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ILAC MRA

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C REQUIREMENT

OF

Product Name:	**Digital FM Transmitter**
Model Name:	**EF-6210, EF-6210C**
Model Differences:	**EF-6210C includes cigarette charger whereas EF-6210 excluded the charger**
Brand Name:	**N/A**
FCC ID:	**POSEF-6210**
Report No.:	**ER/2004/C0006**
Issue Date:	**Dec. 17, 2004**
FCC Rule Part:	**§15.239**
Prepared for	**PROCARE INTERNATION CO.,** **11F-6, 410, CHUNG HSIAO E. RD., SEC. 5, TAIPEI, TAIWAN.**
Prepared by	**SGS Taiwan Ltd.** **No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei County, Taiwan.**

VERIFICATION OF COMPLIANCE

Applicant:	PROCARE INTERNATION CO., 11F-6, 410, CHUNG HSIAO E. RD., SEC. 5, TAIPEI, TAIWAN.
Product Description:	Digital FM Transmitter
FCC ID Number:	POSEF-6210
Model No.:	EF-6210, EF-6210C
Model Difference:	EF-6210C includes cigarette charger whereas EF-6210 excluded the charger
File Number:	ER/2004/C0006
Date of test:	Dec .01, 2004 ~ Dec. 08, 2004
Date of EUT Receive:	Dec. 01, 2004

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:	Alex Hsieh	***Date***	Dec. 17, 2004
	Alex Hsieh		
Approved By	Vincent Su	***Date***	Dec. 17, 2004
	Vincent Su		

Version

Version No.	Date
00	Dec. 08, 2004
01	Dec. 10, 2004
02	Dec. 17, 2004

Table of Contents

1. GENERAL INFORMATION

1.1 Product Description

The PROCARE INTERNATION CO., Model: EF-6210, EF-6210C (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.
B). Modulation: Frequency Modulation
C). Antenna Designation: Non-User Replaceable (Fixed)
D). Power Supply: 3Vdc AAA battery or 12 Vdc from car battery.

1.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: **POSEF-6210** filing to comply with Section 15.239 of the FCC Part 15, Subpart C Rules. The composite system (digital device) is compliance with Subpart B is authorized under a DoC procedure.

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 open area test site and conducted measurement facility used to collect the radiated data is located on the address of SGS Taiwan Ltd. No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei Country, Taiwan. The Open Area Test Sites and the Line Conducted labs are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003 and CISPR 22/EN 55022 requirements. Site No. 1(3 &10 meters) Registration Number: 94644, Anechoic chamber (3 meters) Registration Number: 573967

1.5 Special Accessories

Not available for this EUT intended for grant.

1.6 Equipment Modifications

A ferrite core dimension of 20mm, ID 5mm, OD 10mm provides at DC/DC power cable.which is intended for grant. Refer to picture.

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 (Not apply in the report)

The EUT is a placed on as turn table which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 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 according to the requirements in Section 13.1.4.1 of ANSI C63.4-2003.

2.4 Limitation

(1) Conducted Emission (Not applicable in this report)

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

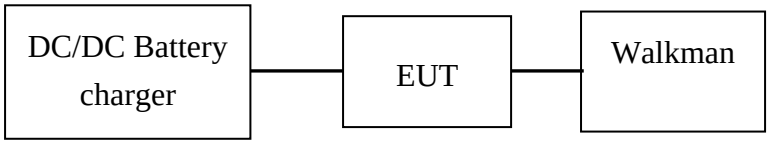


Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/ Type No.	FCC ID	Series No.	Data Cable	Power Cord
1.	Walkman	Panasonic	SN7878	N/A	N/A		N/A
2.							

3. Summary Of Test Results

FCC Rules	Description Of Test	Result
§15.207	Conducted Emission	N/A
§15.239	Radiated Emission	Compliant
§15.239	26 dB Bandwidth	Compliant

4. Description of test modes

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

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)

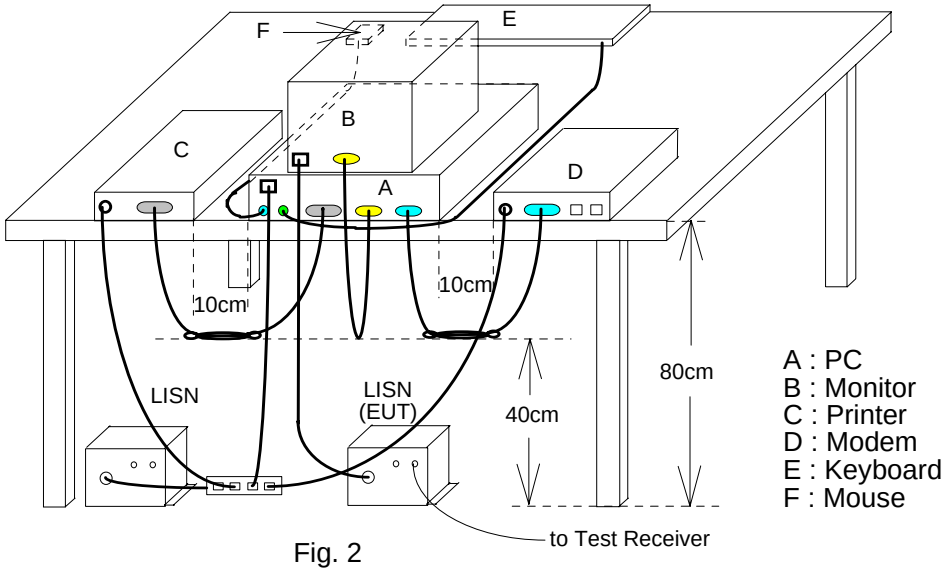


Fig. 2

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	12/31/2003	12/30/2004
EMI Test Receiver	R&S	ESCS30	828985/004	01/15/2004	01/14/2005
LISN	Rolf-Heine	NNB-2/16Z	99012	12/30/2003	12/29/2004
LISN	Rolf-Heine	NNB-2/16Z	99013	11/06/2004	11/05/2005

5.4 Measurement Result:

N/A

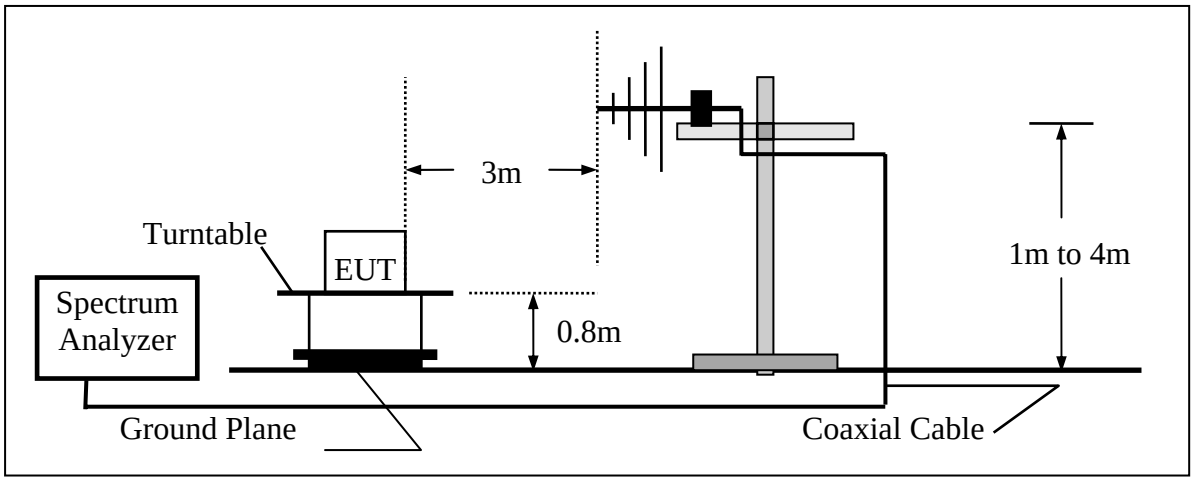
6. Radiated Emission Test

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	R&S	FSP 40	100034	05/27/2004	05/26/2005
Spectrum Analyzer	Agilent	E7405A	US41160416	08/27/2004	08/27/2005
Loop Antenna	Messtec	FLA30	03/10086	03/06/2004	03/05/2005
Bilog Antenna	SCHWAZBECK	VULB9163	152	06/03/2004	06/02/2005
Bilog Antenna	SCHWAZBECK	VULB9160		06/03/2004	06/02/2005
Pre-Amplifier	HP	8447D	2944A09469	07/19/2004	07/18/2005
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	10/09/2004	10/08/2005
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	10/09/2004	10/08/2005
Site NSA	SGS	966 chamber	N/A	11/17/2004	11/16/2005
Site NSA	SGS	10m Open-Site	N/A	10/02/2004	10/01/2005

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

Operation Mode:	Transmitting Mode	Test Date :	Dec.08, 2004
Fundamental Frequency:	88.1 MHz	Test By:	Alex
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	58.53	-18.27	40.26	48.00	-7.74	F
176.20	V	Peak	50.47	-15.06	35.41	43.50	-8.09	H
264.30	V	Peak	44.73	-14.77	29.96	46.00	-16.04	H
352.40	V	Peak	--			46.00		H
440.50	V	Peak	--			46.00		H
528.60	V	Peak	--			46.00		H
616.70	V	Peak	--			46.00		H
704.80	V	Peak	--			46.00		H
101.78	V	Peak	50.13	-17.07	33.06	43.50	-10.44	H
201.69	V	Peak	46.04	-16.63	29.41	43.50	-14.09	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

Measurement Result

Operation Mode: Transmitting Mode
Fundamental Frequency: 88.1 MHz
Temperature : 25 ℃
Humidity : 65 %

Test Date : Dec.08, 2004
Test By: Alex
Pol: Horizontal

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	62.34	-18.27	44.07	48.00	-3.93	F
176.20	H	Peak	54.52	-15.06	39.46	43.50	-4.04	H
264.30	H	Peak	47.14	-14.77	32.37	46.00	-13.63	H
352.40	H	Peak	39.77	-11.91	27.86	46.00	-18.14	H
440.50	H	Peak	--			46.00		H
528.60	H	Peak	--			46.00		H
616.70	H	Peak	--			46.00		H
704.80	H	Peak	--			46.00		H
101.78	H	Peak	49.15	-17.07	32.08	43.50	-11.42	H
201.69	H	Peak	48.70	-16.63	32.07	43.50	-11.43	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.

Measurement Result

Operation Mode:	Transmitting Mode	Test Date :	Dec.08, 2004
Fundamental Frequency:	98.1 MHz	Test By:	Alex
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	62.26	-17.45	44.81	48.00	-3.19	F
196.20	V	QP	56.22	-16.44	39.78	43.50	-3.72	H
294.30	V	Peak	49.79	-13.62	36.17	46.00	-9.83	H
392.40	V	Peak	--			46.00		H
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

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

Measurement Result

Operation Mode:	Transmitting Mode	Test Date :	Dec.08, 2004
Fundamental Frequency:	98.1 MHz	Test By:	Alex
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	63.86	-17.45	46.41	48.00	-1.59	F
196.20	H	QP	55.30	-16.44	38.86	43.50	-4.64	H
294.30	H	Peak	54.86	-13.62	41.24	46.00	-4.76	H
392.40	H	Peak	37.85	-10.79	27.06	46.00	-18.94	H
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

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 :	Dec.08, 2004
Fundamental Frequency:	107.9 MHz	Test By:	Alex
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	62.63	-16.65	45.98	48.00	-2.02	F
215.80	V	Peak	51.96	-16.31	35.65	43.50	-7.85	H
323.70	V	Peak	51.79	-12.71	39.08	46.00	-6.92	H
431.60	V	Peak	--			46.00		H
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

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

Measurement Result

Operation Mode: Transmitting Mode
Fundamental Frequency: 107.9 MHz
Temperature : 25 ℃
Humidity : 65 %

Test Date : Dec.08, 2004
Test By: Alex
Pol: Horizontal

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	63.85	-16.65	47.20	48.00	-0.80	F
215.80	H	Peak	55.02	-16.31	38.71	43.50	-4.79	H
323.70	H	Peak	56.45	-12.71	43.74	46.00	-2.26	H
431.60	H	Peak	--			46.00		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
201.69	H	Peak	48.66	-16.63	32.03	43.50	-11.47	H
303.54	H	Peak	46.69	-13.29	33.40	46.00	-12.60	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.

7. 26dB 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, -26dB.

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

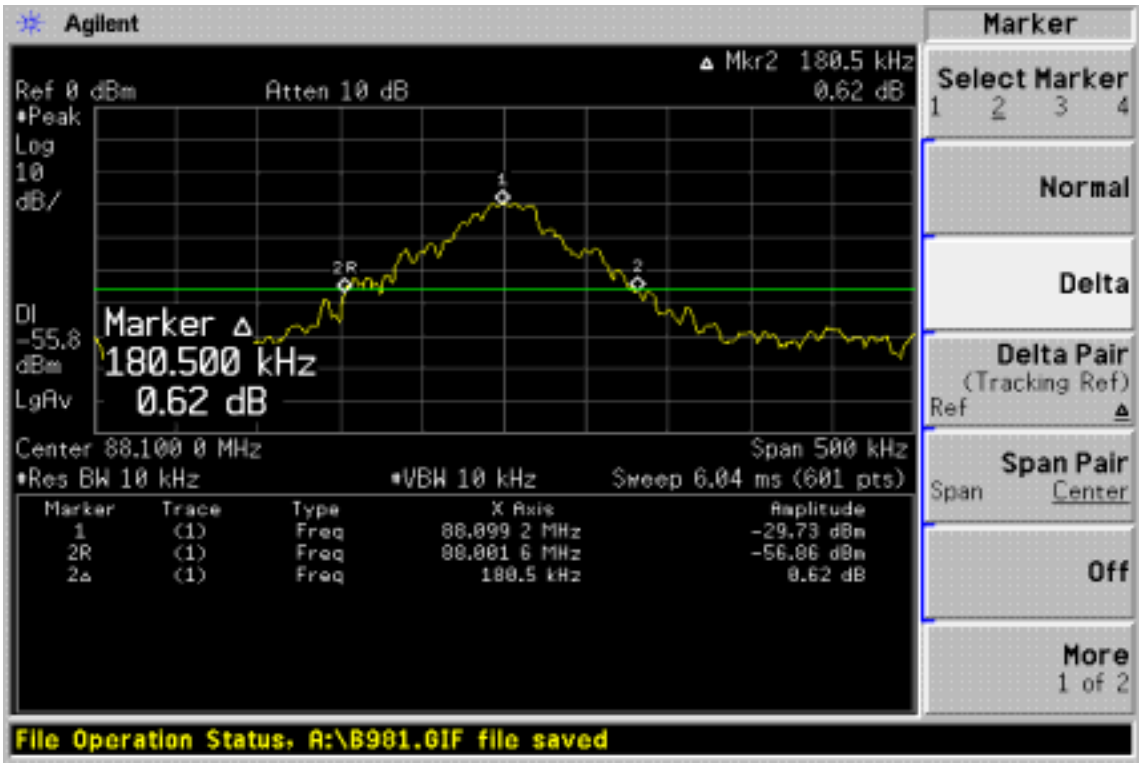
26dB bandwidth (Low)= 180.5 kHz

26dB bandwidth (Mid)= 175.3 kHz

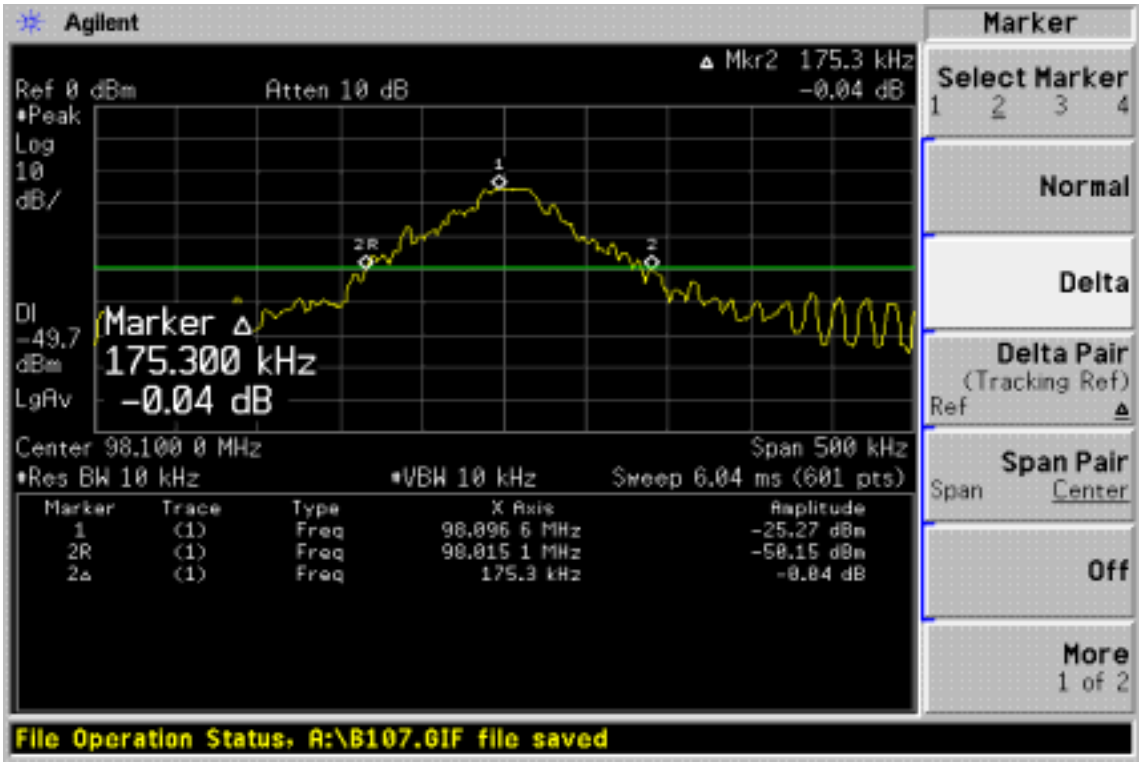
26dB bandwidth (High)= 177.7 kHz

Refer to attached data chart.

26dB Band Width Test Data (Low)



26dB Band Width Test Data (Mid)



26dB Band Width Test Data (High)