ESTECH Co., Ltd.
Rm 1015, World Venture Center II,
426-5 Gasan-dong, Guncheon-gu,
Seoul, 158-803, Korea

Electromagnetic Interference Test Report

Test Report for FCC

Report Number		ESTF150703-007			
Applicant	Company name	Young Electronics Corp.			
	Address	#396-18, CHEONG CHEON-DONG, BUPYEONG-GU, INCHEON, KOREA			
	Telephone	82-32-505-5347, FAX) 82-32-505-5349			
Product	Product name	RF GARAGE DOOR OPENER			
	Model No.	ACCESS-10D	Manufacturer	Young Electronics Corp.	
	Serial No.	NONE	Country of origin	KOREA	
Test date	2007-02-06 ~ 2007-03-02		Date of issue	2007-03-05	
Testing location	ESTECH. Co., Ltd. 97-1 Hoiuk-Ri Majang-Myon, Icheon-city, KyungKi-Do, Korea				
Standard	FCC PART 15.231 Subpart C(2006) , ANSI C 63.4 2003				
Test item	■ Conducted Emission	□ Class A	■ Class B	Test result	N/A
	■ Radiated Emission	□ Class A	■ Class B	Test result	OK
Measurement facility registration number		94696			
Tested by	Senior Engineer M.J.Song (Signature)				
Reviewed by	Manager Engineer J.M.Yang (Signature)				
Abbreviation	OK, Pass = Passed, Fail = Failed, N/A = not applicable				

* Note

- This test report is not permitted to copy partly without our permission
- This test result is dependent on only equipment to be used
- This test result based on a single evaluation of one sample of the above mentioned

Contents

1. Laboratory Information

1.1 General

This EUT (Equipment Under Test) has been shown to be capable of compliance with the applicable technical standards and is tested in accordance with the measurement procedures as indicated in this report.
ESTECH Lab attests to accuracy of test data. All measurement reported herein were performed by ESTECH Co., Ltd.
ESTECH Lab assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

1.2 Test Lab.

Corporation Name : ESTECH Co. Ltd

Head Office : Rm 1015, World Venture Center II, 426-5, Gasan-dong, Geumcheon-gu, Seoul, Korea
(Safety & Telecom. Test Lab)

EMC Test Lab : 58-1 Osan-Ri, GaNam-Myon, YeoJoo-Gun, KyungKi-Do, Korea
97-1 Hoiuk-Ri Majang-Myon, Icheon-city, KyungKi-Do, Korea

1.3 Official Qualification(s)

MIC : Granted Accreditation from Ministry of Information & Communication for EMC, Safety and Telecommunication
KOLAS : Accredited Lab By Korea Laboratory Accreditation Schema base on CENELEC requirements
FCC : Filed Laboratory at Federal Communications Commission
VCCI : Granted Accreditation from Voluntary Control Council for Interference from ITE

2. Description of EUT

2.1 Summary of Equipment Under Test

NONE : RF GARAGE DOOR OPENER

Model Number : ACCESS-10D

Serial Number : NONE

Manufacturer : Young Electronics Corp.

Country of origin : KOREA

Rating : INPUT:9Vdc

Receipt Date : 2007-02-06

EUT Type : RF Remote Control Garage Open Transmitter

Output Power : -37dBm

Freq. Range : CH1:300.09 CH2:300.1

Oscillator(s) : 300MHZ

3. Test Standards

Test Standard : FCC PART 15 (2006)

This Standard sets out the regulations under which an intentional, unintentional, or incidental radiator may be operated without an individual license. It also contains the technical specifications, administrative requirements and other conditions relating to the marketing of Part 15 devices.

Test Method : ANSI C 63.4 (2003)

This standard sets forth uniform methods of measurement of radio-frequency (RF) signals and noise emitted from both unintentional and intentional emitters of RF energy in the frequency range 9 kHz to 40 GHz. Methods for the measurement of radiated and AC power-line conducted radio noise are covered and may be applied to any such equipment unless otherwise specified by individual equipment requirements. These methods cover measurement of certain decides that deliberately radiate energy, such as intentional emitters, but does not cover licensed transmitters. This standard is not intended for certification/approval of avionic equipment or for industrial, scientific, and medical (ISM) equipment These method apply to the measurement of individual units or systems comprised of multiple units

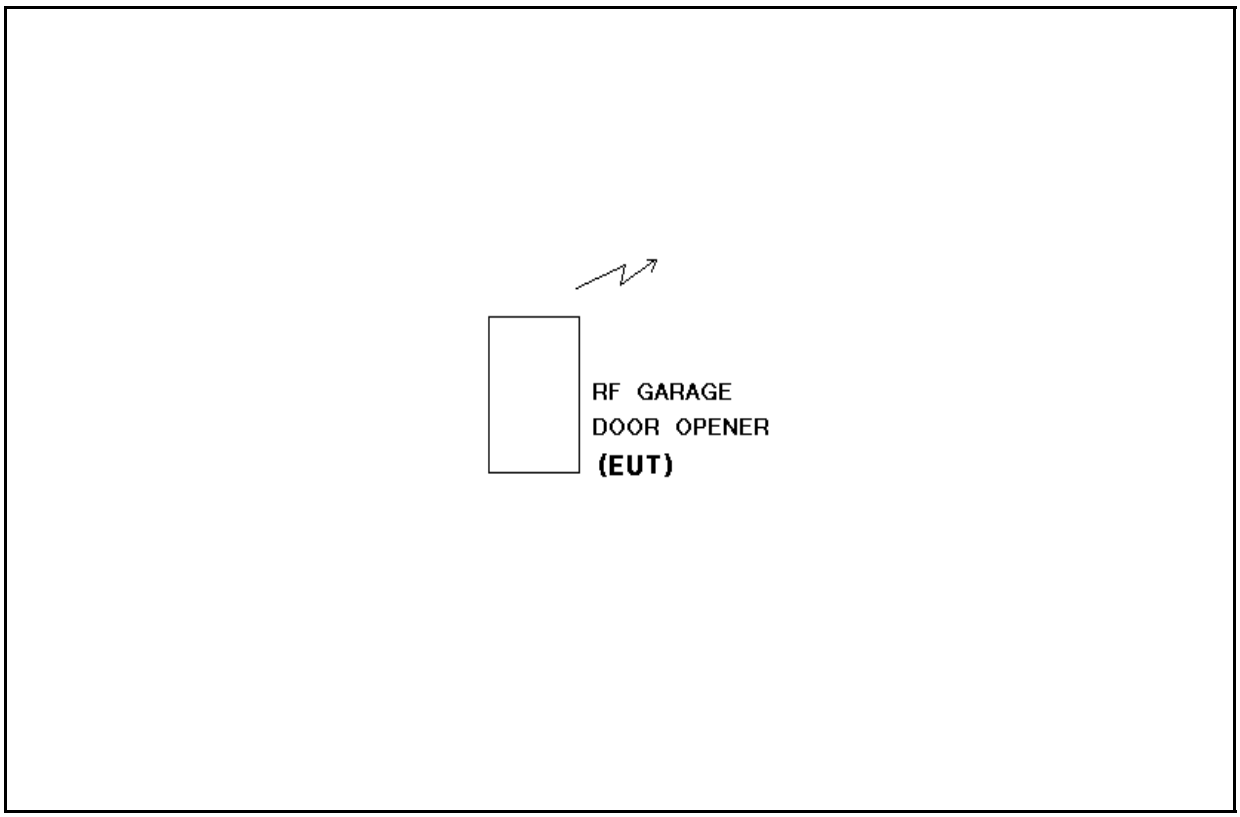
4. Measurement Condition

4.1 EUT Operation.

* The EUT was in the following operation mode during all testing
* The operational conditions of the EUT was determined by the manufacturer according to the typical use of the EUT with respect to the expected hightest level of emission
* The EUT is a one-channel wireless transmitter operating at 300MHz

Tx Freq. Range : 300MHz ~ 300MHz
Oscillator(s) : 300MHz
No. of Channels : 2
Antenna : Built-in internal looped antenna on-board
Power Consumption : 9V DC

4.2 Configuration and Peripherals



4.3 EUT and Support equipment

Equipment Name	Model Name	S/N	Manufacturer	Remark (FCC ID)
RF GARAGE DOOR OPENER	ACCESS-10D	NONE	Young Electronics Corp.	EUT

4.4 Cable Connecting

Start Equipment		End Equipment		Cable Standard		Remark
Name	I/O port	Name	I/O port	Length	Shielded	

5. Measurement of radiated disturbance

Above 30 MHz Electric Field strength was measured in accordance with FCC Part 15 (2006) & ANSI C 63.4 (2003). The test setup was made according to FCC Part 15 (2006) & ANSI C 63.4 (2003) on an open test site, which allows a 3m distance measurement. The EUT was placed in the center of wooden turntable. The height of this table was 0.8m. The measurement was conducted with both horizontal and vertical antenna polarization. The turntable has fully rotated. For further description of the configuration refer to the picture of the test set-up.

5.1 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
TEST Receiver	ESVS10	Rohde & Schwarz	838562/002	2008. 1. 23
Spectrum Analyzer	R3261C	ADVANTEST	61720116	2007. 4. 19
LogBicon Antenna	VULB 9160	S/B	3142	2007. 5. 03
Amplifier	8447F	HP	2805A02972	2007. 6. 26
Spectrum Analyzer	8563E	HP	3623A05297	2007. 3. 06
PREAMPLIFIER	8449B	HP	3008A00581	2007. 3. 09
Turn Table	2087	EMCO	2129	-
Antenna Mast	2070-01	EMCO	9702-203	-
ANT Mast Controller	2090	EMCO	1535	-
Turn Table Controller	2090	EMCO	1535	-

5.2 Environmental Condition

Test Place : Open site(3m)
Temperature (°C) : 5 ℃
Humidity (%) : 42 %

5.3 Test data 30MHz ~ 3GHz Radiated Emissions

Measurement Distance : 3 m

Frequency (MHz)	Reading (dBμV)	Position (V/H)	Height (m)	Correction Factor		Result Value		
				Ant Factor (dB)	Cable (dB)	Limit (dBμV/m)	Result (dBμV/m)	Margin (dB)
Fundamental and Harmonic(Peak Value)								
300.09	53.50	V	1.5	13.19	2.7	75.3	69.39	-25.91
600.16	28.40	V	1.5	19.16	4.0	55.3	51.51	-23.79
900.23	14.50	V	1.4	22.58	4.9	55.3	41.94	-33.36
Other Emission(Qpeak Value)								
36.58	10.20	V	1.0	12.41	0.9	40.0	23.54	-16.46
314.99	7.50	V	1.0	13.51	2.8	46.0	23.77	-22.23
396.40	12.00	V	1.0	15.24	3.1	46.0	30.35	-15.65

Remark

TEST MODE : BUTTON 1 (CH1)
H : Horizontal, V : Vertical
1. The EUT were investigated at X,Y,Z Axis and the worst-case is reported
2.The average value doesn't need to be measured because the result of peak value is under the limit of average.
3. The EUT was tested with a new battery
4. There was no found any emission at above 1000Mhz
5. Radiated Limis per § 15.231 :

Fund. Freq.(MHz)	F/S (μV/m)	F/S Spurious(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
470 & above	12500	1250

6. * Note : These frequencies fall under restricted bands according to §15.205. The field strength of emissions at these frquencies does not exceed the limits specified in § 15.205

5.3 Test data 30MHz ~ 3GHz Radiated Emissions

Measurement Distance : 3 m

Frequency (MHz)	Reading (dBμV)	Position (V/H)	Height (m)	Correction Factor		Result Value		
				Ant Factor (dB)	Cable (dB)	Limit (dBμV/m)	Result (dBμV/m)	Margin (dB)
Fundamental and Harmonic(Peak Value)								
300.10	58.10	V	1.5	13.19	2.7	75.3	73.99	-21.31
600.16	30.80	V	1.4	19.16	4.0	55.3	53.91	-21.39
900.23	16.20	V	1.4	22.58	4.9	55.3	43.64	-31.66
Other Emission(Qpeak Value)								
36.60	12.00	V	1.0	12.42	0.9	40.0	25.34	-14.66
315.00	12.00	V	1.4	13.51	2.8	46.0	28.27	-17.73
370.68	18.00	V	1.4	14.63	3.0	46.0	35.67	-10.33

Remark

TEST MODE : BUTTON 2 (CH2)
H : Horizontal, V : Vertical
1. The EUT were investigated at X,Y,Z Axis and the worst-case is reported
2.The average value doesn't need to be measured because the result of peak value is under the limit of average.
3. The EUT was tested with a new battery
4. There was no found any emission at above 1000Mhz
5. Radiated Limis per § 15.231 :

Fund. Freq.(MHz)	F/S (μV/m)	F/S Spurious(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
470 & above	12500	1250

6. * Note : These frequencies fall under restricted bands according to §15.205. The field strength of emissions at these frquencies does not exceed the limits specified in § 15.205

6. Occupied Bandwidth Measurement

According to §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 20dB down from the modulated carrier.

6.1 Test instruments and measurement setup

The spectrum analyzer is set to as following.

. RBW= 100KHz

. VBW= 100KHz

. Span= 1MHz

. Sweep= suitable duration based on the EUT specification.

20dB Bandwidth Test Instruments

Description	Model	Serial Number
Spectrum Analyzer	E4407B	US42041281
RF Cable	Length: 15cm	-
-Spectrum Analyzer <=> EUT	Loss: 1.0dB	-

6.2 Measurement results

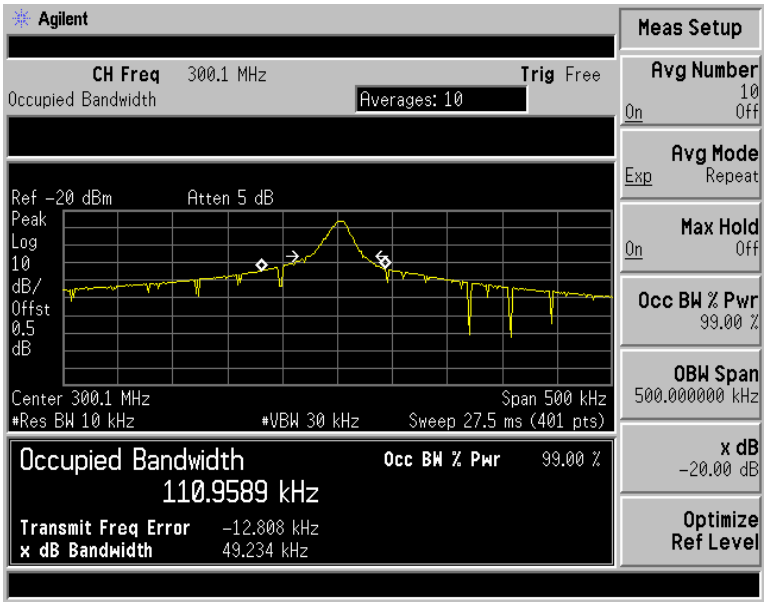
EUT	GARAGE OPEN	MODEL	ACCESS-10D
MODE	ASK	ENVIRONMENTAL CONDITION	25℃, 40%RH
INPUT POWER	DC 9V		

CHANNEL	Channel Frequency (MHz)	Bandwidth at 20dB below(kHz)	Limit (kHz)	PASS/FAIL
1	300.09	49.2	< 775	PASS
2	300.1	49.6	< 775	PASS

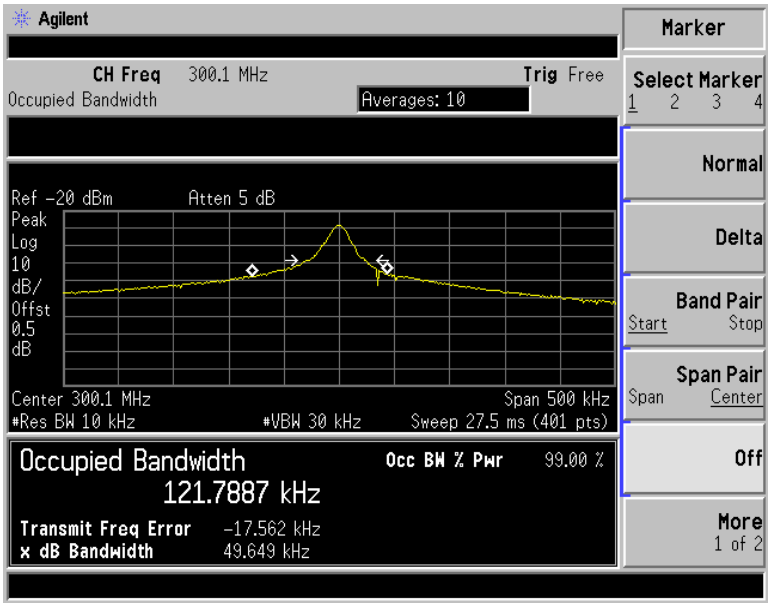
6.3 Trace data

20dB bandwidth

TEST MODE : BUTTON 1 (CH1)



TEST MODE : BUTTON 2 (CH2)



7. Photographs of test setup

7.1 Setup for Radiated Test : 30 ~ 1000 MHz

[Front]

[Rear]

7.2 Setup for Radiated Test :Above 1000 MHz

[Front]

8. Photographs of EUT

[Front]

[Rear]