FCC Part 15
EMI TEST REPORT

of

E.U.T. : E1 Spread Spectrum Radios
Model : SL5113R
FCC ID. : QZG5113R

for

APPLICANT : K-Best Technology Inc.

ADDRESS : 2Fl,-1, No.185, Ko Wang Rd., Kau Yuan Taun, Lung Tan Hsiang, Taoyuan Hsien, Taiwan

Test Performed by

ELECTRONICS TESTING CENTER, TAIWAN
NO. 34, LIN 5, DING FU TSUN, LINKOU HSIANG
TAIPEI HSIEN, TAIWAN, R.O.C.
Tel : (02)26023052 Fax : (02)26010910
http://www.etc.org.tw ; e-mail: etcemi@seed.net.tw

Report Number : ET93R-08-021-01

TEST REPORT CERTIFICATION

Applicant	: K-Best Technology Inc. 2Fl,-1, No.185, Ko Wang Rd., Kau Yuan Taun, Lung Tan Hsiang, Taoyuan Hsien, Taiwan
Manufacturer	: K-Best Technology Inc. 2Fl,-1, No.185, Ko Wang Rd., Kau Yuan Taun, Lung Tan Hsiang, Taoyuan Hsien, Taiwan
Description of EUT	:
a) Type of EUT	: E1 Spread Spectrum Radios
b) Trade Name	: K-Best
c) Model No.	: SL5113R
d) Power Supply	: AC I/P: 100-240VAC,47-63Hz 1.5A；O/P: 48V
Regulation Applied	: FCC Rules and Regulations Part 15 Subpart C (2003)

I HEREBY CERTIFY THAT: The data shown in this report were made in accordance with the procedures given in ANSI C63.4, and the energy emitted by the device was founded to be within the limits applicable. I assume full responsibility for accuracy and completeness of these data.

Note: 1. The result of the testing report relate only to the item tested.
2. The testing report shall not be reproduced expect in full, without the written approval of ETC.

Issued Date : Aug. 26, 2004

Test Engineer : falcon Shi
(falcon Shi)

Approve & Authorized Signer : Will Yauo
Will Yauo, Manager
EMC Dept. II of ELECTRONICS
TESTING CENTER, TAIWAN

Table of Contents Page

1 GENERAL INFORMATION

1.1 Product Description

a) Type of EUT : E1 Spread Spectrum Radios

b) Trade Name : K-Best

c) Model No. : SL5113R

d) Power Supply : AC I/P: 100-240VAC,47-63Hz 1.5A；O/P: 48V

1.2 Characteristics of Device

1. High frequency microwave RF unit and other related RF components design technique (PA, LNA, MIX, DUX etc.)
2. High frequency Synthesizer
3. High amplifier gain control technique
4. Advanced QPSK de/modulation
5. Microwave frame multiplexer
6. Digital equalizer

Frequency	Frequency (TX / RX)	
	A	B
1	5822	5738
2	5838	5754

1.3 Test Methodology

For E1 Spread Spectrum Radios, both conducted and radiated emissions were performed according to the procedures illustrated in ANSI C63.4 (2001). Other required measurements were illustrated in separate sections of this test report for details.

1.4 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located on the roof top of Building at No.34, Lin 5, Ding Fu Tsun, Linkou Hsiang, Taipei Hsien, Taiwan, R.O.C.

This site has been fully described in a report submitted to your office, and accepted in a letter dated Feb. 10, 2000.

2 PROVISIONS APPLICABLE

2.1 Definition

Unintentional radiator:
A device that intentionally generates and radio frequency energy for use within the device, or that sends radio frequency signals by conduction to associated equipment via connecting wiring, but which is not intended to emit RF energy by radiation or induction.

Class A Digital Device:
A digital device which is marketed for use in commercial or business environment; exclusive of a device which is market for use by the general public, or which is intended to be used in the home.

Class B Digital Device :
A digital device which is marketed for use in a residential environment notwithstanding use in a commercial, business of industrial environment. Example of such devices that are marketed for the general public.

Note : A manufacturer may also qualify a device intended to be marketed in a commercial, business, or industrial environment as a Class B digital device, and in fact is encouraged to do so, provided the device complies with the technical specifications for a Class B Digital Device. In the event that a particular type of device has been found to repeatedly cause harmful interference to radio communications, the Commission may classify such a digital device as a Class B Digital Device, Regardless of its intended use.

Intentional radiator:
A device that intentionally generates and emits radio frequency energy by radiation or induction.

2.2 Requirement for Compliance

(1) Conducted Emission Requirement

For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150kHz to 30MHz shall not exceed the limits in the following table, as measured using a 50MH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the band edges.

Frequency MHz	Quasi Peak dBμV	Average dBμV
0.15 - 0.5	66-56	56-46
0.5 - 5.0	56	46
5.0 - 30.0	60	50

(2) Radiated Emission Requirement

For unintentional device, according to §15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency MHz	**Distance Meters**	**Radiated dBμV/m**	**Radiated μV/m**
30 - 88	3	40.0	100
88 - 216	3	43.5	150
216 - 960	3	46.0	200
Above 960	3	54.0	500

For intentional device, according to §15.209(a), the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the above table.

(3) Antenna Requirement

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

(4) Bandwidth Requirement

According to 15.247(a)(2), systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

(5) Output Power Requirement

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands, according to 15.247(b)(3), the maximum peak output power of the transmitter shall not exceed 1 Watt.

According to 15.247(b)(4), except as shown in paragraphs (b)(4)(i), (ii), and (iii) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the peak output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

According to 15.247(b)(4)(ii), systems operating in the 5725-5850 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter peak output power.

(6) 100 kHz Bandwidth of Frequency Band Edges Requirement

According to 15.247(c), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

(7) Power Density Requirement

According to 15.247(d), for digitally modulated systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

2.3 Restricted Bands of Operation

Only spurious emissions are permitted in any of the frequency bands listed below :

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42-16.423	399.9-410	4.5-5.15
0.495 - 0.505 **	16.69475 - 16.69525	608-614	5.35-5.46
2.1735 - 2.1905	16.80425 - 16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475 - 156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2655-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3360-4400	Above 38.6
13.36-13.41			

** : Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz

2.4 Labeling Requirement

The device shall bear the following statement in a conspicuous location on the device:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

2.5 User Information

The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual.

The Federal Communications Commission Radio Frequency Interference Statement includes the following paragraph.

This equipment has been tested and found to comply with the limits for a Class B Digital Device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction may cause harmful interference to radio communication. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-- Reorient or relocate the receiving antenna.

-- Increase the separation between the equipment and receiver.

-- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

-- Consult the dealer or an experienced radio / TV technician for help.

3. SYSTEM TEST CONFIGURATION

3.1 Justification

For both radiated and conducted emissions, the system was configured for testing in a typical fashion as a customer would normally use it. The peripherals other than EUT were connected in normally standing by situation.

All measurement were intentional to maximum the emissions from EUT by varying the connection cables, therefore, the test result is sure to meet the applicable requirement.

3.2 Devices for Tested System

Device	Manufacture	Model/ FCC ID.	Cable Description
E1 Spread Spectrum Radios *	K-Best Technology Inc.	SL5113R/ QZG5113R	1.8 m Unshieled Power Cord 1.2 m Unshielded RS232 Line × 3 2.0 m Unshielded RJ11 Line × 1 2.0 m Unshielded RJ45 Line × 3 1.5 m Unshieled Parallel Line × 2

Remark "*" means equipment under test.

4 RADIATED EMISSION MEASUREMENT

4.1 Applicable Standard

For unintentional radiator, the radiated emission shall comply with §15.209(a).

For direct sequence system, according to §15.247 (a), operation under this provision is limited to frequency hopping and digitally modulated intentional radiators, and the out band emission shall be comply with §15.247 (c)

4.2 Measurement Procedure

1. Setup the configuration per figure 1 and 2 for frequencies measured below and above 1 GHz respectively.
2. For emission frequencies measured below 1 GHz, a pre-scan is performed in a shielded chamber to determine the accurate frequencies of higher emissions will be checked on a open test site. As the same purpose, for emission frequencies measured above 1 GHz, a pre-scan also be performed with a 1 meter measuring distance before final test.
3. For emission frequencies measured below and above 1 GHz, set the spectrum analyzer on a 100 kHz and 1 MHz resolution bandwidth respectively for each frequency measured in step 2.
4. The search antenna is to be raised and lowered over a range from 1 to 4 meters in horizontally polarized orientation. Position the highness when the highest value is indicated on spectrum analyzer, then change the orientation of EUT on test table over a range from 0° to 360° with a speed as slow as possible, and keep the azimuth that highest emission is indicated on the spectrum analyzer. Vary the antenna position again and record the highest value as a final reading. A RF test receiver is also used to confirm emissions measured.
5. Repeat step 4 until all frequencies need to be measured were complete.
6. Repeat step 5 with search antenna in vertical polarized orientations.
7. Check the three frequencies of highest emission with varying the placement of cables associated with EUT to obtain the worse case and record the result.

Figure 1 : Frequencies measured below 1 GHz configuration

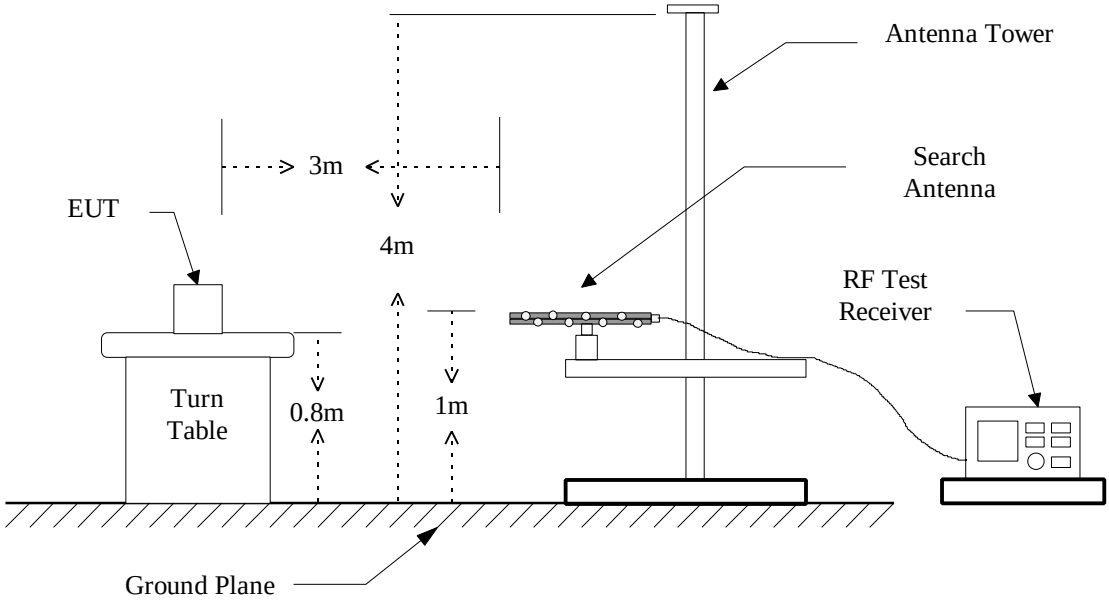
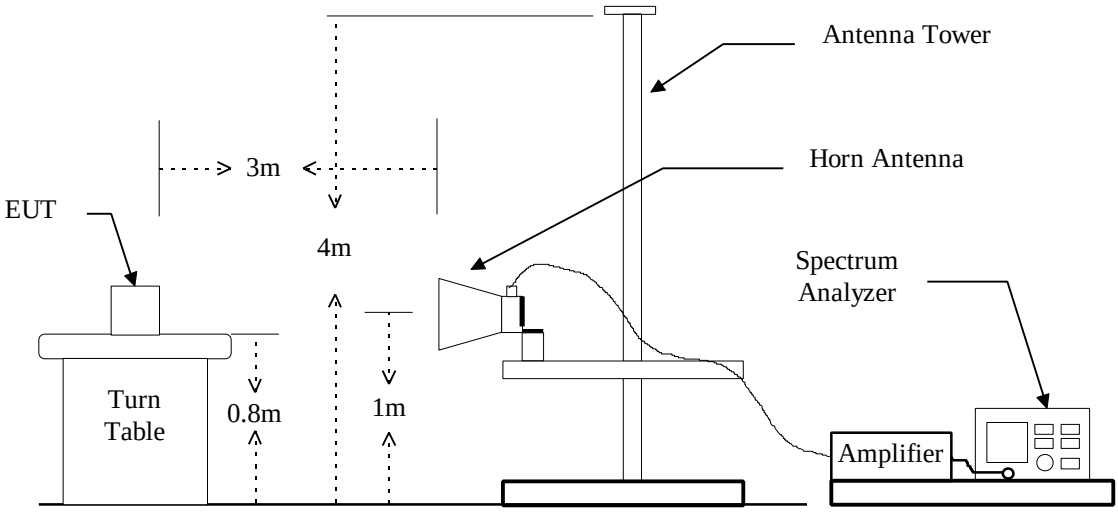


Figure 2 : Frequencies measured above 1 GHz configuration



4.3 Measuring Instrument

The following instrument are used for radiated emissions measurement:

Equipment	Manufacturer	Model No.	Next Cal. Due
Spectrum Analyzer	Rohde & Schwarz	FSP	05/31/2005
RF Test Receiver	Rohde & Schwarz	ESVS 30	08/08/2005
Horn Antenna	EMCO	3115	03/17/2005
Log periodic Antenna	EMCO	3146	10/14/2004
Biconical Antenna	EMCO	3110B	11/04/2004
Horn Antenna	EMCO	3116	05/02/2005
Amplifier	HP	83051A	03/31/2005
Preamplifier	Hewlett-Packard	8447D	10/12/2004

Measuring instrument setup in measured frequency band when specified detector function is used :

Frequency Band (MHz)	Instrument	Function	Resolution bandwidth	Video Bandwidth
30 to 1000	RF Test Receiver	Quasi-Peak	120 kHz	N/A
	Spectrum Analyzer	Peak	100 kHz	100 kHz
Above 1000	Spectrum Analyzer	Peak	1 MHz	1 MHz
	Spectrum Analyzer	Average	1 MHz	10 Hz

4.4 Radiated Emission Data

4.4.1 RF Portion(Transmitting Harmonics and Receiving Local Frequency)

Mode : Dish Antenna

A. CH 1A

Operation Mode : Transmitting
Fundamental Frequency : 5822 MHz
Test Date : Aug. 03, 2004 Temperature : 23 °C Humidity : 63 %

Frequency (MHz)	Reading (dBuV) H Peak	H Ave	V Peak	V Ave	Factor (dB) Corr.	Result @3m (dBuV/m) Peak	Result @3m (dBuV/m) Ave	Limit @3m (dBuV/m) Peak	Limit @3m (dBuV/m) Ave.	Margin (dB)	Table Deg. (Deg.)	Ant. High (m)
11644.218	63.3	---	62.1	---	-14.8	48.5	---	74.0	54.0	-5.5	63	1.4
17466.327	---	---	---	---	-9.2	---	---	74.0	54.0	---	---	---
23288.436	---	---	---	---	10.6	---	---	74.0	54.0	---	---	---
29110.545	---	---	---	---	46.8	---	---	74.0	54.0	---	---	---
34932.654	---	---	---	---	49.2	---	---	74.0	54.0	---	---	---

Operation Mode : Receiving
Fundamental Frequency : 5738 MHz
Test Date : Aug. 03, 2004 Temperature : 23 °C Humidity : 63 %

Frequency (MHz)	Reading (dBuV) H Peak	H Ave	V Peak	V Ave	Factor (dB) Corr.	Result @3m (dBuV/m) Peak	Result @3m (dBuV/m) Ave	Limit @3m (dBuV/m) Peak	Limit @3m (dBuV/m) Ave.	Margin (dB)	Table Deg. (Deg.)	Ant. High (m)
5738.196	64.1	---	63.4	---	-21.7	42.4	---	74.0	54.0	-11.6	59	1.3
11476.392	---	---	---	---	-14.8	---	---	74.0	54.0	---	---	---
17214.588	---	---	---	---	-10.8	---	---	74.0	54.0	---	---	---
22952.784	---	---	---	---	10.6	---	---	74.0	54.0	---	---	---
28690.980	---	---	---	---	46.7	---	---	74.0	54.0	---	---	---
34429.176	---	---	---	---	49.6	---	---	74.0	54.0	---	---	---

Note :

1. Item of margin shown in above table refer to average limit.
2. Remark "---" means that the emission level is too low to be measured, with a preamplifier of 35 dB.
3. Measuring data showed on above table was derived with peak detector function.
4. It is considered that the results of average comply with average limit when measuring data with a peak function detector meet the average limit. Mark "***" means that Peak result is meet average limit.
5. The expanded uncertainty of the radiated emission tests is 3.53 dB.

B. CH 1B

Operation Mode : Transmitting
Fundamental Frequency : 5738 MHz
Test Date : Aug. 03, 2004 Temperature : 23 °C Humidity : 63 %

Frequency (MHz)	Reading (dBuV) H Peak	H Ave	V Peak	V Ave	Factor (dB) Corr.	Result @3m (dBuV/m) Peak	Result @3m (dBuV/m) Ave	Limit @3m (dBuV/m) Peak	Limit @3m (dBuV/m) Ave.	Margin (dB)	Table Deg. (Deg.)	Ant. High (m)
11476.158	64.8	---	64.5	---	-14.8	50.0	---	74.0	54.0	-4.0	112	1.6
17214.237	---	---	---	---	-10.8	---	---	74.0	54.0	---	---	---
22952.316	---	---	---	---	10.6	---	---	74.0	54.0	---	---	---
28690.395	---	---	---	---	46.7	---	---	74.0	54.0	---	---	---
34428.474	---	---	---	---	49.6	---	---	74.0	54.0	---	---	---

Operation Mode : Receiving
Fundamental Frequency : 5822 MHz
Test Date : Aug. 03, 2004 Temperature : 23 °C Humidity : 63 %

Frequency (MHz)	Reading (dBuV) H Peak	H Ave	V Peak	V Ave	Factor (dB) Corr.	Result @3m (dBuV/m) Peak	Result @3m (dBuV/m) Ave	Limit @3m (dBuV/m) Peak	Limit @3m (dBuV/m) Ave.	Margin (dB)	Table Deg. (Deg.)	Ant. High (m)
5822.164	65.1	---	62.5	---	-21.6	43.5	---	74.0	54.0	-10.5	110	1.4
11644.328	---	---	---	---	-14.8	---	---	74.0	54.0	---	---	---
17466.492	---	---	---	---	-9.2	---	---	74.0	54.0	---	---	---
23288.656	---	---	---	---	10.6	---	---	74.0	54.0	---	---	---
29110.820	---	---	---	---	46.8	---	---	74.0	54.0	---	---	---
34932.984	---	---	---	---	49.2	---	---	74.0	54.0	---	---	---

Note :

1. Item of margin shown in above table refer to average limit.
2. Remark "---" means that the emission level is too low to be measured, with a preamplifier of 35 dB.
3. Measuring data showed on above table was derived with peak detector function.
4. It is considered that the results of average comply with average limit when measuring data with a peak function detector meet the average limit. Mark "***" means that Peak result is meet average limit.
5. The expanded uncertainty of the radiated emission tests is 3.53 dB.

C. CH 2A

Operation Mode : Transmitting
Fundamental Frequency : 5838 MHz
Test Date : Aug. 03, 2004 Temperature : 23 °C Humidity : 63 %

Frequency (MHz)	Reading (dBuV) H Peak	H Ave	V Peak	V Ave	Factor (dB) Corr.	Result @3m (dBuV/m) Peak	Result @3m (dBuV/m) Ave	Limit @3m (dBuV/m) Peak	Limit @3m (dBuV/m) Ave.	Margin (dB)	Table Deg. (Deg.)	Ant. High (m)
11675.982	64.7	---	63.9	---	-14.8	49.9	---	74.0	54.0	-4.1	114	1.4
17513.973	---	---	---	---	-8.9	---	---	74.0	54.0	---	---	---
23351.964	---	---	---	---	10.6	---	---	74.0	54.0	---	---	---
29189.955	---	---	---	---	46.9	---	---	74.0	54.0	---	---	---
35027.946	---	---	---	---	49.1	---	---	74.0	54.0	---	---	---

Operation Mode : Receiving
Fundamental Frequency : 5754 MHz
Test Date : Aug. 03, 2004 Temperature : 23 °C Humidity : 63 %

Frequency (MHz)	Reading (dBuV) H Peak	H Ave	V Peak	V Ave	Factor (dB) Corr.	Result @3m (dBuV/m) Peak	Result @3m (dBuV/m) Ave	Limit @3m (dBuV/m) Peak	Limit @3m (dBuV/m) Ave.	Margin (dB)	Table Deg. (Deg.)	Ant. High (m)
5754.108	65.4	---	64.2	---	-21.6	43.8	---	74.0	54.0	-10.2	104	1.4
11508.216	---	---	---	---	-14.8	---	---	74.0	54.0	---	---	---
17262.324	---	---	---	---	-10.5	---	---	74.0	54.0	---	---	---
23016.432	---	---	---	---	10.6	---	---	74.0	54.0	---	---	---
28770.540	---	---	---	---	46.8	---	---	74.0	54.0	---	---	---
34524.648	---	---	---	---	49.6	---	---	74.0	54.0	---	---	---

Note :

1. Item of margin shown in above table refer to average limit.
2. Remark "---" means that the emission level is too low to be measured, with a preamplifier of 35 dB.
3. Measuring data showed on above table was derived with peak detector function.
4. It is considered that the results of average comply with average limit when measuring data with a peak function detector meet the average limit. Mark "***" means that Peak result is meet average limit.
5. The expanded uncertainty of the radiated emission tests is 3.53 dB.

D. CH 2B

Operation Mode : Transmitting
Fundamental Frequency : 5754 MHz
Test Date : Aug. 03, 2004 Temperature : 23 °C Humidity : 63 %

Frequency (MHz)	Reading (dBuV) H Peak	H Ave	V Peak	V Ave	Factor (dB) Corr.	Result @3m (dBuV/m) Peak	Result @3m (dBuV/m) Ave	Limit @3m (dBuV/m) Peak	Limit @3m (dBuV/m) Ave.	Margin (dB)	Table Deg. (Deg.)	Ant. High (m)
11508.135	64.1	---	62.4	---	-14.8	49.3	---	74.0	54.0	-4.7	77	1.4
17262.203	---	---	---	---	-10.5	---	---	74.0	54.0	---	---	---
23016.270	---	---	---	---	10.6	---	---	74.0	54.0	---	---	---
28770.338	---	---	---	---	46.8	---	---	74.0	54.0	---	---	---
34524.405	---	---	---	---	49.6	---	---	74.0	54.0	---	---	---

Operation Mode : Receiving
Fundamental Frequency : 5838 MHz
Test Date : Aug. 03, 2004 Temperature : 23 °C Humidity : 63 %

Frequency (MHz)	Reading (dBuV) H Peak	H Ave	V Peak	V Ave	Factor (dB) Corr.	Result @3m (dBuV/m) Peak	Result @3m (dBuV/m) Ave	Limit @3m (dBuV/m) Peak	Limit @3m (dBuV/m) Ave.	Margin (dB)	Table Deg. (Deg.)	Ant. High (m)
5838.144	63.5	---	64.1	---	-21.6	42.5	---	74.0	54.0	-11.5	73	1.2
11676.288	---	---	---	---	-14.8	---	---	74.0	54.0	---	---	---
17514.432	---	---	---	---	-8.9	---	---	74.0	54.0	---	---	---
23352.576	---	---	---	---	10.6	---	---	74.0	54.0	---	---	---
29190.720	---	---	---	---	46.9	---	---	74.0	54.0	---	---	---
35028.864	---	---	---	---	49.1	---	---	74.0	54.0	---	---	---

Note :

1. Item of margin shown in above table refer to average limit.
2. Remark "---" means that the emission level is too low to be measured, with a preamplifier of 35 dB.
3. Measuring data showed on above table was derived with peak detector function.
4. It is considered that the results of average comply with average limit when measuring data with a peak function detector meet the average limit. Mark "***" means that Peak result is meet average limit.
5. The expanded uncertainty of the radiated emission tests is 3.53 dB.

Mode : Panel Antenna

A. CH 1A

Operation Mode : Transmitting
Fundamental Frequency : 5822 MHz
Test Date : Aug. 03, 2004 Temperature : 23 °C Humidity : 63 %

Frequency (MHz)	Reading (dBuV) H Peak	H Ave	V Peak	V Ave	Factor (dB) Corr.	Result @3m (dBuV/m) Peak	Result @3m (dBuV/m) Ave	Limit @3m (dBuV/m) Peak	Limit @3m (dBuV/m) Ave.	Margin (dB)	Table Deg. (Deg.)	Ant. High (m)
11644.197	64.1	---	63.1	---	-14.8	49.3	---	74.0	54.0	-4.7	63	1.4
17466.296	---	---	---	---	-9.2	---	---	74.0	54.0	---	---	---
23288.394	---	---	---	---	10.6	---	---	74.0	54.0	---	---	---
29110.493	---	---	---	---	46.8	---	---	74.0	54.0	---	---	---
34932.591	---	---	---	---	49.2	---	---	74.0	54.0	---	---	---

Operation Mode : Receiving
Fundamental Frequency : 5738 MHz
Test Date : Aug. 03, 2004 Temperature : 23 °C Humidity : 63 %

Frequency (MHz)	Reading (dBuV) H Peak	H Ave	V Peak	V Ave	Factor (dB) Corr.	Result @3m (dBuV/m) Peak	Result @3m (dBuV/m) Ave	Limit @3m (dBuV/m) Peak	Limit @3m (dBuV/m) Ave.	Margin (dB)	Table Deg. (Deg.)	Ant. High (m)
5738.146	63.9	---	63.1	---	-21.7	42.2	---	74.0	54.0	-11.8	45	1.2
11476.292	---	---	---	---	-14.8	---	---	74.0	54.0	---	---	---
17214.438	---	---	---	---	-10.8	---	---	74.0	54.0	---	---	---
22952.584	---	---	---	---	10.6	---	---	74.0	54.0	---	---	---
28690.730	---	---	---	---	46.7	---	---	74.0	54.0	---	---	---
34428.876	---	---	---	---	49.6	---	---	74.0	54.0	---	---	---

Note :

1. Item of margin shown in above table refer to average limit.
2. Remark "---" means that the emission level is too low to be measured, with a preamplifier of 35 dB.
3. Measuring data showed on above table was derived with peak detector function.
4. It is considered that the results of average comply with average limit when measuring data with a peak function detector meet the average limit. Mark "***" means that Peak result is meet average limit.
5. The expanded uncertainty of the radiated emission tests is 3.53 dB.

B. CH 1B

Operation Mode : Transmitting
Fundamental Frequency : 5738 MHz
Test Date : Aug. 03, 2004 Temperature : 23 °C Humidity : 63 %

Frequency (MHz)	Reading (dBuV) H Peak	H Ave	V Peak	V Ave	Factor (dB) Corr.	Result @3m (dBuV/m) Peak	Result @3m (dBuV/m) Ave	Limit @3m (dBuV/m) Peak	Limit @3m (dBuV/m) Ave.	Margin (dB)	Table Deg. (Deg.)	Ant. High (m)
11476.162	64.3	---	63.9	---	-14.8	49.5	---	74.0	54.0	-4.5	102	1.5
17214.243	---	---	---	---	-10.8	---	---	74.0	54.0	---	---	---
22952.324	---	---	---	---	10.6	---	---	74.0	54.0	---	---	---
28690.405	---	---	---	---	46.7	---	---	74.0	54.0	---	---	---
34428.486	---	---	---	---	49.6	---	---	74.0	54.0	---	---	---

Operation Mode : Receiving
Fundamental Frequency : 5822 MHz
Test Date : Aug. 03, 2004 Temperature : 23 °C Humidity : 63 %

Frequency (MHz)	Reading (dBuV) H Peak	H Ave	V Peak	V Ave	Factor (dB) Corr.	Result @3m (dBuV/m) Peak	Result @3m (dBuV/m) Ave	Limit @3m (dBuV/m) Peak	Limit @3m (dBuV/m) Ave.	Margin (dB)	Table Deg. (Deg.)	Ant. High (m)
5822.113	64.2	---	63.4	---	-21.6	42.6	---	74.0	54.0	-11.4	165	1.2
11644.226	---	---	---	---	-14.8	---	---	74.0	54.0	---	---	---
17466.339	---	---	---	---	-9.2	---	---	74.0	54.0	---	---	---
23288.452	---	---	---	---	10.6	---	---	74.0	54.0	---	---	---
29110.565	---	---	---	---	46.8	---	---	74.0	54.0	---	---	---
34932.678	---	---	---	---	49.2	---	---	74.0	54.0	---	---	---

Note :

1. Item of margin shown in above table refer to average limit.
2. Remark "---" means that the emission level is too low to be measured, with a preamplifier of 35 dB.
3. Measuring data showed on above table was derived with peak detector function.
4. It is considered that the results of average comply with average limit when measuring data with a peak function detector meet the average limit. Mark "***" means that Peak result is meet average limit.
5. The expanded uncertainty of the radiated emission tests is 3.53 dB.

C. CH 2A

Operation Mode : Transmitting
Fundamental Frequency : 5838 MHz
Test Date : Aug. 03, 2004 Temperature : 23 °C Humidity : 63 %

Frequency	Reading (dBuV)				Factor	Result @3m (dBuV/m)		Limit @3m (dBuV/m)		Margin	Table	Ant.
	H		V		(dB)	Peak	Ave	Peak	Ave.	(dB)	Deg.	High
(MHz)	Peak	Ave	Peak	Ave	Corr.						(Deg.)	(m)
11675.017	64.5	---	63.2	---	-14.8	49.7	---	74.0	54.0	-4.3	98	1.4
17512.526	---	---	---	---	-8.9	---	---	74.0	54.0	---	---	---
23350.034	---	---	---	---	10.6	---	---	74.0	54.0	---	---	---
29187.543	---	---	---	---	46.9	---	---	74.0	54.0	---	---	---
35025.051	---	---	---	---	49.1	---	---	74.0	54.0	---	---	---

Operation Mode : Receiving
Fundamental Frequency : 5754 MHz
Test Date : Aug. 03, 2004 Temperature : 23 °C Humidity : 63 %

Frequency	Reading (dBuV)				Factor	Result @3m (dBuV/m)		Limit @3m (dBuV/m)		Margin	Table	Ant.
	H		V		(dB)	Peak	Ave	Peak	Ave.	(dB)	Deg.	High
(MHz)	Peak	Ave	Peak	Ave	Corr.						(Deg.)	(m)
5754.123	64.8	---	63.4	---	-21.6	43.2	---	74.0	54.0	-10.8	109	1.2
11508.246	---	---	---	---	-14.8	---	---	74.0	54.0	---	---	---
17262.369	---	---	---	---	-10.5	---	---	74.0	54.0	---	---	---
23016.492	---	---	---	---	10.6	---	---	74.0	54.0	---	---	---
28770.615	---	---	---	---	46.8	---	---	74.0	54.0	---	---	---
34524.738	---	---	---	---	49.6	---	---	74.0	54.0	---	---	---

Note :

1. Item of margin shown in above table refer to average limit.
2. Remark "---" means that the emission level is too low to be measured, with a preamplifier of 35 dB.
3. Measuring data showed on above table was derived with peak detector function.
4. It is considered that the results of average comply with average limit when measuring data with a peak function detector meet the average limit. Mark "***" means that Peak result is meet average limit.
5. The expanded uncertainty of the radiated emission tests is 3.53 dB.

D. CH 2B

Operation Mode : Transmitting
Fundamental Frequency : 5754 MHz
Test Date : Aug. 03, 2004 Temperature : 23 °C Humidity : 63 %

Frequency (MHz)	Reading (dBuV) H Peak	H Ave	V Peak	V Ave	Factor (dB) Corr.	Result @3m (dBuV/m) Peak	Result @3m (dBuV/m) Ave	Limit @3m (dBuV/m) Peak	Limit @3m (dBuV/m) Ave.	Margin (dB)	Table Deg. (Deg.)	Ant. High (m)
11508.155	64.5	---	63.8	---	-14.8	49.7	---	74.0	54.0	-4.3	83	1.5
17262.233	---	---	---	---	-10.5	---	---	74.0	54.0	---	---	---
23016.310	---	---	---	---	10.6	---	---	74.0	54.0	---	---	---
28770.388	---	---	---	---	46.8	---	---	74.0	54.0	---	---	---
34524.465	---	---	---	---	49.6	---	---	74.0	54.0	---	---	---

Operation Mode : Receiving
Fundamental Frequency : 5838 MHz
Test Date : Aug. 03, 2004 Temperature : 23 °C Humidity : 63 %

Frequency (MHz)	Reading (dBuV) H Peak	H Ave	V Peak	V Ave	Factor (dB) Corr.	Result @3m (dBuV/m) Peak	Result @3m (dBuV/m) Ave	Limit @3m (dBuV/m) Peak	Limit @3m (dBuV/m) Ave.	Margin (dB)	Table Deg. (Deg.)	Ant. High (m)
5838.102	63.5	---	64.1	---	-21.6	42.5	---	74.0	54.0	-11.5	73	1.2
11676.204	---	---	---	---	-14.8	---	---	74.0	54.0	---	---	---
17514.306	---	---	---	---	-8.9	---	---	74.0	54.0	---	---	---
23352.408	---	---	---	---	10.6	---	---	74.0	54.0	---	---	---
29190.510	---	---	---	---	46.9	---	---	74.0	54.0	---	---	---
35028.612	---	---	---	---	49.1	---	---	74.0	54.0	---	---	---

Note :

1. Item of margin shown in above table refer to average limit.
2. Remark "---" means that the emission level is too low to be measured, with a preamplifier of 35 dB.
3. Measuring data showed on above table was derived with peak detector function.
4. It is considered that the results of average comply with average limit when measuring data with a peak function detector meet the average limit. Mark "***" means that Peak result is meet average limit.
5. The expanded uncertainty of the radiated emission tests is 3.53 dB.

4.4.2 Other Emission

a) Emission frequencies below 1 GHz

Test Date : Aug. 03, 2004 Temperature : 23 °C Humidity : 63 %

Frequency (MHz)	Ant-Pol H/V	Meter Reading (dBuV)	Corrected Factor (dB)	Result @3m (dBuV/m)	Limit @3m (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (m)
61.860	V	47.3	-16.3	31.0	40.0	-9.0	96	1.0
79.410	V	51.3	-15.1	36.2	40.0	-3.8	104	1.0
172.560	H	50.2	-9.0	41.2	43.5	-2.3	54	4.0
452.600	V	42.3	-5.5	36.8	46.0	-9.2	98	1.2
701.800	H	42.4	-1.0	41.4	46.0	-4.6	112	1.8
834.100	H	39.0	1.8	40.8	46.0	-5.2	64	2.2

Note :

1. Remark "---" means that the emission level is too low to be measured.
2. The expanded uncertainty of the radiated emission tests is 3.53 dB.

b) Emission frequencies above 1 GHz

Radiated emission frequencies above 1 GHz to 40 GHz were too low to be measured with a pre-amplifier of 35 dB.

4.5 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor, High Pass Filter Loss(if used) and Cable Loss, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation calculation is as follows:

Result = Reading + Corrected Factor

where Corrected Factor

= Antenna FACTOR + Cable Loss + High Pass Filter Loss - Amplifier Gain

4.6 Photos of Radiation Measuring Setup

Mode : Dish Antenna

Mode : Panel Antenna

5 CONDUCTED EMISSION MEASUREMENT

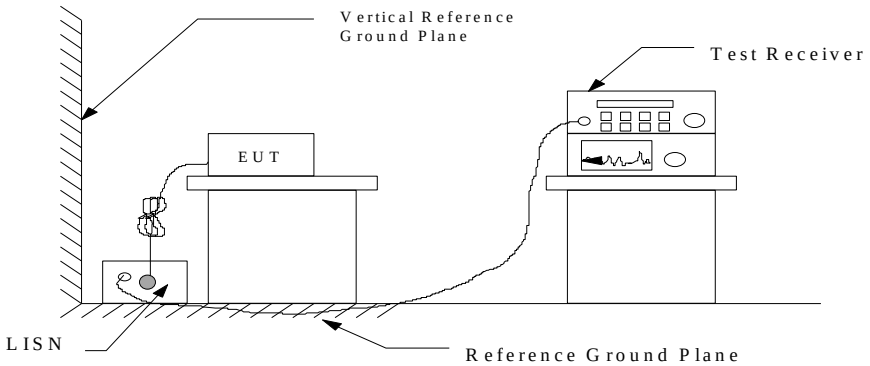
5.1 Standard Applicable

For unintentional and intentional device, Line Conducted Emission Limits are in accordance to §15.107(a) and §15.207(a) respectively.

5.2 Measurement Procedure

1. Setup the configuration per figure 3.
2. A preliminary scan with a spectrum monitor is performed to identify the frequency of emission that has the highest amplitude relative to the limit by operating the EUT in selected modes of operation, typical cable positions, and with a typical system configuration.
3. Record the 6 or 8 highest emissions relative to the limit.
4. Measure each frequency obtained from step 3 by a test receiver set on quasi peak detector function, and then record the accuracy frequency and emission level. If all emissions measured in the specified band are attenuated more than 20 dB from the limit, this step would be ignored, and the peak detector function would be used.
5. Confirm the highest three emissions with variation of the EUT cable configuration and record the final data.
6. Repeat all above procedures on measuring each operation mode of EUT.

Figure 3 : Conducted emissions measurement configuration



5.3 Conducted Emission Data

Fundamental Frequency : CH 1A ; CH 1B

Test Date : Aug. 03, 2004 Temperature : 23 °C Humidity : 63 %

Freq.	**Meter Reading** (dBµV)				**Factor**	**Limit** (dBµV)		**Result** (dBµV)			
	Q.P Value		AVG. Value			Q.P	AVG.	Q.P Value		AVG. Value	
(MHz)	N	L1	N	L1	(dB)	Value	Value	N	L1	N	L1
6.167	39.9	39.2	----	----	0.7	60.0	50.0	40.6	39.9	----	----
9.070	32.2	40.0	----	----	0.8	60.0	50.0	33.0	40.8	----	----
9.156	31.6	39.5	----	----	0.8	60.0	50.0	32.4	40.3	----	----
9.246	31.8	36.7	----	----	0.8	60.0	50.0	32.6	37.5	----	----
11.726	33.1	37.9	----	----	0.9	60.0	50.0	34.0	38.8	----	----
14.718	33.2	34.8	----	----	1.1	60.0	50.0	34.3	35.9	----	----

Fundamental Frequency : CH 1A ; CH 2B

Test Date : Aug. 03, 2004 Temperature : 23 °C Humidity : 63 %

Freq.	**Meter Reading** (dBµV)				**Factor**	**Limit** (dBµV)		**Result** (dBµV)			
	Q.P Value		AVG. Value			Q.P	AVG.	Q.P Value		AVG. Value	
(MHz)	N	L1	N	L1	(dB)	Value	Value	N	L1	N	L1
0.169	38.2	44.9	----	----	0.2	65.0	55.0	38.4	45.1	----	----
0.259	30.7	32.3	----	----	0.2	61.5	51.5	30.9	32.5	----	----
3.968	30.9	41.4	----	----	0.6	56.0	46.0	31.5	42.0	----	----
6.210	40.0	40.1	----	----	0.7	60.0	50.0	40.7	40.8	----	----
6.816	46.9	38.1	----	----	0.7	60.0	50.0	47.6	38.8	----	----
12.593	45.6	37.9	----	----	1.0	60.0	50.0	46.6	38.9	----	----

Note : 1. Please see appendix 1 for Plotted Data

2. The expanded uncertainty of the conducted emission tests is 2.45 dB.

5.4 Result Data Calculation

The result data is calculated by adding the LISN Factor to the measured reading. The basic equation with a sample calculation is as follows:

RESULT = READING + LISN FACTOR

Assume a receiver reading of 22.5 dBμV is obtained, and LISN Factor is 0.1 dB, then the total of disturbance voltage is 22.6 dBμV.

RESULT = 22.5 + 0.1 = 22.6 dBμV
Level in μV = Common Antilogarithm[(22.6 dBμV)/20]
= 13.48 μV

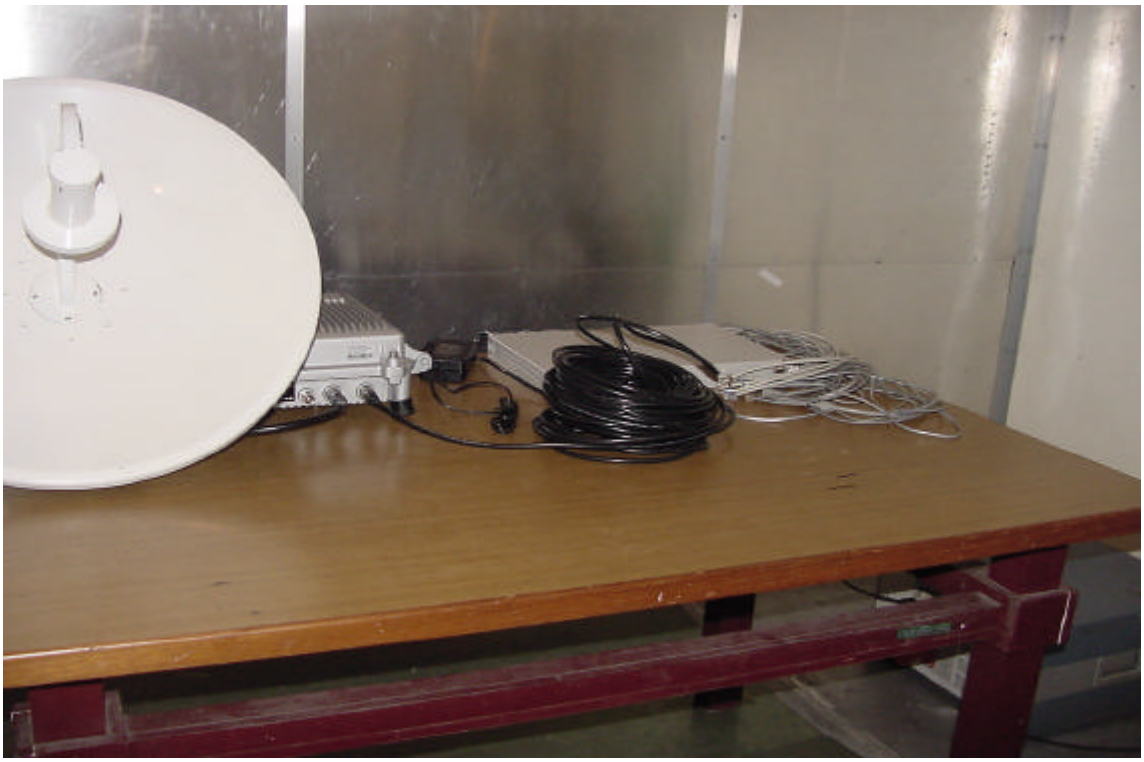
5.5 Conducted Measurement Equipment

The following test equipment are used during the conducted test.

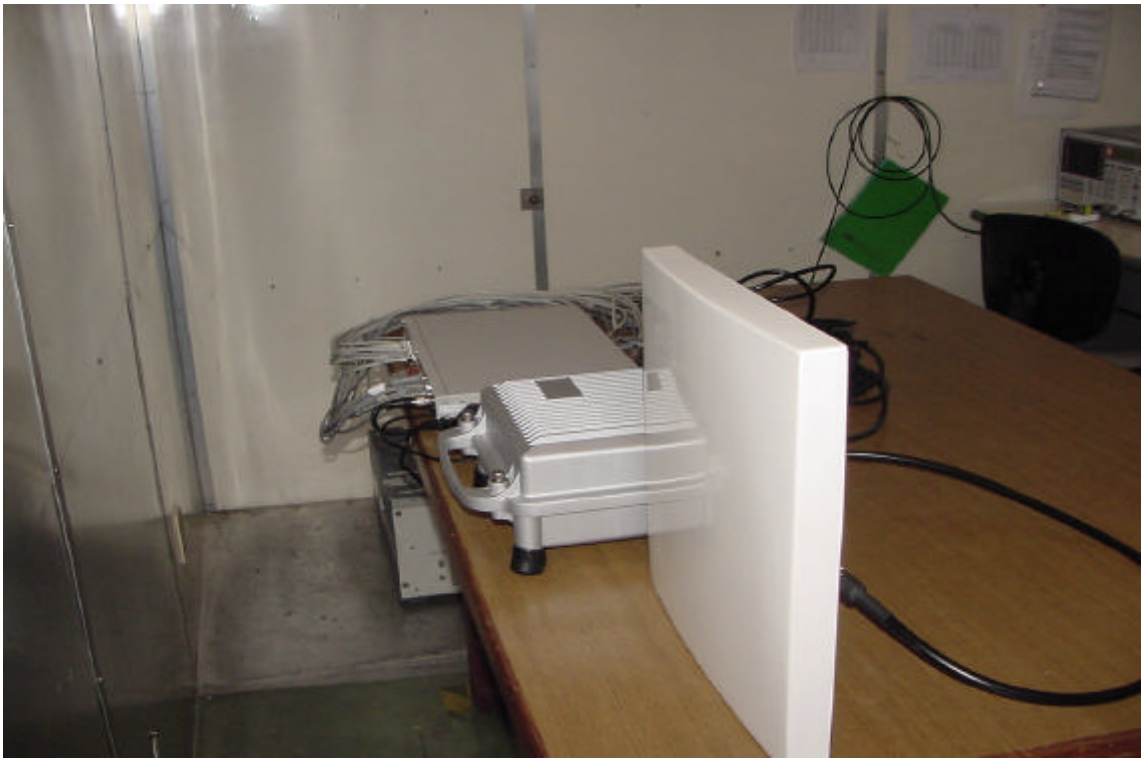
Equipment	Manufacturer	Model No.	Serial No.	Nest Cal. Date
EMI Test Receiver	Rohde and Schwarz	ESCS30	830986/026	12/01/2004
Line Impedance Stabilization network	Rohde and Schwarz	ESH2-Z5	881362/009	09/20/2004
Line Impedance Stabilization network	Kyoritsu	KNW-407	8-823-6	12/24/2004
Shielded Room	Riken	----	----	N/A
Monitor	IBM	E54	----	N/A
Printer	HP	LASERJET 1000	----	N/A
Computer	ACER	Veriton 7500G	----	N/A

5.6 Photos of Conduction Measuring Setup

Mode : Dish Antenna



Mode : Panel Antenna



6.1 Standard Applicable

According to §15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

According to 15.247(b)(4), except as shown in paragraphs (b)(4)(i), (ii), and (iii) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the peak output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

According to 15.247(b)(4)(ii), systems operating in the 5725-5850 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter peak output power.

6.2 Antenna Construction

The antenna terminal of this unit is designed with a Female N-Type Connector. Please see construction Photos Of Exhibit B for details.

Antenna used:

Antenna Model	Antenna type	Antenna Gain (dBi)
KBNT5828-25	5.8GHz Solid Dish Antenna	28.5
KBNT5822-16	5.8GHz Panel Antenna	22

7 EMISSION BANDWIDTH MEASUREMENT

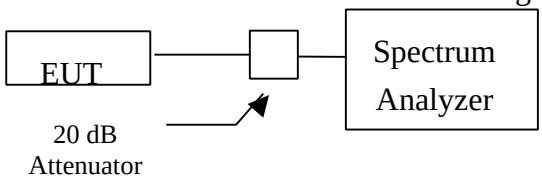
7.1 Standard Applicable

According to 15.247(a)(2), systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

7.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT as shown in figure 4 without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 6 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

Figure 4: Emission bandwidth measurement configuration.



7.3 Measurement Equipment

Equipment	Manufacturer	Model No.	Next Cal. Due
Spectrum Analyzer	Rohde & Schwarz	FSP	05/31/2005

7.4 Measurement Data

Test Date : Aug. 03, 2004 Temperature : 23 °C Humidity : 63 %

a) CH1A:5822MHz : 6 dB Emission Bandwidth is 11.298 MHz
b) CH1B:5738MHz : 6 dB Emission Bandwidth is 11.06 MHz
c) CH2A:5838MHz : 6 dB Emission Bandwidth is 11.14 MHz
d) CH2B:5754MHz : 6 dB Emission Bandwidth is 10.89 MHz

Note : 1. Please see appendix 2 for Plotted Data

2. The expanded uncertainty of the emission bandwidth tests is 1500Hz.

8 OUTPUT POWER MEASUREMENT

8.1 Standard Applicable

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands, according to 15.247(b)(3), the maximum peak output power of the transmitter shall not exceed 1 Watt.

According to 15.247(b)(4), except as shown in paragraphs (b)(4)(i), (ii), and (iii) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the peak output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

According to 15.247(b)(4)(ii), systems operating in the 5725-5850 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter peak output power.

8.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT as shown in figure 4 without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
3. Set RBW of spectrum analyzer to 1 MHz and VBW = RBW.
4. Use channel power function and record the level displayed.
5. Repeat above procedures until all frequencies measured were complete.

8.3 Measurement Equipment

Equipment	Manufacturer	Model No.	Next Cal. Due
Spectrum Analyzer	Rohde & Schwarz	FSP	05/31/2005

8.4 Measurement Data

The directional gain of the antenna used is 26.0 dBi(max). According to 15.247(b)(4)(ii), the maximum peak output power doesn't need to be reduced.

Test Date : Aug. 03, 2004 Temperature : 23 °C Humidity : 63 %

a) CH1A:5822MHz : Output Peak Power is 21.41 dBm or **138.357** mW
b) CH1B:5738MHz : Output Peak Power is 22.42 dBm or **174.582** mW
c) CH2A:5838MHz : Output Peak Power is 21.91 dBm or **155.239** mW
d) CH2B:5754MHz : Output Peak Power is 21.46 dBm or **139.959** mW

Note : 1. Please see appendix 3 for Plotted Data
2. The expanded uncertainty of the output power tests is 2dB.

8.5 Output Power Test Setup Photo

9 100 kHz BANDWIDTH OF BAND EDGES MEASUREMENT

9.1 Standard Applicable

According to 15.247(c), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

9.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT as shown in figure 4 without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
3. Set RBW of spectrum analyzer to 100kHz and VBW = RBW with a convenient frequency span including 100kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

9.3 Measurement Equipment

Equipment	Manufacturer	Model No.	Next Cal. Due
Spectrum Analyzer	Rohde & Schwarz	FSP	05/31/2005

9.4 Measurement Data

Test Date : Aug. 03, 2004 Temperature : 23 °C Humidity : 63 %

a) Lower Band Edge : maximum value is – 17.23 dBm that is attenuated more than 20 dB
b) Upper Band Edge : maximum value is – 16.85 dBm that is attenuated more than 20 dB

Note : 1. Please see appendix 4 for Plotted Data

2. The expanded uncertainty of the 100 khz bandwidth of band edges tests is 2dB.

10 POWER DENSITY MEASUREMENT

10.1 Standard Applicable

According to 15.247(d), for digitally modulated systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

10.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT as shown in figure 4 without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set EUT to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
3. Adjust the center frequency of spectrum analyzer on highest level appearing on spectral display within a 300 kHz frequency span.
4. Set the spectrum analyzer with RBW = 3 kHz and VBW = RBW as well as max hold function.
5. Repeat above procedures until all measured frequencies were complete.

10.3 Measurement Equipment

Equipment	Manufacturer	Model No.	Next Cal. Due
Spectrum Analyzer	Rohde & Schwarz	FSP	05/31/2005

10.4 Measurement Data

Test Date : Aug. 03, 2004 Temperature : 23 °C Humidity : 63 %

a) CH1A:5822MHz : Maximum Power Density of 3 kHz Bandwidth is 0.24 dBm
b) CH1B:5738MHz : Maximum Power Density of 3 kHz Bandwidth is -1.56 dBm
c) CH2A:5838MHz : Maximum Power Density of 3 kHz Bandwidth is 0.80 dBm
d) CH2B:5754MHz : Maximum Power Density of 3 kHz Bandwidth is -2.02 dBm

Note : 1. Please see appendix 5 for Plotted Data

2. The expanded uncertainty of the power density tests is 2dB.

11 OUT-OF-BAND CONDUCTED EMISSION MEASUREMENT

11.1 Standard Applicable

According to 15.247(c), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required.

11.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT as shown in figure 4 without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
3. Use the following spectrum analyzer settings:
   Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic. Typically, several plots are required to cover this entire span.
   RBW = 100 kHz
   VBW ≥ RBW
   Sweep = auto
   Detector function = peak
   Trace = max hold.
4. Allow the trace to stabilize. Set the marker on the peak of any spurious emission recorded. Plot the result on the screen of spectrum analyzer.
5. Repeat above procedures until all measured frequencies were complete.

11.3 Measurement Equipment

Equipment	Manufacturer	Model No.	Next Cal. Due
Spectrum Analyzer	Rohde & Schwarz	FSP	05/31/2005

11.4 Measurement Data

Test Date : Aug. 03, 2004 Temperature : 23 °C Humidity : 63 %

a) 1 GHz to 20 GHz frequency band: All emissions are attenuated more than 20dB from the carrier.
b) 20 GHz to 40 GHz frequency band: All emissions are attenuated more than 20dB from the carrier.

Note : 1. Please see appendix 8 for Plotted Data

2. The expanded uncertainty of the out-of-band conducted emission tests is 2dB.

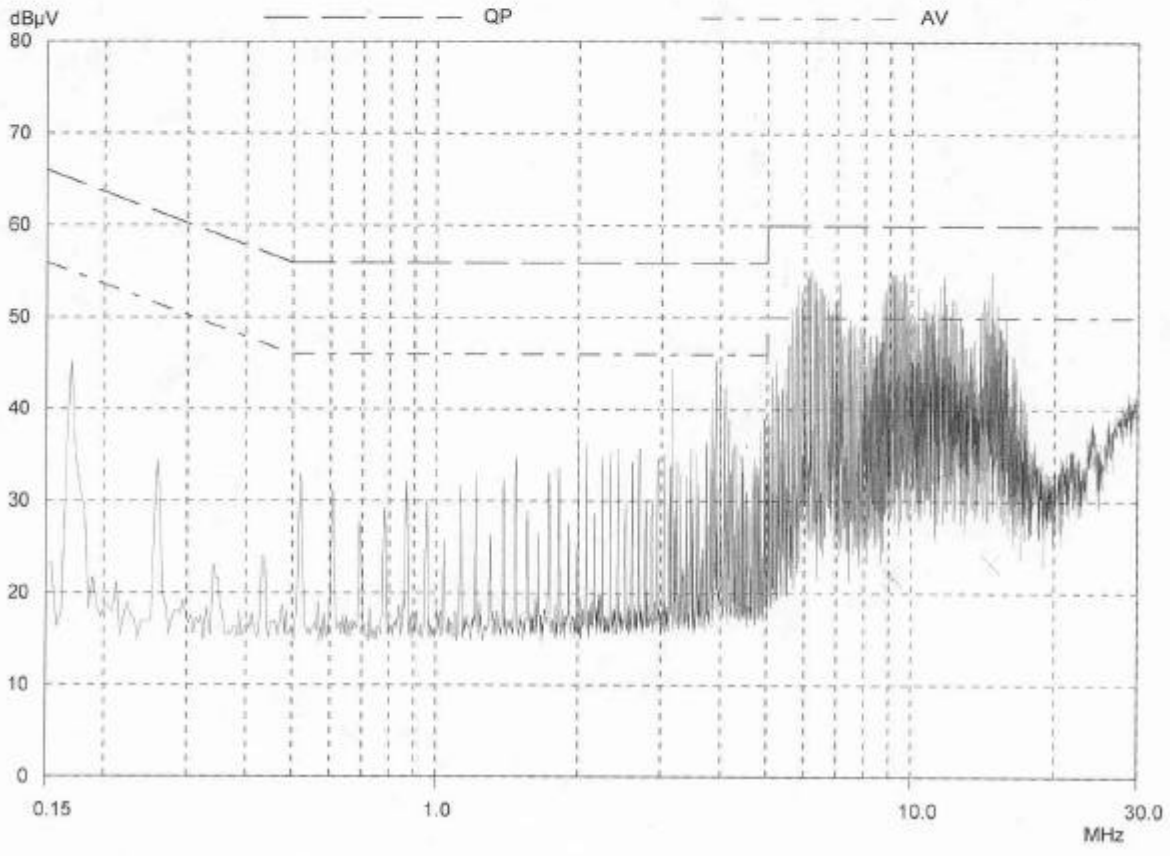
Appendix 1 : Plotted Data of Power Line Conducted Emissions

CONDUCTION EMISSION TEST

Peak Value

EUT:	SL5113R
Manuf:	
Op Cond:	A1 B1
Operator:	
Test Spec:	
Comment:	
	N

Final Measurement:	Detector:	X QP
	Meas Time:	1sec
	Peaks:	8
	Acc Margin:	25 dB

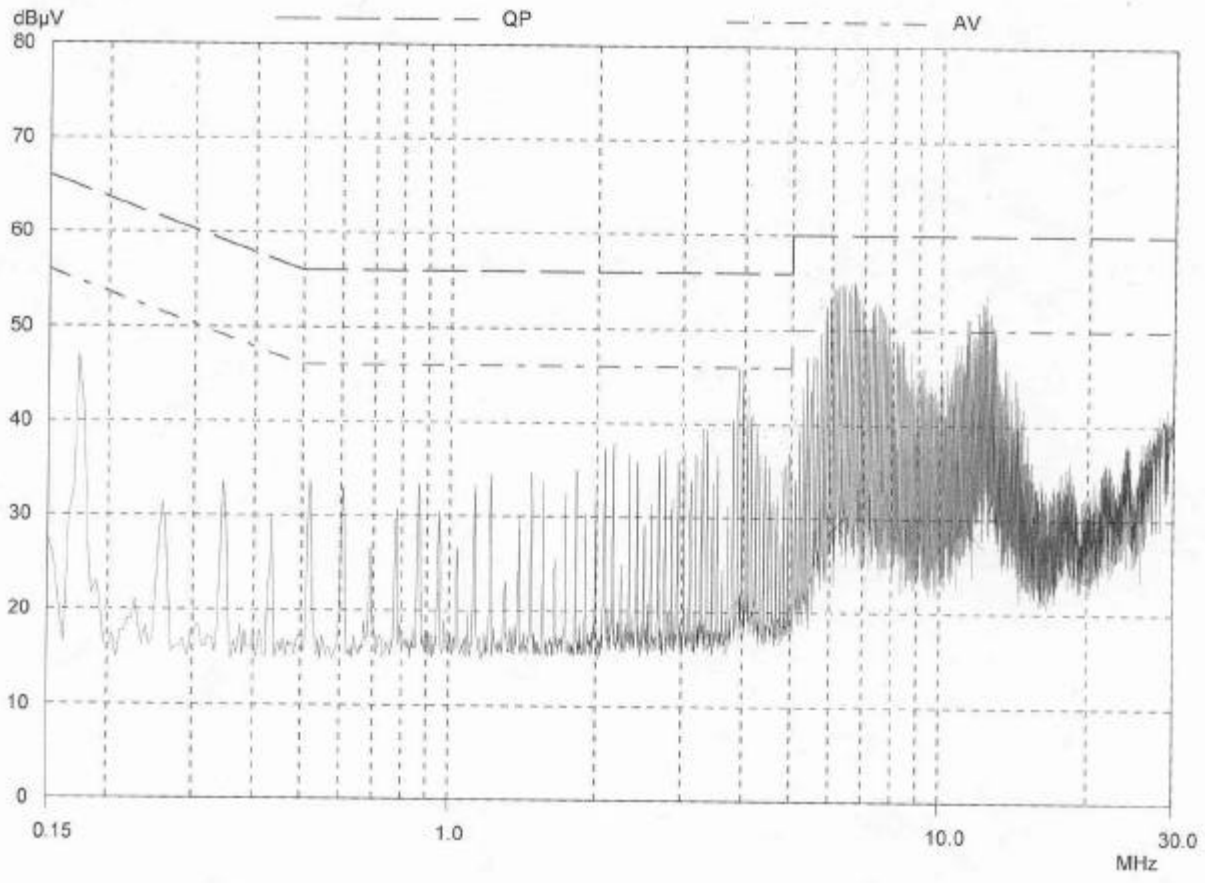


CONDUCTION EMISSION TEST

Peak Value

EUT:	SL5113R
Manuf:	
Op Cond:	A1 B1
Operator:	
Test Spec:	
Comment:	
	L1

Final Measurement:	Detector:	X QP
	Meas Time:	1sec
	Peaks:	8
	Acc Margin:	25 dB

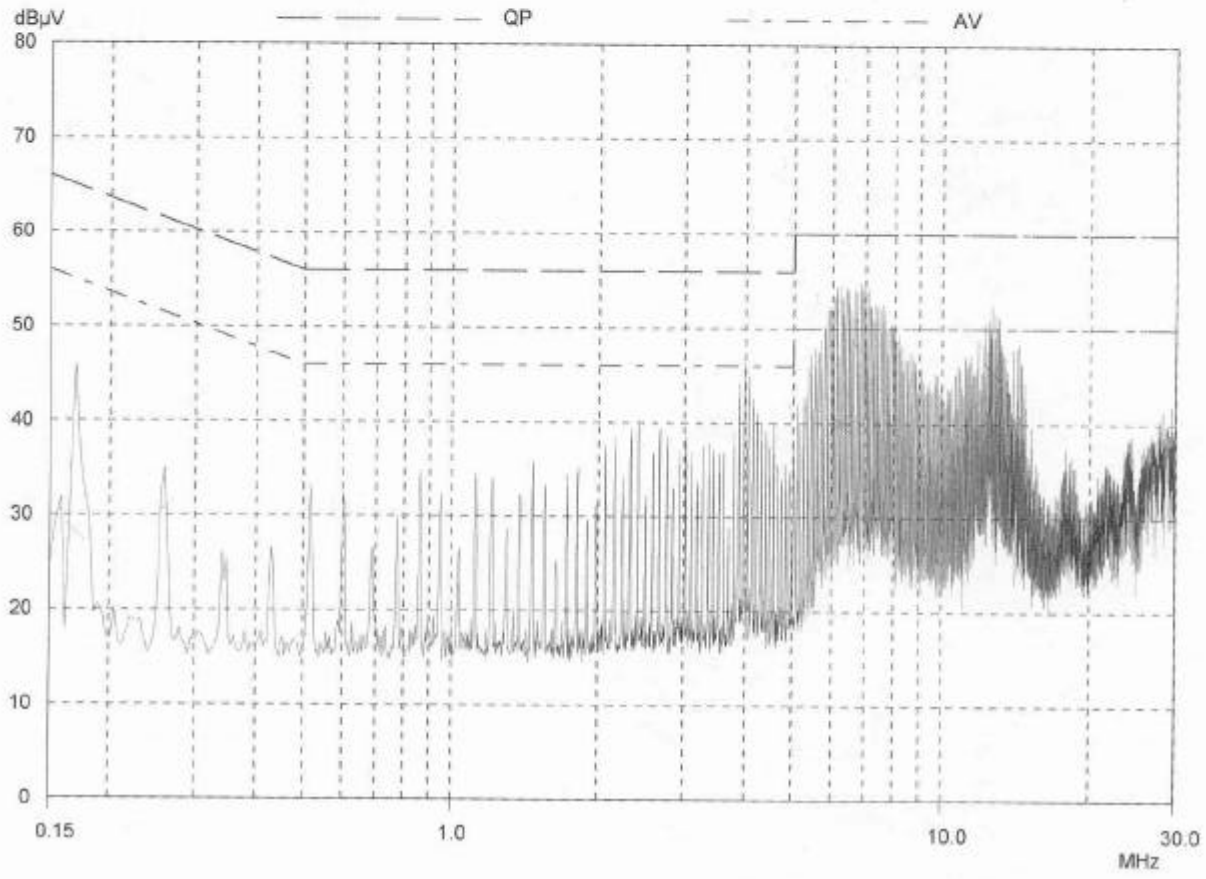


CONDUCTION EMISSION TEST

Peak Value

EUT:	SL5113R
Manuf:	
Op Cond:	A2 B2
Operator:	
Test Spec:	
Comment:	
	N

Final Measurement:	Detector:	X QP
	Meas Time:	1sec
	Peaks:	8
	Acc Margin:	25 dB

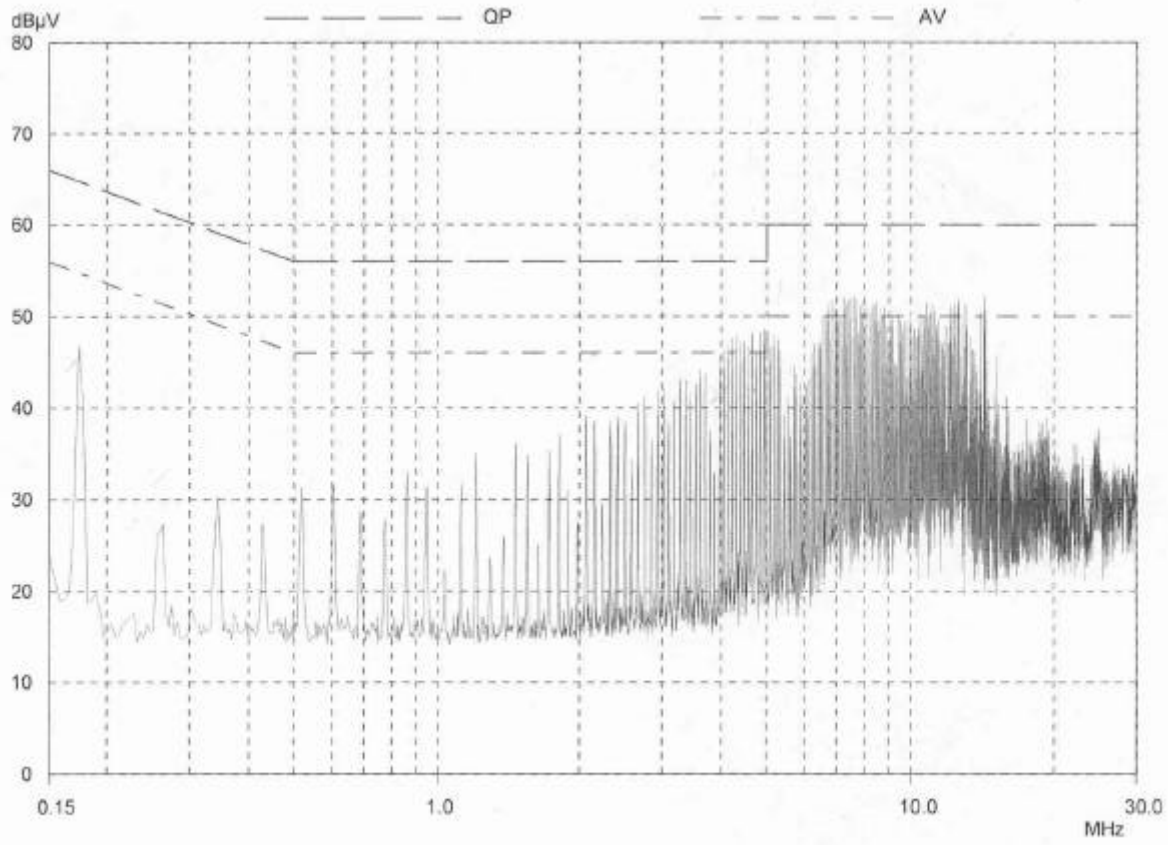


CONDUCTION EMISSION TEST

Peak Value

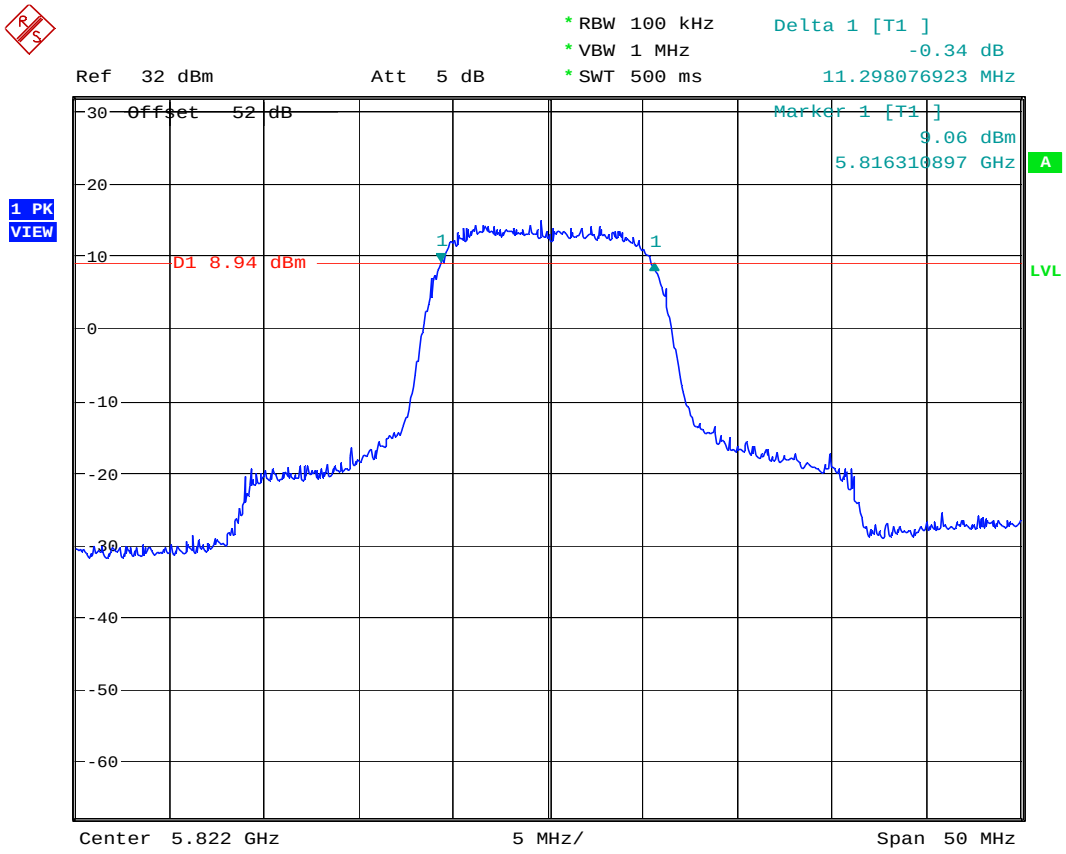
EUT: SL5113R
Manuf:
Op Cond: A2 B2
Operator:
Test Spec:
Comment:
L1

Final Measurement: Detector: X QP
Meas Time: 1sec
Peaks: 8
Acc Margin: 25 dB



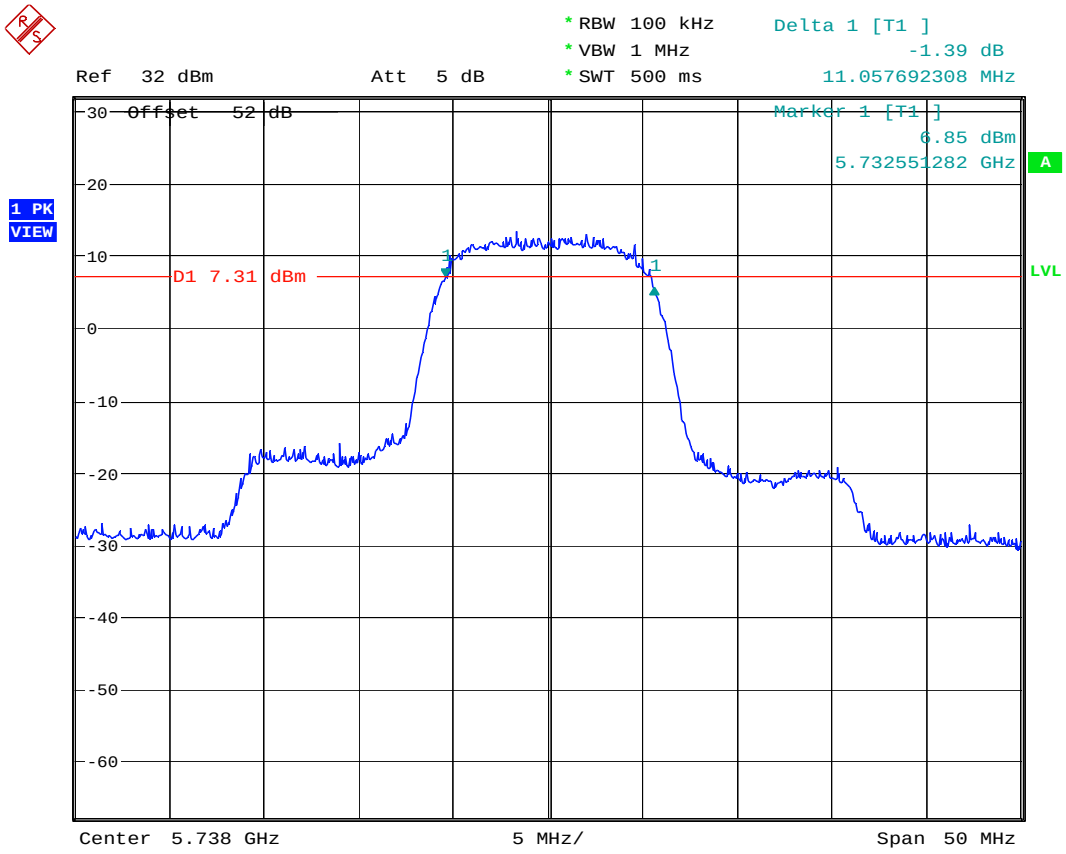
Appendix 2 : Plotted Data of Emissions Bandwidth

A、 CH 1A：5822MHz



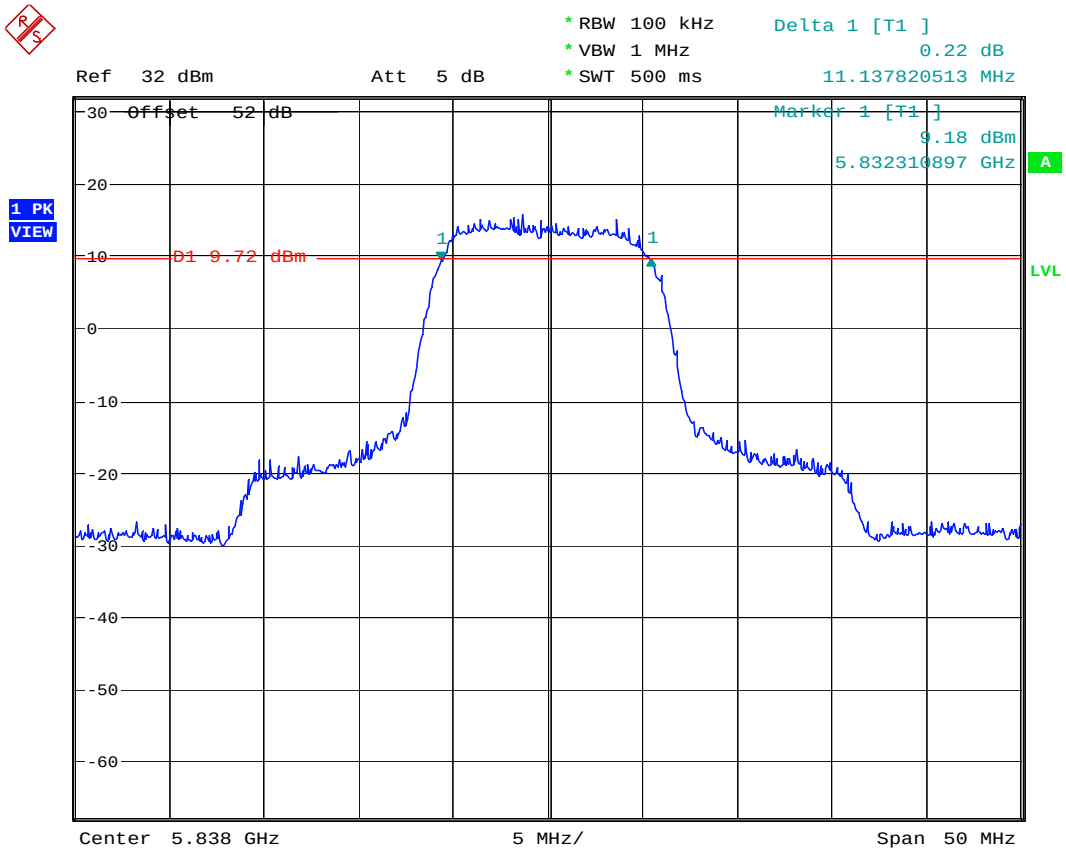
Date: 3.AUG.2004 13:46:13

B、 CH 1B：5738MHz



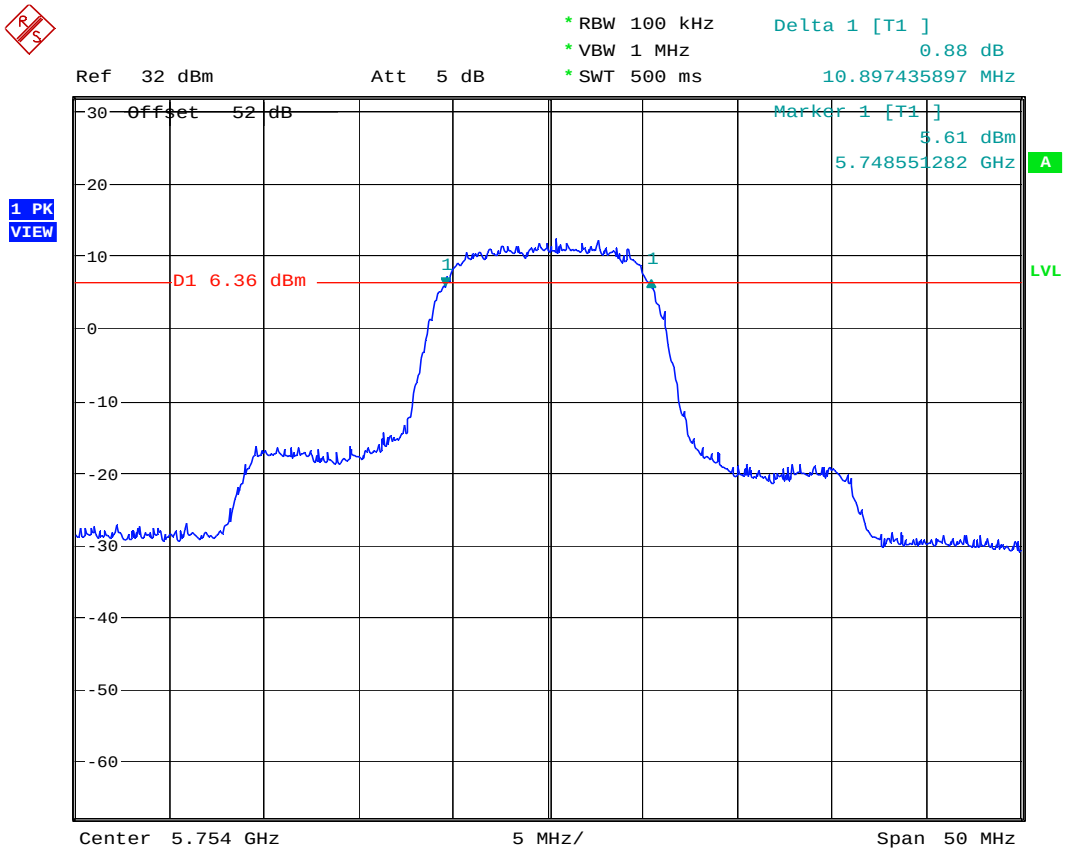
Date: 3.AUG.2004 13:01:41

C、CH 2A:5838MHz



Date: 3.AUG.2004 13:57:47

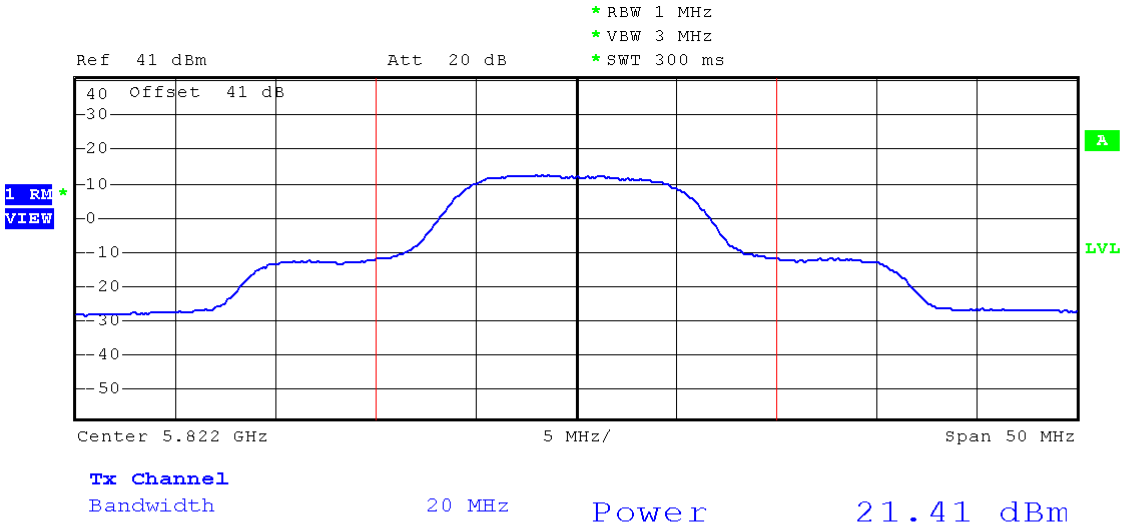
D、 CH 2B：5754MHz



Date: 3.AUG.2004 13:17:47

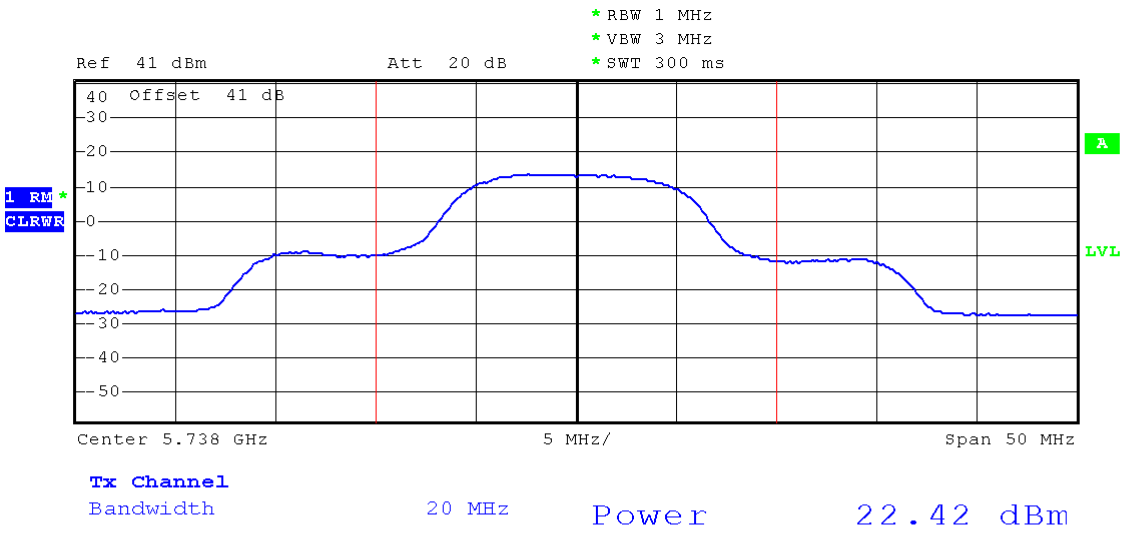
Appendix 3 : Plotted Data of Output Peak Power

A、 CH 1A：5822MHz



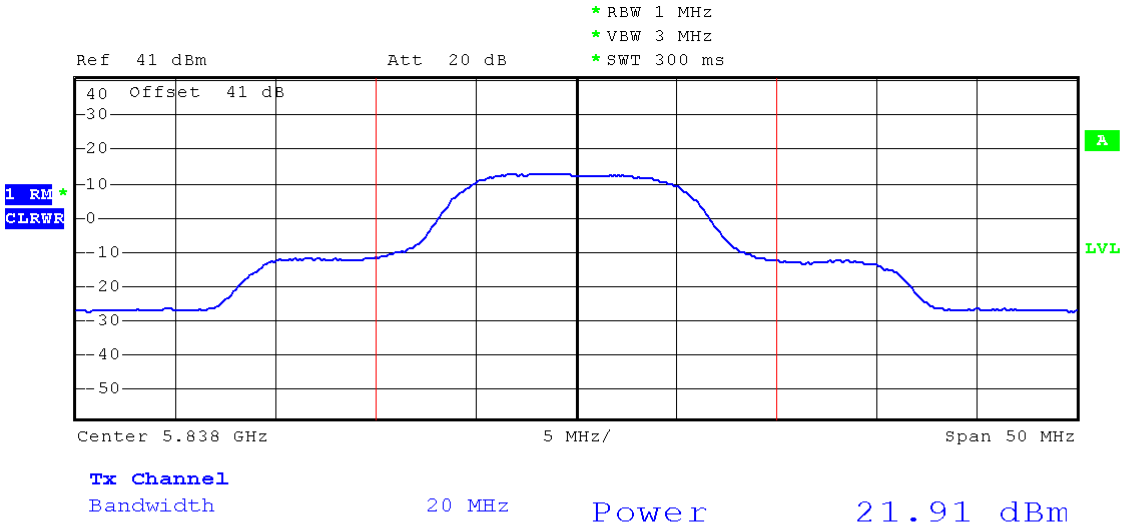
Date: 29.OCT.2004 12:53:18

B、 CH 1B：5738MHz



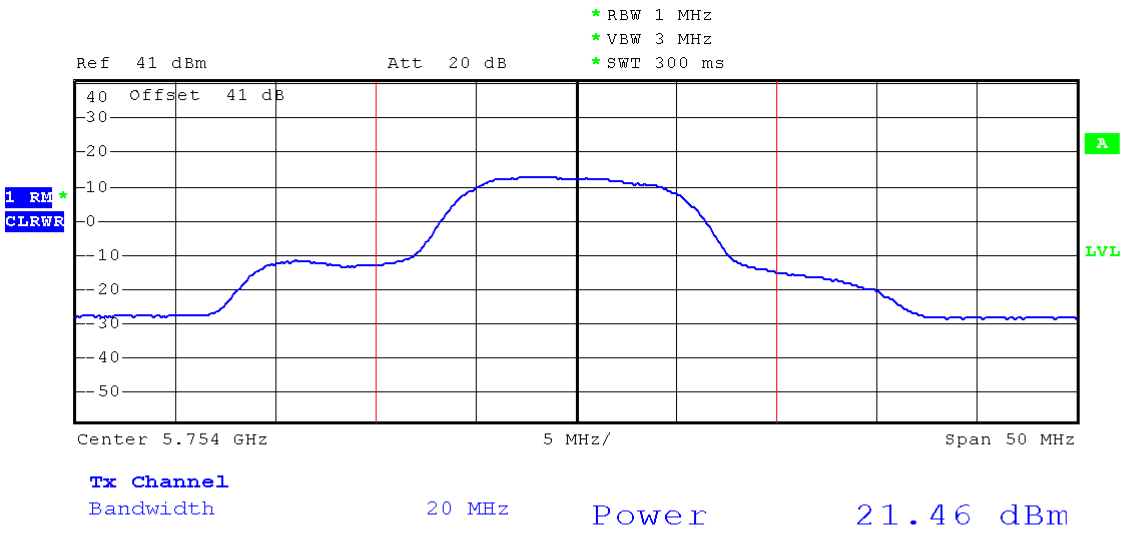
Date: 29.OCT.2004 12:56:41

C、 CH 2A：5838MHz



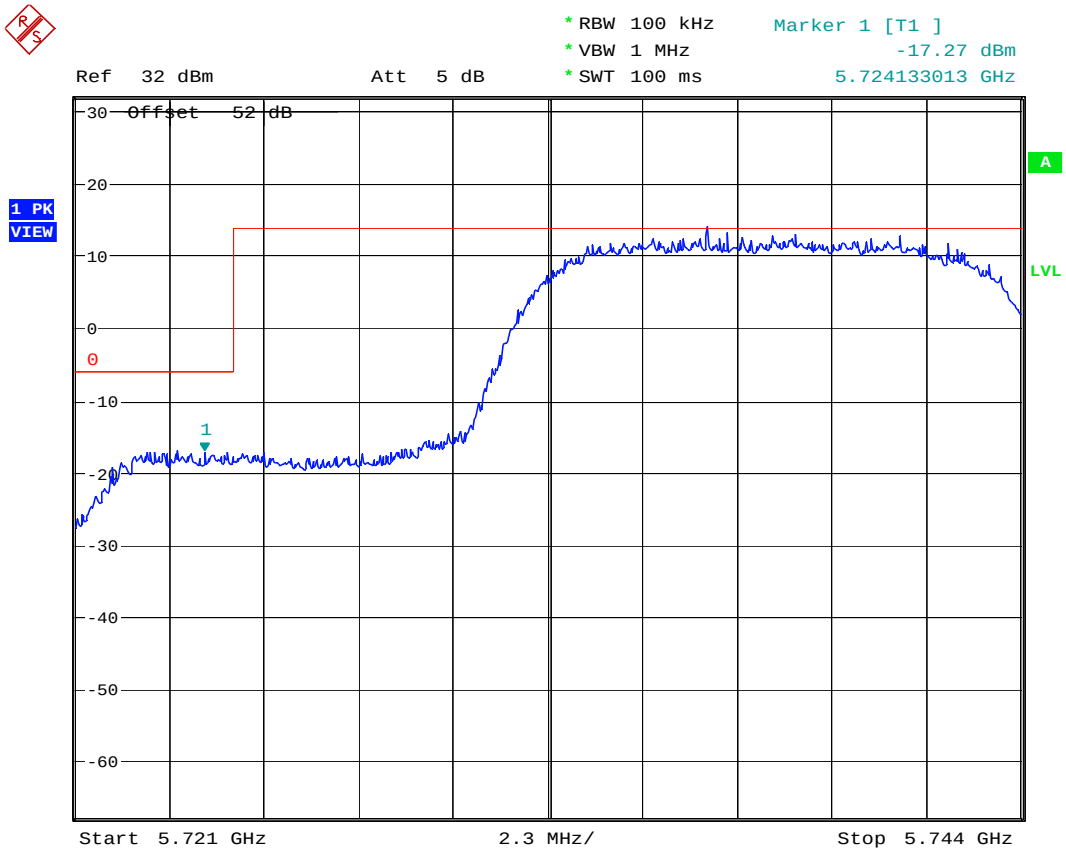
Date: 29.OCT.2004 12:54:47

D、 CH 2B：5754MHz

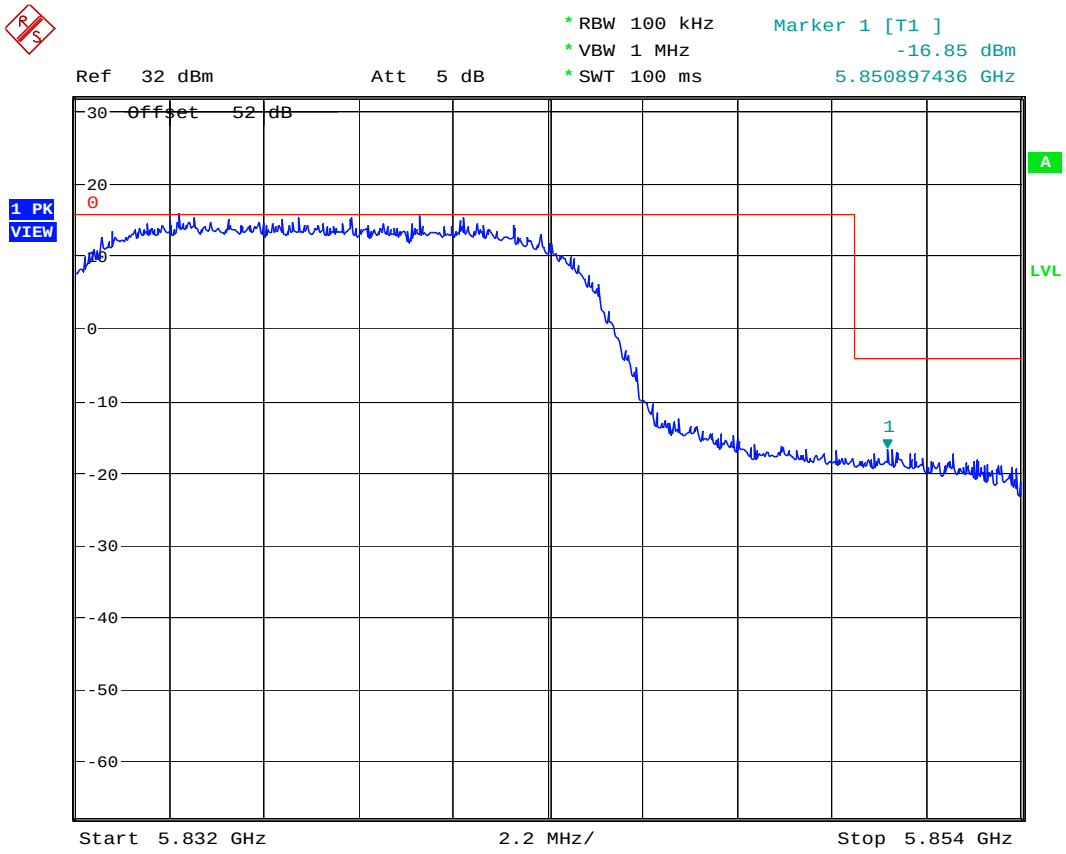


Date: 29.OCT.2004 12:57:38

Appendix 4 : Plotted Data of Band Edge Emission



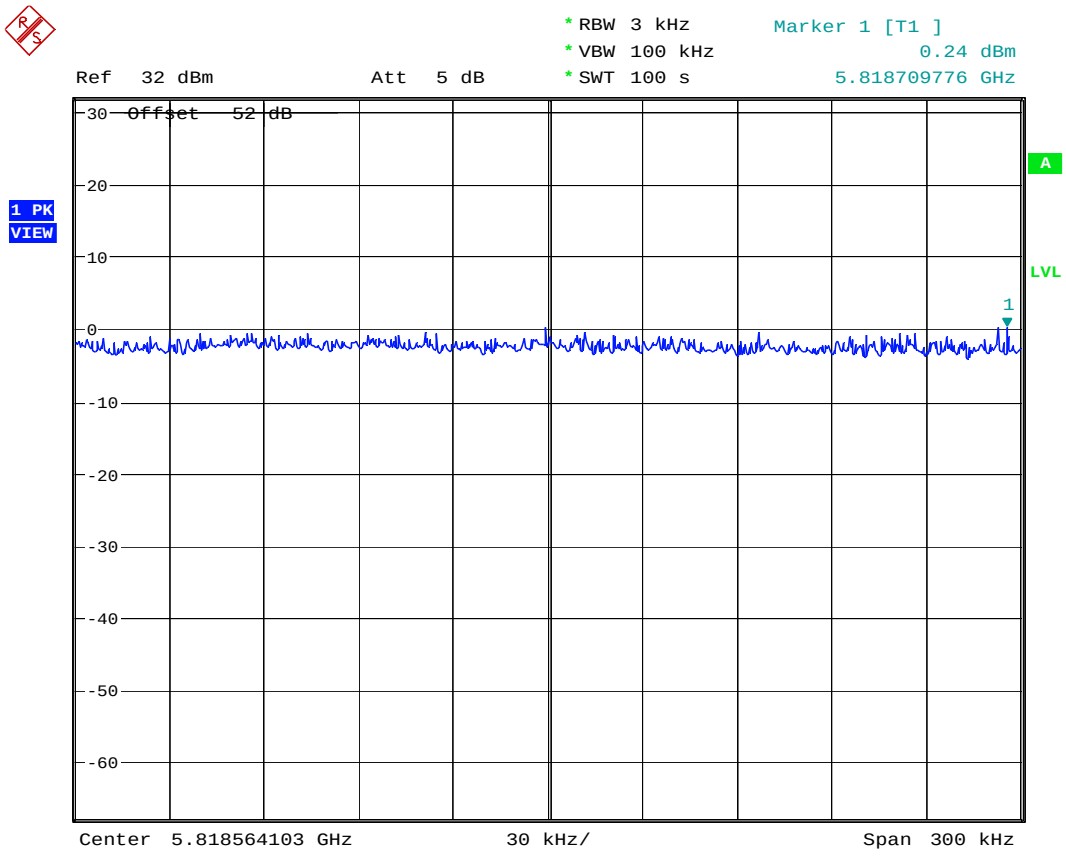
Date: 3.AUG.2004 13:14:05



Date: 3.AUG.2004 14:02:40

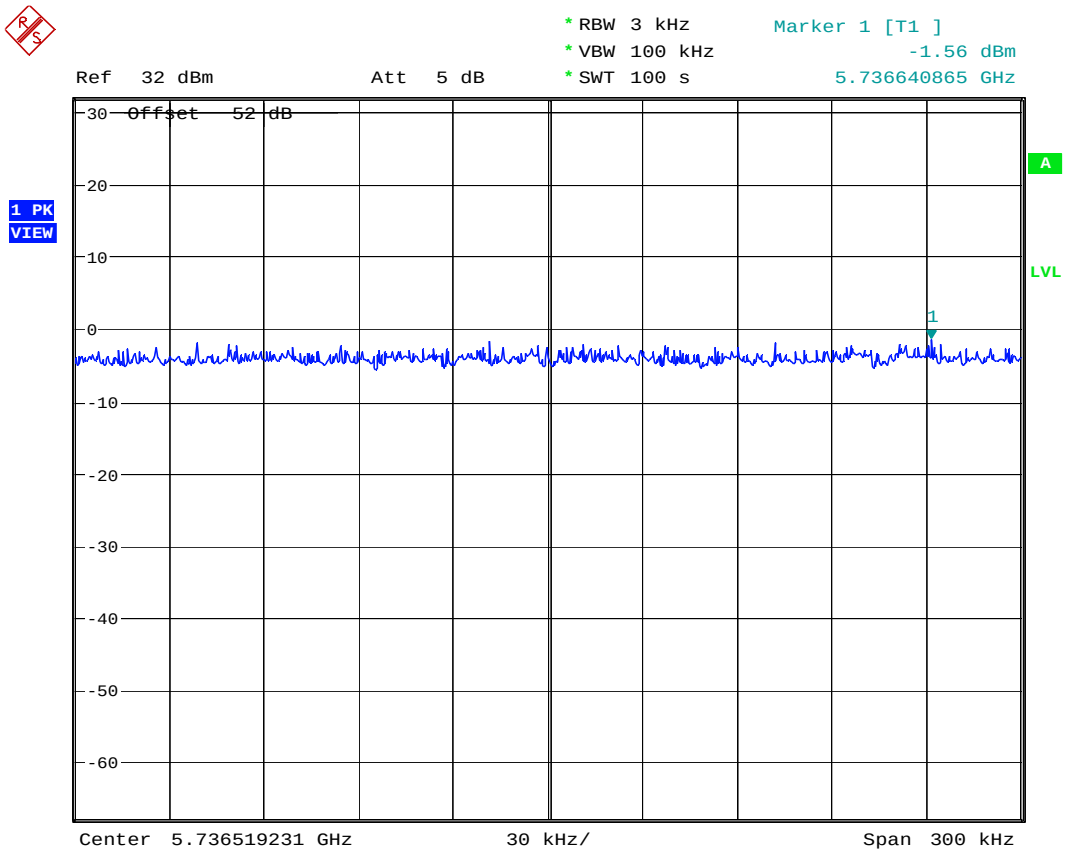
Appendix 5 : Plotted Data of Power Density

A、 CH 1A：5822MHz



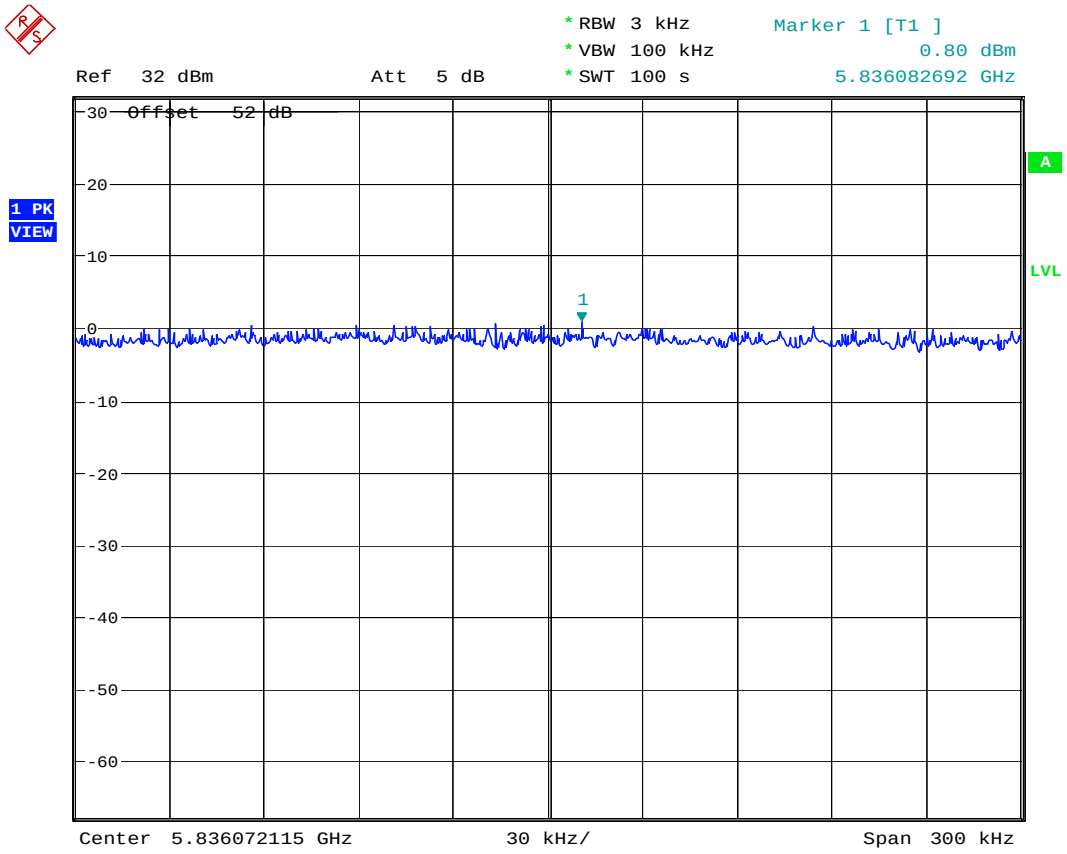
Date: 3.AUG.2004 13:51:33

B、 CH 1B：5738MHz



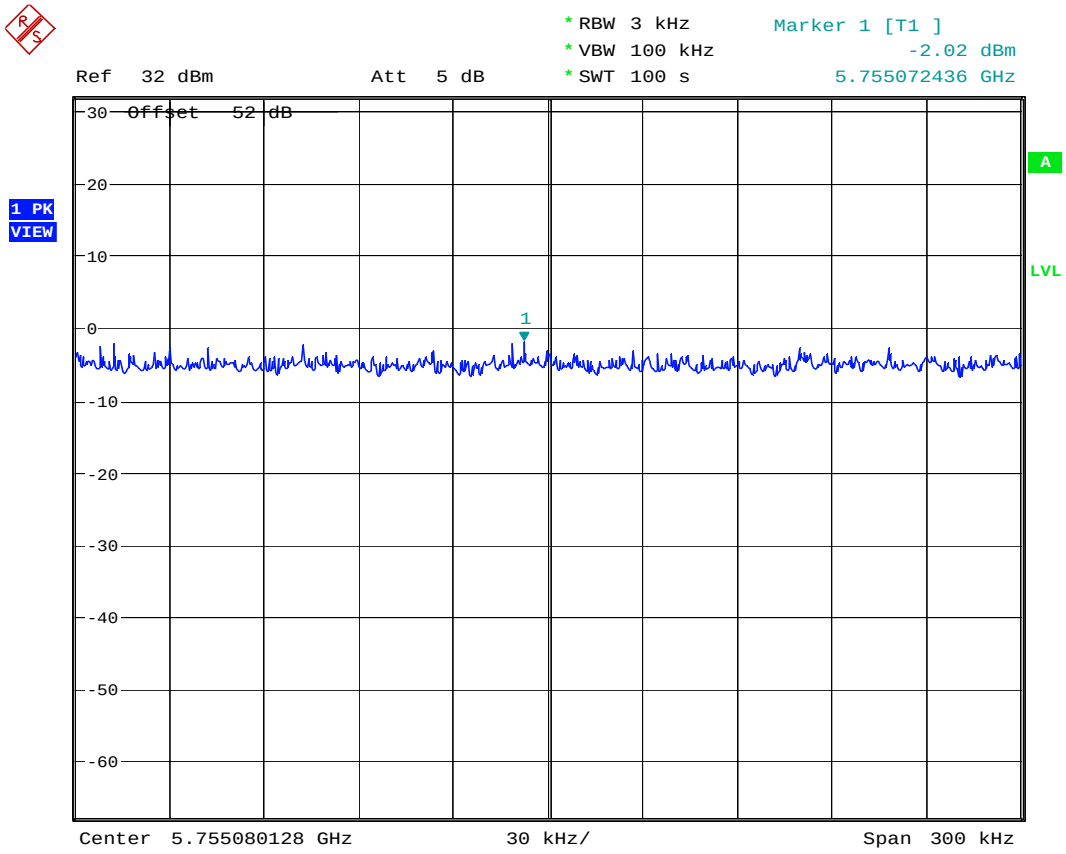
Date: 3.AUG.2004 13:09:36

C、 CH 1B：5838MHz



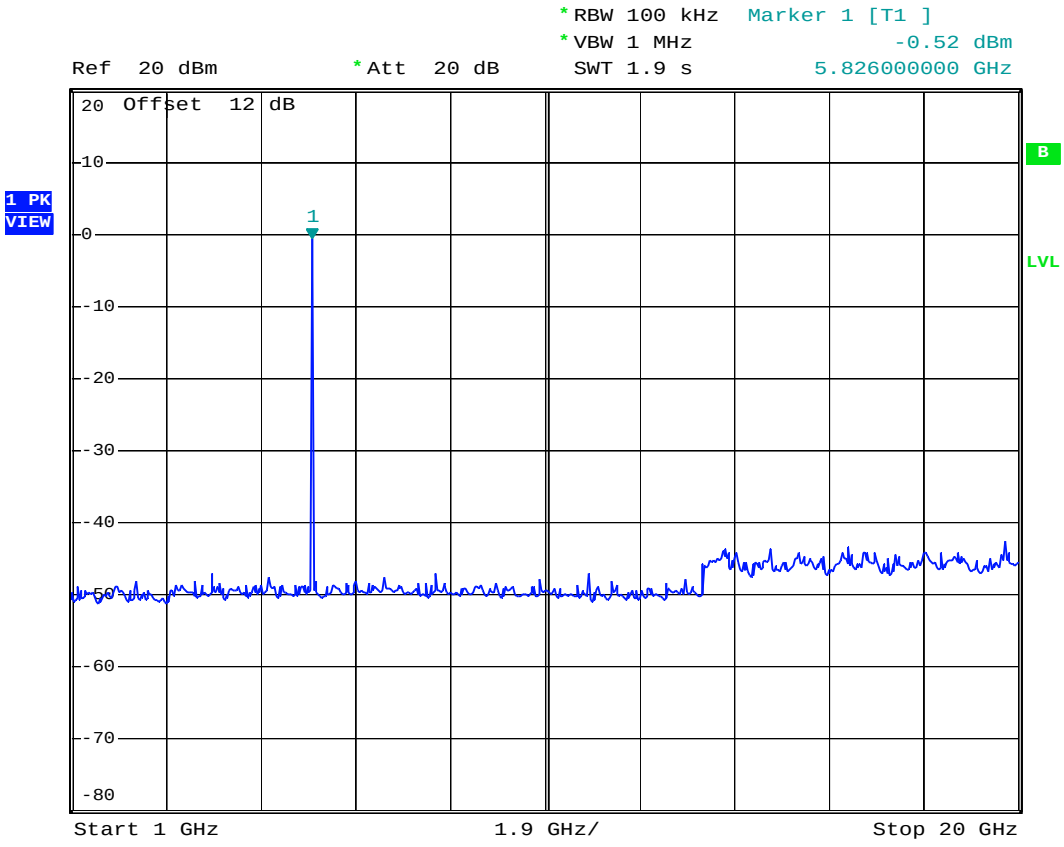
Date: 3.AUG.2004 14:08:16

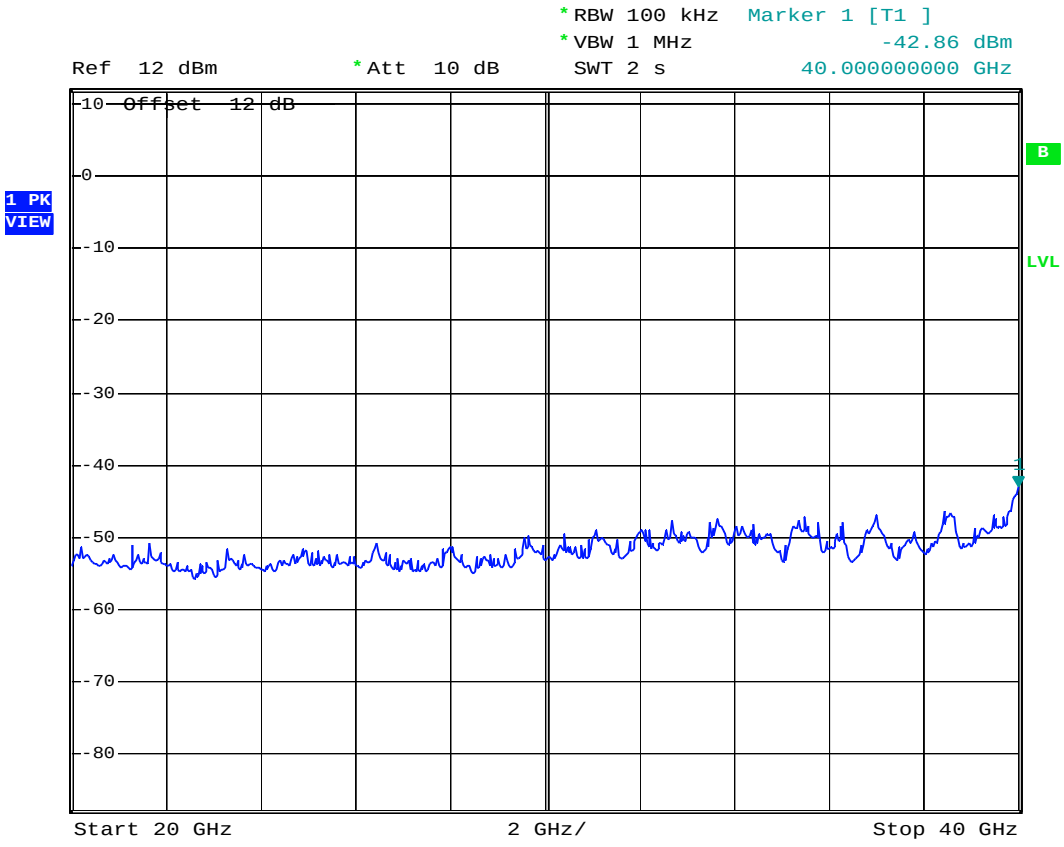
D、 CH 2B:5754MHz

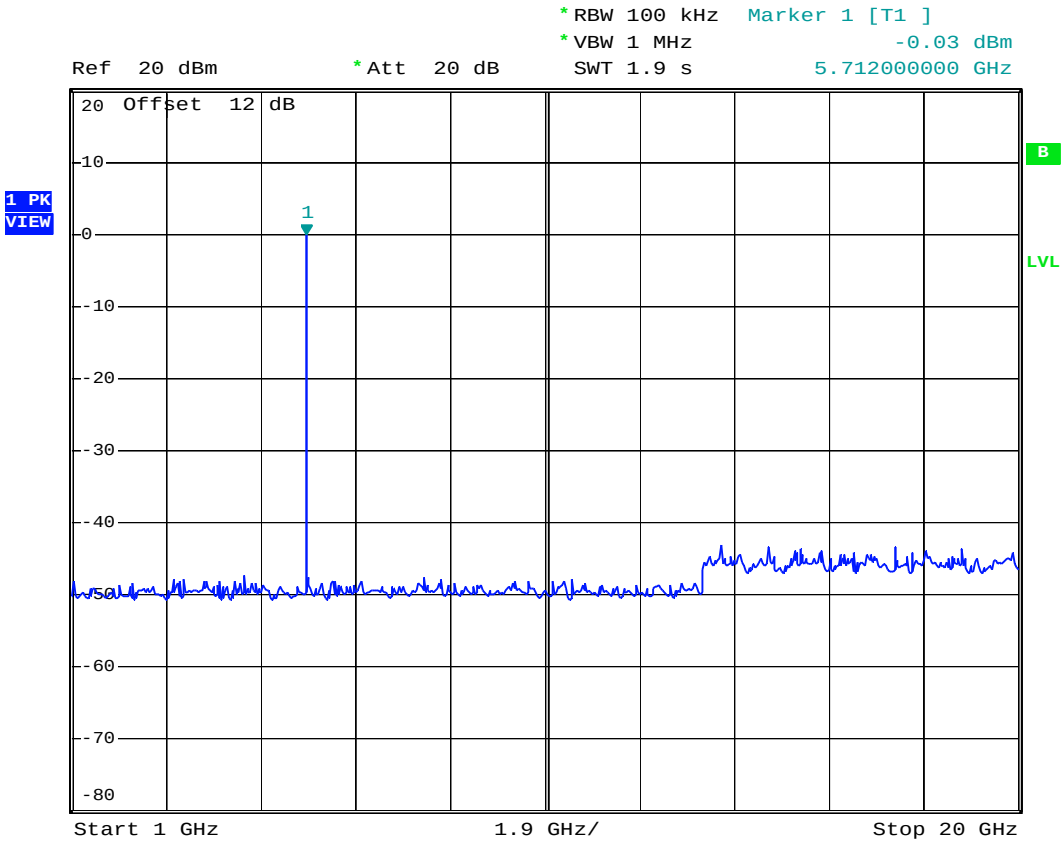


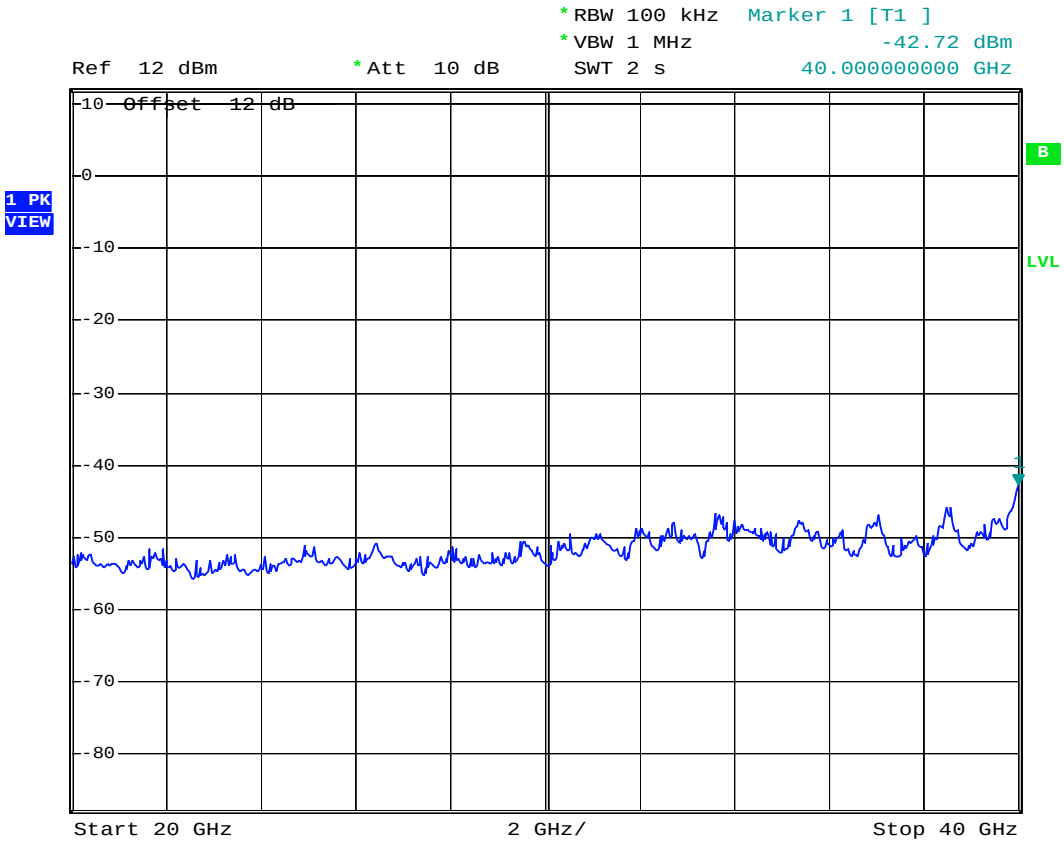
Date: 3.AUG.2004 13:23:13

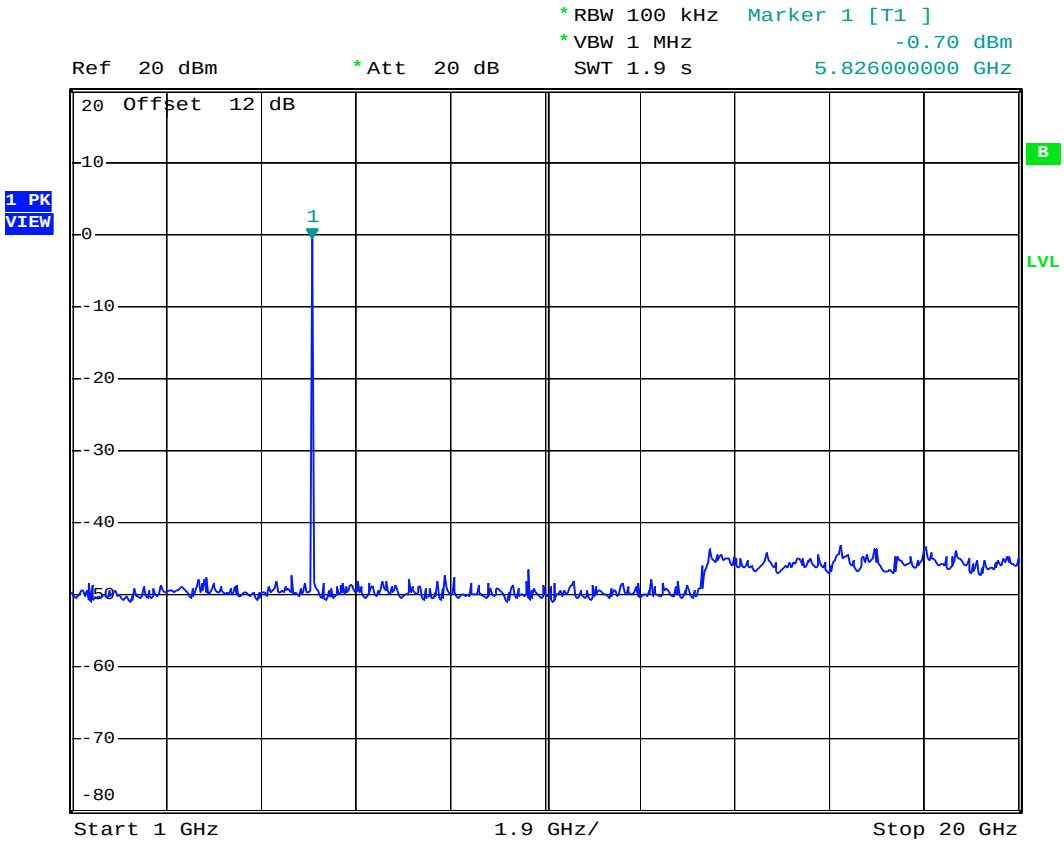
Appendix 6 : Plotted Data for Out-of-Band Conducted Emission

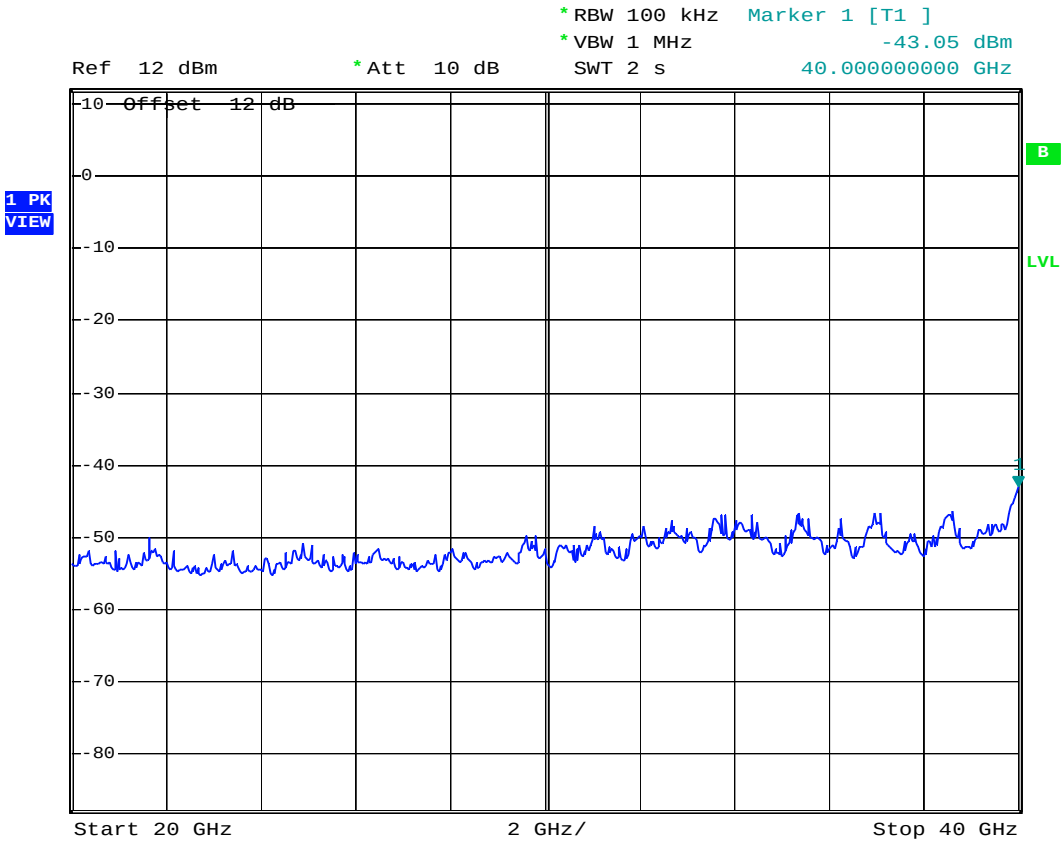

*RBW 100 kHz
Marker 1 [T1]
*VBW 1 MHz
-0.52 dBm
Ref 20 dBm
*Att 20 dB
SWT 1.9 s
5.826000000 GHz
20 Offset 12 dB
1 PK
VIEW
B
LVL
10
0
-10
-20
-30
-40
-50
-60
-70
-80
1
Start 1 GHz
1.9 GHz/
Stop 20 GHz

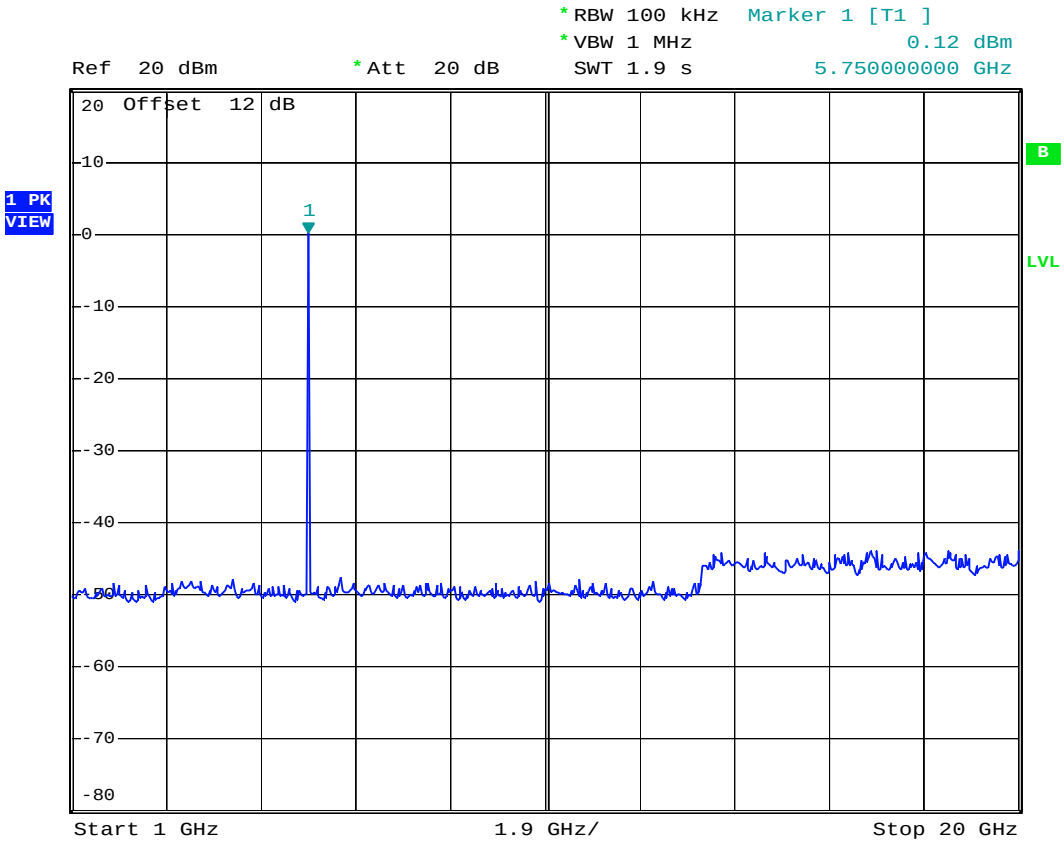

*RBW 100 kHz
Marker 1 [T1]
*VBW 1 MHz
-42.86 dBm
Ref 12 dBm
*Att 10 dB
SWT 2 s
40.000000000 GHz
10 Offset 12 dB
0
-10
-20
-30
-40
-50
-60
-70
-80
1 PK
VIEW
B
LVL
Start 20 GHz
2 GHz/
Stop 40 GHz

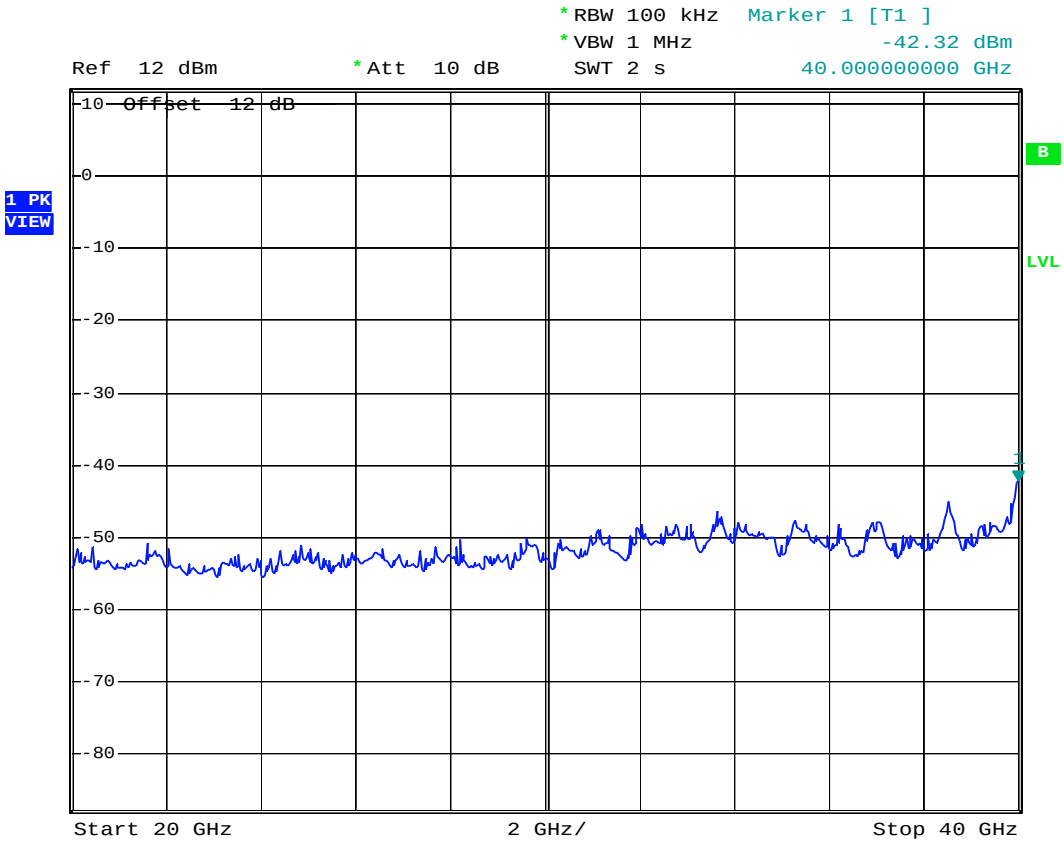

*RBW 100 kHz
Marker 1 [T1]
*VBW 1 MHz
-0.03 dBm
Ref 20 dBm
*Att 20 dB
SWT 1.9 s
5.712000000 GHz
20 Offset 12 dB
1 PK
VIEW
B
LVL
10
0
-10
-20
-30
-40
-50
-60
-70
-80
1
Start 1 GHz
1.9 GHz/
Stop 20 GHz


*RBW 100 kHz
Marker 1 [T1]
*VBW 1 MHz
-42.72 dBm
Ref 12 dBm
*Att 10 dB
SWT 2 s
40.000000000 GHz
Offset 12 dB
10
0
-10
-20
-30
-40
-50
-60
-70
-80
1 PK
VIEW
B
LVL
1
Start 20 GHz
2 GHz/
Stop 40 GHz


*RBW 100 kHz
Marker 1 [T1]
*VBW 1 MHz
-0.70 dBm
Ref 20 dBm
*Att 20 dB
SWT 1.9 s
5.826000000 GHz
20 Offset 12 dB
1 PK
VIEW
B
LVL
10
0
-10
-20
-30
-40
-50
-60
-70
-80
1
Start 1 GHz
1.9 GHz/
Stop 20 GHz


*RBW 100 kHz
Marker 1 [T1]
*VBW 1 MHz
-43.05 dBm
Ref 12 dBm
*Att 10 dB
SWT 2 s
40.000000000 GHz
Offset 12 dB
10
0
-10
-20
-30
-40
-50
-60
-70
-80
1 PK
VIEW
B
LVL
Start 20 GHz
2 GHz/
Stop 40 GHz


*RBW 100 kHz
Marker 1 [T1]
*VBW 1 MHz
0.12 dBm
Ref 20 dBm
*Att 20 dB
SWT 1.9 s
5.750000000 GHz
20 Offset 12 dB
1 PK
VIEW
B
LVL
10
0
-10
-20
-30
-40
-50
-60
-70
-80
Start 1 GHz
1.9 GHz/
Stop 20 GHz


*RBW 100 kHz
Marker 1 [T1]
*VBW 1 MHz
-42.32 dBm
Ref 12 dBm
*Att 10 dB
SWT 2 s
40.000000000 GHz
Offset 12 dB
10
0
-10
-20
-30
-40
-50
-60
-70
-80
1 PK
VIEW
B
LVL
1
Start 20 GHz
2 GHz/
Stop 40 GHz