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RADIO TEST REPORT

Report No: STS1711009W01

Issued for

Shanghai Blozi Electronic Co.,Ltd.

Building 23B, Shanghai Financial Valley, Jiading District,
Shanghai, China

Product Name:	Electronic Article Surveillance
Brand Name:	BLOZI
Model Name:	FS 6
Series Model:	FS 2, FS 7, FS 8, FS 9
FCC ID:	2AN7P-FS6
Test Standard:	FCC Part 15.223



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TEST REPORT CERTIFICATION

Applicant's name: Shanghai Blozi Electronic Co.,Ltd.
Address: Building 23B, Shanghai Financial Valley, Jiading District, Shanghai, China
Manufacture's Name: Shanghai Blozi Electronic Co.,Ltd.
Address: Building 23B, Shanghai Financial Valley, Jiading District, Shanghai, China

Product description

Product Name.....: Electronic Article Surveillance
Brand Name: BLOZI
Model Name: FS 6
Series Model.....: FS 2, FS 7, FS 8, FS 9

Test Standards: FCC Part15.223

Test procedure ANSI C63.10: 2013,ANSI C63.4: 2014

This device described above has been tested by STS, the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Date of Test:

Date (s) of performance of tests.....: 06 Nov. 2017 ~27 Nov. 2017

Date of Issue.....: 27 Nov. 2017

Test Result.....: **Pass**

Testing Engineer :

Sean She

(Sean she)

Technical Manager :

Hakim. hou

(Hakim.hou)

Authorized Signatory :

Vita Li

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1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 15.223 , Subpart C			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	PASS	--
15.209 15.223	Radiated Emission	PASS	--
15.223	field strength emission	PASS	--
15.203	Antenna Requirement	PASS	--
15.223	6dB Bandwidth	PASS	--

NOTE: (1) "N/A" denotes test is not applicable in this Test Report

(2) All tests are according to ANSI C63.4-2014 and ANSI C63.10-2013

1.1 TEST FACTORY

Shenzhen STS Test Services Co., Ltd.
1/F., Building B, Zhuoke Science Park, No.190, Chongqing Road,
Fuyong Street, Bao'an District, Shenzhen, Guangdong, China
CNAS Registration No.: L7649; FCC Registration No.: 625569

IC Registration No.: 12108A; A2LA Certificate No.: 4338.01;

1.2 MEASUREMENT UNCERTAINTY

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

No.	Item	Uncertainty
1	Conducted Emission (9KHz-150KHz)	$\pm 2.88\text{dB}$
2	Conducted Emission (150KHz-30MHz)	$\pm 2.67\text{dB}$
3	RF power,conducted	$\pm 0.71\text{dB}$
4	Spurious emissions,conducted	$\pm 0.63\text{dB}$
5	All emissions,radiated (9KHz-30MHz)	$\pm 3.02\text{dB}$
6	All emissions,radiated (30MHz-200MHz)	$\pm 3.80\text{dB}$
7	All emissions,radiated (200MHz-1000MHz)	$\pm 3.97\text{dB}$



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product Name	Electronic Article Surveillance								
Trade Name	BLOZI								
Model Name	FS 6								
Serial Model	FS 2, FS 7, FS 8, FS 9								
Model Difference	Only model names are different								
Product Description	The EUT is a Electronic Article Surveillance<table><tr><td>Operation Frequency:</td><td>7.8 MHz ~8.1MHz</td></tr><tr><td>Modulation Type:</td><td>FSK</td></tr><tr><td>Antenna Designation:</td><td>Please see Note 3.</td></tr><tr><td>Antenna Gain (dBi)</td><td>15 dBi</td></tr></table>	Operation Frequency:	7.8 MHz ~8.1MHz	Modulation Type:	FSK	Antenna Designation:	Please see Note 3.	Antenna Gain (dBi)	15 dBi
Operation Frequency:	7.8 MHz ~8.1MHz								
Modulation Type:	FSK								
Antenna Designation:	Please see Note 3.								
Antenna Gain (dBi)	15 dBi								
Adapter	Input: AC110V, 0.5A, 50/60 Hz Output: DC 24V, 2A								
Hardware version number	V3.52								
Software version number	V2.0								
Connecting I/O Port(s)	Please refer to the User's Manual								

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2. Table for filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
A	BLOZI	FS 6	onboard Antenna	N/A	15	ANT

3. Channel list

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	7.8	4	8.1
2	7.9	--	--
3	8.0	--	--

4.test channel

CH1	7.9MHz
-----	--------



2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	TX Mode(Middle channel)

	For Conducted Test
Final Test Mode	Description
Mode 1	TX Mode(Middle channel)

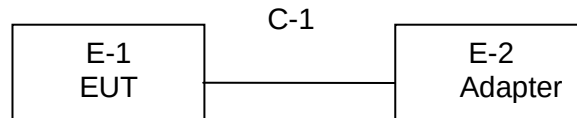
	For Radiated Emission
Final Test Mode	Description
Mode 1	TX Mode(Middle channel)

Note:

- (1) The measurements are performed at the highest, middle, lowest available channels.
- (2) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported
- (3) We have be tested for all avaiable U.S. voltage and frequencies(For 120V,50/60Hz and 240V, 50/60Hz) for which the device is capable of operation.



2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
E-2	Adapter	N/A	YHD001205	N/A	N/A

Item	Shielded Type	Ferrite Core	Length	Note
C-1	unshielded	NO	100cm	N/A

Note:

- (1)The support equipment was authorized by Declaration of Confirmation.
- (2)For detachable type I/O cable should be specified the length in cm in 『Length』 column.



2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
EMI Test Receiver	R&S	ESW	101535	2017.06.01	2018.05.31
Bilog Antenna	TESEQ	CBL6111D	34678	2017.03.24	2018.03.23
Horn Antenna	Schwarzbeck	BBHA 9120D (1201)	9120D-1343	2017.03.06	2018.03.05
Operational Manual Passive Loop ANT(9K--30MHz)	ETS	6512	00165355	2017.03.06	2018.03.05
Pre-mpifier (0.1M-3GHz)	EM	EM330	60538	2017.03.12	2018.03.11
PreAmplifier	Agilent	8449B	60538	2017.10.15	2018.10.14
USB RF power sensor	DARE	RPR3006W	15I00041SNO03	2017.10.15	2018.10.14
Semi-anechoic chamber	Changling	966	N/A	2017.10.15	2018.10.14

Conduction Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Test Receiver	R&S	ESCI	101427	2017.10.15	2018.10.14
LISN	R&S	ENV216	101242	2017.10.15	2018.10.14
conduction Cable	EM	C01	N/A	2017.03.12	2018.03.11
Temperature & Humidity	Mieo	HH660	N/A	2017.10.15	2018.10.14
Signal Analyzer	Agilent	N9020A	MY49100060	2017.03.11	2018.03.10



3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION LIMITS

Operating frequency band. In case the emission fall within the restricted band specified on Part 15. 207(a) limit in the table below has to be followed.

FREQUENCY (MHz)	Class B (dBuV)		Standard
	Quasi-peak	Average	
0.15 -0.5	66 - 56 *	56 - 46 *	CISPR
0.50 -5.0	56.00	46.00	CISPR
5.0 -30.0	60.00	50.00	CISPR

0.15 -0.5	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	56.00	46.00	FCC
5.0 -30.0	60.00	50.00	FCC

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

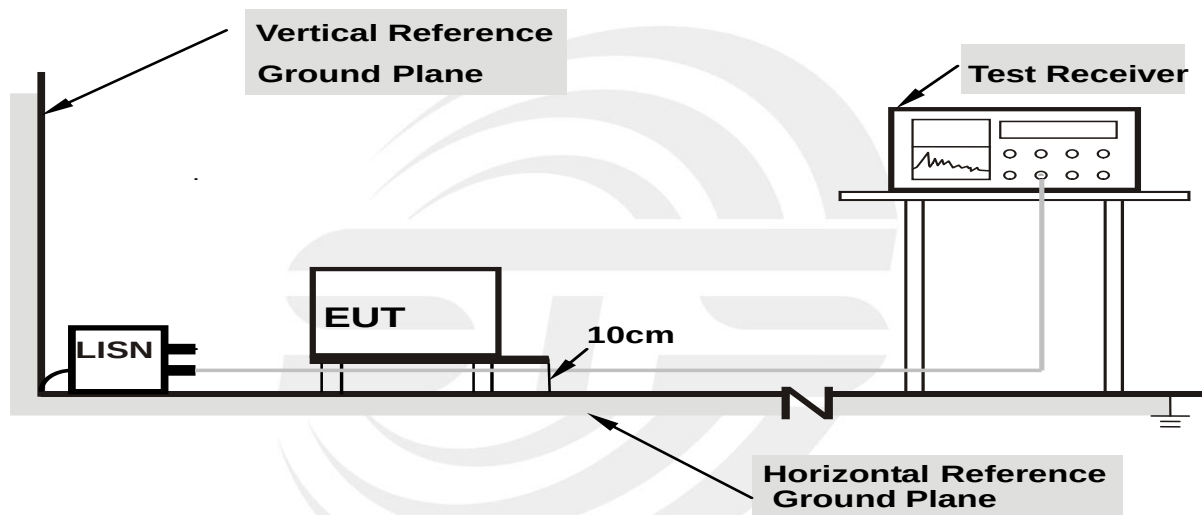
The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

3.2 TEST PROCEDURE

- a. The EUT was 0.1 meters from the horizontal ground plane and 0.4 meters from the vertical ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. 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 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.3 TEST SETUP



**Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes**

3.4 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.



3.5 TEST RESULTS

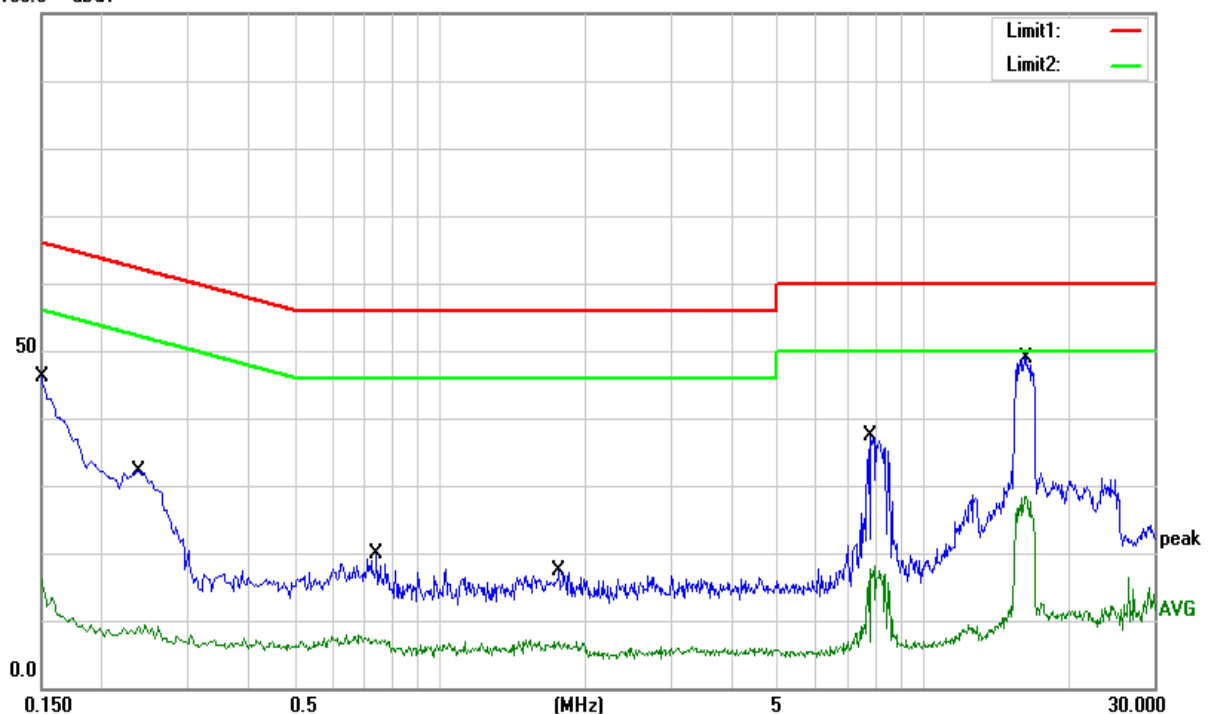
Temperature:	26 °C	Relative Humidity:	54%
Pressure:	1010hPa	Phase:	L
Test Voltage:	AC 120V	Test Mode:	Mode 1

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
0.1500	36.30	9.79	46.09	66.00	-19.91	QP
0.1500	3.97	9.79	13.76	56.00	-42.24	AVG
0.2380	22.26	9.95	32.21	62.17	-29.96	QP
0.2380	-0.85	9.95	9.10	52.17	-43.07	AVG
0.7420	9.97	9.83	19.80	56.00	-36.20	QP
0.7420	-3.00	9.83	6.83	46.00	-39.17	AVG
1.7700	7.59	9.78	17.37	56.00	-38.63	QP
1.7700	-3.16	9.78	6.62	46.00	-39.38	AVG
7.7940	27.53	9.97	37.50	60.00	-22.50	QP
7.7940	6.39	9.97	16.36	50.00	-33.64	AVG
16.2420	38.63	10.29	48.92	60.00	-11.08	QP
16.2420	15.00	10.29	25.29	50.00	-24.71	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Margin = Result (Result = Reading + Factor) – Limit

100.0 dBuV





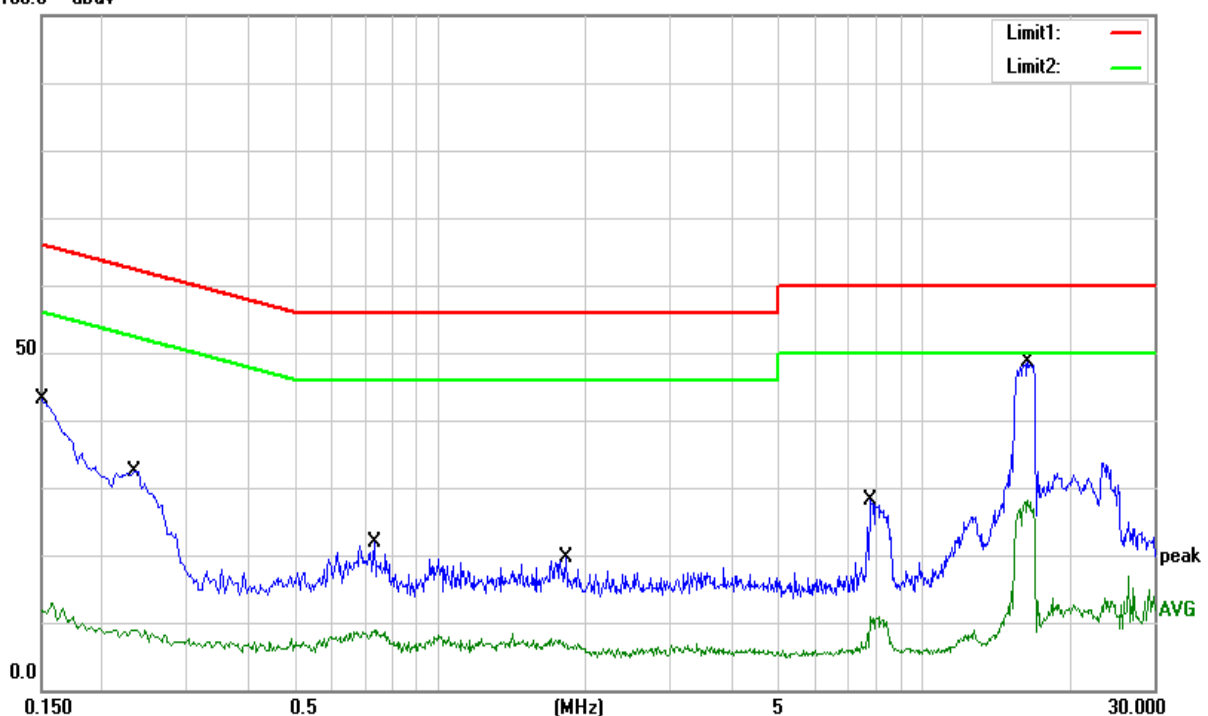
Temperature:	26 °C	Relative Humidity:	54%
Pressure:	1010hPa	Phase:	N
Test Voltage:	AC 120V	Test Mode:	Mode 1

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
0.1500	33.22	9.79	43.01	66.00	-22.99	QP
0.1500	2.28	9.79	12.07	56.00	-43.93	AVG
0.2340	22.37	9.93	32.30	62.31	-30.01	QP
0.2340	-1.37	9.93	8.56	52.31	-43.75	AVG
0.7340	11.97	9.83	21.80	56.00	-34.20	QP
0.7340	-1.26	9.83	8.57	46.00	-37.43	AVG
1.8220	9.92	9.78	19.70	56.00	-36.30	QP
1.8220	-3.70	9.78	6.08	46.00	-39.92	AVG
7.8100	18.12	9.97	28.09	60.00	-31.91	QP
7.8100	0.10	9.97	10.07	50.00	-39.93	AVG
16.4300	38.35	10.30	48.65	60.00	-11.35	QP
16.4300	17.74	10.30	28.04	50.00	-21.96	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Margin = Result (Result =Reading + Factor)–Limit

100.0 dBuV





4. RADIATED EMISSION MEASUREMENT

4.1 RADIATED EMISSION LIMITS

The field strength of emissions outside of the band 1.705-10.0 MHz shall not exceed the general radiated emission limits in §15.209

(Radiated Emission <30MHz (9KHz-30MHz, H-field)

for <30MHz, Radiated emissions were measured according to ANSIC63.4. The EUT was set to transmit at the highest output power. The EUT was set 30 meter away from the measuring antenna. The loop antenna was positioned 1 meter above the ground from the center of the loop. The measuring bandwidth was set to 10KHz. (Note: During testing the receive antenna was rotated about its axis to maximize the emission from the EUT)

There was no detected Restricted bands and Radiated suprious emission below 30MHz. The 300m/30m limit was converted to 3m Limit using square factor(x) as it was found by measurements as follows;

$$3 \text{ m Limit(dBuV/m)} = 20\log(X) + 40\log(300/3)$$

$$3 \text{ m Limit(dBuV/m)} = 20\log(X) + 40\log(30/3)$$

Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

LIMITS OF RADIATED EMISSION MEASUREMENT (Frequency Range 9kHz-1000MHz)

Frequencies (MHz)	Field Strength (micorvolts/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

NOTE:

- a) Field Strength (dBμV/m) = 20*log[Field Strength (μV/m)].
- b) In the emission tables above, the tighter limit applies at the Band edge.

Radiated Emission >30MHz (30MHz-1GHz, E-field)

According to FCC section 15.205, the field strength of radiated emissions from intentiona radiators at a distance of 3 meters shall not exceed the above values:



Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~90kHz / RB 200Hz for PK & AV
Start ~ Stop Frequency	90kHz~110kHz / RB 200Hz for QP
Start ~ Stop Frequency	110kHz~490kHz / RB 200Hz for PK & AV
Start ~ Stop Frequency	490kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

4.2 TEST PROCEDURE

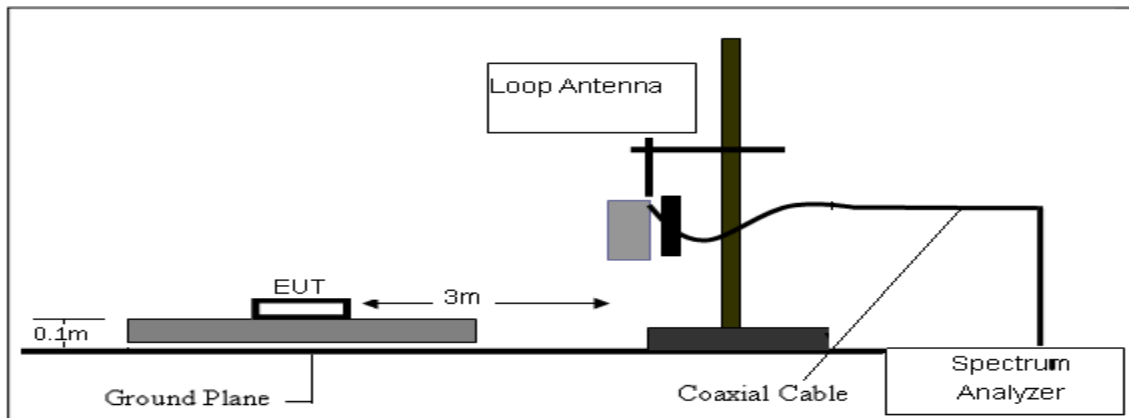
- The test is performed in a 3m Semi-Anechoic Chamber; the antenna factor, cable loss and so on of the site (factors) is calculated to correct the reading. The EUT is placed on a 0.1m high insulating Turn Table, and keeps 3m away from the Test Antenna, which is mounted on a variable-height antenna master tower. For the test Antenna
- In the frequency range of 9KHz to 30MHz, magnetic field is measured with Loop Test Antenna. The Test Antenna is positioned with its plane vertical at 1m distance from the EUT. The center of the Loop Test Antenna is 1m above the ground. During the measurement the Loop Test Antenna rotates about its vertical axis for maximum response at each azimuth about the EUT.
- In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) used. Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength. The emission levels at both horizontal and vertical polarizations should be tested.
- The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

NOTE:

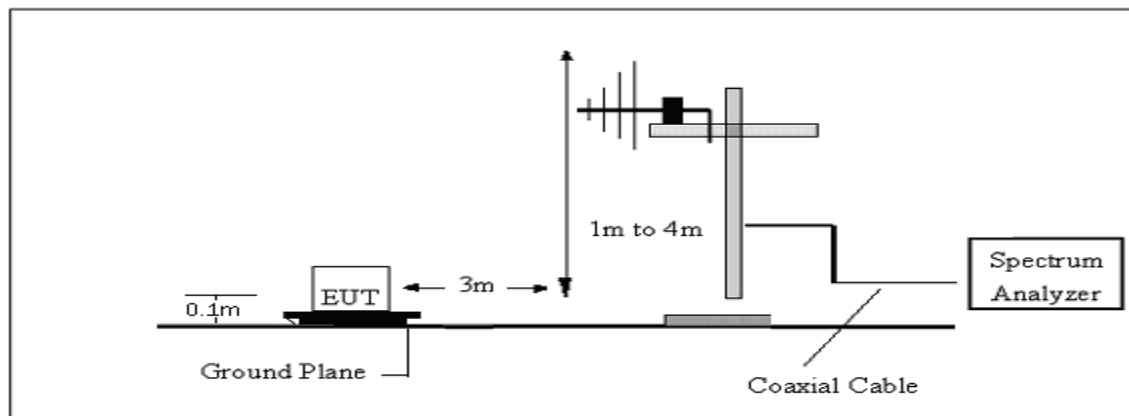
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

4.3 TEST SETUP

(A) Radiated Emission Test-Up Frequency Below 30MHz



(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



4.4 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.



4.5 FIELD STRENGTH CALCULATION

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where

FS = Field Strength

CL = Cable Attenuation Factor (Cable Loss)

RA = Reading Amplitude

AG = Amplifier Gain

AF = Antenna Factor

For example

Frequency	FS	RA	AF	CL	AG	Factor
(MHz)	(dB μ V/m)	(dB μ V/m)	(dB)	(dB)	(dB)	(dB)
300	40	58.1	12.2	1.6	31.9	-18.1

$$\text{Factor} = \text{AF} + \text{CL} - \text{AG}$$





4.6 TEST RESULTS

(Radiated Emission<30MHz (9KHz-30MHz, H-field))

Temperature:	20 °C	Relative Humidity:	48%
Pressure:	1010 hPa	Test Voltage:	AC120V
Test Mode:	Mode 1	Polarization:	--

Freq.	Detector	Level	Limit	Margin	State
(MHz)		(dBuV/m)	(dBuV/m)	(dB)	P/F
1.26	QP	55.18	65.60	-10.42	PASS
10.00	QP	53.57	69.54	-15.97	PASS
15.60	QP	52.25	69.54	-17.29	PASS
23.45	QP	54.18	69.54	-15.36	PASS
28.79	QP	50.26	69.54	-19.28	PASS

Note: Distance extrapolation factor = $40 \log (\text{specific distance}/\text{test distance})$ (dB);
Limit line = specific limits(dBuv) + distance extrapolation factor.



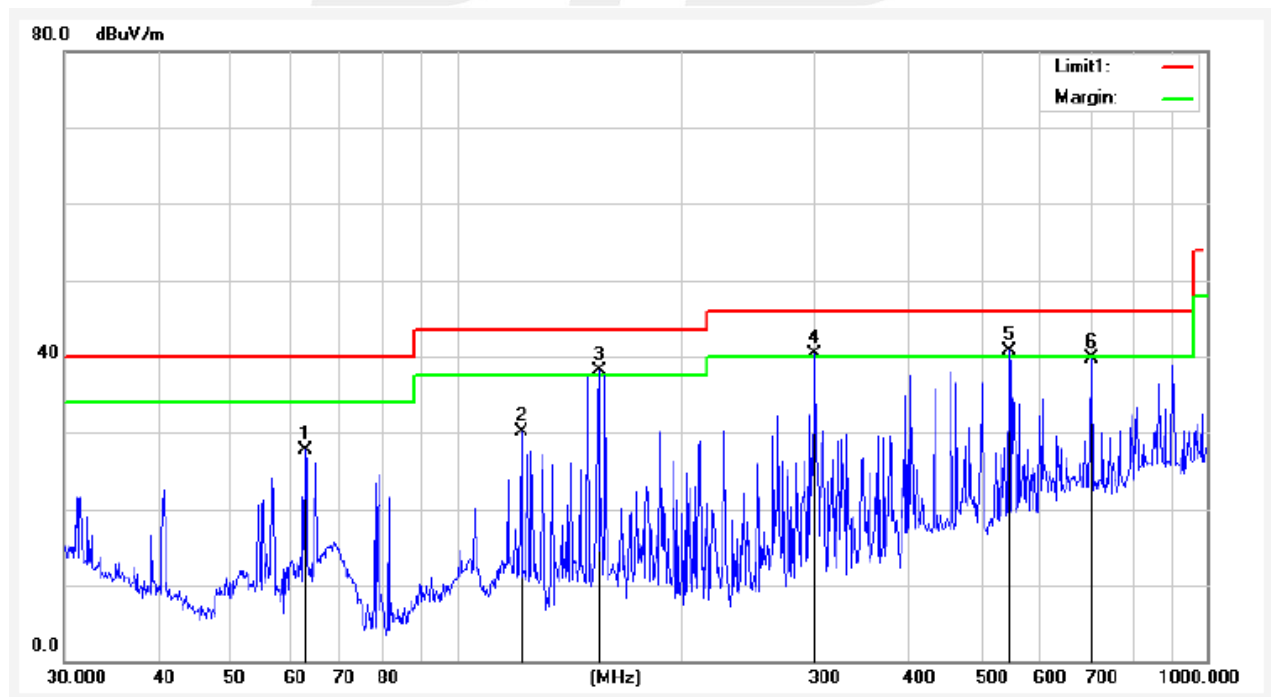
Between 30-1000MHz

Temperature:	26 °C	Relative Humidity:	54%
Pressure:	1010hPa	Phase:	Horizontal
Test Voltage:	AC 120V	Test Mode:	Mode 1

Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
62.8708	51.97	-24.27	27.70	40.00	-12.30	QP
121.9754	47.75	-17.66	30.09	43.50	-13.41	QP
154.8204	56.23	-18.22	38.01	43.50	-5.49	QP
300.3672	55.12	-14.81	40.31	46.00	-5.69	QP
545.1825	47.67	-6.89	40.78	46.00	-5.22	QP
701.7610	44.93	-5.29	39.64	46.00	-6.36	QP

Remark:

1. Margin = Result (Result = Reading + Factor)-Limit



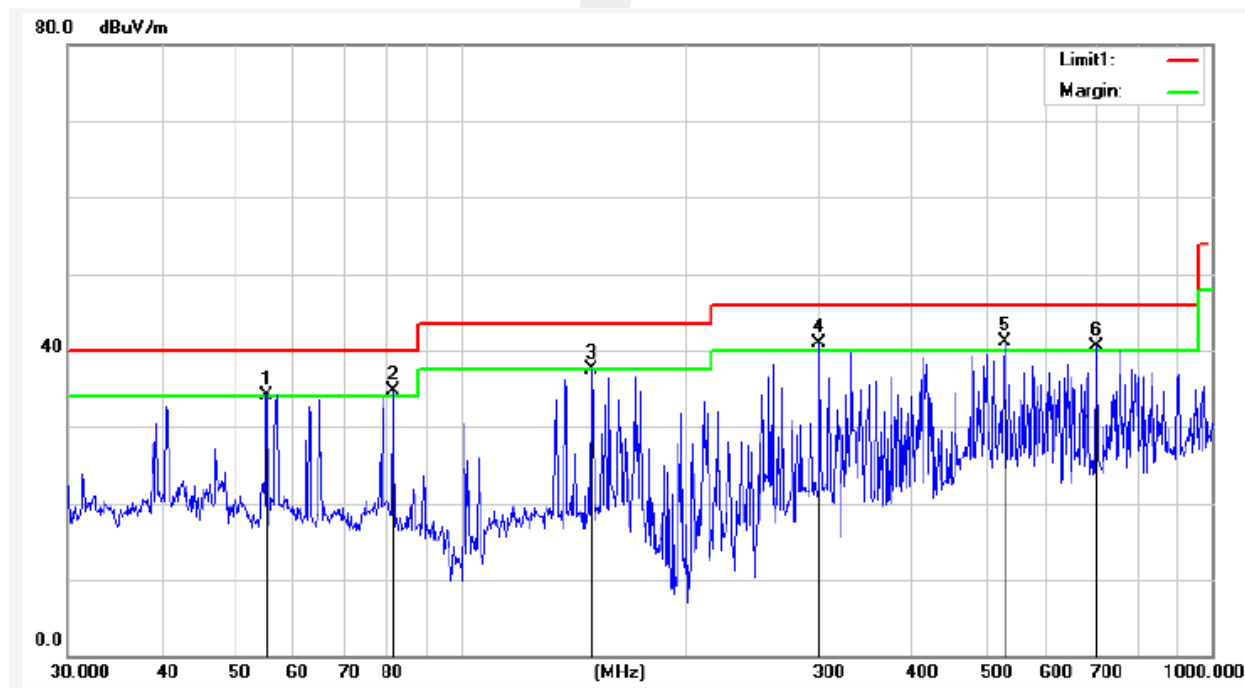


Temperature:	26 °C	Relative Humidity:	54%
Pressure:	1010hPa	Phase:	Vertical
Test Voltage:	AC 120V	Test Mode:	Mode 1

Frequency	Reading	Correct	Result	Limit	Margin	Remark
(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
55.2207	57.16	-22.97	34.19	40.00	-5.81	QP
81.2116	57.17	-22.40	34.77	40.00	-5.23	QP
149.4857	55.49	-17.94	37.55	43.50	-5.95	QP
300.3672	55.81	-14.81	41.00	46.00	-5.00	QP
530.1014	48.97	-7.92	41.05	46.00	-4.95	QP
701.7610	45.70	-5.29	40.41	46.00	-5.59	QP

Remark:

1. Margin = Result (Result = Reading + Factor) – Limit

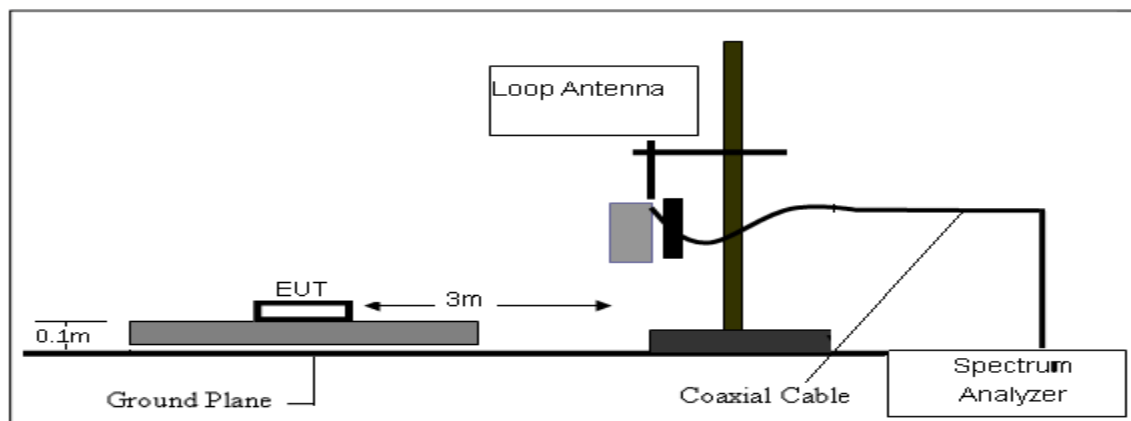


5. FIELD STRENGTH EMISSION

5.1 REQUIREMENT

The field strength of any emission within the band 1.705-10.0 MHz shall not exceed 100 microvolts/meter at a distance of 30 meters. However, if the bandwidth of the emission is less than 10% of the center frequency, the field strength shall not exceed 15 microvolts/meter or (the bandwidth of the device in kHz) divided by (the center frequency of the device in MHz) microvolts/meter at a distance of 30 meters, whichever is the higher level.

5.2 TEST SETUP



5.3 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.



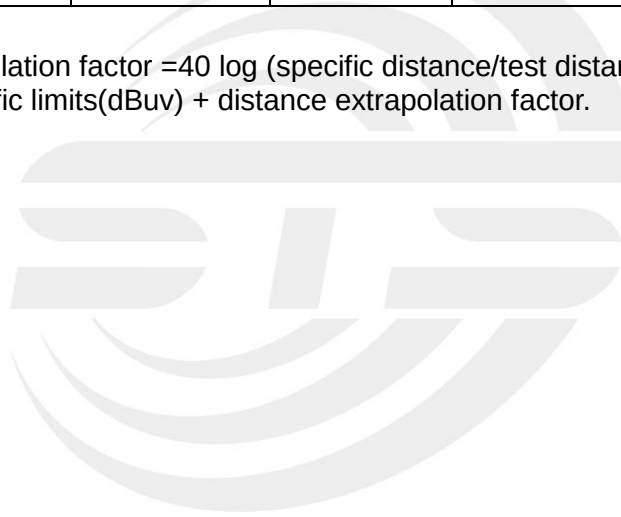
5.5 TEST RESULTS

Temperature:	25 °C	Relative Humidity:	50%
Pressure:	1012 hPa	Test Voltage:	AC 120V
Test Mode:	TX Mode		

3m distance measured

Test frequency (MHz)	detector	Reading (dBuV/m)	factor dB	Corrected level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
7.9	Peak	82.17	-11.06	71.11	91.355	-20.245
	Avg	63.58	-11.06	52.52	71.355	-18.835

Note: Distance extrapolation factor = $40 \log (\text{specific distance}/\text{test distance})$ (dB);
Limit line = specific limits(dBuV) + distance extrapolation factor.





6. 6DB BANDWIDTH

6.1 APPLIED PROCEDURES / LIMIT

For the purposes of this section, bandwidth is determined at the points 6 dB down from the modulated carrier

6.2 TEST PROCEDURE

1. Set RBW = 1 kHz.
2. Set the video Mobile Phonewidth (VBW) ≥ 3 RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

6.3 TEST SETUP



6.4 EUT OPERATION CONDITIONS

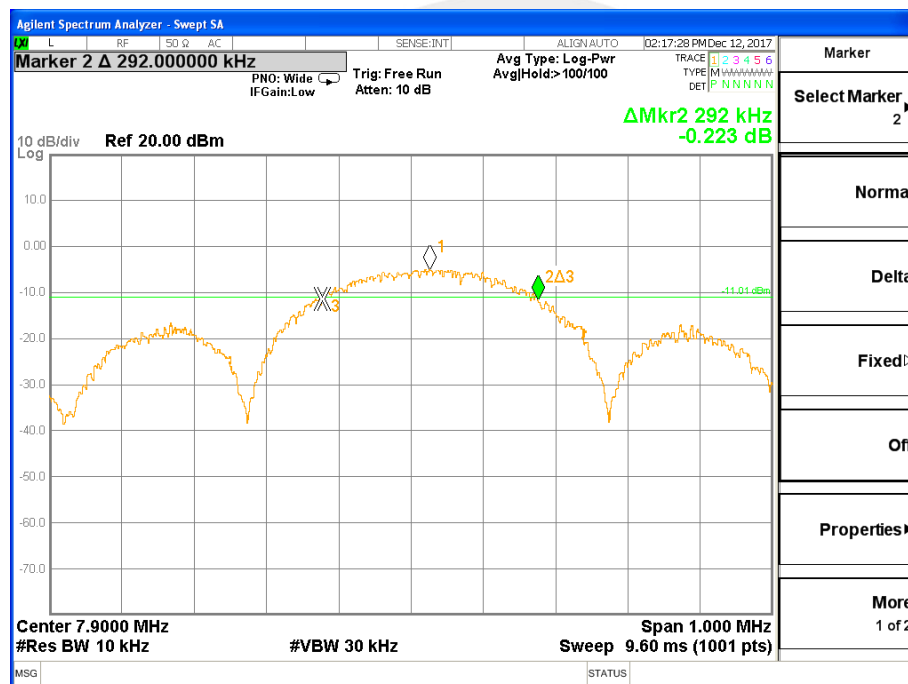
The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

6.5 TEST RESULTS

Temperature:	25 °C	Relative Humidity:	60%
Pressure:	1012 hPa	Test Voltage:	DC 24V
Test Mode:	TX Mode		

Centre Frequency	Measurement	
	6dB Bandwidth (KHz)	Frequency Range (MHz)
7.9 MHz	292	1.705-10

Low channel





7. ANTENNA REQUIREMENT

7.1 STANDARD REQUIREMENT

15.203 requirement: For intentional device, according to 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.

7.2 EUT ANTENNA

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



APPENDIX 1- PHOTOS OF TEST SETUP

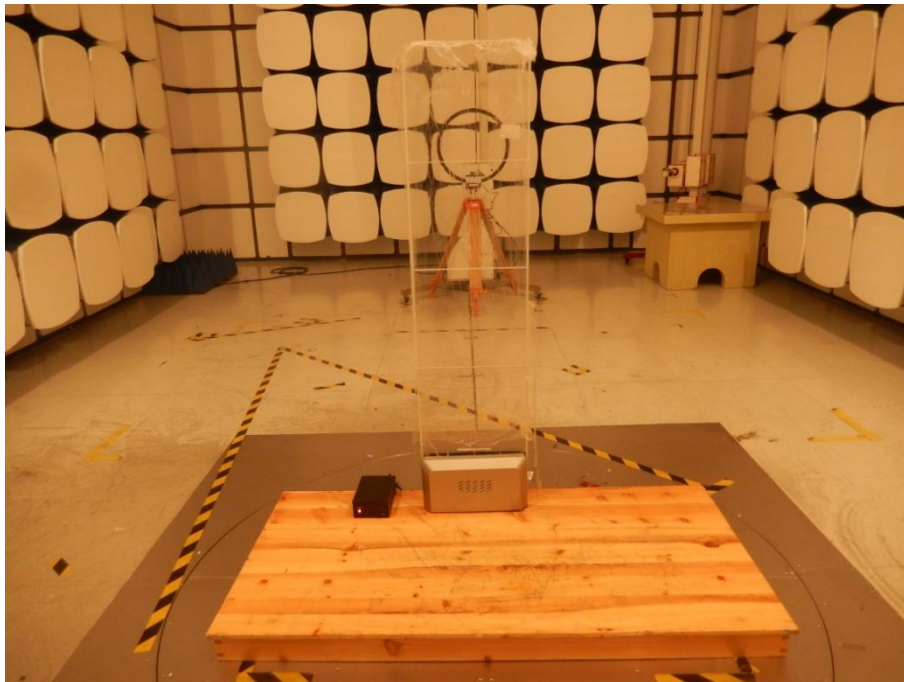
Conduction Measurement Photos



Radiated Measurement Photos



Radiated Measurement Photos-Below 30MHz



*****END OF THE REPORT*****