FCC TEST REPORT

for

Shenzhen Sungworld Electronics Co., LTD.

Mobile Phone

Model Number: F39A1

Serial Number: Worryfree Gadgets W1

FCC ID:WI3-F39A1

Prepared for : Shenzhen Sungworld Electronics Co., LTD.

Address : 4#, North District, Shangxue Industrial Park Bantian, Long Gang District, Shenzhen, China

Prepared by : Keyway Testing Technology Co., Ltd.

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Report No. : 16KWE063928F

Date of Test : Jun. 8~Jun. 22, 2016

Date of Report : Jun. 23, 2016

Keyway Testing Technology Co., Ltd.

Applicant: **Address:**	Shenzhen Sungworld Electronics Co., LTD. 4#, North District, Shangxue Industrial Park Bantian,Long Gang District, Shenzhen, China		
Manufacturer: **Address:**	Shenzhen Sungworld Electronics Co., LTD. 4#, North District, Shangxue Industrial Park Bantian,Long Gang District, Shenzhen, China		
E.U.T:	Mobile Phone		
Model Number:	F39A1		
Serial Model:	Worryfree Gadgets W1		
Trade Name:	N/A	**Serial No.:**	------
Date of Receipt:	Jun. 6, 2016	**Date of Test:**	Jun. 8~Jun. 22, 2016
Test Specification:	FCC Part 22H and 24E: 01 Oct. 2015 TIA/EIA 603D		
Test Result:	The equipment under test was found to be compliance with the requirements of the standards applied.		

Issue Date: Jun. 23, 2016

Tested by:	Reviewed by:	Approved by:
Keven Wu / Engineer	Mike Xu / Supervisor	Andy Gao / Supervisor

Other Aspects:

None.

Abbreviations: OK/P=passed fail/F=failed n.a/N=not applicable E.U.T=equipment under tested

This test report is based on a single evaluation of one sample of above mentioned products. It is not permitted to be duplicated in extracts without written approval of Keyway Testing Technology Co., Ltd.

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1. GENERAL INFORMATION

1.1 PRODUCT DESCRIPTION

A major technical description of EUT is described as following:

Product Designation:	Mobile Phone
Model No.:	F39A1
Serial Model:	Worryfree Gadgets W1
Model Difference	All the models are the same circuit and RF module, except the model names.
Frequency Bands:	☒GSM 850 ☒PCS 1900 (U.S. Bands) ☐GSM 900 ☐DCS 1800 (Non-U.S. Bands)
Antenna:	PIFA Antenna
Antenna gain:	1.0 dBi
Power Supply:	DC 3.7V by battery
Battery parameter:	DC 3.7V,1200mAh
Adapter Input:	100-240V~,50/60 Hz
Adapter Output:	5.0V⎓,700mA
GPRS Class	Multi-Class12 Only 4 timeslots are used for GPRS
SIM CARD	The Phone Two SIM Card sockets
Extreme Vol. Limits:	DC3.5V to 4.2 V (Nominal DC3.7 V)
Extreme Temp. Tolerance	-10℃ to +50℃
HW Version	N/A
SW Version	N/A
** Note: The High Voltage 4.2V and Low Voltage 3.5V was declared by manufacturer, The EUT couldn't be operate normally with higher or lower voltage.	

1.2 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: WI3-F39A1** filing to comply with the FCC Part 22H&24E .

1.3 TEST METHODOLOGY

The radiated emission testing was performed according to the procedures of TIA/EIA 603D and FCC CFR 47 Rules of 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057.

1.4 TEST FACILITY

The test site used to collect the radiated data is located at:
Keyway Testing Technology Co., Ltd.
Building 1, Baishun Industrial Zone, Zhangmutou Town, Dongguan, Guangdong, China
FCC Registration No.: 370994
IC Registration No.: 9868A
CNAS Registration No.:L5783

1.5 MEASUREMENT INSTRUMENTS

NAME OF EQUIPMENT	MANUFACTURER	MODEL	SERIAL NUMBER	NEXT CAL. DATE
SPECTRUM ANALYZER	AGILENT	E4440A	US44300399	2016.7.06
TEST RECEIVER	R&S	ESCI	A0304218	2016.7.06
COMMUNICATION TESTER	R&S	CMU200	A0304247	2016.7.06
TEST RECEIVER	R&S	FCKL1528	A0304230	2016.7.06
LISN	SCHWARZBECK	NSLK8127	A0304233	2016.7.06
CLIMATE CHAMBER	ALBATROSS	--	--	2016.7.06
Bilog Antenna	A.H. Systems Inc.	SAS-521-4	VULB9168-438	2016.7.06
Bilog Antenna	A.H. Systems Inc.	SAS-521-4	VULB9168-439	2016.7.06
Horn Antenna	EM	EM-AH-10180	A052604	2016.7.06
Horn Antenna	EM	EM-AH-10180	A052605	2016.7.06
Vector signal generator	Agilent	E8257D-521	MY45141029	2016.10.14

1.6 SPECIAL ACCESSORIES

The battery and the charger supplied by the applicant were used as accessories and being tested with EUT intended for FCC grant together.

1.7 EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

2. SYSTEM TEST CONFIGURATION

2.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commission's requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT EXERCISE

The Transmitter was operated in the maximum output power mode through Communication Tester. The TX frequency was fixed which was for the purpose of the measurements.

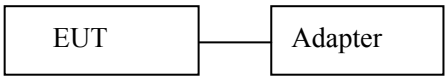
2.3 GENERAL TECHNICAL REQUIREMENTS

Item Number	Item Description		FCC Rules
1	Output Power	Conducted output power	22.913(a) / 24.232 (b)
		Radiated output power	
2	Spurious Emission	Conducted spurious emission	2.1051 / 22.917 / 24.238
		Radiated spurious emission	
3	Frequency Stability		2.1055 /24.235
4	Occupied Bandwidth		2.1049 (h)(i)
5	Emission Bandwidth		22.917(b) / 24.238 (b)
6	Band Edge		22.917(b) / 24.238 (b)
7	Peak-to-Average Ratio		24.232(d)
8	Conducted Emission		2.1051/22.917(a)/24.238(a)

2.4 CONFIGURATION OF EUT SYSTEM

Fig. 2-1 Configuration of EUT System

For AC Conducted Emission Mode



For Radiated Test

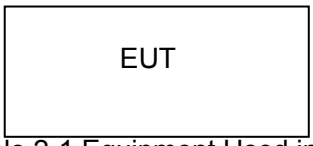


Table 2-1 Equipment Used in EUT System

Item	Equipment	Model No.	ID or Specification	Note
1	Mobile Phone	F39A1	FCC ID: WI3-F39A1	EUT
2	adapter	JJC-011050700	N/A	Peripherals

Note: All the accessories have been used during the test.

The following "EUT" in setup diagram means EUT system.

3. SUMMARY OF TEST RESULTS

Item Number	Item Description		FCC Rules	Result
1	Output Power	Conducted Output Power	22.913(a) / 24.232 (b)	Pass
		Radiated Output Power		
2	Spurious Emission	Conducted Spurious Emission	2.1051 / 22.917 / 24.238	Pass
		Radiated Spurious Emission		
3	Frequency Stability		2.1055 /24.235	Pass
4	Occupied Bandwidth		2.1049 (h)(i)	Pass
5	Emission Bandwidth		22.917(b) / 24.238 (b)	Pass
6	Band Edge		22.917(b) / 24.238 (b)	Pass
7	Peak-to-Average Ratio		24.232(d)	Pass
8	Conducted Emission		2.1051/22.917(a)/24.238(a)	Pass

4. DESCRIPTION OF TEST MODES

During the testing, the EUT was controlled via Rhode & Schwarz Digital Radio Communication Tester (CMU 200) to ensure max power transmission and proper modulation. Three channels (The top channel, the middle channel and the bottom channel) were chosen for testing on both GPRS850 and GPRS1900 frequency band.

Note: GSM/GPRS 850, GSM/GPRS 1900 have been tested during the test. the worst condition (GSM850，GSM1900) be recorded in the test report if no other modes test data.

5. OUTPUT POWER

5.1 Conducted Output Power

5.1.1 MEASUREMENT METHOD

The EUT was setup for the max output power with pseudo random data modulation. Power was measured with Spectrum Analyzer. The measurements were performed on all modes(GSM/GPRS 850, GSM/GPRS 1900) at 3 typical channels(the Top Channel, the Middle Channel and the Bottom Channel) for each band.

5.1.2 MEASUREMENT RESULT

GSM850:

Mode	**Frequency (MHz)**	Maximum Burst-Average Output Power
GSM850	824.2	32.42
	836.6	32.13
	848.8	32.27
GPRS850 (1 Slot)	824.2	32.36
	836.6	32.32
	848.8	32.21
GPRS850 (2 Slot)	824.2	31.76
	836.6	31.63
	848.8	31.59
GPRS850 (3 Slot)	824.2	29.36
	836.6	29.24
	848.8	29.12
GPRS850 (4 Slot)	824.2	28.38
	836.6	28.34
	848.8	28.57

PCS1900:

Mode	**Frequency (MHz)**	Maximum Burst-Average Output Power
GSM1900	1850.2	29.73
	1880	29.65
	1909.8	28.46
GPRS1900 (1 Slot)	1850.2	29.37
	1880	29.45
	1909.8	28.63
GPRS1900 (2 Slot)	1850.2	28.13
	1880	28.55
	1909.8	28.49
GPRS1900 (3 Slot)	1850.2	27.26
	1880	26.45
	1909.8	26.52
GPRS1900 (4 Slot)	1850.2	26.34
	1880	26.47
	1909.8	25.59

5.2 Radiated Output Power

5.2.1 MEASUREMENT METHOD

The measurements procedures specified in TIA-603-D-2010 were applied.

1 In an anechoic antenna test chamber, a half-wave dipole antenna for the frequency band of interest is placed at the reference centre of the chamber. An RF Signal source for the frequency band of interest is connected to the dipole with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A known (measured) power (Pin) is applied to the input of the dipole, and the power received (Pr) at the chamber's probe antenna is recorded.

2 The substitution method is used. Substitution values at each frequency are measured before and saved to the test software. A "reference path loss" is established as ARpl=Pin + 2.15 - Pr. The ARpl is the attenuation of “reference path loss”, and including the gain of receive antenna, the cable loss and the air loss. The measurement results are obtained as described below: Power=PMea+ARpl

3 The EUT is substituted for the dipole at the reference centre of the chamber and a scan is performed to obtain the radiation pattern.

4 From the radiation pattern, the co-ordinates where the maximum antenna gain occurs are identified.

5 The EUT is then put into continuously transmitting mode at its maximum power level.

6 Power mode measurements are performed with the receiving antenna placed at the coordinates determined in Step 3 to determine the output power as defined in Rule 24.232 (b) and (c). The "reference path loss" from Step1 is added to this result.

7 This value is EIRP since the measurement is calibrated using a half-wave dipole antenna of known gain (2.15 dBi) and known input power (Pin).

8 ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP -2.15dBi..

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

5.2.2 PROVISIONS APPLICABLE

This is the test for the maximum radiated power from the EUT. Rule Part 24.232(b) specifies, “Mobile/portable stations are limited to 2 watts e.i.r.p. Peak power” and 24.232(c) specifies that "Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage.” Rule Part 22.913(a) specifies “Maximum ERP. The effective radiated power (ERP) of base transmitters and cellular repeaters must not exceed 500 Watts. The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.”

Mode	Nominal Peak Power
GSM 850	<=38.45 dBm (7W)
PCS 1900	<=33 dBm (2W)

5.2.3 MEASUREMENT RESULT

Radiated Power (E.I.R.P) for GSM 850 MHZ							
Mode	**Frequency**	**Substituted Level (dBm)**	**Antenna Polarization**	**Antenna Gain (dBi)**	**Cable loss (dB)**	**Absolute Level (dBm)**	**Conclusion**
GSM 850	824.2	24.57	Horizontal	6.4	0.52	30.45	Pass
	824.2	24.46	Vertical	6.4	0.52	30.34	Pass
	836.6	24.35	Horizontal	6.4	0.52	30.23	Pass
	836.6	24.17	Vertical	6.4	0.52	30.05	Pass
	848.8	24.03	Horizontal	6.5	0.52	30.01	Pass
	848.8	24.13	Vertical	6.5	0.52	30.11	Pass

Radiated Power (E.I.R.P) for GPRS 850 MHZ							
Mode	**Frequency**	**Substituted Level (dBm)**	**Antenna Polarization**	**Antenna Gain (dBi)**	**Cable loss (dB)**	**Absolute Level (dBm)**	**Conclusion**
GPRS 850	824.2	24.04	Horizontal	6.4	0.52	29.92	Pass
	824.2	24.24	Vertical	6.4	0.52	30.12	Pass
	836.6	23.81	Horizontal	6.4	0.52	29.69	Pass
	836.6	24.23	Vertical	6.4	0.52	30.11	Pass
	848.8	23.85	Horizontal	6.5	0.52	29.83	Pass
	848.8	23.96	Vertical	6.5	0.52	29.94	Pass

Radiated Power (E.I.R.P) for PCS 1900 MHZ							
Mode	**Frequency**	**Substituted Level (dBm)**	**Antenna Polarization**	**Antenna Gain (dBi)**	**Cable loss (dB)**	**Absolute Level (dBm)**	**Conclusion**
PCS 1900	1850.2	22.42	Horizontal	8.13	0.96	29.59	Pass
	1850.2	21.75	Vertical	8.13	0.96	28.92	Pass
	1880.0	22.26	Horizontal	8.14	0.96	29.44	Pass
	1880.0	21.71	Vertical	8.14	0.96	28.89	Pass
	1909.8	21.84	Horizontal	8.14	0.96	29.02	Pass
	1909.8	21.53	Vertical	8.14	0.96	28.71	Pass

Radiated Power (E.I.R.P) for GPRS 1900 MHZ							
Mode	**Frequency**	**Substituted Level (dBm)**	**Antenna Polarization**	**Antenna Gain (dBi)**	**Cable loss (dB)**	**Absolute Level (dBm)**	**Conclusion**
GPRS 1900	1850.2	21.29	Horizontal	8.13	0.96	28.46	Pass
	1850.2	21.53	Vertical	8.13	0.96	28.70	Pass
	1880.0	20.71	Horizontal	8.14	0.96	27.89	Pass
	1880.0	20.76	Vertical	8.14	0.96	27.94	Pass
	1909.8	21.49	Horizontal	8.14	0.96	28.67	Pass
	1909.8	20.77	Vertical	8.14	0.96	27.95	Pass

6. SPURIOUS EMISSION

6.1 CONDUCTED SPURIOUS EMISSION

6.1.1 MEASUREMENT METHOD

The following steps outline the procedure used to measure the conducted emissions from the EUT.
1, Determine frequency range for measurements: From CFR 2.1057 the spectrum should be investigated from the lowest radio frequency generated in the equipment up to at least the 10th harmonic of the carrier frequency. For the equipment of PCS1900 band, this equates to a frequency range of 30 MHz to 19.1 GHz, data taken from 30 MHz to 20 GHz. For GSM850, data taken from 30 MHz to 9 GHz.
2, Determine EUT transmit frequencies: the following typical channels were chosen to conducted emissions testing.

Typical Channels for testing of GSM 850 MHz	
Channel	Frequency (MHz)
128	824.2
190	836.6
251	848.8

Typical Channels for testing of PCS 1900 MHz	
Channel	Frequency (MHz)
512	1850.2
661	1880.0
810	1909.8

6.1.2 PROVISIONS APPLICABLE

On any frequency outside frequency band of the USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least 43+10Log(P) dB. For all power levels +30 dBm to 0 dBm, this becomes a constant specification limit of -13 dBm.

6.1.3 MEASUREMENT RESULT

PLEASE REFER TO : APPENDIX I TEST PLOTS FOR CONDUCTED SPURIOUS EMISSION

Note: 1. Below 30MHZ no Spurious found and The GSM modes is the worst condition.
2. As no emission found in standby or receive mode, no recording in this report.

6.2 Radiated Spurious Emission

6.2.1 MEASUREMENT METHOD

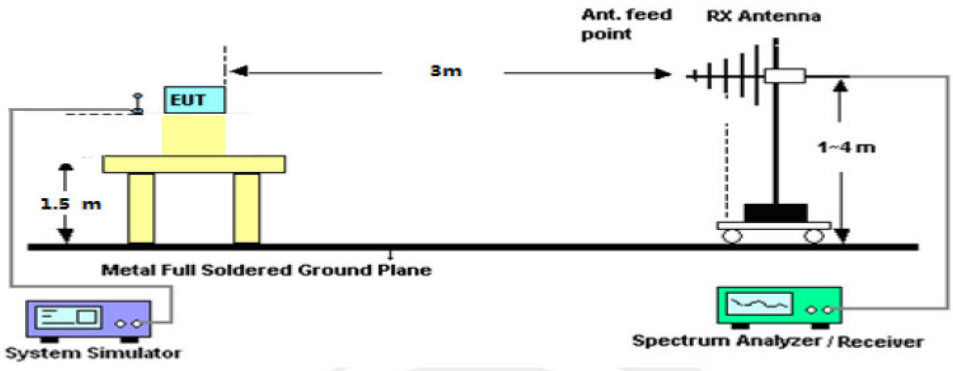
Radiated spurious emissions measurements are performed using the substitution method described inANSI/TIA-603-D-2010 with the EUT transmitting into an integral antenna. Measurements on sig-nalsoperating below 1GHz are performed using horizontally and vertically polarized tuned dipole antennas.Measurements on signals operating above 1GHz are performed using vertically and ho-rizontally polarizedhorn antennas. All measurements are performed as peak measurements while the EUT isoperating at maximum power and at the appropriate frequencies. It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10th harmonic.

The procedure of radiated spurious emissions is as follows:

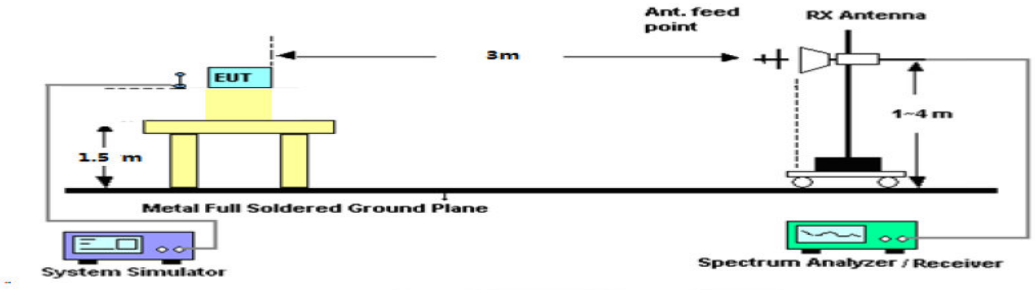
1. The testing follows FCC KDB 971168 D01 Section 5.8 and ANSI/TIA-603-D-2010 – Section 2.2.12
2. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
3. VBW ≥ 3 x RBW
4. Span = 1.5 times the OBW
5. No. of sweep points > 2 x span/RBW
6. Detector = Peak
7. Trace mode = max hold
8. The trace was allowed to stabilize

TEST SETUP

For radiated test from 30MHz to 1GHz



For radiated test from above 1GHz



Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of the PCS 1900 band (1850.2 MHz, 1880 MHz and 1909.8 MHz) ,GSM850 band (824.2MHz, 836.6MHz, 848.8MHz), . It was decided that measurements at these three carrier frequencies would be sufficient to demonstrate compliance with emissions limits because it was seen that all the significant spurs occur well outside the band and no radiation was seen from a carrier in one block of any band into any of the other blocks.

The substitution method is used. Substitution values at each frequency are measured before and saved to the test software. A "reference path loss" is established and the A_{Rpl} is the attenuation of “reference path loss”, and including the gain of receive antenna, the gain of the preamplifier, the cable loss and the air loss. The measurement results are obtained as described below: Power+ Antenna Gain(dBi)- Cable loss(dB) $=P_{Meal}$

6.2.2 PROVISIONS APPLICABLE

(a) On any frequency outside a licensee’s frequency block (e.g. A, D, B, etc.) within the USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least 43+10Log(P) dB. The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

6.2.3 MEASUREMENT RESULT

GSM 850						
Test Results for Channel 128/824.2 MHz						
Frequency(MHz)	Power(dBm)	Antenna Gain (dBi)	Cable loss(dB)	P_{Mea}(dBm)	Limit （dBm）	Polarity
1648.4	-31.05	8.62	0.62	-23.25	-13.00	Vertical
1648.4	-30.32	8.62	0.62	-22.52	-13.00	Horizontal
2472.6	-31.12	12.0	1.0	-20.12	-13.00	Vertical
2472.6	-30.95	12.0	1.0	-19.95	-13.00	Horizontal
3296.8	-30.86	13.8	1.5	-18.56	-13.00	Horizontal
3296.8	-30.34	13.8	1.5	-18.04	-13.00	Vertical
Test Results for Channel 190/836.6 MHz						
1673.2	-31.43	8.7	0.7	-23.43	-13.00	Vertical
1673.2	-30.76	8.7	0.7	-22.76	-13.00	Horizontal
2509.8	-32.63	12.2	1.0	-21.43	-13.00	Vertical
2509.8	-32.73	12.2	1.0	-21.53	-13.00	Horizontal
3346.4	-32.93	14.2	1.5	-20.33	-13.00	Horizontal
3346.4	-32.92	14.2	1.5	-20.32	-13.00	Vertical
Test Results for Channel 251/848.8 MHz						
1697.6	-30.12	8.78	0.68	-22.33	-13.00	Vertical
1697.6	-30.42	8.78	0.68	-22.12	-13.00	Horizontal
2546.4	-32.54	12.69	1.0	-20.66	-13.00	Vertical
2546.4	-33.65	12.69	1.0	-21.43	-13.00	Horizontal
3395.2	-33.23	14.52	1.6	-20.49	-13.00	Horizontal
3395.2	-32.64	14.52	1.6	-19.42	-13.00	Vertical

NOTE:

1.All other emissions more than 30dB below the limit.

2.ALL mode were investingated.The results above show only the worst case.

GPRS 850						
Test Results for Channel 128/824.2 MHz						
Frequency(MHz)	Power(dBm)	Antenna Gain (dBi)	Cable loss(dB)	P_{Mea}(dBm)	Limit （dBm）	Polarity
1648.4	-31.05	8.62	0.62	-23.25	-13.00	Vertical
1648.4	-30.02	8.62	0.62	-22.22	-13.00	Horizontal
2472.6	-31.07	12.0	1.0	-20.07	-13.00	Vertical
2472.6	-30.76	12.0	1.0	-19.76	-13.00	Horizontal
3296.8	-30.54	13.8	1.5	-18.24	-13.00	Horizontal
3296.8	-30.21	13.8	1.5	-17.91	-13.00	Vertical
Test Results for Channel 190/836.6 MHz						
1673.2	-31.35	8.7	0.7	-23.35	-13.00	Vertical
1673.2	-30.62	8.7	0.7	-22.62	-13.00	Horizontal
2509.8	-32.58	12.2	1.0	-21.38	-13.00	Vertical
2509.8	-32.62	12.2	1.0	-21.42	-13.00	Horizontal
3346.4	-32.72	14.2	1.5	-20.12	-13.00	Horizontal
3346.4	-32.64	14.2	1.5	-20.04	-13.00	Vertical
Test Results for Channel 251/848.8 MHz						
1697.6	-30.72	8.78	0.68	-22.62	-13.00	Vertical
1697.6	-30.24	8.78	0.68	-22.14	-13.00	Horizontal
2546.4	-32.43	12.69	1.0	-20.74	-13.00	Vertical
2546.4	-33.61	12.69	1.0	-21.92	-13.00	Horizontal
3395.2	-33.62	14.52	1.6	-20.70	-13.00	Horizontal
3395.2	-32.54	14.52	1.6	-19.62	-13.00	Vertical

PCS1900						
Test Results for Channel 512/1850.2MHz						
Frequency(MHz)	Power(dBm)	Antenna Gain (dBi)	Cable loss(dB)	P_{Mea}(dBm)	Limit （dBm）	Polarity
3700.4	-33.76	15.45	2.03	-20.34	-13.00	Horizontal
3700.4	-34.72	15.45	2.03	-21.3	-13.00	Vertical
5550.6	-33.12	19.63	2.51	-16	-13.00	Vertical
5550.6	-32.34	19.63	2.51	-15.22	-13.00	Horizontal
7400.8	-35.14	22.88	3.62	-15.88	-13.00	Horizontal
7400.8	-35.64	22.88	3.62	-16.38	-13.00	Vertical
Test Results for Channel 661/1880.0MHz						
3760	-36.12	15.83	2.07	-22.36	-13.00	Horizontal
3760	-34.74	15.83	2.07	-20.98	-13.00	Vertical
5640	-35.32	20.32	2.76	-17.76	-13.00	Vertical
5640	-39.11	20.32	2.76	-21.55	-13.00	Horizontal
7520	-38.9	23.48	3.88	-19.3	-13.00	Horizontal
7520	-39.12	23.48	3.88	-19.52	-13.00	Vertical
Test Results for Channel 810/1909.8MHz						
3819.6	-35.11	16.14	2.27	-21.24	-13.00	Horizontal
3819.6	-31.45	16.14	2.27	-17.58	-13.00	Vertical
5729.4	-36.12	20.43	2.77	-18.46	-13.00	Vertical
5729.4	-34.53	20.43	2.77	-16.87	-13.00	Horizontal
7639.2	-40.24	23.78	4.03	-20.49	-13.00	Horizontal
7639.2	-39.15	23.78	4.03	-19.4	-13.00	Vertical

NOTE:

1.All other emissions more than 30dB below the limit.

2.ALL mode were investingated.The results above show only the worst case.

GPRS1900						
Test Results for Channel 512/1850.2MHz						
Frequency(MHz)	Power(dBm)	Antenna Gain (dBi)	Cable loss(dB)	P_{Mea}(dBm)	Limit （dBm）	Polarity
3700.4	-33.71	15.45	2.03	-20.29	-13.00	Horizontal
3700.4	-34.34	15.45	2.03	-20.92	-13.00	Vertical
5550.6	-33.22	19.63	2.51	-16.1	-13.00	Vertical
5550.6	-32.12	19.63	2.51	-15	-13.00	Horizontal
7400.8	-35.24	22.88	3.62	-15.98	-13.00	Horizontal
7400.8	-35.62	22.88	3.62	-16.36	-13.00	Vertical
Test Results for Channel 661/1880.0MHz						
3760	-36.54	15.83	2.07	-22.78	-13.00	Horizontal
3760	-34.72	15.83	2.07	-20.96	-13.00	Vertical
5640	-35.43	20.32	2.76	-17.87	-13.00	Vertical
5640	-39.14	20.32	2.76	-21.58	-13.00	Horizontal
7520	-38.92	23.48	3.88	-19.32	-13.00	Horizontal
7520	-39.11	23.48	3.88	-19.51	-13.00	Vertical
Test Results for Channel 810/1909.8MHz						
3819.6	-35.23	16.14	2.27	-21.36	-13.00	Horizontal
3819.6	-31.34	16.14	2.27	-17.47	-13.00	Vertical
5729.4	-36.25	20.43	2.77	-18.59	-13.00	Vertical
5729.4	-34.43	20.43	2.77	-16.77	-13.00	Horizontal
7639.2	-40.56	23.78	4.03	-20.81	-13.00	Horizontal
7639.2	-39.14	23.78	4.03	-19.39	-13.00	Vertical

NOTE:

1.All other emissions more than 30dB below the limit.

2.ALL mode were investingated.The results above show only the worst case.

7. FREQUENCY STABILITY

7.1 MEASUREMENT METHOD

In order to measure the carrier frequency under the condition of AFC lock, it is necessary to make measurements with the EUT in a “call mode”. This is accomplished with the use of R&S CMU200 DIGITAL RADIO COMMUNICATION TESTER.

1 , Measure the carrier frequency at room temperature.

2 , Subject the EUT to overnight soak at -10℃.

3 , With the EUT, powered via nominal voltage, connected to the CMU200 and in a simulated call on channel 661 for PCS 1900 band , channel 190 for GSM 850 band, channel 9400 for UMTS band II and channel 4175 for UMTS band V measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.

4 , Repeat the above measurements at 10℃ increments from -10℃ to +50℃. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.

5 , Re-measure carrier frequency at room temperature with nominal voltage. Vary supply voltage from minimum voltage to maximum voltage, in 0.1Volt increments re-measuring carrier frequency at each voltage. Pause at nominal voltage for 1 1/2 hours unpowered, to allow any self-heating to stabilize, before continuing.

6 , Subject the EUT to overnight soak at +50℃.

7 , With the EUT, powered via nominal voltage, connected to the CMU200 and in a simulated call on the centre channel, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.

8 , Repeat the above measurements at 10℃ increments from +50℃ to -10℃. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.

9 , At all temperature levels hold the temperature to +/- 0.5℃ during the measurement procedure.

7.2 PROVISIONS APPLICABLE

7.2.1 For Hand carried battery powered equipment

According to the JTC standard the frequency stability of the carrier shall be accurate to within 0.1 ppm of the received frequency from the base station. This accuracy is sufficient to meet Sec. 24.235, Frequency Stability. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. As this transceiver is considered "Hand carried, battery powered equipment" Section 2.1055(d)(2) applies. This requires that the lower voltage for frequency stability testing be specified by the manufacturer. This transceiver is specified to operate with an input voltage of between 3.5VDC and 4.2VDC, with a nominal voltage of 3.7VDC. Operation above or below these voltage limits is prohibited by transceiver software in order to prevent improper operation as well as to protect components from overstress. These voltages represent a tolerance of -10 % and +12.5 %. For the purposes of measuring frequency stability these voltage limits are to be used.

7.2.2 For equipment powered by primary supply voltage

According to the JTC standard the frequency stability of the carrier shall be accurate to within 0.1 ppm of the received frequency from the base station. This accuracy is sufficient to meet Sec. 24.235, Frequency Stability. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. For this EUT section 2.1055(d)(1) applies. This requires varying primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment, the normal environment temperature is 20°C.

7.3 MEASUREMENT RESULT

Frequency Error Against Voltage for GSM 850 band		
Voltage (V)	**Frequency Error (Hz)**	**Frequency Error (ppm)**
3.5	17	0.020
3.7	26	0.031
4.2	12	0.014

Frequency Error Against Temperature for GSM 850 band		
Temperature (℃)	**Frequency Error (Hz)**	**Frequency Error (ppm)**
-10	34	0.041
0	22	0.026
10	17	0.020
20	12	0.014
30	25	0.030
40	13	0.016
50	34	0.041

Note: The EUT doesn't work below -10℃

Frequency Error Against Voltage for GPRS 850 band		
Voltage (V)	**Frequency Error (Hz)**	**Frequency Error (ppm)**
3.5	17	0.020
3.7	15	0.018
4.2	12	0.014

Frequency Error Against Temperature for GPRS 850 band		
Temperature (℃)	**Frequency Error (Hz)**	**Frequency Error (ppm)**
-10	30	0.036
0	28	0.033
10	26	0.031
20	22	0.026
30	25	0.030
40	20	0.024
50	27	0.032

Note: The EUT doesn't work below -10℃

Frequency Error Against Voltage for PCS 1900 band		
Voltage (V)	**Frequency Error (Hz)**	**Frequency Error (ppm)**
3.5	22	0.012
3.7	33	0.018
4.2	21	0.011

Frequency Error Against Temperature for PCS 1900 band		
Temperature (℃)	**Frequency Error (Hz)**	**Frequency Error (ppm)**
-10	26	0.014
0	24	0.013
10	31	0.016
20	35	0.019
30	22	0.012
40	19	0.010
50	16	0.009

Note: The EUT doesn't work below -10℃

Frequency Error Against Voltage for GPRS 1900 band		
Voltage (V)	**Frequency Error (Hz)**	**Frequency Error (ppm)**
3.5	21	0.011
3.7	23	0.012
4.2	24	0.013

Frequency Error Against Temperature for GPRS 1900 band		
Temperature (℃)	**Frequency Error (Hz)**	**Frequency Error (ppm)**
-10	22	0.012
0	24	0.013
10	32	0.017
20	30	0.016
30	28	0.015
40	37	0.020
50	27	0.014

Note: The EUT doesn't work below -10℃

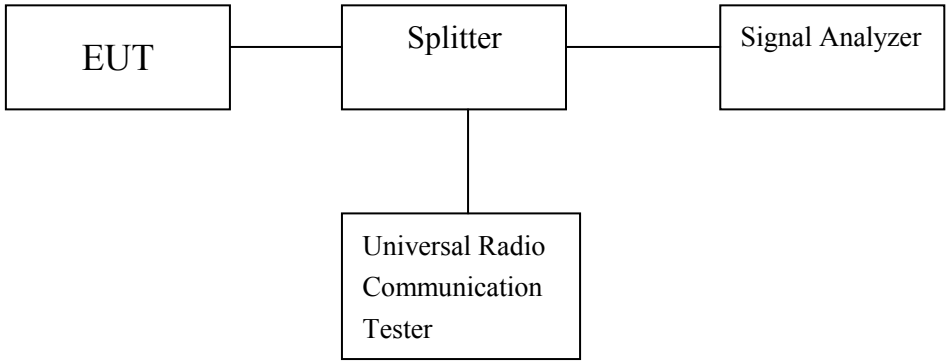
8. BANDWIDTH

8.1APPLICABLE STANDARD

FCC §2.1049, §22.917, §22.905 and §24.238.

8.2 Test Procedure

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The 99% and 26 dB occupied bandwidth (BW) of the middle channel for the highest RF powers.
3. Details according with KDB 971168 section 4.1 & 4.2.



Test Equipment List and Details

Refer a test equipment and calibration data table in this test report.

8.3 MEASUREMENT RESULT

Occupied Bandwidth (99%) for GSM 850 band		
Mode	Frequency(MHz)	Occupied Bandwidth (99%)(kHz)
Low Channel	824.2	246.469
Middle Channel	836.6	246.706
High Channel	848.8	245.079

Occupied Bandwidth (99%) for PCS 1900 band		
Mode	Frequency(MHz)	Occupied Bandwidth (99%)(kHz)
Low Channel	1850.2	244.035
Middle Channel	1880.0	246.709
High Channel	1909.8	247.116

Occupied Bandwidth (99%) for GPRS 850 band		
Mode	Frequency(MHz)	Occupied Bandwidth (99%)(kHz)
Low Channel	824.2	243.348
Middle Channel	836.6	247.328
High Channel	848.8	245.627

Occupied Bandwidth (99%) for GPRS 1900 band		
Mode	Frequency(MHz)	Occupied Bandwidth (99%)(kHz)
Low Channel	1850.2	243.145
Middle Channel	1880.0	245.666
High Channel	1909.8	249.594

Emission Bandwidth (-26dBc) for GSM 850 band		
Mode	Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)
Low Channel	824.2	320.175
Middle Channel	836.6	321.733
High Channel	848.8	321.562

Emission Bandwidth (-26dBc) for PCS 1900 band		
Mode	Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)
Low Channel	1850.2	315.032
Middle Channel	1880.0	314.429
High Channel	1909.8	316.952

Emission Bandwidth (-26dBc) for GPRS 850 band		
Mode	Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)
Low Channel	824.2	315.966
Middle Channel	836.6	321.172
High Channel	848.8	319.977

Emission Bandwidth (-26dBc) for GPRS 1900 band		
Mode	Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)
Low Channel	1850.2	317.677
Middle Channel	1880.0	320.312
High Channel	1909.8	321.452

All the modulation modes and Channels have been tested, the data of the worst mode (GSM) are recorded in the report.

9. BAND EDGE

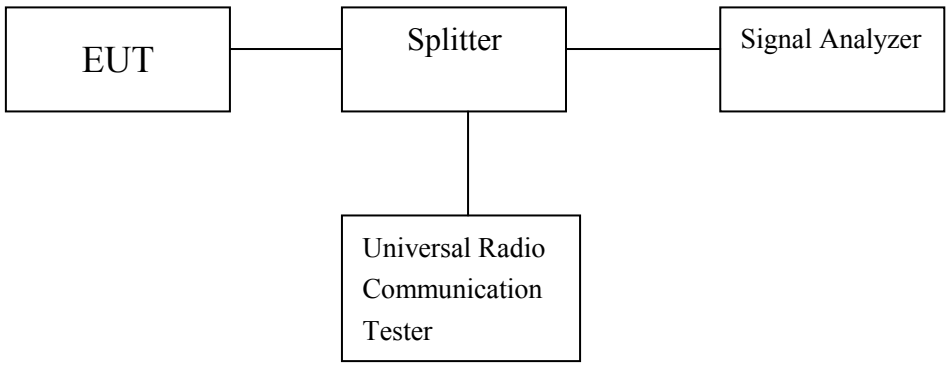
9.1 Applicable Standard

According to § 22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

. According to §24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

9.2 Test Procedure

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The Band Edges of low and high channels for the highest RF powers were measured. Setting RBW as roughly BW/100.
3. Details according with KDB 971168 section 6.0.



Test Equipment List and Details

Refer a test equipment and calibration data table in this test report.

9.3 MEASUREMENT RESULT

Please refers to Appendix III for compliance test plots for band edges, All the modulation modes and Channels have been tested, the data of the worst mode (GSM) are recorded in the report.

10. Peak-to-Average Ratio

DESCRIPTION OF THE PAR MEASUREMENT

The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

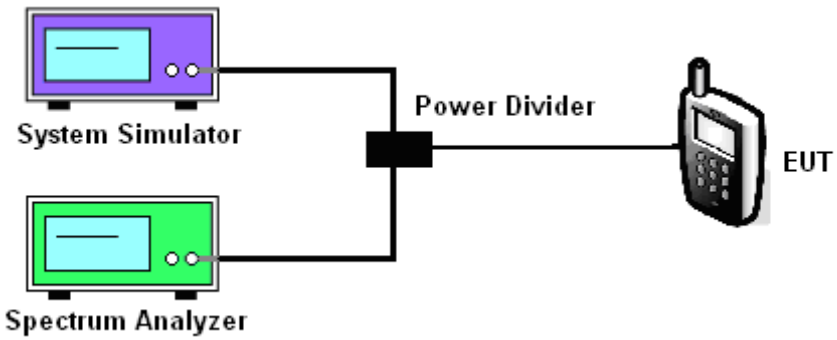
10.1 MEASURING INSTRUMENTS

See list of measuring instruments of this test report.

10.2 TEST PROCEDURES

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. For GSM/EGPRS operating modes:
   a. Set the RBW = 1MHz, VBW = 1MHz, Peak detector in spectrum analyzer.
   b. Set EUT in maximum power output, and triggered the burst signal.
   c. Measured respectively the Peak level and Mean level, and the deviation was recorded as Peak to Average Ratio.
4. For UMTS operating modes:
   a. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
   b. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.

10.3 TEST SETUP



10.4 TEST RESULT OF PEAK-TO-AVERAGE RATIO

Cellular Band						
Modes	**GSM850**			**GSM1900**		
Channel	128 (Low)	190 (Mid)	251 (High)	512 (Low)	661 (Mid)	810 (High)
Frequency(MHz)	824.2	836.6	848.8	1850.2	1880	1909.8
Peak-to-Average Ratio (dB)	0.016	0.024	0.003	0.003	0.001	0.00

Cellular Band						
Modes	**GPRS850**			**GPRS1900**		
Channel	128 (Low)	190 (Mid)	251 (High)	512 (Low)	661 (Mid)	810 (High)
Frequency(MHz)	824.2	836.6	848.8	1850.2	1880	1909.8
Peak-to-Average Ratio (dB)	0.012	0.011	0.006	0.010	0.015	0.002

11. CONDUCTED EMISSIONS TEST

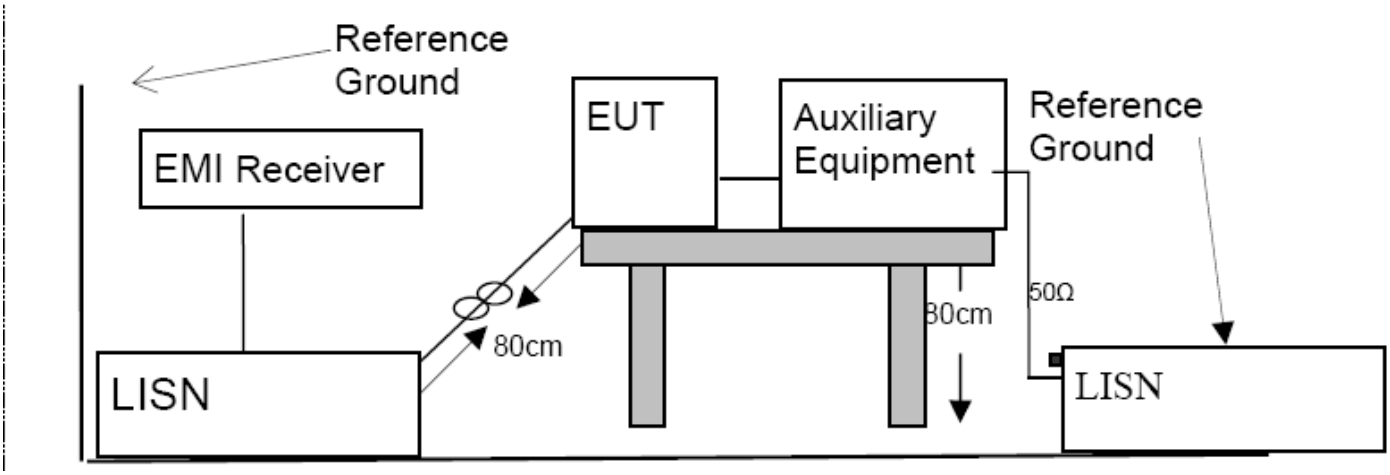
11.1 APPLICABLE STANDARD

According to FCC KDB 971168 D01 v02r02 Section 6.0

11.2 CONFORMANCE LIMIT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

11.3 TEST CONFIGURATION



11.4 TEST PROCEDURE

According to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 Conducted emissions the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode.

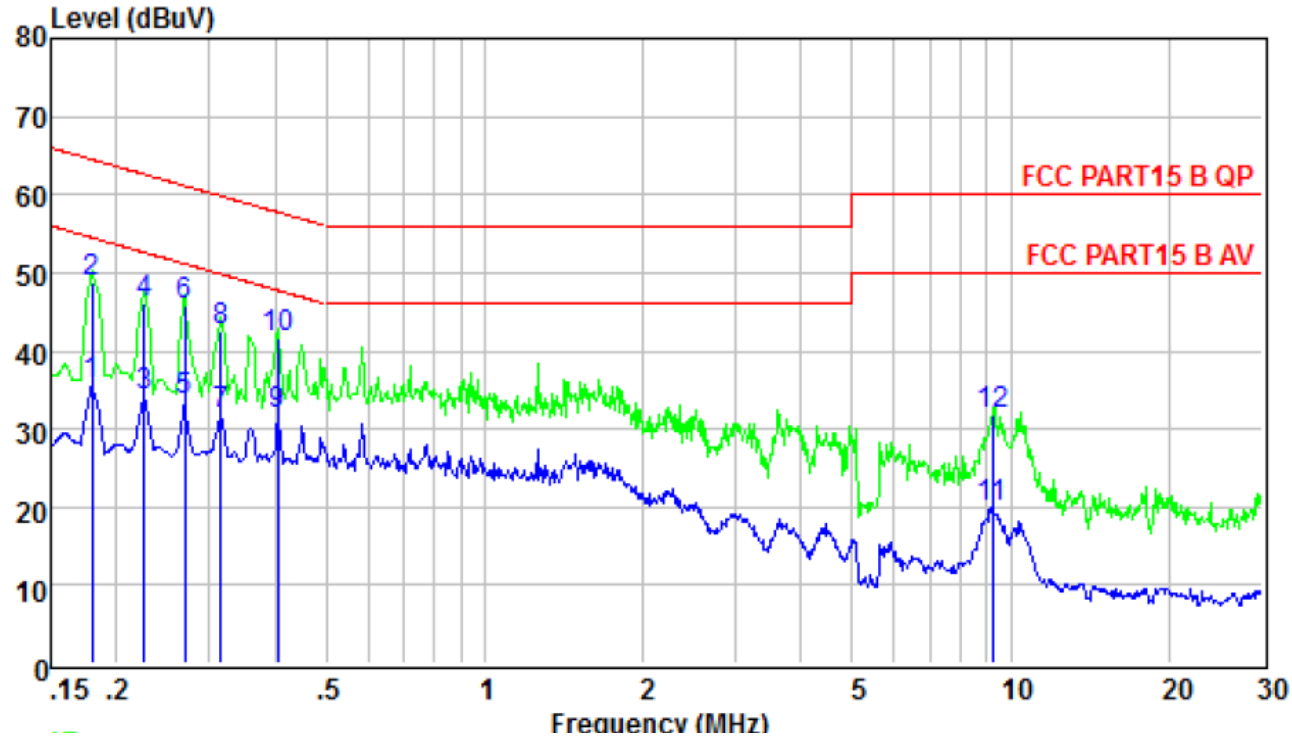
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room.
2. The EUT was placed on a table which is 0.8m above ground plane.
3. Connect EUT to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
4. 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 40cm long.
5. 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.
6. LISN at least 80 cm from nearest part of EUT chassis.
7. The frequency range from 150KHz to 30MHz was searched.

8. Set the test-receiver system to Peak Detect Function and specified bandwidth(IF bandwidth=9KHz) with Maximum Hold Mode

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

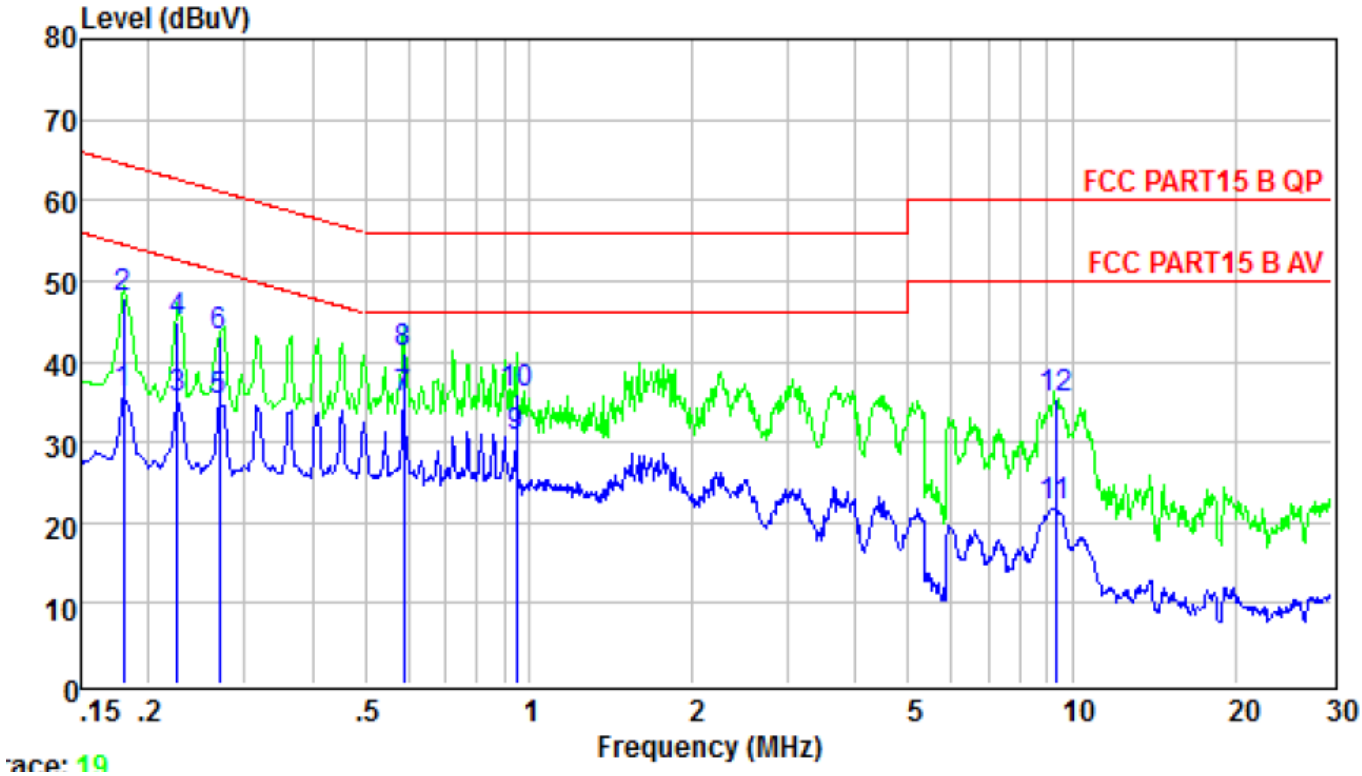
Test Results

EUT：	Mobile Phone	Model Name ：	F39A1
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010hPa	Phase：	L
Test Voltage ：	DC 5.0V form Adapter AC 120V/60Hz		



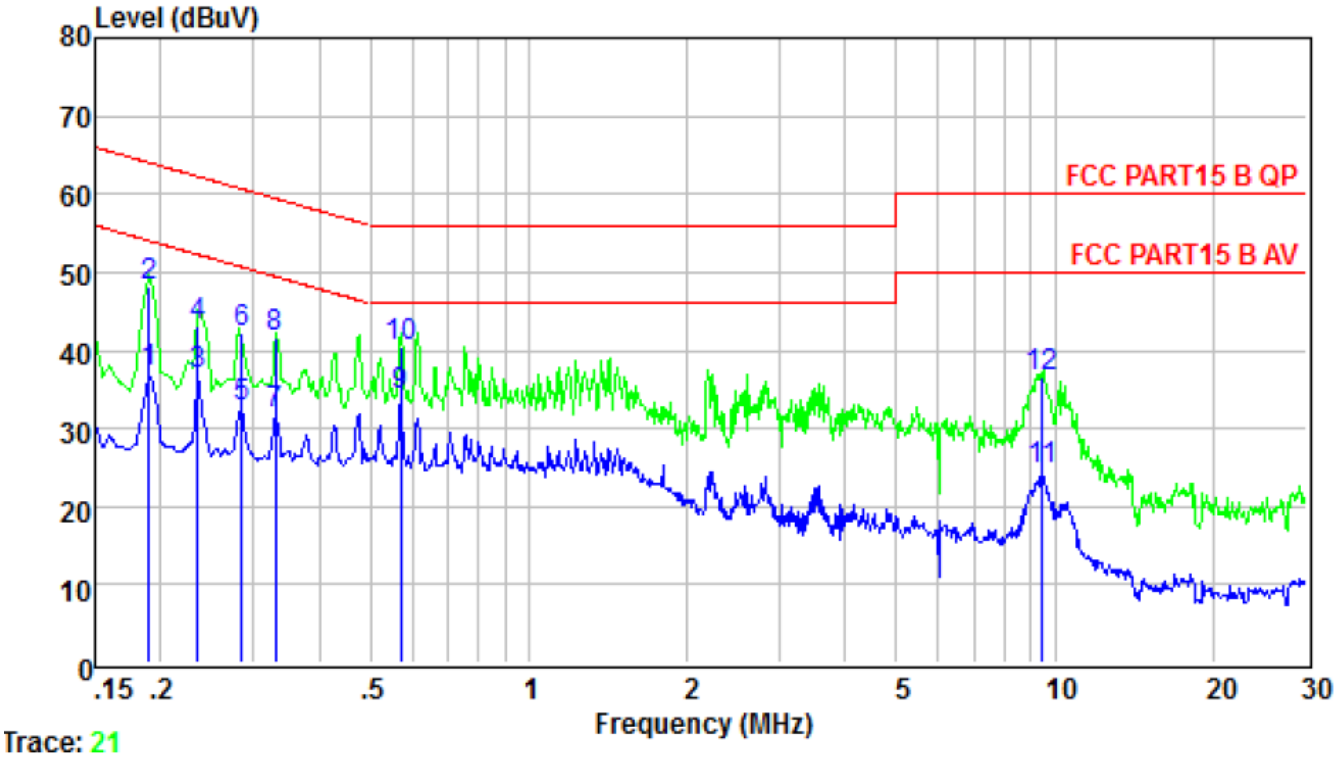
	Freq	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	
1	0.180	35.75	54.50	-18.75	Average
2	0.180	48.76	64.50	-15.74	QP
3	0.226	34.25	52.61	-18.36	Average
4	0.226	46.13	62.61	-16.48	QP
5	0.270	33.56	51.12	-17.56	Average
6	0.270	45.87	61.12	-15.25	QP
7	0.315	31.94	49.84	-17.90	Average
8	0.315	42.54	59.84	-17.30	QP
9	0.404	31.82	47.77	-15.95	Average
10	0.404	41.76	57.77	-16.01	QP
11	9.204	19.78	50.00	-30.22	Average
12	9.204	31.79	60.00	-28.21	QP

EUT：	Mobile Phone	Model Name ：	F39A1
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010hPa	Phase：	N
Test Voltage ：	DC 5.0V form Adapter AC 120V/60Hz		



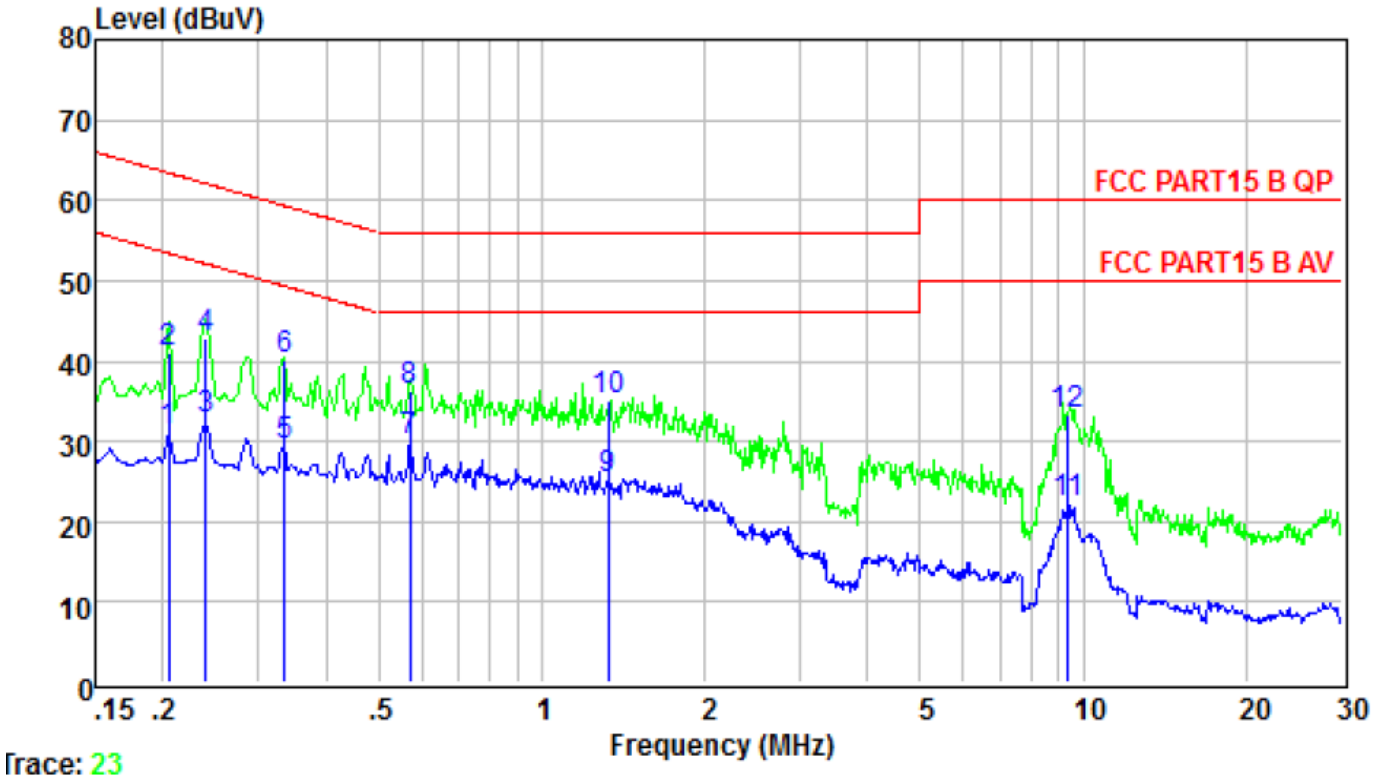
	Freq	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	
1	0.180	36.00	54.50	-18.50	Average
2	0.180	47.91	64.50	-16.59	QP
3	0.226	35.34	52.61	-17.27	Average
4	0.226	45.03	62.61	-17.58	QP
5	0.270	34.99	51.12	-16.13	Average
6	0.270	43.12	61.12	-18.00	QP
7	0.589	35.29	46.00	-10.71	Average
8	0.589	41.16	56.00	-14.84	QP
9	0.948	30.63	46.00	-15.37	Average
10	0.948	36.09	56.00	-19.91	QP
11	9.302	21.92	50.00	-28.08	Average
12	9.302	35.37	60.00	-24.63	QP

EUT：	Mobile Phone	Model Name ：	F39A1
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010hPa	Phase：	L
Test Voltage ：	DC 5.0V form Adapter AC 240V/60Hz		



	Freq	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	
1	0.190	37.12	54.02	-16.90	Average
2	0.190	48.07	64.02	-15.95	QP
3	0.235	36.77	52.26	-15.49	Average
4	0.235	43.15	62.26	-19.11	QP
5	0.285	32.77	50.68	-17.91	Average
6	0.285	42.11	60.68	-18.57	QP
7	0.330	31.82	49.44	-17.62	Average
8	0.330	41.55	59.44	-17.89	QP
9	0.570	34.15	46.00	-11.85	Average
10	0.570	40.32	56.00	-15.68	QP
11	9.451	24.67	50.00	-25.33	Average
12	9.451	36.72	60.00	-23.28	QP

EUT：	Mobile Phone	Model Name ：	F39A1
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010hPa	Phase：	N
Test Voltage ：	DC 5.0V form Adapter AC 240V/60Hz		



Trace: 23

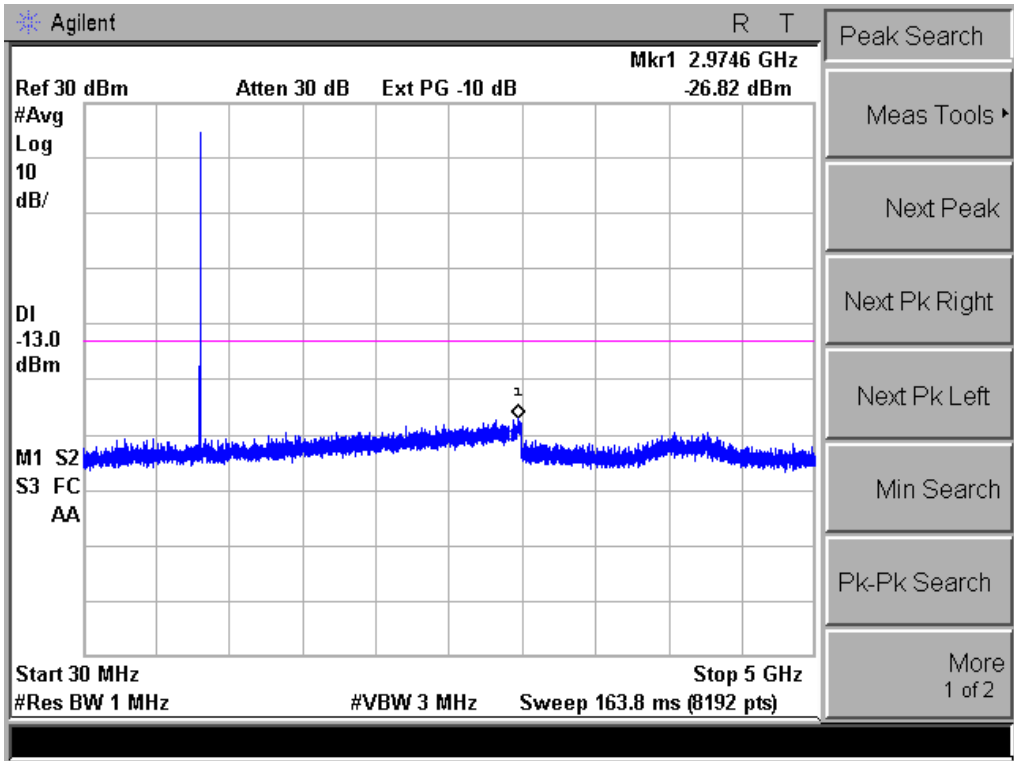
	Freq	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	
1	0.205	31.14	53.40	-22.26	Average
2	0.205	41.16	63.40	-22.24	QP
3	0.240	32.59	52.08	-19.49	Average
4	0.240	42.69	62.08	-19.39	QP
5	0.336	29.35	49.31	-19.96	Average
6	0.336	40.01	59.31	-19.30	QP
7	0.570	29.97	46.00	-16.03	Average
8	0.570	36.17	56.00	-19.83	QP
9	1.324	25.25	46.00	-20.75	Average
10	1.324	35.11	56.00	-20.89	QP
11	9.352	22.17	50.00	-27.83	Average
12	9.352	33.17	60.00	-26.83	QP

APPENDIX I

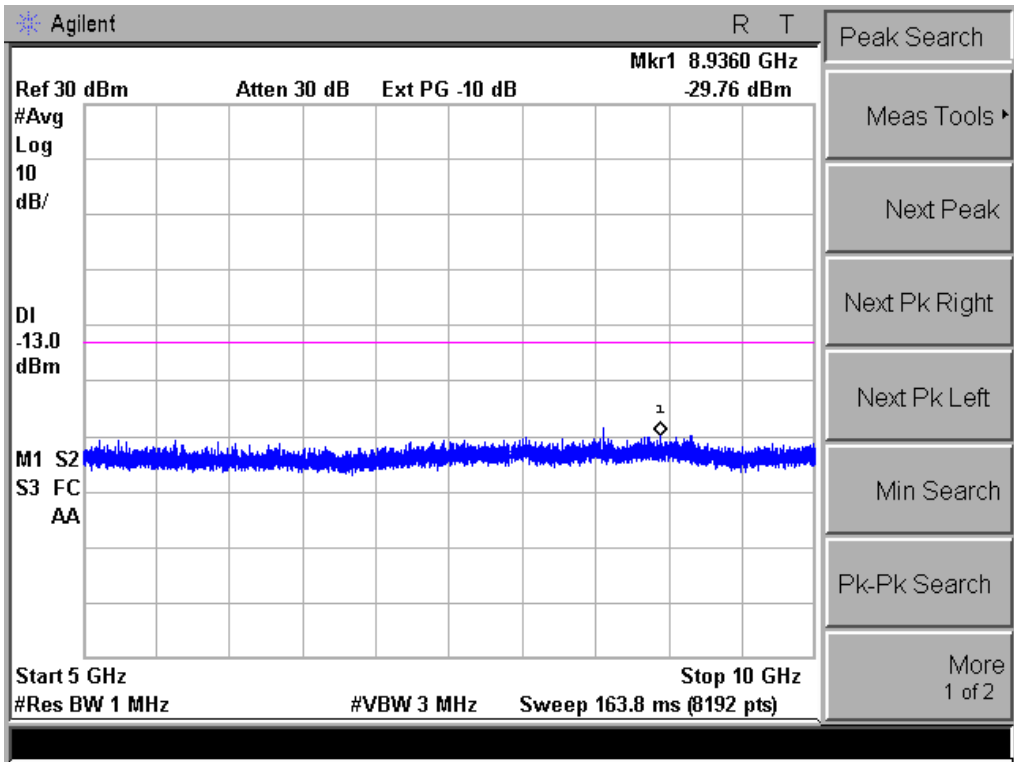
TEST PLOTS FOR CONDUCTED SPURIOUS EMISSION

CONDUCTED EMISSION IN GSM 850 BAND

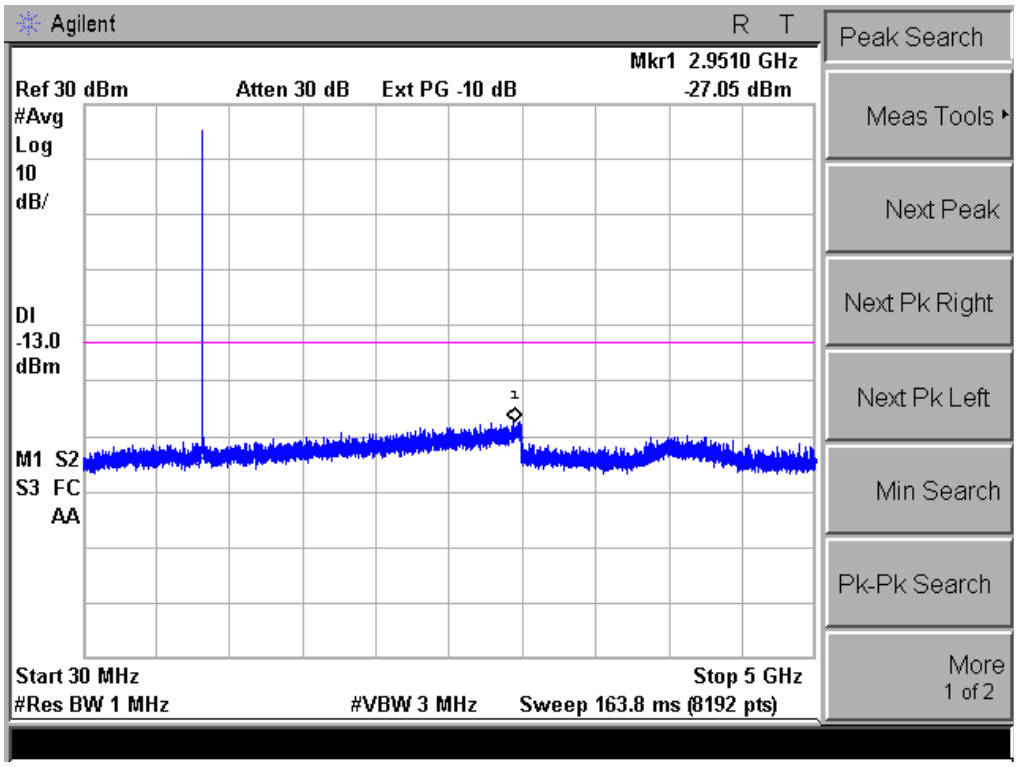
Conducted Emission Transmitting Mode CH 128 30MHz – 5GHz



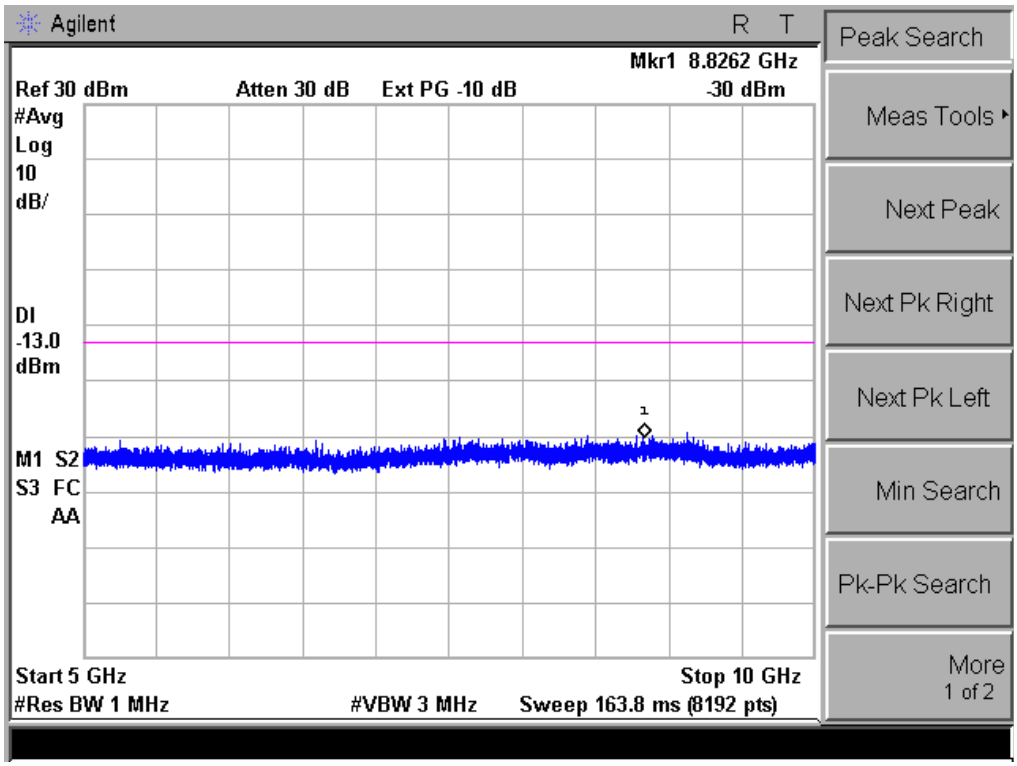
Conducted Emission Transmitting Mode CH 128 5GHz – 10GHz



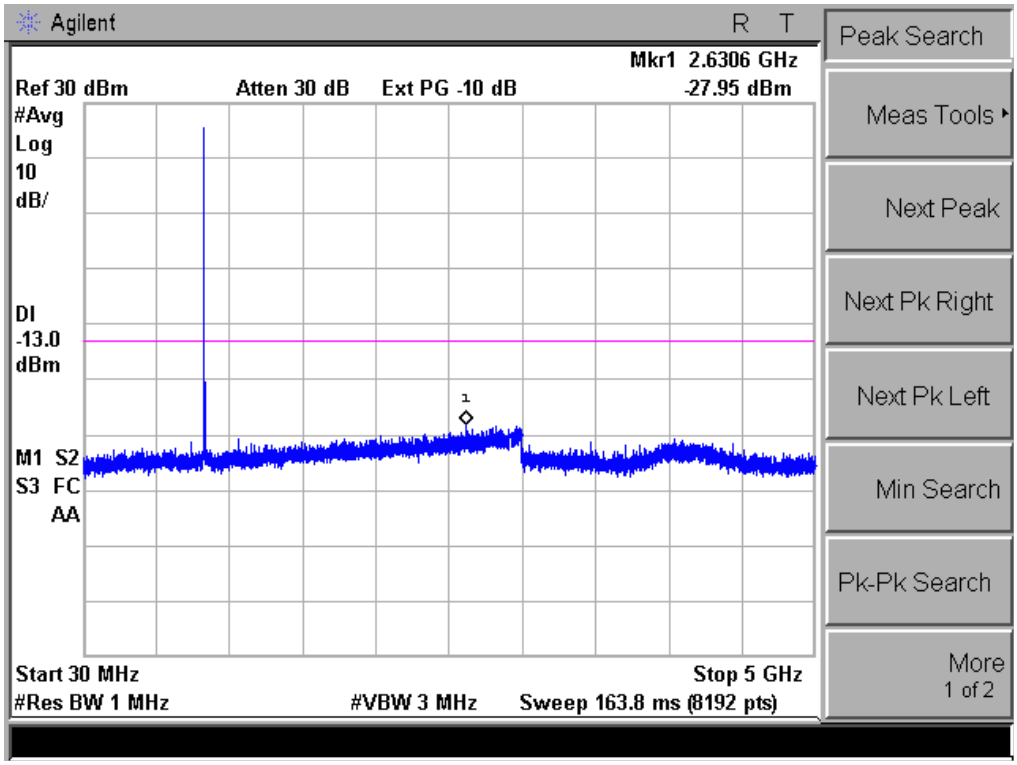
Conducted Emission Transmitting Mode CH 190 30MHz – 5GHz



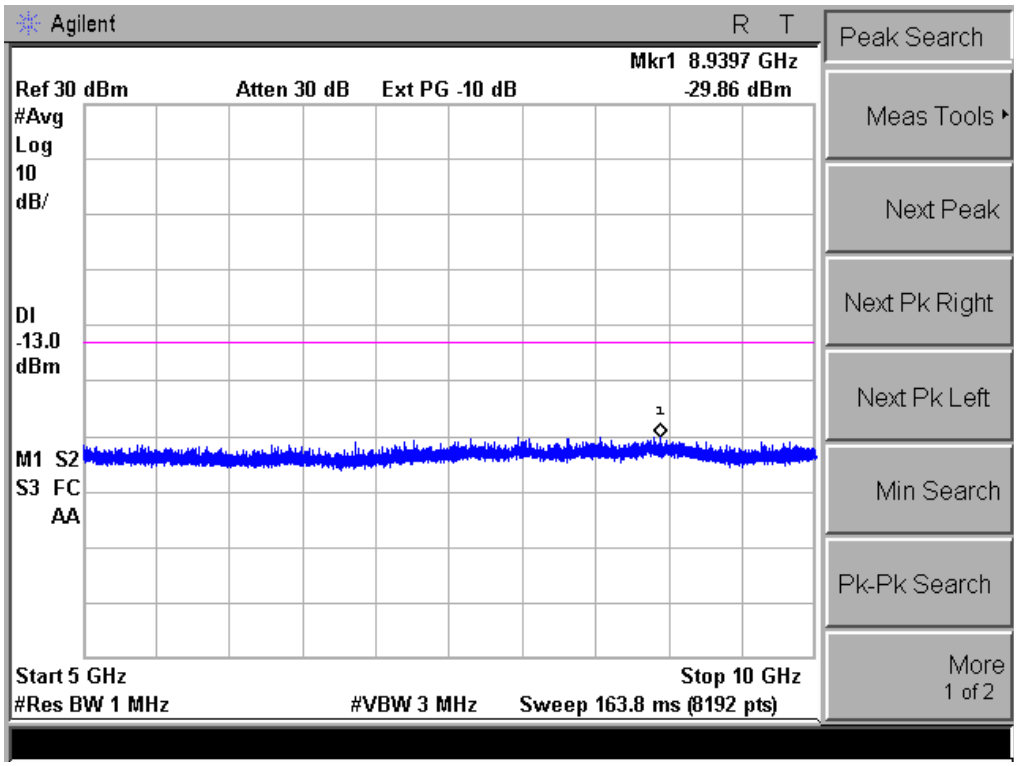
Conducted Emission Transmitting Mode CH 190 5GHz – 10GHz



Conducted Emission Transmitting Mode CH 251 30MHz – 5GHz

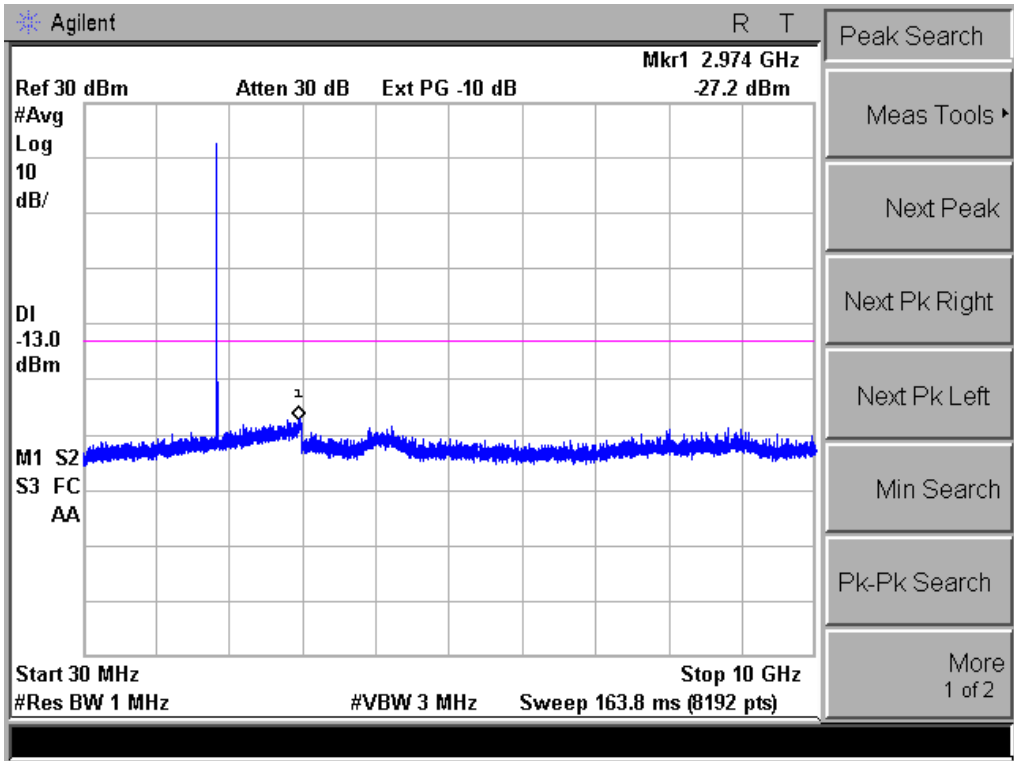


Conducted Emission Transmitting Mode CH 251 5GHz – 10GHz

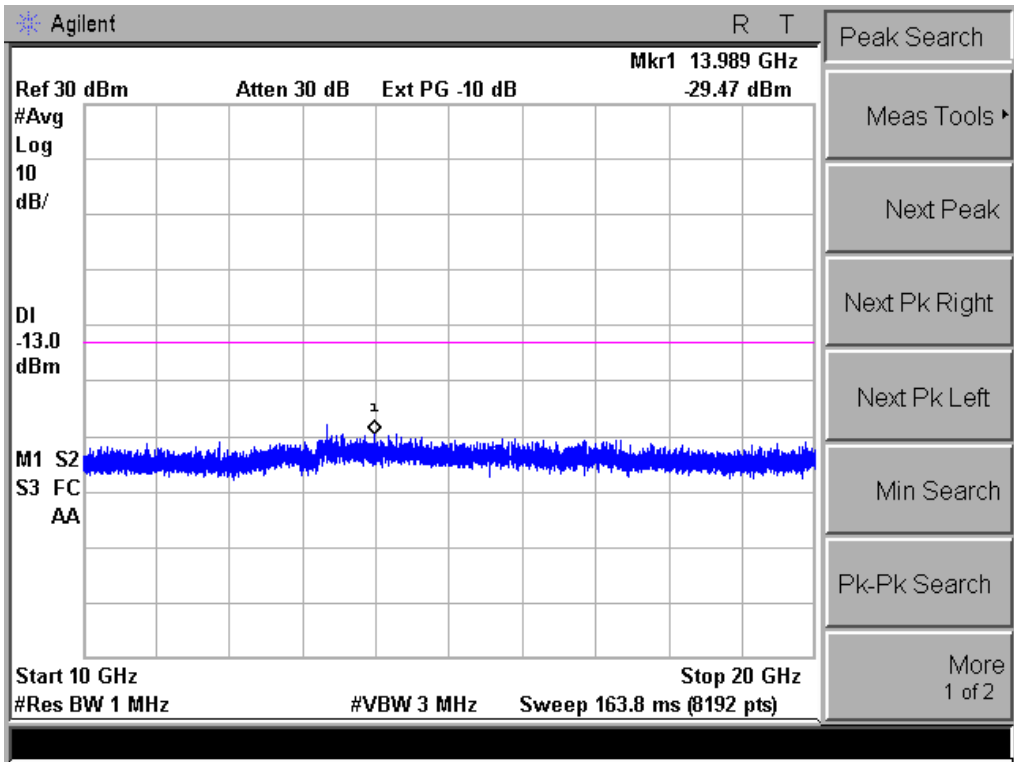


CONDUCTED EMISSION IN PCS1900 BAND

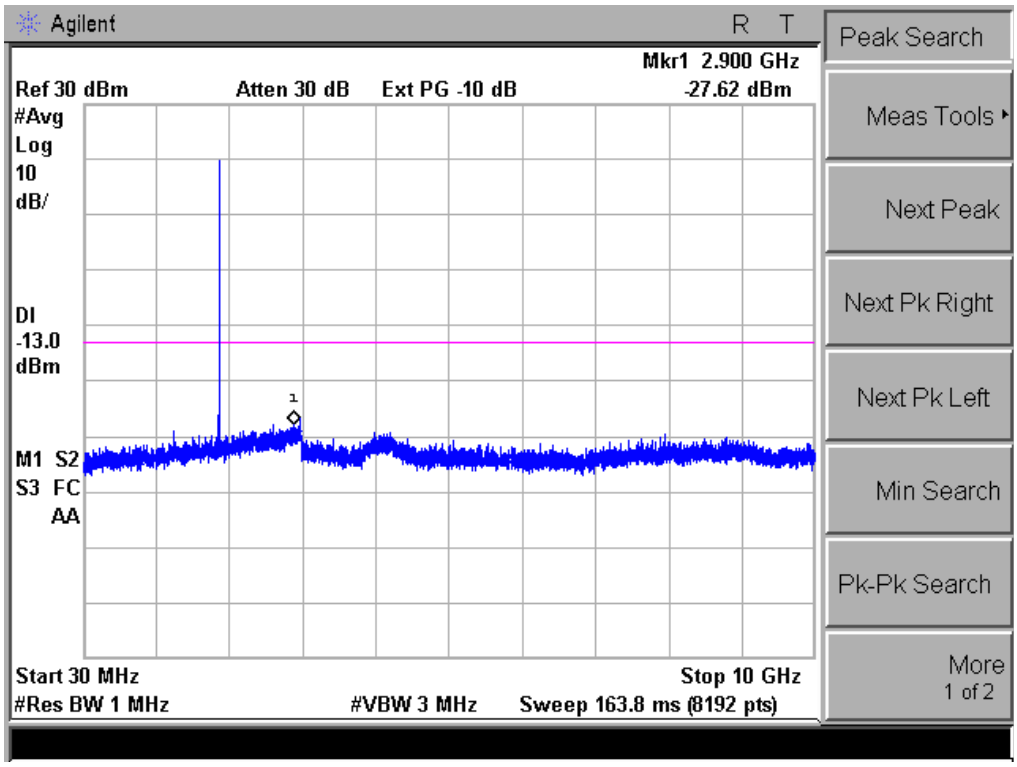
Conducted Emission Transmitting Mode CH 512 30MHz – 10GHz



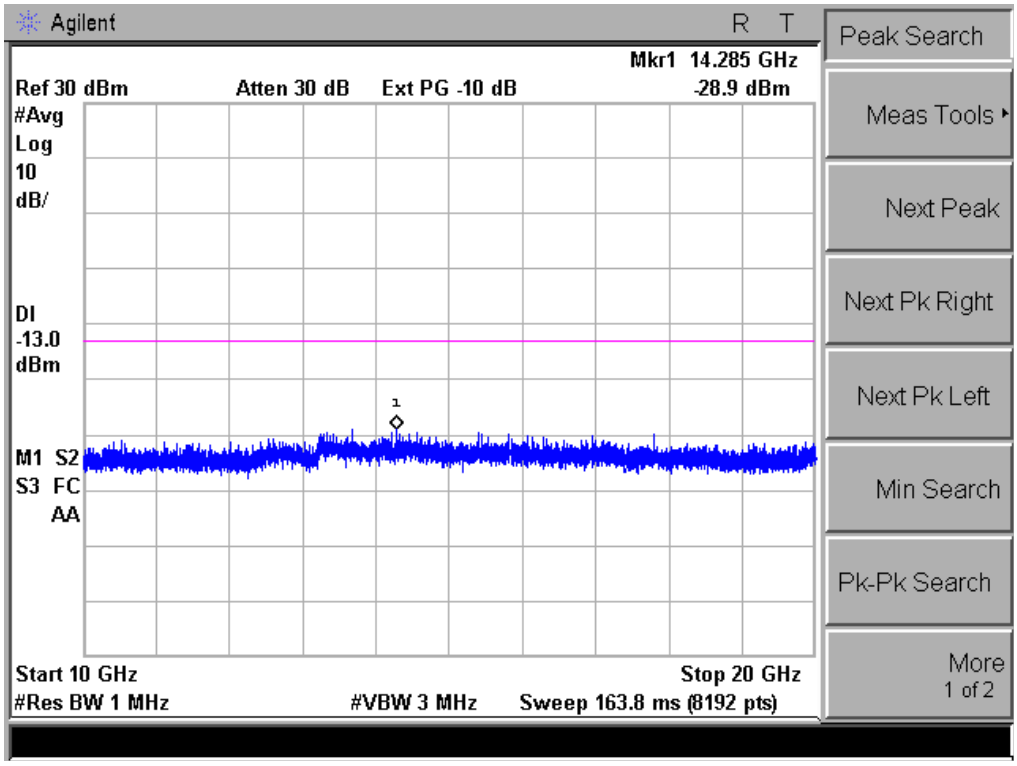
Conducted Emission Transmitting Mode CH 512 10GHz – 20GHz



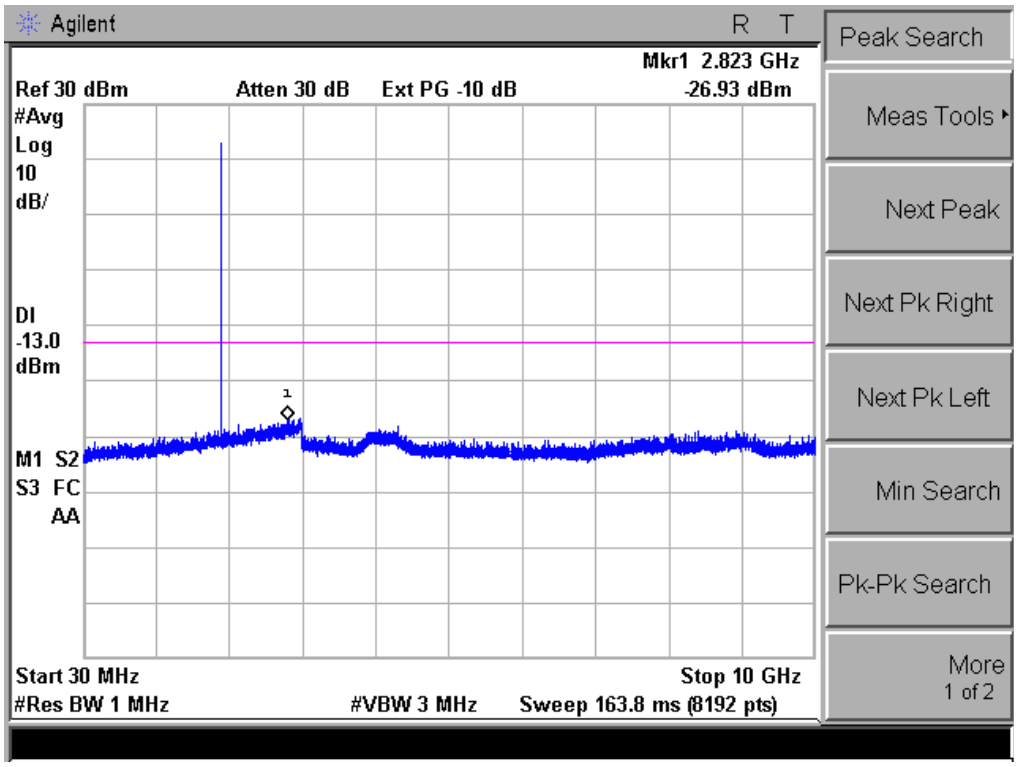
Conducted Emission Transmitting Mode CH 661 30MHz – 10GHz



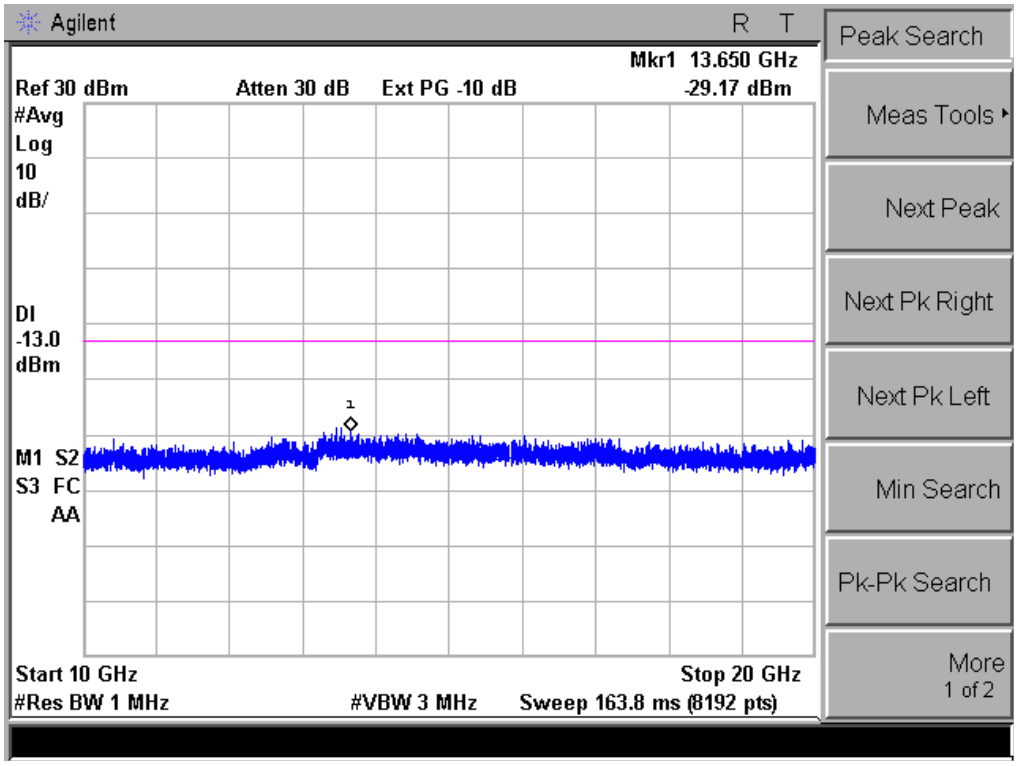
Conducted Emission Transmitting Mode CH 661 10GHz – 20GHz



Conducted Emission Transmitting Mode CH 810 30MHz – 10GHz

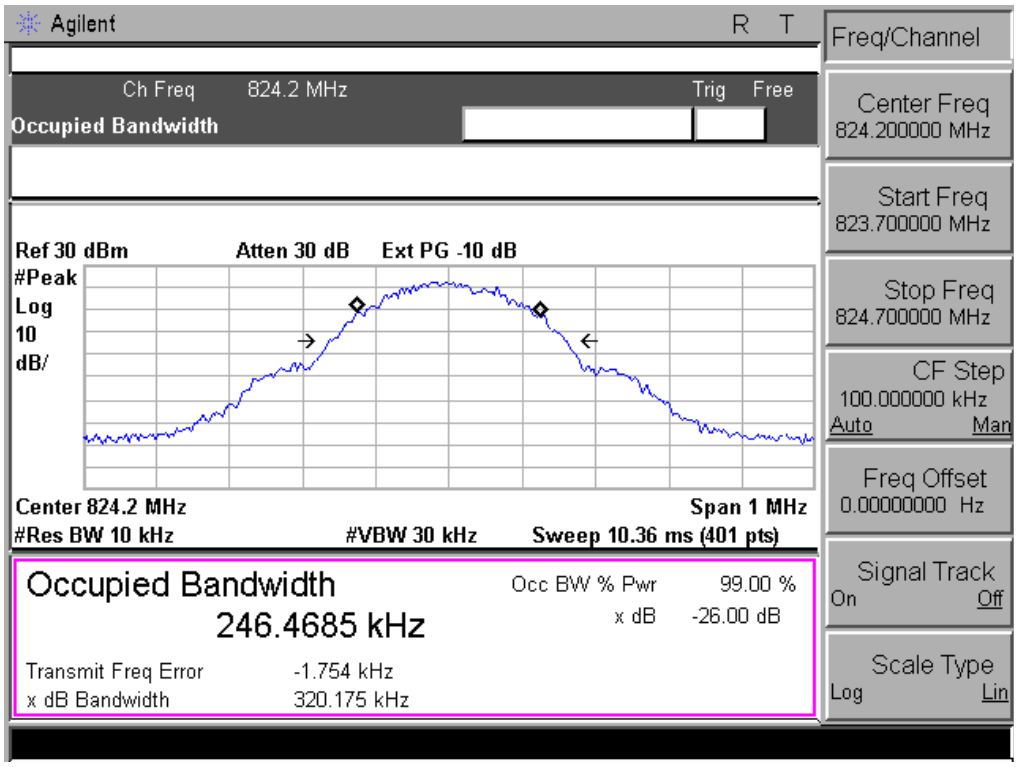


Conducted Emission Transmitting Mode CH 810 10GHz – 20GHz

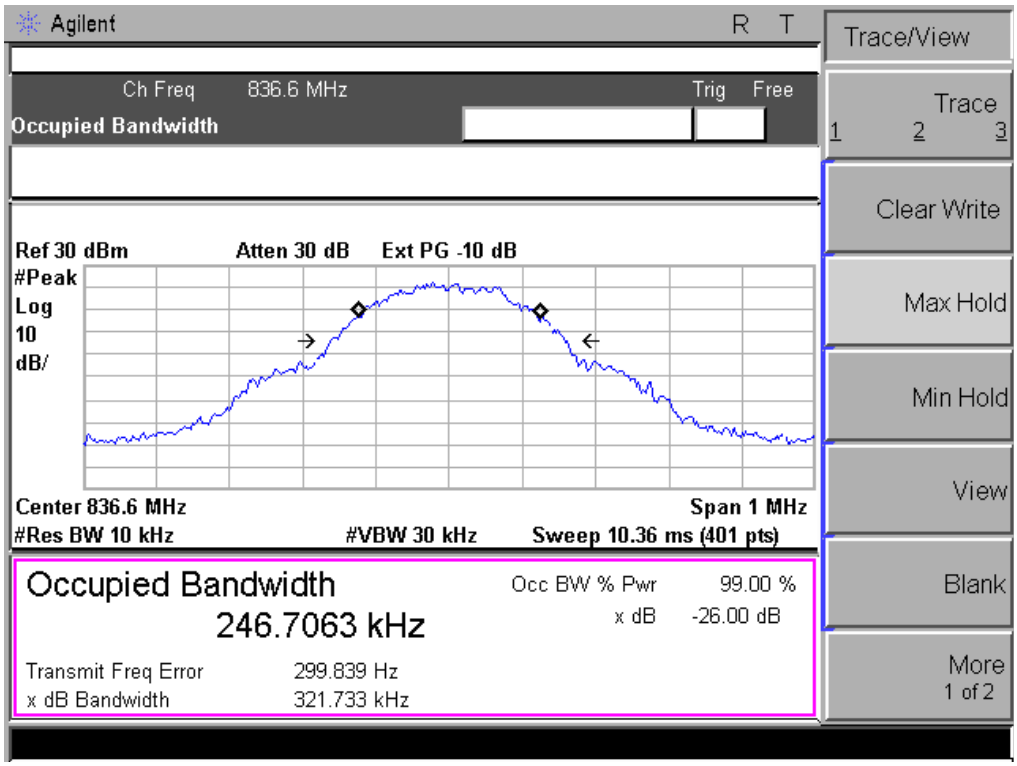


APPENDIX II
TEST PLOTS FOR OCCUPIED BANDWIDTH (99%)
EMISSION BANDWIDTH (-26dBC)

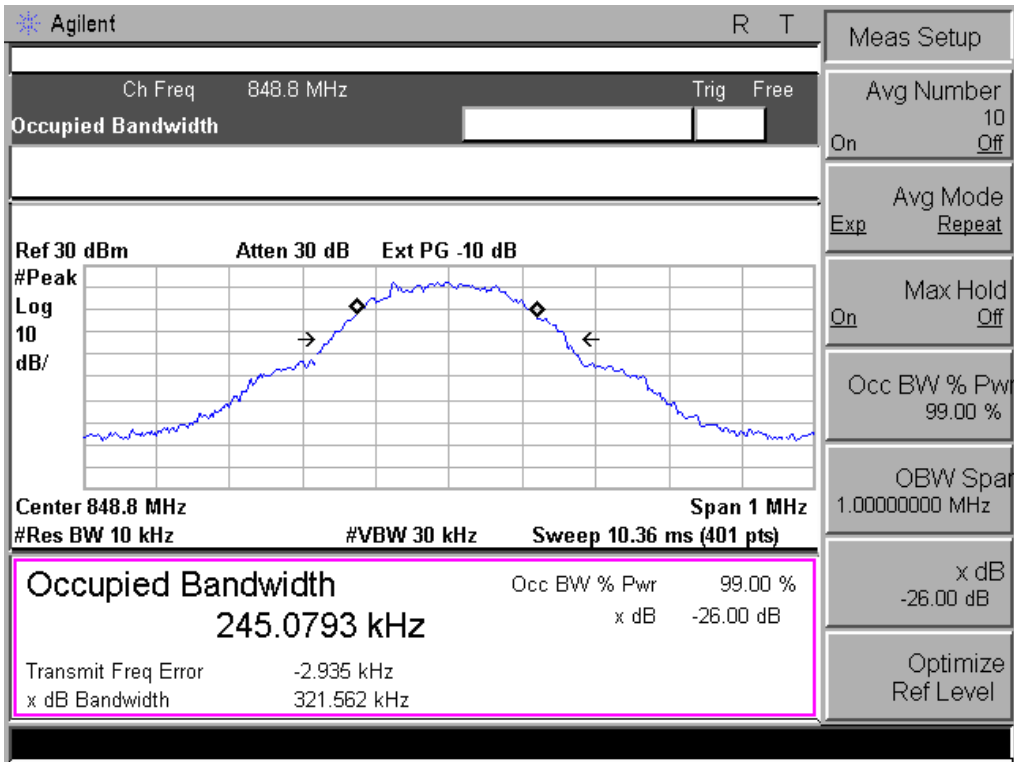
Occupied Bandwidth (99%) GSM 850 BAND CH 128



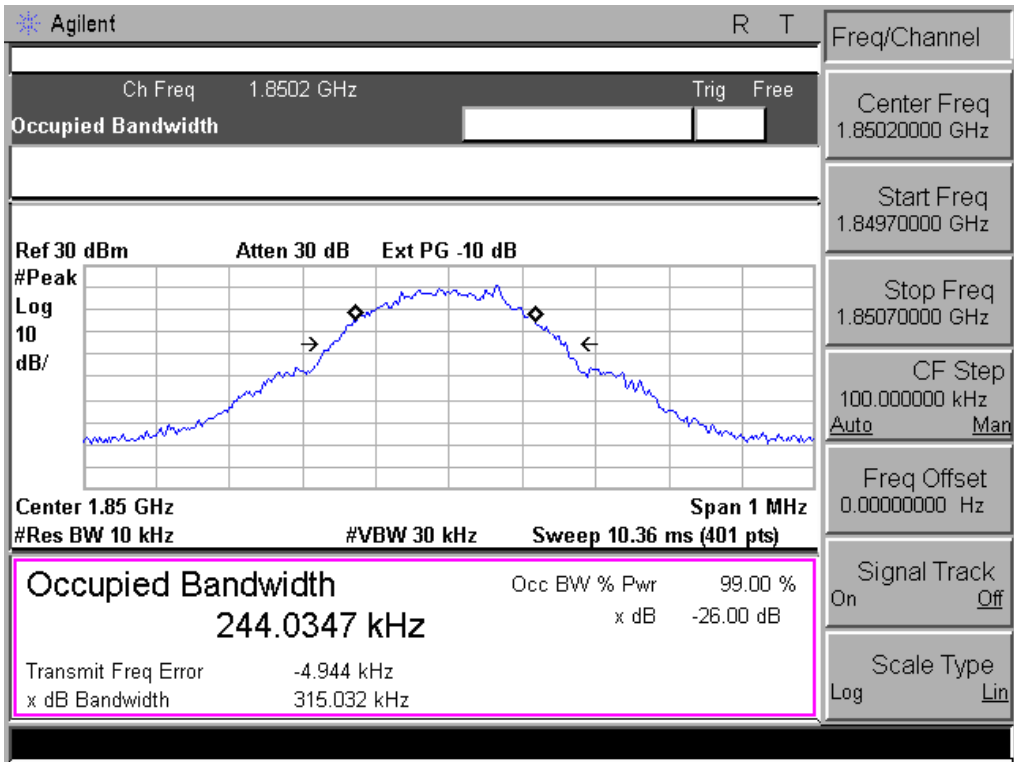
Occupied Bandwidth (99%) GSM 850 BAND CH 190



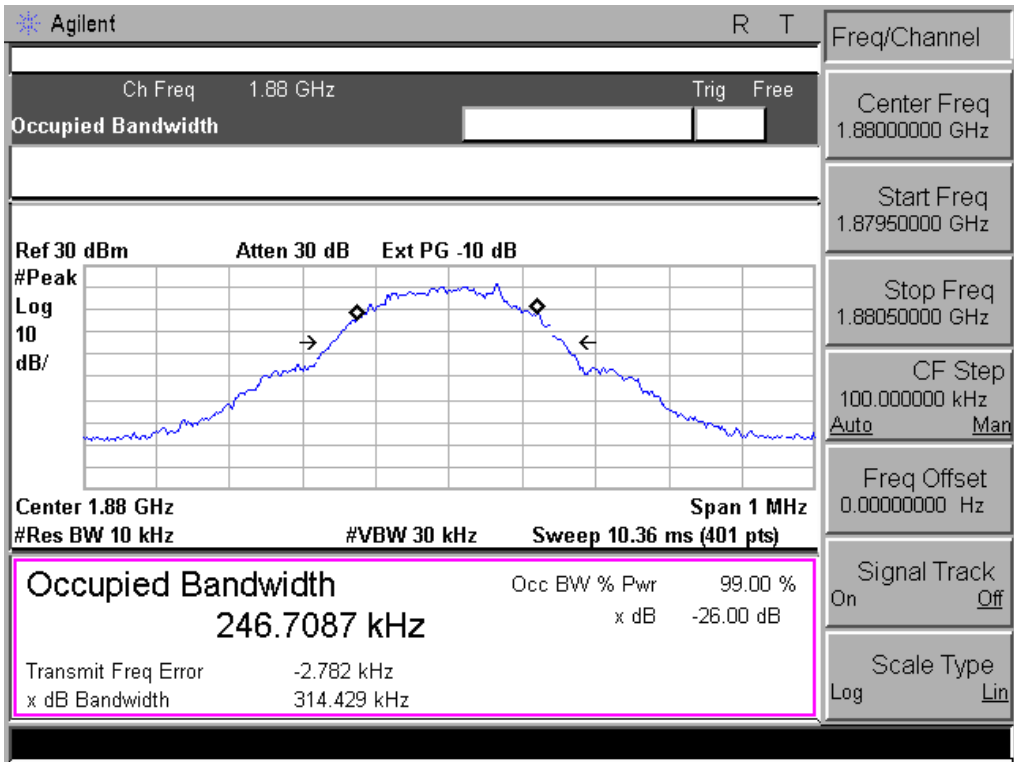
Occupied Bandwidth (99%) GSM 850 BAND CH 251



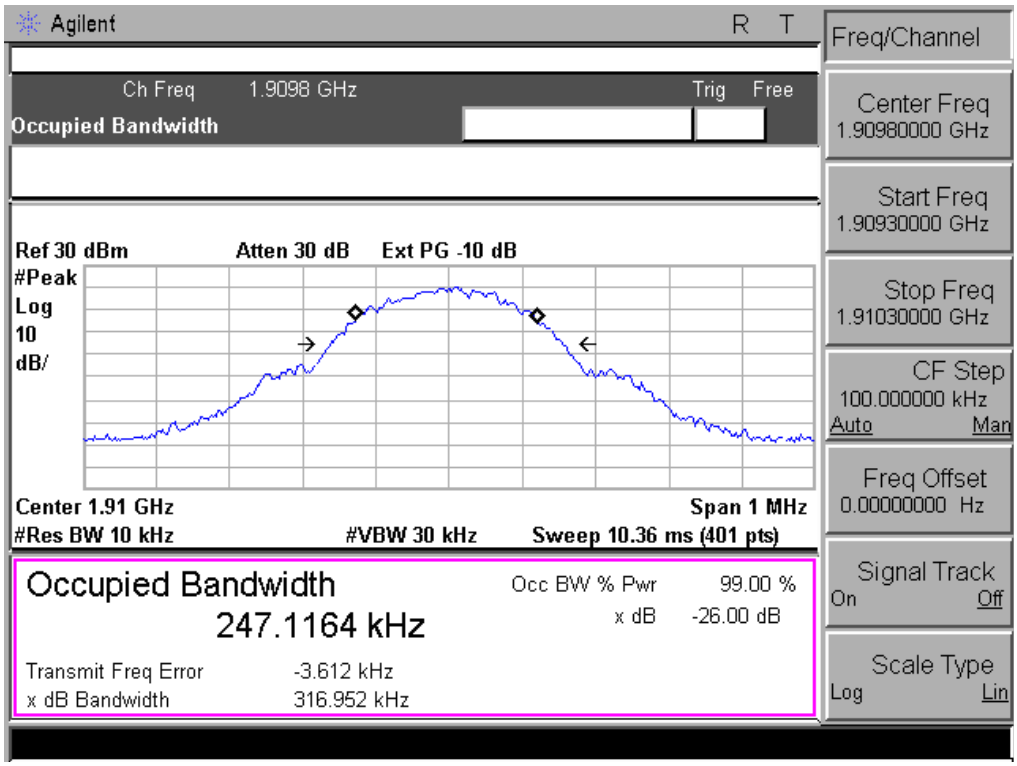
Occupied Bandwidth (99%) PCS 1900 BAND CH 512



Occupied Bandwidth (99%) PCS 1900 BAND CH 661

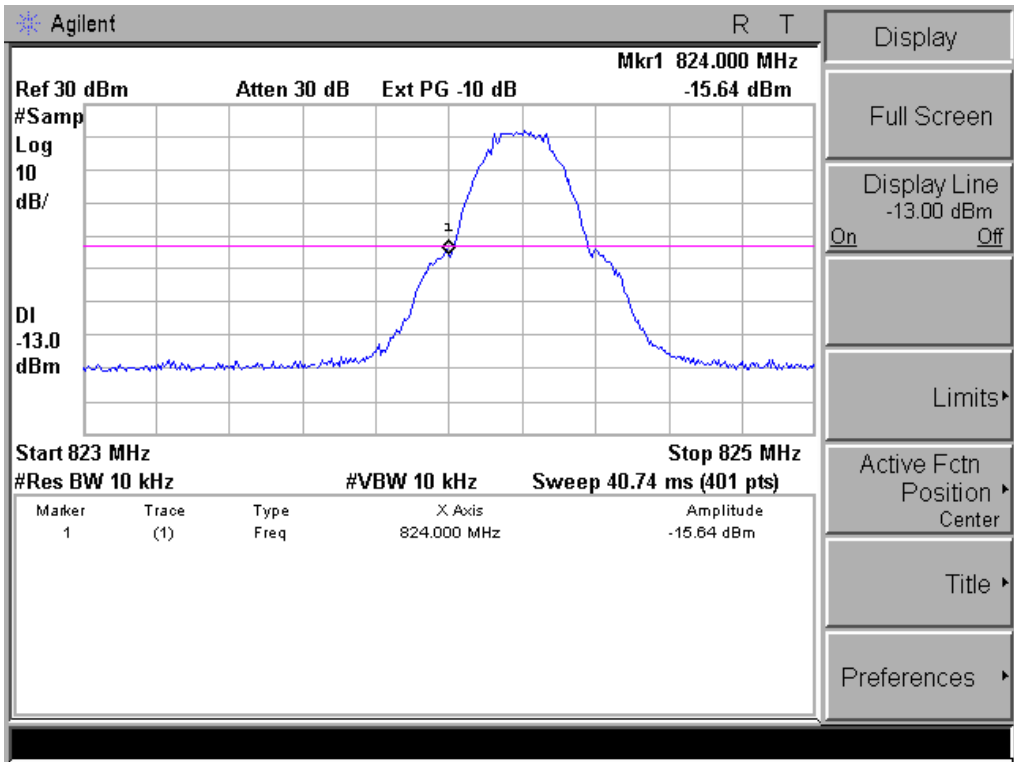


Occupied Bandwidth (99%) PCS 1900 BAND CH 810

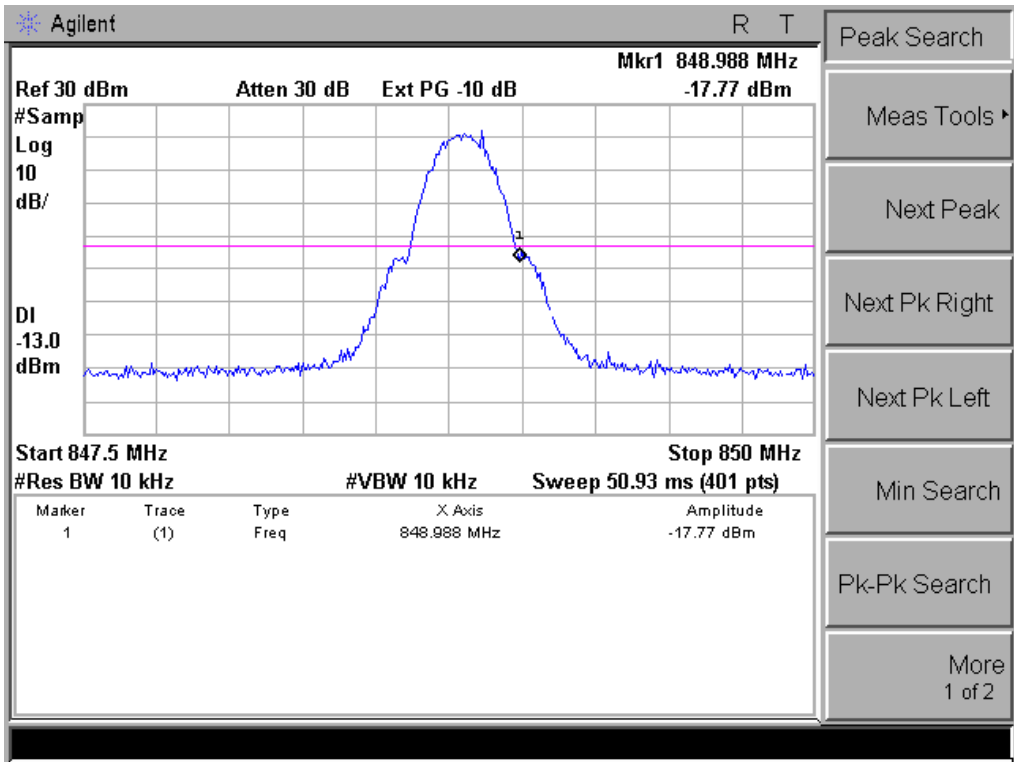


APPENDIX III
TEST PLOTS FOR BAND EDGES

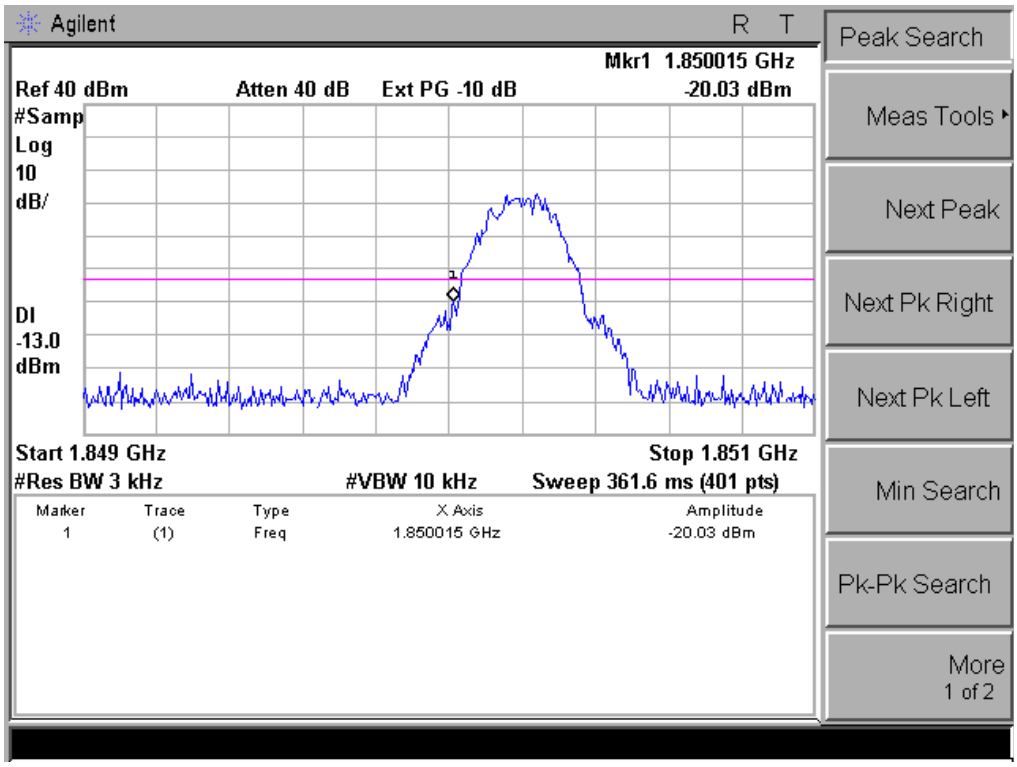
Low Band Edge GSM 850 BAND CH 128



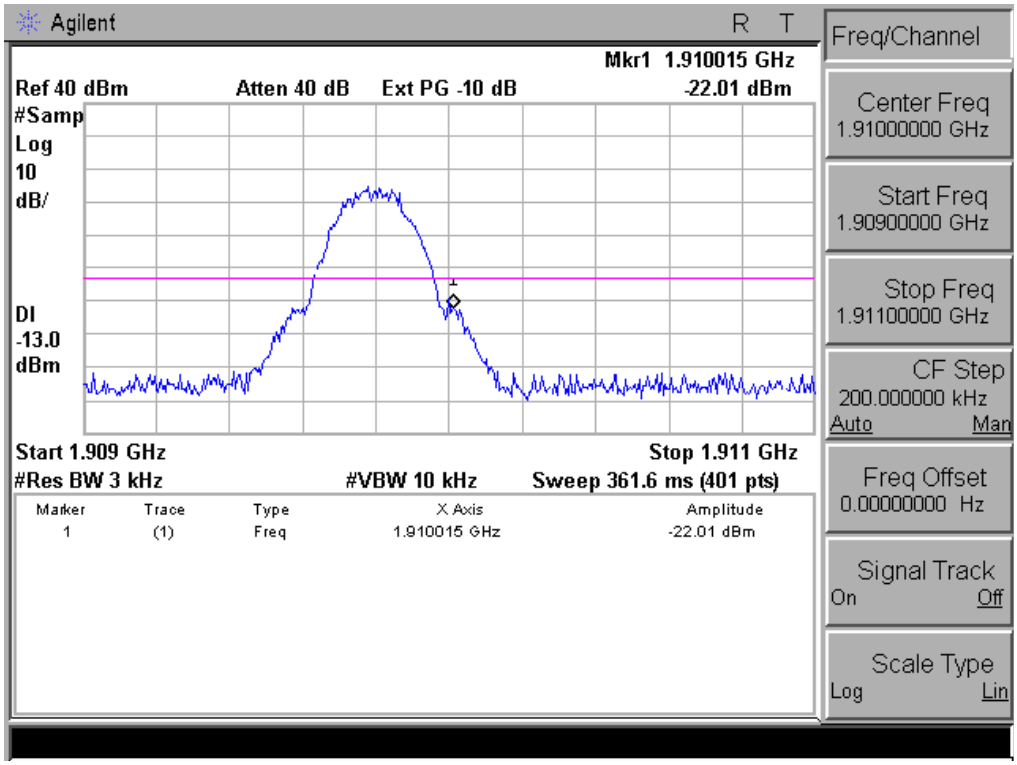
High Band Edge GSM 850 BAND CH 251



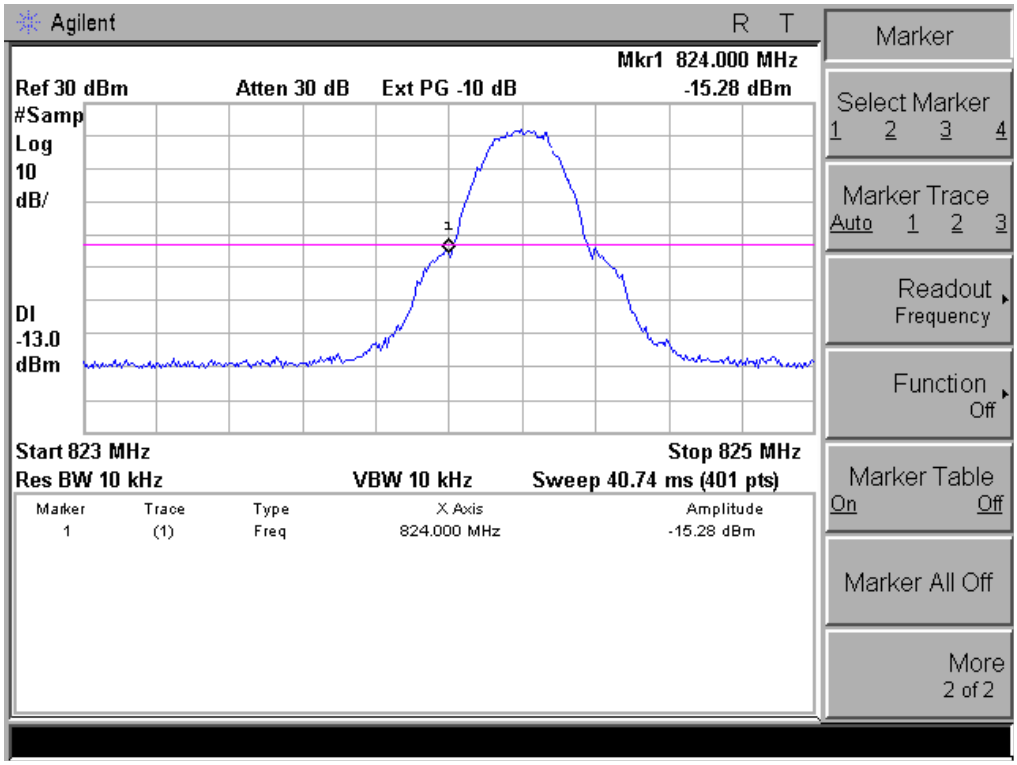
Low Band Edge PCS 1900 BAND CH 512



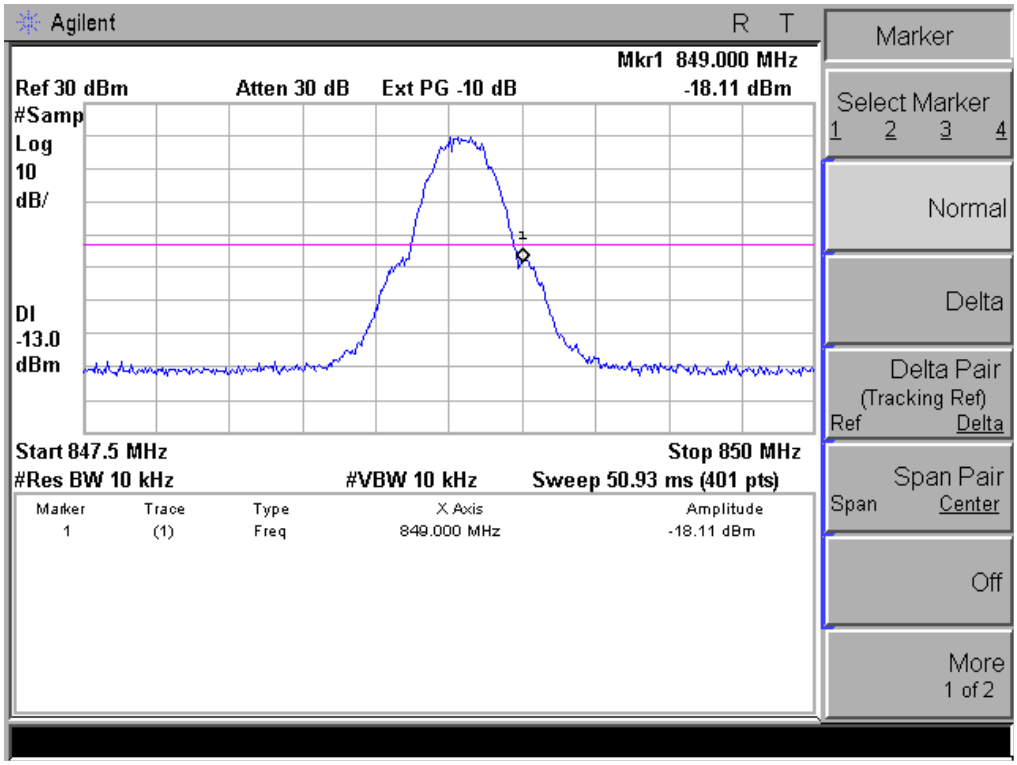
High Band Edge PCS 1900 BAND CH 810



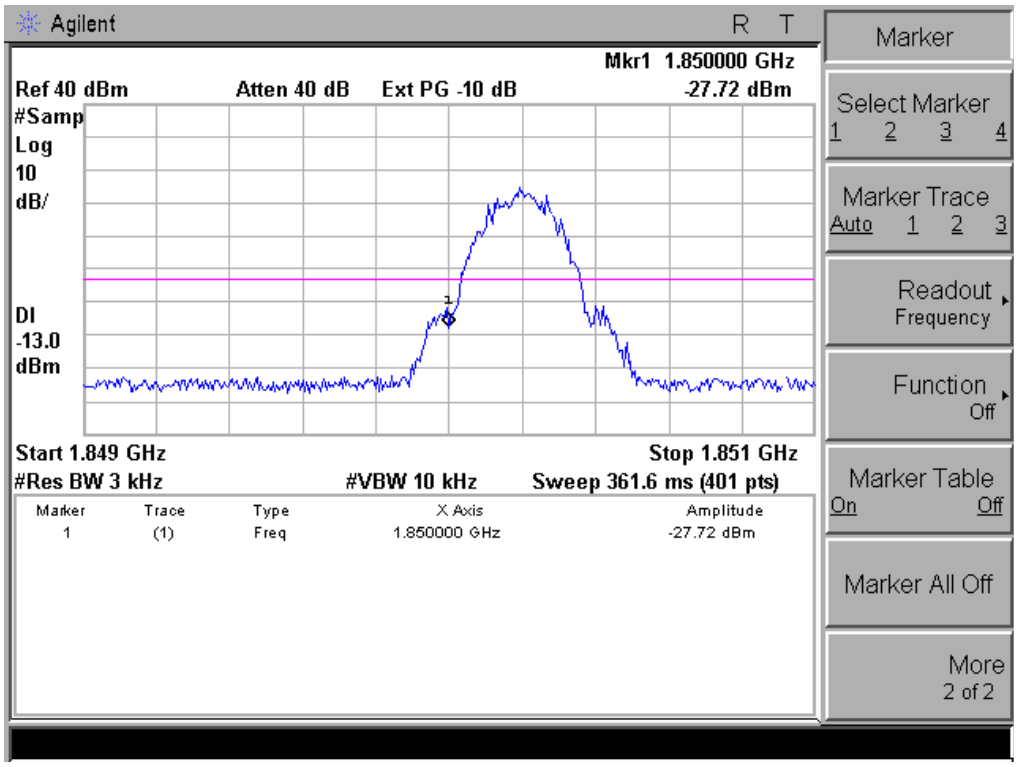
Low Band Edge GPRS 850 BAND CH 128



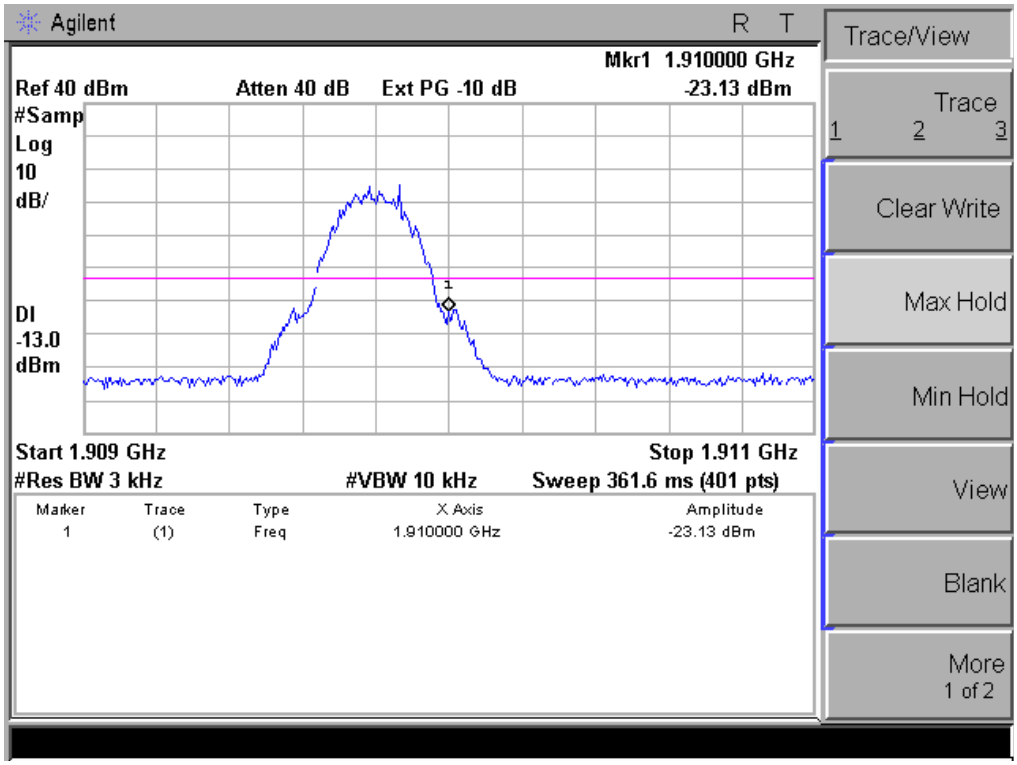
High Band Edge GPRS 850 BAND CH 251



Low Band Edge GPRS 1900 BAND CH 512

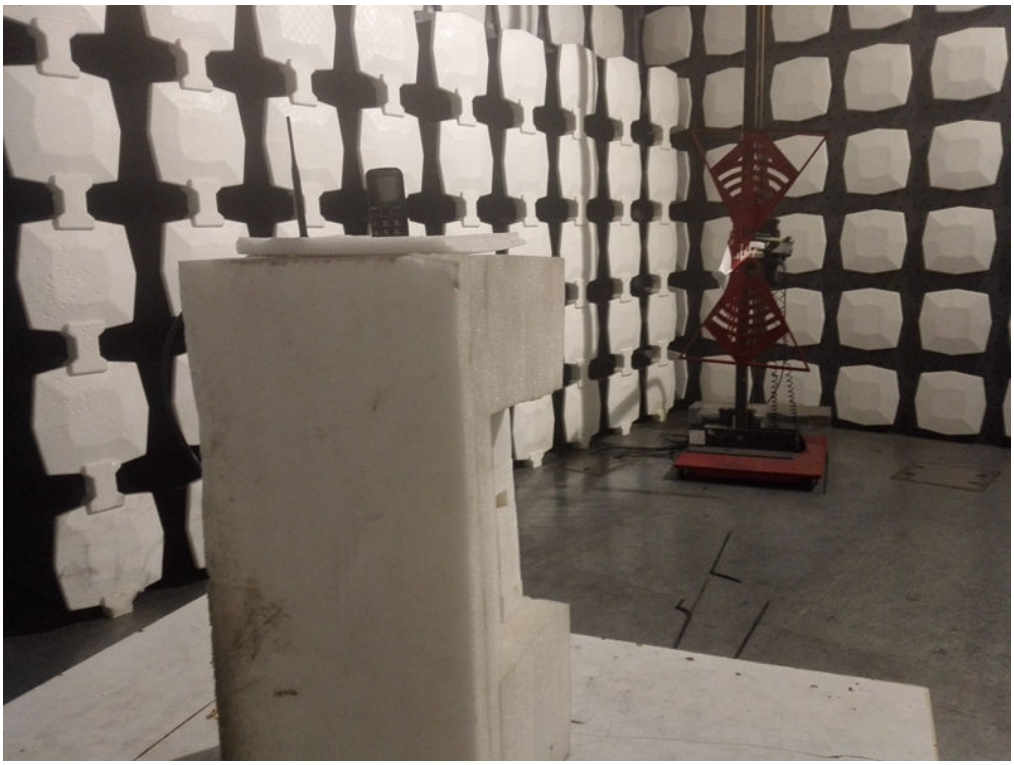


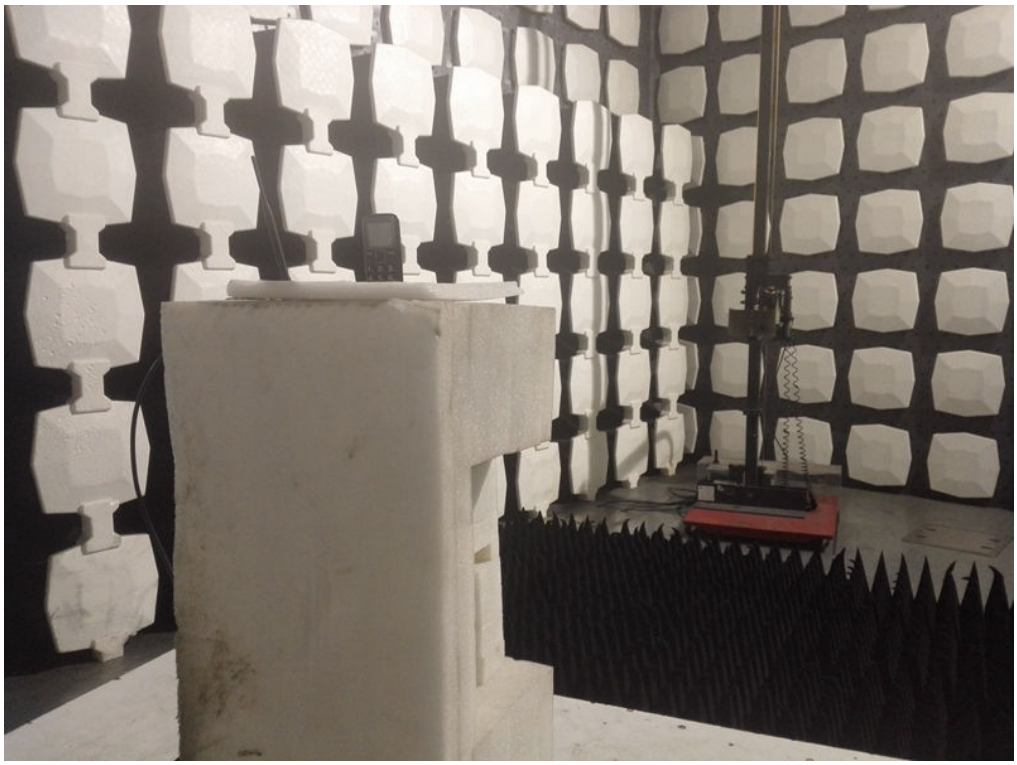
High Band Edge GPRS 1900 BAND CH 810



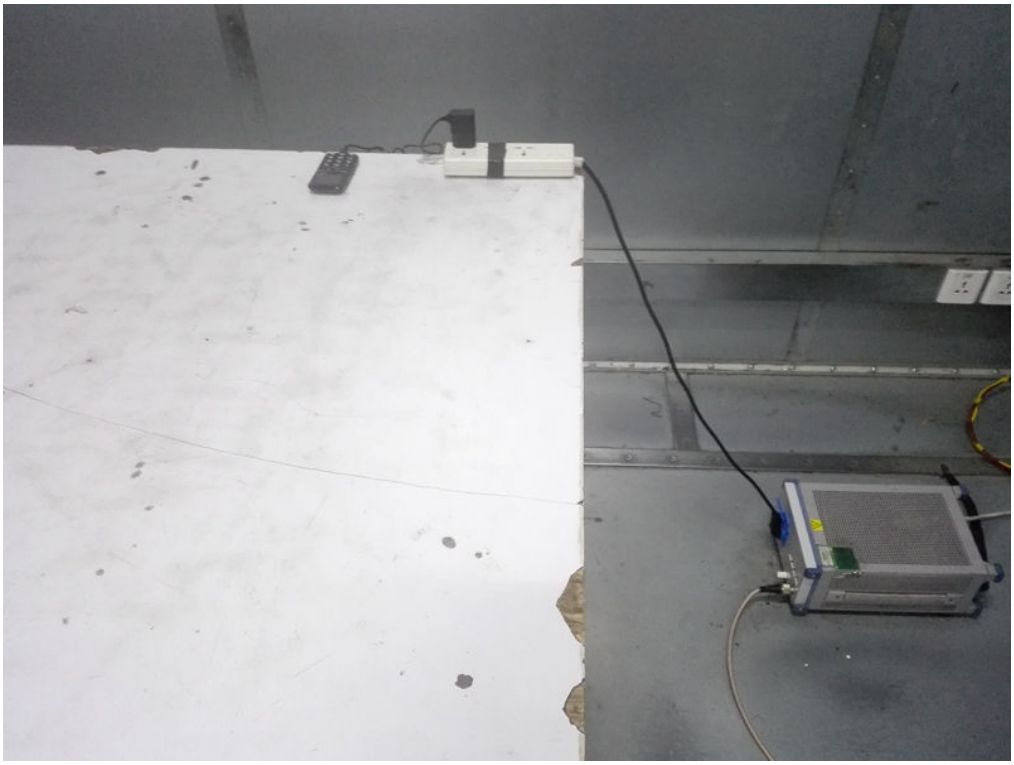
PHOTOGRAPHS OF TEST SETUP

RADIATED SPURIOUS EMISSION





Conducted Emission



12.Photographs of the EUT


cm 1 2 3 4 5 6 7 8 9 10 11 12
INCH 1 2 3 4
32 64 16

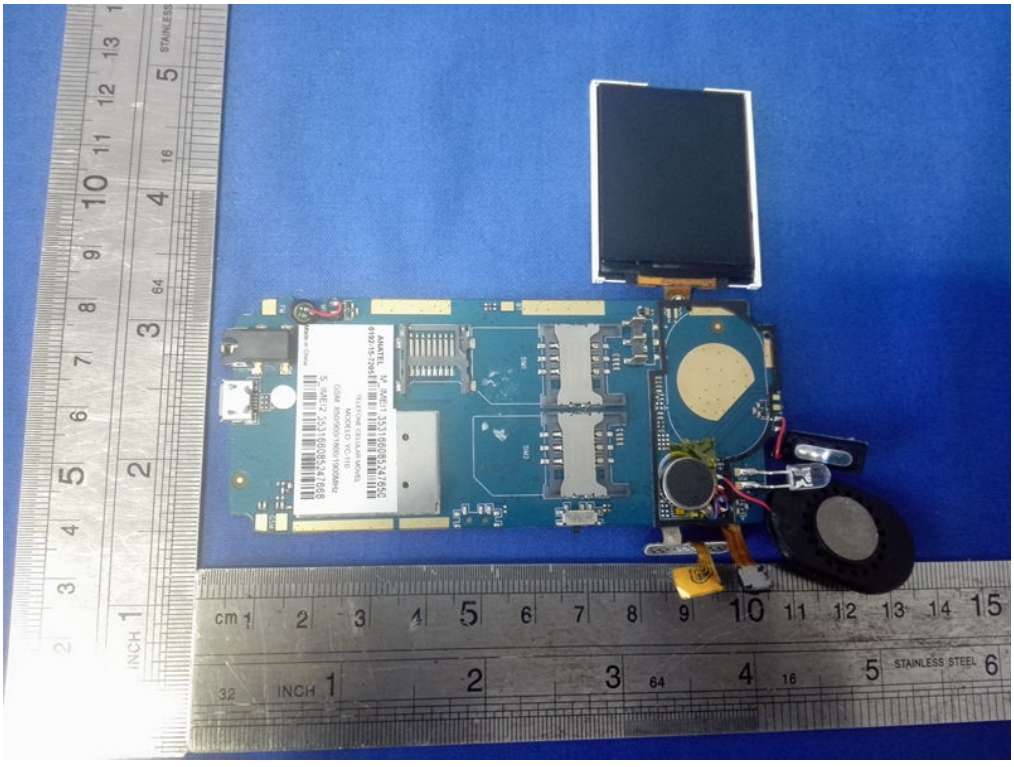

cm 1 2 3 4 5 6 7 8 9 10
INCH 1 2 3 4
32 64

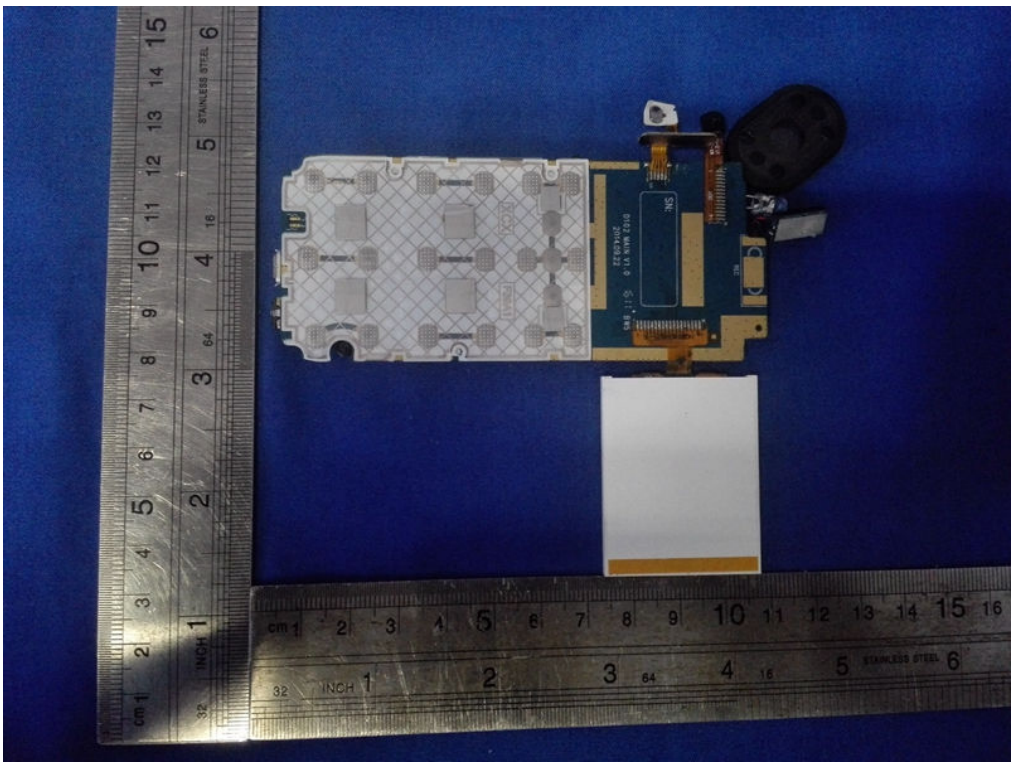

cm 1 2 3 4 5 6 7 8
INCH 1 2 3
32

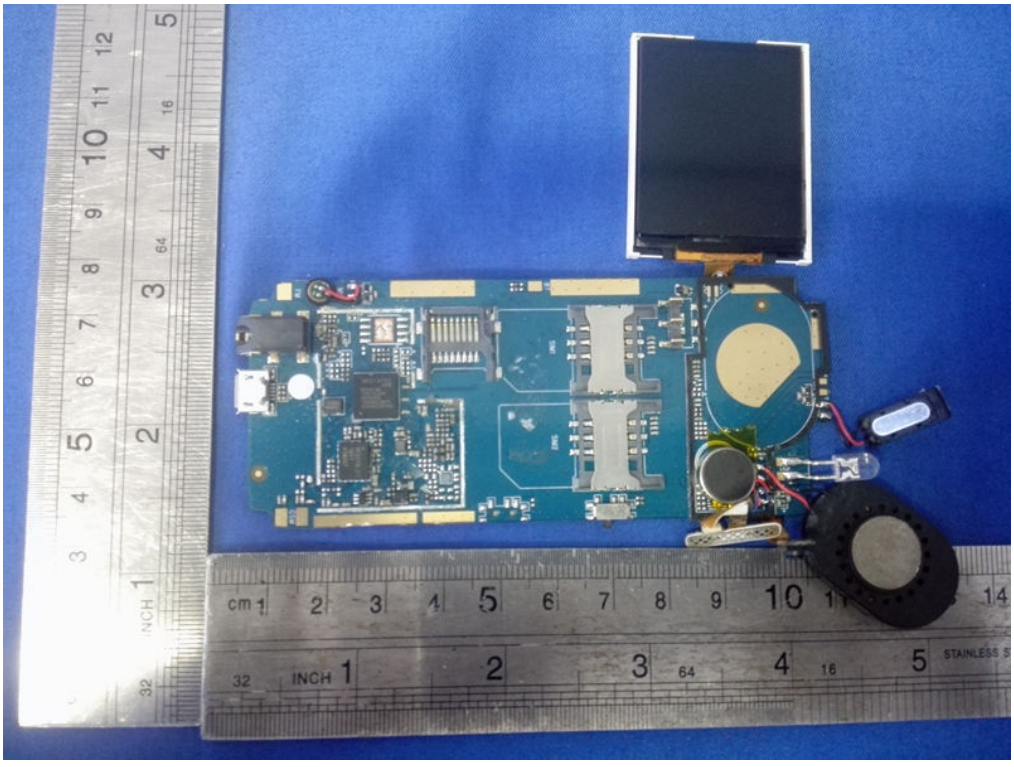

cm 1 2 3 4 5 6 7 8 9 10
INCH 1 2 3 4
32 64

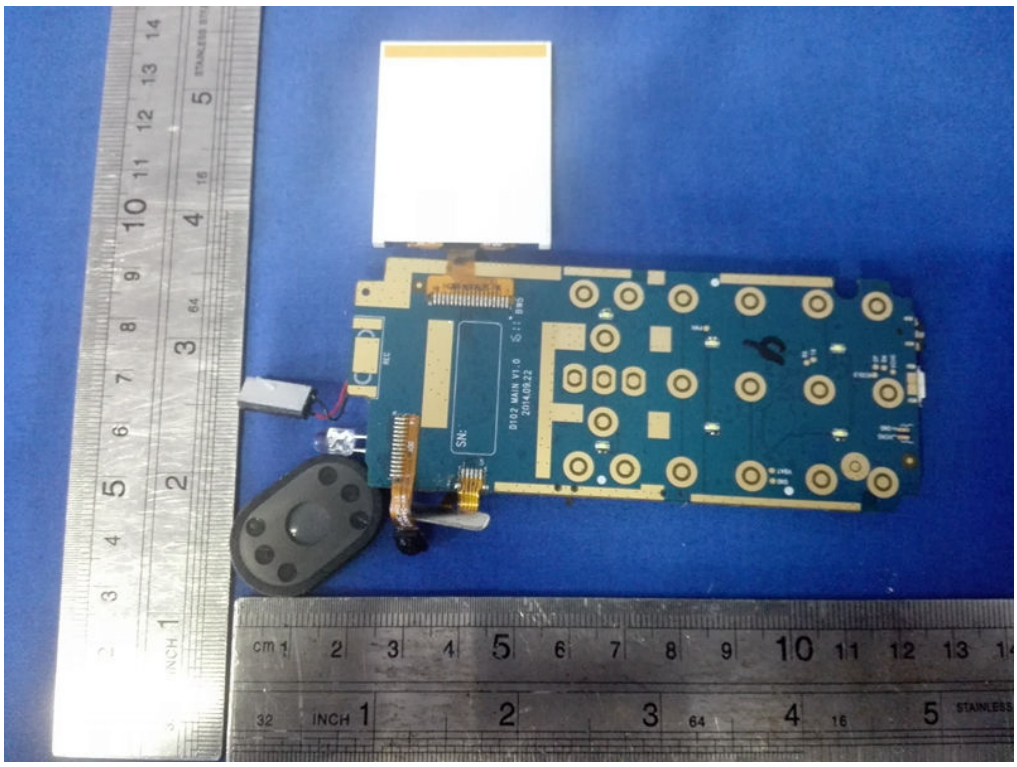

cm 1 2 3 4 5 6 7 8
INCH 1 2 3
32

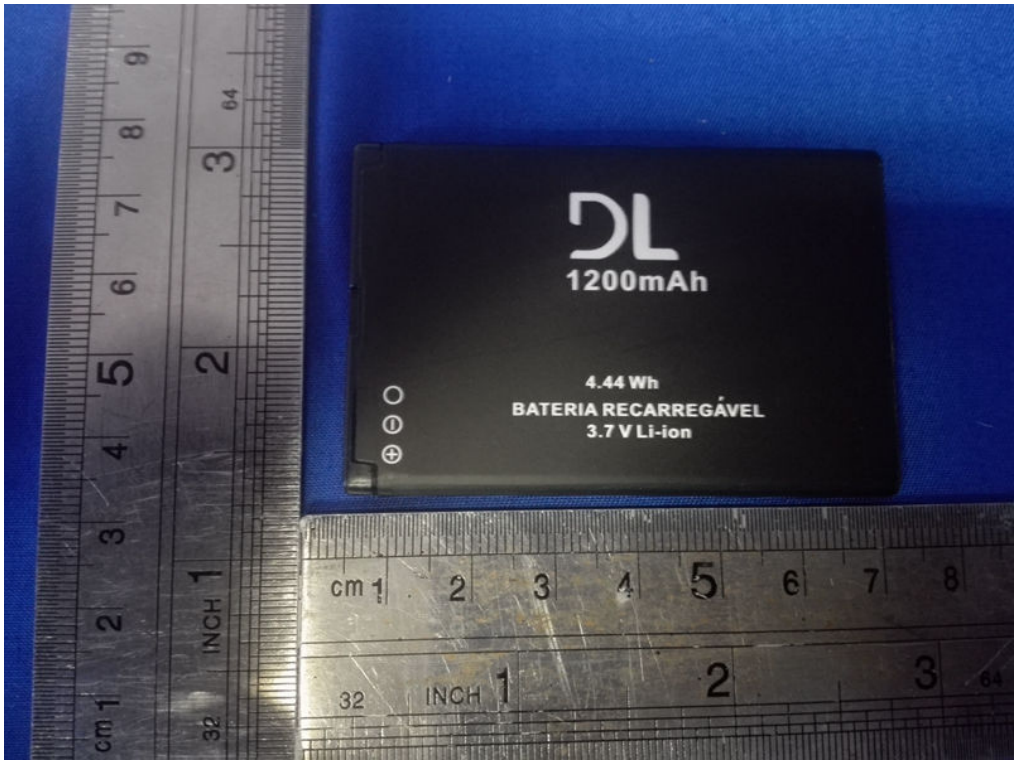

1200mAh
cm 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
INCH 1 2 3 4 5 6 7
32 64 16
STAINLESS STEEL










DL
1200mAh
4.44 Wh
BATERIA RECARREGÁVEL
3.7 V Li-ion


AC/DC ADAPTER
Model:JJC-011050700
Input: AC110--240V 50/60Hz 0.15A
Output:5V⎓700mA
Made in China