Marstech Limited

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

Authorized by: Professional Engineers Ontario

Certificated UL 4 Engineering & Administrative

Testing For FCC Submissions/Verifications

Approved Test Facility

Qualified Facility

TEST REPORT

REPORT DATE:	23 November 1998		REPORT NO: 98478D/B
CONTENTS:	See Table of Contents		
SUBMITTOR:	SMARTHOME PRODUCTS LTD. 8/F Block B Rm. B-812, Sea View Estate 2-8 Watson Road North Point, Hong Kong		
SUBJECT:	Model No: D107		
	FCC ID: LQP-D107		
TEST SPECIFICATION:	FCC CFR 47 Part 15, Subpart "C" Intentional Radiators Sections: 15.205, 15.231 A, B & C IC RSS210 Section 6 NOTE: Tests Conducted Are "Type" Tests.		
DATE SAMPLE RECEIVED:	6 November 1998	DATE TESTED:	17 November 1998
RESULTS:	Equipment tested complies with referenced specification.		
ALTERATIONS	None		
Tested by: **IC Site: 2039**	Original signed by: Jim Sims Ed. Chang Edward Chang	Approved by: R. G. MARSHALL Date:	Robert Marshall Robert G. Marshall, P. Eng. Nov 25/98

TECHNICAL REPORT - FCC 2.1033(b)/IC RSS-210 Cl.5.

Applicant

Smarthome Products Ltd.
8/F Block B, Rm. B-812, Sea View Estate
2-8 Watson Road
North Point, Hong Kong

FCC Identifier

LQP-D107

Manufacturer

Smarthome Products (Shenzhen) Co. Ltd.,
Shui Tian Chuen Industrial Estate
Shiyan, Shenzhen, Baoan
Guangdong, CHINA

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EXHIBIT D

(FCC Ref. 2.1033(b)(6)
IC RSS-210 Cl. 5.2 to 5.8)

"Report of Measurements"

EXHIBIT D(1)

DEVICE MEASURED

(FCC Ref. 2.1033(b)(6))
(IC RSS-210 Cl. 5.3)

APPLICANT:	Smarthome Products Ltd. 8/F Blk. B Rm. B-812, Sea View Estate 2-8 Watson Road North Point, Hong Kong
MANUFACTURER:	Smarthome Products (Shenzhen) Co. Ltd., Shui Tian Chuen Industrial Estate Shiyan, Shenzhen, Baoan, Guangdong, CHINA
FCC IDENTIFIER:	LQP-D107
TRADE NAME:	CHIME-PLUS
MODEL NUMBER:	D107
SERIAL NO.:	Not Marked

Marstech Limited
11 Kelfield Street
Etobicoke, Ontario
M9W 5A1 CANADA

TECHNICIANS:
Jim Sims - Com-Serve Corp.

Robert G. Marshall, P. Eng.

Date: NOV 25/98

EXHIBIT D(2)

TEST FACILITY AND EQUIPMENT LIST

FACILITIES

Radiated — ANSI C63.4 (FCC OET/55) open field 3 meter test range. This test range is protected from the cold and moisture by a non-conductive enclosure.

Conducted — 2.5m Anechoic Chamber

EQUIPMENT

Hewlett-Packard spectrum analyzer # 8554 RF & 141T video.
Anritsu 2601 A spectrum analyzer.
Advantest R3261A Spectrum Analyzer
Hewlett-Packard RF generator # 8640 B with an 002 doubler
Hewlett-Packard attenuator 30 dB # 11708A.
Narda 20 watt (20 dB) attenuator
Compliance Design P950 Preamp (16 dB) ... 25 MHz - 1.0 GHz
A.H. Systems biconical antenna; ..... 20 MHz - 330 MHz
A.H. Systems log periodic antenna; ..... 300 MHz - 1.8 GHz
Eaton dipole antennas; T1, T2, T3 ..... 25 MHz - 1.0 GHz
CDI Roberts dipole antennas; T1, T2, T3 & T4 25 MHz - 1.0 GHz

NOTE:

The Anritsu 2601 A spectrum analyzer, the Hewlett-Packard 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 meter test range has been carefully evaluated to the ANSI document C63.4 and will be remeasured for reflections and losses every three years.

FEDERAL COMMUNICATIONS COMMISSION

7435 Oakland Mills Road
Columbia, MD 21046
Telephone: 301-725-1585 (ext-216)
Facsimile: 301-344-2050

September 23, 1997

IN REPLY REFER TO
31040/SIT
1300F2

Electrohome Electronics Ltd
809 Wellington Street, North
Kitchener, Ontario N2G 4J6, Canada

Attention: Gerry Gallagher

Re: Measurement facility located at Roseville
(3 meter site)

Gentlemen:

Your submission of the description of the subject measurement facility has been reviewed and found to be in compliance with the requirements of Section 2.948 of the FCC Rules. The description has, therefore, been placed on file and the name of your organization added to the Commission's list of facilities whose measurement data will be accepted in conjunction with applications for certification or notification under Parts 15 or 18 of the Commission's Rules. Our list will also indicate that the facility complies with the radiated and AC line conducted test site criteria in ANSI C63.4-1992. Please note that this filing must be updated for any changes made to the facility, and at least every three years the data on file must be certified as current.

Per your request, the above mentioned facility has been also added to our list of those who perform these measurement services for the public on a fee basis. This list is published periodically and is also available on the Laboratory's Public Access Link as described in the enclosed Public Notice.

Sincerely,

Thomas W. Phillips
Electronics Engineer
Customer Service Branch

SUMMARY OF RESULTS

			COMPLIANCE (yes)	(no)
FIELD STRENGTH OF THE CARRIER FREQUENCIES				
Transmitter:	FCC 15.231 (b), IC RSS-210 Cl. 6.1.1 (b)	@ 3 Metres	(x)	( )
BANDWIDTH:				
Transmitter:	FCC 15.231 (c), IC RSS-210 Cl. 6.1.1 (c)	(76 KHz)	(x)	( )
TRANSMITTER BAND RESTRICTIONS				
Transmitter:	FCC 15.205 (a), IC RSS-210 Cl. 6.3		(x)	( )
SPURIOUS RADIATED LEVELS				
Transmitter:	FCC 15.231 (b), IC RSS-210 Cl. 6.1	@ 3 Metres	(x)	( )
Receiver:	FCC 15.109 (a), IC RSS-210 Cl. 7.3		(N/A)	( )
LINE CONDUCTED SPURIOUS EMISSIONS				
Transmitter:	FCC 15.207, IC RSS-210 Cl. 6.6		(N/A)	( )
Receiver:	FCC 15.107, IC RSS-210 Cl. 7.4		(N/A)	( )
ENVIRONMENTAL TESTS				
Transmitter:			(N/A)	( )

EQUIPMENT REQUIREMENTS AND IDENTIFICATION

a) Manufacturers/Applicants or tradename:	(x)	( )
b) Model designation:	(x)	( )
c) FCC ID/IC Certification Number	(x)	( )

CARRIER FREQUENCY FIELD STRENGTH

RESULTS

Transmitter: Maximum carrier field strength of **2,066.7 μV/M:**

Carrier frequency: **315.45 MHz**

Bandwidth: **76 KHz (38 KHz x 2)**

TEST CONDITIONS

Equipment Positioning:
Transmitter — laying on its back

Antenna Polarization:
Transmitter: horizontal

Antenna Type: Roberts ½ Wave Dipole

Measurement Bandwidth: 100 KHz (IF)

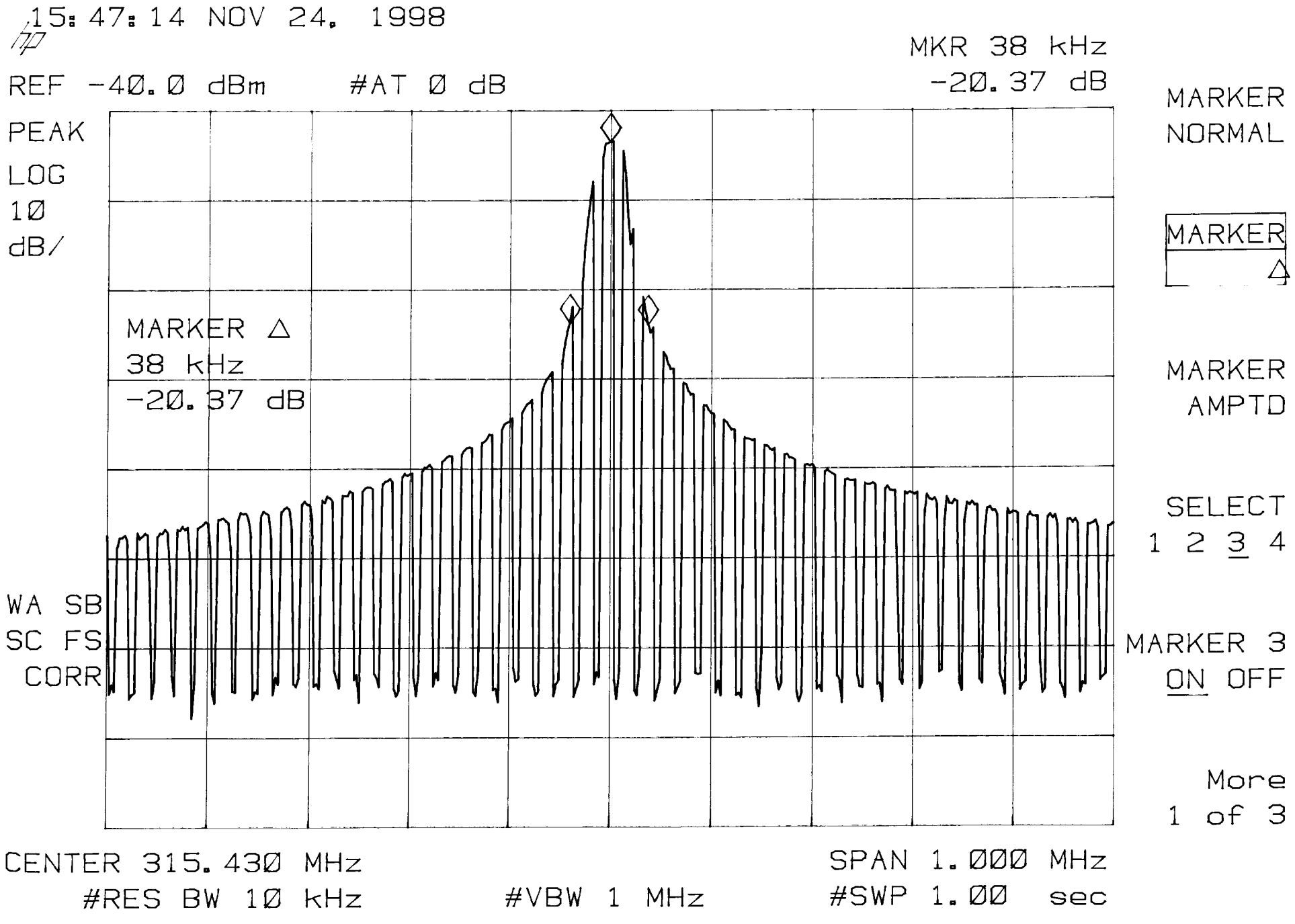
Supply Voltages:
Transmitter: 06 VDC from an internal alkaline battery.

METHODS OF MEASUREMENT

The portable RF transmitter portion of the device was placed on a one metre high, non-metallic turntable. A new six volt, alkaline battery was installed in the transmitter. The transmitter was activated by continuous pressure on the push button switch by a non-conductive actuator. Measurements were made in a minimum of 3 orthogonal equipment positions.

For each of the above conditions the turntable was rotated through 360 degrees while the receiving antenna was varied in height from 1 to 4 metres and set in both planes of polarization to find the maximum signal strength. The level was measured using a spectrum analyzer and a substation signal from an RF generator. The measured level was converted to a field strength using the antenna correction factors and cable losses.

OCCUPIED BANDWIDTH



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SPURIOUS CABINET RADIATION

RESULTS

The maximum field strength of any spurious emission, from the lowest radio frequency signal generated in the device, up to each applicable limit emanating from the transmitter was:

Transmitter: **Maximum field strength of 368 μV/M: at 631.32 MHz**

TEST CONDITIONS

Equipment Positioning:
Receiver: N/A
Transmitter: laying on its side

Antenna Polarization:
Receiver: N/A
Transmitter: horizontal

Measurement Bandwidth: 100 KHz & 1.0 MHz (IF)

Supply Voltages:
Receiver: N/A
Transmitter: 06 VDC from an internal alkaline battery.

METHODS OF MEASUREMENT

The portable RF transmitter portion of the device was placed on a one metre high, non-metallic turntable. A new six volt, alkaline battery was installed in the transmitter. The transmitter was activated by continuous pressure on the push button switch by a non-conductive actuator. Measurements were made in a minimum of 3 orthogonal equipment positions.

For each of the above conditions the turntable was rotated through 360 degrees while the receiving antenna was varied in height from 1 to 4 metres and set in both planes of polarization to find the maximum signal strength. The level was measured using a spectrum analyzer and a substation signal from an RF generator. The measured level was converted to a field strength using the antenna correction factors and cable losses.

RADIATED EMISSION RESULTS

BW: 100 KHz & 1.0 MHz
Span: 05 to 50 MHz

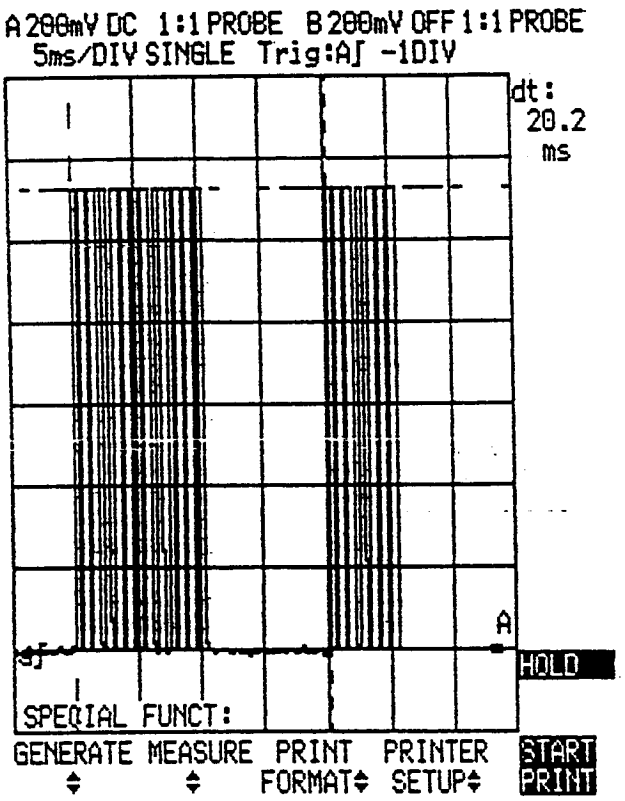
TRANSMITTER

TEST #	FREQ. M Hz	LEVEL μV	ANT. TYPE. PZ	ANT. FACT.	PEAK μV/M	AVERAGE μV/M	LIMIT μV/M	DIFF.TO LIMIT dB
CFS	315.45	546.0	RT.3 H	11.3	6169.8	2221.00	6060	-8.72
01	631.32	70.0	L/P H	14.6	1022.0	368.00	606	-4.33
02	946.94	20.6	L/P H	37.6	774.6	279.00	606	-6.74
03	1262.60	10.2	L/P H	50.0	510.0	184.00	606	-10.35

NOTE: Peak to average correction is:

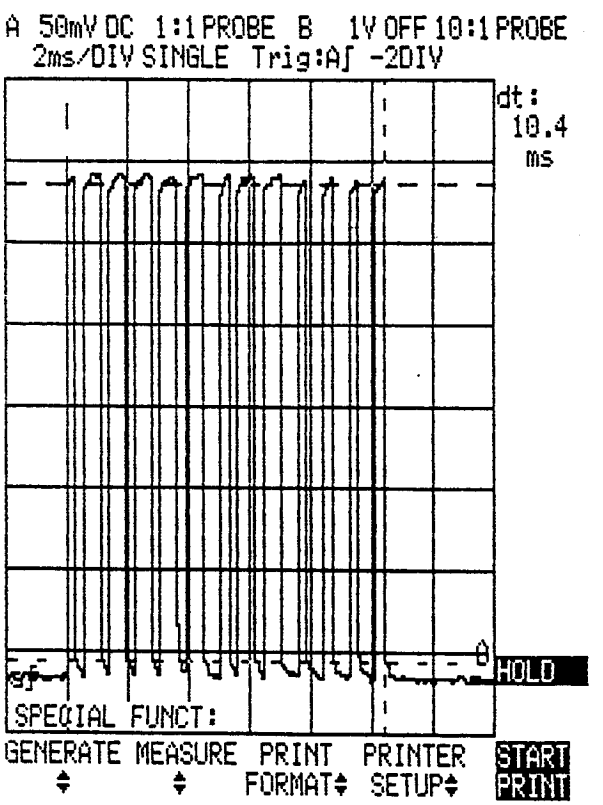
Average = 0.36 Peak

ScopeMeter 97



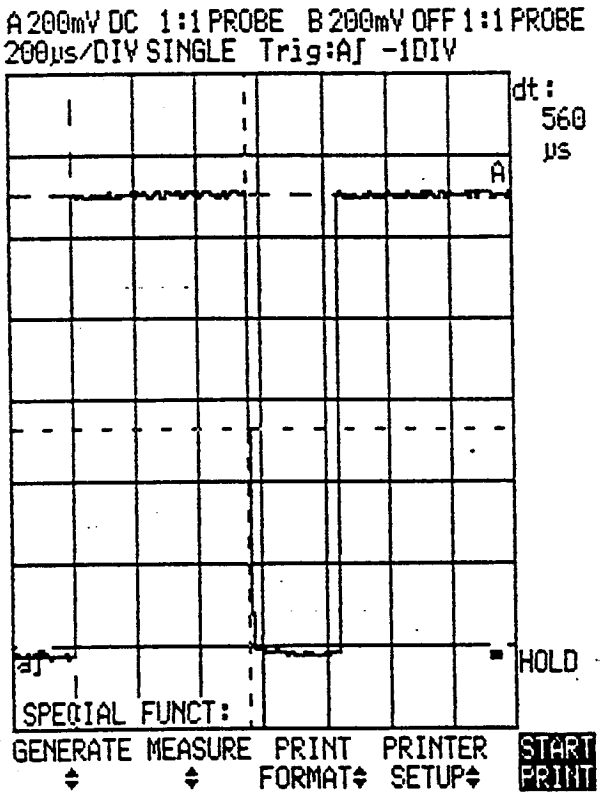
PERIOD = ON + OFF TIME = 20.2 mS

ScopeMeter 97



ON DATA = 13 PULSES

ScopeMeter 97



PULSE ON TIME = 0.56 mS

CALCULATION

TOTAL ON TIME

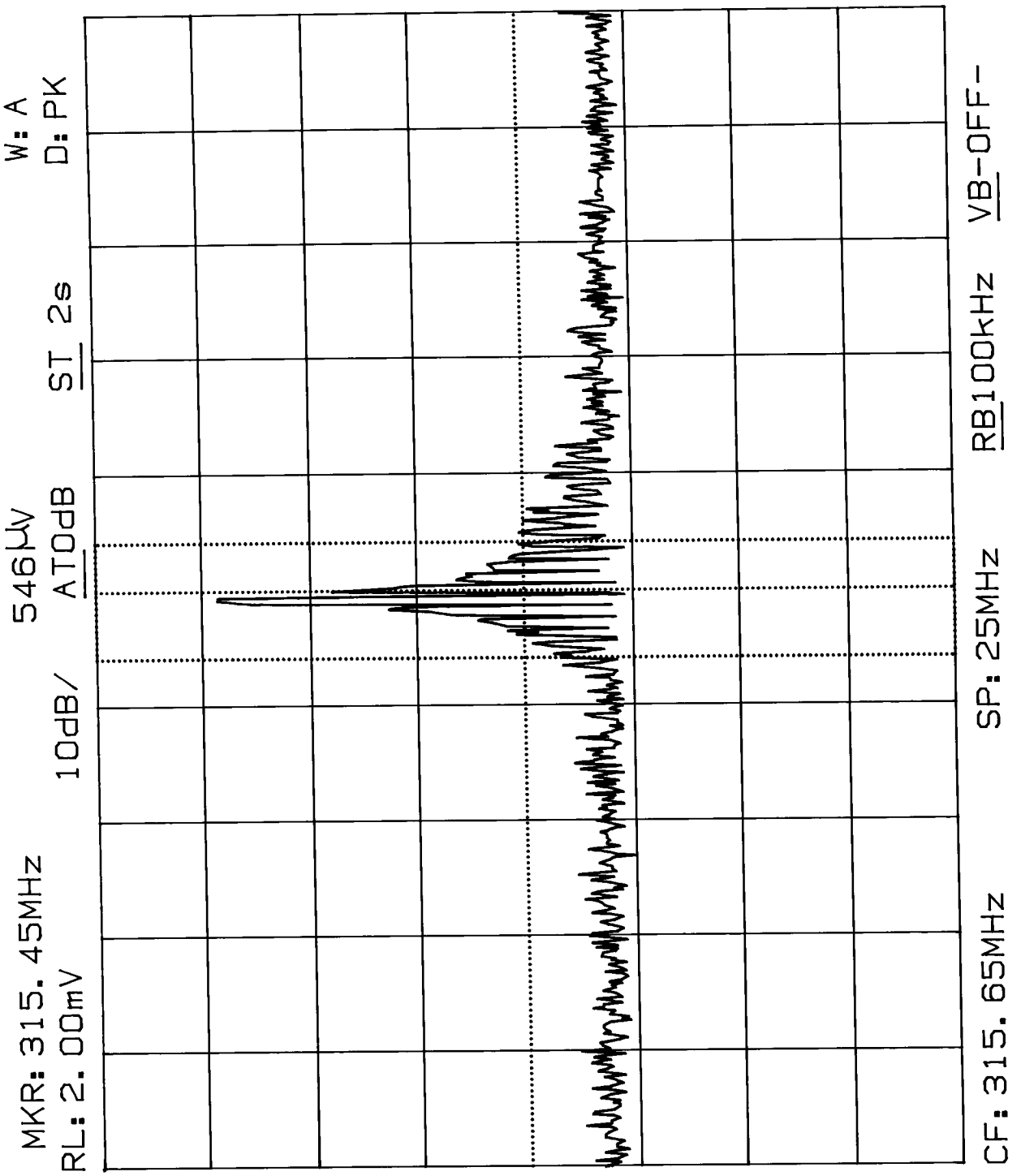
= 13 x .56 = 7.28 mS

PEAK TO AVERAGE FACTOR

$$= 20 \log \frac{7.28}{20.2}$$

$$= 0.36$$

MODULATED CARRIER LEVEL
MODEL; SMARTHOME D107



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