

FCC PART 15.231
MEASUREMENT AND TEST REPORT
For

EUT Name: Remote Digital Meat Thermometer
Item No.: 01095
FCC ID: X4E01095T
Serial No.: Not supplied by client

Prepared for : BASE4 Group, Inc.
2611 Westgrove Drive #109 Carrollton, Texas 75019 USA

Prepared by : Shenzhen Toby Technology Co., Ltd.
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TEST REPORT DECLARATION

Applicant : BASE4 Group, Inc.
Manufacturer : SUNYAN ELECTRONIC CO., LTD.
EUT Description : Remote Digital Meat Thermometer
Model No. : 01095

The device described above is tested by SEM. Test Compliance Service 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 limits for both radiation and conduction emissions.

The measurement results are contained in this test report and Shenzhen Toby Technology Co., Ltd. is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliant with the FCC official limits.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Shenzhen Toby Technology Co., Ltd.

Reported by: Jacky Wang Date: Apr. 20, 2010
(Jacky Wang)

Reviewer: Benny Xu Date: Apr. 22, 2010
(Benny Xu)

Approved by: Justin Zhang Date: Apr. 23, 2010
(Justin Zhang)

1. GENERAL INFORMATION

1.1. Product Description for Equipment Under Test (EUT)

Client Information

Applicant : BASE4 Group, Inc.
 Address : 2611 Westgrove Drive #109 Carrollton, Texas 75019 USA
 Manufacturer : SUNYAN ELECTRONIC CO., LTD.
 Address : NO.2, 7TH South Street, QingGong Road 3, FoShan City,
 GuangDong, P.R.China

General Description of E.U.T

Items	Description
EUT Description:	Remote Digital Meat Thermometer
Trade Name:	Char-Broil
Model No.:	01095
Rated Voltage:	DC 3V Batteries
Out Power:	<10 uW
Frequency Range:	433.92MHz \pm 200Hz
Tape of Antenna:	Integral Antenna
Size:	9.3cm x 4.5cm x 1.5cm
Comment:	Auto Operation Device

For more information refer to the circuit diagram form and the user's manual.

The test data is gathered from a production sample, provided by the manufacturer.

1.2. Test Standards

The following report is prepared on behalf of the BASE4 Group, Inc. in accordance with FCC Part 15, Subpart C, and section 15.231, 15.203, 15.205 and 15.209 of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC Part 15, Subpart C, and section 15.231, 15.203, 15.205 and 15.209 of the Federal Communication Commissions rules.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission/immunity, should be checked to ensure compliance has been maintained.

1.3. Related Submittal(s)/Grant(s)

No Related Submittal(s).

1.4. Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2009, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

The equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted accordingly in reference to the Operating Instructions. The EUT was set to keep transmitting during the test.

1.5. Accessories Equipment List and Details

Manufacturer	Description	Model	Serial Number
/	/	/	/

1.6. EUT Cable List and Details

Cable Description	Length (M)	Shielded/ Unshielded	With Core/ Without Core
/	/	/	/

1.7. Test Location**FCC – Registration No.: 994117**

SEM. Test Compliance Service Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files and the Registration is 994117.

SEM. Test Compliance Service Co., Ltd. Lab.

Address: 3/F, Jinbao Commerce Building, Xin'an Fanshen Road,
Bao'an District, Shenzhen, P. R. C.

2. SUMMARY OF TEST RESULTS

DESCRIPTION OF TEST	RESULT
§15.203 Antenna Requirement	Compliant
§15.205 Restricted Band	Compliant
§15.209 General Requirement	Compliant
§15.231 (e) Deactivation Testing	Compliant
§15.231 (c) 20dB Band Width Testing	Compliant
§15.231 (e) Radiated Emission	Compliant

3. §15.203 - ANTENNA REQUIREMENT

3.1. Standard Applicable

According to FCC 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

3.2. Test Result

This product has a permanent antenna, fulfill the requirement of this section.

4. §15.205, §15.209, §15.231 (E) RADIATED EMISSION

4.1. Measurement Uncertainty

Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any radiation emissions measurement is ± 3.0 dB.

4.2. Standard Applicable

According to §15.231(e), the field strength of emissions from intentional radiators operated under this section shall not exceed the following:

Fundamental Frequency (MHz)	Field Strength of Fundamental (microvolts/meter)	Field Strength of Spurious Emission (microvolts/meter)
40.66-40.70	1000	100
70-130	500	50
130-174	500 to 1500**	50-150**
174-260	1500	150
260-470	1500 to 5000**	150 to 500**
Above 470	5000	500

** linear interpolations

The limits on the field strength of the spurious emissions in the above table are based on the fundamental frequency of the intentional radiator. Spurious emissions shall be attenuated to the average (or, alternatively, CISPR quasi-peak) limits shown in this table or to the general limits shown in §15.209, whichever limit permits a higher field strength compliance with the provisions of §15.205 shall be demonstrated using the measurement instrumentation specified in that section.

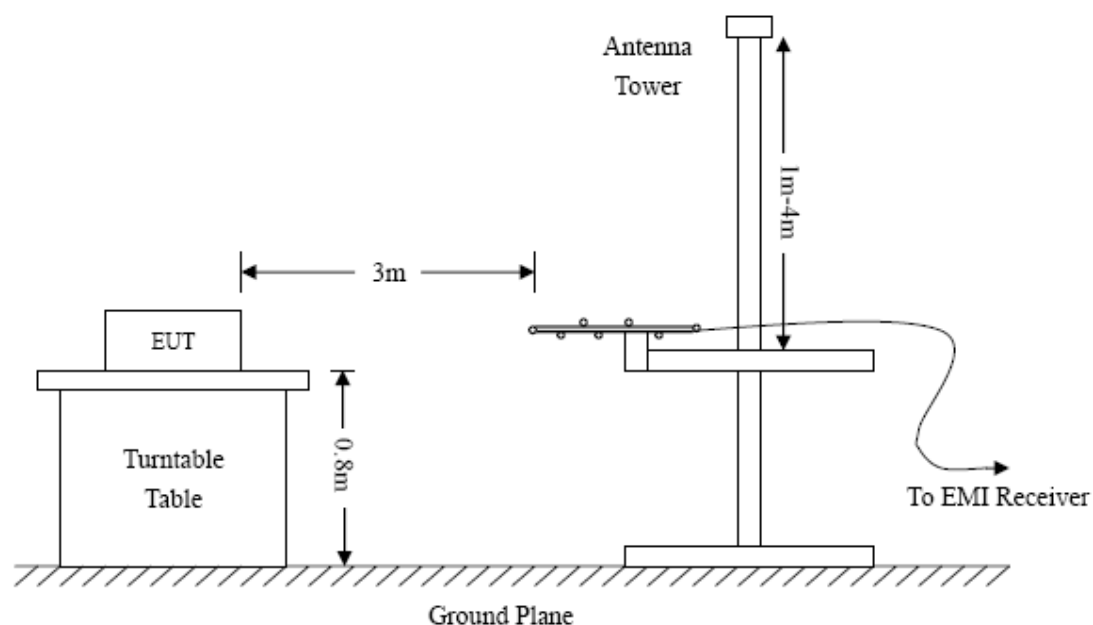
4.3. Test Equipment List and Details

Description	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Date
Spectrum Analyzer	ROHDE& SCHWARZ	FSEA20	DE25181	2009-08-12	2010-08-11
Positioning Controller	C&C	CC-C-1F	N/A	2009-08-12	2010-08-11
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2009-07-21	2010-07-20
Horn Antenna	SCHWARZBECK	BBHX 9120	9120-426	2009-07-21	2010-07-20
RF Switch	EM	EMSW18	SW060023	2009-08-12	2010-08-11
Amplifier	Agilent	8447F	3113A06717	2009-08-12	2010-08-11
Coaxial Cable	SCHWARZBECK	AK9513	9513-10	2009-08-12	2010-08-11
EMI Test Receiver	ROHDE& SCHWARZ	ESPI	25498514	2009-08-12	2010-08-11
EMI Test Receiver	ROHDE& SCHWARZ	ESI26	838786/103	2009-08-12	2010-08-11
Receiver Horn Antenna	ROHDE& SCHWARZ	HF906	100013	2009-08-12	2010-08-11

Statement of Traceability: All calibrations have been performed per the NVLAP requirements traceable to the NIST.

4.4. Test Procedure

The setup of EUT is according with per ANSI C63.4-2009 measurement procedure. The specification used was with the FCC Part 15.205 15.231(e) and FCC Part 15.209 Limit.



4.5. Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and the Cable Factor, and

subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Ant. Loss} + \text{Cab. Loss} - \text{Ampl. Gain}$$

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dBμV means the emission is 6dBμV below the maximum limit for Class B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15.231 Limit}$$

Limit Calculation for Fundamental (Xf):

$$(20\log X_f - 1500) / (434 - 260) = (5000 - 1500) / (470 - 260)$$

$$\text{Limit } X_f = 72.87 \text{ dB}\mu\text{V/m}$$

Limit Calculation for Spurious Emission (Xs):

$$(20\log X_s - 150) / (434 - 260) = (500 - 150) / (470 - 260)$$

$$\text{Limit } X_s = 52.87 \text{ dB}\mu\text{V/m}$$

4.6. Environmental Conditions

Temperature:	21° C
Relative Humidity:	56 %
ATM Pressure:	1011 mbar

4.7. Summary of Test Results/ Plots

According to the data below, the FCC Part 15.205, 15.209 and 15.231 standards, and had the worst margin of:

-13.22 dBμV/m at 1302 MHz in the Vertical polarization, 30 MHz to 5 GHz, 3 Meters

Plot of Radiation Emissions Test Data

Radiated Disturbance

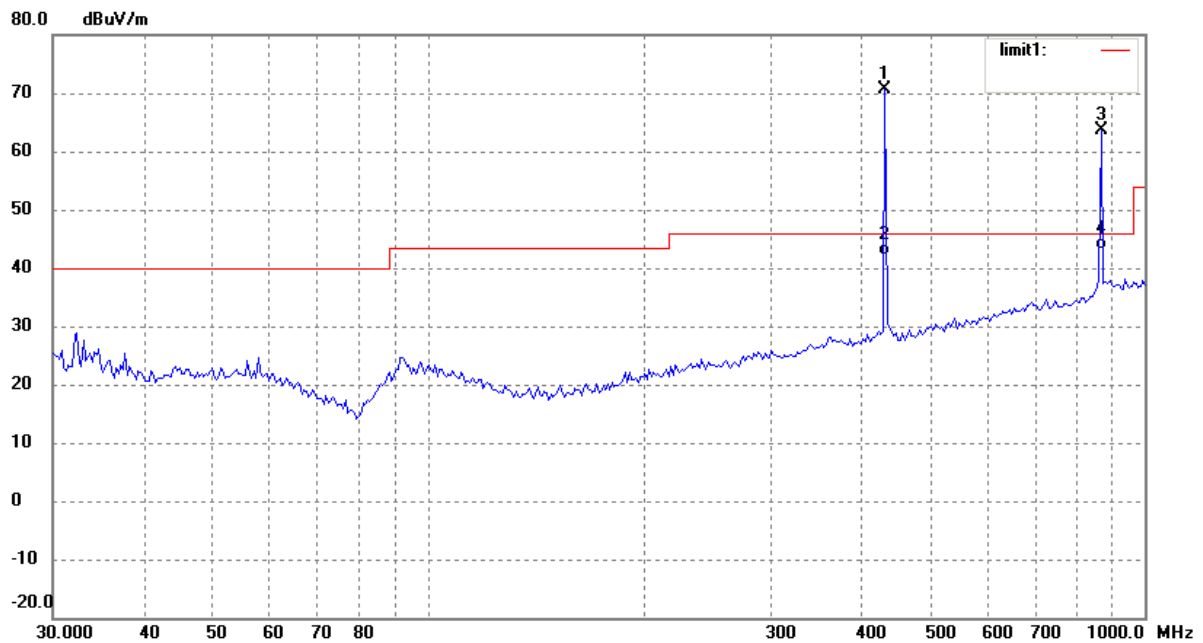
EUT: Remote Digital Meat Thermometer

M/N: 01095

Operating Condition: TX

Test Specification: Horizontal & Vertical

Comment: DC3V

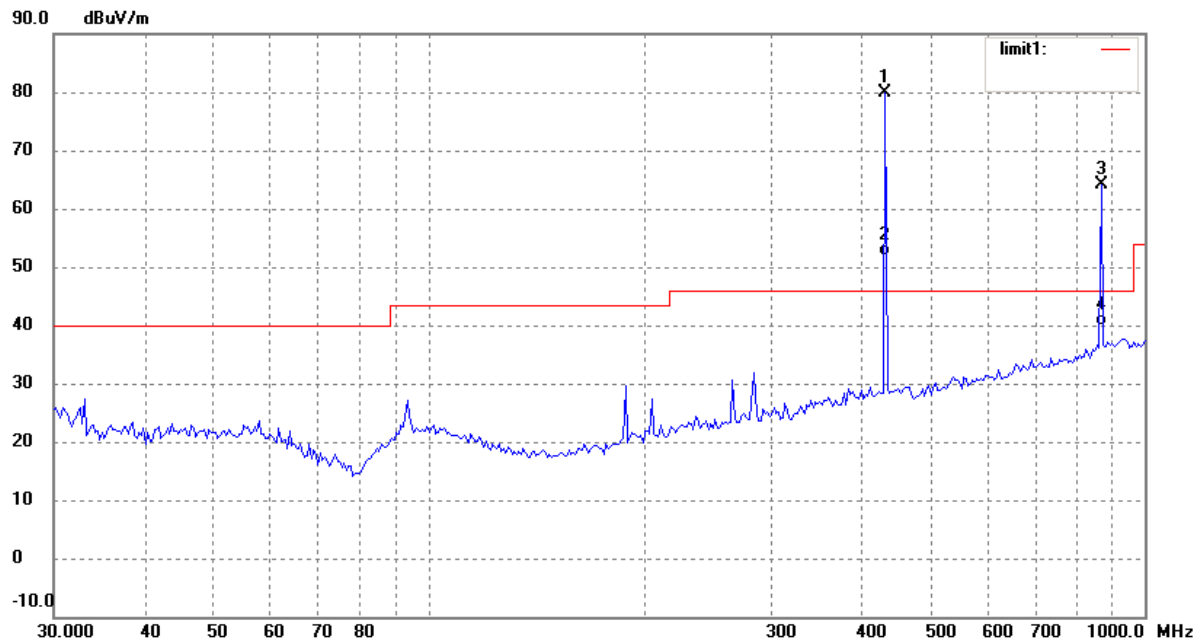
Horizontal

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB)	Result (dBuVm)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	434.0649	57.89	12.65	70.54	92.87	-22.33	185	100	PEAK
2	434.0651	29.58	12.65	42.23	72.87	-30.64	215	100	AVG
3	869.1299	43.60	20.06	63.66	72.87	-9.21	230	100	PEAK
4	869.1302	23.12	20.06	43.18	52.87	-9.69	215	100	AVG

Above 1GHz

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB)	Result (dBuVm)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	1302	31.22	20.80	52.02	74.00	-21.98	90	100	PEAK
2	1736	27.65	22.52	50.17	74.00	-23.83	300	100	PEAK
3	1302	26.78	20.80	47.58	54.00	-6.42	90	100	AVG
4	1736	22.46	22.52	44.98	54.00	-9.02	300	100	AVG

Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB)	Result (dBuVm)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	434.0650	67.32	12.65	79.97	92.87	-12.90	180	100	PEAK
2	434.0651	39.35	12.65	52.00	72.87	-20.87	180	100	AVG
3	869.1301	44.14	20.06	64.20	72.87	-8.67	210	100	PEAK
4	869.1302	19.84	20.06	39.90	52.87	-12.97	210	100	AVG

Above 1GHz

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor (dB)	Result (dBuVm)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	1302	30.51	20.80	51.31	74.00	-22.69	90	100	PEAK
2	1736	26.74	22.52	49.26	74.00	-24.74	300	100	PEAK
3	1302	25.66	20.80	46.46	54.00	-7.54	90	100	AVG
4	1736	21.53	22.52	44.05	54.00	-9.95	300	100	AVG

Note: The EUT was tested in all three orthogonal planes and frequency rang 30MHz to the tenth harmonics. Emissions attenuated closely to the noise base are not reported.

5. §15. 231(C) 20DB BANDWIDTH TESTING

5.1. Standard Applicable

According to FCC 15.231(c), The bandwidth of the emission shall be no wider than 0.25 % of the center frequency for devices operating above 70 MHz and below 900 MHz. Bandwidth is determined at the points 20 dB down from the modulated carrier.

5.2. Test Equipment List and Details

Description	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Date
Agilent	Spectrum Analyzer	E4402B	US41192821	2009-08-12	2010-08-11
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2009-08-12	2010-08-11
Receiver Antenna	ETS	2175	57337	2009-08-12	2010-08-11
50 ohm Coaxial Cable	ETS	SUCOFLEX 104	25498514	2009-08-12	2010-08-11

Statement of Traceability: All calibrations have been performed per the NVLAP requirements traceable to the NIST.

5.3. Test Procedure

With the EUT's antenna attached, the EUT's 20dB Bandwidth power was received by the test antenna, which was connected to the spectrum analyzer with the START, and STOP frequencies set to the EUT's operation band.

5.4. Environmental Conditions

Temperature:	20° C
Relative Humidity:	54 %
ATM Pressure:	1011 mbar

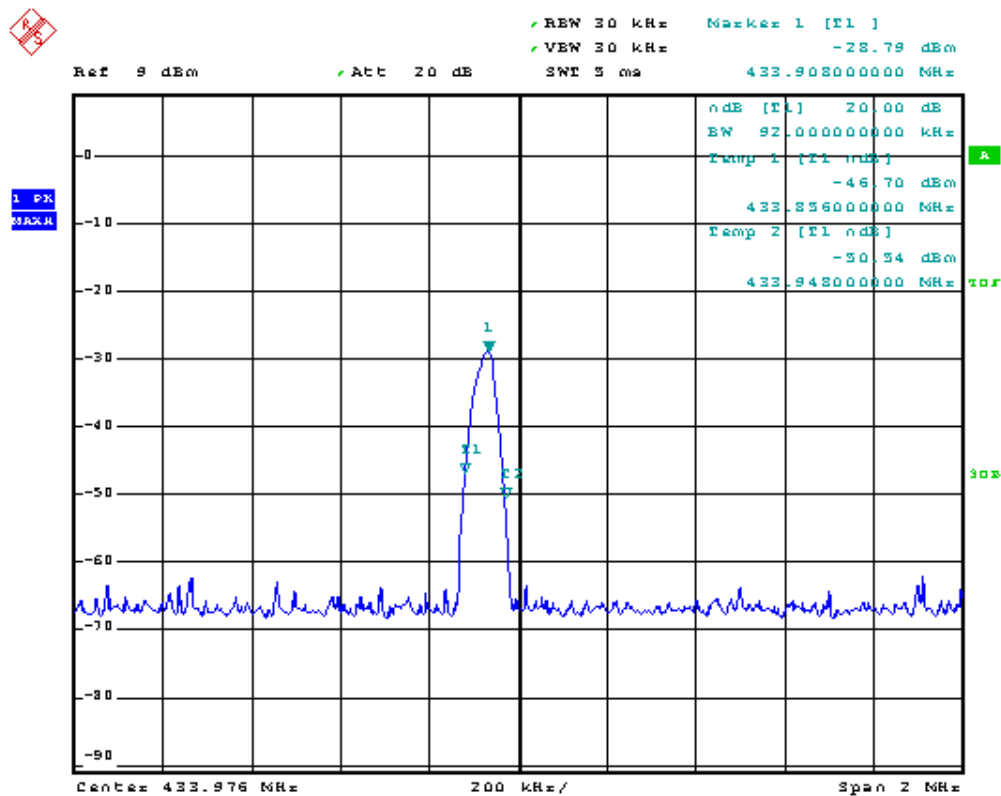
5.5. Summary of Test Results/Plots

Frequency 20dB MHz	Bandwidth kHz	Limit kHz	Result
433.908	92.00	1084.77	Pass

Limit=Fundamental Frequency×0.25%=433.908×0.25%=1084.77kHz

Test Result: Pass

Refer to the attached plots.



Date: 20.APR.2010 15:14:39

6. §15. 231(E) DEACTIVATION TESTING

6.1. Standard Applicable

According to FCC 15.231 (a)(3) there is no limit on the number of individual transmissions, provided the total transmission time does not exceed two seconds per hour.

According to FCC 15.231 (e) devices operated under the provisions of this paragraph shall be provided with a means for automatically limiting operation so that the duration of each transmission shall not be greater than one second and the silent period between transmissions shall be at least 30 times the duration of the transmission but in no case less than 10 seconds.

6.2. Test Equipment List and Details

Description	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Date
Agilent	Spectrum Analyzer	E4402B	US41192821	2009-08-12	2010-08-11
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2009-08-12	2010-08-11
Receiver Antenna	ETS	2175	57337	2009-08-12	2010-08-11
50 ohm Coaxial Cable	ETS	SUCOFLEX 104	25498514	2009-08-12	2010-08-11

Statement of Traceability: All calibrations have been performed per the NVLAP requirements traceable to the NIST.

6.3. Test Procedure

With the EUT's antenna attached, the EUT's output signal was received by the test antenna, which was connected to the spectrum analyzer. Set the center frequency to 433.908MHz, then set the spectrum analyzer to Zero Span for the release time reading.

6.4. Environmental Conditions

Temperature:	21° C
Relative Humidity:	55 %
ATM Pressure:	1011 mbar

6.5. Summary of Test Results/Plots

Refer to the attached plots.

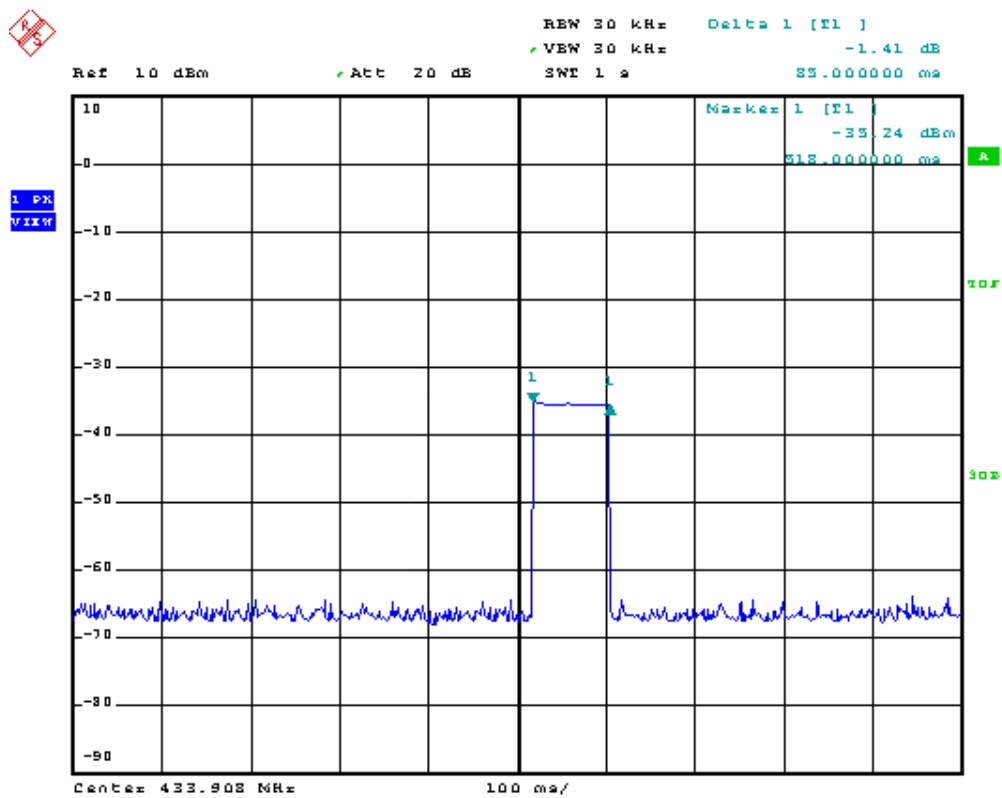
$$\begin{aligned}
 \text{The total transmission time} &= \text{Transmission time} * 3600\text{s} / \text{Silent time} \\
 &= 0.083 \text{ s} * 3600 \text{ s} / 266.4\text{s} \\
 &= 1.121 \text{ s} < 2 \text{ s}
 \end{aligned}$$

$$\text{Transmission time} = 0.083\text{s} < 1 \text{ s}$$

$$\text{Silent time} = 266.4 \text{ s} > 10 \text{ s and Silent time} = 266.4 \text{ s} > 30 * 0.083 \text{ s} = 2.49 \text{ s}$$

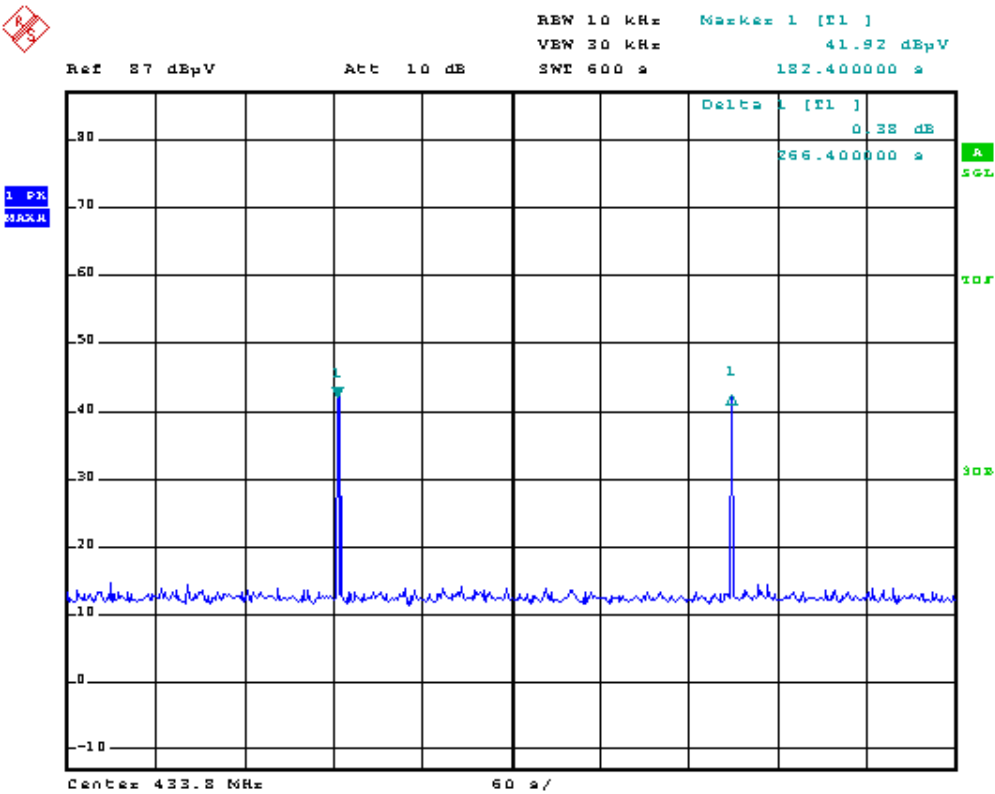
Test Result: Pass

Transmission Time:



Date: 20.APR.2010 15:53:20

Silent Time:



Date: 20.APR.2010 13:39:55

Temperature data normal transmitting plot:

