5. Test of Radiated Emission

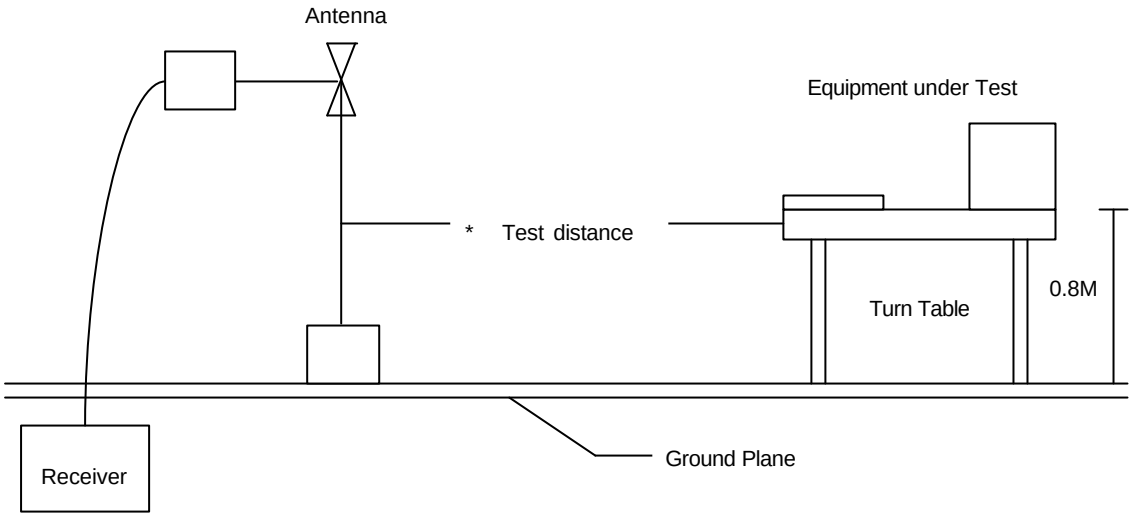
5.1 Test Limit

Radiated emissions from 30 MHz to 40 GHz were measured according to the methods defines in ANSI C63.4-2003. The EUT was placed, 0.8 meter above the ground plane, as shown in section 1.4.2. The interface cables and equipment positions were varied within limits of reasonable applications to determine the positions producing maximum radiated emissions

5.2 Test Procedures

1. The EUT was placed on a rotatable table top 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna is a broadband antenna and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
5. For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.
6. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.
7. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method and reported.
8. 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.

5.3 Typical Test Setup Layout of Radiated Emission

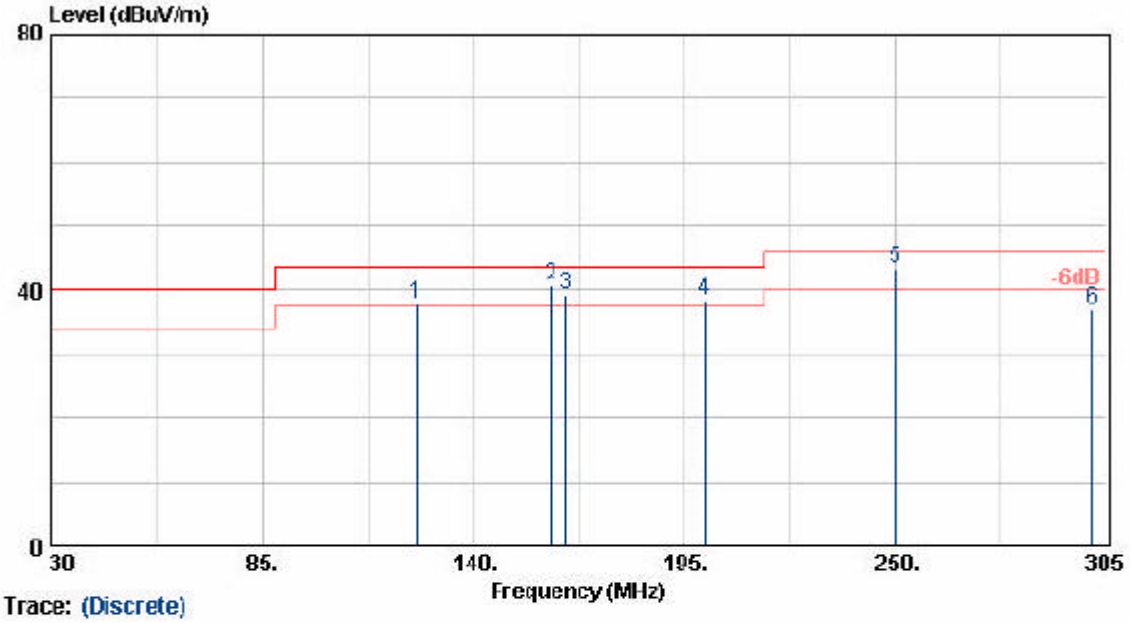


5.4 Measurement equipment

Instrument/Ancillary	Type	Manufacturer	Valid Date
EMI Receiver	8546A	HP	2006/0413
Spectrum Analyzer	FSP40	R&S	2005/12/28
Horn Antenna	3115	EMCO	2006/02/21
Horn Antenna	3116	EMCO	2006/02/21
Bilog Antenna	CBL6112B	Schaffner	2006/04/12
Amplifier	8447D	Agilent	2005/06/30
Amplifier	8449B	Agilent	2005/12/27
Amplifier	PA-840	COM-POWER	2005/08/11

5.5 Test Result and Data

EUT	: IP906SM	Pol/Phase	: HORIZONTAL
Power	: 110V	Temperature	: 25 ℃
Test Mode	: Transmit/Receive	Humidity	: 68 %
Operation Channel	: 1	Atmospheric Pressure	: 1030 mmHg
Modulation Type	: 802.11a		
Rate	: 54 Mbps		



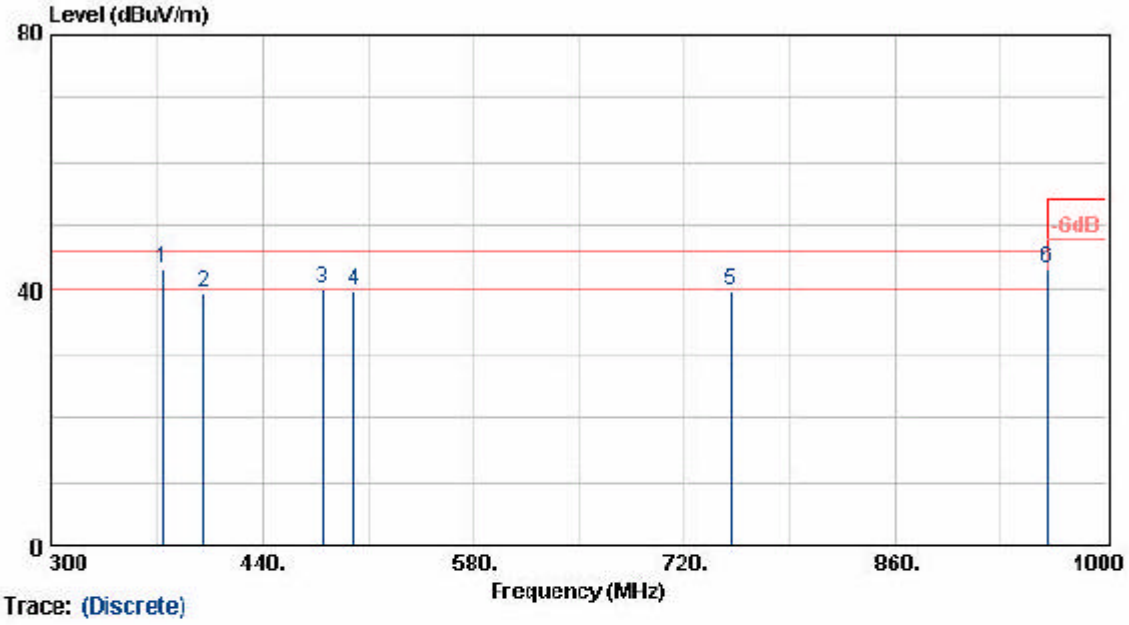
Trace: (Discrete)

Frequency (MHz)	Meter Reading (dBuV)	Corrected Factor (dBuV/m)	Result (dBuV/m)	Limit (dB)	Margin (dB)	Remark	Table Deg.	Ant High (cm)
125.00	53.82	-15.94	37.88	43.50	-5.62	QP	180	100
159.99	56.28	-15.67	40.61	43.50	-2.89	QP	270	100
163.90	55.42	-16.02	39.40	43.50	-4.10	QP	270	100
200.00	55.55	-17.02	38.53	43.50	-4.97	QP	270	100
250.00	56.63	-13.17	43.46	46.00	-2.54	QP	180	100
301.29	48.07	-11.08	36.99	46.00	-9.01	Peak	175	100

Notes:

1. Result = Meter Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier
3. The resolution bandwidth of test receiver/spectrum analyzer is 120KHz and video bandwidth is 300kHz for Peak detection and Quasi-peak detection at frequency below 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
5. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average detection at frequency above 1GHz.
6. The other emissions is too below to be measured.

EUT	: IP906SM	Pol/Phase	: HORIZONTAL
Power	: 110V	Temperature	: 25 ℃
Test Mode	: Transmit/Receive	Humidity	: 68 %
Operation Channel	: 1	Atmospheric Pressure	: 1030 mmHg
Modulation Type	: 802.11a		
Rate	: 54 Mbps		



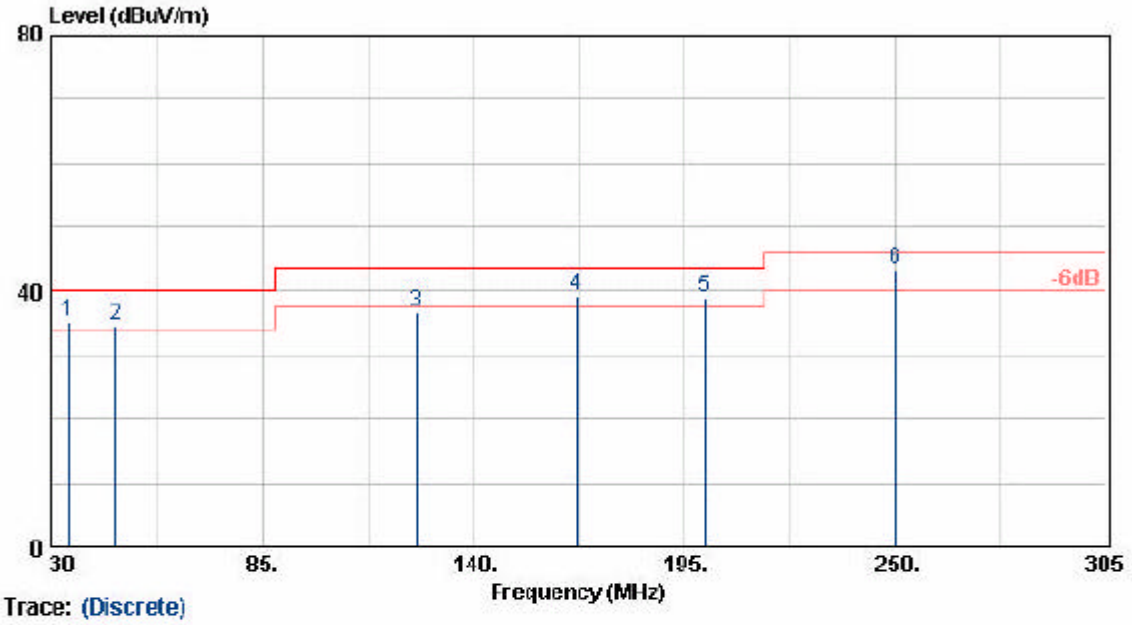
Trace: (Discrete)

Frequency (MHz)	Meter Reading (dBuV)	Corrected Factor (dBuV/m)	Result (dBuV/m)	Limit (dB)	Margin (dB)	Remark	Table Deg.	Ant High (cm)
375.02	52.61	-9.28	43.33	46.00	-2.67	QP	180	100
400.00	48.24	-8.59	39.65	46.00	-6.35	Peak	180	100
479.90	47.69	-7.54	40.15	46.00	-5.85	QP	220	100
500.00	46.54	-6.75	39.79	46.00	-6.21	Peak	180	100
750.05	40.90	-1.05	39.85	46.00	-6.15	Peak	180	100
960.00	40.47	3.00	43.47	46.00	-2.53	QP	220	100

Notes:

1. Result = Meter Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier
3. The resolution bandwidth of test receiver/spectrum analyzer is 120KHz and video bandwidth is 300kHz for Peak detection and Quasi-peak detection at frequency below 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
5. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average detection at frequency above 1GHz.
6. The other emissions is too below to be measured.

EUT	: IP906SM	Pol/Phase	: VERTICAL
Power	: 110V	Temperature	: 25 ℃
Test Mode	: Transmit/Receive	Humidity	: 68 %
Operation Channel	: 1	Atmospheric Pressure	: 1030 mmHg
Modulation Type	: 802.11a		
Rate	: 54 Mbps		



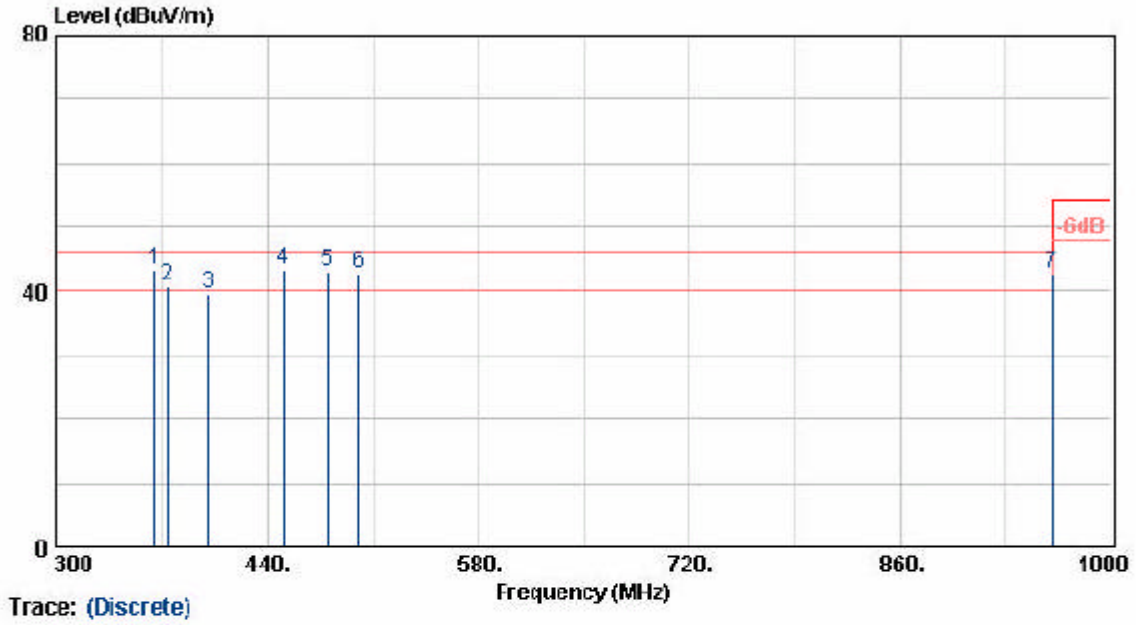
Trace: (Discrete)

Frequency (MHz)	Meter Reading (dBuV)	Corrected Factor (dBuV/m)	Result (dBuV/m)	Limit (dB)	Margin (dB)	Remark	Table Deg.	Ant High (cm)
34.62	40.20	-5.10	35.10	40.00	-4.90	QP	200	100
47.00	48.03	-13.36	34.67	40.00	-5.33	QP	200	100
125.00	52.63	-15.94	36.69	43.50	-6.81	Peak	180	100
166.60	55.47	-16.32	39.15	43.50	-4.35	QP	150	100
200.00	56.00	-17.02	38.98	43.50	-4.52	QP	180	100
250.00	56.39	-13.17	43.22	46.00	-2.78	QP	180	100

Notes:

1. Result = Meter Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Anplifier
3. The resolution bandwidth of test receiver/spectrum analyzer is 120KHz and video bandwidth is 300kHz for Peak detection and Quasi-peak detection at frequency below 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
5. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average detection at frequency above 1GHz.
6. The other emissions is too below to be measured.

EUT	: IP906SM	Pol/Phase	: VERTICAL
Power	: 110V	Temperature	: 25 ℃
Test Mode	: Transmit/Receive	Humidity	: 68 %
Operation Channel	: 1	Atmospheric Pressure	: 1030 mmHg
Modulation Type	: 802.11a		
Rate	: 54 Mbps		



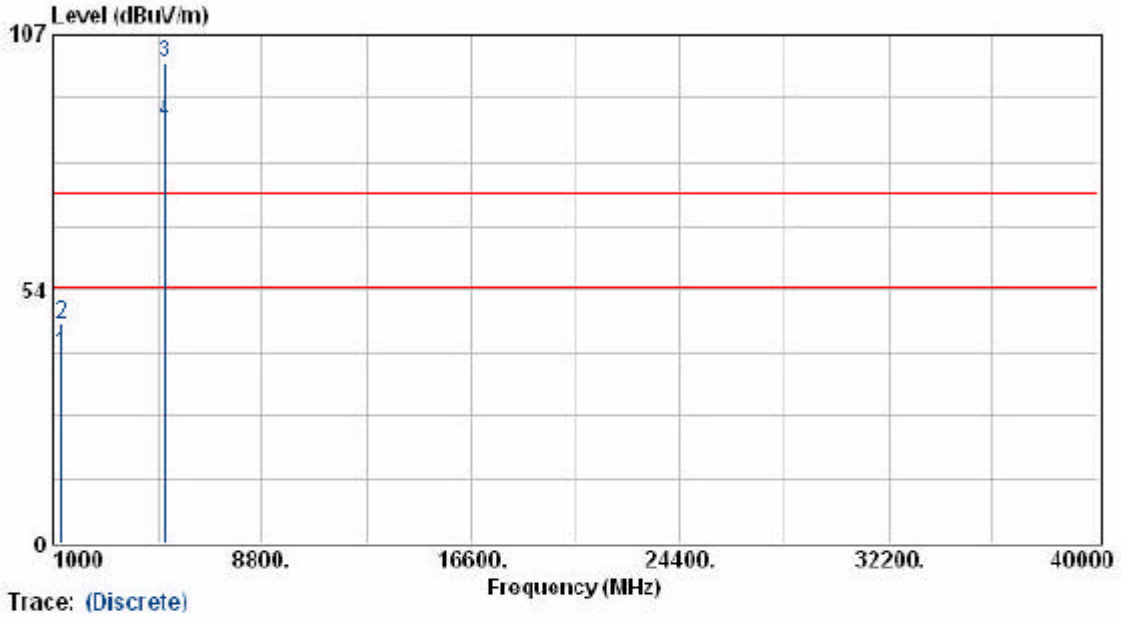
Trace: (Discrete)

Frequency (MHz)	Meter Reading (dBuV)	Corrected Factor (dBuV/m)	Result (dBuV/m)	Limit (dB)	Margin (dB)	Remark	Table Deg.	Ant High (cm)
365.60	53.07	-9.67	43.40	46.00	-2.60	QP	210	100
375.00	50.12	-9.29	40.83	46.00	-5.17	QP	180	100
400.02	48.26	-8.59	39.67	46.00	-6.33	Peak	180	100
450.02	51.97	-8.55	43.42	46.00	-2.58	QP	180	100
480.00	50.71	-7.54	43.17	46.00	-2.83	QP	220	100
500.00	49.49	-6.75	42.74	46.00	-3.26	QP	180	100
960.00	39.88	3.00	42.88	46.00	-3.12	QP	220	100

Notes:

1. Result = Meter Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier
3. The resolution bandwidth of test receiver/spectrum analyzer is 120KHz and video bandwidth is 300kHz for Peak detection and Quasi-peak detection at frequency below 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
5. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average detection at frequency above 1GHz.
6. The other emissions is too below to be measured.

EUT	: IP906SM		
Power	: 110V	Pol/Phase	: HORIZONTAL
Test Mode	: Transmit/Receive	Temperature	: 25 ℃
Operation Channel	: 1	Humidity	: 68 %
Modulation Type	: 802.11a	Atmospheric Pressure	: 1030 mmHg
Rate	: 54 Mbps	Memo	:

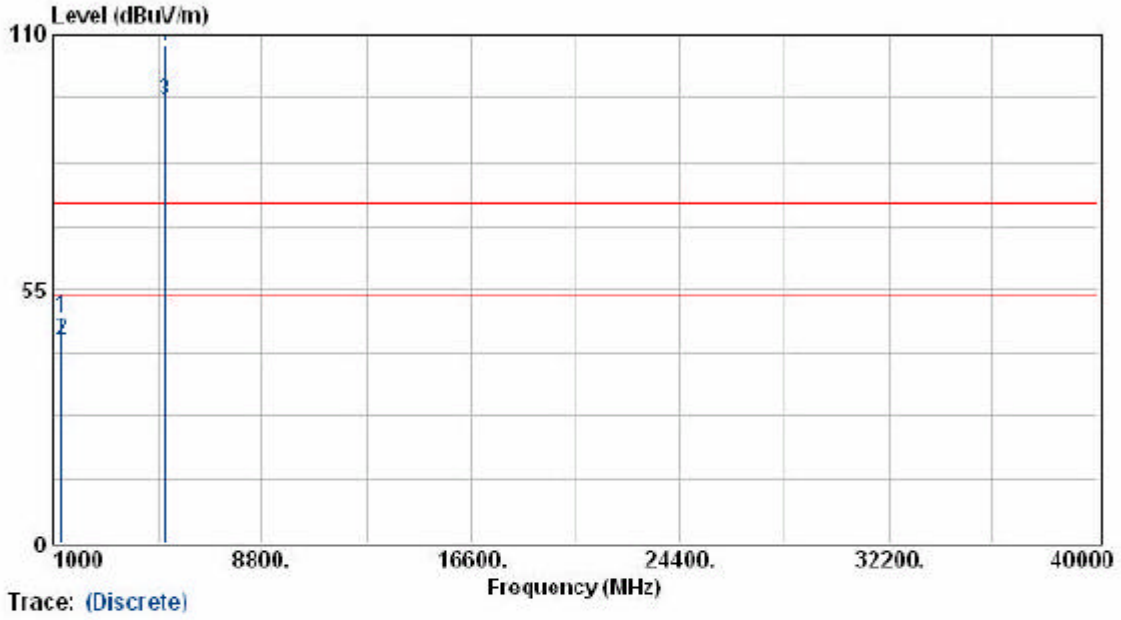


Frequency (MHz)	Meter Reading (dBuV)	Corrected Factor (dBuV/m)	Result (dBuV/m)	Limit (dB)	Margin (dB)	Remark	Table Deg.	Ant High (cm)
1280.00	44.47	-4.54	39.93	54.00	-14.07	Average	31	100
1280.00	50.97	-4.54	46.43	74.00	-27.57	Peak	31	100
5181.80	91.97	9.11	101.08	74.00	27.08	Peak	118	100
5181.80	79.80	9.11	88.91	54.00	34.91	Average	118	100

Notes:

1. Result = Meter Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier
3. The resolution bandwidth of test receiver/spectrum analyzer is 120KHz and video bandwidth is 300kHz for Peak detection and Quasi-peak detection at frequency below 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
5. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average detection at frequency above 1GHz.
6. The other emissions is too below to be measured.

EUT	: IP906SM	Pol/Phase	: VERTICAL
Power	: 110V	Temperature	: 25 ℃
Test Mode	: Transmit/Receive	Humidity	: 68 %
Operation Channel	: 1	Atmospheric Pressure	: 1030 mmHg
Modulation Type	: 802.11a	Memo	:
Rate	: 54 Mbps		

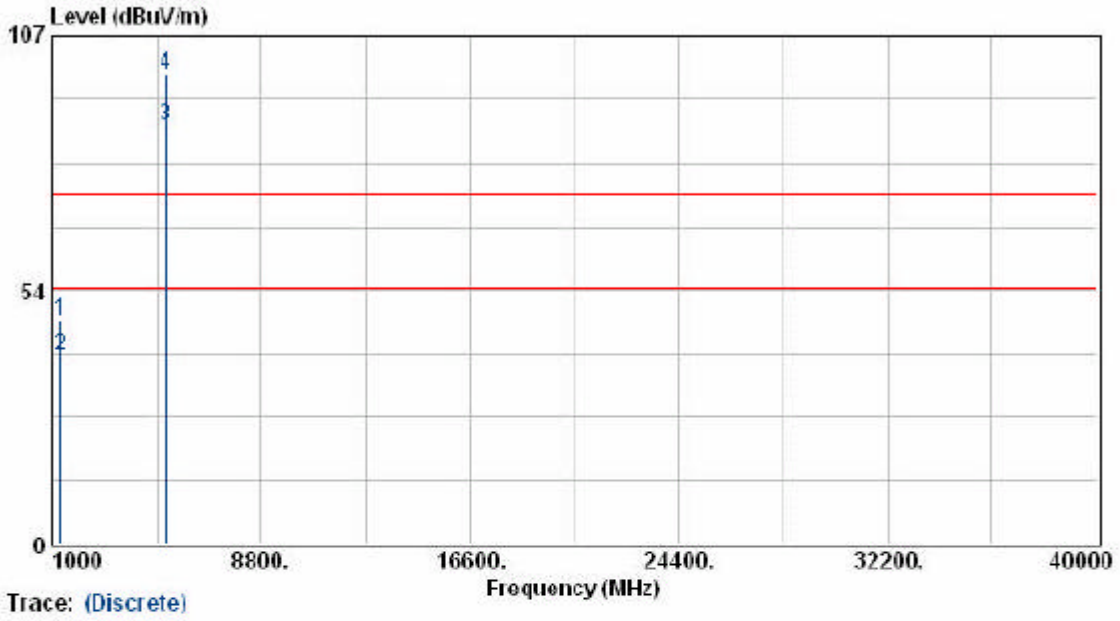


Frequency (MHz)	Meter Reading (dBuV)	Corrected Factor (dBuV/m)	Result (dBuV/m)	Limit (dB)	Margin (dB)	Remark	Table Deg.	Ant High (cm)
1280.00	53.74	-5.04	48.70	74.00	-25.30	Peak	31	100
1280.00	49.23	-5.04	44.19	54.00	-9.81	Average	31	100
5183.40	87.50	8.27	95.77	54.00	41.77	Average	187	100
5183.50	99.24	8.27	107.51	74.00	33.51	Peak	187	100

Notes:

1. Result = Meter Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier
3. The resolution bandwidth of test receiver/spectrum analyzer is 120KHz and video bandwidth is 300kHz for Peak detection and Quasi-peak detection at frequency below 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
5. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average detection at frequency above 1GHz.
6. The other emissions is too below to be measured.

EUT	: IP906SM		
Power	: 110V	Pol/Phase	: HORIZONTAL
Test Mode	: Transmit/Receive	Temperature	: 25 ℃
Operation Channel	: 4	Humidity	: 68 %
Modulation Type	: 802.11a	Atmospheric Pressure	: 1030 mmHg
Rate	: 54 Mbps	Memo	:

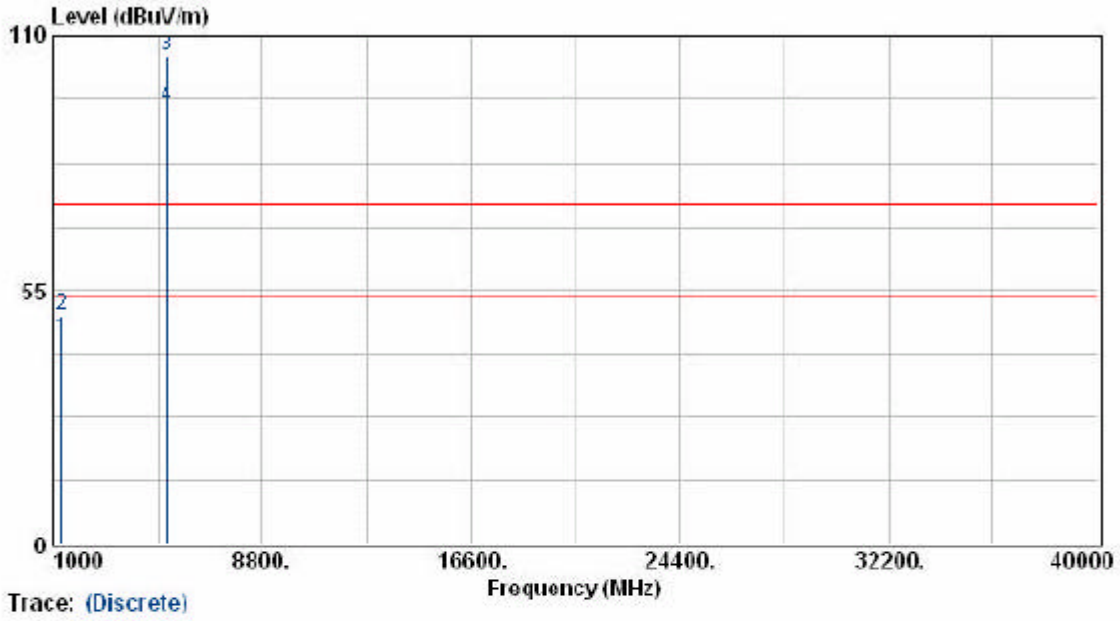


Frequency (MHz)	Meter Reading (dBuV)	Corrected Factor (dBuV/m)	Result (dBuV/m)	Limit (dB)	Margin (dB)	Remark	Table Deg.	Ant High (cm)
1280.00	51.64	-4.54	47.10	74.00	-26.90	Peak	31	100
1280.00	44.28	-4.54	39.74	54.00	-14.26	Average	31	100
5241.60	78.85	9.21	88.06	54.00	34.06	Average	118	100
5241.60	89.69	9.21	98.90	74.00	24.90	Peak	118	100

Notes:

1. Result = Meter Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier
3. The resolution bandwidth of test receiver/spectrum analyzer is 120KHz and video bandwidth is 300kHz for Peak detection and Quasi-peak detection at frequency below 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
5. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average detection at frequency above 1GHz.
6. The other emissions is too below to be measured.

EUT	: IP906SM		
Power	: 110V	Pol/Phase	: VERTICAL
Test Mode	: Transmit/Receive	Temperature	: 25 ℃
Operation Channel	: 4	Humidity	: 68 %
Modulation Type	: 802.11a	Atmospheric Pressure	: 1030 mmHg
Rate	: 54 Mbps	Memo	:

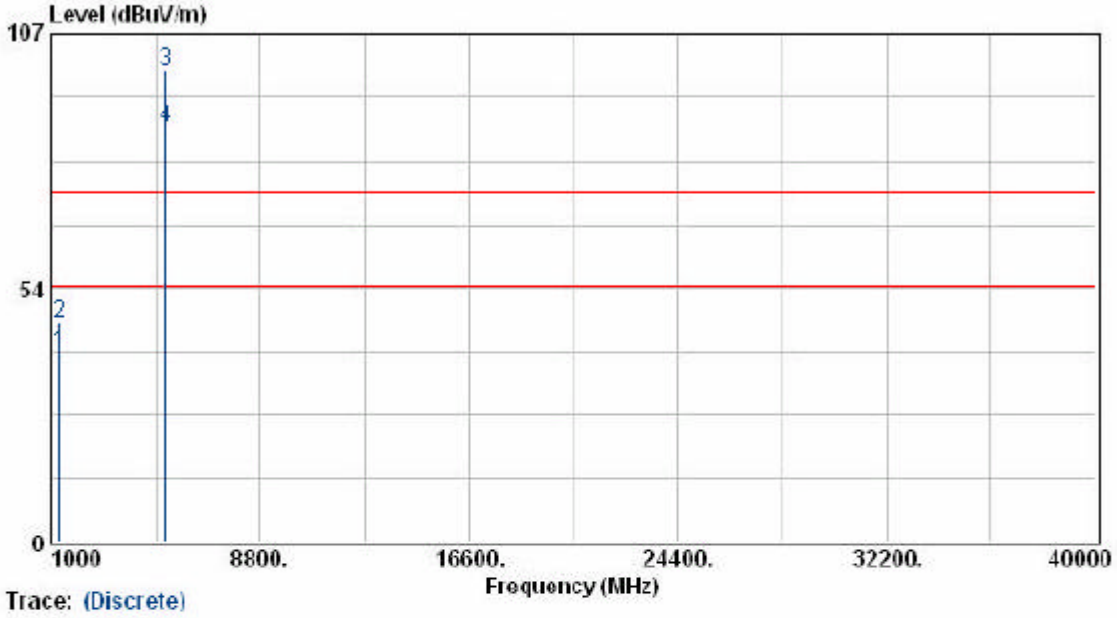


Frequency (MHz)	Meter Reading (dBuV)	Corrected Factor (dBuV/m)	Result (dBuV/m)	Limit (dB)	Margin (dB)	Remark	Table Deg.	Ant High (cm)
1280.00	49.53	-5.04	44.49	54.00	-9.51	Average	31	100
1280.00	54.49	-5.04	49.45	74.00	-24.55	Peak	31	100
5238.10	97.24	8.35	105.59	74.00	31.59	Peak	187	100
5238.10	85.92	8.35	94.27	54.00	40.27	Average	187	100

Notes:

1. Result = Meter Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier
3. The resolution bandwidth of test receiver/spectrum analyzer is 120KHz and video bandwidth is 300kHz for Peak detection and Quasi-peak detection at frequency below 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
5. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average detection at frequency above 1GHz.
6. The other emissions is too below to be measured.

EUT	: IP906SM		
Power	: 110V	Pol/Phase	: HORIZONTAL
Test Mode	: Transmit/Receive	Temperature	: 25 ℃
Operation Channel	: 5	Humidity	: 68 %
Modulation Type	: 802.11a	Atmospheric Pressure	: 1030 mmHg
Rate	: 54 Mbps	Memo	:

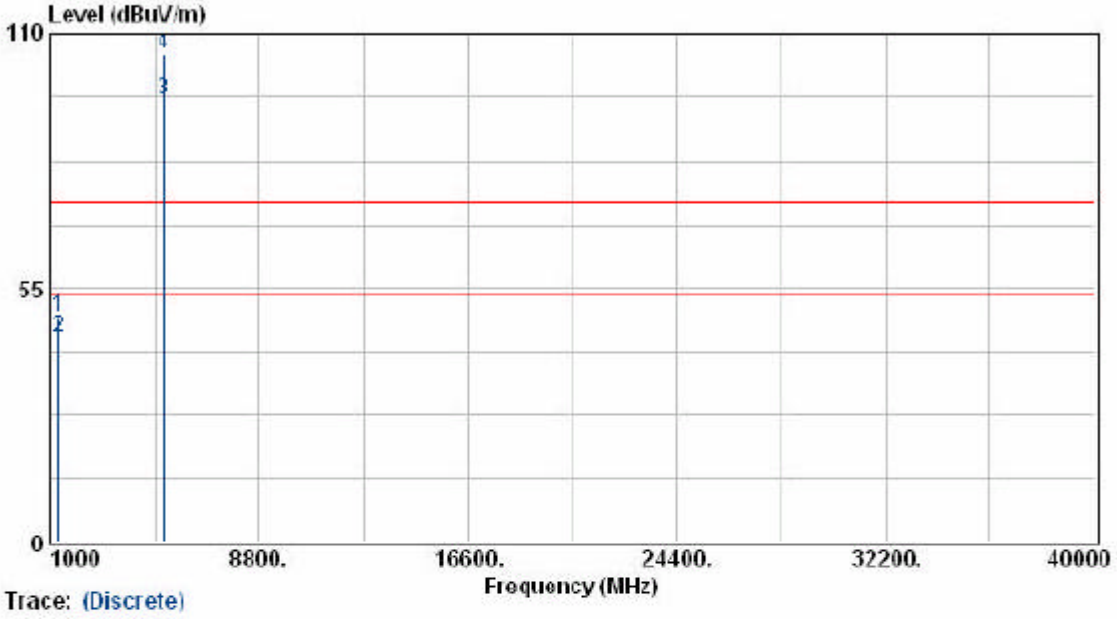


Frequency (MHz)	Meter Reading (dBuV)	Corrected Factor (dBuV/m)	Result (dBuV/m)	Limit (dB)	Margin (dB)	Remark	Table Deg.	Ant High (cm)
1280.00	44.43	-4.54	39.89	54.00	-14.11	Average	31	100
1280.00	50.89	-4.54	46.35	74.00	-27.65	Peak	31	100
5256.40	90.16	9.25	99.41	74.00	25.41	Peak	118	100
5256.40	77.92	9.25	87.17	54.00	33.17	Average	118	100

Notes:

1. Result = Meter Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier
3. The resolution bandwidth of test receiver/spectrum analyzer is 120KHz and video bandwidth is 300kHz for Peak detection and Quasi-peak detection at frequency below 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
5. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average detection at frequency above 1GHz.
6. The other emissions is too below to be measured.

EUT	: IP906SM		
Power	: 110V	Pol/Phase	: VERTICAL
Test Mode	: Transmit/Receive	Temperature	: 25 ℃
Operation Channel	: 5	Humidity	: 68 %
Modulation Type	: 802.11a	Atmospheric Pressure	: 1030 mmHg
Rate	: 54 Mbps	Memo	:

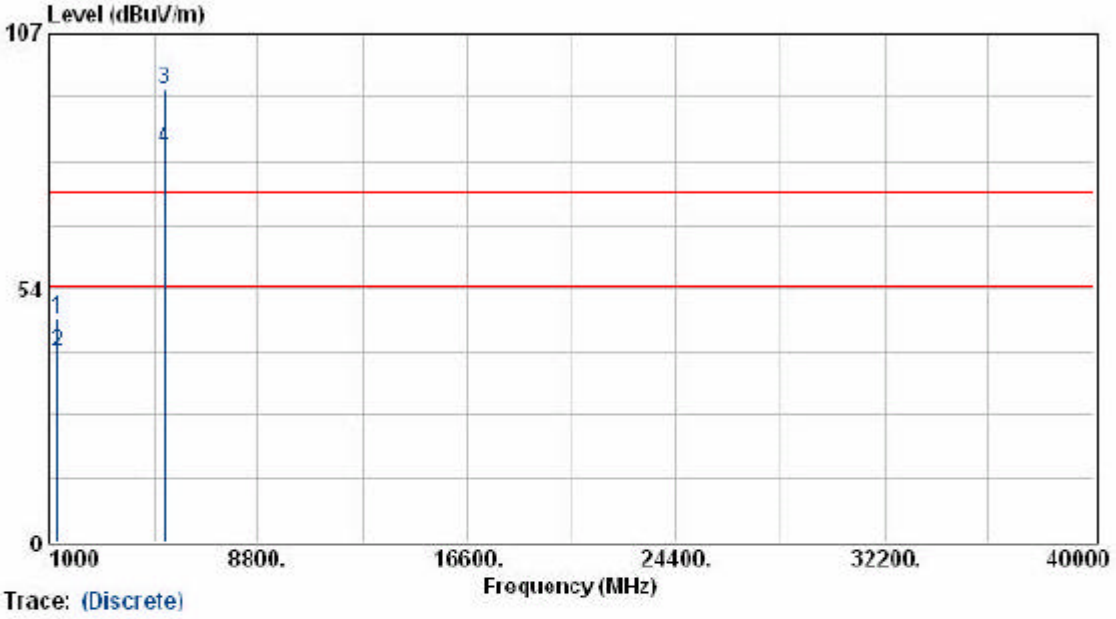


Frequency (MHz)	Meter Reading (dBuV)	Corrected Factor (dBuV/m)	Result (dBuV/m)	Limit (dB)	Margin (dB)	Remark	Table Deg.	Ant High (cm)
1280.00	53.79	-5.04	48.75	74.00	-25.25	Peak	31	100
1280.00	49.43	-5.04	44.39	54.00	-9.61	Average	31	100
5258.10	87.36	8.38	95.74	54.00	41.74	Average	187	100
5258.10	97.26	8.38	105.64	74.00	31.64	Peak	187	100

Notes:

1. Result = Meter Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier
3. The resolution bandwidth of test receiver/spectrum analyzer is 120KHz and video bandwidth is 300kHz for Peak detection and Quasi-peak detection at frequency below 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
5. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average detection at frequency above 1GHz.
6. The other emissions is too below to be measured.

EUT	: IP906SM	Pol/Phase	: HORIZONTAL
Power	: 110V	Temperature	: 25 ℃
Test Mode	: Transmit/Receive	Humidity	: 68 %
Operation Channel	: 8	Atmospheric Pressure	: 1030 mmHg
Modulation Type	: 802.11a	Memo	:
Rate	: 54 Mbps		

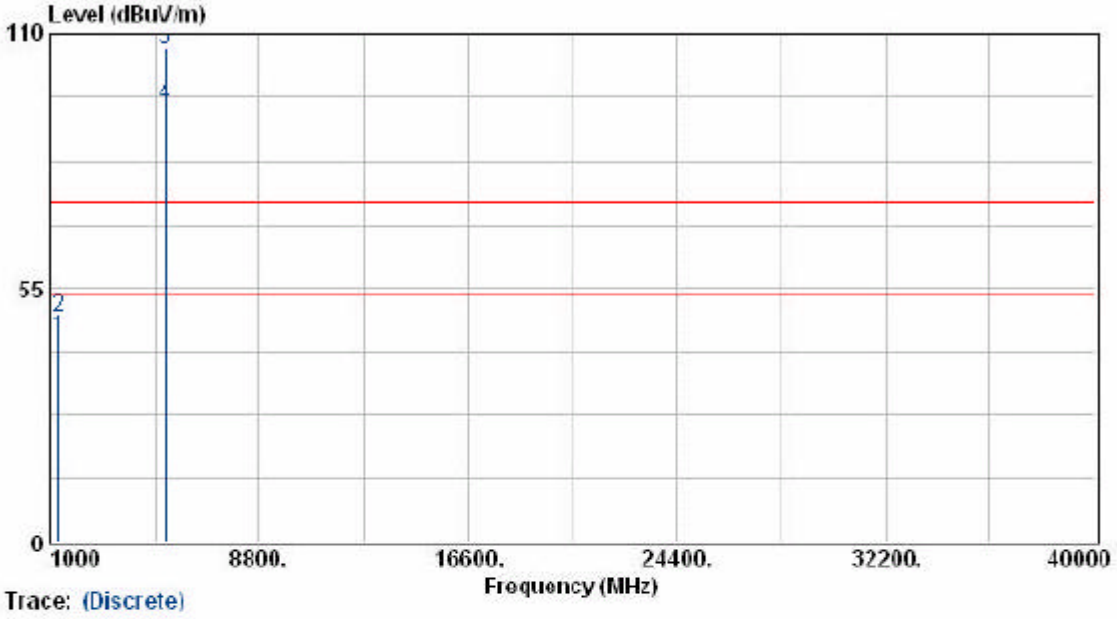


Frequency (MHz)	Meter Reading (dBuV)	Corrected Factor (dBuV/m)	Result (dBuV/m)	Limit (dB)	Margin (dB)	Remark	Table Deg.	Ant High (cm)
1280.00	51.51	-4.54	46.97	74.00	-27.03	Peak	31	100
1280.00	44.66	-4.54	40.12	54.00	-13.88	Average	31	100
5321.70	85.81	9.34	95.15	74.00	21.15	Peak	118	100
5321.70	73.58	9.34	82.92	54.00	28.92	Average	118	100

Notes:

1. Result = Meter Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier
3. The resolution bandwidth of test receiver/spectrum analyzer is 120KHz and video bandwidth is 300kHz for Peak detection and Quasi-peak detection at frequency below 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
5. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average detection at frequency above 1GHz.
6. The other emissions is too below to be measured.

EUT	: IP906SM		
Power	: 110V	Pol/Phase	: VERTICAL
Test Mode	: Transmit/Receive	Temperature	: 25 ℃
Operation Channel	: 8	Humidity	: 68 %
Modulation Type	: 802.11a	Atmospheric Pressure	: 1030 mmHg
Rate	: 54 Mbps	Memo	:

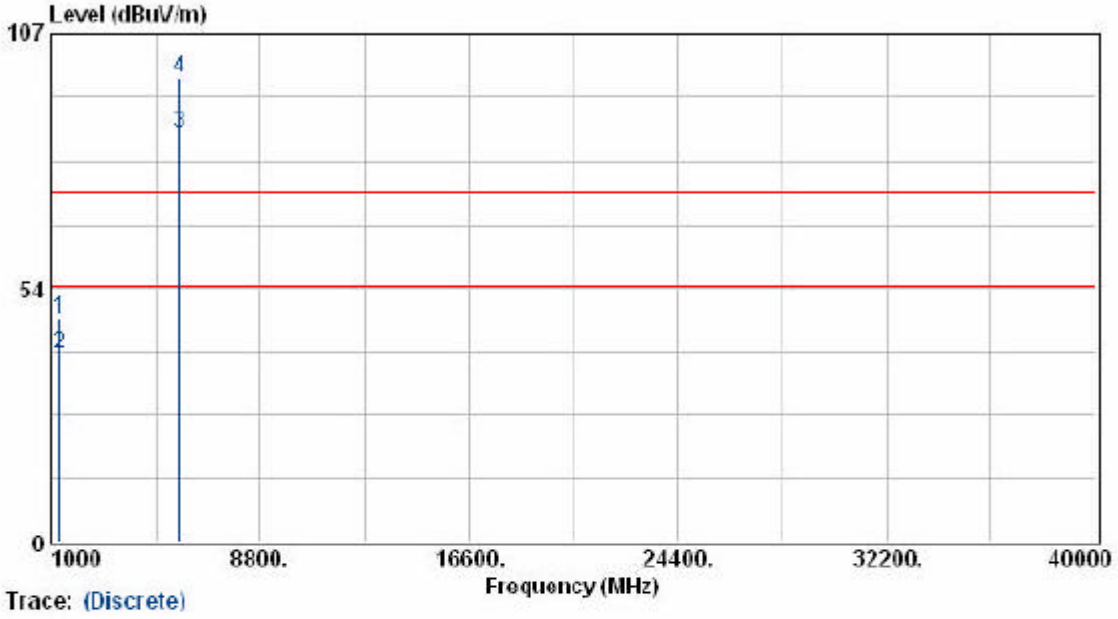


Frequency (MHz)	Meter Reading (dBuV)	Corrected Factor (dBuV/m)	Result (dBuV/m)	Limit (dB)	Margin (dB)	Remark	Table Deg.	Ant High (cm)
1280.00	49.59	-5.04	44.55	54.00	-9.45	Average	31	100
1280.00	53.80	-5.04	48.76	74.00	-25.24	Peak	31	100
5323.40	98.50	8.48	106.98	74.00	32.98	Peak	187	100
5323.40	85.96	8.48	94.44	54.00	40.44	Average	187	100

Notes:

1. Result = Meter Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier
3. The resolution bandwidth of test receiver/spectrum analyzer is 120KHz and video bandwidth is 300kHz for Peak detection and Quasi-peak detection at frequency below 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
5. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average detection at frequency above 1GHz.
6. The other emissions is too below to be measured.

EUT	: IP906SM		
Power	: 110V	Pol/Phase	: HORIZONTAL
Test Mode	: Transmit/Receive	Temperature	: 25 ℃
Operation Channel	: 9	Humidity	: 68 %
Modulation Type	: 802.11a	Atmospheric Pressure	: 1030 mmHg
Rate	: 54 Mbps	Memo	:

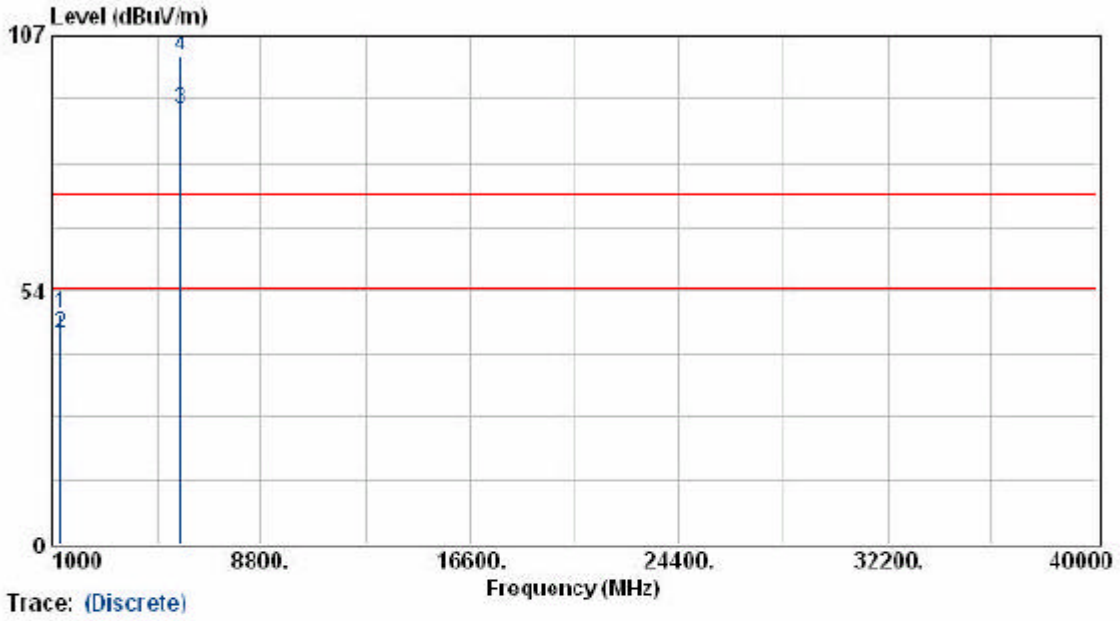


Frequency (MHz)	Meter Reading (dBuV)	Corrected Factor (dBuV/m)	Result (dBuV/m)	Limit (dB)	Margin (dB)	Remark	Table Deg.	Ant High (cm)
1280.00	51.56	-4.54	47.02	74.00	-26.98	Peak	31	100
1280.00	44.34	-4.54	39.80	54.00	-14.20	Average	31	100
5748.40	76.03	9.97	86.00	54.00	32.00	Average	118	100
5748.40	87.53	9.97	97.50	74.00	23.50	Peak	118	100

Notes:

1. Result = Meter Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier
3. The resolution bandwidth of test receiver/spectrum analyzer is 120KHz and video bandwidth is 300kHz for Peak detection and Quasi-peak detection at frequency below 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
5. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average detection at frequency above 1GHz.
6. The other emissions is too below to be measured.

EUT	: IP906SM		
Power	: 110V	Pol/Phase	: VERTICAL
Test Mode	: Transmit/Receive	Temperature	: 25 ℃
Operation Channel	: 9	Humidity	: 68 %
Modulation Type	: 802.11a	Atmospheric Pressure	: 1030 mmHg
Rate	: 54 Mbps	Memo	:



Frequency (MHz)	Meter Reading (dBuV)	Corrected Factor (dBuV/m)	Result (dBuV/m)	Limit (dB)	Margin (dB)	Remark	Table Deg.	Ant High (cm)
1280.00	53.81	-5.04	48.77	74.00	-25.23	Peak	31	100
1280.00	49.52	-5.04	44.48	54.00	-9.52	Average	31	100
5748.50	82.42	9.12	91.54	54.00	37.54	Average	187	100
5748.50	93.54	9.12	102.66	74.00	28.66	Peak	187	100

Notes:

1. Result = Meter Reading + Corrected Factor
2. Corrected Factor = Antenna Factor + Cable Loss - Amplifier
3. The resolution bandwidth of test receiver/spectrum analyzer is 120KHz and video bandwidth is 300kHz for Peak detection and Quasi-peak detection at frequency below 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
5. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average detection at frequency above 1GHz.
6. The other emissions is too below to be measured.