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Test Report

Cover Page

Report No.: CQASZ20190500014EX-05

Applicant: Speedata Group Ltd

Address of Applicant: Room 2-308, building No. 25, No. 9 Anningzhuang Road West, Haidian district,

Beijing, China

Speedata Group Ltd Manufacturer:

Address of Room 2-308, building No. 25, No. 9 Anningzhuang Road West, Haidian district,

Manufacturer: Beijing, China

Equipment Under Test (EUT):

Product: PDA

All Model No.: SD60, SD35, T35, PG35, SD55, T55, SD55LG, SD55MD, SD55UHF, SD55PTT,

T55UHF, T55PPT, PG55, T60, SD60LG, SD60RT, SD60PRT, T60RT, Bio60,

SD50, SN50, SD50RT, T50, PG50

Test Model No.: **SD60 Brand Name:** N/A

FCC ID: 2AJO5SD60

Standards: 47 CFR Part 15, Subpart C Date of Test: 2019-03-26 to 2019-06-13

Date of Issue: 2019-06-13 Test Result: PASS*

Tested By:

(Daisy Qin)

Reviewed By:

Approved By:

(Jack Ai)



The test report is effective only with both signature and specialized stamp, The result(s) shown in this report refer only to the sample(s) tested. Without written approval of CQA, this report can't be reproduced except in full.

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



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2 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20190500014EX-05	Rev.01	Initial report	2019-06-13





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4 Test Summary

Test Item	FCC Test Requirement	FCC Test Requirement Test Method	
Antenna Requirement	47 CFR Part 15, Subpart C	ANSI C63.10 2013	Pass
Antenna Nequirement	Section 15.203	ANSI C03.10 2013	Pass
Electric Field Strength of	47 CFR Part 15, Subpart C	ANIOI 000 40 0040	D
Fundamental and Outside the Allocated bands	Section 15.225(a)/(b)/(c)	ANSI C63.10 2013	Pass
Radiated Emission	47 CFR Part 15, Subpart C	ANSI C63.10 2013	Pass
Radiated Emission	Section 15.225(d)/15.209	ANSI C63. 10 2013	
Fraguenay Toloronoo	47 CFR Part 15, Subpart C	ANSI C63.10 2013	Door
Frequency Tolerance	Section 15.225(e)	ANSI C63. 10 2013	Pass
20dP Occupied Pandwidth	47 CFR Part 15, Subpart C	ANSI C63.10 2013	Pass
20dB Occupied Bandwidth	Section 15.215	ANSI C03. 10 2013	rass



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5 General Information

5.1 Client Information

Applicant:	Speedata Group Ltd
Address of Applicant:	Room 2-308, building No. 25, No. 9 Anningzhuang Road West, Haidian
	district, Beijing, China
Manufacturer:	Speedata Group Ltd
Address of Manufacturer:	Room 2-308, building No. 25, No. 9 Anningzhuang Road West, Haidian
	district, Beijing, China

5.2 General Description of E.U.T.

Product Name:	PDA	
All Model No.:	SD60, SD35, T35, PG35, SD55, T55, SD55LG, SD55MD, SD55UHF, SD55PTT, T55UHF, T55PPT, PG55, T60, SD60LG, SD60RT, SD60PRT, T60RT, Bio60, SD50, SN50, SD50RT, T50, PG50	
Test Model No.:	SD60	
Trade Mark:	N/A	
Hardware Version:	8.1.0	
Software Version:	V.SD60.2.1.20.2019041909	
Operation Frequency:	13.56MHz	
Modulation Type:	ASK	
Product Type:	☐ Mobile ☐ Portable ☐ Fix Location	
Antenna Type:	IFIA antenna	
Antenna Gain:	0dBi	
EUT Power Supply:	DC 3.8V from Battery	
	Model: A138A-120150U-US2	
Adapter Information:	Input: 100-240V-50/60Hz, 0.5A	
	Output: 5V 2.5A/ 9V 2A/ 12V 1.5A	

Note: 1. This report is only for NFC.

- 2. For more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
- 3. There are many products, Only the model SD60 was tested, since the electrical circuit design, layout, components used and internal wiring were identical for the above models, with difference being color of appearance and model name.



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5.3 Test Environment

Temperature:	20.0 °C
Humidity:	53 % RH
Atmospheric Pressure:	1010mbar
Test mode:	Keep EUT working in continuous transmitting mode with 100% duty cycle.

5.4 Description of Support Units

The EUT has been tested with associated equipment below.

Description	Manufacturer	Model No.	Remark	FCC certification
Adapter	AOHAI	A138A-120150U-	Provide by Client	SDOC
		US2		





5.5 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate.

The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities.

The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 "Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements" and is documented in the **Shenzhen Huaxia Testing Technology Co., Ltd.** quality system acc. to DIN EN ISO/IEC 17025.

Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for CQA laboratory is reported:

No.	Item	Uncertainty	Notes
1	Radiated Emission (Below 1GHz)	±5.12dB	(1)
2	Radiated Emission (Above 1GHz)	±4.60dB	(1)
3	Conducted Disturbance (0.15~30MHz)	±3.34dB	(1)
4	Radio Frequency	3×10 ⁻⁸	(1)
5	Duty cycle	0.6 %.	(1)
6	Occupied Bandwidth	1.1%	(1)
7	RF conducted power	0.86dB	(1)
8	RF power density	0.74	(1)
9	Conducted Spurious emissions	0.86dB	(1)
10	Temperature test	0.8℃	(1)
11	Humidity test	2.0%	(1)
12	Supply voltages	0.5 %.	(1)
13	time	0.6 %.	(1)
14	Frequency Error	5.5 Hz	(1)

⁽¹⁾This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.



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5.6 Test Location

Shenzhen Huaxia Testing Technology Co., Ltd,

1F., Block A of Tongsheng Technology Building, Huahui Road, Dalang Street, Longhua District, Shenzhen, China

5.7 Test Facility

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

• CNAS (No. CNAS L5785)

CNAS has accredited Shenzhen Huaxia Testing Technology Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

A2LA (Certificate No. 4742.01)

Shenzhen Huaxia Testing Technology Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 4742.01.

• FCC Registration No.: 522263

Shenzhen Huaxia Testing Technology Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No.:522263





5.8 Equipment List

Test Equipment	Manufacturer	Model No.	Instrument No.	Calibration Date	Calibration Due Date
EMI Test Receiver	R&S	ESR7	CQA-005	2018/9/26	2019/9/25
Spectrum analyzer	R&S	FSU26	CQA-038	2018/10/28	2019/10/27
Preamplifier	MITEQ	AFS4-00010300-18-10P-	CQA-035	2018/9/26	2019/9/25
Loop antenna	Schwarzbeck	FMZB1516	CQA-087	2018/10/28	2020/10/27
Bilog Antenna	R&S	HL562	CQA-011	2018/9/26	2020/9/25
Coaxial Cable (Below 1GHz)	CQA	N/A	C020	2018/9/26	2019/9/25
Spectrum analyzer	Agilent	E4440A	CQA-103	2018/10/28	2019/10/27
high-low temperature chamber	Auchno	OJN-9606	CQA-CB2	2018/9/26	2019/9/25
DC power	KEYSIGHT	E3631A	CQA-028	2018/9/26	2019/9/25



6 Test Result and Measurement Data

6.1 Antenna Requirment

5 C Section 15.203
radiator shall be designed to ensure that no antenna other shed by the responsible party shall be used with the ise of a permanently attached antenna or of an antenna ique coupling to the intentional radiator, the manufacturer e unit so that a broken antenna can be replaced by the ise of a standard antenna jack or electrical connector is



6.2 Electric Field Strength of Fundamental and Outside the Allocated bands

Test Requirement:	47 CFR Part 15, Subpart C Section 15.225(a)/(b)/(c)					
Test Method:	ANSI C63.10: 2013					
Test Site:	3m (Semi-Anechoic Chamber)					
Receiver Setup:	Frequency	Detector	RBW	VBW	Remark	
	0.009MHz-0.090MHz	Peak	10kHz	30kHz	Peak	
	0.009MHz-0.090MHz	Average	10kHz	30kHz	Average	
	0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak	
	0.110MHz-0.490MHz	Peak	10kHz	30kHz	Peak	
	0.110MHz-0.490MHz	Average	10kHz	30kHz	Average	
	0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak	
Limit:	Frequency Range(MHz)	E-field Strengt @ 30 m (μ\			Strength Limit m (dBµV/m)	
	13.560 ± 0.007	15848			124	
	13.410 to 13.553 13.567 to 13.710	334			90	
	13.110 to 13.410 13.710 to 14.010					
	Note: Where the limits he measured at another formula: Extrapolation(dB)=40log ₁	er, the limits have	e been extra	apolated u	sing the followir	
Test Setup:	RX Antenna 3 m Ground Plane Receiver					
	Figure 1. Below 30MHz					
Test Procedure:	The EUT was placed on the top of a rotating table 0.8 meters above the					
	ground at a 3 meter semi-anechoic camber. The table was rotated 360					
	degrees to determine the position of the highest radiation.					
	The EUT was set 3 meters away from the interference-receiving antenna,					
	which was mounted o	n the top of a var	iable-heigh	t antenna	tower.	



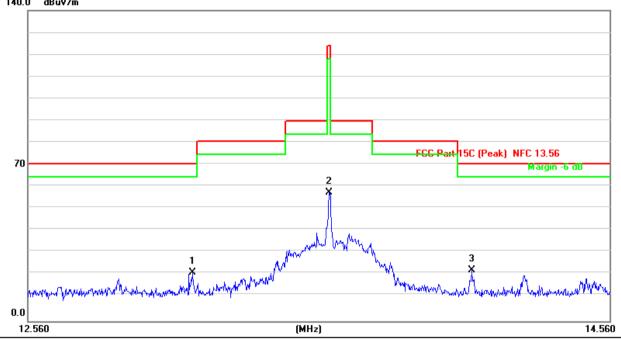
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Test Result:	Pass
Test Mode:	Transmitting with ASK modulation.
	mode is recorded in the report.
	found the X axis positioning which it is worse case, only the test worst case
	7. The radiation measurements are performed in X, Y, Z axis positioning. And
	as specified and then reported in a data sheet.
	would be re-tested one by one using peak, quasi-peak or average method
	would be reported. Otherwise the emissions that did not have 10dB margin
	specified, then testing could be stopped and the peak values of the EUT
	6. If the emission level of the EUT in peak mode was 10dB lower than the limit
	Bandwidth with Maximum Hold Mode.
	5. The test-receiver system was set to Peak Detect Function and Specified
	the maximum reading.
	and the rotatable table was turned from 0 degrees to 360 degrees to find
	test frequency of below 30MHz, the antenna was tuned to heights 1 meter)
	then the antenna was tuned to heights from 1 meter to 4 meters (for the
	4. For each suspected emission, the EUT was arranged to its worst case and
	measurement.
	horizontal and vertical polarizations of the antenna are set to make the
	ground to determine the maximum value of the field strength. Both
	3. The antenna height is varied from one meter to four meters above the

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Measurement Data

X axis positioning 140.0 dBuV/m



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		13.0980	46.98	-25.09	21.89	71.00	-49.11	QP			
2		13.5600	82.96	-25.11	57.85	124.00	-66.15	QP			
3	*	14.0600	47.96	-25.12	22.84	71.00	-48.16	QP			

Remark:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Factor = Antenna Factor + Cable Factor - Preamplifier Factor,

Level = Read Level + Factor,

Over Limit=Level-Limit Line.

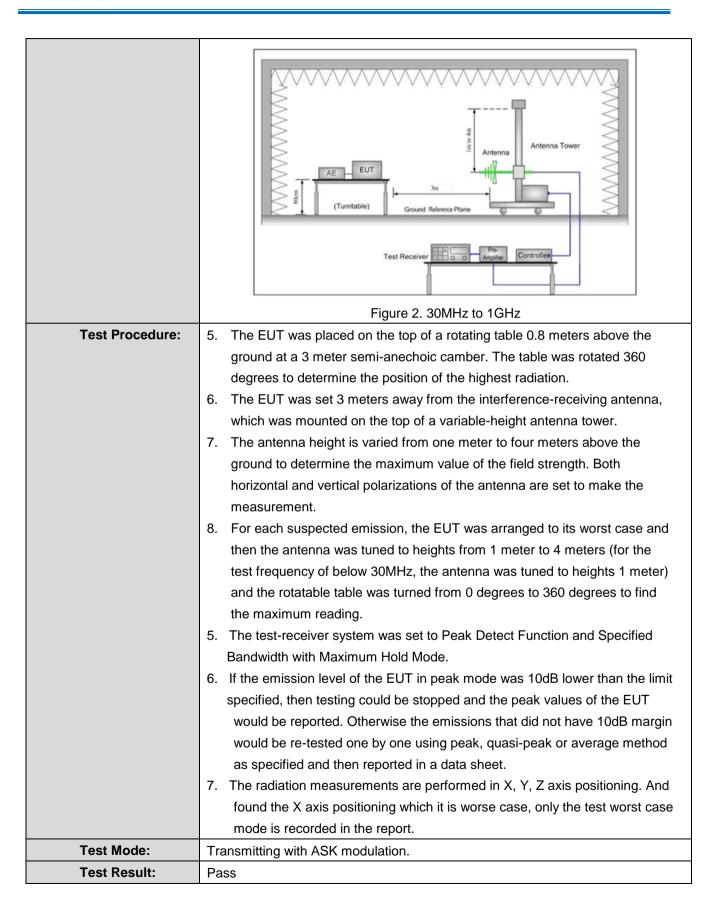


6.3 Radiated Emissions

Test Requirement:	47 CFR Part 15C Section	on 1	5.209 and 15.2	25(d),			
Test Method:	ANSI C63.10: 2013						
Test Site:	3m (Semi-Anechoic Cha	amb	oer)				
Receiver Setup:	Frequency		Detector	RB	W	VBW	Remark
	0.009MHz-0.090MHz	z	Peak	10kHz		30kHz	Peak
	0.009MHz-0.090MHz	Z	Average	10kHz		30kHz	Average
	0.090MHz-0.110MHz	Z	Quasi-peak	10k	Hz	30kHz	Quasi-peak
	0.110MHz-0.490MHz		Peak	10k	Hz	30kHz	Peak
	0.110MHz-0.490MHz	Z	Average	10k	Hz	30kHz	Average
	0.490MHz -30MHz		Quasi-peak	10k	Hz	30kHz	Quasi-peak
	30MHz-1GHz		Peak	100	kHz	300kHz	Peak
Limit:	Frequency	Field strength (microvolt/meter)				t (dBuV/m) @ 3 m	Remark
	0.009MHz-0.490MHz	24	400/F(kHz) @30	00m 128.5-93.8		8.5-93.8	Quasi-peak
	0.490MHz-1.705MHz	4000/F(kHz) @3	7	3.8-63	Quasi-peak		
	1.705MHz-30MHz		30 @30m		70	Quasi-peak	
	30MHz-88MHz		100 @3m			40.0	Quasi-peak
	88MHz-216MHz		150 @3m		43.5	Quasi-peak	
	216MHz-960MHz		200 @3m		46.0	Quasi-peak	
	960MHz-1GHz		500 @3m		54.0	Quasi-peak	
	Note: Where the limits measured at anot formula: Extrapolation(dB)=40log	ther	, the limits have	been	extra	apolated us	sing the following
Test Setup:	Extrapolation(dB)=40log ₁₀ (Measurement Distance/Specification Distance) RX Antenna Ground Plane Receiver						
			Figure 1. Belo	w 30N	ИHz		



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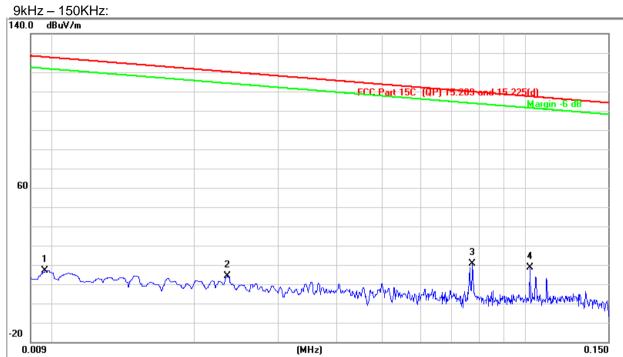




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Measurement Data

X axis positioning



No	. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		0.0097	16.91	0.00	16.91	127.75	-110.84	QP			
2		0.0235	14.12	0.00	14.12	120.09	-105.97	QP			
3		0.0774	20.58	0.00	20.58	109.77	-89.19	QP			
4	*	0.1025	18.75	0.00	18.75	107.34	-88.59	QP			

Remark:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

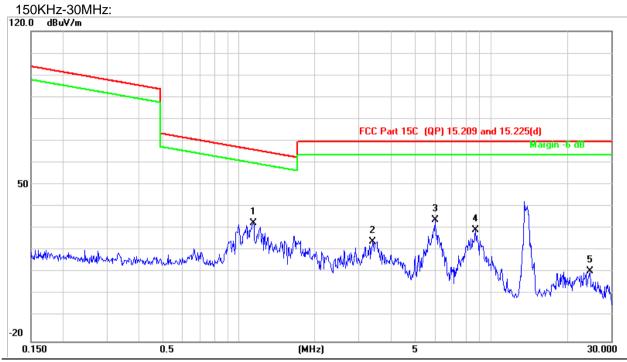
Factor = Antenna Factor + Cable Factor - Preamplifier Factor,

Level = Read Level + Factor,

Over Limit=Level-Limit Line.

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X axis positioning



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	1.1413	33.22	0.00	33.22	66.48	-33.26	QP			
2		3.3994	24.95	0.00	24.95	70.00	-45.05	QP			
3		6.0243	34.85	0.00	34.85	70.00	-35.15	QP			
4		8.6832	30.13	0.00	30.13	70.00	-39.87	QP			
5		24.6594	37.29	-25.58	11.71	70.00	-58.29	QP			

Remark:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Factor = Antenna Factor + Cable Factor - Preamplifier Factor,

Level = Read Level + Factor,

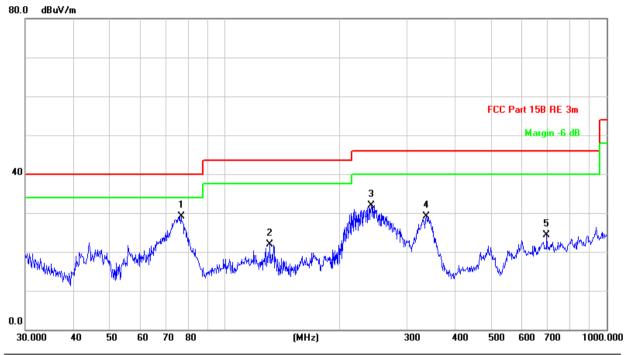
Over Limit=Level-Limit Line.



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30MHz-1GHz

Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	76.7808	47.09	-17.99	29.10	40.00	-10.90	QP			
2		131.2965	34.68	-12.73	21.95	43.50	-21.55	QP			
3	- :	241.6763	44.91	-13.09	31.82	46.00	-14.18	QP			
4	;	337.2155	38.97	-9.83	29.14	46.00	-16.86	QP			
5	(696.8567	27.44	-3.19	24.25	46.00	-21.75	QP			

Remark:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

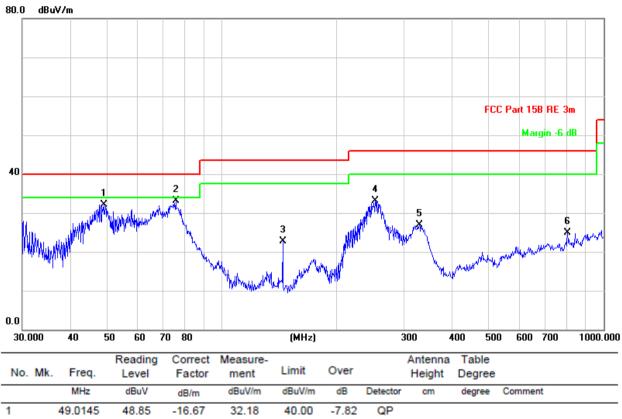
Factor = Antenna Factor + Cable Factor - Preamplifier Factor,

Level = Read Level + Factor, Over Limit=Level-Limit Line.



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No.	Mk.	Freq.	Level	Factor	ment	Limit	Over		Height	Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		49.0145	48.85	-16.67	32.18	40.00	-7.82	QP			
2	*	75.7114	51.34	-18.29	33.05	40.00	-6.95	QP			
3		144.3348	35.86	-13.10	22.76	43.50	-20.74	QP			
4		252.0627	46.21	-13.11	33.10	46.00	-12.90	QP			
5	;	329.0390	37.40	-10.40	27.00	46.00	-19.00	QP			
6		804.6028	25.71	-0.85	24.86	46.00	-21.14	QP			

Remark:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Factor = Antenna Factor + Cable Factor - Preamplifier Factor,

Level = Read Level + Factor,

Over Limit=Level-Limit Line.



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6.4 Frequency Stability

Test Requirement:	47 CFR Part 15 C Section 15.225(e)					
Test Method:	ANSI C63.10: 2013					
Test Setup:	Thermal Chamber Coil Antenna					
	EUT Spectrum Analyzer					
Frequency Range:	Operation within the band 13.110-14.010 MHz					
Requirements:	The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.					
Method of Measurement:	The EUT was placed in an environmental test chamber and powered such that control element received normal voltage and the transmitter provided maximum RF output.					
Test Result:	The unit does meet the FCC Part 15 C Section 15.225(e) requirements.					

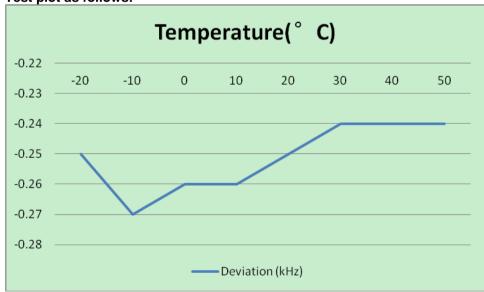


Test Frequency: 13.5	56MHz	Temperature:20℃		
Supply Voltage	Test Result	Deviation	Limit	Result
(V) DC	(MHz)	(kHz)	±0.01% (kHz)	
3.8	13.55975	-0.25	1.3560	Pass
4.2	13.55973	-0.27	1.3560	Pass
3.5	13.55976	-0.24	1.3560	Pass

Test Frequency: 13.	Voltage:3.8Vdc					
Temperature	Test Result	Deviation	Limit	Result		
(℃)	(MHz)	(kHz)	±0.01% (kHz)			
-20	13.55975	-0.25	1.3560			
-10	13.55973	-0.27	1.3560			
0	13.55974	-0.26	1.3560			
10	13.55974	-0.26	1.3560	Pass		
20	13.55975	-0.25	1.3560	FdSS		
30	13.55976	-0.24	1.3560			
40	13.55976	-0.24	1.3560			
50	13.55976	-0.24	1.3560			

Note: Deviation (KHz) = (Test Result-13.56MHz)*1000

Test plot as follows:





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6.5 20dB Occupied Bandwidth

Test Requirement:	47 CFR Part 15 C Section 15.215 (C)					
Test Method:	ANSI C63.10: 2013					
Test Setup:	Coil Antenna EUT Spectrum Analyzer					
Frequency Range:	Operation within the band 13.110 – 14.010 MHz					
Requirements:	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.					
Limit:	For 13.56 MHz the permitted frequency band is 14kHz, so the limit is 11.2 kHz.					

Test Data:

20dB bandwidth (kHz)	FL (MHz)	FH (MHz)	Limit(MHz)	Result
8.172	13.55655	13.56357	13.110 - 14.010	Pass



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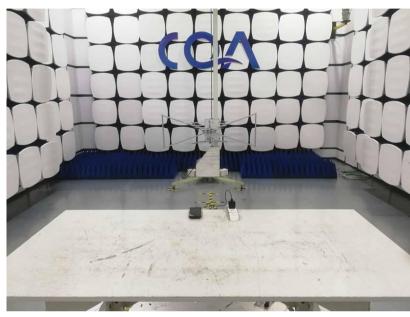
Test plot as follows:





7 Photographs - EUT Test Setup

7.1 Radiated Emission



30MHz~1GHz:



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8 Photographs - EUT Construction Details

Please refer to the report No: CQASZ20190500014EX-01

The End