



STC Test Report

Date : 2013-05-31

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No. : DM111223

Applicant (DGS517): Smart Technologies & Investment Ltd.
Units C&D, 18/F Spectrum Tower, No. 53 Hung To Road,
Kwun Tong, Kowloon, Hong Kong

Description of Sample(s): Submitted sample(s) said to be
Product: GTO ACCESS WIRELESS ESTATE
INTERCOM
Brand Name: GTO / ACCESS SYSTEMS and GTO /
PRO
Model Number: F3100MBC
FCC ID: N9KGTOF3100

Date Sample(s) Received: 2013-05-15

Date Tested: 2013-05-21

Investigation Requested: Perform ElectroMagnetic Interference measurement in
accordance with FCC 47CFR [Codes of Federal Regulations]
Part 15: 2012 and ANSI C63.4: 2009 for FCC Certification.

Conclusion(s): The submitted product COMPLIED with the requirements of
Federal Communications Commission [FCC] Rules and
Regulations Part 15. The tests were performed in accordance
with the standards described above and on Section 2.2 in this
Test Report.

Remark(s): For additional model(s) details, see page 4



LONG Yun Jian, Along
Authorized Signatory
ElectroMagnetic Compatibility Department
For and on behalf of
STC (Dongguan) Company Limited

The Hong Kong Standards and Testing Centre Ltd.

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1.0 General Details

1.1 Equipment Under Test [EUT] Description of Sample(s)

Submitted sample(s) said to be

Product:

Manufacturer:

Brand Name:

Model Number:

Additional Model Number(s):

Rating:

The AC/DC adaptor was provided by the test lab with following details:

Brand name: N/A; Model no.: S-1200F; Input: 100-240Va.c. 50/60Hz 28.8W;

Output: 3-15Vd.c. 1200mA.

GTO ACCESS WIRELESS ESTATE INTERCOM

Smart Electronic Industrial (Dong Guan) Co., Ltd.

Qing Long Road, Long Jian Tian-Cun, Huang Jiang-Zhen, Dong Guan, Guang Dong, China

GTO / ACCESS SYSTEMS and GTO / PRO

F3100MBC

RF1257SMA

12-24Vd.c. with Jack / 6Vd.c. ("AAA" size battery x 4)

1.1.1 Description of EUT Operation

The Equipment Under Test (EUT) is a Smart Electronic Industrial (Dong Guan) Co., Ltd. GTO ACCESS WIRELESS ESTATE INTERCOM. Entry code presses the CALL button on the keypad. The base (indoor) unit and the keypad will ring. A user at the base (indoor) unit answers the call by pressing the PUSH TO ANSWER/TALK button.

1.2 Date of Order

2013-05-15

1.3 Submitted Sample(s):

1 Sample

1.4 Test Duration

2013-05-21

1.5 Country of Origin

China

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2.0 Technical Details

2.1 Investigations Requested

Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15 2012 and ANSI C63.4:2009 for FCC Certification.

2.2 Test Standards and Results Summary Tables

EMISSION Results Summary						
Test Condition	Test Requirement	Test Method	Class / Severity	Test Result		
				Pass	Failed	N/A
Field Strength of Fundamental Emissions & Spurious Emissions	FCC 47CFR 15.231a	ANSI C63.4:2009	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Radiated Emissions	FCC 47CFR 15.209	ANSI C63.4:2009	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
AC Mains Conducted Emissions	FCC 47CFR 15.207	ANSI C63.4:2009	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Note: N/A - Not Applicable

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3.0 Test Results

3.1 Emission

3.1.1 Radiated Emissions

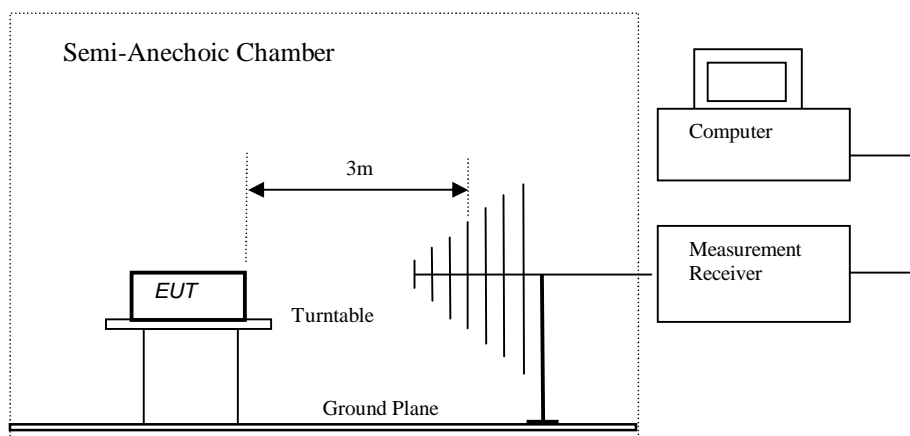
Test Requirement:	FCC 47CFR 15.231a
Test Method:	ANSI C63.4:2009
Test Date:	2013-05-21
Mode of Operation:	Tx mode

Test Method:

The sample was placed 0.8m above the ground plane of semi-anechoic chamber*. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

*: Semi-anechoic chamber located on the STC (Dongguan) Company Ltd. 68 Fumin Nan Road, Dalang, Dongguan, Guangdong, PRC with a metal ground plane filed with the FCC pursuant to section 2.948 of the FCC rules, with Registration Number: 629686.

Test Setup:



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Limits for Field Strength of Fundamental Emissions [FCC 47CFR 15.231a]:

Frequency Range of Fundamental [MHz]	Field Strength of Fundamental Emission [Average] [μV/m]	Field Strength of Spurious Emission [Average] [μV/m]
40.66-40.70	2,250	225
70-130	1,250	125
130-174	1,250 to 3,750 *	125 to 375 *
174-260	3,750	375
260-470	3,750 to 12,500 *	375 to 1,250 *
Above 470	12,500	1,250

Where F is the frequency in MHz, the formulas for calculating the maximum permitted fundamental field strengths are as follows: for the band 130-174 MHz, $\mu\text{V/m}$ at 3 meters = $56.81818(F) - 6136.3636$; for the band 260-470 MHz, $\mu\text{V/m}$ at 3 meters = $41.6667(F) - 7083.3333$. The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.

Results of Tx mode: PASS

Field Strength of Fundamental Emissions Peak Value						
Frequency MHz	Measured Level @3m dBμV	Correction Factor dB/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
317.69	61.7	15.8	77.5	7498.9	61,537.6	Vertical

Field Strength of Spurious Emissions Peak Value						
Frequency MHz	Measured Level @3m dBμV	Correction Factor dB/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
635.38	30.1	22.4	52.5	421.7	6,153.8	Vertical
953.07	30.9	26.6	57.5	749.9	6,153.8	Vertical
+ 1588.45	< 1.0	1.0	< 2.0	< 1.3	5,000.0	Vertical
1906.14	16.5	32.1	48.6	269.2	6,153.8	Vertical

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Results of Tx mode: PASS

Field Strength of Fundamental Emissions						
Average Value						
Frequency MHz	Measured Level @3m dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
317.69	49.5	15.8	65.3	1840.8	6,153.8	Vertical

Field Strength of Spurious Emissions						
Average Value						
Frequency MHz	Measured Level @3m dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
635.38	17.9	22.4	40.3	103.5	615.4	Vertical
953.07	18.7	26.6	45.3	184.1	615.4	Vertical
+ 1588.45	< 1.0	1.0	< 2.0	< 1.3	500.0	Vertical
1906.14	< 4.3	32.1	< 36.4	< 66.1	615.4	Vertical
+ 2223.83	< 1.0	17.2	< 18.2	< 8.1	500.0	Vertical

Remarks:

*: Adjusted by Duty Cycle = -12.2dB

FCC Limit for Average Measurement = $41.6667(317.69\text{MHz}) - 7083.3333 = 6153.8\mu\text{V/m}$

+: Denotes restricted band of operation.

Measurements were made using a peak detector. Any emission less than 1000 MHz and falling within the restricted bands of FCC Rules Part 15 Section 15.205 were not adjusted for averaging and the limits of FCC Rules Part 15 Section 15.209 were applied.

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Limits for Radiated Emissions [FCC 47 CFR 15.209 Class B]:

Frequency Range [MHz]	Quasi-Peak Limits [μ V/m]
0.009-0.490	2400/F (kHz)
0.490-1.705	24000/F (kHz)
1.705-30	30
30-88	100
88-216	150
216-960	200
Above 960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

Result of Tx mode (9kHz - 30MHz): PASS

Emissions detected are more than 20 dB below the limit line(s).

Result of Tx mode (30MHz – 1GHz): PASS

Radiated Emissions Quasi-Peak					
Emission Frequency MHz	E-Field Polarity	Level @3m dB μ V/m	Limit @3m dB μ V/m	Level @3m μ V/m	Limit @3m μ V/m
40.3	Vertical	32.4	40.0	41.7	100
200.0	Vertical	30.1	43.5	32.0	150

Remarks:

Correction Factor includes Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty (30MHz – 1GHz): 4.6dB

(1GHz – 18GHz): 4.4dB

Emissions in the vertical and horizontal polarizations have been investigated and the worst -case test results are recorded in this report.

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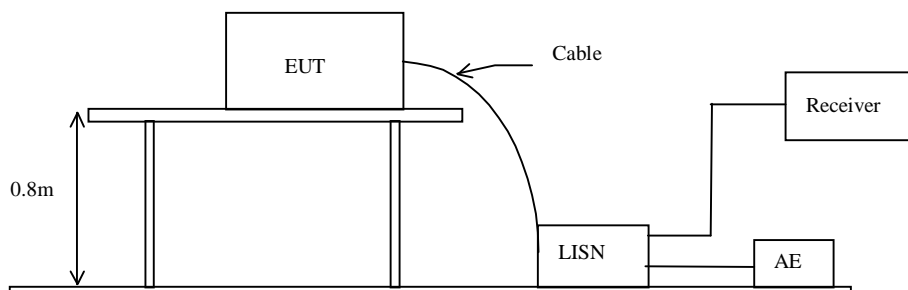
3.1.2 Conducted Emissions (0.15MHz to 30MHz)

Test Requirement: FCC 47CFR 15.207
Test Method: ANSI C63.4:2009
Test Date: 2013-05-21
Mode of Operation: Tx mode

Test Method:

The test was performed in accordance with ANSI C63.4: 2009, with the following: an initial measurement was performed in peak and average detection mode on the live line, any emissions recorded within 30dB of the relevant limit line were re-measured using quasi-peak and average detection on the live and neutral lines with the worst case recorded in the table of results.

Test Setup:



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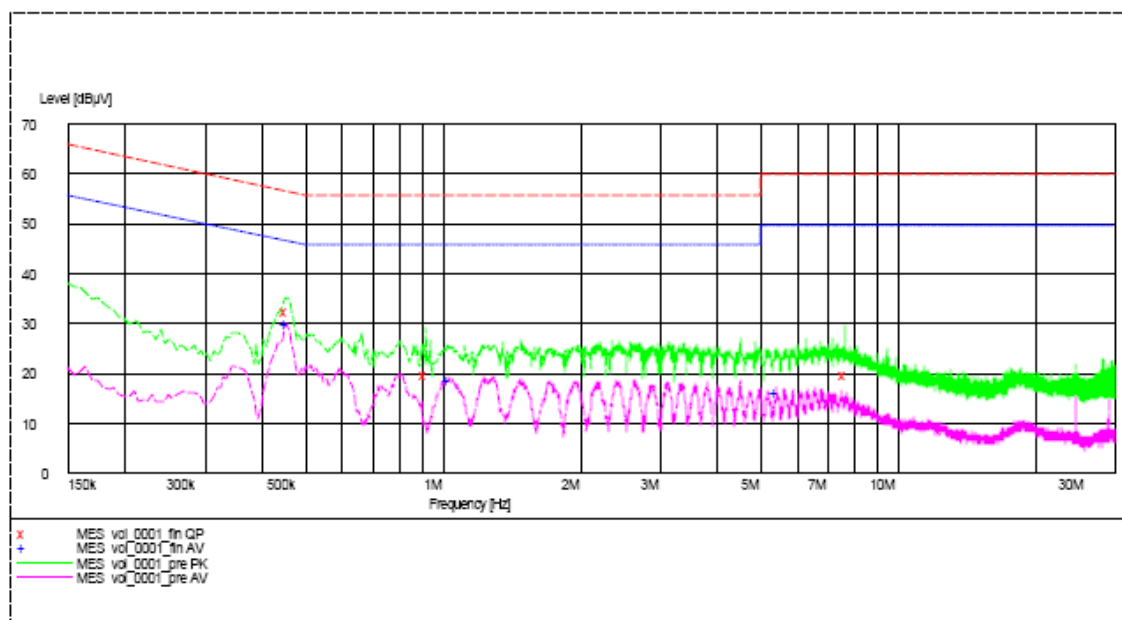
Limit for Conducted Emissions (FCC 47 CFR 15.207):

Frequency Range [MHz]	Quasi-Peak Limits [dBμV]	Average [dBμV]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

* Decreases with the logarithm of the frequency.

Limits for Conducted Emissions Test, please refer to limit lines (Quasi-Peak and Average) in the following diagram.

Results of Tx mode (L): PASS



Conductor Live or Neutral	Frequency MHz	Quasi-peak		Average	
		Level dBμV	Limit dBμV	Level dBμV	Limit dBμV
Live	0.455	32.4	57.0	29.9	47.0
Live	1.035	-*-	-*-	18.6	46.0
Live	5.420	-*-	-*-	16.3	50.0
Live	0.920	19.8	56.0	-*-	-*-
Live	7.665	19.9	60.0	-*-	-*-

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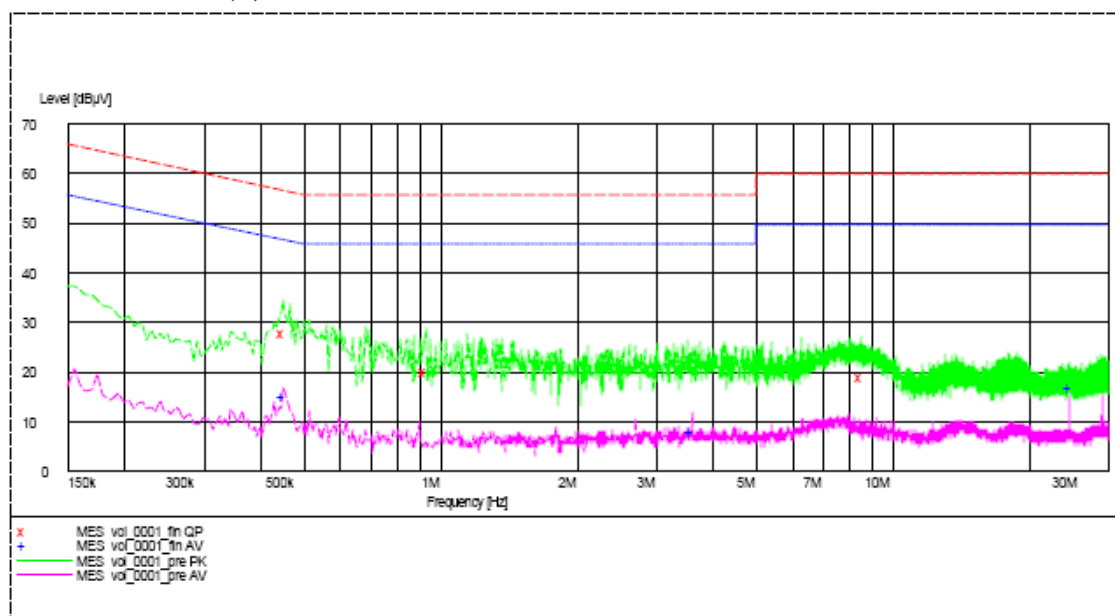
Limit for Conducted Emissions (FCC 47 CFR 15.207):

Frequency Range [MHz]	Quasi-Peak Limits [dBμV]	Average [dBμV]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

* Decreases with the logarithm of the frequency.

Limits for Conducted Emissions Test, please refer to limit lines (Quasi-Peak and Average) in the following diagram.

Results of Tx mode (N): PASS



Conductor Live or Neutral	Frequency MHz	Quasi-peak		Average	
		Level dBμV	Limit dBμV	Level dBμV	Limit dBμV
Neutral	0.450	27.8	57.0	15.4	47.0
Neutral	3.605	-*-	-*-	8.2	46.0
Neutral	24.575	-*-	-*-	16.9	50.0
Neutral	0.930	20.1	56.0	41.8	50.0
Neutral	8.545	19.0	60.0	-*-	-*-

Remarks:

Calculated measurement uncertainty (0.15MHz - 30MHz): 3.25dB

-*- Emission(s) that is far below the corresponding limit line.

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3.2 20dB Bandwidth of Fundamental Emission

Test Requirement:	FCC 47 CFR 15.231a
Test Method:	ANSI C63.4:2009 (Section 13.1.7)
Test Date:	2013-05-21
Mode of Operation:	Tx mode

Test Method:

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

Test Setup:

As Test Setup of clause 3.1.1 in this test report.

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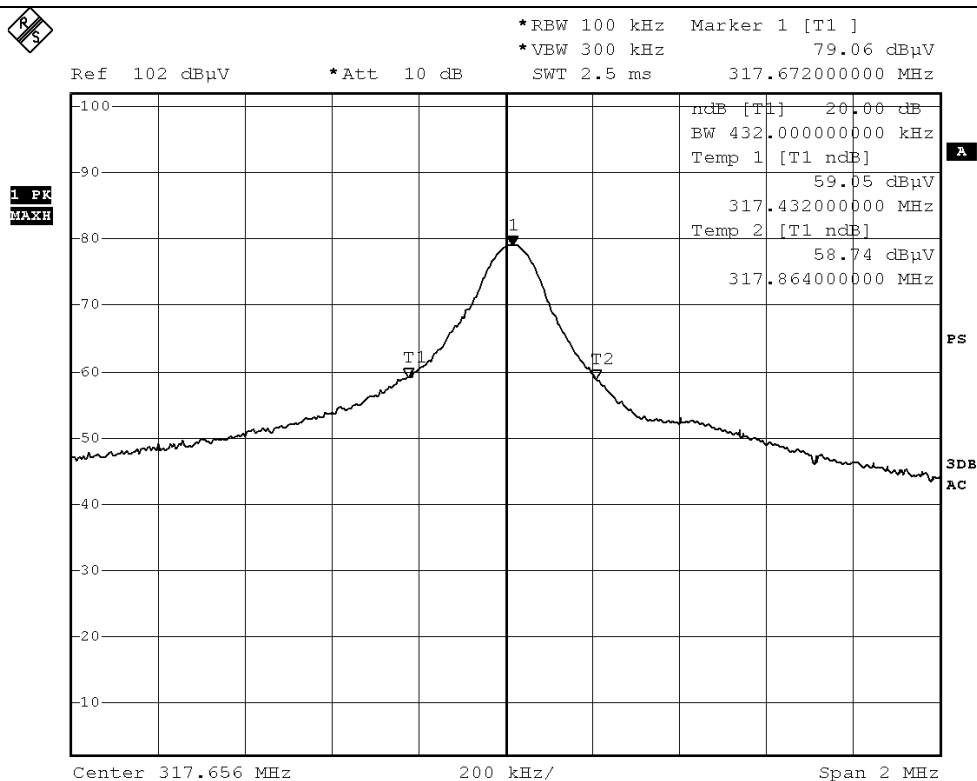
No. : DM111223

Limits for 20 dB Bandwidth of Fundamental Emission:

Frequency Range [MHz]	20dB Bandwidth [kHz]	FCC Limits * [kHz]
317.67	432.0	794.2

*: FCC Limit for Bandwidth measurement
= (0.25%)(Center Frequency)
= (0.0025)(317.67)
= 794.2kHz

20dB Bandwidth of Fundamental Emission



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Appendix A

List of Measurement Equipment

Radiated Emission

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL
EMD015	Signal Generator	MARCONI INSTRUMENTS	2030	112191/012	2013.03.09	2014.03.08
EMD036	EMI Test Receiver	ROHDE & SCHWARZ	ESIB26	100388	2012.07.06	2013.07.05
EMD061	Biconilog Antenna	ETS.LINDGREN	3142C	00060439	2012.11.03	2014.11.02
EMD062	Double-Ridged Waveguide (1 – 18GHz)	ETS.LINDGREN	3117	00075933	2012.11.28	2014.11.27
EMD084	MULTI-DVICE CONTROLLER	ETS.LINDGREN	2090	00060107	N/A	N/A
EMD088	Video Contol Unit	ETS.LINDGREN	Y21953A	2601073	N/A	N/A
EMD093	Monitor	ViewSonic	VA9036	Q8X064201876	N/A	N/A
EMD102	Intelligent Frequency	Ainuo Instrument Co., Ltd	AN97005SS	79707454	N/A	N/A
EMD105	FACT-3 EMC Chamber	ETS.LINDGREN	FACT-3	3803	N/A	N/A
EMD124	Loop Antenna	ETS-Lindgren	6502	00104905	2012.03.26	2014.03.25

CONDUCTED EMISSION

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	LAST CAL
EMD003	IMPULSE GRENZER PULSE LIMITER	ROHDE & SCHWARZ	ESH3-Z2	100071	2013.03.15	2014.03.14
EMD004	ZWEILEITER-V-NETZNACHBILDUNG TWO-LINE V-NETWORK	ROHDE & SCHWARZ	ESH3-Z5	100102	2013.03.15	2014.03.14
EMD009	PASSIVE VOLTAGE PROBE	ROHDE & SCHWARZ	ESH2-Z3	100020	2013.03.15	2014.03.14
EMD036	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESIB26	100388	2012.07.06	2013.07.05
EMD041	TWO-LINE V-NETWORK	ROHDE & SCHWARZ	ENV216	100261	2012.07.06	2013.07.05
EMD103	INTELLIGENT FREQUENCY	AINUO INSTRUMENT CO., LTD	AN97005SS	79707455	N/A	N/A
EMD106	SHIELDING ROOM #1	ETS.LINDGREN	RFD-100	3802	N/A	N/A

Remarks:-

CM Corrective Maintenance
 N/A Not Applicable
 TBD To Be Determined

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Appendix B

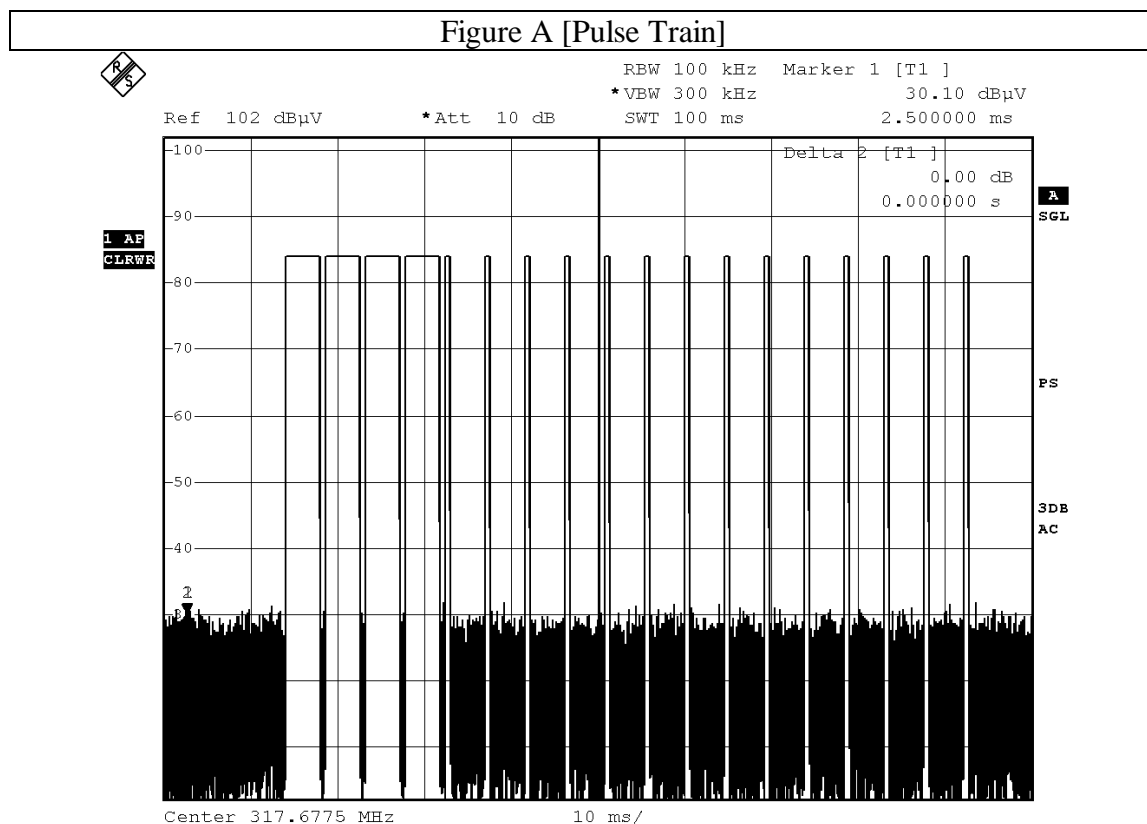
Duty Cycle Correction During 100msec

Each packet period (100msec) never exceeds a series of 4 (4.04msec) long and 14 (0.6msec) short pulses. Assuming any combination of short and long pulses may be obtained due to encoding the worst case transmit duty cycle would be considered $(4 \times 4.04 + 14 \times 0.6)$ msec per 100msec = 24.56% duty cycle. Figure A through C shows the characteristics of the pulses train for one of these functions.

Remarks:

Duty cycle factor = $20\text{Log} [(4.04 \times 4 + 0.6 \times 14)/100] = -12.2\text{dB}$

The following figures [Figure A to Figure C] showed the characteristics of the pulse train for one of these functions.



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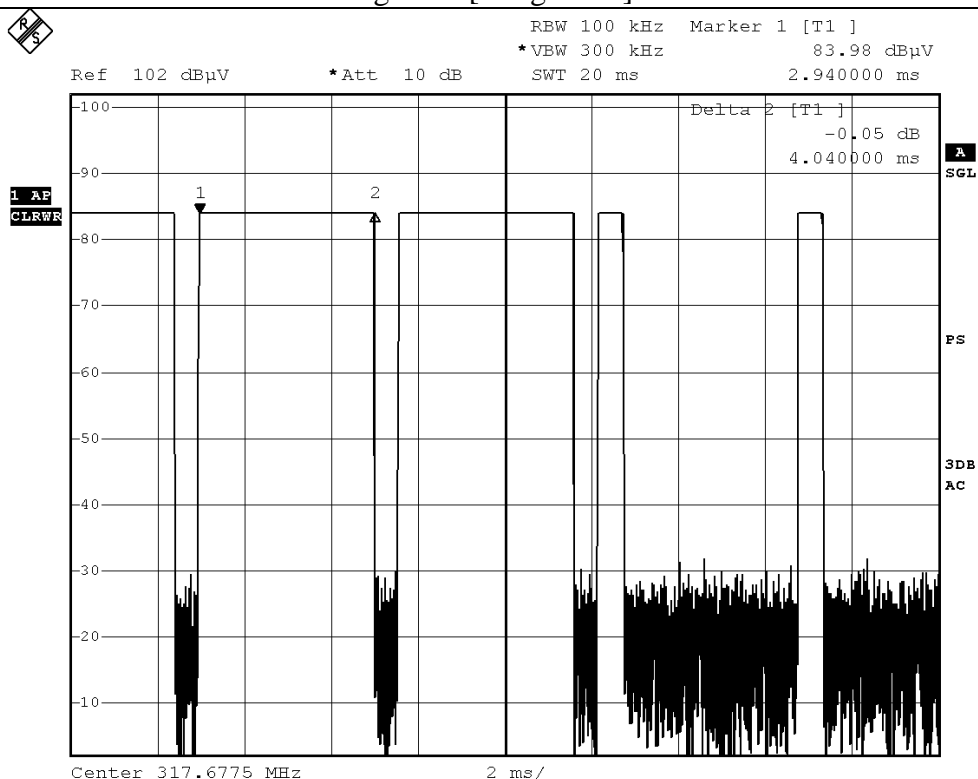
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Figure B [Long Pulse]



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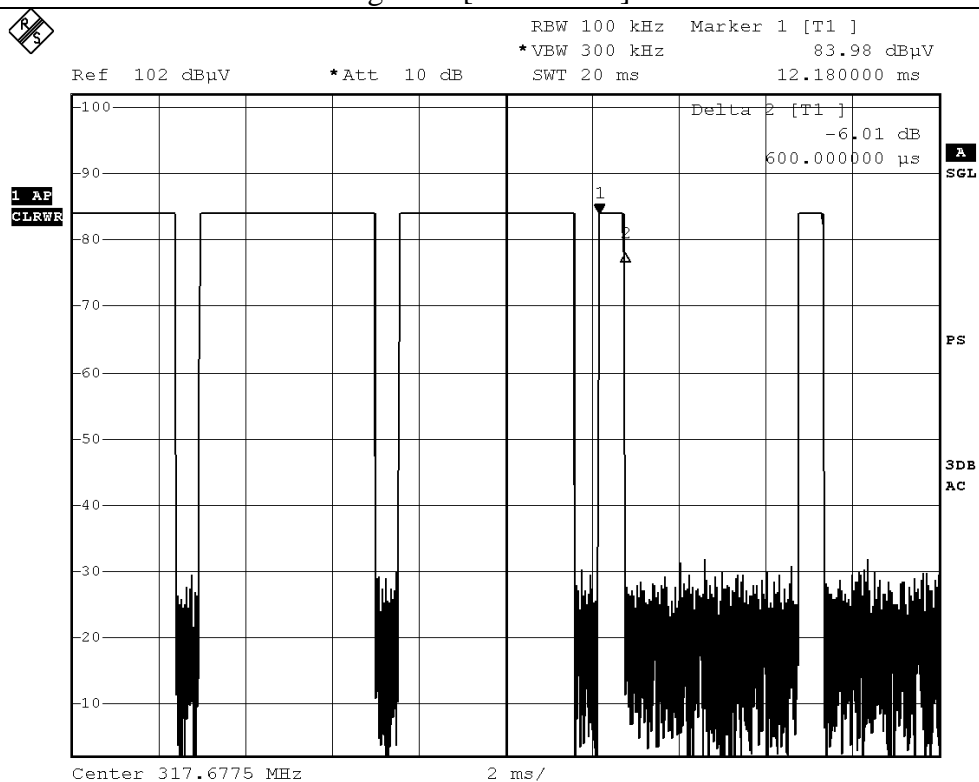
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Figure C [Short Pulse]



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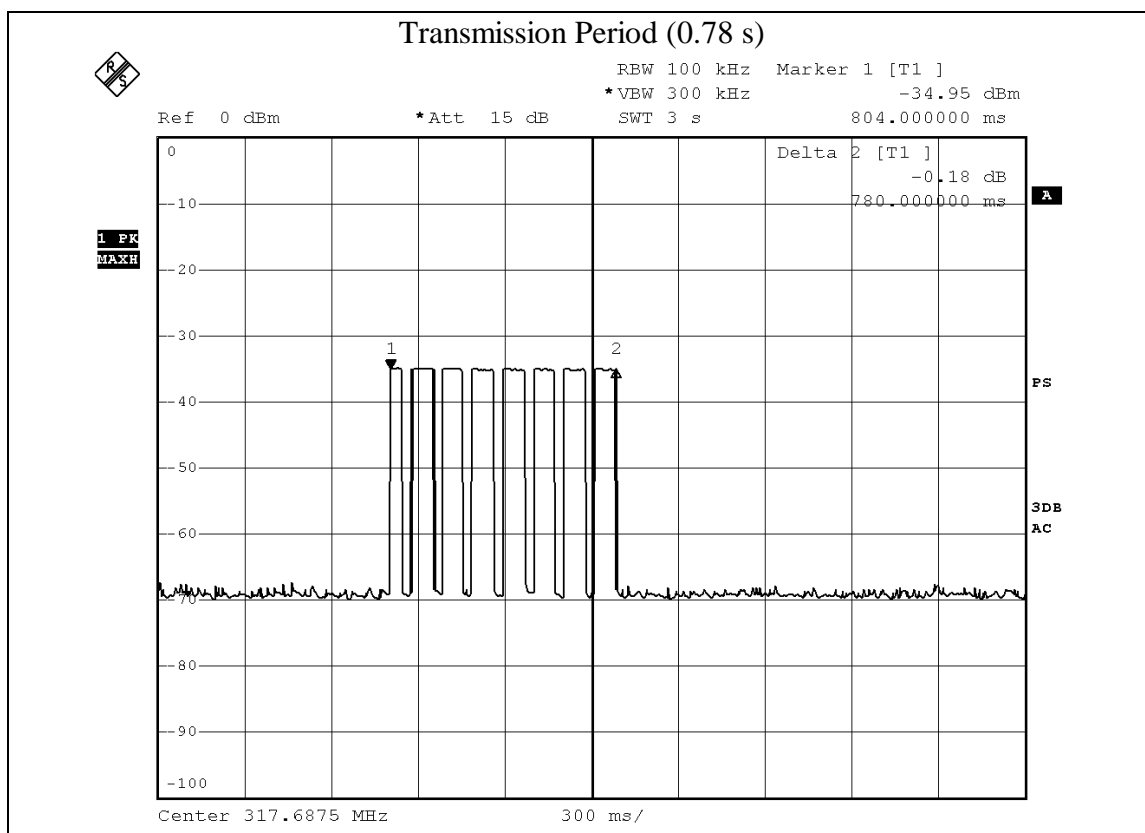
No. : DM111223

Appendix C

Periodic Operation [FCC 47CFR 15.231(a2)]

According to FCC 47CFR15.231 (a1). A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

The EUT ceases transmission almost immediately upon being released and appears to finish the current packet being transmitted. Therefore the longest period of time the transmitter should take to deactivate is a packet length.



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Appendix D

Photographs of EUT

Front View of the product



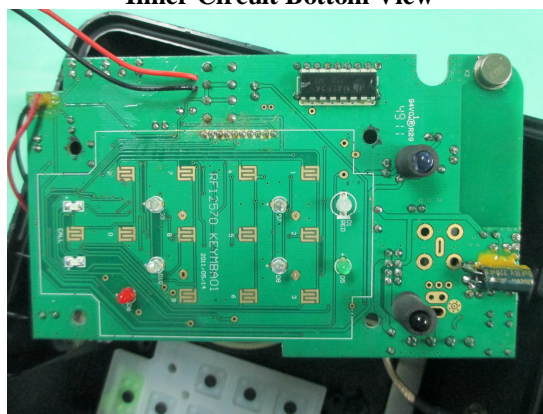
Rear View of the product



Inner Circuit Top View



Inner Circuit Bottom View



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Photographs of EUT

Measurement of Radiated Emission Test Set Up



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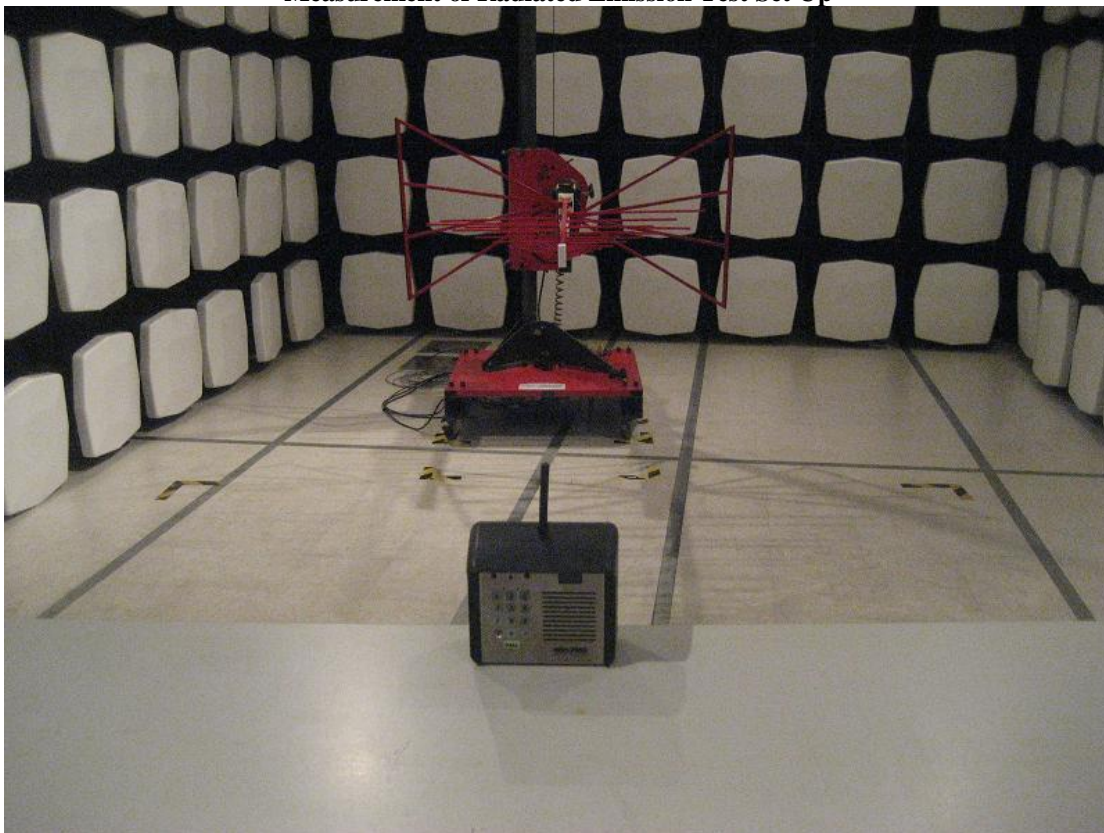
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Photographs of EUT

Measurement of Radiated Emission Test Set Up



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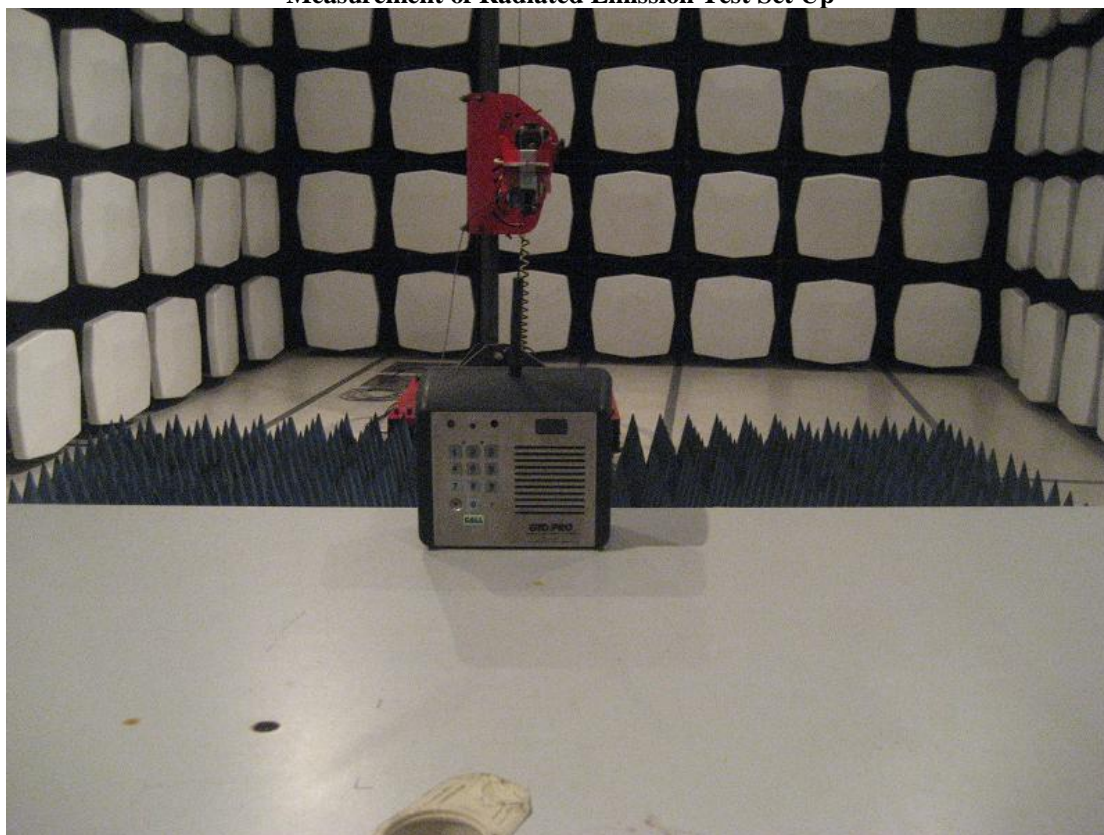
Date : 2013-05-31

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Photographs of EUT

Measurement of Radiated Emission Test Set Up



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Photographs of EUT

Measurement of Conducted Emission Test Set Up



******* End of Test Report *******

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