

**Application for Certification
For an RF Amplifier**

**Taiwan Coiler International Corp.
8F-4, No.75, Sec. 1, Hsin Tai Wu Road
Taipei Hsian
Taiwan**

RF Amplifier

Part # TG-806

FCC ID: RFJTG-806

REPORT # RV48068A-004

This report was prepared in accordance with the requirements of the FCC Rules and Regulations Part 2, Subpart J, 2.1031 through 2.1057, and Part 90 and other applicable sections of the rules as indicated herein.

Prepared By:

Kevin Meyers

**DNB Engineering, Inc.
5969 Robinson Avenue
Riverside, Ca 92503-8620**

16 March 2004

TEST LAB PERSONNEL

Test Performed by:	Date	Signature
Thomas Elders	16 March 2004	<i>Thomas Elders</i>

APPROVALS

Management Approval	Date	Signature
Les Payne Sr. Engineering Manager	16 March 2004	<i>Les Payne</i>

Original report RV48068A-001	Dated 08 Dec 2003
Revised report RV48068A-002	Dated 02 Mar 2004
Revised report RV48068A-003	Dated 10 Mar 2004
Revised report RV48068A-004	Dated 16 Mar 2004

TABLE OF CONTENTS

Section Sheet

Title

	Test Lab Personnel and Approvals	2
	Table of Contents	3
	Table of Figures	4
1.0	ADMINISTRATIVE DATA	5
1.1	Certifications and Qualifications	5
1.2	Measurements and Repeatability Information	5
1.3	Test Methodology	6
1.4	Test Equipment	6
1.5	Deviations	6
1.6	Test Description	7
Note:		
Paragraph numbers in this report follow the application section numbers found in the FEDERAL COMMUNICATIONS COMMISSION Rules and Regulations, Part 2, Subpart J for Certification of electronic equipment.		
2.1033 (C) (1)	Application for Certification	8
2.1033 (C) (2)	FCC Identifier	9
2.1033 (C) (3)	Installation and Operating Instructions (Service manual)	9
2.1033 (C) (4)	Type of Emissions	9
2.1033 (C) (5)	Frequency Range	9
2.1033 (C) (6)	Operating Power	9
2.1033 (C) (7)	Maximum Power Allowed in Applicable part(s) of the Rules	9
2.1033 (C) (8)	Final RF Amplifier Input Power Characteristics	9
2.1033 (C) (9)	Tune Up Procedure	9
2.1033 (C) (10)	Schematic Diagram and Circuit Description	10
2.1033 (C) (11)	Equipment Identification Plate	10
2.1033 (C) (12)	Equipment Photographs (Internal)	10
2.1033 (C) (12)	Equipment Photographs (External)	10
2.1033 (C) (13)	Digital Modulation Techniques	10
2.1033 (C) (14)	Test Data	10
	Test Set-Up	11-12
2.1046	Measurement of RF Power Output	13-19
2.1049	Measurement of Occupied Bandwidth	20-56
2.1051	Spurious Emissions at Antenna Terminals	57-63
2.1053	Measurement of Field Strength of Spurious Radiation	64-70
2.1055	Measurement of Frequency Stability	71
2.1057	Frequency Spectrum to be Investigated	72
	RF Exposure	73-75
	Appendix A Photographs	76-78

TABLE OF FIGURES

**Section
Sheet #**
Title

FIGURE 1: TEST EQUIPMENT.....	6
FIGURE 2: TEST RESULT SUMMARY	10
FIGURE 3: TEST SET UP BLOCK DIAGRAM FOR RF POWER OUTPUT, EMISSIONS LIMITATIONS GSM/TDMA, OCCUPIED BANDWIDTH GSM/TDMA, CONDUCTED SPURIOUS EMISSIONS AT ANTENNA TERMINALS.....	12
FIGURE 4: TEST SET UP BLOCK DIAGRAM FOR RADIATED EMISSIONS.....	12
FIGURE 5: OUTPUT POWER PLOTS, UPLINK.....	14
FIGURE 6: OUTPUT POWER PLOTS, DOWNLINK.....	17
FIGURE 7: OCCUPIED BANDWIDTH, TDMA DOWNLINK.....	21
FIGURE 8: OCCUPIED BANDWIDTH, GSM DOWNLINK.....	27
FIGURE 9: OCCUPIED BANDWIDTH, TDMA UPLINK.....	33
FIGURE 10: OCCUPIED BANDWIDTH, GSM UPLINK.....	39
FIGURE 10: INTER-MODULATION.....	45
FIGURE 11: CONDUCTED SPURIOUS EMISSIONS AT ANTENNA TERMINALS, DOWNLINK.....	58
FIGURE 13: RADIATED FIELD STRENGTH OF SPURIOUS EMISSIONS, UPLINK.....	65
FIGURE 14: RADIATED FIELD STRENGTH OF SPURIOUS EMISSIONS, DOWNLINK.....	68
PHOTOS: RADIATED FIELD STRENGTH OF SPURIOUS EMISSIONS	77
PHOTO: RF POWER OUTPUT, EMISSIONS LIMITATIONS GSM/TDMA, OCCUPIED BANDWIDTH GSM/TDMA, CONDUCTED SPURIOUS EMISSIONS AT ANTENNA TERMINALS	78

1.0 ADMINISTRATIVE DATA

1.1 Certifications and Qualifications

I certify that DNB Engineering, Inc conducted the tests performed in order to obtain the technical data presented in this application. Also, based on the results of the enclosed data, I have concluded that the equipment tested meets or exceeds the requirements of the Rules and Regulations governing this application.

1.2 Measurement Repeatability Information

The test data presented in this report has been acquired using the guidelines set forth in FCC Part 2.1031 through 2.1057, and Part 90. The test results presented in this document are valid only for the equipment identified herein under the test conditions described. Repeatability of these test results will only be achieved with identical measurement conditions. These conditions include: The same test distance, EUT Height, Measurement Site Characteristics, and the same EUT System Components. The system must have the same Interconnecting Cables arranged in identical placement to that in the test set-up, with the system and/or EUT functioning in the identical mode of operation (i.e. software and so on) as on the date of the test. Any deviation from the test conditions and the environment on the date of the test may result in measurement repeatability difficulties.

All changes made to the EUT during the course of testing as identified in this test report must be incorporated into the EUT or identical models to ensure compliance with the FCC regulations.



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1.3 Test Methodology

The tests were performed in accordance with FCC Part 2 Subpart J, 2.1031 through 2.1057, and 90 on a sample of the production model.

1.4 Test Equipment

FIGURE 1: TEST EQUIPMENT

Description	Manufacturer	M/N	S/N	Cal Due	Test Used On
Signal Generator	Agilent	E4433B	N/A	17 Feb 05	Output Power, Occupied Bandwidth (including Intermodulation), Conducted Spurious
Spectrum Analyzer Display	H/P	85662A	2542A13223	2 June 04	Output Power, Occupied Bandwidth (including Intermodulation), Conducted Spurious
Spectrum Analyzer	H/P	85660B	2637A03865	2 June 04	Output Power, Occupied Bandwidth (including Intermodulation), Conducted Spurious
Spectrum Analyzer Display	H/P	85662A	259101-1	10 Jan 04*	Radiated Spur, Conducted Emissions
Spectrum Analyzer	H/P	8566B	259101-2	10 Jan 04*	Radiated Spur, Conducted Emissions
Spec Analyzer Display	H/P	85662A	2318A05282	14 Aug 04	Radiated Emissions
Spectrum Analyzer	H/P	85680B	2049A01403	2 June 04	Radiated Emissions
Quasi-Peak Adapter	H/P	85650A	2043A00184	2 June 04	Radiated Emissions
Bicon Antenna	AH Systems	SAS-200/540	524	26 Dec 04	Radiated Emissions
Logarithmic Antenna	EMCO	3146	1284	26 Dec 04	Radiated Emissions
DRG Antenna	EMCO	3115	2281	2 May 04	Radiated Emissions

* Tests were performed Nov 2003 before Cal expired.

1.5 DEVIATIONS

Deviations/Modifications to the EUT

None

Deviations/Modifications from test standard.

None

1.6 TEST DESCRIPTION

1.6.1 RF Power Output

For RF Amplifiers.

1.6.2 Emissions Limitation and Occupied Bandwidth

Occupied Bandwidth that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are equal to 0.5 percent of the total mean power radiated by a given emission.

1.6.3 Conducted Spurious Emissions at Antenna Terminals

Conducted Spurious Emissions are emissions at the antenna terminals on a frequency or frequencies which are outside an occupied band sufficient to ensure transmission of information of required quality for the class of communication desired. The reduction in the level of these spurious emissions will not affect the quality of the information being transmitted.

1.6.4 Radiated Field Strength of Spurious Emissions

Emissions from the equipment when connected into a non-radiating load on a frequency or frequencies which are outside an occupied band sufficient to ensure transmission of information of required quality for the class of communication desired. The reduction in the level of these spurious emissions will not affect the quality of the information being transmitted.

1.6.5 Conducted Emissions

Emissions which are conducted onto the AC power mains.

1.6.6 Radiated Emissions

Emissions which emanate from the EUT.

2.1033 (C) (1) Application for Certification

Name of Applicant:	Taiwan Coiler International Corp. 8F-4, No.75, Sec. 1, Hsin Tai Wu Road Taipei Hsian Taiwan	
FRN:	To be provided by customer	
Applicant is:	X	Manufacturer Vendor Licensee Prospective Licensee Other
Name of Manufacturer	Taiwan Coiler International Corp.	
Description:	RF Amplifier	
Part Number:	TG-806	
Anticipated Production Quantity:	Multiple Units	
Applicable FCC Parts:	90	
FCC ID No:	RFJTG-806	
FCC Emissions Designator:	90	DXW
	90	GXW
Frequency Range:	Uplink 806-825 MHz Downlink 851-870MHz	
Rated Maximum Input:	1.25?w	
Rated Output Power:	160 mW	

2.1033 (C) (2) FCC Identifier

FCC ID: **RFJTG-806****2.1033 (C) (4) Type of Emission**

Emission Designator:	90	DXW
	90	GXW

2.1033 (C) (5) Frequency Range

Uplink 806-825 MHz
Downlink 851-870MHz

2.1033 (C) (6) Operating Power

Uplink 806-825 MHz	0.16W	(+22dBm)
Downlink 851-870MHz	0.16W	(+22dBm)

2.1033 (C) (7) Maximum Power Allowed in Applicable Part(s) of the Rules

<u>RULES PART</u>	<u>MAXIMUM POWER (WATTS)</u>
Part 90	5

2.1033 (C) (8) Final RF Amplifier Input Power Characteristics

(-29 dBm) 1.25uw maximum input

2.1033 (C) (9) Tune Up Procedure

Customer will provide.

2.1033 (C) (10) Schematic Diagram and Circuit Description

Customer will provide.

2.1033 (C) (11) Equipment Identification Plate

Customer will provide.

2.1033 (C) (12) Equipment Photographs - Internal

Customer will provide.

2.1033 (C) (12) Equipment Photographs - External

Customer will provide.

2.1033 (C) (13) Digital Modulation Techniques

TDMA/ GSM

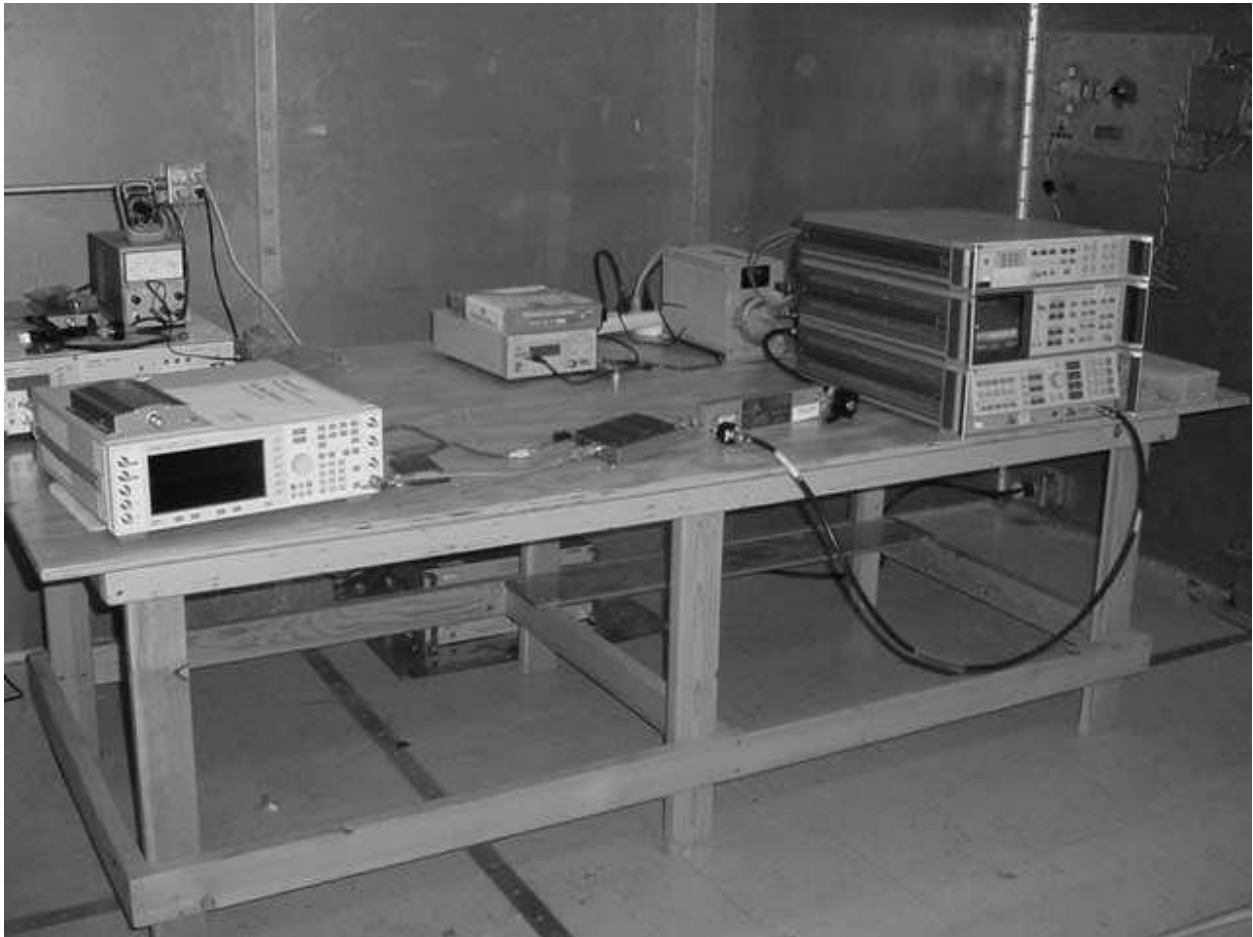
2.1033 (c) (14) Test Data

Refer to 2.1046 through 2.1057

FIGURE 2: TEST RESULT SUMMARY

NAME OF TEST	FCC PARA. NO.	RESULTS
RF Power Output	2.1046	Complies
Emissions Limitations: TDMA	2.1049	Complies
Emissions Limitations: GSM	2.1049	Complies
Occupied Bandwidth: TDMA/GSM	2.1049	Complies
Conducted Spurious Emissions at Antenna Terminals	2.1051	Complies
Radiated Field Strength of Spurious Emissions	2.1053	Complies

2.1033 (c) (14) Photograph of Test Set Up



2.1033 (c) (14)

FIGURE 3: TEST SET UP BLOCK DIAGRAM FOR RF POWER OUTPUT, EMISSIONS LIMITATIONS GSM/TDMA, OCCUPIED BANDWIDTH GSM/TDMA, CONDUCTED SPURIOUS EMISSIONS AT ANTENNA TERMINALS.

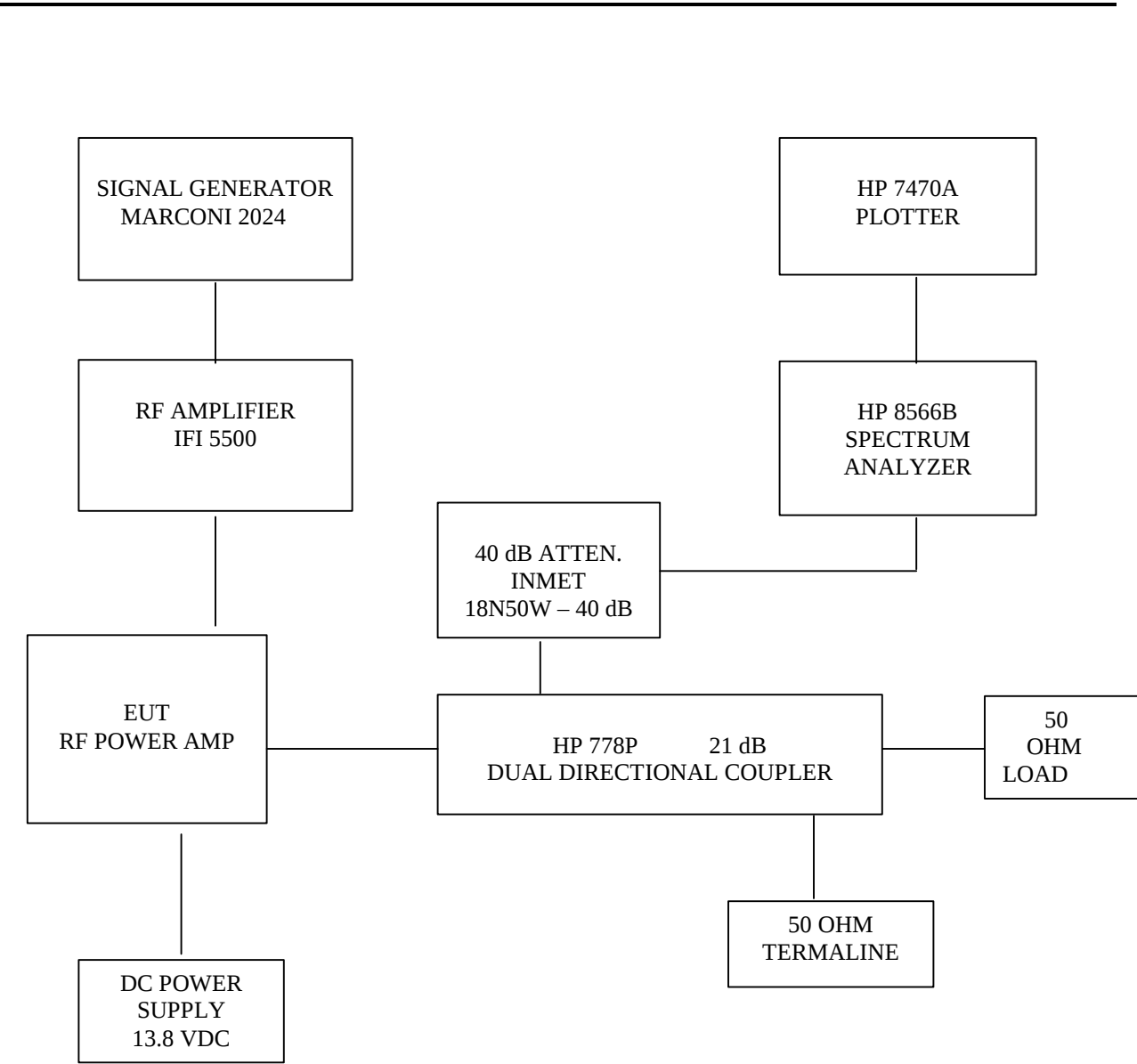
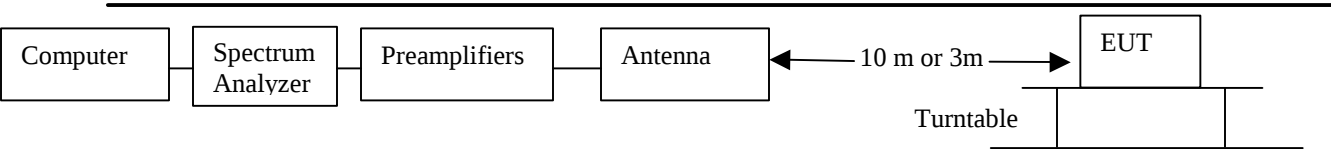


FIGURE 4: TEST SET UP BLOCK DIAGRAM FOR RADIATED EMISSIONS



2.1046 Measurement of RF Power Output

Definition: For RF Amplifiers.

Test Method: See FIGURE 1.

Output Power is measured across a precision 50 ohm load with a Spectrum Analyzer. For the power measurement, CW (no modulation) is used. A maximum rated input of 1.25uW was used to drive the rf amplifier under test.

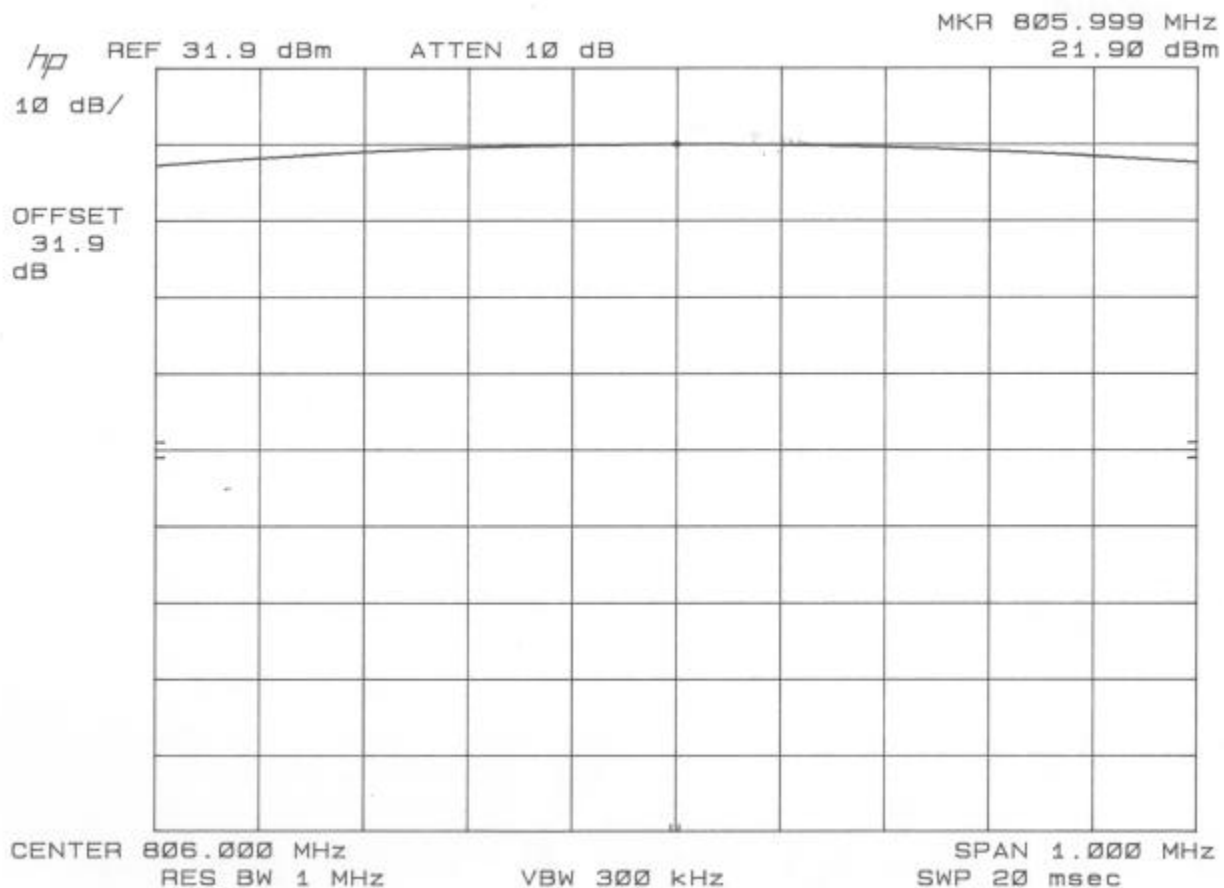
Test Results:

POWER OUTPUT MEASURED AT NOMINAL VOLTAGE WAS:

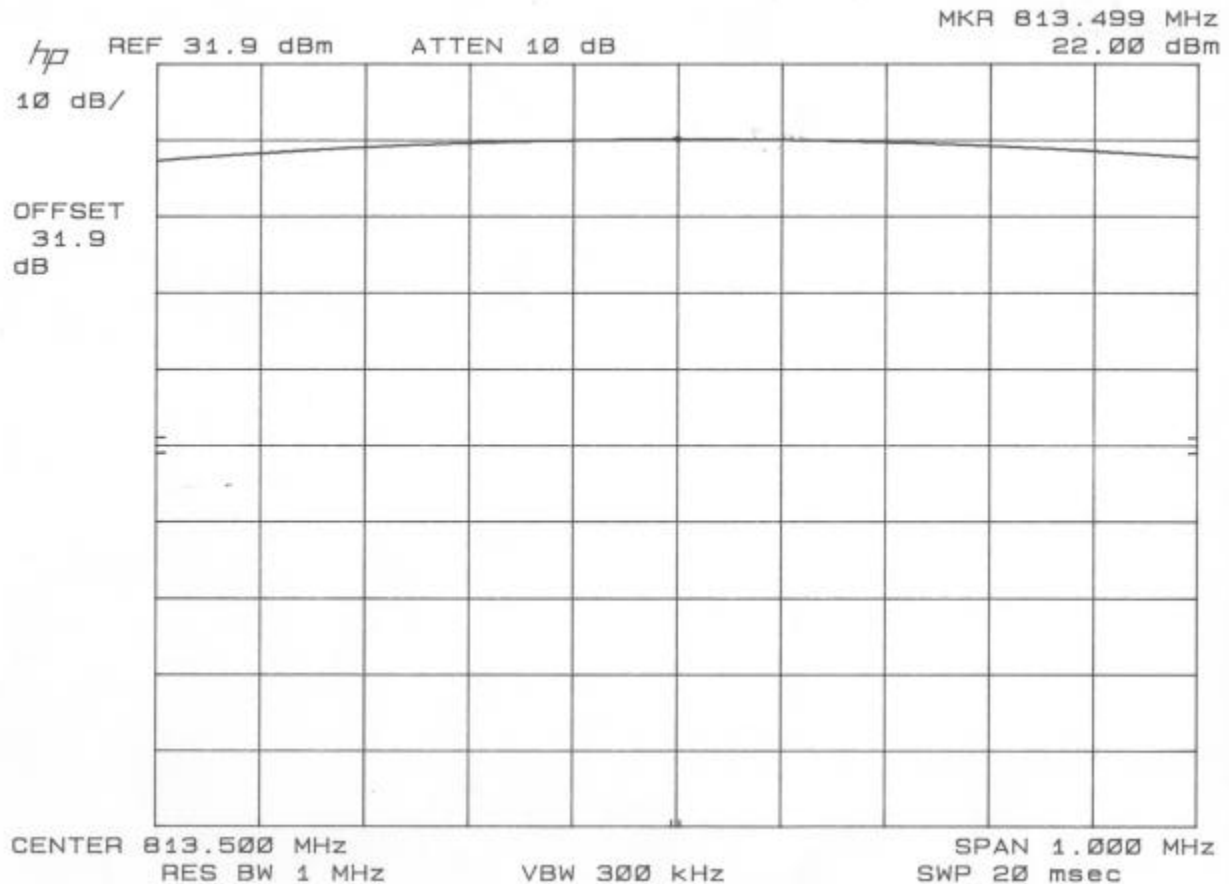
<u>Frequency (MHz)</u>	<u>Power (dBm)</u>	<u>Power (W)</u>
Uplink 806	22dBm	.16W
Uplink 813	22dBm	.16W
Uplink 821	22dBm	.16W
Downlink851	22dBm	.16W
Downlink860	22dBm	.16W
Downlink866	22dBm	.16W

FIGURE 5: OUTPUT POWER PLOTS, UPLINK.

	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704	Output Power	
DNB Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	Uplink 806 MHz		



	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704	Output Power	
DNB Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	813 MHz		



	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704	Output Power	
DNB Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	821 MHz		

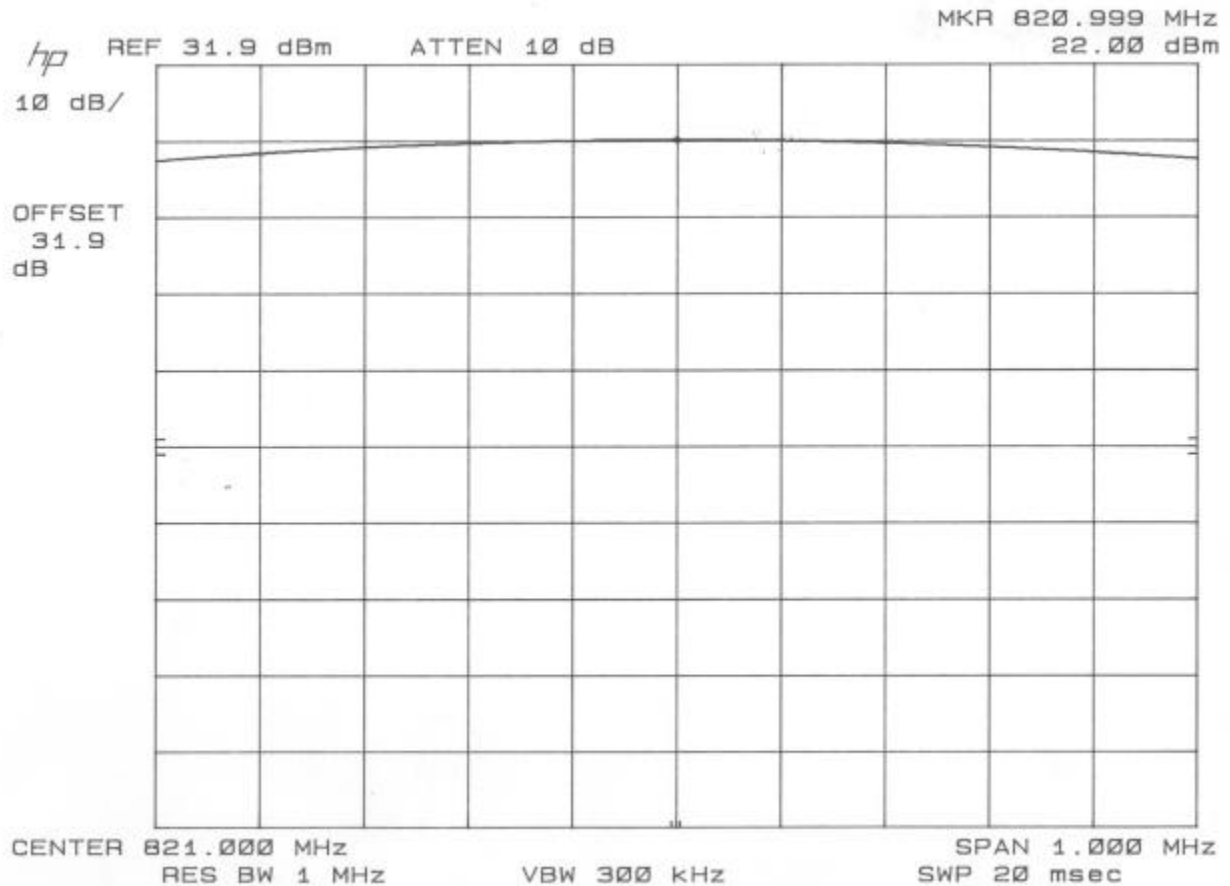
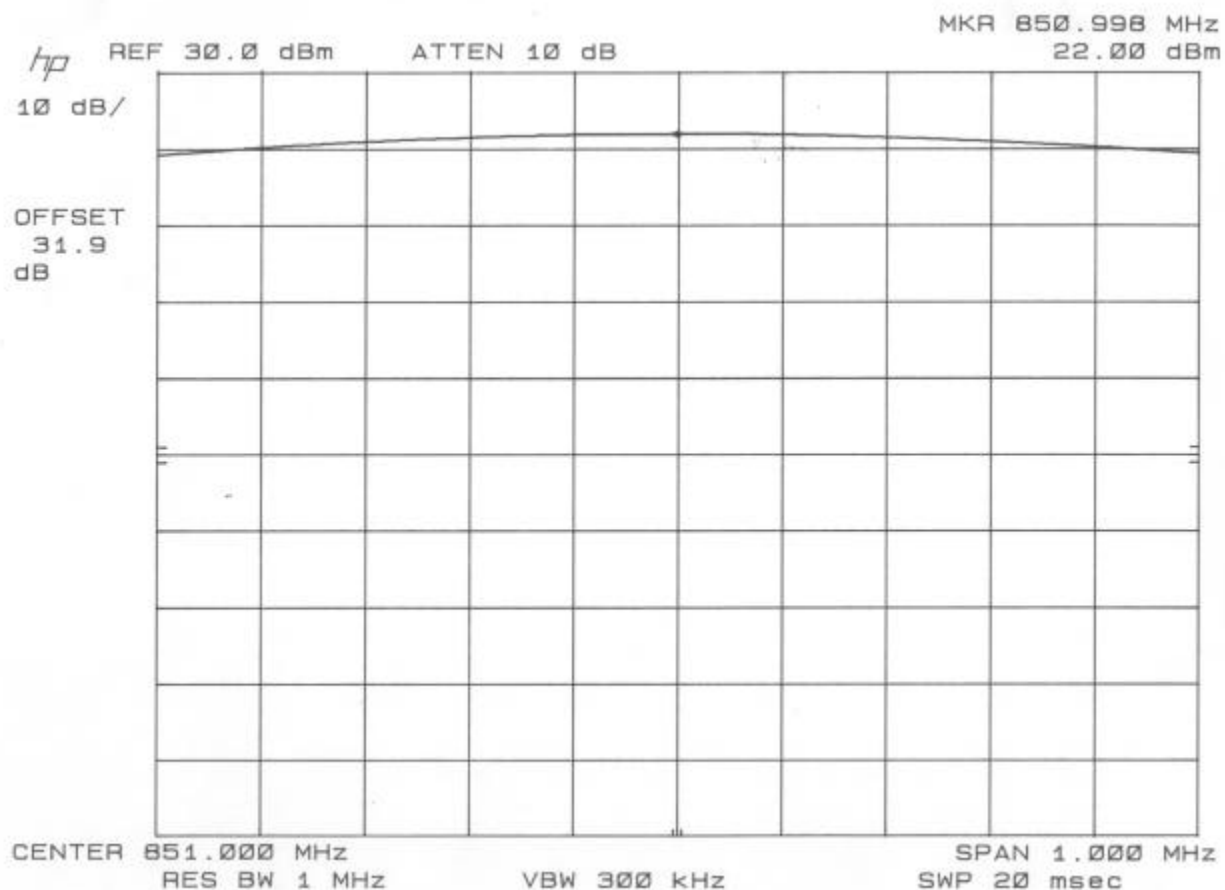
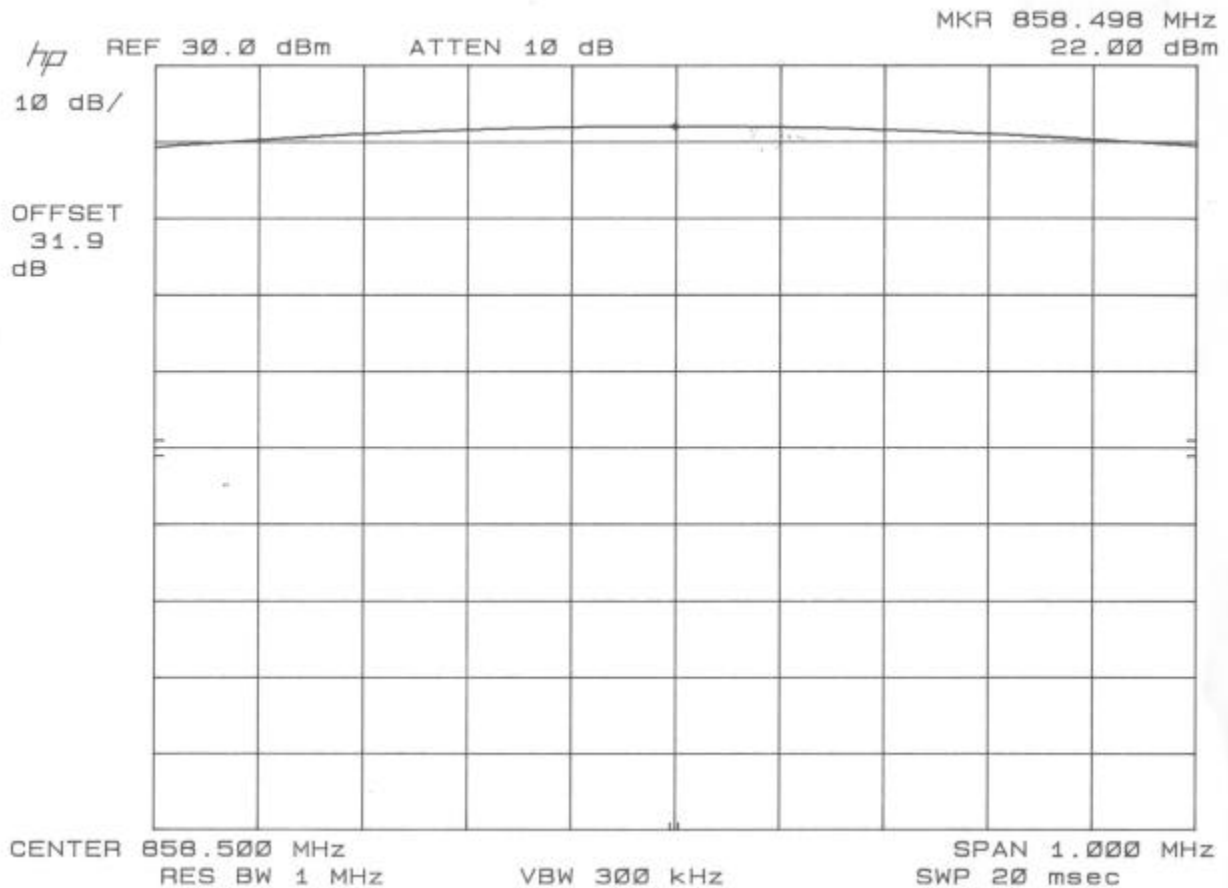


FIGURE 6: OUTPUT POWER PLOTS, DOWNLINK.

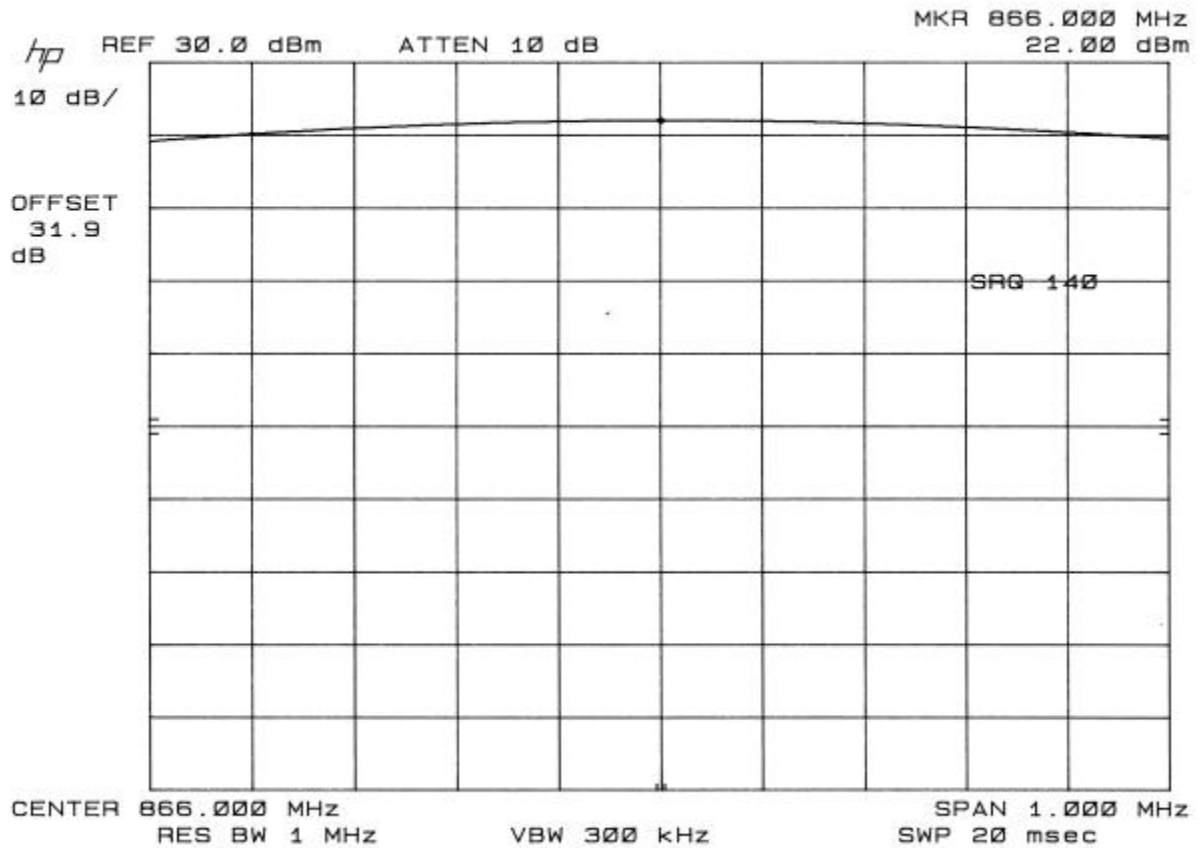
	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704	Output Power	
DNB Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Inteligain		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	Downlink 851 MHz		



	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704	Output Power	
DNB Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Inteligain		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	Downlink 858.5 MHz		



	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704	Output Power	
DNR Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Inteligain		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	Downlink 866 MHz		



2.1049 Measurement of Occupied Bandwidth

Definition:

Occupied Bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are equal to 0.5 percent of the total mean power radiated by a given emission.

Test Method: Connect the Equipment per FIGURE 3.

Measurements were made while the driving source generated the following:

CW signal
TDMA Signal
GSM Signal

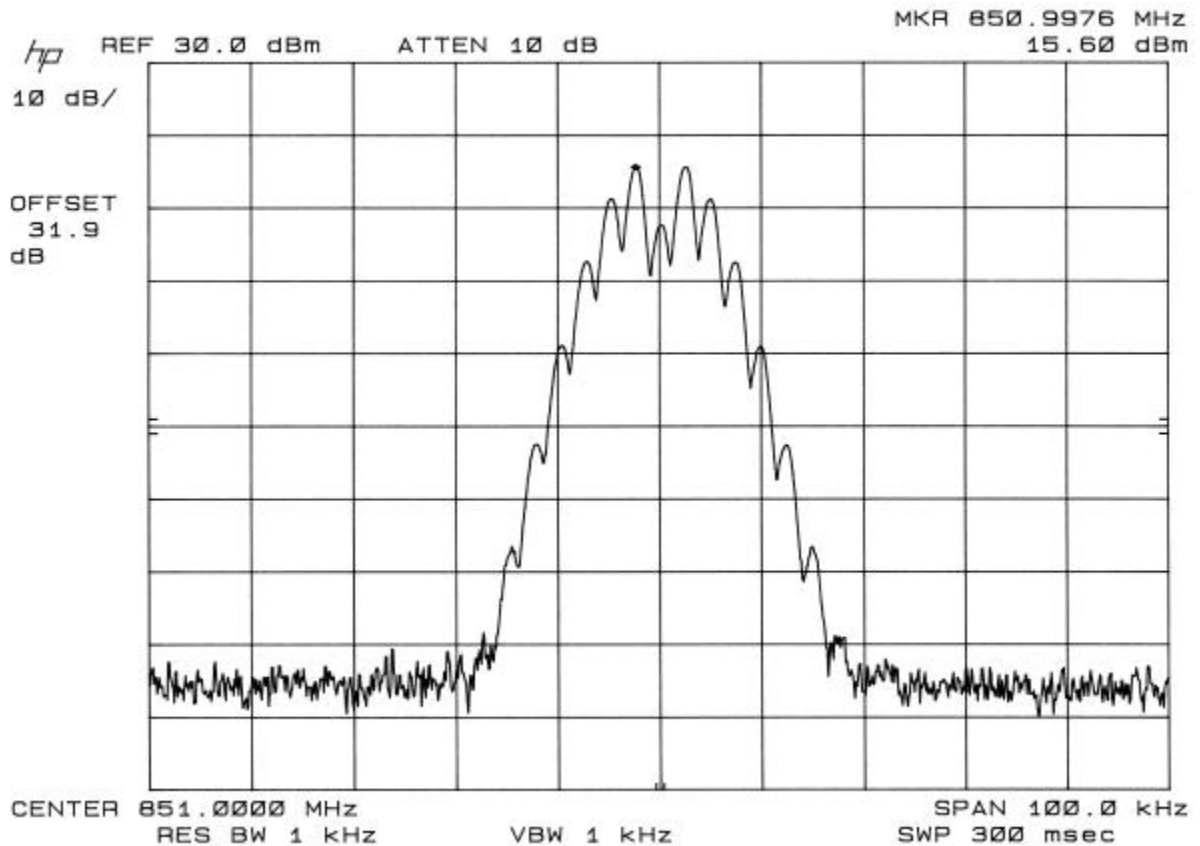
Test Results: See Plots

The center frequency of the signal did not shift with modulation. The Spectrum Bandwidth was well within the limits specified in the FCC Regulations.

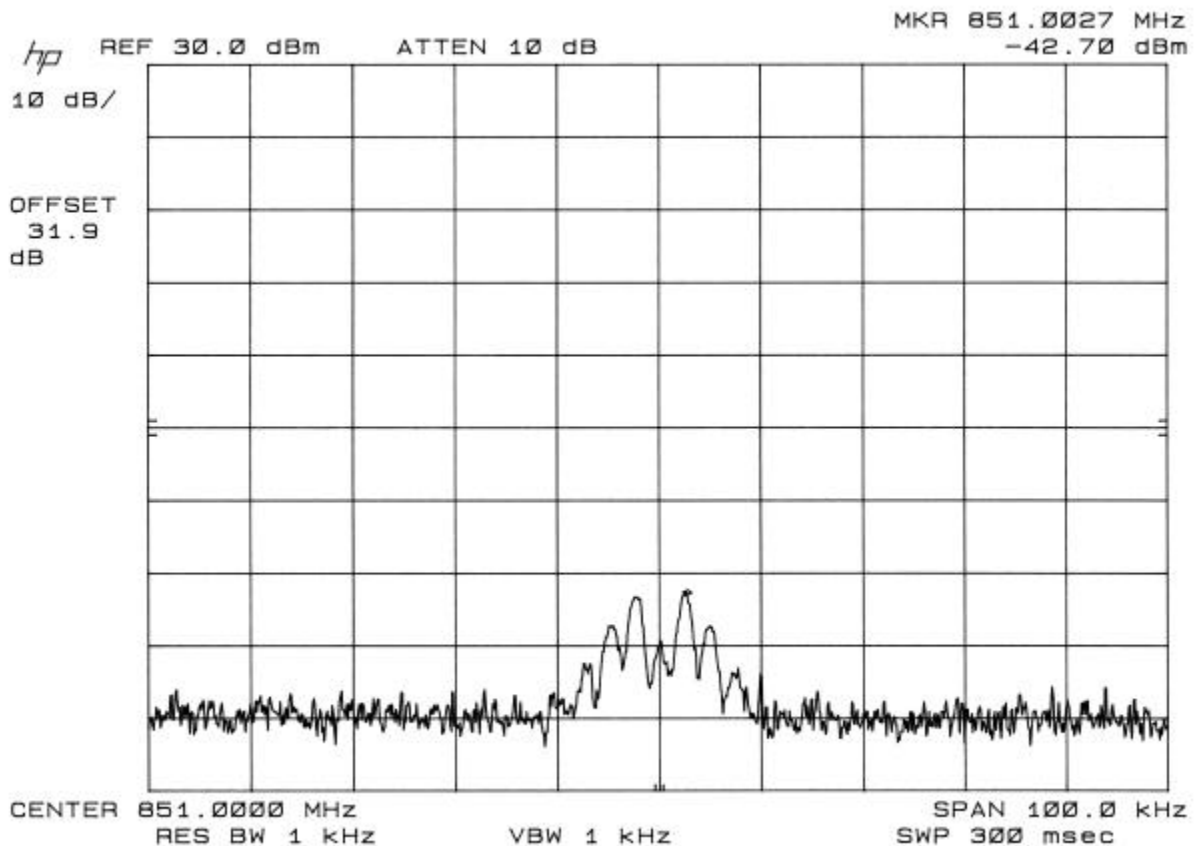
Modulation characteristic plots are shown in this section.

FIGURE 7: OCCUPIED BANDWIDTH, TDMA DOWNLINK.

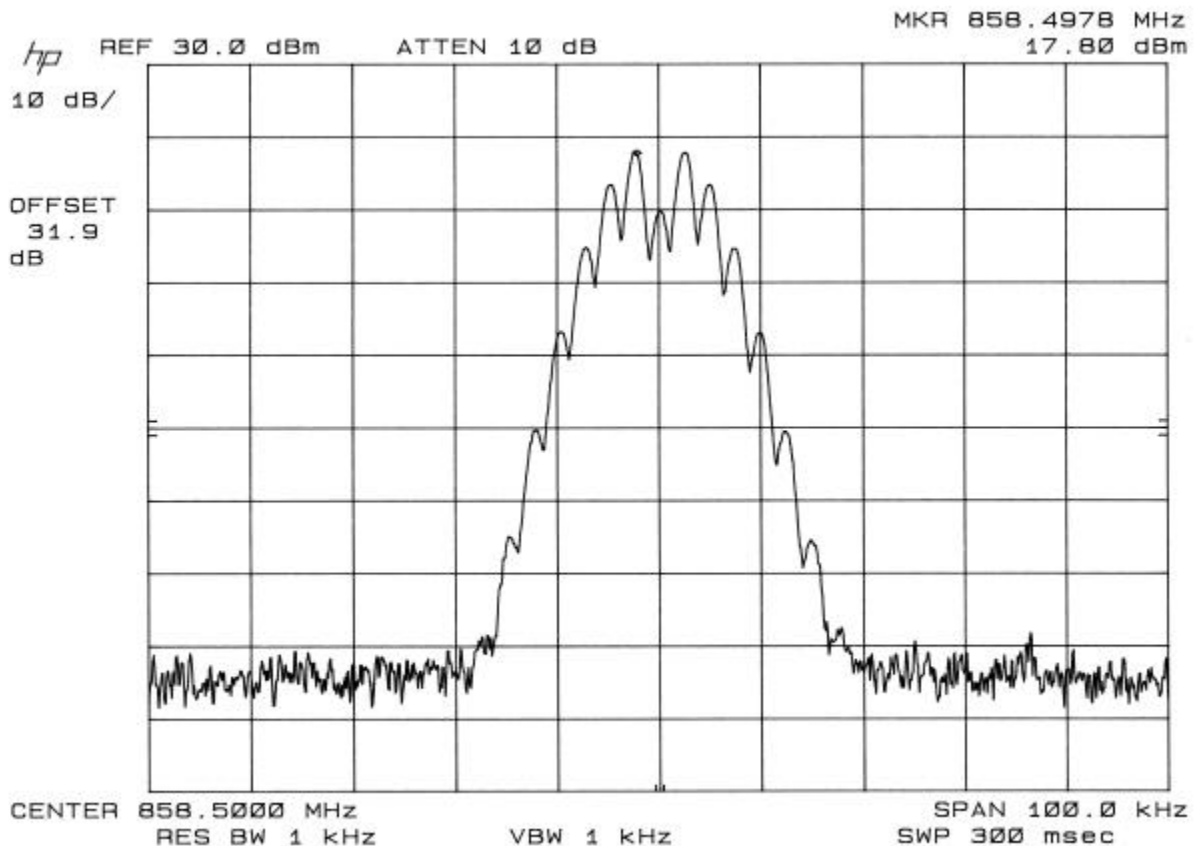
	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704	Occupied Bandwidth	
DNB Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	TDMA Downlink Output 851 MHz		



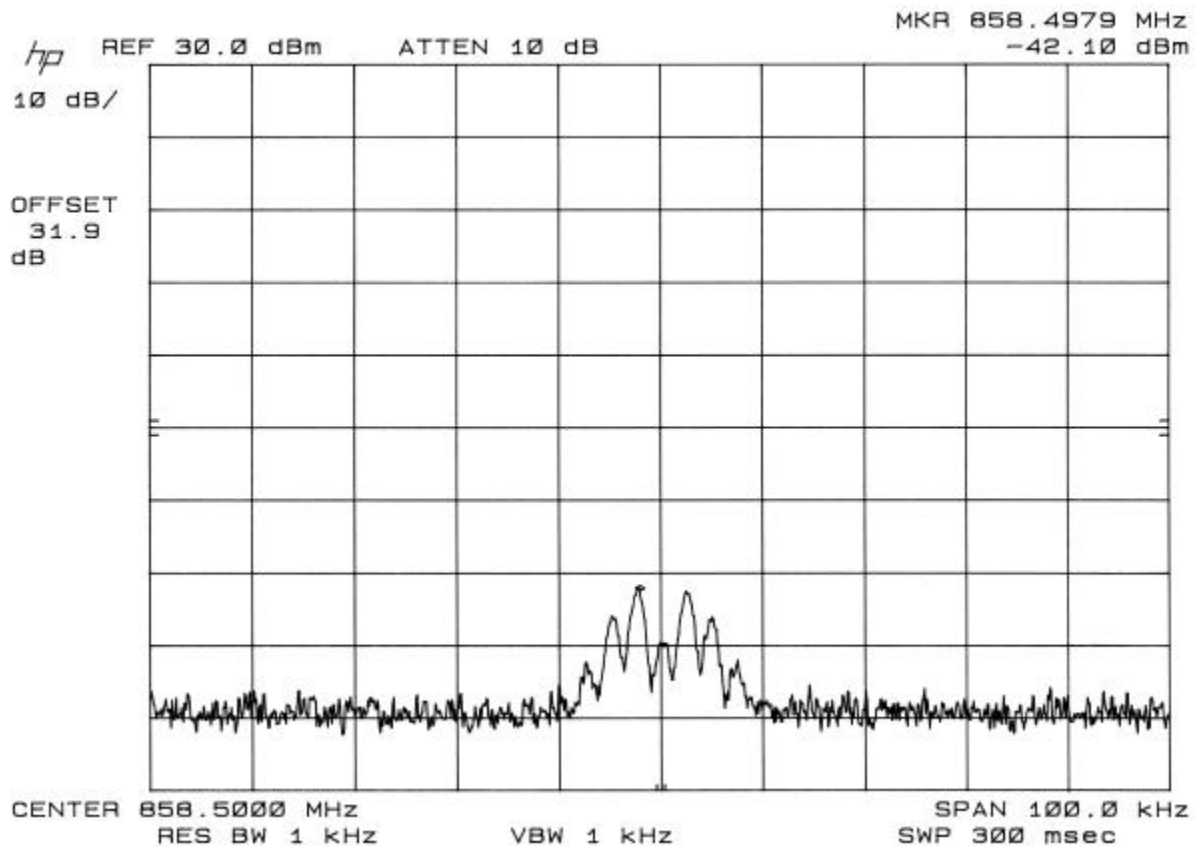
	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704	Occupied Bandwidth	
DNB Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	TDMA Downlink Input 851 MHz		



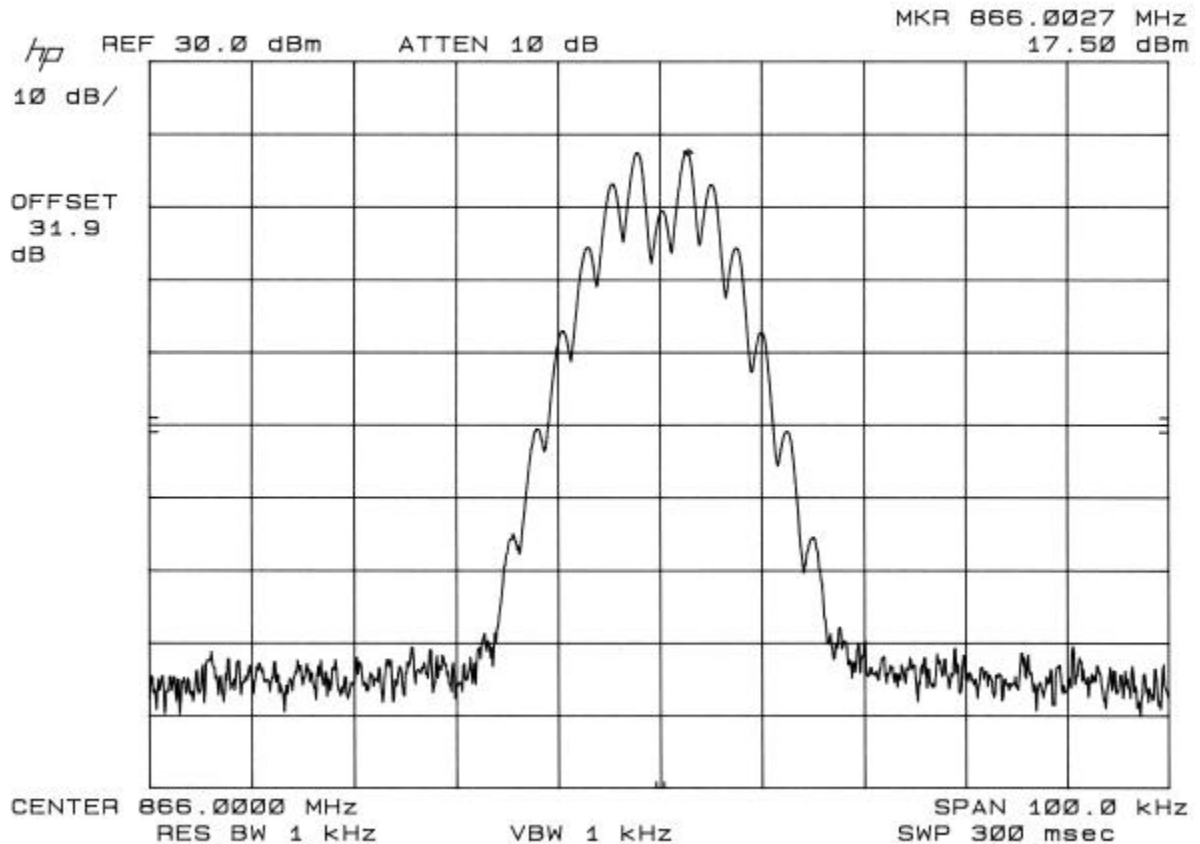
	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704	Occupied Bandwidth	
DNB Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	TDMA Downlink Output 858.5 MHz		



	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704	Occupied Bandwidth	
DNB Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	TDMA Downlink Input 858.5 MHz		



	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704	Occupied Bandwidth	
DNB Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	TDMA Downlink Output 866 MHz		



	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704	Occupied Bandwidth	
DNB Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	TDMA Downlink Input 866 MHz		

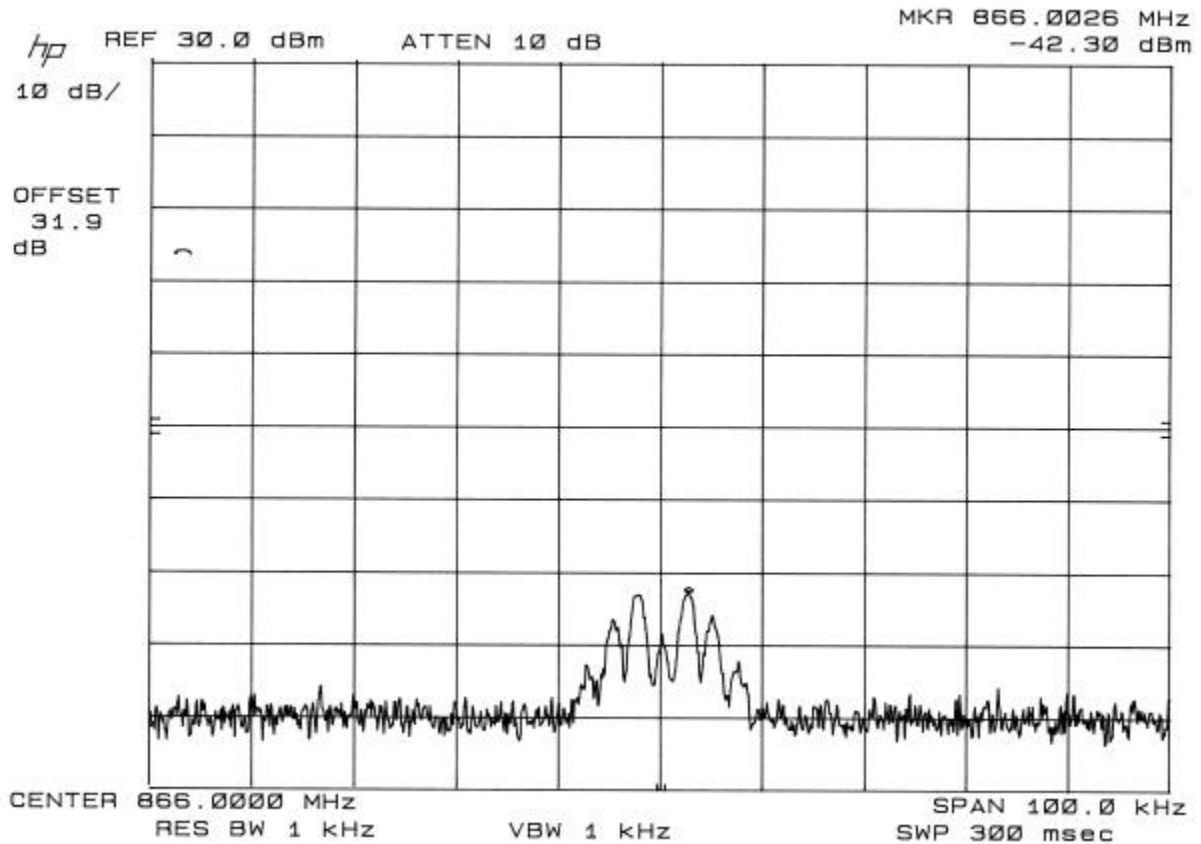
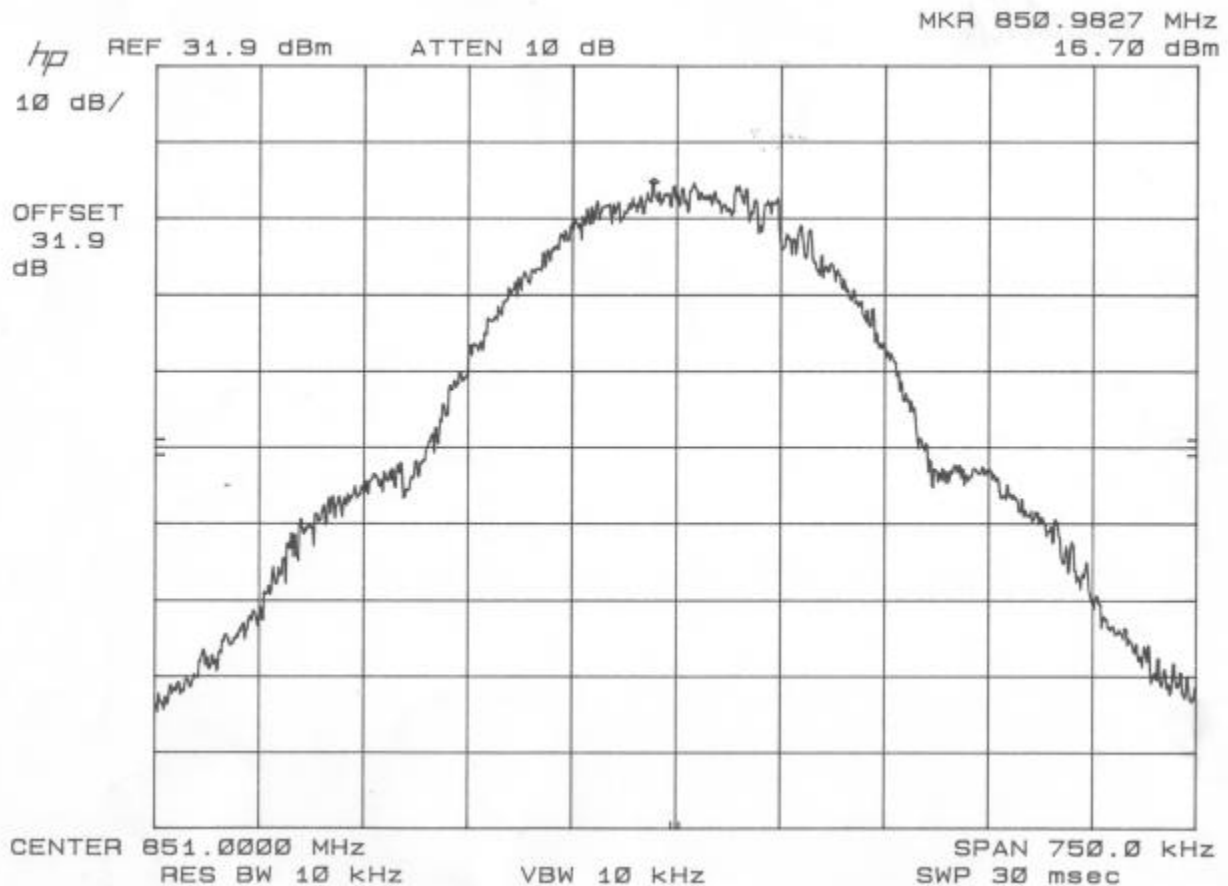
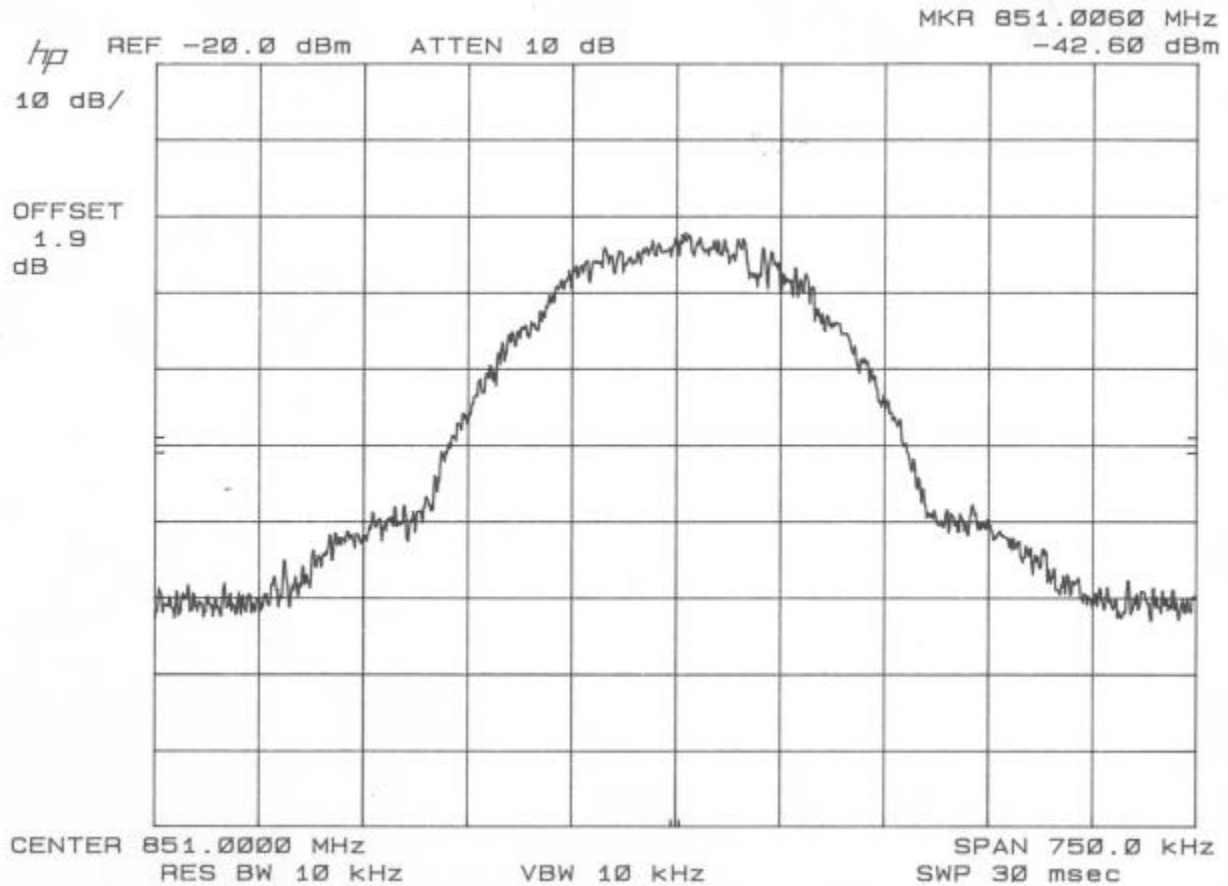


FIGURE 8: OCCUPIED BANDWIDTH, GSM DOWNLINK.

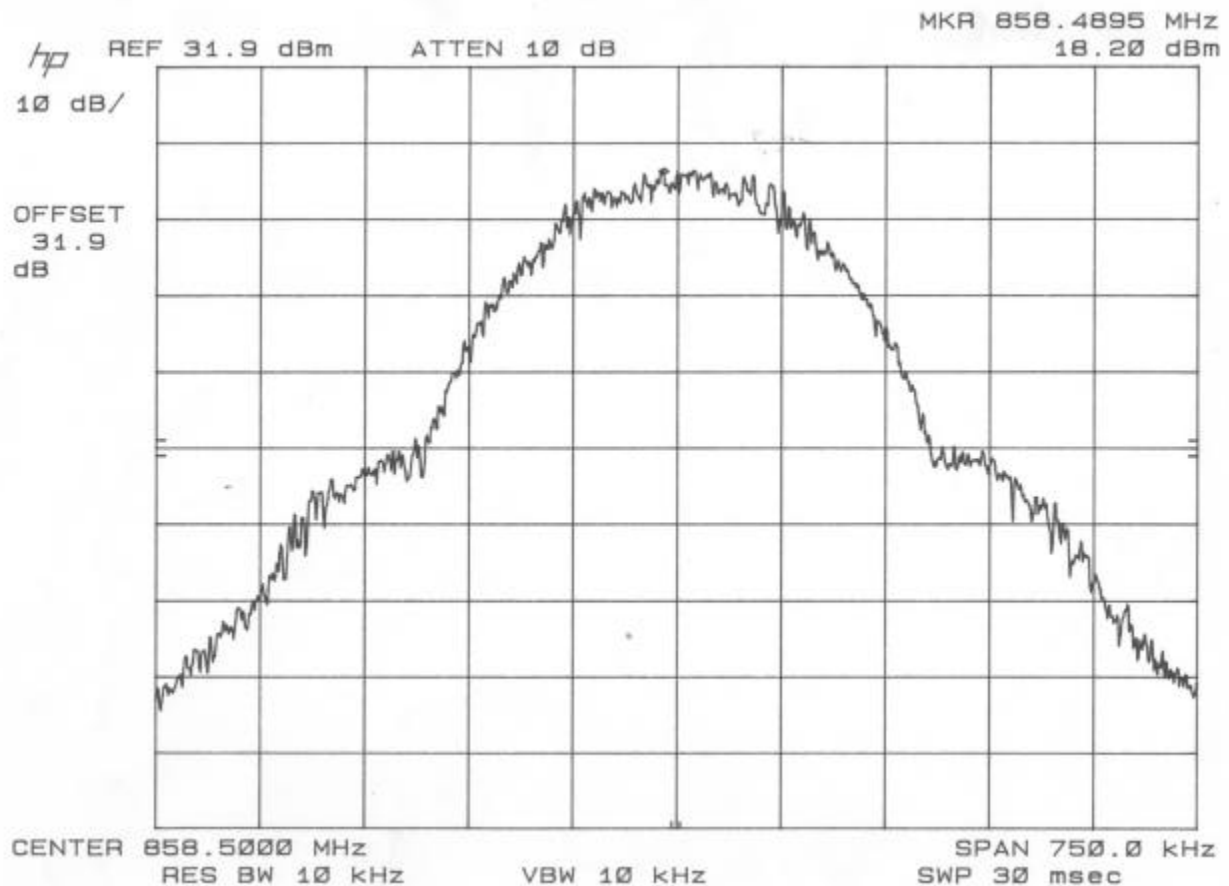
	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704	Occupied Bandwidth	
DNB Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	GSM Downlink Output 851 MHz		



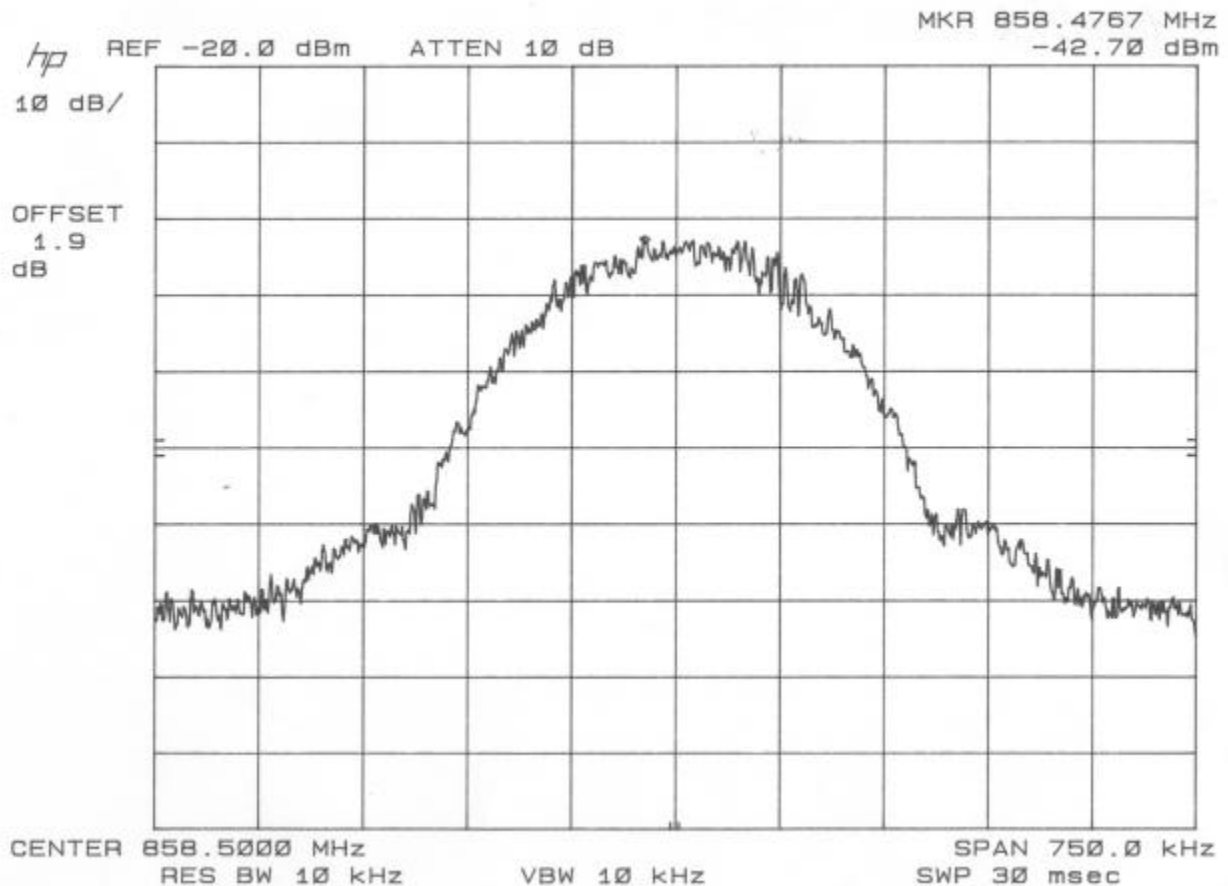
	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704	Occupied Bandwidth	
DNB Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	GSM Downlink Input 851 MHz		



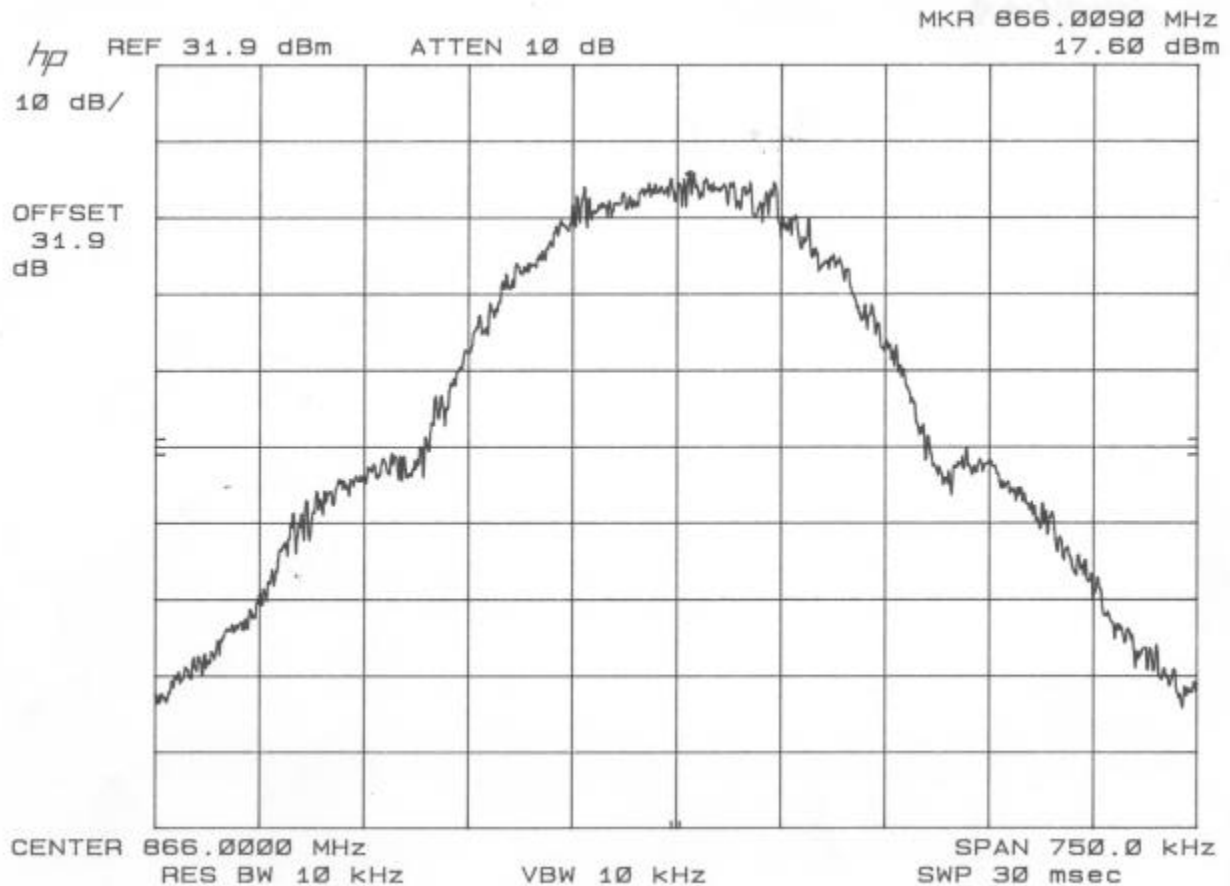
	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704	Occupied Bandwidth	
DNB Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	GSM Downlink Output 858.5 MHz		



	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704	Occupied Bandwidth	
DNB Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	GSM Downlink Input 858.5 MHz		



	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704	Occupied Bandwidth	
DNB Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	GSM Downlink Output 866 MHz		



	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704	Occupied Bandwidth	
DNB Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	GSM Downlink Input 866 MHz		

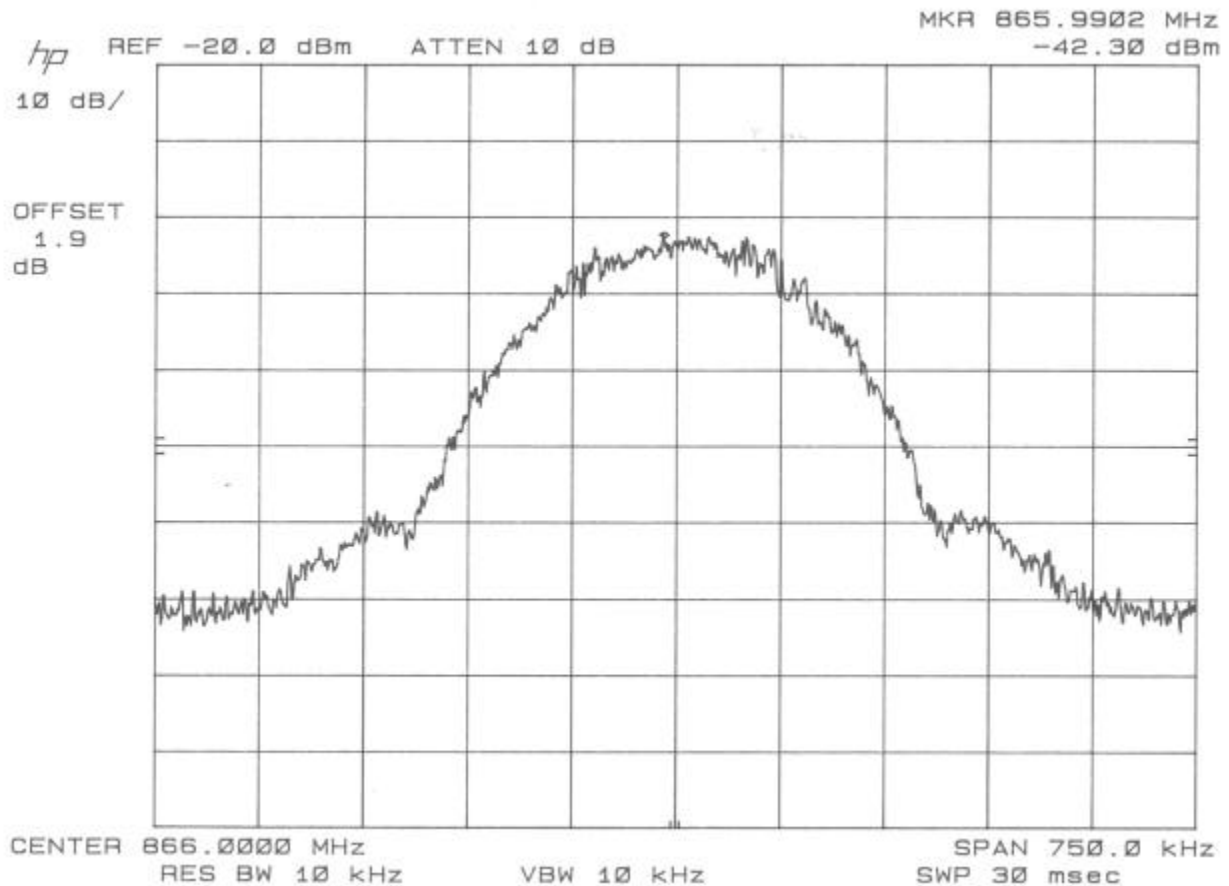
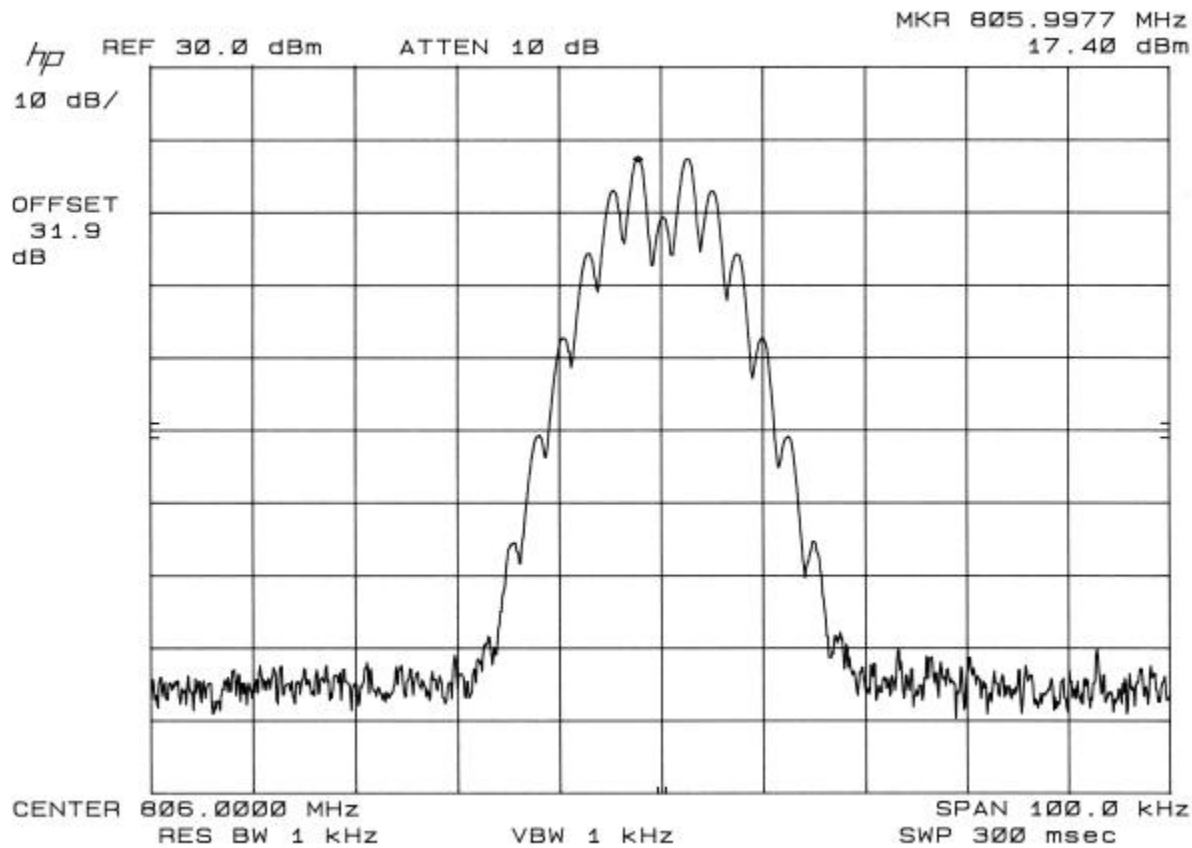
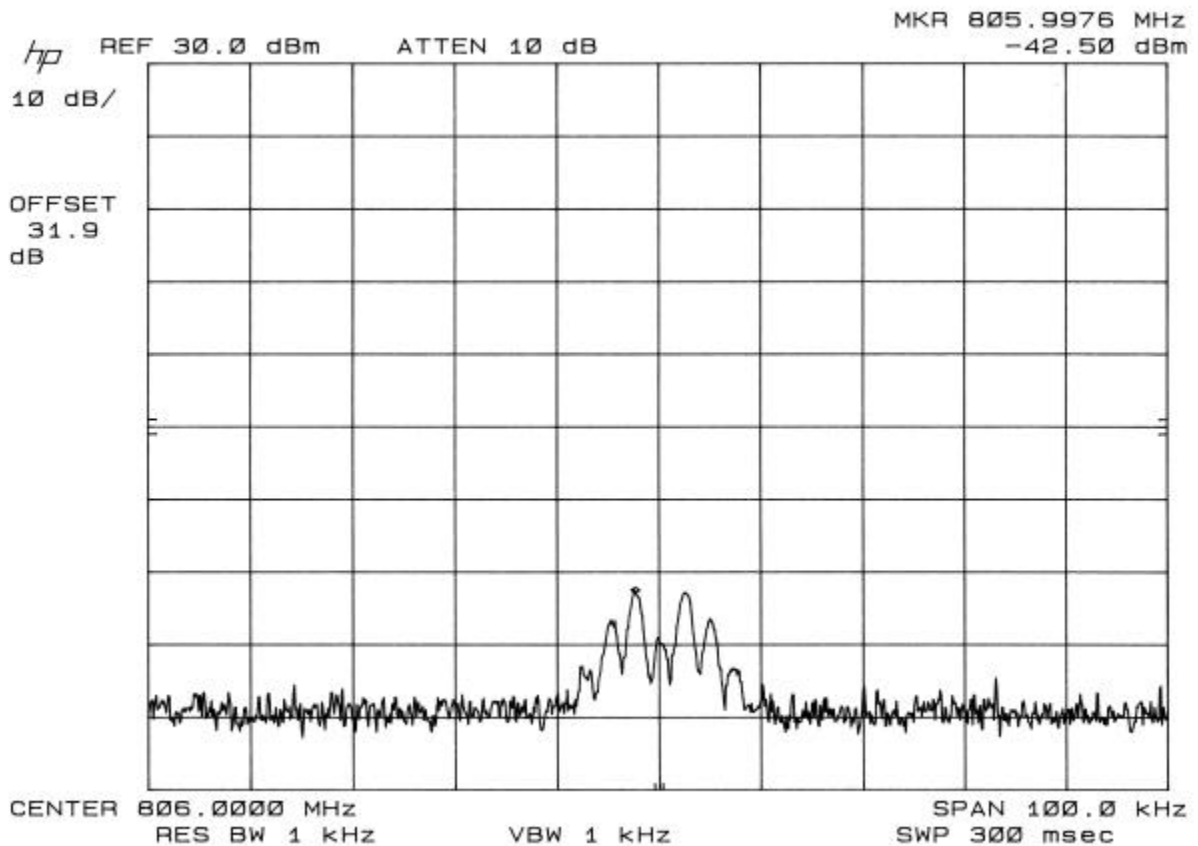


FIGURE 9: OCCUPIED BANDWIDTH, TDMA UPLINK.

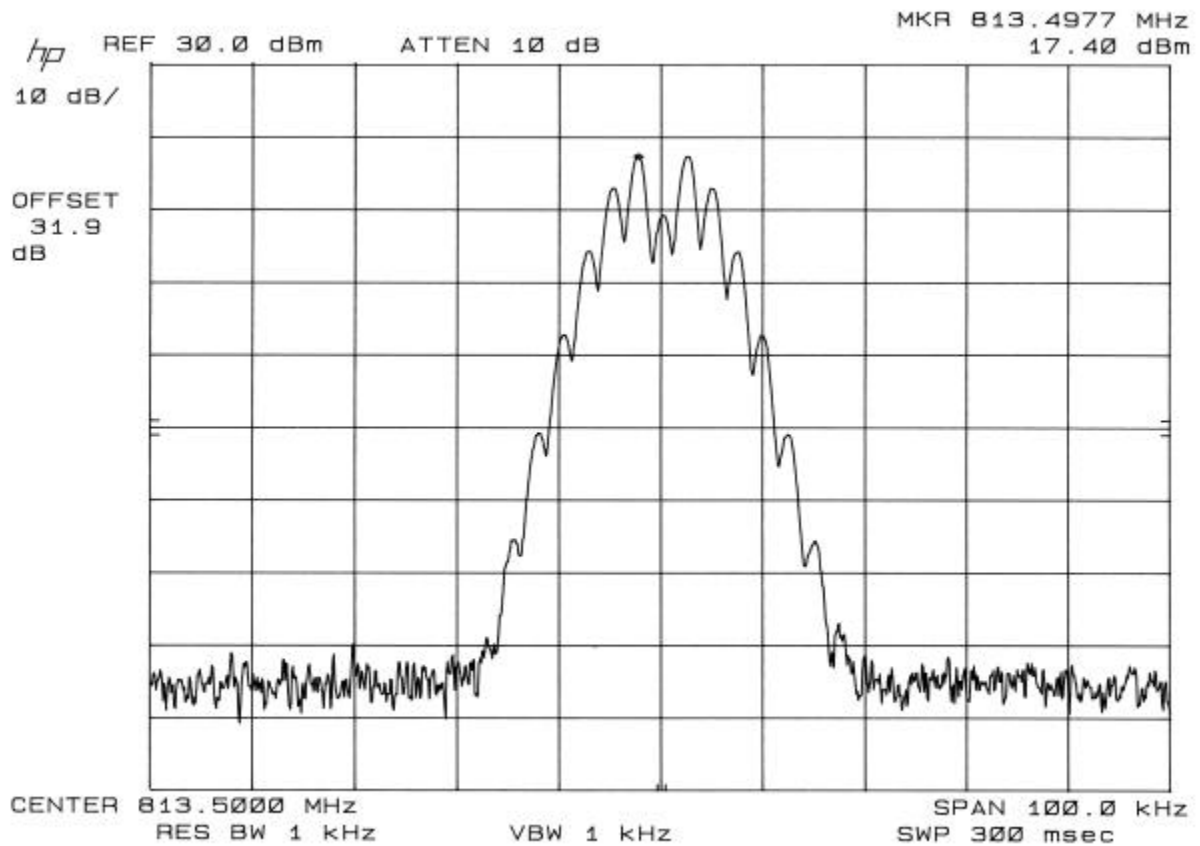
	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704	Occupied Bandwidth	
DNB Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	TDMA Uplink Output 806 MHz		



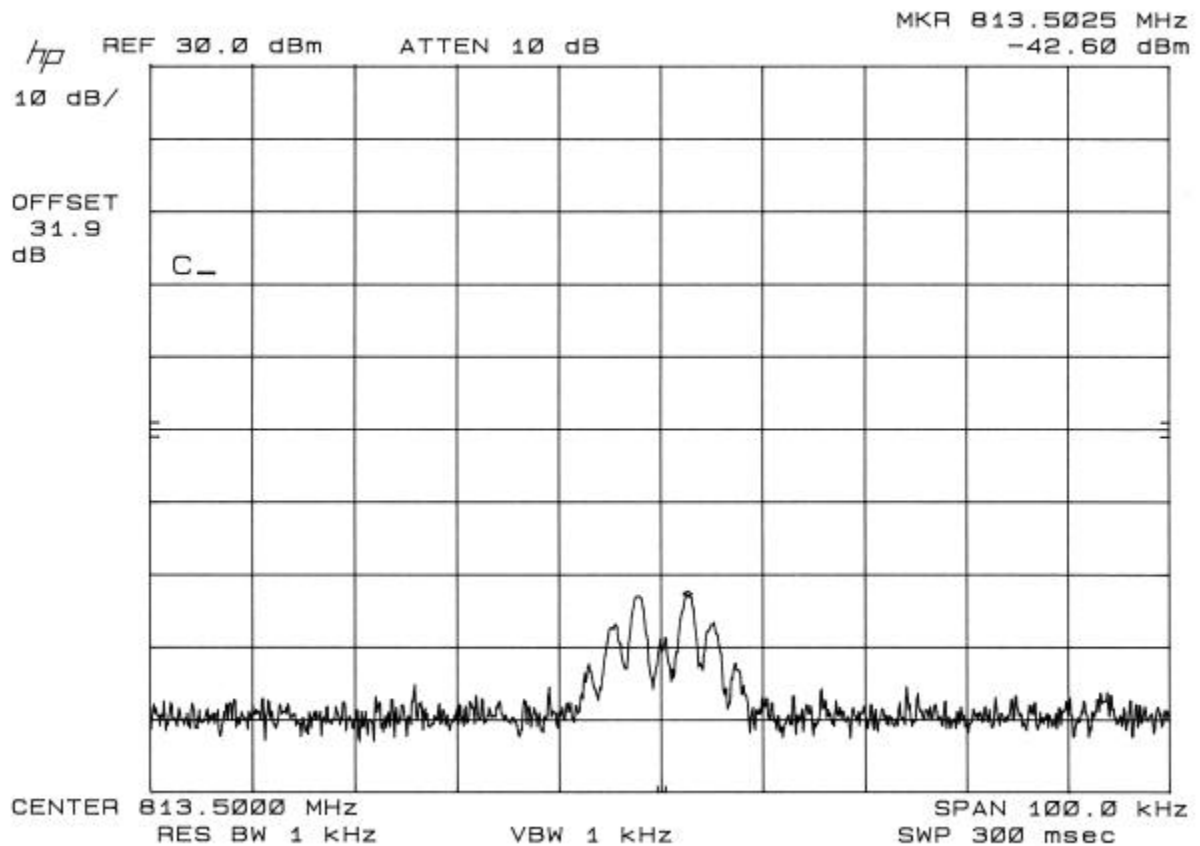
	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704	Occupied Bandwidth	
DNB Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	TDMA Uplink Input 806 MHz		



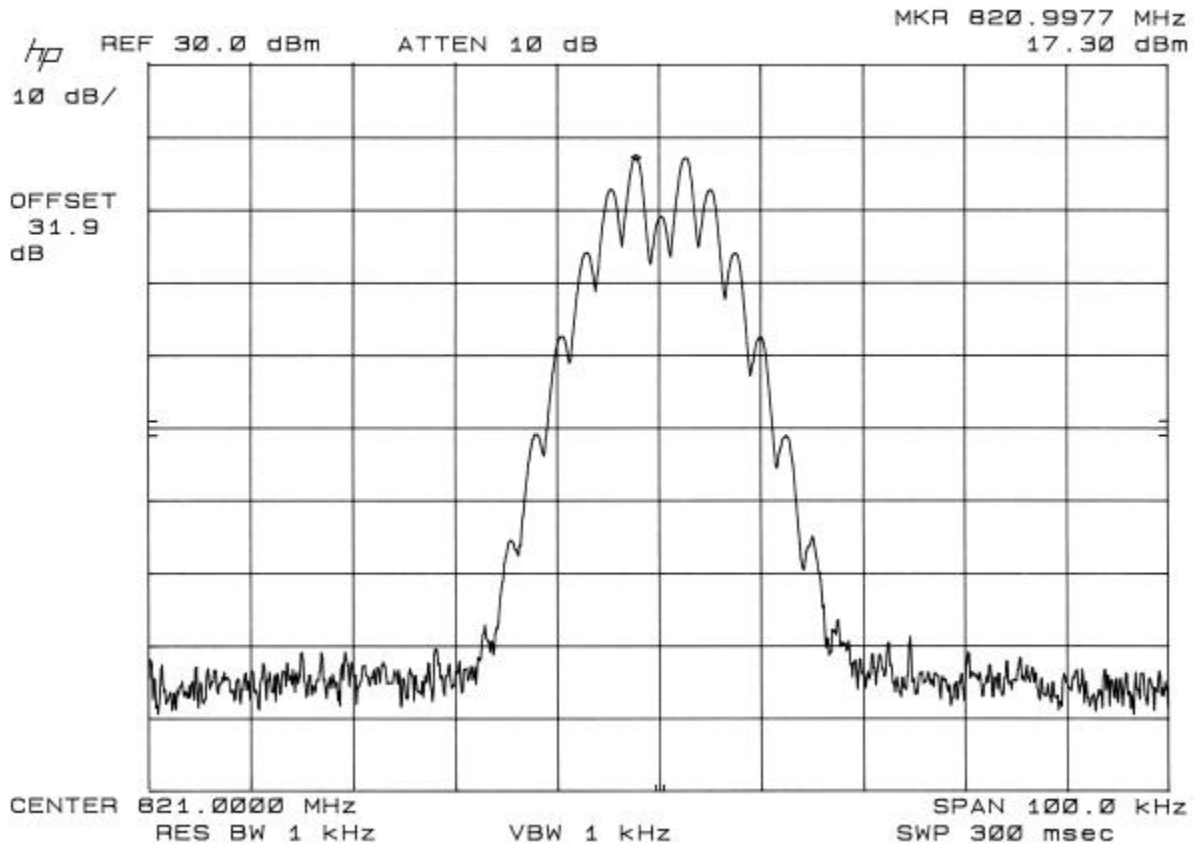
	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704	Occupied Bandwidth	
DNB Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	TDMA Uplink Output 813 MHz		



	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704	Occupied Bandwidth	
DNB Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	TDMA Uplink Input 813 MHz		



	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704	Occupied Bandwidth	
DNB Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	TDMA Uplink Output 821 MHz		



	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704	Occupied Bandwidth	
DNB Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	TDMA Uplink Input 821 MHz		

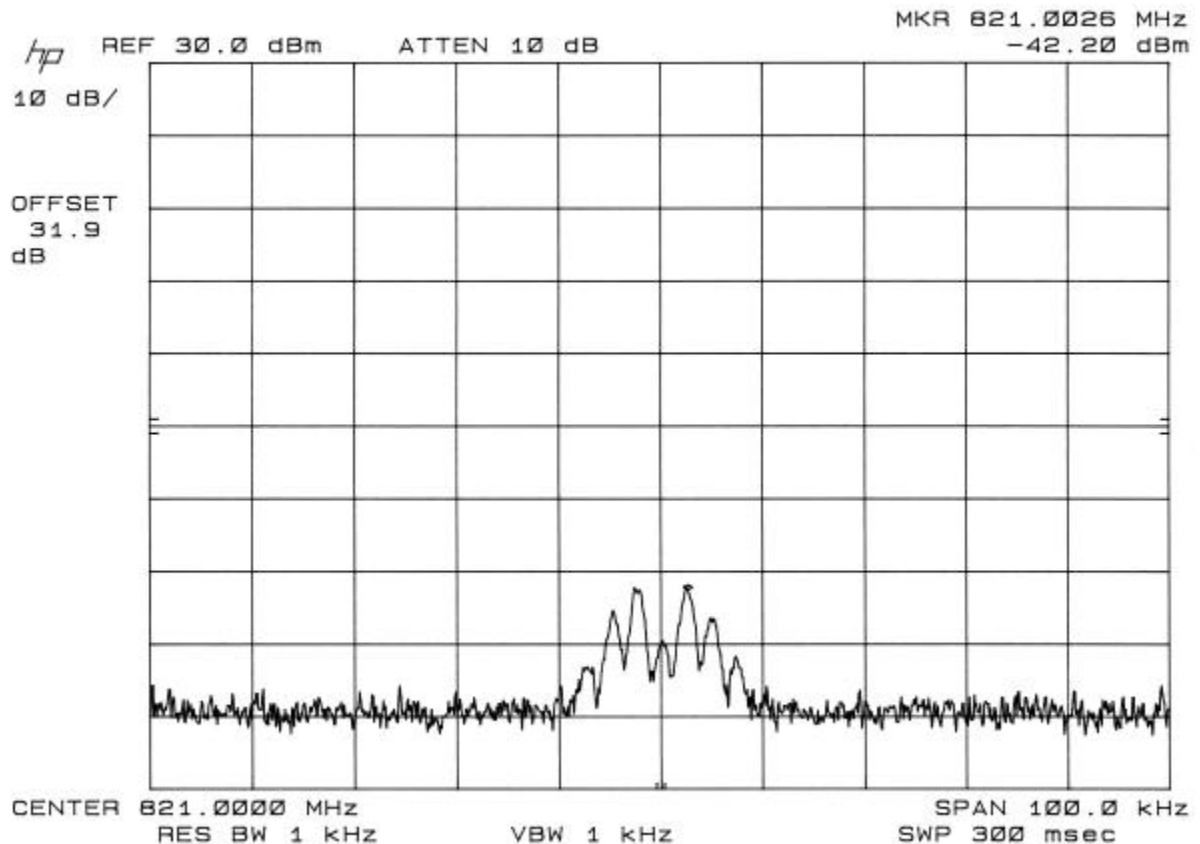
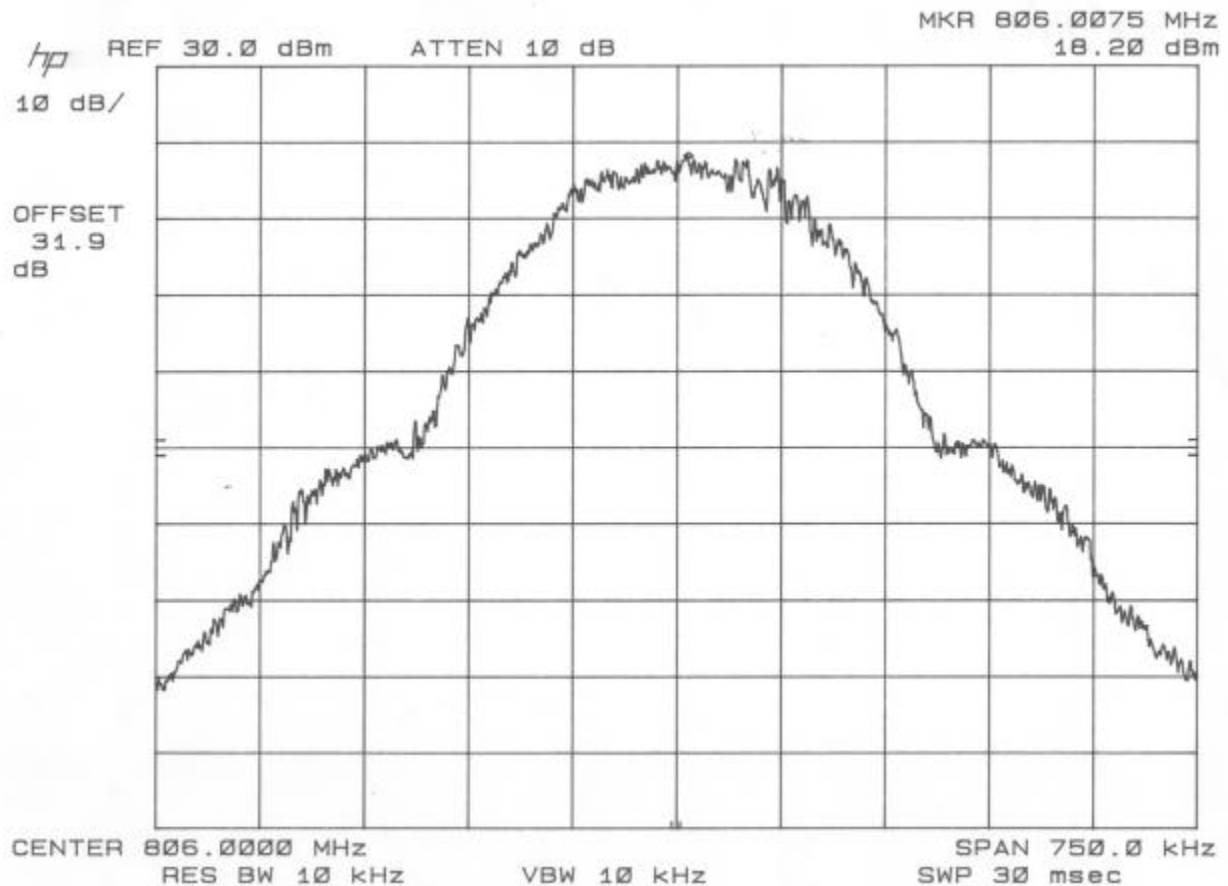
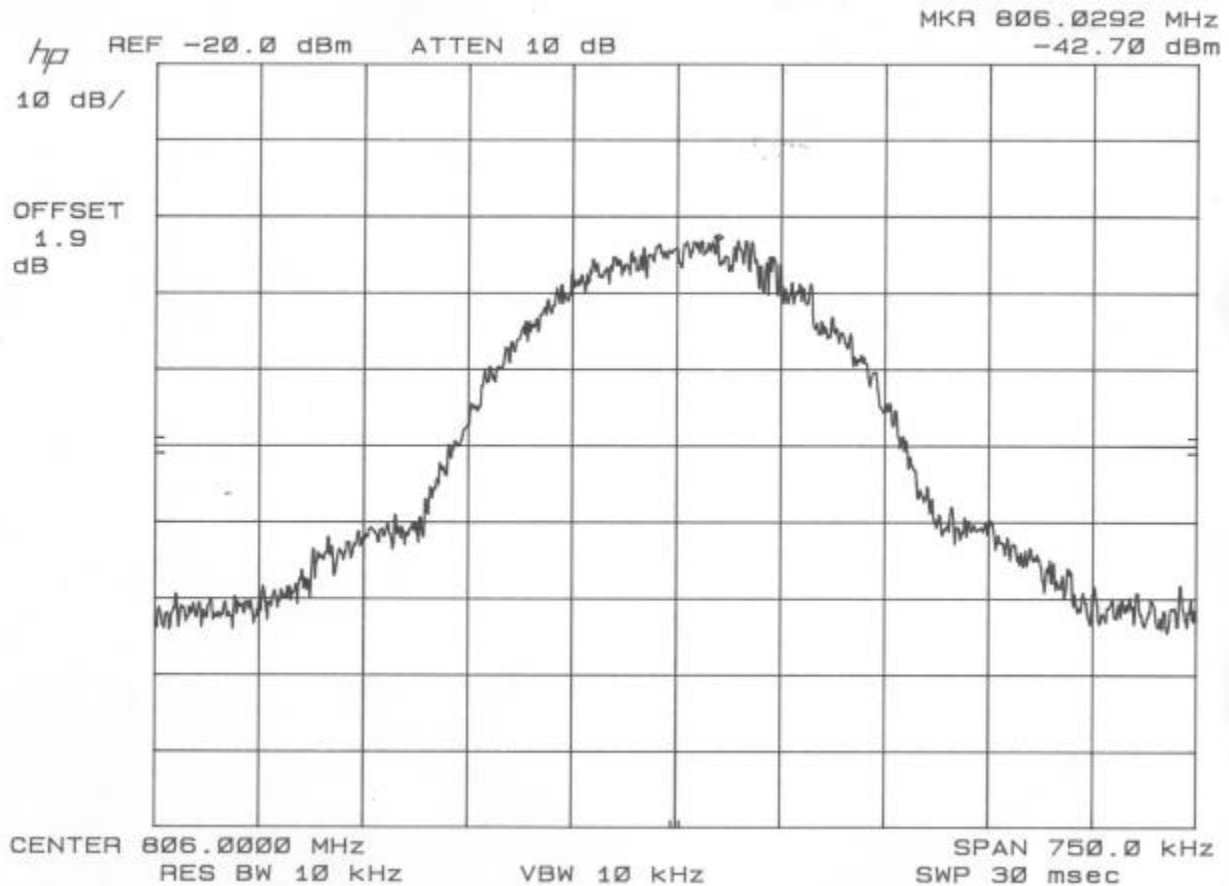


FIGURE 10: OCCUPIED BANDWIDTH, GSM UPLINK.

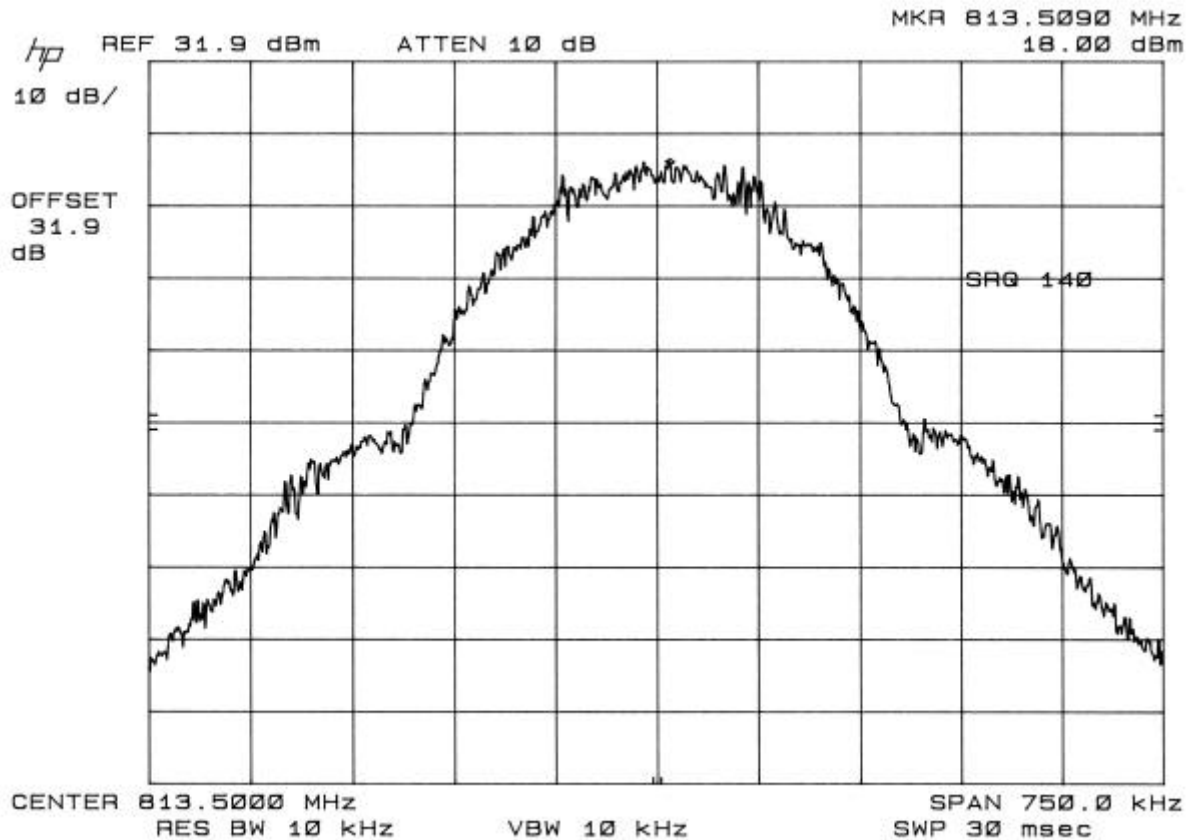
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DNB Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	GSM Uplink Output 806 MHz		



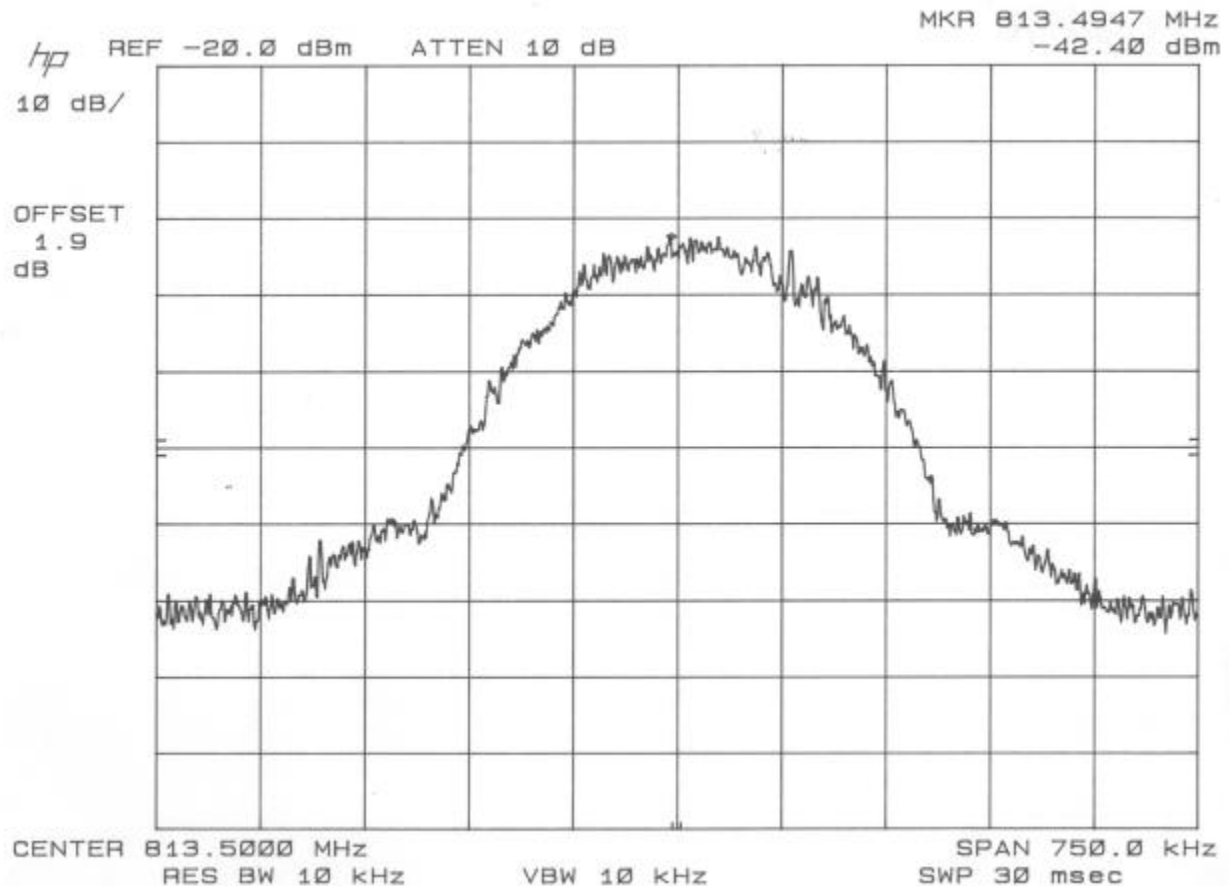
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DNB Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	GSM Uplink Input 806 MHz		



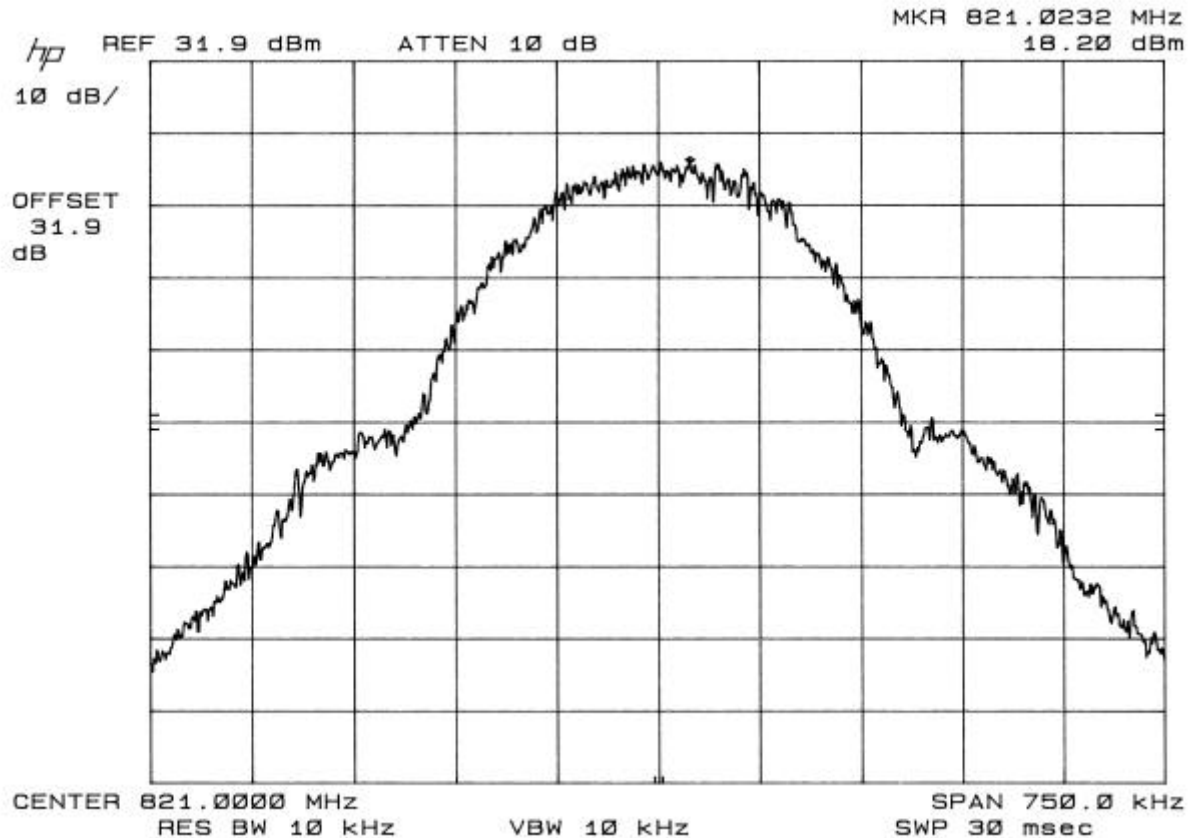
	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704	Occupied Bandwidth	
DNB Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	GSM Uplink Output 813.5 MHz		



	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704	Occupied Bandwidth	
DNB Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	GSM Uplink Input 813 .5 MHz		



	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704	Occupied Bandwidth	
DNB Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	GSM Uplink Output 821 MHz		



	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704	Occupied Bandwidth	
DNB Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	GSM Uplink Input 821 MHz		

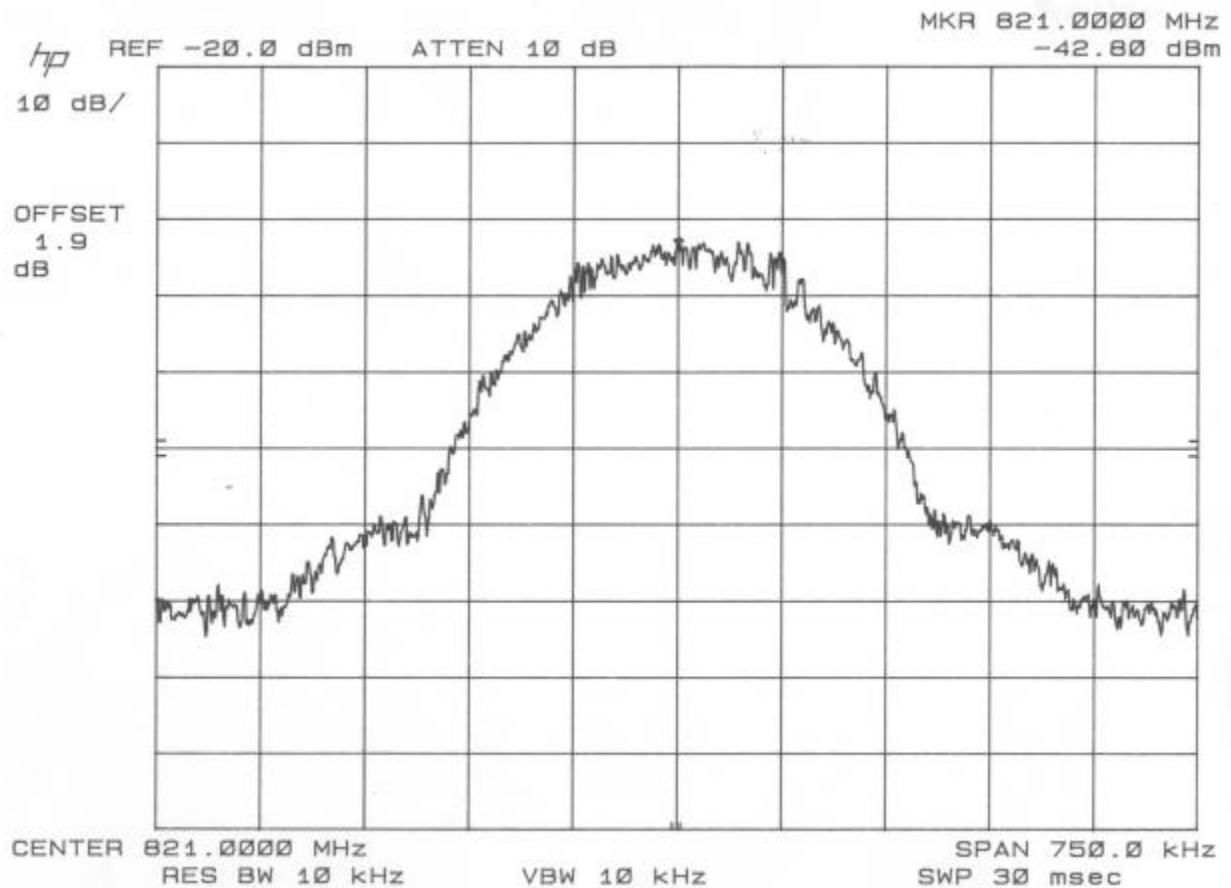
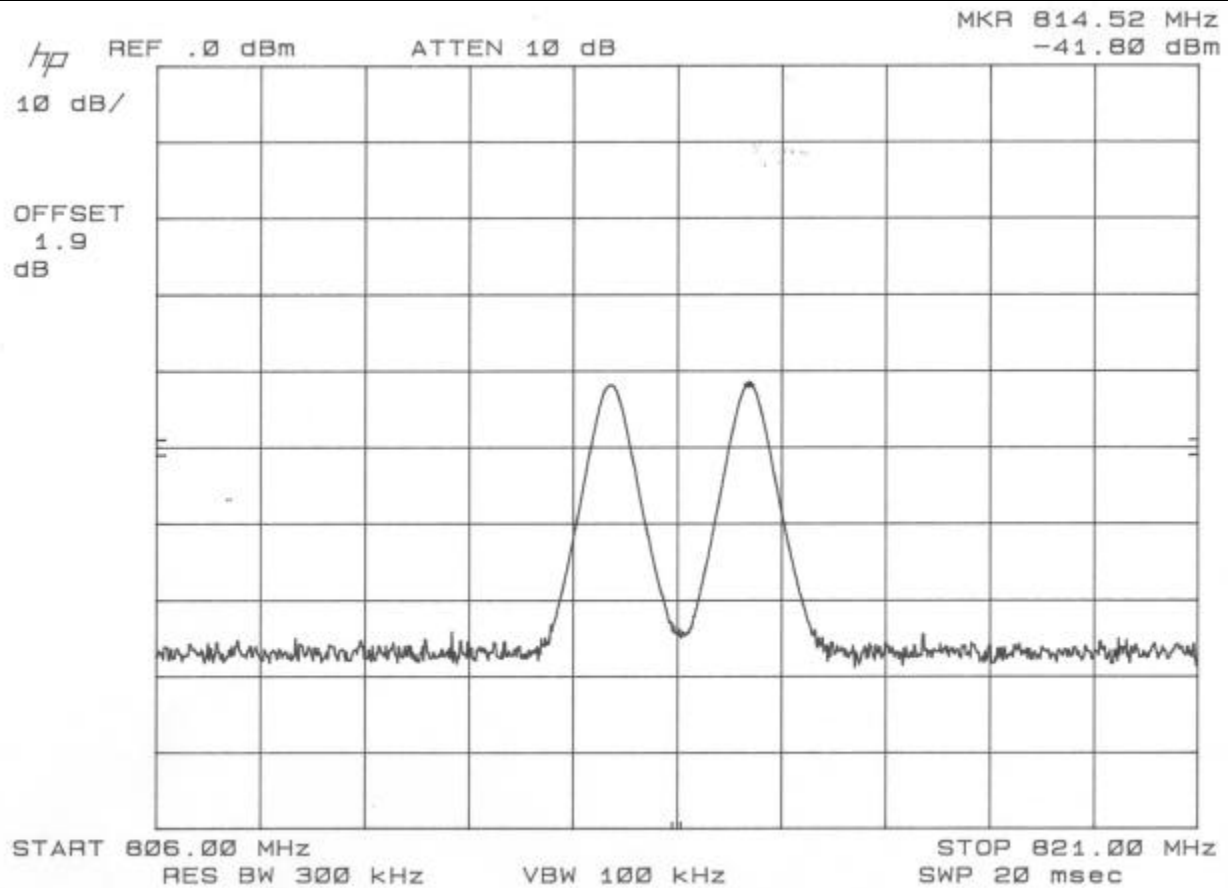
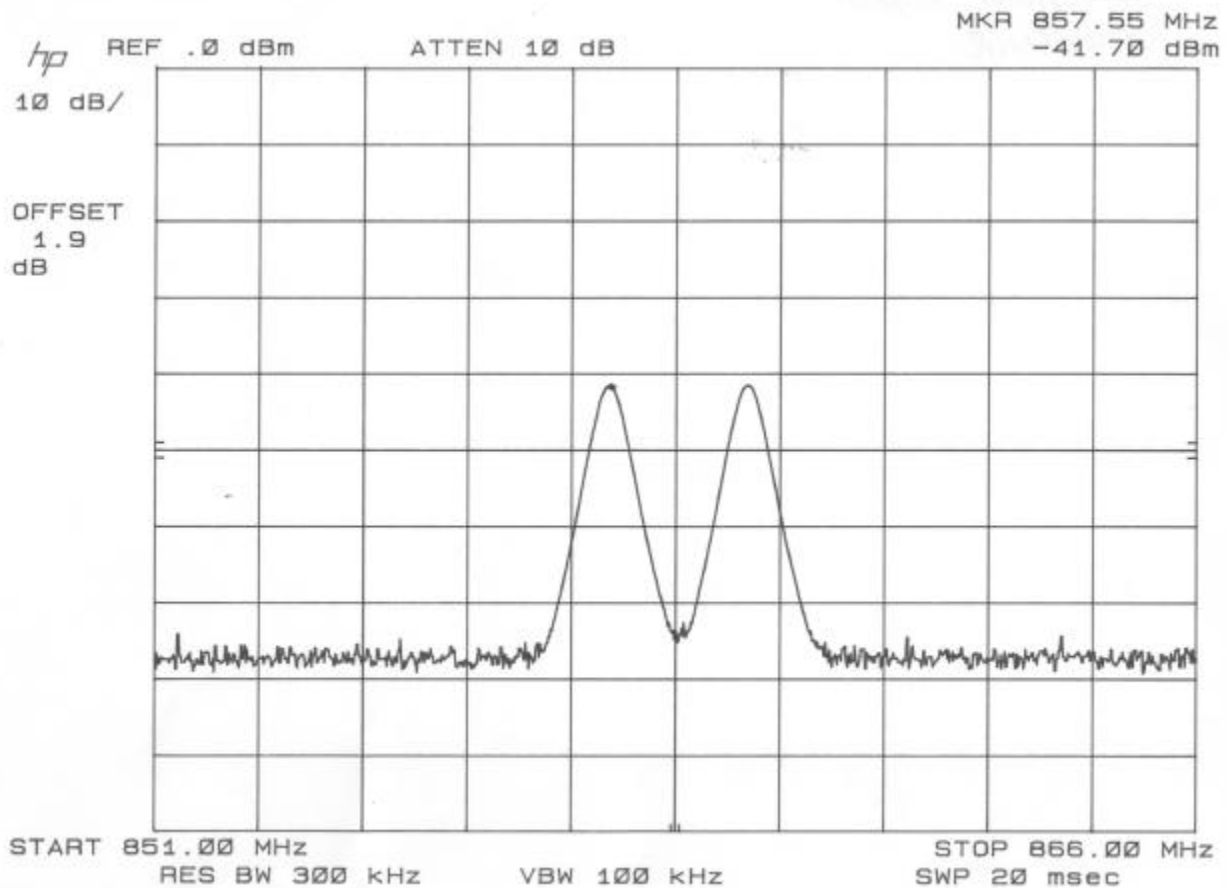


FIGURE 10: INTER-MODULATION

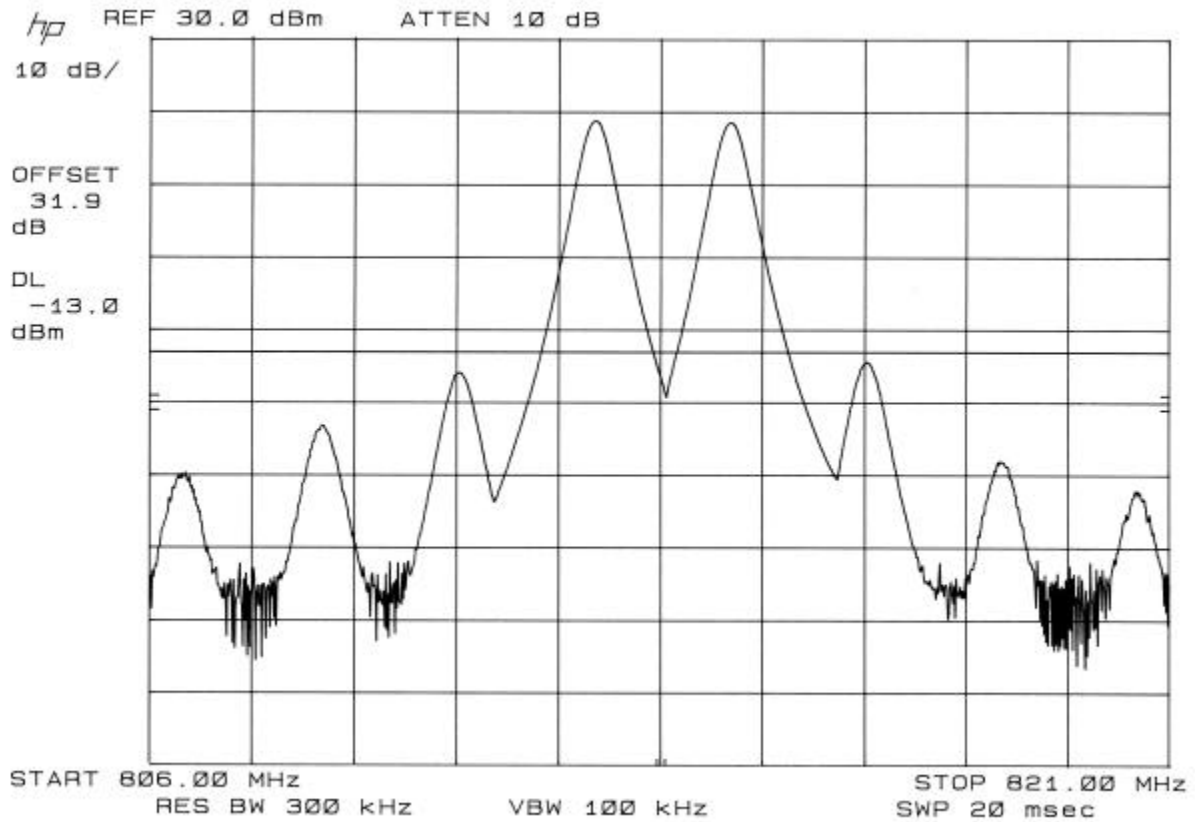
	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704	Inter- Modulation	
DNB Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	Uplink Input		



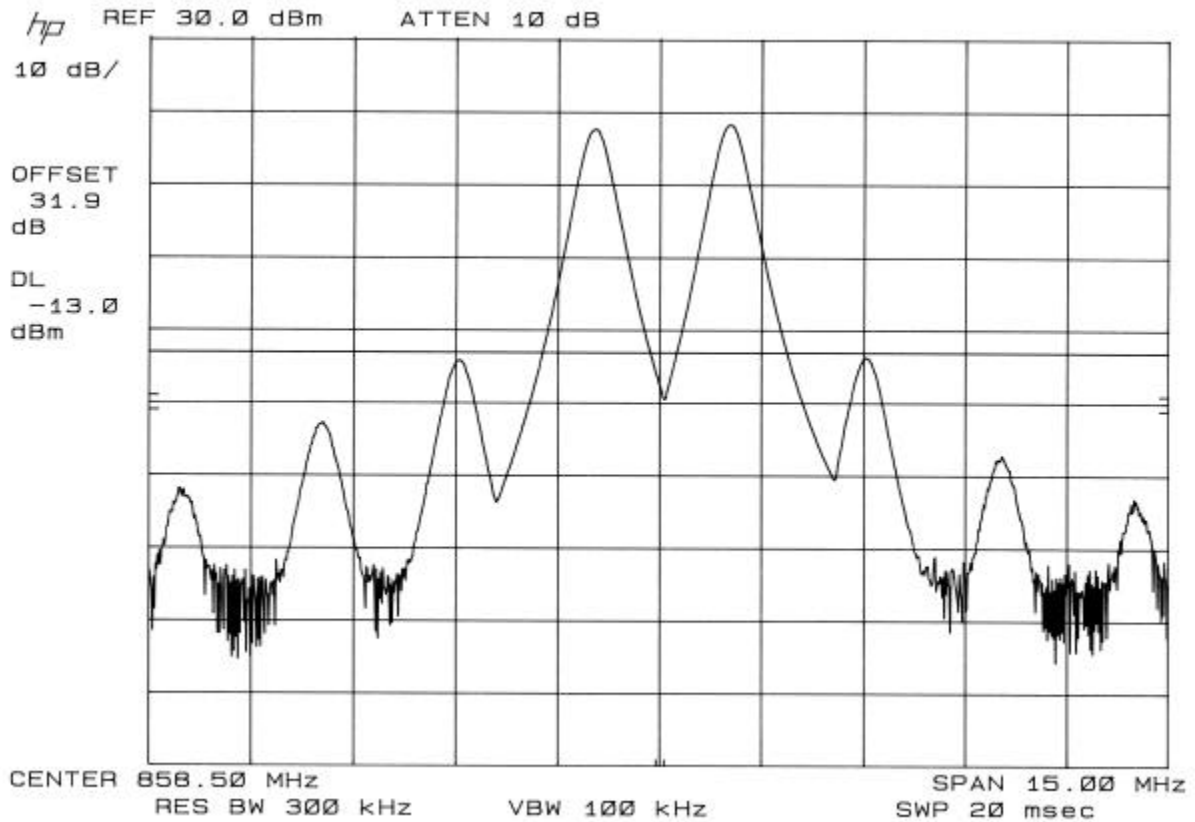
	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704	Inter- Modulation	
DNB Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	Downlink Input		



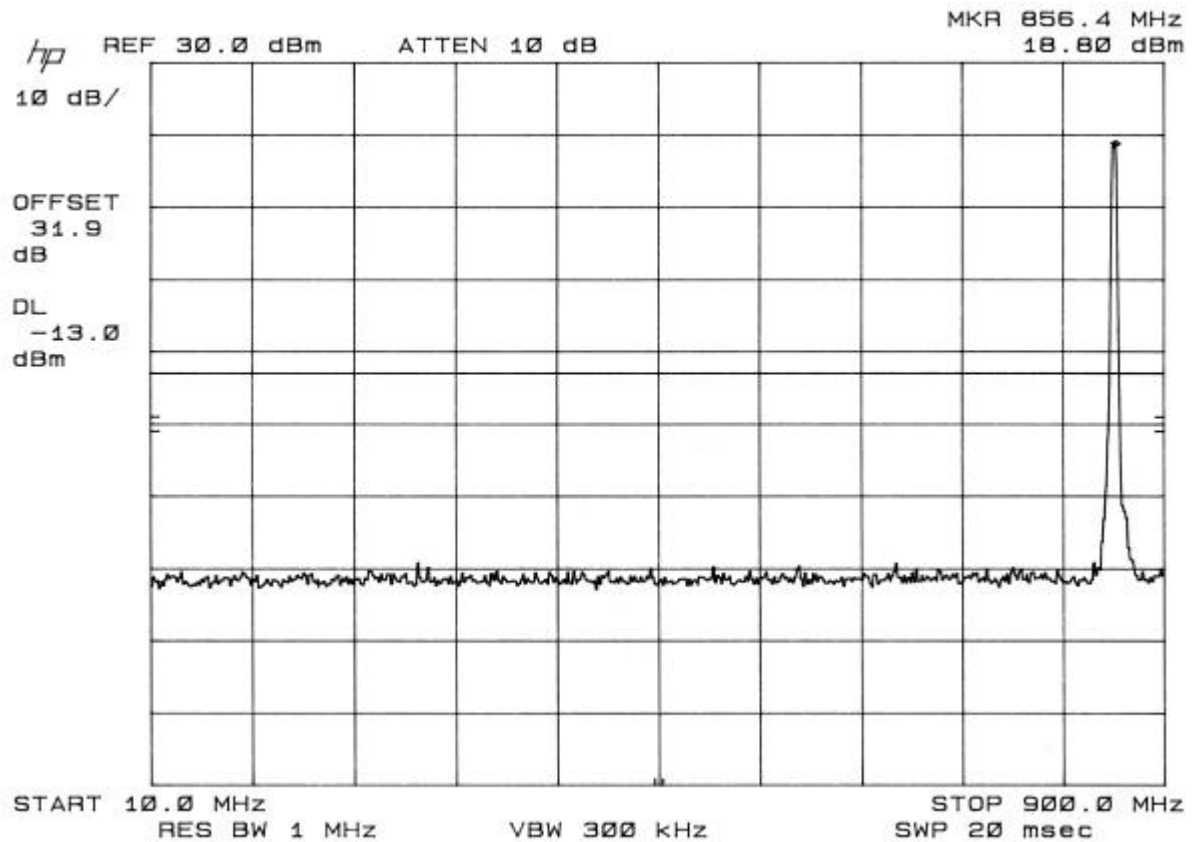
	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704	Inter- Modulation	
DNB Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	Uplink Input -39 dBm Output 22 dBm		



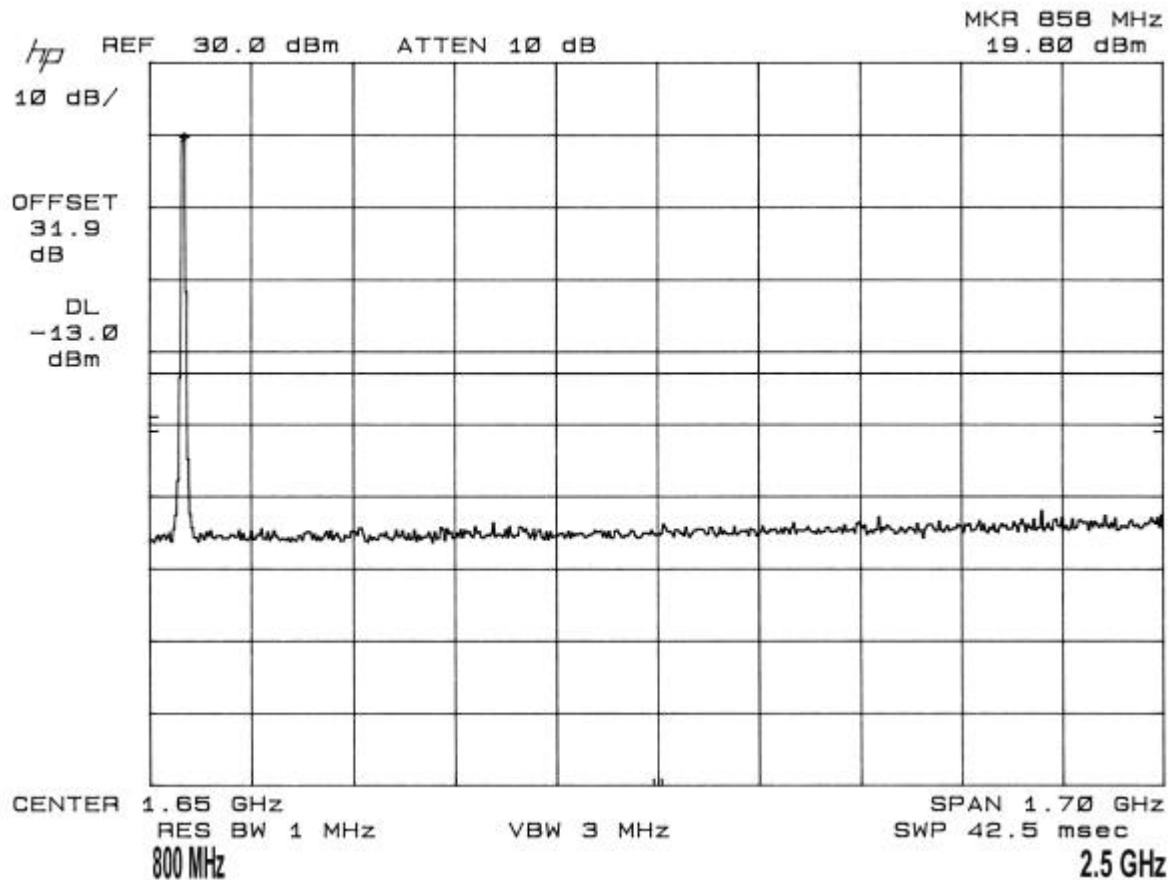
	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704	Inter- Modulation	
DNB Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	Downlink Input -39dBm Output 22dBm		



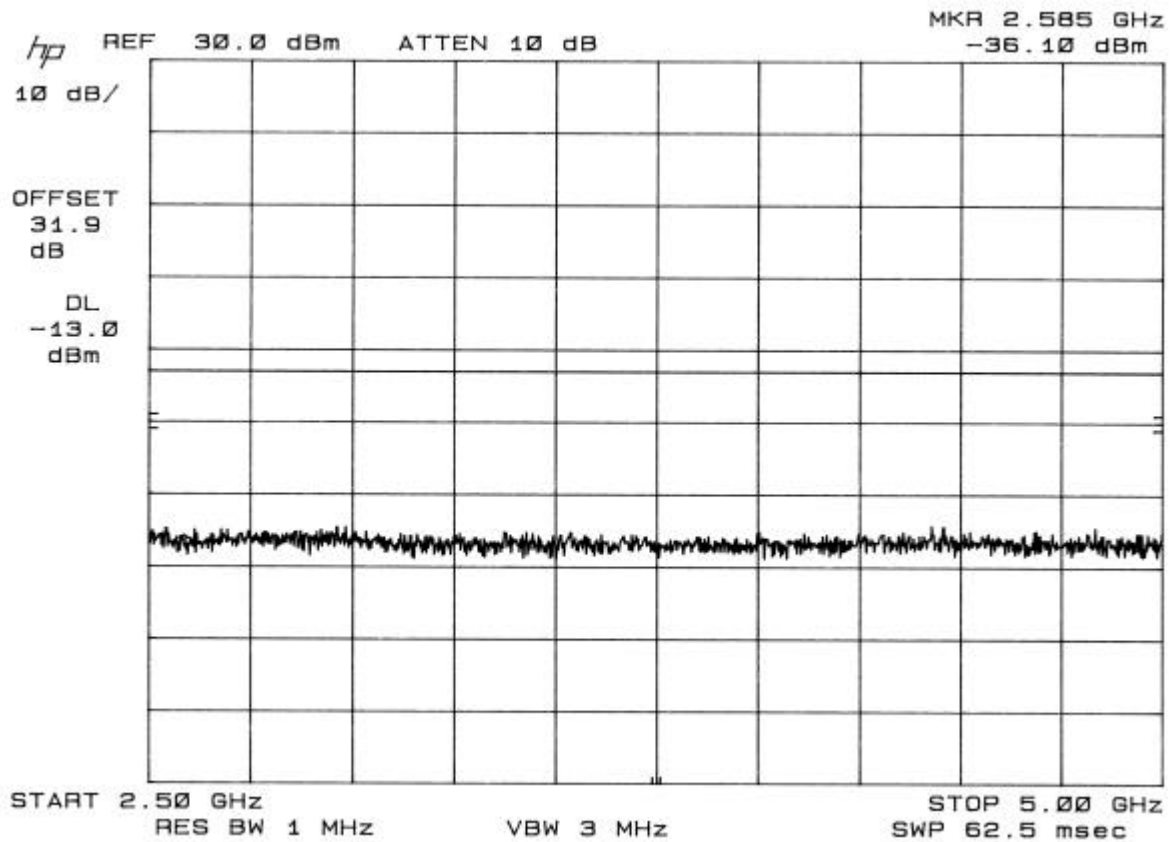
	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704	Inter- Modulation	
DNB Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	Downlink 10 MHz- 900 MHz		



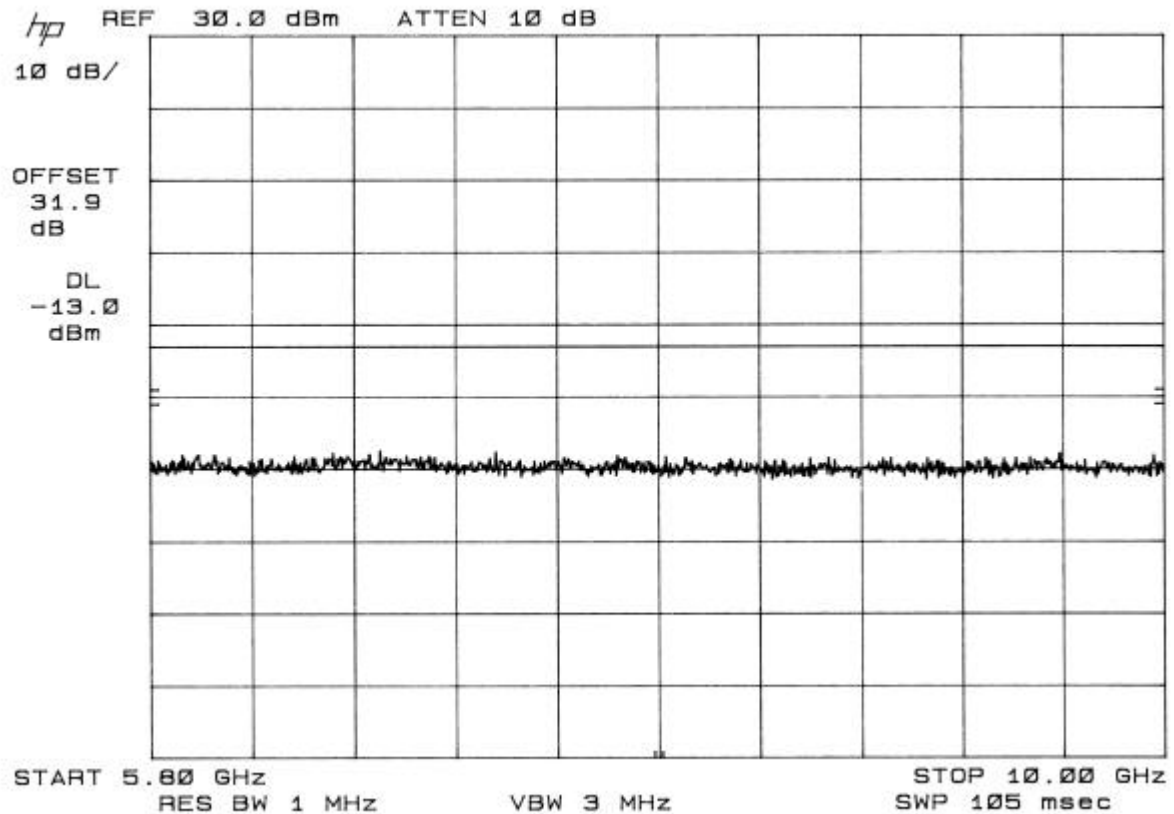
	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704	Inter- Modulation	
DNB Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	Downlink 800 MHz- 2.5 GHz		



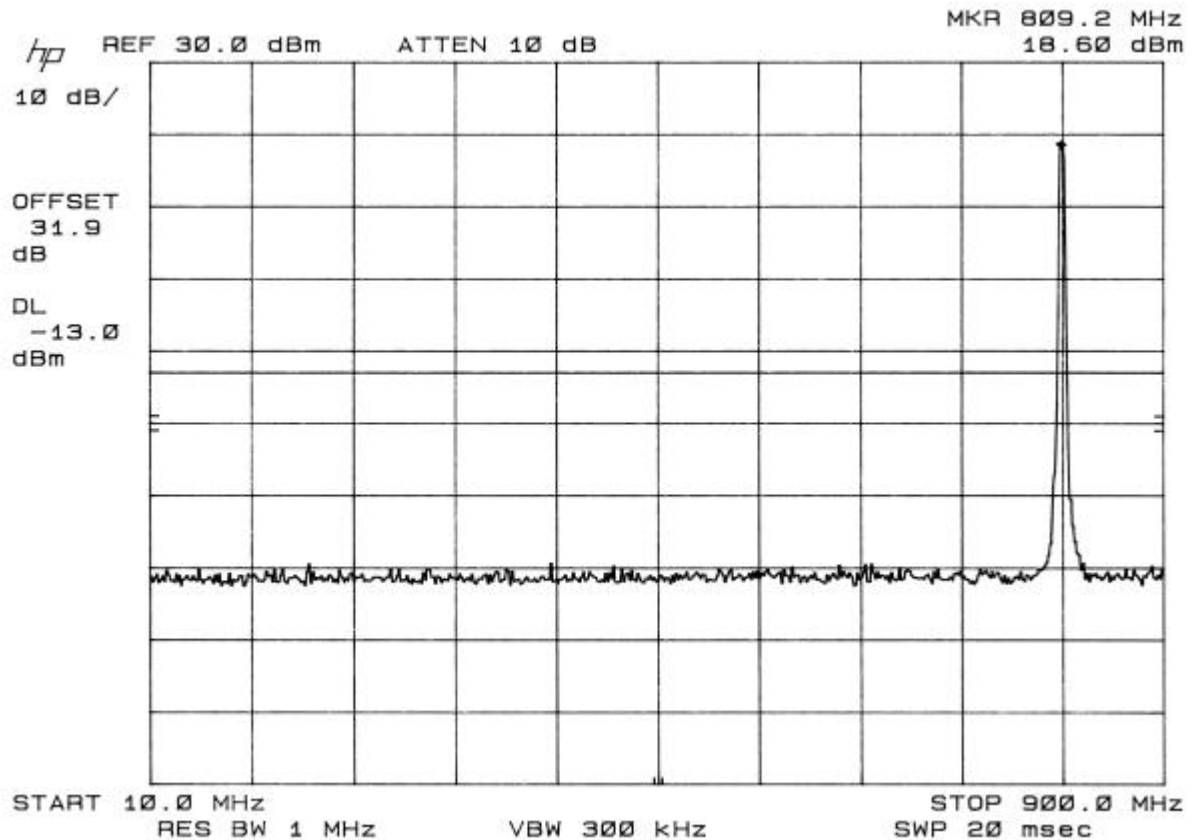
	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704	Inter- Modulation	
DNB Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	Downlink 2.5 GHz- 5.0 GHz		



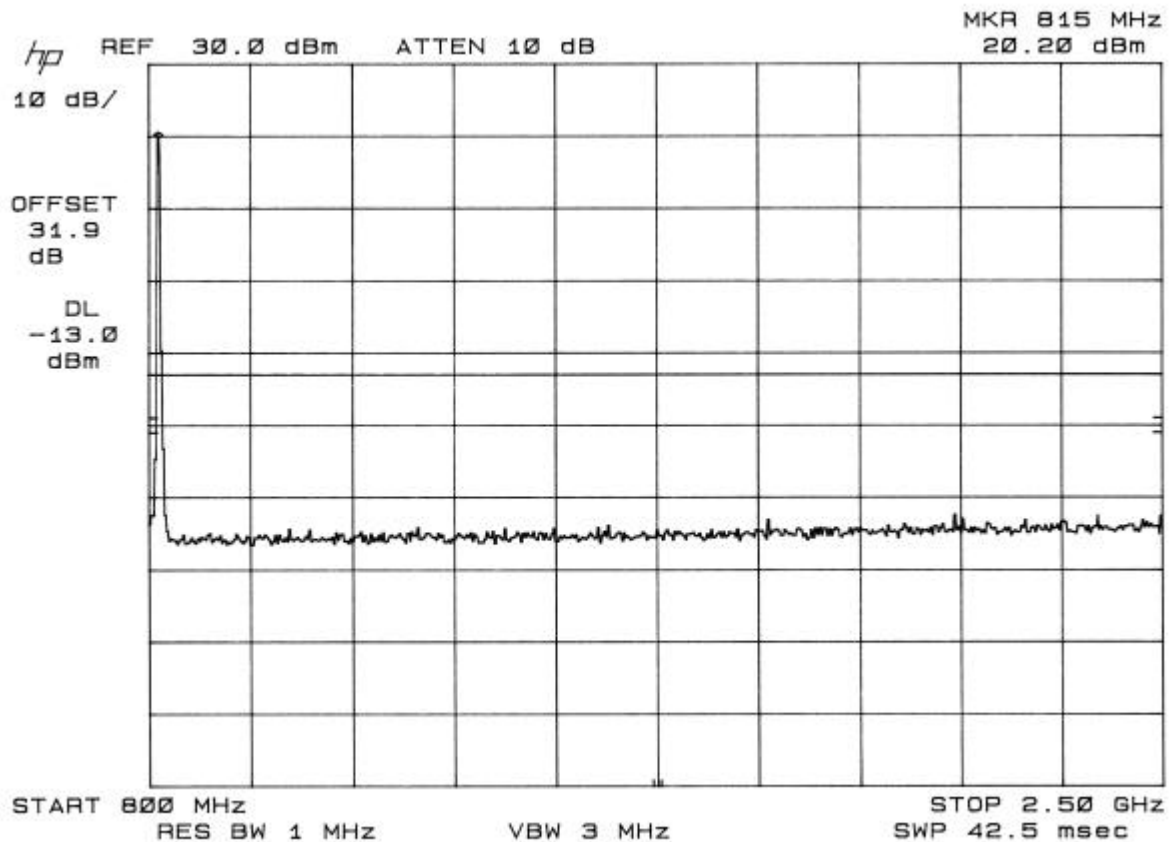
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DNB Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	Downlink 5.8 GHz- 10 GHz		



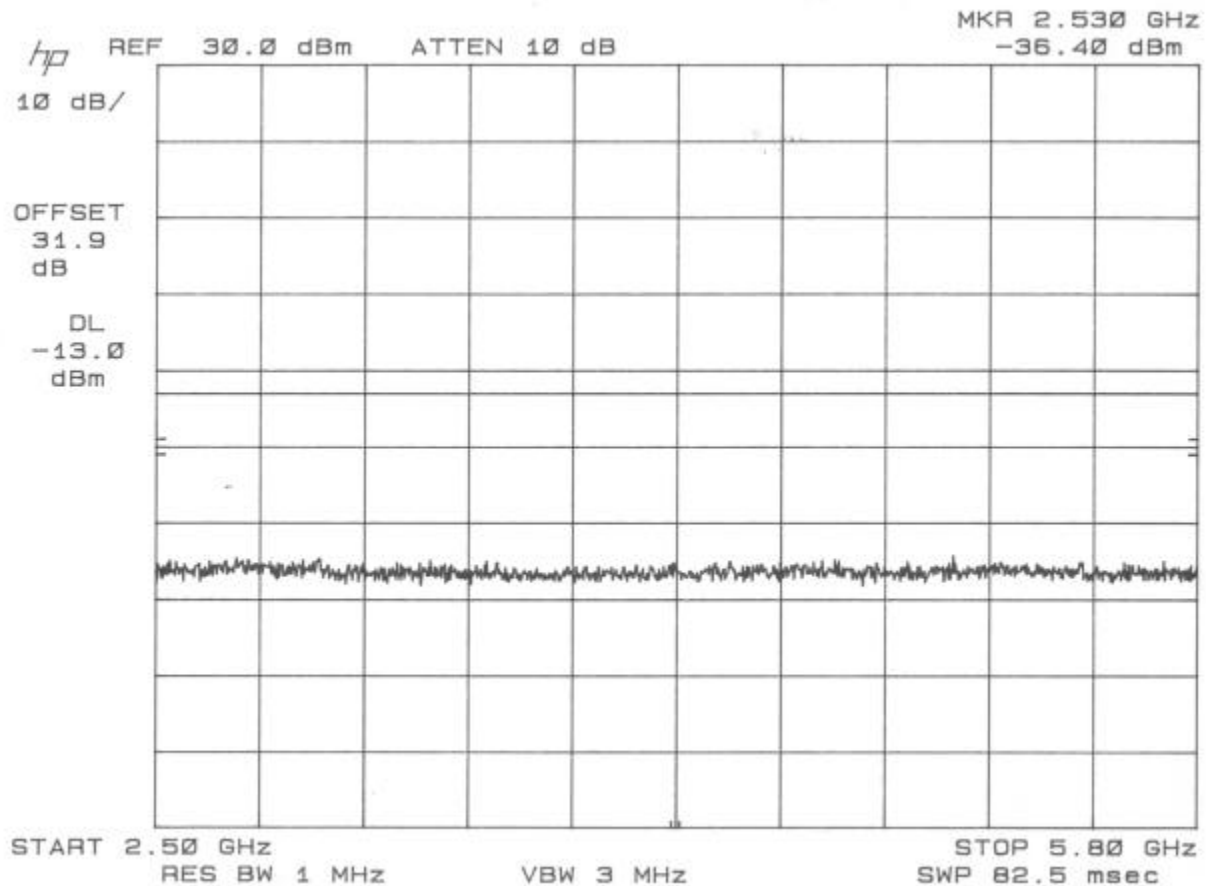
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DNB Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	Uplink 10 MHz- 900 MHz		



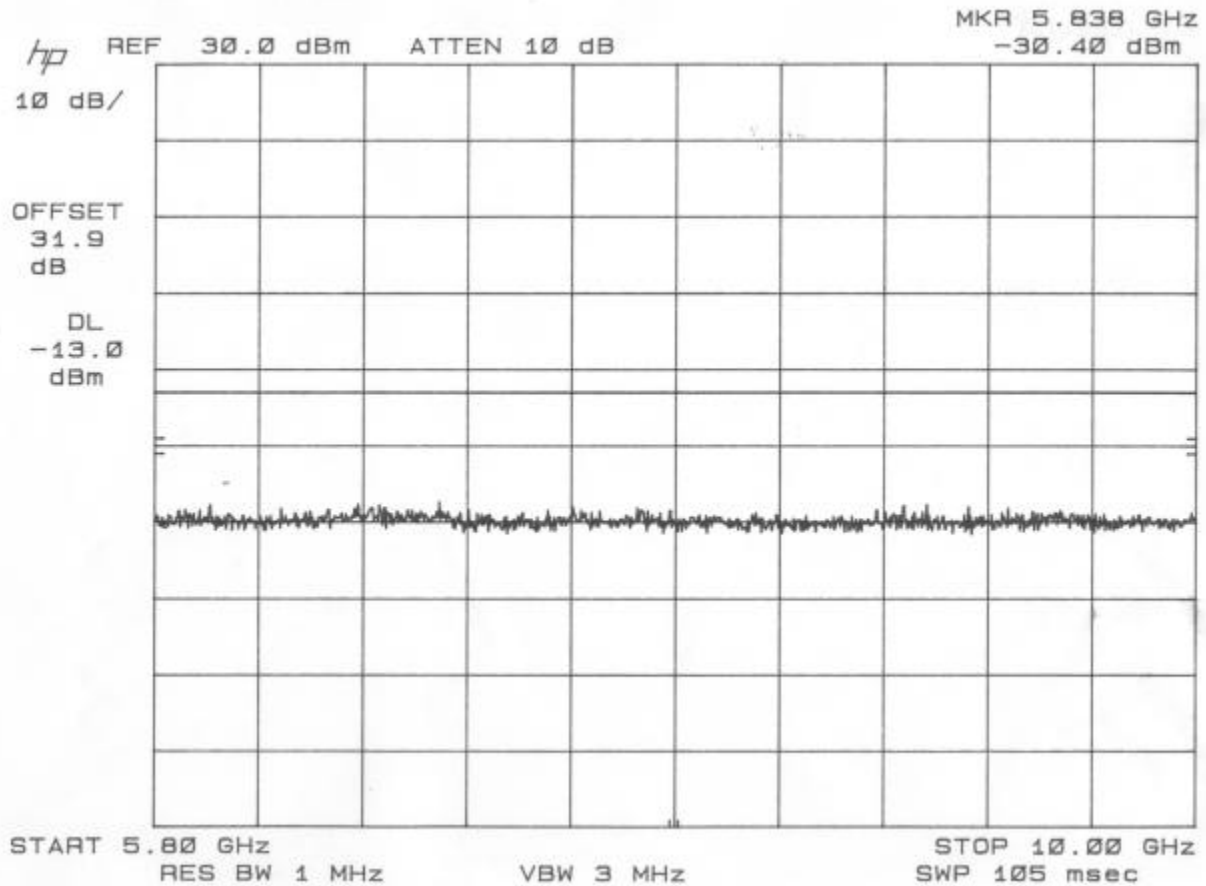
	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704	Inter- Modulation	
DNB Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	Uplink 800 MHz- 2.5 GHz		



	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704	Inter- Modulation	
DNB Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	Uplink 2.5 GHz- 5.8 GHz		



	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704	Inter- Modulation	
DNB Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	Uplink 5.8 GHz - 10 GHz		



2.1051 Spurious Emissions at Antenna Terminals

Definition:

Conducted Spurious Emissions are emissions at the antenna terminals on a frequency or frequencies which are outside an occupied band sufficient to ensure transmission of information of required quality for the class of communication desired. The reduction in the level of these spurious emissions will not affect the quality of the information being transmitted.

Conducted Spurious Emissions shall be attenuated below the maximum level of the carrier frequency in accordance with the following formula:

$$-13\text{dB} = \text{Measured Power} - (43 + 10 \log_{10} (\text{Rated Power}))$$

Test Method: Per EIA RS 152-B, Paragraph 4 as modified below.

Connect the equipment as shown in FIGURE 1.

Adjust the drive source to produce FM modulation. Adjust the Spectrum Analyzer to display the Modulated Carrier.

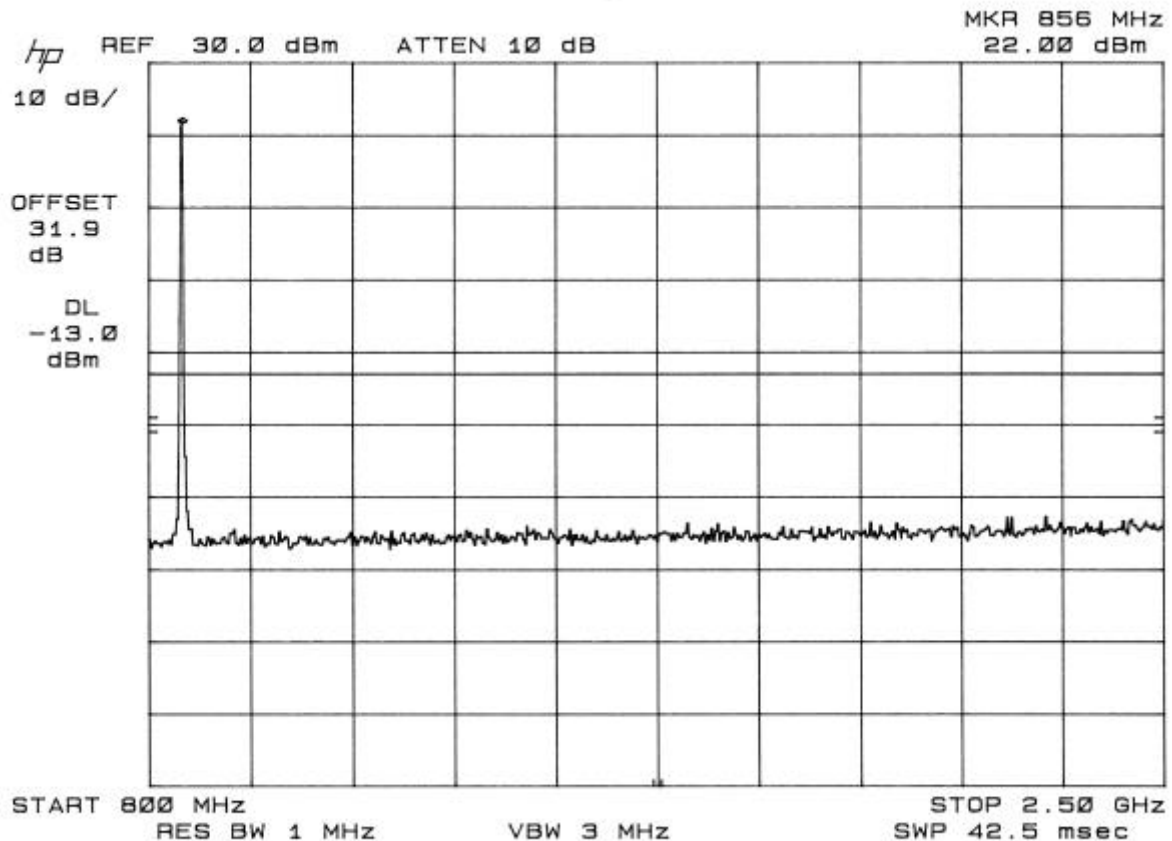
Scan the frequency spectrum from the lowest radio frequency generated in the equipment through the 10th harmonic of the carrier frequency.

Test Results: See Plots

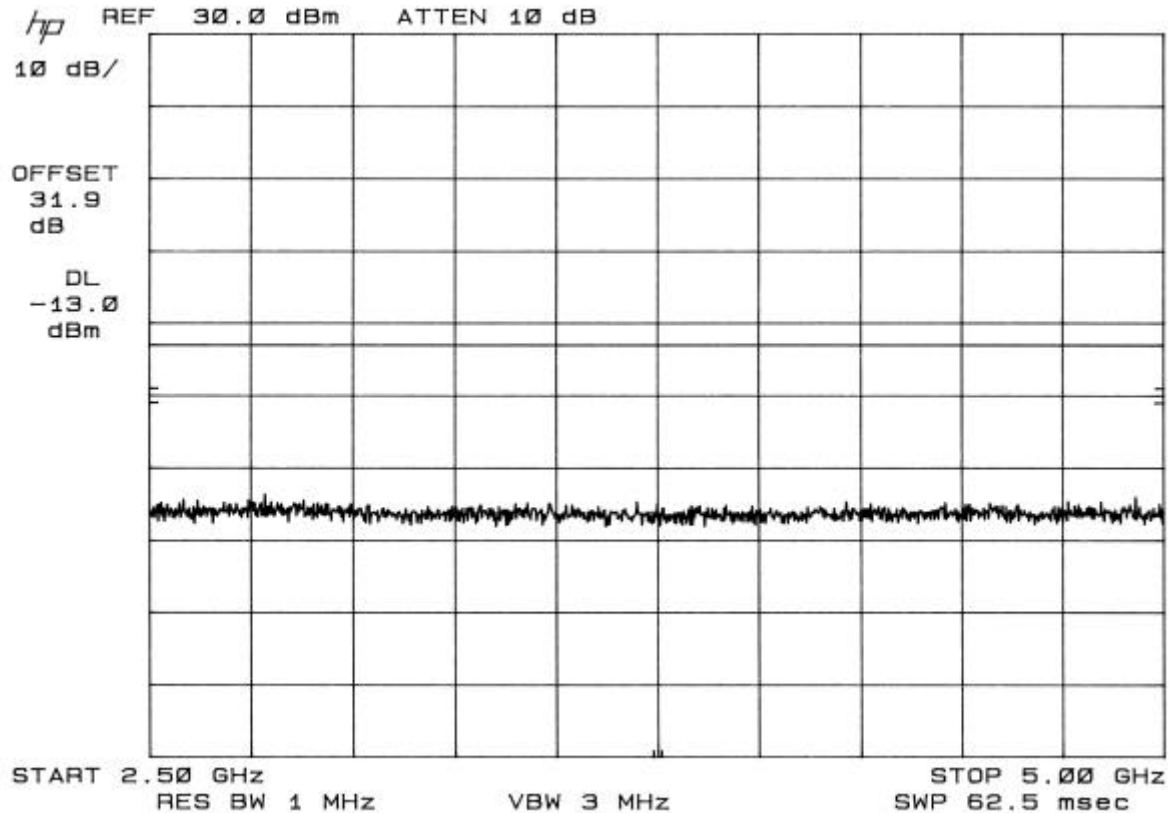
All spurious emissions at the antenna terminals are below the FCC specifications

FIGURE 11: CONDUCTED SPURIOUS EMISSIONS AT ANTENNA TERMINALS, DOWNLINK.

	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704	Antenna Conducted Spurious	
DNB Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	Downlink 856 MHz .8-2.5 GHz		



	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704	Antenna Conducted Spurious	
DNB Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	Downlink 856 MHz 2.5-5.0 GHz		



	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704	Antenna Conducted Spurious	
DNB Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	Downlink 856 MHz 5.8-10.0 GHz		

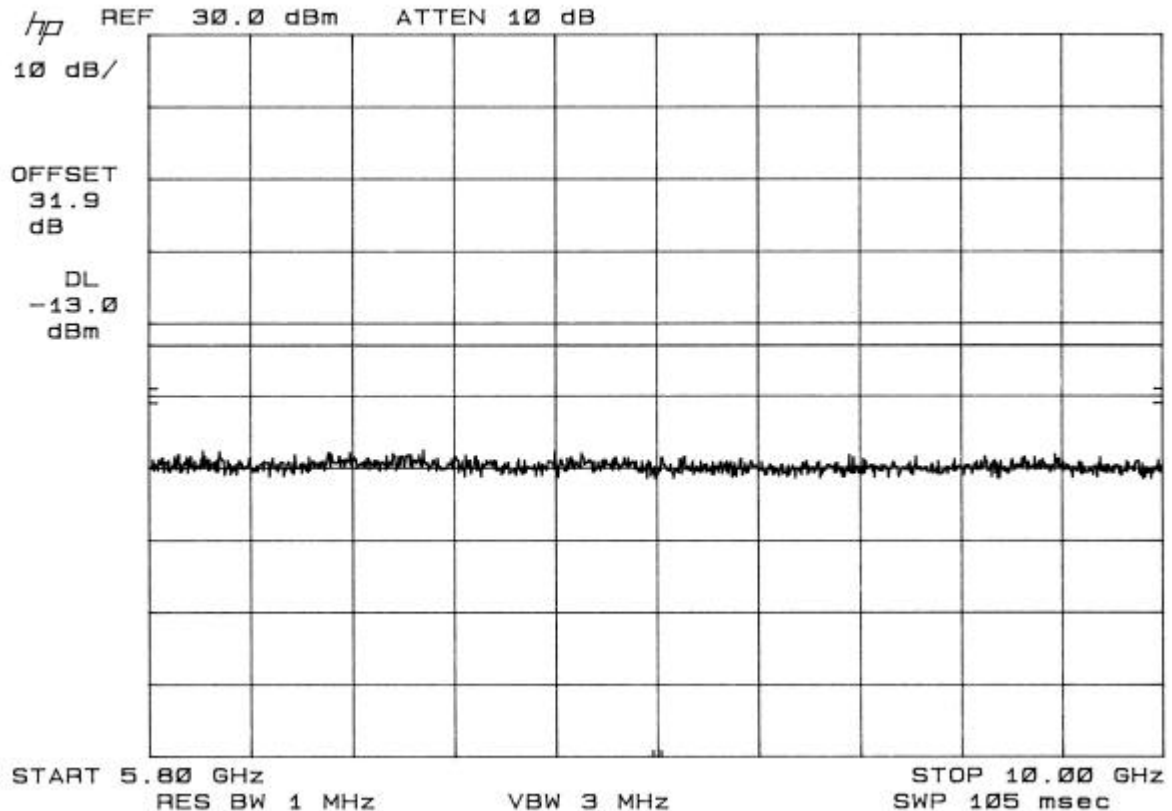
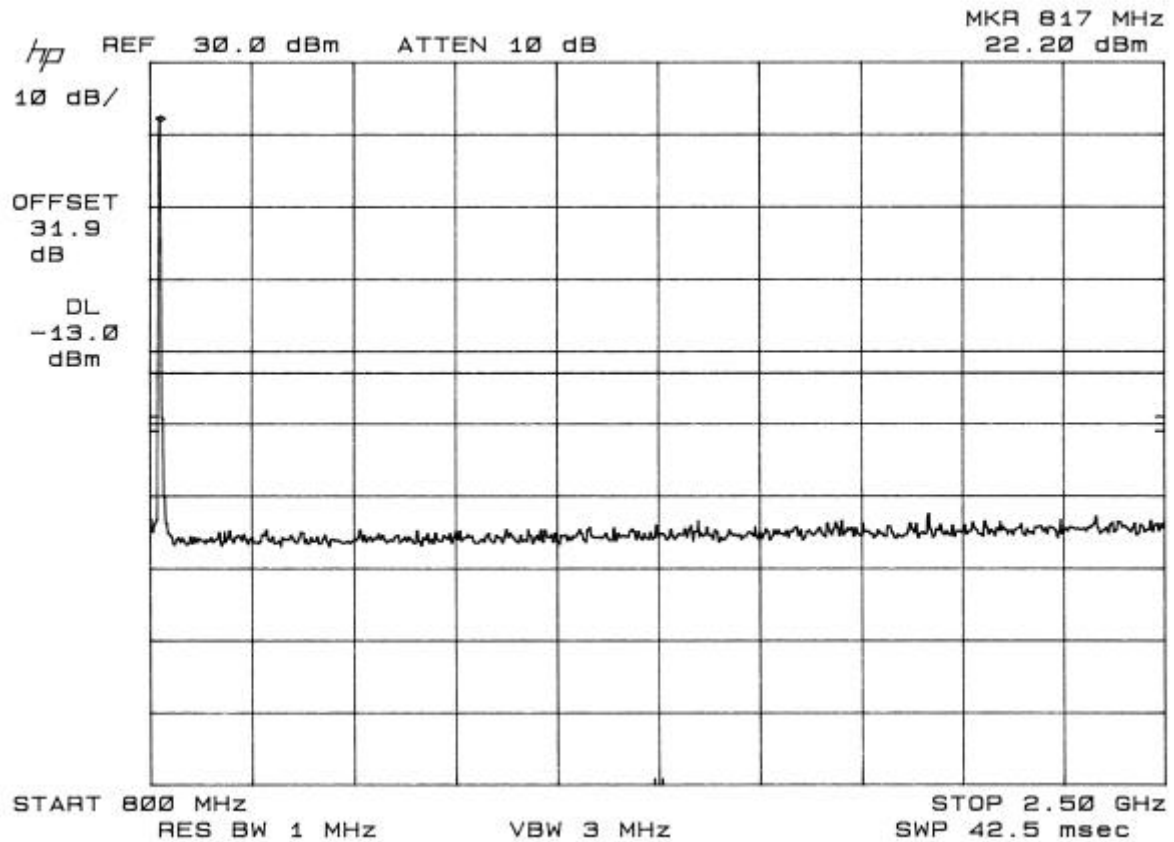
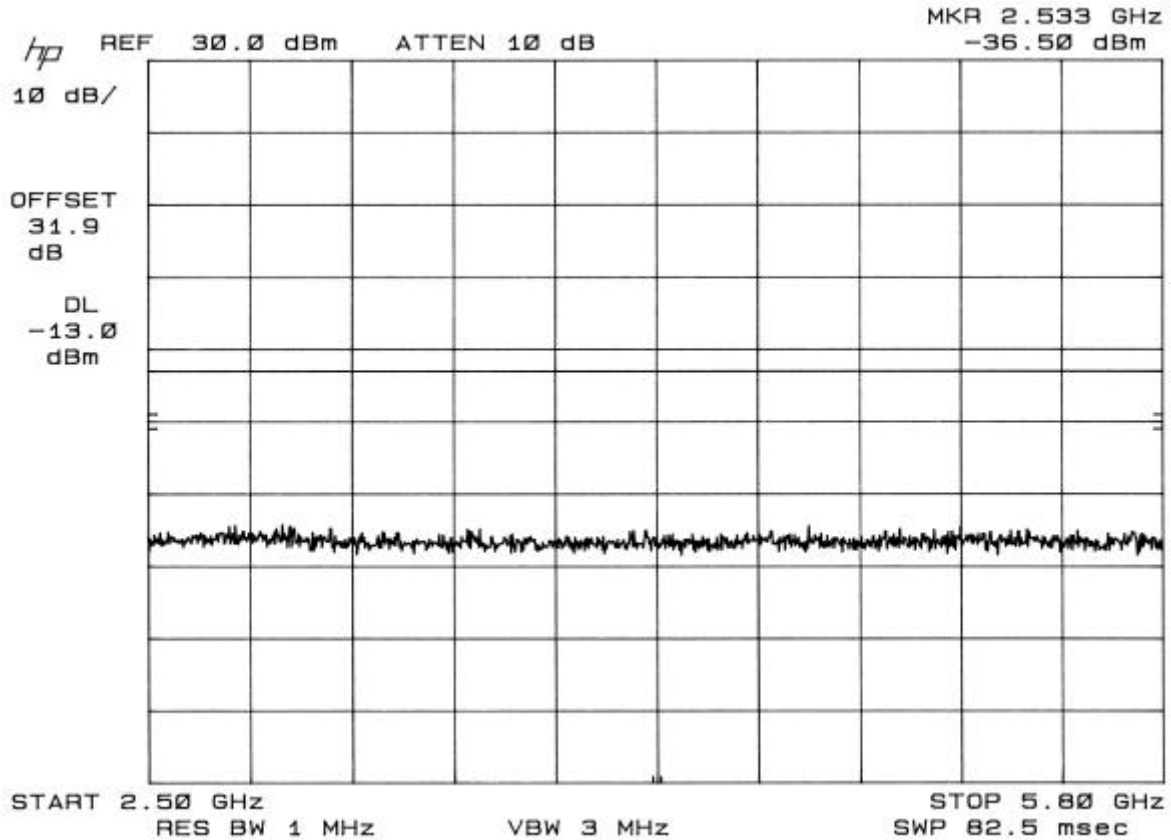


Figure 12: Conducted Spurious Emissions at Antenna Terminals, Uplink.

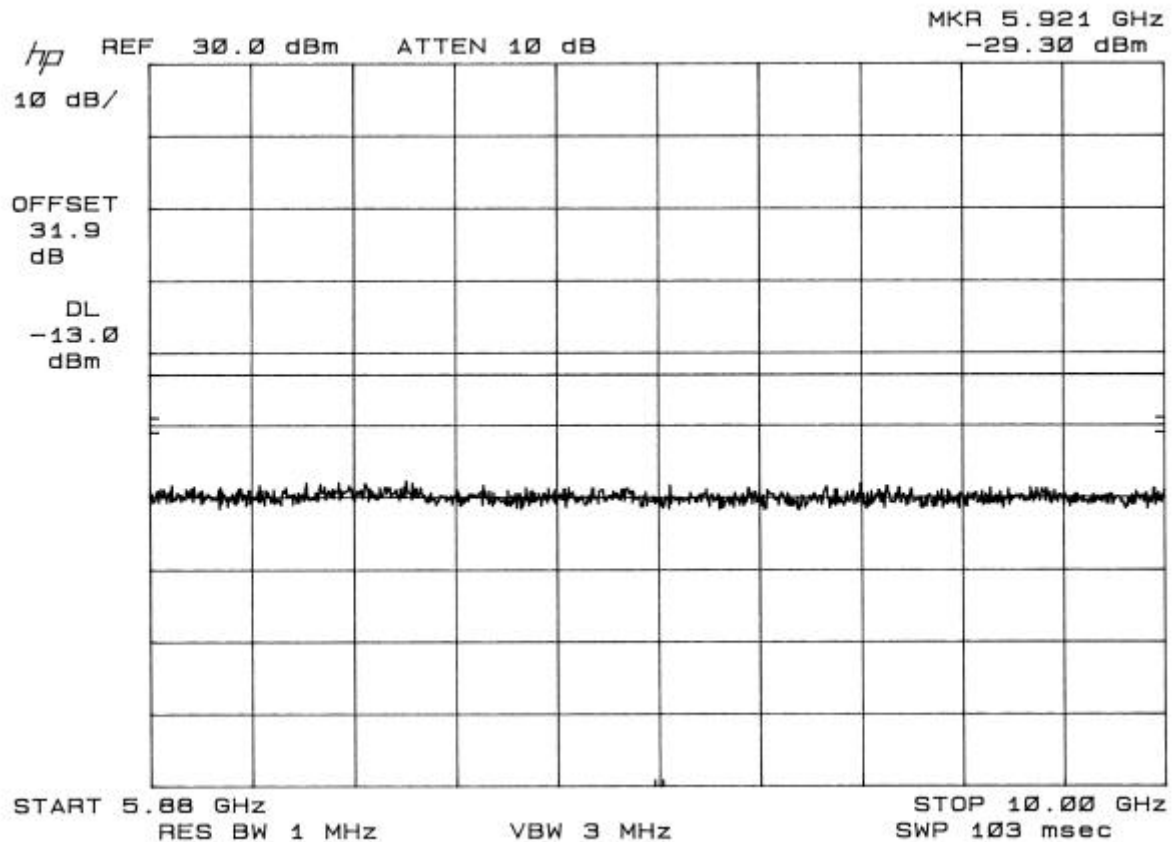
	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704	Antenna Conducted Spurious	
DNB Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	Uplink 817 MHz .8-2.5 GHz		



	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704	Antenna Conducted Spurious	
DNB Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	Uplink 817 MHz 2.5-5.8 GHz		



	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704	Antenna Conducted Spurious	
DNB Job Number:	RV48068A	Date: 1 Mar 2004	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	Uplink 817 MHz 5.88-10.0 GHz		



2.1053 Field Strength of Spurious Radiation

Definition:

Emissions from the equipment when connected into a non-radiating load on a frequency or frequencies which are outside an occupied band sufficient to ensure transmission of information of required quality for the class of communication desired. The reduction in the level of these spurious emissions will not affect the quality of the information being transmitted.

Test Method: Per TIA /EIA 603.

Connect the equipment and follow the procedure described in TIA/EIA 603 for radiated spurious emissions. Measure the amplitude of each spurious radiated signal through the 10th harmonic. The spurious signals are then measured on the 3 meter range. First the EUT is measured using a tuned reference dipole below 1GHz and a double ridge guide Horn antenna above 1GHz. If the DRG antenna is used the appropriate gain factor for the antenna is subtracted from the final measurement. Then a dipole to dipole (or drg to drg) measurement is conducted to determine the actual power at each harmonic being generated by the EUT. If no noticeable emission can be observed the ground floor is recorded in the data sheets.

Test Results: All readings were at the spectrum analyzer ground floor above the fundamental.

All radiated spurious emissions are below the FCC Specifications.

Formula for calculated spurious emissions.

Corrected reading (dBm) = Reading (dBm) – Antenna Gain (in dB)

Where Reading is the measured power at the transmit antenna directly measured with a power meter.

FIGURE 13: RADIATED FIELD STRENGTH OF SPURIOUS EMISSIONS, UPLINK.

	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704	Radiated Spurious	
DNB Job Number:	RV48068A	Date: 24 Nov 2003	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	Uplink		

Uplink 806 Mhz Modulation FM							
			dBm Reading	Antenna Gain	dBm Corrected	-13dB Limit	
2nd	1612	H	-51.61	8.7	-60.31	-13.0	-47.31
	1612	V	-42.91	8.7	-51.61	-13.0	-38.61
3rd	2418	H	-50.79	9.1	-59.89	-13.0	-46.89
	2418	V	-47.39	9.1	-56.49	-13.0	-43.49
4th	3224	H	-58.95	9.5	-68.45	-13.0	-55.45
	3224	V	-53.15	9.5	-62.65	-13.0	-49.65
5th	4030	H	-69.15	9.2	-78.35	-13.0	-65.35
	4030	V	-69.15	9.2	-78.35	-13.0	-65.35
6th	4836	H	-66.28	10.6	-76.88	-13.0	-63.88
	4836	V	-66.28	10.6	-76.88	-13.0	-63.88
7th	5642	H	-65.29	11.0	-76.29	-13.0	-63.29
	5642	V	-65.29	11.0	-76.29	-13.0	-63.29
8th	6448	H	-63.19	11.7	-74.89	-13.0	-61.89
	6448	V	-63.19	11.7	-74.89	-13.0	-61.89
9th	7254	H	-61.82	11.1	-72.92	-13.0	-59.92
	7254	V	-61.82	11.1	-72.92	-13.0	-59.92
10th	8060	H	-57.83	11.0	-68.83	-13.0	-55.83
	8060	V	-57.83	11.0	-68.83	-13.0	-55.83

	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704	Radiated Spurious	
DNB Job Number:	RV48068A	Date: 24 Nov 2003	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	Uplink		

Uplink 813 Mhz Modulation FM							
			dBm Reading	Antenna Gain	dBm Corrected	-13dB Limit	
2nd	1626	H	-43.41	8.7	-52.11	-13.0	-39.11
	1626	V	-43.51	8.7	-52.21	-13.0	-39.21
3rd	2439	H	-46.89	9.2	-56.09	-13.0	-43.09
	2439	V	-46.69	9.2	-55.89	-13.0	-42.89
4th	3252	H	-39.85	9.5	-49.35	-13.0	-36.35
	3252	V	-24.05	9.5	-33.55	-13.0	-20.55
5th	4065	H	-50.75	9.3	-60.05	-13.0	-47.05
	4065	V	-38.65	9.3	-47.95	-13.0	-34.95
6th	4878	H	-44.38	10.6	-54.98	-13.0	-41.98
	4878	V	-46.08	10.6	-56.68	-13.0	-43.68
7th	5691	H	-43.29	11.0	-54.29	-13.0	-41.29
	5691	V	-43.59	11.0	-54.59	-13.0	-41.59
8th	6504	H	-63.09	11.8	-74.89	-13.0	-61.89
	6504	V	-63.09	11.8	-74.89	-13.0	-61.89
9th	7317	H	-49.62	11.0	-60.62	-13.0	-47.62
	7317	V	-50.02	11.0	-61.02	-13.0	-48.02
10th	8130	H	-57.83	11.0	-68.83	-13.0	-55.83
	8130	V	-57.83	11.0	-68.83	-13.0	-55.83

	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704		Radiated Spurious	
DNB Job Number:	RV48068A	Date:	24 Nov 2003	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.			
Model Number:		Serial Number:		
Description:	RF Amplifier Uplink			

Uplink 821 Mhz Modulation FM							
			dBm Reading	Antenna Gain	dBm Corrected	-13dB Limit	
2nd	1642	H	-57.71	8.7	-66.41	-13.0	-53.41
	1642	V	-40.21	8.7	-48.91	-13.0	-35.91
3rd	2462	H	-46.69	9.2	-55.89	-13.0	-42.89
	2462	V	-48.79	9.2	-57.99	-13.0	-44.99
4th	3284	H	-38.25	9.5	-47.75	-13.0	-34.75
	3284	V	-30.65	9.5	-40.15	-13.0	-27.15
5th	4105	H	-46.85	9.4	-56.25	-13.0	-43.25
	4105	V	-35.25	9.4	-44.65	-13.0	-31.65
6th	4926	H	-36.48	10.6	-47.08	-13.0	-34.08
	4926	V	-38.18	10.6	-48.78	-13.0	-35.78
7th	5747	H	-31.29	11.1	-42.39	-13.0	-29.39
	5747	V	-33.09	11.1	-44.19	-13.0	-31.19
8th	6568	H	-54.49	11.7	-66.19	-13.0	-53.19
	6568	V	-54.49	11.7	-66.19	-13.0	-53.19
9th	7389	H	-49.82	10.9	-60.72	-13.0	-47.72
	7389	V	-49.92	10.9	-60.82	-13.0	-47.82
10th	8210	H	-47.73	11.0	-58.73	-13.0	-45.73
	8210	V	-57.83	11.0	-68.83	-13.0	-55.83

FIGURE 14: RADIATED FIELD STRENGTH OF SPURIOUS EMISSIONS, DOWNLINK.

	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704	Radiated Spurious	
DNB Job Number:	RV48068A	Date: 24 Nov 2003	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.		
Model Number:		Serial Number:	
Description:	RF Amplifier		
	Downlink		

Downlink 855 MHz							
			dBm Reading	Antenna Gain	dBm Corrected	-13dB Limit	
2nd	1702	H	-49.11	8.7	-57.81	-13.0	-44.81
	1702	V	-60.11	8.7	-68.81	-13.0	-55.81
3rd	2553	H	-49.89	9.2	-59.09	-13.0	-46.09
	2553	V	-45.49	9.2	-54.69	-13.0	-41.69
4th	3404	H	-31.25	9.5	-40.75	-13.0	-27.75
	3404	V	-26.25	9.5	-35.75	-13.0	-22.75
5th	4255	H	-58.35	9.8	-68.15	-13.0	-55.15
	4255	V	-45.05	9.8	-54.85	-13.0	-41.85
6th	5106	H	-45.78	10.6	-56.38	-13.0	-43.38
	5106	V	-61.58	10.6	-72.18	-13.0	-59.18
7th	5957	H	-39.09	11.3	-50.39	-13.0	-37.39
	5957	V	-36.89	11.3	-48.19	-13.0	-35.19
8th	6808	H	-47.02	11.6	-58.62	-13.0	-45.62
	6808	V	-46.12	11.6	-57.72	-13.0	-44.72
9th	7659	H	-50.84	10.6	-61.44	-13.0	-48.44
	7659	V	-47.94	10.6	-58.54	-13.0	-45.54
10th	8510	H	-57.73	11.1	-68.83	-13.0	-55.83
	8510	V	-57.73	11.1	-68.83	-13.0	-55.83

	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704		Radiated Spurious	
DNB Job Number:	RV48068A	Date:	24 Nov 2003	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.			
Model Number:		Serial Number:		
Description:	RF Amplifier			
	Downlink			

Downlink 860 MHz							
			dBm Reading	Antenna Gain	dBm Corrected	-13dB Limit	
2nd	1720	H	-57.61	8.7	-66.31	-13.0	-53.31
	1720	V	-57.71	8.7	-66.41	-13.0	-53.41
3rd	2580	H	-49.09	9.2	-58.29	-13.0	-45.29
	2580	V	-48.39	9.2	-57.59	-13.0	-44.59
4th	3440	H	-30.85	9.5	-40.35	-13.0	-27.35
	3440	V	-29.75	9.5	-39.25	-13.0	-26.25
5th	4300	H	-46.45	10.0	-56.45	-13.0	-43.45
	4300	V	-42.45	10.0	-52.45	-13.0	-39.45
6th	5160	H	-37.98	10.7	-48.68	-13.0	-35.68
	5160	V	-54.88	10.7	-65.58	-13.0	-52.58
7th	6020	H	-39.29	11.3	-50.59	-13.0	-37.59
	6020	V	-42.09	11.3	-53.39	-13.0	-40.39
8th	6880	H	-45.82	11.5	-57.32	-13.0	-44.32
	6880	V	-48.72	11.5	-60.22	-13.0	-47.22
9th	7740	H	-61.74	10.5	-72.24	-13.0	-59.24
	7740	V	-50.84	10.5	-61.34	-13.0	-48.34
10th	8600	H	-57.63	11.2	-68.83	-13.0	-55.83
	8600	V	-57.63	11.2	-68.83	-13.0	-55.83

	5969 Robinson Avenue Riverside, CA 92503 (909) 637-2630 FAX (909) 637-2704		Radiated Spurious	
DNB Job Number:	RV48068A	Date:	24 Nov 2003	Conformance Standards [X] FCC Part 90
Customer:	Taiwan Coiler International Corp.			
Model Number:		Serial Number:		
Description:	RF Amplifier			
	Downlink			

Downlink 866 MHz							
			dBm Reading	Antenna Gain	dBm Corrected	-13dB Limit	
2nd	1732	H	-57.0	8.7	-65.71	-13.0	-52.71
	1732	V	-52.3	8.7	-61.01	-13.0	-48.01
3rd	2598	H	-51.2	9.2	-60.39	-13.0	-47.39
	2598	V	-55.6	9.2	-64.79	-13.0	-51.79
4th	3464	H	-36.7	9.5	-46.15	-13.0	-33.15
	3464	V	-38.8	9.5	-48.25	-13.0	-35.25
5th	4330	H	-39.6	10.0	-49.55	-13.0	-36.55
	4330	V	-54.3	10.0	-64.25	-13.0	-51.25
6th	5196	H	-44.6	10.7	-55.28	-13.0	-42.28
	5196	V	-51.4	10.7	-62.08	-13.0	-49.08
7th	6062	H	-36.8	11.5	-48.29	-13.0	-35.29
	6062	V	-40.1	11.5	-51.59	-13.0	-38.59
8th	6928	H	-52.1	11.5	-63.62	-13.0	-50.62
	6928	V	-61.4	11.5	-72.92	-13.0	-59.92
9th	7794	H	-61.7	10.5	-72.24	-13.0	-59.24
	7794	V	-61.7	10.5	-72.24	-13.0	-59.24
10th	8660	H	-57.6	11.2	-68.83	-13.0	-55.83
	8660	V	-57.6	11.2	-68.83	-13.0	-55.83

2.1055 Measurement of Frequency Stability

The EUT is a power amplifier and contains no circuitry for generating or stabilizing the RF signal. The driver will be responsible for this task.

2.1057 Frequency Spectrum to be Investigated

The Frequency was searched from the lowest radio frequency generated in the equipment through the 10th harmonic of the carrier frequency.

RF Exposure – MPE Calculations

Within Building

Input

Transmitter Power: 160 mW

Antenna Gain: 3 dB

Cable loss: 2 dB @ 806– 830 MHz
2 dB @ 851 – 870 MHz

Frequency range: 806-830 MHz and 851-870 MHz

Assumptions

1. A single $\frac{1}{4}$ wavelength radiating antenna is assumed.
2. Closest exposure distance is assumed to be 20 cm

Roof Mount

Input

Transmitter Power: 160 mW

Antenna Gain: 12 dB

Cable loss: 2 dB @ 806– 830 MHz
2 dB @ 851 – 870 MHz

Frequency range: 806-830 MHz and 851-870 MHz

Assumptions

1. A single $\frac{1}{4}$ wavelength radiating antenna is assumed.
2. Closest exposure distance is assumed to be 20 cm

RF Exposure – MPE Calculations

Calculations

The following results shall be assumed to be accurate for the far-field only. These predictions will over-estimate power density in the near-field. Based on the use of a $\frac{1}{4}$ wavelength radiator, a distance of 20 cm is considered to be in the far-field for all cases.

$$S = PG/4*\pi*R^2$$

Within Building

@ 806 – 830 MHz

P is 160 mW

G is 3 dB (Antenna gain – loss) or $10^{(2/20)}$ or 1.25

R is 20 cm

$$\underline{\underline{S = 0.045 \text{ mW/cm}^2}}$$

For Occupational/Controlled Exposure

From 300 to 1500 MHz, power density limit is $f/300 \text{ mW/cm}^2$

@ 806 MHz, power density limit is 2.69 mW/cm^2

For General Population/Uncontrolled Exposure

From 300 to 1500 MHz, power density limit is $f/1500 \text{ mW/cm}^2$

@ 806 MHz, Power density limit is 0.54 mW/cm^2

Conclusion: **Meets MPE limits**

@ 851 – 870 MHz

P is 160 mW

G is 3 dB (Antenna gain – loss) or $10^{(1/20)}$ or 1.12

R is 20 cm

$$\underline{\underline{S = 0.045 \text{ mW/cm}^2}}$$

For Occupational/Controlled Exposure

From 1,500 to 100,000 MHz, power density limit is **5 mW/cm^2 for 6 minutes.**

For General Population/Uncontrolled Exposure

From 1,500 to 100,000 MHz, power density limit is **1 mW/cm^2 for 30 minutes.**

Conclusion: **Meets MPE limits**

Roof Mount

@ 806 – 830 MHz

P is 160 mW

G is 12 dB (Antenna gain – loss) or $10^{(2/20)}$ or 1.25

R is 20 cm

$$\underline{S = 0.1.27 \text{ mW/cm}^2}$$

For Occupational/Controlled Exposure

From 300 to 1500 MHz, power density limit is $f/300 \text{ mW/cm}^2$

@ 806 MHz, power density limit is 2.84 mW/cm^2

For General Population/Uncontrolled Exposure

From 300 to 1500 MHz, power density limit is $f/1500 \text{ mW/cm}^2$

@ 806 MHz, Power density limit is 0.57 mW/cm^2

Conclusion: **Meets MPE limits**

@ 851 – 870 MHz

P is 160 mW

G is 12 dB (Antenna gain – loss) or $10^{(1/20)}$ or 1.12

R is 20 cm

$$\underline{S = 0.127 \text{ mW/cm}^2}$$

For Occupational/Controlled Exposure

From 1,500 to 100,000 MHz, power density limit is **5 mW/cm^2 for 6 minutes.**

For General Population/Uncontrolled Exposure

From 1,500 to 100,000 MHz, power density limit is **1 mW/cm^2 for 30 minutes.**

Conclusion: **Meets MPE limits**

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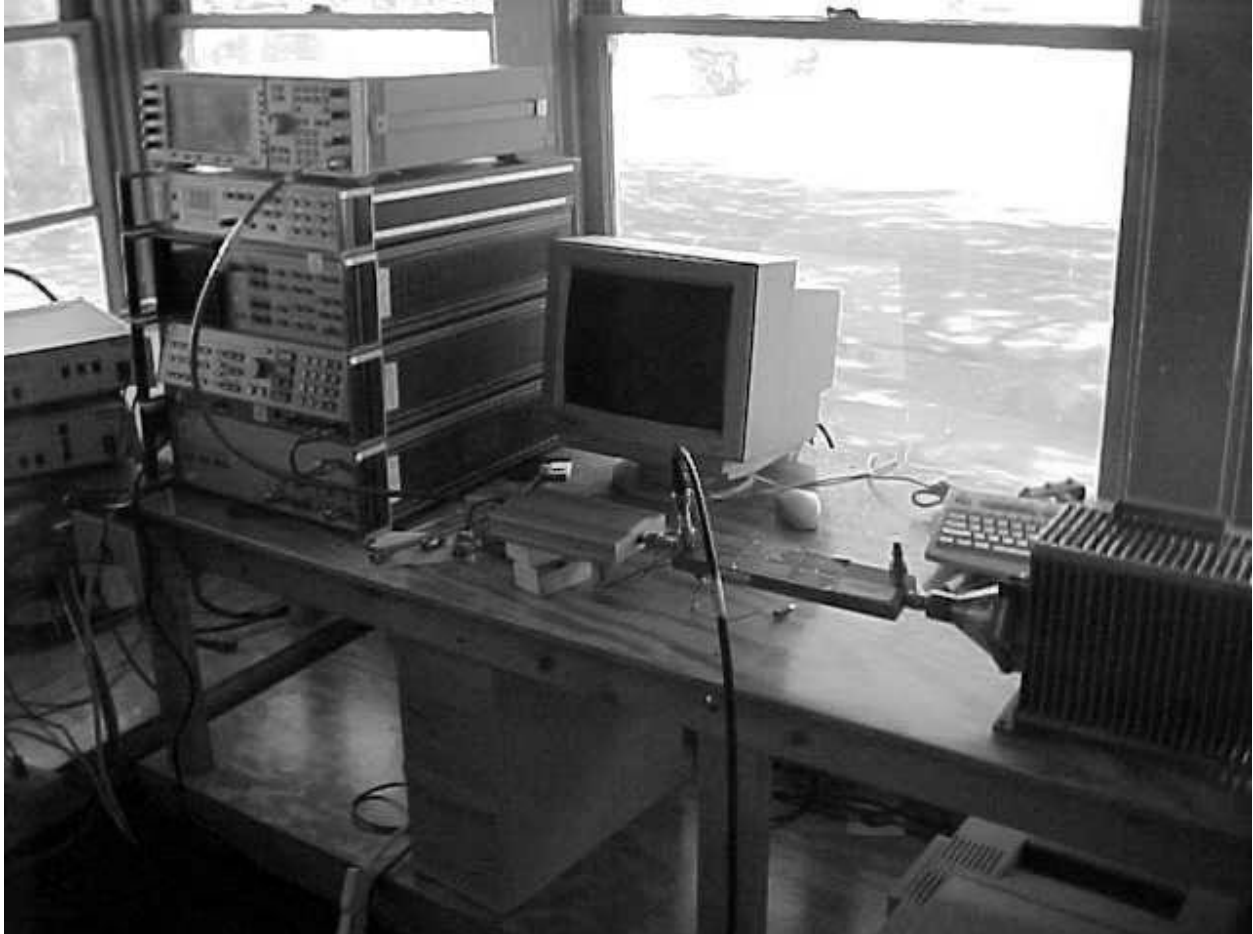
PHOTOS: RADIATED FIELD STRENGTH OF SPURIOUS EMISSIONS

Notes:



PHOTO: RF POWER OUTPUT, EMISSIONS Limitations GSM/TDMA, Occupied Bandwidth GSM/TDMA,
Conducted Spurious Emissions at Antenna Terminals

Notes:



End Of Report