



# TEST REPORT

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**REPORT NUMBER** : ANKK-101206  
**APPLICANT** : Sony Corporation  
**MODEL NUMBER** : DCR-PC120  
**FCC ID** : AK8DCRPC120  
**REGULATION** : FCC Part15C Section 15.247



NVLAP accreditation is valid for  
FCC Part15 (Digital Devices),  
CISPR22 and AS/NZS 3548.  
NVLAP accreditation does not cover  
ICES-003.

**Akzo Nobel K. K.**  
**EMC Division**  
**Kashima Site**

**1, Oaza Sunayama, Hasaki-machi, Kashima-gun**  
**Ibaraki-ken, 314-0255 Japan**  
**Tel.: +81 479 40 1097 Fax.: +81 479 46 1788**

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**ABBREVIATIONS**

**LISN** = Line Impedance Stabilization Network

**AMN** = Artificial Mains Network

**ANT** = Antenna

**BBA** = Broad-band Antenna

**DIP** = Dipole Antenna

**AMP** = Amplifier

**ATT** = Attenuator

**EUT** = Equipment Under Test

**Q-P** = Quasi-peak

**AVG** = Average

**ch** = Channel

**TDD** = Time Division Duplex

## SECTION 1. TEST CERTIFICATION

## APPLICANT INFORMATION

Company	: Sony Corporation
Address	: 6-7-35, Kitashinagawa, Shinagawa-ku, Tokyo, 141-0001 Japan
Telephone number	: +81 3 5769 5643
Fax number	: +81 3 5769 5963

## DESCRIPTION OF TEST ITEM

Kind of equipment	: Digital Video Camera Recorder
Condition of equipment	: Prototype
Type	: Table-Top (Handheld type)
Trademark	: SONY
FCC ID	: AK8DCRPC120
Model number	: DCR-PC120
Serial number	: 79

## TEST PERFORMED

Location	: Kashima No. 1 Test Site (FCC File No. : 31040/SIT)
EUT received	: May 10, 2001
Test started	: May 10, 2001
Test completed	: July 9, 2001
Regulation	: FCC Part15 Subpart C Section 15.247 Intentional Radiators
Test setup	: ANSI C63.4-1992

Report number : ANKK-101206

Report issue date : July 19, 2001

Test engineer : Kazuhiro Ando

: Kazuo Masuda

Report approved by : Junichi Okada  
[Site Manager]

On the basis of the measurements made, the equipment tested is capable of operation in compliance with the requirements of Part 15 of the FCC Rules under normal use and maintenance.

**SECTION 2. SUMMARY OF RESULTS**

<b>Test</b>	<b>Reference</b>	<b>Result</b>
20dB Bandwidth	15.247(a)(1)(ii)	Pass
Carrier Frequency Separation	15.247(a)(1)	Pass
Number of Hopping Frequencies	15.247(a)(1)(ii)	Pass
Time of Occupancy (Dwell Time)	15.247(a)(1)(ii) 15.247(f)	Pass
Maximum Peak Output Power -RF Antenna Conducted	15.247(b)(1)	Pass
Maximum Peak Output Power - Radiated	15.247(b)(1)	Pass
Band Edge Compliance of RF Conducted Emissions	15.247(c)	Pass
Spurious Emissions - RF Antenna Conducted Test	15.247(c)	Pass
Spurious Emissions - Radiated Emission Test	15.247(c) 15.205 15.209	Pass
Restricted Bands of Operation	15.247(c) 15.205 15.209	Pass
Power Spectral Density	15.247(d) 15.247(f)	Pass
AC Conducted Emission	15.207	Pass
Variation of Input Power	15.31(e)	Pass

Note : As for the FCC Part 15 Subpart B-Unintentional Radiators, the EUT has been measured and declared as DoC by Sony Corporation.

As for the data of the processing gain [15.247(e)], refer to the processing gain file.

**SECTION 3. EQUIPMENT UNDER TEST**

The equipment under test (EUT) consisted of the following equipment.  
Indication in the following left side column corresponds to Section 6.

Symbol	Item	Model No.	Serial No.	FCC ID / DoC	Manufacturer	Remarks
A)	Digital Video Camera Recorder	DCR-PC120	79	AK8DCRPC120	SONY	
B)	AC Adaptor	AC-L10A	21232075	N.A.	SONY	

Power ratings of EUT : AC Adaptor : (Input) AC 100-240V, 50/60 Hz, 23W  
(Output) DC8.4V, 1.5A

DoC : Device for Declaration of Conformity

**3.1 Overview of EUT**

Frequency Range	2402 – 2480 MHz
Communication Method	TDD
Number of RF Channel	79
Carrier Spacing	1.0 MHz
Modulation Method	Gaussian Frequency Shift Keying (GFSK)
Spread Method	Frequency Hopping Spread Spectrum (FHSS)
Nominal Hop Rate	1600 hops/s
Symbol Rate on channel	1Mbps
Output Power	0.45mW
Antenna Gain	-4.4dBi

### 3.2 Operating channels and frequencies

<b>Ch</b>	<b>Frequency (GHz)</b>	<b>Ch</b>	<b>Frequency (GHz)</b>	<b>Ch</b>	<b>Frequency (GHz)</b>
<b>1</b>	<b>2.402</b>	<b>28</b>	<b>2.429</b>	<b>55</b>	<b>2.456</b>
<b>2</b>	<b>2.403</b>	<b>29</b>	<b>2.430</b>	<b>56</b>	<b>2.457</b>
<b>3</b>	<b>2.404</b>	<b>30</b>	<b>2.431</b>	<b>57</b>	<b>2.458</b>
<b>4</b>	<b>2.405</b>	<b>31</b>	<b>2.432</b>	<b>58</b>	<b>2.459</b>
<b>5</b>	<b>2.406</b>	<b>32</b>	<b>2.433</b>	<b>59</b>	<b>2.460</b>
<b>6</b>	<b>2.407</b>	<b>33</b>	<b>2.434</b>	<b>60</b>	<b>2.461</b>
<b>7</b>	<b>2.408</b>	<b>34</b>	<b>2.435</b>	<b>61</b>	<b>2.462</b>
<b>8</b>	<b>2.409</b>	<b>35</b>	<b>2.436</b>	<b>62</b>	<b>2.463</b>
<b>9</b>	<b>2.410</b>	<b>36</b>	<b>2.437</b>	<b>63</b>	<b>2.464</b>
<b>10</b>	<b>2.411</b>	<b>37</b>	<b>2.438</b>	<b>64</b>	<b>2.465</b>
<b>11</b>	<b>2.412</b>	<b>38</b>	<b>2.439</b>	<b>65</b>	<b>2.466</b>
<b>12</b>	<b>2.413</b>	<b>39</b>	<b>2.440</b>	<b>66</b>	<b>2.467</b>
<b>13</b>	<b>2.414</b>	<b>40</b>	<b>2.441</b>	<b>67</b>	<b>2.468</b>
<b>14</b>	<b>2.415</b>	<b>41</b>	<b>2.442</b>	<b>68</b>	<b>2.469</b>
<b>15</b>	<b>2.416</b>	<b>42</b>	<b>2.443</b>	<b>69</b>	<b>2.470</b>
<b>16</b>	<b>2.417</b>	<b>43</b>	<b>2.444</b>	<b>70</b>	<b>2.471</b>
<b>17</b>	<b>2.418</b>	<b>44</b>	<b>2.445</b>	<b>71</b>	<b>2.472</b>
<b>18</b>	<b>2.419</b>	<b>45</b>	<b>2.446</b>	<b>72</b>	<b>2.473</b>
<b>19</b>	<b>2.420</b>	<b>46</b>	<b>2.447</b>	<b>73</b>	<b>2.474</b>
<b>20</b>	<b>2.421</b>	<b>47</b>	<b>2.448</b>	<b>74</b>	<b>2.475</b>
<b>21</b>	<b>2.422</b>	<b>48</b>	<b>2.449</b>	<b>75</b>	<b>2.476</b>
<b>22</b>	<b>2.423</b>	<b>49</b>	<b>2.450</b>	<b>76</b>	<b>2.477</b>
<b>23</b>	<b>2.424</b>	<b>50</b>	<b>2.451</b>	<b>77</b>	<b>2.478</b>
<b>24</b>	<b>2.425</b>	<b>51</b>	<b>2.452</b>	<b>78</b>	<b>2.479</b>
<b>25</b>	<b>2.426</b>	<b>52</b>	<b>2.453</b>	<b>79</b>	<b>2.480</b>
<b>26</b>	<b>2.427</b>	<b>53</b>	<b>2.454</b>		
<b>27</b>	<b>2.428</b>	<b>54</b>	<b>2.455</b>		

**Note:**

1. This is for sure that all frequencies are in 2.402GHz to 2.480GHz.
2. Section 15.31(m): Measurements on intentional radiators or receivers shall be performed at three frequencies for operating frequency range over 10 MHz. (The locations of these frequencies one near the low, one near the middle and one near the high.)
3. After test, the EUT operating frequencies are in 2.402GHz to 2.480GHz. So all the items as followed in testing report are need to test these three frequencies: low: ch 1, middle: ch 40, high: ch 79.

## 3.3 Port(s)/Connector(s) :

Port name	Connector type	Connector pin	Remarks
DV (IEEE1394)	1394 Socket	4 pin	i. Link (S100)
S Video out	S type (mini DIN)	4 pin	
A/V	AV mini Jack	5 pin	$\phi$ 3.5mm
USB	mini B	5 pin	
LANC	Stereo mini-mini Jack	5 pin	$\phi$ 2.5mm
Headphone	Stereo mini Jack	4 pin	$\phi$ 3.5mm
MIC in	Stereo mini Jack	4 pin	$\phi$ 3.5mm

## 3.4 Oscillator(s)/Crystal(s) :

Oscillator	Operating frequency	Board name	Remarks
54.0 MHz	27.0 MHz	Main Board	VC
20.0 MHz	10.0 MHz	Main Board	VC $\mu$ com (A)
32.768 kHz	32.768 kHz	Main Board	VC $\mu$ com (A)
48.0 MHz	12.0 MHz	Main Board	VC Host- $\mu$ com
25.8048 MHz	25.8048 MHz	Main Board	VC Host- $\mu$ com
20.0 MHz	10.0 MHz	Main Board	VC $\mu$ com (B)
24.576 MHz	49.152 MHz	Main Board	VC SPLSI (C)
20.0 MHz	10.0 MHz	Main Board	VC $\mu$ com (C)
13.0 MHz	1.0 MHz	BT Board	Base Band
1.2 GHz	2.4 GHz	BT Board	RF PMB6615R Highest frequency

**SECTION 4. SUPPORT EQUIPMENT USED**

The EUT was supported by the following equipment during the test.  
Indication in the following left side column corresponds to Section 6.

Symbol	Item	Model No.	Serial No.	FCC ID / DoC	Manufacturer	Remarks
C)	Memory Stick	MSA-8A	None	N.A.	SONY	
D)	Video Flash Light	NVL-FDH3	None	N.A.	SONY	
E)	Remote Commander	RM-95	None	N.A.	SONY	
F)	Headphone	ATH-M6X	None	N.A.	audio-technica	
G)	Ext. Mic	ECM-K120	None	N.A.	SONY	
H)	BT_JIG	SP-FW	None	N.A.	SONY	
I)	Digital Video Cassette Recorder	GV-A500	15766	N.A.	SONY	
J)	Digital Video Camera Recorder	DCR-PC120	80	AK8DCRPC120	SONY	
K)	Computer	D4553A	SG71703530	DoC	HEWLETT PACKARD	
L)	CRT Display	D1726T-LS	2024314	AK8CPD17SF1	DELL	
M)	Keyboard	RT6656TWJP	40370158	AQ6-MTN4C15	HEWLETT PACKARD	
N)	Mouse	M-S34	LZA70967247	DZL211029	HEWLETT PACKARD	
O)	Printer	C3941A	JPCD204480	B94C3941A	HEWLETT PACKARD	
P)	Computer	TS30H	74789467Y41922A	IIRTS30HT	DELL	
Q)	Mouse	K3P400A	000202489	NIYK3P400A	Cyber solutions	
R)	DC Power Supply Unit	DM-112MV	17330014	N.A.	ALINCO	
S)	AC Adaptor	AC-V615	039923	N.A.	SONY	
T)	AC Adaptor	AC-L10A	F008012	N.A.	SONY	
U)	AC Adaptor	ADP-45GB	N6745059933	N.A.	DELL	

DoC : Device was tested and authorized under a Declaration of Conformity to the applicable FCC rules.

**SECTION 5. CABLE (S) USED**

The following cable(s) was used for the test.

Indication number in the following left side column corresponds to Section 6.

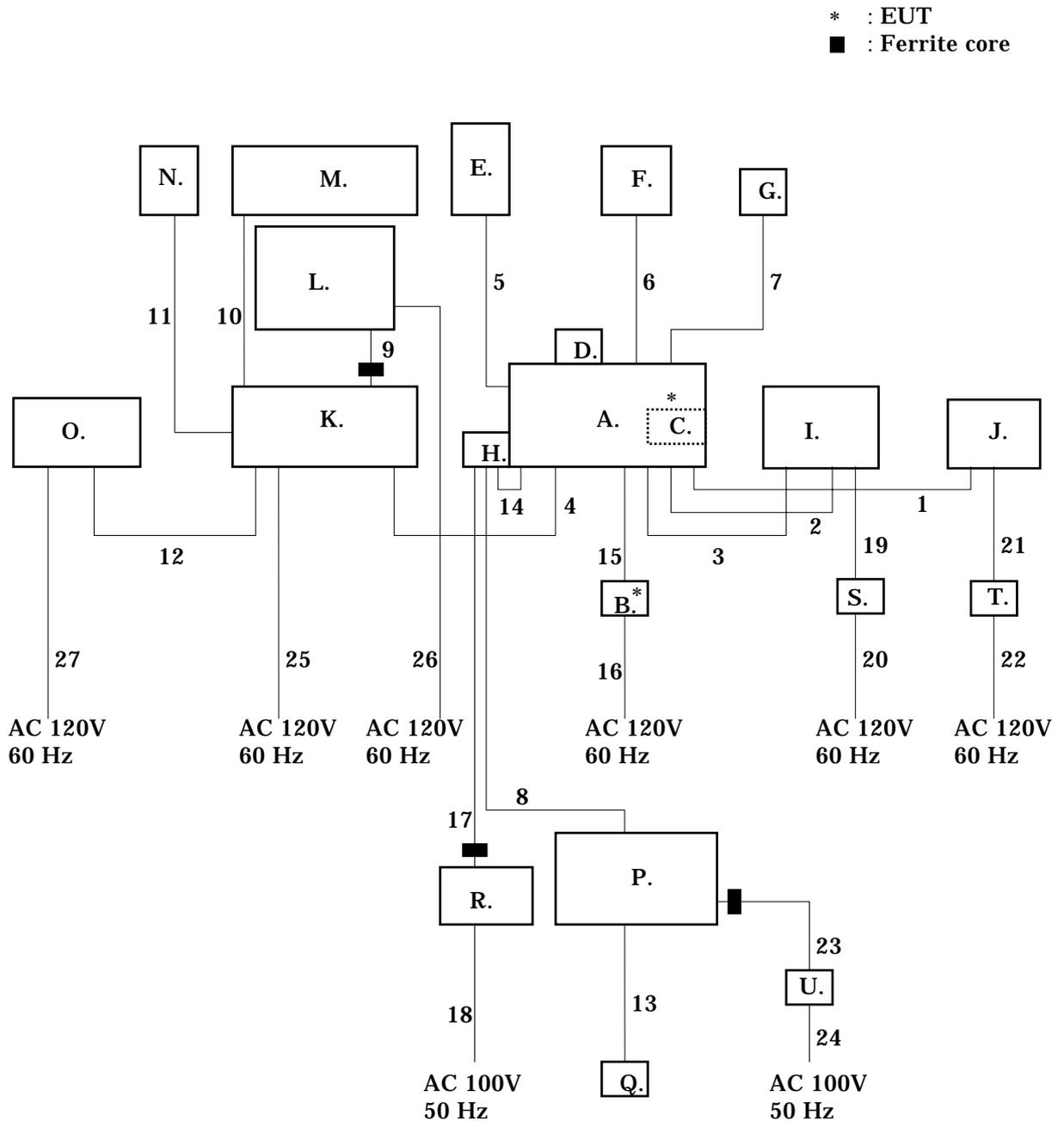
Number	Name	Length	Shield	Connector	Core
1)	i. Link cable	3.50 m	Yes	Metal	
2)	S-cable	2.10 m	Yes	Metal	
3)	AV cable	1.50 m	Yes	Metal	
4)	USB cable	0.90 m	Yes	Metal	
5)	Remote cable	0.80 m	Yes	Metal	
6)	Headphone cable	2.00 m	Yes	Metal	
7)	Mic cable (Curl cord)	0.30 m	Yes	Metal	
8)	Serial cable	1.50 m	Yes	Metal	
9)	Video cable	1.40 m	Yes	Metal	Fixed × 1
10)	Keyboard cable	1.90 m	Yes	Metal	
11)	Mouse cable	1.80 m	Yes	Metal	
12)	Parallel cable	2.30 m	Yes	Metal	
13)	Mouse cable	1.40 m	Yes	Metal	
14)	BT_JIG cable	0.10 m	None		
15)	Power cable for AC Adaptor(B) (DC)	1.70 m	None		
16)	Power cable for AC Adaptor(B) (AC)	2.00 m	None		
17)	Power cable for BT_JIG	0.70 m	None		Removable × 1
18)	Power cable for DC Power Supply Unit	1.30 m	None		
19)	Power cable for AC Adaptor(S) (DC)	2.00 m	None		
20)	Power cable for AC Adaptor(S) (AC)	1.90 m	None		
21)	Power cable for AC Adaptor(T) (DC)	1.70 m	None		
22)	Power cable for AC Adaptor(T) (AC)	2.00 m	None		
23)	Power cable for AC Adaptor(U) (DC)	1.50 m	None		Fixed × 1
24)	Power cable for AC Adaptor(U) (AC)	1.90 m	None		
25)	Power cable for Computer(K)	1.90 m	None		
26)	Power cable for CRT Display	1.90 m	None		
27)	Power cable for Printer	2.00 m	None		

### SECTION 6. CONSTRUCTION OF EQUIPMENT

The construction of EUT during the test was as follows.

#### 6.1 System use

##### System configuration

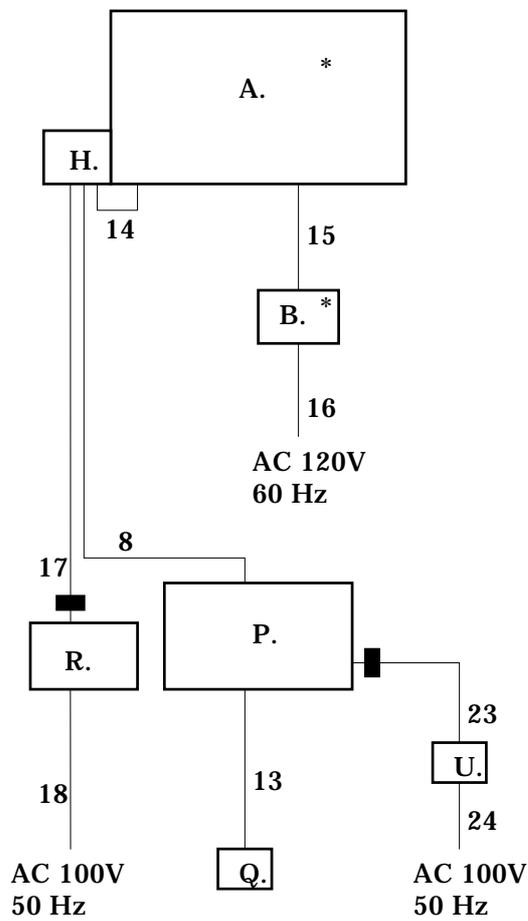


Symbols or numbers assigned to equipment or cables on this diagram are corresponded to the symbols or numbers assigned to equipment or cables on tables in Sections 3 to 5.

## 6.2 Single use

### System configuration

\* : EUT  
 ■ : Ferrite core



Symbols or numbers assigned to equipment or cables on this diagram are corresponded to the symbols or numbers assigned to equipment or cables on tables in Sections 3 to 5.

## SECTION 7. GENERAL TEST CONDITIONS

The EUT was operated under the following conditions during the test.

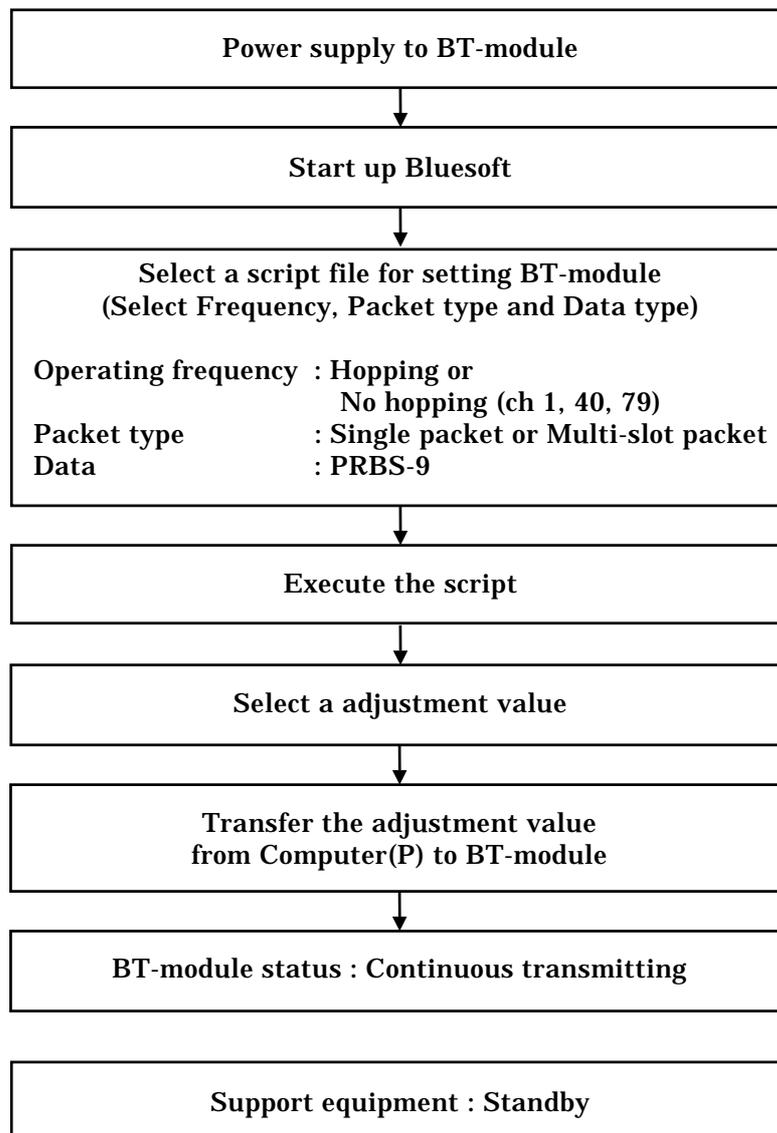
### 7.1 Operating condition

The test was carried out under Test mode, Inquiry mode and Page mode.  
EUT was examined in the operating conditions that had maximum emissions.

### 7.2 Operating flow

#### 7.2.1 Test mode

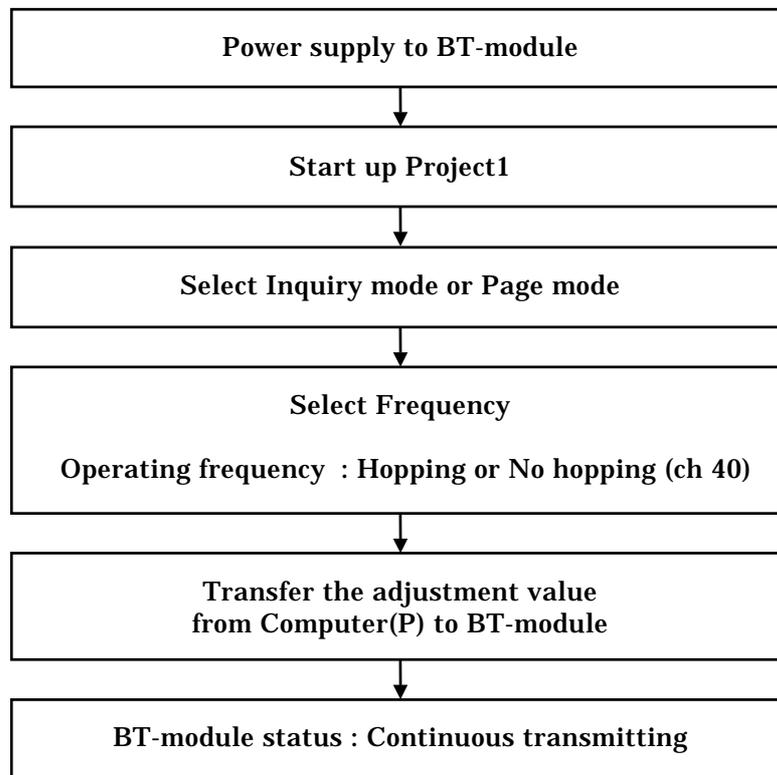
Following programs were performed continuously.



Note : PRBS-9 sequence performing pseudo random sequence, was provided by the applicant.  
The reference was given by the applicant as the details of PRBS-9 sequence (See Appendix).

### 7.2.2 Inquiry mode and Page mode

Following programs were performed continuously.



## **SECTION 8. TEST PROCEDURE(S)**

Test was carried out under the following conditions.

Test was carried out with no deviations from standards and test methods.

### **8.1 Conducted Emission Test [15.207]**

#### **8.1.1 Equipment Setup**

System configuration and Equipment setup are shown on Section 6.

##### **8.1.1.1 Table-Top Equipment**

EUT is placed on the wooden table raised 0.8meter above the metal ground plane.

##### **8.1.1.2 Interconnecting Cables**

Excess part of the interconnecting cables longer than 1 meter are bundled in the center. Cables that hang closer than 40 cm to the ground plane is folded back and forth forming bundle 30 to 40 cm long, hanging approx, in the middle between ground plane and table.

##### **8.1.1.3 AC Power Cable**

AC power cable for EUT is connected to one LISN which is placed on the ground plane. The LISN is placed in 80 cm from the nearest part of EUT chassis. The excess power cable is bundled in the center, or shortened to appropriate length. AC cables except from the EUT are connected second LISN.

#### **8.1.2 Measuring Instruments**

Brief description of Measuring Instruments are as follows;

##### **8.1.2.1 Spectrum Analyzer**

The Spectrum analyzer is used for preliminary measurement.

##### **8.1.2.2 EMI Test Receiver**

The Quasi-peak detector (IF bandwidth : 10 kHz) and average detector (IF bandwidth : 10 kHz) built in test receiver is used for final measurement. The test receiver is complied with the specification of the CISPR publication 16.

##### **8.1.2.3 LISN**

Two 50 $\mu$ H//50 $\Omega$  LISN are used. The chassis of the LISN is bonded to the ground plane by the copper blade. One LISN is connected to the EUT. Other LISN (2nd LISN) is connected to the support equipment. The signal output of the 2nd LISN is terminated with a 50 $\Omega$  termination.

### **8.1.3 Test Procedure**

#### **8.1.3.1 Preliminary Measurement**

**EUT is tested on all operating conditions.**

**The spectrum analyzer is controlled by the computer program to sweep regulation frequency, then spectrum chart are plotted out to detect the worst conditions in operating mode and/or configuration for the final test.**

**All leads other than safety ground are tested.**

#### **8.1.3.2 Final Measurement**

**The EUT is operated in the worst condition where maximum emission is detected by the preliminary test. The equipment and cables are arranged or manipulated within the range of the test standard in the above condition.**

**The each spectrum to be tested are measured in quasi-peak using the test receiver. When the value in the quasi-peak mode is higher than the limit in the standard, the measurement in the average mode is done to compare to the value in the quasi-peak mode. If the value in the quasi-peak mode exceeds the value in the average mode by more than 6 dB, the value reducing 13 dB from the value in the quasi-peak mode is used to compare to the limit.**

## **8.2 Radiated Emission Test [15.247(b), 15.247(c), 15.205, 15.209]**

### **8.2.1 Equipment Setup**

System configuration and Equipment setup are shown on Section 6.

#### **8.2.1.1 Table-Top Equipment**

EUT is placed on the wooden table raised 0.8meter above the metal ground plane (turntable).

#### **8.2.1.2 Interconnecting Cables**

Excess part of the interconnecting cables longer than 1 meter are bundled in the center. Cables that hang closer than 40 cm to the ground plane is folded back and forth forming bundle 30 to 40 cm long, hanging approx, in the middle between ground plane and table.

### **8.2.2 Measuring Instruments**

Brief description of Measuring Instruments are as follows;

#### **8.2.2.1 Antennas**

The Double ridged guide antenna and the Standard gain horn antennas are used for frequency higher than 1000 MHz.

If uncertain result was obtained, the broadband antenna is replaced by the half wave length dipole, then measurement is carried out over again.

#### **8.2.2.2 Pre-amplifier**

The broadband pre-amplifier is used for radiated emission measurement.

The signal to noise ratio is improved by using pre-amplifier.

#### **8.2.2.3 Spectrum Analyzer**

The spectrum analyzer is used for preliminary measurement of frequency range 30 – 1000 MHz, and also used for final measurement of higher than 1000 MHz

#### **8.2.2.4 EMI Test Receiver**

The Quasi-peak detector (IF bandwidth : 120 kHz) built in test receiver is used for final measurement of the frequency 30 – 1000 MHz.

The test receiver is complied with the specification of the CISPR publication 16.

#### **8.2.2.5 Turntable**

The turntable is capable for EUT weight and rotatable 0 to 360 degree horizontally by remote control in the test room.

#### **8.2.2.6 Antenna Mast**

The antenna mast is attachable to all antennas described on clause 8.2.2.1 and antenna height is adjustable 1 to 4 meters continuously by remote control at the test room, and antenna polarization is also changed by the remote control.

### **8.2.3 Test Procedure**

#### **8.2.3.1 Preliminary Measurement**

EUT is tested on all operating conditions.

The spectrum analyzer is set max-hold mode and swept during turntable was rotated 0 to 360 degree. Then spectrum chart are plotted out to detect the worst conditions in configuration, operating mode, or ambient noise notation.

#### **8.2.3.2 Final Measurement**

The EUT operated in the condition where maximum emission is detected in the preliminary test.

The turntable azimuth (EUT direction) and antenna height are adjusted the position so that maximum field strength is obtained for each frequency spectrum to be measured. The equipment and cables are arranged or manipulated within the range of the test standard in the above condition.

When the uncertain result was obtained, the measurement is retried by using the half wave dipole antenna instead of the broadband antenna.

**SECTION 9. TEST DATA****9.1 20dB Bandwidth [15.247(a)(1)(ii)]****9.1.1 Test mode****MEASUREMENT PROCEDURE:**

1. The EUT was set to operate with following conditions.
  - Single use
  - No hopping [ch 1(low), ch 40(mid) and ch 79(high)]
  - Single packet (single time slot) and multi-slot packets (Max. 5 time slots)
2. The Spectrum Analyzer was connected directly to the transmitter output.
3. The Spectrum Analyzer was setup using RBW = 30kHz, VBW = 30kHz, span = 3.0MHz and seep time = Auto.
4. Following data is the worst case.
5. As for the chart of the observed RF profiles, refer to Annex A.

Test date : May 29, 2001  
 Temperature : 20 °C  
 Humidity : 52 %

**[Modulated-carrier] – Multi-slot Packets (5 time slots)**

ch	Frequency (MHz)	20dB Bandwidth (MHz)	15.247(a)(1) Maximum (MHz)	Chart
1	2402.0	0.965	1	Annex A Page 2
40	2441.0	0.970	1	Annex A Page 2
79	2480.0	0.975	1	Annex A Page 3

### 9.1.2 Inquiry mode and Page mode

#### MEASUREMENT PROCEDURE:

1. The EUT was set to operate with following conditions.
  - Single use
  - No hopping [ch 40(mid)]
2. The Spectrum Analyzer was connected directly to the transmitter output.
3. The Spectrum Analyzer was setup using RBW = 30kHz, VBW = 30kHz, span = 3.0MHz and seep time = Auto.
4. As for the chart of the observed RF profiles, refer to Annex A.

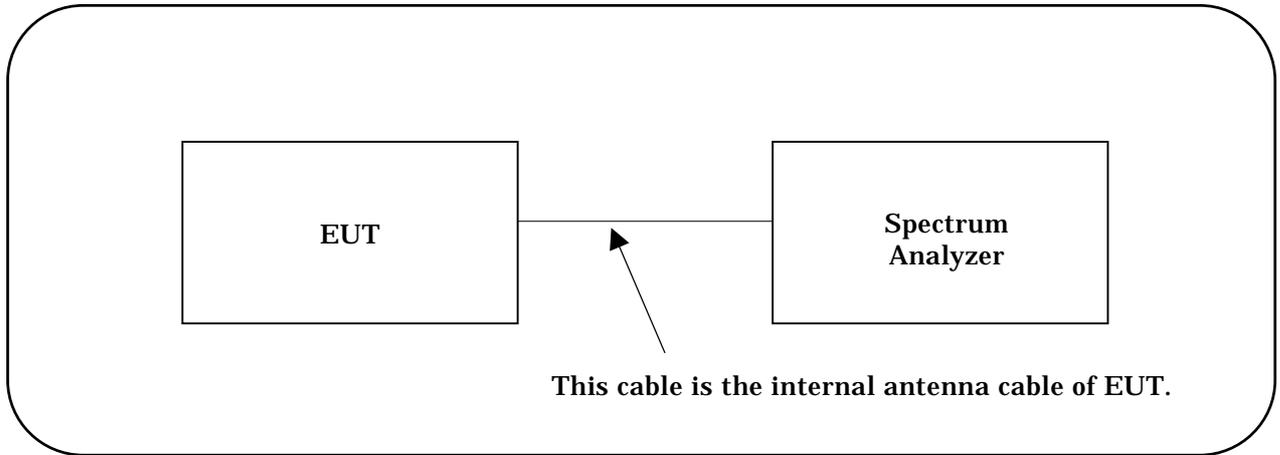
Test date : July 6, 2001  
 Temperature : 26 °C  
 Humidity : 64 %

#### [Inquiry mode]

ch	Frequency (MHz)	20dB Bandwidth (MHz)	15.247(a)(1) Maximum (MHz)	Chart
40	2441.0	0.840	1	Annex A Page 4

#### [Page mode]

ch	Frequency (MHz)	20dB Bandwidth (MHz)	15.247(a)(1) Maximum (MHz)	Chart
40	2441.0	0.730	1	Annex A Page 4

**TEST INSTRUMENTS CONFIGURATION****TEST INSTRUMENTS**

<b>Instrument</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Manufacturer</b>	<b>Last cal. date</b>	<b>Period</b>
Spectrum Analyzer	8564E	3643A00665	HEWLETT PACKARD	Jun. 14, 00	1 Year
	8563E	3821A09565	HEWLETT PACKARD	Oct. 18, 00	1 Year

## 9.2 Carrier Frequency Separation [15.247(a)(1)]

### 9.2.1 Test mode

#### MEASUREMENT PROCEDURE:

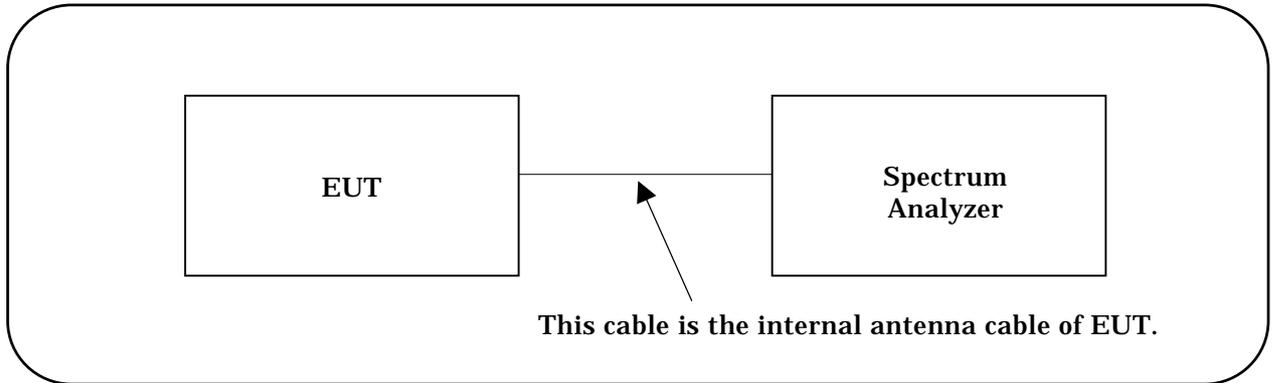
1. The EUT was set to operate with following conditions.
  - Single use
  - Hopping
  - Single packet (single time slot) and multi-slot packets (Max. 5 time slots)
2. The Spectrum Analyzer was connected directly to the transmitter output.
3. The Spectrum Analyzer was setup using RBW = 100kHz, VBW = 300kHz, span = 5MHz and sweep time = Auto.
4. The measurements were carried out between each of 5 hopping channels in the middle of the authorized band.
5. The next page shows the chart of the observed RF profiles.

Test date : May 29, 2001  
Temperature : 20 °C  
Humidity : 52 %

#### [Modulated-carrier] – Multi-slot Packets (5 time slots)

Channel Separation (MHz)	FCC Limit
1.000	> 20 dB Bandwidth

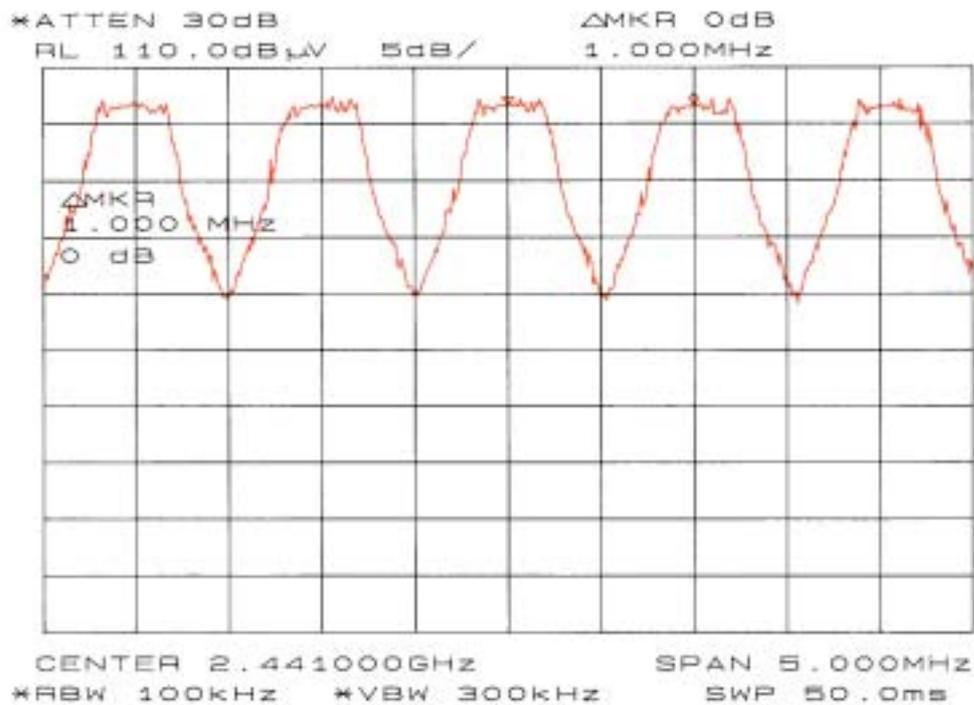
**TEST INSTRUMENTS CONFIGURATION**



**TEST INSTRUMENTS**

Instrument	Model No.	Serial No.	Manufacturer	Last cal. date	Period
Spectrum Analyzer	8564E	3643A00665	HEWLETT PACKARD	June 14, 00	1 Year

**Chart of Carrier Frequency Separation in ch 40**



### 9.3 Number of Hopping Frequencies [15.247(a)(1)(ii)]

#### 9.3.1 Test mode

##### MEASUREMENT PROCEDURE:

1. The EUT was set to operate with following conditions.
  - Single use
  - Hopping
  - Single packet (single time slot) and multi-slot packets (Max. 5 time slots)
2. The Spectrum Analyzer was connected directly to the transmitter output.
3. The Spectrum Analyzer was setup using RBW = 1.0MHz, VBW = 1.0MHz and sweep time = Auto.
4. The next page shows the chart of the observed RF profiles.

Test date : May 29, 2001  
Temperature : 20 °C  
Humidity : 52 %

#### [Modulated-carrier] – Multi-slot Packets (5 time slots)

Number of channels	FCC Limit
79	$\geq 75$

### 9.3.2 Inquiry mode and Page mode

#### MEASUREMENT PROCEDURE:

1. The EUT was set to operate with following conditions.
  - Single use
  - Hopping
2. The Spectrum Analyzer was connected directly to the transmitter output.
3. The Spectrum Analyzer was setup using RBW = 1.0MHz, VBW = 1.0MHz and sweep time = Auto.
4. The next page shows the chart of the observed RF profiles.

Test date : July 6, 2001  
 Temperature : 26 °C  
 Humidity : 64 %

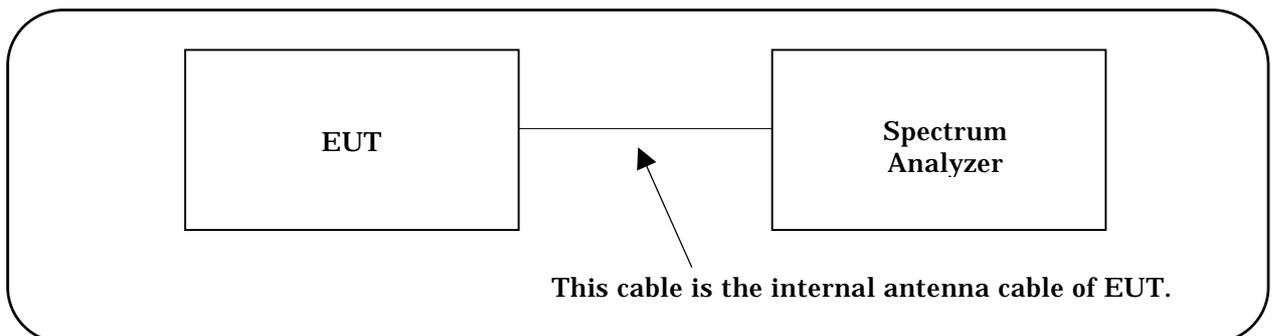
#### [Inquiry mode]

Number of channels	32
--------------------	----

#### [Page mode]

Number of channels	32
--------------------	----

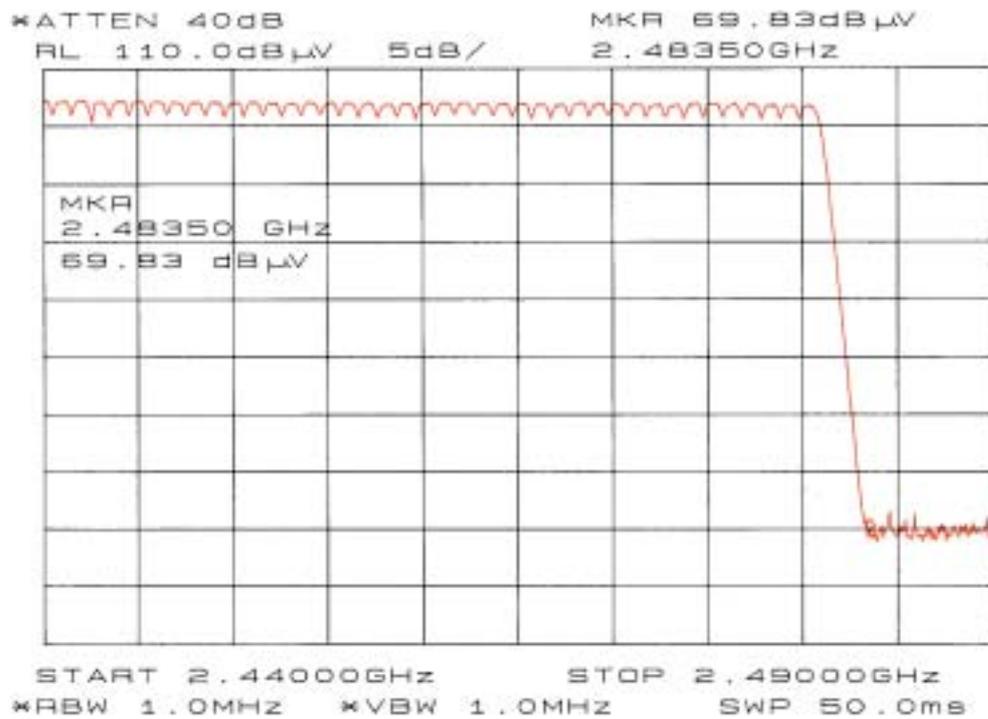
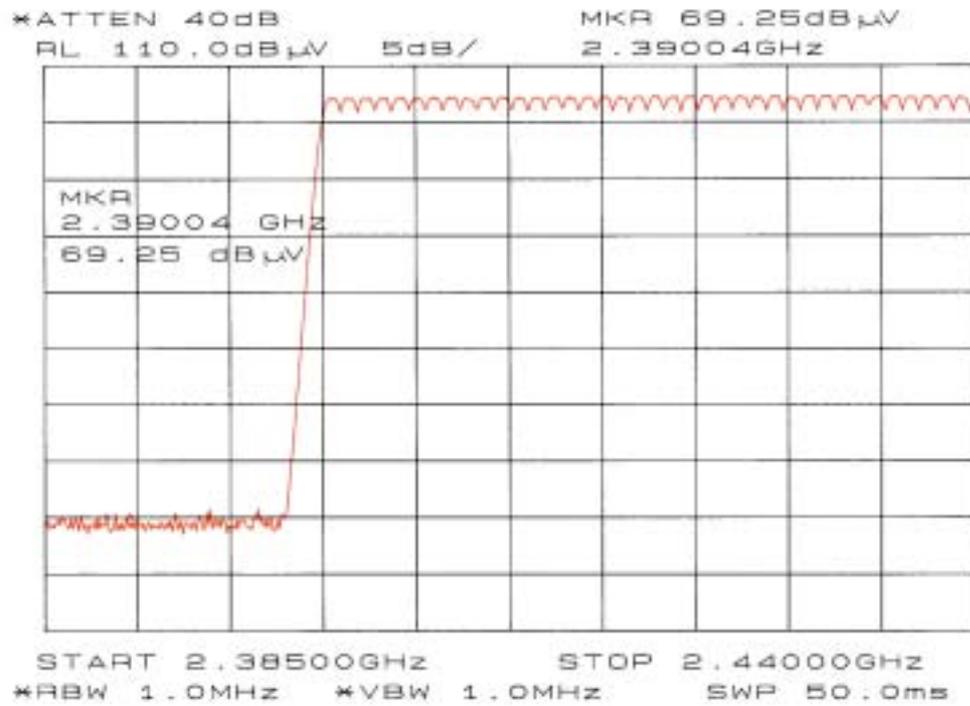
#### TEST INSTRUMENTS CONFIGURATION



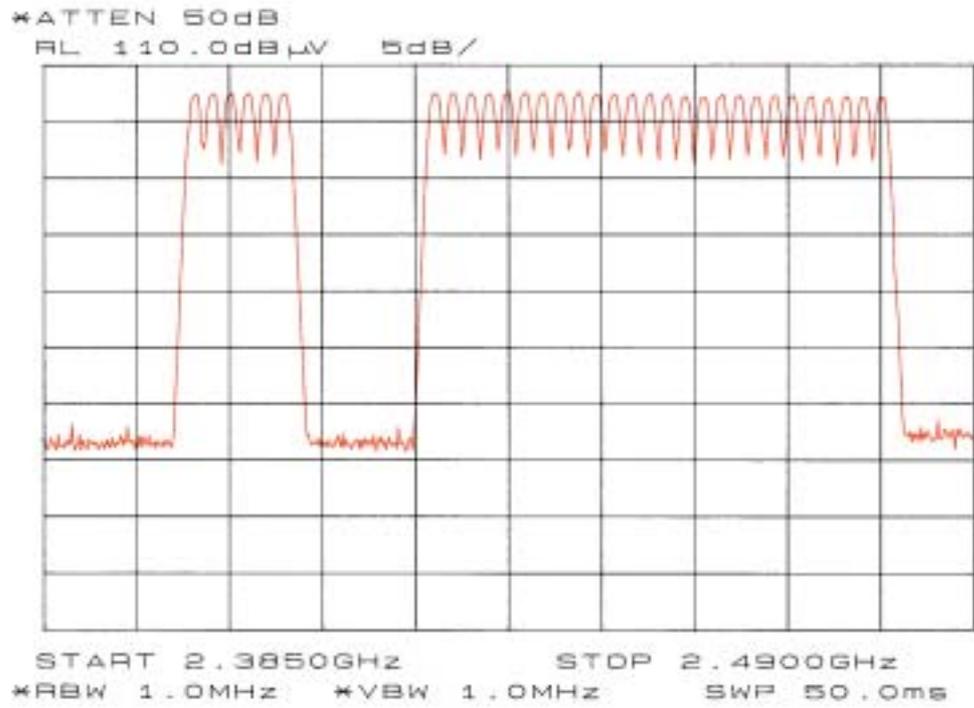
#### TEST INSTRUMENTS

Instrument	Model No.	Serial No.	Manufacturer	Last cal. date	Period
Spectrum Analyzer	8564E	3643A00665	HEWLETT PACKARD	June 14, 00	1 Year
	8563E	3821A09565	HEWLETT PACKARD	Oct. 18, 00	1 Year

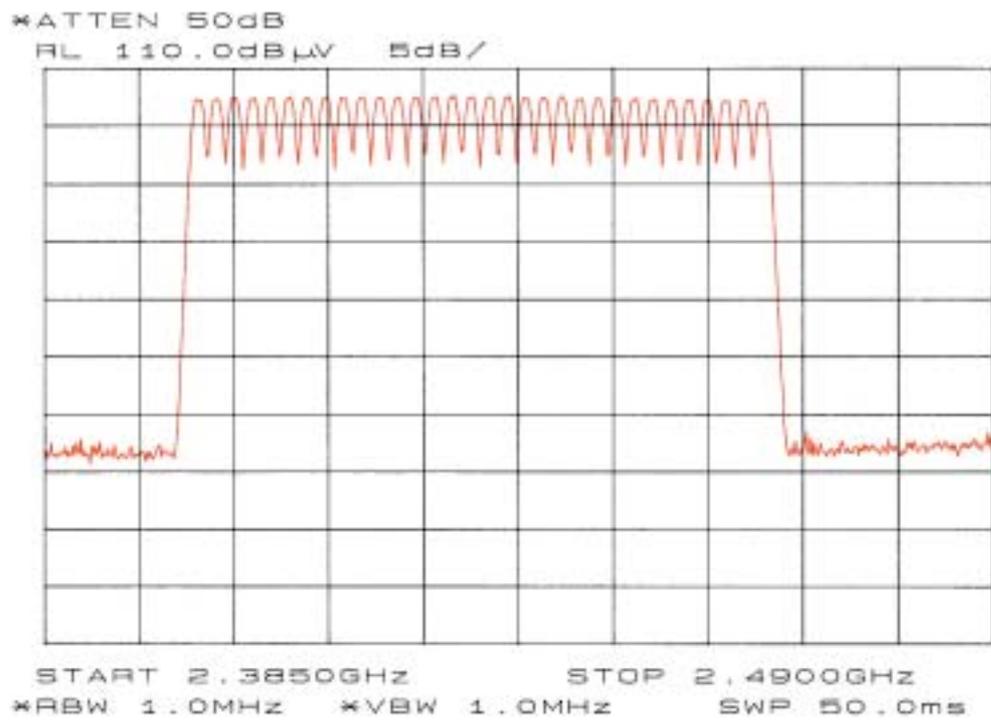
**Chart of Test mode – Multi-slot Packets (5 time slots)**



**Chart of Inquiry mode**



**Chart of Page mode**



**9.4 Time of Occupancy (Dwell Time) [15.247(a)(1)(ii)]****9.4.1 Test mode****MEASUREMENT PROCEDURE:**

1. The EUT was set to operate with following conditions.
  - Single use
  - Hopping
  - Single packet (single time slot) and multi-slot packets (Max. 5 time slots)
2. The Spectrum Analyzer was setup using RBW = 100kHz, VBW = 30kHz, sweep time = 30 sec. and span = zero span.
3. The average dwell time per hopping channel was measured at ch 40.
4. Following data is the worst case.
5. As for the chart of the observed RF profiles, refer to Annex H.

Test date : May 31, 2001  
 Temperature : 19 °  
 Humidity : 68 %

**[Multi-slot packets (5 time slots)]**

<b>SWEEP #</b>	<b># of Transmissions on a Single Channel in a 30 second period</b>
1	96
2	81
3	87
4	93
5	86
<b>Average</b>	<b>88.6</b>

$$2.93\text{mS} \times 88.6 = 259.60\text{mS}$$

<b>Average time of occupancy during a 30 second period</b>	<b>15.247(a)(1)(ii) Limit</b>
259.60mS	< 400mS

#### 9.4.2 Inquiry mode and Page mode

##### MEASUREMENT PROCEDURE:

1. The EUT was set to operate with following conditions.
  - Single use
  - Hopping
2. The Spectrum Analyzer was setup using RBW = 100kHz, VBW = 30kHz, sweep time = 1 sec. and span = zero span.
3. The average dwell time per hopping channel was measured at ch 40.
4. Following data is the worst case.
5. As for the chart of the observed RF profiles, refer to Annex H.

Test date : July 9, 2001  
 Temperature : 25 °  
 Humidity : 58 %

##### [Inquiry mode]

<b>SWEEP #</b>	<b># of Transmissions on a Single Channel in a 1 second period</b>
1	100
2	100
3	100
4	100
5	100
Average	100

$$0.123\text{mS} \times 100 \times 30 = 369\text{mS}$$

<b>Average time of occupancy during a 30 second period</b>	<b>15.247(a)(1)(ii) Limit</b>
369mS	< 400mS

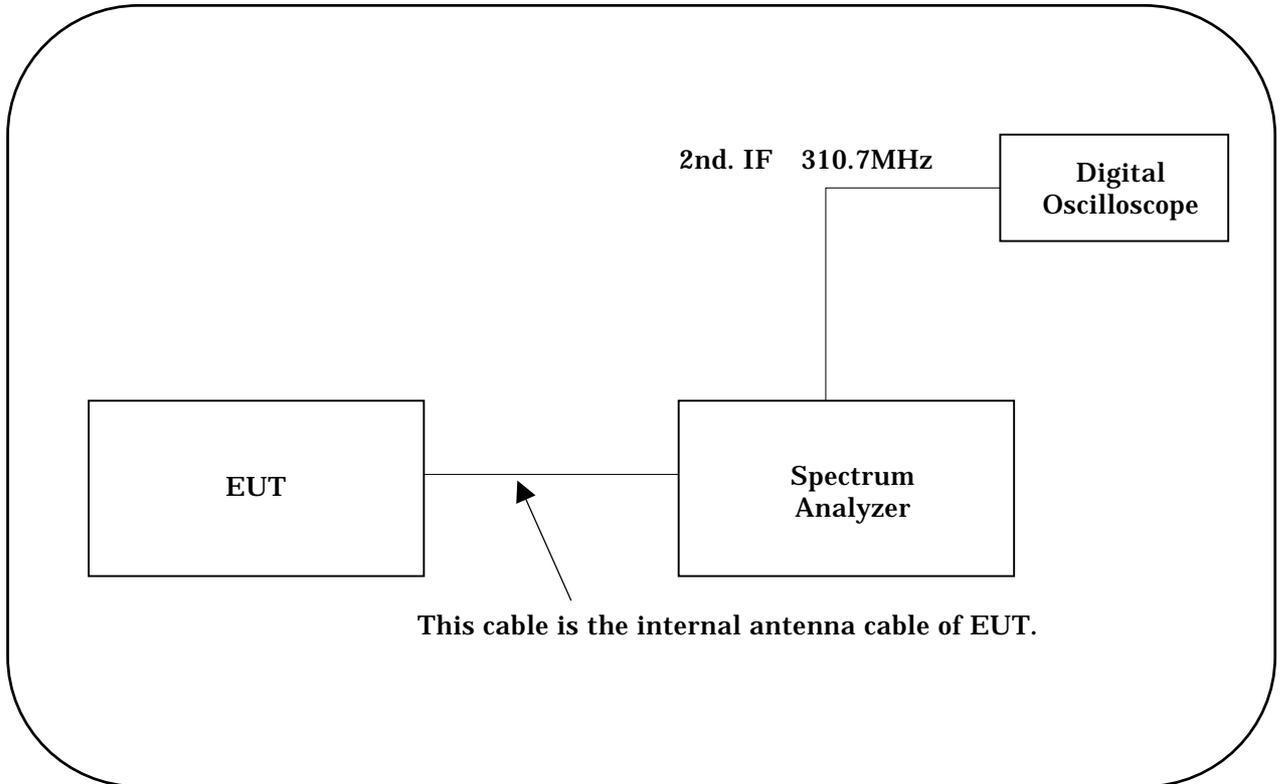
[Page mode]

<b>SWEEP #</b>	<b># of Transmissions on a Single Channel in a 1 second period</b>
1	57
2	57
3	57
4	58
5	57
<b>Average</b>	<b>57.2</b>

$$0.123\text{mS} \times 57.2 \times 30 = 211.07\text{mS}$$

<b>Average time of occupancy during a 30 second period</b>	<b>15.247(a)(1)(ii) Limit</b>
211.07mS	< 400mS

## TEST INSTRUMENTS CONFIGURATION



## TEST INSTRUMENTS

Instrument	Model No.	Serial No.	Manufacturer	Last cal. date	Period
Spectrum Analyzer	8564E	3643A00665	HEWLETT PACKARD	June 14, 00	1 Year
	8563E	3821A09565	HEWLETT PACKARD	Oct. 18, 00	1 Year
Digital Oscilloscope	TDS680B	B010205	Tektronix	May 11, 01	1 Year

## 9.5 Maximum Peak Output Power – RF Antenna Conducted [15.247(b)(1)]

### 9.5.1 Test mode

#### MEASUREMENT PROCEDURE:

- The EUT was set to operate with following conditions.
  - Single use
  - No hopping [ch 1(low), ch 40(mid) and ch 79(high)]
  - Single packet (single time slot) and multi-slot packets (Max. 5 time slots)
- 20dB bandwidth of the EUT was Max. 0.975MHz.
- The Spectrum Analyzer was setup using RBW = 2MHz, VBW = 3MHz, sweep time = Auto and span = 10MHz.
- Following data is the worst case.
- As for the chart of the observed RF profiles, refer to Annex B.

Test date : May 30, 2001  
 Temperature : 18 °C  
 Humidity : 58 %

#### [Modulated-carrier] – Multi-slot Packets (5 time slots)

ch	Freq. (MHz)	Reading		Antenna gain (dBi)	Emission Level (dBm)	Peak Output Power (mW)	15.247(b) Limit (mW)	Chart
		dBuV	dBm					
1	2402.0	107.00	0.00	-4.4	-4.40	0.36	1000	Annex B page 2
40	2441.0	107.17	0.17	-4.4	-4.23	0.38	1000	Annex B page 2
79	2480.0	106.83	-0.17	-4.4	-4.57	0.35	1000	Annex B page 3

#### :Note

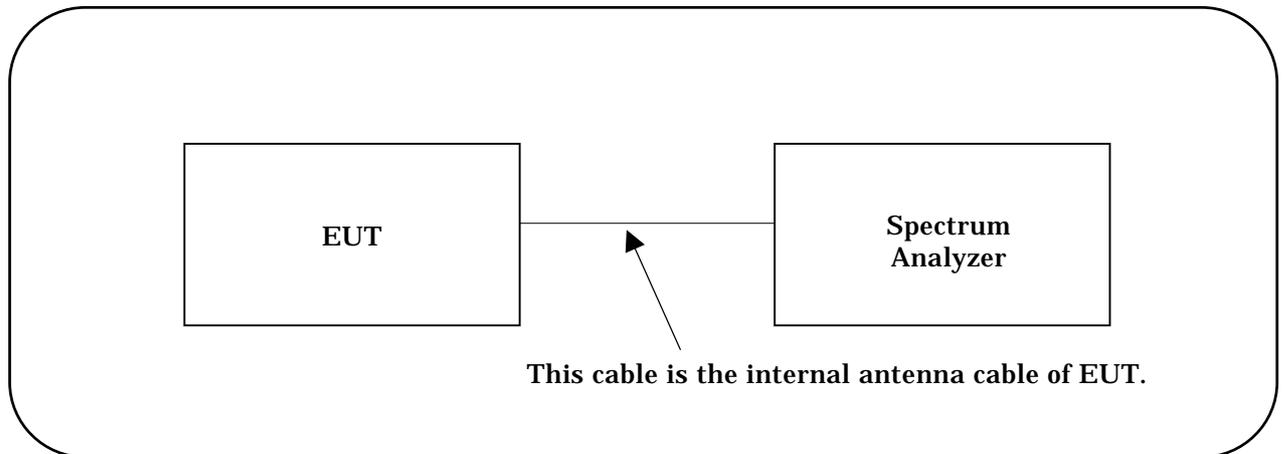
- Antenna gain of EUT : Maximum -4.4dBi
- Reading(dBm) = Reading(dBuV) - 107
- Emission Level(dBm) = Reading(dBm) + Antenna gain(dBi)

#### Example :

The Max RF Antenna Conducted Emission Level of ch 40 = -4.23 dBm

$$10\log P = -4.23 \text{ dBm}$$

$$P = 10^{(-4.23/10)} = 0.38 \text{ mW}$$

**TEST INSTRUMENTS CONFIGURATION****TEST INSTRUMENTS**

<b>Instrument</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Manufacturer</b>	<b>Last cal. date</b>	<b>Period</b>
Spectrum Analyzer	8564E	3643A00665	HEWLETT PACKARD	June 14, 00	1 Year

## 9.6 Maximum Peak Output Power – Radiated [15.247(b)(1)]

### 9.6.1 Test mode

#### MEASUREMENT PROCEDURE:

- The EUT was set to operate with following conditions.
  - Single use
  - No hopping [ch 1(low), ch 40(mid) and ch 79(high)]
  - Single packet (single time slot) and multi-slot packets (Max. 5 time slots)
- 20dB bandwidth of the EUT was Max. 0.975MHz.
- Measurement distance was 1 meter.
- The Spectrum Analyzer was setup using RBW = 2MHz, VBW = 3MHz, sweep time = Auto and span = 10MHz.
- Following data is the worst case.
- As for the chart of the observed RF profiles, refer to Annex C.

Test date : May 10, 2001  
 Temperature : 19 °C  
 Humidity : 64 %

#### [Modulated-carrier] – Multi-slot Packets (5 time slots)

Ch	Freq. (MHz)	Reading (dBuV/m)	Polarization (H/V)	Factor (dB)	Emission Level (dBuV/m)	Peak Output Power (mW)	15.247(b) Limit (mW)	Chart
1	2402.0	59.42	H	37.3	96.72	0.16	1000	Annex C page 2
40	2441.0	60.75	H	37.5	98.25	0.22	1000	Annex C page 2
79	2480.0	63.75	H	37.6	101.35	0.45	1000	Annex C page 3

#### Note :

- Emission Level = Reading + Factor (Antenna, Antenna Pad, Cable)

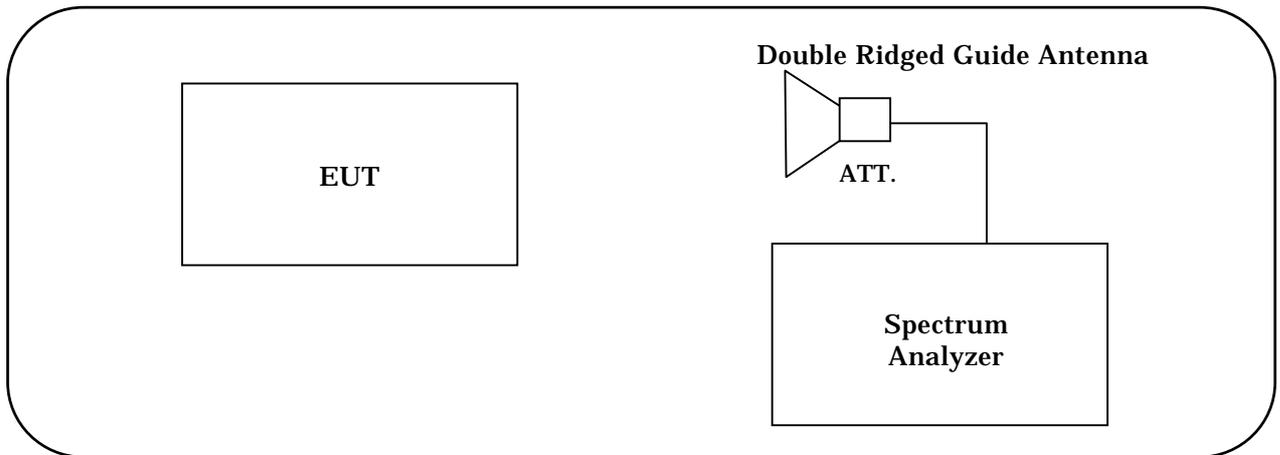
- Peak Output Power :  $P = (E * d)^2 / 30G$

where P is the power, in Watts  
 E is the measured peak field strength, in Volts/meter  
 d is the distance at which the measurement was made, in meters  
 G is the numeric gain of the radiating element

Example: The Max Radiated Emission of ch 79 (Hor.) = 101.35 dBuV/m

$$E = 10^{(101.35/20)} \times 10^{-6} = 0.1168 \text{ V}$$

$$P = (0.1168 \times 1)^2 / 30 \times 1 = 0.00045 \text{ W} = 0.45 \text{ mW}$$

**TEST INSTRUMENTS CONFIGURATION****TEST INSTRUMENTS**

<b>Instrument</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Manufacturer</b>	<b>Last cal. date</b>	<b>Period</b>
Spectrum Analyzer	8564E	3643A00665	HEWLETT PACKARD	June 14, 00	1 Year
3dB Attenuator	6803.17B	None	SUHNER	Jan. 5, 01	1 Year
Double Ridged Guide Antenna	3115	5044	EMCO	Jun. 14, 00	1 Year

## 9.7 Band Edge Compliance of RF Conducted Emissions [15.247(c)]

### 9.7.1 Test mode

#### MEASUREMENT PROCEDURE:

- The EUT was set to operate with following conditions.
  - Single use
  - Hopping and no hopping [ch 1(low) and ch 79(high)]
  - Single packet (single time slot) and multi-slot packets (Max. 5 time slots)
- The Spectrum Analyzer was setup using RBW = 100kHz, VBW = 100kHz, sweep time = Auto and span = 10MHz.
- Following data is the worst case.
- As for the chart of the observed RF profiles, refer to Annex D.

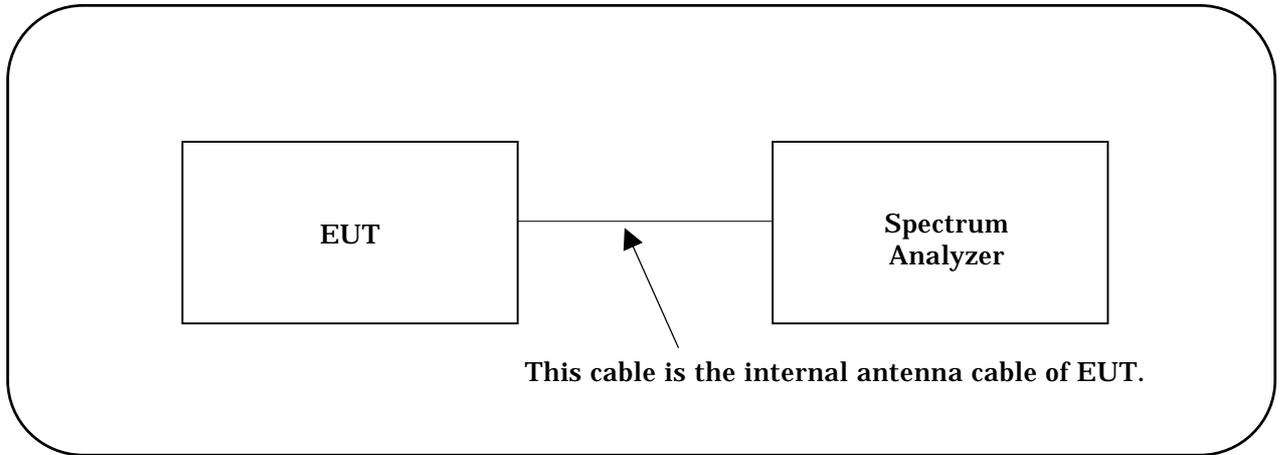
Test date : May 29, 2001  
 Temperature : 20 °C  
 Humidity : 52 %

#### [Hopping with modulated-carrier] – Multi-slot Packets (5 time slots)

ch	Frequency (MHz)	Band Edge frequency (MHz)	Difference of level	15.247(c) Limit (dB)	Chart
1	2402.0	2401.12	35.17	20	Annex D Page 2
79	2480.0	2481.10	35.00	20	Annex D Page 2

#### [No hopping with modulated-carrier] – Multi-slot Packets (5 time slots)

ch	Frequency (MHz)	Band Edge frequency (MHz)	Difference of level	15.247(c) Limit (dB)	Chart
1	2402.0	2401.17	34.00	20	Annex D Page 3
79	2480.0	2481.08	35.16	20	Annex D Page 3

**TEST INSTRUMENTS CONFIGURATION****TEST INSTRUMENTS**

<b>Instrument</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Manufacturer</b>	<b>Last cal. date</b>	<b>Period</b>
Spectrum Analyzer	8564E	3643A00665	HEWLETT PACKARD	June 14, 00	1 Year

## 9.8 Spurious Emissions – RF Antenna Conducted Test [15.247(c)]

### 9.8.1 Test mode

#### MEASUREMENT PROCEDURE:

- The EUT was set to operate with following conditions.
  - Single use
  - Hopping and no hopping [ch 1(low) , ch 40 (mid) and ch 79(high)]
  - Single packet (single time slot) and multi-slot packets (Max. 5 time slots)
- The Spectrum Analyzer was connected directly to the transmitter output.
- The Spectrum Analyzer was setup using RBW = 100kHz, VBW = 100kHz and sweep time = Auto.
- Following data is the worst case.
- As for the chart of the observed RF profiles, refer to Annex E and F.

Test date : May 30, 2001  
 Temperature : 18 °C  
 Humidity : 58 %

#### [Hopping with modulated-carrier] – Multi-slot Packets (5 time slots)

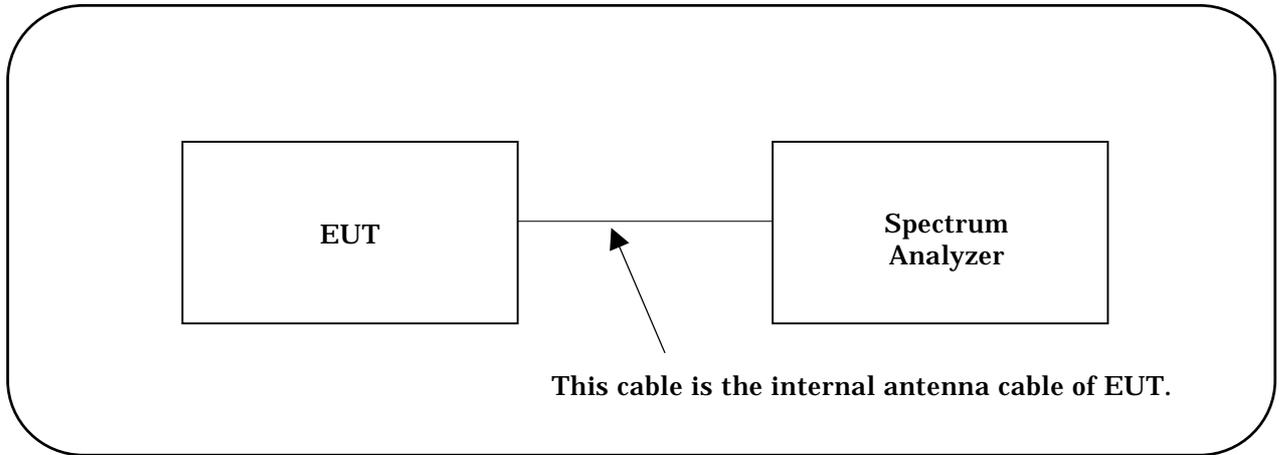
Frequency (MHz)	Chart
2402.0 – 2480.0	Annex E page 2-4

#### [No hopping with modulated-carrier] – Multi-slot Packets (5 time slots)

ch	Frequency (MHz)	Chart
1	2402.0	Annex F page 2-4
40	2441.0	Annex F page 4-7
79	2480.0	Annex F page 8-10

#### Note :

- All out-of-band conducted emissions were more than 20 dB below a carrier.

**TEST INSTRUMENTS CONFIGURATION****TEST INSTRUMENTS**

<b>Instrument</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Manufacturer</b>	<b>Last cal. date</b>	<b>Period</b>
Spectrum Analyzer	8564E	3643A00665	HEWLETT PACKARD	June 14, 00	1 Year

**9.9 Spurious Emissions – Radiated Emission Test [15.247(c), 15.205, 15.209]****9.9.1 Test mode****MEASUREMENT PROCEDURE:**

1. The EUT was set to operate with following conditions.

- System use
- No hopping [ch 1(low), ch 40(mid) and ch 79(high)]
- Single packet (single time slot) and multi-slot packets (Max. 5 time slots)

2. The Spectrum Analyzer was setup using

Peak mode: RBW = 1MHz, VBW = 1MHz

Average mode: RBW = 1MHz, VBW = 10Hz

3. Measurement distance was 1 meter.

4. Following data is the worst case.

Test date : May 10, 2001  
 Temperature : 19 °C  
 Humidity : 64 %

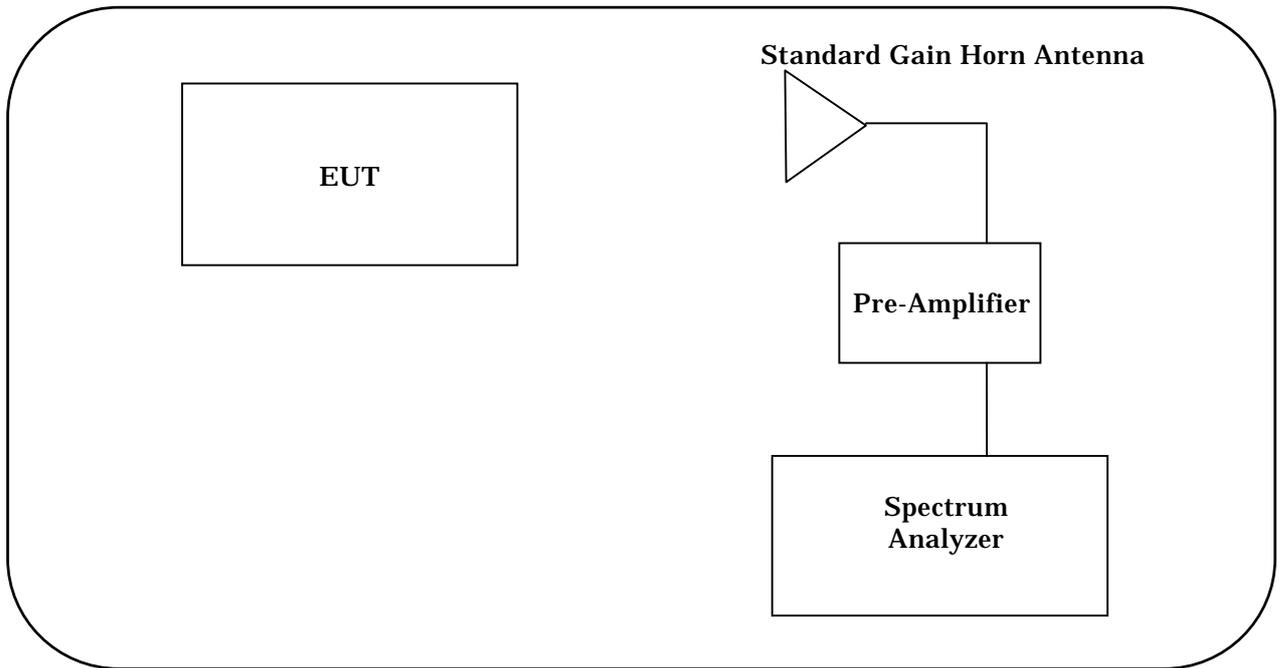
**[Modulated-carrier] – Multi-slot Packets (5 time slots)**

ch	Freq. (MHz)	Reading (dBuV/m)		Polarization (H/V)	Factor (dB)	Emission Level (dBuV/m)		15.247(c) Limit (dBuV/m)		Margin (dB)	
		Peak	Avg.			Peak	Avg.	Peak	Avg.	Peak	Avg.
1	3603.0	42.7	31.9	H	-9.5	33.2	22.4	74	54	40.8	31.6
	3603.0	44.4	35.0	V	-9.5	34.9	25.5	74	54	39.1	28.5
	4804.0	45.1	36.7	H	-4.3	40.8	32.4	74	54	33.2	21.6
	4804.0	47.5	39.7	V	-4.3	43.2	35.4	74	54	30.8	18.6
	7206.0	41.1	29.6	H	2.2	43.3	31.8	74	54	30.7	22.2
	7206.0	41.3	29.6	V	2.2	43.5	31.8	74	54	30.5	22.2
	9608.0	41.0	29.2	H	8.1	49.1	37.3	74	54	24.9	16.7
	9608.0	41.0	29.3	V	8.1	49.1	37.4	74	54	24.9	16.6
40	3661.0	43.4	31.9	V	-9.0	34.4	22.9	74	54	39.6	31.1
	4882.0	46.1	37.5	V	-4.1	42.0	33.4	74	54	32.0	20.6
	7323.0	41.0	29.5	V	2.4	43.4	31.9	74	54	30.6	22.1
	9764.0	39.8	28.5	V	8.0	47.8	36.5	74	54	26.2	17.5
79	3720.0	42.1	30.4	V	-8.5	33.6	21.9	74	54	40.4	32.1
	4960.0	44.6	36.2	V	-3.9	40.7	32.3	74	54	33.3	21.7
	7440.0	41.0	29.4	V	2.5	43.5	31.9	74	54	30.5	22.1
	9920.0	39.6	27.9	V	7.9	47.5	35.8	74	54	26.5	18.2

**Note:**

1. Emission Level = Reading + Factor (Antenna, Cable, Pre-Amp., Distance)
2. Other frequencies : Below the 15.247(c) limit
3. All 100kHz bandwidth out-of-band radiated emissions were more than 20 dB below a carrier.

## TEST INSTRUMENTS CONFIGURATION



## TEST INSTRUMENTS

Instrument	Model No.	Serial No.	Manufacturer	Last cal. date	Period
Spectrum Analyzer	8564E	3643A00665	HEWLETT PACKARD	Jun. 14, 00	1 Year
Pre-Amplifier	83051A	3332A00329	HEWLETT PACKARD	Jan. 5, 01	1 Year
Standard Gain Horn Antenna	3160-04	9702-1032	EMCO	Feb. 24, 99	3 Year
	3160-05	9701-1038	EMCO	Feb. 24, 99	3 Year
	3160-06	9612-1030	EMCO	Feb. 24, 99	3 Year
	3160-07	9703-1069	EMCO	Feb. 24, 99	3 Year
	3160-08	9703-1057	EMCO	Feb. 24, 99	3 Year
	3160-09	9703-1074	EMCO	Feb. 24, 99	3 Year

**9.10 Restricted Bands of Operation [15.247(c),15.205,15.209]****9.10.1 Test mode****MEASUREMENT PROCEDURE:**

1. The EUT was set to operate with following conditions.
  - Single use
  - Hopping
  - Single packet (single time slot) and multi-slot packets (Max. 5 time slots)
2. The Spectrum Analyzer was setup using
  - Peak mode: RBW = 1MHz, VBW = 1MHz
  - Average mode: RBW = 1MHz, VBW = 10Hz
3. Measurement distance was 1 meter.
4. Following data is the worst case.
5. As for the chart of the observed RF profiles, refer to Annex G.

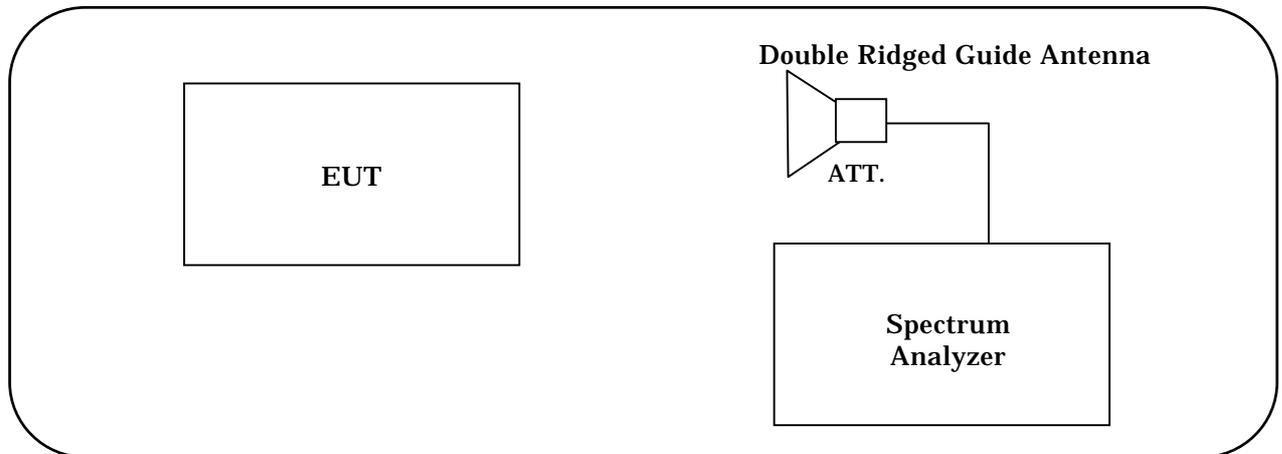
Test date : May 10, 2001  
 Temperature : 19 °C  
 Humidity : 64 %

**[Modulated-carrier] – Multi-slot Packets (5 time slots)**

Freq. (MHz)	Reading (dBuV/m)		Polarization (H/V)	Factor (dB/m)	Emission Level (dBuV/m)		15.247(c) Limit (dBuV/m)		Margin (dB)		Chart
	Peak	Avg.			Peak	Avg.	Peak	Avg.	Peak	Avg.	
2390.0	38.9	19.2	H	27.8	66.7	47.0	74.0	54.0	7.3	7.0	Annex G page 2
2390.0	38.9	19.2	V	27.8	66.7	47.0	74.0	54.0	7.3	7.0	Annex G page 2
2483.5	39.7	19.4	H	28.1	67.8	47.5	74.0	54.0	6.2	6.5	Annex G page 3
2483.5	40.0	19.5	V	28.1	68.1	47.6	74.0	54.0	5.9	6.4	Annex G page 3

Note :

1. Emission Level = Reading + Factor (Antenna, Antenna Pad, Cable, Distance)

**TEST INSTRUMENTS CONFIGURATION****TEST INSTRUMENTS**

<b>Instrument</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Manufacturer</b>	<b>Last cal. date</b>	<b>Period</b>
Spectrum Analyzer	8564E	3643A00665	HEWLETT PACKARD	Jun. 14, 00	1 Year
3dB Attenuator	6803.17B	None	SUHNER	Jan. 5, 01	1 Year
Double Ridged Guide Antenna	3115	5044	EMCO	Jun. 14, 00	1 Year

**9.11 Power Spectral Density [15.247(f), 15.247(d)]****9.11.1 Inquiry mode and Page mode****MEASUREMENT PROCEDURE:**

1. The EUT was set to operate with following conditions.
  - Single use
  - No hopping [ch 40 (mid)]
2. The Spectrum Analyzer was connected directly to the transmitter output.
3. The Spectrum Analyzer was setup using RBW = 3kHz, VBW = 10kHz, span = 300kHz and sweep = 100sec.(span/3kHz).
4. The next page shows the chart of the observed RF profiles.
5. Following data is the worst case.

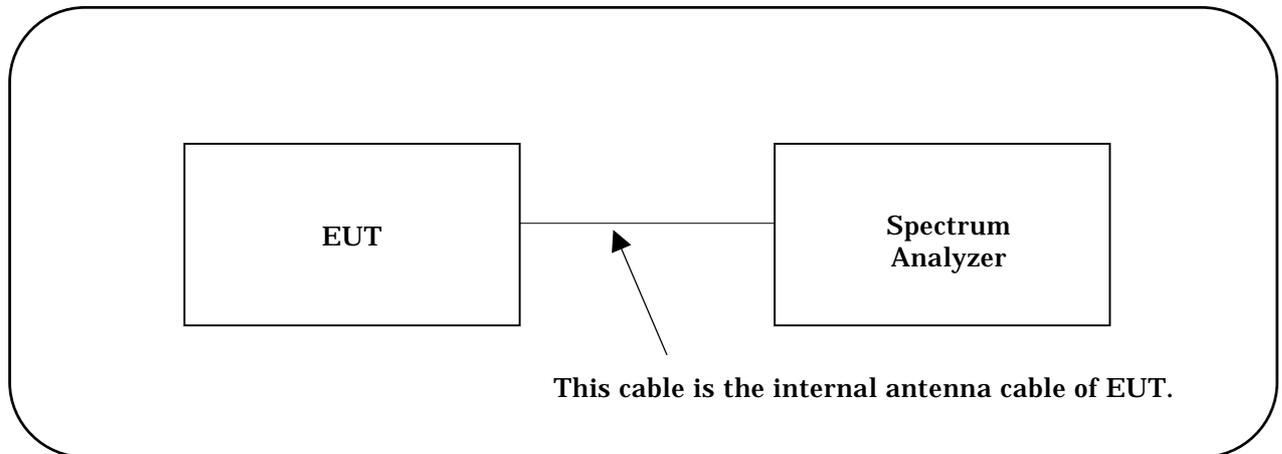
Test date : July 6, 2001  
 Temperature : 26 °C  
 Humidity : 64 %

**[Inquiry mode]**

ch	Frequency (MHz)	Reading (dBm)	Power Spectral Density (dBm)	15.247(d) Limit (dBm)	Chart
40	2441	-11.00	-11.00	8	Page 46

**[Page mode]**

ch	Frequency (MHz)	Reading (dBm)	Power Spectral Density (dBm)	15.247(d) Limit (dBm)	Chart
40	2441	-11.17	-11.17	8	Page 46

**TEST INSTRUMENTS CONFIGURATION****TEST INSTRUMENTS**

<b>Instrument</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Manufacturer</b>	<b>Last cal. date</b>	<b>Period</b>
Spectrum Analyzer	8563E	3821A09565	HEWLETT PACKARD	Oct. 18, 00	1 Year

**Chart of Inquiry mode**



**Chart of Page mode**



**9.12 AC Conducted Emissions [15.207]****9.12.1 Test mode****MEASUREMENT PROCEDURE:**

1. The EUT was set to operate with following conditions.
  - System use
  - Hopping
  - Single packet (single time slot) and multi-slot packets (Max. 5 time slots)
2. The Test Receiver is complied with the specification of the CISPR publication 16.
3. Following data is the worst case.

Test date : May 29, 2001  
 Temperature : 20 °C  
 Humidity : 52 %

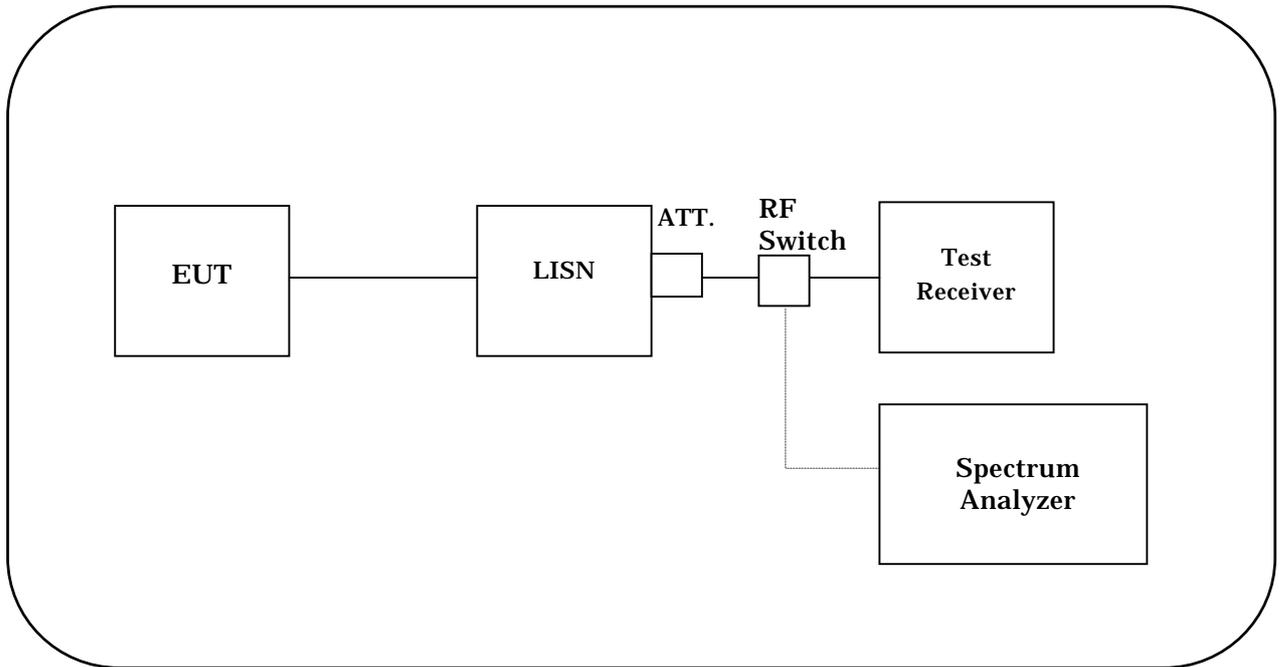
**[Modulated-carrier] – Multi-slot Packets (5 time slots)**

Frequency (MHz)	Reading (dBuV/m)		Factor (dB)		Emission Level (dBuV/m)		15.207 Limit (dBuV/m)	Margin (dB)	
	Line 1	Line 2	Line 1	Line 2	Line 1	Line 2		Line 1	Line 2
0.6334	23.8	22.7	6.4	6.4	30.2	29.1	48.0	17.8	18.9
1.5240	24.3	21.2	6.5	6.5	30.8	27.7	48.0	17.2	20.3
1.8922	17.9	17.5	6.5	6.5	24.4	24.0	48.0	23.6	24.0
2.6494	19.5	19.3	6.6	6.6	26.1	25.9	48.0	21.9	22.1
5.4627	24.9	22.7	6.6	6.6	31.5	29.3	48.0	16.5	18.7
7.4954	25.0	25.4	6.6	6.6	31.6	32.0	48.0	16.4	16.0
9.0187	22.9	26.7	6.7	6.7	29.6	33.4	48.0	18.4	14.6
13.3395	29.9	31.4	6.8	6.9	36.7	38.3	48.0	11.3	9.7
21.0361	25.1	25.8	7.1	7.4	32.2	33.2	48.0	15.8	14.8
25.2446	21.7	22.9	7.1	7.6	28.8	30.5	48.0	19.2	17.5

**Note:**

1. Emission Level = Reading + Factor (LISN, Pad, Cable)
2. Other frequencies: Below the 15.207 limit

## TEST INSTRUMENTS CONFIGURATION



## TEST INSTRUMENTS

Instrument	Model No.	Serial No.	Manufacturer	Last cal. date	Period
Test receiver	ESS	847151/012	ROHDE & SCHWARZ	Feb. 06, 01	1 Year
LISN (EUT)	ESH2-Z5	881492/014	ROHDE & SCHWARZ	Oct. 17, 00	1 Year
6dB Attenuator	CFA-01	None	TME	Oct. 12, 00	1 Year
LISN (Peripheral)	KNW-242	8-851-21	KYORITSU	Feb. 20, 01	1 Year
50Ω Termination	CT-01	A010CON50	TME	Feb. 20, 01	1 Year
RF Switch	ACX-150	None	AKZO NOBEL	Oct. 12, 00	1 Year

### 9.13 Variation of Input Power [15.31(e)]

#### 9.13.1 Test mode

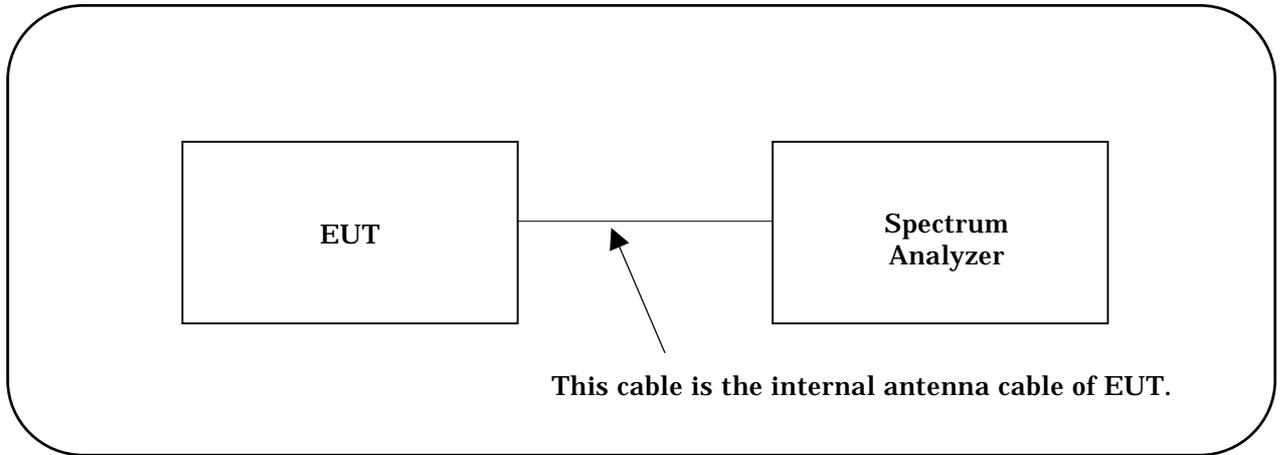
##### MEASUREMENT PROCEDURE:

- The EUT was set to operate with following conditions.
  - Single use
  - No hopping [ch 1(low), ch 40(mid) and ch 79(high)]
  - Single packet (single time slot) and multi-slot packets (Max. 5 time slots)
- The measurements were carried out with the supply voltage varied between 85% and 115% of the nominal rated supply voltage.
- The Spectrum Analyzer was connected directly to the transmitter output.
- The Spectrum Analyzer was setup using RBW = 2MHz, VBW = 3MHz.
- Following data is the worst case.

Test date : May 31, 2001  
 Temperature : 19 °C  
 Humidity : 68 %

#### [Modulated-carrier] – Multi-slot Packets (5 time slots)

ch	Percentage of Rated Supply	AC Voltage (Vac 60Hz)	Peak Level (dBm)	Deviation (dB)
1	85%	102	1.92	0.00
	100%	120	1.92	-
	115%	138	1.92	0.00
40	85%	102	2.00	0.08
	100%	120	1.92	-
	115%	138	2.00	0.08
79	85%	102	1.58	0.00
	100%	120	1.58	-
	115%	138	1.58	0.00

**TEST INSTRUMENTS CONFIGURATION****TEST INSTRUMENTS**

<b>Instrument</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Manufacturer</b>	<b>Last cal. date</b>	<b>Period</b>
Spectrum Analyzer	8564E	3643A00665	HEWLETT PACKARD	June 14, 00	1 Year

**SECTION 10. MEASUREMENT UNCERTAINTY**

The uncertainty of the measurements performed for this report lies:

20dB Bandwidth	[15.247(a)(1)(ii)]
Above 1 GHz .....	+/- 46.7kHz
Carrier Frequency Separation	[15.247(a)(1)]
Above 1 GHz .....	+/- 46.7kHz
Time of Occupancy (Dwell Time)	[15.247(a)(1)(ii)]
.....	+/- 0.2 %
Maximum Peak Output Power	[15.247(b)(1)]
- RF Antenna Conducted	
Above 1 GHz .....	+/- 2.9 dB
Maximum Peak Output Power	[15.247(b)(1)]
- Radiated	
Above 1 GHz .....	+/- 3.9 dB
Band Edge Compliance of RF	[15.247(c)]
Conducted Emission	
Above 1 GHz .....	+/- 2.9 dB
Spurious Emissions	[15.247(c)]
- RF Antenna Conducted Test	
Above 1 GHz .....	+/- 2.9 dB
Spurious Emissions	[15.247(c), 15.205, 15.209]
- Radiated Emission Test	
Above 1 GHz .....	+/- 3.9 dB
Power Spectral Density	[15.247(d)]
Above 1 GHz .....	+/- 2.9 dB
Restricted Bands of Operation	[15.247(c), 15.205, 15.209]
Above 1 GHz .....	+/- 3.9 dB
AC Conducted Emission	[15.207]
9 kHz – 30 MHz .....	+/- 1.8 dB
Radiated Emission from Digital Part	[15.109]
30 – 1000 MHz .....	+/- 3.6 dB
Variation of Input Power	[15.31(e)]
Above 1 GHz .....	+/- 2.9 dB

**Note on Radiated Emission measurement uncertainty**

The following items are not included in the calculations in spite of their own uncertainty components because it is impracticable to find the value.

It is our problem awaiting solution in future.

**(1) Repeatability of measurement**

It is not possible to calculate repeatability since the measurement was carried out only one time.

**(2) Antenna factor variation**

The definition of measured (radiated electric field strength) is not completed on the referred standard(s).

**(3) Loss of EUT radiation propagation**

It is certainly one of the uncertainty components, however is not able to calculate.

Please note that these uncertainties are not reflected to the compliance judgement of the test results in this report.

**SECTION 11. VALIDITY OF TEST REPORT**

- 11.1 The test result of this report is effective for equipment under test itself and under the test configuration described on the report.
- 11.2 This test report does not assure that whether the test result taken in other testing laboratory is compatible or reproducible to the test result on this report or not.
- 11.3 This test report shall not be reproduced except in full, without issuer's permission.

## SECTION 12. DESCRIPTION OF TEST LABORATORY

### 12.1 Outline of Akzo Nobel K.K. (formerly Akzo Kashima Limited), EMC Division

Akzo Nobel K.K., the country organization in Japan for Akzo Nobel NV, was established in 1968. The shares are owned by Akzo Nobel NV (100%). Akzo Nobel NV, headquartered in the Netherlands, is one of the world's leading companies in selected areas of chemicals, coatings, healthcare products and fibers with work force of approximately 70,000 people in over 50 countries.

In 1984, in order to respond to the growing testing demand, in particular, for FCC filing, Akzo Nobel K.K. started EMI testing business, installing the first open air test site in Kashima, Ibaraki prefecture. Further the business has been expanded by installing additional testing facilities not only in Ibaraki but also in other areas such as Shizuoka, Nagano, Kanagawa and Tochigi. As results, Akzo Nobel K.K. has now 16 open air test sites and 4 anechoic chambers for EMI/EMC testing. As the largest EMC testing laboratory in number of testing facilities and staffs, EMC Division has been organized separately in the company and independently operated in conformity with the requirements of ISO Guide 25 (EN 45000) for its competency as a testing laboratory.

Akzo Nobel K.K. EMC Division is the first foreign private laboratory accredited by NVLAP, National Voluntary Laboratory Accreditation Program-NIST, USA. The division has been certified, authorized and/or filed as a competent testing laboratory by various testing organizations/authorities as described below.

### 12.2 Filing, certification, authorization and accreditation list

<u>EMI/EMC testing</u>		<u>Telecommunications terminal testing</u>	
FCC	(USA)	FCC	(USA)
NVLAP	(USA)	NVLAP	(USA)
NEMKO	(Norway)	NATA	(Australia)
VCCI	(Japan)	IC	(Canada)
NMi	(The Netherlands)		
TÜV PRODUCT SERVICE	(Germany)		

Note 1 : The above lists, Filing, certification, authorization and accreditation, are under preparing for the change of the company name to Akzo Nobel K.K. from Akzo Kashima Limited.

Note 2 : NVLAP accreditation does not constitute any product endorsement by NVLAP or any agent of the U.S. Government.

# **Appendix**

## **Bluetooth Specification**

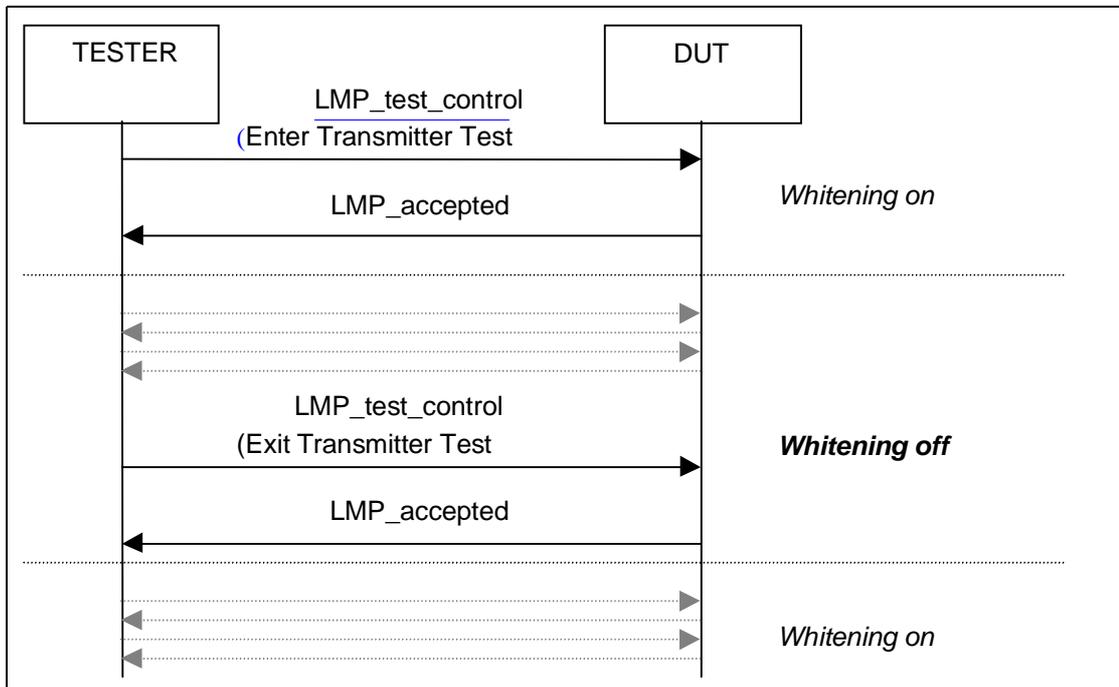


Figure 2.3: Use of whitening in Transmitter mode

### 2.1.2 Pseudorandom Sequence

In case of pseudorandom bit sequence, the same sequence of bits is used for each transmission (i.e. the packet is repeated, see above). A PRBS-9 Sequence<sup>2</sup> is used, see [2] and [3].

The properties of this sequence are as follows (see [3]). The sequence may be generated in a nine-stage shift register whose 5th and 9th stage outputs are added in a modulo-two addition stage (see Figure 2.4), and the result is fed back to the input of the first stage. The sequence begins with the first ONE of 9 consecutive ONEs; i.e. the shift register is initialized with nine ones.

- Number of shift register stages: 9
- Length of pseudo-random sequence:  $2^9 - 1 = 511$  bits
- Longest sequence of zeros: 8 (non-inverted signal)

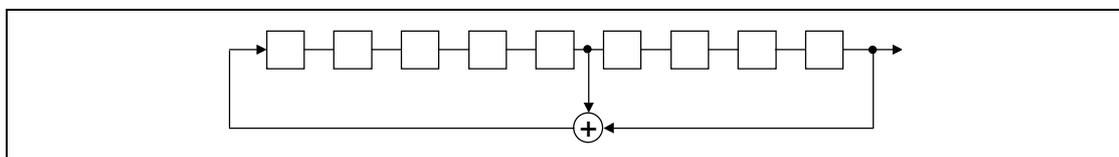


Figure 2.4: Linear Feedback Shift Register for Generation of the PRBS sequence

2. Some uncertainties about Japanese regulatory requirements have been reported. If necessary for regulatory type approval in Japan, some features might be added; e.g. a longer PN sequence.

## **Annex A**

### **20 dB Bandwidth**

Chart of Test mode (ch 1)



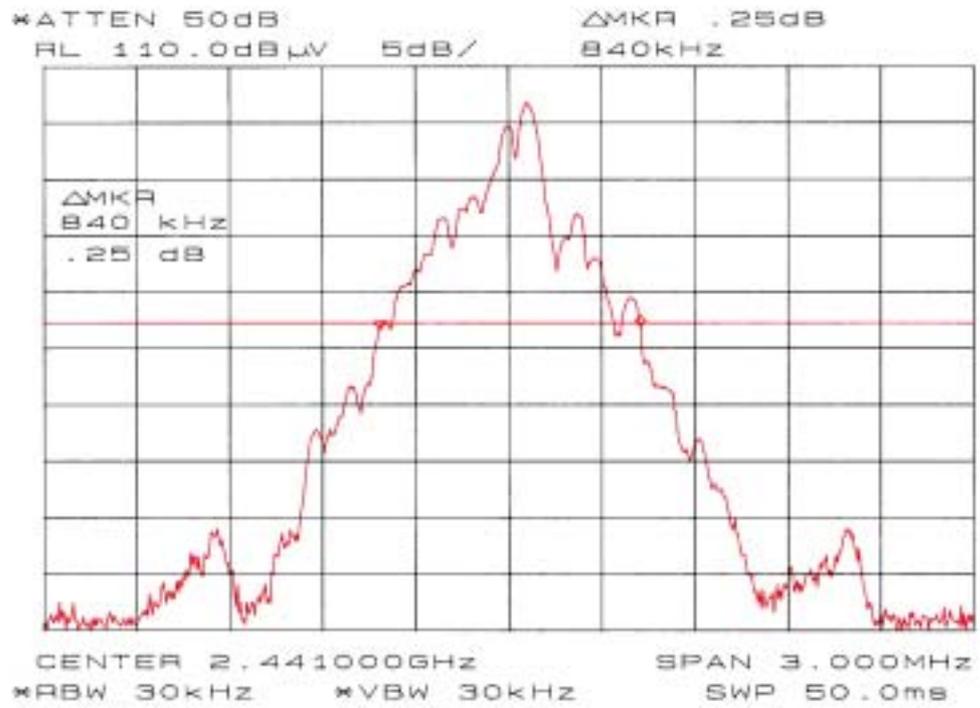
Chart of Test mode (ch 40)



**Chart of Test mode (ch 79)**



**Chart of Inquiry mode (ch 40)**



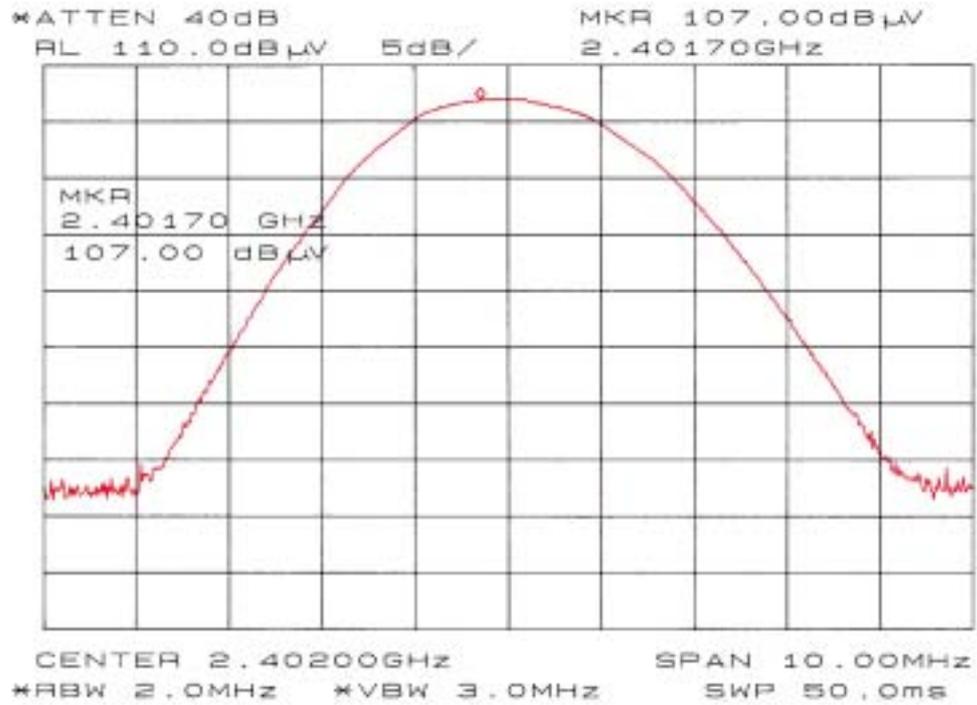
**Chart of Page mode (ch 40)**



## **Annex B**

### **Maximum Peak Output Power - RF Antenna Conducted (Test mode)**

**Chart of ch 1**



**Chart of ch 40**



Chart of ch 79



## **Annex C**

### **Maximum Peak Output Power - Radiated (Test mode)**

Chart of ch 1



Chart of ch 40



Chart of ch 79

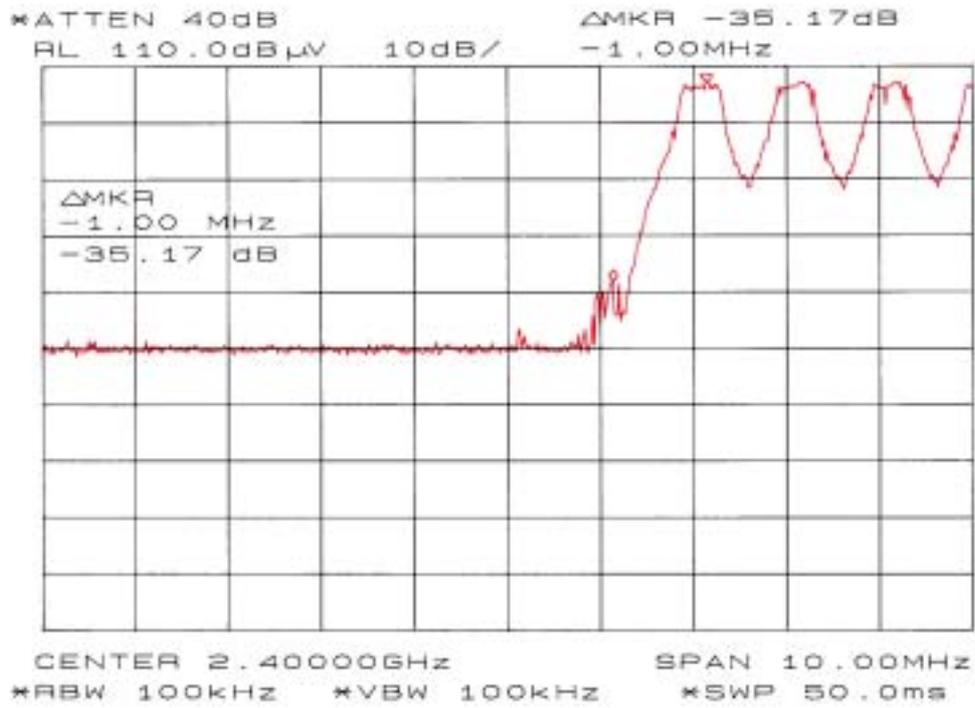


## **Annex D**

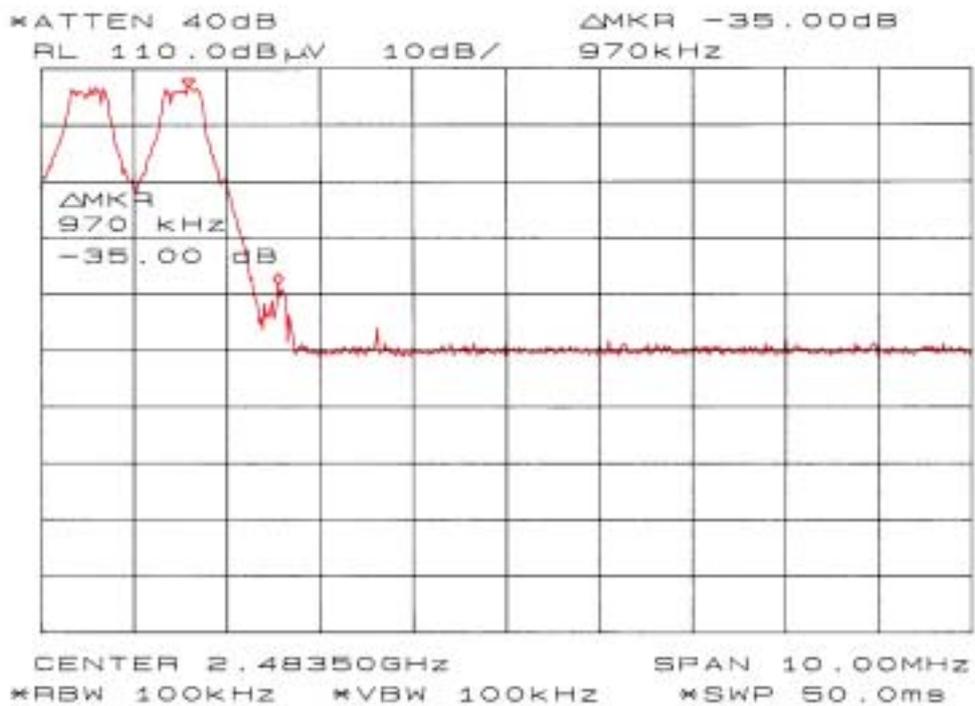
# **Band Edge compliance of RF Conducted Emissions**

**(Test mode)**

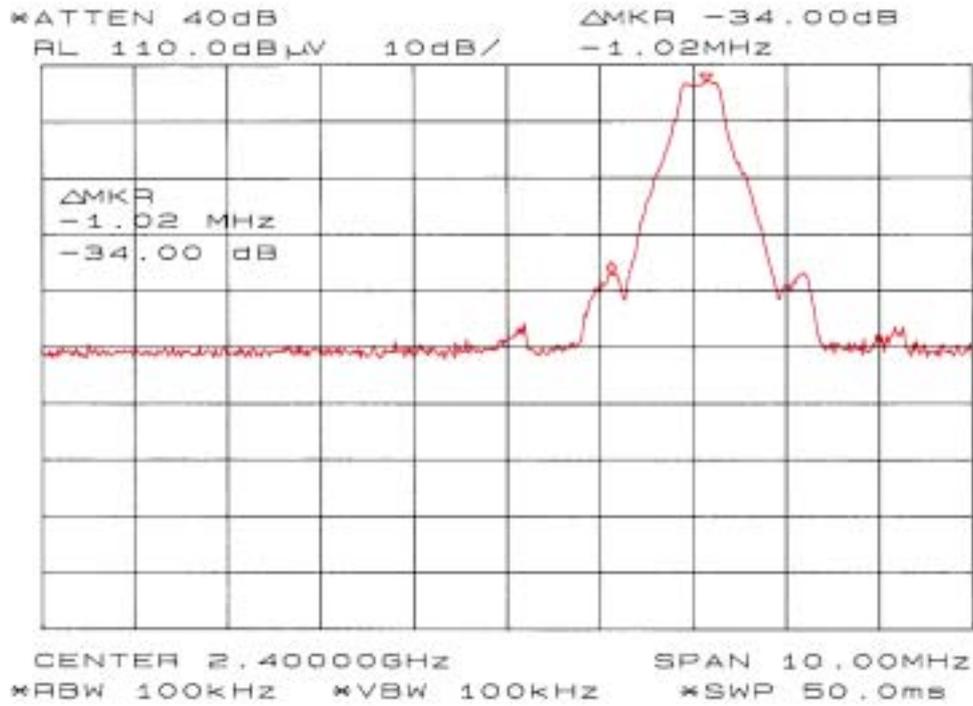
**Chart of ch 1 [Hopping with modulated-carrier] -Multi-slot Packets (5 time slots)**



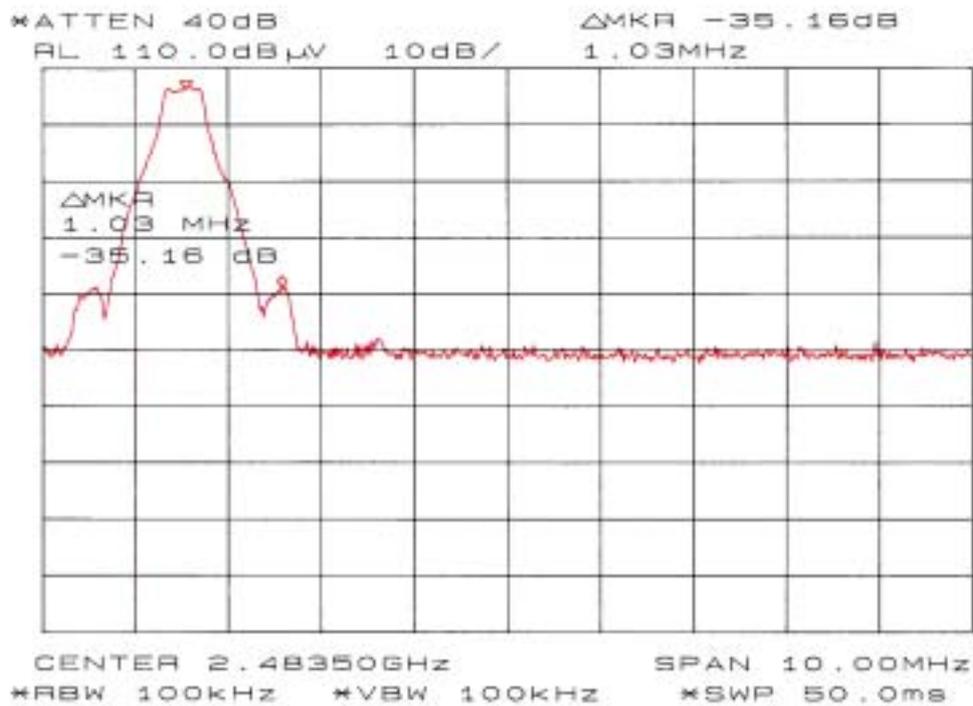
**Chart of ch 79 [Hopping with modulated-carrier] -Multi-slot Packets (5 time slots)**



**Chart of ch 1 [No hopping with modulated-carrier] -Multi-slot Packets (5 time slots)**



**Chart of ch 79 [No hopping with modulated-carrier] -Multi-slot Packets (5 time slots)**



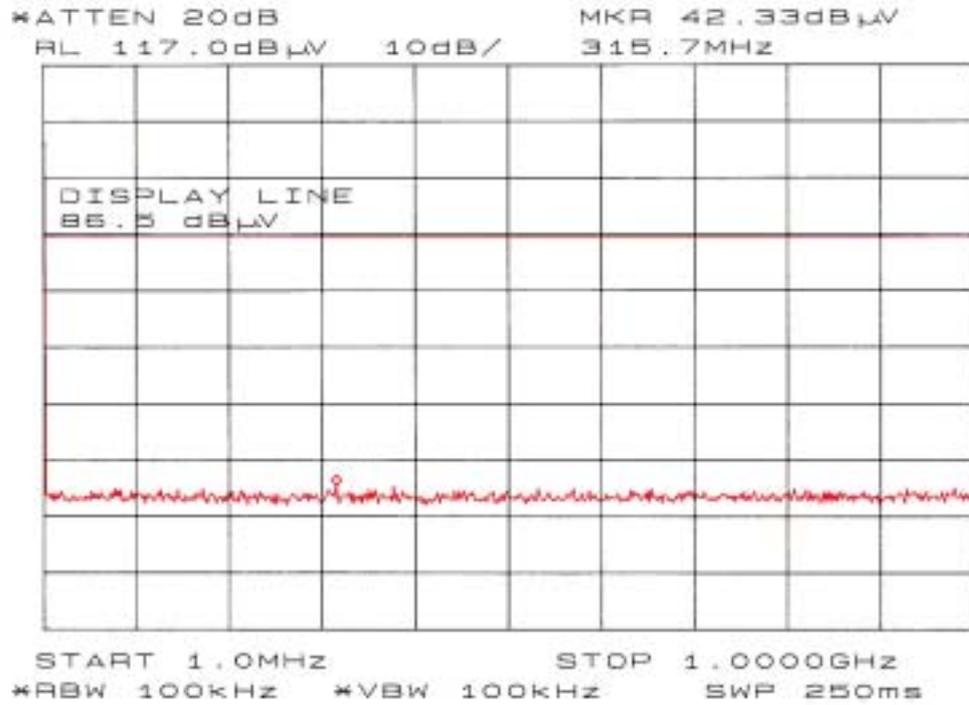
## **Annex E**

### **Spurious Emissions – RF Antenna Conducted Test**

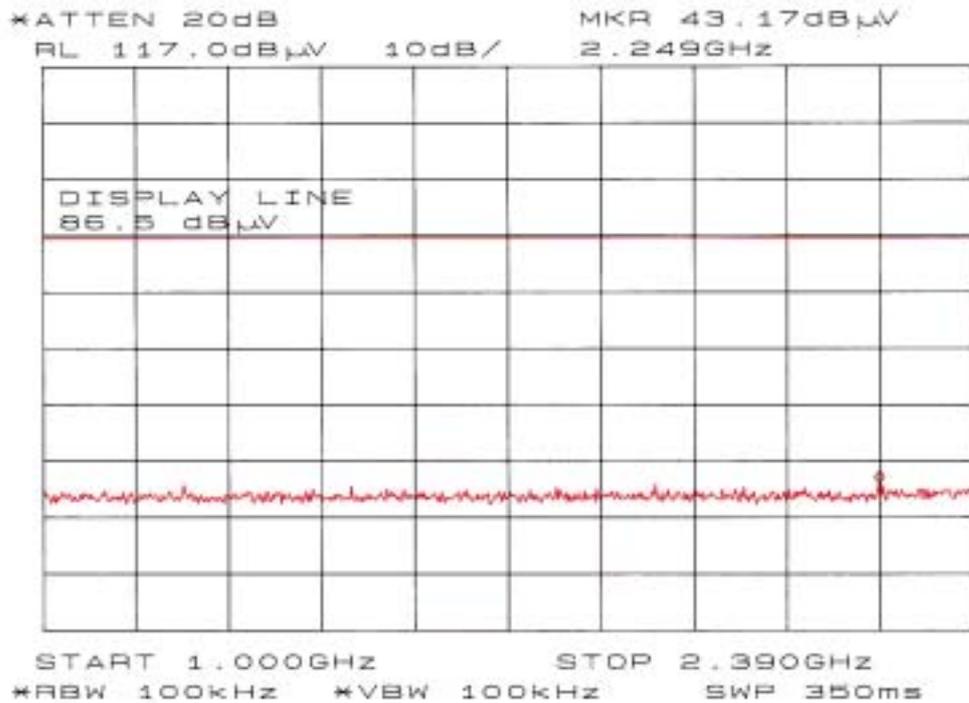
**Hopping with modulated-carrier (FHSS)**

**(Test mode)**

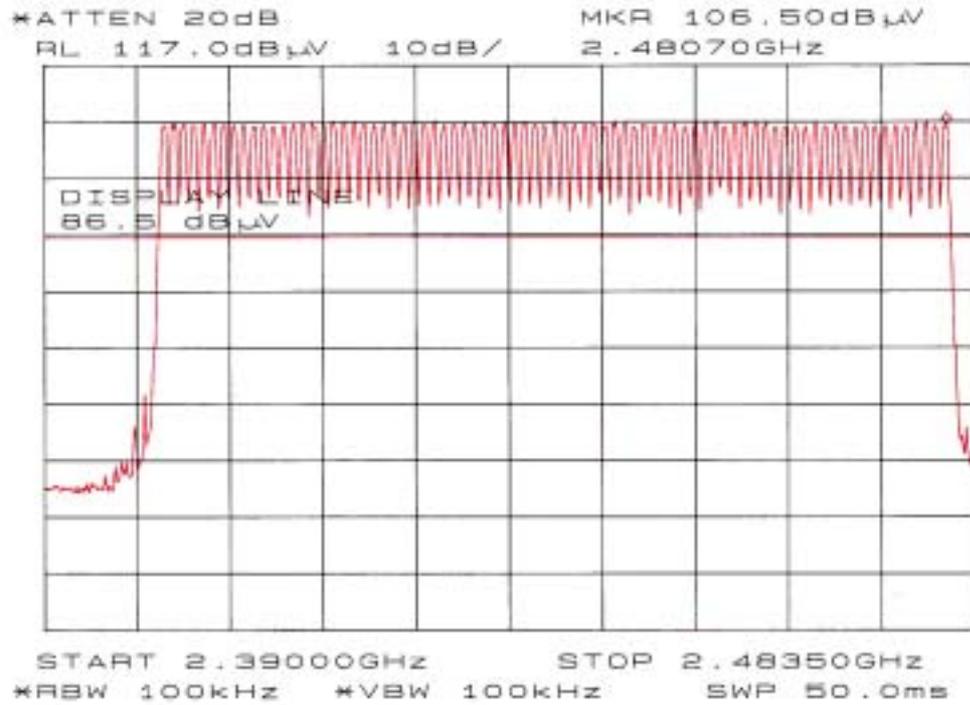
**Chart of FHSS (1MHz-1GHz)**



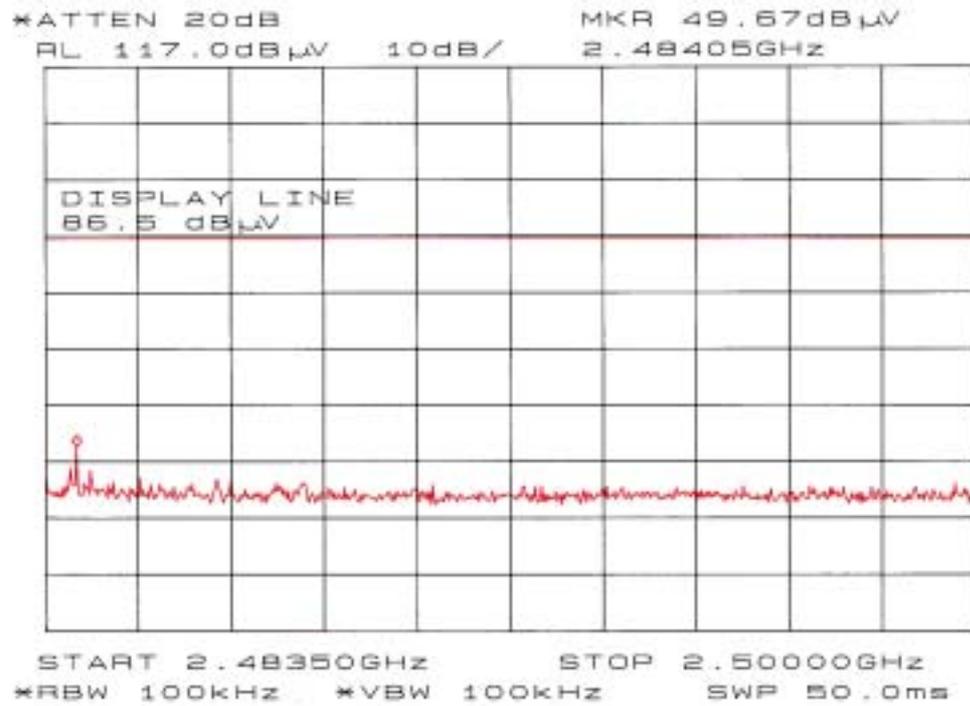
**Chart of FHSS (1GHz-2.390GHz)**



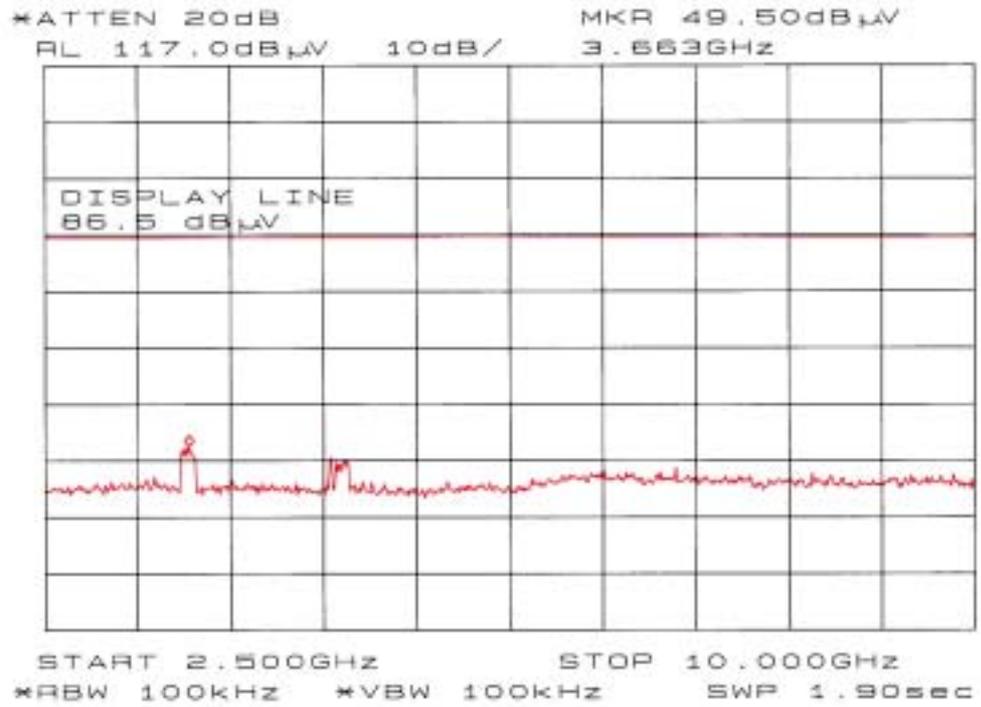
**Chart of FHSS (2.390GHz-2.4835GHz)**



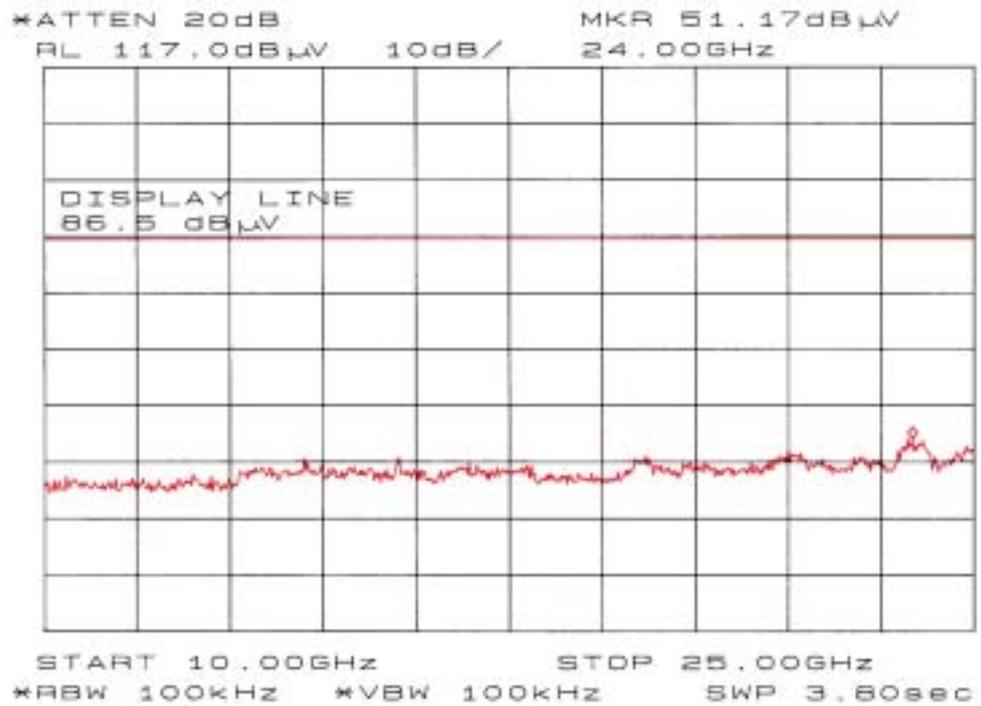
**Chart of FHSS (2.4835GHz-2.5GHz)**



**Chart of FHSS (2.5GHz-10GHz)**



**Chart of FHSS (10GHz-25GHz)**

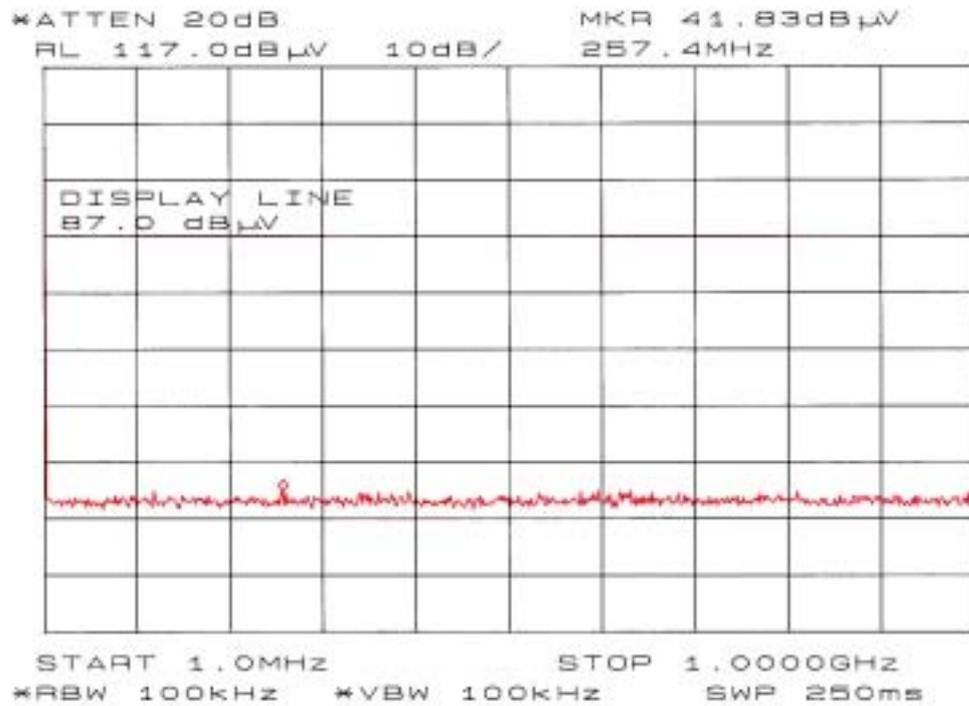


## **Annex F**

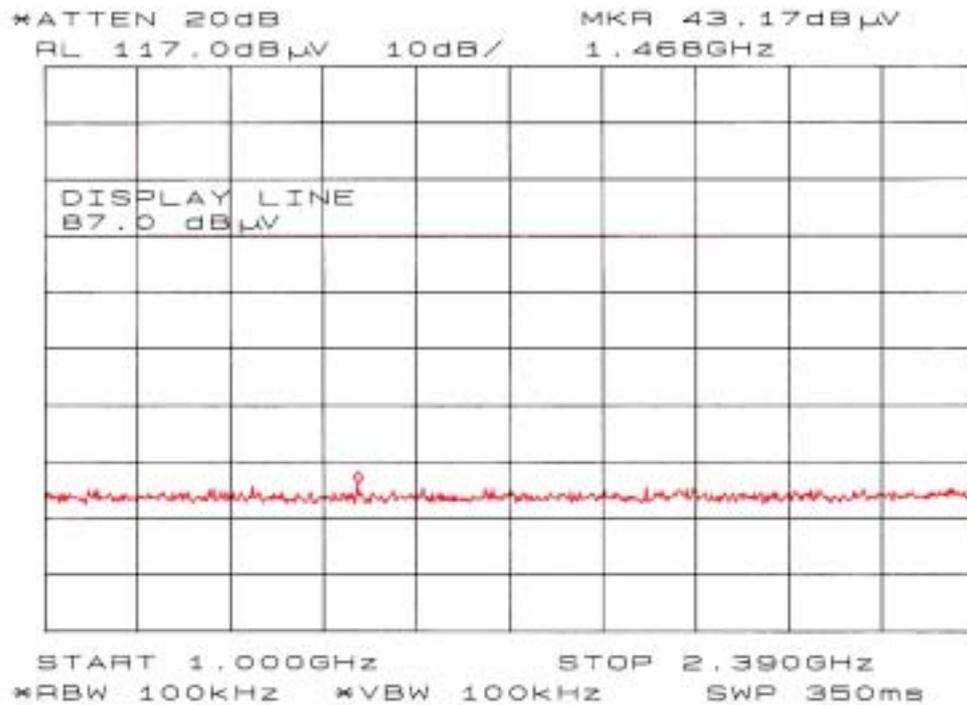
### **Spurious Emissions – RF Antenna Conducted Test**

**No hopping with modulated-carrier  
(Test mode)**

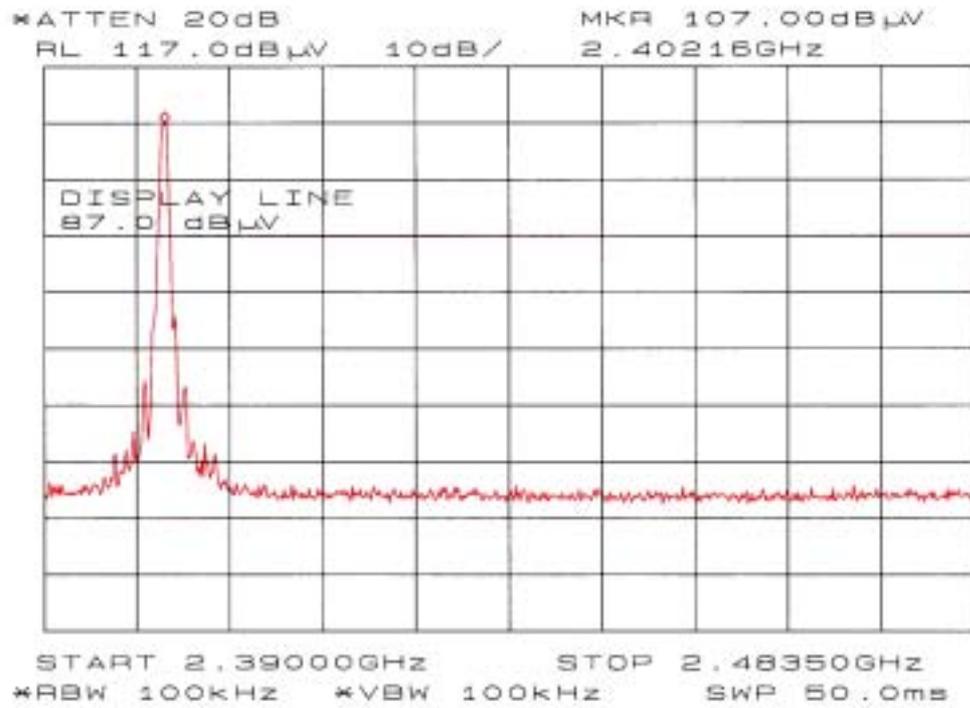
**Chart of ch 1 (1MHz-1GHz)**



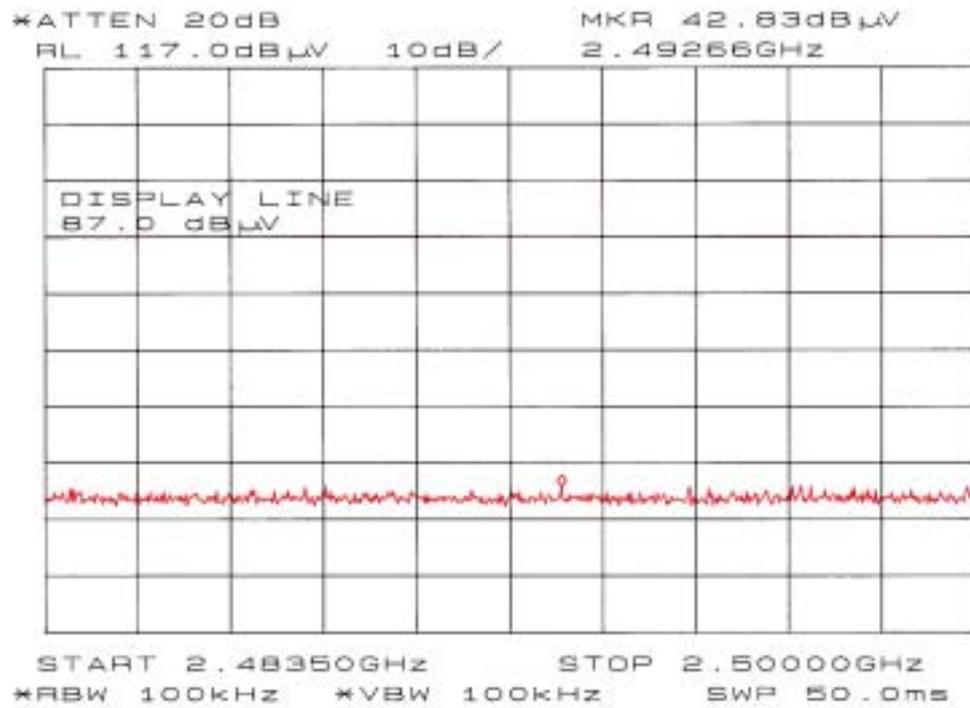
**Chart of ch 1 (1GHz-2.390GHz)**



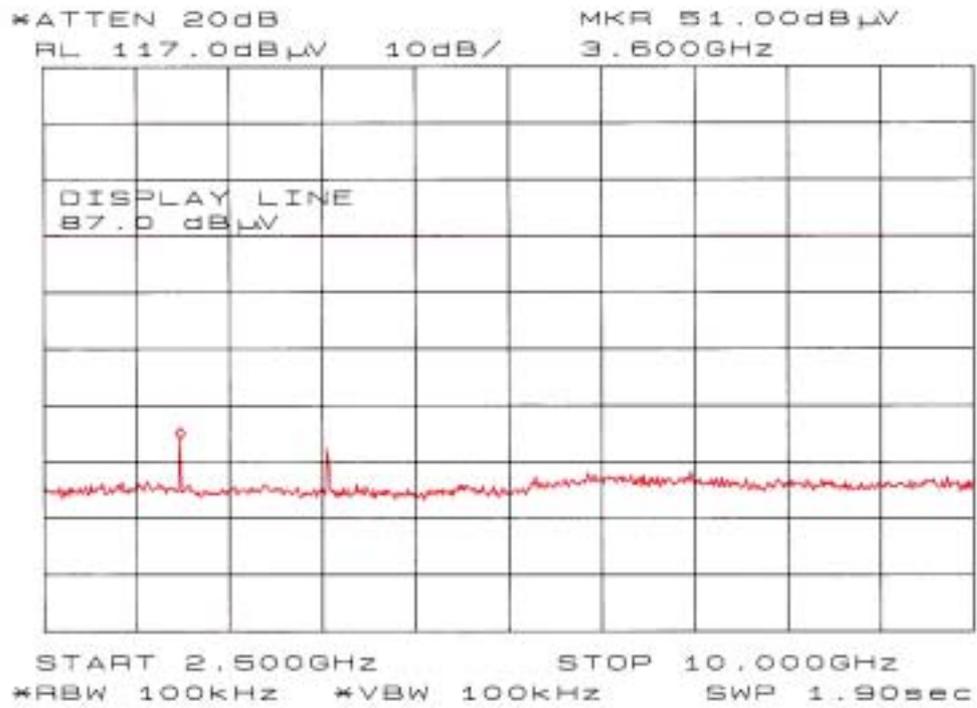
**Chart of ch 1 (2.390GHz-2.4835GHz)**



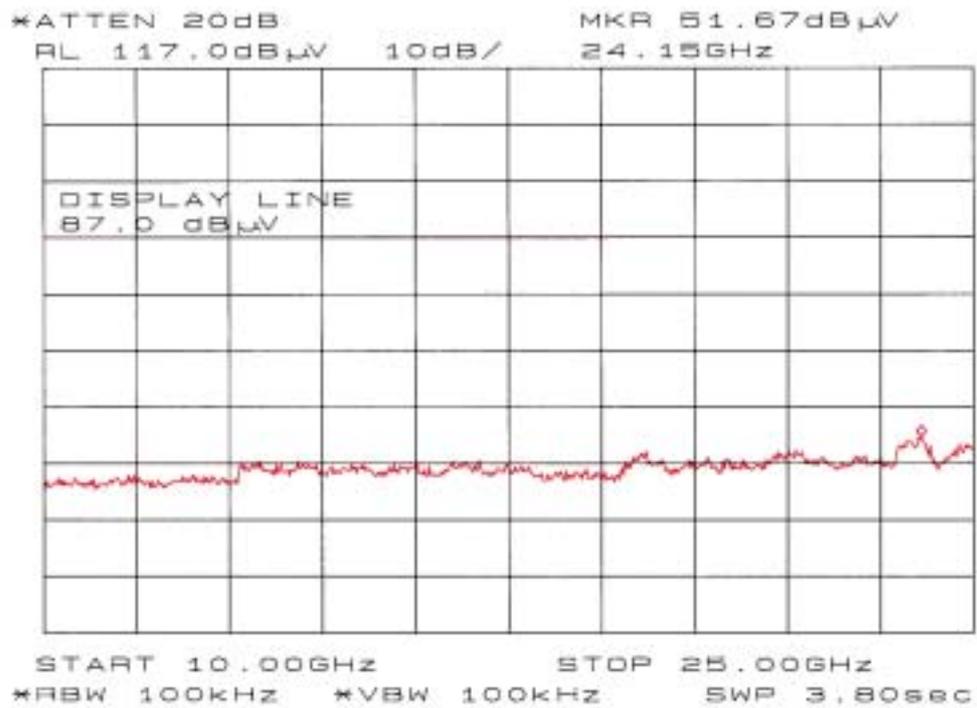
**Chart of ch 1 (2.4835GHz-2.5GHz)**



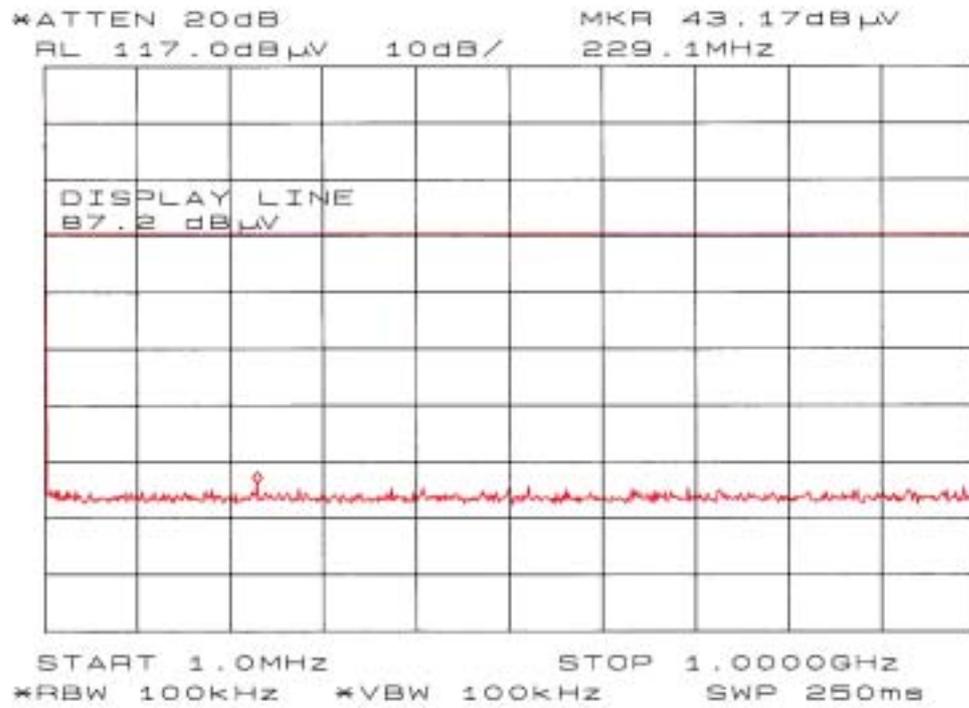
**Chart of ch 1 (2.5GHz-10GHz)**



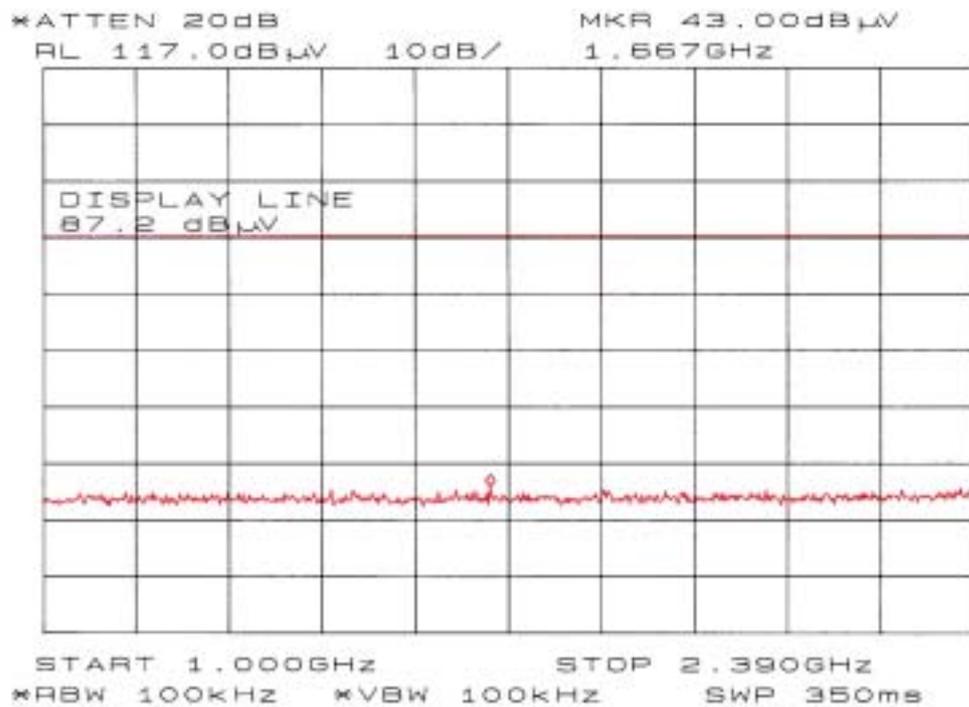
**Chart of ch 1 (10GHz-25GHz)**



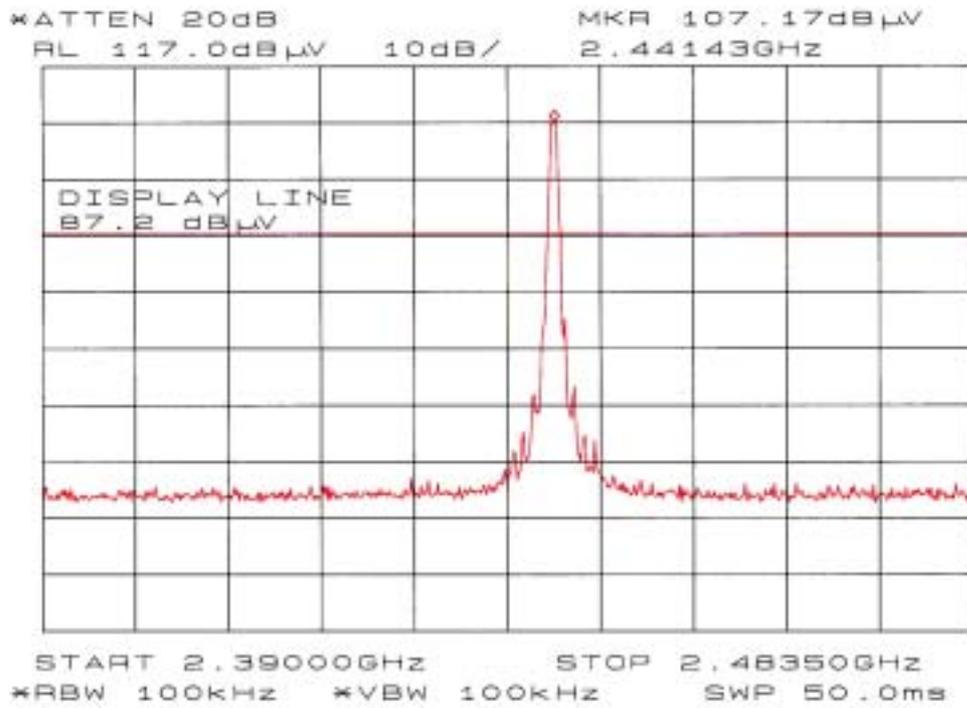
**Chart of ch 40 (1MHz-1GHz)**



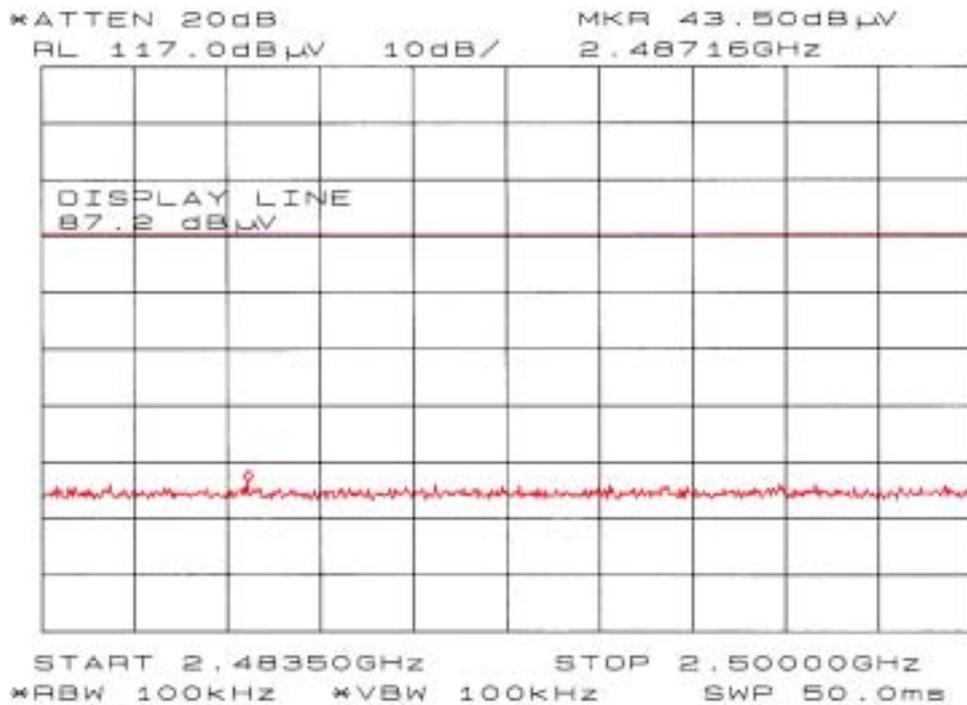
**Chart of ch 40 (1GHz-2.390GHz)**



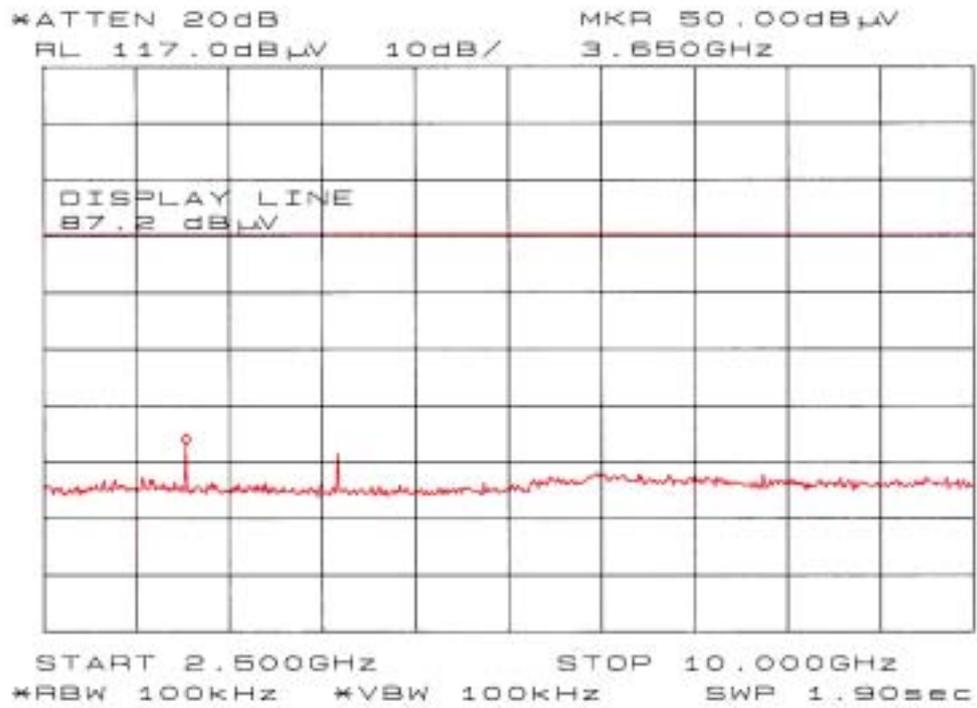
**Chart of ch 40 (2.390GHz-2.4835GHz)**



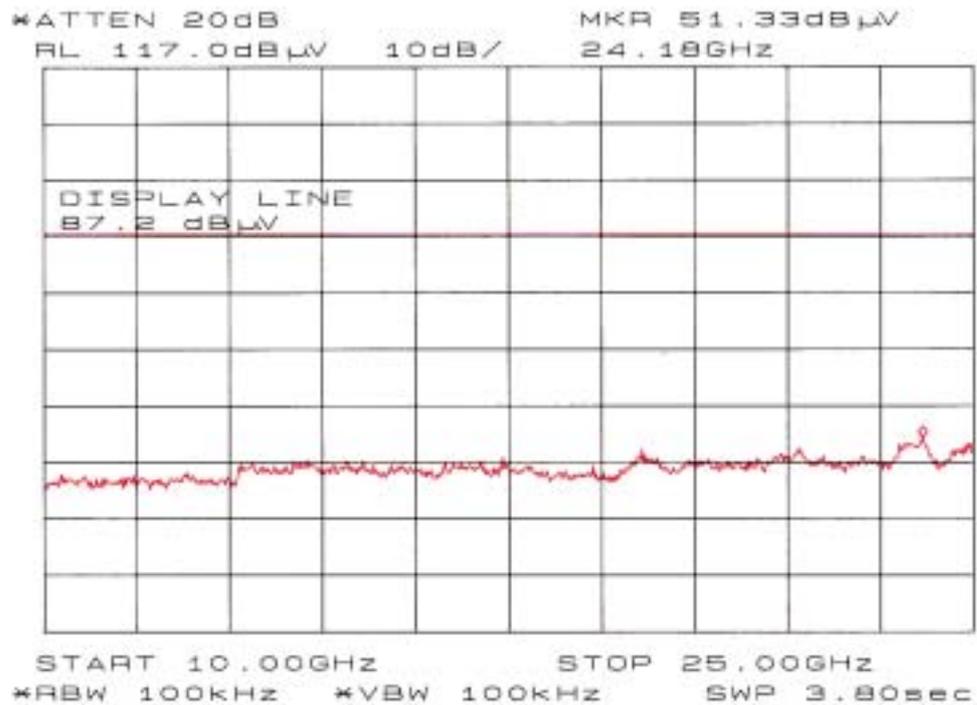
**Chart of ch 40 (2.4835GHz-2.5GHz)**



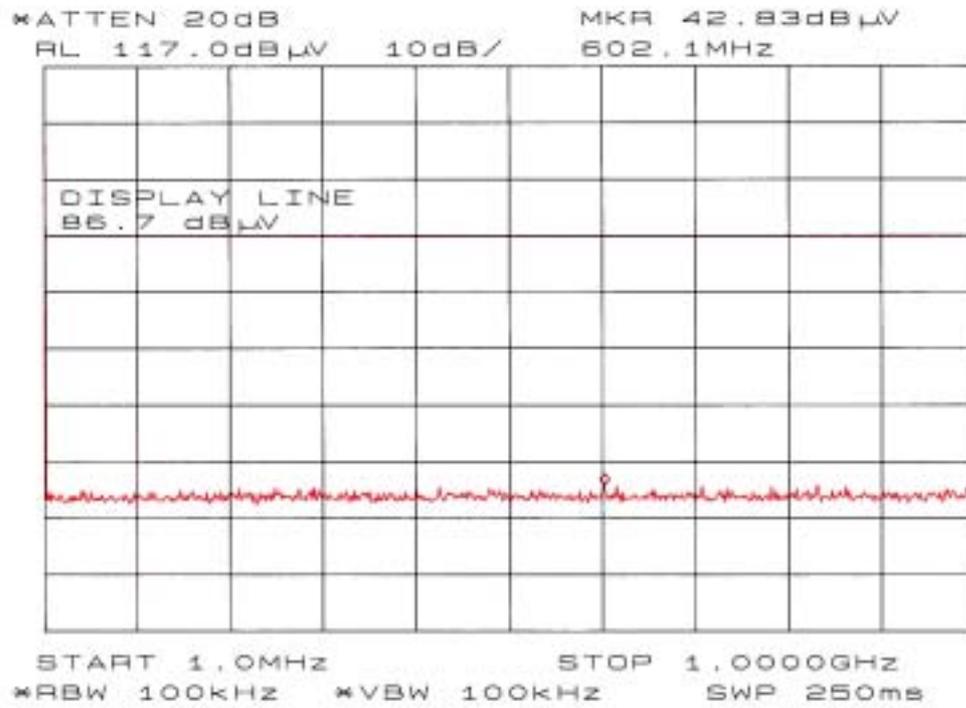
**Chart of ch 40 (2.5GHz-10GHz)**



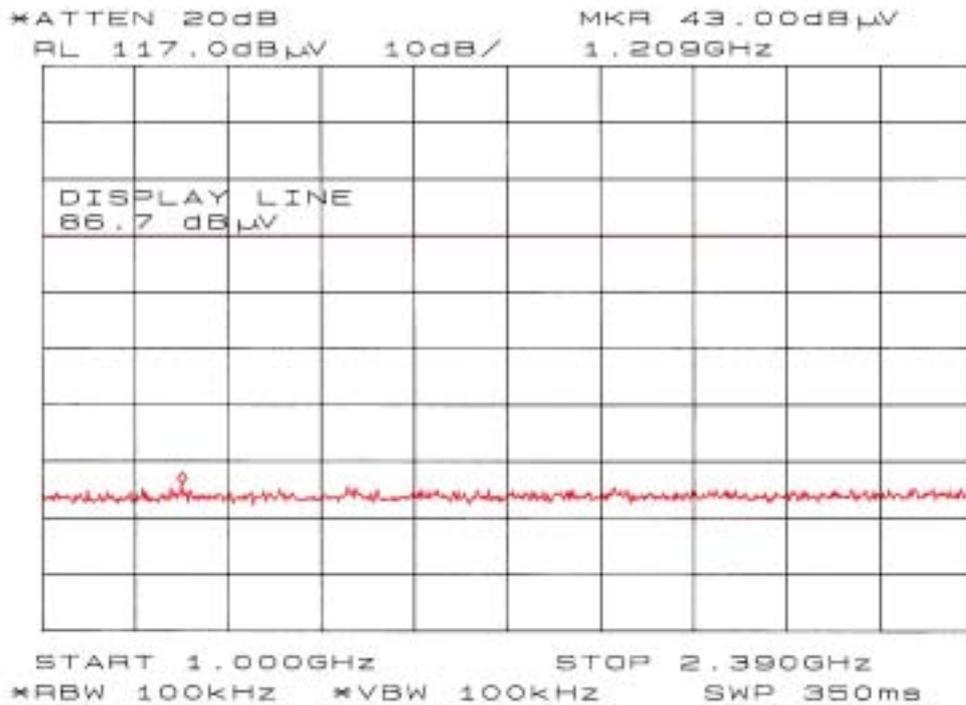
**Chart of ch 40 (10GHz-25GHz)**



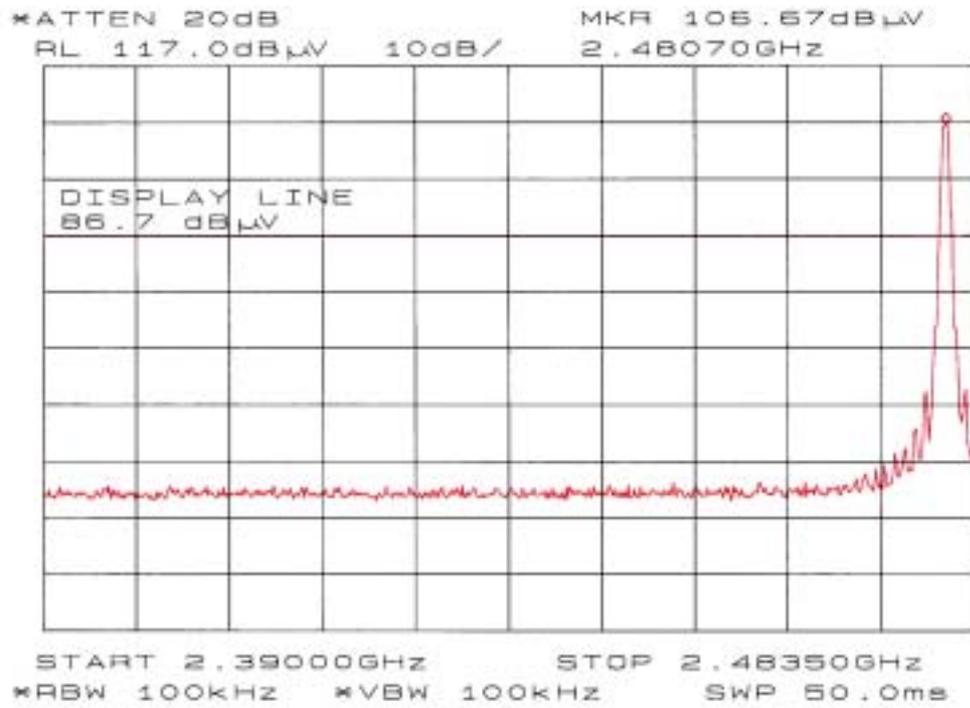
**Chart of ch 79 (1MHz-1GHz)**



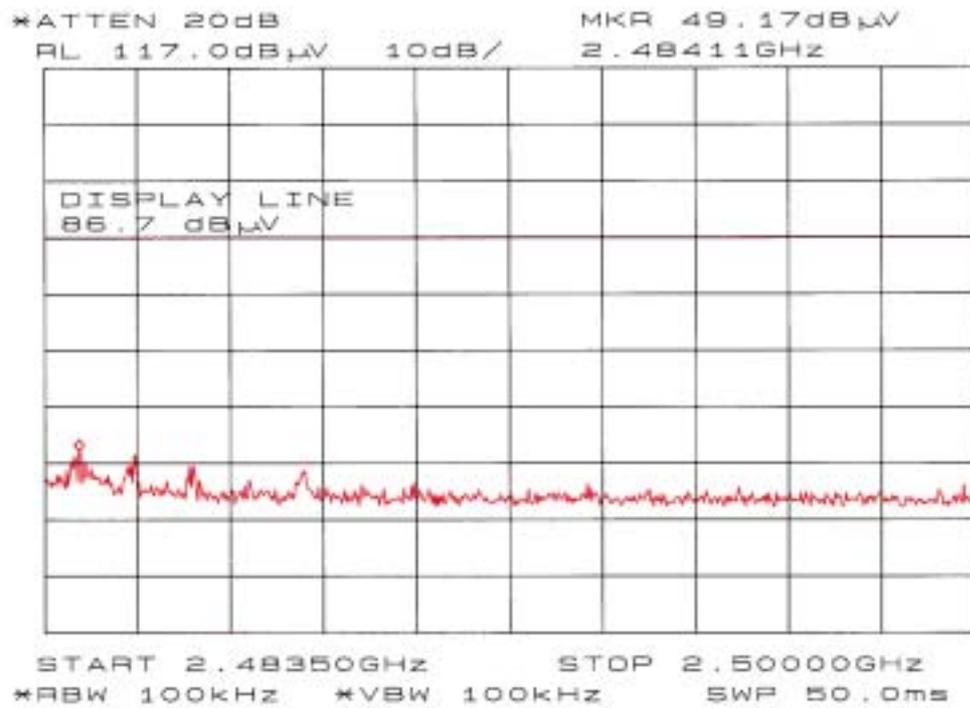
**Chart of ch 79 (1GHz-2.390GHz)**



**Chart of ch 79 (2.390GHz-2.4835GHz)**



**Chart of ch 79 (2.4835GHz-2.5GHz)**

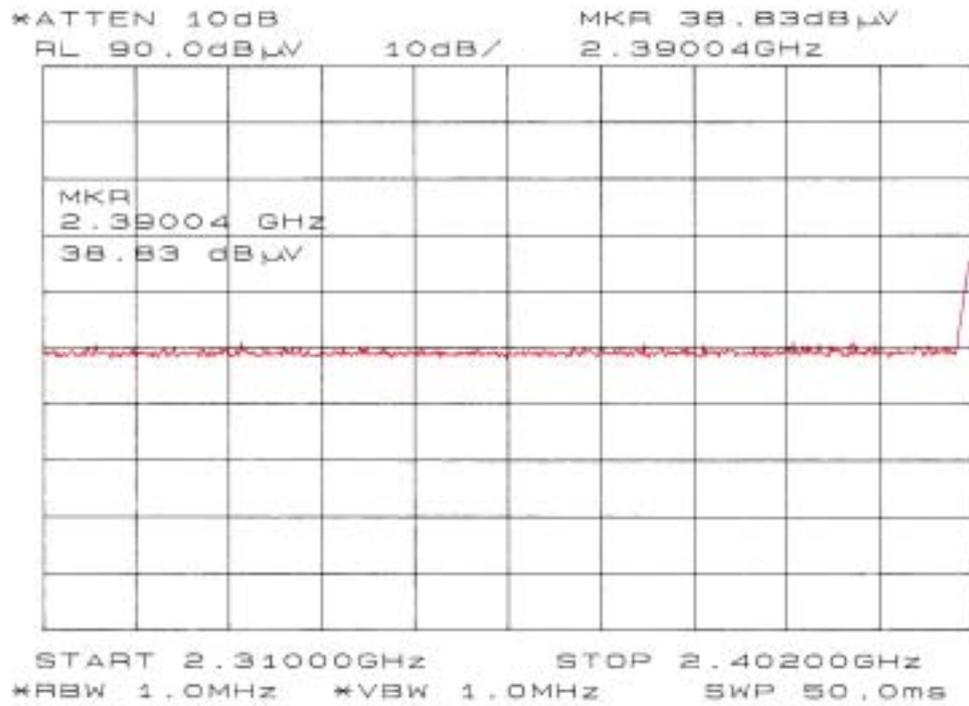




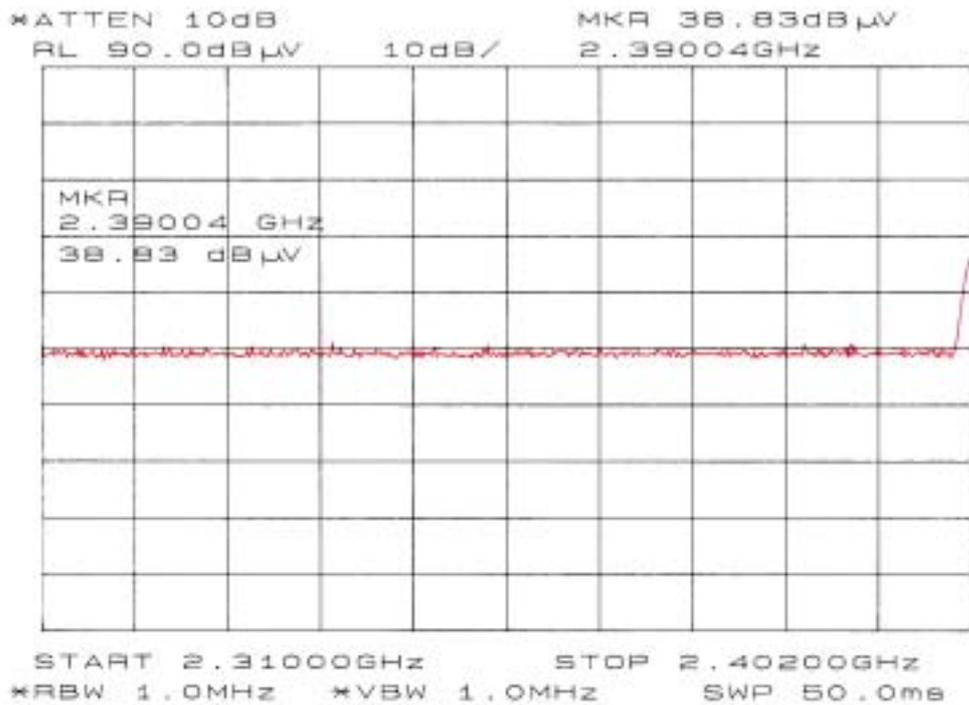
## **Annex G**

### **Restricted Bands of Operation (Test mode)**

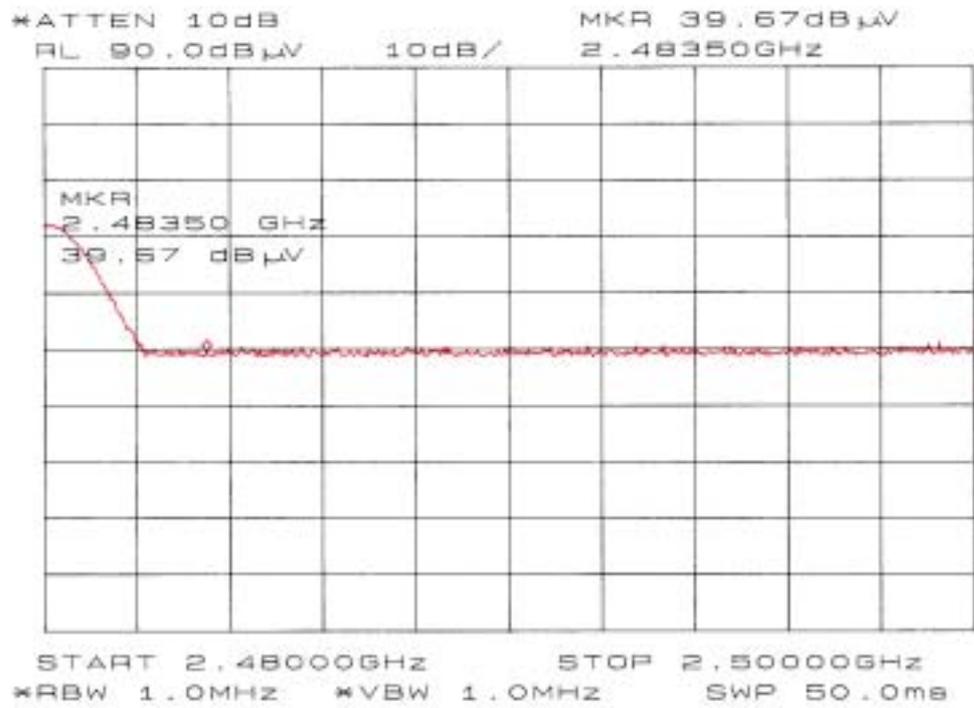
**Chart of ch 1 -Horizontal polarization**



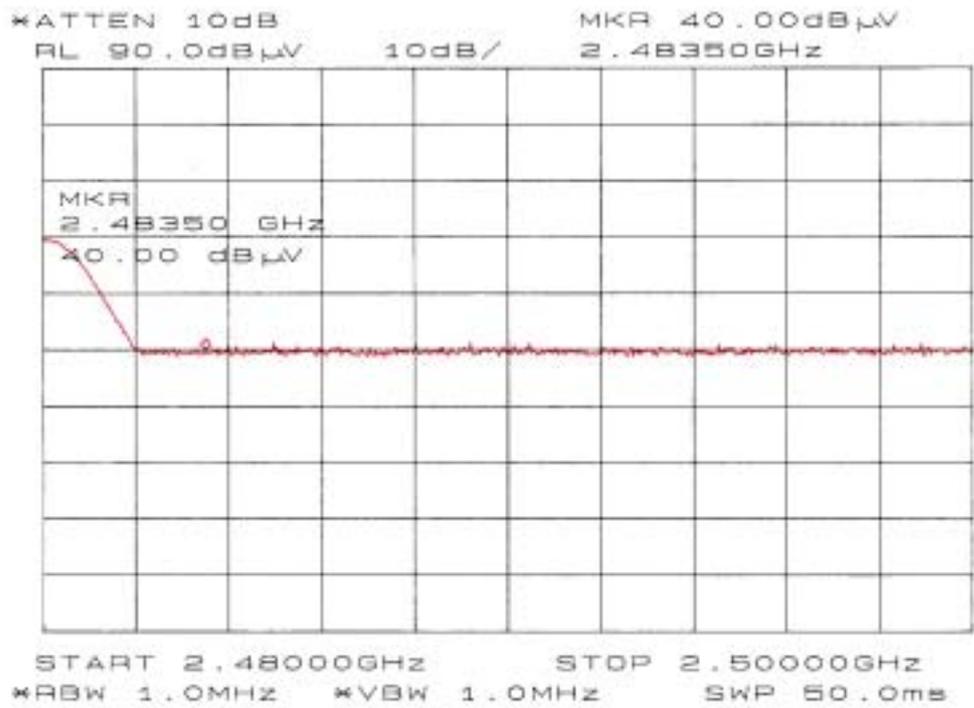
**Chart of ch 1 -Vertical polarization**



**Chart of ch 79 -Horizontal polarization**



**Chart of ch 79 -Vertical polarization**



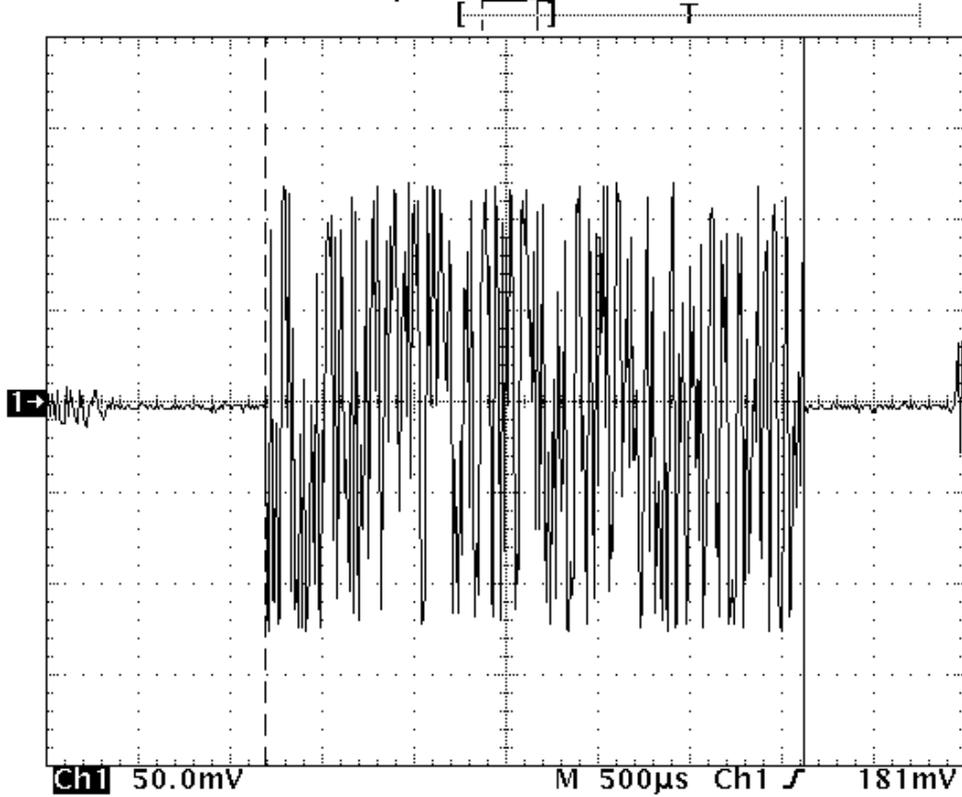
## **Annex H**

### **Time of Occupancy (Dwell Time)**

Chart of Test mode - Multi-slot packets (5 time slots)

Tek Run: 100kS/s

Sample

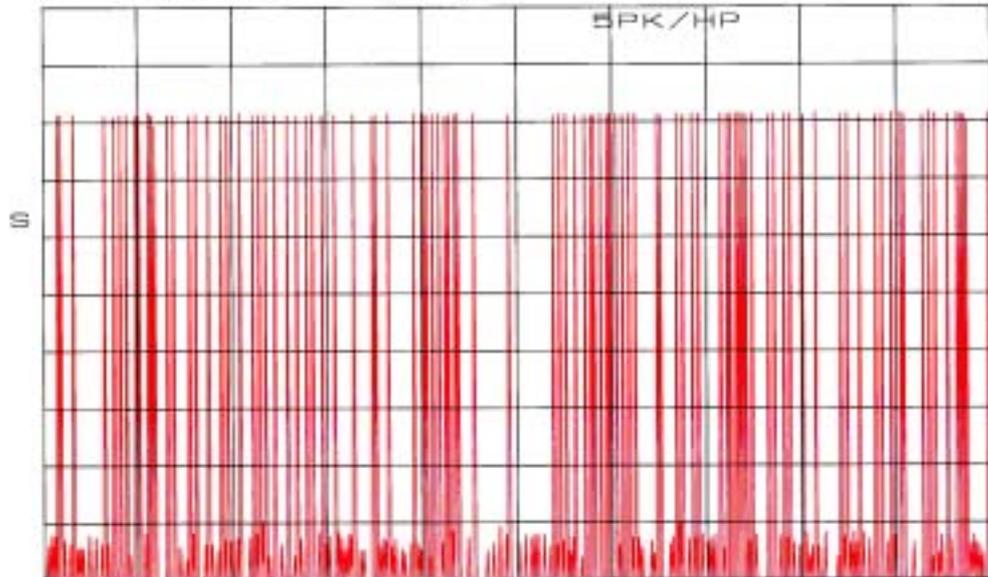


\*ATTEN 40dB

RL 10.0dBm

5dB/

SPK/HP



CENTER 2.441000000GHZ

SPAN 0HZ

\*RBW 100KHZ

\*VBW 30KHZ

\*SWP 30.0sec

Chart of Inquiry mode

Tek **Stop**: Single Seq 2.50MS/s

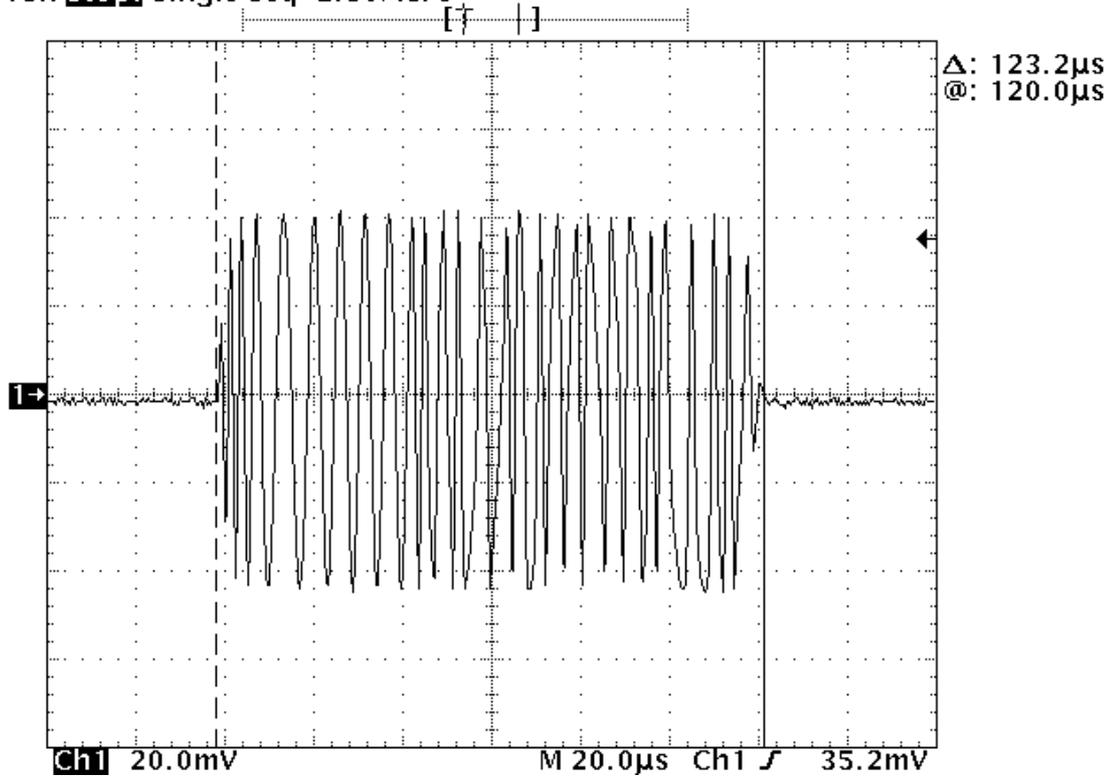


Chart of Inquiry mode

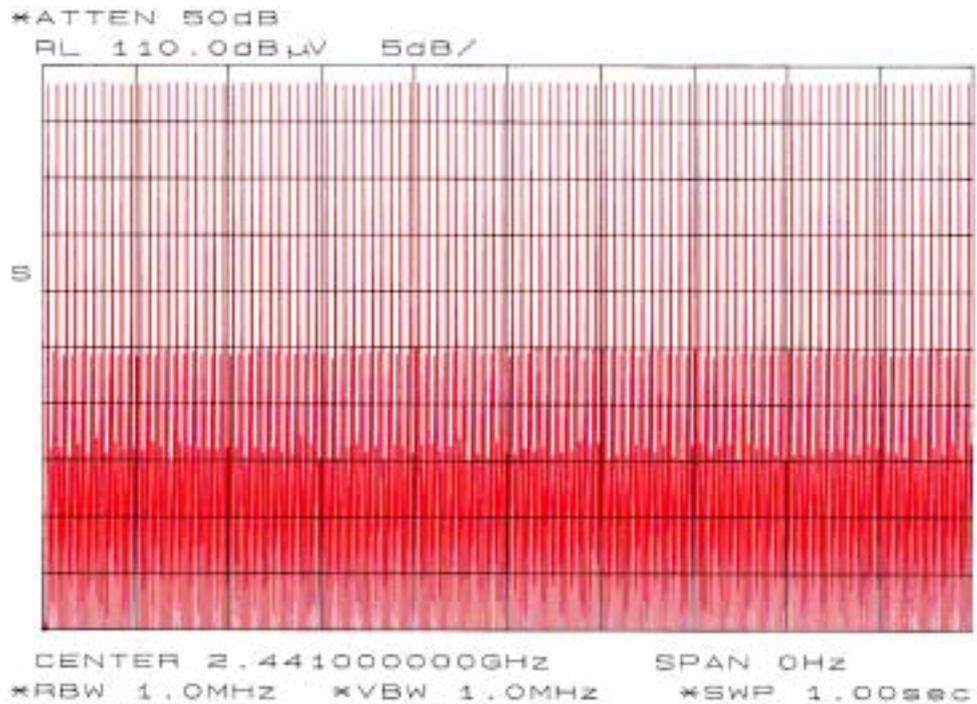


Chart of Page mode

Tek **Stop**: Single Seq 2.50MS/s

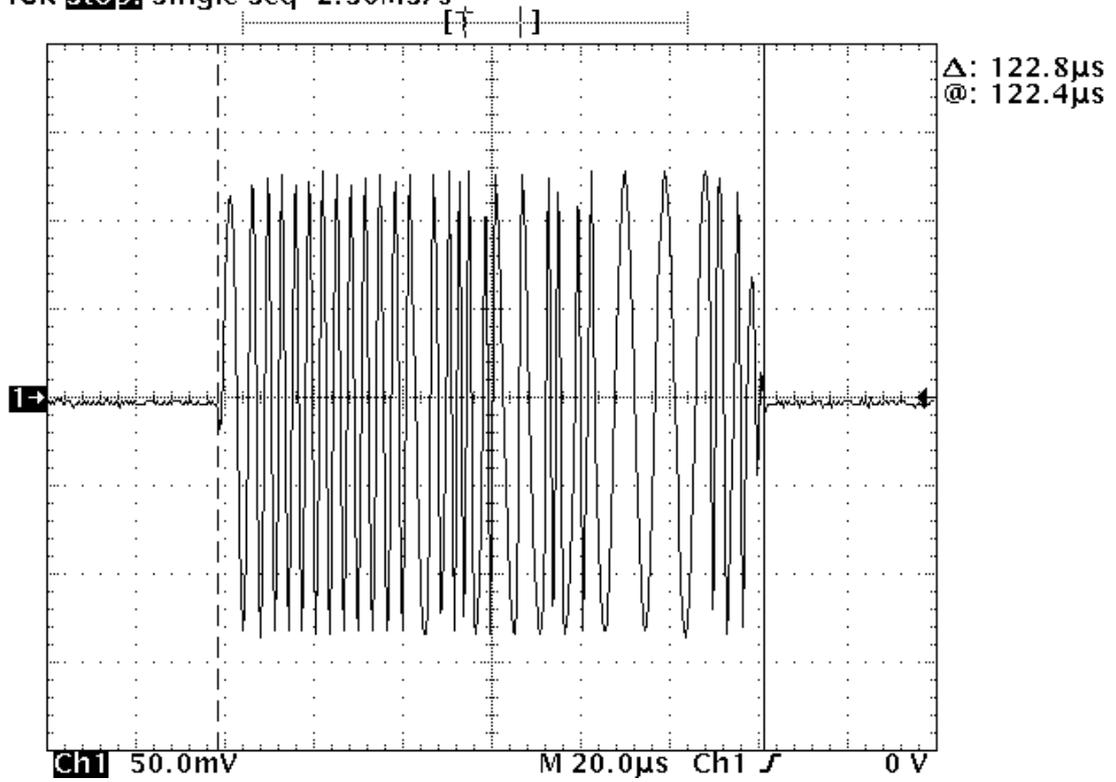


Chart of Page mode

