ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT
CERTIFICATION TO FCC PART 15 REQUIREMENTS

for

INTENTIONAL RADIATOR

315 MHz SKI FINDER ALARM TRANSMITTER

MODEL NO: MFSKITX2

FCC ID NO: OAVSKI315TX

REPORT NO: 00E8929

ISSUE DATE: SEPTEMBER 19, 2000

Prepared for
ALTRUSTY ENTERPRISE CO., LTD.
4th FLOOR, NO. 3, ALLEY 16, LANE 235,
BAU CHIAU ROAD, HSIN-TIEN CITY, TAIPEI ,
TAIWAN, R. O. C.

Prepared by
COMPLIANCE ENGINEERING SERVICES, INC.
d.b.a.
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TABLE OF CONTENTS **PAGE**

TEST DATA

- Maximum Modulation Percentage Plot
- Emission Bandwidth Plot
- Radiated Emission Worksheet for Peak Measurement
- Radiated Emission Worksheet for Average Measurement

1. VERIFICATION OF COMPLIANCE

COMPANY NAME:	ALTRUSTY ENTERPRISE CO., LTD. 4th FLOOR, NO. 3, ALLEY 16, LANE 235, BAU CHIAU ROAD, HSIN-TIEN CITY, TAIPEI , TAIWAN, R. O. C.
CONTACT PERSON:	ERIC WANG / GENERAL MANAGER
TELEPHONE NO.:	02-8665-6969
EUT DESCRIPTION:	315 MHz SKI FINDER ALARM TRANSMITTER
MODEL NAME/NUMBER:	MFSKITX2
FCC ID:	OAVSKI315TX
DATE TESTED:	AUGUST 28, 2000 ~ SEPTEMBER 14, 2000
REPORT NUMBER:	00E8929

TYPE OF EQUIPMENT	SECURITY EQUIPMENT (INTENTIONAL RADIATOR)
EQUIPMENT TYPE	315 MHz SKI FINDER ALARM TRANSMITTER
MEASUREMENT PROCEDURE	ANSI C63.4 / 1992
LIMIT TYPE	CERTIFICATION
FCC RULE	CFR 47, PART 15

The above equipment was tested by Compliance Certification Services for compliance with the requirements set forth in the FCC CFR 47, PART 15. The results of testing in this report apply to the product/system which was tested only. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties. **Warning** : This document reports conditions under which testing was conducted and results of tests performed. This document may not be altered or revised in any way unless done so by Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification will constitute fraud and shall nullify the document.

Rick Yeo

RICK YEO / EMC MANAGER
COMPLIANCE ENGINEERING SERVICES, INC.

2. Product Description

Fundamental Frequency	**315 MHz**
Power Source	**12V Battery**
Transmitting Time	**Periodic ≤ 5 seconds**
Associated Receiver	FCC DoC

3. Test Facility

The 3/10/30 meter open area test site and conducted measurement facility used to collect the radiated data is located at 561F Monterey Road, Morgan Hill, California, U.S.A. A detailed description of the test facility was submitted to the Commission on May 27,1994.

4. Measurement Standards

The site is constructed and calibrated in conformance with the requirements of ANSI C63.4/1992.

5. Test Methodology

For an intentional radiator, the spectrum shall be investigated from the lowest radio frequency signal generated in the device, without going below 9 KHz, up to at least the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower. (CFR 47 Section 15.33)

6. Measurement Equipment Used

Manufacturer	Model Number	Description	Cal Due Date
H.P.	8566B	Spectrum Analyzer (100Hz – 22GHz)	12/00
H.P.	8595EM	Spectrum Analyzer (9KHz – 6.5GHz)	01/01
EMCO	3115	Antenna (1-18GHz)	09/01
EMCO	3142	Antenna (30-2000MHz)	06/01
T.E.C.	PA-102	Amplifier(30-2000MHz)	05/01
MITEQ	NSP2600-44	Amplifier(1-26GHz)	12/00

7. POWERLINE RFI LIMIT

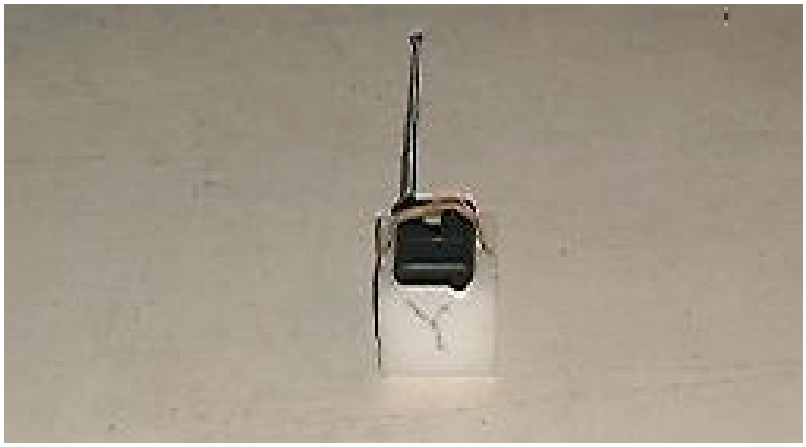
CONNECTED TO AC POWER LINE	SECTION 15.207
CARRIER CURRENT SYSTEM IN THE FREQUENCY RANGE OF 450 kHZ TO 30 MHz	SECTION 15.205 AND SECTION 15.209, 15.221, 15.223, 15.225 OR 15.227, AS APPROPRIATE.
BATTERY POWER	NO REQUIRED.

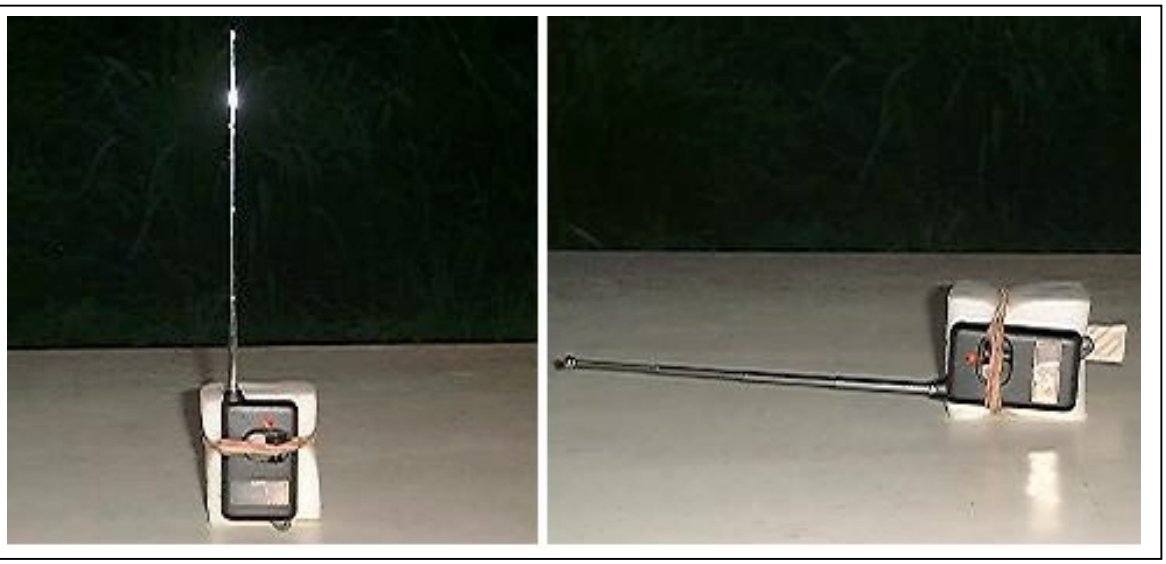
8. RADIATED EMISSION LIMITS

GENERAL REQUIREMENTS	SECTION 15.209
RESTRICTED BANDS OF OPERATION	SECTION 15.205
PERIODIC OPERATION IN THE BAND 40.66 -40.70 MHz AND ABOVE 70 MHz.	SECTION 15.231

9. SYSTEM TEST CONFIGURATION

Use a block of foam and combined it with EUT wrapping rubber band around it. This way it can test X.Y, and Z axis. To activate continuous transmission, place a small plastic block between rubber band and EUT push button.





10. Test Procedure
Radiated Emissions, 15.231(4)(b)

Test Set-up for frequency range 30 – 1000 MHz

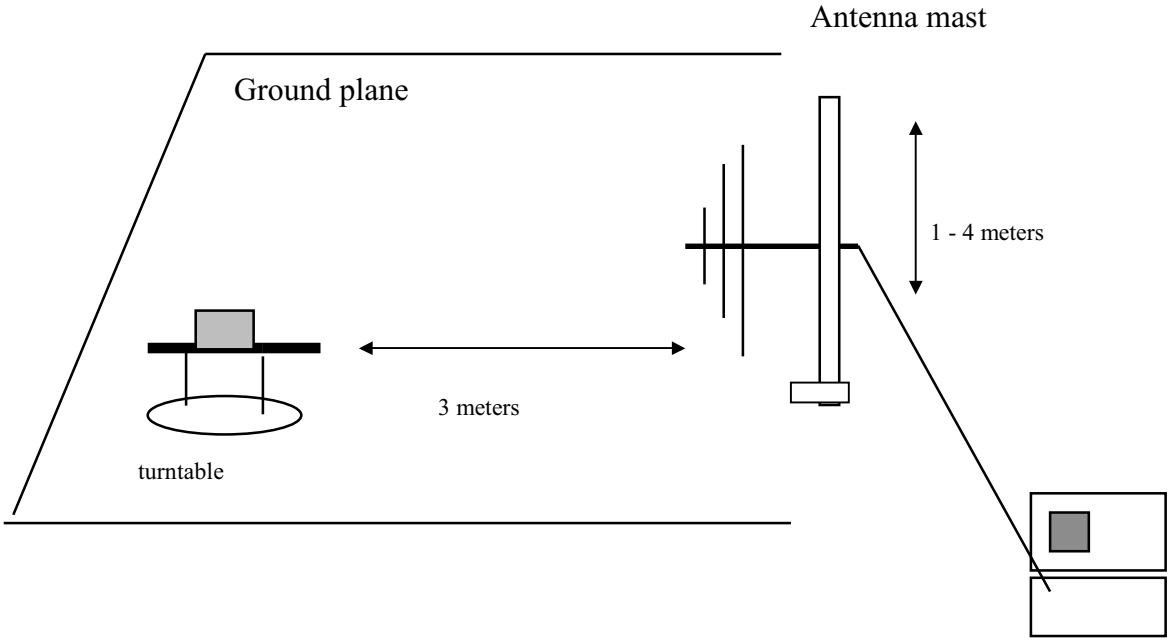


Fig. 1

1. The EUT was placed on a wooden table on the outdoor ground plane. The search antenna was placed 3-meters from the EUT.

2. The turntable was slowly rotated to locate the direction of maximum emission at each emission falling in the restricted bands of 15.205. The EUT was moved throughout the XY, XZ, and YZ planes to maximize emissions received by the search antenna.

3. Once maximum direction was determined, the search antenna was raised and lowered in both vertical and horizontal polarizations. The maximum readings so obtained are recorded in the data listed below.

Test set-up for measurements above 1GHz

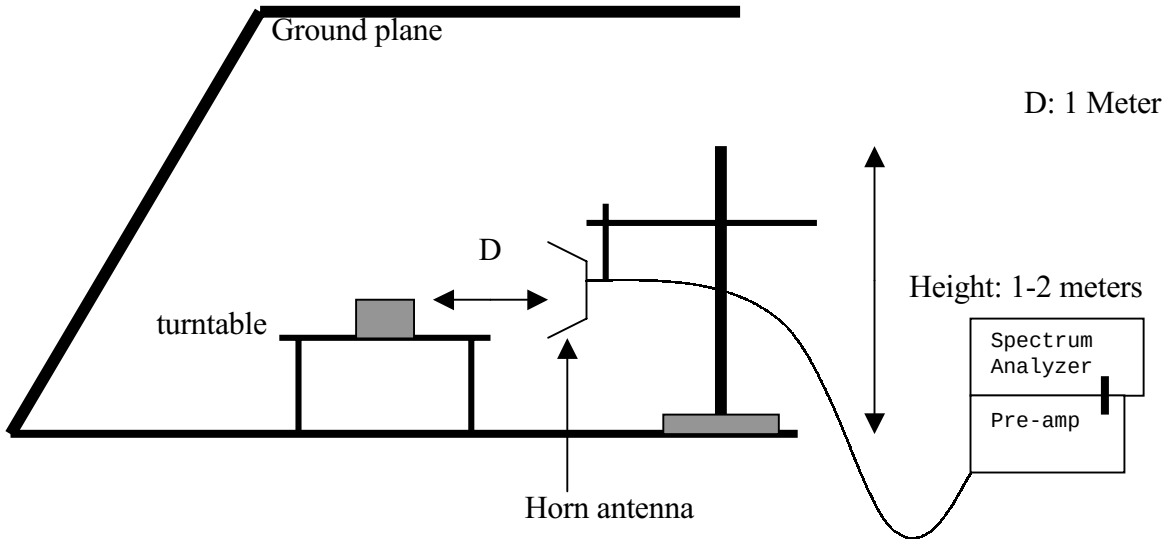


FIG. 2

1. The EUT was placed on a wooden table on the outdoor ground plane. The search antenna was placed 1-meters from the EUT. The EUT antenna was mounted vertically as per normal installation.

2. The turntable was slowly rotated to locate the direction of maximum emission at each emission falling in the restricted bands of 15.205. The EUT was moved throughout the XY, XZ, and YZ planes to maximize emissions received by the search antenna.

3. Once maximum direction was determined, the search antenna was raised and lowered in both vertical and horizontal polarizations. The maximum readings so obtained are recorded in the data listed below.

11. Equipment Modifications

To achieve compliance to FCC Section 15.231 technical limits, the following change(s) were made during compliance testing:

NONE

12. TEST RESULT

Powerline RFI Class B	Eut	Radiated Emission Limits	Eut
SECTION 15.207		SECTION 15.209	X
SECTION 15.205, 15.209, 15.221, 15.223, x 15.225 OR 15.227		SECTION 15.205	
BATTERY POWER	X	SECTION 15.231 (b)	X
		SECTION 15.231 (e)	

12.1 Maximum Modulation Percentage (M%)

CALCULATION:

Average Reading = Peak Reading (dBuV/m)+ 20log (Duty Cycle)

In order to determine possible Maximum Modulation percentage, alternations are made to the EUT. We measured:

WHERE	1 Period	=31.325 mS
	Long pulse	=0.45 mS
	Short pulse	= 0.15 mS
	No of Long pulse	= 15
	No of Short pulse	= 14

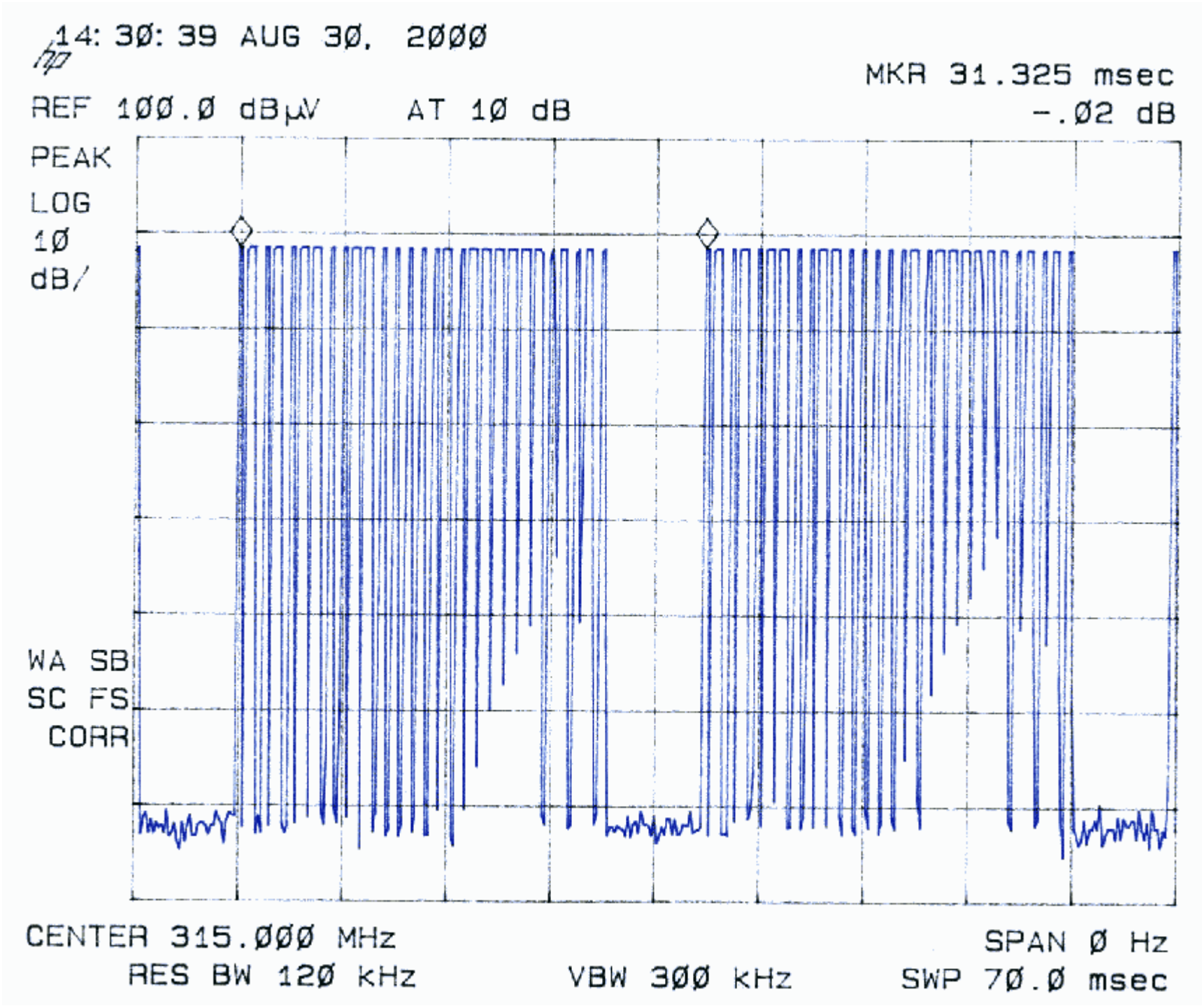
Duty Cycle = (N1L1+N2L2+…+Nn-1Ln-1+NnLn)/100 or T

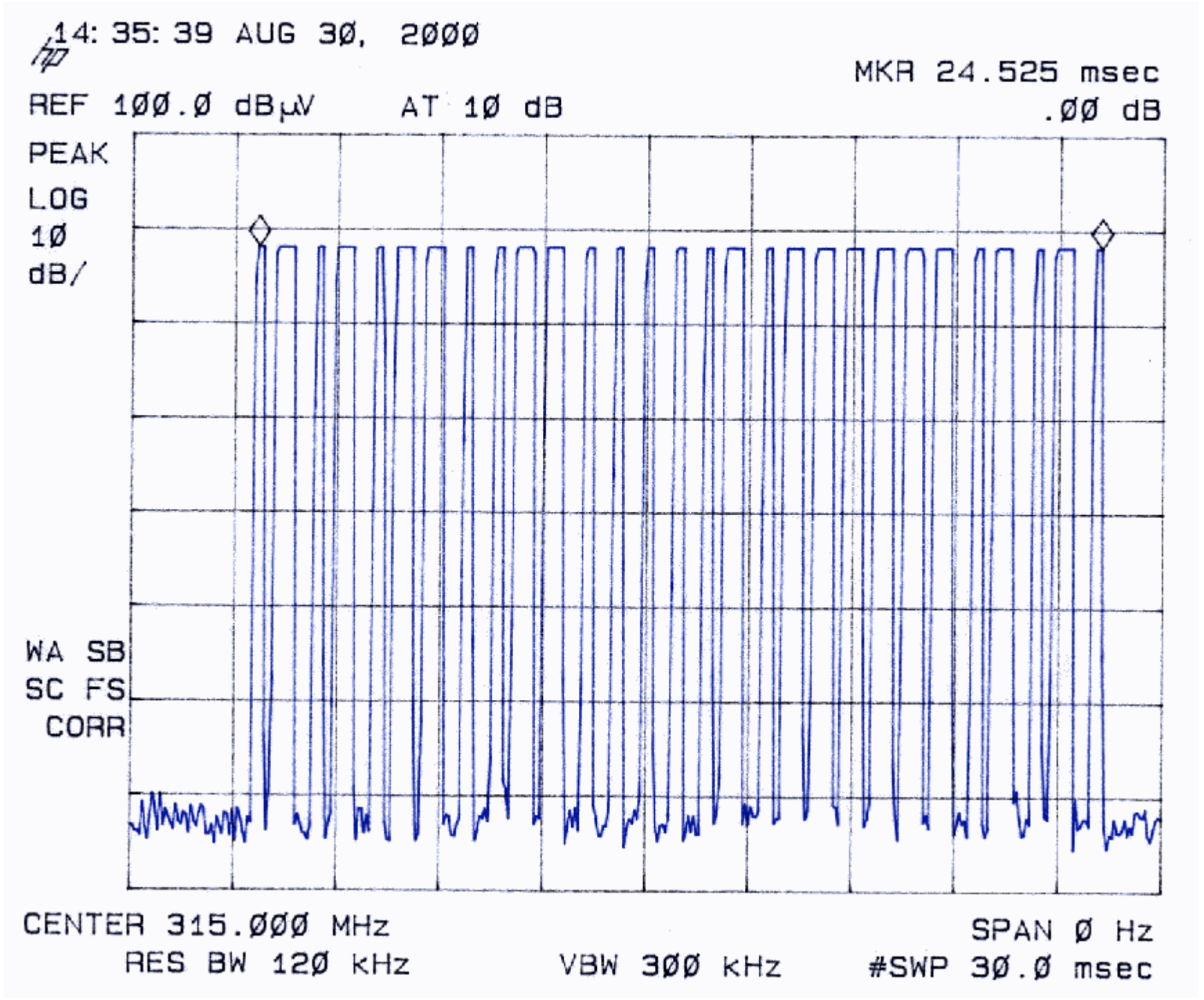
Duty Cycle = ((15x0.45)+(14x0.15))/31.325=0.2825=28.25% or –10.98dB

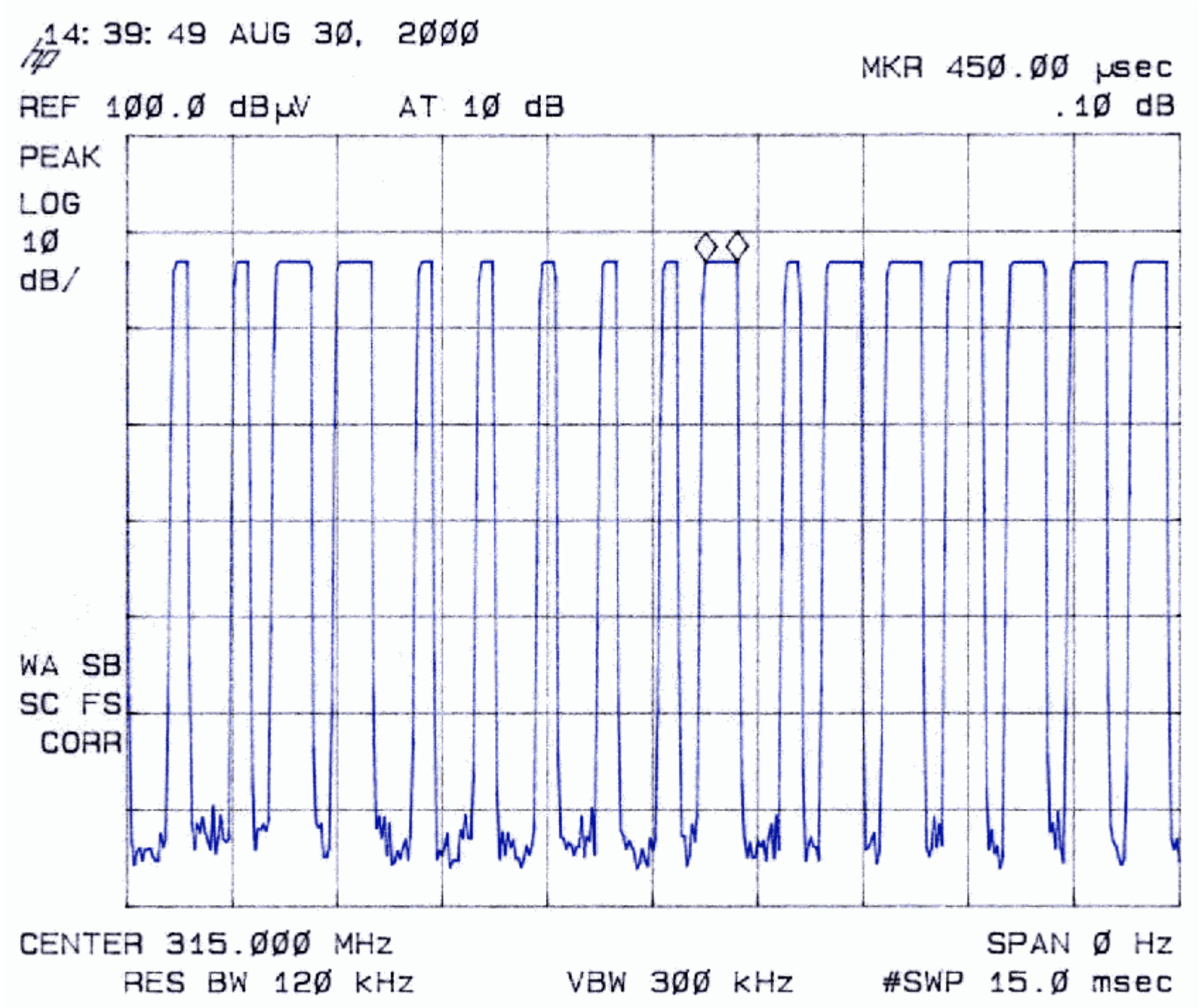
12.2 The Emissions Bandwidth

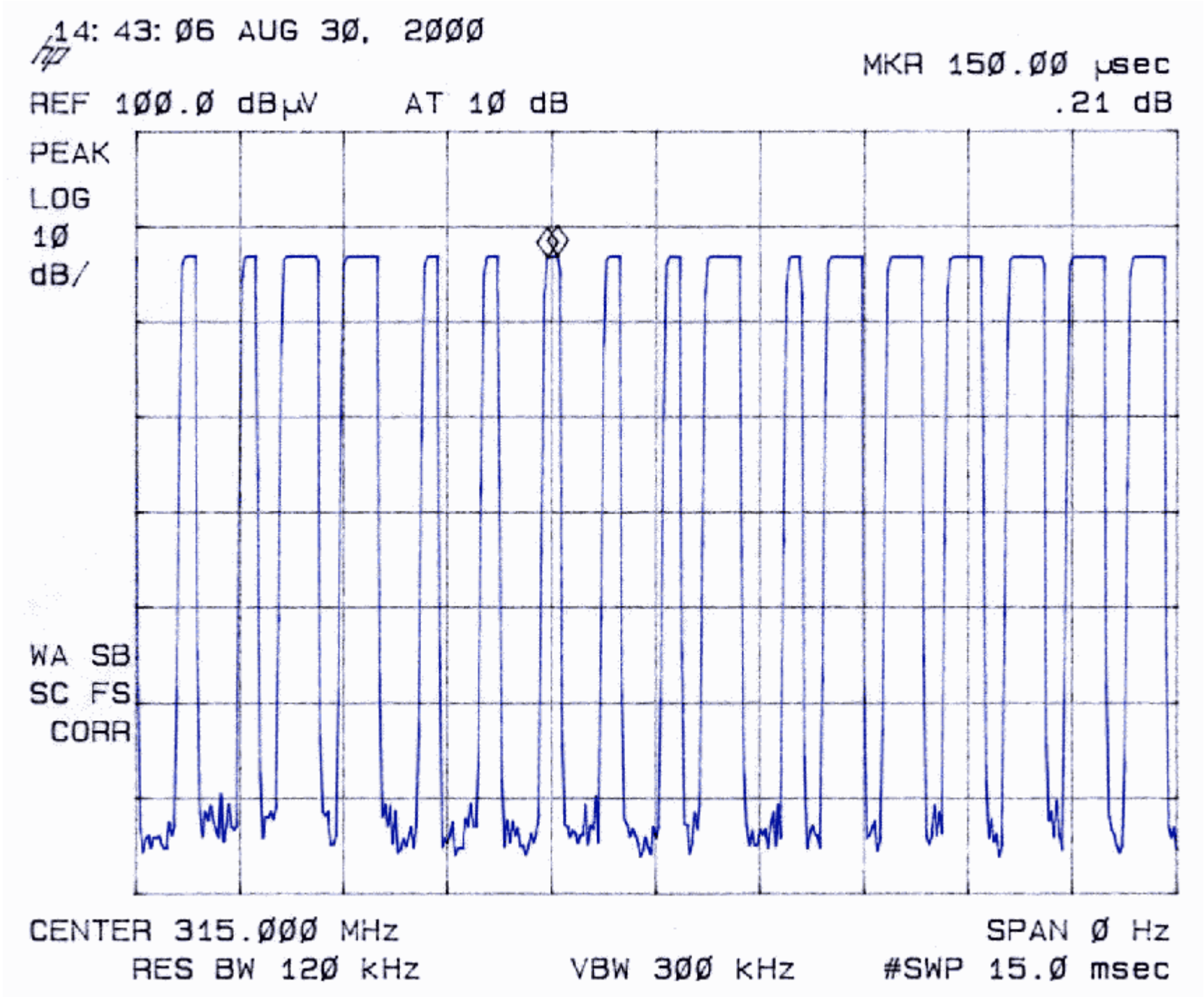
The bandwidth of the emissions were investigated per 15.231(c)

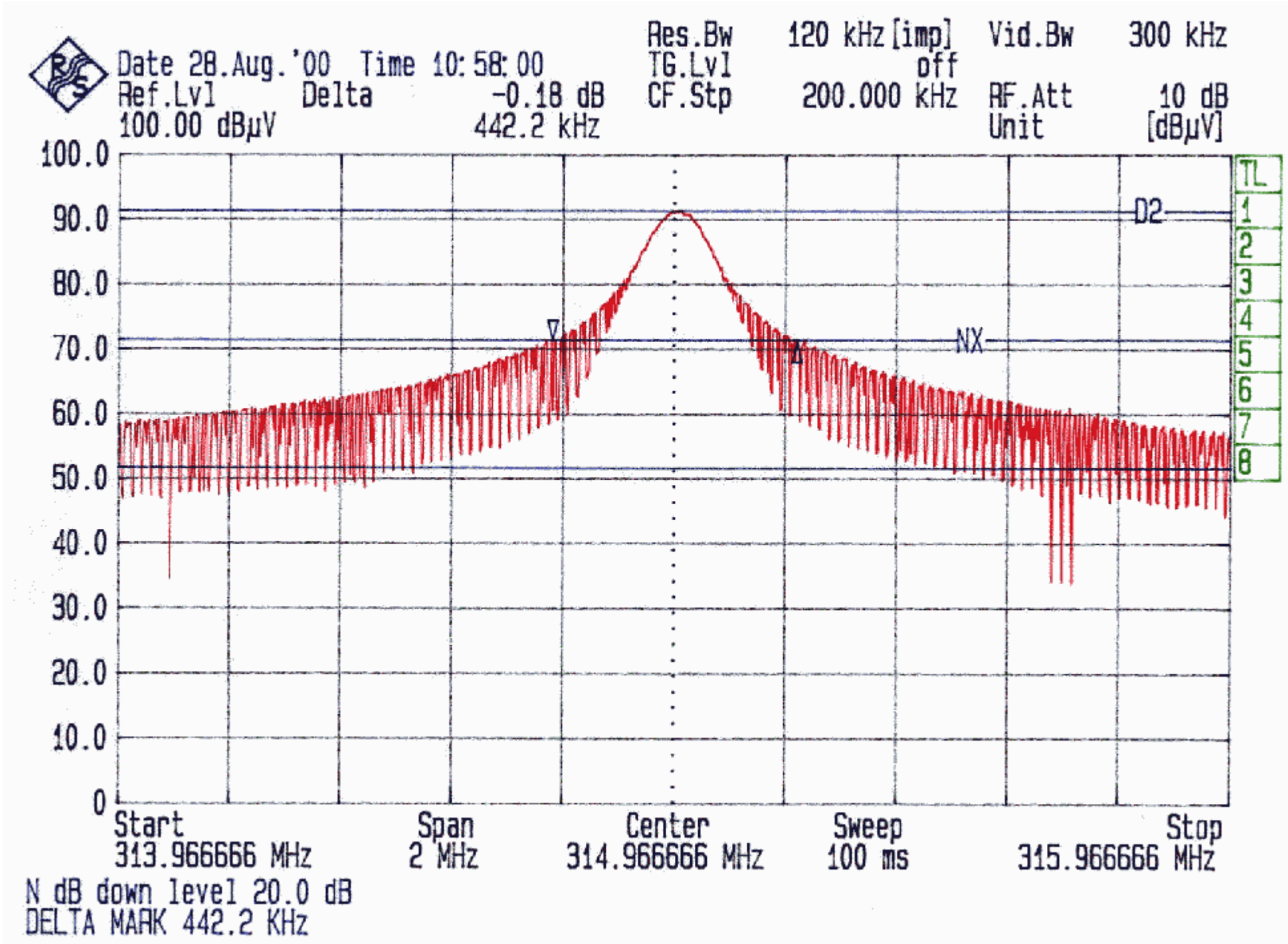
Center Frequency	Measured	Limits
315 MHz	**442.2 kHz < (refer to plot)**	**315X0.25%=787.5 kHz**


14: 30: 39 AUG 30, 2000
MKR 31.325 msec
REF 100.0 dBµV
AT 10 dB
-.02 dB
PEAK
LOG
10
dB/
WA SB
SC FS
CORR
CENTER 315.000 MHz
SPAN 0 Hz
RES BW 120 kHz
VBW 300 kHz
SWP 70.0 msec


14: 35: 39 AUG 3Ø, 2ØØØ
MKR 24.525 msec
REF 1ØØ.Ø dBμV
AT 1Ø dB
.ØØ dB
PEAK
LOG
1Ø
dB/
WA SB
SC FS
CORR
CENTER 315.ØØØ MHz
SPAN Ø Hz
RES BW 12Ø kHz
VBW 3ØØ kHz
#SWP 3Ø.Ø msec


14: 39: 49 AUG 30, 2000
MKR 450.00 µsec
REF 100.0 dBµV
AT 10 dB
.10 dB
PEAK
LOG
10
dB/
WA SB
SC FS
CORR
CENTER 315.000 MHz
SPAN 0 Hz
RES BW 120 kHz
VBW 300 kHz
#SWP 15.0 msec


14: 43: Ø6 AUG 3Ø, 2ØØØ
MKR 15Ø.ØØ µsec
REF 1ØØ.Ø dBµV
AT 1Ø dB
.21 dB
PEAK
LOG
1Ø
dB/
WA SB
SC FS
CORR
CENTER 315.ØØØ MHz
SPAN Ø Hz
RES BW 12Ø kHz
VBW 3ØØ kHz
#SWP 15.Ø msec


Date 28.Aug.'00 Time 10:58:00
Res.Bw 120 kHz [imp]
Vid.Bw 300 kHz
TG.Lvl off
Ref.Lvl 100.00 dBµV
Delta -0.18 dB 442.2 kHz
CF.Stp 200.000 kHz
RF.Att 10 dB
Unit [dBµV]
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0
D2
NX
TL
1
2
3
4
5
6
7
8
Start 313.966666 MHz
Span 2 MHz
Center 314.966666 MHz
Sweep 100 ms
Stop 315.966666 MHz
N dB down level 20.0 dB
DELTA MARK 442.2 KHz

COMPLIANCE Certification Services

FCC, VCCI, CISPR, CE, AUSTEL, NZ
UL, CSA, TUV, BSMI, DHHS, NVLAP

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Project #:	00E8929
Report #:	8929D1
Date& Time:	9/01/00
Test Engr:	VINCE CHIANG

Company:	ALTRUSTY ENTERPRISE CO.,LTD.
EUT Description:	MFSKITX2 (Alam TX /315 MHZ)
Test Configuration :	EUT ONLY
Type of Test:	FCC CLASS B
Mode of Operation:	NORMAL MODE

(•) D-Site ( ) E-Site

M% = ((t1+t2+t3+…)/T) * 100% = **28.25 %**

Av Reading = Pk Reading + 20*log(M%)

20*log(M%) = **-10.98**

	Freq. (MHz)	Pk Rdg (dBuV)	Av Rdg (dBuV)	AF (dB)	Closs (dB)	Pre-amp (dB)	Level (dBuV/m)	Limit FCC_B	Margin (dB)	Pol (H/V)	Az (Deg)	Height (Meter)
	Button #1:											
X	314.97	66.61	55.63	14.44	1.99	22.37	49.69	75.62	-25.93	3mV	0	1.35
Y	314.97	77.79	66.81	14.44	1.99	22.37	60.87	75.62	-14.75	3mV	180	1.35
Z	314.97	71.06	60.08	14.44	1.99	22.37	54.14	75.62	-21.48	3mV	90	1.60
X	314.97	78.73	67.75	14.44	1.99	22.37	61.81	75.62	-13.81	3mH	270	1.00
Y	314.97	90.20	79.22	14.44	1.99	22.37	73.28	75.62	-2.34	3mH	0	2.20
Z	314.98	90.86	79.88	14.44	1.99	22.37	73.94	75.62	-1.68	3mH	0	1.75
Z	629.96	56.33	45.35	20.36	3.29	23.20	45.80	55.62	-9.82	3mH	90	1.50
Z	945.15	37.73	26.75	23.84	4.14	22.26	32.47	55.62	-23.15	3mH	180	1.30
	Button #2:											
X	314.97	90.56	79.58	14.44	1.99	22.37	73.64	75.62	-1.98	3mV	0	1.50
Y	314.97	90.05	79.07	14.44	1.99	22.37	73.13	75.62	-2.49	3mV	270	1.50
Z	314.98	78.80	67.82	14.44	1.99	22.37	61.88	75.62	-13.74	3mV	90	1.70
X	314.97	90.56	79.58	14.44	1.99	22.37	73.64	75.62	-1.98	3mH	270	1.00
Y	314.97	90.05	79.07	14.45	1.98	22.16	73.34	75.62	-2.28	3mH	270	1.00
Z	314.98	78.80	67.82	14.44	1.99	22.37	61.88	75.62	-13.74	3mH	0	1.75
X	629.96	61.69	50.71	20.36	3.29	23.20	51.16	55.62	-4.46	3mH	270	1.00
X	945.03	30.68	19.70	23.84	4.14	22.26	25.42	55.62	-30.20	3mH	0	2.25
	Total data #: 16											

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FCC, VCCI, CISPR, CE, AUSTEL, NZ
UL, CSA, TUV, BSMI, DHHS, NVLAP

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Project #:	00E8929
Report #:	8929D2
Date& Time:	9/14/00 22:44
Test Engr:	Vince Chiang

Company:	ALTRUSTY ENTERPRISE CO.,LTD.
EUT Description:	MFSKITX2 (Alam TX /315 MHZ)
Test Configuration :	EUT ONLY
Type of Test:	FCC CLASS B
Mode of Operation:	NORMAL MODE

(•) D-Site ( ) E-Site 6 Worst Descendin

Freq. (MHz)	Reading (dBuV)	AF (dB)	Closs (dB)	Pre-amp (dB)	Dist dB	Level (dBuV/m)	Limit FCC_B	Margin (dB)	Pol (H/V)	Az (Deg)	Height (Meter	Mark (P/Q/A)
1260	**57.50**	**25.2**	**2.8**	**43.29**	**-9.5**	**32.62**	**74.0**	**-41.38**	**1mV**	**0**	**1.2**	**P**
1260	**46.00**	**25.2**	**2.8**	**43.29**	**-9.5**	**21.12**	**54.0**	**-32.88**	**1mV**	**0**	**1.2**	**A**
1575	**60.04**	**25.5**	**3.1**	**43.13**	**-9.5**	**36.00**	**74.0**	**-38.00**	**1mV**	**0**	**1.2**	**P**
1575	**49.18**	**25.5**	**3.1**	**43.13**	**-9.5**	**25.14**	**54.0**	**-28.86**	**1mV**	**0**	**1.2**	**A**
1260	**50.31**	**25.2**	**2.8**	**43.29**	**-9.5**	**25.43**	**74.0**	**-48.57**	**1mH**	**270**	**1.2**	**P**
1260	**38.03**	**25.2**	**2.8**	**43.29**	**-9.5**	**13.15**	**54.0**	**-40.85**	**1mH**	**270**	**1.2**	**A**
1575	**53.65**	**25.5**	**3.1**	**43.13**	**-9.5**	**29.61**	**74.0**	**-44.39**	**1mH**	**270**	**1.2**	**P**
1575	**39.91**	**25.5**	**3.1**	**43.13**	**-9.5**	**15.87**	**54.0**	**-38.13**	**1mH**	**270**	**1.2**	**A**

No other emissions were found within 20dB under the limits upto 3.2GHz.

Total data #: 8 V.2d

Peak: RBW=VBW=1MHz
Average: RBW=1MHz, VBW=10Hz

Distance = 20log(1/3)= -9.5dB