
FCC Part 15 Class B Emissions Compliance Test Report for Product: iMOTE 1

Oregon Certification
& Environmental Lab
(OCEL)

5200 NE Elam Young
Parkway Hillsboro, OR
97124



Report Number: 06OR174
December 21, 2006



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Background

This test report documents the results of the electromagnetic compatibility testing performed by Intel Corporation, Oregon Environmental Laboratory. The results contained within this test report pertain only to the equipment under test.

Details and results of testing performed on [12/15/06](#) are contained within.



Signatures

To ensure the quality and accuracy of this documentation, the contents and test data have been thoroughly reviewed by the following qualified personnel from the Intel Oregon Environmental Lab.

Written By: Heidi Dayoob
Technical Writer

Signature:

Reviewed/
Approved By: Pete Berquist
EMC Engineer

Signature:

Applicant Information

Manufactured by:	Intel Corporation
Applicant:	Intel Corporation
Product Address:	5200 NE Elam young Parkway Hillsboro, OR 97124
Product:	Bluetooth Sensor
Model Number:	iMOTE 1

Facility Accreditation and Authorization



American Association for Laboratory Accreditation (A2LA)

The Intel Corporation OCEL (Oregon Certification and Environmental Lab) is accredited for emissions and immunity testing. The scope of this accreditation is in adherence to the requirements of ISO/IEC 17025: 2005. A2LA Lab Code: 110083,

CERT # 1130-01



Federal Communication Commission (FCC)

The 3 & 10 meter Open Area Test Site and conducted measurement facilities have been fully described in reports filed with the Federal Communication Commission, and accepted by the FCC in a letter dated May 2002. Registration number: 90687.



The Voluntary Control Council for Interference (VCCI)

The Intel Corporation OCEL has been accepted as an Associate Member to the VCCI (Voluntary Control Council for Interference). The 3 & 10 meter Open Area Test Site radiated measurement facility and conducted measurement facility have been registered in accordance with Regulations for Voluntary Control Measures. Registration number: R-484 and C-500.



NEMKO

The Intel Corporation OCEL is authorized by NEMKO under the test by manufacturer scheme with Laboratory Authorization number 361 as re-stated in a letter dated December 2005. Registration number: TBM-EMC 361.

The data produced by TBM-361 is accepted into the Territory of the Russian Federation. The certificate of accreditation, dated Sept. 10, 1998, was issued by the Certification Body of information, instrumental, medical & electrical equipment on behalf of the Russian Goststandart (GOST R) organization. Through MRA between NEMKO and the current Russian Organization of Certified Bodies, acceptance of data by TBM-361 remains valid for a scope, which includes GOST R 51318.22 and GOST R 50628-95.



APEC Conformity Assessment of Telecommunications Equipment

This laboratory (identifier# US0069) participates in the NIST phase-1 Laboratory CAB designation for the following economies.

Chinese - Taipei BSMI

Accreditation # SL2-IN-E-1023



Korea – MIC's Radio Research Lab



The CAB status' remains in effect while the Laboratory's A2LA scope of accreditation is valid.



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Regulatory Compliance Statement

This device, Intel Model: iMOTE 1 complies with the following regulatory standards:

FCC 47 CFR Part 15, Subpart B

This device, Intel Model: iMOTE 1, complies with Part 15 of the FCC Rules.

Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference.
- (2) this device must accept any interference received, including interference that may cause undesired operation.

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Hillsboro, Oregon 97124
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In addition to the above information, the following text should be placed in the instructions to the user:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.


NOTE: Consult the dealer or an experienced radio/TV technician for help.



Compliance Summary

Laboratory Receipt Date Of Sample: 12/15/06

The results contained within this test report pertain only to the equipment under test (EUT).

Power Line Conducted Emissions Test:	
Laboratory Job Number:	06-2600-OR
Date of Test:	12/15/06
Judgment: 120VAC / 60Hz Measured Results	Passed by 8.6 dB μ V Line 1
Tested by:	Mike Haines
	Signature: 



1 Equipment Under Test

The EUT is an Intel® Bluetooth transmitter model iMOTE 1.

1.1 Condition of EUT upon Laboratory Receipt

The laboratory received the EUT in an operational condition.

1.2 Applicable Model Numbers

Additional model numbers encompassed by the findings documented in this report:

- N/A

1.3 System Modification

Use of EMI suppression devices was not required to achieve regulatory compliance therefore; the EUT was tested as received.



Table 1. Hardware Internal to the EUT

Description	Manufacturer	Model Number	Serial Number
Bluetooth Beacon	Intel	IMOTE1	87348



2 Test Configuration

Pre-scans of the EUT were performed in a 3 meter semi-anechoic chamber to investigate the worst case of cable placement, video resolution and refresh rate. All test data in this report refers to the established worst-case configuration.

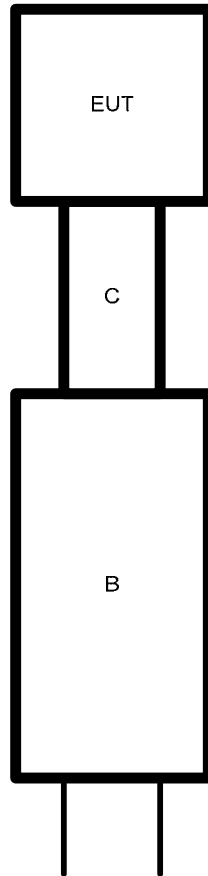
2.1 Adapters/ Peripherals/ I/O Devices

The peripheral devices and cables (external of the EUT) used during testing are reflected in the table and diagram below.

Table 2. Peripherals and I/O Cables External of the EUT

Diagram	Description	Manufacturer	Model Number	Serial Number	Cable Description
B	AC-DC-USB Adapter	Dynex	DX-IPAC	GWKS 6J06	No Cable
C	USB to mini-USB Adapter	-----	-----	-----	No Cable
S	LAN Hub	LinkSys	SD2008	REE105600 0965	6.0m unshielded LAN cable w/o ferrite.
T	Client PC	IBM	T30	78-FDAP2	1.0m unshielded LAN cable w/o ferrite.

Diagram 1 Test Setup Block Diagram





3 Conducted Emissions Test

Power line conducted data was taken with the test methodologies stated in FCC 47 CFR Part 15, Subpart B.

No modifications or deviations from the test methods were implemented to achieve regulatory compliance.

3.1 Test Procedure

Using the spectrum analyzer mode of the receiver, peaks of the disturbances are identified by sweeping from 0.15 to 30 MHz of the spectrum. The sweeps are repeated fifty times, capturing the maximum emission during that time period. Based on those peak disturbances, the maximum quasi-peak and average emission is measure by scanning across the peak disturbances in the EMI receiver mode. Both AC lines are measured and reported independently. The frequency and amplitude of the highest six emissions are reported.

A LISN was used to test the power line ports.

3.2 Test Instruments

The following table contains detailed information of the lab test equipment utilized during conducted emissions testing.

Table 3. Conducted Emissions Test Equipment

Equipment	Manufacturer/ Model Number	Serial Number	Calibration Due
Receiver	Rohde & Schwarz ESBI 1005.4000.52	8400498/024	09-27-2007
LISN	Fischer Custom Communications FCC-LISN-50-25-2	04014	04-27-2007



3.3 Power Line Conducted Test Data

Temperature: 24°C Relative Humidity: 23 %

3.3.1 120VAC/60Hz Measured Test Data

EUT Input Power for Test:	120VAC/ 60Hz
Test Method:	ANSI C63.4
Specification Limits:	FCC, Class B
Judgment:	Passed by -8.6 dB(uV), Line 1

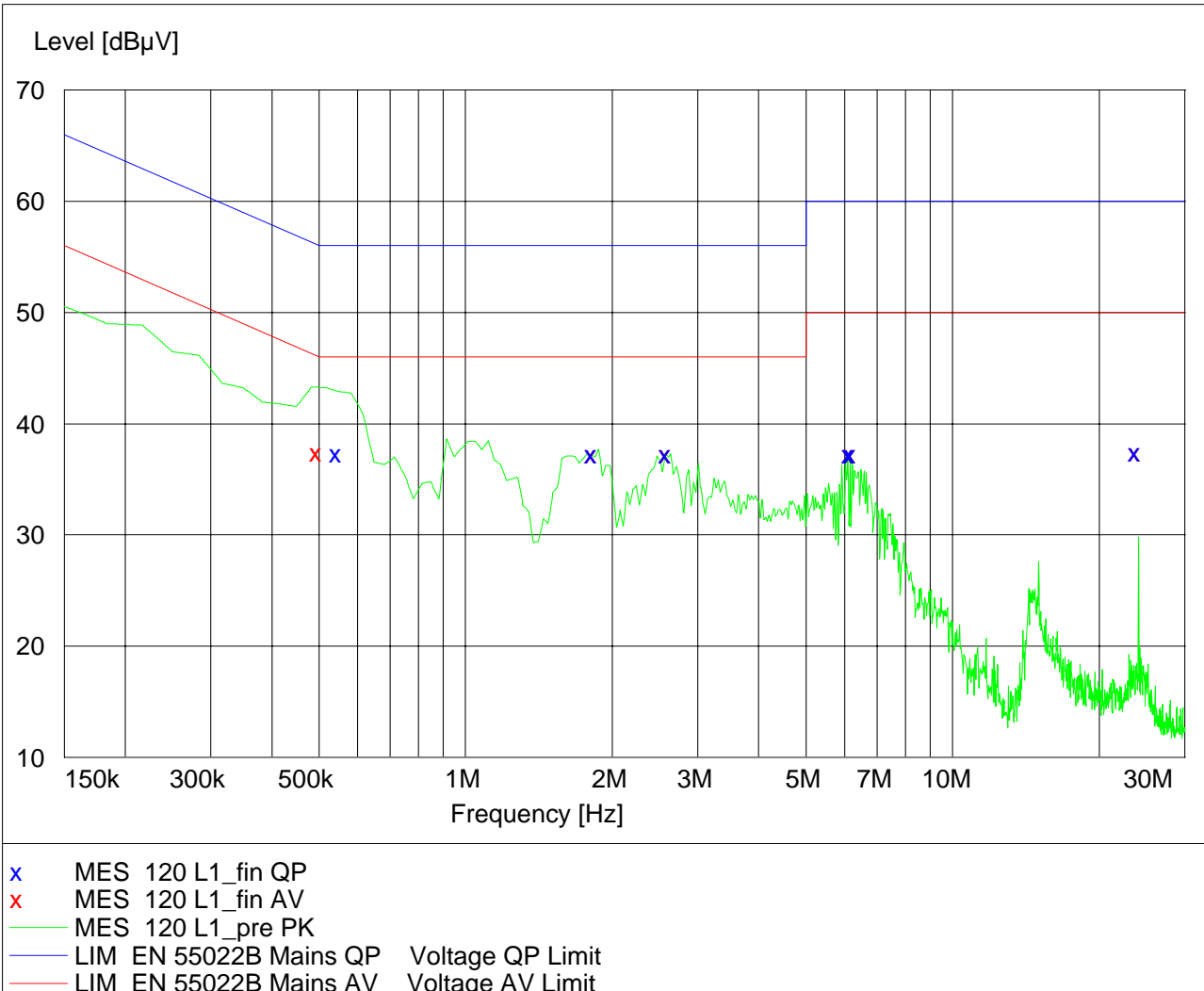
Intel Conducted Emissions Results Report

Oregon Certification & Environmental Lab

EUT: Imote 1
 Manufacturer: Intel Corporation
 Operating Condition: 120 VAC/60 Hz Line 1
 Test Site: OCEL-06-2600-OR
 Operator: Mike Haines
 Test Specification: CISPR 22 B
 Comment: EUT operating normally
 Start of Test: 12/15/2006 / 10:35:21AM

SCAN TABLE: "Mains LISN"

Short Description: EN 55022 Voltage
 Start Stop Step Detector Meas. IF Transducer
 Frequency Frequency Width Time Bandw.
 150.0 kHz 30.0 MHz 5.0 kHz MaxPeak 20.0 ms 10 kHz None
 Average





MEASUREMENT RESULT: "120 L1_fin QP"

12/15/2006 10:39AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.550000	37.30	0.3	56	-18.7	L1	GND
1.835000	37.20	0.2	56	-18.8	L1	GND
2.610000	37.20	0.2	56	-18.8	L1	GND
6.190000	37.20	0.2	60	-22.8	L1	GND
6.255000	37.20	0.2	60	-22.8	L1	GND
24.000000	37.40	0.4	60	-22.6	L1	GND

MEASUREMENT RESULT: "120 L1_fin AV"

12/15/2006 10:39AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.500000	37.40	0.4	46	-8.6	L1	GND
1.835000	37.20	0.2	46	-8.8	L1	GND
2.610000	37.20	0.2	46	-8.8	L1	GND
6.190000	37.20	0.2	50	-12.8	L1	GND
6.255000	37.20	0.2	50	-12.8	L1	GND
24.000000	37.40	0.4	50	-12.6	L1	GND

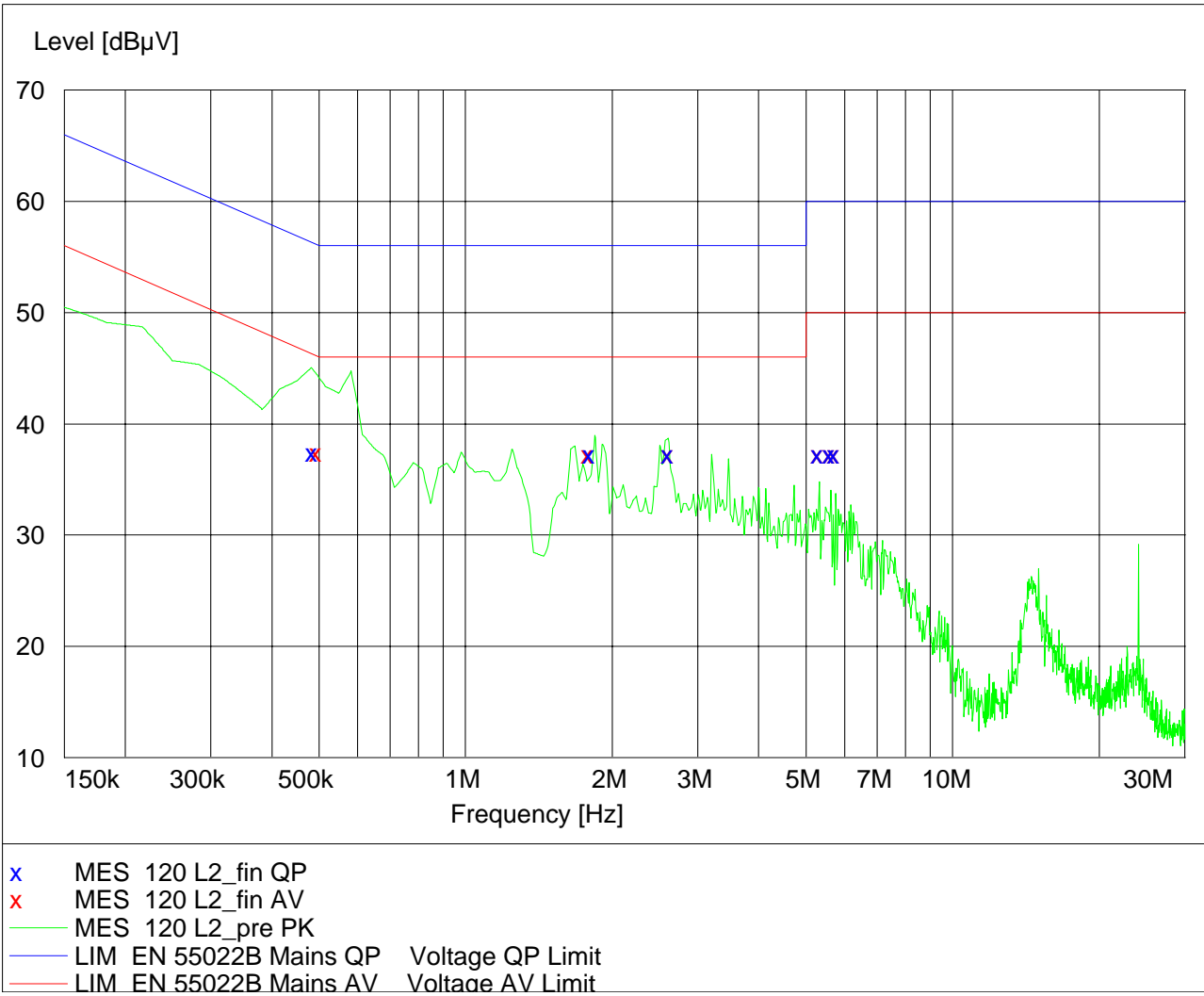
Intel Conducted Emissions Results Report

Oregon Certification & Environmental Lab

EUT: Imote 1
 Manufacturer: Intel Corporation
 Operating Condition: 120 VAC/60 Hz Line 2
 Test Site: OCEL-06-2600-OR
 Operator: Mike Haines
 Test Specification: CISPR 22 B
 Comment: EUT operating normally
 Start of Test: 12/15/2006 / 10:41:37AM

SCAN TABLE: "Mains LISN"

Short Description: EN 55022 Voltage
 Start Stop Step Detector Meas. IF Transducer
 Frequency Frequency Width Time Bandw.
 150.0 kHz 30.0 MHz 5.0 kHz MaxPeak 20.0 ms 10 kHz None
 Average





MEASUREMENT RESULT: "120 L2_fin QP"

12/15/2006 10:45AM

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Line	PE
0.490000	37.40	0.4	56	-18.8	L2	GND
1.820000	37.20	0.2	56	-18.8	L2	GND
2.640000	37.20	0.2	56	-18.8	L2	GND
5.360000	37.20	0.2	60	-22.8	L2	GND
5.660000	37.20	0.2	60	-22.8	L2	GND
5.795000	37.20	0.2	60	-22.8	L2	GND

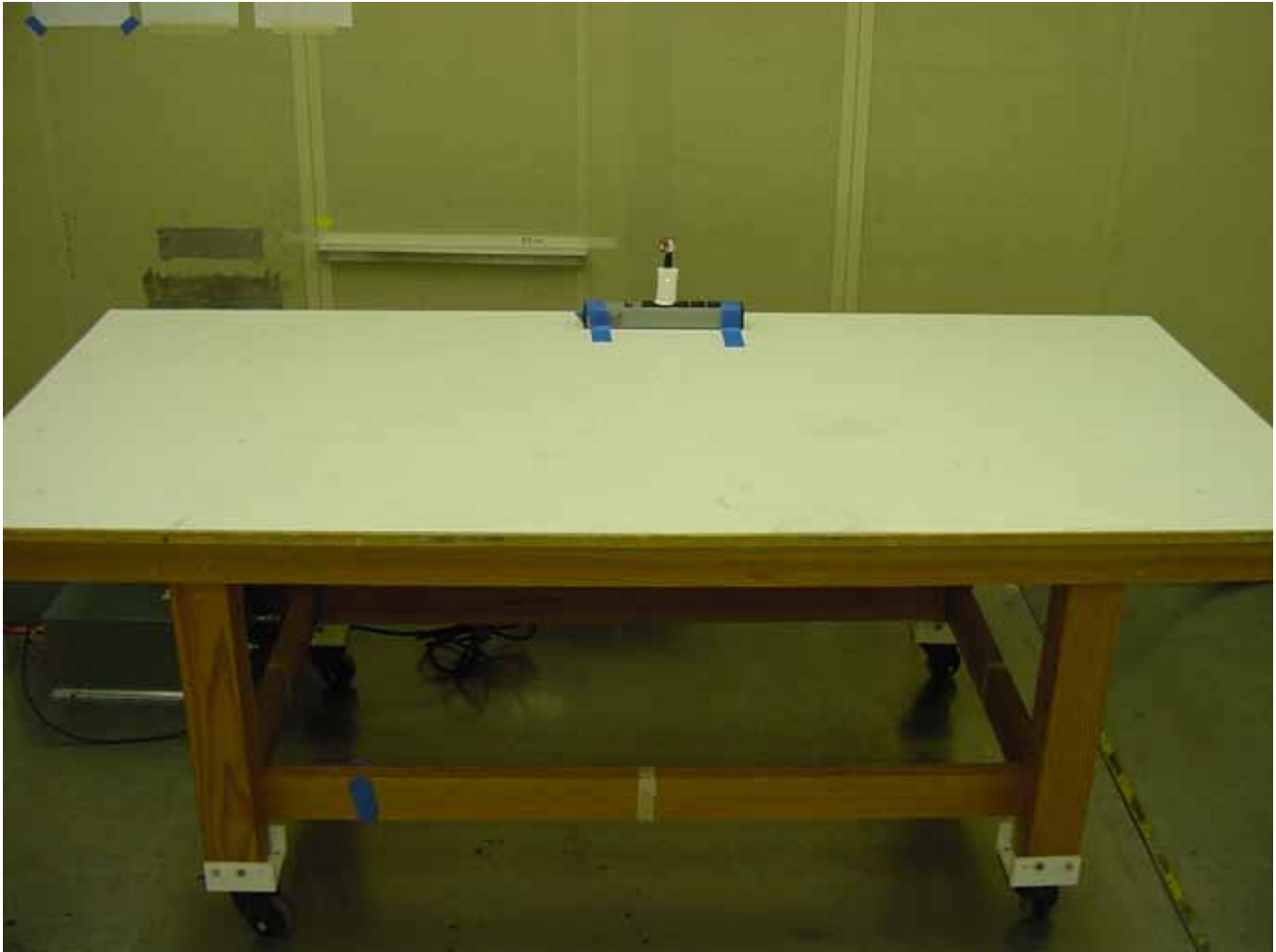
MEASUREMENT RESULT: "120 L2_fin AV"

12/15/2006 10:45AM

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Line	PE
0.500000	37.40	0.4	46	-8.6	L2	GND
1.805000	37.20	0.2	46	-8.8	L2	GND
2.640000	37.20	0.2	46	-8.8	L2	GND
5.360000	37.20	0.2	50	-12.8	L2	GND
5.660000	37.20	0.2	50	-12.8	L2	GND
5.795000	37.20	0.2	50	-12.8	L2	GND

3.4 Conducted Emission Test Setup Photos

Test Setup, Front View



Test Setup, Rear View

