

Mode	Channel	Antenna Pol.	EIRP	Limit (dBm)	Result
PCS1900	512	V	24.66	33.01	Pass
		H	27.85		
	661	V	24.97		
		H	28.34		
	810	V	25.36		
		H	29.02		
GPRS1900	512	V	24.58	33.01	Pass
		H	27.77		
	661	V	24.82		
		H	28.19		
	810	V	25.38		
		H	28.95		
EGPRS 1900	512	V	20.06	33.01	Pass
		H	23.76		
	661	V	20.37		
		H	24.13		
	810	V	20.78		
		H	24.65		

WCDMA:

Mode	Channel	Antenna Pol.	ERP	Limit (dBm)	Result
WCDMA Band V	4132	V	19.42	38.45	Pass
		H	16.67		
	4182	V	20.38		
		H	17.73		
	4233	V	18.97		
		H	15.45		

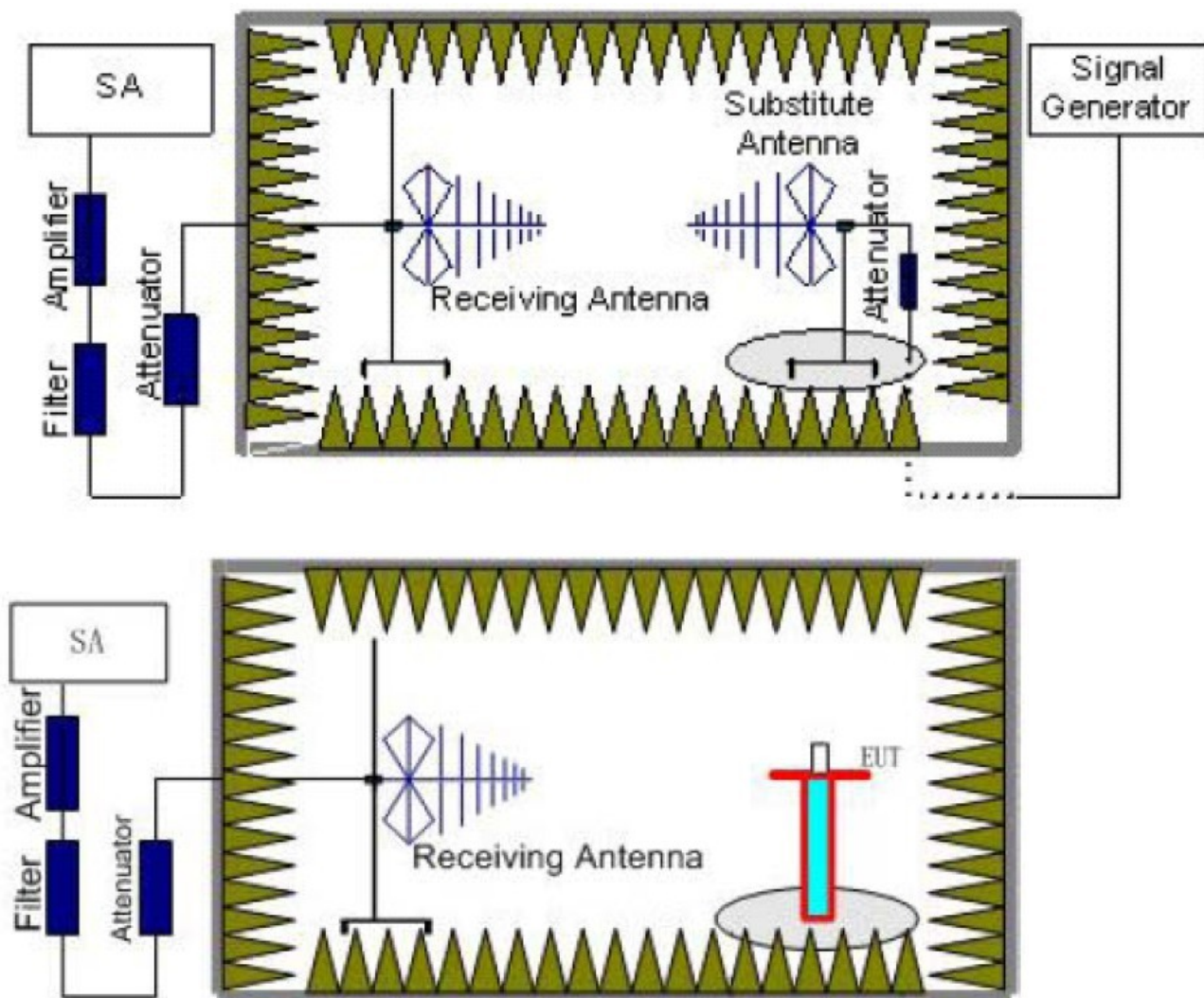
Mode	Channel	Antenna Pol.	EIRP	Limit (dBm)	Result
WCDMA Band II	9262	V	20.08	33.01	Pass
		H	21.35		
	9400	V	20.44		
		H	21.89		
	9538	V	20.76		
		H	22.58		

3.6. Radiated Spurious Emission

LIMIT

-13dBm

TEST CONFIGURATION



TEST RESULTS

1. EUT was placed on a 0.80 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 0.80m. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequencies in three channels (High, Middle, Low) were measured with peak detector.
2. A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.

3. The EUT is then put into continuously transmitting mode at its maximum power level during the test. Set Test Receiver or Spectrum RBW=1MHz, VBW=3MHz, and the maximum value of the receiver should be recorded as (Pr).
4. The EUT shall be replaced by a substitution antenna. In the chamber, a substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (P_{Mea}) is applied to the input of the substitution antenna, and adjusts the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (P_{Mea}) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
5. An amplifier should be connected to the Signal Source output port. And the cable should be connecting between the Amplifier and the Substitution Antenna. The cable loss (P_{cl}), the Substitution Antenna Gain (G_a) and the Amplifier Gain (P_{Ag}) should be recorded after test.
6. The measurement results are obtained as described below:

$$\text{Power(EIRP)} = P_{\text{Mea}} - P_{\text{cl}} + G_a$$

We used SMF100A microwave signal generator which signal level can up to 33dBm,so we not used power Amplifier for substitution test; The measurement results are amend as described below:

$$\text{Power(EIRP)} = P_{\text{Mea}} - P_{\text{cl}} + G_a$$
7. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.
ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP-2.15dBi.

TEST RESULTS

Working Frequency	Sub range (GHz)	RBW	VBW	Sweep time (s)
GSM850/ WCDMA Band V	0.000009~0.000015	1KHz	3KHz	10
	0.000015~0.03	10KHz	30KHz	10
	0.03~1	1 MHz	3 MHz	10
	1~2	1 MHz	3 MHz	2
	2~5	1 MHz	3 MHz	3
	5~8	1 MHz	3 MHz	3
	8~10	1 MHz	3 MHz	3
PCS1900/ WCDMA Band II	0.000009~0.000015	1KHz	3KHz	10
	0.000015~0.03	10KHz	30KHz	10
	0.03~1	1 MHz	3 MHz	10
	1~2	1 MHz	3 MHz	2
	2~5	1 MHz	3 MHz	3
	5~8	1 MHz	3 MHz	3
	8~11	1 MHz	3 MHz	3
	11~14	1 MHz	3 MHz	3
	14~18	1 MHz	3 MHz	3
	18~20	1 MHz	3 MHz	2

GSM850					
Channel	Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
		Polarization	Level (dBm)		
128	1648.40	Vertical	-46.59	-13.00	Pass
	2472.60	Vertical	-49.82		
	3296.80	Vertical	-50.66		
	4121.00	Vertical	-62.37		
	4945.20	Vertical	---		
	1648.40	Horizontal	-38.85	-13.00	Pass
	2472.60	Horizontal	-40.08		
	3296.80	Horizontal	-42.64		
	4121.00	Horizontal	-46.37		
	4945.20	Horizontal	---		
190	1673.20	Vertical	-45.71	-13.00	Pass
	2509.80	Vertical	-48.63		
	3346.40	Vertical	-50.00		
	4183.00	Vertical	-60.16		
	5019.60	Vertical	---		
	1673.20	Vertical	-37.44	-13.00	Pass
	2509.80	Horizontal	-39.12		
	3346.40	Horizontal	-40.58		
	4183.00	Horizontal	-45.17		
	5019.60	Horizontal	---		
251	1697.60	Vertical	-47.20	-13.00	Pass
	2546.40	Vertical	-50.08		
	3395.20	Vertical	-52.46		
	4244.00	Vertical	-62.63		
	5092.80	Vertical	---		
	1697.60	Horizontal	-39.78	-13.00	Pass
	2546.40	Horizontal	-41.29		
	3395.20	Horizontal	-43.35		
	4244.00	Horizontal	-46.99		
	5092.80	Horizontal	---		

Remark :

1. The emission behavior belongs to narrowband spurious emission.
2. Remark"---" means that the emission level is too low to be measured
3. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

PCS1900					
Channel	Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
		Polarization	Level (dBm)		
512	3700.40	Vertical	-46.93	-13.00	Pass
	5550.60	Vertical	-48.12		
	7400.80	Vertical	-50.34		
	9251.00	Vertical	-55.30		
	11101.20	Vertical	---		
	3700.40	Horizontal	-39.11	-13.00	Pass
	5550.60	Horizontal	-41.24		
	7400.80	Horizontal	-43.64		
	9251.00	Horizontal	-49.03		
	11101.20	Horizontal	---		
661	3760.00	Vertical	-45.58	-13.00	Pass
	5640.00	Vertical	-46.99		
	7520.00	Vertical	-49.13		
	9400.00	Vertical	-53.77		
	11280.00	Vertical	---		
	3760.00	Horizontal	-38.01	-13.00	Pass
	5640.00	Horizontal	-39.78		
	7520.00	Horizontal	-41.44		
	9400.00	Horizontal	-48.55		
	11280.00	Horizontal	---		
810	3819.60	Vertical	-47.05	-13.00	Pass
	5729.40	Vertical	-48.45		
	7639.20	Vertical	-50.99		
	9549.00	Vertical	-55.76		
	11458.80	Vertical	---		
	3819.60	Horizontal	-39.11	-13.00	Pass
	5729.40	Horizontal	-41.95		
	7639.20	Horizontal	-43.73		
	9549.00	Horizontal	-49.39		
	11458.80	Horizontal	---		

Remark :

1. The emission behavior belongs to narrowband spurious emission.
2. Remark"---" means that the emission level is too low to be measured
3. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

WCDMA Band V					
Channel	Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
		Polarization	Level (dBm)		
4132	1652.80	Vertical	-50.39	-13.00	Pass
	2479.20	Vertical	-53.45		
	2479.20	Vertical	-57.82		
	3305.60	Vertical	-60.67		
	4132.00	Vertical	---		
	1652.80	Horizontal	-44.99	-13.00	Pass
	2479.20	Horizontal	-47.16		
	2479.20	Horizontal	-52.74		
	3305.60	Horizontal	-55.40		
	4132.00	Horizontal	---		
4182	1673.20	Vertical	-50.01	-13.00	Pass
	2509.80	Vertical	-51.68		
	2509.80	Vertical	-55.94		
	3346.40	Vertical	-59.72		
	4183.00	Vertical	---		
	1673.20	Horizontal	-44.06	-13.00	Pass
	2509.80	Horizontal	-45.93		
	2509.80	Horizontal	-52.00		
	3346.40	Horizontal	-53.89		
	4183.00	Horizontal	---		
4233	1693.20	Vertical	-50.77	-13.00	Pass
	2539.80	Vertical	-53.91		
	2539.80	Vertical	-58.62		
	3386.40	Vertical	-61.42		
	4233.00	Vertical	---		
	1693.20	Horizontal	-45.45	-13.00	Pass
	2539.80	Horizontal	-47.86		
	2539.80	Horizontal	-53.02		
	3386.40	Horizontal	-55.91		
	4233.00	Horizontal	---		

Remark :

1. The emission behavior belongs to narrowband spurious emission.
2. Remark"---" means that the emission level is too low to be measured
3. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

WCDMA Band II					
Channel	Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
		Polarization	Level (dBm)		
9262	3704.80	Vertical	-49.26	-13.00	Pass
	5557.20	Vertical	-52.64		
	7409.60	Vertical	-55.79		
	9262.00	Vertical	-59.68		
	11114.40	Vertical	---		
	3704.80	Horizontal	-41.02	-13.00	Pass
	5557.20	Horizontal	-45.56		
	7409.60	Horizontal	-48.78		
	9262.00	Horizontal	-51.14		
	11114.40	Horizontal	---		
9400	3760.00	Vertical	-48.25	-13.00	Pass
	5640.00	Vertical	-51.16		
	7520.00	Vertical	-53.96		
	9400.00	Vertical	-57.85		
	11280.00	Vertical	---		
	3760.00	Horizontal	-39.89	-13.00	Pass
	5640.00	Horizontal	-43.40		
	7520.00	Horizontal	-46.58		
	9400.00	Horizontal	-50.03		
	11280.00	Horizontal	---		
9538	3183.20	Vertical	-49.97	-13.00	Pass
	5719.80	Vertical	-53.14		
	7626.40	Vertical	-56.99		
	9533.00	Vertical	-61.05		
	11439.60	Vertical	---		
	3183.20	Horizontal	-42.36	-13.00	Pass
	5719.80	Horizontal	-47.79		
	7626.40	Horizontal	-49.26		
	9533.00	Horizontal	-52.38		
	11439.60	Horizontal	---		

Remark :

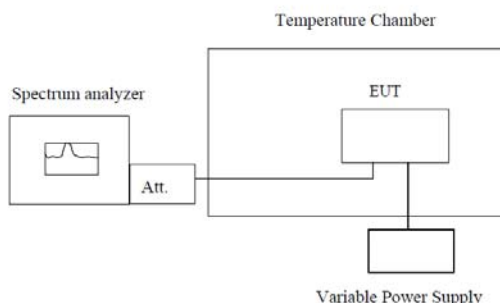
1. The emission behavior belongs to narrowband spurious emission.
2. Remark"---" means that the emission level is too low to be measured
3. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

3.7. Frequency stability

LIMIT

2.5ppm

TEST CONFIGURATION



Note : Measurement setup for testing on Antenna connector

TEST PROCEDURE

1. The equipment under test was connected to an external DC power supply and input rated voltage.
2. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators.
3. The EUT was placed inside the temperature chamber.
4. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25°C operating frequency as reference frequency.
5. Turn EUT off and set the chamber temperature to -30°C. After the temperature stabilized for approximately 30 minutes recorded the frequency.
6. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.
7. Reduce the input voltage to specify extreme voltage variation (+/- 15%) and endpoint, record the maximum frequency change.

TEST RESULTS

Reference Frequency: GSM850 Middle channel=190 channel=836.6MHz					
Voltage (V)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.80	-30	-26	0.031	2.5	Pass
	-20	-27	0.032		
	-10	-28	0.033		
	0	-28	0.033		
	10	-27	0.032		
	20	-31	0.037		
	30	-27	0.032		
	40	-29	0.035		
	50	-27	0.032		
4.35	25	-28	0.033	2.5	Pass
End point 3.60	25	-29	0.035		

Reference Frequency: EGPRS850 Middle channel=190 channel=836.6MHz					
Voltage (V)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.80	-30	-30	0.036	2.5	Pass
	-20	-35	0.042		
	-10	-29	0.035		
	0	-24	0.029		
	10	-33	0.039		
	20	-29	0.035		
	30	-30	0.036		
	40	-28	0.033		
	50	-29	0.035		
4.35	25	-31	0.037	2.5	Pass
End point 3.60	25	-30	0.036		

Reference Frequency: PCS1900 Middle channel=661 channel=1880MHz					
Voltage (V)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.80	-30	-28	0.015	2.5	Pass
	-20	-28	0.015		
	-10	-30	0.016		
	0	-27	0.014		
	10	-25	0.013		
	20	-26	0.014		
	30	-25	0.013		
	40	-27	0.014		
	50	-30	0.016		
4.35	25	-31	0.016	2.5	Pass
End point 3.60	25	-35	0.019		

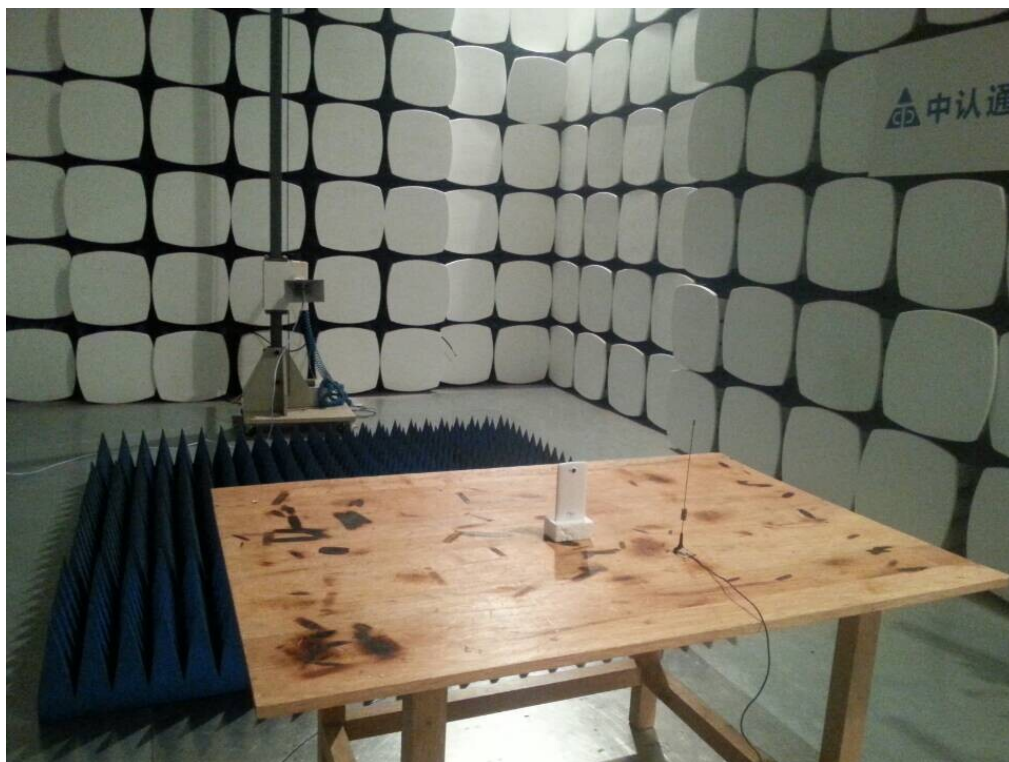
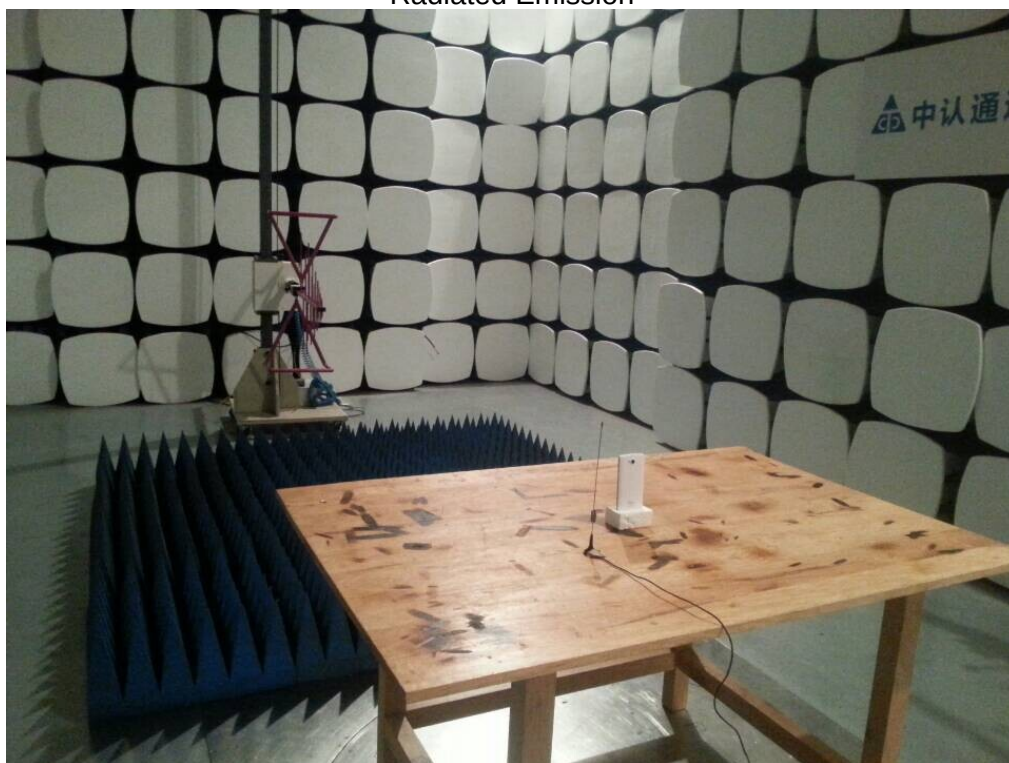
Reference Frequency: EGPRS1900 Middle channel=190 channel=1880MHz					
Voltage (V)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.80	-30	-35	0.019	2.5	Pass
	-20	-29	0.015		
	-10	-29	0.015		
	0	-29	0.015		
	10	-25	0.013		
	20	-36	0.019		
	30	-29	0.015		
	40	-37	0.020		
	50	-39	0.021		
4.35	25	-32	0.017	2.5	Pass
End point 3.60	25	-26	0.014		

Reference Frequency: WCDMA Band V Middle channel=4182 channel=836.6MHz					
Voltage (V)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.80	-30	-39	0.047	2.5	Pass
	-20	-35	0.042		
	-10	-36	0.043		
	0	-41	0.049		
	10	-32	0.038		
	20	-33	0.039		
	30	-35	0.042		
	40	-39	0.047		
	50	-40	0.048		
4.35	25	-41	0.049	2.5	Pass
End point 3.60	25	-35	0.042		

Reference Frequency: WCDMA Band II Middle channel=9400 channel=1880MHz					
Voltage (V)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.80	-30	-36	0.019	2.5	Pass
	-20	-29	0.015		
	-10	-39	0.021		
	0	-35	0.019		
	10	-34	0.018		
	20	-33	0.018		
	30	-24	0.013		
	40	-31	0.016		
	50	-33	0.018		
4.35	25	-32	0.017	2.5	Pass
End point 3.60	25	-28	0.015		

4. EUT TEST PHOTO

Radiated Emission

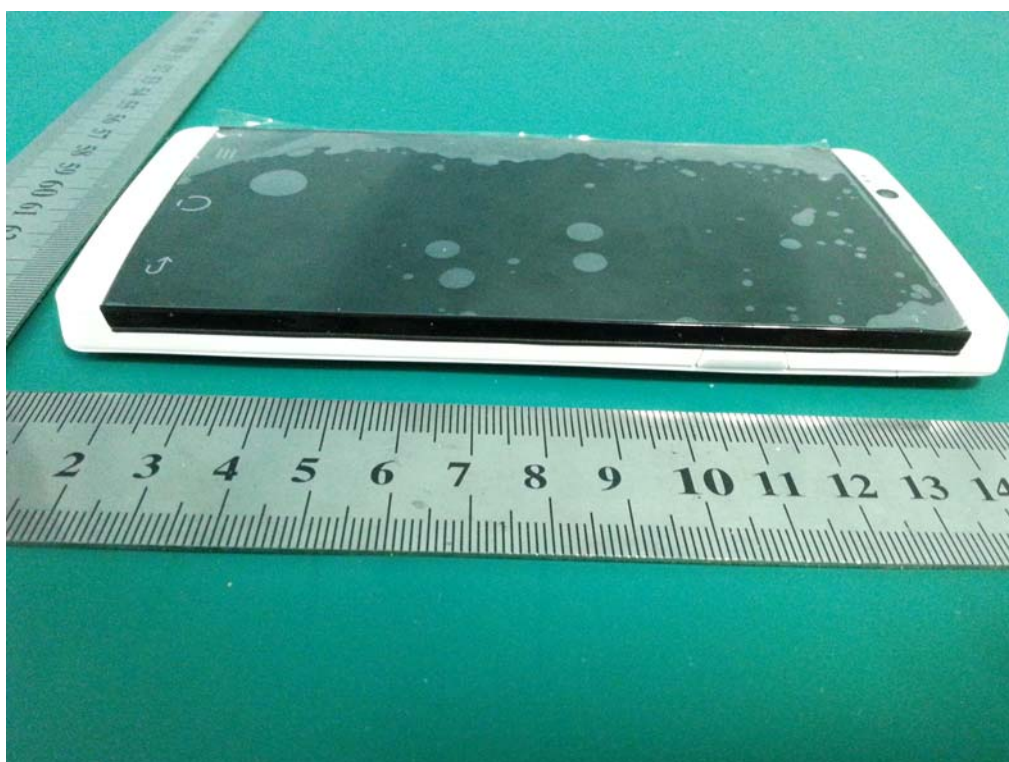


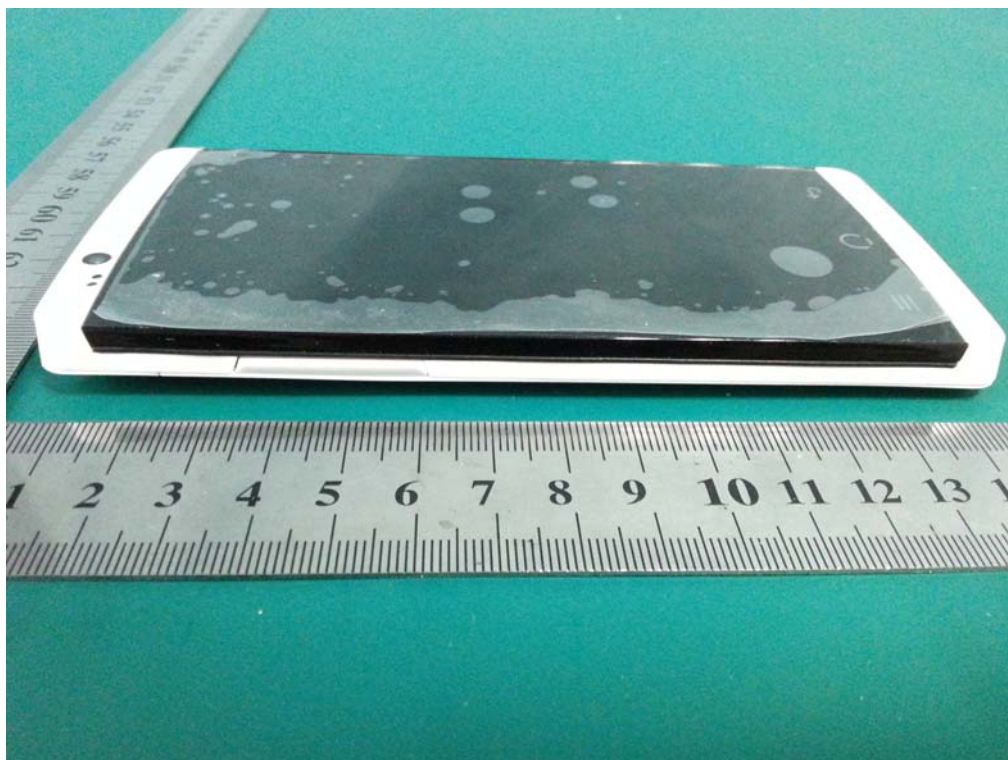
5. HOTOGRAPHS OF EUT CONSTRUCTIONAL

External Photos of EUT



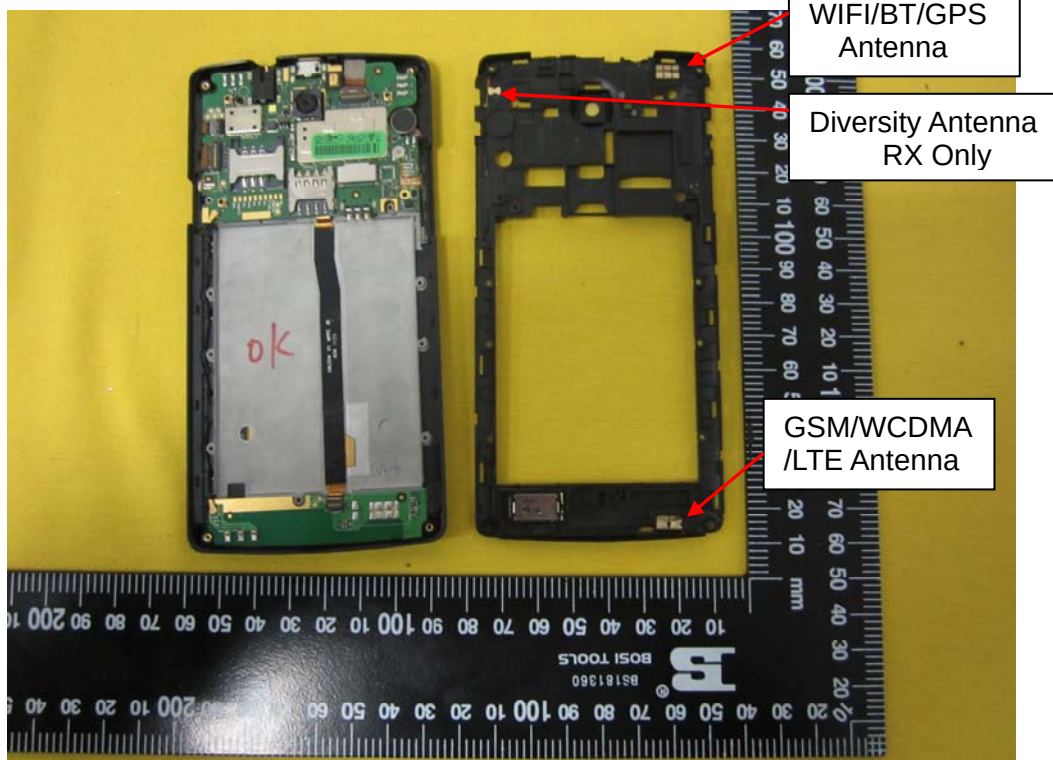


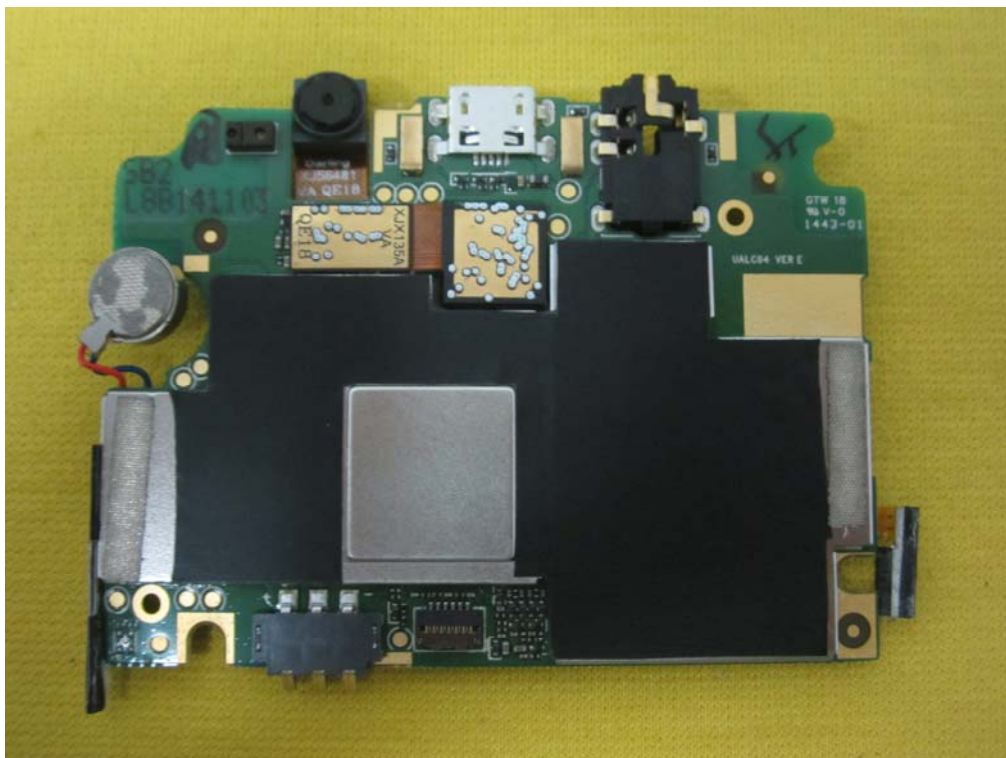
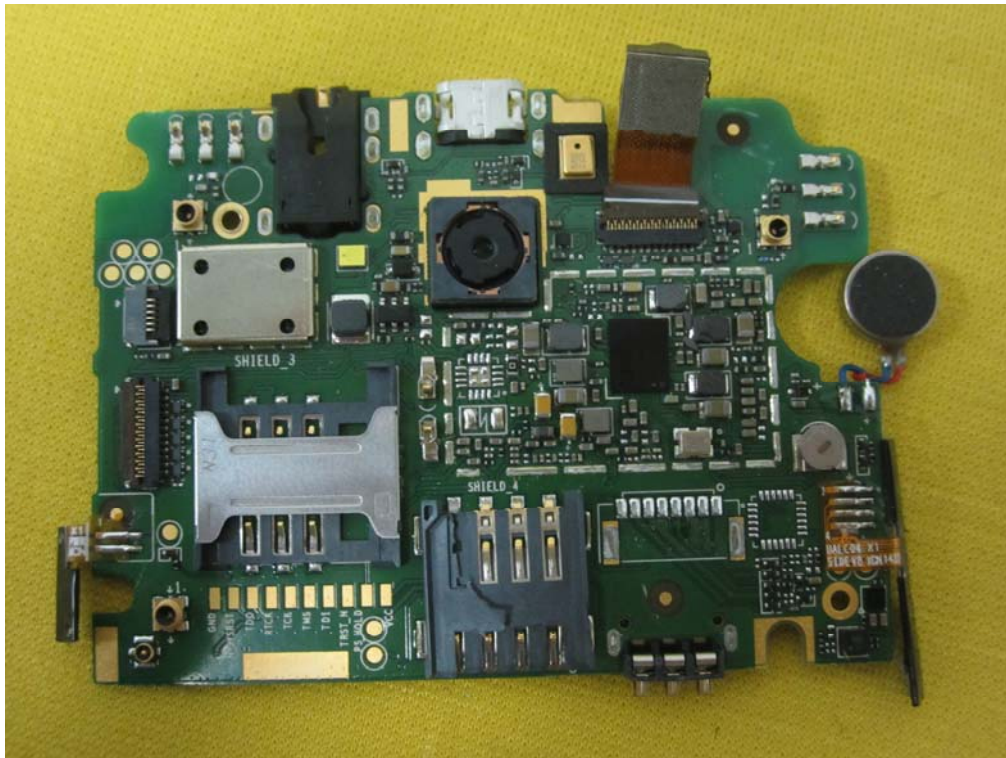


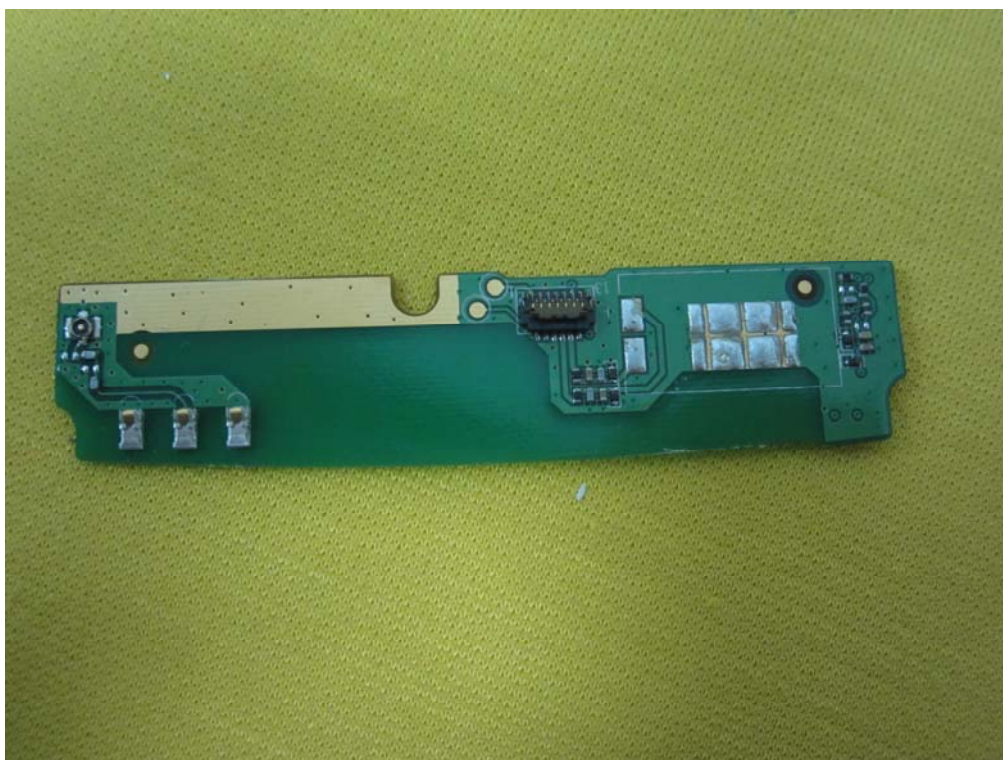


Internal Photos of EUT











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