TEST DATA

Peak Power Spectral Density – 15.247(d)

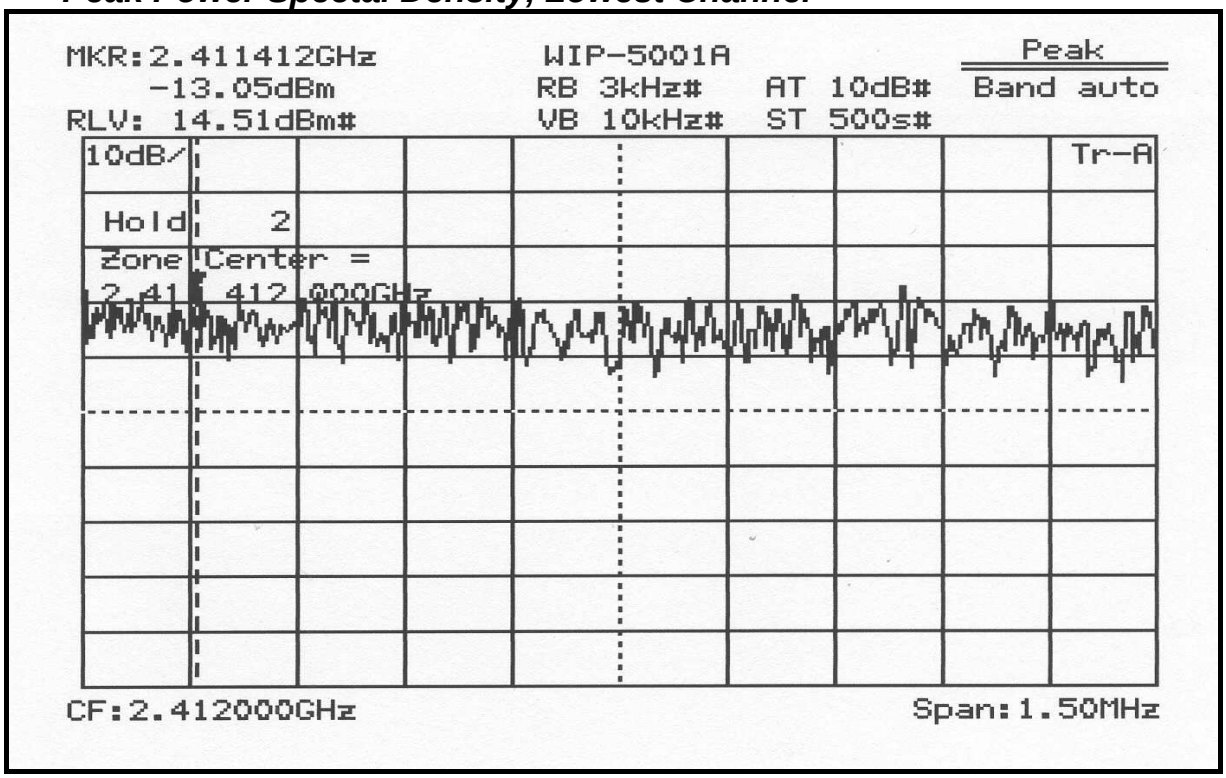
FCC ID : A3LWIP5001A
Test Mode : Set to Lowest channe, Middle channel and Highest channel.

Channel	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dB)
1	2412	-13.05	8	-21.05
6	2437	-12.20	8	-20.20
11	2462	-13.35	8	-21.35

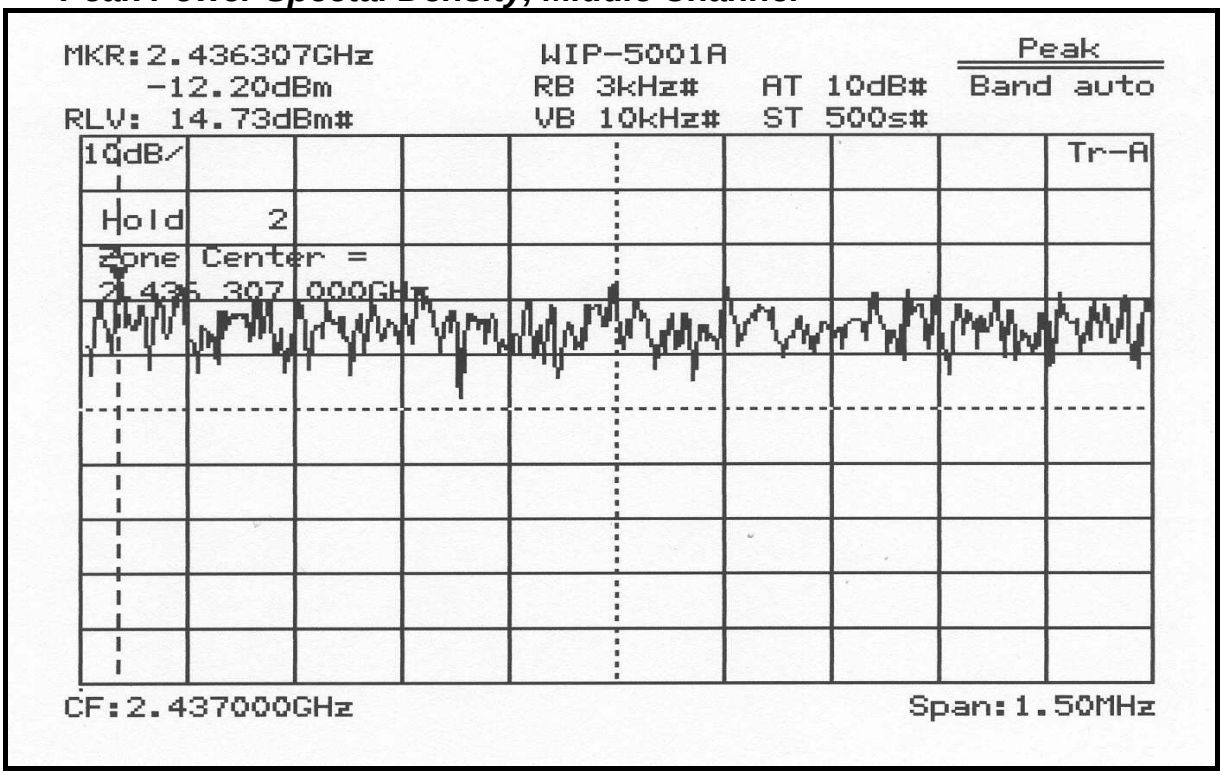
*Tested by **C. S. Choi***

PLOTS OF TEST DATA

Peak Power Spectal Density, Lowest Channel

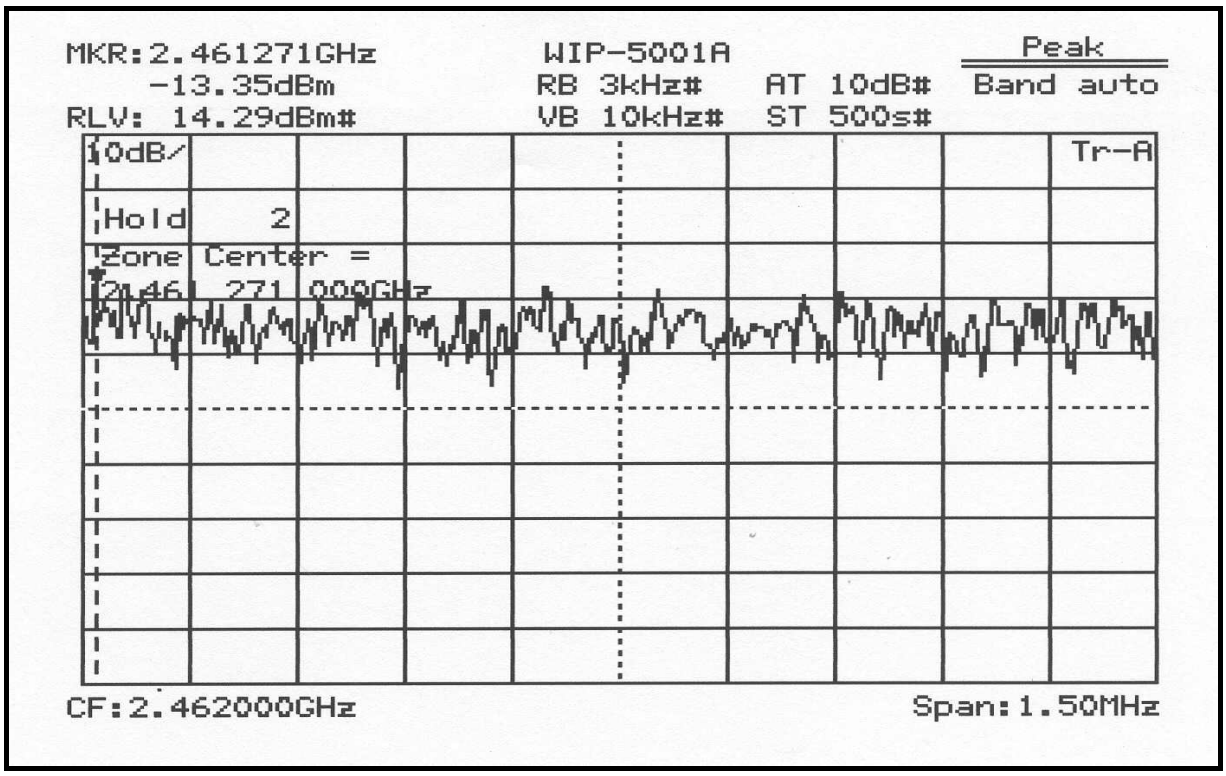


Peak Power Spectal Density, Middle Channel



PLOTS OF TEST DATA

Peak Power Spectal Density, Highest Channel



TEST DATA

MAXIMUM PERMISSIBLE EXPOSURE

RF Exposure Limit

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the Environmental of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

Limits for Maximum Permissible Exposure (MPE)

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm^2)	Averaging Time (Minutes)
(A) Limits for occupational / Contral Exposure				
30 - 300	6.14	0.163	1	6
300 - 1500	…	…	F/300	6
1500 - 100000	…	…	5	6
(B) Limits for General Population / Uncontrolled Exposure				
30 - 300	27.5	0.073	0.2	30
300 - 1500	…	…	F/1500	30
1500 - 100000	…	…	1	30

F = Frequency (MHz)

Fries formula

Fries transmission formula : $Pd = (Pout * G) / (4 * \pi * r^2)$

$r = \sqrt{((Pout * G) / 4 * \pi * Pd)}$

Where

Pd = Power density in ㎽/㎠

Pout = Output power to antenna in ㎽

G = Gain of antenna in linear scale

$\pi = 3.1416$

r = Distance between observation point center of the radiator in cm

Pd is the limit of MPE, 1 ㎽/㎠. If we know the Maximum Gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

TEST DATA

Test Result

The maximum antenna gain is 2dBi or 1.585(Numeric)

Output power into antenna and RF Exposure Distance

Channel	Frequency (MHz)	Output Power to Antenna(mW)	RF Exposure Distance (cm)
1	2412	11.20	1.19
6	2437	11.46	1.20
11	2462	10.52	1.15

MPE Safe Distance = 1.20cm

ACCURACY OF MEASUREMENT

The Measurement Uncertainties stated were calculated in accordance with the requirements of NIST Technical Note 1297 with the confidence level of 95%

1. Radiation Uncertainty Calculation

Contribution	Probability Distribution	Uncertainty(+/-dB)
Antenna Factor	Normal (k=2)	± 0.5
Cable Loss	Normal (k=2)	± 0.04
Receiver Specification	Rectangular	± 2.0
Antenna directivity	Rectangular	± 1.0
Antenna Factor variation with Height		
Antenna Phase Center Variation		
Antenna Factor Frequency Interpolation		
Measurement Distance Variation		
Site Inperfections	Rectangular	± 2.0
Mismatch:Receiver VRC ri=0.3 Antenna VRC rR=0.1(Bi)0.4(Lp) Uncertainty Limits 20Log(1+/-ri rR)	U-Shaped	+ 0.25 / - 0.26
System Repeatibilty	Std.deviation	± 0.05
Repeatability of EUT	-	-
Combined Standard Uncertainty	Normal	± 1.77
Expended Uncertainty U	Normal (k=2)	± 3.5

2. Conducted Uncertainty Calculation

Contribution	Probability Distribution	Uncertainty(+/-dB)
Receiver Specification	Normal (k=2)	± 2.0
LISN coupling spec.	Normal (k=2)	± 0.4
Cable and input attenuator cal.	Rectangular	± 0.4
Mismatch:Receiver VRC ri=0.3 LISN vrc rg=0.1 Uncertainty Limits 20Log(1+/-ri rR)	U-Shaped	± 0.26
System Repeatibilty	Std.deviation	± 0.68
Repeatability of EUT	-	-
Combined Standard Uncertainty	Normal	± 1.18
Expended Uncertainty U	Normal (k=2)	± 2.4

TEST EQUIPMENT

No.	Instrument	Manufacturer	Model	Calibration Date
1	*Test Receiver	R & S	ESCS 30	2003.09
2	*Amplifier	HP	8447F	2004.01
3	*Amplifier	HP	8449B	2004.03
4	*Spectrum Analyzer	Advantest	R3265A	2003.12
5	*Spectrum Analyzer	HP	8566B	2004.03
6	*Spectrum Analyzer	Anritsu	MS2668C	2003.12
7	*Logbicon Super Antenna	Schwarzbeck	VULB9166	2003.05
8	Log-Periodic Antenna	R & S	HL025	2003.05
9	Dipole Antenna	R & S	VHA9103	2003.05
10	Dipole Antenna	R & S	UHA9105	2003.05
11	*Biconical Log Antenna	ARA	LPB-2520/A	2004.01
12	Asorbing Clamp	R & S	MDS21	2003.06
13	*Horn Antenna	Schwarzbeck	BBHA 9120D	2003.10
14	*Signal Generater	R & S	SMP04	2004.02
15	*Signal Generater	HP	E4436B	2004.01
16	Matching Pad	R & S	RAM358.5414.02	2003.05
17	*LISN	R & S	ESH3-Z5	2003.11
18	*LISN	Kyoritsu	KNW-408	2003.12
19	LISN	Kyoritsu	KNW-407	2004.03
20	*Position Controller	EM Eng.	N/A	N/A
21	*Turn Table	EM Eng.	N/A	N/A
22	*Antenna Mast	EM Eng.	N/A	N/A
23	*Anechoic Chamber	EM Eng.	N/A	N/A
24	*Shielded Room	EM Eng.	N/A	N/A
25	*Power Meter	R & S	NRVS	2004.01

***) Test equipment used during the test**

APPENDIX B – SCHEMATIC DIAGRAM

APPENDIX E – BLOCK DIAGRAM

APPENDIX F – USER'S MANUAL

APPENDIX G – OPERATIONAL DESCRIPTION