RF TEST REPORT

Report No.: 15050009-FCC-R1

Applicant	Collage Investments LLC.
Product Name	Mobile Phone
Model No.	LK700
Serial No.	N/A
Test Standard	FCC Part 22(H), FCC Part 24(E); ANSI/TIAC603 D: 2010
Test Date	May 28 to June 02, 2015
Issue Date	June 03, 2015
Test Result	☑ Pass ☐ Fail
Equipment complied with the specification	☑
Equipment did not comply with the specification	☐

Wiky.Jam	Chris You	
Wiky.Jam Test Engineer	Chris You Checked By	

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Test result presented in this test report is applicable to the tested sample only

Issued by:

SIEMIC (SHENZHEN-CHINA) LABORATORIES

Zone A, Floor 1, Building 2 Wan Ye Long Technology Park

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Laboratories Introduction

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Accreditations for Conformity Assessment

Country/Region	Scope
USA	EMC, RF/Wireless, SAR, Telecom
Canada	EMC, RF/Wireless, SAR, Telecom
Taiwan	EMC, RF, Telecom, SAR, Safety
Hong Kong	RF/Wireless, SAR, Telecom
Australia	EMC, RF, Telecom, SAR, Safety
Korea	EMI, EMS, RF, SAR, Telecom, Safety
Japan	EMI, RF/Wireless, SAR, Telecom
Singapore	EMC, RF, SAR, Telecom
Europe	EMC, RF, SAR, Telecom, Safety

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1. Report Revision History

Report No.	Report Version	Description	Issue Date
15050009-FCC-R1	NONE	Original	June 03, 2015

2. Customer information

Applicant Name	Collage Investments LLC.
Applicant Add	11437 NW 34 STREET Doral Florida United States 33178
Manufacturer	ZHENGZHOU SPEED COMMUNICATION EQUIPMEINT CO.,LTD
Manufacturer Add	6F, Tianzhan Building, Tairan 4th Rd, Chegongmiao, Futian District, Shenzhen, China

3. Test site information

Lab performing tests	SIEMIC (Shenzhen-China) LABORATORIES
Lab Address	Zone A, Floor 1, Building 2 Wan Ye Long Technology Park South Side of Zhoushi Road, Bao' an District, Shenzhen, Guangdong China 518108
FCC Test Site No.	718246
IC Test Site No.	4842E-1
Test Software	Radiated Emission Program-To Shenzhen v2.0

4. Equipment under Test (EUT) Information

Description of EUT:	Mobile Phone
Main Model:	LK700
Serial Model:	N/A
Date EUT received:	May 13 2015
Test Date(s):	May 28 to June 02, 2015
Equipment Category：	JBP
Antenna Gain:	GSM850:1.24dBi PCS1900: -3.61dBi UMTS-FDD Band V: 0.65dBi Bluetooth: 0.5dBi
Type of Modulation:	GSM / GPRS: GMSK EGPRS: GMSK, 8PSK UMTS-FDD: QPSK, 16QAM Bluetooth: GFSK, π /4DQPSK, 8DPSK
RF Operating Frequency (ies):	GSM850 TX: 824.2 ~ 848.8 MHz; RX: 869.2 ~ 893.8 MHz PCS1900 TX: 1850.2 ~ 1909.8 MHz; RX: 1930.2 ~ 1989.8 MHz UMTS-FDD Band V TX: 826.4 ~ 846.6 MHz; RX: 871.4 ~ 891.6 MHz Bluetooth: 2402-2480 MHz
Number of Channels:	GSM 850: 124CH PCS1900: 299CH UMTS-FDD Band V : 102CH Bluetooth: 79CH
Maximum Conducted AV Power to Antenna	GSM850: 33.19dBm PCS1900: 30.14 dBm UMTS-FDD Band V : 22.82 dBm

ERP/EIRP:	GSM850: 26.41 dBm / ERP PCS1900: 24.14dBm / EIRP UMTS-FDD Band V : 21.35 dBm / ERP
Port:	Earphone Port, USB Port
Input Power:	Battery: Model: F161 Spec: 3.7V 1000mAh Charger Max Voltage:4.3V Adapter: Model:LK700 Input: AC 100-240V; 50/60Hz 0.15A Max Output:DC5.0V; 500mA
Trade Name :	LIKUID
GPRS/EGPRS Multi-slot class	8/10/12
FCC ID:	GAO-LK700

5. Test Summary

The product was tested in accordance with the following specifications.

All testing has been performed according to below product classification:

FCC Rules	Description of Test	Result
§ 1.1307; § 2.1093	RF Exposure (SAR)	Compliance
§2.1046; § 22.913(a); § 24.232(c); § 27.50(c.10)	RF Output Power	Compliance
§ 24.232 (d)	Peak-Average Ratio	Compliance
§ 2.1047	Modulation Characteristics	Compliance
§ 2.1049; § 22.905; § 22.917; § 24.238;	99% & -26 dB Occupied Bandwidth	Compliance
§ 2.1051; § 22.917(a); § 24.238(a);	Spurious Emissions at Antenna Terminal	Compliance
§ 2.1053; § 22.917(a); § 24.238(a);	Field Strength of Spurious Radiation	Compliance
§ 22.917(a); § 24.238(a);	Out of band emission, Band Edge	Compliance
§ 2.1055; § 22.355; § 24.235;	Frequency stability vs. temperature Frequency stability vs. voltage	Compliance

Note: Testing was performed by configuring EUT to maximum output power status, the declared output power class for different

Measurement Uncertainty

Emissions		
Test Item	**Description**	**Uncertainty**
Band Edge and Radiated Spurious Emissions	Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 (for EUTs < 0.5m X 0.5m X 0.5m)	+5.6dB/-4.5dB
-	-	-

6. MEASUREMENTS, EXAMINATION AND DERIVED RESULTS

6.1 RF Exposure (SAR)

Test Result: Pass

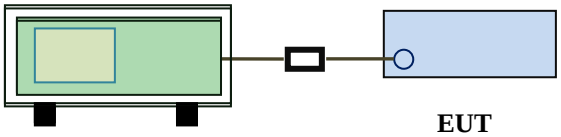
The EUT is a portable device, thus requires SAR evaluation;

Please refer to RF Exposure Evaluation Report: 15050009-SAR-FCC.

6.2 RF Output Power

Temperature	22°C
Relative Humidity	57%
Atmospheric Pressure	1029mbar
Test date :	May 29, 2015
Tested By :	Wiky.Jam

Requirement(s):

Spec	Item	Requirement	Applicable
§22.913 (a)	a)	ERP:38.45dBm	☑
§24.232 (c)	b)	EIRP:33dBm	☑
Test Setup			
Test Procedure	For Conducted Power: - The transmitter output port was connected to base station. - Set EUT at maximum power through base station. - Select lowest, middle, and highest channels for each band and different test mode. For ERP/EIRP: - The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable. - The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis. - The frequency range up to tenth harmonic of the fundamental frequency was investigated. - Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-		

	radiating cable. The absolute levels of the spurious emissions were measured by the substitution. - Spurious emissions in dB = 10 log (TX power in Watts/0.001) – the absolute level - Spurious attenuation limit in dB = 43 + 10 Log10 (power out in Watts.
Remark	
Result	☑ Pass ☐ Fail

Test Data ☑ Yes ☐ N/A

Test Plot ☐ Yes (See below) ☑ N/A

Conducted Power

GSM Mode:

Burst Average Power (dBm);								
Band	GSM850				PCS1900			
Channel	128	190	251	Tune up Power tolerant	512	661	810	Tune up Power tolerant
Frequency (MHz)	824.2	836.6	848.8	/	1850.2	1880	1909.8	/
GSM Voice (1 uplink),GMSK	32.99	33.02	33.19	32.5±1	29.23	29.75	30.14	29.5±1
GPRS Multi-Slot Class 8 (1 uplink),GMSK	32.78	32.89	33.01	32.5±1	29.21	29.71	30.09	29.5±1
GPRS Multi-Slot Class 10 (2 uplink) GMSK	30.89	31.10	31.24	30.5±1	27.31	27.51	27.7	27±1
EGPRS Multi-Slot Class 8 (1 uplink) GMSK MCS1	26.73	26.86	26.98	27±1	25.49	25.78	25.11	25±1
EGPRS Multi-Slot Class 10 (2 uplink) GMSK MCS1	32.84	32.91	32.87	32.5±1	29.21	29.64	30.10	29.5±1
EGPRS Multi-Slot Class 12 (4 uplink) GMSK MCS1	30.75	31.07	31.15	31±1	27.34	27.52	27.69	27±1
EGPRS Multi-Slot Class 8 (1 uplink) 8PSk	26.46	26.25	26.84	27±1	25.21	25.31	25.34	25±1
Remark : GPRS, CS1 coding scheme. EGPRS, MCS1 coding scheme. EGPRS, MCS5 coding scheme. Multi-Slot Class 8 , Support Max 4 downlink, 1 uplink , 5 working link Multi-Slot Class 10 , Support Max 4 downlink, 2 uplink , 5 working link Multi-Slot Class 12 , Support Max 4 downlink, 4 uplink , 5 working link								

Note: Since GSM mode has higher power, so the test items below were not performed to GPRS and EGPRS mode.

UMTS Mode:

UMTS-FDD Band V

Band/ Time Slot configuration	Channel	Frequency	Average power (dBm)
RMC 12.2kbps	4132	826.4	22.81
	4175	835	22.75
	4233	846.6	**22.82**
HSDPA Subtest1	4132	826.4	22.67
	4175	835	22.74
	4233	846.6	22.48
HSDPA Subtest2	4132	826.4	22.79
	4175	835	22.61
	4233	846.6	23.02
HSDPA Subtest3	4132	826.4	22.57
	4175	835	22.36
	4233	846.6	22.49
HSDPA Subtest4	4132	826.4	22.49
	4175	835	22.65
	4233	846.6	22.58
HSUPA Subtest1	4132	826.4	22.47
	4175	835	22.34
	4233	846.6	22.7
HSUPA Subtest2	4132	826.4	22.38
	4175	835	22.47
	4233	846.6	22.68
HSUPA Subtest3	4132	826.4	22.52
	4175	835	22.63
	4233	846.6	22.47
HSUPA Subtest4	4132	826.4	22.81
	4175	835	22.53
	4233	846.6	22.48
HSUPA Subtest5	4132	826.4	22.36
	4175	835	22.82
	4233	846.6	22.81

ERP & EIRP

ERP for Cellular Band (Part 22H)

Frequency (MHz)	Substituted level (dBm)	Antenna Polarization	Antenna Gain correction (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)
824.2	17.29	V	6.8	0.53	23.56	38.45
824.2	19.57	H	6.8	0.53	25.84	38.45
836.6	17.53	V	6.8	0.53	23.80	38.45
836.6	20.14	H	6.8	0.53	**26.41**	38.45
848.8	17.68	V	6.9	0.53	24.05	38.45
848.8	19.83	H	6.9	0.53	26.20	38.45

EIRP for PCS Band (Part 24E)

Frequency (MHz)	Substituted level (dBm)	Antenna Polarization	Antenna Gain correction (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)
1850.2	15.07	V	7.88	0.85	22.10	33
1850.2	16.75	H	7.88	0.85	23.78	33
1880	14.68	V	7.88	0.85	21.71	33
1880	16.82	H	7.88	0.85	23.85	33
1909.8	14.81	V	7.86	0.85	21.82	33
1909.8	17.13	H	7.86	0.85	**24.14**	33

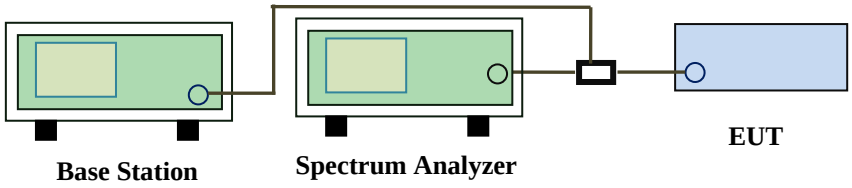
ERP for UMTS-FDD Band V (Part 22H)

Frequency (MHz)	Substituted level (dBm)	Antenna Polarization	Antenna Gain correction (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)
826.4	13.47	V	6.8	0.53	19.74	38.45
826.4	15.08	H	6.8	0.53	**21.35**	38.45
835	13.81	V	6.8	0.53	20.08	38.45
835	14.57	H	6.8	0.53	20.84	38.45
846.6	13.33	V	6.9	0.53	19.70	38.45
846.6	14.85	H	6.9	0.53	21.22	38.45

6.3 Peak-Average Ratio

Temperature	24°C
Relative Humidity	54%
Atmospheric Pressure	1020mbar
Test date :	May 20, 2015
Tested By :	Wiky.Jam

Requirement(s):

Spec	Item	Requirement	Applicable
§24.232(d)	a)	The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.	☑
Test Setup			
Test Procedure	According with KDB 971168 1. The signal analyzer' s CCDF measurement profile is enabled 2. Frequency = carrier center frequency 3. Measurement BW > Emission bandwidth of signal 4. The signal analyzer was set to collect one million samples to generate the CCDF curve 5. The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms. For burst transmissions, the spectrum analyzer is set to use an internal " RF Burst" trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the " on time" of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power		
Remark			
Result	☑ Pass ☐ Fail		

Test Data ☑ Yes ☐ N/A

Test Plot ☐ Yes (See below) ☑ N/A

PCS1900

Frequency (MHz)	Conducted power(dBm)		Peak-Average Ratio(PAR)
	Peak	Average	
1850.2	30.64	30.23	0.41
1880	30.97	30.71	0.26
1909.8	31.67	31.14	0.53

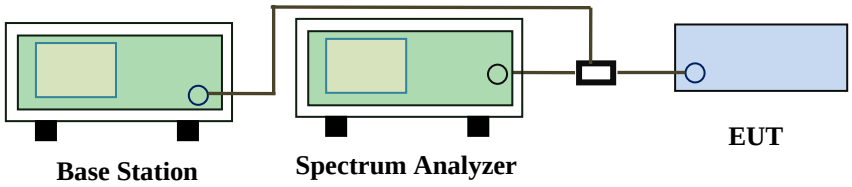
6.4 Modulation Characteristic

According to FCC § 2.1047(d), Part 22H, 24E there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

6.5 Occupied Bandwidth

Temperature	22°C
Relative Humidity	57%
Atmospheric Pressure	1029mbar
Test date :	May 29, 2015
Tested By :	Wiky.Jam

Requirement(s):

Spec	Item	Requirement	Applicable
§2.1049, §22.917, §22.905 §24.238	a)	99% Occupied Bandwidth(kHz)	☑
	b)	26 dB Bandwidth(kHz)	☑
Test Setup			
Test Procedure	- The EUT was connected to Spectrum Analyzer and Base Station via power divider. - The 99% and 26 dB occupied bandwidth (BW) of the middle channel for the highest RF powers.		
Remark			
Result	☑ Pass ☐ Fail		

Test Data ☑ Yes ☐ N/A

Test Plot ☑ Yes (See below) ☐ N/A

Cellular Band (Part 22H) result

Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Bandwidth (kHz)
128	824.2	245.7476	322.159
190	836.6	248.7237	316.720
251	848.8	247.1755	319.238

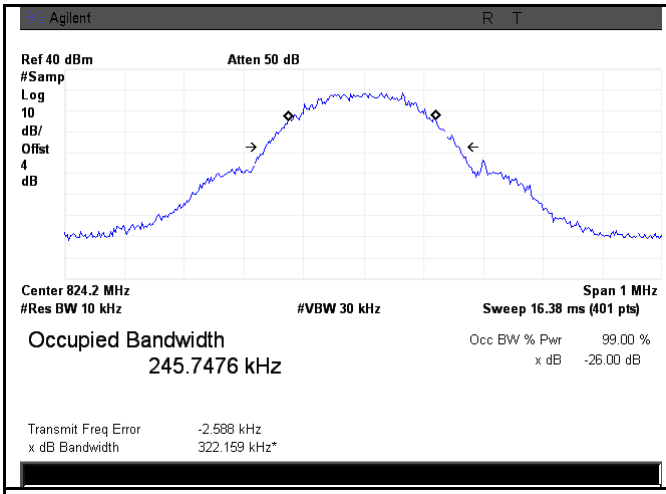
PCS Band (Part 24E) result

Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Bandwidth (kHz)
512	1850.2	247.9871	317.796
661	1880.0	249.9873	308.915
810	1909.8	246.6755	319.052

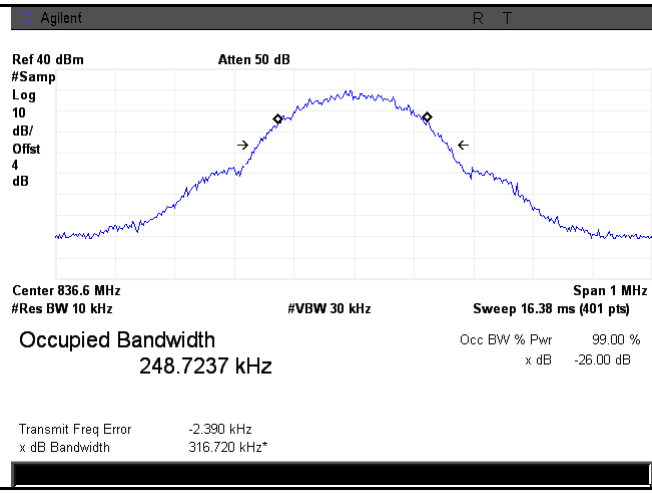
UMTS-FDD Band V (Part 22H)

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
4132	826.4	4.1490	4.7640
4175	835.0	4.1353	4.7360
4233	846.6	4.1718	4.6890

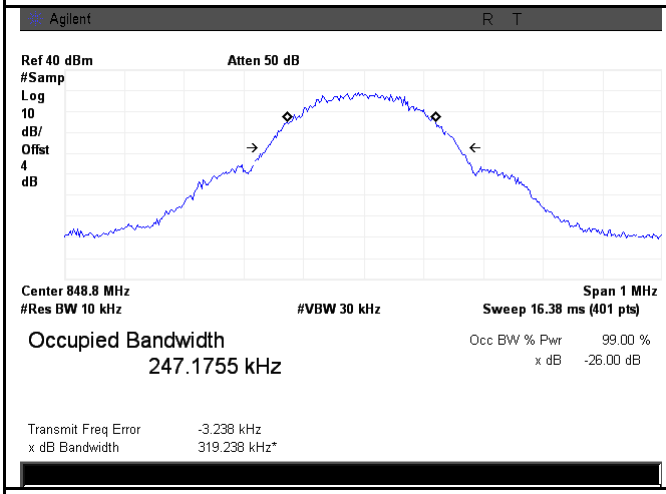
Test Plots



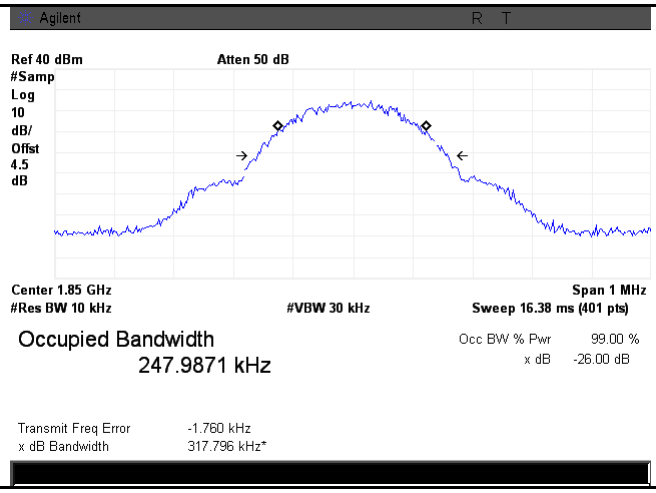
GSM 850 BW - Low CH 824.2MHz



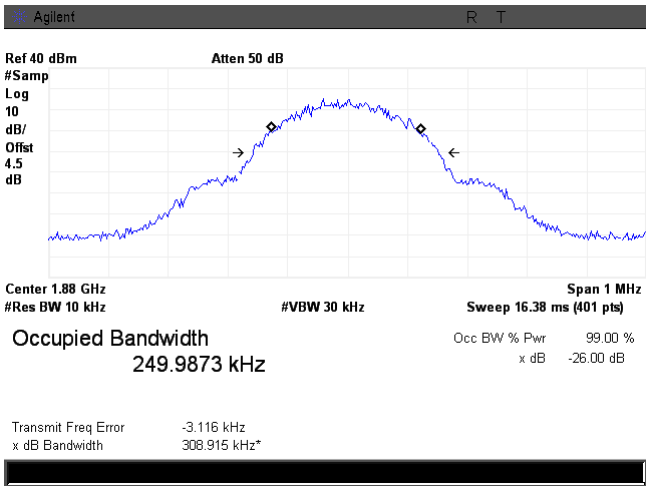
GSM 850 BW - Mid CH 836.6MHz



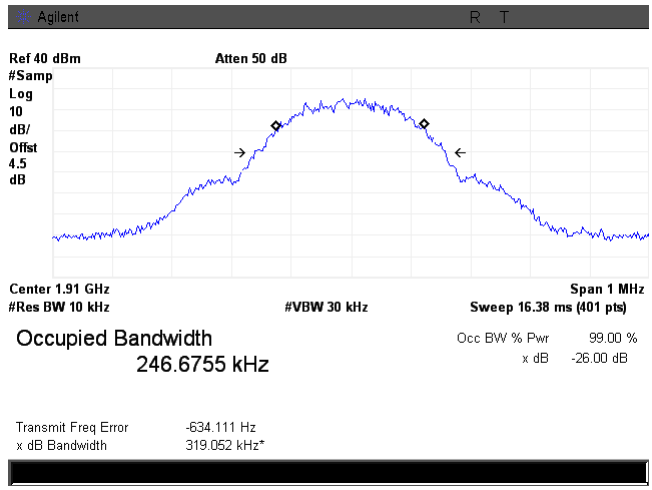
GSM 850 BW - High CH 848.8MHz



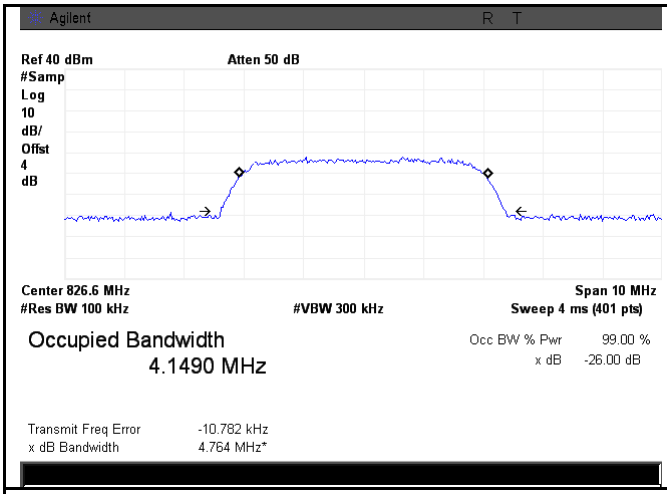
PCS 1900 BW - Low CH 1850.2MHz



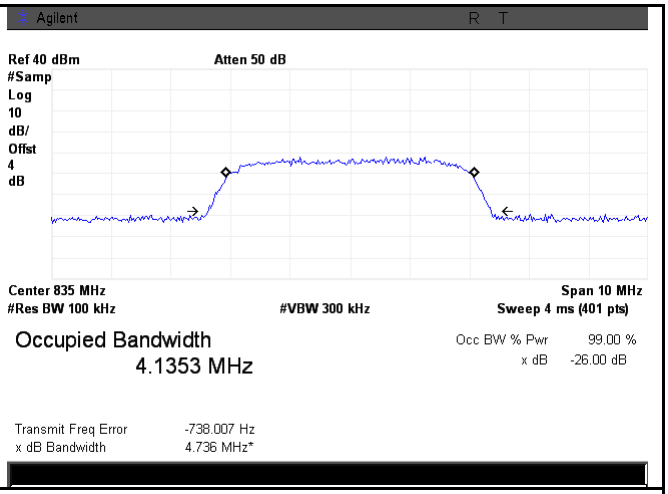
PCS 1900 BW - Mid CH 1880MHz



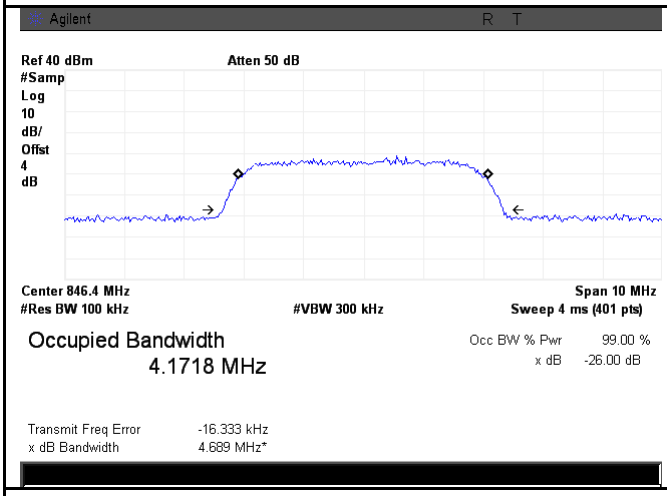
PCS 1900 BW - High CH 1909.8MHz



Band V BW - Low CH 826.6 MHz



Band V BW - Mid CH 835.0 MHz

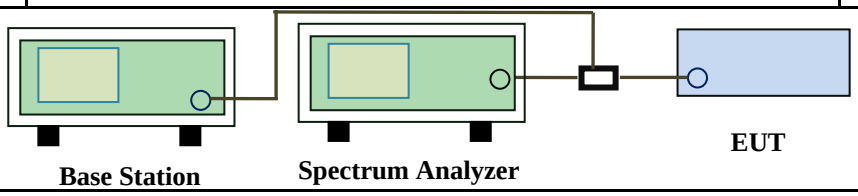


Band V BW - High CH 846.4 MHz

6.6 Spurious Emissions at Antenna Terminals

Temperature	22°C
Relative Humidity	57%
Atmospheric Pressure	1029mbar
Test date :	May 29, 2015
Tested By :	Wiky.Jam

Requirement(s):

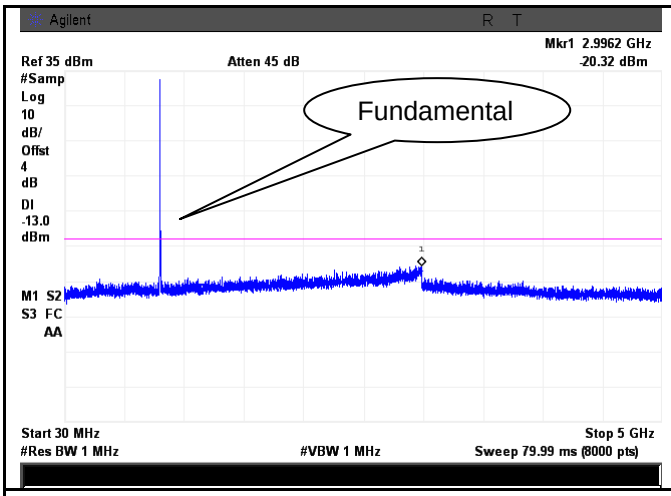
Spec	Item	Requirement	Applicable
§2.1051, §22.917(a)& §24.238(a) § 27.53(h)	a)	The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 43 + 10 log (P) dB	☑
Test Setup			
Test Procedure	- The EUT was connected to Spectrum Analyzer and Base Station via power divider. - The Band Edges of low and high channels for the highest RF powers were measured. - Setting RBW as roughly BW/100.		
Remark			
Result	☑ Pass ☐ Fail		

Test Data ☑ Yes ☐ N/A

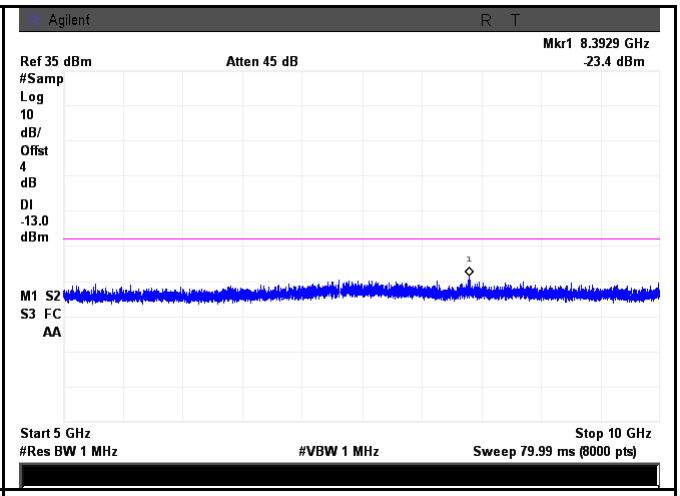
Test Plot ☑ Yes (See below) ☐ N/A

Test Plots

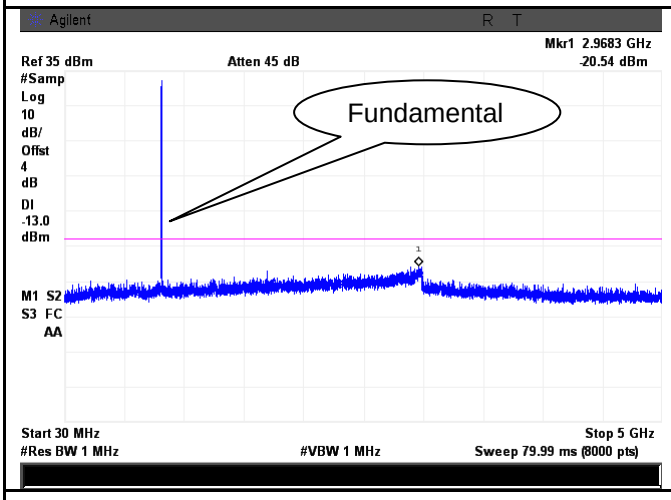
Cellular Band (Part 22H) result



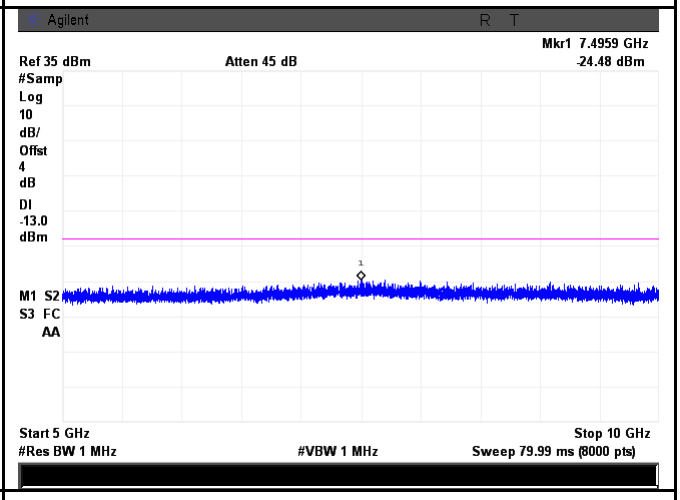
GSM 850 - Low Channel-1



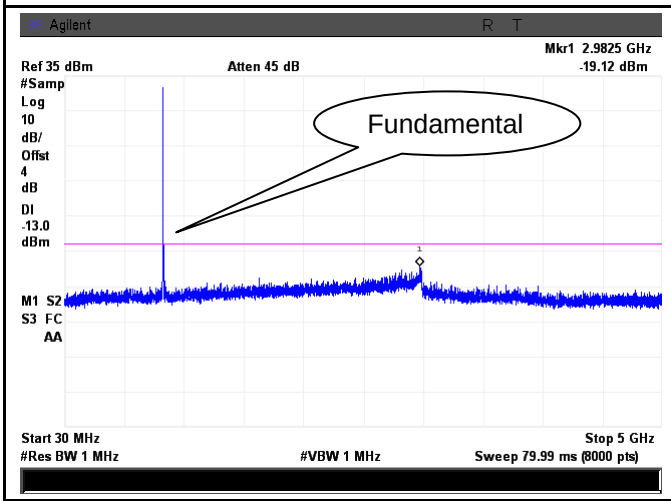
GSM 850 - Low Channel-2



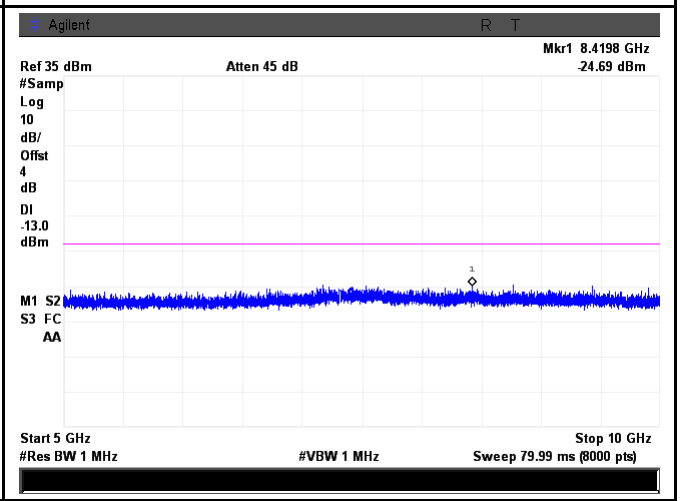
GSM 850 Middle Channel-1



GSM 850 Middle Channel-2

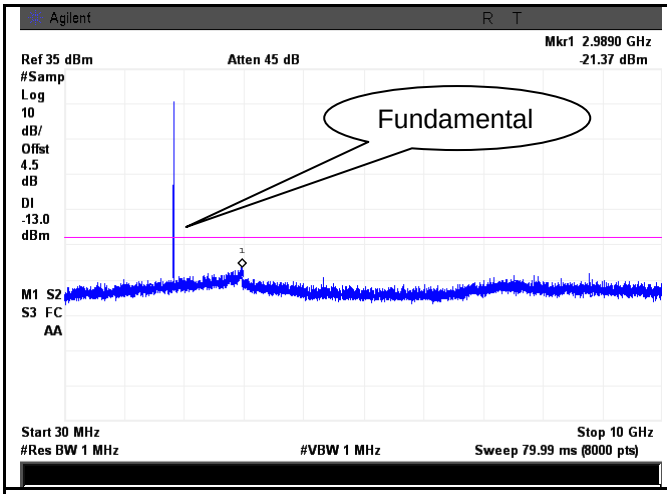


GSM 850 - High Channel-1

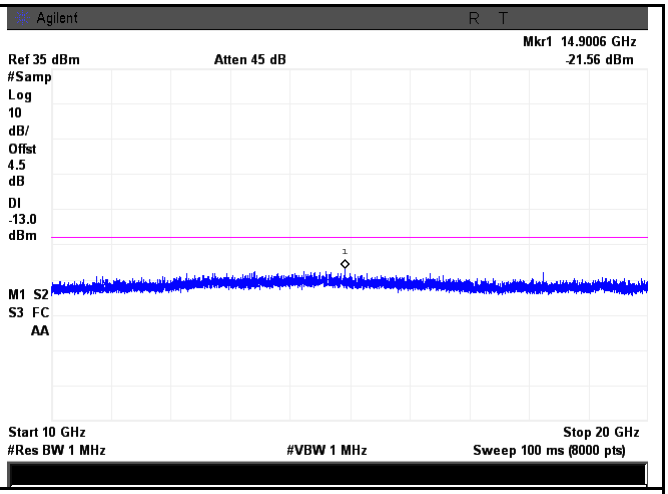


GSM 850 - High Channel-2

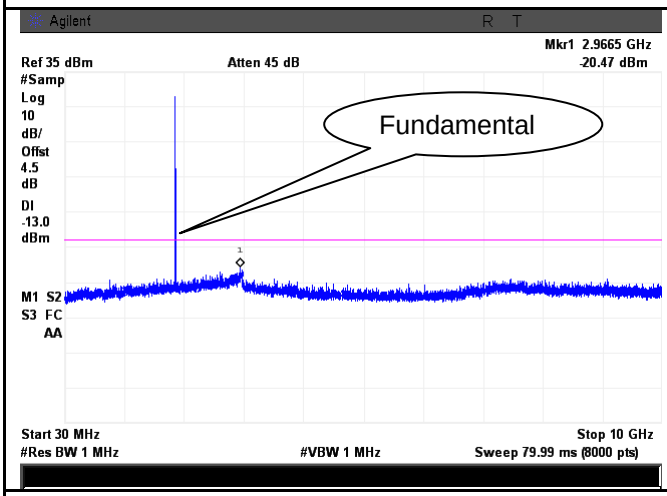
PCS Band (Part24E) result



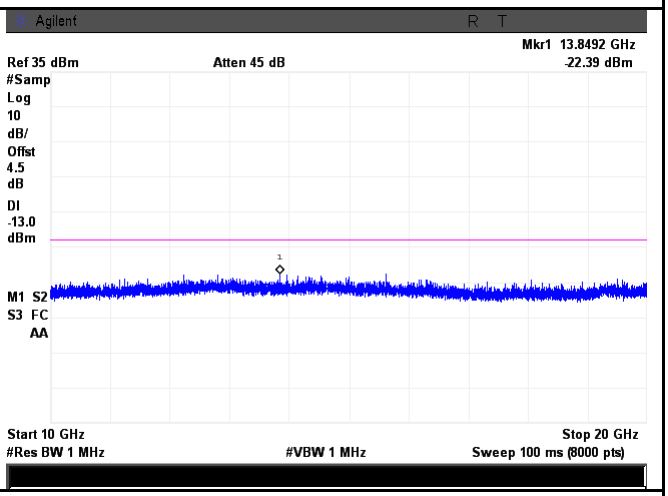
PCS1900 - Low Channel-1



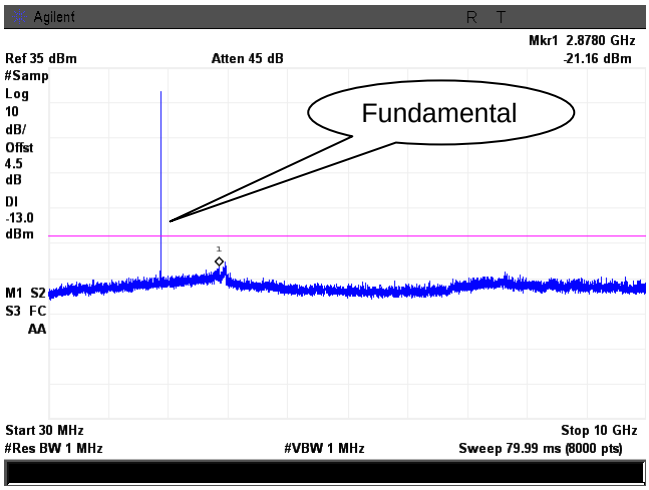
PCS 1900 - Low Channel-2



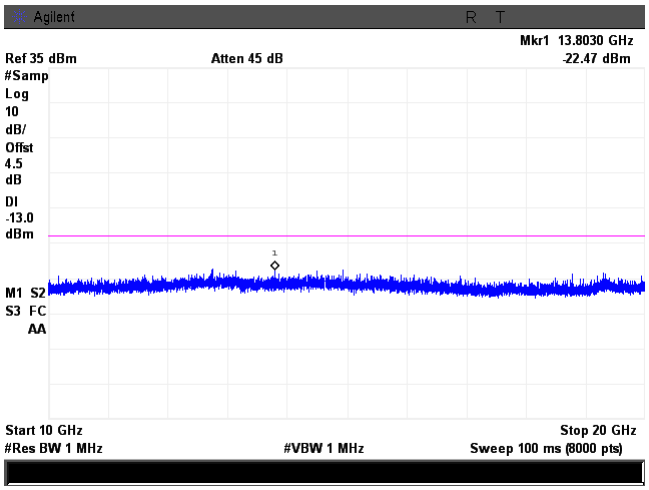
PCS1900 - Middle Channel-1



PCS 1900 - Middle Channel-2

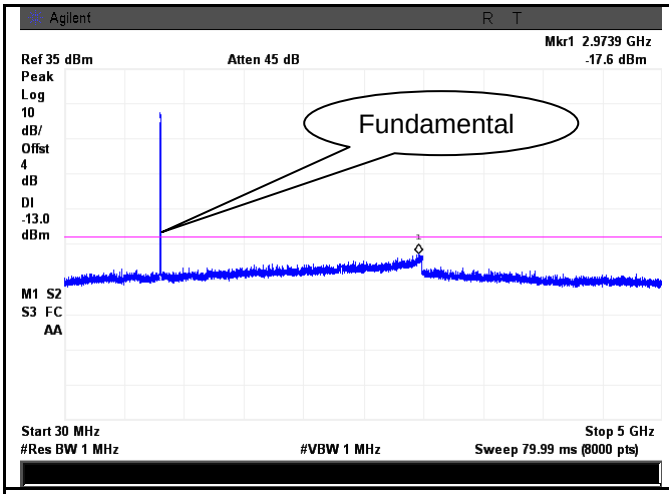


PCS1900 - High Channel-1

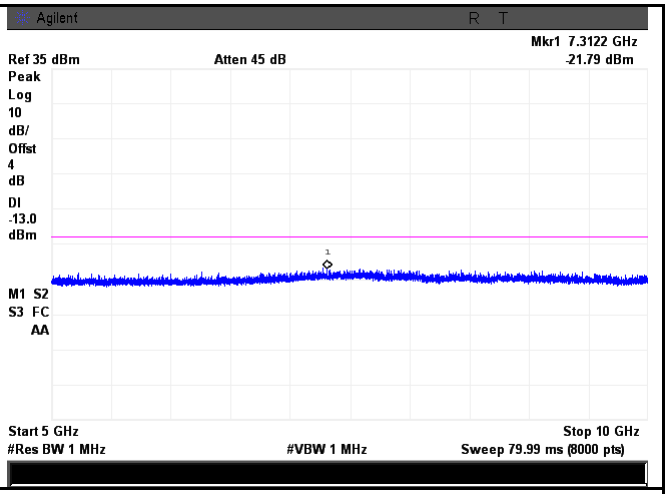


PCS 1900 - High Channel-2

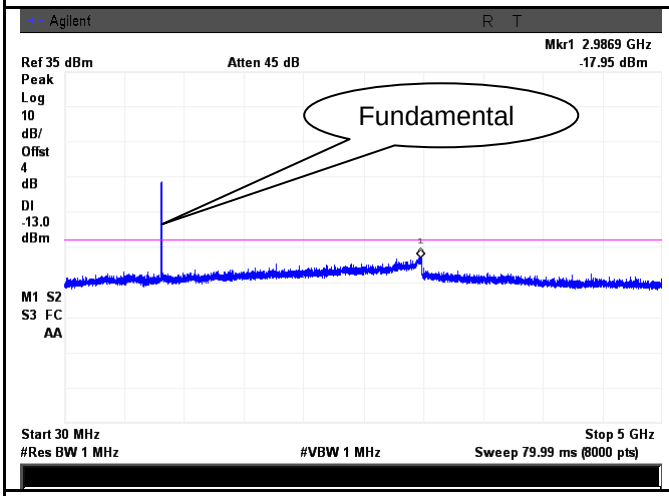
UMTS-FDD Band V (Part 22H)



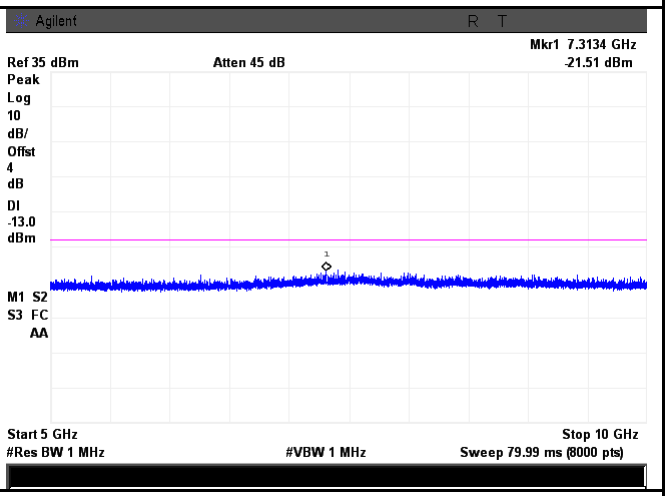
Band V - Low Channel-1



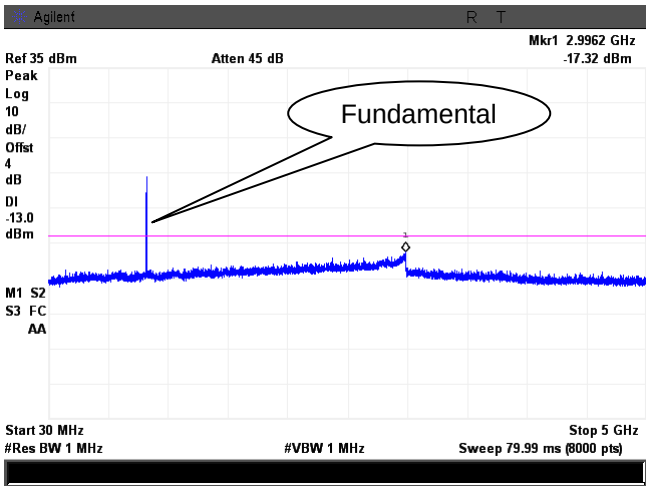
Band V - Low Channel-2



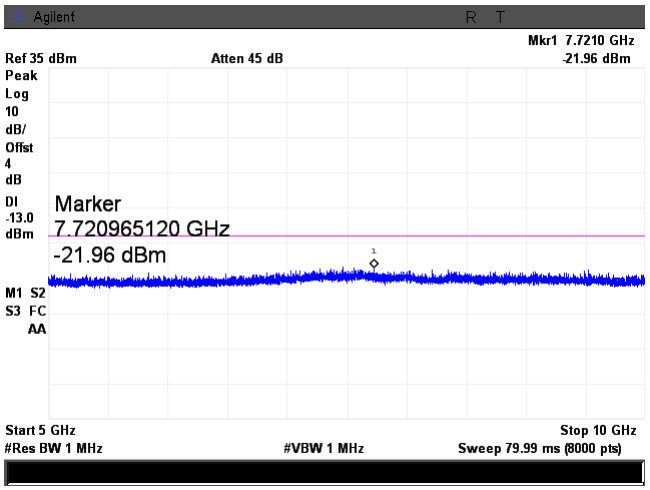
Band V - Middle Channel-1



Band V - Middle Channel-2



Band V - High Channel-1

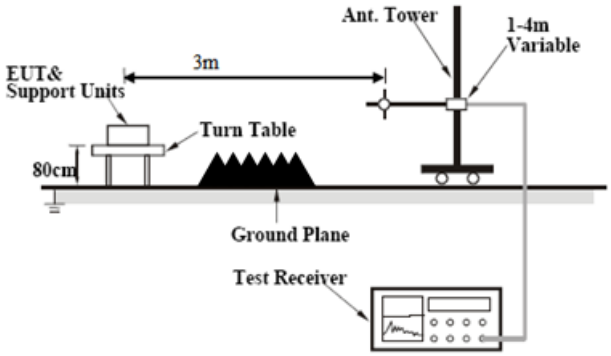


Band V - High Channel-2

6.7 Spurious Radiated Emissions

Temperature	22°C
Relative Humidity	57%
Atmospheric Pressure	1029mbar
Test date :	May 29, 2015
Tested By :	Wiky.Jam

Requirement(s):

Spec	Item	Requirement	Applicable
§2.1053, §22.917 & §24.238 § 27.53(h)	a)	The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.	☑
Test setup			
Test Procedure	1. The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable. 2. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis. 3. Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution. Sample Calculation: EUT Field Strength = Raw Amplitude (dBμV/m) – Amplifier Gain (dB) + Antenna Factor (dB) + Cable Loss (dB) + Filter Attenuation (dB, if used)		
Remark			

Result	☑ Pass	☐ Fail

Test Data ☑ Yes ☐ N/A

Test Plot ☐ Yes (See below) ☑ N/A

Cellular Band (Part 22H) result

Low channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1648.4	-43.56	V	7.95	0.78	-36.39	-13	-23.39
1648.4	-44.81	H	7.95	0.78	-37.64	-13	-24.64
389.3	-54.62	V	6.6	0.3	-48.32	-13	-35.32
768.7	-55.47	H	7.1	0.43	-48.8	-13	-35.8

Middle channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1673.2	-43.72	V	7.95	0.78	-36.55	-13	-23.55
1673.2	-44.93	H	7.95	0.78	-37.76	-13	-24.76
389.1	-55.08	V	6.6	0.3	-48.78	-13	-35.78
768.5	-55.68	H	7.1	0.43	-49.01	-13	-36.01

High channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1697.6	-43.29	V	7.95	0.78	-36.12	-13	-23.12
1697.6	-45.12	H	7.95	0.78	-37.95	-13	-24.95
389.5	-55.76	V	6.6	0.3	-49.46	-13	-36.46
768.9	-56.43	H	7.1	0.43	-49.76	-13	-36.76

PCS Band (Part24E) result

Low channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3700.4	-44.53	V	10.25	2.73	-37.01	-13	-24.01
3700.4	-45.02	H	10.25	2.73	-37.5	-13	-24.5
391.3	-55.89	V	6.6	0.3	-49.59	-13	-36.59
769.2	-56.36	H	7.1	0.43	-49.69	-13	-36.69

Middle channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3760	-44.68	V	10.25	2.73	-37.16	-13	-24.16
3760	-45.31	H	10.25	2.73	-37.79	-13	-24.79
391.5	-55.36	V	6.6	0.3	-49.06	-13	-36.06
769.6	-56.98	H	7.1	0.43	-50.31	-13	-37.31

High channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3819.6	-43.98	V	10.36	2.73	-36.35	-13	-23.35
3819.6	-44.52	H	10.36	2.73	-36.89	-13	-23.89
388.5	-56.05	V	6.6	0.3	-49.75	-13	-36.75
767.9	-57.54	H	7.1	0.43	-50.87	-13	-37.87

UMTS-FDD Band V (Part 22H)

Low channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1652.8	-45.18	V	7.95	0.78	-38.01	-13	-25.01
1652.8	-45.68	H	7.95	0.78	-38.51	-13	-25.51
388.3	-55.62	V	6.6	0.3	-49.32	-13	-36.32
767.5	-56.79	H	7.1	0.43	-50.12	-13	-37.12

Middle channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1670	-44.64	V	7.95	0.78	-37.47	-13	-24.47
1670	-45.64	H	7.95	0.78	-38.47	-13	-25.47
388.6	-55.78	V	6.6	0.3	-49.48	-13	-36.48
767.9	-57.34	H	7.1	0.43	-50.67	-13	-37.67

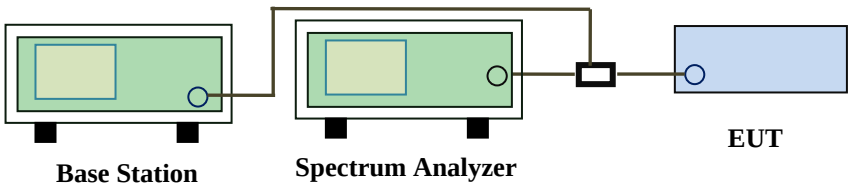
High channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1693.2	-45.06	V	7.95	0.78	-37.89	-13	-24.89
1693.2	-46.12	H	7.95	0.78	-38.95	-13	-25.95
388.1	-54.98	V	6.6	0.3	-48.68	-13	-35.68
768.4	-56.13	H	7.1	0.43	-49.46	-13	-36.46

6.8 Band Edge

Temperature	22°C
Relative Humidity	57%
Atmospheric Pressure	1029mbar
Test date :	May 29, 2015
Tested By :	Wiky.Jam

Requirement(s):

Spec	Item	Requirement	Applicable
§22.917(a) §24.238(a)	a)	The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 43 + 10 log (P) dB.	☑
Test setup			
Procedure	- The EUT was connected to Spectrum Analyzer and Base Station via power divider. - The Band Edges of low and high channels for the highest RF powers were measured. Setting RBW as roughly BW/100.		
Remark			
Result	☑ Pass ☐ Fail		

Test Data ☑ Yes ☐ N/A

Test Plot ☑ Yes (See below) ☐ N/A

Cellular Band (Part 22H) result

Frequency (MHz)	Emission (dBm)	Limit (dBm)
823.9950	-14.51	-13
849.0175	-14.47	-13

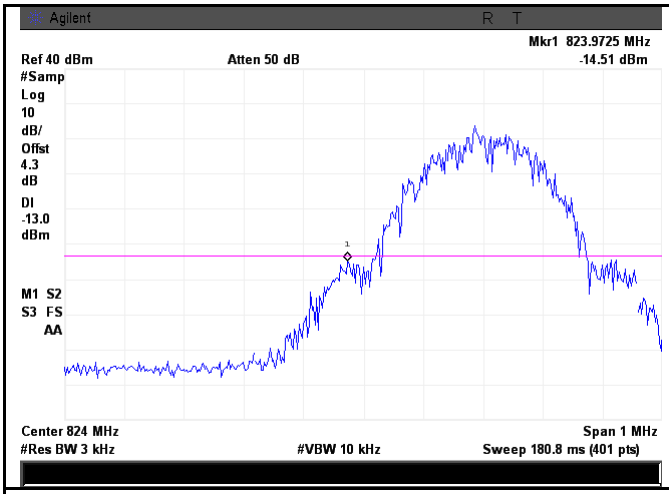
PCS Band (Part24E) result

Frequency (MHz)	Emission (dBm)	Limit (dBm)
1849.9950	-17.16	-13
1910.0175	-15.61	-13

UMTS-FDD Band V (Part 22H)

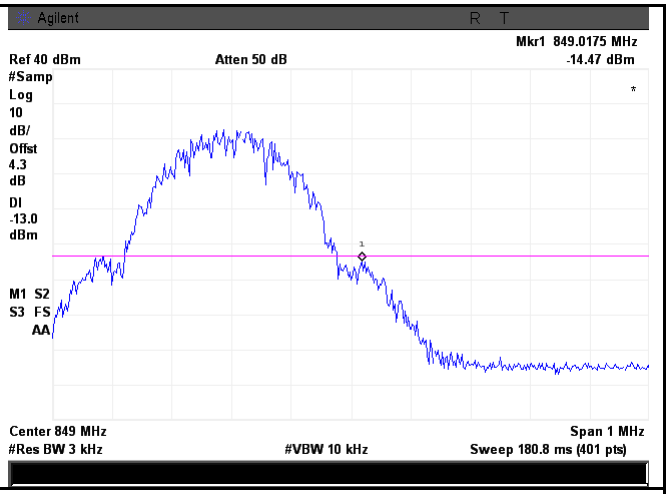
Frequency (MHz)	Emission (dBm)	Limit (dBm)
824.0000	-15.91	-13
849.1500	-16.94	-13

Test Plots



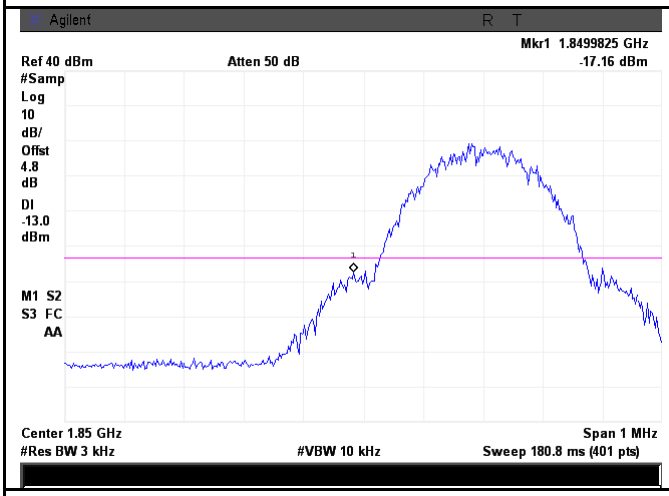
Cellular Band - Low Channel

Note: Offset=Cable loss (4.0) + 10log (3.22/3)=4.0+0.3=4.3 dB



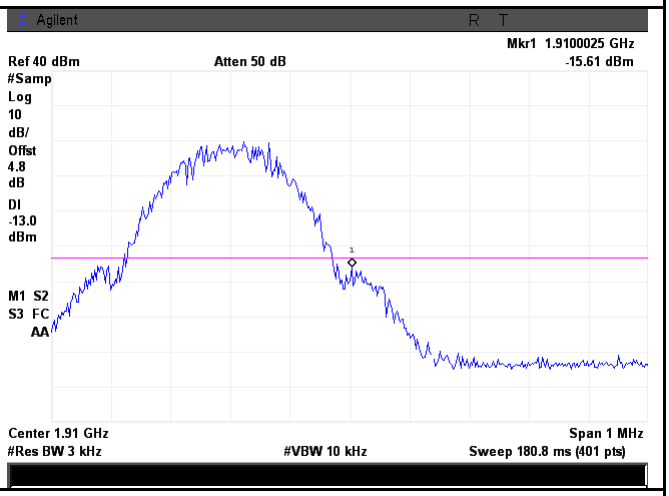
Cellular Band - High Channel

Note: Offset=Cable loss (4.0) + 10log (3.19/3)=4.0+0.3=4.2 dB



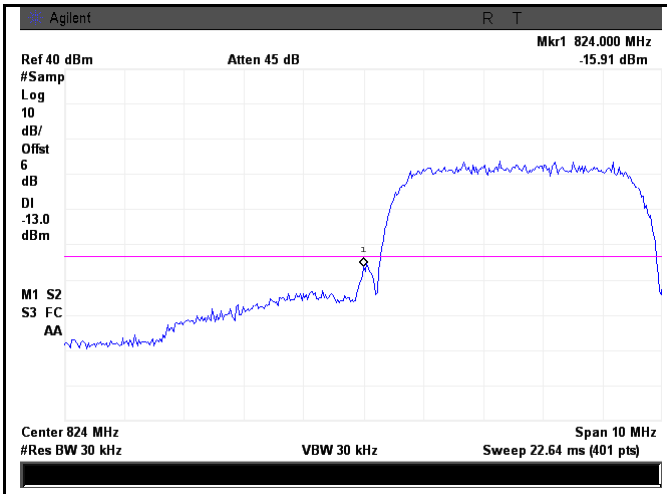
PCS Band - Low Channel

Note: Offset=Cable loss (4.5) + 10log (3.18/3)=4.5+0.3=4.8dB



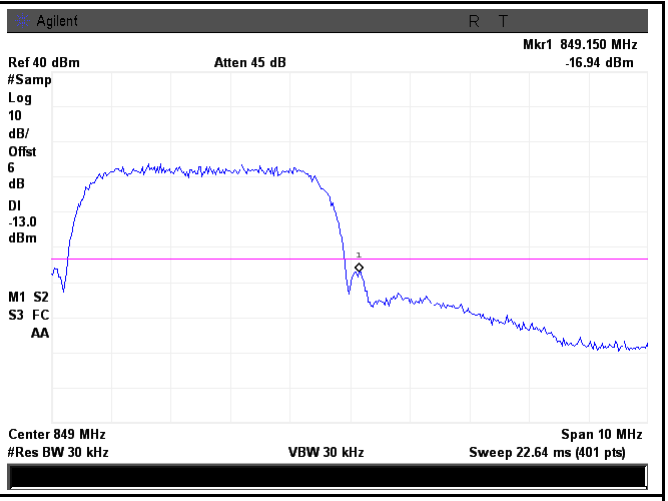
PCS Band - High Channel

Note: Offset=Cable loss (4.5) + 10log (3.19/3)=4.5+0.3=4.8 dB



UMTS-FDD Band V - Low Channel

Note: Offset=Cable loss (4.0) + 10log (47.64/30)=4.0+2=6.0dB



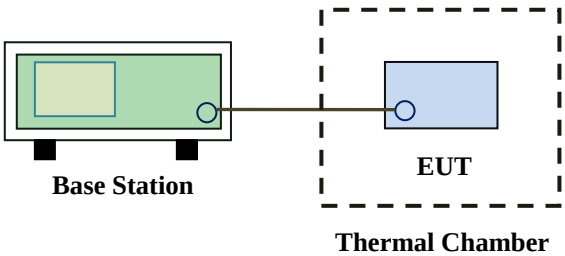
UMTS-FDD Band V - High Channel

Note: Offset=Cable loss (4.0) + 10log (46.89/30)=4.0+2.0=6.0 dB

6.9 Frequency Stability

Temperature	22°C
Relative Humidity	57%
Atmospheric Pressure	1029mbar
Test date :	May 29, 2015
Tested By :	Wiky.Jam

Requirement(s):

<table>
<tr><th>Spec</th><th>Item</th><th>Requirement</th><th>Applicable</th></tr>
<tr><td>§2.1055, §22.355 & §24.235</td><td>a)</td><td>According to §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table below:
Frequency Tolerance for Transmitters in the Public Mobile Services
<table>
<tr><th>Frequency Range (MHz)</th><th>Base, fixed (ppm)</th><th>Mobile ≤ 3 watts (ppm)</th><th>Mobile ≤ 3 watts (ppm)</th></tr>
<tr><td>25 to 50</td><td>20.0</td><td>20.0</td><td>50.0</td></tr>
<tr><td>50 to 450</td><td>5.0</td><td>5.0</td><td>50.0</td></tr>
<tr><td>450 to 512</td><td>2.5</td><td>5.0</td><td>5.0</td></tr>
<tr><td>821 to 896</td><td>1.5</td><td>2.5</td><td>2.5</td></tr>
<tr><td>928 to 29.</td><td>5.0</td><td>N/A</td><td>N/A</td></tr>
<tr><td>929 to 960.</td><td>1.5</td><td>N/A</td><td>N/A</td></tr>
<tr><td>2110 to 2220</td><td>10.0</td><td>N/A</td><td>N/A</td></tr>
</table>
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized frequency block.</td><td>☑</td></tr>
<tr><td>Test setup</td><td colspan="3"> 
</td></tr>
</table>

Procedure	A communication link was established between EUT and base station. The frequency error was monitored and measured by base station under variation of ambient temperature and variation of primary supply voltage. Limit: The frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5ppm) of the center frequency.
Remark	
Result	☑ Pass ☐ Fail

Test Data ☑ Yes ☐ N/A

Test Plot ☐ Yes (See below) ☑ N/A

Cellular Band (Part 22H) result

Middle Channel, f_o = 836.6 MHz				
Temperature (℃)	Power Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10	3.7	8	0.0096	2.5
0		7	0.0084	2.5
10		9	0.0108	2.5
20		8	0.0096	2.5
30		6	0.0072	2.5
40		7	0.0084	2.5
50		11	0.0131	2.5
55		5	0.0060	2.5
25	4.2	10	0.0120	2.5
	3.5	9	0.0108	2.5

PCS Band (Part 24E) result

Middle Channel, f_o = 1880 MHz				
Temperature (℃)	Power Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10	3.7	6	0.0032	2.5
0		7	0.0037	2.5
10		9	0.0048	2.5
20		5	0.0027	2.5
30		10	0.0053	2.5
40		7	0.0037	2.5
50		6	0.0032	2.5
55		11	0.0059	2.5
25	4.2	12	0.0064	2.5
	3.5	9	0.0048	2.5

UMTS-FDD Band V (Part 22H)

Middle Channel, f_o = 835 MHz				
Temperature (℃)	Power Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-10	3.7	-9	0.0108	2.5
0		-7	0.0084	2.5
10		-8	0.0096	2.5
20		-4	0.0048	2.5
30		-10	0.0120	2.5
40		-6	0.0072	2.5
50		-5	0.0060	2.5
55		-8	0.0096	2.5
25	4.2	-10	0.0120	2.5
	3.5	-11	0.0132	2.5

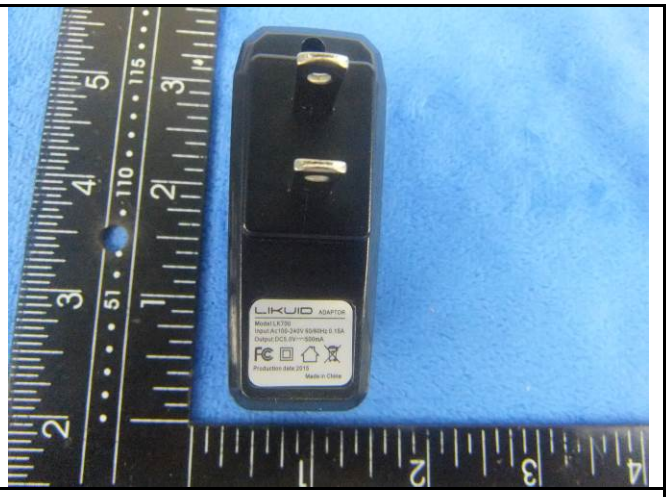
Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Due	In use
RF Conducted Test					
Agilent ESA-E SERIES SPECTRUM ANALYZER	E4407B	MY45108319	09/17/2014	09/16/2015	☑
Power Splitter	1#	1#	09/02/2014	09/01/2015	☑
Universal Radio Communication Tester	CMU200	121393	09/26/2014	09/25/2015	☑
Temperature/Humidity Chamber	UHL-270	001	10/10/2014	10/09/2015	☑
DC Power Supply	E3640A	MY40004013	09/18/2014	09/17/2015	☑
Radiated Emissions					
EMI test receiver	ESL6	100262	09/18/2014	09/17/2015	☑
OPT 010 AMPLIFIER (0.1-1300MHz)	8447E	2727A02430	09/02/2014	09/01/2015	☑
Microwave Preamplifier (1 ~ 26.5GHz)	8449B	3008A02402	03/25/2015	03/24/2016	☑
Bilog Antenna (30MHz~6GHz)	JB6	A110712	09/22/2014	09/21/2015	☑
Bilog Antenna (30MHz~2GHz)	JB1	A112017	09/22/2014	09/21/2015	☑
Double Ridge Horn Antenna (1 ~18GHz)	AH-118	71259	09/25/2014	09/24/2015	☑
Double Ridge Horn Antenna (1 ~18GHz)	AH-118	71283	09/25/2014	09/24/2015	☑
SYNTHESIZED SIGNAL GENERATOR	8665B	3744A01293	09/18/2014	09/17/2015	☑
Tunable Notch Filter	3NF-800/1000-S	AA4	09/02/2014	09/01/2015	☑
Tunable Notch Filter	3NF-1000/2000-S	AM 4	09/02/2014	09/01/2015	☑

Annex B. EUT And Test Setup Photographs

Annex B.i. Photograph: EUT External Photo

Whole Package - Top View



Adapter - Front View

EUT - Front View

EUT - Rear View

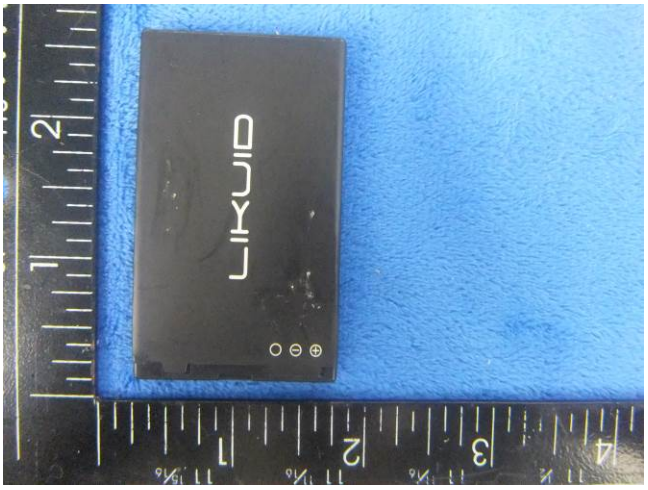
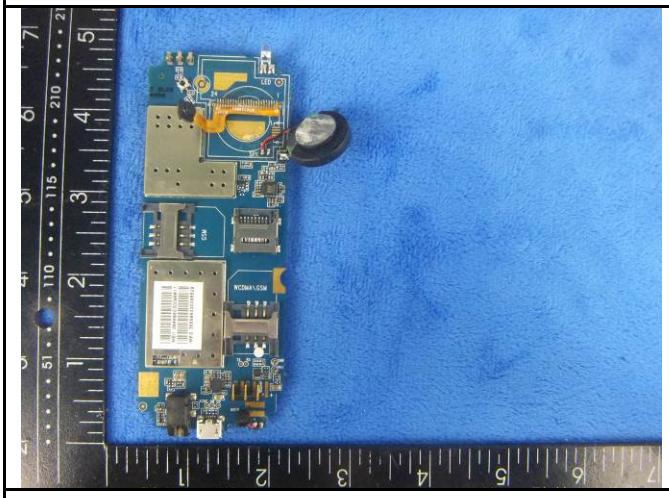
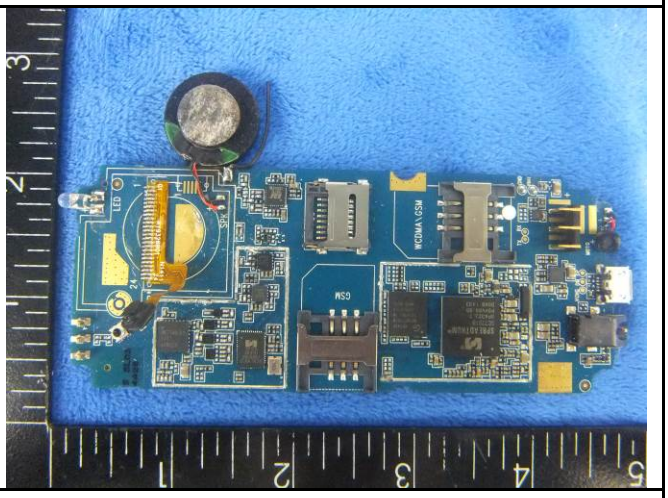
EUT - Top View

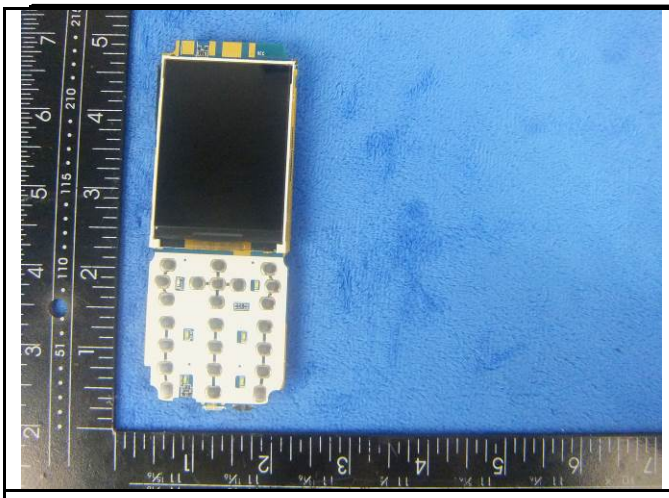
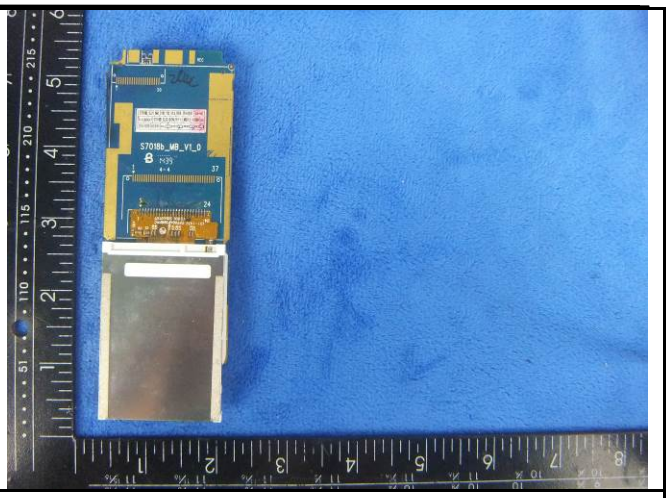
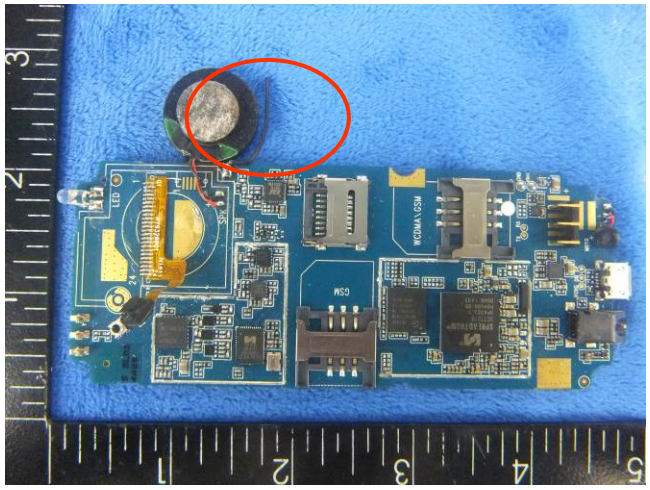
EUT - Bottom View

EUT - Left View

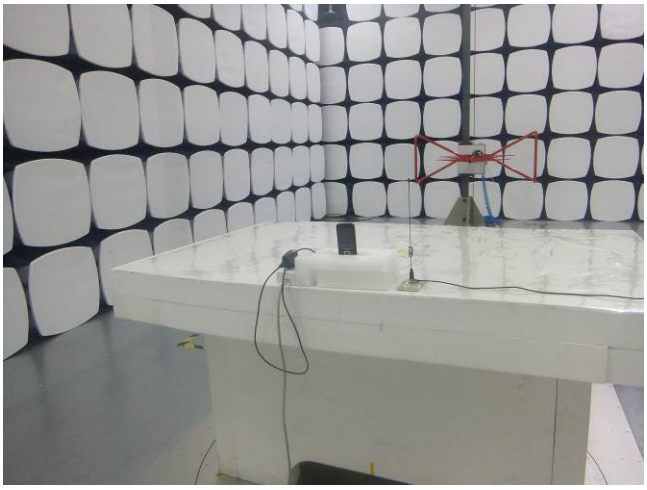
EUT - Right View

Annex B.ii. Photograph: EUT Internal Photo

<table>
<tr><td> </td><td> </td></tr>
<tr><td>Cover Off - Top View 1</td><td>Cover Off - Top View 2</td></tr>
<tr><td>  </td><td> </td></tr>
<tr><td>Battery - Top View</td><td>Battery - Bottom View</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Mainborad With Shielding - Front View</td><td>Mainborad Without Shielding - Front View</td></tr>
</table>

	
Mainborad With Shielding - rear View	Mainborad Without Shielding - rear View
	
BT - Antenna View	GSM/PCS/UMTS-FDD Antenna View

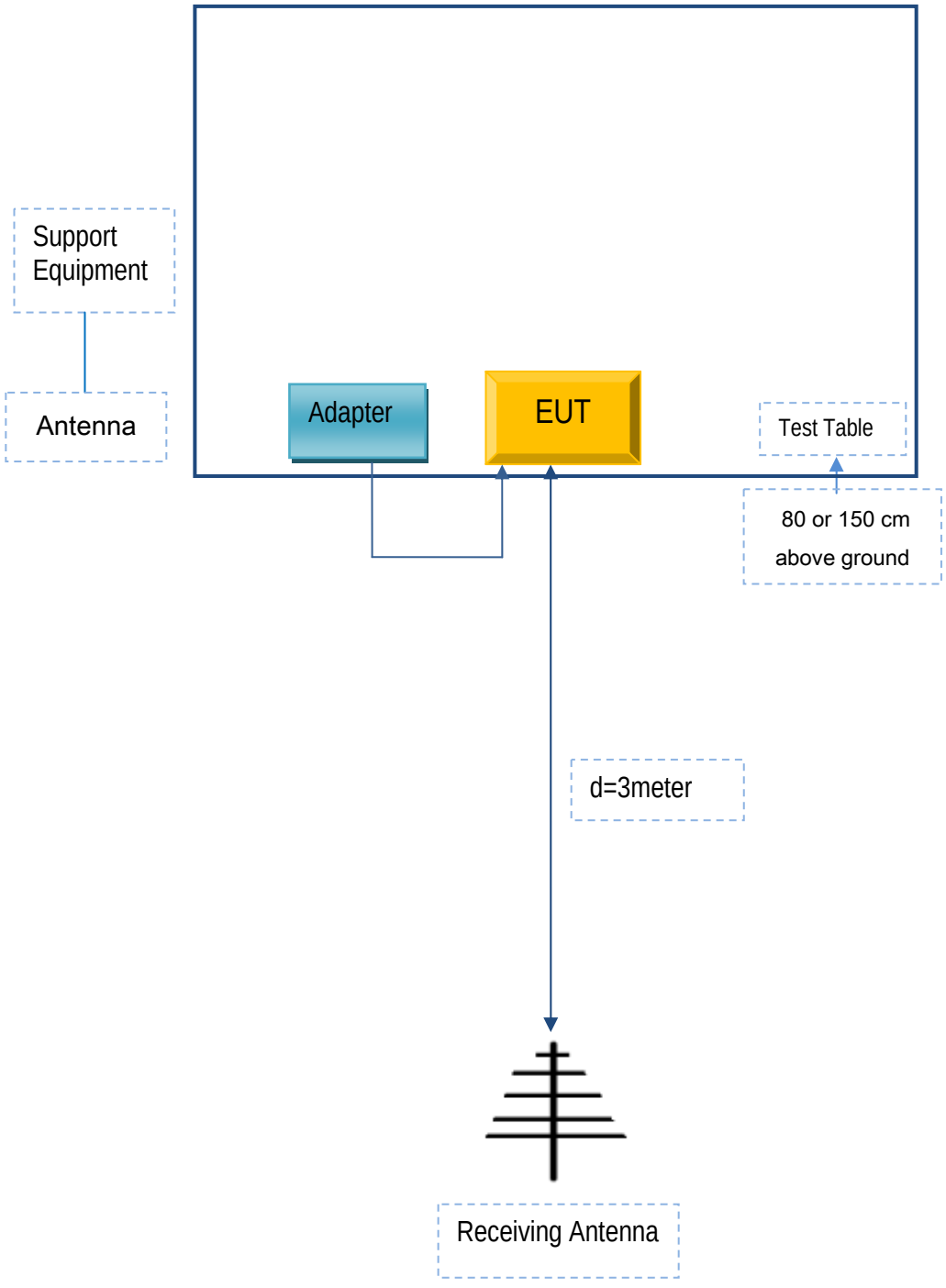
Annex B.iii. Photograph: Test Setup Photo

	
Radiated Spurious Emissions Test Setup Below 1GHz	Radiated Spurious Emissions Test Setup Above 1GHz

Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

Annex C.ii. TEST SET UP BLOCK

Block Configuration Diagram for Radiated Emissions



Annex C. il. SUPPORTING EQUIPMENT DESCRIPTION

The following is a description of supporting equipment and details of cables used with the EUT.

Manufacturer	Equipment Description	Model	Calibration Date	Calibration Due Date
N/A	N/A	N/A	N/A	N/A

Annex C.ii. EUT OPERATING CONKITIONS

The following is the description of how the EUT is exercised during testing.

Test	Description Of Operation
Emissions Testing	The EUT was communicating with base station and set to work at maximum output power.
Others Testing	The EUT was communicating with base station and set to work at maximum output power.

Annex D. User Manual / Block Diagram / Schematics / Partlist

Please see attachment

Annex E. DECLARATION OF SIMILARITY

N/A