

REV	Δ	Description	Sheet Effected	Date	Drawn	Checked
A				15.07.04	D.Lanuel	S.Cohen

EMC Laboratory



## Data Collection Unit

FCCID: **LSQ-DCU-2010C**

Manufactured by  
Elmotech Ltd.

EMC Test Report

According FCC Part 15 Requirements

January 04

	Function/Title	Name	Signature	Date
Prepared by	Test Engineer	D.Lanuel		15.07.04
Checked by	Test Engineer	D.Lanuel		15.07.04
Approved by	EMC Lab. Manager	S.Cohen		15.07.04

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## 1 Introduction

### a. Scope

This document describes the measurement procedures and tests for FCC part 15 of the LSQ-DCU-2010C Manufactured by Elmotech Ltd.

## 2 Test Data Information

### a. Description of equipment Under Test

Equipment Under Test:	DCU Cellular
FCCID	LSQ-DCU-2010C
Manufacturer:	Elmotech Ltd.
Serial Numbers:	031NA10003
Mode of Operation:	RX MODE
Receiver operating frequency:	318MHZ
Year of Manufacture:	2003

### b. Applicant Information:

Applicant:	Elmotech Ltd.
Applicant Address	2, Habarzel Street Tel-Aviv
Telephone:	+972-3-6478871
FAX:	+972-3-6478872
The testing was observed by: following applicant's personnel:	Natan Galperin

### c. Test Performance:

Date of reception for testing:	05.06.04
Dates of testing	06.06.04
Test Laboratory Location	TADIRAN EMC LAB , Hashoftim 26 Holon 58102 ISRAEL Tel: 972-3-5574476 Fax: 972-3-5575320

Applicable EMC Specification:	Federal Communication Commission (FCC), Part 15: Radio Frequency Devices, Sections 15.107 & 15.109
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### 3 Test Summary and Signatures.

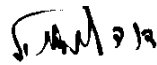
TADIRAN EMC Laboratory has completed testing of E.U.T in accordance with the requirements of the FCC Part 15 Regulations for Class B equipment.

The E.U.T has been found to comply with the emission requirements of the FCC Part 15 Regulations given below

Test	Test Description	Section	Pass/Fail
1	Unintentional Radiated Emission	15.109	Pass
2	Unintentional Conducted Emission	15.107	Pass

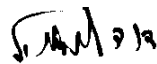
**a. Test performed by:**

Mr. D. Lanuel Test Engineer



**b. Test Report prepared by:**

Mr. D. Lanuel Test Engineer



**c. Test Report Approved by:**

Mr. Samuel Cohen EMC Lab. Manager



## 4 E.U.T information

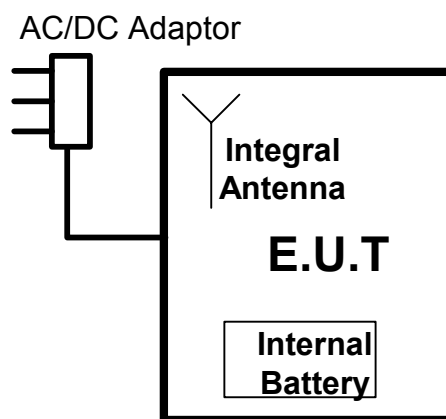
### a. E.U.T description

The EUT, DCU-2010C-2, is a data collection unit, which receives data from 433.92MHz alarm transmitters. It provides communication with monitoring center through modem and POTS lines and infrared communication with a computer.

The device is powered via external AC/12VDC adapter, manufactured by Eggeston Ltd, model number N2UFSW3.

### b. E.U.T Test Configuration

The E.U.T test configuration is shown in figure below



### c. E.U.T Mode of Operation description

- (1) The test was performed to measure emission at RX Mode
- (2) Operating Voltage 110 V, AC 60Hz

## 5 Unintentional Radiated Emission class B test According TO 15.109

E.U.T: LSQ-DCU-2010C S/N 031NA10003  
 Test Method: ANSI C63.4  
 Date: 02/06/04  
 Relative Humidity: 37%  
 Ambient Temperature: 22c  
 Air Pressure: 1042hpa  
 Test Setup: Figure 5f

Testing Engineer: D.Lanuel *[Signature]* Date 06/06/04

### a. General

The test was performed to measure Radiated emission at RX Mode

### b. Test Results Summary & Conclusions

**The E.U.T was found in compliance with 15.109 Requirements**

### c. Limits of Radiated Interference Field Strength according 15.109

The test unit shall meet the limits of Table 5C for Class B equipment.

Table 5c Limits For Class B equipment

Frequency Range (MHz)	Quasi-peak Limits (dB $\mu$ V/m)
30 - 88	40
88 - 216	43
216 - 960	46
Above 960	54

## d. Test Instrumentation and Equipment

Table 5d Test Instrumentation and Equipment

Item	Model	Manufacturer	Next Date Calibration
Spectrum Analyzer	8593E	HP	31/01/05
Broadband Antenna	BTA-L	FRANKONIA	10.04.05
Double Ridged Guide Antenna	3105	EMCO	15.03.05
Low Noise Amplifier (0-1GHz)	AM-1300-N	MITEQ	14.01.05
Low Noise Amplifier (1-2GHz)	SMC-09	MITEQ	14.01.05
Low Noise Amplifier (2-6GHz)	MWA-02060-4025	ELISRA	14.01.05

## e. Test Procedure

### (1) Preliminary Test Procedure

- 1) The EUT was placed on the top of a rotating table 0.8 meters above the ground at a chamber shielded
- 2) The E.U.T was set 3 meters away from the receiving antenna, which was mounted on the top of a variable-height antenna tower.
- 3) The Antenna height varied from one meter to 1.8 meters above the ground and the table was rotated 360° to determine the maximum value of the field strength
- 4) The antenna was set both horizontal and vertical polarization.

### (2) Final Test Procedure

- 1) The EUT was tested at open area for each suspected emission,
- 2) The test procedure was performed according paragraph d. but the Antenna height varied from one meter to four meters above the ground

## f. Final Test Setup

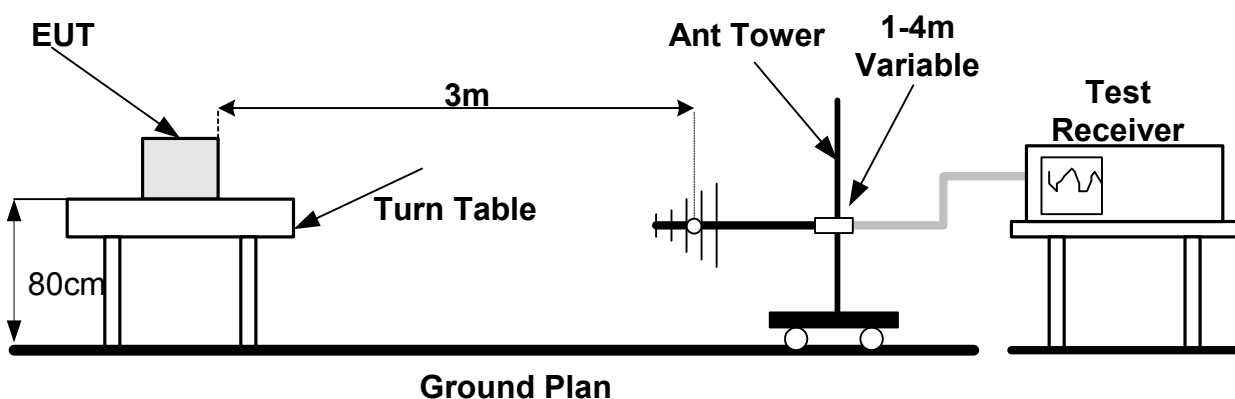


Figure 5f Radiated Emission test configuration

Radiated Emission Test





**g. Results****(1) Preliminary test Results**

Table 5.g.1 Preliminary Test Results for RX Mode 15.109

Antenna Polarization	Freq. Range MHz	Res. BW (kHz)	Plot No.	PASS/FAIL
Vertical	30-1000	120	Plot RE/1	Pass
Horizontal	30-1000	120	Plot RE/2	Pass
Vertical	1000-2800	1000	Plot RE/3	Pass
Horizontal	1000-2800	1000	Plot RE/4	Pass
Vertical	2800-4000	1000	Plot RE/5	Pass
Horizontal	2800-4000	1000	Plot RE/6	Pass

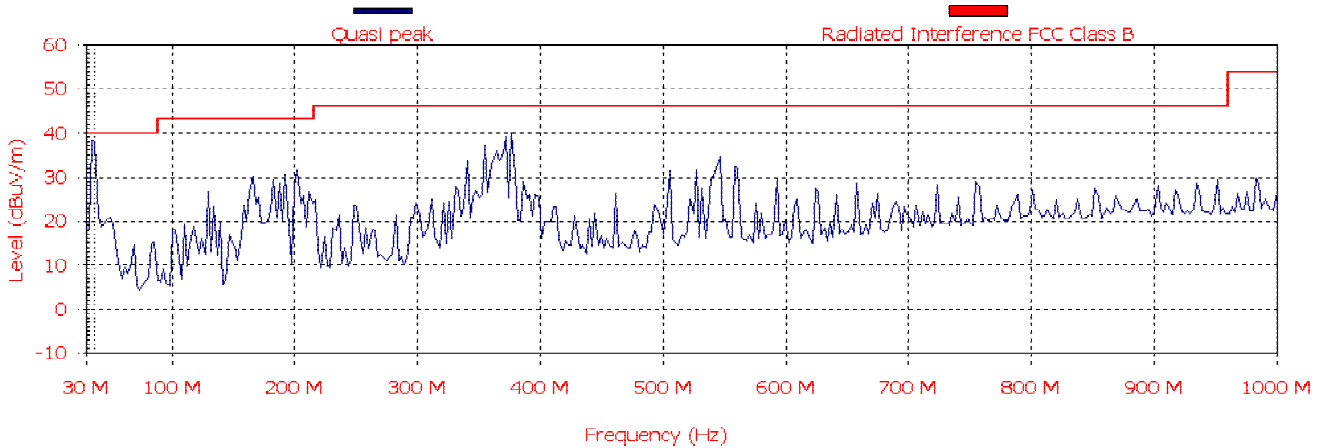
**(2) Final Test Results**

Table 5.g.2 Table RE-B Six Highest Emissions RX Mode 15.109

Freq. (MHz)	Quasi-peak Reading (dB $\mu$ V/m)	peak Reading (dB $\mu$ V/m)	Limit dB $\mu$ V/m	QP Margin (dB)	Antenna Ver/Hor
34.122	28.2	37.5	40	11.8	V
34.275	24.2	36.6	40	15.8	H
34.311	29.2	38.2	40	10.8	V
491.494	37.5	40	46	8.5	H
507.725	28.7	40.2	46	17.3	H
1000 - 4000	No spurious emission were found				

Frequency (MHz)	PK (dbuV)	QP (dbuV)	QP Limit	QP Margin	PASS /FAIL	Angle	Angle	Hight
34.142	37.5	28.2	40	-11.8	PASS	240	240	1.3
34.311	38.2	29.2	40	-10.8	PASS	240	240	1.3

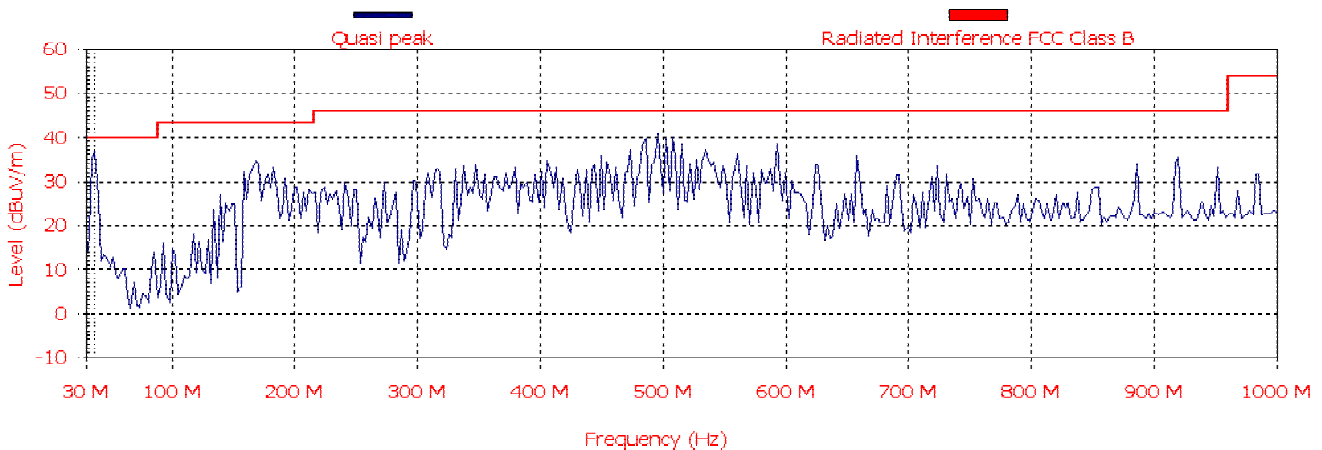
RBW-120KHz, VBW-1000KHz,Sweep time 202Ms, **Antenna-Vertical**



Plot RE/ 1

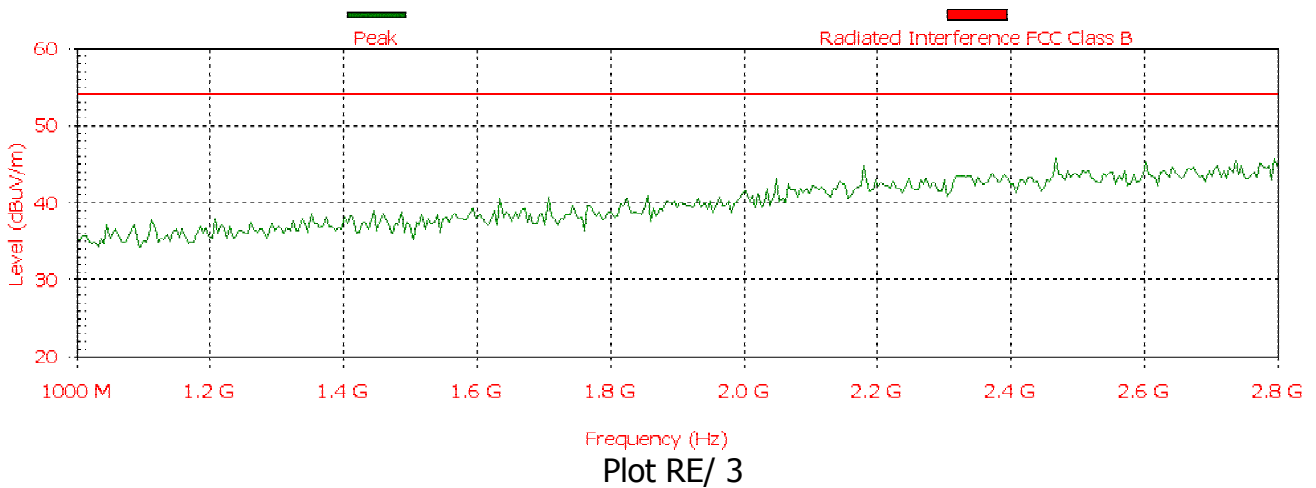
Frequency (MHz)	PK (dbuV)	QP (dbuV)	QP Limit	QP Margin	PASS /FAIL	Angle	Angle	Hight
37.275	36.6	24.2	40	-15.8	PASS	0	240	1.3
491.494	40	37.5	46	-8.5	PASS	240	240	1
507.725	40.2	28.7	46	-17.3	PASS	240	240	1

RBW-120KHz, VBW-1000KHz,Sweep time 202Ms, **Antenna-Horizontal**

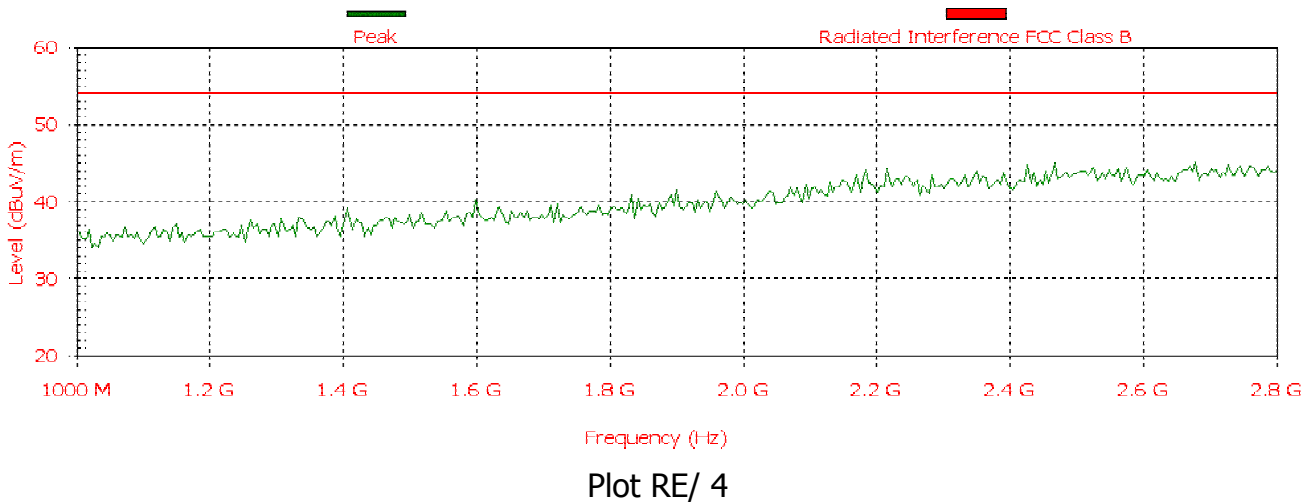


Plot RE/ 2

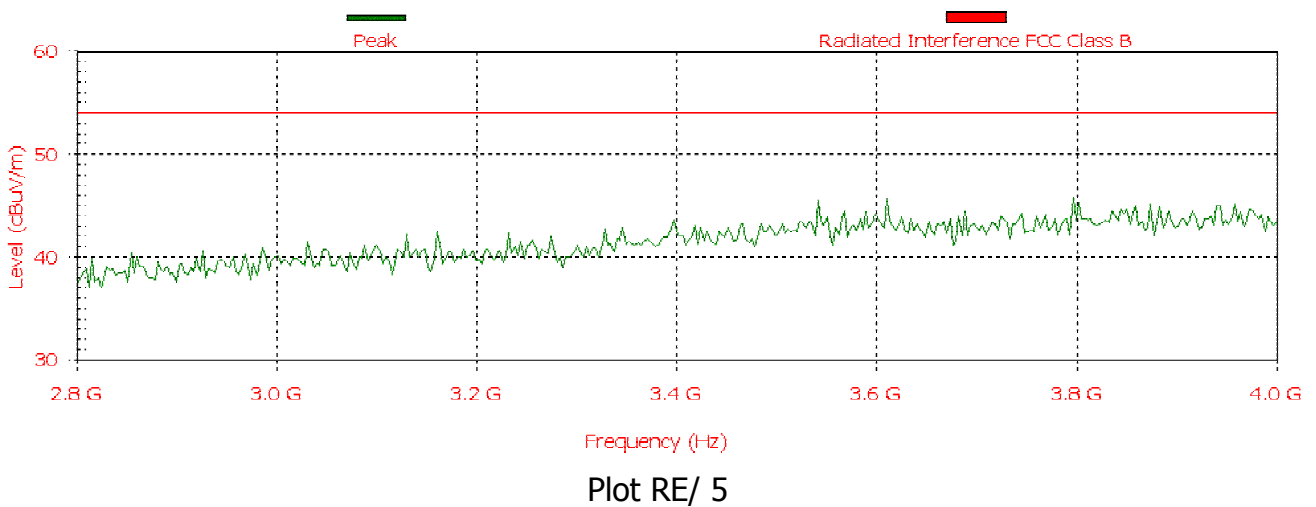
RBW-1000KHz, VBW-1000KHz, Sweep time 24ms, **Antenna-Vertical**



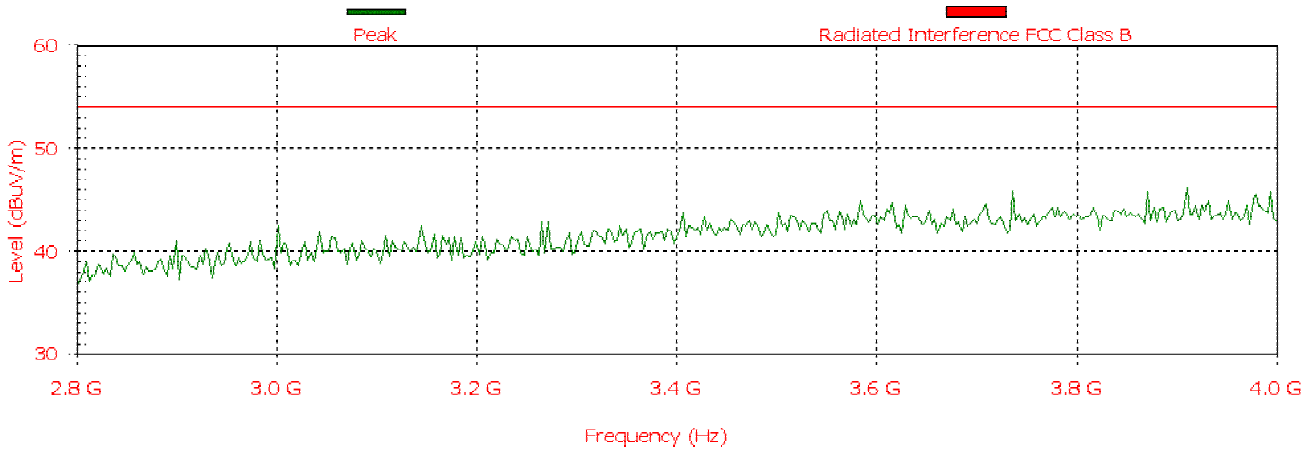
RBW-1000KHz, VBW-1000KHz, Sweep time 24ms, **Antenna-Horizontal**



RBW-1000KHz, VBW-1000KHz, Sweep time 24ms, **Antenna-Vertical**



RBW-1000KHz, VBW-1000KHz, Sweep time 24ms, **Antenna-Horizontal**

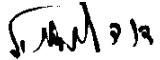


Plot RE/ 6

## 6 Conducted Emission, AC Power Leads According to FCC 15.107

Frequency Range: 150 kHz – 30 MHz

E.U.T: LSQ-DCU-2010C S/N 031NA10003  
 Test Method: ANSI C63.4  
 Date: **02/06/04**  
 Relative Humidity: 37%  
 Ambient Temperature: 22c  
 Air Pressure: 1042hpa  
 Test Setup: Figure 6e

Testing Engineer: D.Lanuel  Date : 06/06/04

### a. Test Results Summary & Conclusions

The LSQ-LPU-800 complies with FCC, Part 15.107 conducted emissions requirement.

### b. Limits of Conducted Emission at Mains Terminals

The test unit shall meet the limits of Table 6b for FCC Part 15 Para 15.107 equipment.

Table 6.b Limits for intentional radiator according 15.107

Frequency Range MHz	Quasi-peak Limits dB $\mu$ V
0.15 – 0.50	66 to 56*
0.50 - 5	56
5 - 30	60

\*Decreases with the logarithm of the frequency

### c. Test Instrumentation and Equipment

Table 6.c – Test Instrumentation and Equipment

Item	Model	Manufacturer	Next Date Calibration
Spectrum Analyzer	8593E	HP	31/01/05
Signal Generator	2017	Marconi	21/06/05
LISN	FCC-LISN-3B	FISCHER	31/08/04

#### d. Test Procedure

- 1) The EUT was placed on the top of table 1m by 1.5m, raised 0.8 meters above the conducting ground plane
- 2) The rear panel of the EUT was located 40cm to the vertical wall of the screen room
- 3) Each EUT power leads were individually connected through an LISN to the input power source. Unused 50 ohm connector of the LISN was terminated in 50ohm and other was connected to the spectrum analyzer through 20db attenuator for maximum conducted interference

#### e. Test setup

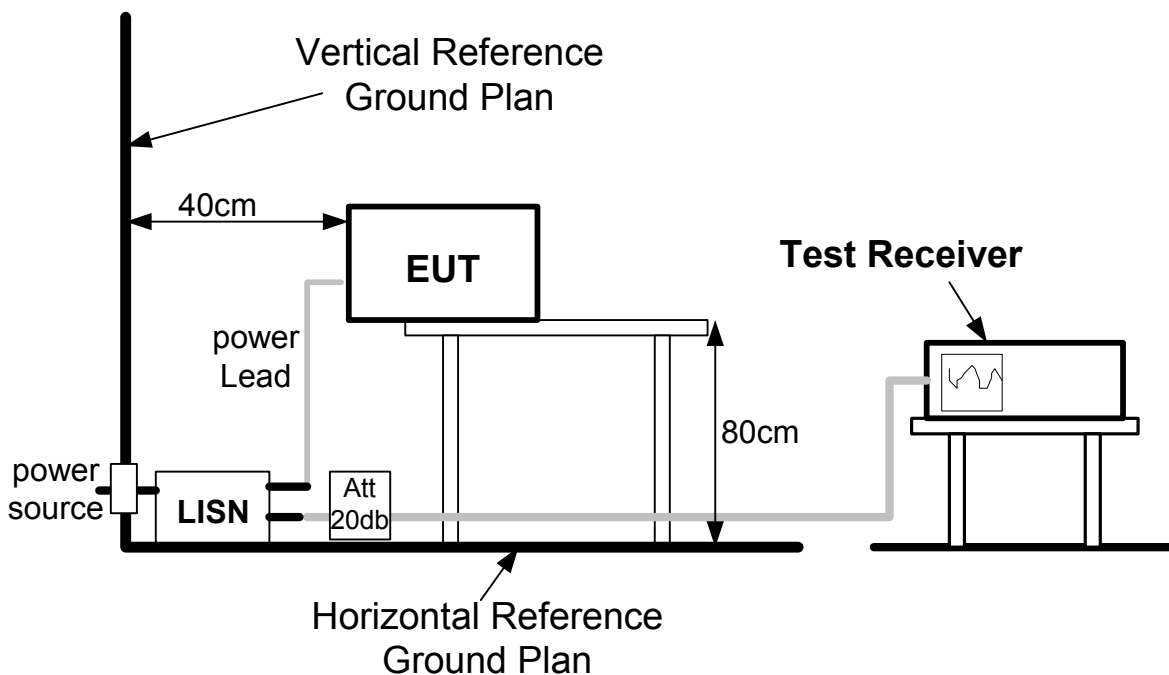


Figure 6.e Conducted emission Test Configuration



**f. Results**

Table 6.f.1 Test Results 15.107

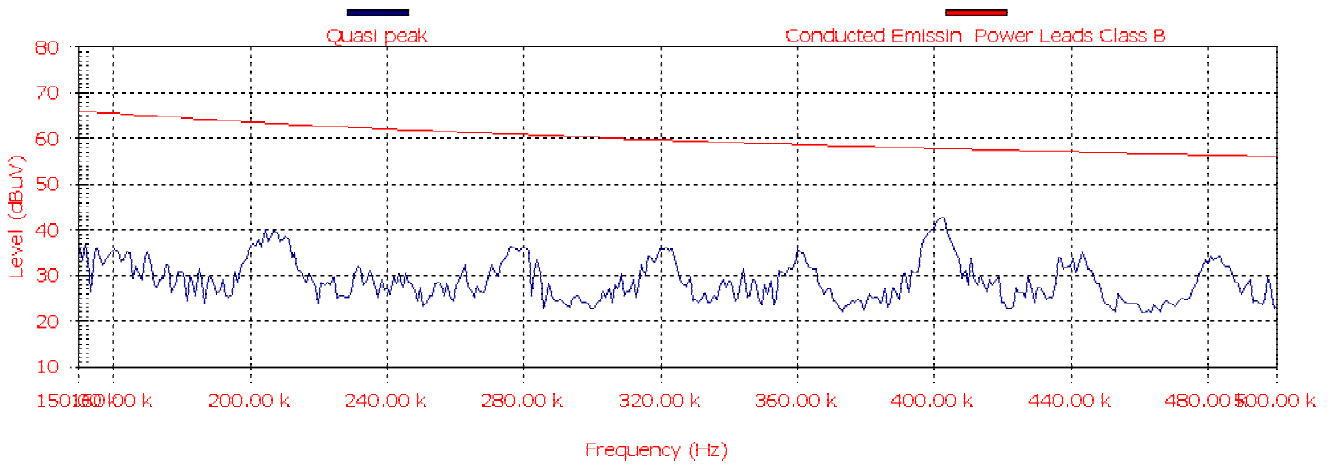
Lead P/N	Mode of Operation	Frequency Range (MHz)	Resolution BW (kHz)	Plot No.	Comply. Y/N
Neutral	RX	0.15 – 0.5	9	CE/ 1	Y
		0.5 - 30		CE/ 2	Y
Phase	RX	0.15 – 0.5	9	CE/ 4	Y
		0.5 - 30		CE/ 5	Y

Table 6.f.2 Table RE-B Six Highest Emissions 15.109

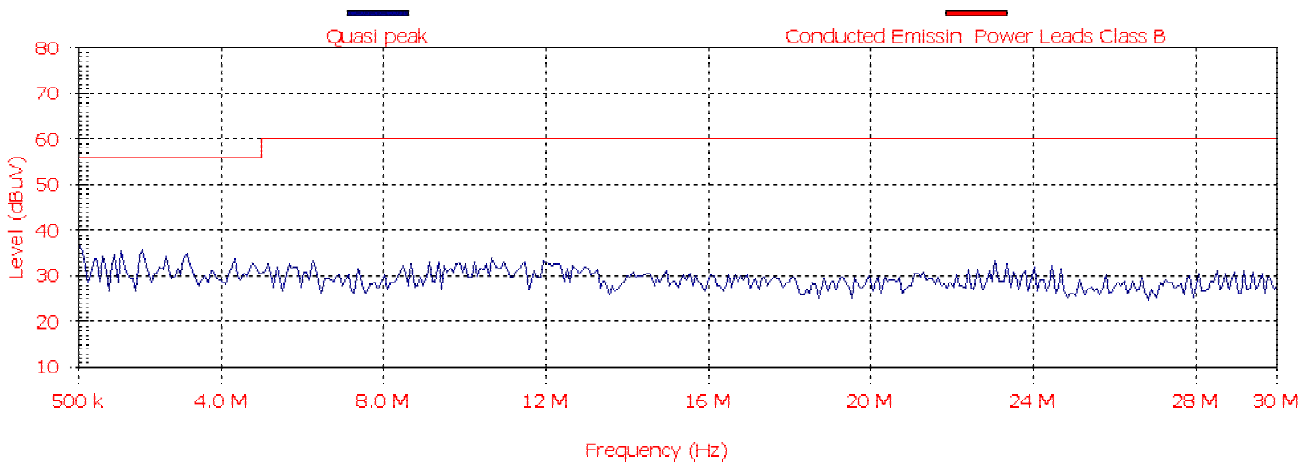
Freq. (MHz)	Quasi-peak Reading (dB $\mu$ V/m)	peak Reading (dB $\mu$ V/m)	Limit dB $\mu$ V/m	QP Margin (dB)	Antenna Ver/Hor
0.15 - 30	All Emission Were Found 20db min Blow the Limit				

**g. Tested Line—Phase**

RBW-9KHz, VBW-1000KHz, Sweep time 33ms



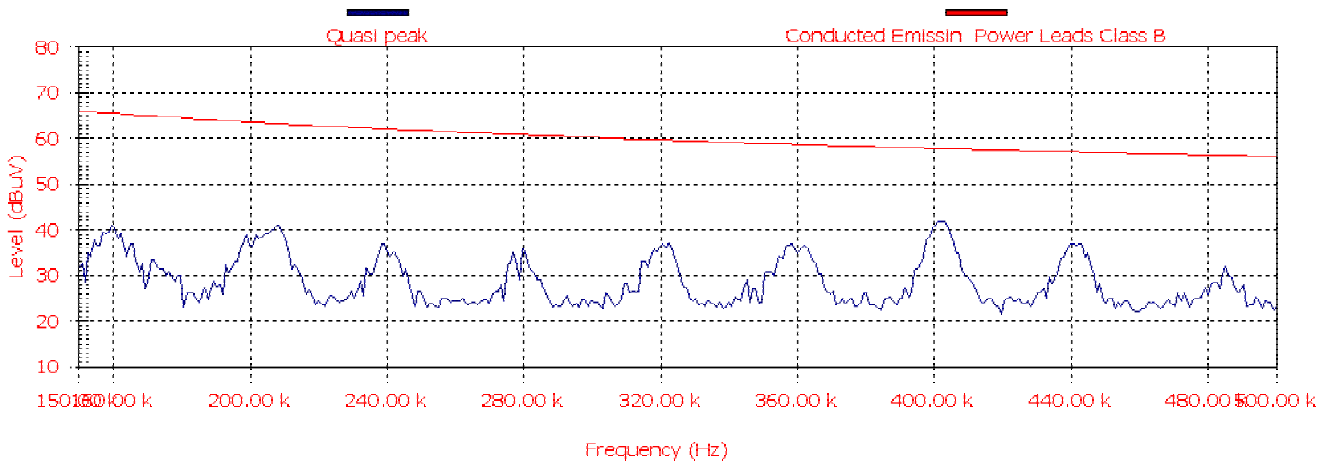
RBW-9KHz, VBW-1000KHz, Sweep time 1s





### h. Tested Line—Neutral

RBW-9KHz, VBW-1000KHz, Sweep time 33ms



RBW-9KHz, VBW-1000KHz, Sweep time 1s

