

# Marstech Limited

11 Kelfield Street, Etobicoke, Ontario, Canada, M9W 5A1  
Telephone (416) 246-1116, Fax (416) 246-1020

Authorized by:  
Professional Engineer  
Ontario



Engineering &  
Administrative

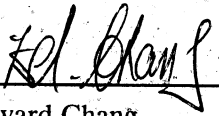

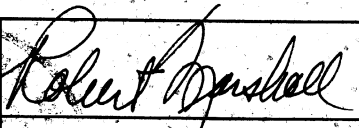


Testing For FCC  
Submissions/Verifications

Approved Test Facility



## TEST REPORT

REPORT DATE: 22 March 2002		REPORT NO: 22025D	
CONTENTS:	See Table of Contents		
SUBMITTOR:	ATLINKS USA, Inc. 101 West 103 <sup>rd</sup> Street Indianapolis, IN 46290-1102 USA		
SUBJECT:	Model No:	26928XXX-A (Model tested is 26938XXX-A) [Alternate Construction - to cover additional minor caller ID circuits; antenna change; pcb layout change and to add Model 26938XXX-A which has the same RF module as revised Model 26928XXX-A]	
	FCC ID:	G9H2-6928A	
TEST SPECIFICATION	FCC 47 CFR Part 15, Class "II". Permissive Change NOTE: Tests Conducted Are "Type" Tests.		
DATE SAMPLE RECEIVED:	11 February 2002	DATE TESTED:	20 February 2002 and 04 March 2002
RESULTS:	Equipment tested complies with referenced specification.		
ALTERATIONS	None		
Tested by:			
	Edward Chang	Approved by:	Robert G. Marshall, P. Eng. Date: Mar 27/02
<b>THIS REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT THE WRITTEN APPROVAL OF MARSTECH LIMITED.</b> This report was prepared by Marstech Limited for the account of the "Submitter". The material in it reflects Marstech's judgement in light of the information available to it at the time of preparation. Any use which a Third Party makes of this report, or any reliance on decisions to be made based on it, are the responsibility of such Third Parties. Marstech accepts no responsibility for damages, if any, suffered by any Third Party as a result of decisions made or actions based on this report.			

TECHNICAL REPORT - FCC 2.1033(b)

Applicant

ATLINKS USA, Inc.  
101 West 103<sup>rd</sup> Street  
Indianapolis, IN  
46290-1102 USA

FCC Identifier

G9H2-6928A

Manufacturer

Huiyang CCT Telecommunications Products Co. Ltd.  
CCT Technology Park, San He Economic Experimental Zone  
Huiyang City, Guangdong Province  
P. R. of China

TABLE OF CONTENTS

<u>Exhibit</u>	<u>Description</u>	<u>FCC Ref.</u>	<u>Page</u>
A	Installation and Operating Instructions Furnished to the User.	2.1033(b)(3)	Exhibit A Exhibit A(1)
B	Description of Circuit Functions Statement of Security Code	2.1033(b)(4)	Exhibit B Exhibit B(1)-1 to -3 Exhibit B(2)
C	Block Diagram Schematic Diagram	2.1033(b)(5)	Exhibit C Exhibit C(1)-1 to -2 Exhibit C(2)-1 to -6
D	Report of Measurements	2.1033(b)(6)	Exhibit D
E	Photographs Label Equipment - External Photos Internal Photos	2.1033(b)(7)	Exhibit E Exhibit E(1) Exhibit E(2)-1 to -2 Exhibit E(2)-3 to -8
F	Verification Report (Not Part of Certification Package)		Exhibit F(1)

EXHIBIT D

[FCC Ref. 2.1033(b)(6)]

"Report of Measurements"

## **TABLE OF CONTENTS**

### TEST REPORT CONTAINING:

Exhibit D(1)-2	Product Description
Exhibit D(1)-3 to -4	Test Equipment List
Exhibit D(1)-5	Test Procedure
Exhibit D(1)-6 to -8	Power Line Conducted Interference
Exhibit D(1)-9 to -11	Band Edges
Exhibit D(1)-12 to -14	Bandwidth
Exhibit D(1)-15 to -17	Field Strength of Emissions
Exhibit D(2)-1 to -2	Test Set Up Photo
Exhibit D(3)	Measurement Facility (3 meter site)

## PRODUCT DESCRIPTION

The RF module of **new Model 26938XXX-A (model tested)**, a single-line 900MHz cordless telephone with caller ID feature that operates from 902 MHz to 928 MHz, is identical to revised Model 26928XXX-A. The antenna used for the base and the handset is permanently attached to the EUT. Its actual frequency range is:

Base: 902.106 to 904.047 MHz

Handset: 925.900 to 927.850 MHz

The Model 26938XXX-A will bear the same FCC ID: G9H2-6928A as revised Model 26928XXX-A.

## TEST FACILITY AND EQUIPMENT LIST

### FACILITIES

- Radiated      ANSI C63.4 (FCC OET/55) open field 3 metre test range. This test range is protected from the cold and moisture by a non-conductive enclosure.
- Conducted     2.5m Anechoic Chamber

### EQUIPMENT

Anritsu 2601A Spectrum Analyzer  
Advantest R3261A Spectrum Analyzer  
Hewlett-Packard RF generator # 8640 B with an 002 doubler  
A.H. Systems biconical antenna; ..... 20 MHZ to 330 MHZ  
A.H. Systems log periodic antenna; ..... 300 MHZ to 1.8 GHz  
Eaton dipole antennas; T1, T2, T3 ..... 25 MHZ to 1.0 GHz  
Roberts dipole antennas; T1, T2, T3 & T4 25 MHZ to 1.0 GHz  
Compliance Design P950 Preamp (16 dB) ... 25 MHZ to 1.0 GHz

### NOTE:

The Anritsu 2601A Spectrum Analyzer and the Advantest R3261A Spectrum Analyzer are calibrated annually, and that calibration is directly traceable to the National Research Council of Canada. (NRC)  
This equipment is only used by qualified technicians and only for the purpose of EMI measurements.  
The three metre test range has been carefully evaluated to the ANSI document C63.4 and will be remeasured for reflections and losses every three years.

**ADDITIONAL TEST EQUIPMENT LIST**

1. Spectrum Analyzer: HP 8591EM, S/N 3639A00995, Calibrated April 2001
2. Spectrum Analyzer: ANRITSU 2601A, S/N MT64544, Calibrated May 2001
3. Spectrum Analyzer: IFR AN940, S/N 635001039, Calibrated March 2002
4. Preamp: HP 8449B, S/N 3008A00378, Calibrated August 2001
5. Horn Antenna: Q-PAR 6878/24, S/N 1721, 1.5-18GHz
6. Line Impedance Stabilization Network.: Marstech, Cal. July 2001

## TEST PROCEDURE

### GENERAL:

Shielded interface cables were used in all cases except for cables connecting to the telephone line and the power cords. A test program was run which simulated a normal transmission.

### POWER LINE CONDUCTED INTERFERENCE:

The procedure used was ANSI STANDARD C63.4 1992 using a 50uH LISN. Both lines were observed with the EUT transmitting. The bandwidth of the spectrum analyzer was 9KHz QP with an appropriate sweep speed. The ambient temperature of the EUT was 24°C with a humidity of 60%.

### BANDWIDTH 6.0dB:

The measurements were made with the spectrum analyzer's resolution bandwidth (RBW)=1.0MHz and the video bandwidth (VBW)=1.0MHz and the span set as shown on plot.

### POWER OUTPUT:

The radiated output power was measured with the spectrum analyzer and Horn Antenna.

### RADIATION INTERFERENCE:

The test procedure used was ANSI STANDARD C63.4-1992 using an appropriate spectrum analyzer, as listed in the Test Equipment List. The bandwidth (RBW) of the spectrum analyzer was 100KHz/120KHz up to 1GHz with an appropriate sweep speed. The VBW above 1.0GHz was = 1.0GHz. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The ambient temperature of the EUT was 24°C with a humidity of 60%.



**15.107 (a) POWER LINE CONDUCTED INTERFERENCE**

**Requirements:**            0.45 - 30MHz            250 $\mu$ V or 47.96dB $\mu$ V

**Test Procedure:**        ANSI STANDARD C63.4-1992.  
The spectrum was scanned from 0.45 to 30MHz.

**Test Data:**

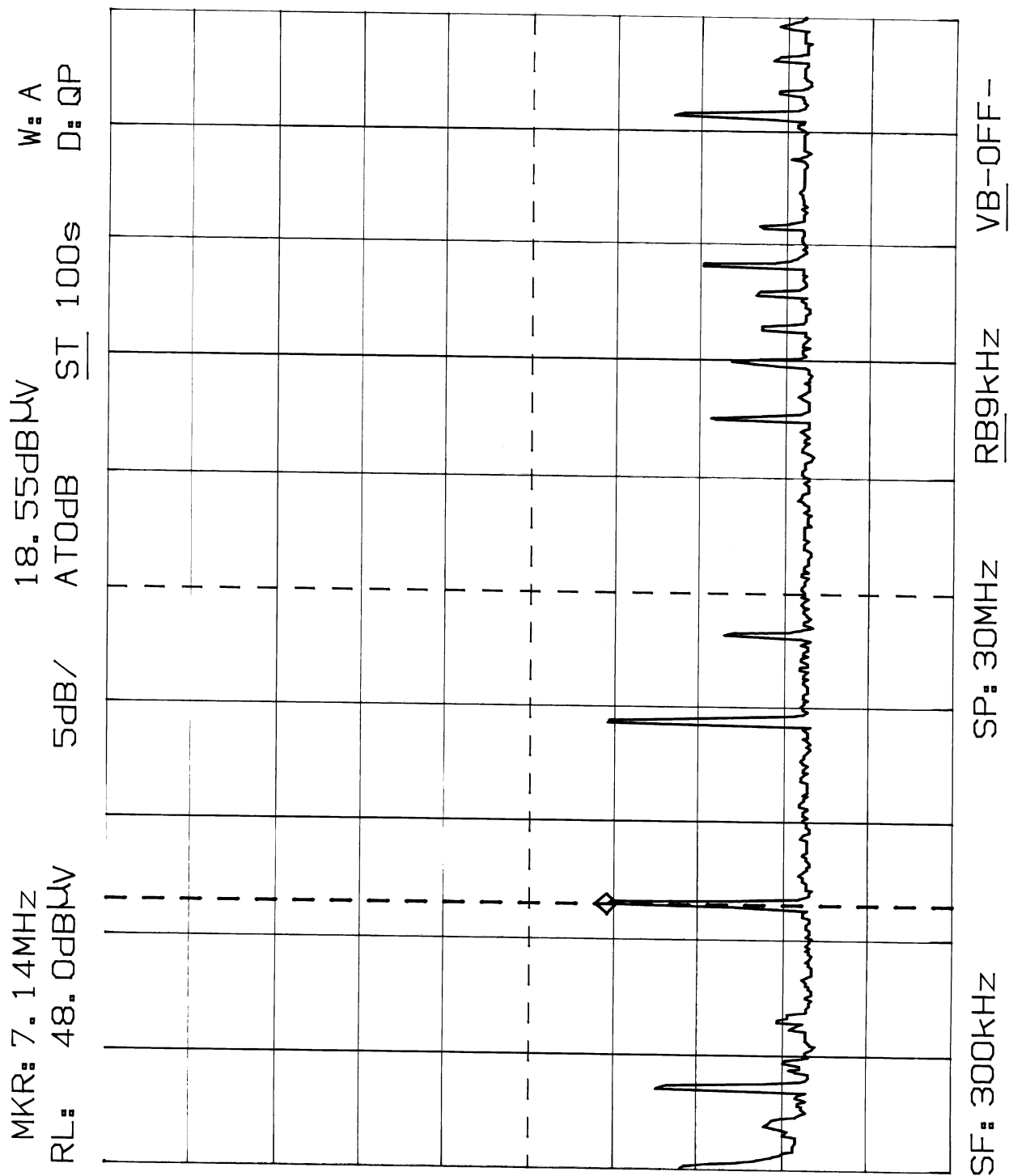
The highest emission read for LINE was 18.55 dB $\mu$ V@ 7.14 MHZ.  
The highest emission read for NEUTRAL was 18.16 dB $\mu$ V@ 7.14 MHZ.

The graphs on Exhibit D(1)-7 to -8 represent the emissions taken for this device.

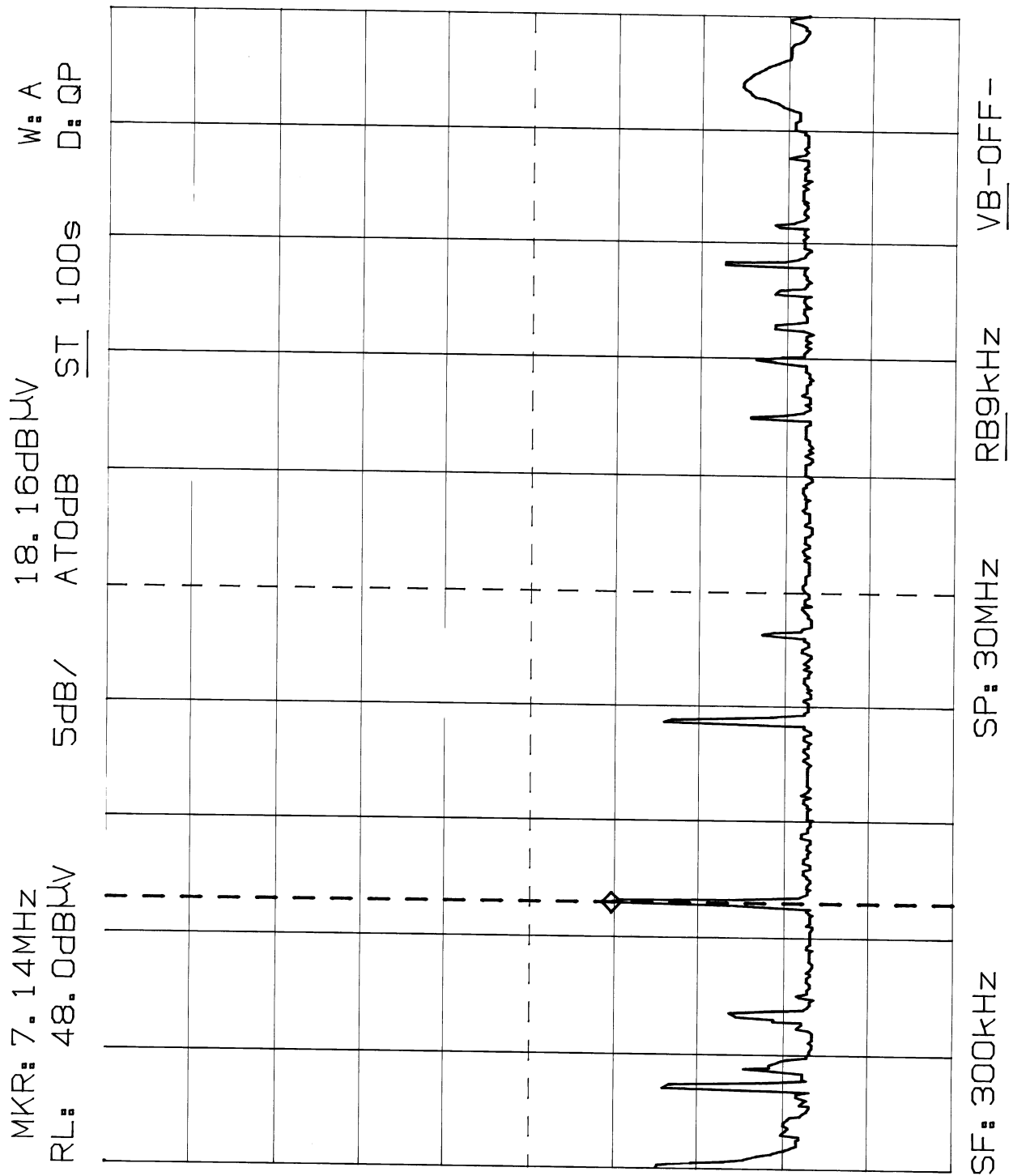
**Test Results:**

Both sides of the line were observed. The measurements indicate that the unit DOES appear to meet the FCC requirements for this class of equipment.

POWER LINE CONDUCTED EMISSIONS  
MODEL 26938XXX-A; LINE



POWER LINE CONDUCTED EMISSIONS  
MODEL 26938XXX-A; NEUTRAL



### **15.249 (c) BAND EDGES**

- Requirements:** Emissions outside of the frequency band must be attenuated 50dB below the fundamental.
- Measurement:** The base was attenuated by 50 dB. The headset was attenuated by 50 dB.
- Measurement Data:** The Bandedge was measured at the Low end of the band for the base, and the High end of the band for the handset. See Plots [Exhibits D(1)-10 to -11].

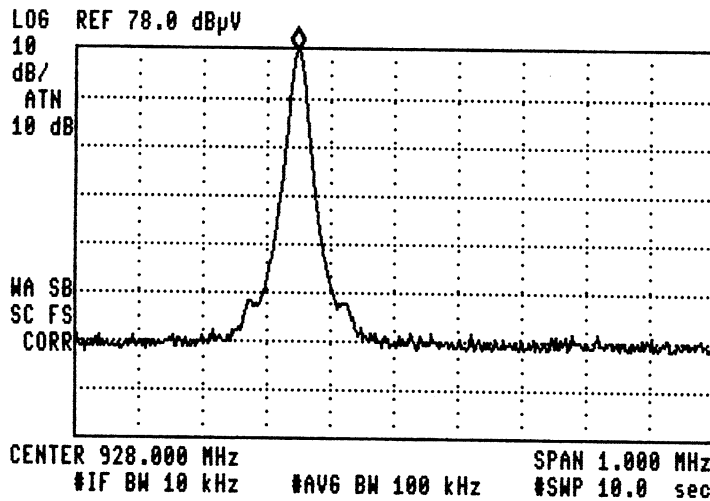
**BAND EDGE (Handset)**  
**MODEL 26938XXX-A**

11:29:00 MAR 04, 2002

/P

MARKER  
927.848 MHz  
77.45 dBμV

ACTV DET: PEAK  
MEAS DET: PEAK QP AVG  
MKR 927.848 MHz  
77.45 dBμV

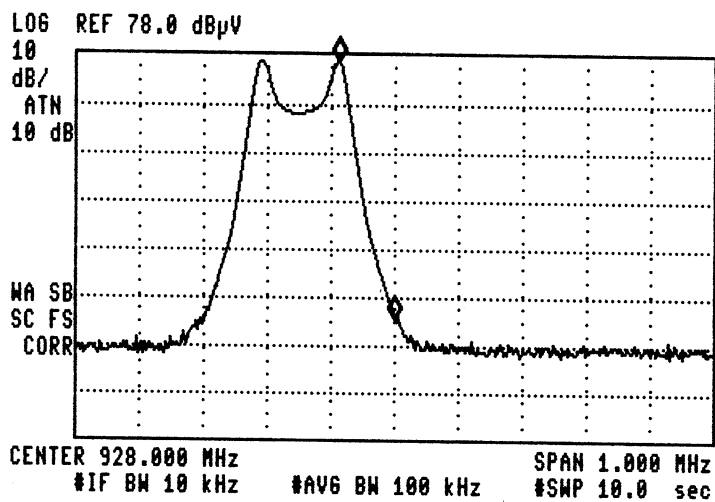


11:31:21 MAR 04, 2002

/P

SWEPTIME  
10.0 sec

ACTV DET: PEAK  
MEAS DET: PEAK QP AVG  
MKRA -88 kHz  
52.83 dB



BAND EDGE (Base)  
MODEL 26938XXX-A

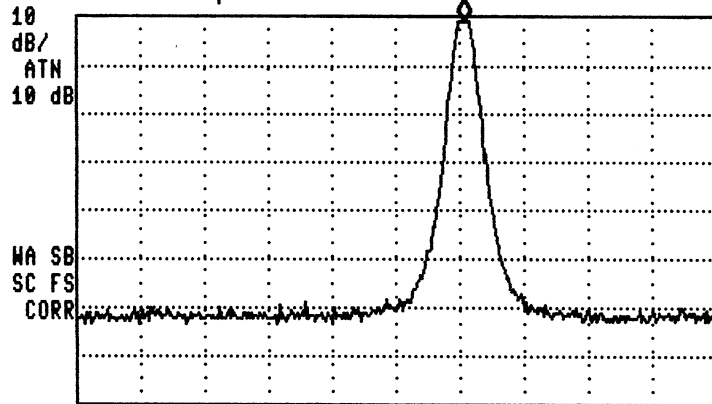
12:14:48 MAR 04, 2002

17

SWEPTIME  
10.0 sec

ACTV DET: PEAK  
MEAS DET: PEAK QP AVG  
MKR 902.100 MHz  
78.13 dB $\mu$ V

LOG REF 79.0 dB $\mu$ V



CENTER 902.000 MHz SPAN 1.000 MHz  
#IF BW 10 kHz #AVG BW 100 kHz #SWP 10.0 sec

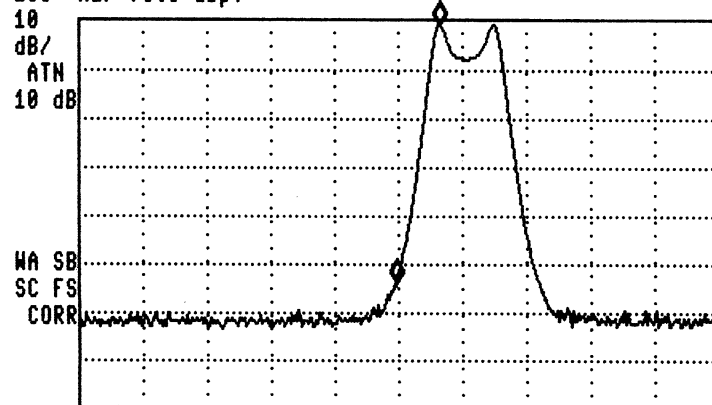
12:19:00 MAR 04, 2002

17

SWEPTIME  
10.0 sec

ACTV DET: PEAK  
MEAS DET: PEAK QP AVG  
MKR<sub>A</sub> 68 kHz  
52.73 dB

LOG REF 79.0 dB $\mu$ V



CENTER 902.000 MHz SPAN 1.000 MHz  
#IF BW 10 kHz #AVG BW 100 kHz #SWP 10.0 sec

## **2.202 BANDWIDTH**

### **Handset**

Channels 1 and 40:     **0.1545 MHZ** [Refer to Exhibit D(1)-13]

### **Base:**

Channels 1 and 40:     **0.1095 MHZ** [Refer to Exhibit D(1)-14]

BANDWIDTH =         **0.2 MHZ**

20dB BANDWIDTH (Handset); CH 1 & CH 40  
MODEL 26938XXX-A

11:45:52 MAR 04, 2002

/P

MARKER Δ  
154.5 kHz  
- .21 dB

ACTV DET: PEAK  
MEAS DET: PEAK QP AVG  
MKRΔ 154.5 kHz  
- .21 dB

LOG REF 79.0 dBμV

10

dB/

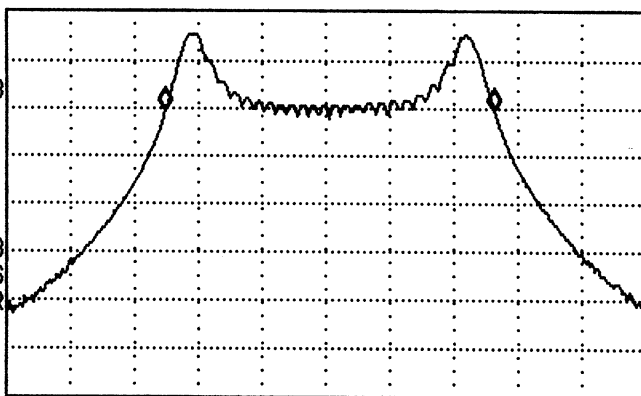
ATN

10 dB

MA SB

SC FS

CORR



CENTER 925.9000 MHz

#IF BW 3.0 kHz

#AVG BW 100 kHz

SPAN 300.0 kHz

#SWP 10.0 sec

11:48:37 MAR 04, 2002

/P

MARKER Δ  
145.5 kHz  
- .28 dB

ACTV DET: PEAK  
MEAS DET: PEAK QP AVG  
MKRΔ 145.5 kHz  
- .28 dB

LOG REF 79.0 dBμV

10

dB/

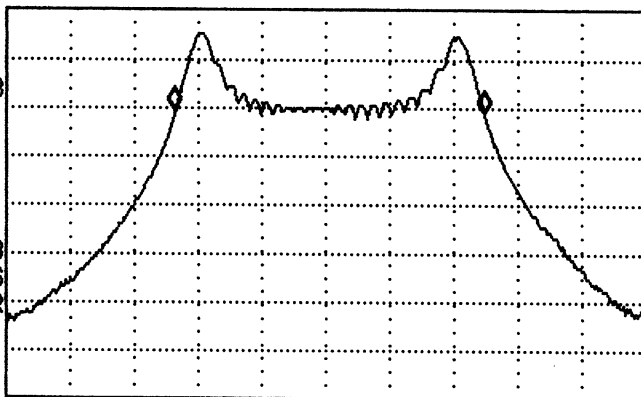
ATN

10 dB

MA SB

SC FS

CORR



CENTER 927.8500 MHz

#IF BW 3.0 kHz

#AVG BW 100 kHz

SPAN 300.0 kHz

#SWP 10.0 sec



20dB BANDWIDTH (Base); CH 1 & CH 40  
MODEL 26938XXX-A

12:22:11 MAR 04, 2002

/p

MARKER Δ  
105.8 kHz  
.12 dB

ACTV DET: PEAK  
MEAS DET: PEAK QP AVG  
MKRA 105.8 kHz  
.12 dB

L06 REF 79.0 dBμV

10

dB/

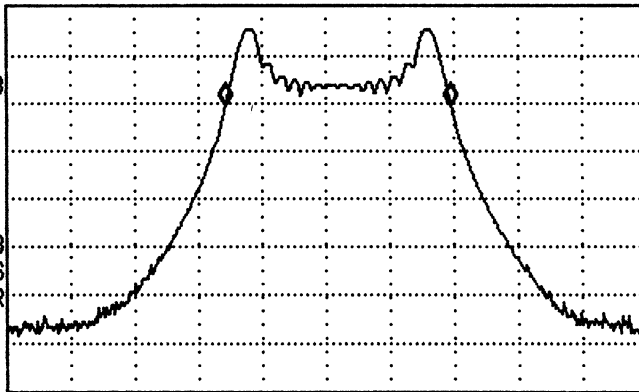
ATN

10 dB

WA SB

SC FS

CORR



CENTER 902.1000 MHz

SPAN 300.0 kHz

#IF BW 3.0 kHz

#AVG BW 100 kHz

#SWP 10.0 sec

12:27:54 MAR 04, 2002

/p

MARKER Δ  
109.5 kHz  
.28 dB

ACTV DET: PEAK  
MEAS DET: PEAK QP AVG  
MKRA 109.5 kHz  
.28 dB

L06 REF 79.0 dBμV

10

dB/

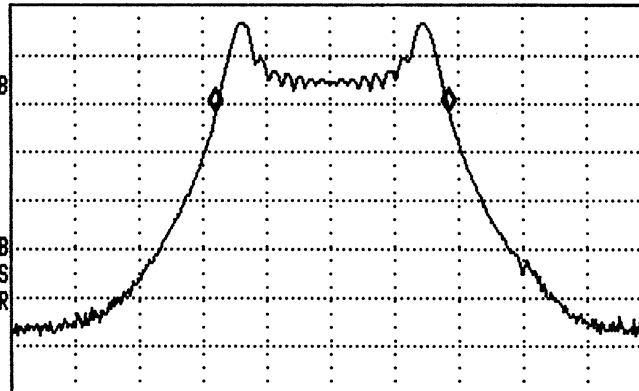
ATN

10 dB

WA SB

SC FS

CORR



CENTER 904.0545 MHz

SPAN 300.0 kHz

#IF BW 3.0 kHz

#AVG BW 100 kHz

#SWP 10.0 sec

**15.249 (a) and 15.249 (b)**  
**FIELD STRENGTH OF EMISSIONS**

Page 1 of 3

**Requirements:**

Field Strength of Fundamental	Field Strength of Harmonics	15.209
		30-88 MHZ 40 dB $\mu$ V/M@ 3m
902 to 928 MHZ 94dB $\mu$ V	54 dB $\mu$ V/M@ 3m	88-216 MHZ 43.5
		216-960 MHZ 46
		Above 960 MHZ 54

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or to the general radiated emission limits in 15.209, whichever is the lesser attenuation.

Emissions that fall in the restricted bands (15.205) must be less than 54dB $\mu$ V/M.

**FIELD STRENGTH OF EMISSIONS****Test Data:****HANDSET (TX Spurious Emission and Carrier)**

Emission Frequency MHZ	Meter Reading @3m dB $\mu$ V	Antenna	Cable and ACF dB	Field Strength dB $\mu$ V/M	FCC Limit dB $\mu$ V/M	Margin dB	Detector & BW KHz
<b><u>Channel 1</u></b>							
925.900	52.30	RT4 V	33.44	85.74	94	-8.26	PK 100
---	---						
<b><u>Channel 40</u></b>							
927.850	51.70	RT4 V	33.46	85.16	94	-8.84	PK 100
----	----						

**FIELD STRENGTH OF EMISSIONS****Test Data:****BASE UNIT (TX Spurious Emission and Carrier)**

Emission Frequency MHZ	Meter Reading @3m dB $\mu$ V	Antenna	Cable and ACF dB	Field Strength dB $\mu$ V/M	FCC Limit dB $\mu$ V/M	Margin dB	Detector & BW KHz
<b><u>Channel 1</u></b>							
902.106	57.30	RT4 V	33.21	90.51	94	-3.49	PK 100
452.10	13.50	LP H	19.20	32.51	46	-13.49	PK 100
<b><u>Channel 40</u></b>							
904.047	56.00	RT4 V	33.23	89.23	94	-4.77	PK 100
----	----						