RF TEST REPORT

Report No.: 15020210-FCC-R2
Supersede Report No.: N/A

Applicant	Beijing InHand Networks Technology Co., Ltd.
Product Name	Embedded Computer
Model No.	InBOX300
Serial No.	InBOX310、InBOX320、InBOX330、InBOX300S、InBOX310S、InBOX320S、InBOX330S
Test Standard	FCC Part 22(H):2016 ;FCC Part 24(E):2016; ANSI/TIA603 D: 2010
Test Date	January 11 to July4, 2016
Issue Date	July 4 , 2016
Test Result	☑ **Pass** ☐ **Fail**
Equipment complied with the specification	☑
Equipment did not comply with the specification	☐

Winnie Zhang	David Huang	
Winnie Zhang **Test Engineer**	**David Huang** **Checked By**	

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

Issued by:
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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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CONTENTS

1. Report Revision History

Report No.	Report Version	Description	Issue Date
15020210-FCC-R2	NONE	Original	January 22,2016
15020210-FCC-R2	NONE	Changing Tune up Power tolerant	July 4 , 2016

2. Customer information

Applicant Name	Beijing InHand Networks Technology Co., Ltd.
Applicant Add	101,West Wing,11th Floor,No.101,Lize central Park Wangjing,Chaoyang District,Beijing,100102,China
Manufacturer	Beijing InHand Networks Technology Co., Ltd.
Manufacturer Add	101,West Wing,11th Floor,No.101,Lize central Park Wangjing,Chaoyang District,Beijing,100102,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.	535293
IC Test Site No.	4842E-1
Test Software	EZ_EMC

4. Equipment under Test (EUT) Information

Description of EUT:	Embedded Computer
Main Model:	InBOX300
Serial Model:	InBOX310、 InBOX320、 InBOX330、 InBOX300S、 InBOX310S、 InBOX320S、 InBOX330S
Date EUT received:	July 13,2015
Test Date(s):	January 11 to July4, 2016
Equipment Category：	PCB
Antenna Gain:	GSM850/PCS1900:1 dBi UMTS-FDD Band V /UMTS-FDD Band II :2.5 dBi WIFI:802.11b/g/n(20M/40M): 2dBi
Type of Modulation:	GSM : GMSK UMTS-FDD: QPSK WIFI:802.11b/g/n(20M/40M): DSSS, OFDM
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 UMTS-FDD Band II TX:1852.4 ~ 1907.6 MHz; RX: 1932.4 ~ 1987.6 MHz WIFI:802.11b/g/n(20M): 2412-2472 MHz (TX/RX) WIFI:802.11n(40M): 2422-2452 MHz (TX/RX)
Maximum Conducted AV Power to Antenna:	GSM850: 32.32 dBm PCS1900: 30.00 dBm UMTS-FDD Band Ⅴ :24.95 dBm UMTS-FDD Band Ⅱ : 25.75 dBm
ERP/EIRP:	GSM850: 32.51 dBm / ERP PCS1900: 32.43 dBm / EIRP UMTS-FDD Band Ⅴ : 22.68 dBm / ERP UMTS-FDD Band Ⅱ : 24.66 dBm / EIRP
Number of Channels:	GSM 850: 124CH PCS1900: 299CH UMTS-FDD Band Ⅴ: 102CH UMTS-FDD Band Ⅱ : 277CH WIFI :802.11b/g/n(20M): 11CH

	WIFI:802.11n(40M):7CH
Port:	Power Port、USB Port*4、Micro SD Port、ttyO6/7 Port , HDMI Port、SIM Port、Speaker Port、MIC Port、ttyO3*2、ttyO5*2、LAN Port
Input Power:	DC 9-24V
Trade Name :	Inhand
GPRS/EGPRS Multi-slot class	8/10/12
FCC ID:	2AANYBOX

Note: the difference between these models please refer to Annex E. DECLARATION OF SIMILARITY.

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) ; § 27.50(d.4)	RF Output Power	Compliance
§ 24.232 (d) ; § 27.50(d)	Peak-Average Ratio	Compliance
§ 2.1049; § 22.905; § 22.917; § 24.238; § 27.53(a.5)	99% & -26 dB Occupied Bandwidth	Compliance
§ 2.1051; § 22.917(a); § 24.238(a); § 27.53(h)	Spurious Emissions at Antenna Terminal	Compliance
§ 2.1053; § 22.917(a); § 24.238(a); § 27.53(h)	Field Strength of Spurious Radiation	Compliance
§ 22.917(a); § 24.238(a); § 27.53(h)	Out of band emission, Band Edge	Compliance
§ 2.1055; § 22.355; § 24.235; § 27.5(h); § 27.54	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)

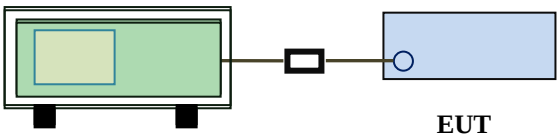
Test Result: Pass

The EUT is a mobile device, thus requires RF exposure evaluation;
Please refer to SIEMIC RF Exposure Report: 15020210-FCC-H1.

6.2 RF Output Power

Temperature	23℃
Relative Humidity	55%
Atmospheric Pressure	1003mbar
Test date :	January 13, 2016
Tested By :	Winnie Zhang

Requirement(s):

Spec	Item	Requirement	Applicable
§22.913 (a)	a)	ERP:38.45dBm	☑
§24.232 (c)	b)	EIRP:33dBm	☑
§27.50 (c)	c)	EIRP: 30dBm	☑
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				GSM1900			
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	/
GPRS Multi-Slot Class 8 (1 uplink),GMSK	32.23	**32.32**	32.24	32±1	29.98	29.64	**30.00**	30±1
GPRS Multi-Slot Class 10 (2 uplink) GMSK	28.89	28.78	28.70	29±1	27.78	27.58	27.93	28±1
GPRS Multi-Slot Class 12 (4 uplink) GMSK	25.33	25.21	25.33	25±1	24.85	24.73	24.75	25±1
EGPRS Multi-Slot Class 8 (1 uplink) ,GMSK	32.22	32.26	32.21	32±1	29.97	29.63	29.98	30±1
EGPRS Multi-Slot Class 10 (2 uplink) GMSK	28.78	28.73	28.71	29±1	27.78	27.51	27.93	28±1
EGPRS Multi-Slot Class 12 (4 uplink) GMSK	25.34	25.31	25.38	25±1	24.90	24.62	24.71	25±1
EGPRS Multi-Slot Class 8 (1 uplink) 8PSK MCS5 (1 uplink),GMSK	26.72	26.58	26.56	27±1	25.61	25.61	25.84	26±1
EGPRS Multi-Slot Class 10 (2 uplink) 8PSK MCS5 (2 uplink),GMSK	24.33	24.25	24.16	24±1	24.90	24.54	24.71	25±1
EGPRS Multi-Slot Class 12 (4 uplink) 8PSK MCS5 (4 uplink),GMSK	21.96	21.87	21.84	22±1	21.54	21.19	21.47	21±1
Remark : GPRS, CS1 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 EGPRS, MCS1 coding scheme. EGPRS, MCS5 coding scheme.								

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	Peak power (dBm)	Average power (dBm)
RMC 12.2kbps	4132	826.4	24.68	22.58
	4175	835	**24.95**	22.98
	4233	846.6	24.76	23.06
HSDPA Subtest1	4132	826.4	24.51	21.26
	4175	835	24.85	21.45
	4233	846.6	24.67	21.56
HSDPA Subtest2	4132	826.4	24.92	21.53
	4175	835	24.56	21.58
	4233	846.6	24.94	21.56
HSDPA Subtest3	4132	826.4	24.87	21.54
	4175	835	24.57	21.62
	4233	846.6	24.8	21.53
HSDPA Subtest4	4132	826.4	24.74	21.68
	4175	835	24.61	21.55
	4233	846.6	24.58	21.56
HSUPA Subtest1	4132	826.4	24.81	21.64
	4175	835	24.62	21.58
	4233	846.6	24.57	21.62
HSUPA Subtest2	4132	826.4	24.71	21.56
	4175	835	24.61	21.55
	4233	846.6	24.5	21.64
HSUPA Subtest3	4132	826.4	24.56	21.61
	4175	835	24.10	21.52
	4233	846.6	24.53	21.49
HSUPA Subtest4	4132	826.4	24.73	21.54
	4175	835	24.59	21.53
	4233	846.6	24.84	21.53
HSUPA Subtest5	4132	826.4	24.75	21.56
	4175	835	24.79	21.62
	4233	846.6	24.85	21.64

UMTS-FDD Band II

Band/ Time Slot configuration	Channel	Frequency	Peak power (dBm)	Average power (dBm)
RMC 12.2kbps	9262	1852.4	24.46	22.25
	9400	1880	**25.75**	22.33
	9538	1907.6	25.56	22.17
HSDPA Subtest1	9262	1852.4	23.45	21.45
	9400	1880	23.51	21.42
	9538	1907.6	23.61	21.41
HSDPA Subtest2	9262	1852.4	23.42	21.43
	9400	1880	23.31	21.42
	9538	1907.6	23.25	21.46
HSDPA Subtest3	9262	1852.4	23.48	21.48
	9400	1880	23.39	21.45
	9538	1907.6	23.47	21.47
HSDPA Subtest4	9262	1852.4	23.51	21.48
	9400	1880	23.61	21.43
	9538	1907.6	23.55	21.45
HSUPA Subtest1	9262	1852.4	23.34	21.42
	9400	1880	23.56	21.46
	9538	1907.6	23.67	21.43
HSUPA Subtest2	9262	1852.4	23.84	21.44
	9400	1880	23.46	21.42
	9538	1907.6	23.37	21.42
HSUPA Subtest3	9262	1852.4	23.71	21.48
	9400	1880	23.54	21.49
	9538	1907.6	23.15	21.45
HSUPA Subtest4	9262	1852.4	23.84	21.44
	9400	1880	23.57	21.51
	9538	1907.6	23.62	21.52
HSUPA Subtest5	9262	1852.4	23.33	21.43
	9400	1880	23.54	21.45
	9538	1907.6	23.24	21.44

ERP for Cellular Band (Part 22H)

Frequency (MHz)	Substituted level (dBm)	Antenna Polarization (H/V)	Antenna Gain correction (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)
824.2	26.18	V	6.8	0.53	32.45	38.45
824.2	24.43	H	6.8	0.53	30.70	38.45
836.6	26.22	V	6.8	0.53	32.49	38.45
836.6	24.47	H	6.8	0.53	30.74	38.45
848.8	26.14	V	6.9	0.53	**32.51**	38.45
848.8	24.48	H	6.9	0.53	30.85	38.45

EIRP for PCS Band (Part 24E)

Frequency (MHz)	Substituted level (dBm)	Antenna Polarization (H/V)	Antenna Gain correction (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)
1850.2	25.34	V	7.88	0.85	32.37	33
1850.2	23.71	H	7.88	0.85	30.74	33
1880	25.39	V	7.88	0.85	32.42	33
1880	23.66	H	7.88	0.85	30.69	33
1909.8	25.42	V	7.86	0.85	**32.43**	33
1909.8	23.65	H	7.86	0.85	30.66	33

ERP for UMTS-FDD BandV (Part 22H)

Frequency (MHz)	Substituted level (dBm)	Antenna Polarization (H/V)	Antenna Gain correction (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)
826.4	16.33	V	6.8	0.53	22.60	38.45
826.4	14.68	H	6.8	0.53	20.95	38.45
835	16.37	V	6.8	0.53	22.64	38.45
835	14.72	H	6.8	0.53	20.99	38.45
846.6	16.31	V	6.9	0.53	**22.68**	38.45
846.6	14.65	H	6.9	0.53	21.02	38.45

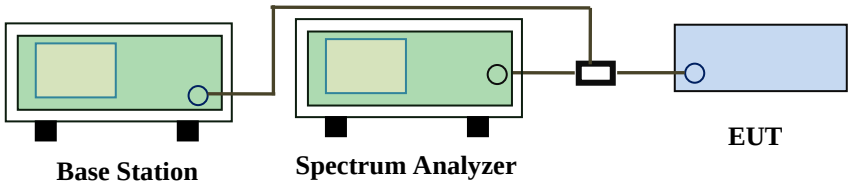
EIRP for UMTS-FDD BandII (Part 24E)

Frequency (MHz)	Substituted level (dBm)	Antenna Polarization (H/V)	Antenna Gain correction (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)
1852.4	17.59	V	7.88	0.85	24.62	33
1852.4	15.94	H	7.88	0.85	22.97	33
1880	17.62	V	7.88	0.85	24.65	33
1880	15.88	H	7.88	0.85	22.91	33
1907.6	17.65	V	7.86	0.85	**24.66**	33
1907.6	15.94	H	7.86	0.85	22.95	33

6.3 Peak-Average Ratio

Temperature	23℃
Relative Humidity	55%
Atmospheric Pressure	1003mbar
Test date :	January 13, 2016
Tested By :	Winnie Zhang

Requirement(s):

Spec	Item	Requirement	Applicable
§24.232(d) § 27.50(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

GSM 1900 PK-AV POWER(PART 24E)

Channel	Frequency	Peak power (dBm)	Average power (dBm)	PK-AV POWER(dBm)
512	1850.2	32.26	29.98	2.28
661	1880	32.25	29.64	2.61
810	1909.8	32.15	30	2.15

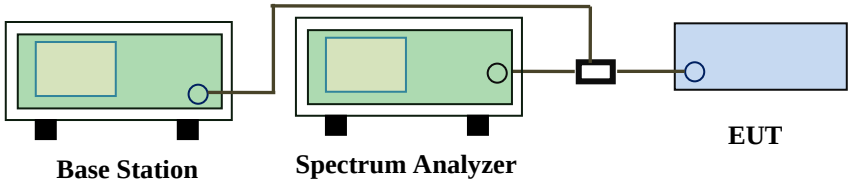
UMTS-FDD BandII PK-AV POWER(PART 24E)

Channel	Frequency	Peak power (dBm)	Average power (dBm)	PK-AV POWER(dBm)
9262	1852.4	28.03	22.25	5.78
9400	1880	27.57	22.33	5.24
9538	1907.6	27.85	22.17	5.68

6.4 Occupied Bandwidth

Temperature	23℃
Relative Humidity	55%
Atmospheric Pressure	1003mbar
Test date :	January 13, 2016
Tested By :	Winnie Zhang

Requirement(s):

Spec	Item	Requirement	Applicable
§2.1049, §22.917, §22.905 §24.238 §27.53(a)	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	244.8103	316.054
190	836.6	242.4827	312.331
251	848.8	242.8373	313.051

PCS Band (Part 24E) result

Channel	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Bandwidth (kHz)
512	1850.2	244.1560	322.142
661	1880.0	244.4050	314.620
810	1909.8	244.5027	318.612

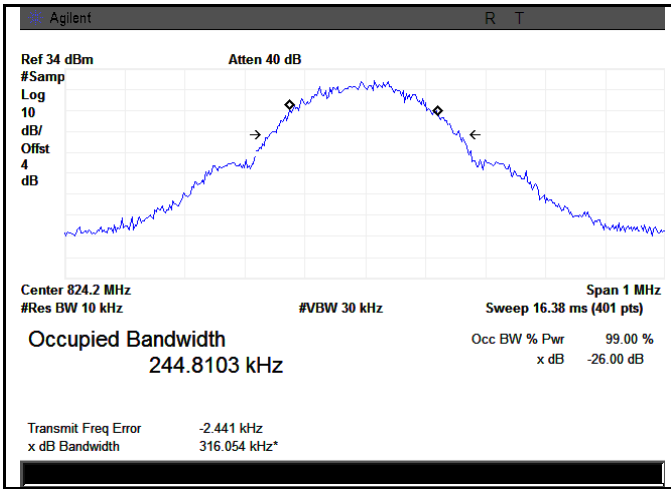
UMTS-FDD Band Ⅴ (Part 22H)

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
4132	826.4	4.1394	4.687
4175	835.0	4.1345	4.680
4233	846.6	4.1174	4.656

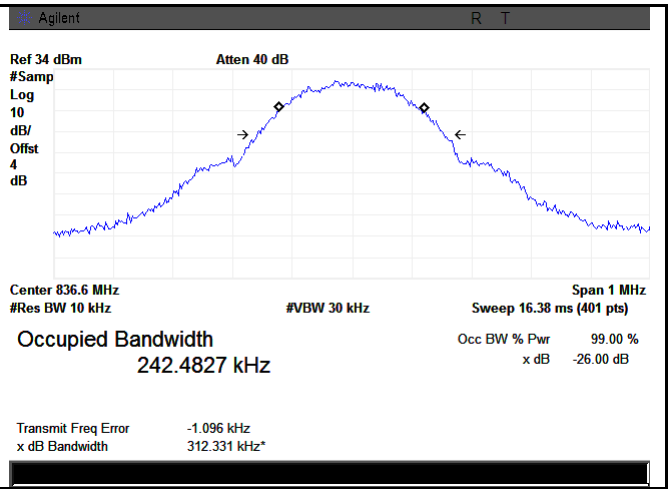
UMTS-FDD Band Ⅱ (Part 24E)

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
9262	1852.4	4.1379	4.667
9400	1880.0	4.1503	4.689
9538	1907.6	4.1369	4.698

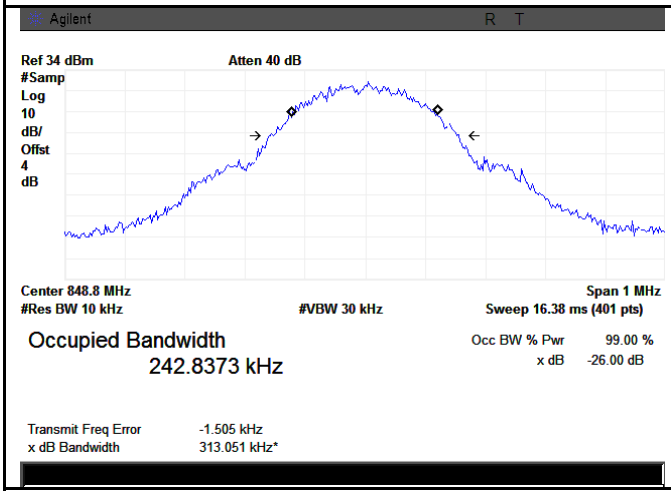
Test Plots



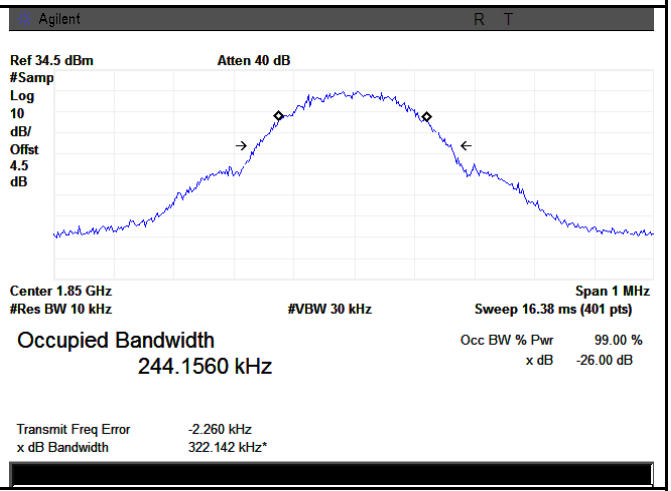
GSM 850 BW - Low CH 824.2MHz



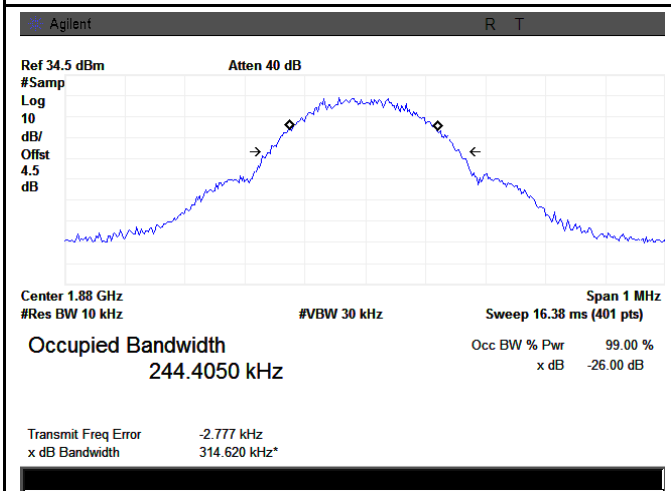
GSM 850 BW - Mid CH 836.6MHz



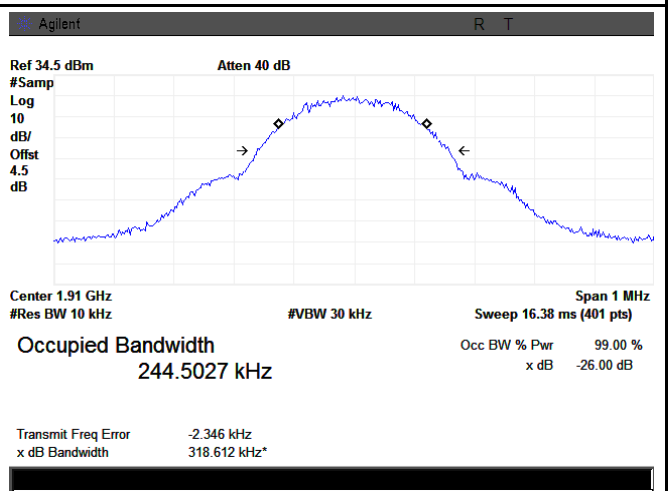
GSM 850 BW - High CH 848.8MHz



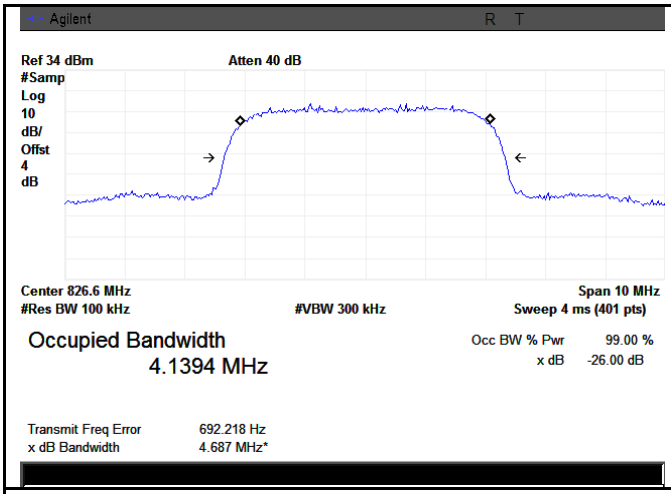
PCS 1900 BW - Low CH 1850.2MHz



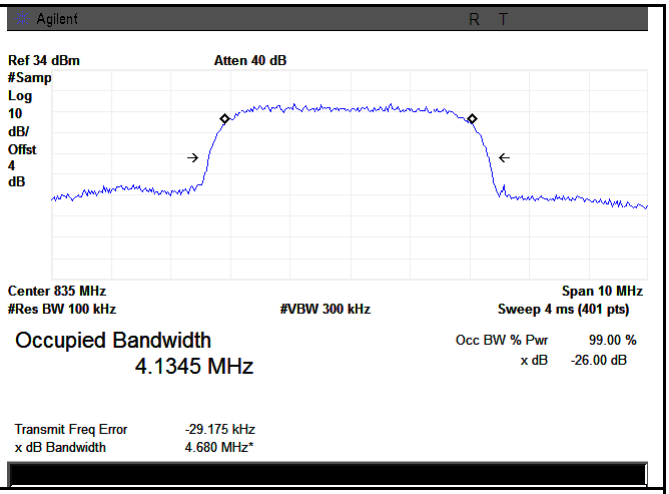
PCS 1900 BW - Mid CH 1880MHz



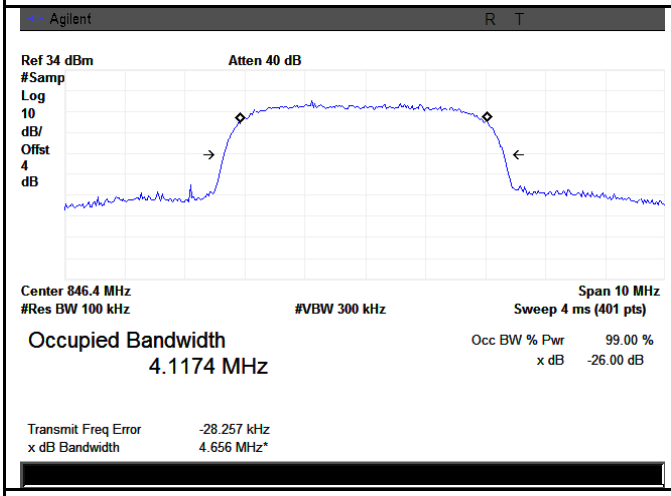
PCS 1900 BW - High CH 1909.8MHz



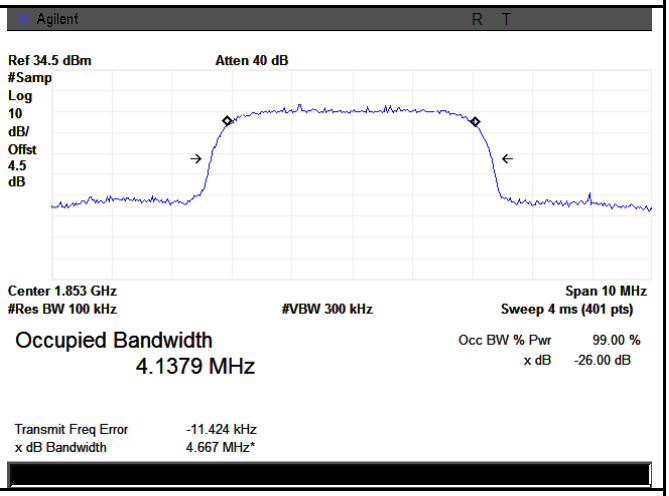
Band V BW - Low CH 826.6 MHz



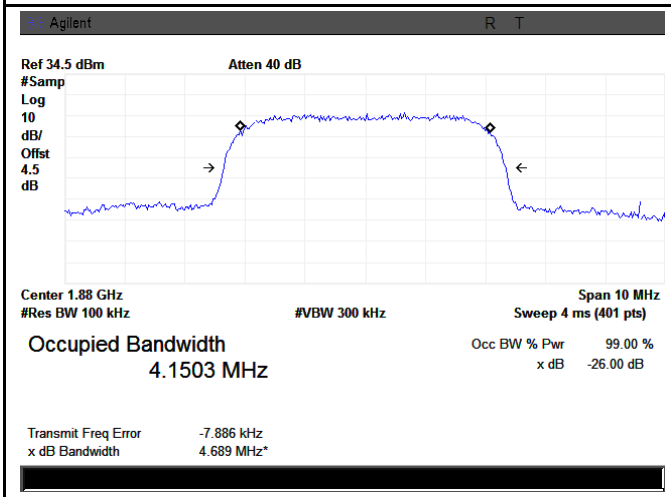
Band V BW - Mid CH 835.0 MHz



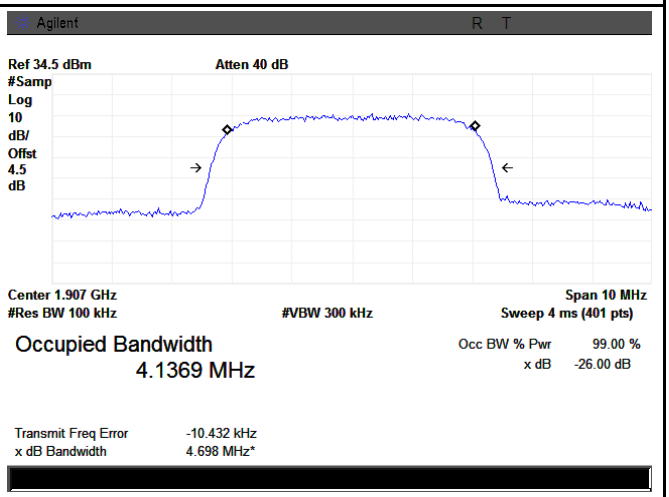
Band V BW - High CH 846.4 MHz



Band II BW - Low CH 1852.4MHz



Band II BW - Mid CH 1880MHz

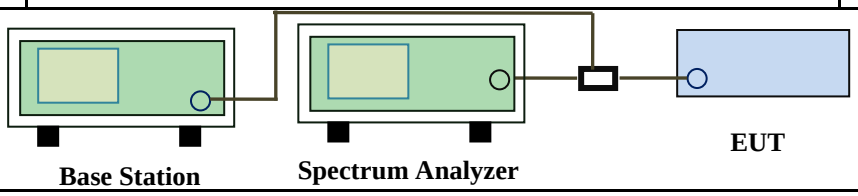


Band II BW - High CH 1907.6MHz

6.5 Spurious Emissions at Antenna Terminals

Temperature		23℃
Relative Humidity		55%
Atmospheric Pressure		1003mbar
Test date :		January 13, 2016
Tested By :		Winnie Zhang

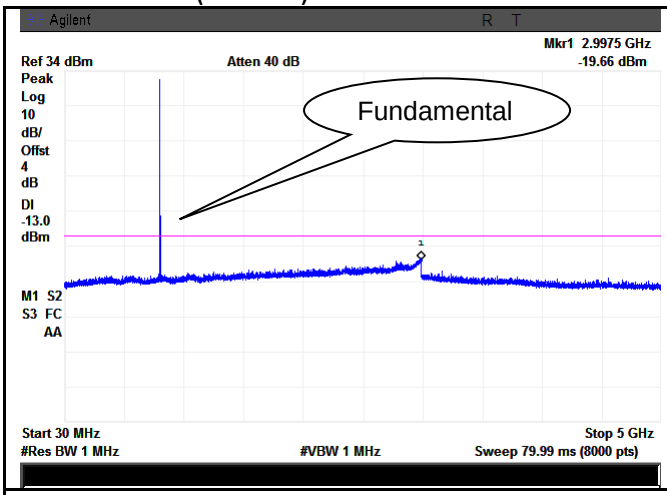
Requirement(s):

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		

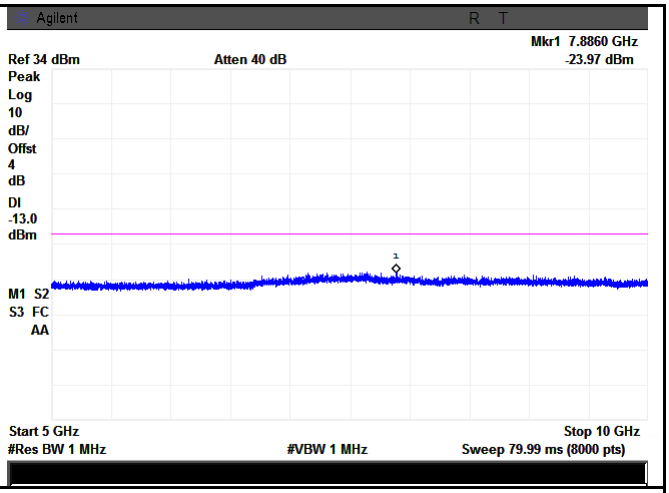
Test Data ☑ Yes ☐ N/A

Test Plot ☑ Yes (See below) ☐ N/A

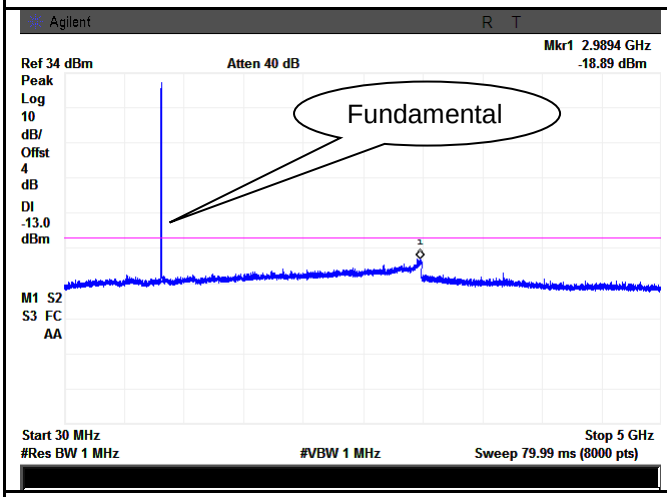
Test Plots
Cellular Band (Part 22H) result



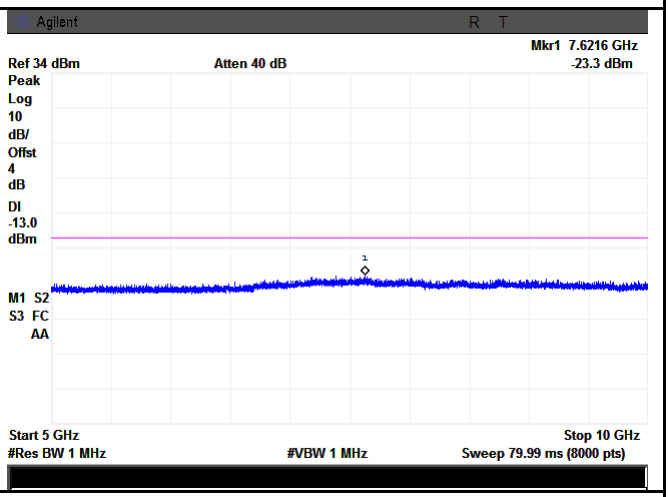
GSM 850 - Low Channel-1



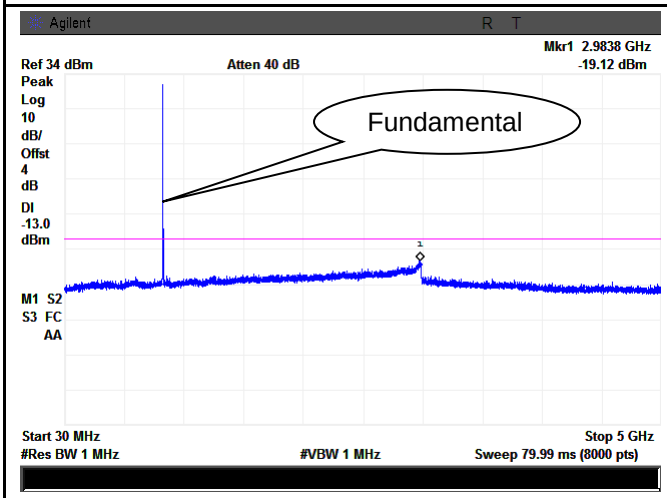
GSM 850 - Low Channel-2



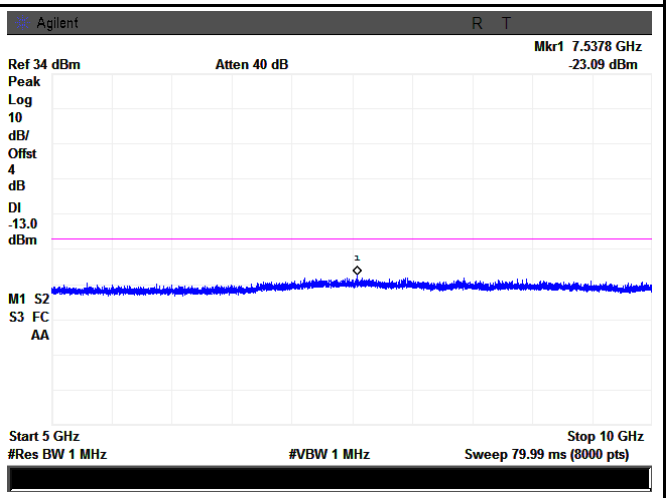
GSM 850 Middle Channel-1



GSM 850 Middle Channel-2

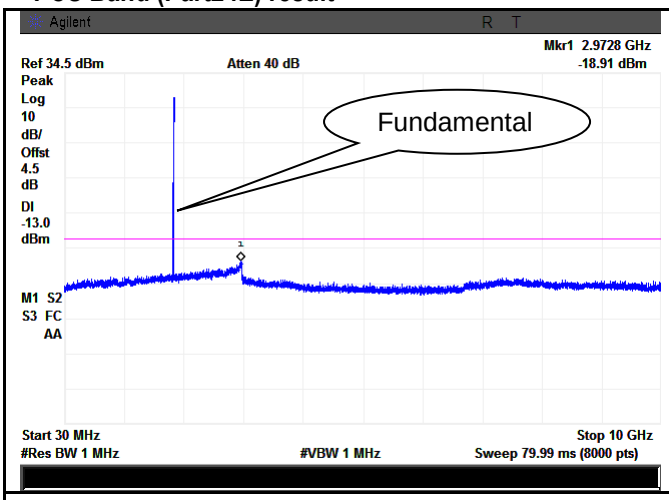


GSM 850 - High Channel-1

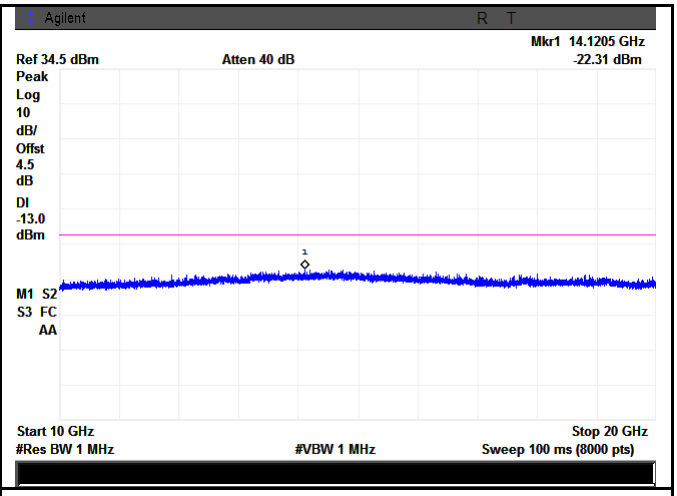


GSM 850 - High Channel-2

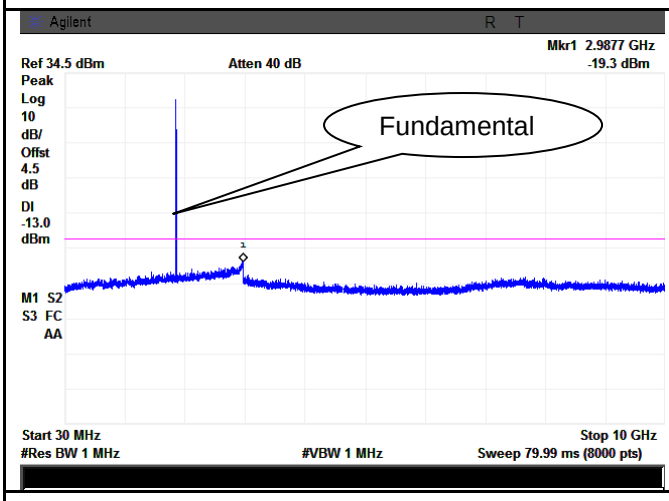
PCS Band (Part24E) result



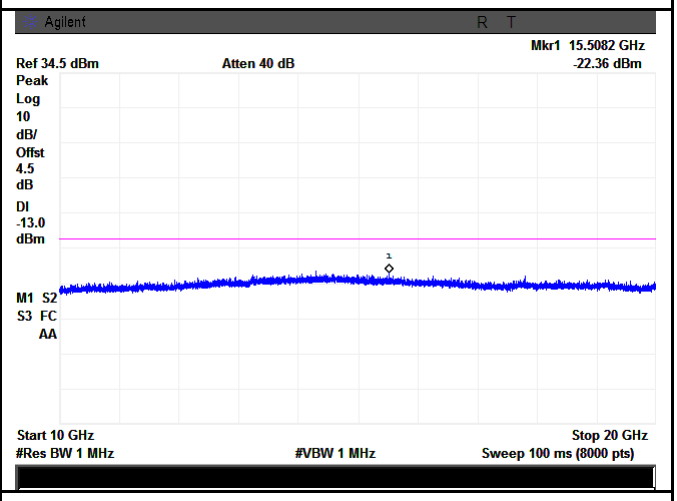
PCS1900 - Low Channel-1



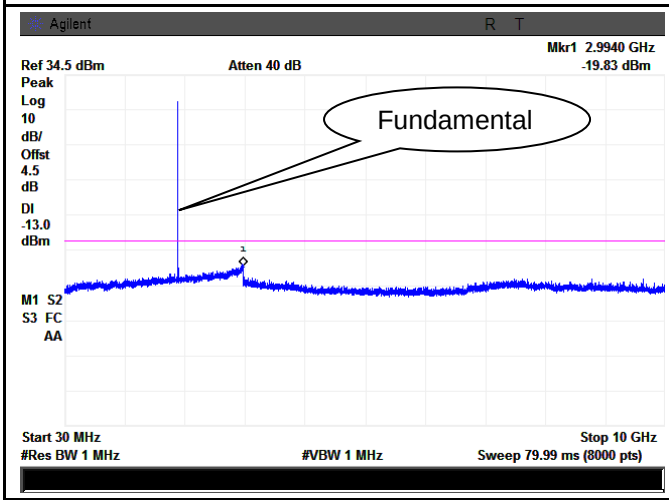
PCS 1900 - Low Channel-2



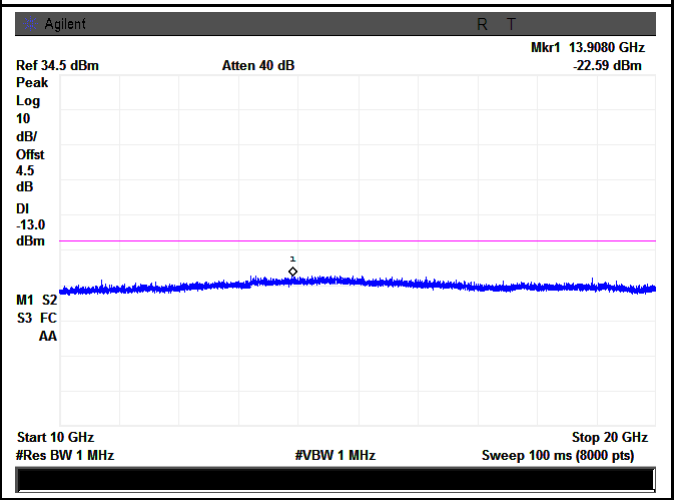
PCS1900 - Middle Channel-1



PCS 1900 - Middle Channel-2

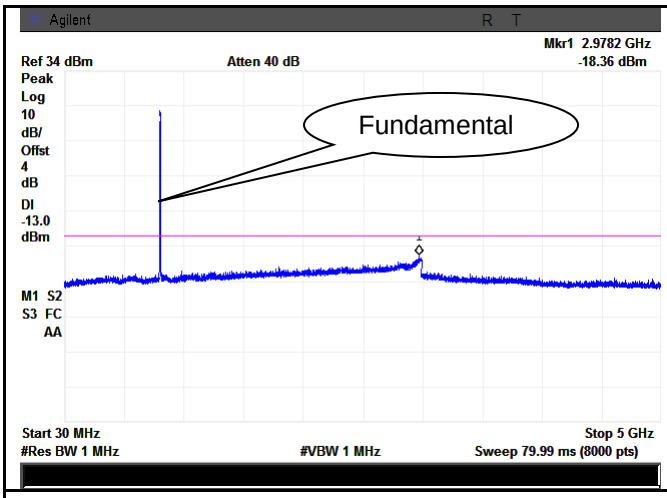


PCS1900 - High Channel-1

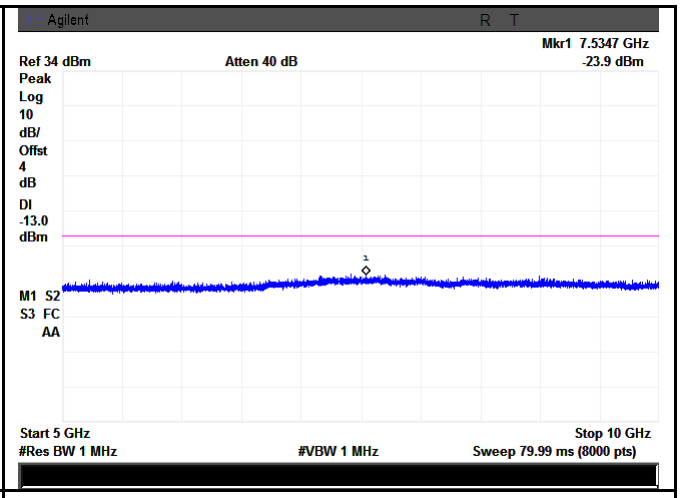


PCS 1900 - High Channel-2

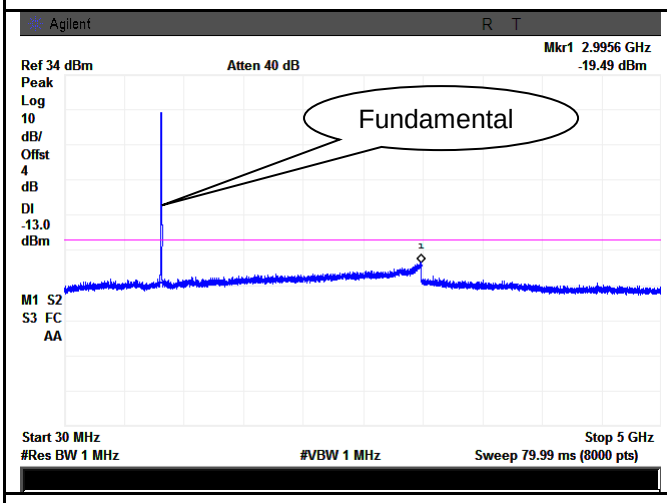
UMTS-FDD Band V (Part 22H)



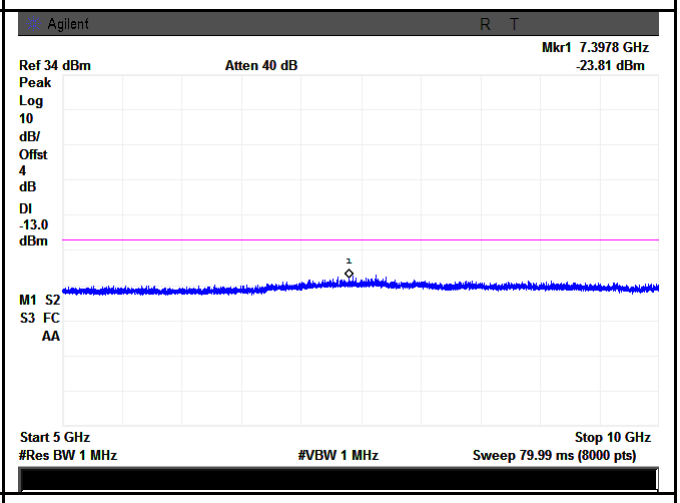
Band V - Low Channel-1



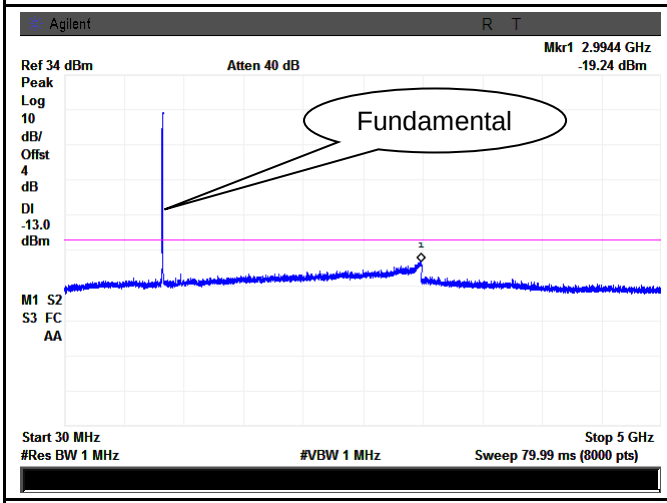
Band V - Low Channel-2



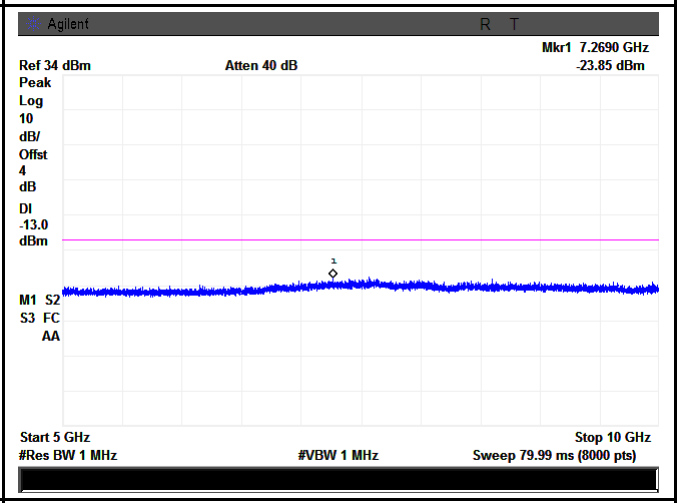
Band V - Middle Channel-1



Band V - Middle Channel-2

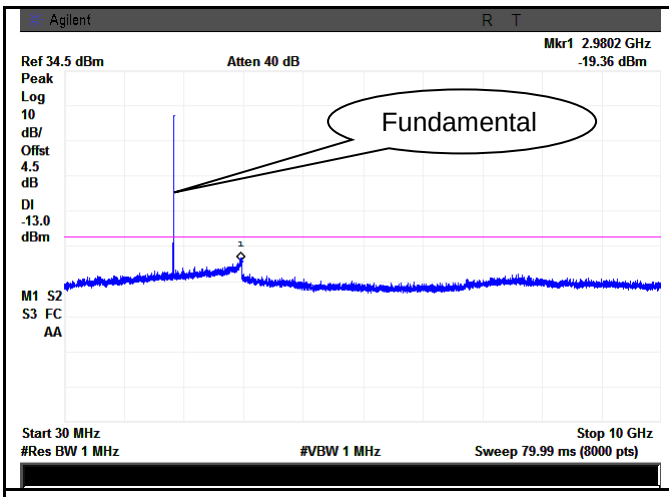


Band V - High Channel-1

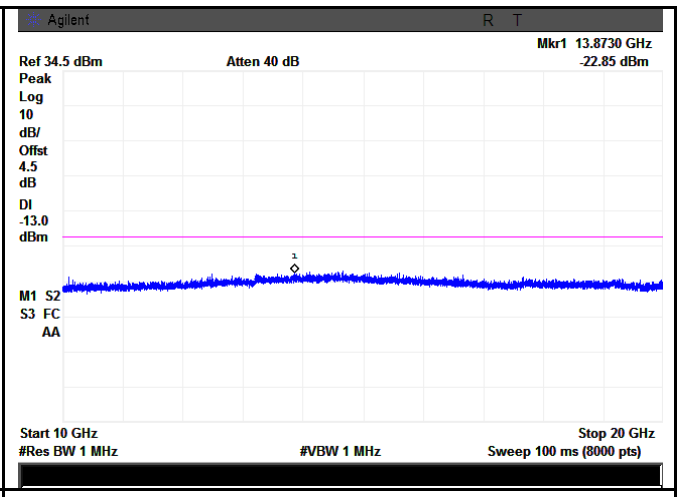


Band V - High Channel-2

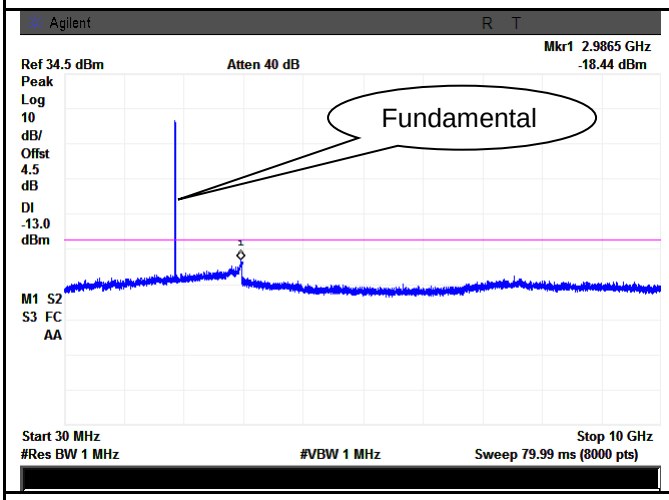
UMTS-FDD Band Ⅱ (Part 24E)



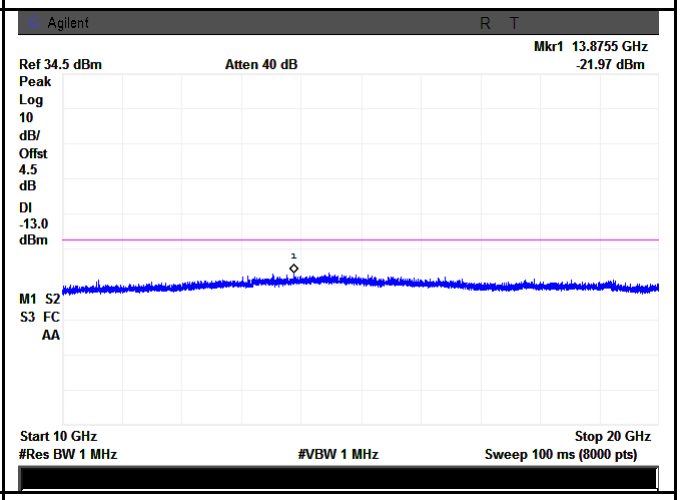
Band II - Low Channel-1



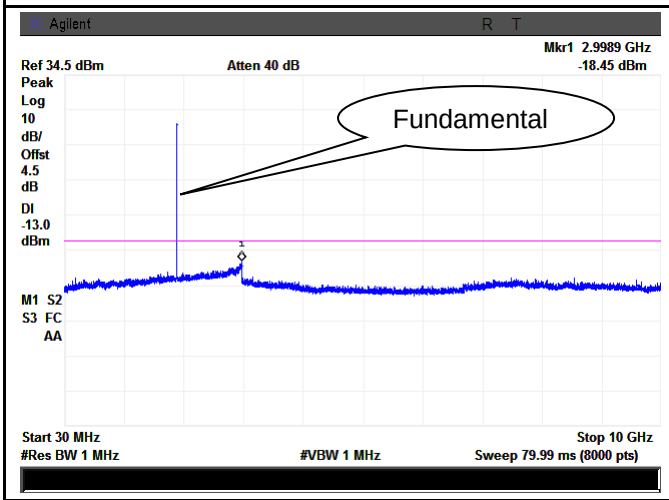
Band II - Low Channel-2



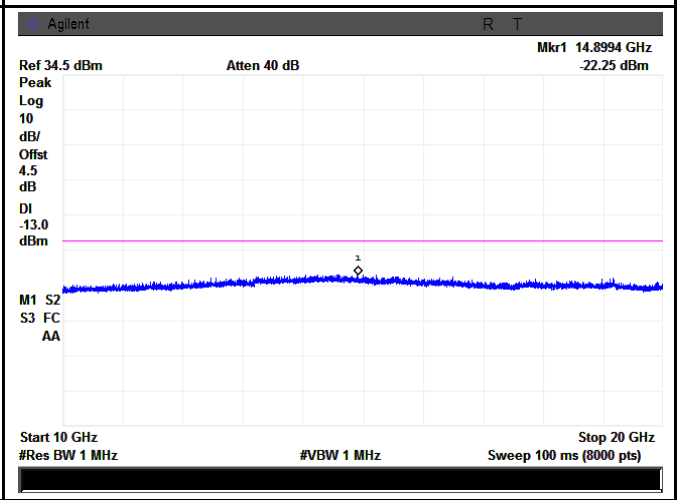
Band II - Middle Channel-1



Band II - Middle Channel-2



Band II - High Channel-1

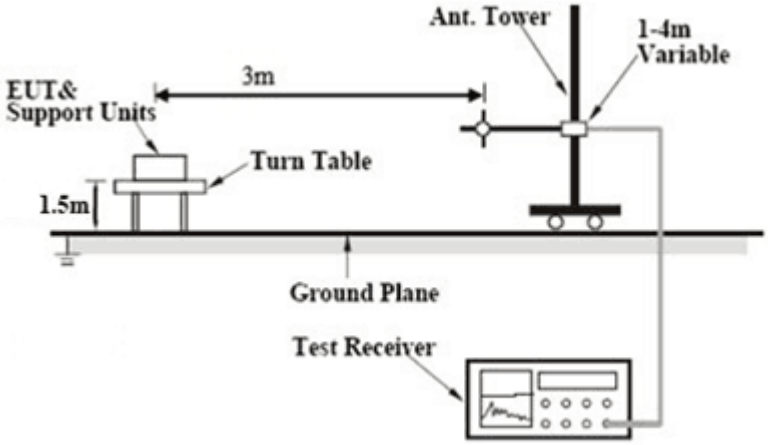


Band II - High Channel-2

6.6 Spurious Radiated Emissions

Temperature	23℃
Relative Humidity	55%
Atmospheric Pressure	1003mbar
Test date :	January 11, 2016
Tested By :	Winnie Zhang

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	-44.71	H	7.95	0.78	-37.54	-13	-24.54
339.7	-50.28	V	6.5	0.3	-44.08	-13	-31.08
691.5	-51.33	H	6.9	0.44	-44.87	-13	-31.87

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	-43.62	V	7.95	0.78	-36.45	-13	-23.45
1673.2	-44.68	H	7.95	0.78	-37.51	-13	-24.51
339.5	-50.31	V	6.5	0.3	-44.11	-13	-31.11
691.8	-51.25	H	6.9	0.44	-44.79	-13	-31.79

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	-43.56	V	7.95	0.78	-36.39	-13	-23.39
1697.6	-44.61	H	7.95	0.78	-37.44	-13	-24.44
339.1	-50.24	V	6.5	0.3	-44.04	-13	-31.04
691.7	-51.31	H	6.9	0.44	-44.85	-13	-31.85

Note:

*1, The testing has been conformed to 10*848.8MHz=8,488MHz*

2, All other emissions more than 30 dB below the limit

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	-45.38	V	10.25	2.73	-37.86	-13	-24.86
3700.4	-46.15	H	10.25	2.73	-38.63	-13	-25.63
338.7	-50.57	V	6.5	0.3	-44.37	-13	-31.37
692.1	-51.44	H	6.9	0.44	-44.98	-13	-31.98

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	-45.29	V	10.25	2.73	-37.77	-13	-24.77
3760	-46.08	H	10.25	2.73	-38.56	-13	-25.56
338.5	-50.43	V	6.5	0.3	-44.23	-13	-31.23
692.8	-51.27	H	6.9	0.44	-44.81	-13	-31.81

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	-45.33	V	10.36	2.73	-37.7	-13	-24.7
3819.6	-46.12	H	10.36	2.73	-38.49	-13	-25.49
338.3	-50.37	V	6.5	0.3	-44.17	-13	-31.17
692.7	-51.18	H	6.9	0.44	-44.72	-13	-31.72

Note:

*1, The testing has been conformed to 10*1909.8MHz=19,098MHz*

2, All other emissions more than 30 dB below the limit

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	-45.23	H	7.95	0.78	-38.06	-13	-25.06
339.2	-50.05	V	6.5	0.3	-43.85	-13	-30.85
691.7	-50.77	H	6.9	0.44	-44.31	-13	-31.31

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	-45.23	V	7.95	0.78	-38.06	-13	-25.06
1670	-45.31	H	7.95	0.78	-38.14	-13	-25.14
339.6	-50.11	V	6.5	0.3	-43.91	-13	-30.91
691.4	-50.56	H	6.9	0.44	-44.1	-13	-31.1

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	-45.16	V	7.95	0.78	-37.99	-13	-24.99
1693.2	-45.27	H	7.95	0.78	-38.1	-13	-25.1
339.9	-50.03	V	6.5	0.3	-43.83	-13	-30.83
691.5	-50.51	H	6.9	0.44	-44.05	-13	-31.05

Note:

*1, The testing has been conformed to 10*846.6MHz=8,466MHz*

2, All other emissions more than 30 dB below the limit

UMTS-FDD Band Ⅱ (Part 24E)

Low channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3704.8	-45.22	V	10.25	2.73	-37.7	-13	-24.7
3704.8	-45.36	H	10.25	2.73	-37.84	-13	-24.84
338.3	-50.17	V	6.5	0.3	-43.97	-13	-30.97
692.7	-50.49	H	6.9	0.44	-44.03	-13	-31.03

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	-45.18	V	10.25	2.73	-37.66	-13	-24.66
3760	-45.32	H	10.25	2.73	-37.8	-13	-24.8
338.6	-50.15	V	6.5	0.3	-43.95	-13	-30.95
692.2	-50.66	H	6.9	0.44	-44.2	-13	-31.2

High channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3815.2	-45.26	V	10.36	2.73	-37.63	-13	-24.63
3815.2	-45.34	H	10.36	2.73	-37.71	-13	-24.71
338.5	-50.29	V	6.5	0.3	-44.09	-13	-31.09
692.9	-50.53	H	6.9	0.44	-44.07	-13	-31.07

Note:

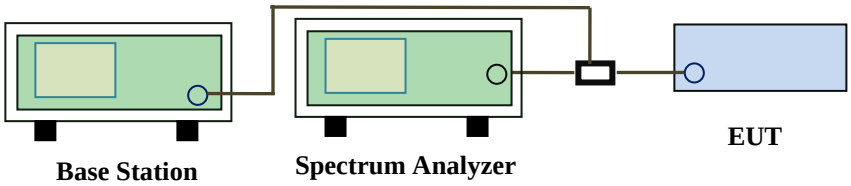
*1, The testing has been conformed to 10*1907.6MHz=19,076MHz*

2, All other emissions more than 30 dB below the limit

6.7 Band Edge

Temperature	23°C
Relative Humidity	55%
Atmospheric Pressure	1003mbar
Test date :	January 13, 2016
Tested By :	Winnie Zhang

Requirement(s):

Spec	Item	Requirement	Applicable
§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			
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)
823.9650	-14.74	-13
849.0075	-13.47	-13

PCS Band (Part24E) result

Frequency (MHz)	Emission (dBm)	Limit (dBm)
1849.9800	-17.56	-13
1910.0225	-19.27	-13

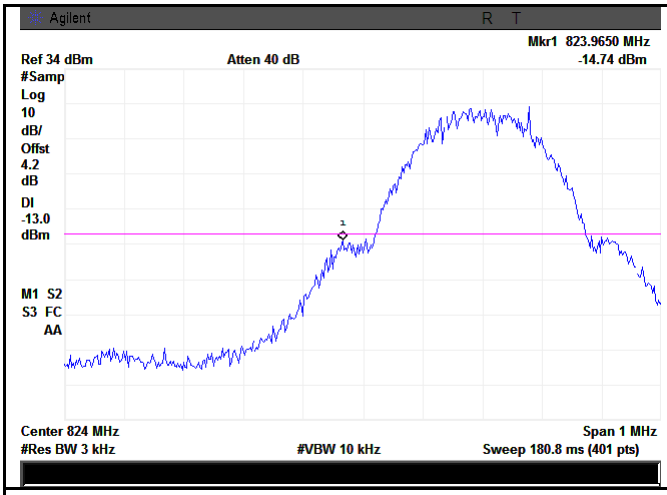
UMTS-FDD Band Ⅴ (Part 22H)

Frequency (MHz)	Emission (dBm)	Limit (dBm)
823.875	-26.28	-13
849.150	-26.61	-13

UMTS-FDD Band II (Part 24E)

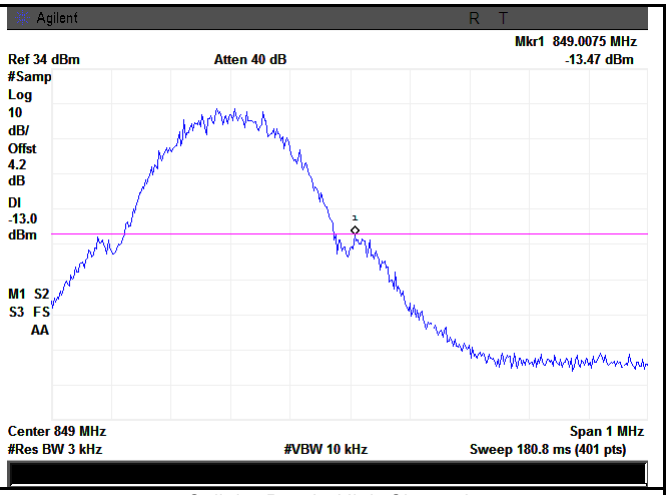
Frequency (MHz)	Emission (dBm)	Limit (dBm)
1849.800	-29.81	-13
1910.100	-27.89	-13

Test Plots



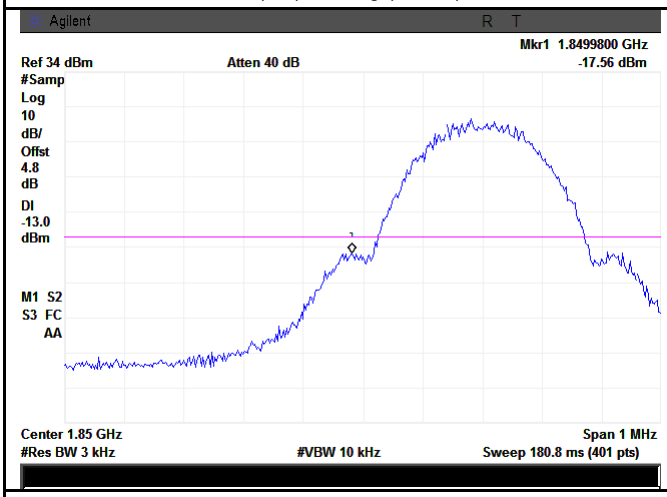
Cellular Band - Low Channel

Note: Offset=Cable loss (4.0) + 10log (3.17/3)=4.0+0.2=4.2 dB



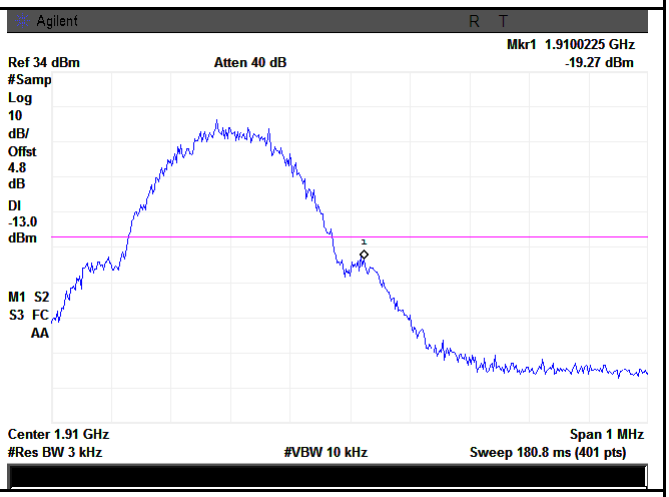
Cellular Band - High Channel

Note: Offset=Cable loss (4.0) + 10log (3.13/3)=4.0+0.2=4.2 dB



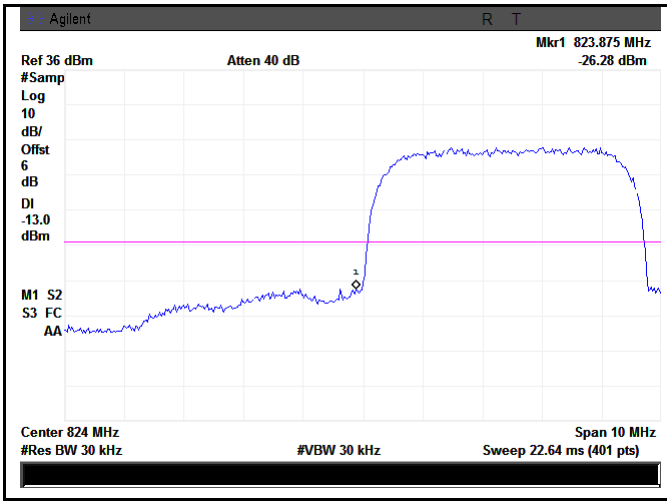
PCS Band - Low Channel

Note: Offset=Cable loss (4.5) + 10log (3.22/3)=4.5+0.3=4.8 dB



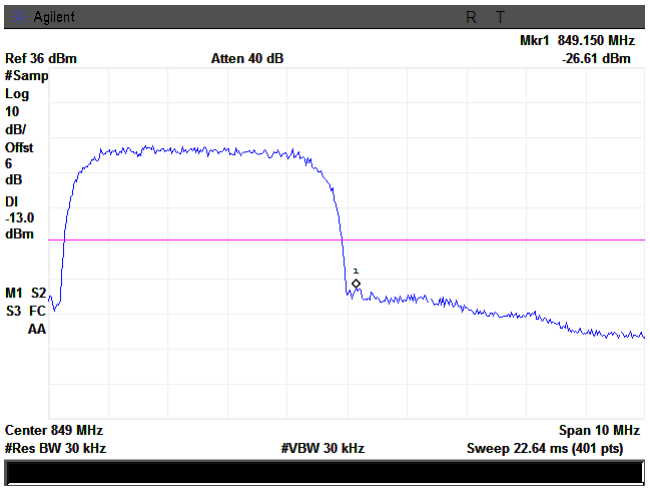
PCS Band - High Channel

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



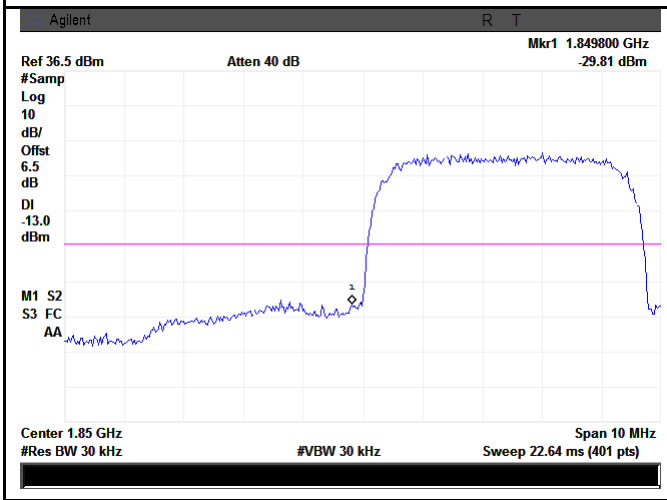
UMTS-FDD Band Ⅴ - Low Channel

Note: Offset=Cable loss (4.0) + 10log (46.87/30)=4.0+2.0=6.0 dB



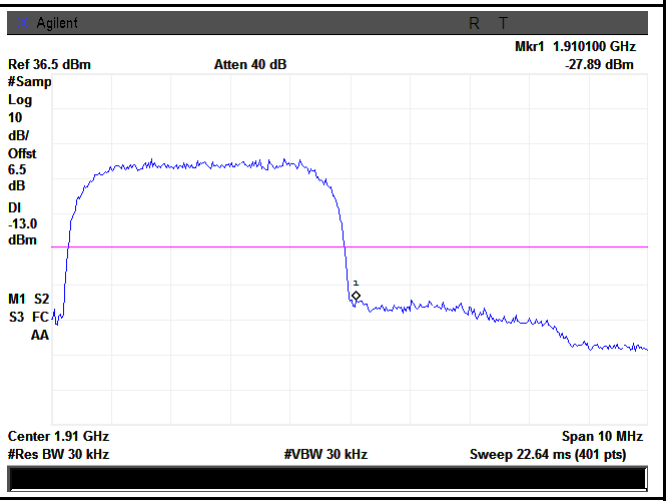
UMTS-FDD Band Ⅴ - High Channel

Note: Offset=Cable loss (4.0) + 10log (46.56/30)=4.0+2.0=6.0 dB



UMTS-FDD Band Ⅱ - Low Channel

Note: Offset=Cable loss (4.5) + 10log (46.67/30)=4.5+2.0=6.5 dB



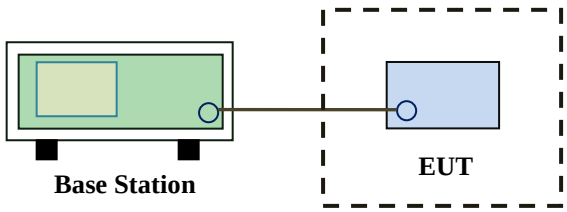
UMTS-FDD Band Ⅱ - High Channel

Note: Offset=Cable loss (4.5) + 10log (46.98/30)=4.5+2.0=6.5 dB

6.8 Frequency Stability

Temperature	23℃
Relative Humidity	55%
Atmospheric Pressure	1003mbar
Test date :	January 13, 2016
Tested By :	Winnie Zhang

Requirement(s):

Spec	Item	Requirement	Applicable
§2.1055, §22.355 & §24.235 § 27.5(h); § 27.54	a)	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 Frequency Range (MHz) / Base, fixed (ppm) / Mobile ≤ 3 watts (ppm) / Mobile ≤ 3 watts (ppm) 25 to 50 / 20.0 / 20.0 / 50.0 50 to 450 / 5.0 / 5.0 / 50.0 45 to 512 / 2.5 / 5.0 / .0 821 to 896 / 1.5 / 2.5 / 2.5 928 to 29. / 5.0 / N/A / N/A 929 to 960. / 1.5 / N/A / N/A 2110 to 2220 / 10.0 / N/A / N/A According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized frequency block.	☑
Test setup	 Thermal Chamber		
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	21	0.0251	2.5
0		20	0.0239	2.5
10		22	0.0263	2.5
20		21	0.0251	2.5
30		17	0.0203	2.5
40		16	0.0191	2.5
50		15	0.0179	2.5
55		25	0.0299	2.5
25	4.2	20	0.0239	2.5
	3.5	21	0.0251	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	21	0.0112	2.5
0		23	0.0122	2.5
10		17	0.0090	2.5
20		15	0.0080	2.5
30		19	0.0101	2.5
40		19	0.0101	2.5
50		23	0.0122	2.5
55		22	0.0117	2.5
25	4.2	21	0.0112	2.5
	3.5	22	0.0117	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	19	0.0228	2.5
0		20	0.0240	2.5
10		15	0.0180	2.5
20		16	0.0192	2.5
30		14	0.0168	2.5
40		13	0.0156	2.5
50		15	0.0180	2.5
55		15	0.0180	2.5
25	4.2	20	0.0240	2.5
	3.5	19	0.0228	2.5

UMTS-FDD Band Ⅱ (Part 24E)

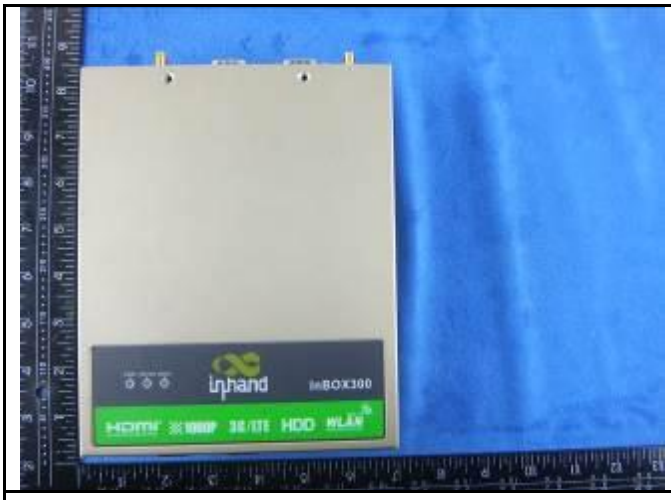
Middle Channel, f_o = 1880 MHz				
Temperature (℃)	**Power Supplied (V_{DC})**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Limit (ppm)**
-10	3.7	18	0.0096	2.5
0		16	0.0085	2.5
10		10	0.0053	2.5
20		11	0.0059	2.5
30		10	0.0053	2.5
40		11	0.0059	2.5
50		12	0.0064	2.5
55		13	0.0069	2.5
25	4.2	10	0.0053	2.5
	3.5	11	0.0059	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	09/17/2015	09/16/2016	☑
Power Splitter	1#	1#	09/01/2015	08/31/2016	☑
Universal Radio Communication Tester	CMU200	121393	09/25/2015	09/24/2016	☑
Temperature/Humidity Chamber	UHL-270	001	10/09/2015	10/08/2016	☑
DC Power Supply	E3640A	MY40004013	09/17/2015	09/16/2016	☑
Power Amplifier	SMC150D	R1553-0313	09/01/2015	08/31/2016	☑
Power Amplifier	S41-25D	R1553-0314	09/01/2015	08/31/2016	☑
Radiated Emissions					
EMI test receiver	ESL6	100262	09/17/2015	09/16/2016	☑
OPT 010 AMPLIFIER (0.1-1300MHz)	8447E	2727A02430	09/01/2015	08/31/2016	☑
Microwave Preamplifier (1 ~ 26.5GHz)	8449B	3008A02402	03/25/2015	03/24/2016	☑
Bilog Antenna (30MHz~6GHz)	JB6	A110712	09/21/2015	09/20/2016	☑
Bilog Antenna (30MHz~2GHz)	JB1	A112017	09/21/2015	09/20/2016	☑
Double Ridge Horn Antenna (1 ~18GHz)	AH-118	71259	09/24/2015	09/23/2016	☑
Double Ridge Horn Antenna (1 ~18GHz)	AH-118	71283	09/24/2015	09/23/2016	☑
SYNTHESIZED SIGNAL GENERATOR	8665B	3744A01293	09/17/2015	09/16/2016	☑
Tunable Notch Filter	3NF-800/1000-S	AA4	09/01/2015	08/31/2016	☑
Tunable Notch Filter	3NF-1000/2000-S	AM 4	09/01/2015	08/31/2016	☑

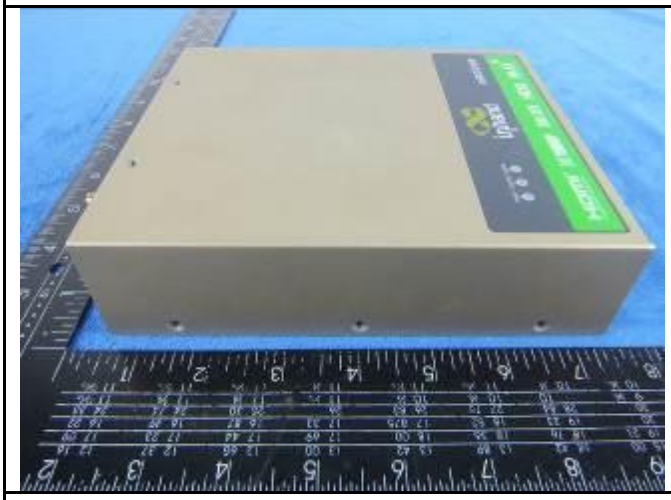
Annex B. EUT And Test Setup Photographs

Annex B.i. Photograph: EUT External Photo

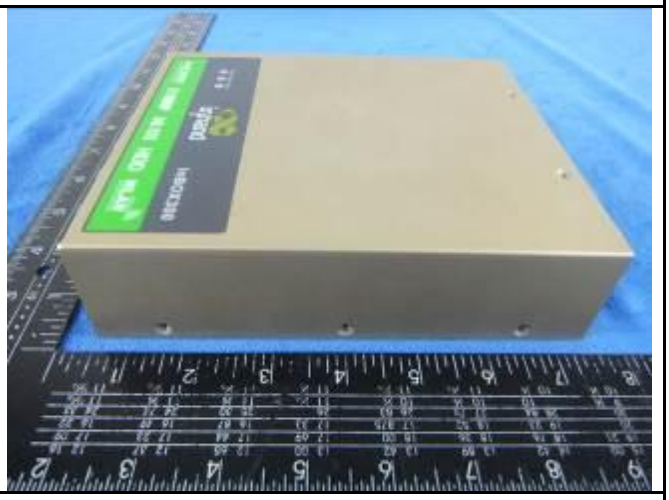


EUT – Top View

EUT – Bottom View



EUT – Left View



EUT – Right View

EUT - Front View

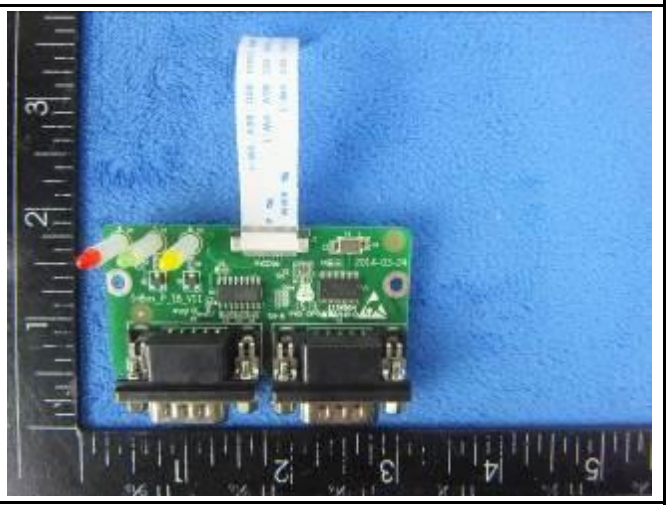
EUT - Rear View

Annex B.ii. Photograph: EUT Internal Photo

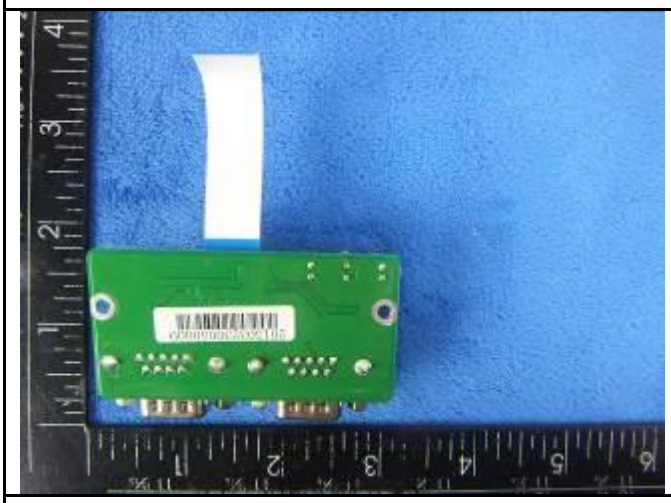
EUT – Uncover Front View 1

EUT – PCB 1 Front View

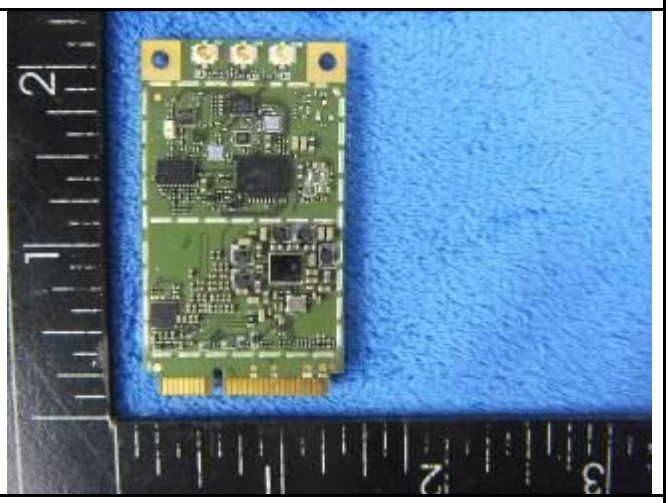
EUT – PCB 1 Rear View



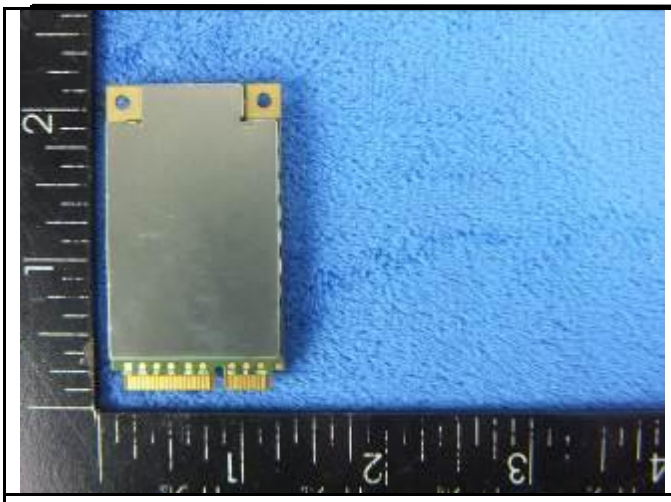
EUT – PCB 2 Front View



EUT – PCB 2 Rear View

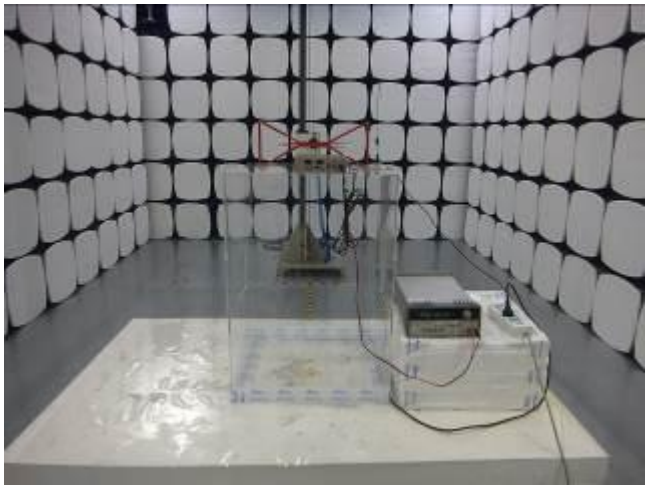
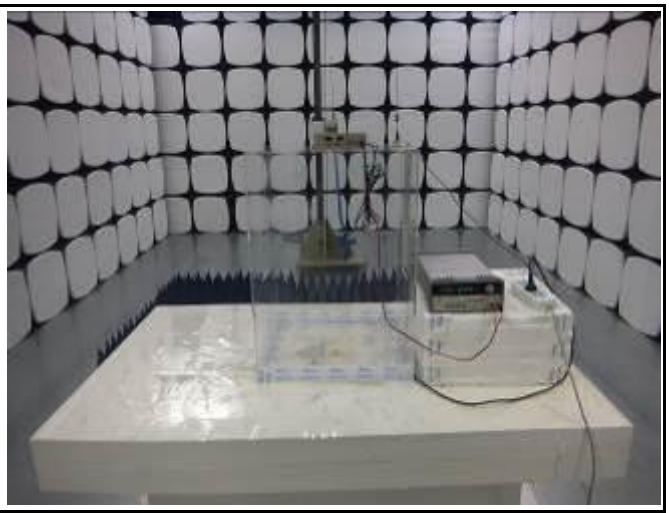


EUT – PCB 3 Front View



EUT – PCB 3 Rear View

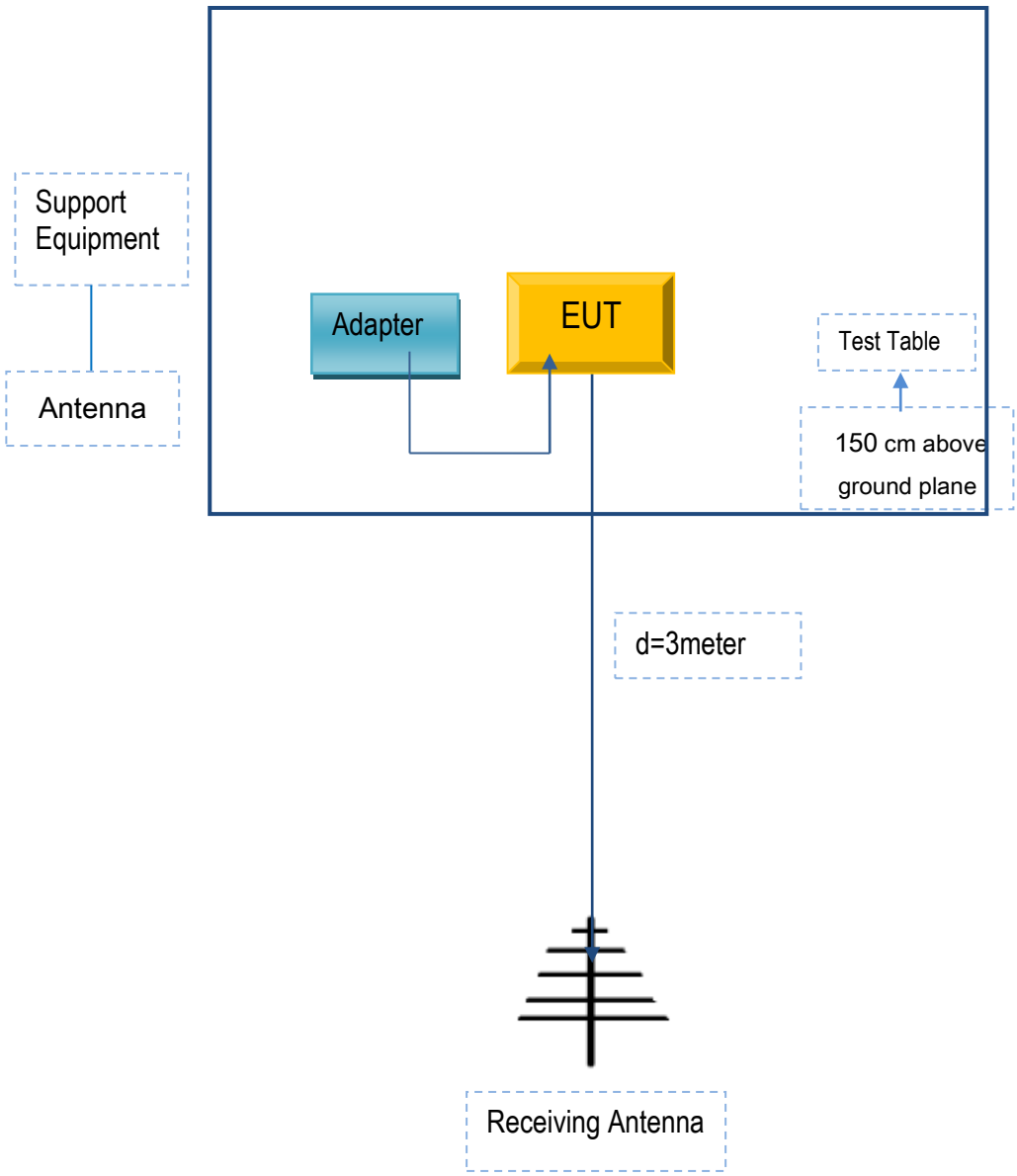
Annex B.iii. Photograph: Test Setup Photo

	
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

N/A

Annex C.ii. EUT OPERATING CONKITIONS

N/A

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

Please see attachment

Annex E. DECLARATION OF SIMILARITY

Beijing InHand Networks Technology Co., Ltd

To: SIEMIC (SHENZHEN-CHINA) LABORATORIES
Zone A, Floor 1, Building 2
Wan Ye Long Technology Park
South Side of Zhoushi Road, Bao' an District
Shenzhen, Guangdong, CHINA 518108

Dear Sir,

For our business issue and marketing requirement, we would like to list different models numbers reports, as following:

Model No.: InBOX300 InBOX310 InBOX320 InBOX330
InBOX300S InBOX310S InBOX320S InBOX330S

The eight models are basically the same in appearance, hardware, PCB layout but they have different number of interfaces: USB, Serial port and different software functions. The software does not affect the RF parameters of the device.

Thank you!

Signature: 

Printed name/title:Biao Wang/ EMC engineer
Address: 101,West Wing,11th Floor,No.101,Lize central Park Wangjing,Chaoyang District,Beijing,100102,China