



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 System Slave

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	PASS	Meet the requirement of limit. Minimum passing margin is – 4.14dB at 0.238MHz.
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 -0.42dB at 2698.08MHz
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 SLAVE
MODEL NO.	GPS050520
POWER SUPPLY	5Vdc from Battery
MODULATION TYPE	FHSS
CHANNEL CONTROL	Auto
ANTENNA GAIN	0.12 dBi
FREQUENCY RANGE	902.1MHZ-925.62MHz
NUMBER OF CHANNEL	50
OUTPUT POWER	-7.486 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.

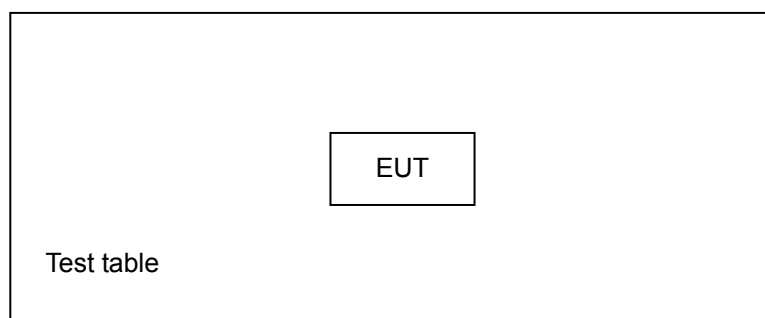
3.2 DESCRIPTION OF TEST MODES

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	√	√	√	√	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

POWER LINE CONDUCTED EMISSION TEST:

- ☒ 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	49	FHSS	IQ	1

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 (dBμV)	
	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 INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESCS30	E1R1002	Nov. 6, 2006
RF signal cable Woken	5D-FB	E1CBL09	Jan. 9, 2007
LISN ROHDE & SCHWARZ	ESH2-Z5	E1L1001	Jan. 20, 2007
LISN ROHDE & SCHWARZ	ESH3-Z5	E1L1002	Jan. 20, 2007
Software ADT	ADT_Cond_V3	NA	NA

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



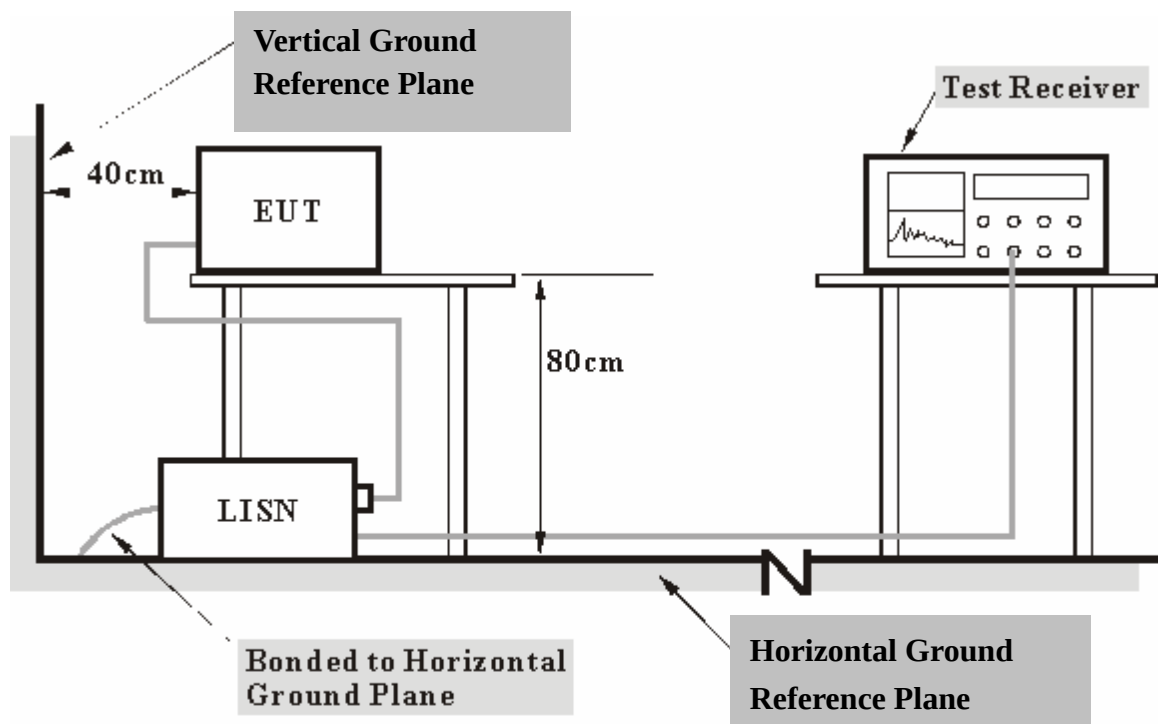
4.1.3 TEST PROCEDURES

- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150 kHz to 30MHz was searched. Emission levels under (Limit - 20dB) were not recorded.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

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

4.1.6 EUT OPERATING CONDITIONS

- Connect the EUT to a PC and place the EUT on a testing table.
- The PC ran a test program to enable EUT under transmission/receiving condition continuously at specific channel frequencies.

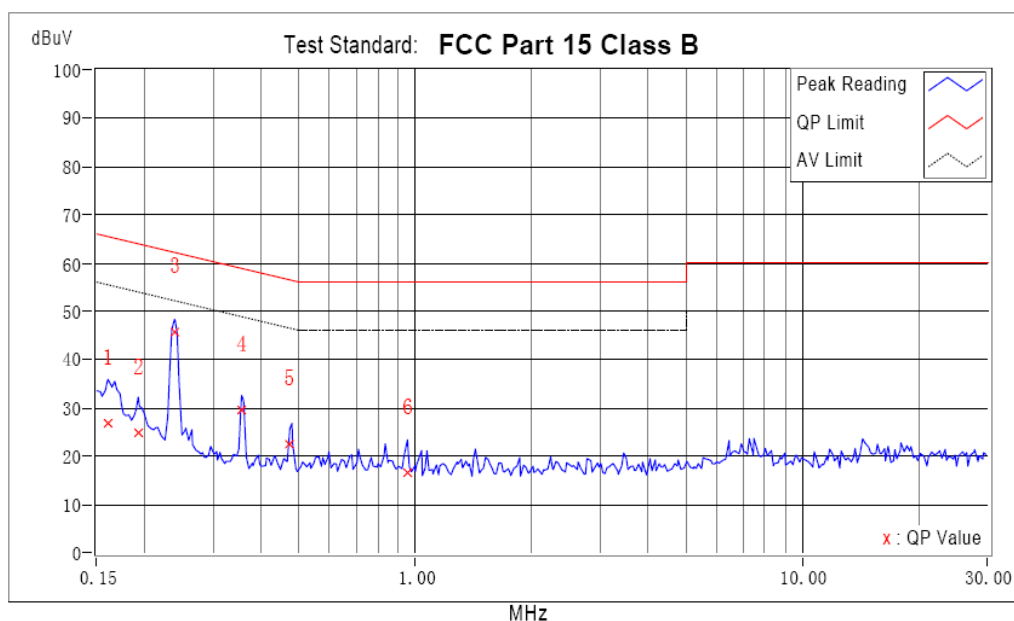
4.1.7 TEST RESULTS

CONDUCTED WORST CASE DATA: CHANNEL 49 FOR FHSS

EUT	GPS Wireless Clock System Slave	MEASUREMENT DETAIL	
MODEL	GPS050520	PHASE	Line 1
CHANNEL	Channel 49	6dB BANDWIDTH	9 kHz
MODULATION TYPE	FHSS	ENVIRONMENTAL CONDITIONS	20deg. C, 54%RH, 991hPa
TEST MODE	Rx	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TESTED BY	Bright		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.161	1.75	26.35	22.05	28.10	23.80	65.44	55.44	-37.33	-31.63
2	0.192	1.07	24.47	21.41	25.54	22.48	63.94	53.94	-38.40	-31.46
3	0.239	0.84	44.99	46.18	45.83	47.02	62.12	52.12	-16.29	-5.10
4	0.355	0.67	29.00	29.96	29.67	30.63	58.84	48.84	-29.16	-18.20
5	0.474	0.51	21.96	22.79	22.47	23.30	56.44	46.44	-33.97	-23.14
6	0.952	0.50	15.97	16.85	16.47	17.35	56.00	46.00	-39.53	-28.65

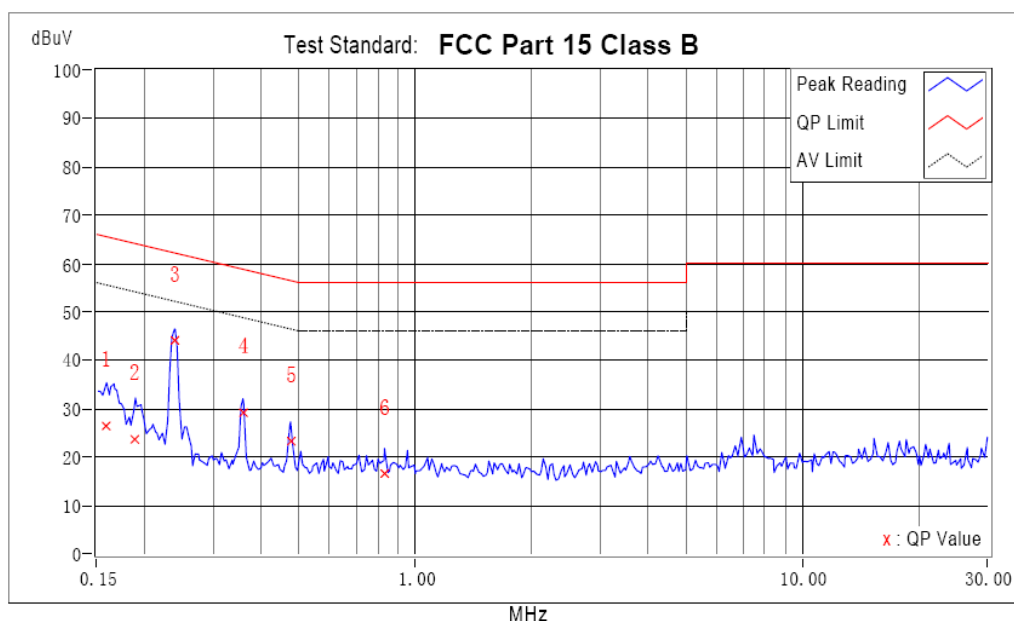
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



EUT	GPS Wireless Clock System Slave	MEASUREMENT DETAIL	
MODEL	GPS050520	PHASE	N
CHANNEL	Channel 49	6dB BANDWIDTH	9 kHz
MODULATION TYPE	FHSS	ENVIRONMENTAL CONDITIONS	20deg. C, 54%RH, 991hPa
TEST MODE	Rx	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TESTED BY	Bright		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.159	1.77	25.99	20.29	27.76	22.06	65.50	55.50	-37.74	-33.44
2	0.189	1.13	23.15	19.58	24.28	20.71	64.08	54.08	-39.79	-33.36
3	0.238	0.84	43.46	44.50	44.30	45.34	62.15	52.15	-17.85	-6.81
4	0.358	0.69	28.59	29.60	29.28	30.29	58.77	48.77	-29.50	-18.49
5	0.475	0.53	22.68	23.56	23.21	24.09	56.42	46.42	-33.21	-22.33
6	0.831	0.56	15.85	16.40	16.41	16.96	56.00	46.00	-39.59	-29.04

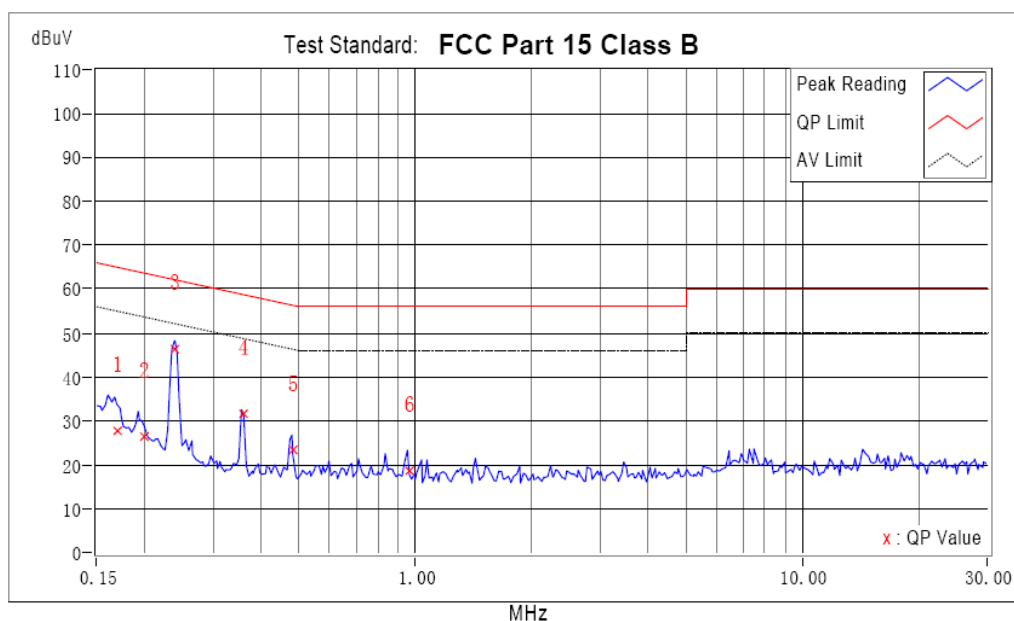
- REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



EUT	GPS Wireless Clock System Slave	MEASUREMENT DETAIL	
MODEL	GPS050520	PHASE	Line 1
CHANNEL	Channel 49	6dB BANDWIDTH	9 kHz
MODULATION TYPE	FHSS	ENVIRONMENTAL CONDITIONS	20deg. C, 54%RH, 991hPa
TEST MODE	Tx	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TESTED BY	Bright		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.171	1.53	27.01	24.05	28.54	25.58	64.93	54.93	-36.39	-29.35
2	0.200	0.90	25.97	25.41	26.87	26.31	63.60	53.60	-36.73	-27.29
3	0.238	0.84	45.89	47.18	46.73	48.02	62.16	52.16	-15.43	-4.14
4	0.359	0.67	31.00	30.96	31.67	31.63	58.75	48.75	-27.08	-17.12
5	0.480	0.50	22.96	21.29	23.46	21.79	56.33	46.33	-32.88	-24.55
6	0.962	0.51	17.97	15.85	18.48	16.36	56.00	46.00	-37.52	-29.64

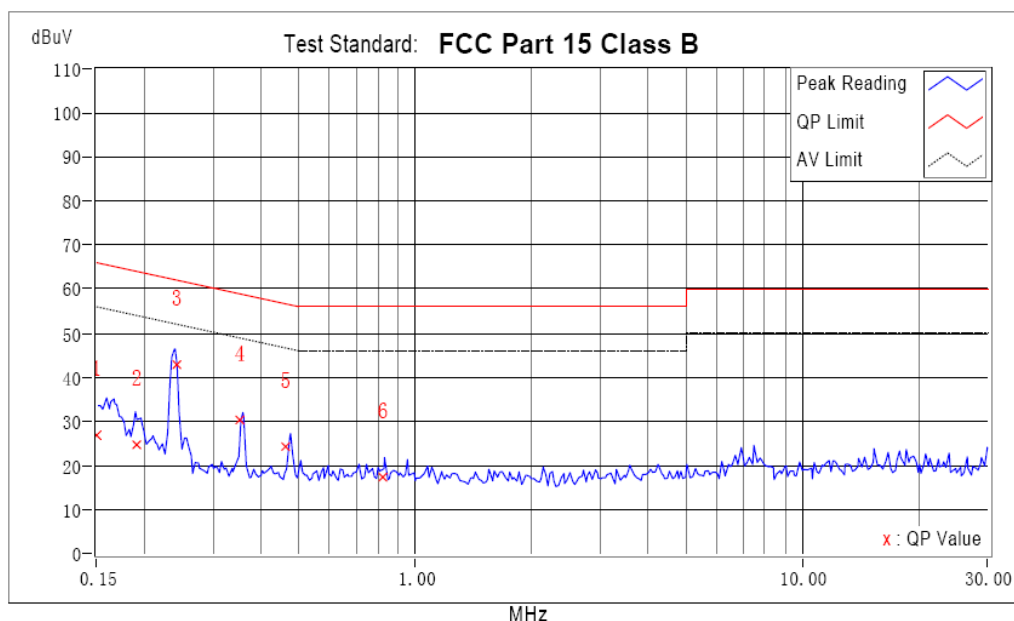
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



EUT	GPS Wireless Clock System Slave	MEASUREMENT DETAIL	
MODEL	GPS050520	PHASE	N
CHANNEL	Channel 49	6dB BANDWIDTH	9 kHz
MODULATION TYPE	FHSS	ENVIRONMENTAL CONDITIONS	20deg. C, 54%RH, 991hPa
TEST MODE	Tx	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TESTED BY	Bright		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	1.96	26.19	21.29	28.15	23.25	66.00	56.00	-37.85	-32.75
2	0.191	1.09	24.15	20.28	25.24	21.37	63.99	53.99	-38.75	-32.62
3	0.240	0.84	42.46	42.50	43.30	43.34	62.08	52.08	-18.78	-8.74
4	0.350	0.70	29.59	27.60	30.29	28.30	58.96	48.96	-28.68	-20.67
5	0.462	0.55	23.68	22.56	24.23	23.11	56.65	46.65	-32.41	-23.53
6	0.821	0.56	16.85	15.40	17.41	15.96	56.00	46.00	-38.59	-30.04

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.





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

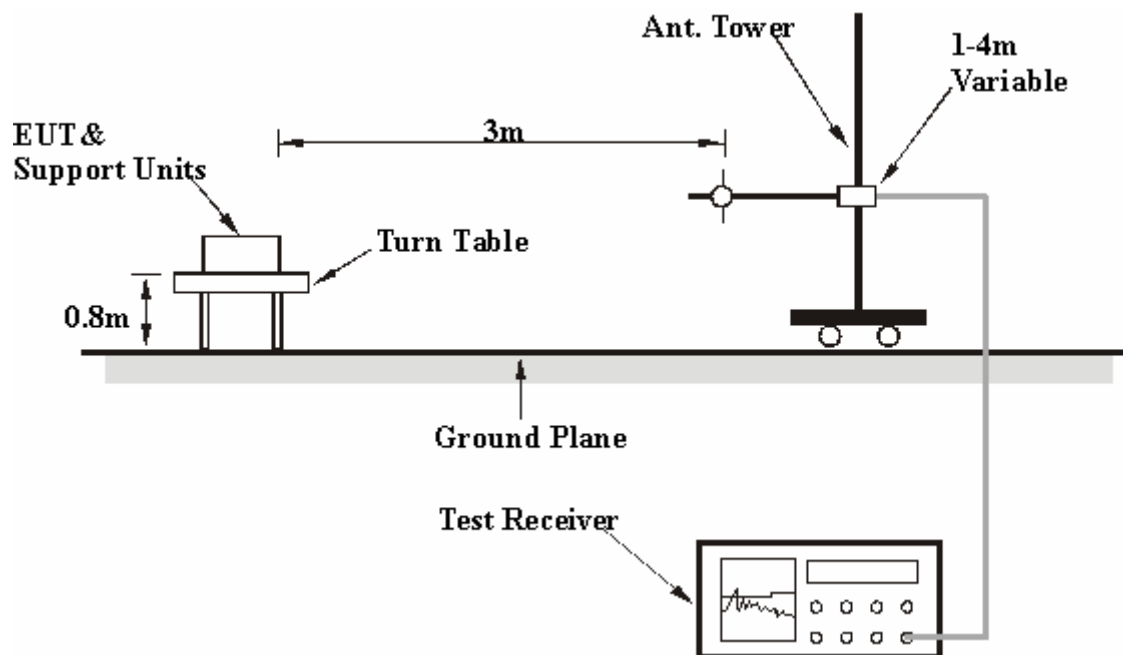
- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on 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(1)

EUT	GPS WIRELESS CLOCK SYSTEMS SLAVE	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	5Vdc 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	56.67 QP	15.01	-6.75	8.26	40	-31.74	200	279
2	156.68 QP	17.04	8.28	25.32	43.5	-18.18	198	324
3	278.25 QP	15.76	7.96	23.72	46	-22.28	100	338
4	408.30 QP	18.92	-6.60	12.32	46	-33.68	165	120
5	565.92 QP	22.42	-6.93	15.49	46	-30.51	141	231
6	733.25 QP	25.17	-7.16	18.01	46	-27.99	286	18

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	202.70 QP	13.00	9.22	22.21	43.5	-21.29	100	0
2	337.98 QP	17.31	-6.63	10.68	46	-35.32	100	55
3	451.95 QP	20.15	-6.65	13.50	46	-32.50	100	0
4	561.08 QP	22.31	-7.11	15.20	46	-30.80	100	195
5	682.33 QP	24.30	-7.25	17.04	46	-28.96	100	270
6	791.45 QP	25.75	-6.81	18.95	46	-27.05	100	343

- 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 SLAVE	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	5Vdc 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	1300.80PK	31.32	18.90	50.23	74	-23.77	101	43
1	1300.80AV	31.32	3.92	35.24	54	-18.76	101	43
2	2084.64PK	34.66	17.77	52.43	74	-21.57	125	65
2	2084.64AV	34.66	4.16	38.82	54	-15.18	125	65
3	2629.92PK	36.26	14.48	50.74	74	-23.26	232	32
3	2629.92AV	36.26	3.48	39.74	54	-14.26	232	32
4	5151.84PK	43.85	13.99	57.84	74	-16.16	231	54
4	5151.84AV	43.85	0.52	44.37	54	-9.63	231	54
5	5935.68PK	46.17	11.85	58.02	74	-15.98	176	154
5	5935.68AV	46.17	-1.59	44.58	54	-9.42	176	154
6	8014.56PK	53.09	12.03	65.12	74	-8.88	175	176
6	8014.56AV	53.09	-2.53	50.56	54	-3.44	175	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	1777.92PK	32.03	13.11	45.14	74	-28.86	165	65
1	1777.92AV	32.03	10.69	42.72	54	-11.28	165	65
2	2220.96PK	35.90	7.99	43.89	74	-30.11	124	53
2	2220.96AV	35.90	4.29	40.19	54	-13.81	124	53
3	3004.80PK	37.22	5.05	42.27	74	-31.73	176	14
3	3004.80AV	37.22	2.36	39.58	54	-14.42	176	14
4	3481.92PK	39.05	5.16	44.21	74	-29.79	225	60
4	3481.92AV	39.05	3.26	42.30	54	-11.70	225	60
5	5015.52PK	43.81	2.18	45.99	74	-28.01	276	87
5	5015.52AV	43.81	0.69	44.5	54	-9.5	276	87
6	5731.20PK	45.22	-0.01	45.21	74	-28.79	234	98
6	5731.20AV	45.22	-3.28	41.94	54	-12.06	234	98

- 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 SLAVE	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	5Vdc 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	46.98 QP	15.49	-7.34	8.16	40	-31.84	136	14
2	170.65 QP	16.01	4.79	20.80	43.5	-22.70	134	289
3	345.25 QP	17.41	-6.07	11.34	46	-34.66	145	178
4	483.48 QP	20.63	-6.60	14.03	46	-31.97	232	106
5	662.92 QP	24.04	-7.22	16.82	46	-29.18	328	24
6	801.15 QP	25.84	-6.63	19.21	46	-26.79	100	277
7	951.50 QP	27.81	-6.61	21.20	46	-24.80	100	258

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	39.70 QP	15.89	-6.96	8.93	40	-31.07	199	48
2	202.18 QP	12.99	1.4	14.38	43.5	-29.12	100	212
3	357.37 QP	17.68	-6.64	11.03	46	-34.97	100	280
4	473.77 QP	20.49	-6.39	14.1	46	-31.9	100	42
5	529.55 QP	21.52	-6.96	14.56	46	-31.44	100	349
6	587.75 QP	22.88	-6.97	15.91	46	-30.09	100	227
7	638.67 QP	23.76	-7.32	16.44	46	-29.56	100	349
8	718.70 QP	24.96	-7.28	17.68	46	-28.32	100	198

- 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 SLAVE	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	5Vdc 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	15.47	50.13	74	-23.87	154	157
1	2084.64AV	34.66	3.99	38.64	54	-15.36	154	157
2	2220.96PK	35.9	16.33	52.23	74	-21.77	187	304
2	2220.96AV	35.9	3.99	39.89	54	-14.11	187	304
3	3004.8PK	37.22	16.01	53.23	74	-20.77	243	21
3	3004.8AV	37.22	4.31	41.52	54	-12.48	243	21
4	3447.84PK	38.66	15.79	54.45	74	-19.55	154	158
4	3447.84AV	38.66	3.29	41.95	54	-12.05	154	158
5	3959.04PK	40.96	14.93	55.89	74	-18.11	254	198
5	3959.04AV	40.96	1.49	42.46	54	-11.54	254	198
6	7128.48PK	50.78	11.88	62.66	74	-11.34	135	218
6	7128.48AV	50.78	-0.71	50.07	54	-3.93	135	218



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	1812 PK	32.2	21.08	53.28	74	-20.72	327	158
1	1812 AV	32.2	9.03	41.23	54	-12.77	327	158
2	2220.96 PK	35.9	17.56	53.46	74	-20.53	281	318
2	2220.96 AV	35.9	4.17	40.07	54	-13.93	281	318
3	3481.92 PK	39.05	15.84	54.89	74	-19.11	154	167
3	3481.92 AV	39.05	3.37	42.42	54	-11.58	154	167
4	3993.12 PK	41.16	13.18	54.34	74	-19.66	200	15
4	3993.12 AV	41.16	0.76	41.92	54	-12.08	200	15
5	4981.44 PK	43.75	12.14	55.89	74	18.11	165	35
5	4981.44 AV	43.75	-0.01	43.73	54	-10.27	165	35
6	5151.84 PK	43.85	12.58	56.43	74	-17.57	254	19
6	5151.84 AV	43.85	0.52	44.37	54	-9.63	254	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.

EUT	GPS WIRELESS CLOCK SYSTEMS SLAVE	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	5Vdc 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	56.67 QP	15.01	-6.75	8.26	40	-31.74	154	299
2	202.75 QP	13	15.74	28.74	43.5	-14.76	189	332
3	393.75 QP	18.52	-6.63	11.9	46	-34.1	208	135
4	483.48 QP	20.63	-6.6	14.03	46	-31.97	232	51
5	650.8 QP	23.9	-7.36	16.54	46	-29.46	230	334
6	709 QP	24.76	-6.81	17.95	46	-28.05	318	12
7	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	202.18 QP	12.99	3.82	16.8	43.5	-26.7	100	102
2	333.12 QP	17.25	-6.51	10.74	46	-35.26	100	186
3	493.18 QP	20.77	-6.74	14.03	46	-31.97	100	259
4	604.73 QP	23.22	-6.95	16.27	46	-29.73	100	327
5	704.15 QP	24.66	-6.66	18	46	-28	100	240
6	822.98 QP	26.32	-7.68	18.63	46	-27.37	100	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.



EUT	GPS WIRELESS CLOCK SYSTEMS SLAVE	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	5Vdc 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	16.15	50.81	74	-23.19	108	36
1	2084.64AV	34.66	6.89	41.55	54	-12.45	108	36
2	2220.96PK	35.9	16.4	52.3	74	-21.7	154	19
2	2220.96AV	35.9	5.35	41.25	54	-12.75	154	19
3	3072.96PK	37.48	15.89	53.37	74	-20.63	351	57
3	3072.96AV	37.48	4	41.49	54	-12.51	351	57
4	3481.92PK	39.05	15.33	54.37	74	-19.63	294	168
4	3481.92AV	39.05	3.37	42.42	54	-11.58	294	168
5	3959.04PK	40.96	13.75	54.71	74	-19.29	168	35
5	3959.04AV	40.96	1.49	42.46	54	-11.54	168	35
6	5049.6 PK	43.82	11.56	55.38	74	-18.62	354	29
6	5049.6 AV	43.82	0.56	44.39	54	-9.61	354	29

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	20.73	53.17	74	-20.83	108	57
1	1846.08AV	32.44	6.12	38.56	54	-15.44	108	57
2	2220.96PK	35.9	18.54	54.44	74	-19.56	168	68
2	2220.96AV	35.9	4.14	40.04	54	-13.96	168	68
3	3481.92PK	39.05	15.47	54.51	74	-19.49	321	168
3	3481.92AV	39.05	3.37	42.42	54	-11.58	321	168
4	3959.04PK	40.96	13.56	54.53	74	-19.47	265	208
4	3959.04AV	40.96	1.37	42.33	54	-11.67	265	208
5	4981.44PK	43.75	12.09	55.83	74	-18.17	323	154
5	4981.44AV	43.75	-0.05	43.69	54	-10.31	323	154
6	5049.6PK	43.82	13.38	57.2	74	-16.8	365	106
6	5049.6AV	43.82	0.56	44.39	54	-9.61	365	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 SLAVE	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	5Vdc 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	63.95QP	14.07	-7.08	6.99	40	-33.01	140	159
2	148.82QP	16.88	-7.04	9.84	43.5	-33.66	195	139
3	274.93QP	15.66	-3.82	11.84	46	-34.16	182	339
4	432.55QP	19.67	-6.68	13	46	-33	348	268
5	619.27QP	23.49	-6.8	16.69	46	-29.31	182	173
6	742.95QP	25.26	-6.9	18.36	46	-27.64	313	265
7*	903PK	27.28	53.57	96.80			258	65
7*	903AV	27.28	44.7	87.93			258	65

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	68.8QP	13.2	-6.93	6.26	40	-33.74	100	114
2	204.6QP	13.03	5.5	18.53	43.5	-24.97	100	350
3	367.07QP	17.95	-6.69	11.26	46	-34.74	100	110
4	454.37QP	20.19	-6.99	13.2	46	-32.8	100	7
5	616.85QP	23.45	-6.77	16.68	46	-29.32	100	181
6	769.62QP	25.56	-6.84	18.71	46	-27.29	100	321
7*	903PK	27.28	45.24	88.43			100	56
7*	903AV	27.28	36.37	79.56			100	56

- 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 SLAVE	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	5Vdc 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	18.54	50.11	74	-23.89	100	193
1	1368.96AV	31.57	7.48	39.05	54	-14.95	100	193
2	1777.92PK	32.03	29.91	61.94			200	0
2	1777.92AV	32.03	21.04	53.07			200	0
3	2220.96PK	35.9	15.1	51.00	74	-23.00	100	98
3	2220.96AV	35.9	4.3	40.2	54	-13.8	100	98
4	3072.96AV	37.48	4.12	41.61	54	-12.39	201	4
5	3584.16AV	39.93	2.47	42.4	54	-11.6	100	156
6	4504.32PK	43.25	16.12	59.37	74	-14.63	142	0
6	4504.32AV	43.25	7.25	50.5	54	-3.5	142	0
7	5117.76PK	43.84	13.54	57.38	74	-16.62	100	252
8	5117.76AV	43.84	0.54	44.39	54	-9.61	154	26
9	5356.32PK	44	11.54	55.54	74	-18.46	100	236
10	5356.32AV	44	-1.76	42.24	54	-11.76	199	178
11	5935.68AV	46.17	-1.64	44.53	54	-9.47	100	128



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	1334.88PK	31.42	19.74	51.16	74	-22.84	120	1
1	1334.88AV	31.42	8.25	39.67	54	-14.33	120	1
2	1777.92PK	32.03	34.47	66.5			127	23
2	1777.92AV	32.03	25.6	57.63			127	23
3	2698.08PK	36.19	26.26	62.45	74	-11.55	100	68
3	2698.08AV	36.19	17.39	53.58	54	-0.42	100	68
4	3107.04PK	37.59	16.33	53.93	74	-20.07	100	354
5	3584.16PK	39.93	18.35	58.28			100	268
5	3584.16AV	39.93	9.48	49.41			100	268
6	3959.04PK	40.96	13.83	54.79	74	-19.21	100	157
7	3959.04AV	40.96	1.37	42.33	54	-11.67	231	15
8	4504.32PK	43.25	15.06	58.31	74	-15.69	100	246
9	4504.32AV	43.25	0.24	43.48	54	-10.52	200	16
10	5015.52PK	43.81	8.67	52.48	74	-21.52	200	64
10	5015.52AV	43.81	0.35	44.16	54	-9.84	200	64
11	5526.72AV	44.4	-2.47	41.92	54	-12.08	200	345
12	5935.68AV	46.17	-1.43	44.74	54	-9.26	200	274
13	6617.28PK	48.79	11.73	60.53	74	-13.47	100	196
14	6617.28AV	48.79	-1.68	47.12	54	-6.88	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 SLAVE	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	5Vdc 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	71.22	12.81	-7.3	5.51	40	-34.49	325	14
2	274.93	15.66	-6.61	9.05	46	-36.95	232	296
3	391.32	18.48	-6.84	11.63	46	-34.37	349	160
4	565.92	22.42	-6.75	15.67	46	-30.33	228	66
5	704.15	24.66	-6.52	18.14	46	-27.86	189	83
6	801.15	25.84	-6.67	19.17	46	-26.83	270	15
7*	912.7	27.46	54.99	98.40			165	98
7*	912.7	27.46	46.12	89.53			165	98

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	148.82	16.88	1.95	18.83	43.5	-24.67	100	337
2	267.65	15.41	-6.59	8.82	46	-37.18	100	203
3	371.93	18.08	-6.91	11.17	46	-34.83	100	130
4	456.8	20.23	-7	13.22	46	-32.78	100	310
5	592.6	22.98	-6.6	16.38	46	-29.62	100	244
6	769.62	25.56	-6.8	18.75	46	-27.25	100	228
7*	912.7	27.46	44.08	87.51			100	205
7*	912.7	27.46	35.21	78.64			100	205

- 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 SLAVE	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	5Vdc 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	18.98	50.53	74	-23.47	100	20
1	1437.12AV	31.55	7.13	38.68	54	-15.32	100	20
2	1812PK	32.2	32.27	64.47			100	120
2	1812AV	32.2	23.4	55.6			100	120
3	2323.2PK	36.04	16.11	52.15	74	-21.85	100	260
3	2323.2AV	36.04	4.38	40.42	54	-13.58	100	260
4	2732.16PK	36.41	25.25	61.66	74	-12.34	100	203
4	2732.16AV	36.41	16.38	52.79	54	-1.21	100	203
5	3072.96AV	37.48	4.04	41.52	54	-12.48	200	119
6	3652.32PK	40.04	15.73	55.77	74	-18.23	100	108
6	3652.32AV	40.04	1.97	42	54	-12	215	319
7	4538.4PK	43.36	16.3	59.66	74	-14.34	100	130
7	4538.4AV	43.36	7.43	50.79	54	-3.21	100	130
8	5867.52PK	45.85	10.46	56.31	74	-17.69	100	280
9	5867.52AV	45.85	-1.73	44.11	54	-9.89	200	159
10	6276.48AV	47.05	-1.89	45.16	54	-8.84	200	136
11	6617.28AV	48.79	-1.45	47.35	54	-6.65	200	19



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	1334.88PK	31.42	19.8	51.23	74	-22.77	200	48
1	1334.88AV	31.42	8.71	40.13	54	-13.87	200	48
2	1812PK	32.2	34.39	66.59			215	135
2	1812AV	32.2	25.52	57.72			215	135
3	2255.04PK	35.94	16.8	52.74	74	-21.26	165	19
3	2255.04AV	35.94	3.83	39.76	54	-14.24	165	19
4	2732.16PK	36.41	24.95	61.36	74	-12.46	230	23
4	2732.16AV	36.41	18.08	52.49	54	-1.51	230	23
5	3107.04AV	37.59	3.51	41.11	54	-12.89	280	19
6	3652.32PK	40.04	18.28	58.32	74	-15.68	289	156
6	3652.32AV	40.04	9.41	49.45	54	-4.55	289	156
7	4538.4PK	43.36	15.5	58.86	74	-15.14	100	145
7	4538.4AV	43.36	6.63	49.99	54	-4.01	100	145
8	5117.76PK	43.84	9.5	53.34	74	-20.66	300	49
8	5117.76AV	43.84	0.5	44.35	54	-9.65	300	49
9	6208.32AV	46.74	-1.92	44.82	54	-9.18	120	219
10	6651.36PK	48.79	11.41	60.2	74	-13.8	290	158
11	6651.36AV	48.79	-1.45	47.34	54	-6.66	167	201

- 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 SLAVE	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	5Vdc 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	51.83QP	15.34	-7.45	7.89	40	-32.11	181	18
2	148.82QP	16.88	-4.75	12.13	43.5	-31.37	199	104
3	277.35QP	15.74	-5.13	10.61	46	-35.39	149	174
4	386.48QP	18.39	-6.78	11.61	46	-34.39	229	243
5	473.77QP	20.49	-6.71	13.78	46	-32.22	320	318
6	587.75QP	22.88	-6.52	16.36	46	-29.64	99	66
7*	927.25PK	27.69	55.94	99.33			105	78
7*	927.25AV	27.69	47.07	80.46			105	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	59.1QP	14.84	-7.51	7.33	40	-32.67	100	104
2	221.57QP	13.96	2.98	16.93	46	-29.07	100	292
3	318.57QP	16.99	-6.77	10.22	46	-35.78	100	193
4	524.7QP	21.39	-6.54	14.85	46	-31.15	100	338
5	648.37QP	23.87	-6.95	16.92	46	-29.08	100	305
6	781.75QP	25.67	-6.75	18.92	46	-27.08	100	215
7*	927.25PK	27.69	45.52	89.51			100	68
7*	927.25AV	27.69	36.65	80.64			100	68

- 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 SLAVE	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	5Vdc 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	1334.88PK	31.42	19.88	51.31	74	-22.69	156	196
1	1334.88AV	31.42	9.13	40.55	54	-13.45	156	196
2	1846.08PK	32.44	30.5	62.94			100	149
2	1846.08AV	32.44	21.63	54.07			100	149
3	2255.04PK	35.94	15.83	51.77	74	-22.23	278	19
3	2255.04AV	35.94	3.66	39.59	54	-14.41	278	19
4	2766.24PK	36.64	24.02	60.66	74	-13.34	100	198
4	2766.24AV	36.64	15.15	51.79	54	-2.21	100	198
5	3686.4PK	40.03	15.55	55.58	74	-18.42	189	193
5	3686.4AV	40.03	1.96	41.99	54	-12.01	399	19
6	4606.56PK	43.55	16.07	59.62	74	-14.38	126	156
6	4606.56AV	43.55	7.2	50.75	54	-3.25	126	156
7	6276.48PK	47.05	10.49	57.54	74	-16.46	190	159
7	6276.48AV	47.05	-1.89	45.16	54	-8.84	200	136

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	26.42	38.47	74	-15.53	199	15
1	1437.12AV	31.55	6.91	38.47	54	-15.53	199	15
2	1846.08PK	32.44	33.36	65.81			200	23
2	1846.08AV	32.44	24.49	57.04			200	78
3	2220.96PK	35.9	19.13	55.03	74	-18.97	199	89
3	2220.96AV	35.9	3.98	39.88	54	-14.12	199	89
4	2766.24PK	36.64	25.33	61.97	74	-12.03	200	159
4	2766.24AV	36.64	16.46	53.1	54	-0.9	200	159
5	3141.12AV	37.61	2.42	40.03	54	-13.97	299	168
6	3686.4PK	40.03	11.19	51.22	74	-22.78	399	19
6	3686.4AV	40.03	1.96	41.99	54	-12.01	399	19
7	4606.56PK	43.55	15.72	59.27	74	-14.73	200	234
7	4606.56AV	43.55	6.95	50.4	54	-3.6	200	234
8	5049.6PK	43.82	9.13	53.00	74	-21.00	199	186
8	5049.6AV	43.82	0.29	44.11	54	-9.89	199	186
9	5356.32PK	44	7.68	51.68	74	-22.32	199	178
9	5356.32AV	44	-1.76	42.24	54	-11.76	199	178
10	5799.36AV	45.53	-1.73	43.8	54	-10.2	299	219
11	7060.32AV	50.59	-1.18	49.42	54	-4.58	399	43

- 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.

4.2.8 TEST RESULTS(2)

Connected with PC

RADIATED WORST CASE DATA: CHANNEL 49 FOR FHSS

EUT	GPS WIRELESS CLOCK SYSTEMS SLAVE	MEASUREMENT DETAIL	
MODEL	GPS050520	FREQUENCY RANGE	Below 1000MHz
CHANNEL	Channel 49	DETECTOR FUNCTION	Quasi-Peak
MODULATION TYPE	FHSS	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 1001hPa
TEST MODE	Rx	INPUT POWER	5Vdc 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	34.98	15.26	15.14	30.4	40	-9.6	275	138
2	90.95	11.85	16.96	28.8	40	-11.2	222	63
3	121.6	14.86	13.82	28.68	40	-11.32	315	327
4	156.45	17.03	12.31	29.34	40	-10.66	263	0
5	229.09	14.47	16.38	30.85	40	-9.15	121	339
6	850.04	26.12	8.2	34.32	47	-12.68	130	216

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	36.42	15.45	16.71	32.16	40	-7.84	100	56
2	76.03	12.12	8.62	20.74	40	-19.26	146	328
3	104.75	13.04	20.28	33.31	40	-6.69	109	221
4	150	16.97	10.29	27.26	40	-12.74	99	228
5	229.09	14.47	15.21	29.68	40	-10.32	126	175
6	767.95	25.54	7.07	32.61	47	-14.39	100	323

- 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 SLAVE	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	5Vdc 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	2220.96PK	35.9	16.87	52.77	74	-21.23	130	309
2	2220.96AV	35.9	4.34	41.56	54	-12.44	130	309
3	4981.44PK	43.75	10.35	54.10	74	-19.90	157	267
3	4981.44AV	43.75	-0.01	43.74	54	-10.26	157	267
4	5867.52PK	45.85	11.67	57.52	74	-16.48	168	328
4	5867.52AV	45.85	-1.73	44.11	54	-9.89	200	159
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
6	7128.48PK	50.78	3.98	50.07	74	-19.24	135	357
6	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	2220.96PK	35.9	17.69	53.59	74	-20.41	208	119
1	2220.96AV	35.9	4.18	40.08	54	-13.92	208	119
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	3652.32PK	40.04	10.97	51.01	74	-22.99	215	319
3	3652.32AV	40.04	1.97	42	54	-12	215	319
4	3959.04PK	40.96	8.33	49.29	74	-24.71	249	9
4	3959.04AV	40.96	1.33	42.3	54	-11.7	249	9
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	8048.64PK	53.07	11.34	64.41	74	-9.59	100	31
6	8048.64AV	53.07	-1.32	51.75	54	-2.25	100	31

- 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 SLAVE	MEASUREMENT DETAIL	
MODEL	GPS050520	FREQUENCY RANGE	Below 1000MHz
CHANNEL	Channel 49	DETECTOR FUNCTION	Quasi-Peak
MODULATION TYPE	FHSS	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 1001hPa
TEST MODE	Tx	INPUT POWER	5Vdc 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	96.14	12.25	17	29.25	40	-10.75	228	100
2	180.05	14.63	15.88	30.52	40	-9.48	150	233
3	229.09	14.47	16.69	31.16	40	-8.84	124	350
4	232.75	14.59	23.83	38.42	47	-8.58	139	81
5	286.37	16.07	22.69	38.77	47	-8.23	119	88
6	750.03	25.33	13.14	38.47	47	-8.53	103	174
7*	927.25PK	27.69	71.89	99.58			105	78
7*	927.25AV	27.69	63.02	90.71			105	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	43.77	15.61	12.38	27.99	40	-12.01	100	175
2	180.05	14.63	16.74	31.38	40	-8.62	100	305
3	229.1	14.47	13.32	27.79	40	-12.21	134	180
4	232.75	14.59	17.06	31.65	47	-15.35	99	169
5	780.02	25.66	-2.61	23.05	47	-23.95	150	139
6	932.73	27.72	3.68	31.4	47	-15.6	129	136
7*	927.25PK	27.69	62.19	89.88			100	68
7*	927.25AV	27.69	53.32	81.01			100	68

- 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 SLAVE	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	5Vdc 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	1334.88PK	31.42	19.88	51.31	74	-22.69	156	196
1	1334.88AV	31.42	9.13	40.55	54	-13.45	156	196
2	1846.08PK	32.44	30.01	62.45			123	256
2	1846.08AV	32.44	21.14	53.58			123	256
3	2255.04PK	35.94	15.83	51.77	74	-22.23	278	19
3	2255.04AV	35.94	3.66	39.59	54	-14.41	278	19
4	2766.24PK	36.64	24.02	60.66	74	-13.34	100	198
4	2766.24AV	36.64	15.15	51.79	54	-2.21	100	198
5	3686.4PK	40.03	15.55	55.58	74	-18.42	189	193
5	3686.4AV	40.03	1.96	41.99	54	-12.01	399	19
6	4606.56PK	43.55	16.07	59.62	74	-14.38	126	156
6	4606.56AV	43.55	7.2	50.75	54	-3.25	126	156
7	6276.48PK	47.05	10.49	57.54	74	-16.46	190	159
7	6276.48AV	47.05	-1.89	45.16	54	-8.84	200	136



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	26.42	38.47	74	-15.53	199	15
1	1437.12AV	31.55	6.91	38.47	54	-15.53	199	15
2	1846.08PK	32.44	33.05	65.49			250	283
2	1846.08AV	32.44	24.18	56.62			250	283
3	2220.96PK	35.9	19.13	55.03	74	-18.97	199	89
3	2220.96AV	35.9	3.98	39.88	54	-14.12	199	89
4	2766.24PK	36.64	24.78	61.42	74	-12.58	165	248
4	2766.24AV	36.64	15.91	52.55	54	-1.45	165	248
5	3141.12AV	37.61	2.42	40.03	54	-13.97	299	168
6	3686.4PK	40.03	11.19	51.22	74	-22.78	399	19
6	3686.4AV	40.03	1.96	41.99	54	-12.01	399	19
7	4606.56PK	43.55	15.72	59.44	74	-14.56	167	24
7	4606.56AV	43.55	7.02	50.57	54	-3.43	167	24
8	5049.6PK	43.82	9.13	53.00	74	-21.00	199	186
8	5049.6AV	43.82	0.29	44.11	54	-9.89	199	186
9	5356.32PK	44	7.68	51.68	74	-22.32	199	178
9	5356.32AV	44	-1.76	42.24	54	-11.76	199	178
10	5799.36AV	45.53	-1.73	43.8	54	-10.2	299	219
11	7060.32AV	50.59	-1.18	49.42	54	-4.58	399	43

- 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.

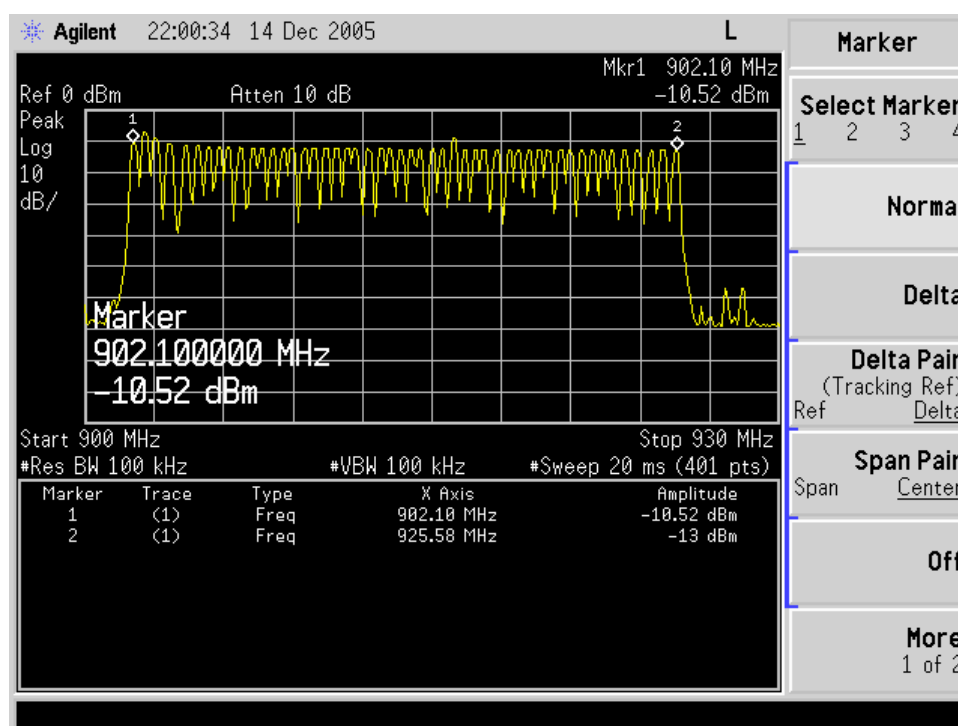
4.3.5 TEST SETUP



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

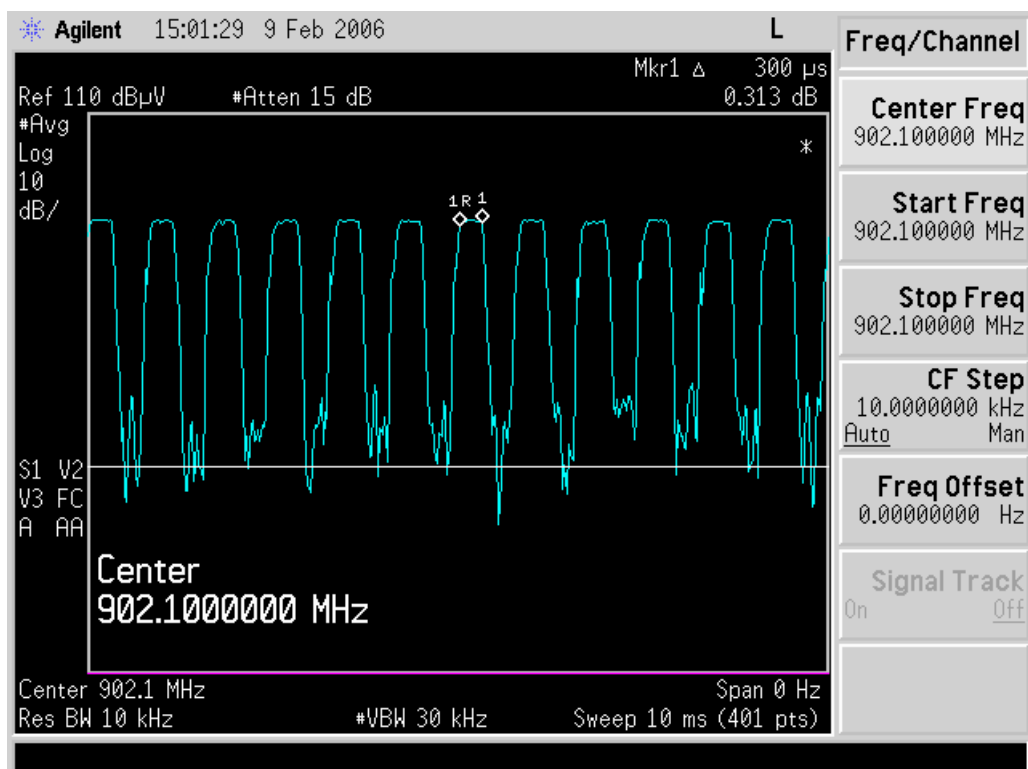
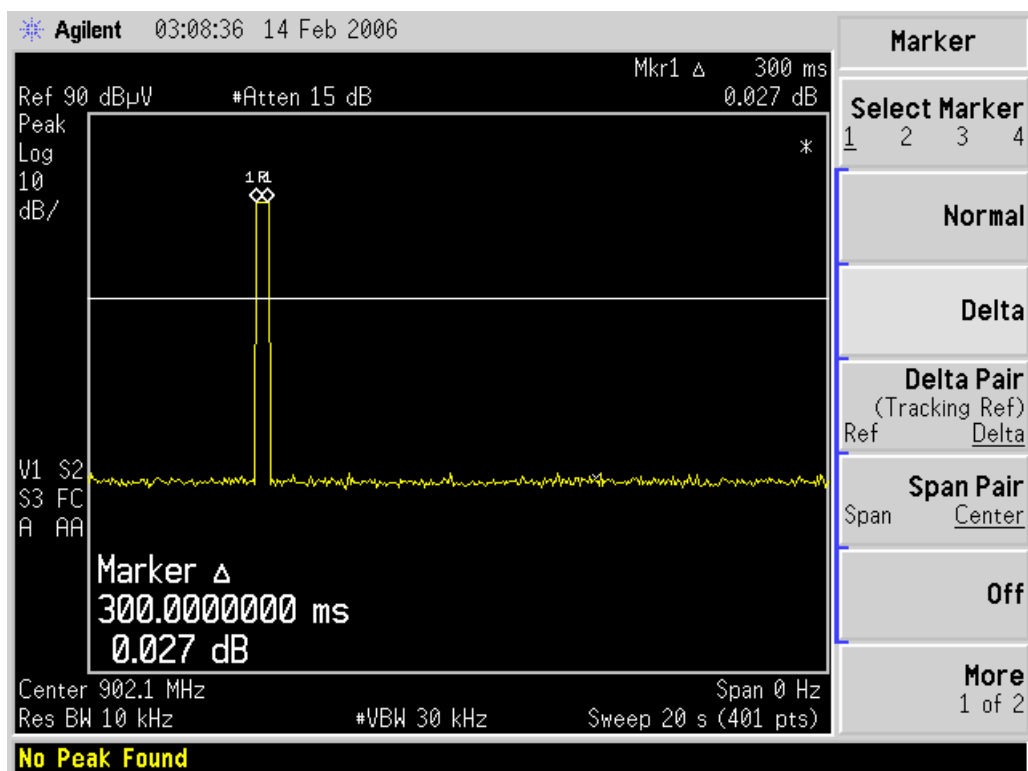
EUT	GPS WIRELESS CLOCK SYSTEMS SLAVE	MODEL	GPS050520
MODULATION TYPE	FHSS	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 1001Hpa
INPUT POWER	5Vdc from battery	TESTED BY	Bright Tong

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

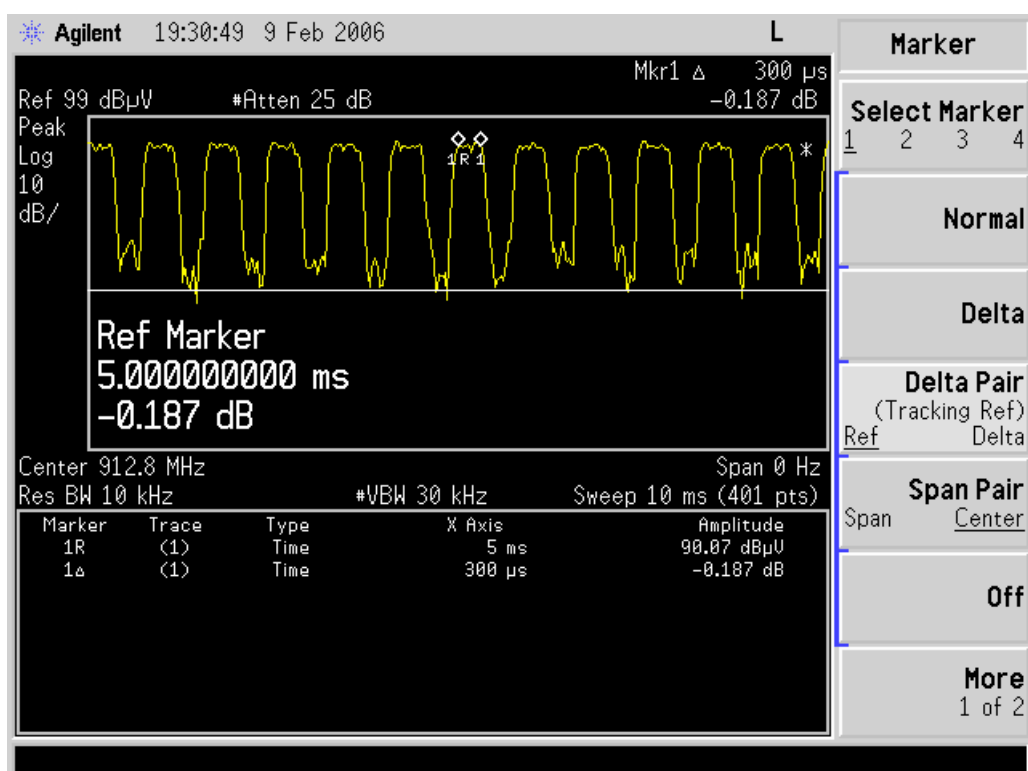
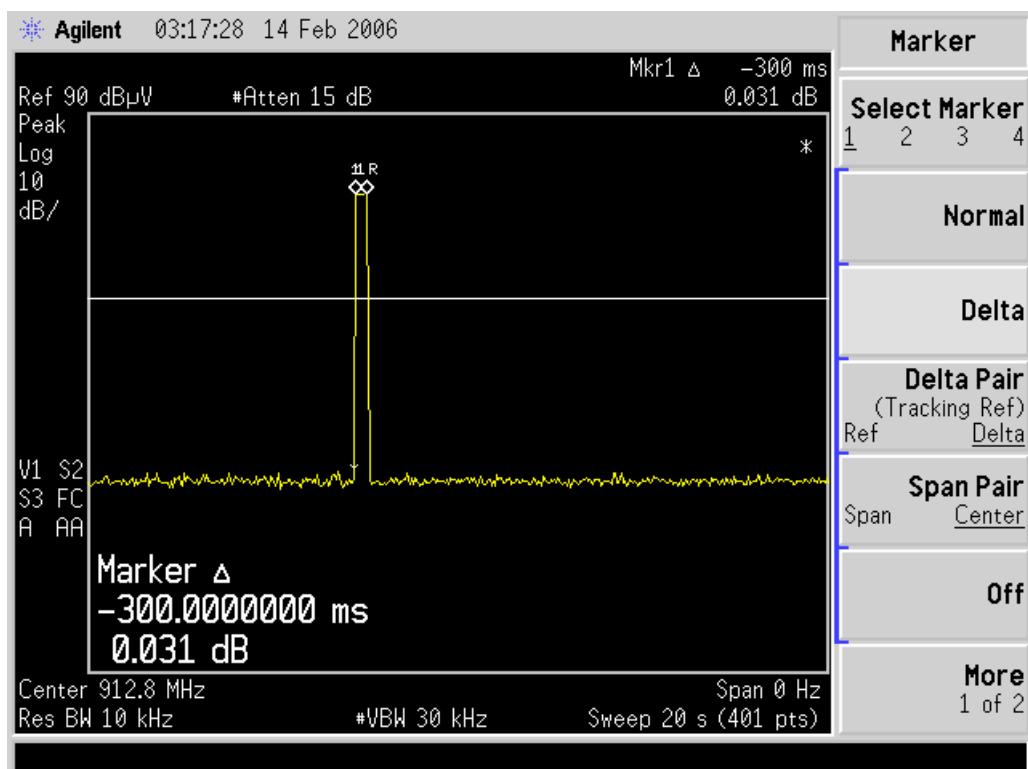
NOTE: Test plots of the transmitting time slot are shown on next 6 images.



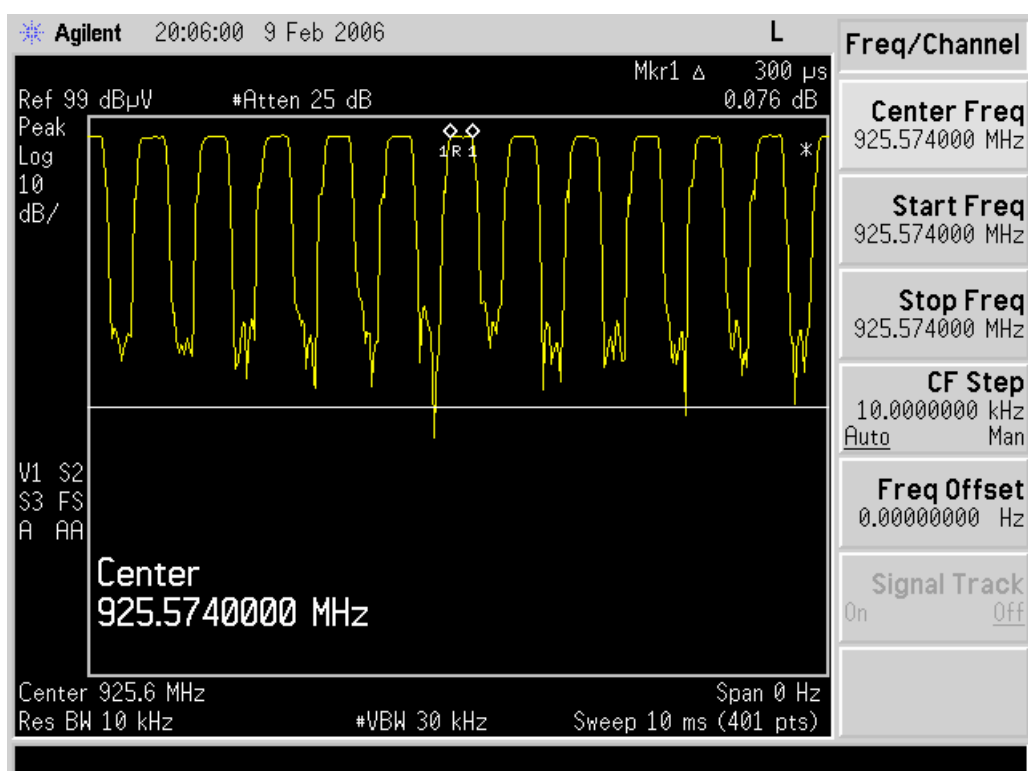
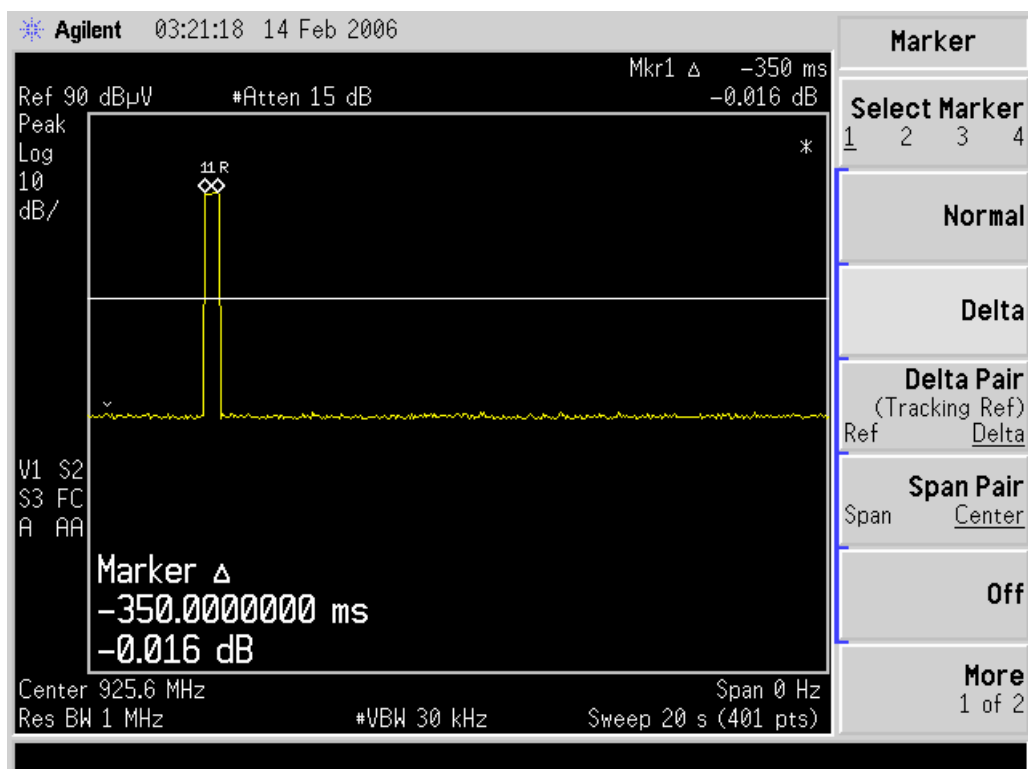
CH0



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.

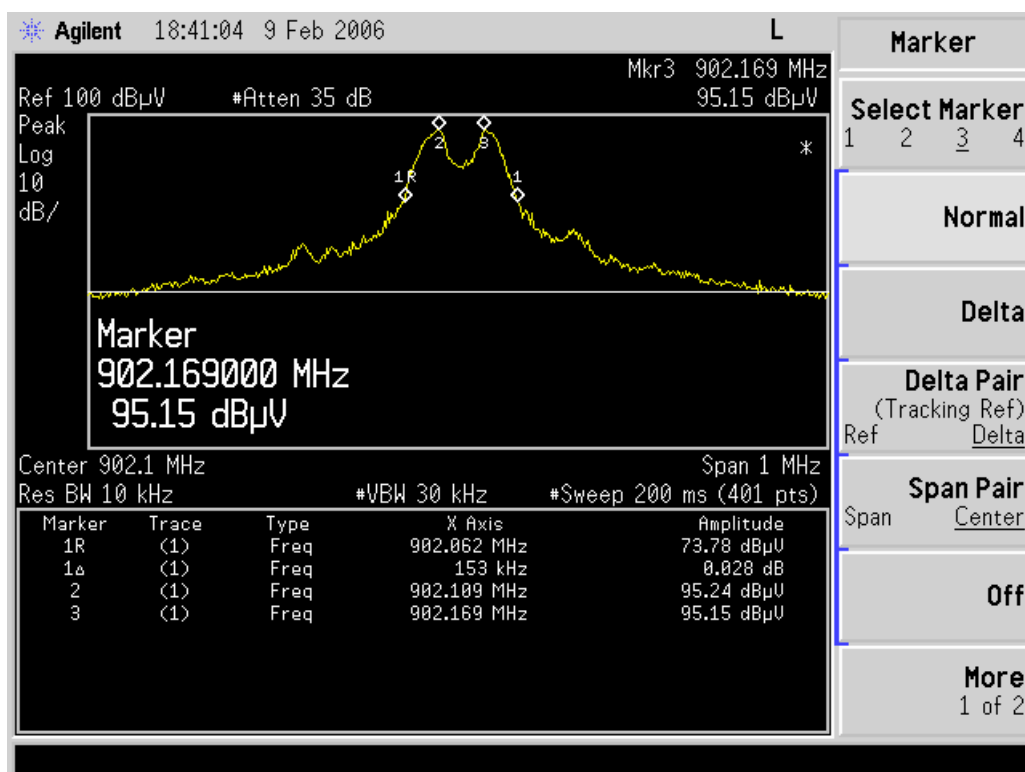
4.5.7 TEST RESULTS

EUT	GPS WIRELESS CLOCK SYSTEMS SLAVE	MODEL	GPS050520
MODULATION TYPE	FHSS	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 1001Hpa
INPUT POWER	5Vdc from battery	TESTED BY	Bright Tong

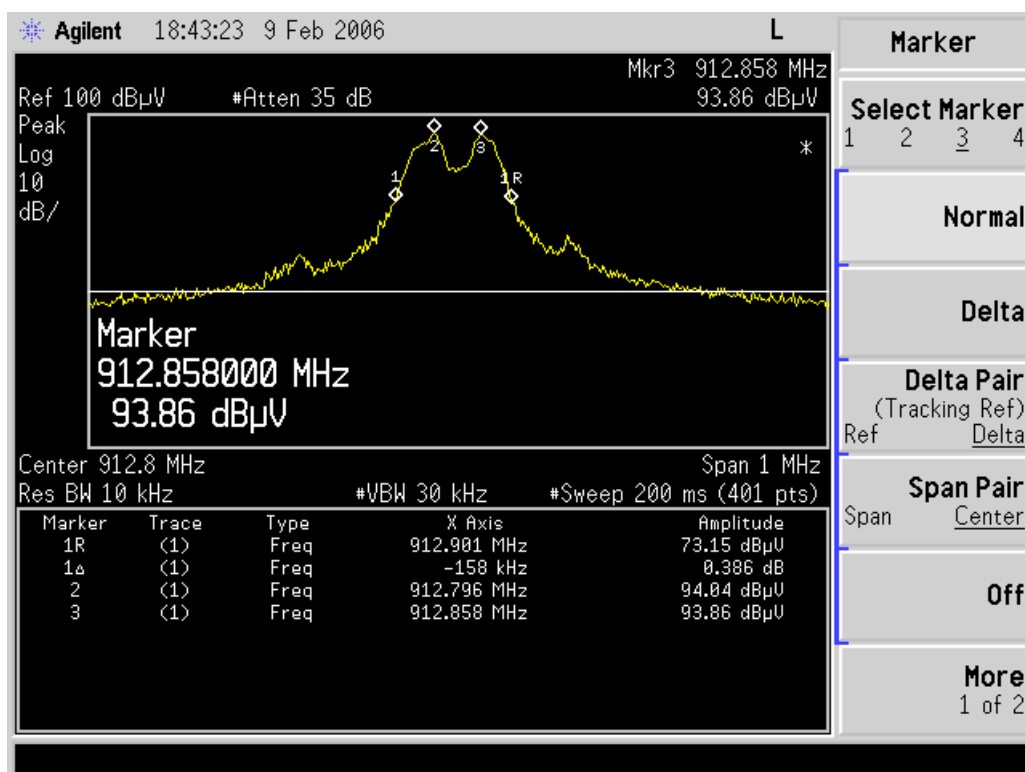
Tx

CHANNEL	CHANNEL FREQUENCY (MHz)	20dB BANDWIDTH (MHz)	MAXIMUM LIMIT (MHz)
0	902.1	0.153	0.25
23	913.14	0.158	0.25
49	925.62	0.165	0.25

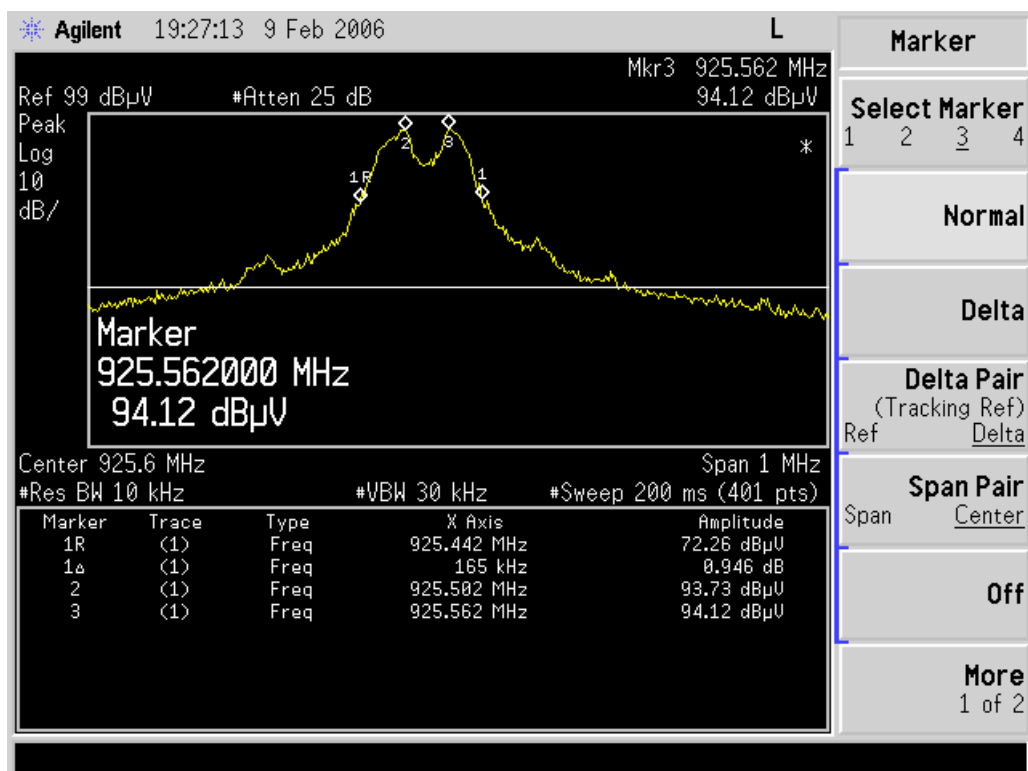
CH 0(Tx)



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

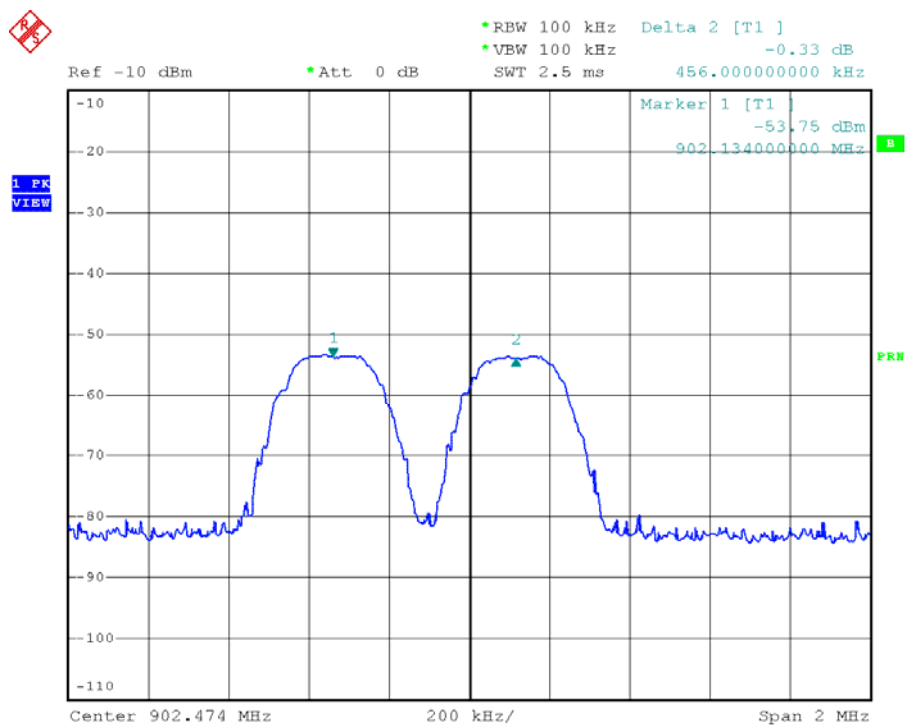
EUT	GPS WIRELESS CLOCK SYSTEMS SLAVE	MODEL	GPS050520
MODULATION TYPE	FHSS	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 1001Hpa
INPUT POWER	5Vdc from battery	TESTED BY	Bright Tong

Tx

CHANNEL	FREQUENCY (MHz)	ADJACENT CHANNEL SEPARATION (MHz)	20dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
0	902.1	0.456	0.153	0.153	PASS
23	913.14	0.378	0.158	0.158	PASS
49	925.62	0.552	0.165	0.165	PASS

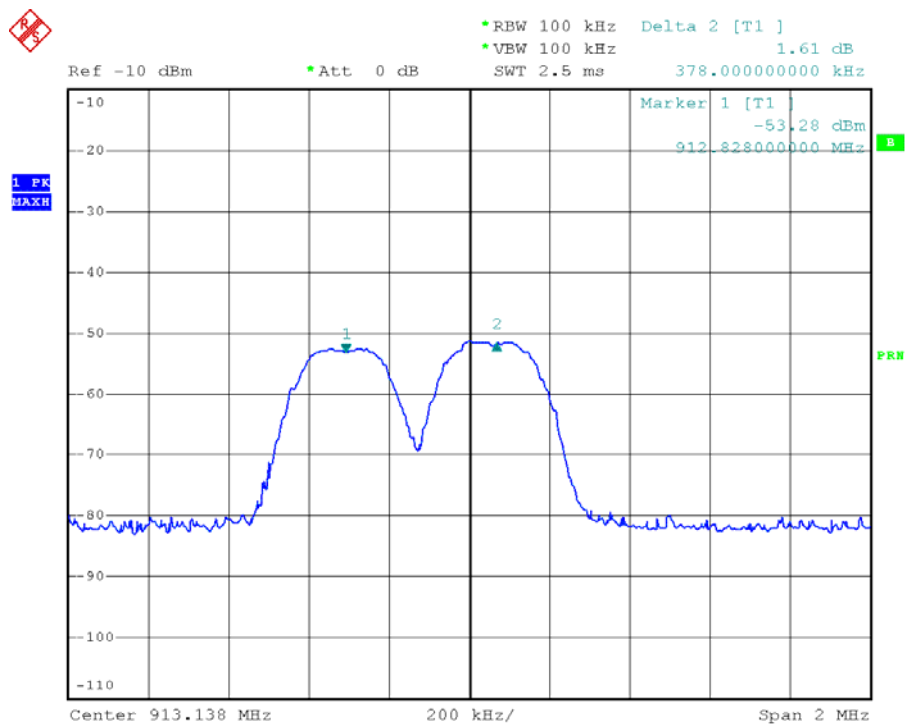
NOTE: The minimum limit is 20dB bandwidth. Test results please refer to next pages.

CH 0(TX)



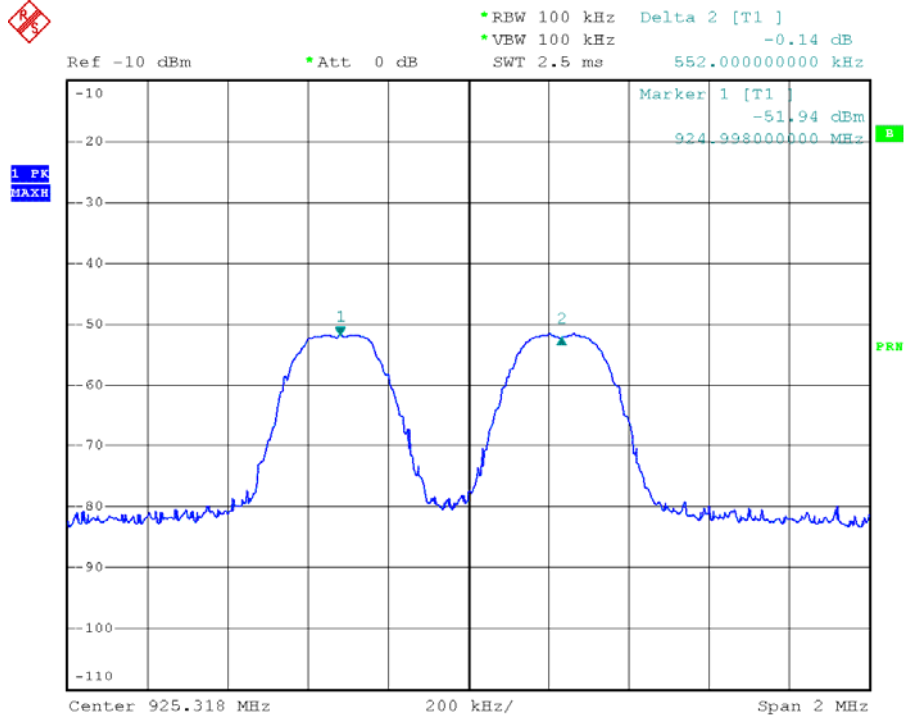
Date: 17.JAN.2006 14:05:24

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.

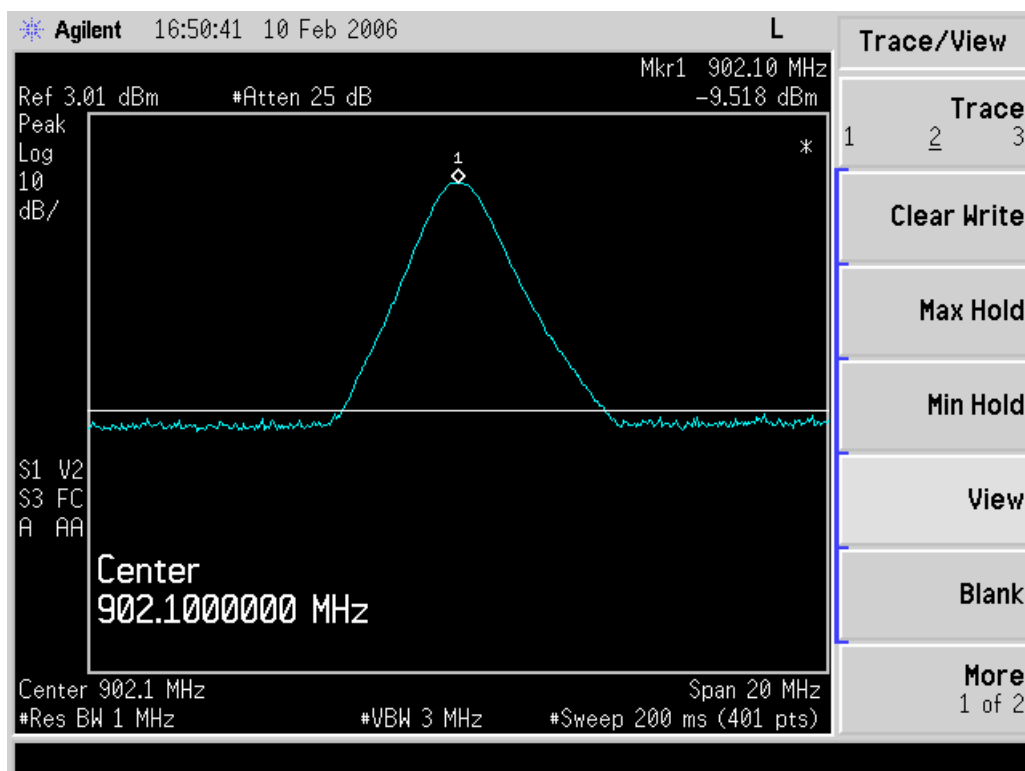
4.7.7 TEST RESULTS

EUT	GPS WIRELESS CLOCK SYSTEMS SLAVE	MODEL	GPS050520
MODULATION TYPE	FHSS	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 1001Hpa
INPUT POWER	5Vdc from battery	TESTED BY	Bright Tong

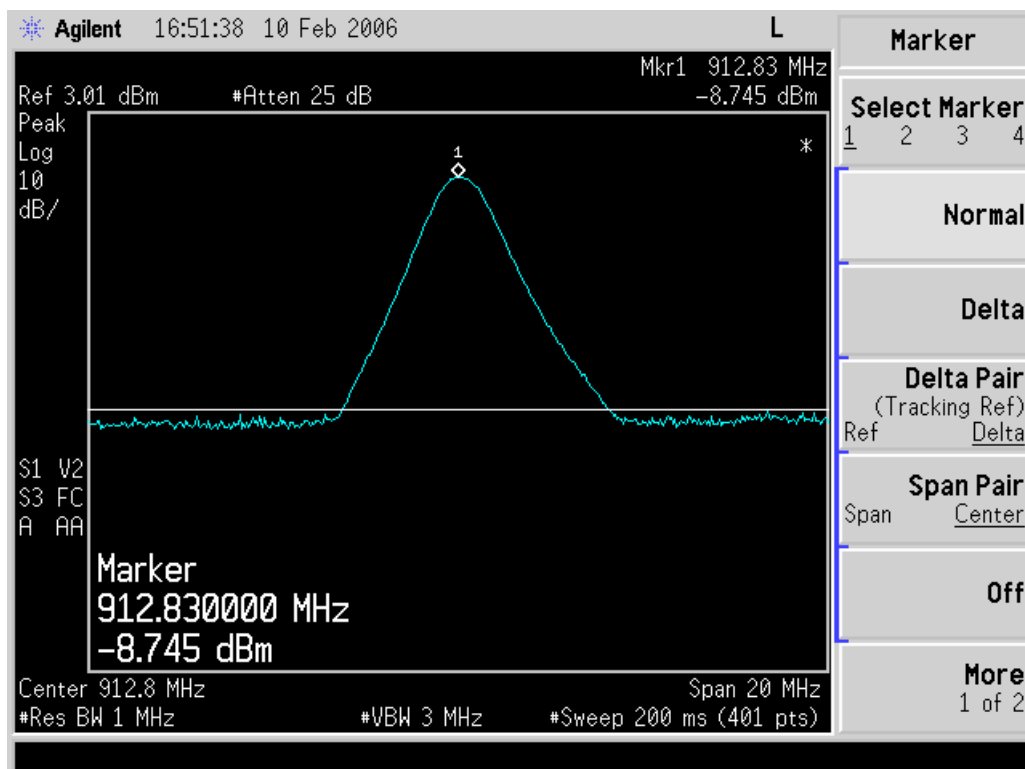
Tx

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (mW)	PASS/FAIL
0	902.1	0.112	-9.518	1000	PASS
23	913.14	0.134	-8.745	1000	PASS
49	925.62	0.178	-7.486	1000	PASS

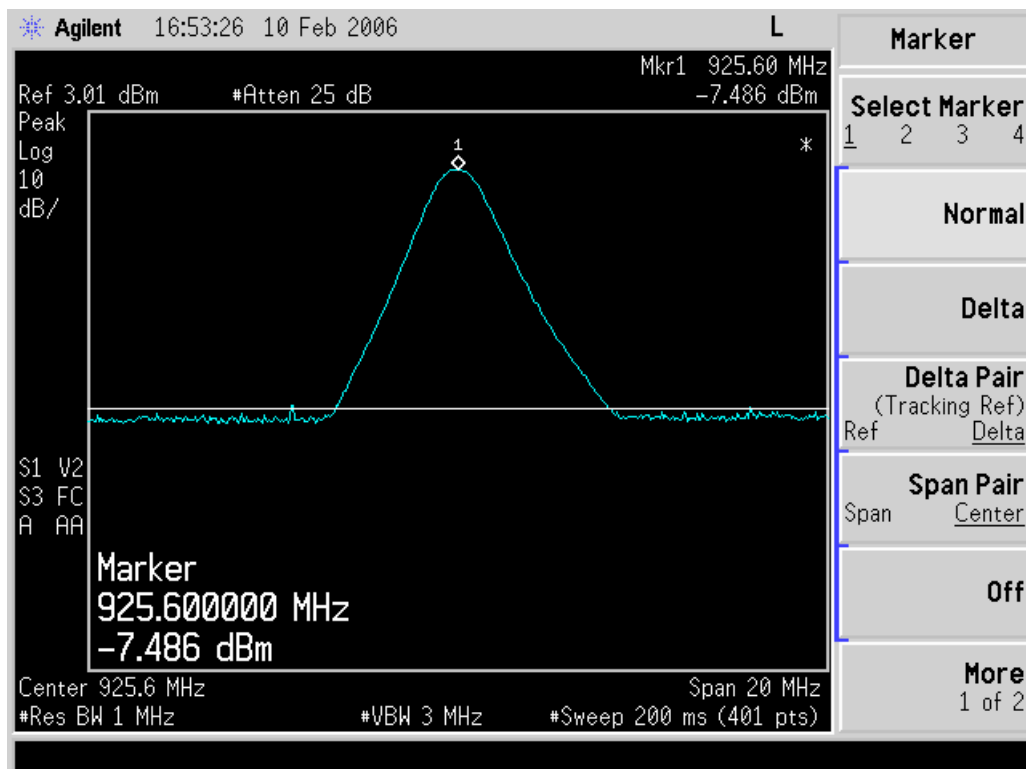
CH 0(Tx)



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 $80.86 - 29.76 = 51.10\text{dBuV/m}$, which is under 74 dBuV/m limit.

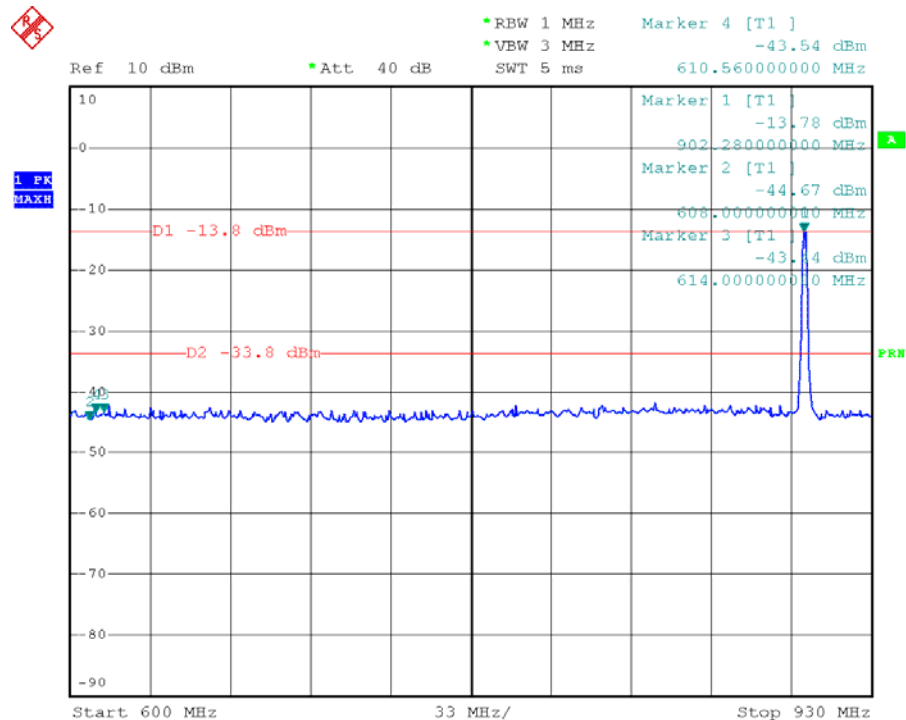
The band edge emission plot on page 60 shows 29.76dBc between carrier maximum power and local maximum emission in restrict band (610.56M Hz). The emission of carrier strength list in the test result of channel 0 at the item 4.2.7 is 50.86dBuV/m (Average), so the maximum field strength in restrict band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

NOTE 2:

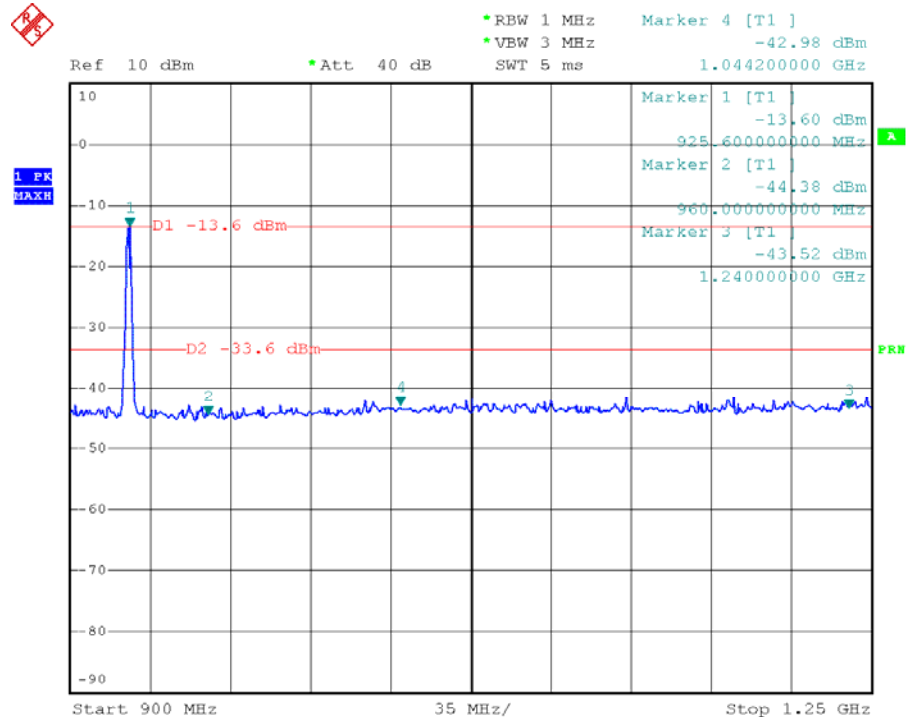
The band edge emission plot on page 60 shows 29.38dBc between carrier maximum power and local maximum emission in restrict band (1.0442GHz). The emission of carrier strength list in the test result of channel 49 at the item 4.2.7 is 83.63dBuV/m (Peak), so the maximum field strength in restrict band is $83.63 - 29.38 = 54.25\text{dBuV/m}$, 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 $53.63 - 29.38 = 24.25\text{dBuV/m}$, 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.