Test Report of FCC CFR 47 Part 15 Subpart C

On Behalf of

gridComm Pte Ltd
71 Ayer Rajah Crescent Unit 03-23 Singapore 139951

Product Name:	**Master Light Controller**
Model/Type No.:	**GC1338-LR**
FCC ID:	**2ALW7-GC1338**
Prepared By:	**Shenzhen Hongcai Testing Technology Co., Ltd.** 1st-3rd Floor, Building C, Shuanghuan Xin Yi Dai Hi-Tech Industrial Park, No.8 Baoqing Road, Baolong Industrial Zone, Longgang District, Shenzhen, Guangdong, China Tel: +86-755-86337020 Fax:+86-755-86337028
Report Number:	HCT17ER137E-1
Tested Date:	June 5~July 07, 2017
Issued Date:	July 10 , 2017
Tested By:	Michelle Shi/ Michelle Shi

Reviewed By: Owen Yang

Owen Yang
EMC Technical Supervisor

Approved By: Tony Wu

Tony Wu
EMC Technical Manager

TABLE OF CONTENTS

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant:	gridComm Pte Ltd
Address of Applicant:	71 Ayer Rajah Crescent Unit 03-23 Singapore 139951
Manufacturer:	Shenzhen Ju Yang Electronics Technology Co. Ltd.
Address of Manufacturer:	Room 384, FuYong Information Building, BaoAn District, ShenZhen City

General Description of E.U.T

Items	Description
EUT Description:	Master Light Controller
Model No.:	GC1338-LR
Supplementary Models:	GC1338, GC1338-VE
Trade Mark:	gridComm , gridComm
Frequency Band:	LR RF Module: 903MHz~927MHz SIM Module: GSM 850,DCS 1900,WCDMA 850,WCDMA 1900
Modulation Type:	LR RF Module: GFSK SIM Module: GSM 850,DCS 1900: GMSK WCDMA 850,WCDMA 1900: QPSK
Antenna Type:	Terminal Antenna
Antenna Gain:	LR RF Module: 2.5dBi SIM Module: 2 dBi
Power Rating:	AC 100~240V, 60Hz

Remark:* The test data gathered are from the production sample provided by the manufacturer.

1.2 Test standards

This submittal(s) is a test report based on the Electromagnetic Interference (EMI) tests performed on the EUT. The EMI measurements were performed according to the measurement procedure described in ANSI C63.10 - 2013.

The tests were performed in order to determine compliance with Section 15.203,15.205,15.207 15.209, 15.215,15.249 under the FCC Rules Part 15 Subpart C.

1.3 Test Facility

All measurement required was performed at laboratory of Shenzhen CTL Testing Technology Co., Ltd. Floor 1-A, Baisha Technology Park, No. 3011, Shahexi Road, Nanshan, Shenzhen 518055 China. There is one 3m semi-anechoic chamber and two line conducted labs for final test. The Test Sites meet the requirements in documents ANSI C63.10-2013 and CISPR 22/EN 55022 requirements.

FCC – Registration No.: 970318

Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 970318, December, 2013.

IC Registration No.: 9618B

The 3m alternate test site of Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration No.: 9618B on November 13, 2013.

1.4 Test Methodology

The tests documented in this report were performed in accordance with ANSI C63.10:2013 and FCC Part 15 C, Paragraph 15.249.

2. SYSTEM TEST CONFIGURATION

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

The calibrated antennas used to sample the radiated field strength are mounted on a non-conductive, motorized antenna mast 3 or 10 meters from the leading edge of the turntable.

2.3 General Test Procedures

Conducted Emissions: The EUT is placed on the table, which is 0.8 m above ground plane According to the requirements in ANSI C63.10-2013 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak detector mode.

Radiated Emissions: The EUT is a placed on as turntable, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in ANSI C63.10-2013.

2.4 Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen CTL Testing Technology Co., Ltd. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Parameter	Uncertainty
Transmitter power conducted	+/- 0.57 dB
Transmitter power Radiated	+/- 2.20 dB
Conducted spurious emission 9KHz-40 GHz	+/- 2.20 dB
Occupied Bandwidth	+/- 0.01 dB
Power Line Conducted Emission	+/- 3.20 dB
Radiated Emission	+/- 4.32 dB

Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

2.5 Measure Results Explanation Example

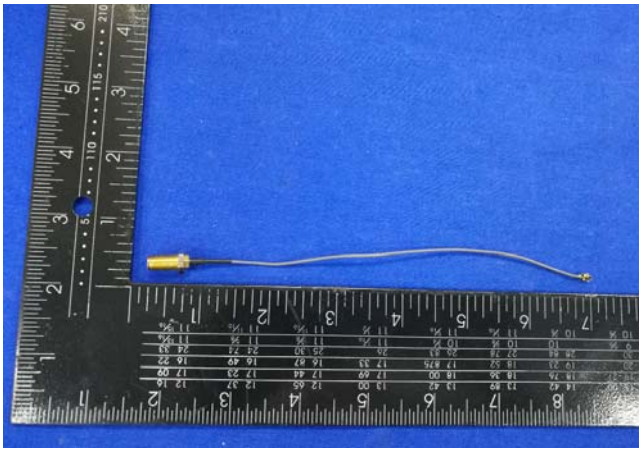
For all conducted test items:

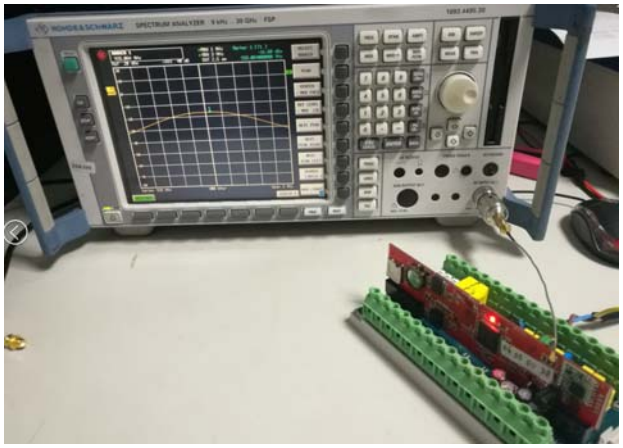
The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

The spectrum analyzer offset is derived from RF cable less and attenuator factor.
Offset= RF cable less+ attenuator factor.

Note: Using a temporary antenna connector for the EUT when the conducted measurements are performed.

Equipment	Manufacturer	Model No.	Frequency range(GHz)	Attenuation values(dBm)
Line	Zhenjiang south electronic	RG316	1-12	0.07
			<1G	0.02
			>12G	0.95
Connector	Zhenjiang south electronic	SMA-K/N-J	1-12	0.01
			<1G	0.005
			>12G	0.03





2.6. Information of EUT configuration for test

The EUT has been tested under operating condition. Manual control the EUT for staying in continuous transmitting mode. Channel Low(903MHz),Channel Middle(915MHz) and Channel High(927MHz) are chosen for the final testing.

2.7 List of Measuring Equipments Used

Test equipments list of Shenzhen CTL Testing Technology Co., Ltd.

No.	Equipment	Manufacturer	Model No.	S/N	Last Calculator	Due Calculator
1	EMI Test Receiver	R&S	ESCI	100687	2016-7-25	2017-7-24
2	EMI Test Receiver	R&S	ESPI	100097	2016-10-1	2017-10-31
3	GSM Mobile Phone Test Set	R&S	CMU200	1100.0008k02	2016-10-1	2017-10-31
4	Teo Line Single Phase Module	SCHWARZBECK	NSLK8128	8128247	2016-10-1	2017-10-31
5	Amplifier	HP	8447D	1937A02492	2016-7-25	2017-7-24
6	TRILOG Broadband Test-Antenna	SCHWARZBECK	VULB9163	9163-324	2016-7-25	2017-7-24
7	Power Sensor	Anritsu	ML2438A	1241002	2016-7-25	2017-7-24
8	Power Sensor	Anritsu	MA2411B	1207366	2016-7-25	2017-7-24
9	10dB attenuator	ELECTRO-METRICS	EM-7600	836	2016-7-25	2017-7-24
10	Spectrum Analyzer	R&S	FSP	100397	2016-10-1	2017-10-31
11	Broadband preamplifier	SCH WARZBECK	BBV9718	9718-182	2016-7-25	2017-7-24
12	Horn Antenna	SCHWARZBECK	BBHA 9120D	0437	2016-7-25	2017-7-24
13	Horn Antenna	SCHWARZBECK	BBHA9170	0483	2016-7-25	2017-7-24

3. SUMMARY OF TEST RESULTS

Standard	Description of Test	Result
§ 15.207	Conducted Emission	Pass
§ 15.215	20dB Bandwidth	Pass
§ 15.249(d)	Band Edges	Pass
§ 15.205	Restricted Band of Operation	Pass
§ 15.209 & § 15.249	Spurious Emission	Pass
§ 15.203	Antenna Requirement	Pass

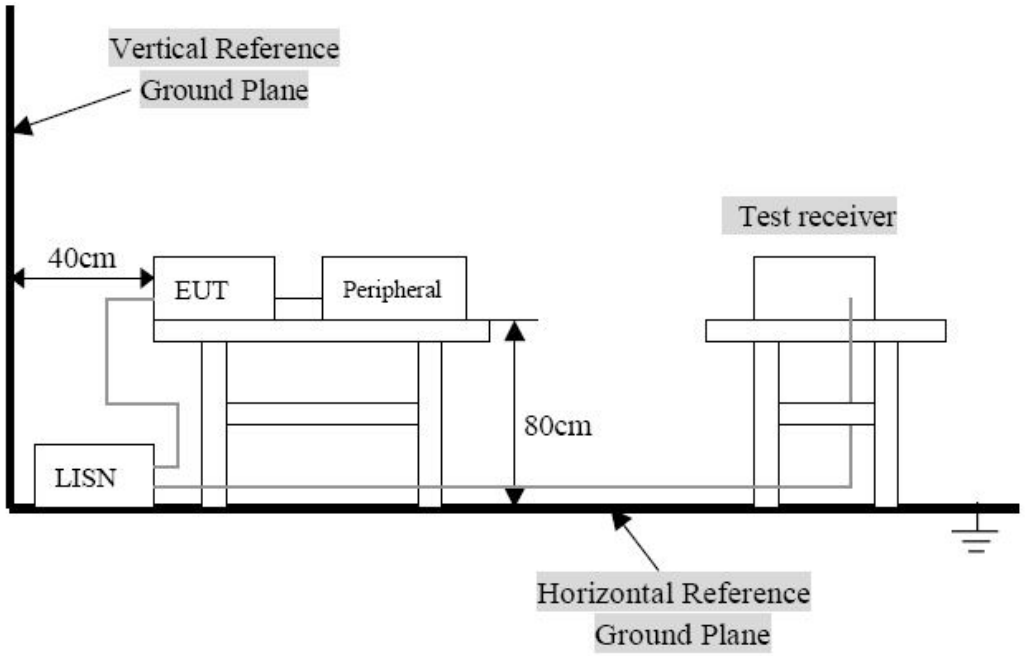
4. TEST OF CONDUCTED EMISSION

4.1 Applicable Standard

Section 15.207: For a Low-power Radio-frequency Device is designed to be connected to the AC power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed below limits table.

Frequency Range (MHz)	Limits (dBuV)	
	Quasi-Peak	Average
0.150～0.500	66～56	56～46
0.500～5.000	56	46
5.000～30.00	60	50

4.2 Test Setup Diagram

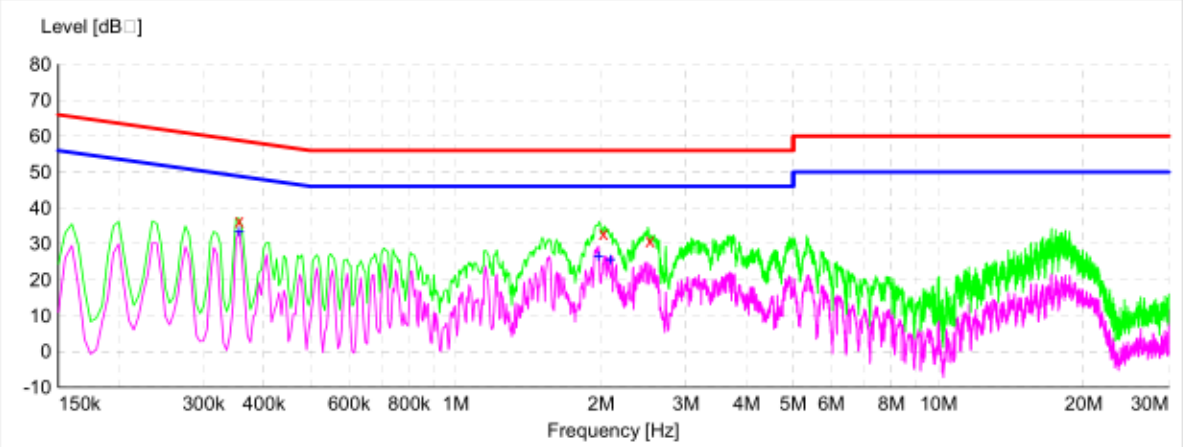


Remark: The setup of EUT is according with per ANSI C63.10:2013 measurement procedure. The specification used was with the FCC 15.207 limits.

Conducted Emission Test Data

EUT:	Master Light Controller
M/N:	GC1338-LR
Operating Condition:	Tx Mode 903MHz
Test Site:	Shielded Room
Operator:	Li
Test Specification:	AC 120V/60Hz
Comment:	Live Line
Start of Test:	Tem:25° Hum:50%

SCAN TABLE: "Voltage(150K-30M)FIN"
Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "YG061416_fin"

Frequency MHz	Level dB□	Transd dB	Limit dB□	Margin dB	Detector	Line	PE
0.355000	36.40	11.0	59	22.4	QP	L1	GND
2.020000	32.90	13.3	56	23.1	QP	L1	GND
2.520000	30.90	12.7	56	25.1	QP	L1	GND

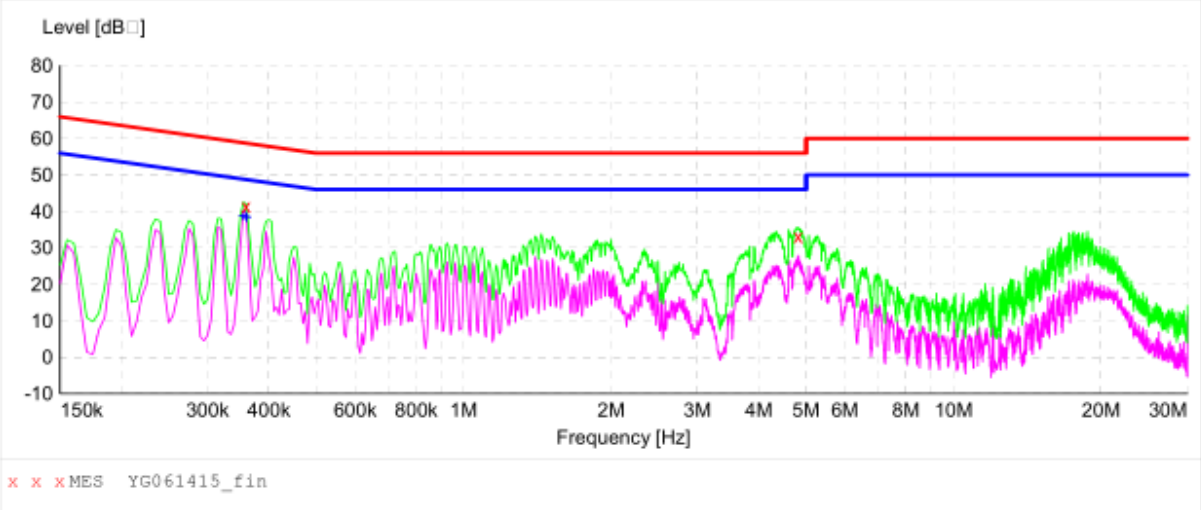
MEASUREMENT RESULT: "YG061416_fin2"

Frequency MHz	Level dB□	Transd dB	Limit dB□	Margin dB	Detector	Line	PE
0.355000	33.30	11.0	49	15.5	AV	L1	GND
1.975000	26.50	13.2	46	19.5	AV	L1	GND
2.090000	25.50	13.2	46	20.5	AV	L1	GND

Conducted Emission Test Data

EUT:	Master Light Controller
M/N:	GC1338-LR
Operating Condition:	Tx Mode 903MHz
Test Site:	Shielded Room
Operator:	Li
Test Specification:	AC 120V/60Hz
Comment:	Neutral Line
Start of Test:	Tem:25° Hum:50%

SCAN TABLE: "Voltage(150K-30M)FIN"
Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "YG061415_fin"

Frequency MHz	Level dB□	Transd dB	Limit dB□	Margin dB	Detector	Line	PE
0.360000	41.40	11.0	59	17.3	QP	N	GND
4.815000	33.10	13.4	56	22.9	QP	N	GND

MEASUREMENT RESULT: "YG061415_fin2"

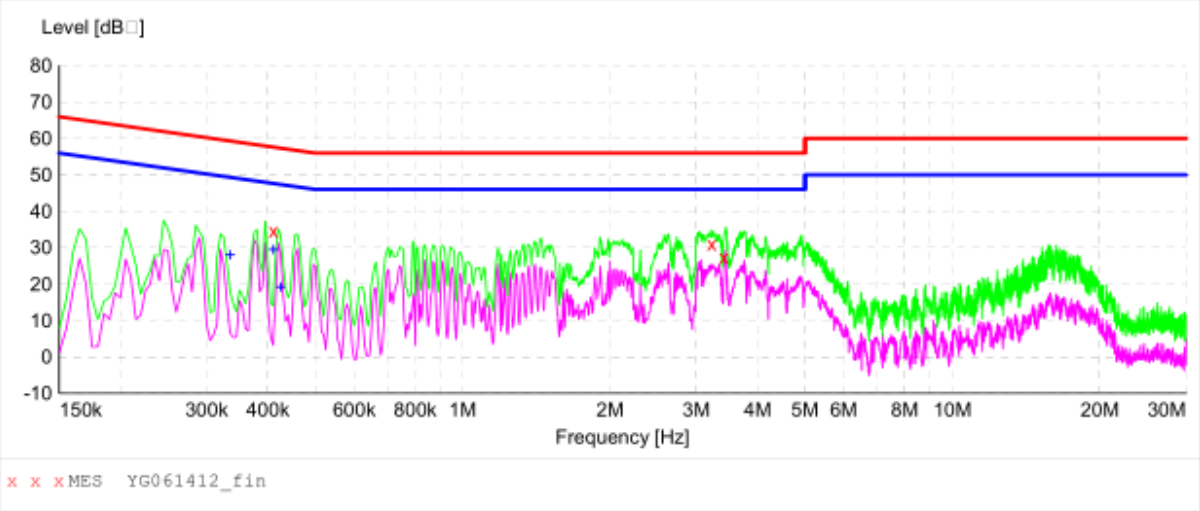
Frequency MHz	Level dB□	Transd dB	Limit dB□	Margin dB	Detector	Line	PE
0.355000	38.80	11.0	49	10.0	AV	N	GND
0.360000	38.40	11.0	49	10.3	AV	N	GND

Conducted Emission Test Data

EUT:	Master Light Controller
M/N:	GC1338-LR
Operating Condition:	Tx Mode 915MHz
Test Site:	Shielded Room
Operator:	Li
Test Specification:	AC 120V/60Hz
Comment:	Live Line
Start of Test:	Tem:25° Hum:50%

SCAN TABLE: "Voltage(150K-30M)FIN"

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "YG061412_fin"

Frequency MHz	Level dB□	Transd dB	Limit dB□	Margin dB	Detector	Line	PE
0.410000	34.60	11.0	58	23.0	QP	L1	GND
3.220000	31.00	12.5	56	25.0	QP	L1	GND
3.415000	27.40	12.7	56	28.6	QP	L1	GND

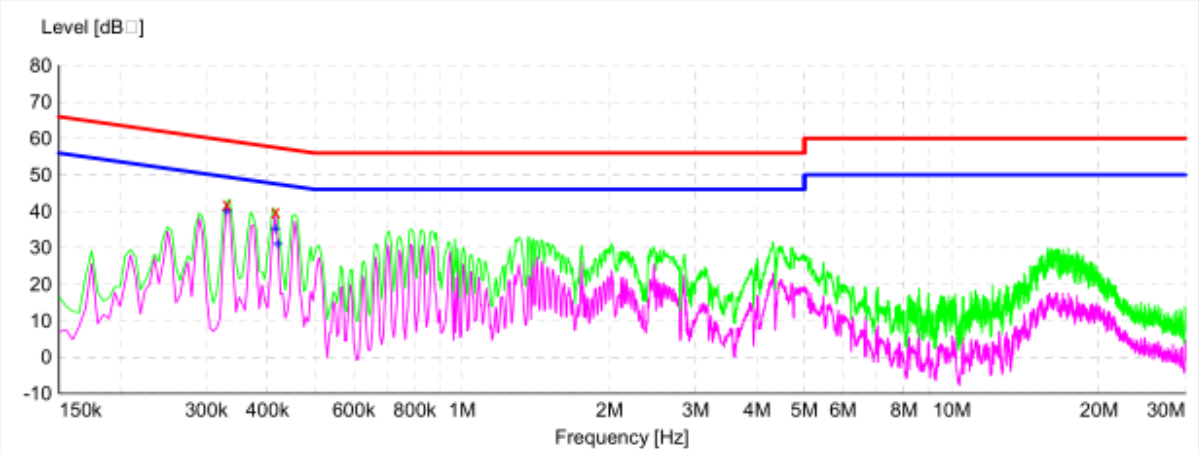
MEASUREMENT RESULT: "YG061412_fin2"

Frequency MHz	Level dB□	Transd dB	Limit dB□	Margin dB	Detector	Line	PE
0.335000	27.90	11.0	49	21.4	AV	L1	GND
0.410000	29.40	11.0	48	18.2	AV	L1	GND
0.425000	19.10	11.0	47	28.2	AV	L1	GND

Conducted Emission Test Data

EUT:	Master Light Controller
M/N:	GC1338-LR
Operating Condition:	Tx Mode 915MHz
Test Site:	Shielded Room
Operator:	Li
Test Specification:	AC 120V/60Hz
Comment:	Neutral Line
Start of Test:	Tem:25° Hum:50%

SCAN TABLE: "Voltage(150K-30M)FIN"
Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "YG061411_fin"

Frequency MHz	Level dB□	Transd dB	Limit dB□	Margin dB	Detector	Line	PE
0.330000	42.00	11.0	60	17.5	QP	N	GND
0.415000	39.90	11.0	58	17.6	QP	N	GND

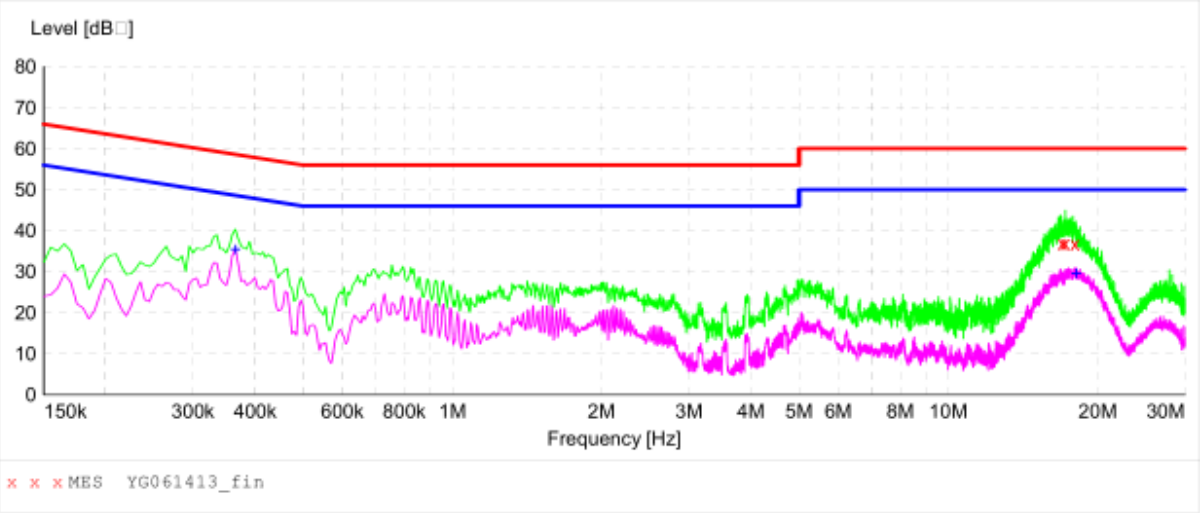
MEASUREMENT RESULT: "YG061411_fin2"

Frequency MHz	Level dB□	Transd dB	Limit dB□	Margin dB	Detector	Line	PE
0.330000	40.10	11.0	50	9.4	AV	N	GND
0.415000	35.20	11.0	48	12.3	AV	N	GND
0.420000	31.10	11.0	47	16.3	AV	N	GND

Conducted Emission Test Data

EUT:	Master Light Controller
M/N:	GC1338-LR
Operating Condition:	Tx Mode 927MHz
Test Site:	Shielded Room
Operator:	Li
Test Specification:	AC 120V/60Hz
Comment:	Live Line
Start of Test:	Tem:25° Hum:50%

SCAN TABLE: "Voltage(150K-30M)FIN"
Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "YG061413_fin"

Frequency MHz	Level dB□	Transd dB	Limit dB□	Margin dB	Detector	Line	PE
16.960000	36.90	13.3	60	23.1	QP	L1	GND
17.170000	37.00	13.2	60	23.0	QP	L1	GND
17.970000	36.80	13.1	60	23.2	QP	L1	GND

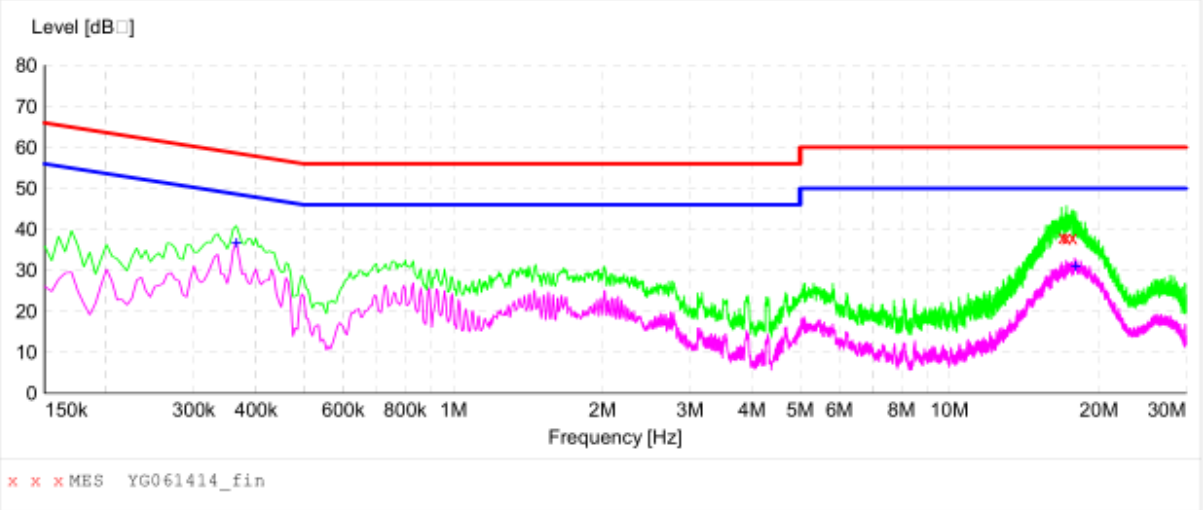
MEASUREMENT RESULT: "YG061413_fin2"

Frequency MHz	Level dB□	Transd dB	Limit dB□	Margin dB	Detector	Line	PE
0.365000	35.40	11.0	49	13.2	AV	L1	GND
18.110000	29.60	13.1	50	20.4	AV	L1	GND

Conducted Emission Test Data

EUT:	Master Light Controller
M/N:	GC1338-LR
Operating Condition:	Tx Mode 927MHz
Test Site:	Shielded Room
Operator:	Li
Test Specification:	AC 120V/60Hz
Comment:	Neutral Line
Start of Test:	Tem:25° Hum:50%

SCAN TABLE: "Voltage(150K-30M)FIN"
Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "YG061414_fin"

Frequency MHz	Level dB□	Transd dB	Limit dB□	Margin dB	Detector	Line	PE
16.925000	38.10	13.3	60	21.9	QP	N	GND
17.170000	38.00	13.2	60	22.0	QP	N	GND
17.720000	38.00	13.2	60	22.0	QP	N	GND

MEASUREMENT RESULT: "YG061414_fin2"

Frequency MHz	Level dB□	Transd dB	Limit dB□	Margin dB	Detector	Line	PE
0.365000	36.70	11.0	49	11.9	AV	N	GND
17.995000	31.00	13.1	50	19.0	AV	N	GND

5. 20DB BANDWIDTH

5.1. Limits

According to the section 15.215(c), Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. In the case of intentional radiators operating under the provisions of subpart E, the emission bandwidth may span across multiple contiguous frequency bands identified in that subpart. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

5.2. Test setup

1. Set the RBW =30kHz.

2. Set the VBW = 100kHz

3. Span=3MHz

4. Detector = peak.

5. Sweep time = auto couple.

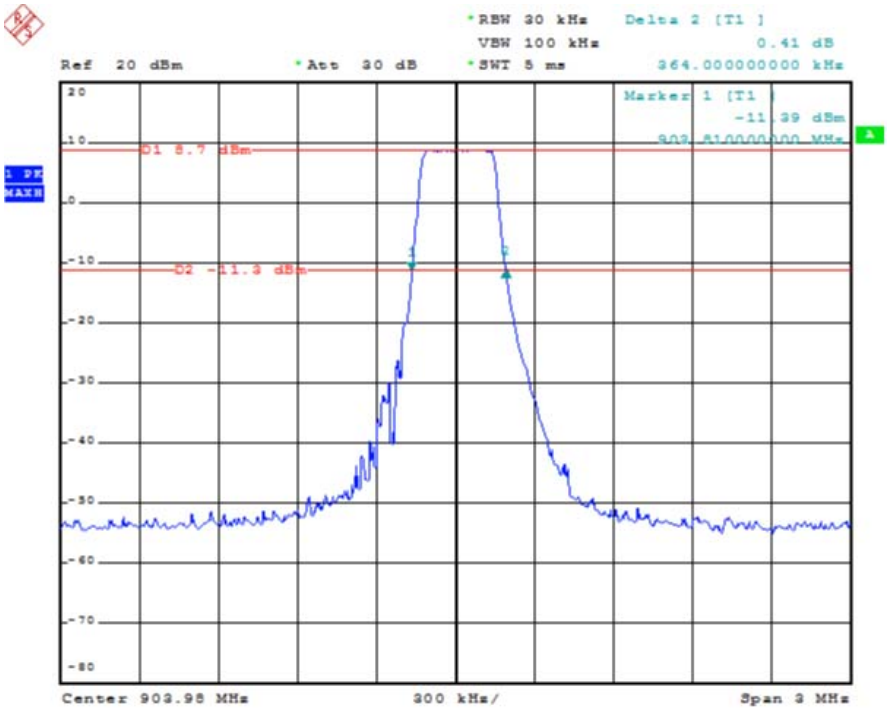
6. Allow trace to fully stabilize, and view the plot.

7. Measure and record the result in the test report.

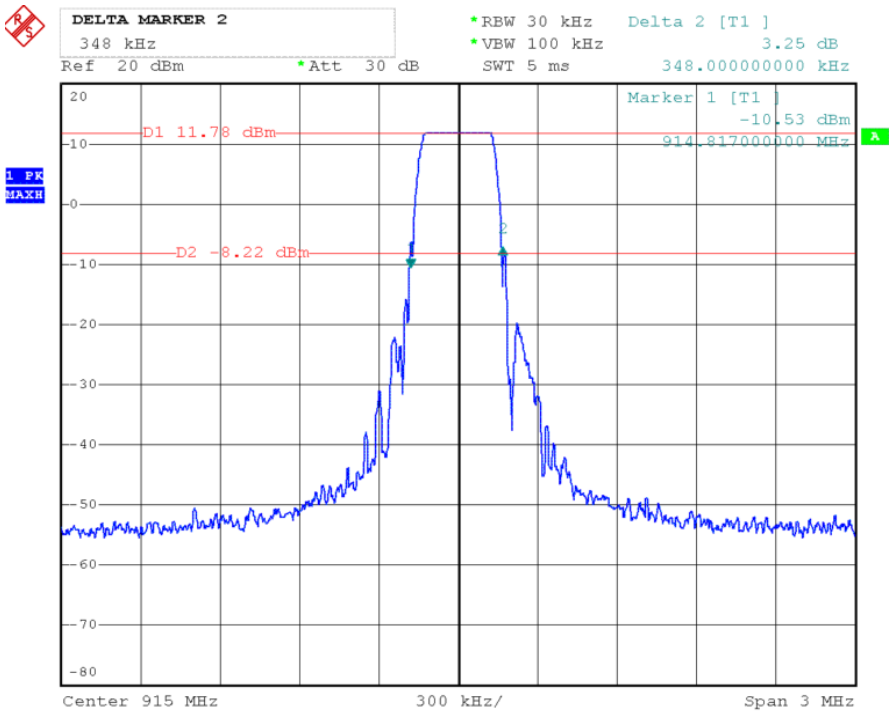
5.3 Test Result

Channel	Channel Frequency (MHz)	20dB Bandwidth (MHz)	Frequency range MHz (20dB Down) fL ＞= 902 MHz	Frequency range MHz (20dB Down) fH ＜= 928 MHz	Pass / Fail
Low	903	0.364	902MHz	/	PASS
Middle	915	0.348	/	/	PASS
High	927	0.354	/	928MHz	PASS

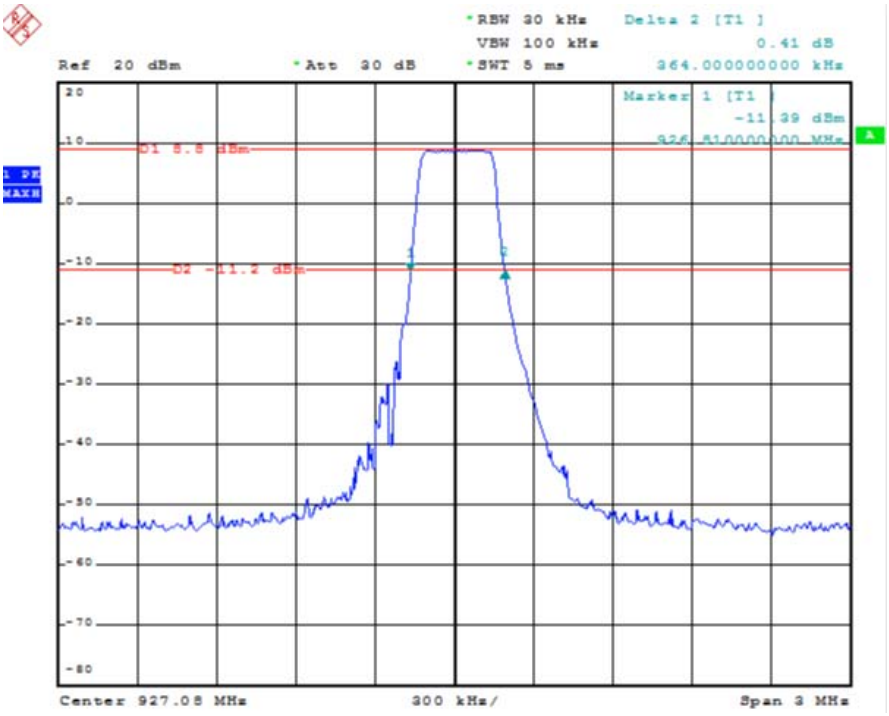
Low Channel:



Middle Channel:



High Channel:



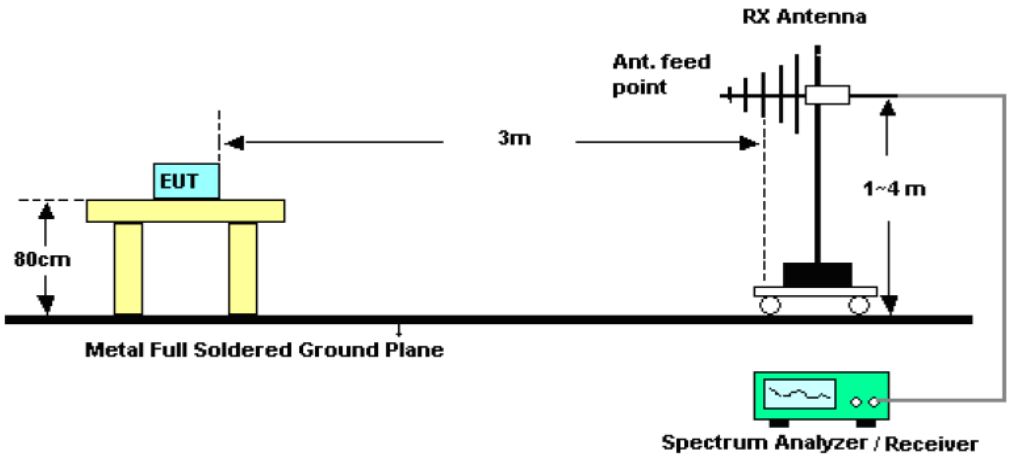
6. TEST OF BAND EDGES EMISSION

6.1 Applicable standard

Refer to FCC §15.249 (d)
Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

6.2 EUT Setup

Radiated Measurement Setup



6.3 Test Equipment List and Details

See section 2.7.

6.4 Test Procedure

Radiated Measurement

1. Configure the EUT according to ANSI C63.10-2013
2. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emission field strength of both horizontal and vertical polarization.
4. For band edge emission, the antenna tower was scan (from 1 M to 4 M) and then the turn table was rotated (from 0 degree to 360 degrees) to find the maximum reading.

6.5 Test Result

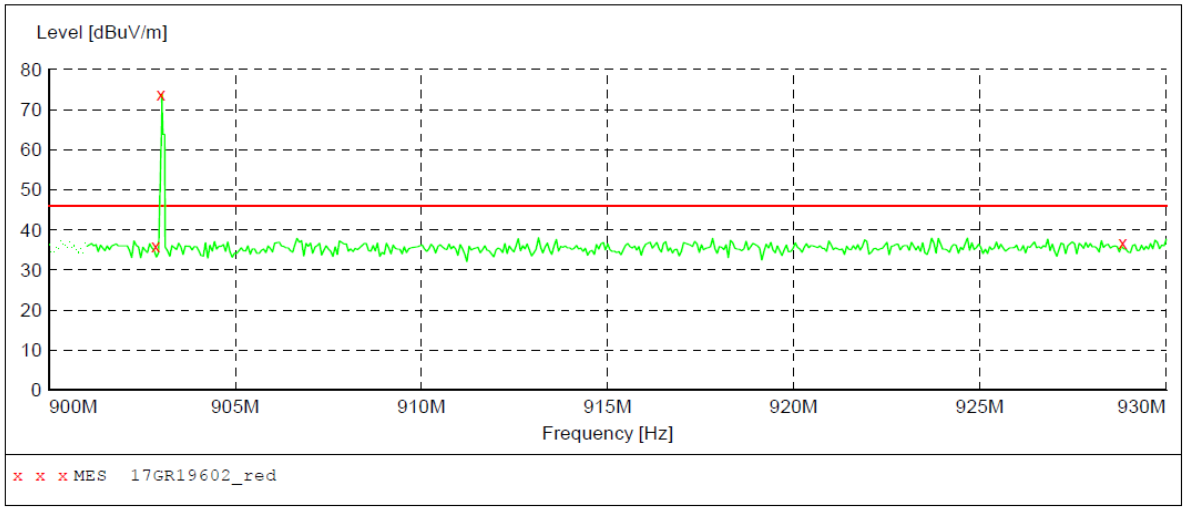
Temperature (℃) : 22~23	EUT: Master Light Controller
Humidity (%RH): 50~54	M/N: GC1338-LR
Barometric Pressure (mbar): 950~1000	Operation Condition: Continuously Tx Mode

For Radiated Band edge Measurement

Lowest Band edge
Channel Low: 903MHz
Polarization: Vertical (Worst case)

SWEEP TABLE: "test (30M-1G)"

Short Description:			Field Strength		
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	9163-2015



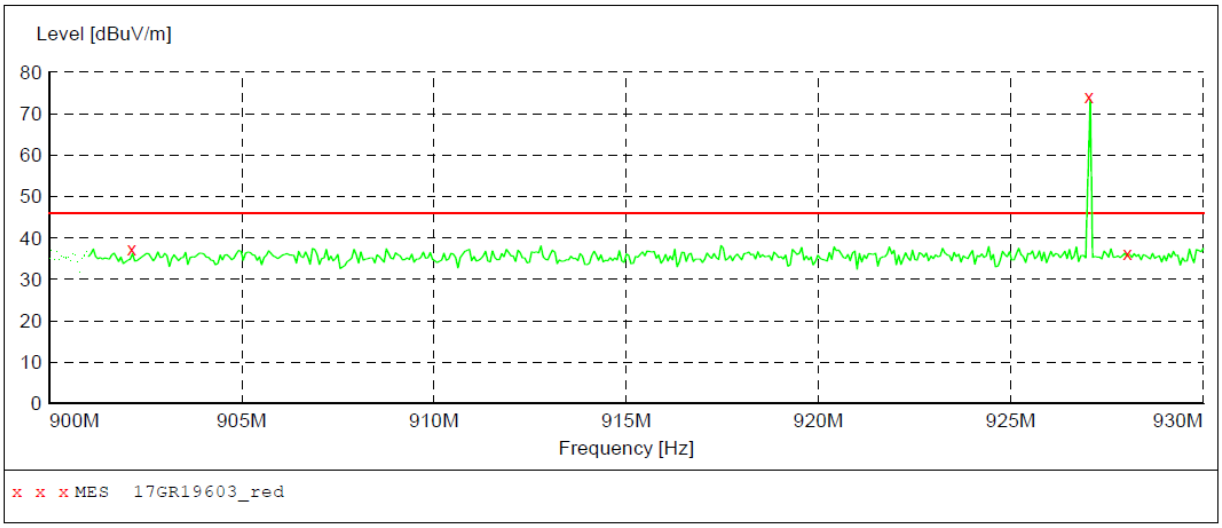
MEASUREMENT RESULT: "17GR19602_red"

Frequency MHz	Level dBuV/m	Transd dB	Limit dBuV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
902.860000	36.10	25.8	46.0	10.1	---	100.0	0.00	VERTICAL
903.000000	74.00	25.9	46.0	-28.0	---	100.0	0.00	VERTICAL
928.820000	36.70	25.9	46.0	8.3	---	100.0	0.00	VERTICAL

Highest Band edge
Channel Low: 927MHz
Polarization: Horizontal (Worst case)

SWEEP TABLE: "test (30M-1G)"

Short Description:		Field Strength			
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	9163-2015



MEASUREMENT RESULT: "17GR19603_red"

Frequency MHz	Level dBuV/m	Transd dB	Limit dBuV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
902.140000	37.30	25.8	46.0	8.7	---	100.0	0.00	HORIZONTAL
927.020000	74.20	25.9	46.0	-28.2	---	100.0	0.00	HORIZONTAL
928.020000	36.20	25.9	46.0	9.8	---	100.0	0.00	HORIZONTAL

7. RADIATED SPURIOUS EMISSIONS

7.1 Limit of Spurious Emissions

1. In the section 15.249(a), Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency (MHz)	Field Strength of Fundamental Field Strength (mV/m)	Field Strength of Harmonics (μmV/m)
902-928 MHz	50	500
2400 - 2483.5 MHz	50	500
5725 - 5875 MHz	50	500
24.0 - 24.25 GHz	250	2500

2. In the section 15.249(c),Field strength limits are specified at a distance of 3 meters.

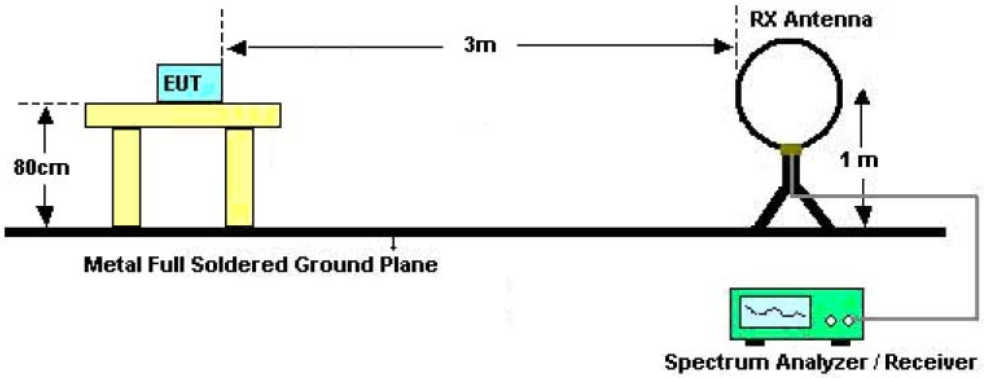
3. In the section 15.249(d),Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

Frequency (MHz)	Field Strength (μV/m at 3-meter)	Field Strength (dBμV/m at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

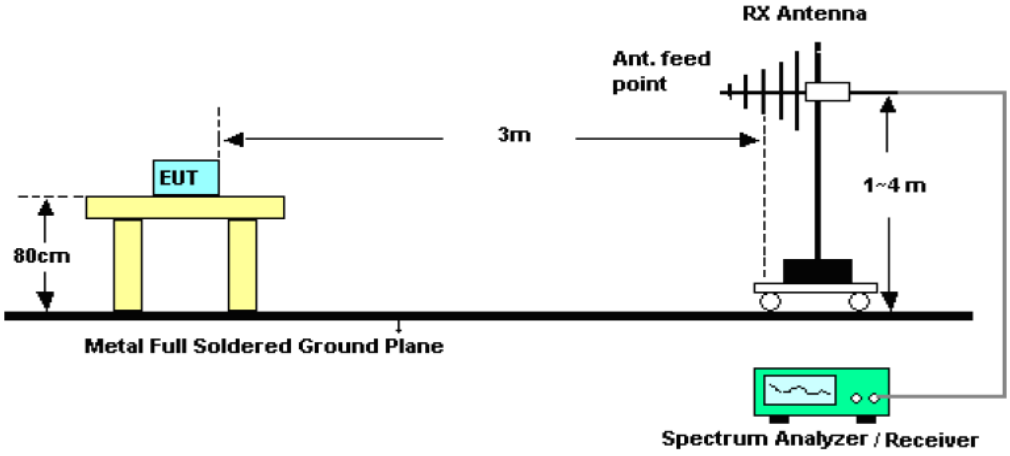
4. In the section 15.249(e),As shown in §15.35(b), for frequencies above 1000 MHz, the field strength limits in paragraphs (a) and (b) of this section are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

7.2 EUT Setup

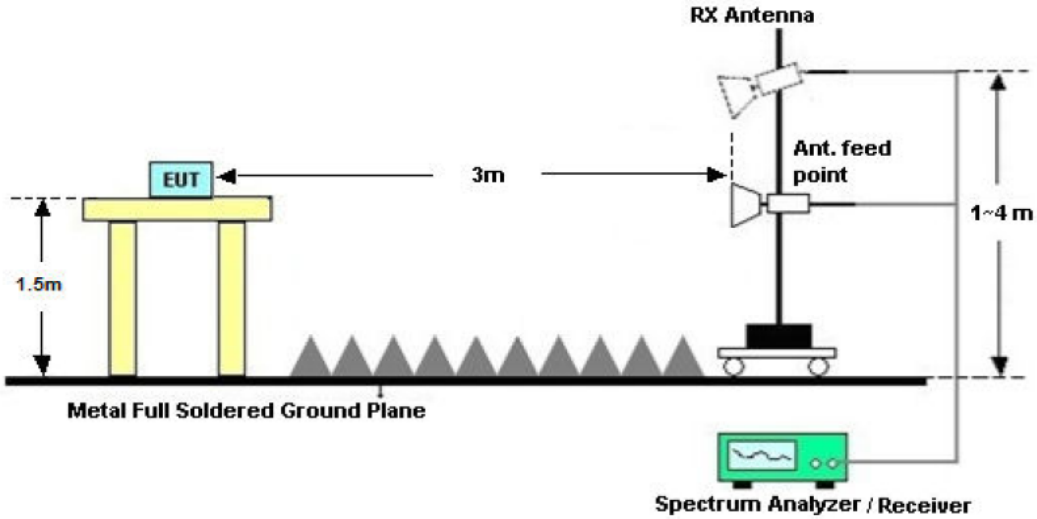
For radiated emission below 30MHz



For radiated emission from 30MHz to1GHz



For radiated emission above1GHz



7.3 Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

1). Configure the EUT according to ANSI C63.10:2013

2). The EUT was placed on the top of the turntable 0.8 meter above ground.

3). The receiving antenna was placed 3 meters far away from the turntable.

4). The turntable was rotated by 360 degrees to determine the position of the highest radiation.

5). The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emission field strength of both horizontal and vertical polarization. For each suspected emission, the antenna tower was scanned (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.

6）For radiated emission above1GHz,the test range of radiated emission is 1GHz~40GHz.

7.4 Radiated Spurious Emissions Test Result

Temperature (℃) : 22~23	EUT: Master Light Controller
Humidity (%RH): 50~54	M/N: GC1338-LR
Barometric Pressure (mbar): 950~1000	Operation Condition: Continuous transmitting

Channel	Freq.(MHz)	Level(dBuV)	Limit(dBuV)	Margin(dB)	Detector
LOW	903	39.70	74	-34.3	Peak
	903	31.96	54	-22.04	Average
HIGH	927	39.8	74	-34.2	Peak
	927	31.76	54	-22.24	Average

RADIATED EMISSION BELOW 30 MHz

(CH Low) operating Mode:903MHz

Frequency	Meter Reading	Antenna Factor	Cable Loss	Emission Levels	Limits	Margin	Detector Mode
(MHz)	(dBµV)	(dB/M)	(dB)	(dBµV/M)	(dBµV/M)	(dB)	PK/QP
10.24	27.88	8.29	-0.92	35.25	69.5	-34.25	QP
25.24	26.52	8.83	1.35	36.7	69.5	-32.8	QP
29.94	28.63	9.01	1.24	38.88	69.5	-30.62	QP
29.97	29.68	8.19	1.82	39.69	69.5	-29.81	QP

(CH Middle) operating Mode:915MHz

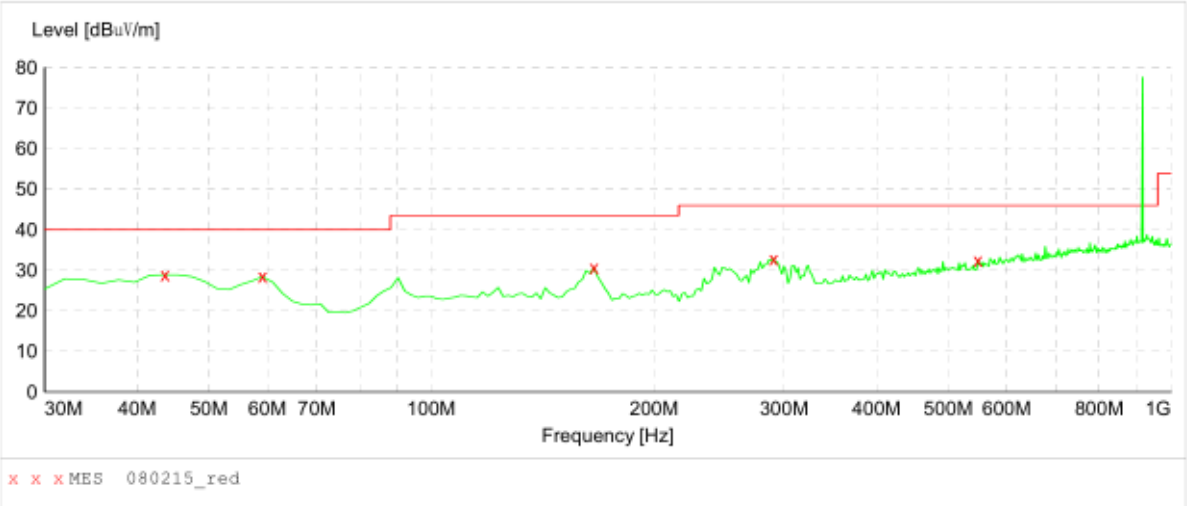
Frequency	Meter Reading	Antenna Factor	Cable Loss	Emission Levels	Limits	Margin	Detector Mode
(MHz)	(dBµV)	(dB/M)	(dB)	(dBµV/M)	(dBµV/M)	(dB)	PK/QP
10.02	25.82	8.33	1.1	35.25	69.5	-34.25	QP
21.89	23.07	9.26	1.15	33.48	69.5	-36.02	QP
28.68	23.3	9.25	1.16	33.71	69.5	-35.79	QP
32.13	26.63	9.17	1.13	36.93	69.5	-32.57	QP

(CH High) operating Mode:927MHz

Frequency	Meter Reading	Antenna Factor	Cable Loss	Emission Levels	Limits	Margin	Detector Mode
(MHz)	(dBµV)	(dB/M)	(dB)	(dBµV/M)	(dBµV/M)	(dB)	PK/QP
10.31	24.25	8.22	1.15	33.62	69.5	-35.88	QP
22.25	23.63	9.37	1.14	34.14	69.5	-35.36	QP
26.65	23.42	9.09	1.15	33.66	69.5	-35.84	QP
34.32	26.35	9.21	1.13	36.69	69.5	-32.81	QP

Radiated Spurious Emissions of LR Module (Below 1 GHz)

Operating Condition:	Only LR Module transmitting Mode
Test Specification:	LR Module Channel Low: 903MHz
Polarization:	Horizontal

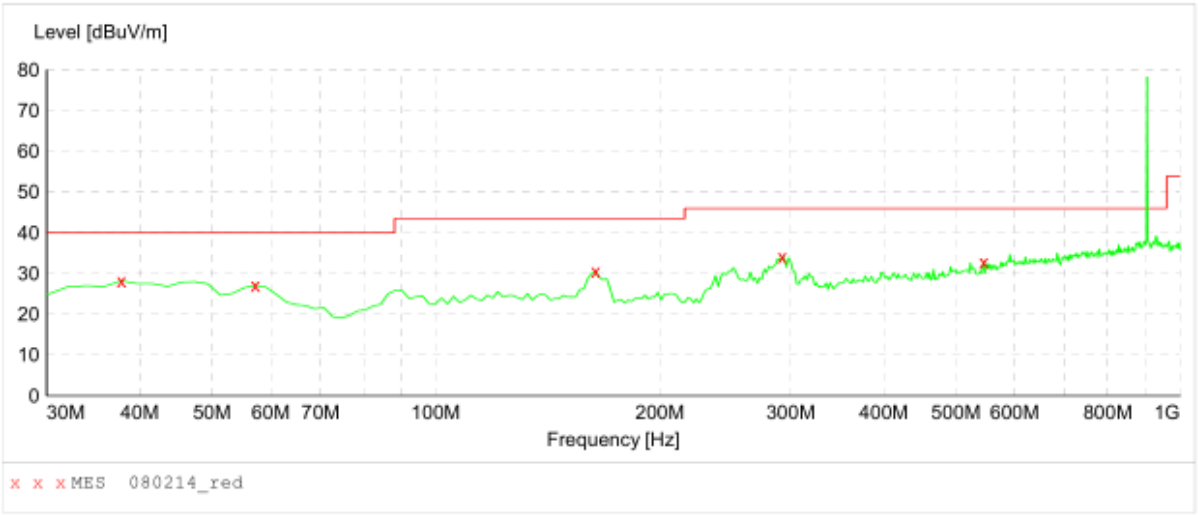


MEASUREMENT RESULT: "080215_red"

Frequency MHz	Level dBuV/m	Transd dB	Limit dBuV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
43.580000	28.90	15.8	40.0	11.1	---	300.0	0.00	HORIZONTAL
59.100000	28.50	15.7	40.0	11.5	---	300.0	0.00	HORIZONTAL
165.800000	30.70	12.9	43.5	12.8	---	300.0	0.00	HORIZONTAL
289.960000	32.90	15.1	46.0	13.1	---	100.0	0.00	HORIZONTAL
547.980000	32.50	20.3	46.0	13.5	---	100.0	0.00	HORIZONTAL

Radiated Spurious Emissions of LR Module (Below 1 GHz)

Operating Condition:	Only LR Module transmitting Mode
Test Specification:	LR Module Channel Low: 903MHz
Polarization:	Vertical

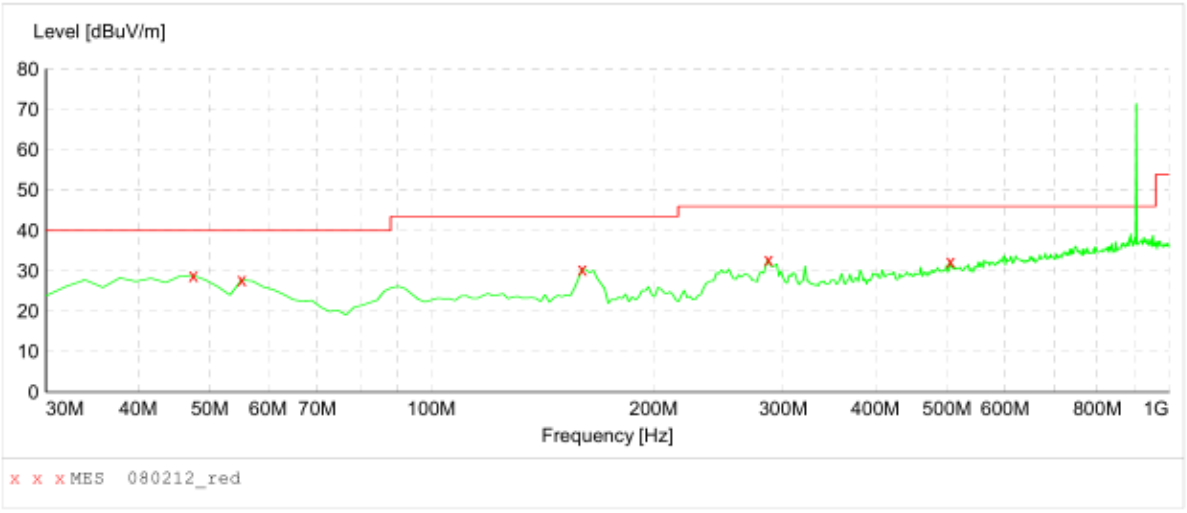


MEASUREMENT RESULT: "080214_red"

Frequency MHz	Level dBuV/m	Transd dB	Limit dBuV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
37.760000	28.20	13.7	40.0	11.8	---	300.0	0.00	VERTICAL
57.160000	27.10	15.7	40.0	12.9	---	300.0	0.00	VERTICAL
163.860000	30.50	12.9	43.5	13.0	---	300.0	0.00	VERTICAL
291.900000	34.10	15.1	46.0	11.9	---	100.0	0.00	VERTICAL
544.100000	32.80	19.9	46.0	13.2	---	100.0	0.00	VERTICAL

Radiated Spurious Emissions of LR Module (Below 1 GHz)

Operating Condition:	Only LR Module transmitting Mode
Test Specification:	LR Module Channel Middle: 915MHz
Polarization:	Horizontal

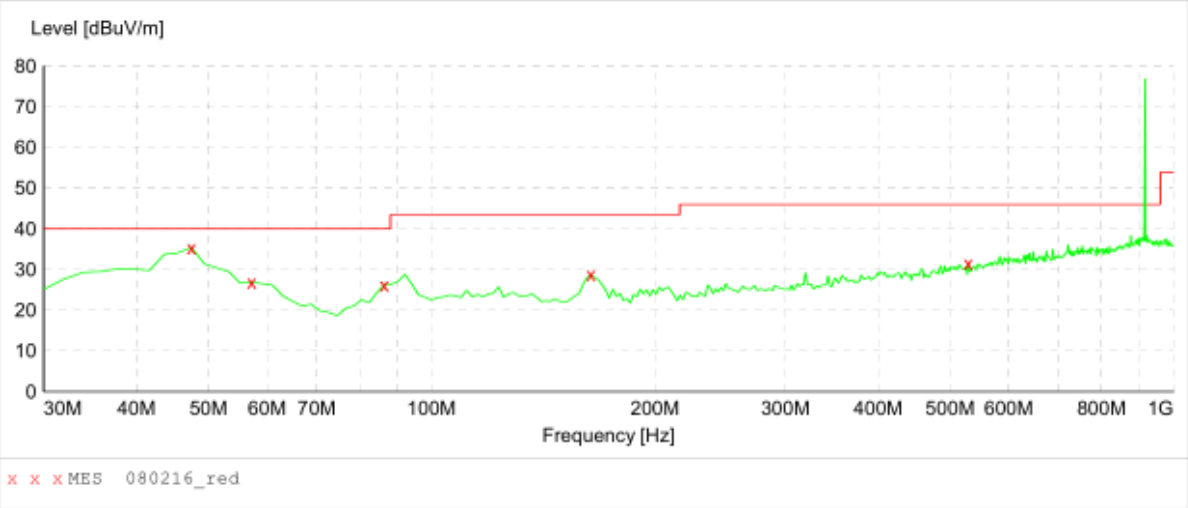


MEASUREMENT RESULT: "080212_red"

Frequency MHz	Level dBuV/m	Transd dB	Limit dBuV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
47.460000	28.90	16.7	40.0	11.1	---	100.0	0.00	HORIZONTAL
55.220000	27.80	15.1	40.0	12.2	---	300.0	0.00	HORIZONTAL
159.980000	30.40	12.9	43.5	13.1	---	300.0	0.00	HORIZONTAL
286.080000	32.80	14.9	46.0	13.2	---	100.0	0.00	HORIZONTAL
505.300000	32.40	19.6	46.0	13.6	---	100.0	0.00	HORIZONTAL

Radiated Spurious Emissions of LR Module (Below 1 GHz)

Operating Condition:	Only LR Module transmitting Mode
Test Specification:	LR Module Channel Middle: 915MHz
Polarization:	Vertical



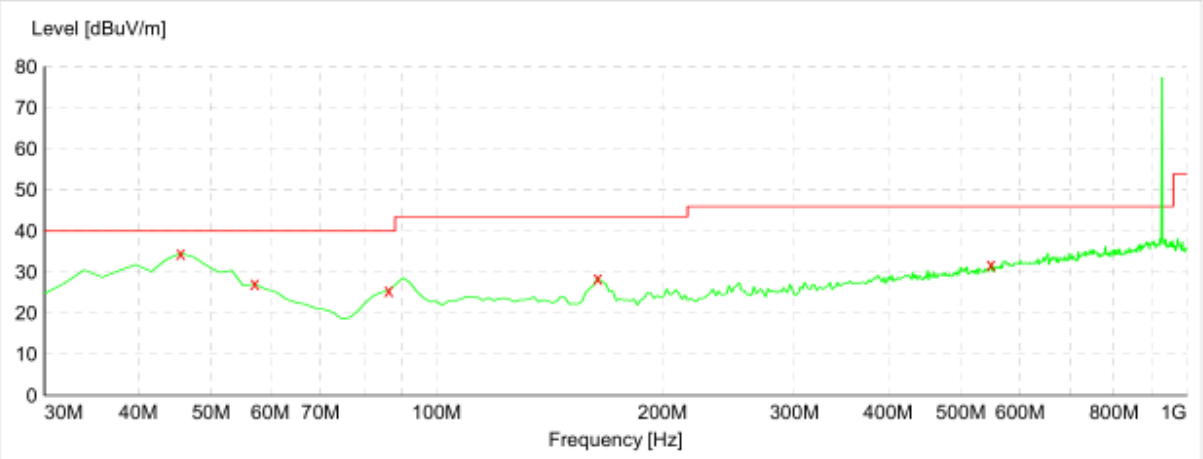
MEASUREMENT RESULT: "080216_red"

8/2/2017 16:01

Frequency MHz	Level dBuV/m	Transd dB	Limit dBuV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
47.460000	35.40	16.7	40.0	4.6	---	100.0	0.00	VERTICAL
57.160000	26.90	15.7	40.0	13.1	---	100.0	0.00	VERTICAL
86.260000	26.20	12.9	40.0	13.8	---	100.0	0.00	VERTICAL
163.860000	28.80	12.9	43.5	14.7	---	100.0	0.00	VERTICAL
528.580000	31.50	19.7	46.0	14.5	---	100.0	0.00	VERTICAL

Radiated Spurious Emissions of LR Module (Below 1 GHz)

Operating Condition:	Only LR Module transmitting Mode
Test Specification:	LR Module Channel High: 927MHz
Polarization:	Horizontal

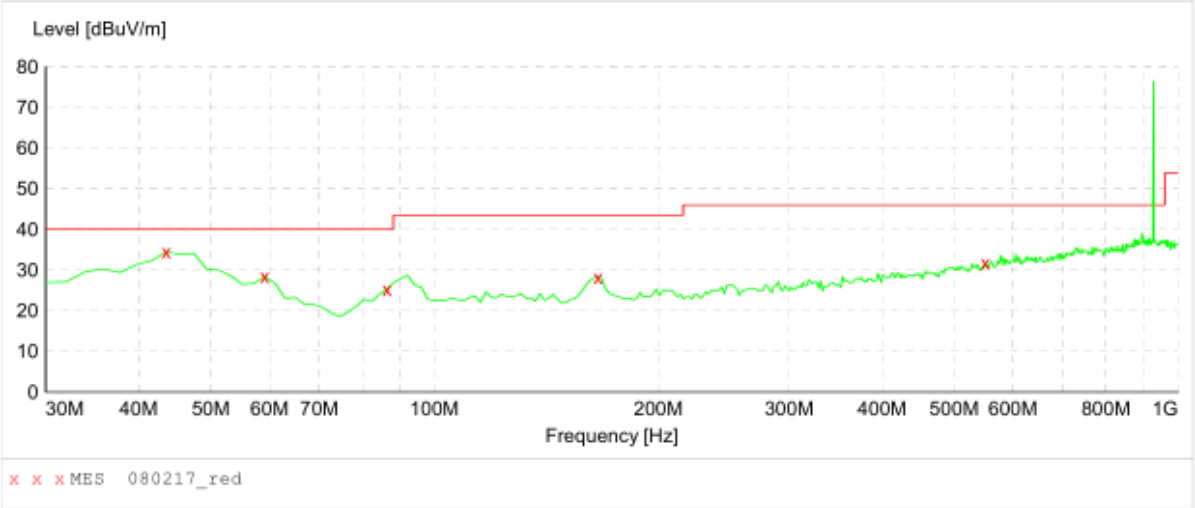


MEASUREMENT RESULT: "080218_red"

Frequency MHz	Level dBuV/m	Transd dB	Limit dBuV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
45.520000	34.60	16.8	40.0	5.4	---	100.0	0.00	HORIZONTAL
57.160000	27.20	15.7	40.0	12.8	---	100.0	0.00	HORIZONTAL
86.260000	25.60	12.9	40.0	14.4	---	100.0	0.00	HORIZONTAL
163.860000	28.60	12.9	43.5	14.9	---	100.0	0.00	HORIZONTAL
547.980000	31.90	20.3	46.0	14.1	---	100.0	0.00	HORIZONTAL

Radiated Spurious Emissions of LR Module (Below 1 GHz)

Operating Condition:	Only LR Module transmitting Mode
Test Specification:	LR Module Channel High: 927MHz
Polarization:	Vertical



MEASUREMENT RESULT: "080217_red"

Frequency MHz	Level dBuV/m	Transd dB	Limit dBuV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
43.580000	34.50	15.8	40.0	5.5	---	100.0	0.00	VERTICAL
59.100000	28.40	15.7	40.0	11.6	---	100.0	0.00	VERTICAL
86.260000	25.30	12.9	40.0	14.7	---	100.0	0.00	VERTICAL
165.800000	28.20	12.9	43.5	15.3	---	100.0	0.00	VERTICAL
549.920000	31.80	20.5	46.0	14.2	---	100.0	0.00	VERTICAL

8. ANTENNA REQUIREMENT

8.1 Standard Applicable

Section 15.203:

An intentional radiator shall be designed to ensure that no antenna other than that 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.

8.2 Antenna Connected Construction

This product has two Dipole antenna terminal antenna for LR RF Module and SIM Module. It is connected with reversed SMA connector. The SMA connector and the antenna are to be fastened through thread and glue to permanently fixed and ensure that it can not be easily replaced. So it fulfill with the requirement of this section.

***** END OF REPORT *****