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FCC ID TEST REPORT

Under
FCC 15 Subpart C, Paragraph 15.245 / RSS - 210 Issue 10
Operation within the band ☒10500–10550 MHz
☒FDS - Part 15 Field Disturbance Sensor

Prepared For:

RISCO LTD.

Hachoma 14 ,75655 Rishon LeZion,Israel

FCC ID: JE4RK200DTG3US
EUT: IND. LUNAR DT AM G3, US
Model: RK200DTG3

November 16, 2020 **Issue Date:**
Original Report **Report Type:**
Test Engineer: Jacky Huang
Review By: Apollo Liu / Manager

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Report Revision History

Report #	Version	Description	Issued Date
KSZ2020090401J01	Rev.01	Initial issue of report	November 10, 2020
KSZ2020090401J01	Rev.02	Update clause 1.6 & 5.6 & 5.7 of report	November 16, 2020

1. General Information

1. 1 Notes

The test results of this report relate exclusively to the test item specified in 1.6. The KMO Lab does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of the KMO Lab.

1. 2 Testing Laboratory

Test Firm Name:	**Ke Mei Ou Lab Co., Ltd.**
Test Firm Address:	2013-2016, 20th Floor, Business Center, Jiahui Xin Cheng, No 3027, Shen Nan Road, Fu Tian, Shen Zhen, Guang Dong, P. R. China
FCC Designation Number:	CN1532
Test Firm Registration Number:	344480
Internet:	www.kmolab.com
Email:	kmo@kmolab.com
ANSI-ASQ National Accreditation Board/ACLASS ISO/IEC 17025 Accredited Lab for telecommunication standards. The Registration Number is AT-1532. The testing quality system meets with ISO/IEC-17025 requirements, This approval results is accepted by MRA of ILAC.	

1. 3 Details of Applicant

Name	RISCO LTD.
Address	Hachoma 14 ,75655 Rishon LeZion,Israel

1. 4 Application Details

Date of Receipt of Application	: September 4, 2020
Date of Receipt of Test Item	: September 21, 2020
Date of Test	: October 9 ~ November 9, 2020

1. 5 Details of Manufacturer

Name	RISCO LTD.
Address	Sderot Yahalom 6 Kiryat Gat, Israel

1. 6 Test Item

EUT Feature	
EUT Description:	IND. LUNAR DT AM G3, US
Brand Name:	RISCO
Model Name:	RK200DTG3
Equipment Class:	☒FDS - Part 15 Field Disturbance Sensor
HW Version:	A
SW Version:	V28
PCB P/N:	1PC200DTG300F
EUT Stage:	☐Identical Prototype ☒Production
Note: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.	

Additional Information

Standard Product Specification				
Tx/Rx Frequency Range	☐902–928 MHz, ☐2435–2465 MHz, ☐5785–5815 MHz,		☒10500–10550 MHz, and ☐24075–24175 MHz	
Number of Channels	1			
Type of radio transmission:	Single Carrier			
Antenna Type / Gain	Chain Number	Antenna Gain	Internal	External
Antenna Type / Gain	1	0dBi	☐Dielectric Chip ☐PIFA ☒PCB	☐Dipole ☐Whip
Type of Modulation	☐N0N ☒CW			
EUT Operational Condition	☐AC			
	☒DC → 9~16Vdc ☐From Battery → ☐External AC adapter ☐POE			
	☐Li-ion battery			
Specification of Accessory				
☐**AC/DC Adapter #1 (Charger)**	**Brand Name**	N/A	**Model Name**	N/A
	Power Rating	N/A		

1. 7 Applicable Standards

Applicable Standards	
According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards: FCC Part 15 Subpart C 15.245 ANSI C63.10-2013	
Note:	1)All test items were verified and recorded according to the standards and without any deviation during the test. 2)This EUT has also been tested and complied with the requirements of FCC 15 Part 15, Subpart B, recorded in a separate test report.

2. Technical Test

2. 1 Summary of Test Results

The EUT has been tested according to the following specifications:

FCC Rules	Test Type	Limit	Result	Notes
15.215(c)	Occupied Bandwidth	N/A	PASS	Complies.
15.245(b)	Field Strength of Fundamental	FCC 15.209(a) & 15.245(b)	PASS	Complies.
15.245(b)	Transmitter Spurious Emissions	FCC 15.209(a) & 15.245(b)	PASS	Complies.
15.207	AC Power Conducted Emission	FCC15.207(a)	N/A	Not Applicable
15.203	Antenna Requirement	N/A	PASS	Complies
2.1091	Maximum Permissible Exposure (MPE)	< 1mW/cm^2	PASS	Complies

2. 2 Antenna Requirement

A. Regulation

Per § 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. 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. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

B. Result

☒EUT has one internal PCB antenna, which was permanently attached and the gain is 0 dBi.
☒EUT has not any provisions for connect to an external antenna.
Therefore the EUT complies with Section 15.203 of the FCC rules.

2. 3 Measurement Uncertainty

Measurement	Frequency	Uncertainty
Conducted emissions	0.15MHz ~ 30MHz	1.72
Radiated emissions	30MHz ~ 300MHz	3.88
Radiated emissions	300MHz ~1000MHz	3.86
Radiated emissions	1GHz ~ 18GHz	4.42
Radiated emissions	18GHz ~ 40GHz	4.65
Radiated emissions	40GHz ~ 220GHz	4.82

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

2. 4 Test Configuration

Tx Test Mode

The following summary table is showing all test modes to demonstrate in compliance with the standard.

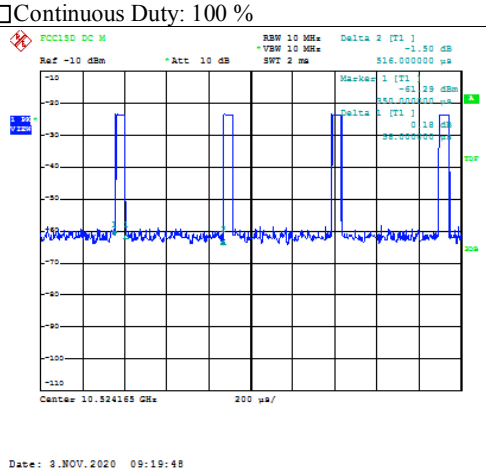
Summary Tables of Test Mode			
Test Item	**Modulation**	**Data Rate**	**Channel Plan**
Conducted Cases	CW	-	10.525 GHz
Radiated Cases	CW	-	10.525 GHz
AC Conducted Emission	EUT is power by DC.		
Note: 1)The worst case of conducted emission is channel 1; only the worst case was reported. 2)For Radiated case, the tests were performed with PCB antenna.			

EUT Operation Test Setup		
Pre-Scan has been conducted to determine the worst-case mode from all possible combinations. Only the worst test mode data was reported. For Tx function, the engineering test program was provided and enabled to make EUT link with controller to continuous transmit/receive. For AC power line conducted emissions, the EUT was set to working normal.		
Pre-Scan Mode		
Test Mode	**Operating Description**	
1	CW / 10.525 GHz	
Conducted Emissions → Final		
Occupied Bandwidth	**Test Mode**	1
AC Conducted Emissions → Final		
Test Mode	1	
Radiated Emissions → Final		
Test Mode	1	
Note: The test modes were carried out for all operation modes (include link and idle). The final test mode of the EUT was the worst test mode for Mode 1, and its test data was reported.		

EUT Duty Cycle

☐Continuous Duty: 100 %

☒Intermittent Duty: 11.24 %

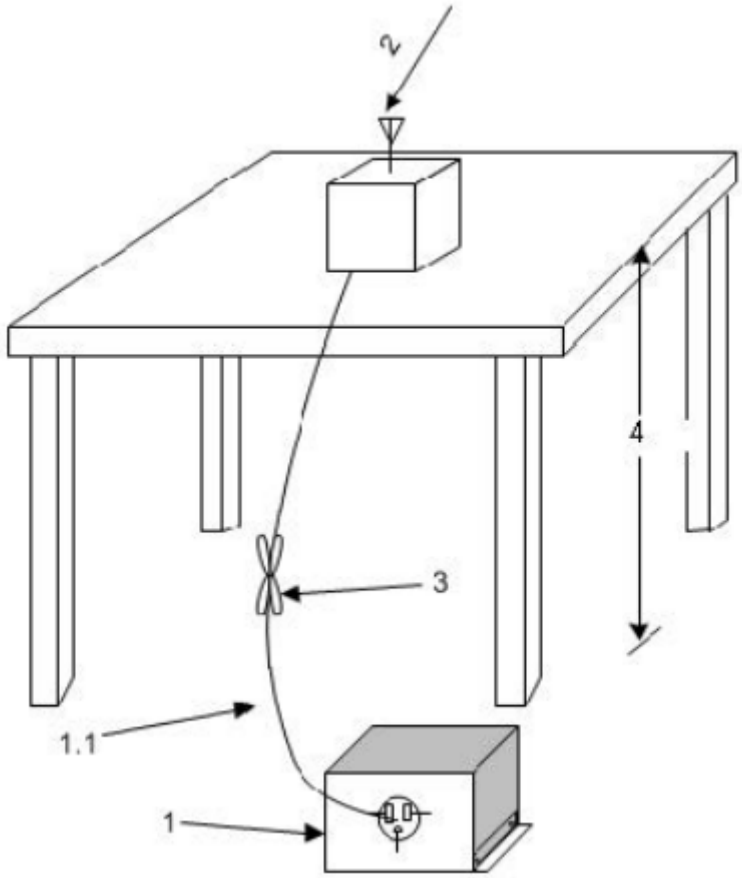


Ton (µs)	Tp (ms)	Duty Cycle	DC Factor
58	0.516	11.24%	-18.98

Note:
Duty Cycle=Ton/Tp*100%,
Duty Cycle factor = 20lg (Duty Cycle)

§ 15.35(c)
Per FCC Part 15.35(c), an average radiated field strength can be determined by applying a duty cycle correction factor to a measured peak radiated field strength level. The duty cycle correction factor is determined based on the worst operation over a 100ms time period on any given channel.

Support Unit				
Device	**Manufacturer**	**Model # Serial #**	**FCC ID/ DoC**	**Cable**
-	-	-	-	-

☒ANSI C63.10:2013 - Test arrangement for radiated emissions

1—A LISN is optional for radiated measurements between 30 MHz and 1000 MHz but not allowed for measurements below 30 MHz and above 1000 MHz. If used, then connect EUT to one LISN. Unused LISN measuring port connectors shall be terminated in 50 Ω loads. The LISN may be placed on top of, or immediately beneath, the reference ground plane. 1.1—LISN spaced at least 80 cm from the nearest part of the EUT chassis. 2—Antenna can be integral or detachable, depending on the EUT. 3—Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 cm to 40 cm long. 4—For emission measurements at or below 1 GHz, the table height shall be 80 cm. For emission measurements above 1 GHz, the table height shall be 1.5 m for measurements, except as otherwise specified.

3. EUT Modifications

No modification by test lab.

4. Conducted Power Line Test

4. 1 Test Equipment

Please refer to Section 10 this report.

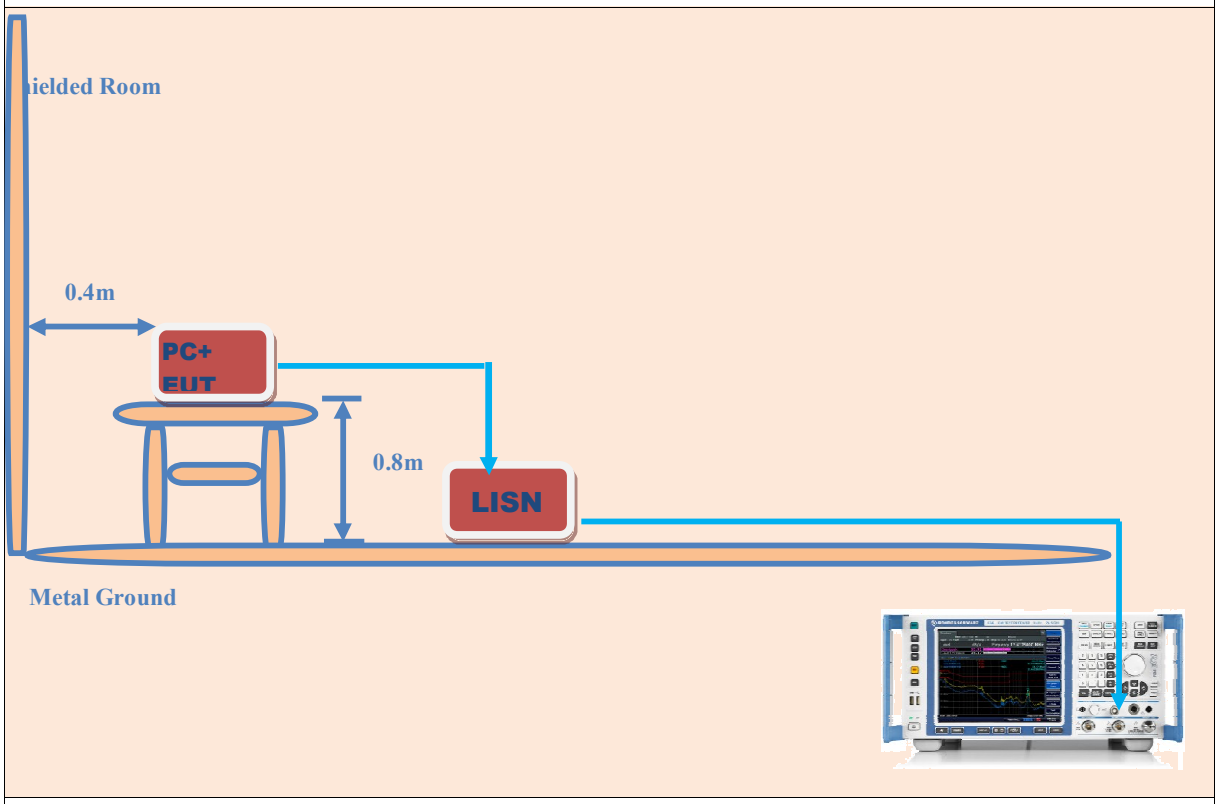
4. 2 Test Procedure

Test Method	
☒	The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission., the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10:2013 on conducted measurement. Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

4. 3 Test Setup

Test Setup

AC Line Conducted Emissions



This test is applicable for radio equipment and/or ancillary equipment for fixed use powered by the AC mains.
This test shall be performed on a representative configuration of the radio equipment, the associated ancillary equipment, or a representative configuration of the combination of radio and ancillary equipment.
This test assesses the level of internally generated electrical noise present on the AC power input/output ports.

4. 4 Configuration of the EUT

Refer to section 2.4 of this test report.

4. 5 EUT Operating Condition

Refer to section 2.4 of this test report.

4. 6 Conducted Power Line Emission Limits

FCC Part 15 Paragraph 15.207 (dBuV)	
Frequency Range (MHz)	**QP/AV**
0.15 – 0.5	66-56/56-46
0.5 – 5.0	56/46
5.0 - 30	60/50

Note: In the above table, the tighter limit applies at the band edges.

4. 7 Conducted Power Line Test Result

Note: The EUT consumes the power from the DC source, therefore, AC power conducted emission test is not applicable.

5. Radiated Emission Test for FCC Part 15.245

5. 1 Test Equipment

Please refer to Section 10 this report.

5. 2 Test Procedure

The radiated emissions test below 30 MHz is performed in the following steps:					
Frequency (MHz)	**RBW(kHz)**	**Step Size(kHz)**	**Pre-Scan**	**Pre-Scan with FFT**	**Final Scan**
0.009 ~ 0.15	0.2	≤0.1	Peak, Average	Peak Quasi-Peak, Average	Peak Quasi-Peak, Average
0.15 ~ 30	9	≤4.5	Peak, Average	Peak Quasi-Peak, Average	Peak Quasi-Peak, Average

The EUT was tested according to ANSI C63.10:2013.
a) The loop antenna is positioned with its plane perpendicular to the ground with the lowest height of the antenna 1 m above the ground.
b) The EUT is placed in its standard position on a turntable capable of rotation through 360° in the horizontal plane and arranged as tabletop or floor-standing equipment, as applicable. The EUT is switched on.
c) The measurement equipment is connected to the loop antenna and set-up according to the specifications of the test.
d) The EUT is turned to a position likely to get the maximum and the test antenna is rotated to detect the maximum of the fundamental in this EUT position.
e) Then the EUT is rotated in a horizontal plane through 360° in steps of 45°. Starting at 0°, at each table position the spectrum for the full frequency range is recorded. If the emission at a certain frequency is higher than the levels already recorded, the current table position is noted as the maximum position.
f) After the last pre-scan, the significant maximum emissions and their table positions are determined and collected in a list.
g) With the test receiver set to the first frequency of the list, the EUT is rotated by ±45° around the table position found during pre-scans while measuring the emission level continuously. For final scan, the worst-case table position is set and the maximum emission level is recorded.
h) Step g) is repeated for all other frequencies in the list.
i) Finally, for frequencies with critical emissions the loop antenna is rotated again to find the maximum of emission. At least, frequency and level of the six highest emissions relative to the limit have to be recorded. However, emissions more than 20 dB below the limit do not need to be reported.
If the EUT may be used in various positions, steps a) to i) are repeated in two other orthogonal positions. If the EUT may be used in one position only, steps a) to i) are repeated in one orthogonal position.

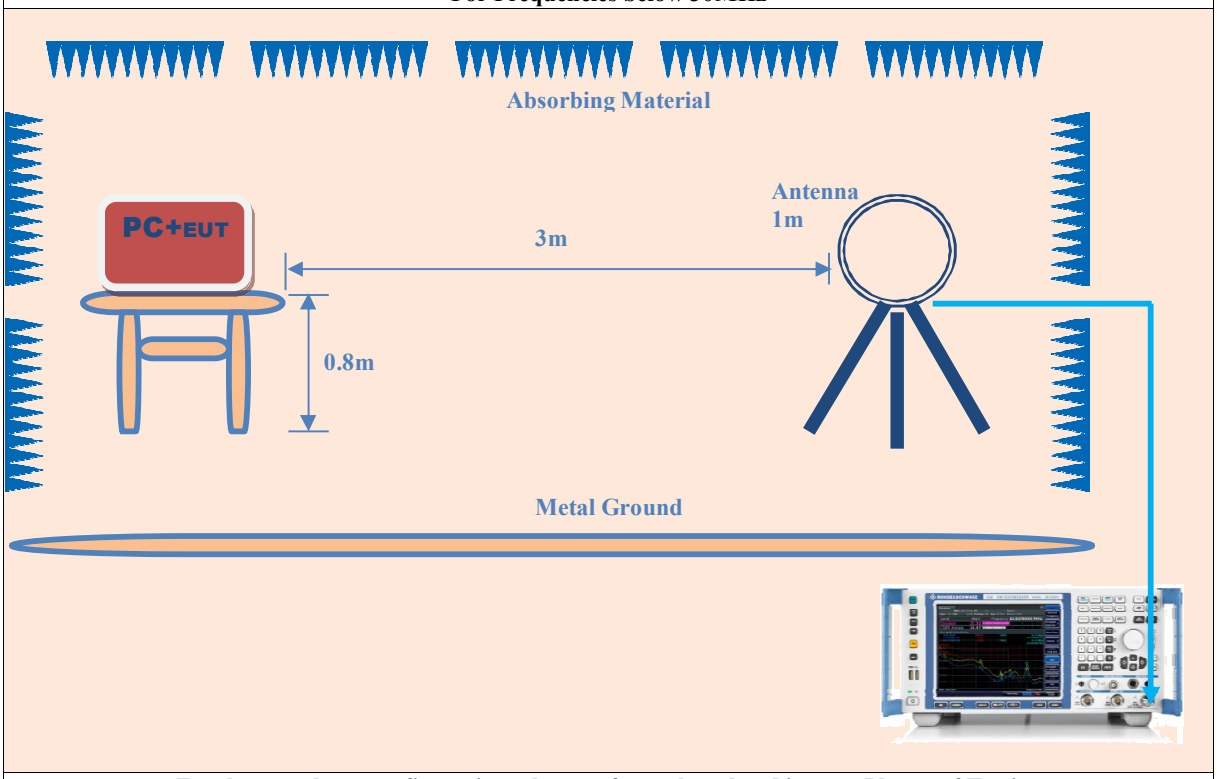
The radiated emissions test from 30 MHz to 960 MHz is performed in the following steps:					
Frequency (MHz)	**RBW(kHz)**	**Step Size(kHz)**	**Pre-Scan**	**Pre-Scan with FFT**	**Final Scan**
30 ~ 960	120	≤60	Peak	Quasi-Peak	Quasi-Peak

The EUT was tested according to ANSI C63.10:2013.
a) The measurement antenna is oriented initially for vertical polarization.
b) The EUT is placed in its standard position on a turntable capable of rotation through 360° in the horizontal plane and arranged as tabletop or floor-standing equipment, as applicable. The EUT is switched on.
c) The measurement equipment is connected to the measurement antenna and set-up according to the specifications of the test
d) The table position is set to 0°.
e) The antenna height is set to 1 m.
f) The spectrum for the full frequency range is recorded. If the emission at a certain frequency is higher than the levels already recorded, the polarization and height of the measurement antenna as well as the current table position are noted as the maximum position.
g) The antenna height is increased to 4 m in steps of 50 cm. At each height, step f) is repeated.
h) The polarization of the measurement antenna is changed to horizontal.
i) The antenna height is decreased from 4 m to 1 m in steps of 50 cm. At each height, step f) is repeated.
j) The EUT is rotated in a horizontal plane through 360° in steps of 60°. At each table position, steps e) to i) are repeated.
k) After the last pre-scan, the significant maximum emissions with their polarizations and heights of the measurement antenna as well as their table positions are determined and collected in a list.
l) With the test receiver set to the first frequency of the list, the measurement antenna is set to the polarization and height and the table is moved to the position as determined during pre-scans.
m) The antenna is moved by ±50 cm around this height and the EUT is rotated by ±60° around this table position while measuring the emission level continuously.
n) For final scan, the worst-case positions of antenna and table are set and the maximum emission level is recorded.
o) Steps l) to n) are repeated for all other frequencies in the list. At least, frequency and level of the six highest emissions relative to the limit have to be recorded. However, emissions more than 20 dB below the limit do not need to be reported.
If the EUT may be used in various positions, steps a) to o) are repeated in two other orthogonal positions.

The radiated emissions test above 960 MHz is performed in the following steps:					
Frequency (MHz)	**RBW(kHz)**	**VBW(kHz)**	**Sweep Time**	**Detector**	**Trace Mode**
>960	1000	3000	AUTO	PK/AV	Max Hold
Radiated emissions above 960 MHz are measured according to clause 6.6 of ANSI C63.10 by conducting exploratory and final radiated emission tests. According to clause 6.6.4.1 of ANSI C63.10, measurements may be performed at a distance closer than that specified in the requirements. However, an attempt shall be made to avoid making final measurements in the near field of both the measurement antenna and the EUT. Final radiated emissions above 1 GHz are measured in a semi-anechoic chamber (SAC) with RF absorbing material on the floor between measurement antenna and EUT. The measurement distance is shown in the appropriate tests. The emissions of the EUT are recorded with an EMI test receiver.					

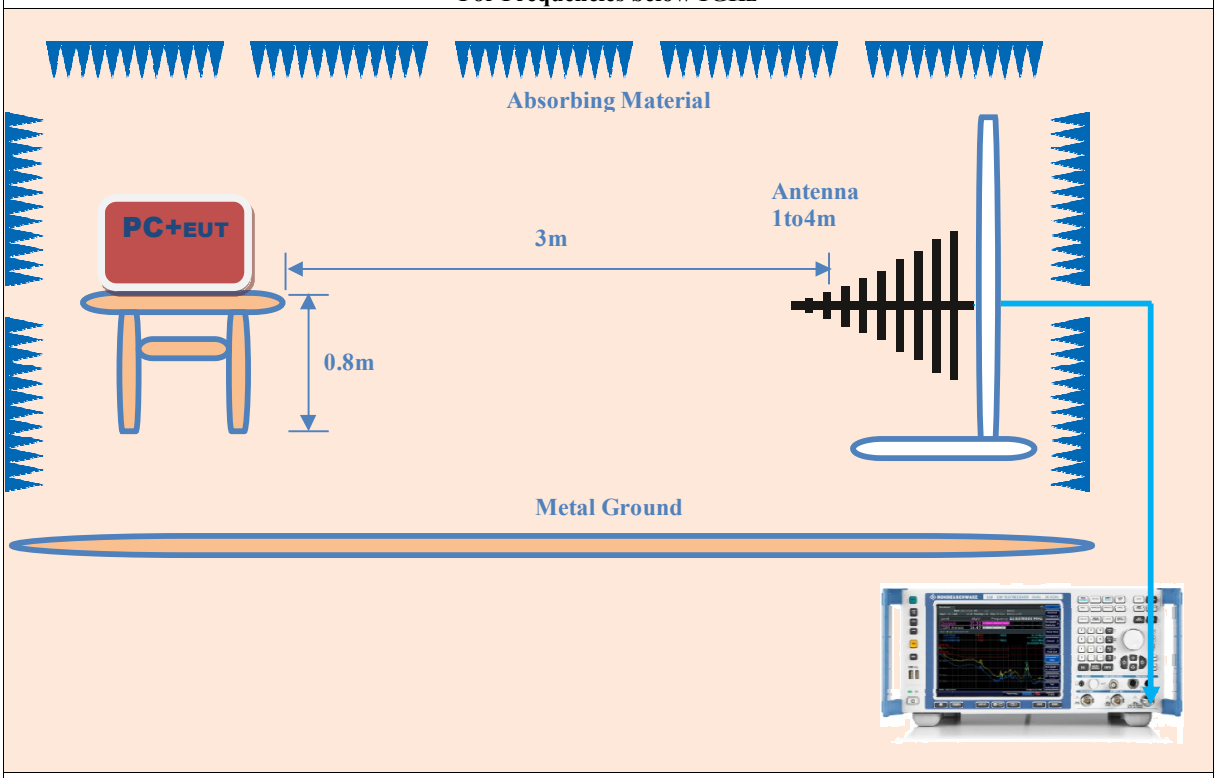
5. 3 Radiated Test Setup

For Frequencies below 30MHz



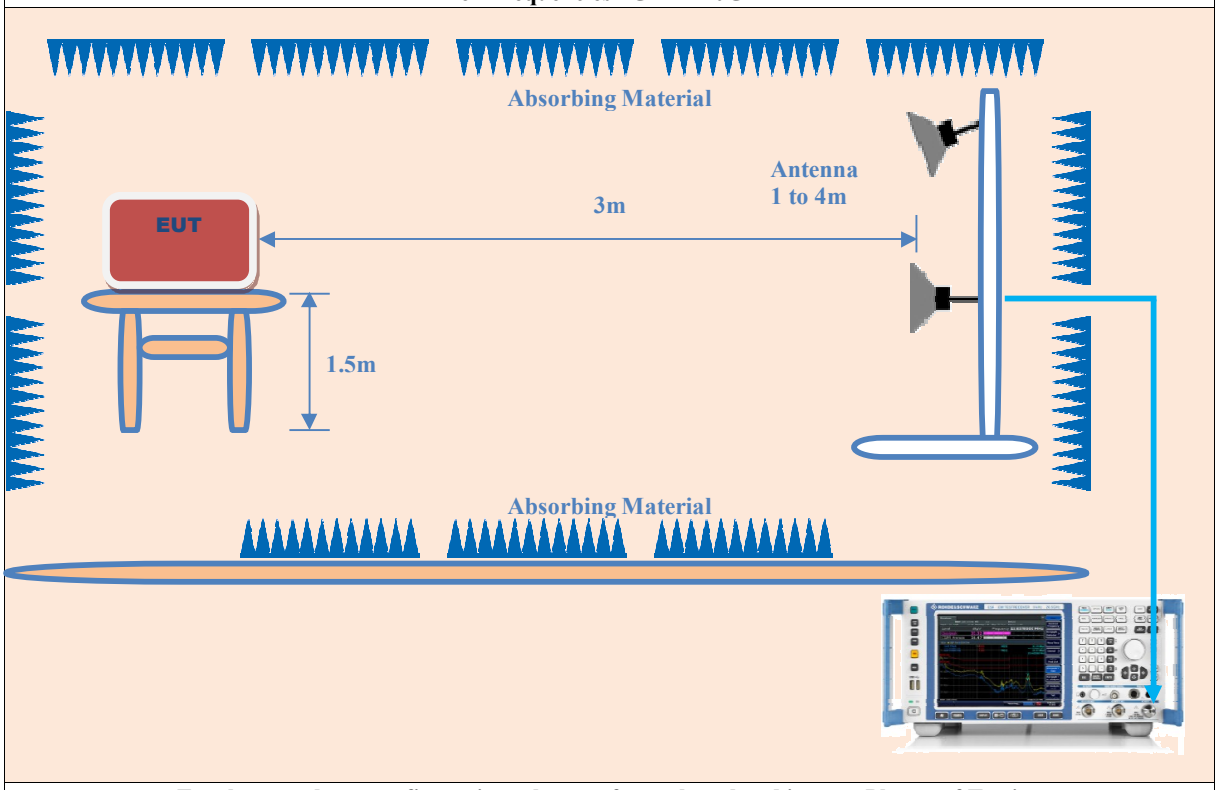
For the actual test configuration, please refer to the related items – Photos of Testing

For Frequencies below 1GHz



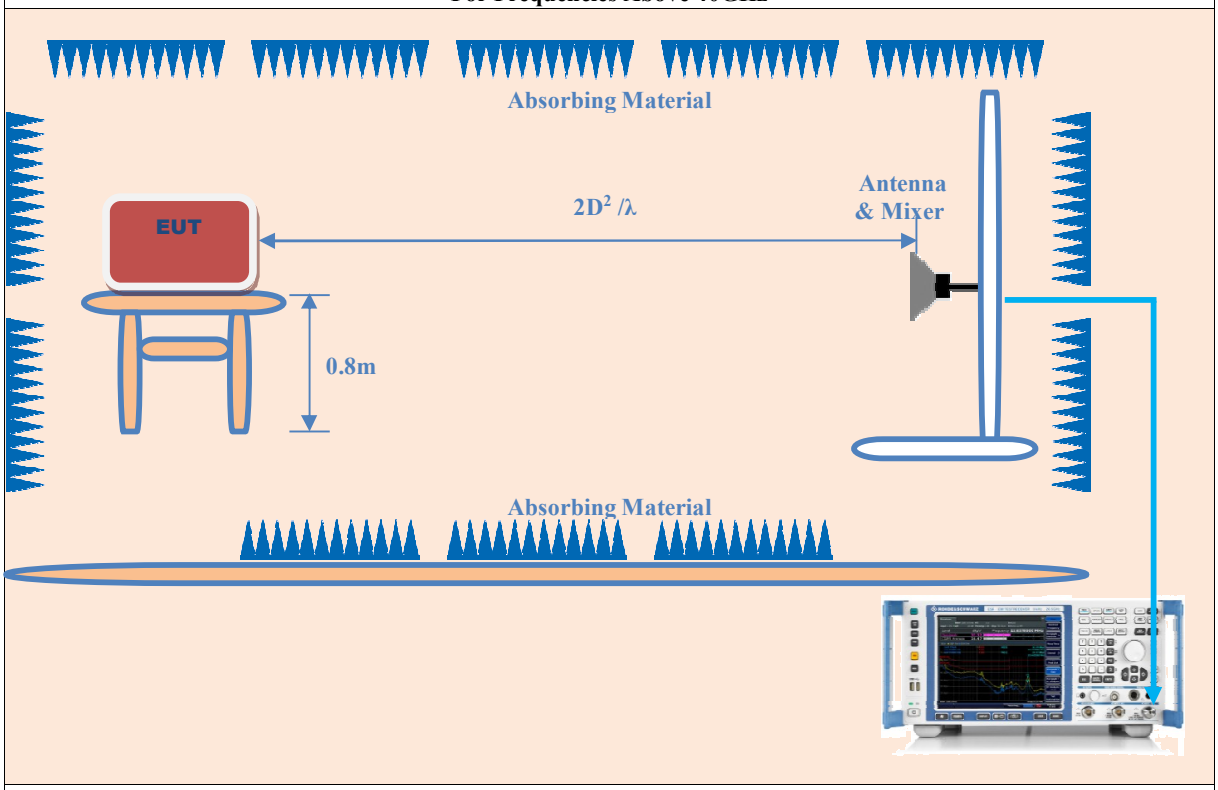
For the actual test configuration, please refer to the related items – Photos of Testing

For Frequencies 1GHz ~ 40GHz



For the actual test configuration, please refer to the related items – Photos of Testing

For Frequencies Above 40GHz



For the actual test configuration, please refer to the related items – Photos of Testing

Although it is preferred that measurements are made in the far field or at the distance at which the applicable limit is specified (e.g., 3 m), this is not always practicable. The far-field boundary distance formula ($\lambda/2\pi$) presented elsewhere in this document for measurements below 30 MHz is applicable where D (largest antenna dimension) << λ (wavelength). For many mm-wave measurements, D >> λ and a more suitable formula for the far-field boundary distance is $2D^2/\lambda$. Even for mm-wave measurements not made in the far field, a linear distance attenuation factor (field strength decay of 20 dB/decade of distance) has been determined to be generally representative and is the default specified by regulatory authorities.

5. 4 Configuration of the EUT

Same as section 2.4 of this report

5. 5 EUT Operating Condition

Same as section 2.4 of this report

5. 6 Radiated Emission Limit

5. 6.1 Field strength of fundamental (15.245(b))

Frequency (MHz)	Field Strength @3m (mV/m)		Field Strength @3m (dBuV/m)	
			Peak	Average
902 ~ 928	5000	500	134	114
2435 ~ 2465	5000	500	134	114
5785 ~ 5815	5000	500	134	114
10500 ~ 10550	25000	2500	148	128
24075 ~ 24175	25000	2500	148	128

5. 6.2 Field strength of harmonics (15.245(b))

Frequency (MHz)	Field Strength @3m (mV/m)		Field Strength @3m (dBuV/m)			
	Harmonic emissions in the ->					
	Restricted bands	Non-restricted bands	Restricted bands		Non-restricted bands	
			Peak	Average	Peak	Average
☐902 ~ 928	FCC 15.209 limit	1.6	FCC 15.209 limit		84	64
	Except harmonic emissions spurious emission		Except harmonic emissions spurious emission			
			Peak		Average	
	Note		Note			
Frequency (MHz)	Field Strength @3m (mV/m)		Field Strength @3m (dBuV/m)			
	Harmonic emissions in the ->					
	Restricted bands at & below 17.7 GHz	Restricted bands at & above 17.7 GHz	Restricted bands at & below 17.7 GHz		Restricted bands at & above 17.7 GHz	
			Peak	Average	Peak	Average
☐2435 ~ 2465 / ☐5785 ~ 5815	FCC 15.209 limit	7.5	FCC 15.209 limit		97.5	77.5
	Harmonic emissions in the ->Non-restricted bands	Except harmonic emissions spurious emission	Harmonic emissions in the ->Non-restricted bands		Except harmonic emissions spurious emission	
			Peak	Average	Peak	Average
	1.6	Note	84	64	Note	
Frequency (MHz)	Field Strength @3m (mV/m)		Field Strength @3m (dBuV/m)			
	Harmonic emissions in the ->					
	Restricted bands at & above 17.7 GHz	Non-restricted bands	Restricted bands at & above 17.7 GHz		Non-restricted bands	
			Peak	Average	Peak	Average
☒10500 ~ 10550	7.5	25	97.5	77.5	108	88
	Except harmonic emissions spurious emission		Except harmonic emissions spurious emission			
			Peak		Average	
	Note		Note			
Frequency (MHz)	Field Strength @3m (mV/m)		Field Strength @3m (dBuV/m)			
	Harmonic emissions in the -> Second & third harmonics	Except harmonic emissions spurious emission	Harmonic emissions in the -> Second & third harmonics		Except harmonic emissions spurious emission	
			Peak	Average	Peak	Average
☐24075 ~ 24175	25	Note	108	88	Note	

Note: FCC 15.209 limit or 50 dB below the fundamental, whichever is the lesser attenuation.

(1) Regardless of the limits shown in the above table, harmonic emissions in the restricted bands below 17.7 GHz, as specified in § 15.205, shall not exceed the field strength limits shown in § 15.209. Harmonic emissions in the restricted bands at and above 17.7 GHz shall not exceed the following field strength limits:

(i) For the second and third harmonics of field disturbance sensors operating in the 24075-24175 MHz band and for other field disturbance sensors designed for use only within a building or to open building doors, 25.0 mV/m.

(ii) For all other field disturbance sensors, 7.5 mV/m.

(iii) Field disturbance sensors designed to be used in motor vehicles or aircraft must include features to prevent continuous operation unless their emissions in the restricted bands, other than the second and third harmonics from devices operating in the 24075-24175 MHz band, fully comply with the limits given in § 15.209. Continuous operation of field disturbance sensors designed to be used in farm equipment, vehicles such as fork lifts that are intended primarily for use indoors or for very specialized operations, or railroad locomotives, railroad cars and other equipment which travels on fixed tracks is permitted. A field disturbance sensor will be considered not to be operating in a continuous mode if its operation is limited to specific activities of limited duration (e.g., putting a vehicle into reverse gear, activating a turn signal, etc.).

(2) Field strength limits are specified at a distance of 3 meters.

(3) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in § 15.209, whichever is the lesser attenuation.

(4) The emission limits shown above are based on measurement instrumentation employing an average detector. The provisions in § 15.35 for limiting peak emissions apply.

5. 6.3 Tx spurious emissions (15.245(b), 15.209)

FCC CFR 47, Part 15, Subpart C, Para, 15.205(a) – Restricted Frequency Bands

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 – 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	([2])
13.36 - 13.41	--	--	--

[1]UntilFebruary1,1999,thisrestrictedbandshallbe0.490–0.510MHz.
[2]Above38.6

FCC 47 CFR, Part 15.209(a) – Field Strength Limits within Restricted Frequency Bands

Frequency (MHz)	Field Strength (µV/m)	Field Strength @3m (dBuV/m)
0.009 ~ 0.490	2,400/F (F in kHz)	128.5 ~ 93.8
0.490 ~ 1.705	24,000/F (F in kHz)	73.8 ~ 63
1.705 ~ 30	30	69.5
30 ~ 88	100	40
88 ~ 216	150	43.5
216 ~ 960	200	46
Above 960	500	53.9

FCC 47 CFR, Part 15.33 – Frequency range of radiated measurements.

	(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 this paragraph:
☐	(1) If the intentional radiator operates below 10 GHz: to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
☒	(2) If the intentional radiator operates at or above 10 GHz and below 30 GHz: to the fifth harmonic of the highest fundamental frequency or to 100 GHz, whichever is lower.
☐	(3) If the intentional radiator operates at or above 30 GHz: to the fifth harmonic of the highest fundamental frequency or to 200 GHz, whichever is lower, unless specified otherwise elsewhere in the rules.
☐	(4) If the intentional radiator operates at or above 95 GHz: To the third harmonic of the highest fundamental frequency or to 750 GHz, whichever is lower, unless specified otherwise elsewhere in the rules.
☐	(5) If the intentional radiator contains a digital device, regardless of whether this digital device controls the functions of the intentional radiator or the digital device is used for additional control or function purposes other than to enable the operation of the intentional radiator, the frequency range shall be investigated up to the range specified in paragraphs (a)(1) through (4) of this section or the range applicable to the digital device, as shown in paragraph (b)(1) of this section, whichever is the higher frequency range of investigation.

5. 7 Radiated Emission Test Result

☒Test Mode 1			Field strength of fundamental & harmonic -> up to fifth harmonic								
Freq. (MHz)	Read Level (dBuV)		Factor (dB)	Emission (dBuV/m)		Horiz./ Vert.	@m	Limit (dBuV/m)		Margin(dB)	
	PK	AV		PK	AV			PK	AV	PK	AV
10525.00	72.73	72.03	24.00	96.73	96.03	Vert.	3.00	148.00	128.00	-51.27	-31.97
10525.00	78.97	75.75	24.00	102.97	99.75	Horiz.	3.00	148.00	128.00	-45.03	-28.25
21058.00	43.98	40.99	6.22	50.20	47.21	Horiz.	3.00	97.50	77.50	-47.30	-
21058.00	44.82	44.47	6.22	51.04	50.69	Vert.	3.00	97.50	77.50	-46.46	-
31574.00	45.12	44.45	15.18	60.30	59.63	Horiz.	3.00	97.50	77.50	-37.20	-17.87
31574.00	46.22	45.62	15.18	61.40	60.80	Vert.	3.00	97.50	77.50	-36.10	-16.70
-	-	-	-	-	-	Vert.	3.00	-	-	-	-
-	-	-	-	-	-	Horiz.	3.00	-	-	-	-

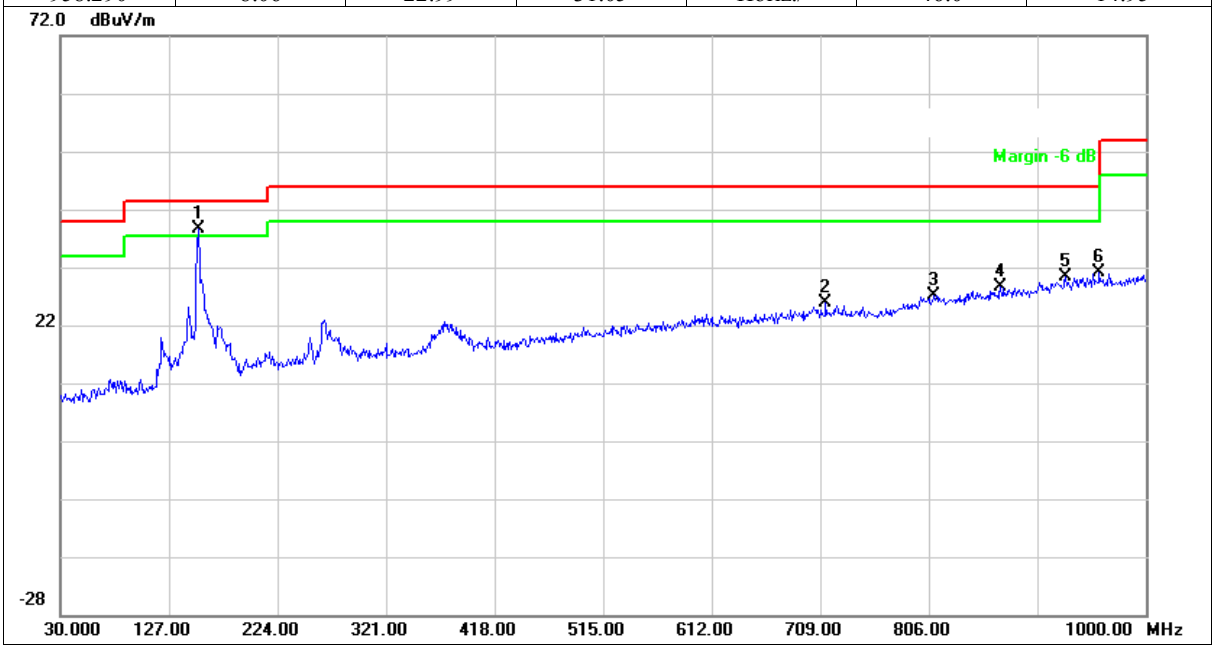
Note:
☐EUT is the continue transmitters, 100% (Duty Cycle).
☒EUT is the pulsed transmitters, the average value shall consider the peak value plus the duty cycle factor if required.

☒Test Mode 1			Field strength of Spurious Emission for Restricted Band								
Freq. (MHz)	Read Level (dBuV)		Factor (dB)	Emission (dBuV/m)		Horiz./ Vert.	@m	Limit (dBuV/m)		Margin(dB)	
	PK	AV		PK	AV			PK	AV	PK	AV
3907.00	35.06	24.81	3.31	38.37	28.12	Horiz.	3.00	74.00	54.00	-35.63	-
7137.00	29.76	13.38	19.30	49.06	32.68	Horiz.	3.00	74.00	54.00	-24.94	-
9823.00	25.92	8.54	22.70	48.62	31.24	Horiz.	3.00	74.00	54.00	-25.38	-
2623.00	31.17	17.71	2.41	33.58	20.12	Vert.	3.00	74.00	54.00	-40.42	-
6438.00	25.93	13.95	16.20	42.13	30.15	Vert.	3.00	74.00	54.00	-31.87	-
9701.00	25.93	13.51	22.70	48.63	36.21	Vert.	3.00	74.00	54.00	-25.37	-
10495.84	28.24	17.53	24.00	52.24	41.53	Vert.	3.00	74.00	54.00	-21.76	-
10496.40	31.01	20.69	24.00	55.01	44.69	Horiz.	3.00	74.00	54.00	-18.99	-9.31
10500.00	26.87	16.85	24.00	50.87	40.85	Vert.	3.00	74.00	54.00	-23.13	-
10500.00	28.89	16.65	24.00	52.89	40.65	Horiz.	3.00	74.00	54.00	-21.11	-
10550.00	27.06	16.86	24.00	51.06	40.86	Vert.	3.00	74.00	54.00	-22.94	-
10550.00	29.40	17.26	24.00	53.40	41.26	Horiz.	3.00	74.00	54.00	-20.60	-
10588.00	28.04	16.91	24.00	52.04	40.91	Vert.	3.00	74.00	54.00	-21.96	-
10551.60	31.16	17.25	24.00	55.16	41.25	Horiz.	3.00	74.00	54.00	-18.84	-12.75

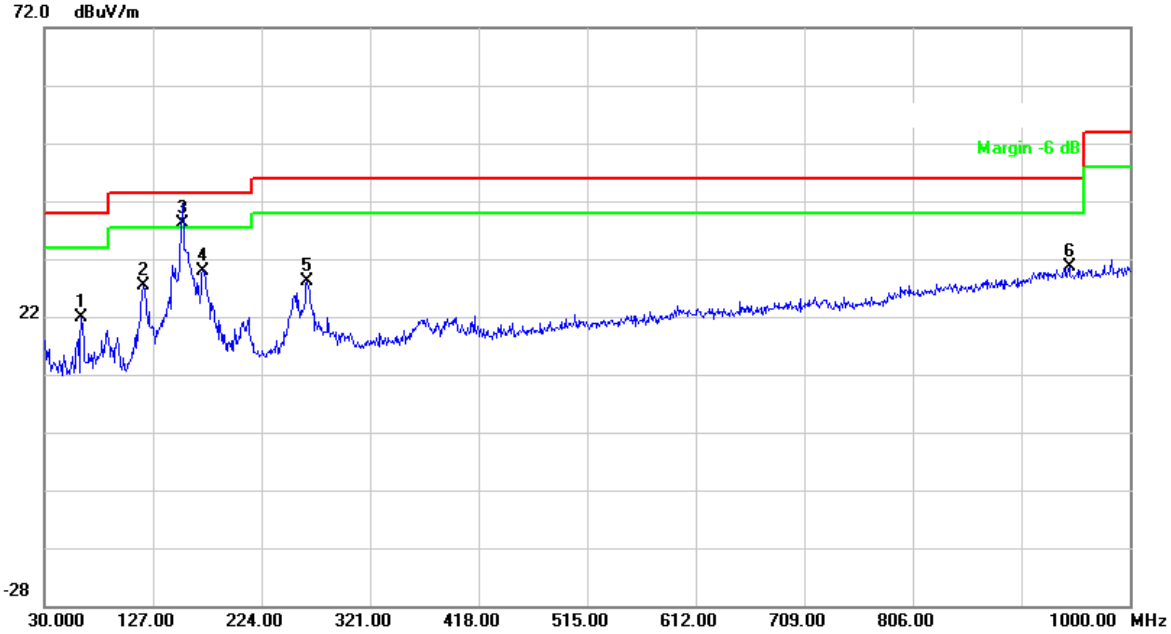
Note:	(1) All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary. (2) "N/A" remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor. (3) Emission Level = Reading Level + Probe Factor + Cable Loss.

☒Test Mode 1		Field strength of Spurious Emission in 30MHz ~ 1GHz Range				
Freq. (MHz)	**Read Level (dBuV)**	**Factor (dB)**	**Emission (dBuV/m)**	**Horiz./ Vert.**	**Limit (dBuV/m)**	**Margin (dB)**
N/A						
N/A						
N/A						
N/A						
N/A						
N/A						
Note:	(1) All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary. (2) "N/A" remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor. (3) Emission Level = Reading Level + Probe Factor + Cable Loss.					

☒Test Mode 1		Field strength of Spurious Emission in 30MHz ~ 1GHz Range				
Freq. (MHz)	Read Level (dBuV)	Factor (dB)	Emission (dBuV/m)	Horiz./ Vert.	Limit (dBuV/m)	Margin (dB)
153.190	24.66	10.96	35.62	Horiz./	43.5	-7.88
713.850	5.16	20.89	26.05	Horiz./	46.0	-19.95
810.850	4.45	22.68	27.13	Horiz./	46.0	-18.87
870.020	6.05	22.68	28.73	Horiz./	46.0	-17.27
928.220	7.33	22.99	30.32	Horiz./	46.0	-15.68
958.290	8.06	22.99	31.05	Horiz./	46.0	-14.95



☒Test Mode 1		Field strength of Spurious Emission in 30MHz ~ 1GHz Range				
Freq. (MHz)	Read Level (dBuV)	Factor (dB)	Emission (dBuV/m)	Horiz./ Vert.	Limit (dBuV/m)	Margin (dB)
62.980	13.02	8.81	21.83	Vert.	40.0	-18.17
118.270	18.62	8.67	27.29	Vert.	43.5	-16.21
153.370	27.26	10.96	38.22	Vert.	43.5	-5.28
171.620	14.63	15.18	29.81	Vert.	43.5	-13.69
264.740	13.17	14.94	28.11	Vert.	46.0	-17.89
945.000	7.52	22.99	30.51	Vert.	46.0	-15.49



Note:	(1) All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary. (2) "N/A" remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor. (3) Emission Level = Reading Level + Probe Factor + Cable Loss.

6. Band Edge

6. 1 Test Equipment

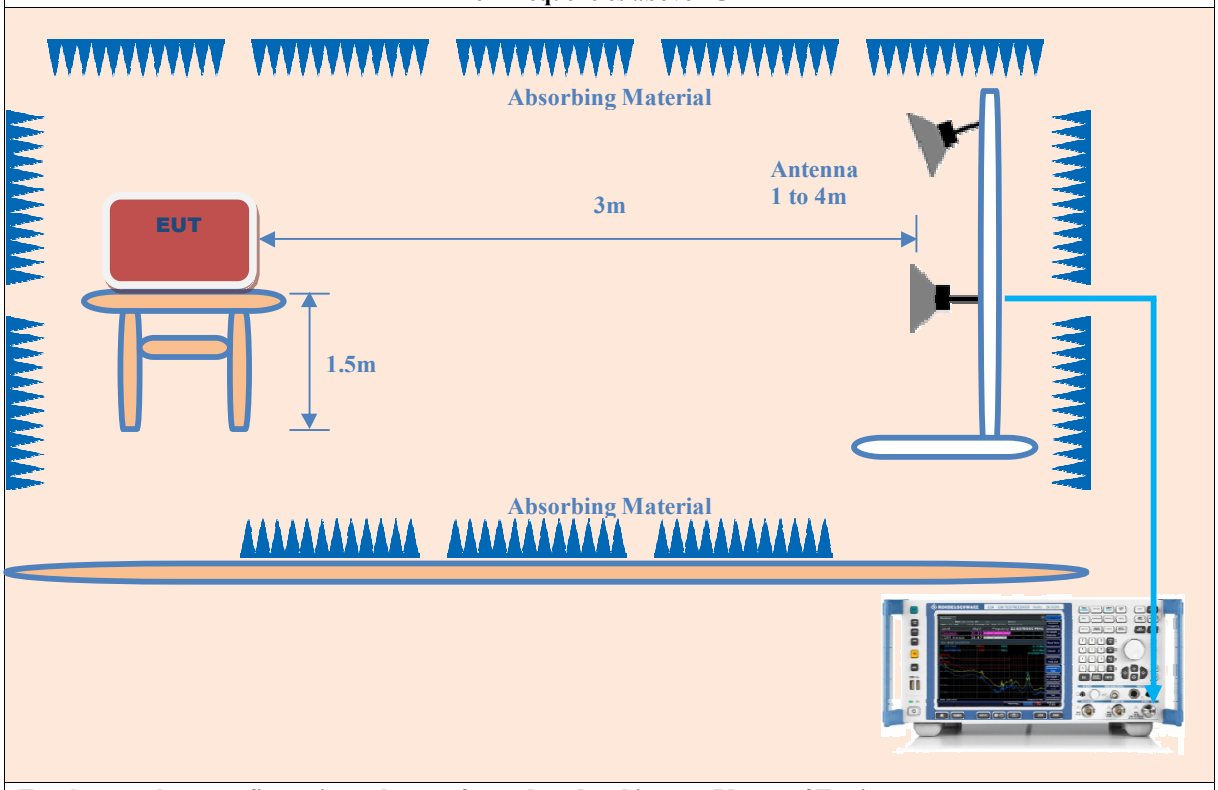
Please refer to Section 10 this report.

6. 2 Test Procedure

1. The EUT was tested according to ANSI C63.10, clause 6.9.3 for occupied bandwidth testing.
2. For radiated measurement. Loop antenna was rotated about the horizontal and vertical axis and the equipment to be measured and the test antenna shall be oriented to obtain the maximum emitted field strength level

6. 3 Radiated Test Setup

For Frequencies above 1GHz



For the actual test configuration , please refer to the related items – Photos of Testing

6. 4 Configuration of the EUT

Same as section 2.4 of this report

6. 5 EUT Operating Condition

Same as section 2.4 of this report.

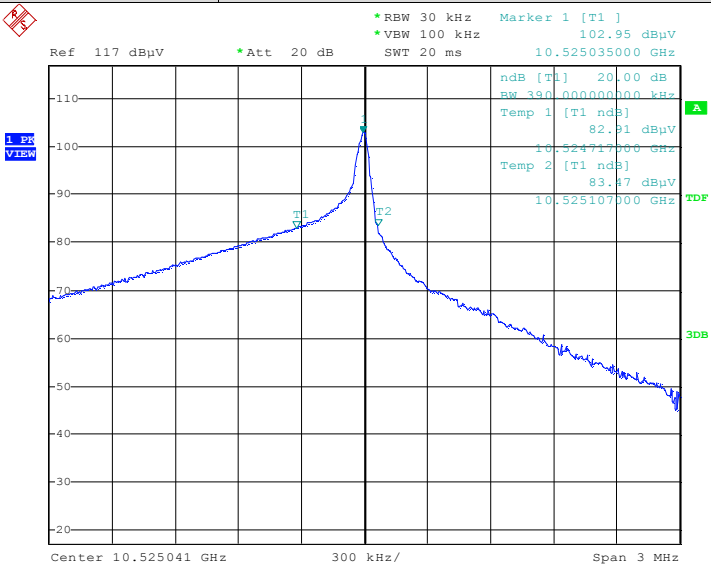
6. 6 Band Edge FCC 15.215(c) Limit

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §15.217 through §15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the 20 dB bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

6. 7 Band Edge Test Result

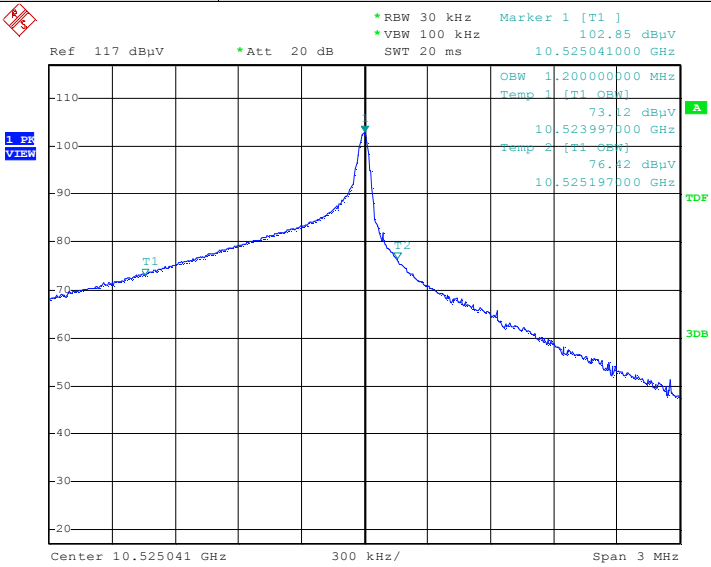
☒Test Mode 1		Occupied Channel Bandwidth			
Frequency (GHz)	20dB BW (kH)	99% OBW (kHz)	Frequency Range (GHz)		Result
			f_L >10.5GHz	f_H <10.55GHz	
10.525	390	1200	10.524717	10.525107	PASS

☒Test Mode 1	Emission Bandwidth Plot - 20dB Bandwidth



Date: 30.OCT.2020 11:44:06

☒Test Mode 1	Emission Bandwidth Plot - 99% Bandwidth



Date: 30.OCT.2020 11:43:17

7. Photos of Testing

Please refer to Exhibits _External Test Setup Photos

8. Photographs – EUT

Please refer to Exhibits _External Photos & Internal Photos

9. FCC ID Label

Please refer to Exhibits _ ID Label & Location Info

10. Test Equipment

The following test equipment were used during the radiated & conducted emission test:

Equipment/ Facilities	Manufacturer	Model #	Serial No.	Cal/Char Date	Due Date
Turntable	Innco systems GmbH	CT-0801	KMO-SZ114S	NCR	NCR
Antenna Tower	Innco systems GmbH	MA-4640-XP-ET	KMO-SZ024S	NCR	NCR
Controller	Innco systems GmbH	CO3000	KMO-SZ025S	NCR	NCR
EMI Test Receiver	Rohde & Schwarz	ESR7	KMO-SZ312	2019/12/5	2022/12/5
Spectrum Analyzer	Rohde & Schwarz	FSP40	KMO-SZ003	2019/12/14	2021/12/14
Loop Antenna	Rohde & Schwarz	HFH2-Z2	KMO-SZ004	2020/2/21	2022/2/21
Trilog-Super Broadband Antenna	SCHWARZBECK	VULB 9163	KMO-SZ314	2019/12/29	2022/12/29
Broad-Band Horn Antenna 1-18 GHz	SCHWARZBECK	BBHA 9120D	KMO-SZ329	2019/12/20	2022/12/20
Pre-Amplifier 1-18 GHz	SCHWARZBECK	BBV9718	KMO-SZ330	2019/12/5	2022/12/5
Pre-Amplifier 18-40 GHz	SCHWARZBECK	BBV9721	KMO-SZ331	2019/12/16	2022/12/16
Broad-Band Horn Antenna 18-40 GHz	SCHWARZBECK	BBHA 9170	KMO-SZ332	2019/12/14	2022/12/14
Coaxial Cable	N/A	BLU18A-SmSm-2m	KMO-SZ333	2019/12/5	2022/12/5
Coaxial Cable	N/A	40G	KMO-SZ334	2019/12/11	2022/12/11
KMO Shielded Room	KMO	KMO-001	KMO-SZ335	NCR	NCR
3m Anechoic Chamber	KMO	966	KMO-SZ316	2018/11/29	2021/11/29

----------End of Report ----------