

FCC PART 15 Subpart C
EMI MEASUREMENT AND TEST REPORT

For

LIONDA TECHNOLOGY CO., LTD.

Block 2 Laodong 2nd Industrial Area, Baoan
Shenzhen, China 518102

FCC ID: O63LD01

June 7, 2001

This Report Concerns: ☒ Original Report	Equipment Type: Cordless Telephone System – Household Appliances
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Test Date: <u>June 4, 2001</u>	
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1 - GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

LIONDA TECHNOLOGY CO., LTD.'s product, FCC ID: O63LD01, Model No.: LD01 and GH9504 or the "EUT" as referred to in this report is a 2.4GHz 70-Channel DSS Basic Cordless Telephone. The EUT was composed of two parts, one is the base which measures approximately 6.50" L x 4.45"W x 2.80" H, and the other is the handset which measures 9.25"L x 2.25" W x 1.55" H.

1.2 Objective

This type approval report is prepared on behalf of *LIONDA TECHNOLOGY CO.,LTD.* in accordance with Part 2, Subpart J, Part 15, Subparts A, B and C of the Federal Communication Commissions rules.

The objective of the manufacturer is to demonstrate compliance with FCC rules for Output Power, Antenna Requirement, 6 dB Bandwidth, power density, 100 kHz Bandwidth of Band Edges Measurement, Conducted and Spurious Radiated Emission.

1.3 Related Submittal(s)/Grant(s)

No Related Submittals.

1.4 Test Methodology

All measurements contained in this report were conducted with 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. All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratory, Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

1.5 Test Facility

The Open Area Test site used by Bay Area Compliance Laboratory Corporation to collect radiated and conducted emission measurement data is located in the back parking lot of the building at 230 Commercial Street, Suite 2, Sunnyvale, California, USA.

Test site at Bay Area Compliance Laboratory Corporation has been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports has been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and December 10, 1997 and Article 8 of the VCCI regulations on December 25, 1997. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-1992.

The Federal Communications Commission and Voluntary Control Council for Interference has the reports on file and is listed under FCC file 31040/SIT 1300F2 and VCCI Registration No.: C-1298 and R-1234. The test site has been approved by the FCC and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, Bay Area Compliance Laboratory Corporation is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (NVLAP). The scope of the accreditation covers the FCC Method - 47 CFR Part 15 - Digital Devices, IEC/CISPR 22: 1998, and AS/NZS 3548: Electromagnetic Interference - Limits and Methods of Measurement of Information Technology Equipment test methods under NVLAP Lab Code 200167-0.

1.6 Test Equipment List

Manufacturer	Description	Model	Serial Number	Cal. Due Date
HP	Spectrum Analyzer	8566B	2610A02165	12/6/01
HP	Spectrum Analyzer	8593B	2919A00242	12/20/01
HP	Amplifier	8349B	2644A02662	12/20/01
HP	Quasi-Peak Adapter	85650A	917059	12/6/01
HP	Amplifier	8447E	1937A01046	12/6/01
A.H. System	Horn Antenna	SAS0200/571	261	12/27/01
Com-Power	Log Periodic Antenna	AL-100	16005	11/2/01
Com-Power	Biconical Antenna	AB-100	14012	11/2/01
Solar Electronics	LISN	8012-50-R-24-BNC	968447	12/28/01
Com-Power	LISN	LI-200	12208	12/20/01
Com-Power	LISN	LI-200	12005	12/20/01
BACL	Data Entry Software	DES1	0001	12/20/01
Rohde & Schwarz	Signal Generator	SMIQ03B	1125.5555.03	7/10/02
Rohde & Schwarz	I/Q Modulation Generator	AMIQ	1110.2003.02	8/10/02

1.7 Equipment Under Test (EUT)

Manufacturer	Description	Model	Serial Number	FCC ID
LIONDA TECHNOLOGY CO., LTD	2.4 GHz 70-Channel DSS Basic Cordless Telephone	LD01, GH9504	None	O63LD01

1.8 Power Supply and Line Filters

Manufacturer	Description	Model	Serial Number	FCC ID
Bell South	Adapter	U120020D	08D	O63LD01

1.8 Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
Teltone Corp.	Simulator	TLS-3B-01	80071	DOC
Panasonic	Telephone	KX-T3175	6IBTB142741	DOC

1.9 External I/O Cabling List and Details

Cable Description	Length (M)	Port/From	To
Unshielded RJ11 Cable	2.0	RJ11 Port/EUT	Simulator
Unshielded RJ11 Cable	2.0	RJ11 Port/Telephone	Simulator

2 - SYSTEM TEST CONFIGURATION

2.1 Description of Test Configuration

The EUT was configured for testing in a typical fashion (as normally used by a typical user).

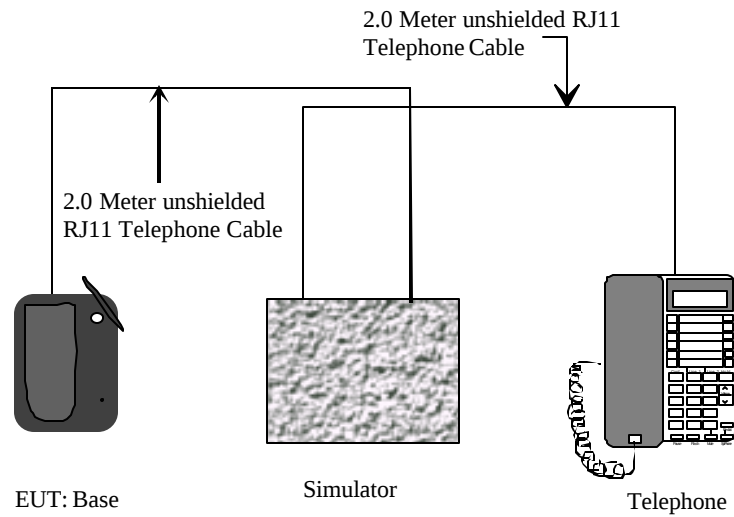
Handset Being tested: The Cordless Telephone – Handset, Model LD01, GH9504 (EUT) was placed on the wooden table and tested in three orthogonal axis. The handset was connected to the headset via its headset port. The Low, middle, and high channels were tested. The handset was transmitting to and receiving from the Base unit. The EUT was investigated for emissions while off hook. The radiated data was taken in this mode of operation. All initial and final investigations were performed with the EMI receiver in manual mode scanning the frequency range continuously. The cables were bundled and routed as shown in the 2.5.

Base being tested: The Cordless Telephone – Base, Model LD01, GH9504 (EUT) was placed on the wooden table. The Low, middle, and high channels were tested. The base was connected to the line simulator and an AC adapter via its Tel Line and power ports, respectively. The base was transmitting and receiving from the 2.4 GHz Analog Cordless Phone – Handset. The conducted as well as radiated data was taken in this mode of operation. All initial and final investigations were performed with the EMI receiver in manual mode scanning the frequency range continuously. The cables were bundled and routed as shown in the 2.3.

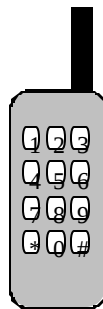
2.2 Configuration of Test System

EUT FCCID: O63LD01

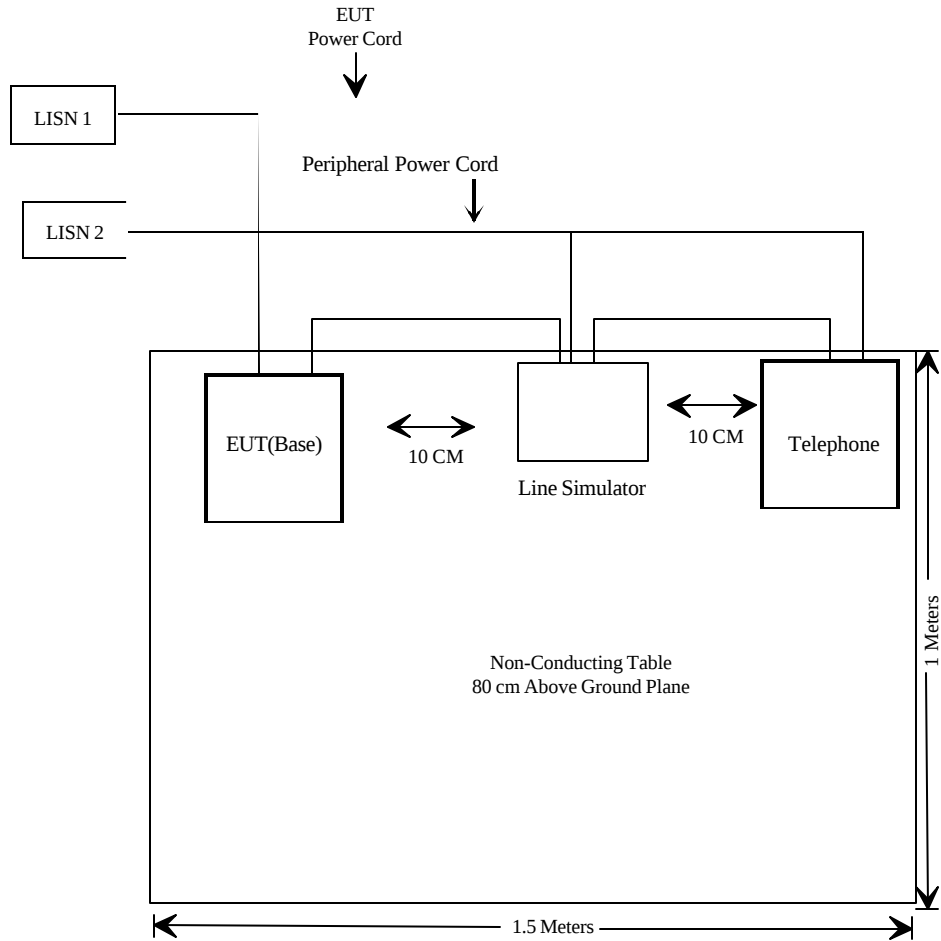
Base



Handset



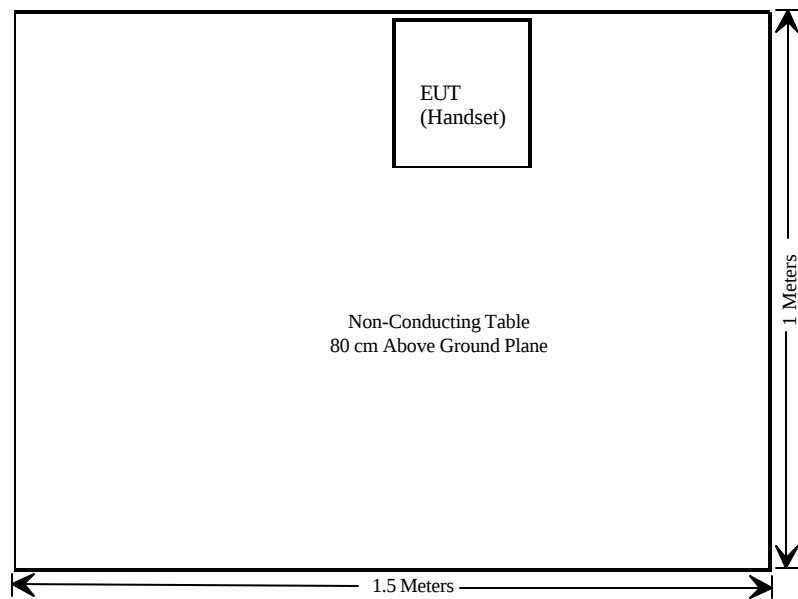
2.3 Test Setup Block Diagram (Base)



EUT Handset Diagram

LISN 1

LISN 2



2.4 Equipment Modifications

No modification(s) was made by BACL Corp. to ensure the EUT complies with the applicable limits and standards.

3 - SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§ 2.1091	RF Safety Requirements	Passed
§ 15.203	Antenna Requirement	Passed
§ 15.205	Restricted Bands	Passed
§ 15.207 (a)	Conducted Emission	Passed
§ 15.209 (a)	Radiated Emission	Passed
§ 15.209 (f)	Spurious Emission	Passed
§ 15.247 (a) (2)	6 dB Bandwidth	Passed
§ 15.247 (b) (2)	Output Power	Passed
§ 15.247 (c)	100 kHz Bandwidth of Frequency Band Edges	Passed
§ 15.247 (d)	Peak Power Spectral Density	Passed
§ 15.247 (e)	Processing Gain	Passed

4 - Conducted Output Power Measurement

4.1 Standard Applicable

For frequency hopping, according to §15.247(b) (2), the maximum peak output power of the transmitter shall not exceed 1 Watt.

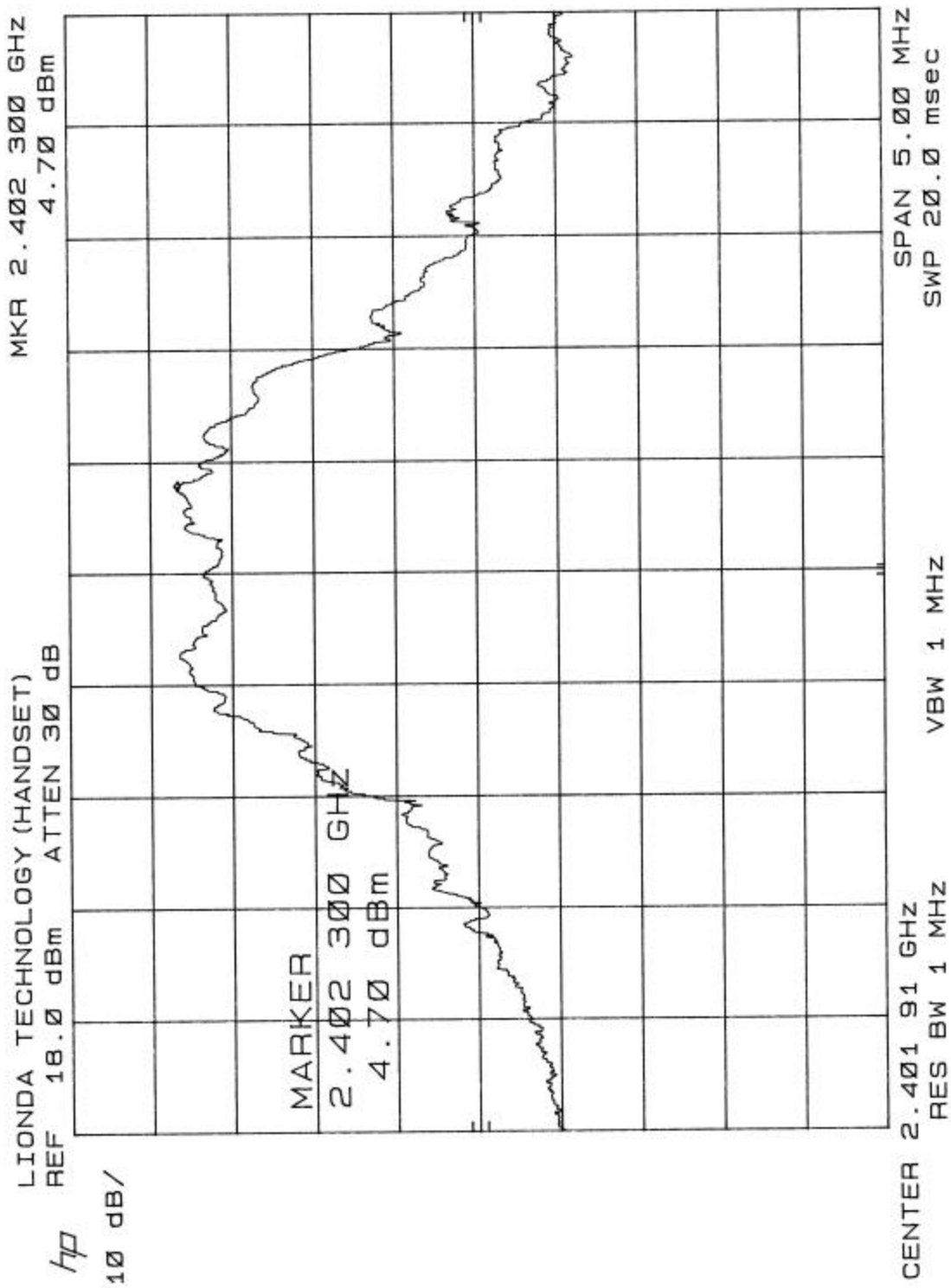
4.2 Measurement Procedure

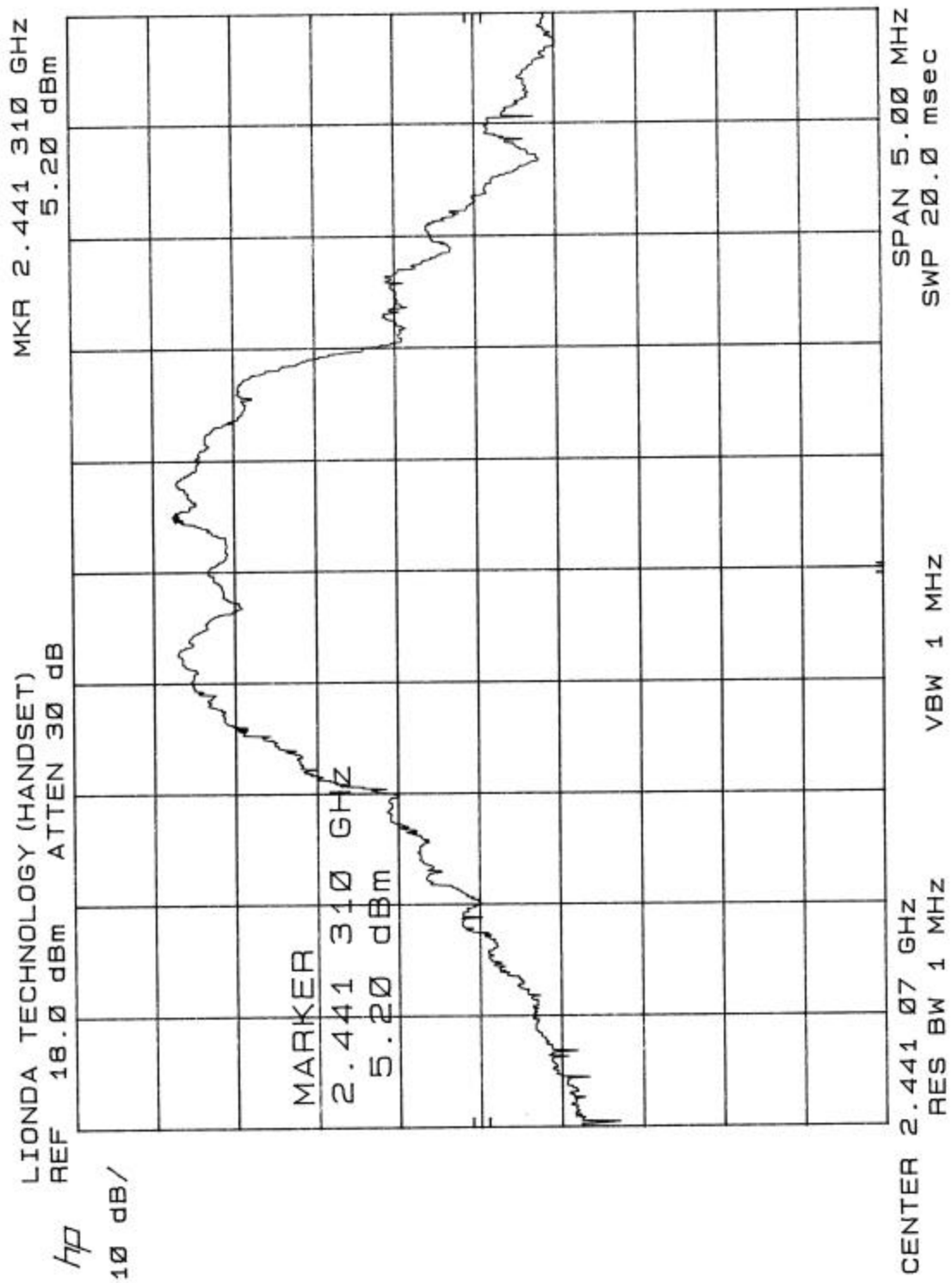
1. Place the EUT on the turntable and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

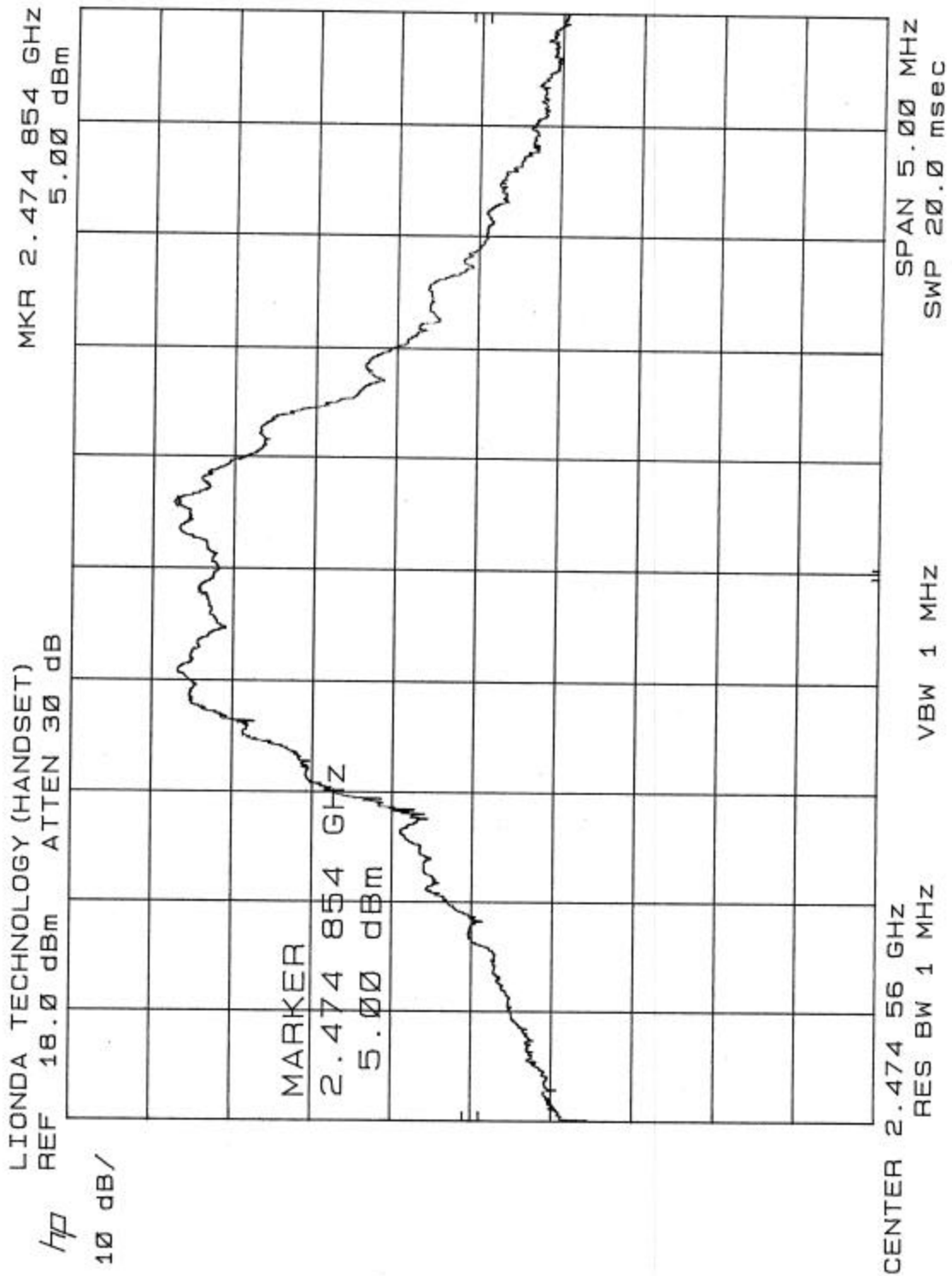
4.3 Measurement Result

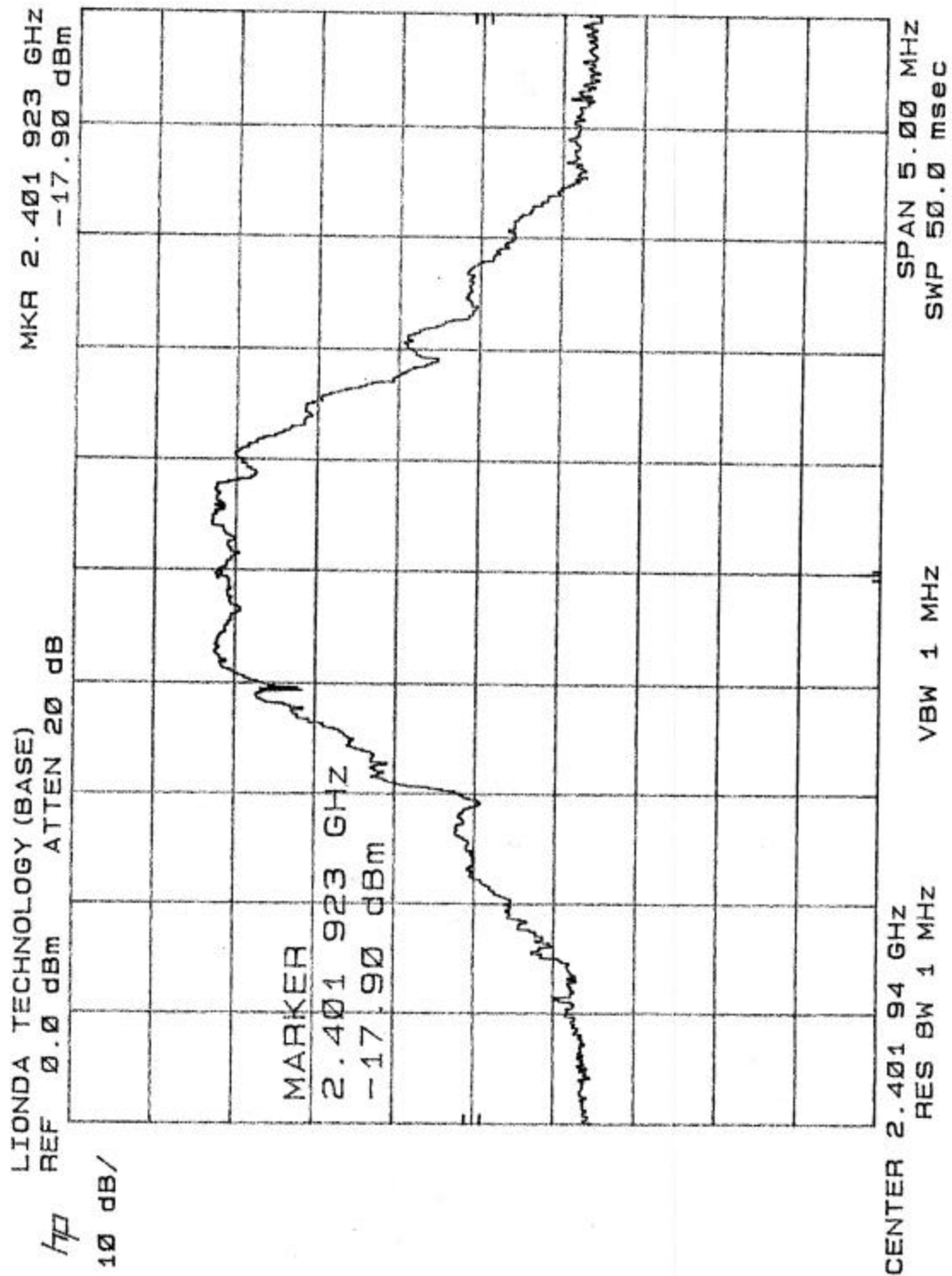
Refer to the attached to the following plots:

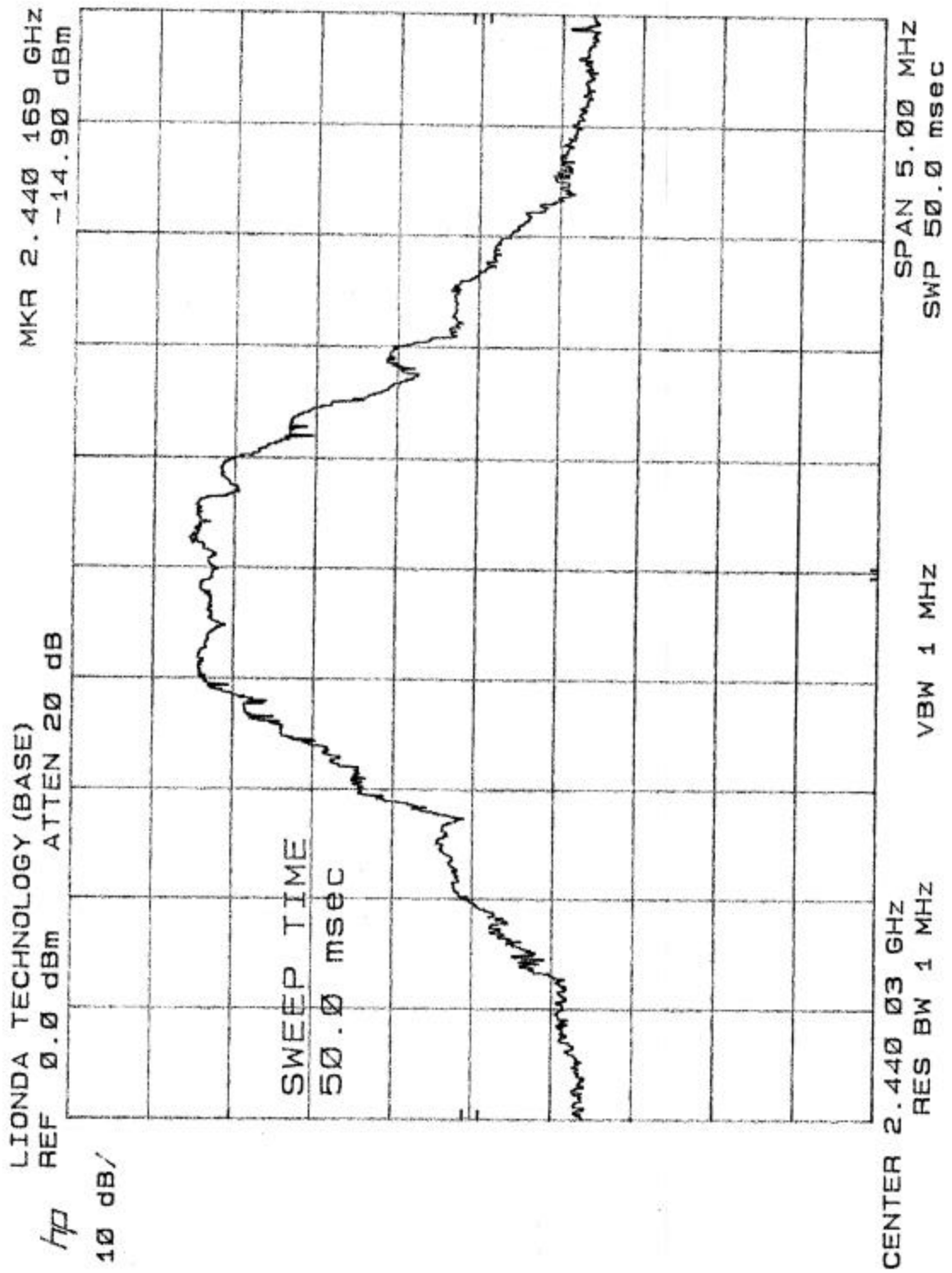
Peak Output Power	Page Reference		Test Result
	Base	Handset	
Low Channel	Page 14	Page 17	Passed
Middle Channel	Page 15	Page 18	Passed
High Channel	Page 16	Page 19	Passed

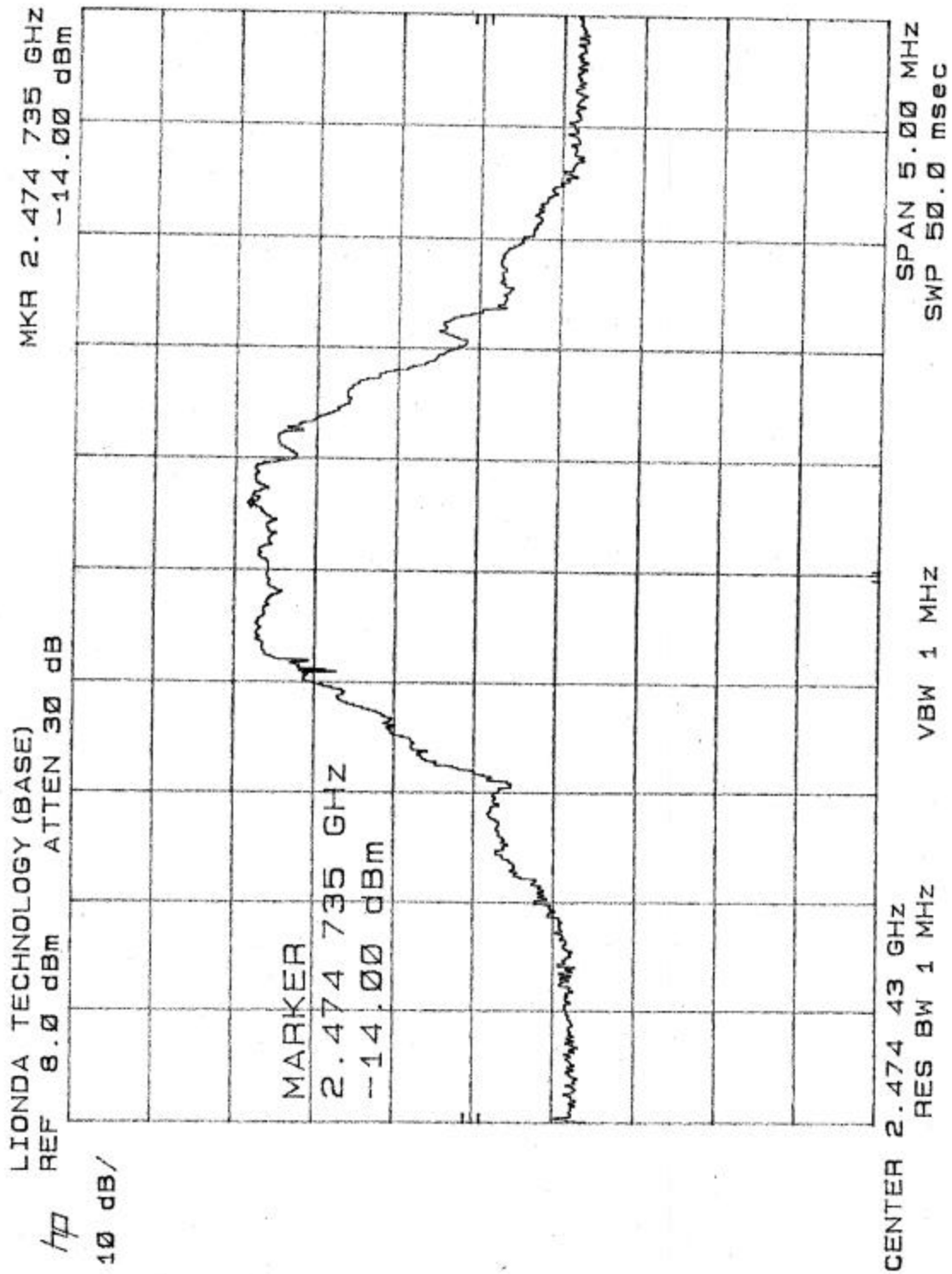












5 – 6 dB BANDWIDTH

5.1 Standard Applicable

According to §15.247(a)(2), for direct sequence systems, the minimum 6 dB bandwidth shall be at least 500 kHz.

5.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

5.3 Measurement Data

The following are plots of Hopping Channel Bandwidth for low, middle and high channel.

Channel Bandwidth	Page Reference		Test Result
	Base	Handset	
Low Channel	Page 21	Page 24	Passed
Middle Channel	Page 22	Page 25	Passed
High Channel	Page 23	Page 26	Passed

