

FCC RADIO TEST REPORT

Applicant's company	TRENDware International Inc.
Applicant Address	20675 Manhattan Place, Torrance, CA 90501 USA
FCC ID	S9ZTEW672GR
Manufacturer's company	TRENDware International Inc.
Manufacturer Address	20675 Manhattan Place, Torrance, CA 90501 USA

Product Name	Dual Band Wireless N Gigabit Router
Brand Name	TRENDnet
Model Name	TEW-672GR
Test Rule	47 CFR FCC Part 15 Subpart C § 15.247
Test Freq. Range	2400 ~ 2483.5MHz / 5725 ~ 5850MHz
Received Date	May. 28, 2008
Final Test Date	Jun. 6, 2008
Submission Type	Original Equipment



Statement

Test result included is only for the Draft n part of the product.

The test result in this report refers exclusively to the presented test model / sample.

Without written approval of SPORTON International Inc., the test report shall not be reproduced except in full.

The measurements and test results shown in this test report were made in accordance with the procedures and found in compliance with the limit given in **ANSI C63.4-2003** and **47 CFR FCC Part 15 Subpart C**.

The test equipment used to perform the test is calibrated and traceable to NML/ROC.

Table of Contents

1. CERTIFICATE OF COMPLIANCE	1
2. SUMMARY OF THE TEST RESULT	2
3. GENERAL INFORMATION	3
3.1. Product Details.....	3
3.2. Accessories.....	4
3.3. Table for Filed Antenna.....	5
3.4. Table for Carrier Frequencies	7
3.5. Table for Test Modes	8
3.6. Table for Testing Locations.....	9
3.7. Table for Supporting Units	9
3.8. Table for Parameters of Test Software Setting	10
3.9. Test Configurations	11
4. TEST RESULT	14
4.1. AC Power Line Conducted Emissions Measurement.....	14
4.2. Maximum Peak Output Power Measurement	21
4.3. Power Spectral Density Measurement	37
4.4. 6dB Spectrum Bandwidth Measurement	46
4.5. Radiated Emissions Measurement	55
4.6. Band Edge Emissions Measurement	83
4.7. Antenna Requirements	90
5. LIST OF MEASURING EQUIPMENTS	91
6. TEST LOCATION.....	93
7. TAF CERTIFICATE OF ACCREDITATION	94
APPENDIX A. PHOTOGRAPHS OF EUT.....	A1 ~ A13
APPENDIX B. TEST PHOTOS.....	B1 ~ B5
APPENDIX C. MAXIMUM PERMISSIBLE EXPOSURE.....	C1 ~ C5

History of This Test Report

Original Issue Date: Jun. 11, 2008

Report No.: FR852817AD

- ☒ No additional attachment.
- ☐ Additional attachment were issued as following record:

Attachment No.	Issue Date	Description

1. CERTIFICATE OF COMPLIANCE

Product Name : Dual Band Wireless N Gigabit Router
Brand Name : TRENDnet
Model Name : TEW-672GR
Applicant : TRENDware International Inc.
Test Rule Part(s) : 47 CFR FCC Part 15 Subpart C § 15.247

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on May. 28, 2008 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.



Wayne Hsu

SPORTON INTERNATIONAL INC.

2. SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart C				
Part	Rule Section	Description of Test	Result	Under Limit
4.1	15.207	AC Power Line Conducted Emissions	Complies	2.31 dB
4.2	15.247(b)(3)	Maximum Peak Conducted Output Power	Complies	0.32 dB
4.3	15.247(e)	Power Spectral Density	Complies	13.94 dB
4.4	15.247(a)(2)	6dB Spectrum Bandwidth	Complies	-
4.5	15.247(d)	Radiated Emissions	Complies	0.63 dB
4.6	15.247(d)	Band Edge Emissions	Complies	0.71 dB
4.7	15.203	Antenna Requirements	Complies	-

Test Items	Uncertainty	Remark
AC Power Line Conducted Emissions	±2.3dB	Confidence levels of 95%
Maximum Peak Conducted Output Power	±0.8dB	Confidence levels of 95%
Power Spectral Density	±0.5dB	Confidence levels of 95%
6dB Spectrum Bandwidth	±8.5×10 ⁻⁸	Confidence levels of 95%
Radiated Emissions (9kHz~30MHz)	±0.8dB	Confidence levels of 95%
Radiated Emissions (30MHz~1000MHz)	±1.9dB	Confidence levels of 95%
Radiated / Band Edge Emissions (1GHz~18GHz)	±1.9dB	Confidence levels of 95%
Radiated Emissions (18GHz~40GHz)	±1.9dB	Confidence levels of 95%
Temperature	±0.7°C	Confidence levels of 95%
Humidity	±3.2%	Confidence levels of 95%
DC / AC Power Source	±1.4%	Confidence levels of 95%

3. GENERAL INFORMATION

3.1. Product Details

Items	Description
Product Type	WLAN (2TX, 3RX)
Radio Type	Intentional Transceiver
Power Type	Power Adapter
Modulation	see the below table for draft n
Data Modulation	OFDM (BPSK / QPSK / 16QAM / 64QAM)
Data Rate (Mbps)	see the below table for Draft n
Frequency Range	2400 ~ 2483.5MHz / 5725 ~ 5850MHz
Channel Number	For 2.4GHz Band: 11 for 20MHz bandwidth ; 7 for 40MHz bandwidth For 5GHz Band: 3 for 20MHz bandwidth ; 2 for 40MHz bandwidth
Channel Band Width (99%)	For 2.4GHz Band: MCS8 (20MHz) : 17.64 MHz ; MCS8 (40MHz) : 36.08 MHz For 5GHz Band: MCS8 (20MHz) : 17.64 MHz ; MCS8 (40MHz) : 36.00 MHz
Conducted Output Power	For 2.4GHz Band: MCS8 (20MHz) : 20.14 dBm ; MCS8 (40MHz) : 19.97 dBm For 5GHz Band: MCS8 (20MHz) : 29.68 dBm ; MCS8 (40MHz) : 29.46 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

Antenna & Band width

Antenna	Single (TX)		Multiple (2TX)	
Band width Mode	20 MHz	40 MHz	20 MHz	40 MHz
802.11a	V	X	X	X
802.11b	V	X	X	X
802.11g	V	X	X	X
Draft n	X	X	V	V

Draft n spec

MCS Index	Nss	Modulation	R	NBPSC	NCBPS		NDBPS		Datarate(Mbps)			
									800nsGI		400nsGI	
					20MHz	40MHz	20MHz	40MHz	20MHz	40MHz	20MHz	40MHz
0	1	BPSK	1/2	1	52	108	26	54	6.5	13.5	7.200	15
1	1	QPSK	1/2	2	104	216	52	108	13.0	27.0	14.400	30
2	1	QPSK	3/4	2	104	216	78	162	19.5	40.5	21.700	45
3	1	16-QAM	1/2	4	208	432	104	216	26.0	54.0	28.900	60
4	1	16-QAM	3/4	4	208	432	156	324	39.0	81.0	43.300	90
5	1	64-QAM	2/3	6	312	648	208	432	52.0	108.0	57.800	120
6	1	64-QAM	3/4	6	312	648	234	486	58.5	121.5	65.000	135
7	1	64-QAM	5/6	6	312	648	260	540	65.0	135.0	72.200	150
8	2	BPSK	1/2	1	104	216	52	108	13.0	27.0	14.444	30
9	2	QPSK	1/2	2	208	432	104	216	26.0	54.0	28.889	60
10	2	QPSK	3/4	2	208	432	156	324	39.0	81.0	43.333	90
11	2	16-QAM	1/2	4	416	864	208	432	52.0	108.0	57.778	120
12	2	16-QAM	3/4	4	416	864	312	648	78.0	162.0	86.667	180
13	2	64-QAM	2/3	6	624	1296	416	864	104.0	216.0	115.556	240
14	2	64-QAM	3/4	6	624	1296	468	972	117.0	243.0	130.000	270
15	2	64-QAM	5/6	6	624	1296	520	1080	130.0	270.0	144.444	300

Symbol	Explanation
NSS	Number of spatial streams
R	Code rate
NBPSC	Number of coded bits per single carrier
NCBPS	Number of coded bits per symbol
NDBPS	Number of data bits per symbol
GI	guard interval

3.2. Accessories

Power	Brand	Model	Rating
Adapter	LEI	MT12-4120100-A1	Input: 120VAC, 50/60Hz, 0.3A Output: 12VDC, 1.0A

3.3. Table for Filed Antenna

For 2.4GHz Band

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Remark
A	JOYMAX	TWF-152XMPXX-711	Dipole Antenna	Brass	2.22	TX / RX Ant.
B	JOYMAX	TWF-152XMPXX-711	Dipole Antenna	Brass	2.22	TX / RX Ant.
C	JOYMAX	TWF-152XMPXX-711	Dipole Antenna	Brass	2.22	TX / RX Ant.

Note: (1) The EUT has three antennas .

(2) The EUT has three antenna ports, and the Port 1 and Port 3 have both TX/RX function , Port 2 have only RX function.

Port 1: Ant. A

Port 2: Ant. B

Port 3: Ant. C

Ant. A and Ant. C can both transmit simultaneously.

Ant. A, Ant. B and Ant. C can both receive simultaneously.

Both Ant. A and Ant. C were tested and recorded in the report.

For 5GHz Band

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
A	JOYMAX	TWF-152XMPXX-711	Dipole Antenna	Brass	3.00
B	JOYMAX	TWF-152XMPXX-711	Dipole Antenna	Brass	3.00
C	JOYMAX	TWF-152XMPXX-711	Dipole Antenna	Brass	3.00

Note:

(1) The EUT has three antennas .

(2) The EUT has three antenna ports, and the Port 1 and Port 3 have both TX/RX function , Port 2 have only RX function.

Port 1: Ant. A

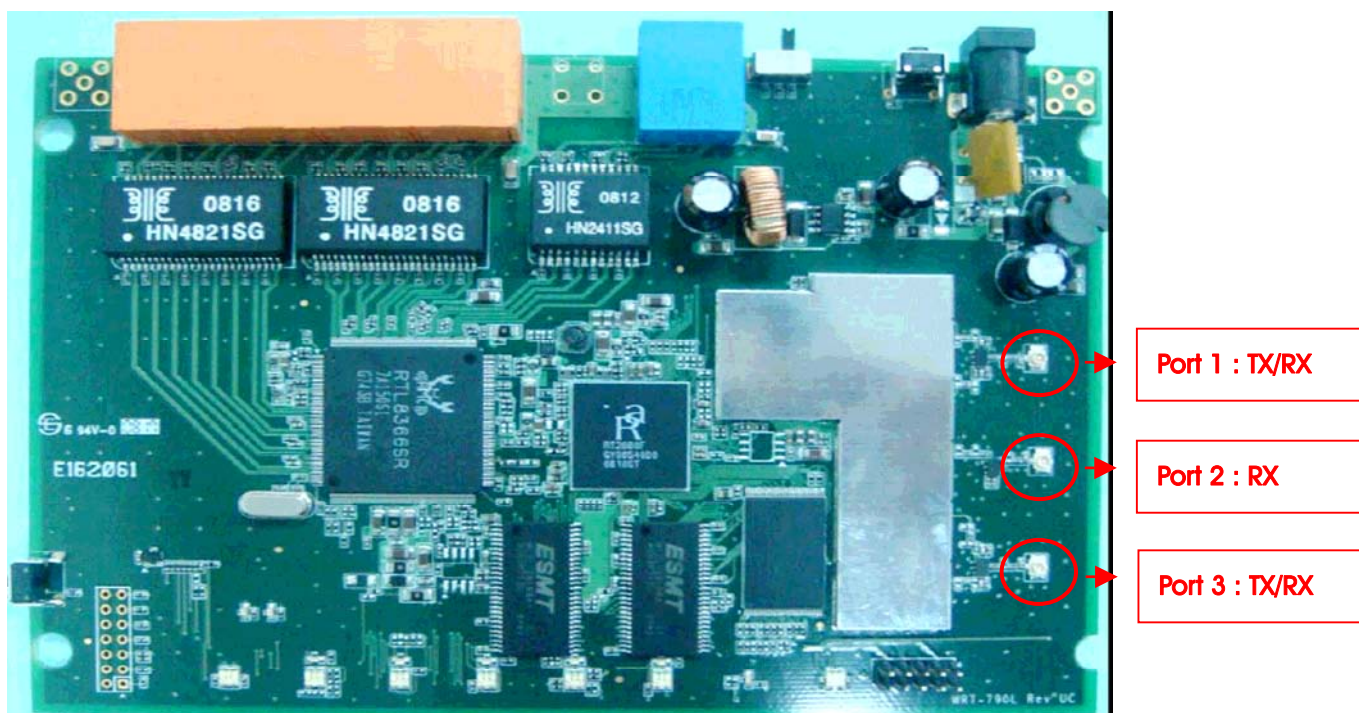
Port 2: Ant. B

Port 3: Ant. C

Ant. A and Ant. C can both transmit simultaneously.

Ant. A, Ant. B and Ant. C can both receive simultaneously.

Both Ant. A and Ant. C were tested and recorded in the report.



3.4. Table for Carrier Frequencies

There are two bandwidth systems for draft n.

For 2.4GHz Band

Frequency Allocation for 802.11b/g

For 20MHz bandwidth systems, use Channel 1~Channel 13.

For 40MHz bandwidth systems, use Channel 3~Channel 11.

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
2400~2483.5MHz	1	2412 MHz	7	2442 MHz
	2	2417 MHz	8	2447 MHz
	3	2422 MHz	9	2452 MHz
	4	2427 MHz	10	2457 MHz
	5	2432 MHz	11	2462 MHz
	6	2437 MHz		

For 5GHz Band

Frequency Allocation for 802.11a

For 20MHz bandwidth systems, use Channel 149, 157, 165.

For 40MHz bandwidth systems, use Channel 151, 159.

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
5725~5850 MHz	149	5745 MHz	161	5805 MHz
	151	5755 MHz	165	5825 MHz
	153	5765 MHz		
	157	5785 MHz		
	159	5795 MHz		

3.5. Table for Test Modes

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

For 2.4GHz Band

Test Items	Mode	Data Rate	Channel	Antenna
AC Power Line Conducted Emissions	Normal Link	Auto	-	-
Maximum Peak Conducted Output Power	MCS8/20MHz	13 Mbps	1/6/11	A / C / A+C
	MCS8/40MHz	27 Mbps	3/6/9	A / C / A+C
Power Spectral Density 6dB Spectrum Bandwidth	MCS8/20MHz	13 Mbps	1/6/11	A / C / A+C
	MCS8/40MHz	27 Mbps	3/6/9	A / C / A+C
Radiated Emissions 9kHz~1GHz	Normal Link	Auto	-	-
Radiated Emissions 1GHz~10 th Harmonic	MCS8/20MHz	13 Mbps	1/6/11	A+C
	MCS8/40MHz	27 Mbps	3/6/9	A+C
Band Edge Emissions	MCS8/20MHz	13 Mbps	1/11	A+C
	MCS8/40MHz	27 Mbps	3/9	A+C

For 5GHz Band

Test Items	Mode	Data Rate	Channel	Antenna
AC Power Line Conducted Emissions	Normal Link	Auto	-	-
Maximum Peak Conducted Output Power	MCS8/20MHz	13 Mbps	149/157/165	A / C / A+C
	MCS8/40MHz	27 Mbps	151/159	A / C / A+C
Power Spectral Density 6dB Spectrum Bandwidth	MCS8/20MHz	13 Mbps	149/157/165	A / C / A+C
	MCS8/40MHz	27 Mbps	151/159	A / C / A+C
Radiated Emissions 9kHz~1GHz	Normal Link	Auto	-	-
Radiated Emissions 1GHz~10 th Harmonic	MCS8/20MHz	13 Mbps	149/157/165	A+C
	MCS8/40MHz	27 Mbps	151/159	A+C
Band Edge Emissions	MCS8/20MHz	13 Mbps	149/165	A+C
	MCS8/40MHz	27 Mbps	151/159	A+C

3.6. Table for Testing Locations

Test Site No.	Site Category	Location	FCC Reg. No.	IC File No.	VCCI Reg. No
03CH03-HY	SAC	Hwa Ya	101377	IC 4088	-
CO04-HY	Conduction	Hwa Ya	101377	IC 4088	-
TH01-HY	OVEN Room	Hwa Ya	-	-	-

Open Area Test Site (OATS); Semi Anechoic Chamber (SAC); Fully Anechoic Chamber (FAC).

Please refer section 6 for Test Site Address.

3.7. Table for Supporting Units

Support Unit	Brand	Model	FCC ID
Notebook	DELL	D520	E2KWM3945ABG
Notebook	DELL	D520	E2KWM3945ABG
Notebook	DELL	1200	E2K4965AGNM
Switch Hub	EtherHub-16	N/A	DOC

3.8. Table for Parameters of Test Software Setting

During testing, Channel & Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

For 2.4GHz Band

Power Parameters of Draft n MCS8 20MHz

Test Software Version	QA		
Frequency	2412 MHz	2437 MHz	2462 MHz
Draft n Ant. A	06	06	06
Draft n Ant. C	0A	0A	0A

Power Parameters of Draft n MCS8 40MHz

Test Software Version	QA		
Frequency	2422 MHz	2437 MHz	2452 MHz
Draft n Ant. A	06	06	06
Draft n Ant. C	0A	0A	0A

For 5GHz Band

Power Parameters of Draft n MCS8 20MHz

Test Software Version	QA		
Frequency	5745 MHz	5785 MHz	5825 MHz
Draft n Ant. A	0D	0E	0E
Draft n Ant. C	0D	0F	0F

Power Parameters of Draft n MCS8 40MHz

Test Software Version	QA	
Frequency	5755 MHz	5795 MHz
Draft n Ant. A	0D	0D
Draft n Ant. C	0D	0F

During the test, "Ping.exe" under WIN XP was executed to link with the remote workstation to receive and transmit signal by LAN and WLAN.

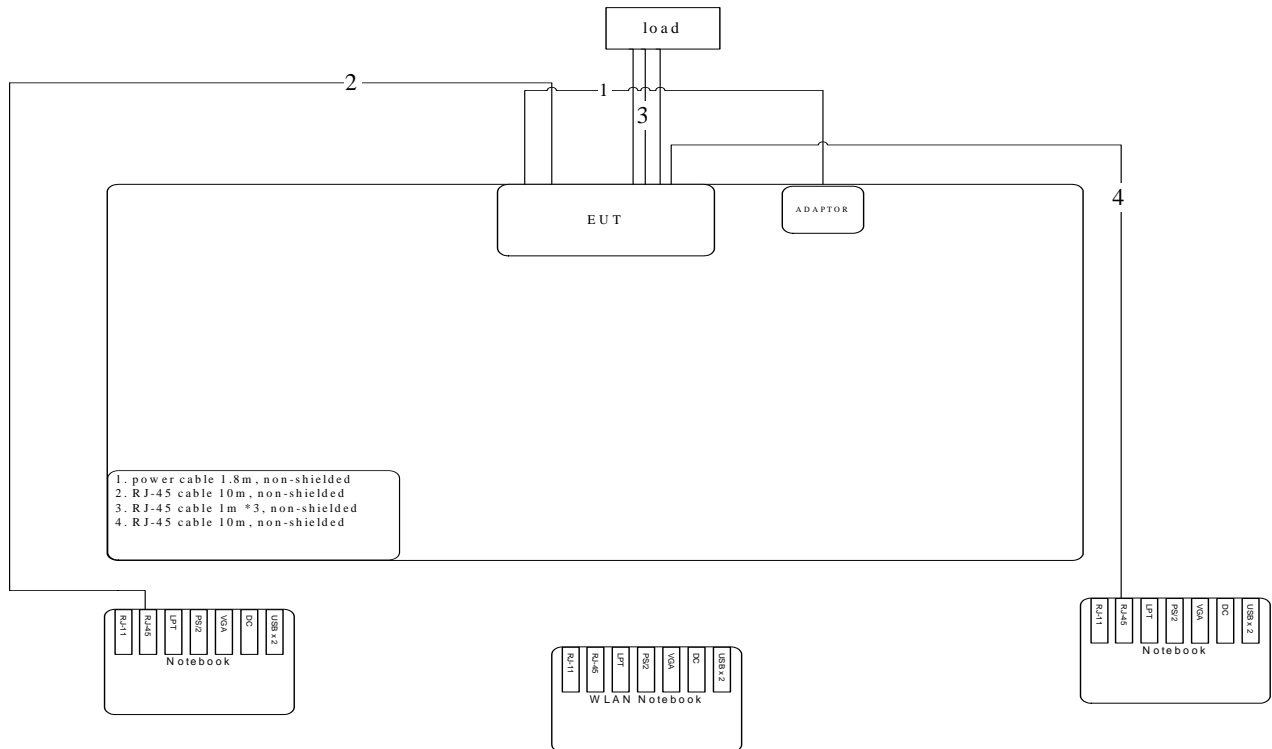
At the same time, "QA" was executed the test program to control the EUT continuously transmit RF signal.

3.9. Test Configurations

3.9.1. Radiation Emissions Test Configuration

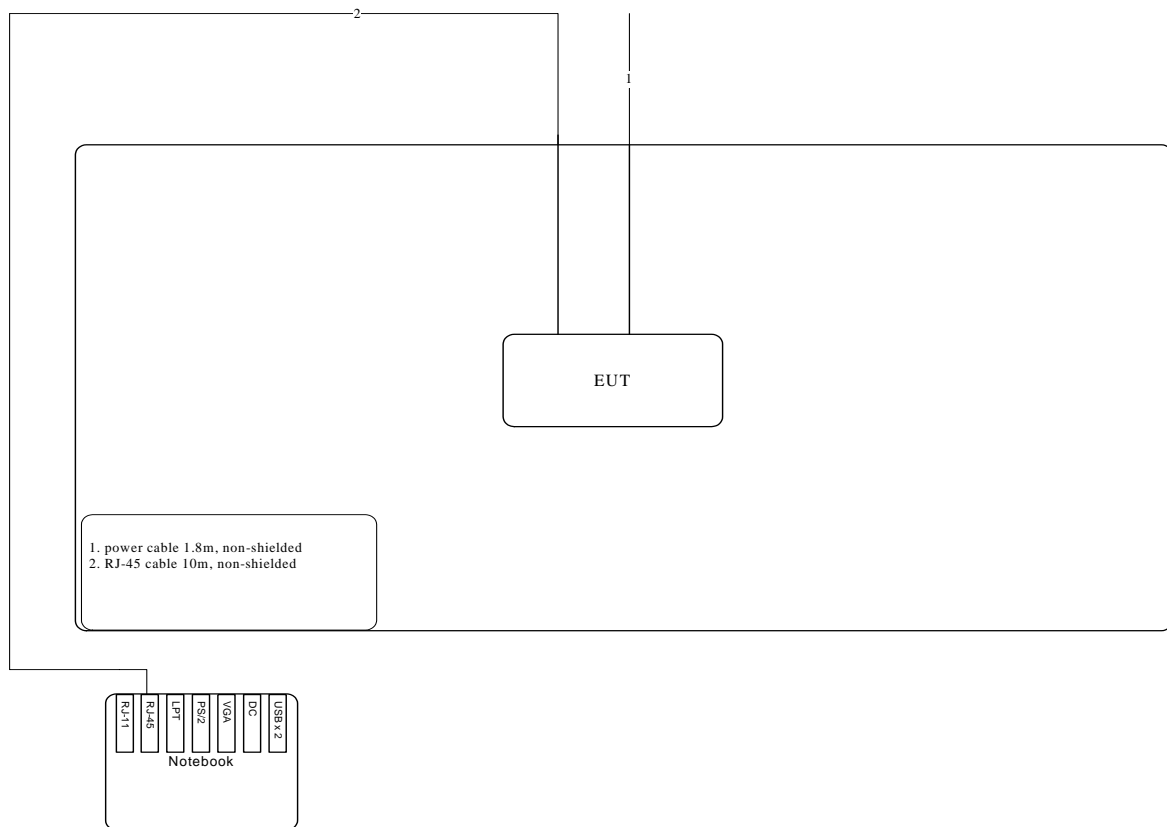
Test Configuration: 30KHz~1GHz

Ant. A / Ant. C

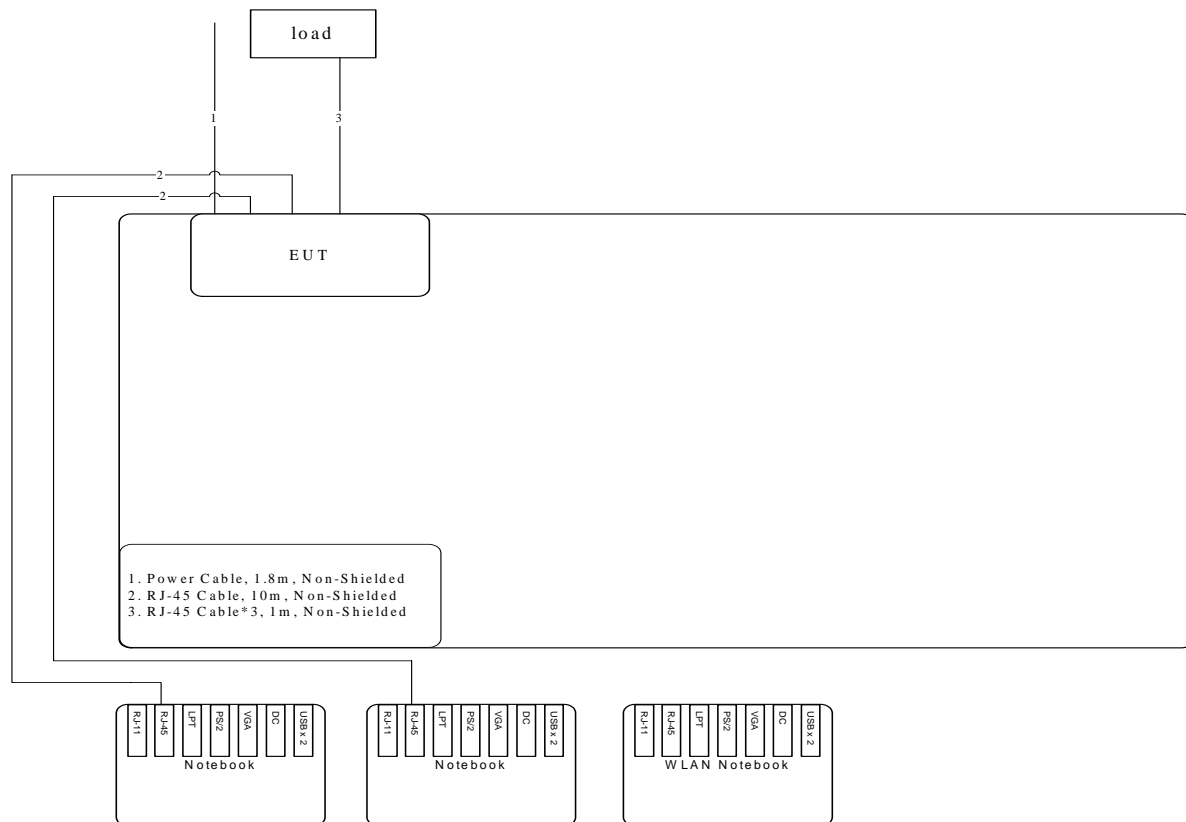


Test Configuration: above 1GHz

Ant. A / Ant. C



3.9.2. AC Power Line Conduction Emissions Test Configuration



4. TEST RESULT

4.1. AC Power Line Conducted Emissions Measurement

4.1.1. Limit

For this product which is designed to be connected to the AC power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed below limits table.

Frequency (MHz)	QP Limit (dBuV)	AV Limit (dBuV)
0.15~0.5	66~56	56~46
0.5~5	56	46
5~30	60	50

4.1.2. Measuring Instruments and Setting

Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 KHz

4.1.3. Test Procedures

1. Configure the EUT according to ANSI C63.4. The EUT or host of EUT has to be placed 0.4 meter far from the conducting wall of the shielding room and at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT or host of EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connected to the other LISNs. The LISN should provide 50uH/50ohms coupling impedance.
4. The frequency range from 150 KHz to 30 MHz was searched.
5. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. The measurement has to be done between each power line and ground at the power terminal.

[illegible]

- (1) Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- (2) I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- (3) EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50 Ω . LISN can be placed on top of, or immediately beneath, reference ground plane.
- (3.1) All other equipment powered from additional LISN(s).
- (3.2) Multiple outlet strip can be used for multiple power cords of non-EUT equipment.
- (3.3) LISN at least 80 cm from nearest part of EUT chassis.
- (4) Cables of hand-operated devices, such as keyboards, mice, etc., shall be placed as for normal use.
- (5) Non-EUT components of EUT system being tested.
- (6) Rear of EUT, including peripherals, shall all be aligned and flush with rear of tabletop.
- (7) Rear of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane.

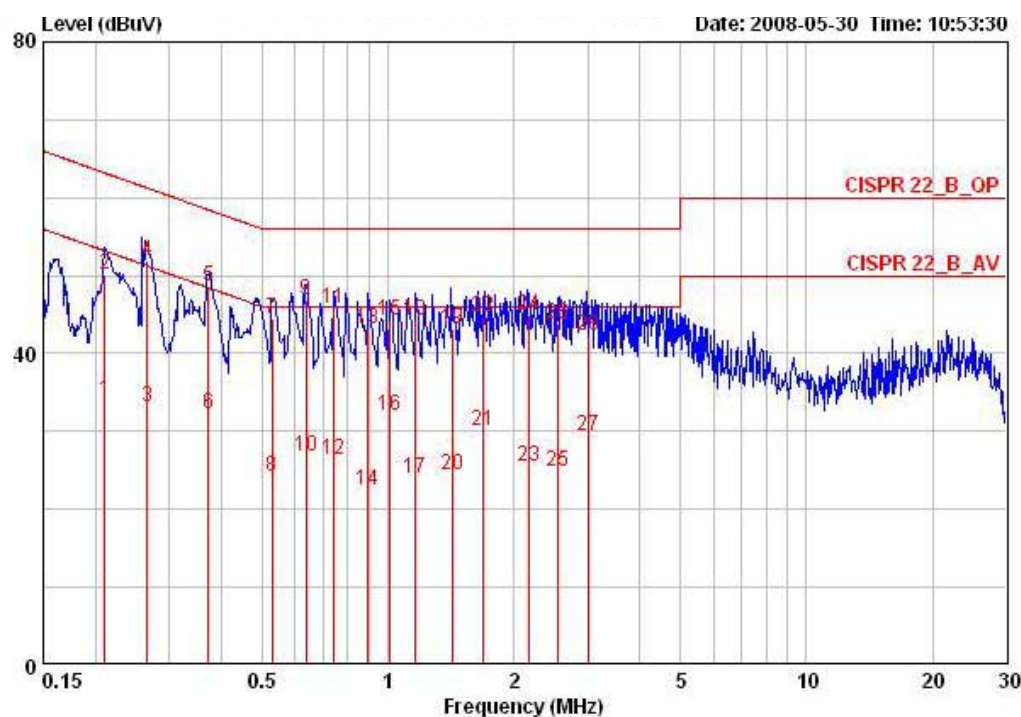
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

The EUT was placed on the test table and programmed in normal function.

4.1.7. Results of AC Power Line Conducted Emissions Measurement

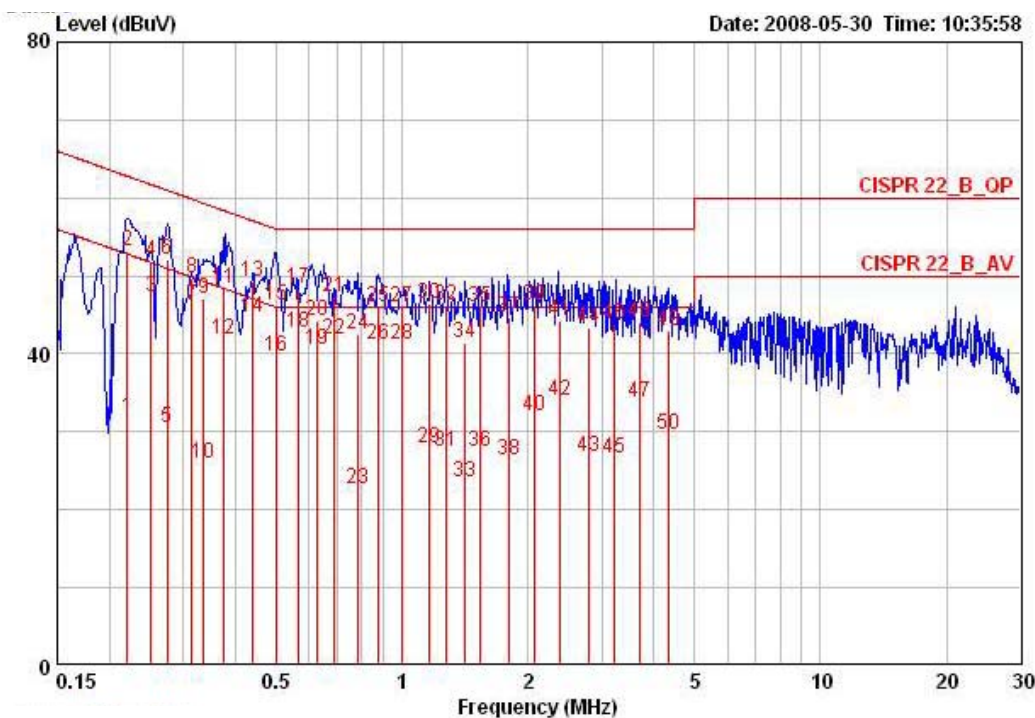
Temperature	23°C	Humidity	54%
Test Engineer	Rex Chiu	Phase	Line
Configuration	Normal Link		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.21055	34.05	-19.13	53.18	33.75	0.10	0.20	AVERAGE
2	0.21055	50.03	-13.15	63.18	49.73	0.10	0.20	QP
3	0.26528	33.08	-18.18	51.26	32.78	0.10	0.20	AVERAGE
4	0.26528	51.87	-9.39	61.26	51.57	0.10	0.20	QP
5	0.37154	48.57	-9.90	58.47	48.27	0.10	0.20	QP
6	0.37154	32.35	-16.12	48.47	32.05	0.10	0.20	AVERAGE
7	0.52855	44.44	-11.57	56.00	44.16	0.08	0.20	QP
8	0.52855	24.22	-21.79	46.00	23.94	0.08	0.20	AVERAGE
9	0.63623	46.79	-9.21	56.00	46.53	0.06	0.20	QP
10	0.63623	26.72	-19.28	46.00	26.46	0.06	0.20	AVERAGE
11	0.74142	45.71	-10.29	56.00	45.47	0.04	0.20	QP
12	0.74142	26.39	-19.61	46.00	26.15	0.04	0.20	AVERAGE
13	0.89761	43.25	-12.76	56.00	43.03	0.02	0.20	QP
14	0.89761	22.54	-23.47	46.00	22.32	0.02	0.20	AVERAGE
15	1.007	44.24	-11.76	56.00	44.04	0.00	0.20	QP
16	1.007	32.10	-13.90	46.00	31.90	0.00	0.20	AVERAGE
17	1.163	24.00	-22.00	46.00	23.84	0.00	0.16	AVERAGE
18	1.163	44.21	-11.79	56.00	44.05	0.00	0.16	QP
19	1.429	43.09	-12.91	56.00	42.98	0.00	0.11	QP
20	1.429	24.40	-21.60	46.00	24.29	0.00	0.11	AVERAGE
21	1.693	30.14	-15.86	46.00	30.00	0.00	0.14	AVERAGE

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
22	1.693	44.60	-11.40	56.00	44.46	0.00	0.14	QP
23	2.170	25.59	-20.41	46.00	25.39	0.00	0.20	AVERAGE
24	2.170	44.83	-11.17	56.00	44.63	0.00	0.20	QP
25	2.542	24.90	-21.10	46.00	24.70	0.00	0.20	AVERAGE
26	2.542	43.71	-12.29	56.00	43.51	0.00	0.20	QP
27	3.009	29.49	-16.51	46.00	29.29	0.00	0.20	AVERAGE
28	3.009	42.20	-13.80	56.00	42.00	0.00	0.20	QP

Temperature	23°C	Humidity	54%
Test Engineer	Rex Chiu	Phase	Neutral
Configuration	Normal Link		



	Freq	Level	Over	Limit	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.22083	31.82	-20.97	52.79	31.42	0.20	0.20	AVERAGE
2	0.22083	53.26	-9.53	62.79	52.86	0.20	0.20	QP
3	0.25083	47.37	-4.36	51.73	46.99	0.18	0.20	AVERAGE
4	0.25083	51.90	-9.83	61.73	51.52	0.18	0.20	QP
5	0.27442	30.42	-20.57	50.98	30.05	0.17	0.20	AVERAGE
6	0.27442	52.10	-8.89	60.98	51.73	0.17	0.20	QP
7	0.31403	46.16	-3.70	49.86	45.81	0.15	0.20	AVERAGE
8	0.31403	49.60	-10.26	59.86	49.25	0.15	0.20	QP
9	0.33562	47.10	-12.21	59.31	46.77	0.13	0.20	QP
10	0.33562	26.00	-23.31	49.31	25.67	0.13	0.20	AVERAGE
11	0.37643	48.29	-10.07	58.36	47.99	0.10	0.20	QP
12	0.37643	41.81	-6.55	48.36	41.51	0.10	0.20	AVERAGE
13	0.43803	49.32	-7.78	57.10	49.02	0.10	0.20	QP
14	0.43803	44.79	-2.31	47.10	44.49	0.10	0.20	AVERAGE
15	0.50233	46.28	-9.72	56.00	45.98	0.10	0.20	QP
16	0.50233	39.60	-6.40	46.00	39.30	0.10	0.20	AVERAGE
17	0.56433	48.45	-7.55	56.00	48.15	0.10	0.20	QP
18	0.56433	42.83	-3.17	46.00	42.53	0.10	0.20	AVERAGE
19	0.62723	40.54	-5.46	46.00	40.24	0.10	0.20	AVERAGE
20	0.62723	44.31	-11.69	56.00	44.01	0.10	0.20	QP
21	0.69003	47.39	-8.61	56.00	47.09	0.10	0.20	QP

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
22	0.69003	41.79	-4.21	46.00	41.49	0.10	0.20	AVERAGE
23	0.78345	22.57	-23.43	46.00	22.27	0.10	0.20	AVERAGE
24	0.78345	42.46	-13.54	56.00	42.16	0.10	0.20	QP
25	0.87871	45.93	-10.07	56.00	45.63	0.10	0.20	QP
26	0.87871	41.27	-4.73	46.00	40.97	0.10	0.20	AVERAGE
27	1.004	45.99	-10.01	56.00	45.69	0.10	0.20	QP
28	1.004	41.16	-4.84	46.00	40.86	0.10	0.20	AVERAGE
29	1.166	27.94	-18.06	46.00	27.68	0.10	0.16	AVERAGE
30	1.166	46.53	-9.47	56.00	46.27	0.10	0.16	QP
31	1.271	27.41	-18.59	46.00	27.17	0.10	0.14	AVERAGE
32	1.271	46.12	-9.88	56.00	45.88	0.10	0.14	QP
33	1.419	23.54	-22.46	46.00	23.33	0.10	0.11	AVERAGE
34	1.419	41.36	-14.64	56.00	41.15	0.10	0.11	QP
35	1.535	45.89	-10.11	56.00	45.68	0.10	0.11	QP
36	1.535	27.45	-18.55	46.00	27.24	0.10	0.11	AVERAGE
37	1.796	44.74	-11.26	56.00	44.48	0.10	0.16	QP
38	1.796	26.43	-19.57	46.00	26.17	0.10	0.16	AVERAGE
39	2.065	46.30	-9.70	56.00	46.00	0.10	0.20	QP
40	2.065	32.00	-14.00	46.00	31.70	0.10	0.20	AVERAGE
41	2.381	44.19	-11.81	56.00	43.89	0.10	0.20	QP
42	2.381	33.99	-12.01	46.00	33.69	0.10	0.20	AVERAGE
43	2.801	26.73	-19.27	46.00	26.43	0.10	0.20	AVERAGE
44	2.801	43.40	-12.60	56.00	43.10	0.10	0.20	QP
45	3.229	26.52	-19.48	46.00	26.17	0.10	0.25	AVERAGE
46	3.229	43.89	-12.11	56.00	43.54	0.10	0.25	QP
47	3.705	33.74	-12.26	46.00	33.34	0.10	0.30	AVERAGE
48	3.705	43.96	-12.04	56.00	43.56	0.10	0.30	QP
49	4.338	43.00	-13.00	56.00	42.60	0.10	0.30	QP
50	4.338	29.69	-16.31	46.00	29.29	0.10	0.30	AVERAGE

Note:

Level = Read Level + LISN Factor + Cable Loss.

4.2. Maximum Peak Output Power Measurement

4.2.1. Limit

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm. The limited has to be reduced by the amount in dB that the gain of the antenna exceed 6dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

4.2.2. Measuring Instruments and Setting

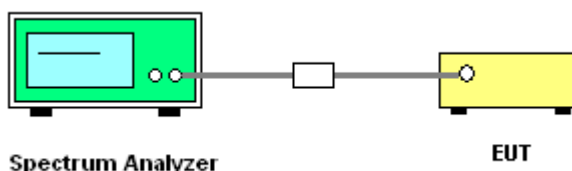
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Encompass the entire emissions bandwidth (EBW) of the signal
RB	1000 kHz
VB	3000 kHz
Detector	Sample
Trace	Average 100 traces.
Sweep Time	20ms

4.2.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. Test was performed in accordance with Measurement of Digital Transmission Systems Operating under Section 15.247 March 23, 2005.
3. When measuring maximum conducted output power with multiple antenna systems, add every result of the values by mathematic formula.

4.2.4. Test Setup Layout



4.2.5. Test Deviation

There is no deviation with the original standard.

4.2.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.2.7. Test Result of Maximum Peak Output Power

Temperature	26°C	Humidity	62%
Test Engineer	Sam Chen	Configurations	Draft n

For 2.4GHz Band

Configuration Draft n MCS8 20MHz Ant. A

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	17.42	30.00	Complies
6	2437 MHz	17.48	30.00	Complies
11	2462 MHz	17.27	30.00	Complies

Configuration Draft n MCS8 20MHz Ant. C

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	16.80	30.00	Complies
6	2437 MHz	16.74	30.00	Complies
11	2462 MHz	16.71	30.00	Complies

Configuration Draft n MCS8 20MHz Ant. A + Ant. C

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	20.13	30.00	Complies
6	2437 MHz	20.14	30.00	Complies
11	2462 MHz	20.01	30.00	Complies

Configuration Draft n MCS8 40MHz Ant. A

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
3	2422 MHz	17.14	30.00	Complies
6	2437 MHz	17.27	30.00	Complies
9	2452 MHz	17.16	30.00	Complies

Configuration Draft n MCS8 40MHz Ant. C

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
3	2422 MHz	16.67	30.00	Complies
6	2437 MHz	16.63	30.00	Complies
9	2452 MHz	16.64	30.00	Complies

Configuration Draft n MCS8 40MHz Ant. A + Ant. C

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
3	2422 MHz	19.92	30.00	Complies
6	2437 MHz	19.97	30.00	Complies
9	2452 MHz	19.92	30.00	Complies

For 5GHz Band

Configuration Draft n MCS8 20MHz Ant. A

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	26.41	30.00	Complies
157	5785 MHz	26.47	30.00	Complies
165	5825 MHz	25.67	30.00	Complies

Configuration Draft n MCS8 20MHz Ant. C

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	26.91	30.00	Complies
157	5785 MHz	26.67	30.00	Complies
165	5825 MHz	23.95	30.00	Complies

Configuration Draft n MCS8 20MHz Ant. A + Ant. C

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	29.68	30.00	Complies
157	5785 MHz	29.58	30.00	Complies
165	5825 MHz	27.90	30.00	Complies

Configuration Draft n MCS8 40MHz Ant. A

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
151	5755 MHz	26.29	30.00	Complies
159	5795 MHz	25.58	30.00	Complies

Configuration Draft n MCS8 40MHz Ant. C

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
151	5755 MHz	26.61	30.00	Complies
159	5795 MHz	26.12	30.00	Complies

Configuration Draft n MCS8 40MHz Ant. A + Ant. C

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
151	5755 MHz	29.46	30.00	Complies
159	5795 MHz	28.87	30.00	Complies



Ref 20 dBm • Att 30 dB SWT 2.5 ms 2.43280000 GHz

Marker 1 [T1] 6.51 dBm

Offset 0.5 dB

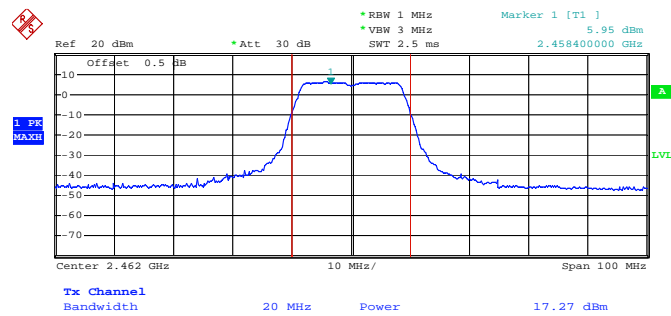
1 PK MAXH

Center 2.437 GHz 10 MHz/ Span 100 MHz

Tx Channel Bandwidth 20 MHz Power 17.48 dBm

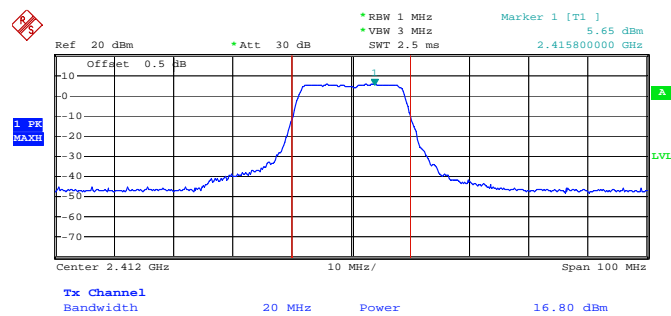
Issued Date : Jun. 11, 2008

Channel Output Power Plot on Configuration Draft n MCS8 20MHz Ant. A / 2462 MHz



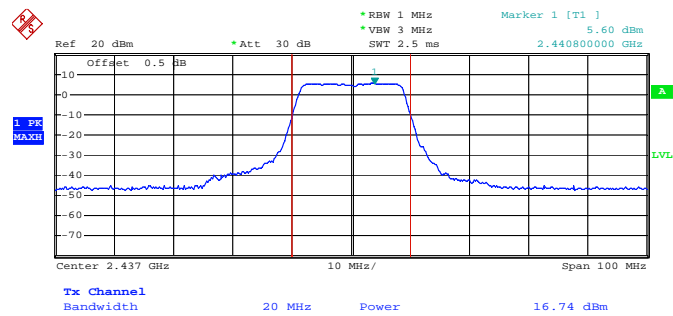
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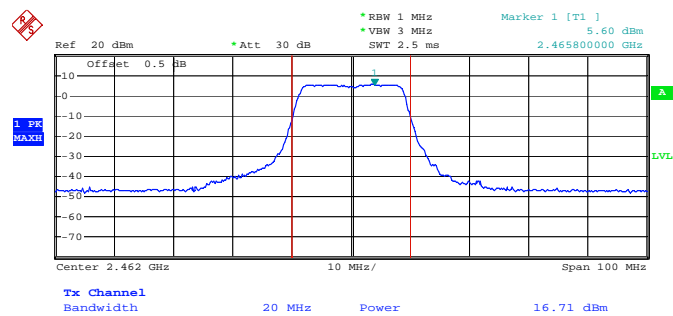
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Channel Output Power Plot on Configuration Draft n MCS8 20MHz Ant. C / 2437 MHz



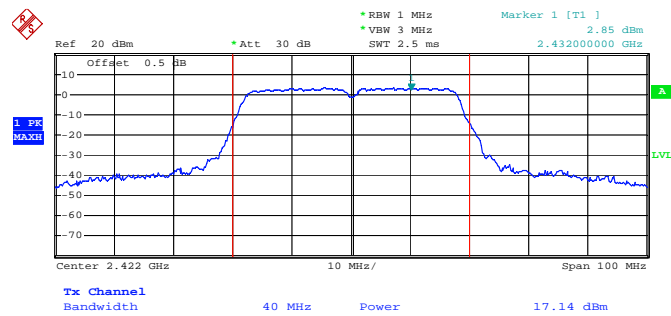
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Channel Output Power Plot on Configuration Draft n MCS8 20MHz Ant. C / 2462 MHz



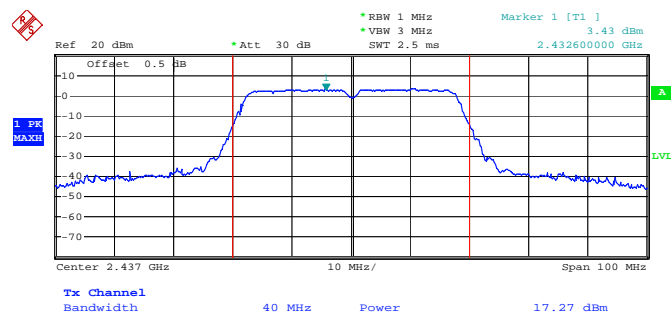
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Channel Output Power Plot on Configuration Draft n MCS8 40MHz Ant. A / 2422 MHz



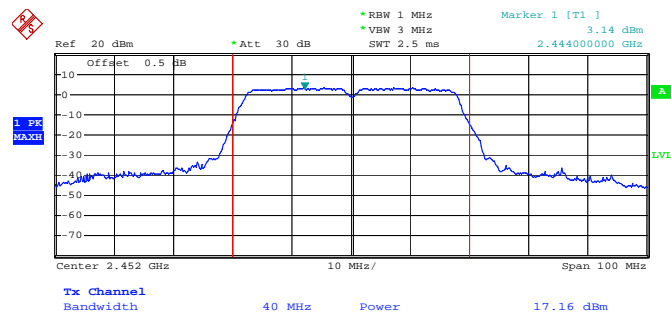
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Channel Output Power Plot on Configuration Draft n MCS8 40MHz Ant. A / 2437 MHz



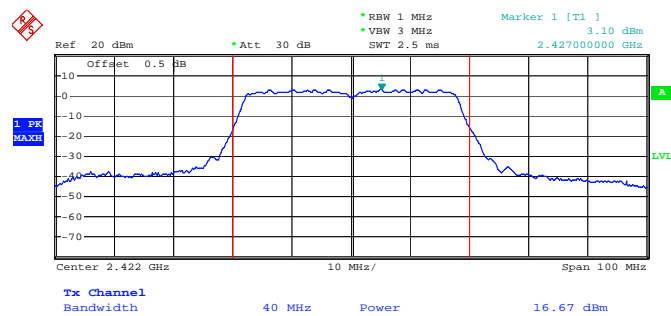
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Channel Output Power Plot on Configuration Draft n MCS8 40MHz Ant. A / 2452 MHz



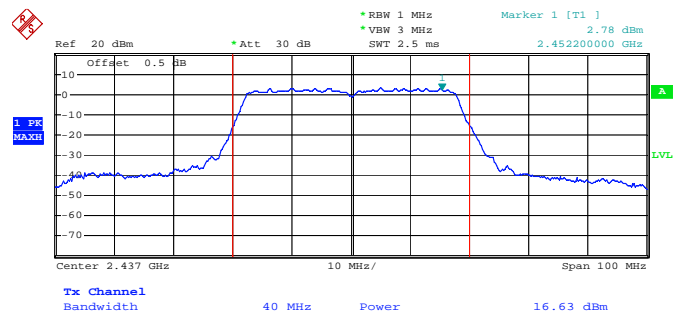
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Channel Output Power Plot on Configuration Draft n MCS8 40MHz Ant. C / 2422 MHz



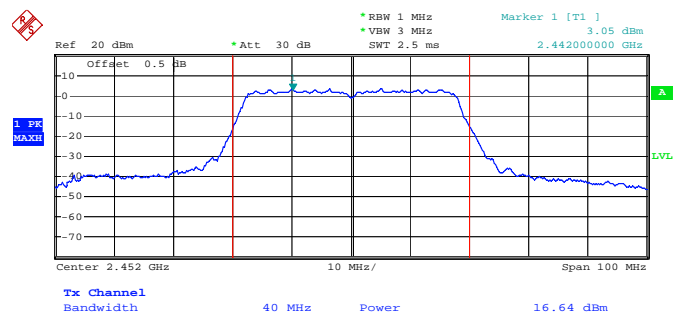
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Channel Output Power Plot on Configuration Draft n MCS8 40MHz Ant. C / 2437 MHz



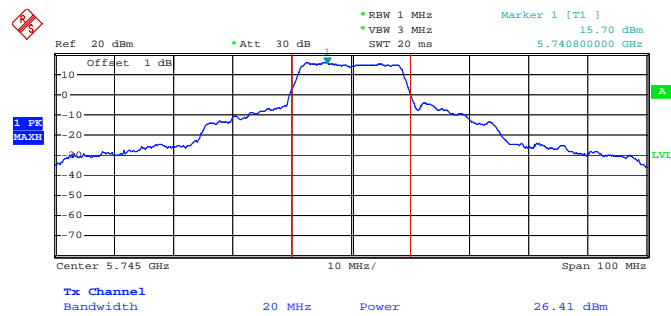
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Channel Output Power Plot on Configuration Draft n MCS8 40MHz Ant. C / 2452 MHz



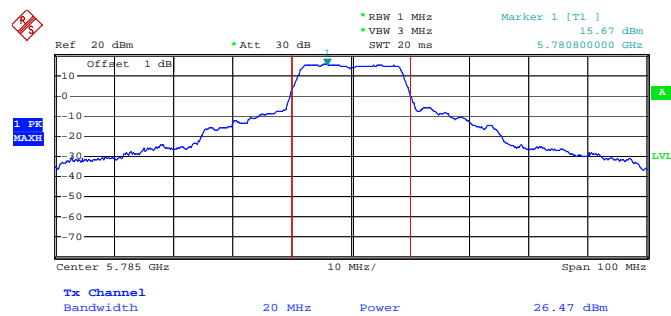
Date: 3.JUN.2008 19:06:57

Channel Output Power Plot on Configuration 11a Draft n MCS8 20MHz Ant. A / 5745 MHz



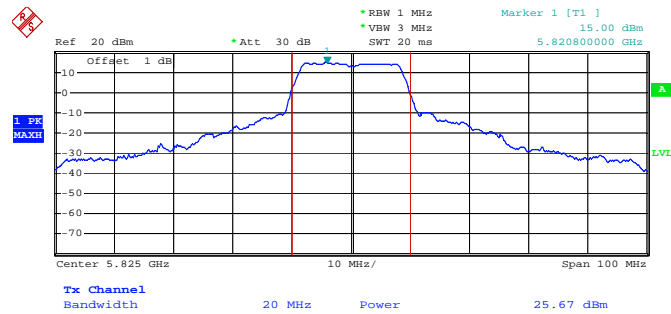
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Channel Output Power Plot on Configuration 11a Draft n MCS8 20MHz Ant. A / 5785MHz



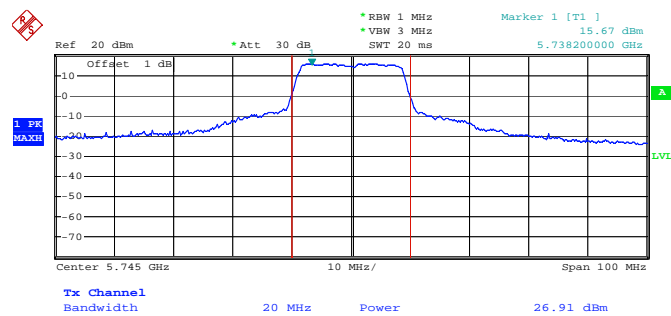
Date: 3.JUN.2008 20:08:01

Channel Output Power Plot on Configuration 11a Draft n MCS8 20MHz Ant. A / 5825 MHz



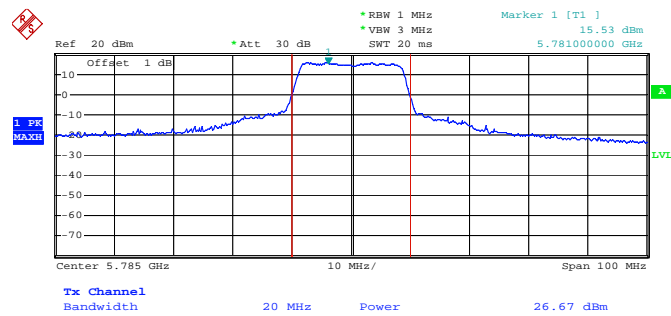
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Channel Output Power Plot on Configuration 11a Draft n MCS8 20MHz Ant. C / 5745 MHz



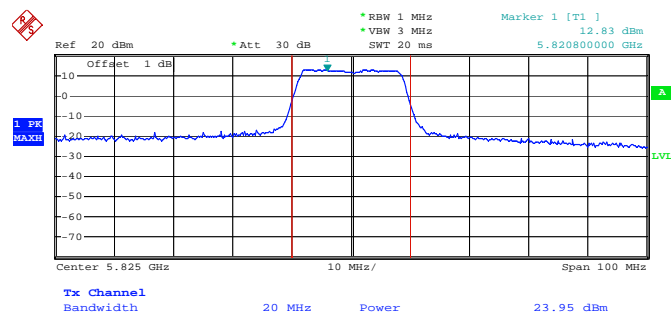
Date: 3.JUN.2008 20:03:35

Channel Output Power Plot on Configuration 11a Draft n MCS8 20MHz Ant. C / 5785MHz



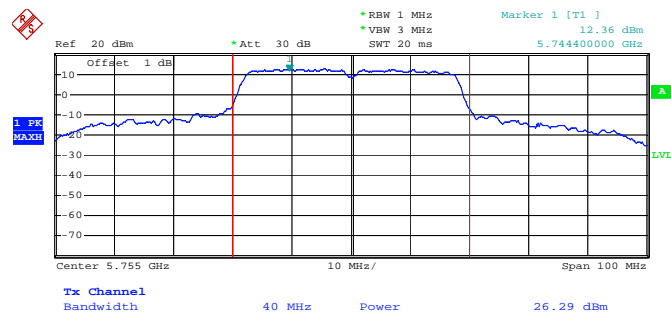
Date: 3.JUN.2008 20:11:22

Channel Output Power Plot on Configuration 11a Draft n MCS8 20MHz Ant. C / 5825 MHz



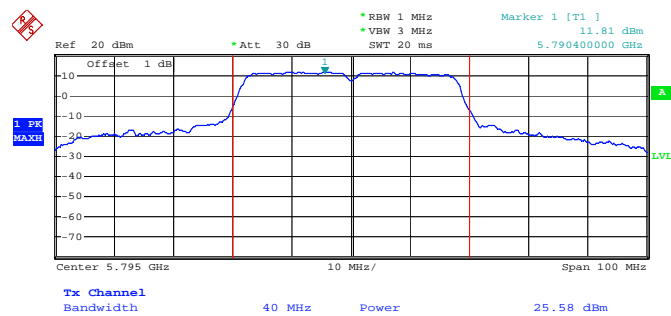
Date: 3.JUN.2008 20:09:41

Channel Output Power Plot on Configuration 11a Draft n MCS8 40MHz Ant. A / 5755 MHz



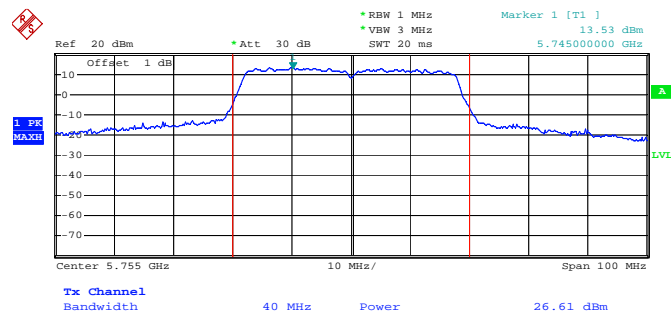
Date: 3.JUN.2008 20:20:27

Channel Output Power Plot on Configuration 11a Draft n MCS8 40MHz Ant. A / 5795 MHz



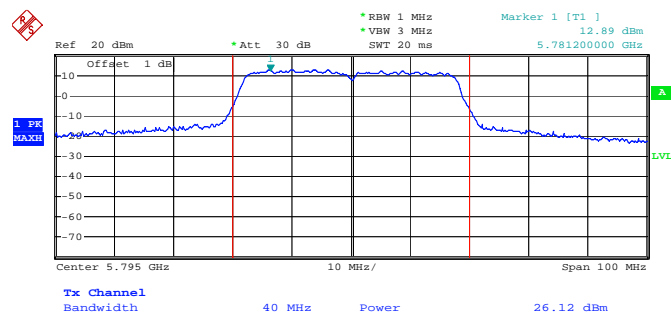
Date: 3.JUN.2008 20:21:51

Channel Output Power Plot on Configuration 11a Draft n MCS8 40MHz Ant. C / 5755 MHz



Date: 3.JUN.2008 20:19:40

Channel Output Power Plot on Configuration 11a Draft n MCS8 40MHz Ant. C / 5795 MHz



Date: 3.JUN.2008 20:22:28

4.3. Power Spectral Density Measurement

4.3.1. Limit

For digitally modulated systems, the 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.

4.3.2. Measuring Instruments and Setting

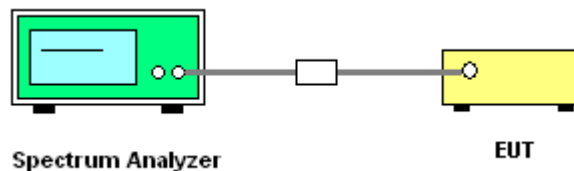
Please refer to section 5 of equipments list in this report. The following table is the setting of Spectrum Analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	1.5MHz
RB	3 kHz
VB	30 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	500s

4.3.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyser.
2. Set RBW of spectrum analyzer to 3kHz and VBW to 30kHz. Set Detector to Peak, Trace to Max Hold.
3. Mark the frequency with maximum peak power as the center of the display of the spectrum.
4. Set the span to 1.5MHz and the sweep time to 500s and record the maximum peak value.
5. Measuring multiple antennas, the connector is required to link with spectrum analyser through a combiner.

4.3.4. Test Setup Layout



4.3.5. Test Deviation

There is no deviation with the original standard.

4.3.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.3.7. Test Result of Power Spectral Density

Temperature	26°C	Humidity	62%
Test Engineer	Sam Chen	Configurations	Draft n

For 2.4GHz Band

Configuration Draft n MCS8 20MHz Ant. A + Ant. C

Channel	Frequency	Power Density (dBm/3kHz)	Max. Limit (dBm)	Result
1	2412 MHz	-15.93	8.00	Complies
6	2437 MHz	-15.86	8.00	Complies
11	2462 MHz	-15.62	8.00	Complies

Configuration Draft n MCS8 40MHz Ant. A + Ant. C

Channel	Frequency	Power Density (dBm/3kHz)	Max. Limit (dBm)	Result
3	2422 MHz	-16.17	8.00	Complies
6	2437 MHz	-15.91	8.00	Complies
9	2452 MHz	-15.82	8.00	Complies

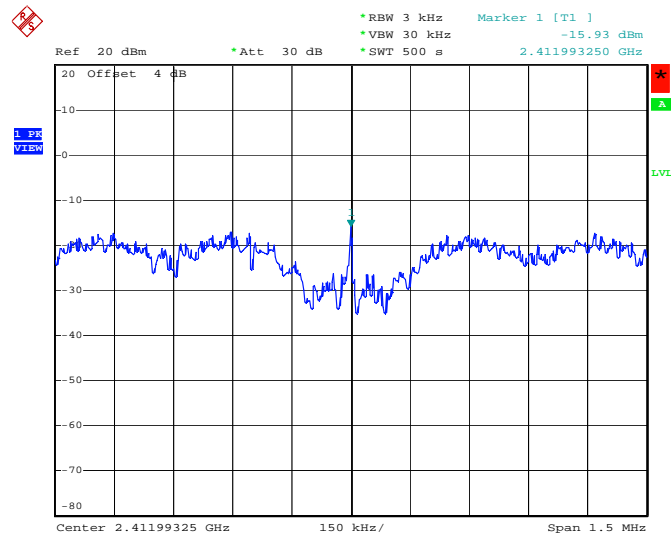
For 5GHz Band
Configuration Draft n MCS8 20MHz Ant. A + Ant. C

Channel	Frequency	Power Density (dBm/3kHz)	Max. Limit (dBm)	Result
149	5745 MHz	-5.94	8.00	Complies
157	5785 MHz	-7.47	8.00	Complies
165	5827 MHz	-8.40	8.00	Complies

Configuration Draft n MCS8 40MHz Ant. A + Ant. C

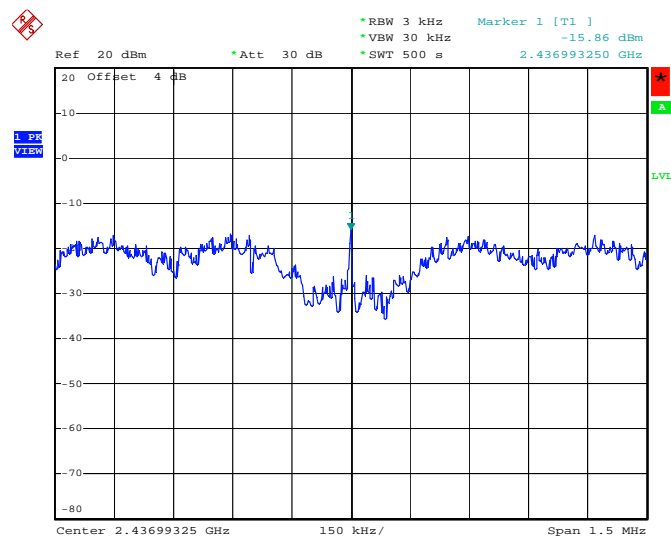
Channel	Frequency	Power Density (dBm/3kHz)	Max. Limit (dBm)	Result
151	5755 MHz	-8.42	8.00	Complies
159	5795 MHz	-8.22	8.00	Complies

Power Density Plot on Configuration Drafft n MCS8 20MHz Ant. A + Ant. C / 2412 MHz



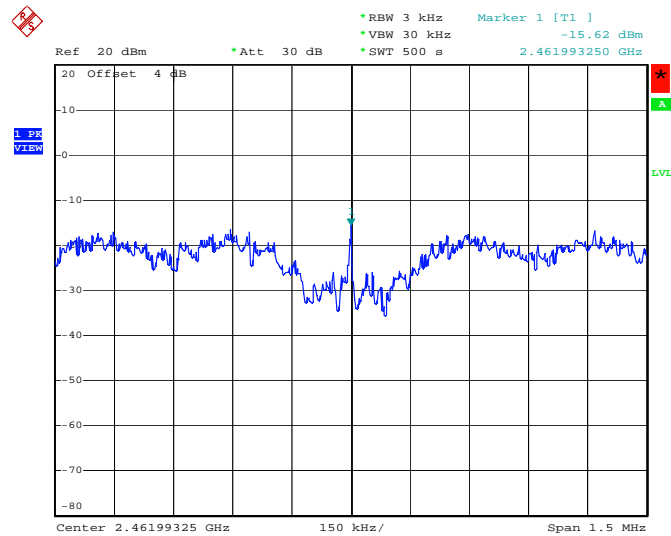
Date: 3.JUN.2008 20:46:14

Power Density Plot on Configuration Drafft n MCS8 20MHz Ant. A + Ant. C / 2437 MHz



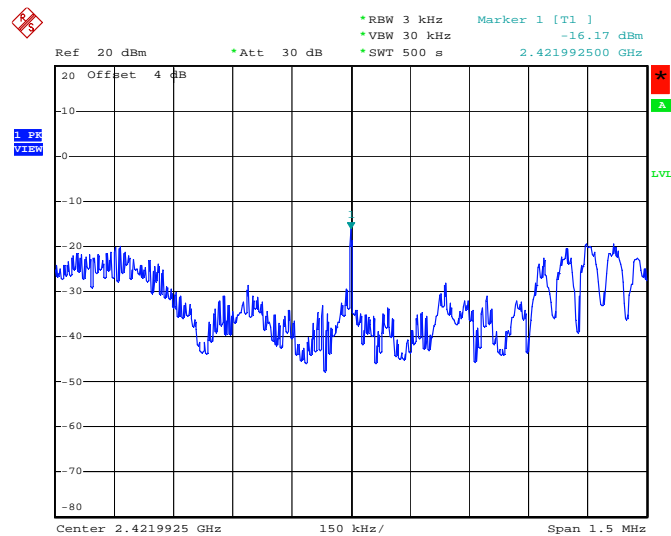
Date: 3.JUN.2008 20:47:13

Power Density Plot on Configuration Drafft n MCS8 20MHz Ant. A + Ant. C / 2462 MHz



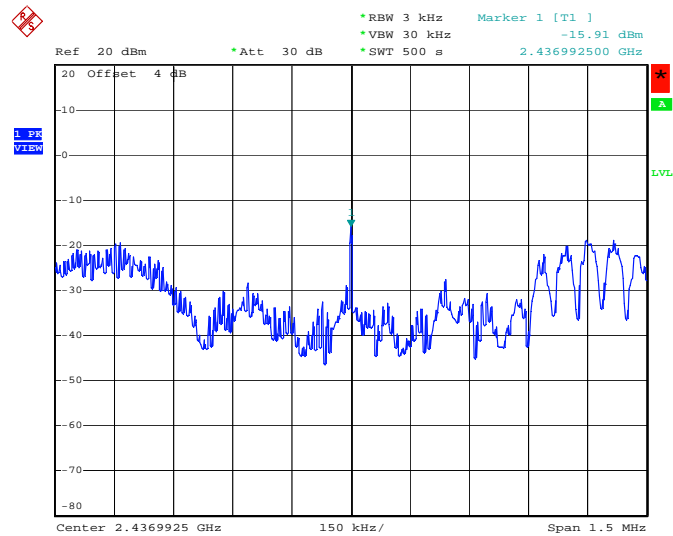
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Power Density Plot on Configuration Drafft n MCS8 40MHz Ant. A + Ant. C / 2422 MHz



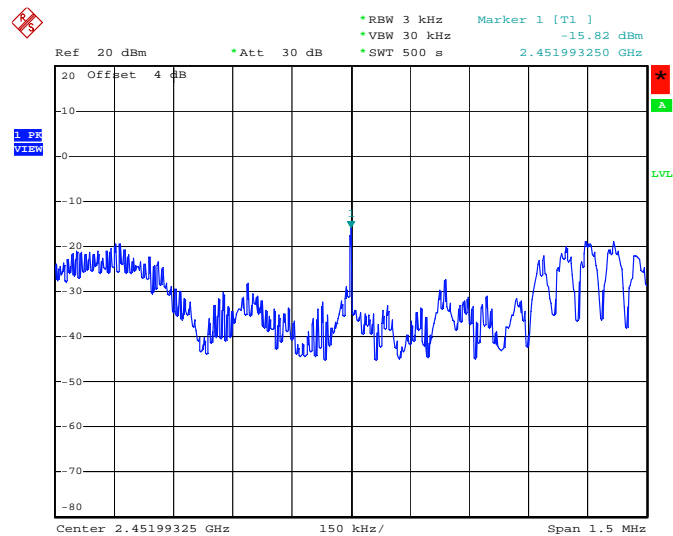
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Power Density Plot on Configuration Drafft n MCS8 40MHz Ant. A + Ant. C / 2437 MHz



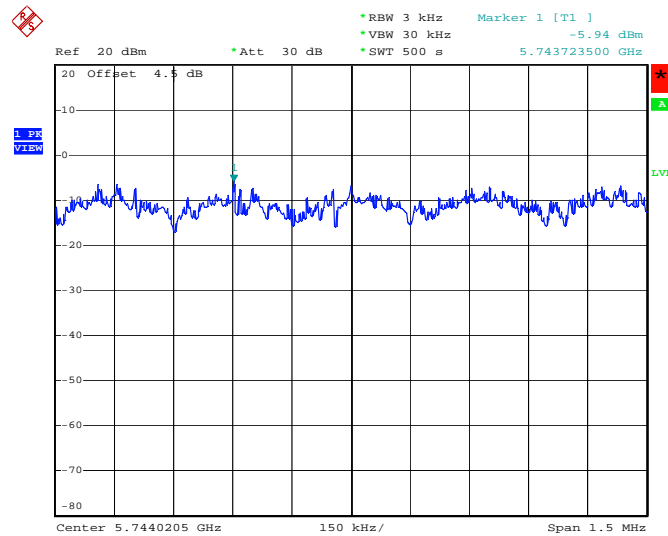
Date: 3.JUN.2008 20:51:26

Power Density Plot on Configuration Drafft n MCS8 40MHz Ant. A + Ant. C / 2452 MHz



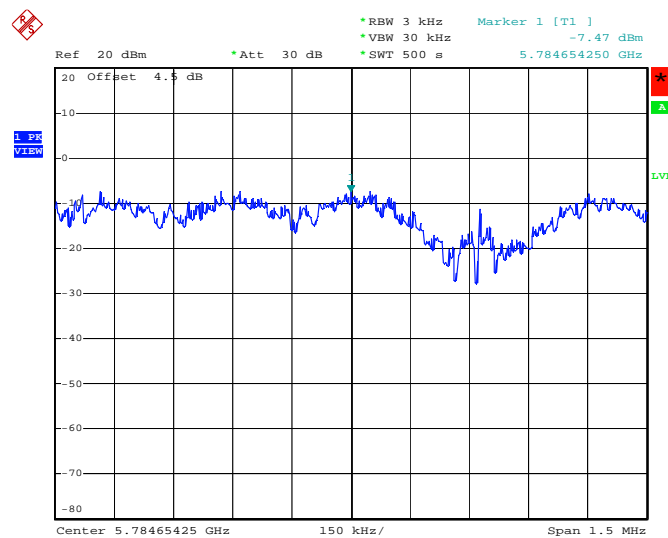
Date: 3.JUN.2008 20:50:06

Power Density Plot on Configuration Drafft n MCS8 20MHz Ant. A + Ant. C / 5745 MHz



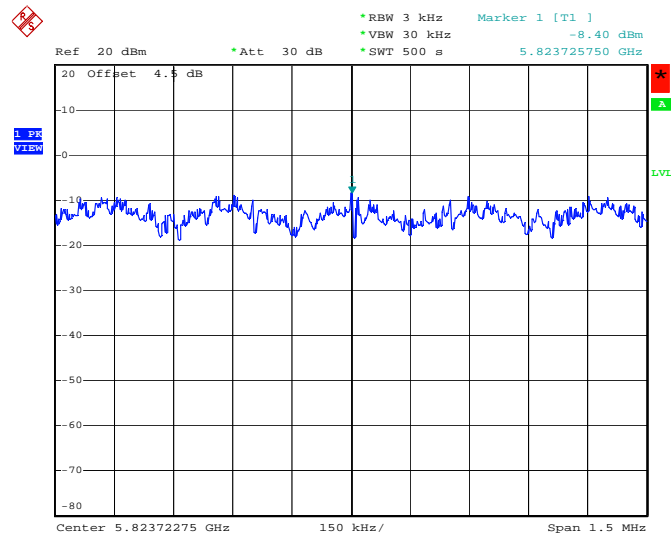
Date: 3.JUN.2008 21:02:20

Power Density Plot on Configuration Drafft n MCS8 20MHz Ant. A + Ant. C / 5785 MHz



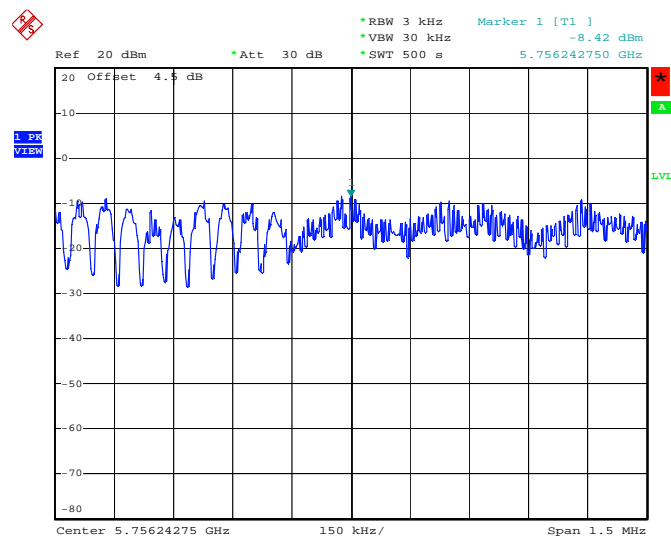
Date: 3.JUN.2008 21:03:43

Power Density Plot on Configuration Drafft n MCS8 20MHz Ant. A + Ant. C / 5825 MHz



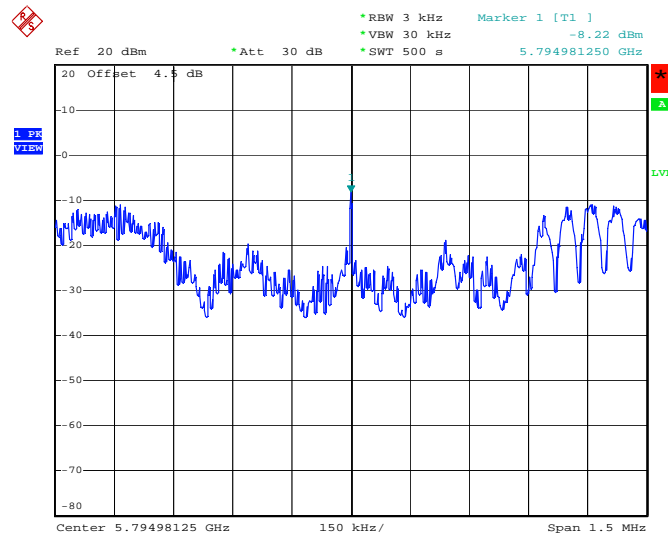
Date: 3.JUN.2008 21:04:42

Power Density Plot on Configuration Drafft n MCS8 40MHz Ant. A + Ant. C / 5755MHz



Date: 3.JUN.2008 21:07:03

Power Density Plot on Configuration Draft n MCS8 40MHz Ant. A + Ant. C / 5795 MHz



Date: 3.JUN.2008 21:08:25

4.4. 6dB Spectrum Bandwidth Measurement

4.4.1. Limit

For digital modulation systems, the minimum 6 dB bandwidth shall be at least 500 kHz.

4.4.2. Measuring Instruments and Setting

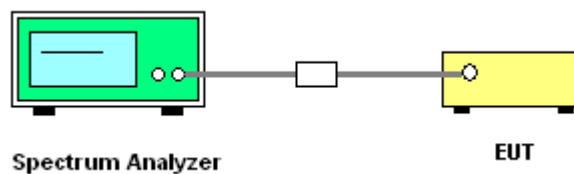
Please refer to section 5 of equipments list in this report. The following table is the setting of the Spectrum Analyzer.

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> 6dB Bandwidth
RB	100 kHz
VB	100 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

4.4.3. Test Procedures

- The transmitter output (antenna port) was connected to the spectrum analyser in peak hold mode.
- The resolution bandwidth of 100 kHz and the video bandwidth of 100 kHz were used.
- Measured the spectrum width with power higher than 6dB below carrier.
- Measuring multiple antennas, the connector is required to link with spectrum analyse through a combiner.

4.4.4. Test Setup Layout



4.4.5. Test Deviation

There is no deviation with the original standard.

4.4.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.4.7. Test Result of 6dB Spectrum Bandwidth

Temperature	26°C	Humidity	62%
Test Engineer	Sam Chen	Configurations	Draft n

For 2.4GHz Band

Configuration Draft n MCS8 20MHz Ant. A + Ant. C

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
1	2412 MHz	17.64	17.64	500	Complies
6	2437 MHz	17.64	17.60	500	Complies
11	2462 MHz	17.68	17.60	500	Complies

Configuration Draft n MCS8 40MHz Ant. A + Ant. C

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
3	2422 MHz	36.40	36.08	500	Complies
6	2437 MHz	36.40	36.00	500	Complies
9	2452 MHz	36.16	36.00	500	Complies

For 5GHz Band

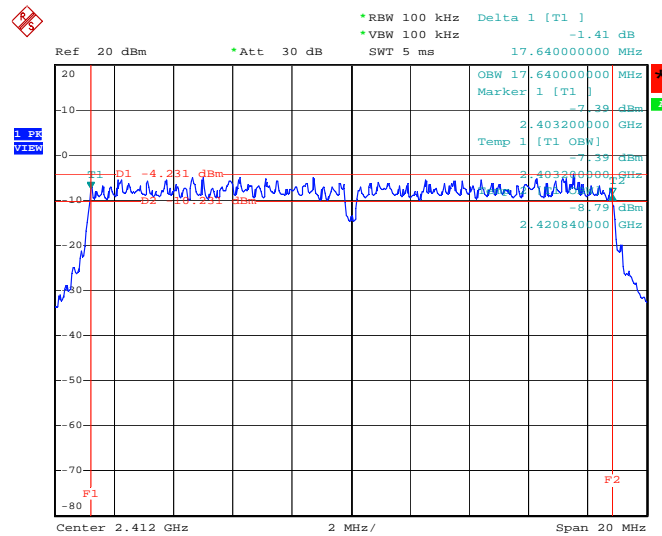
Configuration Draft n MCS8 20MHz Ant. A + Ant. C

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
149	5745 MHz	17.68	17.64	500	Complies
157	5785 MHz	17.64	17.64	500	Complies
165	5825 MHz	17.64	17.64	500	Complies

Configuration Draft n MCS8 40MHz Ant. A + Ant. C

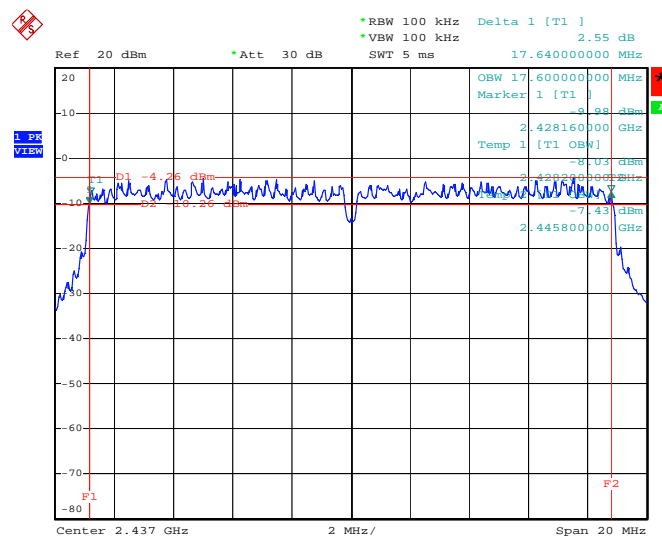
Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
151	5755 MHz	36.08	35.92	500	Complies
159	5795 MHz	36.16	36.00	500	Complies

6 dB Bandwidth Plot on Configuration Draft n MCS8 20MHz Ant. A + Ant. C / 2412 MHz



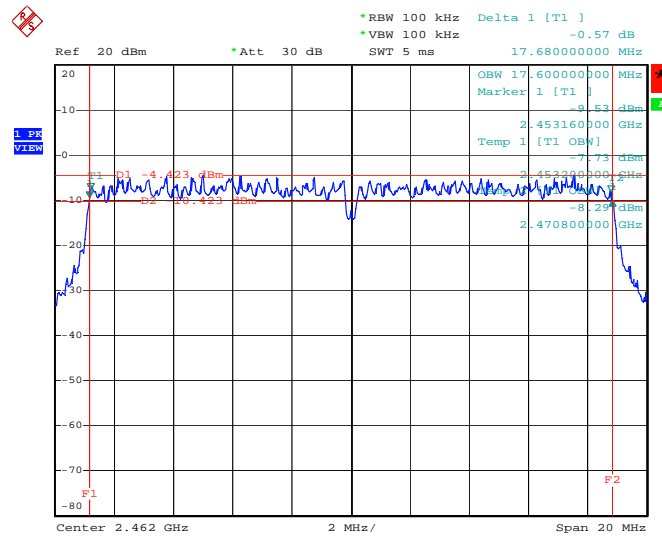
Date: 3.JUN.2008 20:45:48

6 dB Bandwidth Plot on Configuration Draft n MCS8 20MHz Ant. A + Ant. C / 2437 MHz



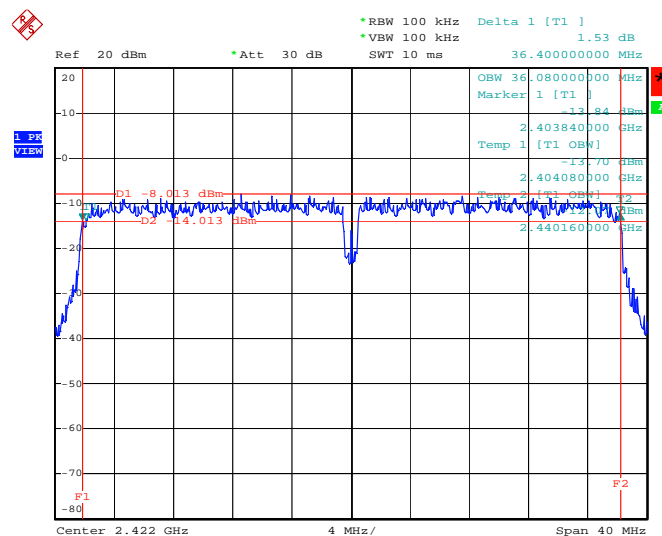
Date: 3.JUN.2008 20:46:57

6 dB Bandwidth Plot on Configuration Draft n MCS8 20MHz Ant. A + Ant. C / 2462 MHz



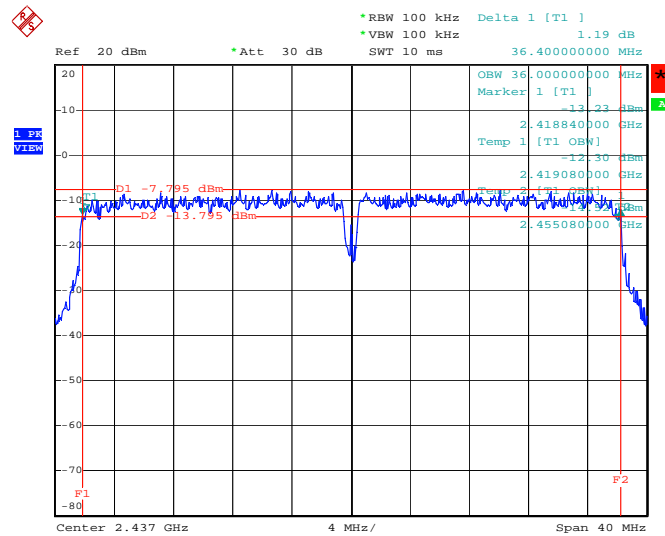
Date: 3.JUN.2008 20:47:52

6 dB Bandwidth Plot on Configuration Draft n MCS8 40MHz Ant. A + Ant. C / 2422 MHz



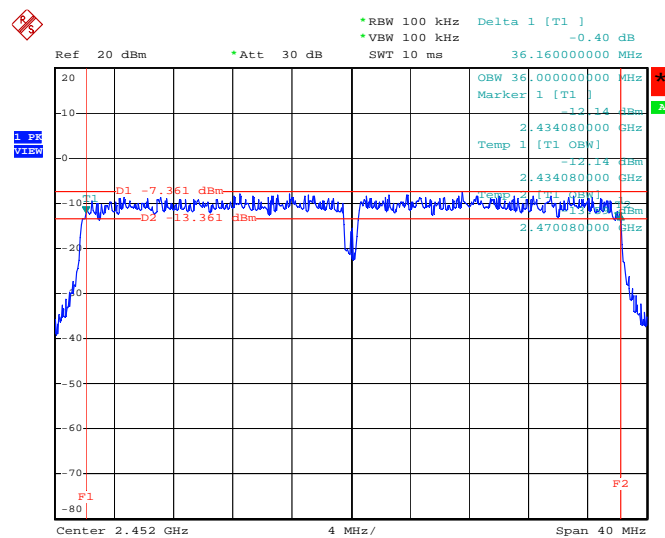
Date: 3.JUN.2008 20:52:33

6 dB Bandwidth Plot on Configuration Draft n MCS8 40MHz Ant. A + Ant. C / 2437 MHz



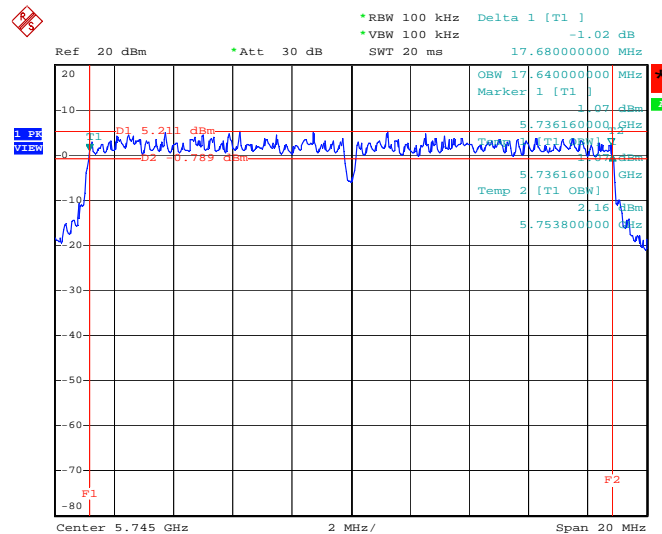
Date: 3.JUN.2008 20:51:01

6 dB Bandwidth Plot on Configuration Draft n MCS8 40MHz Ant. A + Ant. C / 2452 MHz



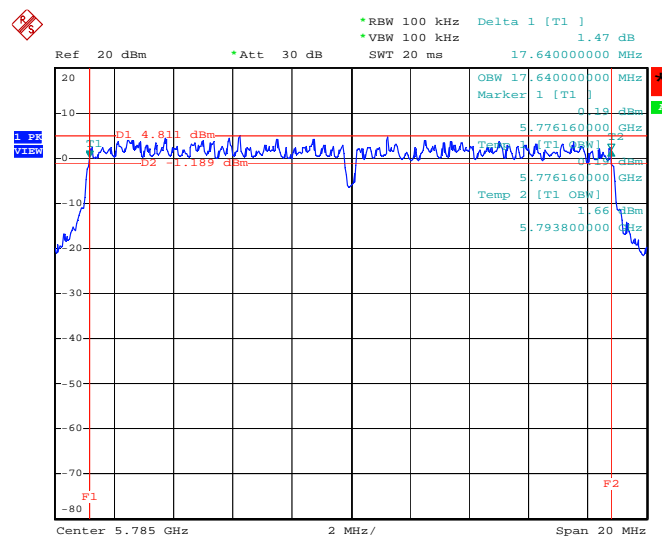
Date: 3.JUN.2008 20:49:41

6 dB Bandwidth Plot on Configuration Drafft n MCS8 20MHz Ant. A + Ant. C / 5745 MHz



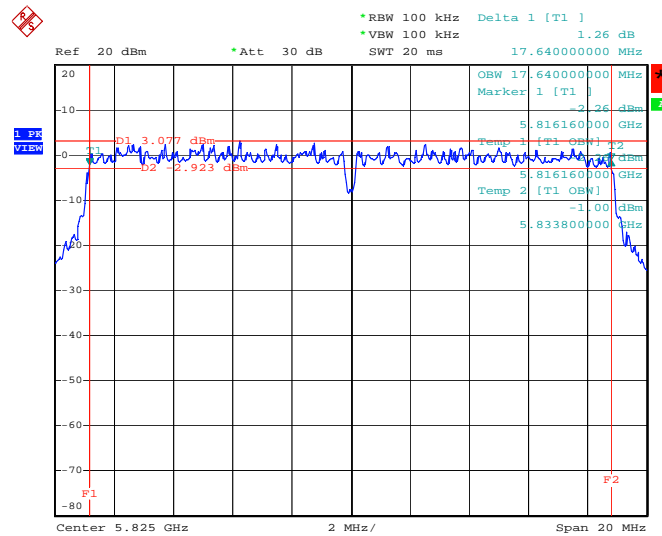
Date: 3.JUN.2008 21:01:55

6 dB Bandwidth Plot on Configuration Drafft n MCS8 20MHz Ant. A + Ant. C / 5785MHz



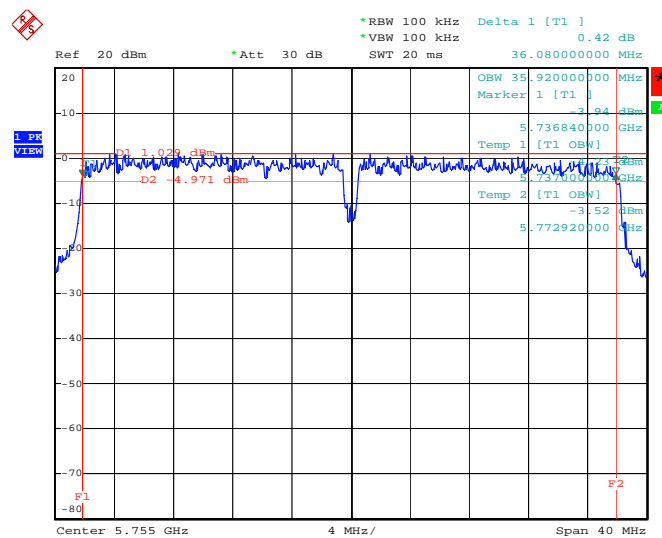
Date: 3.JUN.2008 21:03:18

6 dB Bandwidth Plot on Configuration Draft n MCS8 20MHz Ant. A + Ant. C / 5825 MHz



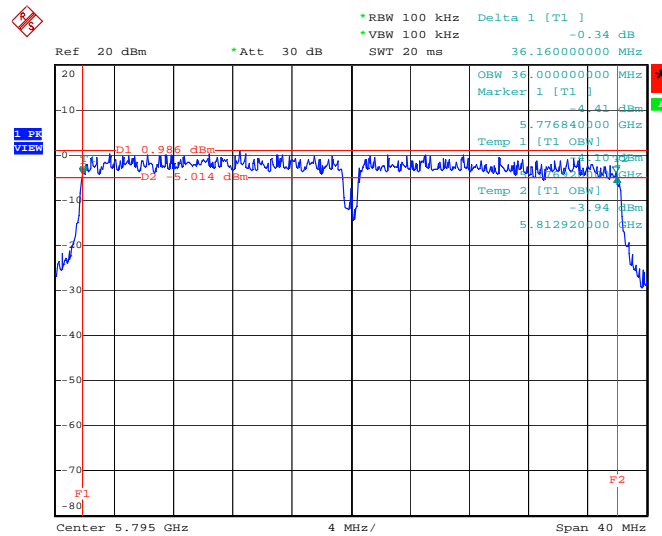
Date: 3.JUN.2008 21:04:16

6 dB Bandwidth Plot on Configuration Draft n MCS8 40MHz Ant. A + Ant. C / 5755MHz



Date: 3.JUN.2008 21:06:38

6 dB Bandwidth Plot on Configuration Draft n MCS8 40MHz Ant. A + Ant. C / 5795 MHz



Date: 3.JUN.2008 21:08:00