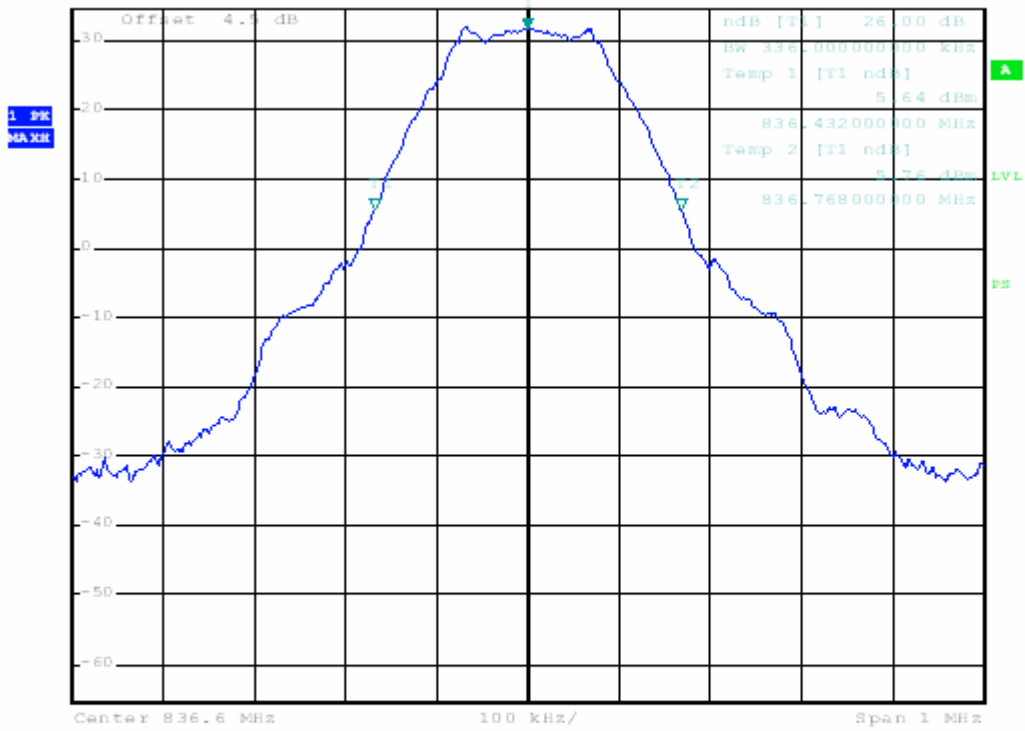
99% Power Bandwidth



26 dB bandwidth



•RBW 30 kHz Marker 1 [T1]
•VBW 100 kHz 31.70 dBm
Ref 34.5 dBm •Att 45 dB SWT 2.5 ma 836.600000000 MHz

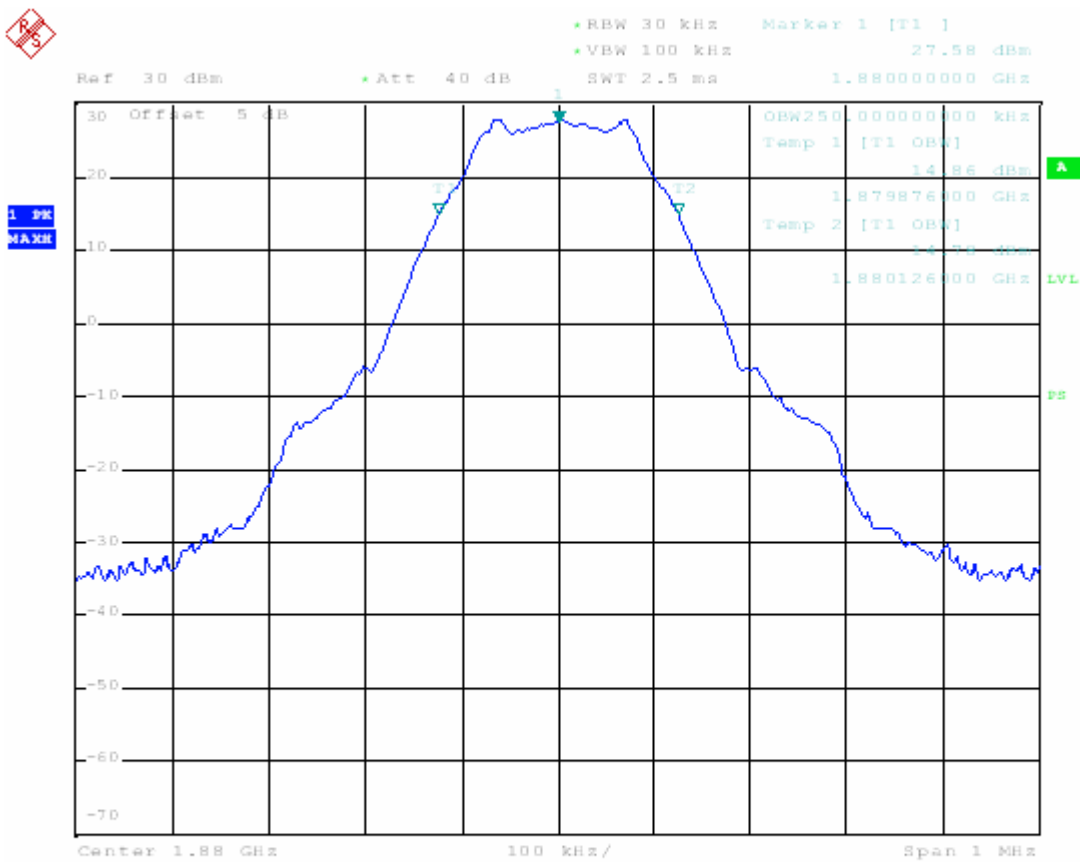


For PCS1900

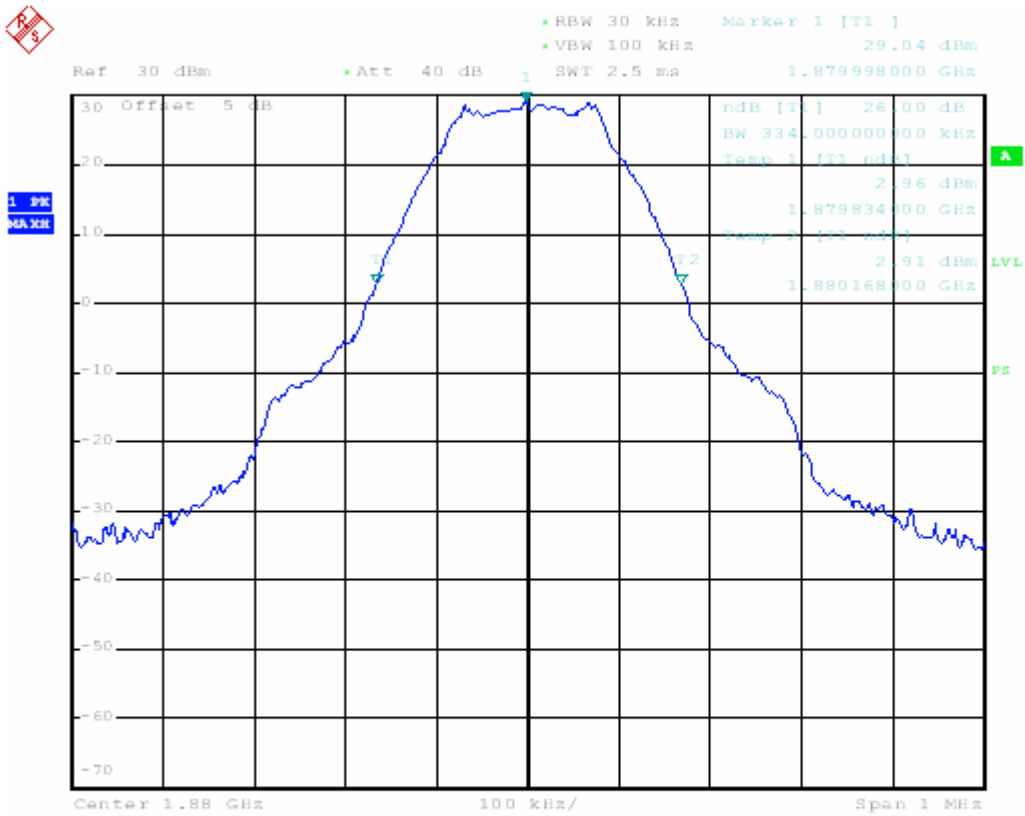
Channel	Channel frequency (MHz)	99% Power Bandwidth (kHz)	26 dB Bandwidth (kHz)
Channel 661	1880.0	250.0	334.0

Please refer to the following plots.

99% Power Bandwidth



26 dB Bandwidth



9.0 SPURIOUS EMISSIONS AT ANTENNA TERMINALS

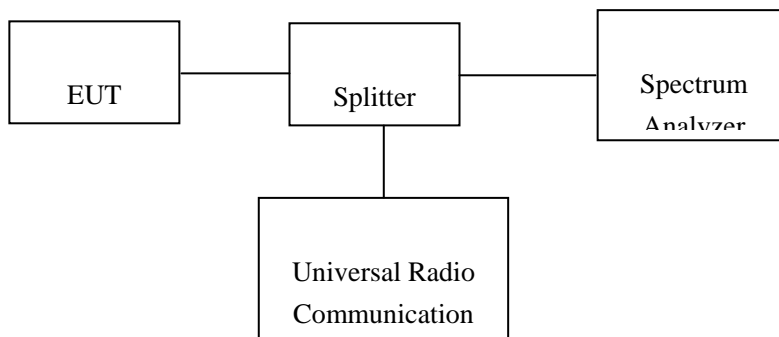
9.1 Applicable Standards

CFR 47 §2.1051, §22.917(a) and §24.238(a).

The spectrum was to be investigated to the tenth harmonics of the highest fundamental frequency as specified in § 2.1051.

9.2 Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer and simulator through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 100 kHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonic.



9.3 Test Data:

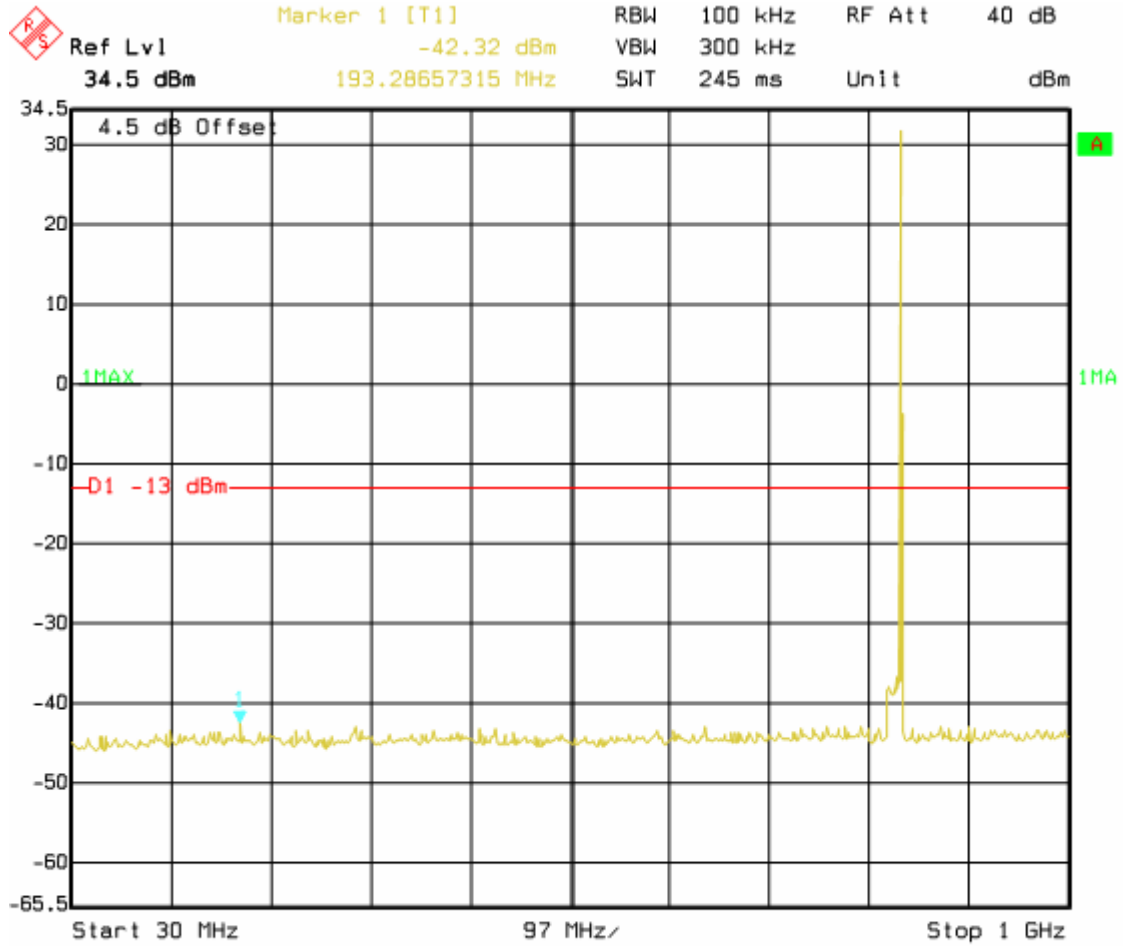
Environmental conditions:

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0kPa

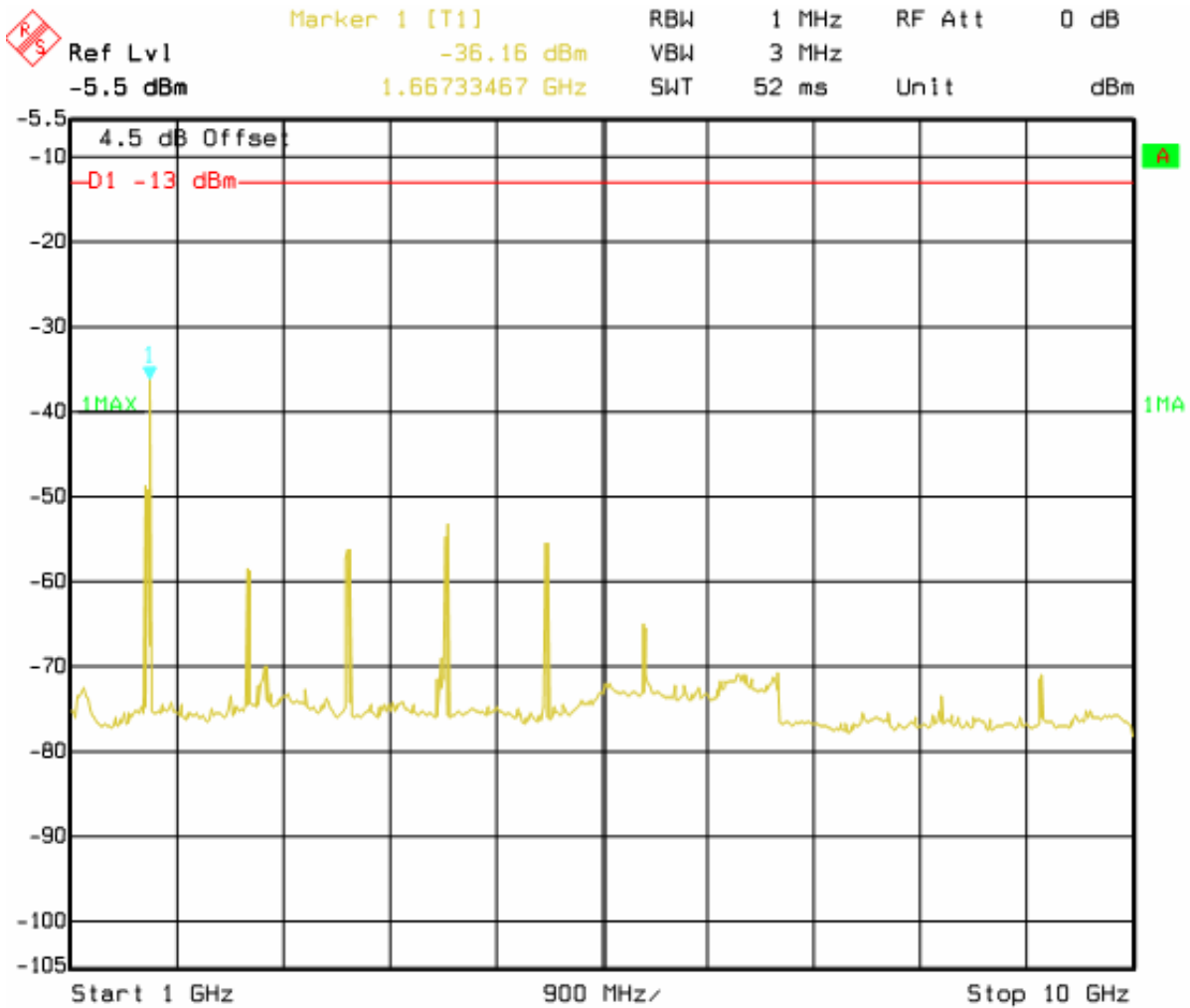
Please refer to the hereinafter plots.

For GSM 850

30MHz-1000MHz - Middle Channel

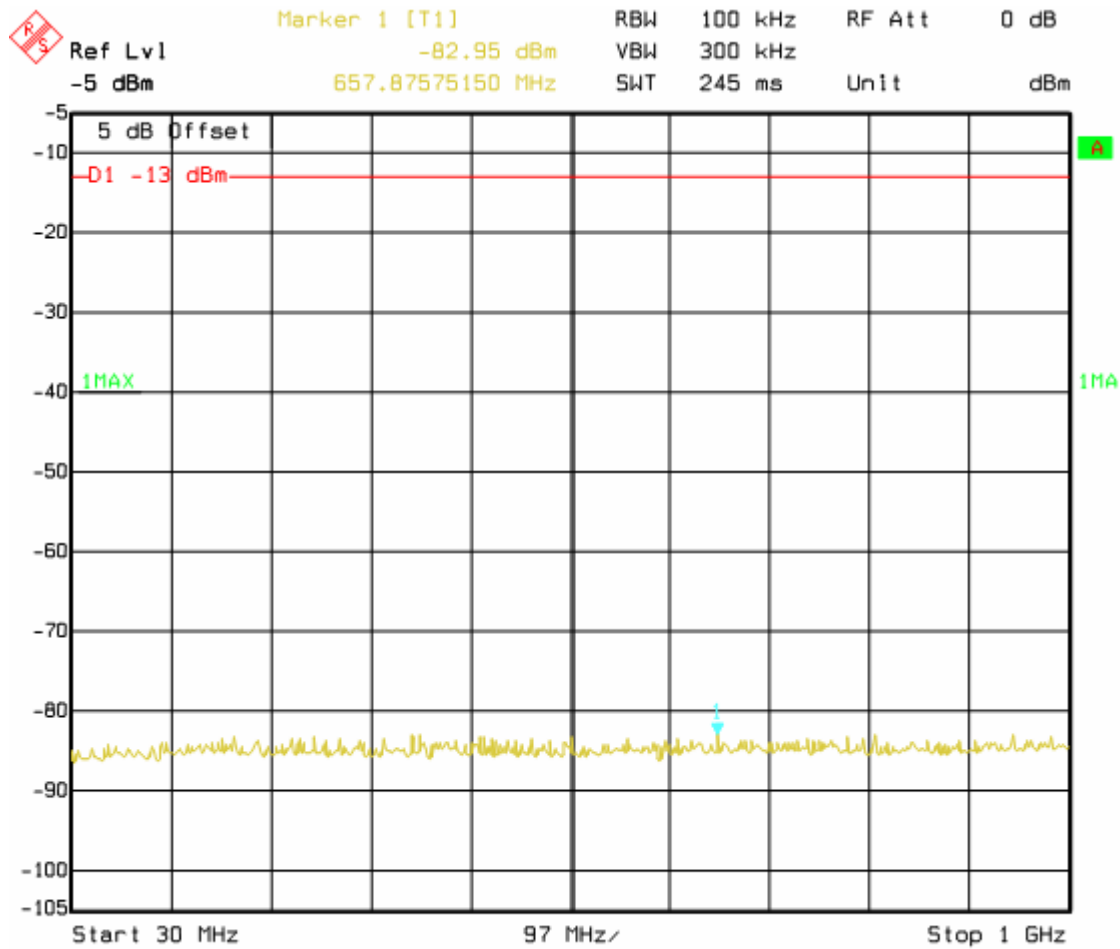


1GHz-10GHz - Middle Channel

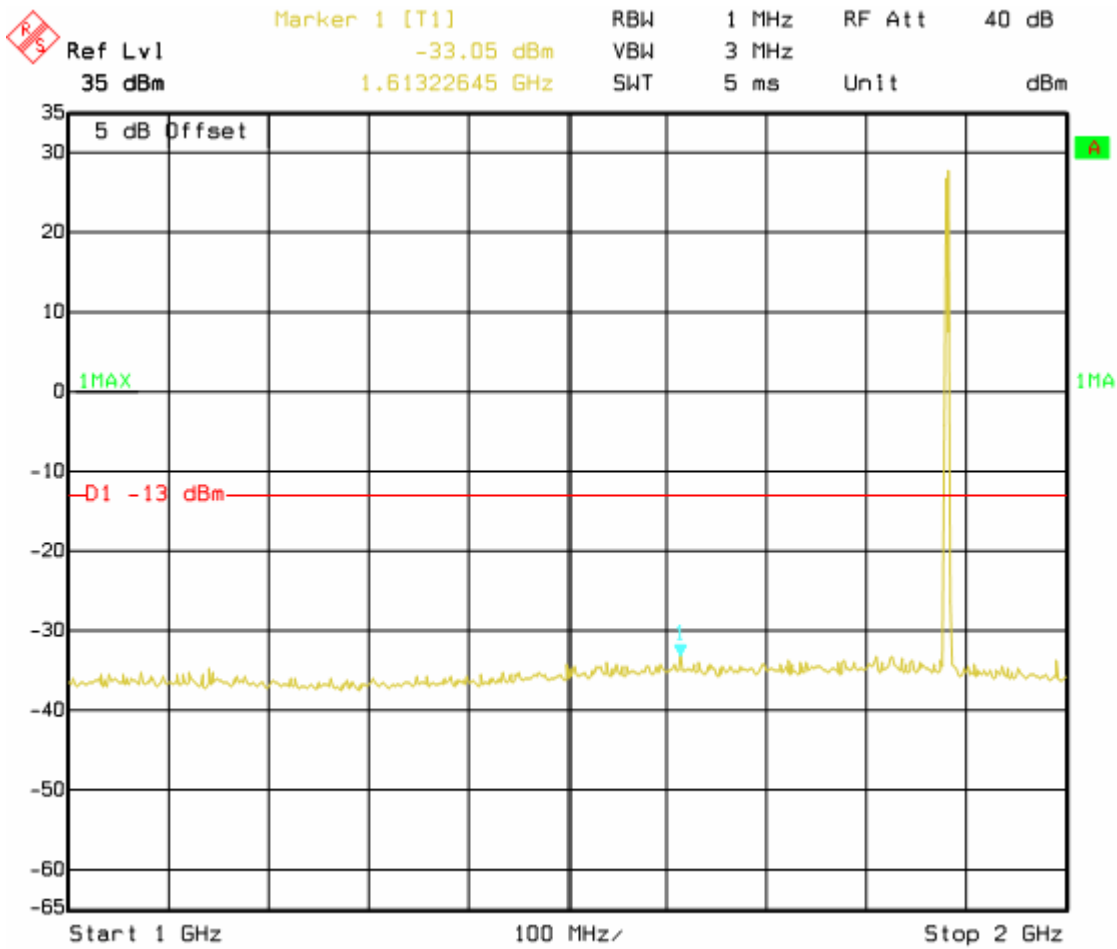


For PCS 1900

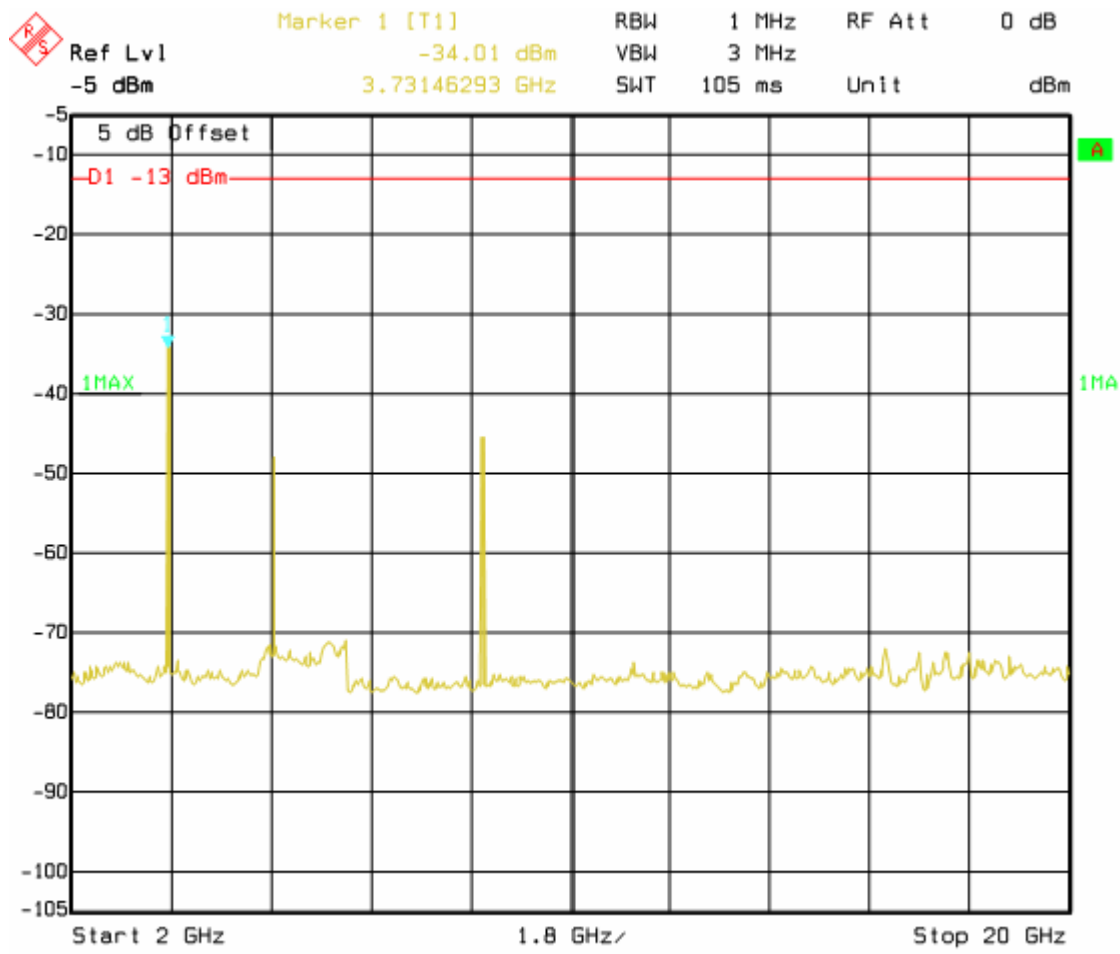
30MHz-1000MHz - Middle Channel



1GHz-2GHz - Middle Channel

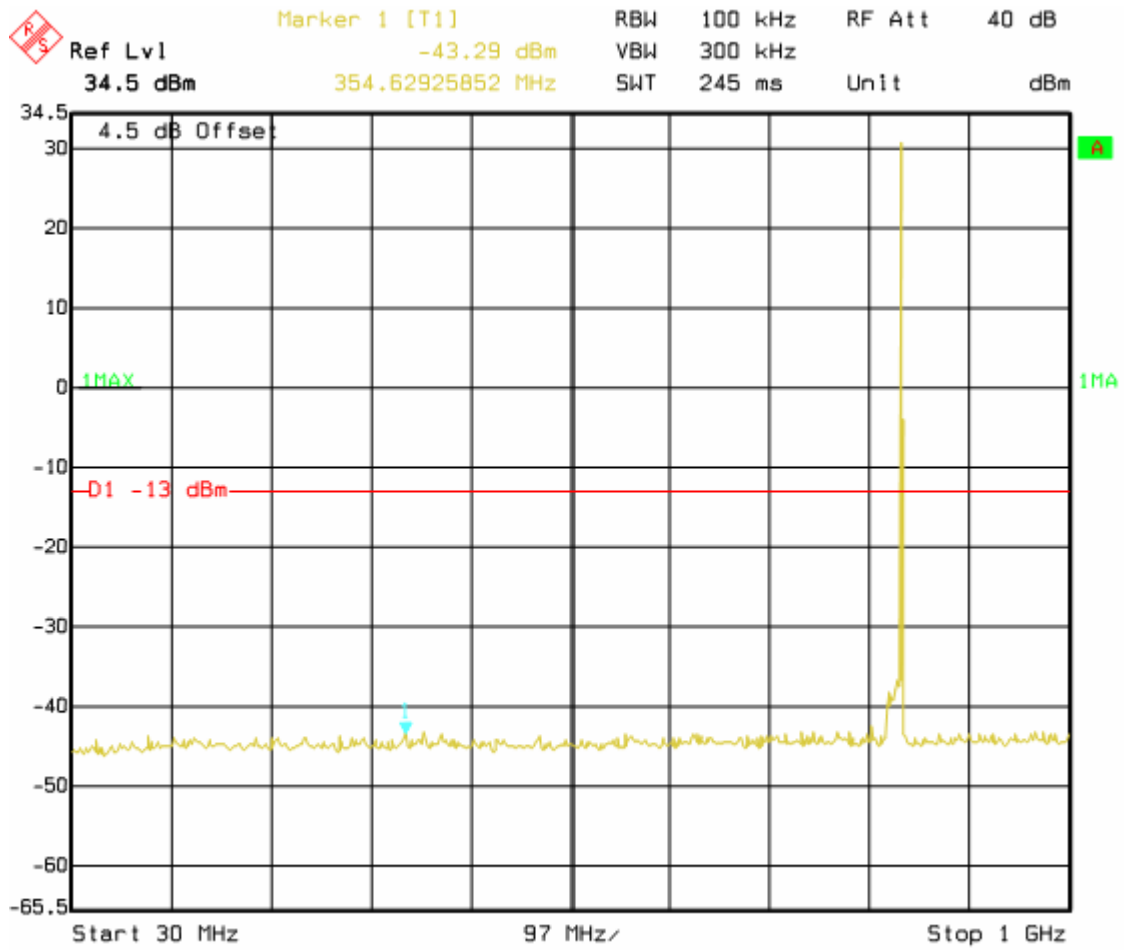


2GHz-20GHz - Middle Channel

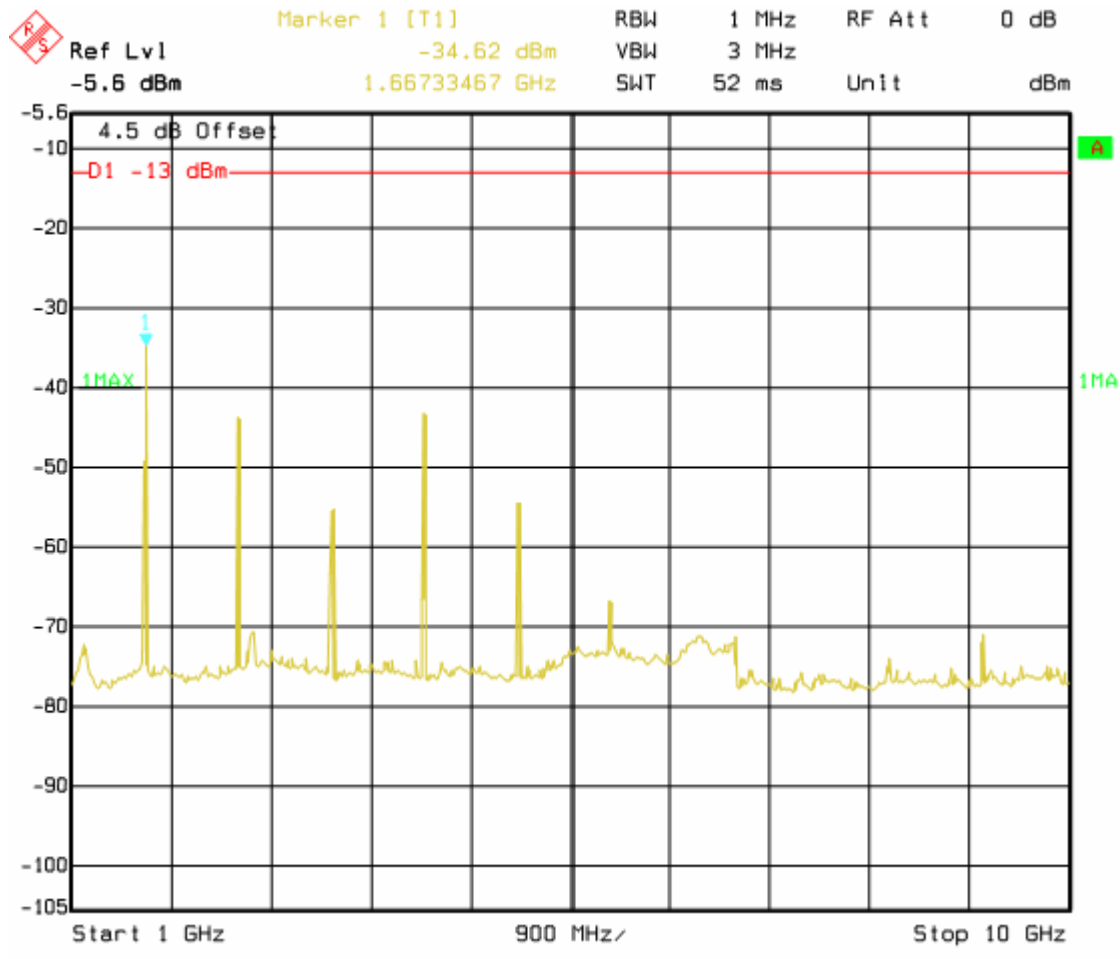


For GPRS Slot 1 (850 MHz)

30MHz-1000MHz - Middle Channel

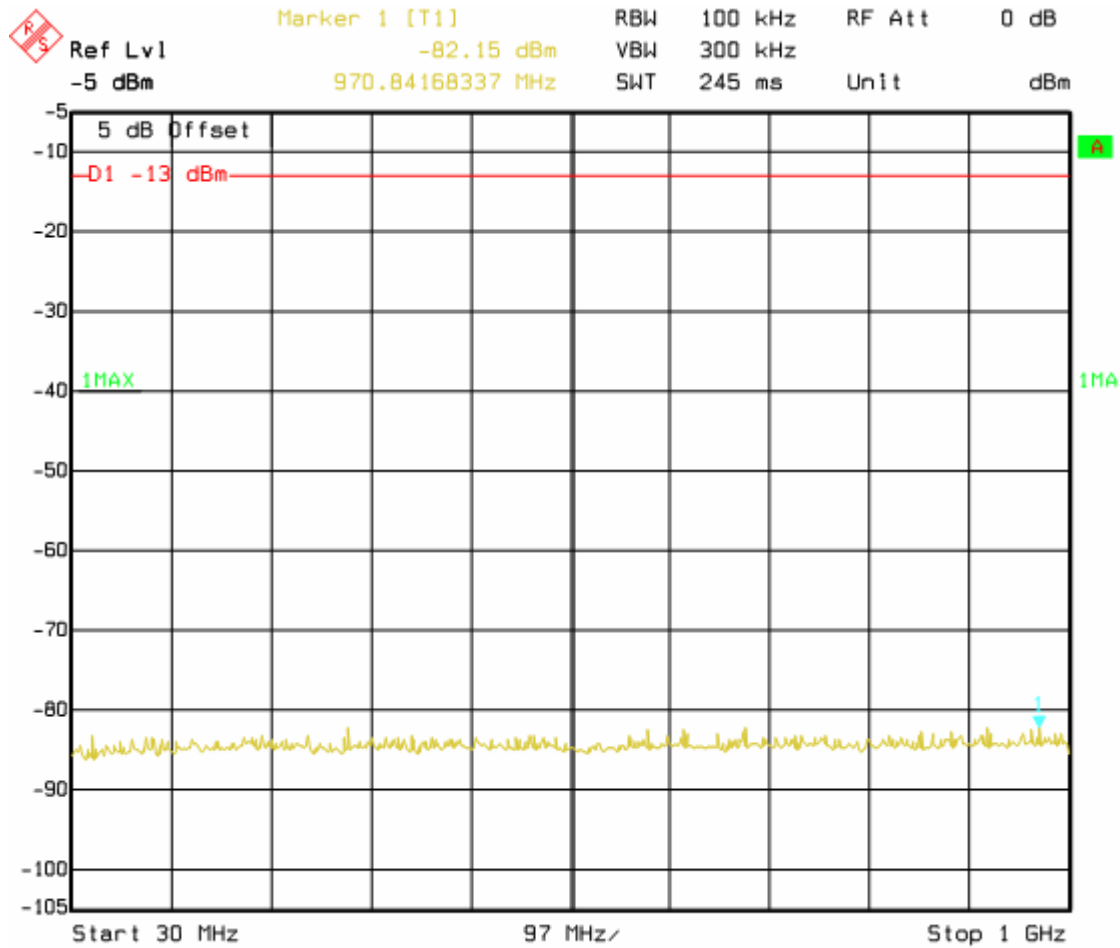


1GHz-10GHz - Middle Channel

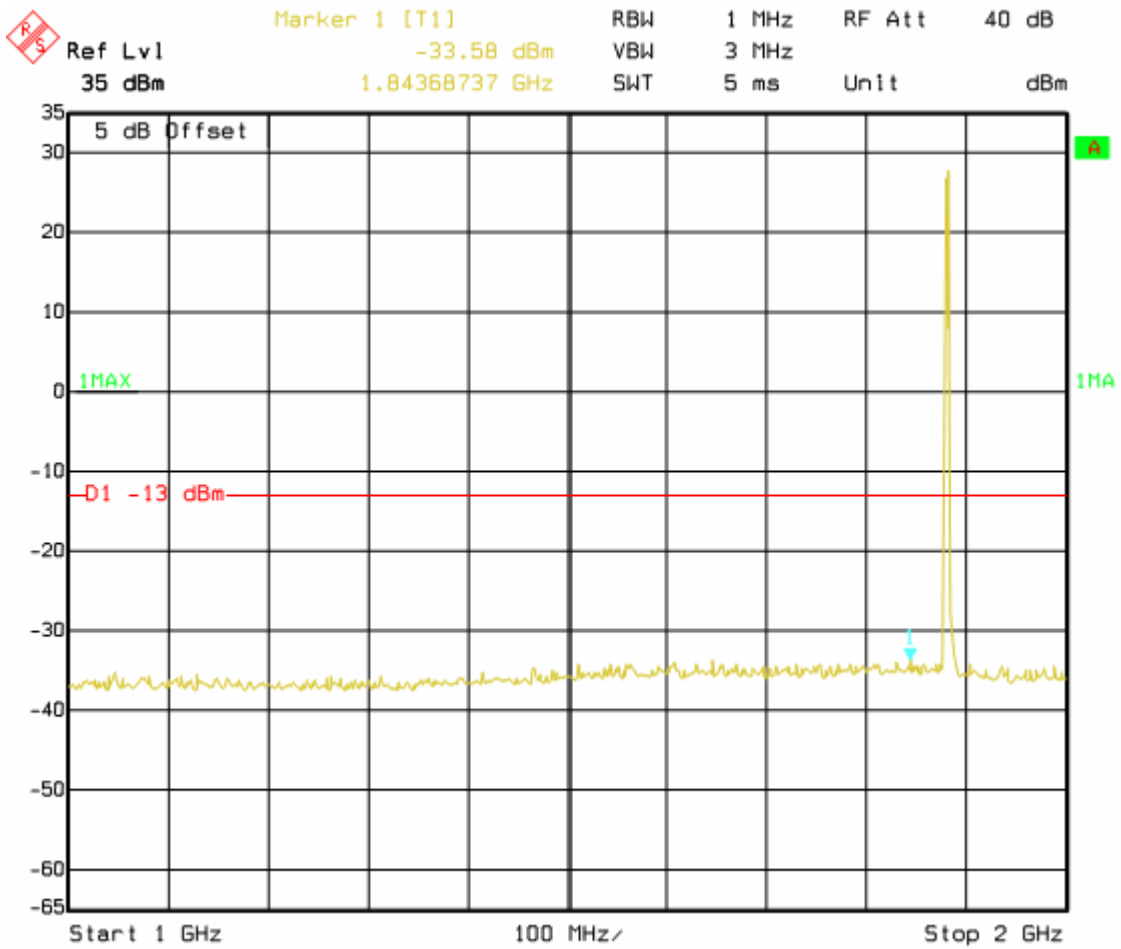


For GPRS Slot 1 (1900 MHz)

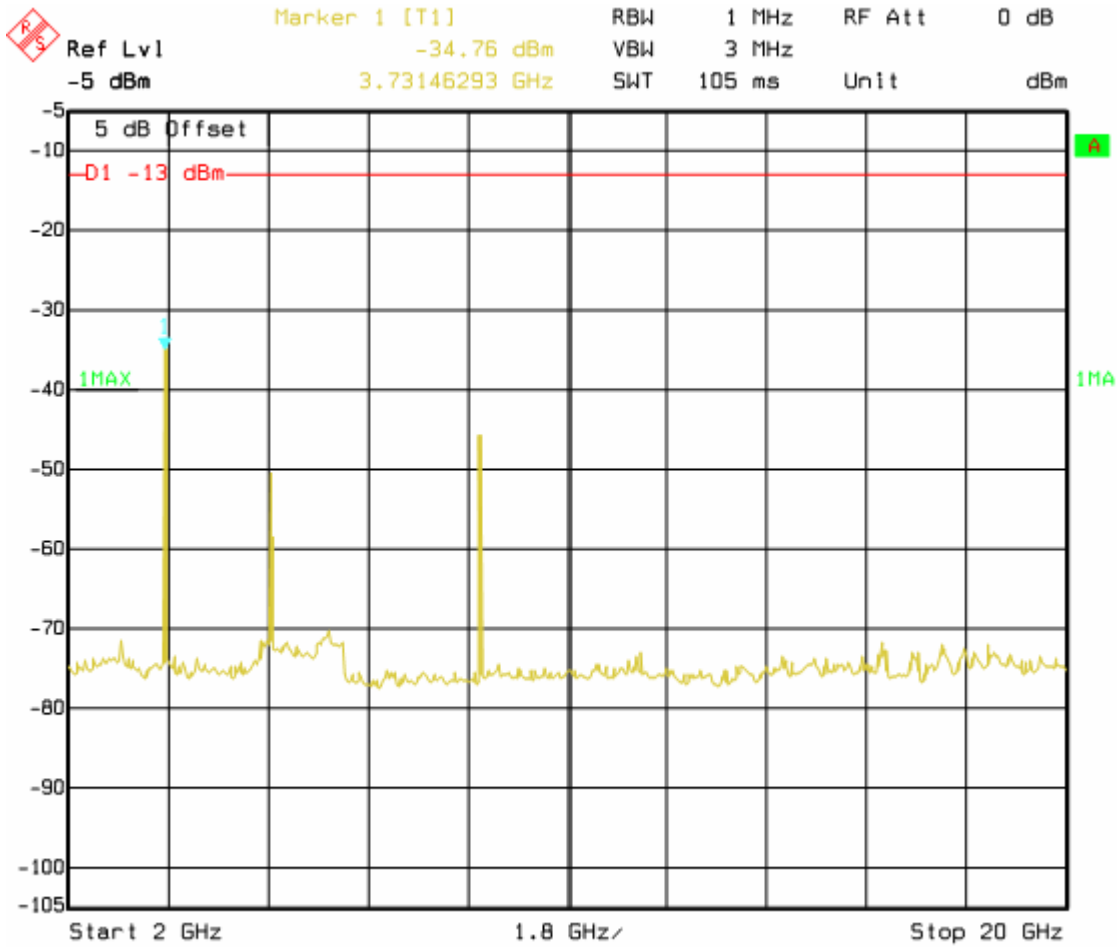
30MHz-1000MHz - Middle Channel



1GHz-2GHz - Middle Channel



2GHz-20GHz - Middle Channel



10.0 SPURIOUS RADIATED EMISSIONS

10.1 Applicable Standards:

CFR 47 § 2.1053, 22.917 and § 24.238.

10.2 Test Procedure

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to tenth harmonic of the fundamental frequency was investigated.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in dB = $10 \lg(\text{TXpwr in Watts}/0.001)$ – the absolute level

Spurious attenuation limit in dB = $43 + 10 \text{Log}_{10}(\text{power out in Watts})$

10.3 Test Data:

Environmental conditions:

Temperature:	25 ° C
Relative Humidity:	56%
ATM Pressure:	100.0kPa

For GSM 850 Band: Below 1GHz:

Indicated		Table Angle Degree	Test Antenna		Substituted		Antenna Gain (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	Reading (dBμV)		Height Meter	Polar H/V	Frequency (MHz)	Level (dBm)					
Middle Channel											
782.89	37.53	242	1.2	V	782.89	-61.3	0	0.88	-62.18	-13	49.18
757.41	38.12	70	1.5	V	757.41	-62.1	0	0.86	-62.96	-13	49.96
80.40	25.07	150	1.5	H	80.40	-67.3	0	0.45	-67.75	-13	54.75
158.93	21.58	210	1.0	H	158.93	-73.6	0	0.48	-74.08	-13	61.08

For PCS 1900 Band: Below 1GHz

Indicated		Table Angle Degree	Test Antenna		Substituted		Antenna Gain (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	Reading (dBμV)		Height Meter	Polar H/V	Frequency (MHz)	Level (dBm)					
Middle Channel											
900.15	42.38	137.0	1.2	V	900.15	-53.7	0	0.76	-54.46	-13	41.46
760.70	37.15	199.0	1.3	V	760.70	-58.4	0	0.86	-59.26	-13	46.26
952.09	32.99	130	1.5	H	952.09	-59.8	0	0.86	-60.66	-13	47.66
900.15	35.81	240	1.2	H	900.15	-60.3	0	0.76	-61.06	-13	48.06

For GSM 850 Band: above 1GHz:

Indicated		Table Angle Degree	Test Antenna		Substituted		Antenna Gain (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	Reading (dBμV)		Height Meter	Polar H/V	Frequency (MHz)	Level (dBm)					
Middle Channel											
2509.8	63.66	210	1.8	H	2509.8	-38.58	7.3	1.19	-32.47	-13	19.47
1673.2	59.98	220	1	V	1673.2	-40.27	6.2	0.94	-35.01	-13	22.01
2509.8	59.82	130	1.5	V	2509.8	-42.00	7.3	1.19	-35.89	-13	22.89
1673.2	56.42	100	1.9	H	1673.2	-43.73	6.2	0.94	-38.47	-13	25.47
1937.9	50.03	180	1.6	V	1937.9	-44.8	6.1	1.04	-39.74	-13	26.74
3346.6	44.53	150	1.4	V	3346.6	-59.11	6.7	1.38	-53.79	-13	40.79
3346.6	44.12	130	1.6	H	3346.6	-59.75	6.7	1.38	-54.43	-13	41.43

For PCS 1900 Band: above 1GHz

Indicated		Table Angle Degree	Test Antenna		Substituted		Antenna Gain (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	Reading (dBμV)		Height Meter	Polar H/V	Frequency (MHz)	Level (dBm)					
Middle Channel											
3760	52.81	200	1.6	V	3760	-50.71	6.9	1.47	-45.28	-13	32.28
3760	51.94	190	1.9	H	3760	-51.44	6.9	1.47	-46.01	-13	33.01
7520	43.98	110	1.5	V	7520	-56.06	7.6	2.09	-50.55	-13	37.55
5640	44.59	80	1.5	V	5640	-57.43	8.3	1.76	-50.89	-13	37.89
7520	43.46	180	1.5	H	7520	-56.52	7.6	2.09	-51.01	-13	38.01
5640	43.83	170	1.6	H	5640	-58.39	8.3	1.76	-51.85	-13	38.85

11.0 BAND EDGES

11.1 Applicable Standards:

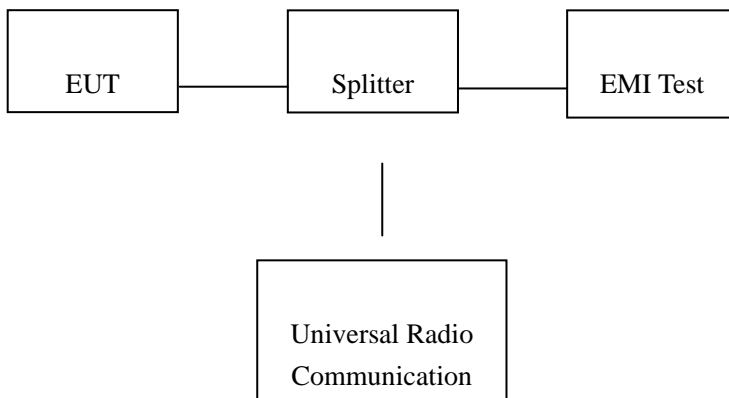
According to § 22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

According to §24.238(a), the power of any emissions 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.

11.2 Test Procedure

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

The center of the spectrum analyzer was set to block edge frequency, RBW set to 10 kHz.



11.3 Test Data

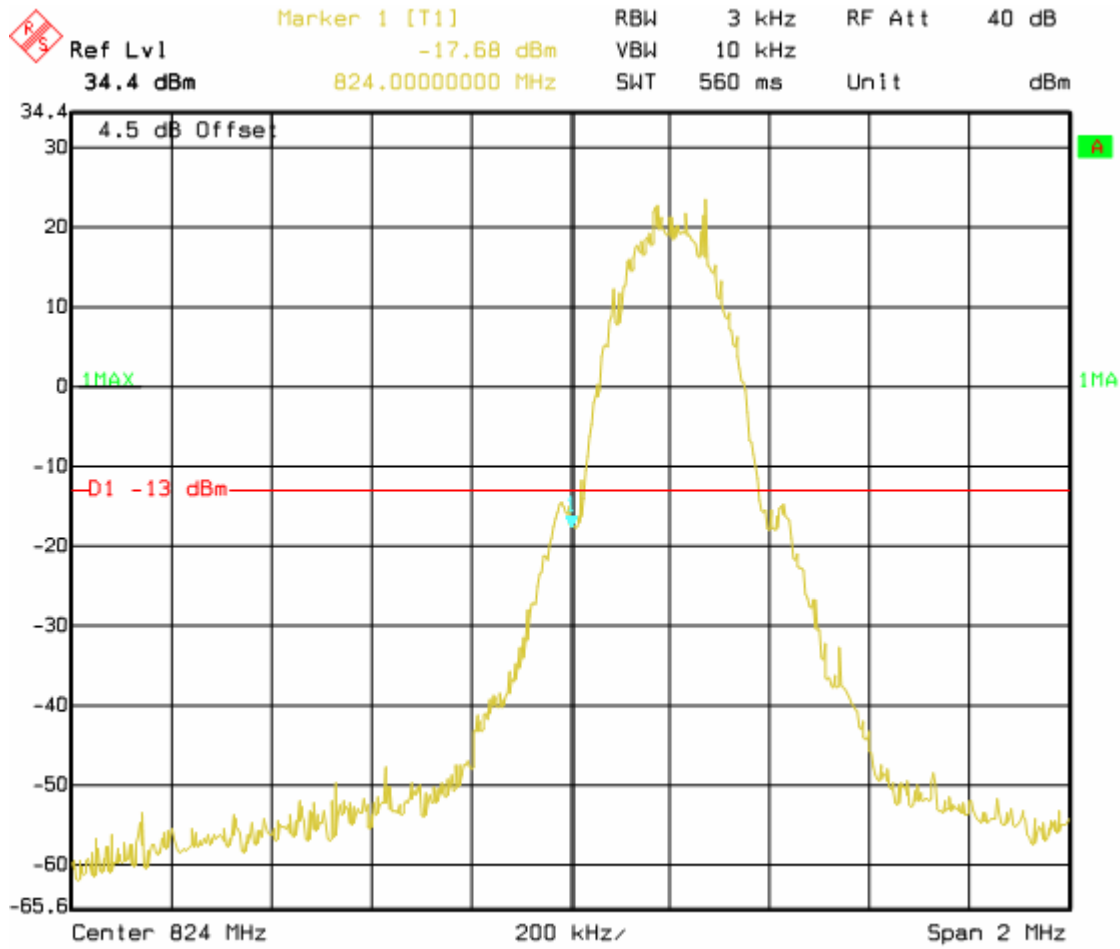
Environmental conditions:

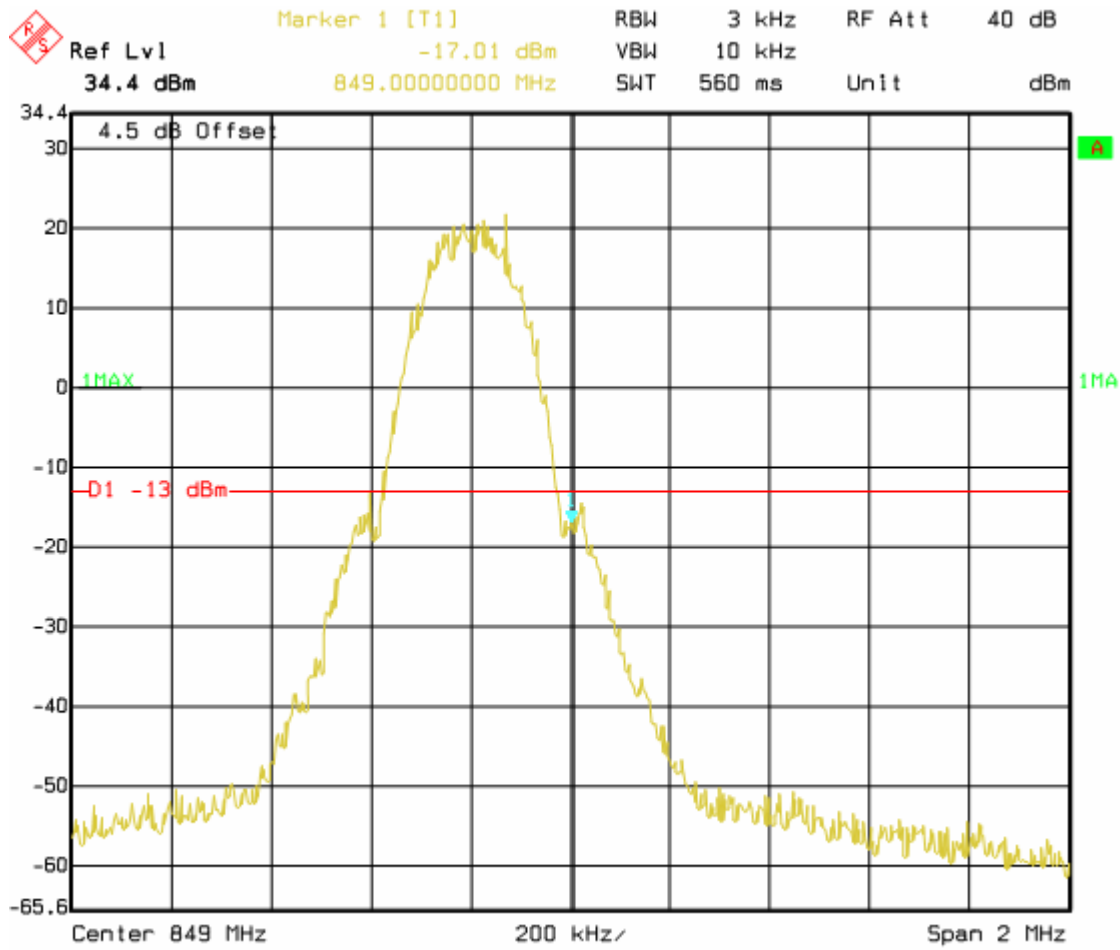
Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.0kPa

Please refer to the following tables and plots.

For GSM 850

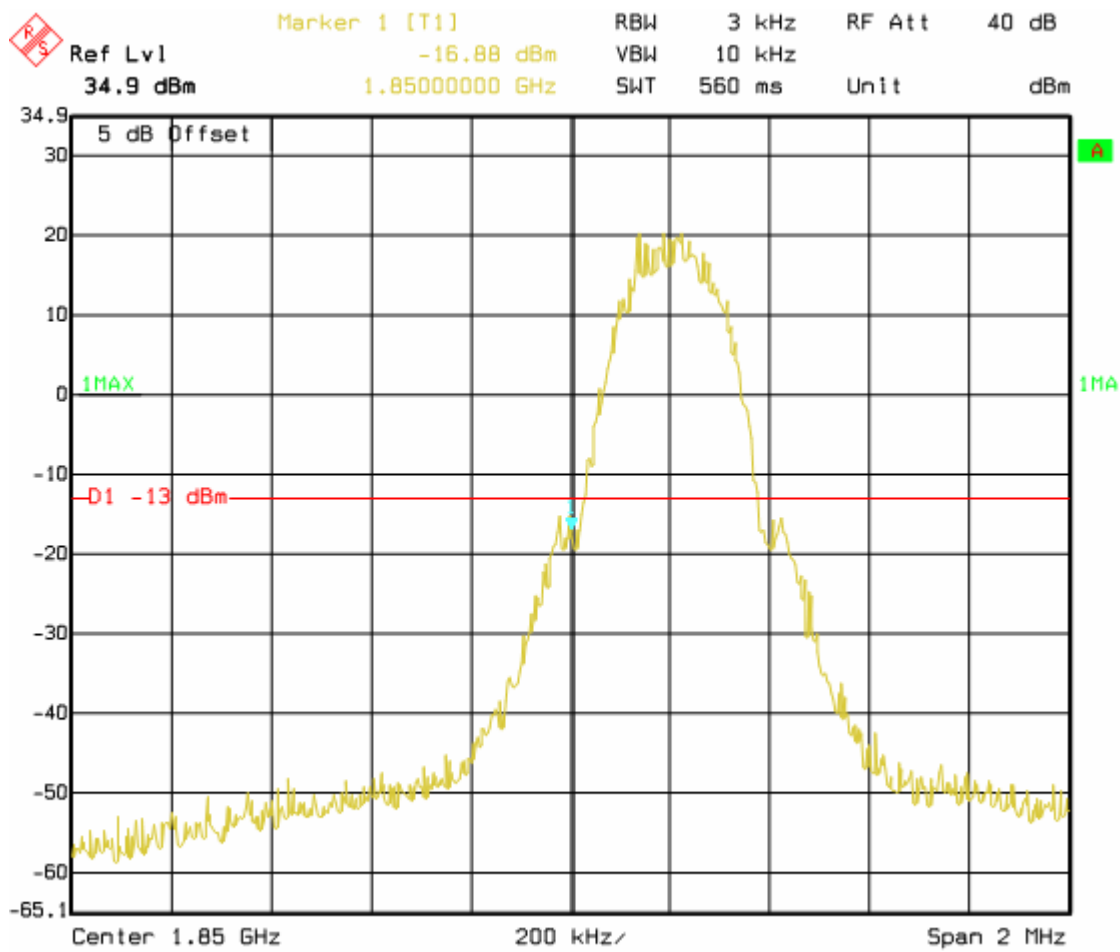
Frequency (MHz)	Emission (dBm)	Limit (dBm)
824	-17.68	-13
849	-17.01	-13

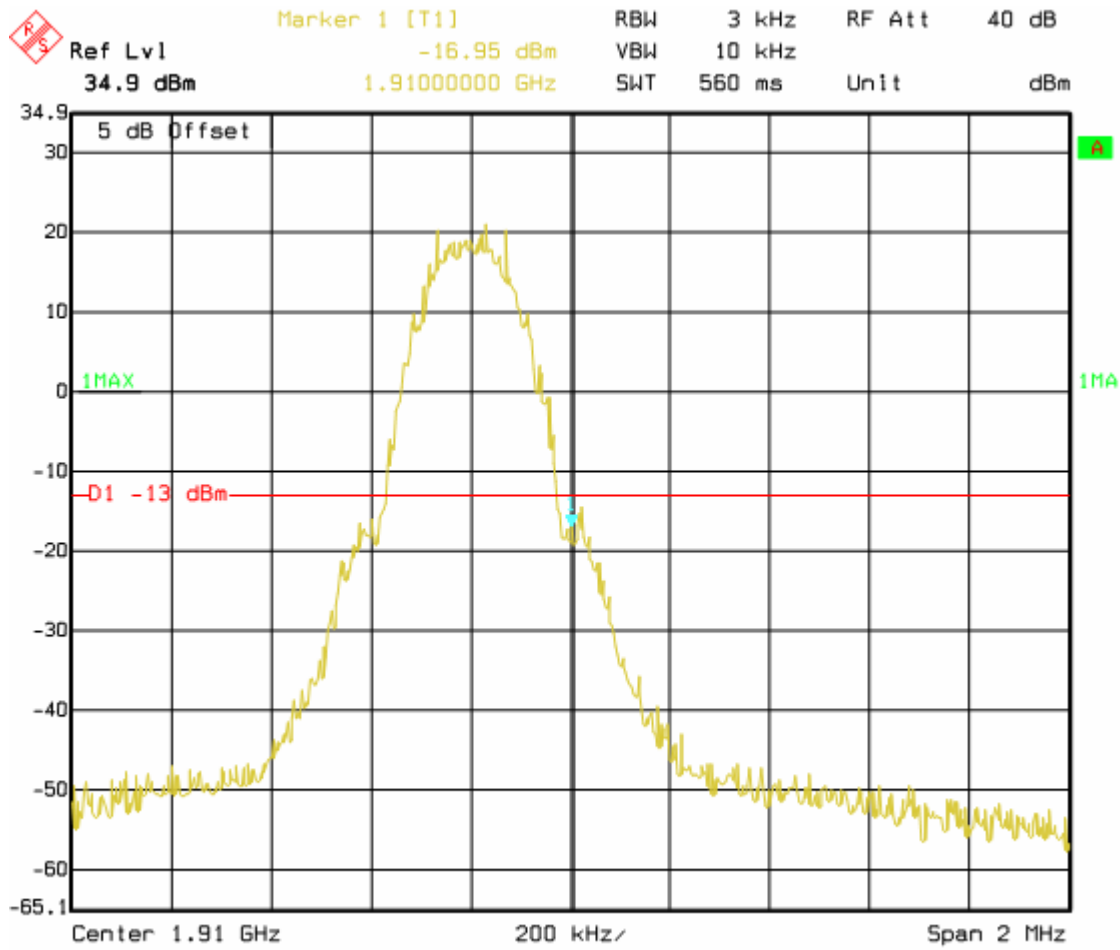




For PCS1900

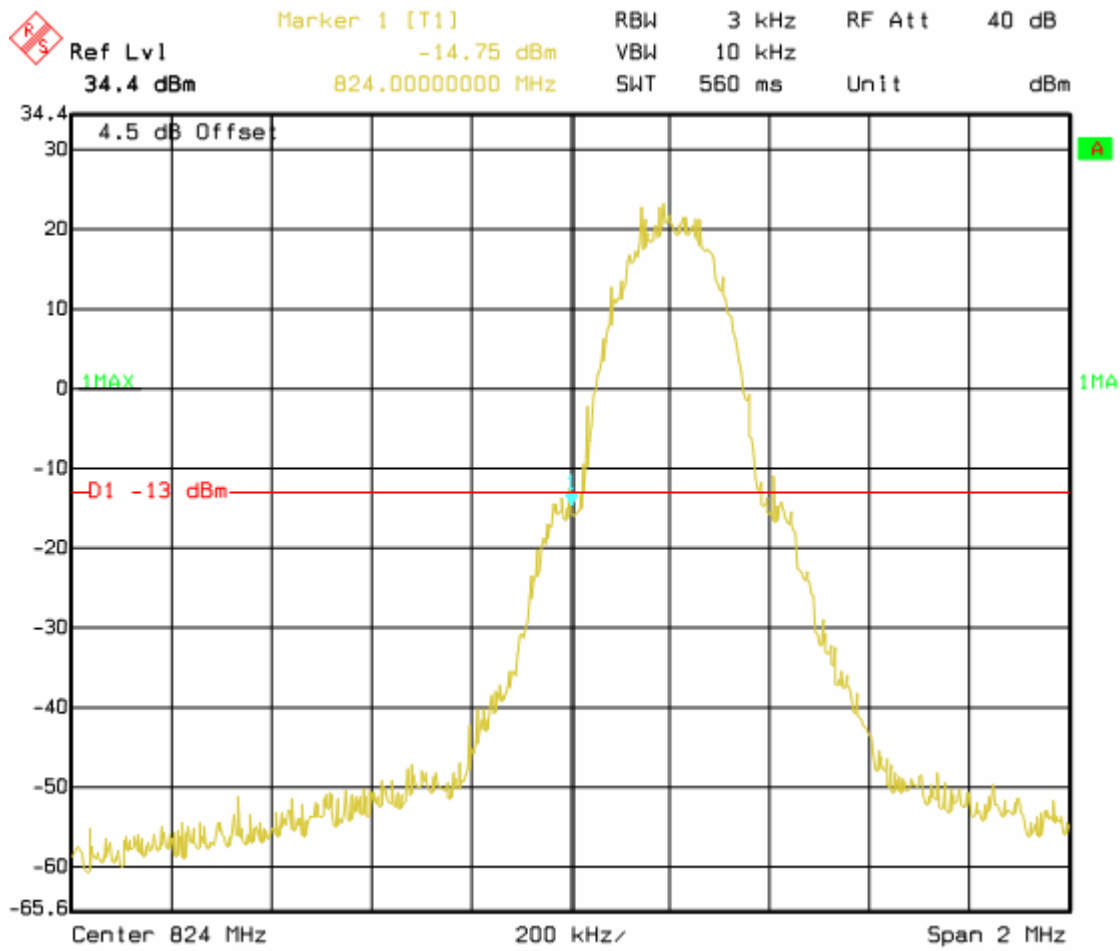
Frequency (MHz)	Emission (dBm)	Limit (dBm)
1850	-16.88	-13
1910	-16.95	-13




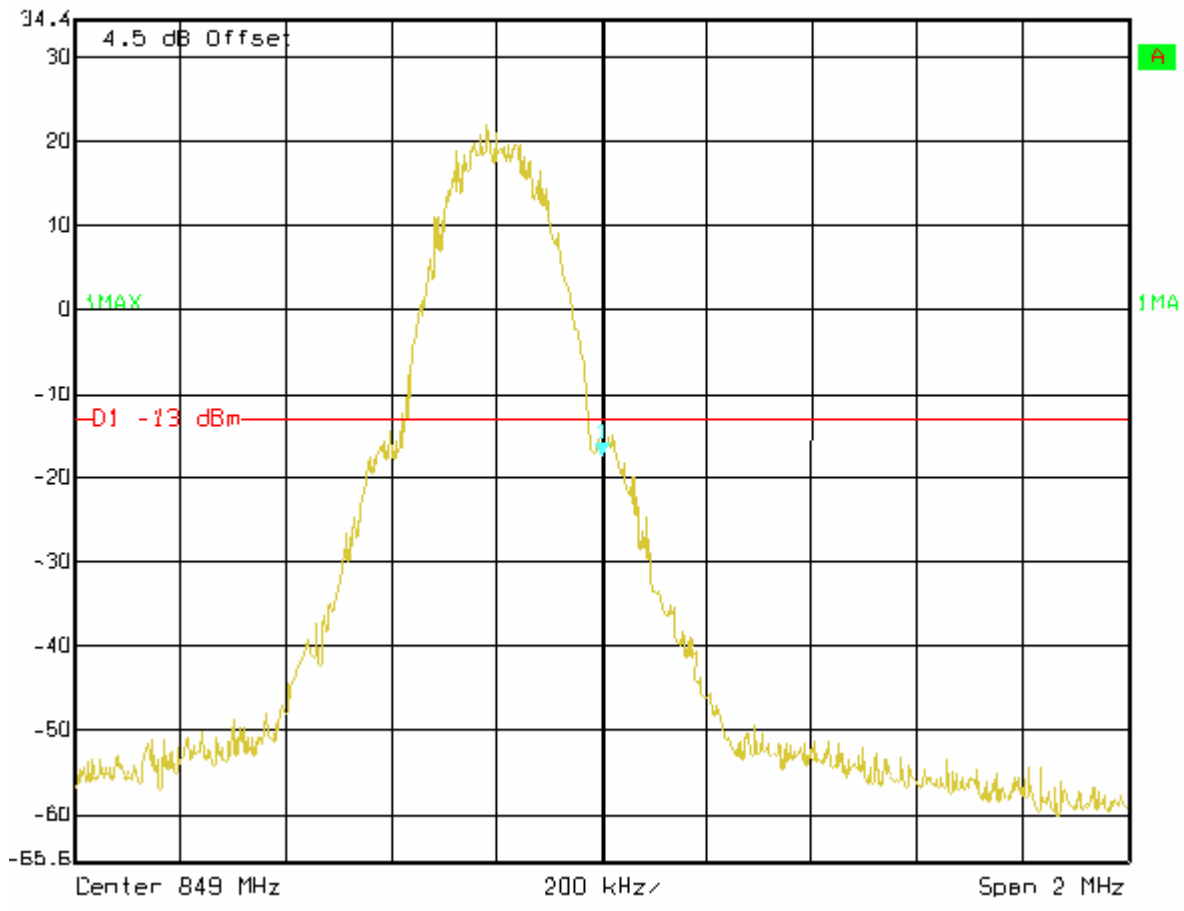


For GPRS (850 MHz)

Frequency (MHz)	Emission (dBm)	Limit (dBm)
824	-14.75	-13
849	-17.55	-13

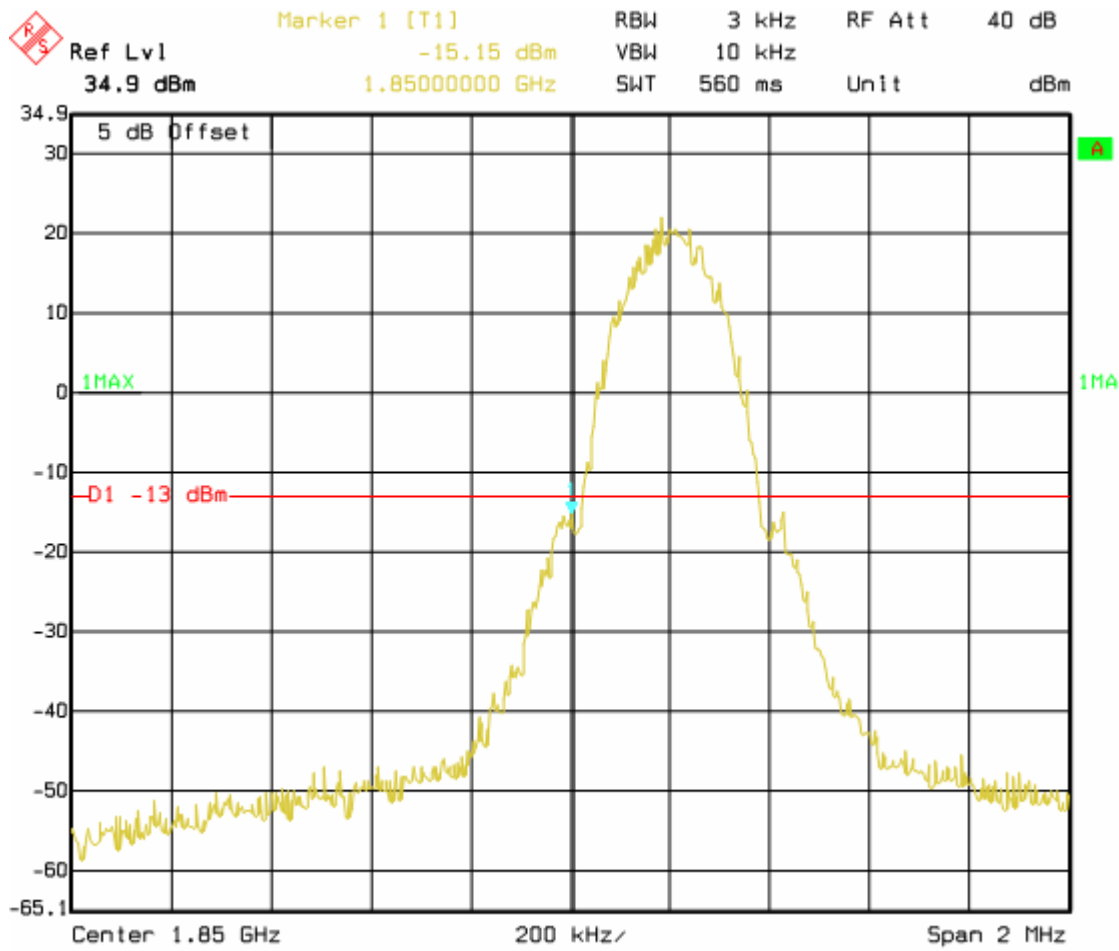



	Ref Lvl	Marker 1 [711]	RBW	3 kHz	RF Att	40 dB
	34.4 dBm	-17.55 dBm	VBW	10 kHz		
		849.00000000 MHz	SWT	560 ms	Unit	dBm

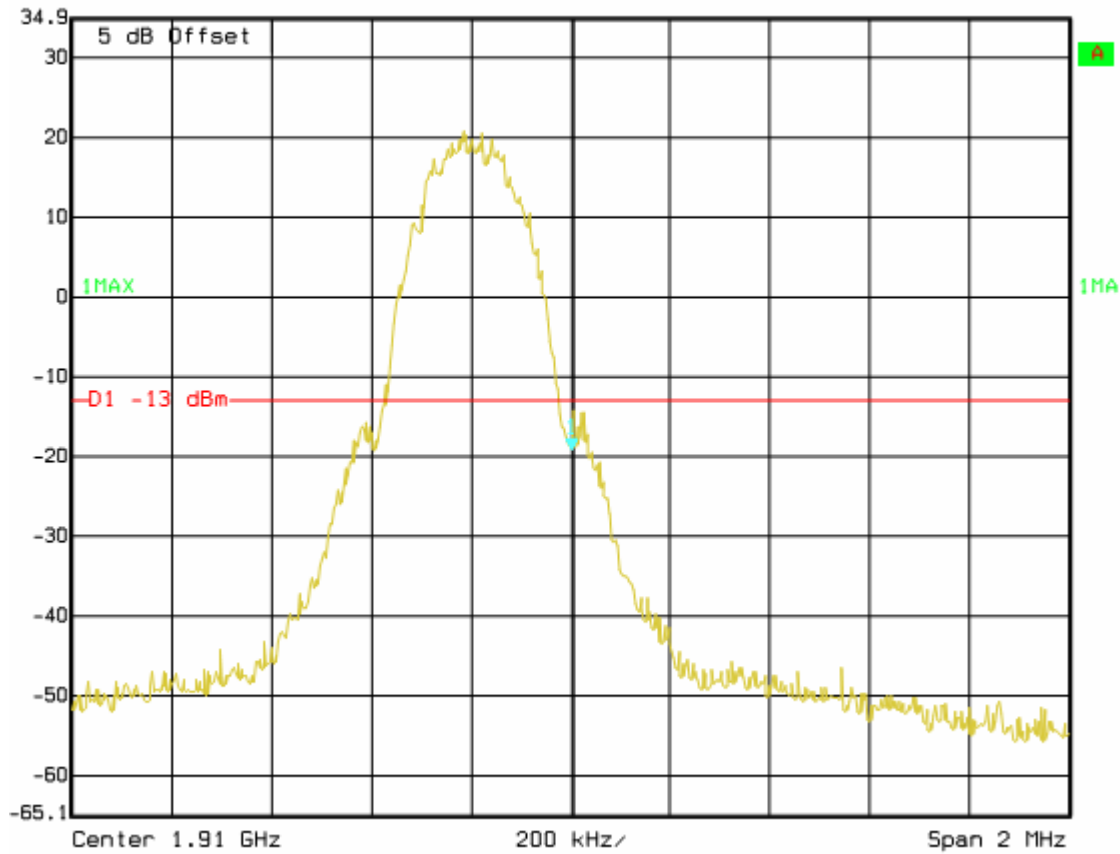


For GPRS (1900 MHz)

Frequency (MHz)	Emission (dBm)	Limit (dBm)
1850	-15.15	-13
1910	-19.13	-13



 **Marker 1 [T1]** RBW 3 kHz RF Att 40 dB
Ref Lvl 34.9 dBm -19.13 dBm VBW 10 kHz
1.9100000 GHz SWT 560 ms Unit dBm



12.0 FREQUENCY STABILITY

12.1 Applicable Standards:

CFR47 § 2.1055 (a), § 2.1055 (d), §22.355, §24.235

According to §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table below:

Frequency Tolerance for Transmitters in the Public Mobile Services

Frequency Range (MHz)	Base, fixed (ppm)	Mobile ≤ 3 watts (ppm)	Mobile ≤ 3 watts (ppm)
25 to 50	20.0	20.0	50.0
50 to 450	5.0	5.0	50.0
450 to 512	2.5	5.0	5.0
821 to 896	1.5	2.5	2.5
928 to 929.	5.0	N/A	N/A
929 to 960.	1.5	N/A	N/A
2110 to 2220	10.0	N/A	N/A

According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

12.2 Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to communication test set via feed-through attenuators. The EUT was placed inside the temperature chamber. The DC leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the communication test set.

Frequency Stability vs. Voltage: An external variable DC power supply was connected to the battery terminals of the equipment under test. The voltage was set to 115% of the nominal value and was then decreased until the transmitter light no longer illuminated; i.e., the battery end point. The output frequency was recorded for each battery voltage.

12.3 Test Data

Environmental conditions:

Temperature:	25 ° C
Relative Humidity:	56%
ATM Pressure:	100.0kPa

Cellular Band:

Middle channel, fo =836.6MHz				
Temperature (°C)	Power Supplied (V)	Frequency Error (Hz)	Error (ppm)	Limit (ppm)
-30	10.2	-21	-0.0251	2.5
	12.0	-24	-0.0287	2.5
	13.8	-23	-0.0275	2.5
-20	10.2	-21	-0.0251	2.5
	12.0	-27	-0.0323	2.5
	13.8	-24	-0.0287	2.5
-10	10.2	-23	-0.0275	2.5
	12.0	-23	-0.0275	2.5
	13.8	-24	-0.0287	2.5
0	10.2	-23	-0.0275	2.5
	12.0	-23	-0.0275	2.5
	13.8	-24	-0.0287	2.5
10	10.2	-32	-0.0383	2.5
	12.0	-25	-0.0299	2.5
	13.8	-24	-0.0287	2.5
20	10.2	-28	-0.0335	2.5
	12.0	-37	-0.0442	2.5
	13.8	-25	-0.0299	2.5
30	10.2	-59	-0.0705	2.5
	12.0	-27	-0.0323	2.5
	13.8	-32	-0.0383	2.5
40	10.2	-70	-0.0837	2.5
	12.0	-41	-0.0490	2.5
	13.8	-32	-0.0383	2.5
50	10.2	-72	-0.0861	2.5
	12.0	-34	-0.0406	2.5
	13.8	-32	-0.0383	2.5

PCS Band:

Middle channel, fo =1880MHz				
Temperature (°C)	Power Supplied (V)	Frequency Error (Hz)	Error (ppm)	Limit (ppm)
-30	10.2	-17	-0.0090	2.5
	12.0	-15	-0.0080	2.5
	13.8	-14	-0.0074	2.5
-20	10.2	-16	-0.0085	2.5
	12.0	-15	-0.0080	2.5
	13.8	-16	-0.0085	2.5
-10	10.2	-18	-0.0096	2.5
	12.0	-8	-0.0043	2.5
	13.8	-16	-0.0085	2.5
0	10.2	-18	-0.0096	2.5
	12.0	-17	-0.0090	2.5
	13.8	-16	-0.0085	2.5
10	10.2	-14	-0.0074	2.5
	12.0	-15	-0.0080	2.5
	13.8	-16	-0.0085	2.5
20	10.2	-21	-0.0112	2.5
	12.0	-22	-0.0117	2.5
	13.8	-18	-0.0096	2.5
30	10.2	-26	-0.0138	2.5
	12.0	-24	-0.0128	2.5
	13.8	-18	-0.0096	2.5
40	10.2	-31	-0.0165	2.5
	12.0	-28	-0.0149	2.5
	13.8	-18	-0.0096	2.5
50	10.2	-28	-0.0149	2.5
	12.0	-29	-0.0154	2.5
	13.8	-18	-0.0096	2.5

******END OF REPORT******