

6 - SPURIOUS EMISSIONS AT ANTENNA TERMINALS

6.1 Applicable Standards

According to FCC §2.1049 and §24.238, on any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least $43 + 10 \log (P)$ dB.

6.2 Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 1 MHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonic.

6.3 Test Equipment

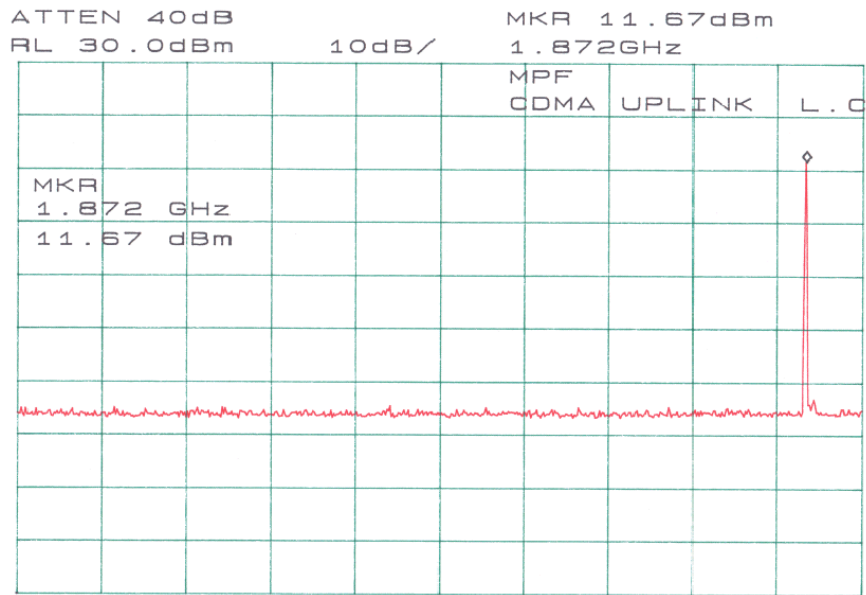
HP 8566B Spectrum Analyzer
HP 7470A Plotter
Hewlett Packard HP8566B Spectrum Analyzer
Hewlett Packard HP 7470A Plotter
Rohde & Schwarz SMIQ03B Signal Generator
Rohde & Schwarz AMIQ I/Q Modulation Generator

6.4 Test Results

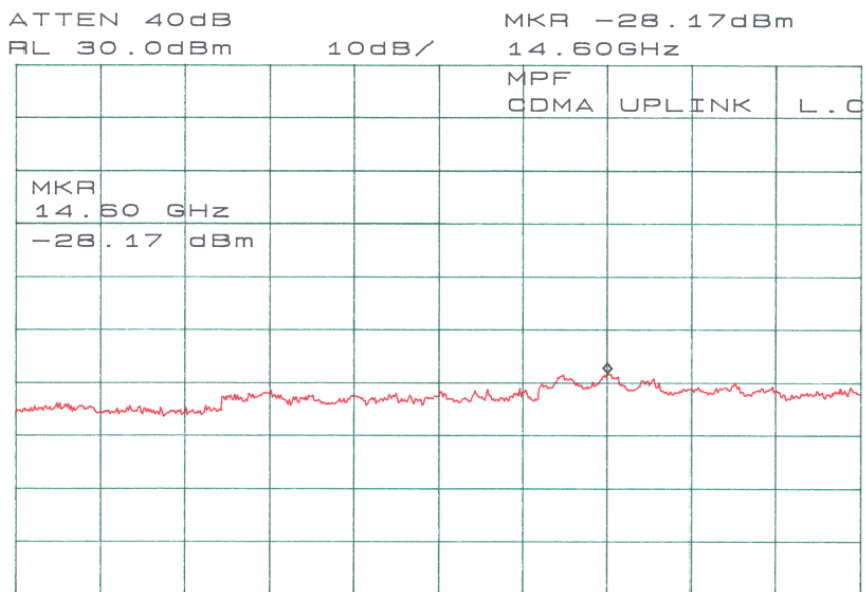
Modulation	Mode	Channel	Measured
CDMA	Up-link	Low	< -13dBm
		Mid	< -13dBm
		High	< -13dBm
	Down-link	Low	< -13dBm
		Mid	< -13dBm
		High	< -13dBm

6.5 Plots of Out-of-Band Emissions at Antenna Terminal

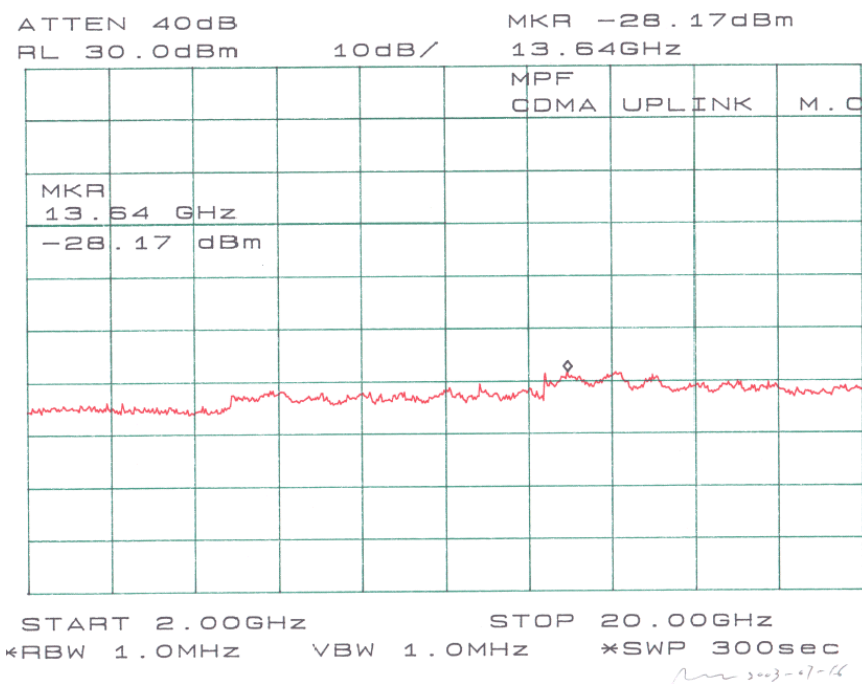
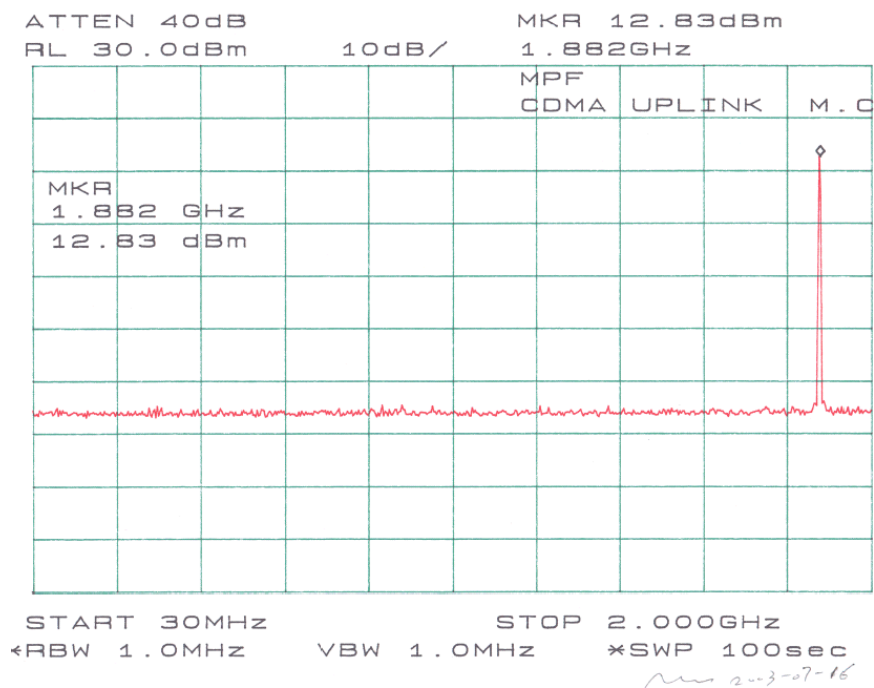
Please refer to plots hereinafter.

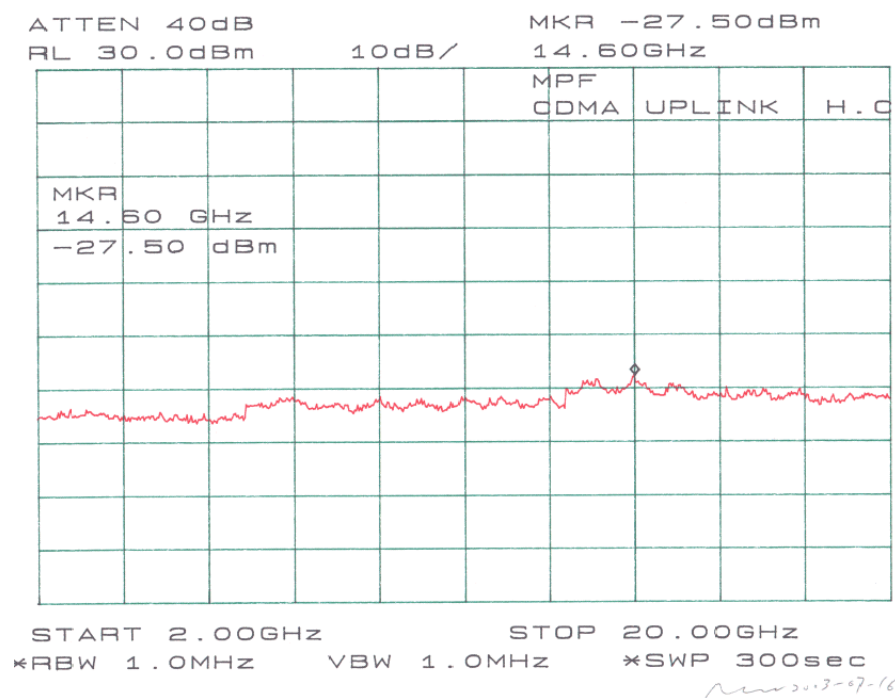
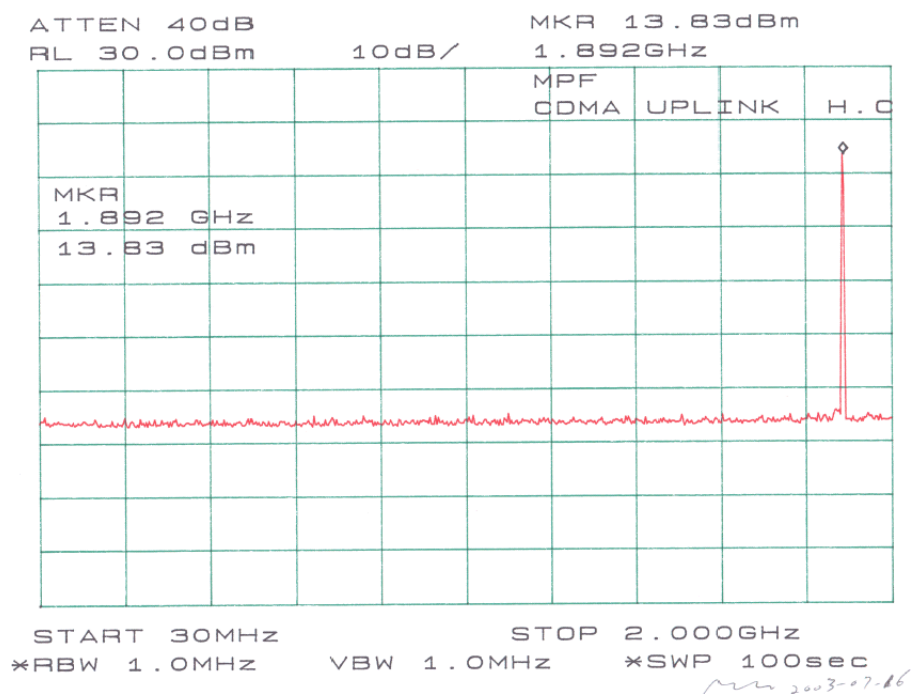


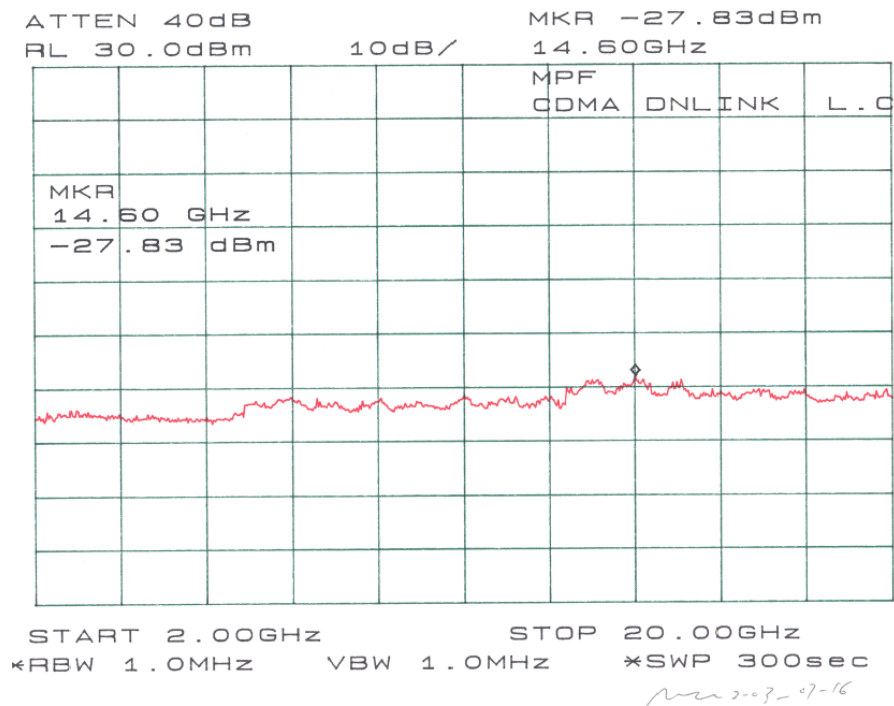
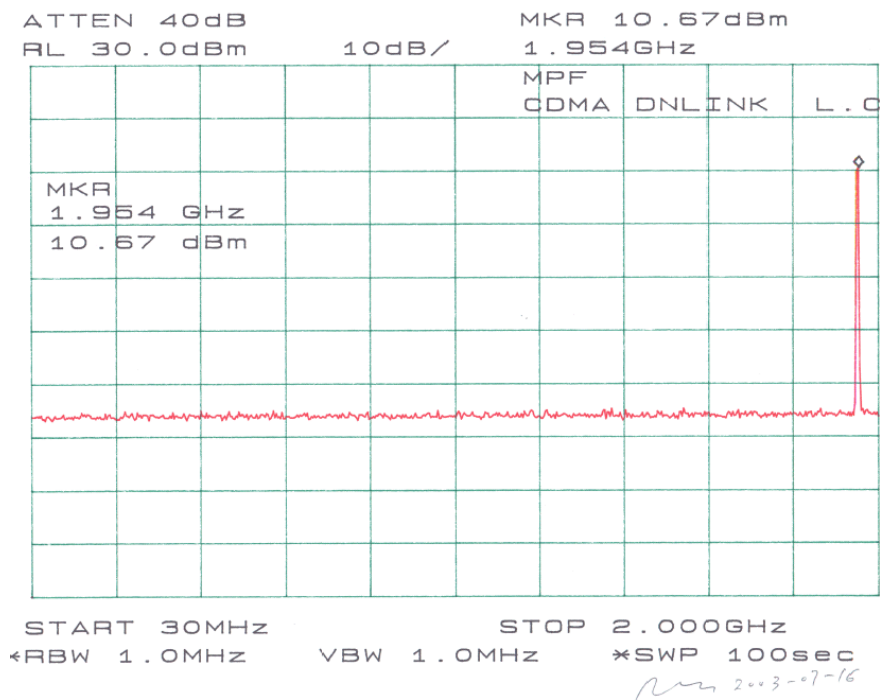
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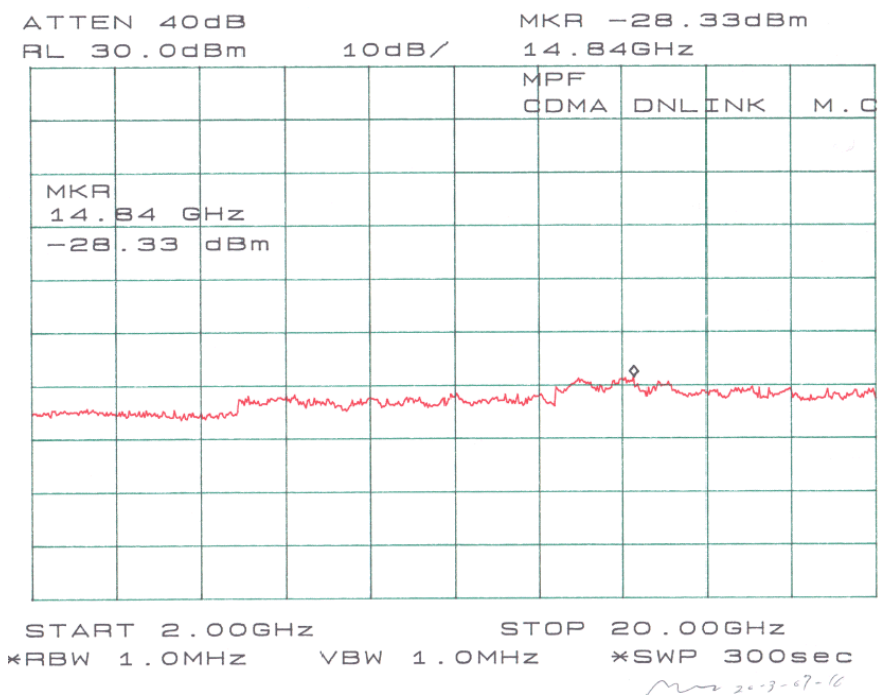
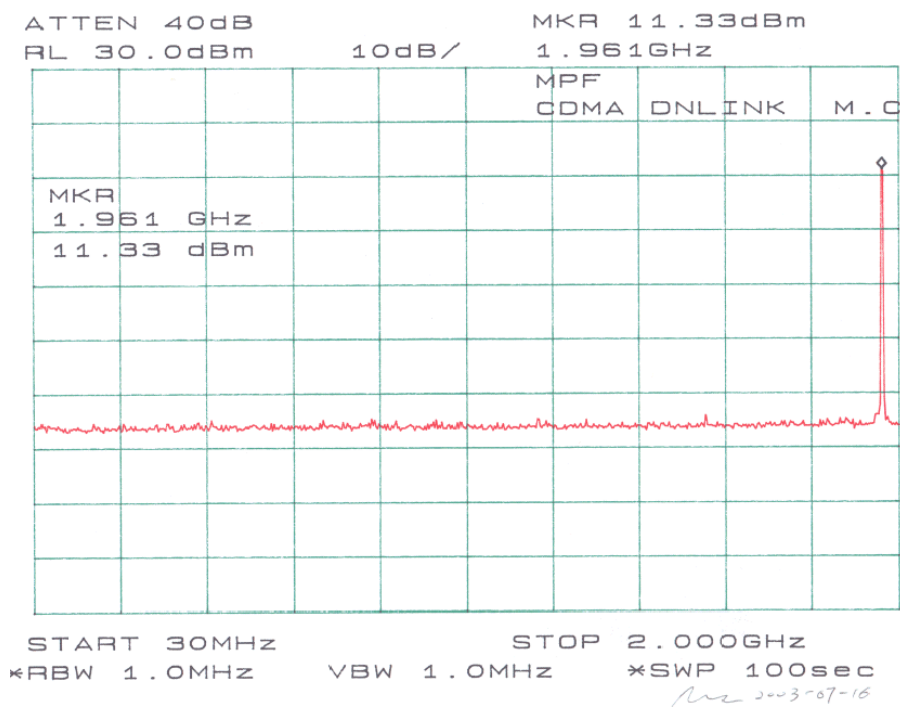


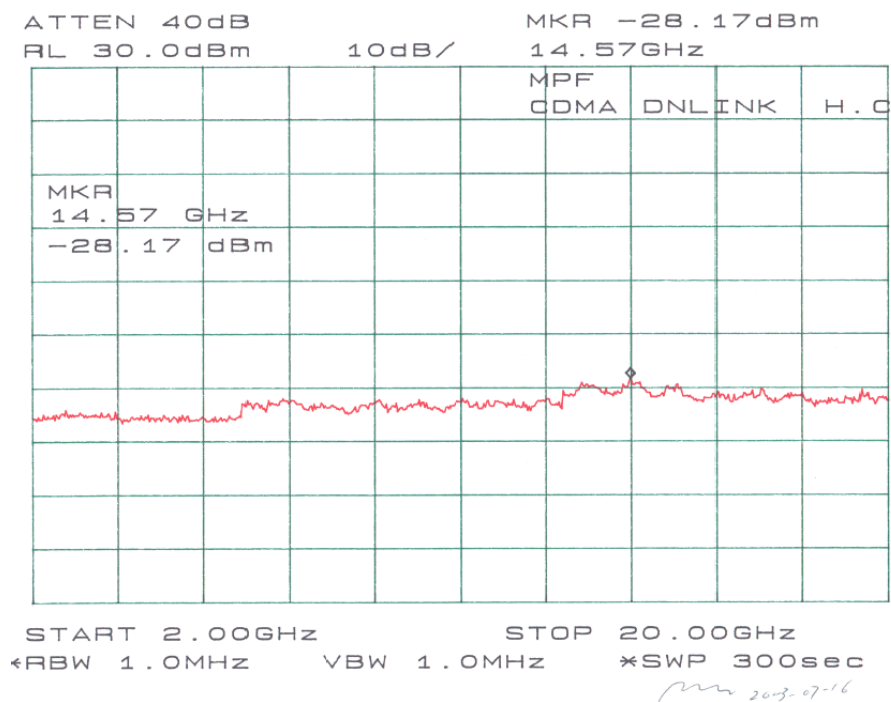
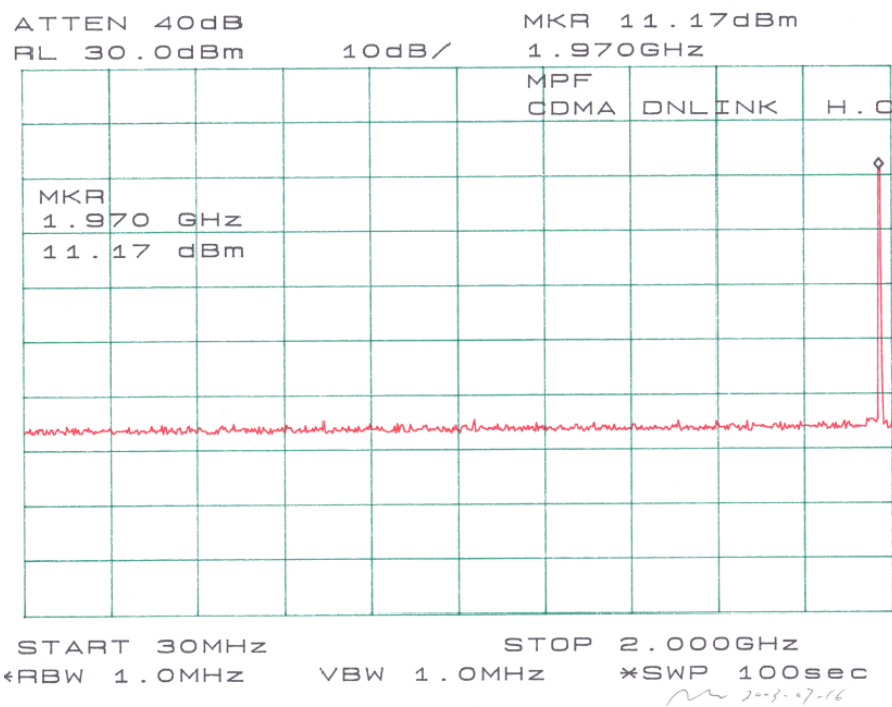
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7 - TWO-TONE TEST

7.1 Applicable Standards

According to IS-138A (3.4.4), Intermodulation products must be attenuated below the rated power of the EUT by at least $43 + 10\log(P)$, equivalent to -13 dBm.

7.2 Test Procedure

The RF output of the EUT was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 1 MHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonic. Two input signals are equal in level (and can be raised equally), were send to the EUT.

7.3 Test Equipment

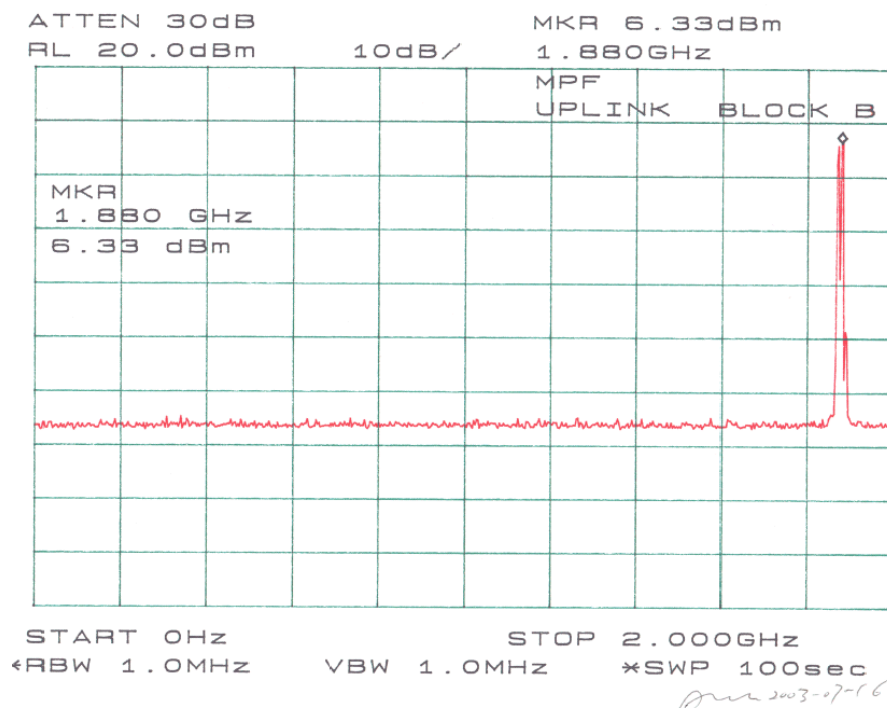
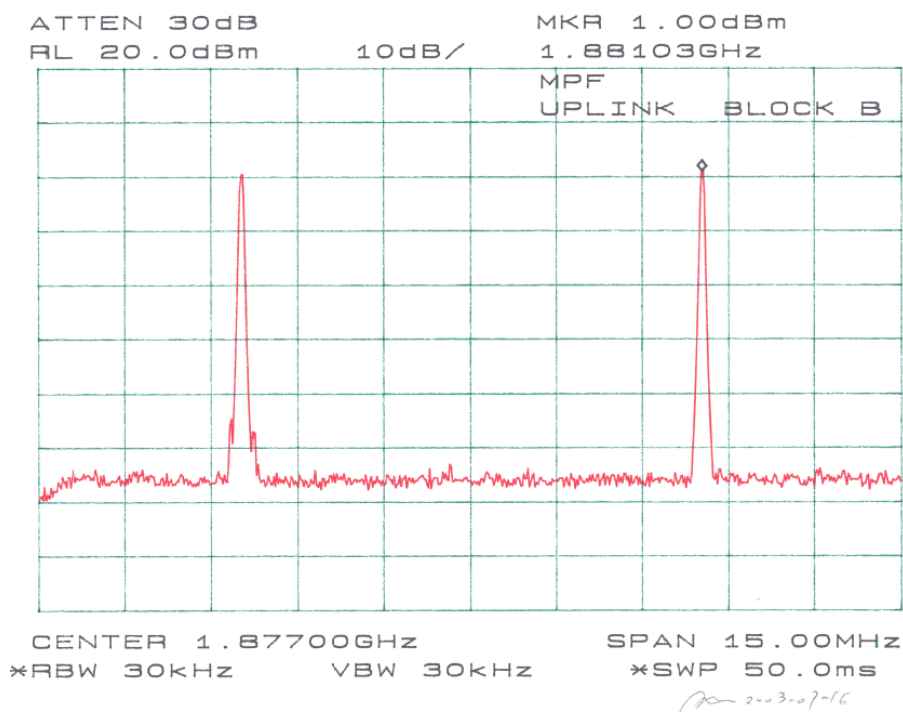
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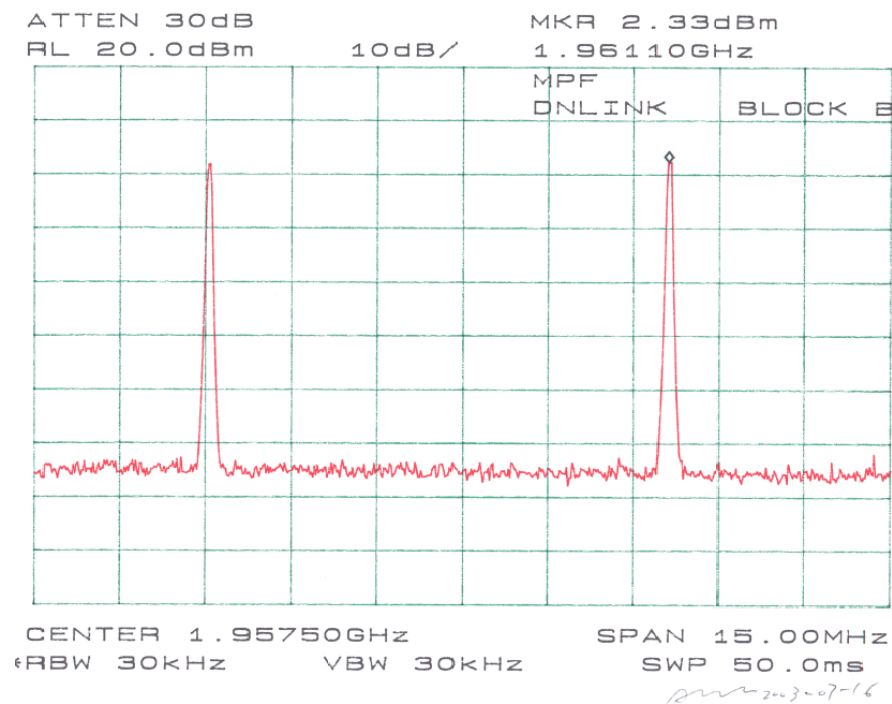
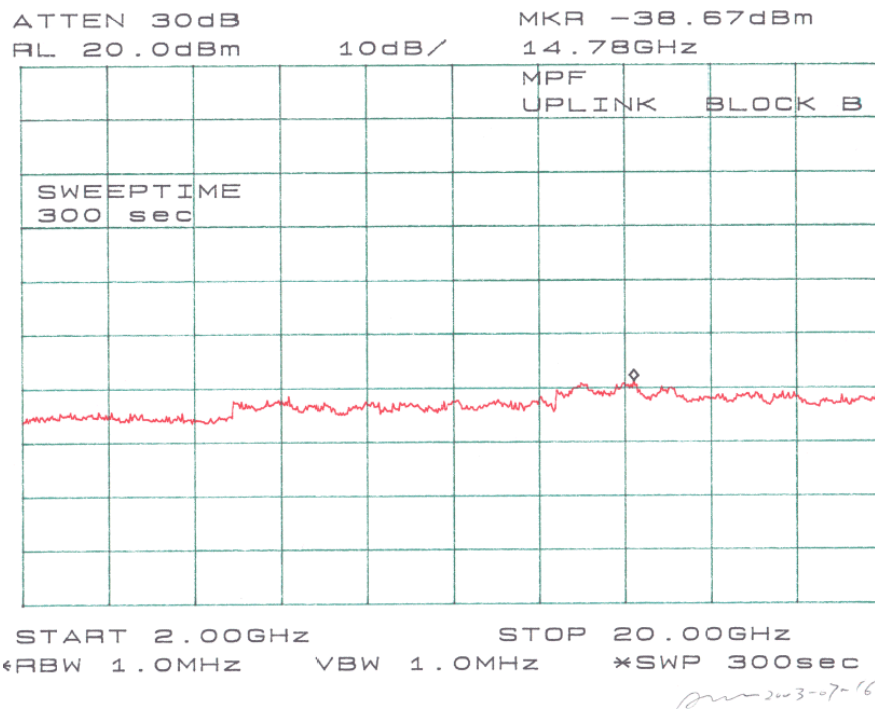
7.4 Test Results

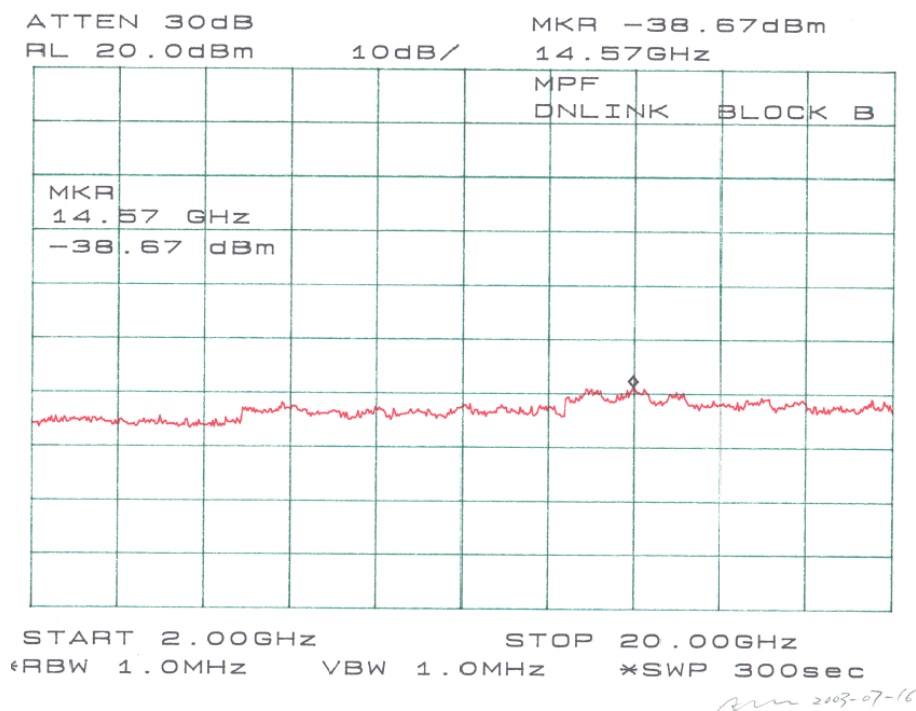
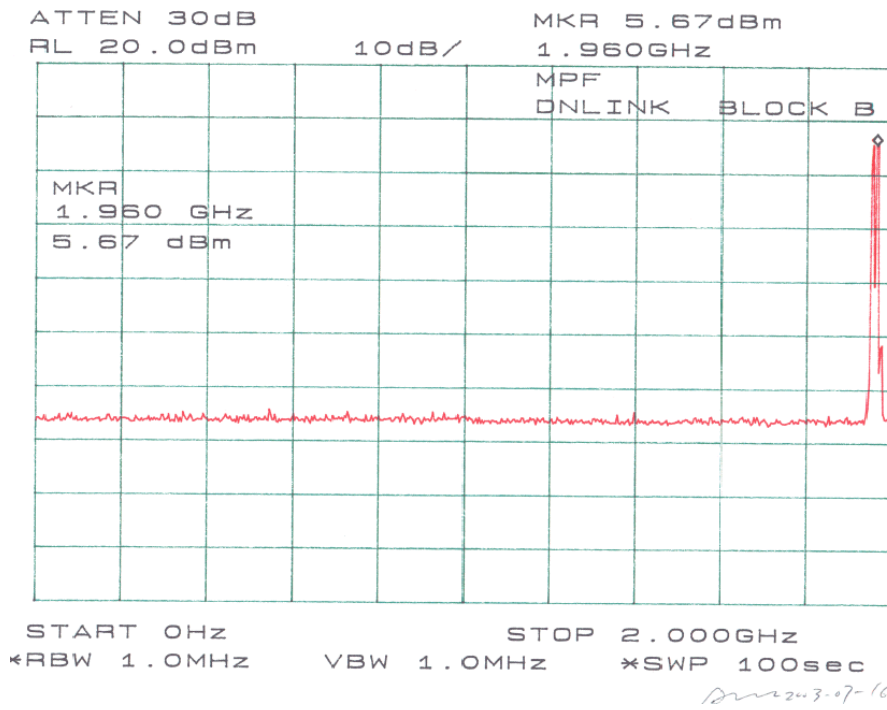
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		High	< -13dBm
	Down-link	Low	< -13dBm
		Mid	< -13dBm
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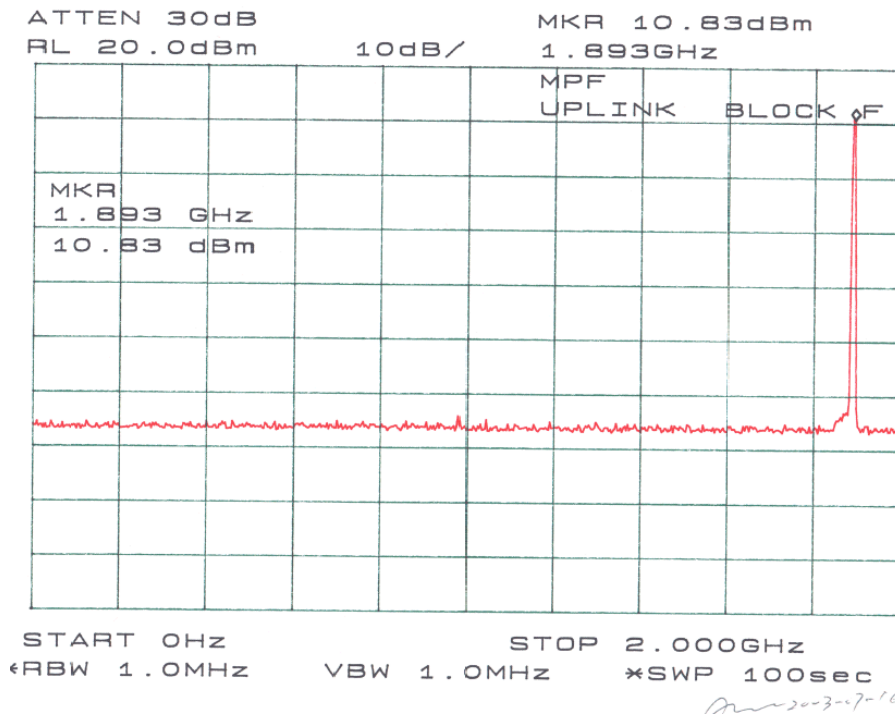
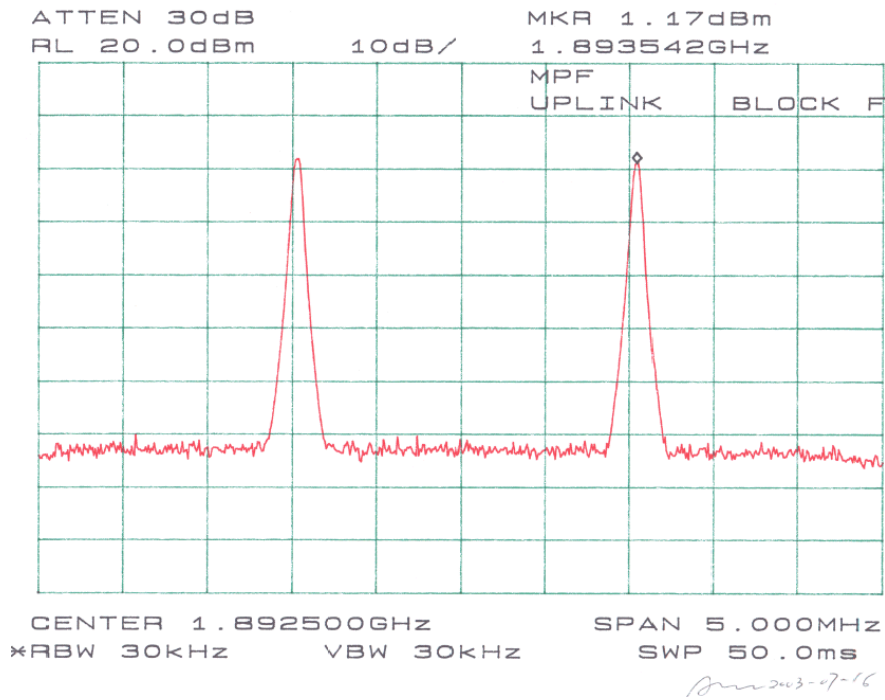
7.5 Plots of Two-Tone Test Result

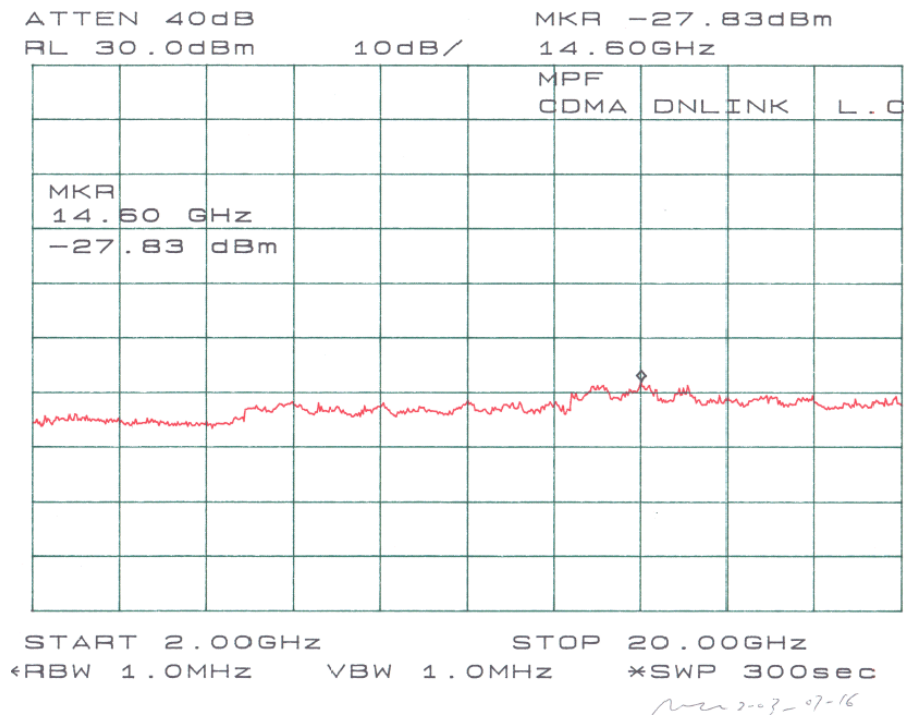
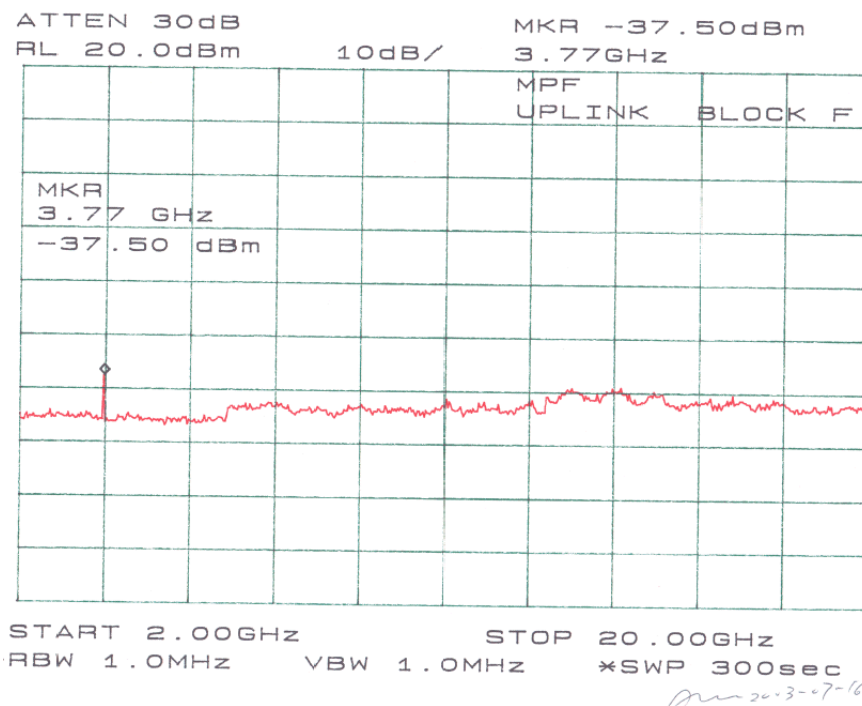
Please refer to plots hereinafter.

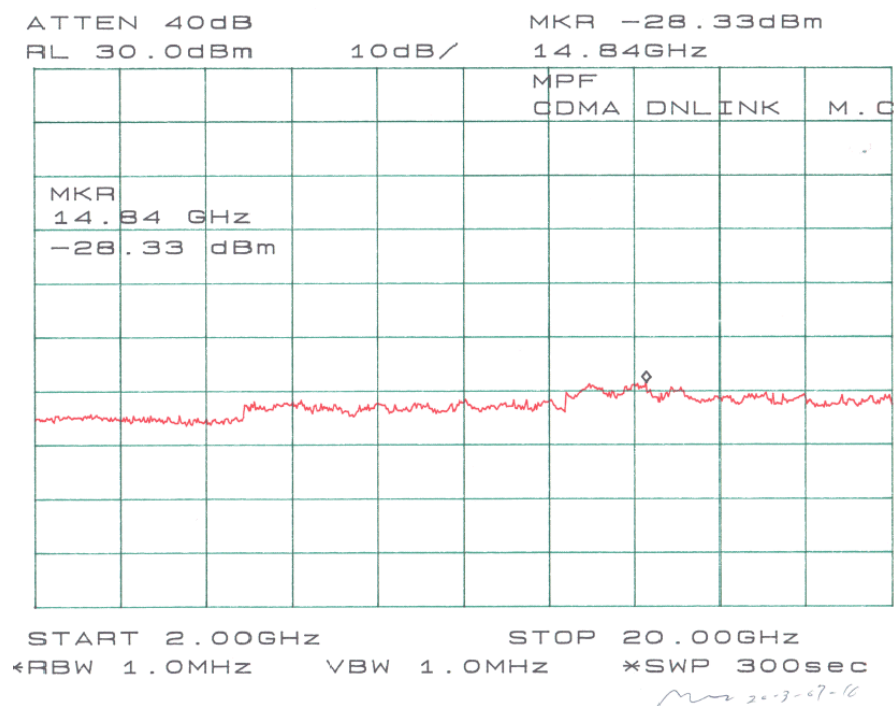
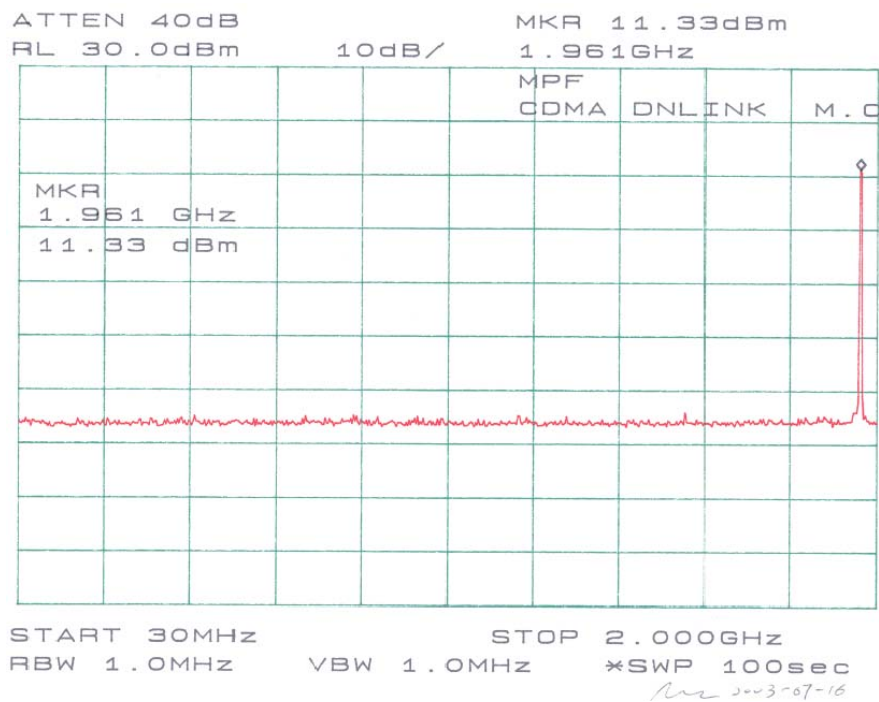












8 - FIELD STRENGTH OF SPURIOUS RADIATION

8.1 Test Procedure

Requirements: CFR 47, § 2.1053, and § 24.238 (a).

8.2 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 = $43 + 10 \text{Log}_{10} (\text{power out in Watts})$

8.3 Test Equipment

CDI B100/200/300 Biconical Antennas
EMCO Bi-logcon Antenna
EMCO 3115 Horn Antenna
HP 8566B Spectrum Analyzer
Preamplifiers
HP8640 Generator
Non-radiating Load

8.4 Test Result

Up-link:

Low Frequency: -27.4 dBm at 3746MHz
Middle Frequency: -27 dBm at 3766MHz
High Frequency: -27.2 dBm at 3786MHz

Down-link:

Low Frequency: -27.6 dBm at 3906MHz
Middle Frequency: -27.2 dBm at 3926MHz
High Frequency: -27.4 dBm at 3946MHz

Up-Link, Primary Scan at 1873 MHz (Low Channel)

EUT					Generator						Standard	
Indicated		Table	Test Antenna		Substitution			Antenna	Cable	Absolute	FCC	FCC
Frequency MHz	Ampl. dBuV/m	Angle Degree	Height Meter	Polar H/V	Frequency MHz	Level dBm	Polar H/V	Gain Corrected	Loss dBm	Level dB	Limit dBm	Margin DBm
1873	94.3	30	1.5	V	1873	3.2	V	6.1	0.1	9.2		
1873	85.6	15	1.8	H	1873	1.1	H	6.1	0.1	7.1		
3746	46.9	30	1.2	V	3746	-46.9	V	6.8	0.3	-40.4	-13	-27.4
3746	45.4	110	1.5	H	3746	-48.1	H	6.8	0.3	-41.6	-13	-28.6
5619	44.3	180	1.2	V	5619	-49.7	V	7.6	0.5	-42.6	-13	-29.6
5619	43.5	270	1.5	H	5619	-50.6	H	7.6	0.5	-43.5	-13	-30.5

Up-link, Primary Scan at 1883 MHz (Middle Channel)

EUT					Generator						Standard	
Indicated		Table	Test Antenna		Substitution			Antenna	Cable	Absolute	FCC	FCC
Frequency MHz	Ampl. dBuV/m	Angle Degree	Height Meter	Polar H/V	Frequency MHz	Level dBm	Polar H/V	Gain Corrected	Loss dBm	Level dB	Limit dBm	Margin DBm
1883	98.5	90	1.5	V	1883	3.7	V	6.1	0.1	9.7		
1883	88.7	45	1.2	H	1883	1.9	H	6.1	0.1	7.9		
3766	47.9	90	1.5	V	3766	-46.5	V	6.8	0.3	-40	-13	-27
3766	46.3	110	1.5	H	3766	-47.8	H	6.8	0.3	-41.3	-13	-28.3
5649	45.2	180	1.5	V	5649	-49.2	V	7.6	0.5	-42.1	-13	-29.1
5649	44.1	230	1.2	H	5649	-50.3	H	7.6	0.5	-43.2	-13	-30.2

Up-Link, Primary Scan at 1893 MHz (High Channel)

EUT					Generator						Standard	
Indicated		Table	Test Antenna		Substitution			Antenna	Cable	Absolute	FCC	FCC
Frequency MHz	Ampl. dBuV/m	Angle Degree	Height Meter	Polar H/V	Frequency MHz	Level dBm	Polar H/V	Gain Corrected	Loss dBm	Level dB	Limit dBm	Margin DBm
1893	96.8	90	1.5	V	1893	3.4	V	6.1	0.1	9.4		
1893	86.5	60	1.5	H	1893	1.6	H	6.1	0.1	7.6		
3786	47.2	150	1.2	V	3786	-46.7	V	6.8	0.3	-40.2	-13	-27.2
3786	45.9	180	1.2	H	3786	-47.9	H	6.8	0.3	-41.4	-13	-28.4
5679	44.6	90	2	V	5679	-49.5	V	7.6	0.5	-42.4	-13	-29.4
5679	43.8	0	1.5	H	5679	-50.4	H	7.6	0.5	-43.3	-13	-30.3

Down-Link, Primary Scan at 1953 MHz (Low Channel)

EUT					Generator						Standard	
Indicated		Table	Test Antenna		Substitution			Antenna	Cable	Absolute	FCC	FCC
Frequency MHz	Ampl. dBuV/m	Angle Degree	Height Meter	Polar H/V	Frequency MHz	Level dBm	Polar H/V	Gain Corrected	Loss dBm	Level dB	Limit dBm	Margin DBm
1953	92.1	90	1.5	V	1953	3.2	V	6.1	0.1	9.2		
1953	87.4	130	1.8	H	1953	1.7	H	6.1	0.1	7.7		
3906	46.9	0	1.2	V	3906	-47.1	V	6.8	0.3	-40.6	-13	-27.6
3906	46.1	120	1.5	H	3906	-47.9	H	6.8	0.3	-41.4	-13	-28.4
5859	44.2	230	1.2	V	5859	-50.3	V	7.6	0.5	-43.2	-13	-30.2
5859	43.5	150	1.3	H	5859	-50.8	H	7.6	0.5	-43.7	-13	-30.7

Down-Link, Primary Scan at 1963 MHz (Middle Channel)

EUT					Generator						Standard	
Indicated		Table	Test Antenna		Substitution			Antenna	Cable	Absolute	FCC	FCC
Frequency MHz	Ampl. dBuV/m	Angle Degree	Height Meter	Polar H/V	Frequency MHz	Level dBm	Polar H/V	Gain Corrected	Loss dBm	Level dB	Limit dBm	Margin DBm
1963	97.1	180	1.5	V	1963	3.5	V	6.1	0.1	9.5		
1963	89.3	130	1.5	H	1963	2.1	H	6.1	0.1	8.1		
3926	47.5	180	1.6	V	3926	-46.7	V	6.8	0.3	-40.2	-13	-27.2
3926	46.3	110	1.6	H	3926	-47.5	H	6.8	0.3	-41	-13	-28
5889	44.8	270	1.5	V	5889	-49.6	V	7.6	0.5	-42.5	-13	-29.5
5889	43.9	160	1.2	H	5889	-50.4	H	7.6	0.5	-43.3	-13	-30.3

Down-Link, Primary Scan at 1973 MHz (High Channel)

EUT					Generator						Standard	
Indicated		Table	Test Antenna		Substitution			Antenna	Cable	Absolute	FCC	FCC
Frequency MHz	Ampl. dBuV/m	Angle Degree	Height Meter	Polar H/V	Frequency MHz	Level dBm	Polar H/V	Gain Corrected	Loss dBm	Level dB	Limit dBm	Margin DBm
1973	93.5	90	1.5	V	1973	3.3	V	6.1	0.1	9.3		
1973	86.4	120	1.5	H	1973	1.8	H	6.1	0.1	7.8		
3946	47.1	0	1.2	V	3946	-46.9	V	6.8	0.3	-40.4	-13	-27.4
3946	46.2	30	1.5	H	3946	-47.7	H	6.8	0.3	-41.2	-13	-28.2
5719	44.3	210	1.8	V	5719	-49.8	V	7.6	0.5	-42.7	-13	-29.7
5719	43.7	250	1.5	H	5719	-50.6	H	7.6	0.5	-43.5	-13	-30.5