Ansen Electronic Company
FCC Part 15, Certification Application
Model 0581

April 9, 2001

MEASUREMENT/TECHNICAL REPORT

COMPANY NAME: **Ansen Electronic Company**

MODEL: **0581**

FCC ID: **L5C0581TX**

DATE: **April 9, 2001**

This report concerns (check one): Original grant_X_
Class II change_____

Equipment type: **Low Power Transmitter**

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? yes_____ No_X_

If yes, defer until:_____
date

__N.A.__ agrees to notify the Commission by__N.A.____
date
of the intended date of announcement of the product so that the grant can be issued on that date.

Report prepared by:

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TABLE OF CONTENTS

LIST OF FIGURES AND TABLES

FIGURES

TABLES

SECTION 1

GENERAL INFORMATION

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Product Description

The Equipment Under Test (EUT) is a Ansen Electronic Company, 0581.

The EUT is part of the Wireless Remote Control Switch system that comes with a “Santa Claus” remote control handset, a “FIREPLACE” remote plug station and two “SOCK” remote plug stations. The “Santa Claus” remote control handset communicates with the remote plug stations using radio signals. Each “SOCK” plug station controls one piece of home appliance and the “FIREPLACE” plug station control three pieces of home appliance.

The EUT incorporates an internal antenna.

Related Submittal(s)/Grant(s)

The EUT will be used with two different receivers which were approved using FCC DoC authorizations.

SECTION 2

TESTS AND MEASUREMENTS

TESTS AND MEASUREMENTS

Configuration of Tested System

The sample was tested per ANSI C63.4, Methods of Measurement from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz (1992). Conducted and radiated emissions data were taken with the test receiver or spectrum analyzer's resolution bandwidth adjusted to 9 kHz and 120 kHz, respectively. All measurements are peak unless stated otherwise. The video filter associated with the spectrum analyzer was off throughout the evaluation process. Interconnecting cables were manipulated as necessary to maximize emissions. A block diagram of the tested system is shown in Figure 1. Test configuration photographs for spurious and fundamental emissions are shown in Figure 2.

Since the EUT is a hand held device, it was placed into a continuous mode of transmit and rotated about all 3 axis to obtain worse case results.

Test Facility

Testing was performed at US Tech's measurement facility at 3505 Francis Circle, Alpharetta, GA. This site has been fully described and submitted to the FCC, and accepted in their letter marked 31040/SIT. Additionally this site has also been fully described and submitted to Industry Canada (IC), and has been approved under file number IC2982.

Modifications

No modifications were made to bring the EUT into compliance with FCC Part 15, Class B Requirements.

Test Equipment

Table 2 describes test equipment used to evaluate this product.

FIGURE 1

TEST CONFIGURATION

FIGURE 2a

Photograph(s) for Spurious and Fundamental Emissions

FIGURE 2b

Photograph(s) for Spurious and Fundamental Emissions

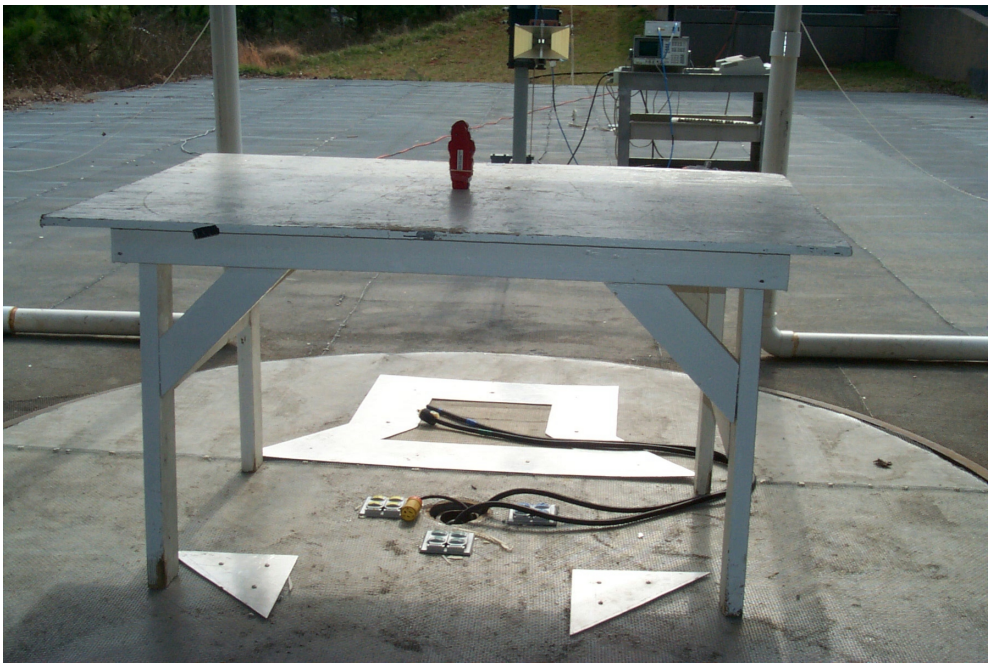


TABLE 1

EUT and Peripherals

PERIPHERAL MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID:	CABLES P/D
Transmitter Ansen Electronic Company (EUT)	0581	None	L5C0581TX (Pending)	None

TABLE 2

TEST INSTRUMENTS

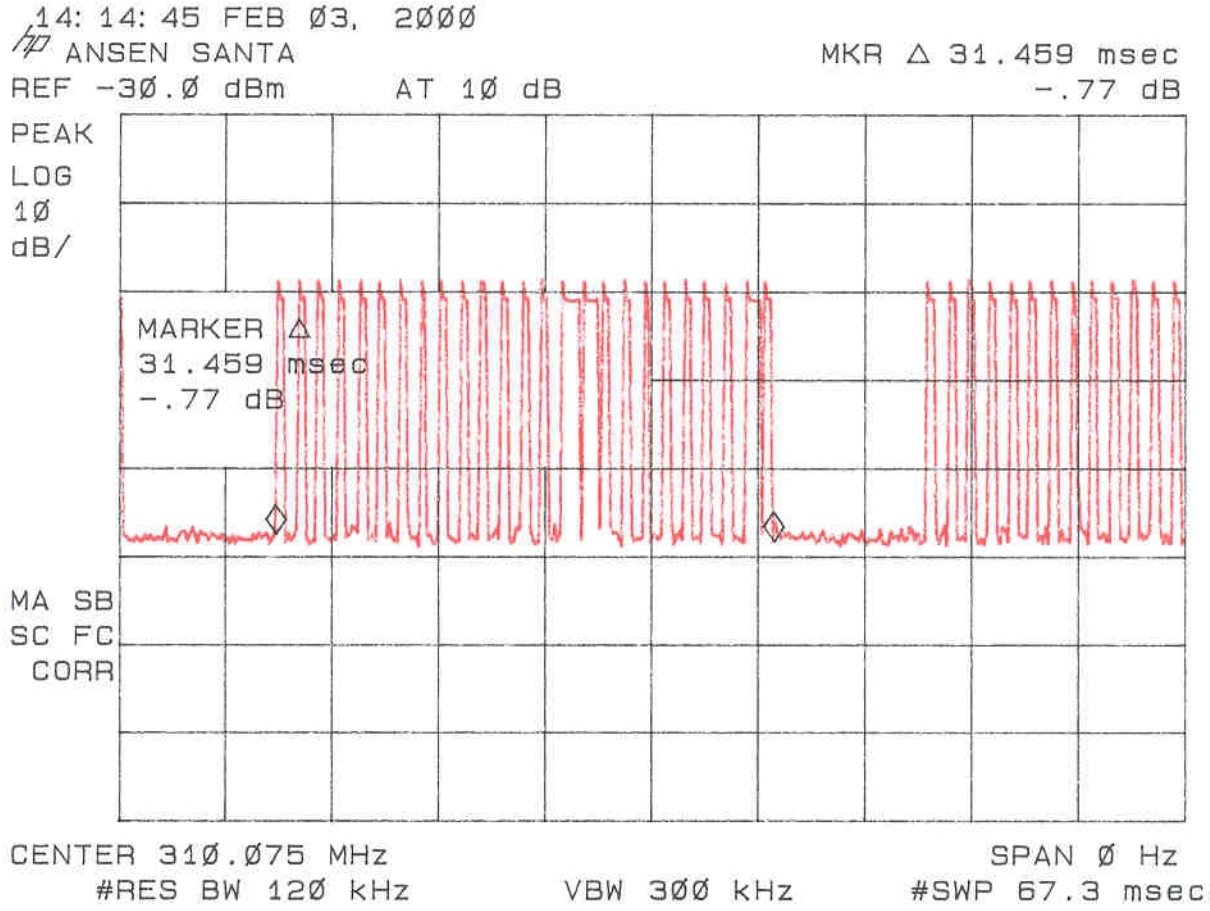
TYPE	MANUFACTURER	MODEL	SN.
SPECTRUM ANALYZER	HEWLETT-PACKARD	8593E	3205A00124
SPECTRUM ANALYZER	HEWLETT-PACKARD	8558B	2332A09900
S A DISPLAY	HEWLETT-PACKARD	853A	2404A02387
COMB GENERATOR	HEWLETT-PACKARD	8406A	1632A01519
RF PREAMP	HEWLETT-PACKARD	8447D	1937A03355
RF PREAMP	HEWLETT-PACKARD	8449B	3008A00480
HORN ANTENNA	EMCO	3115	3723
BICONICAL ANTENNA	EMCO	3110	9307-1431
LOG PERIODIC ANTENNA	EMCO	3146	9110-3600
LISN	SOLAR ELE.	8028	910495 & 910494
THERMOMETER	FLUKE	52	5215250
MULTIMETER	FLUKE	85	53710469
PLOTTER	HEWLETT-PACKARD	7475A	2325A65394
BILOG	CHASE	CBL6112A	2238

Periodic Operation (47 CFR 15.231(a1))

A transmitter manually activated must automatically deactivate within not more than 5 seconds of being released. The transmitter is a 5 button transmitter. The EUT continues to transmit while each button is being pressed. The EUT ceases transmission almost immediately upon being released and appears to finish the current packet being transmitted. Therefore the longest period of time the transmitter should take to deactivate is a packet length, or 31.5 msec as shown in Figure 3.

FIGURE 3

Periodic Operation 15.231(a)(c1)



Field Strength of Fundamental Emission (47 CFR 15.231b)

Measurements were made using a peak detector. Field strength of the peak fundamental emission is shown in Table 3 and Figure 4.

Duty Cycle Correction During 100 msec:

Each function key sends a different series of characters, but each packet period (41.05 msec) never exceeds a series of 25 pulses. Assuming any combination of short or long pulses may be obtained due to encoding the worse case transmit duty cycle would be considered 25 x 0.975 µs per 41.05 msec = 59.4% duty cycle. Figures 5a through 5g show the characteristics of the pulse train for one of these functions.

Duty Cycle Correction = 20 log (0.594) = -4.5 dB

Field strength of the average fundamental emission is shown in Table 4.

TABLE 3

FIELD STRENGTH OF FUNDAMENTAL EMISSION

Test Date: February 3, 2000
UST Project: 00-0026
Customer: Ansen Electronic Company
Model: 0581

Peak Measurement

FREQ. (MHz)	TEST DATA (dBm) @ 3m	ANTENNA FACTOR + CABLE ATTENUATION	RESULTS (uV/m) @ 3m	PEAK FCC LIMITS (uV/m) @ 3m
310.7	-47.0	18.6	8554.2	58,625

SAMPLE CALCULATIONS:

RESULTS uV/m @ 3m = Antilog ((-47.0 + 18.6 + 107)/20) = 8554.2
CONVERSION FROM dBm TO dBuV = 107 dB

Test Results
Reviewed By: _____ **Name:** Brian T. Parks

TABLE 4

FIELD STRENGTH OF FUNDAMENTAL EMISSION

Test Date: February 3, 2000
UST Project: 00-0026
Customer: Ansen Electronic Company
Model: 0581

Average Measurement

FREQ. (MHz)	TEST DATA (dBm) @ 3m*	ANTENNA FACTOR + CABLE ATTENUATION	RESULTS (uV/m) @ 3m	AVERAGE FCC LIMITS (uV/m) @ 3m
310.7	-51.5	18.6	5069.9	5,862.5

*** Adjusted by duty cycle = 20 log (0.594) = -51.5 dB**

SAMPLE CALCULATIONS:

RESULTS uV/m @ 3m = Antilog ((-51.5 + 18.6 + 107)/20) = 5069.9
CONVERSION FROM dBm TO dBuV = 107 dB

Test Results
Reviewed By: _____ **Name:** Brian T. Parks

FIGURE 4

FIELD STRENGTH OF FUNDAMENTAL EMISSION 15.231(b)

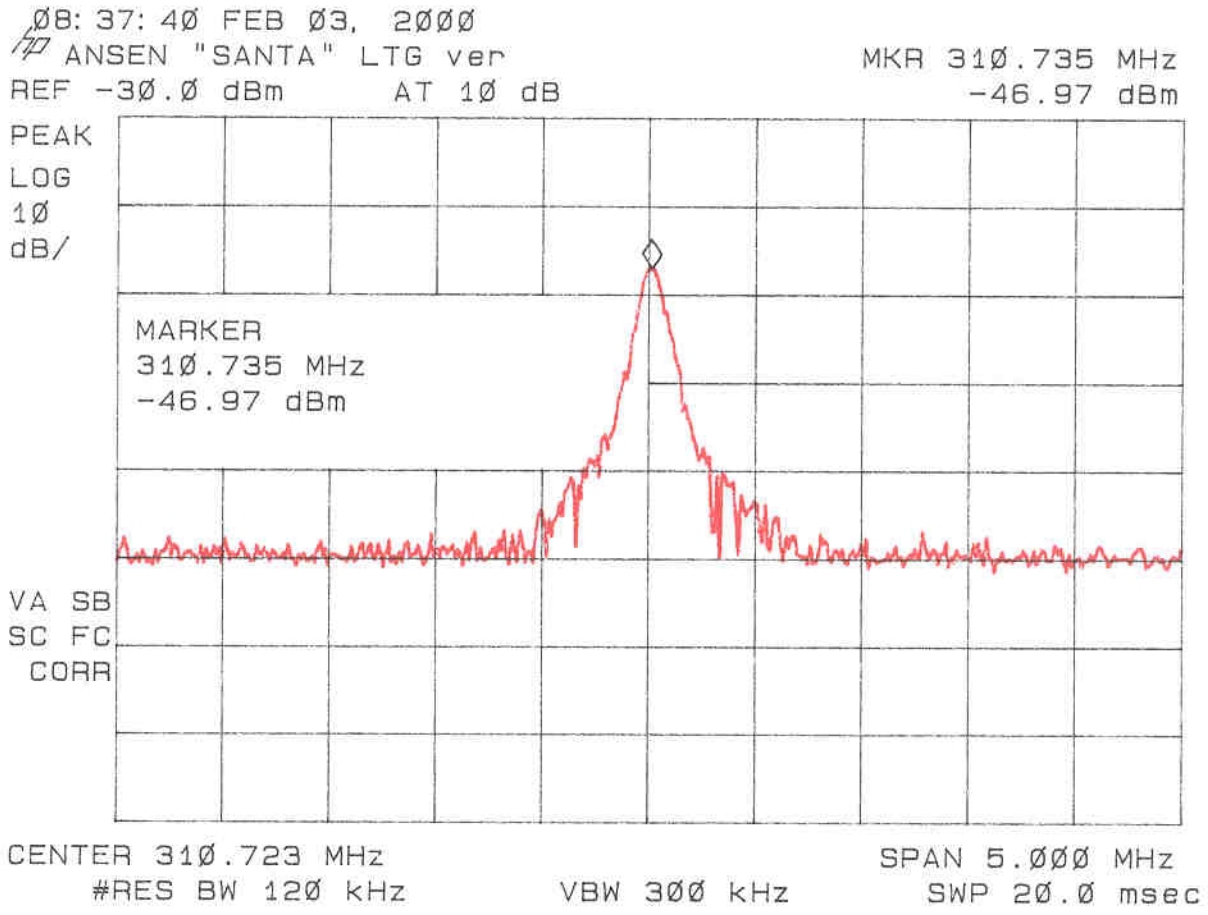


FIGURE 5a

DUTY CYCLE CHARACTERISTICS

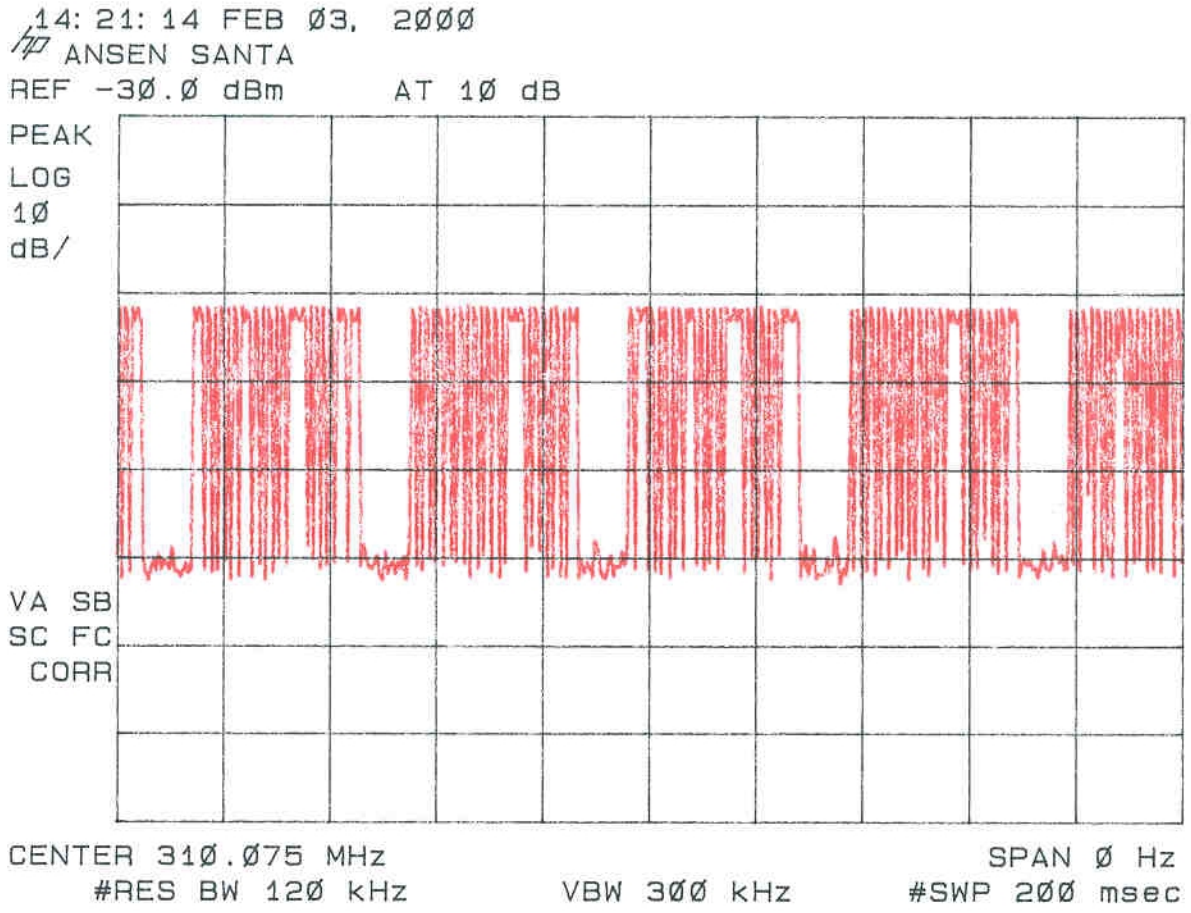


FIGURE 5b

DUTY CYCLE CHARACTERISTICS

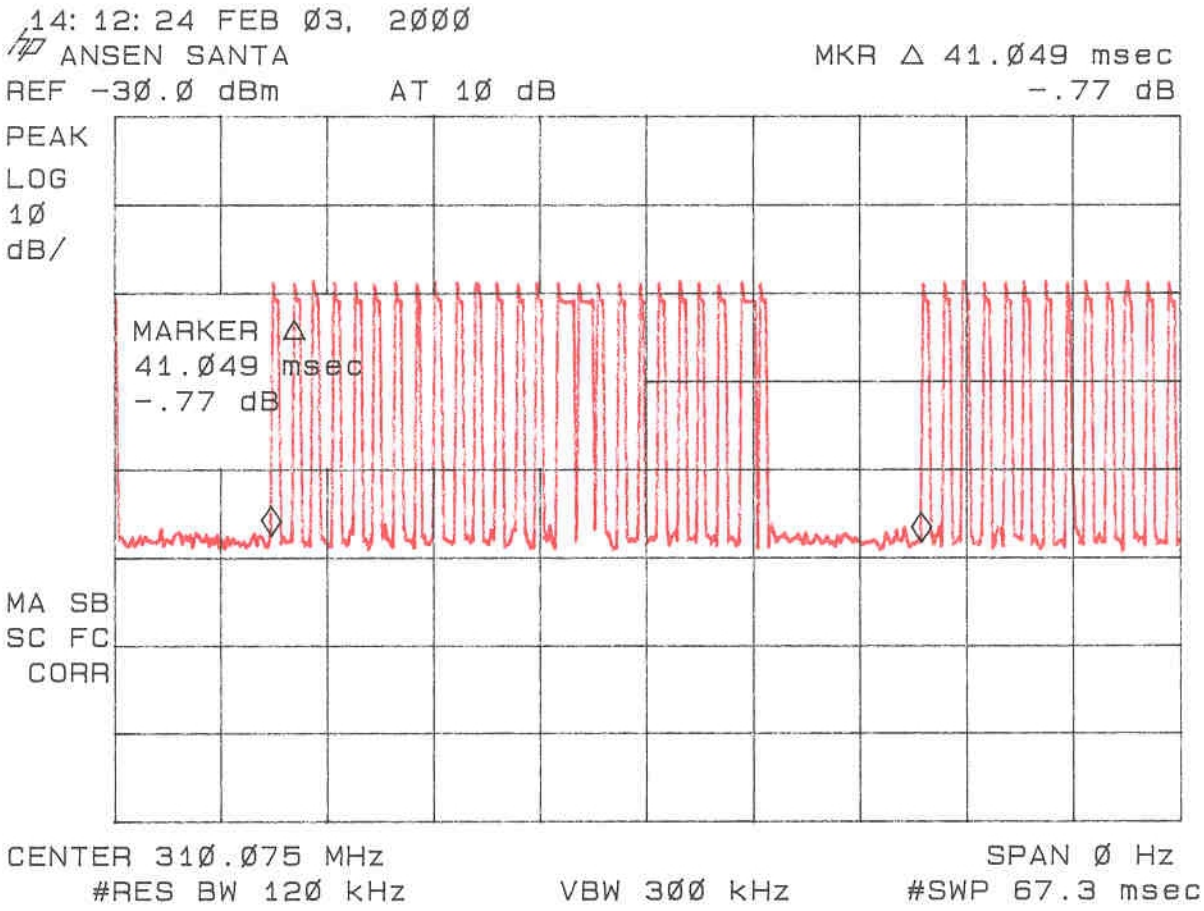


FIGURE 5c

DUTY CYCLE CHARACTERISTICS

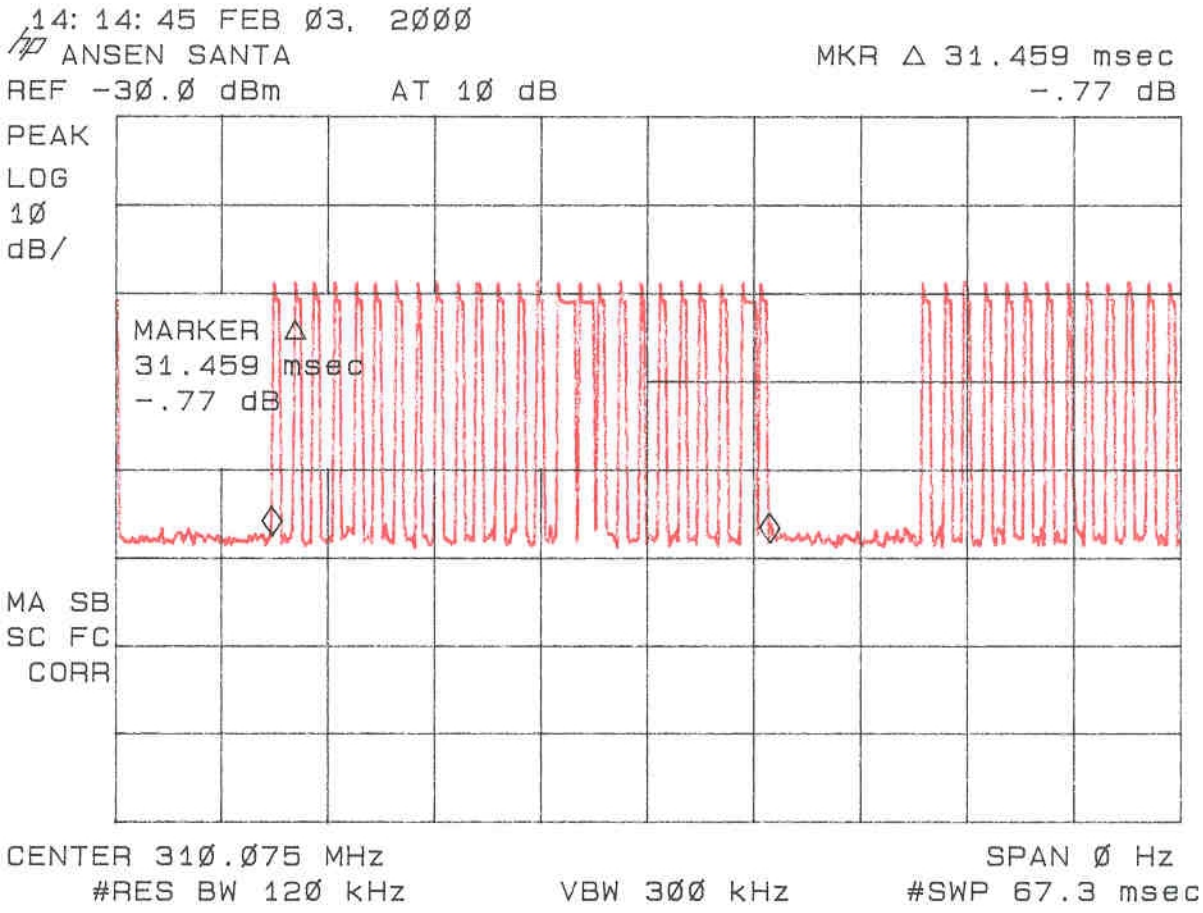


FIGURE 5d

DUTY CYCLE CHARACTERISTICS

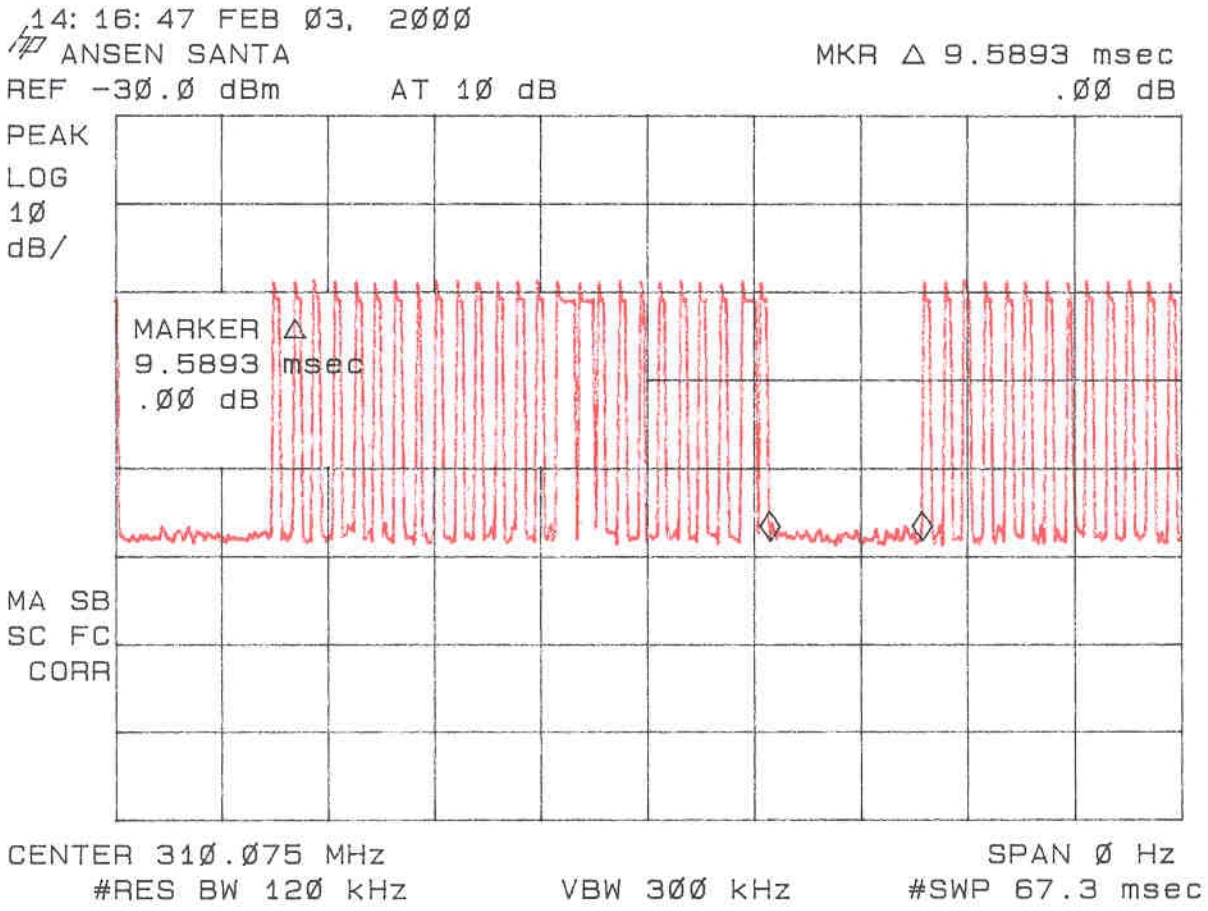


FIGURE 5e

DUTY CYCLE CHARACTERISTICS

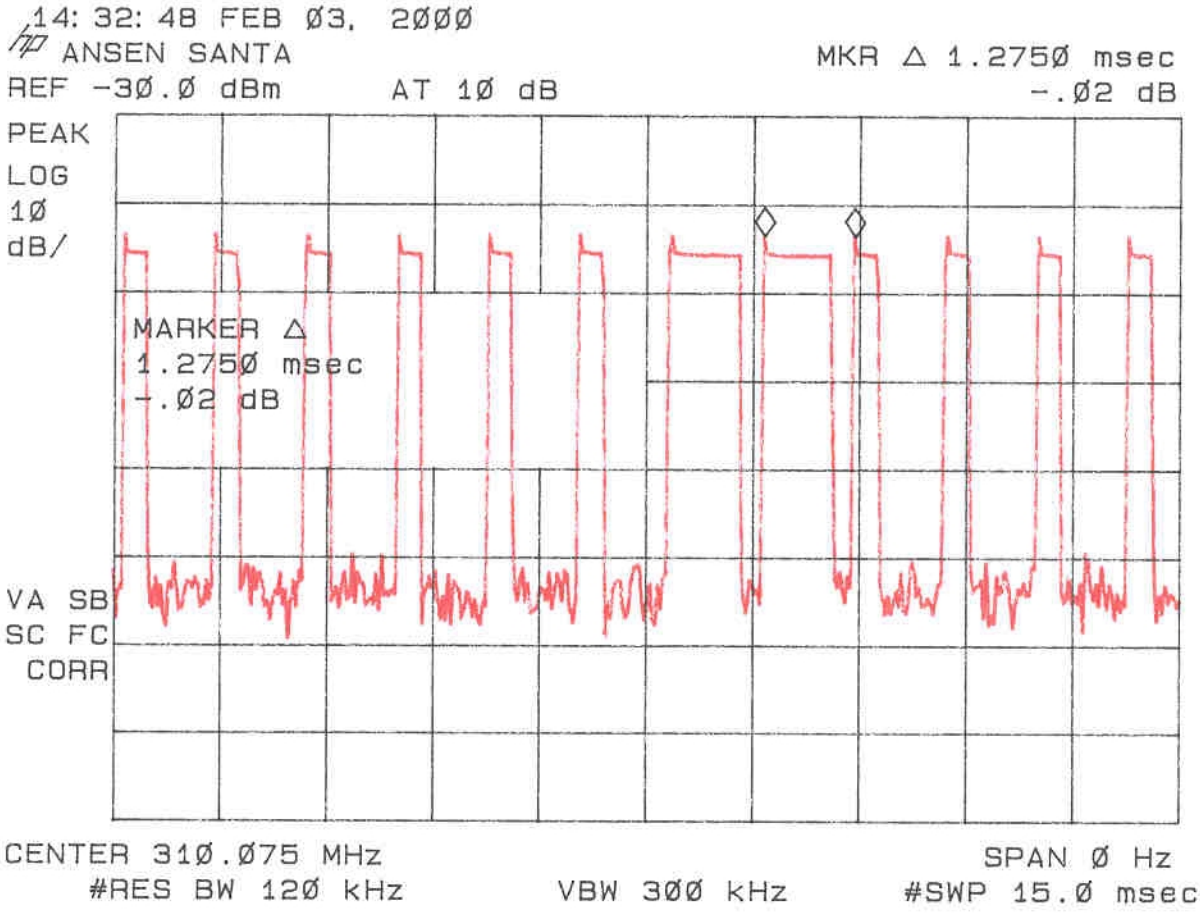


FIGURE 5f

DUTY CYCLE CHARACTERISTICS

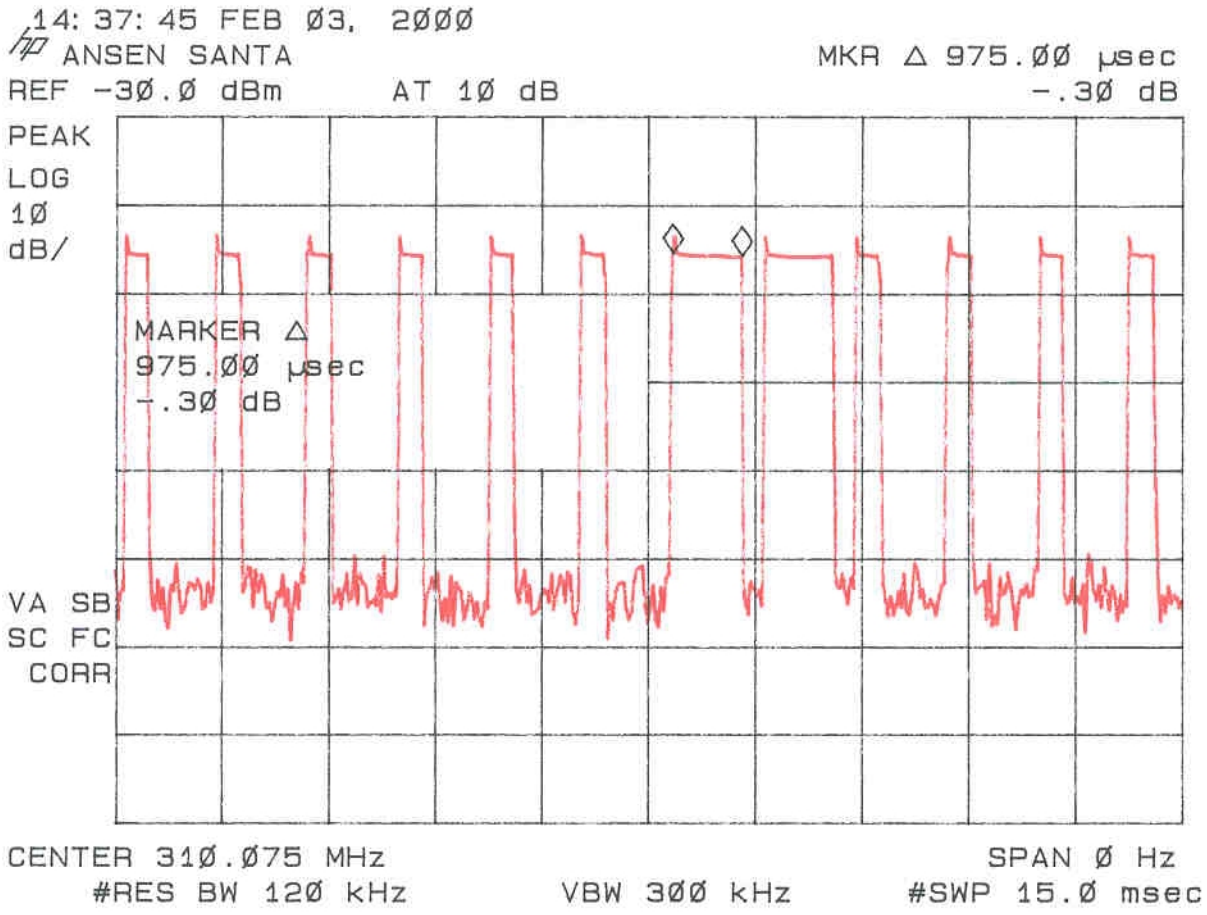
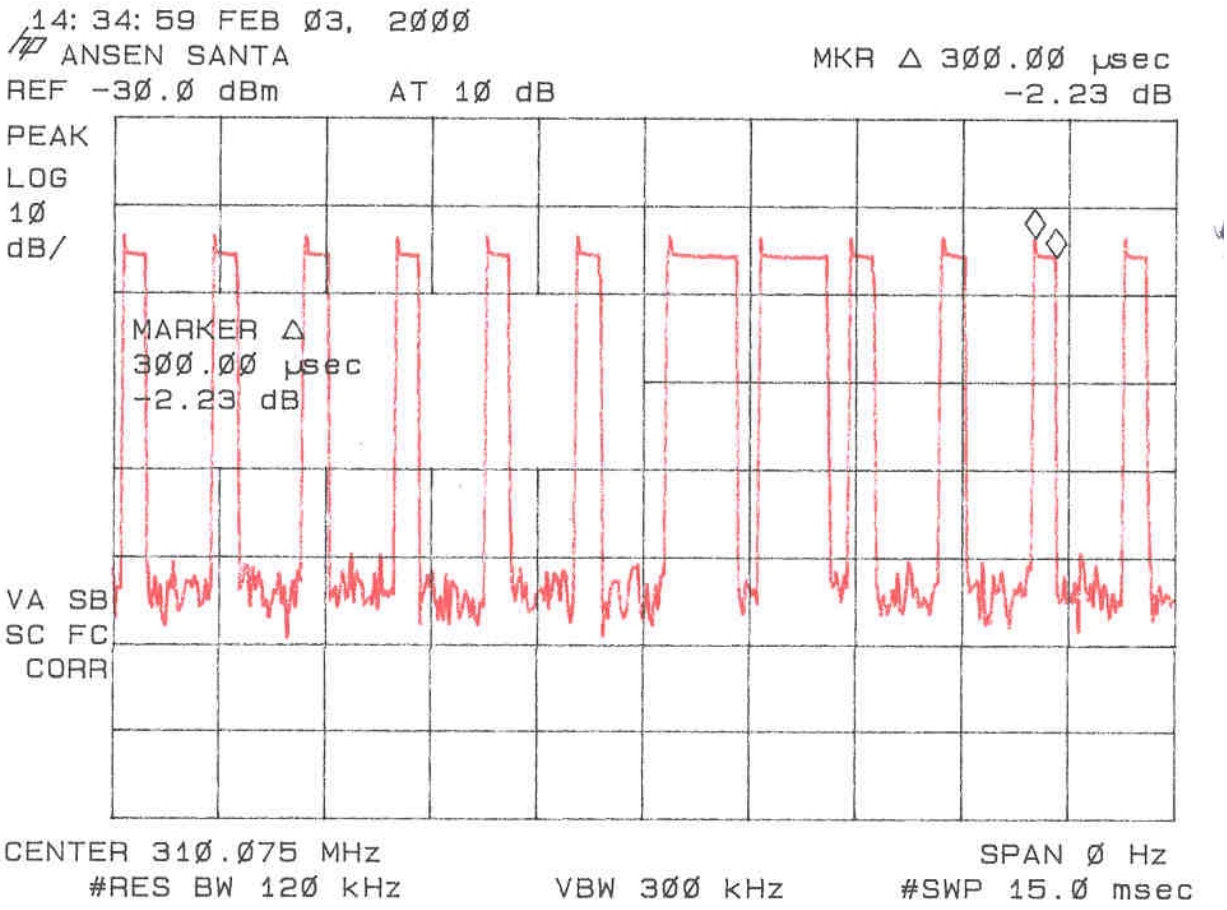


FIGURE 5g

DUTY CYCLE CHARACTERISTICS



Field Strength Of Spurious Emissions (47 CFR 15.231b)

Measurements were made using a peak detector. Field strength of Spurious Emissions are shown in Table 5 and Figures 6. For comparison to the average limits, duty cycle corrections were made as given in the previous section. Any emission less than 1000 MHz and falling within the restricted bands of 15.205 were not adjusted for averaging and the limits of 15.209 were applied.

TABLE 5a

FIELD STRENGTH OF SPURIOUS EMISSIONS

Test Date: February 17, 2000
UST Project: 00-0026
Customer: Ansen Electronic Company
Model: 0581

Peak Measurement

FREQ. (MHz.)	TEST DATA (dBm) @ 3m	ANTENNA FACTOR + CABLE ATTENUATION - AMP GAIN	RESULTS (uV/m) @ 3m	PEAK FCC LIMITS (uV/m) @ 3m
620.3	-74.5	25.3	778.5	5862.5
929.8	-89.9	31.1	256.4	5862.5

**** Denotes restricted band of operation**

SAMPLE CALCULATIONS:

RESULTS uV/m @ 3m = Antilog ((-74.5 + 25.3 + 107)/20) =
CONVERSION FROM dBm TO dBuV = 107 dB

Test Results
Reviewed By: _____ **Name:** Brian T. Parks

TABLE 5b

FIELD STRENGTH OF SPURIOUS EMISSIONS

Test Date: February 17, 2000
UST Project: 00-0026
Customer: Ansen Electronic Company
Model: 0581

Average Measurement

FREQ. (MHz.)	TEST DATA (dBm) @ 3m*	ANTENNA FACTOR + CABLE ATTENUATION - AMP GAIN	RESULTS (uV/m) @ 3m	AVERAGE FCC LIMITS (uV/m) @ 3m
620.3	-79.0	25.3	463.7	586.3
929.8	-94.4	31.1	152.7	586.3

*** Adjusted by duty cycle = 20 log (0.594) = -4.5 dB**
**** Denotes restricted band of operation**

SAMPLE CALCULATIONS:

RESULTS uV/m @ 3m = Antilog ((-79.0 + 25.3 + 107)/20) = 462.4
CONVERSION FROM dBm TO dBuV = 107 dB

Test Results
Reviewed By: _____ **Name:** Brian T. Parks

FIGURE 6a

SPURIOUS EMISSIONS 15.231(b)

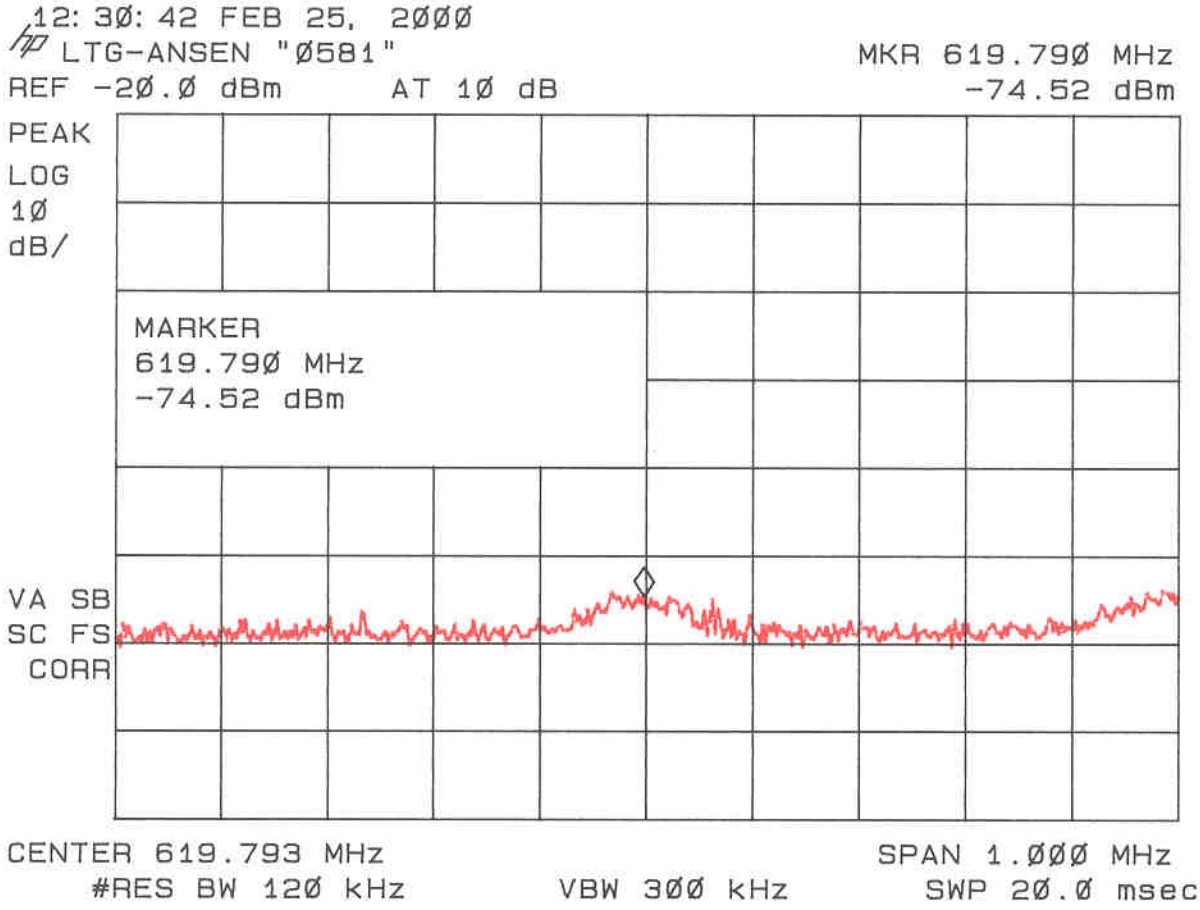
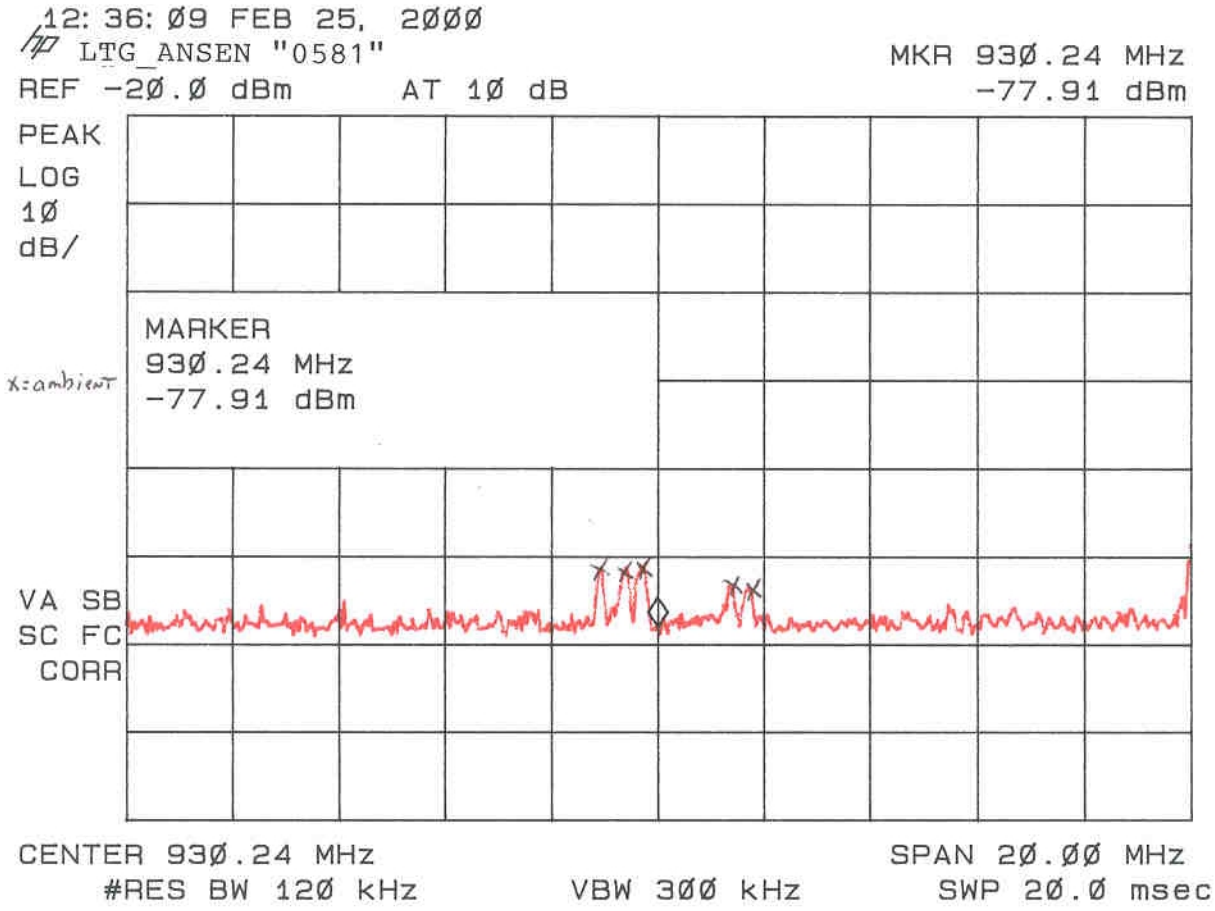


FIGURE 6b

SPURIOUS EMISSIONS 15.231(b)



20 dB Bandwidth of Fundamental Emission (47 CFR 15.231c)

The peak 20 dB bandwidth measurement of the fundamental emission is shown in Table 6 and Figure 7.

TABLE 6

20 dB BANDWIDTH OF FUNDAMENTAL EMISSION

Test Date: ddd
UST Project: 99-714
Customer: Ansen Electronic Company
Model: 0581

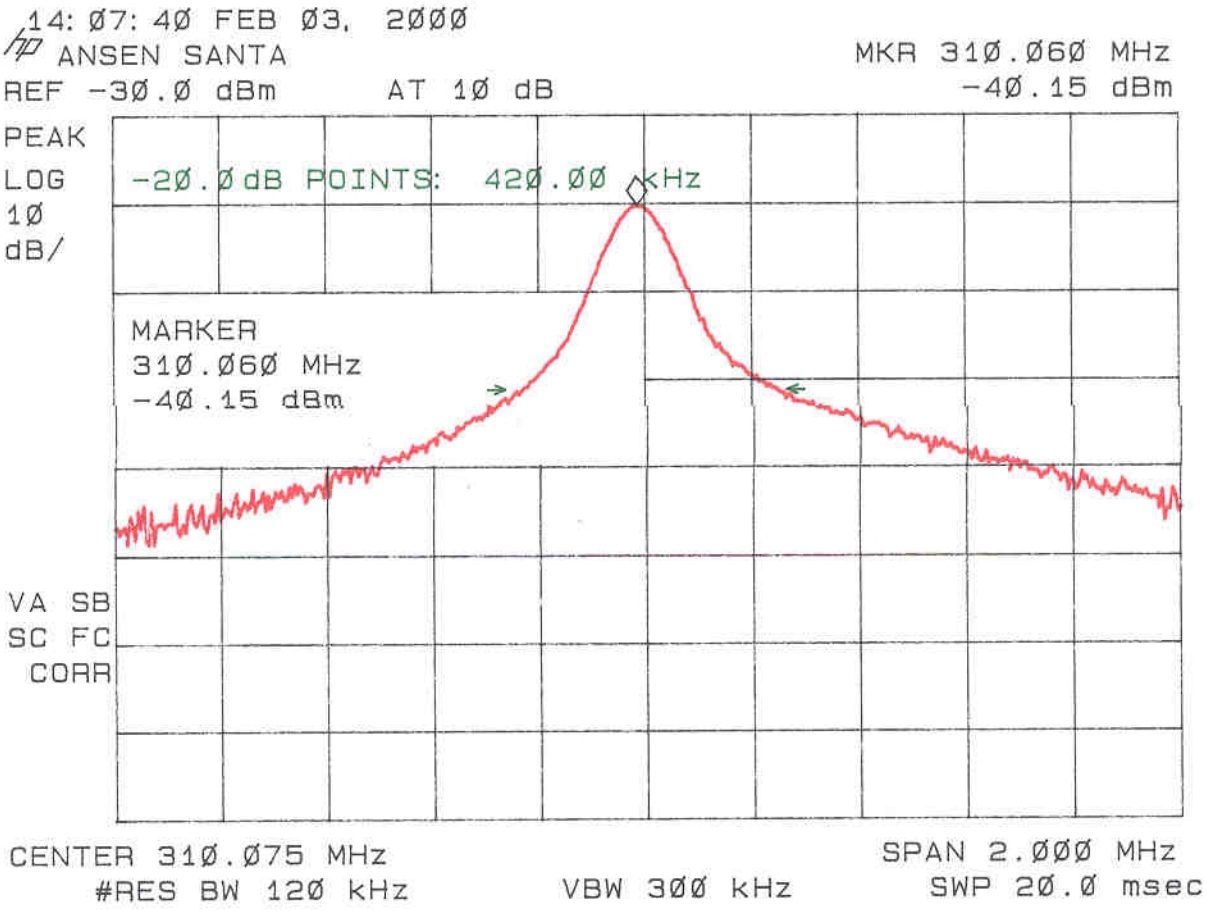
FREQUENCY (MHz)	20 dB BANDWIDTH (kHz)	FCC LIMITS (kHz)
310.0	420.0	775.0

FCC Limit = (0.25%) (Center Frequency) = (0.0025)(310.0) = 775 kHz

Test Results
Reviewed By: _____ **Name:** Tim R. Johnson

FIGURE 7

20 dB BANDWIDTH OF FUNDAMENTAL EMISSION 15.231(c)



Frequency Tolerance of Carrier Signal (47 CFR 15.231d)

The EUT does not operate in the 40.66 - 40.70 MHz band, therefore frequency tolerance measurements were deemed unnecessary.

Radiated Digital Device Emissions (47 CFR 15.109a)

Radiated emissions were evaluated from 30 to 1000 MHz. Measurements were made with the analyzer's bandwidth set to 120 kHz. Emissions are shown in Table 7.

TABLE 7

CLASS B
RADIATED EMISSIONS

Test Date: February 3, 2000
UST Project: 99-714
Customer: Ansen Electronic Company
Model: 0581

FREQ. (MHz)	TEST DATA (dBm) @ 3m	ANTENNA FACTOR + CABLE ATTENUATION	RESULTS (uV/m) @ 3m	FCC LIMITS (uV/m) @ 3m
NO EMISSIONS DETECTED WITHIN 10 dB OF THE FCC LIMITS				

Test Results
Reviewed By: _____ **Name:** Tim R. Johnson

Power Line Conducted Emissions (47 CFR 15.107a)

The EUT is operated by internal battery power only, therefore power line conducted emissions was deemed unnecessary.