Shenzhen GTI Technology Co., Ltd.

1F,2 Block, Jiaquan Building, Guanlan High-tech Park Baoan District,
Shenzhen, Guangdong, China.
Tel: +86-755-27559792
Fax: +86-755-86116468

FCC TEST REPORT

Product name	.....:	Hemispheric HD IP Video Door Phone
Trademark	.....:	Grandstream
Model/Type reference	.....:	GDS3710
Listed Model(s)	.....:	/
FCC ID	.....:	YZZGDS3710
Test Standards	.....:	**47 CFR FCC Part 15 Subpart C - Intentional Radiators** **ANSI C63.10: 2013**
Applicant	.....:	Grandstream Networks, Inc.
Address of applicant	.....:	126 Brookline Ave, 3rd Floor Boston, MA 02215，USA
Date of Receipt	.....:	Sep. 16, 2016
Date of Test Date	.....:	Sep. 19, 2016 to Sep. 28, 2016
Data of issue.	.....:	Sep. 29, 2016

Test result	**Pass ***

* In the configuration tested, the EUT complied with the standards specified above

GENERAL DESCRIPTION OF EUT	
Equipment:	Hemispheric HD IP Video Door Phone
Model Name:	GDS3710
Listed Model(s)	/
Models Differences	/
Manufacturer:	Grandstream Networks, Inc.
Manufacturer Address:	126 Brookline Ave, 3rd Floor Boston, MA 02215, USA
Factory:	Grandstream Networks, Inc.
Factory Address:	126 Brookline Ave, 3rd Floor Boston, MA 02215, USA
Operationg Frequency:	125kHz
Type of Modulation:	ASK
Number of Channels:	1CH
Power Rating:	Powered by PoE or DC 12V, 1.0A
Antenna gain:	0 dBi

Compiled By: Viky Shi
(Viky Shi)

Reviewed By: Winner Zhang
(Winner Zhang)

Approved By:
(Walter Chen)

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1. SUMMARY

1.1 Test Standards

The tests were performed according to following standards:

47 CFR FCC Part 15 Subpart C - Intentional Radiators

ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices

1.2 Test Description

Emission Measurement requirements		
Radiated Emission	Part15.209	PASS
Conducted Disturbance	Part15.207	PASS
20dB Bandwidth	Part15.215	PASS
Antenna Requirement	Part15.203	PASS

Remark: The measurement uncertainty is not included in the test result.

1.3 Test Facility

1.3.1 Address of the test laboratory

Shenzhen General Testing & Inspection Technology Co., Ltd.

Add: 1F, 2 Block,Jiaquan Building, Guanlan High-tech Park Baoan District, Shenzhen, Guangdong,China.

1.3.2 Laboratory accreditation

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

IC Registration No.: 9783A

The 3m alternate test site of Shenzhen GTI Technology Co., Ltd.EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: 9783A on Aug, 2011.

FCC-Registration No.: 214666

Shenzhen GTI Technology Co., Ltd. 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 214666, Sep 19, 2011

1.4 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 General Testing & Inspection 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 General Testing & Inspection laboratory is reported:

A. Conducted Measurement:

Test Site	Method	Measurement Frequency Range	U(dB)	NOTE
C01	ANSI	150 KHz ~ 30MHz	3.2	

B. Radiated Measurement:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	0.15~30MHz	3.6 dB	(1)
Radiated Emission	30~1000MHz	4.7 dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

2. GENERAL INFORMATION

2.1 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Normal Temperature:	25°C
Relative Humidity:	55 %
Air Pressure:	101KPa

2.2 Description of Test Modes

Mode 1:
The EUT has been tested under typical operating condition. The user can control the EUT for staying in continuous transmitting & receiving mode for testing.

2.3 Description of Peripheral during Testing

No.	Product	Manufacturer	Model:	Serial No.
1	PC	GS	12AH-200AH	N/A

2.4 Measurement Instruments List

Radiated Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	EMI Test Receiver	R&S	ESCI	100967	Jan 04,2017
2	Log-Bicon Antenna	Schwarzbeck	CBL6141A	4180	Jan 04,2017
3	Active Loop Antenna	SCHWARZBECK	FMZB1519	1519-037	Jan 07,2017
4	Pre-Amplifier	HP	8447D	1937A03050	Jan 04,2017
5	Antenna Mast	UC	UC3000	N/A	N/A
6	Turn Table	UC	UC3000	N/A	N/A
7	Cable Below 1GHz	Schwarzbeck	AK9515E	33155	Jan 04,2017

Conducted Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	LISN	R&S	ENV216	101112	Jan. 04, 2018
2	Test Receiver	R&S	ESCI	100920	Jan. 04, 2018

20dB Bandwidth					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSU26	100105	Jan 04,2017

Note: 1. The Cal. Interval was one year.

3. EMC EMISSION TEST

3.1 Radiated Emission

3.1.1 RF Portion

LIMITS

Limit for 125kHz at 300m distances is 19.2 uV/m or 25.7 dBuV/m. The equivalent limit at 3m distances is 105.67 dBuV/m.

TEST PROCEDURE

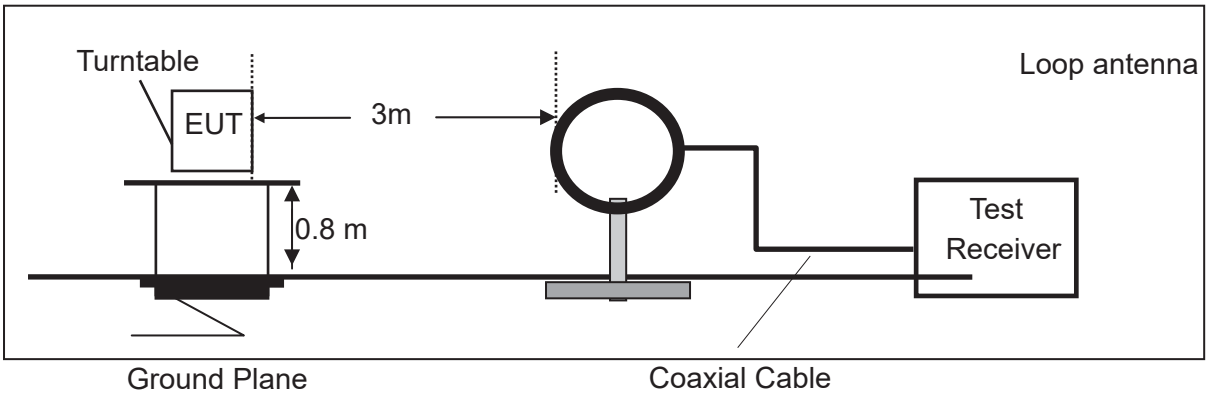
a) The measuring distance of at 3 m shall be used for measurements at frequency up to 30MHz.

b) The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.

c) If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet AV Limits and then no additional AV Mode measurement performed.

TEST SETUP

For the actual test configuration, please refer to the related Item –EUT Test Photos.



TEST RESULTS

A. Fundamental

Frequency (MHz)	Pol./Ant	Result@3m (dBμV/m)		Limit@3m (dBμV/m)		Margin PK (dB)	Margin AV (dB)
		PK	AV	PK	AV		
0.125	V	86.88	83.67	125.7	105.7	-38.82	-22.03
Note: Remark: Only worse case data or setup is reported.							

B Harmonics

Frequency (MHz)	Pol./Ant	Result@3m (dBμV/m)		Limit@3m (dBμV/m)	Margin PK (dB)	Margin AV (dB)
		PK	AV			
0.110	---	55.62	48.30	106.78	-51.16	-58.48
0.250	---	---	---	119.65	---	---
0.375	---	---	---	116.12	---	---
0.500	---	---	---	73.62	---	---
0.625	---	---	---	71.69	---	---
0.750	---	---	---	70.10	---	---
0.875	---	---	---	68.76	---	---
1.000	---	---	---	67.60	---	---
1.125	---	---	---	66.58	---	---
1.250	---	---	---	65.67	---	---
Note: Remark “---” means that the emission level is too low to be measured. Only worse case data or setup is reported.						

3.1.2 Other Emission(30-1000MHz)

LIMITS

LIMITS OF RADIATED EMISSION MEASUREMENT (Below 1000MHz)

FREQUENCY (MHz)	Class A (at 10m)	Class B (at 3m)
	dBuV/m	dBuV/m
30 ~ 88	39.0	40.0
88 ~ 216	43.5	43.5
216 ~ 960	46.5	46.0
Above 960	49.5	54.0

Notes:

1) The limit for radiated test was performed according to as following: CISPR 22/ FCC PART 15B /ICES-003.
2) The tighter limit applies at the band edges.
3) Emission level (dBuV/m)=20log Emission level (uV/m).

TEST PROCEDURE

d) The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.

e) The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.

f) The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

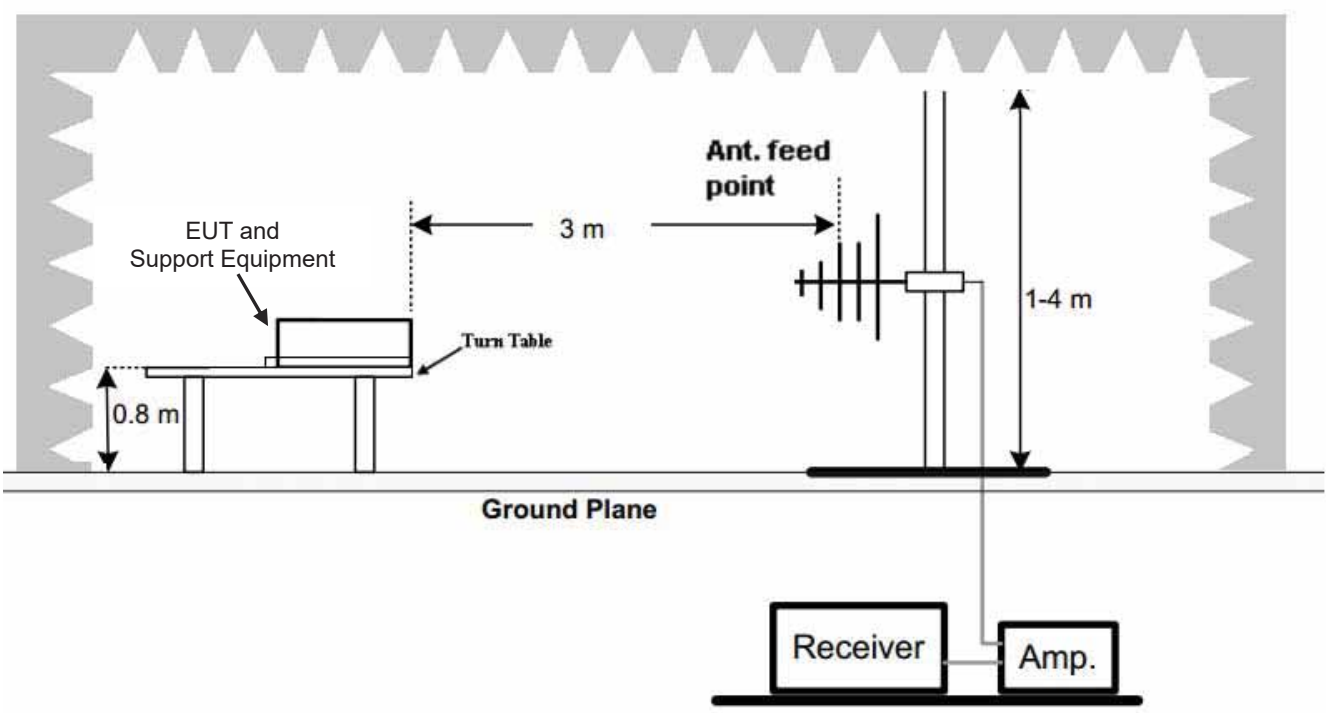
g) The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured, above 1G Average detector mode will be instead.

h) If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP (AV) Limits and then no additional QP Mode measurement performed.

TEST SETUP

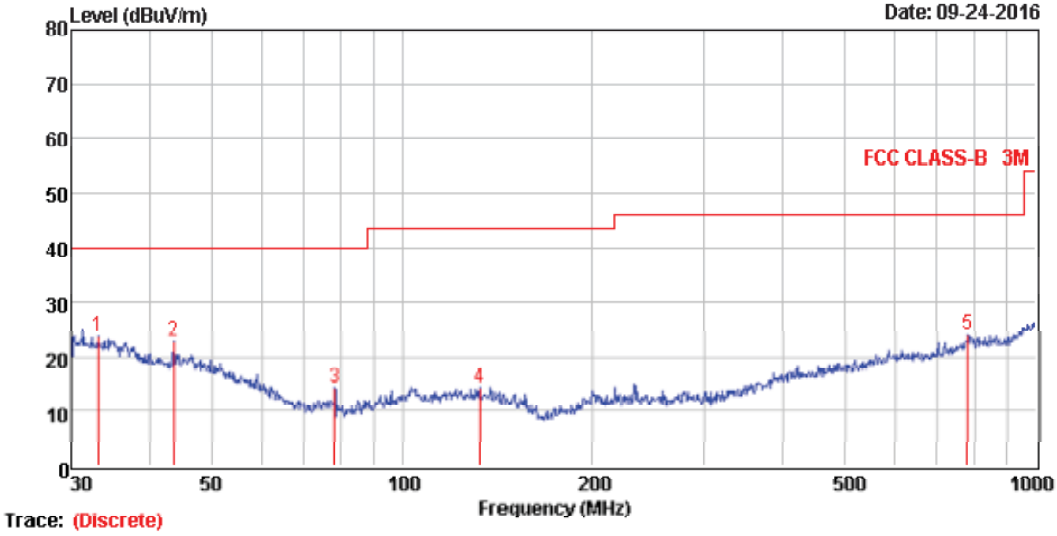
For the actual test configuration, please refer to the related Item –EUT Test Photos.

Radiated Emission Test Set-Up Frequency below 1 GHz



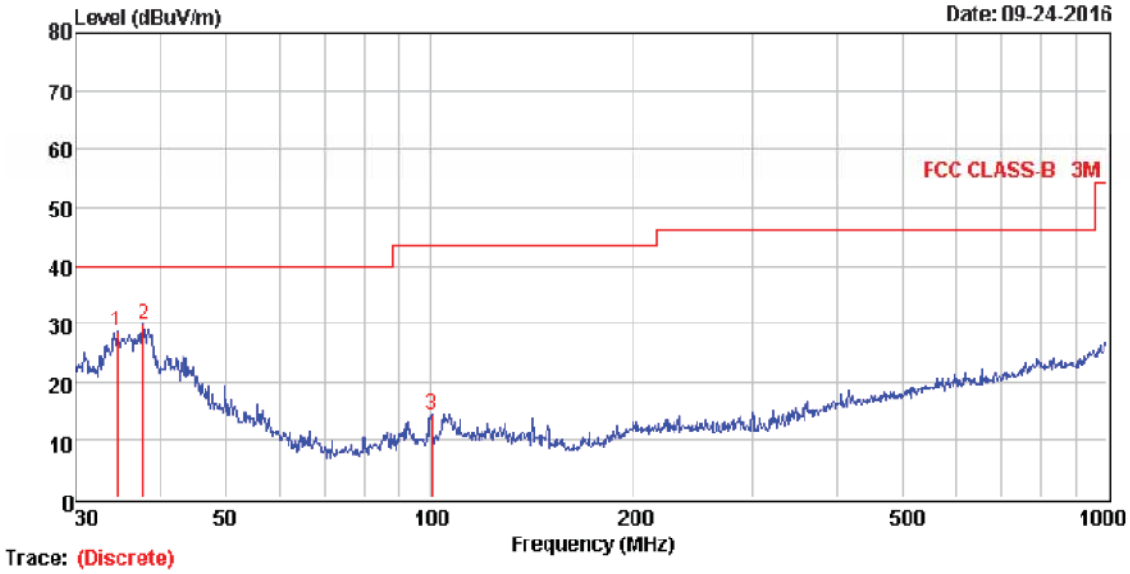
TEST RESULTS

Test mode:	Mode 1	Polarization:	Horizontal



Mark	Frequency MHz	Level dBuV/m	Factor dB/m	Reading dBuV	Limit dBuV/m	Margin dB	Polarization	Detector
1	33.09	23.65	-5.76	29.41	40.00	16.35	HORIZONTAL	Peak
2	43.66	22.79	-9.57	32.36	40.00	17.21	HORIZONTAL	Peak
3	78.41	14.35	-17.92	32.27	40.00	25.65	HORIZONTAL	Peak
4	132.69	14.41	-14.71	29.12	43.50	29.09	HORIZONTAL	Peak
5	782.35	24.05	-4.16	28.21	46.00	21.95	HORIZONTAL	Peak

Test mode:	Mode 1	Polarization:	Vertical



Mark	Frequency MHz	Level dBuV/m	Factor dB/m	Reading dBuV	Limit dBuV/m	Margin dB	Polarization	Detector
1	34.52	28.64	-6.55	35.19	40.00	11.36	VERTICAL	Peak
2	37.81	29.74	-7.73	37.47	40.00	10.26	VERTICAL	Peak
3	100.58	14.42	-15.30	29.72	43.50	29.08	VERTICAL	Peak

3.2 CONDUCTED EMISSION MEASUREMENT

3.2.1 POWER LINE CONDUCTED EMISSION (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *
0.50 -5.0	73.00	60.00	56.00	46.00
5.0 -30.0	73.00	60.00	60.00	50.00

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.

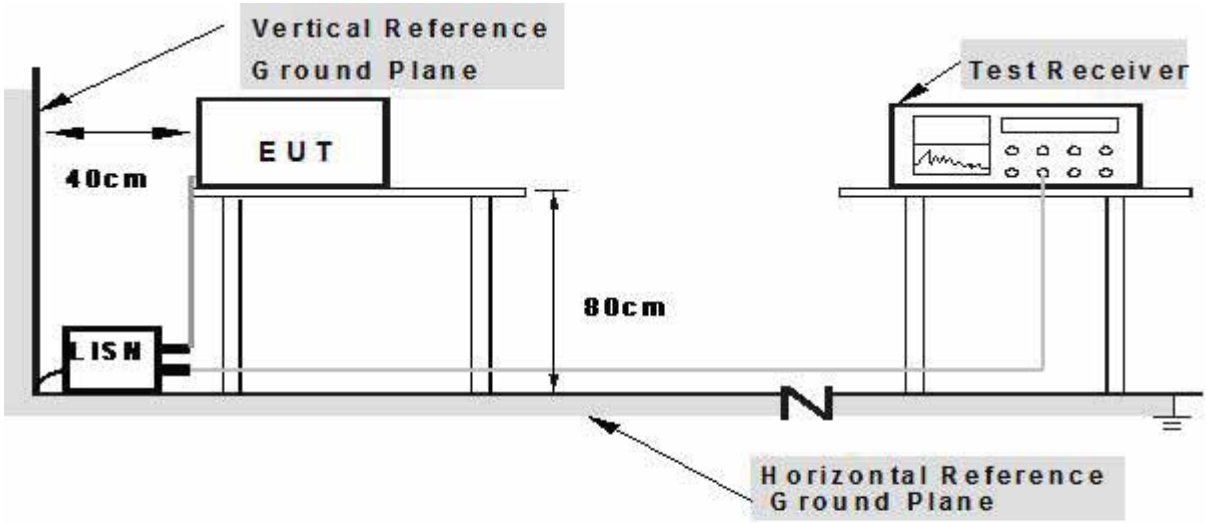
The following table is the setting of the receiver

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

3.2.2 TEST PROCEDURE

a. The EUT was placed 0.8 meters from the horizontal 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.

3.2.3 TEST SETUP



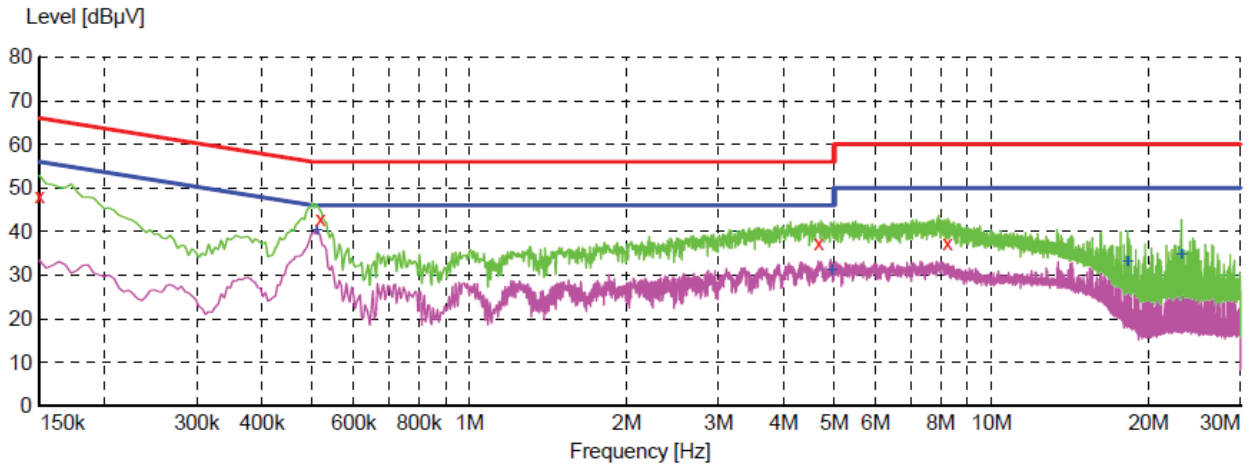
Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

3.2.4 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **2.1** Unless otherwise a special operating condition is specified in the follows during the testing.

3.2.5 TEST RESULTS

EUT：	Hemispheric HD IP Video Door Phone	Model Name. ：	GDS3710
Temperature：	22.4 ℃	Relative Humidity：	60%
Pressure：	101 Kpa	Test Date：	2017-02-12
Test Mode：	/	Phase：	L
Test Voltage ：	AC 120V/60Hz		



MEASUREMENT RESULT: "GTI170212002_fin"

2/12/2017 4:54PM

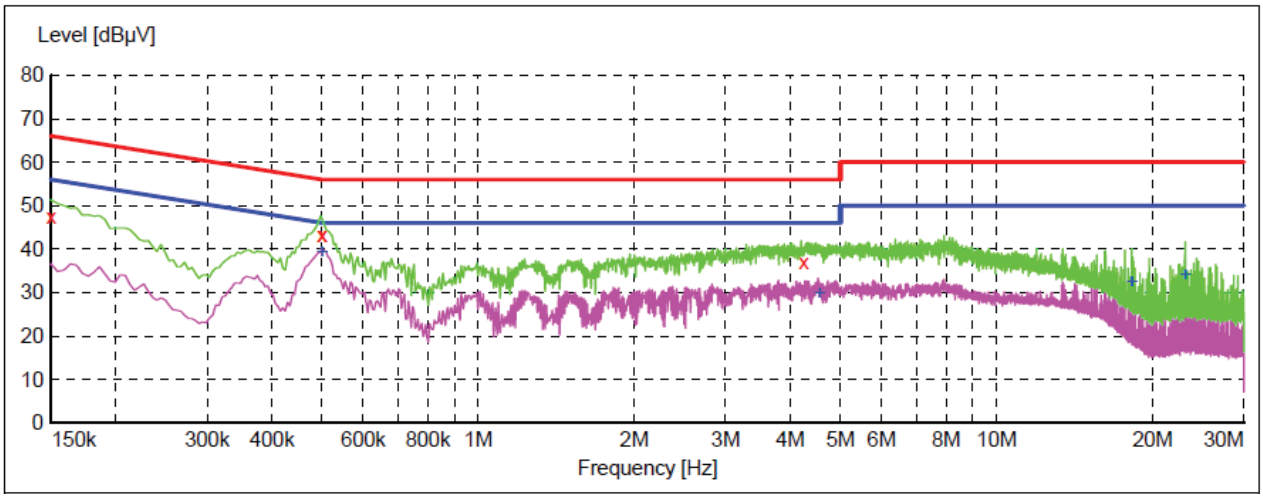
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	48.00	9.8	66	18.0	QP	L1	GND
0.518000	42.80	9.8	56	13.2	QP	L1	GND
4.667000	37.30	10.4	56	18.7	QP	L1	GND
8.222000	37.40	10.5	60	22.6	QP	L1	GND

MEASUREMENT RESULT: "GTI170212002_fin2"

2/12/2017 4:54PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.509000	40.30	9.8	46	5.7	AV	L1	GND
4.937000	31.00	10.4	46	15.0	AV	L1	GND
18.248000	33.10	10.8	50	16.9	AV	L1	GND
23.126000	34.60	11.0	50	15.4	AV	L1	GND

EUT：	Hemispheric HD IP Video Door Phone	Model Name. ：	GDS3710
Temperature：	22.4 ℃	Relative Humidity：	60%
Pressure：	101 Kpa	Test Date：	2017-02-12
Test Mode：	/	Phase：	N
Test Voltage ：	AC 120V/60Hz		



MEASUREMENT RESULT: "GTI170212003_fin"

2/12/2017 4:57PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	47.50	9.5	66	18.5	QP	N	GND
0.500000	43.20	9.5	56	12.8	QP	N	GND
0.500000	43.30	9.5	56	12.7	QP	N	GND
4.244000	36.80	10.2	56	19.2	QP	N	GND

MEASUREMENT RESULT: "GTI170212003_fin2"

2/12/2017 4:57PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.500000	39.30	9.5	46	6.7	AV	N	GND
4.550000	29.90	10.2	46	16.1	AV	N	GND
18.248000	32.40	10.5	50	17.6	AV	N	GND
23.126000	34.10	10.7	50	15.9	AV	N	GND

3.2 20dB Bandwidth

Limit

According to §15.215(c), 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, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

Test Procedure

The transmitter output was connected to the spectrum analyzer through a low loss RF cable. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 200Hz RBW and 500Hz VBW.

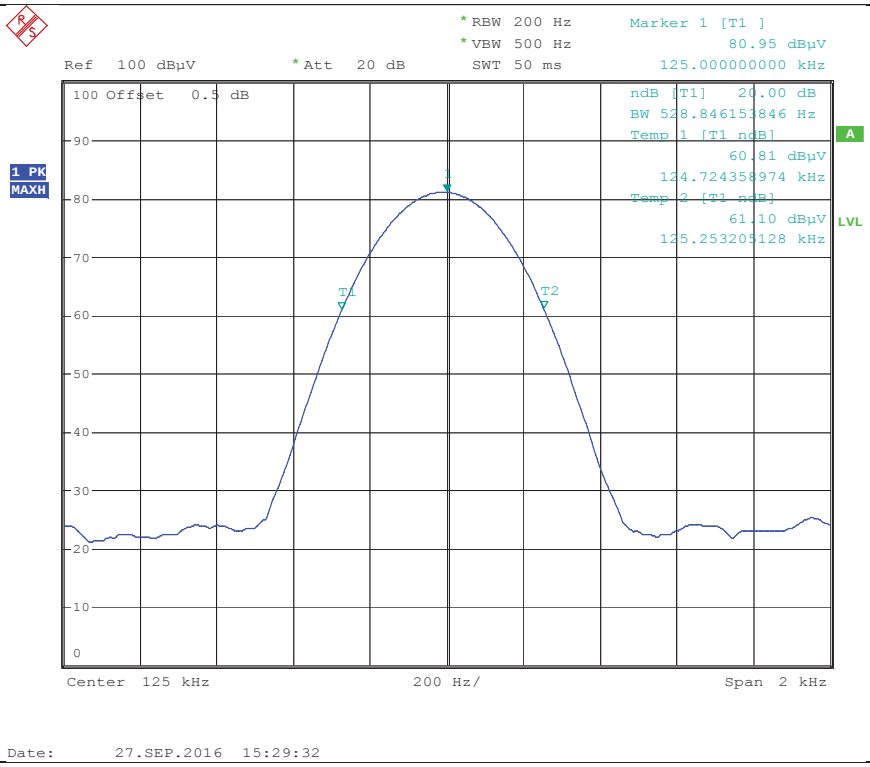
The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

Test Configuration

Test Results

Modulation	20dB bandwidth (kHz)	Result
ASK	0.529	Pass

Test plot as follows:


*RBW 200 Hz
*VBW 500 Hz
Ref 100 dBµV
*Att 20 dB
SWT 50 ms
Marker 1 [T1]
80.95 dBµV
125.000000000 kHz
100 Offset 0.5 dB
ndB [T1] 20.00 dB
BW 528.846153846 Hz
Temp 1 [T1 ndB]
60.81 dBµV
124.724358974 kHz
Temp 2 [T1 ndB]
61.10 dBµV
125.253205128 kHz
1 PK
MAXH
A
LVL
T1
T2
Center 125 kHz
200 Hz/
Span 2 kHz
Date: 27.SEP.2016 15:29:32

3.3 Antenna Requirement

Standard Applicable

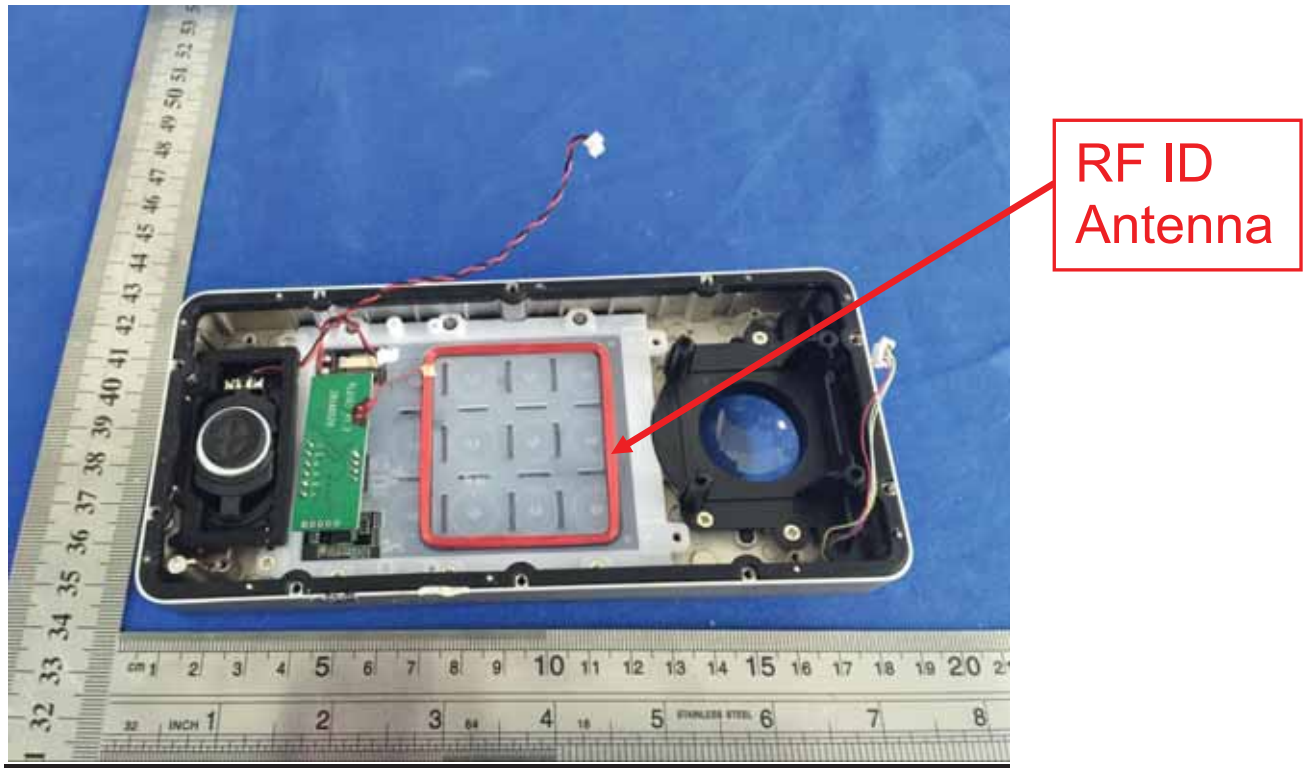
For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.247 (c), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

Refer to statement below for compliance

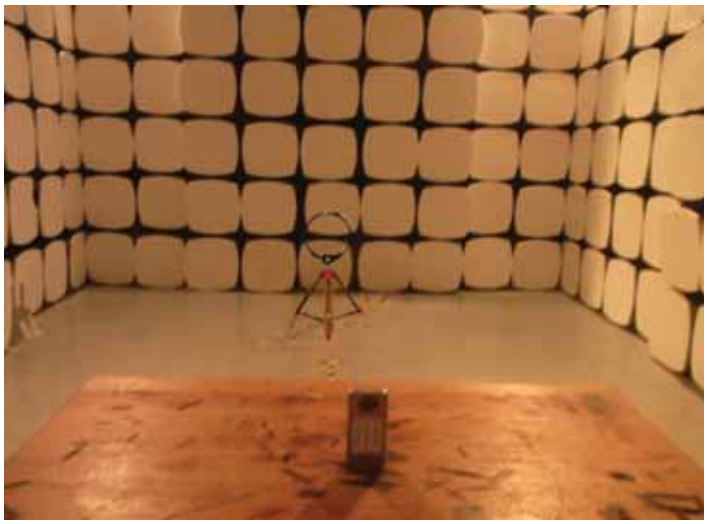
The antenna is integrated loop antenna and no consideration of replacement.

Antenna Connected Construction

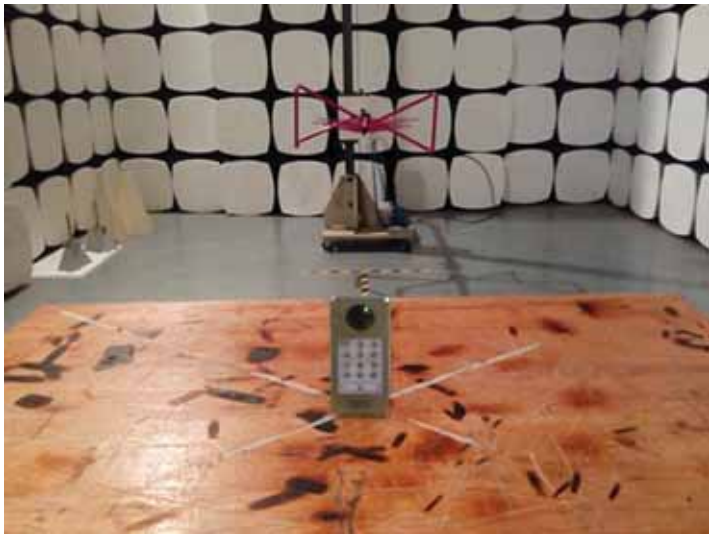


4 EUT TEST PHOTO

Radiated Emission below 30MHz



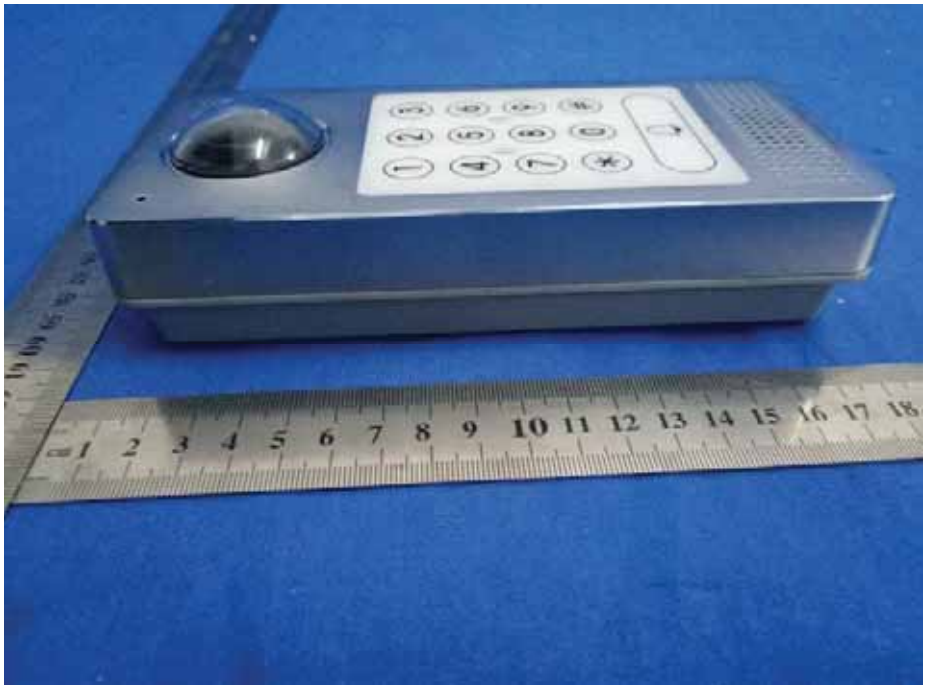
Radiated Emission below 1GHz



Conducted Emission

5 PHOTOGRAPHS OF EUT CONSTRUCTIONAL

External Photos of EUT



Internal Photos of EUT


cm 1 2 3 4 5 6 7 8
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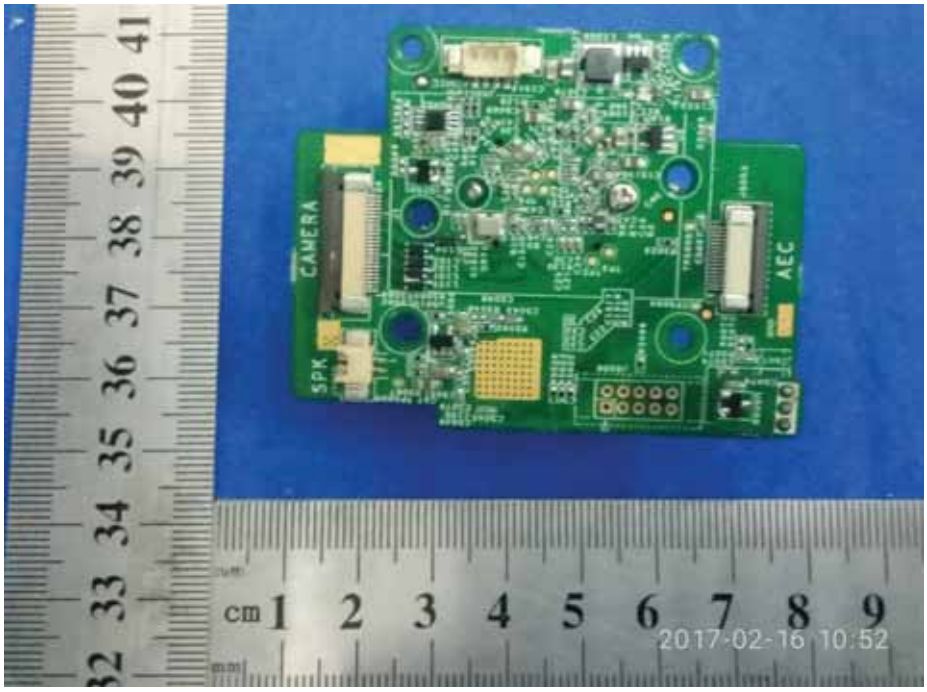
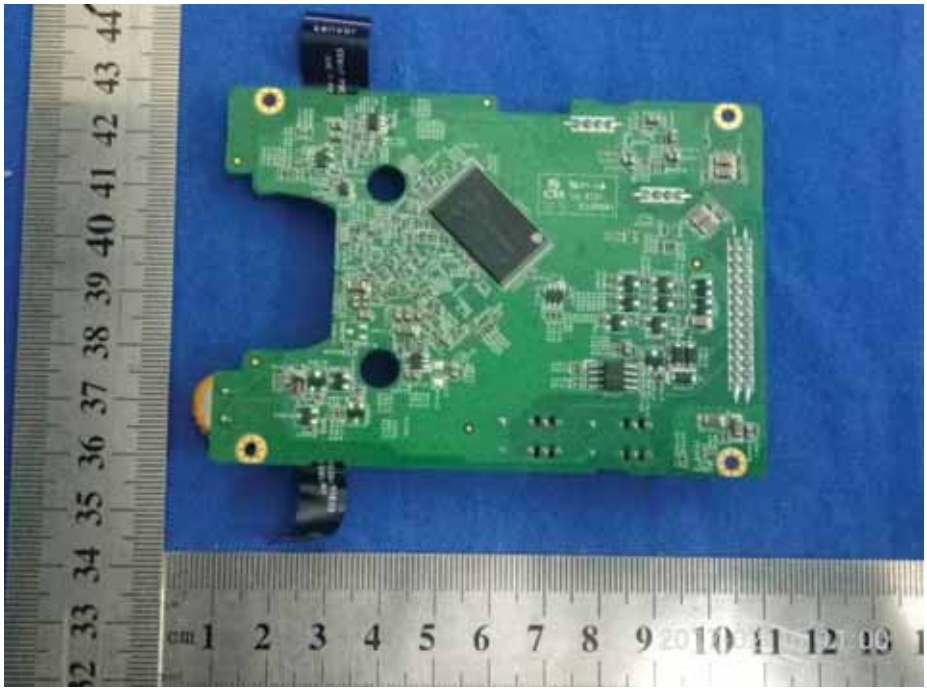
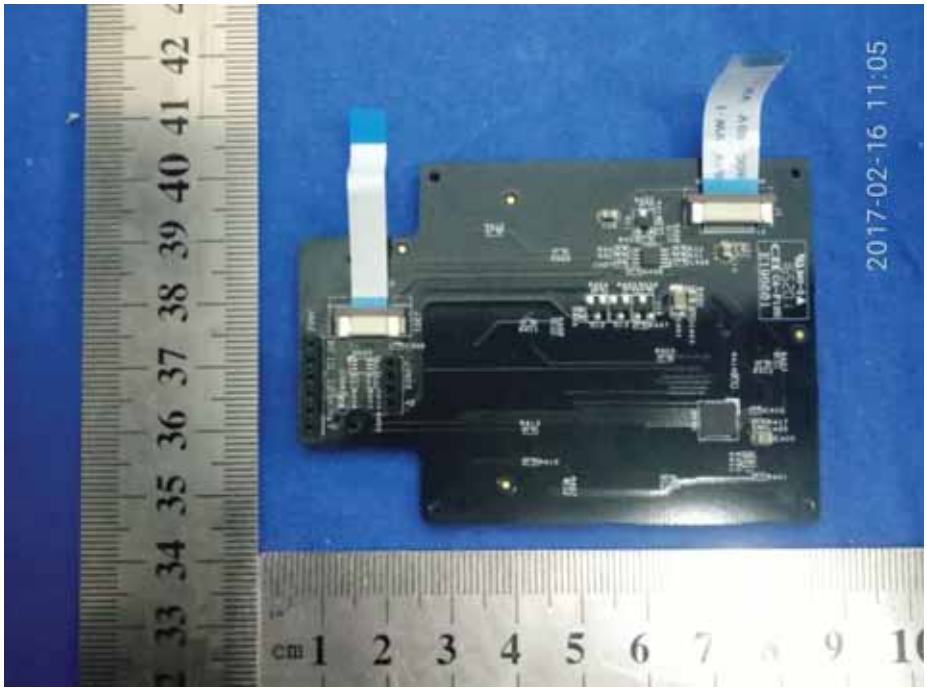

CAMERA
SPK
AEC
cm 1 2 3 4 5 6 7 8 9
2017-02-16 10:52


sensor




2017-02-16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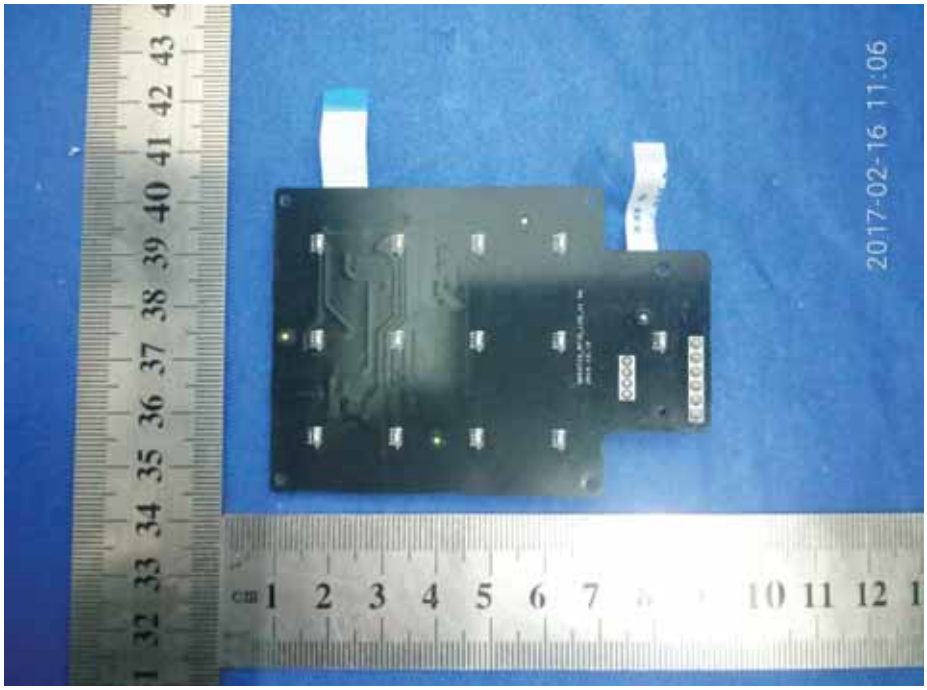
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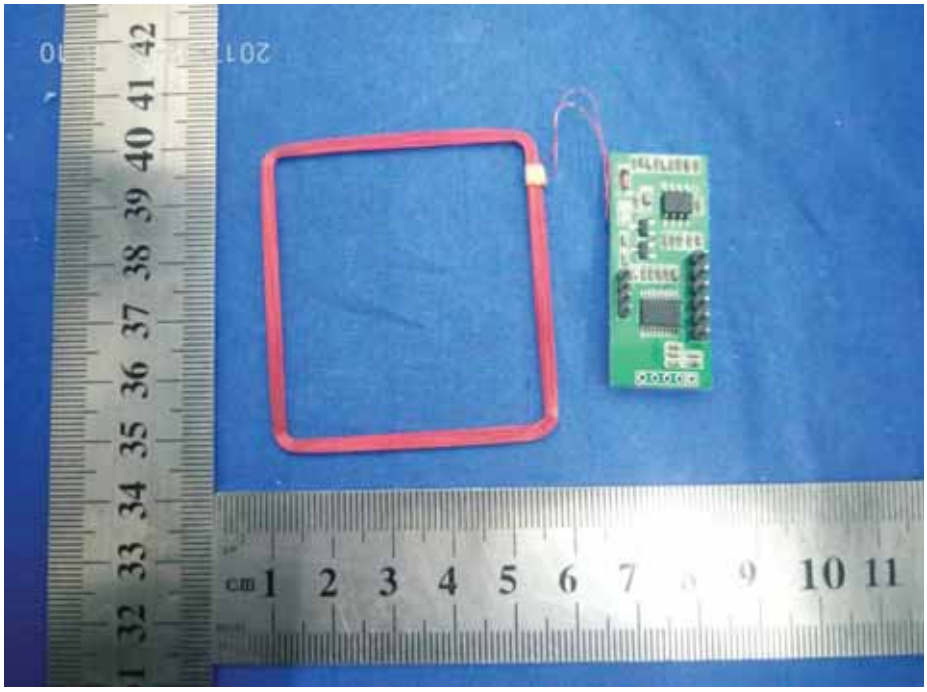
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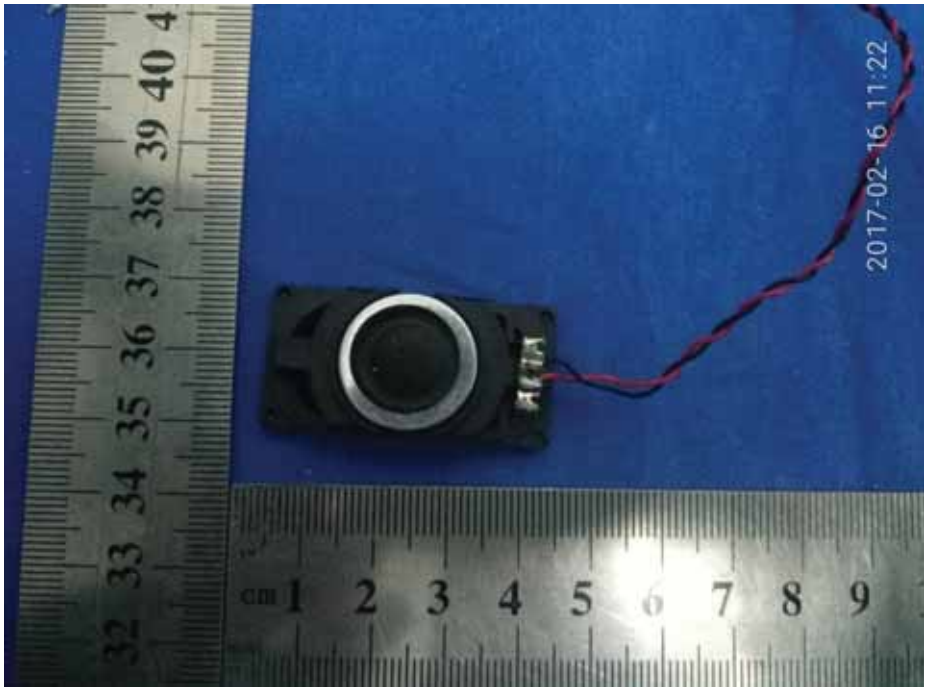
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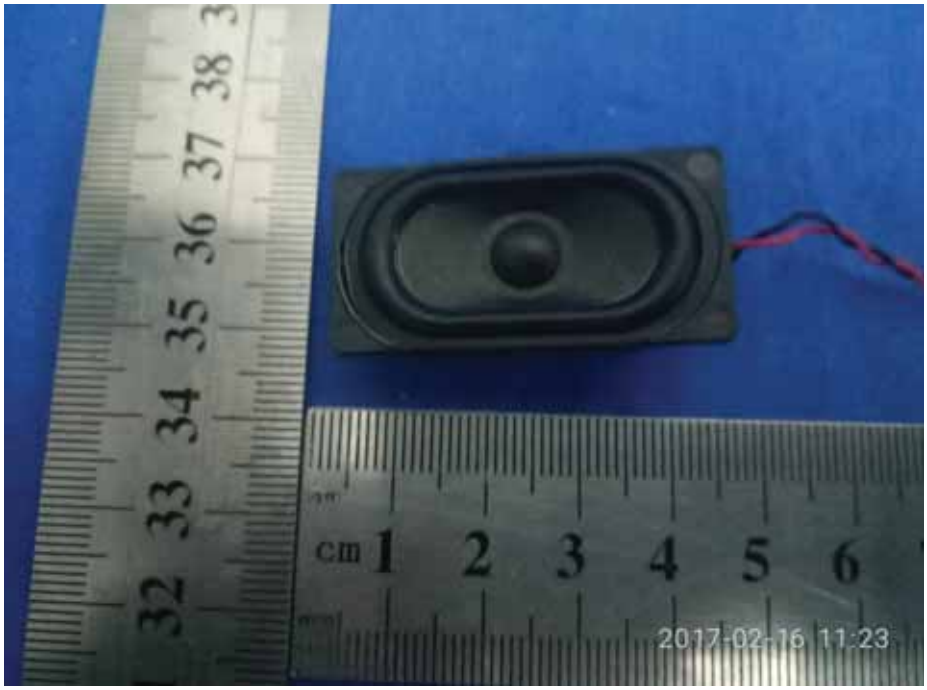

**********THE END**********