TEST REPORT

FCC ID: 2ACMLTIX6-GW

Applicant : Condeco Ltd
Address : 8th Floor, Exchange Tower, 2 Harbour Exchange Square
London E14 9GE UK

Equipment under Test (EUT):

Name	:	Sense Gateway
Model	:	TIX6-GW
Trademark	:	CONDECO

Standards **:** FCC PART 2, FCC PART 22H, FCC PART 24E

Report No. **:** C1850476 05

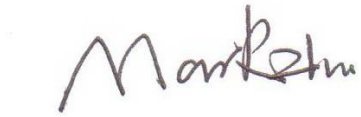
Date of Test **:** November 12, 2015- January 17, 2016

Date of Issue **:** January 19, 2016

Test Result :	**PASS ***

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

Authorized Signature



(Mark Zhu)
Manager

The manufacture should ensure that all the products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of Shenzhen Certification Technology Service Co., Ltd. Or test done by Shenzhen Certification Technology Service Co., Ltd. Approvals in connection with, distribution or use of the product described in this report must be approved by Shenzhen Certification Technology Service Co., Ltd. Approvals in writing.

Contents

1. General Information

1.1. Description of Device (EUT)

EUT	:	Sense Gateway
Model No.	:	TIX6-GW
Difference of model No	:	N/A
Power supply	:	DC 3.7V from battery or DC 12V from adapter.
Radio Technology	:	GSM/GPRS, WCDMA/HSDPA/HSUPA
Operation frequency	:	GSM/GPRS 850 and PCS/GPRS 1900; WCDMA/HSDPA/HSUPA: Band II and Band V
Antenna Type and Gain	:	Rod Antenna, maximum 2dBi
Applicant	:	Condeco Ltd
Address	:	8th Floor, Exchange Tower, 2 Harbour Exchange Square, London E14 9GE UK
Manufacturer		NOTE Electronics (Dongguan) Ltd
Address		6 Lindong Third Road, Lincun Industrial Center, Tangxia, Dongguan 523710, P. R. China

1.2. Accessories of device (EUT)

Accessories 1	:	Power adapter
M/N	:	VEP24US12
Accessories 2	:	N/A
Type	:	N/A

1.3. Test Lab information

Shenzhen Certification Technology Service Co., Ltd.
2F, Building B, East Area of Nanchang Second Industrial Zone,
Gushu 2nd Road, Bao'an District, Shenzhen 518126, P.R. China
FCC Registered No.:197647

2. Summary of test

2.1. Summary of test result

Description of Test Item	Standard	Results
Conducted Output power	FCC PART 2: 2.1046 FCC PART 22H: 22.913 (a) FCC PART 24E: 24.232 (c)	PASS
Radiated Output power(erp/eirp)	FCC PART 22H:22.913 (a) FCC PART 24E:24.232(c)	PASS
Occupied bandwidth	FCC PART 2: 2.1049 FCC PART 22H: 22.917 (b) FCC PART 24E: 24.238 (b)	PASS
Frequency stability	FCC PART 2: 2.1055 FCC PART 22H: 22.355 FCC PART 24E: 24.235	PASS
Conducted spurious emission (Antenna terminal)	FCC PART 2: 2.1051 FCC PART 22H: 22.917 FCC PART 24E: 24.238	PASS
Radiated spurious emissions	FCC PART 2: 2.1053 FCC PART 22H: 22.917 FCC PART 24E: 24.238	PASS
Band edge compliance	FCC PART 22H: 22.917 (b) FCC PART 24E: 24.238 (b)	PASS
Power Line Conducted Emission Test	FCC Part 15: 15.207 ANSI C63.4: 2014	PASS

2.2. Assistant equipment used for test

Description	:	Power adapter
Model No.	:	VEP24US12

2.3. Test mode

During all testing, EUT is in link mode with base station emulator at maximum power level in each test mode and channel as below:

Mode	Channel	Frequency(MHz)
GSM/GPRS 850	128	824.2
	189	836.4
	251	848.8
PCS/GPRS 1900	512	1850.2
	661	1880.0
	810	1909.8
WCDMA Band II	9262	1852.4
	9400	1880.0
	9538	1907.6
WCDAM Band V	4132	826.4
	4182	836.4
	4233	846.6

2.4. Test Environment Conditions

Temperature range	21-25℃
Humidity range	40-75%
Pressure range	86-106kPa

2.5. Measurement Uncertainty (95% confidence levels, k=2)

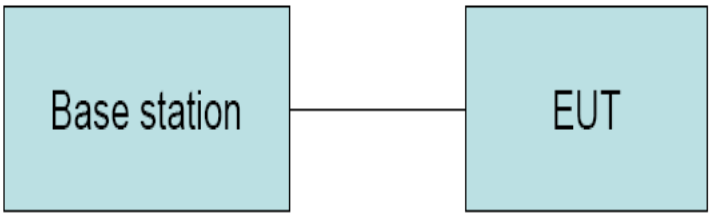
Item	MU	Remark
Uncertainty for Power point Conducted Emissions Test	2.42dB	
Uncertainty for Radiation Emission test in 3m chamber (30MHz to 1GHz)	3.54dB	Polarize: V
	4.1dB	Polarize: H
Uncertainty for Radiation Emission test in 3m chamber (1GHz to 25GHz)	2.08dB	Polarize: H
	2.56dB	Polarize: V
Uncertainty for radio frequency	1×10-9	
Uncertainty for conducted RF Power	0.65dB	
Uncertainty for temperature	0.2℃	
Uncertainty for humidity	1%	
Uncertainty for DC and low frequency voltages	0.06%	

2.6. Test Equipment

Equipment	Manufacture	Model No.	Serial No.	Last cal.	Cal Interval
3m Semi-Anechoic	ETS-LINDGREN	N/A	SEL0017	2015.01.19	1Year
Spectrum analyzer	Agilent	E4407B	MY46185649	2015.01.19	1Year
Receiver	R&S	ESCI	1166.5950K03-1011	2015.01.19	1Year
Receiver	R&S	ESCI	101202	2015.01.19	1Year
Bilog Antenna	Schwarzbeck	VULB 9168	VULB9168-438	2015.01.21	1Year
Horn Antenna	EMCO	3115	640201028-06	2015.01.21	1Year
Active Loop Antenna	Beijing Daze	ZN30900A	SEL0097	2015.01.21	1Year
Cable	Resenberger	N/A	No.1	2015.01.19	1Year
Cable	SCHWARZBECK	N/A	No.2	2015.01.19	1Year
Cable	SCHWARZBECK	N/A	No.3	2015.01.19	1Year
Pre-amplifier	Schwarzbeck	BBV9743	9743-019	2015.01.19	1Year
Pre-amplifier	R&S	AFS33-18002650-30-8P-44	SEL0080	2015.01.19	1Year
Base station	Agilent	E5515C	GB44300243	2015.01.19	1 Year
Temperature controller	Terchy	MHQ	120	2015.01.19	1Year
Power divider	Anritsu	K240C	020346	2015.01.19	1 Year
Signal Generator	HP	83732B	VS3449051	2015.01.19	1 Year
Power Meter	Anritsu	ML2487A	6K00001491	2015.01.19	1Year
Power sensor	Anritsu	ML2491A	32516	2015.01.19	1Year
L.I.S.N.#1	Schwarzbeck	NSLK8126	8126466	2016.01.19	1Year
L.I.S.N.#2	R&S	ENV216	101043	2016.01.19	1 Year

3. Conducted Output power

3.1. Block Diagram of Test Setup



3.2. Limit

Cellular Telephone 850MHz	PCS 1900MHz
38.5dBm(ERP)	33dBm(EIRP)

3.3. Test Procedure

(1) The EUT's RF output port was connected to base station.
(2) A call was set up by the SS according to the generic call set up procedure
(3) Set EUT at maximum power level through base station by power level command
(4) Measure the maximum output power of EUT at each frequency band and mode by base station.

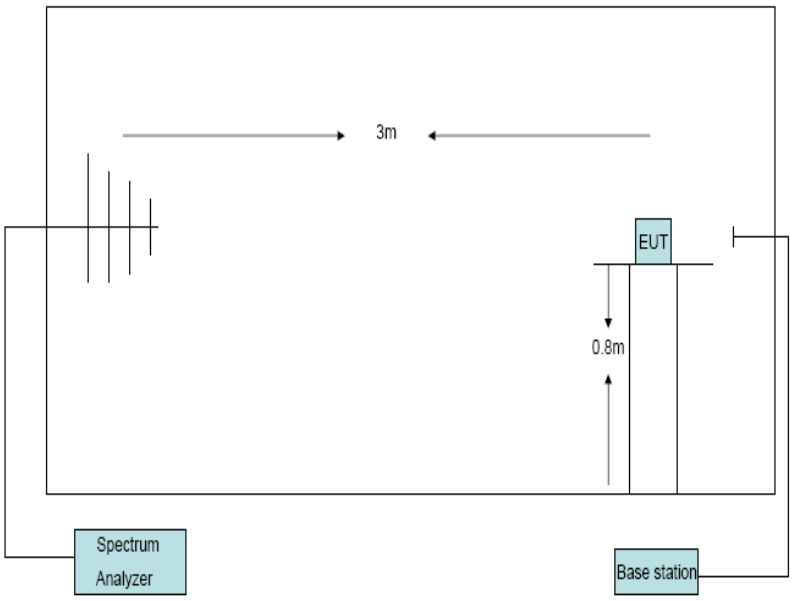
3.4. Test Result

EUT: Sense Gateway M/N:TIX6-GW							
Power: DC 3.7V							
Ambient Temperature:23℃		Relative Humidity: 60%					
Test date: 2015-07-12		Test site: RF site Tested by: Simple Guan					
Conclusion: PASS							
Mode	Channel	PK Output Power (dBm)					Limit (dBm)
		GSM850	GPRS -1 Slot	GPRS -2 Slot	GPRS -3 Slot	GPRS -4 Slot	
GSM 850	128	32.51	32.37	31.49	29.74	28.78	38.5
	190	32.59	32.48	31.60	29.82	28.86	38.5
	251	32.56	32.47	31.65	29.81	28.88	38.5
PCS 1900	512	29.04	29.00	28.01	26.16	25.15	33
	661	29.32	29.31	28.29	26.48	25.47	33
	810	29.59	29.54	28.56	26.72	25.71	33

EUT: Sense Gateway M/N:TIX6-GW Power: DC 3.7V from battery												
Ambient Temperature:24℃		Relative Humidity: 62%										
Test date: 2015-12-13		Test site: RF site Tested by: Simple Guan										
Conclusion: PASS												
Mode	Channel	PK Output Power(dBm)										Limit (dBm)
		WCDMA RMC	HSDPA				HSUPA					
			Sub Test1	Sub Test2	Sub Test3	Sub Test4	Sub Test1	Sub Test2	Sub Test3	Sub Test4	Sub Test5	
WCDMA 850	4132	22.85	22.01	21.92	22.36	22.30	21.87	19.86	20.78	19.9	21.91	38.5
	4182	22.86	22.02	21.86	22.33	22.31	21.90	19.88	20.87	19.87	21.91	38.5
	4233	22.75	21.96	21.91	22.21	22.16	21.83	19.82	20.81	19.75	21.92	38.5
WCDMA 1900	9262	22.58	21.98	21.87	21.47	21.40	21.85	18.83	19.80	18.87	20.88	33
	9400	23.31	22.55	22.47	22.03	22.00	22.57	19.54	20.58	19.56	21.60	33
	9538	22.33	21.44	21.36	21.81	21.79	21.45	19.42	20.41	19.44	21.51	33

4. Radiated Output power

4.1. Block Diagram of Test Setup



4.2. Limit

Cellular Telephone 850MHz	PCS 1900MHz
38.5dBm(ERP)	33dBm(EIRP)

4.3. Test Procedure

1. The EUT was placed on a non-conductive rotating platform with 0.8 meter height in an anechoic chamber. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and a spectrum analyzer with RBW= 3 MHz, VBW= 3 MHz and peak detector settings.
2. During the measurement, the EUT was enforced in maximum power and linked with a base station. The highest emission was recorded from analyzer power level (LVL) from the 360 degrees rotation of the turntable and the test antenna raised and lowered over a range from 1 to 4 meters in both horizontally and vertically polarized orientations
3. Effective Isotropic Radiated Power (EIRP) was measured by substitution method according to TIA/EIA-603-C. The EUT was replaced by dipole antenna (for frequency below 1GHz) or Horn antenna (for frequency above 1GHz) at same location with same polarize of receiver antenna and then a known power of each measure frequency from S.G. was applied into the dipole antenna or Horn antenna through a Tx cable, and then

recorded the maximum Analyzer reading through raised and lowered the test antenna. The correction factor (in dB) = S.G. - Tx Cable loss + Substitution antenna gain –Substitution antenna Loss (only for Dipole antenna) - Analyzer reading. Then the EUT's EIRP was calculated with the correction factor, EIRP= LVL + Correction factor and ERP = EIRP – 2.15

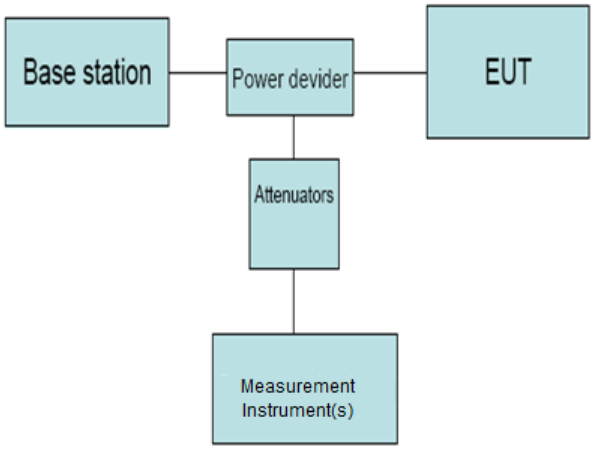
4.4. Test Result

EUT: Sense Gateway M/N:TIX6-GW					
Power: DC 12V from adapter					
Ambient Temperature:23℃			Relative Humidity: 60%		
Test date: 2015-12-23			Test site: RF site	Tested by: Simple Guan	
Conclusion: PASS					
Mode	Channel	LVL (dBm)	Correction factor(dB)	ERP (dBm)	EIRP (dBm)
GSM 850	128	2.21	30.42	30.48	/
	190	2.05	30.21	30.11	/
	251	2.75	30.05	30.65	/
PCS 1900	512	-19.63	46.80	/	27.17
	661	-18.67	46.45	/	27.78
	810	-18.13	46.58	/	28.45
ERP=LVL + Correction factor -2.15 EIRP=LVL+ Correction factor					

EUT: Sense Gateway M/N:TIX6-GW					
Power: DC 12V from adapter					
Ambient Temperature:23℃			Relative Humidity: 60%		
Test date: 2015-12-23			Test site: RF site	Tested by: Simple Guan	
Conclusion: PASS					
Mode	Channel	LVL (dBm)	Correction factor(dB)	ERP (dBm)	EIRP (dBm)
WCDMA BAND V	4132	-6.35	30.27	21.77	/
	4182	-6.64	30.16	21.37	/
	4233	-7.02	30.24	21.07	/
WCDMA BAND II	9262	-25.18	46.83	/	21.65
	9400	-25.36	46.97	/	21.61
	9538	-25.75	46.96	/	21.21
ERP=LVL + Correction factor -2.15 EIRP=LVL+ Correction factor					

5. Peak-to-Average Ratio

5.1. Block Diagram of Test Setup



5.2. Limit

In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

5.3. Test Procedure

The EUT' RF output port was connected to Measurement Instrument(s) and Base Station via power divider, and then measure the test data.

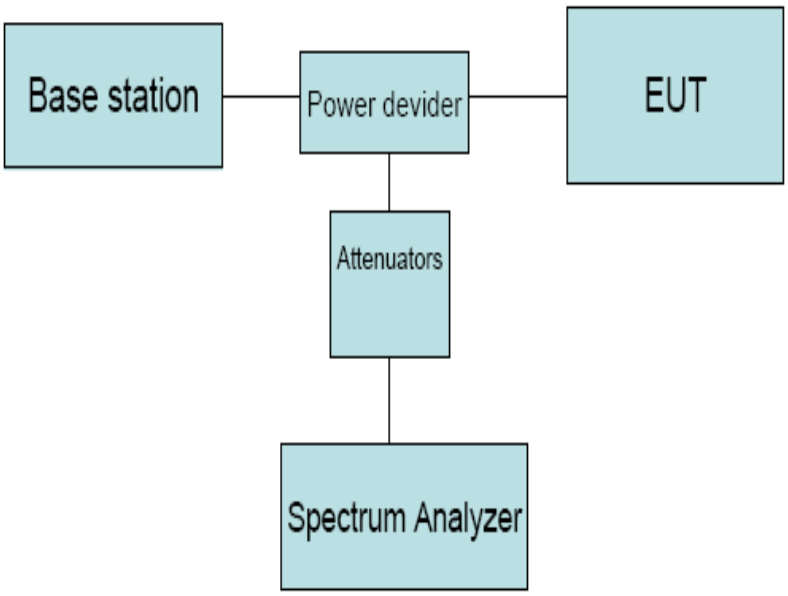
5.4. Test Result

Test Band	Test Mode	Test Channel	Measured[dB]	Limit [dB]	Verdict
GSM 1900	GSM	LCH	0.36	13	PASS
		MCH	0.47	13	PASS
		HCH	0.32	13	PASS

Test Band	Test Mode	Test Channel	Measured[dB]	Limit [dB]	Verdict
WCDMA 1900	WCDMA	LCH	2.61	13	PASS
		MCH	3.62	13	PASS
		HCH	2.57	13	PASS

6. Occupied Bandwidth

6.1. B lock Diagram of Test Setup



6.2. Limit

N/A

6.3. Test Procedure

1. The EUT' RF output port was connected to Spectrum Analyzer and Base Station via power divider.

2. Spectrum analyzer's occupied bandwidth measure function was used to measure 99% bandwidth and -26dBc bandwidth

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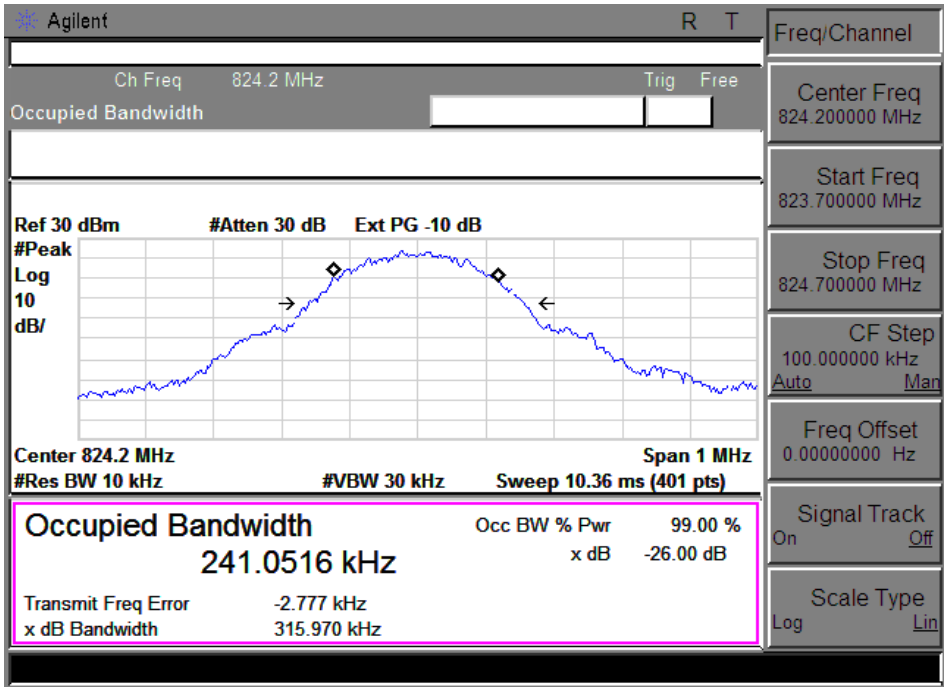
6.4. Test Result

EUT: Sense Gateway M/N:TIX6-GW			
Power: DC 12V from adapter			
Ambient Temperature:23℃		Relative Humidity: 60%	
Test date: 2015-12-23		Test site: RF site	Tested by: Simple Guan
Mode	Channel	99% bandwidth (KHz)	-26dBc bandwidth (KHz)
GSM 850	128	241.05	315.97
	190	246.68	321.36
	251	247.54	316.28
PCS 1900	512	242.23	319.34
	661	239.60	317.49
	810	247.28	320.67

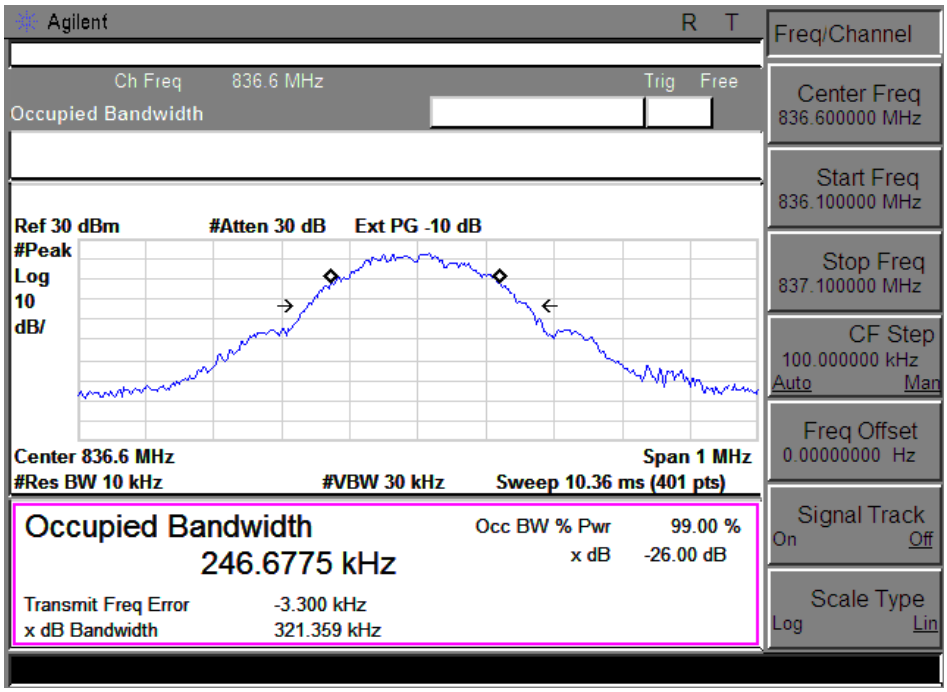
EUT: Sense Gateway M/N:TIX6-GW			
Power: DC 12V from adapter			
Ambient Temperature:23℃		Relative Humidity: 60%	
Test date: 2015-12-23		Test site: RF site	Tested by: Simple Guan
Mode	Channel	99% bandwidth (MHz)	-26dBc bandwidth (MHz)
WCDMA BAND V	4132	4.1622	4.736
	4182	4.1707	4.741
	4233	4.1672	4.696
WCDMA BAND II	9262	4.1644	4.717
	9400	4.1655	4.706
	9538	4.1701	4.724

6.5. Orginal test data

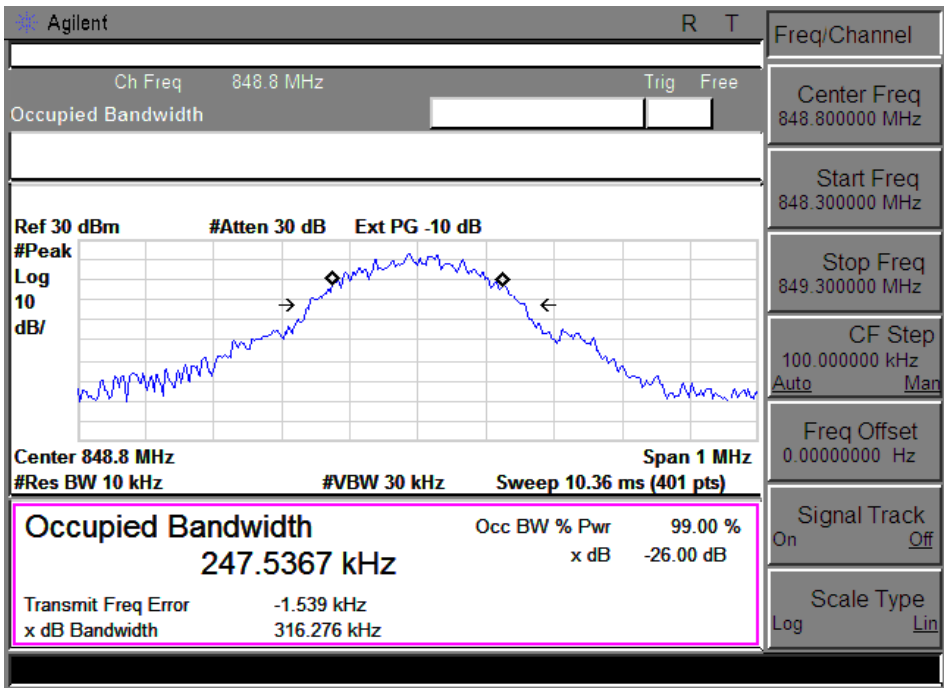
GSM 850 CH128



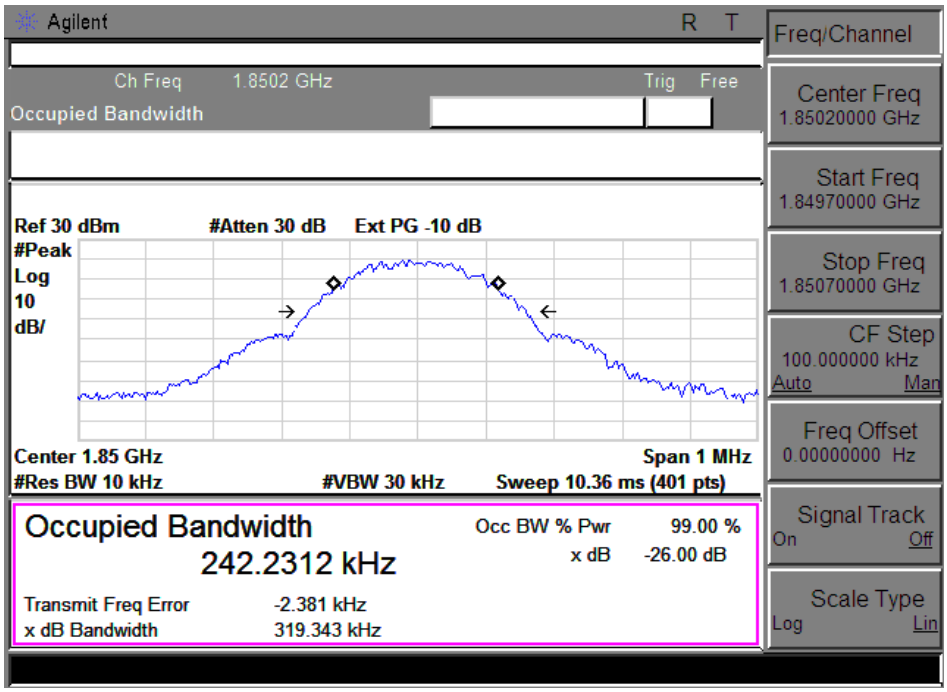
GSM 850 CH190



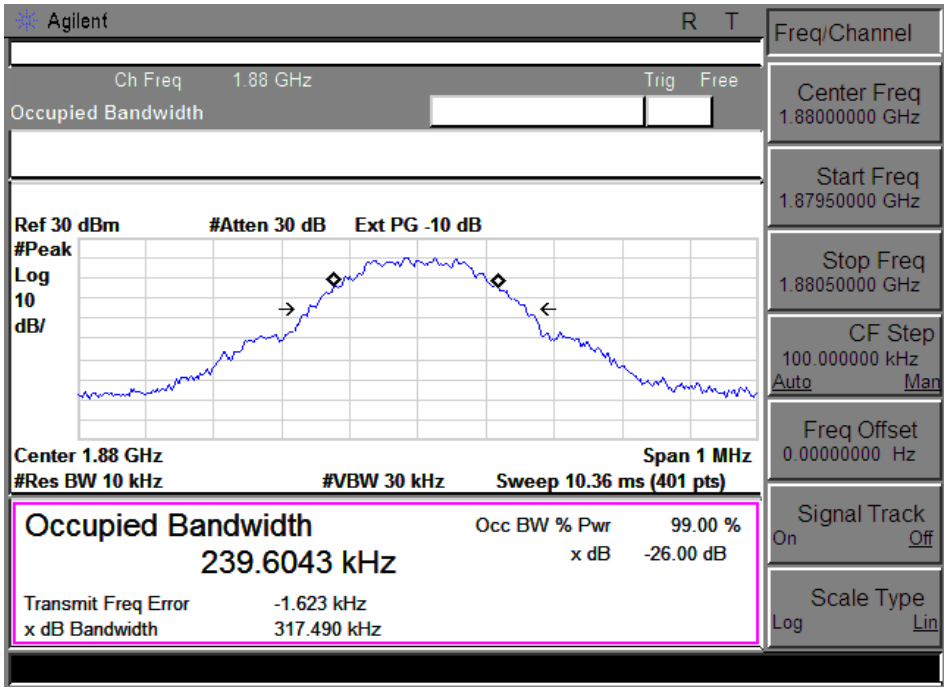
GSM 850 CH251



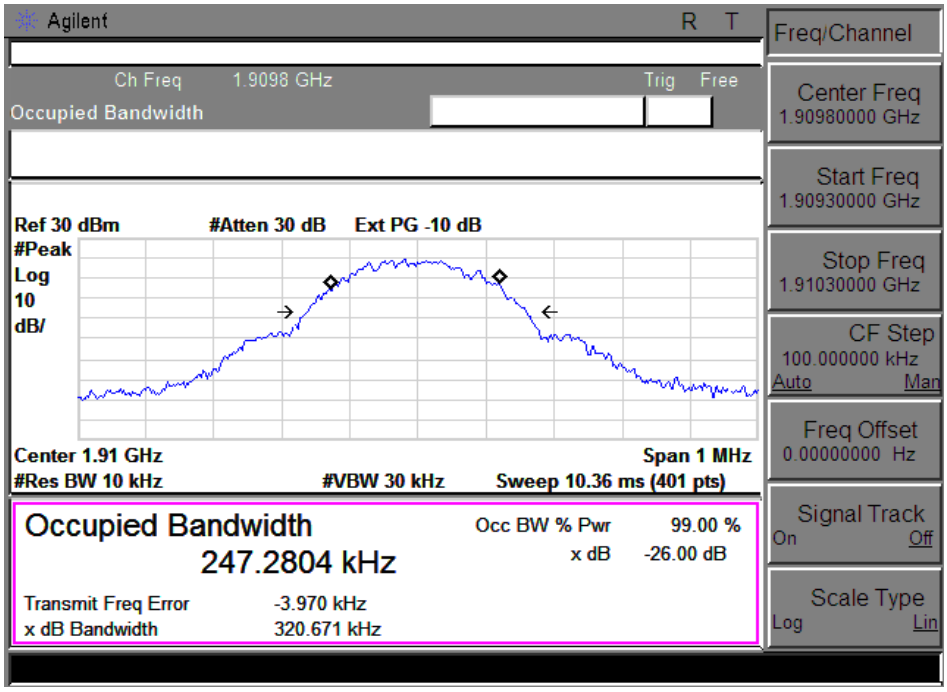
PCS 1900 CH512



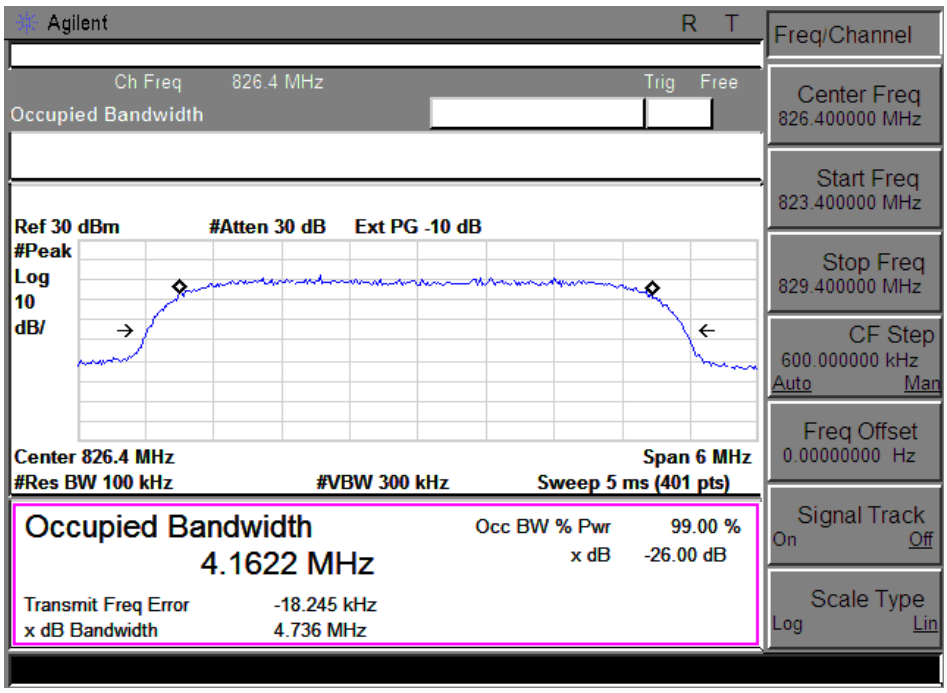
PCS 1900 CH661



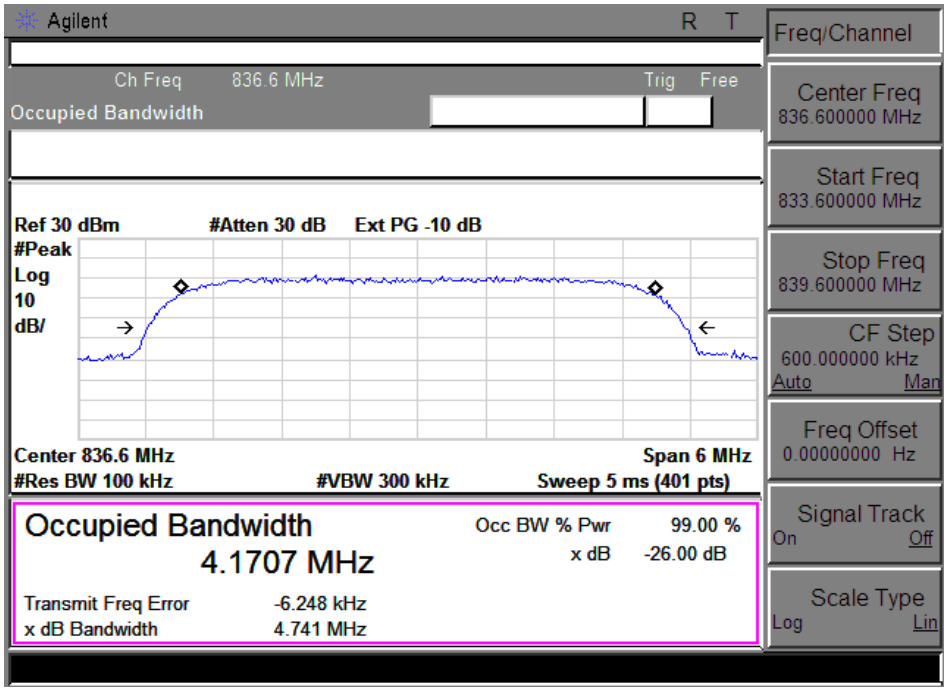
PCS 1900 CH810



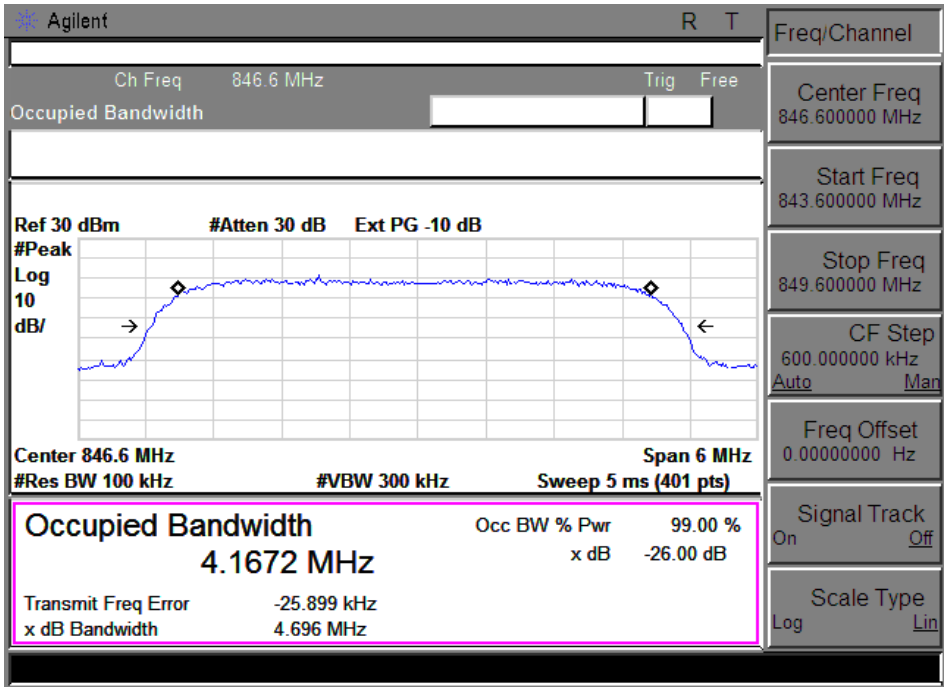
WCDMA BAND V CH4132



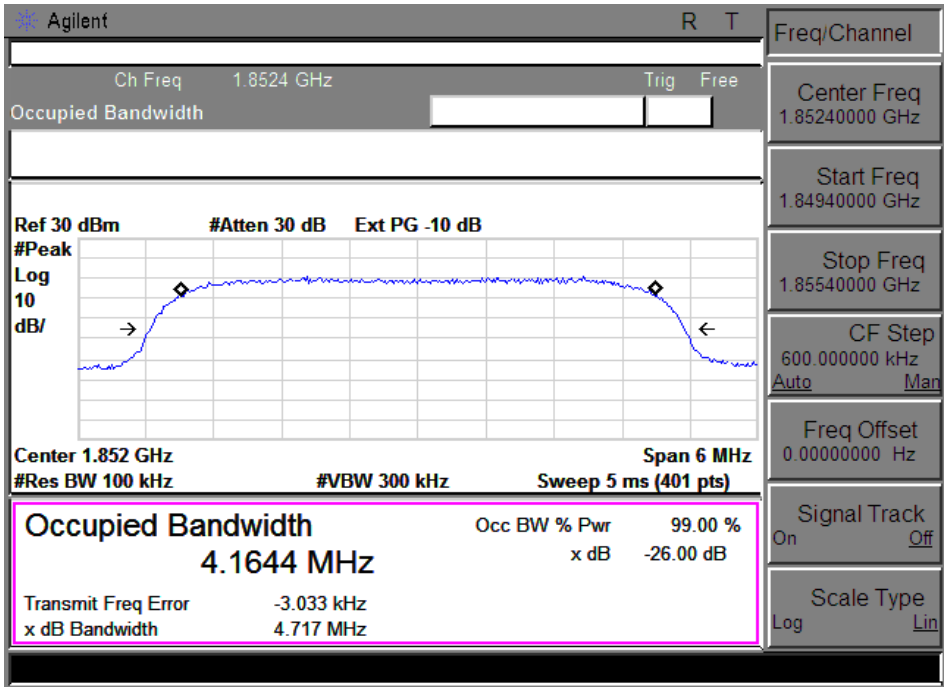
WCDMA BAND V CH4182



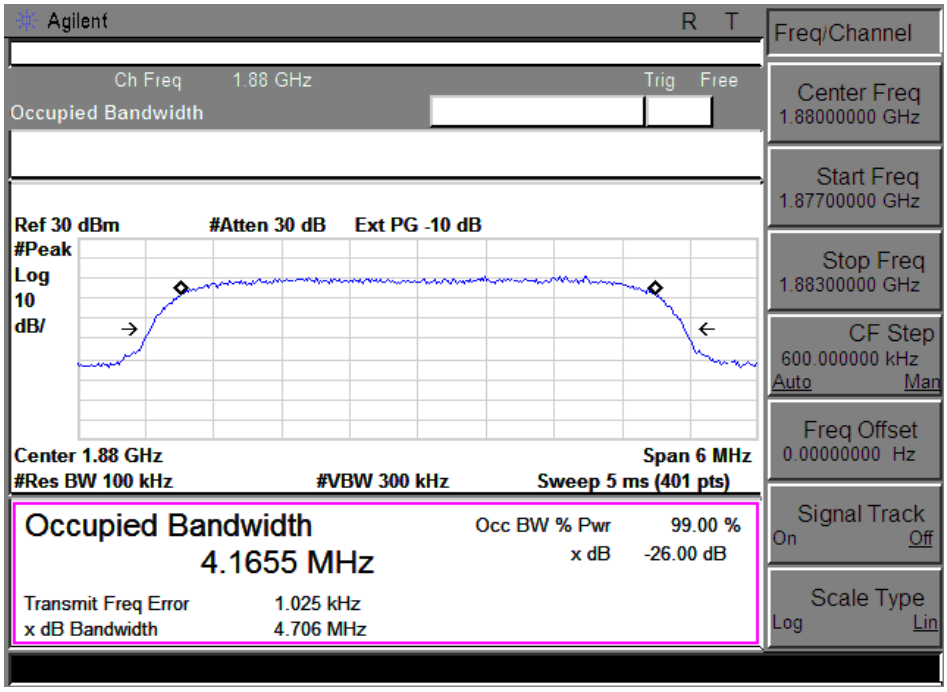
WCDMA BAND V CH4233



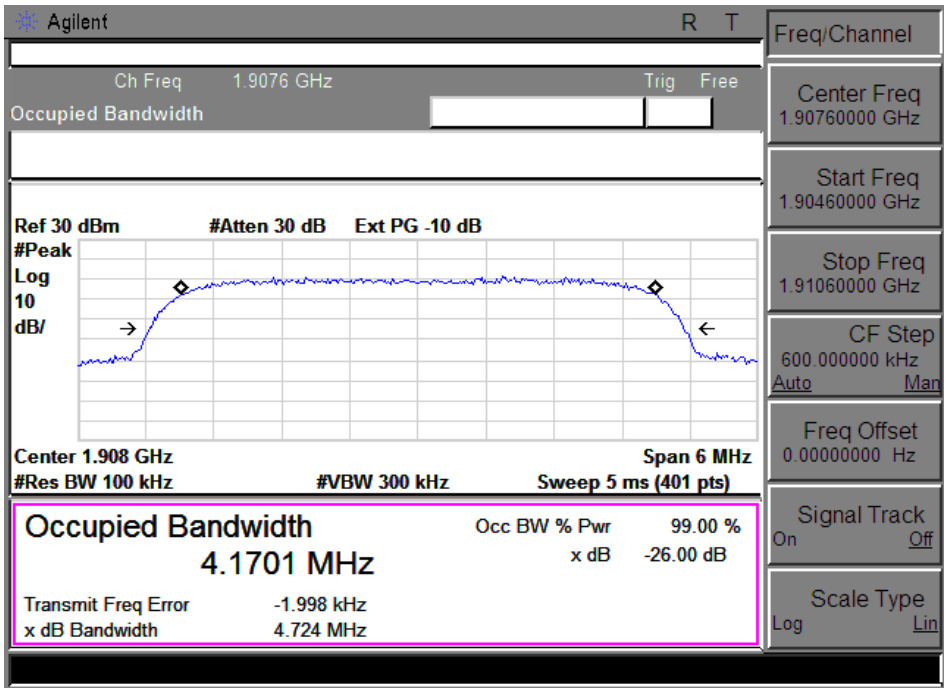
WCDMA BAND II CH9262



WCDMA BAND II CH9400

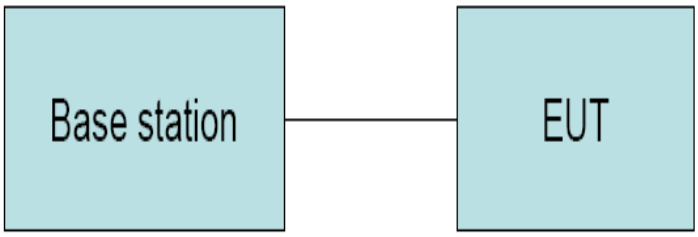


WCDMA BAND II CH9538



7. Frequency stability

7.1. Block Diagram of Test Setup



7.2. Limit

Cellular Telephone 850MHz	PCS 1900MHz
± 2.5 ppm	Must stay within the authorized frequency block

7.3. Test Procedure

Test Procedures for Temperature Variation:

1. The EUT was set up in the thermal chamber and connected with the base station.
2. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized for three hours. Power was applied and the maximum change in frequency was recorded within one minute.
3. With power OFF, the temperature was raised in 10°C step up to 50°C. The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.

Test Procedures for Voltage Variation

1. The EUT was placed in a temperature chamber at 25±5° C and connected with the base station.
2. The power supply voltage to the EUT was varied from DC 14 V to 10 V
3. The variation in frequency was measured for the worst case.

7.4. Test Result

EUT: Sense Gateway M/N:TIX6-GW			
Power: DC 12V from adapter			
Ambient Temperature:23℃		Relative Humidity: 60%	
Test date: 2015-12-23		Test site: RF site	Tested by: Simple Guan
Conclusion: PASS			
Mode	Voltage (V)	Frequency error (Hz)	frequency error (ppm)
GSM 850 CH 190	14V	-16.43	-0.02
	13V	-16.35	-0.02
	12V	-18.59	-0.022
	11V	-21.74	-0.026
	10V	-15.93	-0.019
PCS 1900 CH661	14V	-32.68	-0.017
	13V	-34.85	-0.019
	12V	-33.71	-0.018
	11V	-31.92	-0.017
	10V	-30.82	-0.016

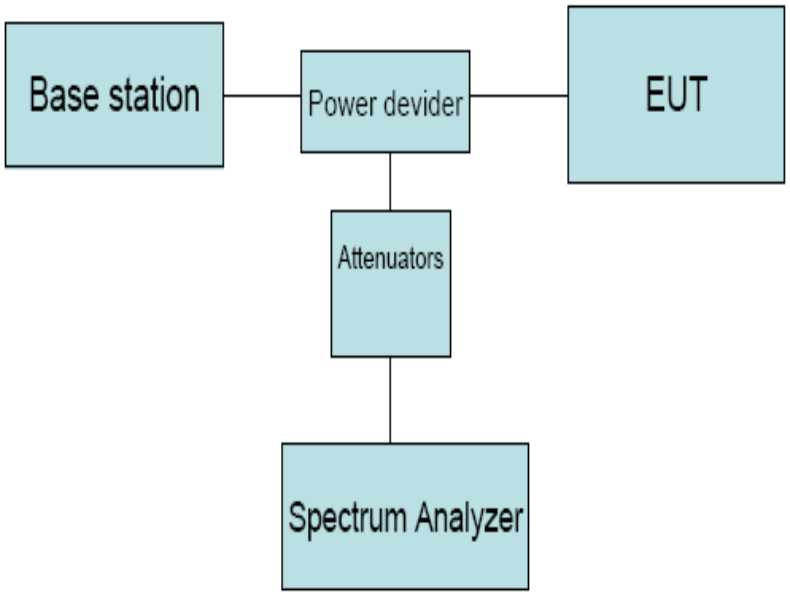
Mode	Temperature (℃)	Frequency error (Hz)	frequency error (ppm)
GSM 850 CH190	-30	21.57	0.026
	-20	22.48	0.027
	-10	20.65	0.025
	0	-19.81	-0.024
	10	-15.46	-0.018
	20	-19.32	-0.023
	30	-22.87	-0.027
	40	-18.54	-0.022
	50	-21.39	-0.026
PCS 1900 CH661	-30	63.36	0.034
	-20	62.51	0.033
	-10	63.38	0.034
	0	64.27	0.034
	10	69.38	0.037
	20	72.59	0.039
	30	71.48	0.038
	40	-54.53	-0.029
	50	-45.73	-0.024

EUT: Sense Gateway M/N:TIX6-GW			
Power: DC 12V from adapter			
Ambient Temperature:23℃		Relative Humidity: 60%	
Test date: 2015-12-23		Test site: RF site	Tested by: Simple Guan
Conclusion: PASS			
Mode	Voltage (V)	Frequency error (Hz)	frequency error (ppm)
WCDMA BAND V CH4182	14V	27.83	0.033
	13V	32.26	0.039
	12V	35.13	0.042
	11V	-33.58	-0.04
	10V	31.29	0.037
WCDMA BAND II CH9400	14V	42.07	0.022
	13V	41.83	0.022
	12V	45.57	0.024
	11V	-46.24	-0.025
	10V	-41.34	-0.022

Mode	Temperature (℃)	Frequency error (Hz)	frequency error (ppm)
WCDMA BAND V CH4182	-30	36.58	0.044
	-20	36.26	0.044
	-10	35.38	0.042
	0	-33.72	-0.04
	10	-34.68	-0.041
	20	-37.53	-0.045
	30	35.41	0.042
	40	26.21	0.031
	50	-40.47	-0.048
WCDMA BAND II CH9400	-30	54.83	0.029
	-20	55.26	0.029
	-10	56.38	0.030
	0	46.21	0.025
	10	60.04	0.032
	20	-51.25	-0.027
	30	42.84	0.023
	40	57.09	0.030
	50	51.58	0.027

8. Conducted spurious emissions

8.1. Block Diagram of Test Setup



8.2. Limit

The mean power of emissions must be attenuated below the mean power of the unmodulated carrier (P) on any frequency outside the frequency band by at least (43 + 10 log P) dB, in this case, -13dBm.

8.3. Test Procedure

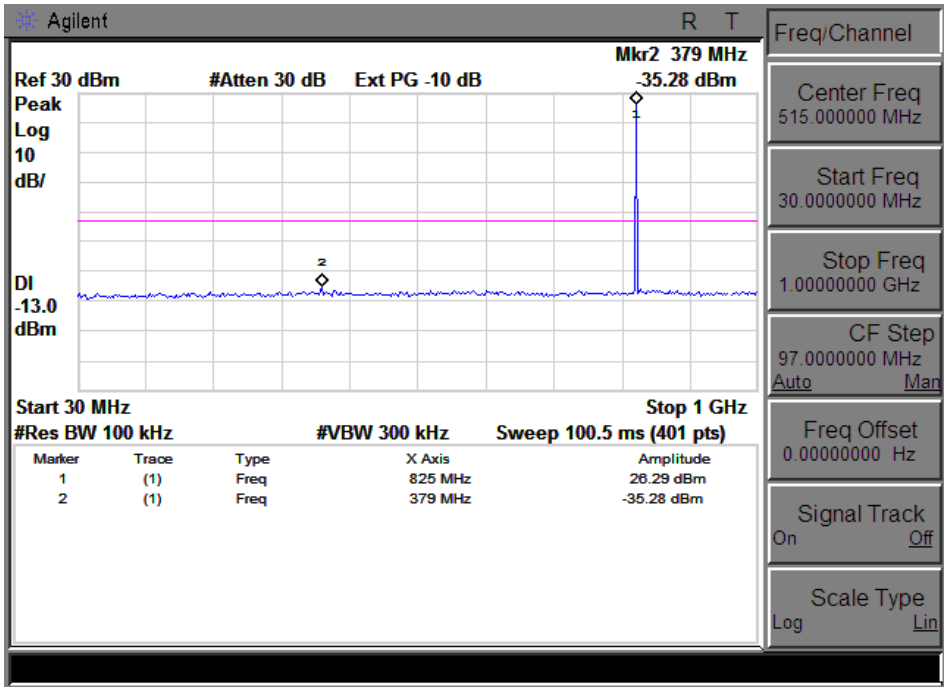
1. The EUT was connected to spectrum analyzer and base station via power divider.

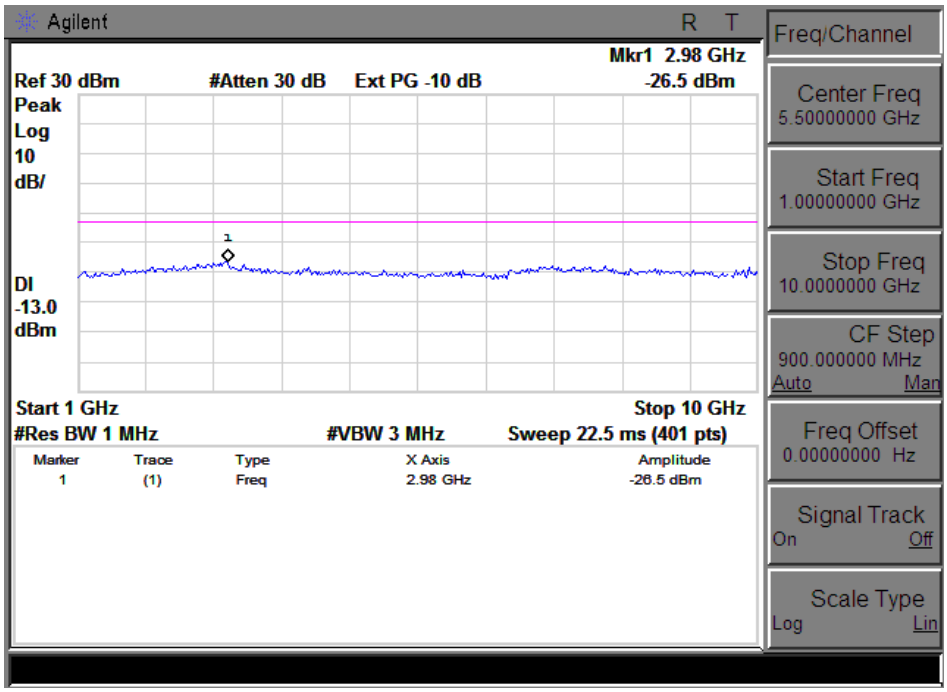
2. The low, middle and high channels of each band and mode's spurious emissions for 30MHz to 10th Harmonic were measured by Spectrum analyzer.

8.4. Test Result

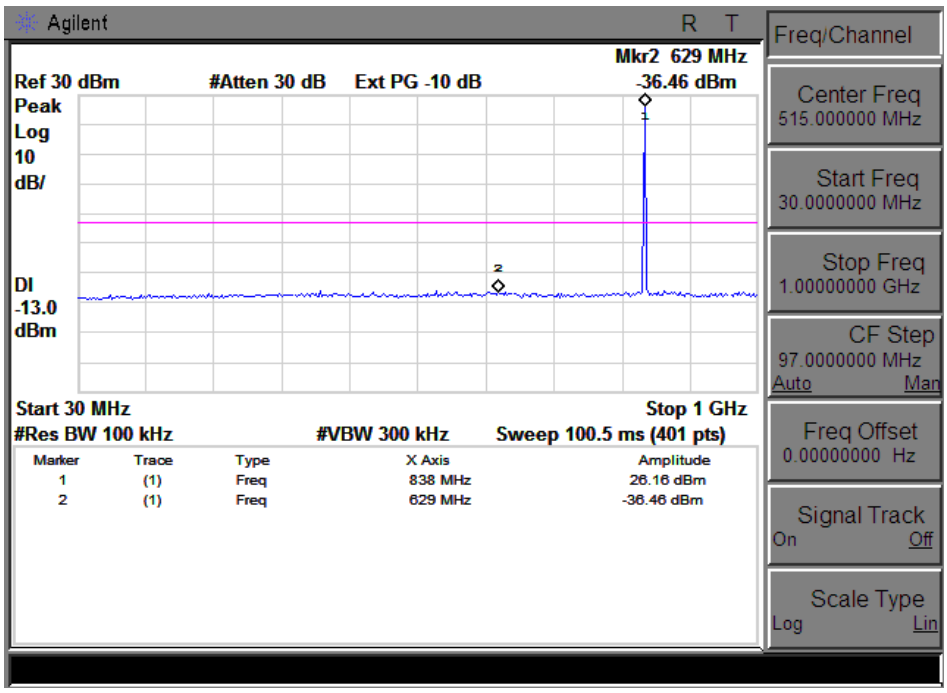
PASS

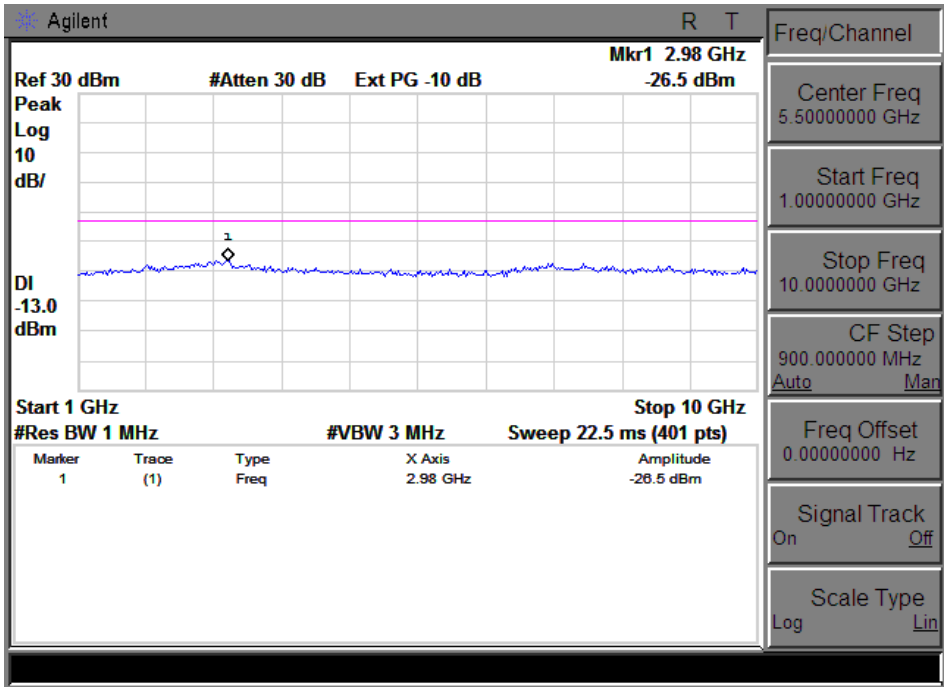
Test Mode: GSM 850 CH 128



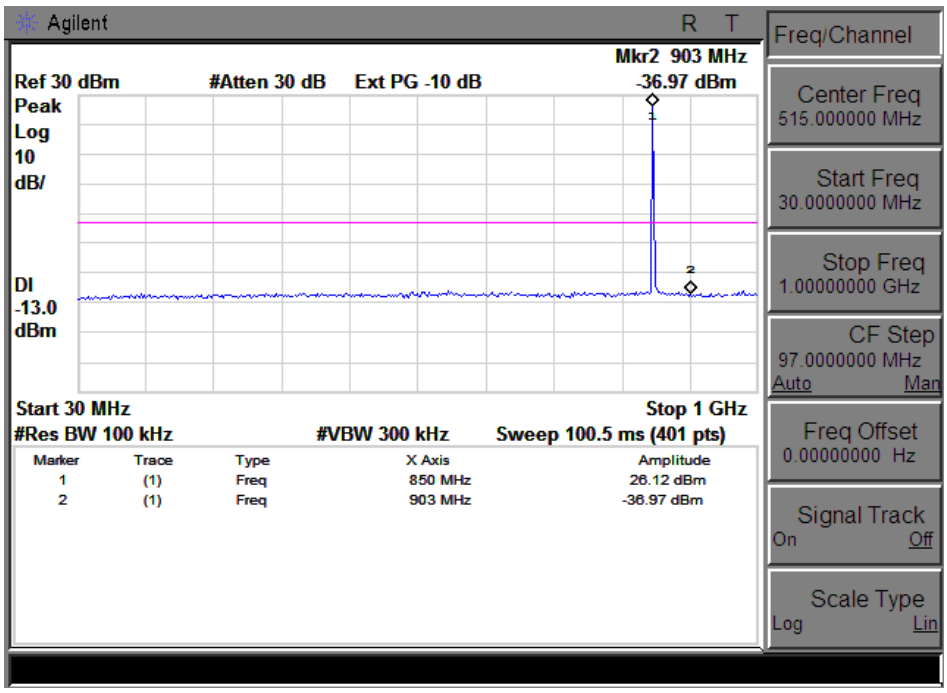


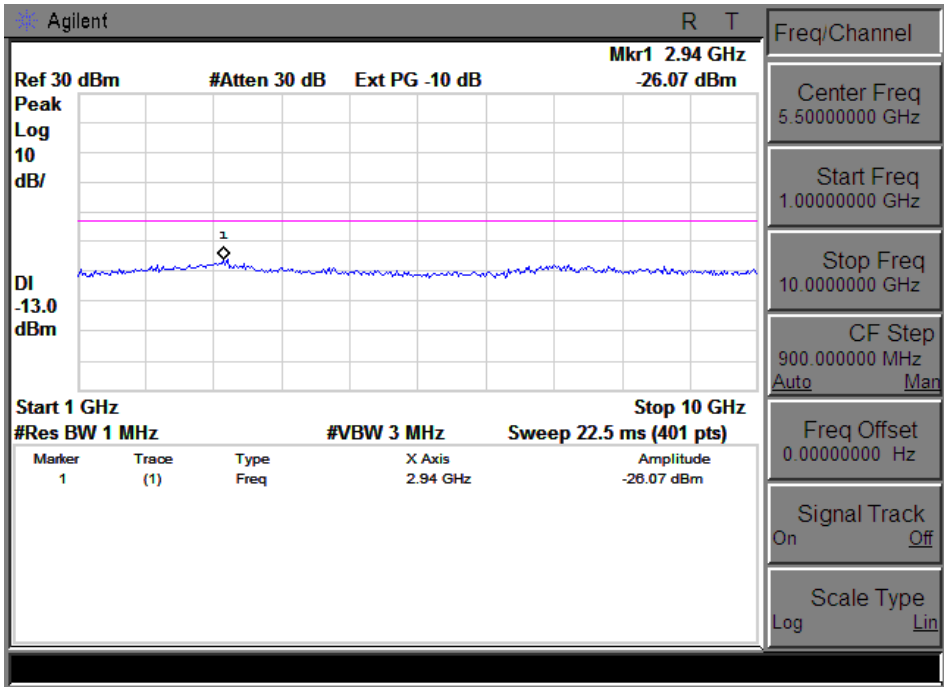
Test Mode: GSM 850 CH 190



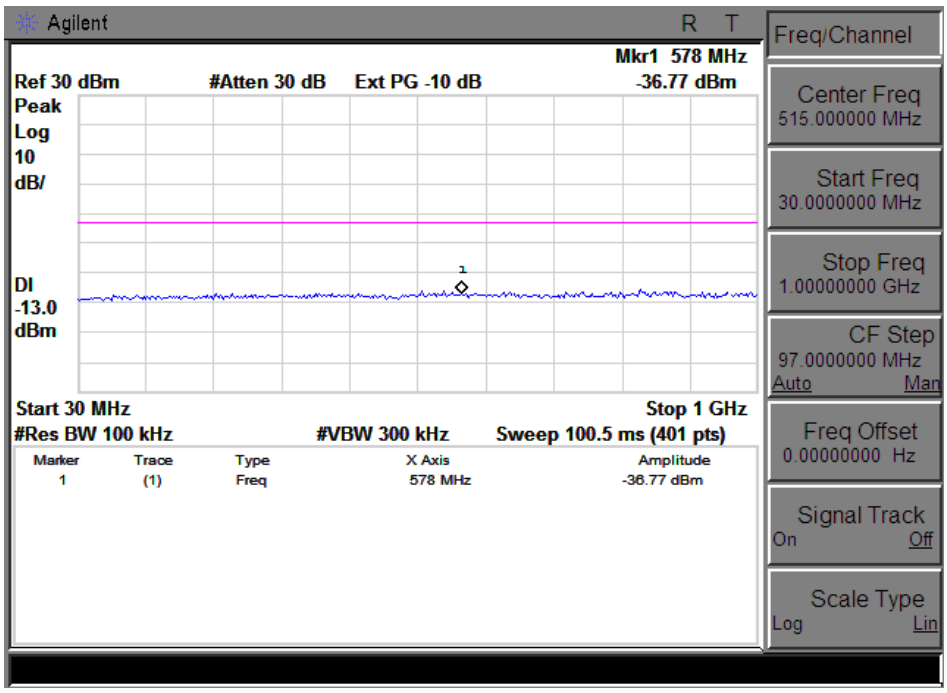


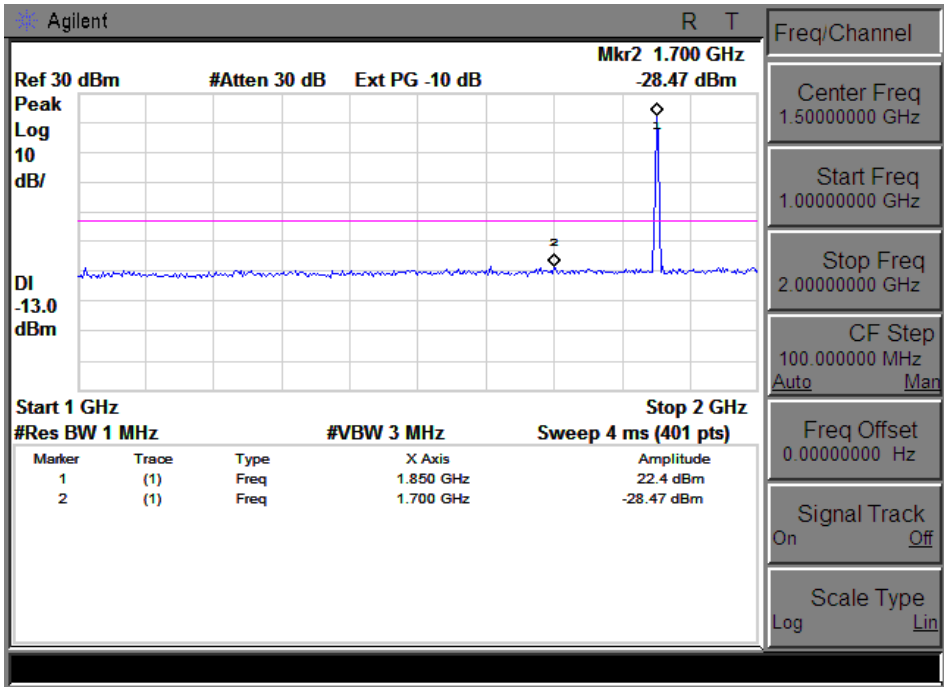
Test Mode: GSM 850 CH 251

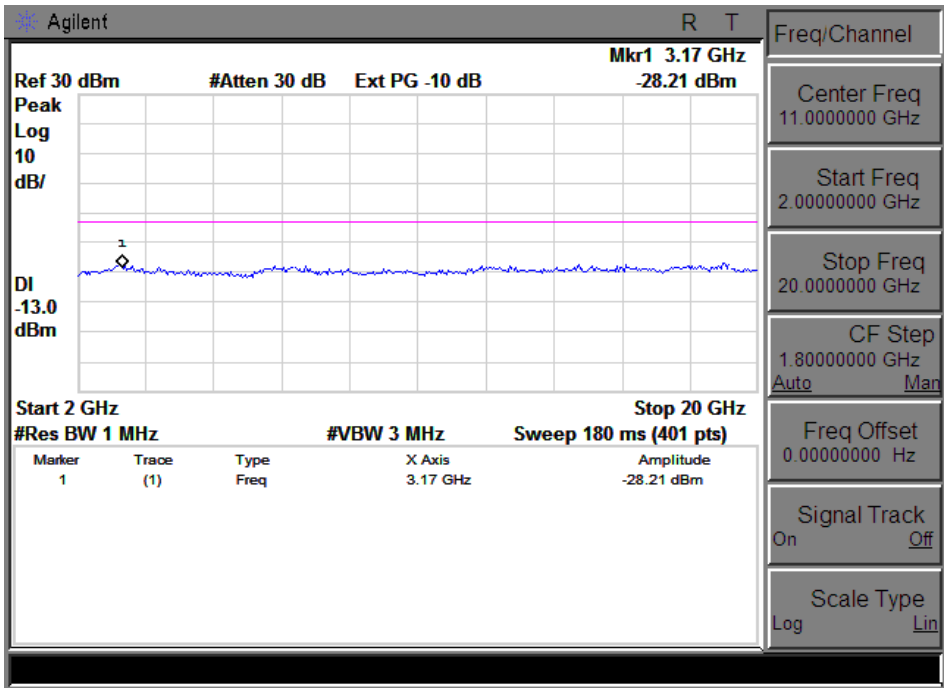




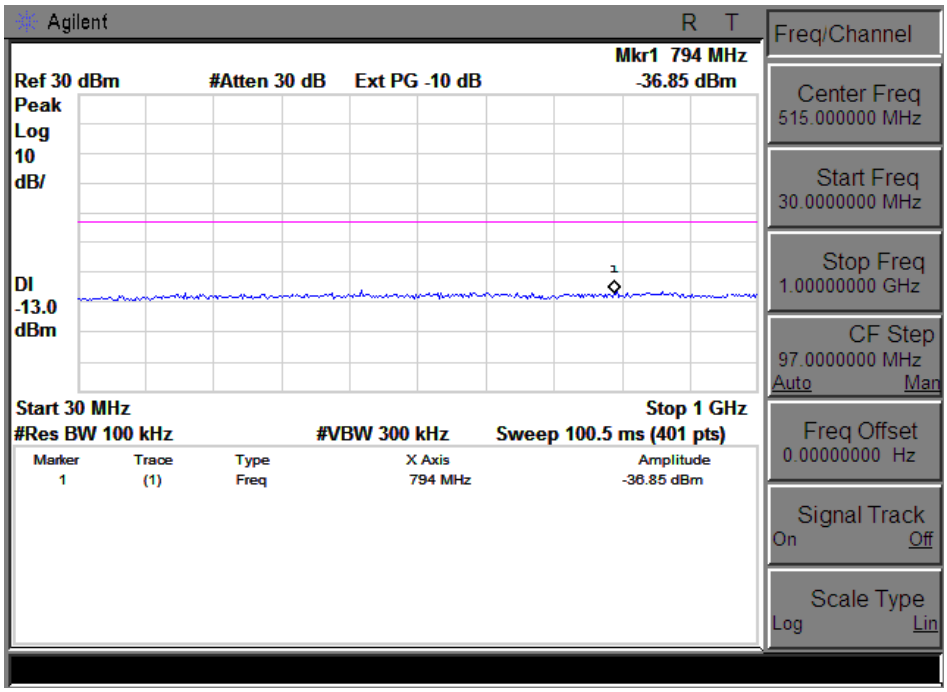
Test Mode: GSM 1900 CH 512

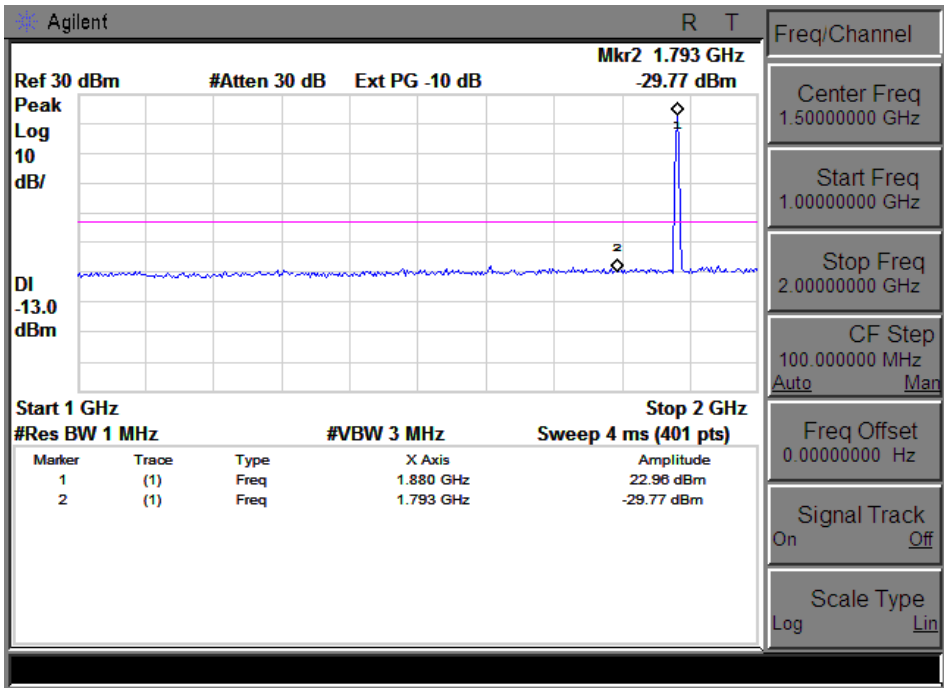


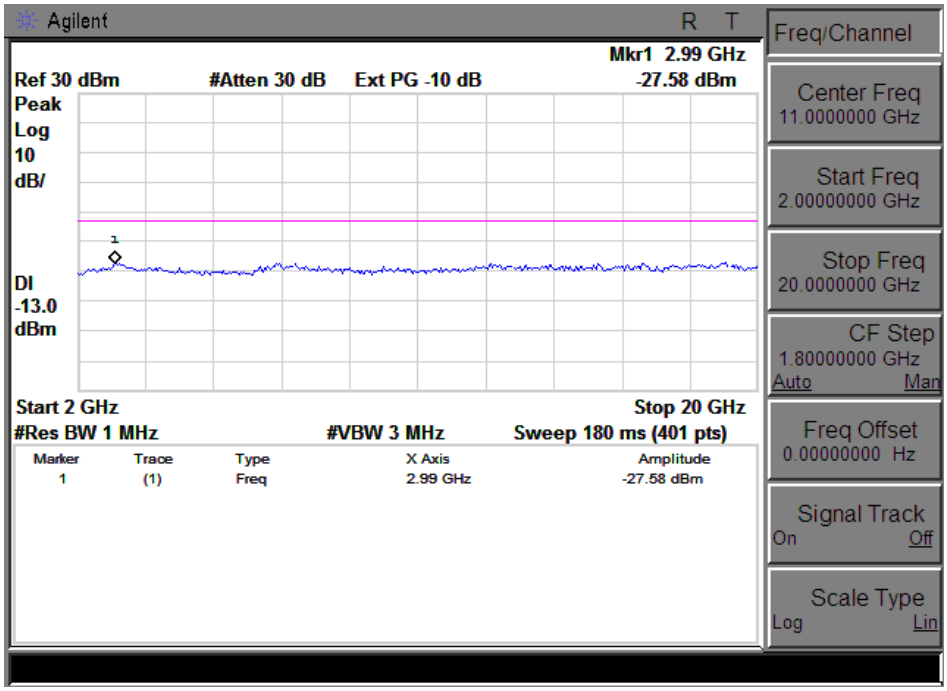




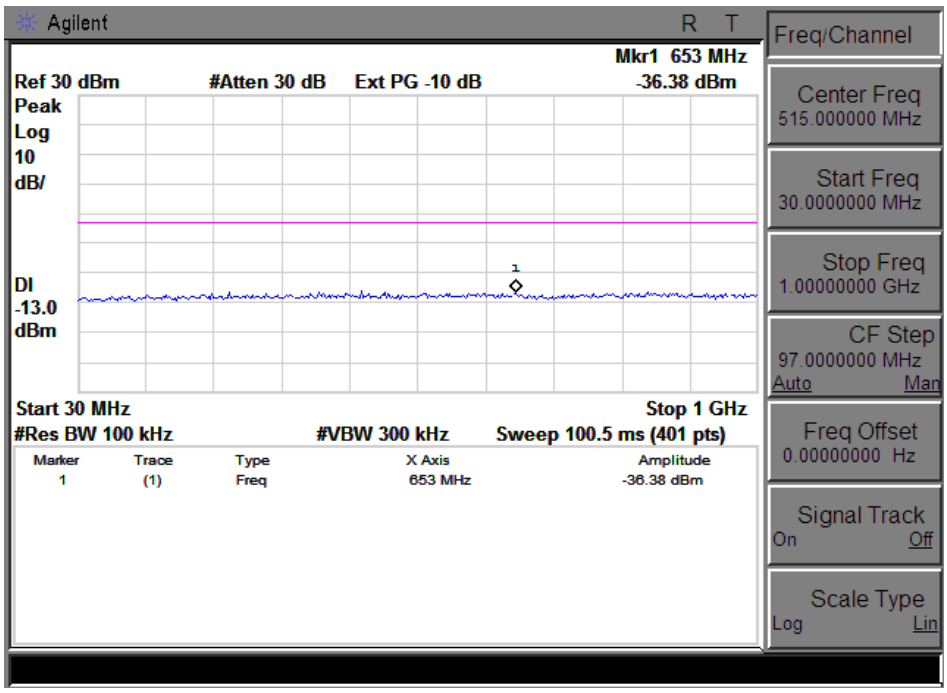
Test Mode: GSM 1900 CH 661

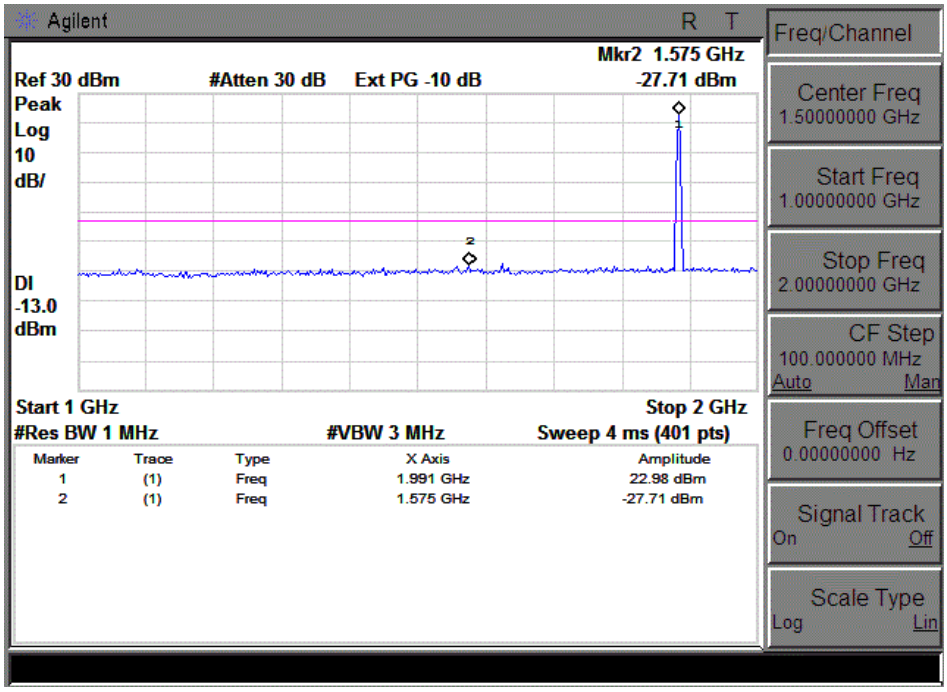


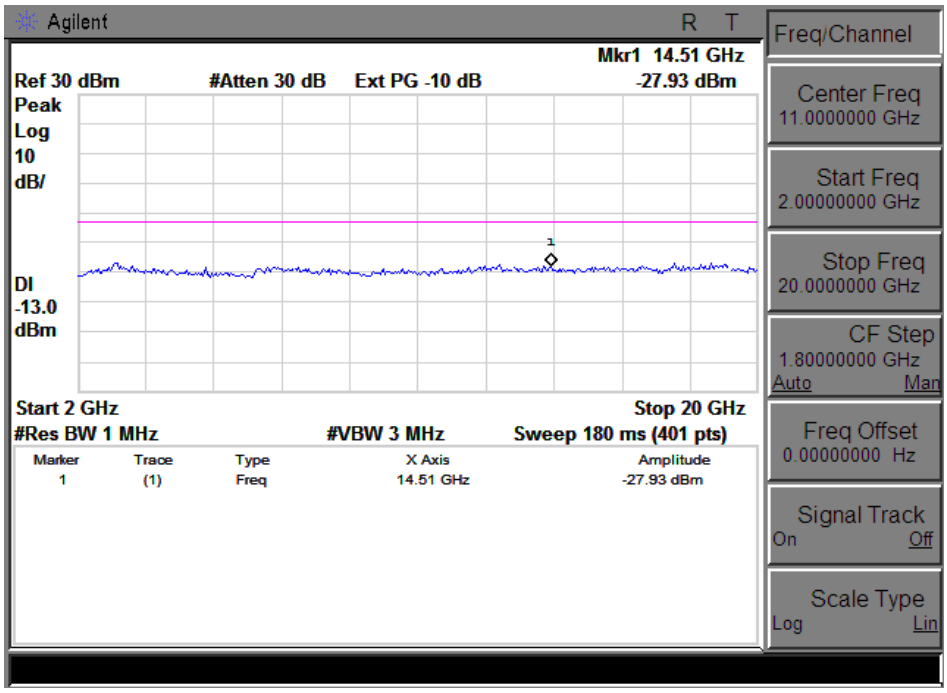

Agilent
R T
Mkr2 1.793 GHz
Ref 30 dBm
#Atten 30 dB
Ext PG -10 dB
-29.77 dBm
Peak
Log
10
dB/
DI
-13.0
dBm
Start 1 GHz
Stop 2 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 4 ms (401 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 1.880 GHz 22.96 dBm
2 (1) Freq 1.793 GHz -29.77 dBm
Freq/Channel
Center Freq
1.50000000 GHz
Start Freq
1.00000000 GHz
Stop Freq
2.00000000 GHz
CF Step
100.000000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Scale Type
Log Lin


Agilent
R T
Mkr1 2.99 GHz
Ref 30 dBm
#Atten 30 dB
Ext PG -10 dB
-27.58 dBm
Peak
Log
10
dB/
DI
-13.0
dBm
Start 2 GHz
Stop 20 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 180 ms (401 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.99 GHz -27.58 dBm
Freq/Channel
Center Freq
11.0000000 GHz
Start Freq
2.00000000 GHz
Stop Freq
20.0000000 GHz
CF Step
1.80000000 GHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Scale Type
Log Lin

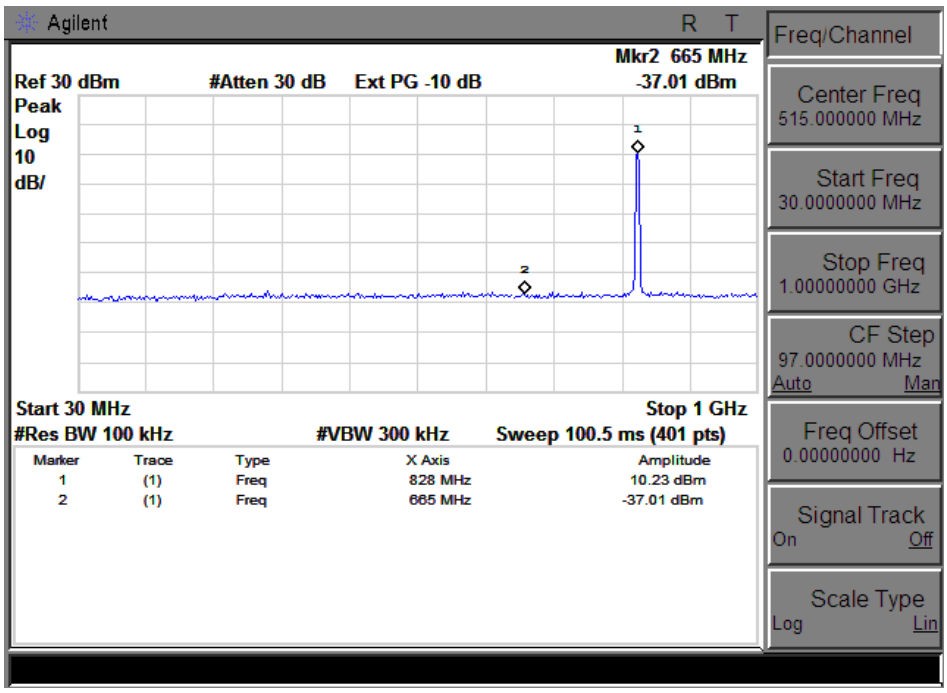
Test Mode: GSM 1900 CH 810

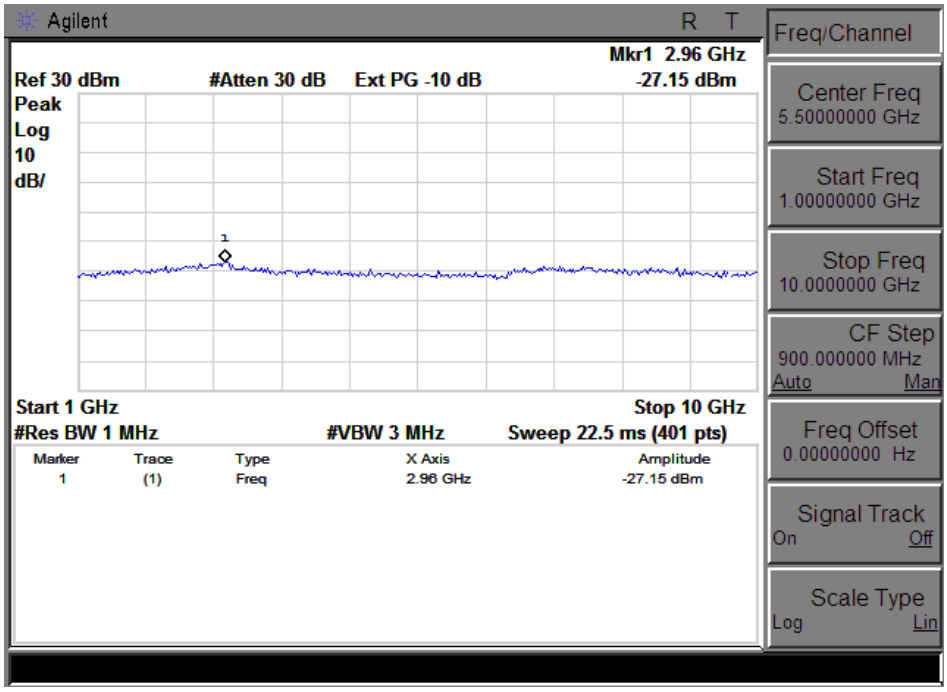




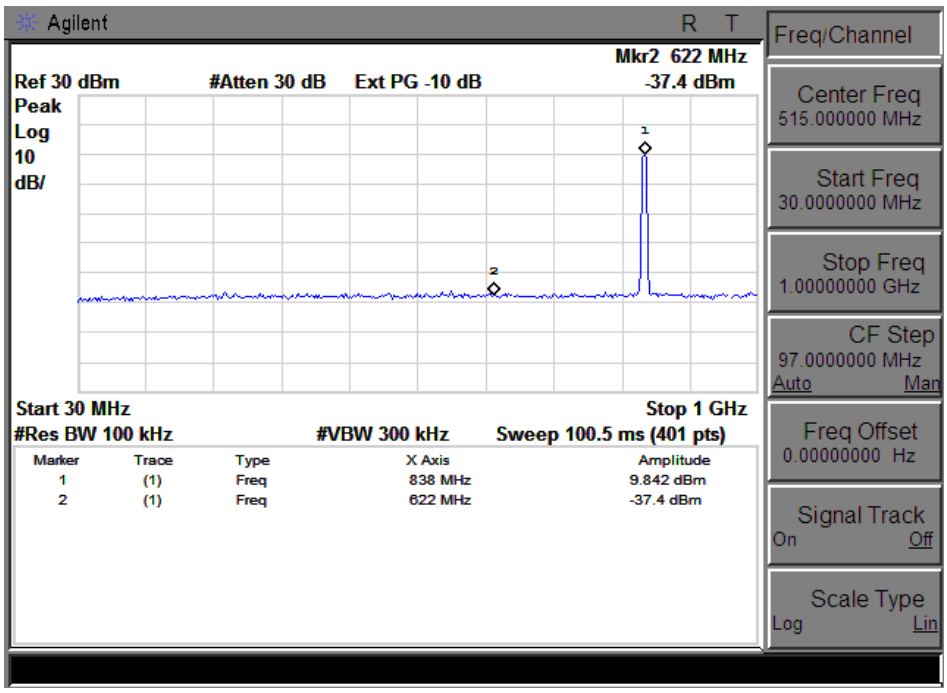

Agilent
R T
Mkr1 14.51 GHz
Ref 30 dBm
#Atten 30 dB
Ext PG -10 dB
-27.93 dBm
Peak
Log
10
dB/
DI
-13.0
dBm
Start 2 GHz
Stop 20 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 180 ms (401 pts)
Marker
Trace
Type
X Axis
Amplitude
1
(1)
Freq
14.51 GHz
-27.93 dBm
Freq/Channel
Center Freq
11.0000000 GHz
Start Freq
2.00000000 GHz
Stop Freq
20.0000000 GHz
CF Step
1.80000000 GHz
Auto
Man
Freq Offset
0.00000000 Hz
Signal Track
On
Off
Scale Type
Log
Lin

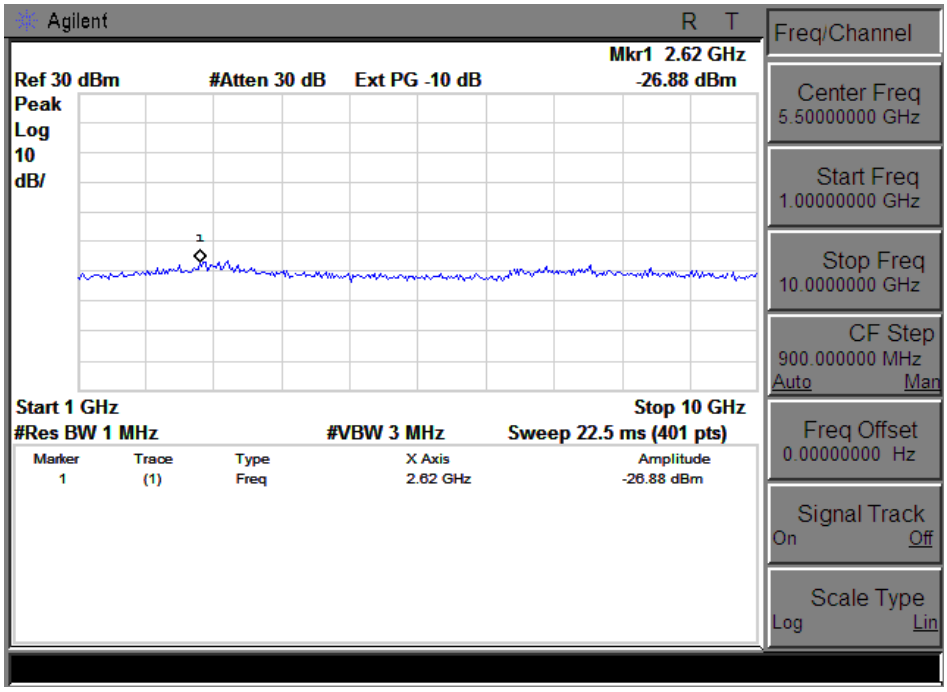
Test Mode: WCDMA BAND V CH4132



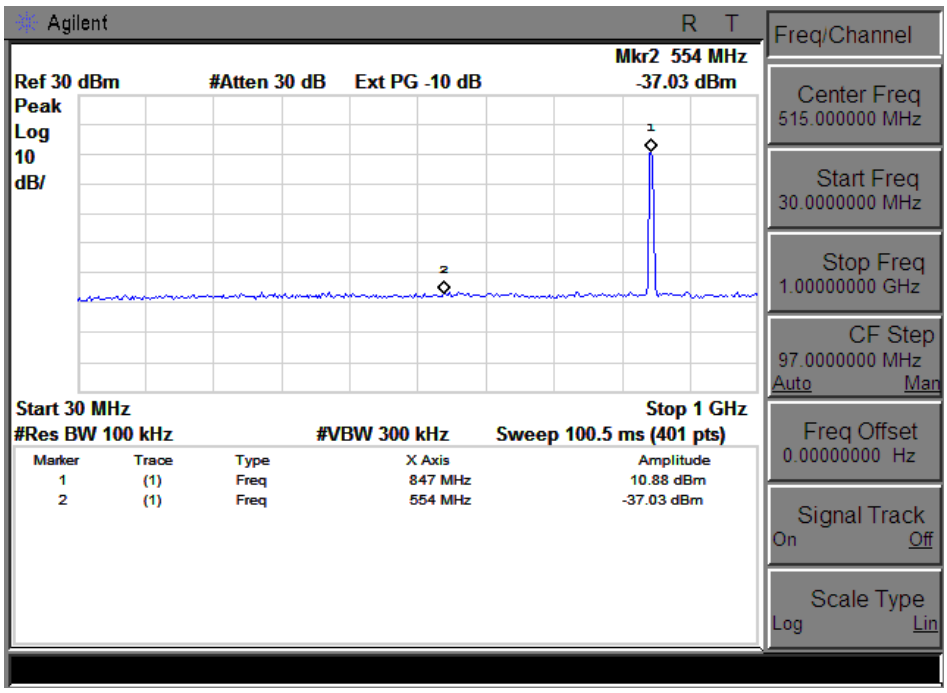


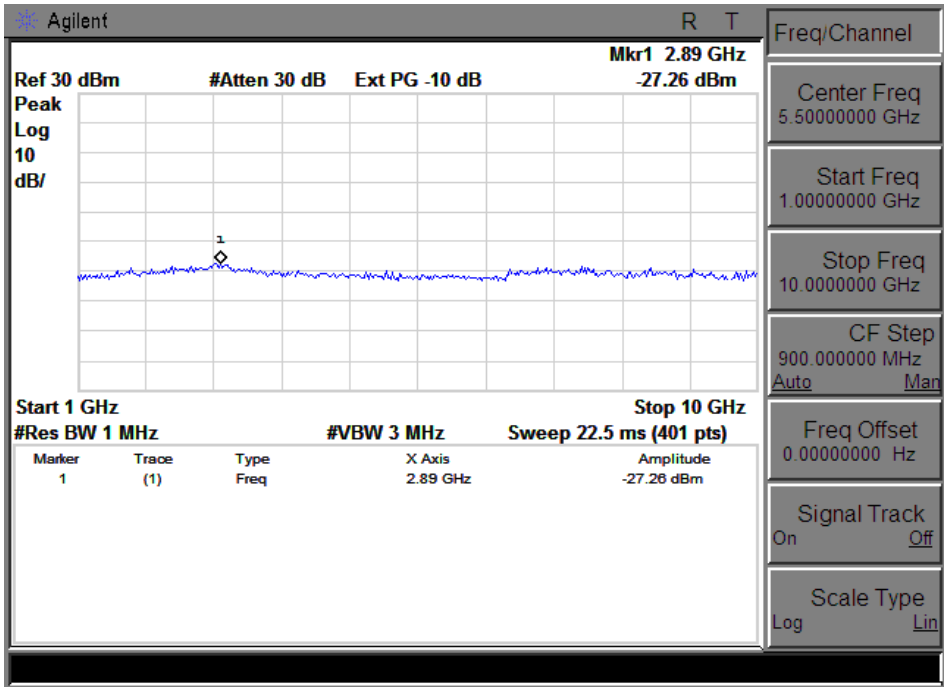
Test Mode: WCDMA BAND V CH4182



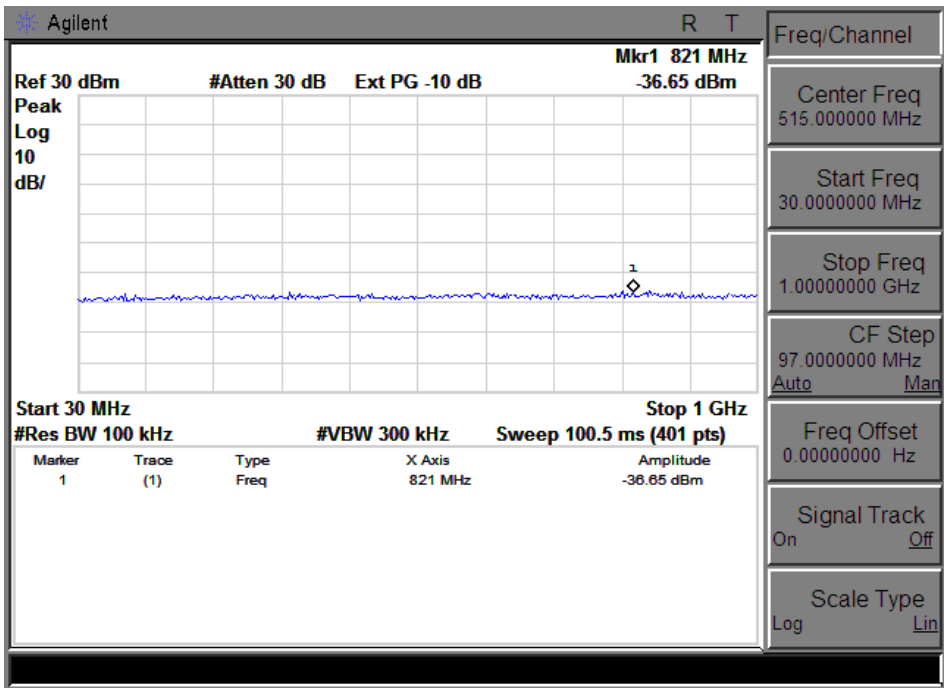


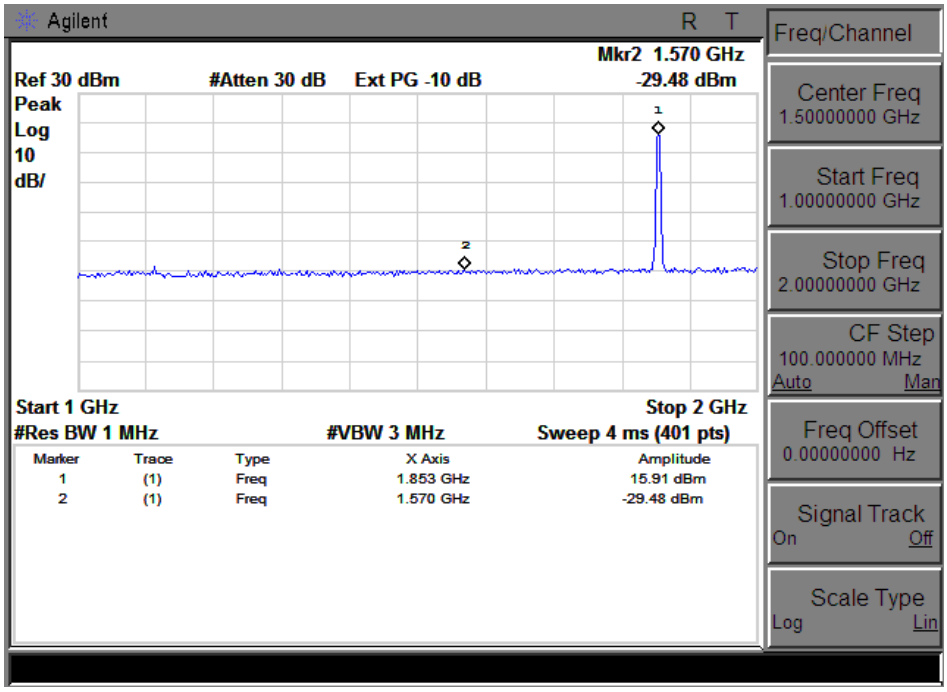
Test Mode: WCDMA BAND V CH4233

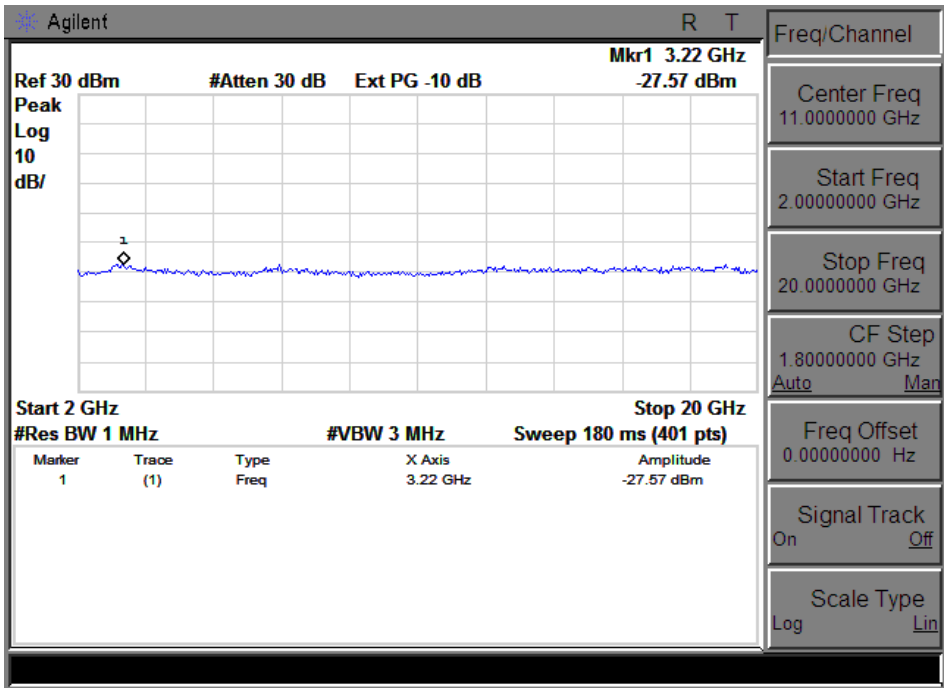




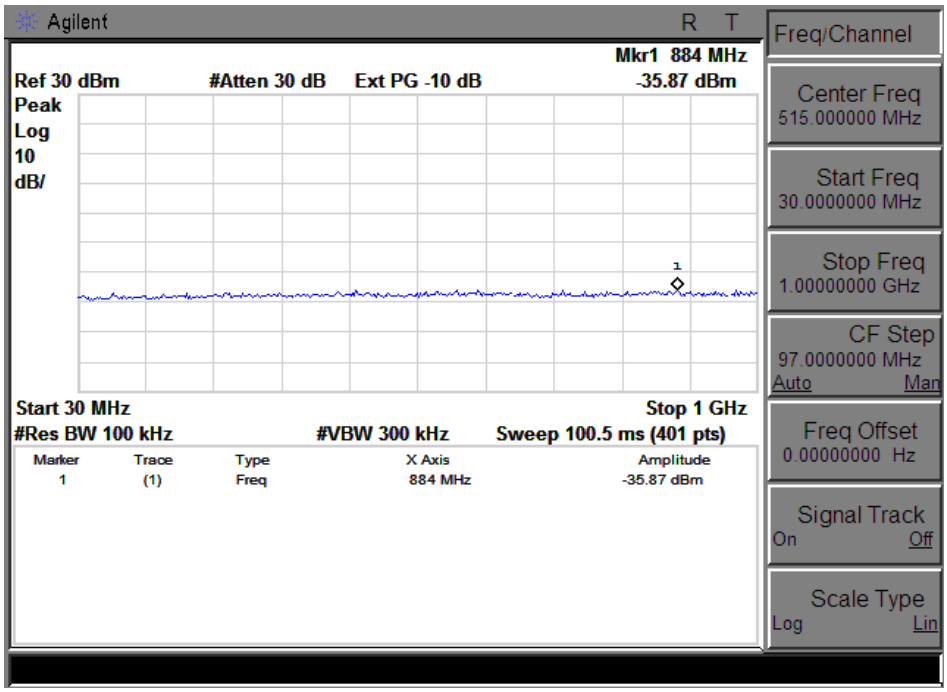
Test Mode: WCDMA BAND II CH9262

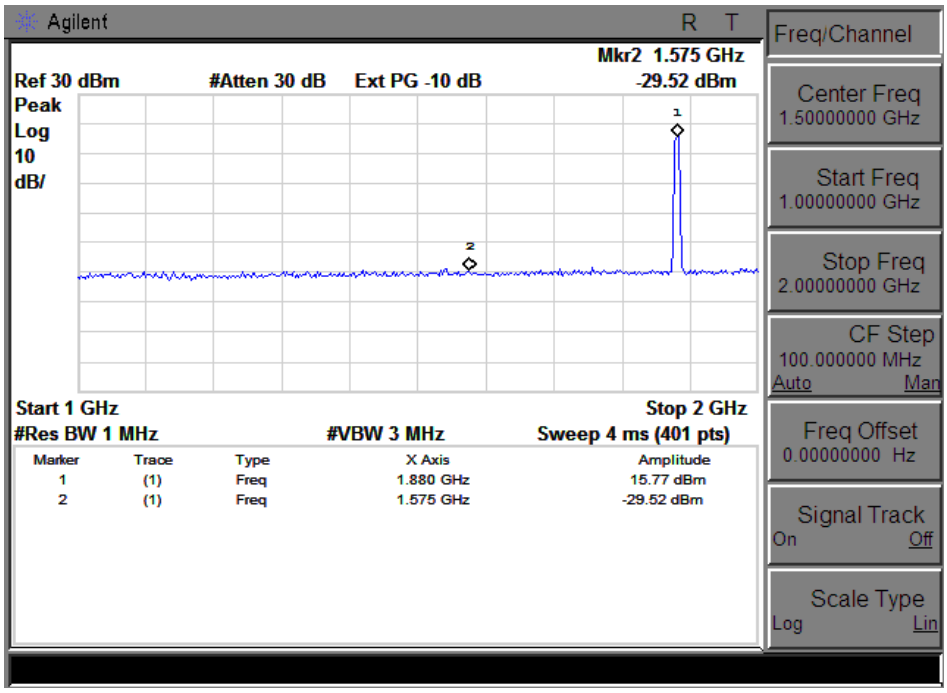


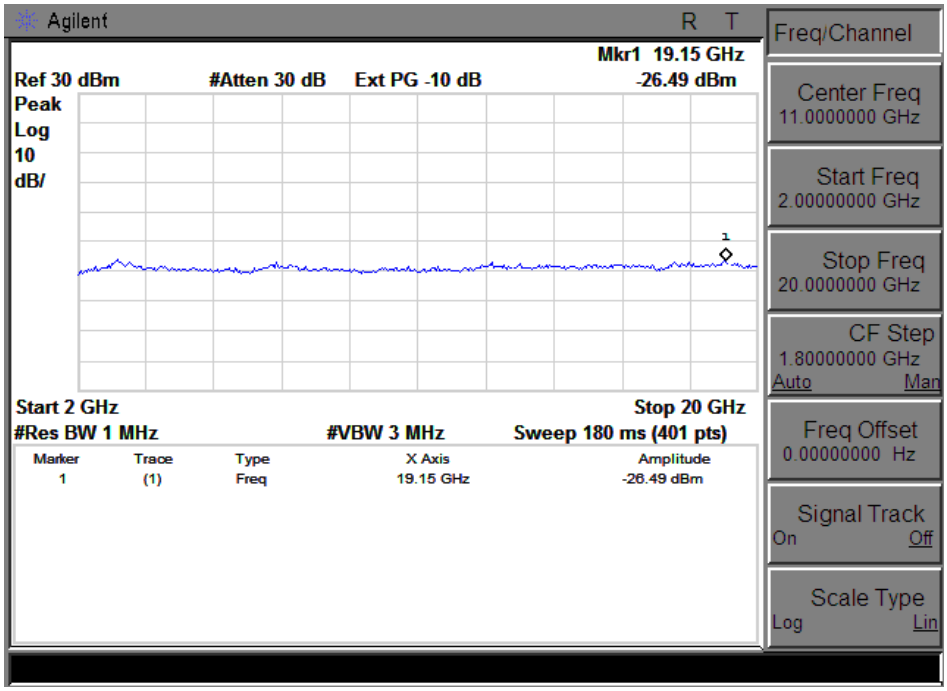




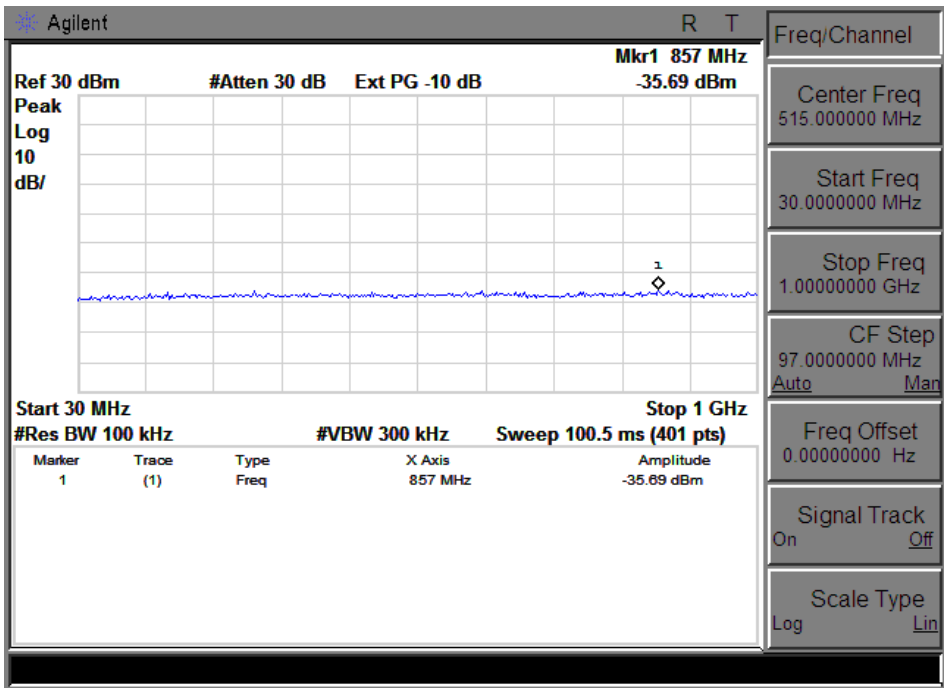
Test Mode: WCDMA BAND II CH9400

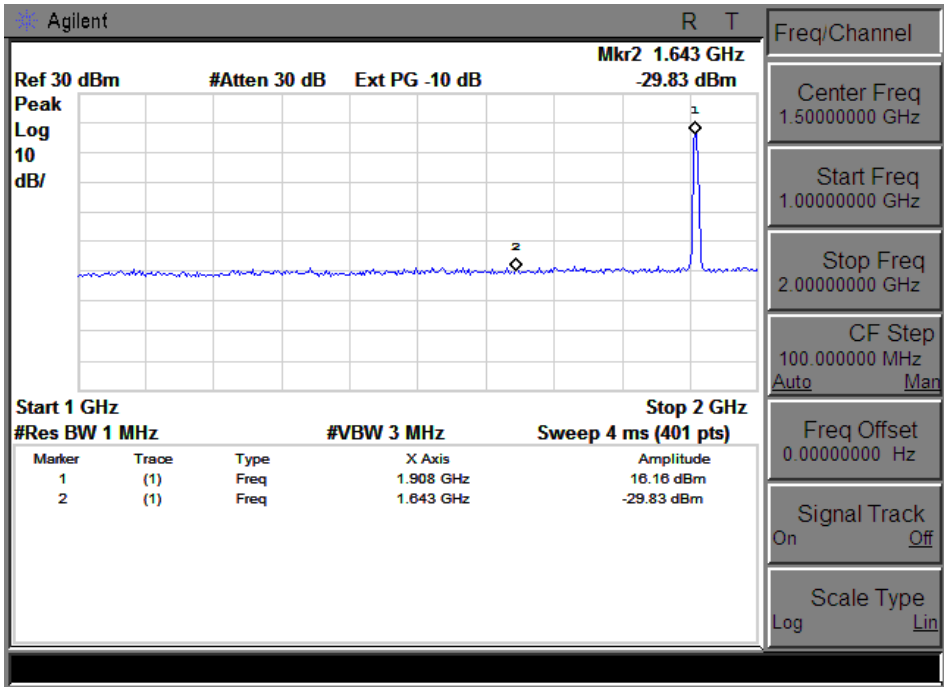


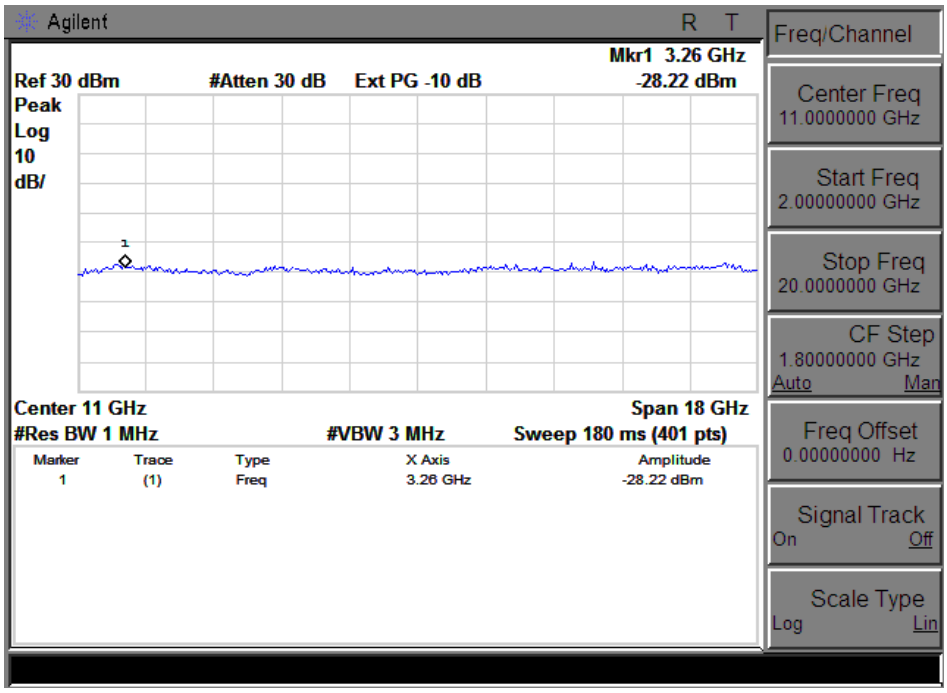

Agilent
R T
Mkr2 1.575 GHz
Ref 30 dBm
#Atten 30 dB
Ext PG -10 dB
-29.52 dBm
Peak
Log
10
dB/
Start 1 GHz
Stop 2 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 4 ms (401 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 1.880 GHz 15.77 dBm
2 (1) Freq 1.575 GHz -29.52 dBm
Freq/Channel
Center Freq
1.50000000 GHz
Start Freq
1.00000000 GHz
Stop Freq
2.00000000 GHz
CF Step
100.000000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Scale Type
Log Lin


Agilent
R T
Mkr1 19.15 GHz
Ref 30 dBm
#Atten 30 dB
Ext PG -10 dB
-26.49 dBm
Peak
Log
10
dB/
Start 2 GHz
Stop 20 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 180 ms (401 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 19.15 GHz -26.49 dBm
Freq/Channel
Center Freq
11.0000000 GHz
Start Freq
2.00000000 GHz
Stop Freq
20.0000000 GHz
CF Step
1.80000000 GHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Scale Type
Log Lin

Test Mode: WCDMA BAND II CH9538

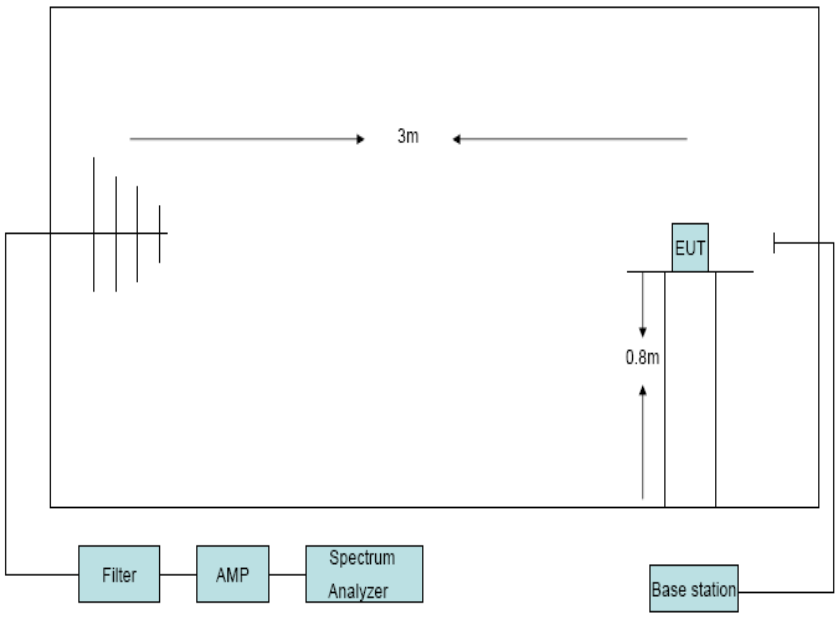





Agilent
R T
Mkr1 3.26 GHz
Ref 30 dBm
#Atten 30 dB
Ext PG -10 dB
-28.22 dBm
Peak
Log
10
dB/
Center 11 GHz
Span 18 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 180 ms (401 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 3.26 GHz -28.22 dBm
Freq/Channel
Center Freq
11.0000000 GHz
Start Freq
2.00000000 GHz
Stop Freq
20.0000000 GHz
CF Step
1.80000000 GHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Scale Type
Log Lin

9. Radiated spurious emissions

9.1. Block Diagram of Test Setup



9.2. Limit

The mean power of emissions must be attenuated below the mean power of the unmodulated carrier (P) on any frequency outside the frequency band by at least (43 + 10 log P) dB, in this case, -13dBm.

9.3. Test Procedure

1. The EUT was placed on an non-conductive rotating platform with 0.8 meter height in an anechoic chamber. The radiated spurious emissions from 30MHz to 10th harmonious of fundamental frequency were measured at 3m with a test antenna and a spectrum analyzer with RBW= 1MHz, VBW= 1MHz ,peak detector settings.
2. During the measurement, the EUT was enforced in maximum power and linked with a base station. All the spurious emissions (record as LVL) at 3m were measured by rotation of the turntable and the test antenna raised and lowered over a range from 1 to 4 meters in both horizontally and vertically polarized orientations.
3. Final spurious emissions levels were measured by substitution method according to TIA/EIA-603-C. The EUT was replaced by dipole antenna (for frequency below 1GHz) or Horn antenna (for frequency above 1GHz) at same location with same polarize of receiver antenna and then a known power of each measure frequency from S.G. was

applied into the dipole antenna or Horn antenna through a Tx cable, and then recorded the maximum Analyzer reading through raised and lowered the test antenna. The correction factor (in dB) = S.G. - Tx Cable loss + Substitution antenna gain –Substitution antenna Loss (only for Dipole antenna) - Analyzer reading. Then final spurious emissions were calculated with the correction factor, EIRP= LVL + Correction factor and ERP = EIRP – 2.15

9.4. Test Result

EUT:Sense Gateway M/N:TIX6-GW						
Power: DC 12V from adapter						
Test Date: 2015-12-23	Test site: RF Chamber		Tested by: Simple Guan			
Ambient Temperature: 24℃	Relative Humidity: 60%					
Conclusion: PASS						
Test result						
Test Mode： GSM 850 CH128						
Frequency (MHz)	Antenna polarization	LVL (dBm)	Correction factor(dB)	Result (ERP)(dBm)	Limit (dBm)	Margin (dB)
1648.4	H	-59.43	11.50	-50.08	-13.00	37.08
1648.4	V	-55.21	10.56	-46.8	-13.00	33.8
Test Mode： GSM 850 CH190						
1673.2	H	-59.76	10.94	-50.97	-13.00	37.97
2509.8	H	/	/	/	-13.00	/
1673.2	V	-53.18	10.90	-44.43	-13.00	31.43
2509.8	V	/	/	/	-13.00	/
Test mode: GSM 850 CH251						
1697.6	H	-58.94	11.67	-49.42	-13.00	36.42
2546.4	H	/	/	/	-13.00	/
1697.6	V	-54.27	11.13	-45.29	-13.00	32.29
2546.4	V	/	/	/	-13.00	/

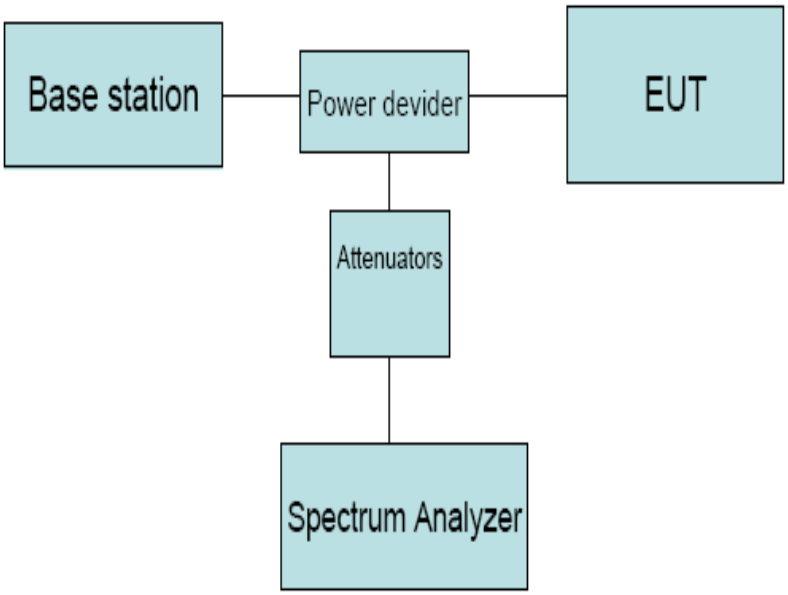
Test Mode：GSM 1900 CH512						
Frequency (MHz)	Antenna polarization	LVL (dBm)	Correction factor(dB)	Result (EIRP)(dBm)	Limit (dBm)	Margin (dB)
537.31	H	-57.69	-6.53	-64.22	-13	51.22
537.31	V	-56.69	-6.53	-63.22	-13	50.22
3700.4	H	-53.7	8.57	-45.13	-13	32.13
3700.4	V	-53.02	8.37	-44.65	-13	31.65
Test Mode： GSM 1900 CH661						
3760	H	-55.87	8.75	-47.12	-13	34.12
3760	V	-53.46	8.55	-44.91	-13	31.91
Test mode: GSM 1900 CH810						
3819.6	H	-55.87	8.94	-46.93	-13	33.93
3819.6	V	-53.46	8.72	-44.74	-13	31.74
Note: All the other emissions not recorded were too low to read, and deemed to comply with limit.						

EUT: Sense Gateway M/N:TIX6-GW						
Power: DC 12V from adapter						
Test Date: 2015-12-23		Test site: RF Chamber		Tested by: Simple Guan		
Ambient Temperature: 24℃		Relative Humidity: 60%				
Conclusion: PASS						
Test result						
Test Mode： WCDMA BAND V CH4132						
Frequency (MHz)	Antenna polarization	LVL (dBm)	Correction factor(dB)	Result (ERP)(dBm)	Limit (dBm)	Margin (dB)
1652.8	H	-55.89	11.50	-46.54	-13.00	33.54
1652.8	V	-54.21	10.56	-45.80	-13.00	32.80
Test Mode： WCDMA BAND V CH4182						
1673.2	H	-56.93	10.94	-48.14	-13.00	35.14
2509.8	H	/	/	/	-13.00	/
1673.2	V	-52.71	10.90	-43.96	-13.00	30.96
2509.8	V	/	/	/	-13.00	/
Test mode: WCDMA BAND V CH4233						
1693.2	H	-57.48	11.67	-47.96	-13.00	34.96
2546.4	H	/	/	/	-13.00	/
1693.2	V	-51.09	11.13	-42.11	-13.00	29.11
2546.4	V	/	/	/	-13.00	/

Test Mode： WCDMA BAND II CH9262						
Frequency (MHz)	Antenna polarization	LVL (dBm)	Correction factor(dB)	Result (EIRP)(dBm)	Limit (dBm)	Margin (dB)
3704.8	H	-53.38	8.57	-44.81	-13.00	31.81
5550.6	H	/	/	/	-13.00	/
3704.8	V	-50.12	8.37	-41.75	-13.00	28.75
5550.6	V	/	/	/	-13.00	/
Test Mode：WCDMA BAND II CH9400						
3760	H	-52.71	8.75	-43.96	-13.00	30.96
5640	H	/	/	/	-13.00	/
3760	V	-48.69	8.55	-40.14	-13.00	27.14
5640	V	/	/	/	-13.00	/
Test mode: WCDMA BAND II CH9538						
3815.2	H	-52.59	8.94	-43.65	-13.00	30.65
5729.4	H	/	/	/	-13.00	/
3815.2	V	-51.47	8.72	-42.75	-13.00	29.75
5729.4	V	/	/	/	-13.00	/
Note: All the other emissions not recorded were too low to read, and deemed to comply with limit.						

10. Band Edge Compliance

10.1. Block Diagram of Test Setup



10.2. Limit

The mean power of emissions must be attenuated below the mean power of the unmodulated carrier (P) on any frequency outside the frequency band by at least (43 + 10 log P) dB, in this case, -13dBm.

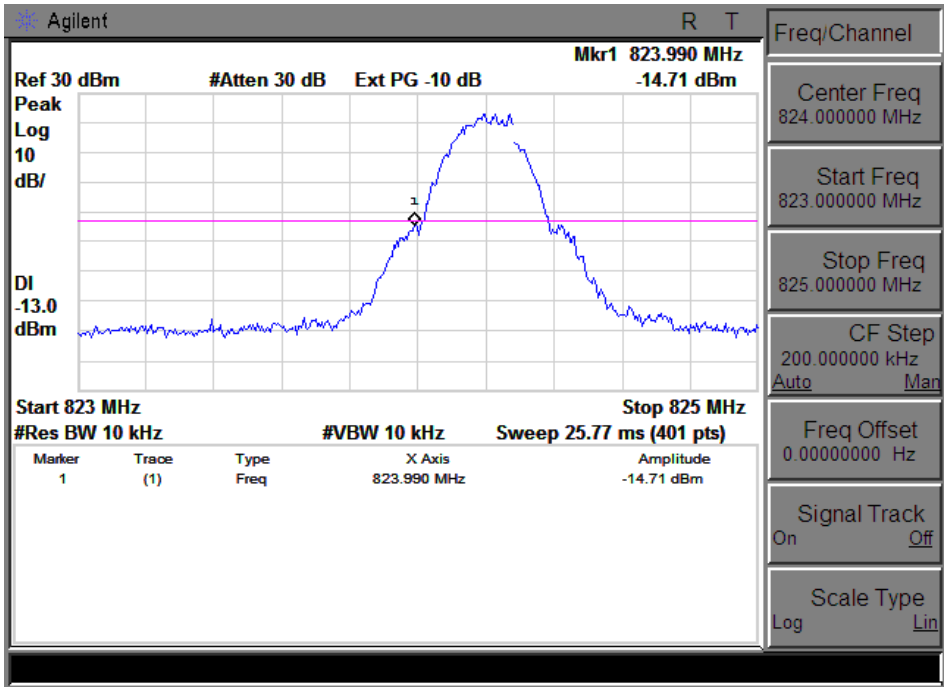
10.3. Test Procedure

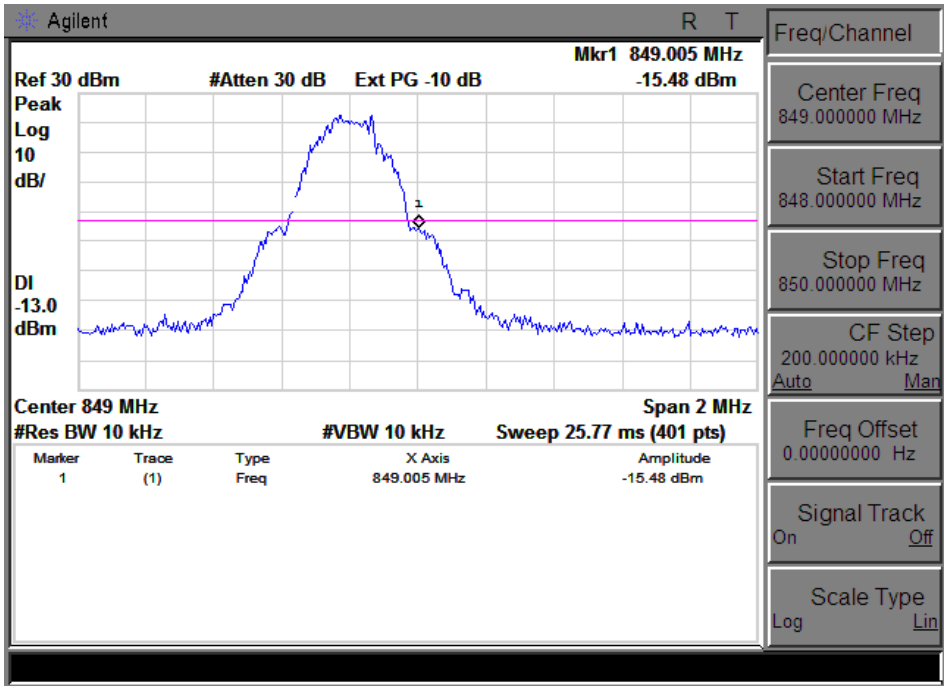
1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The band edges of low and high channels for the highest RF powers were measured.

10.4.Test Result

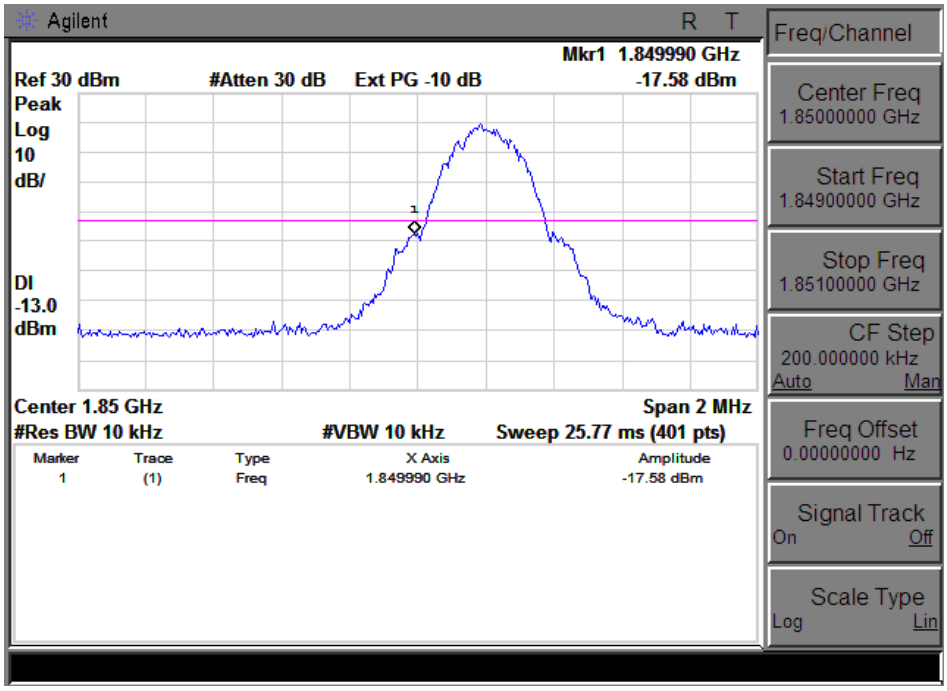
PASS

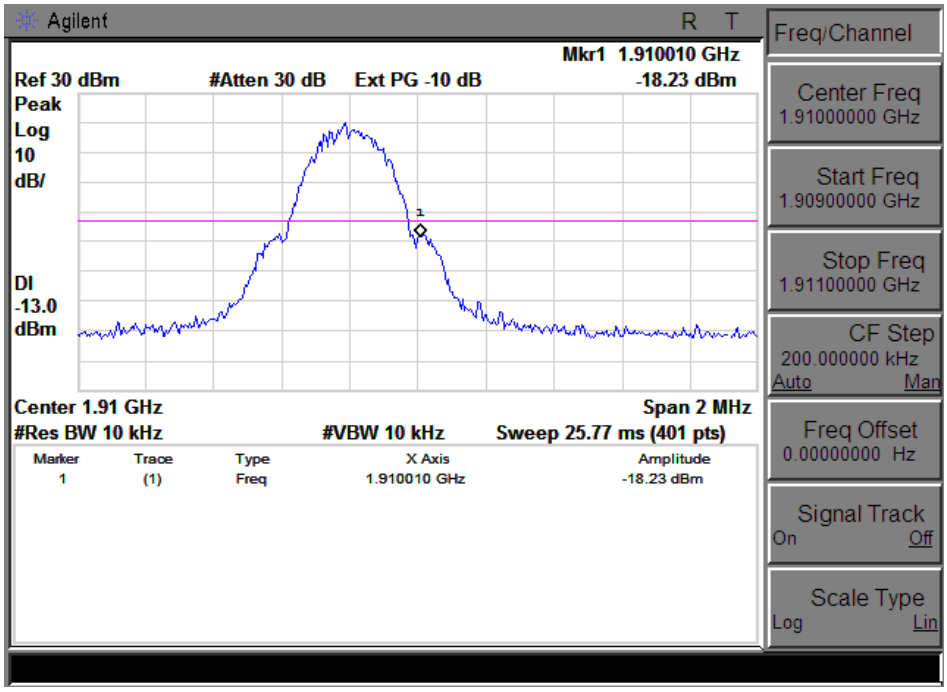
Test Mode: GSM 850



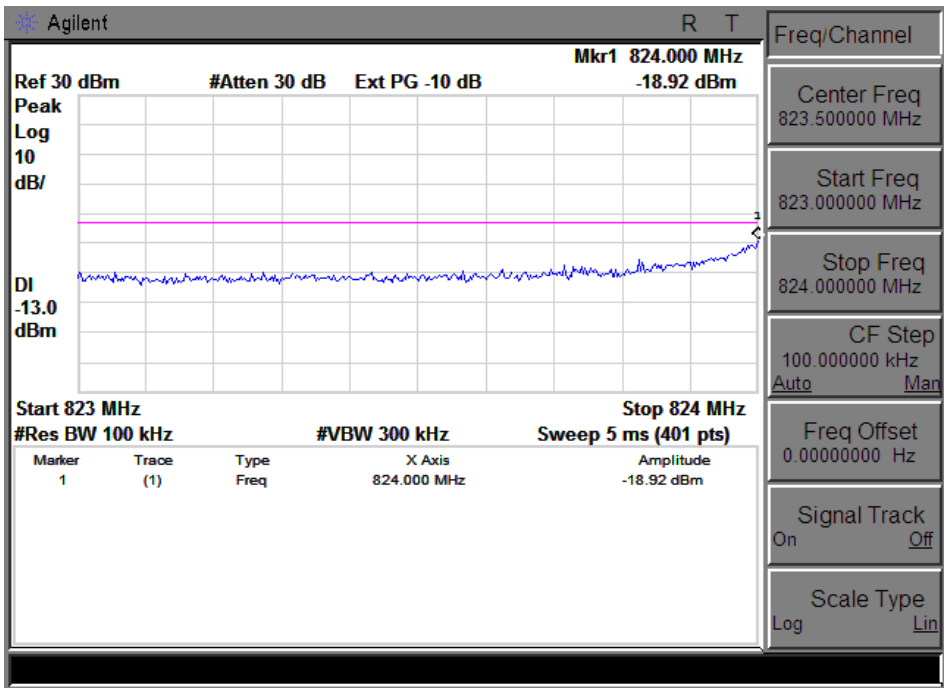


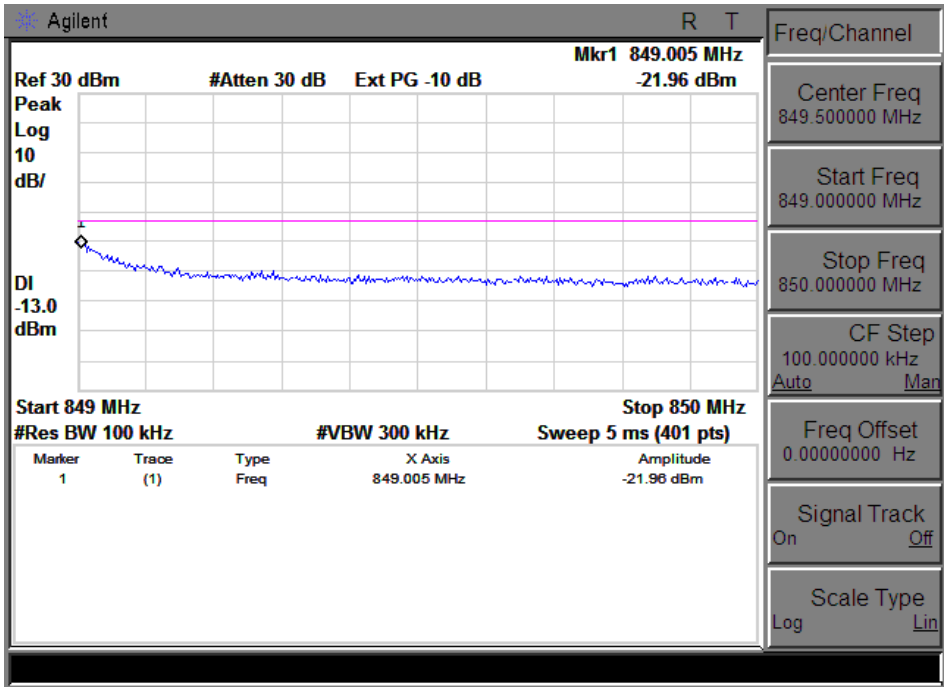
Test Mode: GSM 1900



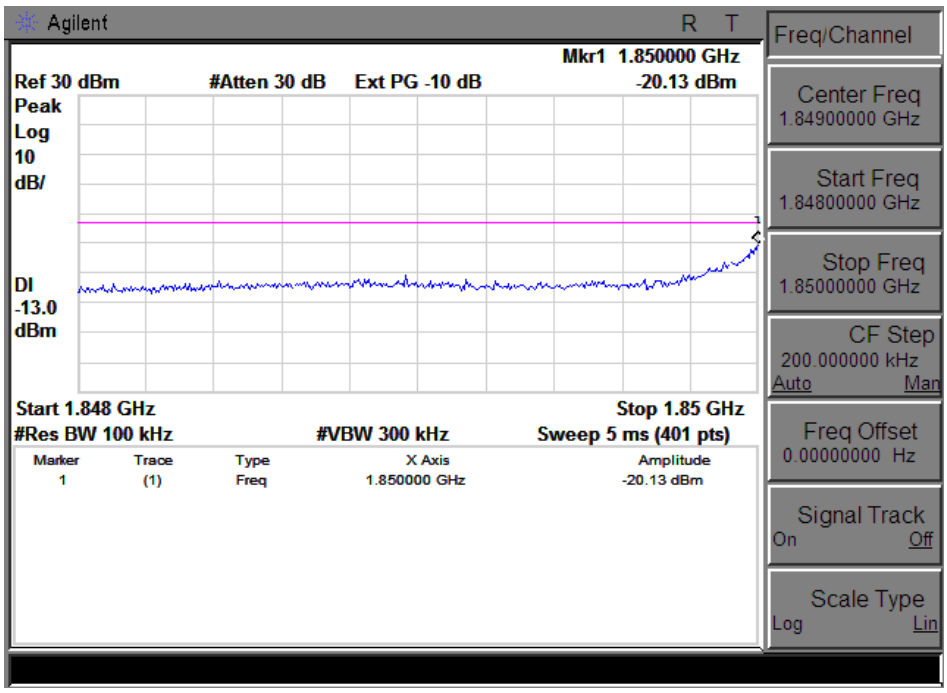


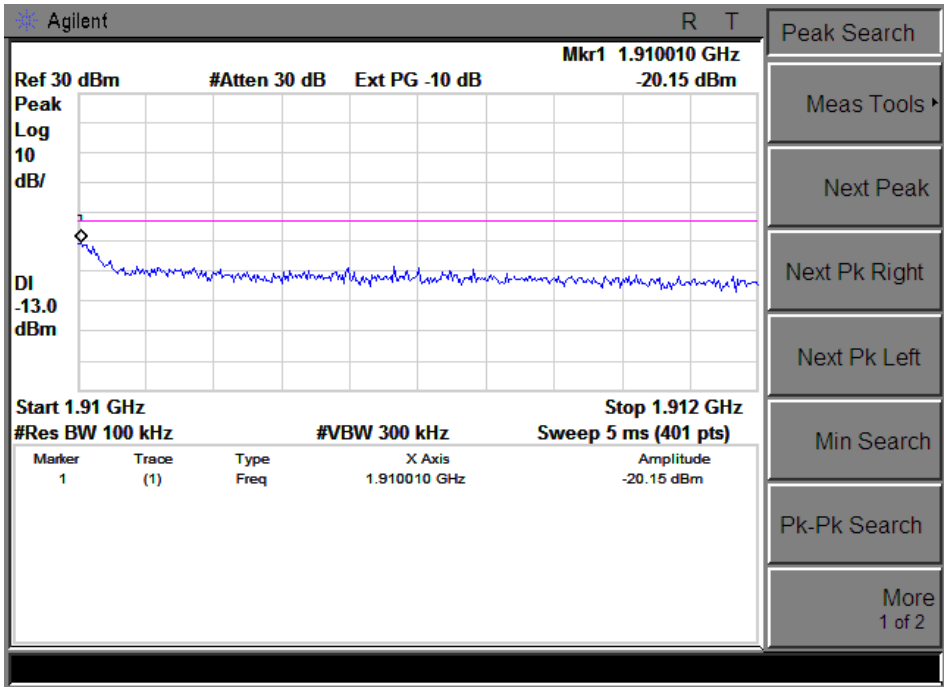
Test Mode: WCDMA BAND V





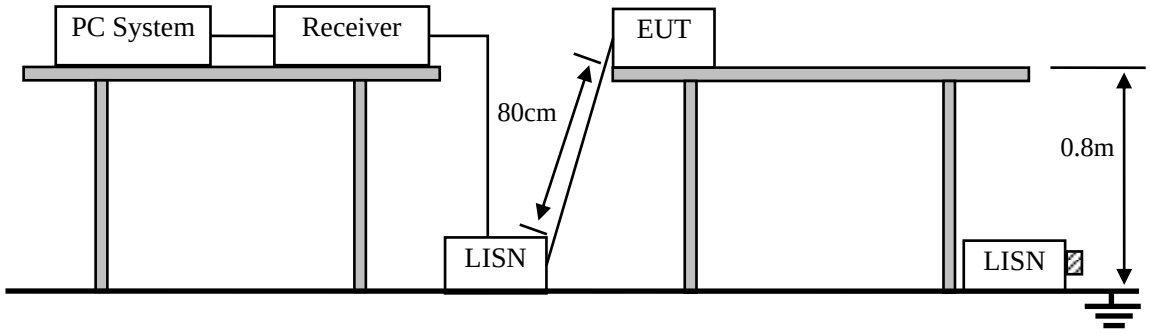
Test Mode: WCDMA BAND II





11. Power line conducted emission

11.1. Block Diagram of Test Setup



11.2. Limit

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level dB(μV)	Average Level dB(μV)
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

Notes: 1. * Decreasing linearly with logarithm of frequency.

2. The lower limit shall apply at the transition frequencies.

11.3. Test Procedure

(1) The EUT was placed on a non-metallic table, 80cm above the ground plane.

(2) Setup the EUT and simulator as shown in 10.1

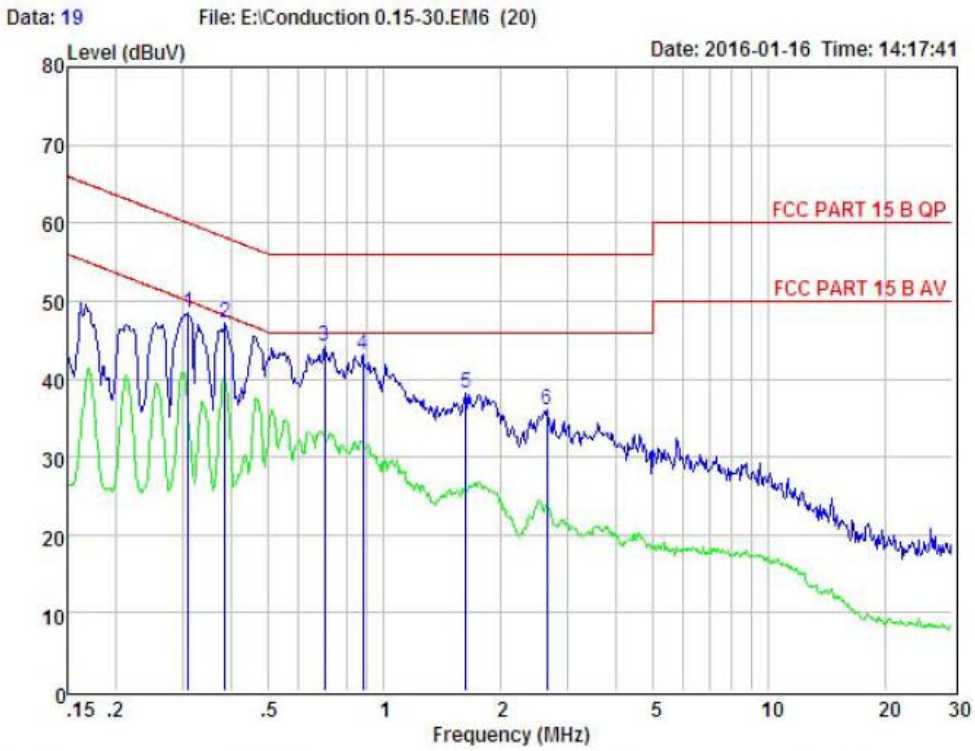
(3) The EUT Power connected to the power mains through a power adapter and a line impedance stabilization network (L.I.S.N1). The other peripheral devices power cord connected to the power mains through a line impedance stabilization network (L.I.S.N1), this provided a 50-ohm coupling impedance for the EUT (Please refer to the block diagram of the test setup and photographs). Both sides of power line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment's and all of the interface cables were changed according to ANSI C63.4 2009 and ANSI C64.10:2009 on conducted Emission test.

(4) The bandwidth of test receiver is set at 10 KHz.

(5) The frequency range from 150 KHz to 30 MHz is checked.

11.4.Test Result

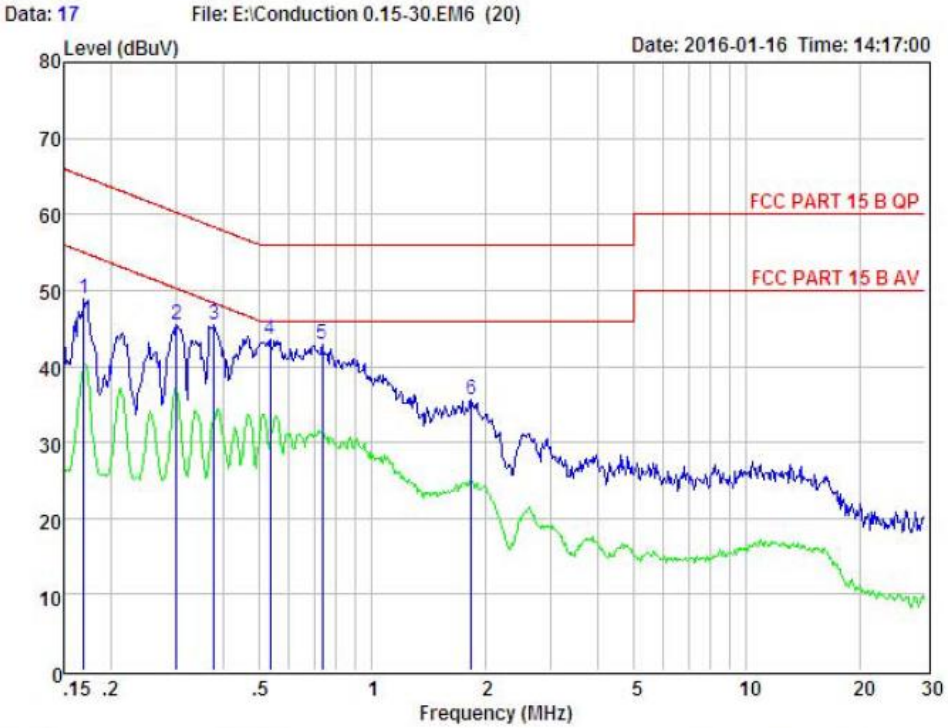
PASS. (See below detailed test data)



Condition : FCC PART 15 B QP POL: LINE Temp:25.7 ℃ Hum:51 %
EUT :
Model No :
Test Mode :
Power : AC 120V/60Hz
Test Engineer:
Remark :

Item	Freq	Read	LISN Factor	Preamp Factor	Cable Lose	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	0.310	38.69	0.03	-9.56	0.10	48.38	59.97	-11.59	Peak
2	0.385	37.39	0.03	-9.57	0.10	47.09	58.17	-11.08	Peak
3	0.701	34.44	0.04	-9.59	0.10	44.17	56.00	-11.83	Peak
4	0.880	33.37	0.04	-9.62	0.10	43.13	56.00	-12.87	Peak
5	1.628	28.40	0.05	-9.69	0.10	38.24	56.00	-17.76	Peak
6	2.650	26.19	0.06	-9.76	0.11	36.12	56.00	-19.88	Peak

Remarks: Level = Read + LISN Factor - Preamp Factor + Cable loss



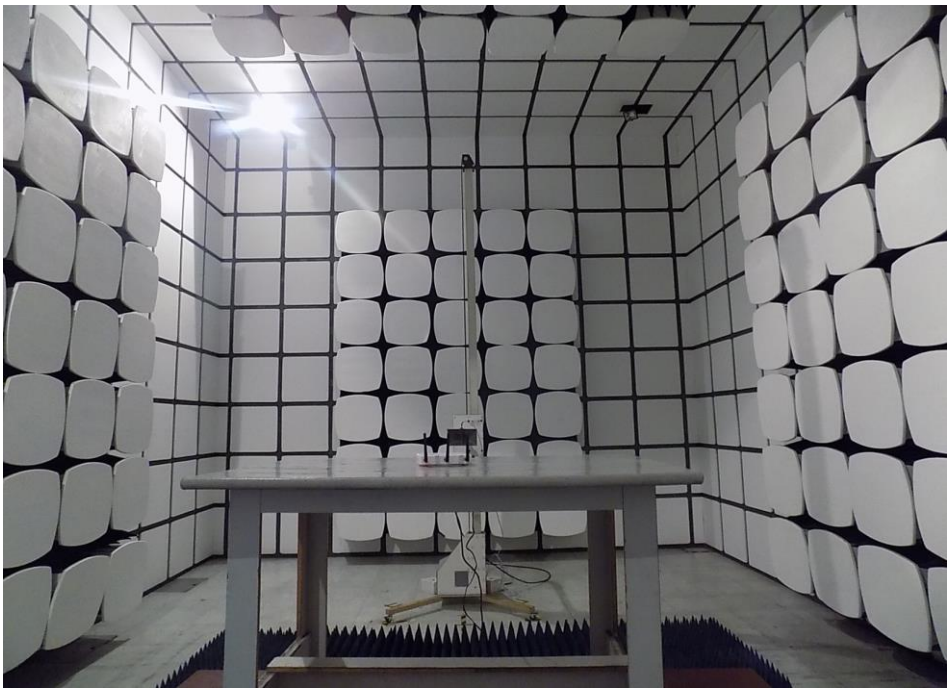
Condition : FCC PART 15 B QP POL: NEUTRAL Temp:25.7 ℃ Hum:51 %
EUT :
Model No :
Test Mode :
Power : AC 120V/60Hz
Test Engineer:
Remark :

Item	Freq	Read	LISN Factor	Preamp Factor	Cable Lose	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	0.169	39.29	0.03	-9.52	0.10	48.94	64.99	-16.05	Peak
2	0.300	35.73	0.03	-9.56	0.10	45.42	60.24	-14.82	Peak
3	0.377	35.71	0.03	-9.57	0.10	45.41	58.34	-12.93	Peak
4	0.535	33.87	0.03	-9.58	0.10	43.58	56.00	-12.42	Peak
5	0.735	33.26	0.04	-9.59	0.10	42.99	56.00	-13.01	Peak
6	1.839	25.72	0.05	-9.70	0.10	35.57	56.00	-20.43	Peak

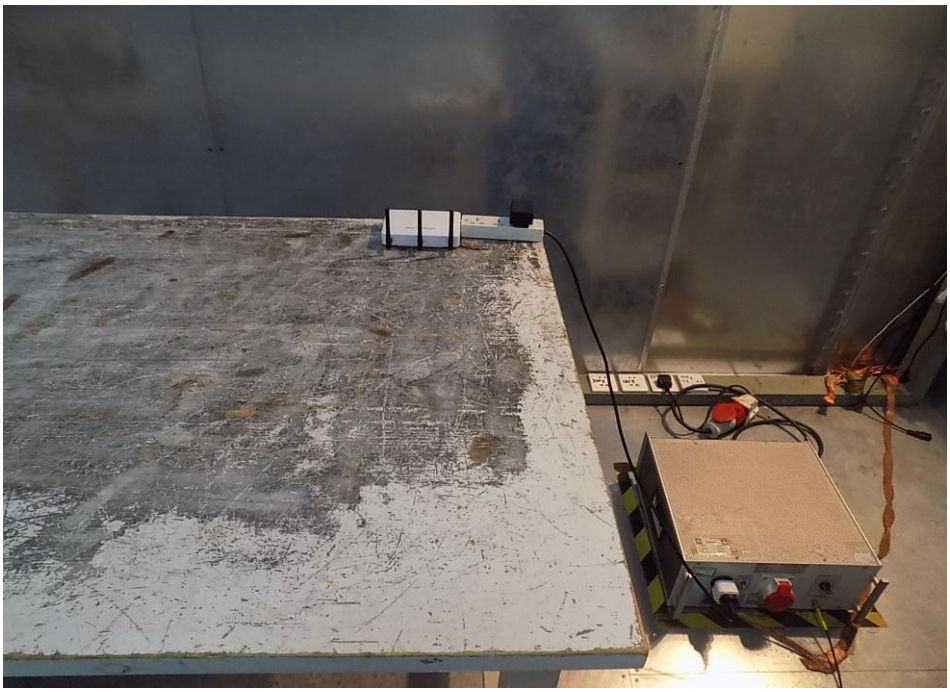
Remarks: Level = Read + LISN Factor - Preamp Factor + Cable loss

12. Test setup photo

Photographs-Radiated Emission Test Setup in Chamber



Photographs-Conducted Emission Test Setup



---------END OF THE REPORT-------