5.3 Radiated Spurious Emissions

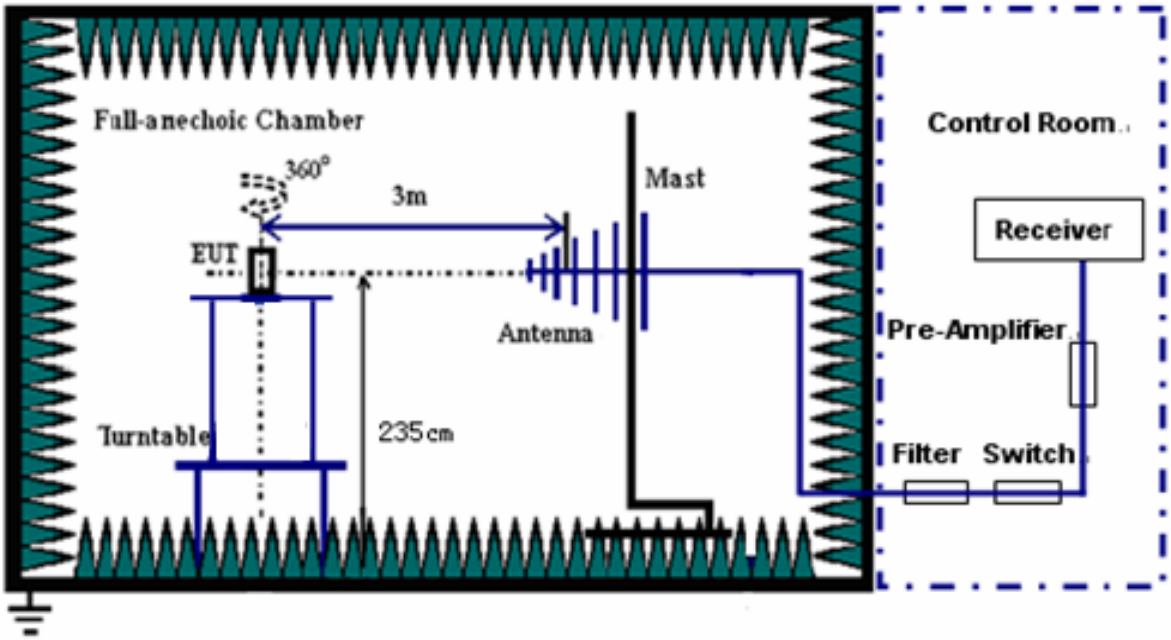
5.3.1 Test Procedure

A test site fulfilling the requirements of ITU-R Recommendation SM329-10 was used. The EUT was placed on a non-conducting support in the anechoic chamber and was operated from a power source via an RF filter to avoid radiation from the power leads.

Step 1:

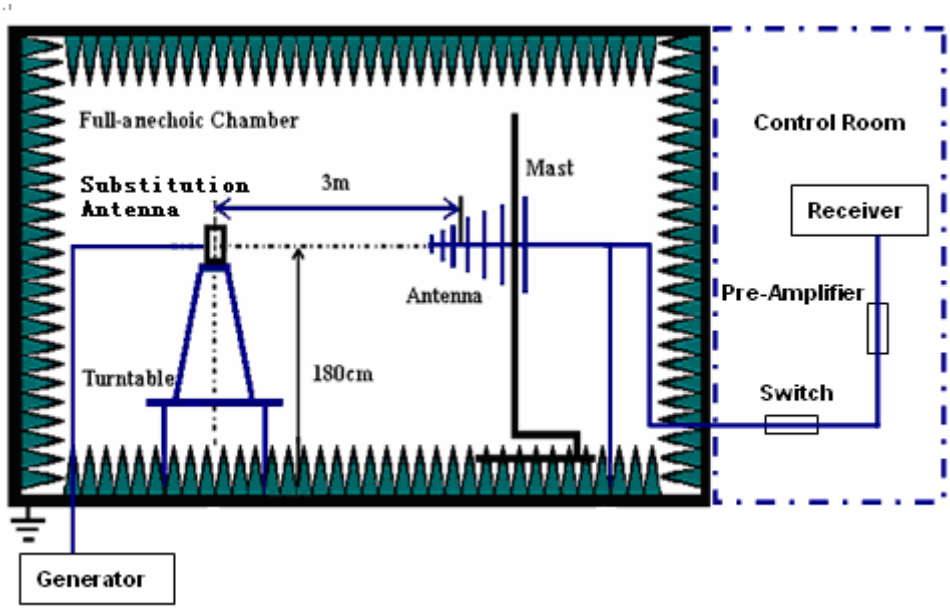
For transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, EIRP shall be measured when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in 2.1033(c)(8). Connect the EUT to the BTS simulator via the air interface.

Test the Radiated maximum output power by the Rohde and Schwarz ESMI Test Receiver from test antenna.



Step 2:

Use substitution method to verify the maximum output power. The EUT is substituted by a dipole antenna. The dipole is connected to a signal generator. And then adjust the output level of the signal generator to get the same received power recorded in step1 on ESIB26 Test Receiver, and record the power level of Signal Generator. Of course, the cable loss at the test frequency should be compensated.



According to part 22.917, the defined measurement bandwidth as following:

22.917(b) Measurement procedure: Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater.

Measurement bandwidth (RBW) for 9 kHz up to 1GHz: 100 kHz;
Measurement bandwidth (RBW) for 1GHz up to 12.75GHz: 1MHz;

Frequency band	**Minimum requirement (E.R.P) traffic mode**
30MHz~18GHz	-13dBm

According to part 24.238, the defined measurement bandwidth as following:

24.238 (b) Measurement procedure: Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater.

Measurement bandwidth (RBW) for 9 kHz up to 26GHz: 1 MHz;

Table 9 Radiated Spurious Emissions Limits

Frequency band	**Minimum requirement (E.R.P) traffic mode**
30MHz~26GHz	-13dBm

5.3.2 Test Results

The EUT has met the requirements of TS151010-1's requirement.

The test data see section 8.5 of this report.

6 Main Test Instruments

Table 10 Main Test Equipments

Test item	Test Instrument	Model	Manufacturer	Cal-Date	Cal Interval (month)
RE	EMI Test receiver	ESMI	R&S	April.23, 2007	12
	Broadband Antenna	CBL 6112B (2941)	SCHAFFNER	Feb.26, 2007	12
CE	EMI Test receiver	ESCS30	*R&S*	May.29, 2007	12
	Artificial Mains Network	ENV4200	R&S	May.21, 2007	12
RSE	EMI Test receiver	ESIB26	R&S	May.30.2007	12
	Horn Antenna	3117	EMCO	May.20.2007	12
	Broadband Antenna	CBL6112B /2941	SCHAFFNER	Feb.16.2007	12
	Horn Antenna	3160	EMCO	May.20.2007	12

Software Information			
Test Item	Software Name	Manufacturer	Version
RE/CE	ES-K1	R&S	1.7.1
RSE	EMC32	R&S	V5.0

7 System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

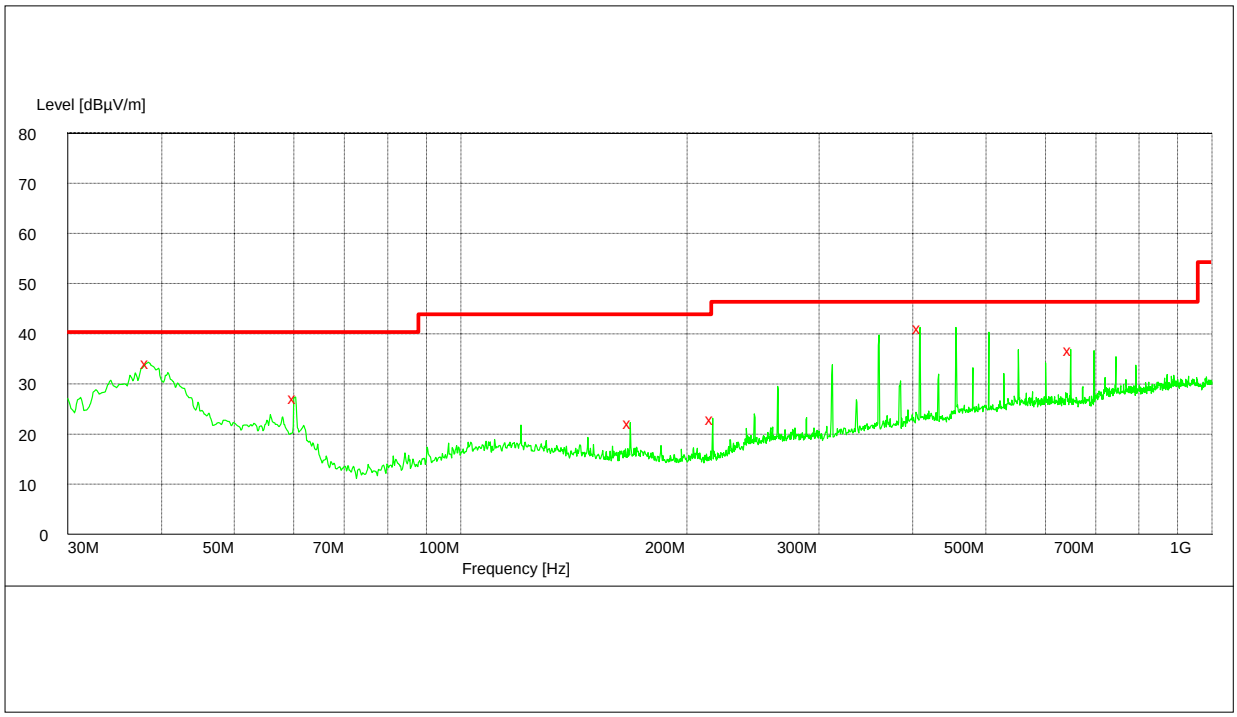
Table 11 System Measurement Uncertainty

Items		Extended Uncertainty
RE	Field strength （dBμV/m）	U=4.6dB; k=2(30MHz-1GHz)
RSE	ERP (dBm)	U＝2.2dB；k＝2
CE	Disturbance Voltage（dBμV）	U=3.3dB; k=2

8 Graph and Data of Emission Test

8.1 Radiated Disturbance

8.1.1 Radiated Disturbance of TC1

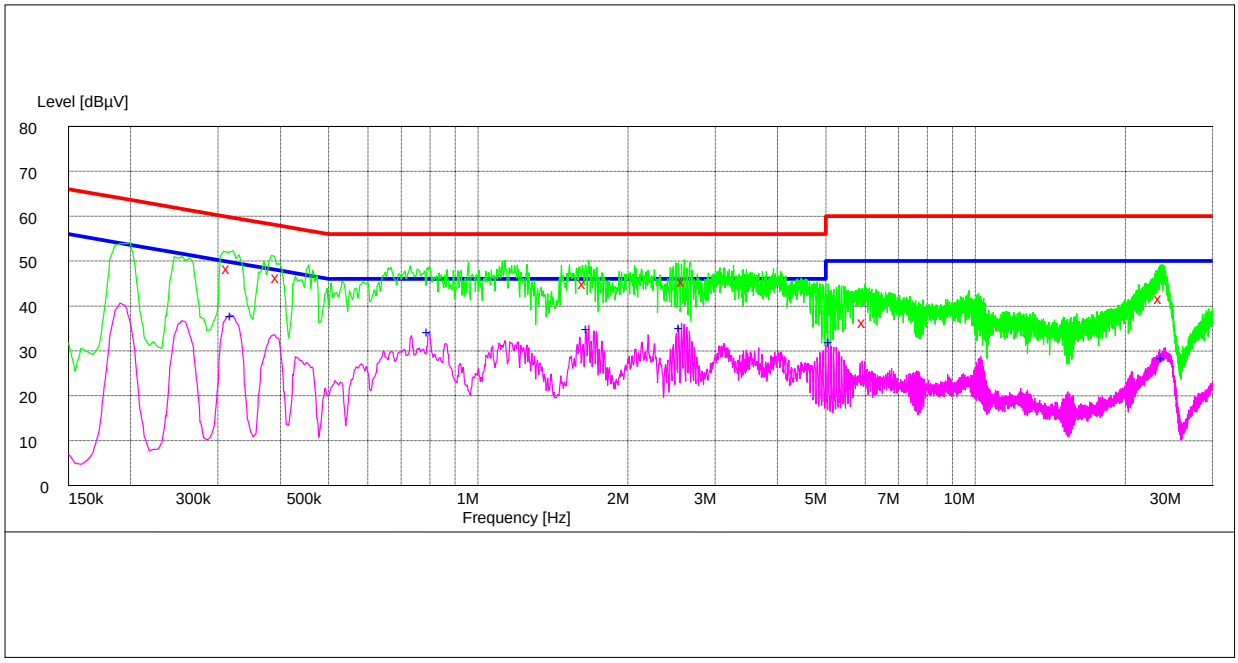


MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarisation
38.400000	34.30	-8.7	40.0	5.7	100.0	0.00	VERTICAL
60.300000	27.30	-16.4	40.0	12.7	104.0	220.00	VERTICAL
168.300000	22.30	-11.8	43.5	21.2	198.0	0.00	HORIZONTAL
216.600000	23.10	-11.5	46.0	22.9	110.0	100.00	HORIZONTAL
408.888889	41.30	-3.9	46.0	4.7	100.0	92.00	HORIZONTAL
648.444444	36.90	-1.6	46.0	9.1	100.0	94.00	HORIZONTAL

8.2 Conducted Disturbance

8.2.1 AC Power Port Test Data



MEASUREMENT RESULT: QP Detector

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.316500	48.80	10.2	60	11.0	QP	L3	FLO
0.397500	46.80	10.1	58	11.1	QP	L3	FLO
1.644000	45.30	9.9	56	10.7	QP	L3	FLO
2.598000	45.80	10.1	56	10.2	QP	L3	FLO
6.013500	36.70	10.3	60	23.3	QP	L3	FLO
23.658000	42.00	15.3	60	18.0	QP	N	FLO

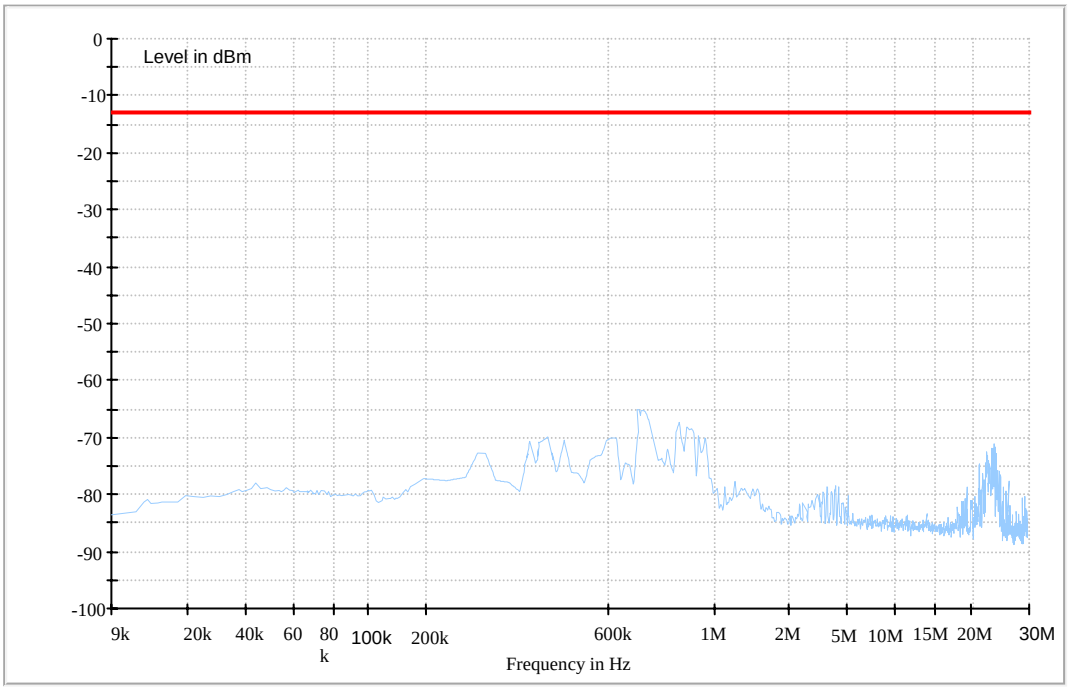
MEASUREMENT RESULT: AV Detector

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.321000	38.10	10.2	50	11.6	AV	L3	FLO
0.798000	34.60	9.9	46	11.4	AV	L3	FLO
1.666500	35.30	9.9	46	10.7	AV	L3	FLO
2.566500	35.40	10.1	46	10.6	AV	L3	FLO
5.131500	32.30	10.1	50	17.7	AV	L3	FLO
23.941500	28.80	15.2	50	21.2	AV	N	FLO

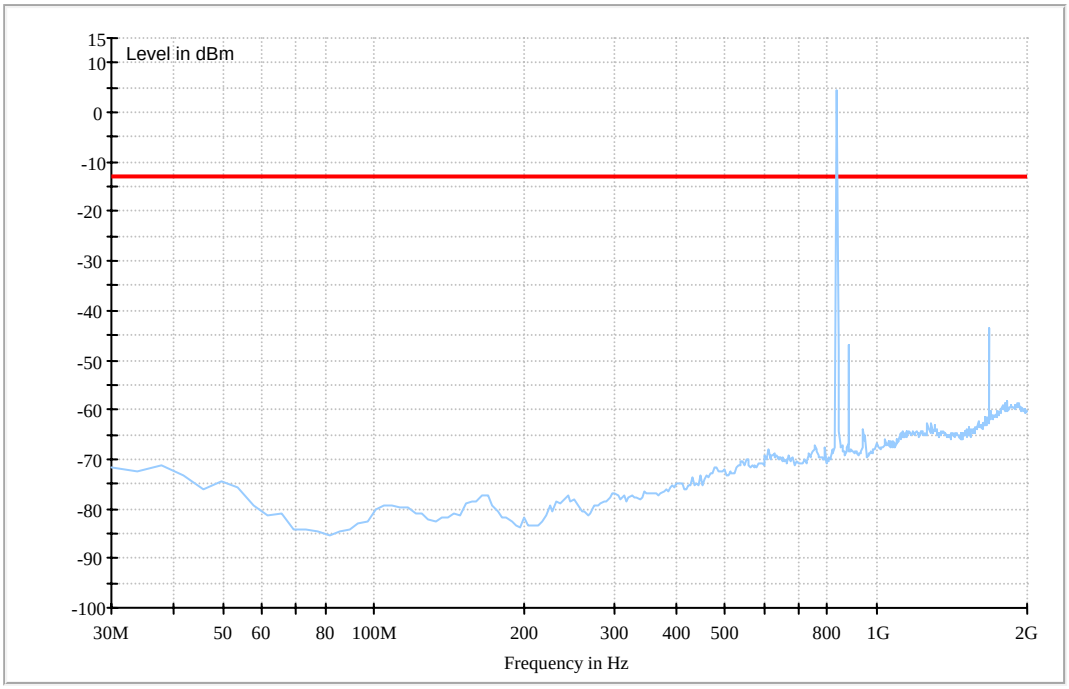
8.3 Radiated Spurious Emission

8.3.1 For GSM 850(Traffic Mode)

Traffic Mode (9kHz-30MHz)



Traffic Mode (30MHz-2GHz)



Traffic Mode (2GHz-18GHz)

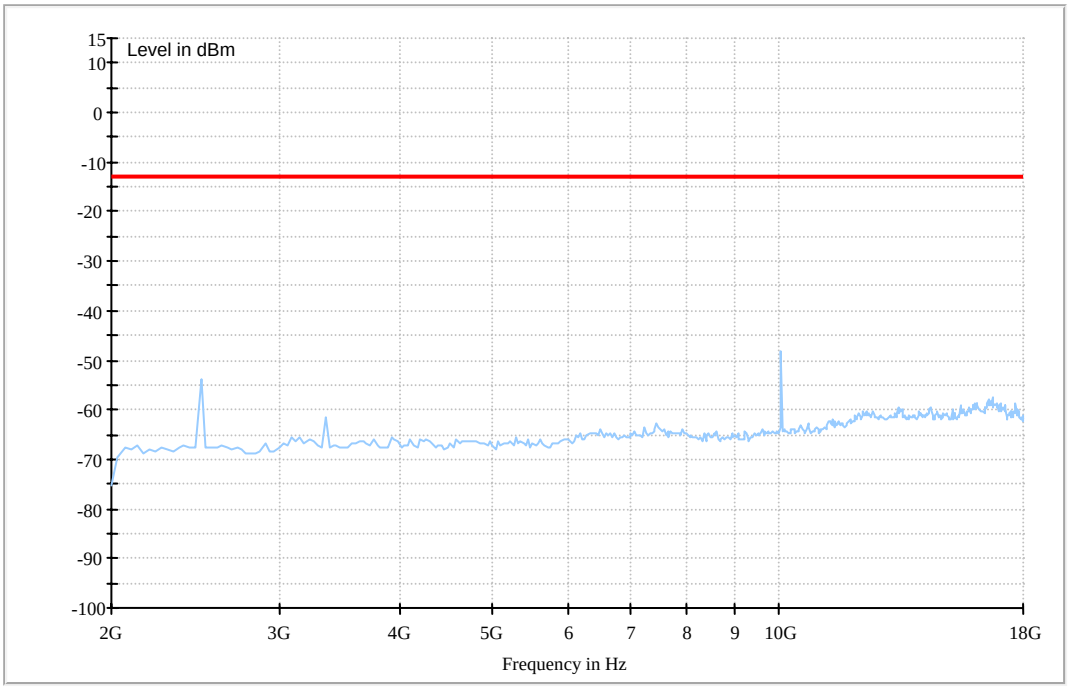


Figure 6. Radiated Spurious Emission

Substitution test result：

Table 12

Test Mode	Freq. [MHz]	Meas. Level [dBm]	Substitution Antenna Type	SGP [dBm]	Substitution Gain [dBd]	Cable Loss [dB]	Substitution Level (ERP) [dBm]	Result

Note: a, For get the ERP (Efficient Radiated Power) in substitution method, the following formula should take to calculate it,

ERP [dBm] = SGP [dBm] – Cable Loss [dB] + Gain [dBd]

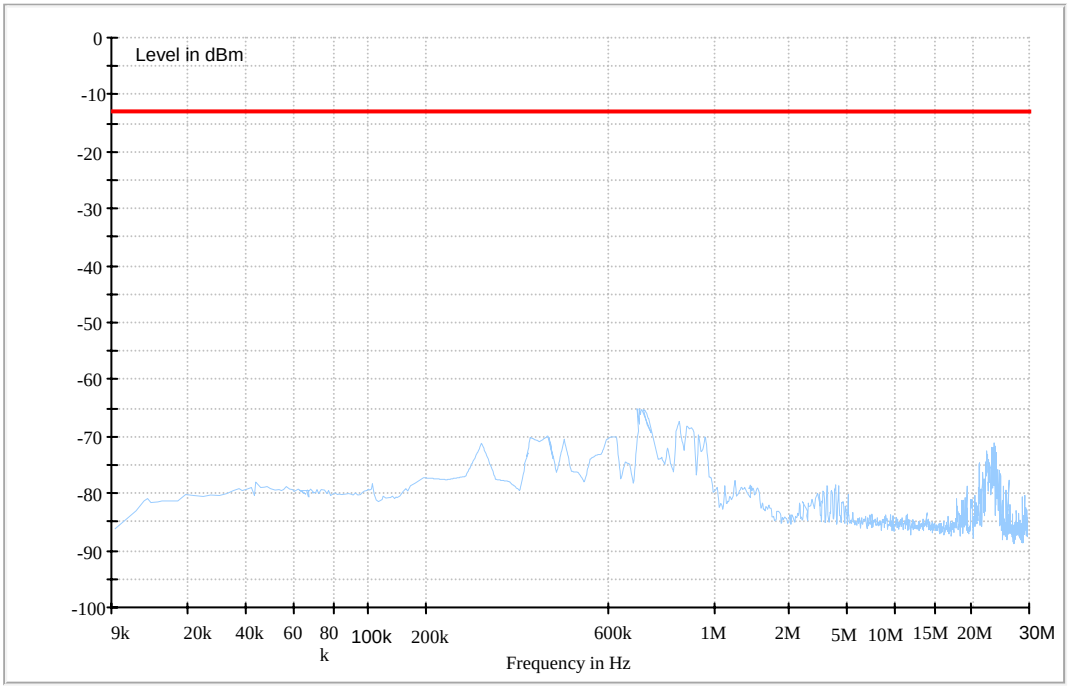
SGP: Signal Generator Level

b, A cdma signal with bandwidth of 1.23MHz are created by the vector generator R&S SMU200A.

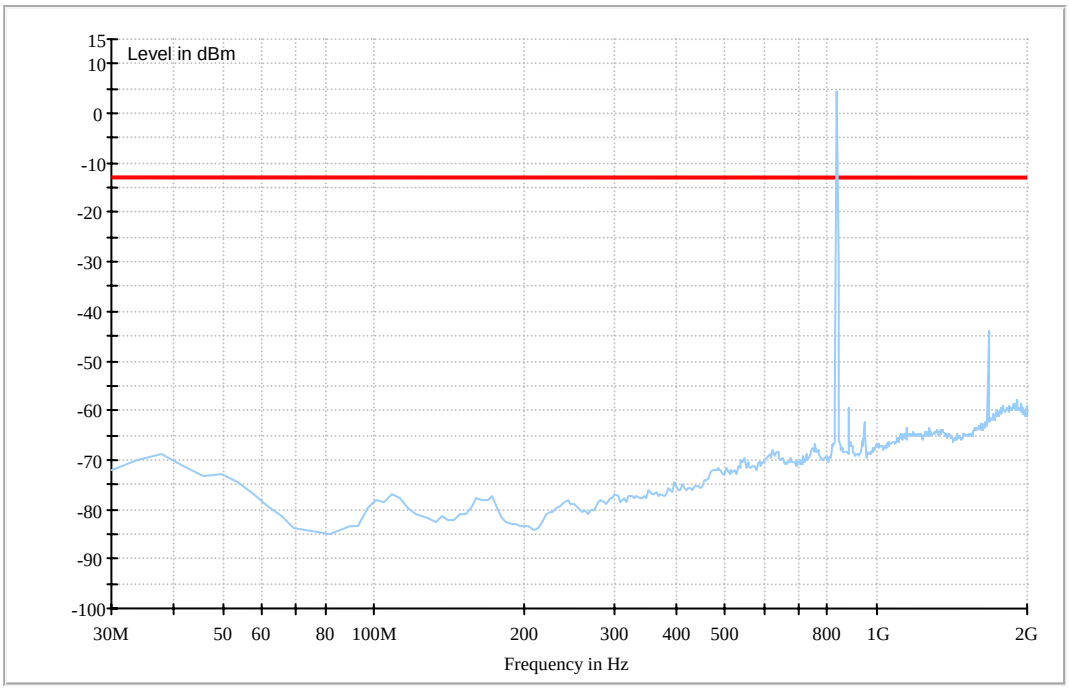
c, RBW=10kHz, VBW=300kHz, and integrated by the instrument to 1.23MHz.

8.3.2 For EGPRS 850

Traffic Mode (9kHz-30MHz)



Traffic Mode (30MHz-2GHz)



Traffic Mode (2GHz-18GHz)

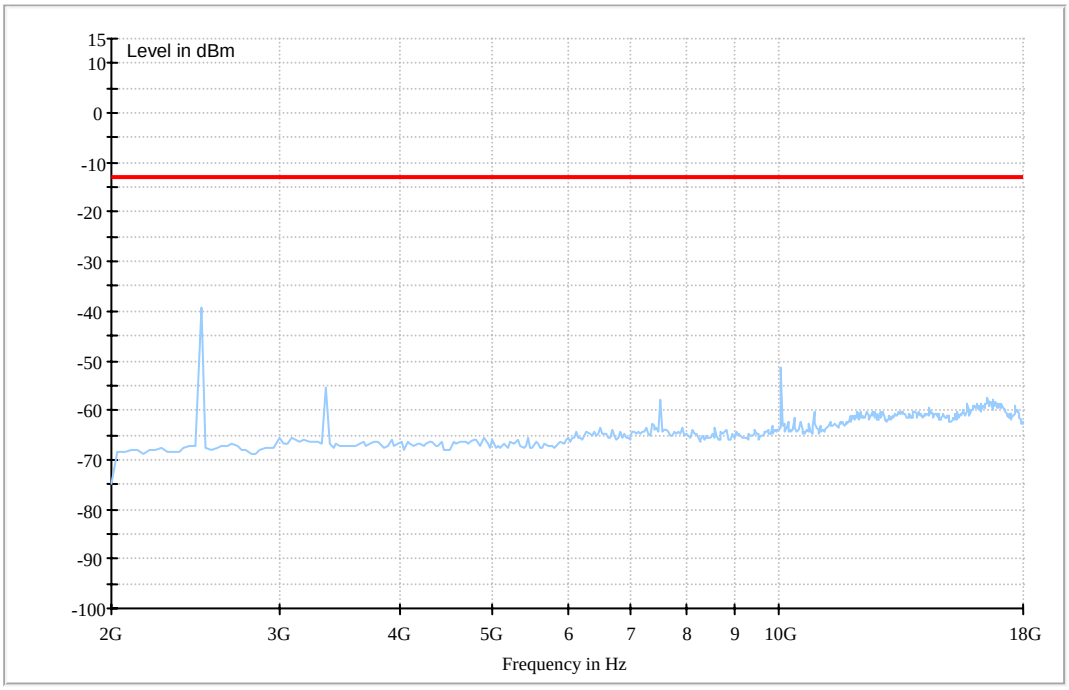
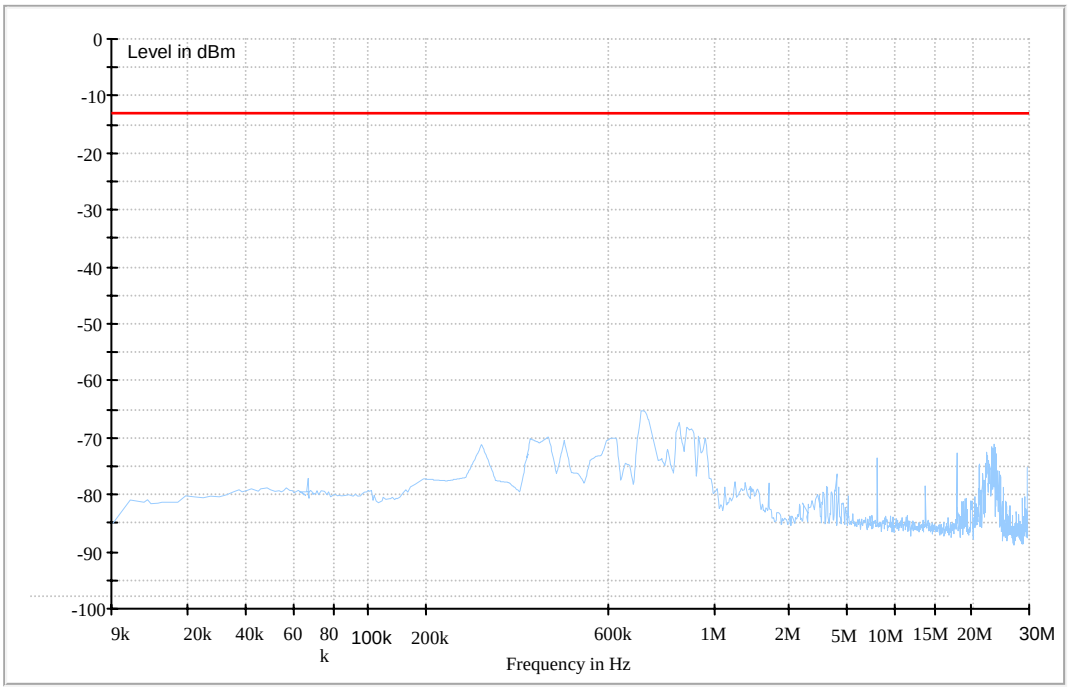


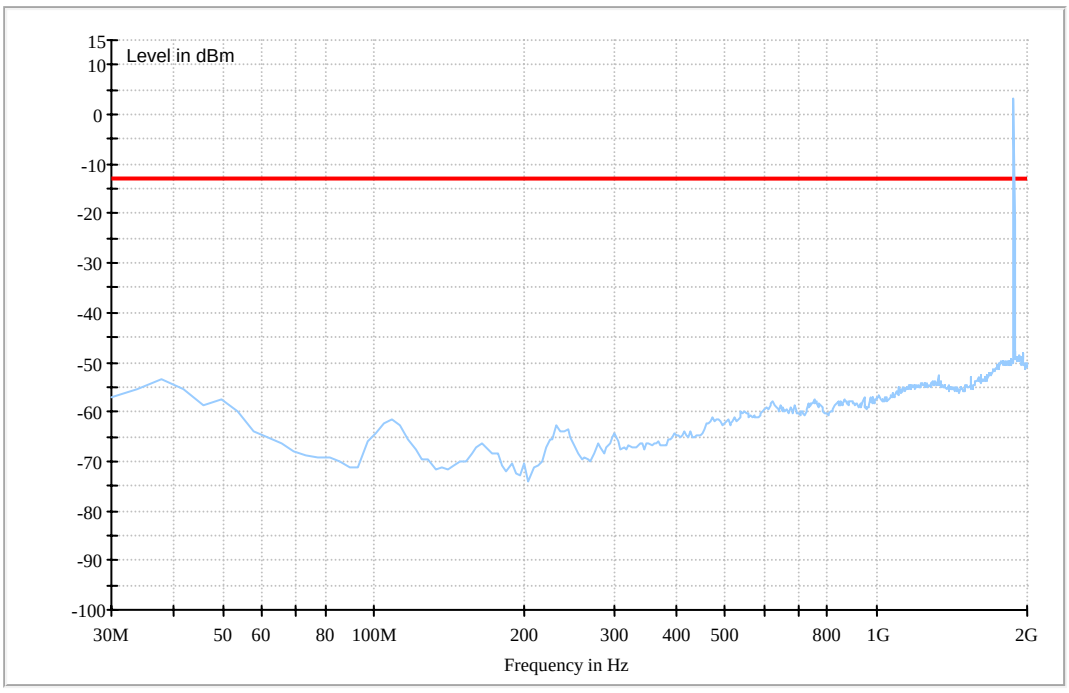
Figure 7. Radiated Spurious Emission

8.3.3 For PCS1900

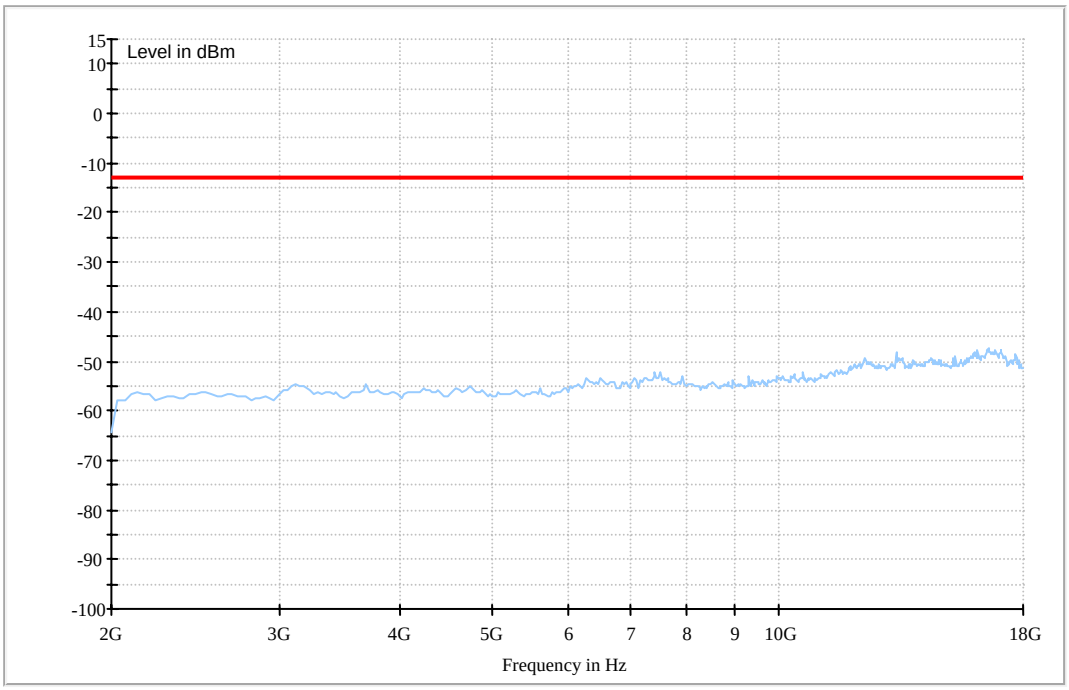
Traffic Mode (9kHz-30MHz)



Traffic Mode (30MHz-2GHz)



Traffic Mode (2GHz-18GHz)



Traffic Mode (18GHz-26GHz)

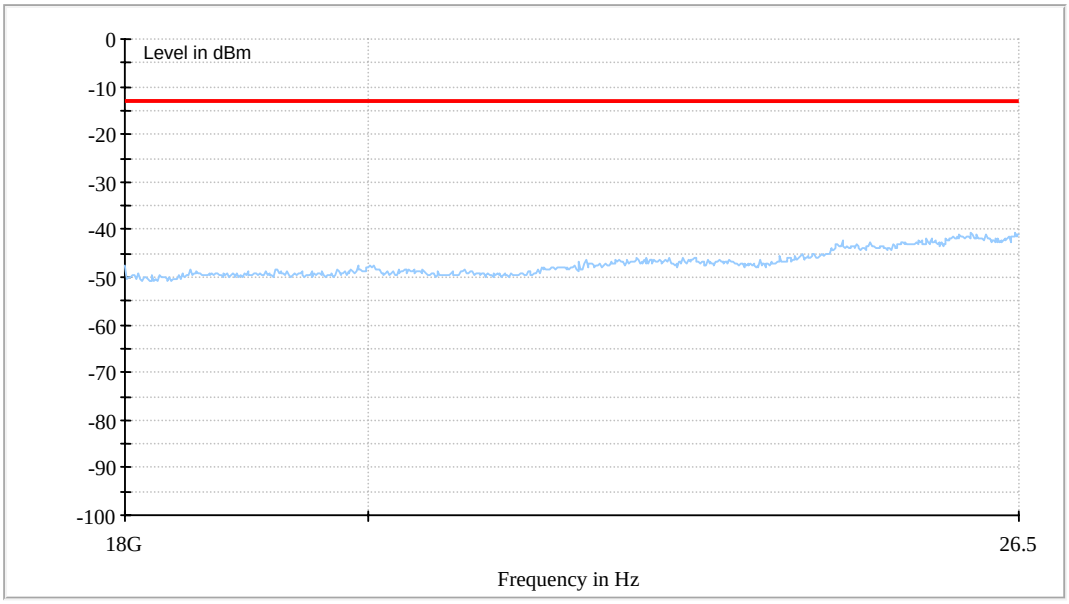
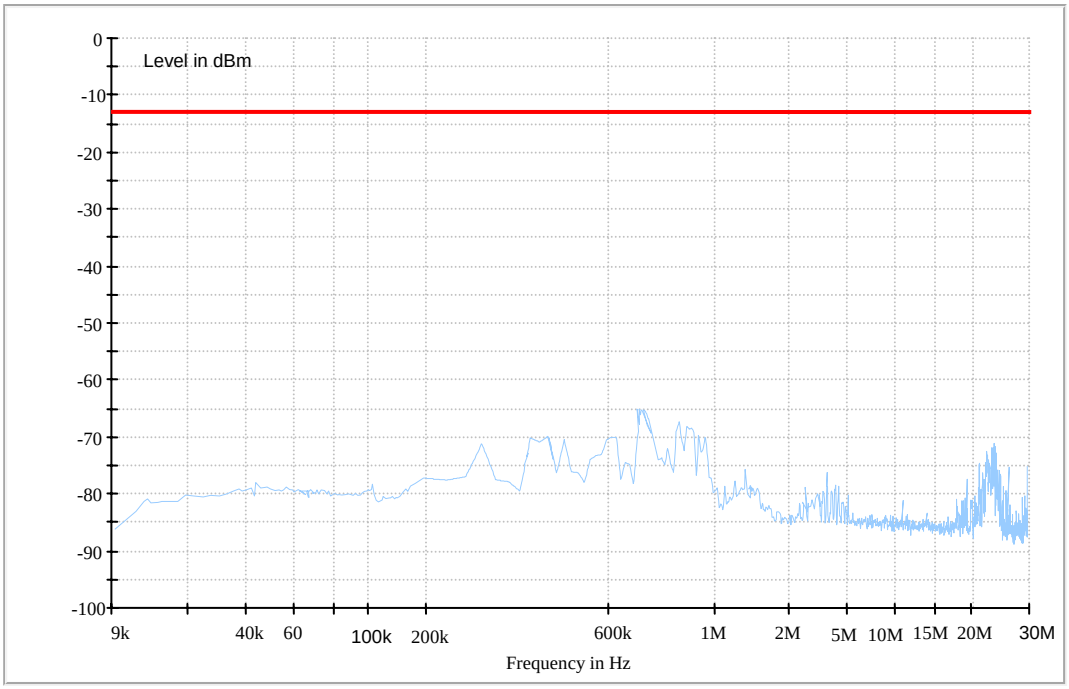


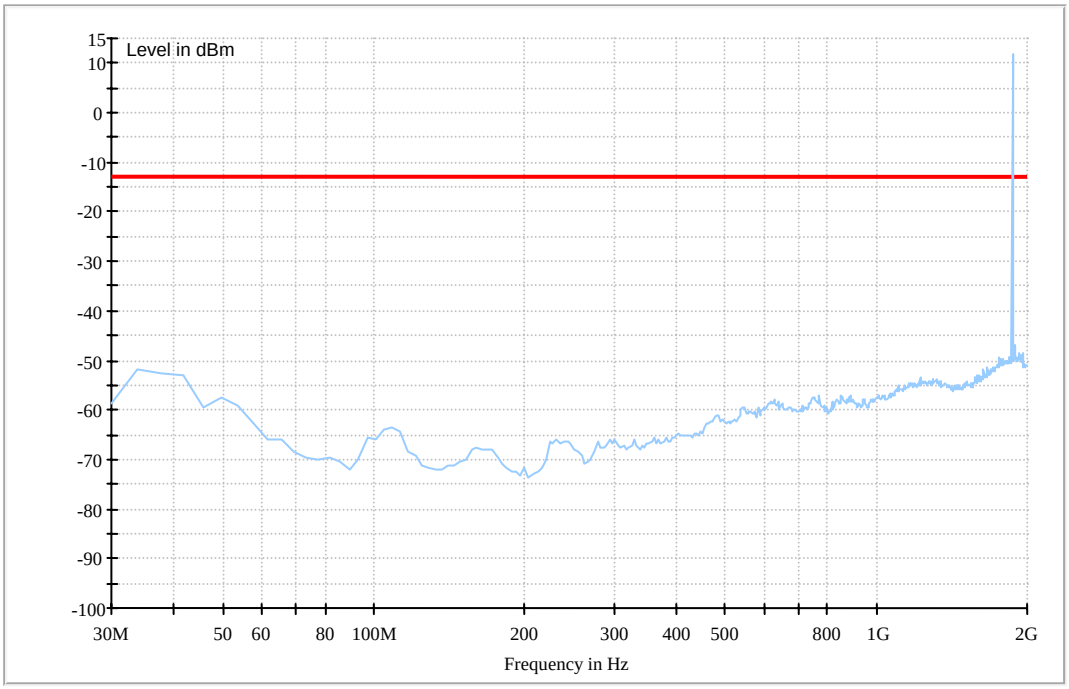
Figure 8. Radiated Spurious Emission

8.3.4 For EGPRS1900

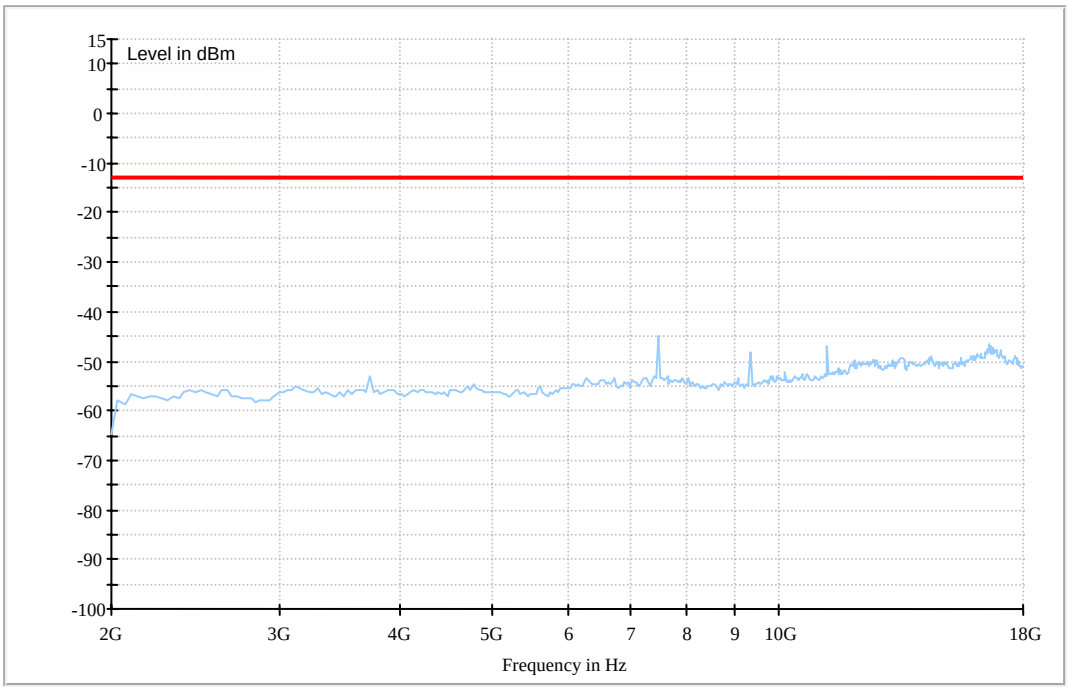
Traffic Mode (9kHz-30MHz)



Traffic Mode (30MHz-2GHz)



Traffic Mode (2GHz-18GHz)



Traffic Mode (18GHz-26GHz)

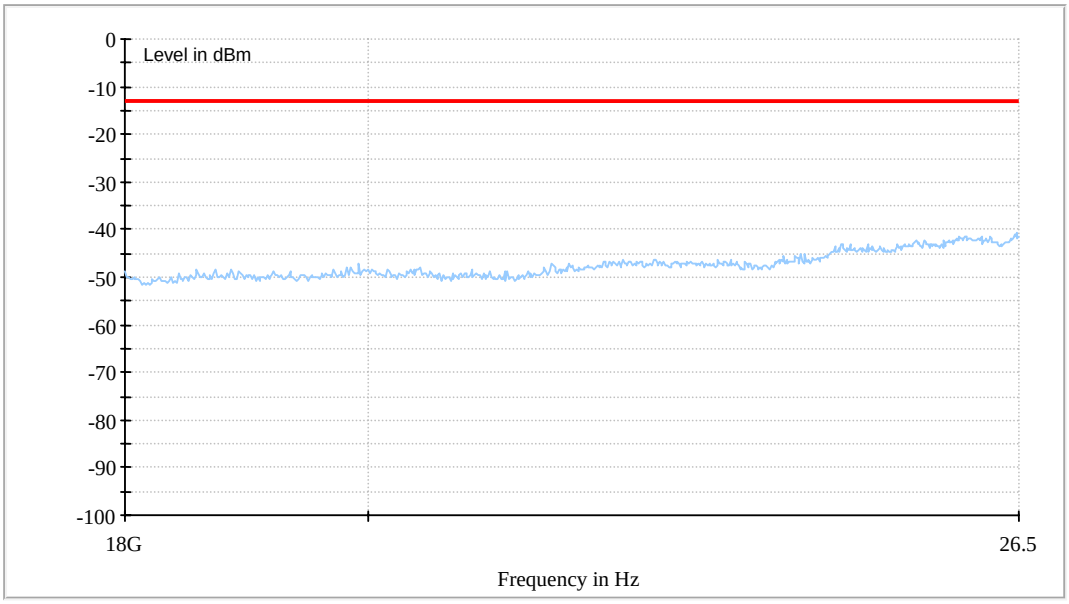
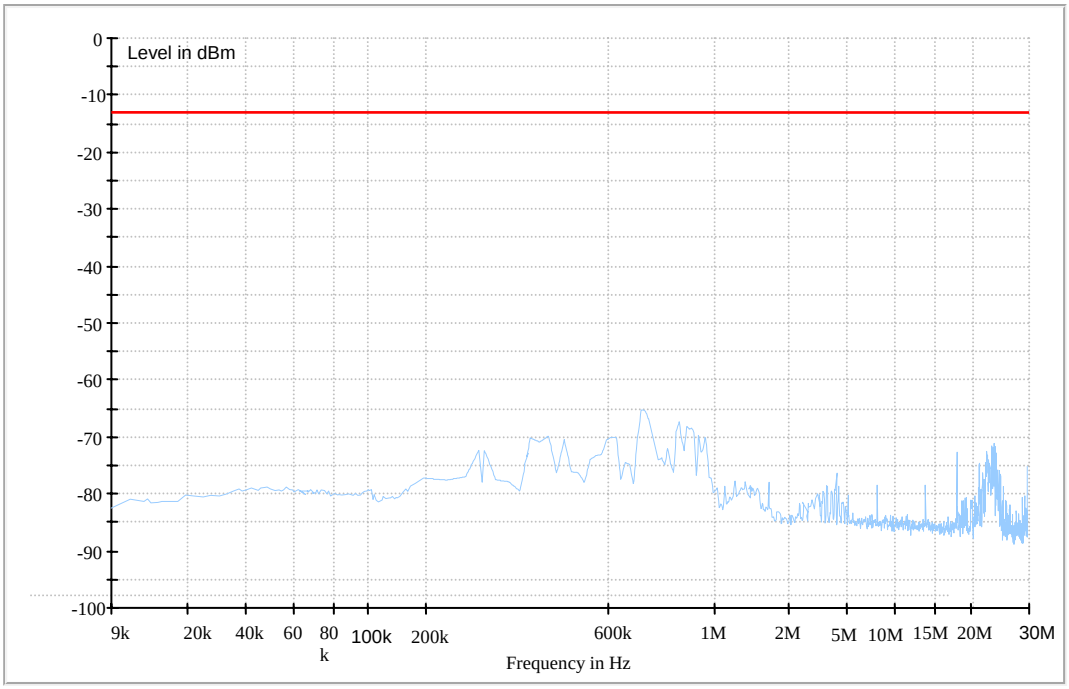


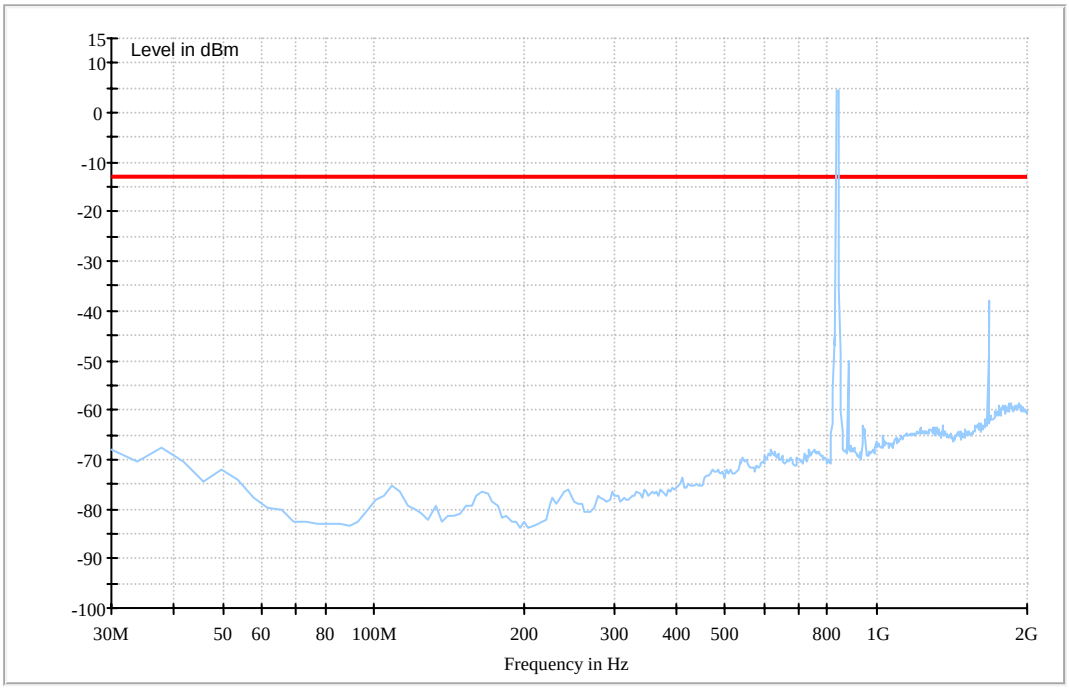
Figure 9. Radiated Spurious Emission

8.3.5 For WCDMA Band II

Traffic Mode (9kHz-30MHz)



Traffic Mode (30MHz-2GHz)



Traffic Mode (2GHz-18GHz)

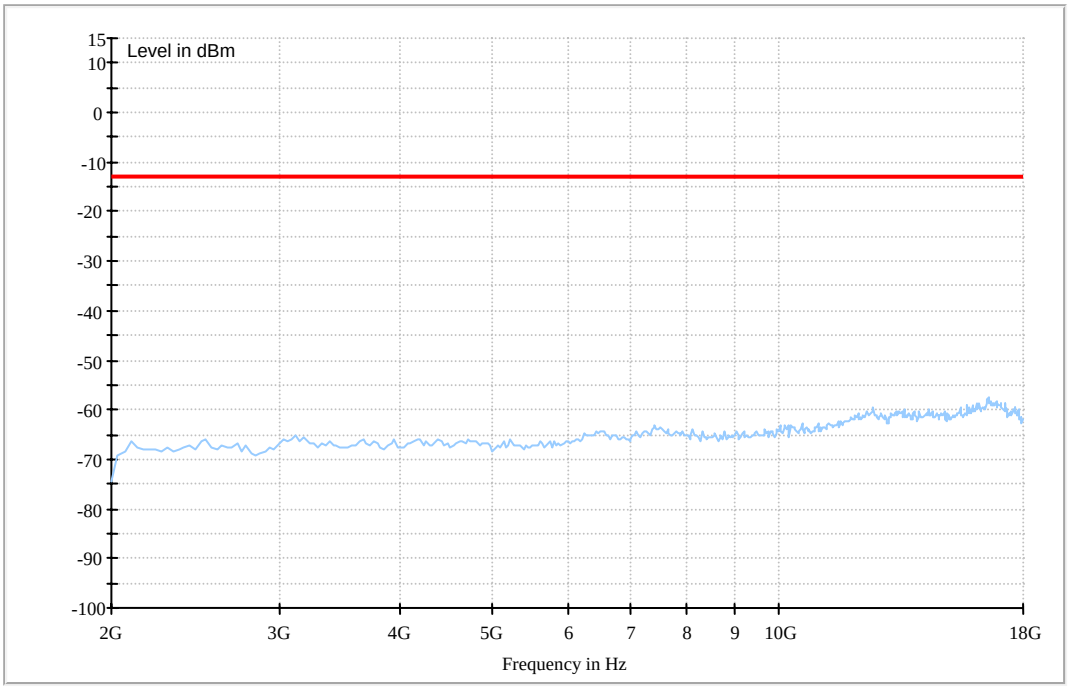
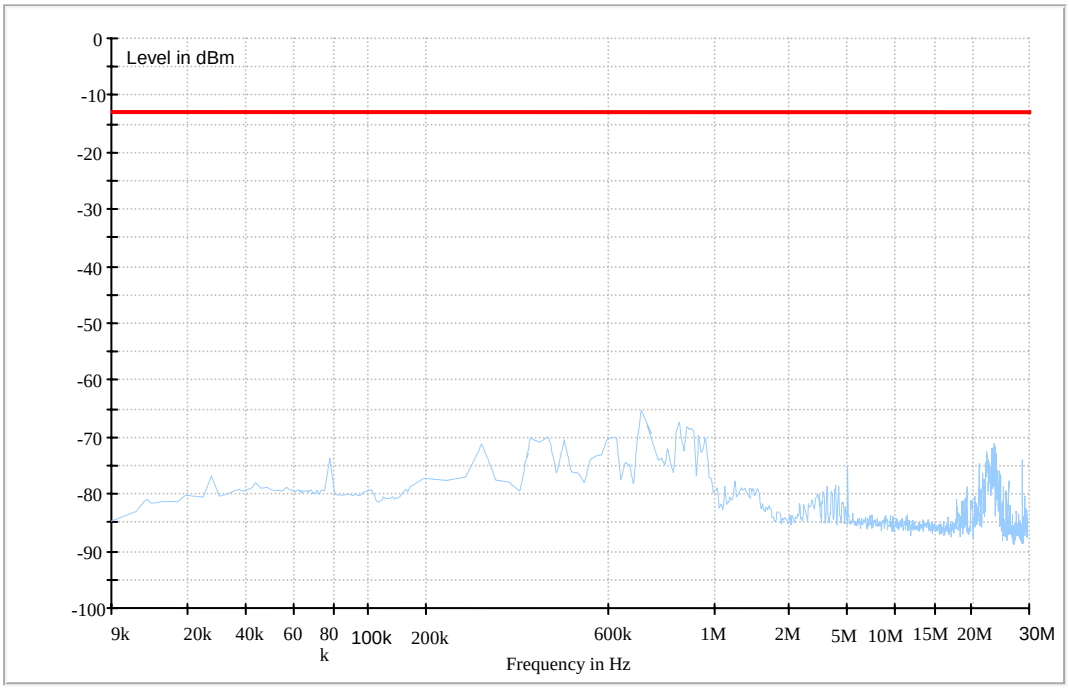


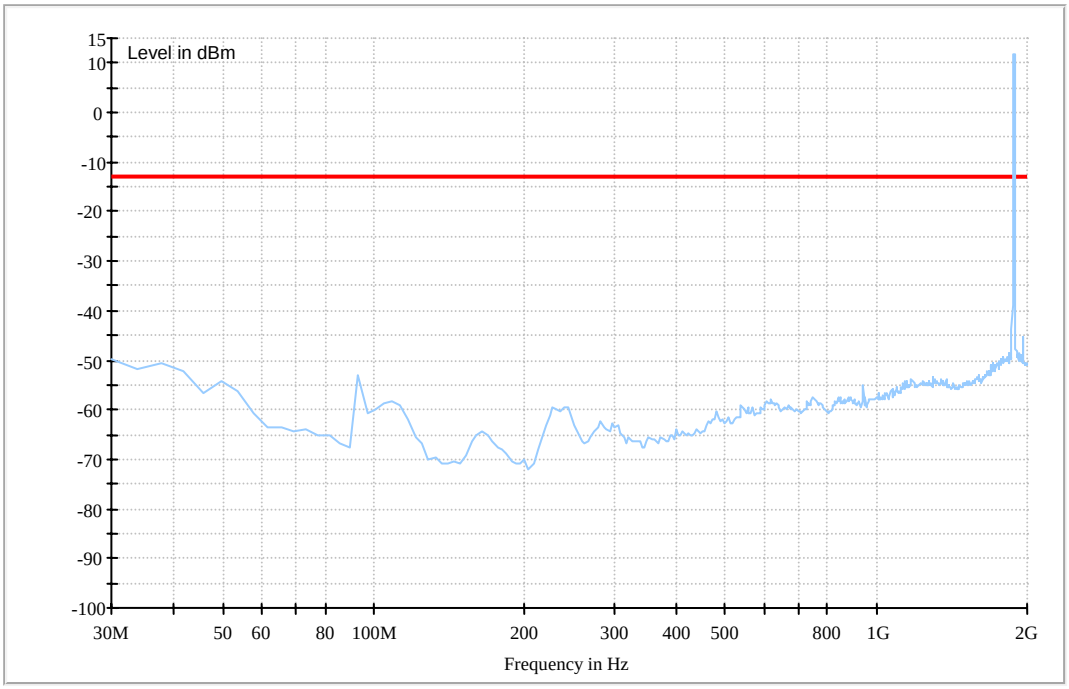
Figure 10. Radiated Spurious Emission

8.3.6 For WCDMA Band V

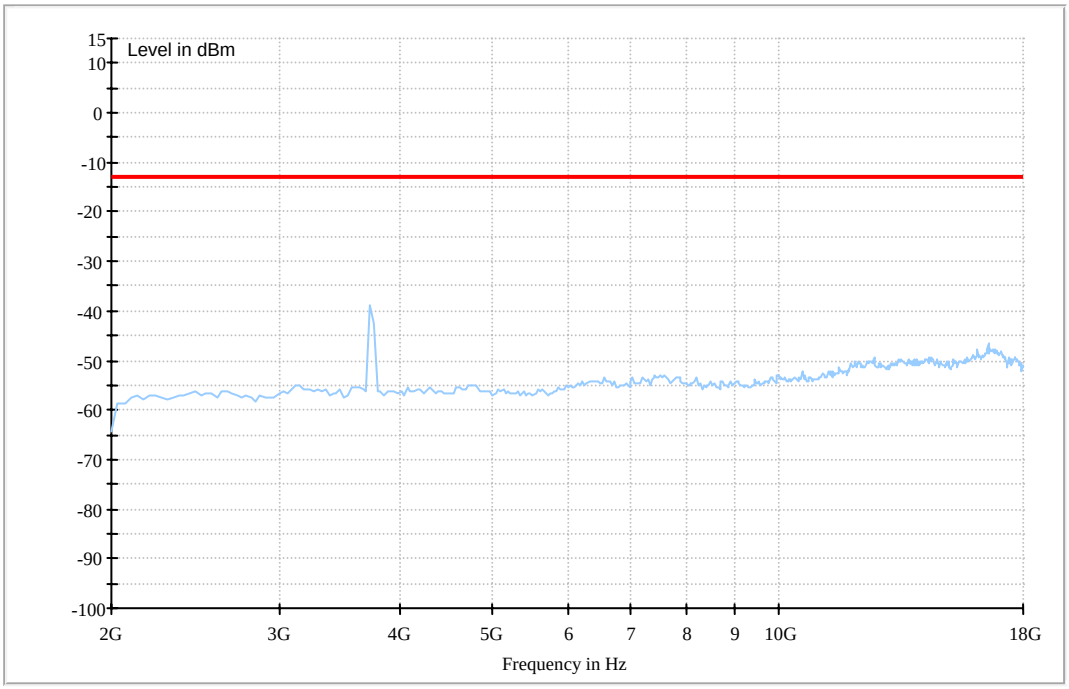
Traffic Mode (9kHz-30MHz)



Traffic Mode (30MHz-2GHz)



Traffic Mode (2GHz-18GHz)



Traffic Mode (18GHz-26GHz)

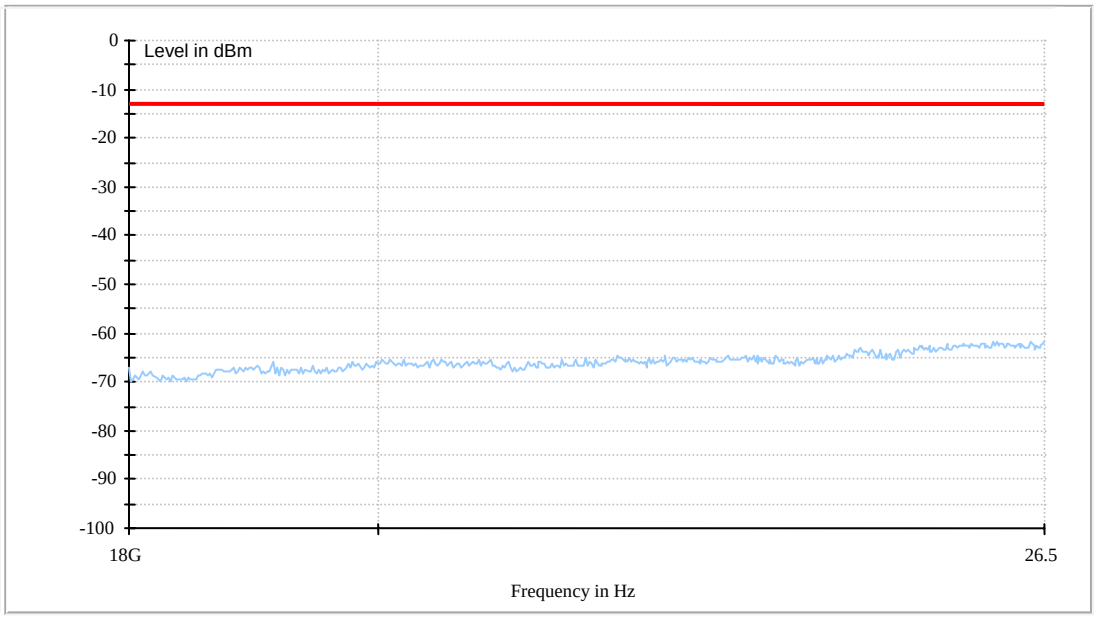
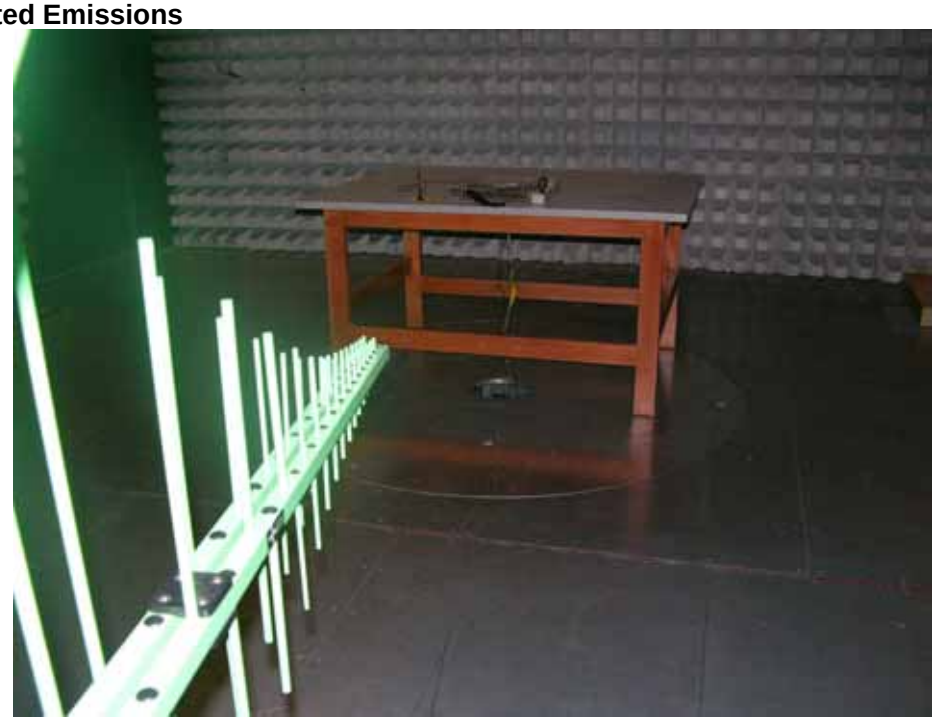


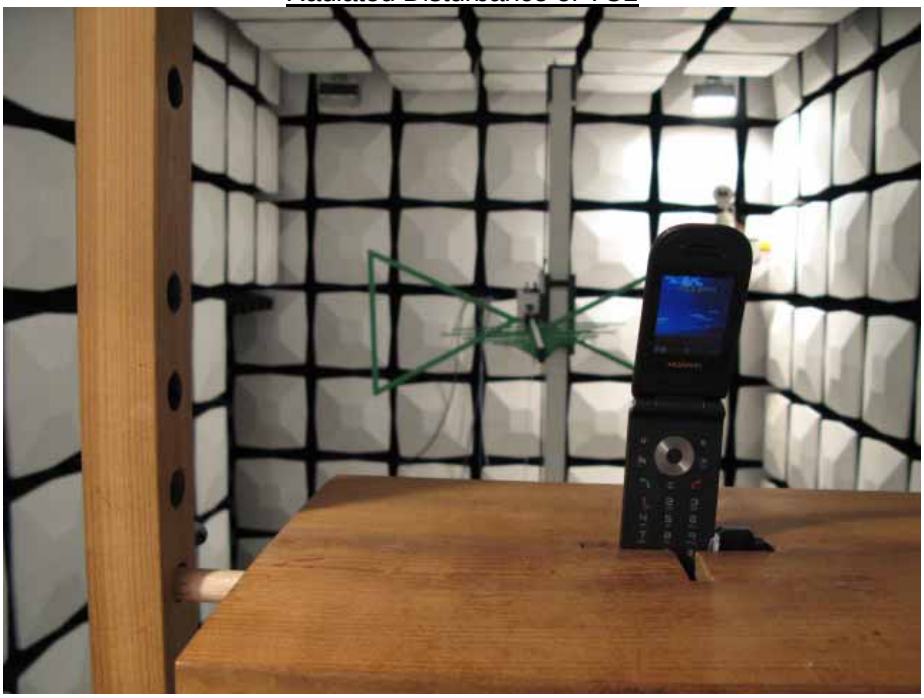
Figure 11. Radiated Spurious Emission

9 Photographs of Test Set-ups

9.1 Radiated Emissions



Radiated Disturbance of TC1

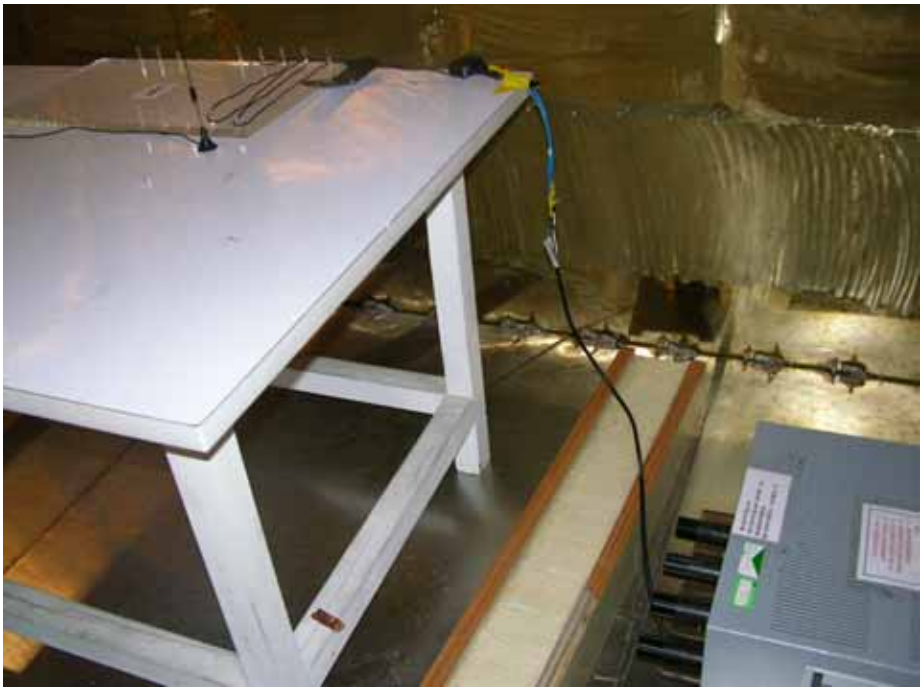


Radiated Spurious Emission(30MHz~2000MHz)

Radiated Spurious Emission(2GHz~18GHz)

Radiated Spurious Emission(2GHz~18GHz)

9.2 Conducted Emissions



Conducted Emissions of AC Power Port

END