ECMG
Worldwide Certification Solutions
EMC Compliance Management Group
670 National Avenue, Mountain View, CA 94043
Tel. (650) 988-0900 Fax (650) 988-6647
www.ecmg-global.com

FCC CERTIFICATION RADIO MEASUREMENT TECHNICAL REPORT

On Model Name: GSC

Model Number : A741

Trademark : GAS N GO

FCC ID : U54-GSCGG00100240

Prepared for Petratec International., Ltd

According to FCC Part 15 (2006), Subpart C

Test Report #:	*PET-0612-0826-FCC433M*
Prepared by:	*Chris Huang*
Reviewed by:	*Harry Zhao*
QC Manager:	*Paul Chen*

Test Report Released by: Paul J. Chen *2007, April 30*

Paul Chen *Date*

Test Location

Tests performed at EMC Compliance Management Group (China) in a Certified ANSI Semi-Anechoic Chamber and Shielded Room performed testing.

Test Site Location: *Shanghai Institute of Process Automation Instrumentation (SIPAI)*
103 Caobao Road, Shanghai, 200233
Tel: *86-21-64368180*
Fax: *86-21-64333566*
Registration Number: *96504*

Table of Contents

Administrative Data

Test Sample : GSC

Model Number : A741

Brand Name : Gas N Go

Date Tested : 2007, February 6

Applicant : Petratec International., Ltd
12 Derech Ha' Sharon St. Kfar Saba, Israel

Telephone : 972-9-7466105

Fax : 972-9-7466150

Manufacturer : GRE –Golden Regent Electronics Industrial Ltd.
Unit 2-5, 18/F, Millennium Trade Centre,
No.56 Kwai Cheong Road, Kwai Chung, N.T.,
Hong Kong.

Telephone : 852-35824907

Fax : 852-25263884

EUT Description

Petratec International., Ltd model name A741 (referred to as the EUT in this report) is a GSC. It has a 433MHz module communicate with the meter it also has a 2.4GHz module to communicate with reader. In this test report, only 433MHz part was tested.

Test Summary

The Electromagnetic Compatibility requirements on A741 for this test are stated below. All results listed in this report relate exclusively to this above-mentioned model as the Equipment Under Test. This report confers no approval or endorsement upon any other component, host or subsystem used in the test set-up.

EMC Test Items *Reference FCC Part 15 (2006), Subpart C*			
Specification	***Description***	***Test Results***	***Remark***
FCC Part 15.203	*Antenna Requirement*	*Compliance*	*Attachment 1*
FCC Part 15.205	*Restricted Band of Operation*	*Compliance*	*Attachment 3*
FCC Part 15.209	*Radiated Emission Limits*	*Compliance*	*Refer to Attachment 4*
FCC Part 15.231	*Periodic Operation in the Band 40.66-40.70MHz and above 70MHz*	--	--
(a)	*Operation Mode*	*Compliance*	*Attachment 2*
(b)	*Field Strength of Fundamental and Spurious Emissions*	*Compliance*	*Attachment 4*
(c)	*Bandwidth*	*Compliance*	*Attachment 5*

Test Mode Justification

The test modes (Lie, Side, Stand) were done for testing.
Note: Lie mode means let EUT put flat;
Side mode means let EUT stand with side;
Stand mode means let EUT stand up.

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

EUT Exercise Software

The device is in a system, and use software "GSC_PC.exe" supplied by the manufacturer.

Equipment Modification

Any modifications installed previous to testing by Petratec International., Ltd. will be incorporated in each production model sold or leased in United States.

There were no modifications installed by EMC Compliance Management Group (China) test personnel.

Test System Details

EUT	
Model Number:	A741
Trademark::	GAS N Gas
Serial Number:	Engineering Sample
Input Voltage:	120V / 60Hz
Description:	GSC
Manufacturer:	Petratec International., Ltd

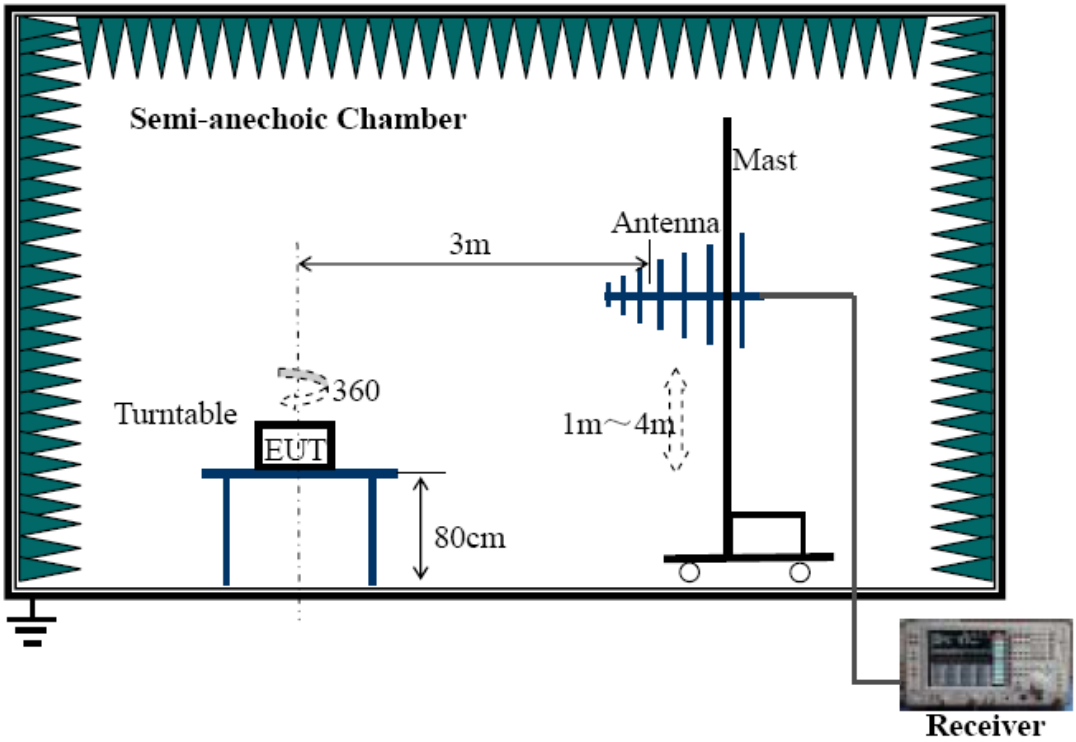
Support Equipment

Description	Model Number	Serial Number	Manufacturer	Power Cable Description
PC	M4800C	M0633038677	Lenovo	1.8m Unshielded
Monitor	LXM-ML-19BH	6M01876618	Lenovo	1.8m Unshielded
Keyboard	SK-8110	C4739-60101	Lenovo	N/A
Mouse	M-UAE96	LZ6360E0EG	Logitech	N/A
DC Power	YJ56	N/A	Shanghai Huguang	1.2m Unshielded

Cable Description

Description	From	To	Length (GSCs)	Shielded (Y/N)	Ferrite Loaded (Y/N)
Ethernet Cable	EUT	PC	2.0	N	N
VGA Cable	Monitor	PC	1.5	Y	Y (x2)
Keyboard Cable	Keyboard	PC	1.8	N	N
Mouse Cable	Mouse	PC	1.8	N	N

Configuration of Tested System



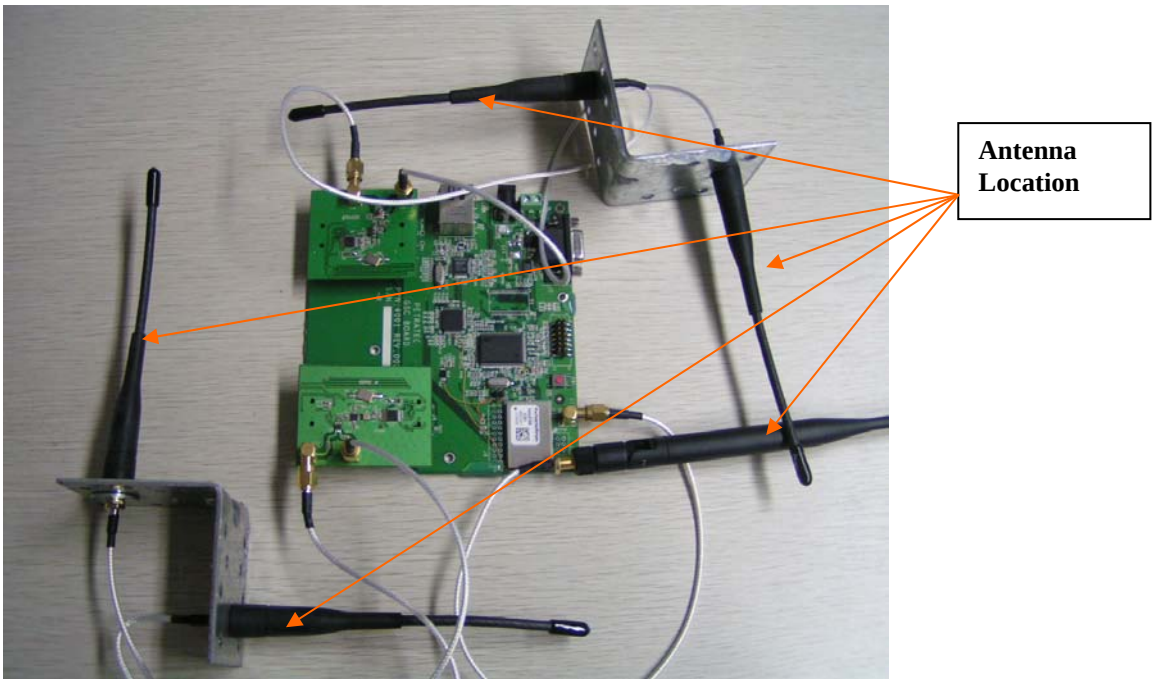
ATTACHMENT 1 – ANTENNA REQUIREMENT

CLIENT:	Petratec International., Ltd	**TEST STANDARD:**	FCC Part 15.203 (2006)
MODEL NUMBER:	A741	**PRODUCT:**	GSC
SERIAL NO.:	Engineering Sample	**EUT DESIGNATION:**	RF Equipment
TEMPERATURE:	22°C	**HUMIDITY:**	56%RH
ATM PRESSURE:	101.8 kPa	**GROUNDING:**	No Grounding
TESTED BY:	Sulz	**DATE OF TEST:**	2007, February 7

SETUP METHOD:	N/A
ANTENNA REQUIREMENT:	An intentional radiator shall be designed to ensure that no antenna other than 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. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.
TEST VOLTAGE:	120V / 60Hz
TEST STATUS:	Normal Operation As Usual
RESULTS:	The EUT meets the Antenna requirement. The test results relate only to the equipment under test provided by client.
CHANGES OR MODIFICATIONS:	There were no modifications installed by EMC Compliance Management Group (China) test personnel.
M. UNCERTAINTY:	N/A

FCC Section	FCC Rules	Conclusion
15.203	*Described how the EUT complies with the requirement that either its antenna is permanently attached, or that it employs a unique antenna connector, for every antenna proposed for use with the EUT.* *The exception is in those cases where EUT must be professionally installed. In order to demonstrate that professional installation is required, the following 3 points must be addressed:* ● *The application (or intended use) of the EUT* ● *The installation requirements of the EUT* ● *The method by which the EUT will be marketed*	*The RF Device uses dedicated antennas with unique SMA antenna connectors.* *For 433MHz transceiver: Tx has 2 antennas (gain: 3dBi) ; Rx also has 2 antennas (gain: 3dBi).* *For 2.4GHz transceiver: it employs one 6dBi gain antenna.*

Antenna Location



ATTACHMENT 2 – OPERATION MODE

CLIENT:	Petratec International., Ltd	**TEST STANDARD:**	FCC Part 15.231 (e)
MODEL NUMBER:	A741	**PRODUCT:**	GSC
SERIAL NO.:	Engineering Sample	**EUT DESIGNATION:**	RF Equipment
TEMPERATURE:	22°C	**HUMIDITY:**	56%RH
ATM PRESSURE:	101.8 kPa	**GROUNDING:**	No Grounding
TESTED BY:	Sulz	**DATE OF TEST:**	2007, February 7

SETUP METHOD:	N/A
OPERATION MODE REQUIREMENT:	(1) In addition, 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.
TEST VOLTAGE:	120V / 60Hz
TEST STATUS:	Keep Tx in normal transmission mode, modulated, to measure the silent period; Keep Tx in continuous transmission mode, modulated, to measure the transmitting period.
RESULTS:	The EUT meets the operation mode requirement. The test results relate only to the equipment under test provided by client.
CHANGES OR MODIFICATIONS:	There were no modifications installed by EMC Compliance Management Group (China) test personnel.
M. UNCERTAINTY:	N/A

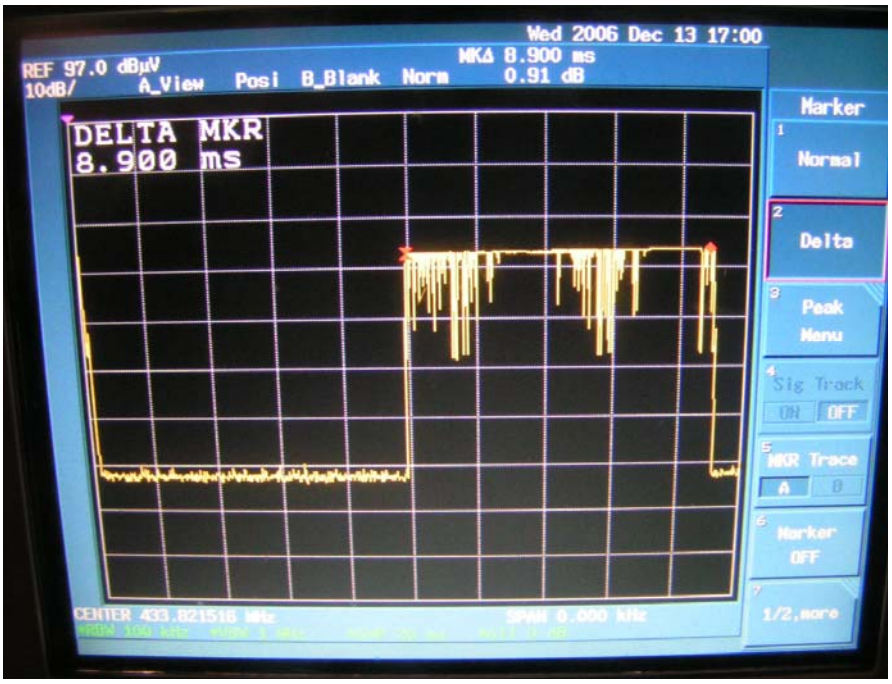
Transmission period:

Frequency (Fundamental)	*Transmission period(continuous transmission)*	*Limits*	*Result*
433.86MHz	*8.9ms*	*1s*	*Pass*
433.86MHz	*Burst time is 1s*	*1s*	*Pass*

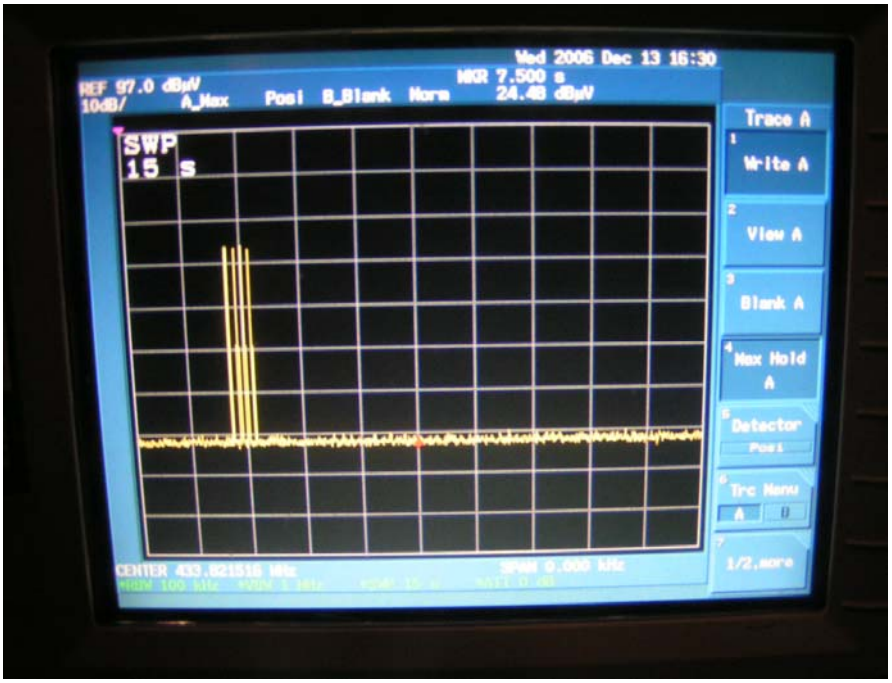
Silent period:

Frequency (Fundamental)	*Silent period(normal transmission)*	*Limits 1 about transmission period*	*Limits 2*	*Result*
433.86MHz	*60s*	*1*30=30s*	*10s*	*Pass*

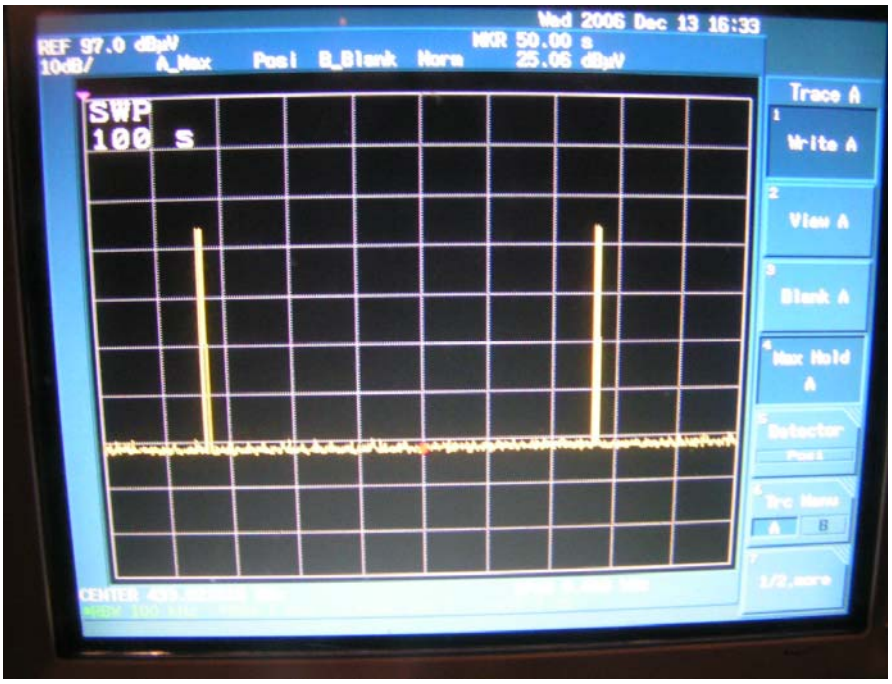
FCC Section	***FCC Rules***	***Conclusion***
15.231 (e)	*In addition, devices operated under the provisions of this paragraph shall be provided with a means for automatically limiting operation so that the duration of each transmission shall not be greater than one second and the silent period between transmissions shall be at least 30 times the duration of the transmission but in no case less than 10 seconds.*	*When the GSC is powered on and the communication is set up, it will send signal (duration time 8.9ms) for 4 times, the burst time is 1s. Then it will send signal per 60s. It will transmit signal (duration time 8.9ms) at a predetermined interval of 60s. All these can be adjusted by software and the test result is a typical setup. Please refer the plots in the next 2 pages.*



Transmission period #1



Transmission period #2 = 1s



Silent period

ATTACHMENT 3 – RESTRICTED BAND OF OPERATION

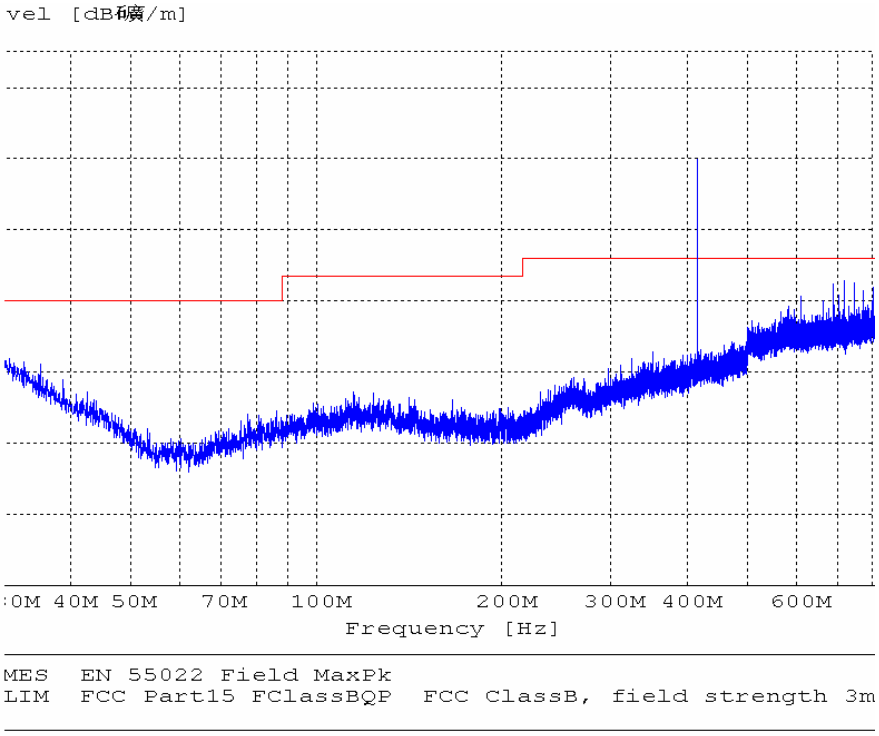
CLIENT:	Petratec International., Ltd	**TEST STANDARD:**	FCC Part 15.231(b), FCC Part 15.35
MODEL NUMBER:	A741	**PRODUCT:**	GSC
SERIAL NO.:	Engineering Sample	**EUT DESIGNATION:**	RF Equipment
TEMPERATURE:	22°C	**HUMIDITY:**	56%RH
ATM PRESSURE:	101.6 kPa	**GROUNDING:**	No Grounding
TESTED BY:	Sulz	**DATE OF TEST:**	2007, February 7

SETUP METHOD:	ANSI C63.4 : 2003
RESTRICTED BANDS OF OPERATION REQUIREMENT:	The only spurious emissions are permitted in any of the frequency bands listed below table of next page.
TESTED RANGE:	30MHz to 5000MHz
TEST VOLTAGE:	120V / 60Hz
TEST STATUS:	Keep Tx in continuous transmission mode, modulated
RESULTS:	The EUT meets the restricted bands of operation requirement. The test results relate only to the equipment under test provided by client.
CHANGES OR MODIFICATIONS:	There were no modifications installed by EMC Compliance Management Group (China) test personnel.

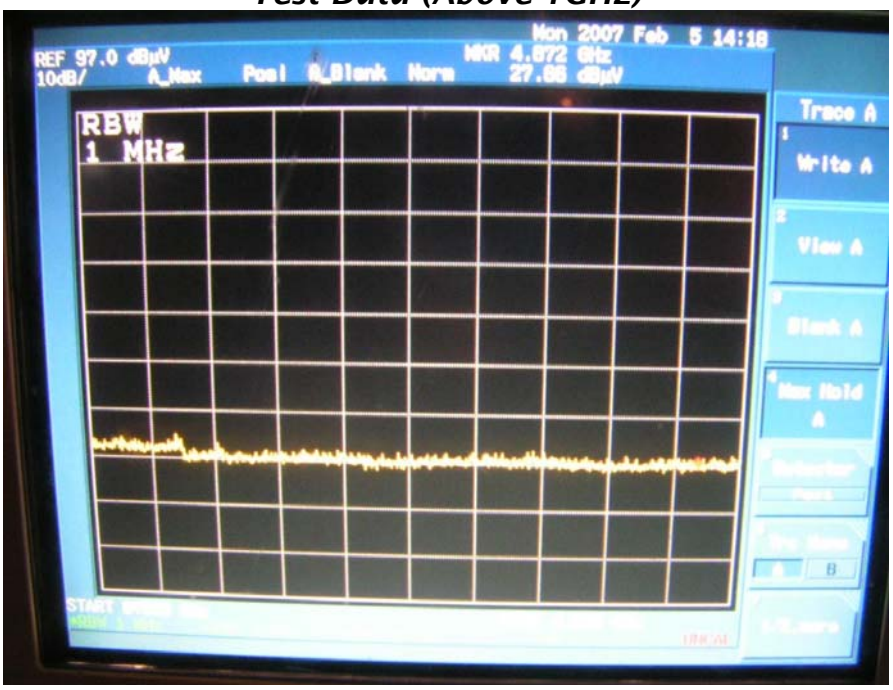
MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	([2])
13.36 - 13.41			

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.
[2] Above 38.6

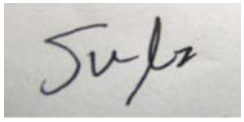
Test Data (Below 1GHz)



Test Data (Above 1GHz)



Test Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal. Due Date
Spectrum	Advantest	R3162	001-33	11/10/06	11/09/07
BiLog antenna	Chase	CBL 6112B	2532	03/22/06	03/21/07
Broad-Band Horn Antenna	EMCO	3115	9901-5664	10/16/06	10/15/07
3m semi-anechoic chamber	LINDGREN	07′×08′-4	15427-A	02/24/06	02/23/07
Note: All testing were performed using internationally recognized standards. All test instruments were calibrated.					

SIGNED BY:  **REVIEWED BY:** 

ENGINEER **SENIOR ENGINEER**

ATTACHMENT 4 –FIELD STRENGTH OF FUNDAMENTAL AND SPURIOUS EMISSIONS

CLIENT:	PETRATEC INTERNATIONAL., LTD	**TEST STANDARD:**	FCC Part 15.231(e), FCC Part 15.35
MODEL NUMBER:	A741	**PRODUCT:**	GSC
SERIAL NO.:	Engineering Sample	**EUT DESIGNATION:**	RF Equipment
TEMPERATURE:	22°C	**HUMIDITY:**	56%RH
ATM PRESSURE:	101.6 kPa	**GROUNDING:**	No Grounding
TESTED BY:	Sulz	**DATE OF TEST:**	2007, February 6

SETUP METHOD:	ANSI C63.4 : 2003, FCC Part 15.35
TEST PROCEDURE:	a. The EUT was placed on a rotatable table with 0.8 meters above ground. b. The EUT was set 3 meters from the interference-receiving antenna, which was mounted on the top of a variable height antenna tower. c. The antenna was varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna were set to make measurement. d. For each suspected emission the EUT was arranged to its worst case and then change the antenna tower height (from 1m to 4m) and turn table (from 0 degree to 360 degree) to find the maximum reading. e. If the emission level of the EUT in peak mode was 20 dB lower than the specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be tested using the quasi-peak method in about six maximal points and the results will be reported. f. Broadband antenna (Calibrated antenna) was used as receiving antenna below 1000MHz. Horn antenna were used as receiving antenna above 1000MHz. g. The bandwidth is 120 kHz below 1000 MHz, and 1 MHz above 1000 MHz Explanation of the Correction Factor are given as follows: FS= RA + AF + CF - AG - DC Where: FS = Field Strength RA = Receiver Amplitude AF = Antenna Factor CF = Cable Attenuation Factor AG = Amplifier Gain DC = Duty Cycle Correction Factor

CONTINUE ON THE NEXT PAGE…

TESTED RANGE:	30MHz to 5000MHz
TEST VOLTAGE:	120V / 60Hz
TEST STATUS:	Keep Tx in continuous transmission mode, modulated
RESULTS:	The EUT meets the requirements of field strength test. The test results only to the equipment under test provided by client.
CHANGES OR MODIFICATIONS:	There were no modifications installed by EMC Compliance Management Group (China) test personnel.
M. UNCERTAINTY:	Freq. ± 2x10-7 x Center Freq., Amp ± 2.6 dB

Peak value of the measured emissions:

Direction	Polarization	Frequency Type	Frequency (MHz)	Field Strength dB(μV/m)	Limit dB(μV/m)	Over Limit dB(μV/m)	Read Level dB(μV)	Factor (dB)	Duty cycle Correction Factor (dB)
Lying	Horizontal	Fundamental	433.86	66.80	72.86	-6.06	45.9	20.9	--
		Spurious	867.66	47.90	52.86	-4.96	22.1	25.8	--
		Spurious	1301.58	43.50	54.00	-10.50	14.9	28.6	--
		Spurious	1735.44	44.30	52.86	-8.56	12.6	31.7	--
	Vertical	Fundamental	433.86	67.10	72.86	-5.76	46.2	20.9	--
		Spurious	867.66	48.80	52.86	-4.06	23	25.8	--
		Spurious	1301.58	45.20	54.00	-8.80	16.6	28.6	--
		Spurious	1735.44	47.90	52.86	-4.96	16.2	31.7	--
Side	Horizontal	Fundamental	433.86	68.20	72.86	-4.66	47.3	20.9	--
		Spurious	867.66	49.30	52.86	-3.56	23.5	25.8	--
		Spurious	1301.58	49.10	54.00	-4.900	20.5	28.6	--
		Spurious	1735.44	47.20	52.86	-5.66	15.5	31.7	--
	Vertical	Fundamental	433.86	67.80	72.86	-5.06	46.9	20.9	--
		Spurious	867.66	46.50	52.86	-6.36	20.7	25.8	--
		Spurious	1301.58	46.20	54.00	-7.80	17.6	28.6	--
		Spurious	1735.44	46.80	52.86	-6.06	15.1	31.7	--
Stand	Horizontal	Fundamental	433.86	66.40	72.86	-6.46	45.5	20.9	--
		Spurious	867.66	47.30	52.86	-5.56	21.5	25.8	--
		Spurious	1301.58	47.50	54.00	-6.50	18.9	28.6	--
		Spurious	1735.44	46.50	52.86	-6.36	14.8	31.7	--
	Vertical	Fundamental	433.86	65.30	72.86	-7.56	44.4	20.9	--
		Spurious	867.66	45.10	52.86	-7.76	19.3	25.8	--
		Spurious	1301.58	45.30	54.00	-8.70	16.7	28.6	--
		Spurious	1735.44	49.00	52.86	-3.86	17.3	31.7	--

Note:

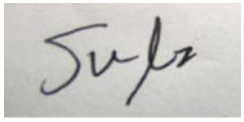
1. *Where F is the frequency in MHz, the formulas for calculating the maximum permitted fundamental field strengths are as follow:*
   For fundamental frequency (F=433.86MHz)
   Average field Strength of Fundamental (dBuV/m)
   =20log{5000-[(5000-1500)(470-433.86)/(470-260)]}*
   =20log(4397.6667)
   =72.86 dBuV/m
   Average field Strength of Spurious (dBuV/m) = 72.86 – 20 = 52.86 dBuV/m

   According to FCC 15.35(b), maximum permitted peak field strength is 20dB above the maximum permitted average emission limit.

2. *Field Strength=Read Level + Factor – Duty Cycle Correction Factor*
   Factor = Antenna Factor + Cable Loss - Preamp Factor

3. As the peak readings are lower than average limits, the duty cycle factor is not calculated.

Test Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal. Due Date
Spectrum	Advantest	R3162	001-33	11/10/06	11/09/07
BiLog antenna	Chase	CBL 6112B	2532	03/22/06	03/21/07
Broad-Band Horn Antenna	EMCO	3115	9901-5664	10/16/06	10/15/07
3m semi-anechoic chamber	LINDGREN	07′×08′-4	15427-A	02/24/06	02/23/07
Note: All testing were performed using internationally recognized standards. All test instruments were calibrated.					

SIGNED BY:  **REVIEWED BY:** 

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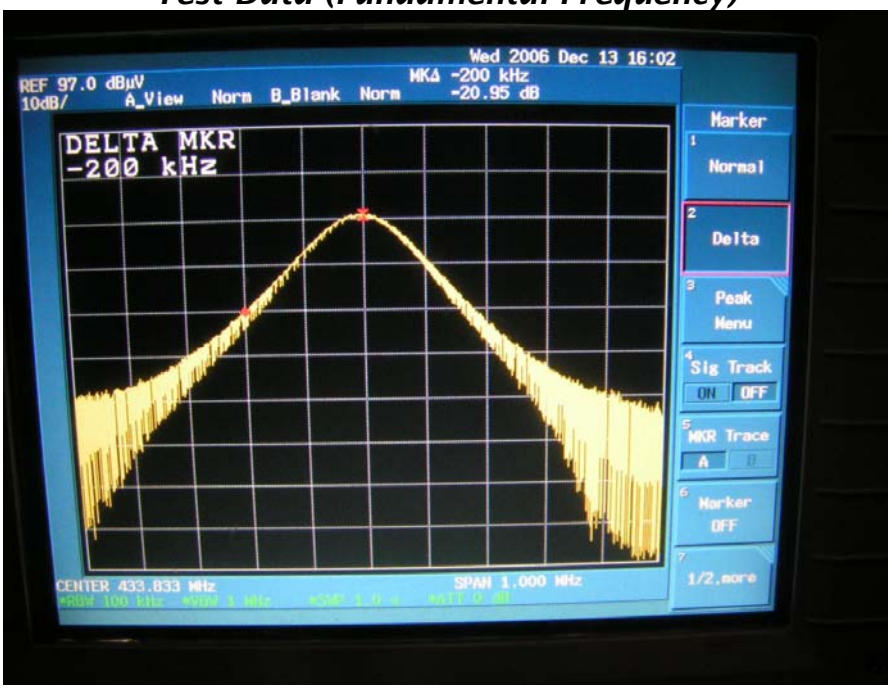
ATTACHMENT 5– BANDWIDTH TEST

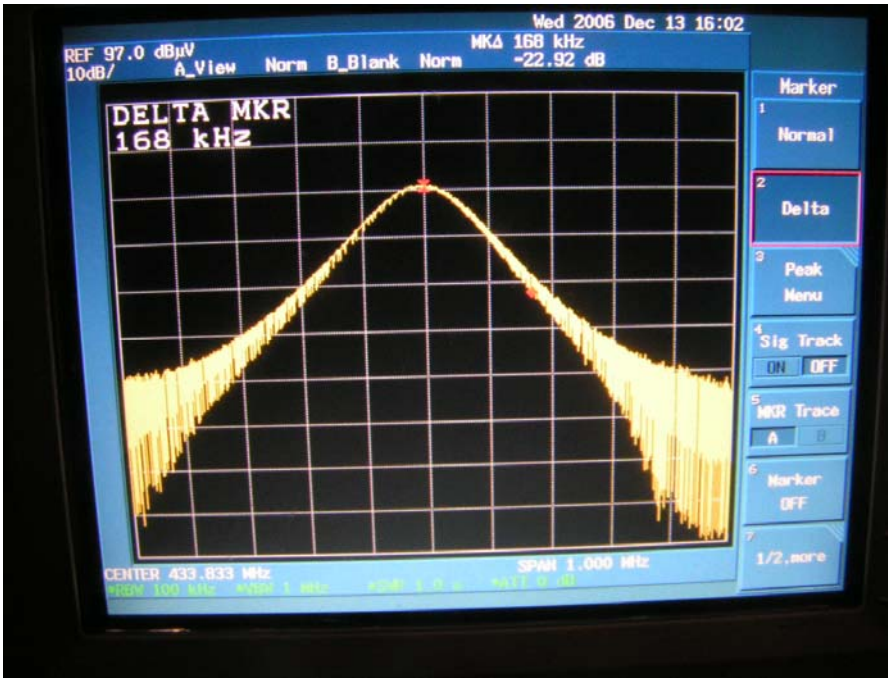
CLIENT:	Petratec International., Ltd	**TEST STANDARD:**	FCC Part 15.231 (C)
MODEL TESTED:	A741	**PRODUCT:**	GSC
SERIAL NO.:	Engineering Sample	**EUT DESIGNATION:**	RF Equipment
TEMPERATURE:	22°C	**HUMIDITY:**	56%RH
ATM PRESSURE:	101.6 kPa	**GROUNDING:**	No Grounding
TESTED BY:	Sulz	**DATE OF TEST:**	2007, February 6

SETUP METHOD:	ANSI C63.4 - 2003
BANDWIDTH REQUIREMENT:	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. For devices operating above 900 MHz, The emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.
TEST VOLTAGE:	120 V / 60Hz
TEST STATUS:	Keep Tx in continuous transmission mode, modulated
RESULTS:	The EUT meets the bandwidth requirement. The test results relate only to the equipment under test provided by client.
CHANGES OR MODIFICATIONS:	There were no modifications installed by EMC Compliance Management Group (China) test personnel.
M. UNCERTAINTY:	Freq. $\pm$ $2x10^{-7}$ x Center Freq., Amp $\pm$ 2.6 dB

Test Data (Fundamental Frequency)



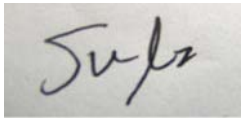
20dB Bandwidth #1



20dB Bandwidth #2

Frequency (MHz)			Test Result (MHz)	Bandwidth Limit (MHz) (F_{center} x 0.25%)	Conclusion
Center	Left	Right			
433.833	0.200	0.168	0.368	1.0846	Compliance

Test Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal. Due Date
Spectrum	Advantest	R3162	001-33	11/10/06	11/09/07
BiLog antenna	Chase	CBL 6112B	2532	03/22/06	03/21/07
Broad-Band Horn Antenna	EMCO	3115	9901-5664	10/16/06	10/15/07
3m semi-anechoic chamber	LINDGREN	07′×08′-4	15427-A	02/24/06	02/23/07
Note: All testing were performed using internationally recognized standards. All test instruments were calibrated.					

SIGNED BY:  **REVIEWED BY:** 

ENGINEER **SENIOR ENGINEER**