CONFORMANCE TEST REPORT
FOR
FCC 47 CFR, Part 95 Subpart C

Report No.: 08-07-MAS-168-03

Client:	CHINA DIGITAL CO., LTD.
Product:	Radio control
Trade Name:	TGR
Model No.:	2711
FCC ID:	WML-2711
Manufacturer/supplier:	CHINA DIGITAL CO., LTD.

Date test item received:	2008/07/21
Date test campaign completed:	2008/08/01
Date of issue:	2008/08/27

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Total number of pages of this test report: 20 pages

Total number of pages of photos: External photos 1 page
Internal photos 2 pages
Setup photos 2 pages

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Address	: 1F., No.33, Lane148, Xinsheng St., Zhonghe City, Taipei County 235,Taiwan.
Manufacturer	: CHINA DIGITAL CO., LTD.
Address	: No 3, second west street, xingfa middle road, the sixth industrial zone Liwu, wusha, Changan town, dongguan city, guangdong province, China
EUT	: Radio control
Trade name	: TGR
Model No.	: 2711
Power Source	: 12V dc
Regulations applied	: FCC 47 CFR, Part 95 Subpart C (2007)

The testing described in this report has been carried out to the best of our knowledge and ability, and our responsibility is limited to the exercise of reasonable care. This certification is not intended to believe the sellers from their legal and/or contractual obligations.

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③ Filing: FCC, Industry Canada, VCCI
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⑤ FCC Registration Number: 90588, 91094, 91095

NVLAP Lab Code 200133-0

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1. GENERAL INFORMATION

1.1 Product Description

a) Type of EUT : Radio control
b) Model No. : 2711
c) Trade Name : TGR
d) FCC ID : WML-2711
e) Working Frequency : 26.995 MHz，27.045 MHz，27.095 MHz，27.145 MHz，27.195 MHz，27.255 MHz
f) Power Supply : 12V dc (Battery)

1.2 Characteristics of Device:

The EUT is a Radio control. The Radio control will send the AM signal to control the "throttle" and "direction" of the receiver.

1.3 Test Methodology

Both Conducted and radiated testing were performed according to the procedures in ANSI C63.4（2003）, TIA/EIA-603, FCC 47 CFR Part 2 and Part 95.

1.4 Test Facility

The semi-anechoic chamber and conducted measurement facility used to collect the radiated and conducted data are located inside the Building at No.8, Lane 29, Wen-ming Road, Lo-shan Tsun, Kweishan Hsiang, Taoyuan, Taiwan, R.O.C.
This site has been accreditation as a FCC filing site.

2. TEST SYSTEM AND LIMITATION

2.1 Device for Tested System

Device	Manufacture	Model No.	Cable Description
Radio control*	CHINA DIGITAL CO., LTD.	2711	----

Remark "*" means equipment under test.

2.2 Test Equipment

The following instrument are used for radiated emissions measurement :

Equipment	Manufacturer	Model No.	Next Cal. Due
EMI Receiver	R&S	ESIB 7	07/17/2009
PRE-Amplifier	ADVANTEST	BB525C	12/27/2008
BiLog Antenna	Schaffner	CBL 6112B	07/03/2009
Dipole Antenna	Dipole Antenna	914	07/30/2009
Dipole Antenna	Dipole Antenna	915	07/30/2009
Signal Generator	HP	8648D	05/27/2009
Loop Antenna	EMCO	6512	07/18/2010
Loop Antenna	EMCO	6512	07/18/2010
Temperature Chamber	ESPEC	EBR-3HW6P4A-22	08/11/2009
Digital Multi Meter	YF-FONG	YF1069	04/16/2009
Spectrum Analyzer	Agilent	8564EC	10/10/2008
Spectrum Analyzer	R&S	FSU46	11/23/2008

Note: The standards used to perform this calibration are traceable to NML/ROC, NIST/USA and NPL.

2.3 Limitation

(1) R/C Transmitter Channel Frequencies :

According to §95.623(a):

The R/C transmitter channel frequencies are:

Frequency (MHz)
26.995
27.045
27.095
27.145
27.195
27.255

(2) Emission Types :

According to §95.631(b):

An R/C transmitter may transmit any appropriate non-voice emission which meets the emission limitations of § 95.633.

(3) Emission Bandwidth :

According to §95.633(b):

The authorized bandwidth for any emission type transmitted by an R/C transmitter is 8 kHz.

(4) Maximum Transmitter Power :

According to §95.639(b):

No R/C transmitter, under any condition of modulation, shall exceed a carrier power or peak envelope TP (single- sideband only) of:

(1) 4 W in the 26–27 MHz frequency band, except on channel frequency 27.255 MHz;
(2) 25 W on channel frequency 27.255 MHz;
(3) 0.75 W in the 72–76 MHz frequency band.

(5) Unwanted Radiation :

According to §95.635(b):

(1) At least 25 dB (decibels) on any frequency removed from the center of the authorized bandwidth by more than 50% up to and including 100% of the authorized bandwidth.

(3) At least 35 dB on any frequency removed from the center of the authorized bandwidth by more than 100% up to and including 250% of the authorized bandwidth.

(7) At least 43 + 10 log10 (T) dB on any frequency removed from the center of the authorized bandwidth by more than 250%.

(6) Frequency Stability :

According to §95.623(b):

Each R/C transmitter that transmits in the 26–27 MHz frequency band with a mean TP of 2.5 W or less and that is used solely by the operator to turn on and/or off a device at a remote location, other than a device used solely to attract attention, must be maintained within a fequency tolerance of 0.01%. All other R/C transmitters that transmit in the 26–27 MHz frequency band must be maintained within a frequency tolerance of 0.005%.

3. R/C TRANSMITTER CHANNEL FREQUENCY

3.1 Applicable Standard

According to §95.623(a):

The R/C transmitter channel frequencies are:

Frequency (MHz)
26.995
27.045
27.095
27.145
27.195
27.255

3.2 EUT Operating Frequency

Frequency (MHz)
26.995
27.045
*27.095
27.145
27.195
27.255

Note：”*” means the frequency chosen for testing.

4. EMISSION TYPES

4.1 Applicable Standard

According to §95.631(b):

An R/C transmitter may transmit any appropriate non-voice emission which meets the emission limitations of § 95.633.

4.2 Type of Emission

The emission use non-voice modulation to transmit.

5. EMISSION BANDWIDTH MEASUREMENT

5.1 Applicable Standard

According to §95.633(b):

The authorized bandwidth for any emission type transmitted by an R/C transmitter is 8 kHz.

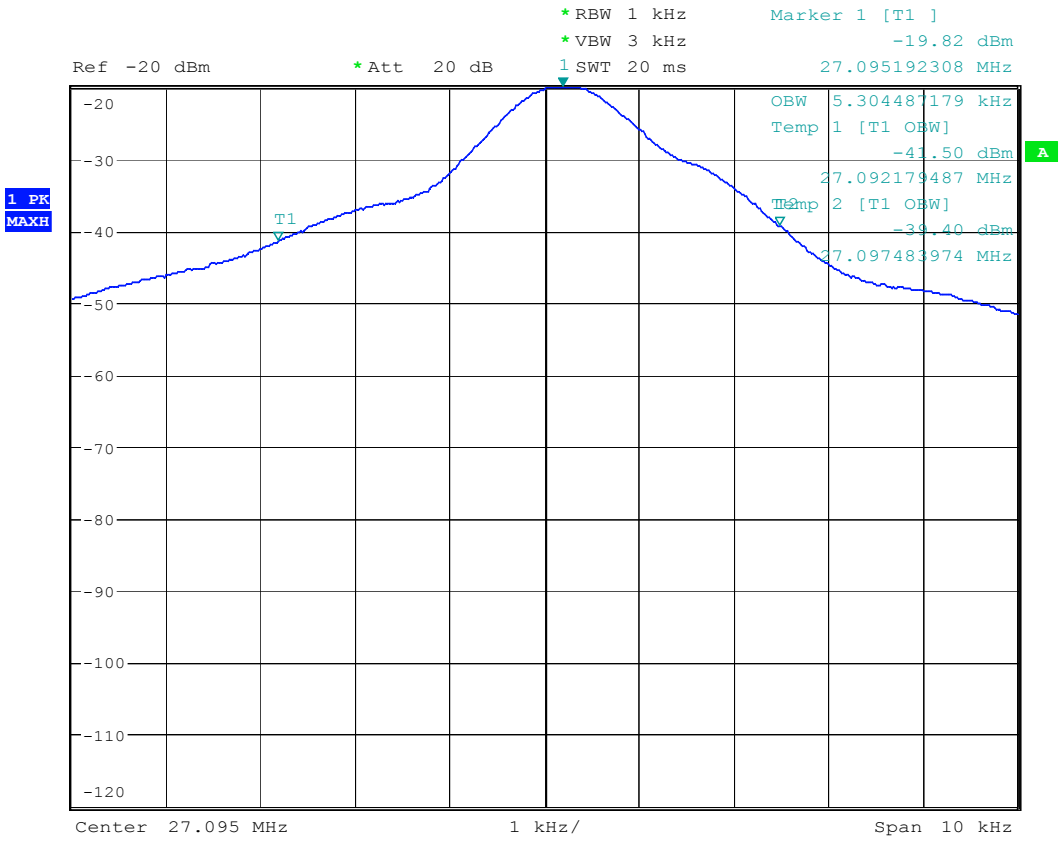
5.2 Test Result

Test Date: Aug.13, 2008 Temperature: 26 ℃ Humidity: 63 %

Test Frequency (MHz)	Test Result (kHz)	Limit (kHz)
27.095	5.304	8

Note: Please see the next page plot.

Emission Bandwidth Measurement



6. TRANSMITTER POWER AND SPURIOUS MEASUREMENT

6.1 Applicable Standard

According to §95.639(b):

No R/C transmitter, under any condition of modulation, shall exceed a carrier power or peak envelope TP (single- sideband only) of:

(1) 4 W in the 26–27 MHz frequency band, except on channel frequency 27.255 MHz;
(2) 25 W on channel frequency 27.255 MHz;
(3) 0.75 W in the 72–76 MHz frequency band.

According to §95.635(b):

(7) At least 43 + 10 log10 (T) dB on any frequency removed from the center of the authorized bandwidth by more than 250%.

6.2 Measurement Procedure

A.Preliminary Measurement For Portable Devices.

For portable devices, the following procedure was performed to determine the maximum emission axis of EUT:

1. With the receiving antenna is H polarization, rotate the EUT in turns with three orthogonal axes to determine the axis of maximum emission.
2. With the receiving antennna is V polarization, rotate the EUT in turns with three orthogonal axes to determine the axis of maximum emission.
3. Compare the results derived from above two steps. So, the axis of maximum emission from EUT was determined and the configuration was used to perform the final measurement.

B. Final Measurement

1. Setup the configuration per figure 1 and 2 for frequencies measured below and above 30 MHz respectively. Turn on EUT and make sure that it is in continuous operating function.
2. The search antenna is to be raised and lowered over a range from 1 to 4 meters in horizontally polarized orientation. Position the highness when the highest value is indicated on spectrum analyzer, then change the orientation of EUT on test table over a range from 0 ° to 360 ° with a speed as slow as possible, and keep the azimuth that highest emission is indicated on the spectrum analyzer. Vary the antenna position again and record the highest value as a final reading. A RF test receiver is also used to confirm emissions measured.
3. Use a known signal source replaces the device to measure the substitution measurement. The radiated power is equal to the power supplied by the signal generator, increased by the known relationship if necessary and after corrections due to the gain of the substitution antenna and the cable loss between the signal generator and the substitution antenna.

Figure 1: Frequencies measured below 30 MHz configuration

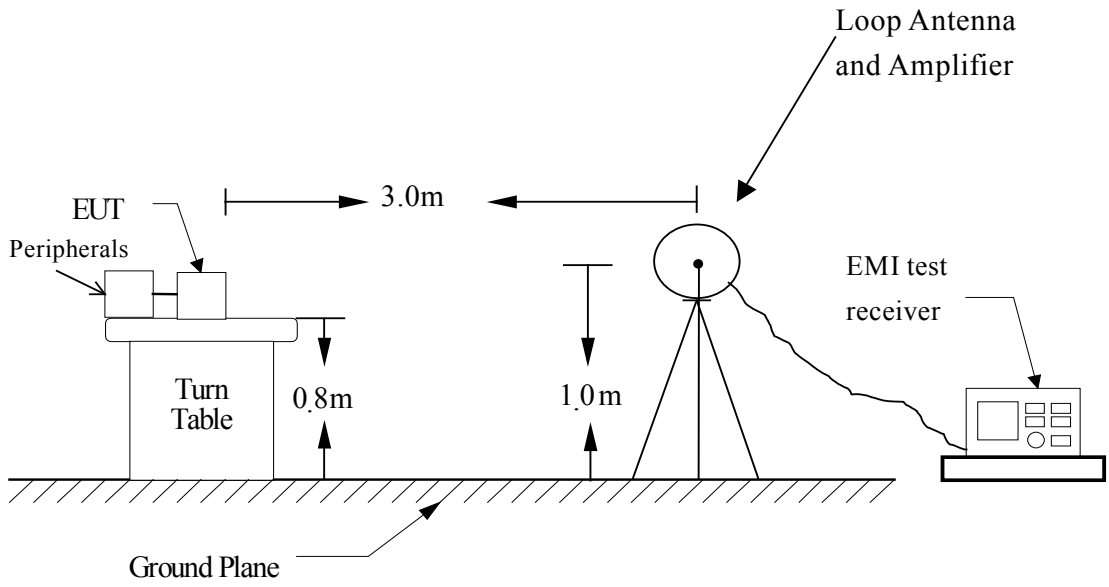
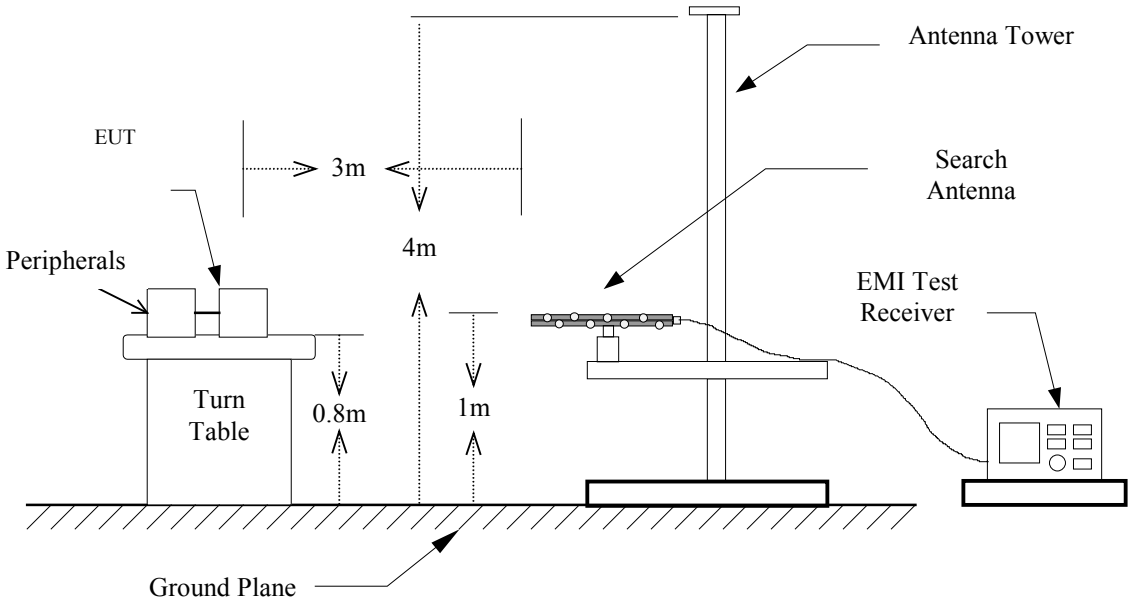


Figure 2: Frequencies measured above 30 MHz configuration



6.3 Test Data

Operated mode : Continue Transmitting
Test Date : Aug. 13, 2008 Temperature : 26 ℃ Humidity : 63 %

6.3.1 Fundamental

Frequency (MHz)	SG Reading (dBm)	Corrected Factor (dB)	Result (dBm)	Result (W)	Limit (W)	Margin (W)
27.095	21.3	-0.4	20.9	0.195	4.0	3.805

6.3.2 Harmonics

Frequency (MHz)	Antenna (H/V)	SG Reading (dBm)	Corrected Factor (dB)	Resulot (dBm)	Limit (dBm)	Margin (dB)
54.190	H	-57.1	8.8	-48.3	-15.0	-33.7
54.190	V	-41.5	8.8	-32.7	-15.0	-18.1
81.285	H	-74.2	8.9	-65.3	-15.0	-50.7
81.285	V	-58.8	8.9	-49.9	-15.0	-35.3
108.380	H	-73.8	13.7	-60.1	-15.0	-45.5
108.380	V	-63.7	13.7	-50.0	-15.0	-35.4
135.475	H	-77.2	14.0	-63.2	-15.0	-48.6
135.475	V	-73.9	14.0	-59.9	-15.0	-45.3
162.570	H	-73.2	12.0	-61.2	-15.0	-46.6
162.570	V	-71.3	12.0	-59.3	-15.0	-44.7
189.665	H	-77.6	12.0	-65.6	-15.0	-51.0
189.665	V	-77.8	12.0	-65.8	-15.0	-51.2
216.760	H	-82.1	13.2	-68.9	-15.0	-54.3
216.760	V	-85.3	13.2	-72.1	-15.0	-57.5
243.885	H	-82.1	15.2	-66.9	-15.0	-52.3
243.885	V	-81.6	15.2	-66.4	-15.0	-51.8
270.950	H	-84.4	16.2	-68.2	-15.0	-53.6
270.950	V	-84.9	16.2	-68.7	-15.0	-54.1

6.3.3 Other Emission

Frequency (MHz)	Antenna (H/V)	Reading (dBm)	Corrected Factor (dB)	Resulot (dBm)	Limit (dBm)	Margin (dB)
31.856	H	-82.9	13.1	-69.8	-15.0	-54.8
33.808	V	-74.1	13.1	-61.0	-15.0	-46.0
102.124	H	-88.5	11.5	-77.0	-15.0	-62.0
102.124	V	-78.7	11.5	-67.2	-15.0	-52.2
143.114	V	-85.6	14.6	-71.0	-15.0	-56.0
174.345	V	-82.6	15.0	-67.6	-15.0	-52.6
176.297	H	-73.2	14.8	-78.4	-15.0	-63.4
264.132	H	-89.6	15.1	-74.5	-15.0	-59.5

Note:

1. Place of Measurement: Measuring site of the ETC.
2. Test Result = SG Reading + Correct Factor
3. If the data table appeared symbol of "***" means the value was too low to be measured.
4. The estimated measurement uncertainty of the result measurement is
   ±4.2dB (9kHz≦f<30MHz)
   ±4.6dB (30MHz≦f≦300MHz)

6.4 Calculation

ERP

The ERP is calculated by adding the Antenna Gain and Cable Loss from the SG measured reading. The basic equation with a sample calculation is as follows:

RESULT = SG READING + CORR. FACTOR

where CORR. FACTOR = Antenna Gain + Cable Loss

7. EMISSION MASK MEASUREMENT

7.1 Applicable Standard

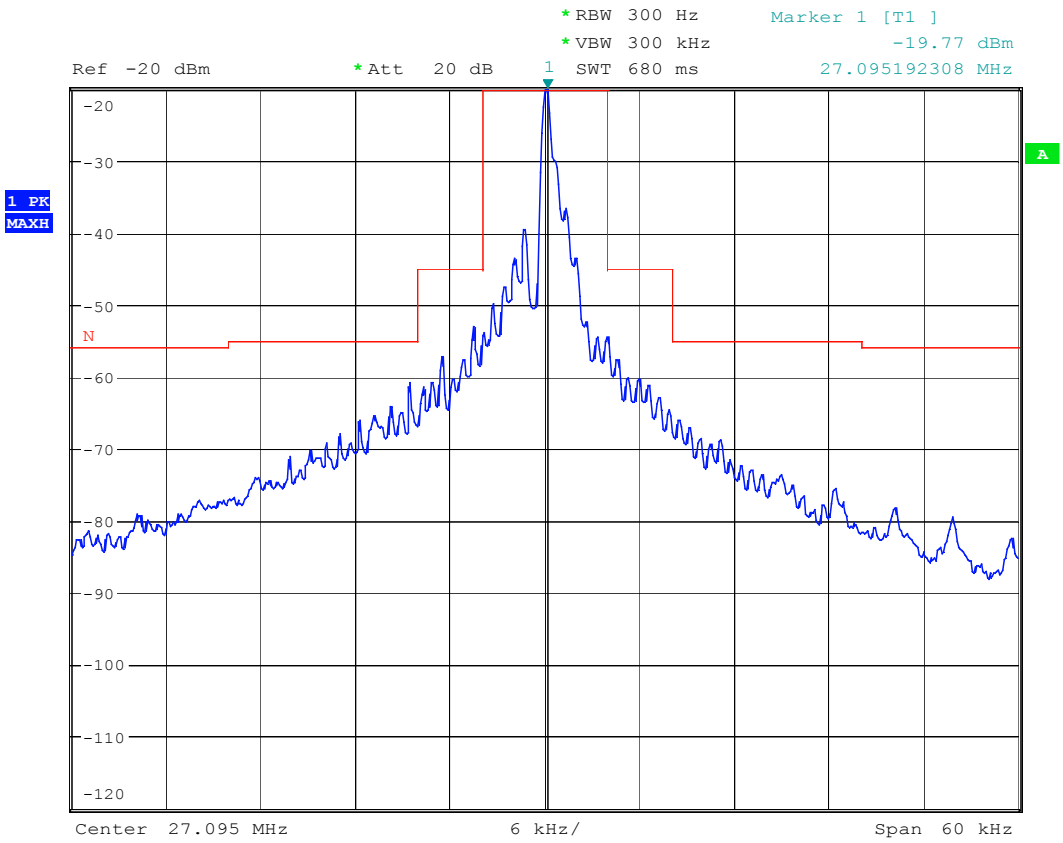
According to §95.635(b):

(1) At least 25 dB (decibels) on any frequency removed from the center of the authorized bandwidth by more than 50% up to and including 100% of the authorized bandwidth.

(3) At least 35 dB on any frequency removed from the center of the authorized bandwidth by more than 100% up to and including 250% of the authorized bandwidth.

(7) At least 43 + 10 log10 (T) dB on any frequency removed from the center of the authorized bandwidth by more than 250%.

7.2 Test Result



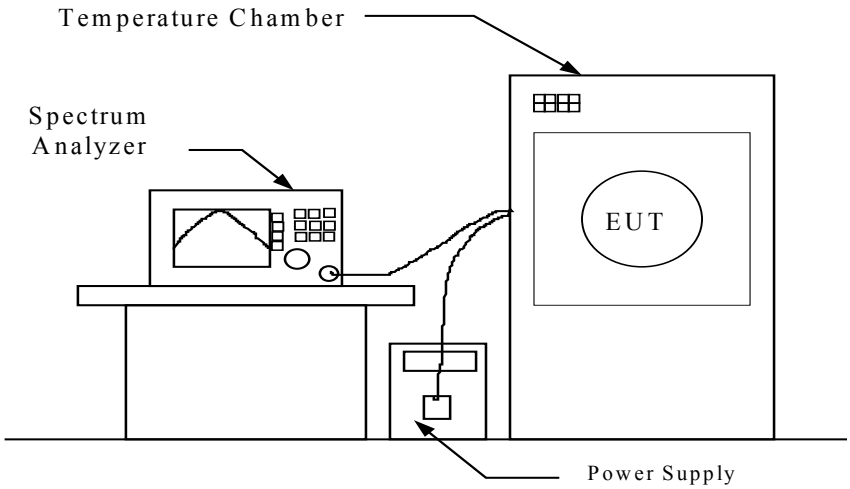
8. FREQUENCY STABILITY

8.1 Applicable Standard

According to Part 2.1055, §95.623(b):

Each R/C transmitter that transmits in the 26–27 MHz frequency band with a mean TP of 2.5 W or less and that is used solely by the operator to turn on and/or off a device at a remote location, other than a device used solely to attract attention, must be maintained within a fequency tolerance of 0.01%. All other R/C transmitters that transmit in the 26–27 MHz frequency band must be maintained within a frequency tolerance of 0.005%.

8.2 Test Setup



8.3 Test Procedure

A. Frequency stability vs. temperature measurement

1. The EUT was placed into the constant temperature chamber.
2. The spectrum analyzer (a wide band antenna connected to the spectrum analyzer) was used to read the EUT operating frequency.
3. Set the constant temperature chamber temperature within the range of −30℃ to +50℃, and measured the EUT operating frequency at start-up, and two, five, and ten minutes after startup.

B. Frequency stability vs. input voltage measurement

1. The EUT was placed into the constant temperature chamber and set the temperature to 20℃.
2. The spectrum analyzer (a wide band antenna connected to the spectrum analyzer) was used to read the EUT operating frequency.
3. The EUT is powered with the DC Power Supply, supplied it with 85% and 115% voltage, and measured the EUT operating frequency.

8.4 Test Data

Operated mode : Continue Transmitting

Test Date : Aug. 14, 2008 Temperature : 25 ℃ Humidity : 60 %

Frequency Stability Versus Environment Temperature (50℃~ -20℃):

Reference Frequency : 27.095 MHz					Limit : ±0.005%(±50PPM)			
Environment Temperature (℃)	Frequency Measure with Time Elapsed							
	0 Minutes		2 Minutes		5 Minutes		10 Minutes	
	MHz	PPM	MHz	PPM	MHz	PPM	MHz	PPM
50	27.095460	+17.0	27.095458	+16.9	27.095466	+17.2	27.095463	+17.1
40	27.095341	+12.6	27.095342	+12.6	27.095342	+12.6	27.095340	+12.5
30	27.095288	+10.6	27.095282	+10.4	27.095286	+10.6	27.095285	+10.5
20	27.095192	+7.1	27.095193	+7.1	27.095194	+7.2	27.095192	+7.1
10	27.095014	+0.5	27.095005	+0.2	27.095012	+0.4	27.095009	+0.3
0	27.094786	-7.9	27.094779	-8.2	27.094788	-7.8	27.095784	-8.0
-10	27.094533	-17.2	27.094534	-17.2	27.094529	-17.4	27.094536	-17.1
-20	27.094317	-25.2	27.094319	-25.1	27.094321	-25.1	27.094318	-25.2
-30	27.094026	-35.9	27.094043	-35.3	27.094034	-35.7	27.094036	-35.6

Frequency Stability Versus Input Power (±15%):
Environment Temperature : 20 ℃

Reference Frequency :27.095000 MHz					Limit : ±0.005%(±50PPM)			
Power Supplied (Vdc)	Frequency Measure with Time Elapsed							
	0 Minutes		2 Minutes		5 Minutes		10 Minutes	
	MHz	PPM	MHz	PPM	MHz	PPM	MHz	PPM
10.2	27.095188	+7.3	27.095189	+7.0	27.095190	+7.0	27.095187	+7.1
12.0	27.095192	+7.1	27.095193	+7.1	27.095194	+7.2	27.095192	+7.1
13.8	27.095199	+7.1	27.095191	+7.0	27.095192	+7.1	27.095194	+7.2

- End of Report -