5.5.8. Photographs of Conducted Emission Test Configuration

FRONT VIEW

REAR VIEW

5.6. Test of Spurious Radiated Emission

5.6.1. Applicable Standard

Section 15.247(d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. In addition, radiated emissions that fall in the restricted bands, as defined in Section 15.205, must also comply with the radiated emission limits specified in Section 15.209.

5.6.2. Measuring Instruments

Please reference item 1~15 in chapter 6 for the instruments used for testing.

5.6.3. Description of Major Test Instruments Setting

- Spectrum Analyzer : R&S FSP40
  Attenuation : Auto
  Start Frequency : 1000 MHz
  Stop Frequency : 10th carrier harmonic
  RB / VB : 1 MHz / 1MHz for Peak
  RB / VB : 1 MHz / 10Hz for Average

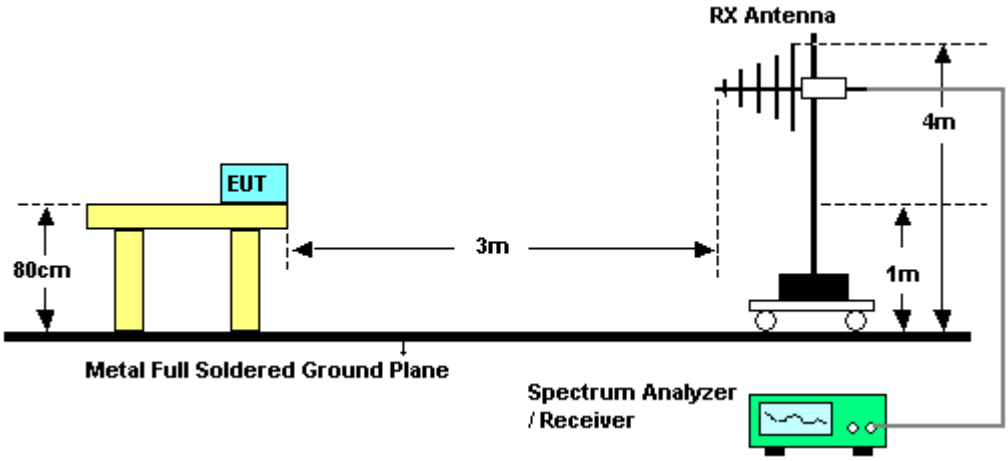
- Test Receiver : R&S ESCS 30
  Attenuation : Auto
  Start Frequency : 9 kHz
  Stop Frequency : 1000 MHz
  RB : 120 KHz for QP or PK

5.6.4. Test Procedures

1. Configure the EUT according to ANSI C63.4.-2003
2. The EUT was placed on the top of the turntable 0.8 meter above ground.
3. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
4. Power on the EUT and all the supporting units.
5. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
6. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emission field strength of both horizontal and vertical polarization.
7. For each suspected emission, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
8. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
9. For emission above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.

10. If the emission level of the EUT in peak mode was 3 dB lower than the average 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 for below 1GHz and average method for above the 1GHz. the reported.
11. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB higher 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.

5.6.5. Test Setup Layout



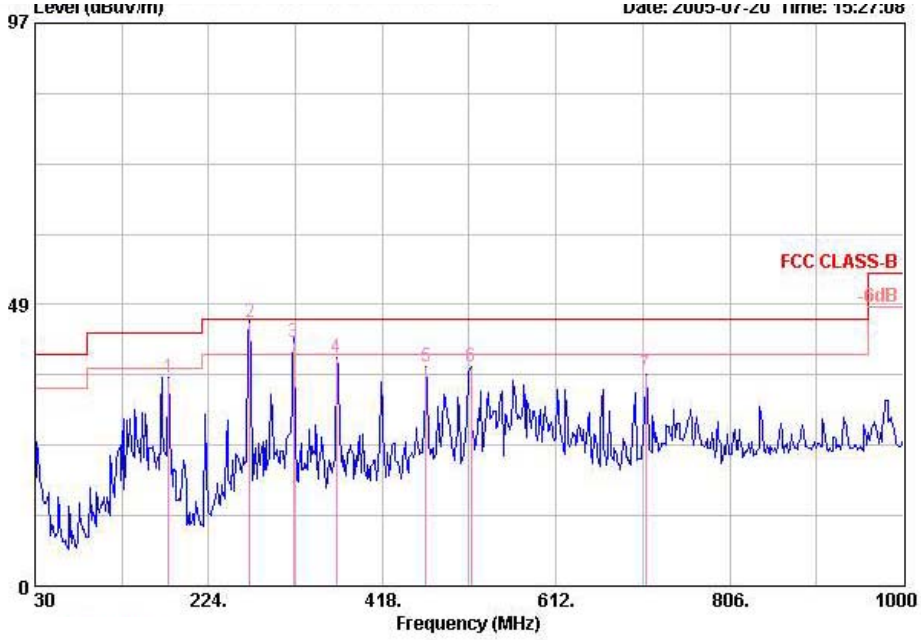
5.6.6. Test Criteria

All test results complied with the requirements of 15.247(d). Measurement Uncertainty is 2.26dB.

5.6.7. Test Results for CH 01 / 2440 MHz (for emission below 1GHz)

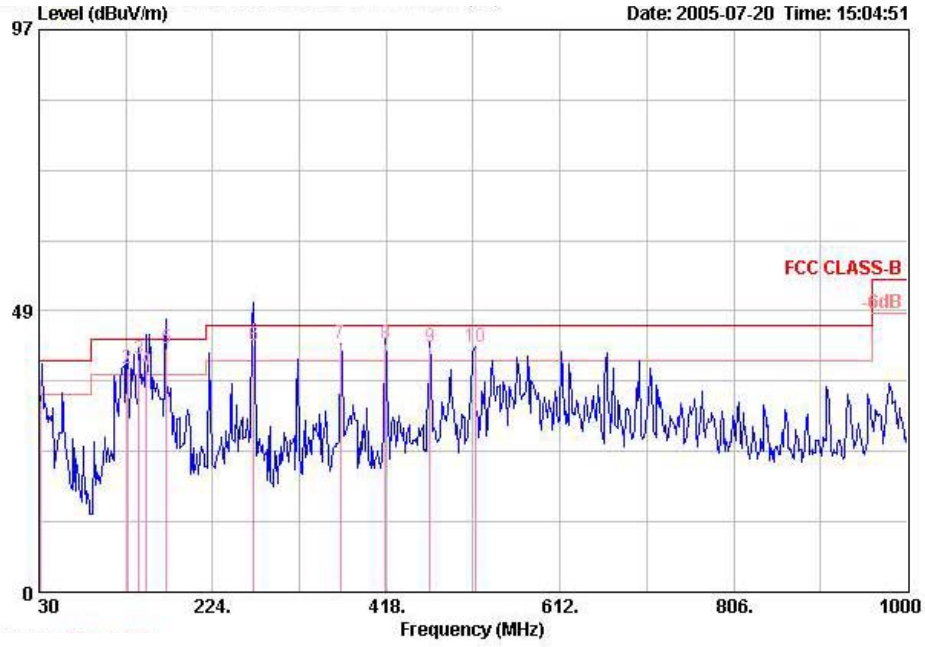
- Modulation Type: DSSS
- Temperature: 26°C
- Relative Humidity: 64%
- Duty Cycle of the Equipment During the Test: 50.00%
- Test Engineer: Steven Lu

(A) Polarization: Horizontal



	Freq	Level	Over Limit	Limit Line	Antenna Factor	Cable Loss	Preamp Factor	Read Level	Pol/Phase	Remark
	MHz	dBuV/m	dB	dBuV/m	dB/m	dB	dB	dBuV		
1	179.380	36.00	-7.50	43.50	8.37	1.06	30.06	56.64	HORIZONTAL	Peak
2 @	270.000	45.54	-0.46	46.00	12.50	1.30	30.04	61.78	HORIZONTAL	QP
3 !	319.060	42.15	-3.85	46.00	13.67	1.41	30.39	57.46	HORIZONTAL	QP
4	366.590	39.31	-6.69	46.00	14.83	1.51	30.55	53.52	HORIZONTAL	Peak
5	466.500	37.92	-8.08	46.00	16.82	1.71	30.52	49.91	HORIZONTAL	Peak
6	516.940	37.80	-8.20	46.00	17.66	1.80	30.56	48.90	HORIZONTAL	Peak
7	711.910	36.41	-9.59	46.00	19.28	2.14	30.34	45.32	HORIZONTAL	Peak

(B) Polarization: Vertical



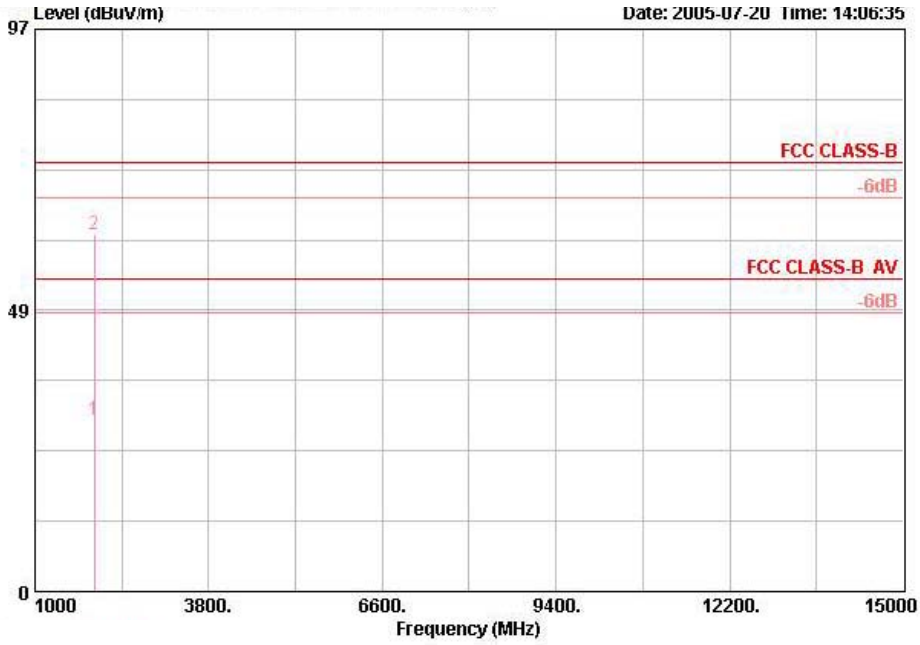
	Freq	Level	Over Limit	Limit Line	Antenna Factor	Cable Loss	Preamp Factor	Read Level	Pol/Phase	Remark
	MHz	dBuV/m	dB	dBuV/m	dB/m	dB	dB	dBuV		
1	31.976	33.06	-6.94	40.00	17.00	0.48	29.79	45.36	VERTICAL	PEAK
2 !	128.940	38.60	-4.90	43.50	11.81	0.90	30.03	55.92	VERTICAL	QP
3 !	141.550	40.26	-3.24	43.50	10.85	0.94	30.04	58.51	VERTICAL	QP
4 !	150.000	38.41	-5.09	43.50	10.10	0.97	30.10	57.44	VERTICAL	QP
5 @	172.000	41.99	-1.51	43.50	8.95	1.04	30.18	62.18	VERTICAL	QP
6 !	270.000	42.62	-3.38	46.00	12.50	1.30	30.04	58.86	VERTICAL	QP
7 !	366.590	42.95	-3.05	46.00	14.83	1.51	30.55	57.15	VERTICAL	Peak
8 !	417.030	42.79	-3.21	46.00	16.53	1.61	30.36	55.02	VERTICAL	Peak
9 !	466.500	42.30	-3.70	46.00	16.82	1.71	30.52	54.29	VERTICAL	Peak
10 !	516.940	42.41	-3.59	46.00	17.66	1.80	30.56	53.51	VERTICAL	Peak

Note:
Emission level (dBuV/m) = 20 log Emission level (uV/m)
Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

5.6.8. Test Results for CH 01 / 2440 MHz (for emission above 1GHz)

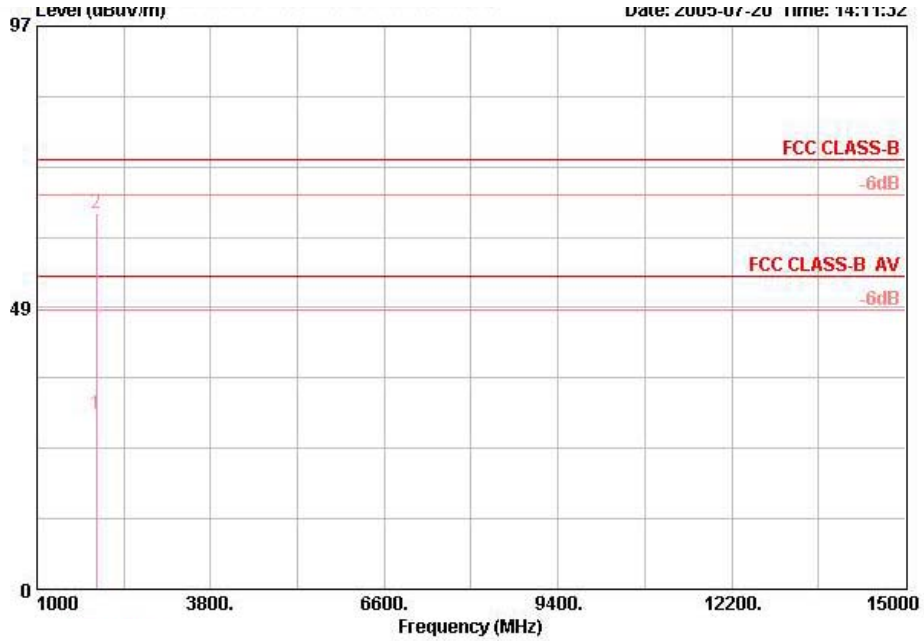
- Modulation Type: DSSS
- Temperature: 26°C
- Relative Humidity: 64%
- Duty Cycle of the Equipment During the Test: 50.00%
- Test Engineer: Steven Lu

(A) Polarization: Horizontal



	Freq	Level	Over Limit	Limit Line	Antenna Factor	Cable Loss	Preamp Factor	Read Level	Pol/Phase	Remark
	MHz	dBuV/m	dB	dBuV/m	dB/m	dB	dB	dBuV		
1 @	1951.720	29.54	-24.46	54.00	26.91	1.74	34.92	35.81	HORIZONTAL	AVERAGE
2 @	1951.960	61.52	-12.48	74.00	26.91	1.74	34.92	67.79	HORIZONTAL	PEAK

(B) Polarization: Vertical

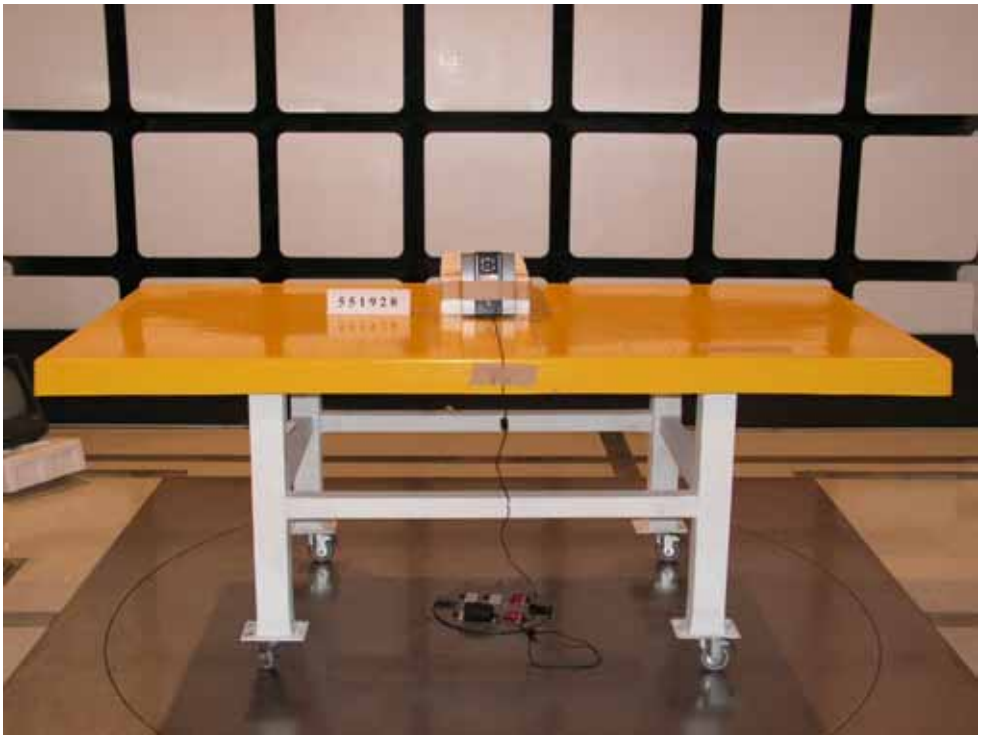


	Freq	Level	Over Limit	Limit Line	Antenna Factor	Cable Loss	Preamp Factor	Read Level	Pol/Phase	Remark
	MHz	dBuV/m	dB	dBuV/m	dB/m	dB	dB	dBuV		
1 @	1951.680	30.17	-23.83	54.00	26.91	1.74	34.92	36.44	VERTICAL	AVERAGE
2 @	1952.000	64.88	-9.12	74.00	26.91	1.74	34.92	71.15	VERTICAL	PEAK

Note:
Emission level (dBuV/m) = 20 log Emission level (uV/m)
Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

5.6.9. Photographs of Radiated Emission Test Configuration

FRONT VIEW



REAR VIEW