FCC EMC Test Report

(Declaration of Conformity)

For

Electromagnetic Interference

Of

Product： GAMING MOUSE

Trade Name： N/A

Model Number： MGL01

Prepared for

GTA ELECTRONICS., LTD.

9F, No.788, Zhongzheng Rd., Zhonghe Dist., New Taipei City 235, Taiwan

Prepared by

NTEK Testing Technology Co., Ltd.

1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street
Bao'an District, Shenzhen P.R. China
Tel.: +86-0755-61156588 Fax.: +86-0755-61156599
Website:www.ntek.org.cn

TEST RESULT CERTIFICATION

Applicant's name..... :	GTA ELECTRONICS., LTD.
Address..... :	9F, No.788, Zhongzheng Rd., Zhonghe Dist., New Taipei City 235, Taiwan
Manufacture's Name..... :	GTA ELECTRONICS., LTD.
Address..... :	Lan Yuan Road, Zeng Tian Industrial District, Chang An Town, Dong Guan City, China

Product description

Product name..... :	GAMING MOUSE
Trademark ..... :	N/A
Model and/or type reference . :	MGL01
Rating(s)..... :	DC 5V, 100mA
Standards..... :	FCC Part15B:2009 ANSI C63.4: 2009

This device described above has been tested by NTEK, and the test results show that the equipment under test (EUT) is in compliance with the 2004/108/EC requirements. And it is applicable only to the tested sample identified in the report.

This report shall not be reproduced except in full, without the written approval of NTEK, this document may be altered or revised by NTEK, personal only, and shall be noted in the revision of the document.

Date of Test..... :	
Date (s) of performance of tests..... :	13 Oct. 2011 ~19 Oct. 2011
Date of Issue..... :	21 Oct. 2011
Test Result..... :	**Pass**

NTEK TESTING TECHNOLOGY CO., LTD. APPROVED

Testing Engineer : Apple Huang

(Apple Huang)

Technical Manager : Jim He

(Jim He)

Authorized Signatory : Bovey Yang

(Bovey Yang)

Table of Contents Page

. TEST SUMMARY

Test procedures according to the technical standards:

EMC Emission				
Standard	Test Item	Limit	Judgment	Remark
FCC Part15B:2009 ANSI C63.4: 2009	Conducted Emission	Class B	PASS	
	Radiated Emission	Class B	PASS	

NOTE:

(1)" N/A" denotes test is not applicable in this Test Report

(2) For client's request and manual description, the test will not be executed.

TEST FACILITY

NTEK Testing Technology Co., Ltd.
Add. : 1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen P.R. China.
FCC FRN Registration Number:238937; IC Registration Number:9270A-1

MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y ± U**，where expended uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k=2**，providing a level of confidence of approximately **95** %。

A. Conducted Measurement :

Test Site	Method	Measurement Frequency Range	U，(dB)	NOTE
NTEKC01	ANSI	150 KHz ~ 30MHz	3.2	

B. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	U，(dB)	NOTE
NTEKA01	ANSI	30MHz ~ 1000MHz	4.7	
		1GHz ~6000GHz	5.0	

. GENERAL INFORMATION

GENERAL DESCRIPTION OF EUT

Equipment	GAMING MOUSE
Brand Name	N/A
Model Name.	MGL01
Serial No	N/A
Model Difference	N/A
Product Description	The EUT is a GAMING MOUSE. Operating frequency: N/A Connecting I/O port: USB Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.
Power Source	DC Voltage
Power Rating	DC 5V, 100mA

DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	Running

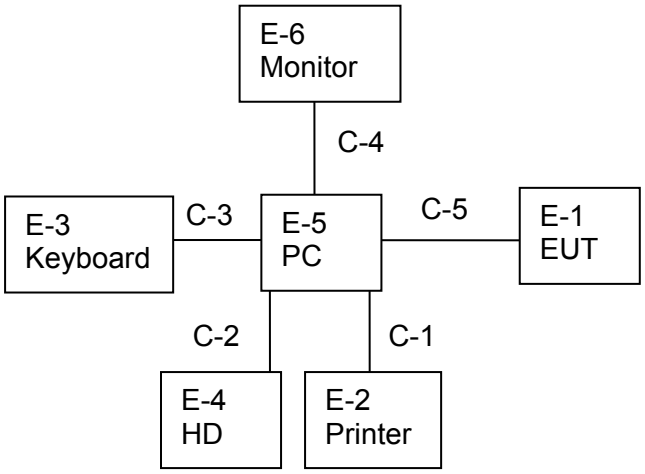
For Conducted Test	
Final Test Mode	Description
Mode 1	Running

For Radiated Test	
Final Test Mode	Description
Mode 1	Running

For EMS Test	
Final Test Mode	Description
Mode 1	Running

DESCRIPTION OF TEST SETUP

Mode 1



DESCRIPTION TEST PERIPHERAL AND EUT PERIPHERAL

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.	Note
E-1	GAMING MOUSE	N/A	MGL01	VOC	N/A	EUT
E-2	Printer	Canon	L11121E	VOC	LBP2900	N/A
E-3	Keyboard	DELL	SK-8185	VOC	OY526KUS	N/A
E-4	HD	Buffalo inc.	HD-PET320U2	VOC	55571500924085	N/A
E-5	PC	DELL	FT4Y23X	VOC	34413561645	N/A
E-6	Monitor	DELL	IN2020MB	VOC	cn-0y6mhx-74261-11f-67es	N/A

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	NO	1.2M	
C-2	NO	NO	1.8M	
C-3	NO	NO	1.0M	
C-4	NO	NO	1.2M	
C-5	NO	NO	1.5M	

Note:

(1) The support equipment was authorized by Declaration of Confirmation.
(2) For detachable type I/O cable should be specified the length in cm in『Length』column.
(3) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.

MEASUREMENT INSTRUMENTS LIST

CONDUCTED TEST SITE

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	LISN	R&S	ENV216	101313	Jul. 06, 2012
2	LISN	EMCO	3816/2	00042990	Jul. 06, 2012
3	50Ω Switch	ANRITSU CORP	MP59B	6200983704	Jul. 06, 2012
4	Test Cable	N/A	C01	N/A	Jul. 06, 2012
5	Test Cable	N/A	C02	N/A	Jul. 06, 2012
6	Test Cable	N/A	C03	N/A	Jul. 06, 2012
7	EMI Test Receiver	R&S	ESCI	101160	Jul. 06, 2012
8	Passive Voltage Probe	ESH2-Z3	R&S	100196	Jul. 06, 2012
9	Triple-Loop Antenna	EVERFINE	LIA-2	11020003	Jul. 06, 2012
10	Absorbing Clamp	R&S	MDS-21	100423	Jul. 08, 2012

RADIATED TEST SITE

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Bilog Antenna	TESEQ	CBL6111D	31216	Jul. 06, 2012
2	Test Cable	N/A	R-01	N/A	Jul. 06, 2012
3	Test Cable	N/A	R-02	N/A	Jul. 06, 2012
4	EMI Test Receiver	R&S	ESCI-7	101318	Jul. 06, 2012
5	Antenna Mast	EM	SC100_1	N/A	N/A
6	Turn Table	EM	SC100	060531	N/A
7	50Ω Switch	Anritsu Corp	MP59B	6200983705	Jul. 06, 2012
8	Spectrum Analyzer	Aglient	E4407B	MY45108040	Jul. 06. 2012
9	Horn Antenna	EM	EM-AH-10180	2011071402	Jul. 06. 2012
10	Amplifier	EM	EM-30180	060538	Jul. 06. 2012

. EMC EMISSION TEST

CONDUCTED EMISSION MEASUREMENT

POWER LINE CONDUCTED EMISSION (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *
0.50 -5.0	73.00	60.00	56.00	46.00
5.0 -30.0	73.00	60.00	60.00	50.00

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

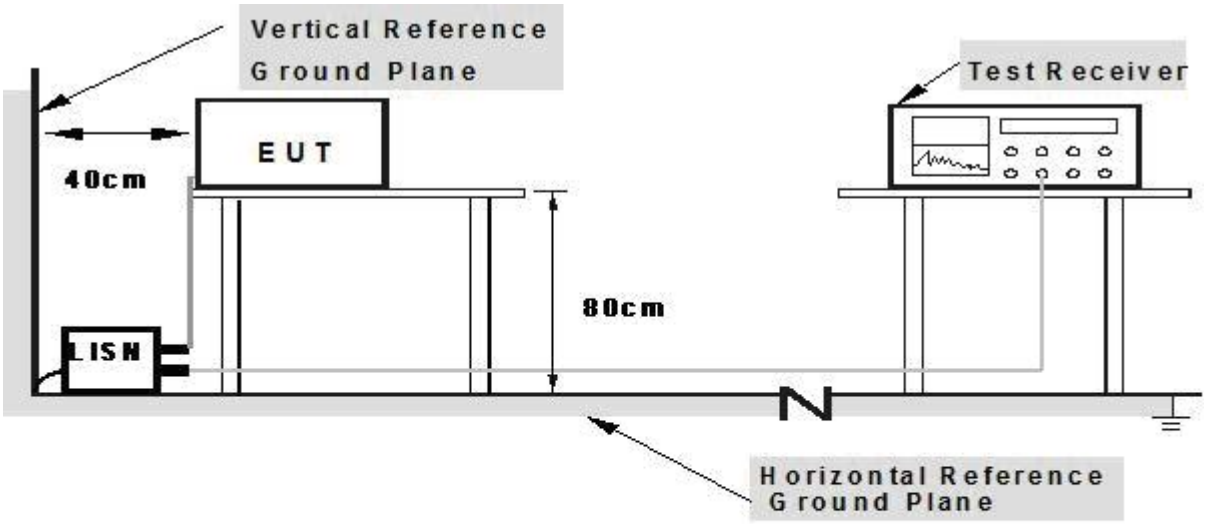
The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

TEST PROCEDURE

a. The EUT was placed 0.4 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

TEST SETUP



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

EUT OPERATING CONDITIONS

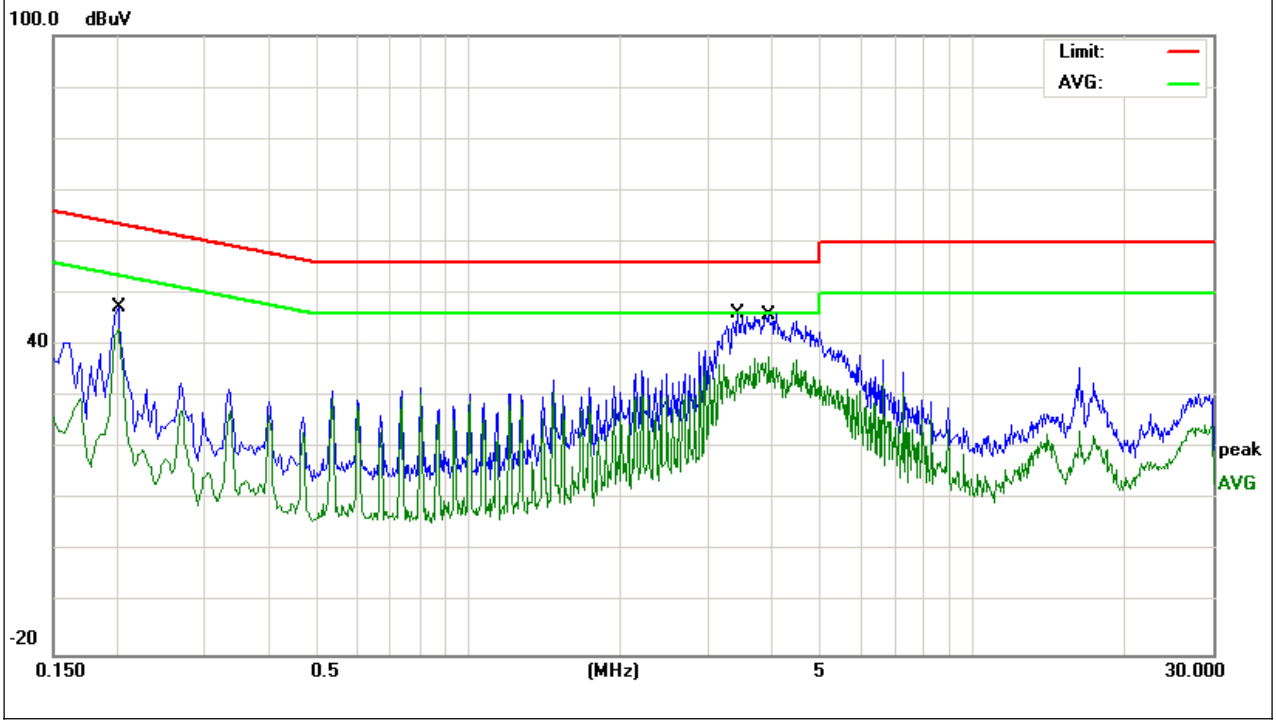
The EUT tested system was configured as the statements of **2.3** Unless otherwise a special operating condition is specified in the follows during the testing.

TEST RESULTS

EUT：	GAMING MOUSE	Model Name. ：	MGL01
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010hPa	Test Date：	2011-10-17
Test Mode：	Running	Phase：	L
Test Voltage ：	DC 5V 30mA From PC AC 120V/60Hz		

Freq. (MHz)	Reading (dBuV)	Factor (dBuV)	Measurement (dBuV)	Limit (dBuV)	Over (dB)	Detector
0.202	36.84	10.44	47.28	63.52	-16.24	QP
0.202	32.58	10.44	43.02	53.52	-10.5	AVG
3.418	35.52	10.6	46.12	56	-9.88	QP
3.954	27.06	10.62	37.68	46	-8.32	AVG

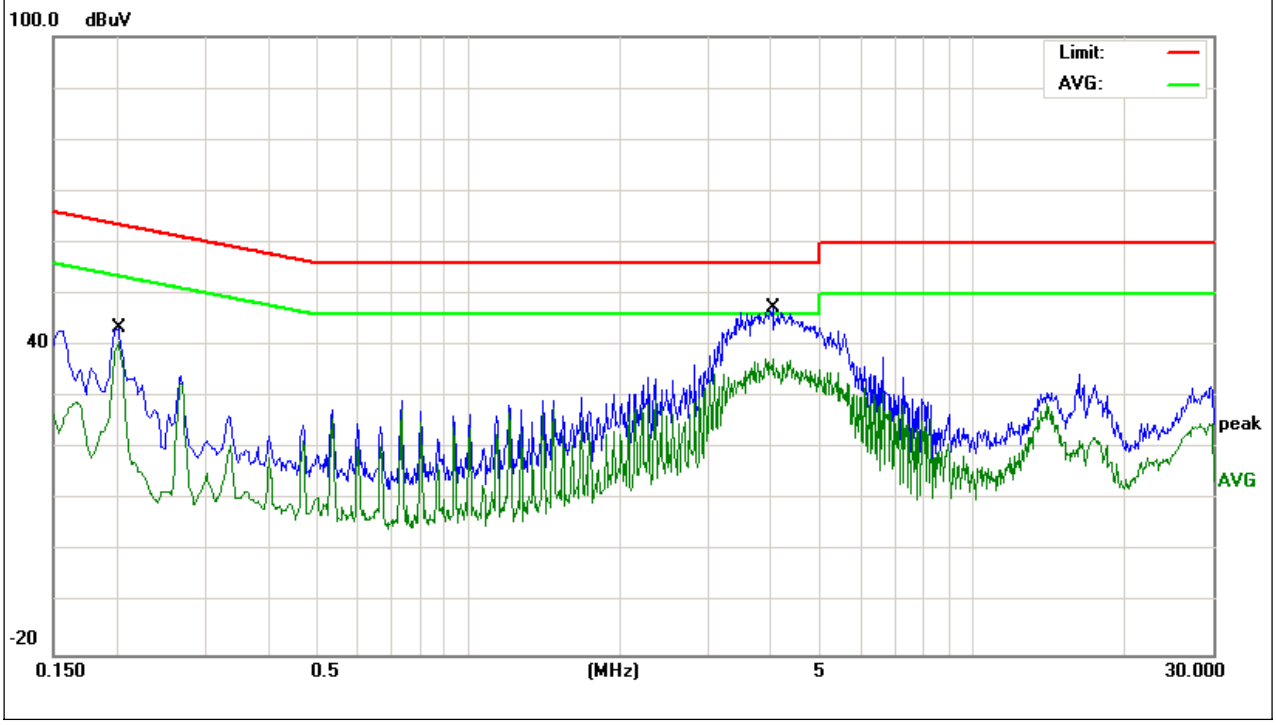
Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.
3. N/A means All Data have pass Limit



EUT：	GAMING MOUSE	Model Name. ：	MGL01
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010hPa	Test Date：	2011-10-17
Test Mode：	Running	Phase：	N
Test Voltage ：	DC 5V 30mA From PC AC 120V/60Hz		

Freq. (MHz)	Reading (dBuV)	Factor (dBuV)	Measurement (dBuV)	Limit (dBuV)	Over (dB)	Detector
0.202	33	10.43	43.43	63.52	-20.09	QP
0.202	30.34	10.43	40.77	53.52	-12.75	AVG
4.022	36.82	10.65	47.47	56	-8.53	QP
4.022	26.87	10.65	37.52	46	-8.48	AVG

Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.
3. N/A means All Data have pass Limit



RADIATED EMISSION MEASUREMENT

LIMITS OF RADIATED EMISSION MEASUREMENT

FREQUENCY (MHz)	Class A (at 10m)	Class B (at 3m)
	dBuV/m	dBuV/m
30 ~ 88	39.0	40.0
88 ~ 216	43.5	43.5
216 ~ 960	46.5	46.0
Above 960	49.5	54.0

Notes:

(1) The limit for radiated test was performed according to as following: FCC PART 15B /ICES-003.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

TEST PROCEDURE

a. The measuring distance of at 10 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.

b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.

c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

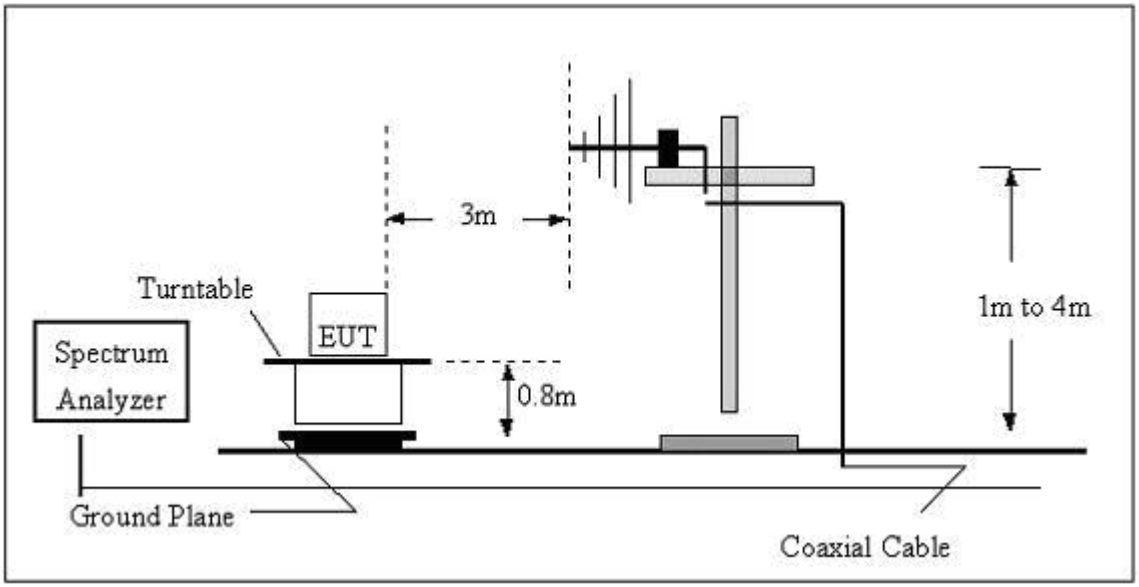
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured, above 1G Average detector mode will be instead.

e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP(AV) Limits and then no additional QP Mode measurement performed.

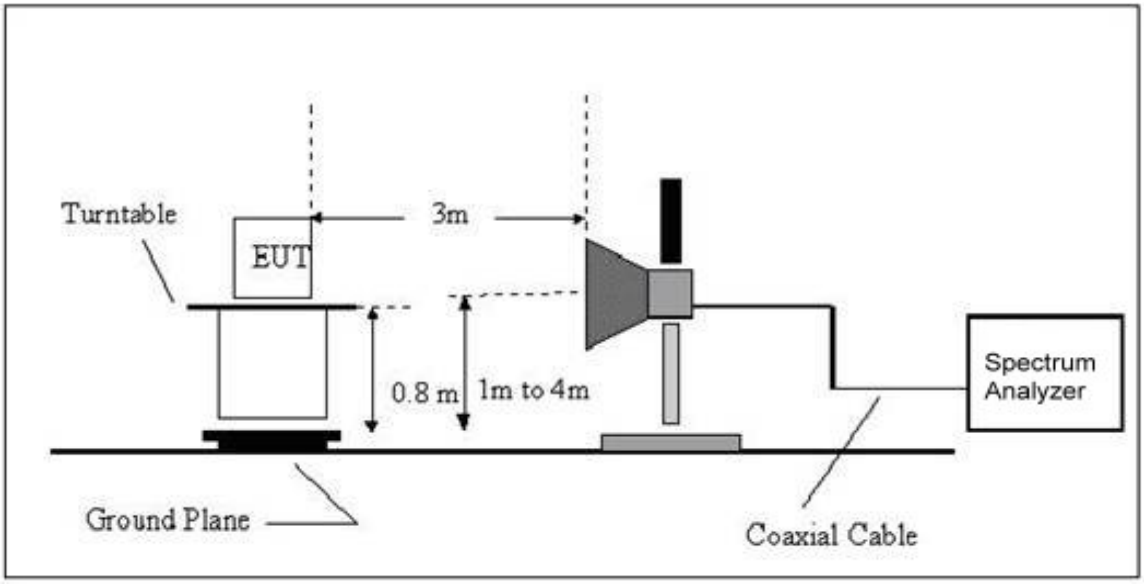
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

TEST SETUP

(A) Radiated Emission Test Set-Up Frequency Below 1 GHz



(B) Radiated Emission Test Set-Up Frequency Above 1GHz



EUT OPERATING CONDITIONS

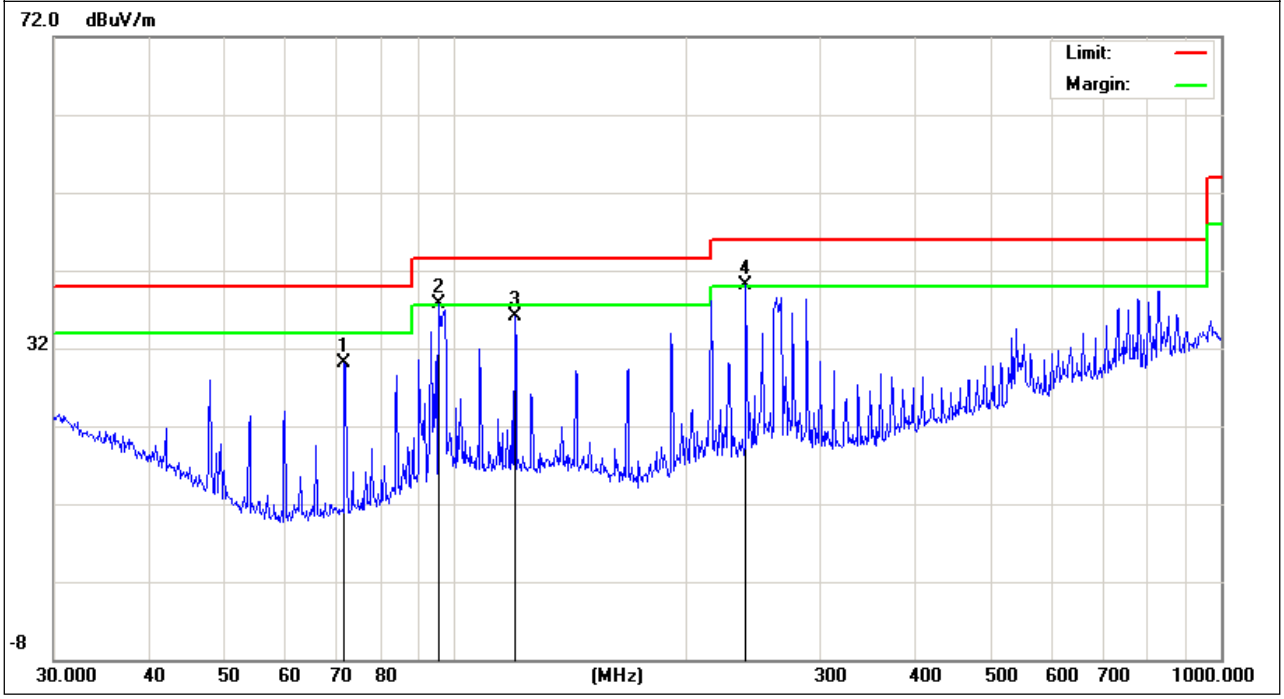
The EUT tested system was configured as the statements of **2.3** Unless otherwise a special operating condition is specified in the follows during the testing.

TEST RESULTS

EUT：	GAMING MOUSE	Model Name ：	MGL01
Temperature：	24 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Date：	2011-10-17
Test Mode ：	Running	Polarization：	Horizontal
Test Power ：	DC 5V 30mA From PC AC 120V/60Hz		

Freq. (MHz)	Reading (dBuV)	Factor (dBuV)	Measurement (dBuV)	Limit (dBuV)	Over (dB)	Detector
71.832	23.83	6.24	30.07	40	-9.93	QP
95.427	27.84	9.96	37.8	43.5	-5.7	QP
119.8556	24.28	11.77	36.05	43.5	-7.45	QP
239.9874	28.74	11.36	40.1	46	-5.9	QP

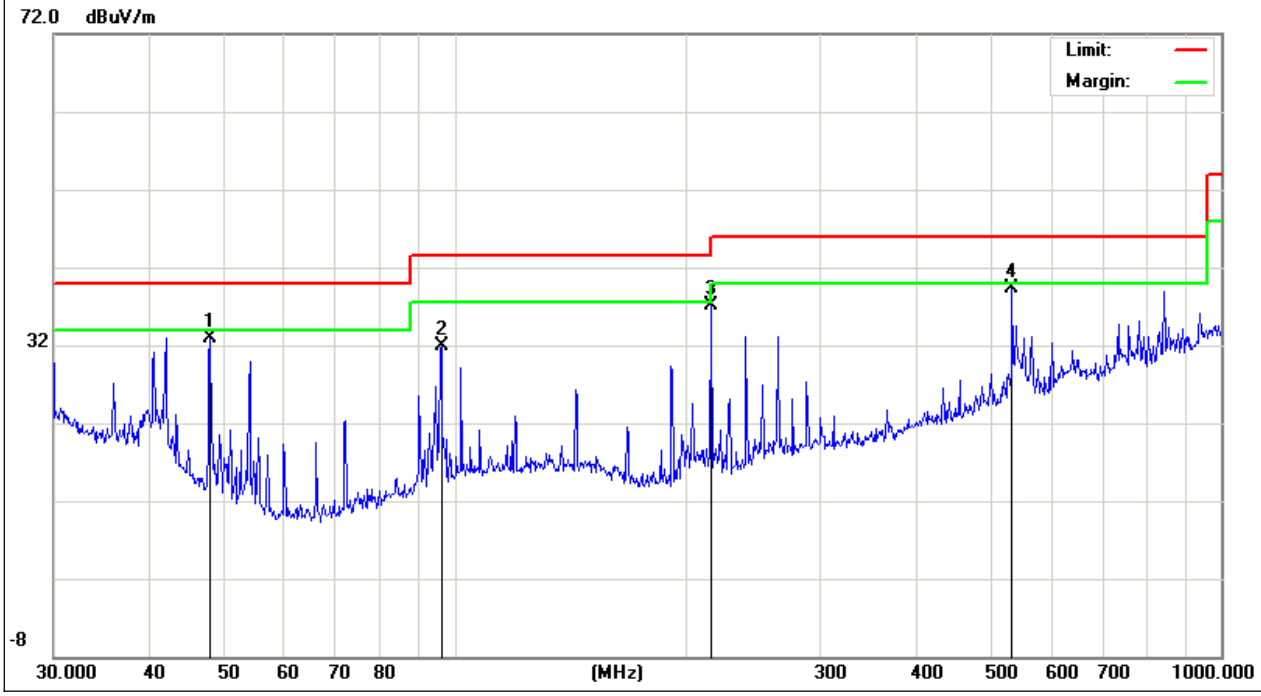
Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Antenna Factor + Cable Loss.
3. N/A means All Data have pass Limit



EUT：	GAMING MOUSE	Model Name ：	MGL01
Temperature：	24 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Date：	2011-10-17
Test Mode ：	Running	Polarization：	Vertical
Test Power ：	DC 5V 30mA From PC AC 120V/60Hz		

Freq. (MHz)	Reading (dBuV)	Factor (dBuV)	Measurement (dBuV)	Limit (dBuV)	Over (dB)	Detector
47.994	23.78	9.13	32.91	40	-7.09	QP
96.0986	21.86	10.03	31.89	43.5	-11.61	QP
216.024	27.53	9.52	37.05	46	-8.95	QP
533.8321	17.24	21.99	39.23	46	-6.77	QP

Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Antenna Factor + Cable Loss.
3. N/A means All Data have pass Limit

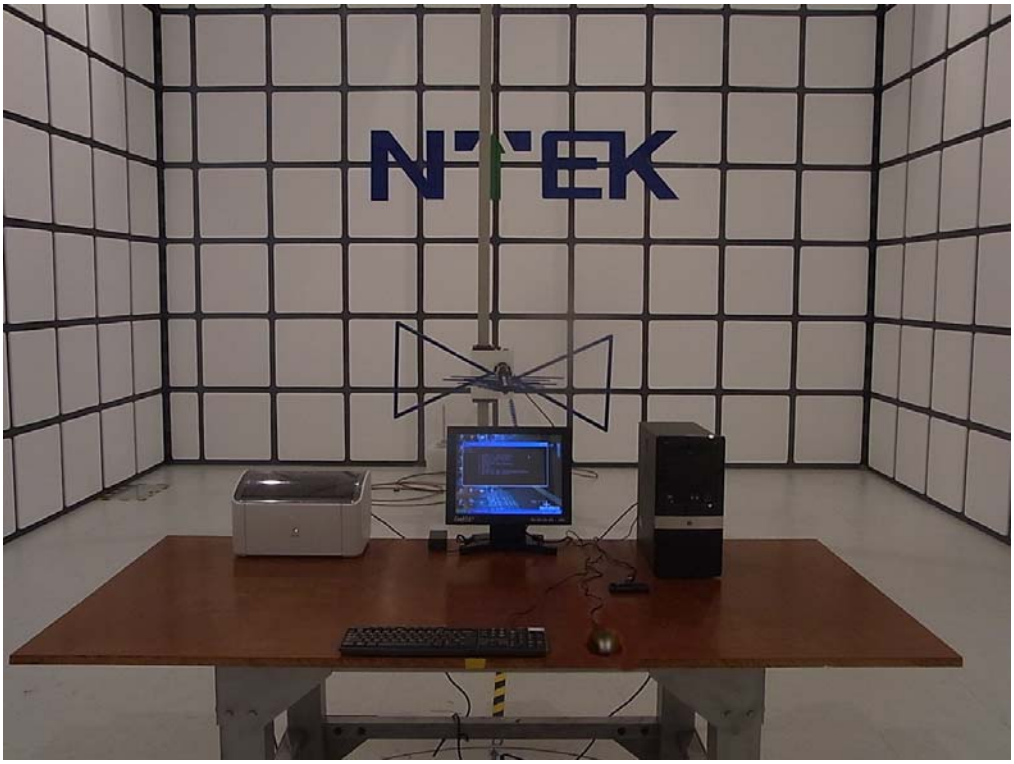


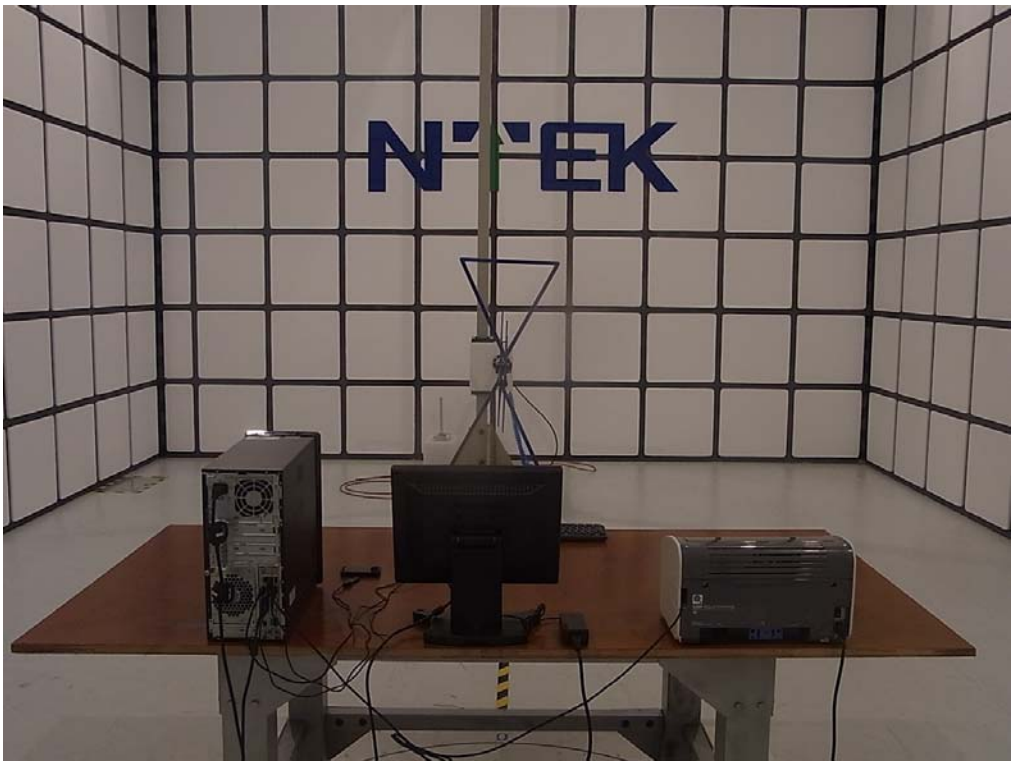
TEST RESULTS(Above 1GHz)

EUT：	GAMING MOUSE	Model Name ：	MGL01
Temperature：	24 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Date :	N/A
Test Mode ：	N/A	Polarization :	N/A
Test Power ：	N/A		

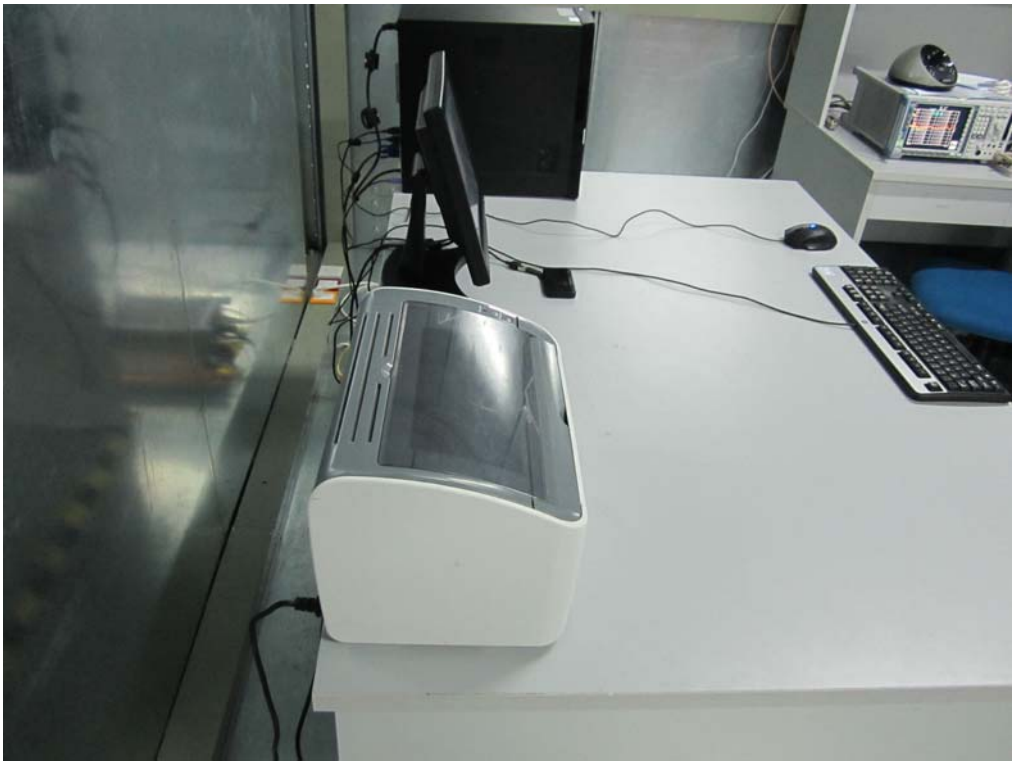
. EUT TEST PHOTO

Radiated Measurement Photos





conducted Measurement Photos



ATTACHMENT PHOTOGRAPHS OF EUT

Photo 1

Photo 2

Photo 3

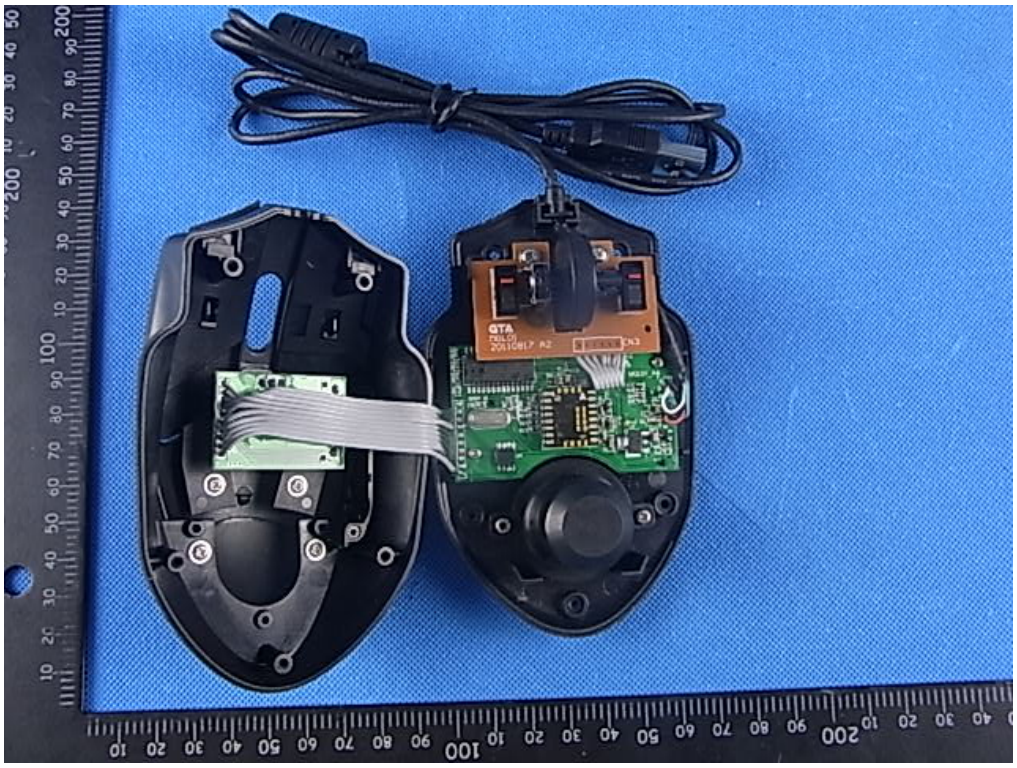


Photo 4

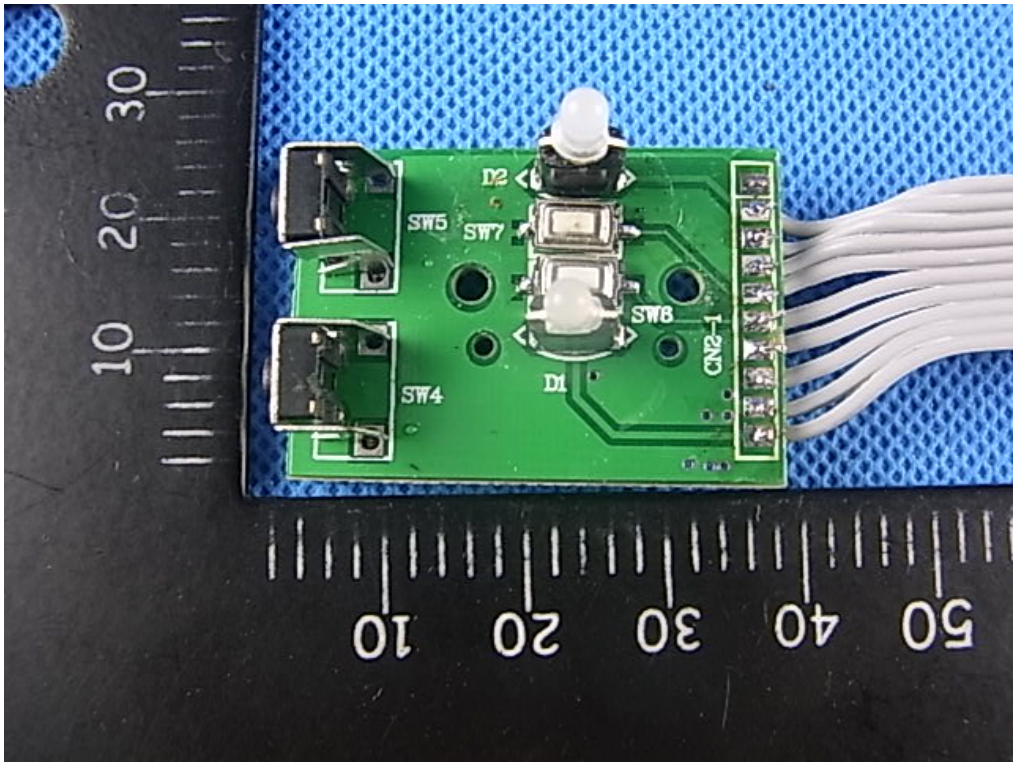


Photo 5

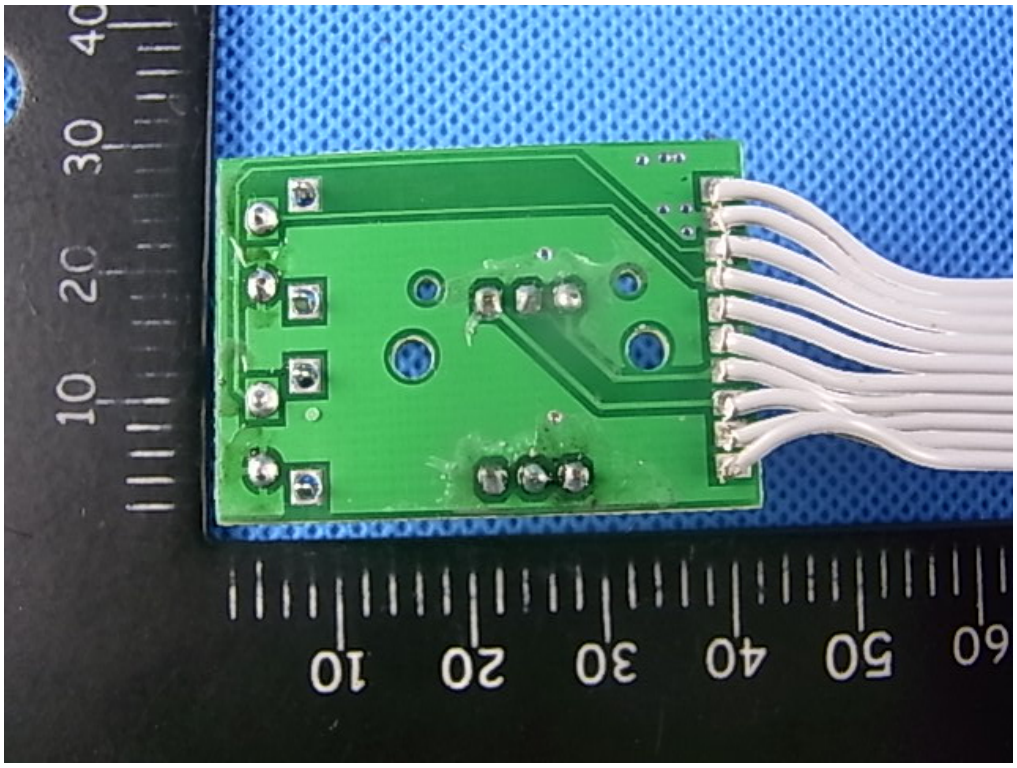


Photo 6

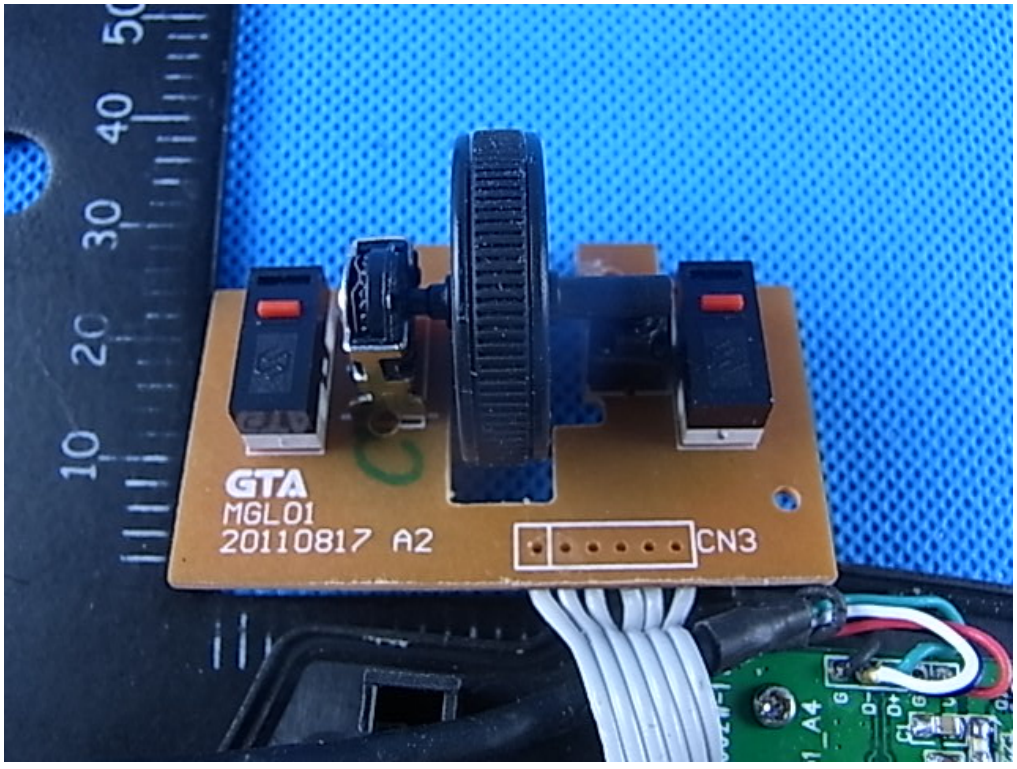


Photo 7

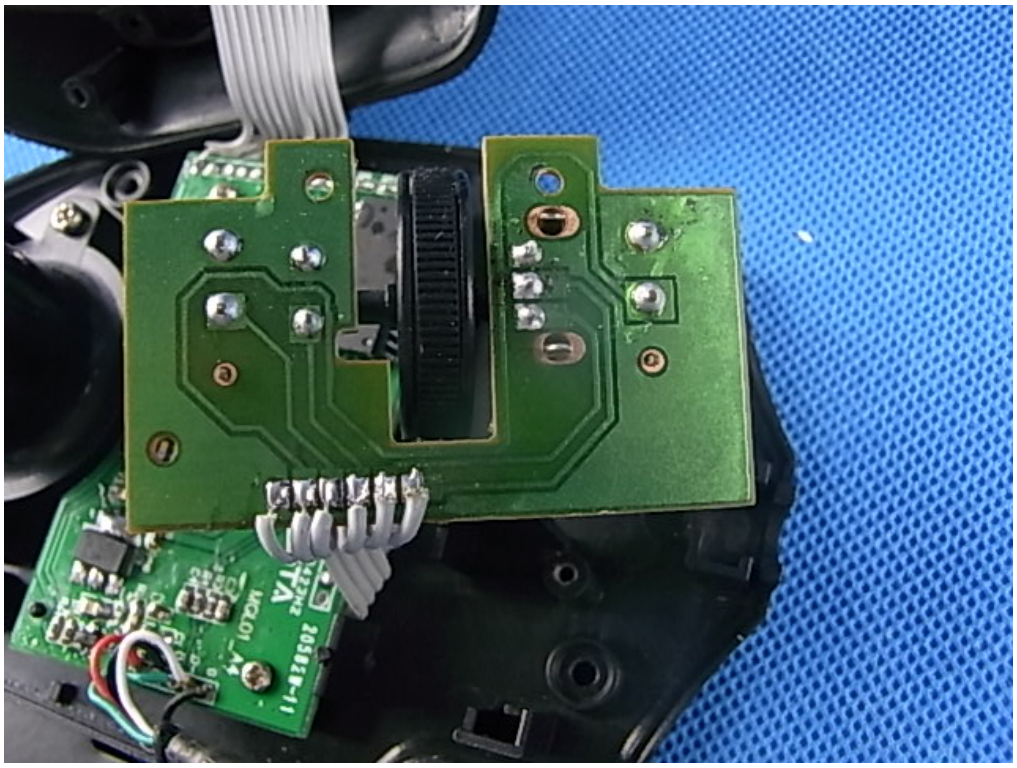


Photo 8

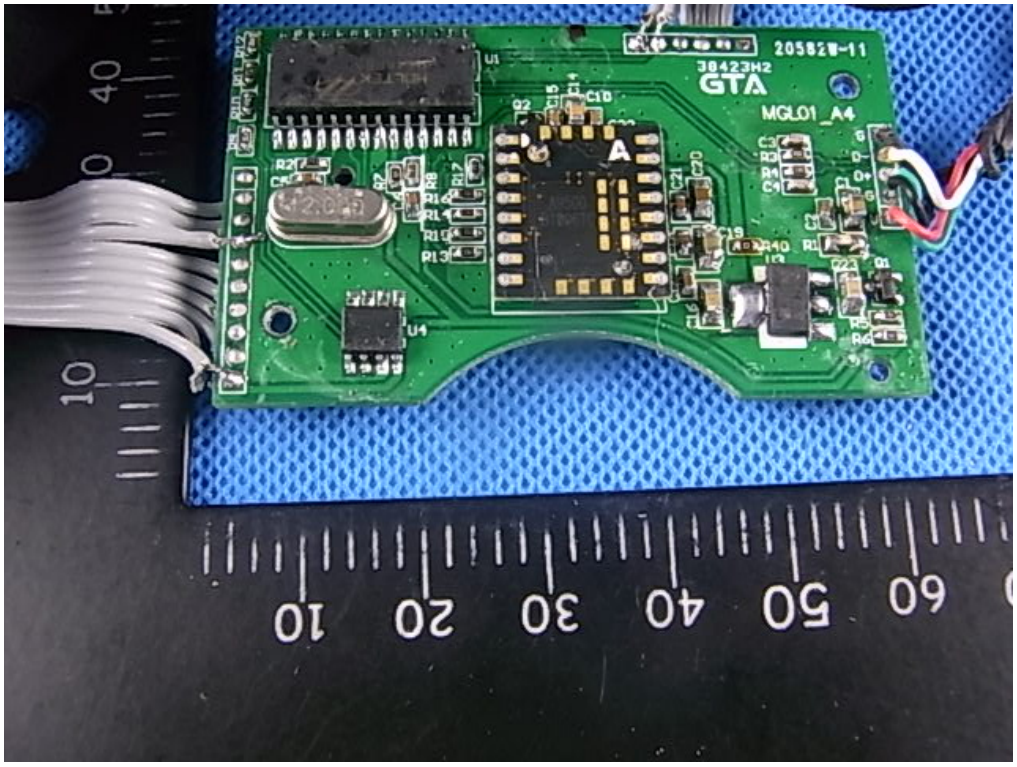


Photo 9