

Report No.: GZEM200801448503

Page: 1 of 26 FCC ID: TG3-FMS352HJ

TEST REPORT

Application No.: GZEM2008014485CR **Applicant:** FKA Distributing Co., LLC

Address of Applicant: 3000 North Pontiac Trial, Commerce Township, MI 48390

Manufacturer: Zhangzhou easepal Industrial Corporation

Address of Manufacturer: No.228 JiaoSong Road, Taiwanese Investment Zone, Zhangzhou Fujian, China

Factory: Zhangzhou easepal Industrial Corporation

Address of Factory: No.228 JiaoSong Road, Taiwanese Investment Zone, Zhangzhou Fujian, China

Equipment Under Test (EUT):

FCC ID: TG3-FMS352HJ
EUT Name: Foot Massager
Model No.: FMS-352HJ
Trade Mark: HoMedics

Standard(s): 47 CFR Part 15, Subpart C 15.231

Date of Receipt: 2020-08-18

Date of Test: 2020-08-19 to 2020-08-31

Date of Issue: 2020-10-14

Test Result: Pass*

This report GZEM200801448503 supersedes the previous report GZEM200801448502, issued on 2020-09-29, which is hereby deemed null and void.

Kobe Jian

EMC Laboratory Manager

检验检测专用章

nspection & Testing Services

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



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Revision Record					
Version	Chapter	Date	Modifier	Remark	
01		2020-09-29		Original (null)	
02		2020-10-14		Revised report: Updated section 7.3.	

Authorized for issue by:		
Tested By	Cumy Wu	2020-08-19 to 2020-08-31
	Curry_Wu /Project Engineer	Date
Checked By	Riday Liu	2020-10-14
	Ricky_Liu /Reviewer	Date



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2 Test Summary

Radio Spectrum Technical Requirement					
Item Standard Method Requirement Result					
Antenna Requirement	47 CFR Part 15, Subpart C 15.231	N/A	47 CFR Part 15, Subpart C 15.203	Pass	

N/A: Not applicable

Radio Spectrum Matter Part						
Item	Standard	Method	Requirement	Result		
20dB Bandwidth	47 CFR Part 15, Subpart C 15.231	ANSI C63.10 (2013) Section 6.9	47 CFR Part 15, Subpart C 15.231(c)	Pass		
Dwell Time (15.231(a))	47 CFR Part 15, Subpart C 15.231	ANSI C63.10 (2013) Section 7.8.4	47 CFR Part 15, Subpart C 15.231(a)	Pass		
Field Strength of the Fundamental Signal (15.231(b))	47 CFR Part 15, Subpart C 15.231	ANSI C63.10 (2013) Section 6.5	47 CFR Part 15, Subpart C 15.231(b)	Pass		
Radiated Emissions	47 CFR Part 15, Subpart C 15.231	ANSI C63.10 (2013) Section 6.4&6.5&6.6	47 CFR Part 15, Subpart C 15.209	Pass		

Remark for report GZEM200801448503:

This report GZEM200801448503 supersedes the previous report GZEM200801448502, only updated section 7.3.



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General Information

4.1 Details of E.U.T.

Power Supply: AC 120V 60Hz for main unit

DC 3V for remote controller

Test Voltage: DC3 V

Cable: about 1m x 2 wires unscreened AC mains cable

Antenna Type: Integrated antenna

Antenna gain: 0dBi Channel Spacing: N/A Modulation Type: OOK Number of Channels: N/A Operation Frequency: 315MHz Power setting: N/A V1.0 Software version:

Hardware version: M50351-RF-Y V1.0

Sample no.:

4.2 Description of Support Units

The EUT has been tested as an independent unit.

4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	±5.5 x 10 ⁻⁸
2	Duty cycle	±0.57%
3	Occupied Bandwidth	±3%
4	RF Conducted power	±0.68dB
5	RF Power Density	±1.50dB
6	Conducted Spurious Emissions	±1.04dB
7	RF Radiated Power	±4.5dB (below 1GHz)
/	hr hadiated fower	±4.8dB (above 1GHz)
8	Padiated Spurious Emission Test	±4.5dB (30MHz-1GHz)
0	Radiated Spurious Emission Test	±4.8dB (1GHz-18GHz)
9	Temperature	±0.4℃
10	Humidity	±1.3%
11	Supply Voltages	±1.5%
12	Time	±3%



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4.4 Duty cycle of the EUT

Pre-analysis Check: While conducting average power measurement, duty cycle of each mode shall be checked to ensure its duty cycle in order to compensate for the loss due to insufficient ratio of duty cycle.

All duty cycle is pre-scanned, and result as obtained below shows only the most representative ones where duty cycle is conducted as the given transmission with given virtual operation that expresses the percent.

Formula:

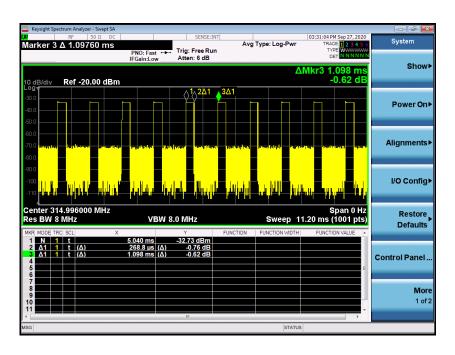
Duty Cycle = Ton/(Ton+Toff)

Measurement Procedure:

- 1. Set span = Zero
- 2. RBW=8MHz
- 3. VBW=8MHz
- 4. Detector=Peak

Channel(MHz)	Mode	Duty Cycle(%)	Correction Factor(dB)*
315MHz	OOK	24.48	6.11

^{*}Correction Factor(dB) =10log(1/Duty Cycle)





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4.5 Test Location

All tests were performed at:

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Tel: +86 20 82155555 Fax: +86 20 82075059

No tests were sub-contracted.



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4.6 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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4.7 Deviation from Standards

None

4.8 Abnormalities from Standard Conditions

None



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Equipment List

20dB Bandwidth						
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date	
EXA Signal Analzer	AgilentTechnologies	N9010A	EMC2138	2019-11-18	2020-11-17	
6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14	
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A	
MI CABLE	SGS-EMC	0.8M	EMC2136	2019-11-02	2021-11-01	
MI CABLE	SGS-EMC	0.8M	EMC2137	2019-11-02	2021-11-01	

Dwell Time (15.231(a))						
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date	
EXA Signal Analzer	AgilentTechnologies	N9010A	EMC2138	2019-11-18	2020-11-17	
6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14	
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A	
MI CABLE	SGS-EMC	M8.0	EMC2136	2019-11-02	2021-11-01	
MI CABLE	SGS-EMC	M8.0	EMC2137	2019-11-02	2021-11-01	

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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Ne	Toot Eastingers	Manufacturer Mode	Model No	Cowiel No.	Cal. date	Cal.Due date
No.	Test Equipment		Model No.	Serial No.	(YYYY-MM-DD)	(YYYY-MM-DD)
EMC0525	Compact Semi- Anechoic Chamber	ChangZhou ZhongYu	N/A	N/A	2019-10-20	2022-10-19
EMC0522	EMI Test Receiver	Rohde & Schwarz	ESIB26	100283	2020-01-10	2021-01-09
EMC0056	EMI Test Receiver	Rohde & Schwarz	ESCI	100236	2020-01-10	2021-01-09
EMC2174	Trilog Broadband Antenna 30-1000MHz	SCHWARZBECK MESS- ELEKTRONIK	VULB 9168	0920	2018-09-06	2021-09-05
SEM003-18	Trilog Broadband Antenna 25-2000MHz	SCHWARZBECK MESS- ELEKTRONIK	VULB 9168	00666	2019-02-22	2022-02-22
EMC0519	Bilog Type Antenna	Schaffner -Chase	CBL6143	5070	2020-06-08	2023-06-07
EMC2026	Horn Antenna	SCHWARZBECK MESS- ELEKTRONIK	BBHA 9120D	9120D-841	2019-09-25	2022-09-24
EMC0518	Horn Antenna (1G~18G)	R& S	HF906	100096	2018-09-02	2021-09-01
EMC0521	1-26.5 GHz Pre-Amplifier	Agilent	8449B	3008A01649	2020-01-10	2021-01-09
EMC2065	Amplifier	HP	8447F	N/A	2020-05-26	2021-05-25
EMC2086	PRE AMPLIFIER MH648A	ANRITSU CORP	MH648A	N/A	2019-11-18	2020-11-17
EMC0523	Active Loop Antenna	EMCO	6502	42963	2020-05-19	2022-05-18
EMC2041	Broad-Band Horn Antenna (14)15-26.5(40)GHz	SCHWARZBECK MESS- ELEKTRONI	BBHA 9170	9170-375	2020-06-16	2023-06-15
EMC2079	High Pass Filter(915MHz)	FSY MICROWAVE	HM1465-9SS	009	2020-01-10	2021-01-09
EMC2142	966 Anechoic Chamber	C.R.T	9mX6mX6m	NA	2017-12-19	2020-12-18
EMC2139	MXE EMI Receiver	Keysight	N9038A	MY57290121	2019-11-18	2020-11-17
EMC2138	EXA Signal Analyzer	Keysight	N9010A	MY57120105	2019-11-18	2020-11-17
EMC2069	2.4GHz Filter	Micro-Tronics	BRM 50702	149	2020-01-10	2021-01-09
EMC0530	10m Semi- Anechoic Chamber	ETS	N/A	N/A	2019-10-20	2022-10-19



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6 Radio Spectrum Technical Requirement

6.1 Antenna Requirement

6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203

6.1.2 Conclusion

Standard Requirement:

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 antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit permanently attached antenna or of an so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

EUT Antenna:

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 0dBi.

Antenna phot please refer to Internal photo.



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7 Radio Spectrum Matter Test Results

7.1 20dB Bandwidth

Test Requirement 47 CFR Part 15, Subpart C 15.231(c)
Test Method: ANSI C63.10 (2013) Section 6.9

Limit:

Frequency range(MHz)	Limit
70-900	No wider than 0.25% of the center frequency
Above 900	No wider than 0.5% of the center frequency

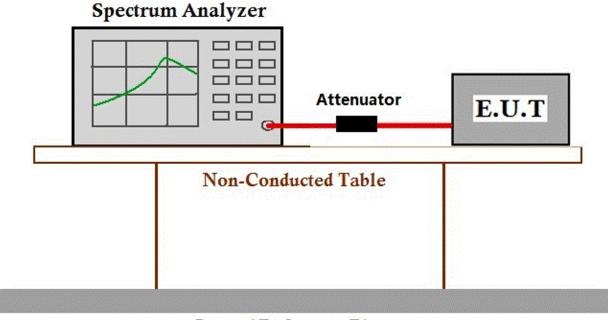
7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 24.9 °C Humidity: 63.7 % RH Atmospheric Pressure: 1020 mbar

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

7.1.2 Test Setup Diagram







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7.1.3 Measurement Procedure and Data

Frequency	20 dB bandwidth	Limit	result	
315 MHz	33.28 kHz	<787.5kHz	Pass	





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7.2 Dwell Time (15.231(a))

Test Requirement 47 CFR Part 15, Subpart C 15.231(a) Test Method: ANSI C63.10 (2013) Section 7.8.4

Limit:

Device type	Limit			
Manually operated transmitter	The switch automatically deactivate the transmitter within not more than 5 seconds of being released			
Automatically actived transmitter	Cease transmission within 5 seconds after activation			
Periodic transmissions to determine system integrity of transmitters used in security or safety applications	The total transmission time does not exceed 2 seconds per hour			

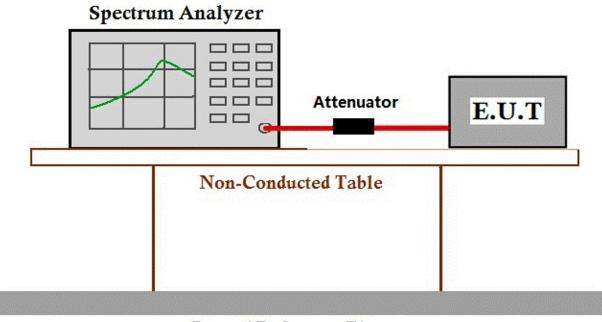
7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 24.9 °C Humidity: 63.7 % RH Atmospheric Pressure: 1020 mbar

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

7.2.2 Test Setup Diagram







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7.2.3 Measurement Procedure and Data

Carrier Frequency	Shutdown Time	Limit	result	
315MHz	2.940s	≤5s	pass	





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7.3 Field Strength of the Fundamental Signal (15.231(b))

Test Requirement 47 CFR Part 15, Subpart C 15.231(b)
Test Method: ANSI C63.10 (2013) Section 6.5

Measurement Distance: 3m

Limit:

Fundamental frequency(MHz)	Field strength of fundamental(microvolts/meter)	Field strength of spurious emissions(microvolts/meter)		
40.66-40.70	2250	225		
70-130	1250	125		
130-174	1250 to 3750	125 to 375		
174-260	3750	375		
260-470	3750 to 12500	375 to 1250		
Above 470	12500	1250		

Remark: the emission limit is based on measurement instrumentation employing an average detector at a distance of 3 meters. The frequencies above 1000MHz 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.



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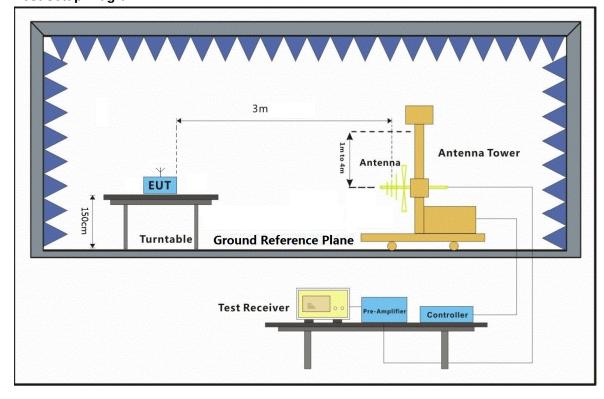
7.3.1 E.U.T. Operation

Operating Environment:

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

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

7.3.2 Test Setup Diagram





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7.3.3 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. The radiation measurements are performed in different position. And found the position show as setup photo which it is worse case, only the test worst case mode is recorded in the report.

Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor Limit =20*LOG{(470-260)*(315-260)/(12500-3750) +3750} =75.62dBuV/m

Frequency	Field strength	limit	Result	
315 MHz	67.15dBuV/m	75.62dBuV/m	Pass	



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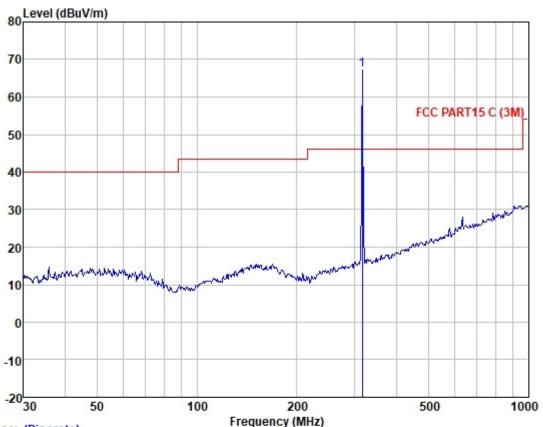
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Trace: (Discrete)

Site : SGS

Condition: FCC PART15 C (3M) 3m HORIZONTAL

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 * 315.481 77.45 14.10 3.00 27.40 67.15 46.00 21.15 HORIZONTAL QP



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7.4 Radiated Emissions

Test Requirement 47 CFR Part 15, Subpart C 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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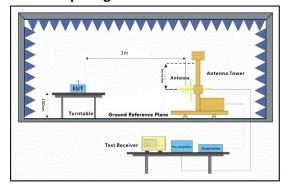
7.4.1 E.U.T. Operation

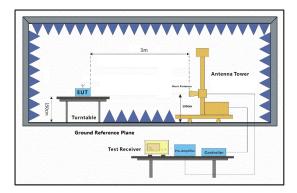
Operating Environment:

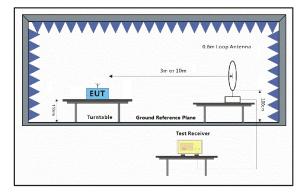
Temperature: 23.3 °C Humidity: 58 % RH Atmospheric Pressure: 1020 mbar

Test Mode: a: TX mode Keep the EUT in transmitting with modulation mode.

7.4.2 Test Setup Diagram







7.4.3 Measurement Procedure and Data

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. Only the worst position of vertical was shown in the report.

Measured Level I=Read Level + Antenna Factor + Cable Loss - Preamp Factor

For 9KHz to 30MHz, all emissions were greater than 20 dB below the limit so the test plot no show in the report.

According to C63.10:2013 clause 6.6.4.3 note 1, Where limits are specified by regulations for both average and peak detection, if the maximized peak, measured value complies with the average limit, then it is unnecessary to perform an average measurement.



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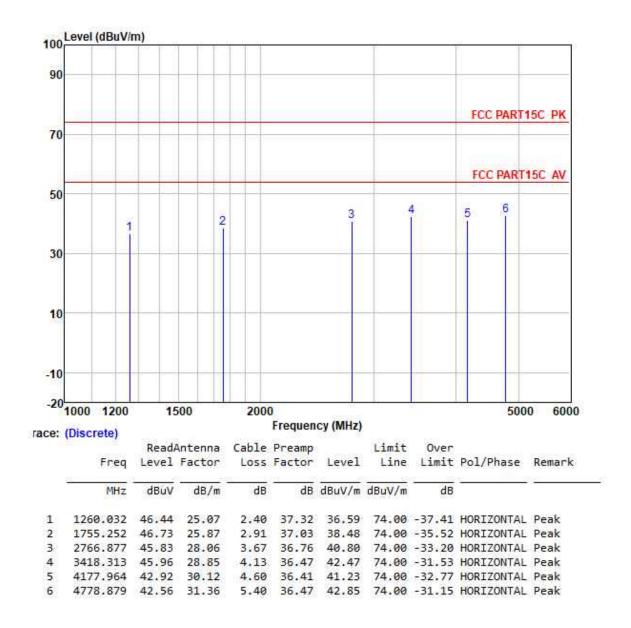
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Mode:a; Polarization:Horizontal, 1-6G





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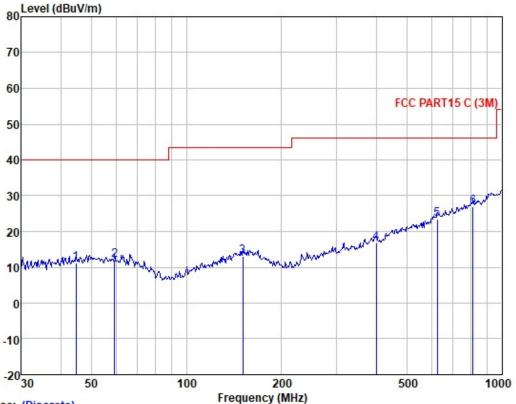
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Mode:a; Polarization:Horizontal, 30M-1G



Trace: (Discrete)

Site : SGS

Condition: FCC PART15 C (3M) 3m HORIZONTAL

Job Model Power Test Mode:

	Freq		ntenna Factor						Pol/Phase	Remark
07	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	44.743	23.46	13.83	1.19	27.17	11.31	40.00	-28.69	HORIZONTAL	QP
2	59.232	24.25	13.48	1.32	27.16	11.89	40.00	-28.11	HORIZONTAL	QP
3	151.067	23.97	13.80	2.06	26.88	12.95	43.50	-30.55	HORIZONTAL	QP
4	400.432	24.96	15.70	3.93	27.90	16.69	46.00	-29.31	HORIZONTAL	QP
5	625.078	26.14	20.40	4.94	28.08	23.40	46.00	-22.60	HORIZONTAL	QP
6	810.265	26.50	22.70	5.90	28.11	26.99	46.00	-19.01	HORIZONTAL	QP



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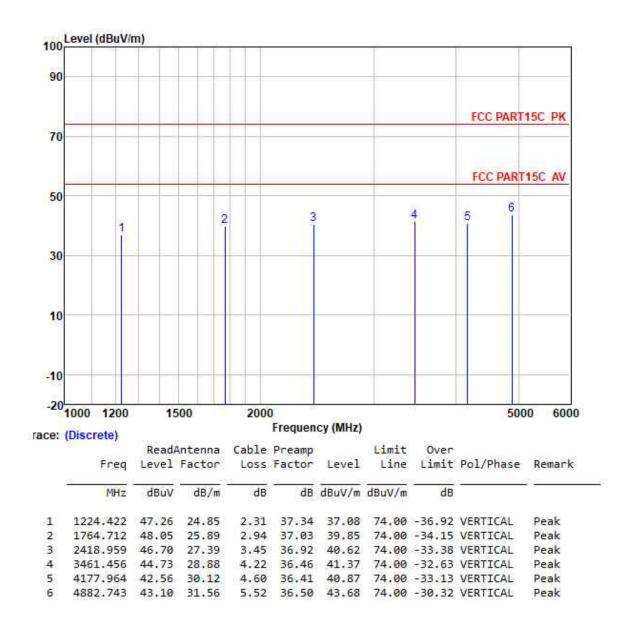
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Mode:a; Polarization: Vertical, 1-6G





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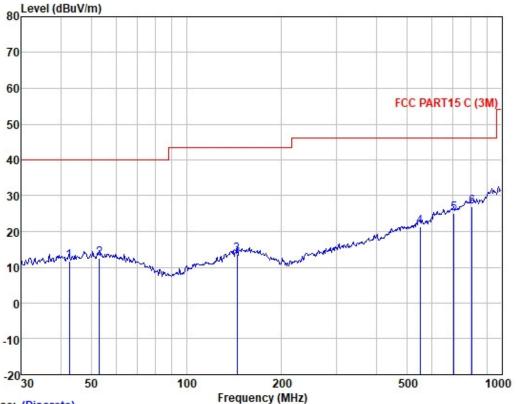
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Mode:a; Polarization: Vertical, 30M-1G



Trace: (Discrete)

Site : SGS

Condition: FCC PART15 C (3M) 3m VERTICAL

Job Model Power Test Mode:

	Freq		ntenna Factor						Pol/Phase	Remark
Ġ.	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	-	
1	42.600	24.07	13.73	1.12	27.17	11.75	40.00	-28.25	VERTICAL	QP
2	52.945	24.62	13.90	1.24	27.17	12.59	40.00	-27.41	VERTICAL	QP
3	144.842	24.91	13.65	2.02	26.91	13.67	43.50	-29.83	VERTICAL	QP
4	550.948	26.06	18.70	4.50	28.06	21.20	46.00	-24.80	VERTICAL	QP
5	704.226	26.73	21.10	5.30	28.11	25.02	46.00	-20.98	VERTICAL	QP
6	804.603	26.40	22.65	5.99	28.12	26.92	46.00	-19.08	VERTICAL	QP

-- End of Report--



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