FCC / IC Test Report

EQUIPMENT	:	Tsunami GX800
BRAND NAME	:	Tsunami
MODEL NO.	:	GX800-XX-LNK (XX = band designation)
FCC ID	:	HZB-GX800-23
STANDARD	:	47 CFR FCC Part 101 IC SRSP-321.8
APPLICANT	:	Proxim Wireless Corporation 1561 Buckeye Drive, Milpitas CA 95035 USA
MANUFACTURER		UBTs dustrial (Shanghai)

The product sample received on Nov. 17, 2010 and completely tested on Dec. 08, 2010. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2009 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Jordan Hsiao 2011.3.9

Reviewed by: Jordan Hsiao

Testing Laboratory 1190

TABLE OF CONTENTS

SUMMARY OF TEST RESULT

FCC / IC Standard Requirements and Conformance Test Specifications					
Report Clause	**Ref. FCC Std. Clause**	**Ref. IC Std. Clause**	**Description**	**Result**	**Remark**
3.1	15.107	GEN 7.2.2	AC Power Conducted Emissions	Complied	-
3.2	2.1049/101.109	GEN 4.6.1	Occupied Bandwidth	Complied	-
3.3	101.113	SRSP-321.8	Transmitter Power	Complied	-
3.4	101.111	SRSP-321.8	Radiated Out-of-band Emissions	Complied	-
3.5	2.1051/101.111	SRSP-321.8	Conducted Out-of-band Emissions	Complied	-
3.6	101.111	SRSP-321.8	Spectrum Mask Emissions	Complied	-
3.7	101.107	GEN 4.7	Frequency Tolerance	Complied	-
4.1	2.1091	RSS-102	Maximum Permissible Exposure	Complied	-

REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR/CR0N2309AD	Rev. 01	Initial issue of report	Dec. 15, 2010
FR/CR0N2309AD	Rev. 02	Modify the description of antenna	Mar. 09, 2011

1 General Description

1.1 Information

1.1.1 EUT information

Items	Description
Modulation	QPSK, 16QAM, 32QAM, 64QAM,128QAM, 256QAM
Bandwidth	10 MHz , 20 MHz , 30 MHz , 40 MHz , 50 MHz ,
Data Rate Range(Mbps)	10~310 Mbps
Transmitter Frequency	21472 - 21786 MHz , 22704 - 23018 MHz
Receiver Frequency	22704 - 23018 MHz, 21472 - 21786 MHz
Channel Band Width (99%)	48.4 MHz
Max output Power	20.41 dBm
Max Antenna Gaun	45.00 dBi
Max EIRP power	65.41 dBm

Note: Because QPSK is max power , so we choose it to test for report. The EUT has five kinds bandwidth , we choose max and min to test for report.

1.1.2 The Channel Plan(s)

The Channel Plan(s)	
Channel Plan 1:	21200 - 23600 MHz Band
Authorized Bandwidth 1:	10 MHz
Authorized Bandwidth 2:	50 MHz
TX/RX Space:	1232 MHz
NOTE: EUT complied with FCC 101.101 NOTE: We choose max / min Bandwidth to test for report.	

1.1.3 Transmit Operating Modes

The Different Transmit Operating Modes
☒ Operating mode 1: Single Antenna Equipment
☐ Operating mode 2: Smart Antenna Systems - without beam forming
☐ Operating mode 3: Smart Antenna Systems - with beam forming

1.1.4 Smart Antenna Systems

In Case of Smart Antenna Systems		
☒ No, EUT is without smart antenna feature.		
☐ Yes, specify smart antenna feature:		
The number of Receive chains:	N/A	
The number of Transmit chains:	N/A	
Equal power distribution among the transmit chains:	☐ Yes ; ☐ No	
☐ In case of beam forming, the maximum beam forming gain:		dB

1.1.5 Antenna Information

Antenna Information	
Integral antenna gain:	N/A dBi
	☐ Temporary RF connector provided
	☒ No temporary RF connector provided
☒ External antenna (parabolic antennas)	
	☒ Diameter 30cm gain=34.4 dBi
	☒ Diameter 60cm gain=39.8 dBi
	☐ Diameter 90cm
	☒ Diameter 120cm gain=45 dBi
	☐ Diameter 180cm
NOTE: EUT antenna complied with FCC 101.115, antenna requirements.	

1.1.6 Type of Equipment

Type of Equipment
☒ Stand-alone
☐ Combined Equipment (The radio part is fully integrated within another type of equipment)
☐ Plug-in radio device (Equipment intended for a variety of host systems)
☐ Other:

1.1.7 Transmit Power

(a) Highest Power Levels (without antenna)						
Applicable power levels		☒ Conducted; ☐ EIRP				
Authorized Bandwidth:		1 (10 MHz)				
Operating Mode & Frequency (MHz)		Highest setting (P_{high}): (dBm)				
		Power Setting	Modulation	Data Rate (Mb/s)	Power	EIRP Power Limit
Mode 1	21472	20	QPSK	14.96	20.40	85
	21786	20	QPSK	14.96	20.41	85
	23018	21	QPSK	14.96	20.25	85

(b) Highest Power Levels (without antenna)						
Applicable power levels:	☒ Conducted ☐ EIRP					
Authorized Bandwidth:	2 (50 MHz)					
Operating Mode & Frequency (MHz)		Highest setting (P_{high}): (dBm)				
		Power Setting	Modulation	Data Rate (Mb/s)	Power	EIRP Power Limit
Mode 2	21472	19	QPSK	76.70	18.31	85
	21786	18	QPSK	76.70	18.32	85
	23018	21	QPSK	76.70	20.25	85

1.1.8 Extreme Operating

The Extreme Operating Temperature Range that Apply to the Equipment					
☒ -30 °C to +50 °C					
☐ 0 °C to +35 °C					
☐ Other:					
The nominal voltages of the stand-alone radio equipment or the nominal voltages of the combined (host) equipment or test jig in case of plug-in devices.					
Details provided are for the:	☒ stand-alone equipment				
	☐ combined (or host) equipment				
	☐ test jig				
Supply Voltage	☒ AC mains	State AC voltage	100-240	V	
Supply Voltage	☐ DC	State DC voltage		V	
		State DC current		mA	
In case of DC, indicate the type of power source:					
☐ Internal Power Supply					
☒ External Power Supply from IDU					
☐ Battery	☐ Nickel Cadmium				
	☐ Alkaline				
	☐ Nickel-Metal Hydride				
	☐ Lithium-Ion				
	☐ Lead acid (Vehicle regulated)				
	☐ Other:				
Operating Voltage	☒ Vnom (-48 VDC)	☒ Vmin (-40.8 VDC)	☒ Vmax (-55.5 VDC)		
Operating Climatic	☒ Tnom (20°C)	☒ Tmin (-30°C)	☒ Tmax (50°C)		

1.2 Additional Information Provided by the Submitter

1.2.1 Modulation

Modulation		
ITU Class of emission - Mode 1	G1D (QPSK, 8PSK), D1D (16QAM, 64QAM, 128QAM, 256QAM)	
Can the transmitter operate un-modulated:	☐ Yes	☒ No

1.2.2 Duty Cycle

Duty Cycle		
The transmitter is intended for:	☒	Continuous Duty: 100 %
	☐	Intermittent Duty: … %
	☐	Continuous operation possible for testing purposes

1.2.3 About the EUT

About the EUT	
☒	The equipment submitted are representative production models.
☐	If not, the equipment submitted are pre-production models
☐	If pre-production equipment is submitted, the final production equipment will be identical in all respects with the equipment tested.
☐	If not, supply full details:

1.3 Ancillary and/or Support Equipment

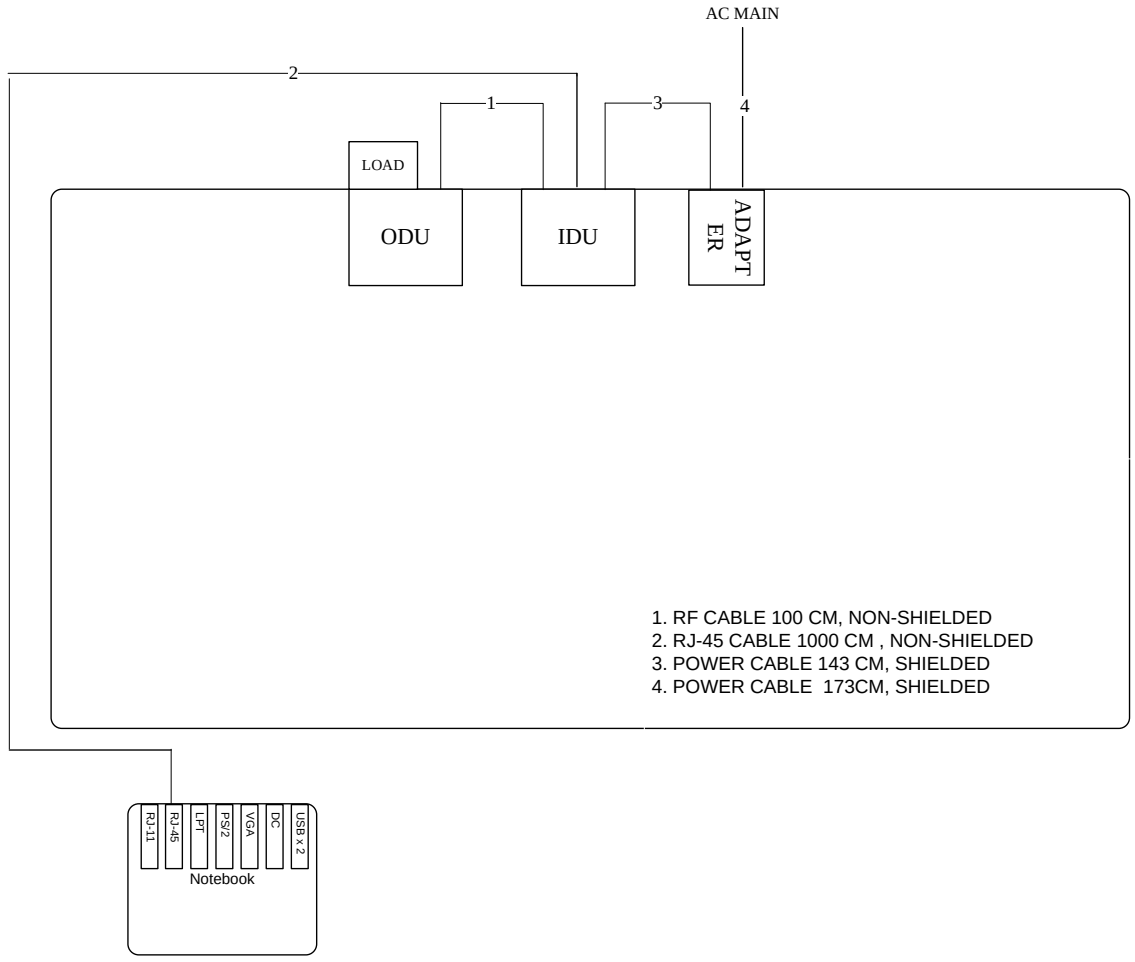
Ancillary Equipment (AE)				
Item	**Equipment**	**Brand Name**	**Model Name**	**Serial No.**
AE01	Tsunami GX800	Tsunami	GX800-XX-LNK	-

Support Equipment (SE)				
Item	**Equipment**	**Brand Name**	**Model Name**	**Serial No.**
SE01	Notebook PC	Dell	PP25L	E2K4965AGNM
SE02	AC/DC Power Adapter	GX800-IDU	GX800	-

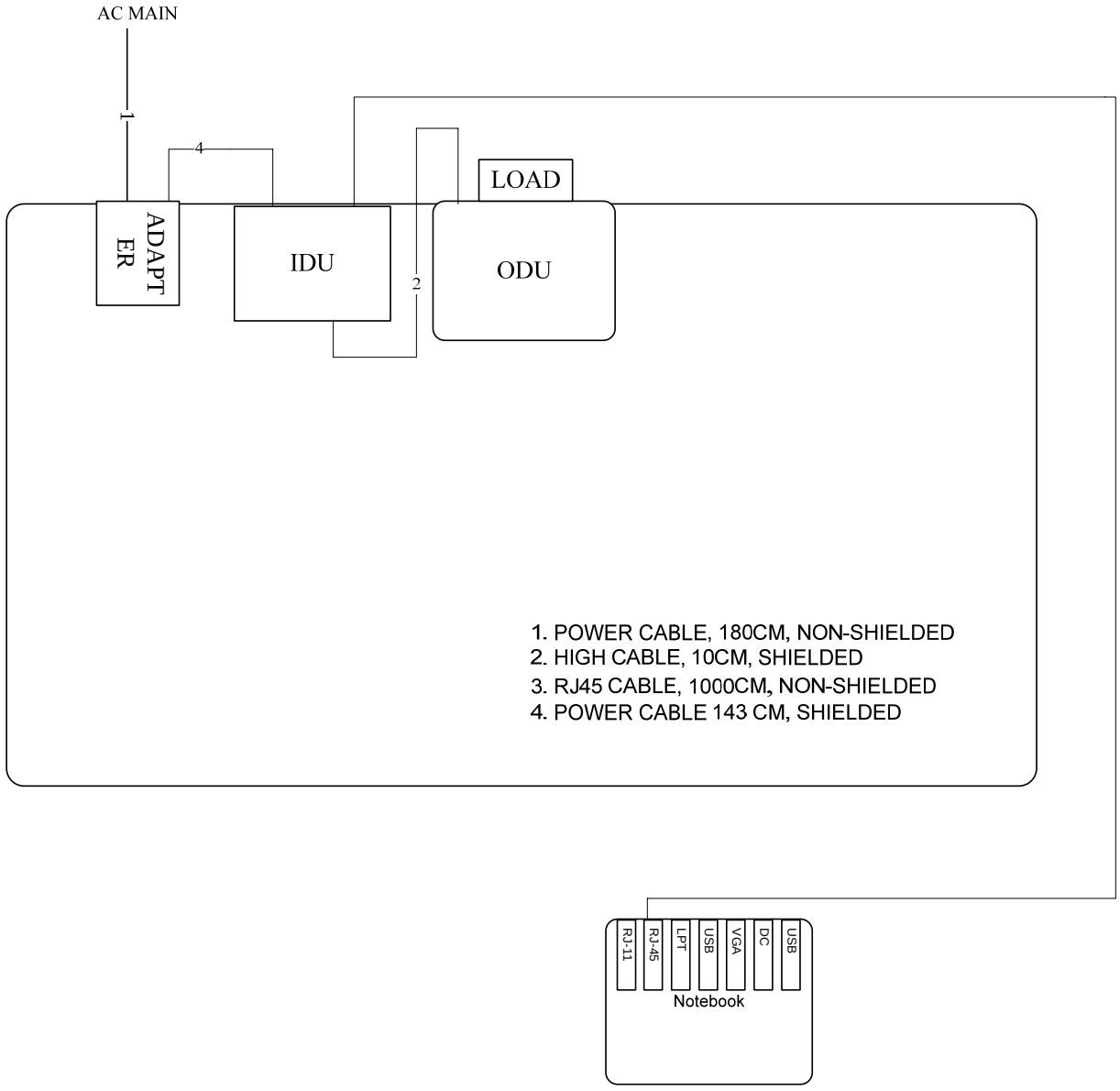
1.4 EUT Setups

For the purposes of this test report, EUT's ancillary equipment (AE) or testing support equipment (SE) is defined as equipment which is used in conjunction with the EUT to provide operational and control features to the EUT. It is necessary to configure the system in a typical fashion, as a customer would normally use it. But nevertheless EUT's ancillary equipment (AE) or testing support equipment (SE) could possible influence the test results. EUT setups describe the combination of EUT's and EUT's ancillary equipment (AE) or testing support equipment (SE) used for testing.

Setup No.	Combination of EUT with AE or SE	Description
Setup_01	EUT + AE01 +SE01 + SE02	Setup for radiated emission



Setup No.	Combination of EUT with AE or SE	Description
Setup_02	EUT + AE01 +SE01 + SE02	Setup for AC power conducted emission



1.5 Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- 47 CFR FCC Part 101
- ANSI C63.10-2009
- IC SRSP-321.8
- IC RSS-GEN

1.6 Testing Location

Testing Location							
☐	HWA YA	ADD	:	No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.			
		TEL	:	886-3-327-3456	FAX	:	886-3-318-0055
☒	JHUBEI	ADD	:	No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C.			
		TEL	:	886-3-656-9065	FAX	:	886-3-656-9085
		E-Mail	:	LeoHuang@sporton.com.tw	Internet	:	http://www.sporton.com.tw
Testing Site No.							
TH01-CB		03CH03-CB		-		-	

1.7 Abbreviations Used for the Test Report

- Test Channel: B (Bottom Channel), M (Middle Channel), and T (Top Channel).
- EUT: Equipment under Test.
- AE: EUT's Ancillary Equipment
- SE: Testing Support Equipment
- TPC: Transmit Power Control
- OFS: Private Operational Fixed Point-to-Point Microwave Service

2 Test Configuration of Equipment under Test

2.1 Test Channel Frequencies

Authorized Bandwidth 1 (10 MHz)				
Frequency Band	**Channel Plan**	**B (Bottom Channel)**	**M (Middle Channel)**	**T (Top Channel)**
21200 - 23600 MHz	1	21472 MHz (F1)	21786 MHz (F2)	23018 MHz (F3)

Authorized Bandwidth 2 (50 MHz)				
Frequency Band	**Channel Plan**	**B (Bottom Channel)**	**M (Middle Channel)**	**T (Top Channel)**
21200 - 23600 MHz	1	21472 MHz (F1)	21786 MHz (F2)	23018 MHz (F3)

2.2 Conformance Tests and Related Test Frequencies

Test	Test Frequencies (MHz)	Test Operating Mode	Test Channel Bandwidth
AC Power Conducted Emissions	F2	1	2
Occupied Bandwidth	F1, F2, F3	1	1, 2
Transmitter Power	F1, F2, F3	1	1, 2
Radiated Out-of-band Emissions	F2	1	1
Conducted Out-of-band Emissions	F1, F2, F3	1	1, 2
Frequency Tolerance	F2	1	2
F1: The centre frequency of the lowest declared channel for every declared authorized bandwidth.			
F2: The centre frequency of the middle declared channel for every declared authorized bandwidth.			
F3: The centre frequency of the highest declared channel for every declared authorized bandwidth.			
Transmit operating modes (see test report clause 0), Operating Mode 1: Single Antenna Equipment.			
Test Channel Bandwidth (see test report clause 1.1.2), Channel Bandwidth: 1 (10 MHz),2 (50 MHz)			

3 Transmitter Test Result

3.1 AC Power Conducted Emissions

3.1.1 Limit of AC Power Conducted Emissions

AC Power Conducted Emissions Limit		
Frequency Emission (MHz)	**Quasi-Peak**	**Average**
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50
Note: * Decreases with the logarithm of the frequency.		

3.1.2 Measuring Instruments

Refer a measuring instruments list in this test report.

3.1.3 Test Procedures

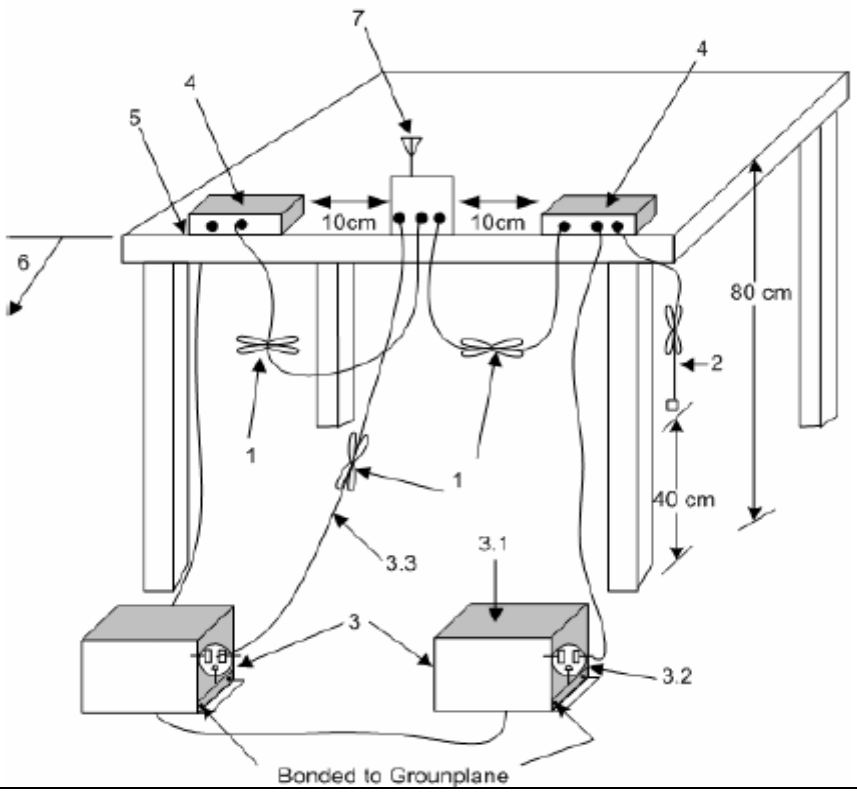
Method of measurement: Refer as ANSI C63.10-2009, clause 6.2.

3.1.4 Test Information

Test Information			
Test Engineer	**Test Ambient Temp. / Rel. Humidity**	**Test Date**	**Test Site**
Ryo Fan	25 °C / 60 %	2010/12/03	CO01-CB
Measurement Uncertainty		±2.26 dB	

3.1.5 Test Setup

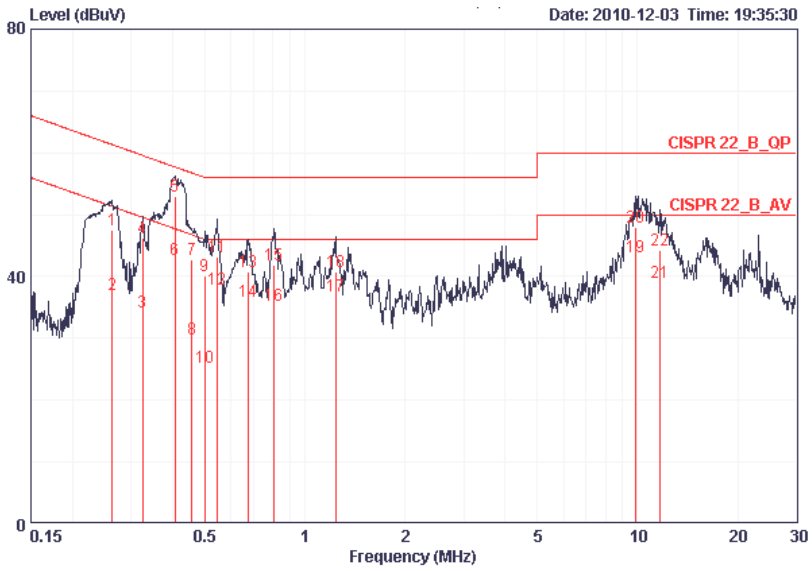
AC Power Conducted Emissions



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 cm to 40 cm long (see ANSI C63.10, clause 6.2.3.1).
2. I/O cables that are not connected to an accessory 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 (see ANSI C63.10, clause 6.2.2).
3. EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50 ohm loads. LISN can be placed on top of, or immediately beneath, reference ground plane (see ANSI C63.10, clauses 6.2.2 and 6.2.3).
   3.1. All other equipment powered from additional LISN(s).
   3.2. A 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. Non-EUT components of EUT system being tested.
5. Rear of EUT, including peripherals, shall all be aligned and flush with edge of tabletop (see ANSI C63.10, clause 6.2.3.1).
6. Edge of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane (see ANSI C63.10, clause 6.2.2 for options).
7. Antenna may be integral or detachable. If detachable, the antenna shall be attached for this test.

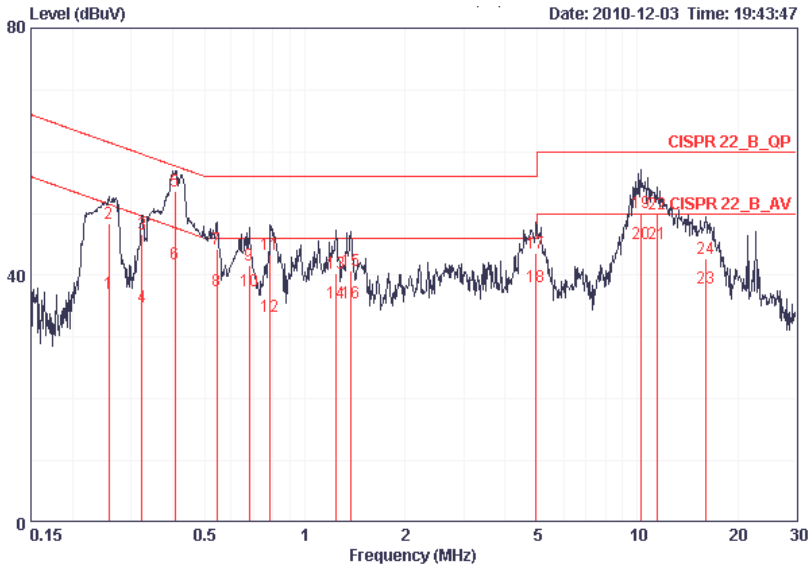
3.1.6 Test Result of AC Power Conducted Emissions

Test Configure:	Continuous Receive		
Power Phase:	Line	Test Freq. (MHz):	F2



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.26303	47.56	-13.77	61.34	47.32	0.04	0.20	QP
2	0.26303	37.10	-14.23	51.34	36.86	0.04	0.20	AVERAGE
3	0.32512	34.19	-15.39	49.57	33.95	0.04	0.20	AVERAGE
4	0.32512	46.27	-13.31	59.57	46.03	0.04	0.20	QP
5 @	0.40615	53.06	-4.67	57.73	52.83	0.03	0.20	QP
6	0.40615	42.62	-5.11	47.73	42.39	0.03	0.20	AVERAGE
7	0.45636	42.66	-14.10	56.76	42.43	0.03	0.20	QP
8	0.45636	29.83	-16.93	46.76	29.60	0.03	0.20	AVERAGE
9	0.49937	40.19	-15.82	56.01	39.98	0.03	0.18	QP
10	0.49937	25.22	-20.79	46.01	25.01	0.03	0.18	AVERAGE
11	0.54644	43.11	-12.89	56.00	42.88	0.03	0.20	QP
12	0.54644	38.00	-8.00	46.00	37.77	0.03	0.20	AVERAGE
13	0.67544	40.77	-15.23	56.00	40.54	0.03	0.20	QP
14	0.67544	36.03	-9.97	46.00	35.80	0.03	0.20	AVERAGE
15	0.80876	41.82	-14.18	56.00	41.59	0.03	0.20	QP
16	0.80876	35.25	-10.75	46.00	35.02	0.03	0.20	AVERAGE
17	1.236	36.73	-9.27	46.00	36.55	0.04	0.15	AVERAGE
18	1.236	40.69	-15.31	56.00	40.51	0.04	0.15	QP
19	9.913	43.07	-6.93	50.00	42.42	0.35	0.30	AVERAGE
20	9.913	47.98	-12.02	60.00	47.33	0.35	0.30	QP
21	11.621	39.11	-10.89	50.00	38.28	0.43	0.40	AVERAGE
22	11.621	44.25	-15.75	60.00	43.42	0.43	0.40	QP

Test Configure:	Continuous Receive		
Power Phase:	Neutral	Test Freq. (MHz):	F2



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.25751	37.14	-14.37	51.51	36.86	0.08	0.20	AVERAGE
2	0.25751	48.41	-13.10	61.51	48.13	0.08	0.20	QP
3	0.32340	46.74	-12.88	59.62	46.47	0.07	0.20	QP
4	0.32340	34.91	-14.71	49.62	34.64	0.07	0.20	AVERAGE
5 @	0.40673	53.57	-4.14	57.71	53.30	0.07	0.20	QP
6	0.40673	41.78	-5.93	47.71	41.51	0.07	0.20	AVERAGE
7	0.54355	44.20	-11.80	56.00	43.93	0.07	0.20	QP
8	0.54355	37.57	-8.43	46.00	37.30	0.07	0.20	AVERAGE
9	0.67902	41.66	-14.34	56.00	41.39	0.07	0.20	QP
10	0.67902	37.47	-8.53	46.00	37.20	0.07	0.20	AVERAGE
11	0.78761	43.44	-12.56	56.00	43.17	0.07	0.20	QP
12	0.78761	33.34	-12.66	46.00	33.07	0.07	0.20	AVERAGE
13	1.242	40.41	-15.59	56.00	40.19	0.08	0.15	QP
14	1.242	35.49	-10.51	46.00	35.27	0.08	0.15	AVERAGE
15	1.374	40.69	-15.31	56.00	40.49	0.08	0.12	QP
16	1.374	35.45	-10.55	46.00	35.25	0.08	0.12	AVERAGE
17	4.952	43.54	-12.46	56.00	43.04	0.20	0.30	QP
18	4.952	38.16	-7.84	46.00	37.66	0.20	0.30	AVERAGE
19	10.233	50.12	-9.88	60.00	49.37	0.40	0.34	QP
20	10.233	45.05	-4.95	50.00	44.30	0.40	0.34	AVERAGE
21	11.438	45.12	-4.88	50.00	44.27	0.45	0.40	AVERAGE
22	11.438	49.94	-10.06	60.00	49.09	0.45	0.40	QP
23	15.970	37.82	-12.18	50.00	36.80	0.62	0.40	AVERAGE

3.2 Occupied Bandwidth

3.2.1 Limit of Occupied Bandwidth

99% Occupied Bandwidth (see Note 1)	None
NOTE 1: The 99% occupied bandwidth is the frequency bandwidth of the signal power at the 99% channel power of occupied bandwidth when resolution bandwidth should be approximately 1 % to 5 % of the occupied bandwidth (OBW). These measurements shall also be performed at normal test conditions.	

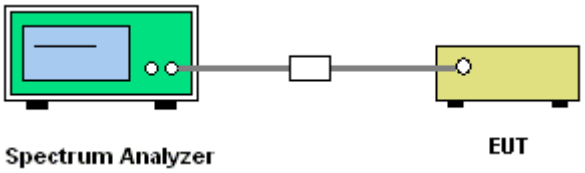
3.2.2 Measuring Instruments

Refer a measuring instruments list in this test report.

3.2.3 Test Procedures

Method of measurement: Refer as ANSI C63.10-2009, clauses 6.9.1.

3.2.4 Test Setup

Occupied Channel Bandwidth


3.2.5 Test Information

Test Information			
Test Engineer	**Test Ambient Temp. / Rel. Humidity**	**Test Date**	**Test Site**
Sam Chen	25 °C / 60 %	2010/11/27	TH01-CB
Measurement Uncertainty		±8.5×10^{-8} Hz	

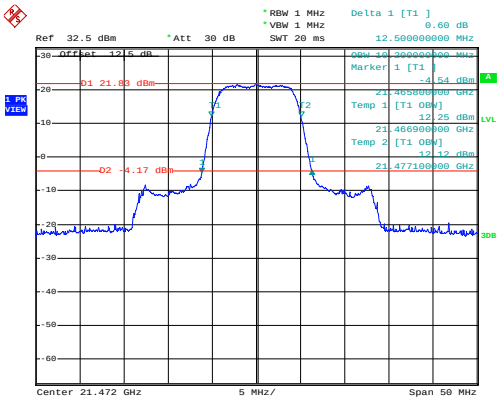
3.2.6 Test Result of Occupied Bandwidth

Transmitter Bandwidth (21200 - 23600 MHz Band)			
10 MHz-QPSK	**F1**	**F2**	**F3**
TxPwr	20.00	20.00	21.00
99% Bandwidth	10.20	10.20	10.10
26dB Bandwidth	12.50	12.50	12.60
Limit	N/A		
Complied Limit	**Complied**		

Transmitter Bandwidth (21200 - 23600 MHz Band)			
50 MHz-QPSK	**F1**	**F2**	**F3**
TxPwr	19.00	18.00	21.00
99% Bandwidth	48.20	48.40	48.20
26dB Bandwidth	53.00	53.20	53.00
Limit	N/A		
Complied Limit	**Complied**		

3.2.6.1 Bandwidth Plots for 21200 - 23600 MHz Band

Occupied Bandwidth (F1) 10 MHz-QPSK



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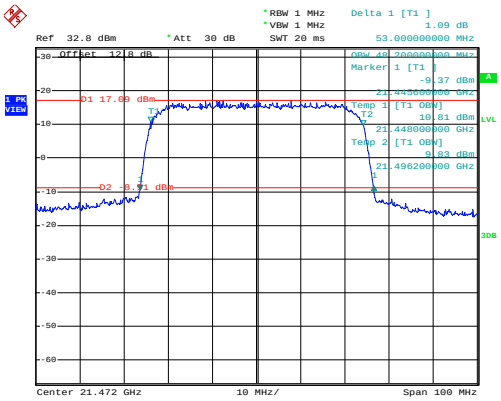
Occupied Bandwidth (F1) 50 MHz-QPSK



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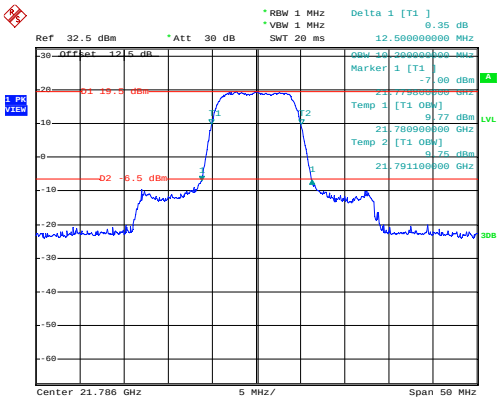
Occupied Bandwidth (F2) 10 MHz-QPSK



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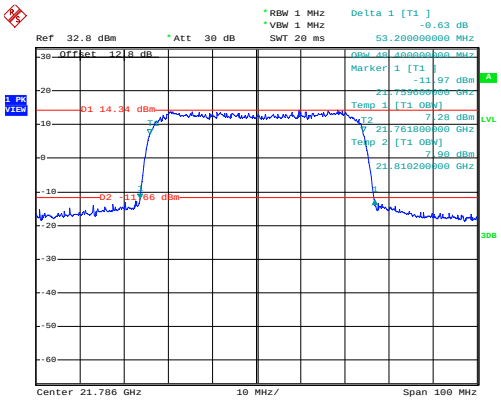
Occupied Bandwidth (F2) 50 MHz-QPSK



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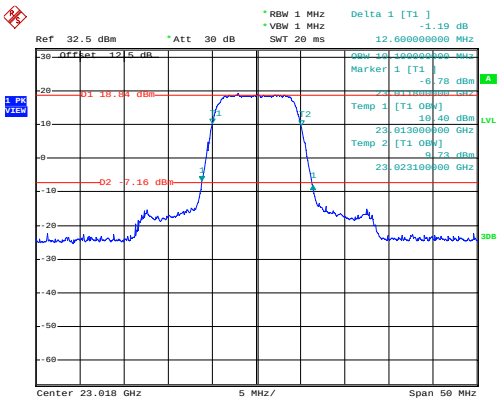
Occupied Bandwidth (F3) 10 MHz-QPSK



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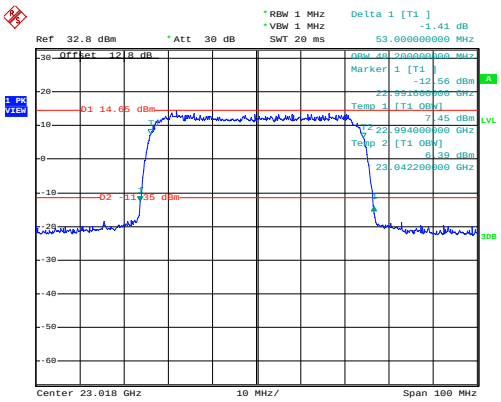
Occupied Bandwidth (F3) 50 MHz-QPSK



Date: 30.NOV.2010 14:27:47

3.3 Transmitter Power

3.3.1 Limit of Transmitter Power

Frequency Band	Transmitter Power (EIRP)
21200 - 23600 MHz	55 dBW (85 dBm)
NOTE: For the applicable limit, see FCC 101.113	

3.3.2 Measuring Instruments

Refer a measuring instruments list in this test report.

3.3.3 Test Procedures

Method of measurement:
☒ Refer as ANSI C63.10-2009, clause 6.10.2.1 for power meter measurement.
☐ Refer as ANSI C63.10-2009, clause 6.10.2.2 for spectrum analyzer measurement.

3.3.4 Test Setup

Transmitter Power (Conducted)

3.3.5 Test Information

Test Information			
Test Engineer	**Test Ambient Temp. / Rel. Humidity**	**Test Date**	**Test Site**
Sam Chen	25 °C / 60 %	2010/12/01	TH01-CB
Measurement Uncertainty		±0.5 dB	

3.3.6 Test Result of Transmitter Power

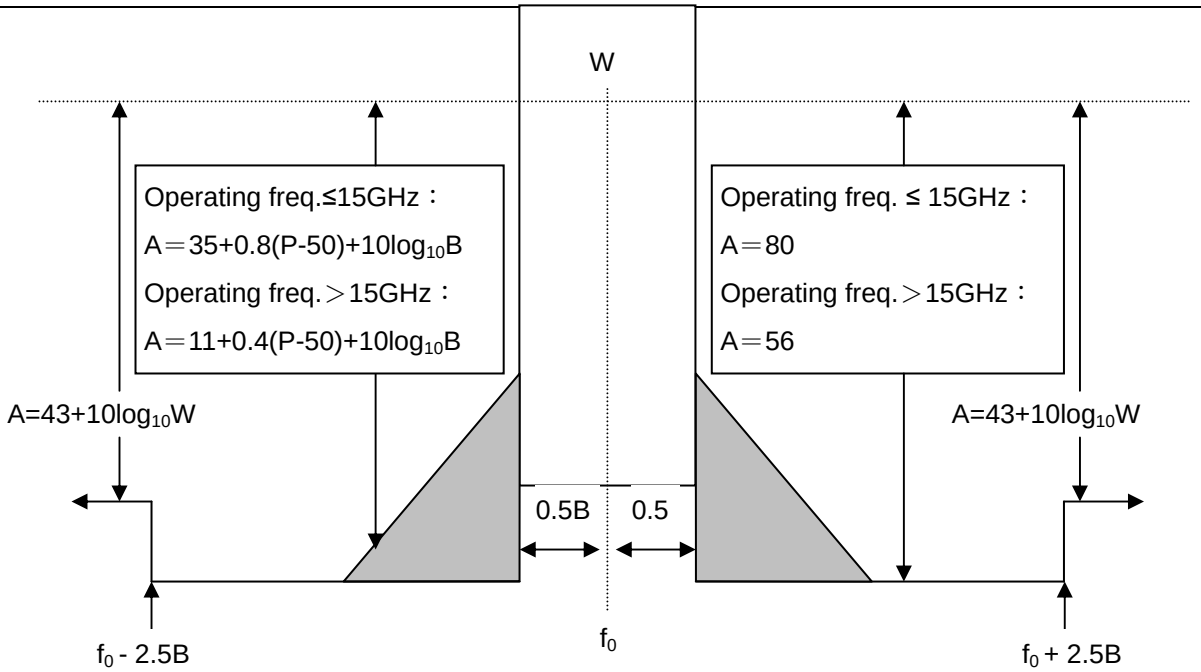
Transmitter Power (21200 - 23600 MHz Band)			
Minimum Antenna Gain (dBi)	38		
10 MHz-QPSK	**F1**	**F2**	**F3**
TxPwr	20.00	20.00	21.00
Conducted Power (dBm)	20.40	20.41	20.25
EIRP Power (dBm)	58.40	58.41	58.25
Maximum EIRP Power (dBm)	58.41		
EIRP Power Limit (dBm)	85.00		
Complied Limit	**Complied**		

Transmitter Power (21200 - 23600 MHz Band)			
Minimum Antenna Gain (dBi)	38		
50 MHz-QPSK	**F1**	**F2**	**F3**
TxPwr	19.00	18.00	21.00
Conducted Power (dBm)	18.31	18.32	20.25
EIRP Power (dBm)	56.31	56.32	58.25
Maximum EIRP Power (dBm)	58.25		
EIRP Power Limit (dBm)	85.00		
Complied Limit	**Complied**		

3.4 Radiated Out-of-band Emissions

3.4.1 Limit of Radiated Out-of-band Emissions

Radiated Out-of-band Emissions



For operating frequencies below 15 GHz, Inside the 250 percent of the authorized bandwidth: A＝ 35+0.8(P-50)+10log$_{10}$B or 80 dB, whichever is the lesser attenuation. Outside the 250 percent of the authorized bandwidth: As specified by the following limit. 80 dB or 43 + 10 log (P) dB [-13dBm/MHz], whichever is the lesser attenuation.

EIRP (dBm)	dBuV/m at 3m	dBuV/m at 1m
-13	82.2	91.8

For operating frequencies above 15 GHz, Inside the 250 percent of the authorized bandwidth: A＝ 11+0.4(P-50)+10log$_{10}$B or 56 dB, whichever is the lesser attenuation. Outside the 250 percent of the authorized bandwidth: As specified by the following limit. 56 dB or 43 + 10 log (P) dB [-13dBm/MHz], whichever is the lesser attenuation.

NOTE: For the applicable limit, see FCC 101.111

3.4.2 Measuring Instruments

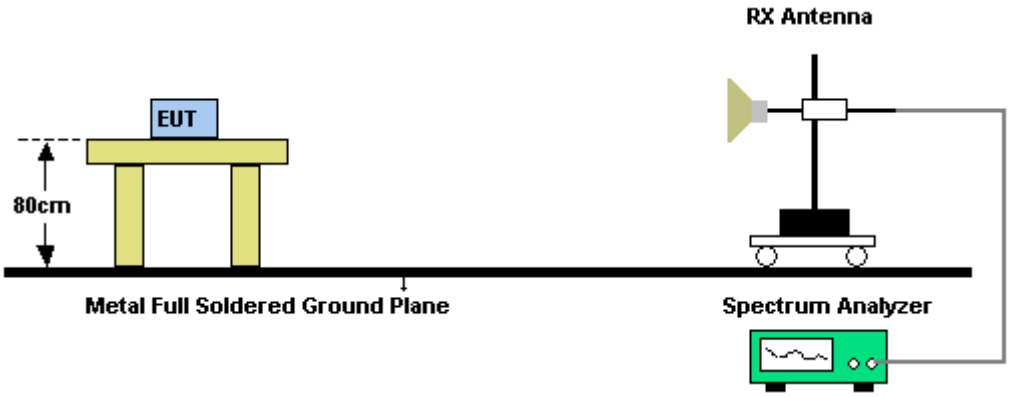
Refer a measuring instruments list in this test report.

3.4.3 Test Procedures

Method of measurement:
☒ Refer as ANSI C63.10-2009, clause 6.5 for radiated measurement for 30 – 1000 MHz emissions.
☒ Refer as ANSI C63.10-2009, clause 6.6 for radiated measurement for above 1000 MHz emissions.

3.4.4 Test Setup

Radiated Out-of-band Emissions

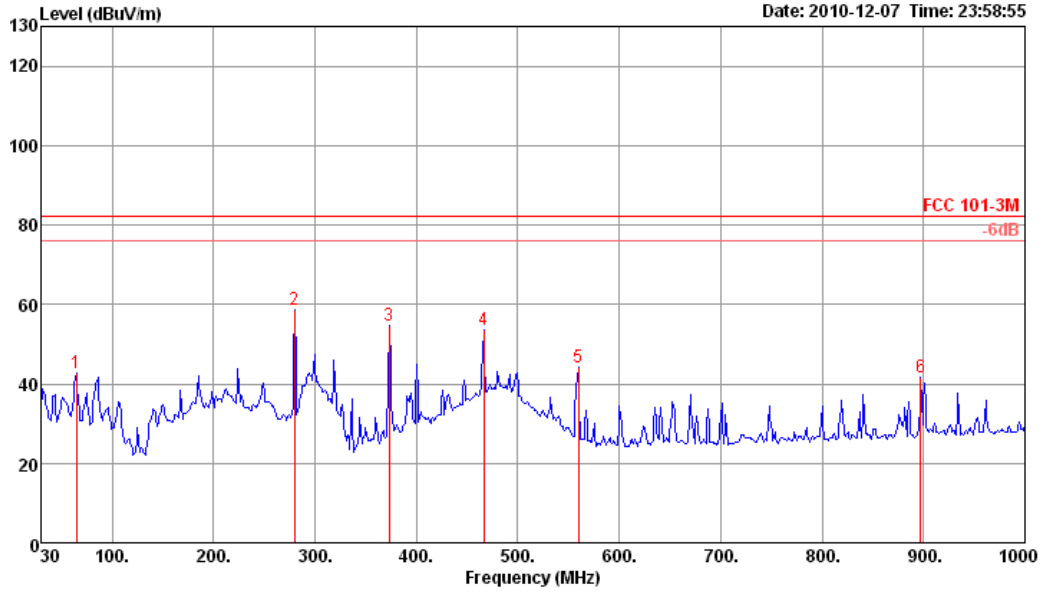


3.4.5 Test Information

Test Information			
Test Engineer	**Test Ambient Temp. / Rel. Humidity**	**Test Date**	**Test Site**
Sam Chen	25 °C / 60 %	2010/12/03-2010/12/08	03CH03-CB
Measurement Uncertainty		30 – 1000 MHz	±2.28 dB
		1 – 18 GHz	±2.59 dB
		18 – 40 GHz	±2.37 dB
		40 – 200 GHz	±4.43 dB

3.4.6 Test Result of Radiated Out-of-band Emissions

Frequency Band:	21200 - 23600 MHz Band	Power Setting:	1, (20)
Modulation:	QPSK	Operating Mode:	1
Test Range:	30 MHz – 1000 MHz	Polarization:	Vertical

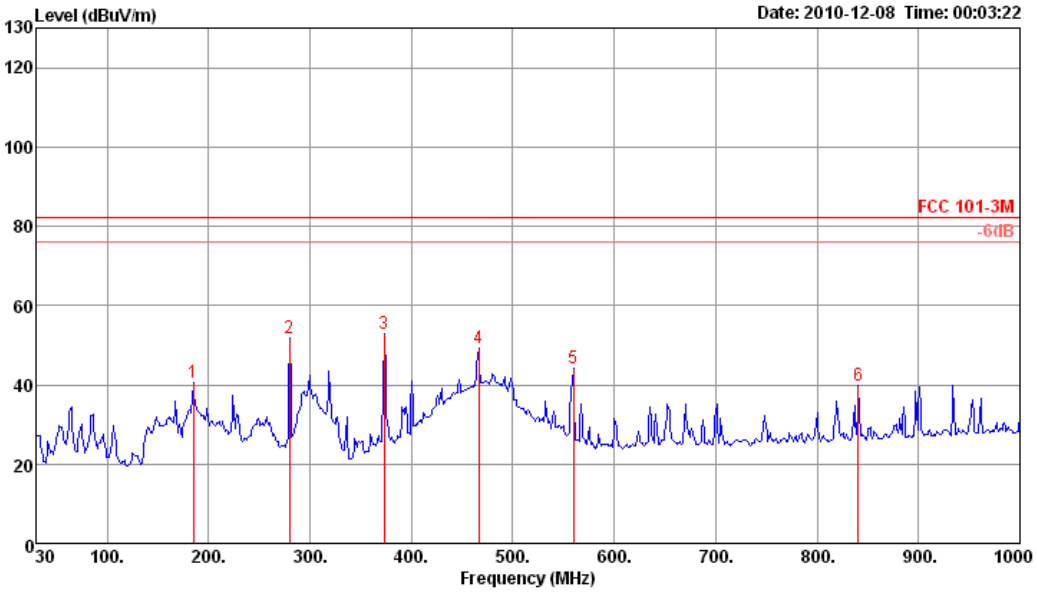


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase	Au Facto
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm			d
1	64.92	42.57	82.20	-39.63	62.71	0.90	27.74	6.70	0	400	Peak	VERTICAL	0.0
2 p	280.26	58.68	82.20	-23.52	70.47	2.02	26.94	13.13	0	400	Peak	VERTICAL	0.0
3	373.38	54.72	82.20	-27.48	64.53	2.25	27.41	15.35	0	400	Peak	VERTICAL	0.0
4	466.50	53.42	82.20	-28.78	61.62	2.63	27.93	17.10	0	400	Peak	VERTICAL	0.0
5	559.62	44.09	82.20	-38.11	51.06	2.82	28.10	18.31	0	400	Peak	VERTICAL	0.0
6	897.18	41.81	82.20	-40.39	45.12	3.59	27.41	20.51	0	400	Peak	VERTICAL	0.0

NOTE 1: “>20dB” means the tables in this clause should only list values of spurious emissions that exceed the level of 20 dB below the applicable limit, see ANSI C63.4, clause 10.1.8.2.

NOTE 2: “N/F” means Nothing Found (No spurious emissions were detected.)

Frequency Band:	21200 - 23600 MHz Band	Power Setting:	1, (20)
Modulation:	QPSK	Operating Mode:	1
Test Range:	30 MHz – 1000 MHz	Polarization:	Horizontal

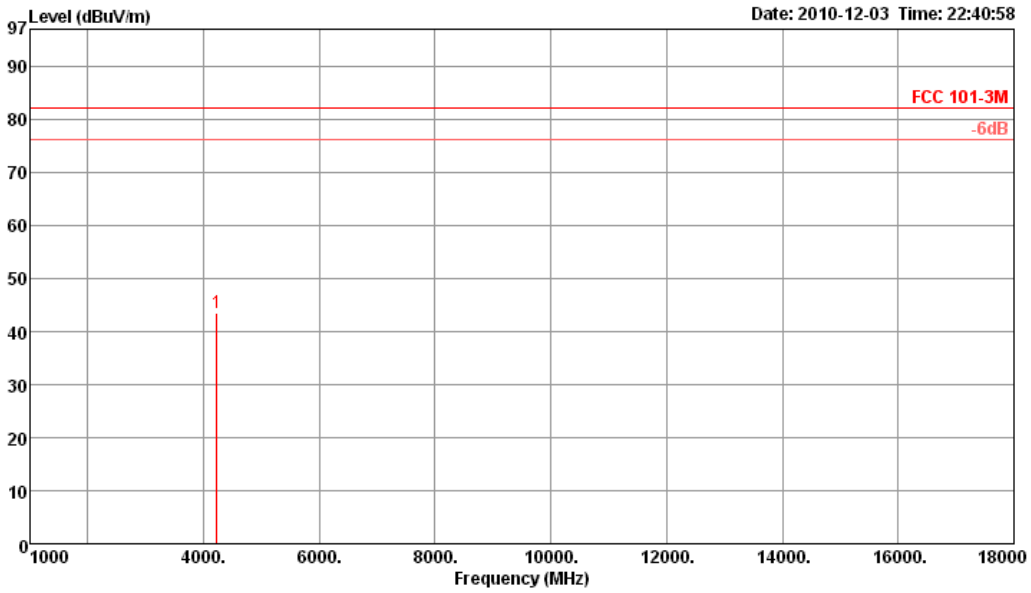


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase	Au Facto
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm			d
1	185.20	40.50	82.20	-41.70	53.93	1.62	27.17	12.12	0	100	Peak	HORIZONTAL	0.0
2	280.26	51.74	82.20	-30.46	63.53	2.02	26.94	13.13	0	100	Peak	HORIZONTAL	0.0
3 p	373.38	53.02	82.20	-29.18	62.83	2.25	27.41	15.35	0	100	Peak	HORIZONTAL	0.0
4	466.50	49.20	82.20	-33.00	57.40	2.63	27.93	17.10	0	100	Peak	HORIZONTAL	0.0
5	559.62	44.27	82.20	-37.93	51.24	2.82	28.10	18.31	0	100	Peak	HORIZONTAL	0.0
6	840.92	39.99	82.20	-42.21	44.05	3.38	27.52	20.08	0	100	Peak	HORIZONTAL	0.0

NOTE 1: “>20dB” means the tables in this clause should only list values of spurious emissions that exceed the level of 20 dB below the applicable limit, see ANSI C63.4, clause 10.1.8.2.

NOTE 2: “N/F” means Nothing Found (No spurious emissions were detected.

Frequency Band:	21200 - 23600 MHz Band	**Power Setting:**	1, (20)
Modulation:	QPSK	**Operating Mode:**	1
Test Range:	1 GHz – 18 GHz	**Polarization:**	Vertical

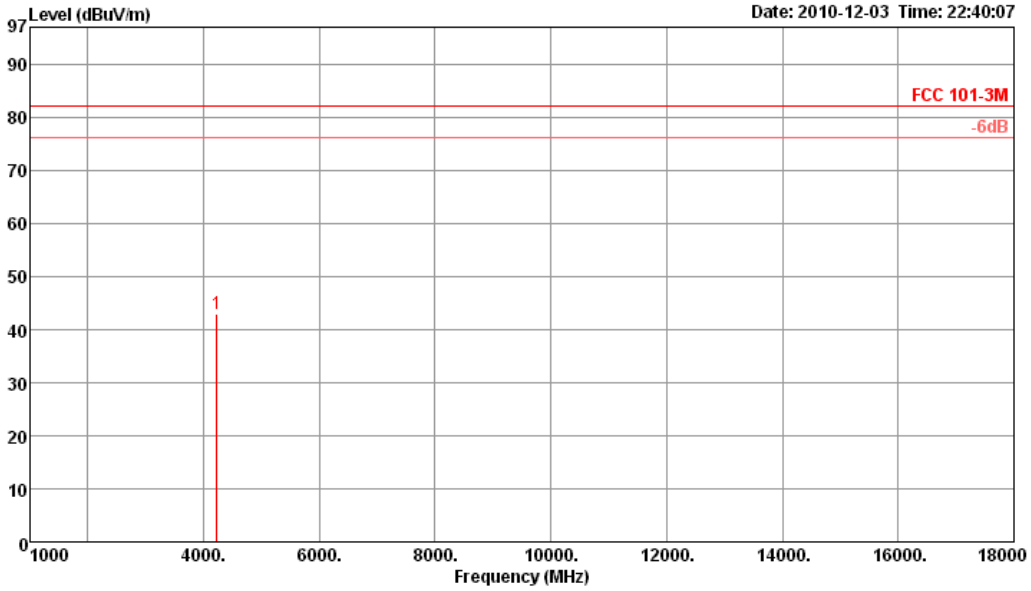


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase	Au Facto
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm			d
1 p	4225.60	43.40	82.20	-38.80	42.33	3.52	35.20	32.75	100	100	Peak	VERTICAL	0.0

NOTE 1: “>20dB” means the tables in this clause should only list values of spurious emissions that exceed the level of 20 dB below the applicable limit, see ANSI C63.4, clause 10.1.8.2.

NOTE 2: “N/F” means Nothing Found (No spurious emissions were detected.)

Frequency Band:	21200 - 23600 MHz Band	**Power Setting:**	1, (20)
Modulation:	QPSK	**Operating Mode:**	1
Test Range:	1 GHz – 18 GHz	**Polarization:**	Horizontal

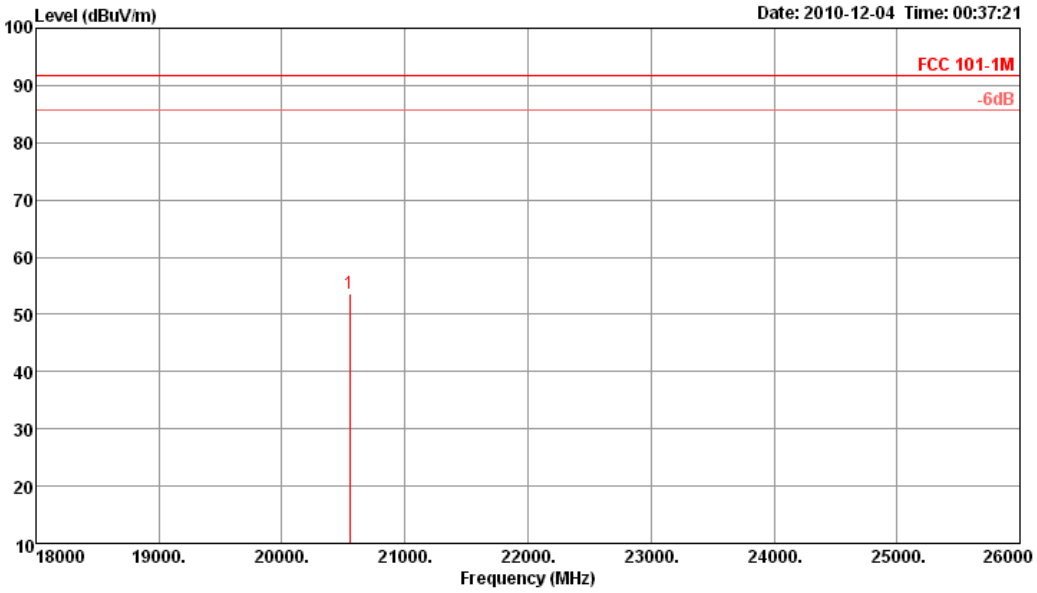


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase	Au Facto
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm			d
1 p	4225.40	42.83	82.20	-39.37	41.76	3.52	35.20	32.75	152	100	Peak	HORIZONTAL	0.0

NOTE 1: “>20dB” means the tables in this clause should only list values of spurious emissions that exceed the level of 20 dB below the applicable limit, see ANSI C63.4, clause 10.1.8.2.

NOTE 2: “N/F” means Nothing Found (No spurious emissions were detected.)

Frequency Band:	21200 - 23600 MHz Band	Power Setting:	1, (20)
Modulation:	QPSK	Operating Mode:	1
Test Range:	18 GHz – 26 GHz	Polarization:	Vertical

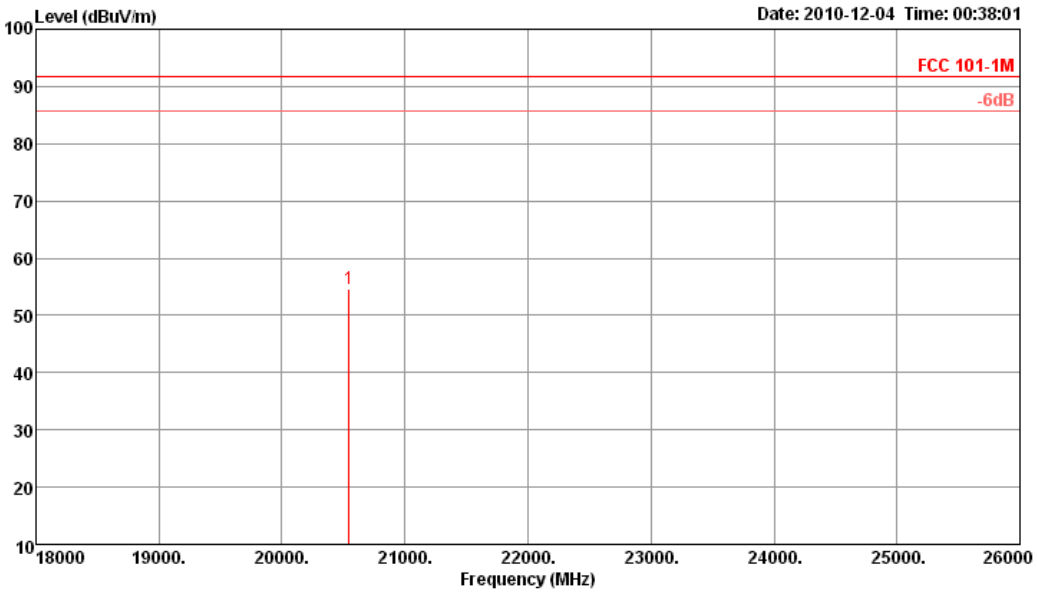


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase	Au Facto
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm			d
1 p	20551.60	53.67	91.80	-38.13	43.85	7.58	35.70	37.94	289	100	Peak	VERTICAL	0.0

NOTE 1: “>20dB” means the tables in this clause should only list values of spurious emissions that exceed the level of 20 dB below the applicable limit, see ANSI C63.4, clause 10.1.8.2.

NOTE 2: “N/F” means Nothing Found (No spurious emissions were detected.)

Frequency Band:	21200 - 23600 MHz Band	Power Setting:	1, (20)
Modulation:	QPSK	Operating Mode:	1
Test Range:	18 GHz – 26 GHz	Polarization:	Horizontal

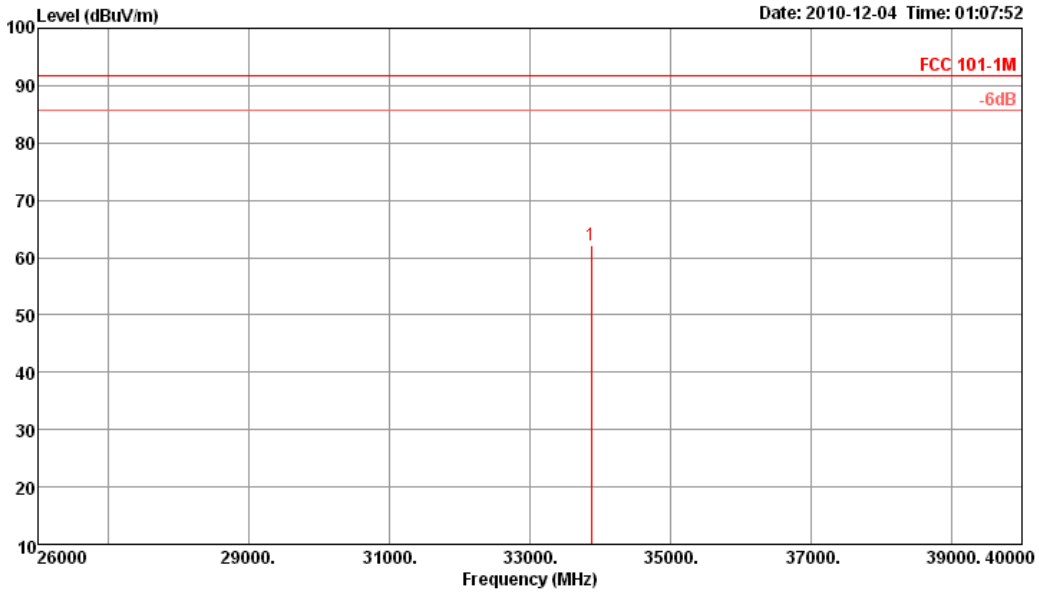


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase	Au Facto
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm			d
1 p	20545.00	54.53	91.80	-37.27	44.71	7.58	35.70	37.94	258	100	Peak	HORIZONTAL	0.0

NOTE 1: “>20dB” means the tables in this clause should only list values of spurious emissions that exceed the level of 20 dB below the applicable limit, see ANSI C63.4, clause 10.1.8.2.

NOTE 2: “N/F” means Nothing Found (No spurious emissions were detected.)

Frequency Band:	21200 - 23600 MHz Band	Power Setting:	1, (20)
Modulation:	QPSK	Operating Mode:	1
Test Range:	26 GHz – 40 GHz	Polarization:	Vertical

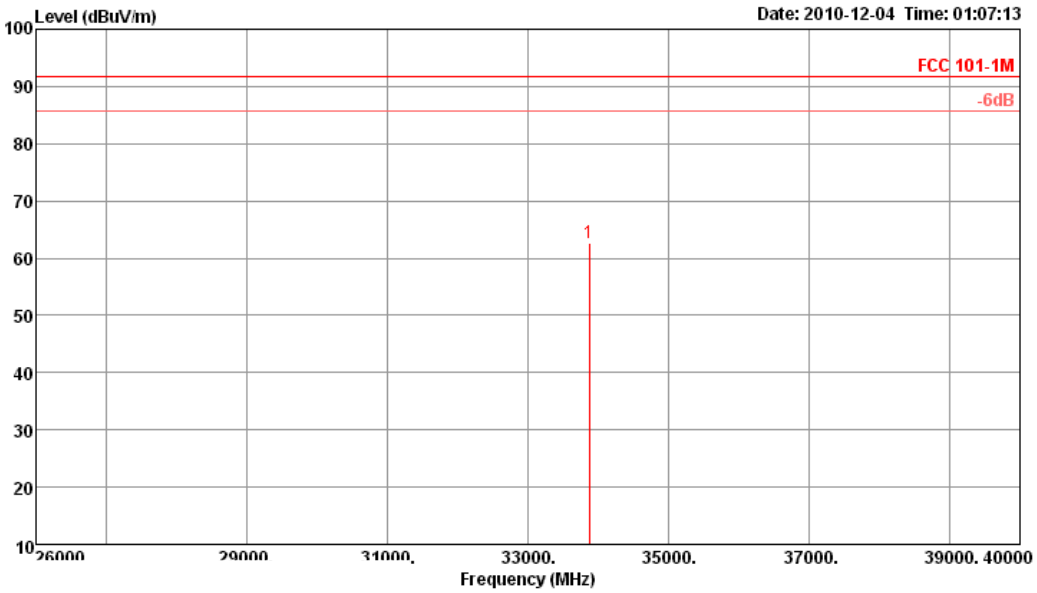


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase	Au Facto
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm			d
1 p	33867.83	62.03	91.80	-29.77	49.18	6.00	34.63	41.48	158	100	Peak	VERTICAL	0.0

NOTE 1: “>20dB” means the tables in this clause should only list values of spurious emissions that exceed the level of 20 dB below the applicable limit, see ANSI C63.4, clause 10.1.8.2.

NOTE 2: “N/F” means Nothing Found (No spurious emissions were detected.)

Frequency Band:	21200 - 23600 MHz Band	Power Setting:	1, (20)
Modulation:	QPSK	Operating Mode:	1
Test Range:	26 GHz – 40 GHz	Polarization:	Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	T/Pos	A/Pos	Remark	Pol/Phase	Au Facto
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m	deg	cm			d
1 p	33867.77	62.73	91.80	-29.07	49.88	6.00	34.63	41.48	258	100	Peak	HORIZONTAL	0.0

NOTE 1: “>20dB” means the tables in this clause should only list values of spurious emissions that exceed the level of 20 dB below the applicable limit, see ANSI C63.4, clause 10.1.8.2.

NOTE 2: “N/F” means Nothing Found (No spurious emissions were detected.)

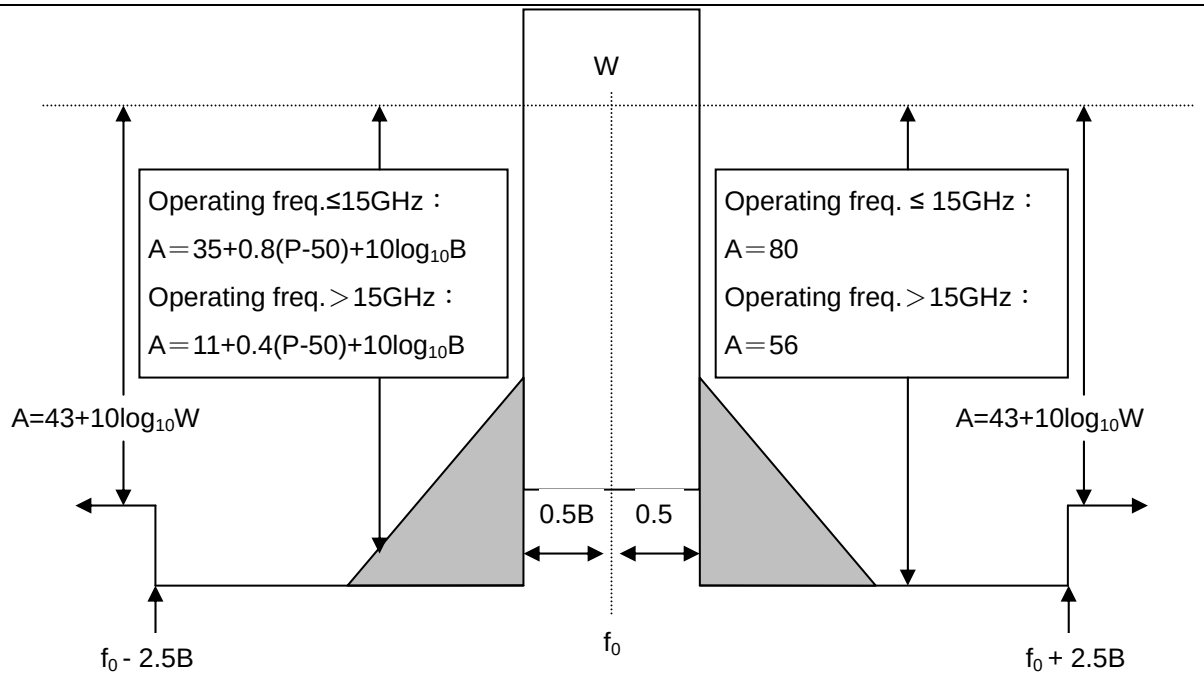
Frequency Band:	21200 - 23600 MHz Band	**Power Setting:**	1, (20)
Modulation:	QPSK	**Operating Mode:**	1
Test Range:	40 GHz – 200 GHz		

Frequency (GHz)	Measurement Distance (m)	Peak Power (dBm)	Peak Power (dBi)	Level (dBm)	Limit (dBm)	Margin	Result
43.572	0.5	-74.44	23	-38.23	-13.00	-25.23	pass

3.5 Conducted Out-of-band Emissions

3.5.1 Limit of Conducted Out-of-band Emissions

Conducted Out-of-band Emissions



For operating frequencies below 15 GHz, Inside the 250 percent of the authorized bandwidth: A＝ 35+0.8(P-50)+10log$_{10}$B or 80 dB, whichever is the lesser attenuation. Outside the 250 percent of the authorized bandwidth: As specified by the following limit. 80 dB or 43 + 10 log (P) dB [-13dBm/MHz], whichever is the lesser attenuation.

For operating frequencies above 15 GHz, Inside the 250 percent of the authorized bandwidth: A＝ 11+0.4(P-50)+10log$_{10}$B or 56 dB, whichever is the lesser attenuation. Outside the 250 percent of the authorized bandwidth: As specified by the following limit. 56 dB or 43 + 10 log (P) dB [-13dBm/MHz], whichever is the lesser attenuation.

NOTE: For the applicable limit, see FCC 101.111 and FCC 2.1051

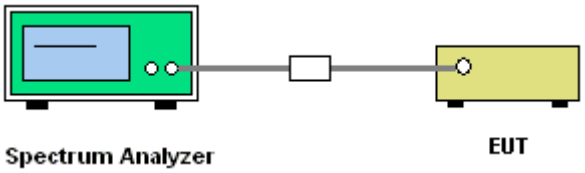
3.5.2 Measuring Instruments

Refer a measuring instruments list in this test report.

3.5.3 Test Procedures

Method of measurement: Refer as ANSI C63.10-2009, clauses 6.7.

3.5.4 Test Setup

Conducted Out-of-band Emissions


3.5.5 Test Information

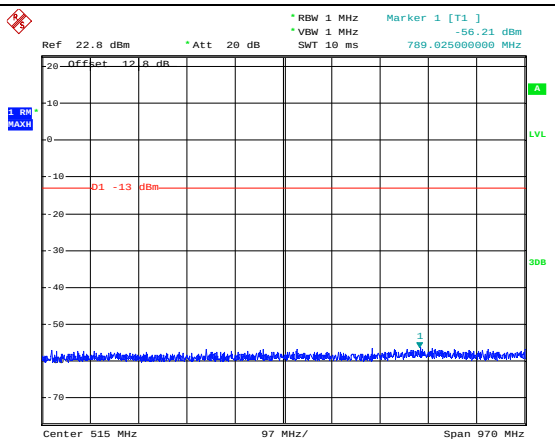
Test Information			
Test Engineer	**Test Ambient Temp. / Rel. Humidity**	**Test Date**	**Test Site**
Sam Chen	25 °C / 60 %	2010/11/29	TH01-CB
Measurement Uncertainty		30 – 1000 MHz	±0.51 dB
		1 – 18 GHz	±0.67 dB
		18 – 40 GHz	±0.83 dB
		40 – 60 GHz	±1.23 dB

3.5.6 Test Result of Conducted Out-of-band Emissions

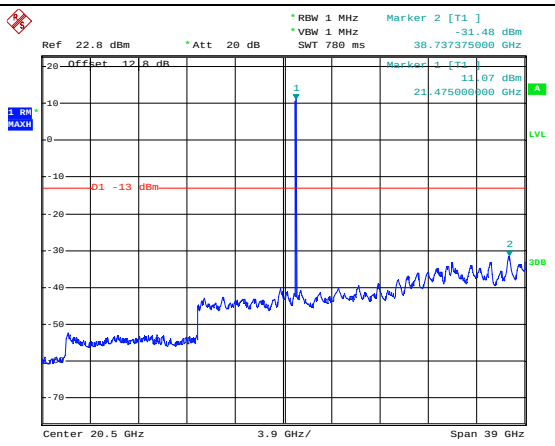
3.5.6.1 Test Frequency F1 (10 MHz), Conducted Out-of-band Emissions

Frequency Band:	21200 - 23600 MHz Band	Power Setting:	1, (20)
Modulation:	QPSK	Operating Mode:	1
Test Frequency:	F1	Authorized Bandwidth #:	10 MHz

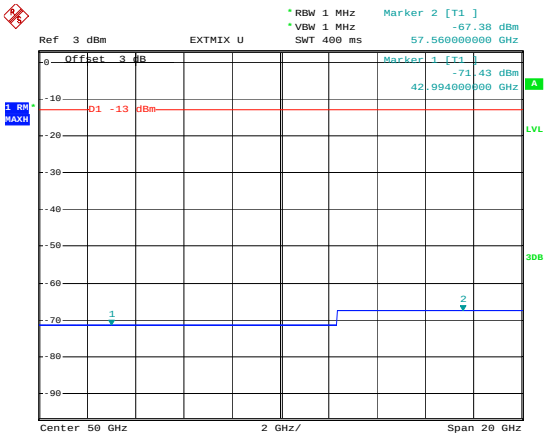
30 – 1000 MHz



1 – 40 GHz



40 – 60 GHz

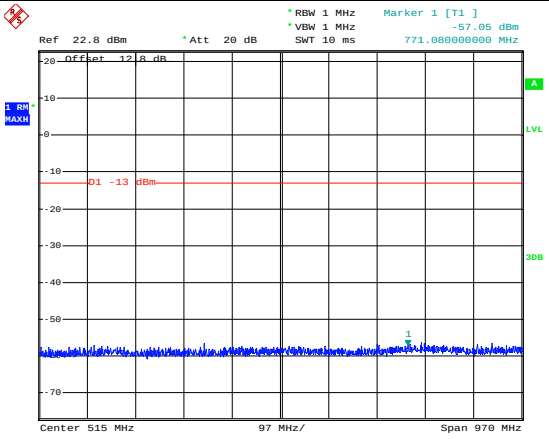


Date: 30.NOV.2010 09:32:36

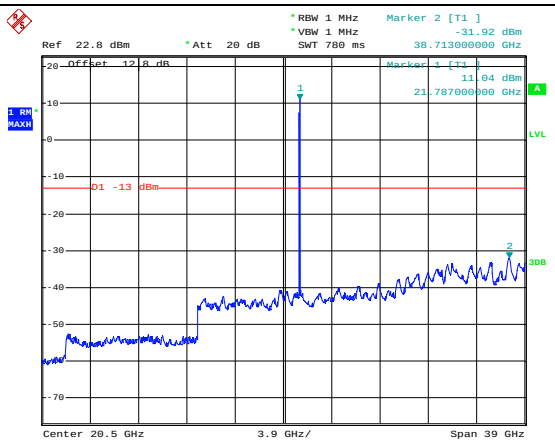
3.5.6.2 Test Frequency F2 (10 MHz), Conducted Out-of-band Emissions

Frequency Band:	21200 - 23600 MHz Band	Power Setting:	1, (20)
Modulation:	QPSK	Operating Mode:	1
Test Frequency:	F2	Authorized Bandwidth #:	10 MHz

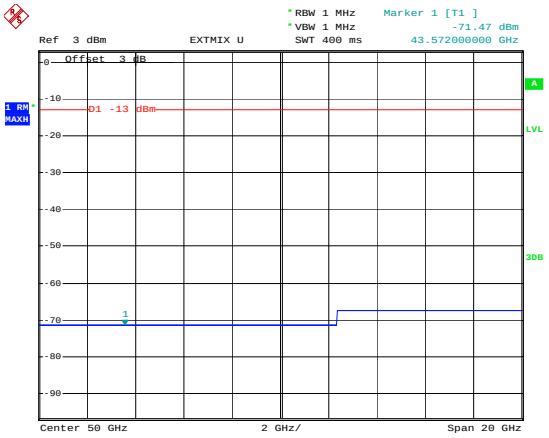
30 – 1000 MHz



1 – 40 GHz



40 – 60 GHz

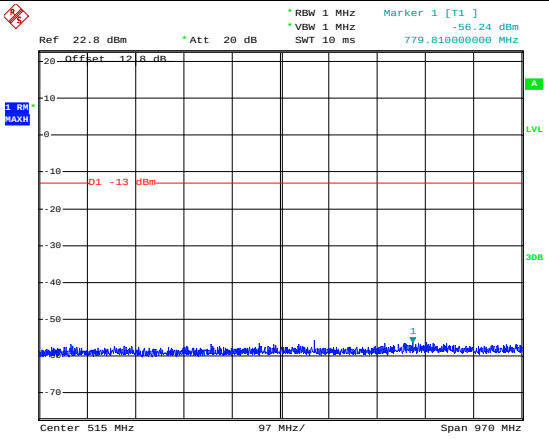


Date: 30.NOV.2010 09:34:36

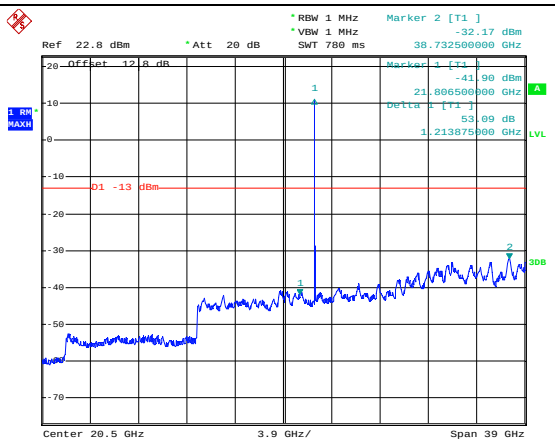
3.5.6.3 Test Frequency F3 (10 MHz), Conducted Out-of-band Emissions

Frequency Band:	21200 - 23600 MHz Band	Power Setting:	1, (20)
Modulation:	QPSK	Operating Mode:	1
Test Frequency:	F3	Authorized Bandwidth #:	10 MHz

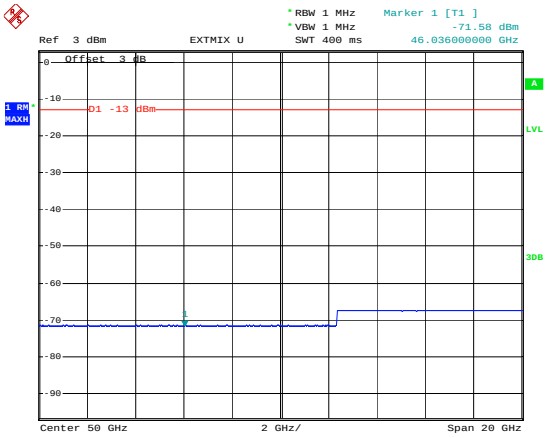
30 – 1000 MHz



1 – 40 GHz



40 – 60 GHz

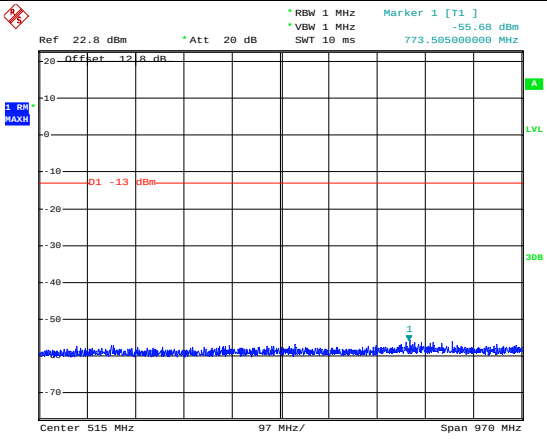


Date: 30.NOV.2010 10:34:48

3.5.6.4 Test Frequency F1 (50 MHz), Conducted Out-of-band Emissions

Frequency Band:	21200 - 23600 MHz Band	Power Setting:	1, (19)
Modulation:	QPSK	Operating Mode:	1
Test Frequency:	F1	Authorized Bandwidth #:	50 MHz

30 – 1000 MHz



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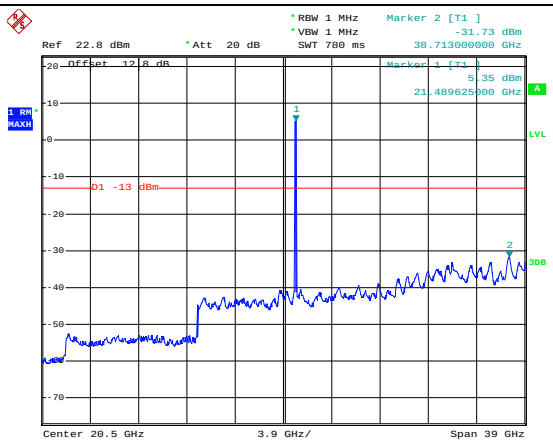
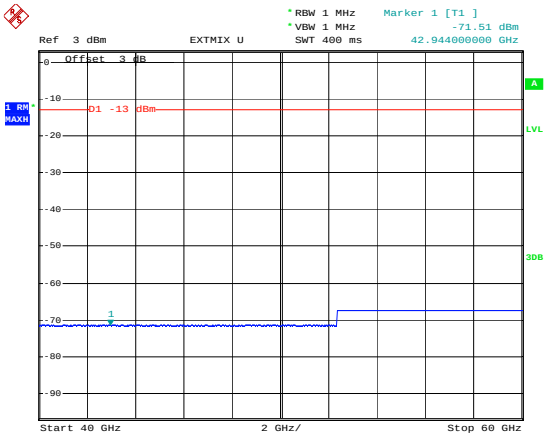
1 – 40 GHz



Date: 29.NOV.2010 20:21:12

40 – 60 GHz

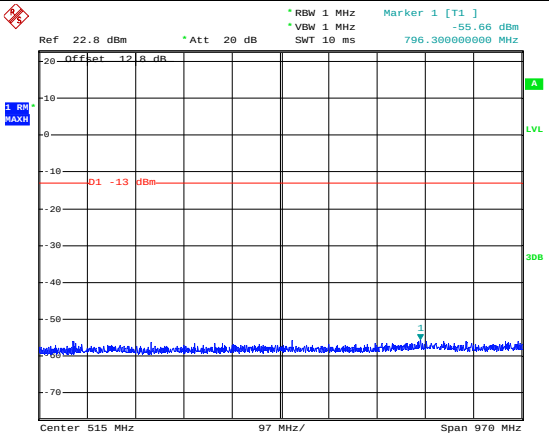


Date: 30.NOV.2010 09:58:24

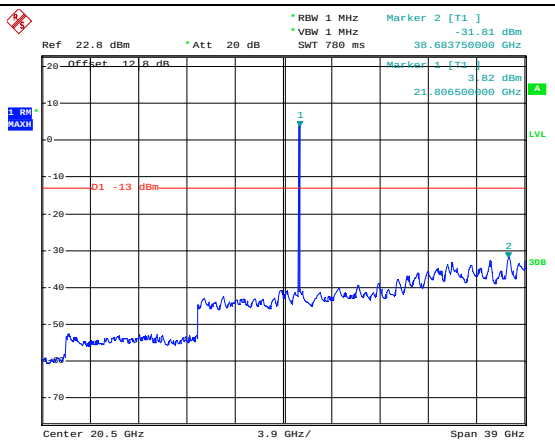
3.5.6.5 Test Frequency F2 (50 MHz), Conducted Out-of-band Emissions

Frequency Band:	21200 - 23600 MHz Band	Power Setting:	1, (19)
Modulation:	QPSK	Operating Mode:	1
Test Frequency:	F2	Authorized Bandwidth #:	50 MHz

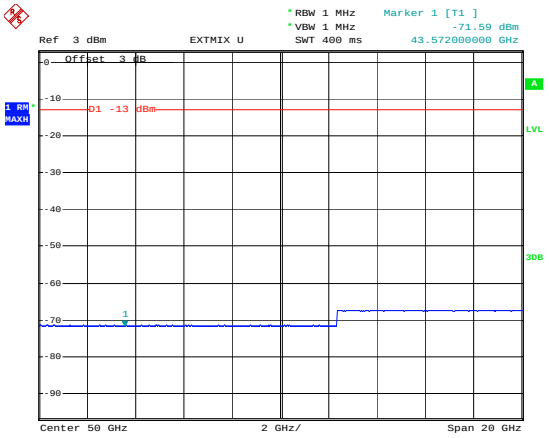
30 – 1000 MHz



1 – 40 GHz



40 – 60 GHz

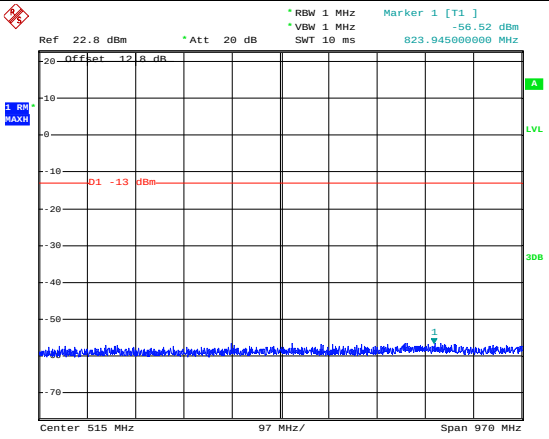


Date: 30.NOV.2010 09:53:12

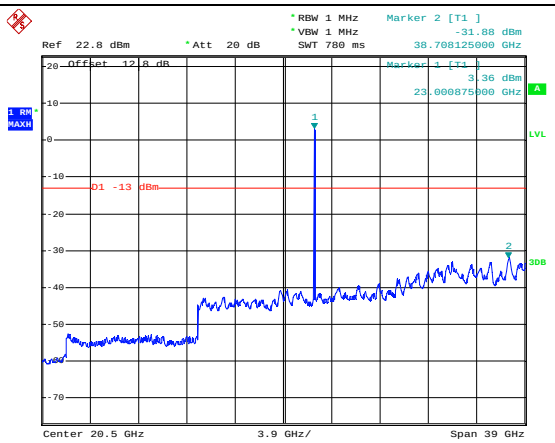
3.5.6.6 Test Frequency F3 (50 MHz), Conducted Out-of-band Emissions

Frequency Band:	21200 - 23600 MHz Band	Power Setting:	1, (19)
Modulation:	QPSK	Operating Mode:	1
Test Frequency:	F3	Authorized Bandwidth #:	50 MHz

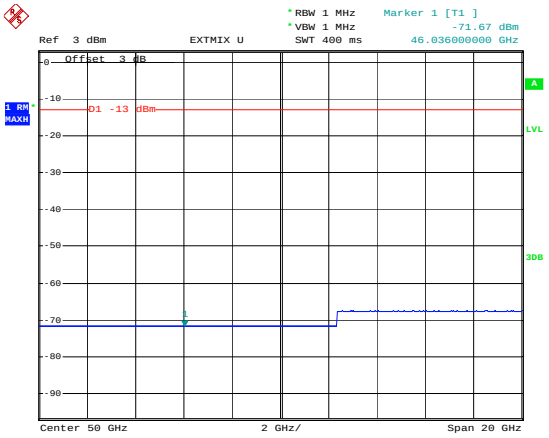
30 – 1000 MHz



1 – 40 GHz



40 – 60 GHz

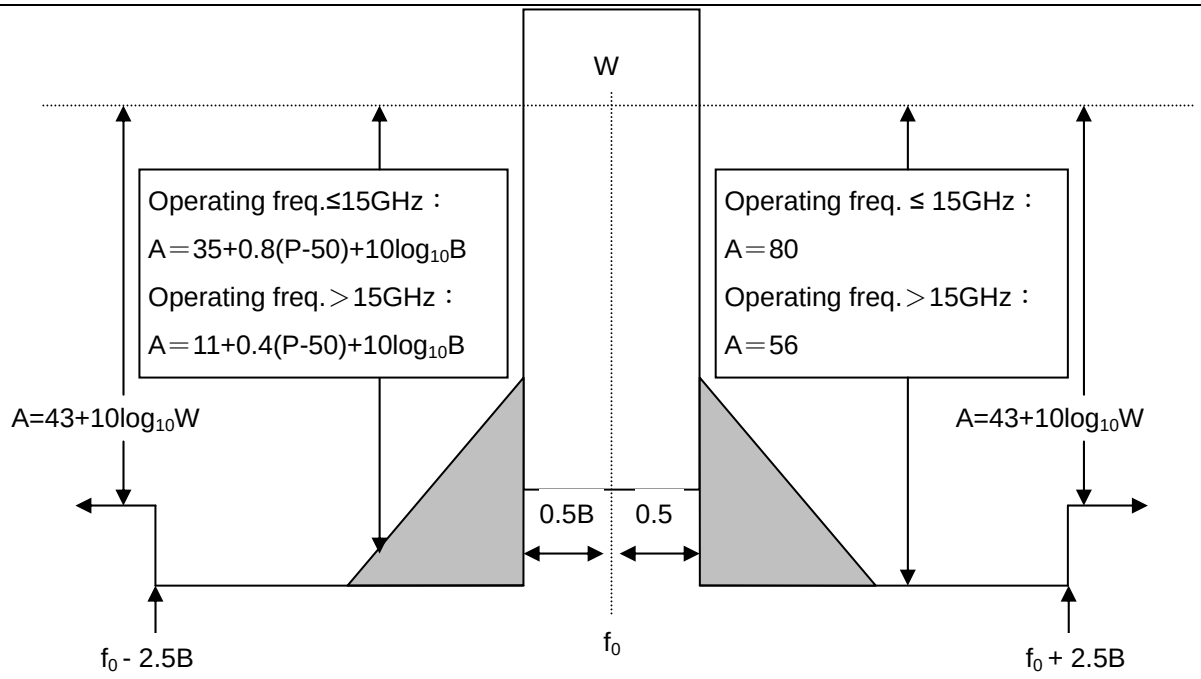


Date: 30.NOV.2010 10:35:05

3.6 Spectrum Mask Emissions

3.6.1 Limit of Spectrum Mask Emissions

Spectrum Mask Emissions



For operating frequencies below 15 GHz, Inside the 250 percent of the authorized bandwidth: A＝ 35+0.8(P-50)+10log$_{10}$B or 80 dB, whichever is the lesser attenuation.

For operating frequencies above 15 GHz, Inside the 250 percent of the authorized bandwidth: A＝ 11+0.4(P-50)+10log$_{10}$B or 56 dB, whichever is the lesser attenuation.

NOTE: For the applicable limit, see FCC 101.111

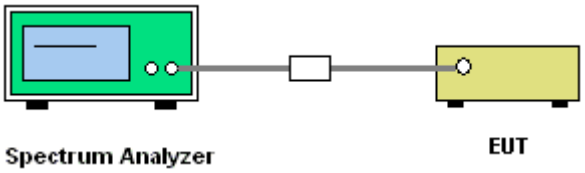
3.6.2 Measuring Instruments

Refer a measuring instruments list in this test report.

3.6.3 Test Procedures

Method of measurement: Refer as ANSI C63.10-2009, clauses 6.7.

3.6.4 Test Setup

Spectrum Mask Emissions


3.6.5 Test Information

Test Information			
Test Engineer	**Test Ambient Temp. / Rel. Humidity**	**Test Date**	**Test Site**
Sam Chen	25 °C / 60 %	2010/12/3	TH01-CB
Measurement Uncertainty		1 – 18 GHz	±0.67 dB
		18 – 40 GHz	±0.83 dB

3.6.6 Test Result of Spectrum Mask Emissions

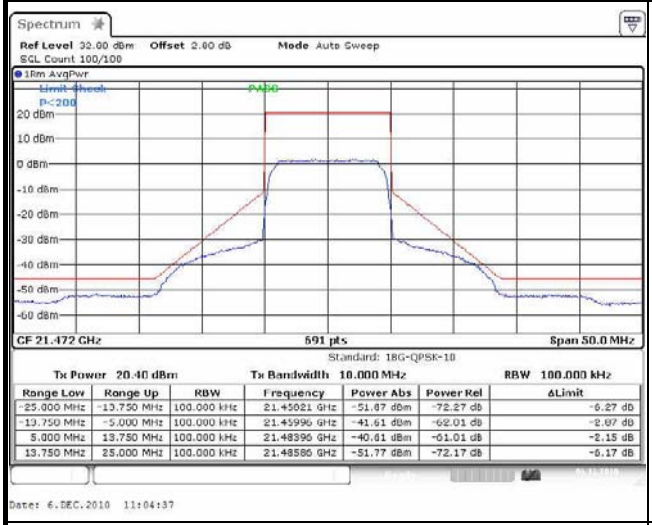
Spectrum Mask Emissions (21200 - 23600 MHz Band)			
10 MHz-QPSK	**F1**	**F2**	**F3**
TxPwr	20.40	20.41	20.25
Complied Limit	**Complied**	**Complied**	**Complied**

Spectrum Mask Emissions (21200 - 23600 MHz Band)			
50 MHz-QPSK	**F1**	**F2**	**F3**
TxPwr	18.31	18.32	20.25
Complied Limit	**Complied**	**Complied**	**Complied**

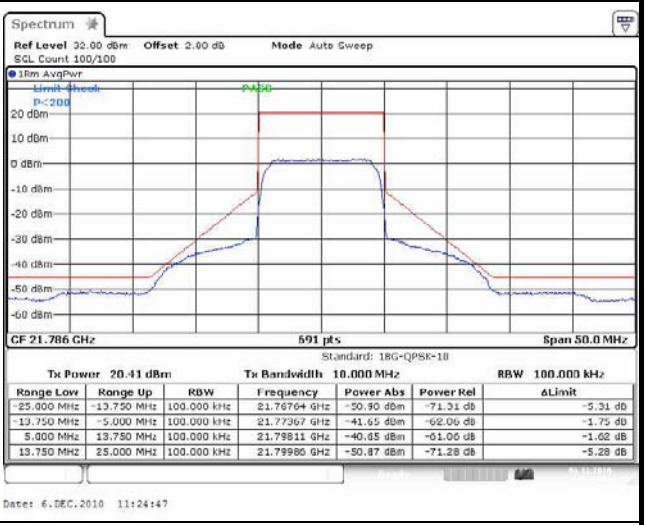
3.6.6.1 Test Frequency F1, F2, F3 (10 MHz), Spectrum Mask Emissions

Frequency Band:	21200 - 23600 MHz Band	Power Setting:	1, (20)
Modulation:	QPSK	Operating Mode:	1
Test Frequency:	F1, F2, F3	Authorized Bandwidth #:	10 MHz

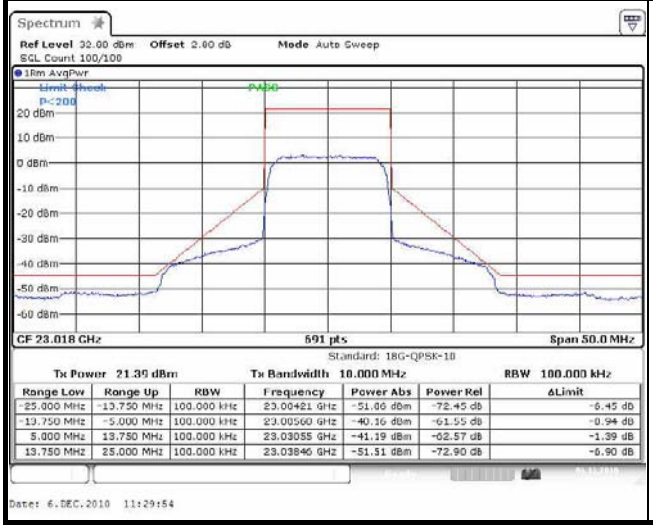
F1



F2



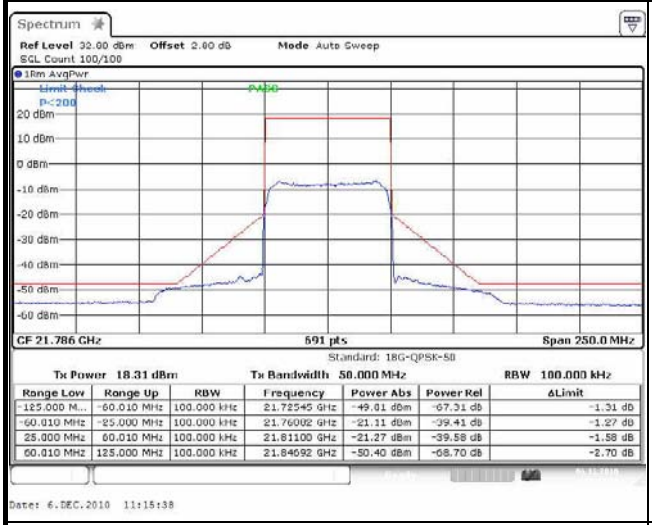
F3



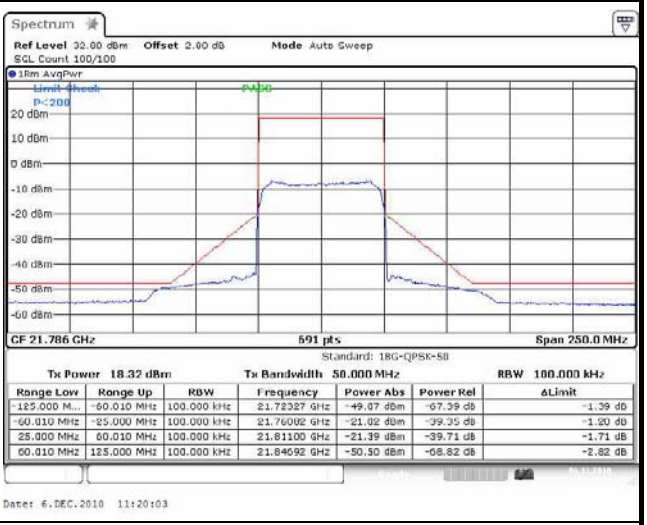
3.6.6.2 Test Frequency F1, F2, F3 (50 MHz), Spectrum Mask Emissions

Frequency Band:	21200 - 23600 MHz Band	Power Setting:	1, (19)
Modulation:	QPSK	Operating Mode:	1
Test Frequency:	F1, F2, F3	Authorized Bandwidth #:	50 MHz

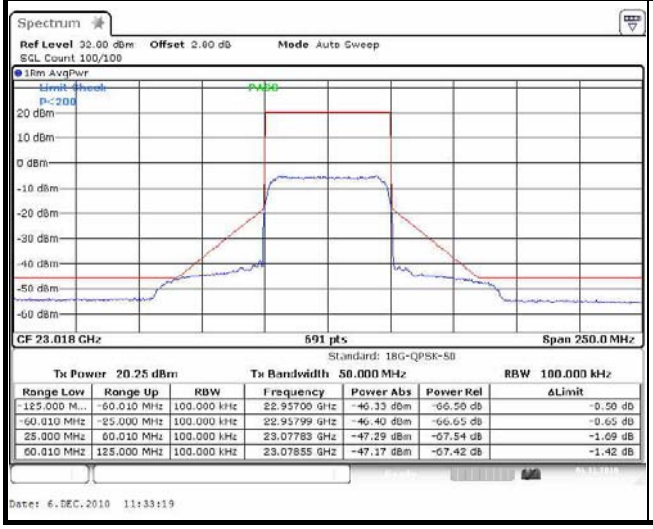
F1



F2



F3



3.7 Frequency Tolerance

3.7.1 Limit of Frequency Tolerance

Frequency Tolerance	Limit
Refer as FCC 101.107	± 10 ppm
Note: These measurements shall also be performed at normal and extreme test conditions.	

3.7.2 Measuring Instruments

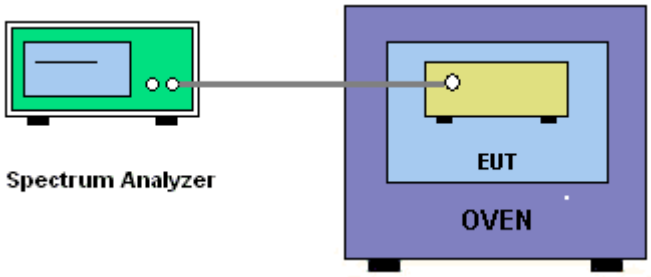
Refer a measuring instruments list in this test report.

3.7.3 Test Procedures

Method of measurement: Refer as ANSI C63.10-2009, clauses 6.8.

3.7.4 Test Setup

Frequency Tolerance



3.7.5 Test Information

Test Information			
Test Engineer	**Test Ambient Temp. / Rel. Humidity**	**Test Date**	**Test Site**
Sam Chen	25 °C / 60 %	2010/12/01	TH01-CB
Measurement Uncertainty		±8.5×10^{-8} Hz	

3.7.6 Test Result of Frequency Tolerance

3.7.6.1 Frequency Tolerance with Varying Supply Voltage

Temperature vs. Frequency Tolerance				
Test Channel		**F2**	**F2**	**F2**
Measure Time (min)		**2**	**5**	**10**
10 MHz-QPSK		21786	21786	21786
50 °C	**Vnom**	21785.9857	21786.0432	21785.9662
40 °C	**Vnom**	21786.0787	21785.9672	21785.9780
30 °C	**Vnom**	21786.0700	21785.9360	21786.0287
20 °C	**Vnom**	21785.9600	21785.9800	21785.9700
10 °C	**Vnom**	21785.9643	21786.0456	21786.1340
0 °C	**Vnom**	21785.9371	21785.9321	21786.1024
-10 °C	**Vnom**	21785.9255	21785.9970	21786.0112
-20 °C	**Vnom**	21785.9130	21786.1086	21786.1089
-30 °C	**Vnom**	21785.8933	21786.1100	21786.1190
Maximum Frequency Tolerance (ppm)		6.1507		
Frequency Tolerance limit		± 10 ppm		
Complied Limit		**Complied**		

Temperature vs. Frequency Tolerance				
Test Channel		**F2**	**F2**	**F2**
Measure Time (min)		**2**	**5**	**10**
50 MHz-QPSK		21786	21786	21786
50 °C	**Vnom**	21785.9477	21785.8995	21786.0015
40 °C	**Vnom**	21786.1070	21785.9595	21785.9470
30 °C	**Vnom**	21785.9993	21786.1033	21785.9912
20 °C	**Vnom**	21785.9800	21786.0200	21786.0100
10 °C	**Vnom**	21786.0576	21786.0348	21785.9350
0 °C	**Vnom**	21786.0355	21785.9245	21786.0035
-10 °C	**Vnom**	21785.9643	21786.0022	21785.9330
-20 °C	**Vnom**	21786.0068	21786.0680	21786.0820
-30 °C	**Vnom**	21786.0245	21786.0340	21786.0792
Maximum Frequency Tolerance (ppm)		4.9114		
Frequency Tolerance limit		± 10 ppm		
Complied Limit		**Complied**		

3.7.6.2 Frequency Tolerance with Varying Supply Voltage

Temperature vs. Frequency Tolerance				
Test Channel		**F2**	**F2**	**F2**
Measure Time (min)		**2**	**5**	**10**
10 MHz-QPSK		21786	21786	21786
20 °C	**Vnom**	21785.9600	21785.9800	21785.9700
20 °C	**Vmin**	21785.8996	21786.0914	21786.0230
20 °C	**Vmax**	21785.9850	21786.0446	21786.0030
Maximum Frequency Tolerance (ppm)		-4.6085		
Frequency Tolerance limit		± 10 ppm		
Complied Limit		**Complied**		

Temperature vs. Frequency Tolerance				
Test Channel		**F2**	**F2**	**F2**
Measure Time (min)		**2**	**5**	**10**
50 MHz-QPSK		21786	21786	21786
20 °C	**Vnom**	21785.9800	21786.0200	21786.0100
20 °C	**Vmin**	21785.9357	21785.9168	21786.0026
20 °C	**Vmax**	21785.9570	21786.1044	21786.0231
Maximum Frequency Tolerance (ppm)		4.7921		
Frequency Tolerance limit		± 10 ppm		
Complied Limit		**Complied**		

4 Maximum Permissible Exposure

4.1 Maximum Permissible Exposure

4.1.1 Limit of Maximum Permissible Exposure

Limits for Occupational / Controlled Exposure				
Frequency Range (MHz)	**Electric Field Strength (E) (V/m)**	**Magnetic Field Strength (H) (A/m)**	**Power Density (S) (mW/ cm²)**	**Averaging Time |E|²,|H|² or S (minutes)**
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842 / f	4.89 / f	(900 / f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100,000			5	6
Limits for General Population / Uncontrolled Exposure				
Frequency Range (MHz)	**Electric Field Strength (E) (V/m)**	**Magnetic Field Strength (H) (A/m)**	**Power Density (S) (mW/ cm²)**	**Averaging Time |E|²,|H|² or S (minutes)**
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30
NOTE 1: f = frequency in MHz ; *Plane-wave equivalent power density NOTE 2: For the applicable limit, see FCC 1.1310				

4.1.2 MPE Calculation Method

E (V/m) = $\frac{\sqrt{30 \times P \times G}}{d}$

Power Density: Pd (W/m^2) = $\frac{E^2}{377}$

E = Electric field (V/m)

P = RF output power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

Pd = $\frac{30 \times P \times G}{377 \times d^2}$

From the EUT RF output power, the minimum mobile separation distance, d= 5.3 m, as well as the gain of the used antenna, the RF power density can be obtained.

4.1.3 Result of Maximum Permissible Exposure

For max ANT gain=45 dBi

Antenna Gain (dBi)	Antenna Gain (numeric)	Output Power (dBm)	Output Power (mW)	Power Density (S) (mW/cm^2)	Limit of Power Density (S) (mW/cm^2)	Test Result
45	31622.7766	20.4100	109.9006	0.985051	1	Complies

5 List of Measuring Equipments

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Until	Remark
EMI Test Receiver	R&S	ESCS 30	100377	9kHz ~ 2.75GHz	Sep. 01, 2010	Sep. 01, 2011	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150kHz ~ 100MHz	Apr. 24, 2010	Apr. 24, 2011	Conduction (CO01-CB)
V- LISN	Schwarzbeck	NSLK 8127	8127-478	9K ~ 30MHz	Oct. 30, 2010	Oct. 30, 2011	Conduction (CO01-CB)
PULSE LIMITER	R&S	ESH3-Z2	100430	9K~30MHz	Jan. 04, 2010	Jan. 04, 2011	Conduction (CO01-CB)
COND Cable	-	Cable	-	0.15MHz~30MHz	Dec. 01, 2010	Dec. 01, 2011	Conduction (CO01-CB)
BILOG ANTENNA	Schaffner	CBL6112D	22021	20MHz ~ 2GHz	Oct. 17, 2010	Oct. 17, 2011	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz~18GHz	Nov. 13, 2010	Nov. 13, 2011	Radiation (03CH01-CB)
Horn Antenna	SCHWARZBEAK	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Oct. 08, 2010	Oct. 08, 2011	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10991	0.1MHz ~ 1.3GHz	Nov. 17, 2010	Nov. 17, 2011	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Nov. 06, 2010	Nov. 06, 2011	Radiation (03CH01-CB)
Pre-Amplifier	WM	TF-130N-R1	923365	26.5GHz ~ 40GHz	Nov. 17, 2010	Nov. 17, 2011	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSP	100304	9kHz ~ 40GHz	Nov. 06, 2010	Nov. 06, 2011	Radiation (03CH01-CB)
EMI Test Receiver	R&S	ESCS 30	100355	9KHz ~ 2.75GHz	Mar. 06, 2010	Mar. 06, 2011	Radiation (03CH01-CB)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz - 30 MHz	Sep. 09, 2010*	Sep. 09, 2012*	Radiation (03CH01-CB)
Turn Table	INN CO	CO 2000	N/A	0 ~ 360 degree	N/A	N/A	Radiation (03CH01-CB)
Antenna Mast	INN CO	CO2000	N/A	1 m - 4 m	N/A	N/A	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-1	-	30 MHz - 1 GHz	Nov. 17, 2010	Nov. 17, 2011	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-1	-	1 GHz – 26.5 GHz	Nov. 17, 2010	Nov. 17, 2011	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-2	-	1 GHz – 26.5 GHz	Nov. 17, 2010	Nov. 17, 2011	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-3	-	1 GHz - 40 GHz	Nov. 17, 2010	Nov. 17, 2011	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-4	-	1 GHz - 40 GHz	Nov. 17, 2010	Nov. 17, 2011	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSP30	100023	9KHz~30GHz	Mar. 05, 2010	Mar. 05, 2011	Conducted (TH01-CB)
Temp. and Humidity Chamber	TEN BILLION	TTH-D3SP	TBN-931011	-30~100℃	May. 21, 2010	May. 21, 2011	Conducted (TH01-CB)

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Calibration Until	Remark
Signal Generator	R&S	SMR40	100302	10MHz-40GHz	Mar. 09, 2010	Mar. 09, 2011	Conducted (TH01-CB)
RF Power Divider	HP	11636A	00306	2GHz ~ 18GHz	N/A	N/A	Conducted (TH01-CB)
RF Power Splitter	Anaren	44100	1839	2GHz ~ 18GHz	N/A	N/A	Conducted (TH01-CB)
RF Power Splitter	Anaren	42100	17930	2GHz ~ 18GHz	N/A	N/A	Conducted (TH01-CB)
Signal generator	R&S	SMU200A	102782	10MHz-40GHz	Mar. 09, 2010	Mar. 09, 2011	Conducted (TH01-CB)
Horn Antenna	COM-POWER	AH-118	071187	1GHz – 18GHz	Apr. 16, 2010	Apr. 16, 2011	Conducted (TH01-CB)
Horn Antenna	COM-POWER	AH-118	071042	1GHz – 18GHz	Oct. 14, 2010	Oct. 14, 2011	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-7	-	1 GHz – 26.5 GHz	Nov. 17, 2010	Nov. 17, 2011	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-8	-	1 GHz – 26.5 GHz	Nov. 17, 2010	Nov. 17, 2011	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-9	-	1 GHz – 26.5 GHz	Nov. 17, 2010	Nov. 17, 2011	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-10	-	1 GHz – 26.5 GHz	Nov. 17, 2010	Nov. 17, 2011	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-11	-	1 GHz – 26.5 GHz	Nov. 17, 2010	Nov. 17, 2011	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-12	-	1 GHz – 26.5 GHz	Nov. 17, 2010	Nov. 17, 2011	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-13	-	1 GHz – 26.5 GHz	Nov. 17, 2010	Nov. 17, 2011	Conducted (TH01-CB)
Power Sensor	Anritsu	MA2411B	0917223	300MHz~40GHz	Sep. 13, 2010	Sep. 13, 2011	Conducted (TH01-CB)
Power Meter	Anritsu	ML2495A	1035008	300MHz~40GHz	Sep. 08, 2010	Sep. 08, 2011	Conducted (TH01-CB)
Horn Antenna + Mixer	OML	M19HW/A	U91113-1	40 ~ 60 GHz	Nov. 16, 2009	Nov. 12, 2012	Conducted (TH01-CB)
Horn Antenna + Mixer	OML	M15HW/A	V91113-1	50 ~ 75 GHz	Nov. 16, 2009	Nov. 12, 2012	Conducted (TH01-CB)
Horn Antenna + Mixer	OML	M12HW/A	E91113-1	60 ~ 90 GHz	Nov. 16, 2009	Nov. 12, 2012	Conducted (TH01-CB)
Horn Antenna + Mixer	OML	M08HW/A	F91113-1	90 ~ 140 GHz	Nov. 16, 2009	Nov. 12, 2012	Conducted (TH01-CB)
Horn Antenna + Mixer	OML	M05HW/A	G91113-1	140 ~ 220 GHz	Nov. 16, 2009	Nov. 12, 2012	Conducted (TH01-CB)-

6 Certification of TAF Accreditation

TAF

Certificate No. : L1190-100319

財團法人全國認證基金會
Taiwan Accreditation Foundation

Certificate of Accreditation

This is to certify that

Sporton International Inc.
EMC & Wireless Communications Laboratory
No.52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.

is accredited in respect of laboratory

Accreditation Criteria	:	ISO/IEC 17025:2005
Accreditation Number	:	1190
Originally Accredited	:	December 15, 2003
Effective Period	:	January 10, 2010 to January 09, 2013
Accredited Scope	:	Testing Field, see described in the Appendix
Specific Accreditation Program	:	Accreditation Program for Designated Testing Laboratory for Commodities Inspection Accreditation Program for Telecommunication Equipment Testing Laboratory Accreditation Program for BSMI Mutual Recognition Arrangment with Foreign Authorities

Jay-San Chen
President, Taiwan Accreditation Foundation
Date : March 19, 2010

P1, total 22 pages

The Appendix forms an integral part of this Certificate, which shall be invalid when use without the Appendix

Appendix A. Test Photos

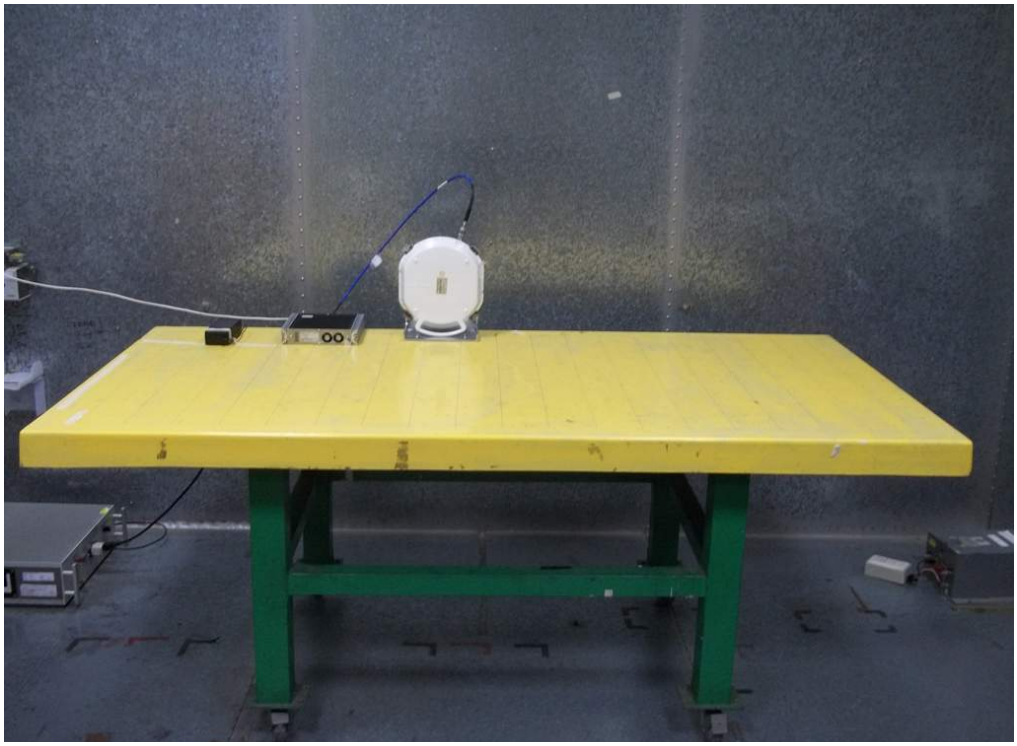
Radiated Emissions 30 MHz - 1GHz, EUT Setups: Setup_01

Radiated Emissions 1 GHz - 40GHz, EUT Setups: Setup_01

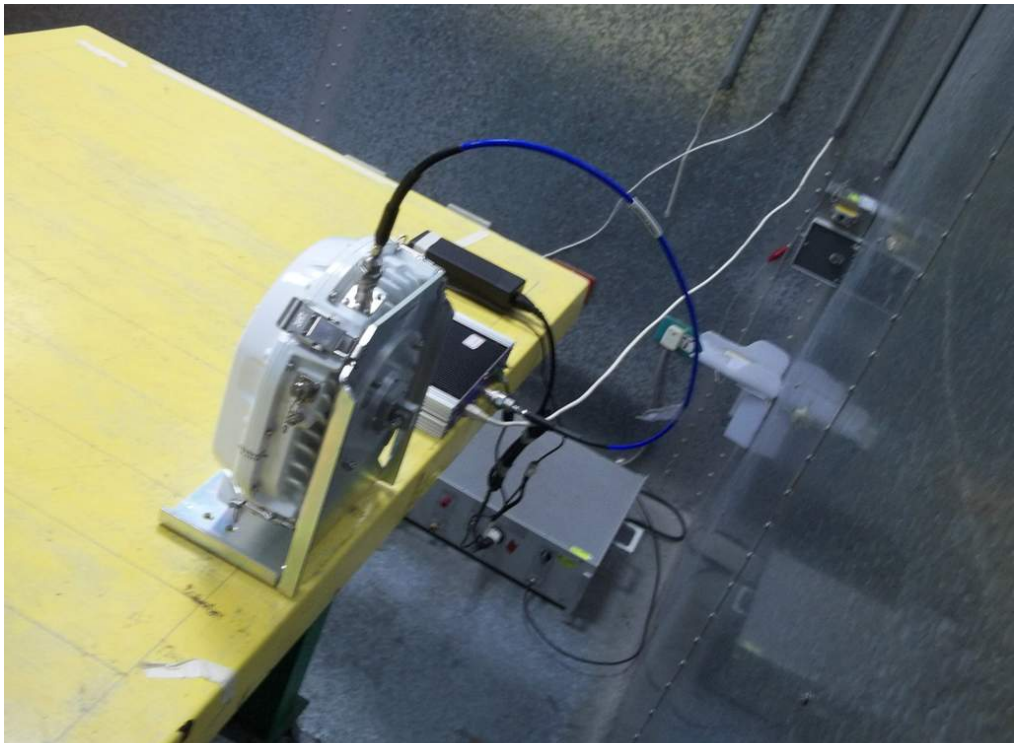
Radiated Emissions 1 GHz - 40GHz, EUT Setups: Setup_01

Radiated Emissions 1 GHz - 40GHz, EUT Setups: Setup_02

AC Power Conducted, EUT Setups: Setup_01



AC Power Conducted, EUT Setups: Setup_02



Appendix B. Photographs of EUT

Please refer to Appendix B. Photographs as below.