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Electromagnetic Emissions Test Report and Application for Grant of Equipment Authorization pursuant to FCC Part 15 Subpart C on the SDR Electronics Transmitter Model: iTrip SE (P1129)

FCC ID: VKM1129

GRANTEE: SDR Electronics
XingTang District, Houjie Town
Dongguan, Guangdong, China

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

REPORT DATE: February 21, 2008

FINAL TEST DATE: January 28, 2008

AUTHORIZED SIGNATORY: _____
Mark E. Hill
Staff Engineer

ACCREDITED
2016-01

REVISION HISTORY

Revision #	Date	Comments	Modified By
1	May 6, 2008	Initial Release	David Guidotti

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SCOPE

An electromagnetic emissions test has been performed on the SDR Electronics model iTrip SE pursuant to the following rules:

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 SDR Electronics model iTrip SE 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.

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 SDR Electronics model iTrip SE complied with the requirements of the following regulations:

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	Description	Measured Value / Comments	Limit / Requirement	Result
15.239	Transmitter Fundamental Signal Emissions, 88 - 108 MHz	47.8 dBuV/m @ 100.1 MHz (-0.2dB)	250 uV/m @ 3 meters	Complies
15.239	Transmitter Radiated Spurious Emissions, 30 - 1000 MHz	28.4 dBµV/m @ 200.17 MHz (-15.1dB)	Refer to table in limits section	Complies
15.239	20-dB Bandwidth	169 kHz	Must be < 200kHz	Complies

Note, attempts to tune the device outside of the 88.1 MHz to 107.9 MHz band were not successful. The system would loop from the highest channel, 107.9 MHz, to the lowest channel, 88.1 MHz, and vice versa.

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	± 2.4
Radiated Emissions	0.015 to 30	± 3.0
Radiated Emissions	30 to 1000	± 3.6
Radiated Emissions	1000 to 40000	± 6.0

EQUIPMENT UNDER TEST (EUT) DETAILS

GENERAL

The SDR Electronics model iTrip SE is a portable FM transmitter that is designed to transmit audio information from an iPod or a computer. For this testing, the EUT was placed on a tabletop. The EUT is powered via the port to iPod and iPod is charged using the USB port of a computer.

The sample was received on December 14, 2007 and tested on January 28, 2008. The EUT consisted of the following component(s):

Manufacturer	Model	Description	Serial Number	FCC ID
SDR Electronics	iTrip SE (P1129)	FM Transmitter	-	VKM1129

ANTENNA SYSTEM

The antenna system used with the SDR Electronics model iTrip SE is integral to the device.

ENCLOSURE

The EUT enclosure is primarily constructed of plastic. It measures approximately 6 cm wide by 2 cm deep by 3.5 cm 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
WinBook	WinBook XL	Laptop	H1106587	-
Apple	iPod Nano	Music Player	-	-

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)
USB	Laptop	USB Cable	Shielded	1.0
iPod	iPod	-	-	-

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 January 28, 2008 at the Elliott Laboratories Anechoic Chamber 5 located at 41039 Boyce Road, Fremont, CA. 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.

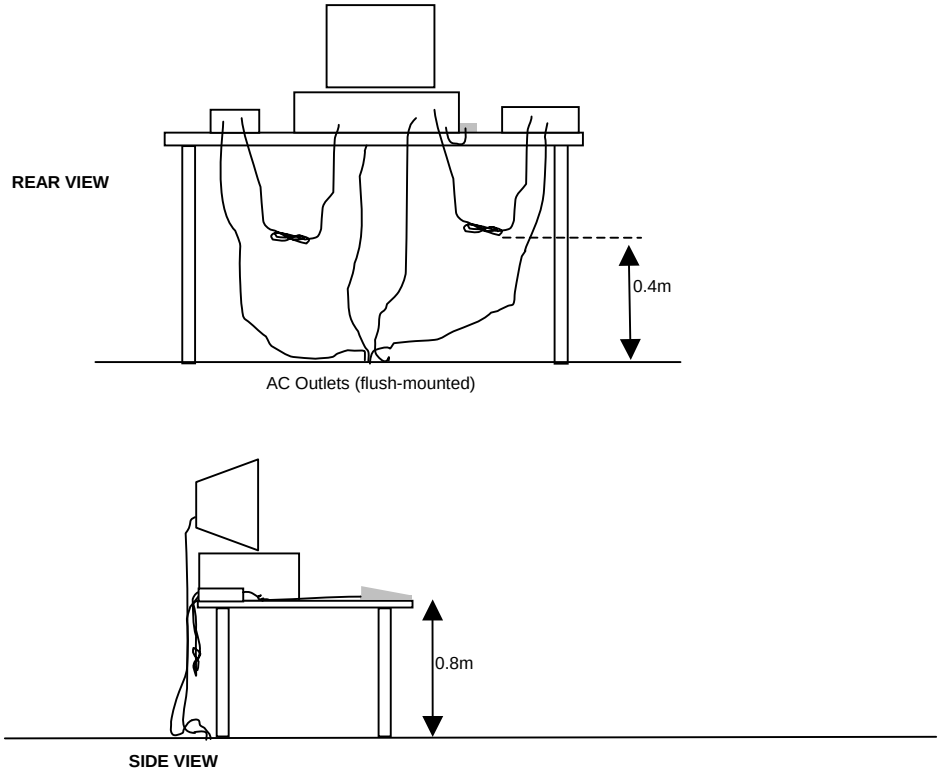
RADIATED EMISSIONS

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.

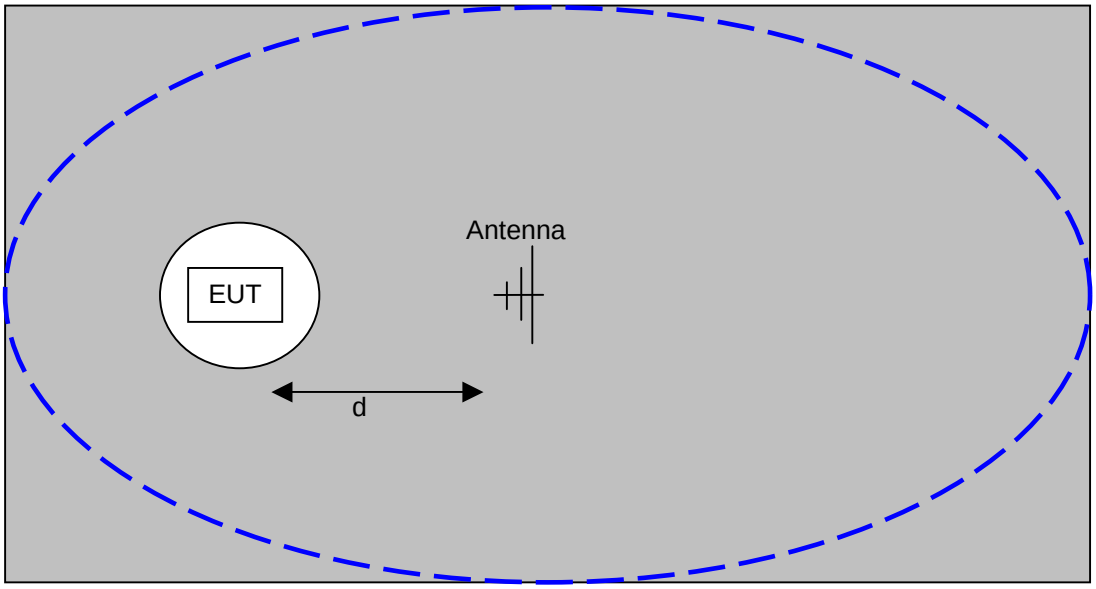
A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions. Other methods used during the preliminary scan for EUT emissions involve scanning with near field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.

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.

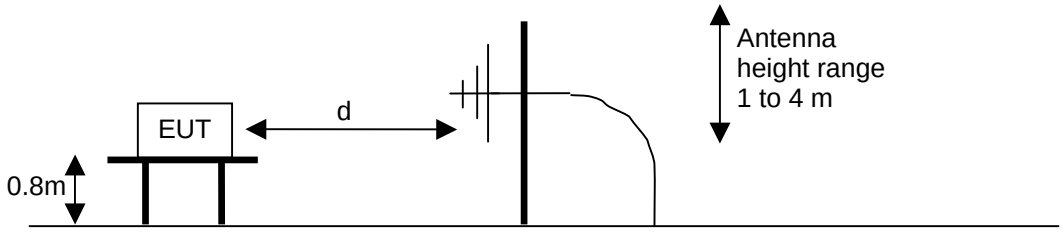
When testing above 18 GHz, the receive antenna is located at 1meter from the EUT and the antenna height is restricted to a maximum of 2.5 meters.



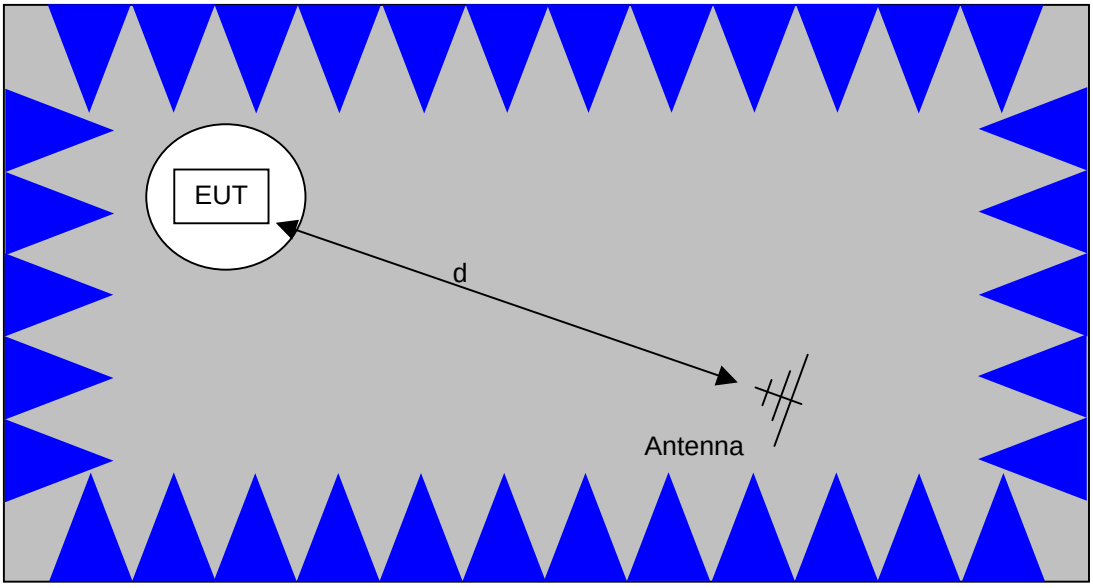
Typical Test Configuration for Radiated Field Strength Measurements



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.

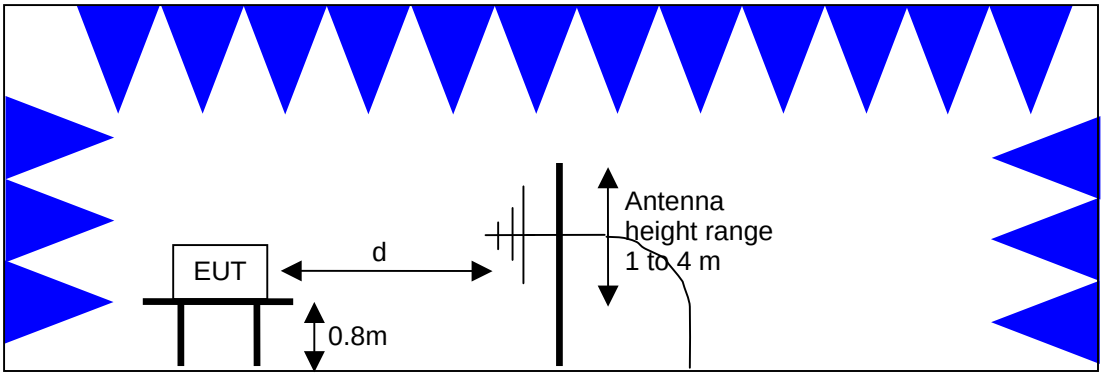


Test Configuration for Radiated Field Strength Measurements
OATS- Plan and Side Views



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.

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 bands[1] (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	$2400/F_{KHz}$ @ 300m	$67.6-20*\log_{10}(F_{KHz})$ @ 300m
0.490-1.705	$24000/F_{KHz}$ @ 30m	$87.6-20*\log_{10}(F_{KHz})$ @ 30m
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:

$$F_d = 20*LOG_{10} (D_m/D_s)$$

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:

$$F_d = 40*LOG_{10} (D_m/D_s)$$

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 = Receiver Reading in dBuV/m

F_d = Distance Factor in dB

R_c = Corrected Reading in dBuV/m

L_s = Specification Limit in dBuV/m

M = 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 - 1,000 MHz, 15-Dec-07

Engineer: Rafael Varelas

Manufacturer	Description	Model #	Asset #	Cal Due
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1538	25-Aug-08
Hewlett Packard	Preamplifier, 100 kHz - 1.3 GHz	8447E	1606	07-Feb-08
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	1657	03-May-08

EXHIBIT 2: Test Measurement Data

10 Pages

Elliott

EMC Test Data

Client:	SDR Electronics	Job Number:	J70239
Model:	iTrip SE w/ New Chip (P1129)	Test-Log Number:	T70242
		Project Manager:	Sheareen
Contact:	Jeff Altheide		
Emissions Spec:	FCC Part 15.239	Class:	N/A
Immunity Spec:	-	Environment:	-

EMC Test Data

For The

SDR Electronics

Model

iTrip SE w/ New Chip (P1129)

Date of Last Test: 1/28/2008

Client:	SDR Electronics	Job Number:	J70239
Model:	iTrip SE w/ New Chip (P1129)	Test-Log Number:	T70242
		Project Manager:	Sheareen
Contact:	Jeff Altheide		
Emissions Spec:	FCC Part 15.239	Class:	N/A
Immunity Spec:	-	Environment:	-

EUT INFORMATION

General Description

The EUT is a portable FM transmitter that is designed to transmit audio information from an iPod or a computer. For this testing, the EUT was placed on a tabletop. The EUT is powered via the port to iPod and iPod is charged using the USB port of a computer.

Equipment Under Test

Manufacturer	Model	Description	Serial Number	FCC ID
SDR Electronics	iTrip SE (P1129)	FM Transmitter	N/A	VKM1129

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 6 cm wide by 2 cm deep by 3.5 cm high.

Modification History

Mod. #	Test	Date	Modification
1			
2			
3			

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

Client:	SDR Electronics	Job Number:	J70239
Model:	iTrip SE w/ New Chip (P1129)	T-Log Number:	T70242
		Project Manager:	Sheareen
Contact:	Jeff Altheide		
Emissions Spec:	FCC Part 15.239	Class:	N/A
Immunity Spec:	-	Environment:	-

Test Configuration #1

The following information was collected during the test sessions(s).

Local Support Equipment

Manufacturer	Model	Description	Serial Number	FCC ID
WinBook	WinBook XL	Laptop	H1106587	-
Apple	iPod Nano	Music Player	-	-

Remote Support Equipment

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

Cabling and Ports

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
USB	Laptop	USB Cable	Shielded	1.0
iPod	iPod	-	-	-

EUT Operation During Emissions Tests

During emissions testing the EUT was configured to play an audio file in a continous loop.

Client:	SDR Electronics	Job Number:	J70239
Model:	iTrip SE w/ New Chip (P1129)	T-Log Number:	T70242
		Account Manager:	Sheareen
Contact:	Jeff Altheide		
Standard:	FCC Part 15.239	Class:	N/A

Radiated Emissions

(Elliott Laboratories Fremont Facility, Semi-Anechoic Chamber)

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: 1/28/2008
Test Engineer: Rafael Varelas
Test Location: Fremont Chamber #5
Config. Used: 1
Config Change: None
EUT Voltage: Powered from iPod

General Test Configuration

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

The test distance and extrapolation factor (if applicable) are detailed under each run description.

Note, preliminary testing indicates that the emissions were maximized by orientation of the EUT and elevation of the measurement antenna. Maximized testing indicated that the emissions were maximized by orientation of the EUT, elevation of the measurement antenna, and manipulation of the EUT's interface cables.

Ambient Conditions:

Temperature: 18.2 °C
Rel. Humidity: 39 %

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1	Fundamental Measurements	FCC 15.239(b)	Pass	47.8 dBuV/m @ 100.1 MHz (-0.2dB)
2	30 - 1000 MHz Spurious Emissions	FCC 15.239(b)	Pass	28.4 dBuV/m @ 200.17 MHz (-15.1dB)
3	20dB Bandwidth	FCC 15.239(b)	Pass	169 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.

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
30 - 1000 MHz	3	3	0.0

Client:	SDR Electronics	Job Number:	J70239
Model:	iTrip SE w/ New Chip (P1129)	T-Log Number:	T70242
		Account Manager:	Sheareen
Contact:	Jeff Altheide		
Standard:	FCC Part 15.239	Class:	N/A

Run #1a: Fundamental Radiated Emissions.
EUT Configuration: EUT (Elliott Asst # 2007-2173 iTrip SE Unit)
iPod was playing a Song with Volume set to high

Tested with Mini-USB cable

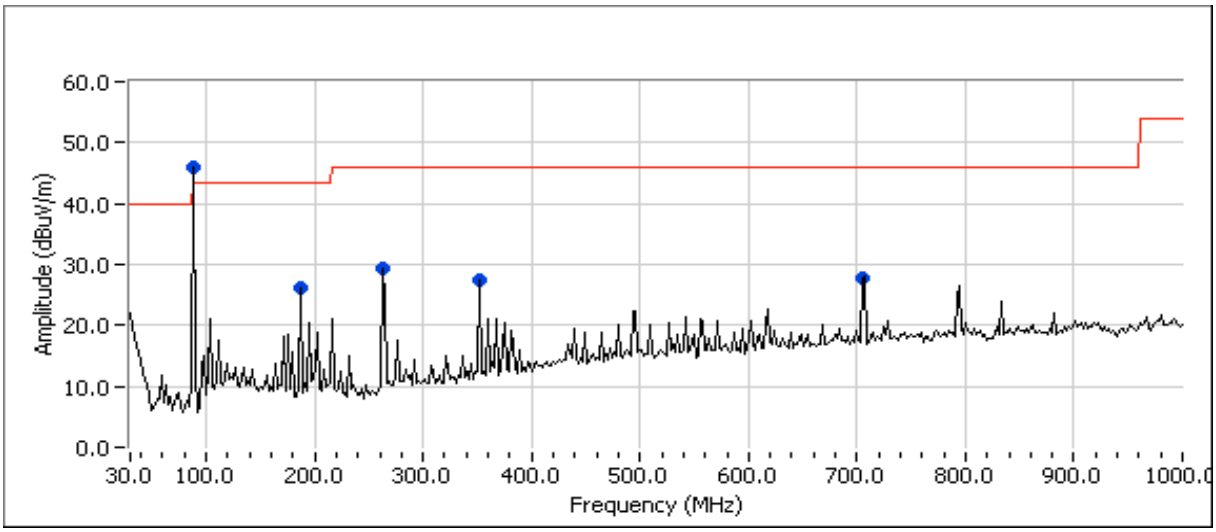
Frequency	Level	Pol	FCC 15.239(b)		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
EUT Flat								
88.100	46.3	H	48.0	-1.7	AVG	169	2.3	Setting 00.3
88.100	39.2	V	48.0	-8.8	AVG	267	3.0	Setting 00.3
100.100	47.5	H	48.0	-0.5	AVG	195	2.9	Setting 00.5
100.100	40.4	V	48.0	-7.6	AVG	97	3.4	Setting 00.5
107.900	46.6	H	48.0	-1.4	AVG	268	2.8	Setting 00.6
107.900	38.9	V	48.0	-9.1	AVG	202	2.4	Setting 00.6
88.100	49.3	H	68.0	-18.7	PK	169	2.3	Setting 00.3
107.900	49.6	H	68.0	-18.4	PK	268	2.8	Setting 00.6
EUT Upright								
88.100	47.3	H	48.0	-0.7	AVG	154	2.2	Setting 00.4
88.100	39.0	V	48.0	-9.0	AVG	112	3.3	Setting 00.4
100.100	47.8	H	48.0	-0.2	AVG	180	2.9	Setting 00.5
100.100	40.5	V	48.0	-7.5	AVG	90	3.5	Setting 00.5
107.900	46.6	H	48.0	-1.4	AVG	270	2.7	Setting 00.6
107.900	38.6	V	48.0	-9.4	AVG	218	2.5	Setting 00.6
100.100	50.8	H	68.0	-17.2	PK	180	2.9	Setting 00.5
EUT Side								
88.100	47.3	H	48.0	-0.7	AVG	174	2.3	Setting 00.5
88.100	40.0	V	48.0	-8.0	AVG	272	3.2	Setting 00.5
100.100	47.9	H	48.0	-0.1	AVG	311	2.9	Setting 00.6
100.100	40.8	V	48.0	-7.2	AVG	97	2.8	Setting 00.6
107.900	45.0	H	48.0	-3.0	AVG	277	2.8	Setting 00.6
107.900	35.8	V	48.0	-12.2	AVG	77	2.1	Setting 00.6

Note: all measurements taken with a test receiver using an average detector with an IF bandwidth of 120kHz.
Note: the lower the "setting number", the lower the output power. For example, setting 00.3 has a lower output then setting

Client:	SDR Electronics	Job Number:	J70239
Model:	iTrip SE w/ New Chip (P1129)	T-Log Number:	T70242
		Account Manager:	Sheareen
Contact:	Jeff Altheide		
Standard:	FCC Part 15.239	Class:	N/A

Run #2: Radiated Spurious Emissions 30 - 1000MHz

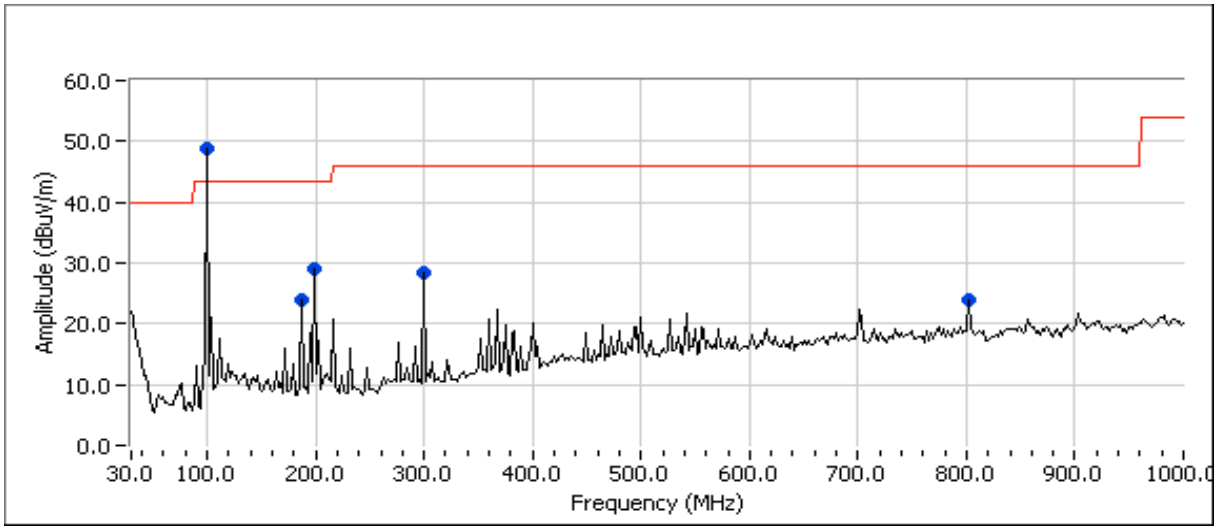
Run 2a: Spurious emissions, Low Channel (88.1MHz)
USB cable connected, EUT Flat, Power setting 00.3



Frequency	Level	Pol	FCC 15.239(b)		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
88.100	46.0	H	-	-	Peak	164	2.5	Fundamental
352.685	27.3	H	46.0	-18.7	Peak	255	1.0	
704.529	27.9	H	46.0	-18.1	Peak	192	1.0	
187.560	25.7	H	43.5	-17.8	QP	270	1.5	
264.305	29.1	H	46.0	-16.9	QP	262	1.0	

Client:	SDR Electronics	Job Number:	J70239
Model:	iTrip SE w/ New Chip (P1129)	T-Log Number:	T70242
		Account Manager:	Sheareen
Contact:	Jeff Altheide		
Standard:	FCC Part 15.239	Class:	N/A

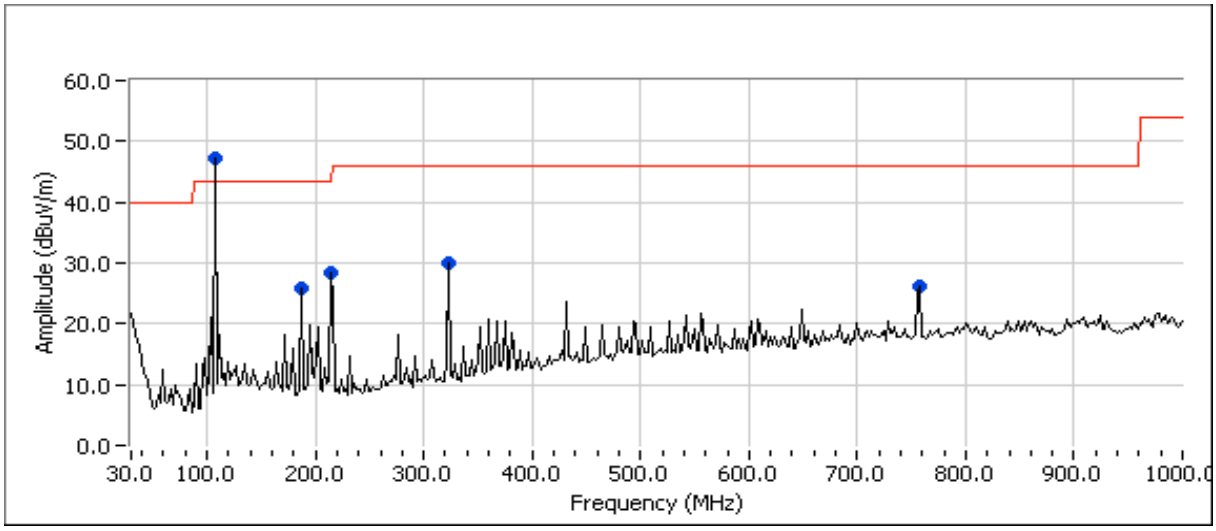
Run 2b: Spurious emissions, Middle Channel (100.1MHz)
USB cable connected, EUT Upright, Power setting 00.5



Frequency	Level	Pol	FCC 15.239(b)		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
100.100	48.8	H	-	-	Peak	336	3.0	Fundamental
187.455	24.0	H	43.5	-19.5	Peak	280	1.0	
801.723	23.9	H	46.0	-22.1	Peak	284	1.0	
200.179	28.4	H	43.5	-15.1	QP	134	1.5	
300.282	27.8	H	46.0	-18.2	QP	291	1.0	

Client:	SDR Electronics	Job Number:	J70239
Model:	iTrip SE w/ New Chip (P1129)	T-Log Number:	T70242
		Account Manager:	Sheareen
Contact:	Jeff Altheide		
Standard:	FCC Part 15.239	Class:	N/A

Run 2c: Spurious emissions, High Channel (107.9MHz)
USB cable connected, EUT Flat, Power setting 00.6

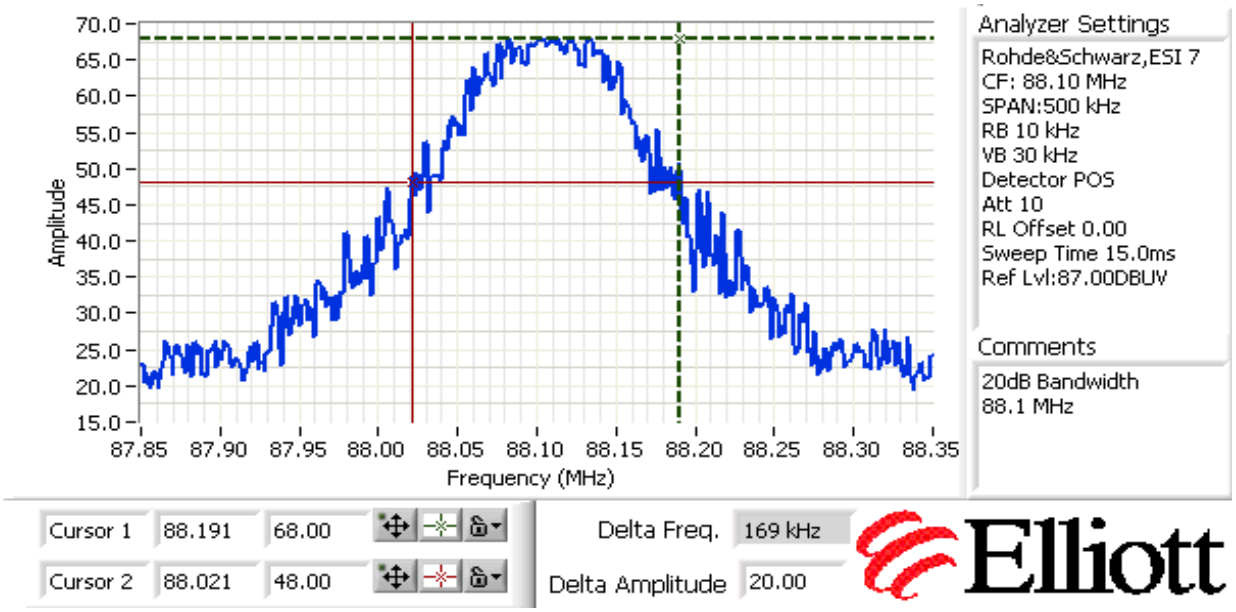


Frequency	Level	Pol	FCC 15.239(b)		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
107.900	47.1	H	-	-	Peak	270	3.0	
187.455	25.9	H	43.5	-17.6	Peak	270	1.5	
757.014	26.1	H	46.0	-19.9	Peak	208	1.0	
215.777	27.9	H	43.5	-15.6	QP	114	1.5	
323.725	29.3	H	46.0	-16.7	QP	304	1.0	

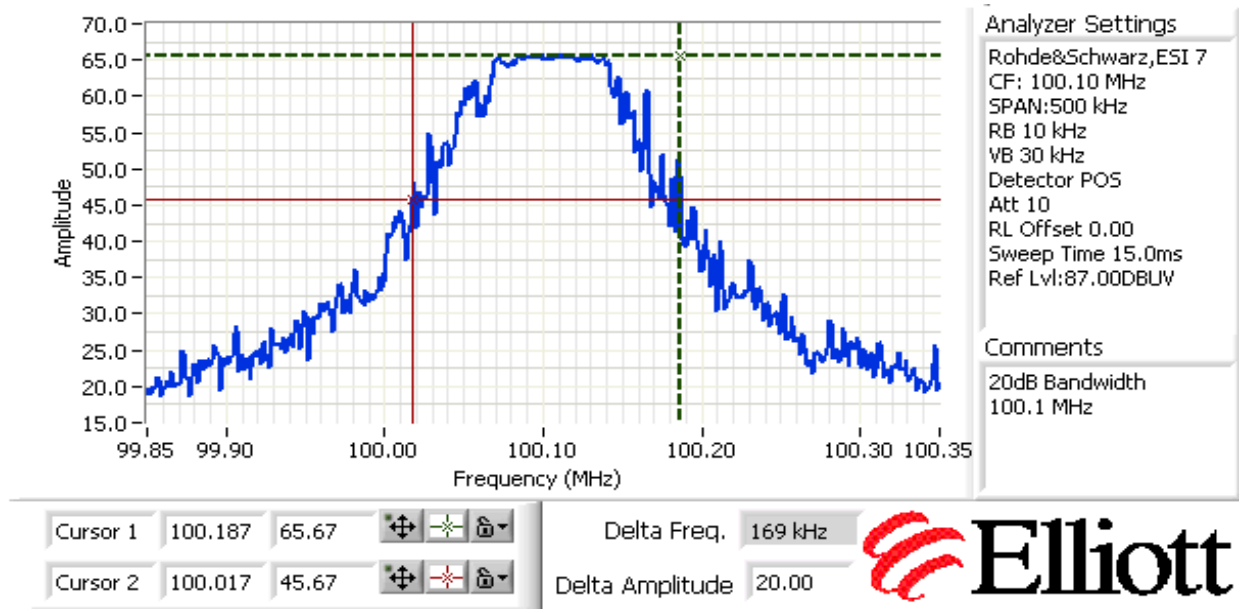
Client:	SDR Electronics	Job Number:	J70239
Model:	iTrip SE w/ New Chip (P1129)	T-Log Number:	T70242
		Account Manager:	Sheareen
Contact:	Jeff Altheide		
Standard:	FCC Part 15.239	Class:	N/A

Run #3: Bandwidth Measurement

Low Channel



Middle Channel



Client:	SDR Electronics	Job Number:	J70239
Model:	iTrip SE w/ New Chip (P1129)	T-Log Number:	T70242
		Account Manager:	Sheareen
Contact:	Jeff Altheide		
Standard:	FCC Part 15.239	Class:	N/A

High Channel

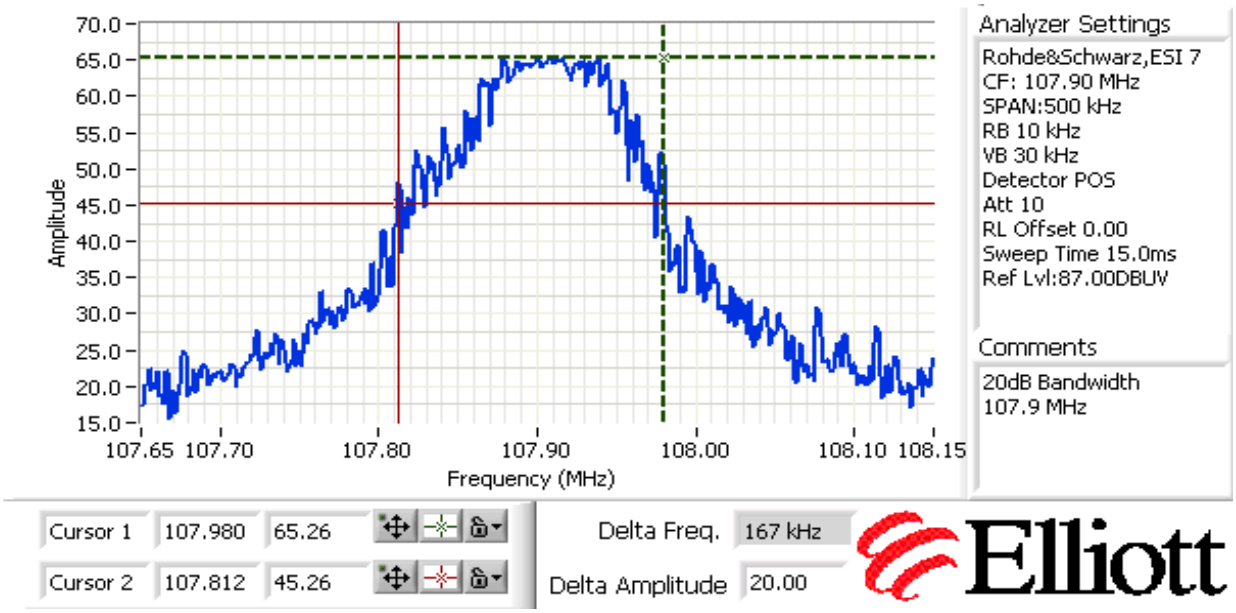


EXHIBIT 3: Photographs of Test Configurations

1 Page

EXHIBIT 4: Proposed FCC ID Label & Label Location

EXHIBIT 5: Detailed Photographs of SDR Electronics iTrip SE Construction

2 Pages

EXHIBIT 6: Operator's Manual for SDR Electronics Model iTrip SE

1 Page

EXHIBIT 7: Block Diagram of SDR Electronics Model iTrip SE

1 Page

EXHIBIT 8: Schematic Diagrams for SDR Electronics Model iTrip SE

1 Page

EXHIBIT 9: Theory of Operation for SDR Electronics Model iTrip SE

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