



FCC Test Report

FCC Part 22, 24 / RSS 132,133

For the
L-3 Communications

L-3 Guardian TM

Model Number: L-3 Guardian TM -G

FCC ID: N7NMC8775

TEST REPORT #: EMC_L3COM_003_FCC22_24_MC8775V_Rev1
DATE: 2008-09-05



Bluetooth
Bluetooth
Qualification Test
Facility
(BQTF)

CTIA Authorized Test Lab

LAB CODE 20020328-00

FCC listed:
A2LA accredited

IC recognized #
3462B

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1 Assessment

The following is in compliance with the applicable criteria specified in FCC rules Parts 2, 22 and 24 of Title 47 of the Code of Federal Regulations and in compliance with the applicable criteria specified in Industry Canada rules RSS132 and RSS133.

Company	Description	Model #
L-3 Communications	Cell phone / PDA	L-3 Guardian™ -G

Technical responsibility for area of testing:

Lothar Schmidt
(Director Regulatory & Antenna

2008-09-05 EMC & Radio Services)

Date	Section	Name	Signature
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This report is prepared by:

Marc Douat

2008-09-05 EMC & Radio (EMC Project Engineer)

Date	Section	Name	Signature
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The test results of this test report relate exclusively to the test item specified in Identification of the Equipment under Test. The CETECOM Inc. USA does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of the CETECOM Inc USA.

The test results of this test report relate exclusively to radiated measurement only. Radio module used in this product has been previously certified under its own FCC and IC ID.

2 Administrative Data

2.1 Identification of the Testing Laboratory Issuing the EMC Test Report

Company Name:	CETECOM Inc.
Department:	EMC
Address:	411 Dixon Landing Road Milpitas, CA 95035 U.S.A.
Telephone:	+1 (408) 586 6200
Fax:	+1 (408) 586 6299
Responsible Test Lab Manager:	Lothar Schmidt
Responsible Project Leader:	Marc Douat
Date of test:	2008-04-21 to 2008-05-15

2.2 Identification of the Client

Applicant's Name:	L-3 Communications
Address Line 1:	1 Federal Street
Address Line 2:	
City/ Zip Code	Camden, New Jersey 08103
Country:	USA
Contact Person:	Robert Dovi
Phone No.:	+1 856 338 3583
Fax:	+1 856 338 3150
e-mail:	robert.dovi@l-3com.com

2.3 Identification of the Manufacturer

Same as above applicant

3 Equipment under Test (EUT)

3.1 Specification of the Equipment under Test

Marketing Name of EUT (if not same as Model No.)	L-3 Guardian™
Model No.	L-3 Guardian™ -G
FCC-ID	N7NMC8775
IC-ID (Industry Canada)	N/A
Frequency Range:	824.2MHz – 848.8MHz for GSM 850 1850.2MHz – 1909.8MHz for PCS 1900 826.4MHz – 846.6MHz for UMTS FDD5 1852.4MHz – 1907.6MHz for UMTS FDD2
Type(s) of Modulation:	GMSK, 8PSK, QPSK
Number of Channels:	124 for GSM-850, 299 for PCS-1900
Antenna Type:	PCB -3.5 dBi to 1.3 dBi
Max. Output Power:	Conducted : Tests Conducted not by Cetecom. Radiated : see section 5.1.5 and 5.1.6. GSM 850: ERP 26.53 dBm (0.450 W) @ 836.6 MHz PCS 1900: EIRP 25.12 dBm (0.325 W) @ 1880 MHz UMTS FDD5: ERP 23.37 dBm (0.217 W) @ 846.6 MHz UMTS FDD2: EIRP 22.78 dBm (0.190 W) @ 1880 MHz

3.2 Identification of the Equipment Under Test (EUT)

EUT #	TYPE	MANF.	MODEL	SERIAL #
1	EUT	L-3 Communications	L-3 Guardian TM -G	21000076

3.3 Identification of Accessory equipment

AE #	TYPE	MANF.	MODEL	SERIAL #
1	AC/DC Adapter	Globtek, Inc	GS-1295L(R)	000002
2	AC/DC Adapter	Ault, Inc	PW170KB0900B02	EngSamp1

4 Subject of Investigation

All testing was performed on the EUT listed in Section 3. The EUT was maximized in the X,Y, Z positions , all data in this report shows the worst case between horizontal and vertical polarization for above 1GHz.

The objective of the measurements done by Cetecom Inc. was to measure the performance of the EUT as specified by requirements listed in FCC rules Parts 2, 22 and 24 of Title 47 of the Code of Federal Regulations and Industry Canada rules RSS132 and RSS133.

This EUT contains an FCC approved module with the FCC ID N7NMC8775. This report refers only to the radiated measurements in GSM and WCDMA technology. Testing was performed to ensure continued compliance to FCC rules while the pre-certified module is placed within the EUT.

5 Measurements

5.1 RF Power Output

5.1.1 FCC 2.1046 Measurements required: RF power output.

Power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on circuit elements as specified. The electrical characteristics of the radio frequency load attached to the output terminals when this test is made shall be stated.

5.1.2 Limits:

5.1.2.1 FCC 22.913 (a) Effective radiated power limits.

The effective radiated power (ERP) of mobile transmitters must not exceed 7 Watts.

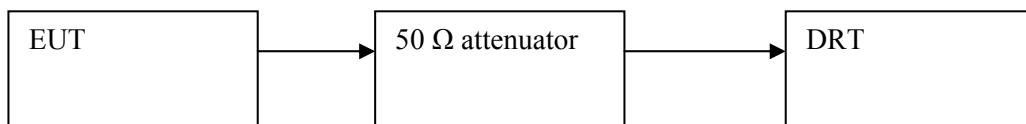
5.1.2.2 FCC 24.232 (b)(c) Power limits.

(b) Mobile/portable stations are limited to 2 Watts effective isotropic radiated power (EIRP).
(c) Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms equivalent voltage. The measurement results shall be properly adjusted for any limitations, such as detector response times, limited resolution bandwidth capability when compared to the emission bandwidth, sensitivity, etc., so as to obtain a true peak measurement over the full bandwidth of the channel.

5.1.3 Conducted Output Power Measurement procedure:

Based on TIA-603C 2004

2.2.1 Conducted Carrier Output Power Rating

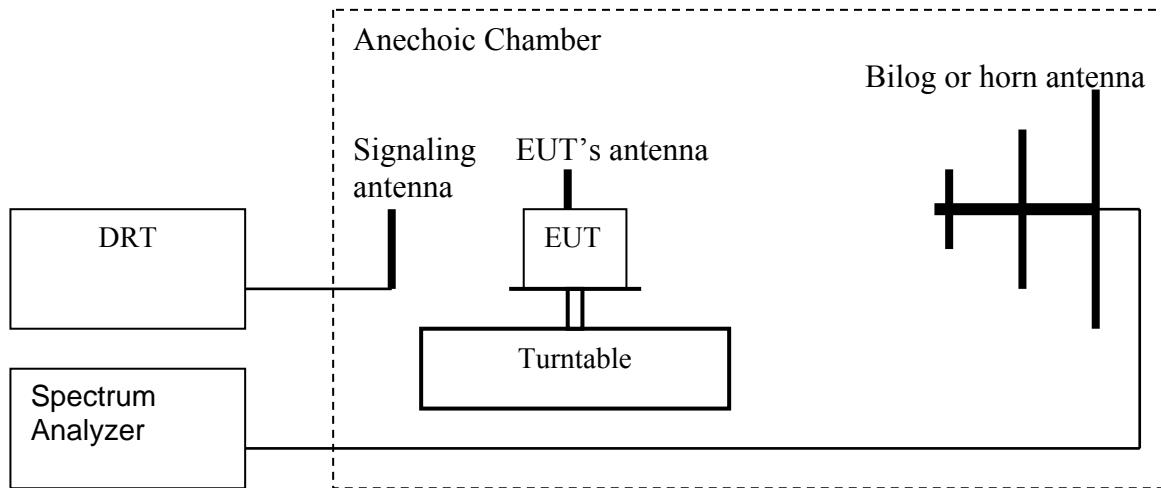


1. Connect the equipment as shown in the above diagram. A Digital Radiocommunication Tester (DRT) is used to enable the EUT to transmit and to measure the output power.
2. Adjust the settings of the DRT to set the EUT to its maximum power at the required channel.
3. Record the output power level measured by the DRT.
4. Correct the measured level for all losses in the RF path.
5. Measurements are to be performed with the EUT set to the low, middle and high channel of each frequency band.

5.1.4 Radiated Output Power Measurement procedure:

Based on TIA-603C 2004

2.2.17.2 Effective Radiated Power (ERP) or Effective Isotropic Radiated Power (EIRP)



1. Connect the equipment as shown in the above diagram with the EUT's antenna in a vertical orientation.
2. Adjust the settings of the Digital Radiocommunication Tester (DRT) to set the EUT to its maximum power at the required channel.
3. Set the spectrum analyzer to the channel frequency. Set the analyzer to measure peak hold with the required settings.
4. Rotate the EUT 360°. Record the peak level in dBm (**LVL**).
5. Replace the EUT with a vertically polarized half wave dipole or known gain antenna. The center of the antenna should be at the same location as the center of the EUT's antenna.
6. Connect the antenna to a signal generator with known output power and record the path loss in dB (**LOSS**). **LOSS** = Generator Output Power (dBm) – Analyzer reading (dBm).
7. Determine the ERP using the following equation:
$$\text{ERP (dBm)} = \text{LVL (dBm)} + \text{LOSS (dB)}$$
8. Determine the EIRP using the following equation:
$$\text{EIRP (dBm)} = \text{ERP (dBm)} + 2.14 \text{ (dB)}$$
9. Measurements are to be performed with the EUT set to the low, middle and high channel of each frequency band. **Spectrum analyzer settings = rbw=vbw=3MHz**

(note: Steps 5 and 6 above are performed prior to testing and **LOSS** is recorded by test software. Steps 3, 4, 7 and 8 above are performed with test software.)

5.1.5 ERP Results 850 MHz band:

Power Control Level	Burst Peak ERP
5	$\leq 38.45\text{dBm}$ (7W)

Frequency (MHz)	Effective Isotropic Radiated Power (dBm)
	GSM
824.2	27.71 (25.61)
836.6	28.63 (26.53)
848.8	28.51 (26.41)

Frequency (MHz)	Effective Radiated Power (dBm)
	UMTS FDD5
836.4	22.84 (20.74)
836.6	24.03 (21.93)
846.6	25.47 (23.47)

*Values reported are EIRP and (ERP) in parentheses.

5.1.6 EIRP Results 1900 MHz band:

Power Control Level	Burst Peak EIRP
0	$\leq 33\text{dBm}$ (2W)

7527S

Frequency (MHz)	Effective Isotropic Radiated Power (dBm)
	GSM
1850.2	24.63
1880.0	25.12
1909.8	22.53

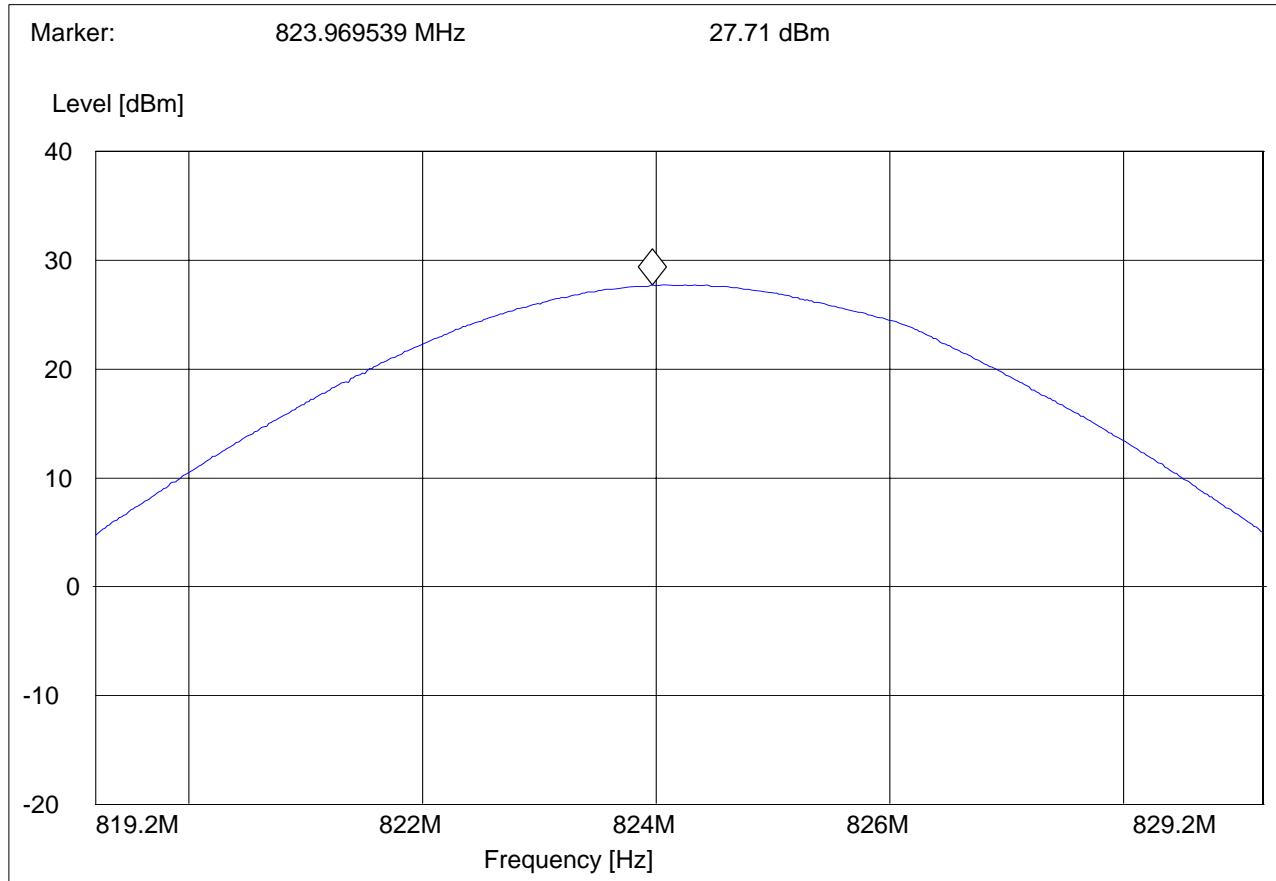
Frequency (MHz)	Effective Radiated Power (dBm)
	UMTS FDD2
1852.4	21.68
1880	22.78
1907.6	21.29

EIRP (GSM 850) CHANNEL 128 §22.913(a)

EUT: 34LC00b/C01
Customer: L3 Communications
Test Mode: GSM 850 CH128
ANT Orientation: V
EUT Orientation: V
Test Engineer: Chris
Voltage: AC Adaptor
Comments:

SWEEP TABLE: "EIRP 850 CH 128 V"

Start Frequency	Stop Frequency	Detector Meas.	IF Time	Transducer Bandw.
819.2 MHz	829.2 MHz	MaxPeak	MaxPeak	3 MHz DUMMY-DBM

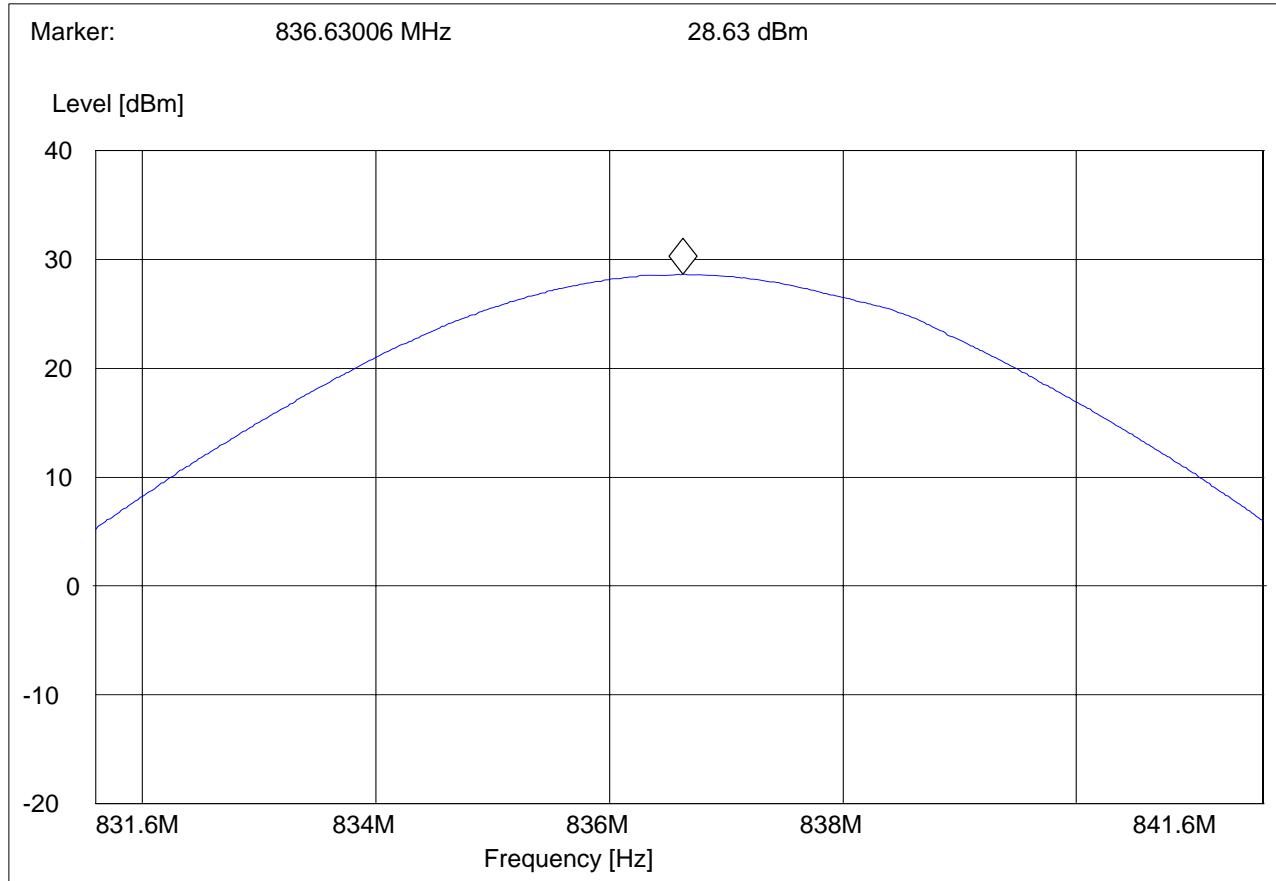


EIRP (GSM 850) CHANNEL 190 §22.913(a)

EUT: 34LC00b/C01
Customer: L3 Communications
Test Mode: GSM 850 CH190
ANT Orientation: V
EUT Orientation: V
Test Engineer: Chris
Voltage: AC Adaptor
Comments:

SWEEP TABLE: "EIRP 850 CH 190 V"

Start Frequency	Stop Frequency	Detector Meas.	IF Time	Transducer Bandw.
831.6 MHz	841.6 MHz	MaxPeak	Coupled	3 MHz DUMMY-DBM
		MaxPeak		

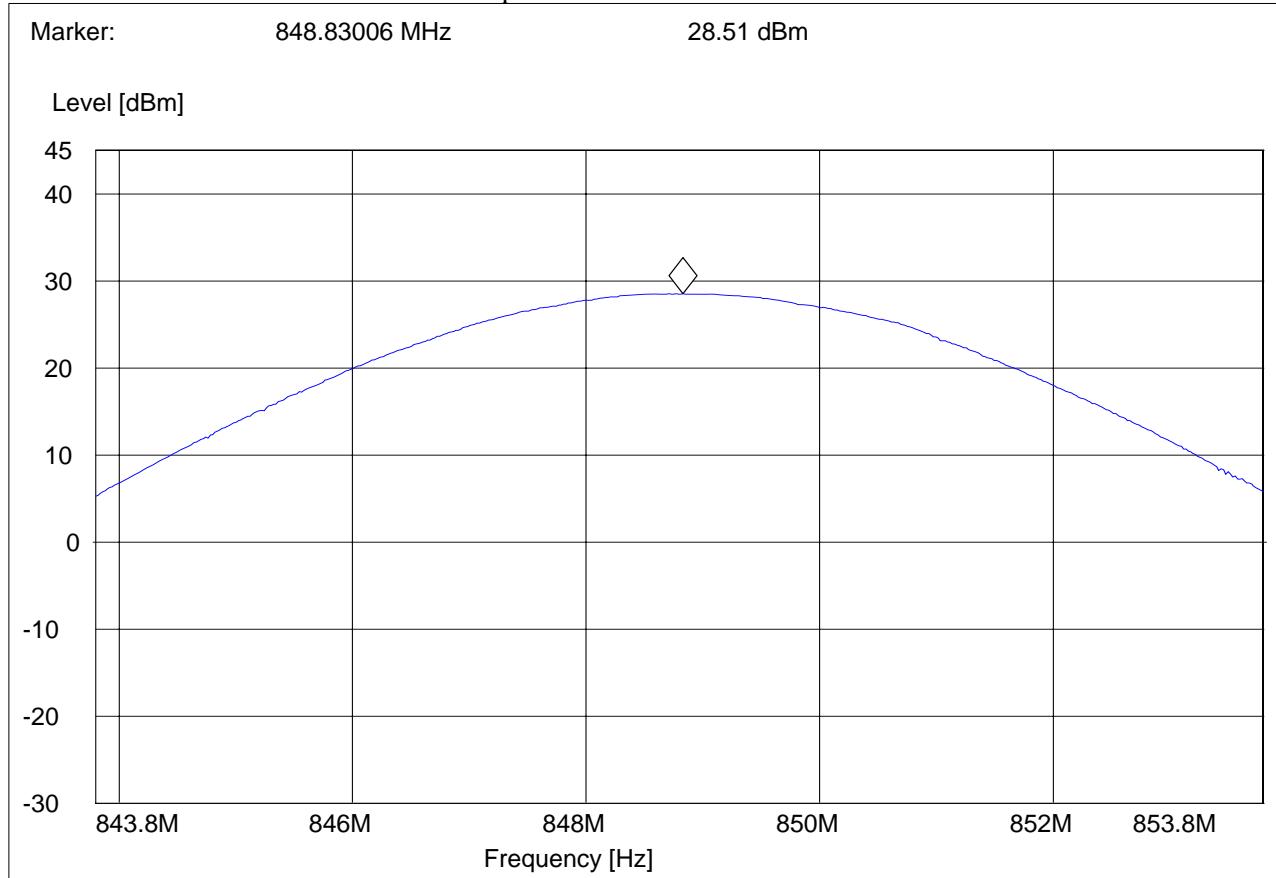


EIRP (GSM 850) CHANNEL 251 §22.913(a)

EUT: 34LC00b/C01
Customer: L3 Communications
Test Mode: GSM 850 CH251
ANT Orientation: V
EUT Orientation: V
Test Engineer: Chris
Voltage: AC Adaptor
Comments:

SWEEP TABLE: "EIRP 850 CH 251 V"

Start Frequency	Stop Frequency	Detector Meas.	IF Time	Transducer Bandw.
843.8 MHz	853.8 MHz	MaxPeak	Coupled	3 MHz DUMMY-DBM

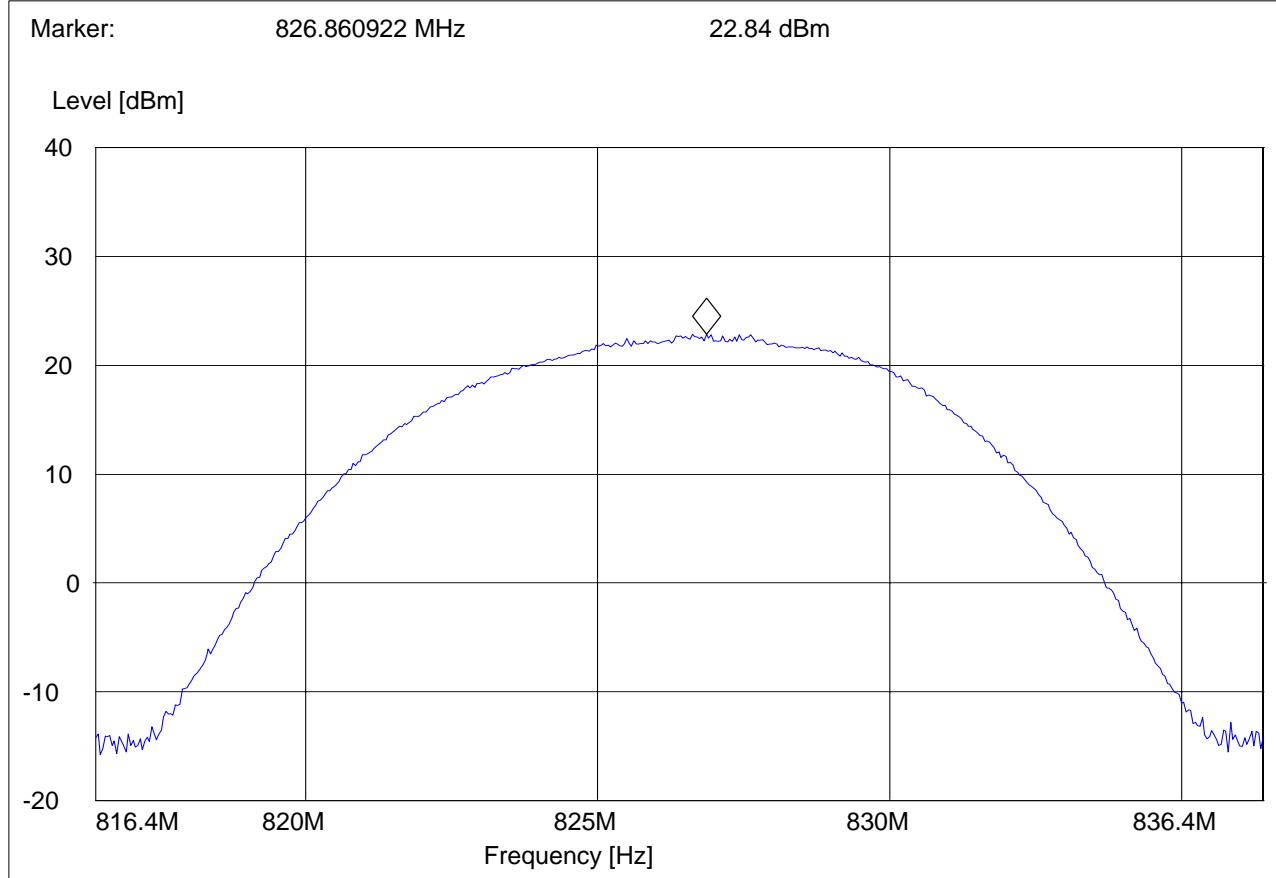


EIRP (UMTS FDD5) CHANNEL 4132 §22.913(a)

EUT: 34LC00b/C01
Customer: L3 Communications
Test Mode: WCDMA FDD5 ch.4132
ANT Orientation: H
EUT Orientation: V
Test Engineer: Chris
Voltage: AC Adaptor
Comments:

SWEEP TABLE: "EIRP 850 CH 4132H"

Start Frequency	Stop Frequency	Detector	Meas.	IF Time	Transducer Bandw.
816.4 MHz	836.4 MHz	MaxPeak	Coupled	5 MHz	DUMMY-DBM
		MaxPeak			

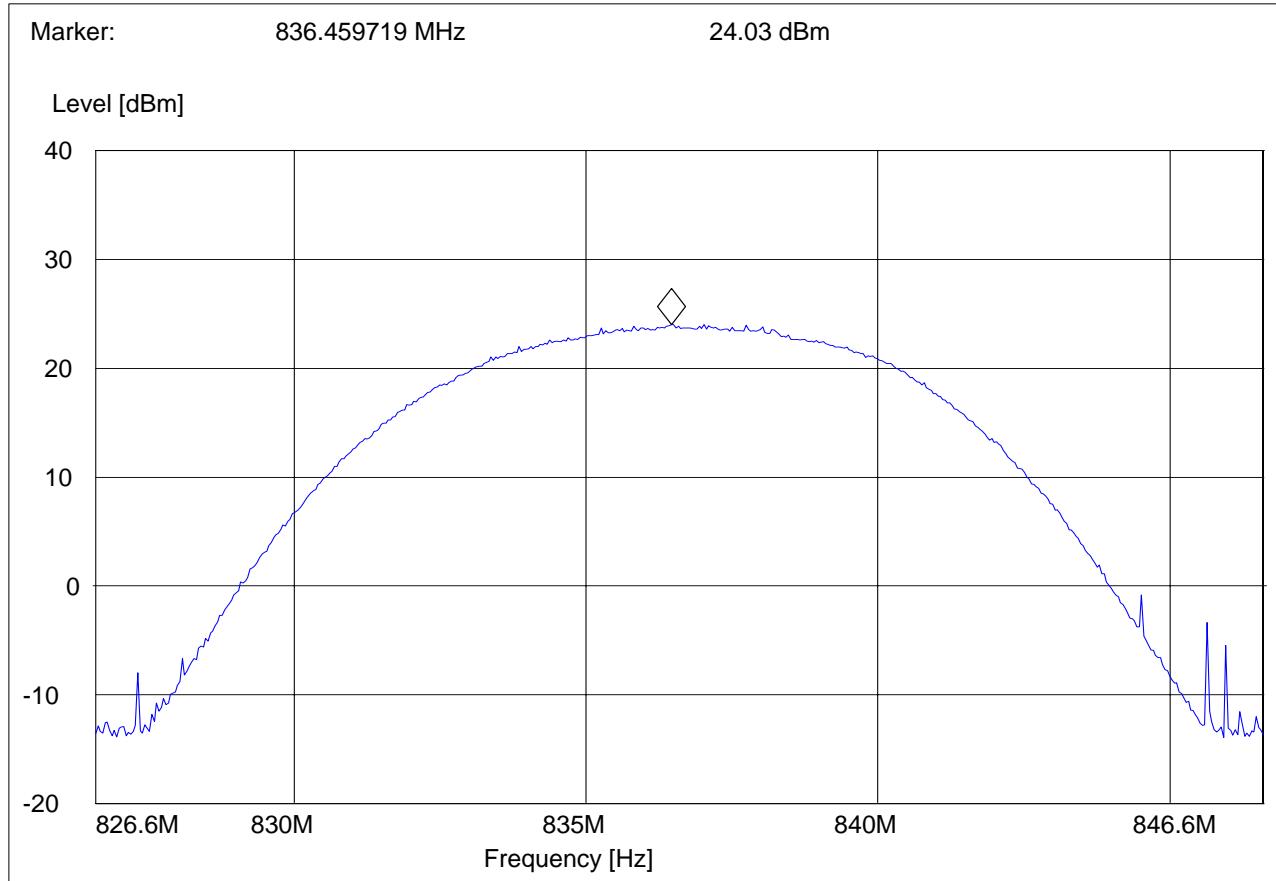


EIRP (UMTS FDD5) CHANNEL 4183 §22.913(a)

EUT: 34LC00b/C01
Customer: L3 Communications
Test Mode: WCDMA FDD5 ch.4183
ANT Orientation: H
EUT Orientation: V
Test Engineer: Chris
Voltage: AC Adaptor
Comments:

SWEEP TABLE: "EIRP 850 CH 4183 H"

Start Frequency	Stop Frequency	Detector	Meas.	IF Time	Transducer Bandw.
826.6 MHz	846.6 MHz	MaxPeak	Coupled	5 MHz	DUMMY-DBM
		MaxPeak			

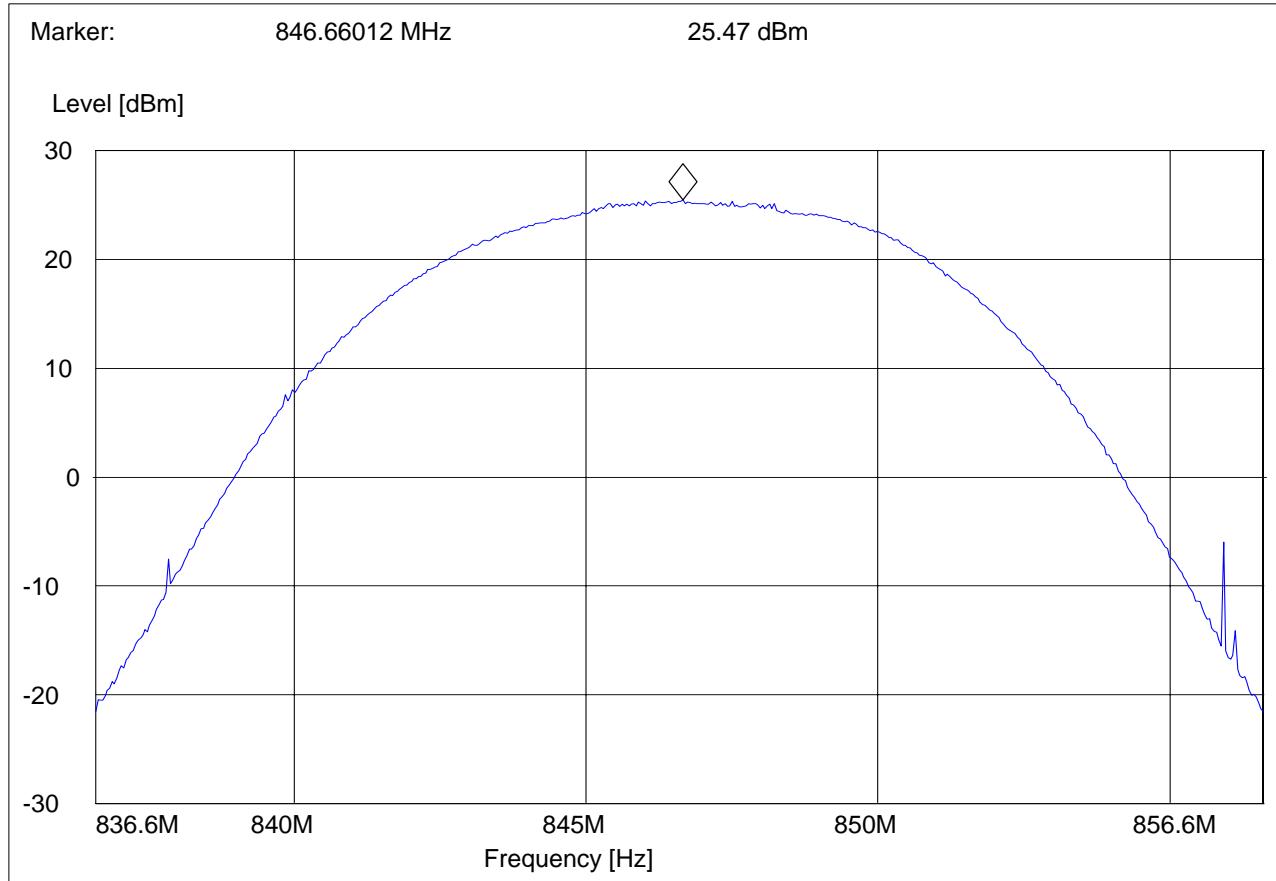


EIRP (UMTS FDD5) CHANNEL 4233 §22.913(a)

EUT: 34LC00b/C01
Customer: L3 Communications
Test Mode: WCDMA FDD5 ch.4233
ANT Orientation: H
EUT Orientation: V
Test Engineer: Chris
Voltage: AC Adaptor
Comments:

SWEEP TABLE: "EIRP 850 CH 4233H"

Start Frequency	Stop Frequency	Detector	Meas.	IF Time	Transducer Bandw.
836.6 MHz	856.6 MHz	MaxPeak	Coupled	5 MHz	DUMMY-DBM
		MaxPeak			

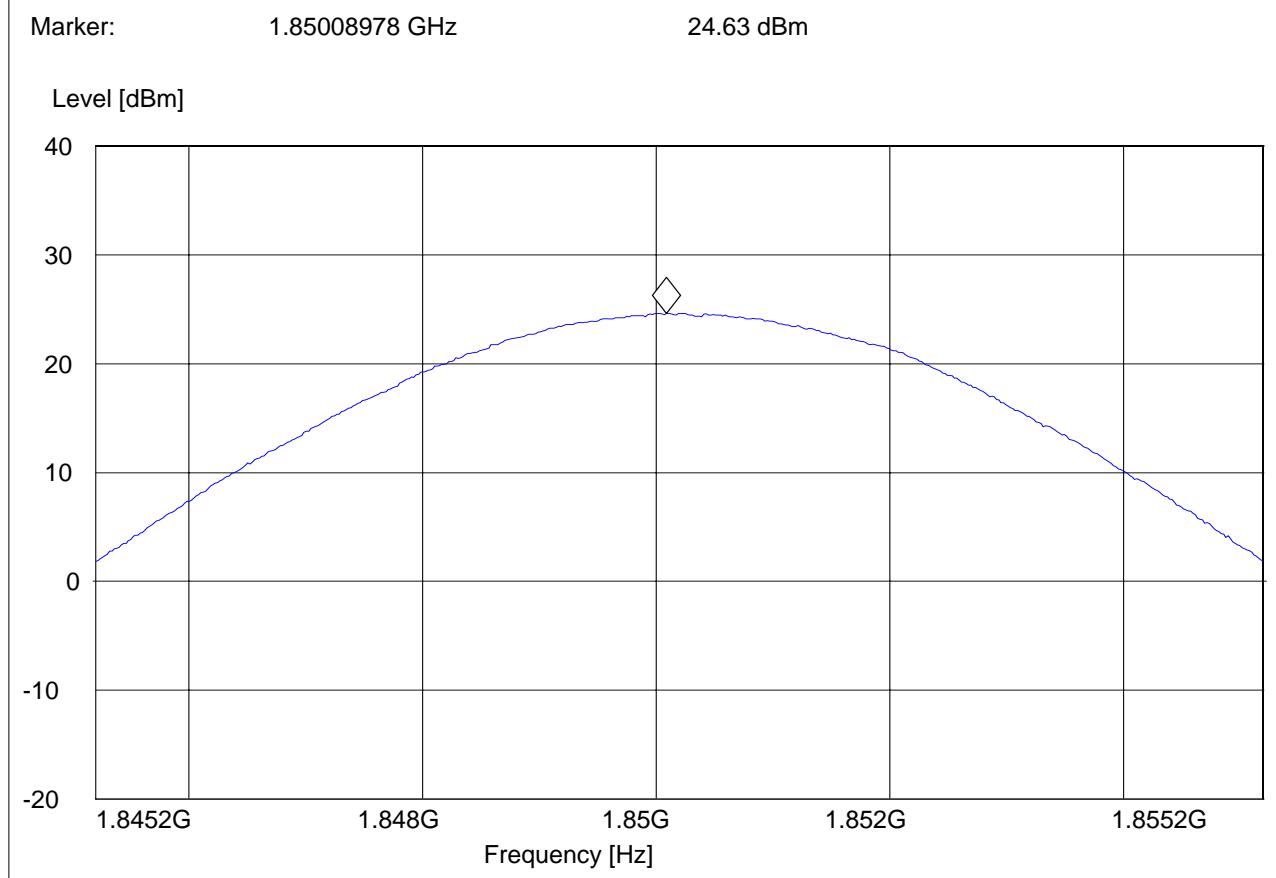


EIRP (PCS-1900) CHANNEL 512 §24.232(b)

EUT: 34LC00b/C01
Customer: L3 Communications
Test Mode: GSM 1900 CH512
ANT Orientation: H
EUT Orientation: V
Test Engineer: Chris
Voltage: AC Adaptor
Comments:

SWEEP TABLE: "EIRP 1900 CH512"

Short Description: EIRP PCS 1900 for channel-512
Start Stop Detector Meas. IF Transducer
Frequency Frequency Time Bandw.
1.8 GHz 1.9 GHz MaxPeak Coupled 3 MHz DUMMY-DBM

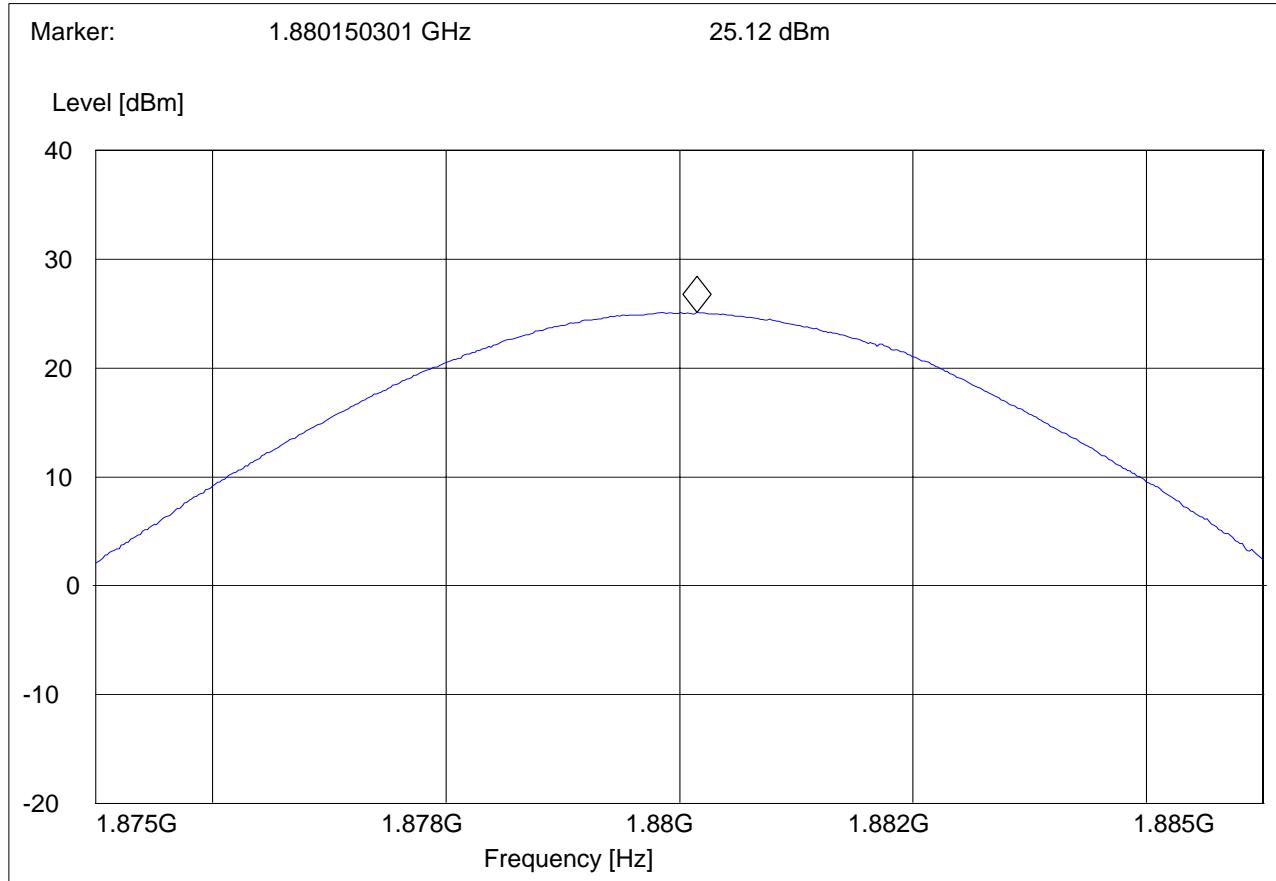


EIRP (PCS-1900) CHANNEL 661 §24.232(b)

EUT: 34LC00b/C01
Customer: L3 Communications
Test Mode: GSM 1900 CH661
ANT Orientation: H
EUT Orientation: V
Test Engineer: Chris
Voltage: AC Adaptor
Comments:

SWEEP TABLE: "EIRP 1900 CH661"

Short Description: EIRP PCS 1900 for channel-661
Start Stop Detector Meas. IF Transducer
Frequency Frequency Time Bandw.
1.9 GHz 1.9 GHz MaxPeak Coupled 3 MHz DUMMY-DBM
MaxPeak

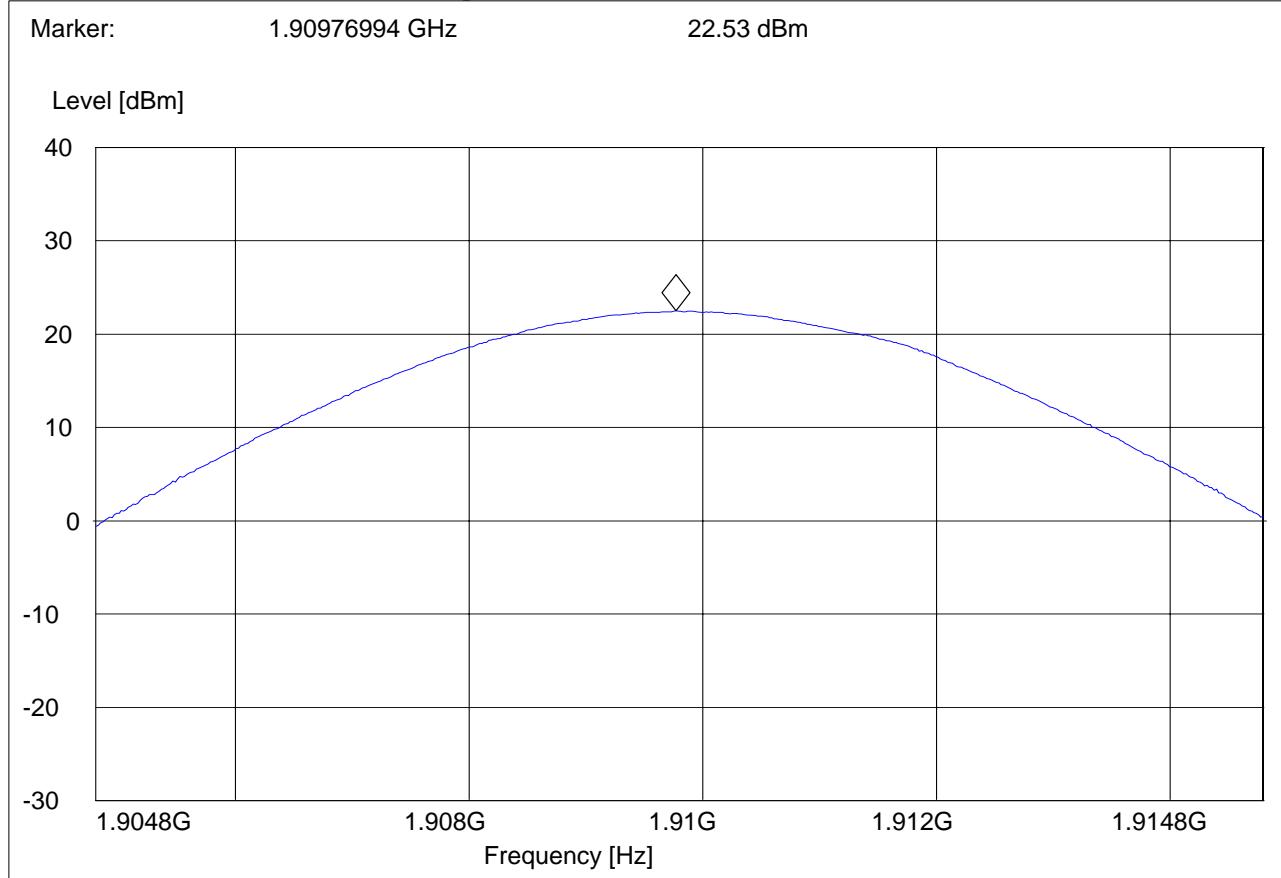


EIRP (PCS-1900) CHANNEL 810 §24.232(b)

EUT: 34LC00b/C01
Customer: L3 Communications
Test Mode: GSM 1900 CH810
ANT Orientation: H
EUT Orientation: V
Test Engineer: Chris
Voltage: AC Adaptor
Comments:

SWEEP TABLE: "EIRP 1900 CH810"

Short Description: EIRP PCS 1900 for channel-810
Start Stop Detector Meas. IF Transducer
Frequency Frequency Time Bandw.
1.9 GHz 1.9 GHz MaxPeak Coupled 3 MHz DUMMY-DBM

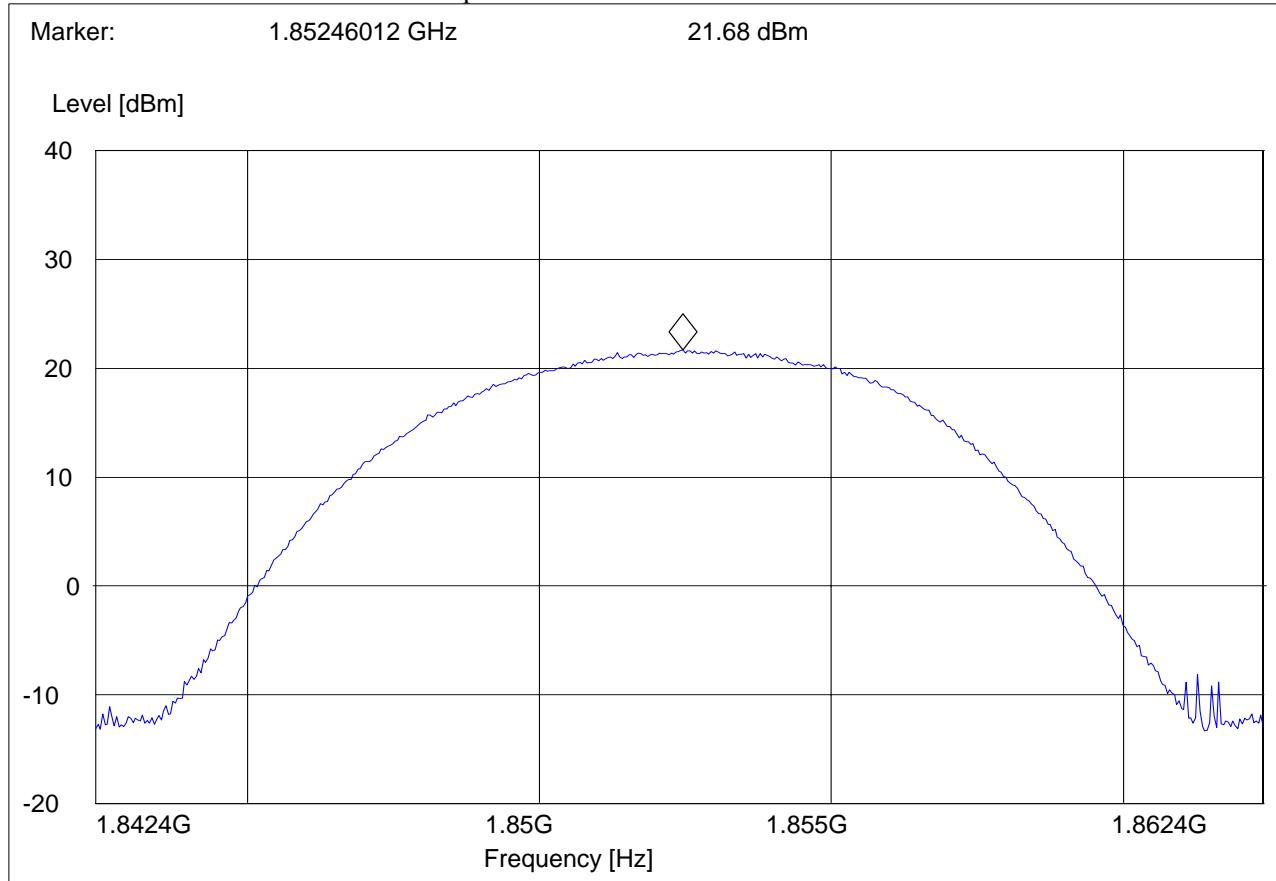


EIRP (UMTS FDD2) CHANNEL 9262 §24.232(b)

EUT: 34LC00b/C01
Customer: L3 Communications
Test Mode: WCDMA FDD2 ch.9262
ANT Orientation: H
EUT Orientation: V
Test Engineer: Chris
Voltage: AC Adaptor
Comments:

SWEEP TABLE: "EIRP 1900 CH 9262"

Short Description: EIRP PCS 1900 for channel-512
Start Stop Detector Meas. IF Transducer
Frequency Frequency Time Bandw.
1.8 GHz 1.9 GHz MaxPeak Coupled 5 MHz DUMMY-DBM

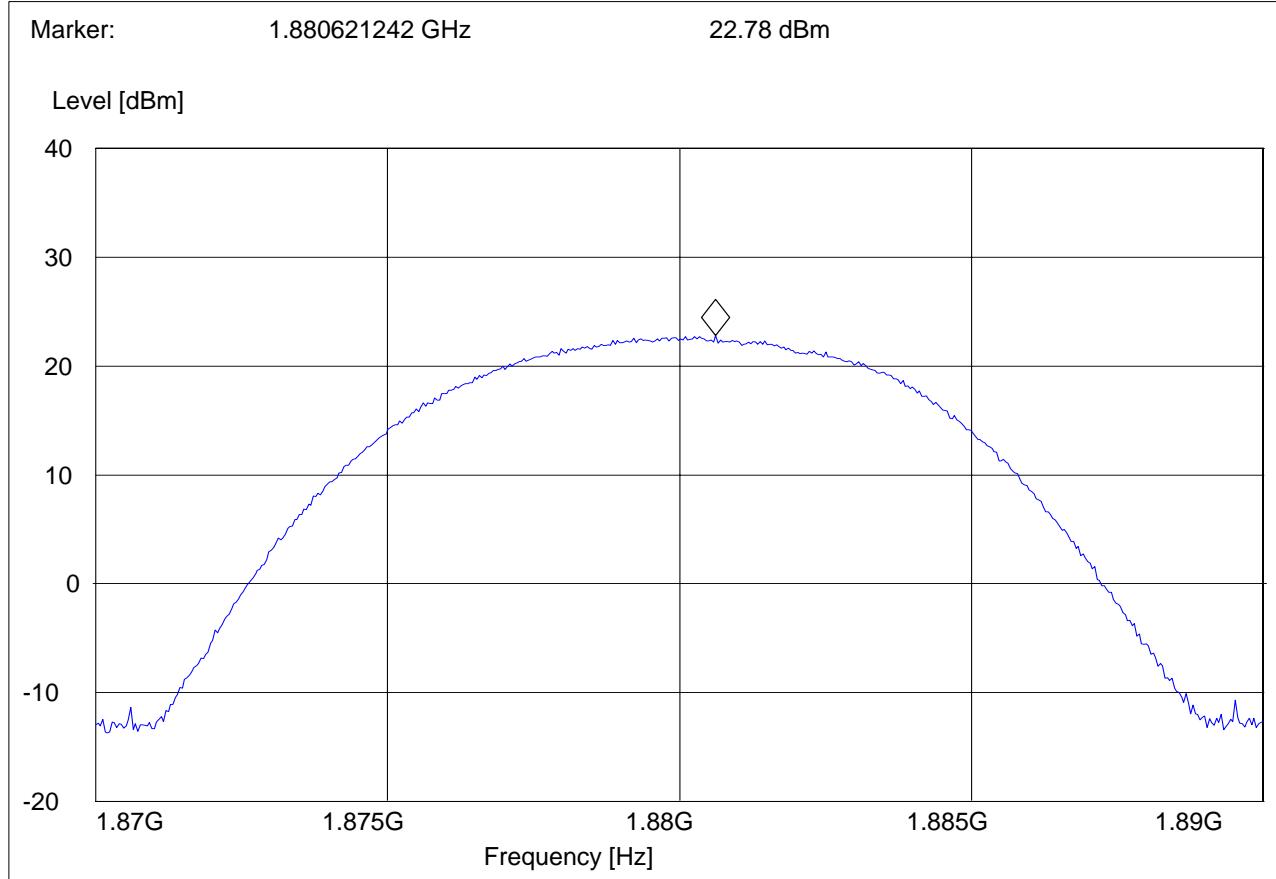


EIRP (UMTS FDD2) CHANNEL 9400 §24.232(b)

EUT: 34LC00b/C01
Customer: L3 Communications
Test Mode: WCDMA FDD2 ch.9400
ANT Orientation: H
EUT Orientation: V
Test Engineer: Chris
Voltage: AC Adaptor
Comments:

SWEEP TABLE: "EIRP 1900 CH 9400"

Short Description: EIRP PCS 1900 for channel-661
Start Stop Detector Meas. IF Transducer
Frequency Frequency Time Bandw.
1.9 GHz 1.9 GHz MaxPeak Coupled 5 MHz DUMMY-DBM
MaxPeak



EIRP (UMTS FDD2) CHANNEL 9538 §24.232(b)

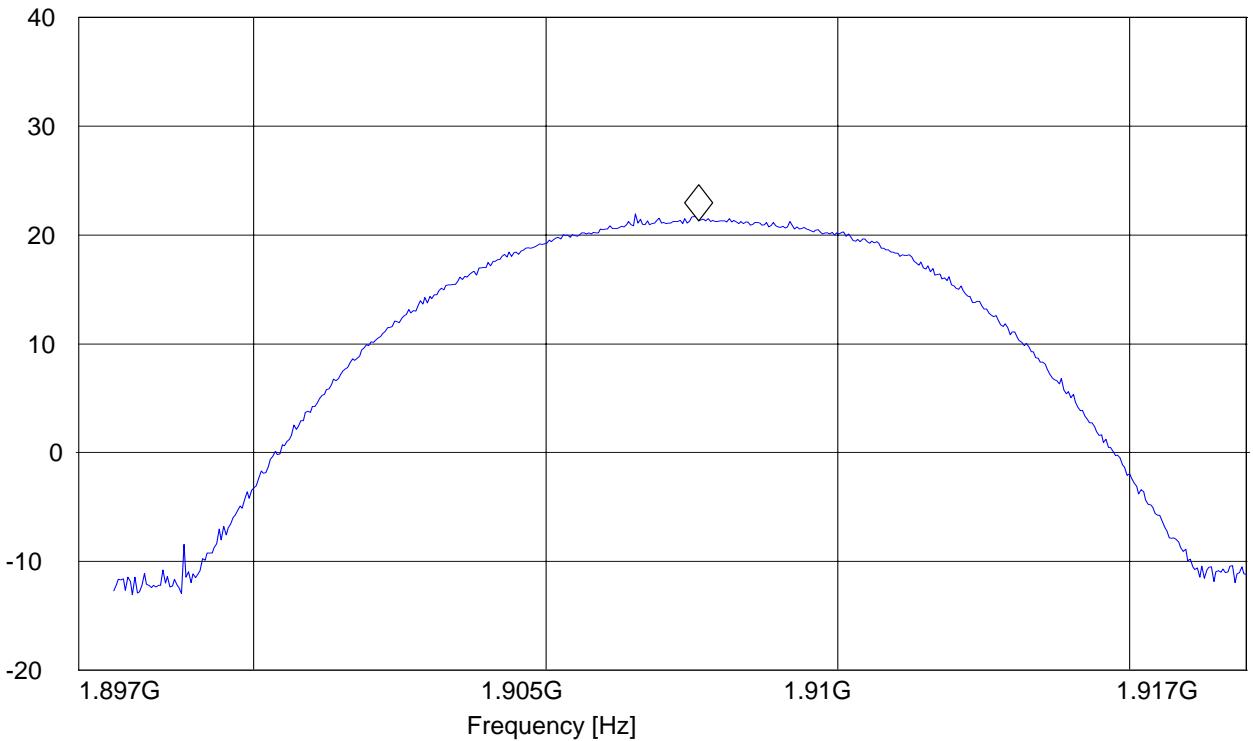
EUT: 34LC00b/C01
Customer: L3 Communications
Test Mode: WCDMA FDD2 ch.9538
ANT Orientation: H
EUT Orientation: V
Test Engineer: Chris
Voltage: AC Adaptor
Comments:

SWEEP TABLE: "EIRP 1900 CH 9538"

Short Description:		EIRP PCS 1900 for channel-810			
Start Frequency	Stop Frequency	Detector	Meas.	IF	Transducer
1.9 GHz	1.9 GHz	MaxPeak	Coupled	5 MHz	DUMMY-DBM

Marker: 1.90762004 GHz 21.29 dBm

Level [dBm]



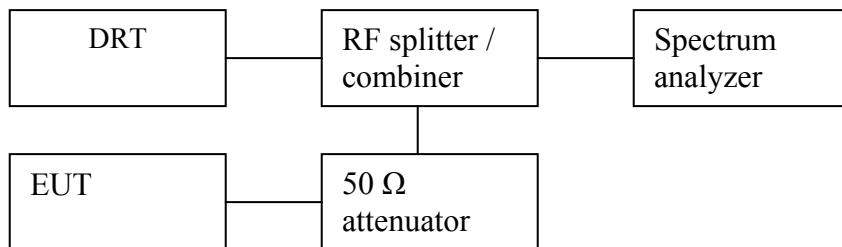
5.2 Occupied Bandwidth/Emission Bandwidth

5.2.1 FCC 2.1049 Measurements required: Occupied bandwidth

The occupied bandwidth, that is the frequency bandwidth such that below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured under the following conditions as applicable.

(h) Transmitters employing digital modulation techniques-when modulated by an input signal such that its amplitude and symbol rate represent the maximum rated conditions under which the equipment will be operated.

5.2.2 Occupied / emission bandwidth measurement procedure:



1. Connect the equipment as shown in the above diagram.
2. Adjust the settings of the Digital Radiocommunication Tester (DRT) to set the EUT to its maximum power at the required channel.
3. Set the spectrum analyzer to measure the 99% (-20 dB) occupied bandwidth. Record the value.
4. Set the spectrum analyzer to measure the 99.5% (-26 dB) emission bandwidth. Record the value.
5. Measurements are to be performed with the EUT set to the low, middle and high channel of each frequency band.

5.2.3 Occupied / Emission bandwidth results 850 MHz band:

The test results of this test report relate exclusively to radiated measurement only. Radio module used in this product has been previously certified under its own FCC ID. For results of the conducted measurement please refer to the conducted test report.

5.3 Frequency Stability

5.3.1 Limit

For Hand carried battery powered equipment:

According to the JTC standard the frequency stability of the carrier shall be accurate to within 0.1 ppm of the received frequency from the base station. This accuracy is sufficient to meet Sec. 24.235, Frequency Stability. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. As this transceiver is considered "Hand carried, battery powered equipment" Section 2.1055(d)(2) applies. This requires that the lower voltage for frequency stability testing be specified by the manufacturer. This transceiver is specified to operate with an input voltage of between 3.2VDC and 4.5VDC, with a nominal voltage of 3.7VDC. Operation above or below these voltage limits is prohibited by transceiver software in order to prevent improper operation as well as to protect components from overstress. These voltages represent a tolerance of -2.7% and +21.62%. For the purposes of measuring frequency stability these voltage limits are to be used.

Method of Measurement:

In order to measure the carrier frequency under the condition of AFC lock, it is necessary to make measurements with the EUT in a "call mode". This is accomplished with the use of R&S CMU 200 UNIVERSAL RADIO COMMUNICATION TESTER.

1. Measure the carrier frequency at room temperature.
2. Subject the EUT to overnight soak at -30 C.
3. With the EUT, powered via nominal voltage, connected to the CMU 200 and in a simulated call on mid channel (190 for GSM 850 & 4183 for FDD5 & 661 for PCS-1900&9400 for FDD2), measure the carrier frequency. These measurements should be made within 2 minutes of powering up the EUT, to prevent significant self-warming.
4. Repeat the above measurements at 10 C increments from -30 C to +50 C. Allow at least 1 1/2 hours at each temperature, un-powered, before making measurements.
5. Re-measure carrier frequency at room temperature with nominal voltage. Vary supply voltage from minimum voltage to maximum voltage, in 0.1Volt increments re-measuring carrier frequency at each voltage. Pause at nominal voltage for 1 1/2 hours un-powered, to allow any self-heating to stabilize, before continuing.
6. Subject the EUT to overnight soak at +50 C.
7. With the EUT, powered via nominal voltage, connected to the CMU 200 and in a simulated call on mid channel (190 for GSM 850 & 4183 for FDD5 & 661 for PCS-1900&9400 for FDD2), measure the carrier frequency. These measurements should be made within 2 minutes of powering up the EUT, to prevent significant self-warming.
8. Repeat the above measurements at 10 C increments from +50 C to -30 C. Allow at least 1 1/2 hours at each temperature, un-powered, before making measurements.
9. At all temperature levels hold the temperature to +/- 0.5 C during the measurement procedure.

For equipment powered by primary supply voltage:

According to the JTC standard the frequency stability of the carrier shall be accurate to within 0.1 ppm of the received frequency from the base station. This accuracy is sufficient to meet Sec. 24.235, Frequency Stability. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

For this EUT section 2.1055(d)(1) applies. This requires to vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

5.3.2 Test Results Frequency Stability (GSM-850)

The test results of this test report relate exclusively to radiated measurement only. Radio module used in this product has been previously certified under its own FCC and IC ID. For results of the conducted measurement please refer to the conducted test report.

5.3.3 FREQUENCY STABILITY (PCS-1900)

The test results of this test report relate exclusively to radiated measurement only. Radio module used in this product has been previously certified under its own FCC and IC ID. For results of the conducted measurement please refer to the conducted test report.

5.4 Spurious Emissions Conducted

5.4.1 FCC 2.1051 Measurements required: Spurious emissions at antenna terminals.

The radio frequency voltage or power generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminals when properly loaded with a suitable artificial antenna. Curves or equivalent data shall show the magnitude of each harmonic and other spurious emission that can be detected when the equipment is operated under the conditions specified in FCC 2.1049 as appropriate. The magnitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be specified.

5.4.2 Limits:

5.4.2.1 FCC 22.917 Emission limitations for cellular equipment.

The rules in this section govern the spectral characteristics of emissions in the Cellular Radiotelephone Service.

(a) *Out of band emissions.* The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

(b) *Measurement procedure.* Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (*i.e.* 100 kHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center

frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

5.4.2.2 FCC 24.238 Emission limitations for Broadband PCS equipment.

The rules in this section govern the spectral characteristics of emissions in the Broadband Personal Communications Service.

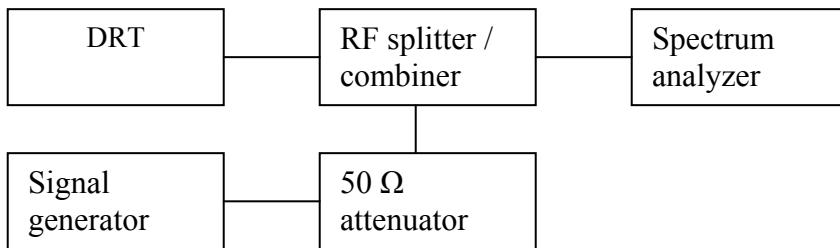
(a) *Out of band emissions.* The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

(b) *Measurement procedure.* Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (*i.e.* 100 kHz of 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

5.4.3 Conducted out of band emissions measurement procedure:

Based on TIA-603C 2004

2.2.13 Unwanted Emissions: Conducted Spurious



1. Connect the equipment as shown in the above diagram.
2. Set the spectrum analyzer to measure peak hold with the required settings.
3. Set the signal generator to a known output power and record the path loss in dB (**LOSS**) for frequencies up to the tenth harmonic of the EUT's carrier frequency. **LOSS** = Generator Output Power (dBm) – Analyzer reading (dBm).
4. Replace the signal generator with the EUT.
5. Adjust the settings of the Digital Radiocommunication Tester (DRT) to set the EUT to its maximum power at the required channel.
6. Set the spectrum analyzer to measure peak hold with the required settings. Offset the spectrum analyzer reference level by the path loss measured above.
7. Measure and record all spurious emissions up to the tenth harmonic of the carrier frequency.

8. Measurements are to be performed with the EUT set to the low, middle and high channel of each frequency band.
9. If necessary steps 6 and 7 may be performed with the spectrum analyzer set to average detector.

(**note:** Step 3 above is performed prior to testing and **LOSS** is recorded by test software. Steps 2, 6, and 7 above are performed with test software.)

5.4.4 Test Results: Conducted Emission:

The test results of this test report relate exclusively to radiated measurement only. Radio module used in this product has been previously certified under its own FCC ID. For results of the conducted measurement please refer to the conducted test report.

5.5 Spurious Emissions Radiated

5.5.1 FCC 2.1053 Measurements required: Field strength of spurious radiation.

- (a) Measurements shall be made to detect spurious emissions that may be radiated directly from the cabinet, control circuits, power leads or intermediate circuit elements under normal conditions of installation and operation. Curves or equivalent data shall be supplied showing the magnitude of each harmonic and other spurious emission.

5.5.2 Limits:

5.5.2.1 FCC 22.917 Emission limitations for cellular equipment.

The rules in this section govern the spectral characteristics of emissions in the Cellular Radiotelephone Service.

(a) *Out of band emissions.* The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

(b) *Measurement procedure.* Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (*i.e.* 100 kHz of 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

5.5.2.2 FCC 24.238 Emission limitations for Broadband PCS equipment.

The rules in this section govern the spectral characteristics of emissions in the Broadband Personal Communications Service.

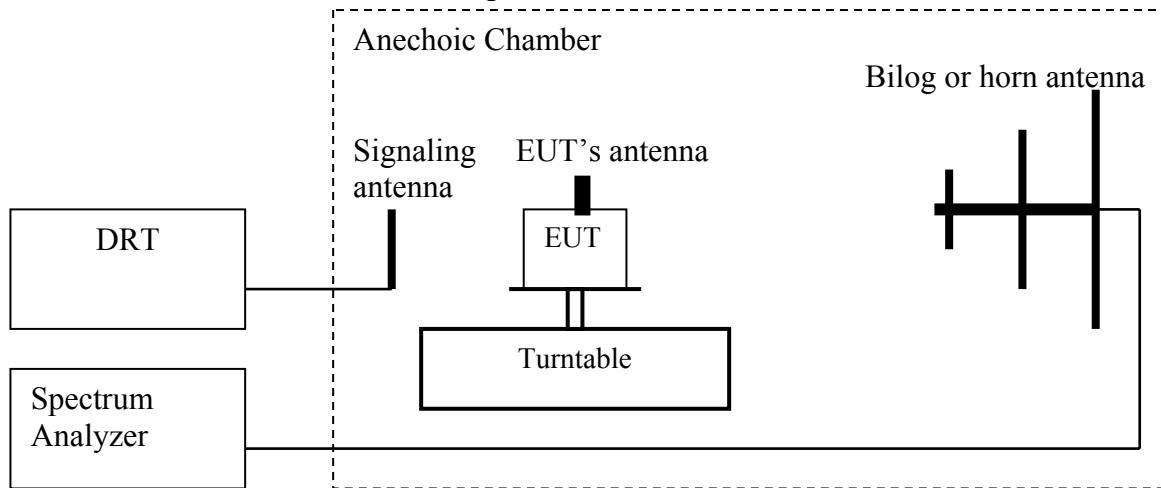
(a) *Out of band emissions.* The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

(b) *Measurement procedure.* Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (*i.e.* 100 kHz of 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

5.5.3 Radiated out of band measurement procedure:

Based on TIA-603C 2004

2.2.12 Unwanted emissions: Radiated Spurious



1. Connect the equipment as shown in the above diagram with the EUT's antenna in a horizontal orientation.
2. Adjust the settings of the Digital Radiocommunication Tester (DRT) to set the EUT to its maximum power at the required channel.
3. Set the spectrum analyzer to measure peak hold with the required settings.
4. Place the measurement antenna in a horizontal orientation. Rotate the EUT 360°. Raise the measurement antenna up to 4 meters in 0.5 meters increments and rotate

the EUT 360° at each height to maximize all emissions. Measure and record all spurious emissions (**LVL**) up to the tenth harmonic of the carrier frequency.

5. Replace the EUT with a horizontally polarized half wave dipole or known gain antenna. The center of the antenna should be at the same location as the center of the EUT's antenna.
6. Connect the antenna to a signal generator with known output power and record the path loss in dB (**LOSS**). **LOSS** = Generator Output Power (dBm) – Analyzer reading (dBm).
7. Determine the level of spurious emissions using the following equation:
Spurious (dBm) = **LVL** (dBm) + **LOSS** (dB):
8. Repeat steps 4, 5 and 6 with all antennas vertically polarized.
9. Determine the level of spurious emissions using the following equation:
Spurious (dBm) = **LVL** (dBm) + **LOSS** (dB):
10. Measurements are to be performed with the EUT set to the low, middle and high channel of each frequency band.

(**note:** Steps 5 and 6 above are performed prior to testing and **LOSS** is recorded by test software. Steps 3, 4 and 7 above are performed with test software.)

Spectrum analyzer settings:

Res B/W: 1 MHz

Vid B/W: 1 MHz

Measurement Survey:

Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of the GSM-850 & PCS-1900 bands. It was decided that measurements at these three carrier frequencies would be sufficient to demonstrate compliance with emissions limits because it was seen that all the significant spurs occur well outside the band and no radiation was seen from a carrier in one block of the GSM-850 & PCS-1900 band into any of the other blocks respectively. The equipment must still, however, meet emissions requirements with the carrier at all frequencies over which it is capable of operating and it is the manufacturer's responsibility to verify this.

Radiated emission measurements were made only with Circuit Switched mode GMSK modulation because this mode represents the worse case emission for all the modulations for GSM. See section 5.5.4.1 and 5.5.4.3

Radiated emissions measurements were made also with UMTS FDD mode. See section 5.5.4.2 and 5.5.4.4

5.5.4 Radiated out of band emissions results on EUT:

5.5.4.1 Test Results Transmitter Spurious Emission GSM850:

Harmonics	Tx ch-128 Freq. (MHz)	Level (dBm)	Tx ch-190 Freq. (MHz)	Level (dBm)	Tx ch-251 Freq. (MHz)	Level (dBm)
2	1648.4	NF	1673.2	NF	1697.6	NF
3	2472.6	NF	2509.8	NF	2546.4	NF
4	3296.8	NF	3346.4	NF	3395.2	NF
5	4121	NF	4183	NF	4244	NF
6	4945.2	NF	5019.6	NF	5092.8	NF
7	5769.4	NF	5856.2	NF	5941.6	NF
8	6593.6	NF	6692.8	NF	6790.4	NF
9	7417.8	NF	7529.4	NF	7639.2	NF
10	8242	NF	8366	NF	8488	NF
NF = NOISE FLOOR						

RADIATED SPURIOUS EMISSIONS (GSM-850) TX: 30MHz - 1GHz

Spurious emission limit -13dBm

Antenna: vertical

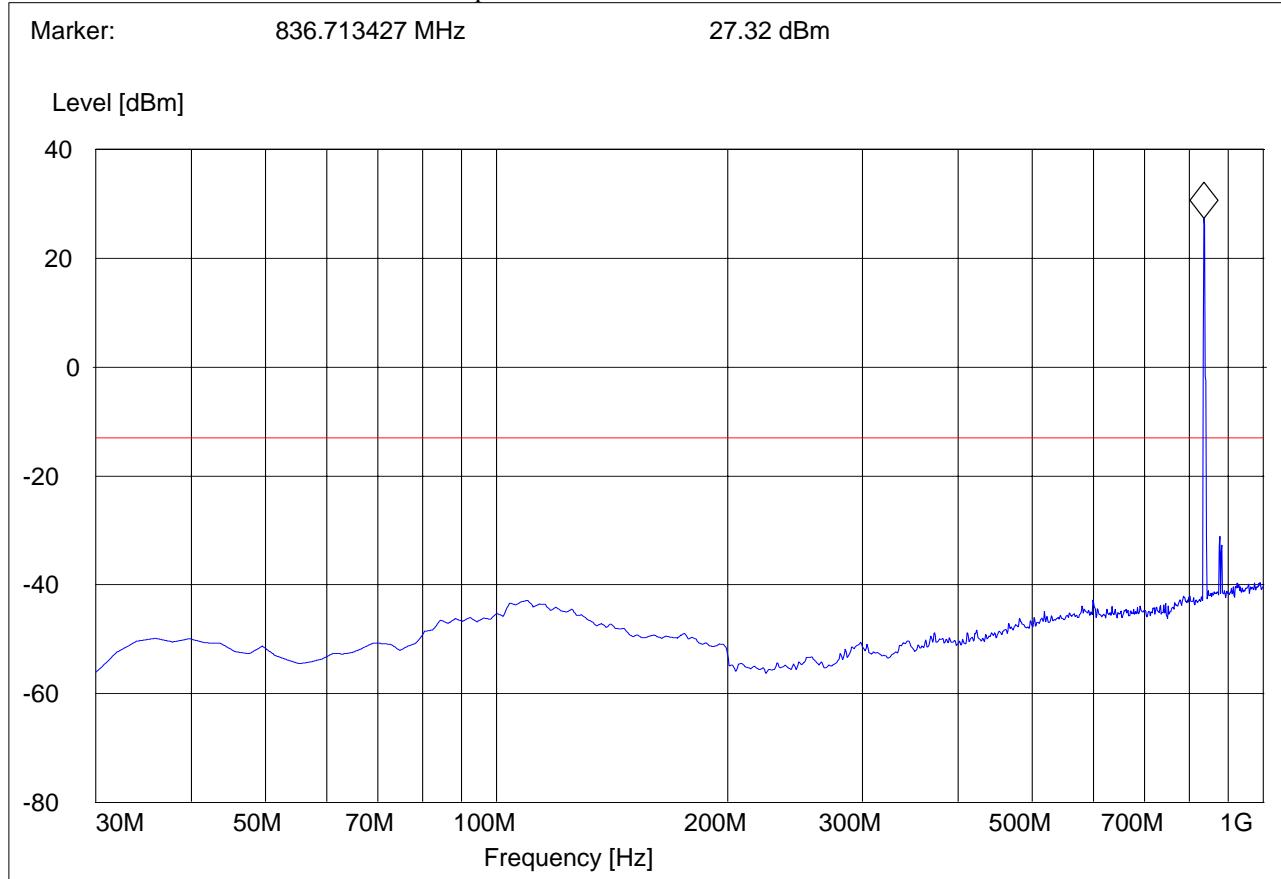
Note:

1. The peak above the limit line is the carrier freq.
2. This plot is valid for low, mid & high channels (worst-case plot)

EUT: 34LC00b/C01
Customer: L3 Communications
Test Mode: GSM 850 CH190
ANT Orientation: V
EUT Orientation: V
Test Engineer: Chris
Voltage: AC Adaptor
Comments:

SWEEP TABLE: "FCC 24 Spur 30M-1G_V"

Start Frequency	Stop Frequency	Detector Meas.	IF Time	Transducer Bandw.
30.0 MHz	1.0 GHz	MaxPeak	Coupled	1 MHz DUMMY-DBM



RADIATED SPURIOUS EMISSIONS (GSM-850)TX: 30MHz - 1GHz

Spurious emission limit -13dBm

Antenna: horizontal

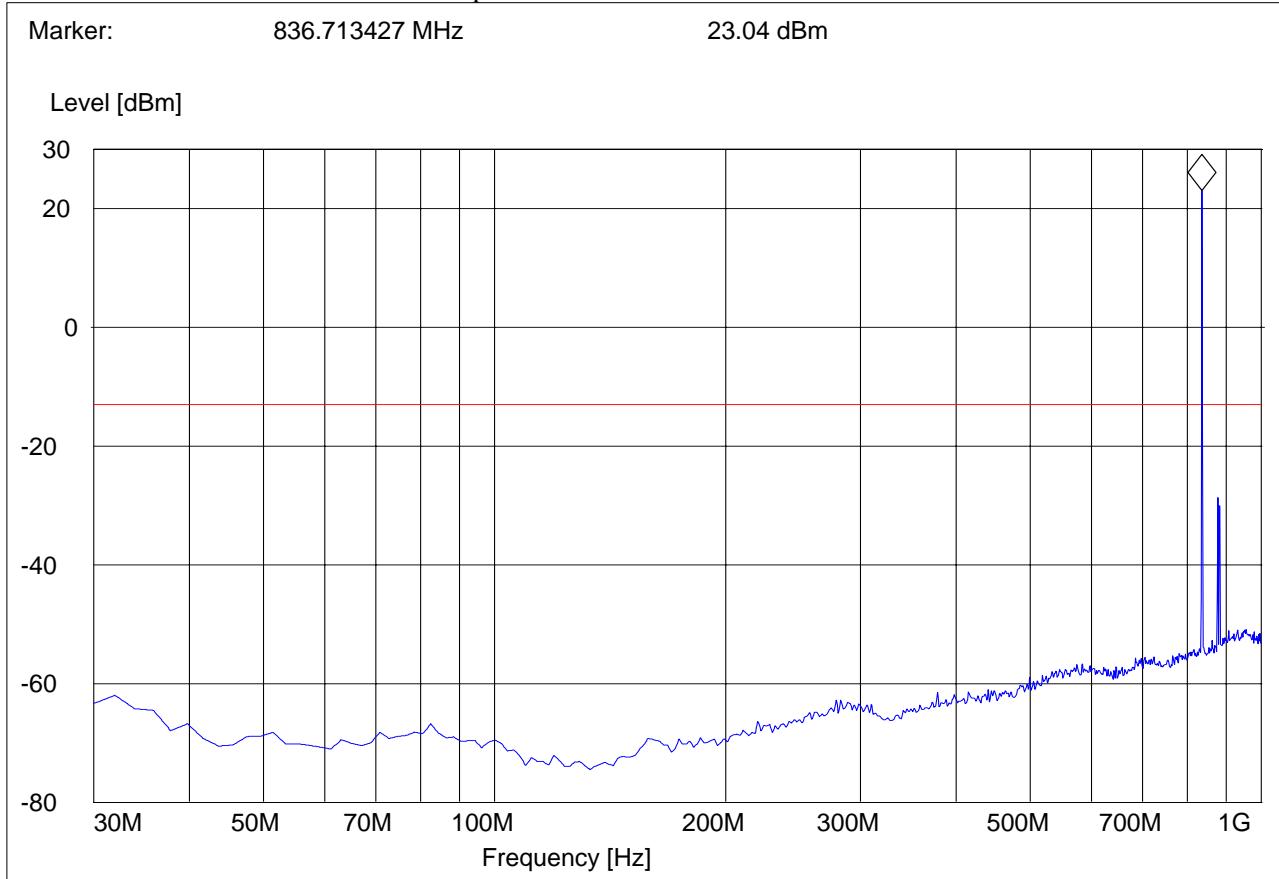
Note:

1. The peak above the limit line is the carrier freq.
2. This plot is valid for low, mid & high channels (worst-case plot)

EUT: 34LC00b/C01
Customer: L3 Communications
Test Mode: GSM 850 CH190
ANT Orientation: H
EUT Orientation: V
Test Engineer: Chris
Voltage: AC Adaptor
Comments:

SWEEP TABLE: "FCC 24 Spur 30M-1G_H"

Start Frequency	Stop Frequency	Detector Meas.	IF Time	Transducer Bandw.
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz DUMMY-DBM



RADIATED SPURIOUS EMISSIONS (GSM-850) CHANNEL 128 Tx : 1GHz – 3GHz

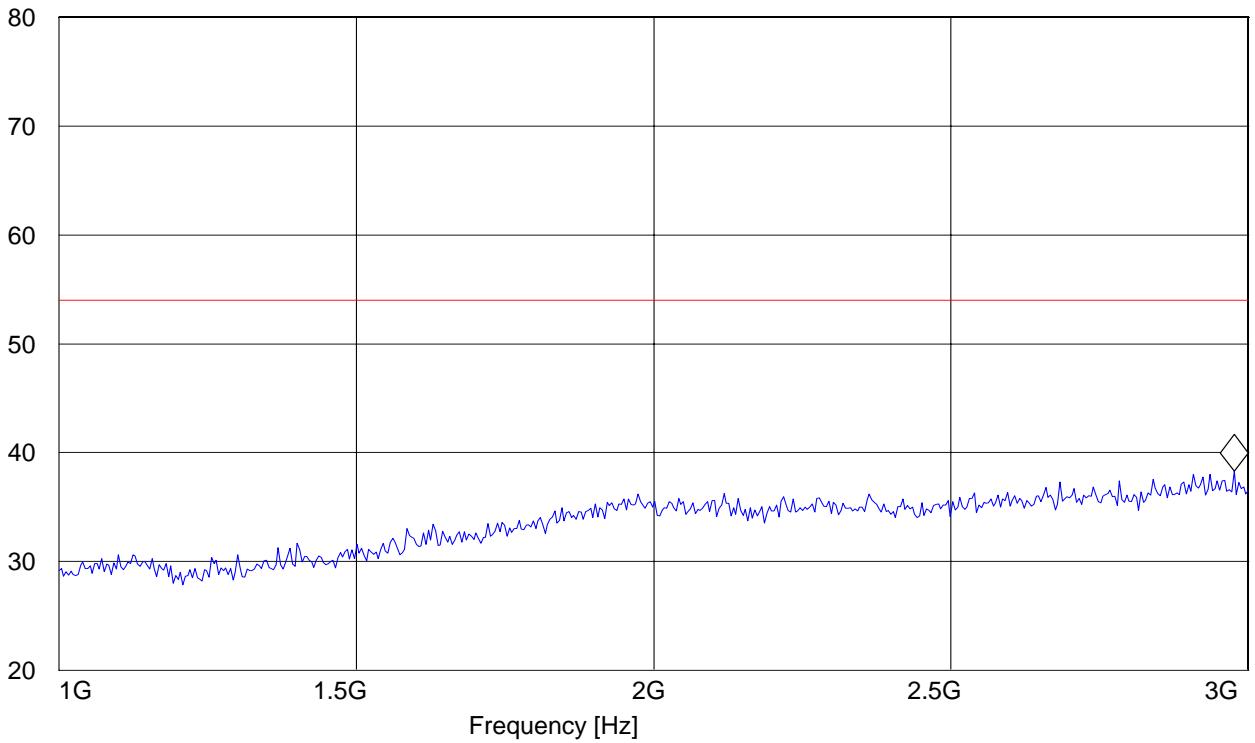
EUT: 34LC00b/C01
Customer: L3 Communications
Test Mode: GSM 850 CH 128
ANT Orientation: V
EUT Orientation: H
Test Engineer: VAL
Voltage: AC
Comments:

SWEEP TABLE: "CANADA RE_1-3G"

Start Frequency	Stop Frequency	Detector Meas.	IF Time	Transducer Bandw.
1.0 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz #326horn AF horz

Marker: 2.975951904 GHz 38.29 dB μ V/m

Level [dB μ V/m]



RADIATED SPURIOUS EMISSIONS (GSM-850) Tx CHANNEL 128: 3GHz – 9GHz

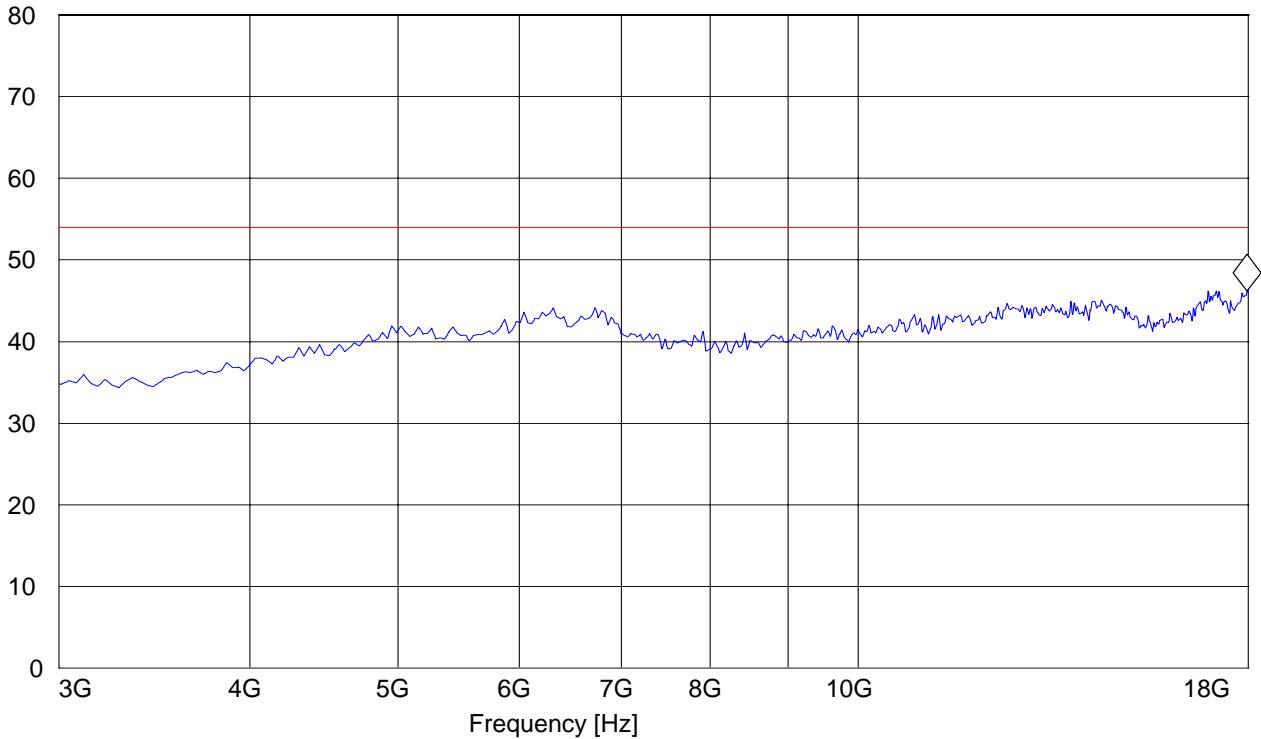
EUT: 34LC00b/C01
Customer: L3 Communications
Test Mode: GSM 850 CH 128
ANT Orientation: V
EUT Orientation: H
Test Engineer: VAL
Voltage: AC
Comments:

SWEEP TABLE: "CANADA RE_3-18G"

Start Frequency	Stop Frequency	Detector Meas.	IF Time	Transducer Bandw.
1.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz #326horn AF horz

Marker: 17.965931864 GHz 46.23 dB μ V/m

Level [dB μ V/m]

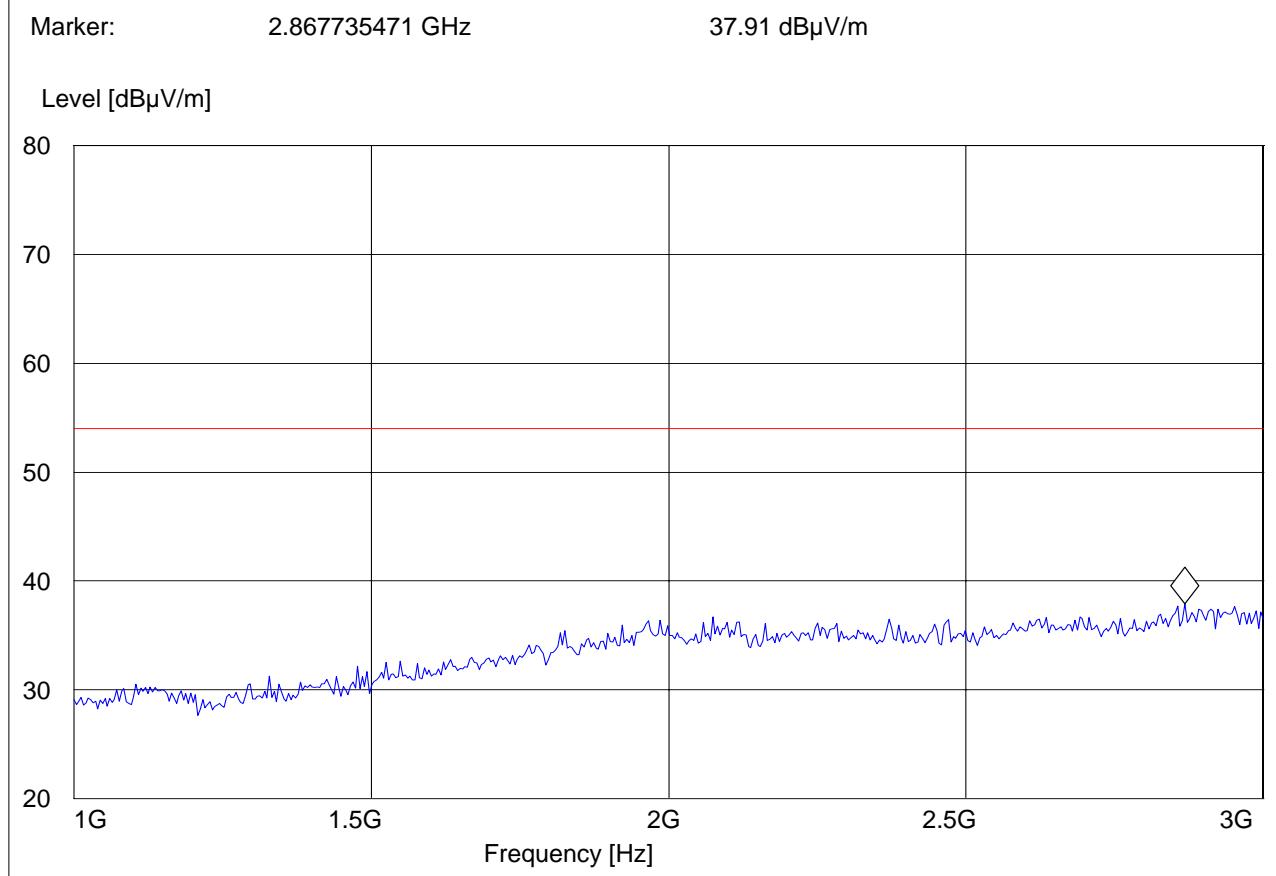


RADIATED SPURIOUS EMISSIONS (GSM-850) Tx CHANNEL 190: 1GHz – 3GHz

EUT: 34LC00b/C01
Customer: L3 Communications
Test Mode: GSM 850 CH 190
ANT Orientation: V
EUT Orientation: H
Test Engineer: VAL
Voltage: AC
Comments:

SWEEP TABLE: "CANADA RE_1-3G"

Start Frequency	Stop Frequency	Detector Meas.	IF Time	Transducer Bandw.
1.0 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz #326horn AF horz



RADIATED SPURIOUS EMISSIONS (GSM-850) Tx CHANNEL 190: 3 GHz – 9 GHz

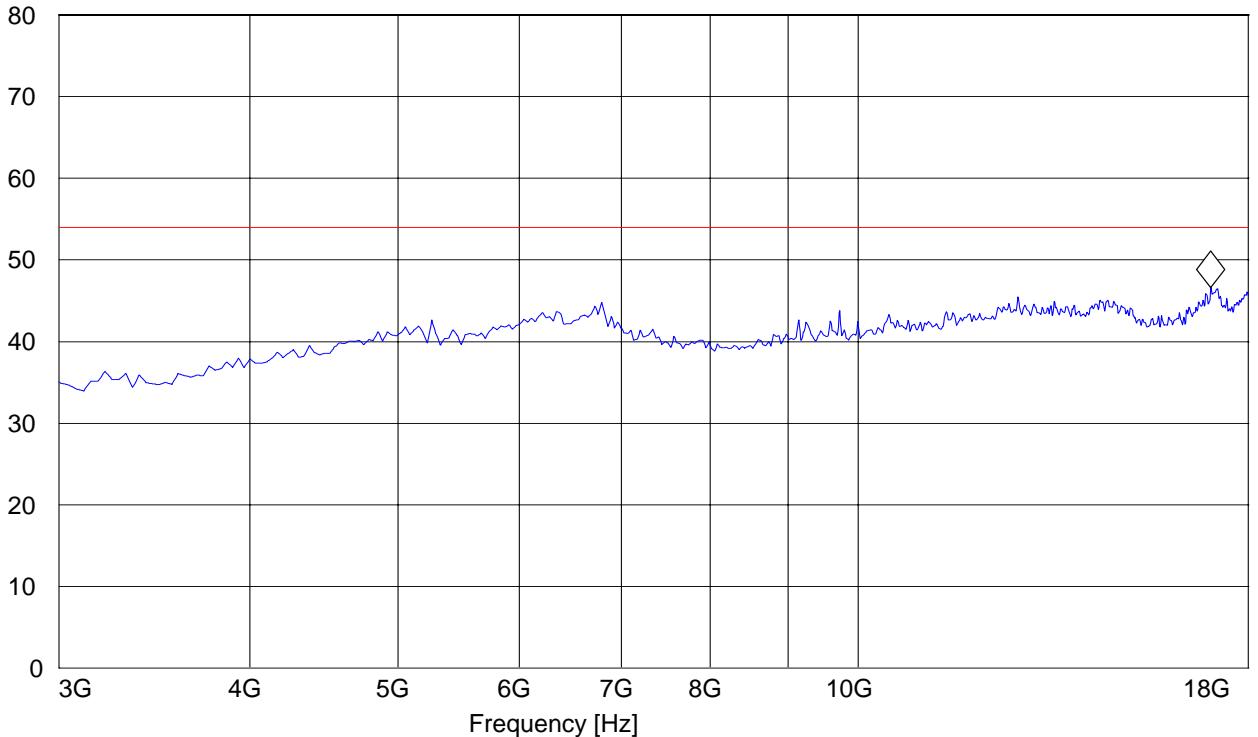
EUT: 34LC00b/C01
Customer: L3 Communications
Test Mode: GSM 850 CH 190
ANT Orientation: V
EUT Orientation: H
Test Engineer: VAL
Voltage: AC
Comments:

SWEEP TABLE: "CANADA RE_3-18G"

Start Frequency	Stop Frequency	Detector Meas.	IF	Transducer
1.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz #326horn AF horz

Marker: 17.012024048 GHz 46.63 dB μ V/m

Level [dB μ V/m]

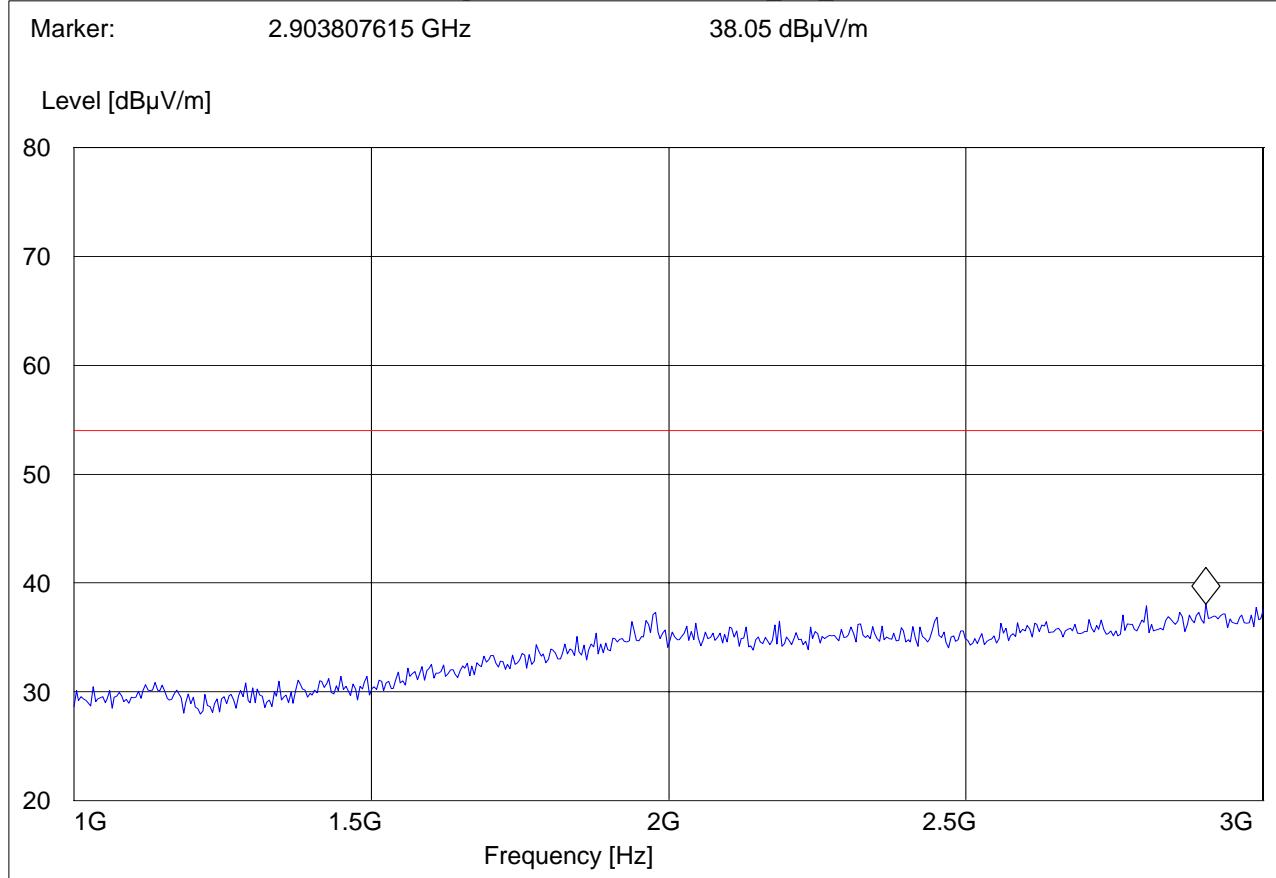


RADIATED SPURIOUS EMISSIONS (GSM-850) Tx CHANNEL 251: 1GHz – 3GHz

EUT: 34LC00b/C01
Customer: L3 Communications
Test Mode: GSM 850 CH 251
ANT Orientation: V
EUT Orientation: H
Test Engineer: VAL
Voltage: AC
Comments:

SWEEP TABLE: "CANADA RE_1-3G"

Start Frequency	Stop Frequency	Detector Meas.	IF Time	Transducer Bandw.
1.0 GHz	3.0 GHz	MaxPeak	Coupled 1 MHz	#326horn AF horz

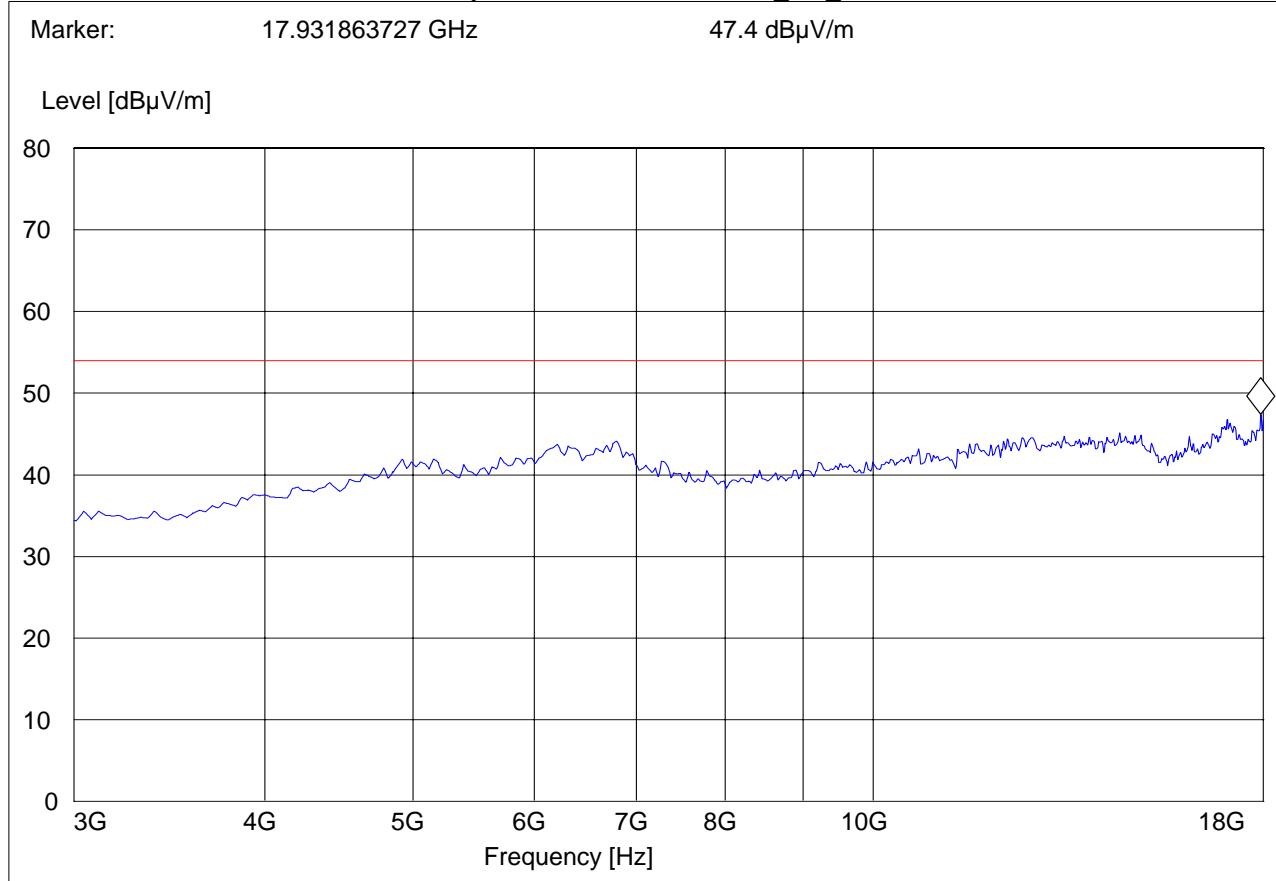


RADIATED SPURIOUS EMISSIONS (GSM-850) Tx CHANNEL 251: 3 GHz –9GHz

EUT: 34LC00b/C01
Customer: L3 Communications
Test Mode: GSM 850 CH 251
ANT Orientation: V
EUT Orientation: H
Test Engineer: VAL
Voltage: AC
Comments:

SWEEP TABLE: "CANADA RE_3-18G"

Start Frequency	Stop Frequency	Detector Meas.	IF Time	Transducer Bandw.
1.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz #326horn AF horz



5.5.4.2 Test Results Transmitter Spurious Emission UMTS FDD5

Harmonics	Tx ch-4132 Freq. (MHz)	Level(dBm)	Tx ch-4183 Freq. (MHz)	Level(dBm)	Tx ch-4233 Freq. (MHz)	Level(dBm)
2	1652.8	NF	1673.2	NF	1693.2	NF
3	2479.2	NF	2509.8	NF	2539.8	NF
4	3305.6	NF	3346.4	NF	3386.4	NF
5	4132	NF	4183	NF	4233	NF
6	4958.4	NF	5019.6	NF	5079.6	NF
7	5784.8	NF	5856.2	NF	5926.2	NF
8	6611.2	NF	6692.8	NF	6772.8	NF
9	7437.6	NF	7529.4	NF	7619.4	NF
10	8264	NF	8366	NF	8466	NF

RADIATED SPURIOUS EMISSIONS (UMTS FDD5) TX: 30MHz - 1GHz
Spurious emission limit -13dBm
Antenna: vertical

Note:

1. The peak above the limit line is the carrier freq.
2. This plot is valid for low, mid & high channels (worst-case plot)

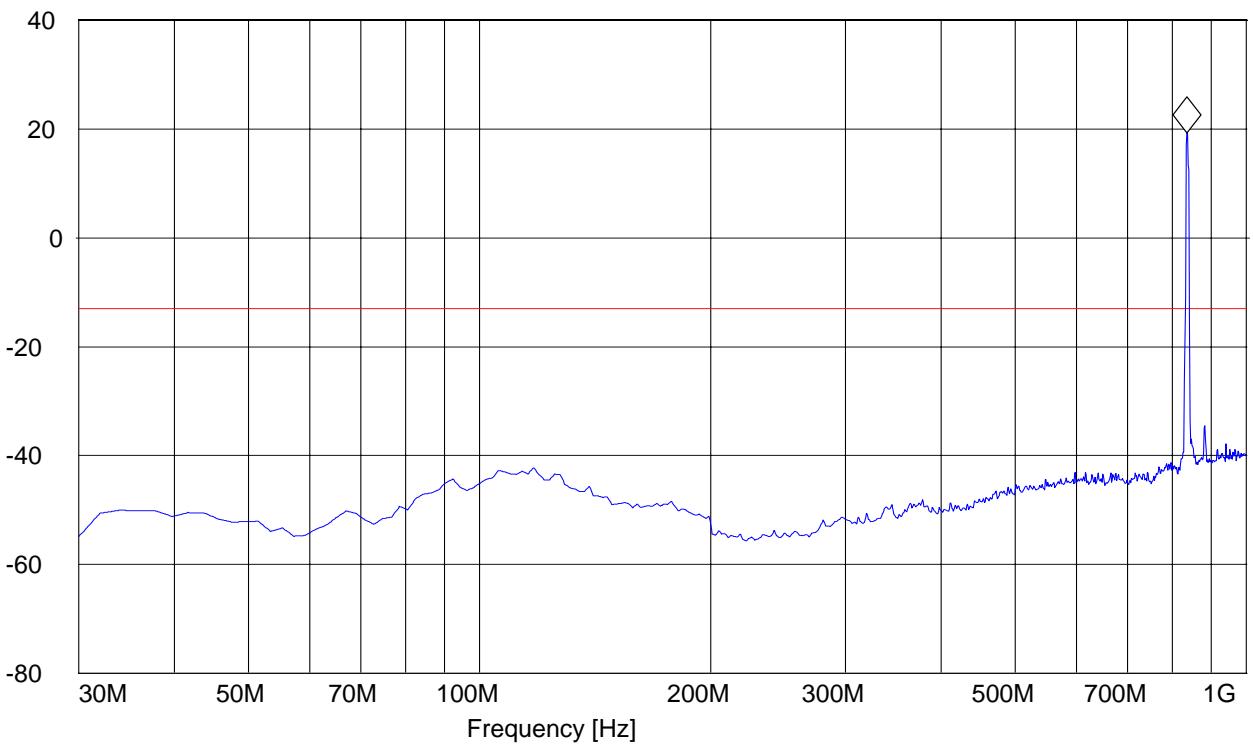
EUT: 34LC00b/C01
Customer: L3 Communications
Test Mode: WCDMA FDD5 ch.4183
ANT Orientation: V
EUT Orientation: V
Test Engineer: Chris
Voltage: AC Adaptor
Comments: Marker placed on uplink

SWEEP TABLE: "FCC 24 Spur 30M-1G_V"

Start Frequency	Stop Frequency	Detector Meas.	IF Time	Transducer Bandw.
30.0 MHz	1.0 GHz	MaxPeak	Coupled	1 MHz DUMMY-DBM

Marker: 836.713427 MHz 19.24 dBm

Level [dBm]



RADIATED SPURIOUS EMISSIONS (UMTS FDD5) TX: 30MHz - 1GHz
Spurious emission limit -13dBm
Antenna: Horizontal

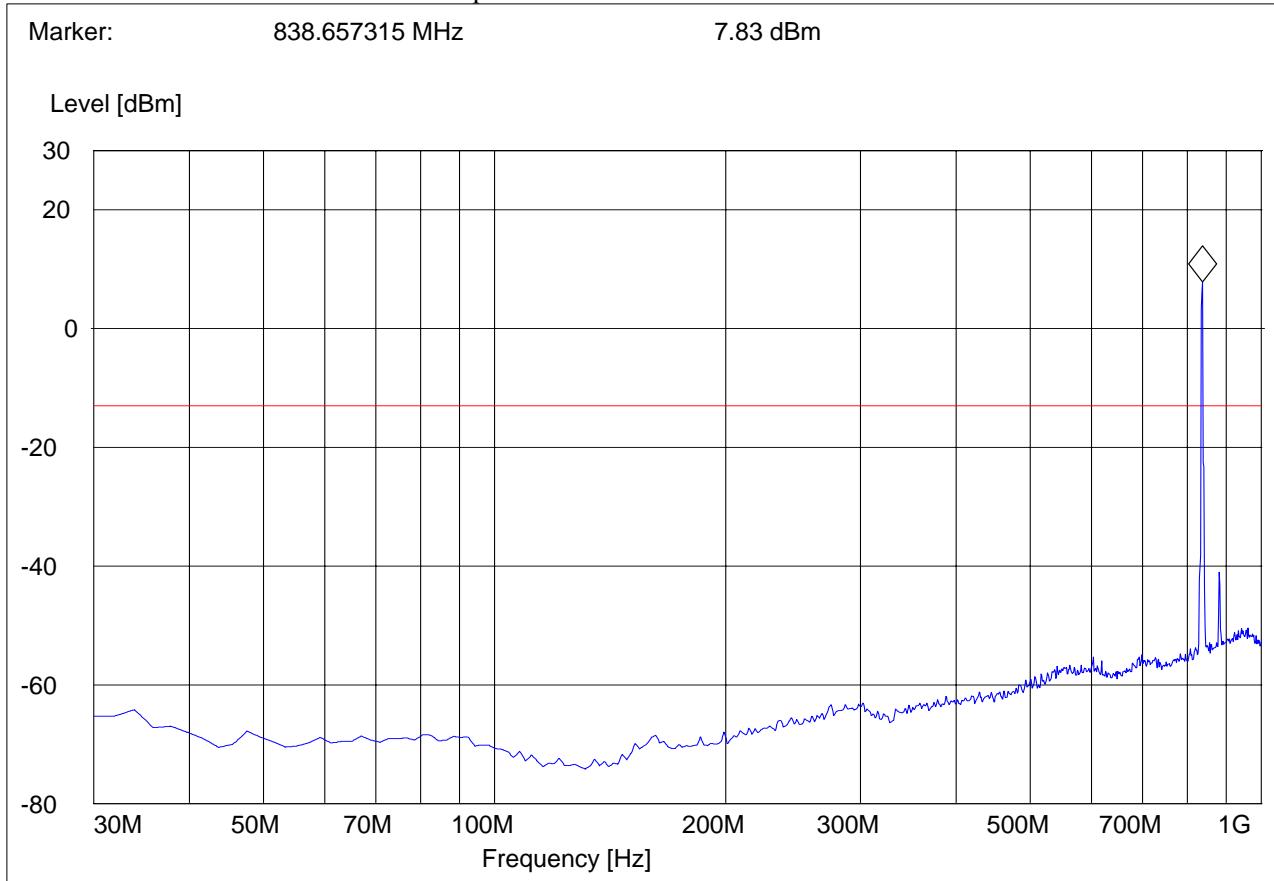
Note:

1. The peak above the limit line is the carrier freq.
2. This plot is valid for low, mid & high channels (worst-case plot)

EUT: 34LC00b/C01
Customer: L3 Communications
Test Mode: WCDMA FDD5 ch.4183
ANT Orientation: H
EUT Orientation: V
Test Engineer: Chris
Voltage: AC Adaptor
Comments: Marker placed on uplink

SWEEP TABLE: "FCC 24 Spur 30M-1G_H"

Start Frequency	Stop Frequency	Detector Meas.	IF Time	Transducer Bandw.	
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	DUMMY-DBM

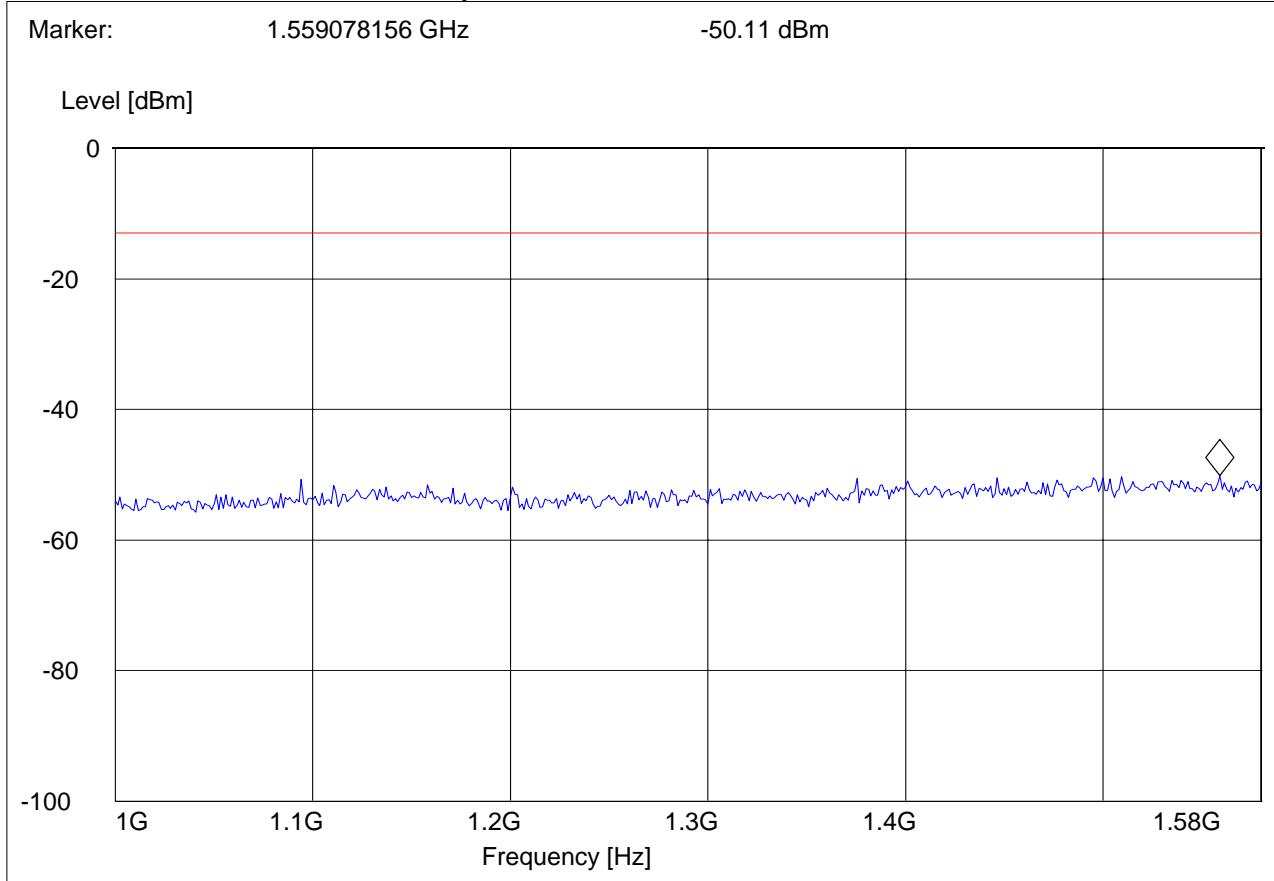


RADIATED SPURIOUS EMISSIONS (UMTS FDD5) Tx CHANNEL 4132: 1GHz - 1.58GHz

EUT: 34LC00b/C01
Customer: L3 Communications
Test Mode: WCDMA FDD5 ch.4132
ANT Orientation: V
EUT Orientation: V
Test Engineer: Chris
Voltage: AC Adaptor
Comments: Marker placed on uplink

SWEEP TABLE: "FCC 22Spuri 1-1.58G"

Start Frequency	Stop Frequency	Detector Meas.	IF Time	Transducer Bandw.
1.0 GHz	1.6 GHz	MaxPeak	Coupled	1 MHz DUMMY-DBM

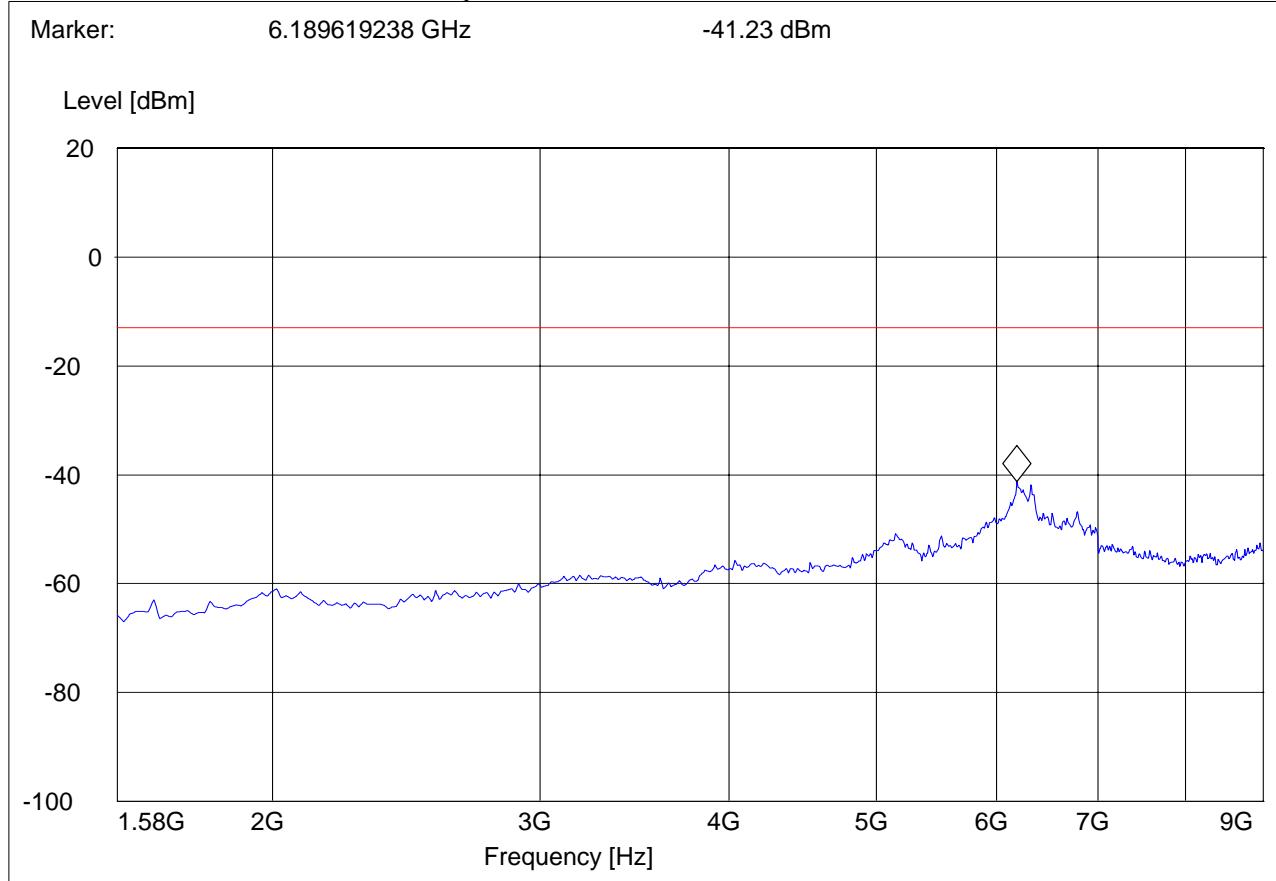


RADIATED SPURIOUS EMISSIONS (UMTS FDD5) Tx CHANNEL 4132: 1.58GHz – 9GHz

EUT: 34LC00b/C01
Customer: L3 Communications
Test Mode: WCDMA FDD5 ch.4132
ANT Orientation: V
EUT Orientation: V
Test Engineer: Chris
Voltage: AC Adaptor
Comments:

SWEEP TABLE: "FCC 22Spuri 1.58-9G"

Start Frequency	Stop Frequency	Detector Meas.	IF Time	Transducer Bandw.
1.6 GHz	9.0 GHz	MaxPeak	Coupled	1 MHz DUMMY-DBM

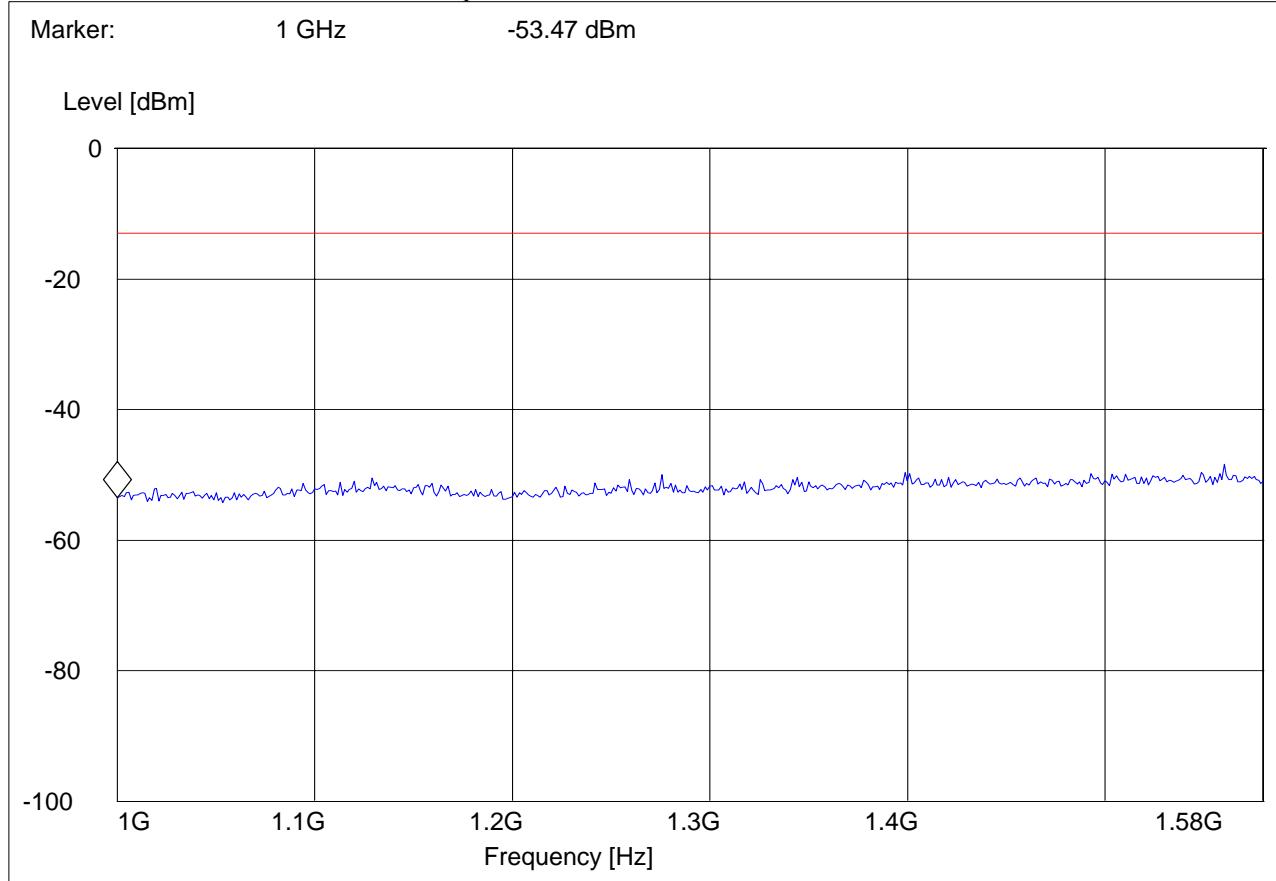


RADIATED SPURIOUS EMISSIONS (UMTS FDD5) Tx CHANNEL 4183: 1GHz - 1.58GHz

EUT: 34LC00b/C01
Customer: L3 Communications
Test Mode: WCDMA FDD5 ch.4183
ANT Orientation: V
EUT Orientation: V
Test Engineer: Chris
Voltage: AC Adaptor
Comments: Marker placed on uplink

SWEEP TABLE: "FCC 22Spuri 1-1.58G"

Start Frequency	Stop Frequency	Detector Meas.	IF Time	Transducer Bandw.
1.0 GHz	1.6 GHz	MaxPeak	Coupled	1 MHz DUMMY-DBM

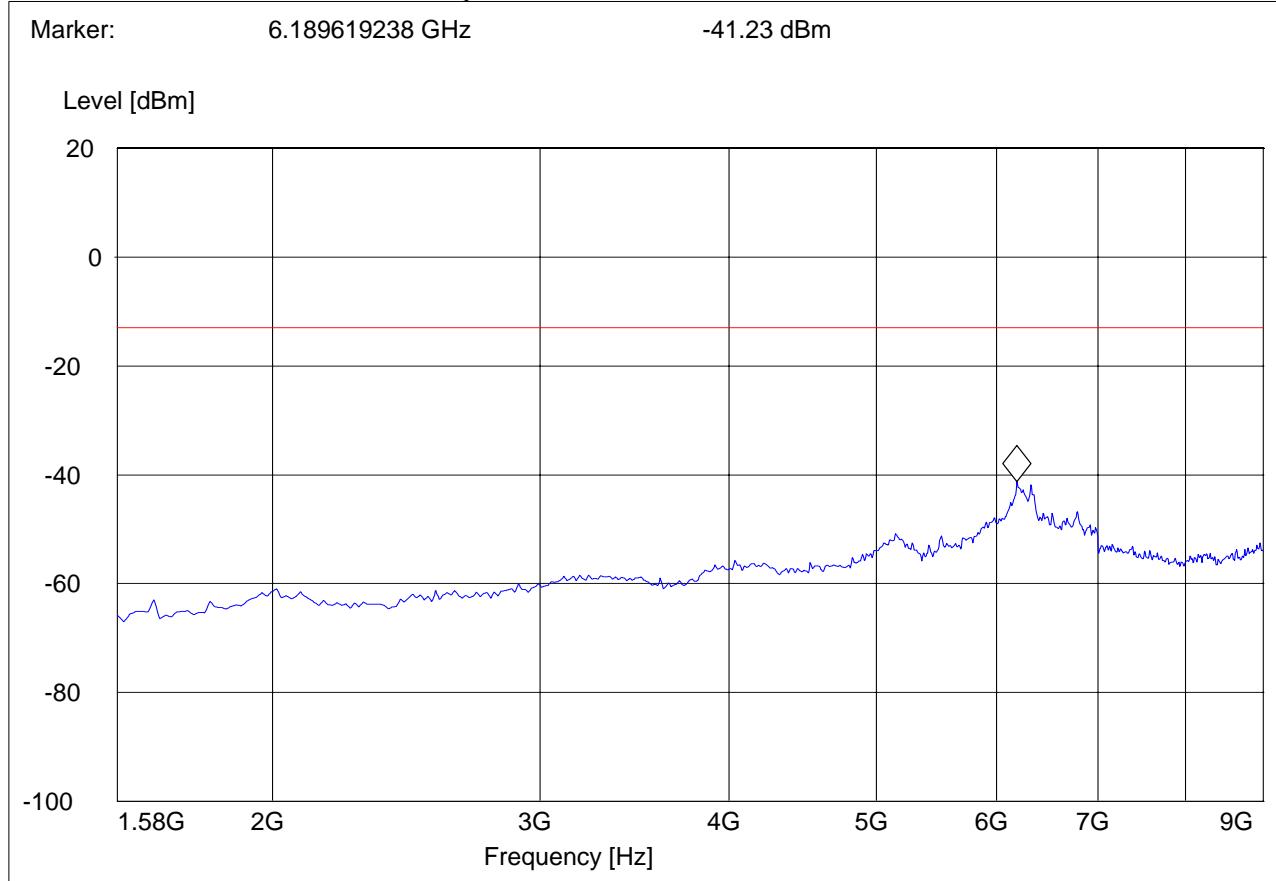


RADIATED SPURIOUS EMISSIONS (UMTS FDD5) Tx CHANNEL 4183: 1.58GHz – 9GHz

EUT: 34LC00b/C01
Customer: L3 Communications
Test Mode: WCDMA FDD5 ch.4183
ANT Orientation: V
EUT Orientation: V
Test Engineer: Chris
Voltage: AC Adaptor
Comments:

SWEEP TABLE: "FCC 22Spuri 1.58-9G"

Start Frequency	Stop Frequency	Detector Meas.	IF Time	Transducer Bandw.
1.6 GHz	9.0 GHz	MaxPeak	Coupled	1 MHz DUMMY-DBM



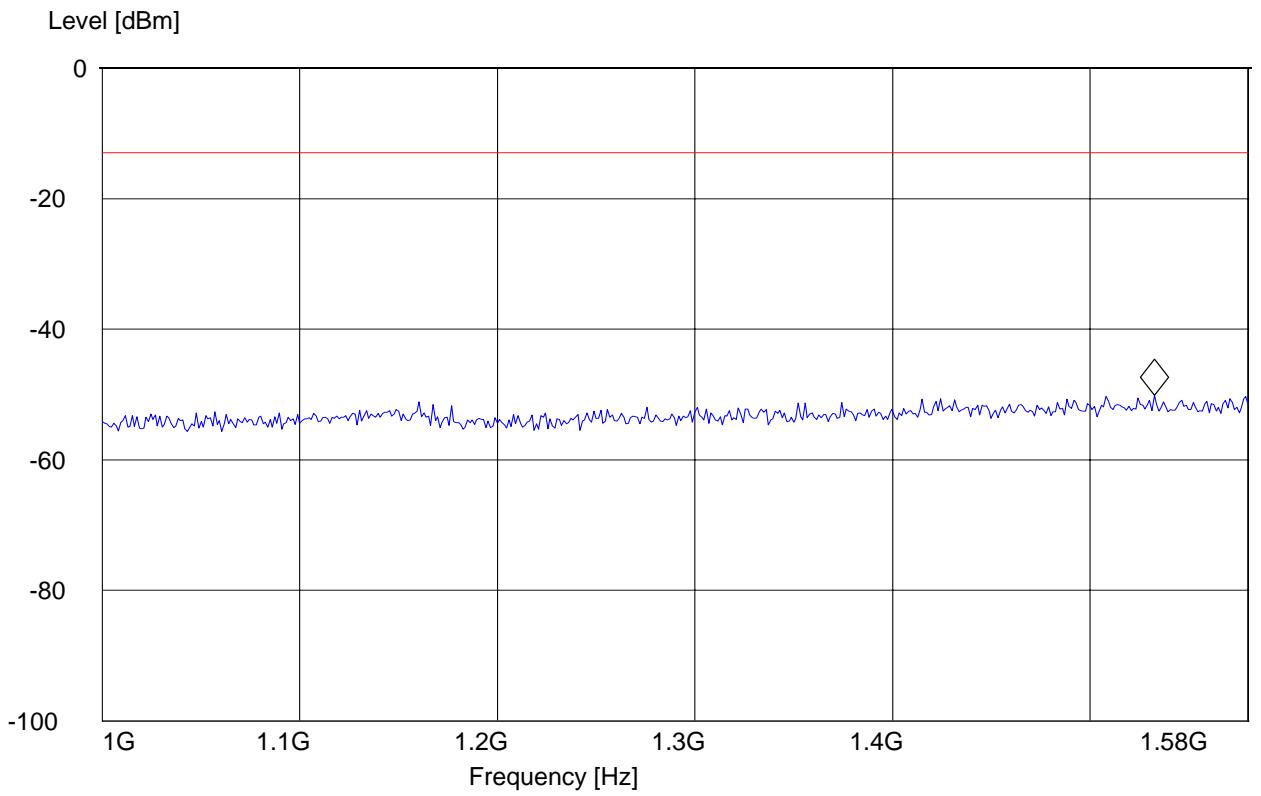
RADIATED SPURIOUS EMISSIONS (UMTS FDD5) Tx CHANNEL 4233: 1GHz - 1.58GHz

EUT: 34LC00b/C01
Customer: L3 Communications
Test Mode: WCDMA FDD5 ch.4233
ANT Orientation: V
EUT Orientation: V
Test Engineer: Chris
Voltage: AC Adaptor
Comments: Marker placed on uplink

SWEEP TABLE: "FCC 22Spuri 1-1.58G"

Start Frequency	Stop Frequency	Detector	Meas.	IF	Transducer
1.0 GHz	1.6 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM

Marker: 1.532344689 GHz -50.17 dBm

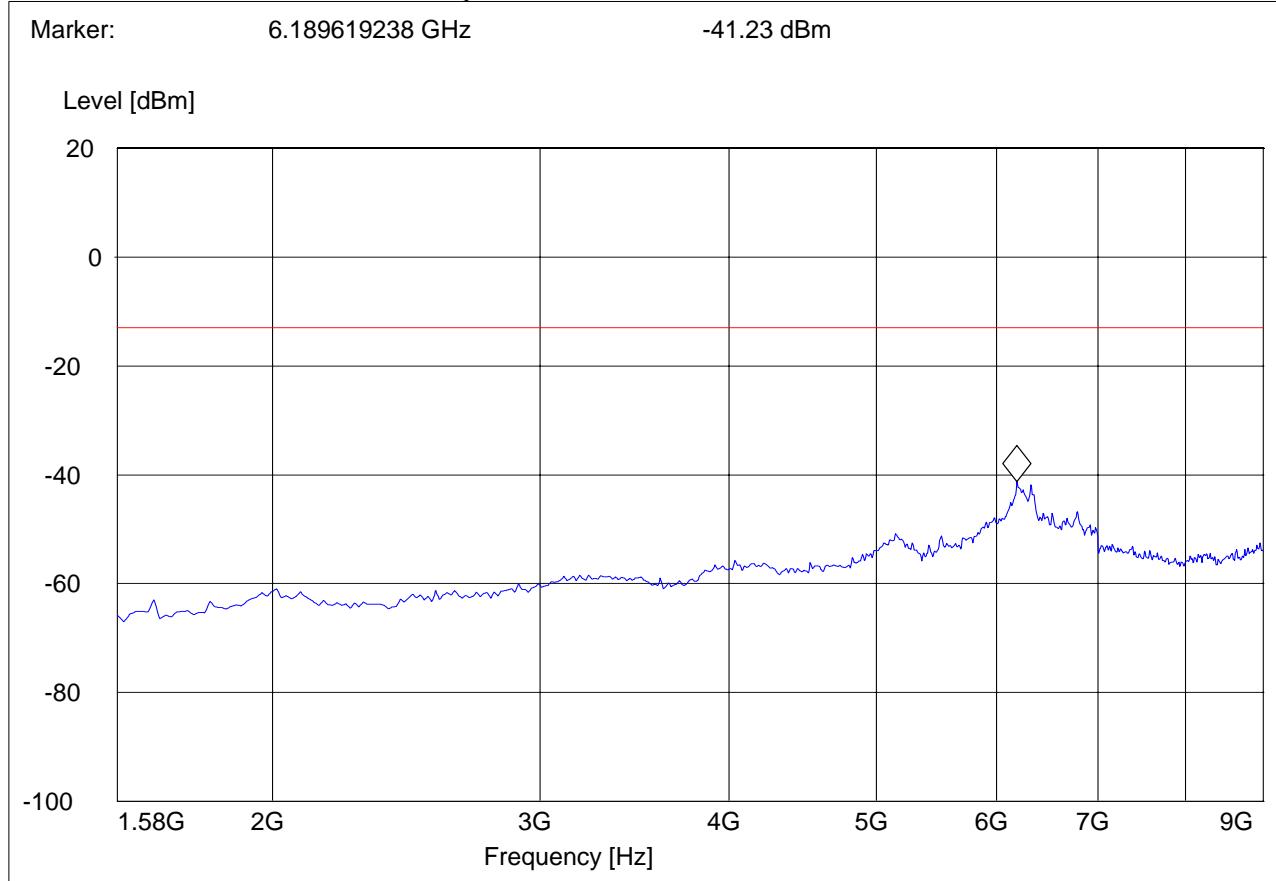


RADIATED SPURIOUS EMISSIONS (UMTS FDD5) Tx CHANNEL 4233: 1.58GHz –9GHz

EUT: 34LC00b/C01
Customer: L3 Communications
Test Mode: WCDMA FDD5 ch.4233
ANT Orientation: V
EUT Orientation: V
Test Engineer: Chris
Voltage: AC Adaptor
Comments:

SWEEP TABLE: "FCC 22Spuri 1.58-9G"

Start Frequency	Stop Frequency	Detector Meas.	IF Time	Transducer Bandw.
1.6 GHz	9.0 GHz	MaxPeak	Coupled	1 MHz DUMMY-DBM



5.5.4.3 Test Results Transmitter Spurious Emission PCS-1900:

Harmonic	Tx ch-512 Freq.(MHz)	Level (dBm)	Tx ch-661 Freq. (MHz)	Level (dBm)	Tx ch-810 Freq. (MHz)	Level (dBm)
2	3700.4	NF	3760	NF	3819.6	NF
3	5550.6	NF	5640	NF	5729.4	NF
4	7400.8	NF	7520	NF	7639.2	NF
5	9251	NF	9400	NF	9549	NF
6	11101.2	NF	11280	NF	11458.8	NF
7	12951.4	NF	13160	NF	13368.6	NF
8	14801.6	NF	15040	NF	15278.4	NF
9	16651.8	NF	16920	NF	17188.2	NF
10	18502	NF	18800	NF	19098	NF
NF = NOISE FLOOR						

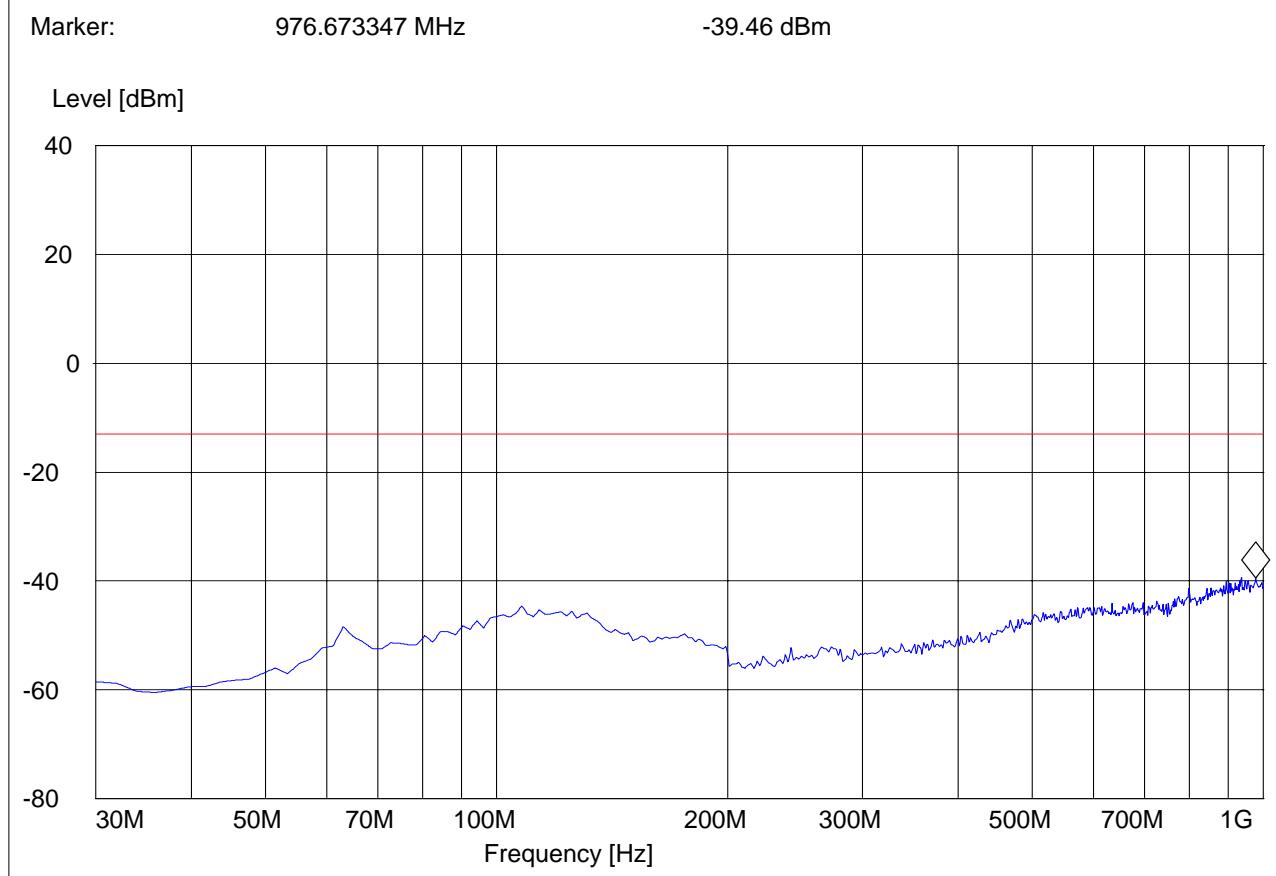
RADIATED SPURIOUS EMISSIONS(PCS 1900) TX: 30MHz - 1GHz

Antenna: Vertical

EUT: 34LC00b/C01
Customer: L3 Communications
Test Mode: GSM1900 CH.512
ANT Orientation: V
EUT Orientation: H
Test Engineer: Chris
Voltage: Battery w/ charger
Comments:

SWEEP TABLE: "FCC 24 Spur 30M-1G_V"

Start Frequency	Stop Frequency	Detector Meas.	IF Time	Transducer Bandw.
30.0 MHz	1.0 GHz	MaxPeak	Coupled	1 MHz DUMMY-DBM



RADIATED SPURIOUS EMISSIONS(PCS 1900) TX: 30MHz - 1GHz

Antenna: Horizontal

EUT: 34LC00b/C01

Customer: L3 Communications

Test Mode: GSM1900 CH.512

ANT Orientation: H

EUT Orientation: H

Test Engineer: Chris

Voltage: Battery w/ charger

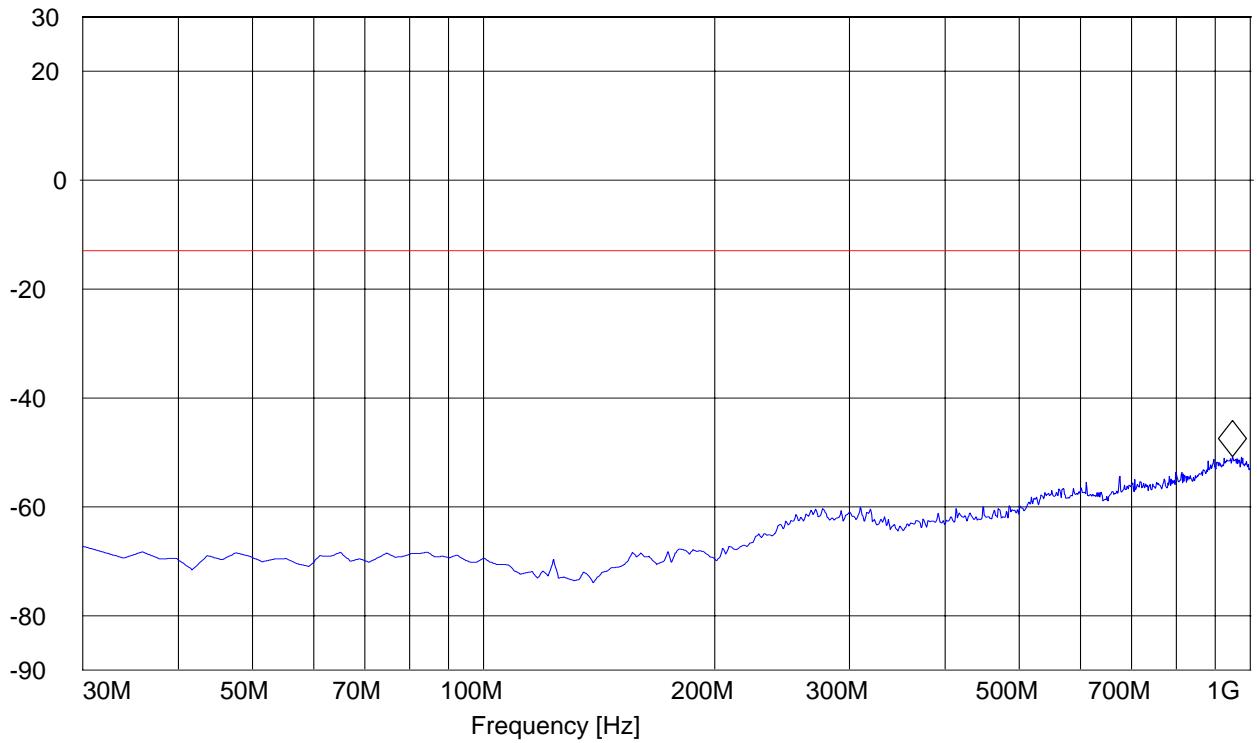
Comments:

SWEEP TABLE: "FCC 24 Spur 30M-1G_H"

Start Frequency	Stop Frequency	Detector Meas.	IF Time	Transducer Bandw.
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz DUMMY-DBM

Marker: 947.51503 MHz -50.81 dBm

Level [dBm]



RADIATED SPURIOUS EMISSIONS(PCS 1900) Tx CHANNEL 512: 1GHz – 3GHz

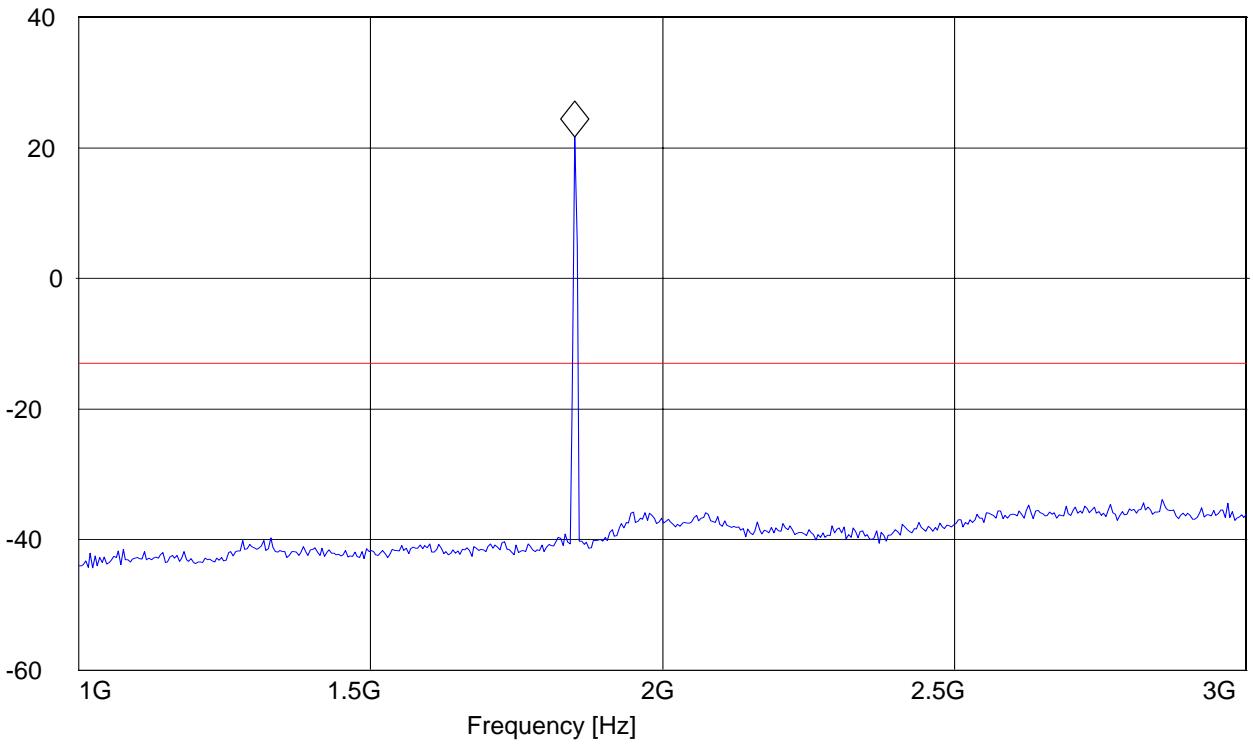
EUT: 34LC00b/C01
Customer: L3 Communications
Test Mode: GSM1900 CH.512
ANT Orientation: V
EUT Orientation: H
Test Engineer: Chris
Voltage: Battery w/ charger
Comments: Marker on Tx signal

SWEEP TABLE: "FCC 24Spuri 1-3G"

Start Frequency	Stop Frequency	Detector Meas.	IF Time	Transducer Bandw.
1.0 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz DUMMY-DBM

Marker: 1.849699399 GHz 21.63 dBm

Level [dBm]

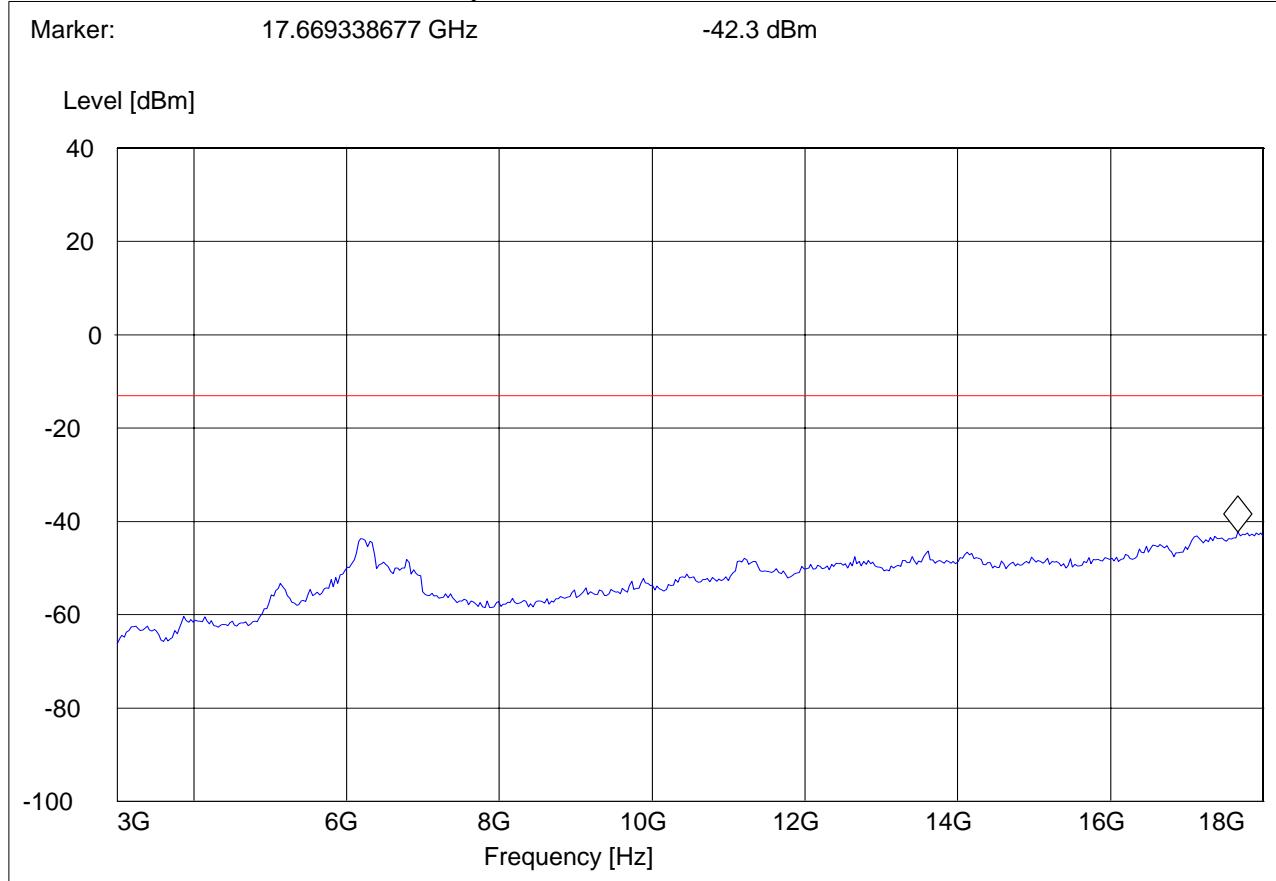


RADIATED SPURIOUS EMISSIONS(PCS 1900) Tx CHANNEL 512: 3GHz – 18GHz

EUT: 34LC00b/C01
Customer: L3 Communications
Test Mode: GSM 1900 ch. 512
ANT Orientation: V
EUT Orientation: H
Test Engineer: Chris
Voltage: Battery w/ charger
Comments:

SWEEP TABLE: "FCC 24Spuri 3-18G"

Start Frequency	Stop Frequency	Detector Meas.	IF Time	Transducer Bandw.
3.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz DUMMY-DBM

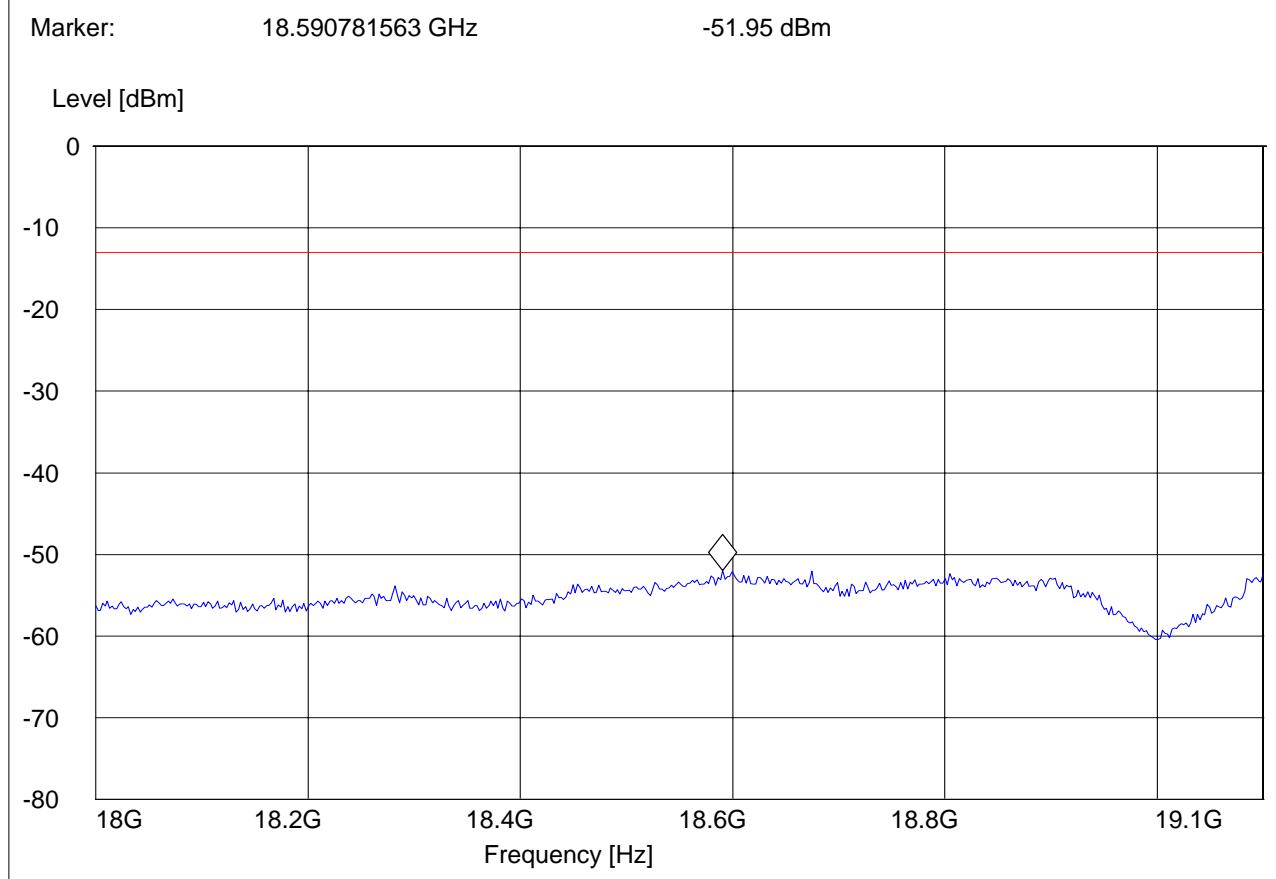


RADIATED SPURIOUS EMISSIONS(PCS 1900) Tx CHANNEL 512: 18-19.1GHz

EUT: 34LC00b/C01
Customer: L3 Communications
Test Mode: GSM1900 CH.512
ANT Orientation: V
EUT Orientation: H
Test Engineer: Chris
Voltage: Battery w/ charger
Comments:

SWEEP TABLE: "FCC 24spuri 18-19.1G"

Start Frequency	Stop Frequency	Detector Meas.	IF Time	Transducer Bandw.
18.0 GHz	19.1 GHz	Average	Coupled	1 MHz DUMMY-DBM

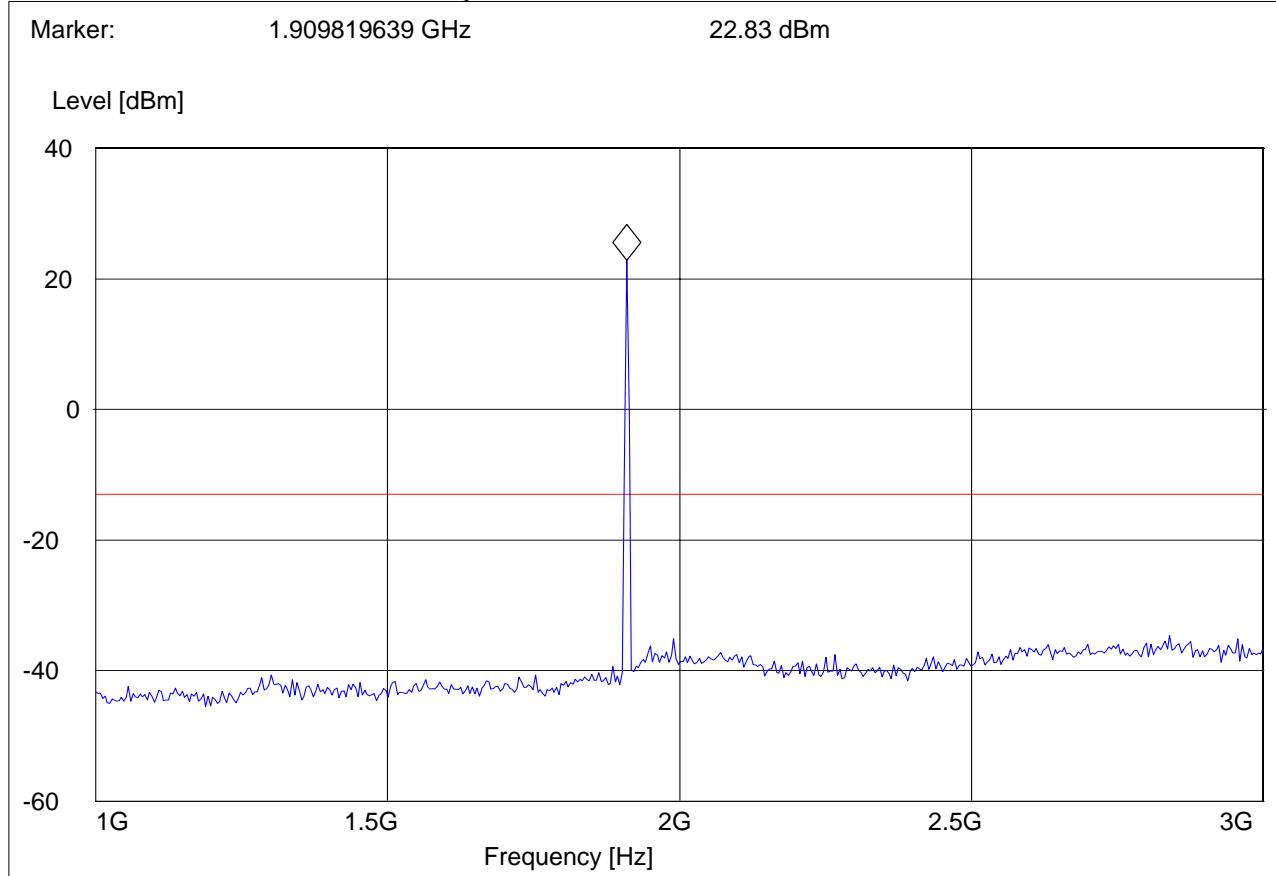


RADIATED SPURIOUS EMISSIONS(PCS 1900) Tx CHANNEL 661: 1GHz – 3GHz

EUT: 34LC00b/C01
Customer: L3 Communications
Test Mode: GSM 1900 CH661
ANT Orientation: H
EUT Orientation: V
Test Engineer: Chris
Voltage: AC Adaptor
Comments: Marker on Tx signal

SWEEP TABLE: "FCC 24Spuri 1-3G"

Start Frequency	Stop Frequency	Detector Meas.	IF Time	Transducer Bandw.
1.0 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz DUMMY-DBM

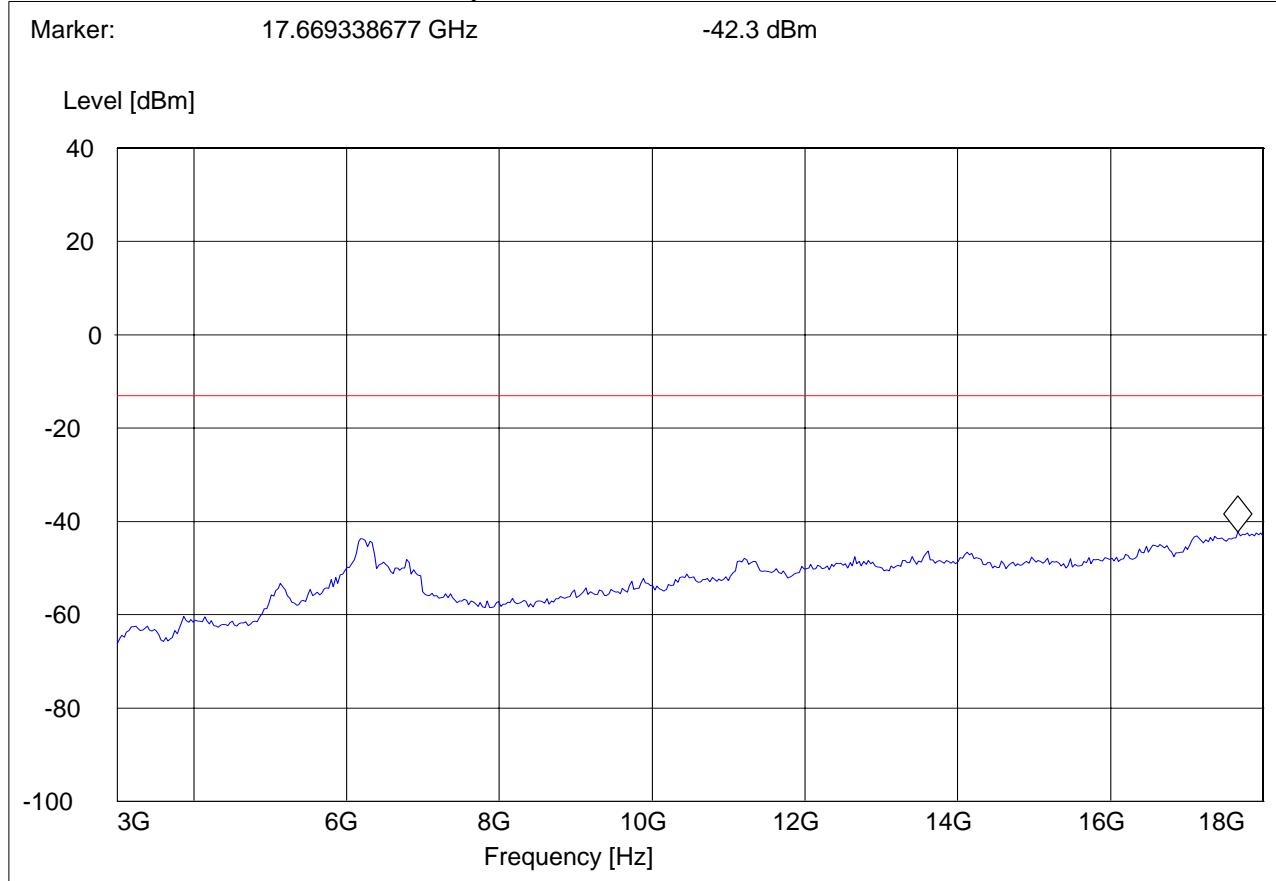


RADIATED SPURIOUS EMISSIONS(PCS 1900) Tx CHANNEL 661: 3GHz – 18GHz

EUT: 34LC00b/C01
Customer: L3 Communications
Test Mode: GSM 1900 Ch. 661
ANT Orientation: V
EUT Orientation: H
Test Engineer: Chris
Voltage: Battery w/ charger
Comments:

SWEEP TABLE: "FCC 24Spuri 3-18G"

Start Frequency	Stop Frequency	Detector Meas.	IF Time	Transducer Bandw.
3.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz DUMMY-DBM

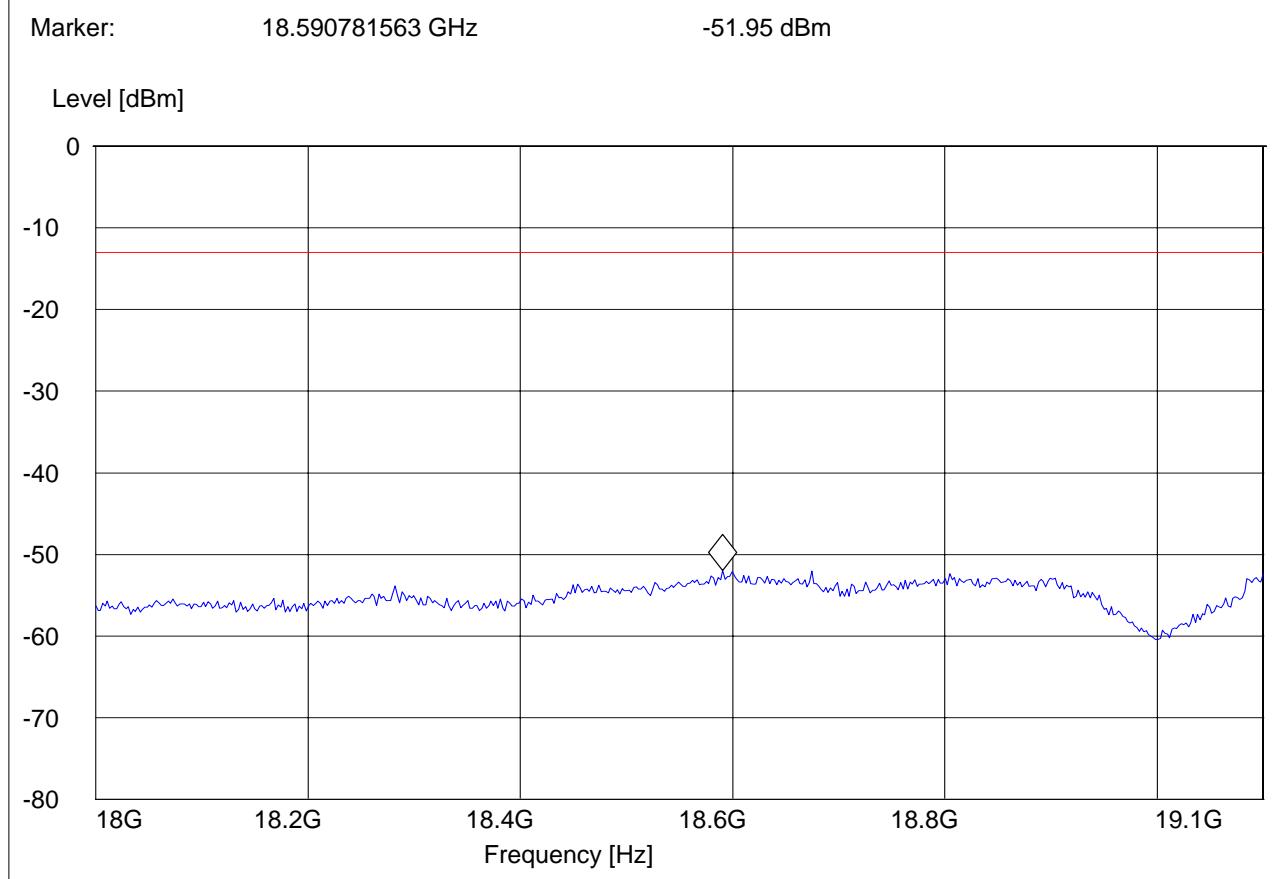


RADIATED SPURIOUS EMISSIONS(PCS 1900) Tx CHANNEL 661: 18-19.1GHz

EUT: 34LC00b/C01
Customer: L3 Communications
Test Mode: GSM1900 CH.661
ANT Orientation: V
EUT Orientation: H
Test Engineer: Chris
Voltage: Battery w/ charger
Comments:

SWEEP TABLE: "FCC 24spuri 18-19.1G"

Start Frequency	Stop Frequency	Detector Meas.	IF Time	Transducer Bandw.
18.0 GHz	19.1 GHz	Average	Coupled	1 MHz DUMMY-DBM

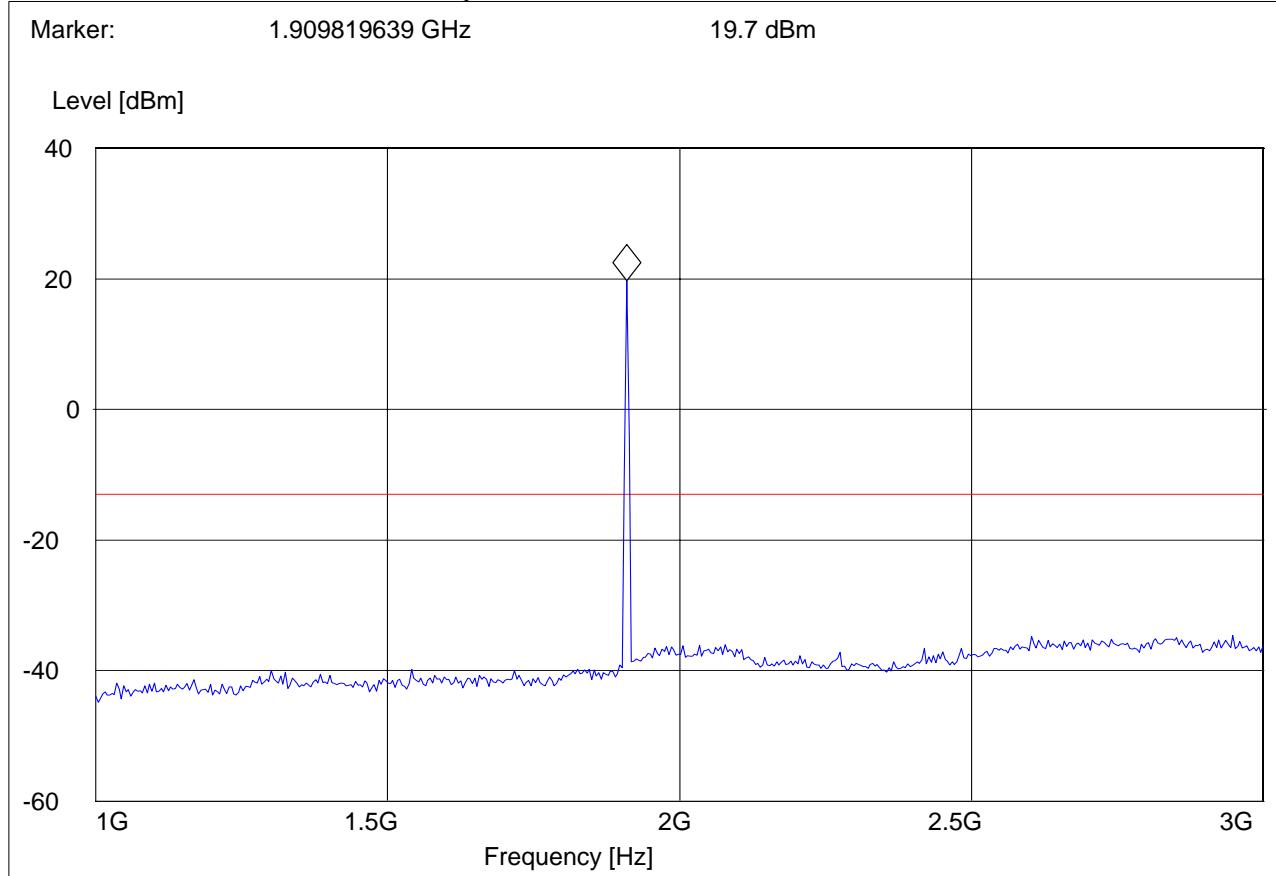


RADIATED SPURIOUS EMISSIONS(PCS 1900) Tx CHANNEL 810: 1GHz – 3GHz

EUT: 34LC00b/C01
Customer: L3 Communications
Test Mode: GSM1900 CH.810
ANT Orientation: V
EUT Orientation: H
Test Engineer: Chris
Voltage: Battery w/ charger
Comments: Marker on Tx signal

SWEEP TABLE: "FCC 24Spuri 1-3G"

Start Frequency	Stop Frequency	Detector Meas.	IF Time	Transducer Bandw.
1.0 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz DUMMY-DBM

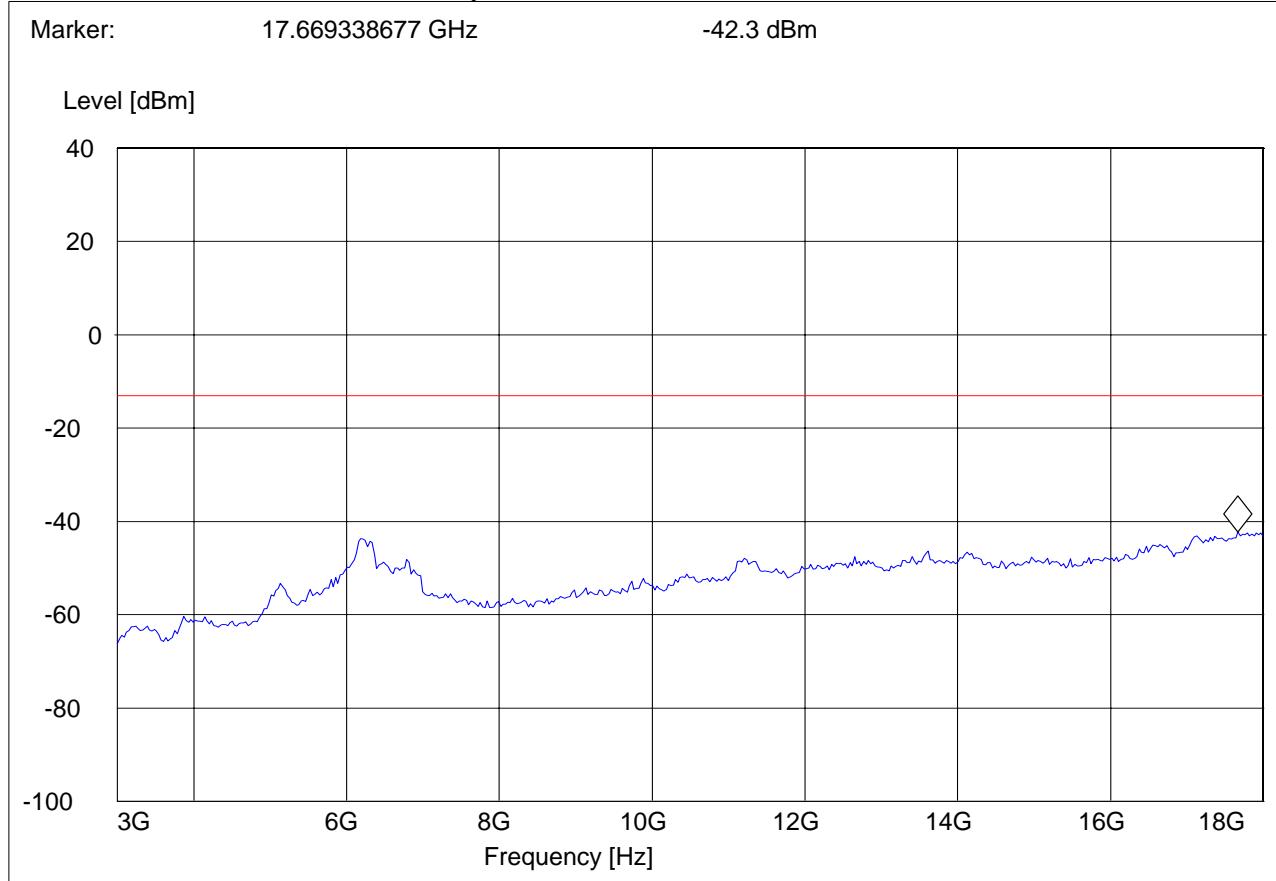


RADIATED SPURIOUS EMISSIONS(PCS 1900) Tx CHANNEL 810: 3GHz – 18GHz

EUT: 34LC00b/C01
Customer: L3 Communications
Test Mode: GSM 1900 ch. 810
ANT Orientation: V
EUT Orientation: H
Test Engineer: Chris
Voltage: Battery w/ charger
Comments:

SWEEP TABLE: "FCC 24Spuri 3-18G"

Start Frequency	Stop Frequency	Detector Meas.	IF Time	Transducer Bandw.
3.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz DUMMY-DBM

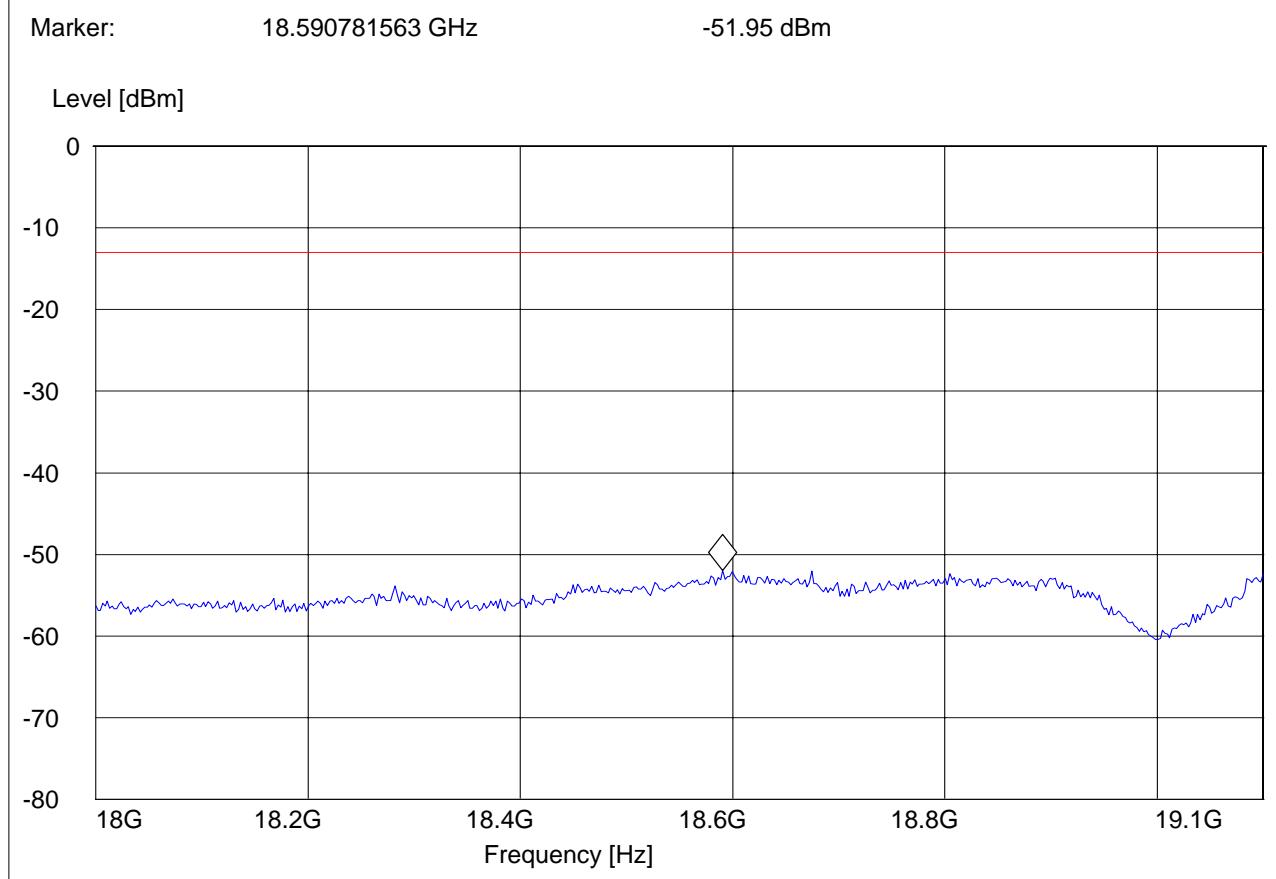


RADIATED SPURIOUS EMISSIONS(PCS 1900) Tx CHANNEL 810: 18GHz – 19.1GHz

EUT: 34LC00b/C01
Customer: L3 Communications
Test Mode: GSM1900 CH.810
ANT Orientation: V
EUT Orientation: H
Test Engineer: Chris
Voltage: Battery w/ charger
Comments:

SWEEP TABLE: "FCC 24spuri 18-19.1G"

Start Frequency	Stop Frequency	Detector Meas.	IF Time	Transducer Bandw.
18.0 GHz	19.1 GHz	Average	Coupled	1 MHz DUMMY-DBM



5.5.4.4 Test Results Transmitter Spurious Emission UMTS FDD2:

Harmonics	Tx ch-9262 Freq. (MHz)	Level (dBm)	Tx ch-9400 Freq. (MHz)	Level (dBm)	Tx ch-9538 Freq. (MHz)	Level (dBm)
2	3704.8	NF	3760	NF	3815.2	NF
3	5557.2	NF	5640	NF	5722.8	NF
4	7409.6	NF	7520	NF	7630.4	NF
5	9262	NF	9400	NF	9538	NF
6	11114.4	NF	11280	NF	11445.6	NF
7	12966.8	NF	13160	NF	13353.2	NF
8	14819.2	NF	15040	NF	15260.8	NF
9	16671.6	NF	16920	NF	17168.4	NF
10	18524	NF	18800	NF	19076	NF

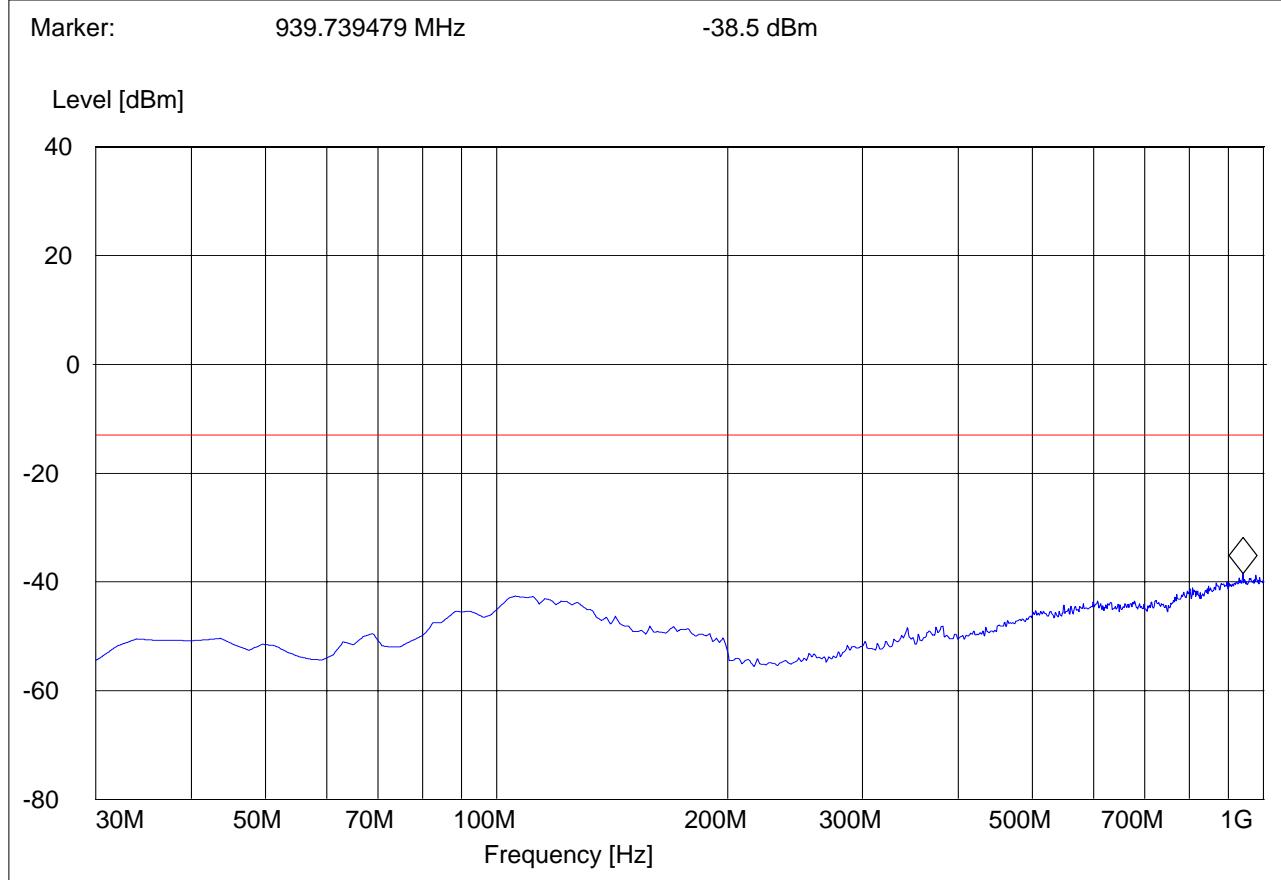
RADIATED SPURIOUS EMISSIONS (UMTS FDD2) TX: 30MHz - 1GHz

Antenna: Vertical

EUT: 34LC00b/C01
Customer: L3 Communications
Test Mode: WCDMA FDD2
ANT Orientation: V
EUT Orientation: V
Test Engineer: Chris
Voltage: AC Adaptor
Comments:

SWEEP TABLE: "FCC 24 Spur 30M-1G_V"

Start Frequency	Stop Frequency	Detector	Meas.	IF	Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM

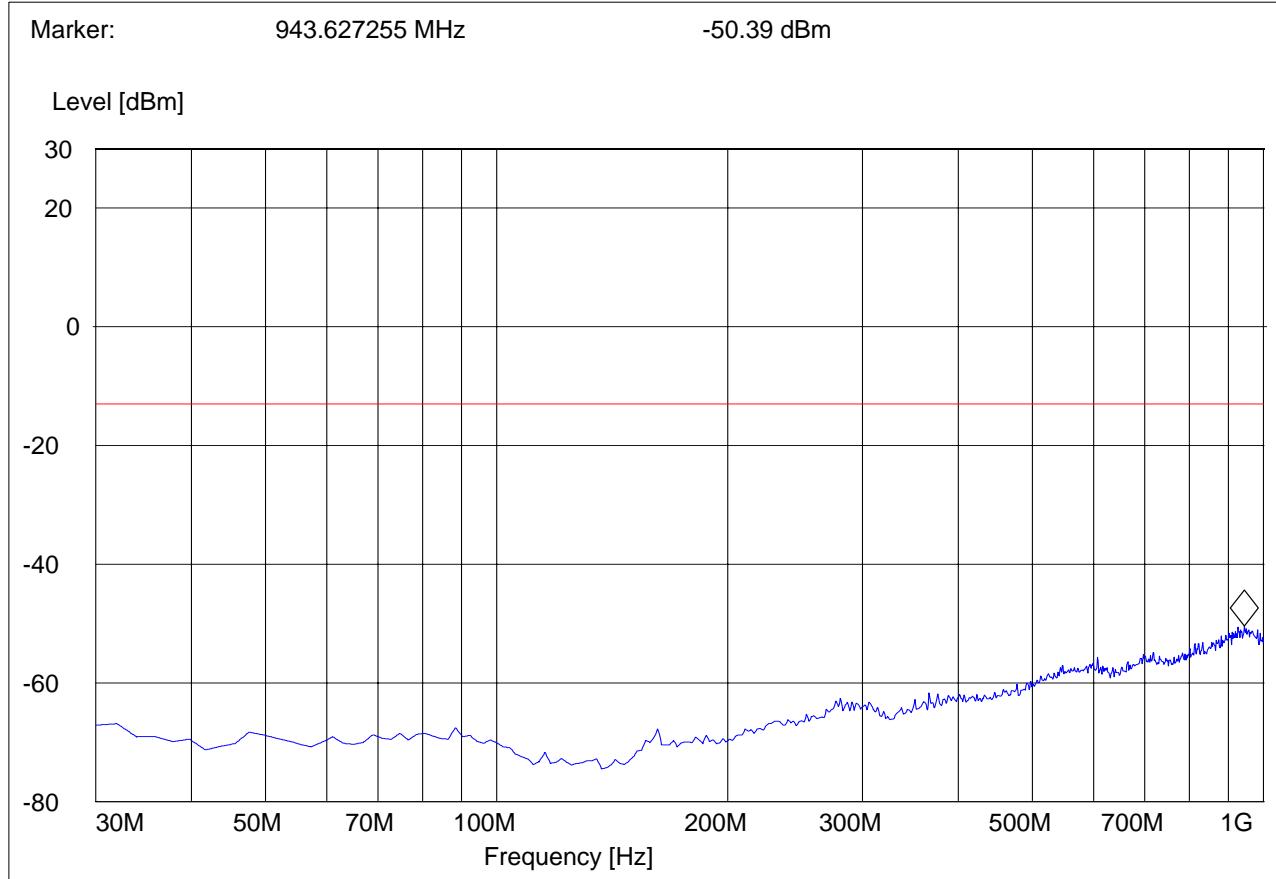


RADIATED SPURIOUS EMISSIONS(UMTS FDD2) TX: 30MHz - 1GHz
Antenna: Horizontal

EUT: 34LC00b/C01
Customer:: L3 Communications
Test Mode: WCDMA FDD2
ANT Orientation: H
EUT Orientation: V
Test Engineer: Chris
Voltage: AC Adaptor
Comments:

SWEET TABLE: "FCC 24 Spur 30M-1G_H"

Start Frequency	Stop Frequency	Detector	Meas.	IF Time	Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	DUMMY-DBM



RADIATED SPURIOUS EMISSIONS(UMTS FDD2) Tx CHANNEL 9262: 1GHz – 3GHz

Note: The peak above the limit line is the carrier freq. at ch-9262.

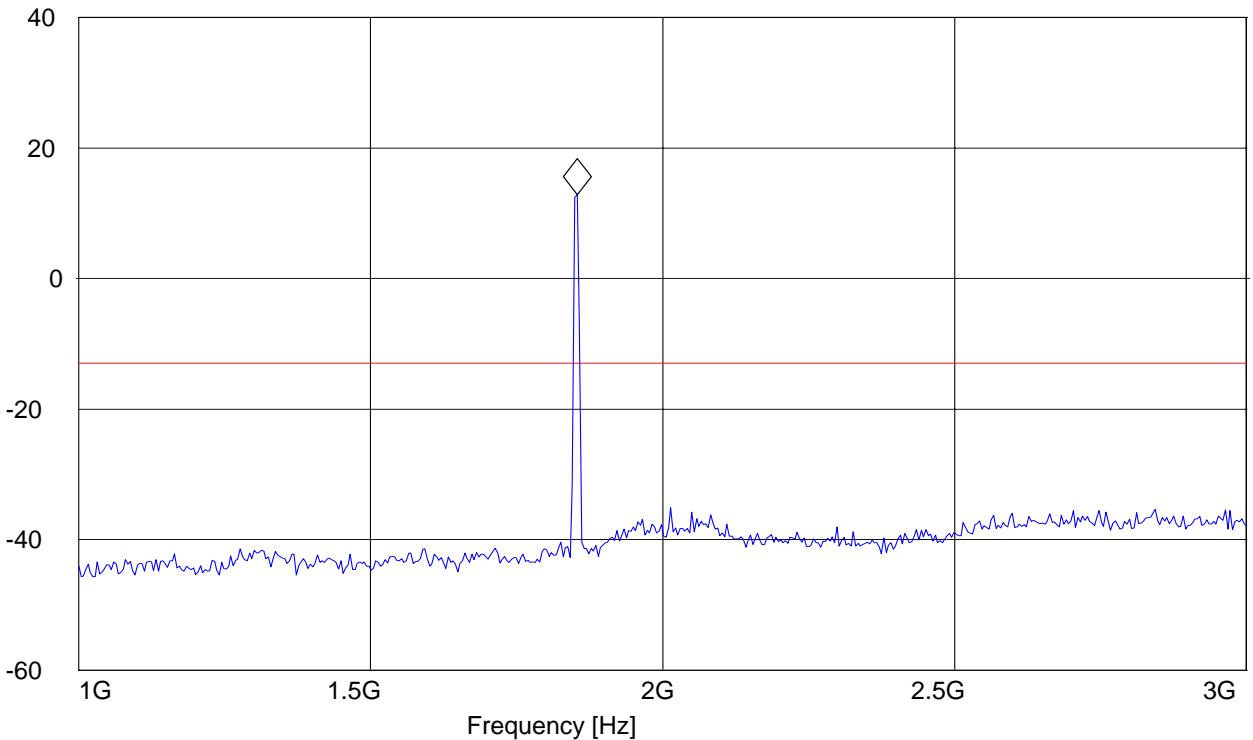
EUT: 34LC00b/C01
Customer:: L3 Communications
Test Mode: WCDMA FDD2
ANT Orientation: V
EUT Orientation: V
Test Engineer: Chris
Voltage: AC Adaptor
Comments: Marker on Tx signal

SWEET TABLE: "FCC 24Spuri 1-3G"

Start Frequency	Stop Frequency	Detector	Meas.	IF	Transducer
1.0 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM

Marker: 1.853707415 GHz 12.85 dBm

Level [dBm]

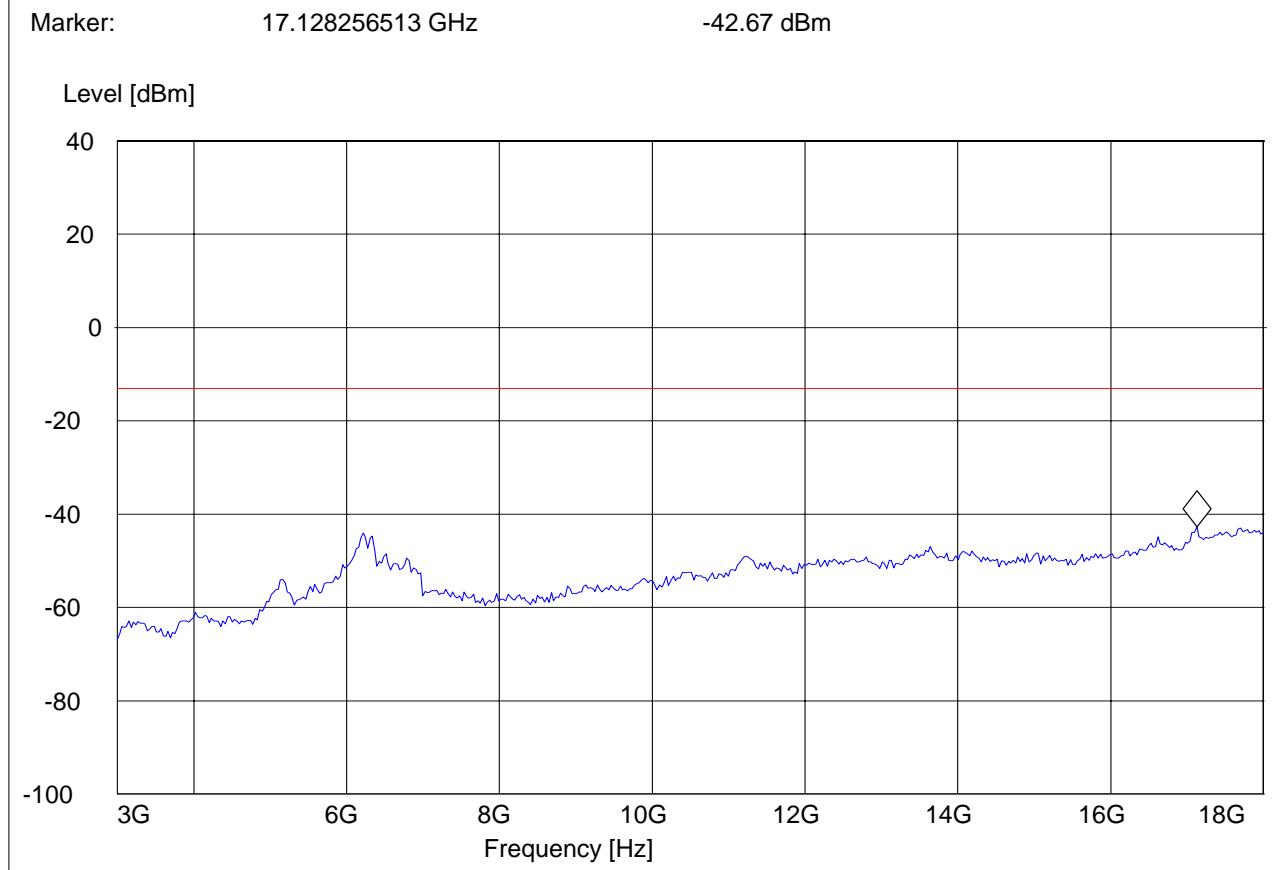


RADIATED SPURIOUS EMISSIONS(UMTS FDD2) Tx CHANNEL 9262: 3GHz – 18GHz

EUT: 34LC00b/C01
Customer: L3 Communications
Test Mode: WCDMA FDD2
ANT Orientation: V
EUT Orientation: V
Test Engineer: Chris
Voltage: AC Adaptor
Comments:

SWEET TABLE: "FCC 24Spuri 3-18G"

Start Frequency	Stop Frequency	Detector	Meas.	IF	Transducer
3.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM



RADIATED SPURIOUS EMISSIONS(UMTS FDD2) Tx CHANNEL 9262: 18GHz – 19.1GHz

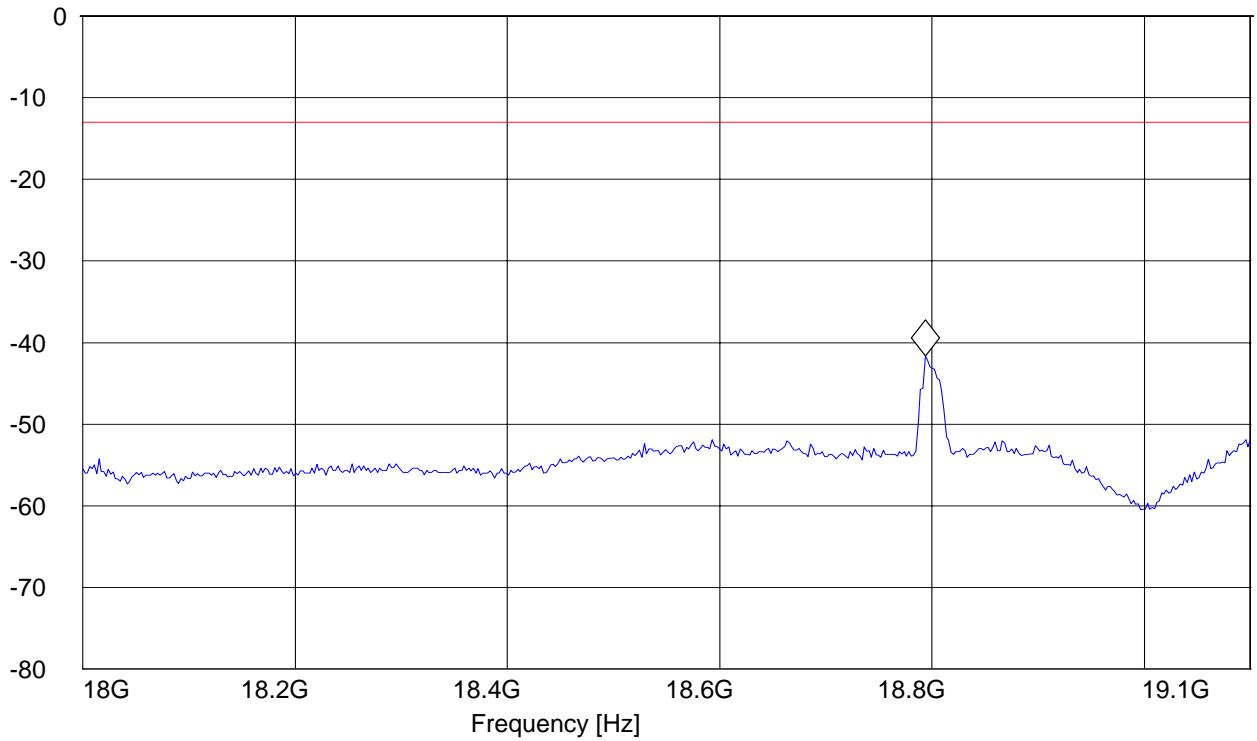
EUT: 34LC00b/C01
Customer: L3 Communications
Test Mode: WCDMA FDD2
ANT Orientation: H
EUT Orientation: V
Test Engineer: Chris
Voltage: AC Adaptor
Comments:

SWEET TABLE: "FCC 24spuri 18-19.1G"

Start Frequency	Stop Frequency	Detector	Meas.	IF	Transducer
18.0 GHz	19.1 GHz	Average	Coupled	1 MHz	DUMMY-DBM

Marker: 18.793587174 GHz -41.64 dBm

Level [dBm]

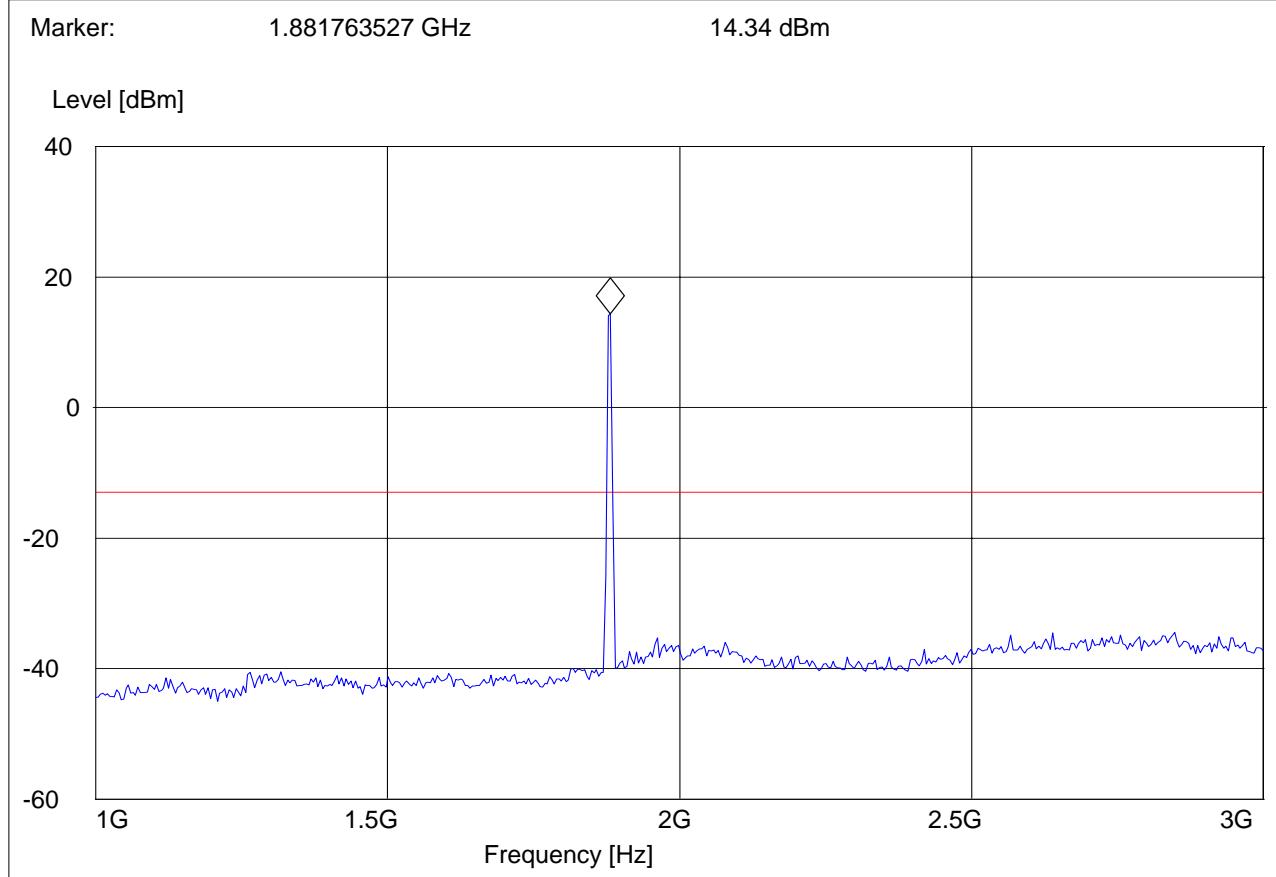


RADIATED SPURIOUS EMISSIONS(UMTS FDD2) Tx CHANNEL 9400: 1GHz – 3GHz

EUT: 34LC00b/C01
Customer: L3 Communications
Test Mode: WCDMA FDD2
ANT Orientation: V
EUT Orientation: V
Test Engineer: Chris
Voltage: AC Adaptor
Comments: Marker on Tx signal

SWEEP TABLE: "FCC 24Spuri 1-3G"

Start Frequency	Stop Frequency	Detector	Meas.	IF	Transducer
1.0 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM



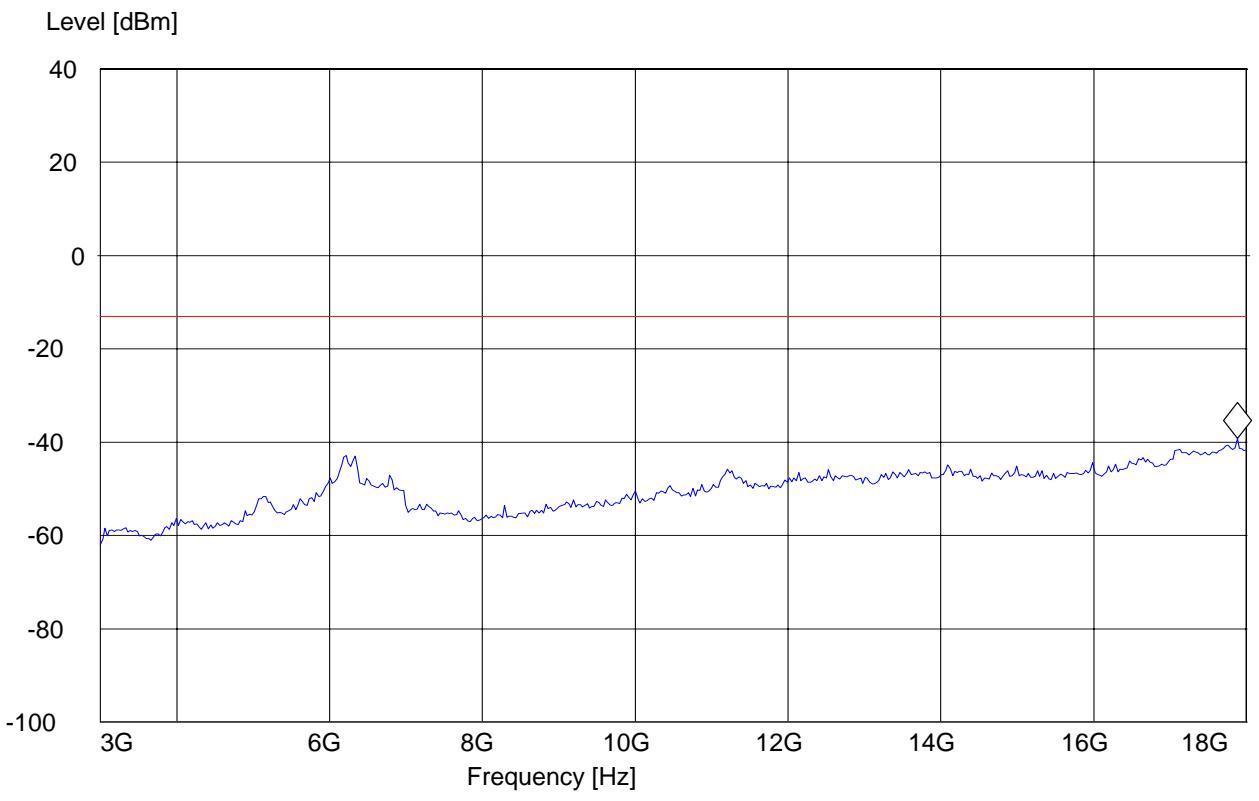
RADIATED SPURIOUS EMISSIONS(UMTS FDD2) Tx CHANNEL9400: 3GHz – 18GHz

EUT: 34LC00b/C01
Customer: L3 Communications
Test Mode: WCDMA FDD2
ANT Orientation: V
EUT Orientation: V
Test Engineer: Chris
Voltage: AC Adaptor
Comments:

SWEET TABLE: "FCC 24Spuri 3-18G"

Start Frequency	Stop Frequency	Detector	Meas.	IF	Transducer
3.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM

Marker: 17.879759519 GHz -39.21 dBm



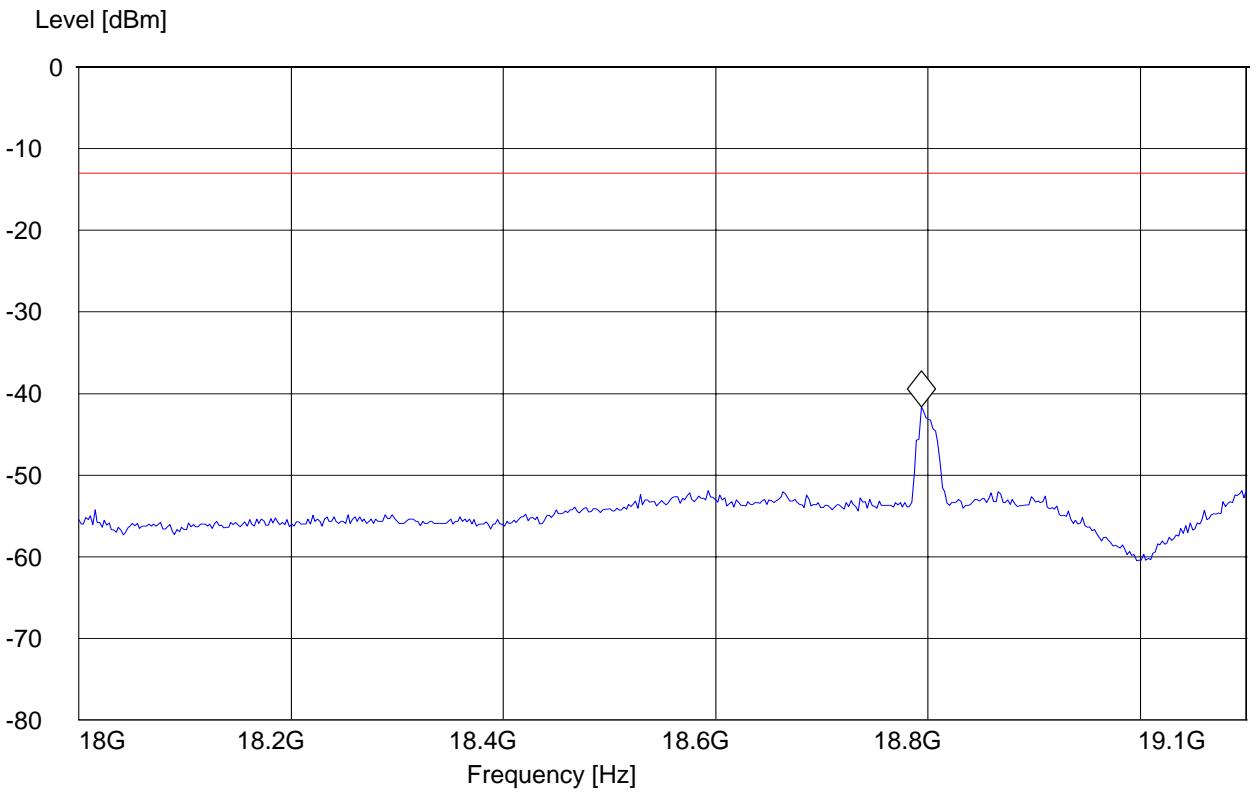
RADIATED SPURIOUS EMISSIONS(UMTS FDD2) Tx CHANNEL 9400: 18GHz – 19.1GHz

EUT: 34LC00b/C01
Customer: L3 Communications
Test Mode: WCDMA FDD2
ANT Orientation: H
EUT Orientation: V
Test Engineer: Chris
Voltage: AC Adaptor
Comments:

SWEET TABLE: "FCC 24spuri 18-19.1G"

Start Frequency	Stop Frequency	Detector	Meas.	IF Time	Transducer
18.0 GHz	19.1 GHz	Average	Coupled	1 MHz	DUMMY-DBM

Marker: 18.793587174 GHz -41.64 dBm

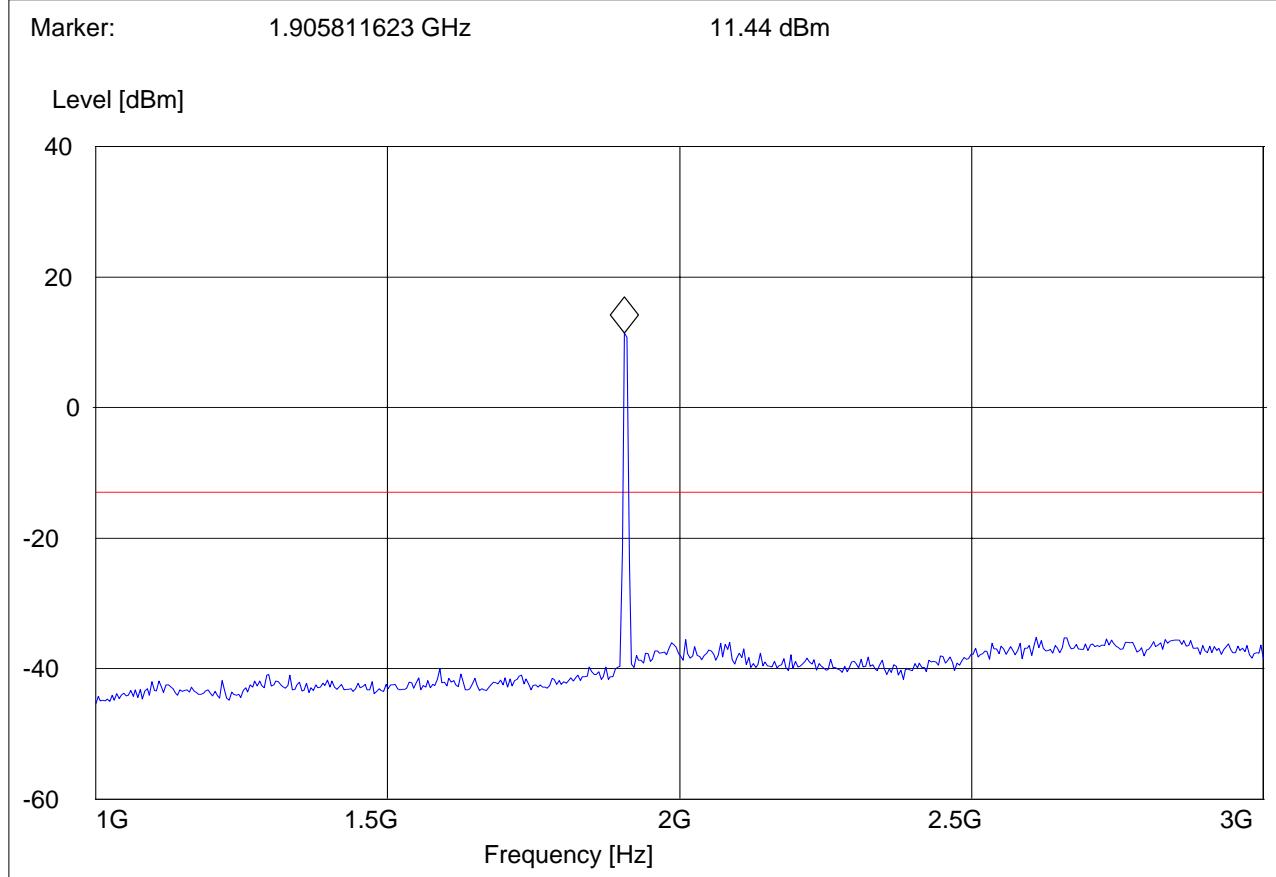


RADIATED SPURIOUS EMISSIONS(UMTS FDD2) Tx CHANNEL 9538: 1GHz – 3GHz

EUT: 34LC00b/C01
Customer: L3 Communications
Test Mode: WCDMA FDD2
ANT Orientation: V
EUT Orientation: V
Test Engineer: Chris
Voltage: AC Adaptor
Comments: Marker on Tx signal

SWEEP TABLE: "FCC 24Spuri 1-3G"

Start Frequency	Stop Frequency	Detector	Meas.	IF	Transducer
1.0 GHz	3.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM



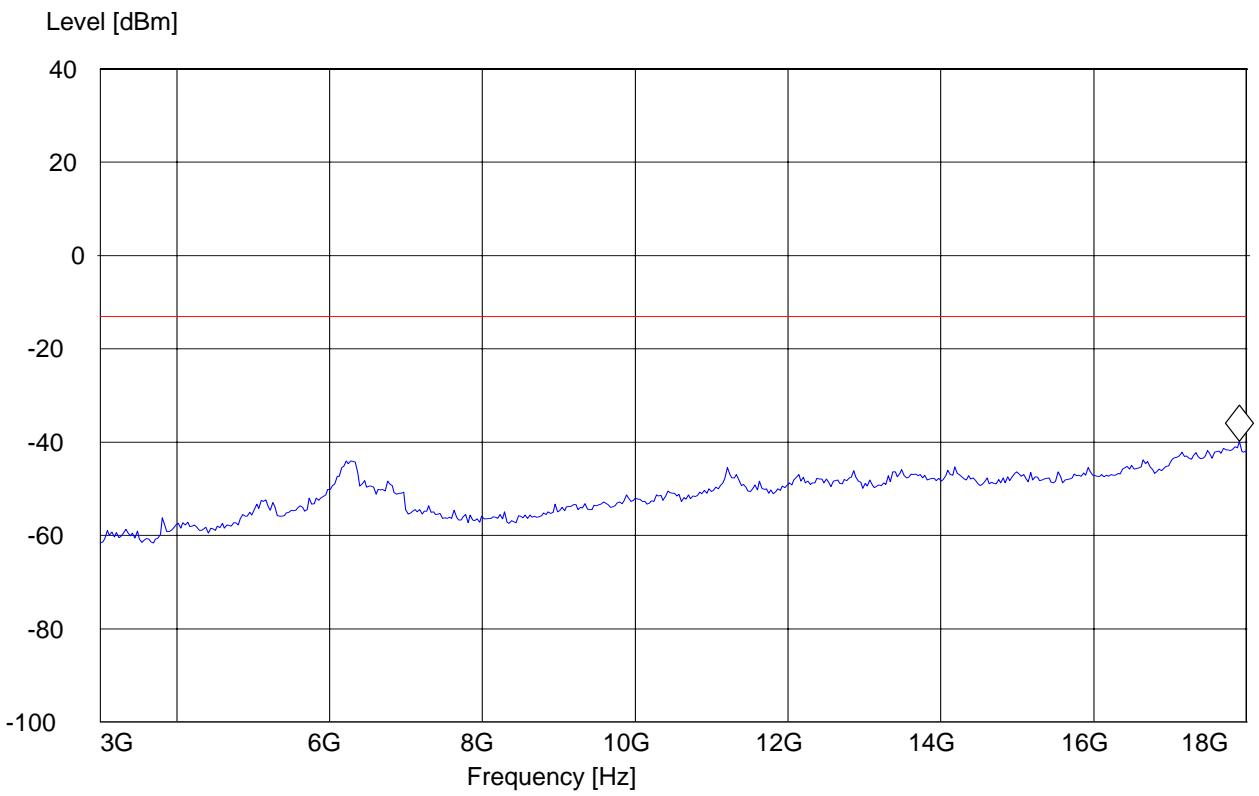
RADIATED SPURIOUS EMISSIONS(UMTS FDD2) Tx CHANNEL 9538: 3GHz – 18GHz

EUT: 34LC00b/C01
Customer: L3 Communications
Test Mode: WCDMA FDD2
ANT Orientation: V
EUT Orientation: V
Test Engineer: Chris
Voltage: AC Adaptor
Comments:

SWEET TABLE: "FCC 24Spuri 3-18G"

Start Frequency	Stop Frequency	Detector	Meas.	IF	Transducer
3.0 GHz	18.0 GHz	MaxPeak	Coupled	1 MHz	DUMMY-DBM

Marker: 17.909819639 GHz -39.79 dBm



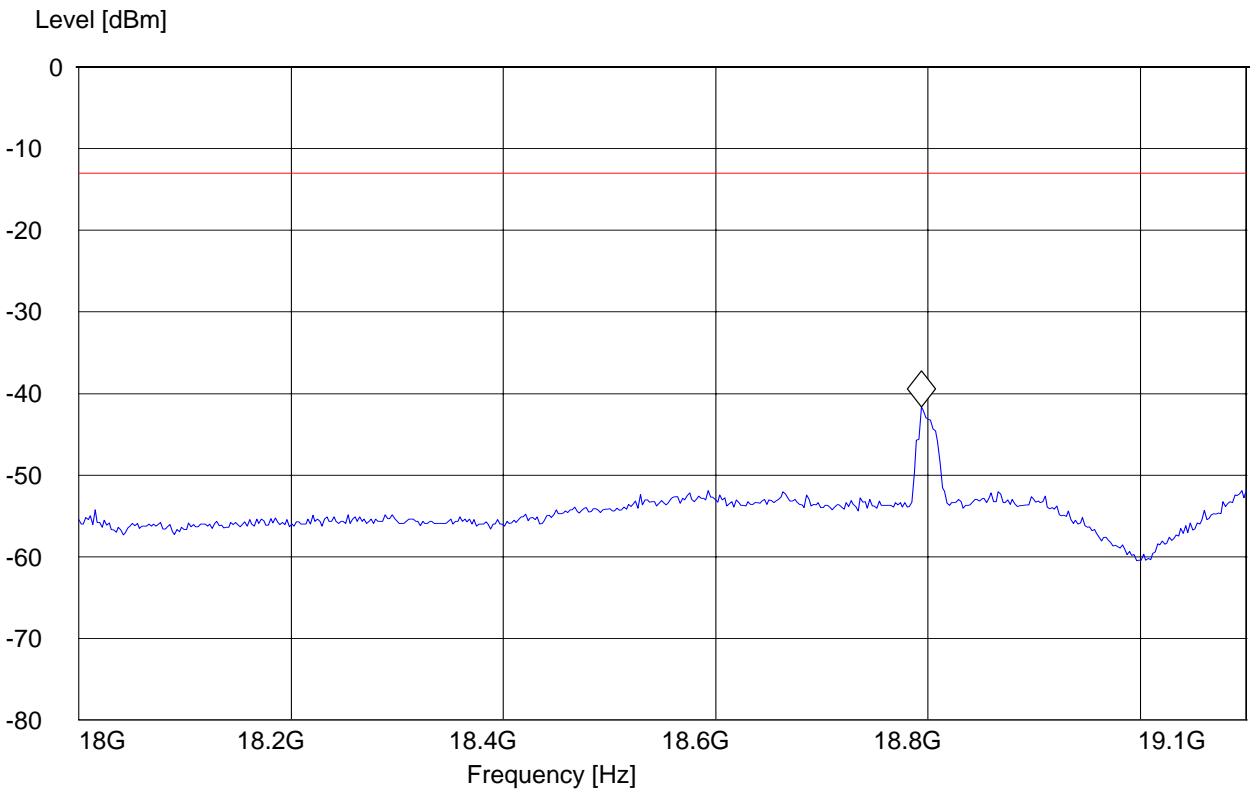
RADIATED SPURIOUS EMISSIONS(UMTS FDD2) 18GHz – 19.1GHz

EUT: 34LC00b/C01
Customer: L3 Communications
Test Mode: WCDMA FDD2
ANT Orientation: H
EUT Orientation: V
Test Engineer: Chris
Voltage: AC Adaptor
Comments:

SWEET TABLE: "FCC 24spuri 18-19.1G"

Start Frequency	Stop Frequency	Detector	Meas.	IF	Transducer
18.0 GHz	19.1 GHz	Average	Coupled	1 MHz	DUMMY-DBM

Marker: 18.793587174 GHz -41.64 dBm



5.6 AC POWER LINE CONDUCTED EMISSIONS § 15.107/207

5.6.1 Limits

Technical specification: 15.107 / 15.207 (Revised as of August 20, 2002)

§15.107 (a) Except for Class A digital devices, for equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Limit

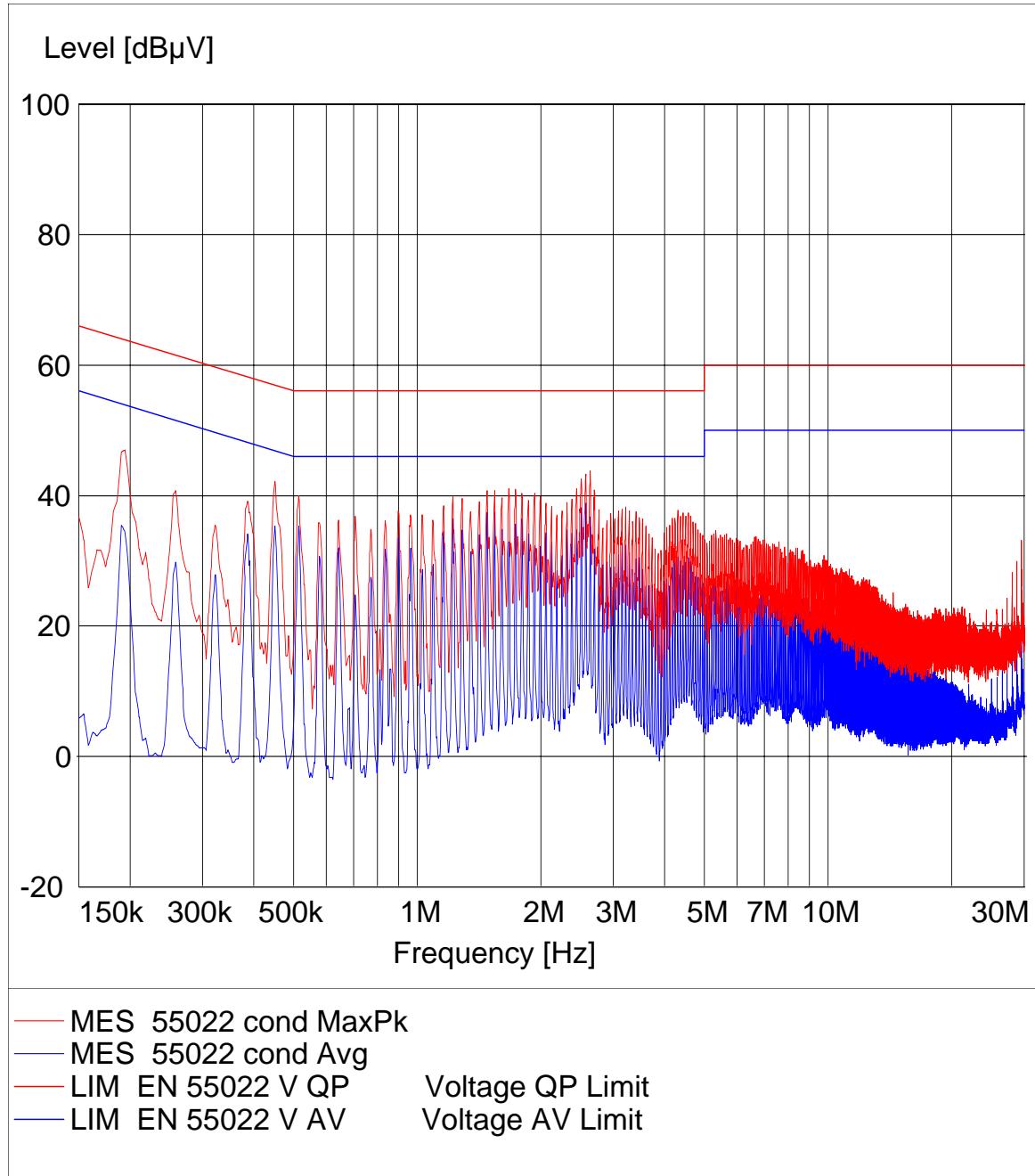
Frequency of Emission (MHz)	Conducted Limit (dB μ V)	
	Quasi-Peak	Average
0.15 – 0.5	66 to 56*	56 to 46*
0.5 – 5	56	46
5 – 30	60	50

* Decreases with logarithm of the frequency

ANALYZER SETTINGS: RBW = 10KHz VBW = 10KHz

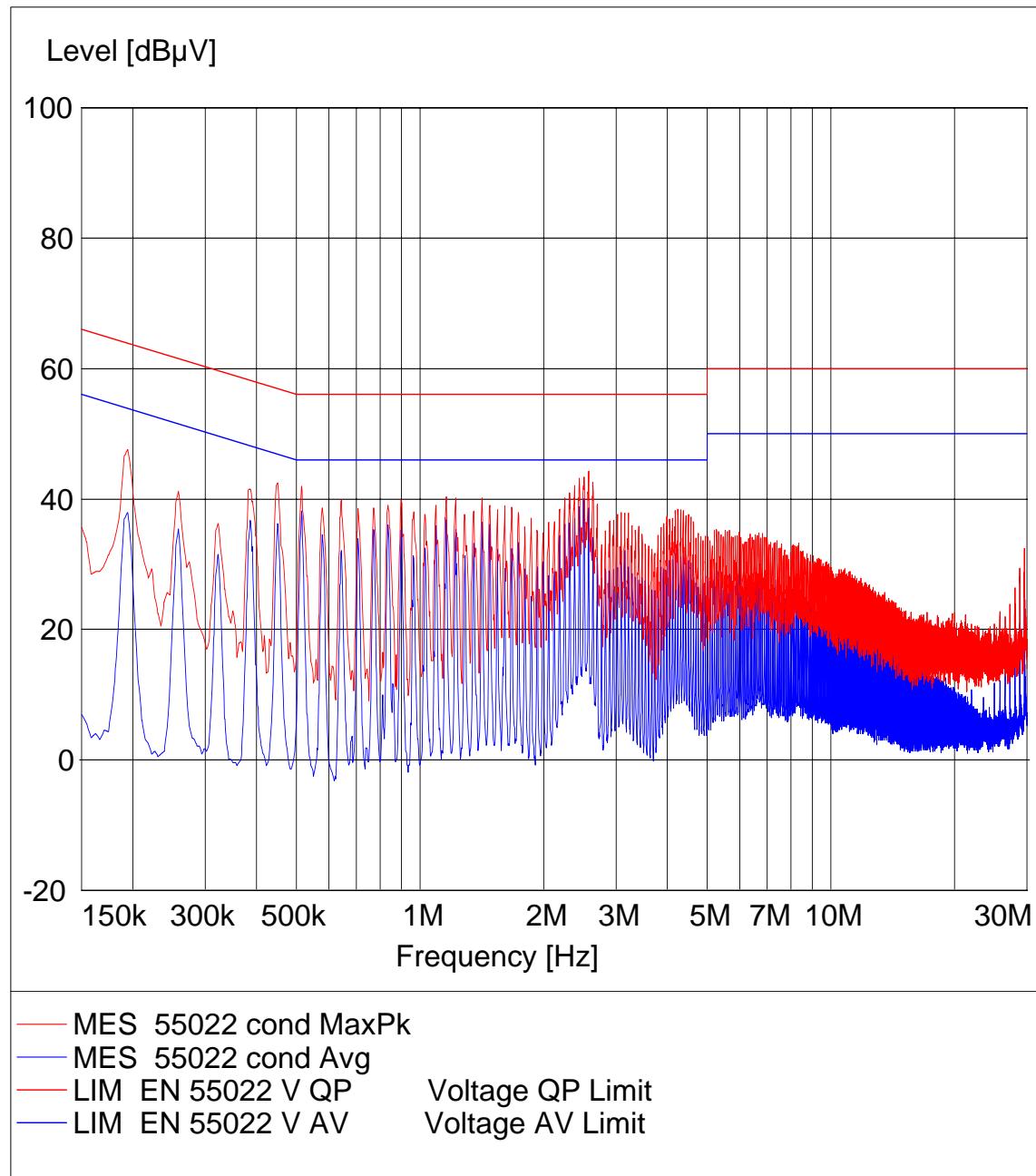
5.6.2 Results, TX Transmit Line:

EUT: 34LC00b/C01
Manufacturer: L3 Communications
Test Mode: GSM 850MHz; Ch. 190
ANT Orientation:: Conducted
EUT Orientation:: H
Test Engineer:: Chris
Power Supply: : AC Adapter
Comments: : 120V Line



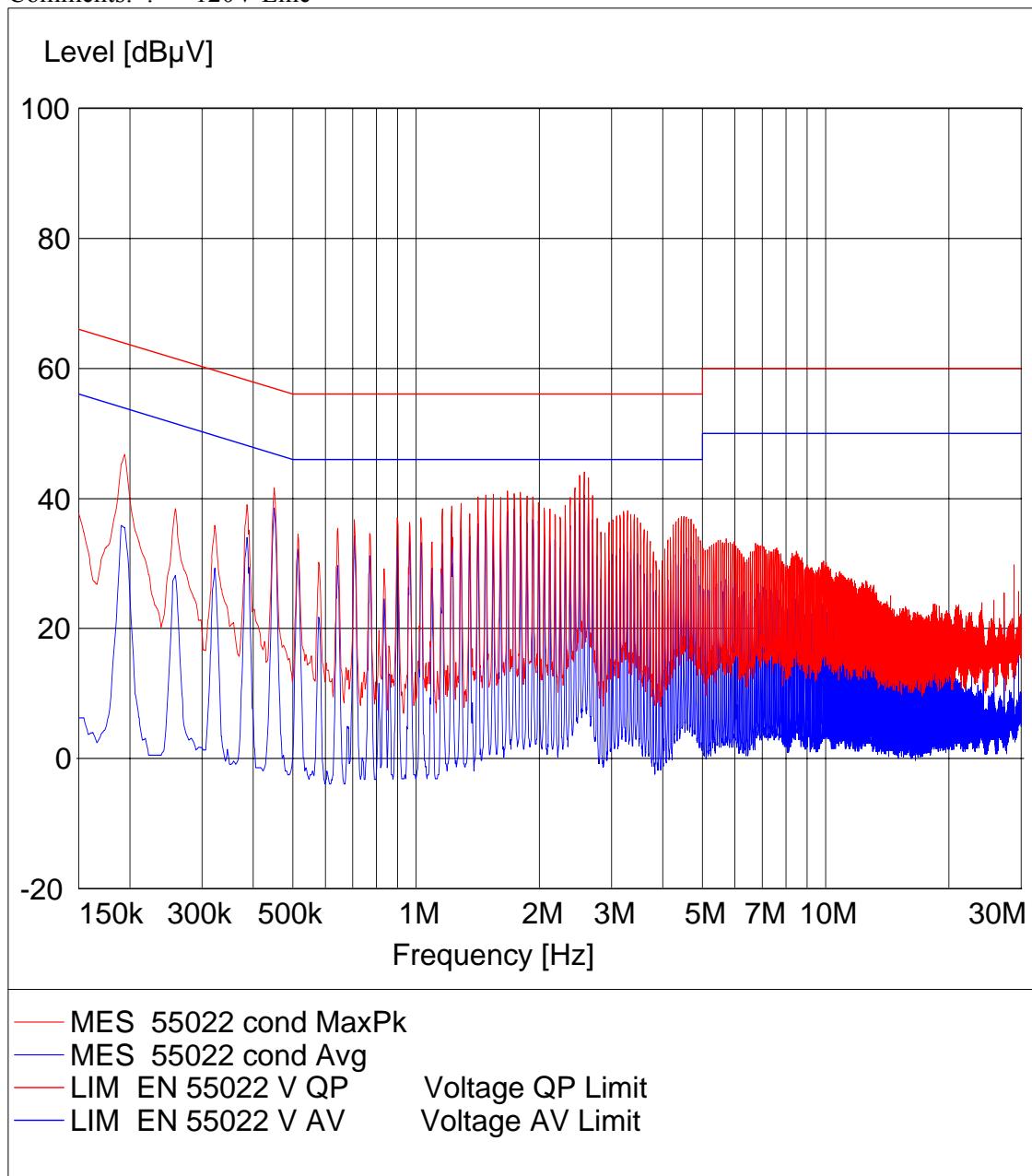
5.6.3 TX Transmit Neutral:

EUT: 34LC00b/C01
Manufacturer: L3 Communications
Test Mode: GSM 850MHz; Ch.190
ANT Orientation:: Conducted
EUT Orientation:: H
Test Engineer:: Chris
Power Supply: : AC Adapter
Comments: : 120V Neutral



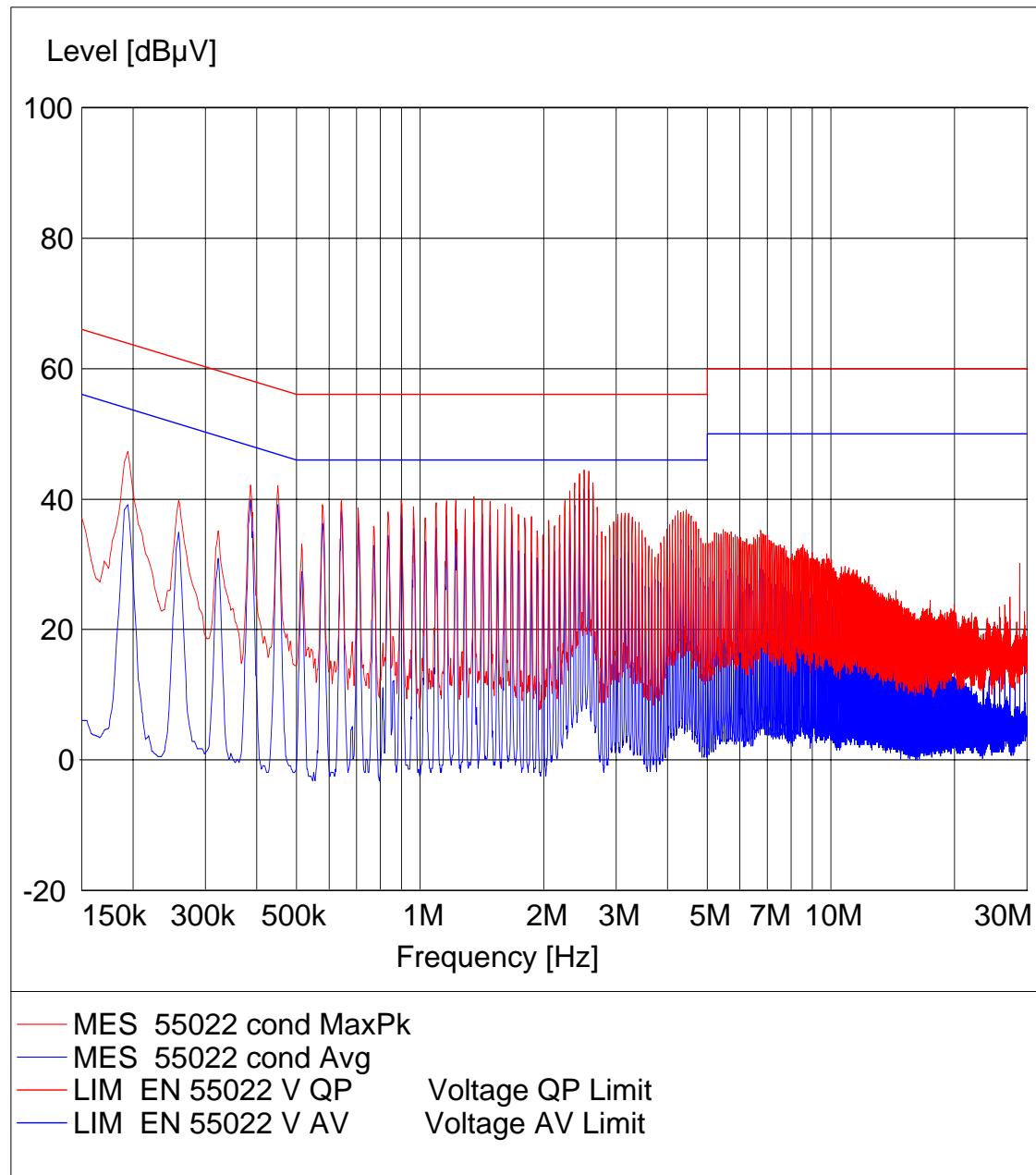
5.6.4 RX Transmit Line:

EUT: 34LC00b/C01
Manufacturer: L3 Communications
Test Mode: GSM 850MHz; RX
ANT Orientation:: Conducted
EUT Orientation:: H
Test Engineer:: Chris
Power Supply: : AC Adapter
Comments: : 120V Line



5.6.5 RX Transmit Neutral:

EUT: 34LC00b/C01
Manufacturer: L3 Communications
Test Mode: GSM 850MHz; RX
ANT Orientation: Conducted
EUT Orientation: H
Test Engineer: Chris
Power Supply: AC Adapter
Comments: 120V Neutral



6 TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

No	Instrument/Ancillary	Type	Manufacturer	Serial No.	Cal Due	Interval
01	Spectrum Analyzer	ESIB 40	Rohde & Schwarz	100107	May 2009	1 year
02	Spectrum Analyzer	FSEM 30	Rohde & Schwarz	100017	May 2009	1 year
03	Signal Generator	SMY02	Rohde & Schwarz	836878/011	May 2009	1 year
04	Power-Meter	NRVD	Rohde & Schwarz	0857.8008.02	May 2009	1 year
05	Biconilog Antenna	3141	EMCO	0005-1186	June 2009	1 year
06	Horn Antenna (1-18GHz)	SAS-200/571	AH Systems	325	June 2009	1 year
07	Horn Antenna (18-26.5GHz)	3160-09	EMCO	1240	June 2009	1 year
08	Power Splitter	11667B	Hewlett Packard	645348	n/a	n/a
09	Climatic Chamber	VT4004	Voltsch	G1115	May 2009	1 year
10	High Pass Filter	5HC2700	Trilithic Inc.	9926013	n/a	n/a
11	High Pass Filter	4HC1600	Trilithic Inc.	9922307	n/a	n/a
12	Pre-Amplifier	JS4-00102600	Miteq	00616	May 2009	1 year
13	Power Sensor	URV5-Z2	Rohde & Schwarz	DE30807	May 2009	1 year
14	Digital Radio Comm. Tester	CMD-55	Rohde & Schwarz	847958/008	May 2009	1 year
15	Universal Radio Comm. Tester	CMU 200	Rohde & Schwarz	832221/06	May 2009	1 year
16	LISN	ESH3-Z5	Rohde & Schwarz	836679/003	May 2009	1 year
17	Loop Antenna	6512	EMCO	00049838	July 2010	2 years

7 References

Title 47—Telecommunication, CHAPTER I--FEDERAL COMMUNICATIONS COMMISSION, PART 2--FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS October 1, 2001.

Title 47—Telecommunication, CHAPTER I--FEDERAL COMMUNICATIONS COMMISSION, PART 22 PUBLIC MOBILE SERVICES October 1, 1998.

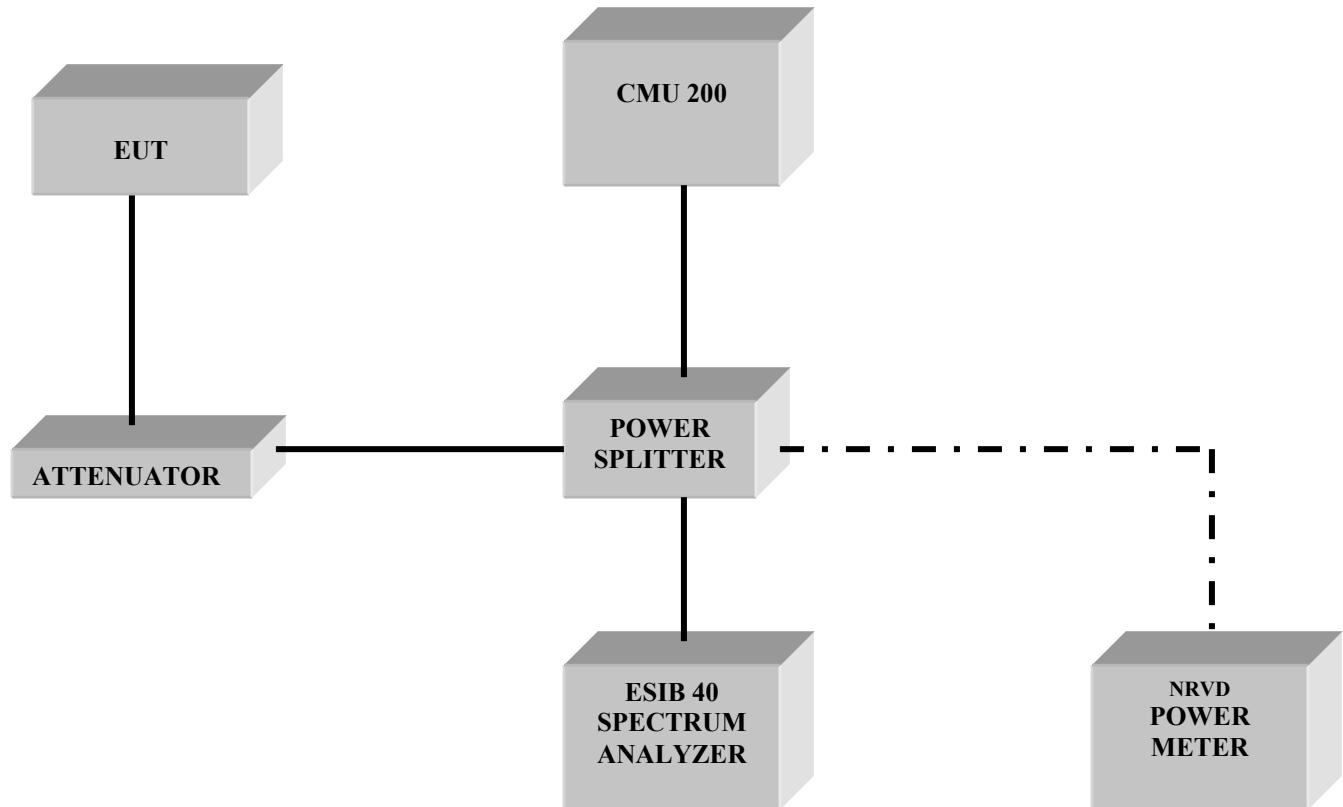
FCC Report and order 02-229 September 24, 2002.

Title 47—Telecommunication, CHAPTER I--FEDERAL COMMUNICATIONS COMMISSION, PART 24 PERSONAL COMMUNICATIONS SERVICES October 1, 1998.

ANSI / TIA-603-C-2004 Land Mobile FM or PM Communications Equipment Measurement and Performance Standard November 7, 2002.

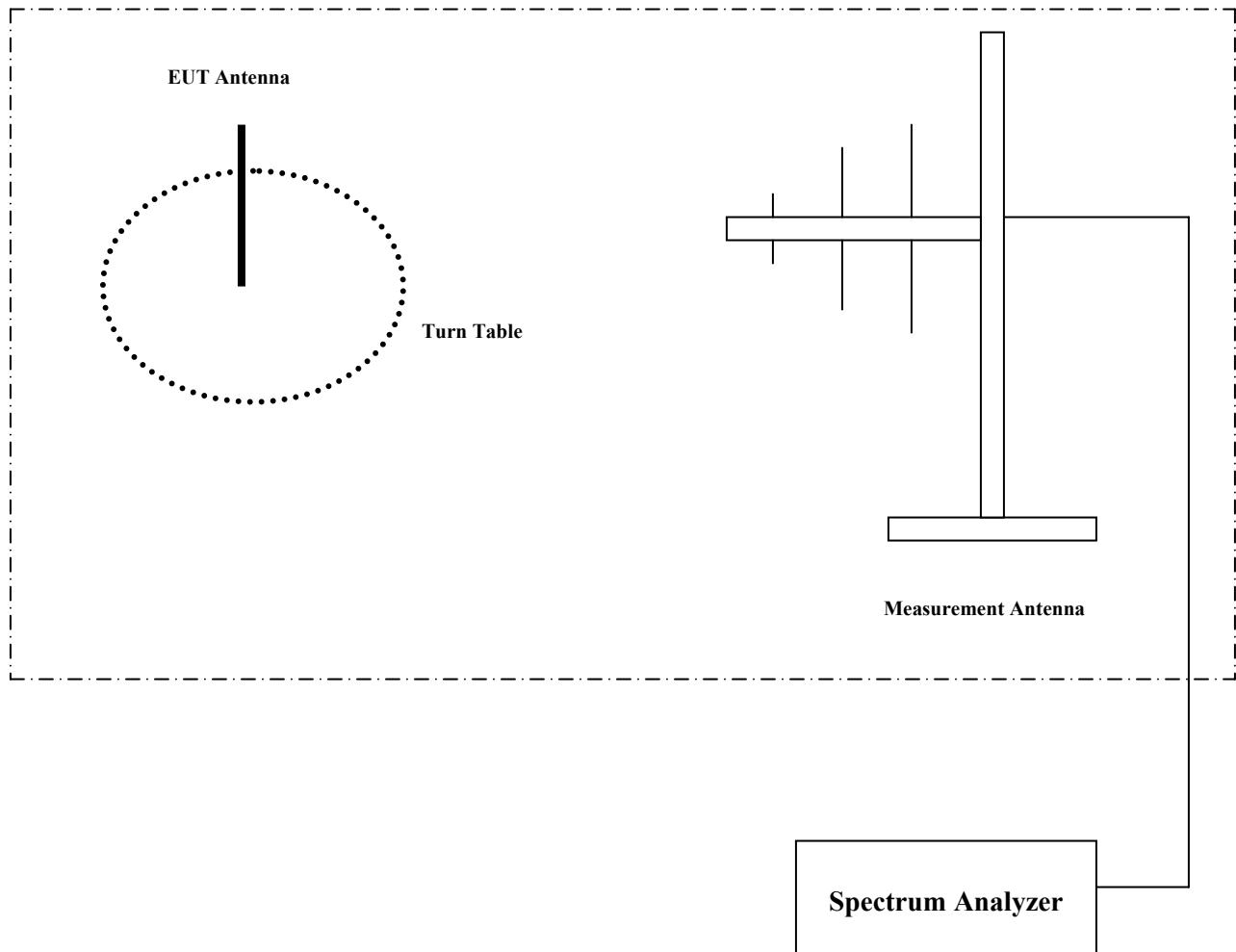
8 BLOCK DIAGRAMS

Conducted Testing



Radiated Testing

ANECHOIC CHAMBER



9 Revision History

2008-07-18 Original report.
2008-09-05 Updated Accessory equipment. Added “Marker on Tx signal” to pages 52, 54, 58, 64, 67, 70. Updated report number and date.