

TEST REPORT

Report Number: 100101158ATL-001

May 11, 2010

Product Designation: CN 12

Standard: CFR, Title 47, Chapter I, Part 15 Subpart B (USA)
ICES-003, Issue 4, 2004 (Canada)

Tested by:

Intertek Testing Services NA Inc.
1950 Evergreen Blvd., Suite 100
Duluth, GA 30096

Client:

Mercury Instruments
305A East Drive
Melbourne, FL 32904
Contact: Lawrence Sabec
Phone: 321.259.9700
Fax: 321.259.2900

Tests performed by:

A handwritten signature in blue ink, appearing to read "Larry Miller".

Larry E. Miller
EMC Project Engineer

Report reviewed by:

A handwritten signature in blue ink, appearing to read "Troy J. Ihle".

Troy J. Ihle
EMC Project Engineer

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1.0 Introduction and Conclusion

The tests indicated in section 2.0 were performed on the product constructed as described in section 3.0. The remaining test sections are the verbatim text from the actual data sheets used during the investigation. These test sections include the test name, the specified test Method, a list of the actual Test Equipment Used, documentation Photos, Results and raw Data. No additions, deviations, or exclusions have been made from the standard(s) unless specifically noted.

Based on the results of our investigation, we have concluded the product tested complies with the requirements of the standard(s) indicated. The results obtained in this test report pertain only to the item(s) tested.

2.0 Test Summary

Section	Test Full Name	Test Date	Result
4.0	System setup including cable interconnection details, support equipment and simplified block diagram. (System Setup)		
5.0	Radiated emissions (E-field) GSM Cellular radio - G24L (Radiated Emissions)	05/03/2010	PASS
6.0	Radiated emissions (E-field) CDMA cellular radio - C24 (Radiated Emissions)	05/03/2010	PASS

3.0 Description of Equipment Under Test

Equipment Under Test			
Description	Manufacturer	Model Number	Serial Number
Data Logger (pulse accumulator)	Mercury Instruments, Inc.	CN12, w/GSM Radio-G24L	IMEI: 355826016819228
Data Logger (pulse accumulator)	Mercury Instruments, Inc.	CN12, w/CDMA Radio-C24	MEID: A0000002FF7274

EUT receive date:	5/3/2010
EUT receive condition:	Good

Description of EUT provided by Client:

The CN12 product consists of a main circuit board with cellular radio housed in an enclosure and can be powered from a variety of power sources. It serves as a data logger (pulse accumulator) and a cellular modem for the natural gas industry. Either a Motorola GSM cellular radio (model G24L) or Motorola CDMA cellular radio (model C24) is supplied with the product.

The product also has several optional communications boards that allow the customer to connect external equipment to the unit. A universal mounting base (UMB index) allows the unit to mount directly to a natural gas pipeline and measure gas flow.

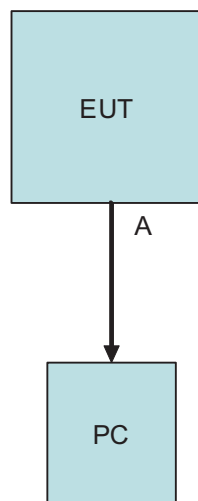
Description of EUT exercising:

EUT was powered at 6Vdc (four D batteries), once powered the CN12 was placed into a test mode. This test mode places the CN12 board into a fully awake operating mode with the serial port active and the cellular radio in the receive mode.

4.0 System setup including cable interconnection details, support equipment and simplified block diagram. (System Setup)

Method:

Record the details of EUT cabling, document the support equipment, and show the interconnections in a block diagram.

Drawing:

Simplified block diagram

4.0 System setup including cable interconnection details, support equipment and simplified block diagram. (System Setup)

Data:

EUT Cabling						
ID	Description	Length	Shielding	Ferrites	Connection	
					From	To
A	Serial Cable	7m	yes	none	EUT	PC

Support Equipment			
Description	Manufacturer	Model Number	Serial Number
PC	Dell	Latitude D610 (PP11L)	OU8082-48643-SAP-0878

5.0 Radiated emissions (E-field) GSM Cellular radio - G24L (Radiated Emissions)

Method:

Measurements in the frequency range of 30 MHz to 1000 MHz shall be performed with a quasi-peak detector instrument that meets the requirements of Section One of CISPR 16. Above 1000 MHz, a peak detector shall be used. Peak values converted to average by applying the duty cycle correction factor, when applicable. When an average detector is used, it shall meet the requirements of Section One of CISPR 16. The measuring antenna shall correlate to a balanced dipole.

Bandwidths:

30 MHz to 1000 MHz: 120 kHz RBW and 1 MHz VBW

Above 1000 MHz: 1 MHz RBW and 3 MHz VBW

Measurements of the radiated field are made with the antenna located at a distance of 3 or 10 meters from the EUT. The limit applied to the measurement shall be appropriate for the test distance. The test distance shall be indicated in the results section.

The EUT shall be arranged and connected with cables terminated in accordance with the product specification.

Exploratory tests should be carried out while varying the cable positions to determine the maximum or near-maximum emission level. During manipulation, cables shall not be placed under or on top of the system test components unless such placement is required by the inherent equipment design.

The antenna shall be adjusted between 1m and 4m in height above the ground plane for maximum meter reading at each test frequency.

The antenna-to-EUT azimuth shall be varied during the measurement to find the maximum field-strength readings.

The antenna-to-EUT polarization (horizontal and vertical) shall be varied during the measurements to find the maximum field-strength readings.

If the EUT is intended for tabletop use, it shall be placed on a table whose top is 0.8m above the ground plane. The table shall be constructed of non-conductive materials. Its dimensions are at least 1m by 1.5m, but may be extended for larger EUT.

If EUT is floor standing, the EUT was placed on a horizontal metal ground plane and isolated from the ground plane by up to 12 mm of insulating material.

Equipment setup for radiated disturbance tests shall follow the guidelines of

ANSI C63.4:2003,

EN 55022:1998 +A1:2000 +A2:2003

AS/NZS CISPR22:2002

VCCI V-3 / 2007.04

TEST SITE

The test site for radiated emissions is located at 1950 Evergreen Blvd, Suite 100, Duluth, Georgia 30096. It is a 10 meter semi-anechoic chamber manufactured by Panashield. Embedded in the floor is a 3 meter diameter turntable.

A2LA: 1455.01

IC: 2077-1

VCCI Registration Number: R-2570

MEASUREMENT UNCERTAINTY

Compliance of the product is based on the measured value. However, the measurement uncertainty is included for informational purposes. The values given are the measurement uncertainty values with an expanded uncertainty of k=2.

30 MHz to 1000 MHz at 3 meters: +/- 3.9 dB

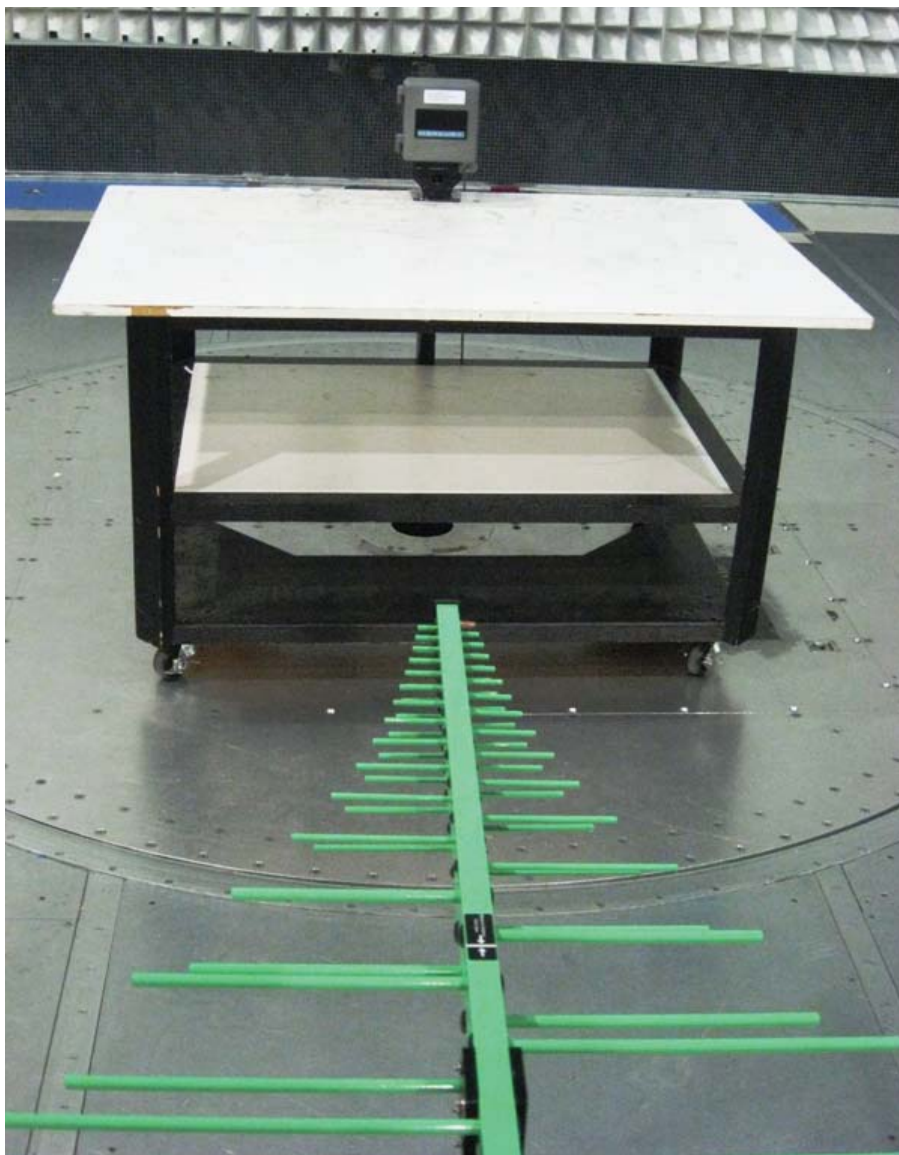
30 MHz to 1000 MHz at 10 meters: +/- 3.6 dB

1 GHz to 18 GHz at 3 meters: +/- 4.2 dB

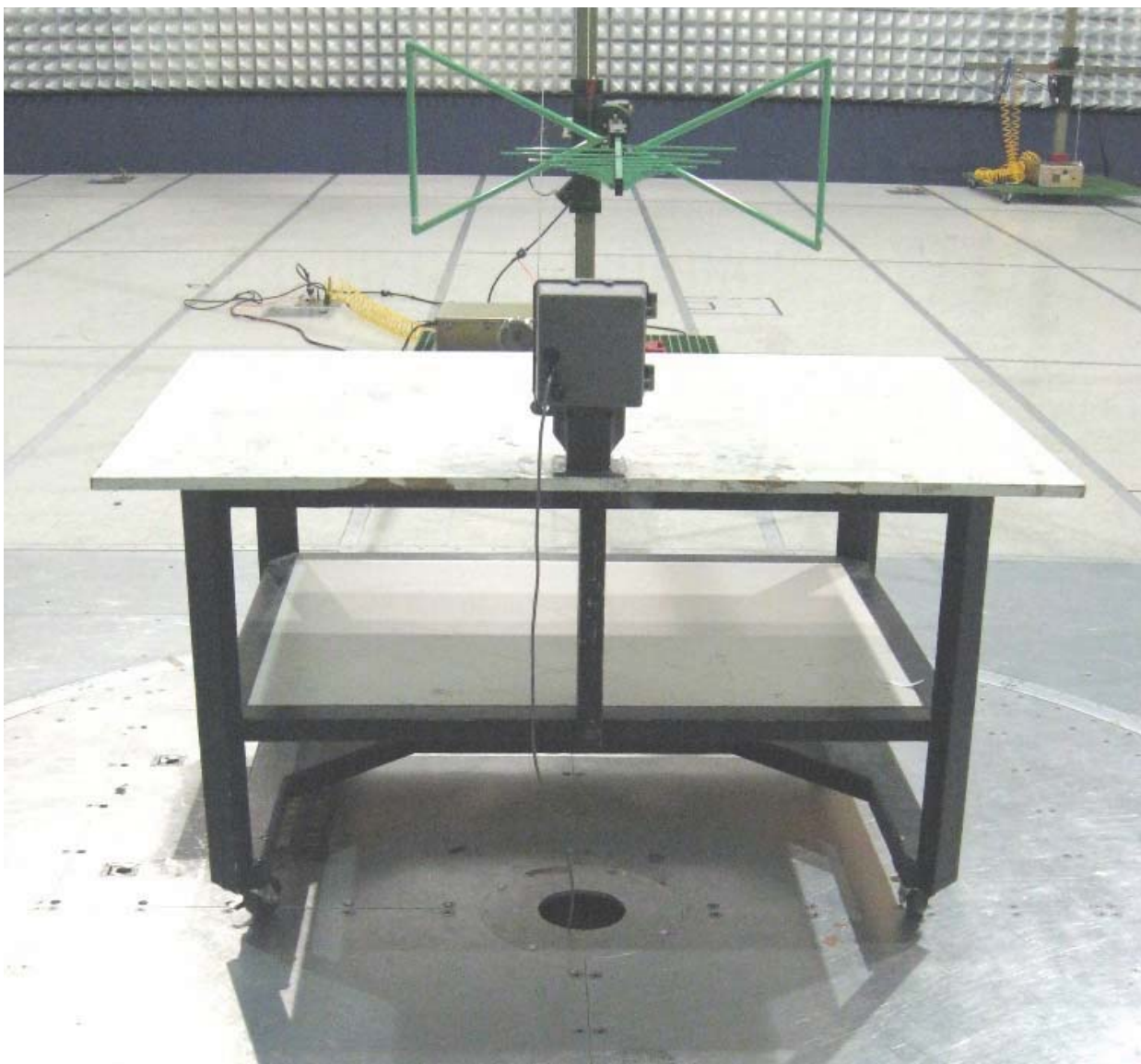
Test Equipment Used:

Description:	Manufacturer:	Model:	Asset Number:	Cal Date:	Cal Due:
Antenna, BiLog, 20-2000MHz	Chase	CBL6112B	211386	10/02/2009	10/02/2010
Cable E11, <18GHz	Huber-Suhner	Sucoflex 104PEA	E11 211266	06/19/2009	06/19/2010
Cable, N-N, 3 meters, 18GHz	Megaphase	TM18-NKNK-118	E205	05/12/2009	05/12/2010
EMI Receiver	Hewlett Packard	8546A	213109	10/06/2009	10/06/2010
EMI Receiver, Preselector section	Hewlett Packard	85460A	213108	10/06/2009	10/06/2010
Excel spreadsheet for radiated emissions	Software	Excel - RE Worksh	SW004	12/09/2009	12/09/2010
Preamplifier, 20MHz to 2GHz, 30 dB	A.H. Systems	PAM-0202	200082	12/28/2009	12/28/2010
Spectrum Analyzer, 20Hz-40GHz	Rohde & Schwarz	FSEK30	200062	10/19/2009	10/19/2010
Tile - software profile for radiated and conducted emissions testing.	Software	Tile - Emissions	SW006	12/09/2009	12/09/2010

Results: The sample tested was found to Comply.

5.0 Radiated emissions (E-field) GSM Cellular radio - G24L (Radiated Emissions)**Photo:**

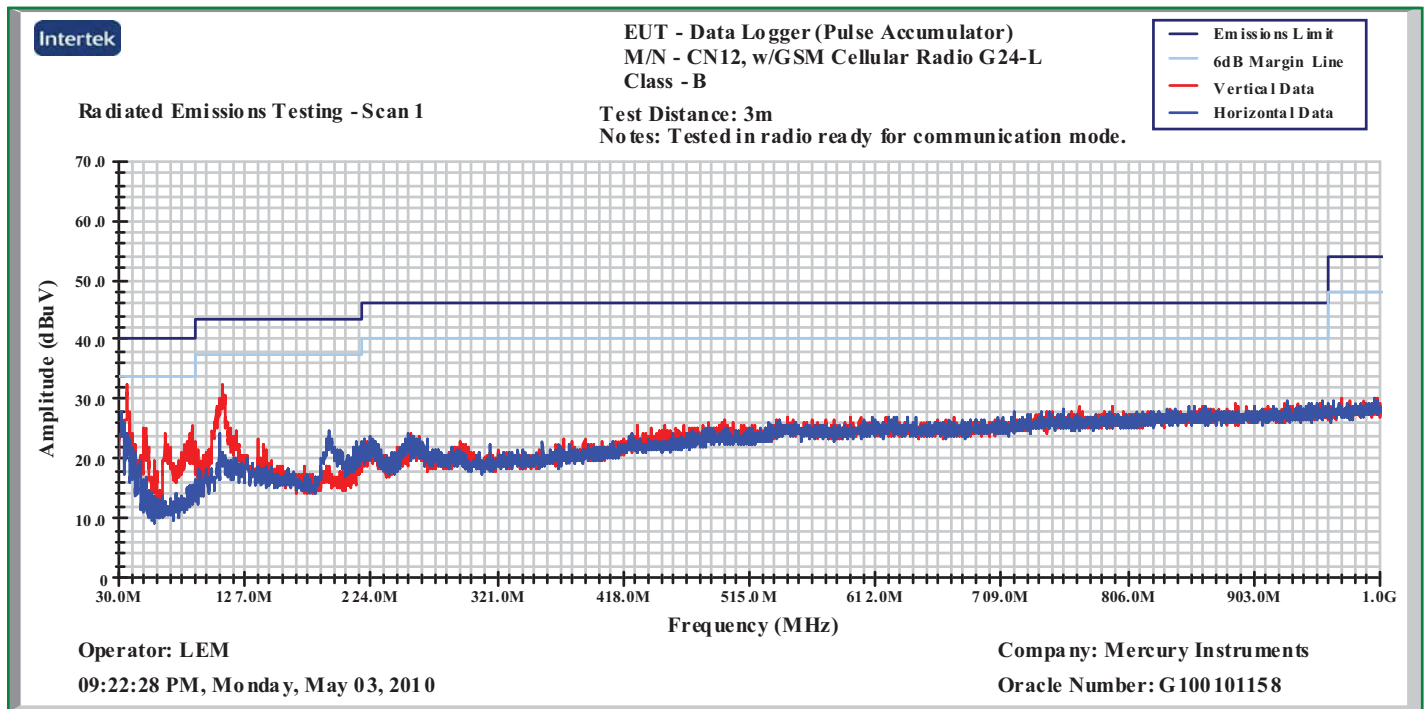
Setup Front View

5.0 Radiated emissions (E-field) GSM Cellular radio - G24L (Radiated Emissions)**Photo:**

Setup Rear View

5.0 Radiated emissions (E-field) GSM Cellular radio - G24L (Radiated Emissions)

Plot:



30-1000MHz

5.0 Radiated emissions (E-field) GSM Cellular radio - G24L (Radiated Emissions)

Data:

Client: Mercury Instruments

Receiver: HP 8546A

Model Number: CN12, w/GSM Radio-G24-L

Antenna: Chase 2622

Project Number: G100101158

Cables: E01+E205+MP3

Tested By: LEM

Preamp: AH PAM-0202

Date: 5/3/2010

Frequency Range (MHz): 30-1000MHz

Test Distance (m): 3m

Input power: 6Vdc

Limit: FCC15 Class B-3m

Modifications for compliance (y/n): n

A	B	C	D	E	F	G	H	I	J
Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Net dB(uV/m)	3m Limit dB(uV/m)	Margin dB	Detectors / Bandwidths Det/RBW/VBW
V	36.450	43.9	16.6	1.0	31.0	30.5	40.0	-9.5	QP 120/300kHz
V	110.825	44.9	12.3	1.8	31.0	28.0	43.5	-15.5	QP 120/300kHz
V	97.113	42.2	10.4	1.7	31.0	23.3	43.5	-20.2	QP 120/300kHz
V	49.000	42.1	9.8	1.2	31.0	22.1	40.0	-17.9	QP 120/300kHz
V	84.125	38.6	8.4	1.6	31.0	17.6	40.0	-22.4	QP 120/300kHz
H	32.688	33.7	17.2	1.0	31.0	20.8	40.0	-19.2	QP 120/300kHz
Calculations		G=C+D+E-F		I=G-H					

6.0 Radiated emissions (E-field) CDMA cellular radio - C24 (Radiated Emissions)

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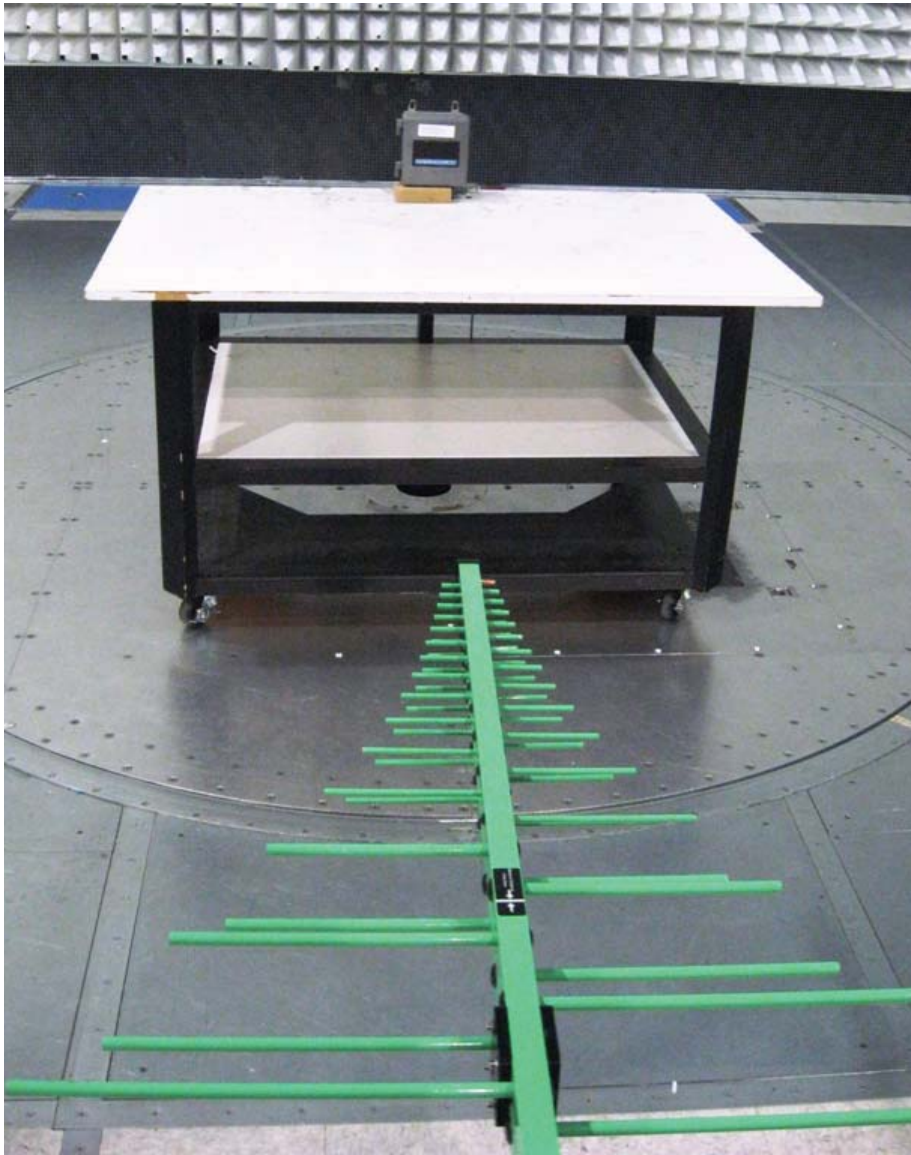
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Tile - software profile for radiated and conducted emissions testing.	Software	Tile - Emissions	SW006	12/09/2009	12/09/2010

Results: The sample tested was found to Comply.

6.0 Radiated emissions (E-field) CDMA cellular radio - C24 (Radiated Emissions)**Photo:**

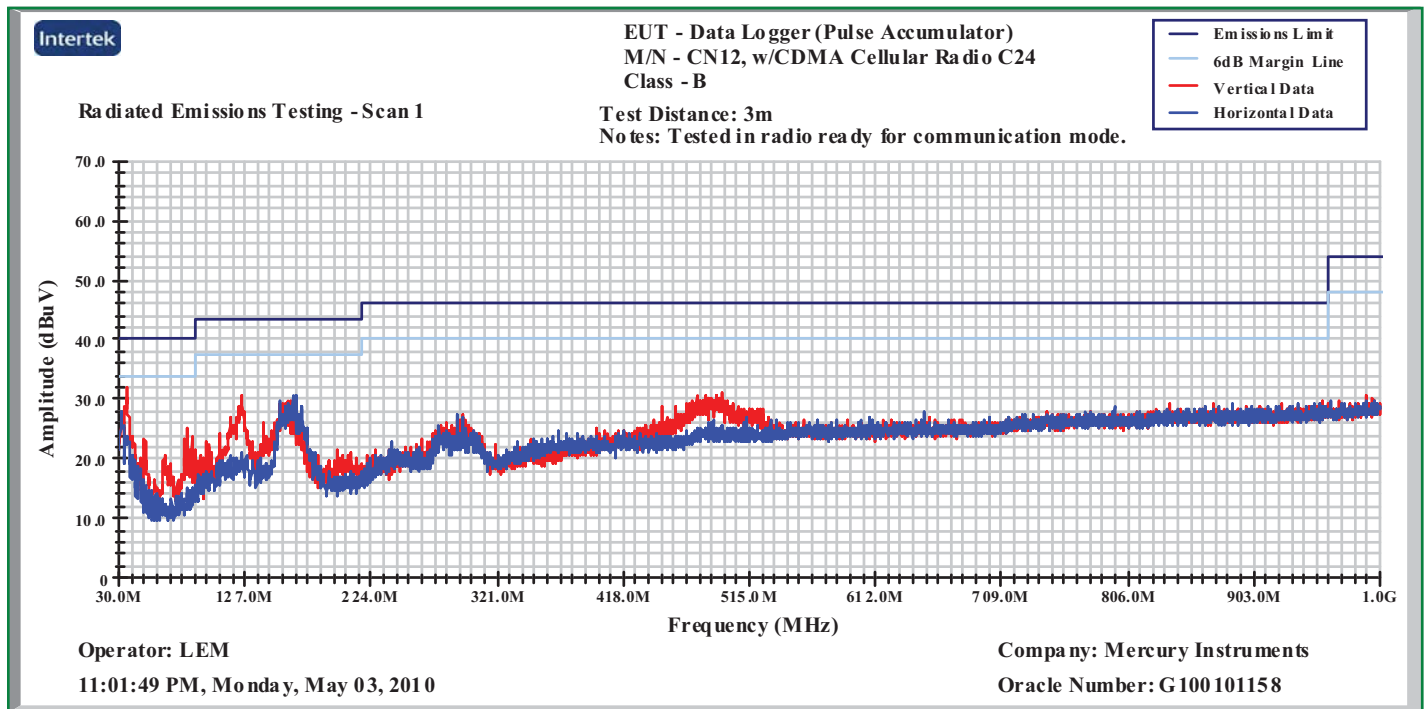
Setup Front View

6.0 Radiated emissions (E-field) CDMA cellular radio - C24 (Radiated Emissions)**Photo:**

Setup Rear View

6.0 Radiated emissions (E-field) CDMA cellular radio - C24 (Radiated Emissions)

Plot:



30-1000MHz

6.0 Radiated emissions (E-field) CDMA cellular radio - C24 (Radiated Emissions)**Data:****Client:** Mercury Instruments**Model Number:** CN12, w/CDMA Radio-C24**Project Number:** G100101158**Tested By:** LEM**Date:** 5/3/2010**Frequency Range (MHz):** 30-1000MHz**Input power:** 6Vdc**Receiver:** HP 8546A**Antenna:** Chase 2622**Cables:** E01+E205+MP3**Preamp:** AH PAM-0202**Test Distance (m):** 3m**Limit:** FCC15 Class B-3m**Modifications for compliance (y/n):** n

A	B	C	D	E	F	G	H	I	J
Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Net dB(uV/m)	3m Limit dB(uV/m)	Margin dB	Detectors / Bandwidths Det/RBW/VBW
V	36.610	43.4	16.5	1.0	31.0	29.8	40.0	-10.2	QP 120/300kHz
V	124.963	41.3	12.7	1.9	31.0	24.9	43.5	-18.6	QP 120/300kHz
V	157.063	45.5	10.9	2.2	31.0	27.6	43.5	-15.9	QP 120/300kHz
V	97.130	41.5	10.4	1.7	31.0	22.6	43.5	-20.9	QP 120/300kHz
H	164.000	45.3	10.8	2.2	31.0	27.4	43.5	-16.1	QP 120/300kHz
H	36.985	35.4	14.6	1.0	31.0	20.0	40.0	-20.0	QP 120/300kHz
Calculations		G=C+D+E-F		I=G-H					