FCC REPORT

Applicant:	TS Co., Ltd.
Address of Applicant:	201-1901Daesang, Hyundai Apt. 616, MadulRo, DoBongGu, Seoul, Korea

Equipment Under Test (EUT)

Product Name:	Car Bluetooth Receiver with FM Transmitter
Model No.:	TS-721CF
Trade Mark:	/
FCC ID:	2ADFE721CF
Applicable standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.249:2014
Date of sample receipt:	October 13, 2104
Date of Test:	October 13~ October 27, 2104
Date of report issued:	October 27, 2104
Test Result :	PASS *

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

Authorized Signature:

Robinson Lo
Laboratory Manager

2 Version

Version No.	Date	Description
00	*October 27, 2104*	*Original*

Prepared By: Sam. Gao ***Date:*** *October 27, 2104*

Project Engineer

Check By: hank. yan ***Date:*** *October 27, 2104*

Reviewer

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4 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203	Pass
AC Power Line Conducted Emission	15.207	Pass
Field strength of the fundamental signal	15.249 (a)	Pass
Spurious emissions	15.249 (a) (d)/15.209	Pass
Band edge	15.249 (d)/15.205	Pass
20dB Occupied Bandwidth	15.215 (c)	Pass

Pass: The EUT complies with the essential requirements in the standard.

5 General Information

5.1 Client Information

Applicant:	TS Co., Ltd
Address of Applicant:	201-1901Daesang, Hyundai Apt. 616, MadulRo, DoBongGu, Seoul, Korea
Manufacturer/Factory:	TS Co., Ltd
Address of Manufacturer/Factory:	201-1901Daesang, Hyundai Apt. 616, MadulRo, DoBongGu, Seoul, Korea

5.2 General Description of EUT

Product Name:	Car Bluetooth Receiver with FM Transmitter
Model No.:	TS-721CF
Test Model No.:	TS-721CF
Operation Frequency:	2402MHz~2480MHz
Channel numbers:	79
Channel separation:	1MHz
Modulation type:	GFSK, Pi/4QPSK, 8DPSK
Antenna Type:	PCB Antenna
Antenna gain:	-0.61dBi
Power supply:	DC 12V

Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2402MHz	21	2422MHz	41	2442MHz	61	2462MHz
2	2403MHz	22	2423MHz	42	2443MHz	62	2463MHz
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
19	2420MHz	39	2440MHz	59	2460MHz	79	2480MHz
20	2421MHz	40	2441MHz	60	2461MHz		

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Channel	Frequency
The lowest channel	2402MHz
The middle channel	2441MHz
The Highest channel	2480MHz

5.3 Test mode

Transmitting mode	Keep the EUT in continuously transmitting mode with GFSK modulation.
Remark: During the test, the full charged battery was used.	

Per-test mode.

We have verified the construction and function in typical operation, The EUT was placed on three different polar directions; i.e. X axis, Y axis, Z axis. which was shown in this test report and defined as follows:

Axis	X	Y	Z
Field Strength(dBuV/m)	93.04	95.35	90.37

Final Test Mode:

The EUT was tested in GFSK, Pi/4QPSK, 8DPSK modulation, and found the GFSK modulation is the worst case.

According to ANSI C63.4 standards, the test results are both the “worst case” and “worst setup”:

Y axis (see the test setup photo)

5.4 Description of Support Units

Description	Manufacturer	Model	Serial Number	FCC ID/DoC
IBM Thinkpad	Notebook PC	2374	L3-G0686	FCC ID
IBM	AC Adapter	92P1024	N/A	FCC DoC

5.5 Test Facility

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

● **CNAS —Registration No.: CNAS L5775**

CNAS has accredited Global United Technology Services Co., Ltd. To ISO/IEC 17025 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.

● **FCC —Registration No.: 600491**

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fuly described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files. Registration 600491, June 28, 2013.

● **Industry Canada (IC) —Registration No.: 9079A-2**

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 9079A-2, June 26, 2013.

5.6 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.
Address: 2nd Floor, Block No.2, Laodong Industrial Zone, Xixiang Road Baoan District, Shenzhen, China
Tel: 0755-27798480
Fax: 0755-27798960

5.7 Other Information Requested by the Customer

None.

6 Test Instruments list

Radiated Emission:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	Mar. 30 2013	Mar. 29 2015
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	Spectrum Analyzer	Agilent	E4440A	GTS533	Jul. 07 2014	Jul. 06 2015
4	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	Mar. 10 2014	Mar. 09 2015
5	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	Jul. 07 2014	Jul. 06 2015
6	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	9120D-829	GTS208	Mar. 10 2014	Mar. 09 2015
7	Horn Antenna	ETS-LINDGREN	3160	GTS217	N/A	N/A
8	EMI Test Software	AUDIX	E3	N/A	Jul. 07 2014	Jul. 06 2015
9	Coaxial Cable	GTS	N/A	GTS213	Jul. 07 2014	Jul. 06 2015
10	Coaxial Cable	GTS	N/A	GTS211	Jul. 07 2014	Jul. 06 2015
11	Coaxial cable	GTS	N/A	GTS210	Jul. 07 2014	Jul. 06 2015
12	Coaxial Cable	GTS	N/A	GTS212	Jul. 07 2014	Jul. 06 2015
13	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	Jul. 07 2014	Jul. 06 2015
14	Amplifier(2GHz-20GHz)	HP	8349B	GTS206	Jul. 07 2014	Jul. 06 2015
15	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	Jul. 07 2014	Jul. 06 2015
16	Band filter	Amindeon	82346	GTS219	Mar. 30 2013	Mar. 29 2015

Conducted Emission:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	Shielding Room	ZhongYu Electron	7.0(L)x3.0(W)x3.0(H)	GTS264	Sep. 08 2013	Sep. 07 2015
2	EMI Test Receiver	Rohde & Schwarz	ESCS30	GTS223	Jul. 07 2014	Jul. 06 2015
3	10dB Pulse Limita	Rohde & Schwarz	N/A	GTS224	Jul. 07 2014	Jul. 06 2015
4	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	Jul. 07 2014	Jul. 06 2015
5	LISN	SCHWARZBECK MESS-ELEKTRONIK	NSLK 8127	GTS226	Jul. 07 2014	Jul. 06 2015
6	Coaxial Cable	GTS	N/A	GTS227	N/A	N/A
7	EMI Test Software	AUDIX	E3	N/A	Sep. 08 2013	Sep. 07 2015

7 Test results and Measurement Data

7.1 Antenna requirement:

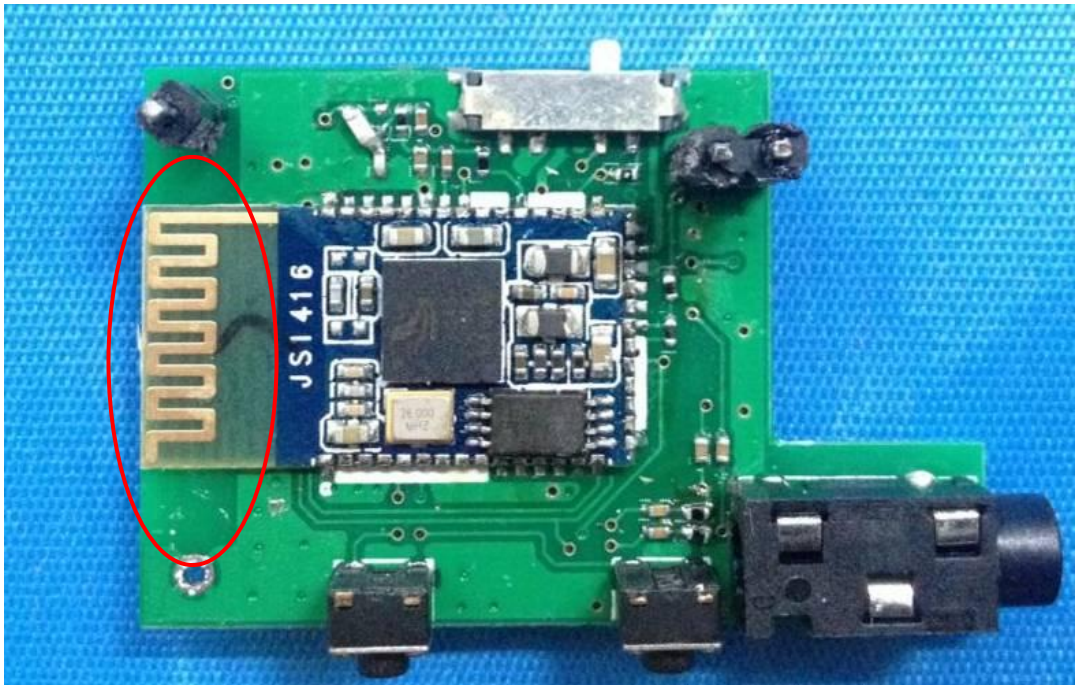
Standard requirement:	FCC Part15 C Section 15.203

15.203 requirement:

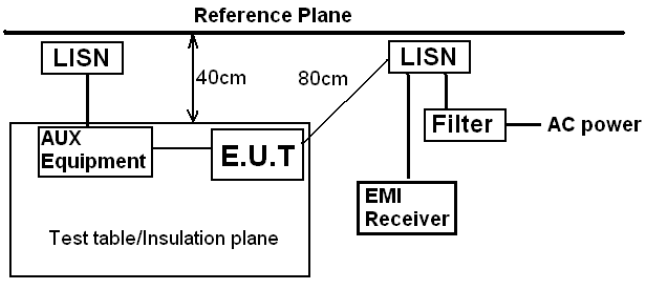
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

E.U.T Antenna:

The antenna is PCB Antenna, the best case gain of the antenna is -0.61dBi

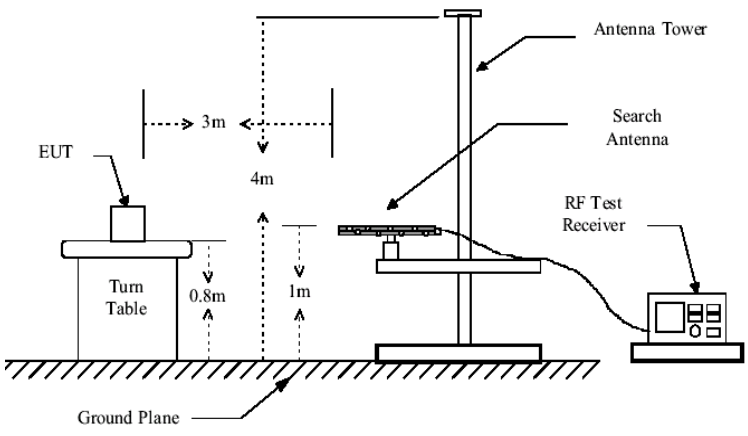


7.2 Conducted Emissions

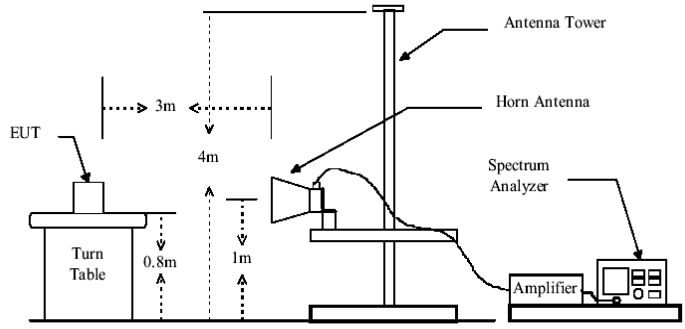
Test Requirement:	FCC Part15 C Section 15.207
Test Method:	ANSI C63.4:2003
Test Frequency Range:	150KHz to 30MHz
Class / Severity:	Class B
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=auto
Limit:	Frequency range (MHz) / Limit (dBuV): Quasi-peak / Average 0.15-0.5: 66 to 56* / 56 to 46* 0.5-5: 56 / 46 5-30: 60 / 50 * Decreases with the logarithm of the frequency.
Test setup:	 *Remark:* *E.U.T: Equipment Under Test* *LISN: Line Impedence Stabilization Network* *Test table height=0.8m*
Test procedure:	1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2003 on conducted measurement.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.3 for details
Test results:	N/A

Notes: For the EUT is powered by DC source, no AC mains need to conducted emission test.

7.3 Radiated Emission Method

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 C Section 15.209</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.4:2003</td></tr>
<tr><td>Test Frequency Range:</td><td>30MHz to 25GHz</td></tr>
<tr><td>Test site:</td><td>Measurement Distance: 3m</td></tr>
<tr><td>Receiver setup:</td><td>
<table>
<tr><th>Frequency</th><th>Detector</th><th>RBW</th><th>VBW</th><th>Remark</th></tr>
<tr><td>30MHz-1GHz</td><td>Quasi-peak</td><td>120KHz</td><td>300KHz</td><td>Quasi-peak Value</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr>
<tr><td>Peak</td><td>1MHz</td><td>10Hz</td><td>Average Value</td></tr>
</table>
</td></tr>
<tr><td>Limit:
(Field strength of the fundamental signal)</td><td>
<table>
<tr><th>Frequency</th><th>Limit (dBuV/m @3m)</th><th>Remark</th></tr>
<tr><td rowspan="2">2400MHz-2483.5MHz</td><td>94.00</td><td>Average Value</td></tr>
<tr><td>114.00</td><td>Peak Value</td></tr>
</table>
</td></tr>
<tr><td>Limit:
(Spurious Emissions)</td><td>
<table>
<tr><th>Frequency</th><th>Limit (dBuV/m @3m)</th><th>Remark</th></tr>
<tr><td>30MHz-88MHz</td><td>40.00</td><td>Quasi-peak Value</td></tr>
<tr><td>88MHz-216MHz</td><td>43.50</td><td>Quasi-peak Value</td></tr>
<tr><td>216MHz-960MHz</td><td>46.00</td><td>Quasi-peak Value</td></tr>
<tr><td>960MHz-1GHz</td><td>54.00</td><td>Quasi-peak Value</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>54.00</td><td>Average Value</td></tr>
<tr><td>74.00</td><td>Peak Value</td></tr>
</table>
</td></tr>
<tr><td>Limit:
(band edge)</td><td>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.</td></tr>
<tr><td>Test setup:</td><td>Below 1GHz
 

Above 1GHz</td></tr>
</table>

	
Test Procedure:	1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. 4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Measurement data:

7.3.1 Field Strength of The Fundamental Signal

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
2402.00	91.24	27.58	5.39	30.18	94.03	114.00	-19.97	Vertical
2402.00	89.17	27.58	5.39	30.18	91.96	114.00	-22.04	Horizontal
2441.00	89.68	27.55	5.43	30.06	92.60	114.00	-21.40	Vertical
2441.00	88.00	27.55	5.43	30.06	90.92	114.00	-23.08	Horizontal
2480.00	92.24	27.52	5.47	29.93	95.30	114.00	-18.65	Vertical
2480.00	89.45	27.52	5.47	29.93	92.51	114.00	-21.49	Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
2402.00	80.89	27.58	5.39	30.18	83.68	94.00	-10.32	Vertical
2402.00	78.77	27.58	5.39	30.18	81.56	94.00	-12.44	Horizontal
2441.00	79.10	27.55	5.43	30.06	82.02	94.00	-11.98	Vertical
2441.00	76.21	27.55	5.43	30.06	79.13	94.00	-14.87	Horizontal
2480.00	81.93	27.52	5.47	29.93	84.99	94.00	-9.01	Vertical
2480.00	79.09	27.52	5.47	29.93	82.15	94.00	-11.85	Horizontal

According to the follow transmitter output power (P_t) formula:

$P_t=(E \times d)^2/(30 \times g_t)$

P_t =transmitter output power in watts

g_t =numeric gain of the transmitting antenna (unitless)

E=electric field strength in V/m

d= measurement distance in meters (m).

According to the above test data, Emax=95.30dBuV/m=0.0582V/m, d=3m, g_t=0.869

$P_t =(E \times d)^2/(30 \times g_t)= (0.0582\times 3)^2/(30 \times 0.860)=0.0008739W=0.874mW$

7.3.2 Spurious emissions

■ Below 1GHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
37.81	45.02	15.06	0.64	32.06	28.66	40.00	-11.34	Vertical
47.33	42.74	15.41	0.74	31.98	26.91	40.00	-13.09	Vertical
59.86	44.32	14.71	0.86	31.94	27.95	40.00	-12.05	Vertical
66.27	45.51	12.16	0.91	31.90	26.68	40.00	-13.32	Vertical
96.10	38.72	14.90	1.16	31.75	23.03	43.50	-20.47	Vertical
155.91	42.33	10.51	1.60	32.00	22.44	43.50	-21.06	Vertical
59.23	39.34	14.74	0.85	31.94	22.99	40.00	-17.01	Horizontal
106.39	38.15	14.59	1.25	31.79	22.20	43.50	-21.30	Horizontal
213.76	42.41	13.00	1.92	32.15	25.18	43.50	-18.32	Horizontal
329.04	38.43	15.73	2.52	32.08	24.60	46.00	-21.40	Horizontal
407.52	38.65	17.22	2.89	31.86	26.90	46.00	-19.10	Horizontal
526.40	38.05	19.10	3.43	31.41	29.17	46.00	-16.83	Horizontal

■ Above 1GHz

Test channel:	Lowest channel

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4804.00	38.25	31.78	8.60	32.09	46.54	74.00	-27.46	Vertical
7206.00	33.49	36.15	11.65	32.00	49.29	74.00	-24.71	Vertical
9608.00	33.11	37.95	14.14	31.62	53.58	74.00	-20.42	Vertical
12010.00	*					74.00		Vertical
14412.00	*					74.00		Vertical
4804.00	40.89	31.78	8.60	32.09	49.18	74.00	-24.82	Horizontal
7206.00	33.98	36.15	11.65	32.00	49.78	74.00	-24.22	Horizontal
9608.00	31.29	37.95	14.14	31.62	51.76	74.00	-22.24	Horizontal
12010.00	*					74.00		Horizontal
14412.00	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4804.00	25.71	31.78	8.60	32.09	34.00	54.00	-20.00	Vertical
7206.00	20.65	36.15	11.65	32.00	36.45	54.00	-17.55	Vertical
9608.00	19.72	37.95	14.14	31.62	40.19	54.00	-13.81	Vertical
12010.00	*					54.00		Vertical
14412.00	*					54.00		Vertical
4804.00	29.49	31.78	8.60	32.09	37.78	54.00	-16.22	Horizontal
7206.00	22.50	36.15	11.65	32.00	38.30	54.00	-15.70	Horizontal
9608.00	19.08	37.95	14.14	31.62	39.55	54.00	-14.45	Horizontal
12010.00	*					54.00		Horizontal
14412.00	*					54.00		Horizontal

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*
3. *"*", means this data is the too weak instrument of signal is unable to test.*

Test channel:	Middle channel

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4882.00	40.53	31.85	8.67	32.12	48.93	74.00	-25.07	Vertical
7323.00	33.46	36.37	11.72	31.89	49.66	74.00	-24.34	Vertical
9764.00	32.94	38.35	14.25	31.62	53.92	74.00	-20.08	Vertical
12205.00	*					74.00		Vertical
14646.00	*					74.00		Vertical
4882.00	37.52	31.85	8.67	32.12	45.92	74.00	-28.08	Horizontal
7323.00	32.11	36.37	11.72	31.89	48.31	74.00	-25.69	Horizontal
9764.00	32.27	38.35	14.25	31.62	53.25	74.00	-20.75	Horizontal
12205.00	*					74.00		Horizontal
14646.00	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4882.00	27.16	31.85	8.67	32.12	35.56	54.00	-18.44	Vertical
7323.00	19.72	36.37	11.72	31.89	35.92	54.00	-18.08	Vertical
9764.00	19.80	38.35	14.25	31.62	40.78	54.00	-13.22	Vertical
12205.00	*					54.00		Vertical
14646.00	*					54.00		Vertical
4882.00	25.13	31.85	8.67	32.12	33.53	54.00	-20.47	Horizontal
7323.00	19.57	36.37	11.72	31.89	35.77	54.00	-18.23	Horizontal
9764.00	19.87	38.35	14.25	31.62	40.85	54.00	-13.15	Horizontal
12205.00	*					54.00		Horizontal
14646.00	*					54.00		Horizontal

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*
3. *"*", means this data is the too weak instrument of signal is unable to test.*

Test channel:	Highest channel

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4960.00	38.20	31.93	8.73	32.16	46.70	74.00	-27.30	Vertical
7440.00	34.09	36.59	11.79	31.78	50.69	74.00	-23.31	Vertical
9920.00	33.47	38.81	14.38	31.88	54.78	74.00	-19.22	Vertical
12400.00	*					74.00		Vertical
14880.00	*					74.00		Vertical
4960.00	37.08	31.93	8.73	32.16	45.58	74.00	-28.42	Horizontal
7440.00	32.87	36.59	11.79	31.78	49.47	74.00	-24.53	Horizontal
9920.00	32.84	38.81	14.38	31.88	54.15	74.00	-19.85	Horizontal
12400.00	*					74.00		Horizontal
14880.00	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4960.00	24.97	31.93	8.73	32.16	33.47	54.00	-20.53	Vertical
7440.00	21.27	36.59	11.79	31.78	37.87	54.00	-16.13	Vertical
9920.00	20.65	38.81	14.38	31.88	41.96	54.00	-12.04	Vertical
12400.00	*					54.00		Vertical
14880.00	*					54.00		Vertical
4960.00	24.73	31.93	8.73	32.16	33.23	54.00	-20.77	Horizontal
7440.00	21.18	36.59	11.79	31.78	37.78	54.00	-16.22	Horizontal
9920.00	21.19	38.81	14.38	31.88	42.50	54.00	-11.50	Horizontal
12400.00	*					54.00		Horizontal
14880.00	*					54.00		Horizontal

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*
3. *"*", means this data is the too weak instrument of signal is unable to test.*

7.3.3 Bandedge emissions

All of the restriction bands were tested, and only the data of worst case was exhibited.

Test channel:	Lowest channel

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2390.00	41.20	27.59	5.38	30.18	43.99	74.00	-30.01	Horizontal
2400.00	52.18	27.58	5.39	30.18	54.97	74.00	-19.03	Horizontal
2390.00	42.19	27.59	5.38	30.18	44.98	74.00	-29.02	Vertical
2400.00	54.82	27.58	5.39	30.18	57.61	74.00	-16.39	Vertical

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2390.00	31.30	27.59	5.38	30.18	34.09	54.00	-19.91	Horizontal
2400.00	40.19	27.58	5.39	30.18	42.98	54.00	-11.02	Horizontal
2390.00	31.66	27.59	5.38	30.18	34.45	54.00	-19.55	Vertical
2400.00	41.98	27.58	5.39	30.18	44.77	54.00	-9.23	Vertical

Test channel:	Highest channel

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	42.64	27.53	5.47	29.93	45.71	74.00	-28.29	Horizontal
2500.00	41.57	27.55	5.49	29.93	44.68	74.00	-29.32	Horizontal
2483.50	43.52	27.53	5.47	29.93	46.59	74.00	-27.41	Vertical
2500.00	42.59	27.55	5.49	29.93	45.70	74.00	-28.30	Vertical

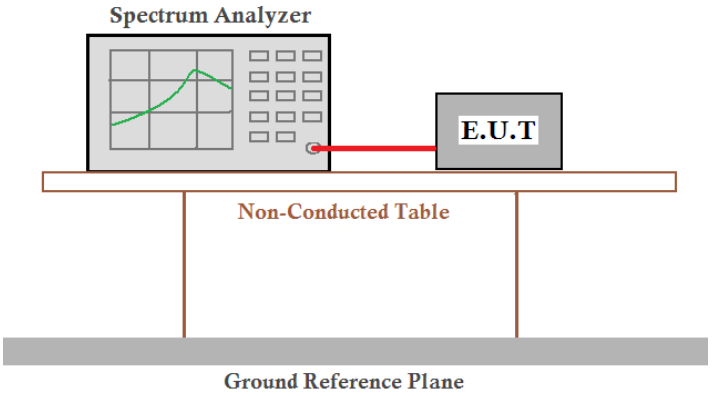
Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	33.46	27.53	5.47	29.93	36.53	54.00	-17.47	Horizontal
2500.00	33.20	27.55	5.49	29.93	36.31	54.00	-17.69	Horizontal
2483.50	33.05	27.53	5.47	29.93	36.12	54.00	-17.88	Vertical
2500.00	32.89	27.55	5.49	29.93	36.00	54.00	-18.00	Vertical

Remark:

1. Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor

7.4 20dB Occupy Bandwidth

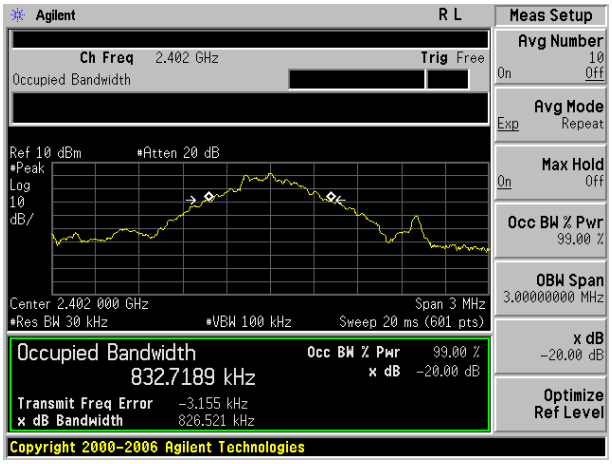
Test Requirement:	FCC Part15 C Section 15.249/15.215
Test Method:	ANSI C63.4:2003
Limit:	Operation Frequency range 2400MHz~2483.5MHz
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Measurement Data

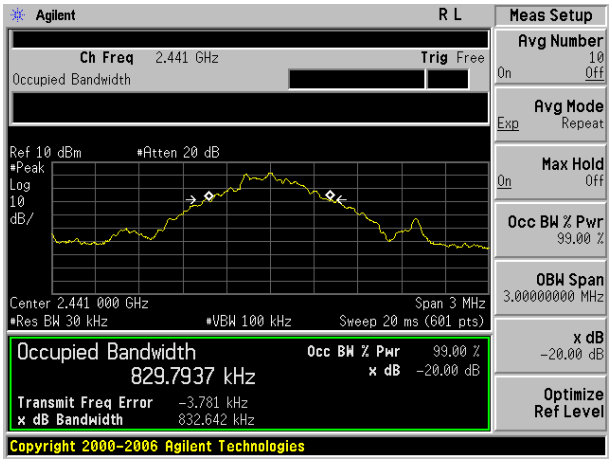
Worst case GFSK modulation

Test channel	20dB bandwidth(MHz)	Result
Lowest	0.827	Pass
Middle	0.833	Pass
Highest	0.844	Pass

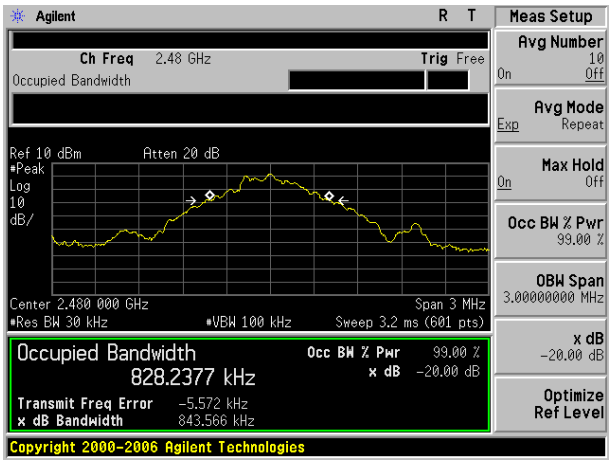
Test plot as follows:



Lowest channel



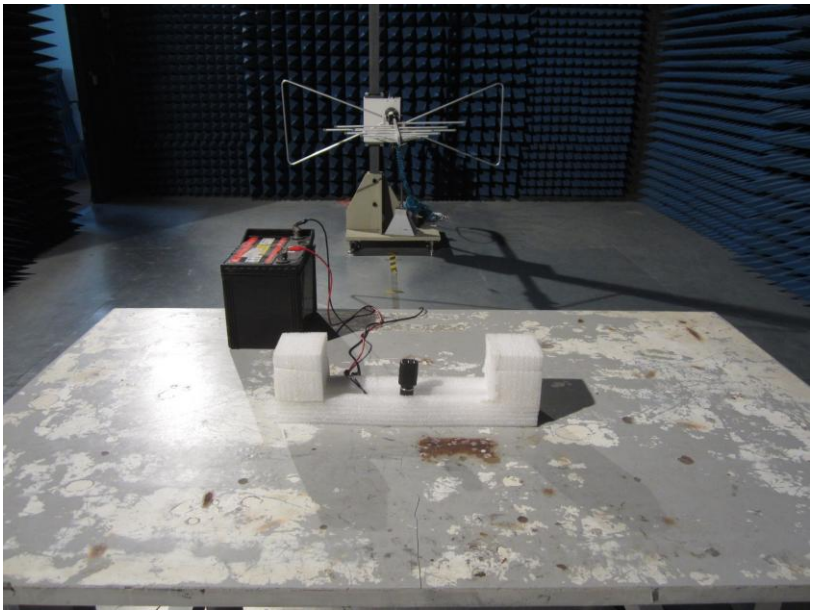
Middle channel

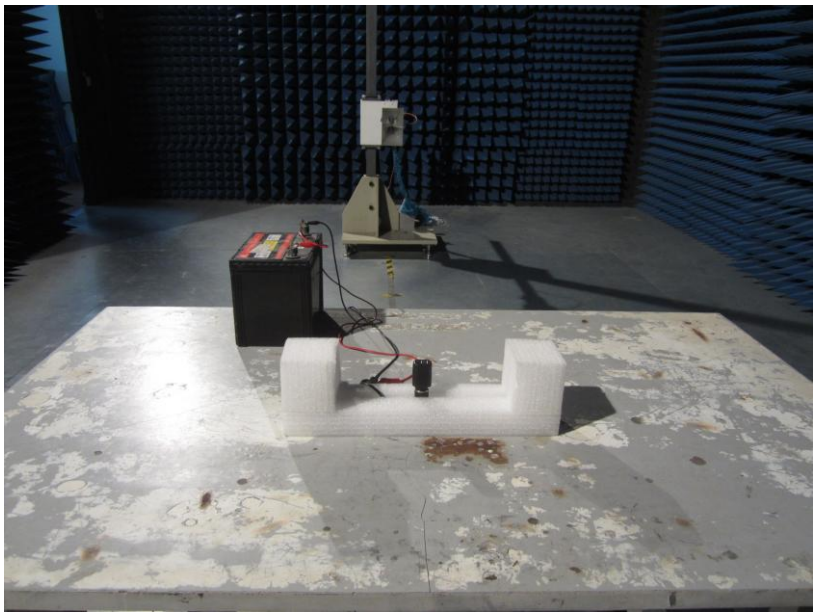


Highest channel

8 Test Setup Photo

Radiated Emission





9 EUT Constructional Details

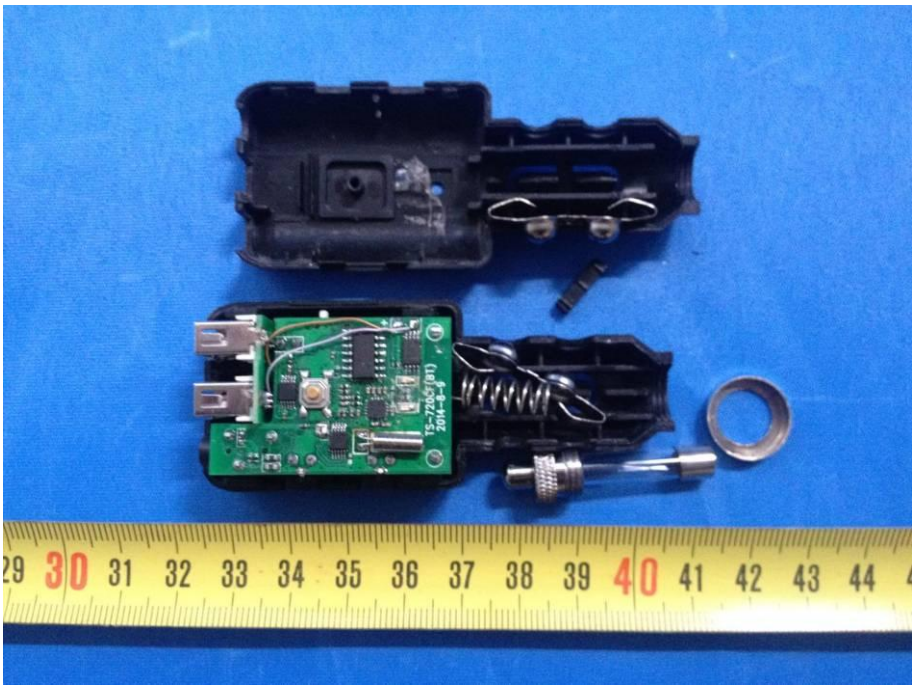
Back side:

Top side:

Bottom side:

Right side:

Left side: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2014-8-9
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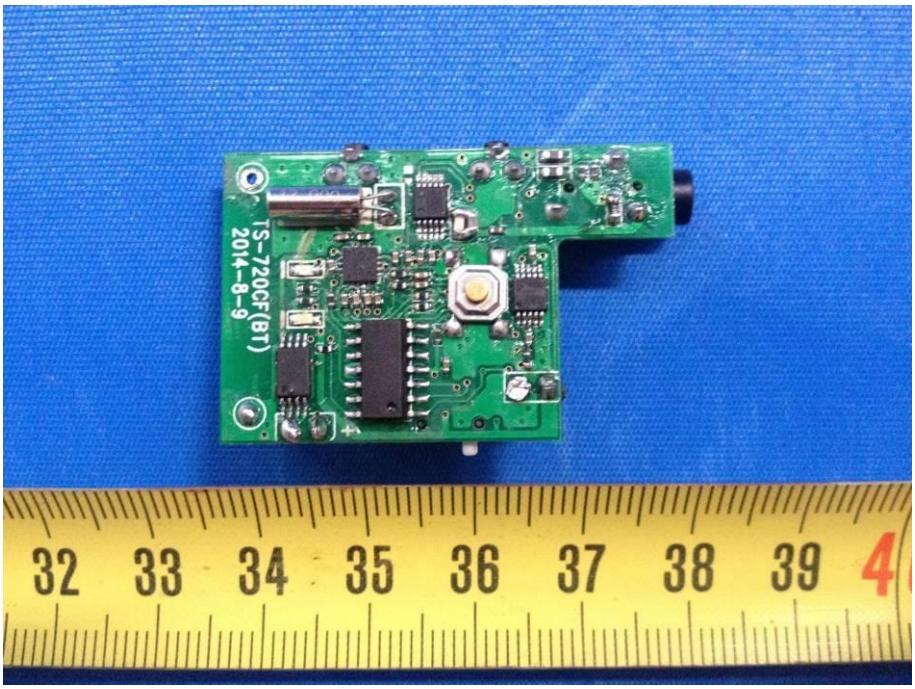
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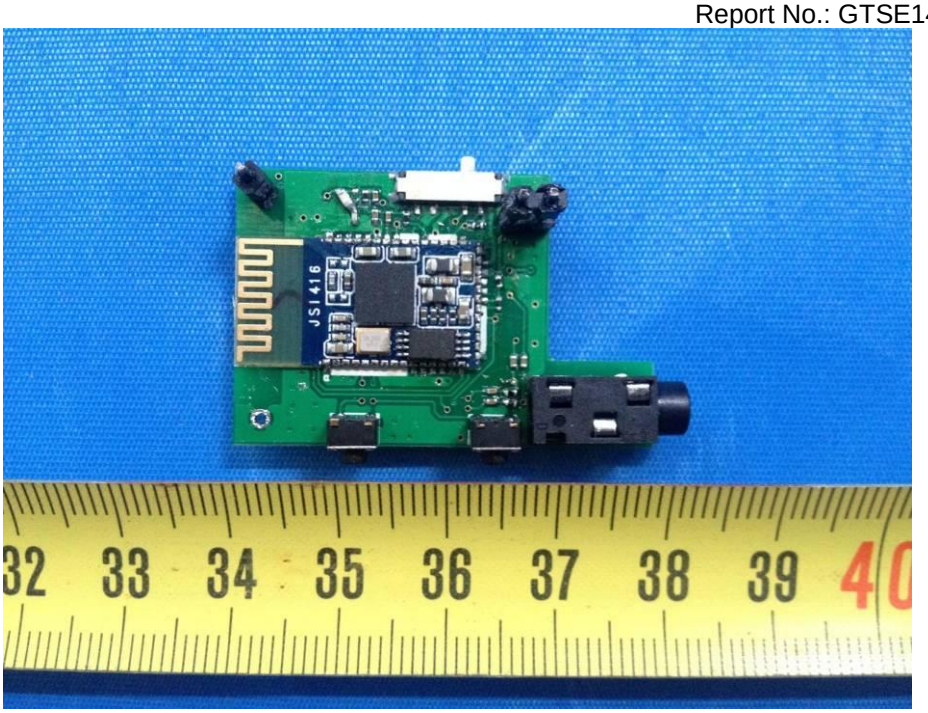
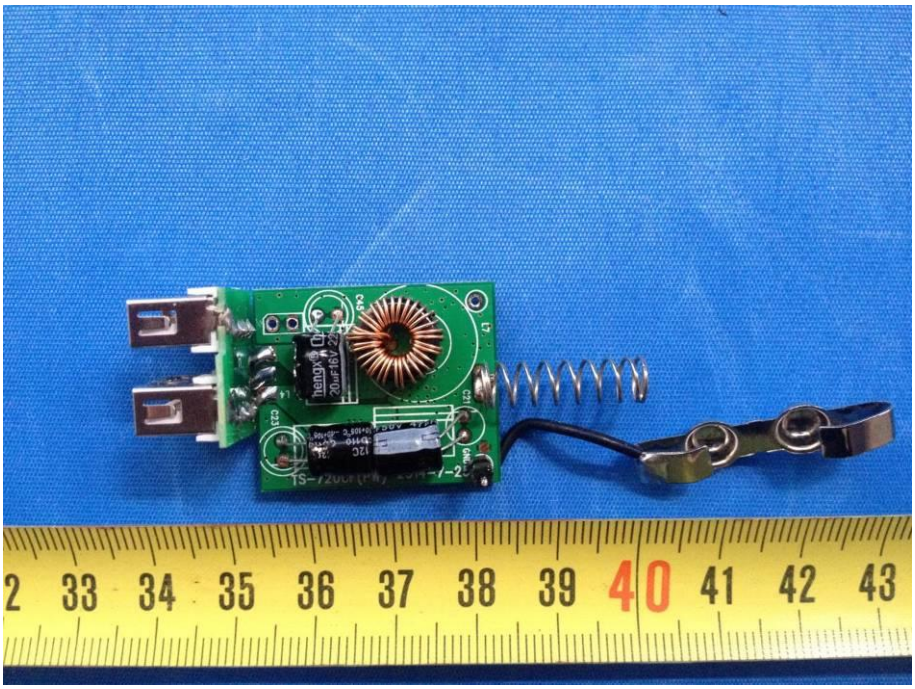

JSI416
32 33 34 35 36 37 38 39 40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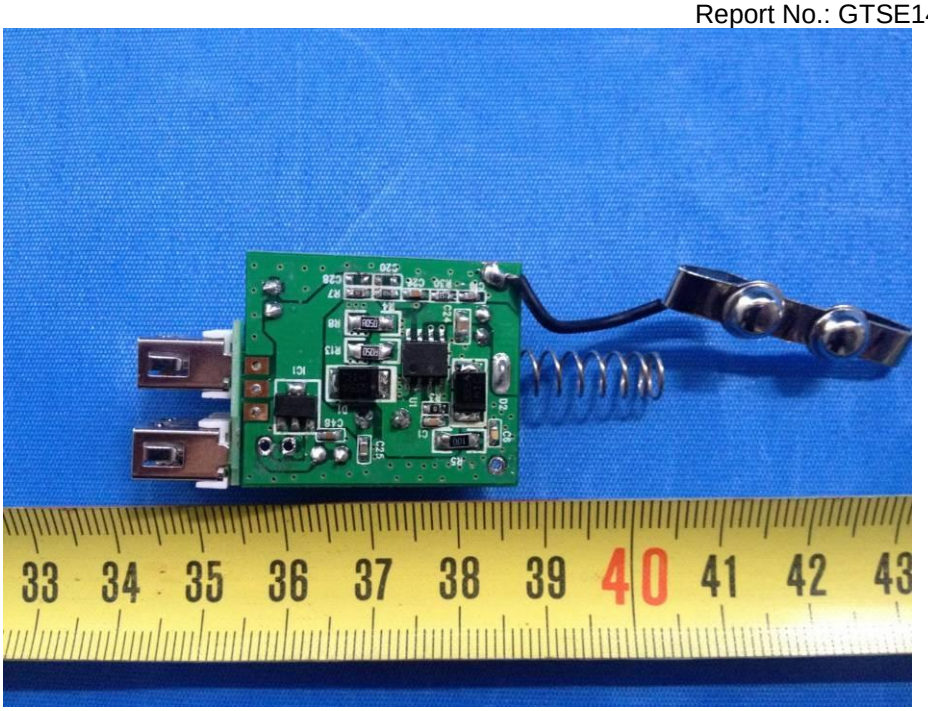
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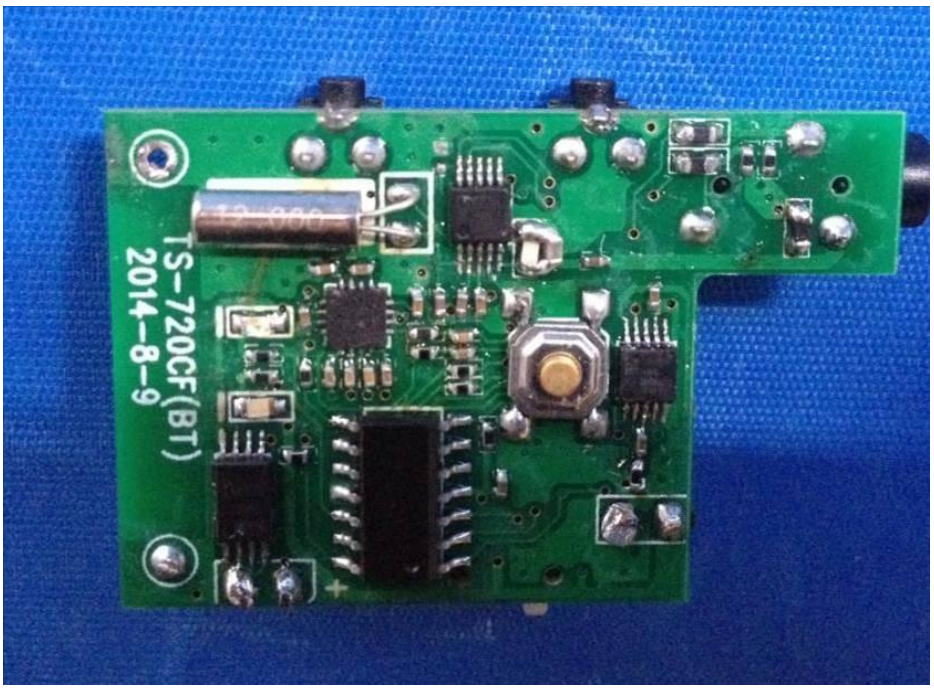
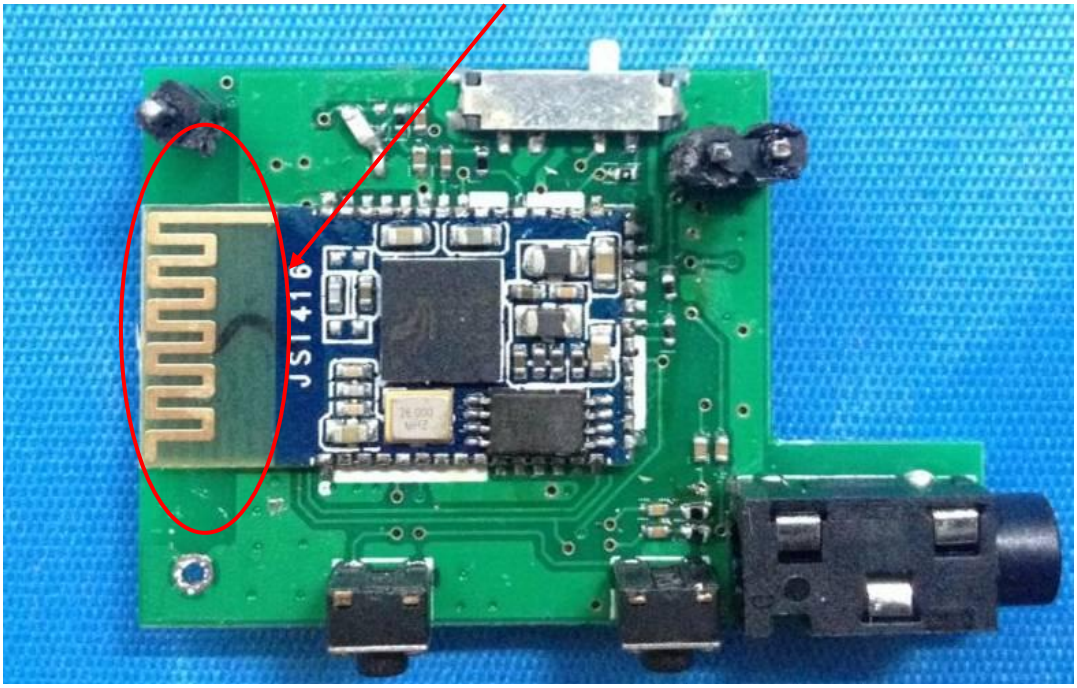

TS-720CF(BT)
2014-8-9

RF Antenna



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