Testing Laboratory
1190

FCC Test Report

According to

47 CFR Part 15 Subpart C

Equipment	:	**PDA Phone**
Model No.	:	**RAPH110**
FCC ID	:	**NM8RPL**
Filing Type	:	**Certification**
Applicant	:	**HTC Corporation** 23 Xinghua Rd., Taoyuan 330, Taiwan

- The test result refers exclusively to the test presented test model / sample.
- Without written approval of SPORTON International Inc., the test report shall not be reproduced except in full.
- The data shown in this test report were carried out on July 24, 2008 at **Sporton International Inc. LAB.**
- Report No.: FR830416B, Report Version: Rev.01

Roy Wu
Manager

SPORTON International Inc.
No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.

Table of Contents

History of This Test Report

Report Issue Date: July 24, 2008

Report No.	Description

1. General Description of Equipment under Test

1.1 Applicant

HTC Corporation
23 Xinghua Rd., Taoyuan 330, Taiwan

1.2 Manufacturer

HTC Corporation
23 Xinghua Rd., Taoyuan 330, Taiwan

1.3 Basic Description of Equipment under Test

PDA Phone A	PDA Phone with Camera 1 + Main Source
PDA Phone B	PDA Phone with Camera 2 + Second Source
PDA Phone C	PDA Phone without Camera

1.4 Feature of Equipment under Test

Product Feature & Specification				
DUT Type :	PDA Phone			
Model Name :	RAPH110			
FCC ID :	NM8RPL			
Tx Frequency :	2400 MHz ~ 2483.5 MHz			
Rx Frequency :	2400 MHz ~ 2483.5 MHz			
Maximum Output Power to Antenna :	Bluetooth: 1.24 dBm (1Mbps) Bluetooth EDR: 2.37dBm (2Mbps) / 1.96dBm (3Mbps)			
Type of Antenna Connector :	N/A			
Antenna Type :	PIFA Antenna			
Antenna Gain :	0 dBi			
Type of Modulation :	Bluetooth (1Mbps) : GFSK Bluetooth EDR (2Mbps) : π/4-DQPSK Bluetooth EDR (3Mbps) : 8-DPSK			
Function Type :	Transmitter		Transceiver	V
DUT Stage :	Production Unit			

2. Test Configuration of Equipment under Test

2.1 Test Manner

a. The EUT has been associated with peripherals pursuant to ANSI C63.4-2003 and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

b. The data rate, 2Mbps, was chosen to being tested, due to the highest RF output power.

Channel	Frequency	Data Rate / Modulation		
		GFSK	π/4-DQPSK	8-DPSK
		1Mbps	2Mbps	3Mbps
Ch00	2400MHz	0.95 dBm	2.07 dBm	1.58 dBm
Ch39	2441MHz	1.24 dBm	**2.37** dBm	1.96 dBm
Ch78	2480MHz	1.13 dBm	2.23 dBm	1.81 dBm

Bluetooth uses frequency hopping spread spectrum (FHSS) operation which also facilities Bluetooth multiple access and coexistence among other types of wireless systems. The basic frequency-hopping pattern is a pseudo-random ordering of 79 channel frequencies in the ISM band and the hopping rate is nominally 1600 hops per second. The EDR modulation format uses one of two types of DPSK (Pi/4-DQPSK or 8-DPSK) in the payload section of the packet. As shown in figure, the EDR packet begins using GFSK modulation during the access code and header portions of the packet but changes to DPSK modulation after the guard time. Changing to a DPSK format allows increased data rates of 2 Mb/s or 3 Mb/s.

c. The EUT is programmed to transmit signal continuously for all testings.

d. Frequency range investigated: conduction 150 KHz to 30 MHz, radiation 30 MHz to 25000 MHz.

2.2 Test Mode

Application	Test Mode		
Radiated Emission / RF Conducted	BT Tx	BT Tx(EDR 2Mbps)	BT Tx(EDR 3Mbps)
	Mode 1: CH00_2402 MHz	Mode 4: CH00_2402 MHz	Mode 7: CH00_2402 MHz
	Mode 2: CH39_2441 MHz	Mode 5: CH39_2441 MHz	Mode 8: CH39_2441 MHz
	Mode 3: CH78_2480 MHz	Mode 6: CH78_2480 MHz	Mode 9: CH78_2480 MHz
Conducted Emission	Mode 1: PDA Phone A + GSM Idle + BT Link + WLAN Link + Battery 1 + Adapter 1		
	Mode 2: PDA Phone A + GSM Idle + BT Link + WLAN Link + Battery 1 + Adapter 2		
	Mode 3: PDA Phone A + GSM Idle + BT Link + WLAN Link + Battery 2 + Adapter 3 + USB Cable 1		
	Mode 4: PDA Phone A + GSM Idle + BT Link + WLAN Link + Battery 2 + Adapter 3 + USB Cable 2		
	Mode 5: PDA Phone A + GSM Idle + BT Link + WLAN Link + Battery 2 + Adapter 4		
	Mode 6: PDA Phone B + GSM Idle + BT Link + WLAN Link + Battery 1 + Adapter 2		
	Mode 7: PDA Phone C + GSM Idle + BT Link + WLAN Link + Battery 1 + Adapter 2		

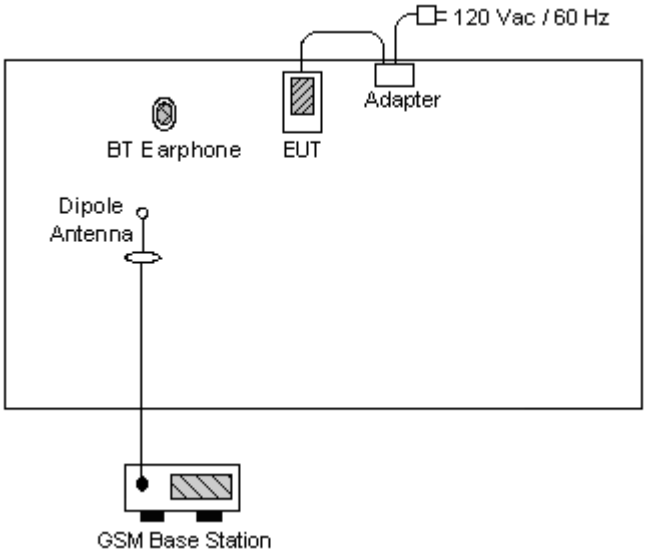
Remark：The worst case for radiated emission is mode 4~6; only the test data of mode 4~6 was reported.

2.3 Ancillary Equipment List

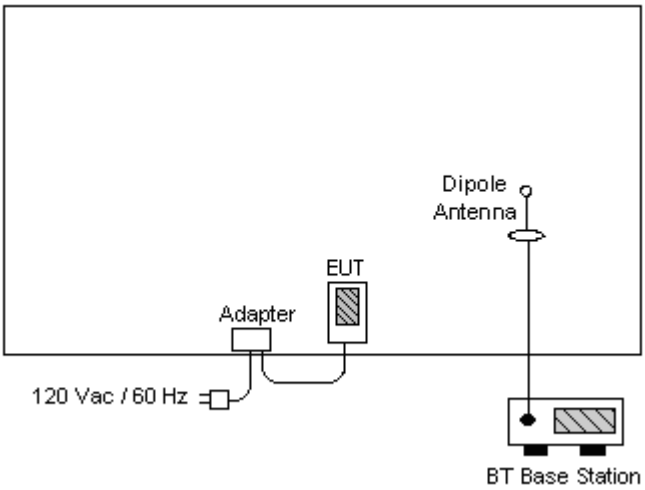
Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Base Station	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
2.	BT Base Station	Anritus	8852A	N/A	N/A	Unshielded, 1.8 m
3.	Bluetooth Earphone	Engotech	ET-BH111	PQY471087	N/A	N/A

2.4 Connection Diagram of Test System

<Conducted Emission>



<Radiated Emission>



3. RF Utility

The programmed RF Utility is installed in EUT to provide channel selection, power level, data rate and the application type. RF Utility can send transmitting signal for all testings.

4. General Information of Test

Test Site Location	:	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 886-3-327-3456 FAX : 886-3-328-4978
Test Site No	:	CO05-HY, 03CH06-HY
FCC Designation No	:	TW1022

4.1 Test Voltage

AC 120V / 60Hz

4.2 Standard for Methods of Measurement

ANSI C63.4-2003

4.3 Test Compliance

47 CFR Part 15 Subpart C

4.4 Frequency Range

a. Conduction: from 150 kHz to 30 MHz
b. Radiation: from 30 MHz to 25000 MHz

4.5 Test Distance

The test distance of radiated emission from antenna to EUT is 3 m.

5. Test Data and Test Result

5.1 List of Measurements and Examinations

The Emission Mode: Bluetooth

FCC Rule	Description of Test	Result
15.207	Conducted Emission	Pass
15.247(a)(1)(iii)	Hopping Channel Bandwidth	Pass
15.247(a)(1)	Hopping Channel Separation	Pass
15.247(a)(1)(iii)	Number of Hopping Frequency	Pass
15.247(a)(1)(iii)	Dwell Time of Each Frequency	Pass
15.247(b)(1)	Output Power	Pass
15.247(d)	100 KHz Bandwidth of Frequency Band Edges	Pass
15.209(a) 15.247(d)	Radiated Emission	Pass
15.203 15.247(b)(4)	Antenna Requirement	Pass

5.2 Band Edges Measurement

5.2.1 Measuring Instruments

As described in chapter 6 of this test report.

5.2.2 Test Procedure

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

5.2.3 Test Result

- Temperature : 24~25℃
- Relative Humidity : 55~57%
- Test Engineer : Ken

Test Result in BT lower band	:	**PASS**
Test Result in BT higher band	:	**PASS**
Test Result in BT EDR(2Mbps) lower band	:	**PASS**
Test Result in BT EDR(2Mbps) higher band	:	**PASS**
Test Result in BT EDR(3Mbps) lower band	:	**PASS**
Test Result in BT EDR(3Mbps) higher band	:	**PASS**

5.2.4 Note on Band Edge Emission

➢ **BT(2Mbps)**

CH00 (Horizontal)

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.99	51.39	-22.61	74.00	51.29	31.86	3.92	35.68	100	0	Peak
2389.99	32.79	-21.21	54.00	32.69	31.86	3.92	35.68	194	19	Average

CH00 (Vertical)

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.99	48.82	-25.18	74.00	48.72	31.86	3.92	35.68	100	0	Peak
2389.99	32.17	-21.83	54.00	32.07	31.86	3.92	35.68	125	180	Average

CH78 (Horizontal)

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.47	72.73	-1.27	74.00	72.40	31.98	4.05	35.70	100	0	Peak
2483.47	40.43	-13.57	54.00	40.10	31.98	4.05	35.70	155	28	Average

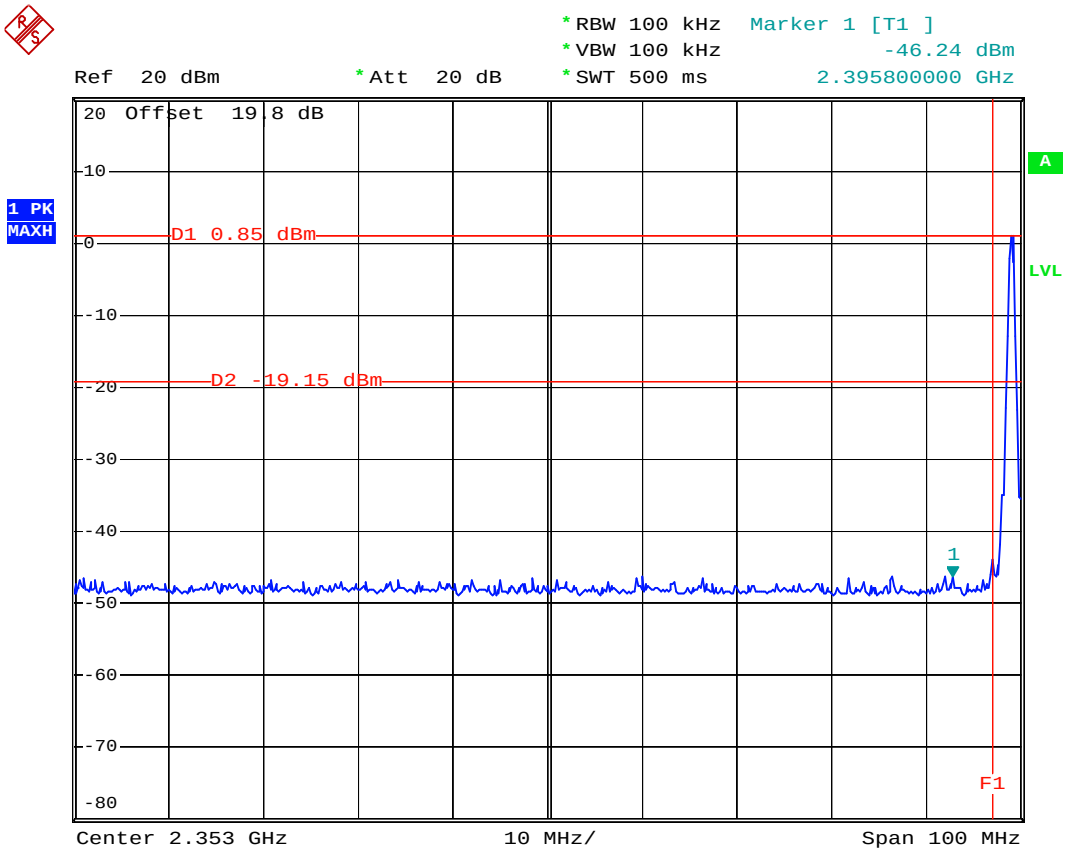
CH78 (Vertical)

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.47	67.15	-6.85	74.00	66.82	31.98	4.05	35.70	100	0	Peak
2483.47	38.76	-15.24	54.00	38.43	31.98	4.05	35.70	187	352	Average

5.2.5 20dB Band Edge

BT

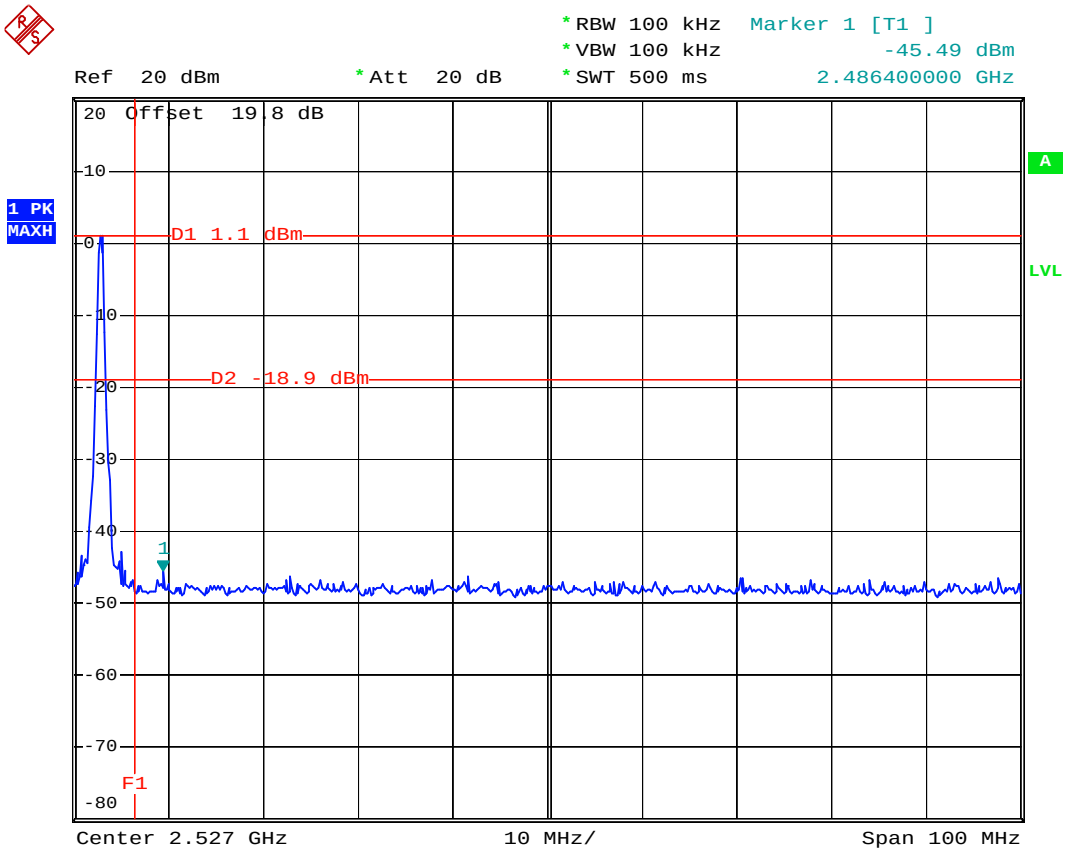
CH00



2nd comment ...

Date: 24.JUL.2008 03:36:46

CH78

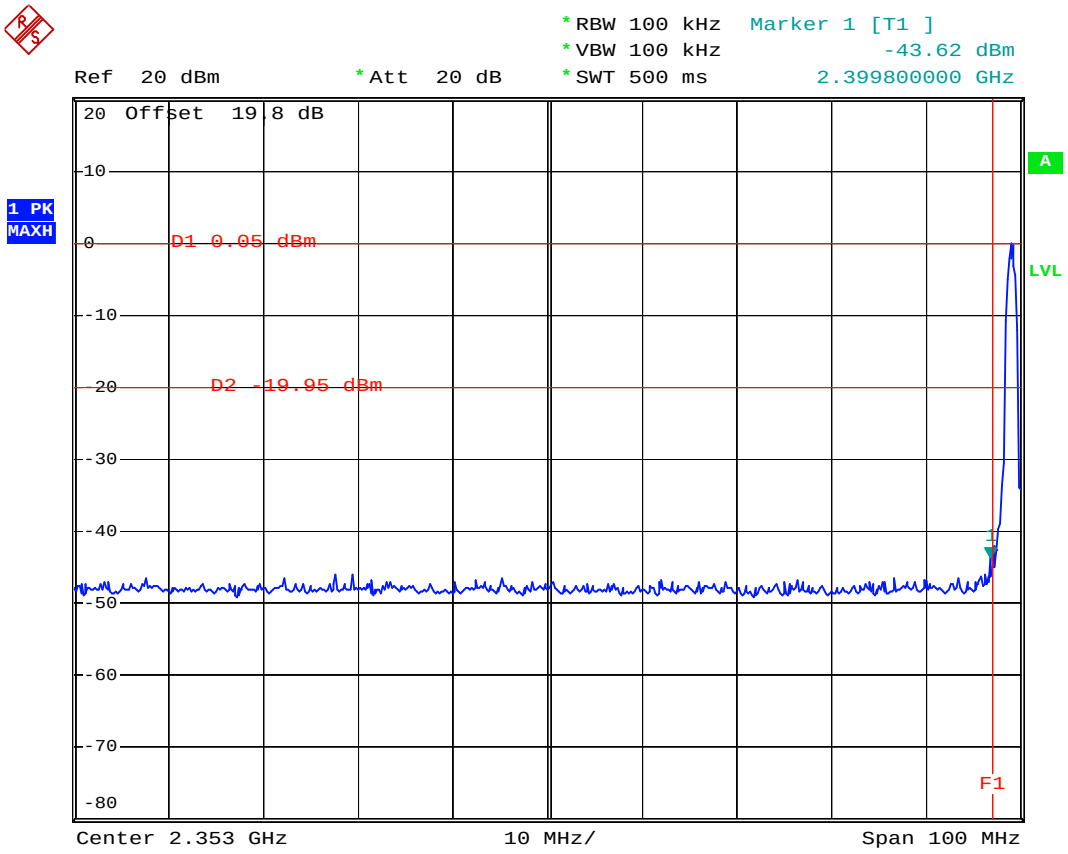


2nd comment ...

Date: 24.JUL.2008 03:35:33

BT EDR(2Mbps)

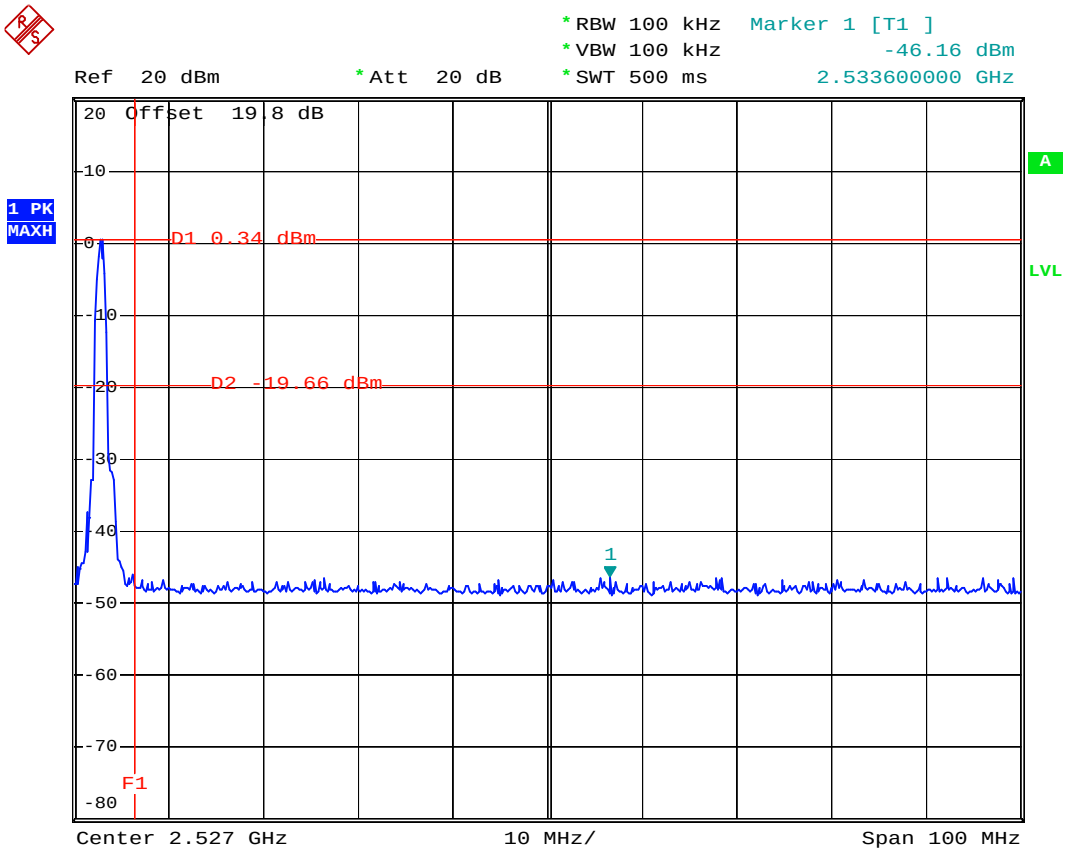
CH00



2nd comment ...

Date: 24.JUL.2008 04:24:56

CH78

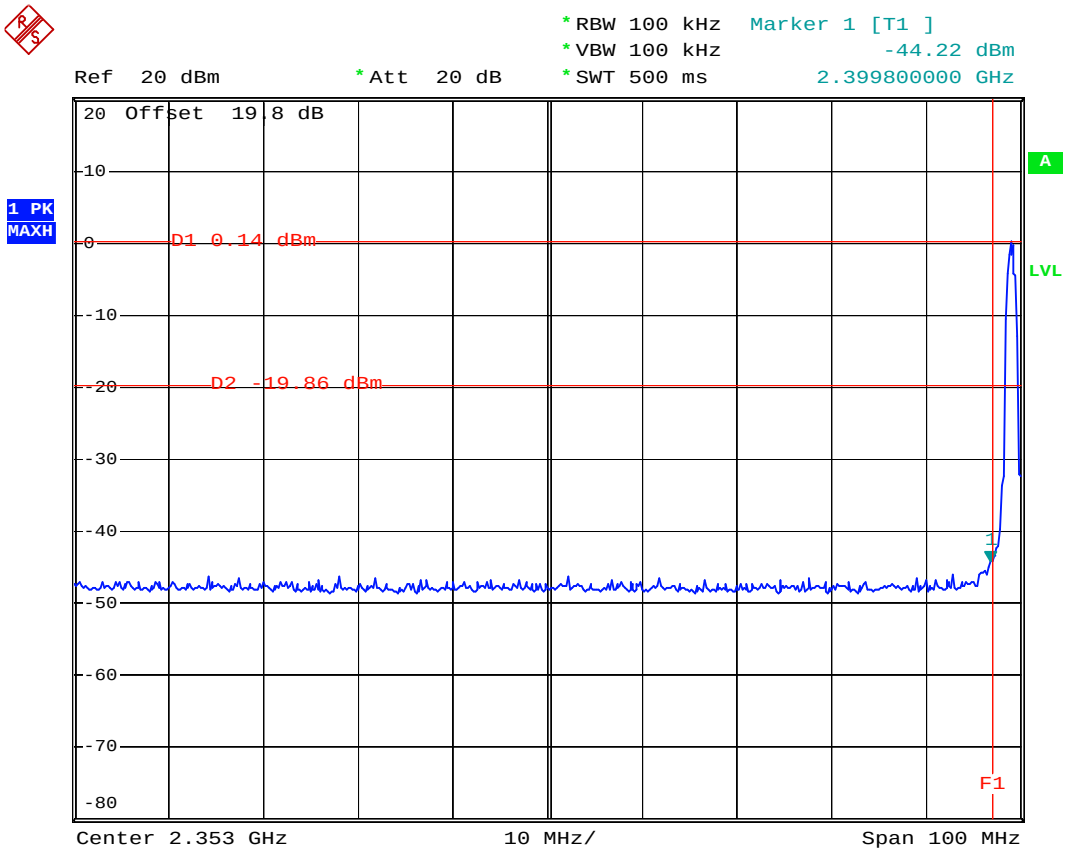


2nd comment ...

Date: 24.JUL.2008 04:23:45

BT EDR(3Mbps)

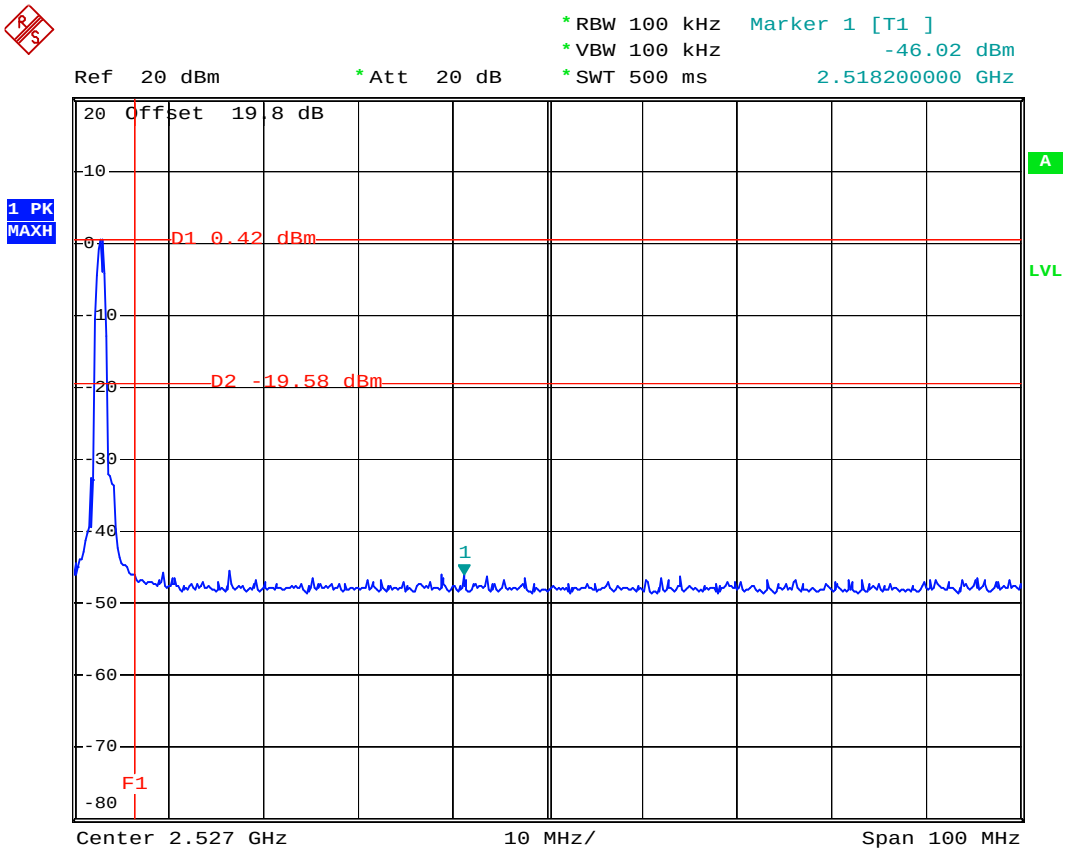
CH00



2nd comment ...

Date: 24.JUL.2008 04:37:23

CH78



2nd comment ...

Date: 24.JUL.2008 04:35:18

5.3 Hopping Channel Separation

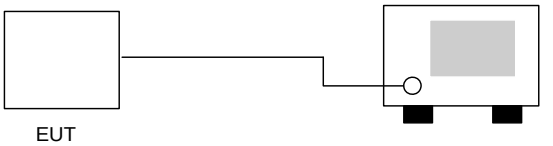
5.3.1 Measuring Instruments

As described in chapter 9 of this test report.

5.3.2 Test Procedure

1. The output of EUT was connected to the spectrum analyzer by a low loss cable..
2. Set RBW of spectrum analyzer to 30 KHz and VBW to 100 KHz.
3. The Hopping Channel Separation is defined as the channel is separated with the next channel.

5.3.3 Test Setup Layout



5.3.4 Test Result：The spectrum analyzer plots are attached as below

- Application Type : BT
- Temperature : 24~25℃
- Relative Humidity : 55~57%
- Test Engineer : Ken

Channel	Frequency (MHz)	Carrier Frequency Separation (MHz)	Limits (MHz)	Plot Ref. No.
00	2402	1.000	0.572	Mode 1
39	2441	1.004	0.575	Mode 2
78	2480	1.000	0.575	Mode 3

Remark: Hopping Channel Separation shall be greater 2/3 of 20dB bandwidth.

- Application Type : BT EDR(2Mbps)
- Temperature : 24~25℃
- Relative Humidity : 55~57%
- Test Engineer : Ken

Channel	Frequency (MHz)	Carrier Frequency Separation (MHz)	Limits (MHz)	Plot Ref. No.
00	2402	0.992	0.853	Mode 4
39	2441	1.000	0.851	Mode 5
78	2480	1.008	0.853	Mode 6

Remark: Hopping Channel Separation shall be greater 2/3 of 20dB bandwidth.

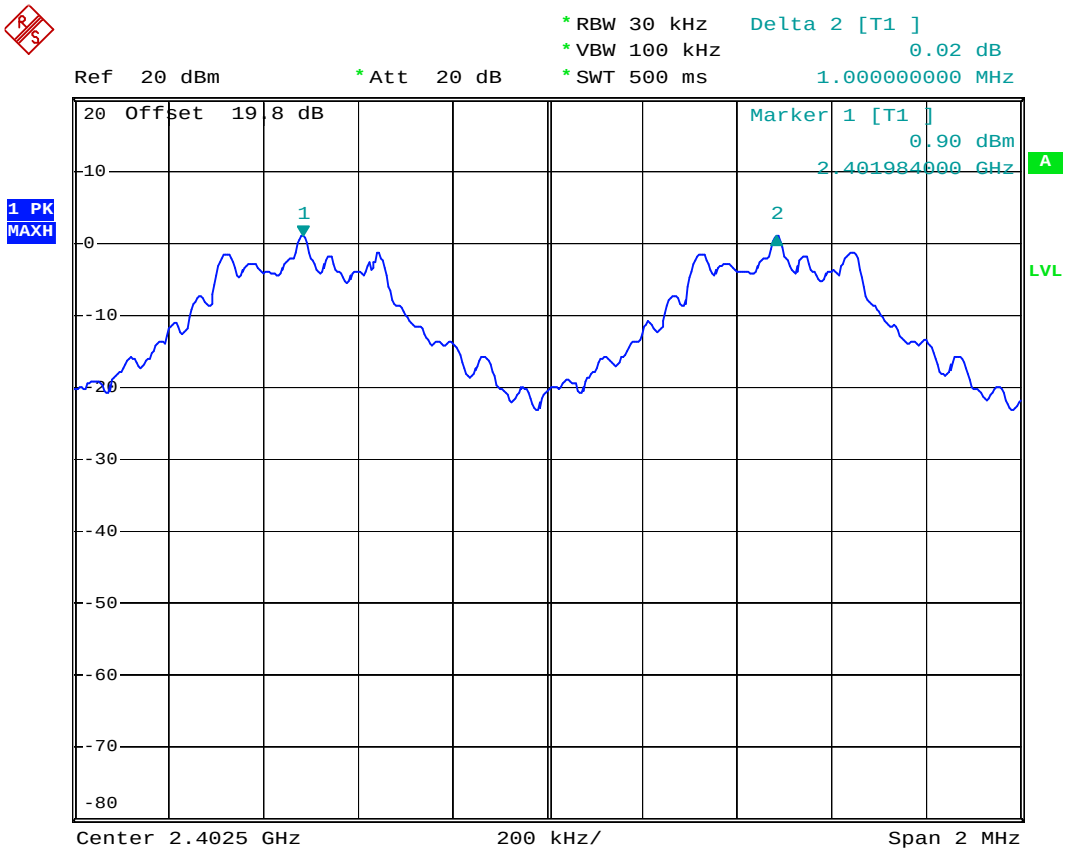
- Application Type : BT EDR(3Mbps)
- Temperature : 24~25℃
- Relative Humidity : 55~57%
- Test Engineer : Ken

Channel	Frequency (MHz)	Carrier Frequency Separation (MHz)	Limits (MHz)	Plot Ref. No.
00	2402	1.000	0.837	Mode 7
39	2441	1.000	0.840	Mode 8
78	2480	0.992	0.845	Mode 9

Remark: Hopping Channel Separation shall be greater 2/3 of 20dB bandwidth.

5.3.5 Hopping Channel Seperation

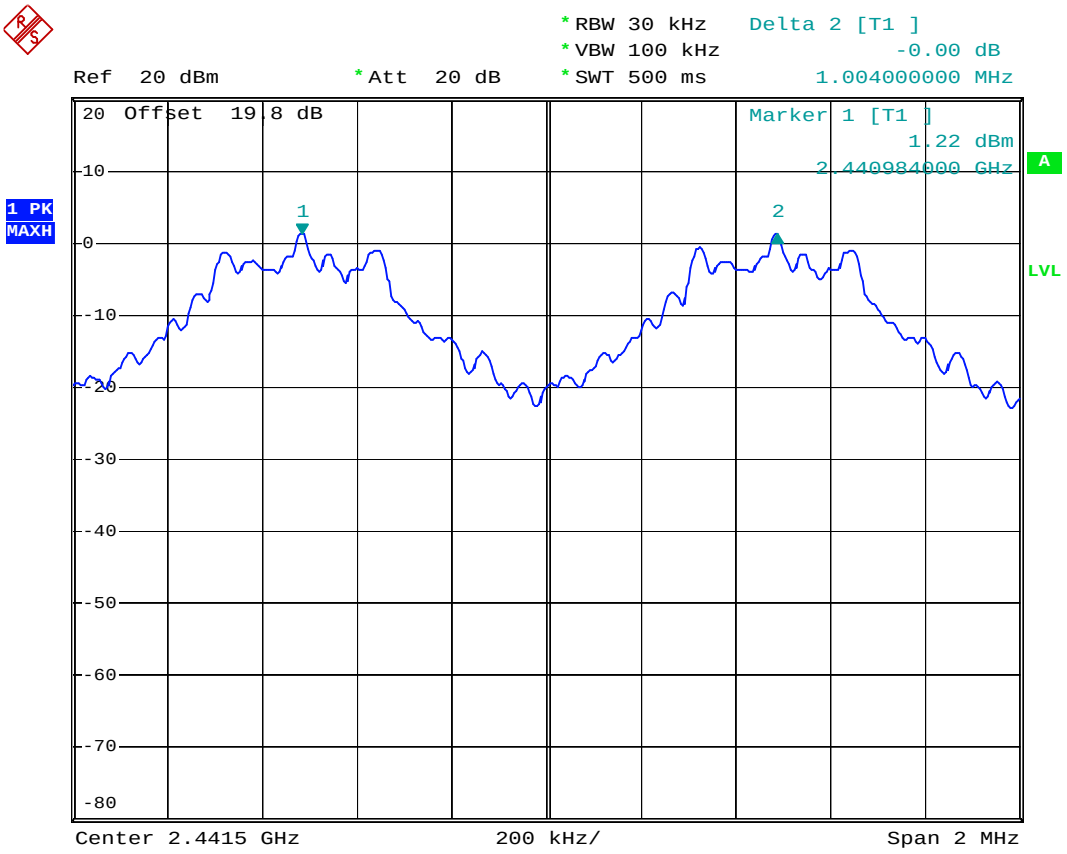
Mode 1



2nd comment ...

Date: 24.JUL.2008 03:37:33

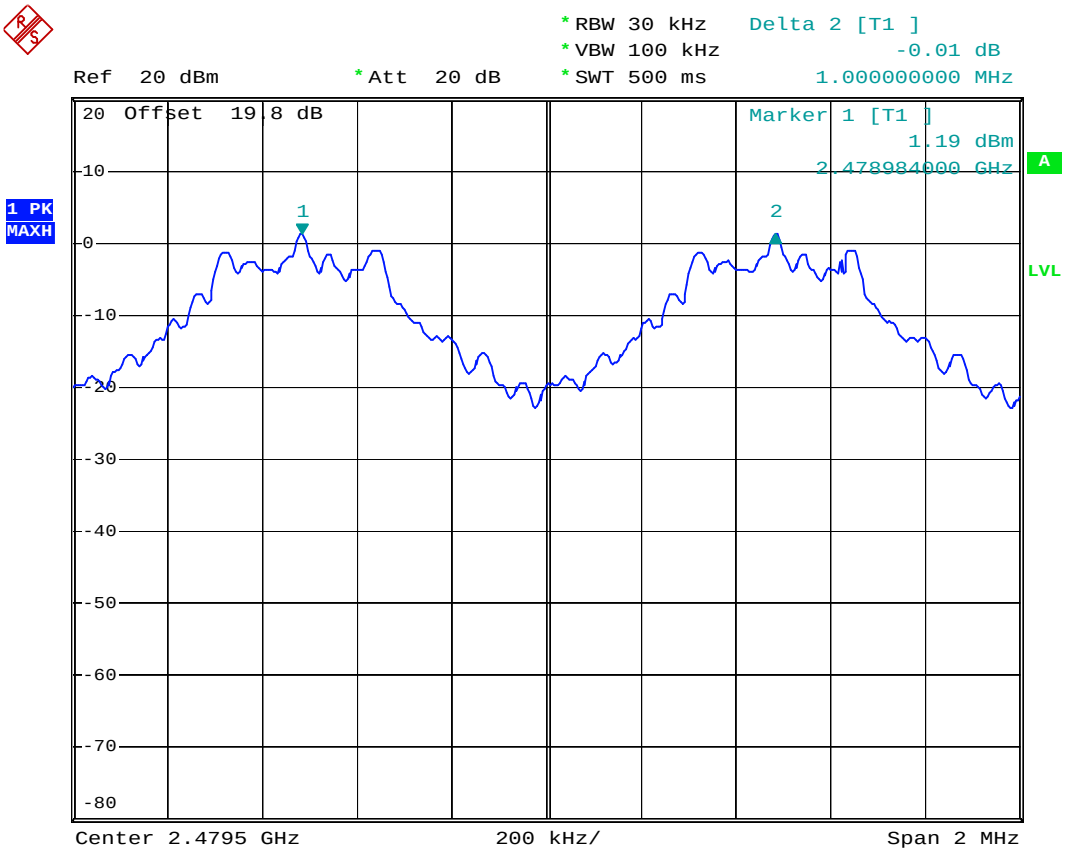
Mode 2



2nd comment ...

Date: 24.JUL.2008 03:38:30

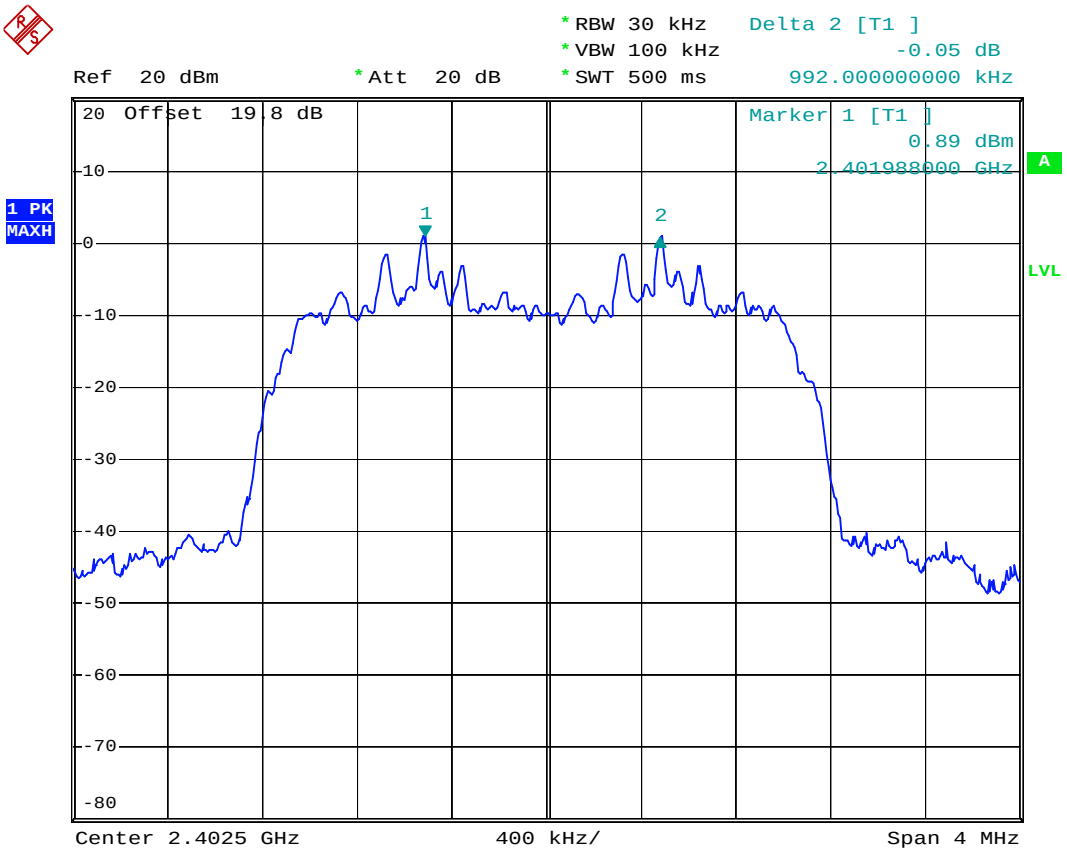
Mode 3



2nd comment ...

Date: 24.JUL.2008 03:39:26

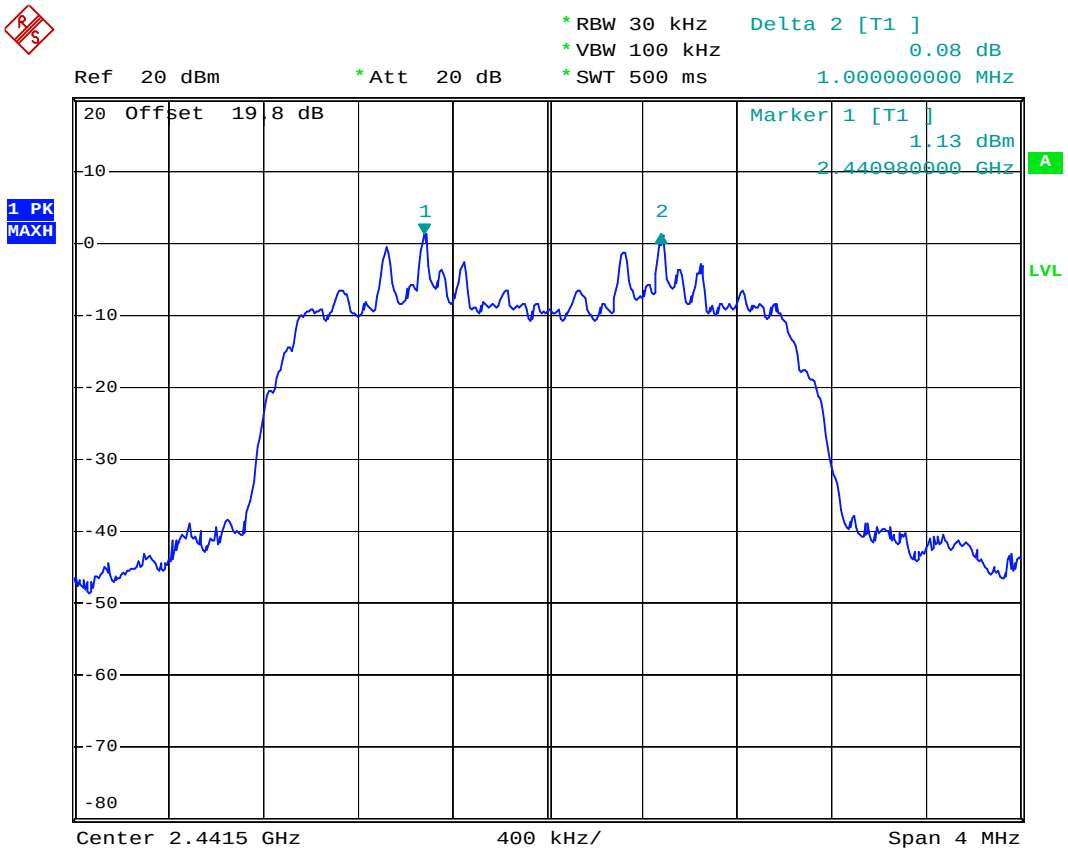
Mode 4



2nd comment ...

Date: 24.JUL.2008 04:44:43

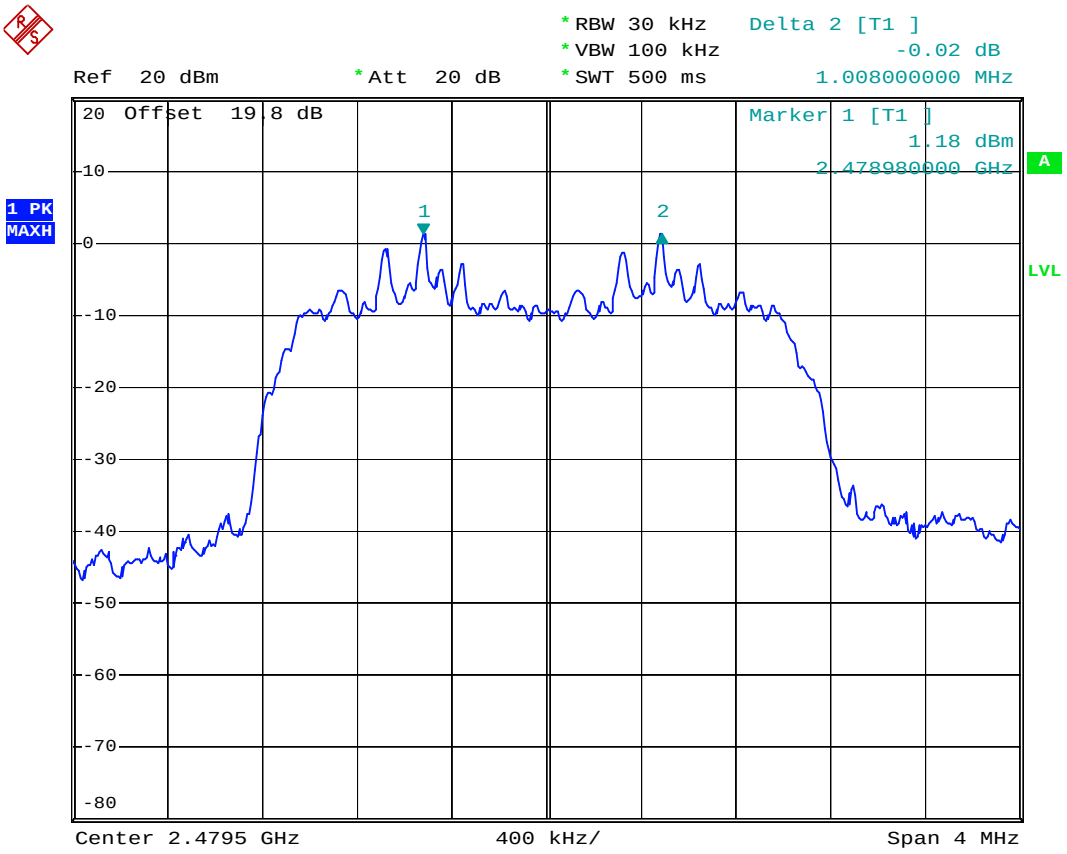
Mode 5



2nd comment ...

Date: 24.JUL.2008 04:45:41

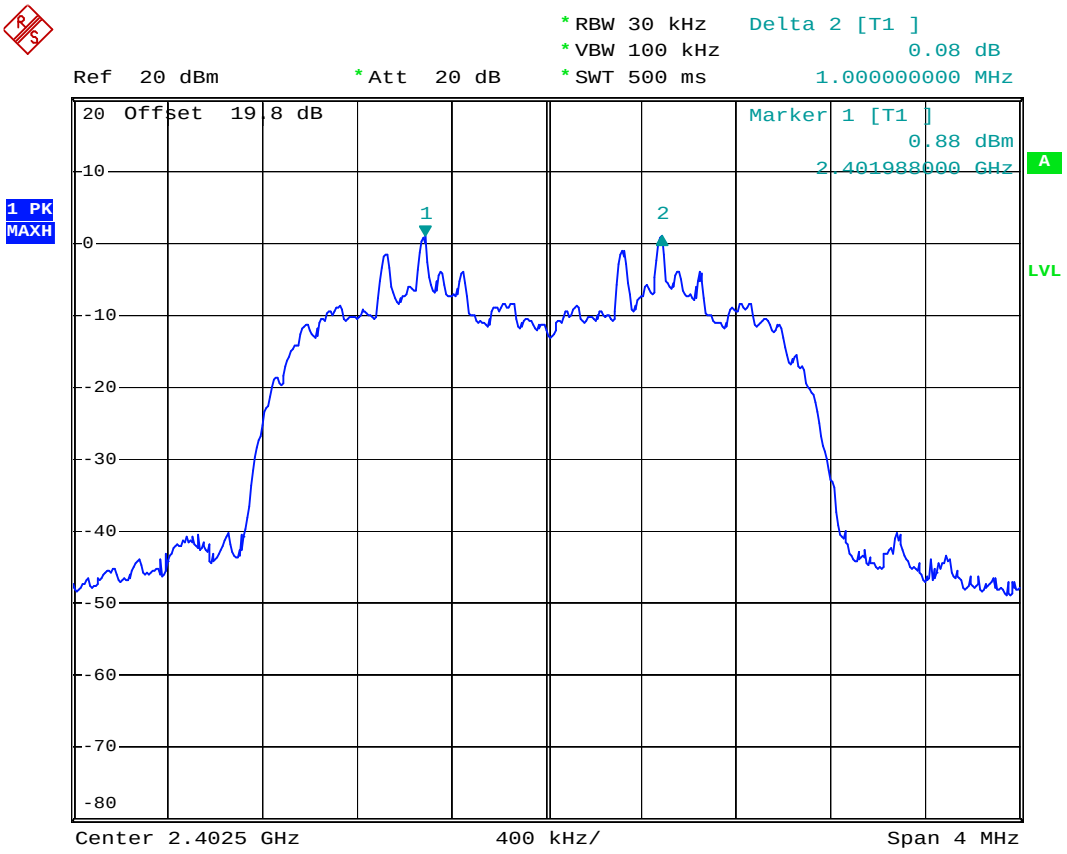
Mode 6



2nd comment ...

Date: 24.JUL.2008 04:46:29

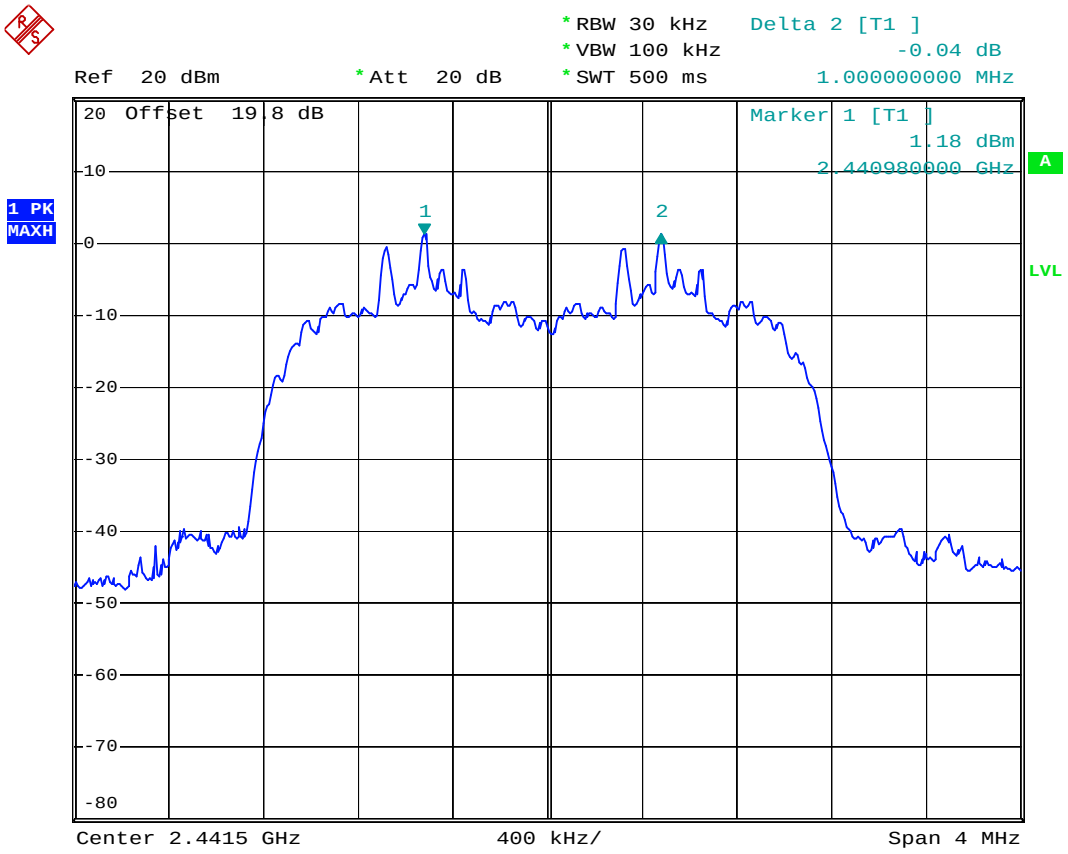
Mode 7



2nd comment ...

Date: 24.JUL.2008 04:39:14

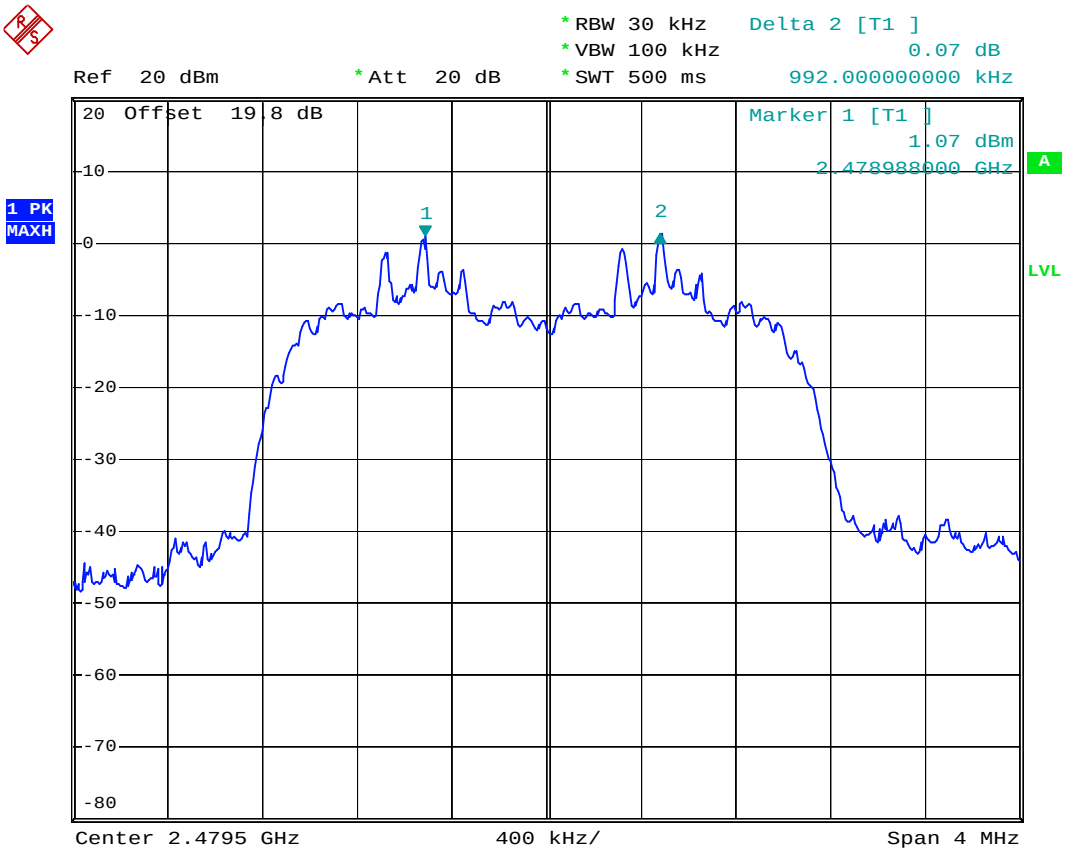
Mode 8



2nd comment ...

Date: 24.JUL.2008 04:40:45

Mode 9



2nd comment ...

Date: 24.JUL.2008 04:43:07

5.4 Number of Hopping Frequency

5.4.1 Measuring Instruments

As described in chapter 9 of this test report.

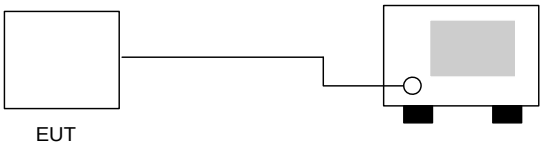
5.4.2 Test Procedure

a. The output of EUT was connected to the spectrum analyzer by a low loss cable.

b. Set RBW of spectrum analyzer to 100 KHz and VBW to 100 KHz.

c. The number of hopping frequency used is defined as the device has the numbers of total channel.

5.4.3 Test Setup Layout



5.4.4 Test Result：See spectrum analyzer plots below

- Application Type : BT
- Temperature : 24~25℃
- Relative Humidity : 55~57%
- Test Engineer : Ken

Number of Hopping Frequency (Channel)	Limits (Channel)
79	15

- Application Type : BT EDR(2Mbps)
- Temperature : 24~25℃
- Relative Humidity : 55~57%
- Test Engineer : Ken

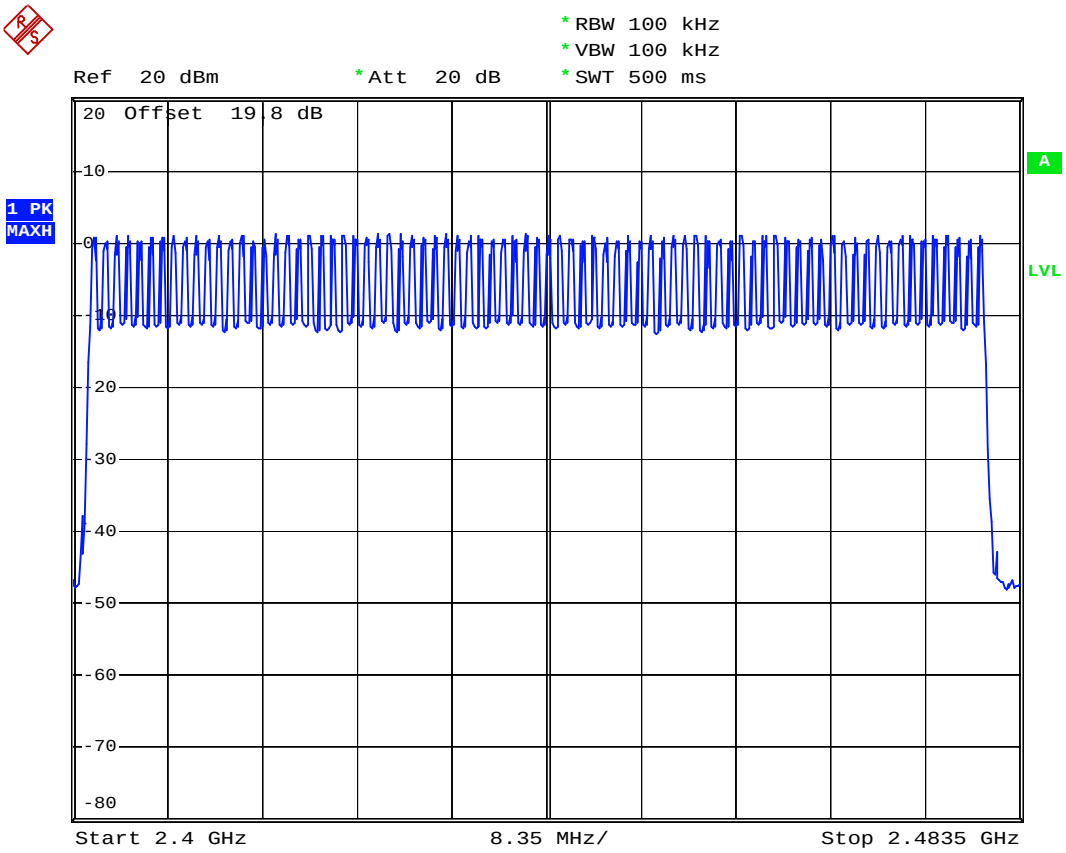
Number of Hopping Frequency (Channel)	Limits (Channel)
79	15

- Application Type : BT EDR(3Mbps)
- Temperature : 24~25℃
- Relative Humidity : 55~57%
- Test Engineer : Ken

Number of Hopping Frequency (Channel)	Limits (Channel)
79	15

5.4.5 Number of Hopping Frequency

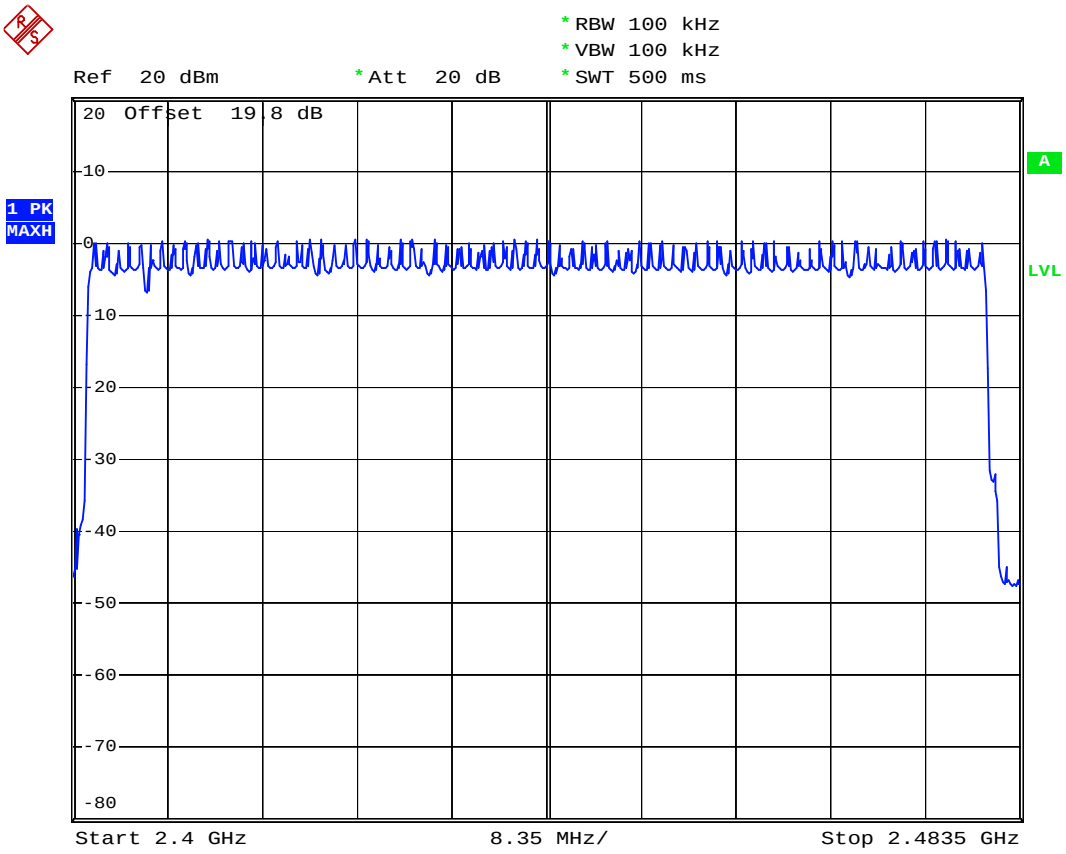
BT



2nd comment ...

Date: 24.JUL.2008 03:54:48

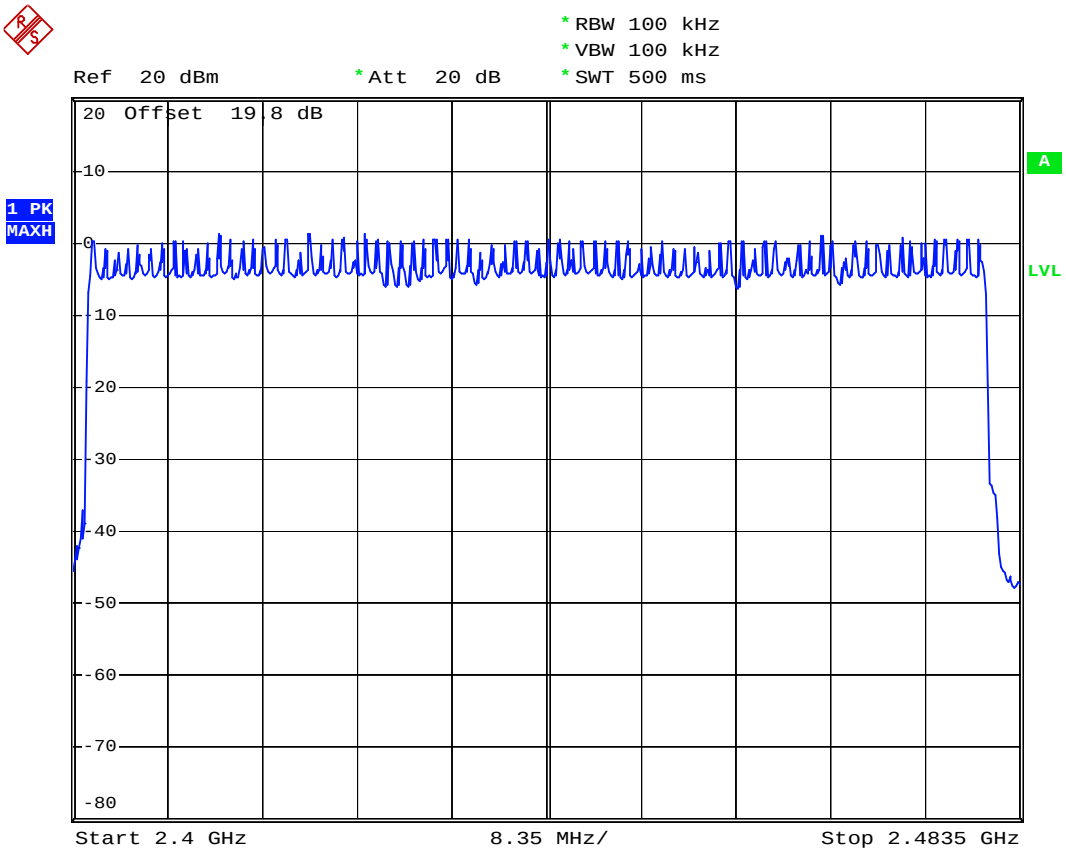
BT EDR(2Mbps)



2nd comment ...

Date: 24.JUL.2008 04:00:14

BT EDR(3Mbps)



2nd comment ...

Date: 24.JUL.2008 04:08:10

5.5 Hopping Channel Bandwidth

5.5.1 Measuring Instruments

As described in chapter 9 of this test report.

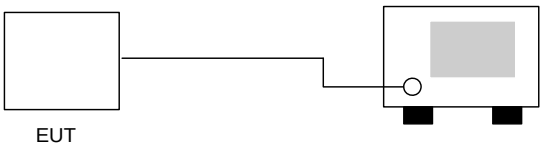
5.5.2 Test Procedure

a. The transmitter output was connected to the spectrum analyzer by a low loss cable.

b. Set RBW of spectrum analyzer to 30 KHz and VBW to 300 KHz.

c. The Hopping Channel bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20 dB.

5.5.3 Test Setup Layout



5.5.4 Test Result：See spectrum analyzer plots below

- Application Type : BT
- Temperature : 24~25℃
- Relative Humidity : 55~57%
- Test Engineer : Ken

Channel	Frequency (MHz)	Hopping Channel Bandwidth (MHz)	Plot Ref. No.
00	2402	0.858	Mode 1
39	2441	0.862	Mode 2
78	2480	0.862	Mode 3

- Application Type : BT EDR(2Mbps)
- Temperature : 24~25℃
- Relative Humidity : 55~57%
- Test Engineer : Ken

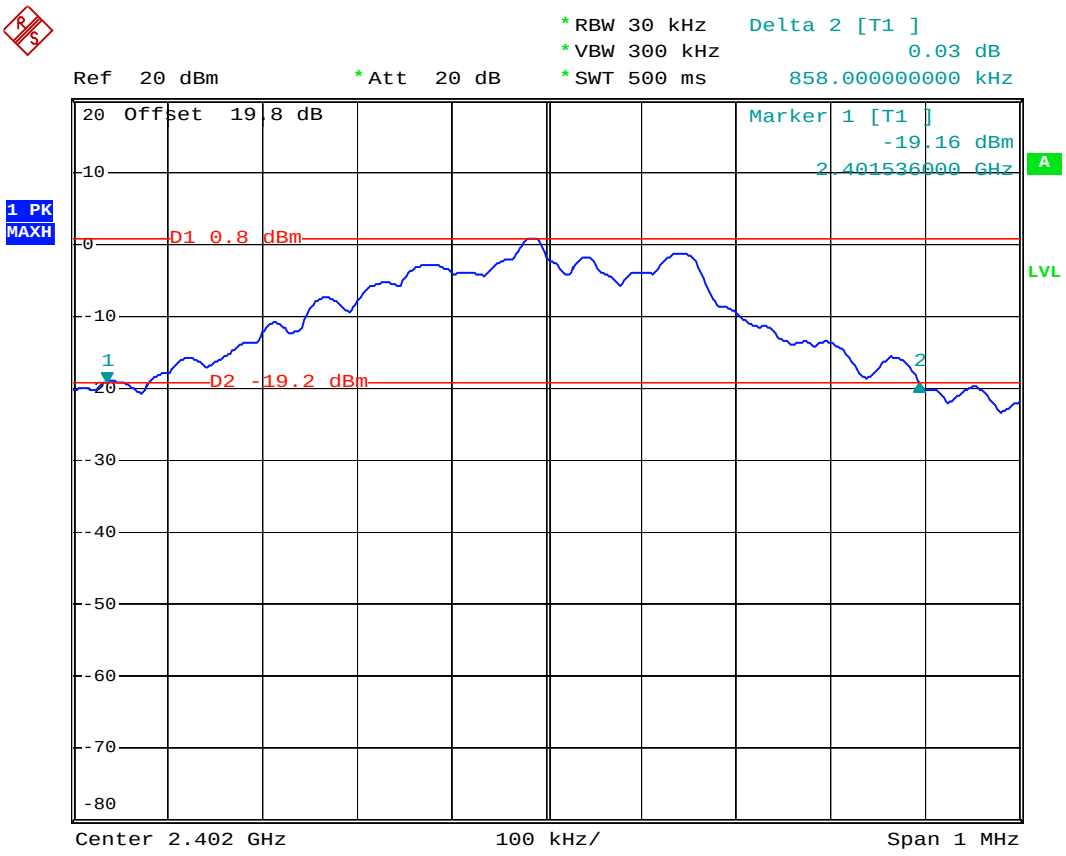
Channel	Frequency (MHz)	Hopping Channel Bandwidth (MHz)	Plot Ref. No.
00	2402	1.280	Mode 4
39	2441	1.276	Mode 5
78	2480	1.280	Mode 6

- Application Type : BT EDR(3Mbps)
- Temperature : 24~25℃
- Relative Humidity : 55~57%
- Test Engineer : Ken

Channel	Frequency (MHz)	Hopping Channel Bandwidth (MHz)	Plot Ref. No.
00	2402	1.256	Mode 7
39	2441	1.260	Mode 8
78	2480	1.268	Mode 9

5.5.5 Hopping Channel Bandwidth

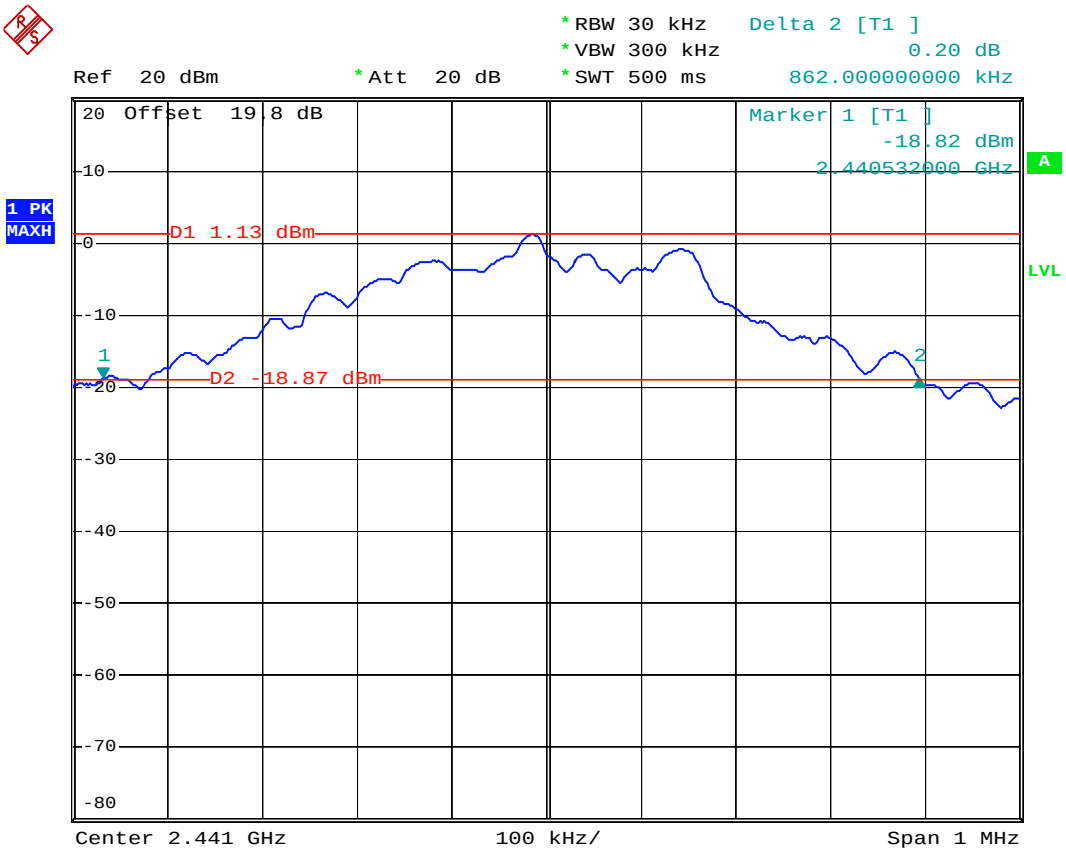
Mode 1



2nd comment ...

Date: 24.JUL.2008 03:31:12

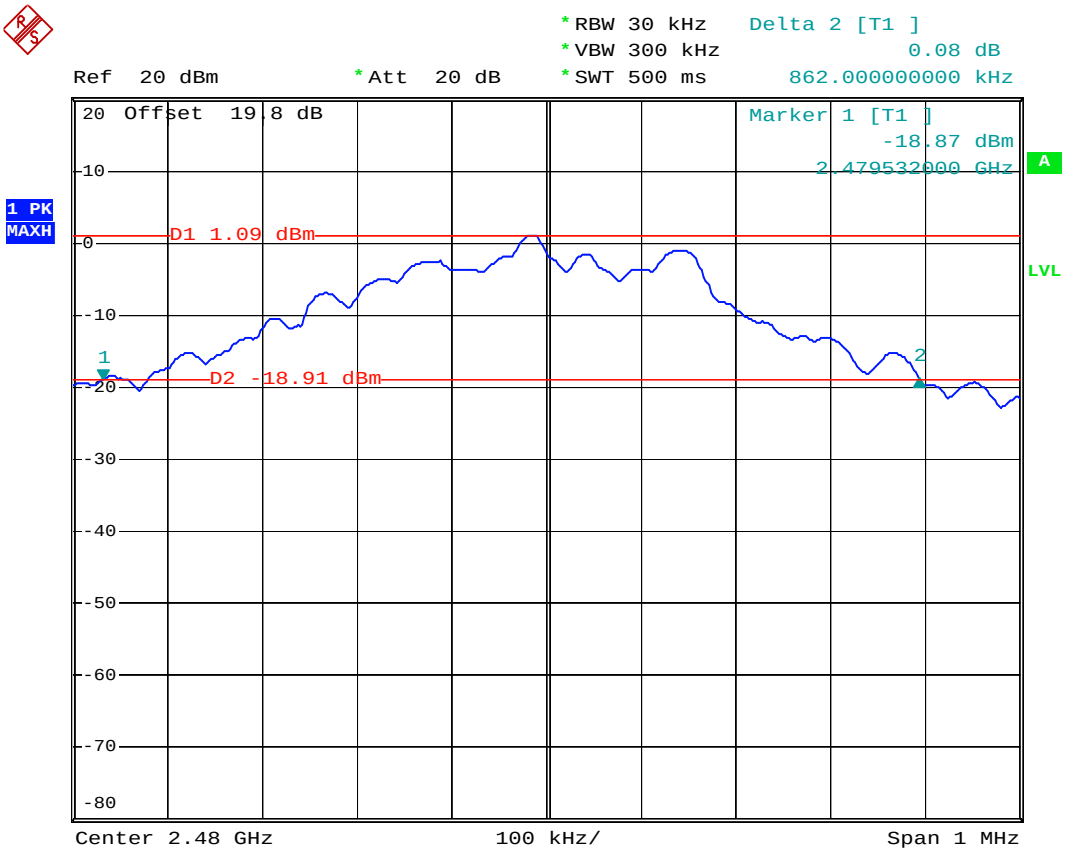
Mode 2



2nd comment ...

Date: 24.JUL.2008 03:32:25

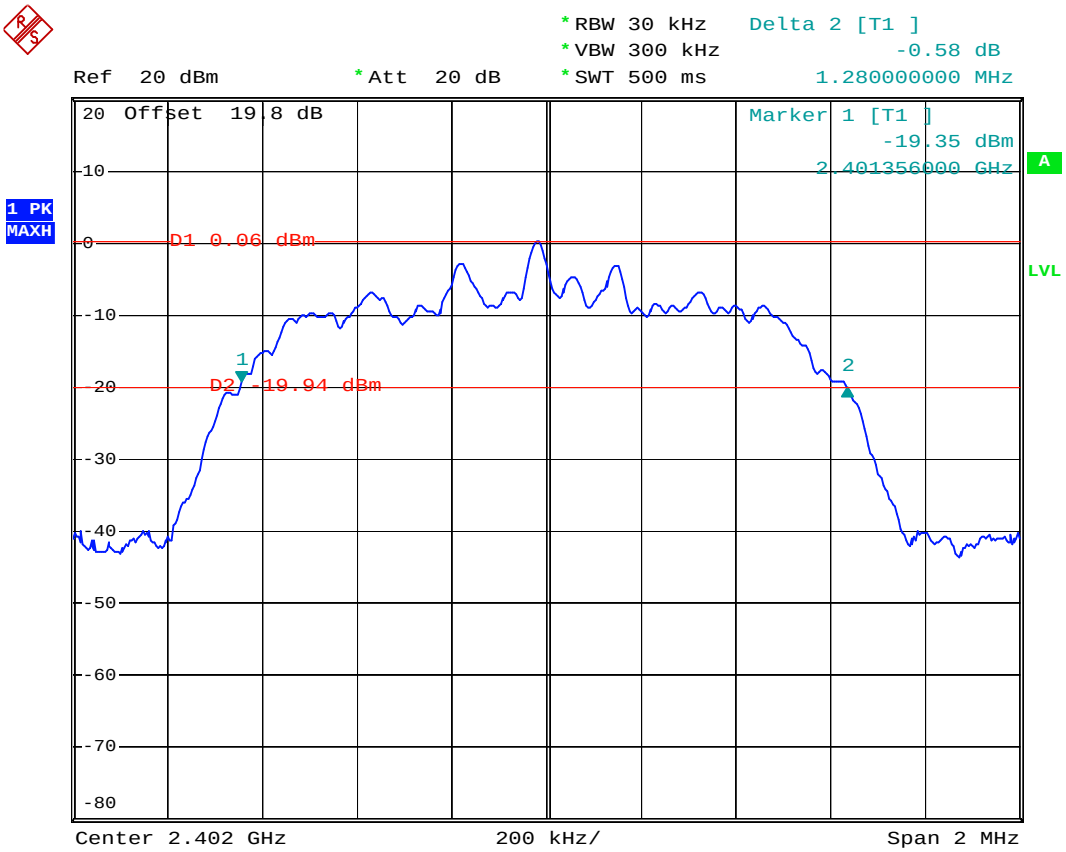
Mode 3



2nd comment ...

Date: 24.JUL.2008 03:34:19

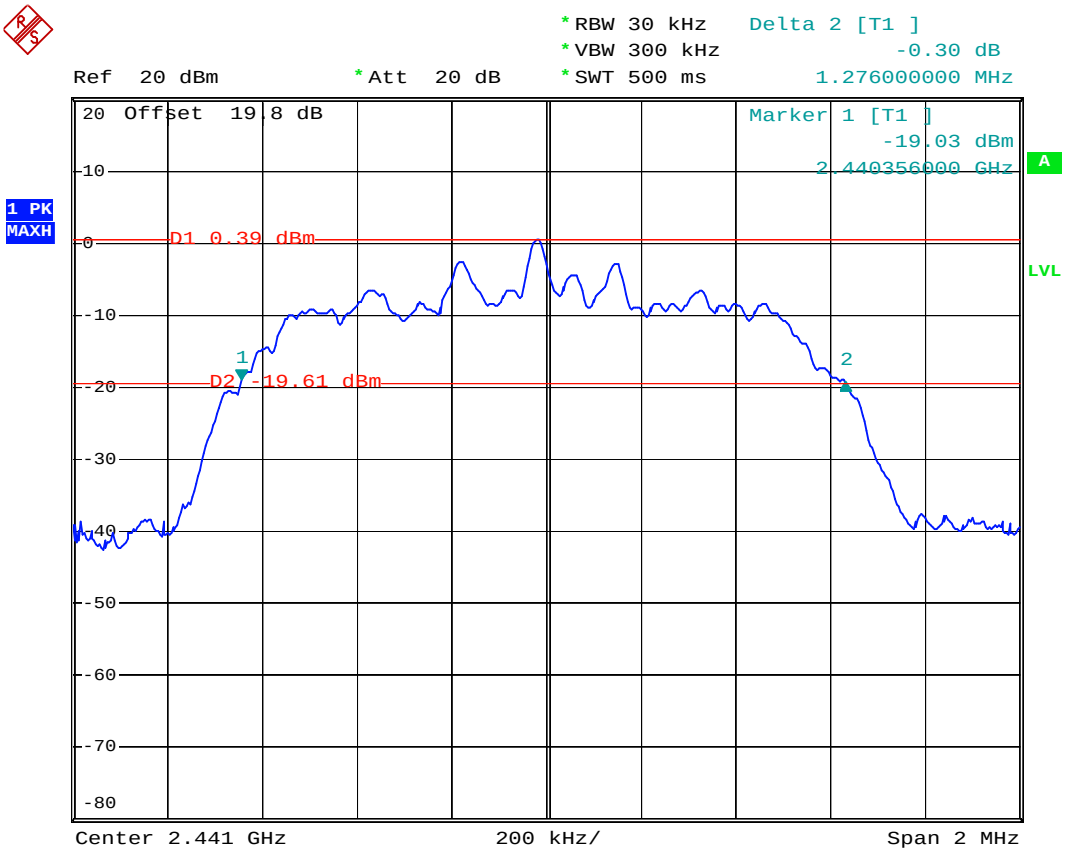
Mode 4



2nd comment ...

Date: 24.JUL.2008 04:19:00

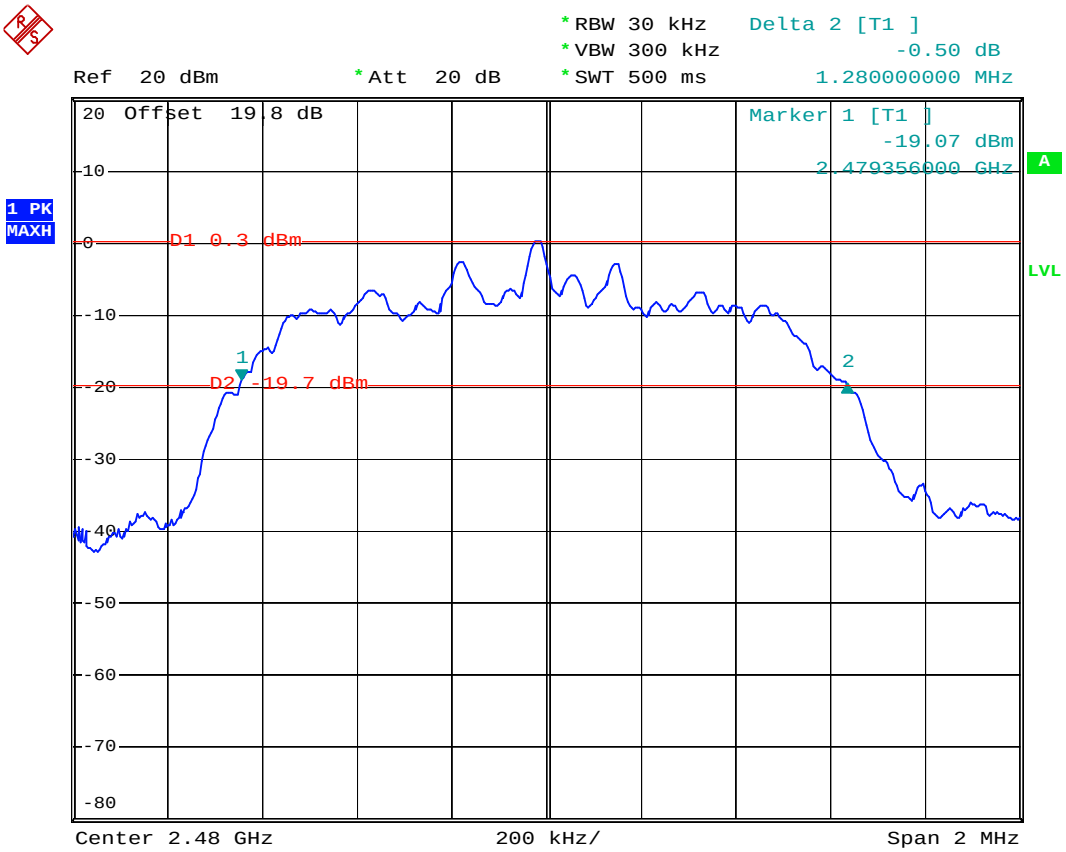
Mode 5



2nd comment ...

Date: 24.JUL.2008 04:20:13

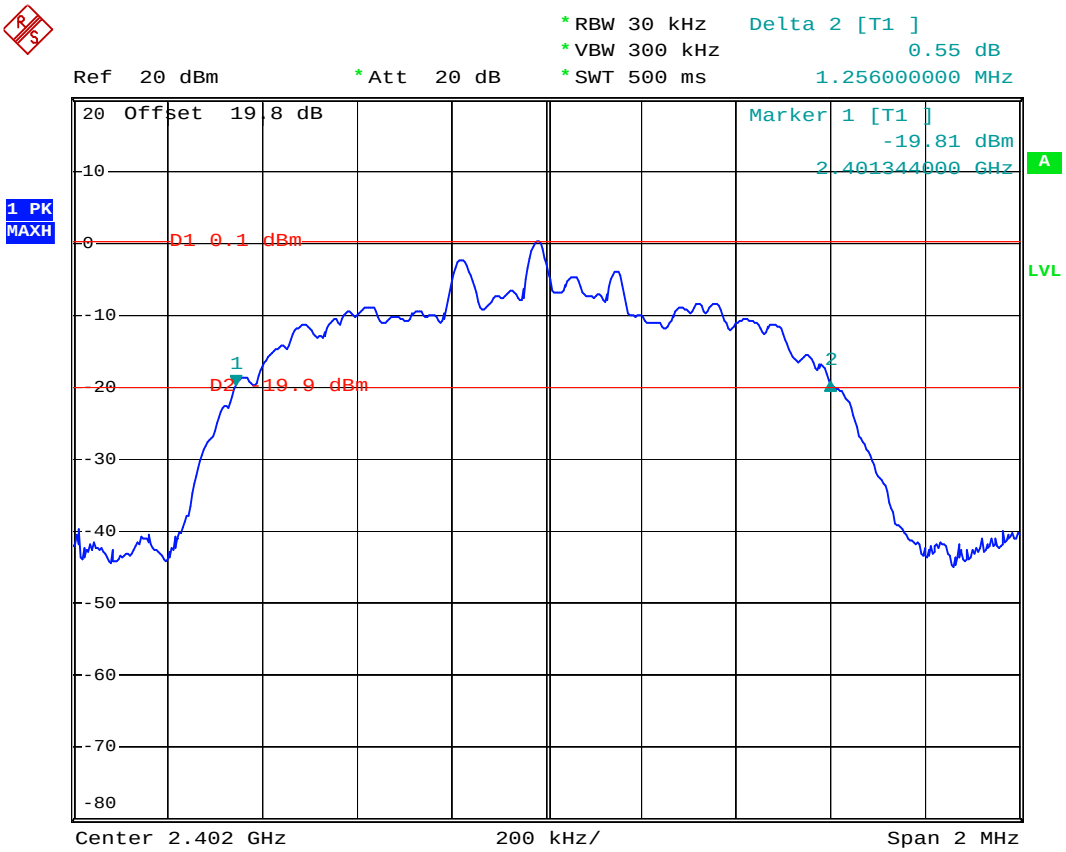
Mode 6



2nd comment ...

Date: 24.JUL.2008 04:21:52

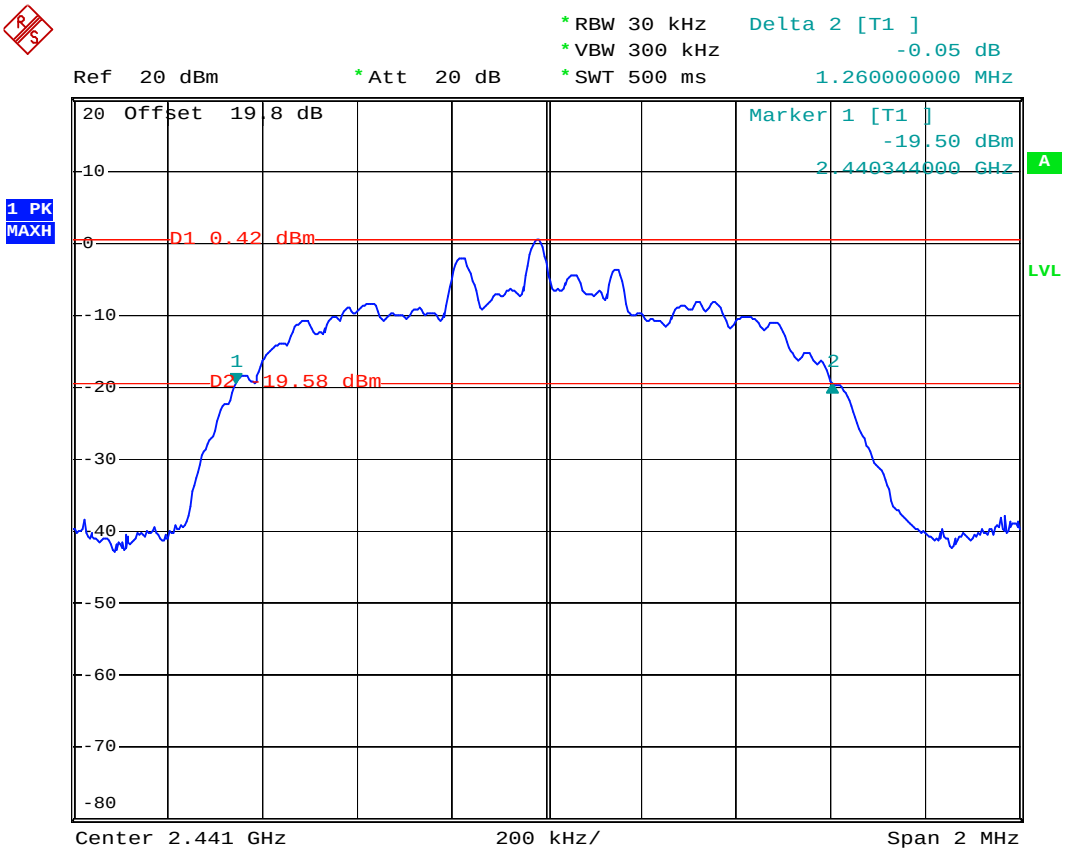
Mode 7



2nd comment ...

Date: 24.JUL.2008 04:30:04

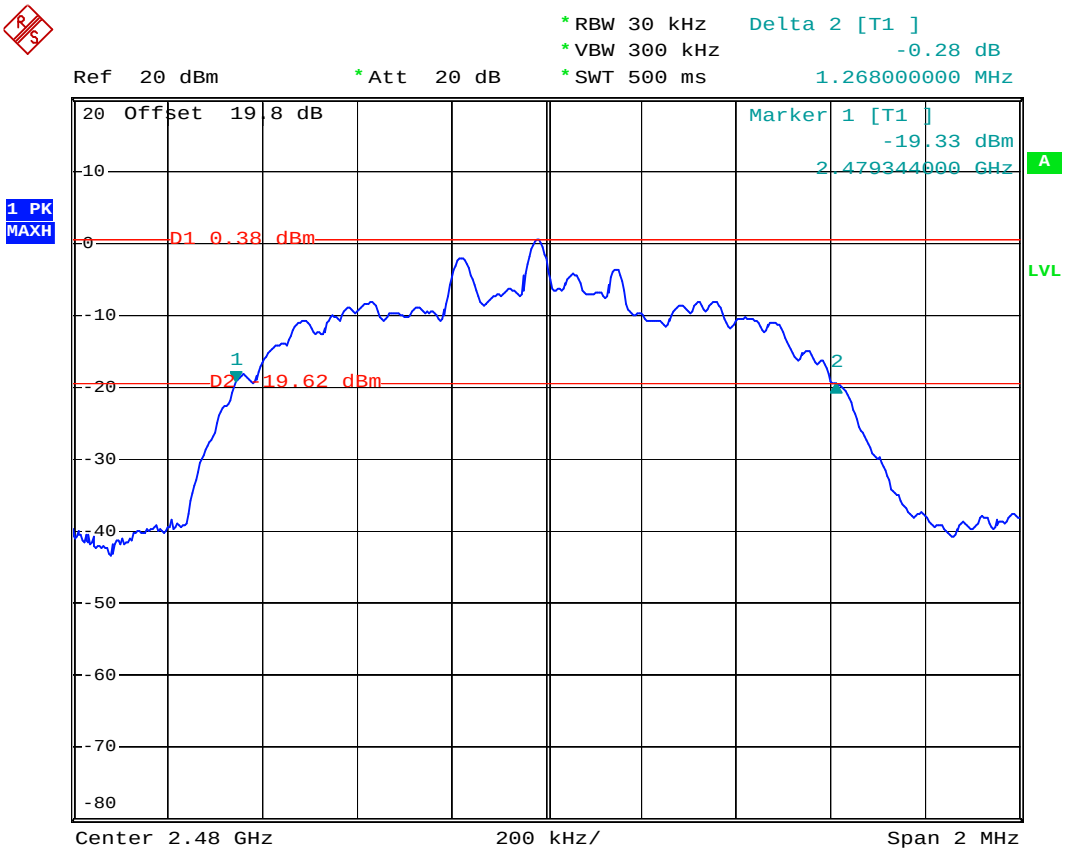
Mode 8



2nd comment ...

Date: 24.JUL.2008 04:31:10

Mode 9



2nd comment ...

Date: 24.JUL.2008 04:33:11

5.6 Dwell Time of Each Frequency

5.6.1 Measuring Instruments

As described in chapter 9 of this test report.

5.6.2 Test Procedure

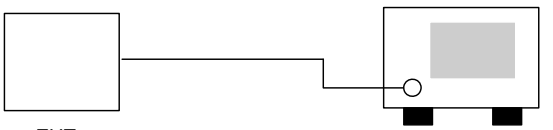
a. The transmitter output was connected to the spectrum analyzer by a low loss cable.

b. Set RBW of spectrum analyzer to 1MHz and VBW to 1MHz.

c. Set the center frequency on any frequency would be measure and set the frequency span to zero span.

d. The calculate =79 * 0.4 * (1600/79) * t (t = the time duration of one single pulse)

5.6.3 Test Setup Layout



5.6.4 Test Result：See spectrum analyzer plots below

- Application Type : BT
- Temperature : 24~25℃
- Relative Humidity : 55~57%
- Test Engineer : Ken

CH39

Package Mode	Average Hopping Channel	Package Transfer Time (us)	Dwell Time (s)	Limit (s)
DH1	9.1	440	0.127	0.4
DH3	5.7	1740	0.313	0.4
DH5	3.7	3060	0.358	0.4

- Application Type : BT EDR(2Mbps)
- Temperature : 24~25℃
- Relative Humidity : 55~57%
- Test Engineer : Ken

CH39

Package Mode	Average Hopping Channel	Package Transfer Time (us)	Dwell Time (s)	Limit (s)
DH1	9.1	448	0.129	0.4
DH3	4.7	1750	0.260	0.4
DH5	3.1	3000	0.294	0.4

- Application Type : BT EDR(3Mbps)
- Temperature : 24~25℃
- Relative Humidity : 55~57%
- Test Engineer : Ken

CH39

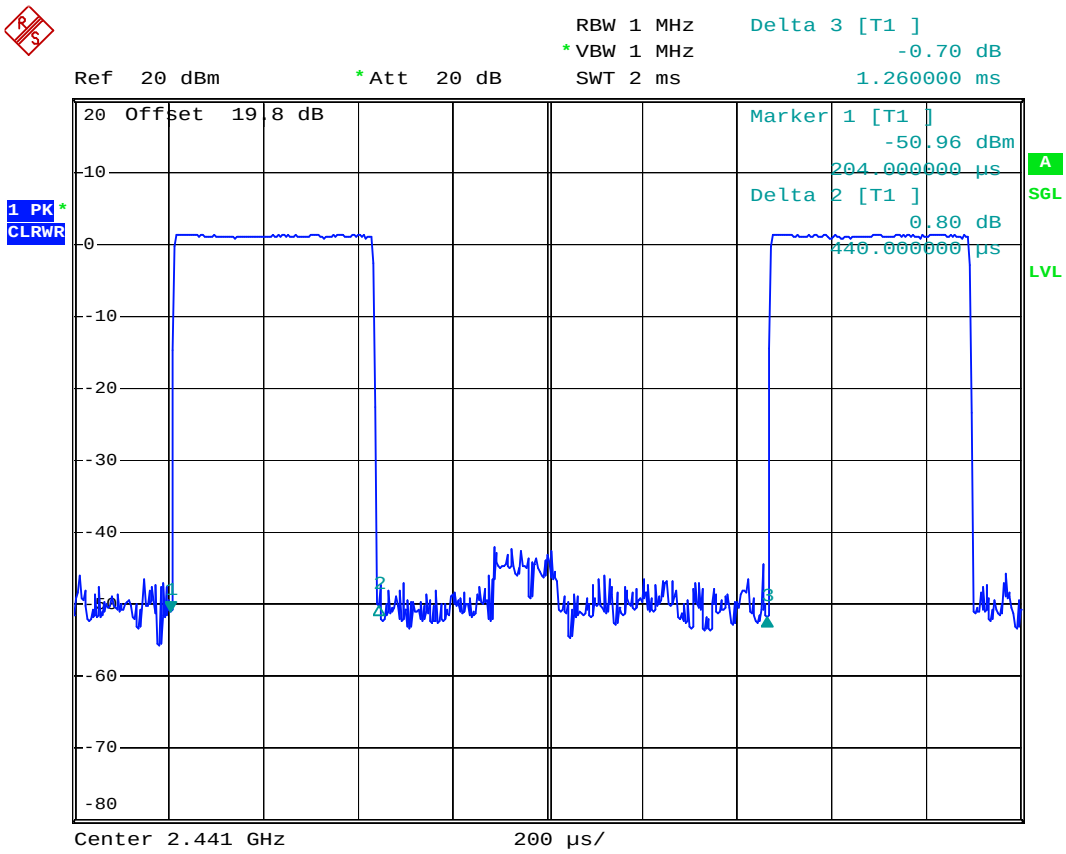
Package Mode	Average Hopping Channel	Package Transfer Time (us)	Dwell Time (s)	Limit (s)
DH1	8.9	464	0.130	0.4
DH3	5.3	1720	0.288	0.4
DH5	4.0	2980	0.377	0.4

※ Remark:

1. Dwell Time=79(channels) x 0.4(s) x average hopping channel x package transfer time
2. 79 channels come from the Hopping Channel number.
3. Average Hopping Channel = hops/sweep time
4. t: Package Transfer Time(us)

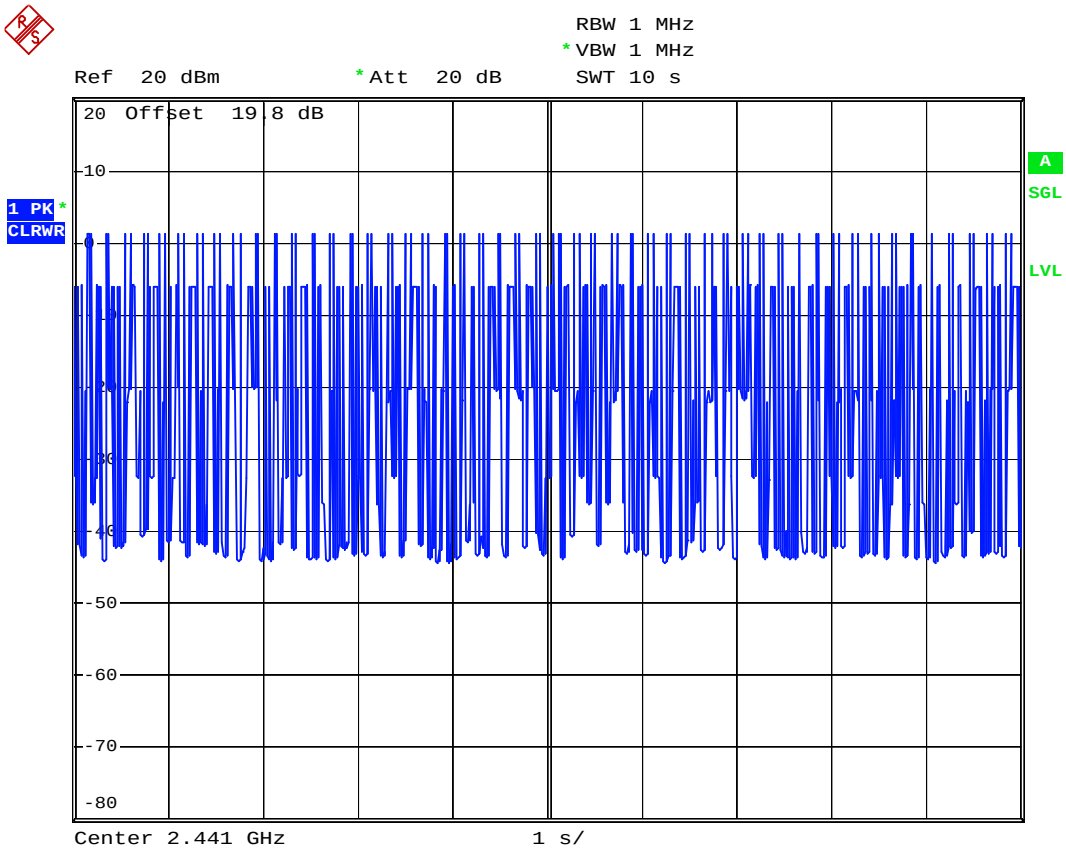
5.6.5 Dwell Time

DH1 (CH39)



2nd comment ...

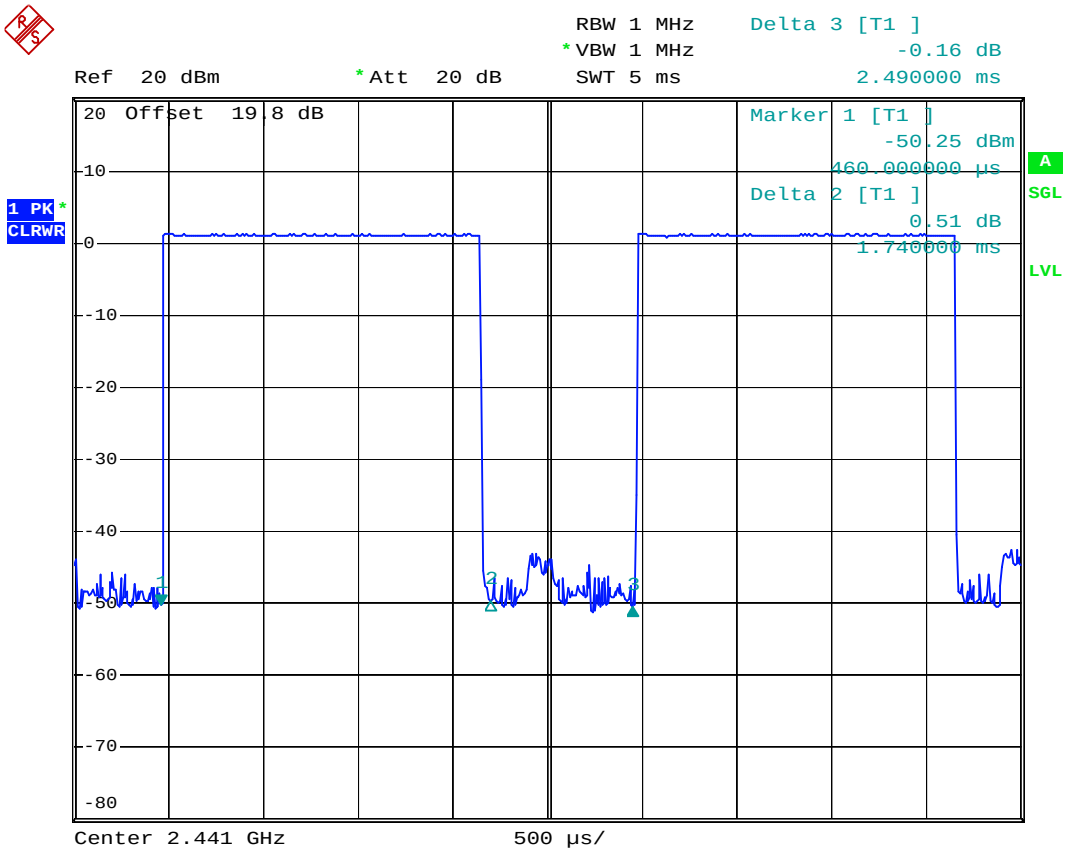
Date: 24.JUL.2008 03:40:27



2nd comment ...

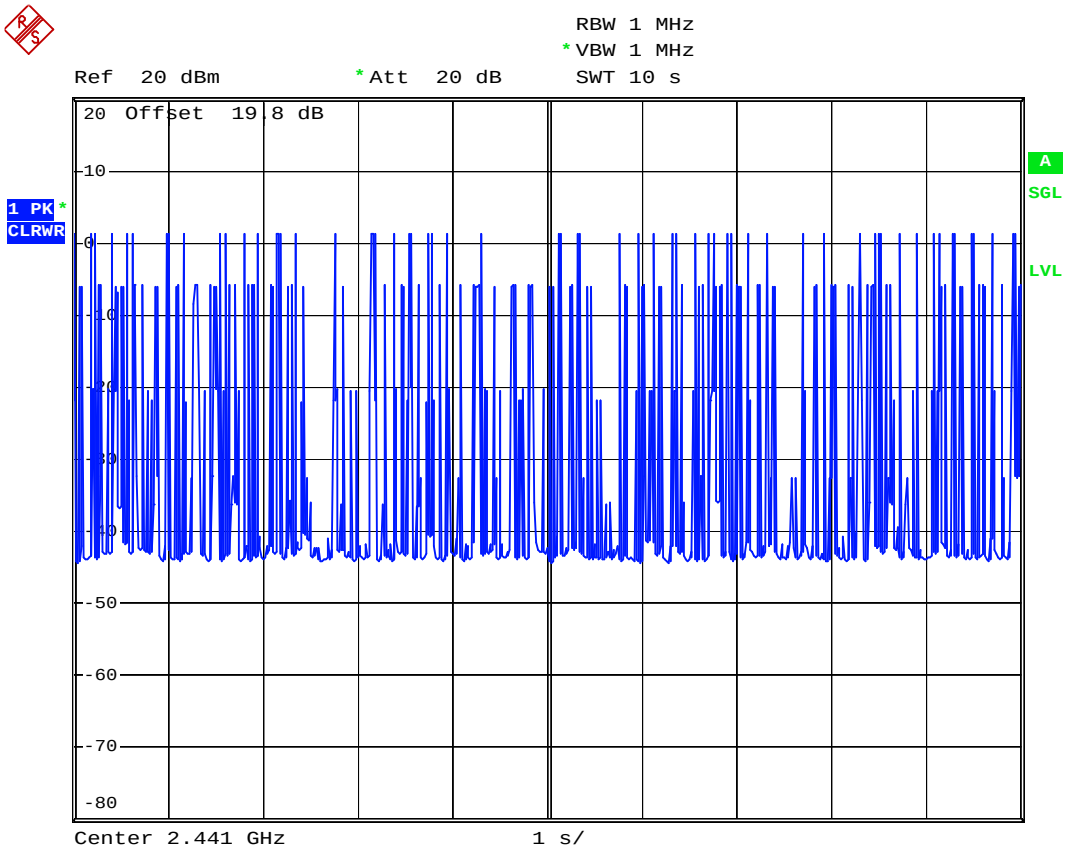
Date: 24.JUL.2008 03:43:24

DH3 (CH39)



2nd comment ...

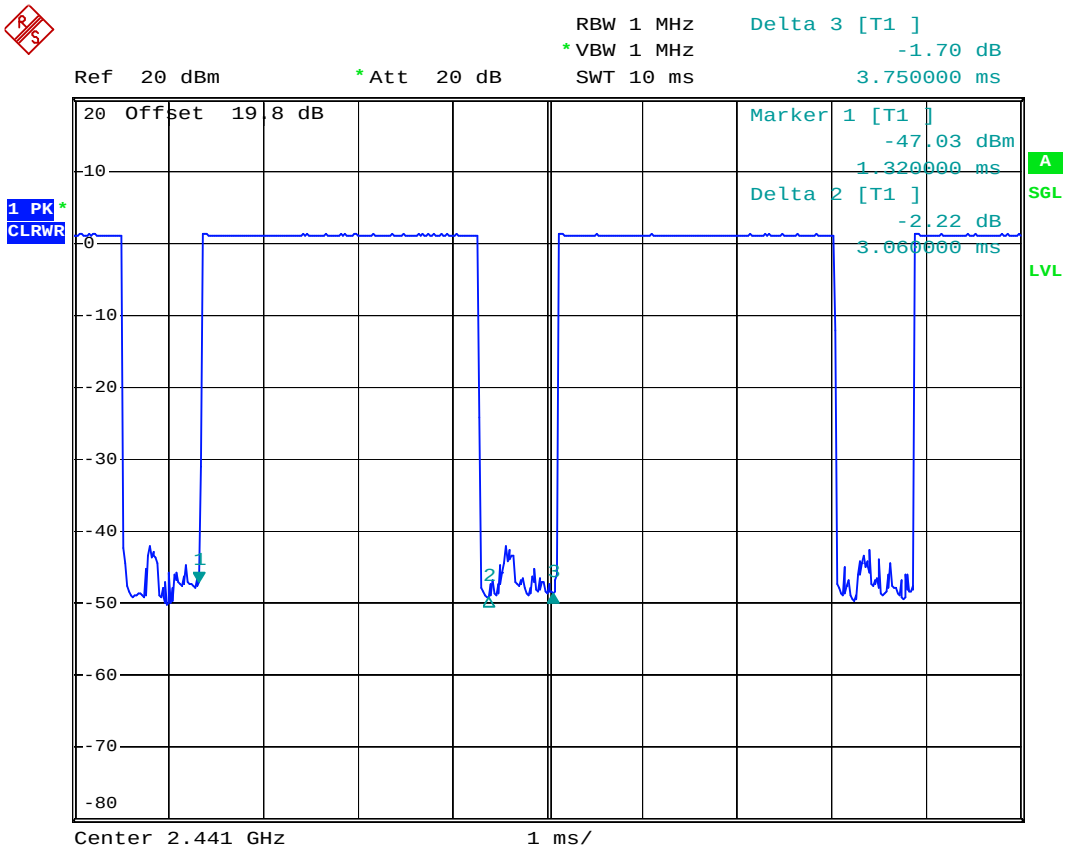
Date: 24.JUL.2008 03:41:01



2nd comment ...

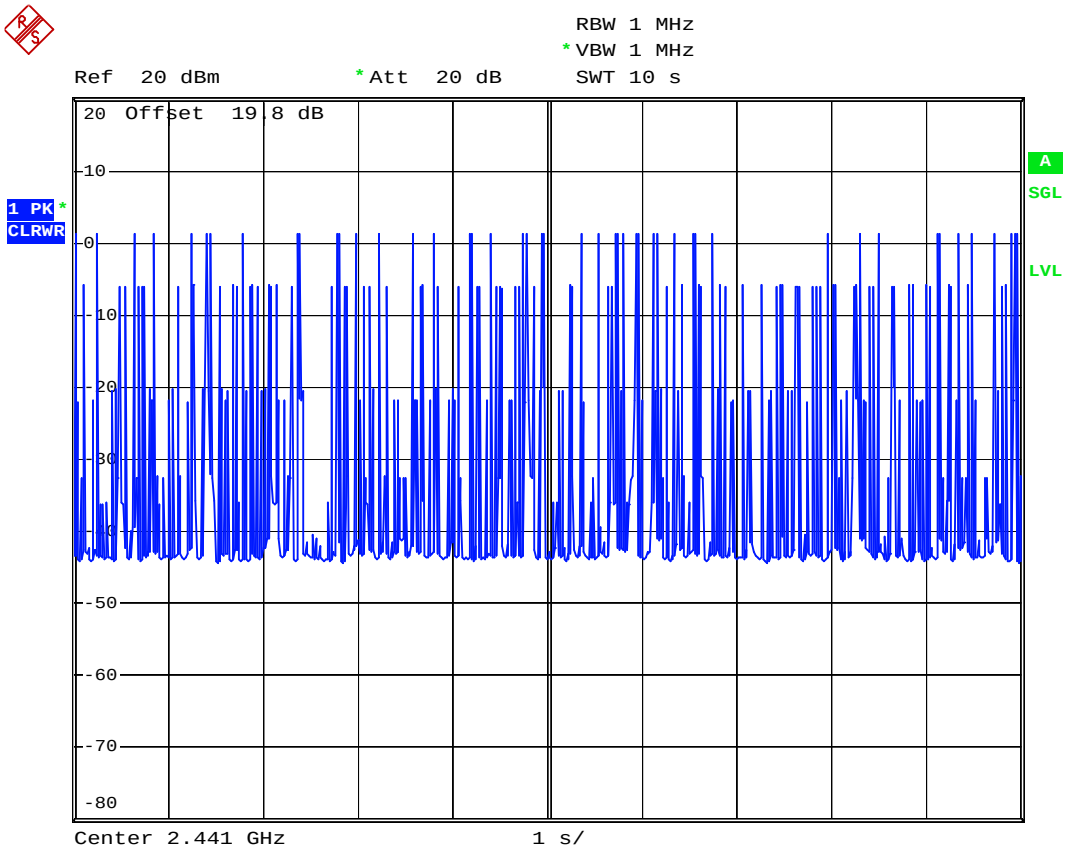
Date: 24.JUL.2008 03:44:09

DH5 (CH39)



2nd comment ...

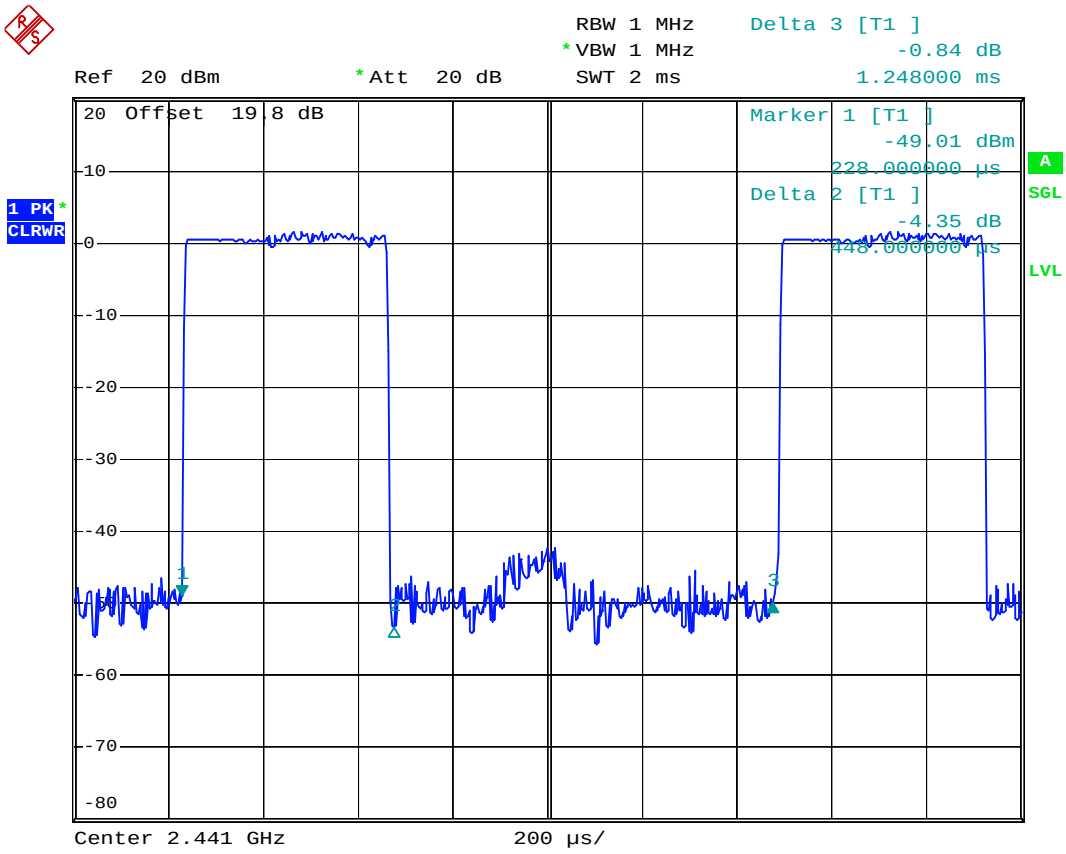
Date: 24.JUL.2008 03:42:01



2nd comment ...

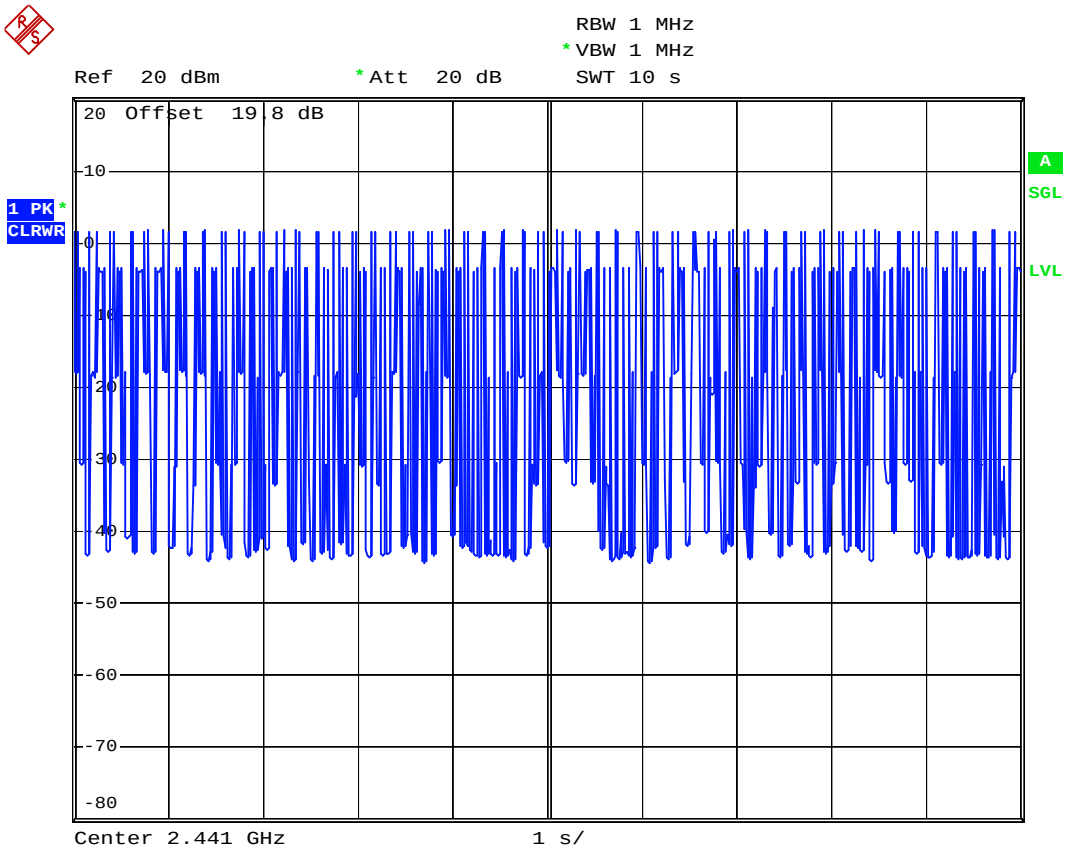
Date: 24.JUL.2008 03:43:02

2DH1 (CH39)



2nd comment ...

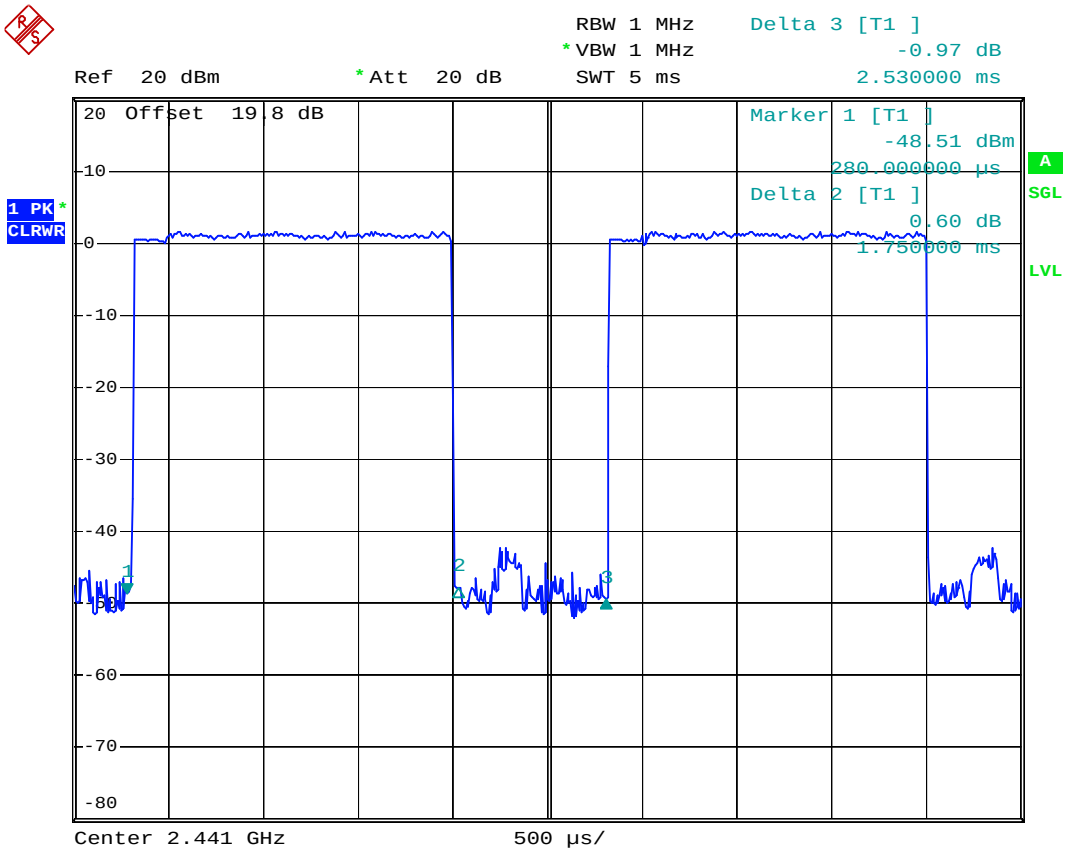
Date: 24.JUL.2008 04:13:12



2nd comment ...

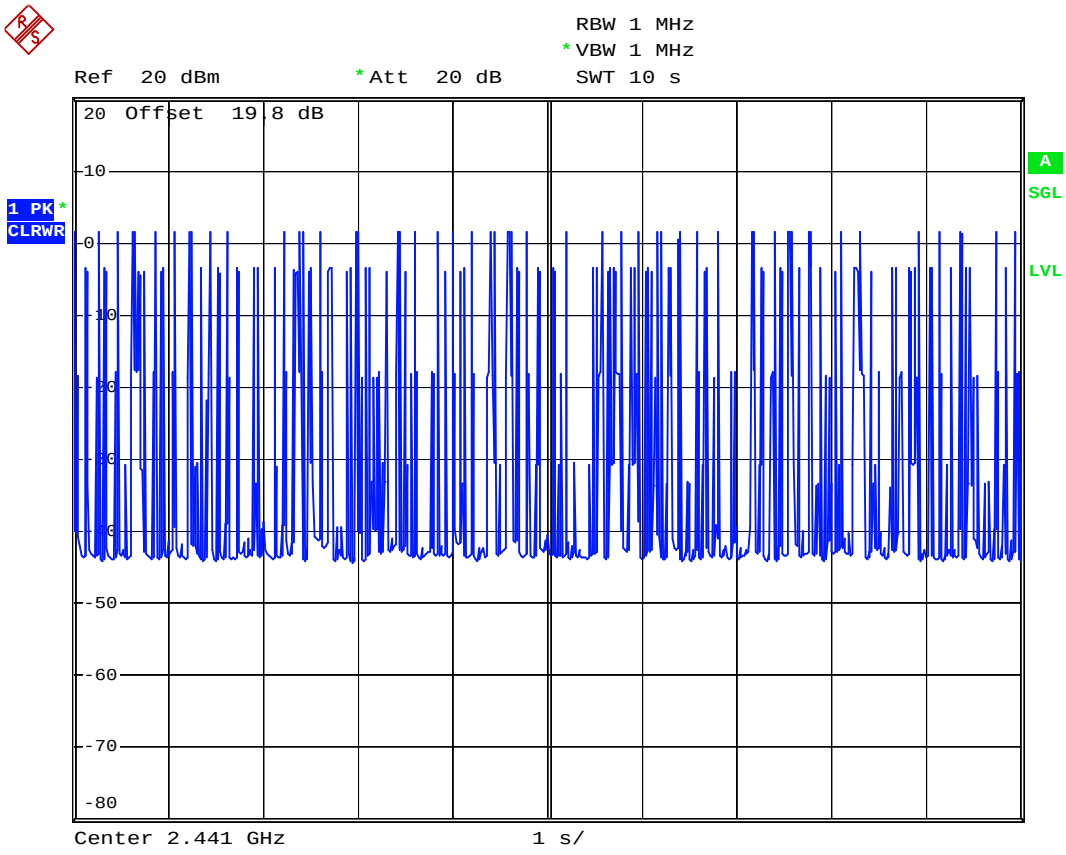
Date: 24.JUL.2008 04:10:41

2 DH3 (CH39)



2nd comment ...

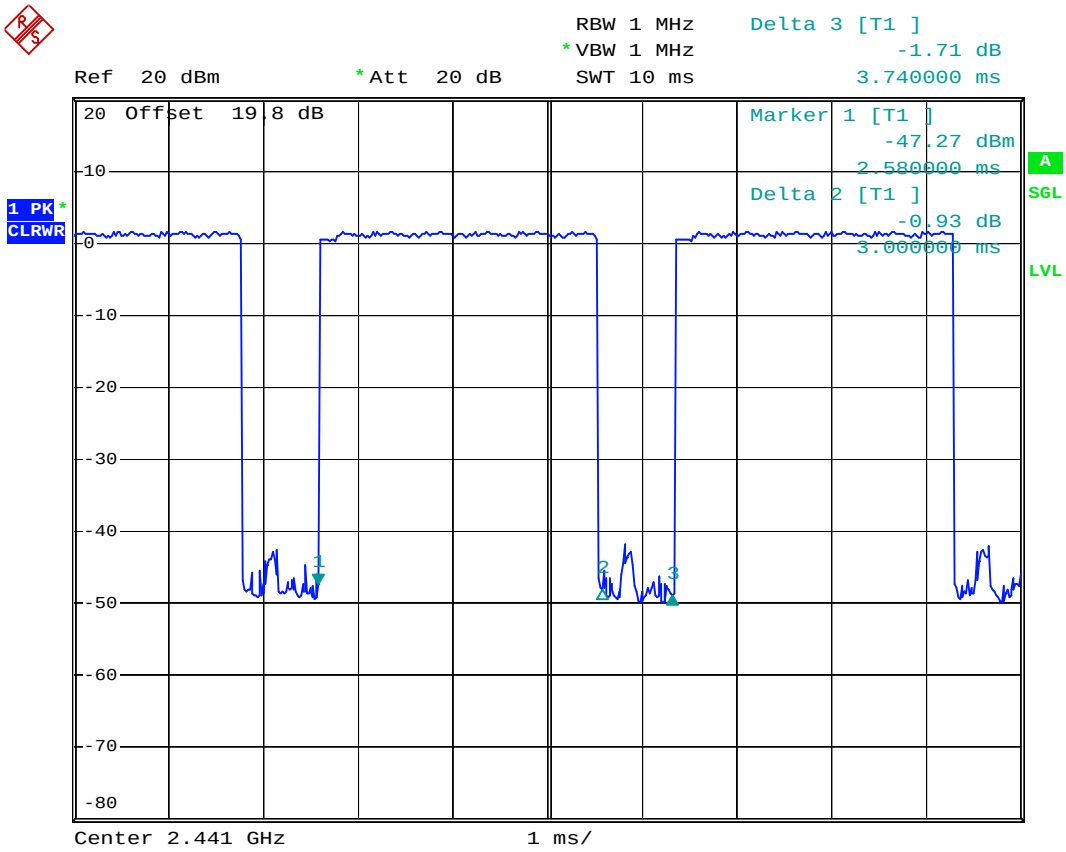
Date: 24.JUL.2008 04:13:56



2nd comment ...

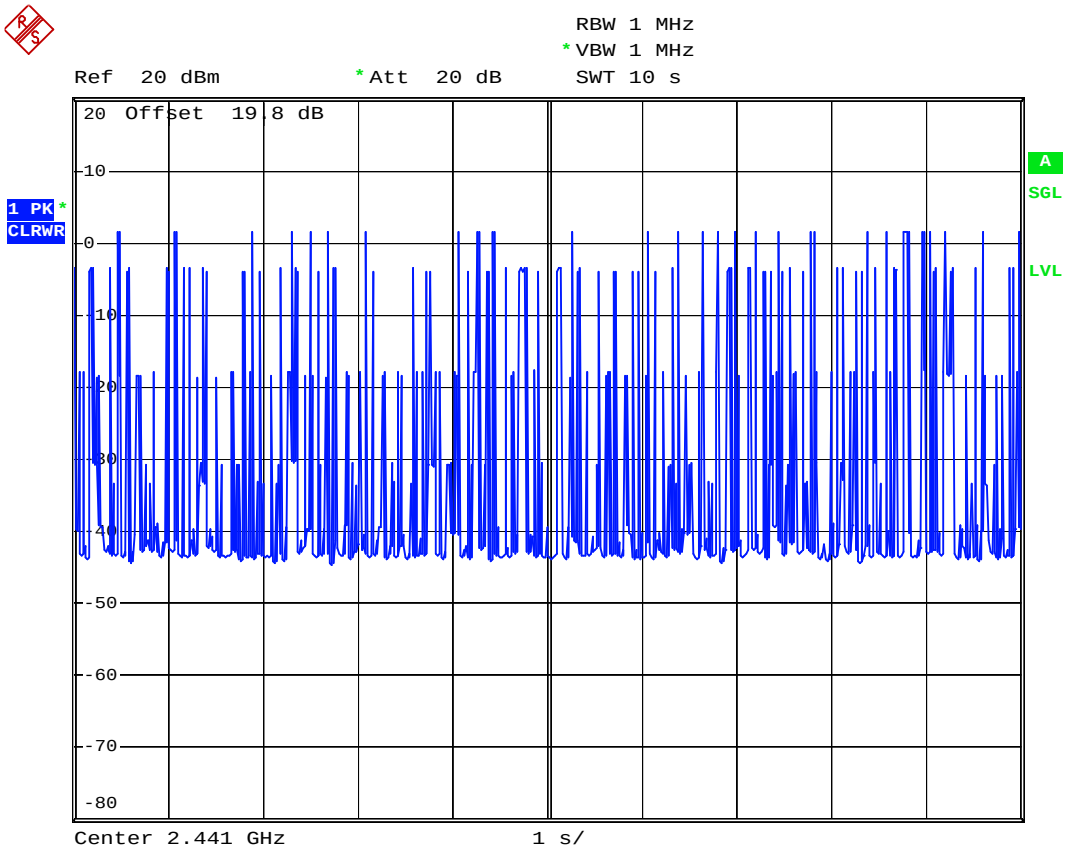
Date: 24.JUL.2008 04:11:53

2 DH5 (CH39)



2nd comment ...

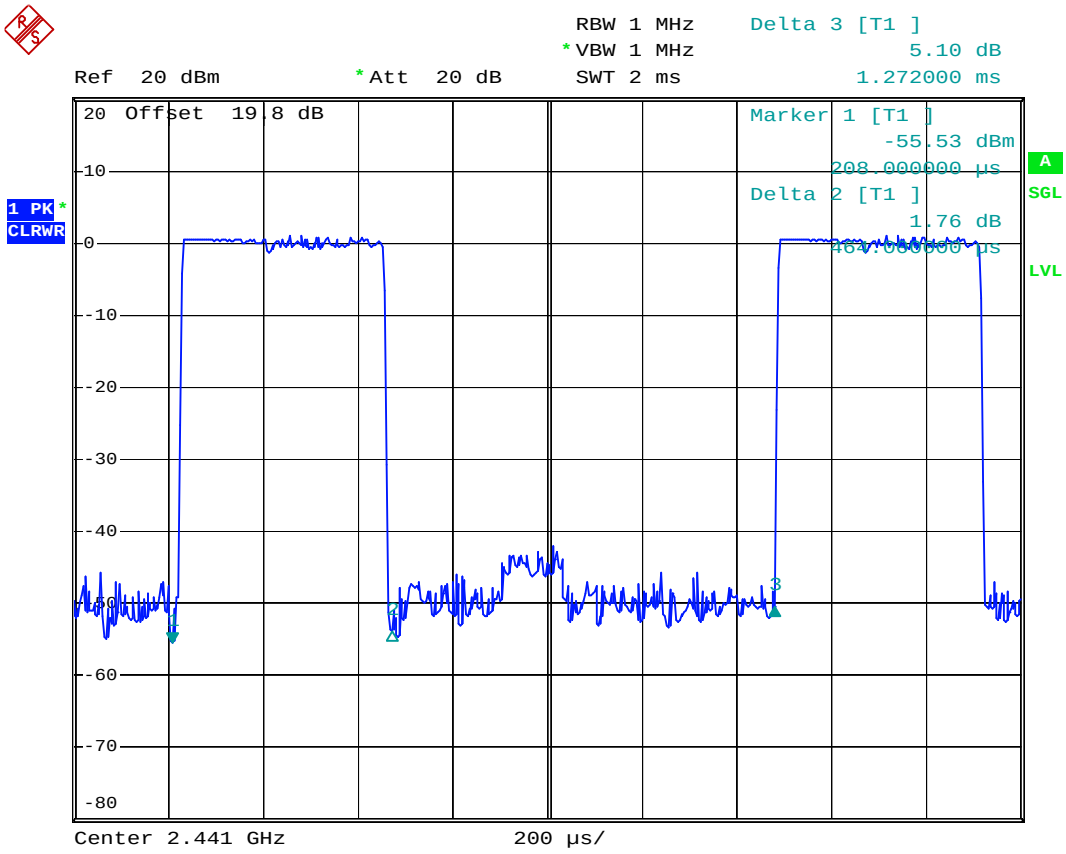
Date: 24.JUL.2008 04:14:28



2nd comment ...

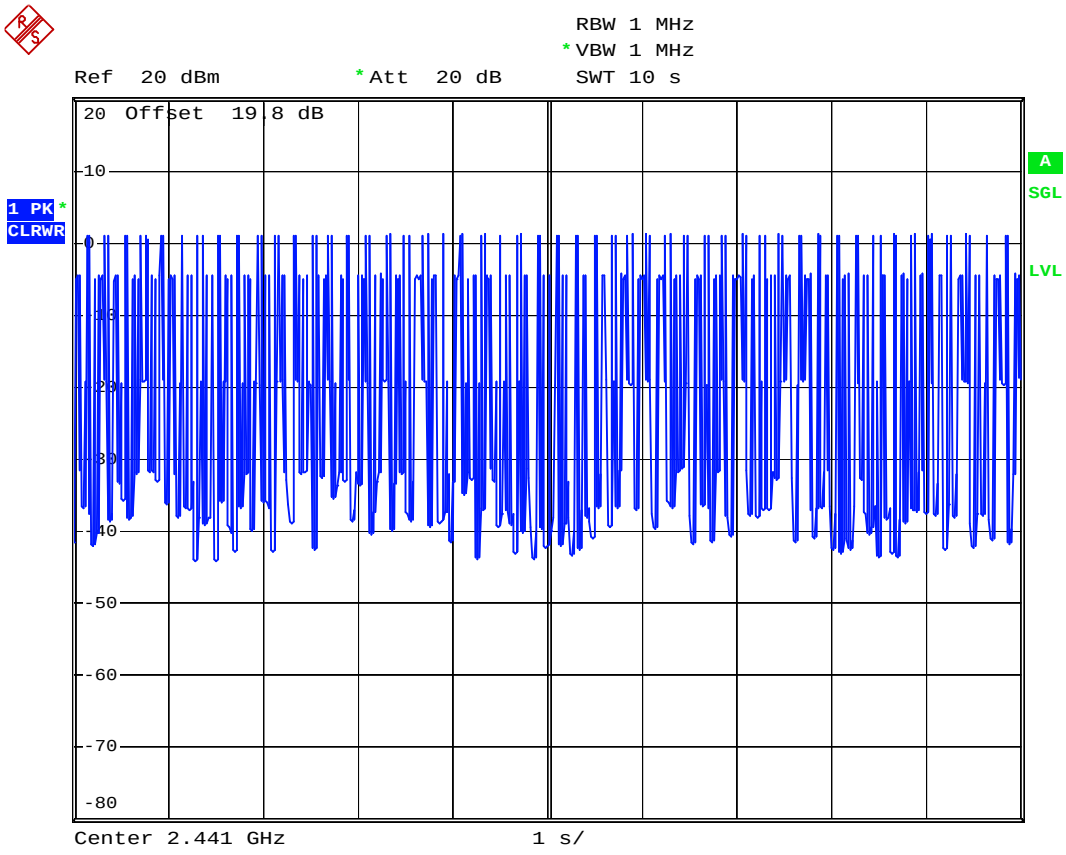
Date: 24.JUL.2008 04:12:24

3DH1 (CH39)



2nd comment ...

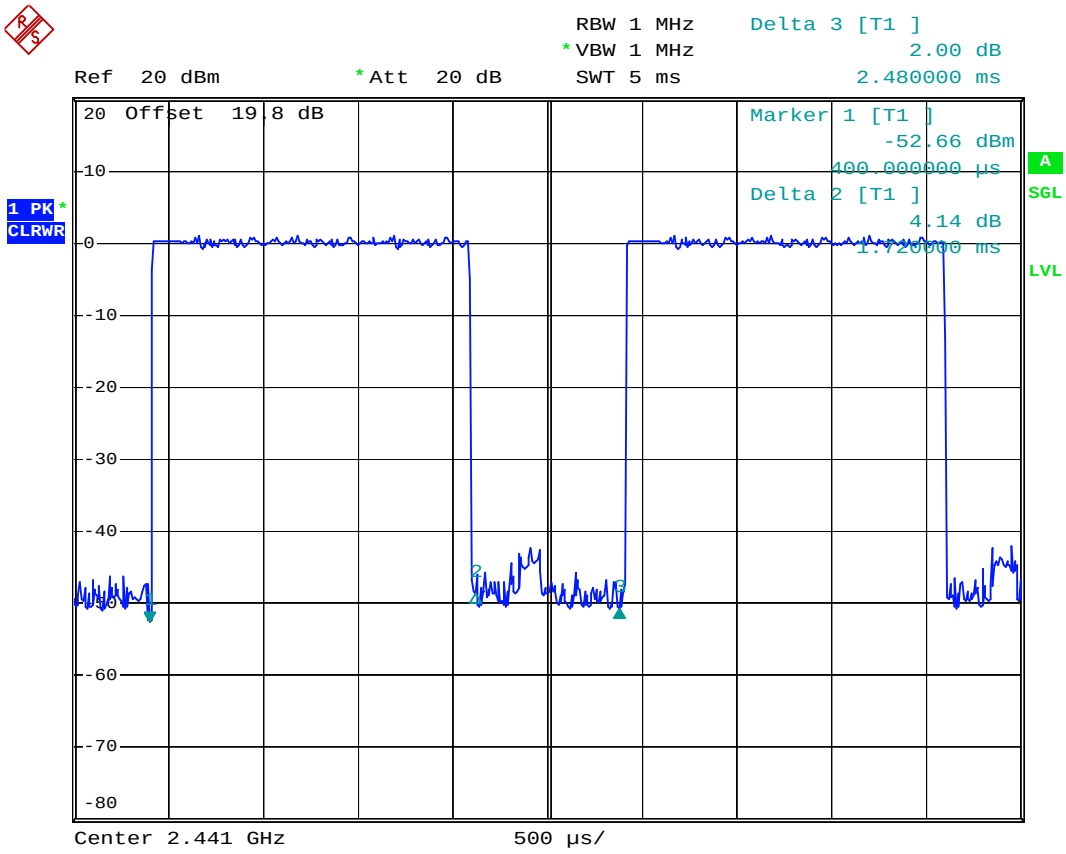
Date: 24.JUL.2008 04:15:12



2nd comment ...

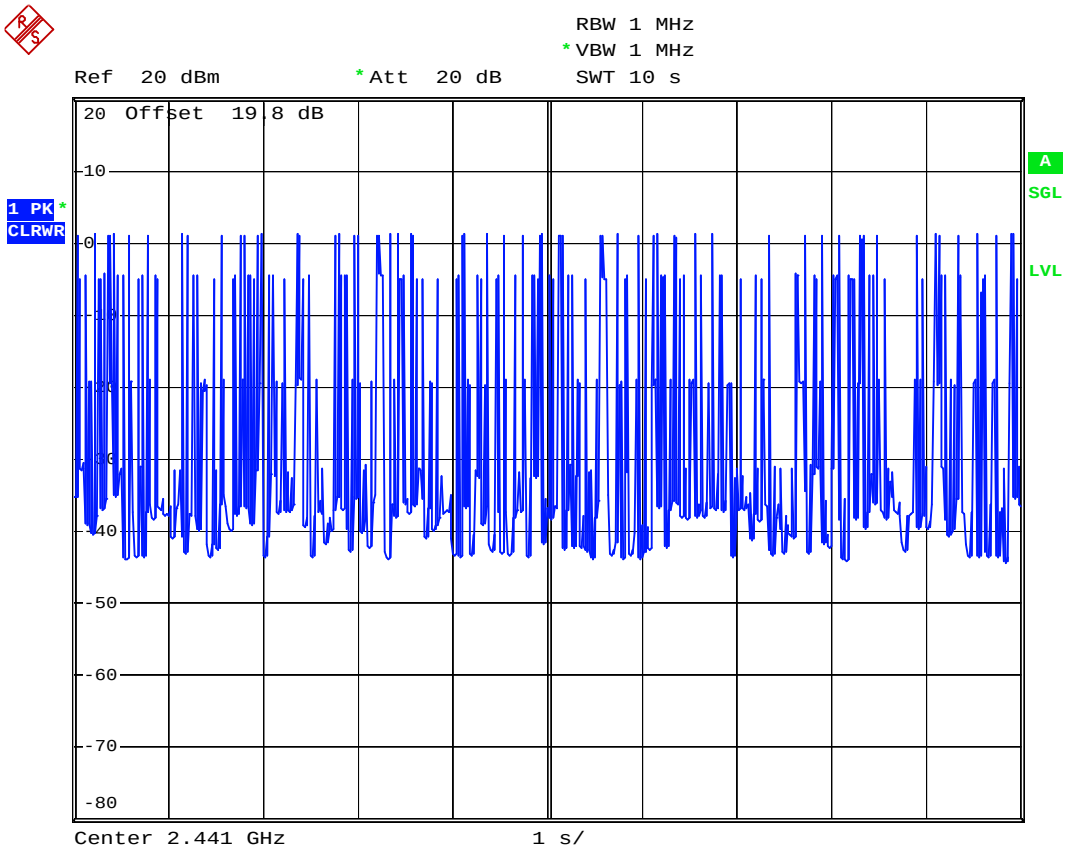
Date: 24.JUL.2008 04:09:36

3DH3 (CH39)



2nd comment ...

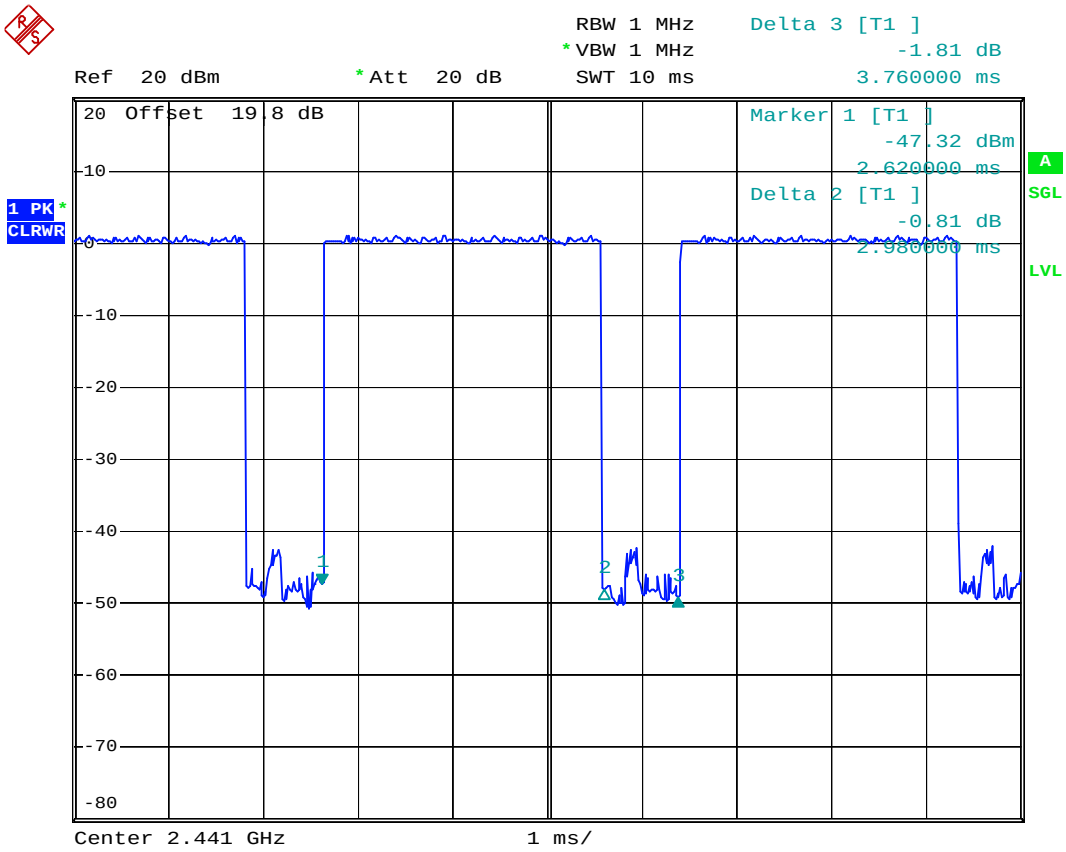
Date: 24.JUL.2008 04:15:56



2nd comment ...

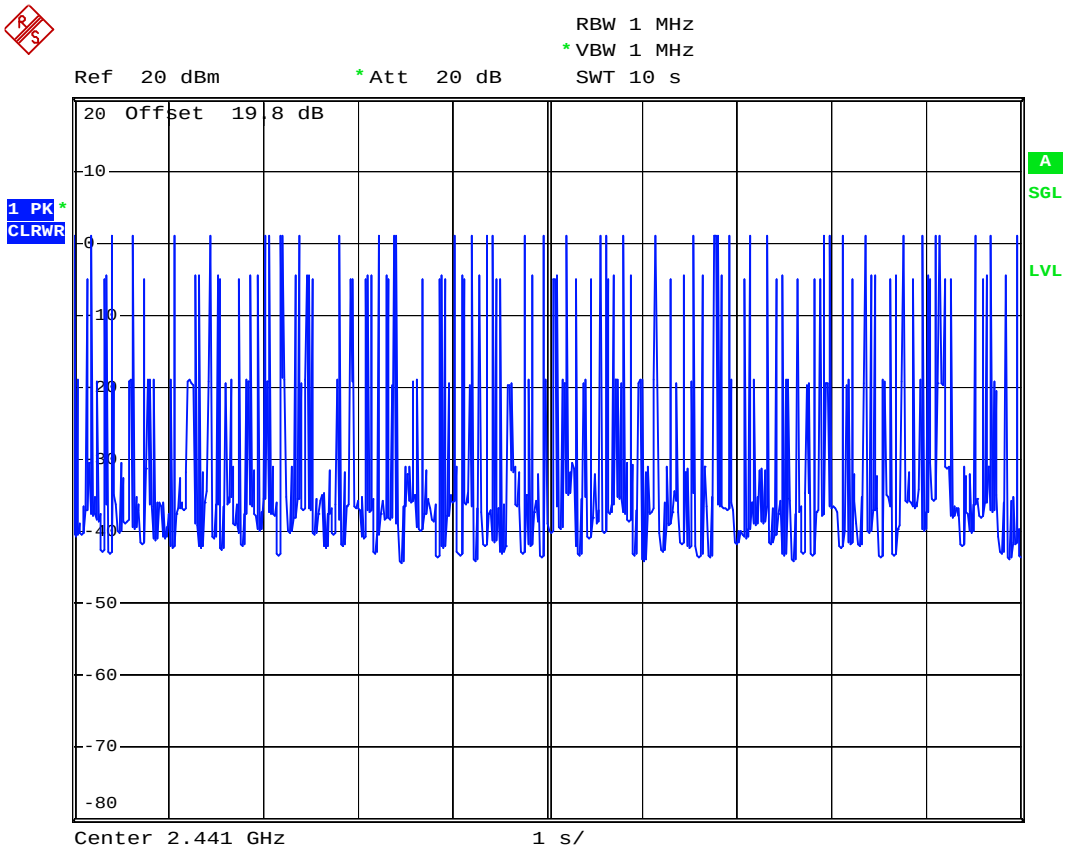
Date: 24.JUL.2008 04:09:59

3DH5 (CH39)



2nd comment ...

Date: 24.JUL.2008 04:16:36



2nd comment ...

Date: 24.JUL.2008 04:09:15

5.7 Peak Output Power Measurement

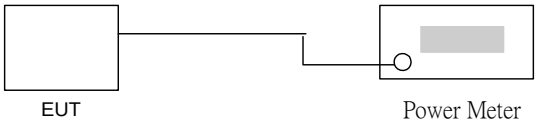
5.7.1 Measuring Instruments

As described in chapter 6 of this test report.

5.7.2 Test Procedure

The antenna port (RF output) of the EUT was connected to the input (RF input) of a spectrum analyzer for BT measurement. RBW and VBW are set to 3MHz. The cable loss has been offset before testing.

5.7.3 Test Setup Layout



5.7.4 Test Result

- Application Type : BT
- Temperature : 24~25℃
- Relative Humidity : 55~57%
- Test Engineer : Ken

- **BT(1Mbps)**

Channel	Frequency (MHz)	Measured Output Power (dBm)	Limits (Watt/dBm)
00	2402	0.95	1W/30 dBm
39	2441	1.24	1W/30 dBm
78	2480	1.13	1W/30 dBm

- **BT EDR(2Mbps)**

Channel	Frequency (MHz)	Measured Output Power (dBm)	Limits (Watt/dBm)
00	2402	2.07	1W/30 dBm
39	2441	2.37	1W/30 dBm
78	2480	2.23	1W/30 dBm

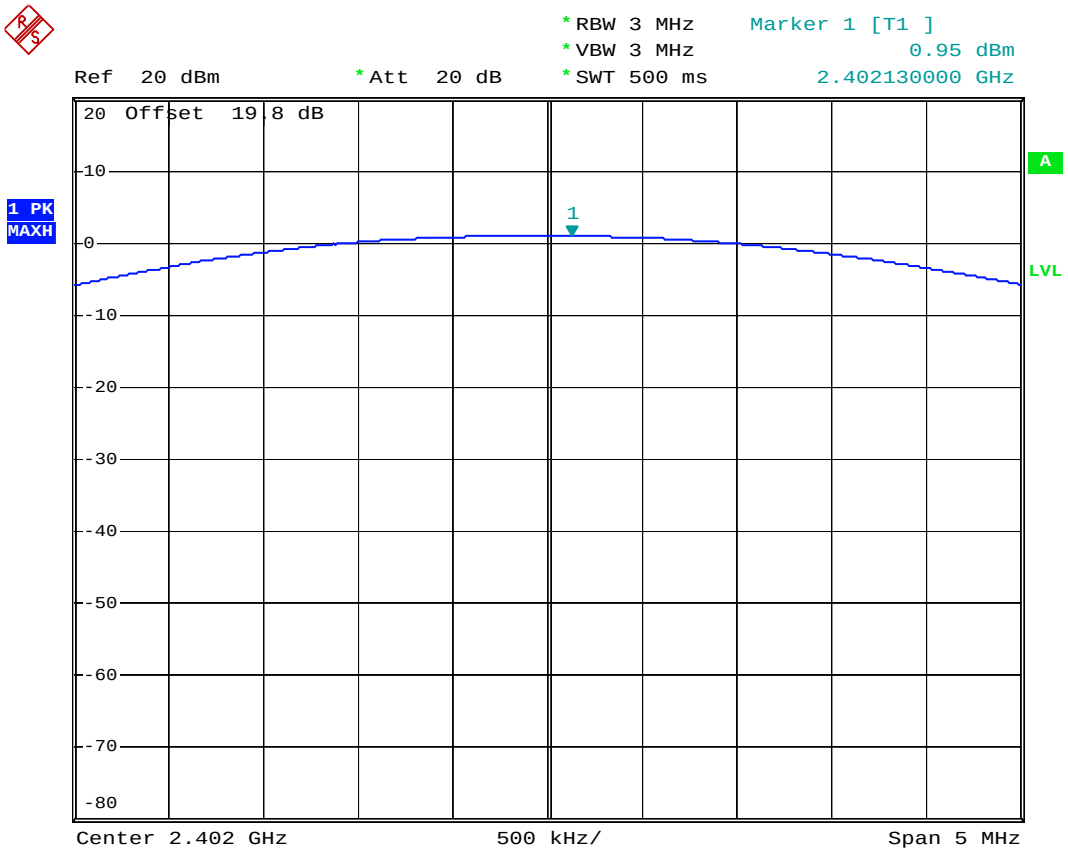
- **BT EDR(3Mbps)**

Channel	Frequency (MHz)	Measured Output Power (dBm)	Limits (Watt/dBm)
00	2402	1.58	1W/30 dBm
39	2441	1.96	1W/30 dBm
78	2480	1.81	1W/30 dBm

5.7.5 Output Power

BT(1Mbps)

Mode : CH00 (2402MHz)

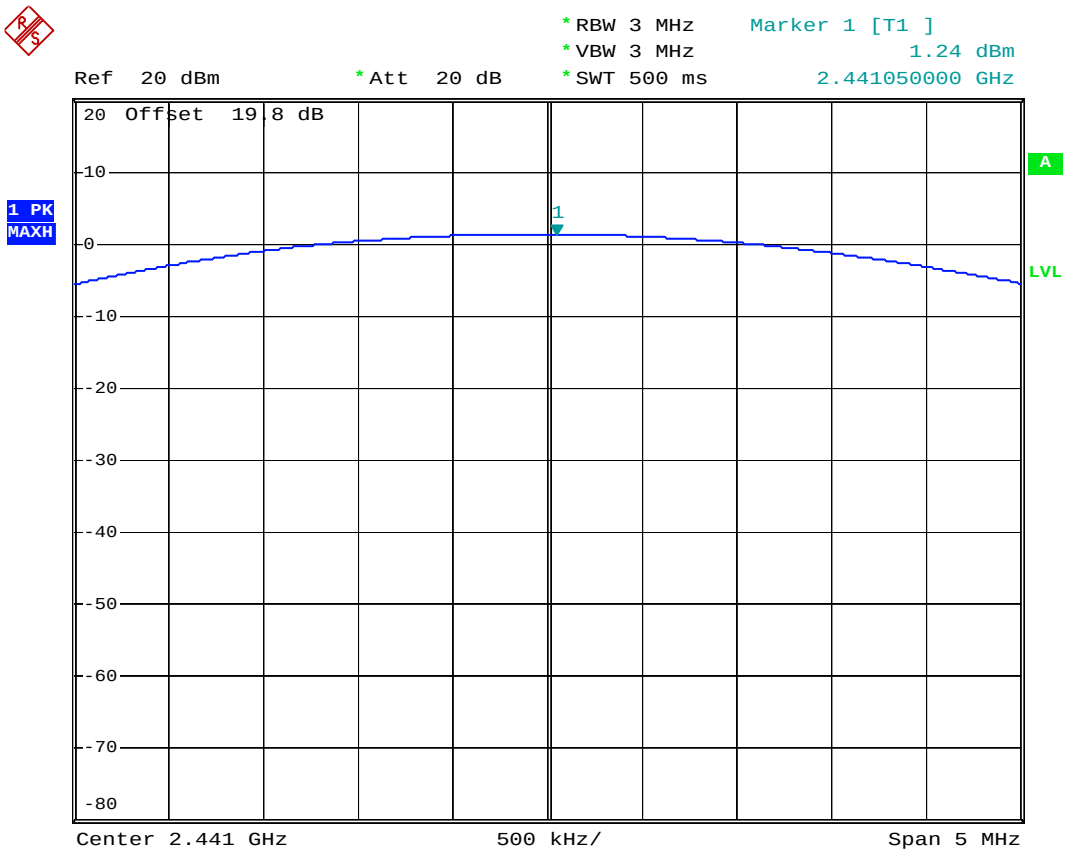


2nd comment ...

Date: 24.JUL.2008 03:12:23

BT(1Mbps)

Mode : CH39 (2441MHz)

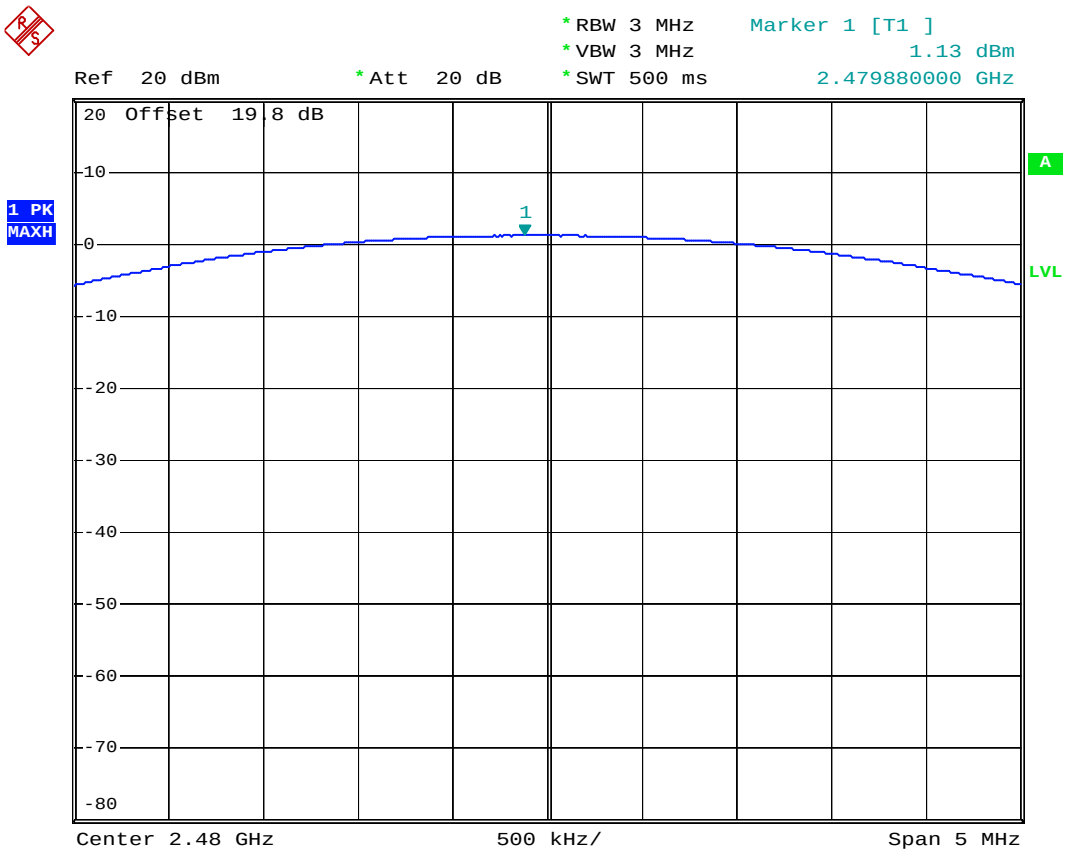


2nd comment ...

Date: 24.JUL.2008 03:13:46

Bluetooth(1Mbps)

Mode : CH78 (2480MHz)

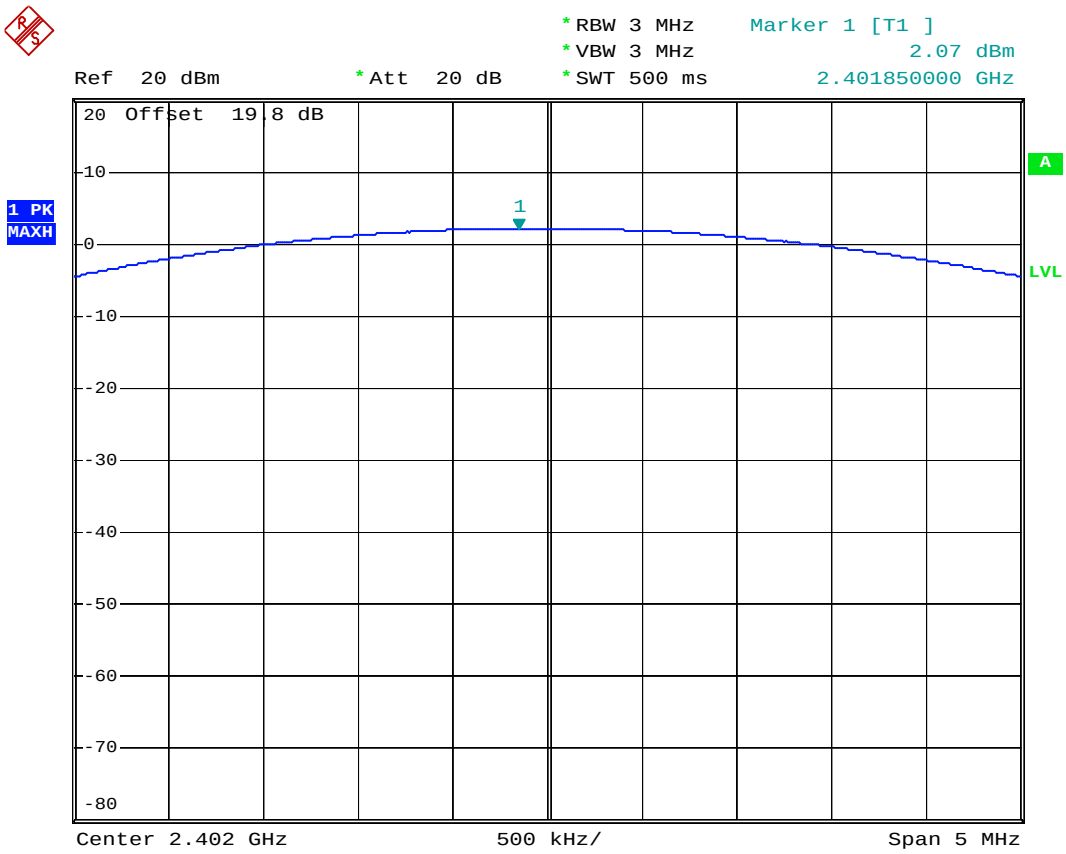


2nd comment ...

Date: 24.JUL.2008 03:14:03

Bluetooth(2Mbps)

Mode : CH00 (2402MHz)

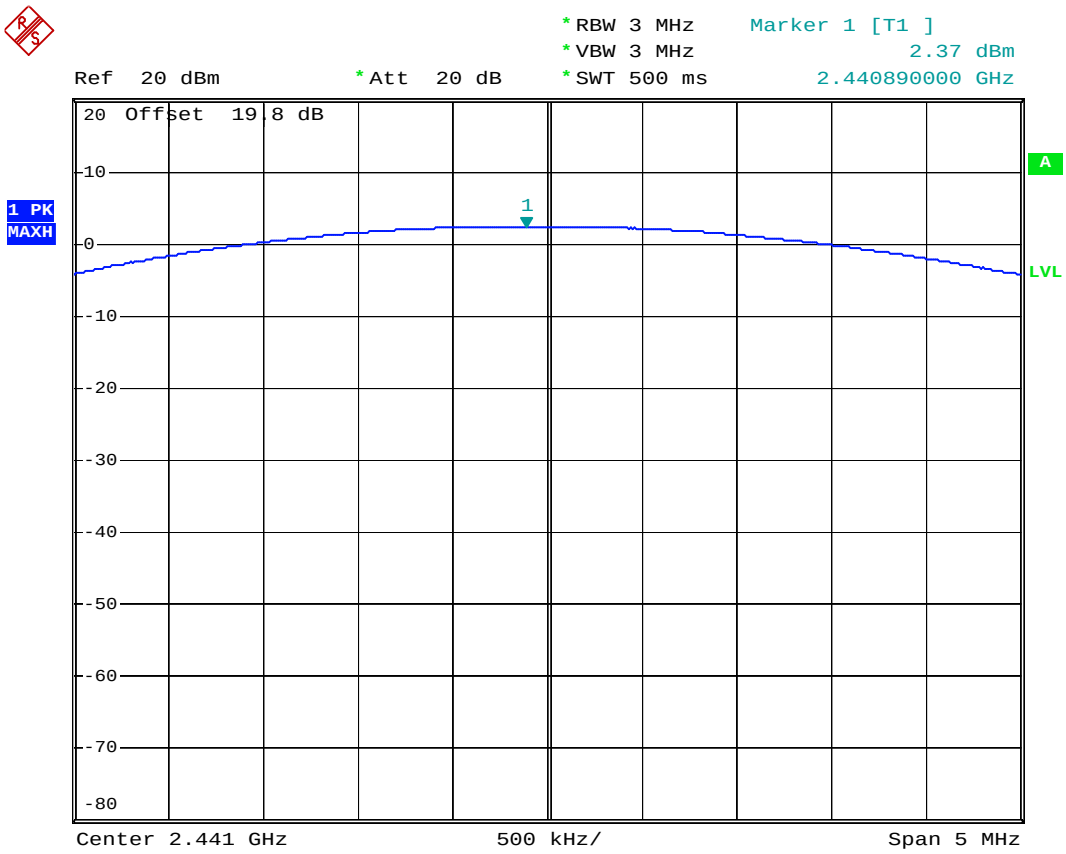


2nd comment ...

Date: 24.JUL.2008 03:16:16

Bluetooth(2Mbps)

Mode : CH39 (2441MHz)

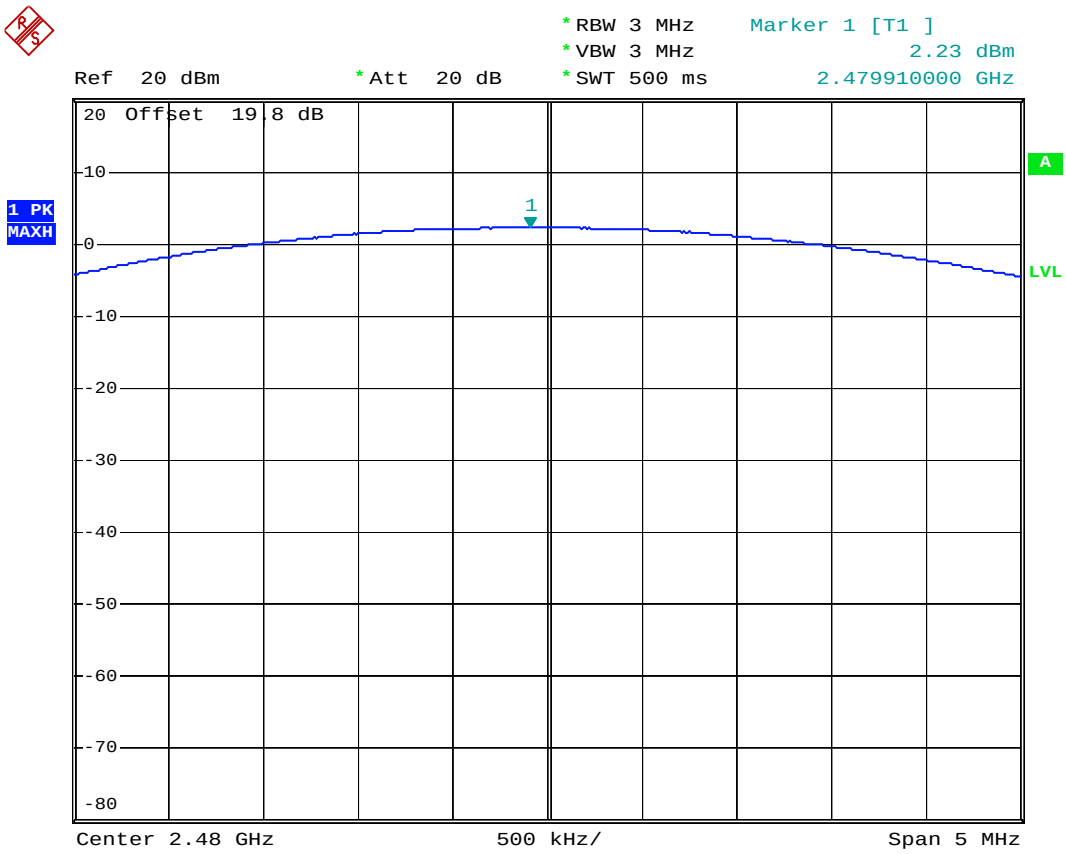


2nd comment ...

Date: 24.JUL.2008 03:16:32

Bluetooth(2Mbps)

Mode : CH78 (2480MHz)

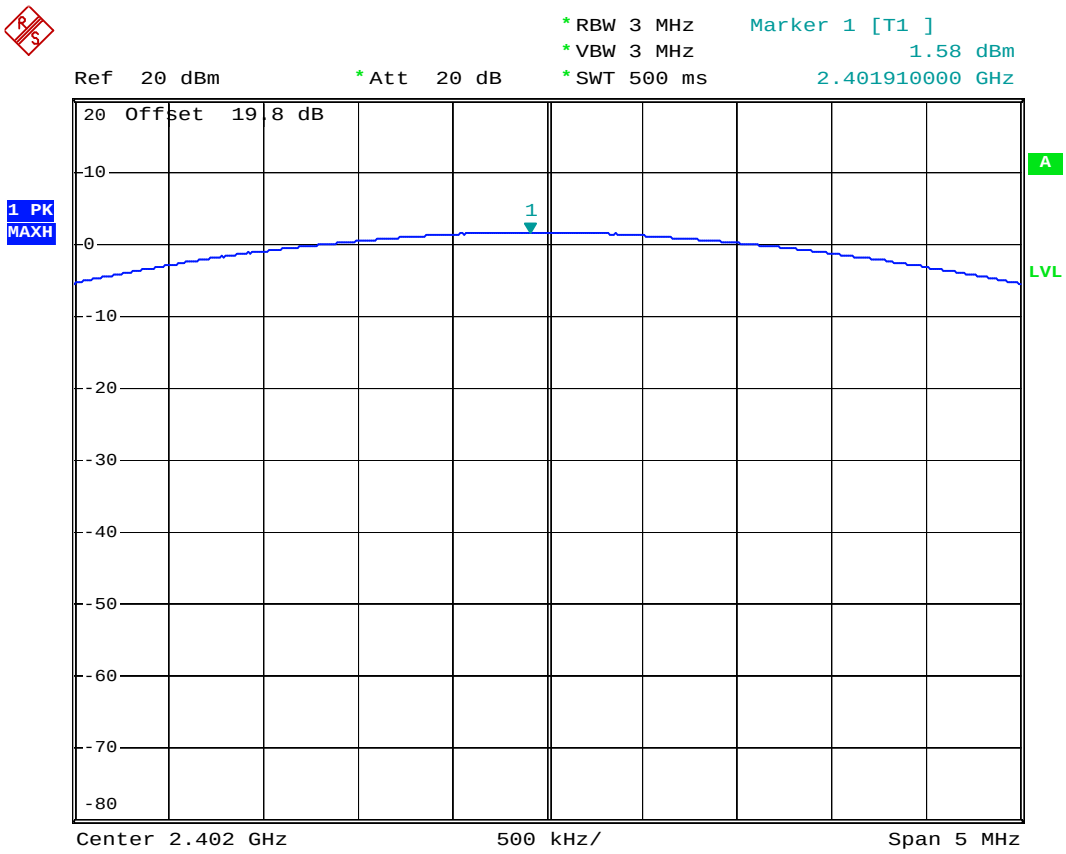


2nd comment ...

Date: 24.JUL.2008 03:16:57

Bluetooth(3Mbps)

Mode : CH00 (2402MHz)

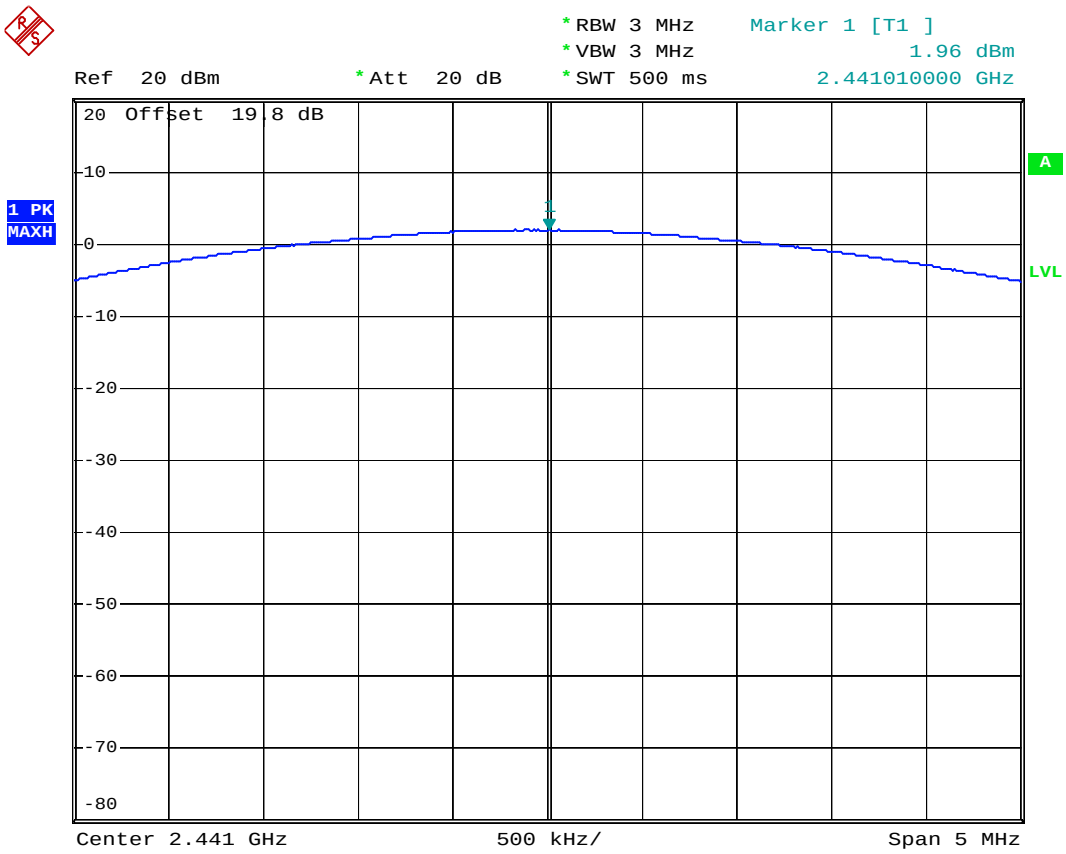


2nd comment ...

Date: 24.JUL.2008 03:18:21

Bluetooth(3Mbps)

Mode : CH39 (2441MHz)

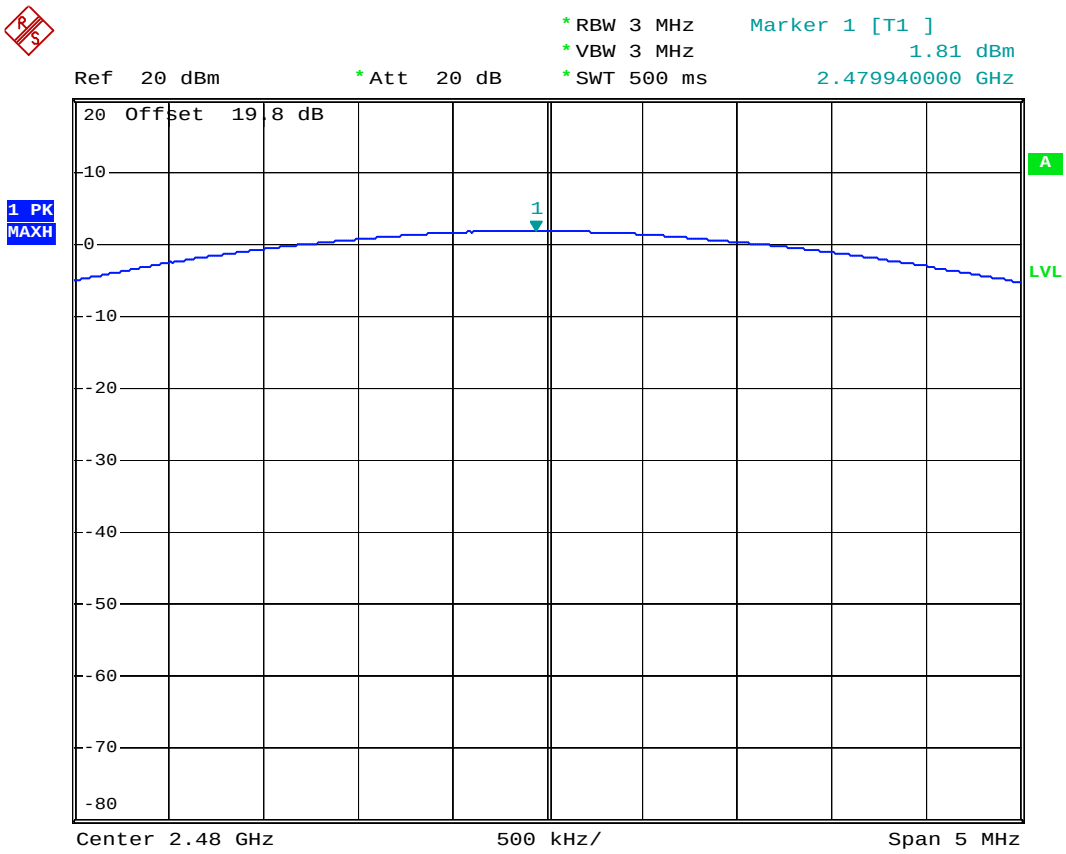


2nd comment ...

Date: 24.JUL.2008 03:18:51

Bluetooth(3Mbps)

Mode : CH78 (2480MHz)



2nd comment ...

Date: 24.JUL.2008 03:19:06

5.8 Conducted Emission

5.8.1 Measuring Instruments

As described in chapter 6 of this test Report.

5.8.2 Test Procedures

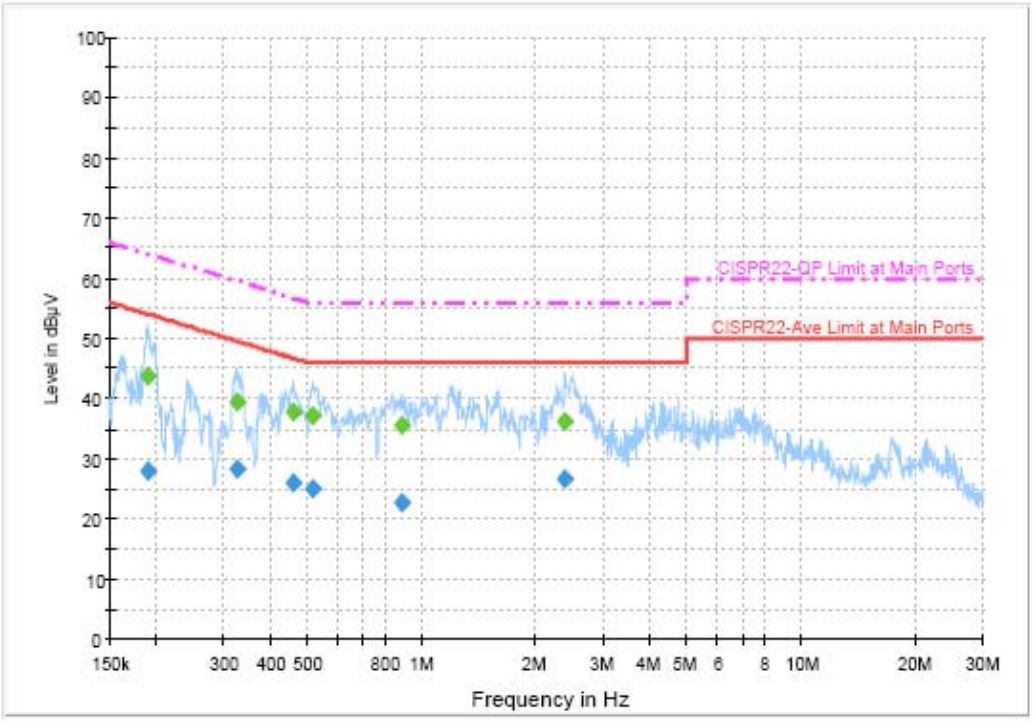
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power port of a line impedance stabilization network (LISN).
3. All the support units are connected to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 KHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

5.8.3 Test Data

- Temperature : 24~25℃
- Relative Humidity : 55~57%
- Test Enginner : Sam
- Test Mode : Mode 1

■ The test that passed at minimum margin was marked by the frame in the following table.

<Line>



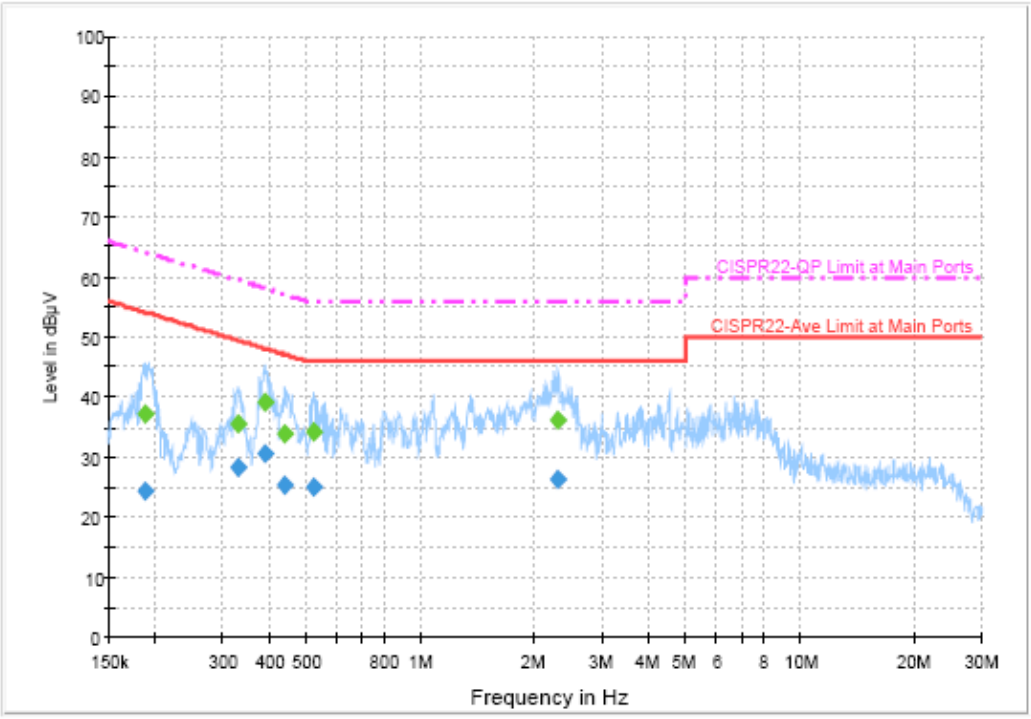
Final Measurement Detector 1

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.190600	27.8	Off	L1	9.5	26.2	54.0
0.324110	28.3	Off	L1	9.5	21.3	49.6
0.456870	25.9	Off	L1	9.5	20.8	46.7
0.517060	25.0	Off	L1	9.5	21.0	46.0
0.882790	22.8	Off	L1	9.6	23.2	46.0
2.385360	26.6	Off	L1	9.6	19.4	46.0

Final Measurement Detector 2

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.190600	43.6	Off	L1	9.5	20.4	64.0
0.324110	39.4	Off	L1	9.5	20.2	59.6
0.456870	37.7	Off	L1	9.5	19.0	56.7
0.517060	37.1	Off	L1	9.5	19.0	56.0
0.882790	35.7	Off	L1	9.6	20.3	56.0
2.385360	36.3	Off	L1	9.6	19.7	56.0

<Neutral>



Final Measurement Detector 1

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.188330	24.2	Off	N	9.6	29.9	54.1
0.329330	28.3	Off	N	9.5	21.2	49.5
0.386350	30.7	Off	N	9.5	17.4	48.1
0.439000	25.2	Off	N	9.5	21.9	47.1
0.523290	25.0	Off	N	9.5	21.0	46.0
2.301180	26.5	Off	N	9.6	19.5	46.0

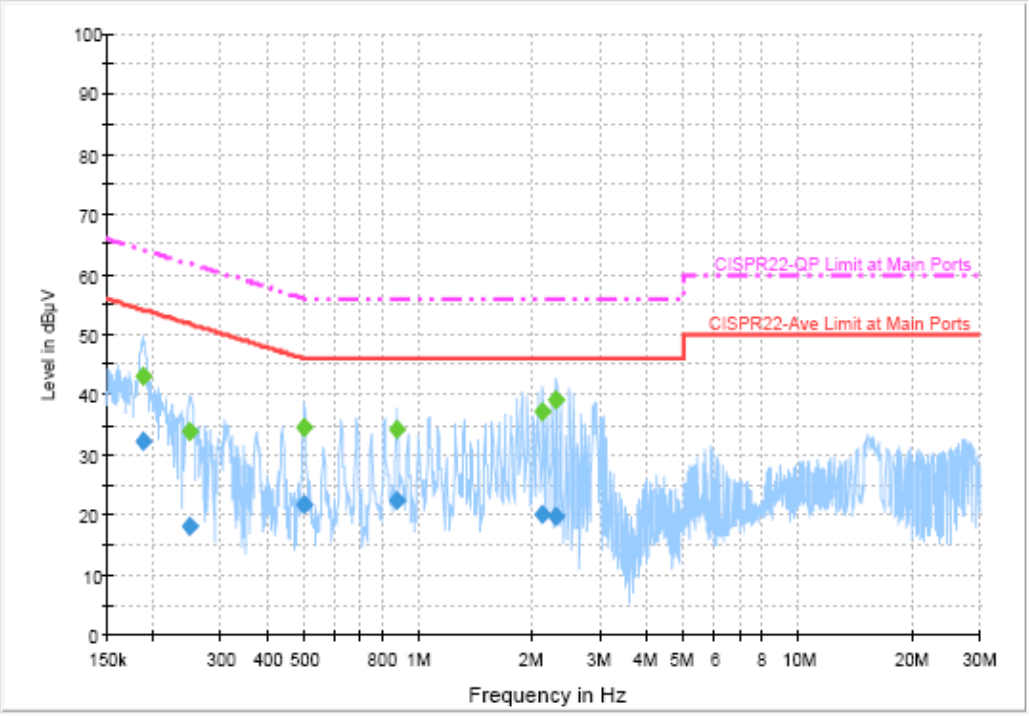
Final Measurement Detector 2

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.188330	37.1	Off	N	9.6	27.0	64.1
0.329330	35.4	Off	N	9.5	24.1	59.5
0.386350	39.0	Off	N	9.5	19.1	58.1
0.439000	34.0	Off	N	9.5	23.1	57.1
0.523290	34.1	Off	N	9.5	21.9	56.0
2.301180	36.1	Off	N	9.6	19.9	56.0

- Temperature : 24~25℃
- Relative Humidity : 55~57%
- Test Enginner : Sam
- Test Mode : Mode 2

■ The test that passed at minimum margin was marked by the frame in the following table.

<Line>



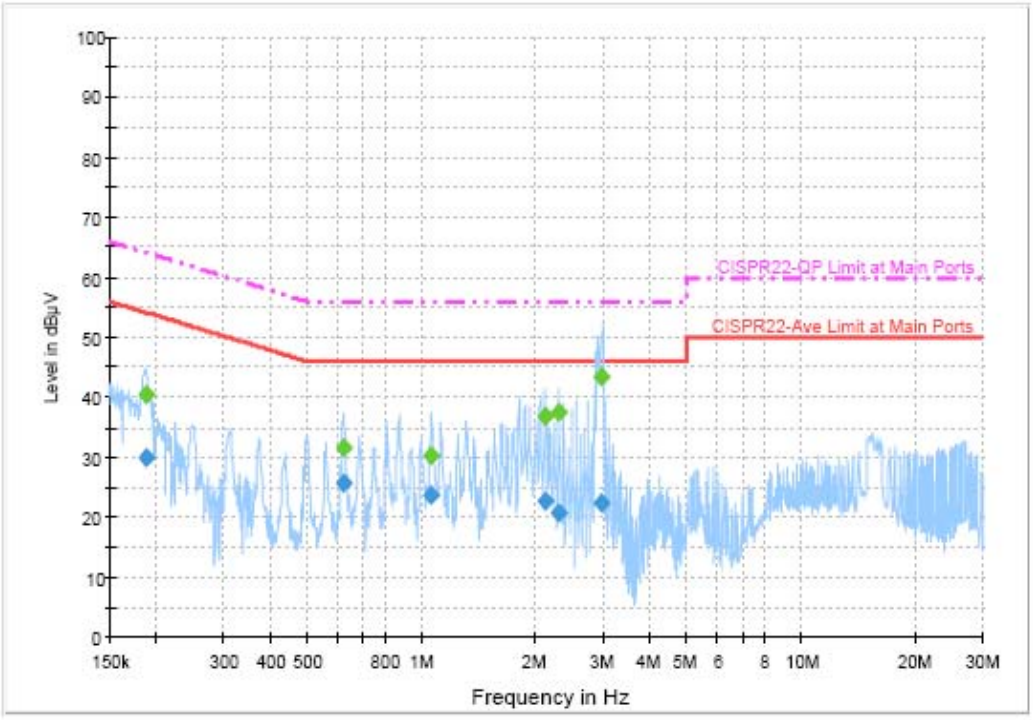
Final Measurement Detector 1

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.187580	32.3	Off	L1	9.5	21.8	54.1
0.250040	18.0	Off	L1	9.5	33.8	51.8
0.498810	21.7	Off	L1	9.5	24.3	46.0
0.872290	22.4	Off	L1	9.6	23.6	46.0
2.116130	20.2	Off	L1	9.6	25.8	46.0
2.301180	19.8	Off	L1	9.6	26.2	46.0

Final Measurement Detector 2

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.187580	43.2	Off	L1	9.5	20.9	64.1
0.250040	34.0	Off	L1	9.5	27.8	61.8
0.498810	34.4	Off	L1	9.5	21.6	56.0
0.872290	34.1	Off	L1	9.6	21.9	56.0
2.116130	37.3	Off	L1	9.6	18.7	56.0
2.301180	39.2	Off	L1	9.6	16.8	56.0

<Neutral>



Final Measurement Detector 1

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.186830	30.0	Off	N	9.6	24.2	54.2
0.621290	25.8	Off	N	9.5	20.2	46.0
1.056520	23.6	Off	N	9.6	22.4	46.0
2.107700	22.8	Off	N	9.6	23.2	46.0
2.292010	20.7	Off	N	9.6	25.3	46.0
2.976080	22.3	Off	N	9.6	23.7	46.0

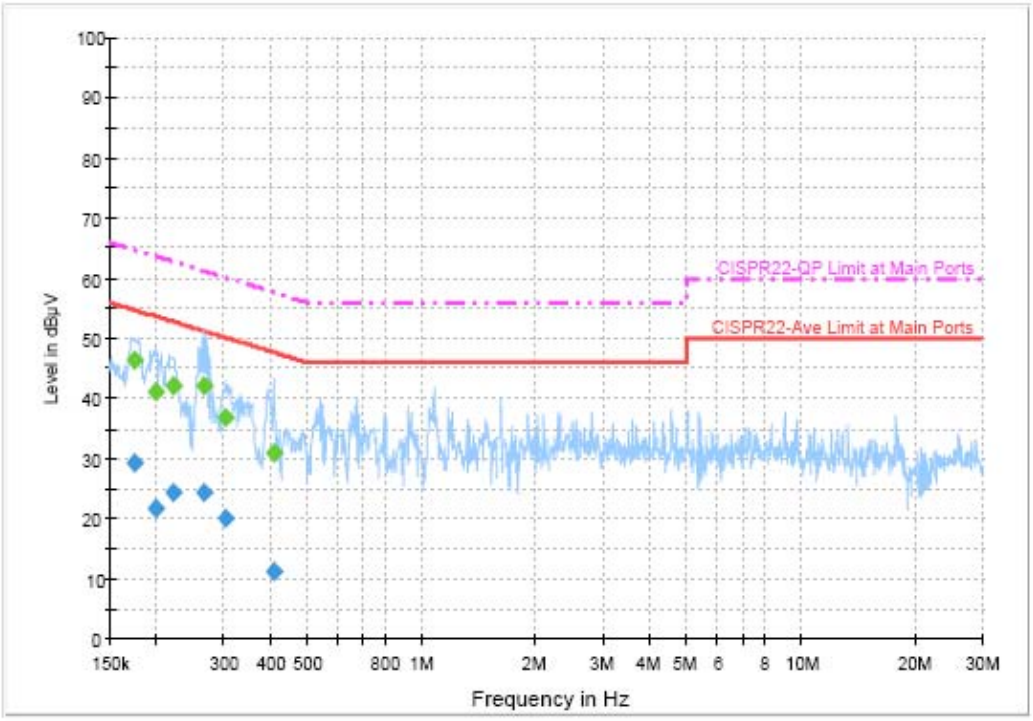
Final Measurement Detector 2

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.186830	40.4	Off	N	9.6	23.8	64.2
0.621290	31.5	Off	N	9.5	24.5	56.0
1.056520	30.3	Off	N	9.6	25.7	56.0
2.107700	36.7	Off	N	9.6	19.3	56.0
2.292010	37.4	Off	N	9.6	18.6	56.0
2.976080	43.3	Off	N	9.6	12.7	56.0

- Temperature : 24~25℃
- Relative Humidity : 55~57%
- Test Enginner : Sam
- Test Mode : Mode 3

■ The test that passed at minimum margin was marked by the frame in the following table.

<Line>



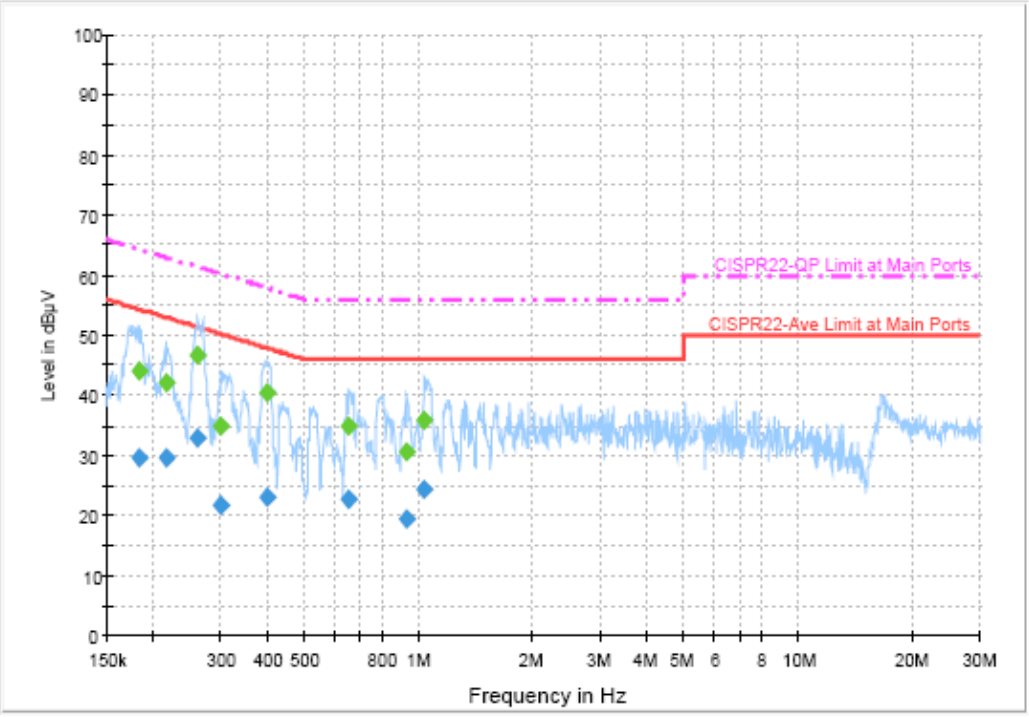
Final Measurement Detector 1

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.174570	29.3	Off	L1	9.5	25.4	54.7
0.199950	21.6	Off	L1	9.5	32.0	53.6
0.221820	24.4	Off	L1	9.5	28.4	52.8
0.267600	24.3	Off	L1	9.5	26.9	51.2
0.305280	20.2	Off	L1	9.5	29.9	50.1
0.405310	11.2	Off	L1	9.5	36.5	47.7

Final Measurement Detector 2

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.174570	46.2	Off	L1	9.5	18.5	64.7
0.199950	41.2	Off	L1	9.5	22.4	63.6
0.221820	42.2	Off	L1	9.5	20.6	62.8
0.267600	42.1	Off	L1	9.5	19.1	61.2
0.305280	36.8	Off	L1	9.5	23.3	60.1
0.405310	31.0	Off	L1	9.5	26.7	57.7

<Neutral>



Final Measurement Detector 1

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.183140	29.5	Off	N	9.6	24.8	54.3
0.215700	29.7	Off	N	9.5	23.3	53.0
0.261260	32.8	Off	N	9.5	18.6	51.4
0.301640	21.8	Off	N	9.5	28.4	50.2
0.395720	23.2	Off	N	9.5	24.7	47.9
0.651770	22.8	Off	N	9.5	23.2	46.0
...	...	...	...	...	...	...

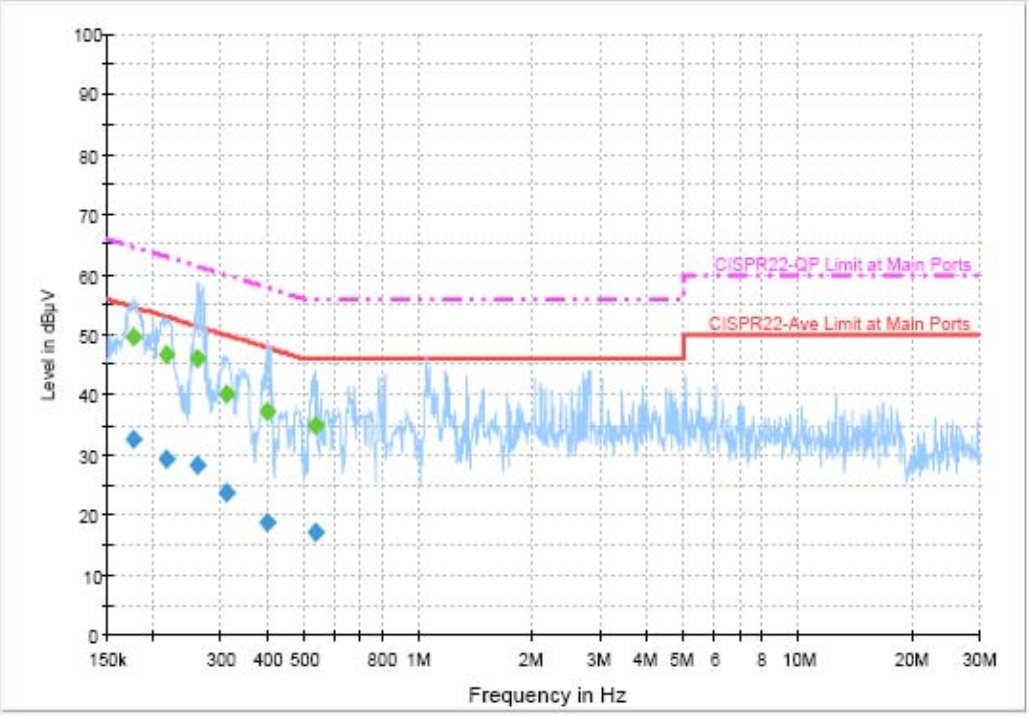
Final Measurement Detector 2

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.183140	44.2	Off	N	9.6	20.1	64.3
0.215700	42.1	Off	N	9.5	20.9	63.0
0.261260	46.6	Off	N	9.5	14.8	61.4
0.301640	34.7	Off	N	9.5	25.5	60.2
0.395720	40.5	Off	N	9.5	17.4	57.9
0.651770	34.9	Off	N	9.5	21.1	56.0
...	...	...	...	...	...	...

- Temperature : 24~25℃
- Relative Humidity : 55~57%
- Test Enginner : Sam
- Test Mode : Mode 4

■ The test that passed at minimum margin was marked by the frame in the following table.

<Line>



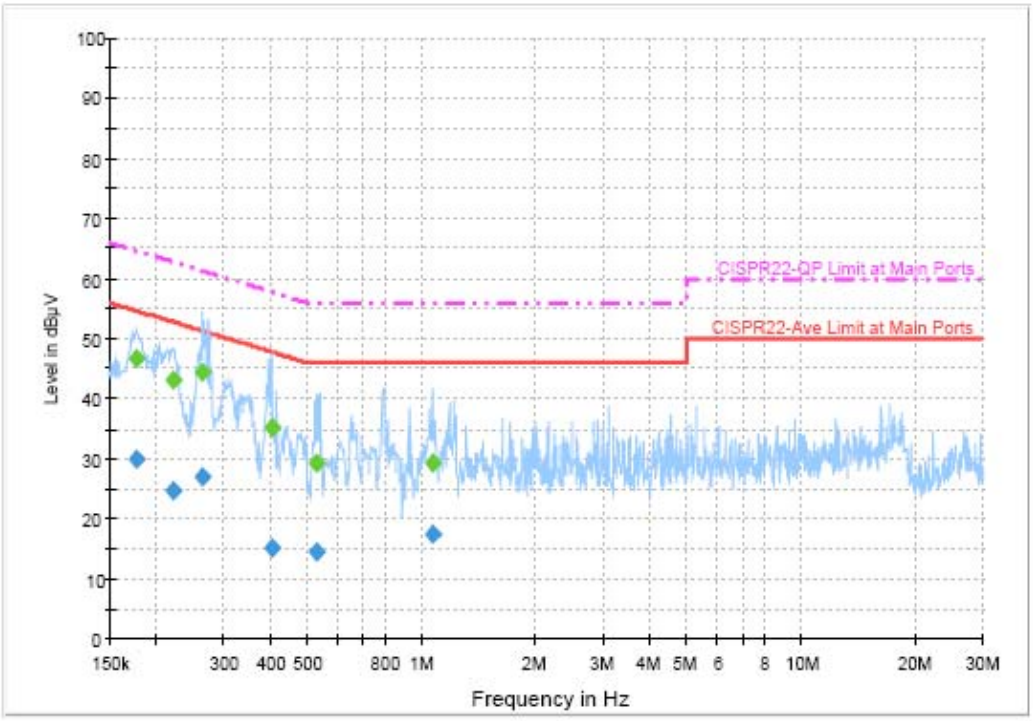
Final Measurement Detector 1

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.177380	32.5	Off	L1	9.5	22.1	54.6
0.214850	29.3	Off	L1	9.5	23.7	53.0
0.260220	28.3	Off	L1	9.5	23.1	51.4
0.308950	23.6	Off	L1	9.5	26.4	50.0
0.397300	18.8	Off	L1	9.5	29.1	47.9
0.531710	17.0	Off	L1	9.5	29.0	46.0

Final Measurement Detector 2

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.177380	49.5	Off	L1	9.5	15.1	64.6
0.214850	46.6	Off	L1	9.5	16.4	63.0
0.260220	46.2	Off	L1	9.5	15.2	61.4
0.308950	40.2	Off	L1	9.5	19.8	60.0
0.397300	37.1	Off	L1	9.5	20.8	57.9
0.531710	35.0	Off	L1	9.5	21.0	56.0

<Neutral>



Final Measurement Detector 1

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.177380	29.8	Off	N	9.6	24.8	54.6
0.220050	24.6	Off	N	9.5	28.2	52.8
0.263360	27.0	Off	N	9.5	24.3	51.3
0.400480	15.3	Off	N	9.6	32.5	47.8
0.525380	14.5	Off	N	9.5	31.5	46.0
1.060740	17.4	Off	N	9.6	28.6	46.0

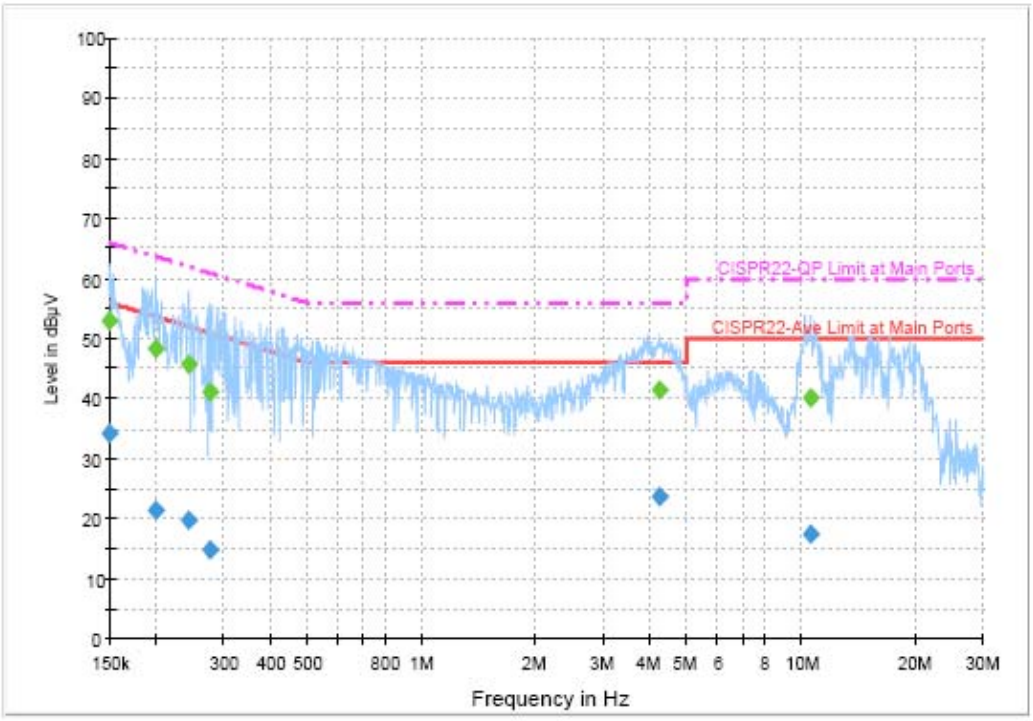
Final Measurement Detector 2

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.177380	46.8	Off	N	9.6	17.8	64.6
0.220050	43.1	Off	N	9.5	19.7	62.8
0.263360	44.4	Off	N	9.5	16.9	61.3
0.400480	35.1	Off	N	9.6	22.7	57.8
0.525380	29.2	Off	N	9.5	26.8	56.0
1.060740	29.2	Off	N	9.6	26.8	56.0

- Temperature : 24~25℃
- Relative Humidity : 55~57%
- Test Enginner : Sam
- Test Mode : Mode 5

■ The test that passed at minimum margin was marked by the frame in the following table.

<Line>



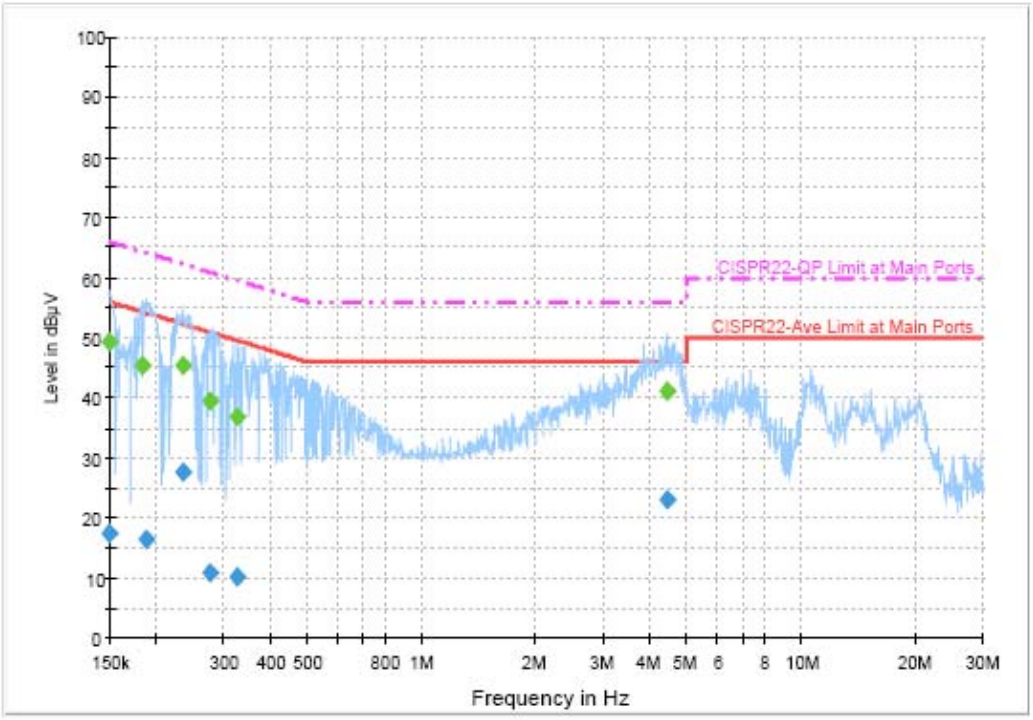
Final Measurement Detector 1

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150600	34.2	Off	L1	9.5	21.8	56.0
0.198360	21.4	Off	L1	9.5	32.3	53.7
0.242180	19.6	Off	L1	9.6	32.4	52.0
0.277390	14.8	Off	L1	9.5	36.1	50.9
4.221580	23.7	Off	L1	9.6	22.3	46.0
10.531630	17.6	Off	L1	9.7	32.4	50.0

Final Measurement Detector 2

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150600	52.8	Off	L1	9.5	13.2	66.0
0.198360	48.3	Off	L1	9.5	15.4	63.7
0.242180	45.7	Off	L1	9.6	16.3	62.0
0.277390	41.1	Off	L1	9.5	19.8	60.9
4.221580	41.4	Off	L1	9.6	14.6	56.0
10.531630	40.0	Off	L1	9.7	20.0	60.0

<Neutral>



Final Measurement Detector 1

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	17.6	Off	N	9.5	38.4	56.0
0.187580	16.6	Off	N	9.6	37.5	54.1
0.233630	27.7	Off	N	9.6	24.6	52.3
0.276280	10.7	Off	N	9.5	40.2	50.9
0.325410	10.2	Off	N	9.5	39.4	49.6
4.411090	22.9	Off	N	9.7	23.1	46.0

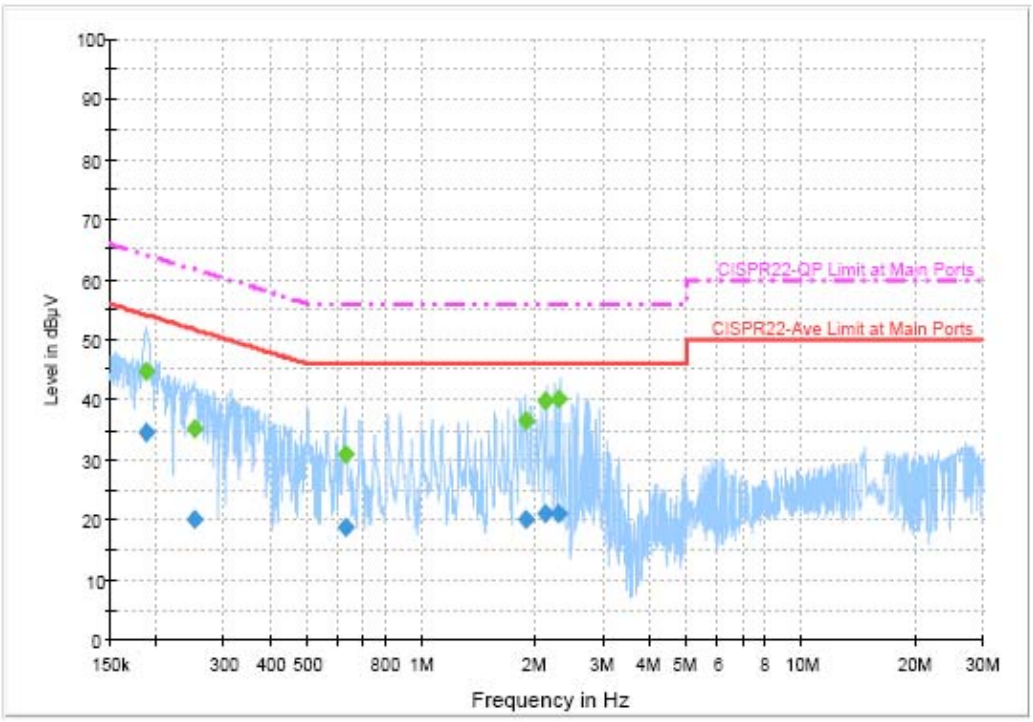
Final Measurement Detector 2

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	49.2	Off	N	9.5	16.8	66.0
0.183140	45.4	Off	N	9.6	18.9	64.3
0.233630	45.6	Off	N	9.6	16.7	62.3
0.276280	39.5	Off	N	9.5	21.4	60.9
0.325410	36.9	Off	N	9.5	22.7	59.6
4.411090	41.2	Off	N	9.7	14.8	56.0

- Temperature : 24~25℃
- Relative Humidity : 55~57%
- Test Enginner : Sam
- Test Mode : Mode 6

■ The test that passed at minimum margin was marked by the frame in the following table.

<Line>



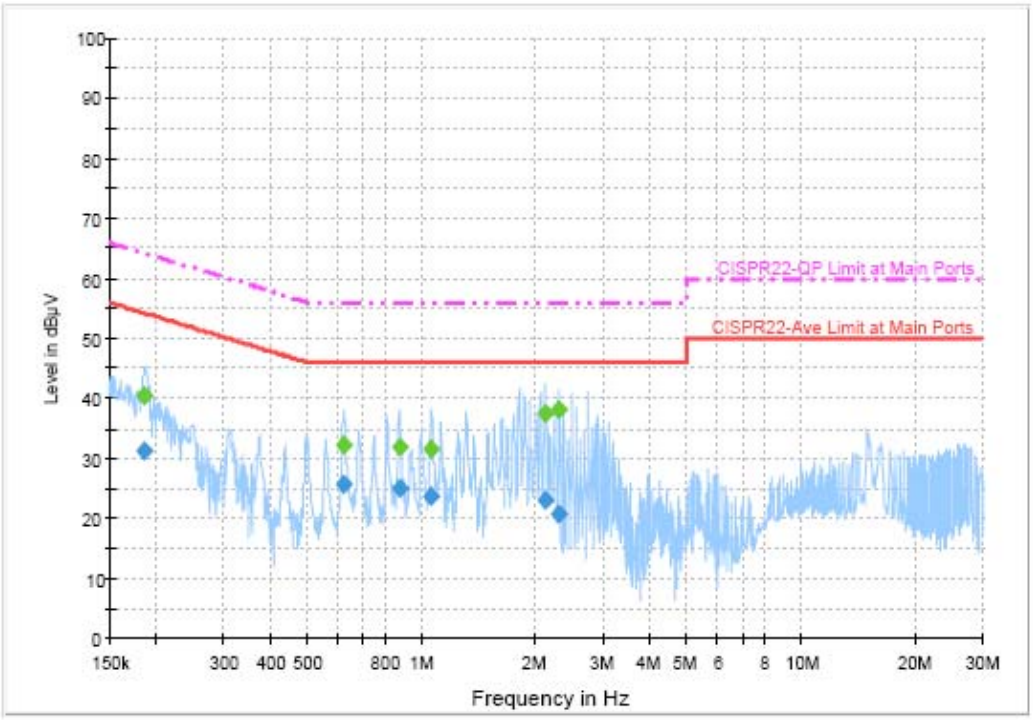
Final Measurement Detector 1

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.188330	34.5	Off	L1	9.5	19.6	54.1
0.251040	20.2	Off	L1	9.6	31.5	51.7
0.626270	18.9	Off	L1	9.5	27.1	46.0
1.869810	19.9	Off	L1	9.6	26.1	46.0
2.112780	20.9	Off	L1	9.6	25.1	46.0
2.302640	20.9	Off	L1	9.6	25.1	46.0

Final Measurement Detector 2

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.188330	44.9	Off	L1	9.5	19.2	64.1
0.251040	35.2	Off	L1	9.6	26.5	61.7
0.626270	30.8	Off	L1	9.5	25.2	56.0
1.869810	36.6	Off	L1	9.6	19.4	56.0
2.112780	39.9	Off	L1	9.6	16.1	56.0
2.302640	40.2	Off	L1	9.6	15.8	56.0

<Neutral>



Final Measurement Detector 1

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.186090	31.4	Off	N	9.6	22.8	54.2
0.621290	25.6	Off	N	9.5	20.4	46.0
0.868810	25.1	Off	N	9.6	20.9	46.0
1.056520	23.7	Off	N	9.6	22.3	46.0
2.107700	22.9	Off	N	9.6	23.1	46.0
2.292010	20.7	Off	N	9.6	25.3	46.0

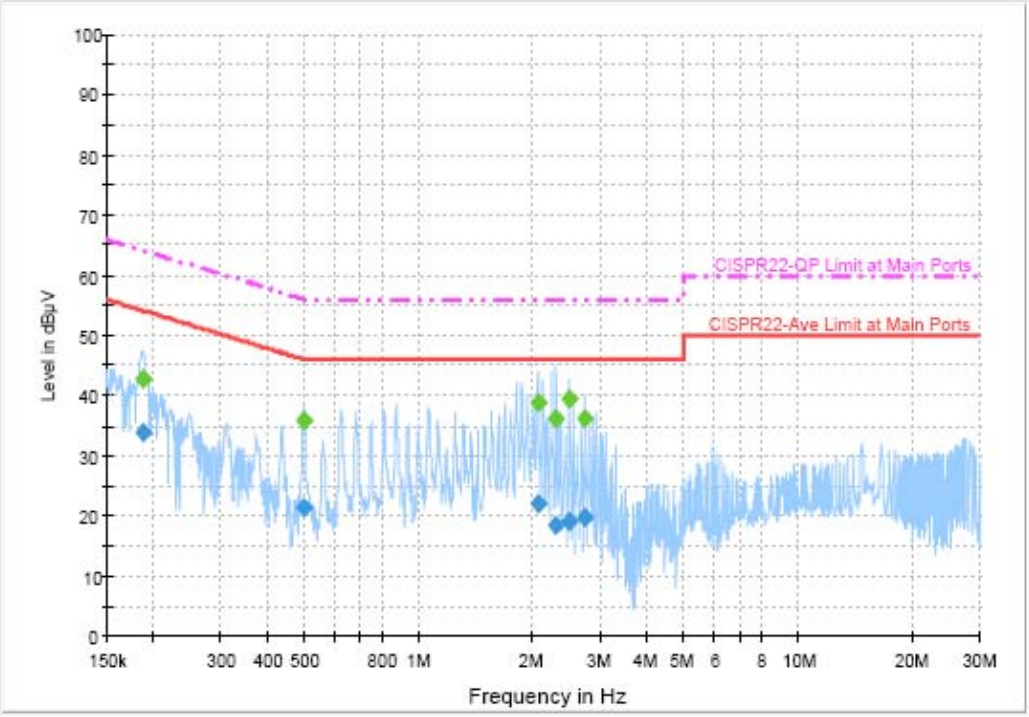
Final Measurement Detector 2

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.186090	40.6	Off	N	9.6	23.6	64.2
0.621290	32.4	Off	N	9.5	23.6	56.0
0.868810	31.9	Off	N	9.6	24.1	56.0
1.056520	31.4	Off	N	9.6	24.6	56.0
2.107700	37.7	Off	N	9.6	18.3	56.0
2.292010	38.2	Off	N	9.6	17.8	56.0

- Temperature : 24~25℃
- Relative Humidity : 55~57%
- Test Enginner : Sam
- Test Mode : Mode 7

■ The test that passed at minimum margin was marked by the frame in the following table.

<Line>



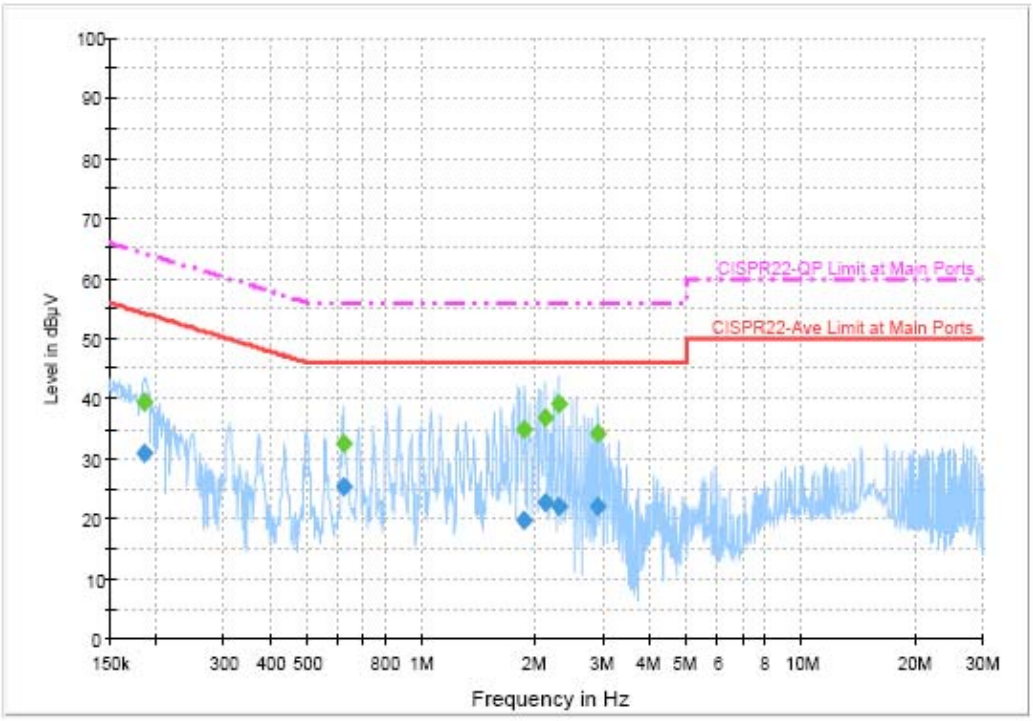
Final Measurement Detector 1

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.186830	34.0	Off	L1	9.5	20.2	54.2
0.496830	21.5	Off	L1	9.5	24.6	46.1
2.049620	22.0	Off	L1	9.6	24.0	46.0
2.301180	18.5	Off	L1	9.6	27.5	46.0
2.482510	19.1	Off	L1	9.6	26.9	46.0
2.732120	19.7	Off	L1	9.6	26.3	46.0

Final Measurement Detector 2

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.186830	42.8	Off	L1	9.5	21.4	64.2
0.496830	35.7	Off	L1	9.5	20.4	56.1
2.049620	39.0	Off	L1	9.6	17.0	56.0
2.301180	36.3	Off	L1	9.6	19.7	56.0
2.482510	39.4	Off	L1	9.6	16.6	56.0
2.732120	36.1	Off	L1	9.6	19.9	56.0

<Neutral>



Final Measurement Detector 1

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.186090	31.1	Off	N	9.6	23.1	54.2
0.621290	25.4	Off	N	9.5	20.6	46.0
1.862360	19.7	Off	N	9.6	26.3	46.0
2.107700	22.7	Off	N	9.6	23.3	46.0
2.292010	21.9	Off	N	9.6	24.1	46.0
2.912330	22.1	Off	N	9.6	23.9	46.0

Final Measurement Detector 2

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.186090	39.5	Off	N	9.6	24.7	64.2
0.621290	32.4	Off	N	9.5	23.6	56.0
1.862360	34.9	Off	N	9.6	21.1	56.0
2.107700	37.0	Off	N	9.6	19.0	56.0
2.292010	39.1	Off	N	9.6	16.9	56.0
2.912330	34.2	Off	N	9.6	21.8	56.0

5.9 Radiated Emission Measurement

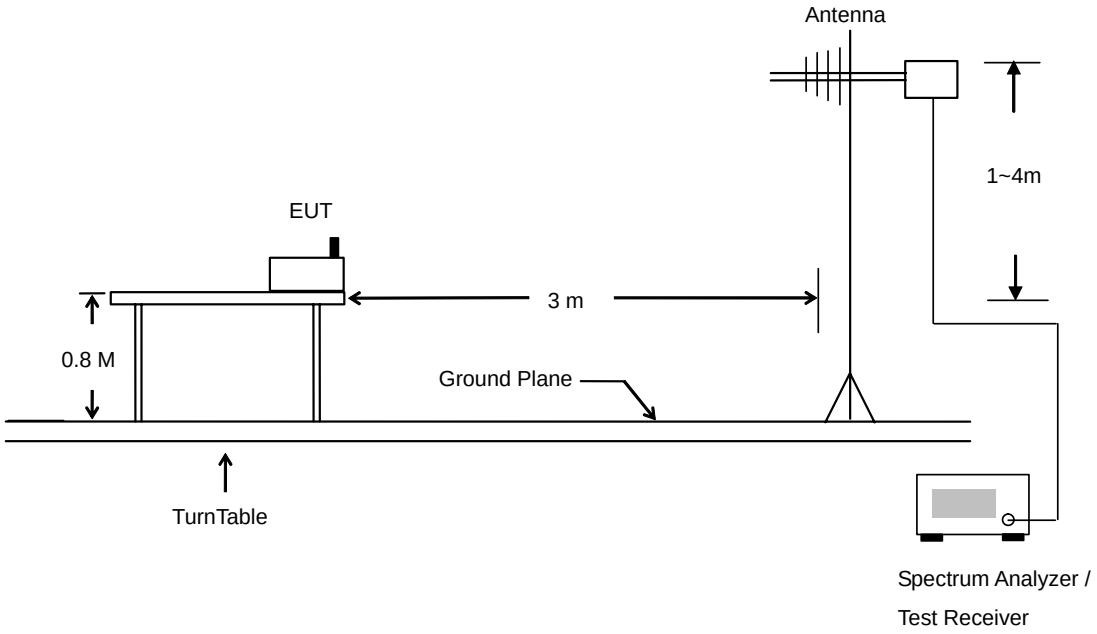
5.9.1 Measuring Instruments

As described in chapter 6 of this Report.

5.9.2 Test Procedures

1. The EUT was placed on a rotatable table top 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna is a broadband antenna and its height is varied between one meter and four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.
7. For testing below 1GHz, If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the quasi-peak method and reported.
8. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in average mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

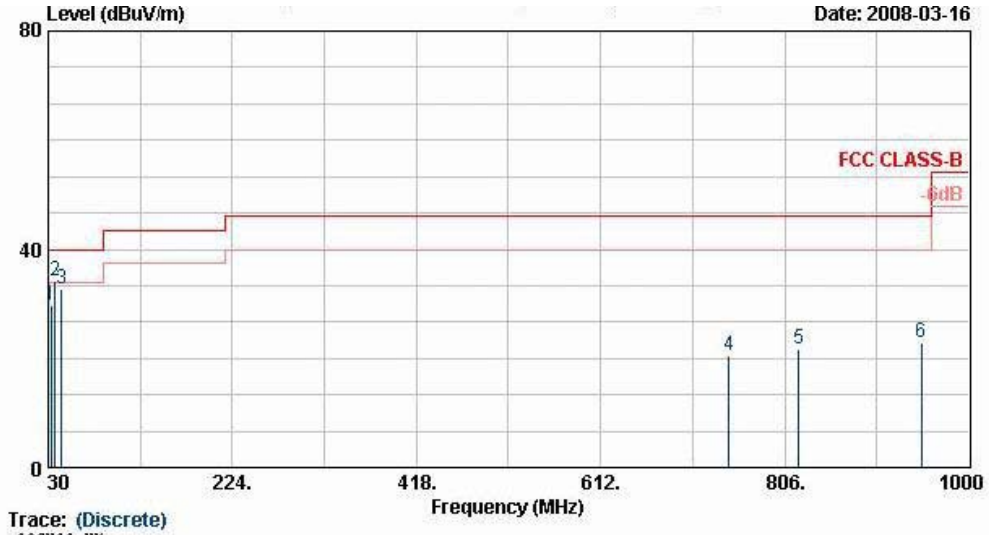
5.9.3 Typical Test Setup Layout of Radiated Emission



5.9.4 Test Data

- Temperature : 25~26℃
- Relating Humidity : 49~51%
- Test Engineer : Sun
- Test Mode : Mode 4
- Polarization : Horizontal (30MHz-1GHz)

■ The test that passed at minimum margin was marked by the boldface in the following table.



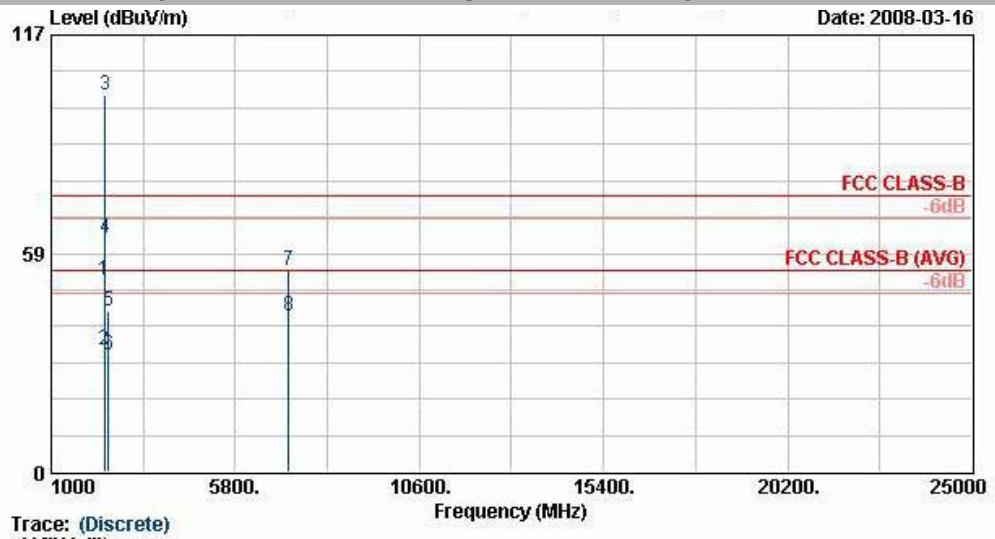
Trace: (Discrete)

Site : 03CH06-HY
Condition : FCC CLASS-B 3m LF-ANT(95112I) HORIZONTAL
EUT : Smart Phone WCDMA (band I/VIII) + GSM/GPRS/EDGE(900/1800/1900)
Power : 120Vac/60Hz
Model : FR 830416
Mode : BT Tx_CH00;2402MHz + Adaptor A
IMEI : 355195000000001701
Data Rate : 3DH1
Plane : E2(slide off)

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	33.24	29.77	-10.23	40.00	45.31	17.54	0.30	33.38	---	---	Peak
2 !	**37.29**	**34.17**	**-5.83**	**40.00**	**52.55**	**14.56**	**0.30**	**33.24**	**100**	**88**	**Peak**
3	44.31	32.84	-7.16	40.00	54.63	11.02	0.30	33.11	---	---	Peak
4	747.30	20.66	-25.34	46.00	33.12	19.32	1.10	32.89	---	---	Peak
5	820.80	21.75	-24.25	46.00	33.20	19.96	1.20	32.61	---	---	Peak
6	950.30	23.04	-22.96	46.00	33.37	20.89	1.21	32.43	---	---	Peak

- Polarization : Horizontal (1GHz-25GHz)

■ The test that passed at minimum margin was marked by the boldface in the following table.



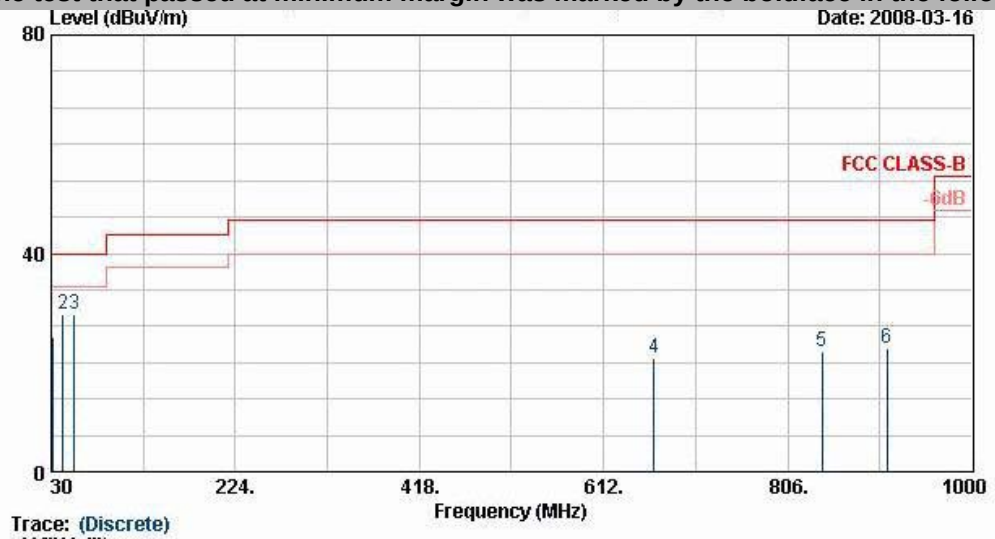
Site : 03CH06-HY
Condition : FCC CLASS-B 3m SHF-EHF HORN HORIZONTAL
EUT : Smart Phone WCDMA (band I/VIII) + GSM/GPRS/EDGE(900/1800/1900)
Power : 120Vac/60Hz
Model : FR 830416
Mode : BT Tx_CH00;2402MHz + Adaptor A
TMET : 355195000000001701
Data Rate : 3DH1
Plane : E2(slide off)

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	2389.99	51.39	-22.61	74.00	51.29	31.86	3.92	35.68	100	0	Peak
2	2389.99	32.79	-21.21	54.00	32.69	31.86	3.92	35.68	194	19	Average
3 @	2402.00	101.04			100.92	31.88	3.92	35.68	100	0	Peak
4 X	2402.00	62.70			62.60	31.86	3.92	35.68	194	19	Average
5	2484.00	43.13	-30.87	74.00	42.80	31.98	4.05	35.70	100	0	Peak
6	2484.00	31.39	-22.61	54.00	31.06	31.98	4.05	35.70	194	19	Average
7	7191.00	53.91	-20.09	74.00	47.11	35.72	7.16	36.08	100	0	Peak
8	7191.00	41.58	-12.42	54.00	34.78	35.72	7.16	36.08	100	115	Average

Remark: #3 and #4 are Fundamental Signals

- Polarization : Vertical (30MHz-1GHz)

■ The test that passed at minimum margin was marked by the boldface in the following table.



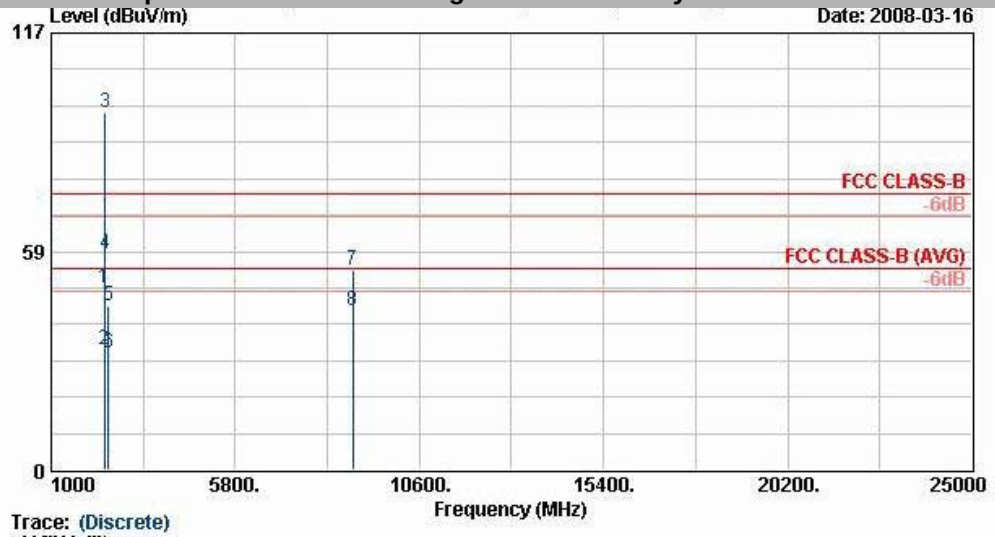
Trace: (Discrete)

Site : 03CH06-HY
Condition : FCC CLASS-B 3m LF-ANT(95112I) VERTICAL
EUT : Smart Phone WCDMA (band I/VIII) + GSM/GPRS/EDGE(900/1800/1900)
Power : 120Vac/60Hz
Model : FR 830416
Mode : BT Tx_CH39;2441MHz + Adaptor A
TMET : 355195000000001701
Data Rate : 3DH1
Plane : E2(slide off)

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	31.08	24.76	-15.24	40.00	38.97	18.95	0.30	33.46	---	---	Peak
2	42.69	28.86	-11.14	40.00	49.69	12.02	0.30	33.15	100	36	Peak
3	54.03	28.81	-11.19	40.00	54.26	7.50	0.38	33.33	---	---	Peak
4	665.40	20.96	-25.04	46.00	34.23	18.74	1.05	33.06	---	---	Peak
5	841.80	22.01	-23.99	46.00	33.36	20.12	1.20	32.66	---	---	Peak
6	910.40	22.48	-23.52	46.00	33.30	20.61	1.29	32.72	---	---	Peak

- Polarization : Vertical (1GHz-25GHz)

■ The test that passed at minimum margin was marked by the boldface in the following table.



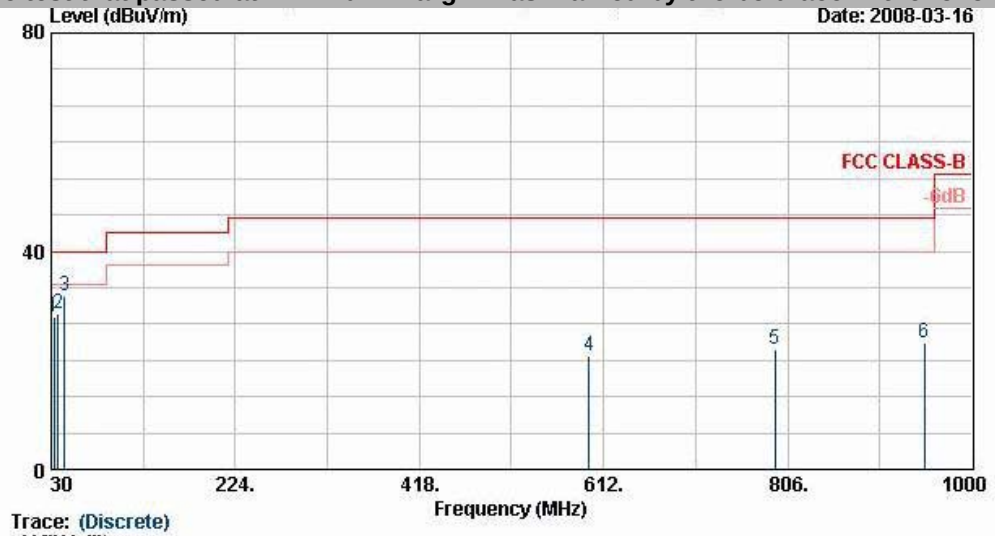
Site : 03CH06-HY
Condition : FCC CLASS-B 3m SHF-EHF HORN VERTICAL
EUT : Smart Phone WCDMA (band I/VIII) + GSM/GPRS/EDGE(900/1800/1900)
Power : 120Vac/60Hz
Model : FR 830416
Mode : BT Tx_CH00;2402MHz + Adaptor A
IMEI : 355195000000001701
Data Rate : 3DH1
Plane : E2(slide off)

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	2389.99	48.82	-25.18	74.00	48.72	31.86	3.92	35.68	100	0	Peak
2	2389.99	32.17	-21.83	54.00	32.07	31.86	3.92	35.68	125	180	Average
3 @	2402.00	95.72			95.60	31.88	3.92	35.68	100	0	Peak
4 X	2402.00	57.64			57.54	31.86	3.92	35.68	125	180	Average
5	2486.00	43.95	-30.05	74.00	43.62	31.98	4.05	35.70	100	0	Peak
6	2486.00	31.41	-22.59	54.00	31.08	31.98	4.05	35.70	125	180	Average
7	8871.00	53.28	-20.72	74.00	45.84	36.31	7.65	36.53	100	0	Peak
8	8871.00	42.67	-11.33	54.00	35.23	36.31	7.65	36.53	100	86	Average

Remark: #3 and #4 are Fundamental Signals

- Test Mode : Mode 5
- Polarization : Horizontal (30MHz-1GHz)

■ The test that passed at minimum margin was marked by the boldface in the following table.



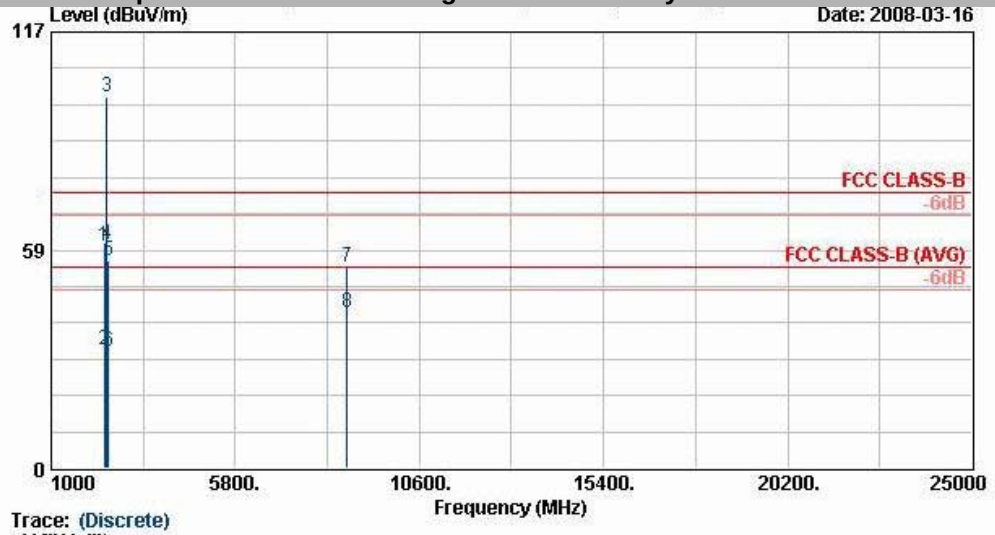
Trace: (Discrete)

Site : 03CH06-HY
Condition : FCC CLASS-B 3m LF-ANT(95112I) HORIZONTAL
EUT : Smart Phone WCDMA (band I/VIII) + GSM/GPRS/EDGE(900/1800/1900)
Power : 120Vac/60Hz
Model : FR 830416
Mode : BT Tx_CH39;2441MHz + Adaptor A
IMEI : 355195000000001701
Data Rate : 3DH1
Plane : E2(slide off)

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	33.24	27.91	-12.09	40.00	43.45	17.54	0.30	33.38	---	---	Peak
2	37.29	28.62	-11.38	40.00	47.00	14.56	0.30	33.24	---	---	Peak
3	44.04	31.70	-8.30	40.00	53.01	11.52	0.30	33.13	100	258	Peak
4	596.80	20.76	-25.24	46.00	34.21	18.43	1.00	32.88	---	---	Peak
5	792.80	21.95	-24.05	46.00	33.61	19.75	1.20	32.61	---	---	Peak
6	950.30	23.21	-22.79	46.00	33.55	20.89	1.21	32.43	---	---	Peak

- Polarization : Horizontal (1GHz-25GHz)

The test that passed at minimum margin was marked by the boldface in the following table.



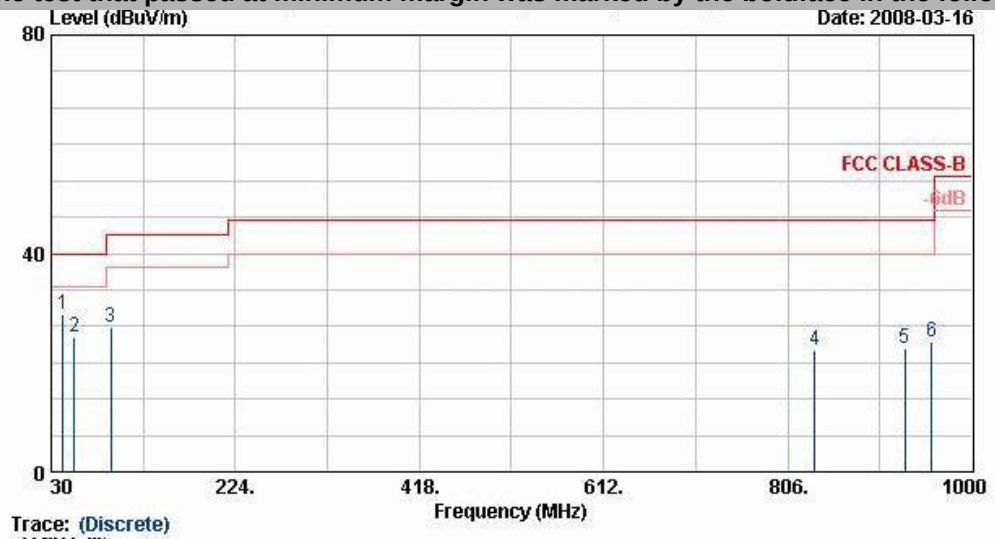
Site : 03CH06-HY
Condition : FCC CLASS-B 3m SHF-EHF HORN HORIZONTAL
EUT : Smart Phone WCDMA (band I/VIII) + GSM/GPRS/EDGE(900/1800/1900)
Power : 120Vac/60Hz
Model : FR 830416
Mode : BT Tx_CH39;2441MHz + Adaptor A
IMEI : 355195000000001701
Data Rate : 3DH1
Plane : E2(slide off)

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	2390.00	59.71	-14.29	74.00	59.61	31.86	3.92	35.68	100	0	Peak
2	2390.00	31.61	-22.39	54.00	31.51	31.86	3.92	35.68	100	23	Average
3 @	2441.00	99.46			99.23	31.93	3.99	35.69	100	0	Peak
4 X	2441.00	59.82			59.60	31.93	3.99	35.69	100	23	Average
5	2486.00	55.70	-18.30	74.00	55.37	31.98	4.05	35.70	100	0	Peak
6	2486.00	31.30	-22.70	54.00	30.97	31.98	4.05	35.70	100	23	Average
7	8706.00	53.98	-20.02	74.00	46.87	36.08	7.45	36.42	100	0	Peak
8	8706.00	41.94	-12.06	54.00	34.83	36.08	7.45	36.42	100	14	Average

Remark: #3 and #4 are Fundamental Signals

- Polarization : Vertical (30MHz-1GHz)

■ The test that passed at minimum margin was marked by the boldface in the following table.



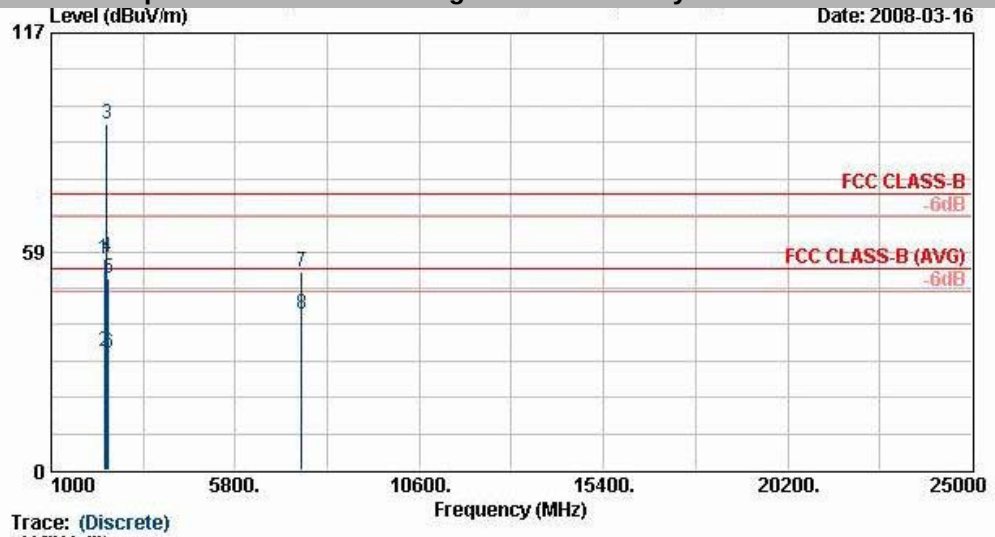
Trace: (Discrete)

Site : 03CH06-HY
Condition : FCC CLASS-B 3m LF-ANT(95112I) VERTICAL
EUT : Smart Phone WCDMA (band I/VIII) +
: GSM/GPRS/EDGE(900/1800/1900)
Power : 120Vac/60Hz
Model : FR 830416
Mode : BT Tx_CH39;2441MHz + Adaptor A
TMET : 355195000000001701
Data Rate : 3DH1
Plane : E2(slide off)

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	42.69	28.86	-11.14	40.00	49.69	12.02	0.30	33.15	100	199	Peak
2	54.03	24.81	-15.19	40.00	50.26	7.50	0.38	33.33	---	---	Peak
3	92.64	26.38	-17.12	43.50	49.59	9.62	0.50	33.33	---	---	Peak
4	834.80	22.22	-23.78	46.00	33.60	20.07	1.20	32.64	---	---	Peak
5	929.30	22.75	-23.25	46.00	33.40	20.74	1.20	32.59	---	---	Peak
6	957.30	23.92	-22.08	46.00	34.09	20.94	1.27	32.38	---	---	Peak

- Polarization : Vertical (1GHz-25GHz)

■ The test that passed at minimum margin was marked by the boldface in the following table.



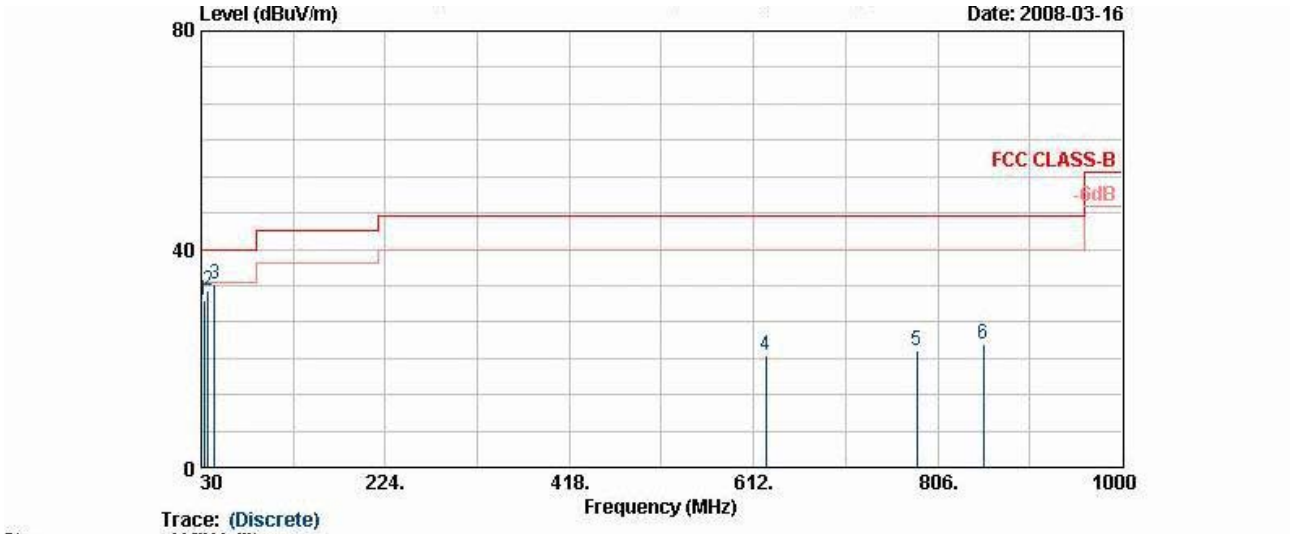
Site : 03CH06-HY
Condition : FCC CLASS-B 3m SHF-EHF HORN VERTICAL
EUT : Smart Phone WCDMA (band I/VIII) + GSM/GPRS/EDGE(900/1800/1900)
Power : 120Vac/60Hz
Model : FR 830416
Mode : BT Tx_CH39;2441MHz + Adaptor A
TMET : 355195000000001701
Data Rate : 3DH1
Plane : E2(slide off)

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	2390.00	56.63	-17.37	74.00	56.53	31.86	3.92	35.68	100	0	Peak
2	2390.00	31.57	-22.43	54.00	31.47	31.86	3.92	35.68	123	180	Average
3 X	2441.00	92.66			92.44	31.93	3.99	35.69	100	0	Peak
4 X	2441.00	56.97			56.75	31.93	3.99	35.69	123	180	Average
5	2492.00	51.14	-22.86	74.00	50.79	32.00	4.05	35.70	100	0	Peak
6	2492.00	31.31	-22.69	54.00	30.96	32.00	4.05	35.70	123	180	Average
7	7527.00	53.14	-20.86	74.00	46.46	35.61	7.28	36.21	100	0	Peak
8	7527.00	41.81	-12.19	54.00	35.13	35.61	7.28	36.21	100	13	Average

Remark: #3 and #4 are Fundamental Signals

- Test Mode : Mode 6
- Polarization : Horizontal (30MHz-1GHz)

■ The test that passed at minimum margin was marked by the boldface in the following table.

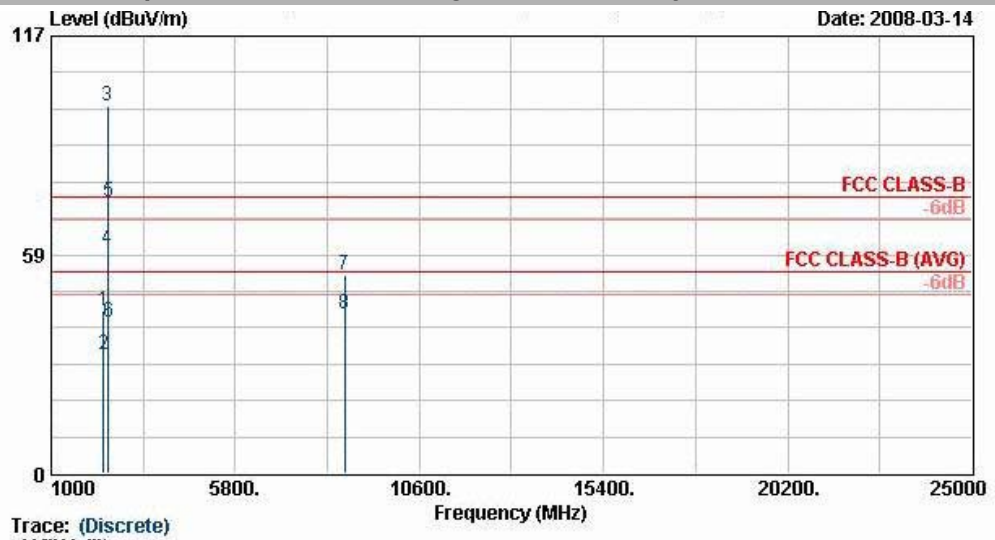


Site : 03CH06-HY
Condition : FCC CLASS-B 3m LF-ANT(951121) HORIZONTAL
EUT : Smart Phone WCDMA (band I/VIII) + GSM/GPRS/EDGE(900/1800/1900)
Power : 120Vac/60Hz
Model : FR 830416
Mode : BT Tx_CH78;2480MHz + Adaptor A
IMEI : 355195000000001701
Data Rate : 3DH1
Plane : E2(slide off)

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	33.24	30.61	-9.39	40.00	46.15	17.54	0.30	33.38	---	---	Peak
2	37.29	32.54	-7.46	40.00	50.92	14.56	0.30	33.24	---	---	Peak
3	44.04	33.58	-6.42	40.00	54.89	11.52	0.30	33.13	100	65	Peak
4	624.80	20.58	-25.42	46.00	33.89	18.57	1.05	32.94	---	---	Peak
5	784.40	21.52	-24.48	46.00	33.30	19.68	1.20	32.65	---	---	Peak
6	854.40	22.68	-23.32	46.00	33.96	20.21	1.20	32.69	---	---	Peak

- Polarization : Horizontal (1GHz-25GHz)

■ The test that passed at minimum margin was marked by the boldface in the following table.



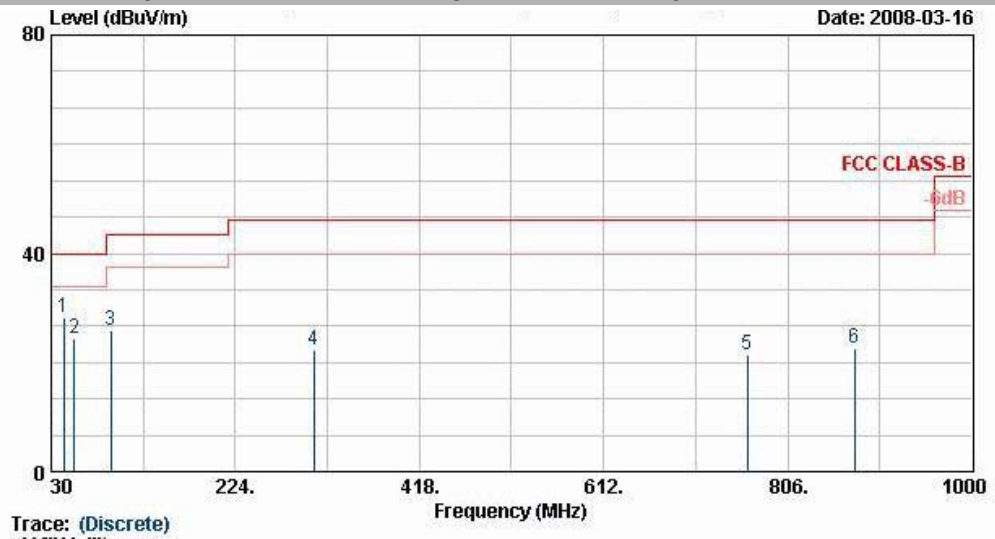
Site : 03CH06-HY
Condition : FCC CLASS-B 3m SHF-EHF HORN HORIZONTAL
EUT : Smart Phone WCDMA (band I/VIII) + GSM/GPRS/EDGE(900/1800/1900)
Power : 120Vac/60Hz
Model : FR 830416
Mode : BT Tx_CH78;2480MHz + Adaptor A
IMEI : 355195000000001701
Data Rate : 3DH1
Plane : E2(slide off)

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	2372.00	43.64	-30.36	74.00	43.59	31.83	3.89	35.68	100	0	Peak
2	2372.00	31.54	-22.46	54.00	31.50	31.83	3.89	35.68	155	28	Average
3 @	2480.00	98.37			98.04	31.98	4.05	35.70	100	0	Peak
4 X	2480.00	59.84			59.51	31.98	4.05	35.70	155	28	Average
5 !	2483.47	72.73	-1.27	74.00	72.40	31.98	4.05	35.70	100	0	Peak
6	2483.47	40.43	-13.57	54.00	40.10	31.98	4.05	35.70	155	28	Average
7	8661.00	53.05	-20.95	74.00	46.02	36.03	7.39	36.39	100	0	Peak
8	8661.00	42.65	-11.35	54.00	35.62	36.03	7.39	36.39	100	247	Average

Remark: #3 and #4 are Fundamental Signals

- Polarization : Vertical (30MHz-1GHz)

The test that passed at minimum margin was marked by the boldface in the following table.



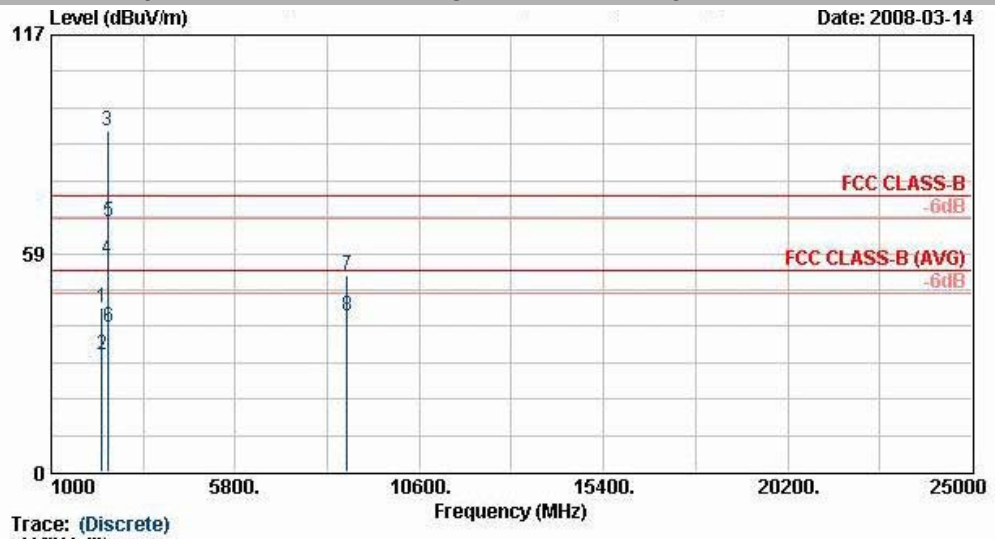
Trace: (Discrete)

Site : 03CH06-HY
Condition : FCC CLASS-B 3m LF-ANT(951121) VERTICAL
EUT : Smart Phone WCDMA (band I/VIII) + GSM/GPRS/EDGE(900/1800/1900)
Power : 120Vac/60Hz
Model : FR 830416
Mode : BT Tx_CH78;2480MHz + Adaptor A
IMEI : 355195000000001701
Data Rate : 3DH1
Plane : E2(slide off)

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	43.23	28.29	-11.71	40.00	49.60	11.52	0.30	33.13	100	23	Peak
2	54.03	24.27	-15.73	40.00	49.72	7.50	0.38	33.33	---	---	Peak
3	92.64	26.01	-17.49	43.50	49.23	9.62	0.50	33.33	---	---	Peak
4	306.30	22.18	-23.82	46.00	41.35	13.38	0.76	33.32	---	---	Peak
5	763.40	21.50	-24.50	46.00	33.70	19.48	1.10	32.79	---	---	Peak
6	876.80	22.53	-23.47	46.00	33.61	20.36	1.30	32.74	---	---	Peak

- Polarization : Vertical (1GHz-25GHz)

The test that passed at minimum margin was marked by the boldface in the following table.



Site : 03CH06-HY
Condition : FCC CLASS-B 3m SHF-EHF HORN VERTICAL
EUT : Smart Phone WCDMA (band I/VIII) + GSM/GPRS/EDGE(900/1800/1900)
Power : 120Vac/60Hz
Model : FR 830416
Mode : BT Tx_CH78;2480MHz + Adaptor A
TMET : 355195000000001701
Data Rate : 3DH1
Plane : E2(slide off)

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	2316.00	44.11	-29.89	74.00	44.22	31.73	3.82	35.67	100	0	Peak
2	2316.00	31.27	-22.73	54.00	31.38	31.73	3.82	35.67	187	352	Average
3 @	2480.00	91.53			91.19	31.98	4.05	35.70	100	0	Peak
4 X	2480.00	56.77			56.44	31.98	4.05	35.70	187	352	Average
5	2483.47	67.15	-6.85	74.00	66.82	31.98	4.05	35.70	100	0	Peak
6	2483.47	38.76	-15.24	54.00	38.43	31.98	4.05	35.70	187	352	Average
7	8706.00	52.78	-21.22	74.00	45.68	36.08	7.45	36.42	100	0	Peak
8	8706.00	41.97	-12.03	54.00	34.86	36.08	7.45	36.42	100	211	Average

Remark: #3 and #4 are Fundamental Signals

5.10 Antenna Requirements

5.10.1 Standard Applicable

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

And according to FCC 47 CFR Section 15.247 (b), if directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi.

5.10.2 Antenna Connected Construction

The antennas used in this product is PIFA Antenna for BT without connector and it is considered to meet antenna requirement of FCC.

5.10.3 Antenna Gain

The antenna gain of EUT is less than 6 dBi. Therefore, it is not necessany to reduce maximum peak output powen limit.

6. List of Measuring Equipments

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Due Date	Remark
EMI Receiver	R&S	ESCS 30	100356	9kHz – 2.75GHz	Jul. 26, 2007	Jul. 25, 2008	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100081	9kHz – 30MHz	Dec. 06, 2007	Dec. 05, 2008	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100080	9kHz – 30MHz	Dec. 06, 2007	Dec. 05, 2008	Conduction (CO05-HY)
DC-Lisn	R&S	ESH3-26	1000485	0.1MHz-200MHz	Feb. 04, 2008	Feb. 03, 2009	Conduction (CO05-HY)
DC-Lisn	R&S	ESH3-26	1000484	0.1MHz-200MHz	Feb. 04, 2008	Feb. 03, 2009	Conduction (CO05-HY)
Bilog Antenna	SCHAFFNER	CBL6112B	2885	30MHz~2GHz	Dec. 01, 2007	Nov. 31, 2008	Radiation (03CH06-HY)
Double Ridge Horn Antenna	EMCO	3117	66583	1G~18G	Aug. 29, 2007	Aug. 28, 2008	Radiation (03CH06-HY)
SHF-EHF Horn	SCHWARZBECK	BBHA 9170	9170-251	15G~40GHz	Oct. 17, 2007	Oct. 16, 2008	Radiation (03CH06-HY)
Spectrum Analyzer	Agilent	E4408B	MY44211028	9KHz~26.5GHz	Oct. 17, 2007	Oct. 16, 2008	Radiation (03CH06-HY)
EMI Test Receiver	R&S	ESVS10	834468/003	20~1000MHz	Apr. 24, 2008	Apr. 23, 2009	Radiation (03CH06-HY)
Pre Amplifier	Agilent	310N	186713	9KHz~1GHz	Apr. 21, 2008	Apr. 20, 2009	Radiation (03CH06-HY)
Pre Amplifier	Agilent	8449B	3008A01917	1G~26.5G	Nov. 22, 2007	Nov. 21, 2008	Radiation (03CH06-HY)
Base Station Simulator	R & S	CMU200	103937	N/A	Oct. 19, 2007	Oct. 18, 2008	Radiation (03CH06-HY)

7. Uncertainty Evaluation

Uncertainty of Conducted Emission Measurement (150 KHz ~ 30 MHz)

Contribution	Uncertainty of x_i		$u(x_i)$
	dB	Probability Distribution	
Receiver reading	0.10	Normal(k=2)	0.05
Cable loss	0.10	Normal(k=2)	0.05
AMN insertion loss	2.50	Rectangular	0.63
Receiver Spec	1.50	Rectangular	0.43
Site imperfection	1.39	Rectangular	0.80
Mismatch	+0.34/-0.35	U-shape	0.24
Combined standard uncertainty Uc(y)	**1.13**		
Measuring uncertainty for a level of Confidence of 95% U=2Uc(y)	**2.26**		

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Contribution	Uncertainty of x_i		$u(x_i)$
	dB	Probability Distribution	
Receiver reading	0.11	Normal(k=2)	0.06
Antenna factor calibration	0.91	Normal(k=2)	0.46
Cable loss calibration	0.12	Normal(k=2)	0.06
Pre Amplifier Gain calibration	0.15	Normal(k=2)	0.08
RCV/SPA specification	2.50	Rectangular	0.72
Antenna Factor Interpolation for Frequency	1.00	Rectangular	0.29
Site imperfection	1.52	Rectangular	0.88
Mismatch	+0.45/-0.48	U-shaped	0.33
Combined standard uncertainty Uc(y)	**1.30**		
Measuring uncertainty for a level of Confidence of 95% U=2Uc(y)	**2.60**		

Uncertainty of Radiated Emission Measurement (1 GHz ~ 40 GHz)

Contribution	Uncertainty of x_i		$u(x_i)$	Ci	$Ci*u(x_i)$
	dB	Probability Distribution			
Receiver reading	±0.10	Normal(k=1)	0.10	1	0.10
Antenna factor calibration	±1.70	Normal(k=2)	0.85	1	0.85
Cable loss calibration	±0.50	Normal(k=2)	0.25	1	0.25
Receiver Correction	±2.00	Rectangular	1.15	1	1.15
Antenna Factor Directional	±1.50	Rectangular	0.87	1	0.87
Site imperfection	±2.80	Triangular	1.14	1	1.14
Mismatch Receiver VSWR Γ1= 0.197 Antenna VSWR Γ2= 0.194 Uncertainty=20log(1-Γ1*Γ2*Γ3)	+0.34/-0.35	U-shaped	0.244	1	0.244
Combined standard uncertainty Uc(y)	**2.36**				
Measuring uncertainty for a level of Confidence of 95% U=2Uc(y)	**4.72**				

The measured result is ：y dBuV ± U dB

for a level of confidence of approximately 95%，(k= 2)

Appendix A. Photographs of EUT

Please refer to Sporton report number EP860416 as below.