

TABLE OF CONTENTS

APPLICANT: BOXER TOYS CO., LTD.

FCC ID: KT6B2199

TEST REPORT CONTAINING:

PAGE 1.....TEST EQUIPMENT & TEST PROCEDURE
PAGE 2.....TEST PROCEDURE CONTINUED
PAGE 3.....CIRCUIT DESCRIPTION
PAGE 4.....49.86 MHz Tx RADIATION INTERFERENCE TEST DATA
PAGE 5.....49.405MHz Tx RADIATION INTERFERENCE TEST DATA
PAGE 6.....OCCUPIED BANDWIDTH TEST DATA

EXHIBITS ATTACHMENTS:

EXHIBIT 1.....BLOCK DIAGRAM
EXHIBIT 2.....SCHEMATICS
EXHIBIT 3.....INSTRUCTION MANUAL
EXHIBIT 4.....FCC ID LABEL SAMPLE
EXHIBIT 5.....FCC ID LABEL LOCATION
EXHIBIT 6.....FRONT VIEW EXTERNAL PHOTOGRAPH
EXHIBIT 7.....REAR VIEW EXTERNAL PHOTOGRAPH
EXHIBIT 8.....INTERNAL COMPONENT SIDE PHOTOGRAPH
EXHIBIT 9.....INTERNAL COPPER SIDE PHOTOGRAPH
EXHIBIT 10.....TEST SET UP PHOTO
EXHIBIT 11.....OCCUPIED BANDWIDTH PLOT - 49.86 MHz TX
EXHIBIT 12.....OCCUPIED BANDWIDTH PLOT - 49.405 MHz TX
EXHIBIT 13.....CIRCUIT DESCRIPTION

APPLICANT: BOXER TOYS CO., LTD.

FCC ID: KT6B2199

REPORT #: T:\cus\B\BOXER\545AZ0\545AZ0RPT.doc

TABLE OF CONTENTS

APPLICANT: BOXER TOYS CO., LTD.
FCC ID: KT6B2199

TEST EQUIPMENT LIST

1. X Spectrum Analyzer: HP 8566B-Opt 462, S/N 3138A07786, w/
preselector HP 85685A, S/N 3221A01400, Quasi-Peak Adapter
HP 85650A, S/N 3303A01690 & Preamplifier HP 8449B-OPT H02,
S/N 3008A00372 Cal. 10/17/99
2. X Biconnical Antenna: Eaton Model 94455-1, S/N 1057
3. Biconnical Antenna: Electro-Metrics Model BIA-25, S/N 1171
4. X Log-Periodic Antenna: Electro-Metrics Model EM-6950, S/N 632
5. Log-Periodic Antenna: Electro-Metrics Model LPA-30, S/N 409
6. Double-Ridged Horn Antenna: Electro-Metrics Model RGA-180,
1-18 GHz, S/N 2319
7. 18-26.3GHz Systron Donner Standard Gain Horn #DBE-520-20
8. Horn 40-60GHz: ATM Part #19-443-6R
9. Line Impedance Stabilization Network: Electro-Metrics Model
ANS-25/2, S/N 2604 Cal. 2/9/00
10. Temperature Chamber: Tenney Engineering Model TTRC, S/N 11717-7
11. Frequency Counter: HP Model 5385A, S/N 3242A07460 Cal 10/6/99
12. Peak Power Meter: HP Model 8900C, S/N 2131A00545
13. X Open Area Test Site #1-3meters Cal. 12/22/99
14. Signal Generator: HP 8640B, S/N 2308A21464 Cal. 9/23/99
15. Signal Generator: HP 8614A, S/N 2015A07428
16. Passive Loop Antenna: EMCO Model 6512, 9KHz to 30MHz, S/N
9706-1211 Cal. 6/10/00
17. Dipole Antenna Kit: Electro-Metrics Model TDA-30/1-4, S/N 153
Cal. 11/24/99
18. AC Voltmeter: HP Model 400FL, S/N 2213A14499 Cal. 9/21/99
19. Digital Multimeter: Fluke Model 8012A, S/N 4810047 Cal 9/21/99
20. Digital Multimeter: Fluke Model 77, S/N 43850817 Cal 9/21/99
21. Oscilloscope: Tektronix Model 2230, S/N 300572 Cal 9/23/99

TEST PROCEDURES

GENERAL: This report shall NOT be reproduced except in full without
the written approval of TIMCO ENGINEERING, INC.

RADIATION INTERFERENCE: The test procedure used was ANSI STANDARD
C63.4-1992 using a HEWLETT PACKARD spectrum analyzer with a prese-
lector. The bandwidth of the spectrum analyzer was 100 kHz with an
appropriate sweep speed. The analyzer was calibrated in dB above a
microvolt at the output of the antenna. The resolution bandwidth was
100KHz and the video bandwidth was 300KHz. The ambient temperature of
the UUT was 80otemperature and a humidity of 55%.

APPLICANT: BOXER TOYS CO., LTD.
FCC ID: KT6B2199
REPORT #: T:\cus\B\BOXER\545AZ0\545AZ0RPT.doc
PAGE #: 1

TEST PROCEDURES CONTINUED

APPLICANT: BOXER TOYS CO., LTD.
FCC ID: KT6B2199

FORMULA OF CONVERSION FACTORS: The Field Strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBuV) to the antenna correction factor supplied by the antenna manufacturer. The antenna correction factors are stated in terms of dB. The gain of the Preselector was accounted for in the Spectrum Analyzer Meter Reading.

Example:

Freq (MHz)	METER READING + ACF = FS
33	20 dBuV + 10.36 dB = 30.36 dBuV/m @ 3m

POWER LINE CONDUCTED INTERFERENCE: The procedure used was ANSI STANDARD C63.4-1992 using a 50uH LISN. Both lines were observed. The bandwidth of the spectrum analyzer was 10kHz with an appropriate sweep speed. The ambient temperature of the UUT was 80 with a humidity of 55 %.

ANSI STANDARD C63.4-1992 10.1.7 MEASUREMENT PROCEDURES: The unit under test was placed on a table 80 cm high and with dimensions of 1m by 1.5m. The table used for radiated measurements is capable of continuous rotation.

When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical planes.

The situation was similar for the conducted measurement except that the table did not rotate. The EUT was setup as described in ANSIC63.4-1992 with the EUT 40 cm from the vertical ground wall.

APPLICANT: BOXER TOYS CO., LTD.
FCC ID: KT6B2199
REPORT #: T:\cus\B\BOXER\545AZ0\545AZ0RPT.doc
PAGE #: 2

APPLICANT: BOXER TOYS CO., LTD.

FCC ID: KT6B2199

NAME OF TEST: RADIATION INTERFERENCE

RULES PART NO.: 15.235

REQUIREMENTS: CARRIER FREQUENCY WILL NOT EXCEED 80 dBuV/m AT 3M.
OUT-OF-BAND EMISSIONS SHALL NOT EXCEED:

30 - 88 MHz 40.0 dBuV/M MEASURED AT 3 METERS
88 - 216 MHz 43.5 dBuV/M
216 - 960 MHz 46.0 dBuV/M
ABOVE 960 MHz 54.0 dBuV/M
* Harmonics must be less than the fundamental.

TEST DATA:

EMISSION FREQUENCY MHz	METER READING AT 3 METERS dBuV	COAX LOSS dB	ANTENNA CORRECTION FACTOR dB	FIELD STRENGTH dBuV/m@3m	MARGIN dB	ANT. POL.
49.86	38.00	0.25	10.99	49.24	30.76	V
99.70	24.60	0.80	8.39	33.79	9.71	H
149.50	25.50	0.80	16.90	43.20	0.30	H
199.40	7.80	0.90	12.66	21.36	22.14	H
249.30	20.90	1.20	13.35	35.45	10.55	H
299.10	9.10	1.40	15.64	26.14	19.86	H
349.00	8.60	1.40	15.52	25.52	20.48	V
398.80	12.90	1.40	16.97	31.27	14.73	H
448.70	4.50	1.60	18.12	24.22	21.78	H
498.60	0.60	1.60	19.27	21.47	24.53	V

SAMPLE CALCULATION: $FSdBuV/m = MR(dBuV) + ACFdB$.

TEST PROCEDURE: The procedure used was ANSI STANDARD C63.4-1992. The spectrum was scanned from 30 MHz to 1000 MHz. When an emission was found, the table was rotated to produce the maximum signal strength. The antenna was placed in both the horizontal and vertical planes and the worse case emissions were reported.

TEST RESULTS: THE UNIT DOES MEET THE FCC REQUIREMENTS.

PERFORMED BY: JOSEPH SCOGLIO

DATE: JANUARY 11, 2001

FCC ID: KT6B2199
REPORT #: T:\cus\B\BOXER\545AZ0\545AZ0RPT.doc
PAGE #: 4

APPLICANT: BOXER TOYS CO., LTD.

FCC ID: KT6B2199

NAME OF TEST: RADIATION INTERFERENCE

RULES PART NUMBER: 15.209

REQUIREMENTS: 1.705 to 30 MHz: 49.54 dBuV/m @ 3 METERS
30 to 88 MHz: 40.00 dBuV/M @ 3 METERS
88 to 216 MHz: 43.52 dBuV/M
216 to 960 MHz: 46.02 dBuV/M
ABOVE 960 MHz: 54.00 dBuV/M
* Harmonics must be less than the fundamental.

TEST RESULTS: A search was made of the spectrum from 25 to 1000 MHz and the measurements indicate that the unit DOES meet the FCC requirements.

TEST DATA:

EMISSION FREQUENCY MHz	METER READING AT 3 METERS dBuV	COAX LOSS dB	ANTENNA CORRECTION FACTOR dB	FIELD STRENGTH dBuV/m@3m	MARGIN dB	ANT. POL.
49.40	26.80	0.25	10.98	38.03	1.97	V
98.80	25.50	0.80	8.81	35.11	8.39	H
148.20	14.40	0.80	16.90	32.10	11.40	H
197.60	13.40	0.90	12.86	27.16	16.34	H
247.00	15.20	1.20	13.29	29.69	16.31	H
296.40	17.10	1.40	15.47	33.97	12.03	H
345.80	11.20	1.40	15.43	28.03	17.97	H
395.20	8.50	1.40	16.86	26.76	19.24	V
444.60	8.80	1.60	18.03	28.43	17.57	V

SAMPLE CALCULATION: $FS_{dBuV/m} = MR_{dBuV} + ACF_{dB}$.

TEST PROCEDURE: ANSI STANDARD C63.4-1992 using a Hewlett Packard Model 8566B spectrum analyzer, a Hewlett Packard Model 85685A Preselector, a Hewlett Packard Model 85650A Quasi-Peak adapter, Electro-Metric Dipole kits, models TDA, TDS-25-1, TDS-25-2, and an Eaton Model 94455-1 Biconical Antenna. The bandwidth of spectrum analyzer was 100 kHz with an appropriate sweep speed. When an emission was found, the table was rotated to produce the maximum signal strength. The antenna was placed in both the horizontal and vertical planes and the worse case emissions were reported.

PERFORMED BY: JOSEPH SCOGLIO

DATE: JANUARY 11, 2001

FCC ID: KT6B2199

REPORT #: T:\cus\B\BOXER\545AZ0\545AZ0RPT.doc

PAGE #: 5

APPLICANT: BOXER TOYS CO., LTD.
FCC ID: KT6B2199
NAME OF TEST: Occupied Bandwidth
RULES PART NO.: 15.235
REQUIREMENTS: The field strength of any emissions appearing between the band edges and up to 10 kHz above and below the band edges shall be attenuated at least 26 dB below the level of the unmodulated carrier or to the general limits of 15.209, whichever permits the higher emission levels.

THE GRAPHS IN EXHIBITS 11-12 REPRESENT THE EMISSIONS TAKEN FOR THE DEVICE.

METHOD OF MEASUREMENT: A small sample of the transmitter output was fed into the spectrum analyzer and the above photo was taken. The vertical scale is set to -10 dBm per division. The horizontal scale is set to 5 kHz per division.

TEST RESULTS: The unit DOES meet the FCC requirements.

PERFORMED BY: JOSEPH SCOGLIO

JANUARY 11, 2001

APPLICANT: BOXER TOYS CO., LTD.
FCC ID: KT6B2199
REPORT #: T:\cus\B\BOXER\545AZ0\545AZ0RPT.doc
PAGE #: 6

hp

REF 58.0 dB μ V ATTEN 10 dB +0 dB

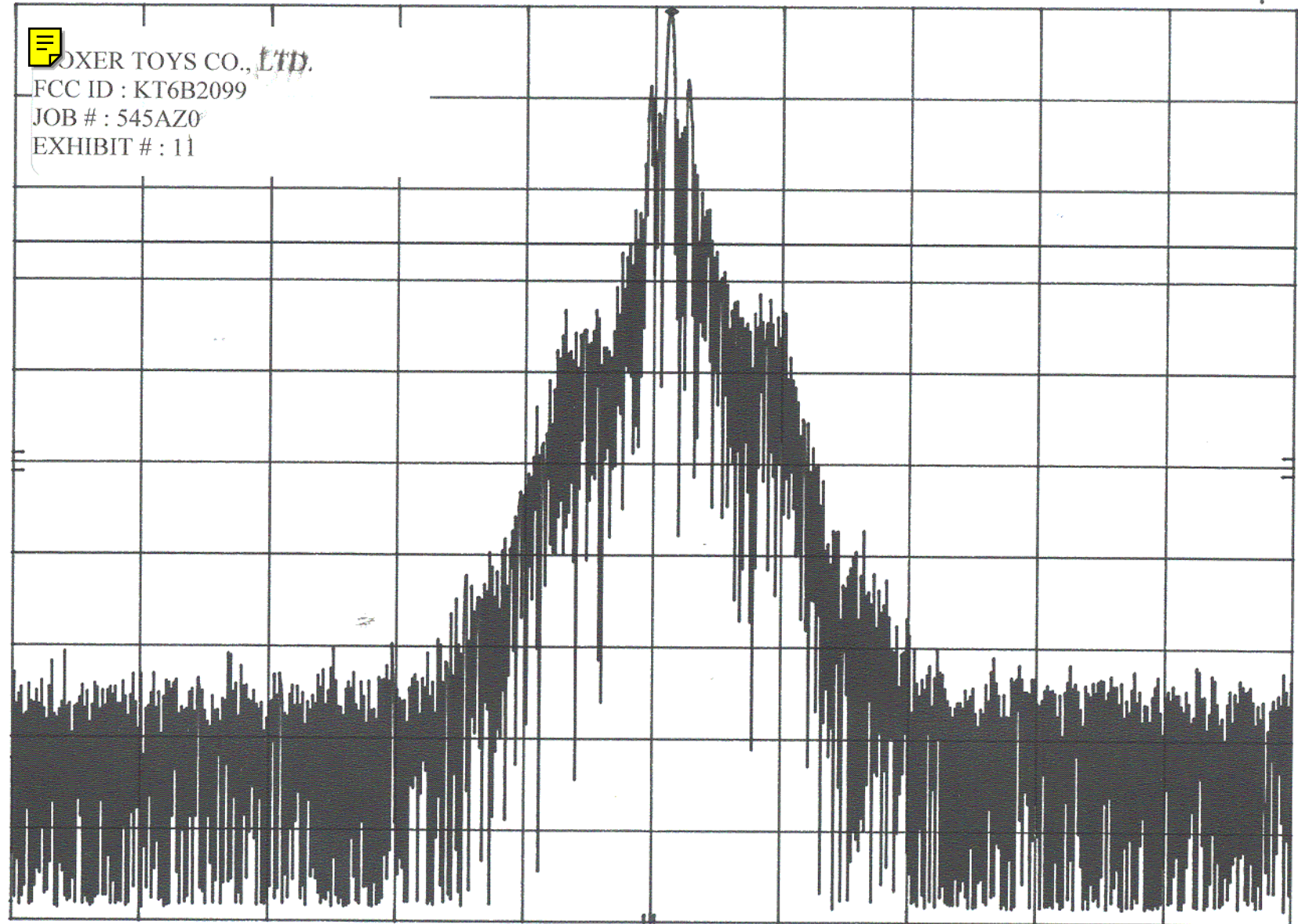
MKR 49.860 96 MHz
57.50 dB μ V

10 dB/

FOXER TOYS CO., LTD.
FCC ID : KT6B2099
JOB # : 545AZ0
EXHIBIT # : 11

OFFSET
-20.0
dB

DL
32.0
dB μ V



START 49.820 0 MHz

RES BW 300 Hz (i) VBW 100 kHz

STOP 49.900 0 MHz

SWP 6.00 sec

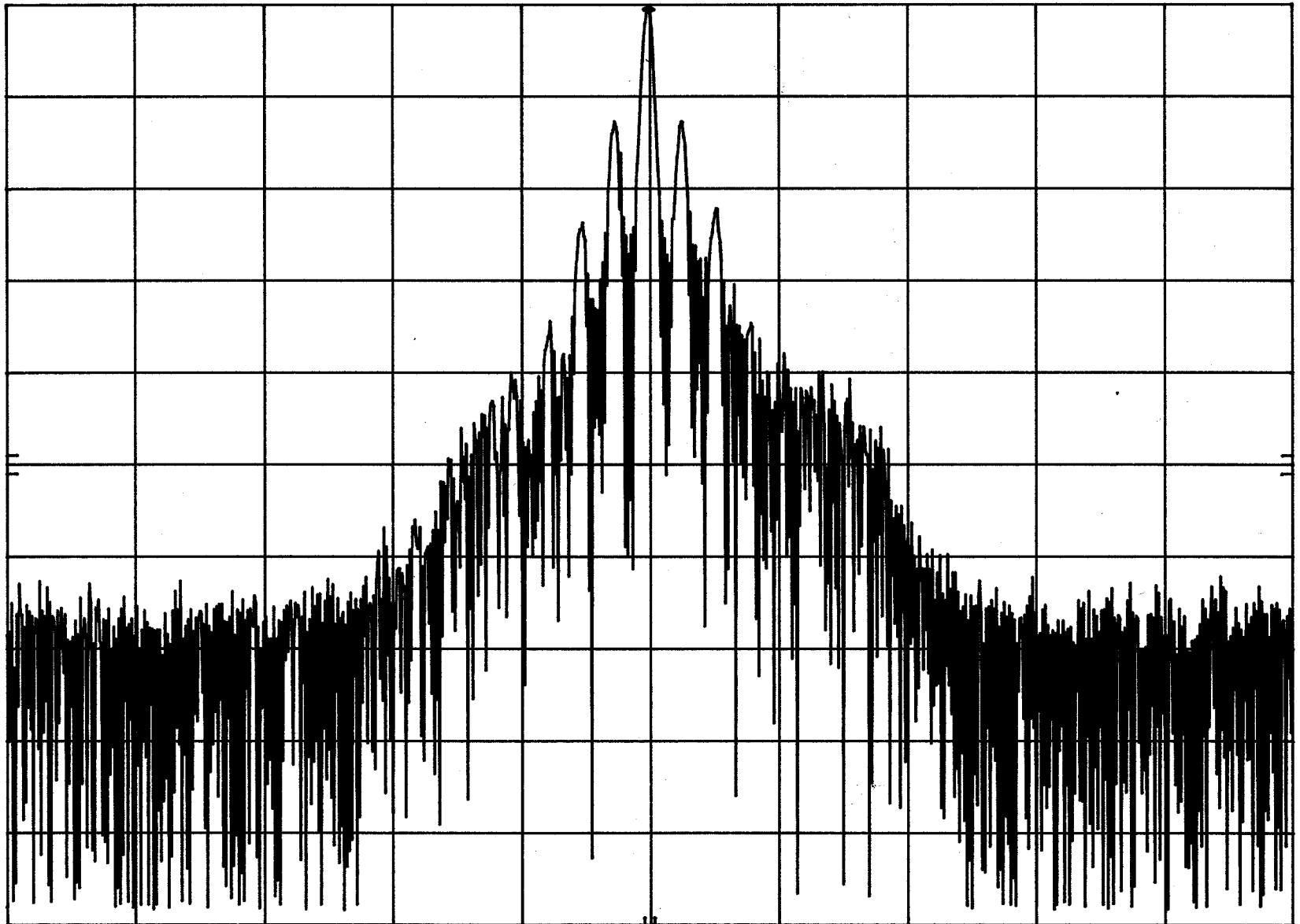
BOXER TOYS CO., LTD.
FCC ID: KT6B2199
JOB #: 545AZ0
EXHIBIT #: 12

MKR 49.405 55 MHz
44.50 dB μ V

hp REF 45.0 dB μ V ATTEN 10 dB +0 dB

10 dB/

OFFSET
-20.0
dB



CENTER 49.405 6 MHz

RES BW 300 Hz (i) VBW 100 kHz

SPAN 50.0 kHz
SWP 4.00 sec