



FCC TEST REPORT

FCC ID: 2AEBXCXPOS-I100

On Behalf of

ZHUHAI HONOR TECHNOLOGY CO.LTD

Smart handheld printer

Model No.: XPOS-I100, XPOS-I100A, XPOS-I100B, XPOS-I100C, XPOS-I100D, XPOS-I100E, XPOS-I100F, XPOS-I100S, XPOS-I100P, XPOS-I100X, XPOS-I100C1, XPOS-I100C2, XPOS-I100C3, XPOS-I100S1, XPOS-I100S2, XPOS-I100S3, POS-I100, POS-I100A, POS-I100B, POS-I100C, POS-I100D, POS-I100E, POS-I100F, POS-I100S, POS-I100P, POS-I100X, POS-I100C1, POS-I100C2, POS-I100C3, POS-I100S1, POS-I100S2, POS-I100S3

Prepared for : ZHUHAI HONOR TECHNOLOGY CO.LTD

Address : A 2nd Floor,Building 3,No. 639,Huayu Road,Xiangzhou
District,Zhuhai,China

Prepared By : Shenzhen Alpha Product Testing Co., Ltd.

Address : Building i, No.2, Lixin Road, Fuyong Street, Bao'an
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Version Number : V0

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TEST REPORT DECLARATION

Applicant : ZHUHAI HONOR TECHNOLOGY CO.LTD

Address : A 2nd Floor,Building 3,No. 639,Huayu Road,Xiangzhou District,Zhuhai,China

Manufacturer : ZHUHAI HONOR TECHNOLOGY CO.LTD

Address : A 2nd Floor,Building 3,No. 639,Huayu Road,Xiangzhou District,Zhuhai,China

EUT Description : Smart handheld printer

(A) Model No. : XPOS-I100, XPOS-I100A, XPOS-I100B, XPOS-I100C, XPOS-I100D, XPOS-I100E, XPOS-I100F, XPOS-I100S, XPOS-I100P, XPOS-I100X, XPOS-I100C1, XPOS-I100C2, XPOS-I100C3, XPOS-I100S1, XPOS-I100S2, XPOS-I100S3, POS-I100, POS-I100A, POS-I100B, POS-I100C, POS-I100D, POS-I100E, POS-I100F, POS-I100S, POS-I100P, POS-I100X, POS-I100C1, POS-I100C2, POS-I100C3, POS-I100S1, POS-I100S2, POS-I100S3

(B) Trademark : N/A

Measurement Standard Used:

FCC CFR Title 47 Part 2
FCC CFR Title 47 Part22 Subpart H
FCC CFR Title 47 Part24 Subpart E

The device described above is tested by Shenzhen Alpha Product Testing Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C limits both conducted and radiated emissions. The test results are contained in this test report and Shenzhen Alpha Product Testing Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

After the test, our opinion is that EUT compliance with the requirement of the above standards.

This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Shenzhen Alpha Product Testing Co., Ltd.

Tested by (name + signature).....: Ella Liang
Project Engineer



Approved by (name + signature).....: Simple Guan
Project Manager



Date of issue..... : September 06, 2019

Revision History

Revision	Issue Date	Revisions	Revised By
V0	September 06, 2019	Initial released Issue	Simple Guan

1 Test Summary

Test Item	Section in CFR 47	Result
RF Exposure (SAR)	Part 1.1307 Part 2.1093	Pass* (Please refer to SAR Report)
RF Output Power	Part 2.1046 Part 22.913 (a)(5) Part 24.232 (c)	Pass
Peak-to-Average Ratio	Part 2.1046 Part 22.913(d) Part 24.232 (d)	Pass
Modulation Characteristics	Part 2.1047	Pass
99% & -26 dB Occupied Bandwidth	Part 2.1049 Part 22.917 Part 24.238	Pass
Spurious Emissions at Antenna Terminal	Part 2.1051 Part 22.917 (a) Part 24.238 (a)	Pass
Field Strength of Spurious Radiation	Part 2.1053 Part 22.917 (a) Part 24.238 (a)	Pass
Out of band emission, Band Edge	Part 22.917 (a) Part 24.238 (a)	Pass
Frequency stability vs. temperature	Part 2.1055(a)(1)(b)	Pass
Frequency stability vs. voltage	Part 2.1055(d)(1)(2)	Pass

Pass: The EUT complies with the essential requirements in the standard.

2 General Information

2.1 General Description of EUT

Description of Device (EUT)

Description	: Smart handheld printer
Trademark	: N/A
Model Number	: XPOS-I100, XPOS-I100A, XPOS-I100B, XPOS-I100C, XPOS-I100D, XPOS-I100E, XPOS-I100F, XPOS-I100S, XPOS-I100P, XPOS-I100X, XPOS-I100C1, XPOS-I100C2, XPOS-I100C3, XPOS-I100S1, XPOS-I100S2, XPOS-I100S3, POS-I100, POS-I100A, POS-I100B, POS-I100C, POS-I100D, POS-I100E, POS-I100F, POS-I100S, POS-I100P, POS-I100X, POS-I100C1, POS-I100C2, POS-I100C3, POS-I100S1, POS-I100S2, POS-I100S3
DIFF.	: All model's the function, software and electric circuit are the same, except the model number difference. This report performs the model XPOS-I100.
Test Voltage	: DC 3.8V from battery or Input DC 5V/2A
Support Networks:	: GSM, GPRS, WCDMA GSM850: 824.20MHz-848.80MHz
Support Bands:	: PCS1900: 1850.20MHz-1909.80MHz WCDMA Band V: 826.40MHz -846.60MHz WCDMA Band II: 1852.40MHz -1907.60MHz
GPRS Class	: 12 GSM/GPRS: GMSK
Modulation type	: WCDMA Band II/V: QPSK
Antenna Type	: PIFA Antenna, Maximum Gain is -1.14dBi
Software version	: V1.0
Hardware version	: L5F1GB-V2

Operation Frequency List:

GSM 850		PCS1900		WCDMA Band V		WCDMA Band II	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
128	824.20	512	1850.20	4132	826.40	9262	1852.40
129	824.40	513	1850.40	4133	826.60	9263	1852.60
· ∴	· ∴	· ∴	· ∴	· ∴	· ∴	· ∴	· ∴
189	836.40	660	1879.80	4181	836.20	9399	1879.80
190	836.60	661	1880.00	4182	836.40	9400	1880.00
191	836.80	662	1880.20	4183	836.60	9401	1880.20
· ∴	· ∴	· ∴	· ∴	· ∴	· ∴	· ∴	· ∴
250	848.60	809	1909.60	4232	846.40	9537	1907.40
251	848.80	810	1909.80	4233	846.60	9538	1907.60

Regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Final test channel:

GSM 850		PCS1900		WCDMA Band V		WCDMA Band II	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
128	824.20	512	1850.20	4132	826.40	9262	1852.40
190	836.60	661	1880.00	4183	836.60	9400	1880.00
251	848.80	810	1909.80	4233	846.60	9538	1907.60

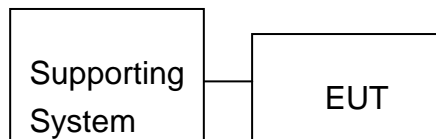
2.2 Accessories of Device (EUT)

Accessories1	:	Switching power adapter
Manufacturer	:	Shenzhen Fangxin Technology Co., Ltd.
Model	:	FX2U-050200U
Input	:	AC 100-240V, 50/60Hz, 0.4A max
Output	:	DC 5V/2A
Accessories 2	:	USB Cable
Manufacturer	:	Dongguan jiulian Electronics Co., Ltd.
Model	:	/
Ratings	:	1m
Accessories 3	:	Charging base
Manufacturer	:	ZHUHAI HONOR TECHNOLOGY CO.LTD
Model	:	XPOS-I100 Charging base
Input	:	DC 5V/2A

2.3 Tested Supporting System Details

No.	Description	Manufacturer	Model	Serial Number	Certification or DOC
--	--	--	--	--	--

2.4 Block Diagram of connection between EUT and simulators



2.5 Test Conditions

Items	Required	Actual
Temperature range:	15-35°C	24°C
Humidity range:	25-75%	56%
Pressure range:	86-106kPa	98kPa

2.6 Test Facility

Shenzhen Alpha Product Testing Co., Ltd
Building i, No.2, Lixin Road, Fuyong Street, Bao'an District, 518103,
Shenzhen, Guangdong, China

June 21, 2018 File on Federal Communication Commission
Registration Number: 293961

July 15, 2019 Certificated by IC
Registration Number: CN0085

3 Test Instruments list

Equipment	Manufacture	Model No.	Serial No.	Last cal.	Cal Interval
9*6*6 anechoic chamber	CHENYU	9*6*6	N/A	2018.09.21	1Year
Spectrum analyzer	ROHDE&SCHWARZ	FSU	1166.1660.26	2018.09.21	1Year
Spectrum analyzer	Agilent	N9020A	MY499100060	2018.09.11	2019.09.10
Spectrum analyzer	Agilent	E4407B	MY49510055	2018.09.21	2019.09.20
Receiver	ROHDE&SCHWARZ	ESR	1316.3003K03-102082-Wa	2018.09.21	1Year
Receiver	R&S	ESCI	101165	2018.09.21	1Year
Bilog Antenna	Schwarzbeck	VULB 9168	VULB9168-438	2018.04.13	2Year
Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D(1201)	2018.04.13	2Year
Active Loop Antenna	Beijing Daze	ZN30900A	SEL0097	2018.04.13	2Year
Cable	Resenberger	N/A	No.1	2018.09.21	1Year
Cable	Resenberger	N/A	No.2	2018.09.21	1Year
Cable	Resenberger	N/A	No.3	2018.09.21	1Year
Pre-amplifier	HP	HP8347A	2834A00455	2018.09.21	1Year
Pre-amplifier	Agilent	8449B	3008A02664	2018.09.21	1Year
L.I.S.N.#1	Schwarzbeck	NSLK8126	8126466	2018.09.21	1Year
L.I.S.N.#2	ROHDE&SCHWARZ	ENV216	101043	2018.09.21	1 Year
20db Attenuator	ICPROBING	IATS1	82347	2018.09.21	1 Year
Horn Antenna	A-INFOMW	LB-180100-KF	J211020657	2018.09.21	2 Year
Preamplifier	SKET	LNPA_1840-50	SK2018101801	2018.09.21	1 Year
Power Meter	Agilent	E9300A	MY41496625	2018.09.21	1 Year
Temp. & Humid. Chamber	Weihuang	WHTH-1000-40-880	100631	2018.9.11	1 Year
Switching Mode Power Supply	JUNKE	JK12010S	20140927-6	2018.09.11	1 Year
CMU200	ROHDE&SCHWARZ	CMU200	116785	2018.09.11	2019.09.10
CMW500	ROHDE&SCHWARZ	CMW500	1201.0002K50-117239-sM	2018.09.21	2019.09.20

4 System test configuration

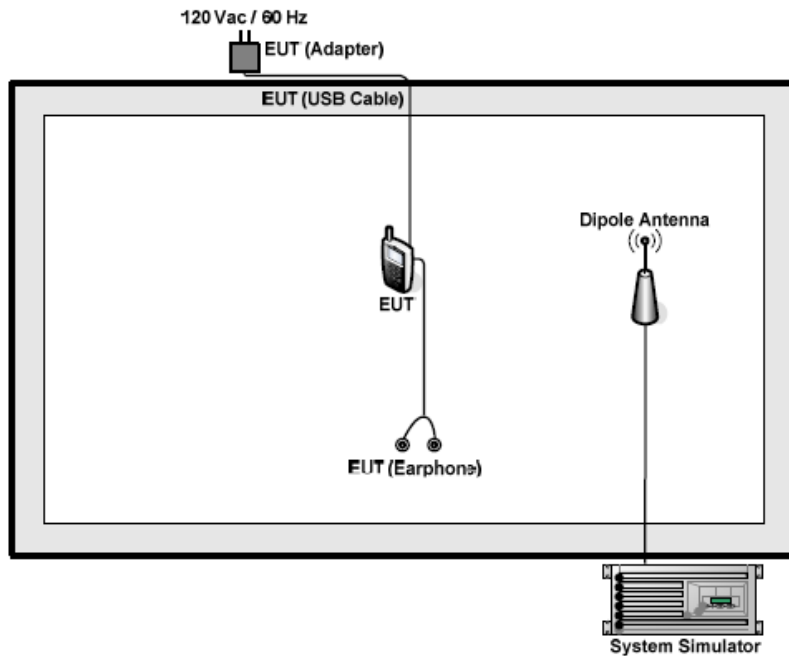
4.1 Test mode

During all testing, EUT is in link mode with base station emulator at maximum power level. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT is rotated on three test planes to find out the worst emission.

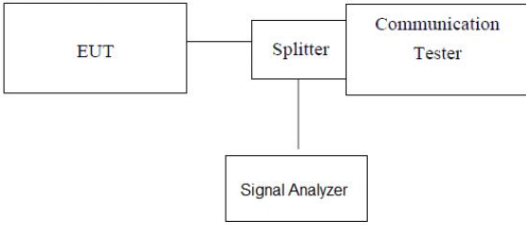
Test modes		
Band	Radiated	Conducted
GSM 850	■ GSM link	■ GSM link
	■ GPRS 1 link	■ GPRS 1 link
PCS 1900	■ GSM link	■ GSM link
	■ GPRS 1 link	■ GPRS 1 link
WCDMA II	■ RMC 12.2Kbps link	■ RMC 12.2Kbps link
WCDMA Band V	■ RMC 12.2Kbps link	■ RMC 12.2Kbps link

Note: The maximum power levels are GSM mode for GMSK link, GPRS multi-slot class 8 mode for GMSK link, RMC12.2Kbps mode for WCDMA Band V/II. only these modes were used for all tests.

4.2 Configuration of Tested System



4.3 Conducted Output Power

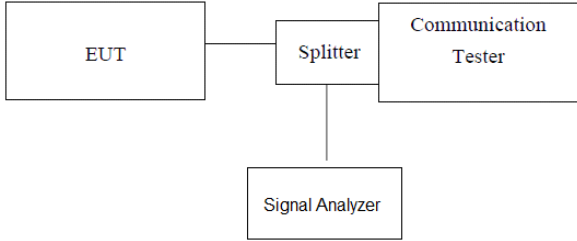
Test Requirement:	FCC part 22.913(a) (5)and FCC part24.232(b)
Test Method:	ANSI C63.26: 2015
Limit:	GSM850, WCDMA Band V: 7W PCS1900, WCDMA Band II: 2W
Test setup:	 <p><i>Note: Measurement setup for testing on Antenna connector</i></p>
Test Procedure:	<ol style="list-style-type: none"> 1. The transmitter output port was connected to base station. 2. The RF output of EUT was connected to the Signal Analyzer by RF cable and attenuator, the path loss was compensated to the results for each measurement. 3. Set EUT at maximum power through base station. 4. Select lowest, middle, and highest channels for each band and different modulation. 5. Measure the maximum burst average power.
Test results:	Pass

Measurement Data

Burst Average Power (dBm)						
Band	GSM 850			PCS 1900		
Channel	128	190	251	512	661	810
Frequency (MHz)	824.2	836.6	848.8	1850.2	1880.0	1909.8
GSM(GMSK, 1-Slot)	32.32	32.95	32.65	29.05	28.7	30.07
GPRS (GMSK, 1-Slot)	32.53	32.57	32.4	29.27	29.03	27.73
GPRS (GMSK, 2-Slot)	32.01	31.63	32.04	28.69	27.63	27.54
GPRS (GMSK, 3-Slot)	29.49	29.96	30.72	27.11	26.38	25.92
GPRS (GMSK, 4-Slot)	28.13	28.74	28.98	25.76	25.85	25.69

Burst Average Power (dBm)						
Band	WCDMA Band II			WCDMA Band V		
Channel	9262	9400	9538	4132	4183	4233
Frequency	1852.4	1880.0	1907.6	826.4	836.6	846.6
RMC 12.2Kbps	24.19	23.33	24.20	22.77	23.58	23.23
HSDPA Subtest-1	23.27	22.84	23.10	21.80	22.18	21.85
HSDPA Subtest-2	23.12	22.79	22.67	22.01	22.18	22.28
HSDPA Subtest-3	22.80	23.47	22.16	21.62	22.02	22.32
HSDPA Subtest-4	22.91	23.18	23.38	21.38	21.32	21.47
HSUPA Subtest-1	22.68	23.15	23.48	21.36	22.26	22.64
HSUPA Subtest-2	23.39	23.57	22.66	21.67	22.20	22.23
HSUPA Subtest-3	23.10	22.78	22.49	21.86	22.69	22.13
HSUPA Subtest-4	22.54	23.13	22.72	22.19	22.67	21.56
HSUPA Subtest-5	22.39	23.31	23.63	22.61	22.10	22.62
AMR	22.45	23.10	23.00	22.91	22.39	22.56

4.4 Peak-to-Average Ratio

Test Requirement:	FCC part 22.913(d) & 24.232(d)
Test Method:	ANSI C63.26: 2015
Limit:	13db
Test setup:	 <p><i>Note: Measurement setup for testing on Antenna connector</i></p>
Test Procedure:	<ol style="list-style-type: none"> 1. The transmitter output port was connected to base station. 2. The RF output of EUT was connected to the Signal Analyzer by RF cable and attenuator, the path loss was compensated to the results for each measurement. 3. Set EUT at maximum power through base station. 4. Select lowest, middle, and highest channels for each band and different modulation. 5. Measure the maximum burst average power. 6. Record the maximum peak-to-average ratio value.
Test results:	Pass Note: Pre-scan all modes and recorded the worst case results in this report.

Measurement data

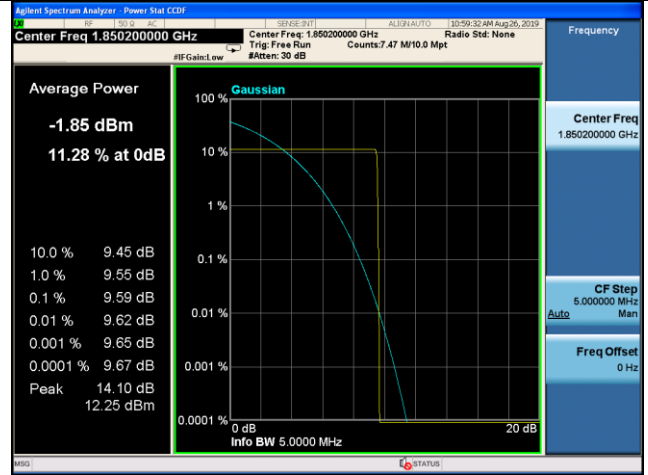
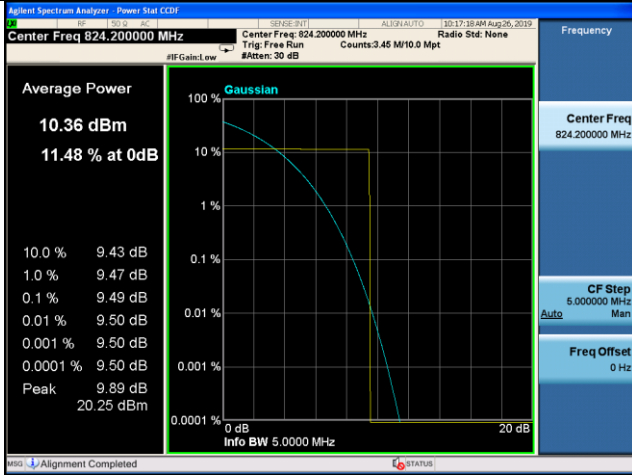
Test mode	Peak to Average Ratio (dB)			Limit (dB)	Result
	Low Ch.	Middle Ch.	High Ch.		
GSM/TM1/GSM850	9.49	9.55	9.74	13	PASS
GSM/TM1/GSM1900	9.95	9.63	9.37	13	PASS

Test mode	Peak to Average Ratio (dB)			Limit (dB)	Result
	Low Ch.	Middle Ch.	High Ch.		
WCDMA Band II	2.36	2.25	2.10	13	PASS
WCDMA Band V	2.32	2.78	2.76		

Peak-to-Average Ratio (PAR)

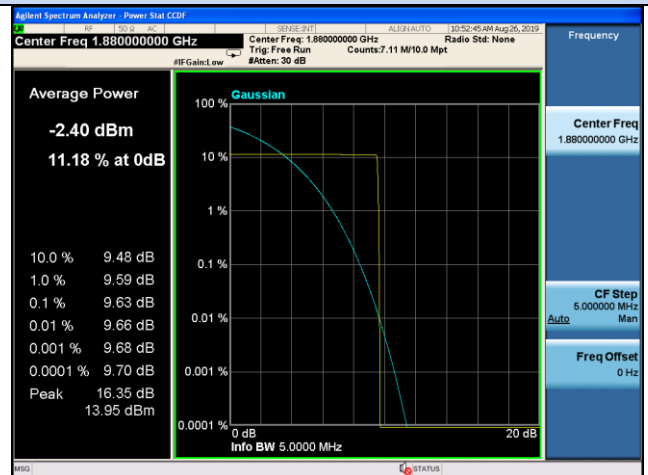
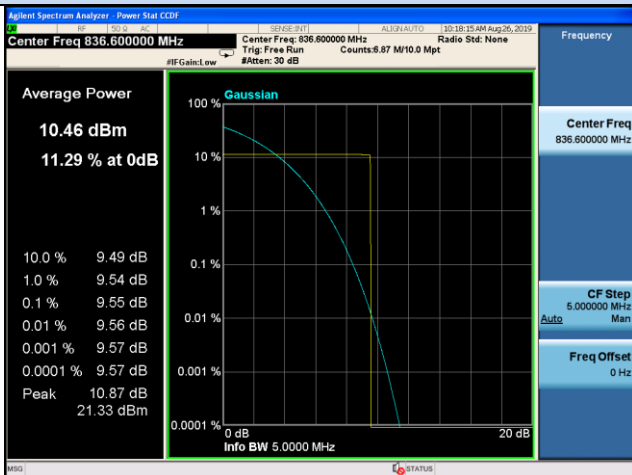
GSM/TM1/GSM850(GSM)

GSM/TM1/GSM1900(GSM)



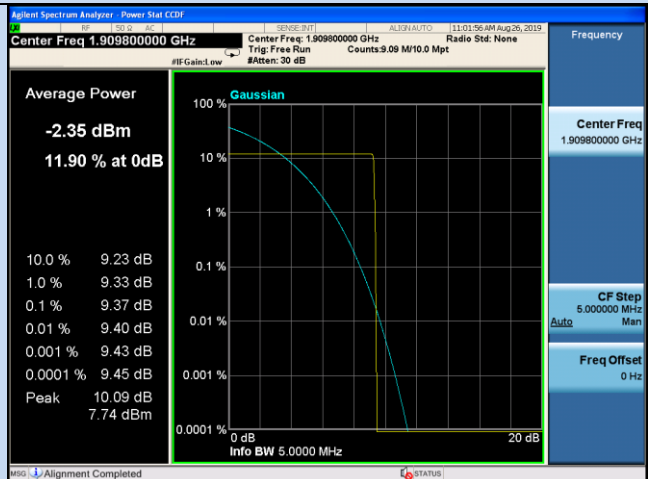
Channel 128/ 824.2 MHz

Channel 512 / 1850.20 MHz



Channel 190/ 836.6 MHz

Channel 661 / 1880.00 MHz

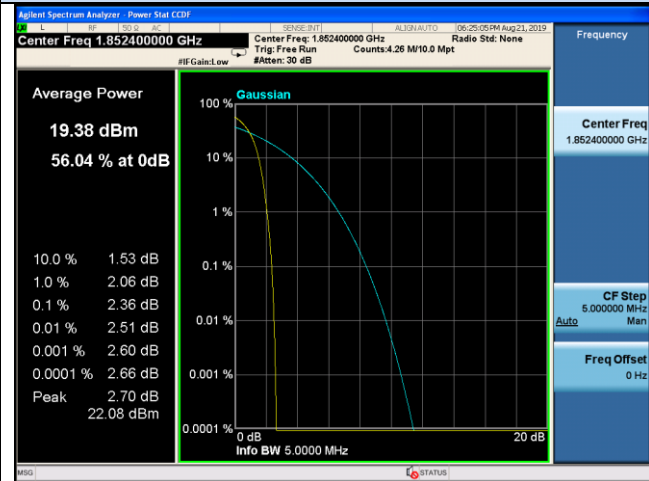


Channel 251/ 848.8 MHz

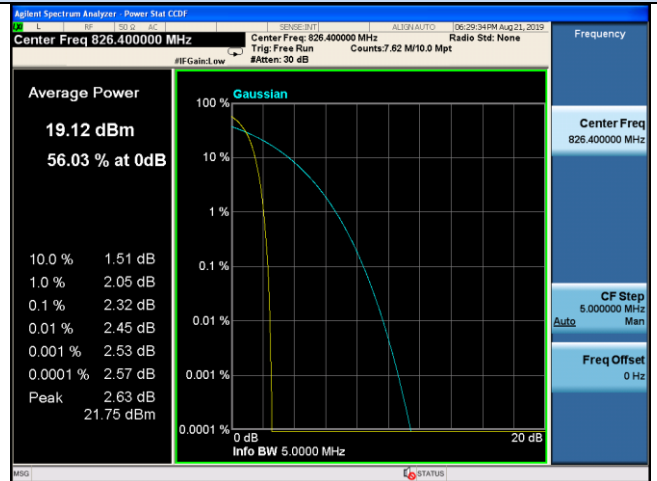
Channel 810 1909.8 MHz

Peak-to-Average Ratio (PAR)

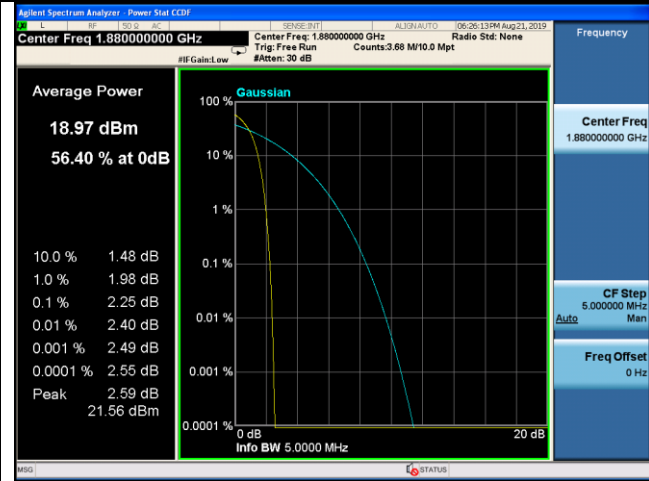
UMTS/TM1/ WCDMA Band II



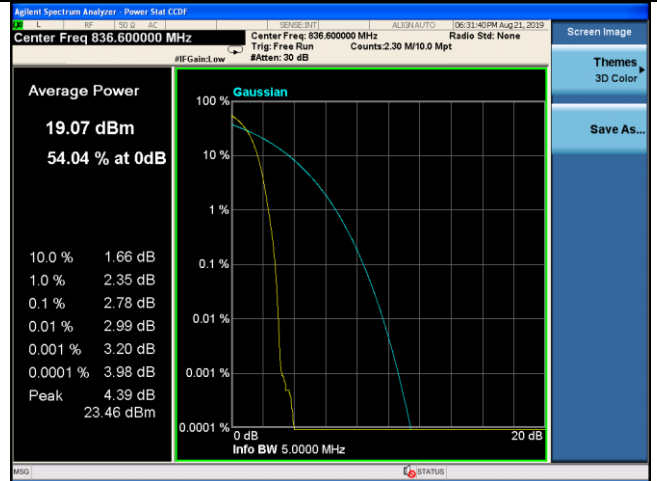
UMTS/TM1/ WCDMA Band V



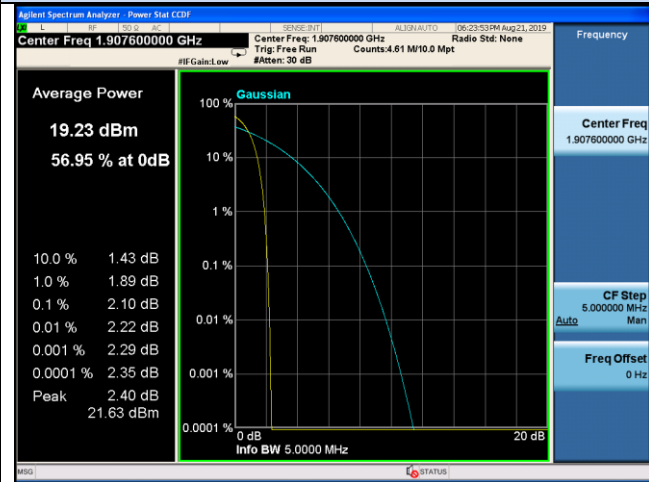
Channel 9262 / 1852.4 MHz



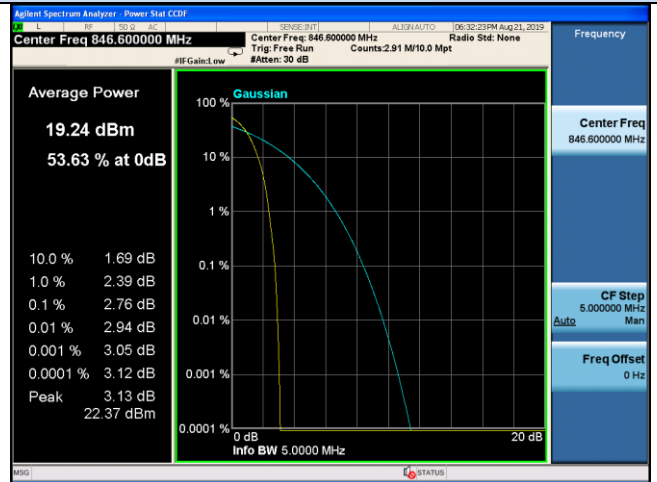
Channel 4132/ 826.4 MHz



Channel 9400 / 1880.0 MHz



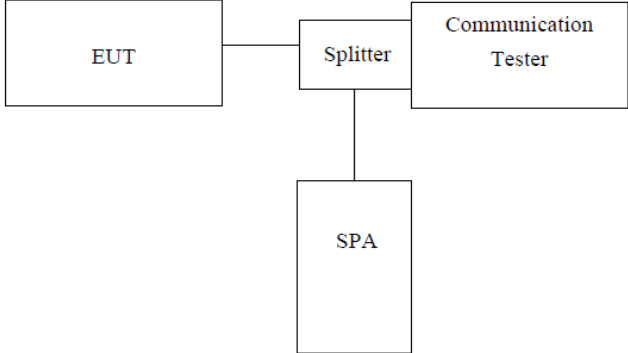
Channel 4183/ 836.6 MHz



Channel 9538 / 1907.6 MHz

Channel 4233/ 846.6 MHz

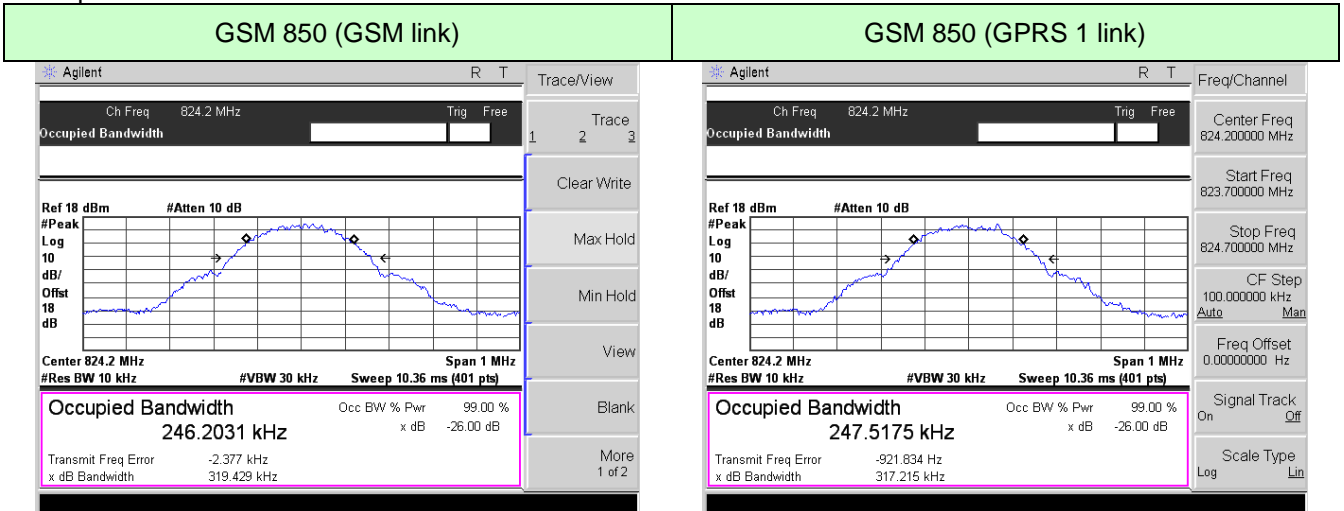
4.5 Occupy Bandwidth

Test Requirement:	FCC part 22.917&24.238&2.1049
Test Method:	ANSI C63.26: 2015
Test setup:	 <pre> graph LR EUT[EUT] --- Splitter[Splitter] Splitter --- CT[Communication Tester] Splitter --- SPA[SPA] </pre> <p><i>Note: Measurement setup for testing on Antenna connector</i></p>
Test Procedure:	<ol style="list-style-type: none"> 1. The EUT's output RF connector was connected with a short cable to the spectrum analyzer 2. RBW was set to about 1% of emission BW, VBW= 3 times RBW. 3. -26dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace.
Test results:	Pass

Measurement Data

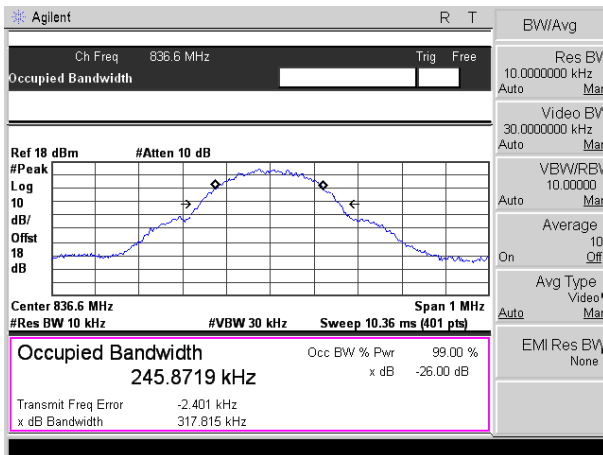
EUT Mode	Channel	Frequency (MHz)	99% Occupy bandwidth (KHz)	-26dB bandwidth (KHz)
GSM 850 (GSM link)	128	824.20	246.2031	319.429
	190	836.60	245.8719	317.815
	251	848.80	242.7606	316.570
GSM 850 (GPRS 1 link)	128	824.20	247.5175	317.215
	190	836.60	239.3647	310.645
	251	848.80	244.0950	318.033
PCS 1900 (GSM link)	512	1850.20	247.0323	320.069
	661	1880.00	244.5845	318.073
	810	1909.80	247.4704	323.391
PCS 1900 (GPRS 1 link)	512	1850.20	247.0546	320.511
	661	1880.00	247.2145	320.431
	810	1909.80	245.3556	319.199
WCDMA Band V (RMC 12.2Kbps link)	4132	826.40	4205.6	4861.00
	4183	836.60	4224.4	4882.00
	4233	846.60	4208.7	4897.00
WCDMA Band II (RMC 12.2Kbps link)	9262	1852.4	4225.0	4884.00
	9400	1880.0	4206.1	4909.00
	9538	1907.6	4215.3	4884.00

Test plot as follows:

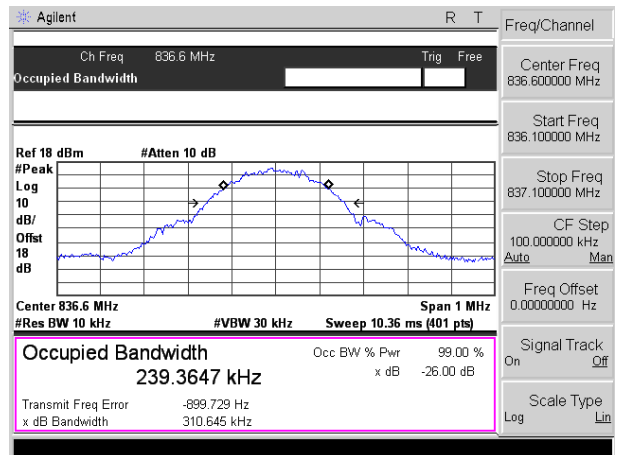


Lowest channel

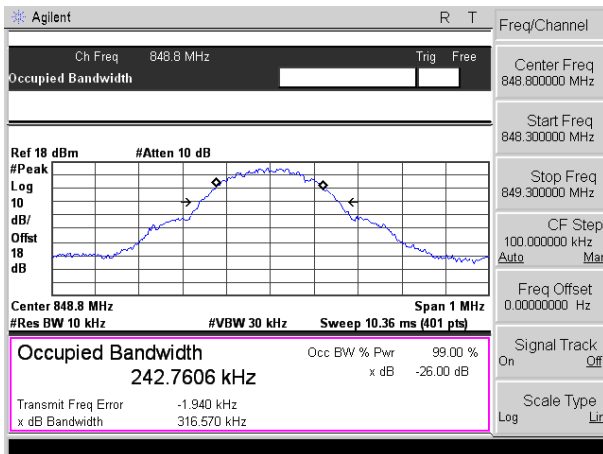
Lowest channel



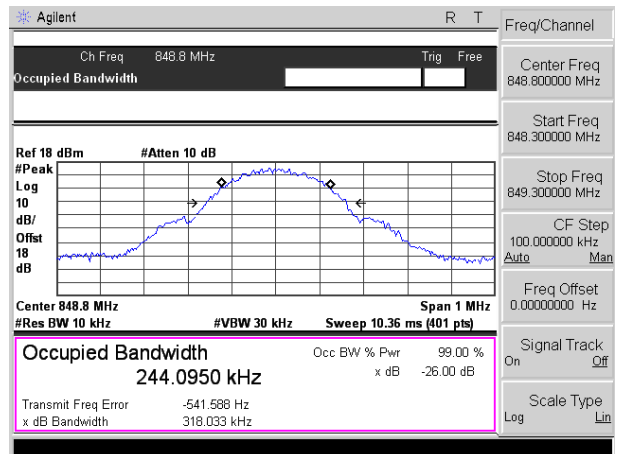
Middle channel



Middle channel

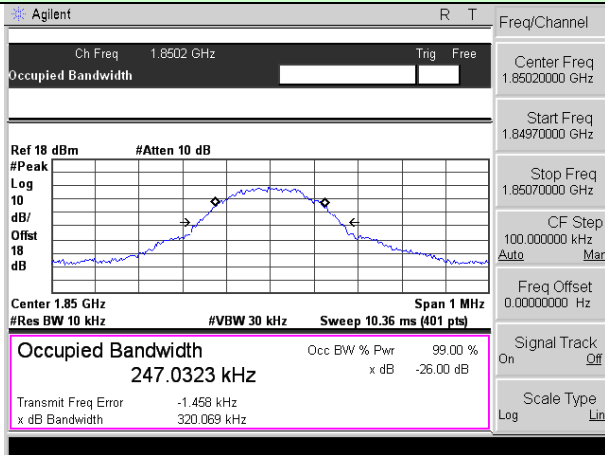


Highest channel

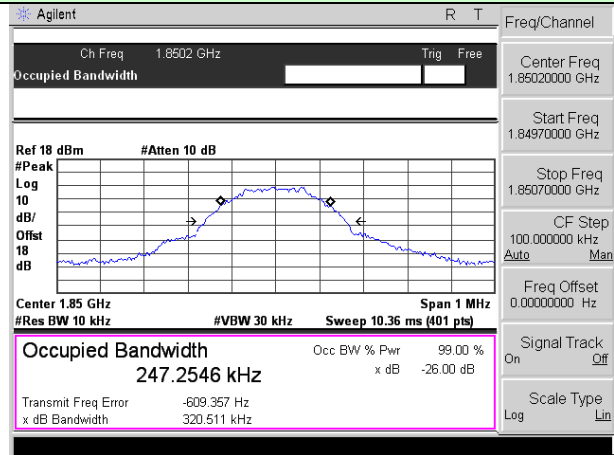


Highest channel

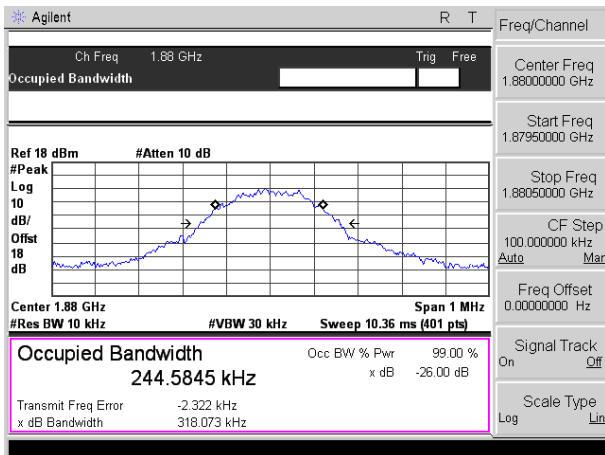
PCS 1900 (GSM link)	PCS 1900 (GPRS 1 link)
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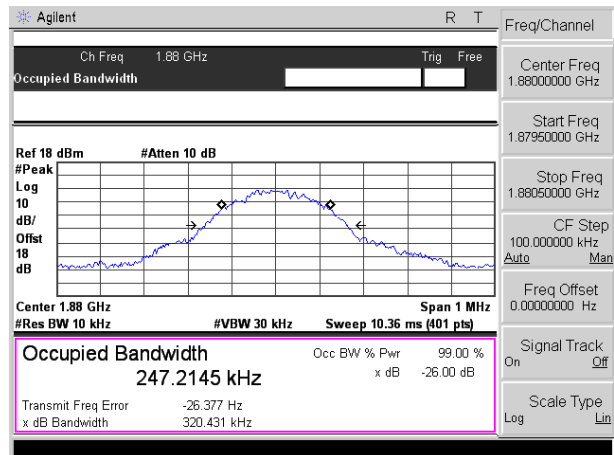
Lowest channel



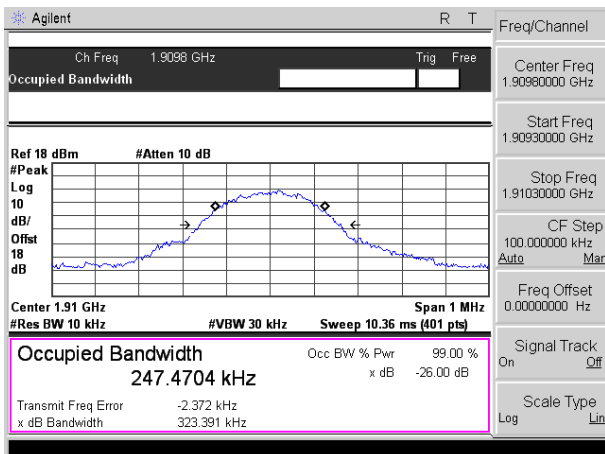
Lowest channel



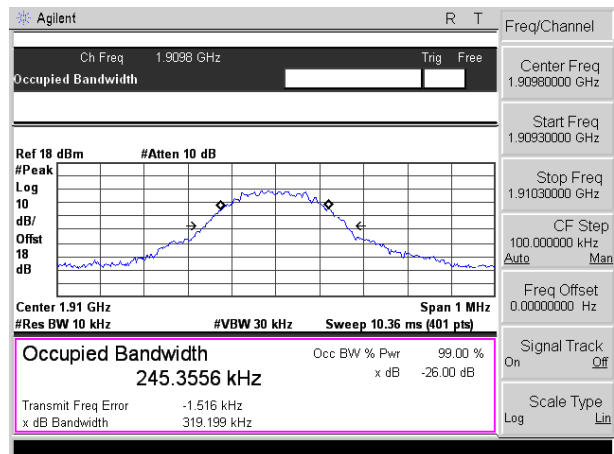
Middle channel



Middle channel

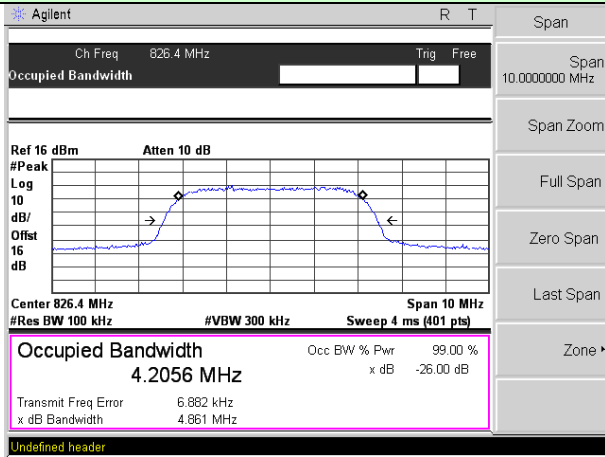


Highest channel

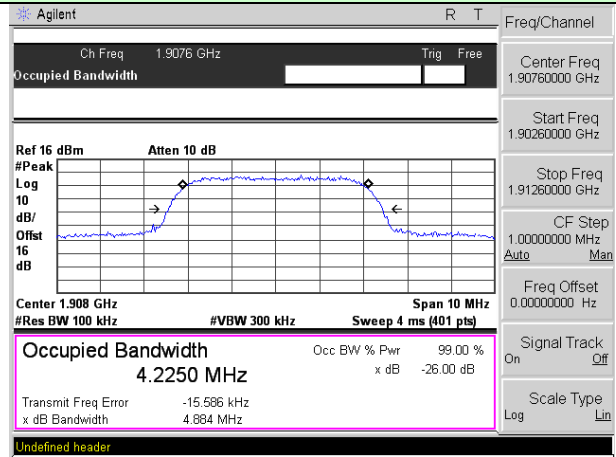


Highest channel

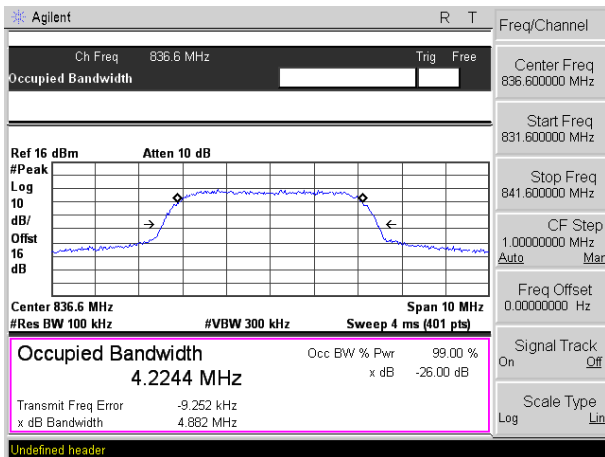
WCDMA Band V (RMC 12.2Kbps link)	WCDMA Band II (RMC 12.2Kbps link)
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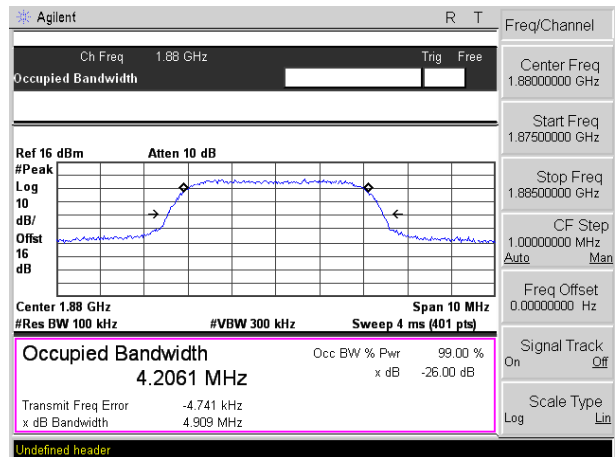
Lowest channel



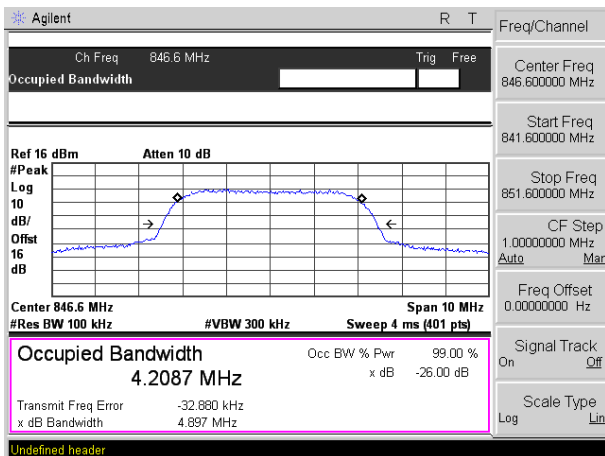
Lowest channel



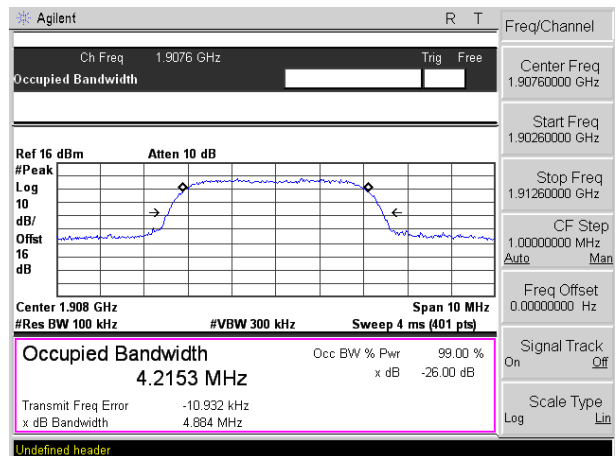
Middle channel



Middle channel



Highest channel

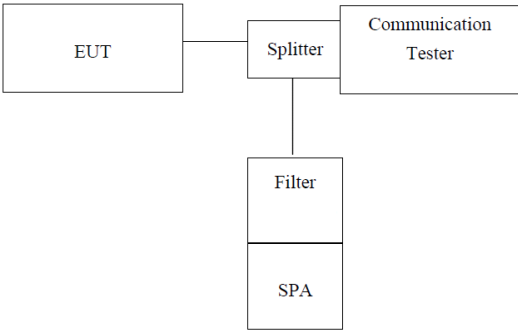


Highest channel

4.6 MODULATION CHARACTERISTIC

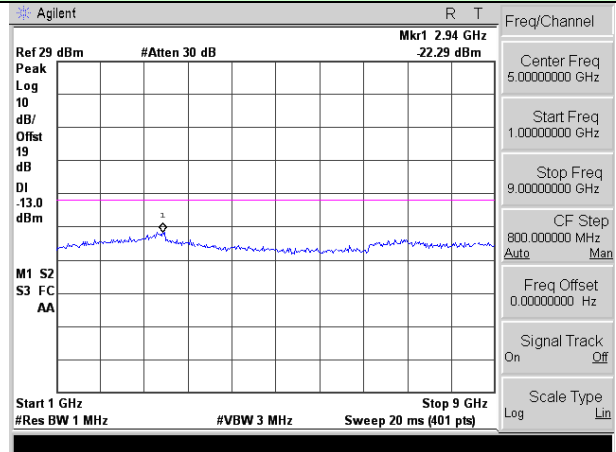
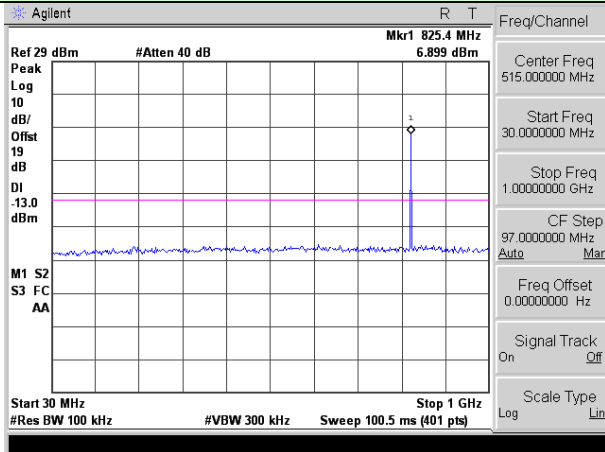
According to FCC § 2.1047(d), Part 22H & 24E there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

4.7 Out of band emission at antenna terminals

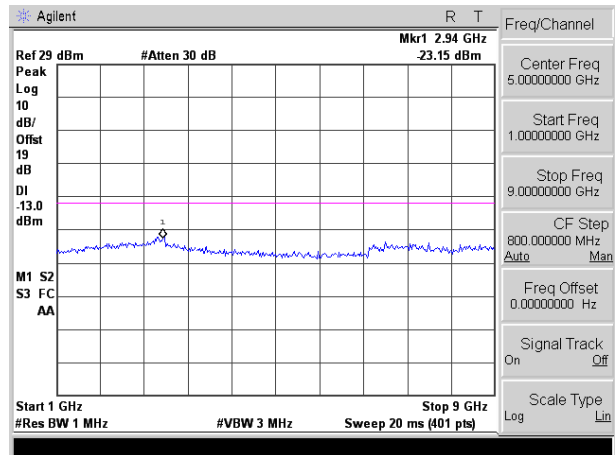
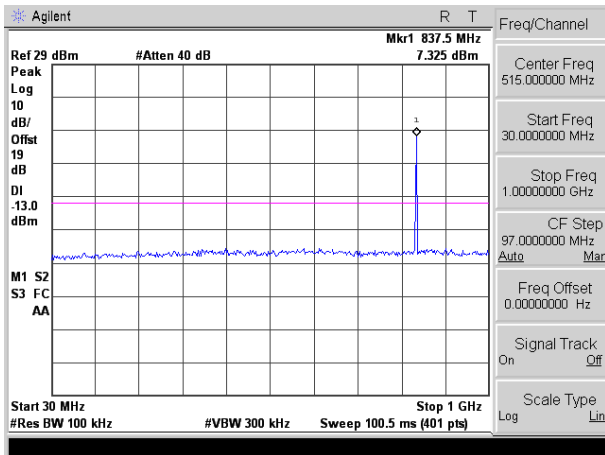
Test Requirement:	FCC part22.917(a) and FCC part24.238(a)
Test Method:	ANSI C63.26: 2015
Limit:	-13dBm
Test setup:	 <p><i>Note: Measurement setup for testing on Antenna connector</i></p>
Test Procedure:	<ol style="list-style-type: none"> 1 The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. 2 The resolution bandwidth of the spectrum analyzer was set at 1MHz, sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic. 3 For the out of band: Set the RBW, VBW = 1MHz, Start=30MHz, Stop= 10th harmonic. 4 Band Edge Requirements: In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions.
Test results:	Pass

Test plot as follows:

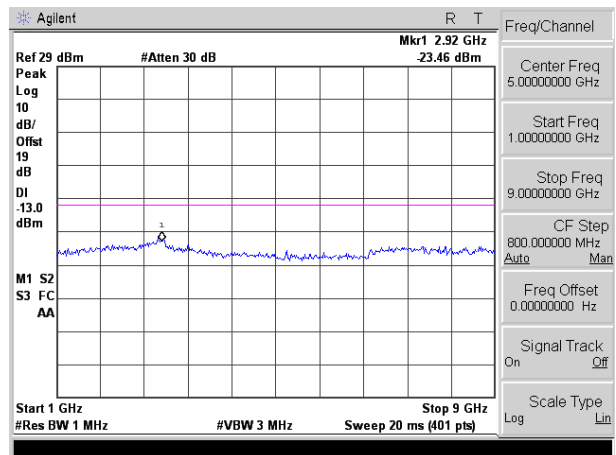
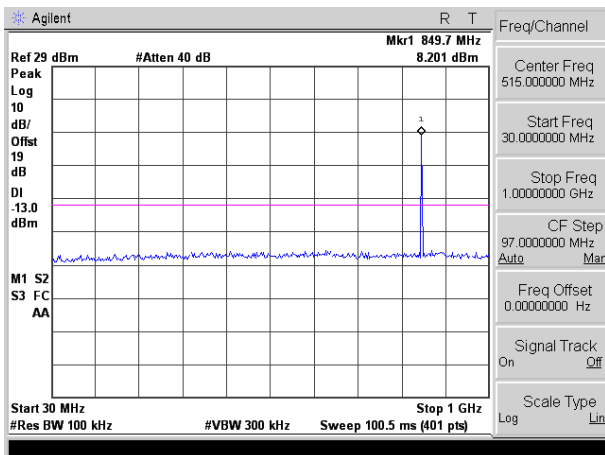
Test Mode: Traffic mode GSM 850 (GSM link)



Lowest channel



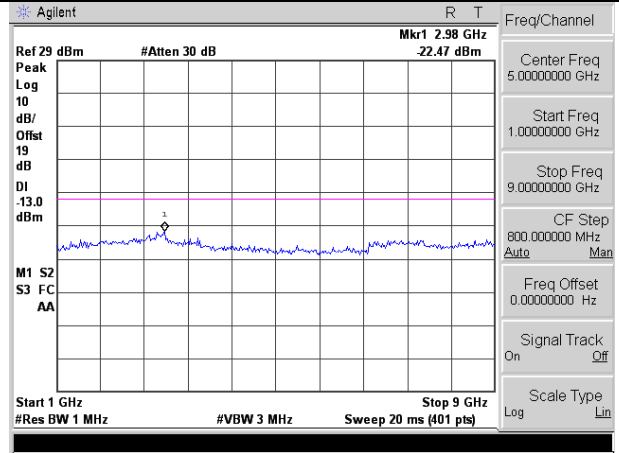
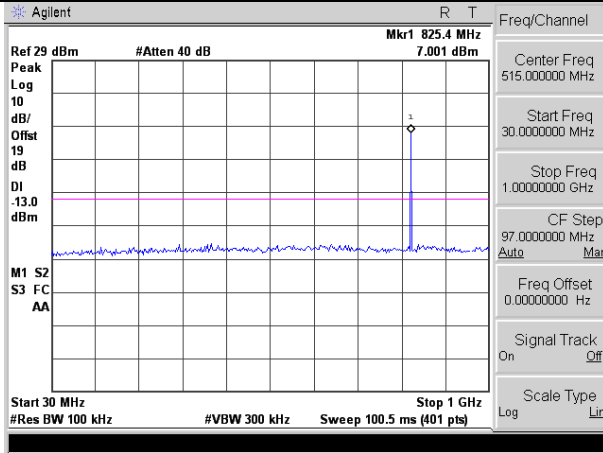
Middle channel



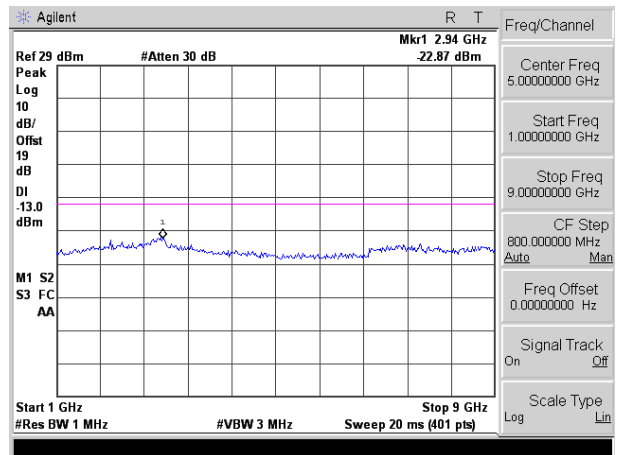
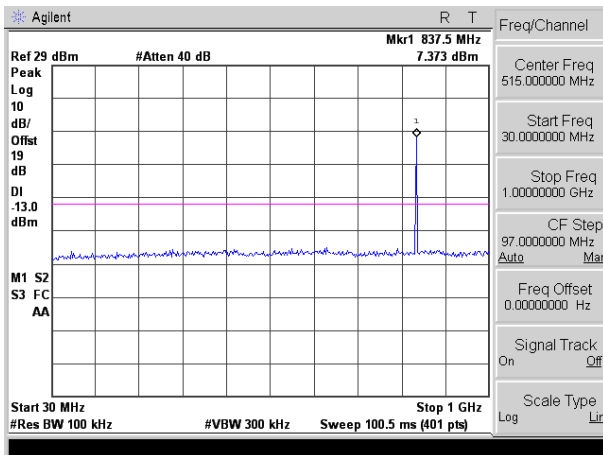
Highest channel

Test Mode: Traffic mode

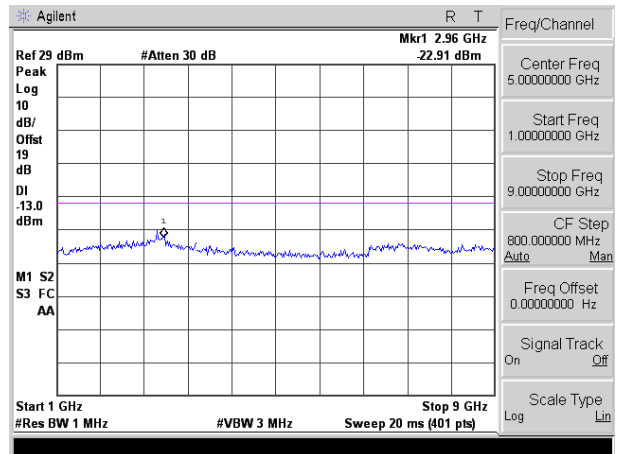
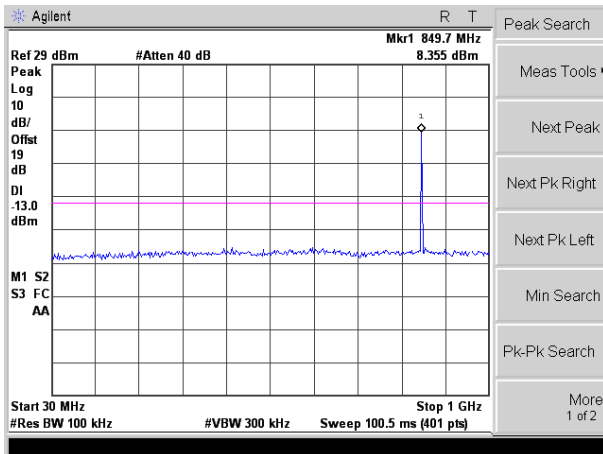
GSM 850 (GPRS 1 link)



Lowest channel

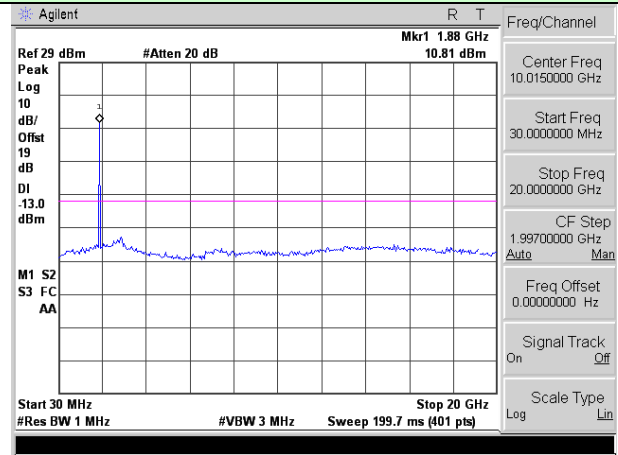
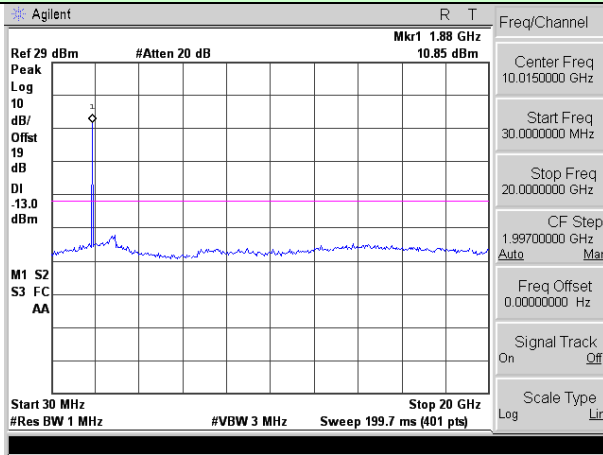


Middle channel

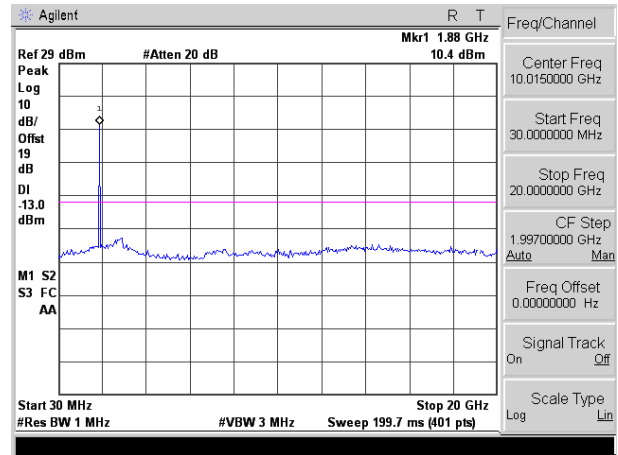
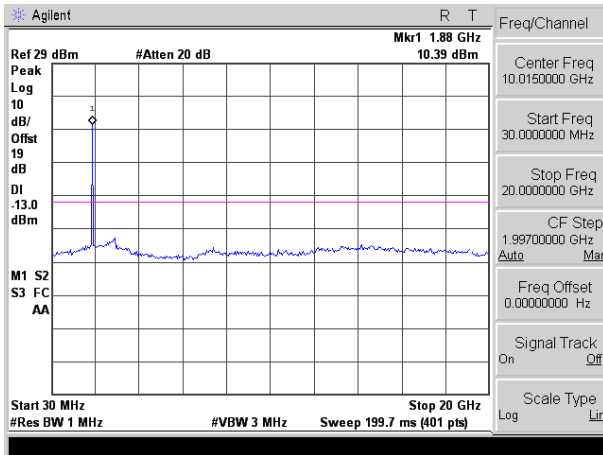


Highest channel

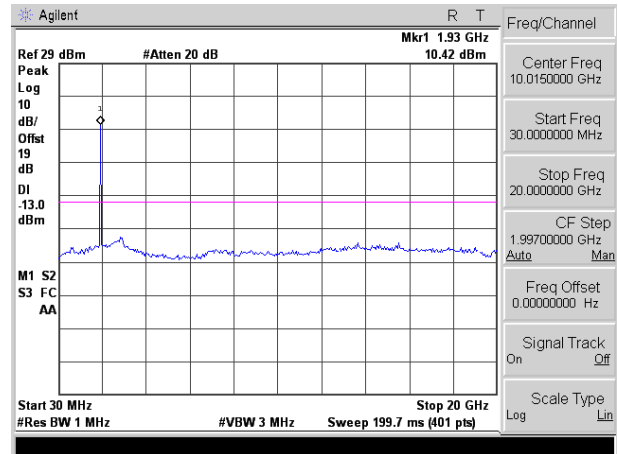
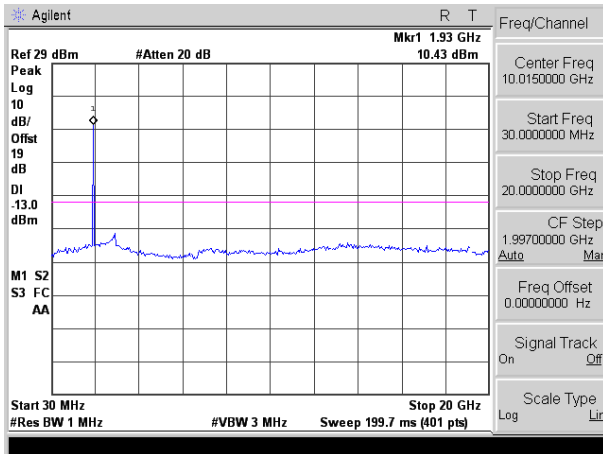
Test Mode: Traffic mode	
PCS1900 (GSM link)	PCS1900 (GPRS 1 link)



Lowest channel



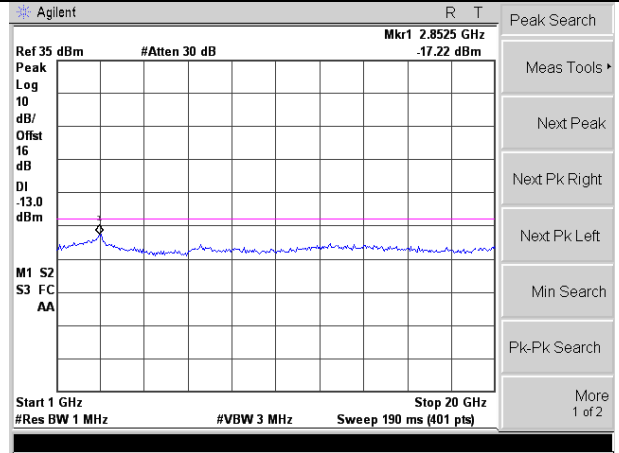
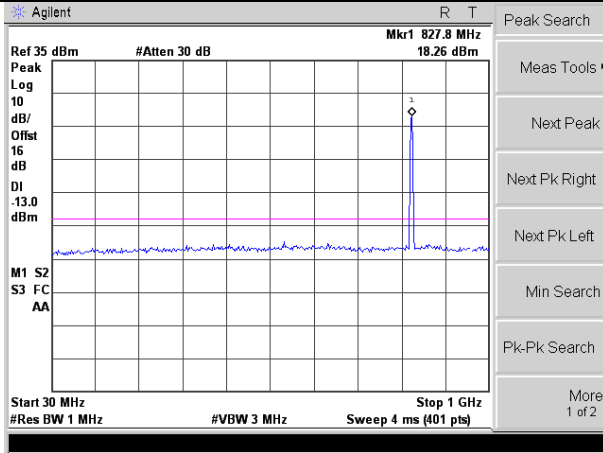
Middle channel



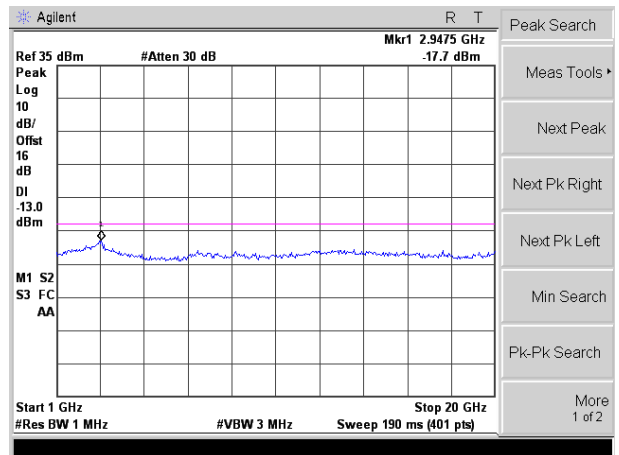
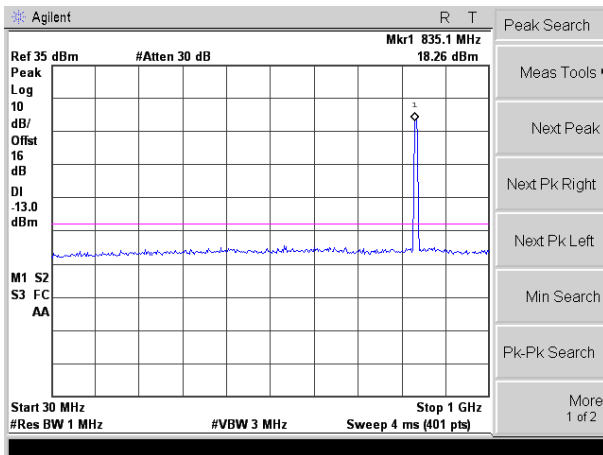
Highest channel

Test Mode: Traffic mode

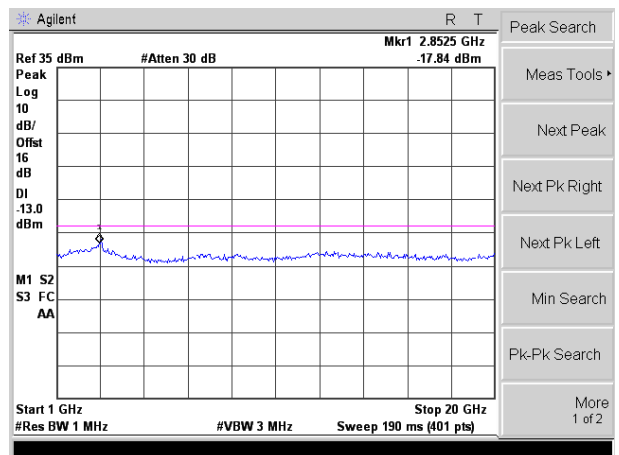
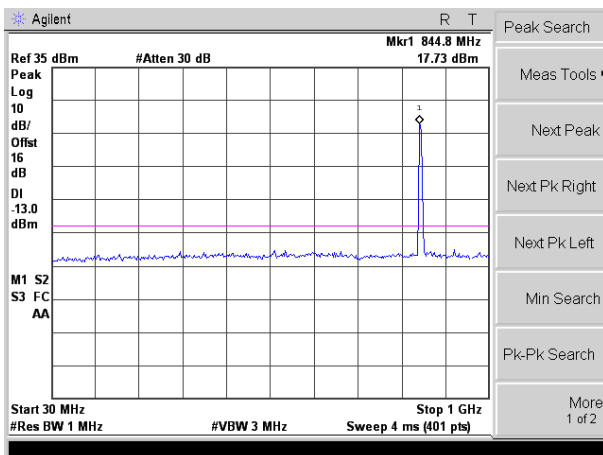
WCDMA Band V (RMC 12.2Kbps link)



Lowest channel

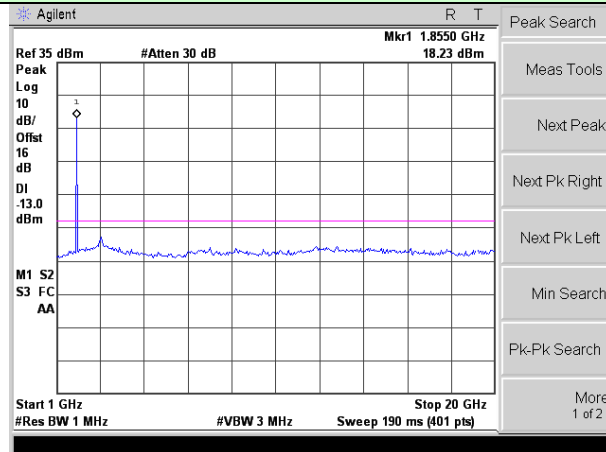
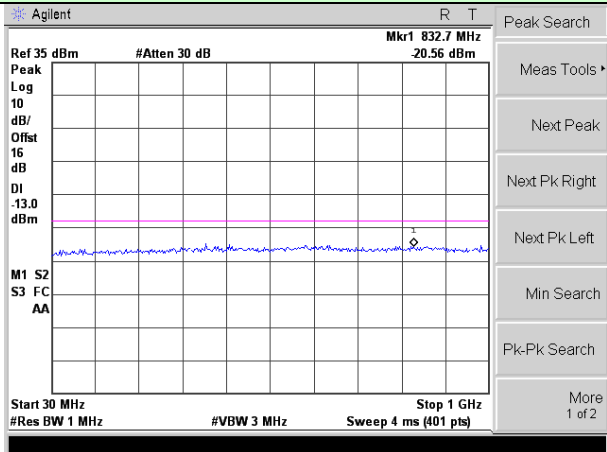


Middle channel

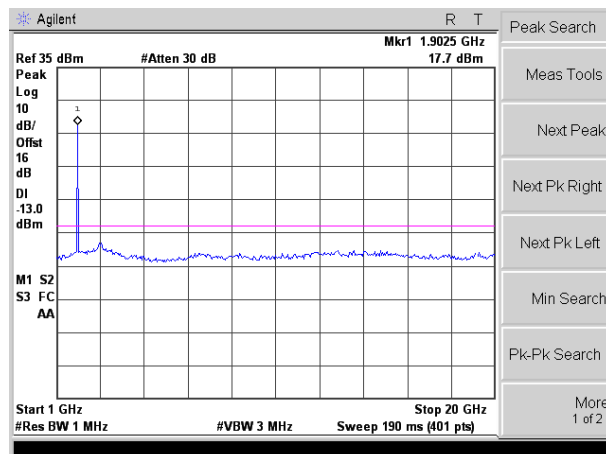
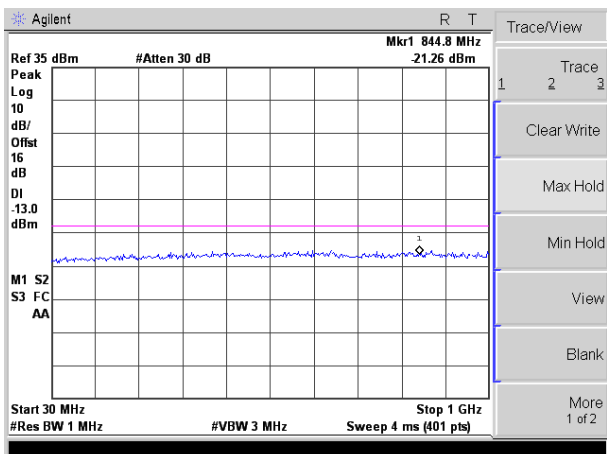


Highest channel

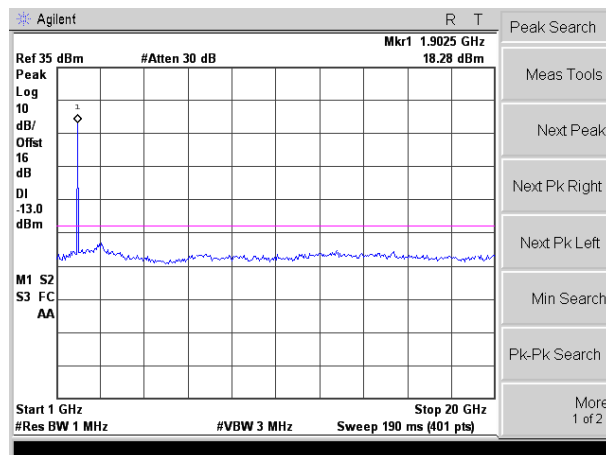
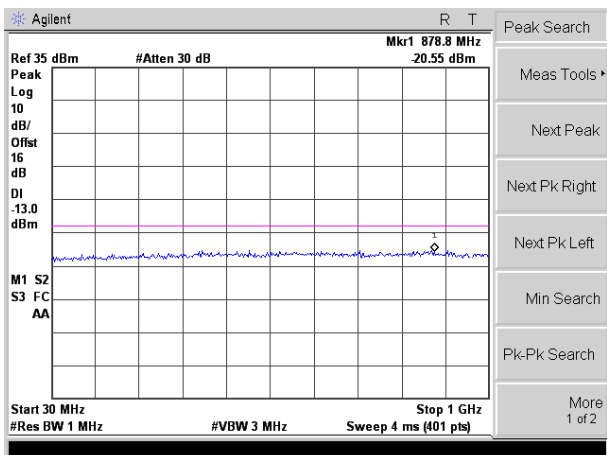
Test Mode: Traffic mode WCDMA Band II (RMC 12.2Kbps link)



Lowest channel



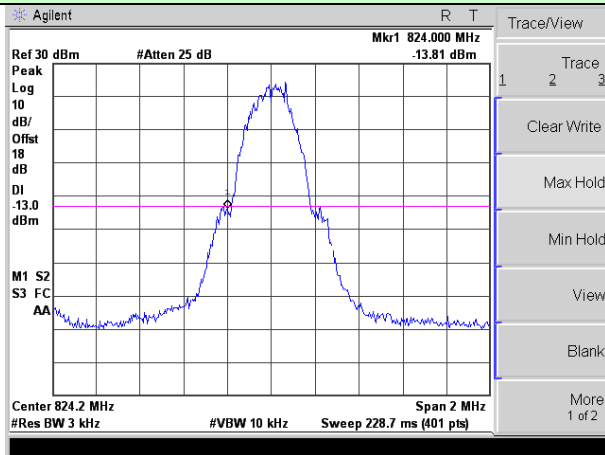
Middle channel



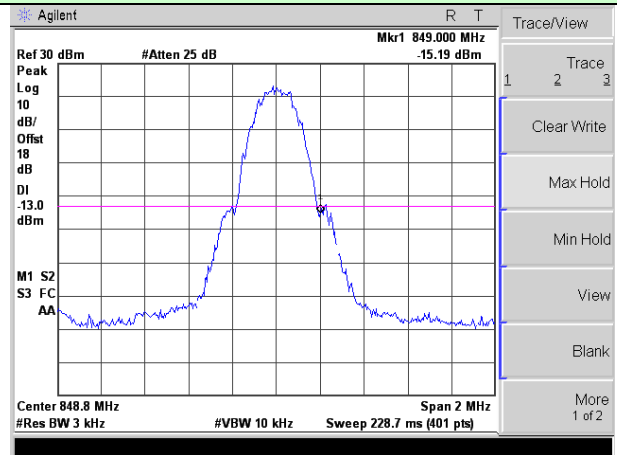
Highest channel

Band Edge:

Test Mode: Traffic mode GSM850 (GSM link)

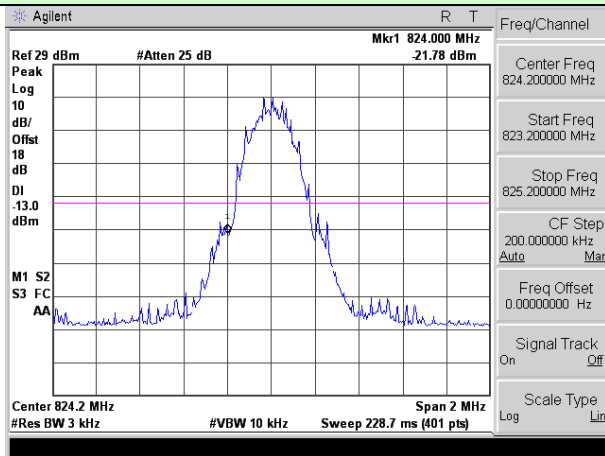


Lowest channel

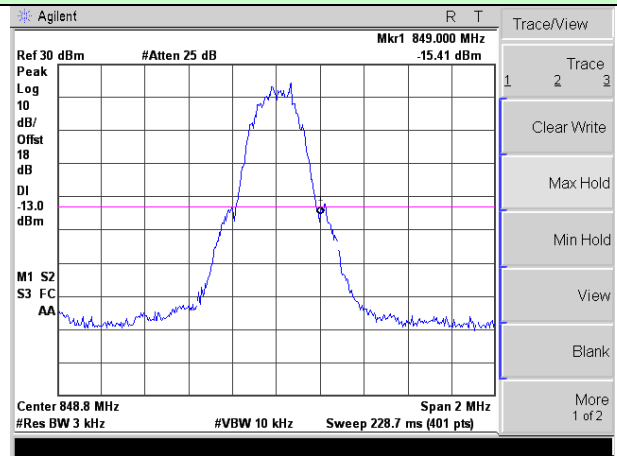


Highest channel

Test Mode: Traffic mode GSM850 (GPRS 1 link)

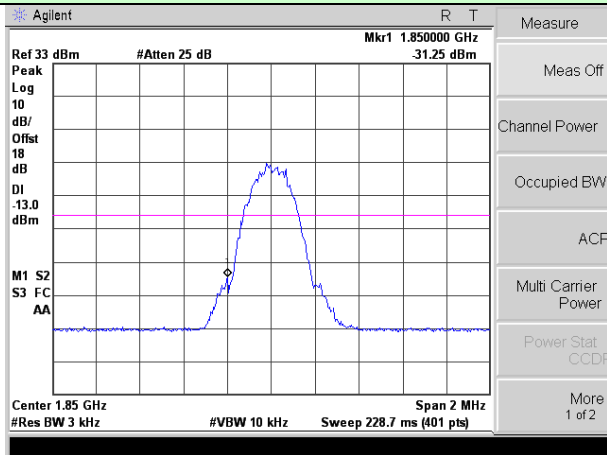


Lowest channel

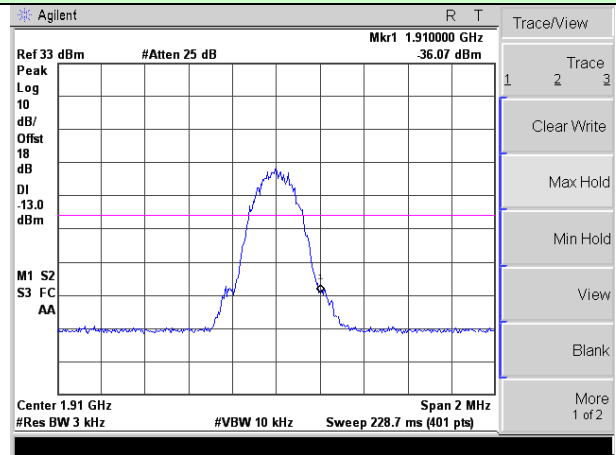


Highest channel

Test Mode: Traffic mode PCS1900 (GSM link)

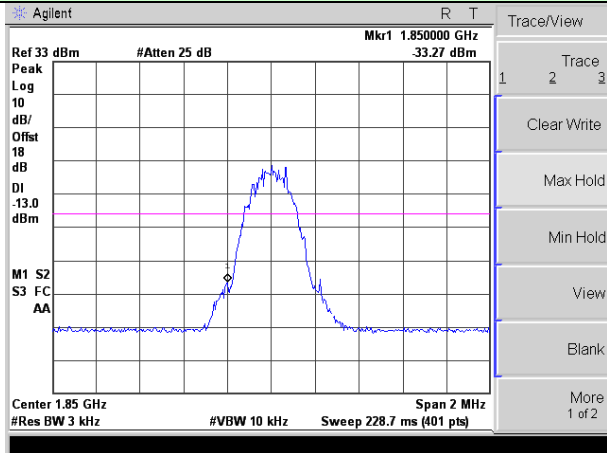


Lowest channel

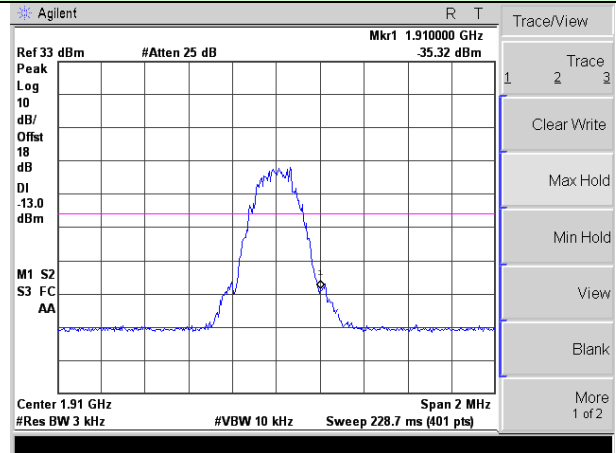


Highest channel

Test Mode: Traffic mode PCS1900 (GPRS 1 link)

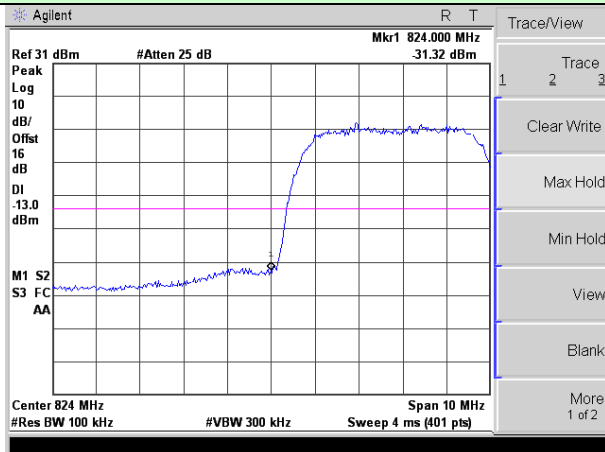


Lowest channel

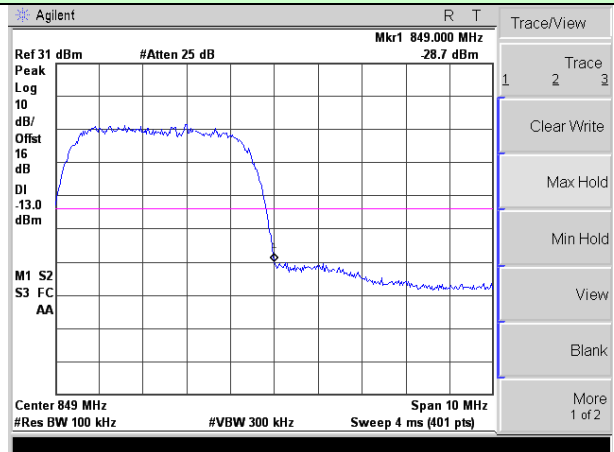


Highest channel

Test Mode: Traffic mode WCDMA Band V (RMC 12.2Kbps link)

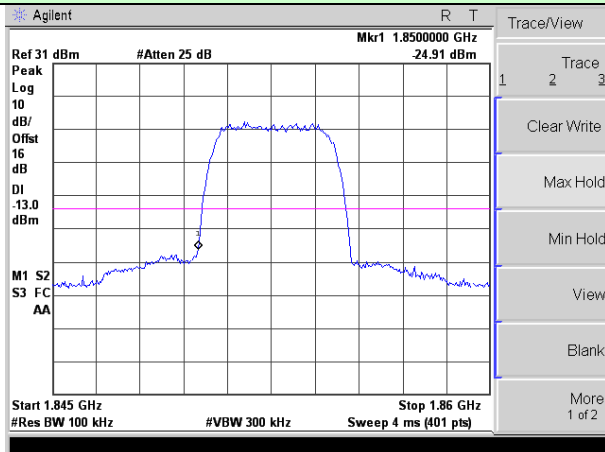


Lowest channel

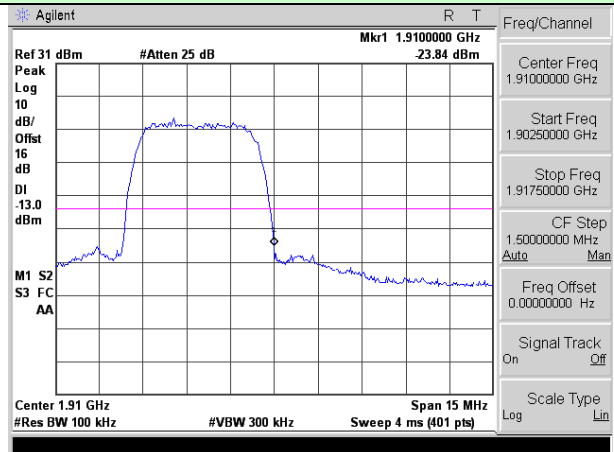


Highest channel

Test Mode: Traffic mode WCDMA Band II (RMC 12.2Kbps link)

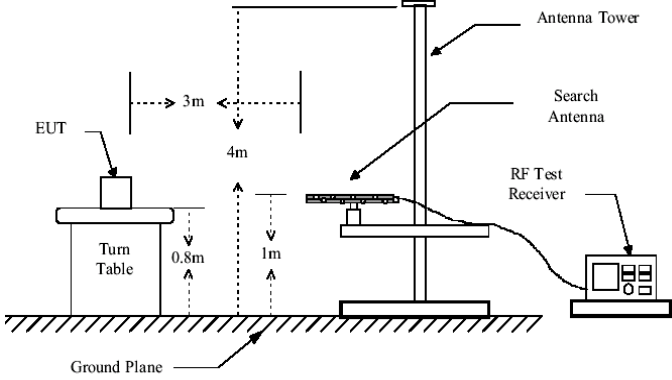
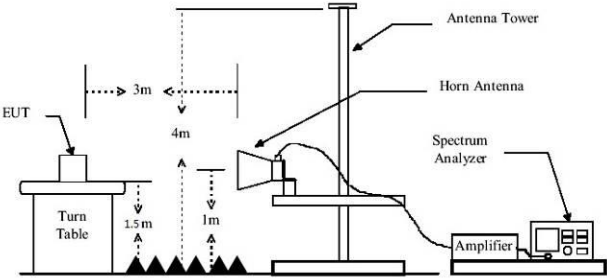
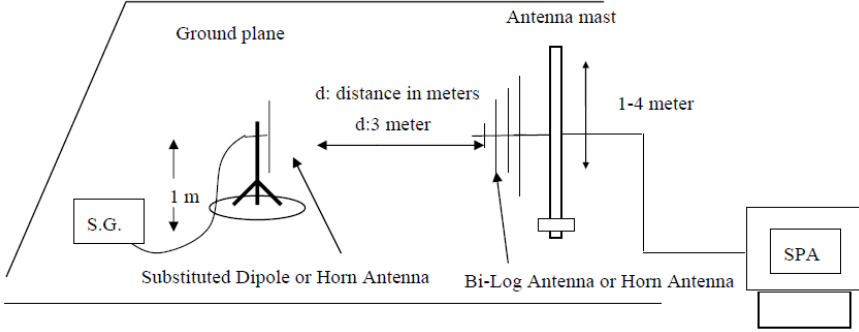


Lowest channel



Highest channel

4.8 ERP, EIRP Measurement

Test Requirement:	FCC part22.913(a) and FCC part24.232(b)
Test Method:	ANSI C63.26: 2015
Limit:	GSM850, WCDMA Band V: 7W PCS1900, WCDMA Band II: 2W
Test setup:	<p>Below 1GHz</p>  <p>Above 1GHz</p>  <p>Substituted method:</p> 

Test Procedure:	<ol style="list-style-type: none"> 1. The EUT was placed on an non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer. 2. During the measurement, the EUT was communication with the station. The highest emission was recorded with the rotation of the turntable and the lowering of the test antenna from 4m to 1m. The reading was recorded and the field strength (E in dBuV/m) was calculated. 3. ERP in frequency band 824.2 –848.80.8MHz were measured using a substitution method. The EUT was replaced by dipole antenna connected, the S.G. output was recorded and ERP was calculated as follows: $\text{ERP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBd)} - \text{Cable Loss (dB)}$ 4. EIRP in frequency band 1850.2 –1909.8MHz were measured using a substitution method. The EUT was replaced by or horn antenna connected, the S.G. output was recorded and EIRP was calculated as follows: $\text{EIRP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBi)} - \text{Cable Loss (dB)}$
Test results:	Pass

Measurement Data

EUT mode	Channel	EUT Pol.	Antenna Pol.	ERP(dBm)	Limit (dBm)	Result
GSM850 (GSM link)	Lowest	H	V	27.49	38.45	Pass
			H	30.11		
		E1	V	26.94		
			H	29.36		
		E2	V	26.93		
			H	29.95		
	Middle	H	V	26.99	38.45	Pass
			H	29.58		
		E1	V	26.82		
			H	29.91		
		E2	V	27.55		
			H	28.97		
	Highest	H	V	27.10	38.45	Pass
			H	29.93		
		E1	V	26.97		
			H	30.08		
		E2	V	27.15		
			H	27.76		

EUT mode	Channel	EUT Pol.	Antenna Pol.	ERP(dBm)	Limit (dBm)	Result
GSM850 (GPRS 1 link)	Lowest	H	V	27.66	38.45	Pass
			H	30.03		
		E1	V	26.95		
			H	29.40		
		E2	V	26.91		
			H	30.01		
	Middle	H	V	27.61	38.45	Pass
			H	30.05		
		E1	V	27.29		
			H	29.94		
		E2	V	27.24		
			H	29.81		
	Highest	H	V	27.51	38.45	Pass
			H	30.01		
		E1	V	27.08		
			H	30.08		
		E2	V	27.18		
			H	30.04		

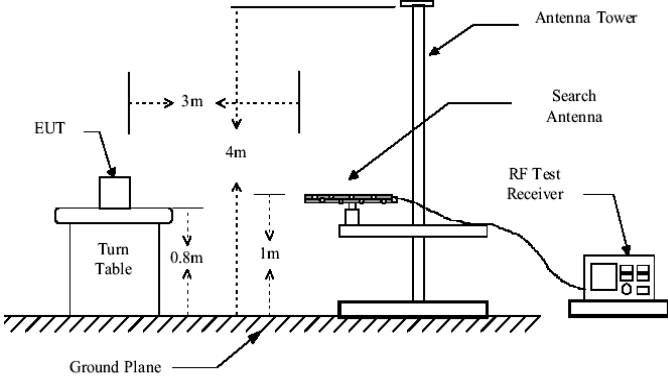
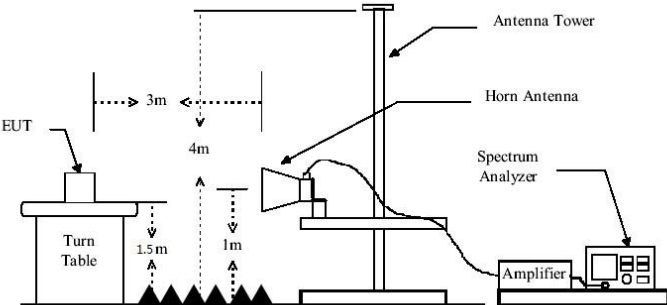
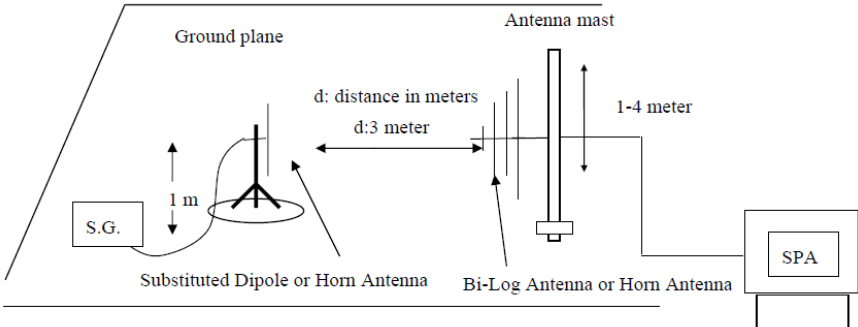
EUT mode	Channel	EUT Pol.	Antenna Pol.	EIRP (dBm)	Limit (dBm)	Result
PCS1900 (GSM link)	Lowest	H	V	23.49	33.01	Pass
			H	27.39		
		E1	V	23.55		
			H	26.85		
		E2	V	22.74		
			H	26.94		
	Middle	H	V	23.97	33.01	Pass
			H	27.23		
		E1	V	23.73		
			H	27.16		
		E2	V	22.96		
			H	26.70		
	Highest	H	V	24.66	33.01	Pass
			H	27.49		
		E1	V	24.04		
			H	26.89		
		E2	V	23.32		
			H	26.73		

EUT mode	Channel	EUT Pol.	Antenna Pol.	EIRP (dBm)	Limit (dBm)	Result
PCS1900 (GPRS 1 link)	Lowest	H	V	20.59	33.01	Pass
			H	23.95		
		E1	V	20.62		
			H	23.70		
		E2	V	22.94		
			H	24.02		
	Middle	H	V	23.13	33.01	Pass
			H	24.62		
		E1	V	22.15		
			H	24.40		
		E2	V	21.94		
			H	23.99		
	Highest	H	V	23.02	33.01	Pass
			H	24.34		
		E1	V	23.87		
			H	24.08		
		E2	V	23.15		
			H	25.01		

EUT mode	Channel	EUT Pol.	Antenna Pol.	ERP(dBm)	Limit (dBm)	Result
WCDMA Band V	Lowest	H	V	23.00	38.45	Pass
			H	26.30		
		E1	V	22.91		
			H	25.87		
		E2	V	22.69		
			H	25.97		
	Middle	H	V	22.40	38.45	Pass
			H	26.25		
		E1	V	23.18		
			H	25.28		
		E2	V	22.41		
			H	24.73		
	Highest	H	V	23.65	38.45	Pass
			H	26.23		
		E1	V	24.03		
			H	26.23		
		E2	V	23.30		
			H	25.41		

EUT mode	Channel	EUT Pol.	Antenna Pol.	EIRP(dBm)	Limit (dBm)	Result
WCDMA Band II	Lowest	H	V	23.43	33.01	Pass
			H	25.84		
		E1	V	22.66		
			H	25.97		
		E2	V	21.79		
			H	26.03		
	Middle	H	V	22.40	33.01	Pass
			H	26.07		
		E1	V	23.39		
			H	25.46		
		E2	V	21.56		
			H	25.07		
	Highest	H	V	23.49	33.01	Pass
			H	25.32		
		E1	V	23.67		
			H	25.87		
		E2	V	23.66		
			H	25.78		

4.9 Field strength of spurious radiation measurement

Test Requirement:	FCC part22.917(a) and FCC part24.238(a)
Test Method:	ANSI C63.26: 2015
Limit:	-13dBm
Test setup:	<p>Below 1GHz</p>  <p>Above 1GHz</p>  <p>Substituted method:</p> 

Test Procedure:	<ol style="list-style-type: none"> 1. The EUT was placed on a non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer. 2. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations. 3. The frequency range up to tenth harmonic was investigated for each of three fundamental frequency (low, middle and high channels). Once spurious emission was identified, the power of the emission was determined using the substitution method. 4. The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency. $\text{ERP / EIRP} = \text{S.G. output (dBm)} + \text{Antenna Gain(dB/dBi)} - \text{Cable Loss (dB)}$
Test results:	<p>Pass</p> <p>Note: Pre-scan all modes and recorded the worst case results in this report.</p>

Measurement Data

Test mode:	GSM850		Test channel:	Lowest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1648.40	Vertical	-36.88	-13.00	Pass
2472.60	V	-40.09		
3296.80	V	-42.37		
4121.00	V	-44.34		
4945.20	V	--		
1648.40	Horizontal	-42.09	-13.00	Pass
2472.60	H	-46.27		
3296.80	H	-48.10		
4121.00	H	-50.39		
4945.20	H	---		
Test mode:	GSM850		Test channel:	Middle
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1673.20	Vertical	-38.38	-13.00	Pass
2509.80	V	-40.17		
3346.40	V	-43.01		
4183.00	V	-43.73		
5019.60	V	--		
1673.20	Horizontal	-42.96	-13.00	Pass
2509.80	H	-46.33		
3346.40	H	-46.94		
4183.00	H	-49.21		
5019.60	H	---		
Test mode:	GSM850		Test channel:	Highest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1697.60	Vertical	-39.85	-13.00	Pass
2546.40	V	-41.34		
3395.20	V	-41.81		
4244.00	V	-45.11		
5092.80	V	---		
1697.60	Horizontal	-42.69	-13.00	Pass
2546.40	H	-45.06		
3395.20	H	-44.65		
4244.00	H	-47.15		
5092.80	H	---		

Remark :

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

Test mode:	PCS1900		Test channel:	Lowest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3700.40	Vertical	-38.34	-13.00	Pass
5550.60	V	-39.67		
7400.80	V	-42.95		
9251.00	V	-41.38		
11101.20	V	--		
3700.40	Horizontal	-41.37	-13.00	Pass
5550.60	H	-43.31		
7400.80	H	-47.23		
9251.00	H	-47.09		
11101.20	H	---		
Test mode:	PCS1900		Test channel:	Middle
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3760.00	Vertical	-33.56	-13.00	Pass
5640.00	V	-37.49		
7520.00	V	-40.97		
9400.00	V	-41.24		
11280.00	V	--		
3760.00	Horizontal	-38.81	-13.00	Pass
5640.00	H	-41.17		
7520.00	H	-44.69		
9400.00	H	-46.88		
11280.00	H	---		
Test mode:	PCS1900		Test channel:	Highest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3819.60	Vertical	-35.74	-13.00	Pass
5729.40	V	-36.20		
7639.20	V	-41.93		
9549.00	V	-40.02		
11458.80	V	--		
3819.60	Horizontal	-38.80	-13.00	Pass
5729.40	H	-44.91		
7639.20	H	-46.52		
9549.00	H	-48.93		
11458.80	H	---		

Remark:

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

Test mode:		WCDMA Band V		Test channel:	Lowest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result	
	Polarization	Level (dBm)			
1652.80	Vertical	-35.07	-13.00	Pass	
2479.20	V	-41.54			
3305.60	V	-42.71			
4132.00	V	-39.66			
4958.40	V	--			
1652.80	Horizontal	-38.69	-13.00	Pass	
2479.20	H	-41.84			
3305.60	H	-45.54			
4132.00	H	-52.05			
4958.40	H	---			
Test mode:		WCDMA Band V		Test channel:	Middle
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result	
	Polarization	Level (dBm)			
1672.80	Vertical	-39.34	-13.00	Pass	
2509.20	V	-38.52			
3345.60	V	-41.43			
4182.00	V	-44.51			
5018.40	V	--			
1672.80	Horizontal	-38.93	-13.00	Pass	
2509.20	H	-43.93			
3345.60	H	-48.15			
4182.00	H	-48.84			
5018.40	H	---			
Test mode:		WCDMA Band V		Test channel:	Highest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result	
	Polarization	Level (dBm)			
1693.20	Vertical	-37.25	-13.00	Pass	
2539.80	V	-38.37			
3386.40	V	-42.47			
4233.00	V	-46.00			
5079.60	V	--			
1693.20	Horizontal	-38.81	-13.00	Pass	
2539.80	H	-44.26			
3386.40	H	-44.69			
4233.00	H	-51.71			
5079.60	H	---			

Remark :

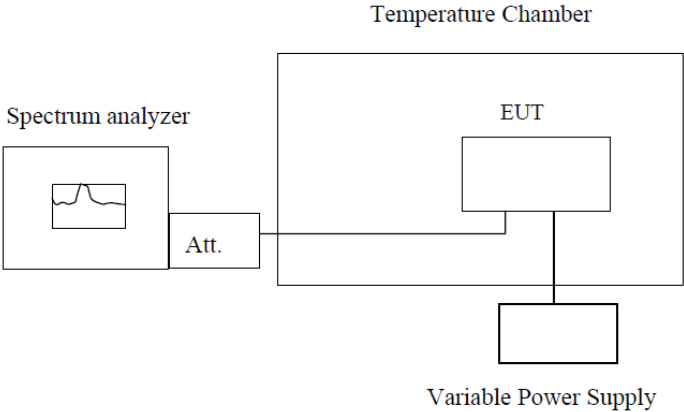
1. The emission behaviour belongs to narrowband spurious emission.
2. Remark"---" means that the emission level is too low to be measured
3. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

Test mode:	WCDMA Band II		Test channel:	Lowest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3704.80	Vertical	-36.43	-13.00	Pass
5557.20	V	-42.47		
7409.60	V	-44.84		
9262.00	V	-48.29		
11114.40	V	--		
3704.80	Horizontal	-46.09	-13.00	Pass
5557.20	H	-47.87		
7409.60	H	-52.19		
9262.00	H	-53.11		
11114.40	H	---		
Test mode:	WCDMA Band II		Test channel:	Middle
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3760.00	Vertical	-37.57	-13.00	Pass
5640.00	V	-42.55		
7520.00	V	-46.06		
9400.00	V	-47.76		
11280.00	V	--		
3760.00	Horizontal	-44.27	-13.00	Pass
5640.00	H	-50.67		
7520.00	H	-50.06		
9400.00	H	-55.39		
11280.00	H	---		
Test mode:	WCDMA Band II		Test channel:	Highest
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3815.20	Vertical	-36.49	-13.00	Pass
5722.80	V	-42.66		
7630.40	V	-43.85		
9538.00	V	-45.58		
11445.60	V	--		
3815.20	Horizontal	-42.16	-13.00	Pass
5722.80	H	-49.42		
7630.40	H	-50.50		
9538.00	H	-52.80		
11445.60	H	---		

Remark:

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

4.10 Frequency stability V.S. Temperature measurement

Test Requirement:	FCC Part2.1055(a)(1)(b)
Test Method:	ANSI C63.26: 2015
Limit:	2.5ppm WCDMA Band II and GSM1900 should be within authorized band.
Test setup:	 <p style="text-align: center;">Note : Measurement setup for testing on Antenna connector</p>
Test procedure:	<ol style="list-style-type: none"> 1. The equipment under test was connected to an external DC power supply and input rated voltage. 2. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. 3. The EUT was placed inside the temperature chamber. 4. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25°C operating frequency as reference frequency. 5. Turn EUT off and set the chamber temperature to –30°C. After the temperature stabilized for approximately 50 minutes recorded the frequency. 6. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.
Test results:	Pass

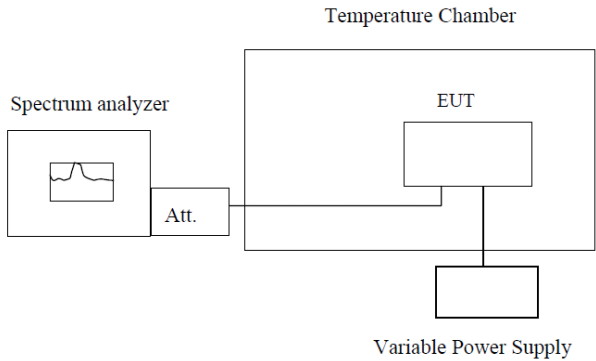
Measurement Data

Reference Frequency: GSM850 (GSM link) Middle channel=190 channel=836.6MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.80	-30	38	0.0451	2.5	Pass
	-20	40	0.0480		
	-10	32	0.0381		
	0	31	0.0375		
	10	35	0.0413		
	20	29	0.0345		
	30	52	0.0624		
	40	43	0.0514		
	50	41	0.0487		
Reference Frequency: GSM850 (GPRS 1 link) Middle channel=190 channel=836.6MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.80	-30	18	0.0217	2.5	Pass
	-20	32	0.0384		
	-10	16	0.0197		
	0	16	0.0187		
	10	19	0.0222		
	20	13	0.0160		
	30	33	0.0389		
	40	34	0.0404		
	50	21	0.0250		

Reference Frequency: PCS1900 (GSM link) Middle channel=661 channel=1880MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.80	-30	31	0.0167	within authorized band	Pass
	-20	48	0.0255		
	-10	35	0.0186		
	0	23	0.0122		
	10	30	0.0159		
	20	40	0.0214		
	30	57	0.0305		
	40	44	0.0234		
	50	39	0.0207		
Reference Frequency: PCS1900 (GPRS 1 link) Middle channel=661 channel=1880MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.80	-30	39	0.0205	within authorized band	Pass
	-20	48	0.0255		
	-10	41	0.0217		
	0	33	0.0178		
	10	34	0.0181		
	20	27	0.0145		
	30	52	0.0277		
	40	41	0.0219		
	50	43	0.0227		

Reference Frequency: WCDMA Band V Middle channel=4183 channel=836.6MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.80	-30	98	0.1166	2.5	Pass
	-20	137	0.1637		
	-10	156	0.1866		
	0	68	0.0808		
	10	112	0.1343		
	20	123	0.1469		
	30	184	0.2194		
	40	173	0.2068		
	50	207	0.2476		
Reference Frequency: WCDMA Band II Middle channel=9400 channel=1880.0MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.80	-30	88	0.0468	within authorized band	Pass
	-20	85	0.0450		
	-10	75	0.0401		
	0	69	0.0365		
	10	68	0.0364		
	20	61	0.0326		
	30	66	0.0349		
	40	73	0.0391		
	50	73	0.0388		

4.11 Frequency stability V.S. Voltage measurement

Test Requirement:	FCC Part2.1055(d)(1)(2)
Test Method:	ANSI C63.26: 2015
Limit:	2.5ppm WCDMA Band II and GSM1900 should be within authorized band.
Test setup:	 <p style="text-align: center;">Temperature Chamber</p> <p style="text-align: center;">Spectrum analyzer</p> <p style="text-align: center;">Att.</p> <p style="text-align: center;">EUT</p> <p style="text-align: center;">Variable Power Supply</p> <p>Note : Measurement setup for testing on Antenna connector</p>
Test procedure:	<ol style="list-style-type: none"> 1. Set chamber temperature to 25°C. Use a variable DC power source to power the EUT and set the voltage to rated voltage. 2. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency. 3. Reduce the input voltage to specified extreme voltage variation (+/- 15%) and endpoint, record the maximum frequency change.
Test results:	Pass

Measurement Data

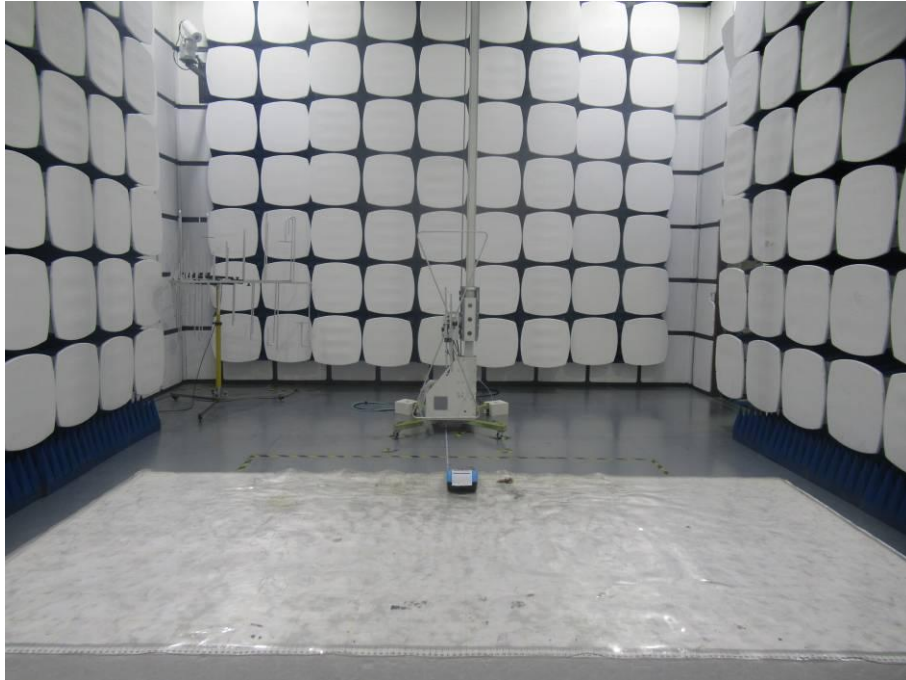
Reference Frequency: GSM850 (GSM link) Middle channel=190 channel=836.6MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.37	55	0.0657	2.5	Pass
	3.80	61	0.0724		
	3.23	68	0.0817		
Reference Frequency: GSM850 (GPRS 1 link) Middle channel=190 channel=836.6MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.37	32	0.0386	2.5	Pass
	3.80	29	0.0343		
	3.23	21	0.0255		

Reference Frequency: PCS1900 (GSM link) Middle channel=661 channel=1880MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.37	47	0.0248	within authorized band	Pass
	3.80	59	0.0314		
	3.23	58	0.0310		
Reference Frequency: PCS1900 (GPRS 1 link) Middle channel=661 channel=1880MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.37	49	0.0260	within authorized band	Pass
	3.80	35	0.0188		
	3.23	28	0.0151		

Reference Frequency: WCDMA Band V Middle channel=4183 channel=836.6MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.37	56	0.0666	2.5	Pass
	3.80	44	0.0531		
	3.23	62	0.0738		
Reference Frequency: WCDMA Band II Middle channel=940 channel=1880.0MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.37	9	0.0047	within authorized band	Pass
	3.80	15	0.0082		
	3.23	15	0.0077		

5 Test Setup Photo

Radiated Emission



6 EUT Constructional Details

Please refer to report A1907043-C01-R11.

-----End-----