



FCC TEST REPORT

REPORT NO.: 051106FIA01

MODEL NO.: GPS050520

RECEIVED: Nov. 2, 2005

TESTED: Dec. 7, 2005 ~ Jan. 16, 2006

ISSUED: Jan. 17, 2006

APPLICANT: Hong Kong Primex Asia Limited Shenzhen
Representative Office

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ADT (Shanghai) Corporation



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1 CERTIFICATION

PRODUCT: GPS Wireless Clock Systems Host

MODEL NO.: GPS050520

APPLICANT: Hong Kong Primex Asia Limited Shenzhen Representative Office

TESTED: Dec. 7, 2005 ~ Jan. 16, 2006

TEST ITEM: Engineering Sample

STANDARDS: FCC Part 15, Subpart C (Section 15.247),
ANSI C63.4-2003

We, **Advance Data Technology Corp.**, declare that the equipment above has been tested in our facility and found compliance with the requirement limits of applicable standards. The test record, data evaluation and Equipment Under Test (EUT) configurations represented herein are true and accurate under the standards herein specified. This report contains data that were produced under subcontract by Laboratory ADT (Shanghai) Corporation.

TECHNICAL

ACCEPTANCE : _____ , **DATE:** JAN. 17, 2006
Responsible for RF (Wailand Zhang)

APPROVED BY : _____ , **DATE:** JAN. 17, 2006
Director of Operations (Wallace Pan, Manager)

2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 15, Subpart C			
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT	REMARK
15.207	AC Power Conducted Emission	NA	Power supply is 4.8Vdc from batteries
15.247(a)(1)(iii)	Number of Hopping Frequency Used Spec.: At least 15 channels	PASS	Meet the requirement of limit.
15.247(a)(1)(iii)	Dwell Time on Each Channel Spec.: Max. 0.4 second within 31.6 second	PASS	Meet the requirement of limit.
15.247(a)(1)	1. Hopping Channel Separation Spec. : Min. 25 kHz or 20 dB bandwidth, whichever is greater (see Note 1) 2. Spectrum Bandwidth of a Frequency Hopping Sequence Spread Spectrum System	PASS	Meet the requirement of limit.
15.247(b)	Maximum Peak Output Power Spec.: max. 30dBm (see Note 1)	PASS	Meet the requirement of limit.
15.247(d)	Transmitter Radiated Emissions Spec.: Table 15.209	PASS	Meet the requirement of limit. Minimum passing margin is -1.14dB at 2766.24MHz
15.247(d)	Band Edge Measurement	PASS	Meet the requirement of limit.

Note: 1. If the Frequency Hopping System operating in 902.1-925.62MHz band and the output power less than 1000mW. The hopping channel carrier frequencies separated by a minimum of 250kHz or greater. The maximum allowed 20 dB bandwidth of the hopping channel is 500kHz.

2. This report contains data that were produced under subcontract by Laboratory ADT (Shanghai) Corporation.

2.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4:

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	9kHz ~ 30MHz	2.44 dB
Radiated emissions	30MHz ~ 200MHz	3.73 dB
	200MHz ~ 1000MHz	3.74 dB
	1GHz ~ 18GHz	2.20 dB
	18GHz ~ 40GHz	1.88 dB

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	GPS WIRELESS CLOCK SYSTEMS HOST
MODEL NO.	GPS050520
POWER SUPPLY	4.8Vdc from Battery
MODULATION TYPE	FHSS
CHANNEL CONTROL	Auto
ANTENNA GAIN	0.12dBi
FREQUENCY RANGE	902.1MHZ-925.62MHz
NUMBER OF CHANNEL	50
OUTPUT POWER	-6.305 dBm
ANTENNA TYPE	Helix
ANTENNA JOINT	SMA-K
CHANNEL SEPARATION	470KHz
FREQUENCY OF EACH CHANNEL	Fixed
I/O PORTS	Refer to user's manual
DATA CABLE	NA
ASSOCIATED DEVICES	NA

NOTE: The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

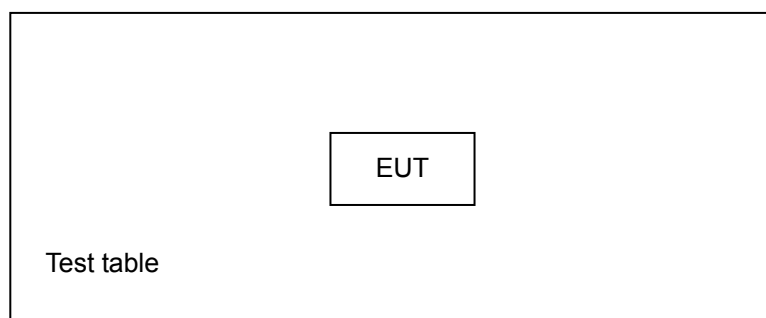
3.2 DESCRIPTION OF TEST MODES

50 channels are provided to this EUT:

CHANNEL	FREQ. (MHz)	CHANNEL	FREQ. (MHz)	CHANNEL	FREQ. (MHz)
0	902.1	20	911.7	40	921.3
1	902.58	21	912.18	41	921.78
2	903.06	22	912.66	42	922.26
3	903.54	23	913.14	43	922.74
4	904.02	24	913.62	44	923.22
5	904.5	25	914.1	45	923.7
6	904.98	26	914.58	46	924.18
7	905.46	27	915.06	47	924.66
8	905.94	28	915.54	48	925.14
9	906.42	29	916.02	49	925.62
10	906.9	30	916.5		
11	907.38	31	916.98		
12	907.86	32	917.46		
13	908.34	33	917.94		
14	908.82	34	918.42		
15	909.3	35	918.9		
16	909.78	36	919.38		
17	910.26	37	919.86		
18	910.74	38	920.34		
19	911.22	39	920.82		

Note: Test mode A is “Rx”, mode B is “Tx”.

3.2.1 CONFIGURATION OF SYSTEM UNDER TEST





3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	Applicable to				Description
	PLC	RE<1G	RE≥1G	APCM	
A/B	X	√	√	√	FHSS Modulation

Where **PLC**: Power Line Conducted Emission **RE<1G**: Radiated Emission below 1GHz
RE≥1G: Radiated Emission above 1GHz **APCM**: Antenna Port Conducted Measurement

RADIATED EMISSION TEST (BELOW 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and packet types.

☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE
A/B	0 to 49	0, 23, 49	FHSS	IQ	1



RADIATED EMISSION TEST (ABOVE 1 GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and packet types.
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE
A/B	0 to 49	0, 23, 49	FHSS	IQ	1

BANDEDGE MEASUREMENT:

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and packet types.
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE
A/B	0 to 49	0, 23, 49	FHSS	IQ	1

ANTENNA PORT CONDUCTED MEASUREMENT:

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and packet types.
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE
A/B	0 to 49	0, 23, 49	FHSS	IQ	1



3.2.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a GPS wireless clock. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C. (15.247)

ANSI C63.4- 2003

All test items have been performed and recorded as per the above standards.

3.2.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit.

4 TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dB μ V)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

- NOTES:**
- (1) The lower limit shall apply at the transition frequencies.
 - (2) The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.
 - (3) All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

4.1.2 TEST RESULTS

Since the EUT does not have AC port, the test item is not applicable.

4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

FREQUENCIES (MHz)	FIELD STRENGTH (microvolts/meter)	MEASUREMENT DISTANCE (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

- NOTE:**
1. The lower limit shall apply at the transition frequencies.
 2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
 3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.



4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
*Test Receiver ROHDE & SCHWARZ	ESCS30	100296	Apr. 19, 2006
BILOG Antenna SCHWARZBECK	VULB9168	9168-159	Sep. 26, 2006
Preamplifier Agilent	8447D	2944A10643	Jan. 27, 2006
Preamplifier Agilent	8449B	3008A01966	Jan. 27, 2006
Double Ridged Broadband Horn Antenna Schwarzbeck	BBHA 9120D	9120D-398	Feb. 15, 2006
Spectrum Analyzer Agilent	E4403B	MY41440678	Jan. 13, 2007
*Spectrum Analyzer ROHDE & SCHWARZ	FSP30	100019	May. 15, 2006
RF signal cable Woken	RG-402	E1CBH01	May. 30, 2006
RF signal cable Woken	RG-402	E1CBH02	May. 30, 2006
RF signal cable Woken	RG-402	E1CBH03	May. 30, 2006
RF signal cable Woken	RG-412	E1CBL02	May. 30, 2006
RF signal cable Woken	RG-412	E1CBL03	May. 30, 2006
RF signal cable Woken	RG-412	E1CBL04	May. 30, 2006
Software ADT	ADT_Radiated_V7.5	NA	NA

- NOTE:**
1. The calibration interval of the above test instruments is 12 months.
 2. "*" = These equipment are used for the final measurement.
 3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
 4. The Spectrum Analyzer (model: FSP30) and RF signal cable (SERIAL: E1CBH02&E1CBH03) are used only for the measurement of emission frequency above 2GHz if tested.



4.2.3 TEST PROCEDURES

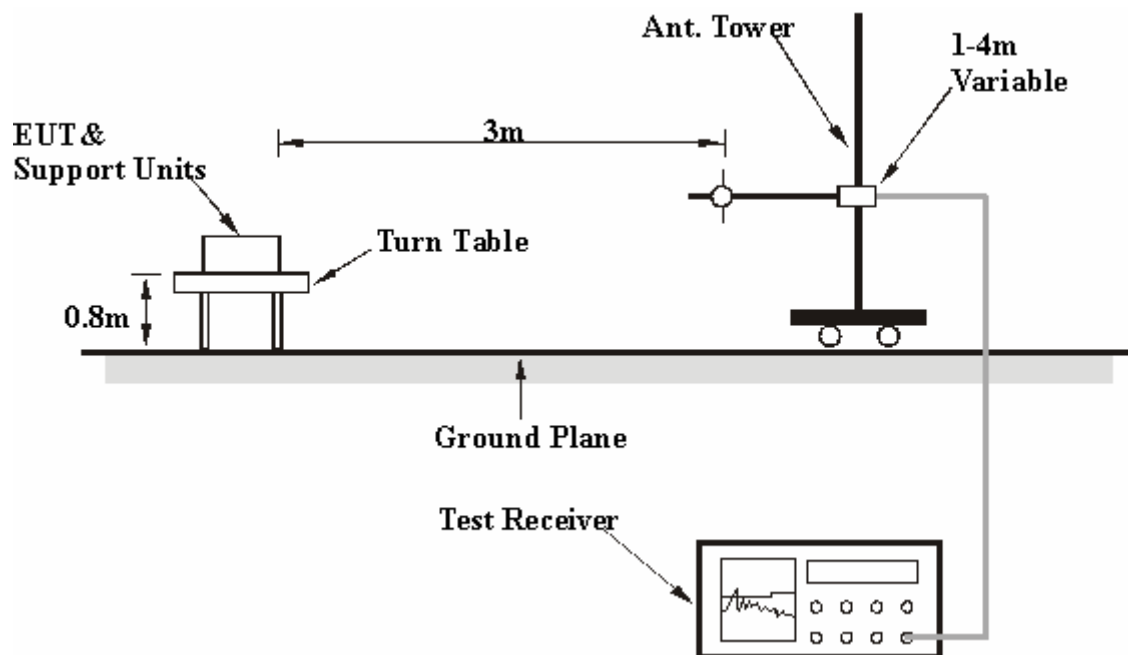
- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

NOTE: 1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection (PK) at frequency above 1GHz.

4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

4.2.5 TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

4.2.6 EUT OPERATING CONDITIONS

Select the relevant channel and make EUT power on.

4.2.7 TEST RESULTS

EUT	GPS WIRELESS CLOCK SYSTEMS HOST	MEASUREMENT DETAIL	
MODEL	GPS050520	FREQUENCY RANGE	Below 1000MHz
CHANNEL	Channel 0	DETECTOR FUNCTION	Quasi-Peak
MODULATION TYPE	FHSS	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 1001hPa
TEST MODE	Rx	INPUT POWER	4.8Vdc from battery
TESTED BY	Bright Tong		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Frequency MHz	Factor dB	Reading dBuV/m	Emission dBuV/m	Limit dBuV/m	Margin dB	Tower cm	Table deg
1	119.72 QP	14.74	6.59	21.32	43.5	-22.18	100	184
2	202.72 QP	13.00	19.22	32.21	43.5	-11.29	151	142
3	333.12 QP	17.25	-6.41	10.84	46	-35.16	304	7
4	483.48 QP	20.63	-6.54	14.09	46	-31.91	151	19
5	641.10 QP	23.79	-7.14	16.64	46	-29.36	235	309
6	818.12 QP	26.21	-7.47	18.74	46	-27.26	178	101

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Frequency MHz	Factor dB	Reading dBuV/m	Emission dBuV/m	Limit dBuV/m	Margin dB	Tower cm	Table deg
1	257.95 QP	15.06	1.06	16.12	46	-29.88	100	53
2	408.30 QP	18.92	-6.66	12.26	46	-33.74	100	123
3	510.15 QP	21.09	-6.93	14.15	46	-31.85	100	123
4	616.85 QP	23.45	-7.14	16.31	46	-29.69	100	197
5	733.25 QP	25.17	-7.14	18.03	46	-27.97	100	275
6	888.45 QP	26.92	-6.85	20.06	46	-25.94	100	348

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.



EUT	GPS WIRELESS CLOCK SYSTEMS HOST	MEASUREMENT DETAIL	
MODEL	GPS050520	FREQUENCY RANGE	Above 1GHz
CHANNEL	Channel 0	DETECTOR FUNCTION	Peak (PK) Average (AV) 1 MHz
MODULATION TYPE	FHSS	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 1001hPa
TEST MODE	Rx	INPUT POWER	4.8Vdc from battery
TESTED BY	Bright Tong		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Frequency MHz	Factor dB	Reading dBuV/m	Emission dBuV/m	Limit dBuV/m	Margin dB	Tower cm	Table deg
1	1948.32PK	33.14	15.73	48.87	74	-25.13	321	56
1	1948.32AV	33.14	4.23	37.37	54	-16.63	321	56
2	3004.80PK	37.22	14.01	51.23	74	-22.77	121	301
2	3004.80AV	37.22	4.27	41.49	54	-12.51	121	301
3	3481.92PK	39.05	13.57	52.62	74	-21.38	343	25
3	3481.92AV	39.05	3.29	42.34	54	-11.66	343	25
4	4947.36PK	43.63	12.68	56.31	74	-17.69	123	158
4	4947.36AV	43.63	-0.50	43.13	54	-10.87	153	128
5	5867.52PK	45.85	11.42	57.27	74	-16.73	198	56
5	5867.52AV	45.85	-1.73	44.11	54	-9.89	200	159
6	6651.36PK	48.79	11.48	60.27	74	-13.73	322	235
6	6651.36AV	48.79	-1.45	47.34	54	-6.66	167	201

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Frequency MHz	Factor dB	Reading dBuV/m	Emission dBuV/m	Limit dBuV/m	Margin dB	Tower cm	Table deg
1	1777.92PK	32.03	15.11	47.14	74	-26.86	321	21
1	1777.92AV	32.03	4.89	36.92	54	-17.08	321	21
2	2459.52PK	36.29	14.68	50.97	74	-23.03	232	25
2	2459.52AV	36.29	4.79	41.07	54	-12.93	232	25
3	3550.08PK	39.66	13.35	53.01	74	-20.99	254	158
3	3550.08AV	39.66	3.40	43.05	54	-10.95	254	158
4	3959.04PK	40.96	9.03	49.99	74	-24.01	154	350
4	3959.04AV	40.96	1.36	42.32	54	-11.68	154	350
5	4981.44PK	43.75	8.67	52.42	74	-21.58	323	154
5	4981.44AV	43.75	-0.06	43.69	54	-10.31	323	154
6	6719.52PK	48.79	4.21	53.00	74	-21.00	219	155
6	6719.52AV	48.79	-3.32	45.47	54	-8.53	219	155

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.



EUT	GPS WIRELESS CLOCK SYSTEMS HOST	MEASUREMENT DETAIL	
MODEL	GPS050520	FREQUENCY RANGE	30 ~ 1000 MHz
CHANNEL	Channel 23	DETECTOR FUNCTION	Quasi-Peak, 120kHz
MODULATION TYPE	FHSS	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 1001hPa
TEST MODE	Rx	INPUT POWER	4.8Vdc from battery
TESTED BY	Bright Tong		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Frequency MHz	Factor dB	Reading dBuV/m	Emission dBuV/m	Limit dBuV/m	Margin dB	Tower cm	Table deg
1	119.72 QP	14.74	2.90	17.63	43.5	-25.87	228	297
2	202.93 QP	13.00	15.70	28.70	43.5	-14.80	194	153
3	408.3 QP	18.92	-6.62	12.3	46	-33.70	316	222
4	575.62 QP	22.63	-7.01	15.63	46	-30.37	227	32
5	764.77 QP	25.50	-6.91	18.59	46	-27.41	143	101
6	866.62 QP	26.41	-6.75	19.66	46	-26.34	100	176

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Frequency MHz	Factor dB	Reading dBuV/m	Emission dBuV/m	Limit dBuV/m	Margin dB	Tower cm	Table deg
1	129.43 QP	15.33	-4.76	10.56	43.5	-32.94	100	67
2	306.45 QP	16.69	-6.5	10.19	46	-35.81	100	130
3	408.30 QP	18.92	-6.58	12.34	46	-33.66	100	117
4	529.55 QP	21.52	-6.96	14.56	46	-31.44	100	349
5	638.67 QP	23.76	-7.32	16.44	46	-29.56	100	349
6	801.15 QP	25.84	-6.63	19.21	46	-26.79	100	277

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.



EUT	GPS WIRELESS CLOCK SYSTEMS HOST	MEASUREMENT DETAIL	
MODEL	GPS050520	FREQUENCY RANGE	Above 1GHz
CHANNEL	Channel 23	DETECTOR FUNCTION	Peak (PK) Average (AV) 1 MHz
MODULATION TYPE	FHSS	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 1001hPa
TEST MODE	Rx	INPUT POWER	4.8Vdc from battery
TESTED BY	Bright Tong		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Frequency MHz	Factor dB	Reading dBuV/m	Emission dBuV/m	Limit dBuV/m	Margin dB	Tower cm	Table deg
1	2084.64PK	34.66	16.65	51.31	74	-22.69	321	105
1	2084.64AV	34.66	4.93	39.59	54	-14.41	321	105
2	3072.96PK	37.48	16.32	53.8	74	-20.2	397	35
2	3072.96AV	37.48	3.28	42.33	54	-11.67	397	35
3	4163.52PK	41.66	12.71	54.37	74	-19.63	198	304
3	4163.52AV	41.66	1.91	43.57	54	-10.43	198	304
4	4981.44PK	43.75	10.35	54.10	74	-19.90	157	267
4	4981.44AV	43.75	-0.01	43.74	54	-10.26	157	267
5	5151.84PK	43.85	12.74	56.59	74	-17.41	247	5
5	5151.84AV	43.85	0.52	44.37	54	-9.63	247	5
6	6072.00PK	46.56	10.72	57.28	74	-16.72	257	73
6	6072.00AV	46.56	-2.85	43.71	54	-30.29	257	73



ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Frequency MHz	Factor dB	Reading dBuV/m	Emission dBuV/m	Limit dBuV/m	Margin dB	Tower cm	Table deg
1	2220.96PK	35.9	16.87	52.77	74	-21.23	130	309
1	2220.96AV	35.9	4.34	41.56	54	-12.44	130	309
2	3481.92PK	39.05	15.59	54.63	74	-19.37	375	50
2	3481.92AV	39.05	3.29	42.34	54	-11.66	375	50
3	3959.04PK	40.96	13.80	54.76	74	-19.24	215	60
3	3959.04AV	40.96	1.32	42.28	54	-11.72	215	60
4	4981.44PK	43.75	12.19	55.94	74	-18.06	102	34
4	4981.44AV	43.75	-0.05	43.69	54	-10.31	323	154
5	5867.52PK	45.85	11.67	57.52	74	-16.48	168	328
5	5867.52AV	45.85	-1.73	44.11	54	-9.89	200	159
6	7878.24PK	52.31	11.25	63.56	74	-10.44	258	37
6	7878.24AV	52.31	-1.50	50.81	54	-3.19	351	300

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.

EUT	GPS WIRELESS CLOCK SYSTEMS HOST	MEASUREMENT DETAIL	
MODEL	GPS050520	FREQUENCY RANGE	30 ~ 1000 MHz
CHANNEL	Channel 49	DETECTOR FUNCTION	Quasi-Peak, 120kHz
MODULATION TYPE	FHSS	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 1001hPa
TEST MODE	Rx	INPUT POWER	4.8Vdc from battery
TESTED BY	Bright Tong		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Frequency MHz	Factor dB	Reading dBuV/m	Emission dBuV/m	Limit dBuV/m	Margin dB	Tower cm	Table deg
1	156.1 QP	17.03	-4.23	12.8	43.5	-30.7	99	215
2	347.68 QP	17.44	-6.65	10.79	46	-35.21	140	120
3	427.7 QP	19.55	-6.33	13.22	46	-32.78	305	215
4	578.05 QP	22.68	-6.91	15.77	46	-30.23	103	173
5	709 QP	24.76	-6.81	17.95	46	-28.05	318	12
6	839.95 QP	26.22	-7.22	18.99	46	-27.01	400	297

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Frequency MHz	Factor dB	Reading dBuV/m	Emission dBuV/m	Limit dBuV/m	Margin dB	Tower cm	Table deg
1	277.35 QP	15.74	-6.29	9.45	46	-36.55	100	162
2	427.7 QP	19.55	-6.43	13.12	46	-32.88	100	92
3	551.37 QP	22.09	-7.24	14.85	46	-31.15	100	166
4	658.08 QP	23.98	-7.29	16.7	46	-29.3	100	88
5	769.62 QP	25.56	-6.94	18.61	46	-27.39	100	19
6	871.48 QP	26.49	-6.69	19.8	46	-26.2	100	315

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.



EUT	GPS WIRELESS CLOCK SYSTEMS HOST	MEASUREMENT DETAIL	
MODEL	GPS050520	FREQUENCY RANGE	Above 1GHz
CHANNEL	Channel 49	DETECTOR FUNCTION	Peak (PK) Average (AV) 1 MHz
MODULATION TYPE	FHSS	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 1001hPa
TEST MODE	Rx	INPUT POWER	4.8Vdc from battery
TESTED BY	Bright Tong		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Frequency MHz	Factor dB	Reading dBuV/m	Emission dBuV/m	Limit dBuV/m	Margin dB	Tower cm	Table deg
1	2255.04PK	35.94	16.05	52.44	74	-21.56	297	54
1	2255.04AV	35.94	4.12	40.05	54	-13.95	297	54
2	3107.04PK	37.59	15.63	53.23	74	-20.77	214	91
2	3107.04AV	37.59	2.44	42.38	54	-11.62	214	91
3	4981.44PK	43.75	10.16	53.91	74	-20.09	109	35
3	4981.44AV	43.75	-0.03	43.72	54	-10.28	109	35
4	5083.68PK	43.83	13.06	56.89	74	-17.11	206	8
4	5083.68AV	43.83	1.4	45.23	54	-8.77	206	8
5	6651.36PK	48.79	11.76	60.55	74	-13.45	168	167
5	6651.36AV	48.79	-1.44	47.36	54	-6.64	165	67
11	7128.48PK	50.78	3.98	50.07	74	-19.24	135	357
11	7128.48AV	50.78	-4.71	46.07	54	-7.93	135	357

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Frequency MHz	Factor dB	Reading dBuV/m	Emission dBuV/m	Limit dBuV/m	Margin dB	Tower cm	Table deg
1	1846.08PK	32.44	22.73	55.17	74	-18.83	156	264
1	1846.08AV	32.44	2.65	35.09	54	-18.91	156	264
2	2629.92PK	36.26	16.39	52.65	74	-21.35	205	347
2	2629.92AV	36.26	5.83	42.09	54	-11.91	205	347
3	3584.16PK	39.93	14.43	54.36	74	-19.64	184	308
3	3584.16AV	39.93	2.48	42.41	54	-11.59	184	308
4	4981.44PK	43.75	10.37	54.12	74	-19.88	103	97
4	4981.44AV	43.75	0.03	43.78	54	-10.22	103	97
5	5969.76PK	46.33	11.03	57.36	74	-16.64	119	207
5	5969.76AV	46.33	0.27	46.6	54	-7.4	119	207
6	8662.08PK	54.06	10.65	64.71	74	-9.29	156	106
6	8662.08AV	54.06	-4.75	49.31	54	-4.69	156	106

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.

EUT	GPS WIRELESS CLOCK SYSTEMS HOST	MEASUREMENT DETAIL	
MODEL	GPS050520	FREQUENCY RANGE	Below 1000MHz
CHANNEL	Channel 0	DETECTOR FUNCTION	Quasi-Peak
MODULATION TYPE	FHSS	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 1001hPa
TEST MODE	Tx	INPUT POWER	4.8Vdc from battery
TESTED BY	Bright Tong		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Frequency MHz	Factor dB	Reading dBuV/m	Emission dBuV/m	Limit dBuV/m	Margin dB	Tower cm	Table deg
1	110.03QP	13.56	-7.01	6.55	43.5	-36.95	266	263
2	202.18QP	12.99	22.22	35.2	43.5	-8.3	390	114
3	362.23QP	17.81	-6.62	11.19	46	-34.81	359	318
4	515QP	21.19	-6.49	14.7	46	-31.3	264	240
5	677.48QP	24.22	-6.9	17.32	46	-28.68	350	331
6	830.25QP	26.31	-7.58	18.73	46	-27.27	400	19
7*	903PK	27.28	54.57	93.83			254	68
7*	903AV	27.28	45.70	84.96			254	68

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Frequency MHz	Factor dB	Reading dBuV/m	Emission dBuV/m	Limit dBuV/m	Margin dB	Tower cm	Table deg
1	147.31QP	16.77	10.39	27.15	43.5	-16.35	100	189
2	284.62QP	16	-6.72	9.29	46	-36.71	100	252
3	393.75QP	18.52	-6.88	11.65	46	-34.35	100	186
4	541.67QP	21.84	-6.75	15.09	46	-30.91	100	119
5	699.3QP	24.57	-6.35	18.21	46	-27.79	100	258
6	847.23QP	26.15	-6.84	19.3	46	-26.7	100	319
7*	903PK	27.28	44.74	87.13			100	64
7*	903AV	27.28	35.87	78.26			100	64

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. The CH49 was the worse case duty cycle for a transmit dwell time on a channel, the duty cycle is equal to: $20\log(36/100) = -8.87$ dB.
 6. Average value = peak reading +duty cycle.



EUT	GPS WIRELESS CLOCK SYSTEMS HOST	MEASUREMENT DETAIL	
MODEL	GPS050520	FREQUENCY RANGE	Above 1GHz
CHANNEL	Channel 0	DETECTOR FUNCTION	Peak (PK) Average (AV) 1 MHz
MODULATION TYPE	FHSS	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 1001hPa
TEST MODE	Tx	INPUT POWER	4.8Vdc from battery
TESTED BY	Bright Tong		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Frequency MHz	Factor dB	Reading dBuV/m	Emission dBuV/m	Limit dBuV/m	Margin dB	Tower cm	Table deg
1	1777.92PK	32.03	30.91	62.94			200	23
1	1777.92AV	32.03	22.04	54.07			200	23
2	3959.04PK	40.96	13.10	54.06	74	-19.94	100	26
2	3959.04AV	40.96	1.53	42.49	54	-11.51	100	26
3	3584.16PK	39.93	18.05	57.98	74	-16.02	142	257
3	3584.16AV	39.93	9.18	49.11	54	-4.89	142	257
4	4981.44PK	43.75	9.96	53.71	74	-20.29	100	174
4	4981.44AV	43.75	0.17	43.92	54	-10.08	100	174
5	5117.76PK	43.84	8.73	52.58	74	-21.42	100	284
5	5117.76AV	43.84	0.66	44.5	54	-9.5	100	284
6	5697.12AV	45.08	-1.86	43.22	54	-10.78	201	126
7	6003.84PK	46.47	10.22	56.7	74	-17.3	100	161
8	6003.84AV	46.47	-1.67	46.8	54	-7.2	100	161
9	6617.28AV	48.79	-1.45	47.34	54	-6.66	100	161
10	8048.64PK	53.07	11.34	64.41	74	-9.59	100	31
11	8048.64AV	53.07	-1.32	51.75	54	-2.25	100	31



ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Frequency MHz	Factor dB	Reading dBuV/m	Emission dBuV/m	Limit dBuV/m	Margin dB	Tower cm	Table deg
1	1437.12PK	31.55	20.01	51.56	74	-22.44	200	123
1	1437.12AV	31.55	7.18	38.73	54	-15.27	200	123
2	1777.92PK	32.03	33.47	65.5			127	165
2	1777.92AV	32.03	24.6	56.63			127	165
3	2152.8AV	35.42	4.27	39.69	54	-14.31	200	2
4	2698.08PK	36.19	25.26	61.45	74	-12.55	100	36
4	2698.08AV	36.19	16.39	52.58	54	-1.42	100	36
5	3072.96AV	37.48	4.11	41.6	54	-12.4	200	8
6	3584.16PK	39.93	18.15	58.08			100	264
6	3584.16AV	39.93	9.28	49.21			100	264
7	3993.12PK	41.16	13.37	54.53	74	-19.47	200	15
7	3993.12AV	41.16	0.76	41.92	54	-12.08	200	15
8	4504.32PK	43.25	10.82	54.07	74	-19.93	200	16
8	4504.32AV	43.25	0.24	43.48	54	-10.52	200	16
9	5935.68AV	46.17	-1.6	44.57	54	-9.43	200	19
10	6378.72AV	47.82	-1.89	45.93	54	-8.07	200	129
11	6889.92AV	49.61	-1.46	48.16	54	-5.84	200	158

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. The CH49 was the worse case duty cycle for a transmit dwell time on a channel, the duty cycle is equal to: $20\log(36/100) = -8.87$ dB.
 6. Average value = peak reading + duty cycle.

EUT	GPS WIRELESS CLOCK SYSTEMS HOST	MEASUREMENT DETAIL	
MODEL	GPS050520	FREQUENCY RANGE	30 ~ 1000 MHz
CHANNEL	Channel 23	DETECTOR FUNCTION	Quasi-Peak, 120kHz
MODULATION TYPE	FHSS	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 1001hPa
TEST MODE	TX	INPUT POWER	4.8Vdc from battery
TESTED BY	Bright Tong		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Frequency MHz	Factor dB	Reading dBuV/m	Emission dBuV/m	Limit dBuV/m	Margin dB	Tower cm	Table deg
1	202.18	12.99	21.22	34.2	43.5	-9.3	101	2
2	328.27	17.18	-6.7	10.48	46	-35.52	207	279
3	471.35	20.45	-6.8	13.65	46	-32.35	400	103
4	650.8	23.9	-6.96	16.94	46	-29.06	109	160
5	755.08	25.39	-6.97	18.42	46	-27.58	134	213
6	842.37	26.19	-7.01	19.19	46	-26.81	148	135
7*	912.7	27.46	55.99	96.42			132	78
7*	912.7	27.46	47.12	87.55			132	78

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Frequency MHz	Factor dB	Reading dBuV/m	Emission dBuV/m	Limit dBuV/m	Margin dB	Tower cm	Table deg
1	207.03	13.07	4	17.07	43.5	-26.43	100	100
2	316.15	16.93	-6.75	10.18	46	-35.82	100	41
3	401.02	18.67	-6.68	11.99	46	-34.01	100	180
4	517.42	21.24	-6.62	14.62	46	-31.38	100	250
5	689.6	24.41	-6.73	17.69	46	-28.31	100	175
6	839.95	26.22	-7.07	19.14	46	-26.86	100	302
7*	912.7	27.46	44.58	89.84			100	357
7*	912.7	27.46	35.71	80.97			100	357

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. The CH49 was the worse case duty cycle for a transmit dwell time on a channel, the duty cycle is equal to: $20\log(36/100) = -8.87$ dB.
 6. Average value = peak reading + duty cycle.

EUT	GPS WIRELESS CLOCK SYSTEMS HOST	MEASUREMENT DETAIL	
MODEL	GPS050520	FREQUENCY RANGE	Above 1GHz
CHANNEL	Channel 23	DETECTOR FUNCTION	Peak (PK) Average (AV) 1 MHz
MODULATION TYPE	FHSS	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 1001hPa
TEST MODE	TX	INPUT POWER	4.8Vdc from battery
TESTED BY	Bright Tong		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Frequency MHz	Factor dB	Reading dBuV/m	Emission dBuV/m	Limit dBuV/m	Margin dB	Tower cm	Table deg
1	1437.12PK	31.55	19.34	50.89	74	-23.11	220	19
1	1437.12AV	31.55	7.06	38.61	54	-15.39	220	19
2	1812PK	32.2	30.27	62.47			200	209
2	1812AV	32.2	21.4	53.6			200	209
3	2220.96PK	35.9	17.69	53.59	74	-20.41	208	119
3	2220.96AV	35.9	4.18	40.08	54	-13.92	208	119
4	2732.16PK	36.41	23.05	59.46	74	-14.54	150	102
4	2732.16AV	36.41	14.18	50.59	54	-3.41	150	102
5	3345.6AV	37.86	2.84	40.7	54	-13.3	234	219
6	3652.32PK	40.04	10.97	51.01	74	-22.99	215	319
6	3652.32AV	40.04	1.97	42	54	-12	215	319
7	3959.04PK	40.96	8.33	49.29	74	-24.71	249	9
7	3959.04AV	40.96	1.33	42.3	54	-11.7	249	9
8	4538.4PK	43.36	16.1	59.46			180	160
8	4538.4AV	43.36	7.23	50.59			180	160
9	5015.52PK	43.81	9.36	53.17	74	-20.83	200	319
9	5015.52AV	43.81	0.36	44.17	54	-9.83	200	319
10	5492.64AV	44.28	-2.68	41.6	54	-12.4	200	198
11	5867.52AV	45.85	-1.73	44.11	54	-9.89	200	159
12	6378.72AV	47.82	-2.14	45.69	74	-28.31	200	231

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Frequency MHz	Factor dB	Reading dBuV/m	Emission dBuV/m	Limit dBuV/m	Margin dB	Tower cm	Table deg
1	1437.12PK	31.55	19.30	50.85	74	-23.16	220	19
1	1437.12AV	31.55	6.95	38.5	54	-15.5	200	19
2	1812PK	32.2	36.39	68.59			200	0
2	1812AV	32.2	27.82	59.72			200	0
3	2220.96PK	35.9	17.74	53.64	74	-20.36	208	119
3	2220.96PK	35.9	16.76	52.66	74	-21.34	208	119
4	2732.16PK	36.41	24.95	61.36	74	-12.64	200	0
4	2732.16AV	36.41	16.08	52.49	54	-1.51	200	0
5	3550.08AV	39.66	2.58	42.23	54	-11.77	200	19
6	3652.32PK	40.04	18.78	58.82	74	-15.18	200	0
6	3652.32AV	40.04	9.91	49.95	54	-4.05	200	0
7	3959.04PK	40.96	12.66	53.62	74	-20.38	200	19
7	3959.04AV	40.96	1.22	42.19	54	-11.81	200	19
8	4538.4PK	43.36	15.1	58.46			200	0
8	4538.4AV	43.36	6.23	49.59			200	0
9	5117.76PK	43.84	13.61	57.46	74	-16.54	200	0
10	5117.76AV	43.84	0.62	44.46	54	-9.54	207	37
11	5492.64AV	44.28	-2.74	41.54	54	-12.46	200	19
12	5935.68AV	46.17	-1.6	44.57	54	-9.43	200	19
13	6617.28AV	48.79	-1.68	47.12	54	-6.88	200	19
14	7128.48AV	50.78	-0.63	50.15	54	-3.85	200	19

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. The CH49 was the worse case duty cycle for a transmit dwell time on a channel, the duty cycle is equal to: $20\log(36/100) = -8.87$ dB.
 6. Average value = peak reading + duty cycle.

EUT	GPS WIRELESS CLOCK SYSTEMS HOST	MEASUREMENT DETAIL	
MODEL	GPS050520	FREQUENCY RANGE	30 ~ 1000 MHz
CHANNEL	Channel 49	DETECTOR FUNCTION	Quasi-Peak, 120kHz
MODULATION TYPE	FHSS	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 1001hPa
TEST MODE	Tx	INPUT POWER	4.8Vdc from battery
TESTED BY	Bright Tong		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Frequency MHz	Factor dB	Reading dBuV/m	Emission dBuV/m	Limit dBuV/m	Margin dB	Tower cm	Table deg
1	110.03QP	13.56	-5.73	7.83	43.5	-35.67	114	106
2	204.6QP	13.03	14.22	27.25	43.5	-16.25	256	237
3	328.27QP	17.18	-6.66	10.52	46	-35.48	290	336
4	430.12QP	19.61	-6.74	12.87	46	-33.13	334	327
5	536.83QP	21.71	-6.32	15.4	46	-30.6	161	184
6	641.1QP	23.79	-6.71	17.07	46	-28.93	199	117
7*	927.25PK	27.69	54.94	97.23			137	106
7*	927.25AV	27.69	46.07	88.36			137	106

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Frequency MHz	Factor dB	Reading dBuV/m	Emission dBuV/m	Limit dBuV/m	Margin dB	Tower cm	Table deg
1	148.82QP	16.88	1.48	18.36	43.5	-25.14	100	144
2	277.35QP	15.74	-6.39	9.35	46	-36.65	100	68
3	439.82QP	19.86	-6.83	13.03	46	-32.97	100	315
4	582.9QP	22.78	-6.48	16.3	46	-29.7	100	267
5	725.98QP	25.1	-6.95	18.15	46	-27.85	100	234
6	852.08QP	26.16	-6.77	19.39	46	-26.61	100	144
7*	927.25PK	27.69	45.72	89.40			100	298
7*	927.25AV	27.69	36.85	80.53			100	298

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. The CH49 was the worse case duty cycle for a transmit dwell time on a channel, the duty cycle is equal to: $20\log(36/100) = -8.87$ dB.
 6. Average value = peak reading + duty cycle.



EUT	GPS WIRELESS CLOCK SYSTEMS HOST	MEASUREMENT DETAIL	
MODEL	GPS050520	FREQUENCY RANGE	Above 1GHz
CHANNEL	Channel 49	DETECTOR FUNCTION	Peak (PK) Average (AV) 1 MHz
MODULATION TYPE	FHSS	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 1001hPa
TEST MODE	TX	INPUT POWER	4.8Vdc from battery
TESTED BY	Bright Tong		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Frequency MHz	Factor dB	Reading dBuV/m	Emission dBuV/m	Limit dBuV/m	Margin dB	Tower cm	Table deg
1	1368.96PK	31.57	19.86	51.43	74	-22.57	200	169
1	1368.96AV	31.57	6.38	37.95	54	-16.05	200	169
2	1846.08PK	32.44	31	63.44			100	219
2	1846.08AV	32.44	22.13	54.57			100	219
3	2220.96PK	35.9	16.89	52.79	74	-21.21	100	159
3	2220.96PK	35.9	4.34	40.24	54	-13.76	100	159
4	2766.24PK	36.64	24.82	61.46	74	-12.54	100	156
4	2766.24AV	36.64	15.95	52.59	54	-1.41	100	156
5	3481.92AV	39.05	3.22	42.26	54	-11.74	200	196
6	3959.04PK	40.96	12.37	53.33	74	-20.67	200	194
6	3959.04AV	40.96	1.07	42.04	54	-11.96	200	194
7	4606.56PK	43.55	16.97	60.52			100	319
7	4606.56AV	43.55	8.1	51.65			100	319
8	5117.76PK	43.84	12.36	56.2	74	-17.8	100	26
9	5117.76AV	43.84	0.54	44.39	54	-9.61	154	26
10	5628.96PK	44.79	8.84	53.63	74	-20.37	100	38
11	6072AV	46.56	-2.85	43.71	74	-30.29	200	48
12	6378.72AV	47.82	-2.14	45.69	74	-28.31	200	231

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Frequency MHz	Factor dB	Reading dBuV/m	Emission dBuV/m	Limit dBuV/m	Margin dB	Tower cm	Table deg
1	1846.08PK	32.44	30.36	62.81			200	129
1	1846.08AV	32.44	21.49	53.94			200	189
2	2766.24PK	36.64	25.09	61.73	74	-12.27	200	139
2	2766.24AV	36.64	16.22	52.86	54	-1.14	200	169
3	3686.4PK	40.03	15.95	55.97	74	-18.03	123	219
4	3686.4AV	40.03	5.05	45.08	54	-8.92	123	219
5	4197.6PK	41.75	11.53	53.28	74	-20.72	158	359
5	4197.6AV	41.75	-0.47	41.28	54	-12.72	158	359
6	4606.56PK	43.55	15.22	58.77	74	-18.23	200	159
6	4606.56AV	43.55	6.35	49.9	54	-4.1	200	193
7	6208.32AV	46.74	-1.9	44.83	54	-9.17	289	193
8	6549.12AV	48.69	-2.35	46.34	54	-7.66	295	319
9	7332.96PK	51.05	10.11	61.16	74	-12.84	235	159
10	7332.96AV	51.05	-3.55	47.5	54	-6.5	235	159

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. The CH49 was the worse case duty cycle for a transmit dwell time on a channel, the duty cycle is equal to: $20\log(36/100) = -8.87$ dB.
 6. Average value = peak reading + duty cycle.

4.3 NUMBER OF HOPPING FREQUENCY USED

4.3.1 LIMIT OF HOPPING FREQUENCY USED

At least 15 channels frequencies, and should be equally spaced.

4.3.2 TEST INSTRUMENTS

DESCRIPTION &	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
*Spectrum Analyzer ROHDE & SCHWARZ	FSP30	100019	May.15, 2006

NOTE: The calibration interval of the above test instruments is 12 months.

4.3.3 TEST PROCEDURES

- Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
- Turn on the EUT and connect its antenna terminal to measurement via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
- Set the SA on MaxHold Mode, and then keep the EUT in hopping mode. Record all the signals from each channel until each one has been recorded.
- Set the SA on View mode and then plot the result on SA screen.
- Repeat above procedures until all frequencies measured were complete.

4.3.4 DEVIATION FROM TEST STANDARD

No deviation.

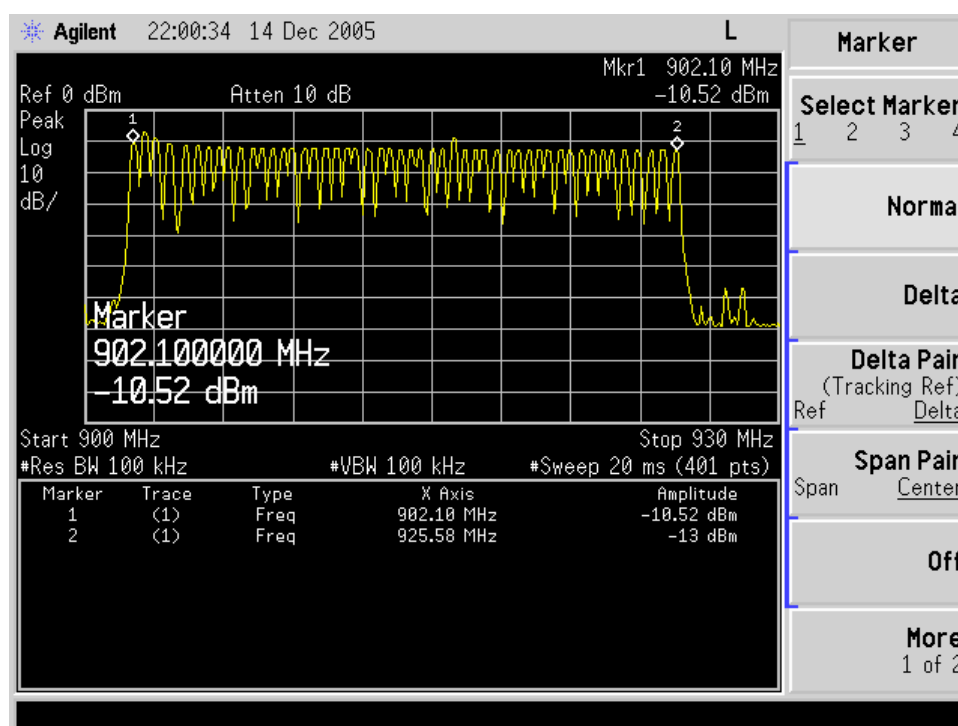
4.3.5 TEST SETUP



4.3.6 TEST RESULTS

There are 50 hopping frequencies in the hopping mode. Please refer to next page for the test result. On the plots, it shows that the hopping frequencies are equally spaced.

TX





4.4 DWELL TIME ON EACH CHANNEL

4.4.1 LIMIT OF DWELL TIME USED

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

4.4.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
*Spectrum Analyzer ROHDE & SCHWARZ	FSP30	100019	May.15, 2006

NOTES: The calibration interval of the above test instruments is 12 months.

4.4.3 TEST PROCEDURES

- Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
- Turn on the EUT and connect its antenna terminal to measurement via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
- Adjust the center frequency of SA on any frequency be measured and set SA to zero span mode. And then, set RBW and VBW of spectrum analyzer to proper value.
- Measure the time duration of one transmission on the measured frequency. And then plot the result with time difference of this time duration.
- Repeat above procedures until all different time-slot modes have been completed.

4.4.4 DEVIATION FROM TEST STANDARD

No deviation.

4.4.5 TEST SETUP



4.4.6 TEST RESULTS

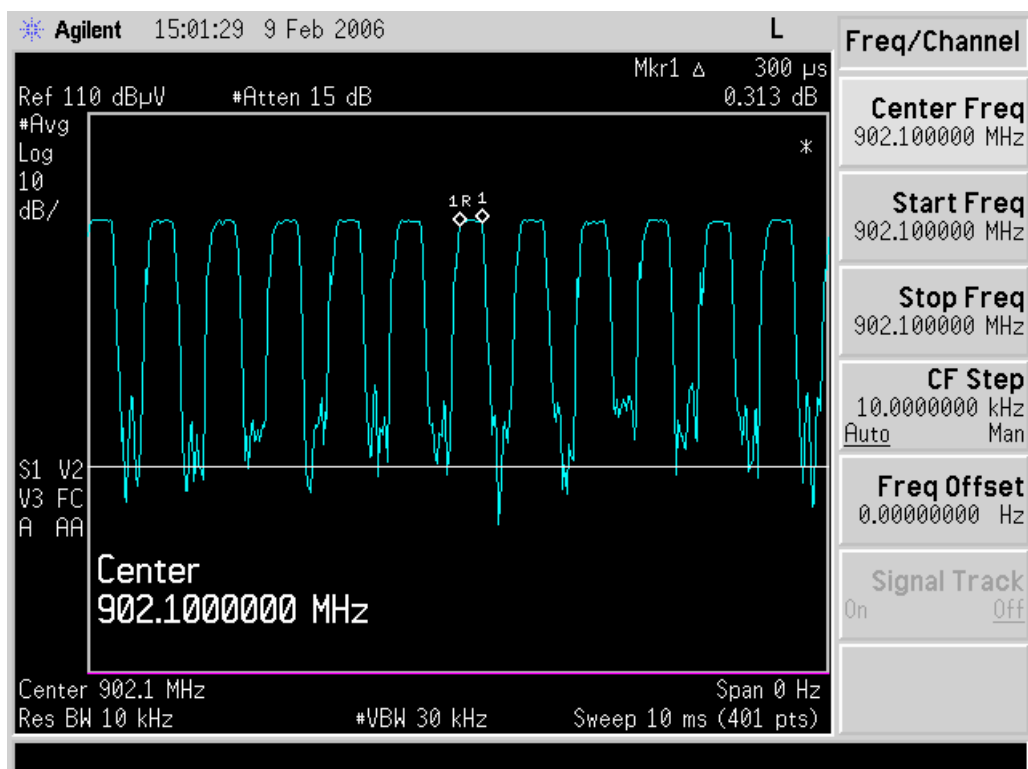
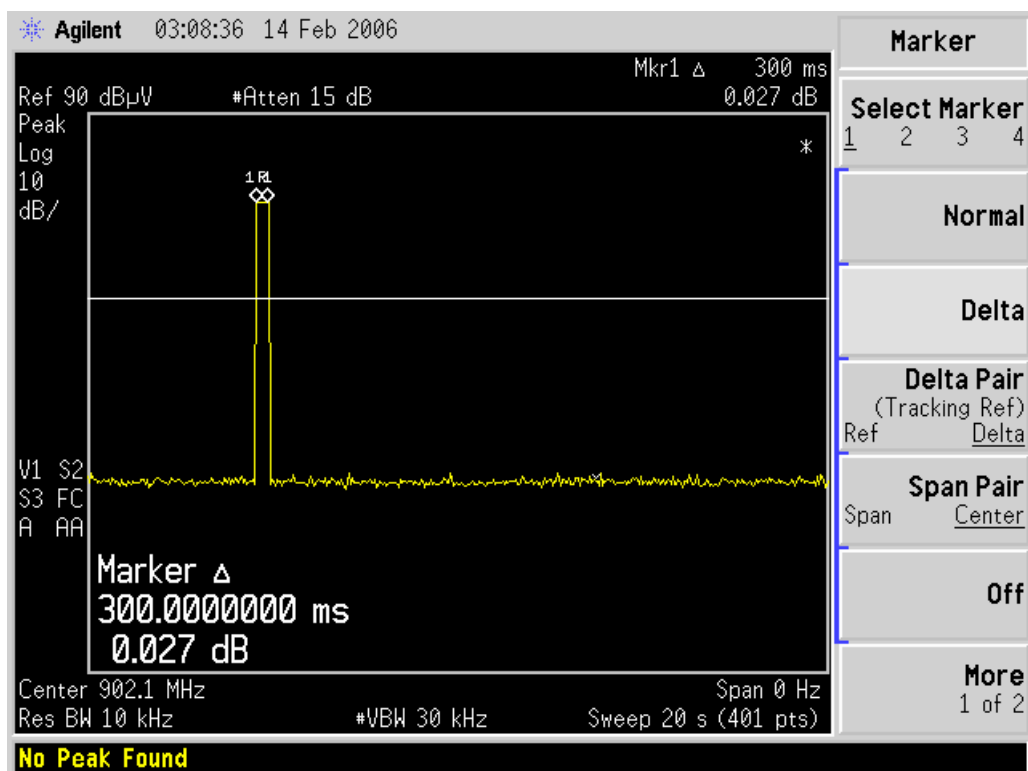
EUT	GPS WIRELESS CLOCK SYSTEMS HOST	MODEL	GPS050520
MODULATION TYPE	FHSS	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 1001Hpa
INPUT POWER	4.8Vdc from battery	TESTED BY	Bright Tong

MODE	LENGTH OF TRANSMISSION TIME (msec)IN A 20 sec	DUTY TIME	RESULT (msec)	LIMIT (msec)
CH0	300	$0.3 \times 12/10 = 0.36$	108	400
CH23	300	$0.3 \times 12/10 = 0.36$	108	400
CH49	350	$0.3 \times 12/10 = 0.36$	126	400

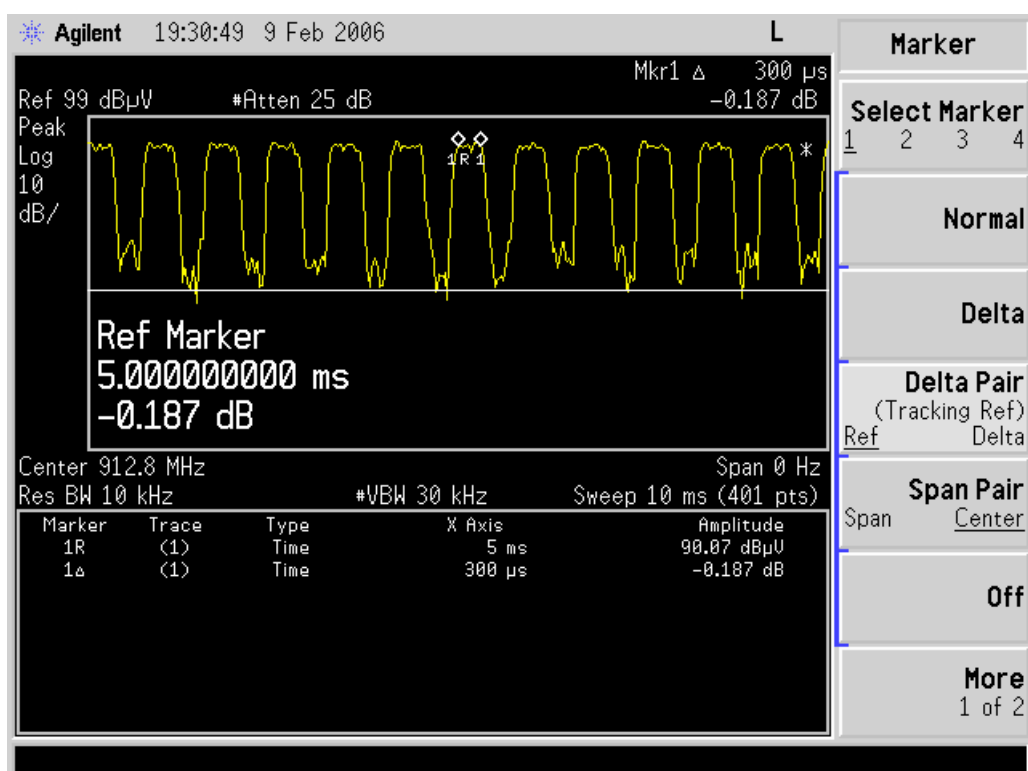
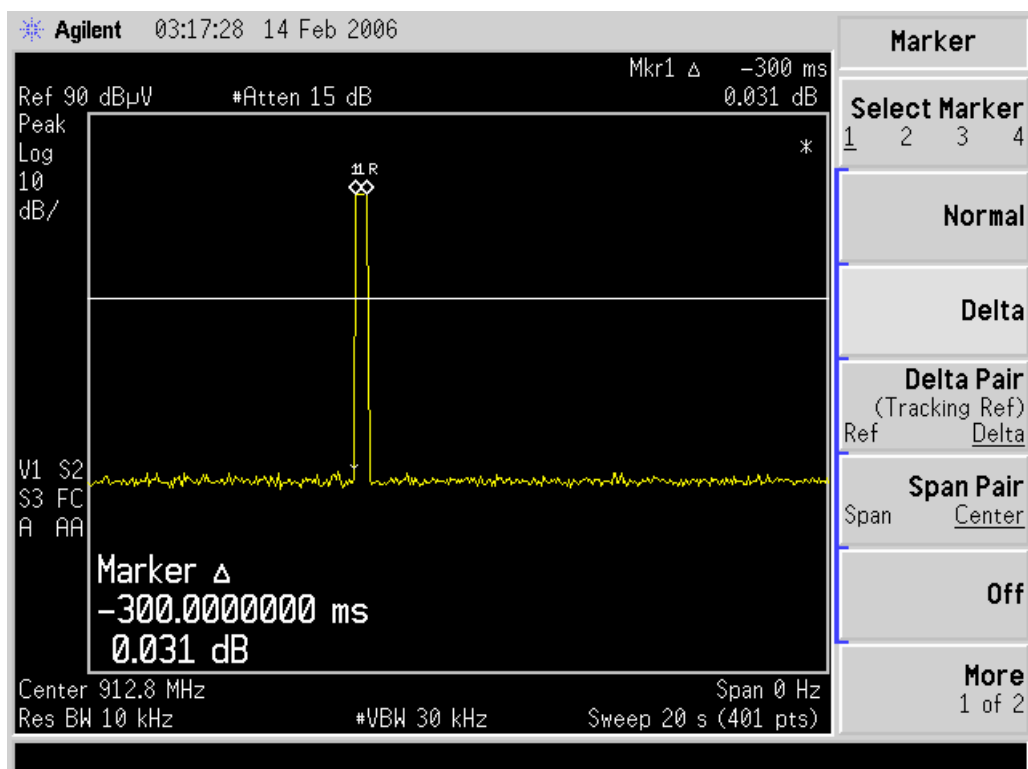
NOTE: Test plots of the transmitting time slot are shown on next 6 images.



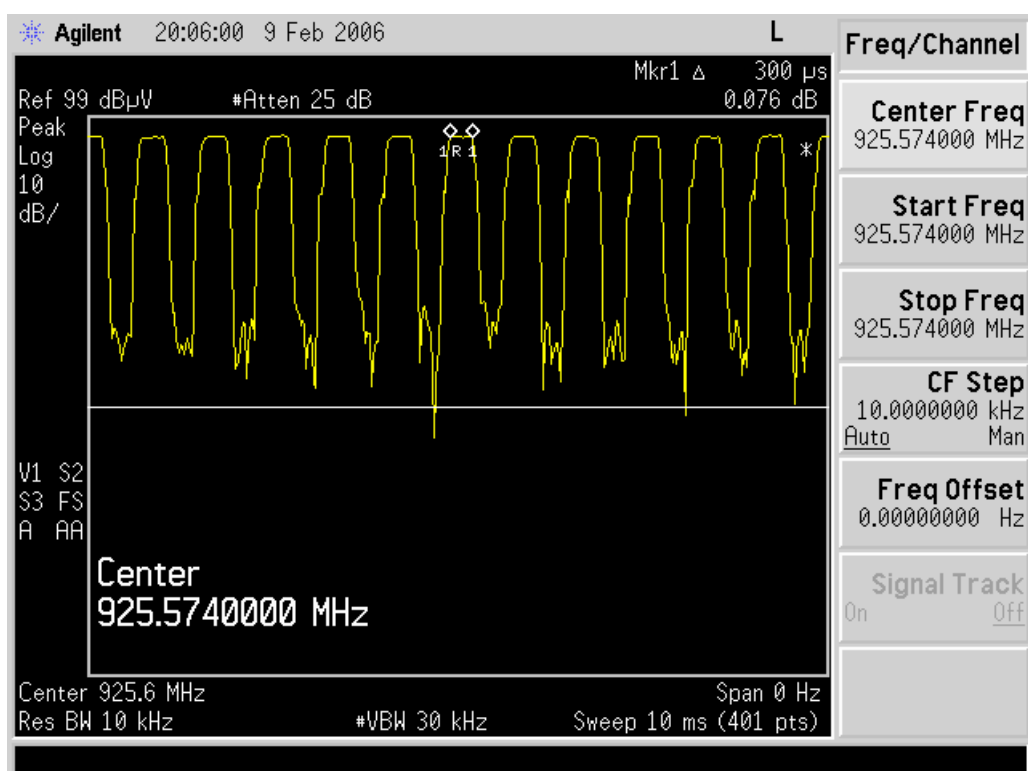
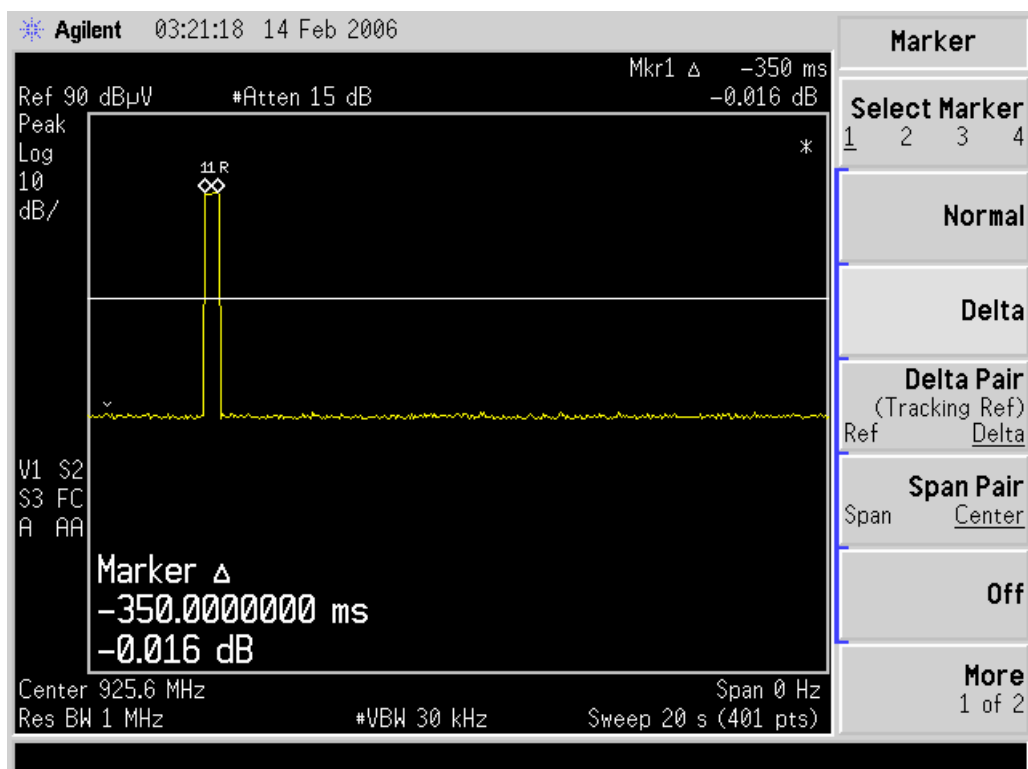
CH0



CH23



CH49



4.5 CHANNEL BANDWIDTH

4.5.1 LIMITS OF CHANNEL BANDWIDTH

For frequency hopping system operating in the 2400-2483.5MHz, If the 20dB bandwidth of hopping channel is greater than 25kHz, two-thirds 20dB bandwidth of hopping channel shall be a minimum limit for the hopping channel separation.

4.5.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
*Spectrum Analyzer ROHDE & SCHWARZ	FSP30	100019	May.15, 2006

NOTE: The calibration interval of the above test instruments is 12 months.

4.5.3 TEST PROCEDURE

- Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
- Measure the frequency difference of two frequencies that were attenuated 20dB from the reference level. Record the frequency difference as the emission bandwidth.
- Repeat above procedures until all frequencies measured were complete.

4.5.4 DEVIATION FROM TEST STANDARD

No deviation.

4.5.5 TEST SETUP



4.5.6 EUT OPERATING CONDITION

The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

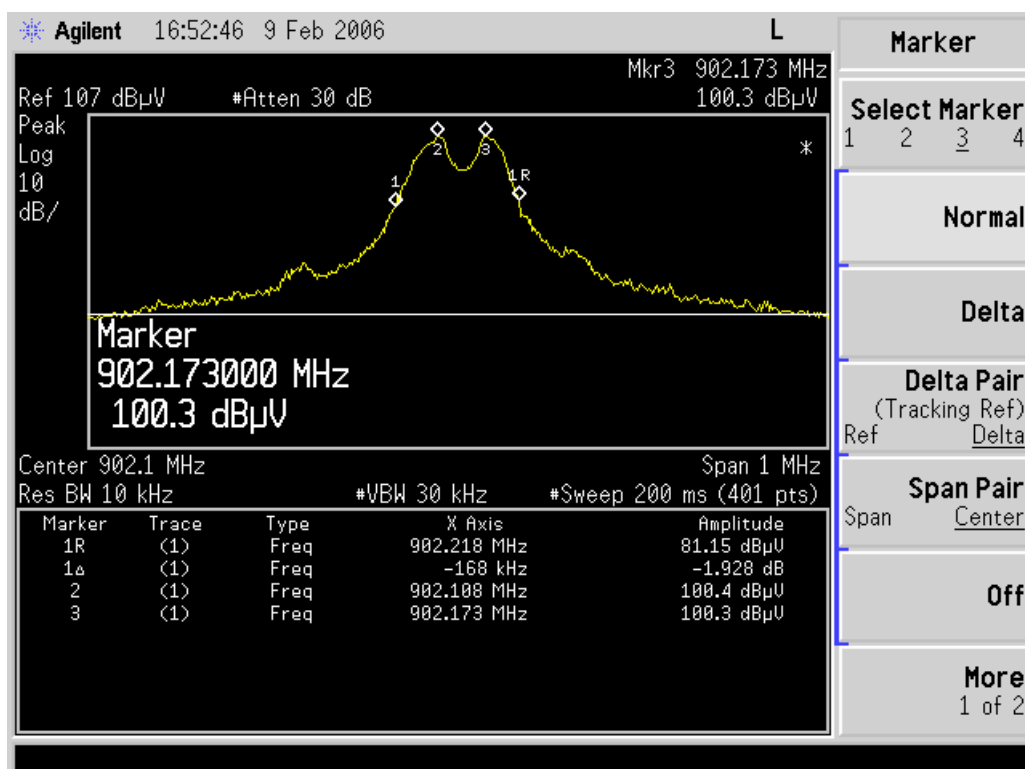
4.5.7 TEST RESULTS

EUT	GPS WIRELESS CLOCK SYSTEMS HOST	MODEL	GPS050520
MODULATION TYPE	FHSS	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 1001Hpa
INPUT POWER	4.8Vdc from battery	TESTED BY	Bright Tong

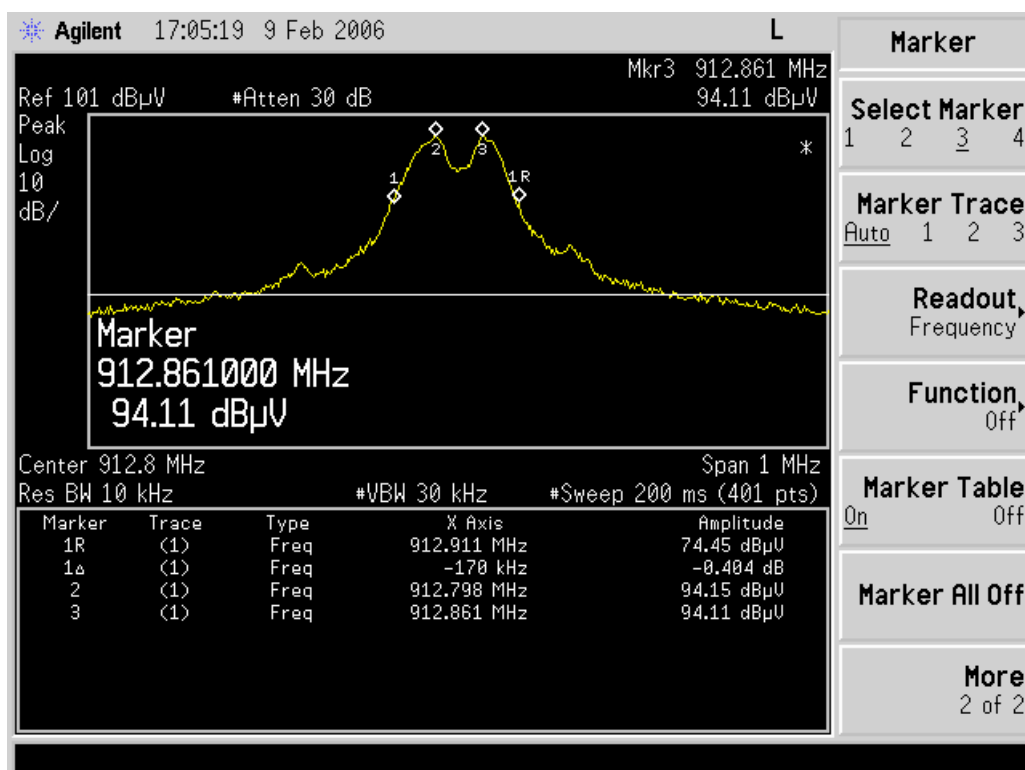
Tx

CHANNEL	CHANNEL FREQUENCY (MHz)	20dB BANDWIDTH (MHz)	MAXIMUM LIMIT (MHz)
0	902.1	0.168	0.25
23	913.14	0.170	0.25
49	925.62	0.163	0.25

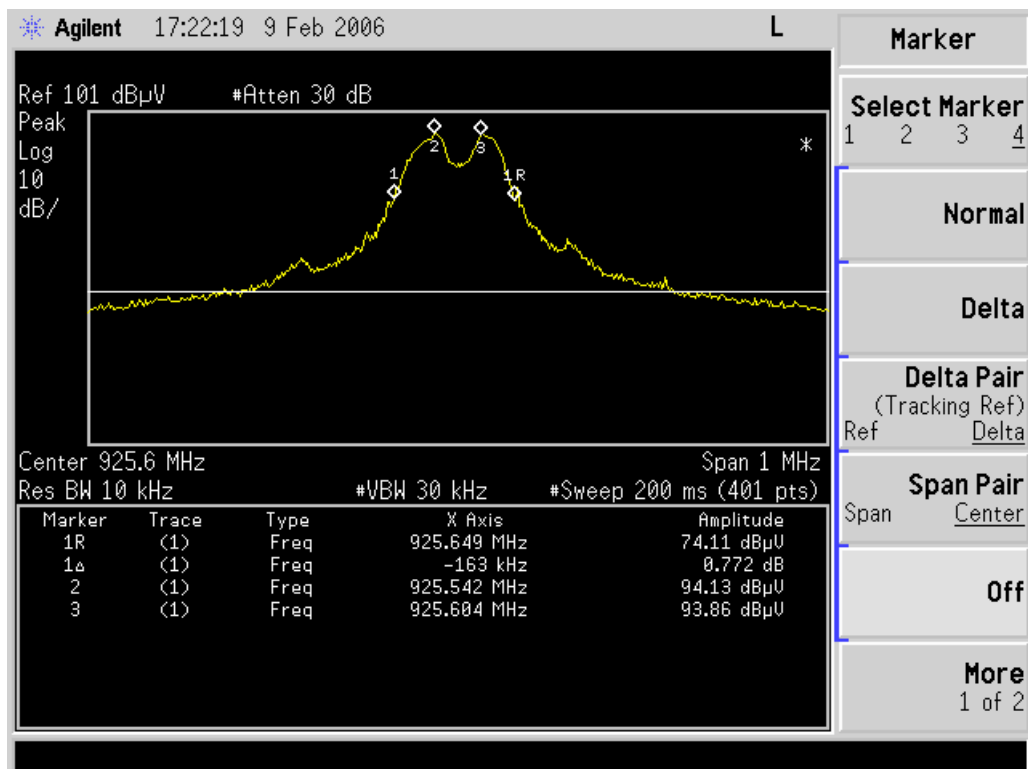
CH 0(Tx)



CH 23(Tx)



CH 49(Tx)



4.6 HOPPING CHANNEL SEPARATION

4.6.1 LIMIT OF HOPPING CHANNEL SEPARATION

At least 25 kHz or 20dB hopping channel bandwidth (whichever is greater)

4.6.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
*Spectrum Analyzer ROHDE & SCHWARZ	FSP30	100019	May.15, 2006

NOTES: The calibration interval of the above test instruments is 12 months.

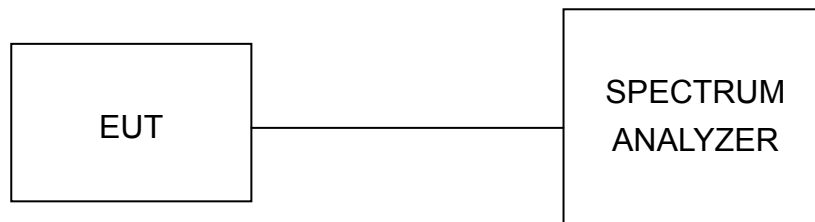
4.6.3 TEST PROCEDURES

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range.
3. By using the MaxHold function record the separation of two adjacent channels.
4. Measure the frequency difference of these two adjacent channels by SA MARK function. And then plot the result on SA screen.
5. Repeat above procedures until all frequencies measured were complete.

4.6.4 DEVIATION FROM TEST STANDARD

No deviation.

4.6.5 TEST SETUP



4.6.6 TEST RESULTS

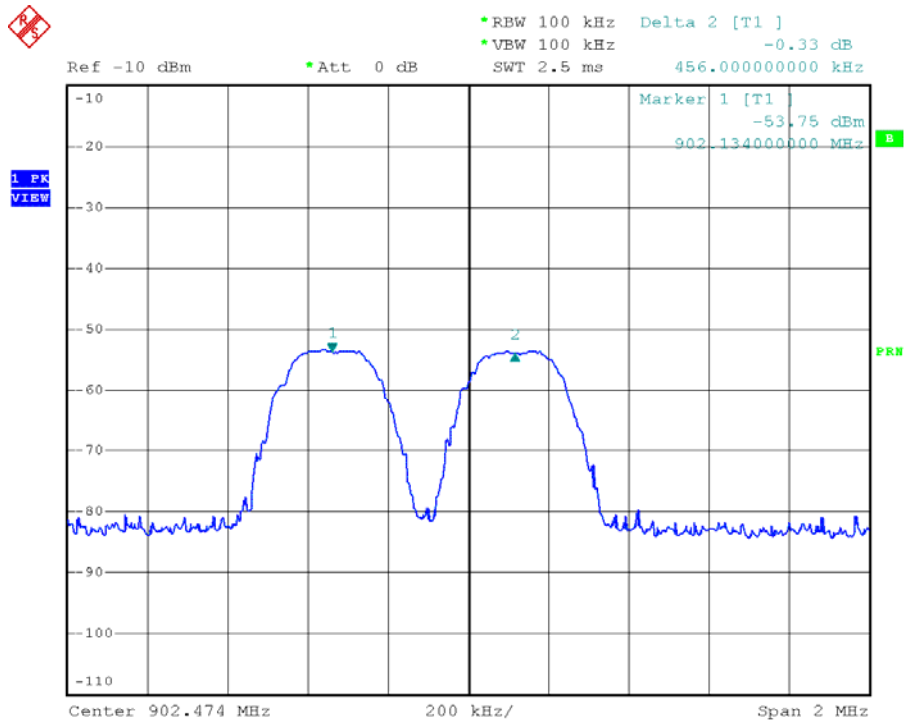
EUT	GPS WIRELESS CLOCK SYSTEMS HOST	MODEL	GPS050520
MODULATION TYPE	FHSS	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 1001Hpa
INPUT POWER	4.8Vdc from battery	TESTED BY	Bright Tong

Tx

CHANNEL	FREQUENCY (MHz)	ADJACENT CHANNEL SEPARATION (MHz)	20dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
0	902.1	0.456	0.168	0.168	PASS
23	913.14	0.378	0.170	0.170	PASS
49	925.62	0.552	0.163	0.163	PASS

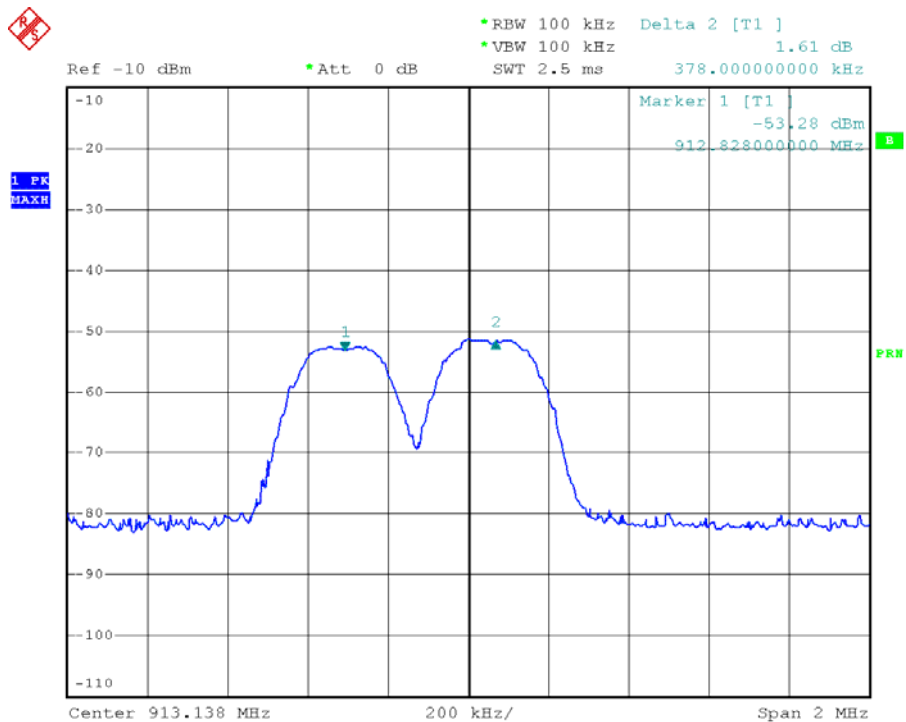
NOTE: The minimum limit is 20dB bandwidth. Test results please refer to next pages.

CH 0(TX)



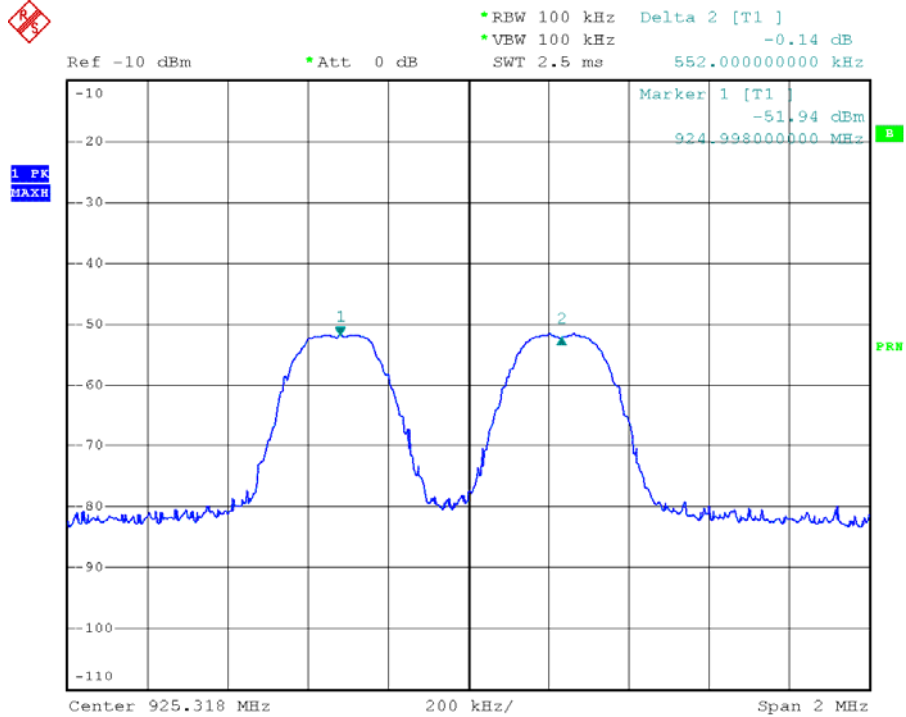
Date: 17.JAN.2006 14:05:24

CH 23(TX)



Date: 17.JAN.2006 13:40:19

CH 49(TX)



Date: 17.JAN.2006 13:43:01



4.7 MAXIMUM PEAK OUTPUT POWER

4.7.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

4.7.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
*Spectrum Analyzer ROHDE & SCHWARZ	FSP30	100019	May.15, 2006

NOTE: The calibration interval of the above test instruments is 12 months.

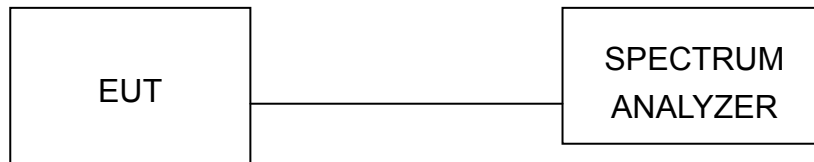
4.7.3 TEST PROCEDURES

- Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
- The center frequency of the spectrum analyzer is set to the fundamental frequency and using 1 MHz RBW and 3 MHz VBW.
- Measure the captured power within the band and recording the plot.
- Repeat above procedures until all frequencies required were complete.

4.7.4 DEVIATION FROM TEST STANDARD

No deviation

4.7.5 TEST SETUP



For the actual test configuration, please refer to the related Item – Photographs of the Test Configuration.

4.7.6 EUT OPERATING CONDITION

The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

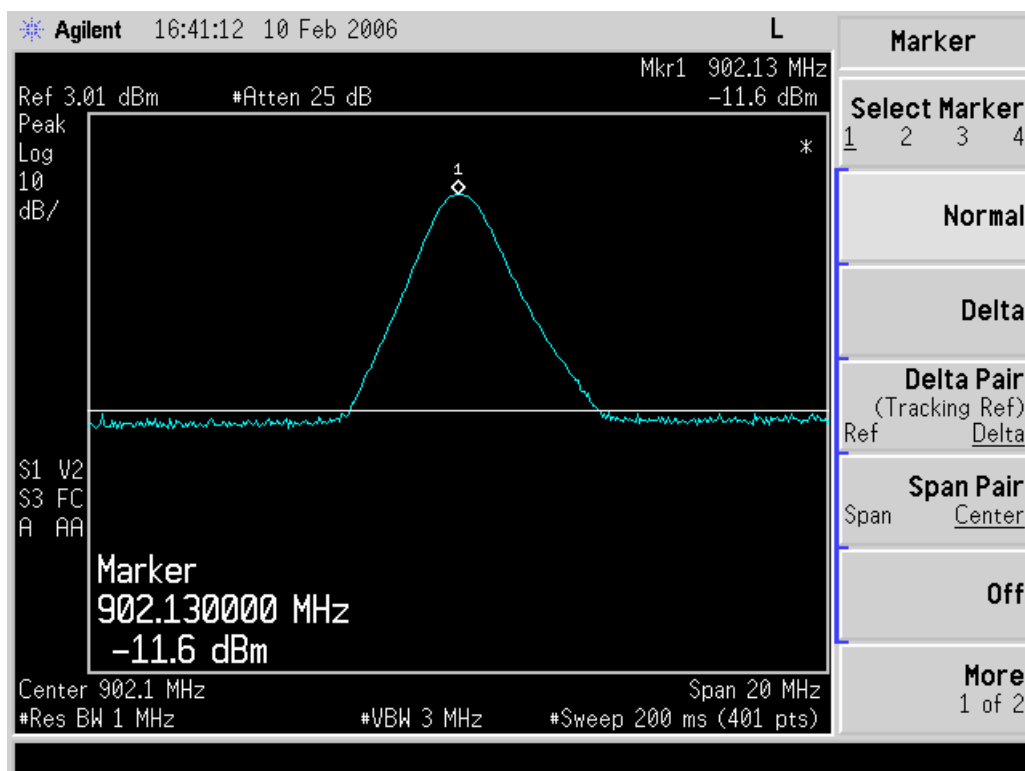
4.7.7 TEST RESULTS

EUT	GPS WIRELESS CLOCK SYSTEMS HOST	MODEL	GPS050520
MODULATION TYPE	FHSS	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 1001Hpa
INPUT POWER	4.8Vdc from battery	TESTED BY	Bright Tong

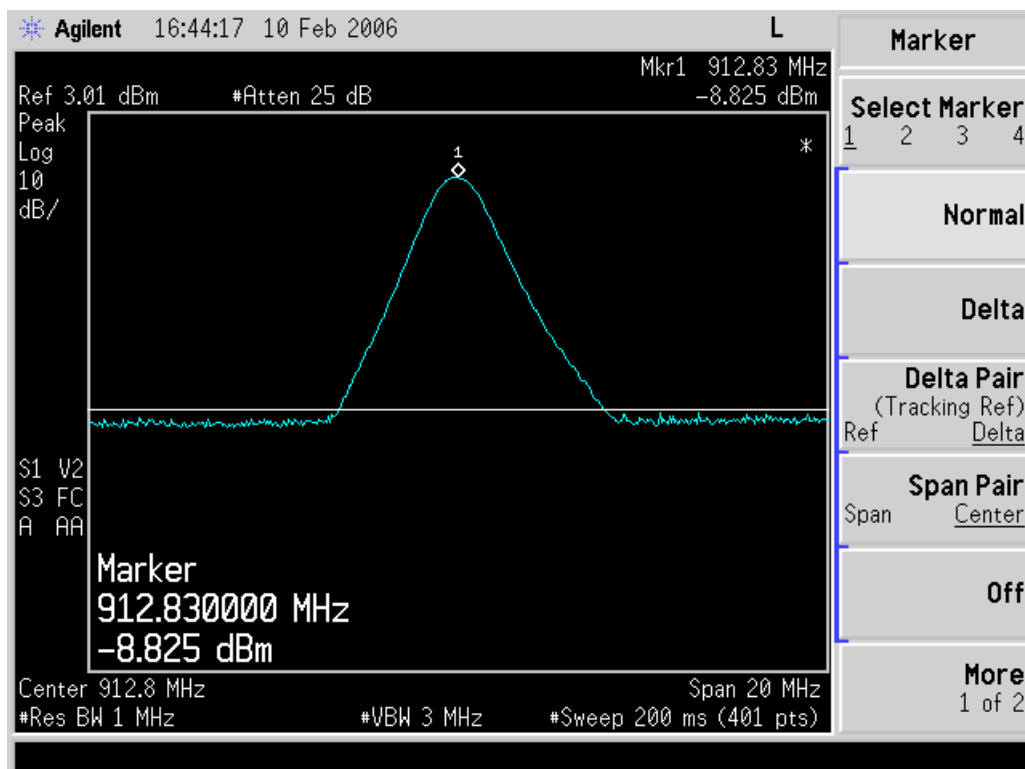
Tx

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (mW)	PASS/FAIL
0	902.1	0.069	-11.6	1000	PASS
23	913.14	0.131	-8.825	1000	PASS
49	925.62	0.234	-6.305	1000	PASS

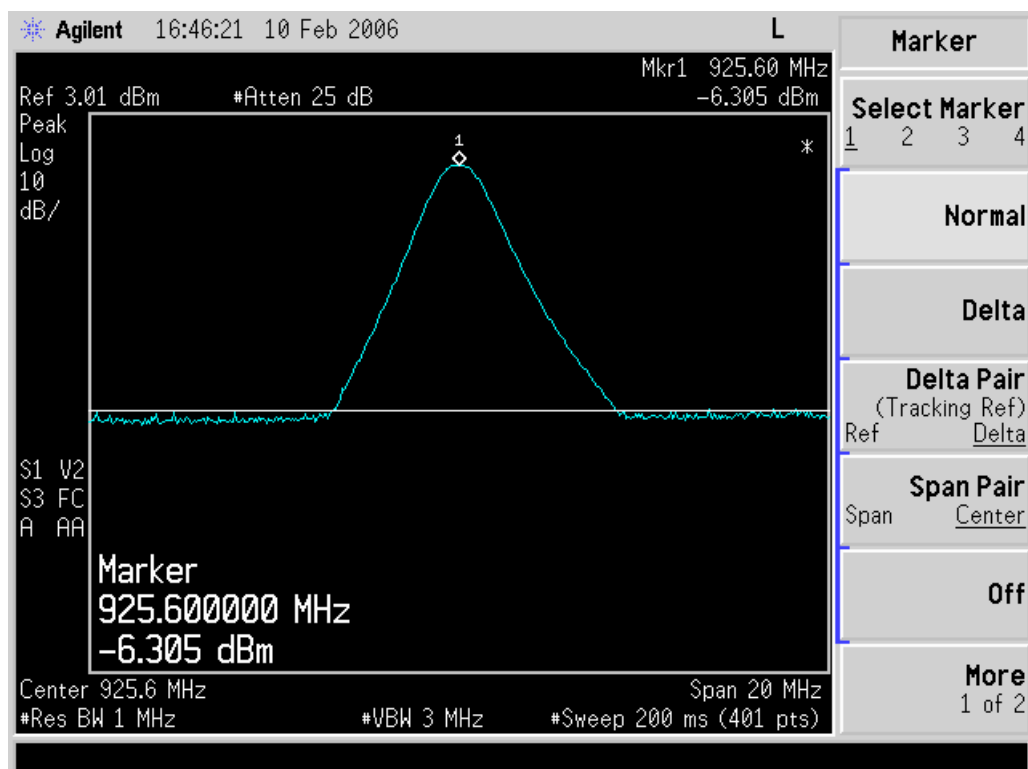
CH 0(Tx)



CH 23(TX)



CH 49(TX)



4.8 BAND EDGES MEASUREMENT

4.8.1 LIMITS OF BAND EDGES MEASUREMENT

Below -20dB of the highest emission level of operating band (in 100 KHz RBW).

4.8.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
*Spectrum Analyzer ROHDE & SCHWARZ	FSP30	100019	May.15, 2006

NOTES: The calibration interval of the above test instruments is 12 months.

4.8.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer via a low loss cable. Set both RBW and VBW of spectrum analyzer to 100 kHz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded.

4.8.4 DEVIATION FROM TEST STANDARD

No deviation.

4.8.5 EUT OPERATING CONDITION

The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.



4.8.6 TEST RESULTS

The spectrum plots are attached on the following 2 images. D1 line indicates the highest level, D2 line indicates the 20dB offset below D1. It shows compliance with the requirement in part 15.247(d).

Mode A for IQ

NOTE 1:

The band edge emission plot on page 60 shows 29.76dBc between carrier maximum power and local maximum emission in restrict band (610.56MHz). The emission of carrier strength list in the test result of channel 0 at the item 4.2.7 is 80.86dBuV/m (Peak), so the maximum field strength in restrict band is $80.86 - 29.76 = 51.10$ dBuV/m, which is under 74 dBuV/m limit.

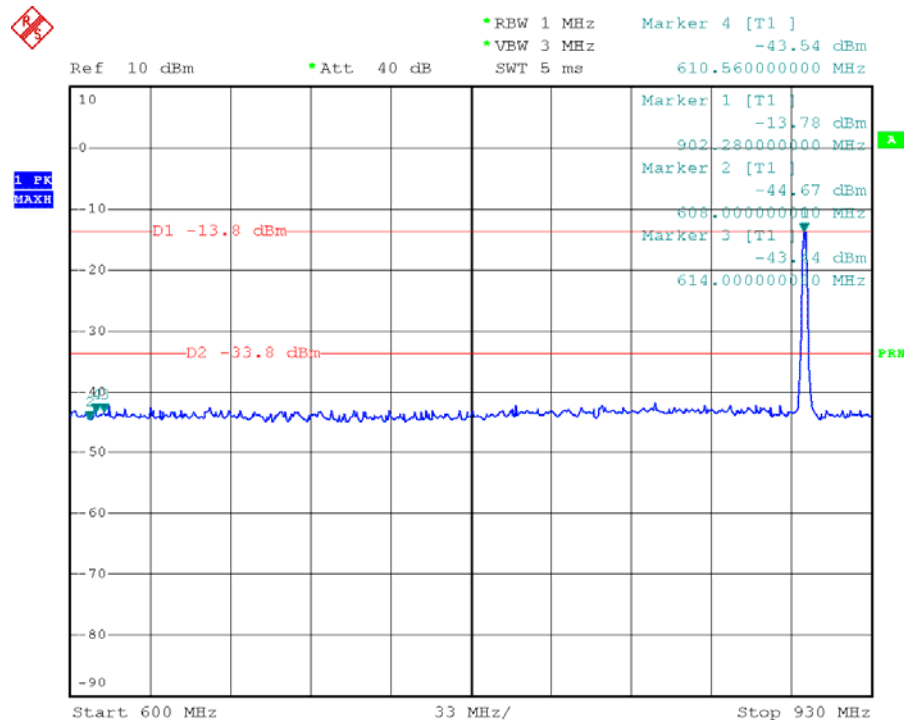
The band edge emission plot on page 60 shows 29.76dBc between carrier maximum power and local maximum emission in restrict band (610.56M Hz). The emission of carrier strength list in the test result of channel 0 at the item 4.2.7 is 50.86dBuV/m (Average), so the maximum field strength in restrict band is $50.86 - 29.76 = 21.10$ dBuV/m, which is under 54 dBuV/m limit.

NOTE 2:

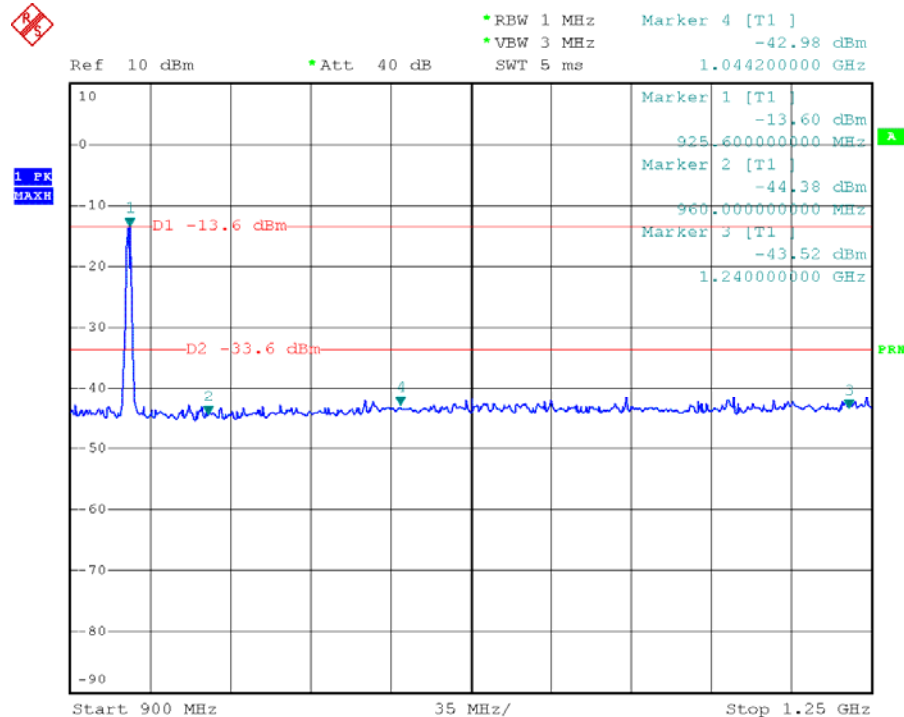
The band edge emission plot on page 60 shows 29.38dBc between carrier maximum power and local maximum emission in restrict band (1.0442GHz). The emission of carrier strength list in the test result of channel 49 at the item 4.2.7 is 83.63dBuV/m (Peak), so the maximum field strength in restrict band is $83.63 - 29.38 = 54.25$ dBuV/m, which is under 74 dBuV/m limit.

The band edge emission plot on page 60 shows 29.38dBc between carrier maximum power and local maximum emission in restrict band (1.0442GHz). The emission of carrier strength list in the test result of channel 78 at the item 4.2.7 is 53.63dBuV/m (Average), so the maximum field strength in restrict band is $53.63 - 29.38 = 24.25$ dBuV/m, which is under 54 dBuV/m limit.

Tx



Date: 18.JAN.2006 13:16:36



Date: 18.JAN.2006 13:21:19



4.9 ANTENNA REQUIREMENT

4.9.1 STANDARD APPLICABLE

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

4.9.2 ANTENNA CONNECTED CONSTRUCTION

The antenna used in this product is Helix antenna with SMA-K connector. The maximum gain of this antenna is 0.12dBi.

5 INFORMATION ON THE TESTING LABORATORIES

We, ADT (Shanghai) Corp., were founded in 2003 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

JAPAN	VCCI
USA	FCC, NVLAP, A2LA
Norway	DNV



Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: www.cnadt.com

If you have any comments, please feel free to contact us at the following:

ADT (Shanghai) Corporation

TEL :86-21-6465-9091

Fax : 86-21-6465-9092

Email: adtsh@vip.163.com

Web Site: www.cnadt.com



APPENDIX-A

MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.