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Guangzhou Branch**

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Report No.: GZEM170800487601

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FCC ID: 2ANEB180GSF

TEST REPORT

Application No.: GZEM1708004876LM
Applicant: Bortex Industry Co Ltd
Address of Applicant: A6 Building, Kaida Industrial Area, Qiaotou Town, Dongguan
Manufacturer: The same as Applicant
Address of Manufacturer: The same as Applicant
Factory: The same as Applicant
Address of Factory: The same as Applicant
Equipment Under Test (EUT):
FCC ID: 2ANEB180GSF
EUT Name: GSF
Model No.: GSF-180, GSF-120, GSF-70, GSF-36. □
□ Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.
Standards: 47 CFR Part 15, Subpart C:2016 section 15.231
Date of Receipt: 2017-08-10
Date of Test: 2017-08-14 to 2017-09-11
Date of Issue: 2017-10-17

Test Result :	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.



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.

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2 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
00		2017-10-17		Original Report

Authorized for issue by:				
Tested By		 Lily_Kuang /Project Engineer		2017-08-14 to 2017-09-11 Date
Checked By		 Ricky_Liu /Reviewer		2017-09-19 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
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.			
⌘ Declaration of EUT Family Grouping: Model No.: GSF-180, GSF-120, GSF-70, GSF-36 According to the declaration from the applicant, the electrical circuit design, layout, components used and internal wiring were identical for all models, only with different Model No. Therefore only one model GSF-180 was tested in this report.			
**: The EUT passed Radiated Emission test after modification.			



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5 General Information

5.1 Details of E.U.T.

Operation Frequency:	433.92MHz
Modulation & Antenna Type:	FSK modulation with integrated PCB antenna
Power Supply:	DC 3.0 V (size of 'CR2030' button cell)
Test Voltage:	DC 3.0V
Cable:	NA

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, Sciencetech 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

No.	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. date	Cal.Due date
					(YYYY-MM-DD)	(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
EMC0306	Shielding Room	Zhong Yu	8 x 3 x 3.8 m ³	N/A	N/A	N/A
EMC1801	V-LISN	EM Test/AG	NNBM 8125	81251342	2016-12-02	2017-12-01
EMC1802	V-LISN	EM Test/AG	NNBM 8125	81251345	2016-12-02	2017-12-01
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
EMC0069	Signal Analyzer	R&S	FSIQ26	100312	2016/12/2	2017/12/1
	(20Hz ~ 26.5Ghz)					



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

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General used equipment						
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. date	Cal.Due date
					(YYYY-MM-DD)	(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 3.0V (new battery)
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 integrated PCB antenna and no consideration of replacement. The maximum gain of the antenna is 0 dBi.

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 (dB μ V/m @ 3 m)	Field Strength of Harmonics and Spurious Emissions (dB μ V/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 to 1000 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, $\mu\text{V/m}$ 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.]

The fundamental frequency of the EUT is 433.92 MHz

The limit for average or QP field strength dB μ V/m for the fundamental emission= 80.8 dB μ V/m

No fundamental is allowed in the restricted bands.

The limit for average field strength dB μ V/m for the spurious emission=60.8 dB μ V/m. Spurious in the restricted bands must be less than 60.8 dB μ V/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:

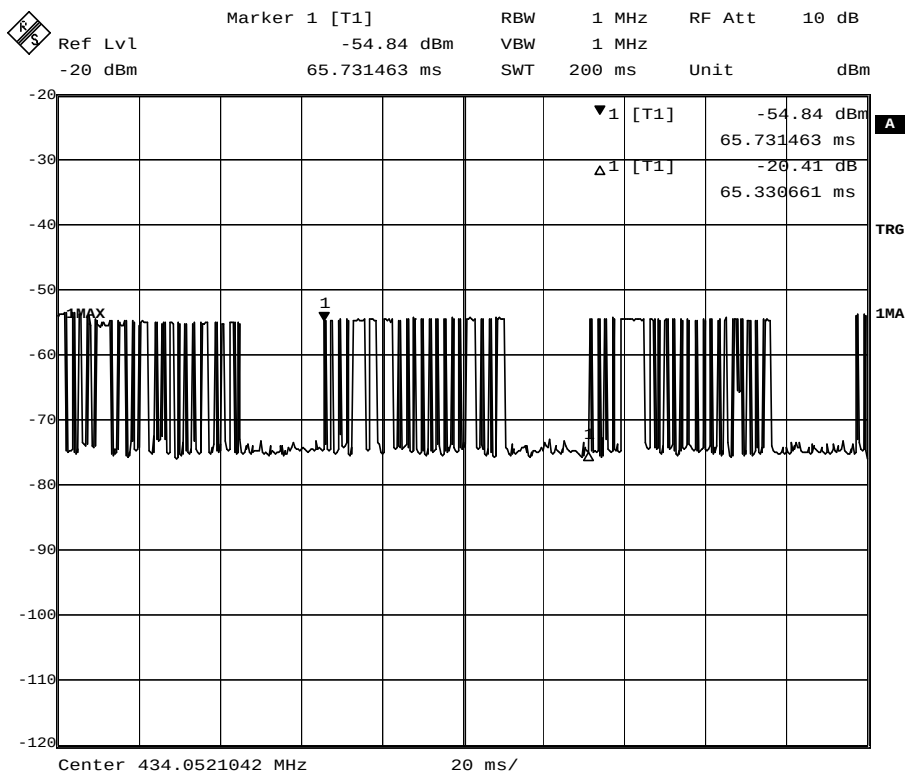
$$20\log(\text{Duty cycle}) = 20\log(T_{\text{pulse}}/65.33) = 20\log(0.217) = -13.27\text{dB}$$

$$\text{Here } T_{\text{pulse}} = (1.37 \times 5 + 0.488 \times 15) = 14.17(\text{ms})$$

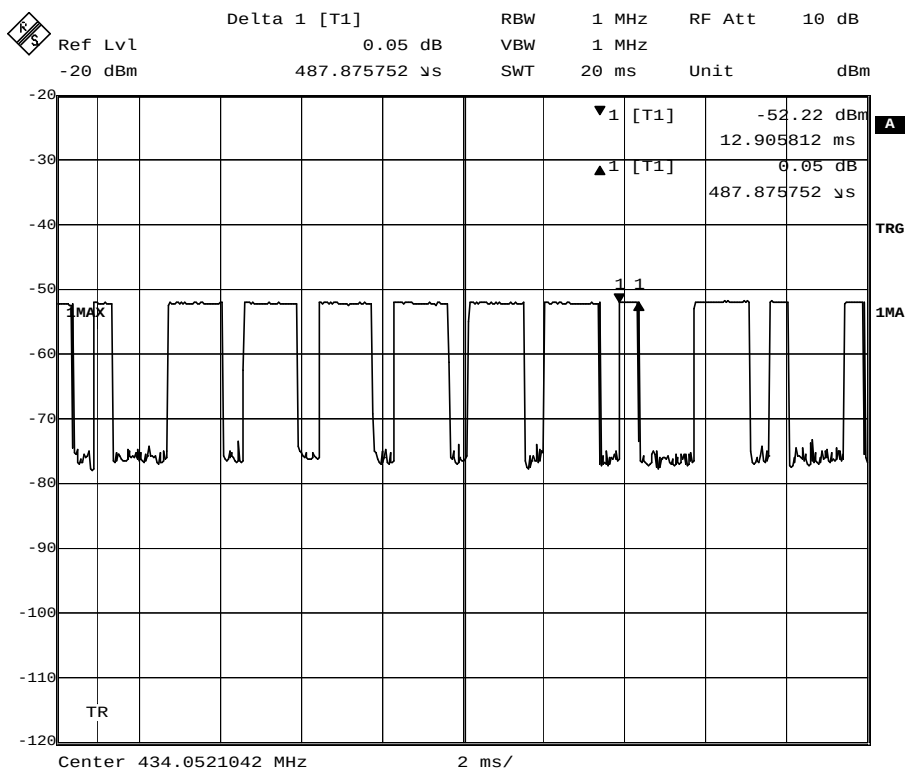
Please refer to below plots for more details.



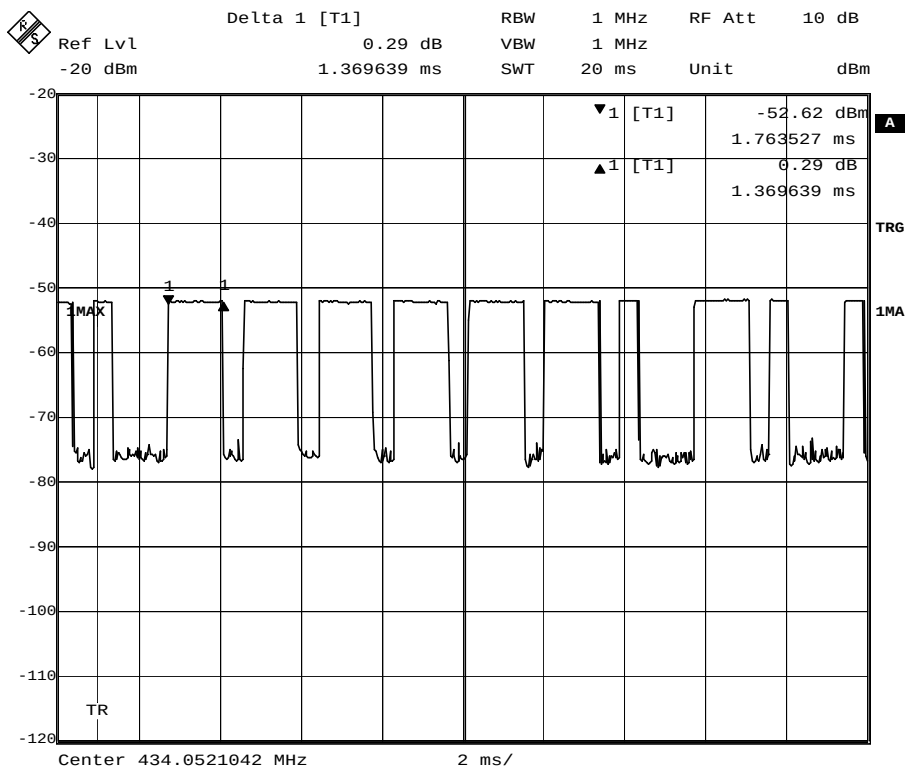
Test plot



Date: 1.JAN.1997 02:49:47



Date: 1.JAN.1997 02:56:27



Date: 1. JAN.1997 02:56:04



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 specified 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 performed with the bi-log type antenna. The measurement is performed with the EUT rotated 360°, the antenna height scanned 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 performed with the horn antenna. The measurement is performed with the EUT rotated 360°, the antenna height scanned 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 $f \geq 1$ GHz, 100 kHz for $f < 1$ GHz

VBW $\geq$ 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 $f \geq 1$ GHz, 100 kHz for $f < 1$ GHz

VBW = 10Hz

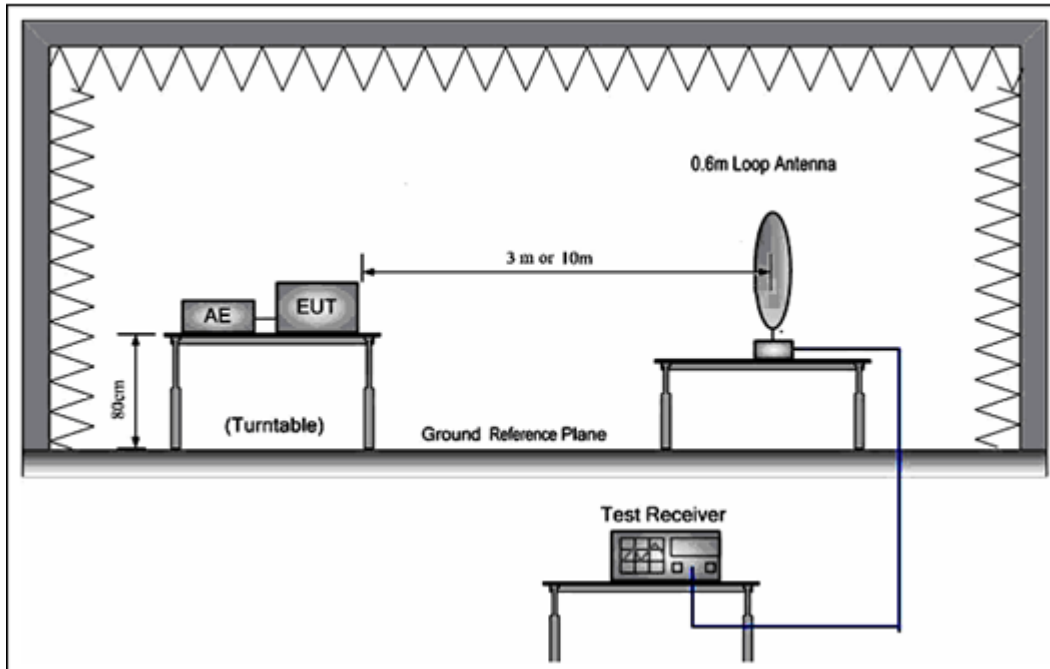
Sweep = auto

Detector function = peak

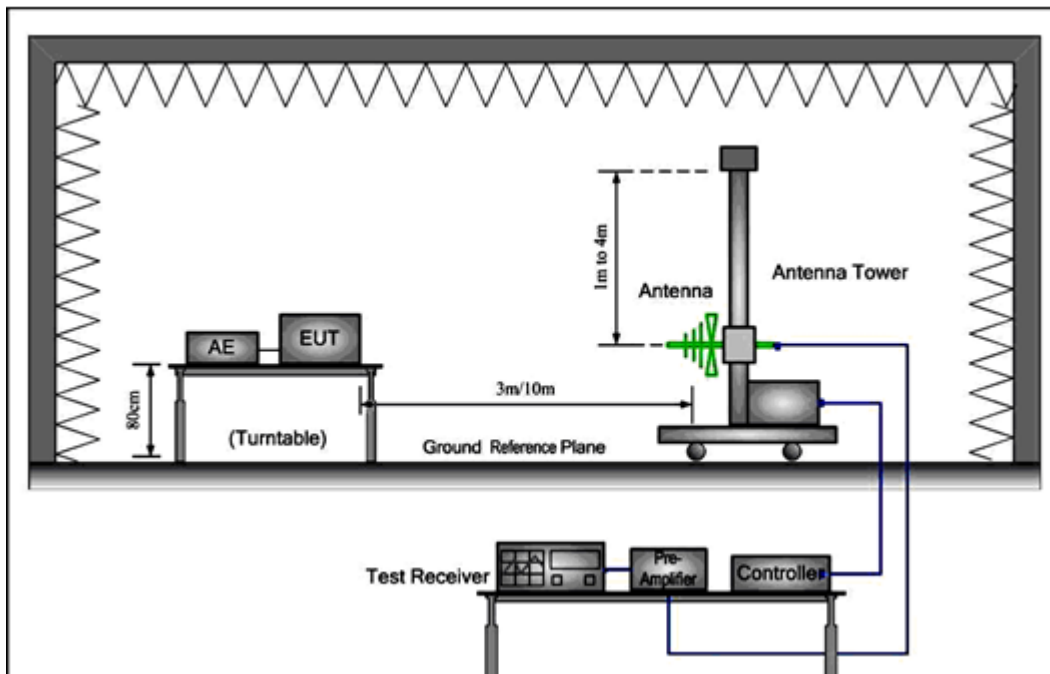
Trace = max hold

Test Configuration:

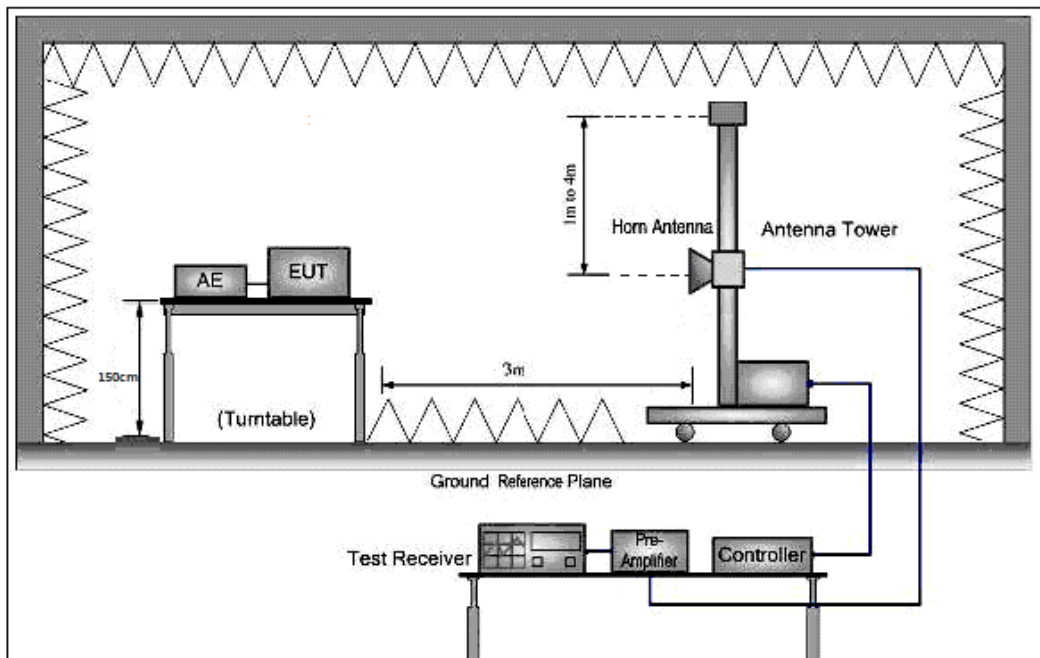
- 1) 9 kHz to 30 MHz emissions:



- 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
433.912	75.17	16.83	2.30	27.42	66.90	80.80	-13.90	Average
433.912	88.46	16.83	2.30	27.42	80.17	100.80	-20.63	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
433.912	70.41	16.83	2.30	27.42	62.14	80.80	-18.66	Average
433.912	83.70	16.83	2.30	27.42	75.41	100.80	-25.39	Peak

Y: rotate EUT by 90° vertically.

X: rotate EUT by 90° clockwise.

Z: EUT as Radiated Emission test setup photograph in section 6 of this report.

Remark: Radiated Emission test setup photograph in section 6 of this report is the worst case and reported.



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 to 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
41.567	26.40	13.78	0.63	27.00	13.81	60.80	-46.99	Average
52.025	26.33	14.44	0.75	27.00	14.52	60.80	-46.28	Average
149.486	26.74	13.35	1.30	26.78	14.61	60.80	-46.19	Average
183.201	27.09	12.52	1.45	26.69	14.37	60.80	-46.43	Average
281.008	28.39	13.61	1.74	26.40	17.34	60.80	-43.46	Average
867.814	47.22	23.17	3.10	27.70	45.79	60.80	-15.01	Average
867.814	60.50	23.17	3.10	27.70	59.07	80.80	-21.73	Peak

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
34.037	27.98	13.95	0.60	27.00	15.53	60.80	-45.27	Average
47.826	25.99	14.40	0.70	27.00	14.09	60.80	-46.71	Average
63.983	25.94	13.60	0.80	27.00	13.34	60.80	-47.46	Average
163.755	26.21	13.55	1.35	26.73	14.38	60.80	-46.42	Average
627.274	29.00	20.52	2.70	28.06	24.16	60.80	-36.64	Average
867.814	47.20	23.17	3.10	27.70	45.77	60.80	-15.03	Average
867.814	60.48	23.17	3.10	27.70	59.05	80.80	-21.75	Peak



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
1299.003	65.32	24.79	5.10	38.88	56.33	60.80	-4.47	Average
1299.003	78.59	24.79	5.10	38.88	69.60	80.80	-11.20	Peak
1301.736	61.10	24.79	5.10	38.88	52.11	54.00	-4.22	Average
1301.736	77.59	24.79	5.10	38.88	68.60	74.00	-5.40	Peak
1733.375	55.37	25.10	5.86	38.96	47.37	60.80	-13.43	Average
1733.375	68.65	25.10	5.86	38.96	60.65	80.80	-20.15	Peak
2165.398	64.34	25.57	6.50	39.03	57.38	60.80	-3.42	Average
2165.398	77.62	25.57	6.50	39.03	70.66	80.80	-10.14	Peak
2598.020	58.51	26.78	7.19	39.18	53.30	60.80	-7.50	Average
2598.020	71.79	26.78	7.19	39.18	66.58	80.80	-14.22	Peak
3031.626	61.40	27.90	7.76	39.44	57.62	60.80	-3.18	Average
3031.626	74.68	27.90	7.76	39.44	70.90	80.80	-9.90	Peak
3464.883	55.19	27.90	8.34	39.87	51.56	60.80	-9.24	Average
3464.883	68.47	27.90	8.34	39.87	64.84	80.80	-15.96	Peak

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
1299.003	54.61	24.79	5.10	38.88	45.62	60.80	-15.18	Average
1299.003	67.88	24.79	5.10	38.88	58.89	80.80	-21.91	Peak
1301.736	52.61	24.79	5.10	38.88	43.62	54.00	-10.38	Average
1301.736	65.88	24.79	5.10	38.88	56.89	74.00	-17.11	Peak
1733.375	44.32	25.10	5.86	38.96	36.32	60.80	-24.48	Average
1733.375	57.60	25.10	5.86	38.96	49.60	80.80	-31.20	Peak
2165.398	53.05	25.57	6.50	39.03	46.09	60.80	-14.71	Average
2165.398	66.33	25.57	6.50	39.03	59.37	80.80	-21.43	Peak
2598.020	49.06	26.78	7.19	39.18	43.85	60.80	-16.95	Average
2598.020	62.34	26.78	7.19	39.18	57.13	80.80	-23.67	Peak
3031.626	54.20	27.90	7.76	39.44	50.42	60.80	-10.38	Average
3031.626	67.48	27.90	7.76	39.44	63.70	80.80	-17.10	Peak
3464.883	46.33	27.90	8.34	39.87	42.70	60.80	-18.10	Average
3464.883	59.61	27.90	8.34	39.87	55.98	80.80	-24.82	Peak

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

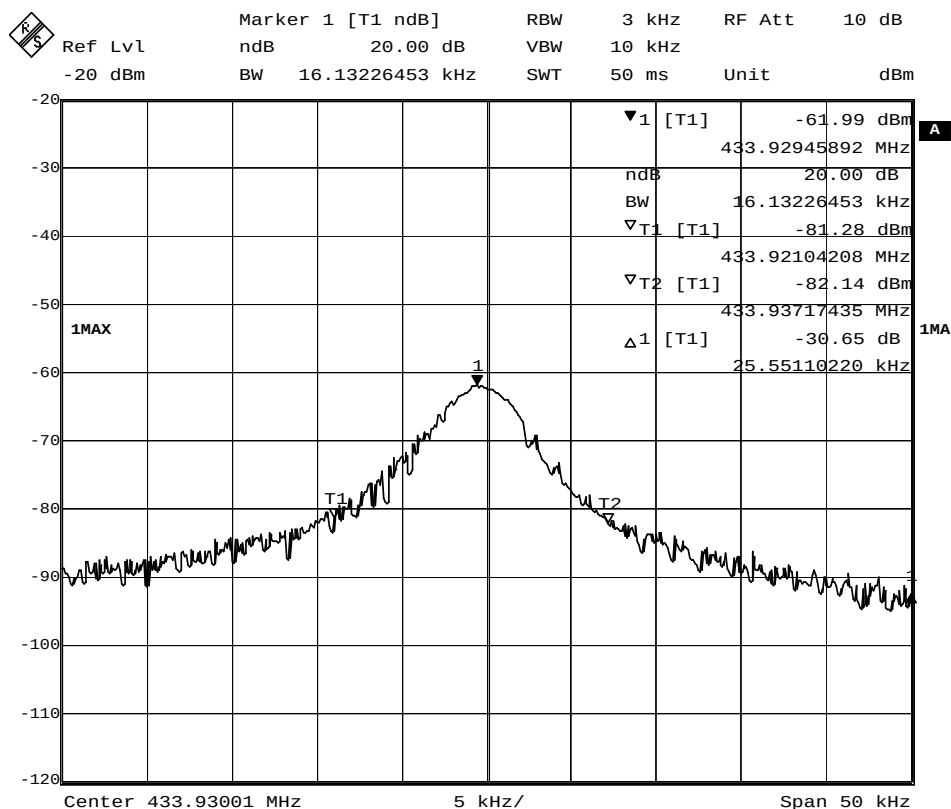
Test Requirement: FCC Part 15 C section 15.231 (c)
Test Method: ANSI C63.10: Clause 6.9
Test Status: Test in transmitting mode at lowest and highest channel.
Requirements: 15.231 (c) The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz 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
433.92MHz	16.13 kHz	1.08 MHz

Test plot:

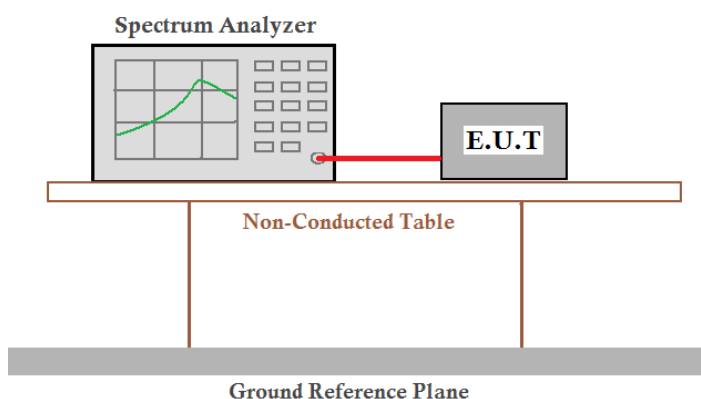


7.5 Dwell Time:

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.

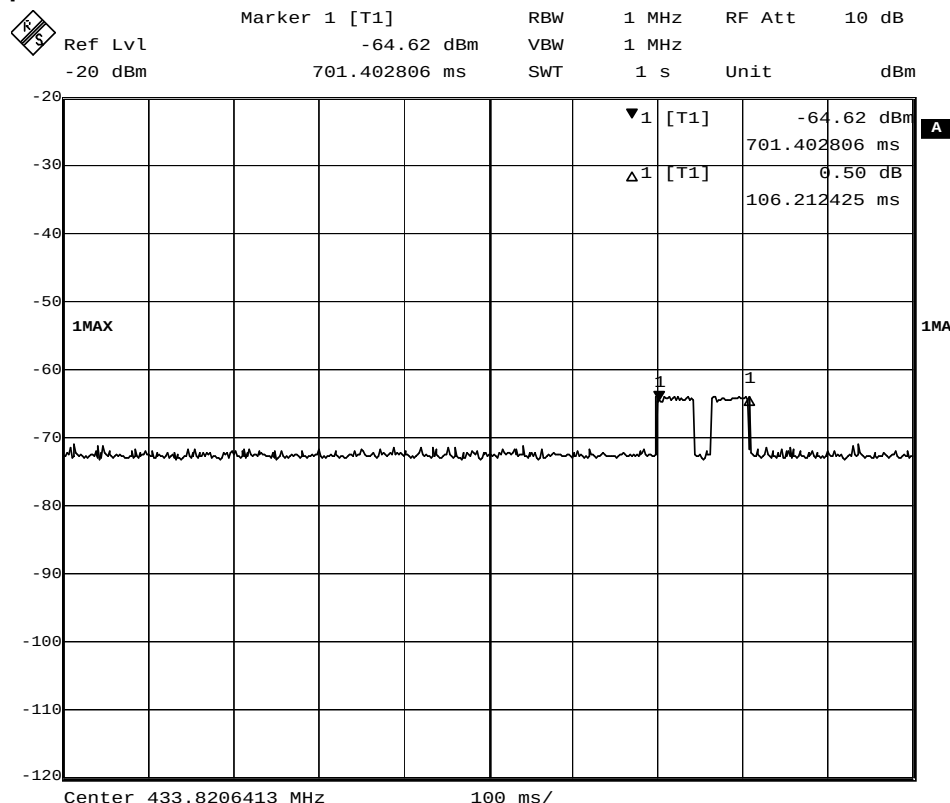
The EUT meets the requirements of this section.

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	106.21ms	≤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.

--The End of Report--