

***Electromagnetic Emissions Test Report
and
Application for Grant of Equipment Authorization
pursuant to
Industry Canada RSS-Gen Issue 2 / RSS 210 Issue 7
FCC Part 15 Subpart C
on the
Griffin Technology
Transmitter
Model: iTrip Nano Adaptor***

UPN: 6384A-9690NANO
FCC ID: PAV9690

GRANTEE: Griffin Technology
1619 Elm Hill Pike, Suite C
Nashville, TN 37210

TEST SITE: Elliott Laboratories, Inc.
41039 Boyce Road
Fremont, CA 94538

REPORT DATE: July 2, 2007

FINAL TEST DATE: June 18 and June 28, 2007

AUTHORIZED SIGNATORY:



David W. Bare
CTO



2016-01

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REVISION HISTORY

Revision #	Date	Comments	Modified By
1	August 17, 2007	Initial Release	David Guidotti

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SCOPE

An electromagnetic emissions test has been performed on the Griffin Technology model iTrip Nano Adaptor pursuant to the following rules:

Industry Canada RSS-Gen Issue 2
RSS 210 Issue 7 “Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment”
FCC Part 15 Subpart C

Conducted and radiated emissions data has been collected, reduced, and analyzed within this report in accordance with measurement guidelines set forth in the following reference standards and as outlined in Elliott Laboratories test procedures:

ANSI C63.4:2003

The intentional radiator above has been tested in a simulated typical installation to demonstrate compliance with the relevant Industry Canada performance and procedural standards.

Final system data was gathered in a mode that tended to maximize emissions by varying orientation of EUT, orientation of power and I/O cabling, antenna search height, and antenna polarization.

Every practical effort was made to perform an impartial test using appropriate test equipment of known calibration. All pertinent factors have been applied to reach the determination of compliance.

The test results recorded herein are based on a single type test of the Griffin Technology model iTrip Nano Adaptor and therefore apply only to the tested sample. The sample was selected and prepared by Jeff Altheide of Griffin Technology.

OBJECTIVE

The primary objective of the manufacturer is compliance with the regulations outlined in the previous section.

Prior to marketing in the USA, all unlicensed transmitters and transceivers require certification. Receive-only devices operating between 30 MHz and 960 MHz are subject to either certification or a manufacturer's declaration of conformity, with all other receive-only devices exempt from the technical requirements.

Prior to marketing in Canada, Class I transmitters, receivers and transceivers require certification. Class II devices are required to meet the appropriate technical requirements but are exempt from certification requirements.

Certification is a procedure where the manufacturer submits test data and technical information to a certification body and receives a certificate or grant of equipment authorization upon successful completion of the certification body's review of the submitted documents. Once the equipment authorization has been obtained, the label indicating compliance must be attached to all identical units, which are subsequently manufactured.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product which may result in increased emissions should be checked to ensure compliance has been maintained (i.e., printed circuit board layout changes, different line filter, different power supply, harnessing or I/O cable changes, etc.).

STATEMENT OF COMPLIANCE

The tested sample of Griffin Technology model iTrip Nano Adaptor complied with the requirements of the following regulations:

Industry Canada RSS-Gen Issue 2
RSS 210 Issue 7 "Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment"
FCC Part 15 Subpart C

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product which may result in increased emissions should be checked to ensure compliance has been maintained (i.e., printed circuit board layout changes, different line filter, different power supply, harnessing or I/O cable changes, etc.).

TEST RESULTS SUMMARY**DEVICES OPERATING UNDER THE GENERAL LIMITS**

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result
15.239	RSS 210 A2.8	Transmitter Fundamental Signal Emissions, 88 - 108 MHz	33.0dB μ V/m (44.7 μ V/m) @ 88.095MHz (-15.0dB)	Refer to table in limits section	Complies
15.239	RSS 210 A2.8	Transmitter Radiated Spurious Emissions, 30 - 1000 MHz	34.9dB μ V/m (55.6 μ V/m) @ 323.614MHz (- 11.1dB)	Refer to table in limits section	Complies
15.239	-	20-dB Bandwidth	63 kHz	Must be < 200kHz	Complies
-	RSS-210 A2.8 RSS GEN 4.4.1	99% Bandwidth	85 kHz	Must be < 200kHz	Complies

GENERAL REQUIREMENTS APPLICABLE TO ALL BANDS

FCC Rule Part	RSS Rule part	Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.203	-	RF Connector	Permanently attached		Complies
15.109	RSS GEN 7.2.3 Table 1	Receiver spurious emissions	Not applicable device is only Tx		N/A
15.207	RSS GEN Table 2	AC Conducted Emissions	Not applicable unit is DC operated	Refer to standard	N/A
	RSS 102	RF Exposure Requirements	Not Applicable – power is less than 200 mW	Refer to OET 65, FCC Part 1 and RSS 102	N/A

Note: The EUT does not allow tuning outside of the 88.1 to 107.9 MHz range. Attempts to tune outside of this band results in the device looping from the 107.9 MHz to 88.1 MHz and from 88.1 MHz to 107.9 MHz.

MEASUREMENT UNCERTAINTIES

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level and were calculated in accordance with UKAS document LAB 34.

Measurement Type	Frequency Range (MHz)	Calculated Uncertainty (dB)
Conducted Emissions	0.15 to 30	\pm 2.4
Radiated Emissions	0.015 to 30	\pm 3.0
Radiated Emissions	30 to 1000	\pm 3.6
Radiated Emissions	1000 to 40000	\pm 6.0

EQUIPMENT UNDER TEST (EUT) DETAILS**GENERAL**

The Griffin Technology model iTrip Nano Adaptor is a FM transmitter that is designed to transmit audio signals from an iPod to an FM receiver. The EUT would typically be connected to an Apple iPod NANO. Therefore, the EUT was tested with an iPod NANO and treated as hand held. The EUT is powered from the iPod.

The sample was received on June 7, 2007 and tested on June 18 and June 28, 2007. The EUT consisted of the following component(s):

Manufacturer	Model	Description	Serial Number	FCC ID
Griffin	iTrip Nano Adaptor	FM Transmitter	Sample #2	PAV9690

ANTENNA SYSTEM

The antenna system used with the Griffin Technology model iTrip Nano Adaptor is integral to the device.

ENCLOSURE

The EUT enclosure is primarily constructed of plastic. It measures approximately 14.3 mm wide by 10 mm deep by 40 mm high.

MODIFICATIONS

The EUT did not require modifications during testing in order to comply with emissions specifications.

SUPPORT EQUIPMENT

The following equipment was used as local support equipment for emissions testing:

Manufacturer	Model	Description	Serial Number	FCC ID
Apple	iPod NANO	MP3 Player	-	N/A

No remote support equipment was used during emissions testing.

EUT INTERFACE PORTS

The I/O cabling configuration during emissions testing was as follows:

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
-	-	-	-	-

EUT OPERATION

During emissions testing the EUT was configured to continuously transmit a typical music file from the iPod with the iPod set to maximum volume). The EUT was configured to transmit at the specified channel.

TEST SITE

GENERAL INFORMATION

Final test measurements were taken on June 18 and June 28, 2007 at the Elliott Laboratories Anechoic Chambers 4 & 5 located at 41039 Boyce Road, Fremont, California. Pursuant to section 2.948 of the FCC's Rules and section 3.3 of RSP-100, construction, calibration, and equipment data has been filed with the Commission.

ANSI C63.4:2003 recommends that ambient noise at the test site be at least 6 dB below the allowable limits. Ambient levels are below this requirement with the exception of predictable local TV, radio, and mobile communications traffic. The test site contains separate areas for radiated and conducted emissions testing. Considerable engineering effort has been expended to ensure that the facilities conform to all pertinent requirements of ANSI C63.4:2003.

RADIATED EMISSIONS CONSIDERATIONS

The FCC has determined that radiation measurements made in a shielded enclosure are not suitable for determining levels of radiated emissions. Radiated measurements are performed in an open field environment or in a semi-anechoic chamber. The test sites are maintained free of conductive objects within the CISPR defined elliptical area incorporated in ANSI C63.4:2003 guidelines and meet the Normalized Site Attenuation (NSA) requirements of ANSI C63.4:2003.

MEASUREMENT INSTRUMENTATION**RECEIVER SYSTEM**

An EMI receiver as specified in CISPR 16-1 is used for emissions measurements. The receivers used can measure over the frequency range of 9 kHz up to 2000 MHz. These receivers allow both ease of measurement and high accuracy to be achieved. The receivers have Peak, Average, and CISPR (Quasi-peak) detectors built into their design so no external adapters are necessary. The receiver automatically sets the required bandwidth for the CISPR detector used during measurements. If the repetition frequency of the signal being measured is below 20Hz, peak measurements are made in lieu of Quasi-Peak measurements.

For measurements above the frequency range of the receivers, a spectrum analyzer is utilized because it provides visibility of the entire spectrum along with the precision and versatility required to support engineering analysis. Average measurements above 1000MHz are performed on the spectrum analyzer using the linear-average method with a resolution bandwidth of 1 MHz and a video bandwidth of 10 Hz, unless the signal is pulsed in which case the average (or video) bandwidth of the measuring instrument is reduced to onset of pulse desensitization and then increased.

INSTRUMENT CONTROL COMPUTER

The receivers utilize either a Rohde & Schwarz EZM Spectrum Monitor/Controller or contain an internal Spectrum Monitor/Controller to view and convert the receiver measurements to the field strength at an antenna or voltage developed at the LISN measurement port, which is then compared directly with the appropriate specification limit. This provides faster, more accurate readings by performing the conversions described under Sample Calculations within the Test Procedures section of this report. Results are printed in a graphic and/or tabular format, as appropriate. A personal computer is used to record all measurements made with the receivers.

The Spectrum Monitor provides a visual display of the signal being measured. In addition, the controller or a personal computer run automated data collection programs which control the receivers. This provides added accuracy since all site correction factors, such as cable loss and antenna factors are added automatically.

FILTERS/ATTENUATORS

External filters and precision attenuators are often connected between the receiving antenna or LISN and the receiver. This eliminates saturation effects and non-linear operation due to high amplitude transient events.

ANTENNAS

A loop antenna is used below 30 MHz. For the measurement range 30 MHz to 1000 MHz either a combination of a biconical antenna and a log periodic or a bi-log antenna is used. Above 1000 MHz, horn antennas are used. The antenna calibration factors to convert the received voltage to electric field strength are included with appropriate cable loss and amplifier gain factors to determine an overall site factor, which is then programmed into the test receivers or incorporated into the test software.

ANTENNA MAST AND EQUIPMENT TURNTABLE

The antennas used to measure the radiated electric field strength are mounted on a non-conductive antenna mast equipped with a motor-drive to vary the antenna height. Measurements below 30 MHz are made with the loop antenna at a fixed height of 1m above the ground plane.

ANSI C63.4:2003 specifies that the test height above ground for table mounted devices shall be 80 centimeters. Floor mounted equipment shall be placed on the ground plane if the device is normally used on a conductive floor or separated from the ground plane by insulating material from 3 to 12 mm if the device is normally used on a non-conductive floor. During radiated measurements, the EUT is positioned on a motorized turntable in conformance with this requirement.

INSTRUMENT CALIBRATION

All test equipment is regularly checked to ensure that performance is maintained in accordance with the manufacturer's specifications. All antennas are calibrated at regular intervals with respect to tuned half-wave dipoles. An exhibit of this report contains the list of test equipment used and calibration information.

TEST PROCEDURES

EUT AND CABLE PLACEMENT

The regulations require that interconnecting cables be connected to the available ports of the unit and that the placement of the unit and the attached cables simulate the worst case orientation that can be expected from a typical installation, so far as practicable. To this end, the position of the unit and associated cabling is varied within the guidelines of ANSI C63.4:2003, and the worst-case orientation is used for final measurements.

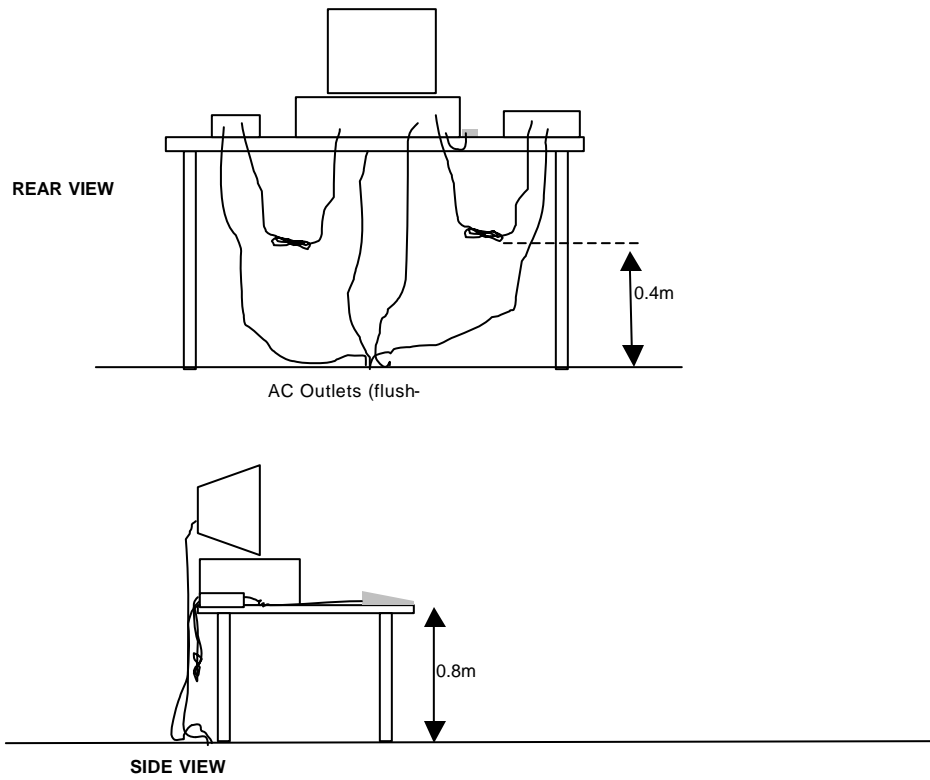
RADIATED EMISSIONS

A preliminary scan of the radiated emissions is performed in which all significant EUT frequencies are identified with the system in a nominal configuration. At least two scans are performed, one scan for each antenna polarization (horizontal and vertical; loop parallel and perpendicular to the EUT). During the preliminary scans, the EUT is rotated through 360°, the antenna height is varied (for measurements above 30 MHz) and cable positions are varied to determine the highest emission relative to the limit. Preliminary scans may be performed in a fully anechoic chamber for the purposes of identifying the frequencies of the highest emissions from the EUT.

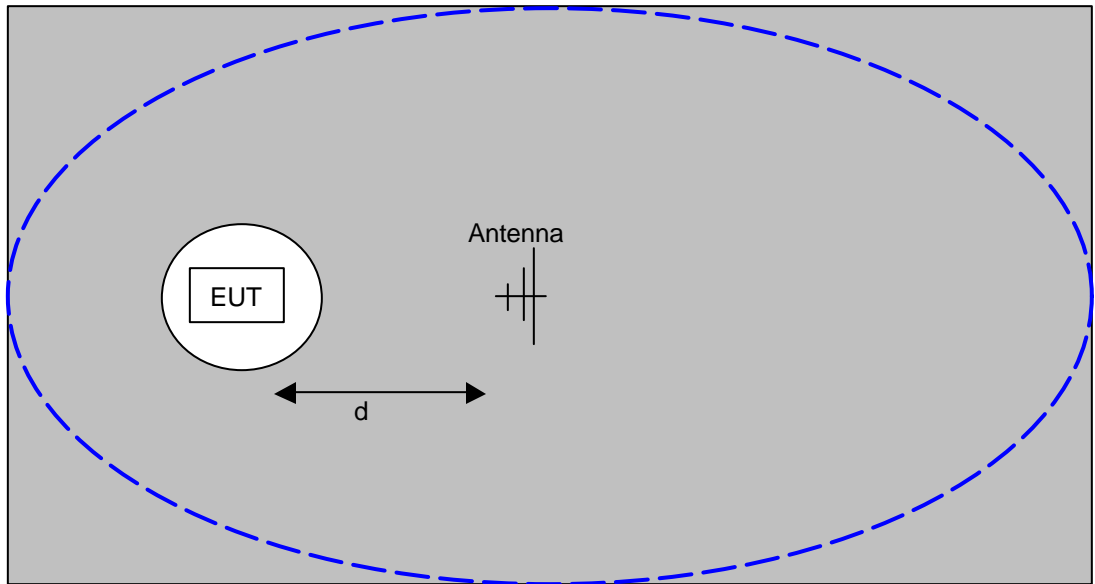
A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions. Other methods used during the preliminary scan for EUT emissions involve scanning with near field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.

Final maximization is a phase in which the highest amplitude emissions identified in the spectral search are viewed while the EUT azimuth angle is varied from 0 to 360 degrees relative to the receiving antenna. The azimuth, which results in the highest emission is then maintained while varying the antenna height from one to four meters (for measurements above 30 MHz, measurements below 30 MHz are made with the loop antenna at a fixed height of 1m). The result is the identification of the highest amplitude for each of the highest peaks. Each recorded level is corrected in the receiver using appropriate factors for cables, connectors, antennas, and preamplifier gain.

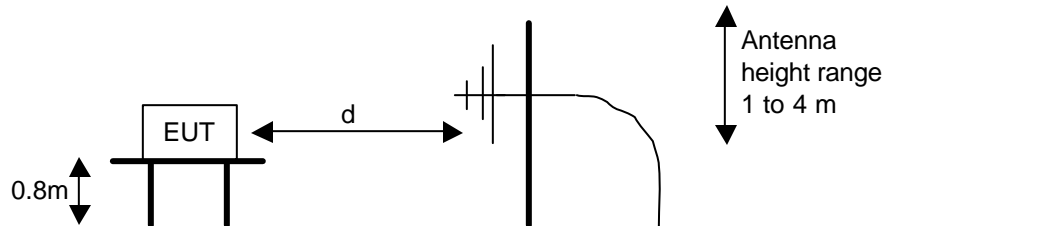
When testing above 18 GHz, the receive antenna is located at 1meter from the EUT and the antenna height is restricted to a maximum of 2.5 meters.



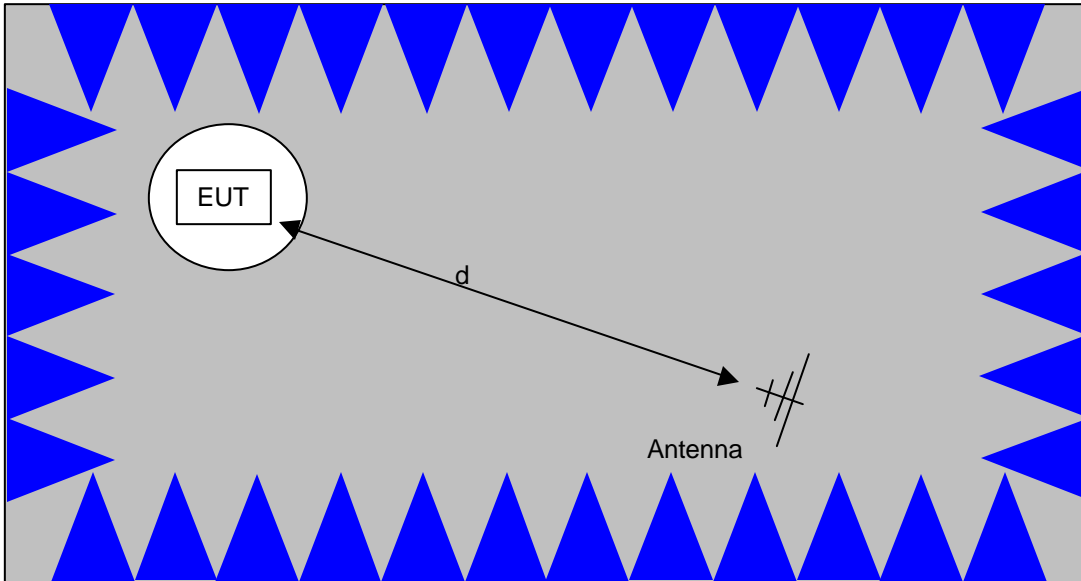
Typical Test Configuration for Radiated Field Strength Measurements



The ground plane extends beyond the ellipse defined in CISPR 16 / CISPR 22 / ANSI C63.4 and is large enough to accommodate test distances (d) of 3m and 10m. Refer to the test data tables for the actual measurement distance.

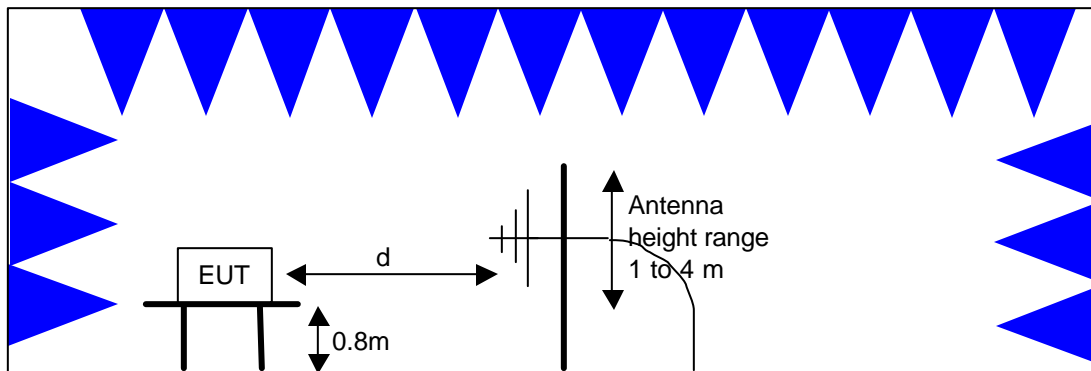


Test Configuration for Radiated Field Strength Measurements
OATS- Plan and Side Views



The anechoic materials on the walls and ceiling ensure compliance with the normalized site attenuation requirements of CISPR 16 / CISPR 22 / ANSI C63.4 for an alternate test site at the measurement distances used.

Floor-standing equipment is placed on the floor with insulating supports between the unit and the ground plane.



Test Configuration for Radiated Field Strength Measurements
Semi-Anechoic Chamber, Plan and Side Views

BANDWIDTH MEASUREMENTS

The 6dB, 20dB and/or 26dB signal bandwidth is measured in using the bandwidths recommended by ANSI C63.4. When required, the 99% bandwidth is measured using the methods detailed in RSS GEN.

SPECIFICATION LIMITS AND SAMPLE CALCULATIONS

The limits for conducted emissions are given in units of microvolts, and the limits for radiated emissions are given in units of microvolts per meter at a specified test distance. Data is measured in the logarithmic form of decibels relative to one microvolt, or dB microvolts (dBuV). For radiated emissions, the measured data is converted to the field strength at the antenna in dB microvolts per meter (dBuV/m). The results are then converted to the linear forms of uV and uV/m for comparison to published specifications.

For reference, converting the specification limits from linear to decibel form is accomplished by taking the base ten logarithm, then multiplying by 20. These limits in both linear and logarithmic form are as follows:

GENERAL TRANSMITTER RADIATED EMISSIONS SPECIFICATION LIMITS

The table below shows the limits for the spurious emissions from transmitters that fall in restricted bands¹ (with the exception of transmitters operating under FCC Part 15 Subpart D and RSS 210 Annex 9), the limits for all emissions from a low power device operating under the general rules of RSS 310 (tables 3 and 4), RSS 210 (table 2) and FCC Part 15 Subpart C section 15.209.

Frequency Range (MHz)	Limit (uV/m)	Limit (dBuV/m @ 3m)
0.009-0.490	$2400/F_{\text{KHz}} @ 300\text{m}$	$67.6-20*\log_{10}(F_{\text{KHz}}) @ 300\text{m}$
0.490-1.705	$24000/F_{\text{KHz}} @ 30\text{m}$	$87.6-20*\log_{10}(F_{\text{KHz}}) @ 30\text{m}$
1.705 to 30	30 @ 30m	29.5 @ 30m
30 to 88	100 @ 3m	40 @ 3m
88 to 216	150 @ 3m	43.5 @ 3m
216 to 960	200 @ 3m	46.0 @ 3m
Above 960	500 @ 3m	54.0 @ 3m

¹ The restricted bands are detailed in FCC 15.203, RSS 210 Table 1 and RSS 310 Table 2

SAMPLE CALCULATIONS - CONDUCTED EMISSIONS

Receiver readings are compared directly to the conducted emissions specification limit (decibel form) as follows:

$$R_r - S = M$$

where:

R_r = Receiver Reading in dBuV

S = Specification Limit in dBuV

M = Margin to Specification in +/- dB

SAMPLE CALCULATIONS - RADIATED EMISSIONS

Receiver readings are compared directly to the specification limit (decibel form). The receiver internally corrects for cable loss, preamplifier gain, and antenna factor. The calculations are in the reverse direction of the actual signal flow, thus cable loss is added and the amplifier gain is subtracted. The Antenna Factor converts the voltage at the antenna coaxial connector to the field strength at the antenna elements.

A distance factor, when used for electric field measurements above 30MHz, is calculated by using the following formula:

$$F_d = 20 * \text{LOG}_{10} (D_m/D_s)$$

where:

F_d = Distance Factor in dB

D_m = Measurement Distance in meters

D_s = Specification Distance in meters

For electric field measurements below 30MHz the extrapolation factor is either determined by making measurements at multiple distances or a theoretical value is calculated using the formula:

$$F_d = 40 * \text{LOG}_{10} (D_m/D_s)$$

Measurement Distance is the distance at which the measurements were taken and Specification Distance is the distance at which the specification limits are based. The antenna factor converts the voltage at the antenna coaxial connector to the field strength at the antenna elements.

The margin of a given emission peak relative to the limit is calculated as follows:

$$R_c = R_r + F_d$$

and

$$M = R_c - L_s$$

where:

$$R_r = \text{Receiver Reading in dBuV/m}$$

$$F_d = \text{Distance Factor in dB}$$

$$R_c = \text{Corrected Reading in dBuV/m}$$

$$L_s = \text{Specification Limit in dBuV/m}$$

$$M = \text{Margin in dB Relative to Spec}$$

SAMPLE CALCULATIONS - FIELD STRENGTH TO EIRP CONVERSION

Where the radiated electric field strength is expressed in terms of the equivalent isotropic radiated power (eirp), or where a field strength measurement of output power is made in lieu of a direct measurement, the following formula is used to convert between eirp and field strength at a distance of 3m from the equipment under test:

$$E = \frac{1000000 \sqrt{30 P}}{3} \quad \text{microvolts per meter}$$

where P is the eirp (Watts)

EXHIBIT 1: Test Equipment Calibration Data

1 Page

Radiated Emissions, 30 - 1,080 MHz, 19-Apr-07

Engineer: Rafael Varelas

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1538	08-Aug-07
Com-Power Corp.	Pre Amplifier, 30-1000 MHz	PA-103	1543	04-Nov-07
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	1549	09-May-07

Radiated Emissions, 18-Jun-07

Engineer: Rafael Varelas

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	1549	23-May-07
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1756	02-Oct-07

EXHIBIT 2: Test Measurement Data

14 Pages



EMC Test Data

Client:	Griffin Technology	Job Number:	J67270
Model:	iTrip Nano Adaptor	Test-Log Number:	T67276
		Project Manager:	Sheareen
Contact:	Jeff Altheide		
Emissions Spec:	FCC 15.239, RSS 210, EN 301 357-2 V1.3.1	Class:	-
Immunity Spec:	EN 301 489-9	Environment:	-

EMC Test Data

For The

Griffin Technology

Model

iTrip Nano Adaptor

Date of Last Test: 7/17/2007



EMC Test Data

Client:	Griffin Technology	Job Number:	J67270
Model:	iTrip Nano Adaptor	Test-Log Number:	T67276
		Project Manager:	Sheareen
Contact:	Jeff Altheide		
Emissions Spec:	FCC 15.239, RSS 210, EN 301 357-2 V1.3.1	Class:	-
Immunity Spec:	EN 301 489-9	Environment:	-

EUT INFORMATION

General Description

The EUT is a FM transmitter that is designed to transmit audio signals from an iPod to an FM receiver. The EUT would typically be connected to an Apple iPod NANO. Therefore, the EUT was tested with an iPod NANO and treated as hand held. The EUT is powered from the iPod.

Equipment Under Test

Manufacturer	Model	Description	Serial Number	FCC ID
Griffin	iTrip Nano Adaptor	FM Transmitter	-	PAV

EUT Antenna (Intentional Radiators Only)

The antenna is integral to the device.

EUT Enclosure

The EUT enclosure is primarily constructed of plastic. It measures approximately 14.3 mm wide by 10 mm deep by 40 mm high.

Modification History

Mod. #	Test	Date	Modification
1			

Modifications applied are assumed to be used on subsequent tests unless otherwise stated as a further modification.



EMC Test Data

Client:	Griffin Technology	Job Number:	J67270
Model:	iTrip Nano Adaptor	T-Log Number:	T67276
		Project Manager:	Sheareen
Contact:	Jeff Altheide		
Emissions Spec:	FCC 15.239, RSS 210, EN 301 357-2 V1.3.1	Class:	-
Immunity Spec:	EN 301 489-9	Environment:	-

Test Configuration #1

Local Support Equipment

Manufacturer	Model	Description	Serial Number	FCC ID
Apple	iPod NANO	MP3 Player	-	N/A

Remote Support Equipment

Manufacturer	Model	Description	Serial Number	FCC ID
-	-	-	-	-

Cabling and Ports

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
-	-	-	-	-

EUT Operation During Emissions Tests

During emissions testing the EUT was configured to continuously transmit a typical music file from the iPod with the iPod set to maximum volume). The EUT was configured to transmit at the specified channel.



EMC Test Data

Client:	Griffin Technology	Job Number:	J67270
Model:	iTrip Nano Adaptor	T-Log Number:	T67276
		Account Manager:	Sheareen
Contact:	Jeff Altheide		
Standard:	FCC 15.239, RSS 210, EN 301 357-2 V1.3.1	Class:	N/A

FCC 15.239 Bandwidth Measurement

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 7/17/2007	Config. Used: 1
Test Engineer: Rafael Varelas	Config Change: None
Test Location: Fremont Chamber #3	EUT Voltage: Battery

General Test Configuration

The EUT was connected to the spectrum analyzer or power meter via a suitable attenuator. All measurements were made on a single chain.

All measurements have been corrected to allow for the external attenuators used.

Ambient Conditions:	Temperature:	23 °C
	Rel. Humidity:	45 %

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	99% Bandwidth	15.239	Pass	85 kHz

Modifications Made During Testing:

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

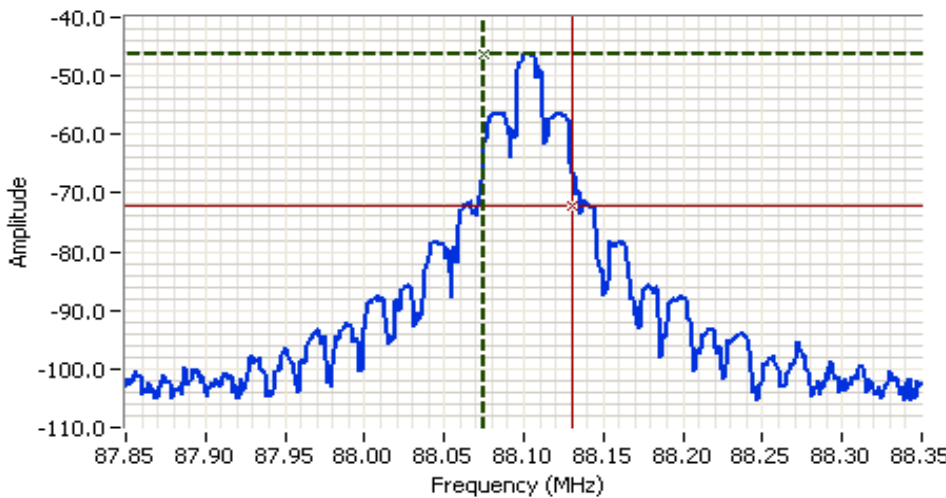
Client: Griffin Technology	Job Number: J67270
Model: iTrip Nano Adaptor	T-Log Number: T67276
	Account Manager: Sheareen
Contact: Jeff Altheide	
Standard: FCC 15.239, RSS 210, EN 301 357-2 V1.3.1	Class: N/A

Run #1: Signal Bandwidth

Audio Setting	Frequency (MHz)	Resolution Bandwidth	Bandwidth (kHz) 99%
Song	88.1	3kHz	55
Song	100.1	3kHz	82
Song	107.9	3kHz	85

Note 1: 99% bandwidth measured in accordance with RSS GEN, with RB > 1% of the span and VB > 3xRB

Note 2: Volume was set to highest when playing the song



Analyzer Settings
 Rohde&Schwarz, ESI
 CF: 88.10 MHz
 SPAN: 500 kHz
 RB 3 kHz
 VB 10 kHz
 Detector POS
 Att 10
 RL Offset 0.00
 Sweep Time 140.0ms
 Ref Lvl: -20.00DBM

Comments
 88.1 MHz
 99% power bandwidth
 55 kHz

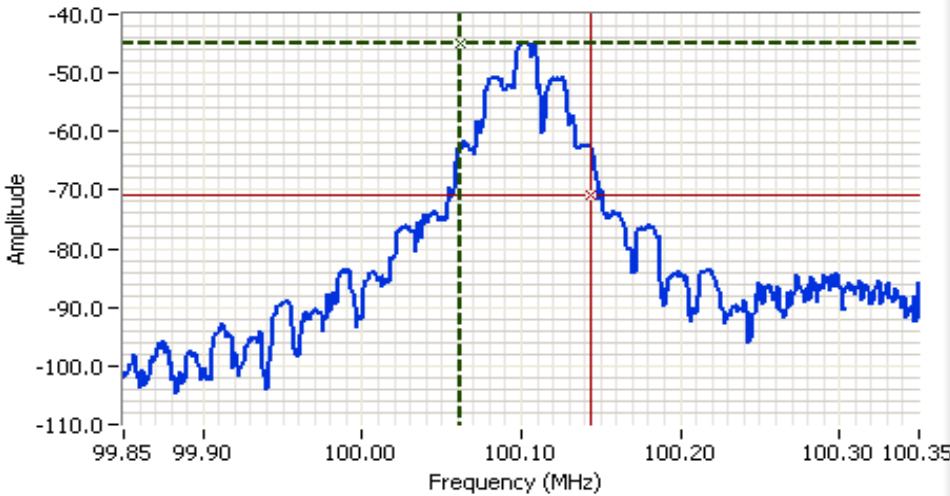
Cursor 1	88.075	-46.16	⊕ ⊖ ⊞ ⊚
Cursor 2	88.130	-72.16	⊕ ⊖ ⊞ ⊚

Delta Freq. 55 kHz
 Delta Amplitude 26.00



Client: Griffin Technology	Job Number: J67270
Model: iTrip Nano Adaptor	T-Log Number: T67276
Contact: Jeff Altheide	Account Manager: Sheareen
Standard: FCC 15.239, RSS 210, EN 301 357-2 V1.3.1	Class: N/A

Run #1: Continued

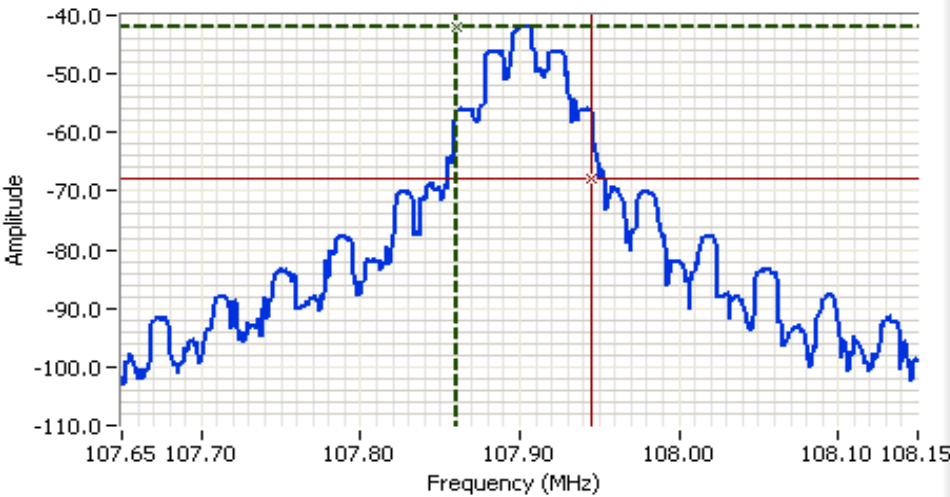


Analyzer Settings
 Rohde&Schwarz,ESI
 CF: 100.10 MHz
 SPAN:500 kHz
 RB 3 kHz
 VB 10 kHz
 Detector POS
 Att 10
 RL Offset 0.00
 Sweep Time 140.0ms
 Ref Lvl:-20.00DBM

Comments
 100.1 MHz
 99% power bandwidth
 82 kHz

Cursor 1	100.062	-44.84	↕	↔	⊞
Cursor 2	100.144	-70.84	↕	↔	⊞

Delta Freq. 82 kHz
 Delta Amplitude 26.00



Analyzer Settings
 Rohde&Schwarz,ESI
 CF: 107.90 MHz
 SPAN:500 kHz
 RB 3 kHz
 VB 10 kHz
 Detector POS
 Att 10
 RL Offset 0.00
 Sweep Time 140.0ms
 Ref Lvl:-20.00DBM

Comments
 107.9 MHz
 99% power bandwidth
 85 kHz

Cursor 1	107.860	-42.00	↕	↔	⊞
Cursor 2	107.945	-68.00	↕	↔	⊞

Delta Freq. 85 kHz
 Delta Amplitude 26.00



Client: Griffin Technology	Job Number: J67270
Model: iTrip Nano Adaptor	T-Log Number: T67276
	Account Manager: Sheareen
Contact: Jeff Altheide	
Standard: FCC 15.239, RSS 210, EN 301 357-2 V1.3.1	Class: -

FCC 15.239 (Operation within Band)

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 6/28/2007	Config. Used: -
Test Engineer: Rafael Varelas	Config Change: -
Test Location: Fremont Chamber #4	EUT Voltage: Battery

General Test Configuration

The EUT was connected to the spectrum analyzer. All measurements were made on a single chain.
 All measurements have been corrected to allow for the external attenuators used.

Ambient Conditions: Temperature: 22.8 °C
 Rel. Humidity: 42 %

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	20dB Bandwidth	15.239	Pass	63 kHz

Modifications Made During Testing:

No modifications were made to the EUT during testing

Deviations From The Standard

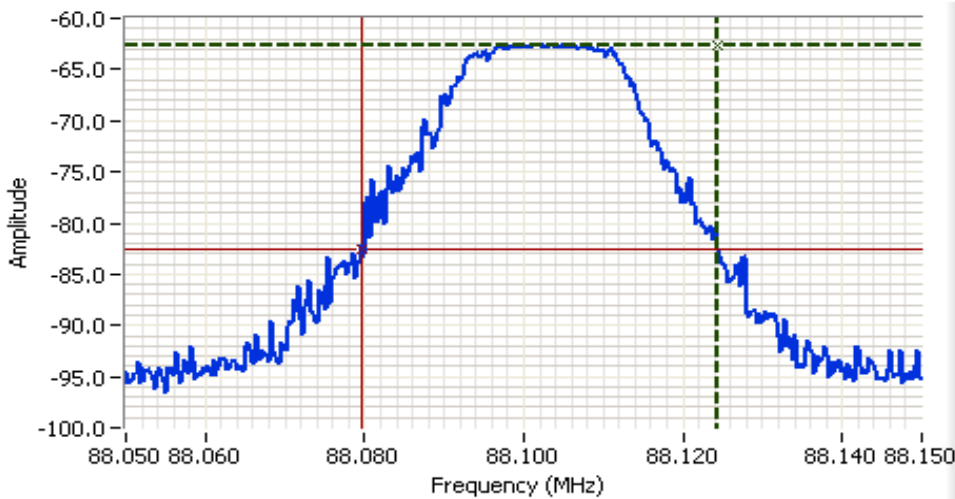
No deviations were made from the requirements of the standard.

Client: Griffin Technology	Job Number: J67270
Model: iTrip Nano Adaptor	T-Log Number: T67276
	Account Manager: Sheareen
Contact: Jeff Altheide	
Standard: FCC 15.239, RSS 210, EN 301 357-2 V1.3.1	Class: -

Run #1: Operation within Band

Audio Setting	Frequency (MHz)	Resolution Bandwidth (kHz)	20dB Bandwidth (kHz)
Song	88.1	10	45
Song	100.1	10	63
Song	107.9	10	56

- Note 1: 20dB bandwidth measured in accordance with various RB and VB > 3xRB
- Note 2: Volume was set to highest when playing the song



Analyzer Settings

HP8593EM

CF: 88.10 MHz
 SPAN: 100 kHz
 RB 10 kHz
 VB 30 kHz
 Detector POS
 Att 10
 RL Offset 0.00
 Sweep Time 30.0ms
 Ref Lvl: -32.00DBM

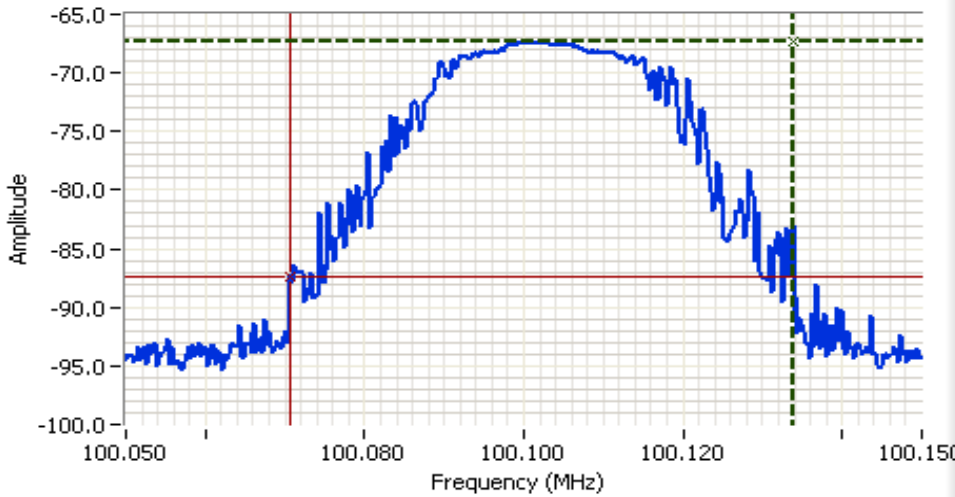
Comments

Low Channel
 88.1 MHz

Cursor 1	88.124	-62.60	⊕ ⊖ 🔒	Delta Freq.	45 kHz
Cursor 2	88.079	-82.60	⊕ ⊖ 🔒	Delta Amplitude	20.00



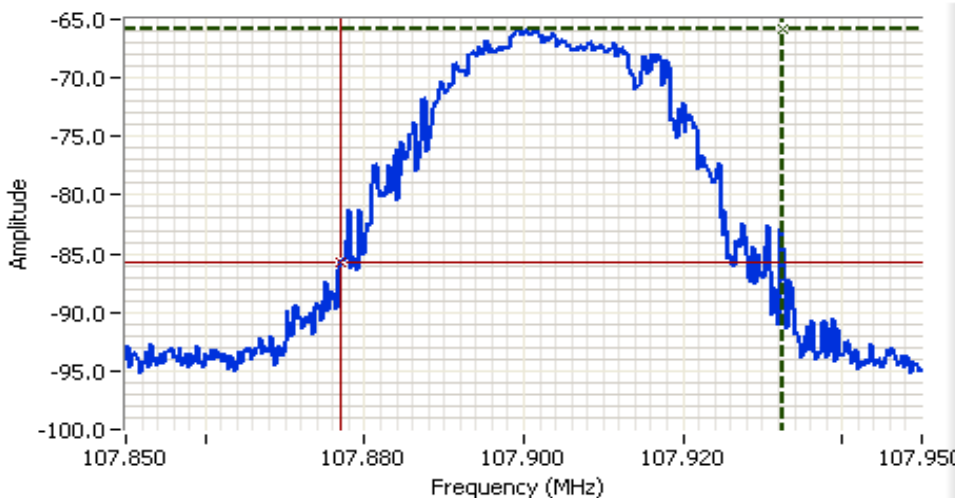
Client: Griffin Technology	Job Number: J67270
Model: iTrip Nano Adaptor	T-Log Number: T67276
Contact: Jeff Altheide	Account Manager: Sheareen
Standard: FCC 15.239, RSS 210, EN 301 357-2 V1.3.1	Class: -



Analyzer Settings
 HP8593EM
 CF: 100.10 MHz
 SPAN: 100 kHz
 RB 10 kHz
 VB 30 kHz
 Detector POS
 Att 10
 RL Offset 0.00
 Sweep Time 30.0ms
 Ref Lvl: -34.00DBM

Comments
 Middle Channel
 100.1 MHz

Cursor 1 100.134 -67.40 Delta Freq. 63 kHz
 Cursor 2 100.071 -87.40 Delta Amplitude 20.00



Analyzer Settings
 HP8593EM
 CF: 107.90 MHz
 SPAN: 100 kHz
 RB 10 kHz
 VB 30 kHz
 Detector POS
 Att 10
 RL Offset 0.00
 Sweep Time 30.0ms
 Ref Lvl: -34.00DBM

Comments
 High Channel
 107.9 MHz

Cursor 1 107.933 -65.75 Delta Freq. 56 kHz
 Cursor 2 107.877 -85.75 Delta Amplitude 20.00



Client: Griffin Technology	Job Number: J67270
Model: iTrip Nano Adaptor	T-Log Number: T67276
	Account Manager: Sheareen
Contact: Jeff Altheide	
Standard: FCC 15.239, RSS 210, EN 301 357-2 V1.3.1	Class: -

FCC 15.239 Radiated Emissions

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 6/18/2007	Config. Used: 1
Test Engineer: Rafael Varelas	Config Change: None
Test Location: Fremont Chamber #5	EUT Voltage: Battery

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing.

For radiated emissions testing the measurement antenna was located 3 meters from the EUT.

Ambient Conditions: Temperature: 21 °C
 Rel. Humidity: 39 %

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	Fundamental Measurement	FCC Part 15.239	Pass	33.0dBµV/m (44.7µV/m) @ 88.095MHz (-15.0dB)
2	RE, 30 - 1080 MHz Spurious Emissions	FCC Part 15.239	Pass	34.9dBµV/m @ 323.614MHz (-11.1dB)

Modifications Made During Testing:

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.



EMC Test Data

Client:	Griffin Technology	Job Number:	J67270
Model:	iTrip Nano Adaptor	T-Log Number:	T67276
		Account Manager:	Sheareen
Contact:	Jeff Altheide		
Standard:	FCC 15.239, RSS 210, EN 301 357-2 V1.3.1	Class:	-

Run #1: Maximized Fundamental Measurements
Sample #2
Playing song continuously, Volume at highest level

Frequency	Level	Pol	FCC 15.239		Detector	Azimuth	Height	Comments
			Limit	Margin				
MHz	dB μ V/m	V/H			Pk/QP/Avg	degrees	meters	
88.095	33.0	H	48.0	-15.0	AVG	86	3.5	EUT Flat
88.095	31.7	H	48.0	-16.3	AVG	9	2.5	Side
88.095	29.1	V	48.0	-18.9	AVG	90	1.0	EUT Upright
107.950	29.0	H	48.0	-19.0	AVG	82	2.8	EUT Flat
100.175	28.1	H	48.0	-19.9	AVG	79	1.8	EUT Flat
88.095	22.0	V	48.0	-26.0	AVG	282	4.0	Side
88.100	21.2	V	48.0	-26.8	AVG	360	1.0	EUT Flat
88.095	19.5	H	48.0	-28.5	AVG	277	2.1	EUT Upright

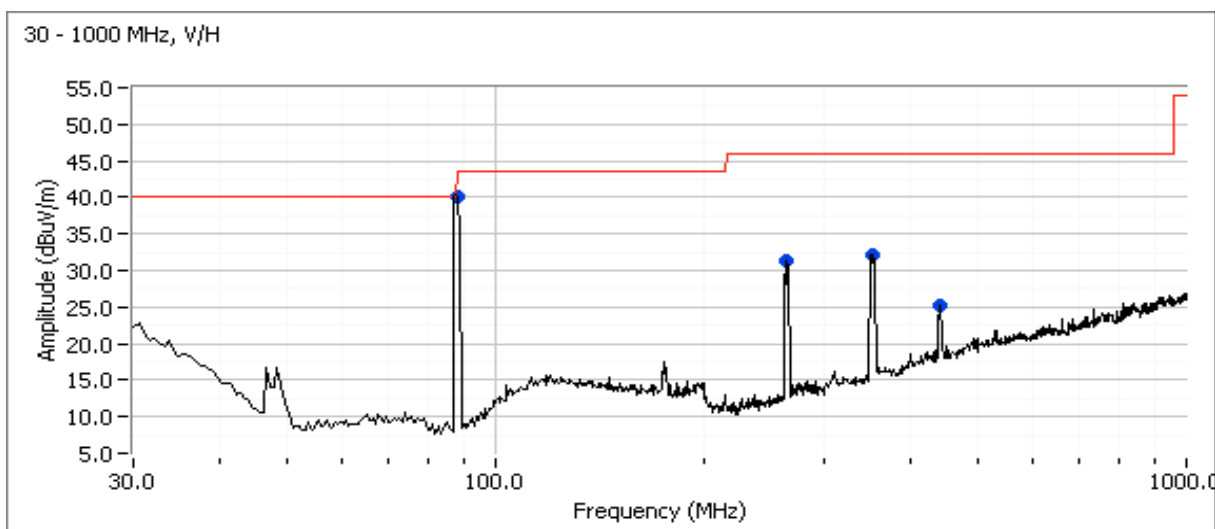
Client: Griffin Technology	Job Number: J67270
Model: iTrip Nano Adaptor	T-Log Number: T67276
Contact: Jeff Altheide	Account Manager: Sheareen
Standard: FCC 15.239, RSS 210, EN 301 357-2 V1.3.1	Class: -

Run #2: Radiated Spurious Emissions, 30 - 1080 MHz.

Run #2a: Low Channel @ 88.1 MHz

EUT in Flat Orientation, Sample #2

Playing song continuously, Volume at highest level



Preliminary Readings

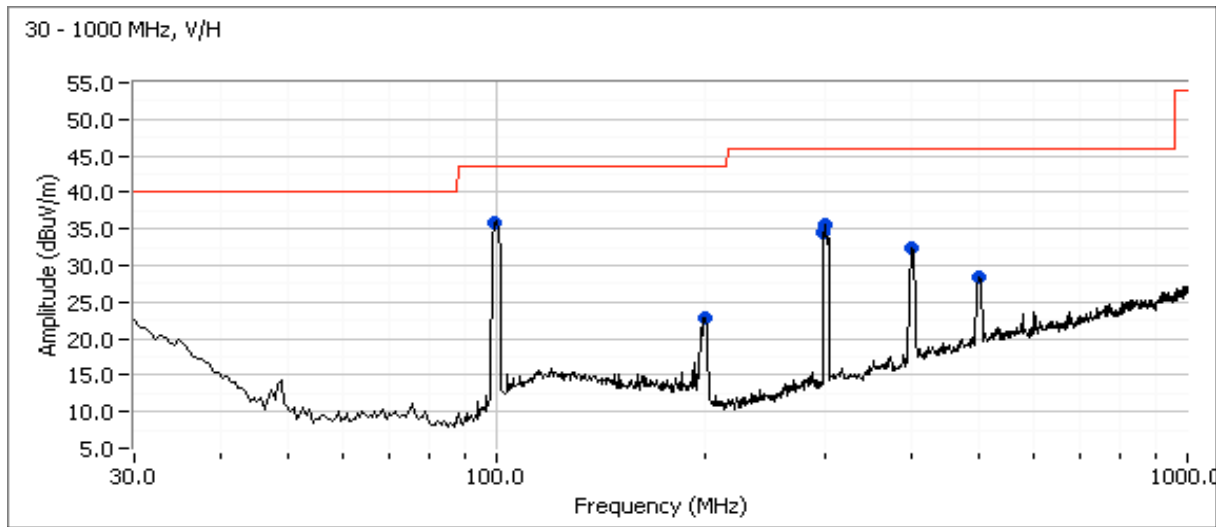
Frequency	Level	Pol	FCC 15.239		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
264.338	31.3	H	46.0	-14.7	Peak	88	1.0	
352.385	32.0	H	46.0	-14.0	Peak	105	1.0	
440.664	25.3	H	46.0	-20.7	Peak	118	1.0	

Maximized Readings

Frequency	Level	Pol	FCC 15.239		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
264.338	29.5	H	46.0	-16.5	QP	89	1.0	
352.385	30.5	H	46.0	-15.5	QP	107	1.0	

Client: Griffin Technology	Job Number: J67270
Model: iTrip Nano Adaptor	T-Log Number: T67276
	Account Manager: Sheareen
Contact: Jeff Altheide	
Standard: FCC 15.239, RSS 210, EN 301 357-2 V1.3.1	Class: -

Run #2b: Center Channel @ 100.1 MHz
EUT in Flat Orientation, Sample #2
Playing song continuously, Volume at highest level



Preliminary Readings

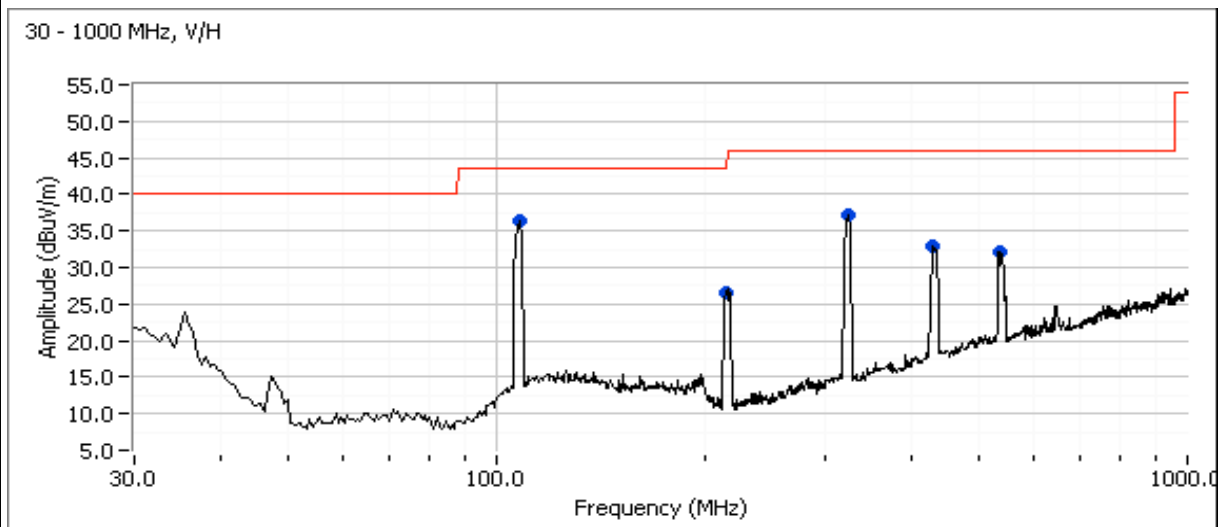
Frequency MHz	Level dB μ V/m	Pol v/h	FCC 15.239		Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
			Limit	Margin				
200.884	22.8	H	43.5	-20.7	Peak	275	1.5	
299.970	35.7	H	46.0	-10.3	Peak	86	1.0	
400.591	32.5	H	46.0	-13.5	Peak	112	1.0	
501.478	28.4	H	46.0	-17.6	Peak	127	2.0	

Maximized Readings

Frequency MHz	Level dB μ V/m	Pol v/h	FCC 15.239		Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
			Limit	Margin				
299.970	33.8	H	46.0	-12.2	QP	87	1.0	
400.591	28.6	H	46.0	-17.4	QP	113	1.0	

Client: Griffin Technology	Job Number: J67270
Model: iTrip Nano Adaptor	T-Log Number: T67276
	Account Manager: Sheareen
Contact: Jeff Altheide	
Standard: FCC 15.239, RSS 210, EN 301 357-2 V1.3.1	Class: -

Run #2c: High Channel @ 107.9 MHz
EUT in Flat Orientation, Sample #2
Playing song continuously, Volume at highest level



Preliminary Readings

Frequency MHz	Level dBµV/m	Pol v/h	FCC 15.239		Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
			Limit	Margin				
215.708	26.6	H	43.5	-16.9	Peak	255	1.0	
323.614	37.2	H	46.0	-8.8	Peak	70	1.0	
431.798	32.9	H	46.0	-13.1	Peak	89	1.0	
538.930	32.0	H	46.0	-14.0	Peak	69	1.5	

Maximized Readings

Frequency MHz	Level dBµV/m	Pol v/h	FCC 15.239		Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
			Limit	Margin				
323.614	34.9	H	46.0	-11.1	QP	72	1.0	
431.798	30.6	H	46.0	-15.4	QP	90	1.0	

EXHIBIT 3: Photographs of Test Configurations

2 Pages

EXHIBIT 4: Proposed FCC ID Label & Label Location

***EXHIBIT 5: Detailed Photographs
of Griffin Technology Model iTrip Nano Adaptor Construction***

5 Pages

**EXHIBIT 6: Operator's Manual
for Griffin Technology Model iTrip Nano Adaptor**

1 Page

**EXHIBIT 7: Block Diagram
of Griffin Technology Model iTrip Nano Adaptor**

1 Page

***EXHIBIT 8: Schematic Diagrams
for Griffin Technology Model iTrip Nano Adaptor***

1 Page

***EXHIBIT 9: Theory of Operation
for Griffin Technology Model iTrip Nano Adaptor***

1 Page