APPLICATION CERTIFICATION
On Behalf of
Energy Technology Laboratories

Invisible Sliding Wall Vault
Model No.: 20720

FCC ID: VX620720RC

Prepared for	:	Energy Technology Laboratories
Address	:	2351 Tenaya Drive Modesto, CA95354, U.S.A
Prepared by	:	ACCURATE TECHNOLOGY CO. LTD
Address	:	F1, Bldg. A, Changyuan New Material Port, Keyuan Rd. Science & Industry Park, Nanshan, Shenzhen, Guangdong P.R. China Tel: (0755) 26503290 Fax: (0755) 26503396

Report Number	:	ATE20080100
Date of Test	:	January 14, 2008
Date of Report	:	January 16, 2008

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Description Page

Test Report Certification

Applicant	:	Energy Technology Laboratories
Manufacturer	:	Shanghai Jinggong Tech. Co., Ltd.
EUT Description	:	Invisible Sliding Wall Vault
		(A) MODEL NO.: 20720
		(B) SERIAL NO.: N/A
		(C) POWER SUPPLY: 12V DC ("27A" battery Type×1)

Measurement Procedure Used:

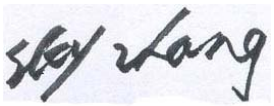
FCC Rules and Regulations Part 15 Subpart C Section 15.231: 2007 & ANSI 63.4: 2003

The device described above is tested by ACCURATE TECHNOLOGY CO. LTD to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C Section 15.231. The measurement results are contained in this test report and ACCURATE TECHNOLOGY CO. LTD is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements.

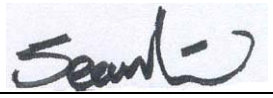
The product is a manually operated radiator. Its release time is 108 ms. According to 15.231 (a) (1), 15.231 (a) (3), (4) and (5) are not applicable.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of ACCURATE TECHNOLOGY CO. LTD.

Date of Test : January 14, 2008

Prepared by : 

(Engineer)

Reviewer : 

(Quality Manager)

Approved & Authorized Signer : 

(Manager)

1. GENERAL INFORMATION

1.1.Description of Device (EUT)

EUT	:	Invisible Sliding Wall Vault
Model Number	:	20720
Power Supply	:	12V DC ("27A" battery Type×1)
Operation Frequency	:	315MHz ±100kHz
Applicant	:	Energy Technology Laboratories
Address	:	2351 Tenaya Drive Modesto, CA95354, U.S.A
Manufacturer	:	Shanghai Jinggong Tech. Co., Ltd.
Address	:	Rm. 506, 5/F, No.33 Leshan Rd., Shanghai, China
Date of sample received	:	January 12, 2008
Date of Test	:	January 14, 2008

1.2.Description of Test Facility

EMC Lab	:	Listed by FCC The Registration Number is 274801 Listed by Industry Canada The Registration Number is IC4174 Accredited by China National Accreditation Committee for Laboratories The Certificate Registration Number is L0579
Name of Firm	:	Shenzhen Academy of Metrology& Quality Inspection
Site Location	:	Bldg. Metrology& Quality Inspection, Longzhu Road, Nanshan, Shenzhen, Guangdong, P.R. China

1.3.Measurement Uncertainty

Conducted emission expanded uncertainty	=	3.5dB, k=2
Radiated emission expanded uncertainty	=	4.5dB, k=2

2. MEASURING DEVICE AND TEST EQUIPMENT

Table 1: List of Test and Measurement Equipment

Kind of equipment	Manufacturer	Type	S/N	Calibrated until
EMI Test Receiver	Rohde&Schwarz	ESCS30	100307	03.31.2008
EMI Test Receiver	Rohde&Schwarz	ESI26	838786/013	01.24.2008
Bilog Antenna	Schwarzbeck	VULB9163	9163-194	03.31.2008
Bilog Antenna	Chase	CBL6112B	2591	01.24.2008
Horn Antenna	Rohde&Schwarz	HF906	100013	01.24.2008
Spectrum Analyzer	Anritsu	MS2651B	6200238856	03.31.2008
Pre-Amplifier	Agilent	8447D	2944A10619	03.31.2008

3. THE FIELD STRENGTH OF RADIATION EMISSION

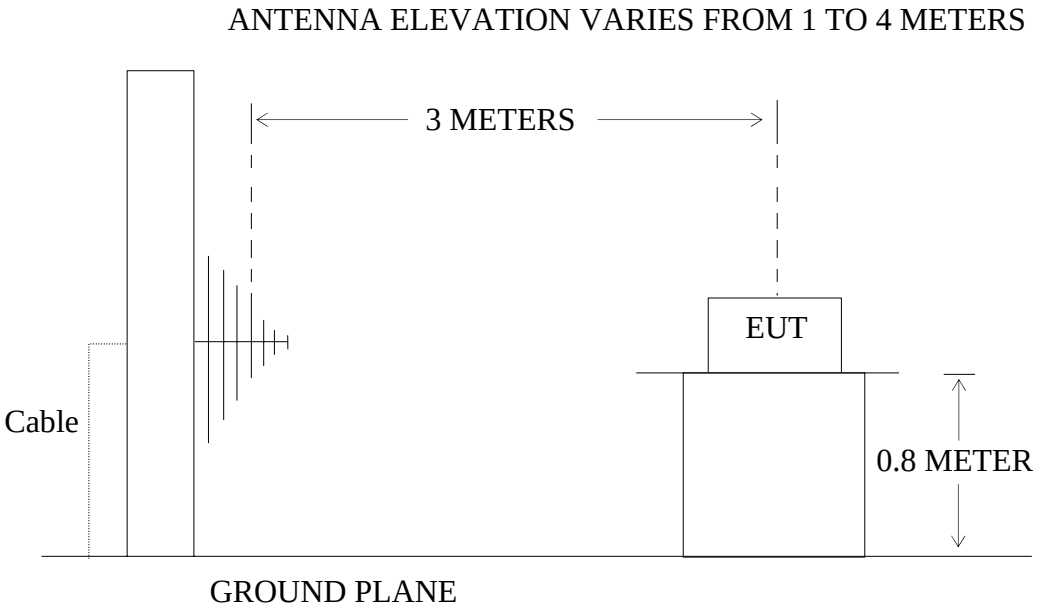
3.1.Block Diagram of Test Setup

3.1.1.Block diagram of connection between the EUT and simulators

EUT

(EUT: Invisible Sliding Wall Vault)

3.1.2.Anechoic Chamber Test Setup Diagram



(EUT: Invisible Sliding Wall Vault)

3.2.The Field Strength of Radiation Emission Measurement Limits

3.2.1 Radiation Emission Measurement Limits According to FCC Part 15 Section 15.231(b)

Frequency Range of Fundamental [MHz]	Field Strength of Fundamental Emission [Average] [μV/m]	Field Strength of Spurious Emission [Average] [μV/m]
40.66-40.70	2250	225
70-130	1250	125
130-174	1250-3750	125-375
174-260	3750	375
260-470	3750-12500	375-1250

Above 470	12500	1250

Where F is the frequency in MHz, The formulas for calculating the maximum permitted fundamental field strengths are as follows: for the band 130-174MHz, μV/m at 3 meters=56.81818(F)-6136.3636; For the band 260-470MHz, μV/m at 3 meters=41.6667(F)-7083.3333. The maximum permissible unwanted emission level is 20dB below the maximum permitted fundamental level.

3.2.2 Restricted Band Radiation Emission Measurement Limits According to FCC part 15 Section 15.205 and Section15.209.

3.3. Configuration of EUT on Measurement

The following equipment are installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

3.3.1. Invisible Sliding Wall Vault (EUT)

Model Number	**:**	20720
Serial Number	**:**	N/A
Manufacturer	**:**	Shanghai Jinggong Tech. Co., Ltd.

3.4. Operating Condition of EUT

3.4.1. Setup the EUT and simulator as shown as Section 3.1.

3.4.2. Turn on the power of all equipment.

3.4.3. Let the EUT work in measuring modes (TX) measure it.

3.5. Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bi-log antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the EUT location must be manipulated according to ANSI 63.4 on radiated emission measurement.

The bandwidth of test receiver (R&S ESI26) is set at 120KHz in 30-1000MHz, and 1MHz in 1000-4000MHz.
The frequency range from 30MHz to 4000MHz is checked.

3.6. The Field Strength of Radiation Emission Measurement Results

PASS.

The frequency range 30MHz to 4000MHz is investigated.

Date of Test:	January 14, 2008	Temperature:	24°C
EUT:	Invisible Sliding Wall Vault	Humidity:	48%
Model No.:	20720	Power Supply:	12V DC ("27A" battery Type×1)
Test Mode:	TX	Test Engineer:	Feng

Frequency (MHz)	Reading (dBμV/m)	Factor Corr.	Average Factor	Result(dBμV/m)		Limit(dBμV/m)		Margin(dBμV/m)		Polarization
	PEAK	(dB)	(dB)	AV	PEAK	AV	PEAK	AV	PEAK	
314.909	**96.9**	**-18.8**	**-7.3**	**70.8**	**78.1**	**75.6**	**95.6**	**4.8**	**17.5**	Horizontal
629.831	56.2	-13.9	-7.3	35.0	42.3	55.6	75.6	20.6	33.3	
944.891	55.2	-11.6	-7.3	36.3	43.6	55.6	75.6	19.3	32.0	
1259.755	58.1	-7.3	-7.3	43.5	50.8	55.6	75.6	12.1	24.8	
314.909	**93.2**	**-18.8**	**-7.3**	**67.1**	**74.4**	**75.6**	**95.6**	**8.5**	**21.2**	Vertical
629.831	54.1	-13.9	-7.3	32.9	40.2	55.6	75.6	22.7	35.4	
944.891	50.2	-11.6	-7.3	31.3	38.6	55.6	75.6	24.3	37.0	
1259.755	56.7	-7.3	-7.3	42.1	49.4	55.6	75.6	13.5	26.2	
*1574.611	34.4	-6.3	-7.3	20.8	28.1	54	74	33.2	45.9	

Note:

1. *: Denotes restricted band of operation.
   Measurements were made using a peak detector and average detector. Any emission Above 1000MHz and falling within the restricted bands of FCC Part 15 Section 15.205 were compliance with the emission limit of FCC Part 15 Section 15.209.

2. The field strength is calculated by adding the antenna factor, high pass filter loss(if used) and cable loss, and subtracting the amplifier gain(if any)from the measured reading. The basic equation calculation is as follows:

   Result = Reading + Corrected Factor

   Where Corrected Factor = Antenna Factor + Cable Loss + High Pass Filter Loss – Amplifier Gain

3. FCC Limit for Average Measurement = 41.6667(315)-7083.3333 = 6041.6772μV/m
   =75.6dBμV/m

4. The spectral diagrams in appendix I display the measurement of peak values.

4. 20DB OCCUPIED BANDWIDTH

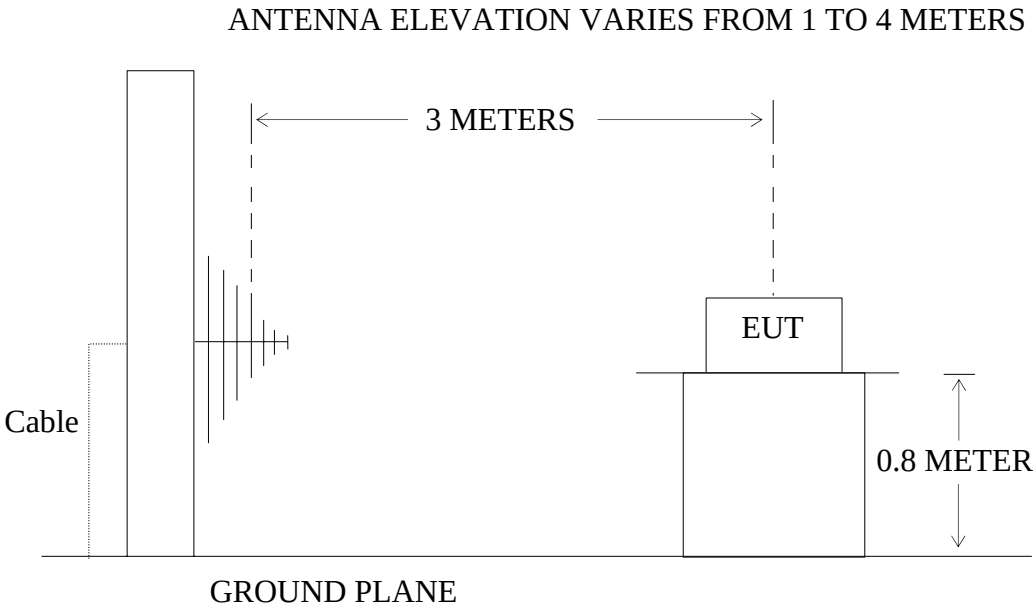
4.1.Block Diagram of Test Setup

4.1.1.Block diagram of connection between the EUT and simulators

EUT

(EUT: Invisible Sliding Wall Vault)

4.1.2.Anechoic Chamber Test Setup Diagram



(EUT: Invisible Sliding Wall Vault)

4.2.The Bandwidth of Emission Limit According To FCC Part 15 Section 15.231(c)

The bandwidth of emission shall be no wider than 0.25% of the center frequency. Therefore, the bandwidth of the emission limit is 315MHz×0.25% = 787.5kHz.
Bandwidth is determined at the two points 20 dB down from the top of modulated carrier.

4.3.EUT Configuration on Measurement

The following equipment are installed on the bandwidth of emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

4.3.1. Invisible Sliding Wall Vault (EUT)

Model Number	**:**	20720
Serial Number	**:**	N/A
Manufacturer	**:**	Shanghai Jinggong Tech. Co., Ltd.

4.4.Operating Condition of EUT

4.4.1.Setup the EUT and simulator as shown as Section 4.1.

4.4.2.Turn on the power of all equipment.

4.4.3.Let the EUT work in measuring mode (TX) measure it.

4.5.Test Procedure

4.5.1. Set SPA Center Frequency = Fundamental frequency, RBW = 10kHz, VBW = 30kHz, Span = 1000kHz.

4.5.2. Set SPA Max hold. Mark peak, -20dB

4.6. Measurement Result

The EUT does meet the FCC requirement.

-20dB bandwidth = 78.0kHz < 787.5kHz.

The spectral diagrams in appendix I.

5. RELEASE TIME MEASUREMENT

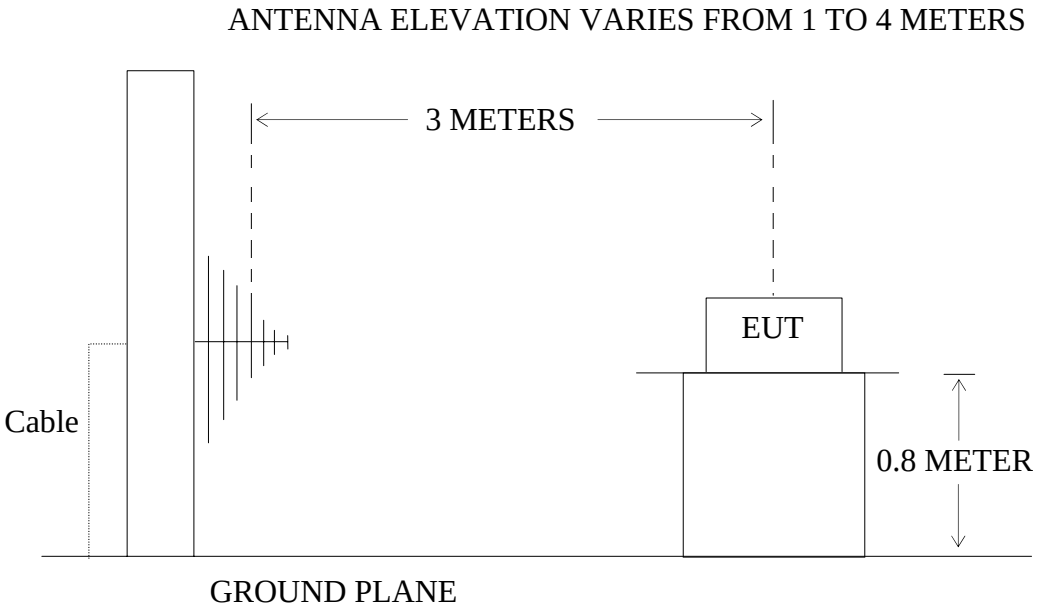
5.1.Block Diagram of Test Setup

5.1.1.Block diagram of connection between the EUT and simulators

EUT

(EUT: Invisible Sliding Wall Vault)

5.1.2.Anechoic Chamber Test Setup Diagram



(EUT: Invisible Sliding Wall Vault)

5.2.Release Time Measurement According To FCC Part 15 Section 15.231(a)

Section 15.231(a) (1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

5.3.EUT Configuration on Measurement

The following equipment are installed on Release Time Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

5.3.1. Invisible Sliding Wall Vault (EUT)

Model Number	**:**	20720
Serial Number	**:**	N/A
Manufacturer	**:**	Shanghai Jinggong Tech. Co., Ltd.

5.4.Operating Condition of EUT

5.4.1.Setup the EUT and simulator as shown as Section 5.1.

5.4.2.Turn on the power of all equipment.

5.4.3.Let the EUT work in measuring mode (TX) measure it.

5.5.Test Procedure

5.5.1. Set SPA Center Frequency = Fundamental frequency, RBW = 100kHz, VBW = 300kHz, Span = 0Hz. Sweep time = 0.5seconds.

5.5.2. Set EUT as normal operation and press Transmitter button.

5.5.3. Set SPA View. Delta Mark time.

5.6. Measurement Result

The release time less than 5 seconds.

Release Time= 108.0ms

The spectral diagrams in appendix I.

6. AVERAGE FACTOR MEASUREMENT

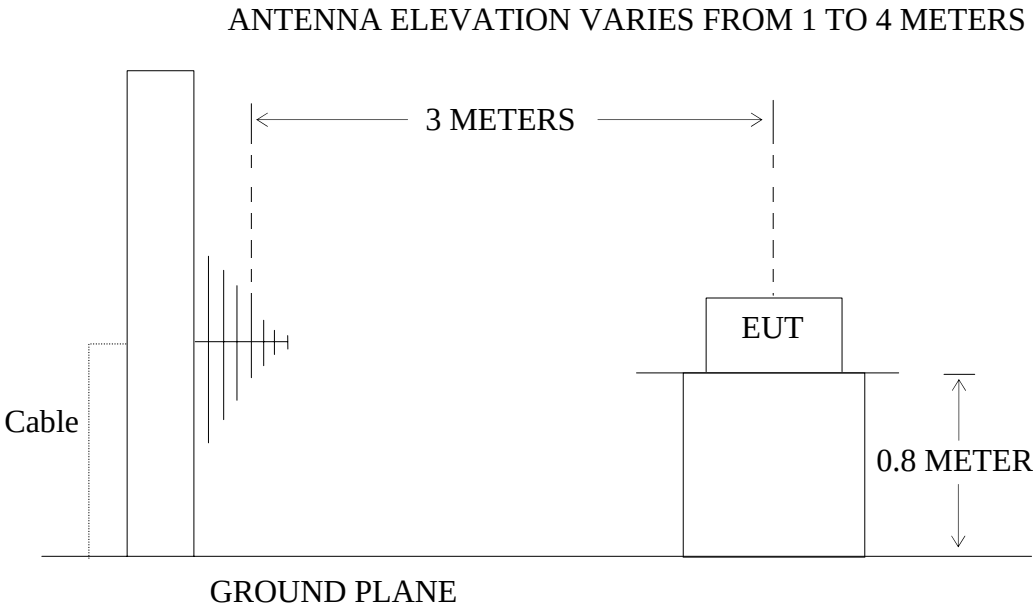
6.1.Block Diagram of Test Setup

6.1.1.Block diagram of connection between the EUT and simulators

EUT

(EUT: Invisible Sliding Wall Vault)

6.1.2.Anechoic Chamber Test Setup Diagram



(EUT: Invisible Sliding Wall Vault)

6.2. Average factor Measurement according to ANSI 63.4: 2003

ANSI 63.4: 2003 Section 13.1.4.2 Devices transmitting pulsed emissions and subject to a limit requiring an average detector function for radiated emissions shall initially be measured with an instrument that uses a peak detector. A radiated emission measured with a peak detector may then be corrected to a true average using the appropriate factor for emission duty cycle. This correction factor relates the measured peak level to the average limit and is derived by averaging absolute field strength over one complete pulse train that is 0.1 s, or less, in length. If the pulse train is longer than 0.1 s, the average shall be determined from the average absolute field strength during the 0.1 s interval in which the field strength is at a maximum. Instructions on calculating the duty cycle of a transmitter with pulsed emissions are provided in ANSI 63.4 H.4, step j.

Average factor in dB = 20 log (duty cycle)

6.3.EUT Configuration on Measurement

The following equipment are installed on average factor Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

6.3.1. Invisible Sliding Wall Vault (EUT)

Model Number	**:**	20720
Serial Number	**:**	N/A
Manufacturer	**:**	Shanghai Jinggong Tech. Co., Ltd.

6.4.Operating Condition of EUT

6.4.1.Setup the EUT and simulator as shown as Section 5.1.

6.4.2.Turn on the power of all equipment.

6.4.3.Let the EUT work in measuring mode (TX) measure it.

6.5.Test Procedure

6.5.1.The time period over which the duty cycle is measured is 100 milliseconds, or the repetition cycle, whichever is a shorter time frame. The worst case (highest percentage on) duty cycle is used for the calculation.

6.5.2. Set SPA Center Frequency = Fundamental frequency, RBW = 100kHz, VBW =300kHz, Span = 0Hz.

6.5.3. Set EUT as normal operation.

6.5.4. Set SPA View. Delta Mark time.

6.6. Measurement Result

The duty cycle is simply the on time divided by the period:

The duration of one cycle = 28.16ms
Effective period of the cycle = (13×0.28)+ (12×0.71) ms= 12.16ms

DC = 12.16ms/28.16ms = 0.432

Therefore, the average factor is found by 20log0.432 = -7.3dB

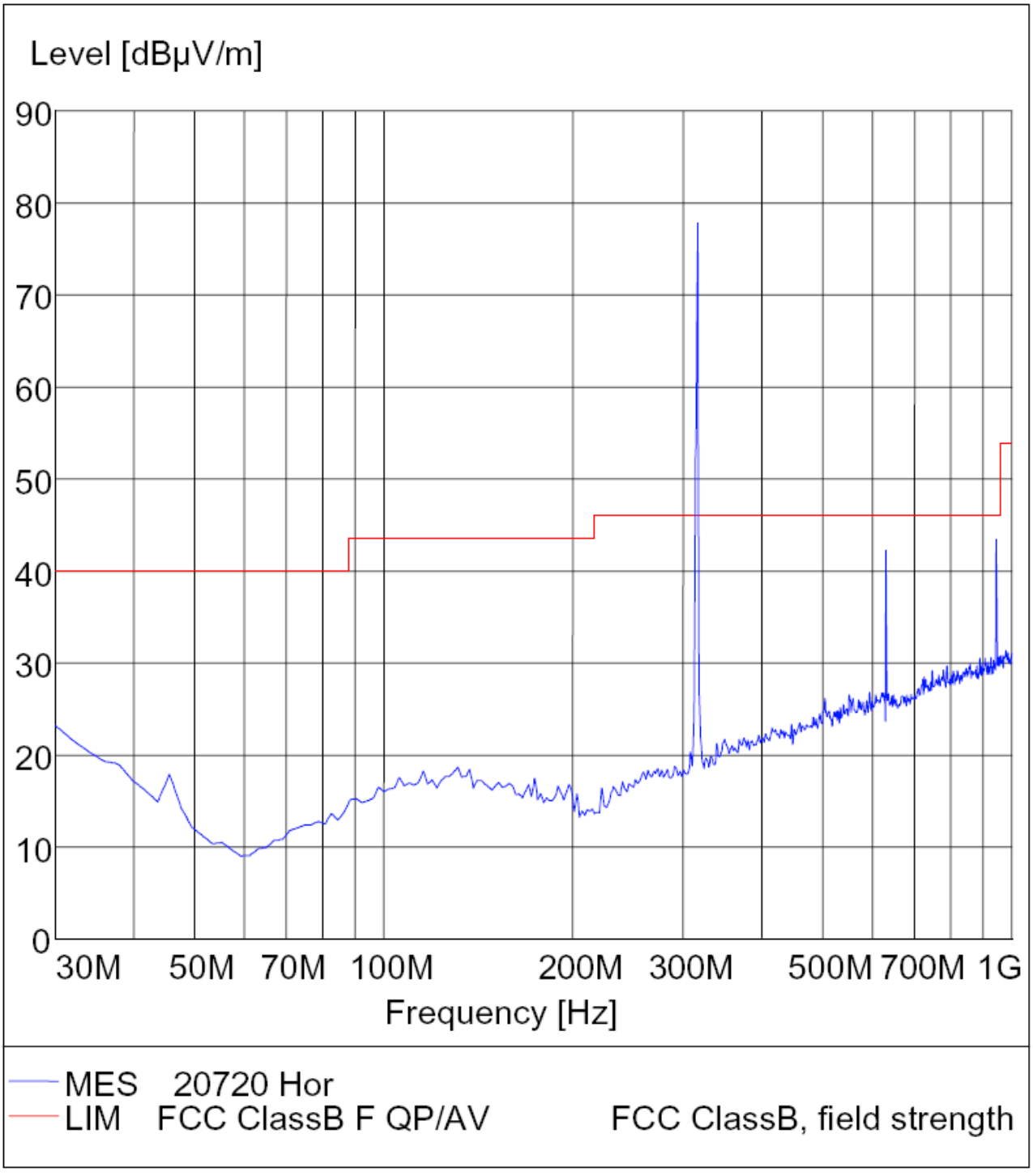
The spectral diagrams in appendix I.

APPENDIX I
(Test Curves)

Radiated Disturbance

FCC Part 15

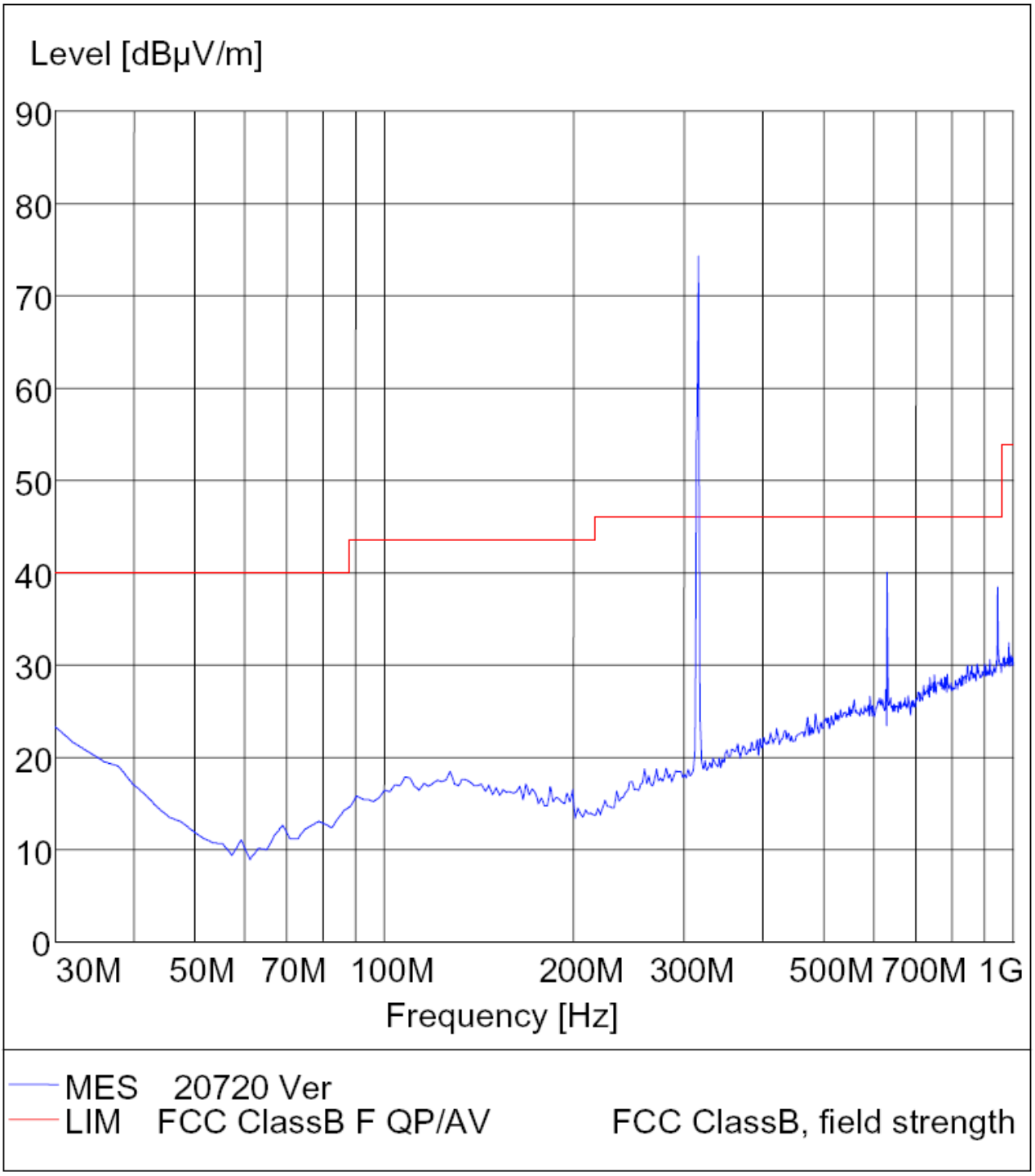
EUT: Invisible Sliding Wall Vault M/N: 20720
Manufacturer: Shanghai Jinggong Tech. Co., Ltd.
Operating Condition: TX
Test Site: ATC EMC Lab.SAC
Operator: Feng
Test Specification: Horizontal
Comment: DC 12V



Radiated Disturbance

FCC Part 15

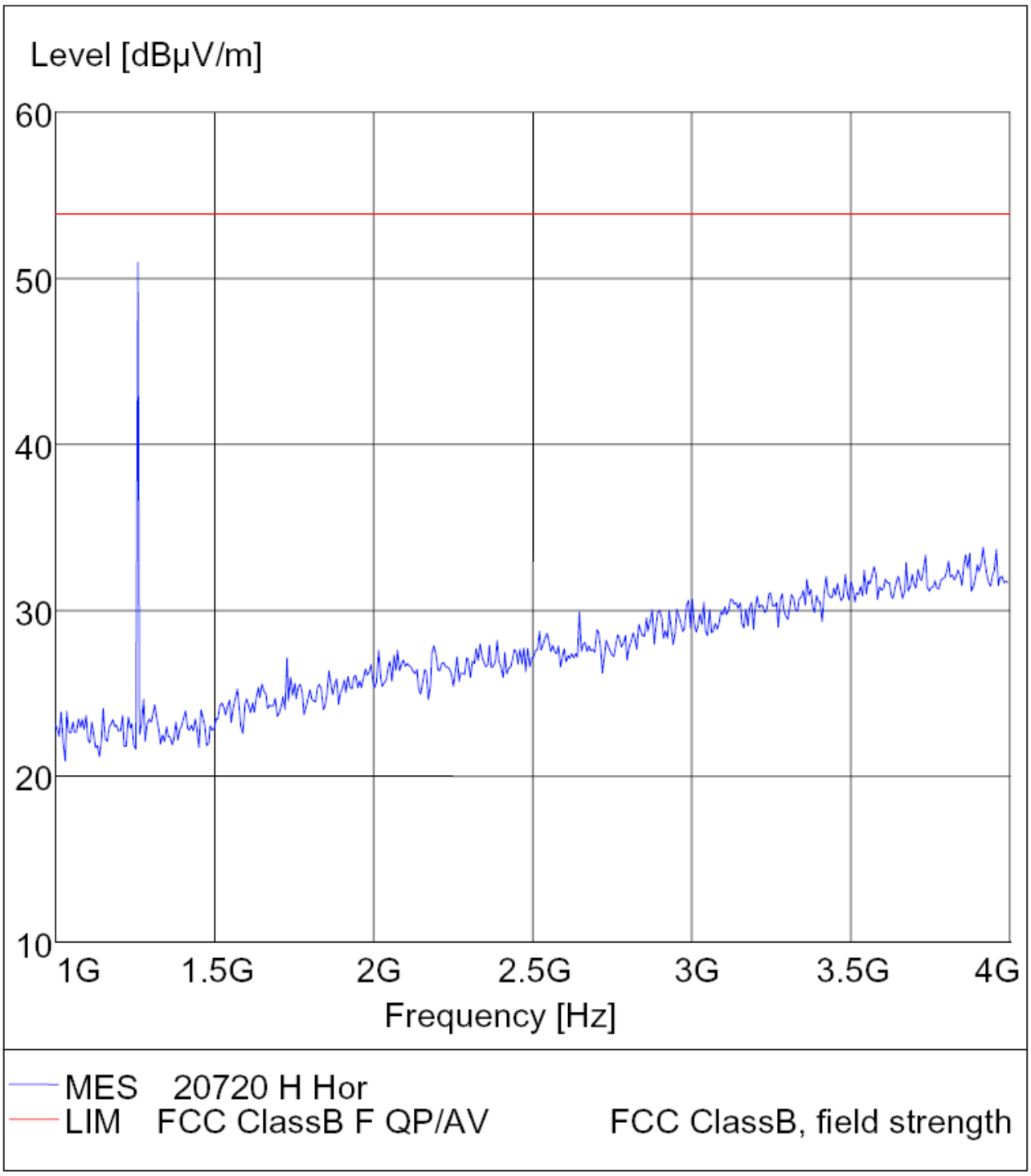
EUT: Invisible Sliding Wall Vault M/N: 20720
Manufacturer: Shanghai Jinggong Tech. Co., Ltd.
Operating Condition: TX
Test Site: ATC EMC Lab.SAC
Operator: Feng
Test Specification: Vertical
Comment : DC 12V



Radiated Disturbance

FCC Part 15

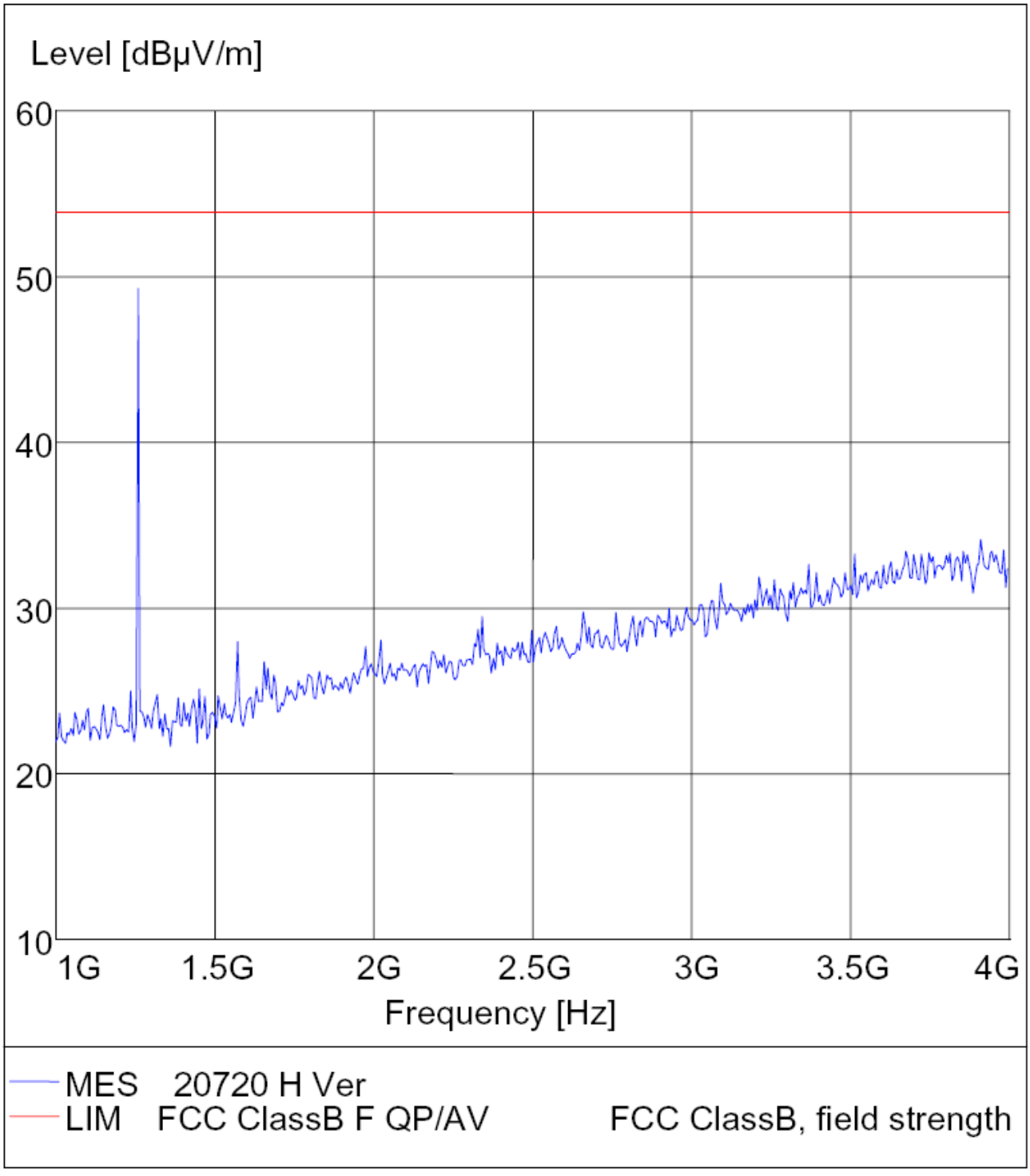
EUT: Invisible Sliding Wall Vault M/N: 20720
Manufacturer: Shanghai Jinggong Tech. Co., Ltd.
Operating Condition: TX
Test Site: ATC EMC Lab.SAC
Operator: Feng
Test Specification: Horizontal
Comment: DC 12V

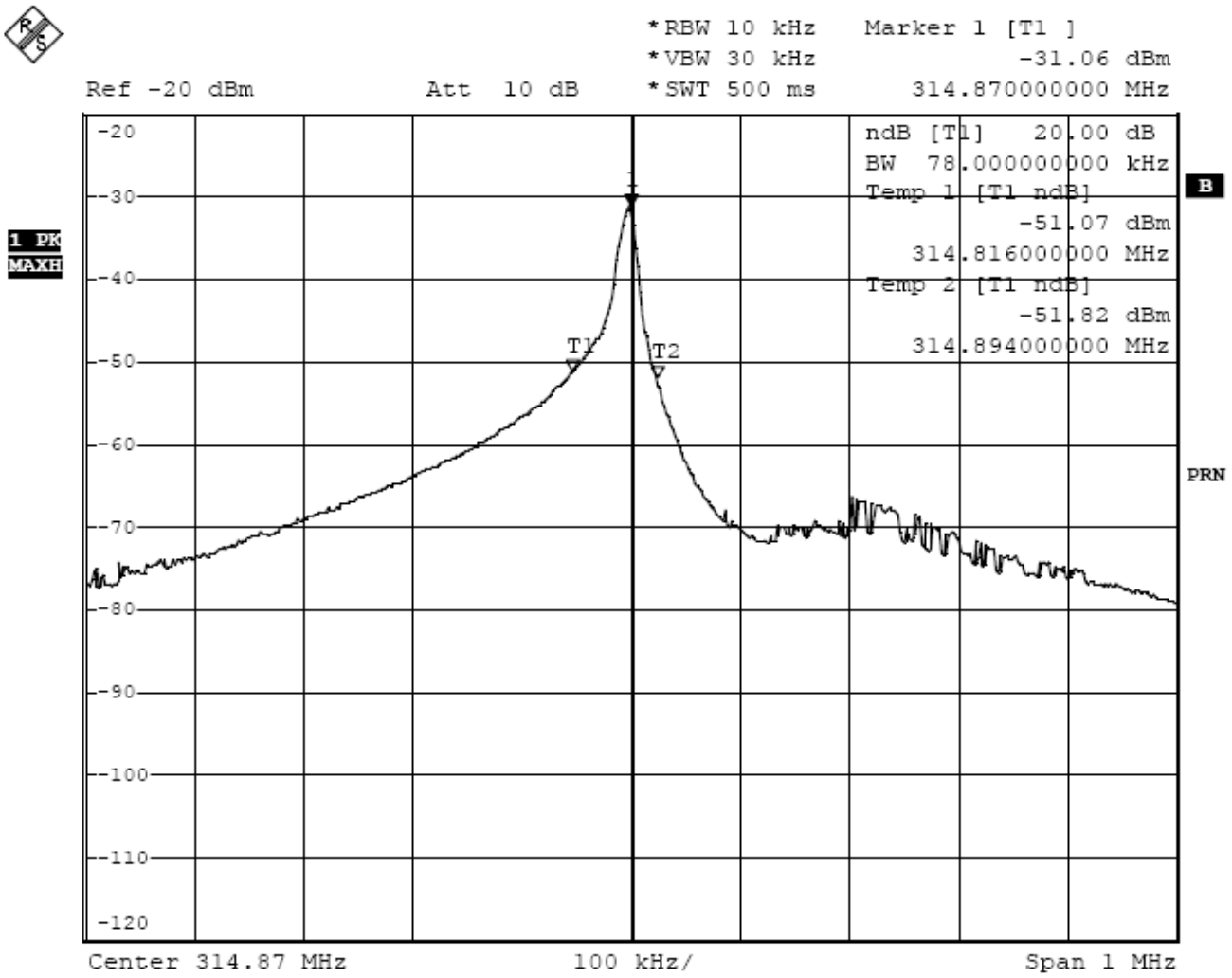


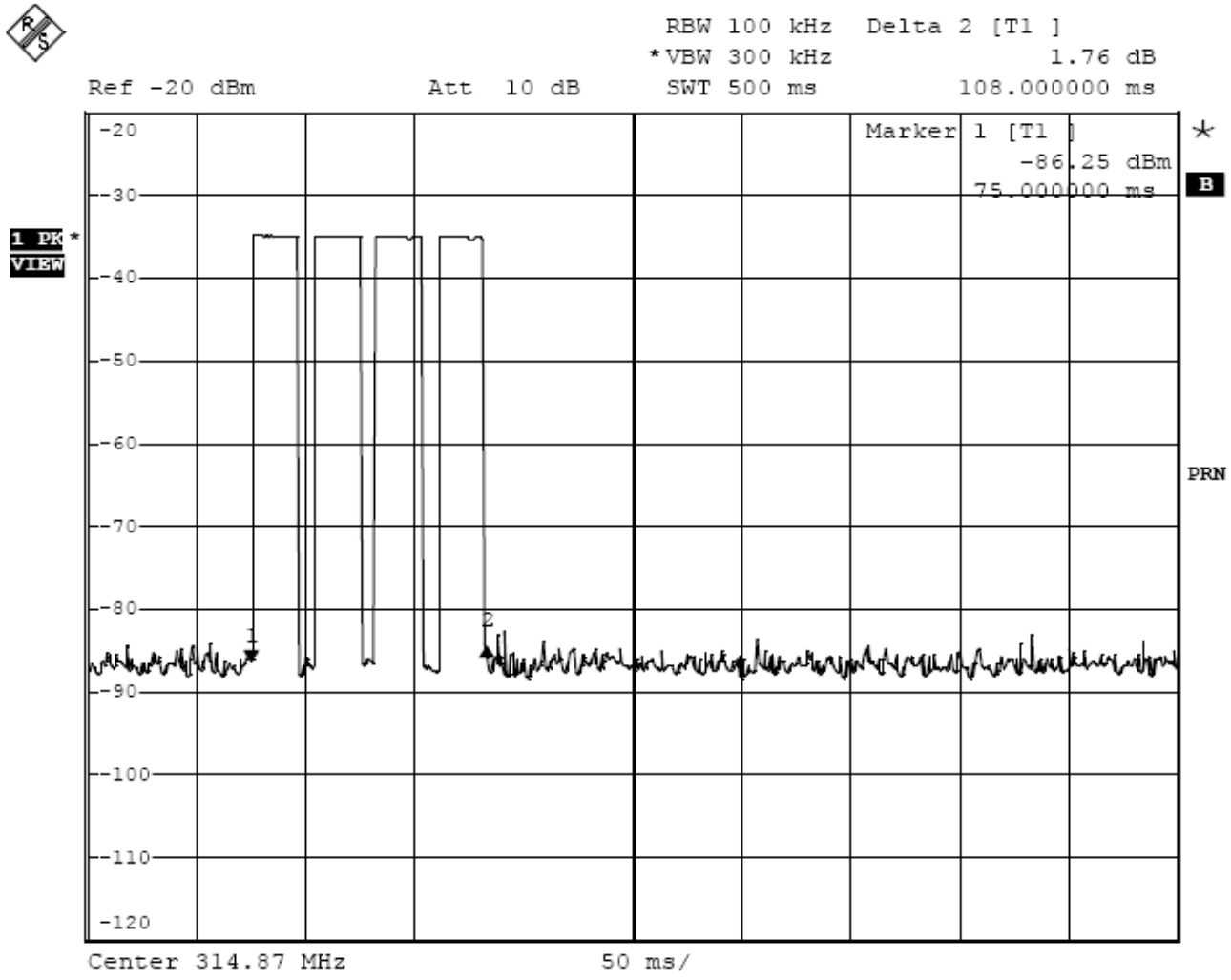
Radiated Disturbance

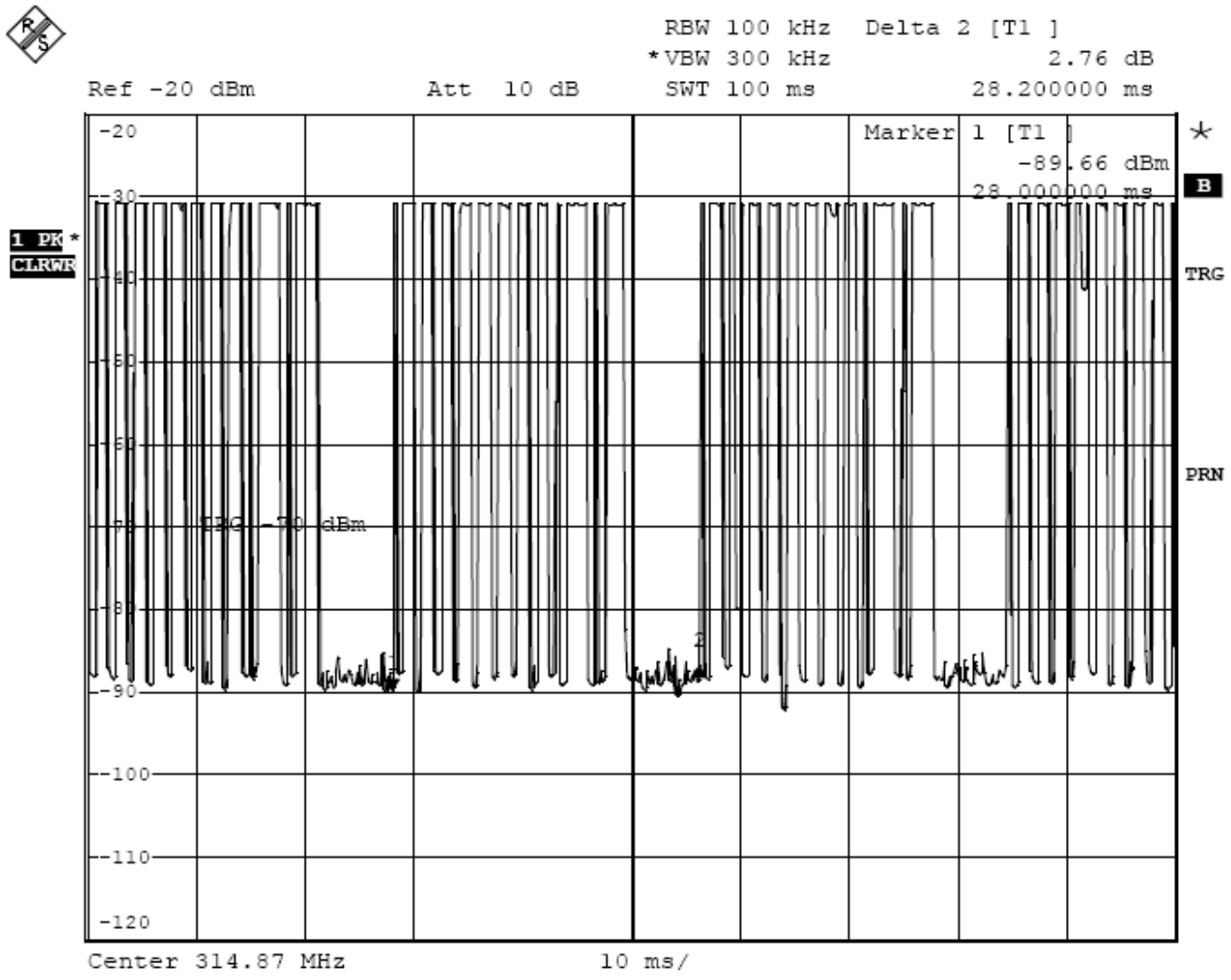
FCC Part 15

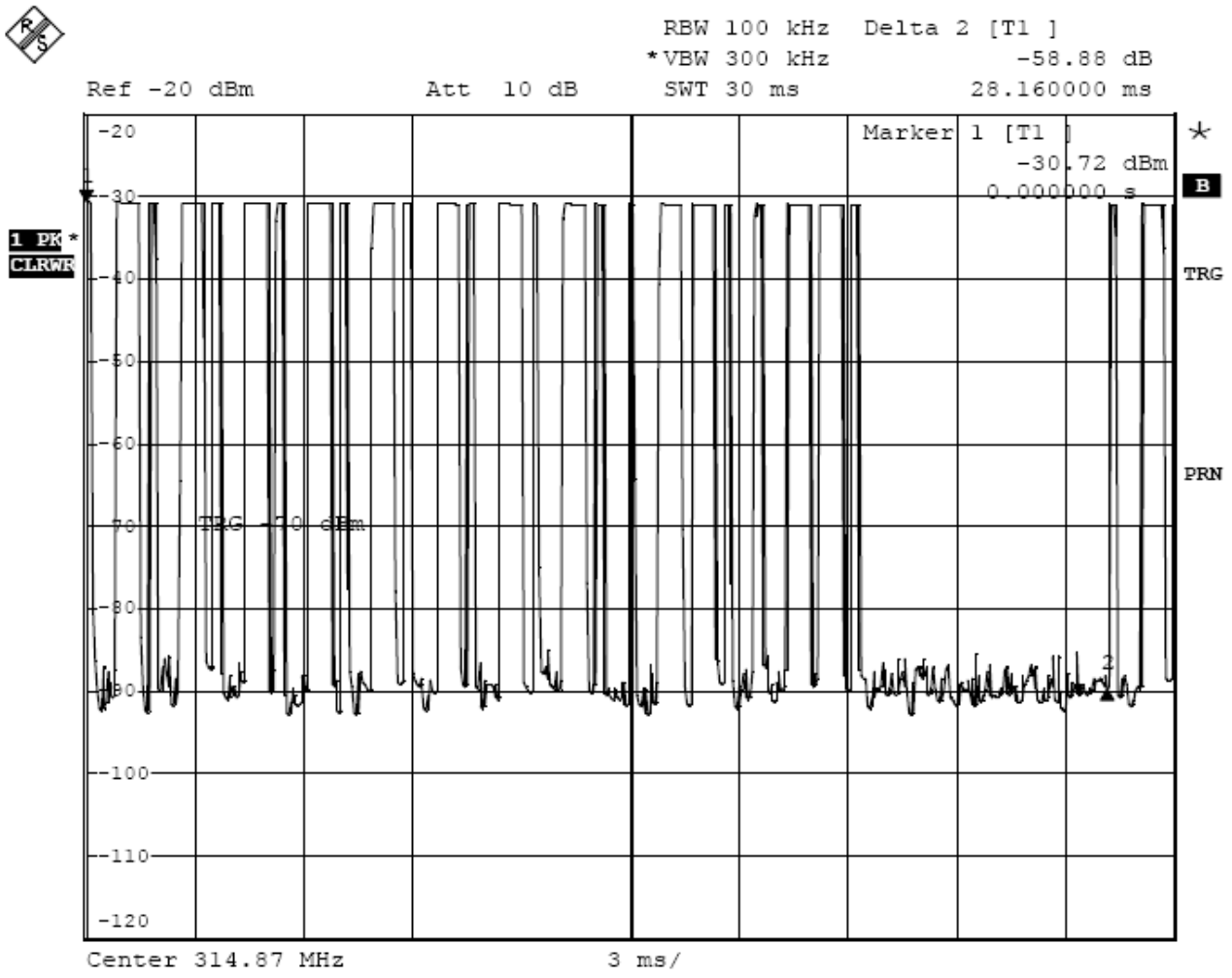
EUT: Invisible Sliding Wall Vault M/N: 20720
Manufacturer: Shanghai Jinggong Tech. Co., Ltd.
Operating Condition: TX
Test Site: ATC EMC Lab.SAC
Operator: Feng
Test Specification: Vertical
Comment : DC 12V



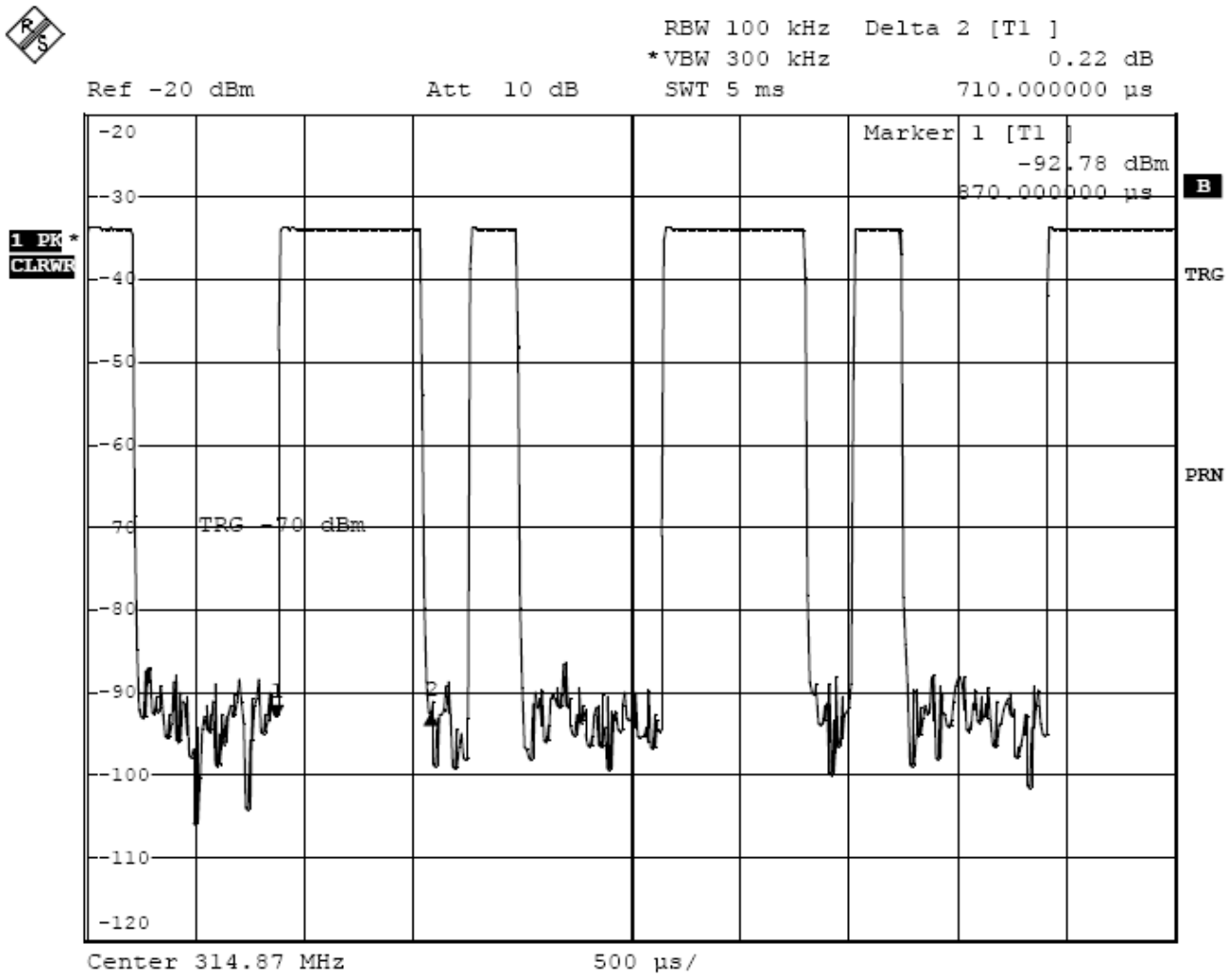

*RBW 10 kHz
*VBW 30 kHz
*SWT 500 ms
Marker 1 [T1]
-31.06 dBm
314.870000000 MHz
Ref -20 dBm
Att 10 dB
ndB [T1] 20.00 dB
BW 78.000000000 kHz
Temp 1 [T1 ndB]
-51.07 dBm
314.816000000 MHz
Temp 2 [T1 ndB]
-51.82 dBm
314.894000000 MHz
1 PK
MAXH
B
PRN
T1
T2
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
Center 314.87 MHz
100 kHz/
Span 1 MHz


RBW 100 kHz
*VBW 300 kHz
SWT 500 ms
Delta 2 [T1]
1.76 dB
108.000000 ms
Ref -20 dBm
Att 10 dB
Marker 1 [T1]
-86.25 dBm
75.000000 ms
1 PK
VIEW
B
PRN
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
Center 314.87 MHz
50 ms/

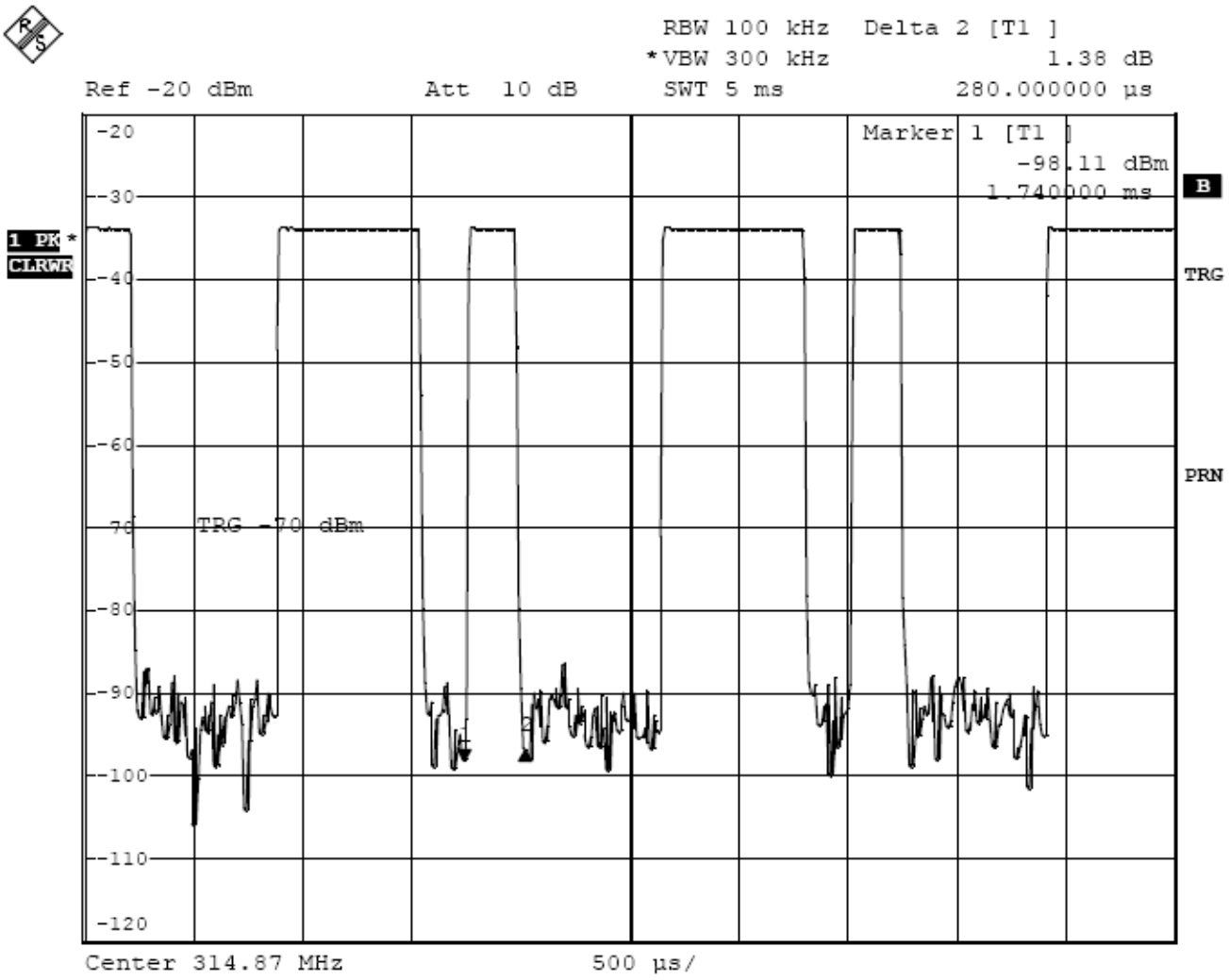

RBW 100 kHz
*VBW 300 kHz
SWT 100 ms
Delta 2 [T1]
2.76 dB
28.200000 ms
Ref -20 dBm
Att 10 dB
Marker 1 [T1]
-89.66 dBm
28.000000 ms
1 PK *
CLRWR
B
TRG
PRN
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
Center 314.87 MHz
10 ms/



The graph shows the pattern of coding during the signal transmission.
It sums of 12 long ‘on’ signals and 13 short ‘on’ signals.



The graph show the duration of long ‘on’ signal. From marker 1 to marker 2, duration is 0.71ms.



The graph show the duration of short ‘on’ signal. From marker 1 to marker 2, duration is 0.28ms.