ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C REQUIREMENT

OF

Product Name:	**CarDock FM Follow Me**
Brand Name:	**Gear4**
Model Name:	**PG361**
Model Differences:	**N/A**
FCC ID:	**WO40361GEAR4**
Report No.:	**ER/2008/70015**
Rule:	**§15.239**
Issue Date:	**Aug. 25, 2008**
Prepared for:	**Disruptive Limited** **4 Blenheim Road, Cressex Business Park, High Wycombe Bucks HP12 3RS, United Kingdom**
Prepared by:	**SGS Taiwan Ltd.** **Electronics & Communication Laboratory No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei County, Taiwan.**

Testing Laboratory
0513

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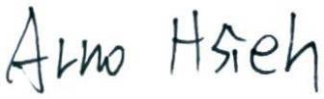
VERIFICATION OF COMPLIANCE

Applicant:	Disruptive Limited 4 Blenheim Road, Cressex Business Park, High Wycombe Bucks HP12 3RS, United Kingdom
Equipment Under Test:	CarDock FM Follow Me
Brand Name:	Gear4
Model No.:	PG361
Model Difference:	N/A
FCC ID:	WO40361GEAR4
File Number:	ER/2008/70015
Date of test:	Aug. 03, 2008 ~ Aug. 22, 2008
Date of EUT Received:	Aug. 03, 2008

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2003) and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.239.

The test results of this report relate only to the tested sample identified in this report.

Test By:		***Date***	Aug. 25, 2008
	Arno Hsieh/Senior Engineer		
Prepared By:		***Date***	Aug. 25, 2008
	Elisa Chen/Asst. Supervisor		
Approved By:		***Date***	Aug. 25, 2008
	Vincent Su / Manager		

Version

Version No.	Date	Description
00	Aug. 25, 2008	Initial creation of document

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1. GENERAL INFORMATION

1.1 Product Description

The Disruptive Limited, Model: PG361 (referred to as the EUT in this report) is a short range, lower power, audio sender. It is designed by way of utilizing the FM modulation achieves the system operating.

A major technical descriptions of EUT is described as following:
A). Operation Frequency: 88.1 –107.9 MHz; 198 channels (100kHz step)
B). Modulation: Frequency Modulation
C). Antenna Designation: Non-User Replaceable (Fixed)
D). Power Supply: 12V from car battery

1.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: **WO40361GEAR4** filing to comply with Section 15.239 of the FCC Part 15, Subpart C Rules.

1.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 (2003). Radiated testing was performed at an antenna to EUT distance 3 meters.

1.4 Test Facility

The measurement facilities used to collect the 3m Radiated Emission and AC power line conducted data are located on the address of SGS Taiwan Ltd. No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei Country, Taiwan which are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003. FCC Registration Number are: 990257 and 236194, Canada Registration Number: 4620A-1

The 10 m Open Area Test Sites located on the address of SGS Taiwan Ltd. No. 29, Pau-Tou-Tsuo Valley Chia-Pau Tsuen, Linkou Hsiang, Taipei county,which is constructed and calibrated to meet the CISPR 22/EN 55022 requirements. SGS Site No. 1(3 &10 meters) and FCC Registration Number: 94644.

1.5 Special Accessories

Not available for this EUT intended for grant.

2. System Test Configuration

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

The Transmitter was operated in the normal operating mode. the Tx frequency was fixed which was for the purpose of the measurements.

2.3 Test Procedure

2.3.1 Conducted Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. According to the requirements in Section 7 and 13 of ANSI C63.4-2003.Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and Average detector mode.

2.3.2 Radiated Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made “while keeping the antenna in the ‘cone of radiation’ from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response.” is still within the 3dB illumination BW of the measurement antenna. according to the requirements in Section 8 and 13 and Subclause 8.3.1.2 of ANSI C63.4-2003.9

2.4 Limitation

(1) Conducted Emission

According to section 15.207(a) Conducted Emission Limits is as following.

Frequency range MHz	Limits dB (uV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50
Note 1.The lower limit shall apply at the transition frequencies 2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.		

(2) Radiated Emission

a. Emission from the intentional radiator shall be confined with a band 200kHz wide centered on the operation frequency. The 200kHz band shall lie wholly within the frequency range of 88-108 MHz.

b. The field strength of any emission within the permitted 200kHz band shall not exceed 250 micro volts/meter at 3 meters. (48dBμV at 3m) The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in section 15.35 for limiting peak emissions apply.

c.The field strength of any emissions radiated on any frequency outside of the specified 200kHz band shall not exceed the general radiated emission limits in section 15.209(Intentional Radiators general limit).as below.

Frequency (MHz)	Field strength μV/m	Distance (m)	Field strength at 3m dBμV/m
1.705-30	30	30	69.54
30-88	100	3	40
88-216	150	3	43.5
216-960	200	3	46
Above 960	500	3	54

Remark: 1. Emission level in dBuV/m=20 log (uV/m)
2. Measurement was performed at an antenna to the closed point of EUT distance of meters.
3. Only spurious frequency is permitted to locate within the Restricted Bands specified in provision of ξ 15.205
4. Emission spurious frequency which appearing within the Restricted Bands specified in provision of ξ15.205, then the general radiated emission limits in ξ 15.209 apply.

2.5 Configuration of Tested System

Fig. 2-1 Configuration of Tested System

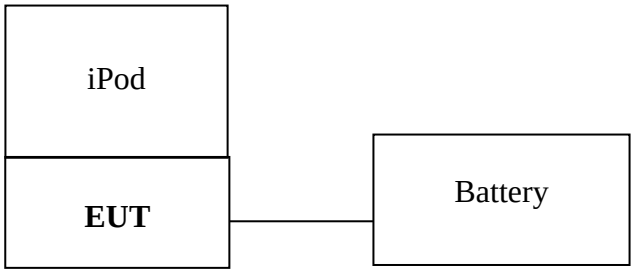


Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/ Type No.	Series No.	Data Cable	Power Cord
1.	iPod	Apple	AZ236	KM741P05YOP	N/A	N/A
2.	Battery	YUASA	NP412	N/A	N/A	N/A

3. Summary of Test Results

Description Of Test	Remark
Conducted Emission	N/A
Radiated Emission	Complied
20dB Bandwidth	No Limit

4. Description of test modes

The frequency 88.1 MHz, 98.1 MHz, 107.9 MHz are chosen with 1kHz audio signal for full testing. And the EUT stay in continuous transmitting mode.

The field strength of radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) the worst case H position was reported.

5. Conducted Emissions Test (Not applicable in the report)

5.1 Measurement Procedure:

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

5.2 Test SET-UP (Block Diagram of Configuration)

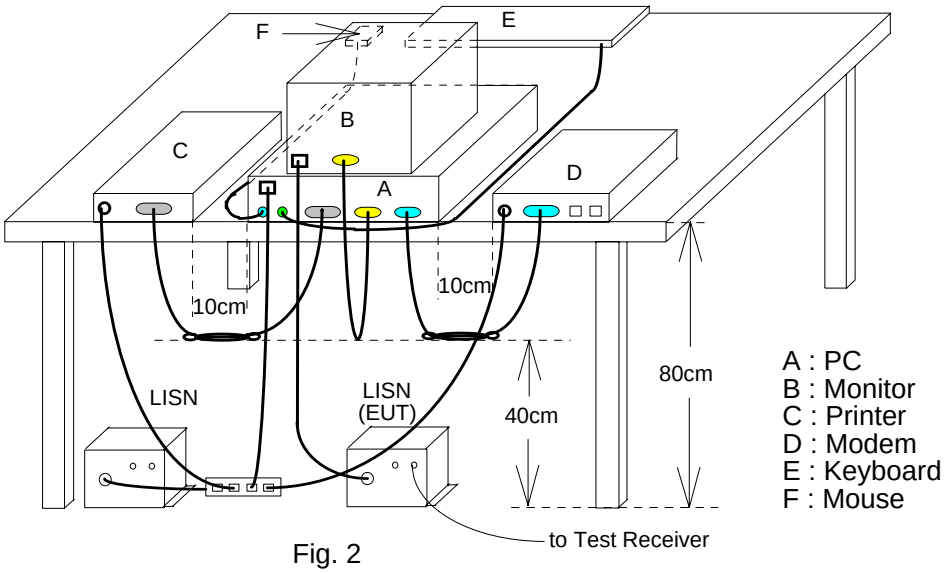


Fig. 2

5.3 Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
EMC Analyzer	HP	8594EM	3624A00203	09/02/2007	09/03/2008
EMI Test Receiver	R&S	ESCS30	828985/004	06/09/2008	06/10/2009
Transient Limiter	HP	11947A	3107A02062	09/02/2007	09/03/2008
LISN	Rolf-Heine	NNB-2/16Z	99012	12/31/2007	12/30/2008
LISN	Rolf-Heine	NNB-2/16Z	99013	01/10/2008	01/09/2009
Coaxial Cables	FCC	FCC-LISN-50/250-2 5-2-01	04034	01/11/2008	01/10/2009

5.4 Measurement Result:

N/A

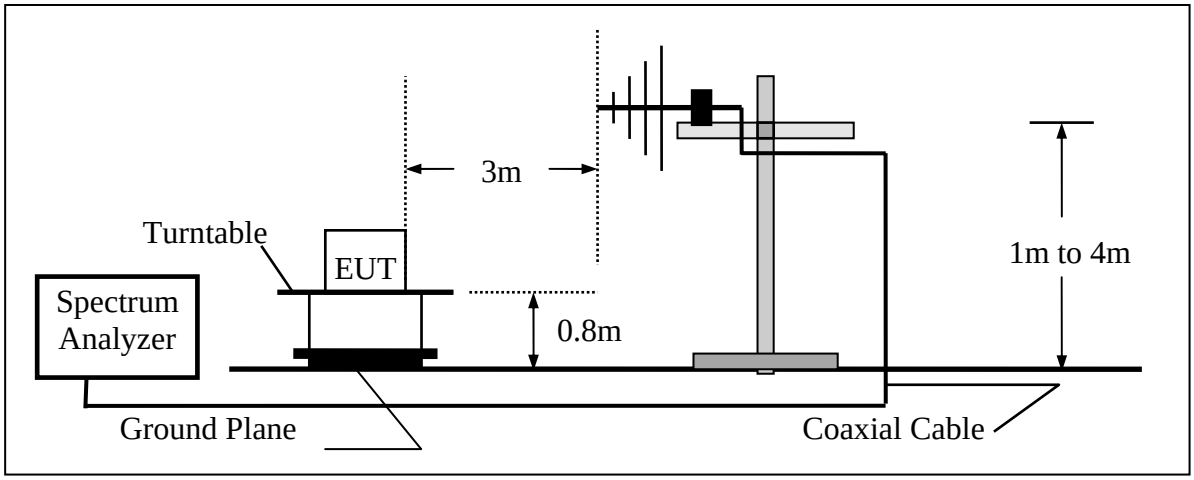
6. Radiated Emission Test

6.1 Measurement Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measured were complete.

6.2 Test SET-UP (Block Diagram of Configuration)

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



6.3 Measurement Equipment Used:

966 Chamber					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Spectrum Analyzer	Agilent	E7405A	US41160416	08/27/2007	08/26/2008
Bilog Antenna	SCHWAZBECK	VULB9160	152	06/03/2008	06/02/2009
Horn antenna	Schwarzbeck	BBHA 9120D	309/320	08/16/2008	08/15/2009
Horn antenna	Schwarzbeck	BBHA 9170	184/185	07/04/2008	07/03/2009
Pre-Amplifier	HP	8447D	2944A09469	07/19/2008	07/18/2009
Turn Table	HD	DT420	N/A	N.C.R	N.C.R
Antenna Tower	HD	MA240-N	240/657	N.C.R	N.C.R
Controller	HD	HD100	N/A	N.C.R	N.C.R
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-10M	10m	10/09/2007	10/08/2008
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	10/09/2007	10/08/2008
Site NSA	SGS	966 chamber	N/A	11/17/2007	11/16/2008

6.4 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL – AG

Where	FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
	RA = Reading Amplitude	AG = Amplifier Gain
	AF = Antenna Factor	

6.5 Measurement Result

*Note: The measurement is done in the chamber FCC Registration Number: 236194.

Operation Mode:	Transmitting Mode	Test Date :	Aug. 08, 2008
Fundamental Frequency:	88.1 MHz	Test By:	Arno
Temperature :	25 ℃	Pol:	Vertical
Humidity :	65 %		

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/AV/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit@3m (dBuV/m)	Safe Margin (dB)	Note
88.10	V	Peak	51.58	-17.80	33.78	48.00	-14.22	F
176.20	V	Peak	--			43.50		H
264.30	V	Peak	--			46.00		H
352.40	V	Peak	43.58	-12.43	31.15	46.00	-14.85	H
440.50	V	Peak	52.10	-9.09	43.01	46.00	-2.99	H
528.60	V	Peak	--			46.00		H
616.70	V	Peak	--			46.00		H
704.80	V	Peak	--			46.00		H
792.90	V	Peak	--			46.00		H
881.00	V	Peak	--			46.00		H

Remark：

(1) Measuring frequencies from 30 MHz to the 1GHz。

(2) Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.

(3) “F” denotes fundamental frequency; “H” denotes spurious frequency. “E” denotes band edge frequency.

(4) Data of measurement within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(5) The IF bandwidth of SPA 30MHz to 1GHz was 100KHz. VBW= 300KHz

Operation Mode:	Transmitting Mode	Test Date :	Aug. 08, 2008
Fundamental Frequency:	88.1 MHz	Test By:	Arno
Temperature :	25 ℃	Pol:	Horizontal
Humidity :	65 %		

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/AV/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit@3m (dBuV/m)	Safe Margin (dB)	Note
88.10	H	Peak	59.97	-17.80	42.17	48.00	-5.83	F
176.20	H	Peak	--			43.50		H
264.30	H	Peak	--			46.00		H
352.40	H	Peak	46.45	-12.43	34.02	46.00	-11.98	H
440.50	H	Peak	49.80	-9.09	40.71	46.00	-5.29	H
528.60	H	Peak	--			46.00		H
616.70	H	Peak	34.84	-4.99	29.85	46.00	-16.15	H
704.80	H	Peak	--			46.00		H
792.90	H	Peak	--			46.00		H
881.00	H	Peak	--			46.00		H

Remark：

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(5) The IF bandwidth of SPA 30MHz to 1GHz was 100KHz, VBW=300KHz.

Operation Mode:	Transmitting Mode	Test Date :	Aug. 08, 2008
Fundamental Frequency:	98.1 MHz	Test By:	Arno
Temperature :	25 ℃	Pol:	Vertical
Humidity :	65 %		

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/AV/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit@3m (dBuV/m)	Safe Margin (dB)	Note
98.10	V	Peak	49.94	-17.11	32.83	48.00	-15.17	F
196.20	V	Peak	--			43.50		H
294.30	V	Peak	--			46.00		H
324.88	V	Peak	42.63	-12.43	30.20	46.00	-15.80	
352.04	V	Peak	45.41	-11.73	33.68	46.00	-12.32	
392.40	V	Peak	--			46.00		H
431.58	V	Peak	51.45	-9.09	42.36	46.00	-3.64	
490.50	V	Peak	--			46.00		H
588.60	V	Peak	--			46.00		H
686.70	V	Peak	--			46.00		H
784.80	V	Peak	--			46.00		H
882.90	V	Peak	--			46.00		H
981.00	V	Peak	--			54.00		H

Remark：

(1) Measuring frequencies from 30 MHz to the 1GHz。

(2) Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.

(3) “F” denotes fundamental frequency; “H” denotes spurious frequency. “E” denotes band edge frequency.

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Operation Mode:	Transmitting Mode	Test Date :	Aug. 08, 2008
Fundamental Frequency:	98.1 MHz	Test By:	Arno
Temperature :	25 ℃	Pol:	Horizontal
Humidity :	65 %		

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/AV/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit@3m (dBuV/m)	Safe Margin (dB)	Note
98.10	H	Peak	59.24	-17.11	42.13	48.00	-5.87	F
196.20	H	Peak	--			43.50		H
294.30	H	Peak	--			46.00		H
324.88	H	Peak	50.54	-12.43	38.11	46.00	-7.89	
392.40	H	Peak	--			46.00		H
405.39	H	Peak	46.90	-9.86	37.04	46.00	-8.96	
431.58	H	Peak	49.13	-9.09	40.04	46.00	-5.96	
490.50	H	Peak	--			46.00		H
588.60	H	Peak	--			46.00		H
686.70	H	Peak	--			46.00		H
784.80	H	Peak	--			46.00		H
882.90	H	Peak	--			46.00		H
981.00	H	Peak	--			54.00		H

Remark：

(1) Measuring frequencies from 30 MHz to the 1GHz。

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(5) The IF bandwidth of SPA 30MHz to 1GHz was 100KHz, VBW=300KHz.

Operation Mode:	Transmitting Mode	Test Date :	Aug. 08, 2008
Fundamental Frequency:	107.9 MHz	Test By:	Arno
Temperature :	25 ℃	Pol:	Vertical
Humidity :	65 %		

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/AV/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit@3m (dBuV/m)	Safe Margin (dB)	Note
107.90	V	Peak	56.73	-16.41	40.32	48.00	-7.68	F
215.80	V	Peak	--			43.50		H
323.70	V	Peak	40.04	-11.86	28.18	46.00	-17.82	H
431.60	V	Peak	51.45	-9.09	42.36	46.00	-3.64	H
492.69	V	Peak	37.50	-8.50	29.00	46.00	-17.00	
539.50	V	Peak	--			46.00		H
647.40	V	Peak	--			46.00		H
755.30	V	Peak	--			46.00		H
863.20	V	Peak	--			46.00		H
971.10	V	Peak	--			54.00		H
1079.00	V	Peak	--			54.00		H

Remark：

(1) Measuring frequencies from 30 MHz to the 1GHz。

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(3) “F” denotes fundamental frequency; “H” denotes spurious frequency. “E” denotes band edge frequency.

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Operation Mode:	Transmitting Mode	Test Date :	Aug. 08, 2008
Fundamental Frequency:	107.9 MHz	Test By:	Arno
Temperature :	25 ℃	Pol:	Horizontal
Humidity :	65 %		

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/AV/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit@3m (dBuV/m)	Safe Margin (dB)	Note
107.90	H	Peak	57.16	-16.41	40.75	48.00	-7.25	F
215.80	H	Peak	--			43.50		H
286.08	H	Peak	--			46.00		H
323.70	H	Peak	51.11	-12.43	38.68	46.00	-7.32	H
431.60	H	Peak	51.20	-9.09	42.11	46.00	-3.89	H
539.50	H	Peak	--			46.00		H
647.40	H	Peak	--			46.00		H
755.30	H	Peak	--			46.00		H
863.20	H	Peak	--			46.00		H
971.10	H	Peak	--			54.00		H
1079.00	H	Peak	--			54.00		H

Remark：

(1) Measuring frequencies from 30 MHz to the 1GHz。

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(3) “F” denotes fundamental frequency; “H” denotes spurious frequency. “E” denotes band edge frequency.

(4) Data of measurement within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(5) The IF bandwidth of SPA 30MHz to 1GHz was 100KHz, VBW=300KHz.

7. 20dB Occupied Bandwidth

7.1 Measurement Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Set EUT as normal operation
3. Set SPA Center Frequency = fundamental frequency, RBW, VBW= 10KHz, Span =500KHz.
4. Set SPA Max hold. Mark peak, -20dB.

7.2 Test SET-UP (Block Diagram of Configuration)

Same as 4.2 Radiated Emission Measurement.

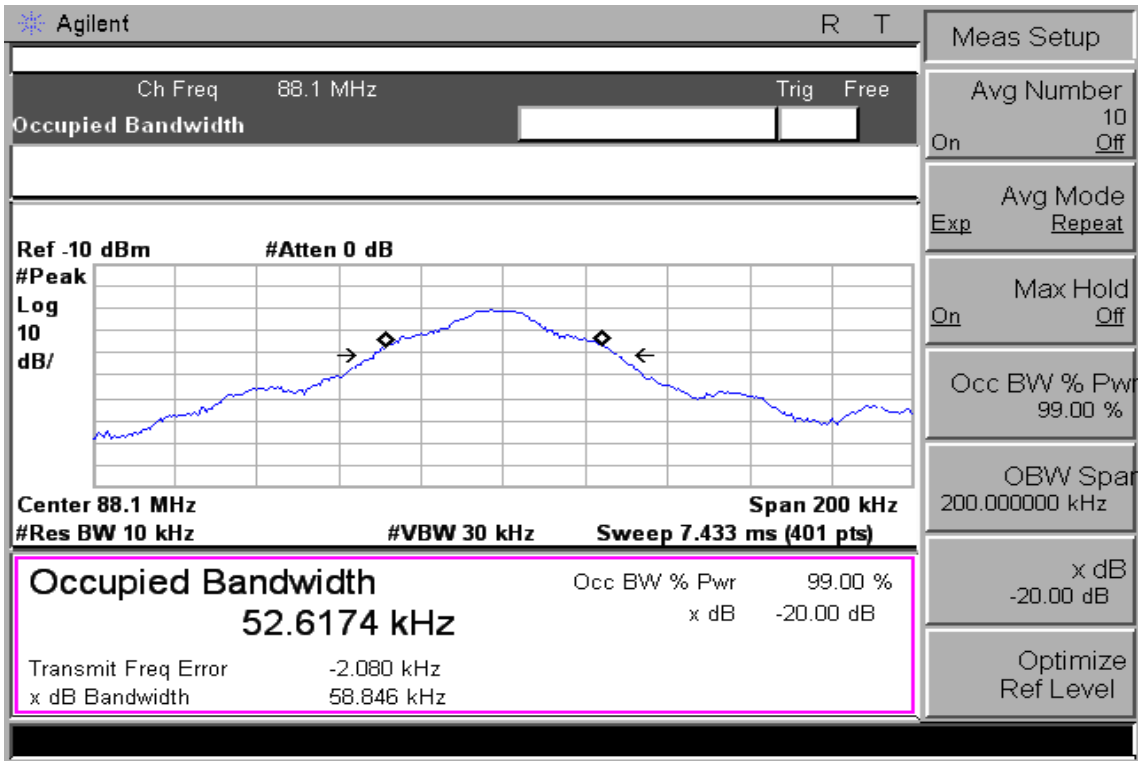
7.3 Measurement Equipment Used:

Same as 4.2 Radiated Emission Measurement.

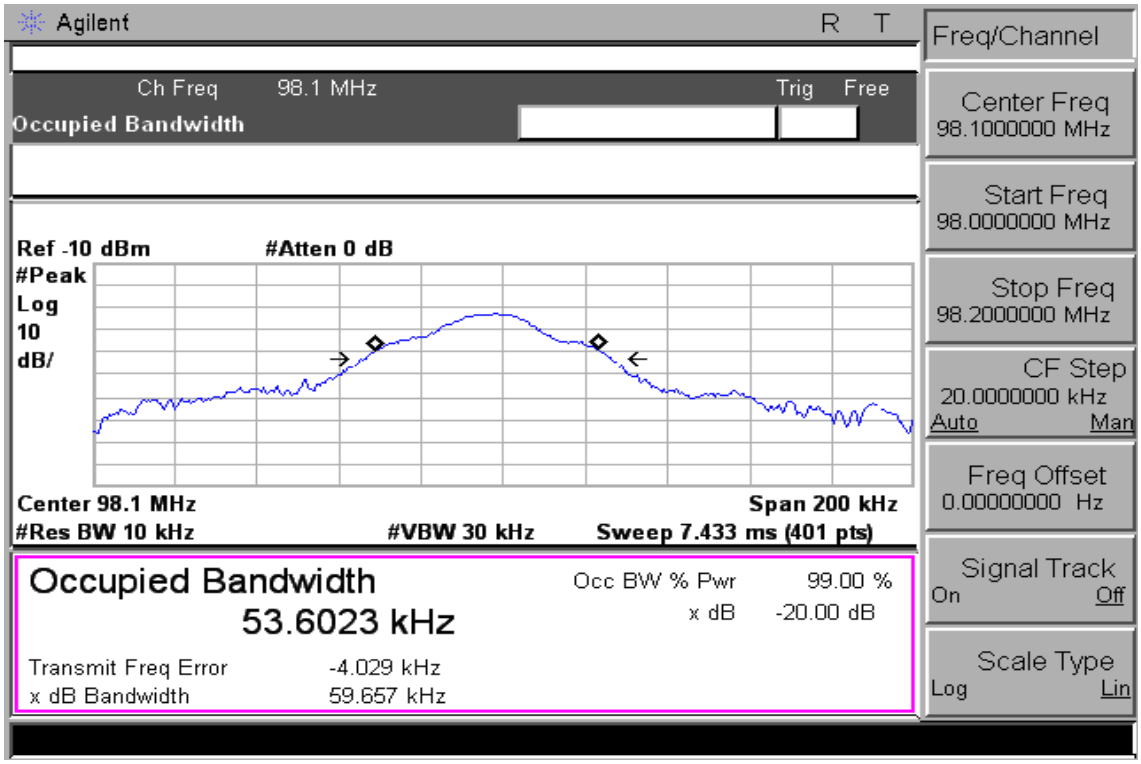
7.4 Measurement Results

Please refer to next page for test plots.

CH Low



CH Mid



CH High