ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C REQUIREMENT AND INDUSTRY CANADA RSS 210

OF

Product Name:	**Phonak EasyCall II**
Brand Name:	**Phonak**
Model No.:	**Phonak EasyCall II**
Model Difference:	**N/A**
FCC ID:	**KWC-EC2**
IC:	**2262A-EC2**
Report No.:	**ER/2015/20007**
Issue Date:	**Feb. 26, 2015**
FCC Rule Part:	**§15.209**
IC Rule Part:	**RSS-210 issue 8 :2010, Annex 2**
FCC Prepared for	**Phonak Inc.** **4520 Weaver Parkway, Warrenville 60555, IL United States**
IC Prepared for:	**PHONAK CANADA LTD.** **80 Courtneypark Dr W, Unit 1, Mississauga, Ontario, Canada**
Prepared by	**SGS Taiwan Ltd.** **Electronics & Communication Laboratory** **No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803**

Testing Laboratory
0513

VERIFICATION OF COMPLIANCE

FCC Applicant	Phonak Inc. 4520 Weaver Parkway, Warrenville 60555, IL United States
IC Applicant:	PHONAK CANADA LTD. 80 Courtneypark Dr W, Unit 1, Mississauga, Ontario, Canada
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Brand Name:	Phonak
Model No.:	Phonak EasyCall II
Model Difference:	N/A
FCC ID:	KWC-EC2
IC:	2262A-EC2
File Number:	ER/2015/20007
Date of test:	Feb. 02, 2015 ~ Feb. 26, 2015
Date of EUT Received:	Feb. 26, 2015

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Electronics & Communication Laboratory The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4:2014 & ANSI C63.10:2013 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits.

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

Test By:	Marcus Tseng	***Date:***	Feb. 26, 2015
	Marcus Tseng / Engineer		
Prepared By:	Karen Huang	***Date:***	Feb. 26, 2015
	Karen Huang / Clerk		
Approved By	Jim Chang	***Date:***	Feb. 26, 2015
	Jim Chang / Asst. Manager		

Version

Version No.	Date	Description
00	Feb. 26, 2015	Initial creation of document

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1. GENERAL INFORMATION

1.1. Product Description

Product Name:	Phonak EasyCall II	
Brand Name:	Phonak	
Model No.:	Phonak EasyCall II	
Model Difference:	N/A	
Hardware Version:	V1	
Software Version:	R1	
Data Cable (USB):	Model No.: N/A, Supplier: N/A	
Power Supply	3.7Vdc from Rechargeable Li-Ion Battery or 5Vdc from USB port	
	Battery:	Model No.: LP-402933-1S-2, Supplier: BAK ELECTRONICS (SHENZHEN) CO., LTD

Operating Frequency	10.6MHz
Transmit Power	< 69.54dBuV/m at 3m.
Number of Channels	1
Modulation Type:	8-DPSK (DQPSK)
Antenna:	coil antenna
Type of Emission:	568KGXD

The signal is very weak and not able to be capture at all

1.2. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for **FCC ID: KWC-EC2** filing to comply with Section 15.209 of the FCC Part 15, Subpart C Rules. And **IC: 2262A-EC2** filing to comply with Industry Canada RSS-210 issue 8: 2010 Annex 2

1.3. Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 (2009). 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. Electronics & Communication Laboratory No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan which are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2009. FCC Registration Number: 990257.The address of SGS Taiwan Ltd.
Electronics & Communication Laboratory No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803, Canada Registration Number: 4620A-5

IC Registration Number: 4620A-6.

1.5. Special Accessories

There are no special accessories used while test was conducted.

1.6. Equipment Modifications

There was no modification incorporated into the EUT.

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

An engineering test mode (software/firmware) that applicant provided was utilized to manipulate the EUT into transmit, selection of the test channel, and modulation scheme.

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 general criterion in Section 7.1 of ANSI C63.4:2009. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz, and the measurement procedure 7.3 in ANSI 63.4:2009 & 6.2.2 is followed to carry out the test. The CISPR Quasi-Peak and Average detector mode is employed according to §15.107

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 of ANSI C63.4:2009, & Section 6.3, 6.4, 6.5.

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) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

(b) In the emission table above, the tighter limit applies at the band edges.

(c) The level of any unwanted emissions from an intentional radiator operating under these general provisions shall not exceed the level of the fundamental emission. For intentional radiators which operate under the provisions of other Sections within this Part and which are required to reduce their nwanted emissions to the limits specified in this table, the limits in this table are based on the frequency of the unwanted emission and not the fundamental frequency. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.

The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

Frequency (MHz)	Field strength μV/m	Distance (m)
0.009-0.490	2400/F(KHz)	300
0.490-1.705	24000/F(KHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

2.5. Configuration of Tested System

Fig. 2-1 Configuration of Tested System

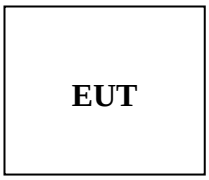


Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/ Type No.	Series No.	Data Cable	Power Cord
1.	N/A					

3. Summary of Test Results

FCC / IC Rules	Description Of Test	Result
§15.207	Conducted Emission	N/A
§15.209 (a) / RSS-210 Issue 8	Fieldstrength of harmonics and spurious	Compliant
§15.35 (c) / RSS-GEN Issue 2 Section 4.5	Timing of the transmitter (Duty cycle correction factor)	Compliant
§ 15.209 / RSS-210 Issue 8	Bandwidth of the modulated carrier	Compliant

4. Description of test modes

The EUT has been tested under continuous operating condition. The Frequency 10.6MHz was chosen for testing.

5. Conducted Emissions Test

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)

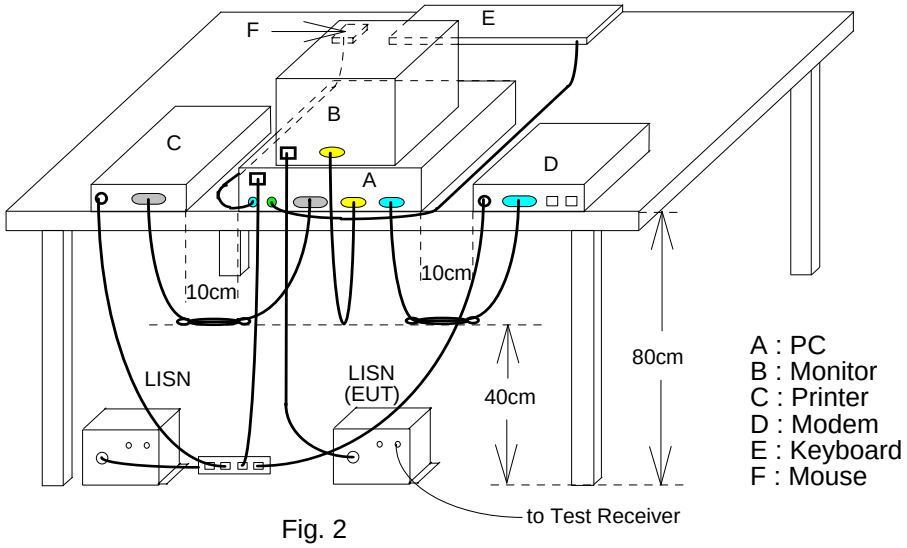


Fig. 2

5.3. Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
EMI Test Receiver	R&S	ESCI7	100760	05/26/2014	05/25/2015
LISN	Rolf-Heine	NNB-2/16Z	99012	03/26/2014	03/25/2015
LISN	FCC	FCC-LISN-50/250-25-2-01	04034	03/19/2014	03/18/2015
Coaxial Cables	N/A	WK CE Cable	N/A	11/26/2014	11/25/2015

5.4. Measurement Result:

N/A, the EUT is powered by DC power supply.

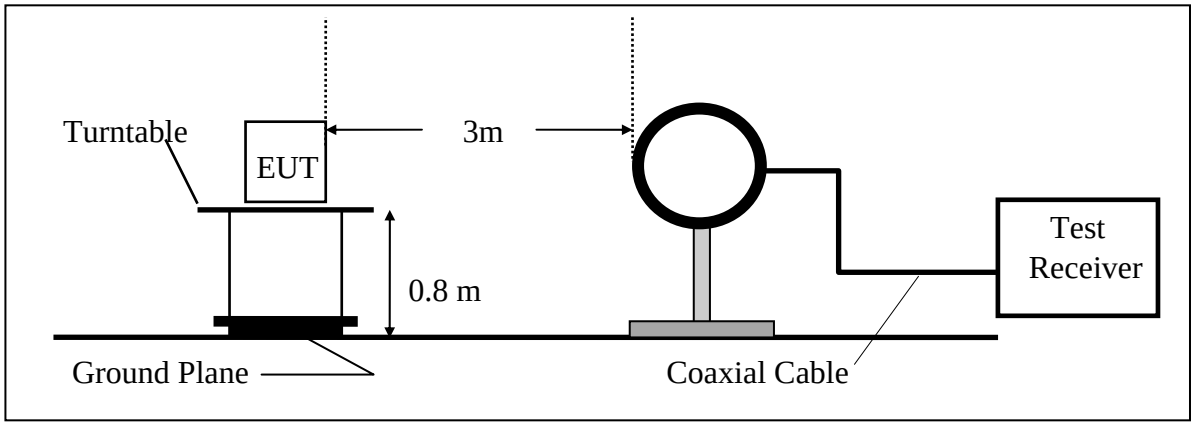
6. Radiated Emission Test

6.1. Measurement Procedure

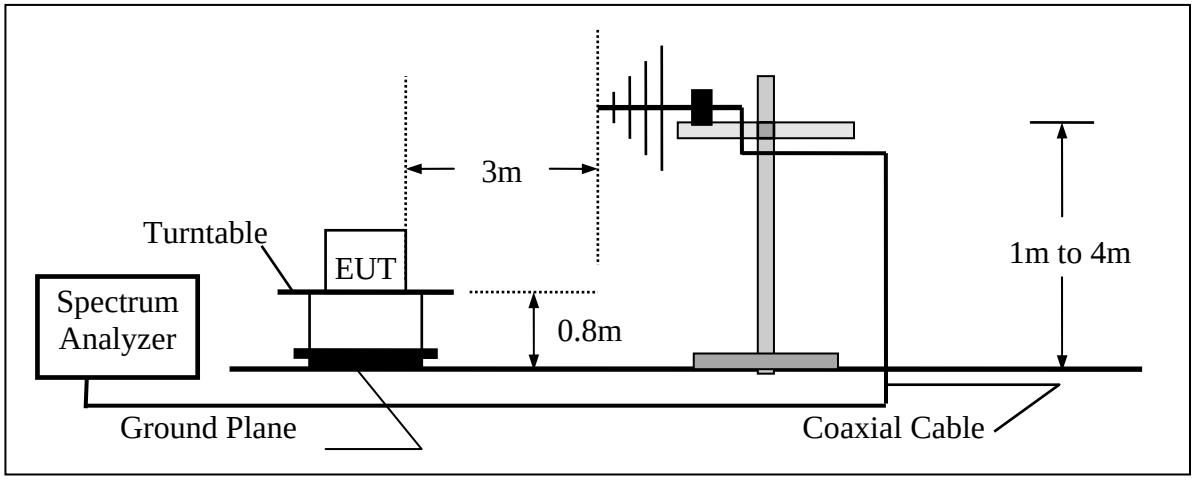
1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above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

6.2. Test SET-UP (Block Diagram of Configuration)

(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) 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.**
EMI Test Receiver	R&S	ESCI7	100760	05/26/2014	05/25/2015
Spectrum Analyzer	Agilent	E4446A	MY51100003	05/19/2014	05/18/2015
EXA Spectrum Analyzer	Agilent	N9010A	MY50420195	12/22/2014	12/21/2015
Spectrum Analyzer	R&S	FSV-30	101398	10/07/2014	10/06/2015
Loop Antenna	ETS.LINDGREN	6502	00148045	07/03/2014	07/02/2015
Bilog Antenna	SCHWAZBECK	VULB9168	378	12/23/2014	12/22/2015
Horn antenna	ETS.LINDGREN	3117	123995	05/19/2014	05/18/2015
Horn Antenna	Schwarzbeck	BBHA9170	184	12/25/2014	12/24/2015
Pre-Amplifier	Agilent	8447D	2944A07676	01/02/2015	01/01/2016
Pre-Amplifier	Agilent	8449B	3008A00578	01/02/2015	01/01/2016
Pre-Amplifier	EMC Instruments Corp.	EMC184045	980135	01/02/2015	01/01/2016
Filter 2400-2483.5 MHz	EWT	EWT-14-0166	M2	01/02/2015	01/01/2016
Attenuator	Mini-Circuit	BW-S10W2+	004	01/02/2015	01/01/2016
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	966_Rx	9	01/02/2015	01/01/2016
3m Site NSA	SGS	966 chamber	N/A	07/15/2014	07/14/2015

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 Band	:	Test Date	:2015-02-06
Fundamental Frequency	:10.6MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:TX	Engineer	:Tin
EUT Pol.	:E2 PLANE	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV / m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV / m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV / m	dBμV / m	dB
10.42	S	Peak	20.59	11.31	31.90	69.54	-37.64
10.50	F	Peak	25.73	11.31	37.04	69.54	-32.50
10.74	S	Peak	23.44	11.31	34.75	69.54	-34.79
36.79	S	Peak	47.12	-10.03	37.09	40.00	-2.91
55.22	S	Peak	38.92	-9.80	29.12	40.00	-10.88
160.95	S	Peak	40.37	-8.83	31.54	43.50	-11.96
228.85	S	Peak	37.24	-10.99	26.25	46.00	-19.75
866.14	S	Peak	26.51	2.46	28.97	46.00	-17.03
960.23	S	Peak	26.88	3.66	30.54	54.00	-23.46

Operation Band	:	Test Date	:2015-02-06
Fundamental Frequency	:10.6MHz	Temp./Humi.	:21 deg_C / 61 RH
Operation Mode	:TX	Engineer	:Tin
EUT Pol.	:E2 PLANE	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV / m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV / m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV / m	dBμV / m	dB
10.45	S	Peak	21.46	11.31	32.77	69.54	-36.77
10.50	F	Peak	24.95	11.31	36.26	69.54	-33.28
10.80	S	Peak	19.19	11.31	30.50	69.54	-39.04
35.82	S	Peak	38.75	-10.11	28.64	40.00	-11.36
46.49	S	Peak	29.37	-9.35	20.02	40.00	-19.98
112.45	S	Peak	29.87	-11.97	17.90	43.50	-25.60
566.41	S	Peak	28.53	-3.40	25.13	46.00	-20.87
772.05	S	Peak	25.69	0.86	26.55	46.00	-19.45
989.33	S	Peak	27.01	3.41	30.42	54.00	-23.58

7. Timing of the transmitter (Duty cycle correction factor)

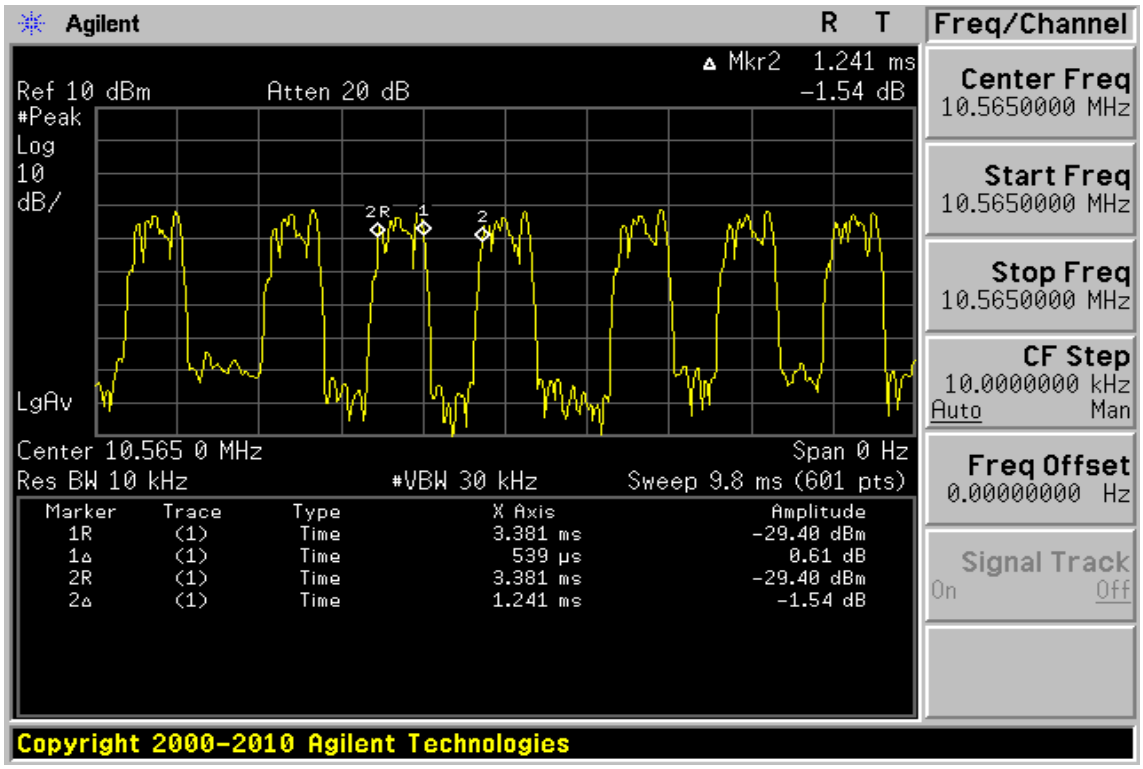
7.1. Limits:

FCC CFR Part SUBCLAUSE § 15.35 (c) Unless otherwise specified, e.g. Section 15.255(b), when the radiated emission limits are expressed in terms of the average value of the emission, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value. The exact method of calculating the average field strength shall be submitted with any application for certification or shall be retained in the measurement data file for equipment subject to notification or verification.

IC RSS-GEN Issue 3 Section 4.5 When the field strength (or envelope power) is not constant or it is in pulses, and an average detector is specified to be used, the value of field strength or power shall be determined by averaging over one complete pulse train, including blanking intervals within the pulse train, as long as the pulse train does not exceed 0.1 seconds. In cases where the pulse train exceeds 0.1 second, the average value of field strength or output power shall be determined during a 0.1 second interval during which the field strength or power is at its maximum value.
The exact method of calculating the average field strength shall be submitted with any application for certification or shall be retained in the measurement data file for equipment subject to notification or verification.

7.2. Measurement Result

Refer to next page for measurement chart.



8. Bandwidth of the modulated carrier

8.1. Standard Applicable:

For 99% Bandwidth

RSS-Gen §4.6.1, the transmitter shall be operated at its maximum carrier power measured under normal test conditions. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts. The resolution bandwidth shall be set to as close to 1% of the selected span as is possible without being below 1%. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used since a peak or, peak hold, may produce a wider bandwidth than actual.

The trace data points are recovered and are directly summed in linear terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points. This frequency is recorded.

The span between the two recorded frequencies is the occupied bandwidth.

8.2. Measurement Equipment Used:

Refer to section 7.2 for details.

8.3. Test Set-up:

Refer to section 7.3 for details.

8.4. Measurement Procedure:

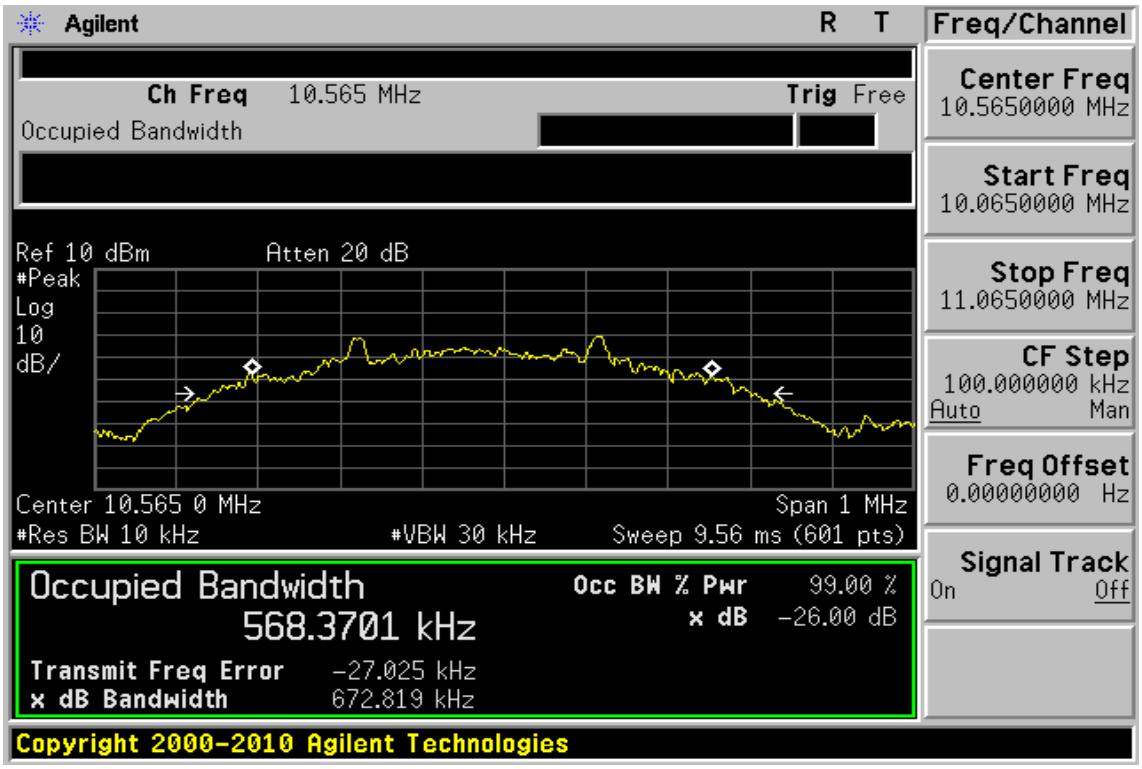
1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW=10 kHz (1 % of 20 dB Bandwidth.), VBW = 30 kHz, Span= 3MHz, Sweep=auto, Detector = Peak, and Max hold for 20dB Bandwidth test.
4. Mark the peak frequency and –20dB (upper and lower) frequency and Turn on the 99% bandwidth function, max reading.
5. Repeat above procedure for 99% Bandwidth, but set RBW to 1% of the span, and detector = peak.
6. Repeat above procedures until all test default channel is completed

8.5. Measurement Result:

99% Bandwidth:

Frequency MHz	99%Bandwidth (MHz)
10.6	**0.568**

99% Band Width Test Data



~ End of Report ~