TEST REPORT

Report No. :	KS2212S5423E
FCC ID :	2ABUP-FT0310MK
Applicant :	Shenzhen Funpower General Technology Co., Ltd.
Address :	ROOM 201B,Habor Venture Building, No.1041 Houhai Avenue,Shekou,Nanshan District,Shenzhen City,PRC.
Manufacturer :	Shenzhen Funpower General Technology Co., Ltd.
Address :	ROOM 201B,Habor Venture Building, No.1041 Houhai Avenue,Shekou,Nanshan District,Shenzhen City,PRC.
Product Name :	Remote Control Transmitter
Model/Type reference :	FT0310MK
Standard :	47 CFR Part 15.231
Date of Receipt :	December 7, 2022
Date of Test Date :	December 7, 2022 to December 20, 2022
Date of issue :	December 20, 2022
**Test result : **	**Pass**

Prepared by: (Printed name + Signature)	Pai Zheng	Pai Zheng
Approved by: (Printed name + Signature)	Sky Dong	Sky Dong

Testing Laboratory Name... :	**KSIGN(Guangdong) Testing Co., Ltd.**
Address :	West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China

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1. TEST SUMMARY

1.1. Test Standards

The tests were performed according to following standards:

47 CFR Part 15.231: Periodic operation in the band 40.66-40.70 MHz and above 70 MHz

1.2. Report Version

Revised No.	Date of issue	Description
01	December 20, 2022	Original

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1.3. Test Description

Test Item	Standard	Requirement	Result
Antenna requirement	47 CFR Part 15.231	Part 15.203	Pass
20dB Bandwidth	47 CFR Part 15.231	47 CFR Part 15.231(c)	Pass
Dwell Time	47 CFR Part 15.231	47 CFR Part 15.231(a)(1) & (a)(2)	Pass
Duty Cycle	47 CFR Part 15.231	47 CFR Part 15.231(b) & (e)	Pass
Field Strength of The Fundamental Signal	47 CFR Part 15.231	47 CFR Part 15.231(b)	Pass
Radiated Emission (below 1GHz)	47 CFR Part 15.231	47 CFR Part 15.231	Pass
Radiated Emission (above 1GHz)	47 CFR Part 15.231	47 CFR Part 15.231	Pass

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1.4. Test Facility

KSIGN(Guangdong) Testing Co., Ltd.

West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu,Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China

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

CNAS-Lab Code: L13261

KSIGN(Guangdong) Testing Co., Ltd. has been assessed and proved to be in Compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2017 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA-Lab Cert. No.: 5457.01

KSIGN(Guangdong) Testing Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025:2017 General Requirementsfor the Competence of Testing and Calibration Laboratories and any additional program requirements in the
identified field of testing

ISED#: 25693 CAB identifier.: CN0096

KSIGN(Guangdong) Testing Co., Ltd. has been listed by Innovation, Science and Economic Development Canada to perform electromagnetic emission measurement.

FCC-Registration No.: 294912 Designation Number: CN1328

KSIGN(Guangdong) Testing Co., Ltd. EMC Laboratory has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

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1.5. Measurement Uncertainty

Test Items	Measurement Uncertainty
RSE (30-1000MHz)	± 5.7dB
RSE (1-18GHz)	± 4.68dB

The reported uncertainty of measurement y ± U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

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2. GENERAL INFORMATION

2.1. General Description Of EUT

Test Sample Number:	1-1(Normal Sample)
Product Name:	Remote Control Transmitter
Model / Type reference:	FT0310MK
Power Supply:	DC 3.0V from battery
Operation Frequency:	303.873MHz
Number of Channels:	1
Modulation Type:	ASK
ANT Type:	Internal Antenna
ANT Gain:	0 dBi

2.2. Accessory Equipment Information

The EUT was tested as an independent device.

2.3. Description of Test Modes

No.	Title	Description of Mode
Test Mode1	TM1	Keep EUT is transmitting mode

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2.4. Measurement Instruments List

20dB Bandwidth				
Test Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Until**
Wideband Radio Communication Tester	R&S	CMU200	115297	2023-03-04
Audio Analyzer	R&S	UPL16	100001	2023-03-04
Shielding box	Gxiong	GX-5915A	2201113	2023-04-23
High Pass Filter	COM-MW Technology Co., Ltd	ZHPF-M1.2-9G-187	09203403	2023-03-04
Band Stop Filter	COM-MW Technology Co., Ltd	ZBSF6-C820-920-188	09203401	2023-03-04
Splitter	COM-MW Technology Co., Ltd	ZPD-M1-8-2103	09203407	2023-03-04
Coaxial Cable	BEBES	A40-2.92M2.92F-4.5M	1907021	2023-03-04
Hygrothermograph	Anymetre	JB913	/	2023-03-07
Climate Chamber	Angul	AGNH80L	1903042120	2023-03-04
Spectrum Analyzer	HP	8593E	3831U02087	2023-03-04
Dual Output DC Power Supply	Agilent	E3646A	MY40009992	2023-03-04
RF Control Unit	Tonscend	JS0806-2	/	2023-03-04
Analog Signal Generator	HP	83752A	3344A00337	2023-03-04
Vector Signal Generator	Agilent	N5182A	MY50142520	2023-03-04
Wideband Radio Communication Tester	R&S	CMW500	157282	2023-03-04
Spectrum Analyzer	R&S	FSV40-N	101798	2023-03-04

Dwell Time				
Test Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Until**
Wideband Radio Communication Tester	R&S	CMU200	115297	2023-03-04
Audio Analyzer	R&S	UPL16	100001	2023-03-04
Shielding box	Gxiong	GX-5915A	2201113	2023-04-23
High Pass Filter	COM-MW Technology Co., Ltd	ZHPF-M1.2-9G-187	09203403	2023-03-04
Band Stop Filter	COM-MW Technology Co., Ltd	ZBSF6-C820-920-188	09203401	2023-03-04
Splitter	COM-MW Technology Co., Ltd	ZPD-M1-8-2103	09203407	2023-03-04
Coaxial Cable	BEBES	A40-2.92M2.92F-4.5M	1907021	2023-03-04
Hygrothermograph	Anymetre	JB913	/	2023-03-07
Climate Chamber	Angul	AGNH80L	1903042120	2023-03-04
Spectrum Analyzer	HP	8593E	3831U02087	2023-03-04
Dual Output DC Power Supply	Agilent	E3646A	MY40009992	2023-03-04
RF Control Unit	Tonscend	JS0806-2	/	2023-03-04
Analog Signal Generator	HP	83752A	3344A00337	2023-03-04
Vector Signal Generator	Agilent	N5182A	MY50142520	2023-03-04
Wideband Radio Communication Tester	R&S	CMW500	157282	2023-03-04

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Spectrum Analyzer	R&S	FSV40-N	101798	2023-03-04

Duty Cycle				
Test Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Until**
Wideband Radio Communication Tester	R&S	CMU200	115297	2023-03-04
Audio Analyzer	R&S	UPL16	100001	2023-03-04
Shielding box	Gxiong	GX-5915A	2201113	2023-04-23
High Pass Filter	COM-MW Technology Co., Ltd	ZHPF-M1.2-9G-187	09203403	2023-03-04
Band Stop Filter	COM-MW Technology Co., Ltd	ZBSF6-C820-920-188	09203401	2023-03-04
Splitter	COM-MW Technology Co., Ltd	ZPD-M1-8-2103	09203407	2023-03-04
Coaxial Cable	BEBES	A40-2.92M2.92F-4.5M	1907021	2023-03-04
Hygrothermograph	Anymetre	JB913	/	2023-03-07
Climate Chamber	Angul	AGNH80L	1903042120	2023-03-04
Spectrum Analyzer	HP	8593E	3831U02087	2023-03-04
Dual Output DC Power Supply	Agilent	E3646A	MY40009992	2023-03-04
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Wideband Radio Communication Tester	R&S	CMW500	157282	2023-03-04
Spectrum Analyzer	R&S	FSV40-N	101798	2023-03-04

Field Strength of The Fundamental Signal				
Test Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Until**
Ultra-Broadband logarithmic period Antenna	Schwarzbeck	VULB 9163	1230	2023-04-12
Pre-Amplifier	Schwarzbeck	BBV 9745	9745#129	2023-03-04
Color Signal Generator	Philips	PM5418	672926	2023-03-04
Broadcast Television Signal Generator	R&S	SFE100	141038	2023-03-04
Analog Signal Generator	Agilent	8648A	3847M00445	2023-03-04
EMI Test Receiver	R&S	ESR	102525	2023-03-04
Horn Antenna	Schwarzbeck	BBHA 9120 D	2023	2023-03-29
Pre-Amplifier	EMCI	EMC051835SE	980662	2023-03-04
Spectrum Analyzer	Keysight	N9020A	MY46471971	2023-03-04
Loop Antenna	Beijin ZHINAN	ZN30900C	18050	2023-03-05

Radiated Emission (below 1GHz)				
Test Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Until**
Ultra-Broadband logarithmic period Antenna	Schwarzbeck	VULB 9163	1230	2023-04-12
Pre-Amplifier	Schwarzbeck	BBV 9745	9745#129	2023-03-04
Color Signal Generator	Philips	PM5418	672926	2023-03-04

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Broadcast Television Signal Generator	R&S	SFE100	141038	2023-03-04
Analog Signal Generator	Agilent	8648A	3847M00445	2023-03-04
EMI Test Receiver	R&S	ESR	102525	2023-03-04
Horn Antenna	Schwarzbeck	BBHA 9120 D	2023	2023-03-29
Pre-Amplifier	EMCI	EMC051835SE	980662	2023-03-04
Spectrum Analyzer	Keysight	N9020A	MY46471971	2023-03-04
Loop Antenna	Beijin ZHINAN	ZN30900C	18050	2023-03-05

Radiated Emission (above 1GHz)				
Test Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Until**
Ultra-Broadband logarithmic period Antenna	Schwarzbeck	VULB 9163	1230	2023-04-12
Pre-Amplifier	Schwarzbeck	BBV 9745	9745#129	2023-03-04
Color Signal Generator	Philips	PM5418	672926	2023-03-04
Broadcast Television Signal Generator	R&S	SFE100	141038	2023-03-04
Analog Signal Generator	Agilent	8648A	3847M00445	2023-03-04
EMI Test Receiver	R&S	ESR	102525	2023-03-04
Horn Antenna	Schwarzbeck	BBHA 9120 D	2023	2023-03-29
Pre-Amplifier	EMCI	EMC051835SE	980662	2023-03-04
Spectrum Analyzer	Keysight	N9020A	MY46471971	2023-03-04
Loop Antenna	Beijin ZHINAN	ZN30900C	18050	2023-03-05

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3. Evaluation Results (Evaluation)

3.1. Antenna requirement

Test 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 permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

4. Radio Spectrum Matter Test Results (RF)

4.1. 20dB Bandwidth

Test Requirement:	47 CFR Part 15.231(c)
Test Limit:	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.
Test Method:	ANSI C63.10-2013, Section 6.9
Procedure:	a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the EMI receiver or spectrum analyzer shall be between two times and five times the OBW. b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW and video bandwidth (VBW) shall be approximately three times RBW, unless otherwise specified by the applicable requirement. c) Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than [10 log (OBW/RBW)] below the reference level. Specific guidance is given in 4.1.5.2. d) Steps a) through c) might require iteration to adjust within the specified tolerances. e) The dynamic range of the instrument at the selected RBW shall be more than 10 dB below the target “-xx dB down” requirement; that is, if the requirement calls for measuring the -20 dB OBW, the instrument noise floor at the selected RBW shall be at least 30 dB below the reference value. f) Set detection mode to peak and trace mode to max hold. g) Determine the reference value: Set the EUT to transmit an unmodulated carrier or modulated signal, as applicable. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace (this is the reference value). h) Determine the “-xx dB down amplitude” using [(reference value) - xx].

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	Alternatively, this calculation may be made by using the marker-delta function of the instrument. i) If the reference value is determined by an unmodulated carrier, then turn the EUT modulation ON, and either clear the existing trace or start a new trace on the spectrum analyzer and allow the new trace to stabilize. Otherwise, the trace from step g) shall be used for step j). j) Place two markers, one at the lowest frequency and the other at the highest frequency of the envelope of the spectral display, such that each marker is at or slightly below the “íxx dB down amplitude” determined in step h). If a marker is below this “-xx dB down amplitude” value, then it shall be as close as possible to this value. The occupied bandwidth is the frequency difference between the two markers. Alternatively, set a marker at the lowest frequency of the envelope of the spectral display, such that the marker is at or slightly below the “íxx dB down amplitude” determined in step h). Reset the marker-delta function and move the marker to the other side of the emission until the delta marker amplitude is at the same level as the reference marker amplitude. The marker-delta frequency reading at this point is the specified emission bandwidth. k) The occupied bandwidth shall be reported by providing plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

4.1.1. E.U.T. Operation:

Operating Environment:	
Temperature:	24.2 °C
Humidity:	51.3 %
Atmospheric Pressure:	102 kPa
Final test mode:	Test Mode1

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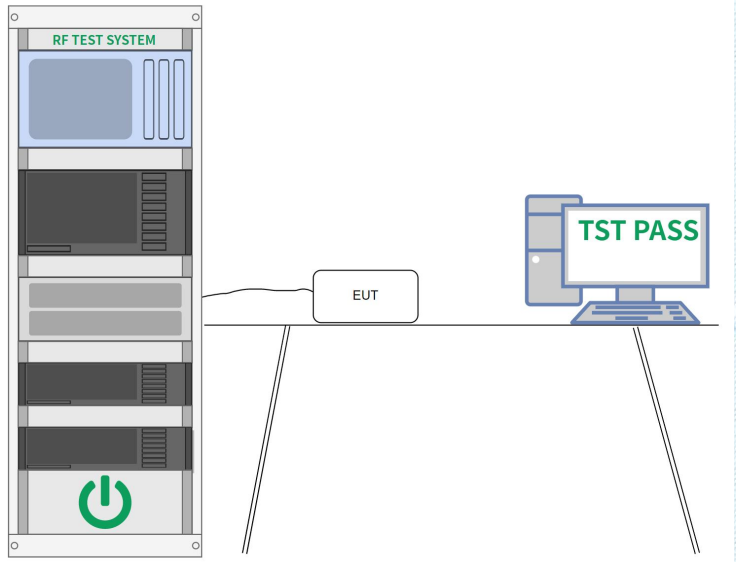
4.1.2. Test Setup Diagram:



4.1.3. Test Data:

Channel frequency (MHz)	99%Bandwidth (kHz)	20dB Bandwidth (kHz)	Limit (MHz)
303.873	64.689	16.060	0.25%*CF=0.760

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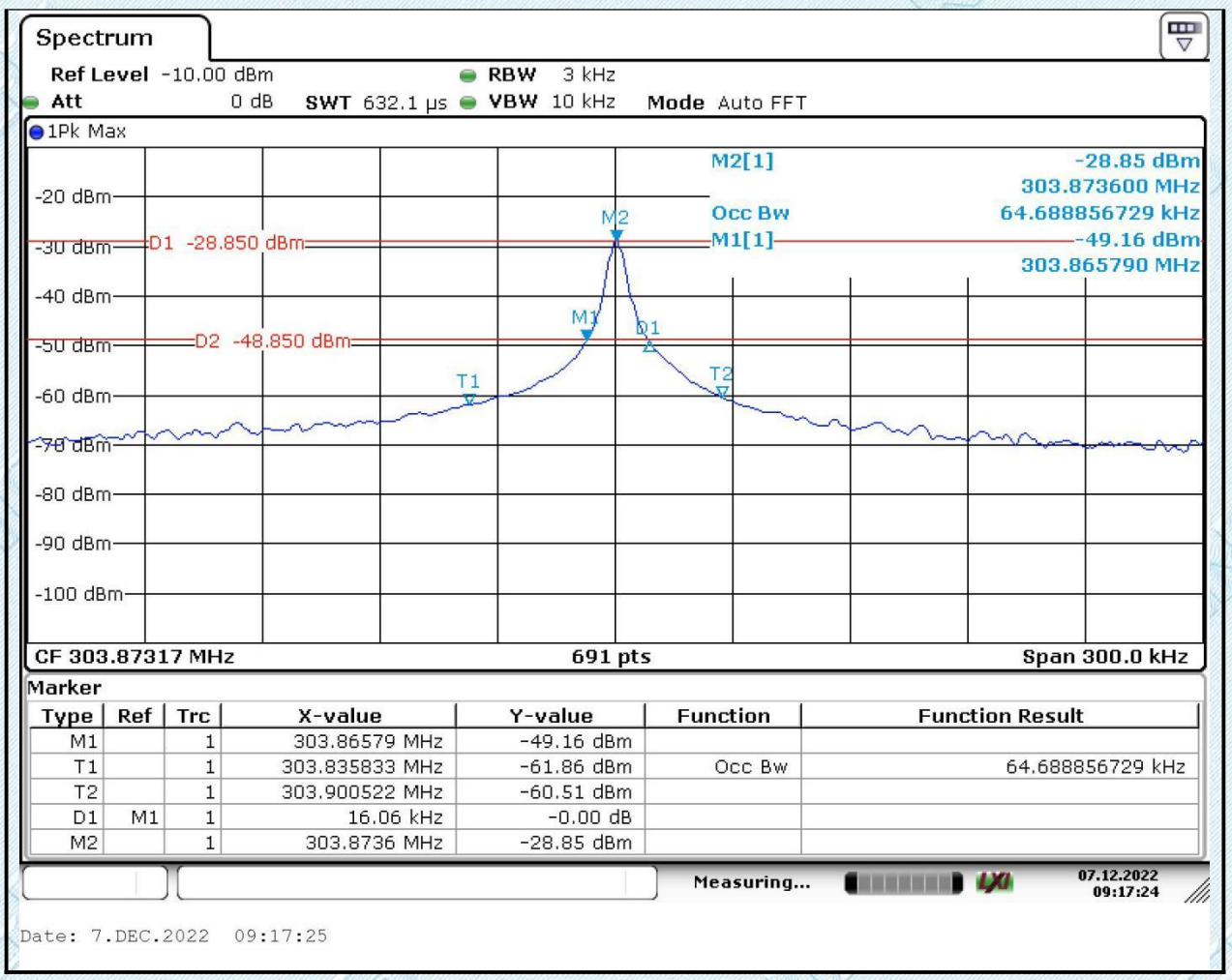

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4.2. Dwell Time

Test Requirement:	47 CFR Part 15.231(a)(1) & (a)(2)
Test Limit:	(1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released. (2) A transmitter activated automatically shall cease transmission within 5 seconds after activation.
Test Method:	ANSI C63.10-2013, Section 7.8.4
Procedure:	a) Span: Zero span, centered on a hopping channel. b) RBW shall be channel spacing and where possible RBW should be set >> 1 / T, where T is the expected dwell time per channel. c) Sweep: As necessary to capture the entire dwell time per hopping channel; where possible use a video trigger and trigger delay so that the transmitted signal starts a little to the right of the start of the plot. The trigger level might need slight adjustment to prevent triggering when the system hops on an adjacent channel; a second plot might be needed with a longer sweep time to show two successive hops on a channel. d) Detector function: Peak. e) Trace: Max hold. Use the marker-delta function to determine the transmit time per hop. If this value varies with different modes of operation (data rate, modulation format, number of hopping channels, etc.), then repeat this test for each variation in transmit time. Repeat the measurement using a longer sweep time to determine the number of hops over the period specified in the requirements. The sweep time shall be equal to, or less than, the period specified in the requirements. Determine the number of hops over the sweep time and calculate the total number of hops in the period specified in the requirements, using the following equation: (Number of hops in the period specified in the requirements) = (number of hops on spectrum analyzer) × (period specified in the requirements / analyzer sweep time) The average time of occupancy is calculated from the transmit time per hop multiplied by the number of hops in the period specified in the requirements. If the number of hops in a specific time varies with different modes of operation (data rate, modulation format, number of hopping channels, etc.), then repeat this test for each variation. The measured transmit time and time between hops shall be consistent with the values described in the operational description for the EUT.

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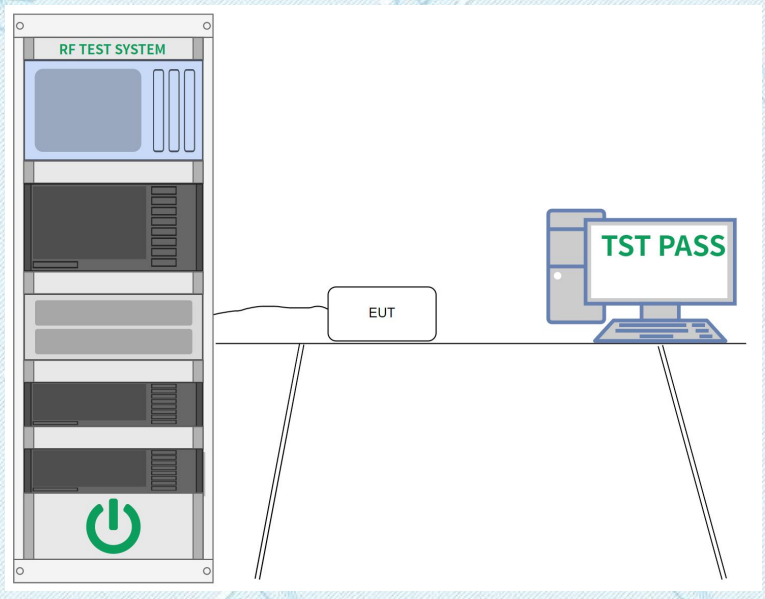
4.2.1. E.U.T. Operation:

Operating Environment:	
Temperature:	24.2 °C
Humidity:	51.3 %
Atmospheric Pressure:	102 kPa
Final test mode:	Test Mode1

4.2.2. Test Setup Diagram:



4.2.3. Test Data:

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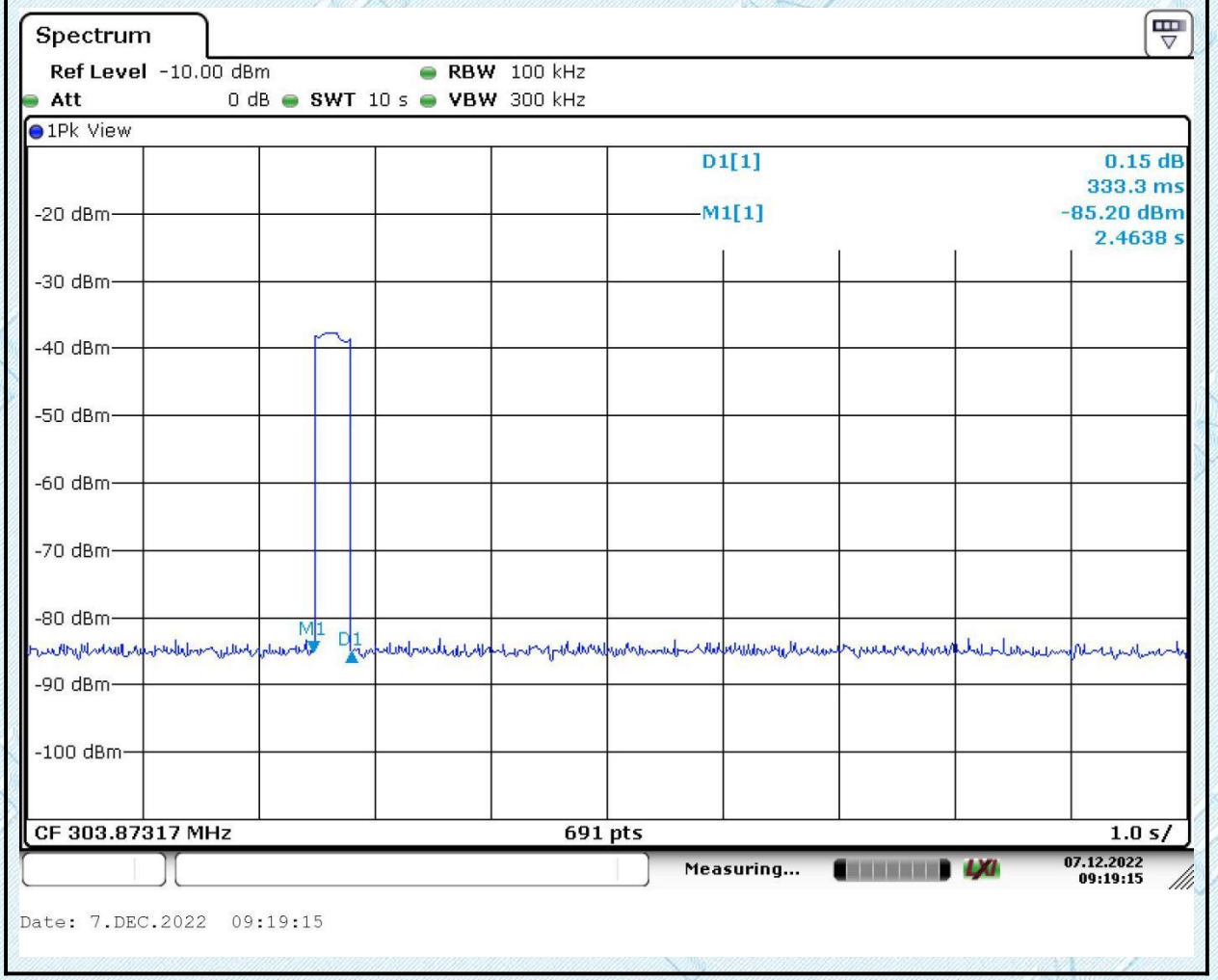
Channel frequency (MHz)	One transmission time (second)	Limit (second)
303.873	0.333	5



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4.3. Duty Cycle

Test Requirement:	47 CFR Part 15.231(b) & (e)
Test Limit:	No limit, only for Report Use.
Test Method:	ANSI C63.10-2013, Section 7.8.4
Procedure:	a) Span: Zero span, centered on a hopping channel. b) RBW shall be channel spacing and where possible RBW should be set >> 1 / T, where T is the expected dwell time per channel. c) Sweep: As necessary to capture the entire dwell time per hopping channel; where possible use a video trigger and trigger delay so that the transmitted signal starts a little to the right of the start of the plot. The trigger level might need slight adjustment to prevent triggering when the system hops on an adjacent channel; a second plot might be needed with a longer sweep time to show two successive hops on a channel. d) Detector function: Peak. e) Trace: Max hold. Use the marker-delta function to determine the transmit time per hop. If this value varies with different modes of operation (data rate, modulation format, number of hopping channels, etc.), then repeat this test for each variation in transmit time. Repeat the measurement using a longer sweep time to determine the number of hops over the period specified in the requirements. The sweep time shall be equal to, or less than, the period specified in the requirements. Determine the number of hops over the sweep time and calculate the total number of hops in the period specified in the requirements, using the following equation: (Number of hops in the period specified in the requirements) = (number of hops on spectrum analyzer) × (period specified in the requirements / analyzer sweep time) The average time of occupancy is calculated from the transmit time per hop multiplied by the number of hops in the period specified in the requirements. If the number of hops in a specific time varies with different modes of operation (data rate, modulation format, number of hopping channels, etc.), then repeat this test for each variation. The measured transmit time and time between hops shall be consistent with the values described in the operational description for the EUT.

4.3.1. E.U.T. Operation:

Operating Environment:	
Temperature:	24.2 °C
Humidity:	51.3 %
Atmospheric Pressure:	102 kPa
Final test mode:	Test Mode1

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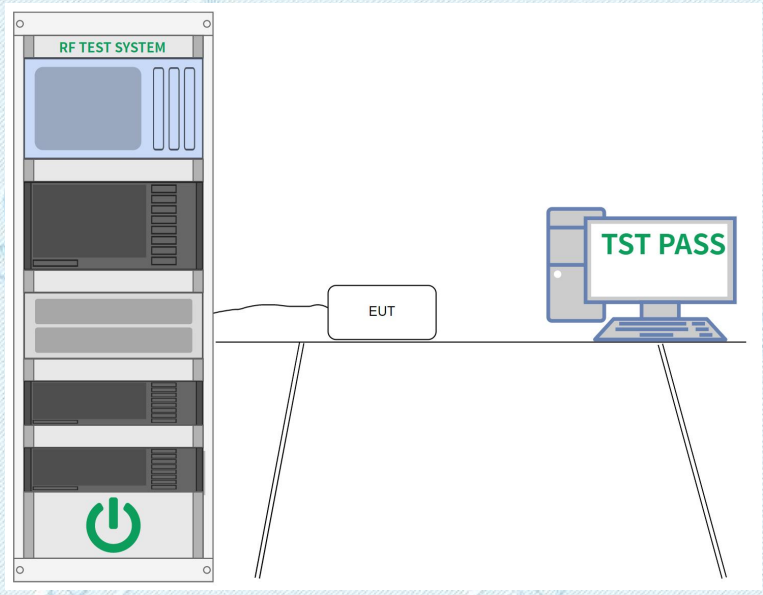
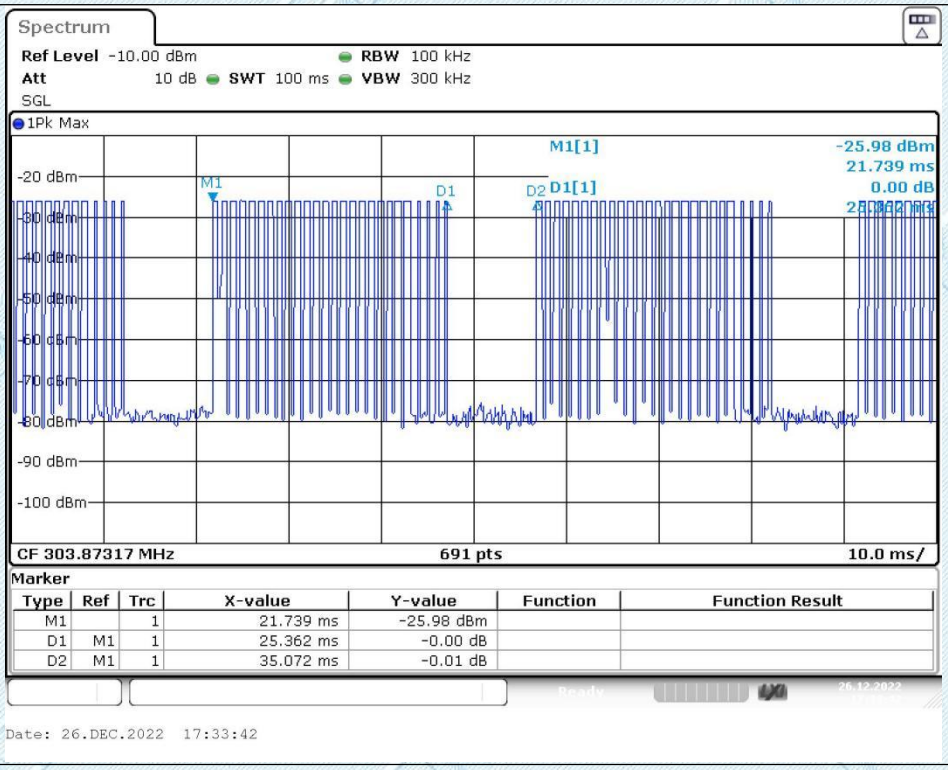
4.3.2. Test Setup Diagram:



4.3.3. Test Data:

T_{on} (s)	$T_{on}+T_{off}$ (s)
0.6957ms*22+0.3043ms*4=16.5226ms=0.0165	0.035
Duty cycle factor (dB)= 20log (Ton / (Ton + Toff)) (dB) = -6.53(dB)	



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4.4. Field Strength of The Fundamental Signal

Test Requirement:	47 CFR Part 15.231(b)
Test Limit:	<table><tr><th>Fundamental frequency (MHz)</th><th>Field strength of fundamental (microvolts/meter)</th><th>Field strength of spurious emissions (microvolts/meter)</th></tr><tr><td>40.66-40.70</td><td>2,250</td><td>225</td></tr><tr><td>70-130</td><td>1,250</td><td>125</td></tr><tr><td>130-174</td><td>[1]1,250 to 3,750</td><td>[1]125 to 375</td></tr><tr><td>174-260</td><td>3,750</td><td>375</td></tr><tr><td>260-470</td><td>[1]3,750 to 12,500</td><td>[1]375 to 1,250</td></tr><tr><td>Above 470</td><td>12,500</td><td>1,250</td></tr></table> [1]Linear interpolations. (1) The above field strength limits are specified at a distance of 3 meters. The tighter limits apply at the band edges.
Test Method:	ANSI C63.10-2013, Section 6.5
Procedure:	Below 1GHz: a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. b. 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. c. 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. d. 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. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. 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 quasi-peak method as specified and then reported in a data sheet. g. Test the EUT in the lowest channel, the middle channel, the Highest channel. h. 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. i. Repeat above procedures until all frequencies measured was complete. Remark: 1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor 2. Scan from 9kHz to 30MHz, the disturbance below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points 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. The disturbance below 1GHz was very low and the harmonics were the highest point could be found when testing, so only the above harmonics had

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	been displayed. Above 1GHz: a. 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. b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. c. 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. d. 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. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. 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 or average method as specified and then reported in a data sheet. g. Test the EUT in the lowest channel, the middle channel, the Highest channel. h. 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. i. Repeat above procedures until all frequencies measured was complete. Remark: 1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor 2. Scan from 18GHz to 40GHz, the disturbance above 18GHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points 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. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report. 4. The disturbance above 18GHz were very low and the harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.

4.4.1. E.U.T. Operation:

Operating Environment:	
Temperature:	25.9 °C
Humidity:	48 %
Atmospheric Pressure:	102 kPa
Final test mode:	Test Mode1

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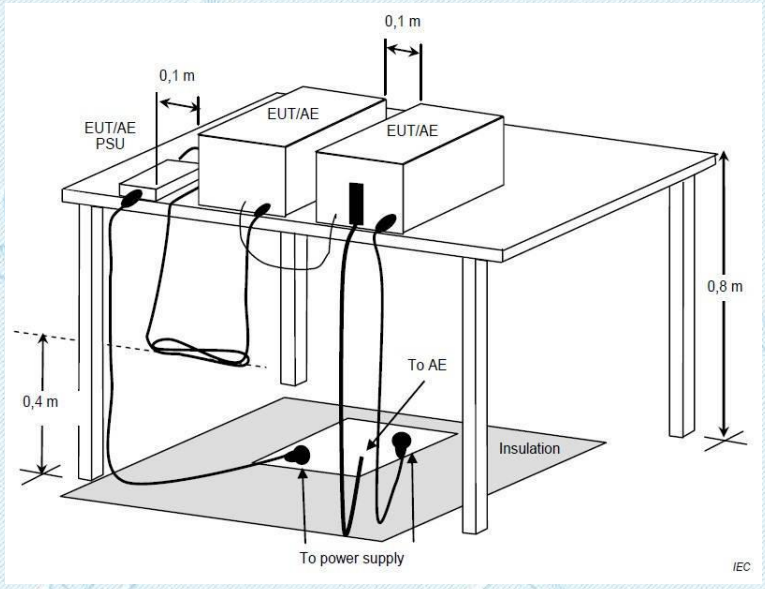
4.4.2. Test Setup Diagram:



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4.4.3. Test Data:

Frequency (MHz)	QP Level (dBuV/m)	QP Level Limit (dBμV/m)	Margin (dB)	Polarization
303.873	74.81	94.93	-20.12	Vertical
303.873	75.74	94.93	-19.19	Horizontal

Frequency (MHz)	QP Level (dBuV/m)	Duty cycle factor(dB)	AV Level (dBuV/m)	AV Level Limit (dBμV/m)	Margin (dB)	Polarization
303.873	74.81	-6.53	68.28	74.93	-6.65	Vertical
303.873	75.74	-6.53	69.21	74.93	-5.72	Horizontal

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4.5. Radiated Emission (below 1GHz)

<table>
<tr><td>Test Requirement:</td><td colspan="3">47 CFR Part 15.231</td></tr>
<tr><td>Test Limit:</td><td colspan="3"><table>
<tr><td>Frequency (MHz)</td><td>Field strength (microvolts/meter)</td><td>Measurement distance (meters)</td></tr>
<tr><td>0.009-0.490</td><td>2400/F(kHz)</td><td>300</td></tr>
<tr><td>0.490-1.705</td><td>24000/F(kHz)</td><td>30</td></tr>
<tr><td>1.705-30.0</td><td>30</td><td>30</td></tr>
<tr><td>30-88</td><td>100 **</td><td>3</td></tr>
<tr><td>88-216</td><td>150 **</td><td>3</td></tr>
<tr><td>216-960</td><td>200 **</td><td>3</td></tr>
<tr><td>Above 960</td><td>500</td><td>3</td></tr>
</table></td></tr>
<tr><td>Test Method:</td><td colspan="3">ANSI C63.10-2013, Section 6.5</td></tr>
<tr><td>Procedure:</td><td colspan="3">Below 1GHz:
a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. 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.
c. 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.
d. 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.
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
f. 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 quasi-peak method as specified and then reported in a data sheet.
g. Test the EUT in the lowest channel, the middle channel, the Highest channel.
h. 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.
i. Repeat above procedures until all frequencies measured was complete.
Remark:
1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor
2. Scan from 9kHz to 30MHz, the disturbance below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points 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. The disturbance below 1GHz was very low and the harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.

Above 1GHz:
a. 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.</td></tr>
</table>

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	b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. c. 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. d. 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. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. 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 or average method as specified and then reported in a data sheet. g. Test the EUT in the lowest channel, the middle channel, the Highest channel. h. 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. i. Repeat above procedures until all frequencies measured was complete. Remark: 1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor 2. Scan from 18GHz to 40GHz, the disturbance above 18GHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points 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. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report. 4. The disturbance above 18GHz were very low and the harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.

4.5.1. E.U.T. Operation:

Operating Environment:	
Temperature:	25.9 °C
Humidity:	48 %
Atmospheric Pressure:	102 kPa
Final test mode:	Test Mode1

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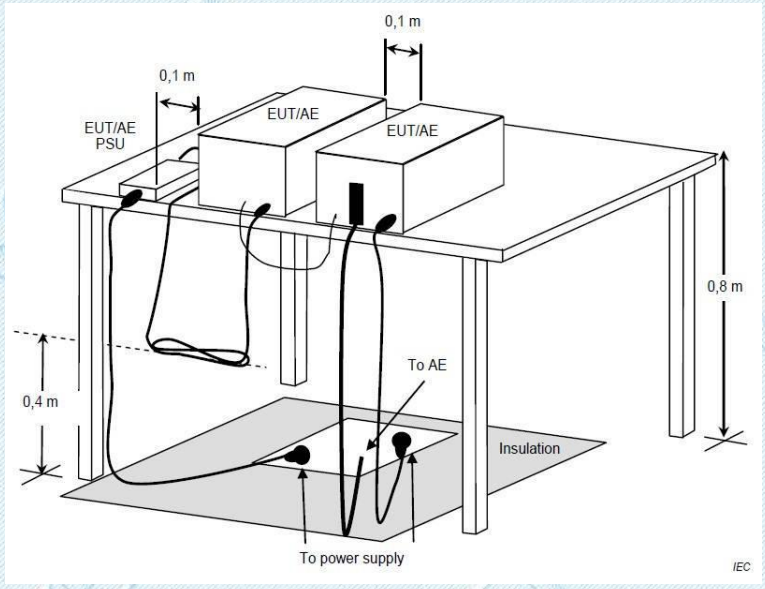
4.5.2. Test Setup Diagram:



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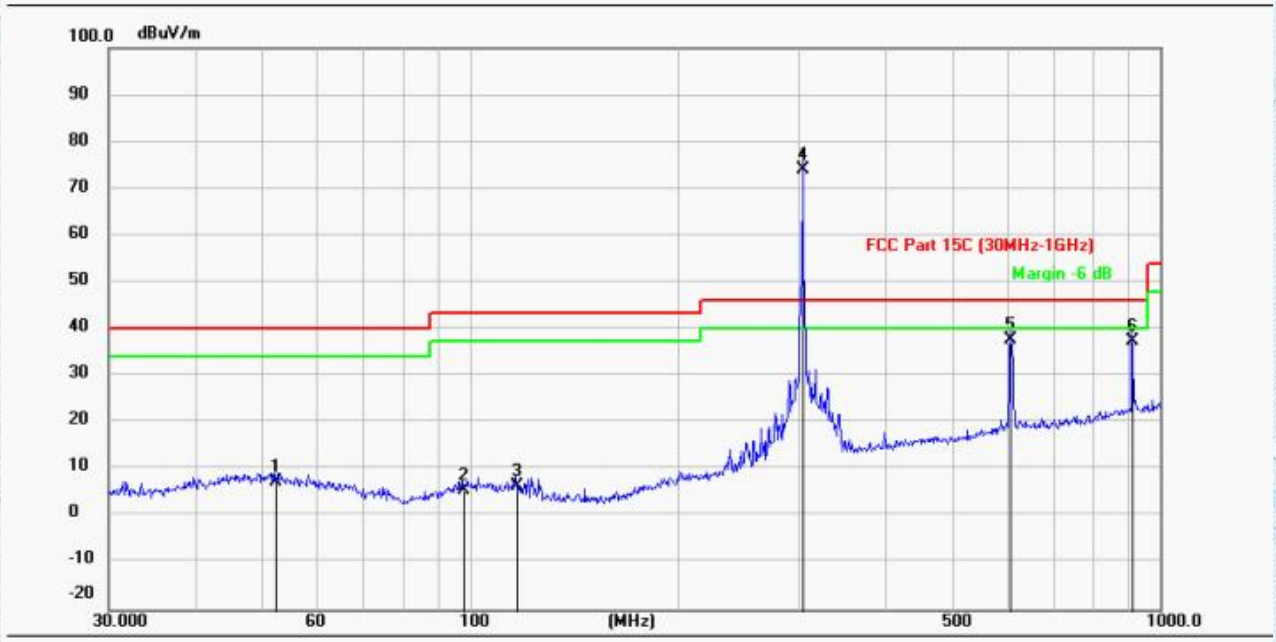
4.5.3. Test Data:

Test Mode1 / Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Detector
1		52.2628	23.42	-16.11	7.31	40.00	-32.69	QP
2		98.0386	23.70	-17.96	5.74	43.50	-37.76	QP
3		116.8264	25.68	-19.10	6.58	43.50	-36.92	QP
4	*	303.8629	88.54	-14.50	74.04	46.00	28.04	QP
5		607.7866	45.47	-7.62	37.85	46.00	-8.15	QP
6		911.9021	41.65	-4.10	37.55	46.00	-8.45	QP

Note:
1.No. 4 is fundamental
2.Measurement=Reading Level+Correct Factor

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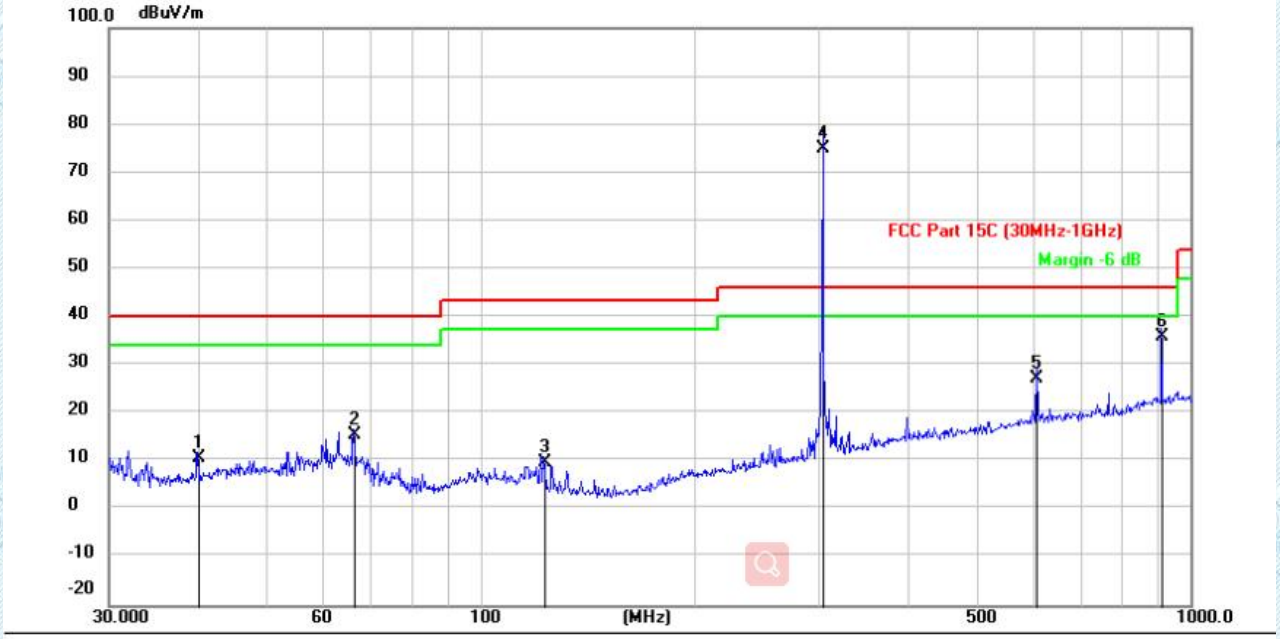
Test Mode1 / Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Detector
1		40.0082	28.01	-17.11	10.90	40.00	-29.10	QP
2		66.3359	34.56	-18.93	15.63	40.00	-24.37	QP
3		123.1359	29.82	-19.82	10.00	43.50	-33.50	QP
4	*	303.8632	89.31	-14.50	74.81	46.00	28.81	QP
5		607.7867	34.96	-7.62	27.34	46.00	-18.66	QP
6		911.9023	39.94	-4.10	35.84	46.00	-10.16	QP

Note:
1.No. 4 is fundamental
2.Measurement=Reading Level+Correct Factor

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4.6. Radiated Emission (above 1GHz)

<table>
<tr><td>Test Requirement:</td><td colspan="3">47 CFR Part 15.231</td></tr>
<tr><td>Test Limit:</td><td colspan="3"><table>
<tr><td>Frequency (MHz)</td><td>Field strength (microvolts/meter)</td><td>Measurement distance (meters)</td></tr>
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</table></td></tr>
<tr><td>Test Method:</td><td colspan="3">ANSI C63.10-2013, Section 6.5</td></tr>
<tr><td>Procedure:</td><td colspan="3">Below 1GHz:
a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. 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.
c. 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.
d. 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.
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
f. 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 quasi-peak method as specified and then reported in a data sheet.
g. Test the EUT in the lowest channel, the middle channel, the Highest channel.
h. 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.
i. Repeat above procedures until all frequencies measured was complete.
Remark:
1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor
2. Scan from 9kHz to 30MHz, the disturbance below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points 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. The disturbance below 1GHz was very low and the harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.

Above 1GHz:
a. 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.</td></tr>
</table>

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	b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. c. 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. d. 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. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. 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 or average method as specified and then reported in a data sheet. g. Test the EUT in the lowest channel, the middle channel, the Highest channel. h. 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. i. Repeat above procedures until all frequencies measured was complete. Remark: 1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor 2. Scan from 18GHz to 40GHz, the disturbance above 18GHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points 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. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report. 4. The disturbance above 18GHz were very low and the harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.

4.6.1. E.U.T. Operation:

Operating Environment:	
Temperature:	25.9 °C
Humidity:	48 %
Atmospheric Pressure:	102 kPa
Final test mode:	Test Mode1

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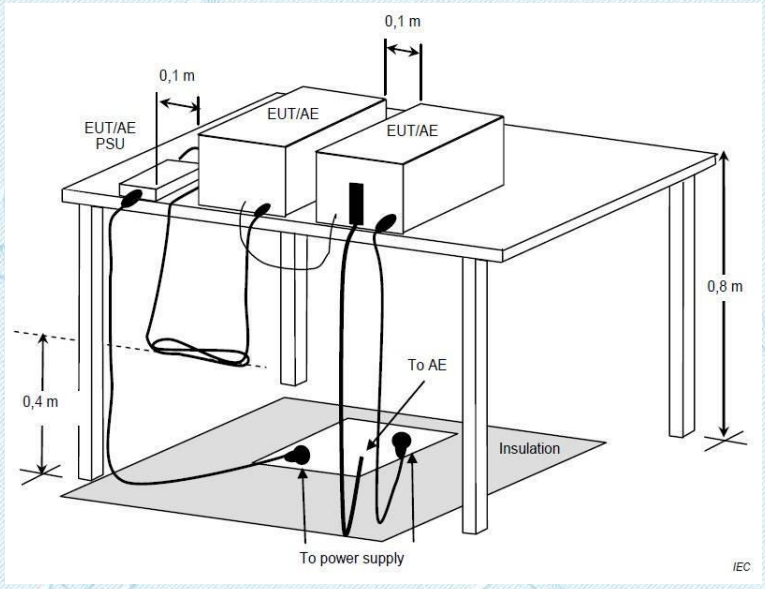
4.6.2. Test Setup Diagram:



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4.6.3. Test Data:

Field Strength of Harmonic

Test Channel			303.873MHz				
Frequency (MHz)	Reading Level (dBuV/m)	Correct Factor (dB)	Final level (dBuV/m)	Limit Line (dBuV/m)	Margin (dB)	Polarization	Test value
1215.492	52.36	-9.56	42.80	74.93	-38.03	Vertical	Peak
1519.365	53.51	-10.01	43.50	74.93	-37.33	Vertical	
1823.238	62.75	-10.99	51.76	74.93	-29.07	Vertical	
2127.111	68.00	-10.52	57.48	74.93	-23.35	Vertical	
1215.492	55.73	-9.59	46.14	74.93	-34.69	Horizontal	
1519.365	56.28	-10.03	46.25	74.93	-34.58	Horizontal	
1823.238	63.08	-10.99	52.09	74.93	-28.74	Horizontal	
2127.111	65.70	-10.52	55.18	74.93	-25.65	Horizontal	

Correct Factor=Antenna Factor + Cable Loss -Preamplifier Factor

Frequency (MHz)	Peak Level (dBuV/m)	Duty cycle factor	AV Level (dBuV/m)	AV Limit (dBμV/m)	Margin (dB)	Polarization
1215.492	42.80	-6.53	36.27	54.93	-18.66	Vertical
1519.365	43.50	-6.53	36.97	54.93	-17.96	Vertical
1823.238	51.76	-6.53	45.23	54.93	-9.70	Vertical
2127.111	57.48	-6.53	50.95	54.93	-3.98	Vertical
1215.492	46.14	-6.53	39.61	54.93	-15.32	Horizontal
1519.365	46.25	-6.53	39.72	54.93	-15.21	Horizontal
1823.238	52.09	-6.53	45.56	54.93	-9.37	Horizontal
2127.111	55.18	-6.53	48.65	54.93	-6.28	Horizontal

Note:Duty cycle factor = 20log (Duty cycle),Duty cycle = T_{on} / (T_{on} + T_{off})

AV Level=Peak Level +Duty cycle factor

Add: West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China
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5. EUT TEST PHOTOS

Radiated Emission (below 1GHz)

Radiated Emission (above 1GHz)


Add: West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China
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6. PHOTOGRAPHS OF EUT CONSTRUCTIONAL

Refer to Appendix - Photographs of EUT Constructional Details for KS2212S5423E.

--THE END--

Add: West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China
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