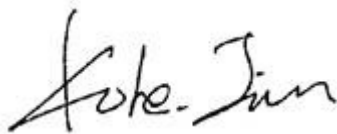


TEST REPORT

Application No.: GZEM2010015712CR
Applicant: Leisure-Tec International Limited
Address of Applicant: Unit A, 8/F, Eton Building, 288 Des Voeux Road Central, Hong Kong
Manufacturer: Foshan Sanshui Colku Electrical Appliance Limited
Address of Manufacturer: No.84 Area B, Sanshui Central Technology Industry Park, Leping, Sanshui Dist., Foshan City, Guangdong, China
Factory: Foshan Sanshui Colku Electrical Appliance Limited
Address of Factory: No.84 Area B, Sanshui Central Technology Industry Park, Leping, Sanshui Dist., Foshan City, Guangdong, China
Equipment Under Test (EUT):
FCC ID: 2AS7YCCP105
EUT Name: Refrigerator
Model No.: CCP30, CCP36, CCP44, CCP60, CCP73, CCP105, CCP96DZ, CCP69DZ, CCP85DZ, 10802010, 10802020, 10802030, 10802040, 10802050, 10802060, 10802070, 10802080 ☐
☐ Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.
Trade Mark: Mycoolman
Standard(s) : 47 CFR Part 15, Subpart C 15.247
Date of Receipt: 2020-10-19
Date of Test: 2020-10-22 to 2020-10-26
Date of Issue: 2019-09-10 (for original report GZEM190401211602)
2020-01-08 (for copy report GZEM190401211608)
2020-10-30 (for copy report GZEM190401211610)

Test Result:	Pass*
---------------------	--------------

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

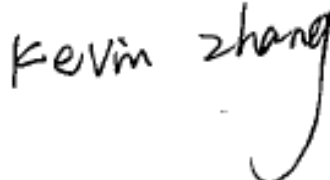



Kobe Jian
EMC Laboratory Manager



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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2019-09-10		Original
02		2020-01-08		Copy report: added new models.
03		2020-10-30		Copy report: added an alternative compressor and added a new model.

Authorized for issue by:			
Tested By			2020-10-22 to 2020-10-26
	Kevin_Zhang /Project Engineer		Date
Checked By			2020-10-30
	Ricky_Liu /Reviewer		Date



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2 Test Summary

Radio Spectrum Matter Part				
Item	Standard	Method	Requirement	Result
Conducted Emissions at AC Power Line (150kHz-30MHz)	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.2	47 CFR Part 15, Subpart C 15.207	Pass
Radiated Spurious Emissions (30MHz-1GHz)	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.4,6.5,6.6	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass

Remark for original report GZEM190401211602

✦ Declaration of EUT Family Grouping:

Model No.: CCP30, CCP36, CCP44, CCP60, CCP73, CCP105, CCP96DZ, CCP69DZ, CCP85DZ

According to the declaration from the applicant, the electrical circuit design, layout, components used and internal wiring were identical for all models, with only difference on the cubage and model No..

Therefore only one model **CCP96DZ** was tested in original report.

Remark for updated report GZEM190401211608

This report GZEM190401211608 was a supplement report based on original report GZEM190401211602, only added new models.

According to the declaration of the applicant, the models 10802010, 10802020, 10802030, 10802040, 10802050, 10802060, 10802070 added in this report and models in the original report were identical, with only difference being the model name.

Therefore original data was kept in this report GZEM190401211608.

Remark for the report GZEM190401211610:

This report GZEM190401211610 was a supplement report based on original report GZEM190401211608, for the changes as below.

1. Add an alternative compressor as below only for certified models CCP30, CCP36(10802010), CCP44(10802020).

Compressor Name	MD20H	Power Supply(V DC)	12/24
Operating Current(A)	Max=3.5	Input Power(W)	Max=42

2. Add a new model.

According to the declaration of the applicant, the new model 10802080, which is revised from original model CCP85DZ, added in this report, with only difference being the model name.

Considered the change as above, the test Conducted Emissions at AC Power Line (150kHz-30MHz) and Radiated Spurious Emissions (30MHz-1GHz) was performed on CCP30 in this report, and the original test data please refer to the original reports.



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4 General Information

4.1 Details of E.U.T.

Power Supply:	AC 100V-240V 50/60Hz DC 12/24V
Test Voltage:	AC 120V 60Hz / DC 12/24V
Cable:	AC input cable (unshielded, 1.5m) DC input cable (unshielded, 1.8m) USB output port (5V, 3A) AC input inlet DC input inlet 1 DC input inlet 2
Antenna Gain	0dBi
Antenna Type	Integrated Antenna
Channel Spacing	2MHz
Modulation Type	GFSK
Number of Channels	40
Operation Frequency	2402MHz to 2480MHz
Hardware:	SM01A V2.0
Software:	SV01
S/N:	A1
Test Software	BLE-CC254x-1.4.0.exe
Power Setting	3 dBm can not be changed by user
Function:	Refrigerator use in vehicle with BLE function

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Laptop	Lenovo	T430u	REF. No.SEA1800
BT test board	SGS EMC	RF 07	RF 07



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 中国·广州·经济技术开发区科学城科珠路198号 邮编: 510663 t (86-20) 82155555 f (86-20) 82075058 sgs.china@sgs.com

4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	$\pm 5.5 \times 10^{-8}$
2	Duty cycle	$\pm 0.57\%$
3	Occupied Bandwidth	$\pm 3\%$
4	RF Conducted power	$\pm 0.68\text{dB}$
5	RF Power Density	$\pm 1.50\text{dB}$
6	Conducted Spurious Emissions	$\pm 1.04\text{dB}$
7	RF Radiated Power	$\pm 4.5\text{dB}$ (below 1GHz)
		$\pm 4.8\text{dB}$ (above 1GHz)
8	Radiated Spurious Emission Test	$\pm 4.5\text{dB}$ (30MHz-1GHz)
		$\pm 4.8\text{dB}$ (1GHz-18GHz)
9	Temperature	$\pm 0.4^\circ\text{C}$
10	Humidity	$\pm 1.3\%$
11	Supply Voltages	$\pm 1.5\%$
12	Time	$\pm 3\%$

4.4 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.



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 中国·广州·经济技术开发区科学城科珠路198号 邮编: 510663 t (86-20) 82155555 f (86-20) 82075058 sgs.china@sgs.com

4.5 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-CL01:2018 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2017 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, CAB identifier: CN0052)**

SGS-CSTC Standards Technical Services Co., Ltd., has been registered by Innovation Science and Economic Development Canada for Wireless Device Testing laboratories to test to Canadian radio equipment requirements. Registration No. 4620B, CAB identifier: CN0052.

● **VCCI (Registration No.: R-12460, C-12584, G-10449 and T-11179)**

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-12460, C-12584, G-10449 and T-11179 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.



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4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None



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5 Equipment List

Conducted Emissions at Mains Terminals (150kHz-30MHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Shielding Room	ChangZhou ZhongYu	8m x 3m x 3.8m	EMC0306	N/A	N/A
Two-Line V-Network	Rohde & Schwarz	ENV216	EMC0118	2020-01-10	2021-01-09
LISN	Rohde & Schwarz	ENV216	EMC2135	2020-09-25	2021-09-24
EMI Test Receiver	Rohde & Schwarz	ESCS30	EMC0506	2019-11-18	2020-11-17
Coaxial Cable	HangTianXing	2m	EMC0107	2020-09-09	2022-09-08
Voltage Probe	SGS-EMC	N/A	EMC0106	2019-05-10	2021-05-09
Conical Metal Housing	SGS-EMC	N/A	EMC0167	2020-04-19	2022-04-18
Test Software E3c	Audix	Ver. 5.4.1221b	GZE100-62	N/A	N/A

Radiated Emissions (30MHz-1GHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EMI Test Receiver	Rohde & Schwarz	ESIB26	EMC0522	2020-01-10	2021-01-09
EMI Test Receiver	Rohde & Schwarz	ESCI	EMC0056	2020-01-10	2021-01-09
Chamber cable	HangTianXing	N/A	EMC0542	2019-06-28	2021-06-27
Trilog Broadband Antenna 25MHz-1GHz	SCHWARZBECKMESS-ELEKTRONIK	VULB 9168	EMC2174	2018-09-06	2021-09-05
Trilog Broadband Antenna 30MHz-1GHz	SCHWARZBECKMESS-ELEKTRONIK	VULB 9168	SEM003-18	2019-02-22	2022-02-22
Bi-log Type Antenna	Schaffner Chase	CBL6143	EMC0519	2020-06-08	2023-06-07
Horn Antenna 1GHz-18GHz	Rohde & Schwarz	HF906	EMC0518	2018-09-02	2021-09-01
1GHz-26.5 GHz Pre-Amplifier	Agilent	8449B	EMC0521	2020-01-10	2021-01-09
Amplifier	HP	8447F	EMC2065	2020-05-26	2021-05-25
Pre-Amplifier MH648A	ANRITSU CORP	MH648A	EMC2086	2019-11-18	2020-11-17
Active Loop Antenna	ETS-Lindgren	6502	EMC2190	2019-12-27	2021-12-26
High Pass Filter(915MHz)	FSY MICROWAVE	HM1465-9SS	EMC2079	2020-01-10	2021-01-09
2.4GHz Filter	Microtech-Tronics	BRM 50702	EMC2069	2020-01-10	2021-01-09
10m Semi-Anechoic Chamber	ETS	N/A	EMC0530	2019-10-20	2022-10-19
966 Anechoic Chamber	C.R.T	9m x 6m x 6m	EMC2142	2017-12-19	2020-12-18
MXE EMI Receiver	Keysight	N9038A	EMC2139	2019-11-18	2020-11-17
EXA Signal Analyzer	Keysight	N9010A	EMC2138	2019-11-18	2020-11-17
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A



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General used equipment					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
DMM	Fluke	73	EMC0006	2020-07-09	2021-07-08
DMM	Fluke	73	EMC0007	2020-07-09	2021-07-08



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6 Radio Spectrum Matter Test Results

6.1 Conducted Emissions at AC Power Line (150kHz-30MHz)

Test Requirement: 47 CFR Part 15, Subpart C 15.207
 Test Method: ANSI C63.10 (2013) Section 6.2
 Limit:

Frequency of emission(MHz)	Conducted limit(dB μ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

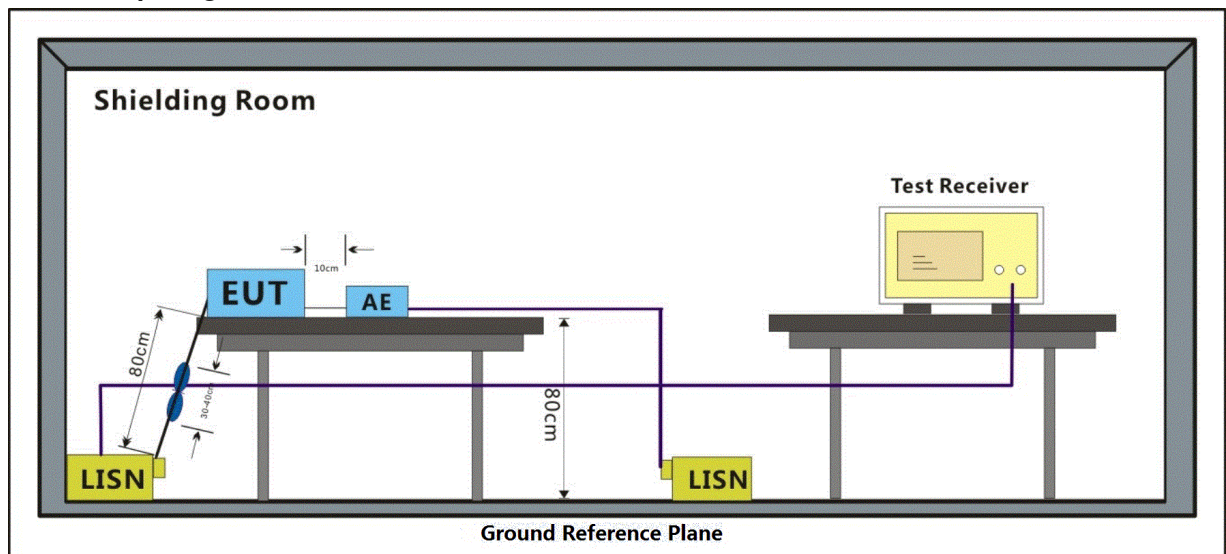
6.1.1 E.U.T. Operation

Operating Environment:

Temperature: 24.7°C Humidity: 52 % RH Atmospheric Pressure: 1020 mbar

Test mode k: Keep the EUT communication with accessory device.

6.1.2 Test Setup Diagram



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6.1.3 Measurement Procedure and Data

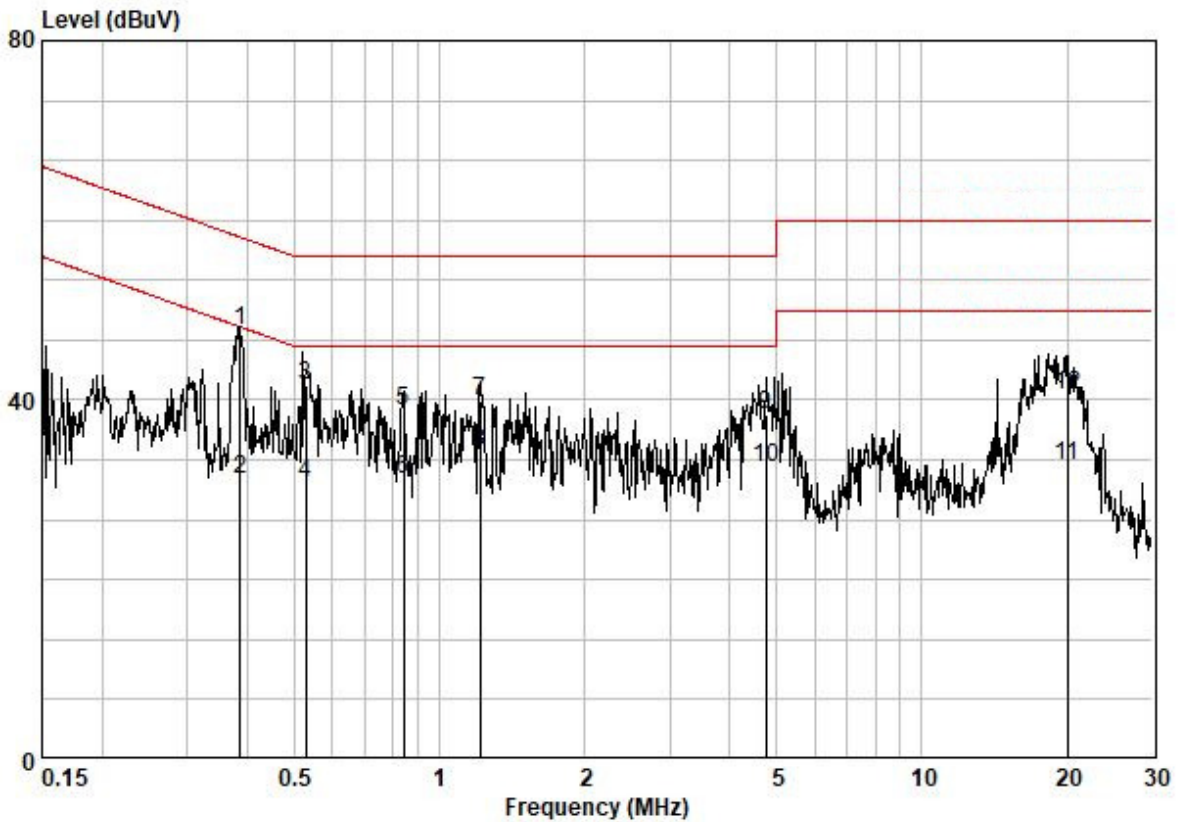
- 1) The mains terminal disturbance voltage test was conducted in a shielded room.
- 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50ohm/50μH + 5ohm linear impedance. The power cables of all other units of the EUT were connected to 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,
- 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.
- 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.

Remark: LISN=Read Level+ Cable Loss+ LISN Factor



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Mode:k; Line:Live Line



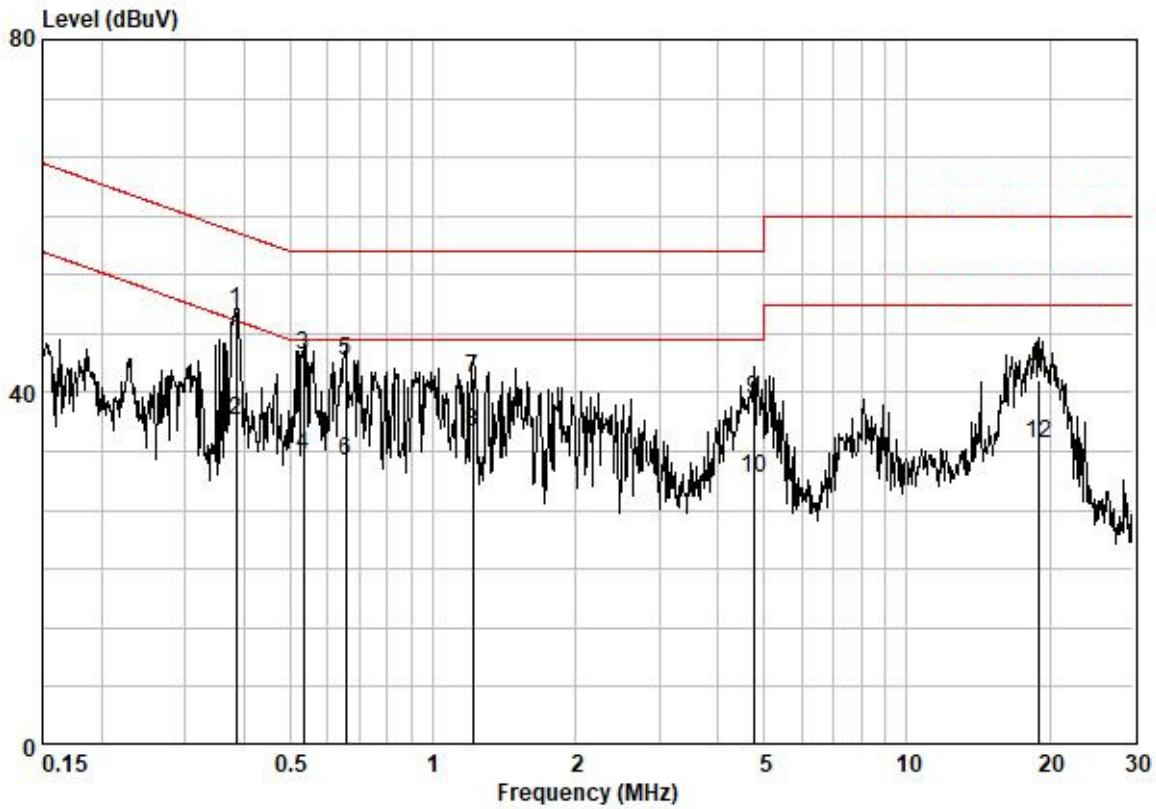
Pol :LIVE
Mode :
Model :

Frequency MHz	read level dBuV	Cable Loss dB	LISN Factor dB	Measured level dBuV	Limit Line dBuV	Over limit dB	Remark
0.39	37.98	0.10	9.61	47.69	58.12	-10.44	QP
0.39	21.47	0.10	9.61	31.18	48.12	-16.95	AVERAGE
0.53	31.96	0.10	9.61	41.67	56.00	-14.33	QP
0.53	21.03	0.10	9.61	30.74	46.00	-15.26	AVERAGE
0.84	29.12	0.10	9.61	38.83	56.00	-17.17	QP
0.84	21.52	0.10	9.61	31.23	46.00	-14.77	AVERAGE
1.22	30.16	0.10	9.61	39.87	56.00	-16.13	QP
1.22	24.45	0.10	9.61	34.16	46.00	-11.84	AVERAGE
4.75	28.60	0.20	9.65	38.45	56.00	-17.55	QP
4.75	22.58	0.20	9.65	32.43	46.00	-13.57	AVERAGE
20.06	22.41	0.40	9.78	32.59	50.00	-17.41	AVERAGE
20.06	30.28	0.40	9.78	40.46	60.00	-19.54	QP



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Mode:k; Line:Neutral Line



Pol : NEUTRAL
Mode :
Model :

Frequency MHz	read level dBuV	Cable Loss dB	LISN Factor dB	Measured level dBuV	Limit Line dBuV	Over limit dB	Remark
0.39	39.48	0.10	9.64	49.22	58.17	-8.95	QP
0.39	27.15	0.10	9.64	36.89	48.17	-11.28	AVERAGE
0.53	34.58	0.10	9.64	44.32	56.00	-11.68	QP
0.53	23.22	0.10	9.64	32.96	46.00	-13.04	AVERAGE
0.65	33.94	0.10	9.66	43.70	56.00	-12.30	QP
0.65	22.58	0.10	9.66	32.34	46.00	-13.66	AVERAGE
1.22	31.90	0.10	9.69	41.69	56.00	-14.31	QP
1.22	25.82	0.10	9.69	35.61	46.00	-10.39	AVERAGE
4.75	29.24	0.20	9.81	39.25	56.00	-16.75	QP
4.75	20.19	0.20	9.81	30.20	46.00	-15.80	AVERAGE
18.92	30.94	0.40	10.12	41.46	60.00	-18.54	QP
18.92	23.68	0.40	10.12	34.20	50.00	-15.80	AVERAGE



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6.2 Radiated Spurious Emissions (30MHz-1GHz)

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209
 Test Method: ANSI C63.10 (2013) Section 6.4,6.5,6.6
 Measurement Distance: 3m
 Limit:

Frequency(MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, 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.



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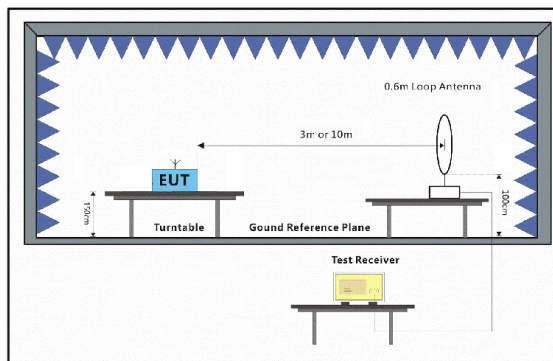
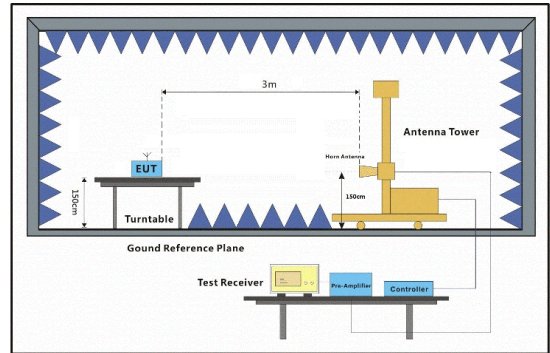
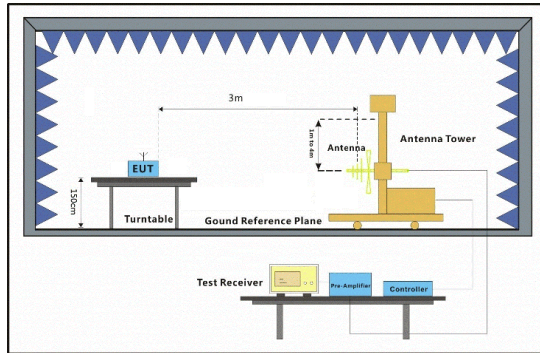
6.2.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 52 % RH Atmospheric Pressure: 1020 mbar

Test mode a: TX mode_Keep the EUT in continuously transmitting mode with GFSK modulation.

6.2.2 Test Setup Diagram



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6.2.3 Measurement Procedure and Data

- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured was complete.

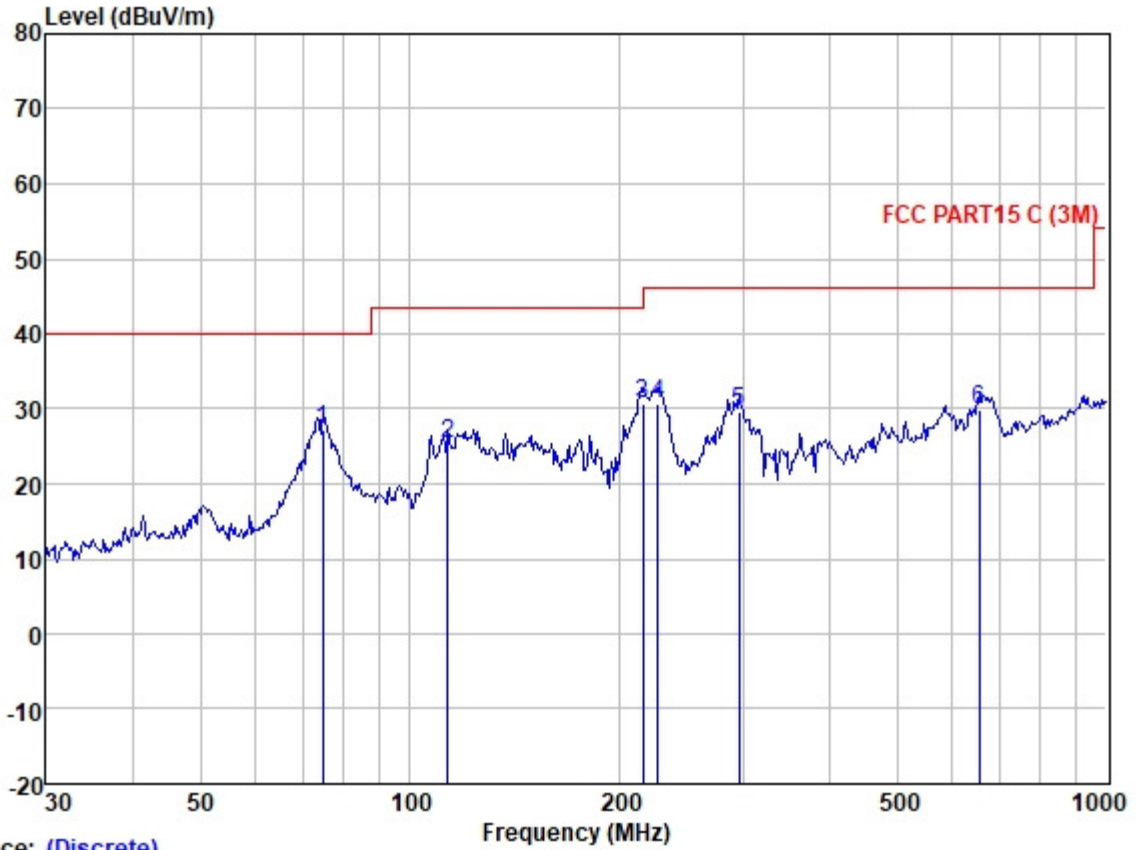
Remark:

- 1) For emission below 1GHz, through pre-scan found the worst case is the lowest channel. Only the worst case is recorded in the report.



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Mode:a; Polarization:Horizontal; Modulation:GFSK; ; Channel:Low



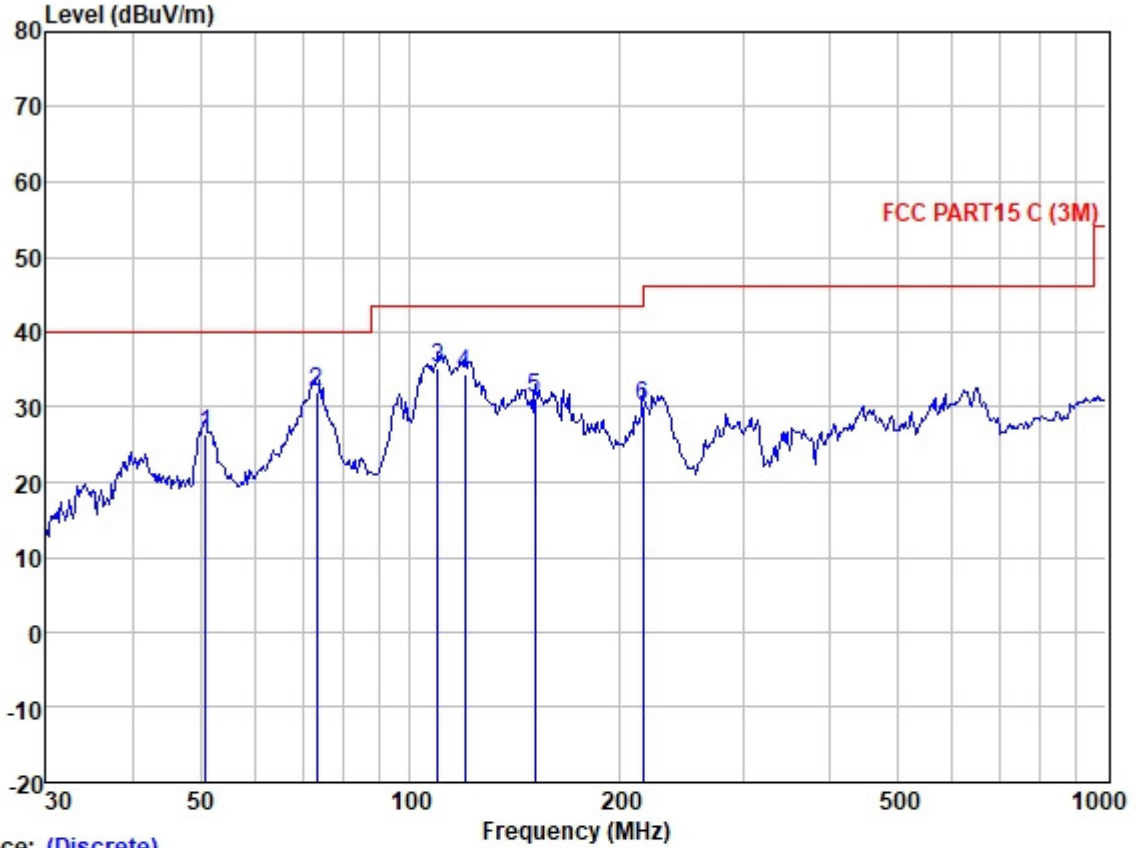
Trace: (Discrete)
 Site : SGS
 Condition: FCC PART15 C (3M) 3m HORIZONTAL
 Job :
 Model :
 Power :
 Test Mode:

	Read	Antenna	Cable	Preamp	Limit	Over				
	Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	74.919	42.34	10.60	1.44	27.11	27.27	40.00	-12.73	HORIZONTAL	QP
2	113.316	40.00	10.57	1.74	27.05	25.26	43.50	-18.24	HORIZONTAL	QP
3	216.024	44.87	9.80	2.58	26.71	30.54	46.00	-15.46	HORIZONTAL	QP
4	226.894	44.75	10.09	2.64	26.69	30.79	46.00	-15.21	HORIZONTAL	QP
5	296.184	39.70	13.52	2.94	26.55	29.61	46.00	-16.39	HORIZONTAL	QP
6	656.530	32.64	20.55	4.91	28.18	29.92	46.00	-16.08	HORIZONTAL	QP



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Mode:a; Polarization:Vertical; Modulation:GFSK; ; Channel:Low



Trace: (Discrete)
 Site : SGS
 Condition: FCC PART15 C (3M) 3m VERTICAL
 Job :
 Model :
 Power :
 Test Mode:

	ReadAntenna	Cable	Preamp	Limit	Over				
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	50.764	38.43	13.93	1.20	27.17	26.39	40.00	-13.61	VERTICAL QP
2	73.359	46.67	11.09	1.43	27.11	32.08	40.00	-7.92	VERTICAL QP
3	109.412	50.18	10.37	1.71	27.06	35.20	43.50	-8.30	VERTICAL QP
4	119.856	48.79	10.90	1.76	27.03	34.42	43.50	-9.08	VERTICAL QP
5	151.067	42.15	13.80	2.06	26.83	31.18	43.50	-12.32	VERTICAL QP
6	216.024	44.59	9.80	2.58	26.71	30.26	46.00	-15.74	VERTICAL QP

--End of Report--



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