FCC TEST REPORT

REPORT NO.: RF940704H02A
MODEL NO.: D1598, D1598-8
RECEIVED: June 14, 2002
TESTED: July 16 ~ August 2, 2002

APPLICANT: Jabil Circuit Taiwan Limited

ADDRESS: 1F, No. 22, Industry East 9 Road, Science-Based Industrail Park, Hsinchu, 300Taiwan, R.O.C.

ISSUED BY: Advance Data Technology Corporation

LAB LOCATION: 47 14th Lin, Chiapau Tsun, Linko, Taipei, Taiwan, R.O.C.

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0536
ILAC MRA

No. 2177-01

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1 CERTIFICATION

PRODUCT :	BTGPS II Trine (Bluetooth GPS Receiver)
BRAND NAME :	EMTAC
MODEL NO. :	D1598, D1598-8
APPLICANT :	Jabil Circuit Taiwan Limited
STANDARDS :	47 CFR Part 15, Subpart C (Section 15.247), ANSI C63.4-2001

The above equipment (Model: D1598) has been tested by **Advance Data Technology Corporation**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : _____ , **DATE:** Dec. 06, 2005
(Midoli Peng)

TECHNICAL ACCEPTANCE : _____ , **DATE:** Dec. 06, 2005
Responsible for RF (Hank Chung)

APPROVED BY : _____ , **DATE:** Dec. 06, 2005
(May Chen, Deputy Manager)

2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: 47 CFR Part 15, Subpart C			
Standard Section	**Test Type and Limit**	**Result**	**REMARK**
15.207	AC Power Conducted Emission Limit: 48dBuV	PASS	Meet the requirement of limit Minimum passing margin is –13.62dB at 0.60 MHz
15.247(a)(1)(I)-(ii)	Number of Hopping Frequency Used Spec.:At least 75 channels	PASS	Meet the requirement of limit
15.247(a)(1)(ii)	Dwell Time on Each Channel Spec. : Max. 0.4 second within 30 second	PASS	Meet the requirement of limit
15.247(a)(1)(I)-(ii)	Hopping Channel Separation Spec. : Min. 25 kHz or 20 dB bandwidth	PASS	Meet the requirement of limit
15.247(a)(2)	Spectrum Bandwidth of a Frequency Hopping Sequence Spread Spectrum System Spec.: Max. 1 MHz	PASS	Meet the requirement of limit
15.247(b)	Maximum Peak Output Power Spec.: max. 30dBm	PASS	Meet the requirement of limit
15.247(c)	Transmitter Radiated Emissions Spec.: Table 15.209	PASS	Meet the requirement of limit Minimum passing margin is –8.70dB at 460.00MHz
15.247(c)	Band Edge Measurement	PASS	Meet the requirement of limit

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	BTGPS II Trine (Bluetooth GPS Receiver)
MODEL NO.	D1598, D1598-8
POWER SUPPLY	5.0VDC from power adapter
MODULATION TYPE	FHSS (GFSK)
FREQUENCY RANGE	2402MHz ~ 2480MHz
NUMBER OF CHANNEL	79
OUTPUT POWER	1.52dBm
ANTENNA TYPE	Ceramic
DATA CABLE	NA
I/O PORTS	NA
ASSOCIATED DEVICES	NA

NOTE:

1. The EUT has two model names, which are identical to each other in all aspects except for the followings:

Brand name	Model name	Note
EMTAC	D1598	The EUT' case is different
	D1598-8	

From the above models, model: **D1598** was selected as representative model for the test and its data was recorded in this report.

2. The EUT is consist of bluetooth device and GPS receiver.
3. This test report was prepared for bluetooth device.
4. This EUT was operated with the following power adapter:

Model No.:	SA070507
Input power :	100-240V, 0.4A, 50-60Hz
Output power :	5.0V

5. For more detailed features description, please refer to the manufacturer's specifications or User's Manual.

3.2 DESCRIPTION OF TEST MODES

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

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a BTGPS II Trine (Bluetooth GPS Receiver). According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC CFR 47 Part 15, Subpart C. (15.247)
ANSI C63.4 : 2001

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

NOTE: The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK	DELL	PP01L	TW-09C748-12800-19O-B220	FCC DoC APPROVED
2	PRINTER	EPSON	LQ-300+	DCGY017096	FCC DoC APPROVED

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	1.2m braid shielded wire, terminated with DB25 and Centronics connector via metallic frame, w/o core

NOTE: All power cords of the above support units are non shielded (1.8m).

4 TEST PROCEDURES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

NOTE:
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
ROHDE & SCHWARZ Test Receiver	ESCS30	847793/022	Mar. 12, 2003
ROHDE & SCHWARZ Artificial Mains Network (for EUT)	ESH2-Z5	828075/003	July 23, 2003
ROHDE & SCHWARZ 200-A Four-line V-Network	ENV4200	830326/018	Oct. 25, 2002
* ROHDE & SCHWARZ 4-wire ISN	ENY41	838119/028	Dec. 2, 2002
* ROHDE & SCHWARZ 2-wire ISN	ENY22	837497/018	Dec. 2, 2002
EMCO-L.I.S.N. (for peripheral)	3825/2	90031627	July 23, 2003
Software	Cond-V2L	NA	NA
RF cable (JYEBAO)	5D-FB	Cable-C05.01	July 23, 2003
LYNICS Terminator (For EMCO LISN)	0900510	E1-01-305	Feb. 20, 2003
LYNICS Terminator (For EMCO LISN)	0900510	E1-01-306	Feb. 20, 2003
Shielded Room	Site 5	ADT-C05	NA
VCCI Site Registration No.	Site 5	C-1093	NA

NOTE:
1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. "*": These equipment are used for conducted telecom port test only (if tested).
4. The test was performed in ADT Open Site No. 5.

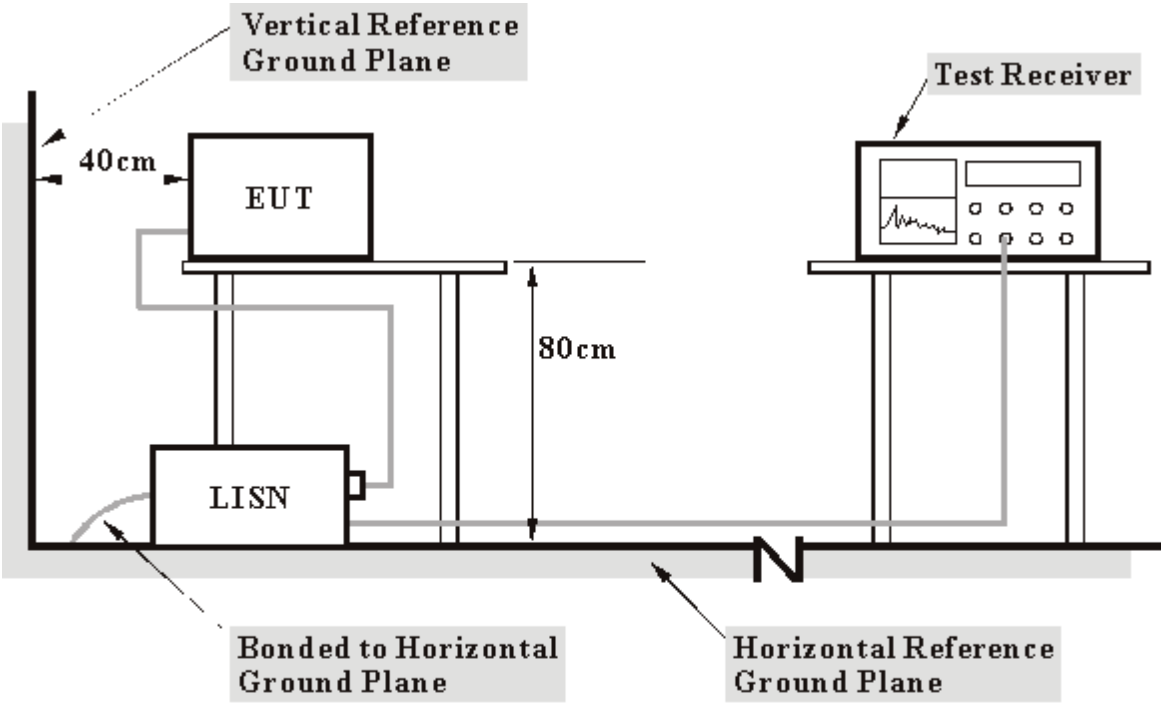
4.1.3 TEST PROCEDURES

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 30 MHz was searched. Emission levels over 10dB under the prescribed limits could not be reported

4.1.4 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.

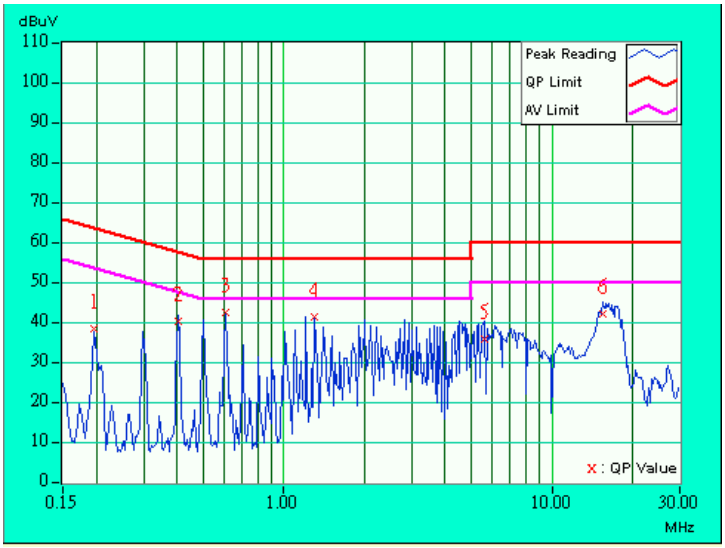
4.1.5 TEST RESULTS

EUT	BTGPS II Trine (Bluetooth GPS Receiver)	**MODEL**	D1598
MODE	Channel 0	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	30 deg. C, 60%RH, 1005 hPa	**TESTED BY**: Bunny Yao	

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.197	0.10	37.96	-	38.06	-	63.74	53.74	-25.68	-
2	0.404	0.10	39.78	-	39.88	-	57.77	47.77	-17.89	-
3	0.603	0.13	41.99	-	42.12	-	56.00	46.00	-13.88	-
4	1.309	0.20	40.76	-	40.96	-	56.00	46.00	-15.04	-
5	5.641	0.45	35.07	-	35.52	-	60.00	50.00	-24.48	-
6	15.401	0.72	41.62	-	42.34	-	60.00	50.00	-17.66	-

NOTE:

1. QP. and AV. are abbreviations of quasi-peak and average individually.
2. "-": NA
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Emission Level = Reading Value + Correction Factor.

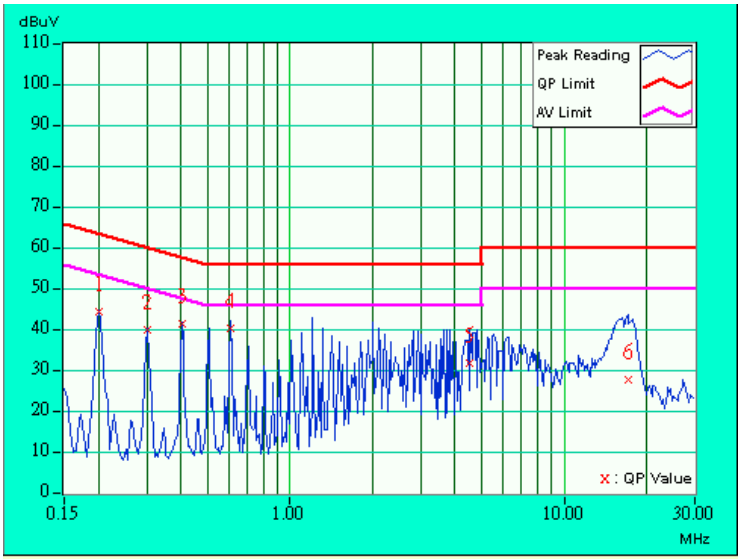


EUT	BTGPS II Trine (Bluetooth GPS Receiver)	**MODEL**	D1598
MODE	Channel 0	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	30 deg. C, 60%RH, 1005 hPa	**TESTED BY**: Bunny Yao	

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.201	0.10	43.70	-	43.80	-	63.58	53.58	-19.78	-
2	0.302	0.10	39.39	-	39.49	-	60.18	50.18	-20.69	-
3	0.404	0.10	40.93	-	41.03	-	57.77	47.77	-16.74	-
4	0.607	0.13	39.70	-	39.83	-	56.00	46.00	-16.17	-
5	4.539	0.31	31.32	-	31.63	-	56.00	46.00	-24.37	-
6	17.051	0.62	27.27	-	27.89	-	60.00	50.00	-32.11	-

NOTE:

1. QP. and AV. are abbreviations of quasi-peak and average individually.
2. "-": NA
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Emission Level = Reading Value + Correction Factor.

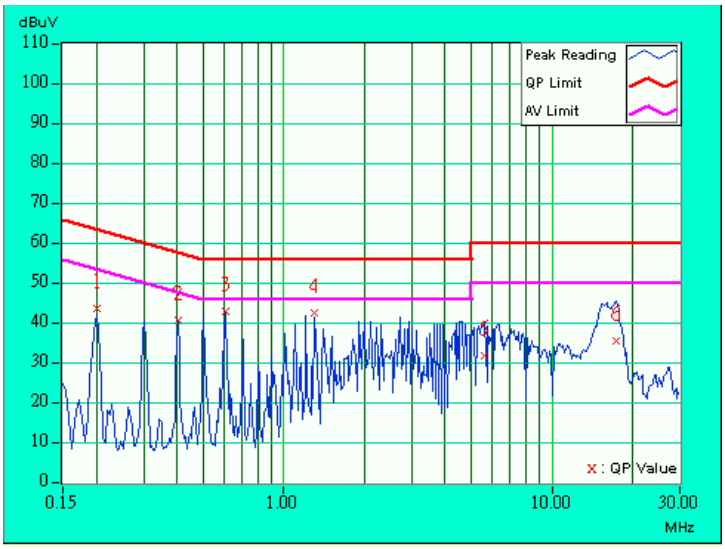


EUT	BTGPS II Trine (Bluetooth GPS Receiver)	**MODEL**	D1598
MODE	Channel 39	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	30 deg. C, 60%RH, 1005 hPa	**TESTED BY**: Bunny Yao	

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.201	0.10	42.75	-	42.85	-	63.58	53.58	-20.73	-
2	0.404	0.10	39.95	-	40.05	-	57.77	47.77	-17.72	-
3	0.603	0.13	42.10	-	42.23	-	56.00	46.00	-13.77	-
4	1.309	0.20	41.58	-	41.78	-	56.00	46.00	-14.22	-
5	5.637	0.45	31.10	-	31.55	-	60.00	50.00	-28.45	-
6	17.305	0.84	34.60	-	35.44	-	60.00	50.00	-24.56	-

NOTE:

1. QP. and AV. are abbreviations of quasi-peak and average individually.
2. "-": NA
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Emission Level = Reading Value + Correction Factor.

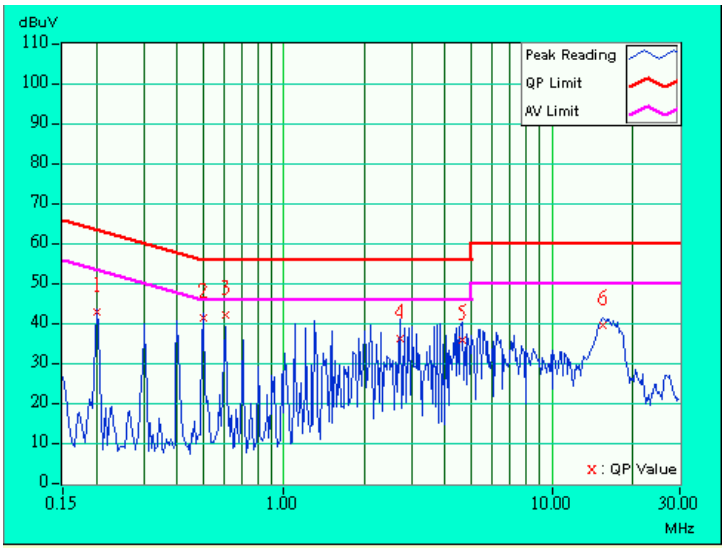


EUT	BTGPS II Trine (Bluetooth GPS Receiver)	**MODEL**	D1598
MODE	Channel 39	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	30 deg. C, 60%RH, 1005 hPa	**TESTED BY**: Bunny Yao	

No	Freq.	Corr. Factor	Reading Value [dB (Uv)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.201	0.10	42.52	-	42.62	-	63.58	53.58	-20.96	-
2	0.502	0.12	40.77	-	40.89	-	56.00	46.00	-15.11	-
3	0.603	0.13	41.55	-	41.68	-	56.00	46.00	-14.32	-
4	2.715	0.24	35.86	-	36.10	-	56.00	46.00	-19.90	-
5	4.625	0.31	35.30	-	35.61	-	56.00	46.00	-20.39	-
6	15.573	0.53	39.06	-	39.59	-	60.00	50.00	-20.41	-

NOTE:

1. QP. and AV. are abbreviations of quasi-peak and average individually.
2. "-": NA
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Emission Level = Reading Value + Correction Factor.

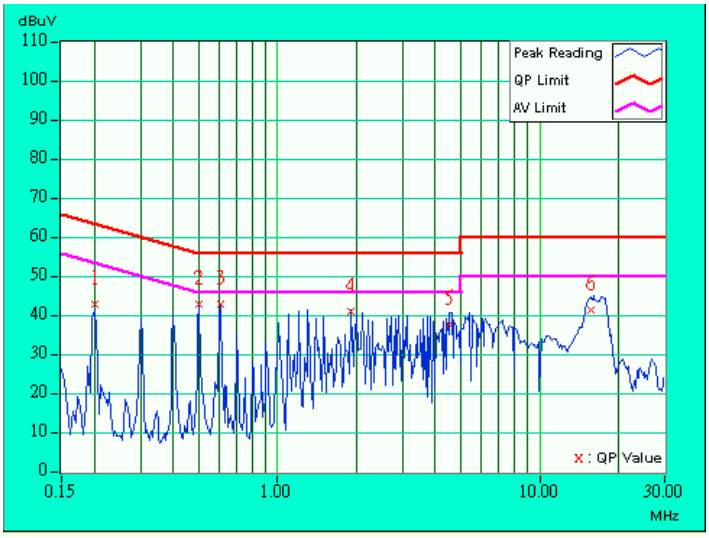


EUT	BTGPS II Trine (Bluetooth GPS Receiver)	**MODEL**	D1598
MODE	Channel 78	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	30 deg. C, 60%RH, 1005 hPa	**TESTED BY**: Bunny Yao	

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.201	0.10	42.30	-	42.40	-	63.58	53.58	-21.18	-
2	0.502	0.12	42.21	-	42.33	-	56.00	46.00	-13.67	-
3	0.603	0.13	42.25	-	42.38	-	56.00	46.00	-13.62	-
4	1.906	0.20	40.36	-	40.56	-	56.00	46.00	-15.44	-
5	4.520	0.42	36.93	-	37.35	-	56.00	46.00	-18.65	-
6	15.660	0.74	40.83	-	41.57	-	60.00	50.00	-18.43	-

NOTE:

1. QP. and AV. are abbreviations of quasi-peak and average individually.
2. "-": NA
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Emission Level = Reading Value + Correction Factor.

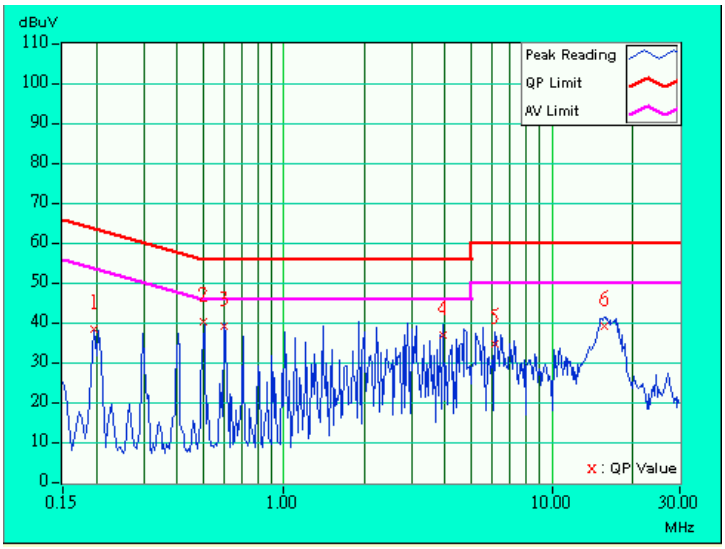


EUT	BTGPS II Trine (Bluetooth GPS Receiver)	**MODEL**	D1598
MODE	Channel 78	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Netural (N)
ENVIRONMENTAL CONDITIONS	30 deg. C, 60%RH, 1005 hPa	**TESTED BY**: Bunny Yao	

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.197	0.10	38.00	-	38.10	-	63.74	53.74	-25.64	-
2	0.500	0.12	39.88	-	40.00	-	56.00	46.00	-16.00	-
3	0.599	0.13	38.74	-	38.87	-	56.00	46.00	-17.13	-
4	3.918	0.30	36.41	-	36.71	-	56.00	46.00	-19.29	-
5	6.125	0.34	34.25	-	34.59	-	60.00	50.00	-25.41	-
6	15.667	0.54	38.64	-	39.18	-	60.00	50.00	-20.82	-

NOTE:

1. QP. and AV. are abbreviations of quasi-peak and average individually.
2. "-": NA
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Emission Level = Reading Value + Correction Factor.



4.2 NUMBER OF HOPPING FREQUENCY USED

4.2.1 LIMIT OF HOPPING FREQUENCY USED

At least 75 hopping frequencies, and should be equally spaced.

4.2.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
SPECTRUM ANALYZER	FSEK30	100049	July 24, 2003

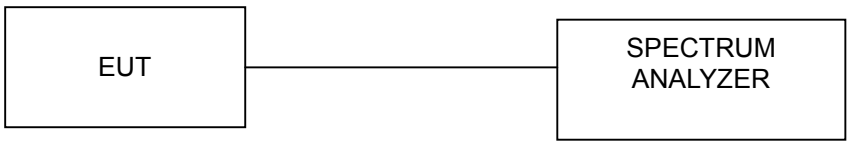
NOTE:

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.

4.2.3 TEST PROCEDURES

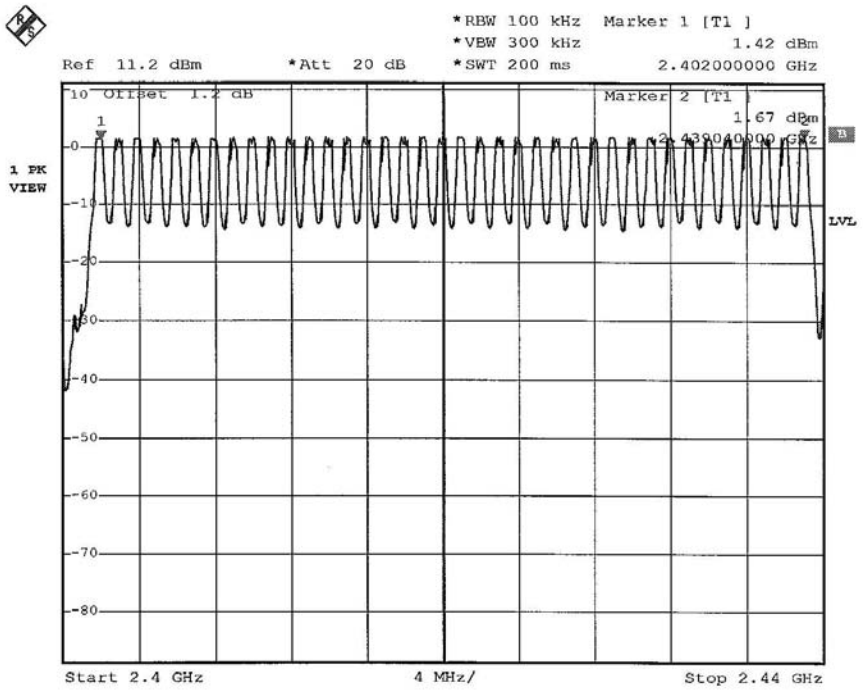
1. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
2. Turn on the EUT and connect its antenna terminal to measurement via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
3. 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.
4. Set the SA on View mode and then plot the result on SA screen.
5. Repeat above procedures until all frequencies measured were complete.

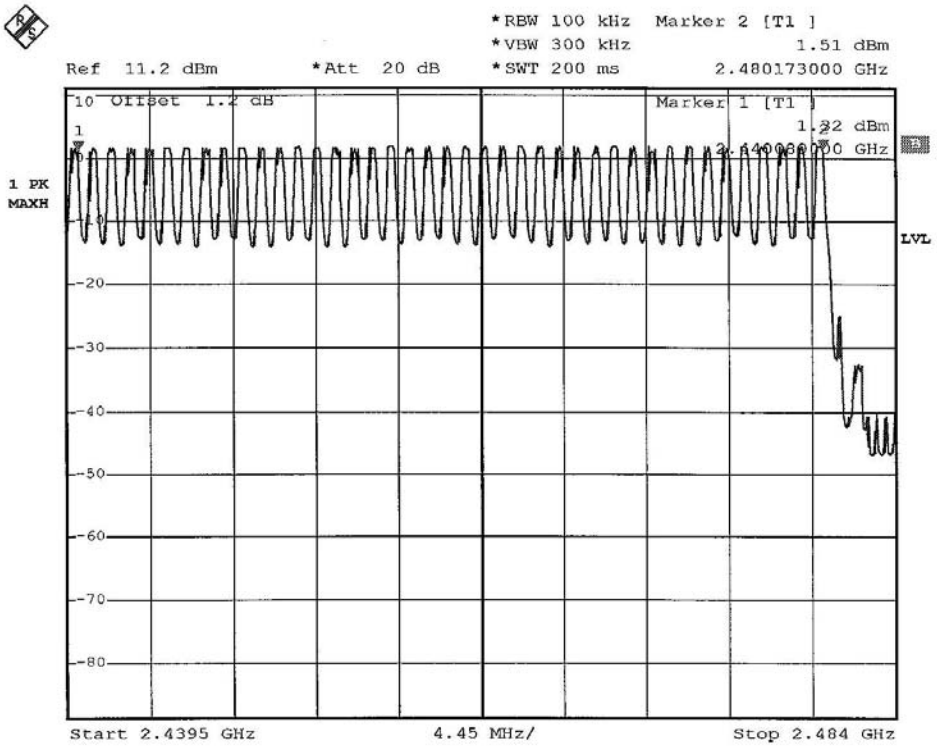
4.2.4 TEST SETUP



4.2.5 TEST RESULTS

There are 79 hopping frequencies in the hopping mode. Please refer to next two pages for the test result. On the plots, it shows that the hopping frequencies are equally spaced.


*RBW 100 kHz
*VBW 300 kHz
*SWT 200 ms
Marker 1 [T1]
1.42 dBm
2.402000000 GHz
Ref 11.2 dBm
*Att 20 dB
Offset 1.2 dB
Marker 2 [T1]
1.67 dBm
1 PK
VIEW
LVL
Start 2.4 GHz
4 MHz/
Stop 2.44 GHz


*RBW 100 kHz
*VBW 300 kHz
*SWT 200 ms
Marker 2 [T1]
1.51 dBm
2.480173000 GHz
Ref 11.2 dBm
*Att 20 dB
Offset 1.2 dB
Marker 1 [T1]
1 PK
MAXH
LVL
Start 2.4395 GHz
4.45 MHz/
Stop 2.484 GHz

4.3 DWELL TIME ON EACH CHANNEL

4.3.1 LIMIT OF DWELL TIME USED

For FHSS, the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 31.6 second period. For hybrid systems, the average time of occupancy on any frequency should not exceed 0.4 seconds within a time period in seconds equal to the number of hopping frequencies employed multiplied by 0.4.

4.3.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
SPECTRUM ANALYZER	FSEK30	100049	July 24, 2003

NOTES:

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.

4.3.3 TEST PROCEDURES

1. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
2. 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.
3. 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.
4. Measure the time duration of one transmission on the measured frequency. And then plot the result with time difference of this time duration.
5. Repeat above procedures until all frequencies measured were complete.

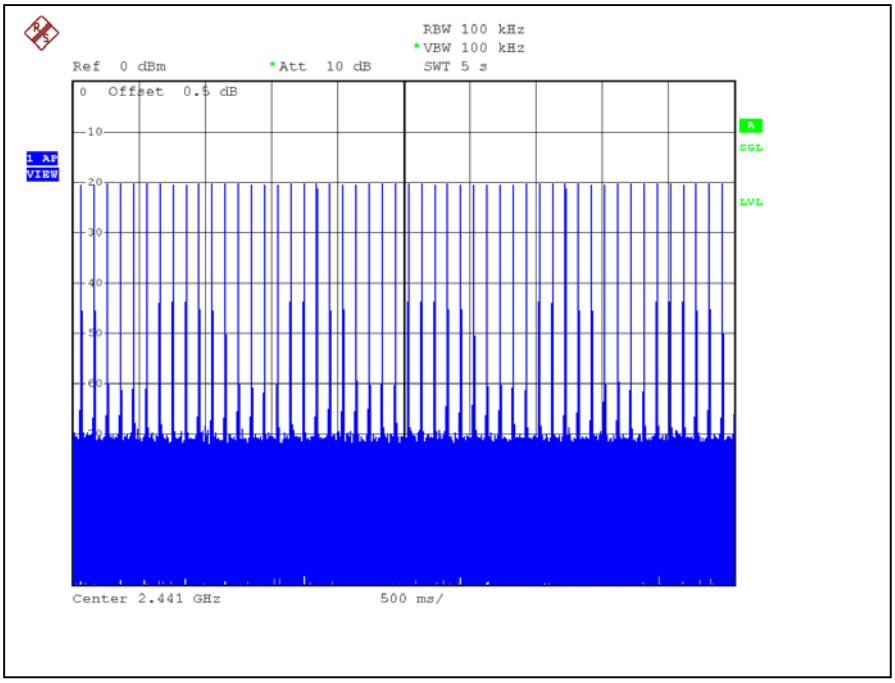
4.3.4 TEST SETUP

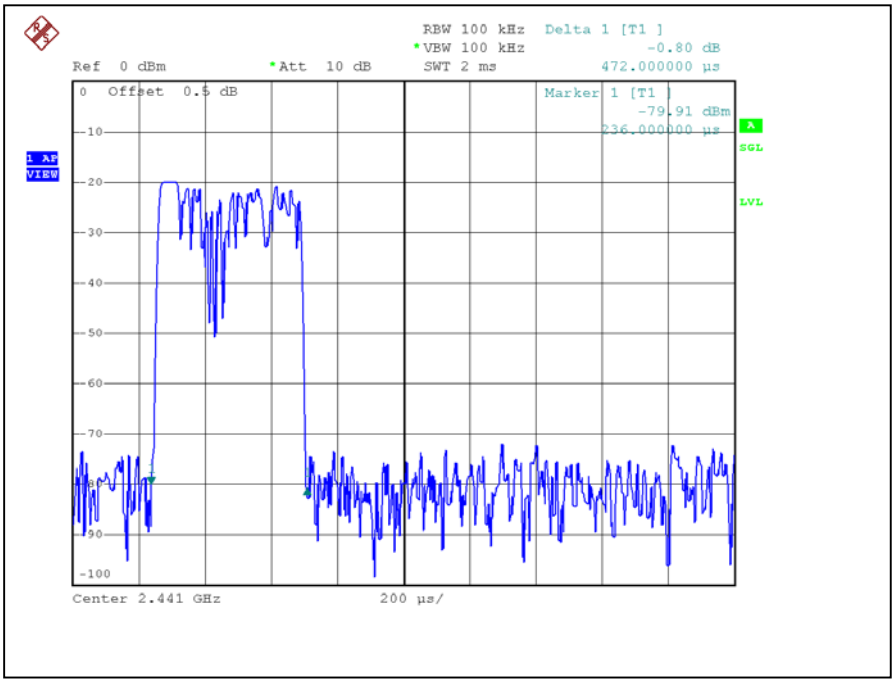
4.3.5 TEST RESULTS

Mode	Number of transmission in a 31.6 (79Hopping*0.4)	Length of transmission time (msec)	Result (msec)	Limit (msec)
DH1	50 (times / 5 sec) *6.32=316 times	0.472	149.152	400
DH3	25 (times / 5 sec) *6.32=158 times	1.742	275.236	400
DH5	17 (times / 5 sec) *6.32=107.44 times	2.992	321.460	400

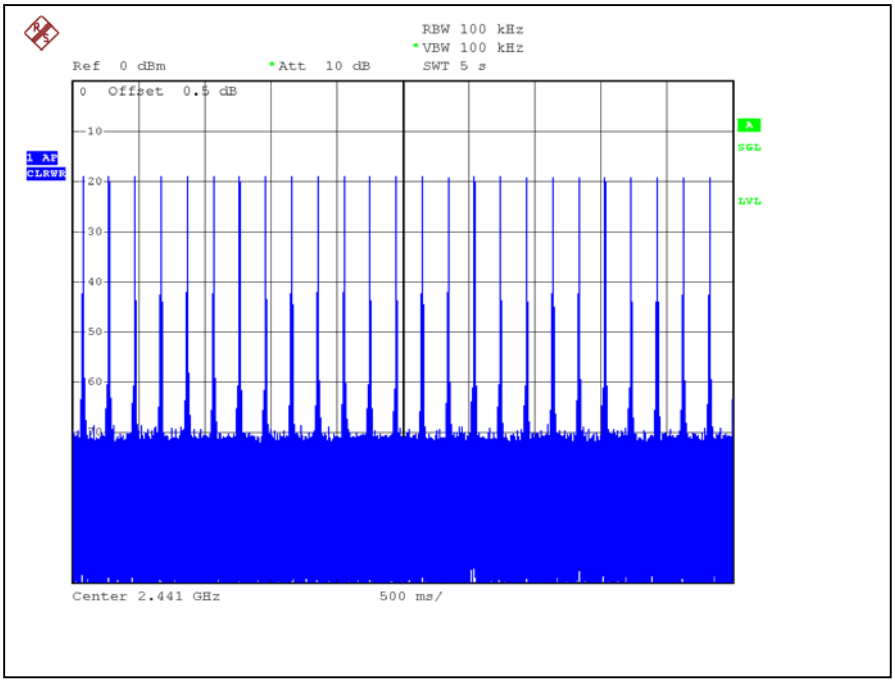
Test plots of the transmitting time slot are shown on next three pages.

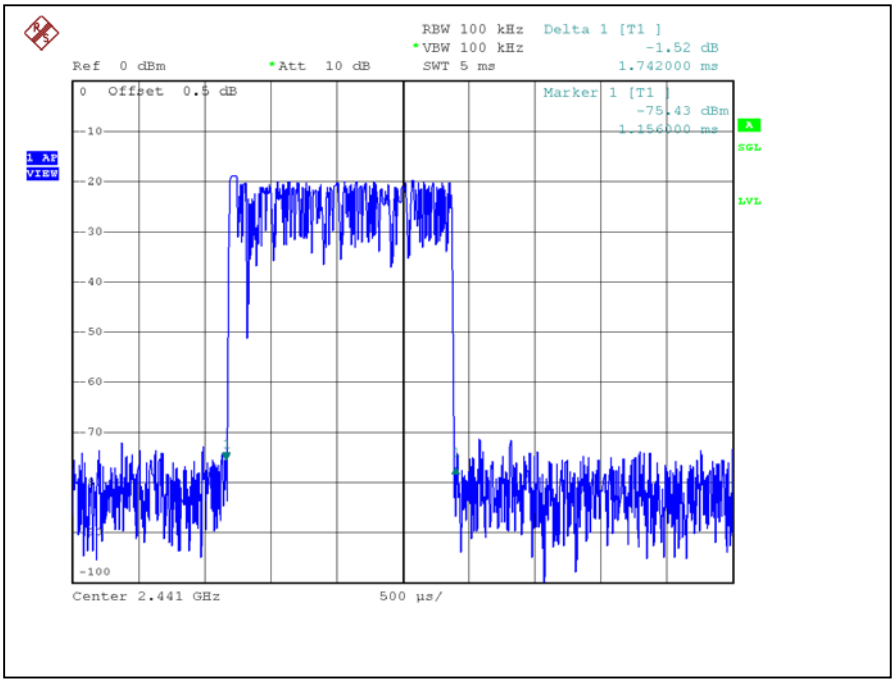
DH1


RBW 100 kHz
VBW 100 kHz
Ref 0 dBm
Att 10 dB
SWT 5 s
0 Offset 0.5 dB
1 AP
VIEW
A
SGL
LVL
Center 2.441 GHz
500 ms/

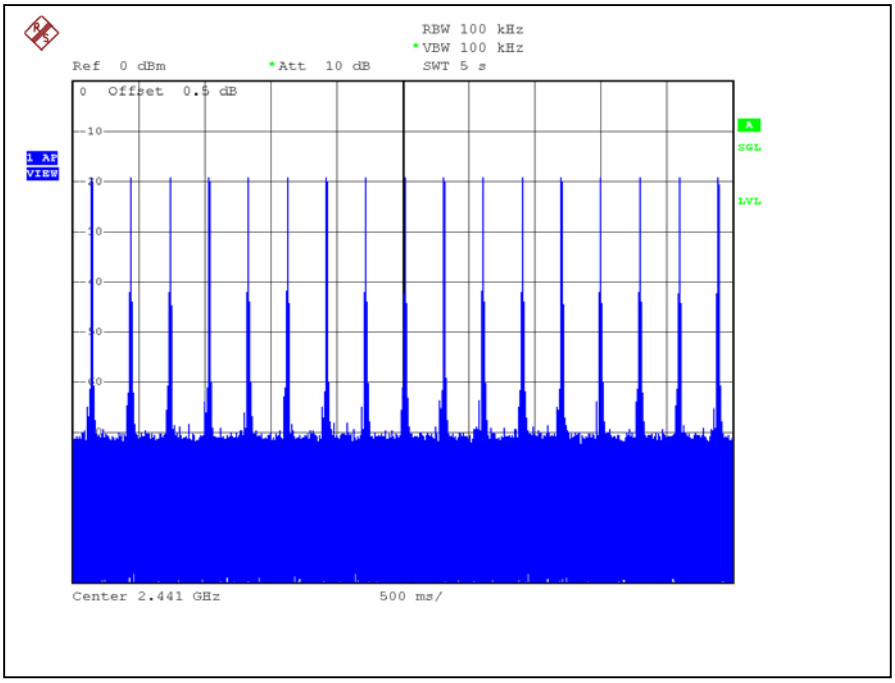

RBW 100 kHz
Delta 1 [T1]
VBW 100 kHz
-0.80 dB
Ref 0 dBm
Att 10 dB
SWT 2 ms
472.000000 µs
0 Offset 0.5 dB
Marker 1 [T1]
-79.91 dBm
236.000000 µs
1 AP
VIEW
A
SGL
LVL
Center 2.441 GHz
200 µs/

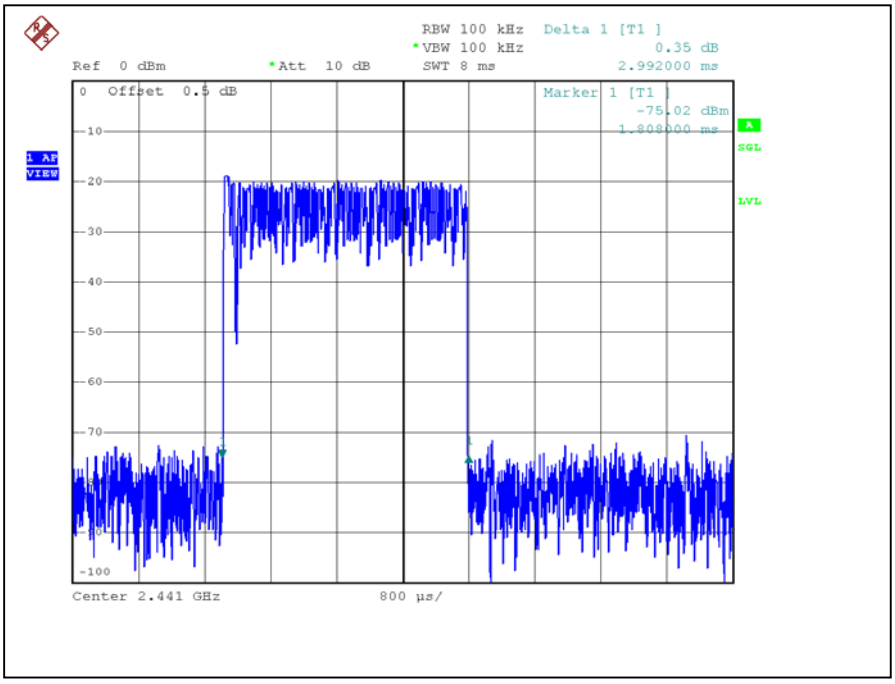
DH3


RBW 100 kHz
VBW 100 kHz
Ref 0 dBm
Att 10 dB
SWT 5 s
0 Offset 0.5 dB
1 AP
CLRWR
A
SGL
LVL
Center 2.441 GHz
500 ms/


RBW 100 kHz
VBW 100 kHz
Ref 0 dBm
Att 10 dB
SWT 5 ms
Delta 1 [T1]
-1.52 dB
1.742000 ms
0 Offset 0.5 dB
Marker 1 [T1]
-75.43 dBm
1.156000 ms
1 AP
VIEW
A
SGL
LVL
Center 2.441 GHz
500 µs/

DH5


RBW 100 kHz
VBW 100 kHz
Ref 0 dBm
Att 10 dB
SWT 5 s
0 Offset 0.5 dB
-10
-20
-30
-40
-50
-60
1 AP
VIEW
A
SGL
LVL
Center 2.441 GHz
500 ms/


RBW 100 kHz
VBW 100 kHz
Ref 0 dBm
Att 10 dB
SWT 8 ms
Delta 1 [T1]
0.35 dB
2.992000 ms
Marker 1 [T1]
-75.02 dBm
1.808000 ms
0 Offset 0.5 dB
-10
-20
-30
-40
-50
-60
-70
-100
1 AP
VIEW
A
SGL
LVL
Center 2.441 GHz
800 µs/

4.4 CHANNEL BANDWIDTH

4.4.1 LIMITS OF CHANNEL BANDWIDTH

For frequency hopping system operating in the 2400-2483.5 MHz and 5725-5850 MHz bands, the maximum 20 dB bandwidth of the hopping channel is 1 MHz.

4.4.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
SPECTRUM ANALYZER	FSEK30	100049	July 24, 2003

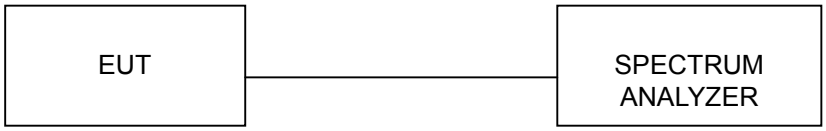
NOTES:

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.

4.4.3 TEST PROCEDURE

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. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 20dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

4.4.4 TEST SETUP



4.4.5 EUT OPERATING CONDITION

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

4.4.6 TEST RESULTS

Data Mode:

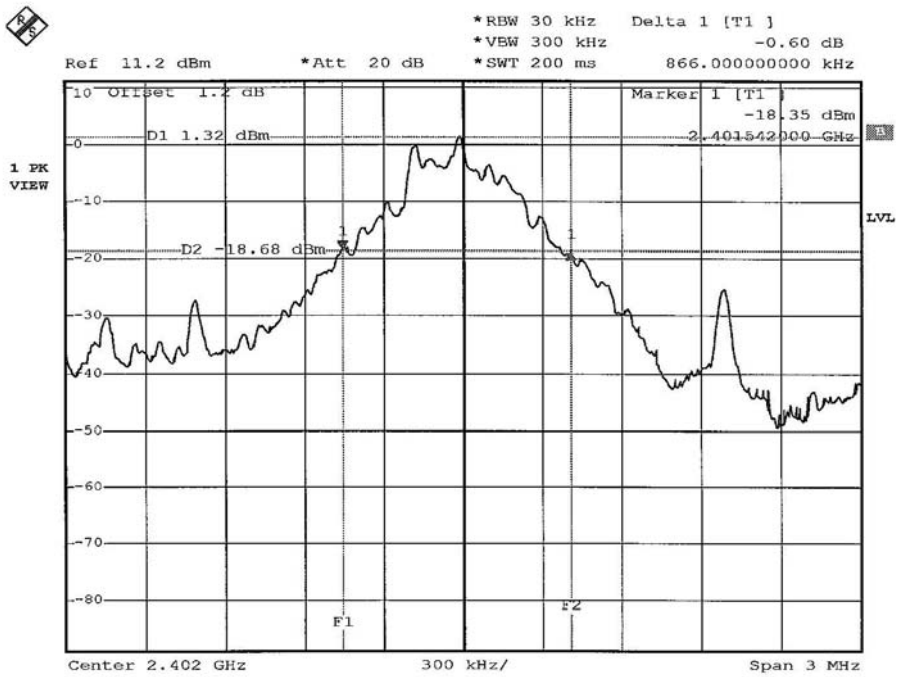
CHANNEL	CHANNEL FREQUENCY (MHz)	20 dB BANDWIDTH (kHz)	MAXIMUM LIMIT (MHz)	PASS/FAIL
0	2402	866.00	1	PASS
39	2441	864.00	1	PASS
78	2480	864.00	1	PASS

Acquisition Mode:

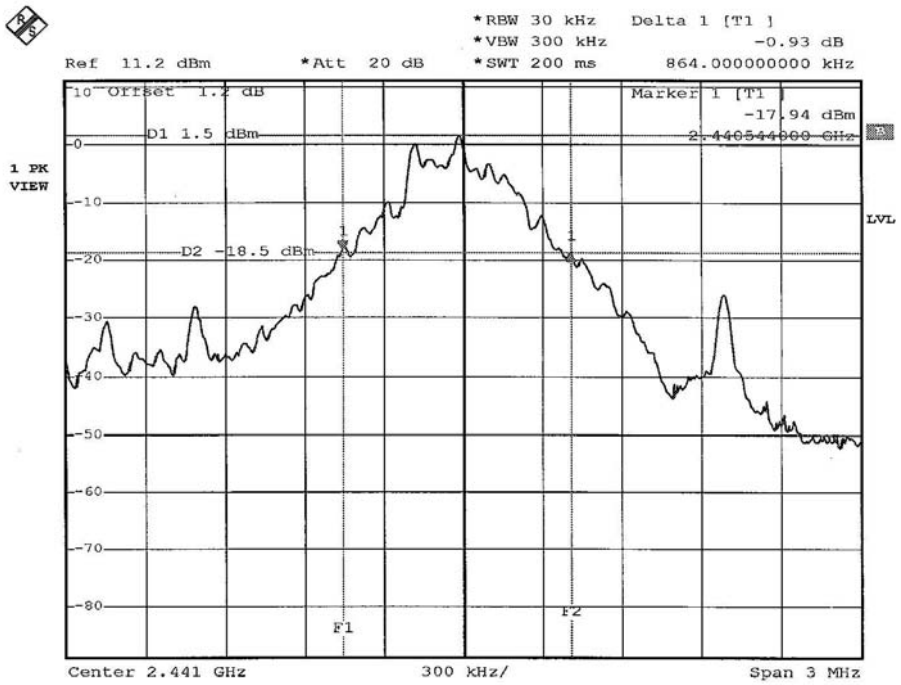
CHANNEL	CHANNEL FREQUENCY (MHz)	20 dB BANDWIDTH (kHz)	MAXIMUM LIMIT (MHz)	PASS/FAIL
0	2402	832.00	1	PASS

Data Mode:

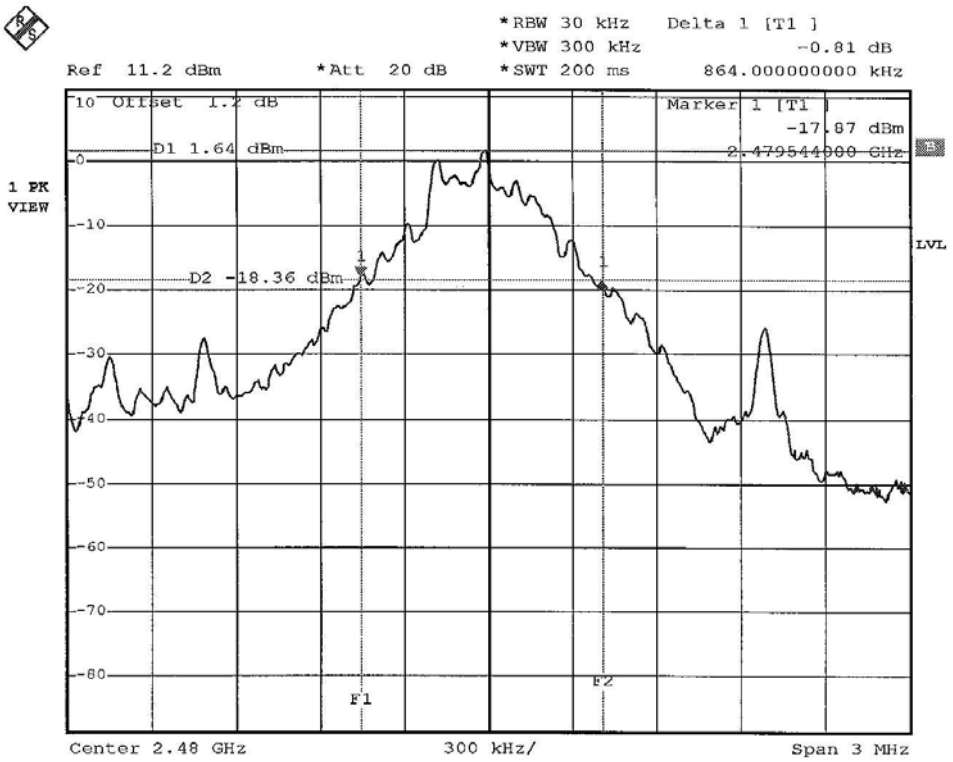
Channel 0



Channel 39

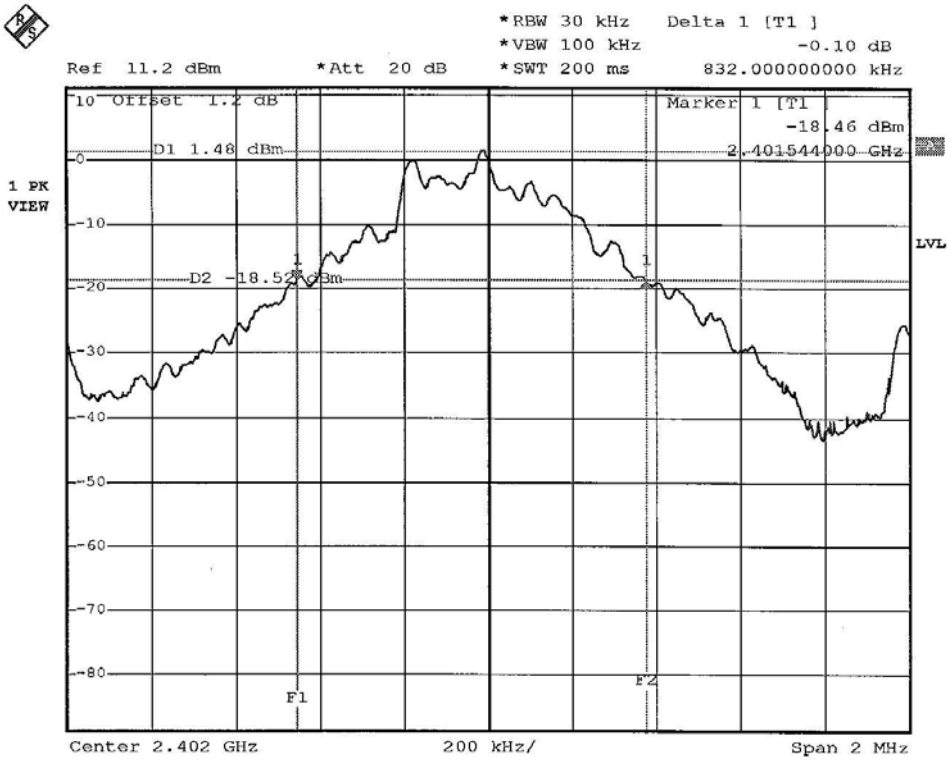


Channel 78


*RBW 30 kHz
*VBW 300 kHz
*SWT 200 ms
Delta 1 [T1]
-0.81 dB
864.000000000 kHz
Ref 11.2 dBm
*Att 20 dB
10 Offset 1.2 dB
Marker 1 [T1]
-17.87 dBm
2.479544000 GHz
D1 1.64 dBm
D2 -18.36 dBm
1 PK
VIEW
LVL
0
-10
-20
-30
-40
-50
-60
-70
-80
F1
F2
Center 2.48 GHz
300 kHz/
Span 3 MHz

Acquisition Mode:

Channel 0



4.5 HOPPING CHANNEL SEPARATION

4.5.1 LIMIT OF HOPPING CHANNEL SEPARATION

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

4.5.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
SPECTRUM ANALYZER	FSEK30	100049	July 24, 2003

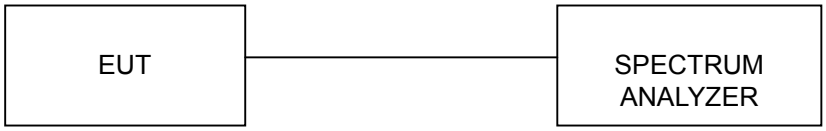
NOTES:

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.

4.5.3 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.

4.5.4 TEST SETUP



4.5.5 TEST RESULTS

Data Mode:

Channel	Frequency (MHz)	Adjacent Channel Separation	Minimum Limit (kHz)	Pass / Fail
0	2402	1MHz	866.00	PASS
39	2441	1MHz	864.00	PASS
78	2480	1MHz	864.00	PASS

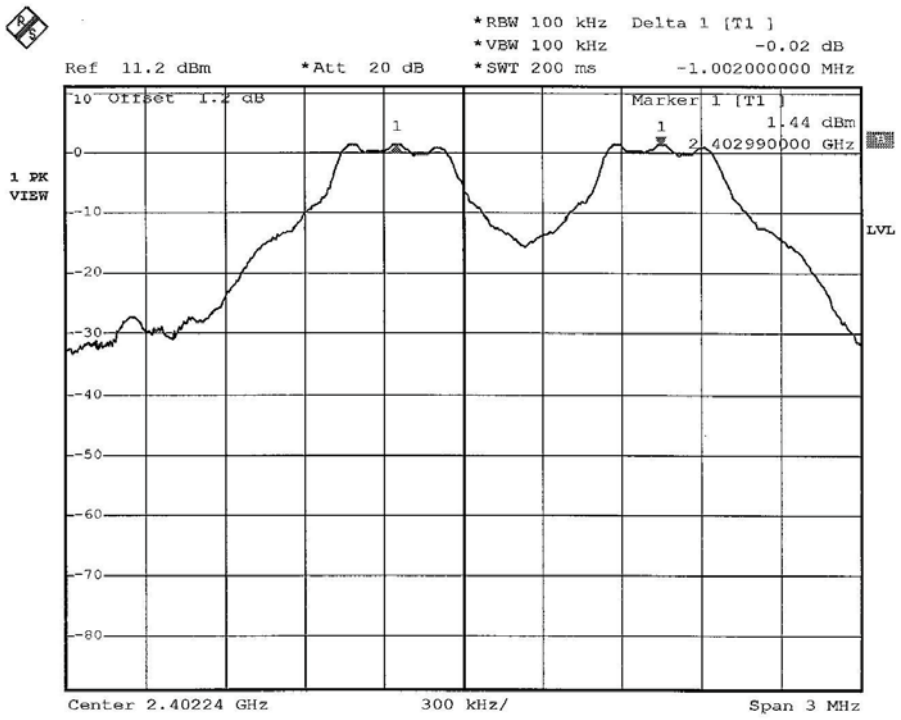
Acquisition Mode:

Channel	Frequency (MHz)	Adjacent Channel Separation	Minimum Limit (kHz)	Pass / Fail
0	2402	1MHz	832.00	PASS

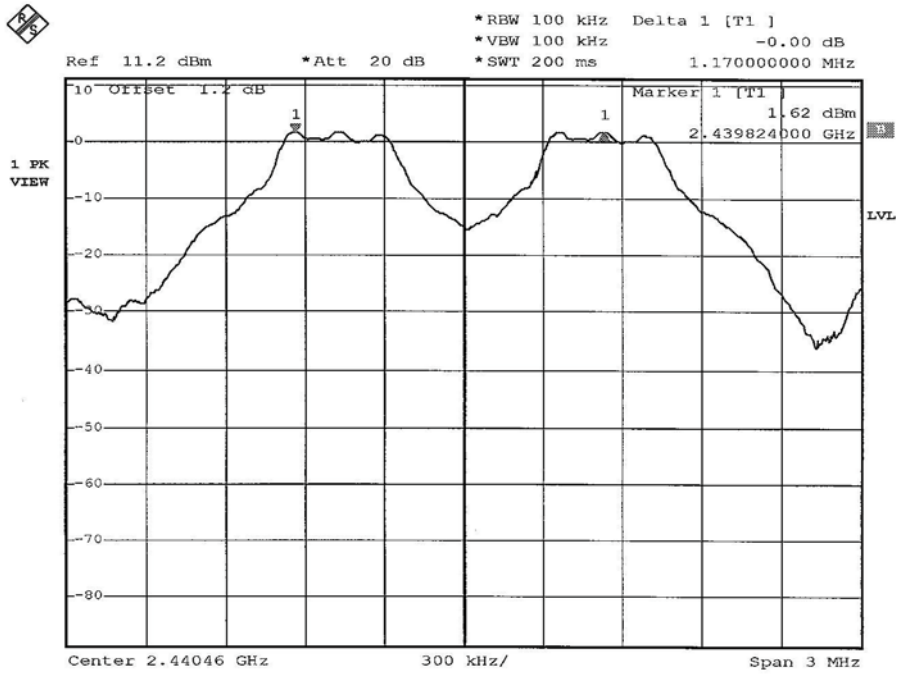
The minimum limit is 20dB bandwidth.

Data Mode:

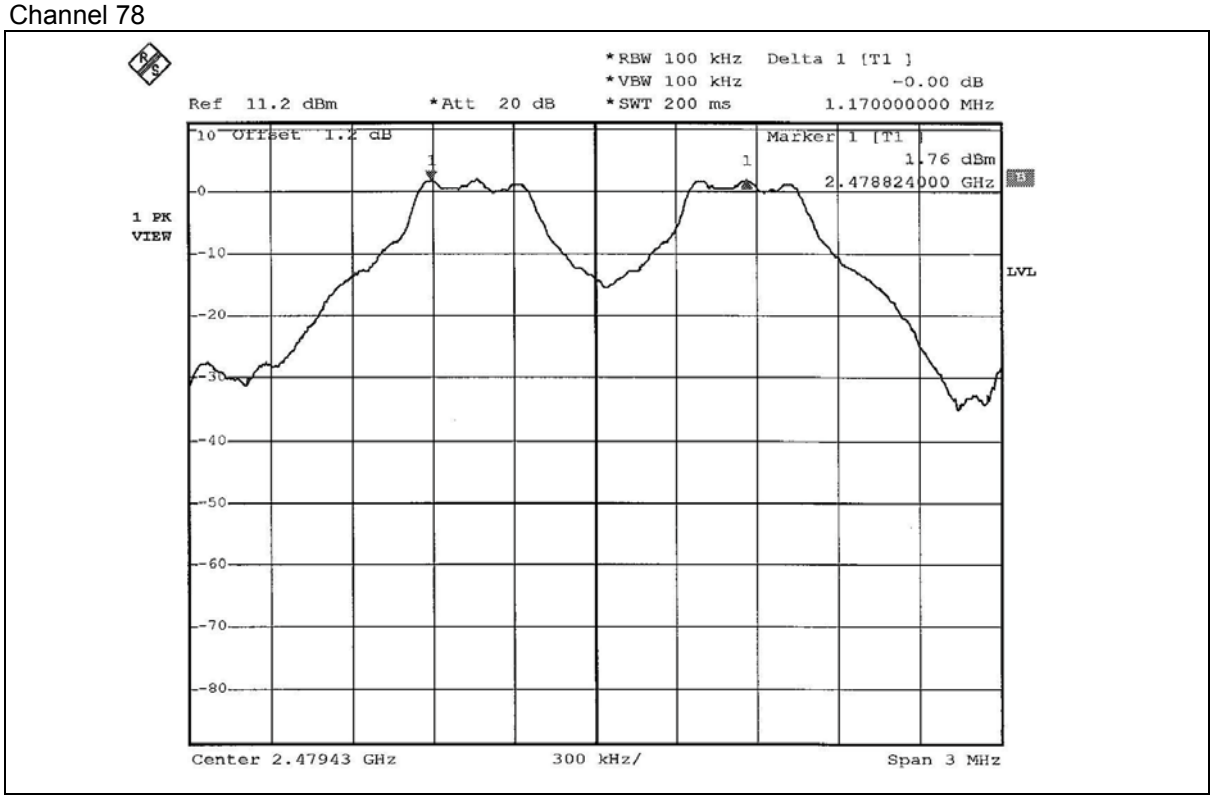
Channel 0



Channel 39

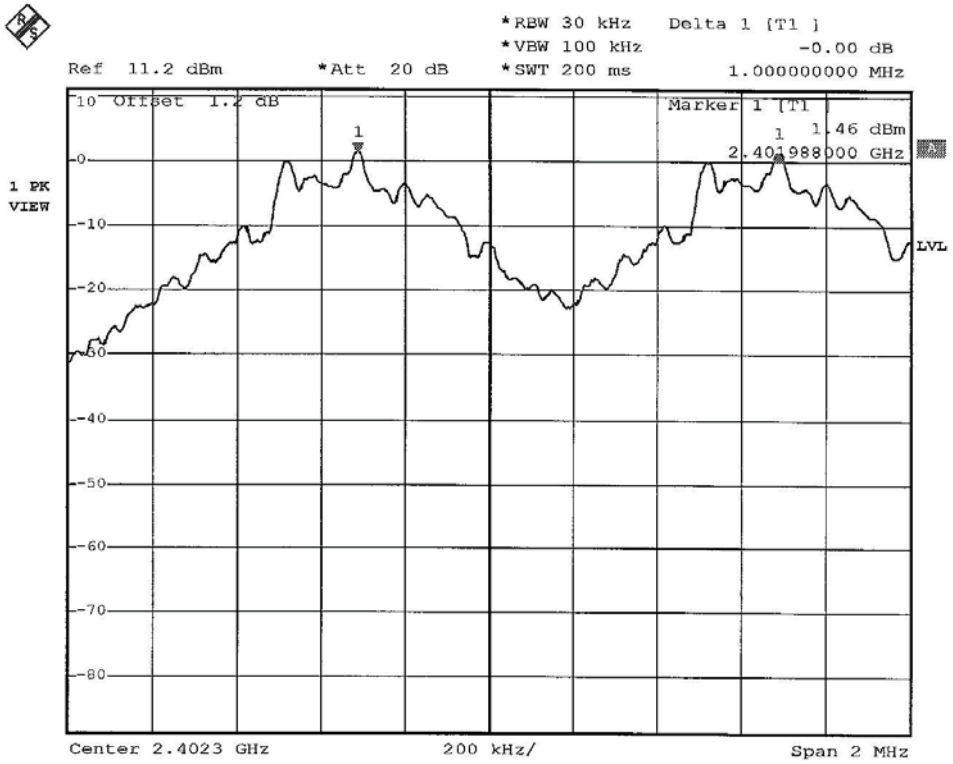


Channel 78


*RBW 100 kHz
*VBW 100 kHz
*SWT 200 ms
Delta 1 [T1]
-0.00 dB
1.170000000 MHz
Ref 11.2 dBm
*Att 20 dB
Offset 1.2 dB
Marker 1 [T1]
1.76 dBm
2.478824000 GHz
1 PK
VIEW
LVL
0
-10
-20
-30
-40
-50
-60
-70
-80
Center 2.47943 GHz
300 kHz/
Span 3 MHz

Acquisition Mode:

Channel 0



4.6 MAXIMUM PEAK OUTPUT POWER

4.6.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Limit of Maximum Peak Output Power Measurement is 30dBm.

4.6.2 INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
SPECTRUM ANALYZER	FSEK30	100049	July 24, 2003

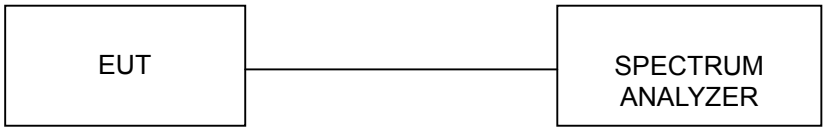
NOTES:

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.

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. Set a reference level on the measuring instrument equal to the highest peak value.
3. The center frequency of the spectrum analyzer is set to the fundamental frequency and using 2 MHz RBW and 3 MHz VBW.
4. Measure the frequency difference of two frequencies that were attenuated 20dB from the reference level. Record the frequency difference as the emission bandwidth.
5. Repeat above procedures until all frequencies measured were complete.

4.6.4 TEST SETUP



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

4.6.5 EUT OPERATING CONDITION

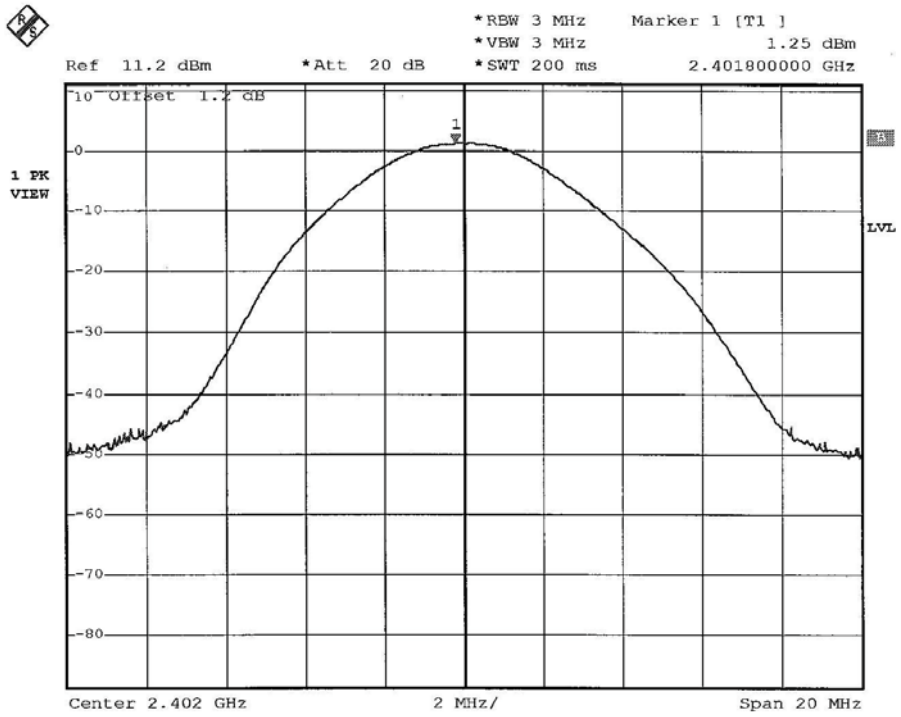
The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

4.6.6 TEST RESULTS

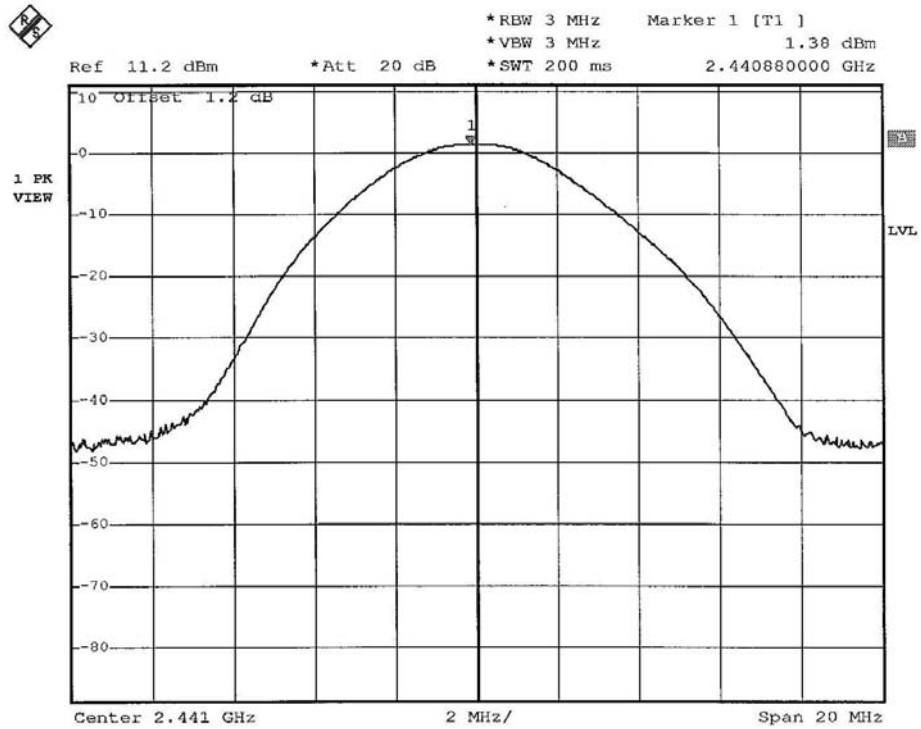
Output Power Into Antenna:

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
0	2402	1.25	30	PASS
39	2441	1.38	30	PASS
78	2480	1.52	30	PASS

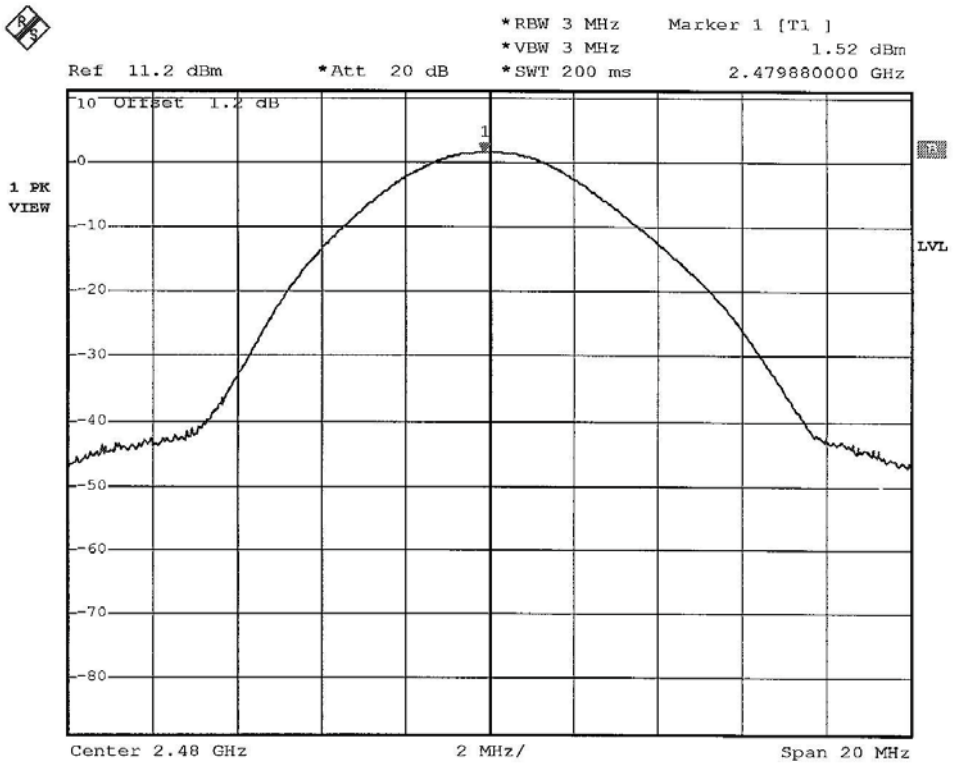
Channel 0



Channel 39



Channel 78


*RBW 3 MHz
*VBW 3 MHz
*SWT 200 ms
Marker 1 [T1]
1.52 dBm
2.479880000 GHz
Ref 11.2 dBm
*Att 20 dB
10 Offset 1.2 dB
1 PK
VIEW
LVL
0
-10
-20
-30
-40
-50
-60
-70
-80
Center 2.48 GHz
2 MHz/
Span 20 MHz

4.7 RADIATED EMISSION MEASUREMENT

4.7.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Field strength limits are at the distance of 3 meters, emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

Frequencies (MHz)	Field Strength of Fundamental	
	uV/m	dBuV/m
30-88	100	40.0
88-216	150	43.5
216-960	200	46.0
Above 960	500	54.0

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.

4.7.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
* HP Spectrum Analyzer	8590L	3544A01176	May 13, 2003
* HP Preamplifier	8447D	2944A08485	Oct. 30, 2002
* HP Preamplifier	8449B	3008A01201	Dec. 06, 2002
* HP Preamplifier	8449B	3008A01292	Aug. 21, 2002
* ROHDE & SCHWARZ TEST RECEIVER	ESMI	839013/007 839379/002	Jan. 27, 2003
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 23, 2002
* CHASE BILOG Antenna	CBL6112A	2221	Aug. 2, 2003
* SCHWARZBECK Horn Antenna	BBHA9120-D1	D130	July 3, 2003
* EMCO Horn Antenna	3115	9312-4192	April 9, 2003
* EMCO Turn Table	1060	1115	NA
* SHOSHIN Tower	AP-4701	A6Y005	NA
* Software	AS61D4	NA	NA
* ANRITSU RF Switches	MP59B	M35046	Jan. 25, 2003
* TIMES RF cable	LMR-600	CABLE-ST5-01	July 12, 2003
Open Field Test Site	Site 5	ADT-R05	July 19, 2003
VCCI Site Registration No.	Site 5	R-1039	NA

NOTE: 1. The measurement uncertainty is less than +/- 3.0dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.
3. "*" = These equipment are used for the final measurement.
4. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
5. The test was performed in ADT Open Site No. 5.

4.7.3 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. 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.

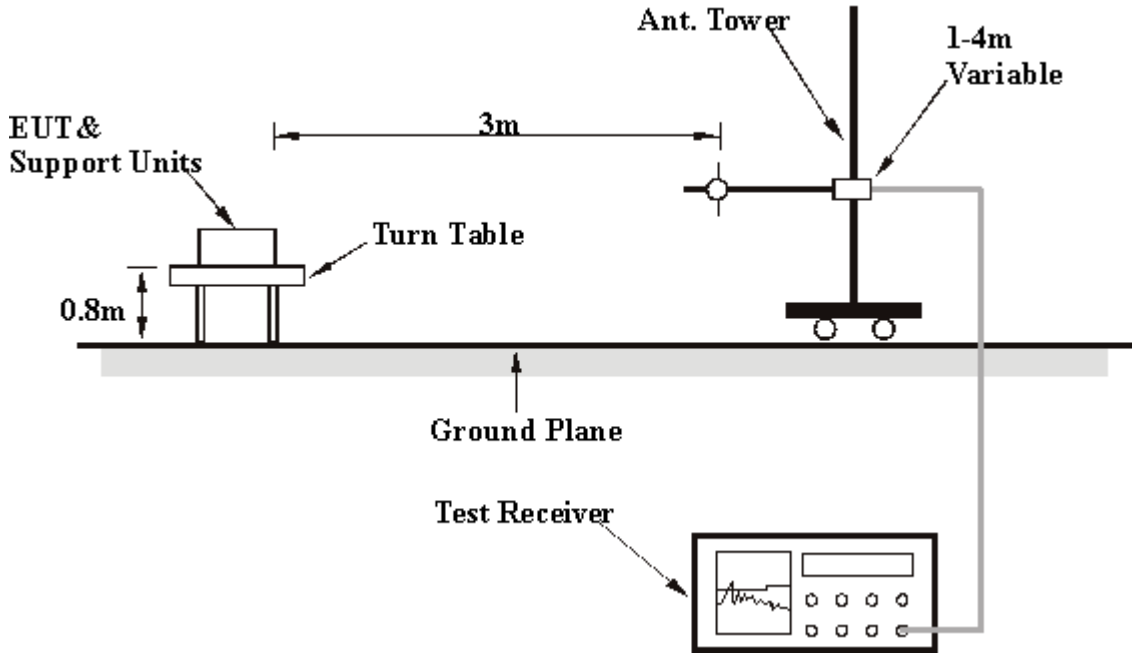
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin 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 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 300 Hz for Average detection (AV) at frequency above 1GHz.

4.7.4 TEST SETUP



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

4.7.5 TEST RESULTS

Digital Portion:

EUT	BTGPS II Trine (Bluetooth GPS Receiver)	**MODEL**	D1598
MODE	Channel 78	**FREQUENCY RANGE**	30-1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Quasi-Peak
ENVIRONMENTAL CONDITIONS	35 deg. C, 60%RH, 1050 hPa	**TESTED BY**: Bunny Yao	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M											
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	144.00	22.0 QP	43.50	-21.50	1.67H	124	8.82	10.58	2.60	0.00	-13.18
2	160.00	18.6 QP	43.50	-24.90	1.35H	114	6.13	9.62	2.85	0.00	-12.48
3	176.00	25.0 QP	43.50	-18.50	1.35H	74	12.64	9.08	3.28	0.00	-12.37
4	192.00	24.8 QP	43.50	-18.70	1.49H	13	12.33	8.95	3.51	0.00	-12.48
5	208.00	28.9 QP	43.50	-14.60	1.60H	311	15.83	9.40	3.67	0.00	-13.07
6	224.00	28.9 QP	46.00	-17.10	1.61H	228	14.54	10.41	3.92	0.00	-14.32
7	240.00	24.1 QP	46.00	-21.90	1.48H	133	8.51	11.41	4.16	0.00	-15.57
8	300.00	26.7 QP	46.00	-19.30	1.49H	283	8.58	13.18	4.94	0.00	-18.12
9	320.00	26.3 QP	46.00	-19.70	1.11H	58	7.41	13.62	5.24	0.00	-18.87
10	336.00	28.0 QP	46.00	-18.00	1.23H	105	8.62	13.92	5.45	0.00	-19.37
11	360.00	28.9 QP	46.00	-17.10	1.46H	185	8.55	14.58	5.77	0.00	-20.35
12	400.00	24.0 QP	46.00	-22.00	1.53H	274	1.63	16.11	6.27	0.00	-22.37
13	460.00	30.8 QP	46.00	-15.20	1.19H	68	7.16	16.53	7.11	0.00	-23.65
14	590.00	26.8 QP	46.00	-19.20	1.49H	346	-0.10	18.48	8.42	0.00	-26.90

EUT	BTGPS II Trine (Bluetooth GPS Receiver)	**MODEL**	D1598
MODE	Channel 78	**FREQUENCY RANGE**	30-1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Quasi-Peak
ENVIRONMENTAL CONDITIONS	35 deg. C, 60%RH, 1050 hPa	**TESTED BY**: Bunny Yao	

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M											
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	160.00	25.1 QP	43.50	-18.40	1.54V	154	12.64	9.62	2.85	0.00	-12.47
2	176.00	25.9 QP	43.50	-17.60	1.54V	198	13.51	9.08	3.28	0.00	-12.36
3	192.00	26.9 QP	43.50	-16.60	1.09V	137	14.40	8.95	3.51	0.00	-12.47
4	208.00	30.8 QP	43.50	-12.70	1.00V	225	17.75	9.40	3.67	0.00	-13.07
5	224.00	29.2 pk	46.00	-16.80	1.02V	253	43.55	10.41	3.92	28.71	14.39
6	256.00	27.6 QP	46.00	-18.40	1.30V	156	10.71	12.56	4.33	0.00	-16.89
7	390.00	28.9 QP	46.00	-17.10	1.25V	193	7.10	15.68	6.12	0.00	-21.81
8	400.00	27.3 QP	46.00	-18.70	1.02V	9	4.93	16.11	6.27	0.00	-22.38
9	432.00	26.9 QP	46.00	-19.10	1.12V	163	3.87	16.28	6.76	0.00	-23.04
10	460.00	37.3 QP	46.00	-8.70	1.19V	118	13.66	16.53	7.11	0.00	-23.65
11	590.00	32.7 QP	46.00	-13.30	1.25V	7	5.80	18.48	8.42	0.00	-26.91

RF Portion :

EUT	BTGPS II Trine (Bluetooth GPS Receiver)	**MODEL**	D1598
MODE	Channel 0	**FREQUENCY RANGE**	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	35 deg. C, 60%RH, 1050 hPa	**TESTED BY**: Bunny Yao	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M											
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2402.00	90.0 PK	-	-	1.09H	117	92.67	27.11	5.10	34.90	2.69
2	*2402.00	68.3 AV	-	-	1.09H	117	71.00	27.11	5.10	34.90	2.69
3	4804.00	34.5 AV	54.00	-19.50	1.10H	118	30.50	31.43	7.23	34.63	-4.02
4	4804.00	44.4 PK	74.00	-29.60	1.10H	118	40.37	31.43	7.23	34.63	-4.02

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M											
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2402.00	86.5 PK	-	-	1.01V	56	54.31	27.11	5.10	0.00	-32.21
2	*2402.00	71.2 AV	-	-	1.01V	56	38.94	27.11	5.10	0.00	-32.21
3	4804.00	36.3 AV	54.00	-17.70	1.06V	116	32.26	31.43	7.23	34.63	-4.02
4	4804.00	46.8 PK	74.00	-27.20	1.06V	116	42.79	31.43	7.23	34.63	-4.02

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
   (Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. " * " : Fundamental frequency
5. The other emission levels were very low against the limit.

EUT	BTGPS II Trine (Bluetooth GPS Receiver)	**MODEL**	D1598
MODE	Channel 39	**FREQUENCY RANGE**	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	35 deg. C, 60%RH, 1050 hPa	**TESTED BY**: Bunny Yao	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M											
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2441.00	88.5 PK	-	-	1.08H	90	91.00	27.33	5.08	34.90	2.50
2	*2441.00	66.8 AV	-	-	1.08H	90	69.33	27.33	5.08	34.90	2.50
3	4882.00	34.9 AV	54.00	-19.10	1.01H	105	30.86	31.47	7.21	34.63	-4.05
4	4882.00	45.3 PK	74.00	-28.70	1.01H	105	41.23	31.47	7.21	34.63	-4.05

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M											
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2441.00	86.5 PK	-	-	1.14H	95	89.00	27.33	5.08	34.90	2.50
2	*2441.00	66.1 AV	-	-	1.14H	95	68.56	27.33	5.08	34.90	2.50
3	4882.00	44.7 PK	74.00	-29.30	1.21H	214	40.60	31.47	7.21	34.63	-4.05
4	4882.00	34.5 AV	54.00	-19.50	1.21H	214	30.42	31.47	7.21	34.63	-4.05

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
   (Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. " * " : Fundamental frequency
5. The other emission levels were very low against the limit.

EUT	BTGPS II Trine (Bluetooth GPS Receiver)	**MODEL**	D1598
MODE	Channel 78	**FREQUENCY RANGE**	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	35 deg. C, 60%RH, 1050 hPa	**TESTED BY**: Bunny Yao	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2480.00	85.7 PK	-	-	1.07H	92	88.00	27.54	5.06	34.90	2.31
2	*2480.00	67.9 AV	-	-	1.07H	92	70.17	27.54	5.06	34.90	2.31
3	4960.00	34.6 AV	54.00	-19.40	1.00H	85	30.40	31.55	7.26	34.61	-4.21
4	4960.00	44.5 PK	74.00	-29.50	1.00H	85	40.27	31.55	7.26	34.61	-4.21

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (DbuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2480.00	85.4 PK	-	-	1.11V	76	87.67	27.54	5.06	34.90	2.31
2	*2480.00	64.5 AV	-	-	1.11V	76	66.83	27.54	5.06	34.90	2.31
3	4960.00	34.9 AV	54.00	-19.10	1.02V	4	30.67	31.55	7.26	34.61	-4.21
4	4960.00	45.1 PK	74.00	-28.90	1.02V	4	40.90	31.55	7.26	34.61	-4.21

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
   (Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. " * " : Fundamental frequency
5. The other emission levels were very low against the limit.

4.8 BAND EDGES MEASUREMENT

4.8.1 LIMITS OF BAND EDGES MEASUREMENT

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

4.8.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
SPECTRUM ANALYZER	FSEK30	100049	July 24, 2003

Notes:

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.

4.8.3 TEST PROCEDURE

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

4.8.4 EUT OPERATING CONDITION

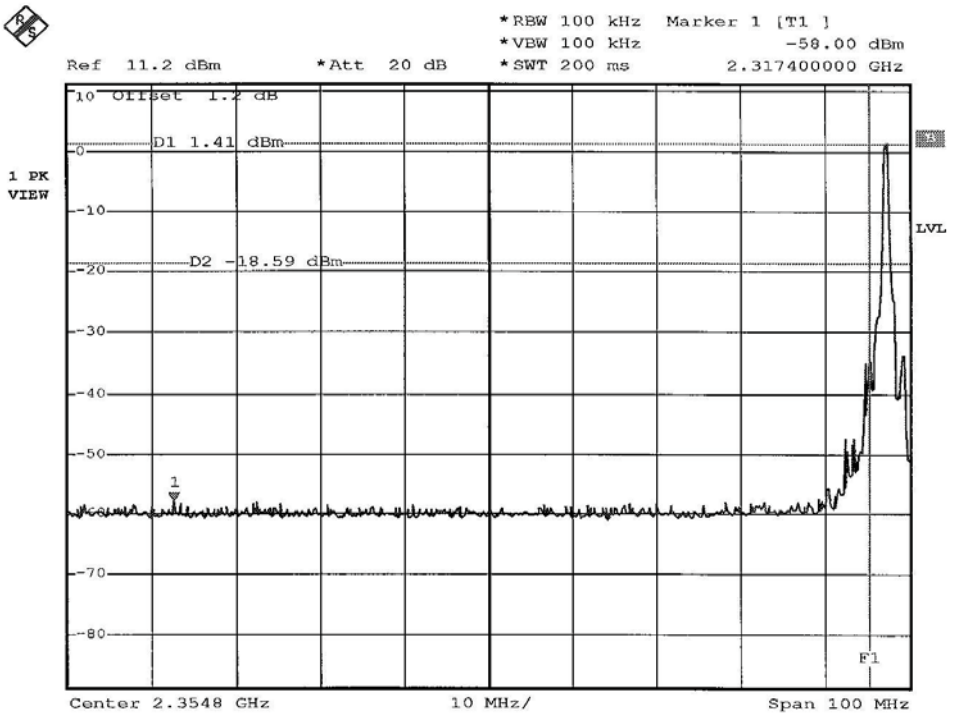
The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

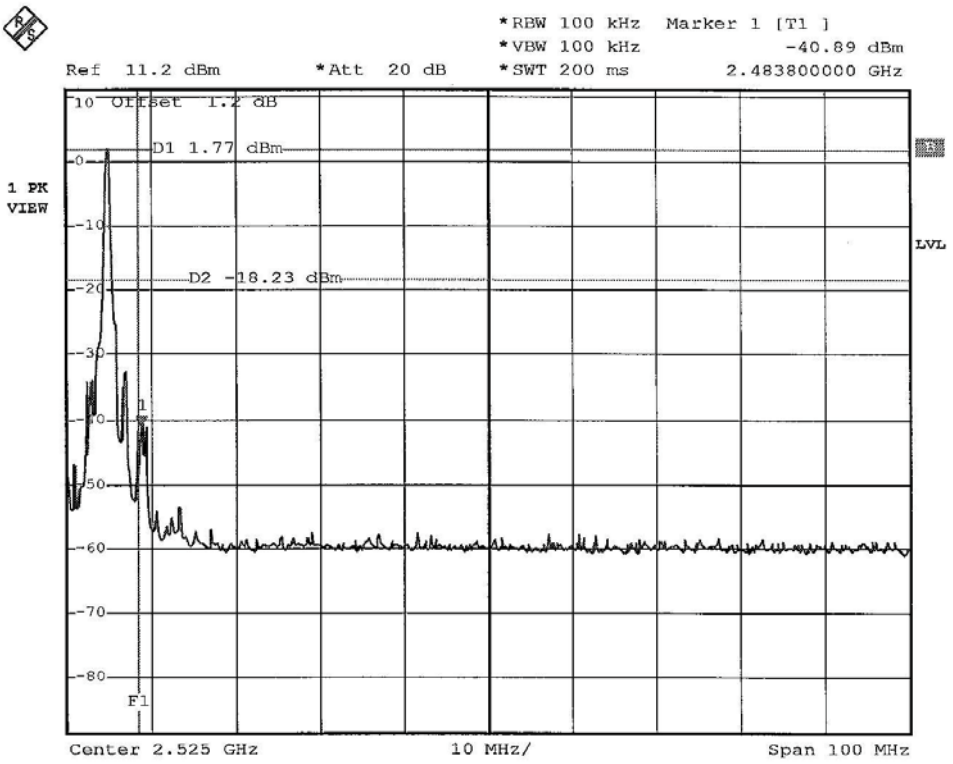
4.8.5 TEST RESULTS

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

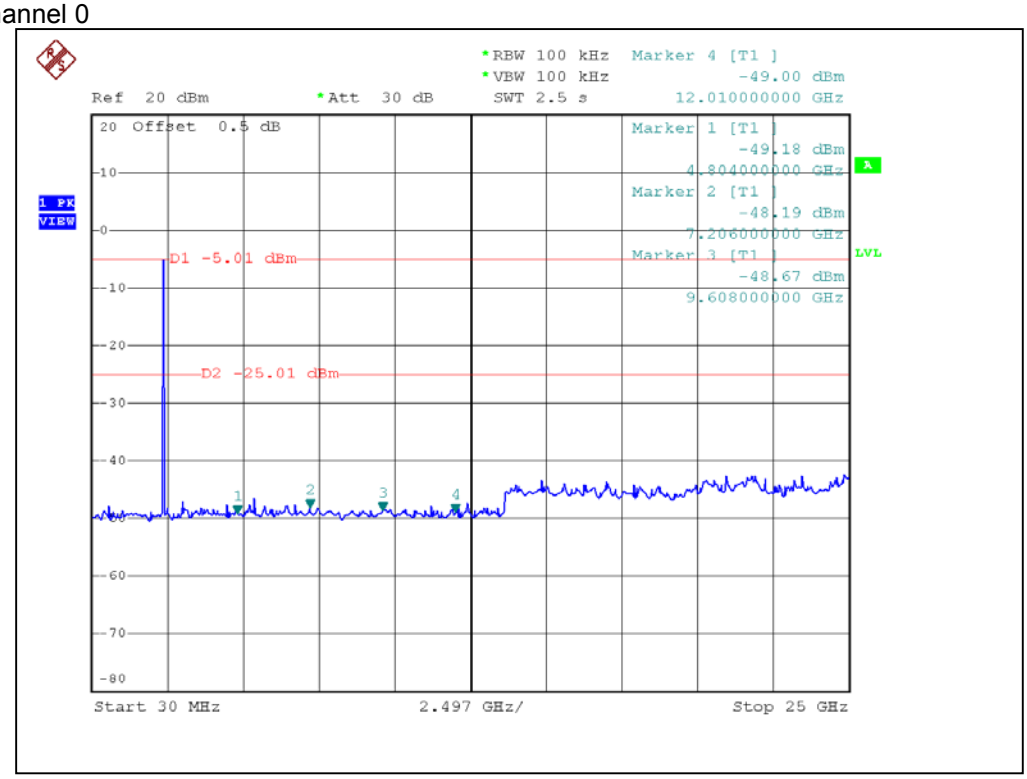
NOTE1: The band edge emission plot on the following first diagram shows 59.41dB delta between carrier maximum power and local maximum emission in restrict band (2.3174GHz). The emission of carrier strength list in the test result of channel 0 at the item 4.7.5 is 71.2dBuV/m, so the maximum field strength in restrict band is 71.2-59.41=11.79 dBuV/m which is under 54 dBuV/m limit.

NOTE2: The band edge emission plot on the following second diagram shows 42.66dB delta between carrier maximum power and local maximum emission in restrict band (2.4838GHz). The emission of carrier strength list in the test result of channel 78 at the item 4.7.5 is 67.9dBuV/m, so the maximum field strength in restrict band is 67.9-42.66=25.24 dBuV/m which is under 54 dBuV/m limit.

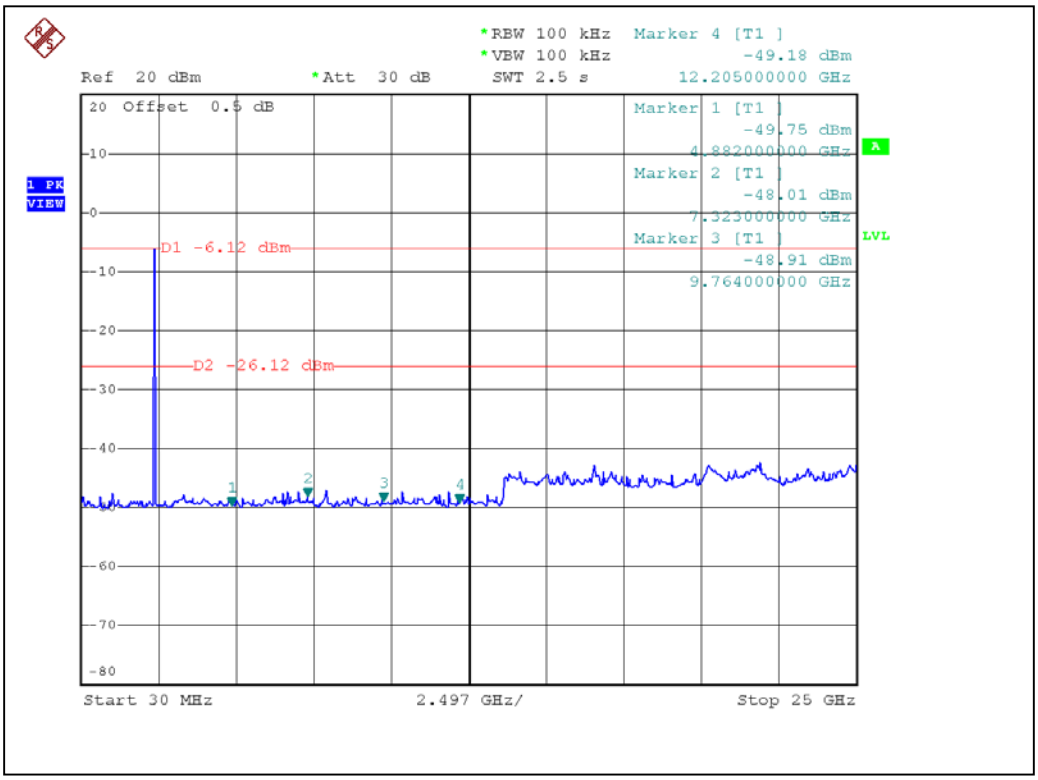

*RBW 100 kHz
*VBW 100 kHz
*SWT 200 ms
Marker 1 [T1]
-58.00 dBm
2.317400000 GHz
Ref 11.2 dBm
*Att 20 dB
Offset 1.2 dB
D1 1.41 dBm
D2 -18.59 dBm
1 PK
VIEW
LVL
F1
Center 2.3548 GHz
10 MHz/
Span 100 MHz


*RBW 100 kHz
*VBW 100 kHz
*SWT 200 ms
Marker 1 [T1]
-40.89 dBm
2.483800000 GHz
Ref 11.2 dBm
*Att 20 dB
Offset 1.2 dB
D1 1.77 dBm
D2 -18.23 dBm
1 PK
VIEW
LVL
F1
Center 2.525 GHz
10 MHz/
Span 100 MHz

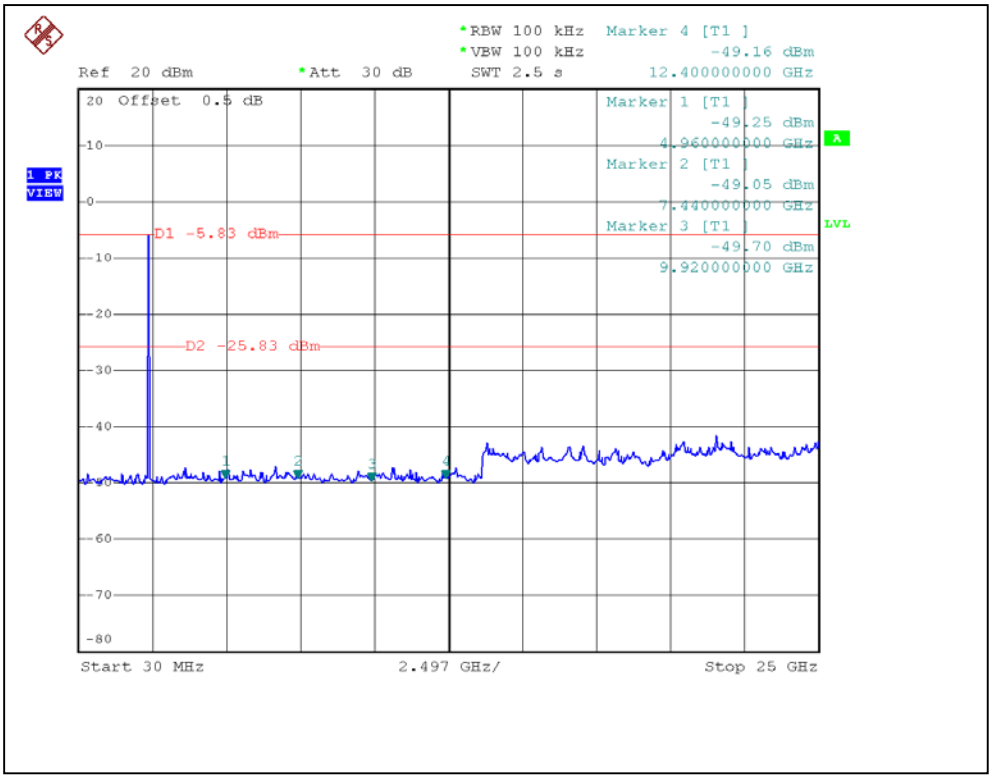
Channel 0



Channel 39



Channel 78


RBW 100 kHz
VBW 100 kHz
SWT 2.5 s
Marker 4 [T1]
-49.16 dBm
12.400000000 GHz
Ref 20 dBm
Att 30 dB
20 Offset 0.5 dB
Marker 1 [T1]
-49.25 dBm
4.960000000 GHz
Marker 2 [T1]
-49.05 dBm
7.440000000 GHz
Marker 3 [T1]
-49.70 dBm
9.920000000 GHz
1 PK
VIEW
A
LVL
D1 -5.83 dBm
D2 -25.83 dBm
Start 30 MHz
2.497 GHz/
Stop 25 GHz

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 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

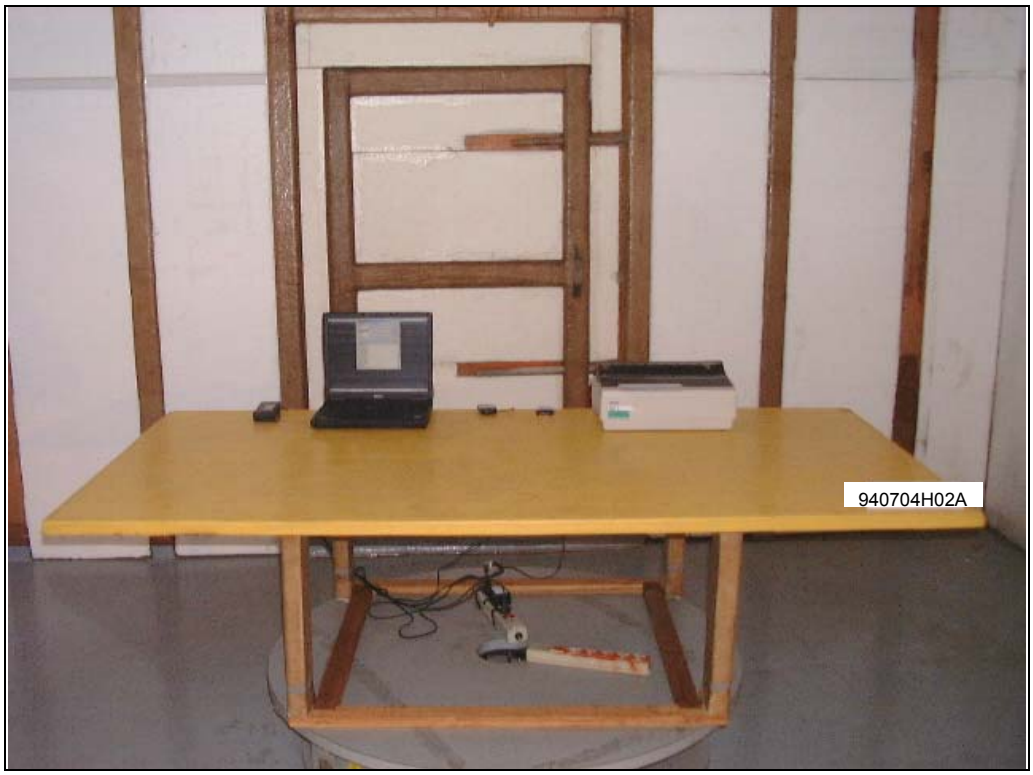
4.9.2 ANTENNA CONNECTED CONSTRUCTION

The antenna used in this product is ceramic antenna. There is no antenna connector. The maximum Gain of this antenna is only 0dBi.

5 PHOTOGRAPHS OF THE TEST CONFIGURATION

CONDUCTED EMISSION TEST

RADIATED EMISSION TEST



6 INFORMATION ON THE TESTING LABORATORIES

We, ADT Corp., were founded in 1988 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:

USA	FCC, NVLAP, UL, A2LA
Germany	TUV Rheinland
Japan	VCCI
Norway	NEMKO
Canada	INDUSTRY CANADA , CSA
R.O.C.	CNLA, BSMI, DGT
Netherlands	Telefication
Singapore	PSB , GOST-ASIA(MOU)
Russia	CERTIS(MOU)

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: www.adt.com.tw/index.5/phtml.
If you have any comments, please feel free to contact us at the following:

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Fax: 886-2-26052943

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The address and road map of all our labs can be found in our web site also.