



TEST REPORT
FCC ID: 2AHB5-STELLARS

For
Zhejiang Hanshow Technology Co., Ltd.
Electronic shelf label

Model No. : Stellar-S, S3

Prepared for : Zhejiang Hanshow Technology Co., Ltd.

Address : Shanghai JiaoTong University Jiaxing Science Park, No.321,
Jiachuang Rd., Xiuzhou District, Jiaxing City, Zhejiang, China

Prepared by : Shenzhen Alpha Product Testing Co., Ltd.

Address : Building B, East Area of Nanchang Second, Industrial Zone,
Gushu 2nd Road, Bao'an, Shenzhen, China

Report No. : T1851958 05

Date of Receipt : January 04, 2016

Date of Test : January 05-14, 2016

Date of Report : January 15, 2016

Version Number : REV0

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DECLARATION

Applicant : Zhejiang Hanshow Technology Co., Ltd.

Manufacturer : Zhejiang Hanshow Technology Co., Ltd.

Product : Electronic shelf label

(A) Model No. : Stellar-S, S3

(B) Trade Name : N/A

(C) Power supply : DC 3V from battery

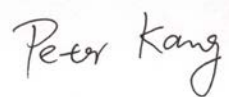
Measurement Standard Used:

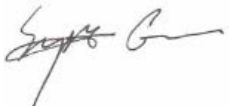
FCC Rules and Regulations Part 15 Subpart C Section 15.249: 2015, ANSI C63.4:2009

The device described above is tested by Shenzhen Alpha Product Testing Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart B Class B limits both conducted and radiated emissions. The test results are contained in this test report and Shenzhen Alpha Product Testing Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

After the test, our opinion is that EUT compliance with the requirement of the above standards.

This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Shenzhen Alpha Product Testing Co., Ltd.

Tested by (name + signature).....: Peter Kang
Test Engineer 

Approved by (name + signature).....: Simple Guan
Project Manager 

Date of issue..... : January 15, 2016

1 General Information

1.1 Description of Device (EUT)

EUT : Electronic shelf label
Model No. : Stellar-S, S3
DIFF : All model's the function, software and electric circuit are the same,
only with a product model named different. The test mode is Stellar-S.
Trade Name : N/A

Operation frequency : 2402-2480MHz
Data Rate : 500Kbps
Number of Channel : 79
Channel Separation : 1MHz
Modulation : GFSK
Antenna Type : PCB Antenna, Maximum Gain 2dBi

Power Supply : DC 3V from battery

Fundamental field strength (PK) : 88.44 dBuV/m

Software version : 3470

Hardware version : V1.2

Applicant : Zhejiang Hanshow Technology Co., Ltd.

Address : Shanghai JiaoTong University Jiaxing Science Park, No.321,
Jiachuang Rd., Xiuzhou District, Jiaxing City, Zhejiang, China

Manufacturer : Zhejiang Hanshow Technology Co., Ltd.

Address : Shanghai JiaoTong University Jiaxing Science Park, No.321,
Jiachuang Rd., Xiuzhou District, Jiaxing City, Zhejiang, China

1.2 Description of Test Facility

Shenzhen Alpha Product Testing Co., Ltd.

Building B, East Area of Nanchang Second, Industrial Zone, Gushu 2nd
Road, Bao'an, Shenzhen, China

March 25, 2015 File on Federal Communication Commission
Registration Number: 203110

July 18, 2014 Certificated by IC
Registration Number: 12135A

2 Summary of Measurement

2.1 Summary of test result

Description of Test Item	Standard	Results
Radiated Emission	Section 15.249&15.209	PASS
Occupied bandwidth	FCC Part 15: 15.215& FCC Part 15: 15.249	PASS
Band Edge Compliance	Section 15.249	PASS
Power Line Conducted Emissions	FCC Part 15: 15.207	N/A
Antenna requirement	FCC Part 15: 15.203	PASS
1. N/A is not applicable. 2. EUT power supply by battery, so Power Line Conducted Emissions test not applicable. 3. The EUT has been tested as an independent unit. And Continual Transmitting in maximum power (The new battery be used during Test).		

2.2 Test mode

Tested mode, channel information		
Mode	Channel	Frequency (MHz)
GFSK	Low :CH1	2402
	Middle: CH40	2441
	High: CH79	2480
Note: For the relevant Conducted Measurement, the temporary antenna connector is used during the measurement. Antenna Connector Impedance: 50 Ω , Cable Loss: 1.0 dB		

Channel list					
CH1	2402MHz	CH39	2440MHz		
CH2	2403MHz	CH40	2441MHz	CH77	2478MHz
CH3	2404MHz	CH41	2442MHz	CH78	2479MHz
.....				CH79	2480MHz

2.3 Block Diagram



2.4 Assistant equipment used for test

Description	:	N/A
Manufacturer	:	N/A
Model No.	:	N/A

Description	:	N/A
Manufacturer	:	N/A
Model No.	:	N/A
Information	:	N/A

2.5 Test Conditions

Temperature range	21-25°C
Humidity range	40-75%
Pressure range	86-106kPa

2.6 Measurement Uncertainty (95% confidence levels, k=2)

Item	MU	Remark
Uncertainty for Power point Conducted Emissions Test	2.70dB	
Uncertainty for Radiation Emission test in 3m chamber (30MHz to 1GHz)	3.90 dB	Polarize: V
	3.92dB	Polarize: H
Uncertainty for Radiation Emission test in 3m chamber (1GHz to 25GHz)	4.26 dB	Polarize: H
	4.28 dB	Polarize: V
Uncertainty for conducted RF Power	0.16dB	

2.7 Test Equipment

Equipment	Manufacture	Model No.	Serial No.	Last cal.	Cal Interval
3m Semi-Anechoic	CHENYU	9*6*6	N/A	2014.01.20	3Year
Spectrum analyzer	Agilent	E4407B	MY49510055	2015.01.19	1Year
Receiver	R&S	ESCI	101165	2015.01.19	1Year
Bilog Antenna	SCHWARZBECK	VULB 9168	9168-438	2014.01.22	2Year
Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D(1201)	2015.01.21	2Year
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA 9170 D(1432)	2015.01.21	2Year
Active Loop Antenna	Beijing Daze	ZN30900A	SEL0097	2015.01.21	1Year
Cable	Resenberger	SUCOFLEX 104	309972/4	2015.01.19	1Year
Cable	Resenberger	SUCOFLEX 104	329112/4	2015.01.19	1Year
Pre-amplifier	Agilent	8449B	3008A02664	2015.03.21	1Year
Pre-amplifier	HP	HP8347A	2834A00455	2015.03.21	1Year

Note: Cable test frequency range:

Equipment	Manufacture	Model No.	Serial No.	Test Location	Frequency Rang
Cable	Resenberger	SUCOFLEX 104	309972/4	Radiation	9KHz-2GHz
Cable	Resenberger	SUCOFLEX 104	329112/4	Radiation	1GHz-26.5G Hz

3 Radiation Emission

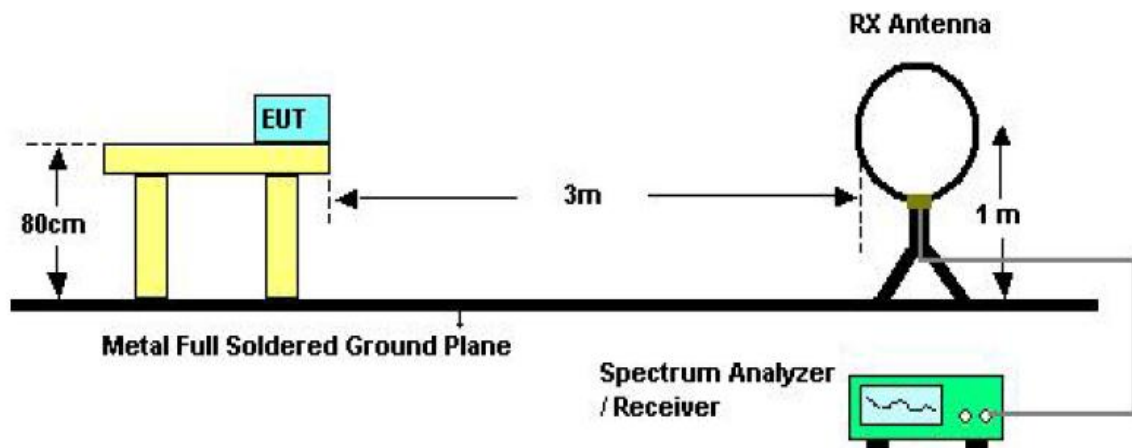
3.1 Radiation Emission Limits(15.209&249)

Frequency (MHz)	Field Strength Limits at 3 metres (watts, e.i.r.p.)		
	uV/m	dB uV/m	Measurement distance(m)
0.009-0.490	2400/F(kHz)	XX	300
0.490-1.705	24000/F(kHz)	XX	30
1.705-30	30	29.5	30
30~88	100(3nW)	40	3
88~216	150(6.8nW)	43.5	3
216~960	200(12nW)	46	3
Above960	500(75nW)	54	3
Carrier frequency		93.97(AV)	3
Carrier frequency		113.97(PK)	3

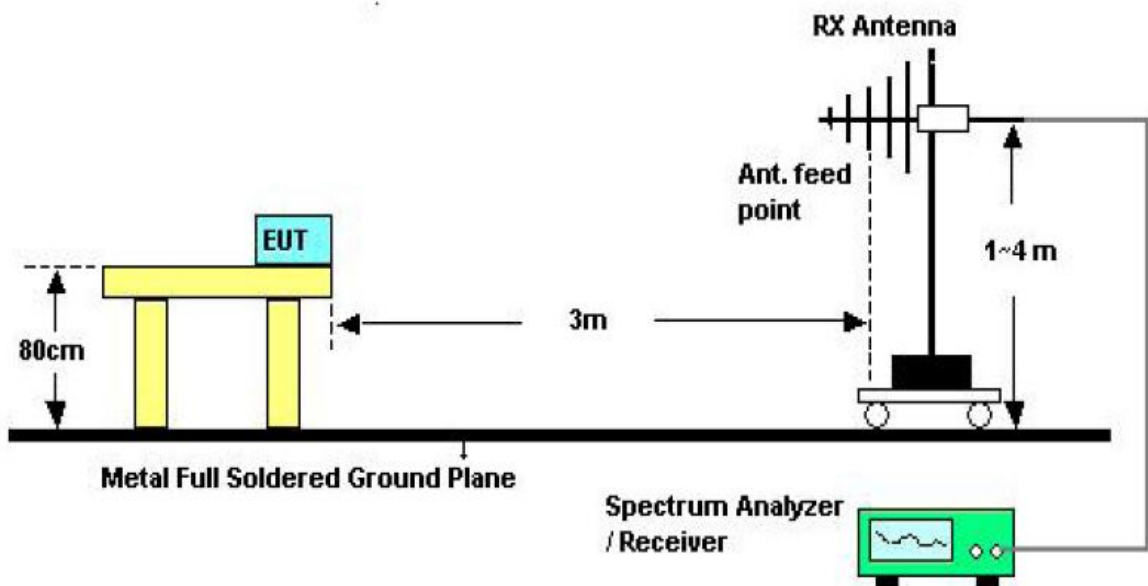
NOTE:

- The tighter limit applies at the band edges.
- Emission Level(dB uV/m)=20log Emission Level(Uv/m)

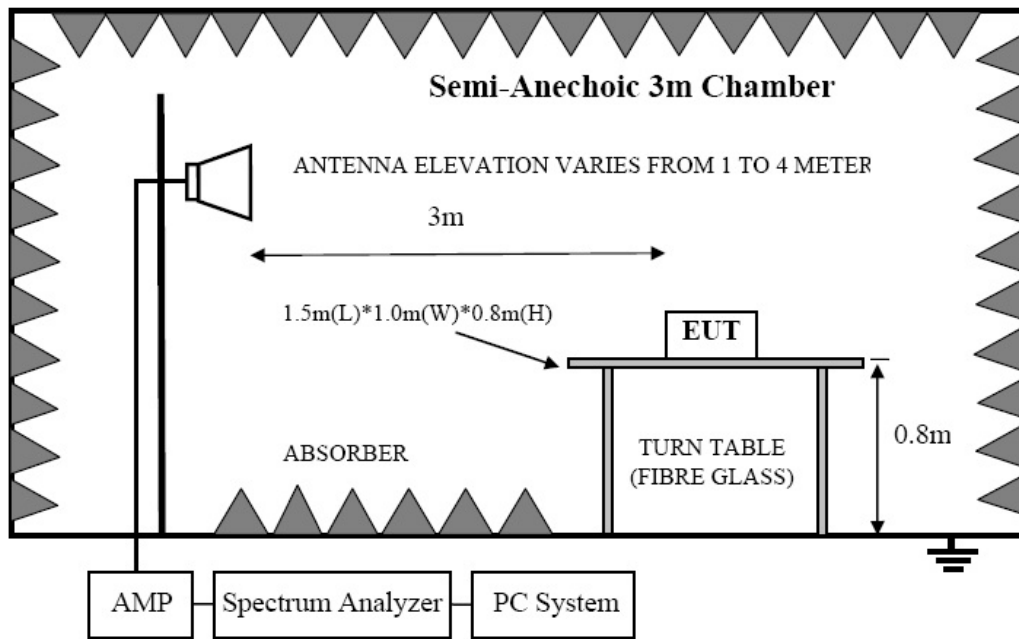
3.2 Test Setup



Below 30MHz Test Setup



Above 30MHz Test Setup



Above 1GHz Test Setup

Note: For harmonic emissions test a appropriate high pass filter was inserted in the input port of AMP.

3.3 Test Procedure

- (1) EUT was placed on a non-metallic table, 80 cm above the ground plane inside a semi-anechoic chamber.
- (2) For the actual test configuration, please see the test setup photo.
- (3) Test antenna was located 3m from the EUT on an adjustable mast. Below pre-scan procedure was first performed in order to find prominent radiated emissions.
 - (a) Change work frequency or channel of device if practicable.
 - (b) Rotated EUT though three orthogonal axes to determine the attitude of EUT arrangement produces highest emissions
- (4) Spectrum frequency from 9KHz to 25GHz (tenth harmonic of fundamental frequency) was investigated
- (5) For final emissions measurements at each frequency of interest, the EUT were rotated and the antenna height was varied between 1m and 4m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.4 2009 on Radiated Emission test.
- (6) For emissions above 1GHz, both Peak and Average level were measured with Spectrum Analyzer, and the RBW is set at 1MHz, VBW is set at 3MHz for Peak measure; RBW is set at 1MHz, VBW is set at 10Hz for Average measure.

(7) For the radiated emission test above 1GHz:

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane

3.4 Test Equipment Setting For emission test.

9KHz~150KHz	RBW 200Hz	VBW 1KHz
150KHz~30MHz	RBW 9KHz	VBW 30KHz
30MHz~1GHz	RBW 120KHz	VBW 300KHz
Above 1GHz	RBW 1MHz	VBW 3MHz

3.5 Test Condition

Continual Transmitting in maximum power.

3.6 Test Result

PASS.

Note: The Radiated emissions is showed the maximum power data of TX test mode and showed worst orthogonal axes with X orthogonal axes.

We have scanned the 10th harmonic from 9KHz to the EUT.

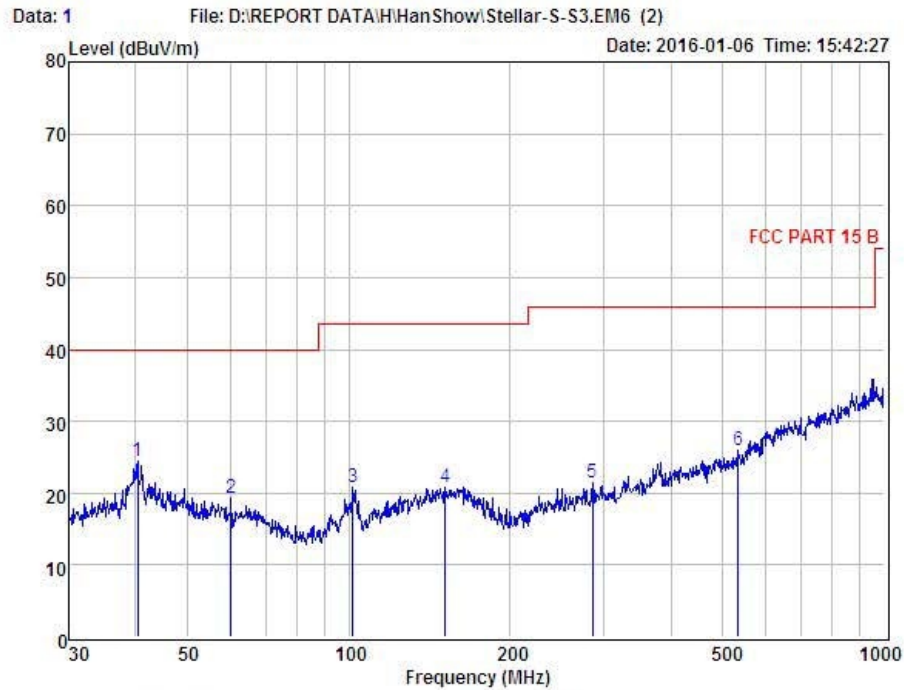
Detailed information please see the following page.

From 9KHz to 30MHz: Conclusion: **PASS**

Note: The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.



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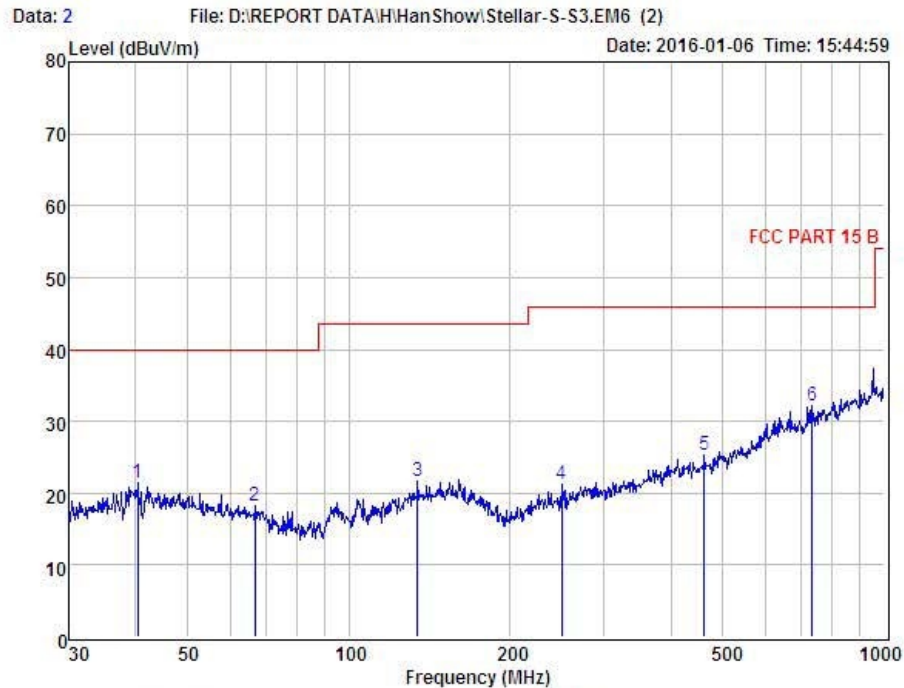
Condition : FCC PART 15 B 3m POL: VERTICAL
 EUT : Electronic shelf label
 Model No : Stellar-S
 Test Mode : TX 2402MHz
 Power : DC 3V
 Test Engineer : Simple
 Remark :
 Temp : 25.2°C
 Hum : 56%

Item	Freq MHz	Read Level dBuV	Antenna Factor dB	Preamp Factor dB	Cable Loss dB	Level dBuV	Limit dBuV	Margin dBuV	Remark
1	40.42	41.04	14.07	30.85	0.18	24.44	40.00	-15.56	Peak
2	60.28	37.16	12.75	30.90	0.24	19.25	40.00	-20.75	Peak
3	101.64	40.12	10.35	30.10	0.34	20.71	43.50	-22.79	Peak
4	151.60	35.65	14.16	29.41	0.42	20.82	43.50	-22.68	Peak
5	284.98	36.45	12.50	28.07	0.67	21.55	46.00	-24.45	Peak
6	533.83	34.74	17.13	27.10	1.08	25.85	46.00	-20.15	Peak

Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss



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Condition : FCC PART 15 B 3m POL: HORIZONTAL
 EUT : Electronic shelf label
 Model No : Stellar-S
 Test Mode : TX 2402MHz
 Power : DC 3V
 Test Engineer : Simple
 Remark :
 Temp : 25.2°C
 Hum : 56%

Item	Freq MHz	Read Level dBuV	Antenna Factor dB	Preamp Factor dB	Cable Loss dB	Level dBuV	Limit dBuV	Margin dBuV	Remark
1	40.42	38.15	14.07	30.85	0.18	21.55	40.00	-18.45	Peak
2	66.73	37.21	11.21	30.39	0.28	18.31	40.00	-21.69	Peak
3	134.56	37.66	13.08	29.44	0.46	21.76	43.50	-21.74	Peak
4	249.43	37.43	11.57	28.24	0.46	21.22	46.00	-24.78	Peak
5	460.73	35.70	16.08	27.41	1.02	25.39	46.00	-20.61	Peak
6	734.49	36.30	20.09	25.49	1.30	32.20	46.00	-13.80	Peak

Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss

Notes: Above is below 1GHz test data. This report only shall the worst case mode for TX 2402MHz.

Radiated Emissions Result of Inside band (2402MHz)

EUT	Electronic shelf label	Model Name	Stellar-S
Temperature	25°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 3V from battery
Test Mode	TX Low	Antenna polarization	Horizontal/Vertical

Channel Low(2402MHz)									
Fre. MHz	Plority H/V	Reading dBuV	Antenna Factor dB	Cable Loss dB	Amplifier Gain dB	Correct Factor dB	Measure Result dBuV/m	Limit dBuV/m	Margin dB
2402	H	89.47 (PK)	27.61	3.92	34.97	-3.44	86.03	113.97	-27.94
2402	H	81.38 (AV)	27.61	3.92	34.97	-3.44	77.94	93.97	-16.03
--	H	--	--	--	--	--	--	--	--
2402	V	88.52 (PK)	27.61	3.92	34.97	-3.44	85.08	113.97	-28.89
2402	V	80.53 (AV)	27.61	3.92	34.97	-3.44	77.09	93.97	-16.88
--	V	--	--	--	--	--	--	--	--

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1489.53	H	46.38	---	-10.27	36.11	---	74.00	54.00	-17.89	Peak
1942.13	H	47.02	---	-8.86	38.16	---	74.00	54.00	-15.84	Peak
2654.72	H	44.62	---	-6.94	37.68	---	74.00	54.00	-16.32	Peak
4804.00	H	44.92	---	0.64	45.56	---	74.00	54.00	-8.44	Peak
N/A										
1218.43	V	47.46	---	-11.52	35.94	---	74.00	54.00	-18.06	Peak
1821.56	V	47.24	---	-9.16	38.08	---	74.00	54.00	-15.92	Peak
2794.23	V	44.91	---	-6.38	38.53	---	74.00	54.00	-15.47	Peak
4804.00	V	44.13		0.64	44.77	---	74.00	54.00	-9.23	Peak
N/A										

Notes: 1 --Means other frequency and mode comply with standard requirements and at least have 20dB margin. Correct Factor=Cable Loss+ Antenna Factor-Amplifier Gain
Measurement Result=Reading + Correct Factor
Margin=Measurement Result-Limit

2 –Spectrum setting:

- a. Peak setting 30MHz-1GHz, RBW=120KHz, VBW=300KHz.
Above 1G: RBW=1MHz, VBW=3MHz
- b. AV setting 30MHz-1GHz, RBW=1MHz, VBW=10Hz.
Above 1G: RBW=1MHz, VBW=10Hz

Radiated Emissions Result of Inside band (2441MHz)

EUT	Electronic shelf label	Model Name	Stellar-S
Temperature	25°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 3V from battery
Test Mode	TX Mid	Antenna polarization	Horizontal/Vertical

Channel Mid(2441MHz)									
Fre. MHz	Plority H/V	Reading dBuV	Antenna Factor dB	Cable Loss dB	Amplifier Gain dB	Correct Factor dB	Measure Result dBuV/m	Limit dBuV/m	Margin dB
2441	H	91.83 (PK)	27.62	3.96	34.97	-3.39	88.44	113.97	-25.53
2441	H	86.57 (AV)	27.62	3.96	34.97	-3.39	83.18	93.97	-10.79
--	H	--	--	--	--	--	--	--	--
2441	V	90.54 (PK)	27.62	3.96	34.97	-3.39	87.15	113.97	-26.82
2441	V	83.66 (AV)	27.62	3.96	34.97	-3.39	80.27	93.97	-13.7
--	V	--	--	--	--	--	--	--	--

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1231.29	H	48.7	---	-11.52	37.18	---	74.00	54.00	-16.82	Peak
2215.05	H	46.72	---	-8.13	38.59	---	74.00	54.00	-15.41	Peak
2932.16	H	46.00	---	-5.95	40.05	---	74.00	54.00	-13.95	Peak
4882.00	H	45.67	---	0.76	46.43	---	74.00	54.00	-7.57	Peak
N/A										
1305.47	V	47.43	---	-10.84	36.59	---	74.00	54.00	-17.41	Peak
2306.43	V	45.07	---	-7.46	37.61	---	74.00	54.00	-16.39	Peak
3145.07	V	45.15	---	-5.63	39.52	---	74.00	54.00	-14.48	Peak
4882.00	V	46.42		0.76	47.18	---	74.00	54.00	-6.82	Peak
N/A										

Notes: 1 --Means other frequency and mode comply with standard requirements and at least have 20dB margin. Correct Factor=Cable Loss+ Antenna Factor-Amplifier Gain
Measurement Result=Reading + Correct Factor
Margin=Measurement Result-Limit

2 –Spectrum setting:

- a. Peak setting 30MHz-1GHz, RBW=120KHz, VBW=300KHz.
Above 1G: RBW=1MHz, VBW=3MHz
- b. AV setting 30MHz-1GHz, RBW=1MHz, VBW=10Hz.
Above 1G: RBW=1MHz, VBW=10Hz

Radiated Emissions Result of Inside band (2480MHz)

EUT	Electronic shelf label	Model Name	Stellar-S
Temperature	25°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 3V from battery
Test Mode	TX High	Antenna polarization	Horizontal/Vertical

Channel High(2480MHz)									
Fre. MHz	Plority H/V	Reading dBuV	Antenna Factor dB	Cable Loss dB	Amplifier Gain dB	Correct Factor dB	Measure Result dBuV/m	Limit dBuV/m	Margin dB
2480	H	88.36 (PK)	27.59	3.98	34.97	-3.4	84.96	113.97	-29.01
2480	H	80.47 (AV)	27.59	3.98	34.97	-3.4	77.07	93.97	-16.90
--	H	--	--	--	--	--	--	--	--
2480	V	85.29 (PK)	27.59	3.98	34.97	-3.4	81.89	113.97	-32.08
2480	V	78.31 (AV)	27.59	3.98	34.97	-3.4	74.91	93.97	-19.06
--	V	--	--	--	--	--	--	--	--

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1256.33	H	47.91	---	-10.96	36.95	---	74.00	54.00	-17.05	Peak
1954.17	H	45.71	---	-8.64	37.07	---	74.00	54.00	-16.93	Peak
2915.74	H	45.70	---	-5.95	39.75	---	74.00	54.00	-14.25	Peak
4960.00	H	44.76	---	0.87	45.63	---	74.00	54.00	-8.37	Peak
N/A										
1294.75	V	48.12	---	-10.96	37.16	---	74.00	54.00	-16.84	Peak
2106.41	V	46.21	---	-8.36	37.85	---	74.00	54.00	-16.15	Peak
3257.22	V	45.67	---	-5.39	40.28	---	74.00	54.00	-13.72	Peak
4960.00	V	44.88		0.87	45.75	---	74.00	54.00	-8.25	Peak
N/A										

Notes: 1 --Means other frequency and mode comply with standard requirements and at least have 20dB margin. Correct Factor=Cable Loss+ Antenna Factor-Amplifier Gain
Measurement Result=Reading + Correct Factor
Margin=Measurement Result-Limit

2 –Spectrum setting:

- a. Peak setting 30MHz-1GHz, RBW=120KHz,VBW=300KHz.
Above 1G: RBW=1MHz, VBW=3MHz
- b. AV setting 30MHz-1GHz, RBW=1MHz, VBW=10Hz.
Above 1G: RBW=1MHz, VBW=10Hz

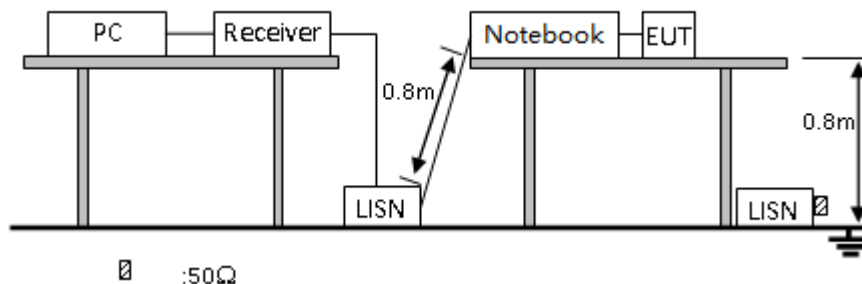
4 POWER LINE CONDUCTED EMISSION

4.1 Conducted Emission Limits(15.207)

Frequency MHz	Limits dB(μ V)	
	Quasi-peak Level	Average Level
0.15 -0.50	66 -56*	56 - 46*
0.50 -5.00	56	46
5.00 -30.00	60	50

- Notes: 1. *Decreasing linearly with logarithm of frequency.
 2. The lower limit shall apply at the transition frequencies.
 3. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

4.2 Test Setup



4.3 Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC lines are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.4-2009 on Conducted Emission Measurement. The bandwidth of test receiver (R & S ESCS30) is set at 9 kHz.

4.4 Test Results

EUT power supply by battery, so this test item not applicable.

5 Occupied bandwidth

5.1 Test limit

Please refer section 15.249

5.2 Method of measurement

a) The bandwidth is measured at an amplitude level reduced 20dB from the reference level. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

b) The test receiver RBW set 100KHz, VBW set 300KHz, Sweep time set auto.

5.3 Test Setup

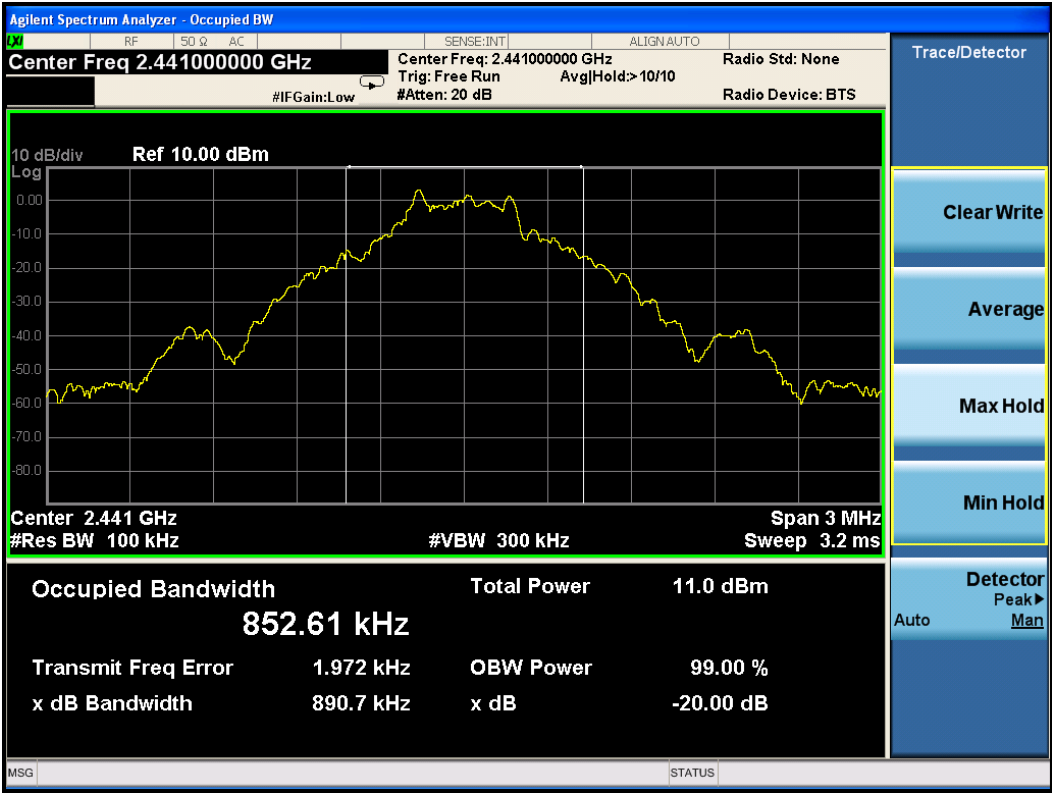


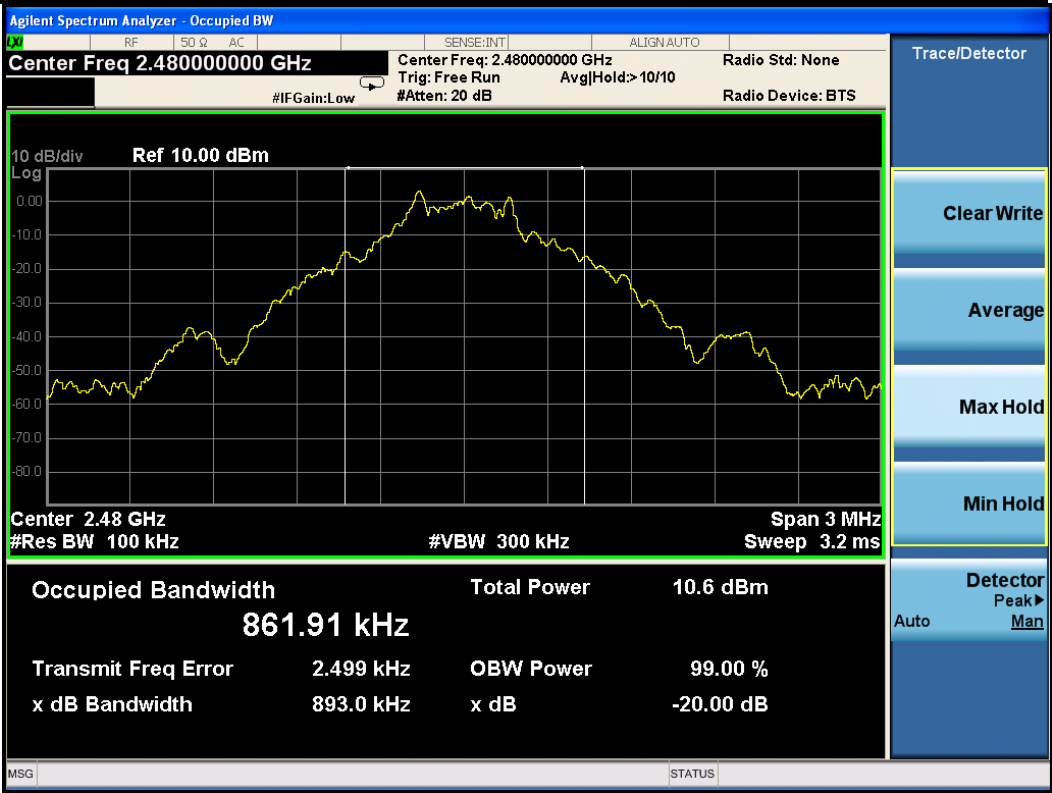
5.4 Test Results

PASS.

Mode	Freq (MHz)	20dB Bandwidth (KHz)	99% Bandwidth (KHz)	Limit (kHz)	Conclusion
GFSK	2402	881.5	860.26	/	PASS
	2441	890.7	852.61	/	PASS
	2480	893.0	861.91	/	PASS

Note: Detailed information please see the following page.





6 Band Edge Check

6.1 Test limit

Please refer section 15.249 and section 15.205.

249(d) 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 section 15.209, whichever is the lesser attenuation.

249(e) As shown in section 15.35(b), for frequencies above 1000MHz, the above field strength limits in paragraphs (a) and (b) of this section 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 point-to-point operation under paragraph (b) of this section, the peak field strength shall not exceed 2500 millivolts/meter at 3 meters along the antenna azimuth.

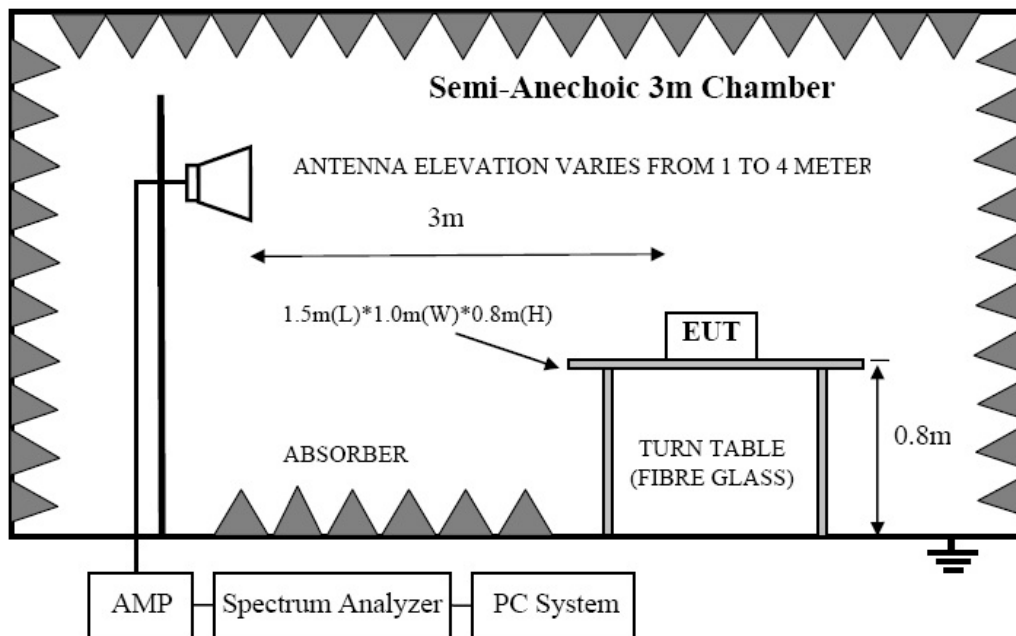
6.2 Test Procedure

All restriction band and non-restriction band have been tested, only worse case is reported.

For the radiated emission test above 1GHz:

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

6.3 Test Setup



6.4 Test Result

Pass.

Radiated Method

Band Edge Test result								
EUT: Electronic shelf label					M/N: Stellar-S			
Power: DC 3V from battery								
Test date: 2016-01-09		Test site: 3m Chamber			Tested by: peter			
Test mode: Tx CH Low 2402MHz								
Antenna polarity: Vertical								
Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2390	43.57	27.62	3.92	34.97	40.14	74	33.86	PK
2390	--	27.62	3.92	34.97	--	54	--	AV
2400	51.99	27.62	3.94	34.97	48.58	74	25.42	PK
2400	--	27.62	3.94	34.97	--	54	--	AV
Antenna Polarity: Horizontal								
2390	41.71	27.62	3.92	34.97	38.28	74	35.72	PK
2390	--	27.62	3.92	34.97	--	54	--	AV
2400	53.15	27.62	3.94	34.97	49.74	74	24.26	PK
2400	--	27.62	3.94	34.97	--	54	--	AV
Note:								
1, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto Detector: PK								
2, Spectrum Set for AV measure: RBW=1MHz, VBW=10Hz, Sweep time=Auto Detector: PK								
3, Result = Read level + Antenna factor + cable loss-Amp factor								
4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.								

Band Edge Test result								
EUT: Electronic shelf label				M/N: Stellar-S				
Power: DC 3V from battery								
Test date: 2016-01-09		Test site: 3m Chamber		Tested by: peter				
Test mode: Tx CH High 2480MHz								
Antenna polarity: Vertical								
Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(d B)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2483.5	41.00	27.89	4.00	34.97	37.92	74	36.08	PK
2483.5		--	--	--	--	54	--	AV
Antenna Polarity: Horizontal								
2483.5	41.59	27.89	4.00	34.97	38.51	74	35.49	PK
2483.5		--	--	--	--	54	--	AV
Note:								
1, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK								
2, Spectrum Set for AV measure: RBW=1MHz, VBW=10Hz, Sweep time=Auto, Detector: PK								
3, Result = Read level + Antenna factor + cable loss-Amp factor								
4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.								

7 Antenna Requirement

7.1 Standard Requirement

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a 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.

7.2 Antenna Connected Construction

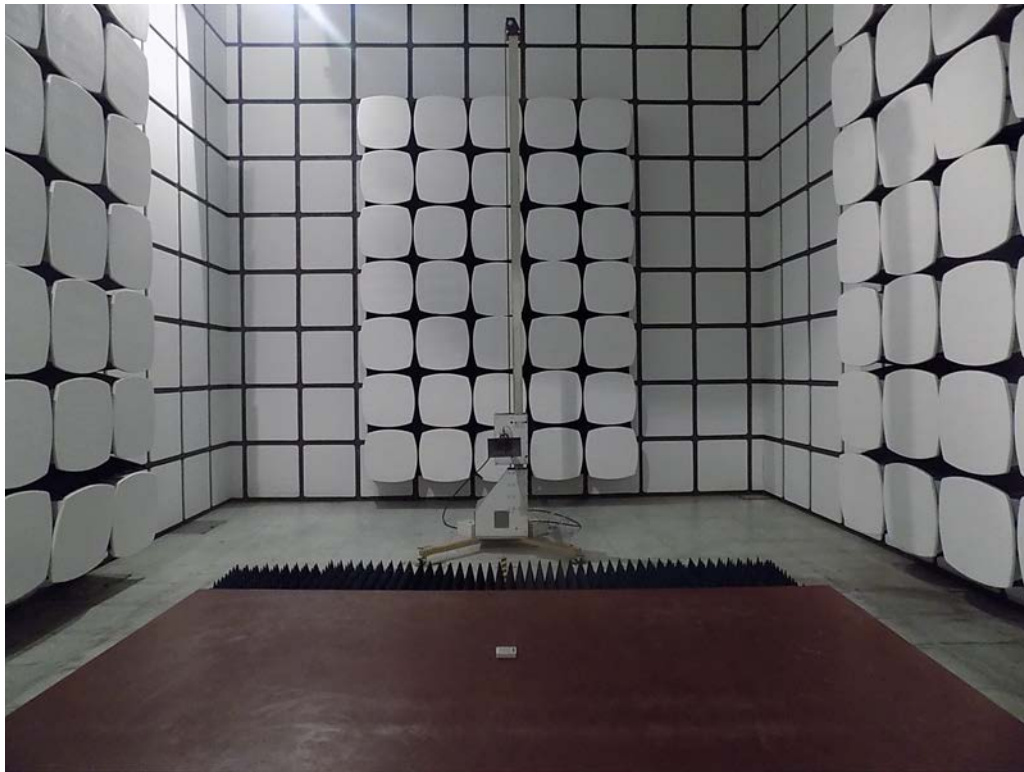
The directional gains of antenna used for transmitting is 2dBi, and the antenna is PCB antenna no consideration of replacement. Please see EUT photo for details.

7.3 Result

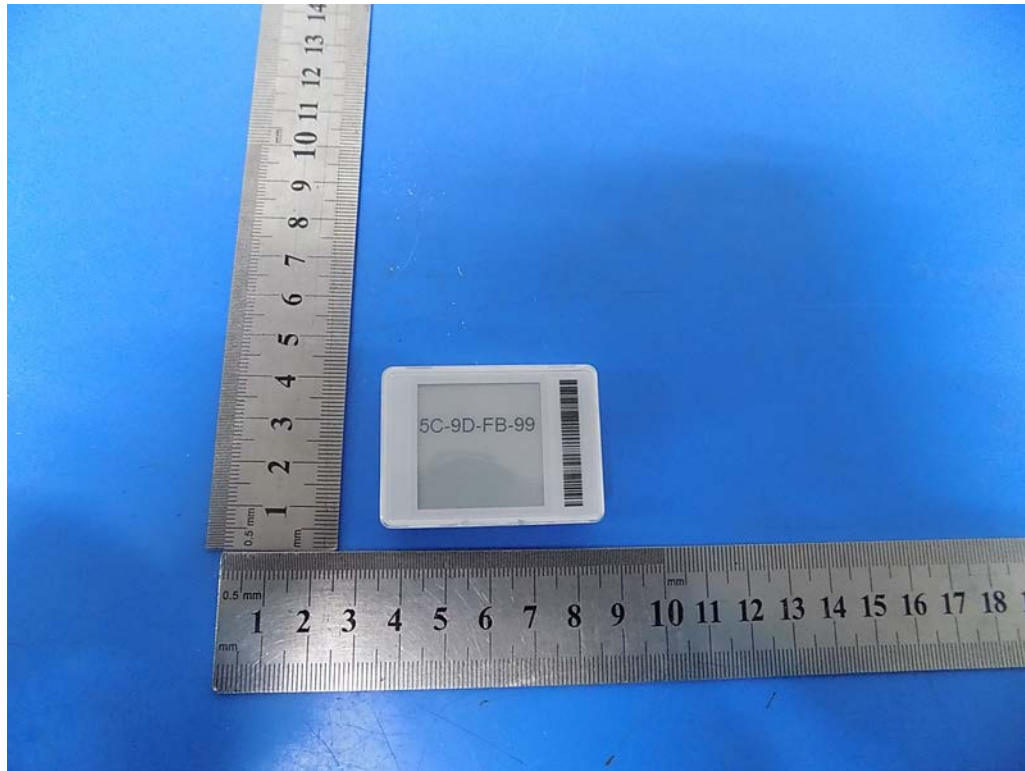
The EUT antenna is PCB Antenna. It comply with the standard requirement.

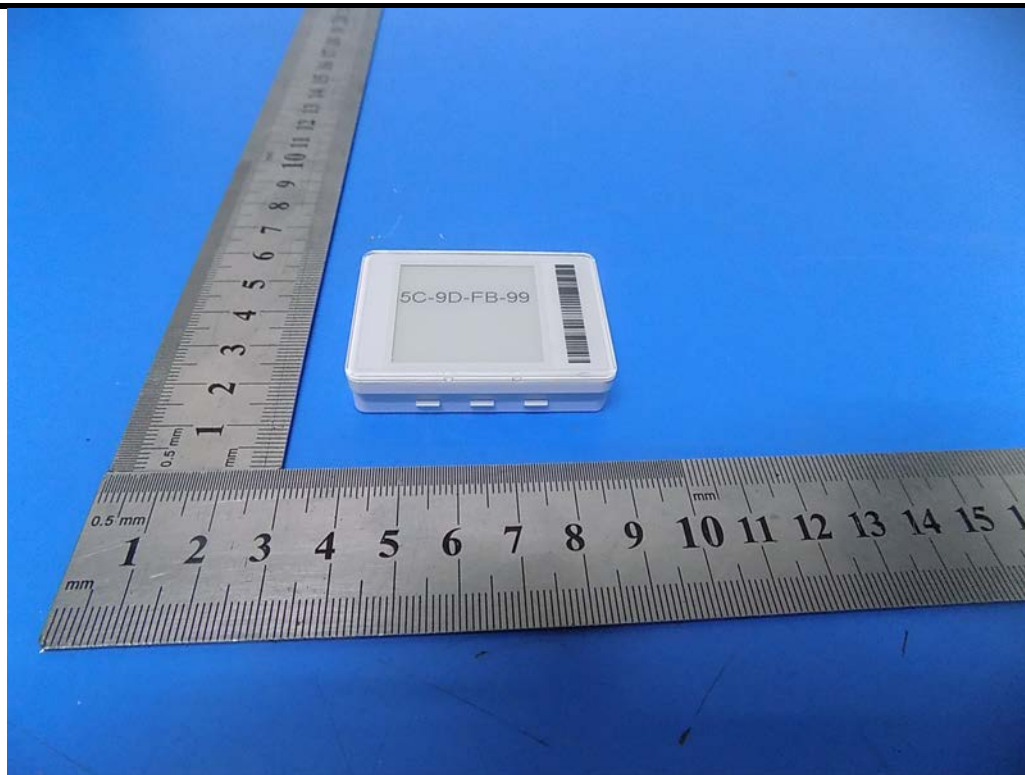
8 Photographs of Test Setup

Photographs-Radiated Emission Test Setup in Chamber

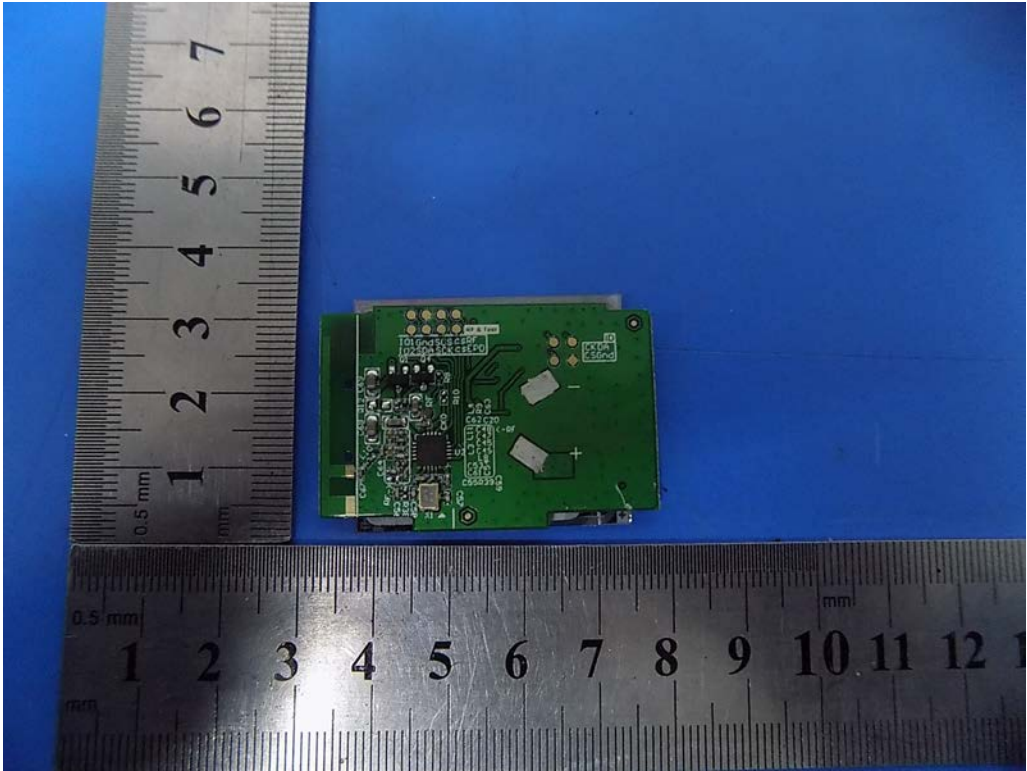
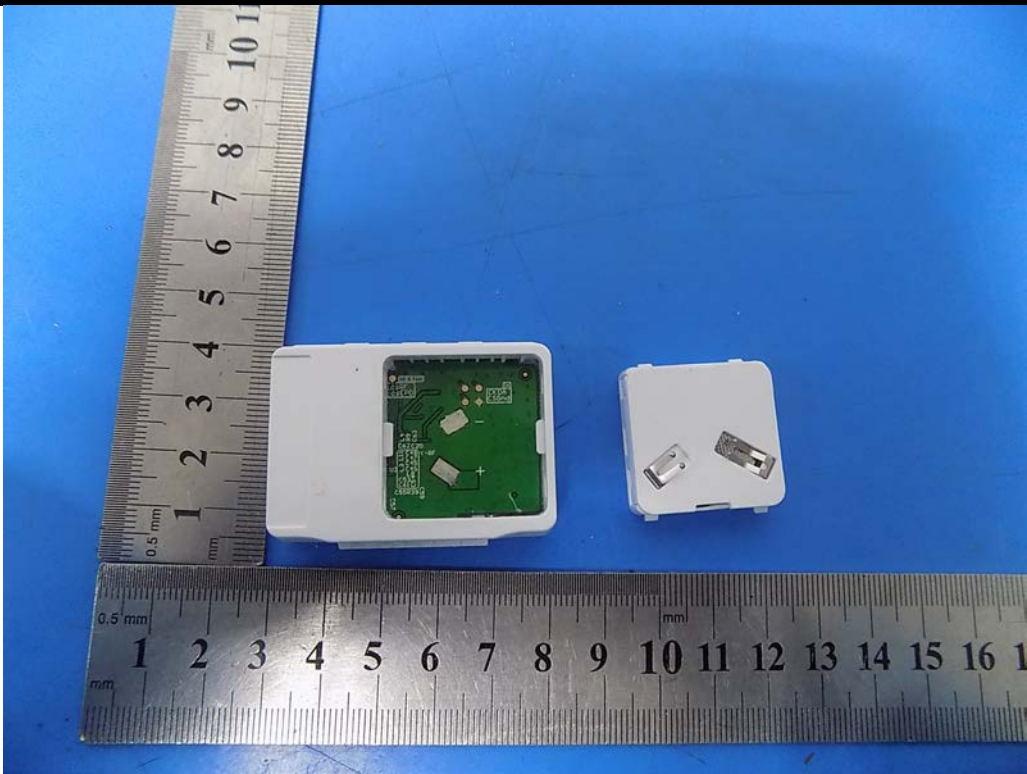


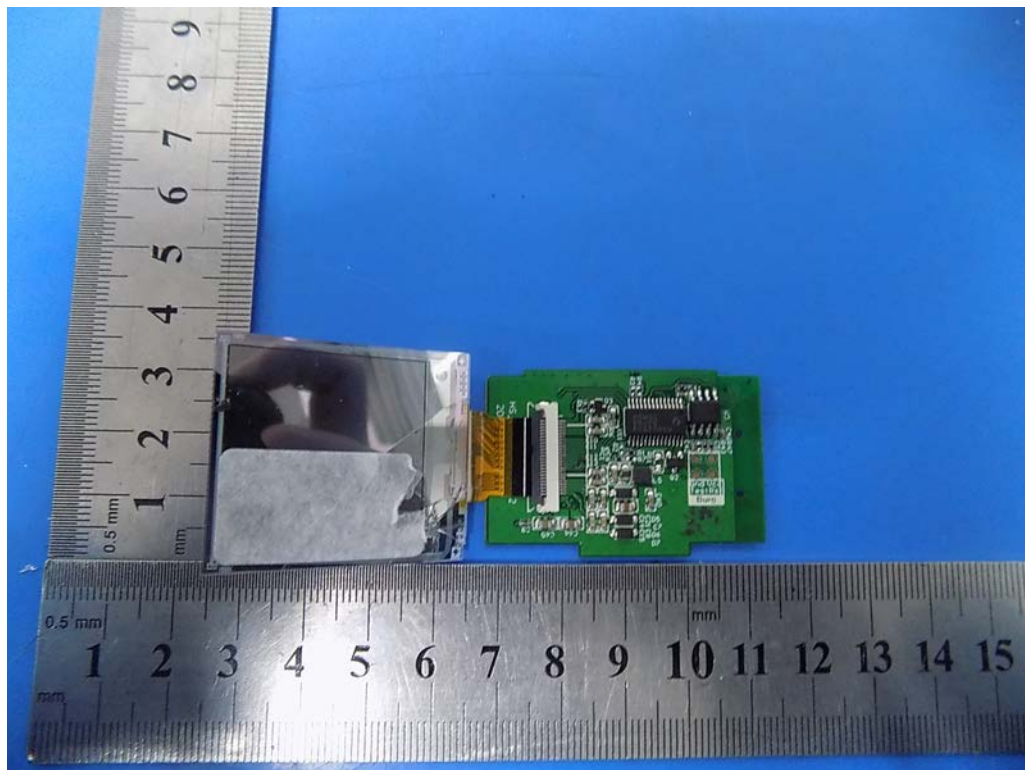
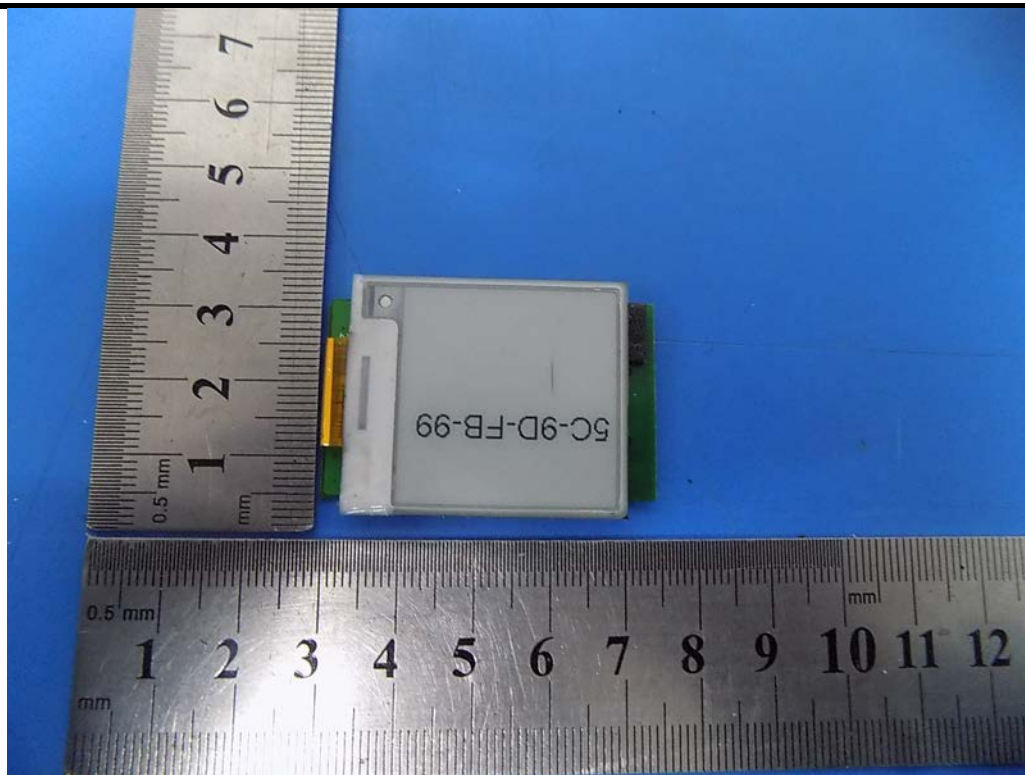
9 Photographs of EUT

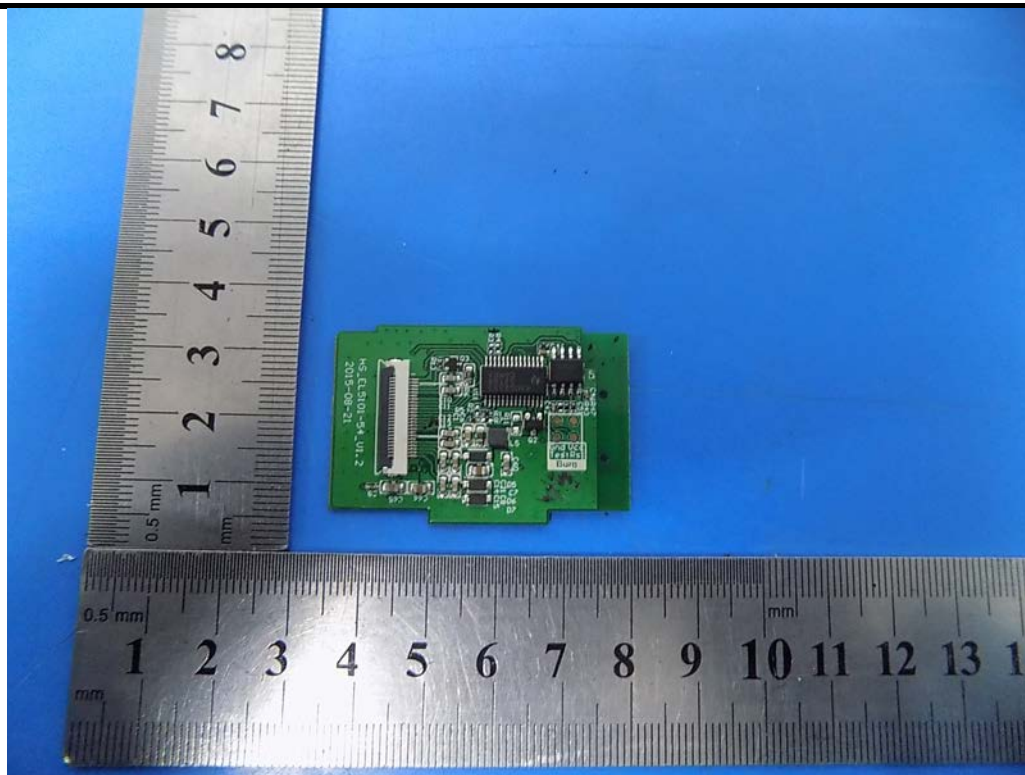












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