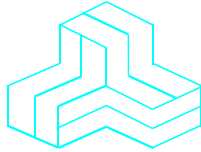


ENGINEERING TEST REPORT



Bi-directional Amplifier
Model No.: BDA1200
FCC ID: H6M-BDA1200
(FCC Class II Permissive Modification)

Applicant: **KAVAL TELECOM INC.**
60 Gough Road
Markham, Ontario
Canada, L3R 8X7

Tested in Accordance With

Federal Communications Commission (FCC)
CFR 47, PARTS 2, 22 (Subpart H) and 90 (Subpart I)

UltraTech's File No.: KTI-037F90

This Test report is Issued under the Authority of
Tri M. Luu, Professional Engineer,
Vice President of Engineering
UltraTech Group of Labs

Date: Dec. 16, 2003



Report Prepared by: Tri M. Luu, P.Eng.

Tested by: N/A

Issued Date: Dec. 17, 2003

Test Dates: N/A

The results in this Test Report apply only to the sample(s) tested, and the sample tested is randomly selected.

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File #: KT1-037F90
Nov. 09/2000

- All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)

EXHIBIT 1. INTRODUCTION

1.1. SCOPE

Reference:	FCC Parts 2 and 90 (Subpart 90)
Title	Telecommunication - Code of Federal Regulations, CFR 47, Parts 2, 22 and 90
Purpose of Test:	To gain FCC Class II Modification Authorization for Radio operating in the frequency bands 896-902, 935-941, 806-824, 851-869, 824-849 and 894-869 MHz.
Test Procedures	Both conducted and radiated emissions measurements were conducted in accordance with TIA/EIA Standard TIA/EIA- 603 (01-Nov-2002) - Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.
Class II Permissive Modifications:	For FCC Part 90 Operation, the outdoor antenna gain limit is changed from 10 dBi to 20 dBi. The separation distance of minimum 10 meters remains the same. There are no changes in either mechanical and electrical design of the certified equipment.

1.2. NORMATIVE REFERENCES

Publication	Year	Title
FCC CFR Parts 2, 22 and 90	2002	Code of Federal Regulations – Telecommunication
ANSI C63.4	1992	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
CISPR 16-1	1999	Specification for Radio Disturbance and Immunity measuring apparatus and methods
TIA/EIA 603, Edition B	01-Nov-2002	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards

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EXHIBIT 2. PERFORMANCE ASSESSMENT

2.1. CLIENT INFORMATION

APPLICANT:	
Name:	KAVAL TELECOM INC.
Address:	60 Gough Road Markham, Ontario Canada, L3R 8X7
Contact Person:	Mr. Alan Aslett Phone #: 905-946-3397 Fax #: 905-946-3392 Email Address: aaslett@kaval.com

MANUFACTURER:	
Name:	KAVAL TELECOM INC.
Address:	60 Gough Road Markham, Ontario Canada, L3R 8X7
Contact Person:	Mr. Alan Aslett Phone #: 905-946-3397 Fax #: 905-946-3392 Email Address: aaslett@kaval.com

2.2. EQUIPMENT UNDER TEST (EUT) INFORMATION

The following information (with the exception of the Date of Receipt) has been supplied by the applicant.

Brand Name	KAVAL TELECOM INC.
Product Name	Bi-directional Amplifier
Model Name or Number	BDA1200
Serial Number	Pre-production
Type of Equipment	Radio Communication Equipment
External Power Supply	None
Transmitting/Receiving Antenna Type	Non-integral

2.3. EUT'S TECHNICAL SPECIFICATIONS

Please refer to FCC Original Test Report, FCC ID: H6M-BDA1200

EXHIBIT 3. RF EXPOSURE REQUIRMENTS @ 1.1310 & 2.1091

3.1. LIMITS

FCC 1.1310:- The criteria listed in the following table shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in 1.1307(b).

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time (minutes)
(A) Limits for Occupational/Control Exposures				
300-1500	...	...	F/300	6
(B) Limits for General Population/Uncontrolled Exposure				
300-1500	...	...	F/1500	6

F = Frequency in MHz

3.2. METHOD OF MEASUREMENTS

Refer to FCC @ 1.1310, 2.1091 and Public Notice DA 00-705 (March 30, 2000)

In order to demonstrate compliance with MPE requirements (see Section 2.1091), the following information is typically needed:

Calculation that estimates the minimum separation distance (20 cm or more) between an antenna and persons required to satisfy power density limits defined for free space.

Antenna installation and device operating instructions for installers (professional/unskilled users), and the parties responsible for ensuring compliance with the RF exposure requirement

Any caution statements and/or warning labels that are necessary in order to comply with the exposure limits

Any other RF exposure related issues that may affect MPE compliance

Calculation Method of RF Safety Distance:

$$S = PG/4\pi r^2 = EIRP/4\pi r^2$$

Where: P: power input to the antenna in mW
EIRP: Equivalent (effective) isotropic radiated power.
S: power density mW/cm²
G: numeric gain of antenna relative to isotropic radiator
r: distance to centre of radiation in cm

FCC radio frequency exposure limits may be exceeded at distances closer than r cm from the antenna of this device

$$r = \sqrt{PG/4\pi S}$$

FCC radio frequency exposure limits may not be exceeded at distances closer than r cm from the antenna of this device

For portable transmitters (see Section 2.1093), or devices designed to operate next to a person's body, compliance is determined with respect to the SAR limit (define in the body tissues) for near-field exposure conditions. If the maximum average output power, operating condition configurations and exposure conditions are comparable to those of existing cellular and PCS phones., an SAR evaluation may be required in order to determine if such a device complies with SAR limit. When SAR evaluation data is not available, and the additional supporting information cannot assure compliance, the Commission may request that an SAR evaluation be performed, as provided for in Section 1.1307(d)

3.3. TEST DATA

Antenna Gain Limit specified by Manufacturer: 20 dBi

Lowest Frequency (MHz)	Maximum Measured RF Conducted Power (dBm)	Calculated EIRP (dBm)	Laboratory's Recommended Minimum RF Safety Distance r (cm)
806	40.9	60.9	427.0

Note 1: RF EXPOSURE DISTANCE LIMITS: $r = (PG/4\pi IS)^{1/2} = (EIRP/4\pi IS)^{1/2}$
For worst case: $S = F/1500 = 806/1500 = 0.537 \text{ mW/cm}^2$

Evaluation of RF Exposure Compliance Requirements	
RF Exposure Requirements	Compliance with FCC Rules
Minimum calculated separation distance between antenna and persons required: 427 cm	Manufacturer' instruction for separation distance between antenna and persons required: 10 meters Please refer to Users/ Manual and FCC RF Exposure Info
Antenna installation and device operating instructions for installers (professional/unskilled users), and the parties responsible for ensuring compliance with the RF exposure requirement	Please refer to Users/ Manual and FCC RF Exposure Info
Caution statements and/or warning labels that are necessary in order to comply with the exposure limits	Please refer to Users/ Manual and FCC RF Exposure Info

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