SGS-CSTC Standards Technical Services Co., Ltd.
Guangzhou Branch

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TEST REPORT

Application No.:	GZEM1708005054CR
Applicant:	SimpliSafe, Inc.
Address of Applicant:	294 Washington Street, 9th Floor, Boston MA 02108, United States
Manufacturer:	SimpliSafe, Inc.
Address of Manufacturer:	294 Washington Street, 9th Floor, Boston MA 02108, United States
Factory:	Jetta (China) Industries Co., Ltd.
Address of Factory:	33 Cai Xin Lu, Lan He Zhen, Nan Sha Qu, Guangzhou Shi, Guangdong Province, China
FCC ID:	U9K-BS3000
Equipment Under Test (EUT):	
EUT Name:	Base station
Model No.:	SSBS3
Trade Mark:	Simplisafe
Standards:	CFR 47 FCC PART 15 SUBPART C:2016 section 231
Date of Receipt:	2017-08-18
Date of Test:	2017-08-28 to 2017-09-04
Date of Issue:	2017-11-13
Test Result :	**Pass***

* In the configuration tested, the EUT complied with the standards specified above.

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Ricky Liu

Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.
The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

2 Version

Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
00		2017-11-13		Original Report

Authorized for issue by:				
Tested By		Vico.Cui **(Vico Cui) / Project Engineer**		2017-08-28 to 2017-09-04 **Date**
Checked By		Ricky Liu **(Ricky Liu) / Reviewer**		2017-09-07 **Date**

3 Test Summary

Test	Test Requirement	Test method	Result
Radiated Emission	FCC PART 15 section 15.231(b)	ANSI C 63.10: Clasue 6.4, 6.5 and 6.6	PASS
Occupied Bandwidth	FCC PART 15 section 15.231(c)	ANSI C 63.10: Clasue 6.9	PASS
Dwell Time	FCC PART 15 section 15.231(a)	FCC PART 15: Section 15.231(a)	PASS
Conducted Emissions at Mains Terminals	FCC PART 15 C section 15.207	ANSI C63.10 : Clause 6.2	PASS

Remark:

EUT: In this whole report EUT means Equipment Under Test.

N/A: not applicable. Refer to the relative section for the details.

Tx: In this whole report Tx (or tx) means Transmitter.

Rx: In this whole report Rx (or rx) means Receiver.

RF: In this whole report RF means Radio Frequency.

4 Contents

5 General Information

5.1 Details of E.U.T.

Operation Frequency:	433.92MHz
Modulation and Antenna Type:	FSK modulation with an integral antenna.
Power Supply:	DC 4.8V: 4 X DC 1.2V size AA battery or DC 6.5V supplied by AC/DC adapter
Adapter detail:	Model number:GQ12-065160-FU Input: 100-240V 50/60Hz 0.4A Max. Output: 6.5V 1.6A
Normal Test Voltage:	DC 4.8V for battery and DC 6.5V for AC
Cable:	2 wires x about 1.8m unscreened DC output cable for adapter
EUT Function:	Staton with 433.92MHz as carrier for data transmission.

5.2 Description of Support Units

The EUT has been tested as an independent unit.

5.3 Deviation from Standards

None.

5.4 Abnormalities from Standard Conditions

None.

5.5 Other Information Requested by the Customer

None.

5.6 Test Location

All tests were performed at:
SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou Branch EMC Laboratory,
198 Kezhu Road, Scientech Park, Guangzhou Economic & Technology Development District,
Guangzhou, China 510663
Tel: +86 20 82155555 Fax: +86 20 82075059
No tests were sub-contracted.

5.7 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **NVLAP (Lab Code: 200611-0)**

  SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

  The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

- **ACMA**

  SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our NVLAP accreditation.

- **SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO**

  Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.

- **CNAS (Lab Code: L0167)**

  SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been assessed and in compliance with CNAS-CL01:2006 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2005 General Requirements) for the Competence of Testing Laboratories.

- **FCC Recognized 2.948 Listed Test Firm(Registration No.: 282399)**

  SGS-CSTC Standards Technical Services 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 282399, May 31, 2002.

- **FCC Recognized Accredited Test Firm(Registration No.: 486818)**

  SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been accredited and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Designation Number: CN5016, Test Firm Registration Number: 486818, Jul 13, 2017.

- **Industry Canada (Registration No.: 4620B-1)**

  The 3m/10m Alternate Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd., has been registered by Certification and Engineering of Industry Canada for radio equipment testing with Registration No. 4620B-1.

- **VCCI (Registration No.: R-2460, C-2584, G-449 and T-1179)**

  The 10m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services Co. Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-2460, C-2584，G-449 and T-1179 respectively.

- **CBTL (Lab Code: TL129)**

  SGS-CSTC Standards Technical Services Co., Ltd., E&E Laboratory has been assessed and fully comply with the requirements of ISO/IEC 17025:2005, the Basic Rules, IECEE 01 and Rules of procedure IECEE 02, and the relevant IECEE CB-Scheme Operational documents.

6 Equipment List

FCC & IC equipment						
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. date (YYYY-MM-DD)	Cal.Due date (YYYY-MM-DD)
EMC0525	Compact Semi-Anechoic Chamber	ChangZhou ZhongYu	N/A	N/A	2016-12-04	2019-12-03
EMC0522	EMI Test Receiver	Rohde & Schwarz	ESIB26	100283	2017-01-20	2018-01-19
EMC0056	EMI Test Receiver	Rohde & Schwarz	ESCI	100236	2017-01-20	2018-01-19
EMC0528	RI High frequency Cable	SGS	20 m	N/A	2016-04-19	2018-04-18
EMC2025	Trilog Broadband Antenna 30-1000MHz	SCHWARZBECK MESS-ELEKTRONIK	VULB 9160	9160-3372	2016-09-08	2019-09-07
SEM003-18	Trilog Broadband Antenna 25-2000MHz	SCHWARZBECK MESS-ELEKTRONIK	VULB 9168	665	2016-06-29	2019-06-28
EMC0524	Bi-log Type Antenna	Schaffner - Chase	CBL6112B	2966	2016-09-08	2019-09-07
EMC0519	Bilog Type Antenna	Schaffner - Chase	CBL6143	5070	2017-05-04	2020-05-03
EMC2026	Horn Antenna 1-18GHz	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120D	9120D-841	2016-09-09	2019-09-08
EMC0521	1-26.5 GHz Pre-Amplifier	Agilent	8449B	3008A01649	2017-01-20	2018-01-19
EMC2065	Amplifier	HP	8447F	N/A	2017-06-19	2018-06-18
EMC2086	PRE AMPLIFIER MH648A	ANRITSU CORP	MH648A	N/A	2016-12-02	2017-12-01
EMC2063	Pre-amplifier 1GHz-26GHz	Compliance Direction Systems Lnc.	PAP-1G26-48	6279.628	2016-12-02	2017-12-01
EMC0523	Active Loop Antenna	EMCO	6502	42963	2016-02-27	2018-02-26
EMC2041	Broad-Band Horn Antenna (14)15-26.5(40)GHz	SCHWARZBECK MESS-ELEKTRONI	BBHA 9170	9170-375	2017-05-23	2020-05-22
EMC2079	High Pass Filter(915MHz)	FSY MICROWAVE	HM1465-9SS	009	2017-01-20	2018-01-19
EMC2069	2.4GHz Filter	Micro-Tronics	BRM 50702	149	2017-01-20	2018-01-19
EMC0530	10m Semi-Anechoic Chamber	ETS	N/A	N/A	2016-04-30	2018-04-29
EMC2136	MI Cable	SGS	0.8m	N/A	2017-11-02	2018-11-01
EMC2137	MI Cable	SGS	0.8m	N/A	2017-11-02	2018-11-01
EMC0069	Signal Analyzer	R&S	FSIQ26	100312	2016/12/2	2017/12/1

	(20Hz ~ 26.5Ghz					

Conducted Emission						
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. date (YYYY-MM-DD)	Cal.Due date (YYYY-MM-DD)
EMC0306	Shielding Room	Zhong Yu	8 x 3 x 3.8 m^3	N/A	N/A	N/A
EMC0118	Two-line v-netwok	R&S	ENV216	100359	2017-01-20	2018-01-19
EMC0102	LISN	SCHAFFNER CHASE	MN2050D/1	1421	2016-09-20	2017-09-19
EMC0506	EMI Test Receiver	Rohde & Schwarz	ESCS30	100085	2016-12-02	2017-12-01
EMC0107	Coaxial Cable	SGS	2m	N/A	2016-07-24	2018-07-23
EMC0106	Voltage Probe	SGS	N/A	N/A	2016-04-05	2018-04-04
EMC2123	8 Line ISN Cat 6	SCHWARZBECK MESS-ELEKTRONIK	NTFM 8158	NTFM 8158 0151	2017-06-23	2018-06-22
EMC2124	8 Line ISN Cat 5	SCHWARZBECK MESS-ELEKTRONIK	CAT5 8158	CAT5 8158-188	2017-06-23	2018-06-22
EMC2126	8 Line ISN Cat 3	SCHWARZBECK MESS-ELEKTRONIK	CAT3 8158	CAT38158-0081	2017-06-23	2018-06-22
EMC2122	ISN S8	SCHWARZBECK MESS-ELEKTRONIK	ISN S8	57	2017-06-23	2018-06-22
EMC2121	ISN S1	SCHWARZBECK MESS-ELEKTRONIK	ISN S1	10	2017-06-23	2018-06-22
EMC2125	2 wires ISN	SCHWARZBECK MESS-ELEKTRONIK	NTFM 8131	8131-198	2017-06-23	2018-06-22
EMC2047	CDN	Elektronik-Feinmechanik	L-801:AF2	2793	2015-09-19	2018-09-18
EMC2048	CDN	Elektronik-Feinmechanik	L-801:M2/M3	2738	2015-09-25	2018-09-24
EMC2062	6dB Attenuator	HP	8491A	24487	2016-04-05	2018-04-04
EMC0167	Conical metal housing	SGS-EMC	N/A	N/A	2016-04-19	2018-04-18

General used equipment						
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. date (YYYY-MM-DD)	Cal.Due date (YYYY-MM-DD)
EMC0006	DMM	Fluke	73	70681569	2017-07-26	2018-07-25
EMC0007	DMM	Fluke	73	70671122	2017-07-26	2018-07-25

7 Test Results

7.1 E.U.T. test conditions

Test Voltage: DC 6.0 V

Requirements: **15.31(e)**: For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery operated equipment, the equipment tests shall be performed using a new battery.

Operating Environment:
Temperature: 22-25.0 °C
Humidity: 48-55% RH
Atmospheric Pressure: 1001-1010 mbar

Test frequencies and frequency range: According to the 15.31(m) Measurements on intentional radiators or receivers, other than TV broadcast receivers, shall be performed and, if required, reported for each band in which the device can be operated with the device operating at the number of frequencies in each band specified in the following table:

According to the 15.33 (a) For an intentional radiator, the spectrum shall be investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to at least the frequency shown in the following table:

Number of fundamental frequencies to be tested in EUT transmit band

Frequency range in which device operates	Number of frequencies	Location in frequency range of operation
1 MHz or less	1	Middle
1 MHz to 10 MHz	2	1 near top and 1 near bottom
More than 10 MHz	3	1 near top, 1 near middle and 1 near bottom

Frequency range of radiated emission measurements

Lowest frequency generated in the device	Upper frequency range of measurement
9 kHz to below 10 GHz	10th harmonic of highest fundamental frequency or to 40 GHz, whichever is lower
At or above 10 GHz to below 30 GHz	5th harmonic of highest fundamental frequency or to 100 GHz, whichever is lower
At or above 30 GHz	5th harmonic of highest fundamental frequency or to 200 GHz, whichever is lower, unless otherwise specified

Remark:Test frequency is 433.92MHz.

7.2 Antenna Requirement

Standard requirement

15.203 requirement:

For intentional device. According to 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.

EUT Antenna

The antenna is a integral antenna and integrated on PCB no consideration of replacement. The maximum gain of the antenna is 0 dBi. The detailed please refer to construction photo.

Test result: The unit does meet the FCC requirements.

7.3 Radiated Emissions

Test Requirement: FCC Part15 C section 15.231(b)

Test Method: ANSI C63.10: Clause 6.4, 6.5 and 6.6

Measurement Distance: 3 m (Semi-Anechoic Chamber)

Test Status: Test in transmitting mode.

Requirements: the field strength of emissions from intentional radiators operated under this Section shall not exceed the following:

Fundamental Frequency MHz	Field Strength of Fundamental (dBµV/m @ 3 m)	Field Strength of Harmonics and Spurious Emissions (dBµV/m @ 3 m)
40.66 to 40.70	67.04	47.04
70 to 130	61.94	41.94
130 to 174	61.94 to 71.48	41.94 to 51.48
174 to 260	71.48	51.48
260 to 470	71.48 to 81.94	51.48 to 61.94
Above 470	81.94	61.94
Detector:	Peak for pre-scan QP for 30MHz to1000 MHz:120 kHz resolution bandwidth Peak for Above 1 GHz: 1 MHz resolution bandwidth	

** linear interpolations

[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, uV/m at 3 meters = 56.81818(F) - 6136.3636; for the band 260-470 MHz, uV/m at 3 meters = 41.6667(F) - 7083.3333. The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.]

The fundamental frequency of the EUT is 433.92 MHz

The limit for average or QP field strength dBuv/m for the fundamental emission= 80.8 dBµV/m

No fundamental is allowed in the restricted bands.

The limit for average field strength dBuv/m for the spurious emission=60.8 dBuV/m.Spurious in the restricted bands must be less than 60.8 dBuV/m or 15.209, whichever limit permits a higher field strength.

And according 15.35(a)

15.35(a) On any frequency or frequencies below or equal to 1000 MHz, the limits shown are based on measuring equipment employing a CISPR quasi-peak detector function and related measurement bandwidths, unless otherwise specified. The specifications for the measuring instrument using the CISPR quasi-peak detector can be found in Publication 16 of the International Special Committee on Radio Interference (CISPR) of the International Electrotechnical Commission. As an alternative to CISPR quasi-peak measurements, the responsible party, at its option, may demonstrate compliance with the emission limits using measuring equipment employing a peak detector function, properly adjusted for such factors as pulse desensitization, as long as the same bandwidths as indicated for CISPR quasi-peak measurements are employed.

Note: For pulse modulated devices with a pulse-repetition frequency of 20 Hz or less and for which CISPR quasi-peak measurements are specified, compliance with the regulations shall be demonstrated using measuring equipment employing a peak detector function, properly adjusted for such factors as pulse desensitization, using the same measurement bandwidths that are indicated for CISPR quasi-peak measurements.

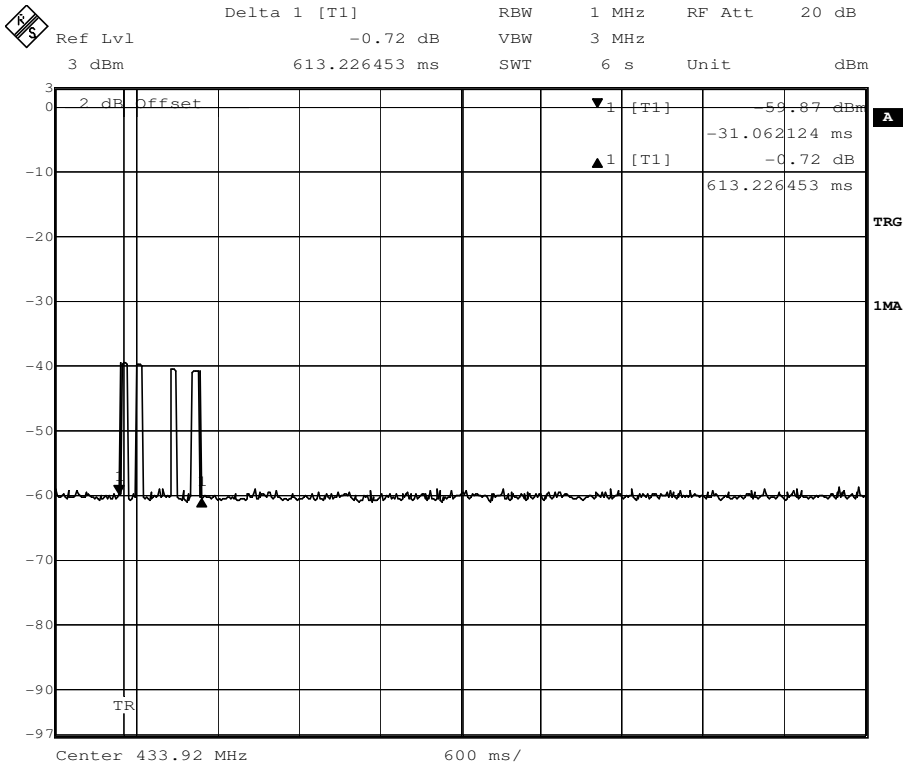
According to 15.35 (b) Unless otherwise specified, on any frequency or frequencies above 1000 MHz, the radiated emission limits are based on the use of measurement instrumentation employing an average detector function. Unless otherwise specified, measurements above 1000 MHz shall be performed using a minimum resolution bandwidth of 1 MHz. When average radiated emission measurements are specified in this part, including average emission measurements below 1000 MHz, there also is a limit on the peak level of the radio frequency emissions. Unless otherwise specified, e.g., see §§ 15.250, 15.252, 15.255, and 15.509-15.519 of this part, the limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device, e.g., the total peak power level. Note that the use of a pulse desensitization correction factor may be needed to determine the total peak emission level. The instruction manual or application note for the measurement instrument should be consulted for determining pulse desensitization factors, as necessary.

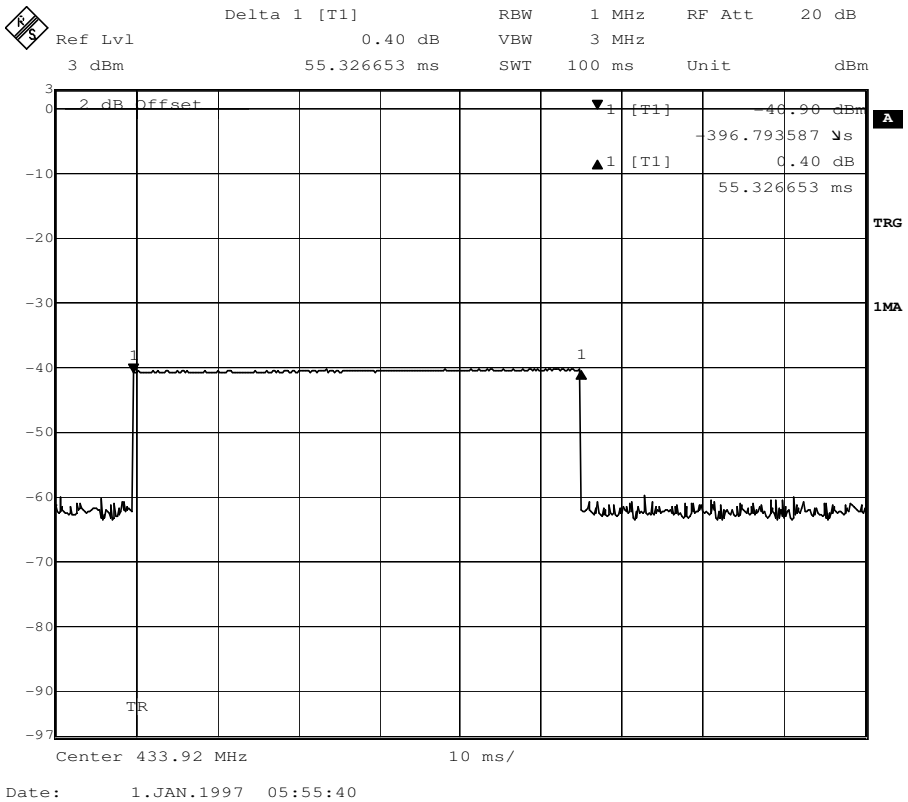
The average correction factor is computed by analyzing the on time in 100ms over one complete pulse train. Analysis of the remote transmitter on time in one complete pulse train, therefore the average value of fundamental frequency is: Average = Peak value + 20log (Duty cycle), where the duty factor is calculated from following formula:

20log (Duty cycle) = 20log(55.33/100) =20log(0.5533)= -5.14

Please refer to below plots for more details.

Test plot





Test Procedure:

1) 9 kHz to 30 MHz emissions:

For testing performed with the loop antenna. The center of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specied distance from the EUT.During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane.

2) 30 MHz to 1 GHz emissions:

For testing perfomed with the bi-log type antenna. The measurement is performed with the EUT rotated 360º, the antenna height scaned between 1m and 4m, and the antenna rotated to repeat the measurement for both the horizontal and vertical antenna polarizations.

3) 1 GHz to 40 GHz emissions:

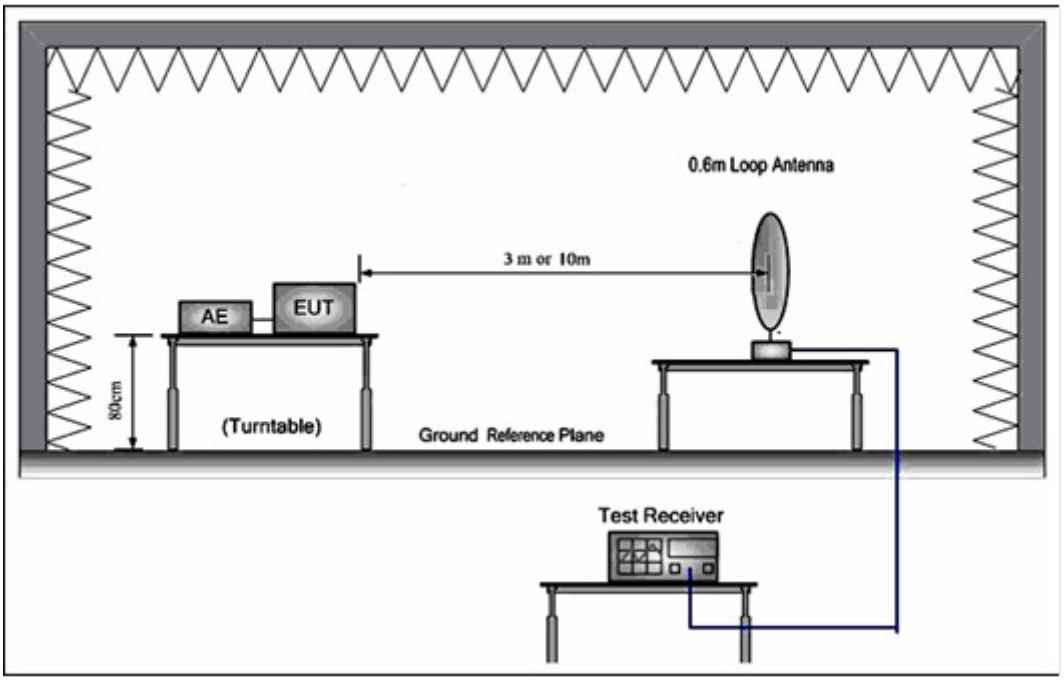
Test site with RF absorbing material covering the ground plane that met the site validation criterion called out in CISPR 16-1-4:2010 was used to perform radiated emission test above 1 GHz.

For testing perfomed with the horn antenna.The measurement is performed with the EUT rotated 360º, the antenna height scaned between 1m and 4m, and the antenna rotated to repeat the measurement for both the horizontal and vertical antenna polarizations.

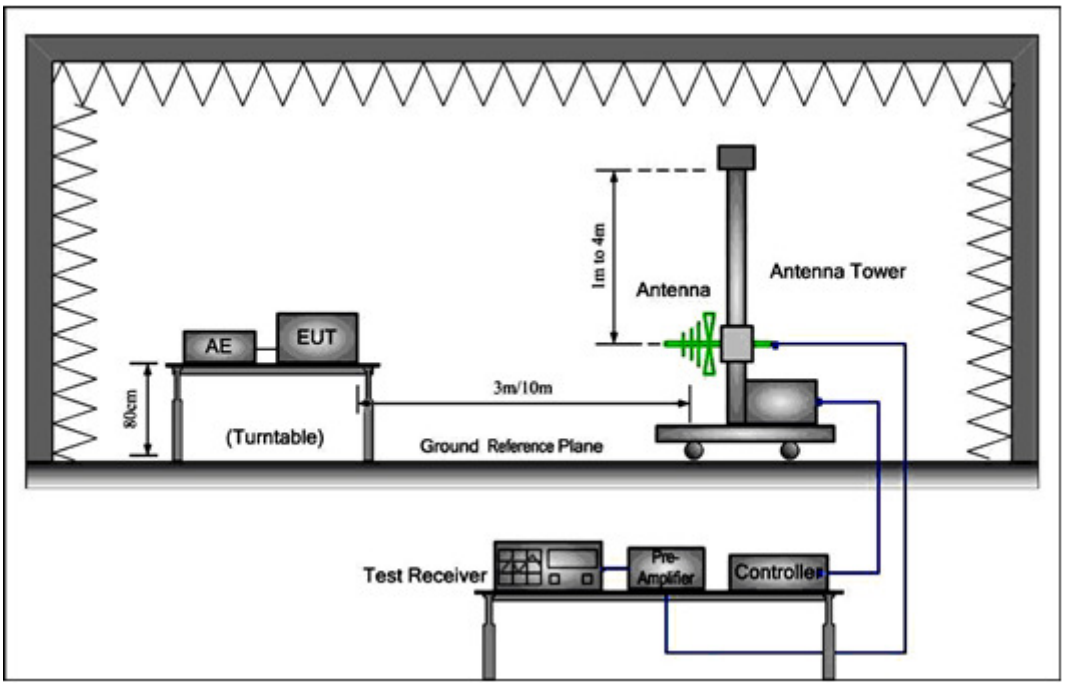
Detector: For PK value:
RBW = 1 MHz for f ≥ 1 GHz, 100 kHz for f < 1 GHz
VBW ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold
For AV value:
For harmonic emissions:
Average = Peak value + 20log (Duty cycle),
For other unwanted emissions:
RBW = 1 MHz for f ≥ 1 GHz, 100 kHz for f < 1 GHz
VBW =10Hz
Sweep = auto
Detector function = peak
Trace = max hold

Test Configuration:

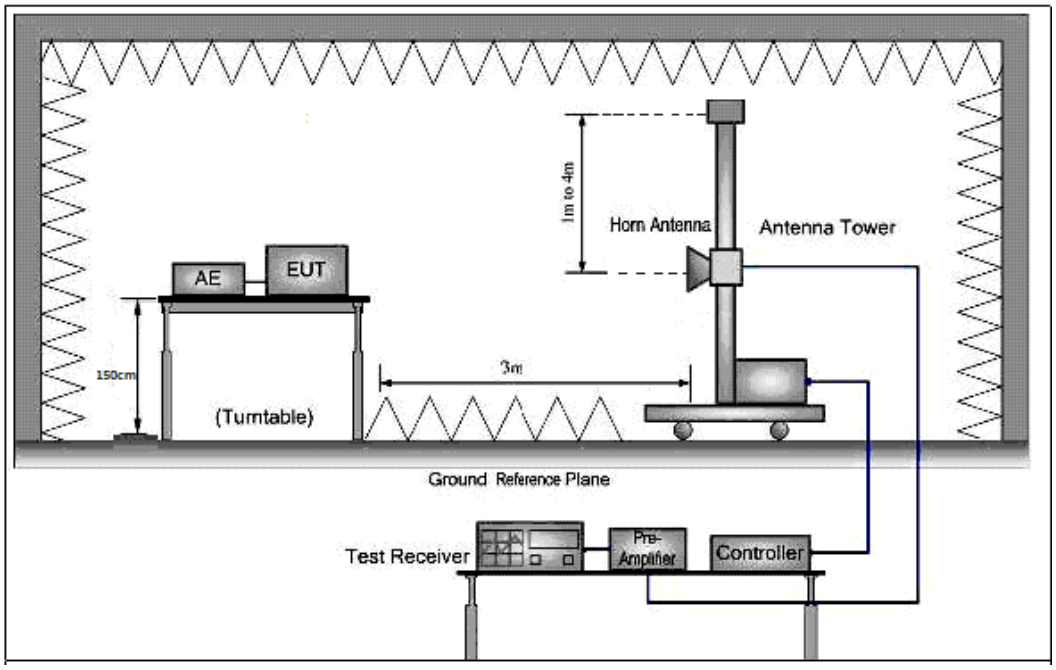
1) 9 kHz to 30 MHz emissions:



2) 30 MHz to 1 GHz emissions:



3) 1 GHz to 40 GHz emissions:



1) Fundamental emission:

Antenna polarization: Horizontal:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark
433.904	83.11	16.83	2.30	27.42	74.82	80.80	-5.98	Average
433.904	88.25	16.83	2.30	27.42	79.96	100.80	-20.84	Peak

Antenna polarization: Vertical

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark
437.120	83.00	16.90	2.30	27.44	74.76	80.80	-6.04	Average
437.120	88.14	16.90	2.30	27.44	79.90	100.80	-20.90	Peak

2) Other Emissions:

The receive was scanned from the lowest frequency generated within the EUT to 5 GHz.When an emission was found, the table was rotated to produce the maximum signal strength. An initial pre-scan was performed for in peak detection mode using the receiver. The EUT was measured for both the Horizontal and Vertical polarities and performed a pre-test three orthogonal planes. The worst case emissions were reported.

An initial pre-scan was performed in the 3 m chamber using the spectrum analyzer in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by Bilog antenna with 2 orthogonal polarities.

The field strength is calculated by adding the Antenna Factor, Cable Factor & Peramplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor –Peramplifier Factor.

The following test results were performed on the EUT.

Since the peak emission level is lower than the average limit, the average emission level does not need to show.

Test the EUT in transmitting mode.:

9 kHz to 30 MHz Field Strength of Unwanted Emissions.Quasi-Peak Measurement

The measurements with active loop antenna were greater than 20dB below the limit, so the test data were not recorded in the test report.

Radiated emission 30 MHz to1GHz

Horizontal

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark
35.499	26.39	13.83	0.60	27.00	13.82	40.00	-26.18	QP
50.057	27.40	14.50	0.70	27.00	15.60	40.00	-24.40	QP
140.835	27.05	13.02	1.27	26.84	14.50	43.50	-29.00	QP
360.448	27.56	15.65	1.96	26.78	18.39	46.00	-27.61	QP
574.626	28.15	19.95	2.55	28.00	22.65	46.00	-23.35	QP
867.525	29.91	23.14	3.1	27.7	28.45	80.8	-52.35	Peak
867.525	24.77	23.14	3.10	27.70	23.31	60.80	-37.49	Average

Vertical

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark
33.799	26.21	13.97	0.60	27.00	13.78	40.00	-26.22	QP
50.057	30.67	14.50	0.70	27.00	18.87	40.00	-21.13	QP
143.830	27.35	13.11	1.28	26.83	14.91	43.50	-28.59	QP
223.733	30.88	11.40	1.58	26.49	17.37	46.00	-28.63	QP
656.530	29.46	20.94	2.75	28.09	25.06	46.00	-20.69	QP
869.130	47.56	23.17	3.1	27.7	46.13	80.8	-34.67	Peak
869.130	42.42	23.17	3.10	27.70	40.99	60.80	-19.81	Average

Radiated Emission above 1GHz

Horizontal

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark
1299.413	43.37	24.79	5.10	38.88	34.38	80.80	-46.42	Peak
1732.042	42.67	25.10	5.86	38.96	34.67	80.80	-46.13	Peak
2172.398	46.88	25.59	6.50	39.03	39.94	80.80	-40.86	Peak
2598.617	42.50	26.78	7.19	39.18	37.29	80.80	-43.51	Peak
3473.883	45.63	27.90	8.36	39.88	42.01	80.80	-38.79	Peak
3897.970	41.18	29.30	8.90	40.04	39.34	80.80	-41.46	Peak
1299.413	38.23	24.79	5.10	38.88	29.24	60.80	-31.56	Average
1732.042	37.53	25.10	5.86	38.96	29.53	60.80	-31.27	Average
2172.398	41.74	25.59	6.50	39.03	34.80	60.80	-26.00	Average
2598.617	37.36	26.78	7.19	39.18	32.15	60.80	-28.65	Average
3473.883	40.49	27.90	8.36	39.88	36.87	60.80	-23.93	Average
3897.970	36.07	29.30	8.90	40.04	34.23	60.80	-26.57	Average

Vertical

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark
1732.553	42.67	25.10	5.86	38.96	34.67	80.80	-46.13	Peak
2165.602	42.60	25.57	6.50	39.03	35.64	80.80	-45.16	Peak
2598.861	41.47	26.78	7.19	39.18	36.26	80.80	-44.54	Peak
3031.998	42.53	27.90	7.76	39.44	38.75	80.80	-42.05	Peak
3455.508	43.41	27.90	8.32	39.87	39.76	80.80	-41.04	Peak
3897.846	40.62	29.30	8.90	40.04	38.78	80.80	-42.02	Peak
1732.553	37.53	25.10	5.86	38.96	29.53	60.80	-31.27	Average
2165.602	37.45	25.57	6.50	39.03	30.49	60.80	-30.31	Average
2598.861	36.33	26.78	7.19	39.18	31.12	60.80	-29.68	Average
3031.998	37.49	27.90	7.76	39.44	33.71	60.80	-27.09	Average
3455.508	38.27	27.90	8.32	39.87	34.62	60.80	-26.18	Average
3897.846	35.28	29.30	8.90	40.04	33.44	60.80	-27.36	Average

Remark:

1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

   Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

2) Scan from 9kHz to 25GHz,The disturbance above 13GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported .

3) As shown in this section, for frequencies above 1GHz, the field strength limits 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. So, only the peak measurements were shown in the report.

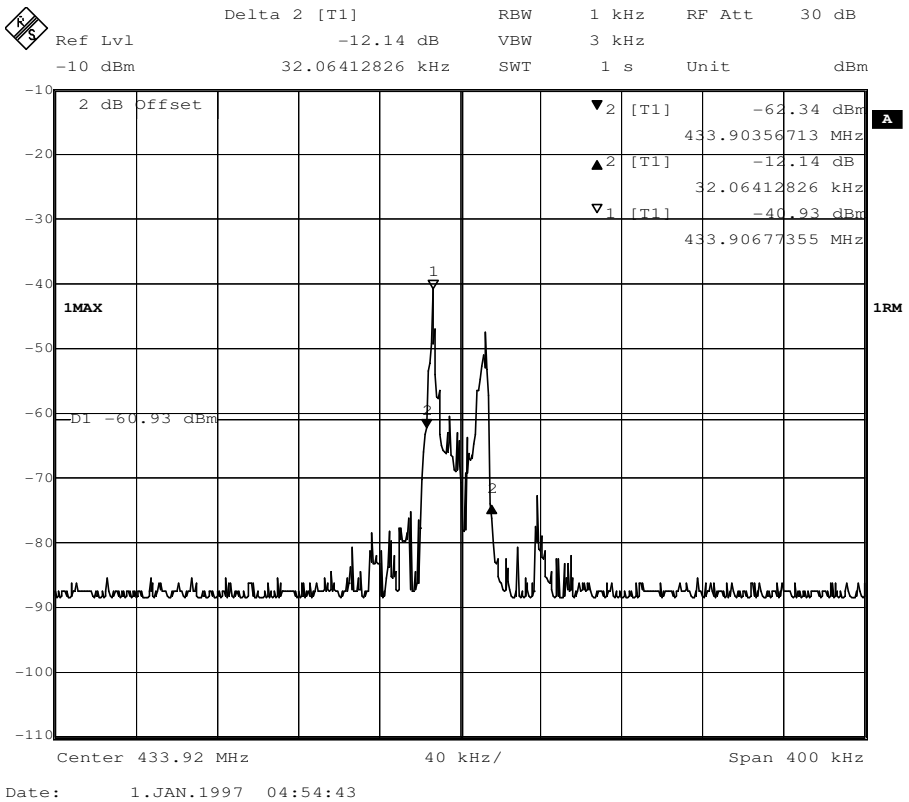
7.4 Occupied Bandwidth

Test Requirement:	FCC Part 15 C section 15.231 (c)
Test Method:	ANSI C63.10: Clause 6.9
Test Status:	Test in transmitting mode at lowest and highest channel.
Requirements:	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. 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.
Method of measurement:	The useful radiated emission from the EUT was detected by the spectrum analyzer with peak detector. Record the 20 dB bandwidth of the carrier.

Test result:

Test Channel	bandwidth	Limit
433.91MHz	32.064 kHz	1.08 MHz

Test plot:

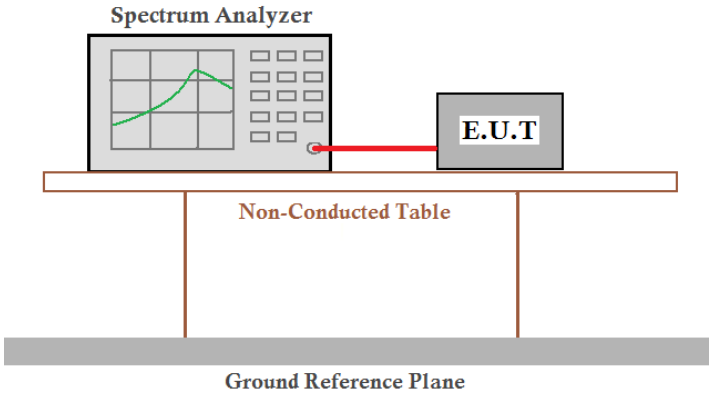


7.5 Dwell Time:

Test Requirement: FCC Part 15 C section 15.231(a)

Test Method: FCC Part 15 C section 15.231(a)

Test Setup:



Test Status: Test in transmitting mode.

Requirements:

1. Regulation 15.231 (a) The provisions of this Section are restricted to periodic operation within the band 40.66 40.70 MHz and above 70 MHz. Except as shown in paragraph (e) of this Section, the intentional radiator is restricted to the transmission of a control signal such as those used with alarm systems, door openers, remote switches, etc. Radio control of toys is not permitted. Continuous transmissions, such as voice or video, and data transmissions are not permitted. The prohibition against data transmissions does not preclude the use of recognition codes. Those codes are used to identify the sensor that is activated or to identify the particular component as being part of the system.

Result:

The EUT is a remote switch without audio or video transmitted.

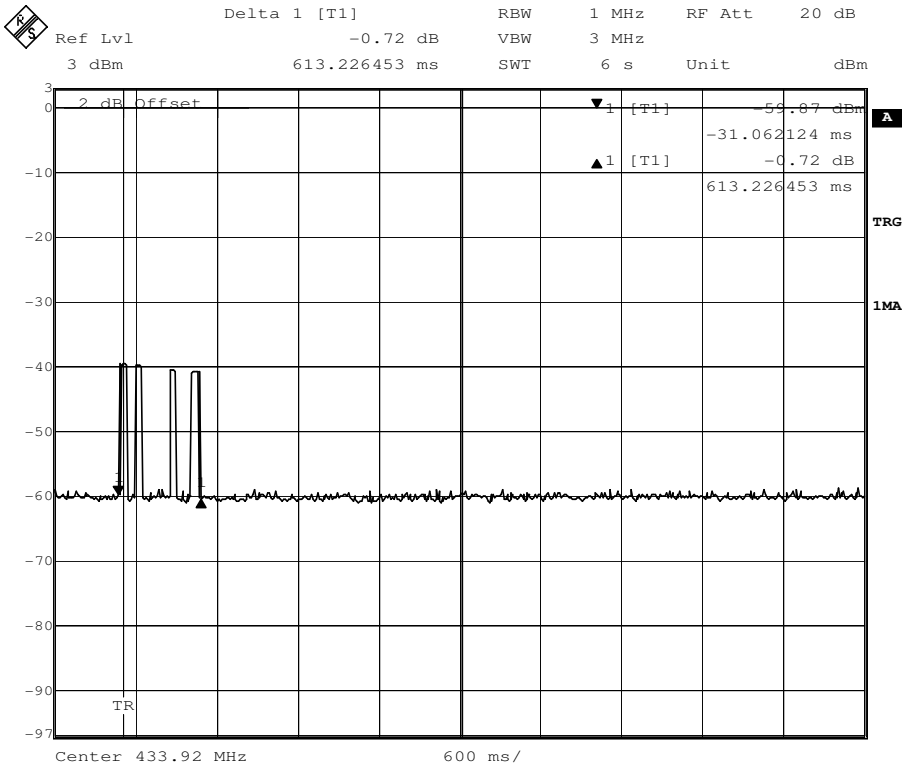
The EUT meets the requirements of this section.

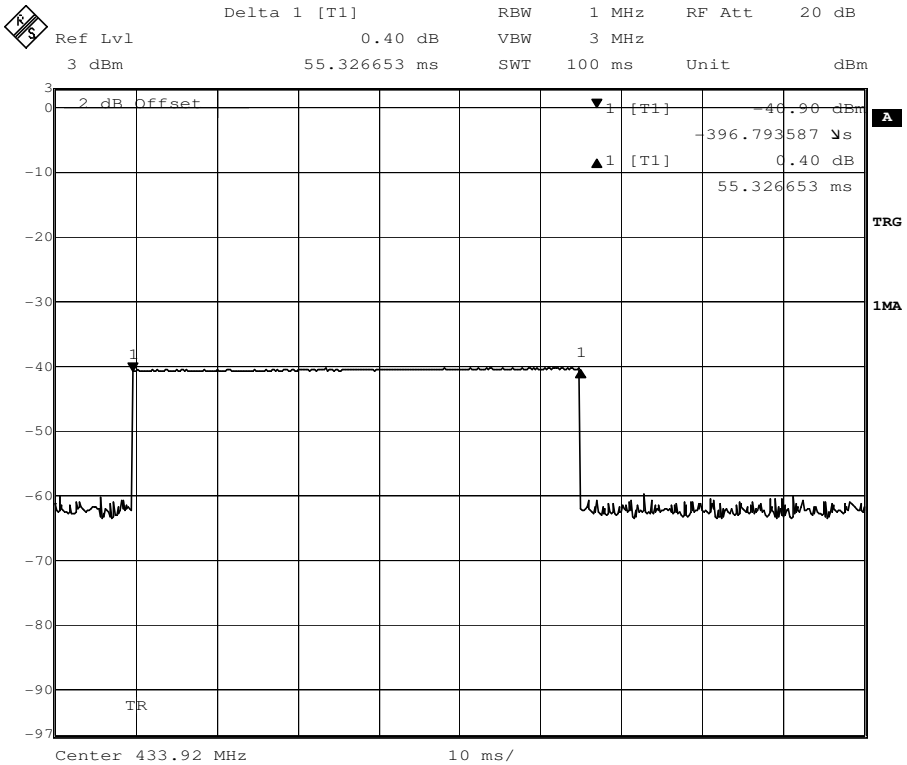
2. Regulation 15.231 (a1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

Result:

Carrier Frequency	Shutdown Time	Limit
433.92MHz	221.2ms	≤5s

Result polt as follows:





3. Regulation 15.231 (a2) A transmitter activated automatically shall cease transmission within 5 seconds after activation.

Result:

The EUT does not have automatic transmission.

4. Regulation15.231 (a3) Periodic transmissions at regular predetermined intervals are not permitted. However, polling or supervision transmissions to determine system integrity of transmitters used in security or safety applications are allowed if the periodic rate of transmission does not exceed one transmission of not more than one second duration per hour for each transmitter.

Result:

The EUT does not employ periodic transmission.

5. Regulation 15.231 (a4) Intentional radiators which are employed for radio control purposes during emergencies involving fire, security, and safety of life, when activated to signal an alarm, may operate during the pendency of the alarm condition.

Result:

This section is not applicable to the EUT.

7.6 Conducted Emissions at Mains Terminals 150 kHz to 30 MHz

Test Requirement: FCC Part 15 C section 15.207

Test Method: ANSI C63.10: Clause 6.2

Frequency Range: 150 kHz to 30 MHz

Detector: Peak for pre-scan (9 kHz Resolution Bandwidth)

Test Limit

Limits for conducted disturbance at the mains ports of class B

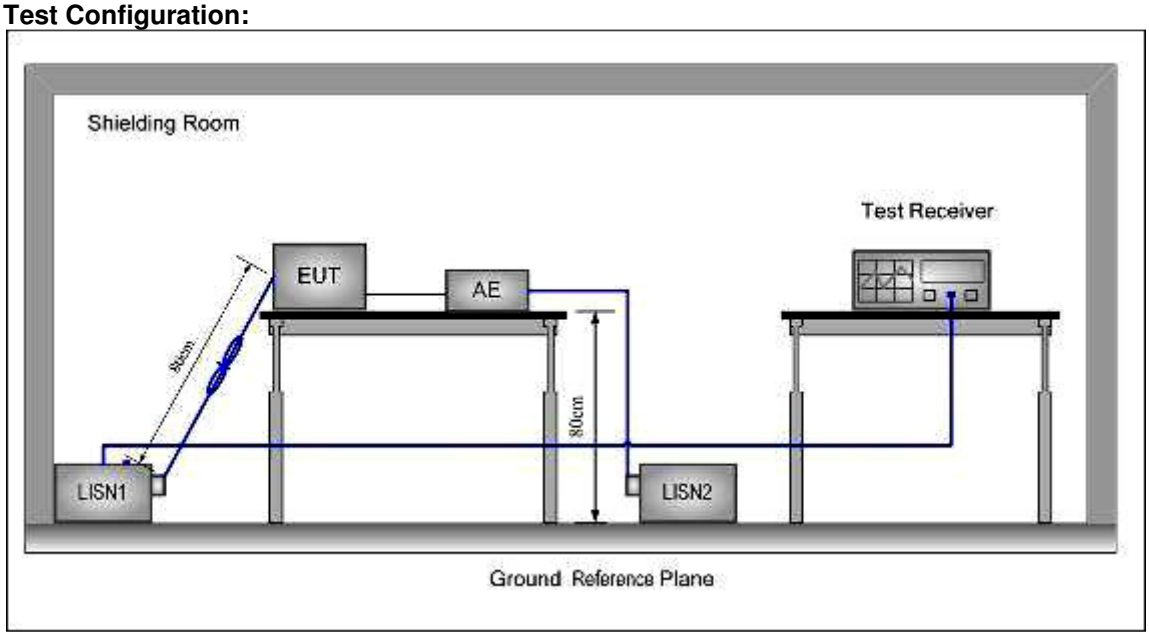
Frequency Range (MHz)	Class B Limit dB(μV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50
NOTE 1 The limit decreases linearly with the logarithm of the frequency in the range 0,15 MHz to 0,50 MHz.		

EUT Operation:

Test in normal operating mode. For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage.

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

Test Configuration:



Test procedure:

1. The mains terminal disturbance voltage test was conducted in a shielded room.

2. The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.

3. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.

4. The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0,4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0,8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0,8 m from the LISN 2.

Measurement Data

An initial pre-scan was performed on the live and neutral lines with peak detector.

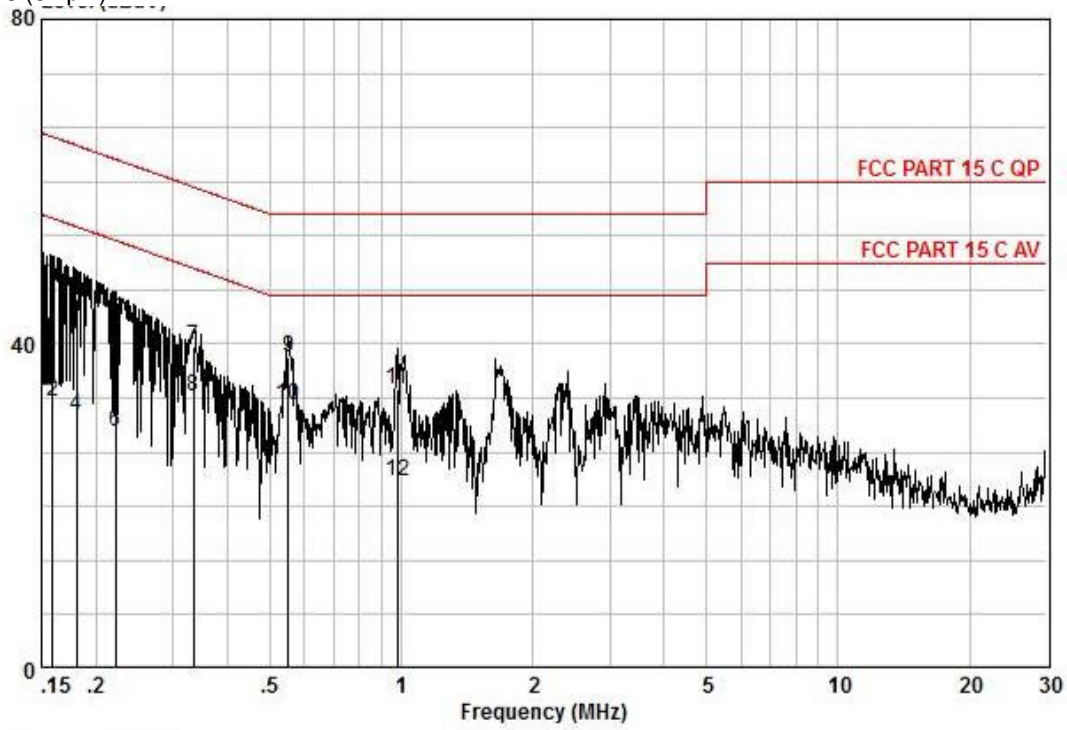
Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected. For EUT the communicating was worst case mode.

The following Quasi-Peak and Average measurements were performed on the EUT:

Test Result:

Neutral Line

Level(dBµV)

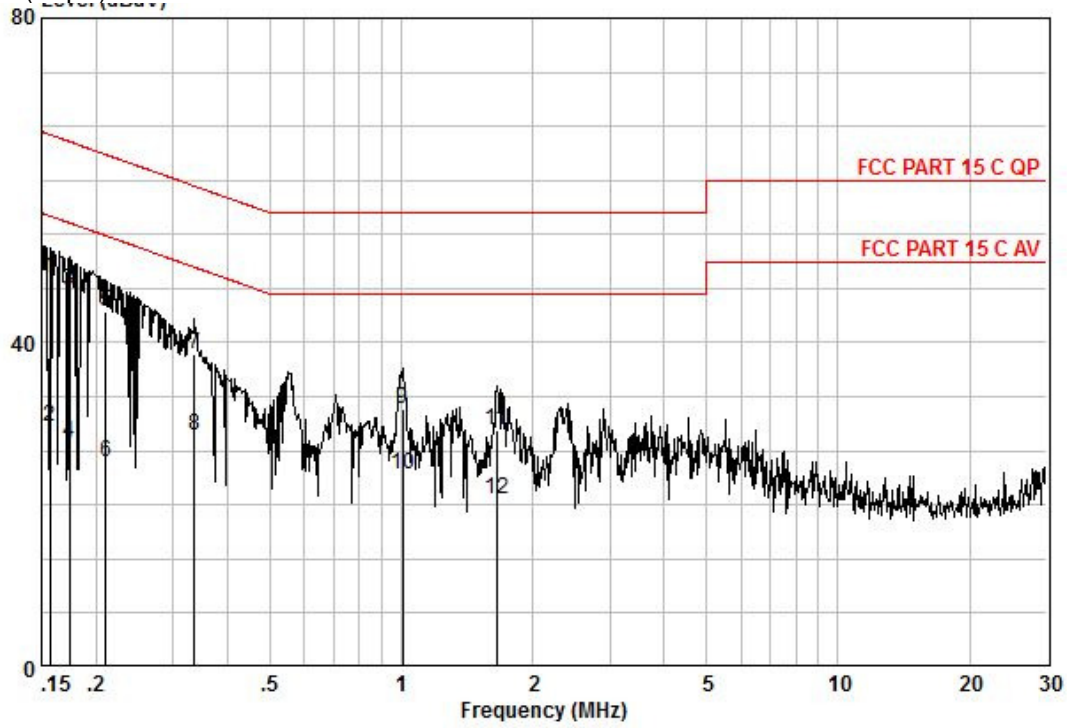


Pol :NEUTRAL
No :
Model :

Frequency MHz	read level dBuV	Cable Loss dB	LISN Factor dB	Measured level dBuV	Limit Line dBuV	Over limit dB	Remark
0,16	37,70	0,10	9,67	47,47	65,52	-18,05	QP
0,16	23,07	0,10	9,67	32,84	55,52	-22,68	AVERAGE
0,18	35,84	0,10	9,67	45,61	64,46	-18,85	QP
0,18	21,33	0,10	9,67	31,10	54,46	-23,36	AVERAGE
0,22	33,14	0,11	9,67	42,92	62,74	-19,83	QP
0,22	19,51	0,11	9,67	29,29	52,74	-23,46	AVERAGE
0,33	29,80	0,16	9,66	39,62	59,35	-19,74	QP
0,33	23,75	0,16	9,66	33,57	49,35	-15,79	AVERAGE
0,55	28,54	0,22	9,67	38,43	56,00	-17,57	QP
0,55	22,58	0,22	9,67	32,47	46,00	-13,53	AVERAGE
0,98	24,50	0,30	9,68	34,47	56,00	-21,53	QP
0,98	13,18	0,30	9,68	23,15	46,00	-22,85	AVERAGE

Live Line

Level(dBµV)



Pol :LIVE
No :
Model :

Frequency MHz	read level dBuV	Cable Loss dB	LISN Factor dB	Measured level dBuV	Limit Line dBuV	Over limit dB	Remark
0,16	38,14	0,10	9,65	47,89	65,65	-17,76	QP
0,16	19,91	0,10	9,65	29,66	55,65	-25,99	AVERAGE
0,17	36,64	0,10	9,65	46,39	64,77	-18,38	QP
0,17	17,95	0,10	9,65	27,70	54,77	-27,07	AVERAGE
0,21	34,16	0,11	9,64	43,91	63,18	-19,28	QP
0,21	15,59	0,11	9,64	25,34	53,18	-27,85	AVERAGE
0,34	28,70	0,16	9,64	38,50	59,31	-20,81	QP
0,34	18,76	0,16	9,64	28,56	49,31	-20,75	AVERAGE
1,00	21,86	0,30	9,66	31,82	56,00	-24,18	QP
1,00	13,78	0,30	9,66	23,74	46,00	-22,26	AVERAGE
1,65	19,28	0,33	9,66	29,27	56,00	-26,73	QP
1,65	10,71	0,33	9,66	20,70	46,00	-25,30	AVERAGE

--The End of Report--