TEST REPORT

Report No.	SST240705013EF01
Applicant:	CRONOS-TECH (CHENGDU) CO.,LTD
Address of Applicant:	4/F, Bldg. 6,No.200, Tianfu 5th Street, High-tech Zone Chengdu, China (Sichuan) Pilot Free Trade Zone, China
Product Name:	RFID Reader
Trade Mark:	Cronos-Tech
Standard(s):	FCC CFR Title 47 Part 15.209
FCC ID:	2A3PV-CT006
Test Report Form No:	SST-RD-7.5-02-E01(A/0)
Date of sample receipt:	2024/7/8
Date of Test:	2024/7/8 - 2024/8/2
Date of report issued:	2024/8/7

*The equipment complies with the requirements according to the standard(s) or Specification above, it is applicable only to the tested sample identified in the report.

Prepared by: _____

Reviewed by: _____

Approved by: _____

GUANGDONG SET SAIL TESTING CO.,LTD. **CERTIFICATE**

Revision History

Version	Description	Date of Issue
V1.0	Original	2024/8/7

2 Contents

3 Test Summary

Test items	Basics standards	Result
Conducted Emission	FCC Part 15.207	Pass
Radiated Emissions	FCC Part 15.209	Pass
Emission bandwidth	FCC part 2.1049	Report only

Notes:
1: NA =Not Applicable
2: Determining compliance based on the results of the compliance measurement, not taking into account measurement uncertainty. If necessary, the applicant shall informing test lab in advance
3: Additions, Deviations and Exclusions from Standards: None.

4 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:
The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Item	Uncertainty (±) (k=2, 95%)	
Output Power, Conducted	0.54	
Power Spectral Density, Conducted	1.28	
Spurious Emissions, Conducted	1.28	
Radiated Emissions(<1GHz)	9kHz~30MHz	2.6
	30MHz~1GHz	5.08
Radiated Emissions(>1GHz)	1GHz~6GHz	4.02
	6GHz~18GHz	4.62
	18GHz~40GHz	4.7
Occupied Bandwidth	1.14	
Conducted Emissions—AC mains	9kHz~150KHz	1.76
	150kHz~30MHz	2.52
Conducted Emissions—Telecom	2.64	

5 General Information

5.1 Client Information

Applicant:	CRONOS-TECH (CHENGDU) CO.,LTD
Address of applicant:	4/F, Bldg. 6,No.200, Tianfu 5th Street, High-tech Zone Chengdu, China (Sichuan) Pilot Free Trade Zone, China
Manufacturer:	Same as applicant
Address of Manufacturer:	Same as applicant
Factory:	Same as applicant
Address of Factory:	Same as applicant

5.2 General Description of EUT

Product Name:	RFID Reader
Model No.:	CT-006，RT16T， RT16BTT
Test model:	CT-006
Test sample(s) ID:	240705013002
Sample(s) Status:	Normal without modified
Operation Frequency:	134.3kHz
Modulation Type:	Carrier
Power supply:	DC 5V by external P.S. or DC 3.7V 400mAh Battery

5.3 Test mode(s)

Mode 1:	Continuously transmitting
Mode 2:	
Mode 3:	
Mode 4:	
Mode 5:	

5.4 Test Facility

The test facility is recognized, certified, or accredited by these organizations:	**FCC Accredited Lab** Test Firm Registration Number: 638130 Designation Number: CN1359
	IC Registration Lab CAB Identifier No.CN0154
	A2LA Accreditation Lab Certificate No.:7057.01

Test Performed at:	**Name** GuangDong Set Sail Testing Co., Ltd.
	Address 101, No.19, Tianxin Hudie 1st Road, Huangjiang Town, Dongguan, Guangdong, China

5.5 Description of Support Units

Manufacturer	Description	Model	Serial Number
/	/	/	/
			/

5.6 Others

The laboratory responsible for all the information provided in the report, except those information provided by the applicant.
The applicant shall fully responsible for the information they provided.
The report would be invalid without a stamp of test laboratory and the signatures of compiler and approver.
The laboratory has not been responsible for the sampling stage; the test report merely corresponds to the test sample received.
Any objection to the test report shall submitted to the test laboratory within 15 days from the date of receipt of the report.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

6 Technical Requirement and Measurement Data

6.1 Generally requirement

15.203 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. 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.
EUT Antenna:
The antenna of EUT is permanently attached

6.2 Conducted Emission

Limit

Frequency (MHz)	☐Class A (dBμV)		☒Class B (dBμV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15~0.50	79	66	66 to 56*	56 to 46*
0.50~5.0	73	60	56	46
5.0~30	73	60	60	50

*Decreases with the logarithm of the frequency.

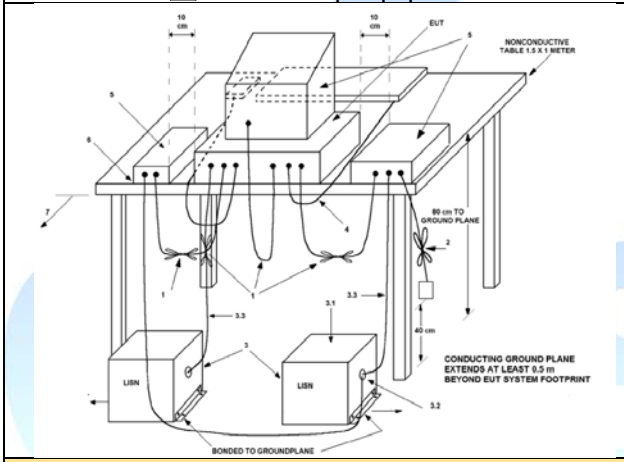
If the limit for the measurement with the average detector is met when using a receiver with a quasi-peak detector, the equipment under test shall be deemed to meet both limits and the measurement using the receiver with an average detector need not be carried out

Measured Frequency Range

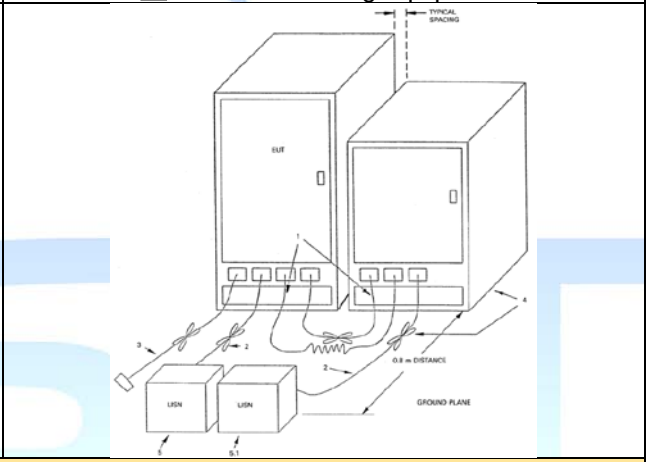
150kHz ~ 30MHz

Block diagram of Test Setup

☒For table-top equipment



☐For floor standing equipment



Test Instrument

Refer to Annex A for details

Test Procedures

The measurement was performed in a shield room.

Measured levels of ac power-line conducted emission shall be the radio-noise voltage from the voltage probe, where permitted, or across the 50 Ω LISN port (to which the EUT is connected), as terminated into a 50 Ω EMI receiver or spectrum analyzer. All radio-noise voltage and current measurements shall be made on each current-carrying conductor at the plug end of the EUT power cord or calibrated extension cord by the use of mating plugs and receptacles on the EUT and LISN, if used. The manufacturer shall test equipment with power cords that are normally supplied or recommended by the manufacturer and that have electrical and shielding characteristics that are the same as those cords normally supplied or recommended. For measurements using a LISN, the 50 Ω measuring port is terminated into a 50 Ω EMI receiver or spectrum analyzer. All other ports are terminated into 50 Ω loads.

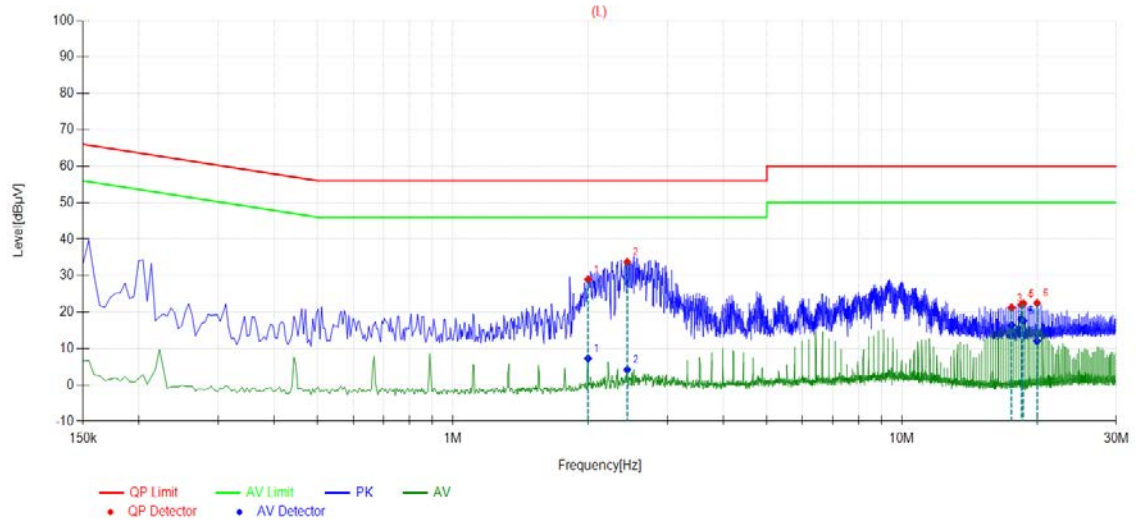
Table top devices shall be placed on a platform of nominal size 1 m by 1.5 m, raised 80 cm above the reference ground plane. The vertical conducting plane or wall of an RF-shielded (screened) room shall be located 40 cm to the rear of the EUT. Floor-standing devices shall be placed either directly on the reference ground-plane or on insulating material as described in ANSI C63.4. All other surfaces of table top or floor-standing EUTs shall be at least 80 cm from any other grounded conducting surface, including the case or cases of one or more LISNs.

The bandwidth of the test receiver is set at 9 kHz.

Verdict

Pass

Test Result			
Test mode	Mode 1	Polarity	Line
Test voltage	AC 120V/60Hz	Temp. /Hum.	25 °C/60%

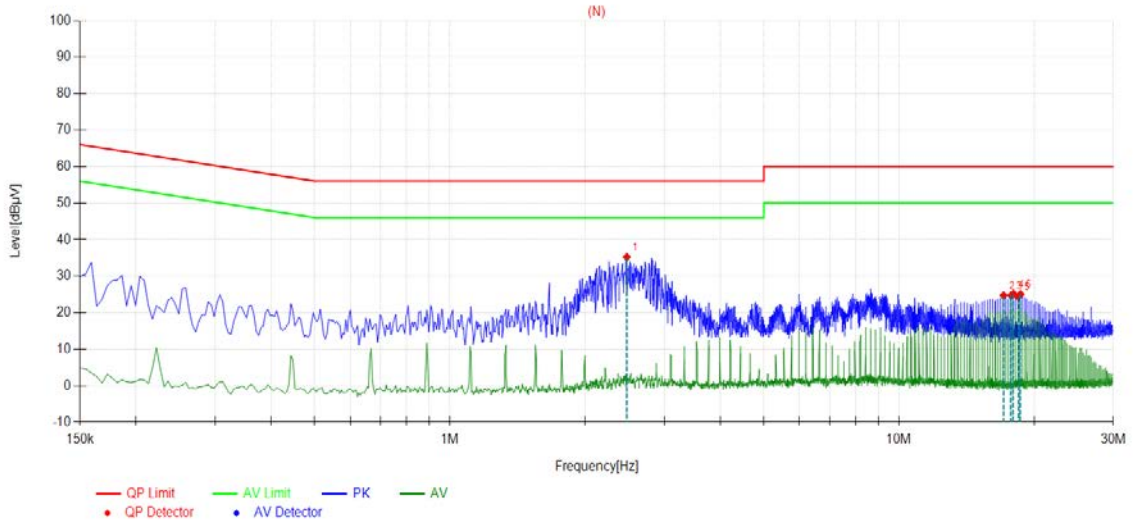


Final Data List

NO.	Freq. [MHz]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]	Verdict	Type
1	1.9995	28.93	56.00	27.07	7.31	46.00	38.69	PASS	L
2	2.445	33.68	56.00	22.32	4.23	46.00	41.77	PASS	L
3	17.5425	21.23	60.00	38.77	16.45	50.00	33.55	PASS	L
4	18.4335	22.05	60.00	37.95	18.08	50.00	31.92	PASS	L
5	18.654	22.33	60.00	37.67	17.58	50.00	32.42	PASS	L
6	19.9905	22.44	60.00	37.56	12.06	50.00	37.94	PASS	L

Note: Final Level =Receiver Read level + Factor
Factor= LISN Factor + Cable Loss
Only the worst data report

Test Result			
Test mode	Mode 1	Polarity	Neutral
Test voltage	AC 120V/60Hz	Temp. /Hum.	25 °C/60%



Suspected List

NO.	Freq. [MHz]	Level [dBµV]	Factor [dB]	Limit [dBµV]	Margin [dB]	Detector	Type	Verdict
1	2.4765	35.23	9.61	56.00	20.77	PK	N	PASS
2	17.1015	24.74	9.96	60.00	35.26	PK	N	PASS
3	17.7675	24.69	9.96	60.00	35.31	PK	N	PASS
4	17.988	25.21	9.97	60.00	34.79	PK	N	PASS
5	18.4335	24.33	9.97	60.00	35.67	PK	N	PASS
6	18.654	25.09	9.97	60.00	34.91	PK	N	PASS

Note: Final Level =Receiver Read level + Factor
Factor= LISN Factor + Cable Loss
Only the worst data report

6.3 Radiated Emission

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

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54–72 MHz, 76–88 MHz, 174–216 MHz or 470–806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.

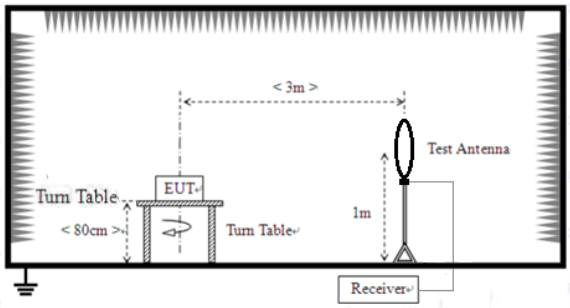
Measured Frequency Range

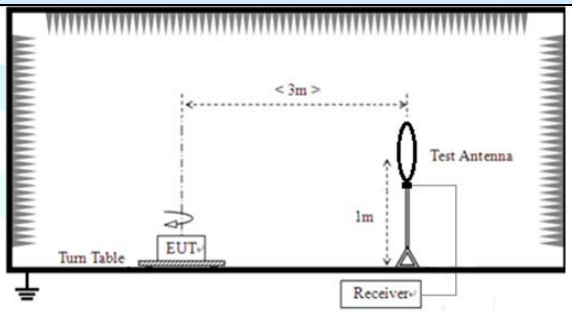
Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30.
1.705–108	1000.
108–500	2000.
500–1000	5000.
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower.

Block diagram of Test Setup

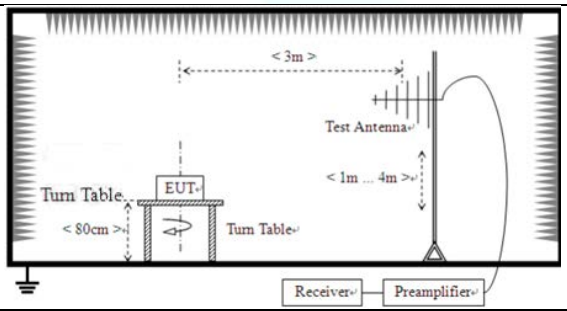
☒For table-top equipment ☐For floor standing equipment

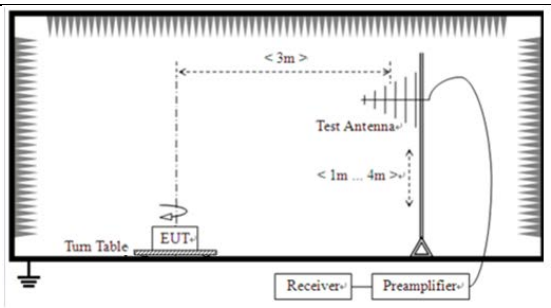
For radiated emissions from 9kHz to 30MHz



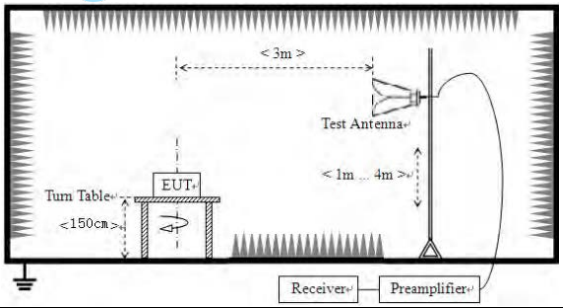


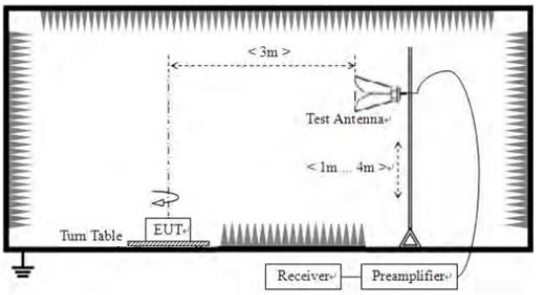
For radiated emissions from 30MHz to1GHz





For radiated emissions above 1GHz





Test Instrument

Refer to Annex A for details

Test Procedures

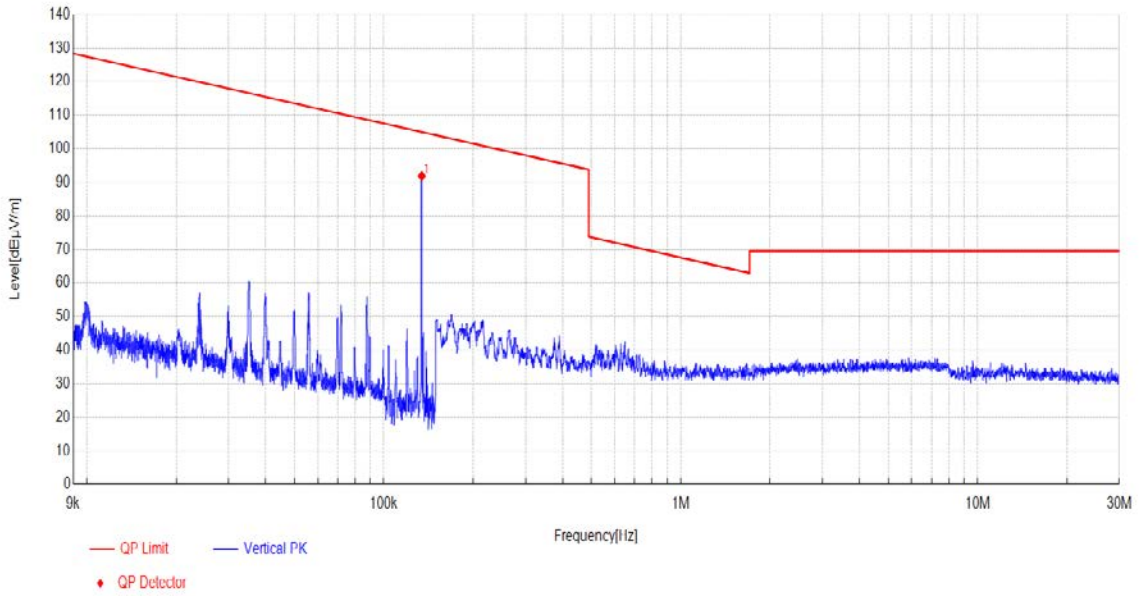
The measurement was performed in a semi-anechoic chamber.
While testing for spurious emission higher than 1GHz, the pre-amplifier (and high pass filter if necessary) is equipped just at the output terminal of the antenna.
The distance from EUT to receiving antenna is 3 meters.
The radiated emission was measured using the test receiver with the resolutions bandwidth set as:
RBW:
9kHz~150kHz: 300Hz
150kHz~30MHz: 10kHz
30MHz~1GHz: 100kHz
VBW: ≥3*RBW
Sweep time: Auto couple
Detector: Peak
Trace: Max hold, Trace allowed to stabilize.

The limit is converted from microvolts/meter to decibel microvolts/meter.
Limit(dBuV/m @3m)=Limit(dBuV/m)+Distance correction
Distance Correction:
0.009MHz~0.49MHz: 40*log(300m/3m)=80dB
0.49MHz~30MHz: 40*log(30m/0m)=40dB

Verdict

Pass

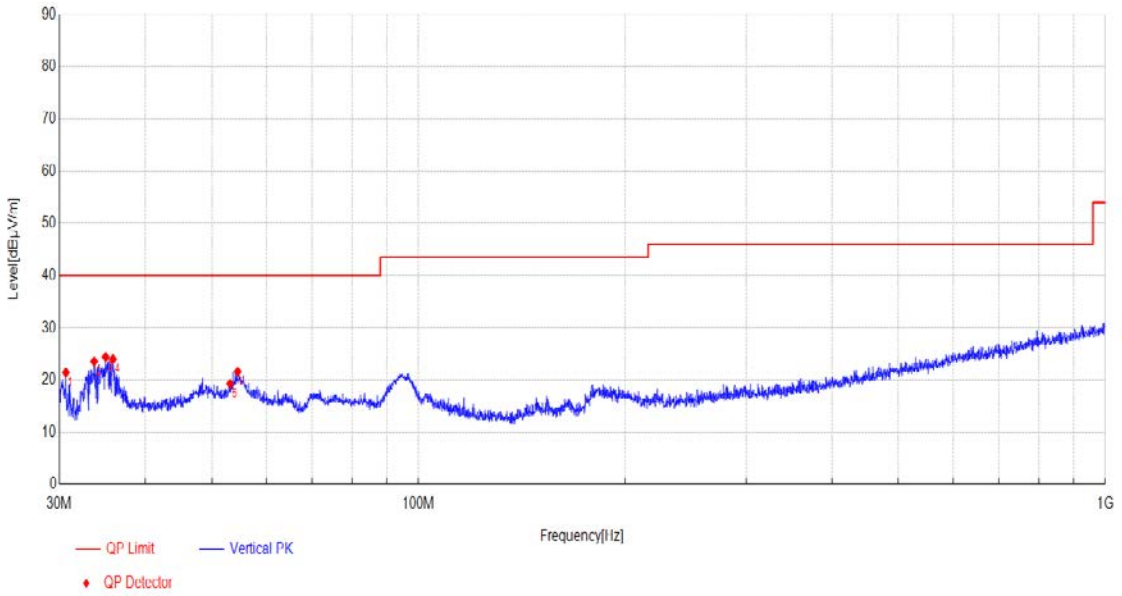
Test Result(Below 30MHz)			
Test mode	Mode 1	Temp. /Hum.	25 °C/60%
Test voltage	AC 120V/60Hz		



NO.	Freq. [MHz]	Factor [dB]	PK Value [dBµV/m]	AV Value [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Verdict
1	0.1343	20.34	91.91	89.05	104.99	15.94	PASS

Note: Final Level =Receiver Read level + Factor
Factor= Antenna Factor + Cable Loss – Preamplifier Factor
Test result contains x,y,z axis

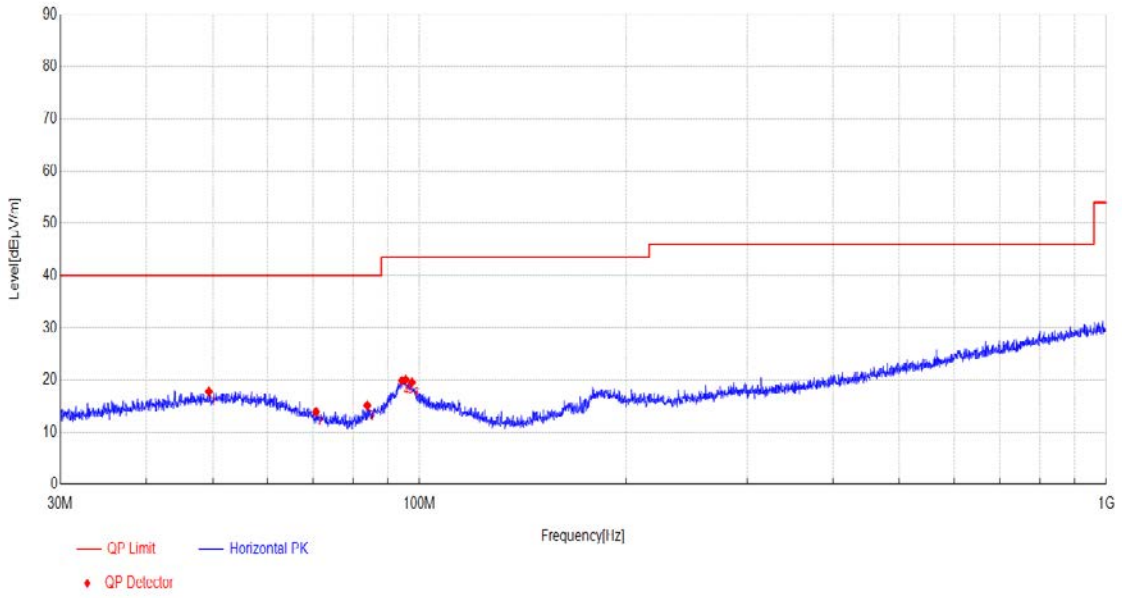
Test Result(Below 1GHz)			
Test mode	Mode 1	Polarity	Vertical
Test voltage	AC 120V/60Hz	Temp. /Hum.	25 °C/60%



NO.	Freq. [MHz]	Factor [dB]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Polarity	Verdict
1	30.6646	10.90	21.47	40.00	18.53	Vertical	PASS
2	33.7089	11.57	23.55	40.00	16.45	Vertical	PASS
3	35.0342	11.87	24.40	40.00	15.60	Vertical	PASS
4	35.9045	12.06	23.99	40.00	16.01	Vertical	PASS
5	53.1703	14.04	19.26	40.00	20.74	Vertical	PASS
6	54.539	13.94	21.61	40.00	18.39	Vertical	PASS

Note: Final Level =Receiver Read level + Factor
Factor= Antenna Factor + Cable Loss – Preamplifier Factor
Only the worst data report

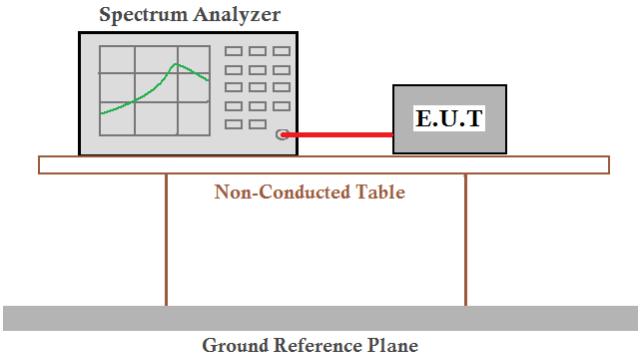
Test Result(Below 1GHz)			
Test mode	Mode 1	Polarity	Horizontal
Test voltage	AC 120V/60Hz	Temp. /Hum.	25 °C/60%



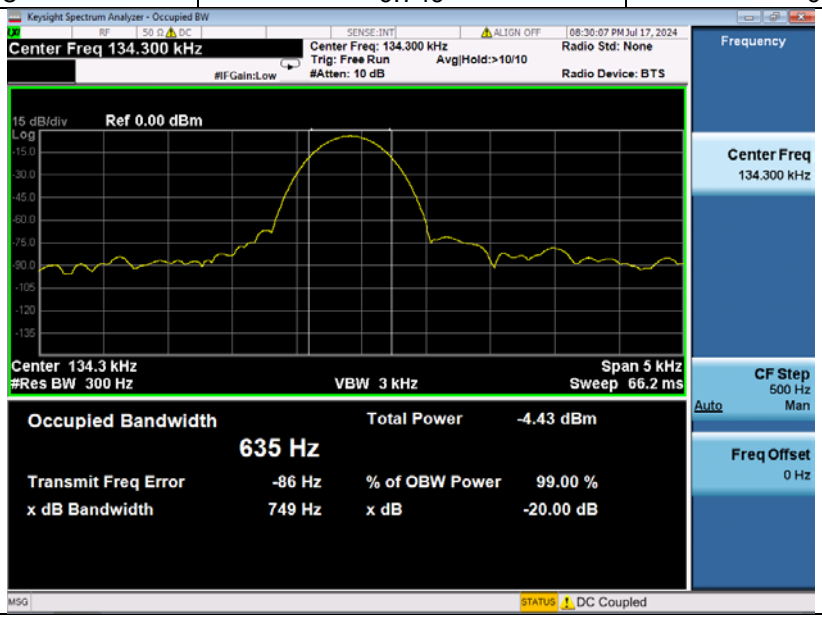
NO.	Freq. [MHz]	Factor [dB]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Polarity	Verdict
1	49.3533	14.18	17.79	40.00	22.21	Horizontal	PASS
2	70.6923	10.05	13.93	40.00	26.07	Horizontal	PASS
3	83.9411	8.90	15.12	40.00	24.88	Horizontal	PASS
4	94.236	10.98	19.88	43.50	23.62	Horizontal	PASS
5	95.483	11.27	20.10	43.50	23.40	Horizontal	PASS
6	97.5127	11.72	19.53	43.50	23.97	Horizontal	PASS

Note: Final Level =Receiver Read level + Factor
Factor= Antenna Factor + Cable Loss – Preamplifier Factor
Only the worst data report

6.4 Emission Bandwidth

Limit
Report only
Block diagram of Test Setup

Test Instrument
Refer to Annex A for details
Test Procedures
Analyser frequency set to the wanted transmitting frequency RBW: >200Hz VBW: ≥3 x RBW Sweep time: Auto couple Detector: Peak Trace: Max hold, trace was allowed to stabilize.
Verdict
Pass

Test Frequency(kHz)	20dB bandwidth(kHz)	99% Occupied bandwidth(kHz)
134.3	0.749	0.635



7 Test Setup Photo

Reference to the **appendix I** for details.

8 EUT Constructional Details

Reference to the **appendix II** for details.

Annex A --Test Instruments list

Radiated Emission:						
Equipment No.	**Test Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. cycle**	**Cal.Date**
SST-E-SAC001	3m Semi- Anechoic Chamber	BOST	966	/	3 years	2023.01.07
SST-E-SCC001	Control Room	BOST	333	/	3 years	2023.01.07
SST-E-SAC002	Breiband TRILOG Messantenne	Schwarzbeck	VULB 9162	00556	1 year	2024.04.20
SST-E-SAC004	Broad-band Horn Antenna	Schwarzbeck	BBHA 9120 D	02783	1 year	2024.04.16
SST-E-SCC003	EMI Test Receiver	R&S	ESU 8	100372	1 year	2024.04.16
SST-E-SCC004	Amplifier	Schwarzbeck	BBV 9744	00327	1 year	2024.04.16
SST-E-SCC015	Amplifie （1-18GHz）	TSTPASS	LNA10180G45	TSAM2303003	1 year	2024.04.16
SST-E-SCC016	Amplifier（40G）	RFsystem	TRLA-180400G45B	23060801	1 year	2024.04.16
SST-E-SAC006	Broadband Horn Antenna（40G）	Schwarzbeck	BBHA9170	01306	1 year	2024.04.17
SST-E-RSC010	Spectrum analyzer	R&S	FSV40-N	/	1 year	2024.04.16
SST-E-SAC007	Loop Antenna	Schwarzbeck	FMZB 1513-60B	1513-60B 044	1 year	2024.04.17
SST-E-SAC005	5W 6dB attenuator	/	DC-6GHz	/	Internal calibration	/
SST-E-EMC006	Thermohygrometer	KTJ	TA218A	879030	1 year	2024.04.18
/	EMI Test Software	Tonscend	TS+	/	/	/

Conducted Emission						
Equipment No.	**Test Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. cycle**	**Cal.Date**
SST-E-CSC001	Shielding Room	BOST	854	/	3 years	2023.01.07
SST-E-CSC002	EMI Test Receiver	R&S	ESR3	103057	1 year	2024.04.16
SST-E-CSC003	LISN	R&S	ENV 216	102832	1 year	2024.04.16
SST-E-CSC004	ISN	R&S	NTFM 8158	00347	1 year	2024.04.16
SST-E-CSC007	Antenna port test assembly	/	DC-3GHz	/	Internal calibration	/
SST-E-EMC011	Thermohygrometer	KTJ	TA218A	879036	1 year	2024.04.18
/	EMI Test Software	Tonscend	TS+	/	/	/

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