

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 22 SUBPART H, PART 24 SUBPART E REQUIREMENT

OF

Product Name:	Tablet
Brand Name:	HP
Model No.:	HSN-I07C
Model Difference:	N/A
FCC ID:	B94HNI07CWR2
Report No.:	ER/2016/B0100
Issue Date:	Dec. 27, 2016
FCC Rule Part:	2 , 22H & 24E
Prepared for:	HP Inc. 3390 East Harmony Road Fort Collins, Colo- rado 80528 United States SGS Taiwan Ltd. Electronics & Communication Laboratory
Prepared by:	No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803

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VERIFICATION OF COMPLIANCE

Applicant: HP Inc.
3390 East Harmony Road Fort Collins, Colorado 80528 United States

Product Name: Tablet

Brand Name: HP

Model No.: HSN-I07C

Model Difference: N/A

FCC ID: B94HNI07CWR2

File Number: ER/2016/B0100

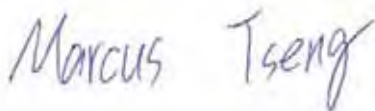
Date of test: Nov. 18, 2016 ~ Dec. 16, 2016

Date of EUT Received: Nov. 18, 2016

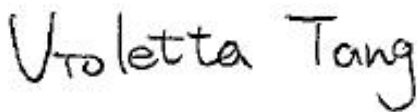
We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Electronics & Communication Laboratory. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in TIA/EIA-603-D-2010 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits.

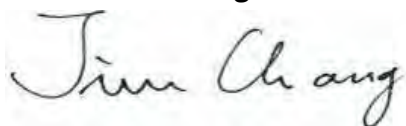
The test results of this report relate only to the tested sample identified in this report.

Test By:**Date:**

Dec. 27, 2016

Marcus Tseng / Sr. Engineer**Prepared By:****Date:**

Dec. 27, 2016

Violetta Tang / Clerk**Approved By:****Date:**

Dec. 27, 2016

Jim Chang / Asst. Manager

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Revision History

Report Number	Revision	Description	Issue Date
ER/2016/B0100	Rev.00	Initial creation of document	Dec. 27, 2016

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1. GENERAL PRODUCT INFORMATION

1.1. Product Description

General:

Product Name:	Tablet	
Brand Name:	HP	
Model No.:	HSN-I07C	
Model Difference:	N/A	
Hardware Version:	N/A	
Software Version:	N/A	
WWAN Module:	Model No.: H380-GL, Supplier: FIBOCOM Wireless Inc.	
Keyboard:	1. Model No.: HSN-D06K, Supplier: HP 2. Model No.: HSTNN-I72K, Supplier: HP	
Power Supply:	7.7Vdc from Rechargeable Li-polymer Battery or 5 / 9 / 10 / 12 / 15 / 20 Vdc from AC/DC Adapter	
	Battery:	Model No.: HSTNN-UB7E, Supplier: SAMSUNG SDI Co., Ltd.
	Adapter:	1. Model No.: TPN-CA06, Supplier: CHICONY POWER TECHNOLOGY (CHONGQING) CO., LTD. 2. Model No.: TPN-AA03, Supplier: Acbel Electronic (Wuhan) Co., Ltd.

GPRS / WCDMA:

Cellular Phone Standards Frequency Range and Power	Operating Frequency		Rated Power
	GPRS 850	824.2 MHz– 848.8 MHz	33dBm
	EDGE 850	824.2 MHz– 848.8 MHz	27dBm
	GPRS 1900	1850.2MHz – 1909.8MHz	30dBm
	EDGE 1900	1850.2MHz – 1909.8MHz	26dBm
	WCDMA/HSUPA/HSDPA /HSPA+ Band II	1852.4MHz – 1907.6MHz	24dBm
	WCDMA/HSUPA/HSDPA /HSPA+ Band V	826.4MHz - 846.6MHz	24dBm
IMEI	860558030009860		

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Type of Emission:

Frequency Band	Type of Emission:
GPRS 850	246KGXW
EDGE 850	248KG7W
GPRS 1900	246KGXW
EDGE 1900	249KG7W
WCDMA Band II	4M06F9W
WCDMA Band V	4M06F9W
HSDPA Band II	4M06F9W
HSDPA Band V	4M06F9W
HSUPA Band II	4M07F9W
HSUPA Band V	4M06F9W

Max ERP/EIRP Power Measurement Result:

	dBm		W
GPRS 850	19.15	ERP	0.082
EDGE 850	21.66	ERP	0.147
GPRS 1900	24.72	EIRP	0.296
EDGE 1900	24.22	EIRP	0.264
WCDMA Band II	21.81	EIRP	0.152
WCDMA Band V	20.73	ERP	0.118
HSDPA Band II	22.67	EIRP	0.185
HSDPA Band V	20.35	ERP	0.108
HSUPA Band II	21.67	EIRP	0.147
HSUPA Band V	20.75	ERP	0.119

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1.2. Test Methodology of Applied Standards

FCC 47 CFR Part 2, 22, 24

ANSI / TIA / EIA 603-D-2010

KDB971168 D01 Power Meas license Digital System

KDB941225 of the Output power Procedure of (SAR Measurement Procedures for 3G Devices, WCDMA / HSPA) was used for EUT and Base station setting.

TS 151 010-1 is used to set, and measure the output power.

Note:

All test items have been performed and record as per the above standards.

1.3. Test Facility

SGS Taiwan Ltd. Electronics & Communication Laboratory No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan. (TAF code 0513)

FCC Registration Numbers are: 509634

Canada Registration Number: 4620A-5.

1.4. Special Accessories

No special accessories were used during testing.

1.5. Equipment Modifications

There were no modifications incorporated into the EUT.

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2. SYSTEM TEST CONFIGURATION

2.1. EUT Configuration

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

2.2. EUT Exercise

The EUT (Transmitter) was operated in the continuous transmission mode employed with the simulator of the Base Station that fixates at test default channels to fix the Tx frequency which was for the purpose of the measurements.

2.3. Test Procedure

2.3.1 Conducted Measurement at Antenna Port

According to measurement procured TIA/EIA 603C, the EUT is placed on a turn table which is 0.8 m above ground plane. A low loss of RF cable was used to connect the antenna port of EUT to measurement equipment.

2.3.2 Radiated Emissions (ERP/EIRP)

According to measurement procured TIA/EIA 603C, The EUT is a placed on as turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both Horizontal and Vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna according to the requirements in Section 8 and 13.

2.4. Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuation factor between EUT conducted port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly EUT RF output level.

Note:

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Following shows an offset computation example with cable loss 0.4 dB for low band and 0.8 dB for high band with 10 dB attenuator and 3.2 splitter

Low Band: Offset = RF cable loss (dB)+ attenuation factor(dB) = 0.4+10+3.2=13.6(dB)

High Band: Offset = RF cable loss (dB)+ attenuation factor(dB) = 0.8+10+3.2=14(dB)

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2.5. Final Amplifier Voltage and Current Information:

Test Mode	DC voltage (V)	DC current (mA)
GPRS 850	7.7 Vdc	525
GPRS 1900	7.7 Vdc	536
EDGE 850	7.7 Vdc	485
EDGE 1900	7.7 Vdc	515
WCDMA Band II	7.7 Vdc	720
WCDMA Band V	7.7 Vdc	660
HSUPA Band II	7.7 Vdc	735
HSUPA Band V	7.7 Vdc	655
HSDPA Band II	7.7 Vdc	752
HSDPA Band V	7.7 Vdc	631

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2.6. Configuration of Tested System

Fig. 2-1 Configuration of Tested System (Fixed Channel-Conducted)

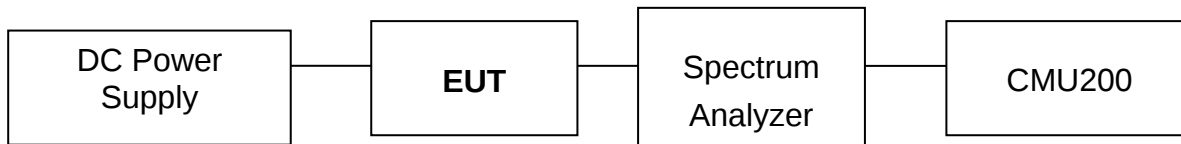


Fig. 2-2 Configuration of Tested System (Fixed Channel-Radiated)

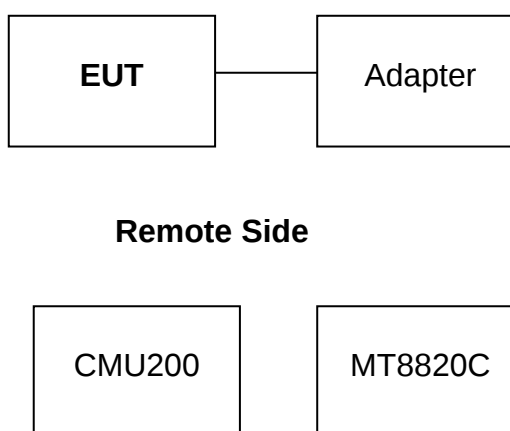


Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/ Type No.	Series No.	Data Cable	Power Cord
1.	Universal Radio Communication Tester	R&S	CMU200	102189	shielded	Un-shielded
2.	Universal Radio Communication Tester	Anritsu	MT8820C	6200995019	shielded	Un-shielded

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3. SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§2.1046(a)	RF Power Output	Compliant
§2.1046(a) §22.913(a)(2) §24.232(c)	ERP/ EIRP measurement	Compliant
§2.1049(h)	99% & 26dB Occupied Bandwidth	Compliant
§2.1051 §22.917(a) §24.238(a)	Out of Band Emissions at Antenna Terminals and Band Edge	Compliant
§2.1053 §22.917(a) §24.238(a)	Field Strength of Spurious Radiation	Compliant
§24.232(d)	Peak to Average Ratio	Compliant
§2.1055(a)(1) §22.355 §24.235	Frequency Stability	Compliant

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4. DESCRIPTION OF TEST MODES

4.1. The Worst Test Modes and Channel Details

1. The EUT has been tested under operating condition.
2. Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, X(E1)Y(E2)Z(H) axis and antenna ports. The worst case was found as listed below. Following channel(s) was (were) selected for the final test as listed below:

BAND	ERP/EIRP	RADIATED EMISSION
GSM/GPRS/EDGE 850	E2-plan	E2-plan
GSM/GPRS/EDGE 1900	E2-plan	E2-plan
WCDMA/HSPA Band II	E2-plan	E2-plan
WCDMA/HSPA Band V	E2-plan	E2-plan

GSM/GPRS/EDGE MODE

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	MODE
ERP	128 to 251	128, 190, 251	GSM/GPRS/EDGE 850
EIRP	512 to 810	512, 661, 810	GSM/GPRS/EDGE 1900
FREQUENCY STABILITY	128 to 251 512 to 810	190 661	GPRS 850 GPRS 1900
OCCUPIED BANDWIDTH	128 to 251 512 to 810	190 661	GSM/GPRS/EDGE 850 GSM/GPRS/EDGE 1900
PEAK TO AVERAGE RATIO	128 to 251 512 to 810	128, 190, 251 512, 661, 810	GSM/GPRS/EDGE 850 GSM/GPRS/EDGE 1900
BAND EDGE	128 to 251 512 to 810	128, 251 512, 810	GSM/GPRS/EDGE 850 GSM/GPRS/EDGE 1900
CONDUCTED EMISSION	128 to 251 512 to 810	128, 190, 251 512, 661, 810	GSM/GPRS/EDGE 850 GSM/GPRS/EDGE 1900
RADIATED EMISSION	128 to 251 512 to 810	128, 190, 251 512, 661, 810	EDGE 850 GPRS 1900

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WCDMA/HSPA MODE

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	MODE
ERP	4132 to 4233	4132, 4183, 4233	WCDMA/HSPA Band V
EIRP	9262 to 9538	9262, 9400, 9583	WCDMA/HSPA Band II
FREQUENCY STABILITY	4132 to 4233 9262 to 9538	4183 9400	WCDMA Band II WCDMA Band V
OCCUPIED BANDWIDTH	4132 to 4233 9262 to 9538	4132, 4183, 4233 9262, 9400, 9583	WCDMA/HSPA Band II WCDMA/HSPA Band V
PEAK TO AVERAGE RATIO	4132 to 4233 9262 to 9538	4132, 4183, 4233 9262, 9400, 9583	WCDMA/HSPA Band II WCDMA/HSPA Band V
BAND EDGE	4132 to 4233 9262 to 9538	4132, 4233 9262, 9583	WCDMA Band II WCDMA Band V
CONDCUDED EMISSION	4132 to 4233 9262 to 9538	4132, 4183, 4233 9262, 9400, 9583	WCDMA Band II WCDMA Band V
RADIATED EMISSION	4132 to 4233 9262 to 9538	4132, 4183, 4233 9262, 9400, 9583	HSDPA Band II HSUPA Band V

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5. MEASUREMENT UNCERTAINTY

Test Items	Uncertainty
RF Power Output	+/- 1.10 dB
ERP/ EIRP measurement	Vertical Polarization = +/- 4.74dB Horizontal Polarization = +/- 4.62dB
99% Occupied Bandwidth	+/- 5.19 Hz
Out of Band Emissions at Antenna	+/- 0.70 dB
Terminals and Band Edge	
Peak to Average Ratio	+/- 0.70 dB
Frequency Stability vs. Temperature	+/- 5.19 Hz
Frequency Stability vs. Voltage	+/- 5.19 Hz
Temperature	+/- 0.65 °C
Humidity	+/- 4.6 %
DC / AC Power Source	DC= +/- 0.13%, AC= +/- 0.2%

Radiated Spurious Emission:

Measurement uncertainty (Polarization : Vertical)	9kHz – 30MHz: +/- 2.87 dB
	30MHz - 180MHz: +/- 3.37dB
	180MHz -417MHz: +/- 3.19dB
	0.417GHz-1GHz: +/- 3.19dB
	1GHz - 18GHz: +/- 4.04dB
	18GHz - 40GHz: +/- 4.04dB

Measurement uncertainty (Polarization : Horizontal)	9kHz – 30MHz: +/- 2.87 dB
	30MHz - 167MHz: +/- 4.22dB
	167MHz -500MHz: +/- 3.44dB
	0.5GHz-1GHz: +/- 3.39dB
	1GHz - 18GHz: +/- 4.08dB
	18GHz - 40GHz: +/- 4.08dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

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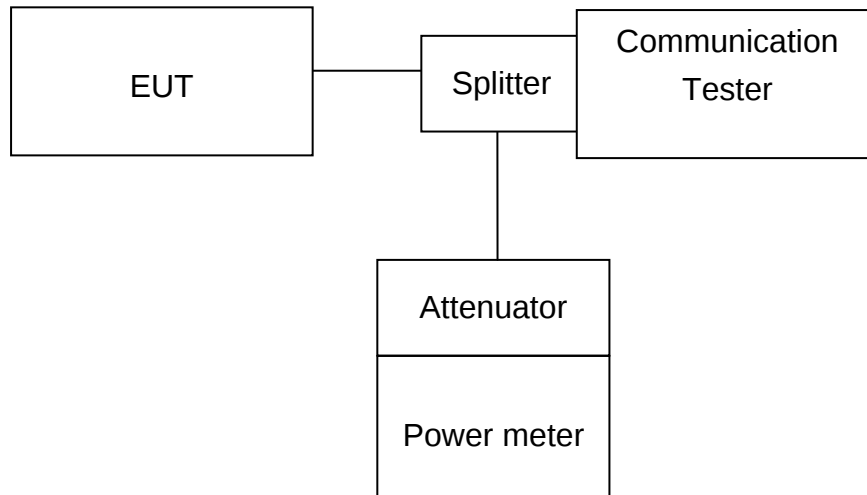
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6. RF CONDUCTED OUTPUT POWER MEASUREMENT

6.1. Standard Applicable

A base station simulator was used to establish communication with the EUT. Its parameters were set to transmit the maximum power on the EUT. The measured power in the radio frequency on the transmitter output terminals.

6.2. Test Set-up



Note: Measurement setup for testing on Antenna connector

6.3. Measurement Procedure

The transmitter output was connected to a calibrated attenuator, the other end of which was connected to a power meter. Transmitter output was read off the power meter in dBm. The power output at the transmitter antenna port was determined by adding the value of the attenuator to the power meter reading. TS 151 010-1 is reference to conduct the test measurement of output power.

The Procedure of KDB941225 (SAR Measurement Procedures for 3G devices, (WCDMA/HSPA) was used for EUT and Base station setting. RMC 12.2kps is used for this testing, and KDB 971168 D01 Power Meas License Digital System as the supplemental test methodology to adjust the proper setting obtaining the measurement results

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6.4. Measurement Equipment Used

SGS Conducted Room					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Power Meter	Anritsu	ML2495A	1005007	12/15/2015	12/14/2016
Power Sensor	Anritsu	MA2411B	917032	12/15/2015	12/14/2016
EXA Spectrum Analyzer	Agilent	N9030A	MY53120760	02/26/2016	02/25/2017
DC Block	Mini-Circuits	BLK-18-S+	1	01/02/2016	01/01/2017
Coaxial Cable	HUBER+SUHNER	SUCOFLEX 102	23670/2	01/02/2016	01/01/2017
Attenuator	Mini-Circuit	BW-S10W2+	2	01/02/2016	01/01/2017
Splitter	Agilent	11636B	N/A	01/02/2016	01/01/2017
DC Power Supply	Agilent	E3640A	MY52410006	11/21/2016	11/20/2017
Temperature Chamber	TERCHY	MHG-120LF	911009	05/17/2016	05/16/2017
Radio Communication Analyzer	R&S	CMU200	102189	02/11/2016	02/10/2017
Radio Communication Analyzer	Anritsu	MT8820C	6200995019	09/24/2016	09/23/2017

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6.5. Measurement Result

RF Conducted Output Power GPRS/EDGE (GMSK; 8-PSK) Result:

EUT Mode	Frequency (MHz)	CH	Average Burst Power (1DN 1UP) (dBm)	Average Burst Power (1DN 2UP) (dBm)	Average Burst Power (1DN 3UP) (dBm)	Average Burst Power (1DN 4UP) (dBm)
GPRS 850	824.2	128	31.53	29.46	28.1	26.52
	836.6	190	31.51	29.32	27.98	26.4
	848.8	251	31.52	29.42	28.08	26.49
GPRS 1900	1850.2	512	29.44	27.21	25.93	24.37
	1880.0	661	29.36	27.18	25.91	24.32
	1909.8	810	29.5	27.32	26.05	24.47
EDGE 850	824.2	128	26.15	23.82	22.63	21.02
	836.6	190	26.1	23.81	22.5	20.96
	848.8	251	26.14	23.84	22.63	21.05
EDGE 1900	1850.2	512	25.37	23.19	22.34	20.81
	1880.0	661	25.36	23.14	22.32	20.78
	1909.8	810	25.51	23.32	22.48	20.93

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WCDMA MODE:

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 V8.4.0 specification. The EUT supports power Class 3, which has a nominal maximum output power of 24 dBm (+1.7/-3.7). RMC 12.2kps is used for this testing.

Results:

EUT Mode		WCDMA Band II	HSDPA Band II	HSUPA Band II
Frequency (MHz)	CH	Avg. Power (dBm)	Avg. Power (dBm)	Avg. Power (dBm)
1852.4	9262	24.49	23.3	23.29
1880.0	9400	24.25	23.08	23.12
1907.6	9538	24.18	23.16	23.1

EUT Mode		WCDMA Band V	HSDPA Band V	HSUPA Band V
Frequency (MHz)	CH	Avg. Power (dBm)	Avg. Power (dBm)	Avg. Power (dBm)
826.4	4132	23.44	22.37	22.4
836.6	4183	23.64	22.45	22.58
846.6	4233	23.36	22.3	22.32

Note: The results above reflect max power with all up bits.

Cable loss offset Low Band: 0.4dB, Cable loss offset High Band: 0.8dB

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HSDPA Release 6 MODE:

The following 4 Sub-Tests were completed according to the test requirements outlined in section 5.2A of the 3GPP TS34.121-1 V8.4.0 specification. All TX RMS power requirements for Power Class 3 were met according to table 5.2AA.5 and 5.2B.5 All UE channels and power ratio's are set according to table C10.1.4 & C11.1.3 in the 3GPP TS34.121-1 V8.4.0. RMC 12.2kps is used for this testing.

HSDPA SUB-TEST Setting

Table C.10.1.4: β values for transmitter characteristics tests with HS-DPCCH(FOR HSDPA)

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note 1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)	RMC (Kbps)
1	2/15	15/15	64	2/15	4/15	0.0	0.0	12.2
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0	12.2
3	15/15	8/15	64	15/8	30/15	1.5	0.5	12.2
4	15/15	4/15	64	15/4	30/15	1.5	0.5	12.2

Note: The recommended HSDPA MPRs are implemented as per following sub-tests.

Results:

Mode	Sub-test	Avg. Power (dBm) Channel			Power Class 3 Lim- itation (dBm)	Comments
		9262	9400	9538		
HSDPA (Band II)	1	24.66	24.14	24.04	20.3dBm – 25.7dBm	Pass
	2	24.37	24.11	24.03	20.3dBm – 25.7dBm	Pass
	3	24.18	23.69	23.51	19.8dBm – 25.7dBm	Pass
	4	24.25	23.7	23.63	19.8dBm – 25.7dBm	Pass

Mode	Sub-test	Avg. Power (dBm) Channel			Power Class 3 Lim- itation (dBm)	Comments
		4132	4183	4233		
HSDPA (Band V)	1	23.61	23.53	23.22	20.3dBm – 25.7dBm	Pass
	2	23.32	23.5	23.21	20.3dBm – 25.7dBm	Pass
	3	23.13	23.08	22.69	19.8dBm – 25.7dBm	Pass
	4	23.2	23.09	22.81	19.8dBm – 25.7dBm	Pass

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HSPA (HSDPA & HSUPA) Release 6 MODE

The following 5 Sub-Tests were completed according to the test requirements outlined in section 5.2A of the 3GPP TS34.121-1 V8.4.0 specification. All TX RMS power requirements for Power Class 3 were met according to table 5.2AA.5 and 5.2B.5 All UE channels and power ratio's are set according to table C11.1.3 in the 3GPP TS34.121-1 V8.4.0. RMC 12.2kps is used for this testing

HSPA SUB-TEST Setting

Table C.11.1.3: β values for transmitter characteristics tests with HS-DPCCH and E-DCH(FOR HSUPA)

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS}	β_{ec}	β_{ed}	β_{ed} (SF)	β_{ed} (Code s)	CM (dB)	MPR (dB)	AG Index	E-TFCI	RMC (Kbps)
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/225	1309/225	4	1	1.0	0.0	20	75	12.2
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67	12.2
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed1} : 47/15 β_{ed2} : 47/15	4 4	2	2.0	1.0	15	92	12.2
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71	12.2
5	15/15 (Note 4)	15/15 (Note 4)	64	15/15 (Note 4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81	12.2

Note: The recommended HSUPA MPRs are implemented as per following sub-tests.

Results:

Mode	Sub-test	Avg. Power (dBm) Channel			Power Class 3 Limitation (dBm)	Comments
		9262	9400	9538		
HSUPA (Band II)	1	24.41	24.23	24.12	18.8dBm – 25.7dBm	Pass
	2	22.46	22.3	22.16	16.8dBm – 25.7dBm	Pass
	3	23.47	23.25	23.2	17.8dBm – 25.7dBm	Pass
	4	22.59	22.35	22.2	16.8dBm – 25.7dBm	Pass
	5	24.3	24.09	24.03	18.8dBm – 25.7dBm	Pass

Mode	Sub-test	Avg. Power (dBm) Channel			Power Class 3 Limitation (dBm)	Comments
		4132	4183	4233		
HSUPA (Band V)	1	23.36	23.62	23.3	18.8dBm – 25.7dBm	Pass
	2	21.41	21.69	21.34	16.8dBm – 25.7dBm	Pass
	3	22.42	22.64	22.38	17.8dBm – 25.7dBm	Pass
	4	21.54	21.74	21.38	16.8dBm – 25.7dBm	Pass
	5	23.25	23.48	23.21	18.8dBm – 25.7dBm	Pass

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WCDMA/HSDPA/HSUPA Band II / V

The EUT output power was controlled by simulator. Set Communication Tester CMU200 function key "UE Power Control" and enter max rated power 24dBm. The EUT is going to be set to max output power to 24dBm. Then record the read (see page 21 for measurement data). The min. power was measures by a function key "minimum power" then record the read. It is -52.3dBm. The power variation can be 0.1dB step by setting.

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7. EFFECTIVE RADIATED POWER AND EQUIVALENT ISOTROPIC RADIATED POWER MEASUREMENT

7.1. Standard Applicable

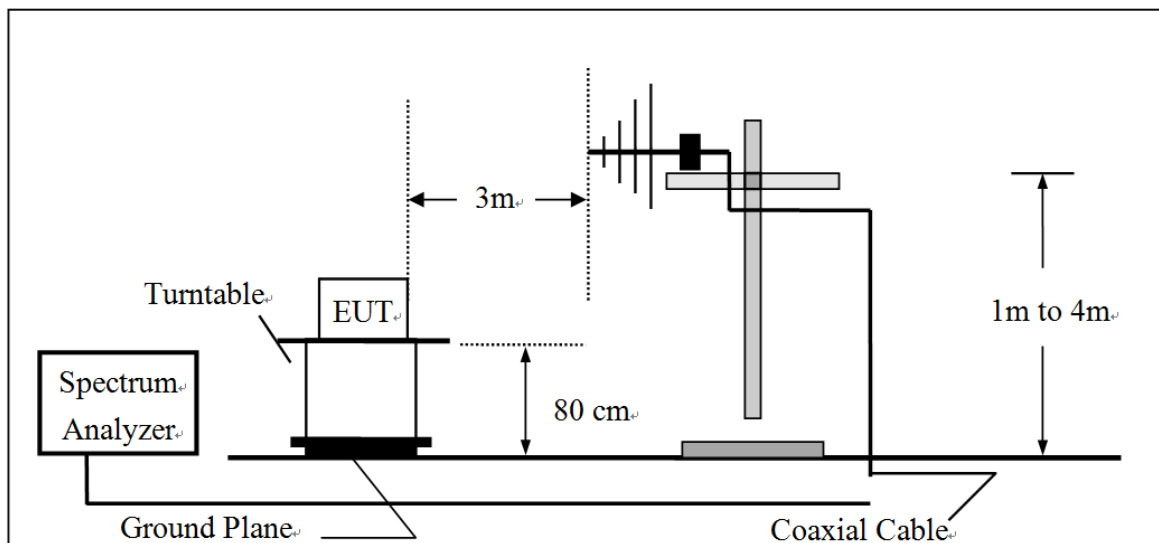
According to FCC §2.1046

FCC 22.913(a) Mobile station is limited to 7W ERP.

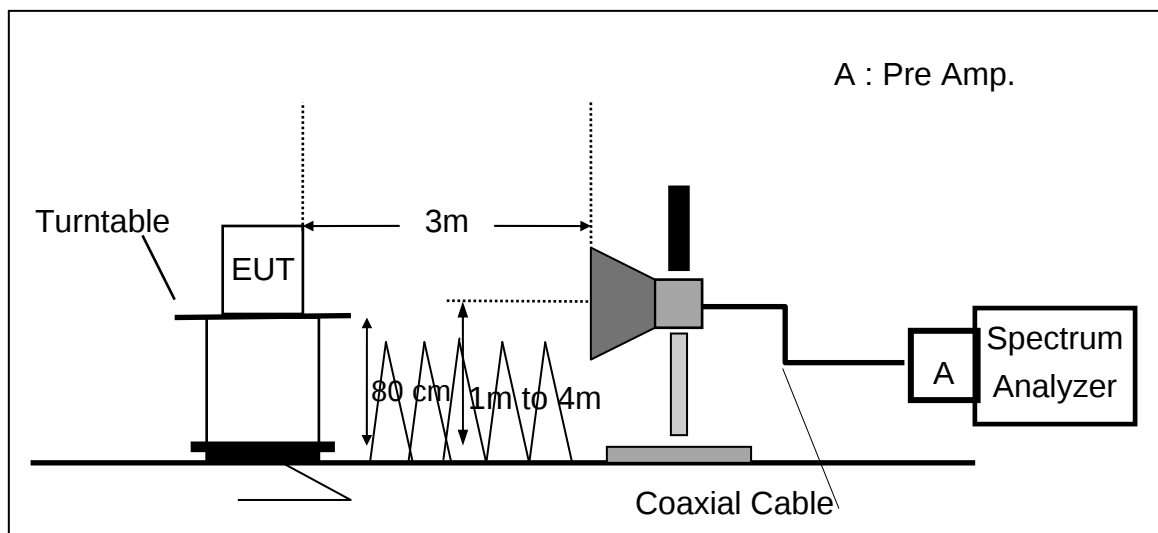
FCC 24.232(b) Mobile and portable stations are limited to 2 W EIRP.

7.2. Test SET-UP

(A) Radiated Power Test Set-Up, Frequency Below 1000MHz



(B) Radiated Power Test Set-UP Frequency Over 1 GHz



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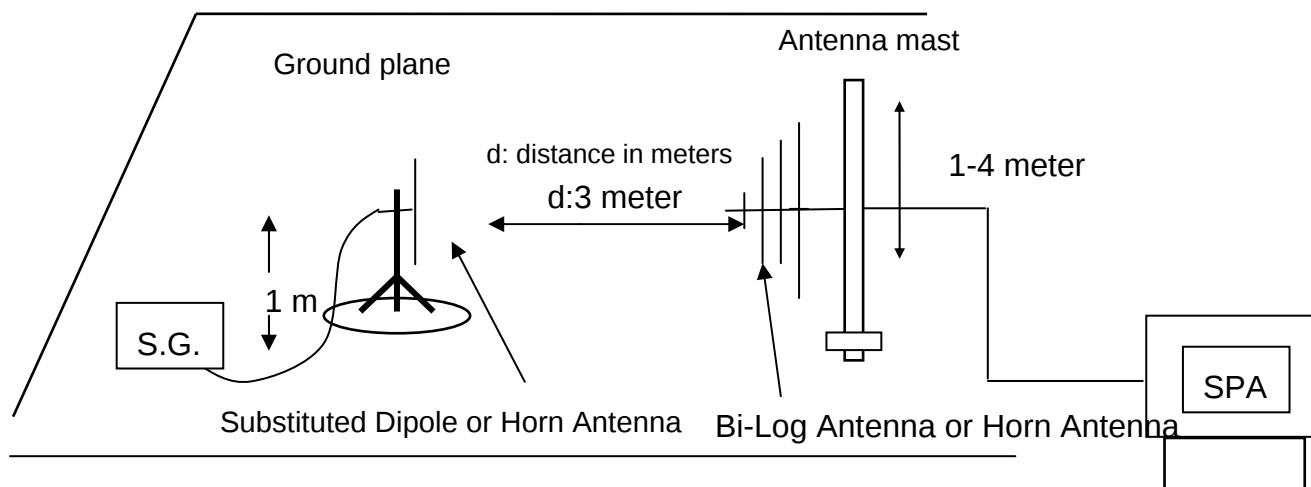
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(C) Substituted Method Test Set-UP



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7.3. Measurement Procedure

1. The testing follows the Measurement Procedure of FCC KDB 971168 D01
2. 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.
3. 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
4. The testing follows the Measurement Procedure of FCC KDB 971168 D01
5. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a tx cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value" of step b. Record the power level of S.G.
6. $ERP = S.G. \text{ output (dBm)} + \text{Antenna Gain (dBd)} - \text{Cable Loss (dB)}$
7. $ERP = S.G. \text{ output (dBm)} + \text{Antenna Gain (dBd)} - \text{Cable Loss (dB)}$
8. Spectrum setting:
 - (1) Detector = Peak, marker the highest value of the detector by maximum hold, set RBW wide enough to capture the entire signal of emission, and $VBW \geq 3 \times RBW$.
 - (2) KDB 971168 D01 is adopted, and the procedure as lists under item 4, Measurement of the Average Power over the Fundamental Signal Bandwidth, is followed to set correspondingly for the acquisition of proper measurement data.

Set frequency = nominal signal center frequency;
 Set span = 2 X occupied BW;
 Set RBW $\approx$ 1~5% of the span, not to exceed 1 MHz
 Set VBW = 3 x RBW;
 Select average power (RMS) detector
 Set sweep time and number of measurement points to achieve a minimum of 1 millisecond/pt integration time (ex. Point = 601points, then sweep time = $601 \times 10^{-3} = 6s$).

Activate trace averaging routine over a minimum of 10 sweeps;

Activate marker/span pair and set span = signal or channel bandwidth;

Activate the band/interval power marker function;

Record the band power level;

Record adjusted value as the average signal power level. Then activate the occupied bandwidth measurement function.

The proper adjustment due to limitation of spectrum capability is given compensated to spectrum with conversion factor of $10 \times \log (TBW/RBW)$, where TBW is the transmission of UE exceeding the maximum BW UE can extends, and RBW is the resolution BW in UE.

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7.4. Measurement Equipment Used

SGS FAC-I					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Spectrum Analyzer	R&S	FSV-30	101398	10/05/2016	10/04/2017
Bi-log Antenna	SCHWAZBECK	VULB9160	9160-3158	10/28/2016	10/27/2017
Bi-log Antenna	SCHWAZBECK	VULB9168	300	12/16/2015	12/15/2016
Horn antenna	ETS.LINDGREN	3117	143279	11/14/2016	11/13/2017
Horn antenna	ETS.LINDGREN	3117	123991	12/12/2016	12/11/2017
Horn Antenna	Schwarzbeck	BBHA9170	184	12/12/2016	12/11/2017
Horn Antenna	Schwarzbeck	BBHA9170	185	07/18/2016	07/17/2017
Filter 2400-2483.5 MHz	EWT	EWT-14-0166	M1	01/02/2016	01/01/2017
Pre-Amplifier	HP	8447F	3113A06892	01/02/2016	01/01/2017
Pre-Amplifier	HP	8449B	3008A01973	01/02/2016	01/01/2017
Network Analyze	Anritsu	MS4644A	1216312	05/26/2016	05/25/2017
Signal Generator	Agilent	E4438C	MY45093613	07/07/2016	07/06/2017
Low Loss Cable	Huber Suhner	SUCOFLEX 104EPA	1166TX	01/02/2016	01/01/2017
Low Loss Cable	Huber Suhner	SUCOFLEX 104EPA	1166RX	01/02/2016	01/01/2017
Attenuator	Mini-Circuit	BW-S10W2+	3	01/02/2016	01/01/2017
Turn Table	HD	DT420	N/A	N.C.R	N.C.R
Antenna Tower	HD	MA240-N	240/657	N.C.R	N.C.R
Controller	HD	HD100	N/A	N.C.R	N.C.R
Site Cal	SGS	1166 chamber	N/A	01/02/2016	01/01/2017
Filter 800-1000	Micro-Tronics	EWT	M1	01/02/2016	01/01/2017
Filter 1800-2000	Micro-Tronics	EWT	M1	01/02/2016	01/01/2017
1GHz High Pass Filter	Micro-Tronics	HPM50108	32	01/02/2016	01/01/2017
2GHz High Pass Filter	Micro-Tronics	HPM50110	36	01/02/2016	01/01/2017
Radio Communication Analyzer	Anritsu	MT8820C	6201465317	12/10/2016	12/09/2017

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7.5. Measurement Result: (Peak) –using option of peak measurement

EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
	MHz		V/H	dBm	dBd	dB	dBm	dBm
GPRS 850	824.2	128	V	18.22	3.31	-2.92	18.61	38.45
			H	18.28	3.31	-2.92	18.66	38.45
	836.6	190	V	17.01	3.29	-2.96	17.34	38.45
			H	18.55	3.29	-2.96	18.88	38.45
	848.8	251	V	17.05	3.27	-3	17.32	38.45
			H	18.88	3.27	-3	19.15	38.45

EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
	MHz		V/H	dBm	dBd	dB	dBm	dBm
EDGE 850	824.2	128	V	20.62	3.31	-2.92	21	38.45
			H	20.6	3.31	-2.92	20.99	38.45
	836.6	190	V	19.37	3.29	-2.96	19.7	38.45
			H	20.97	3.29	-2.96	21.29	38.45
	848.8	251	V	18.97	3.27	-3	19.24	38.45
			H	21.39	3.27	-3	21.66	38.45

Remark :

- (1) The RBW,VBW of SPA for frequency RBW=300kHz, VBW=1MHz

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EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
	MHz		V/H	dBm	dBi	dB	dBm	dBm
GPRS 1900	1850.2	512	V	17.74	9.94	-4.46	23.22	33.01
			H	17.14	9.94	-4.46	22.62	33.01
	1880.0	661	V	18.8	10.03	-4.51	24.33	33.01
			H	19.2	10.03	-4.51	24.72	33.01
	1909.8	810	V	17.84	10.13	-4.55	23.42	33.01
			H	17.88	10.13	-4.55	23.45	33.01

EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
	MHz		V/H	dBm	dBi	dB	dBm	dBm
EDGE 1900	1850.2	512	V	17.29	9.94	-4.46	22.77	33.01
			H	16.87	9.94	-4.46	22.35	33.01
	1880.0	661	V	18.35	10.03	-4.51	23.87	33.01
			H	18.69	10.03	-4.51	24.22	33.01
	1909.8	810	V	17.53	10.13	-4.55	23.1	33.01
			H	17.23	10.13	-4.55	22.8	33.01

Remark :

- (1) The RBW,VBW of SPA for frequency RBW=300kHz, VBW=1MHz

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EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
WCDMA Band II	MHz		V/H	dBm	dBi	dB	dBm	dBm
	1852.4	9262	V	16.33	9.95	-4.47	21.81	33.00
			H	12.44	9.95	-4.47	17.93	33.00
	1880.0	9400	V	15.79	10.03	-4.51	21.31	33.00
			H	15.03	10.03	-4.51	20.55	33.00
	1907.6	9538	V	14.21	10.12	-4.55	19.78	33.00
			H	14.45	10.12	-4.55	20.03	33.00

EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
	MHz		V/H	dBm	dBi	dB	dBm	dBm
HSDPA Band II	1852.4	9262	V	16.16	9.95	-4.47	21.64	33.00
			H	12.4	9.95	-4.46	17.88	33.00
	1880.0	9400	V	17.14	10.04	-4.51	22.67	33.00
			H	14.98	10.03	-4.51	20.5	33.00
	1907.6	9538	V	15	10.12	-4.55	20.57	33.00
			H	12.67	10.12	-4.55	18.24	33.00

EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
	MHz		V/H	dBm	dBi	dB	dBm	dBm
HSUPA Band II	1852.4	9262	V	15.75	9.95	-4.47	21.24	33.00
			H	12.03	9.94	-4.46	17.51	33.00
	1880.0	9400	V	16.14	10.03	-4.51	21.67	33.00
			H	13.7	10.03	-4.51	19.23	33.00
	1907.6	9538	V	14.64	10.12	-4.55	20.21	33.00
			H	11.56	10.12	-4.55	17.13	33.00

Remark :

- (1) The RBW,VBW of SPA for frequency RBW= 5MHz , VBW= 8MHz

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EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
	MHz		V/H	dBm	dBd	dB	dBm	dBm
WCDMA Band V	826.4	4132	V	13.89	3.3	-2.93	14.27	38.45
			H	19.26	3.3	-2.93	19.63	38.45
	836.6	4183	V	16.47	3.29	-2.96	16.8	38.45
			H	18.84	3.29	-2.97	19.16	38.45
	846.6	4233	V	16.37	3.27	-3	16.64	38.45
			H	20.45	3.27	-2.99	20.73	38.45

EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
	MHz		V/H	dBm	dBd	dB	dBm	dBm
HSDPA Band V	826.4	4132	V	18.71	3.3	-2.93	19.08	38.45
			H	19.98	3.3	-2.93	20.35	38.45
	836.6	4183	V	16.32	3.29	-2.96	16.64	38.45
			H	18.14	3.29	-2.96	18.46	38.45
	846.6	4233	V	16.8	3.27	-3	17.08	38.45
			H	19.22	3.27	-2.99	19.5	38.45

EUT			Measurement					
Operation Band	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
	MHz		V/H	dBm	dBd	dB	dBm	dBm
HSUPA Band V	826.4	4132	V	19.04	3.3	-2.93	19.41	38.45
			H	18.78	3.3	-2.93	19.15	38.45
	836.6	4183	V	16.61	3.29	-2.96	16.94	38.45
			H	18.64	3.29	-2.97	18.96	38.45
	846.6	4233	V	16.85	3.27	-2.99	17.13	38.45
			H	20.46	3.27	-2.99	20.75	38.45

Remark :

- (1) The RBW,VBW of SPA for frequency RBW= 5MHz , VBW= 8MHz

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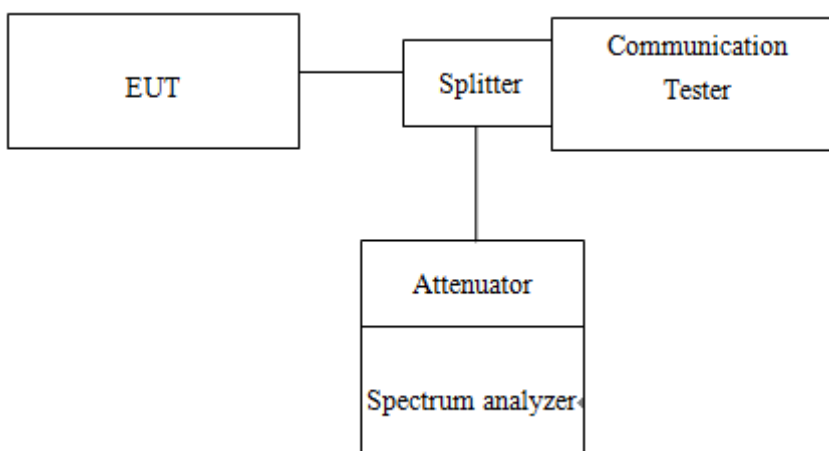
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8. OCCUPIED BANDWIDTH MEASUREMENT

8.1. Standard Applicable

The occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power.

8.2. Test Set-up



8.3. Measurement Procedure

99% & 26dB Bandwidth with detector peak

The EUT's output RF connector was connected with a short cable to the spectrum analyzer, RBW was set to about 1% of emission BW, VBW= 3 times RBW, -26dBc display line was placed on the screen (or 26dB bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace. Then set RBW to 99% bandwidth, RBW= 1%, VBW= 3 RBW, with span > 2 * Signal BW, set % Power = 99%.

99% Bandwidth with detector sample

The EUT's output RF connector was connected with a short cable to the spectrum analyzer, RBW was set to about 1% ~ 5% of emission BW, VBW= 3 times RBW, -20dBc display line was placed on the screen (or 20dB bandwidth). Set RBW to 99% bandwidth, RBW= 1% ~ 5%, VBW= 3 RBW, with span > 2 * Signal BW, set % Power = 99%.

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8.4. Measurement Equipment Used

SGS Conducted Room					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Power Meter	Anritsu	ML2495A	1005007	12/15/2015	12/14/2016
Power Sensor	Anritsu	MA2411B	917032	12/15/2015	12/14/2016
EXA Spectrum Analyzer	Agilent	N9030A	MY53120760	02/26/2016	02/25/2017
DC Block	Mini-Circuits	BLK-18-S+	1	01/02/2016	01/01/2017
Coaxial Cable	HUBER+SUHNER	SUCOFLEX 102	23670/2	01/02/2016	01/01/2017
Attenuator	Mini-Circuit	BW-S10W2+	2	01/02/2016	01/01/2017
Splitter	Agilent	11636B	N/A	01/02/2016	01/01/2017
DC Power Supply	Agilent	E3640A	MY52410006	11/21/2016	11/20/2017
Temperature Chamber	TERCHY	MHG-120LF	911009	05/17/2016	05/16/2017
Radio Communication Analyzer	R&S	CMU200	102189	02/11/2016	02/10/2017
Radio Communication Analyzer	Anritsu	MT8820C	6200995019	09/24/2016	09/23/2017

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8.5. Measurement Result

Freq. (MHz)	CH	99% BW (MHz)	99% BW (MHz)	26 dB BW (MHz)	26 dB BW (MHz)
		GPRS 850	EDGE 850	GPRS 850	EDGE 850
824.2	128	0.24161	0.24551	0.3181	0.3216
836.6	190	0.24178	0.24551	0.3217	0.3048
848.8	251	0.24573	0.24784	0.3157	0.3122

Freq. (MHz)	CH	99% BW (MHz)	99% BW (MHz)	26 dB BW (MHz)	26 dB BW (MHz)
		GPRS 1900	EDGE 1900	GPRS 1900	EDGE 1900
1850.2	512	0.24183	0.2452	0.3212	0.3143
1880.0	661	0.24475	0.24879	0.3185	0.3165
1909.8	810	0.24572	0.24467	0.3233	0.3169

Freq. (MHz)	CH	99% BW (MHz)	99% BW (MHz)	99% BW (MHz)	26 dB BW (MHz)	26 dB BW (MHz)	26 dB BW (MHz)
		WCDMA II	HSDPA II	HSUPA II	WCDMA II	HSDPA II	HSUPA II
1850.20	9262	4.0580	4.0460	4.0655	4.615	4.590	4.621
1880.00	9400	4.0561	4.0532	4.0650	4.609	4.621	4.573
1909.80	9538	4.0591	4.0561	4.0694	4.622	4.646	4.583

Freq. (MHz)	CH	99% BW (MHz)	99% BW (MHz)	99% BW (MHz)	26 dB BW (MHz)	26 dB BW (MHz)	26 dB BW (MHz)
		WCDMA V	HSDPA V	HSUPA V	WCDMA V	HSDPA V	HSUPA V
826.40	4132	4.0567	4.0513	4.0566	4.611	4.622	4.616
836.60	4183	4.0574	4.0584	4.0584	4.616	4.610	4.615
846.60	4233	4.0530	4.0493	4.0472	4.591	4.606	4.576

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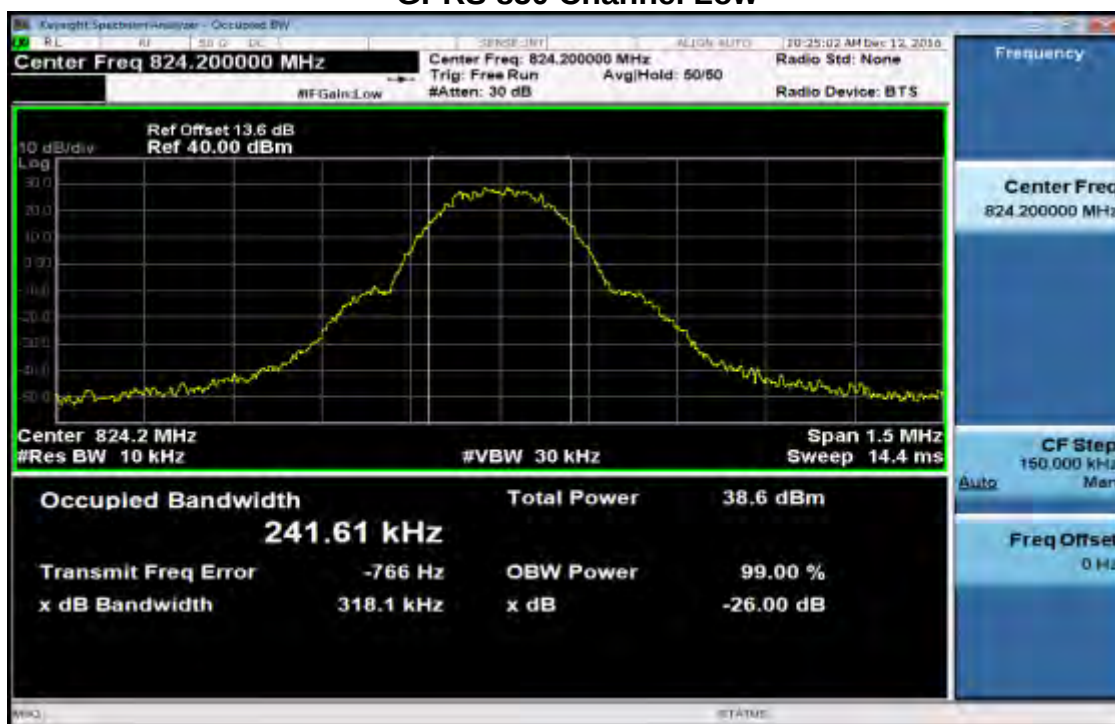
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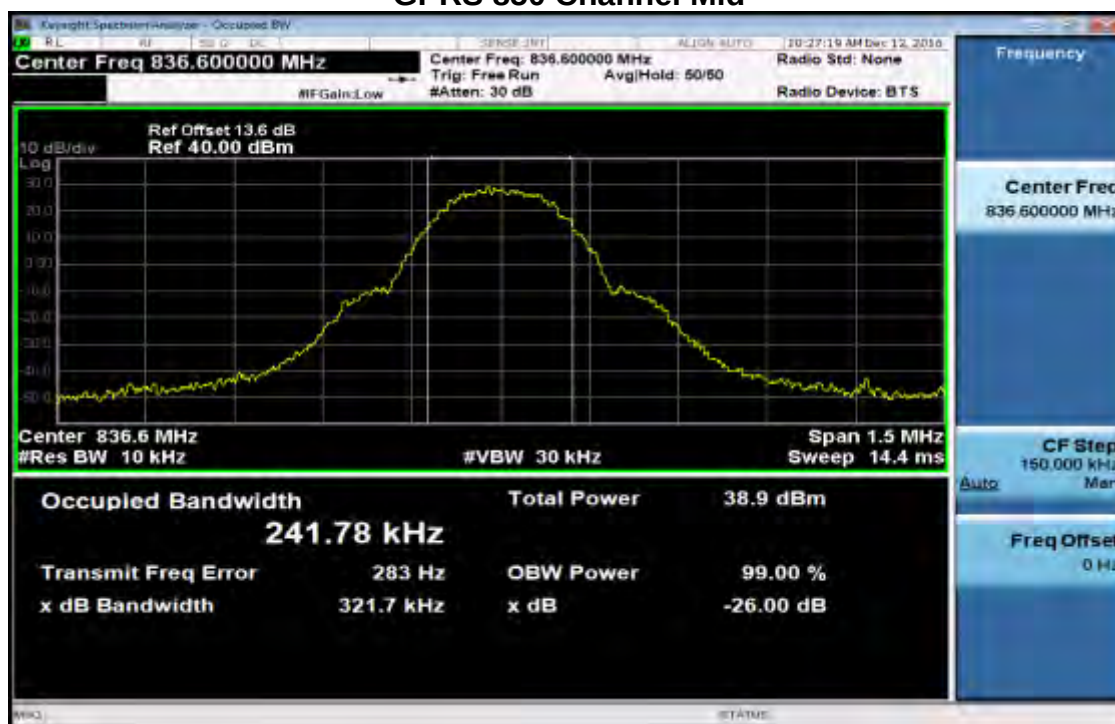
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99% & 26dB Bandwidth Test Data (Detector Peak)
GPRS 850 Channel Low



GPRS 850 Channel Mid

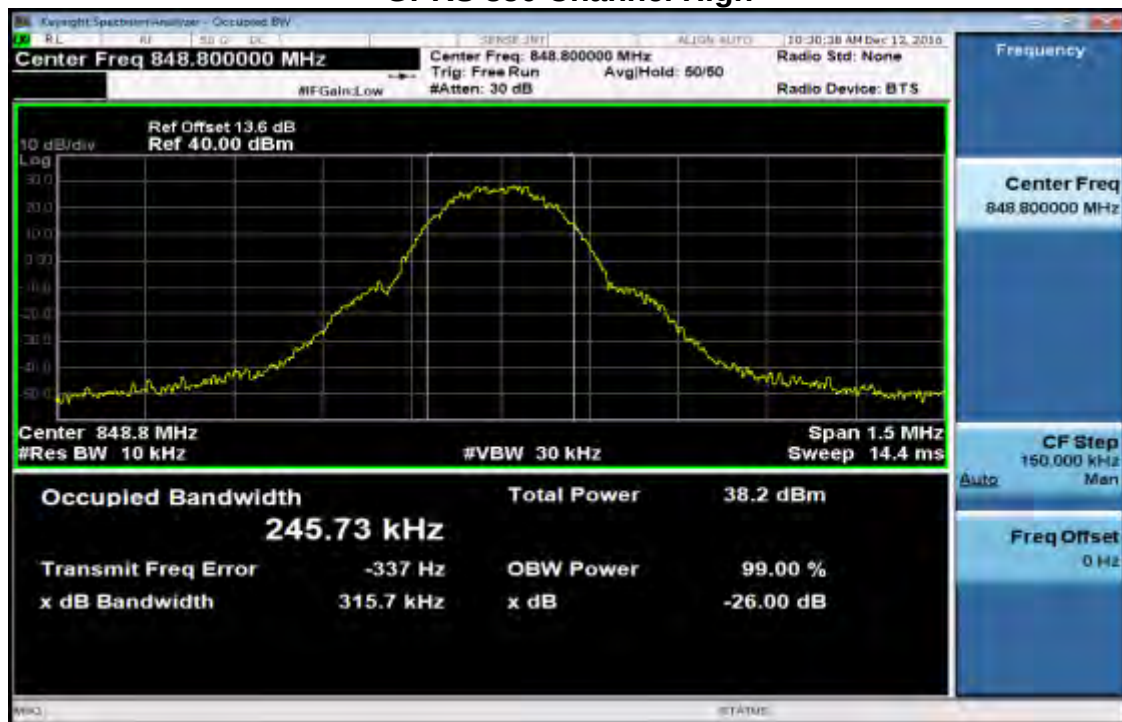


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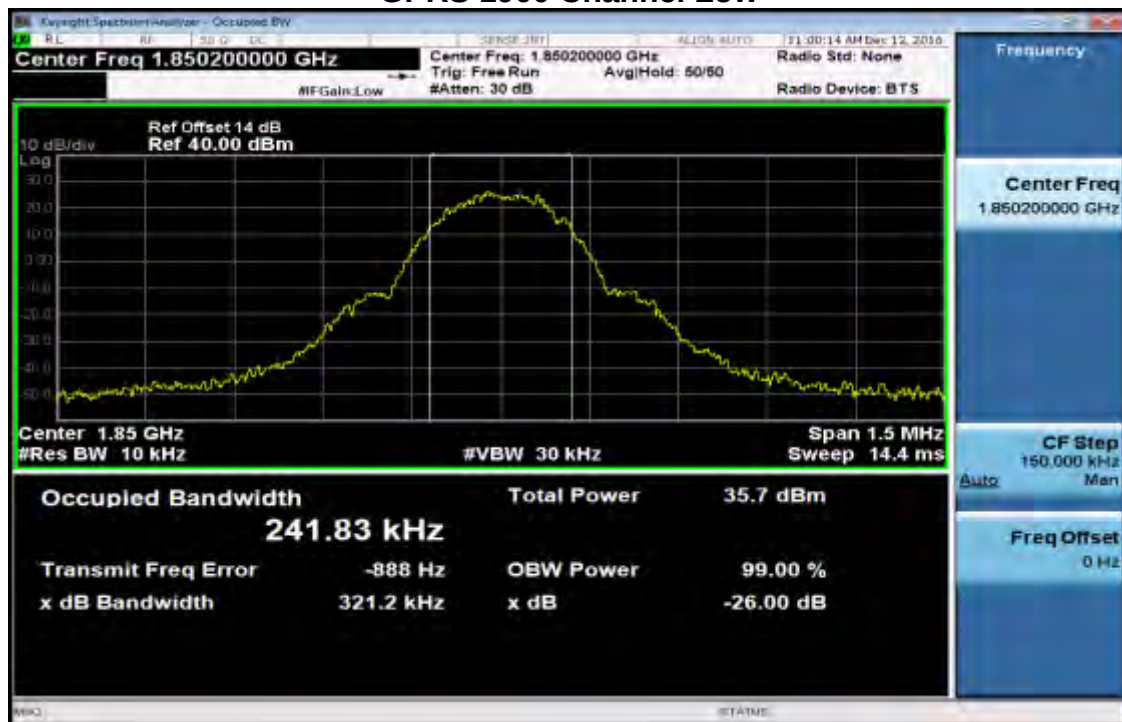
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GPRS 850 Channel High



GPRS 1900 Channel Low



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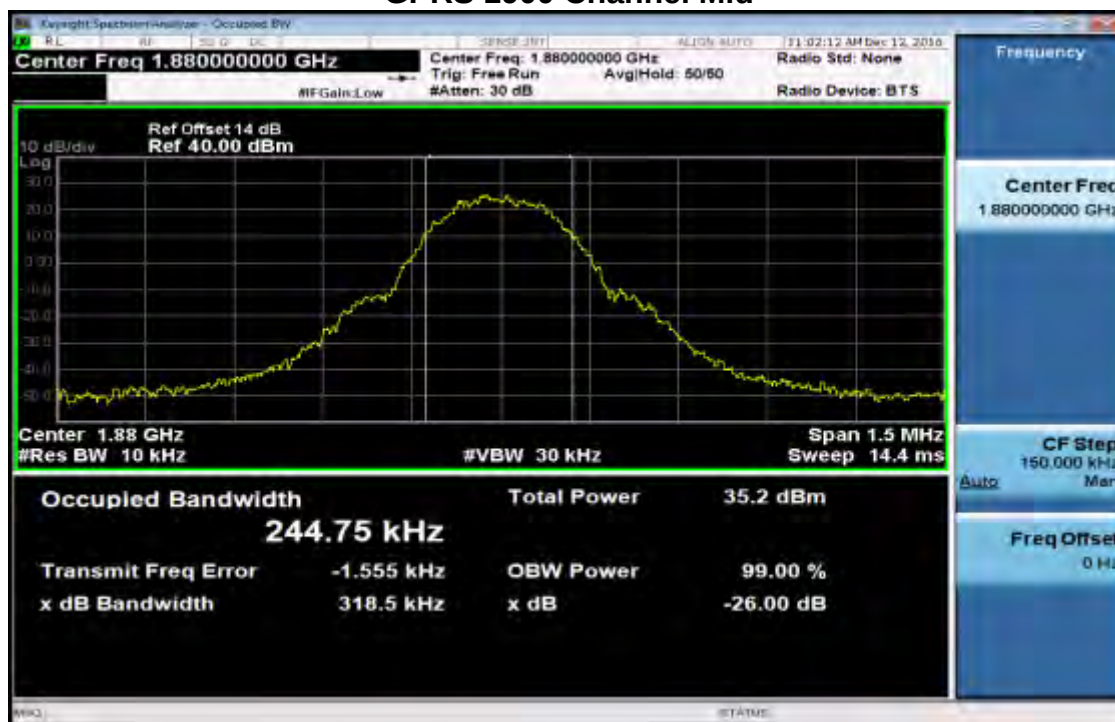
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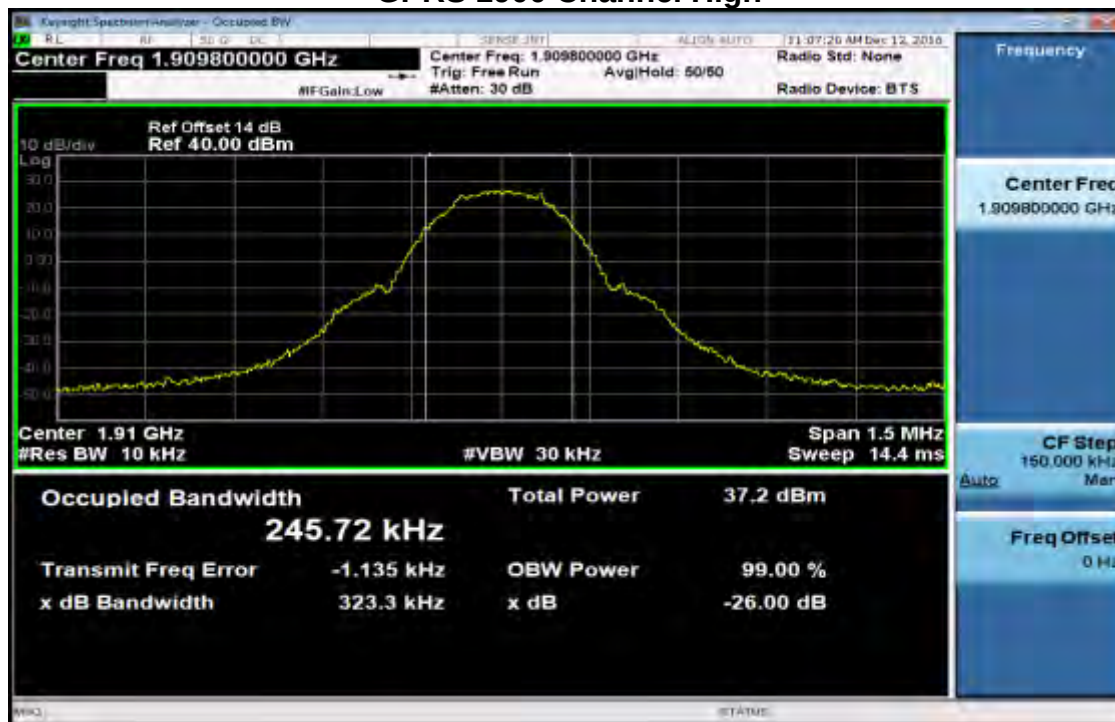
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GPRS 1900 Channel Mid



GPRS 1900 Channel High



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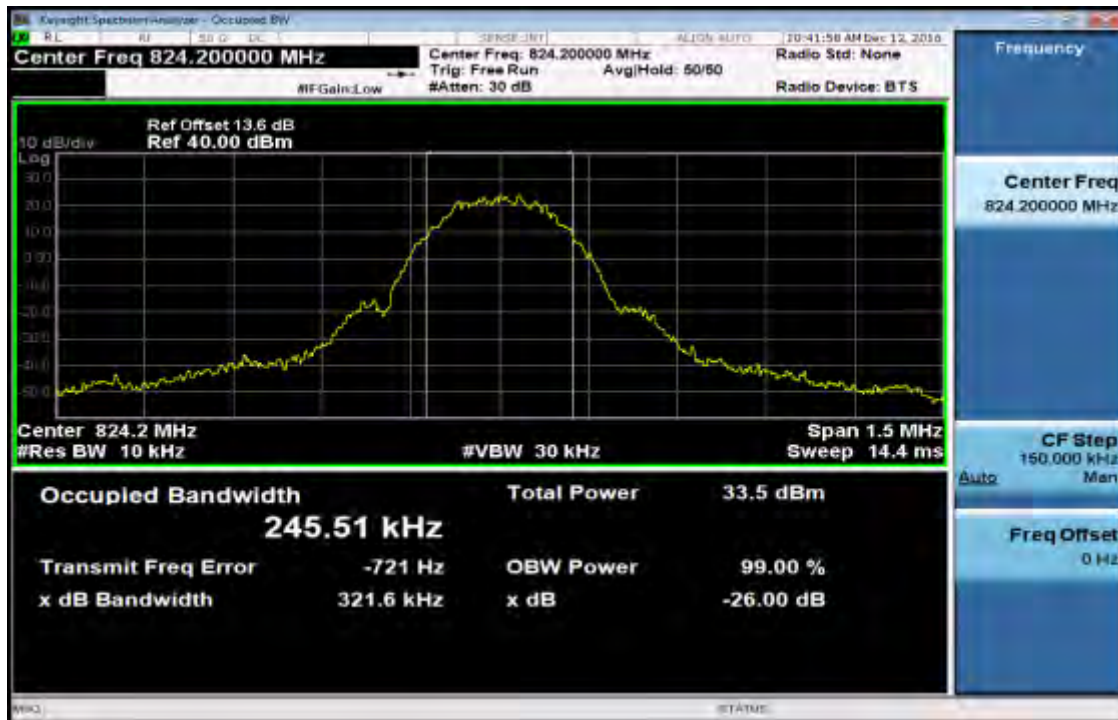
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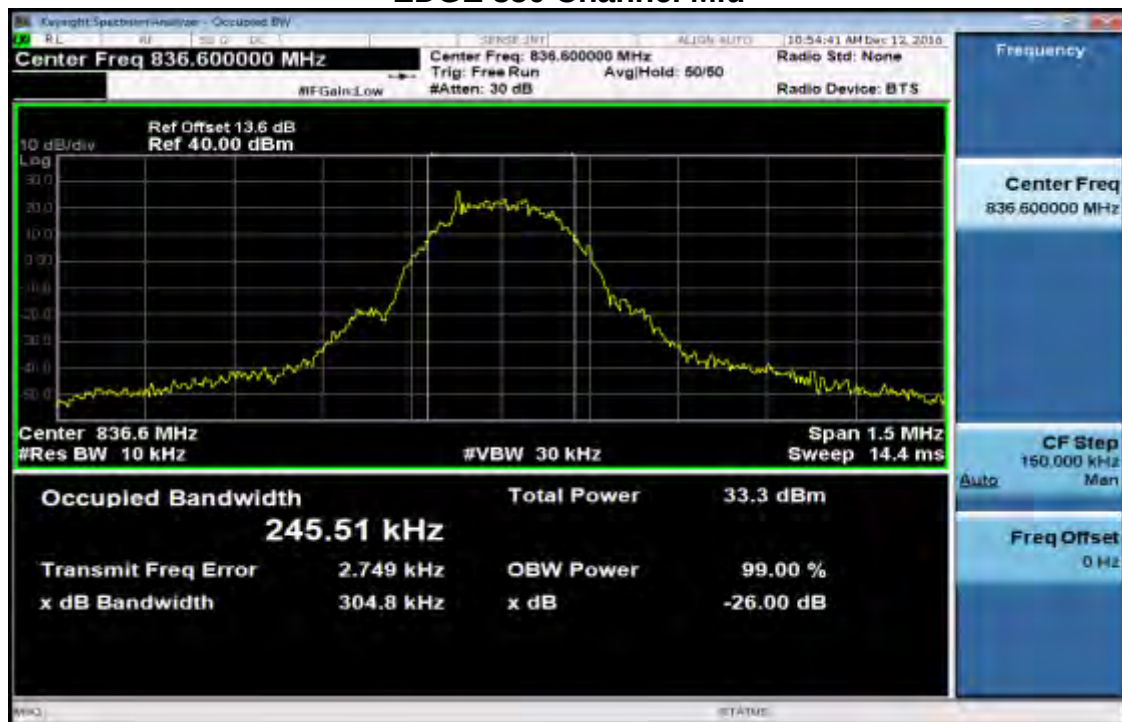
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EDGE 850 Channel Low



EDGE 850 Channel Mid



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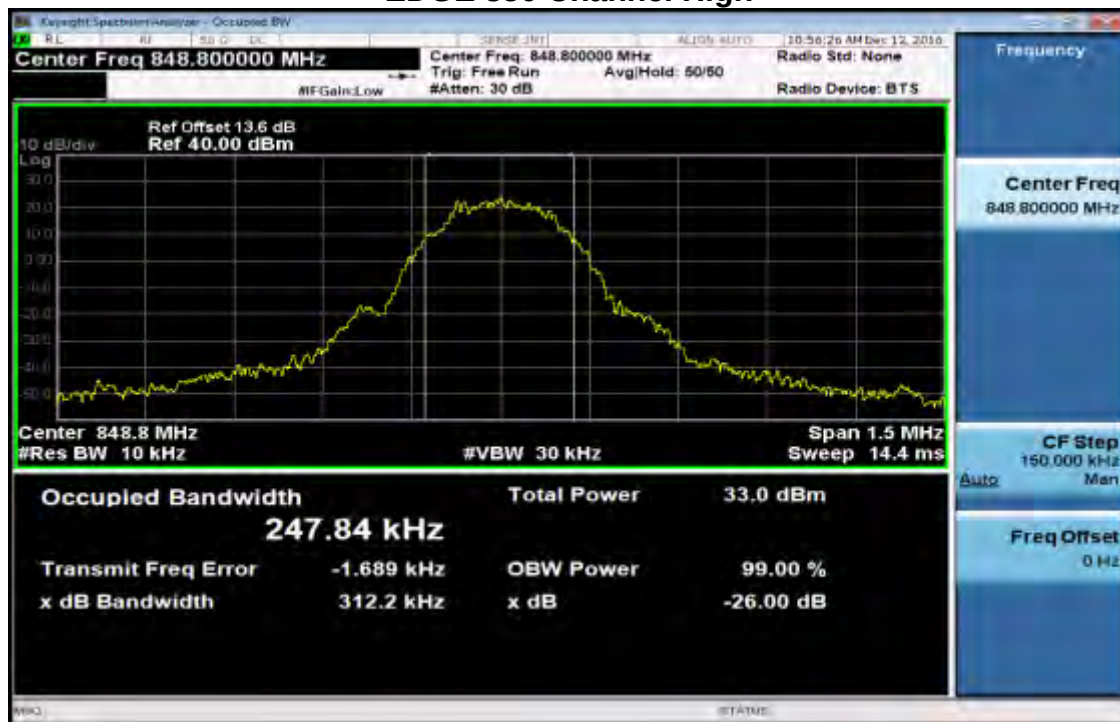
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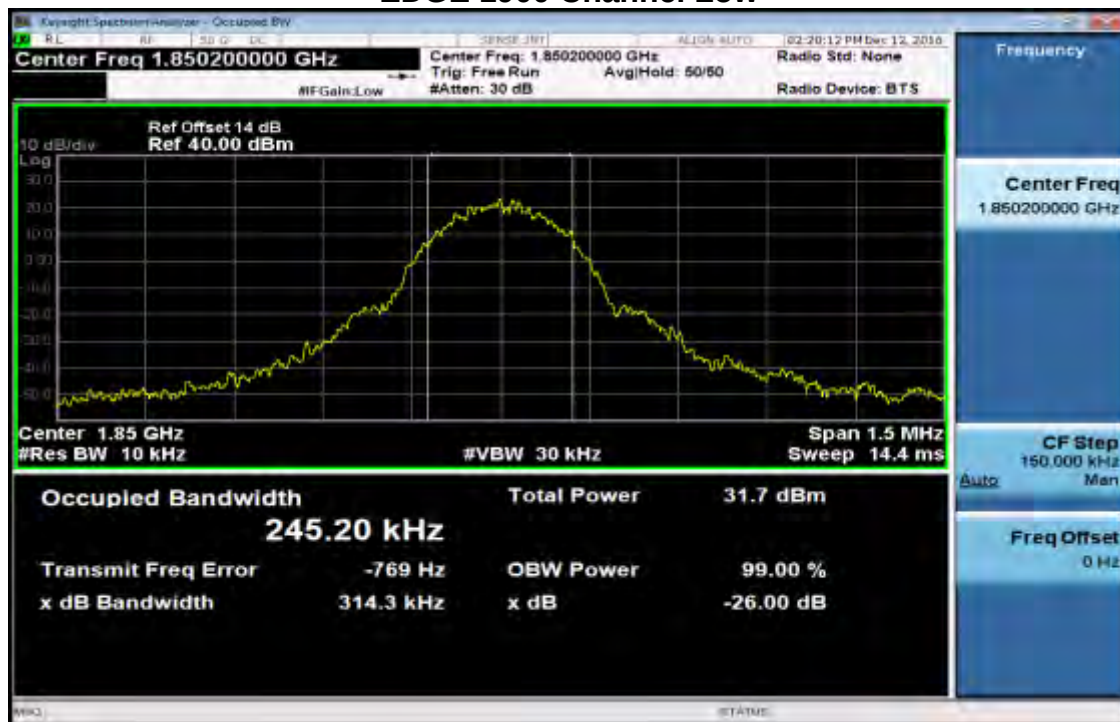
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EDGE 850 Channel High



EDGE 1900 Channel Low



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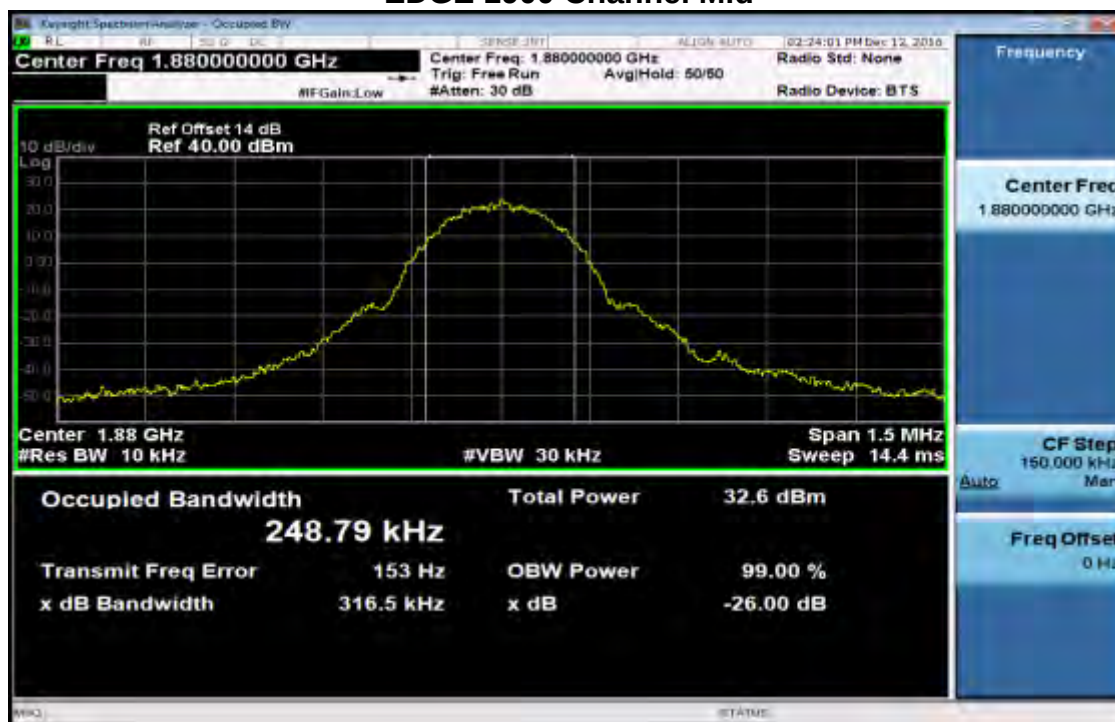
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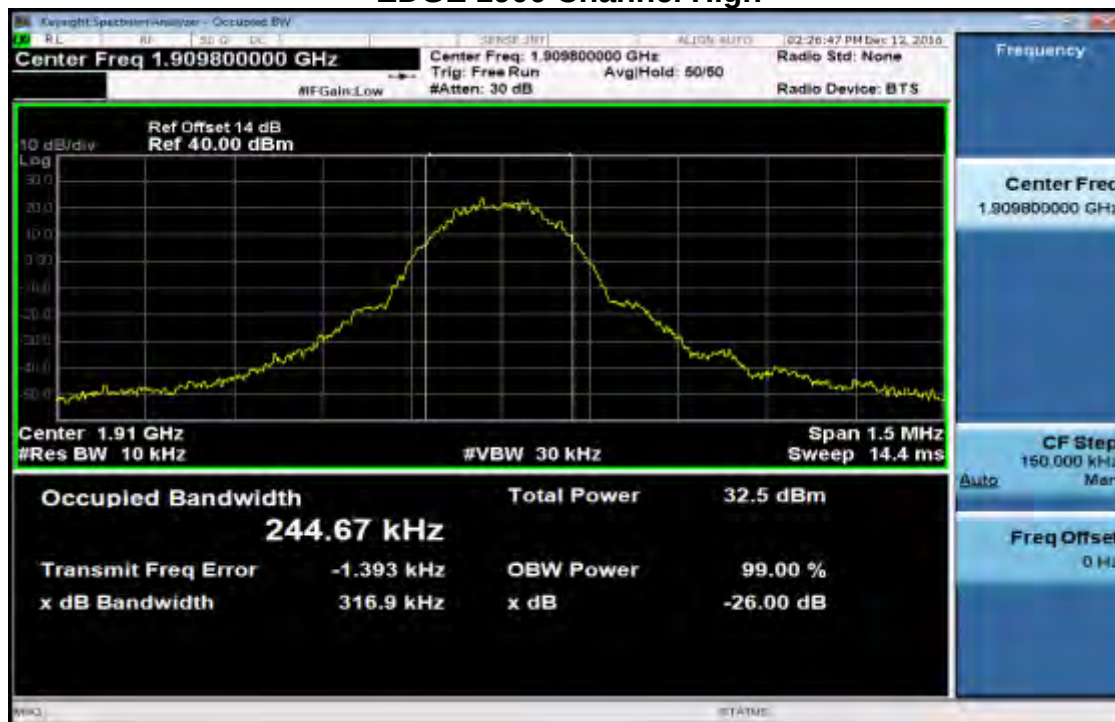
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EDGE 1900 Channel Mid



EDGE 1900 Channel High



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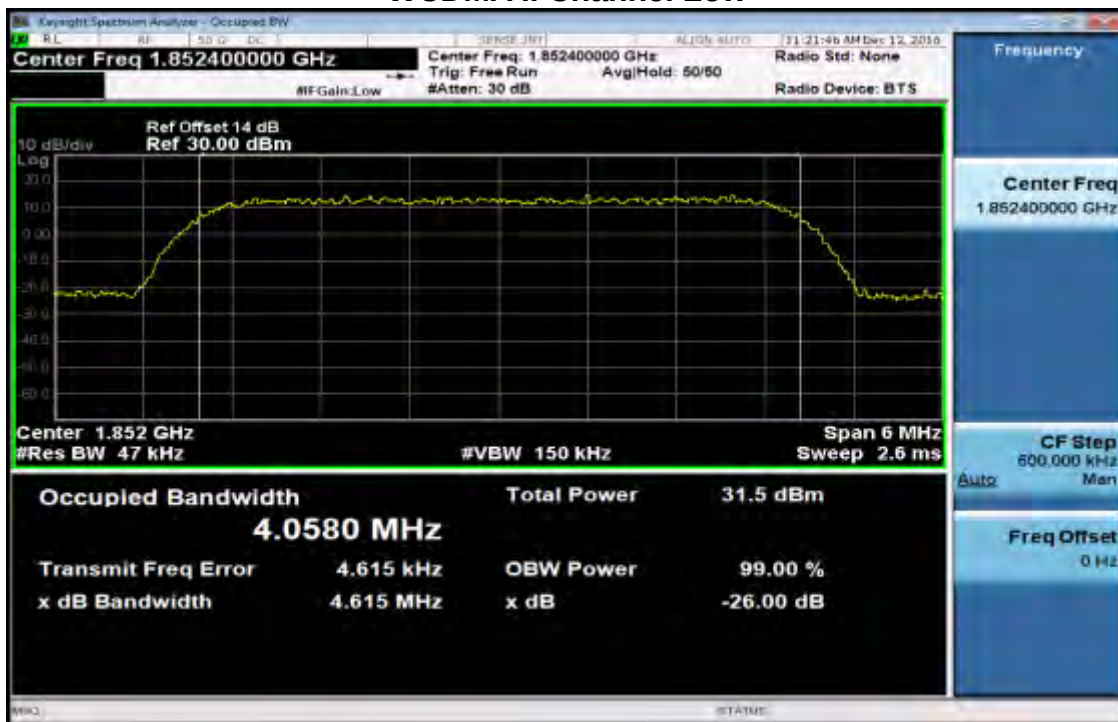
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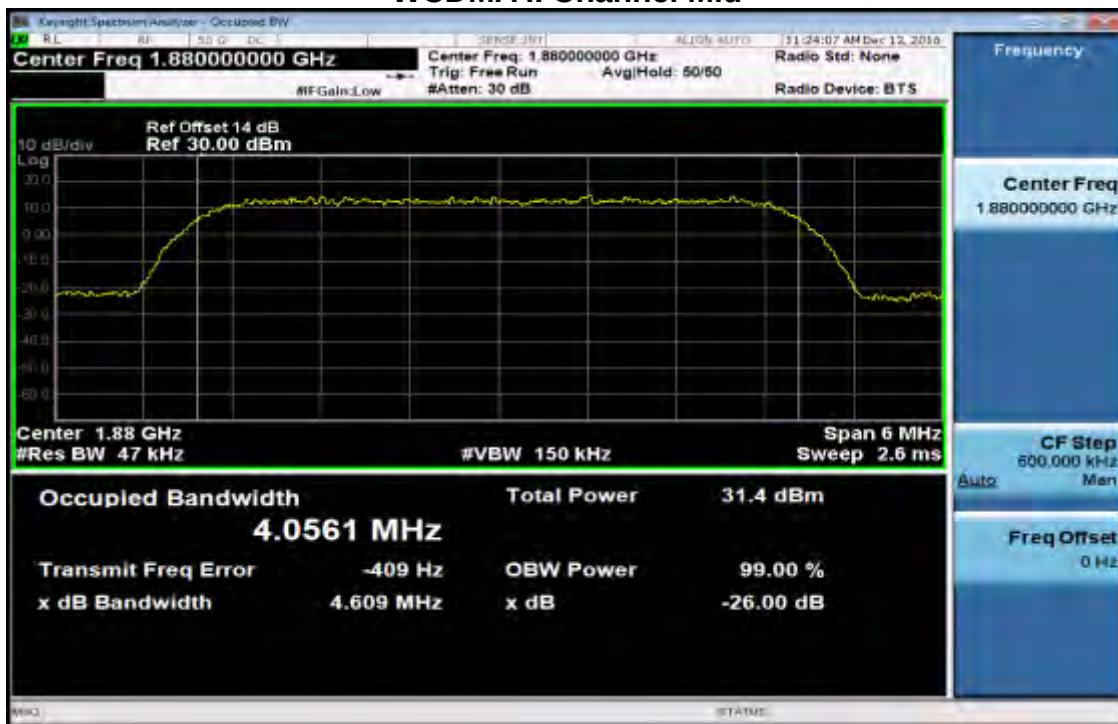
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WCDMA II Channel Low



WCDMA II Channel Mid



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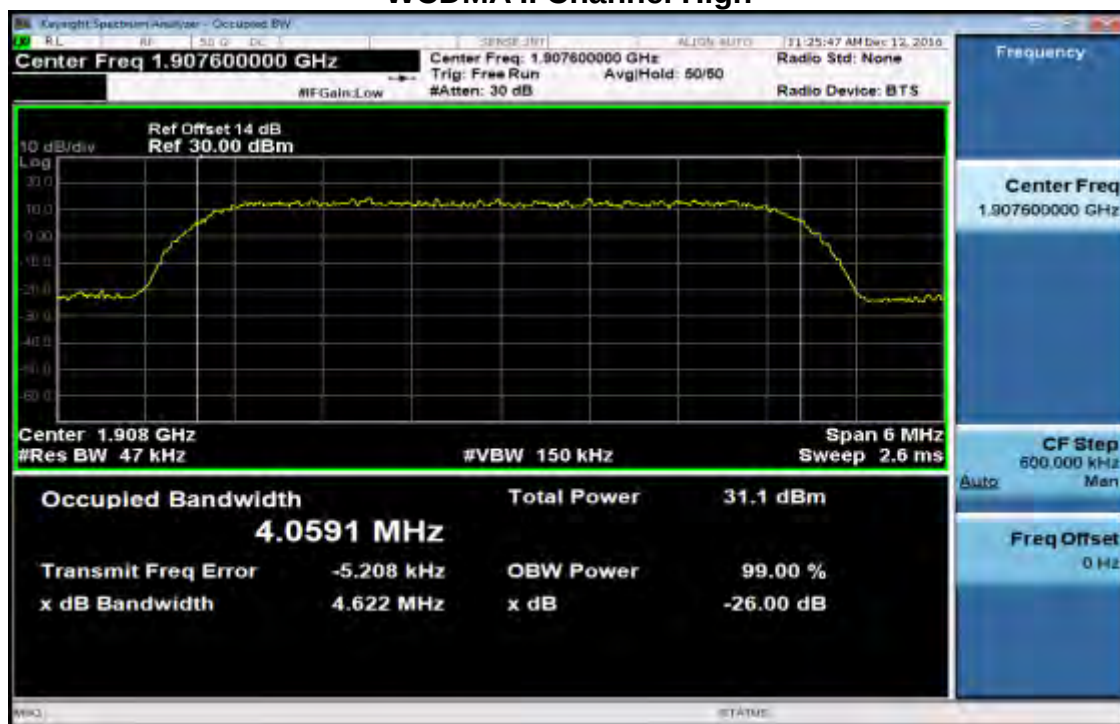
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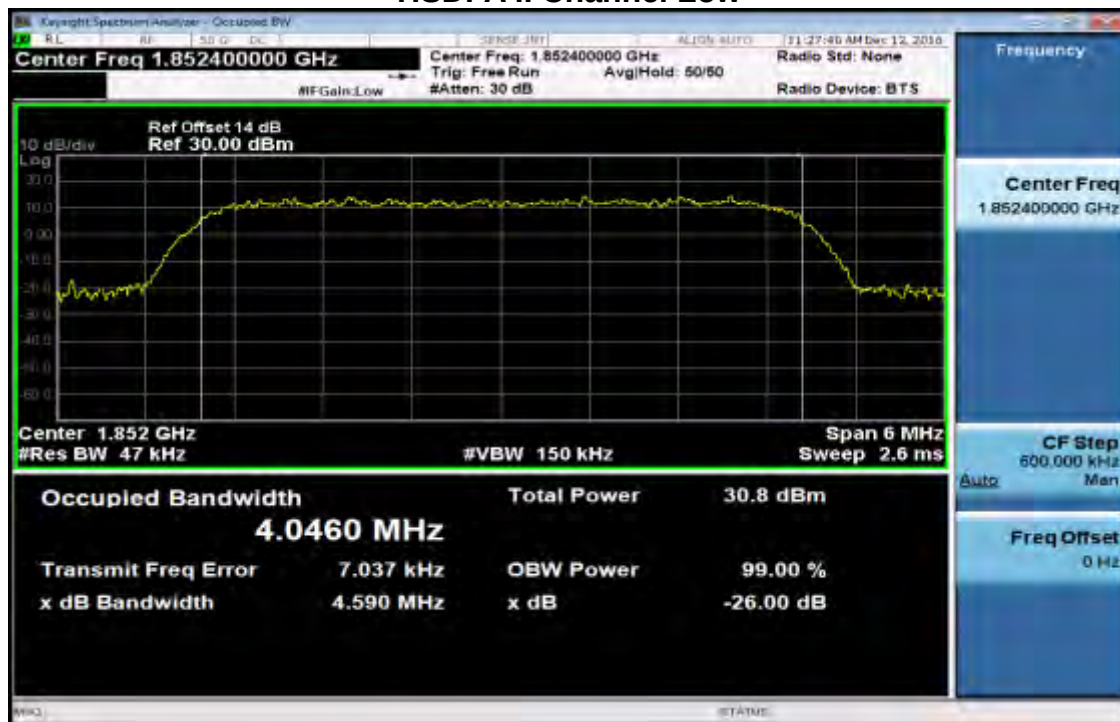
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WCDMA II Channel High



HSDPA II Channel Low



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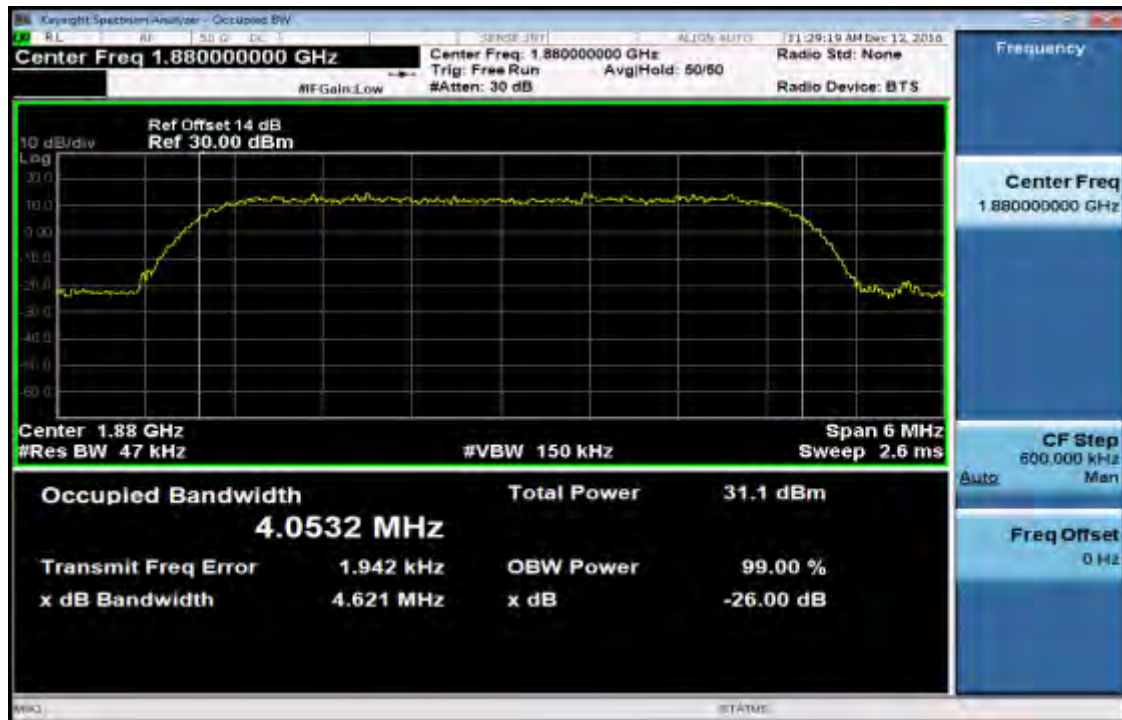
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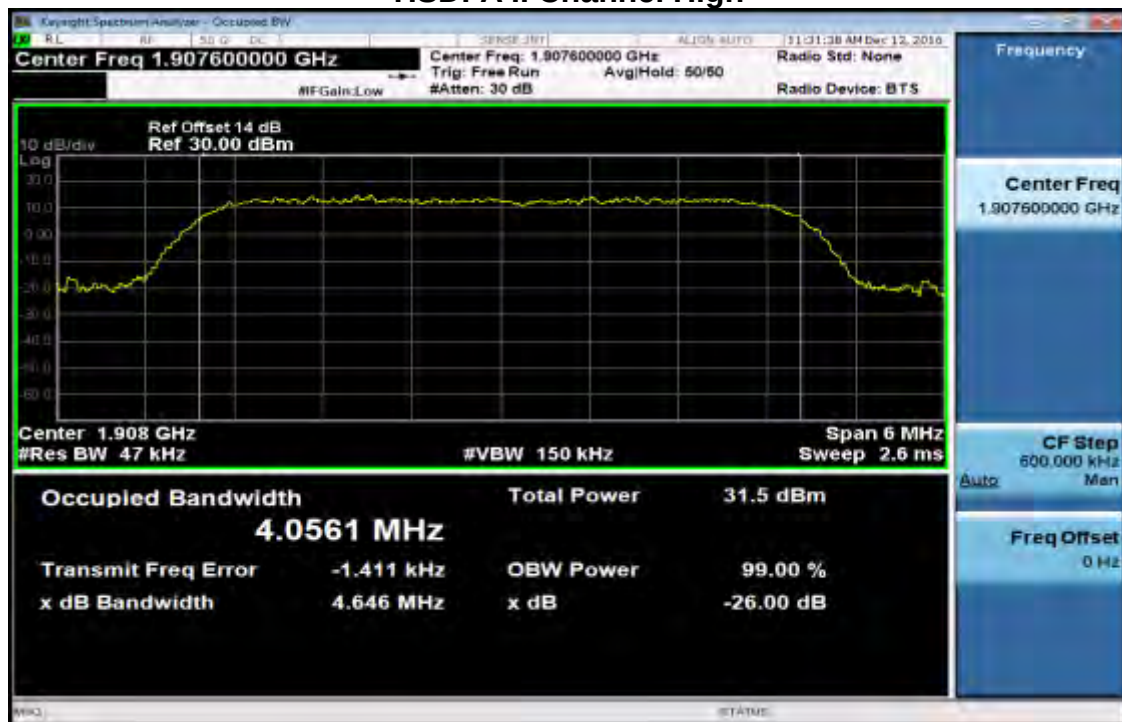
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HSDPA II Channel Mid



HSDPA II Channel High



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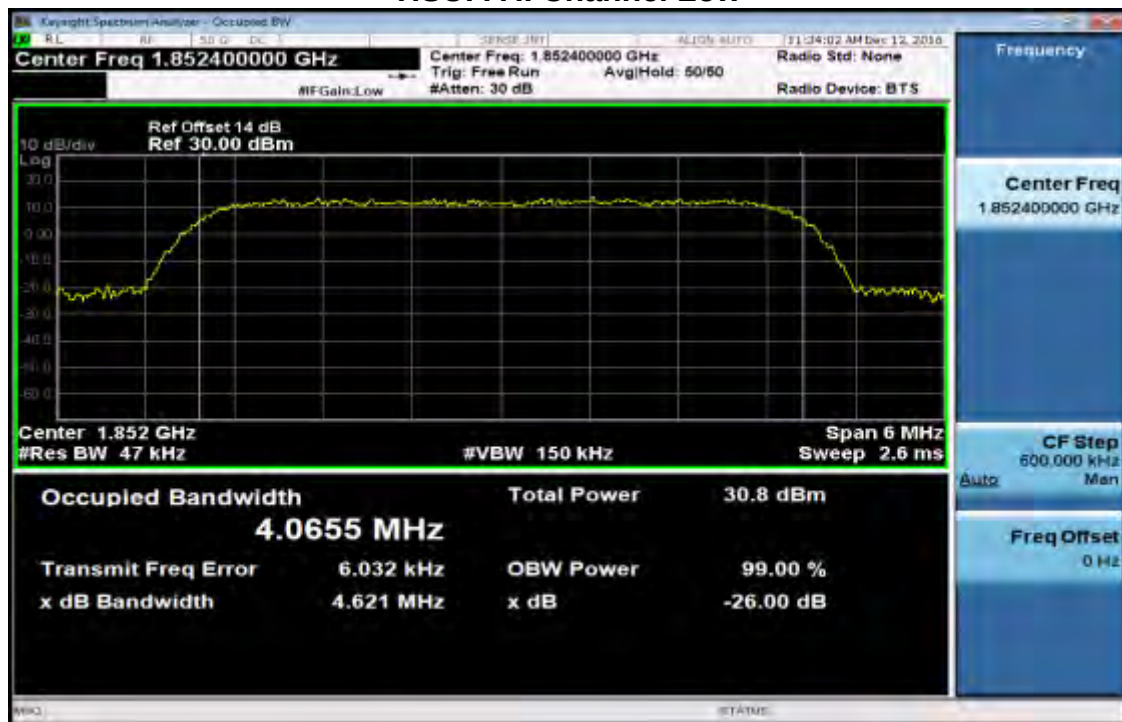
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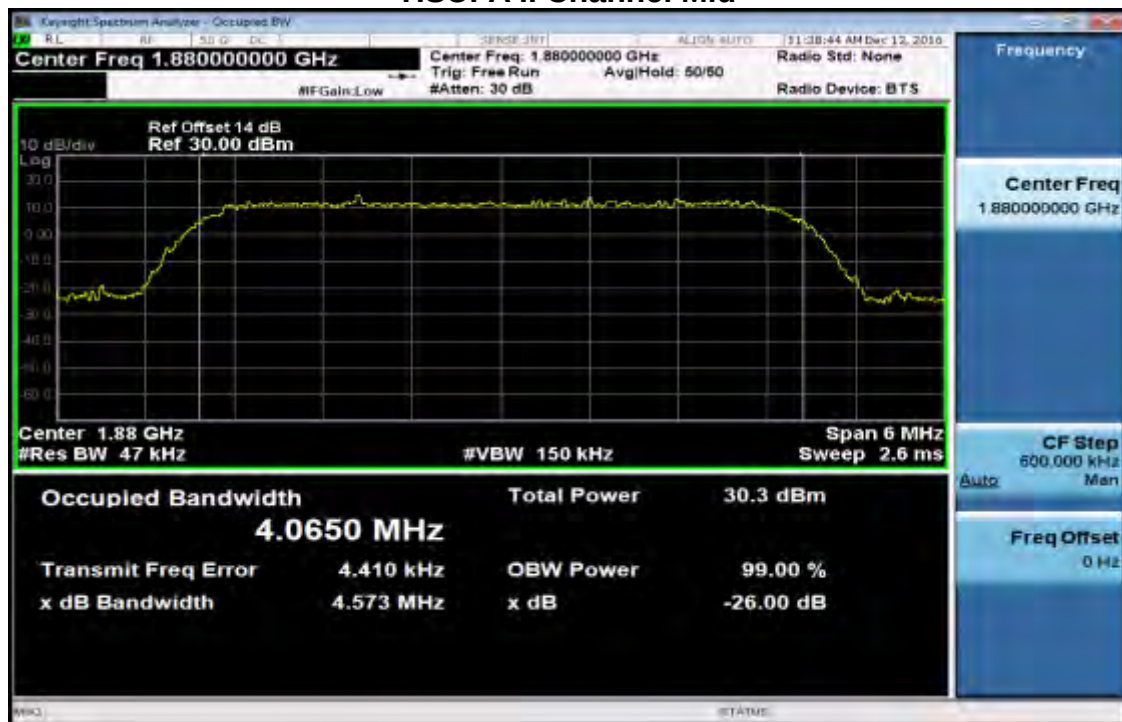
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HSUPA II Channel Low



HSUPA II Channel Mid



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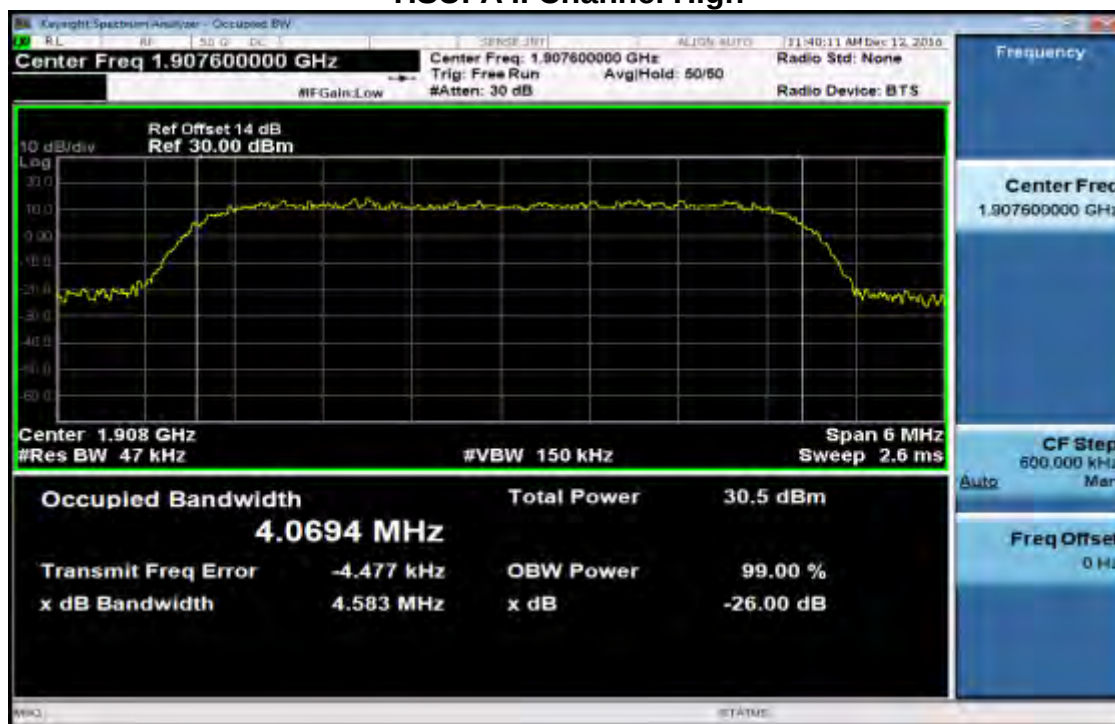
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HSUPA II Channel High



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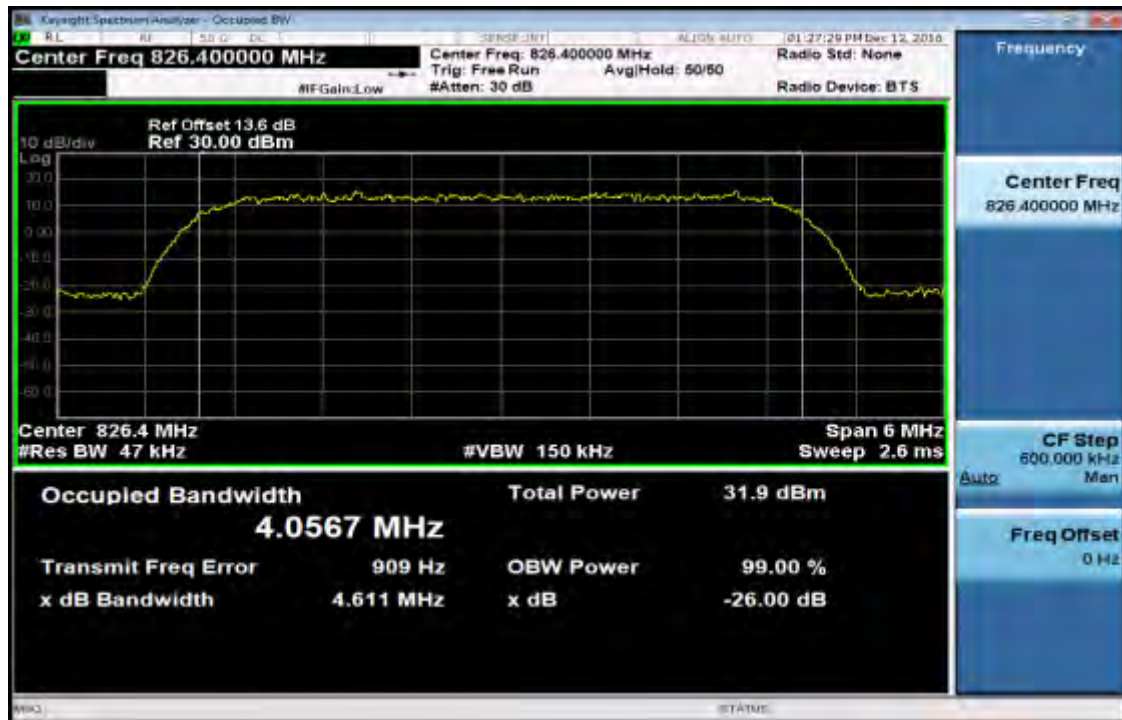
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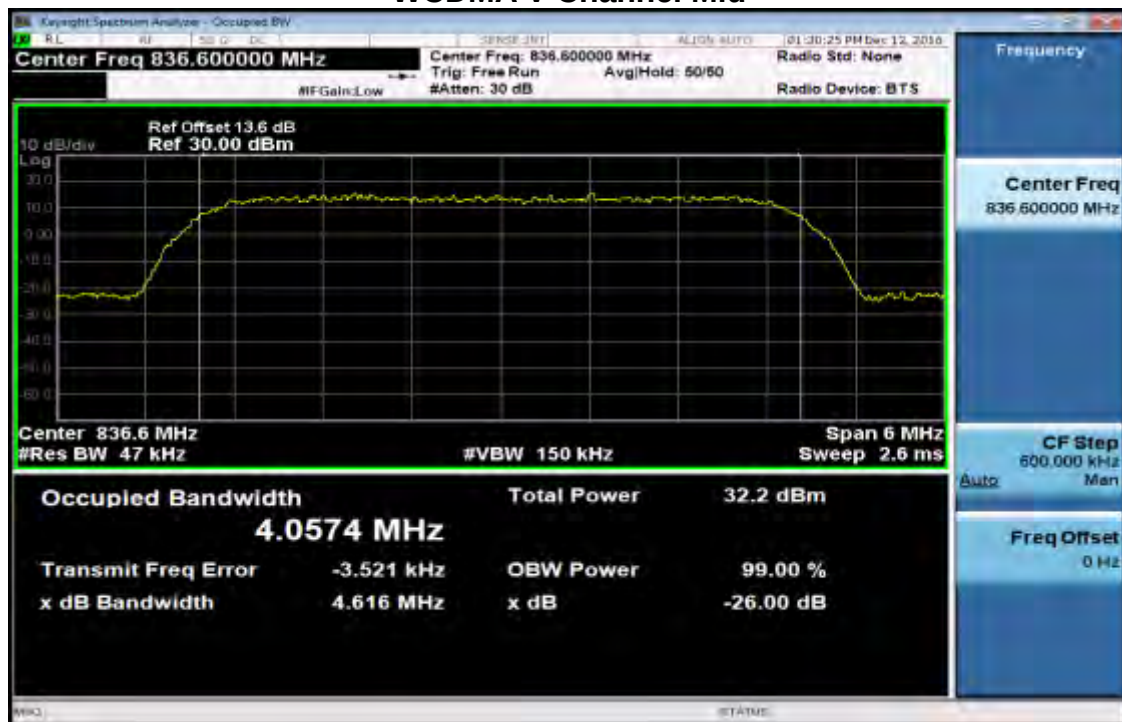
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WCDMA V Channel Low



WCDMA V Channel Mid



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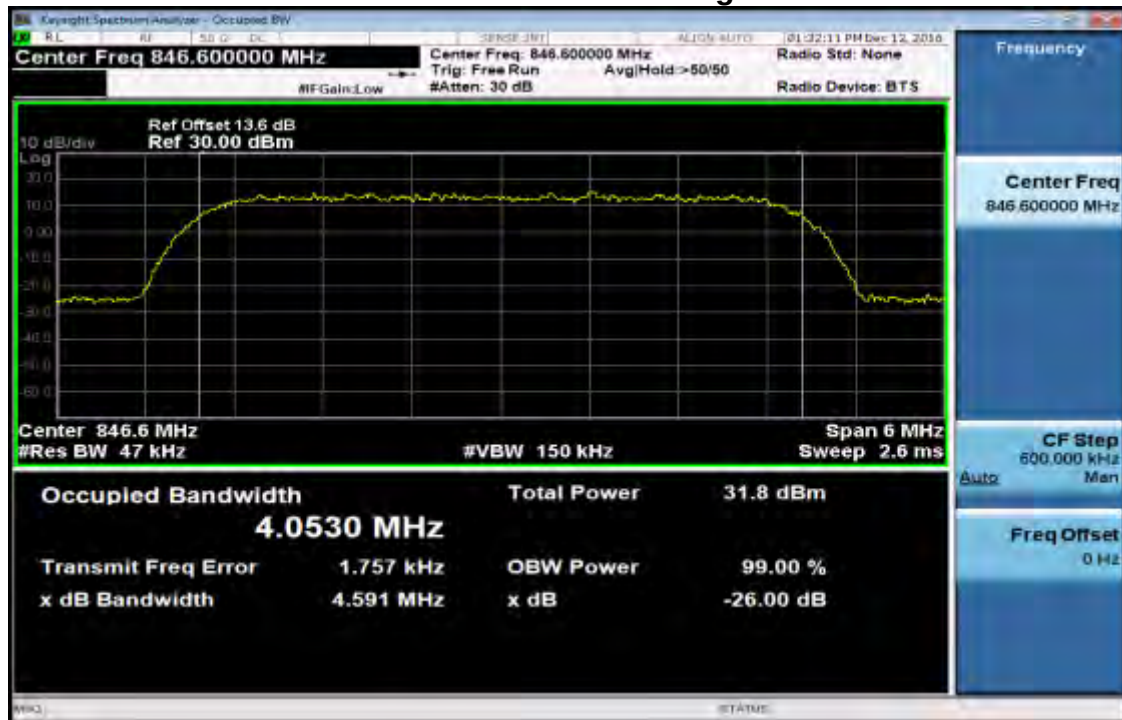
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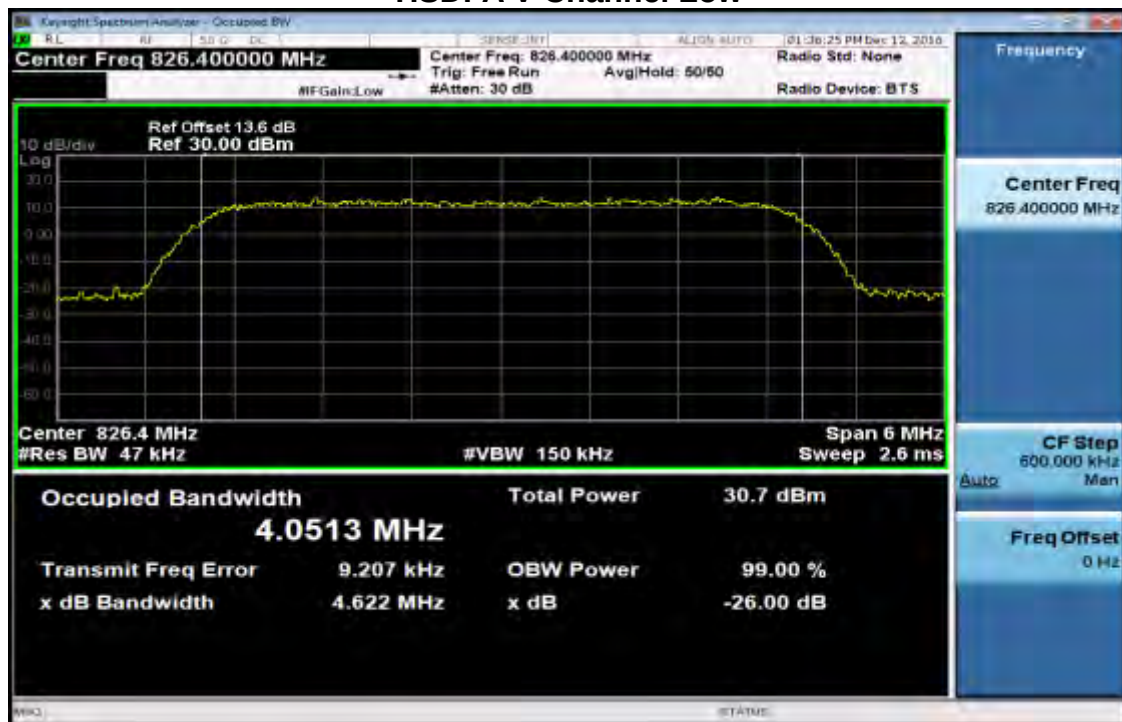
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WCDMA V Channel High



HSDPA V Channel Low



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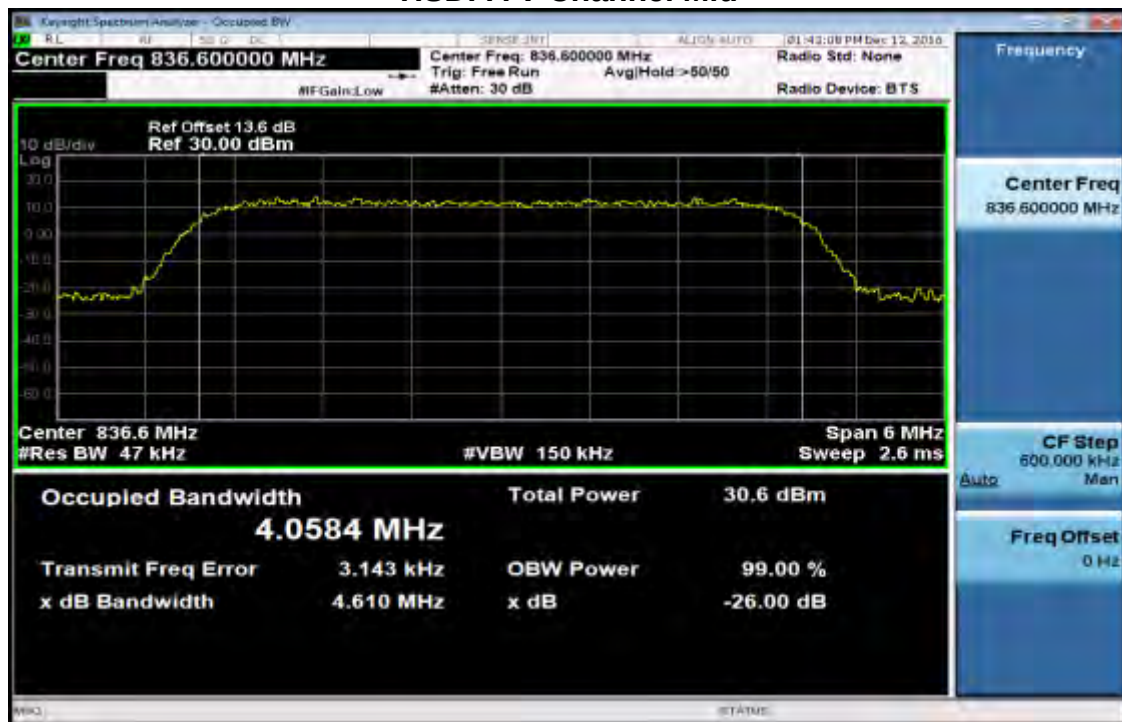
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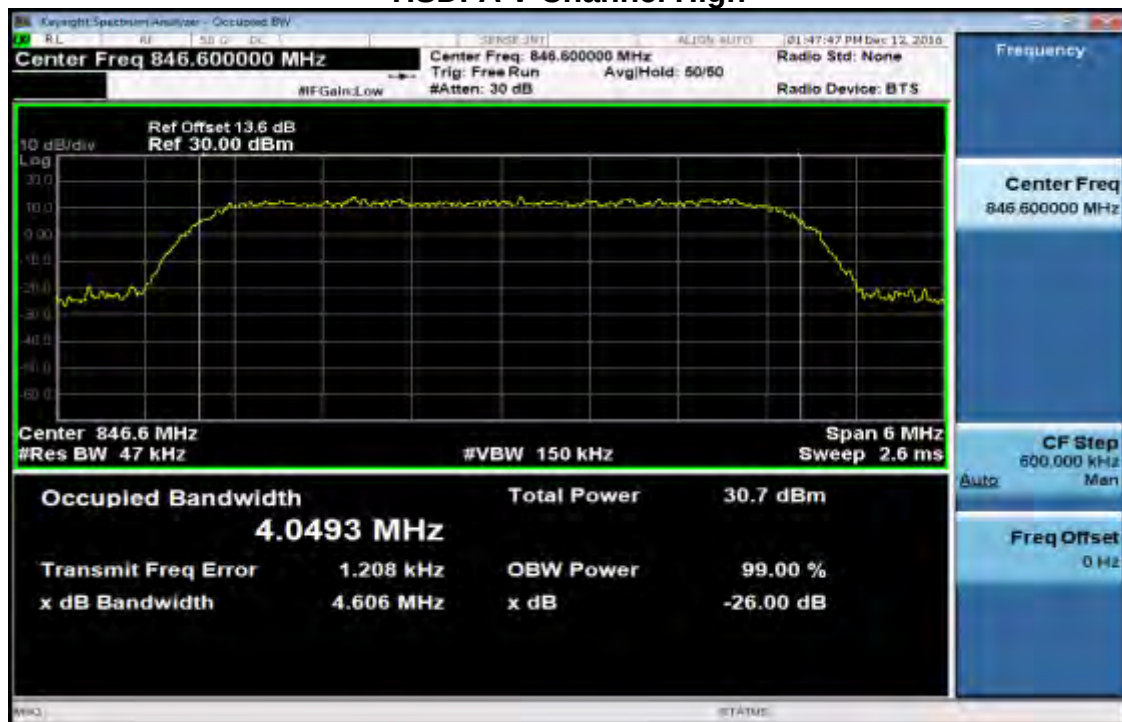
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HSDPA V Channel Mid



HSDPA V Channel High



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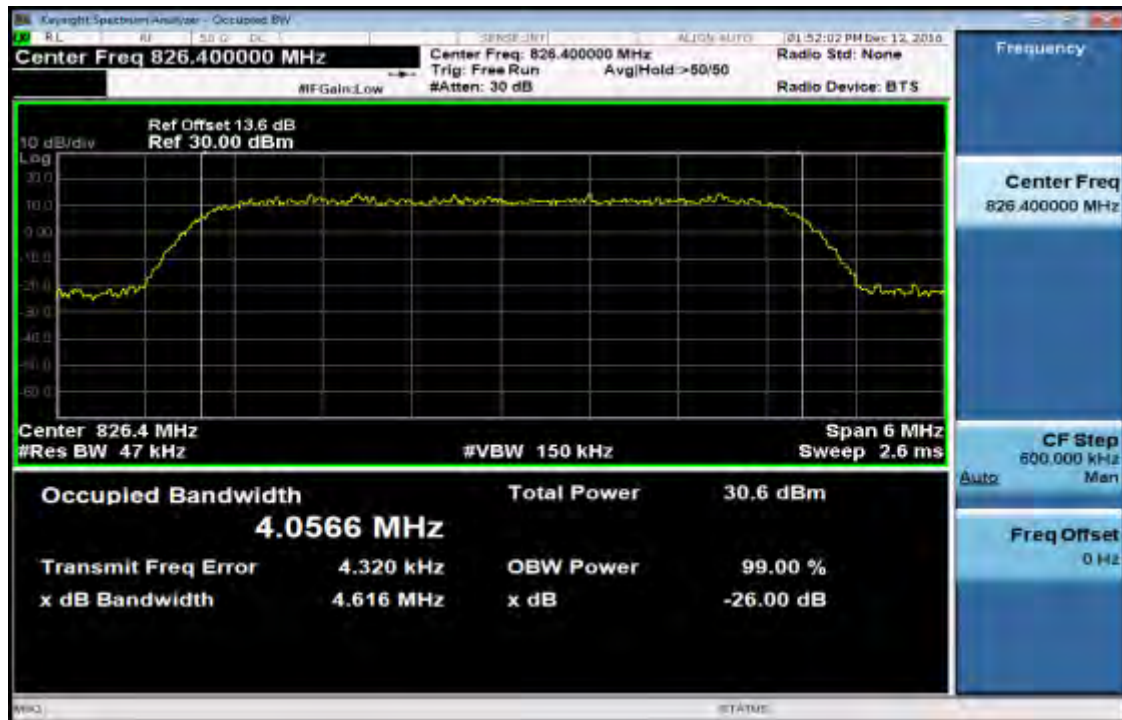
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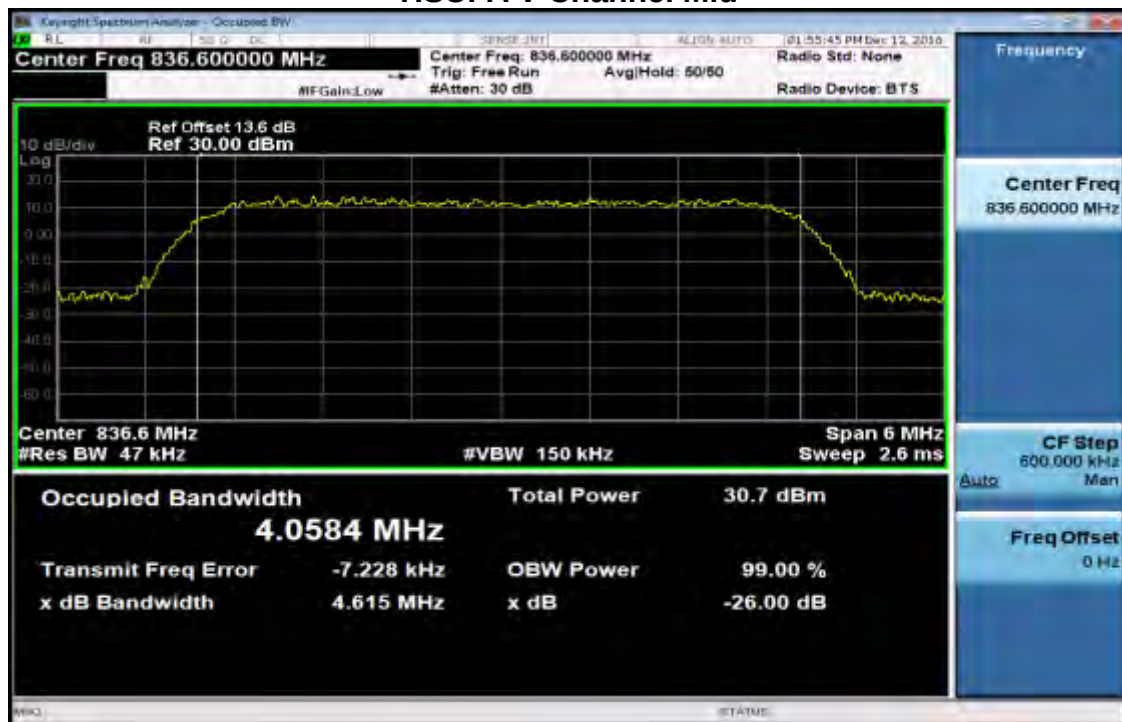
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HSUPA V Channel Low



HSUPA V Channel Mid



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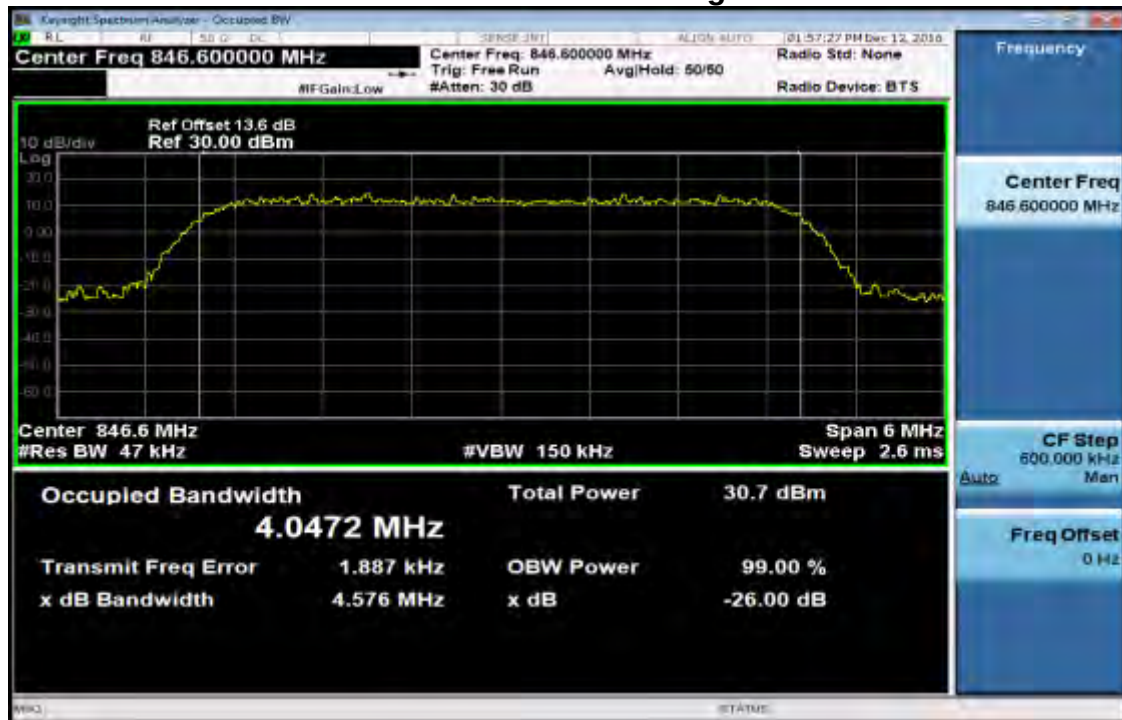
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HSUPA V Channel High



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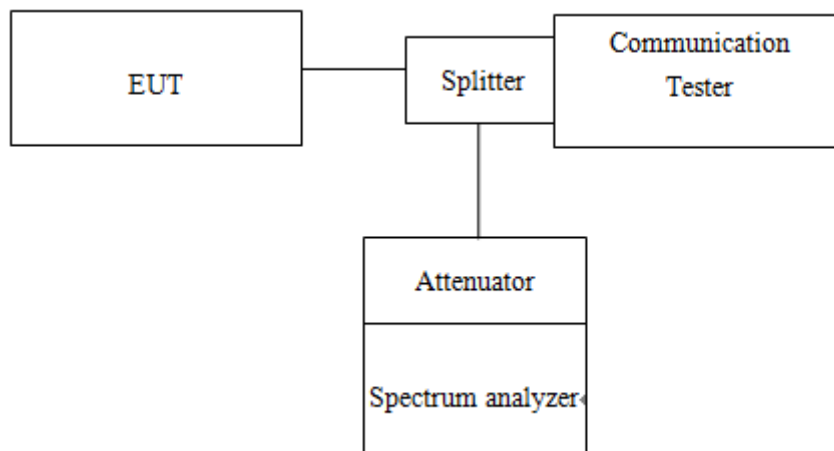
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9. OUT OF BAND EMISSION AT ANTENNA TERMINALS

9.1. Standard Applicable

FCC §22.917(a), §24.238(a), the magnitude of each spurious and harmonic emission that can be detected when the equipment is operated under the conditions specified in the instruction manual and/ or alignment procedure, shall not be less than $43 + 10 \log$ (mean output power in watts) dBc below the mean power output outside a license's frequency block (-13dBm).

9.2. Test SET-UP



9.3. Measurement Procedure

Conducted Emission

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. 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.

1. To connect Antenna Port of EUT to Spectrum.
2. Set RBW = 1MHz & VBW = 1MHz on Spectrum.
3. Allow trace to fully stabilize
4. Repeat above procedures until all default test channel measured were complete.

Band Edge

1. To connect Antenna Port of EUT to Spectrum.
2. The band edge of low and high channels for the highest RF powers was measured. Setting $RBW \geq 1\% EBW$.
3. Allow trace to fully stabilize
4. Repeat above procedures until all default test channel measured were complete.

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9.4. Measurement Equipment Used

SGS Conducted Room					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Power Meter	Anritsu	ML2495A	1005007	12/15/2015	12/14/2016
Power Sensor	Anritsu	MA2411B	917032	12/15/2015	12/14/2016
EXA Spectrum Analyzer	Agilent	N9030A	MY53120760	02/26/2016	02/25/2017
DC Block	Mini-Circuits	BLK-18-S+	1	01/02/2016	01/01/2017
Coaxial Cable	HUBER+SUHNER	SUCOFLEX 102	23670/2	01/02/2016	01/01/2017
Attenuator	Mini-Circuit	BW-S10W2+	2	01/02/2016	01/01/2017
Splitter	Agilent	11636B	N/A	01/02/2016	01/01/2017
DC Power Supply	Agilent	E3640A	MY52410006	11/21/2016	11/20/2017
Temperature Chamber	TERCHY	MHG-120LF	911009	05/17/2016	05/16/2017
Radio Communication Analyzer	R&S	CMU200	102189	02/11/2016	02/10/2017
Radio Communication Analyzer	Anritsu	MT8820C	6200995019	09/24/2016	09/23/2017

9.5. Measurement Result:

Refer to next pages.

NOTE: The occurrence of the spike on the conducted emission is the signal of the fundamental emission.

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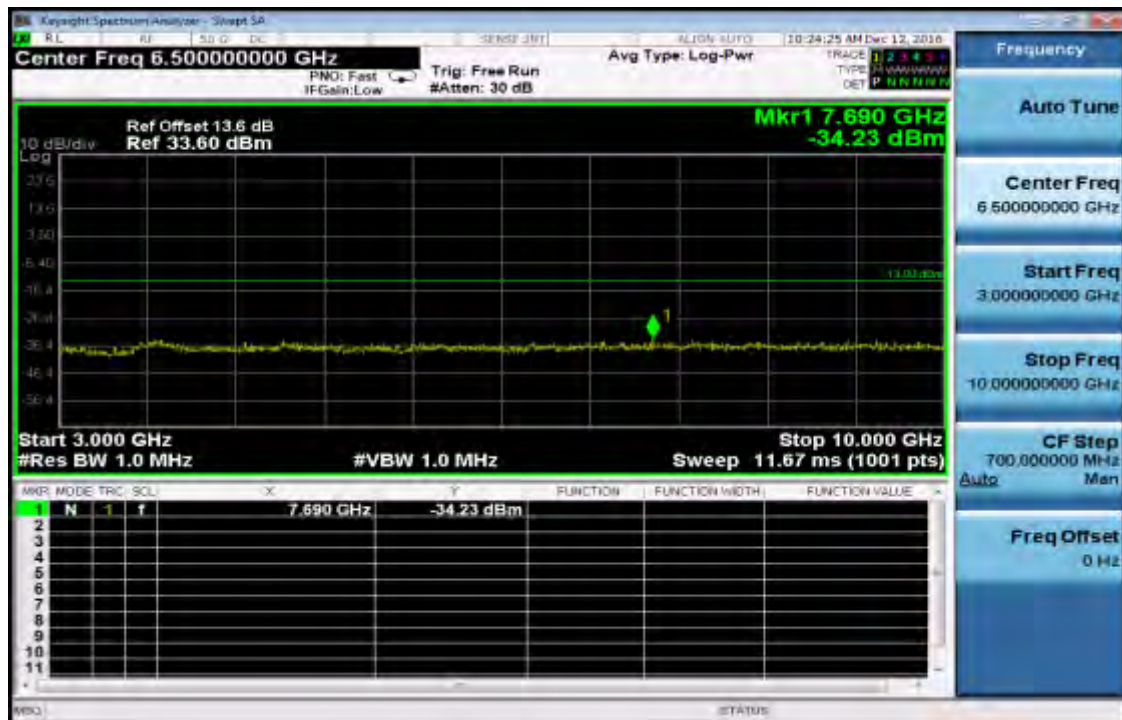
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Out of Band emission at antenna terminals – GPRS 850 Channel Lowest



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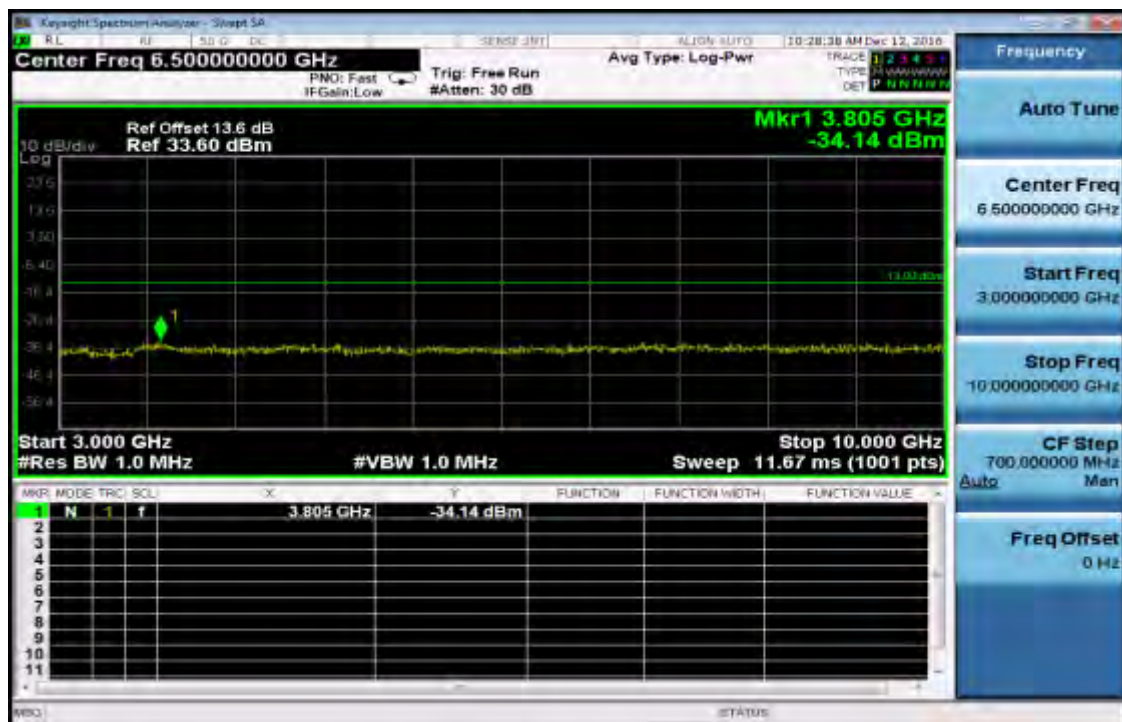
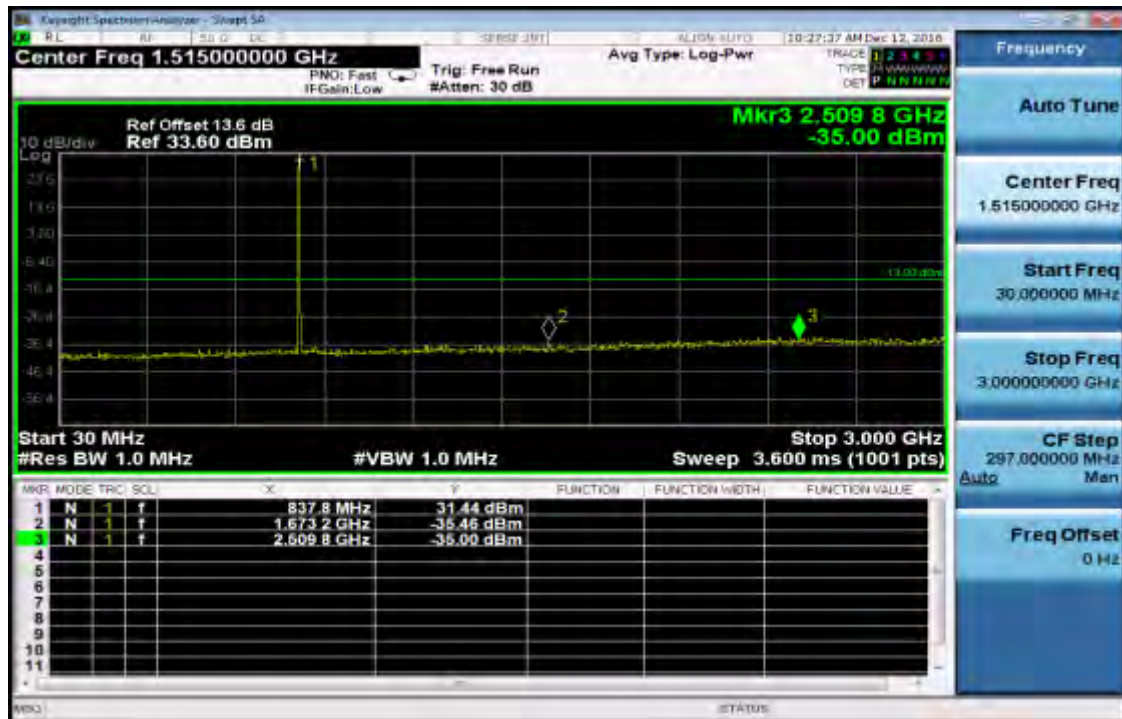
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Out of Band emission at antenna terminals – GPRS 850 Channel Mid



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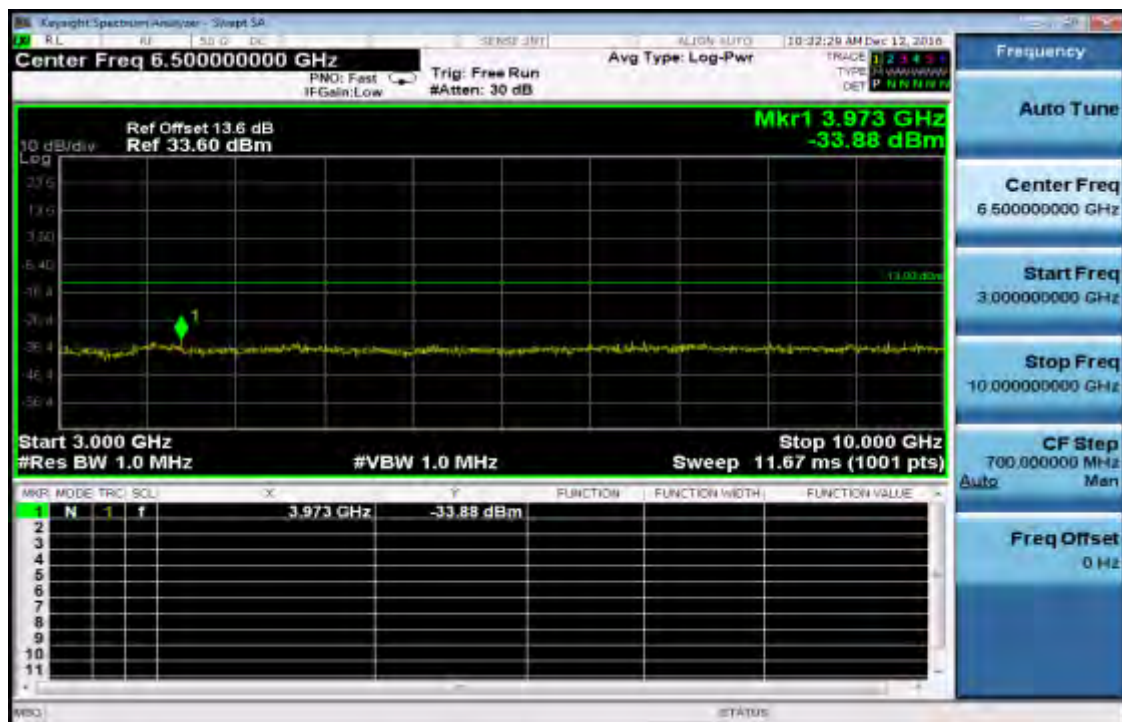
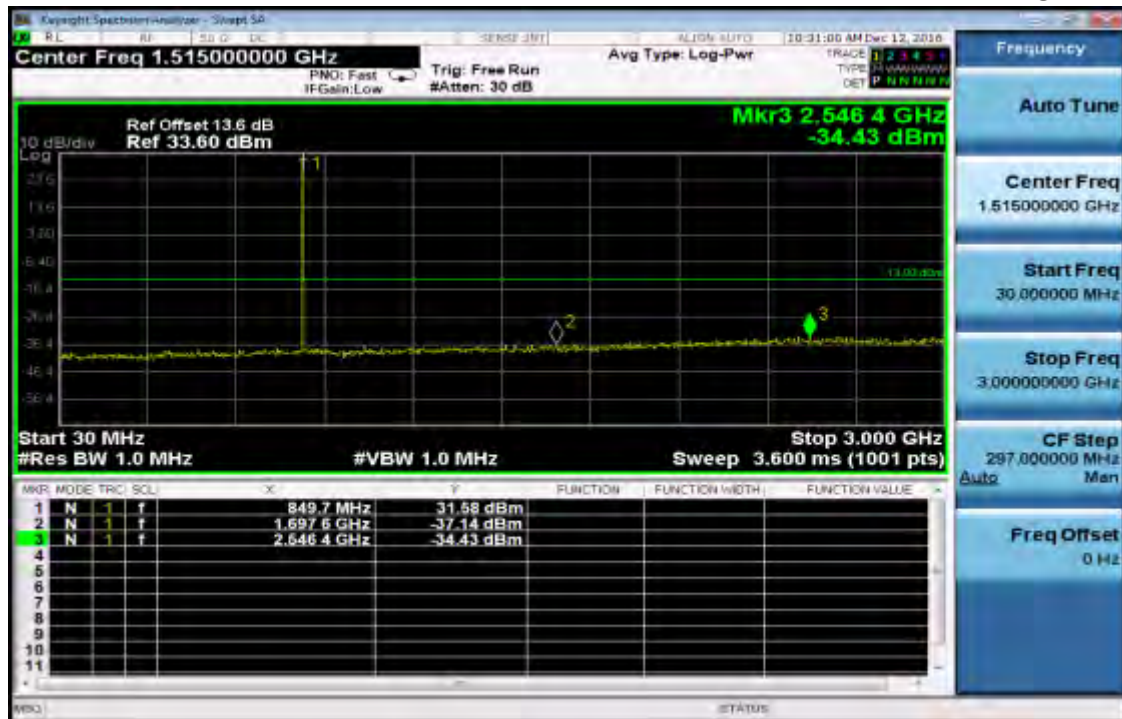
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Out of Band emission at antenna terminals – GPRS 850 Channel Highest



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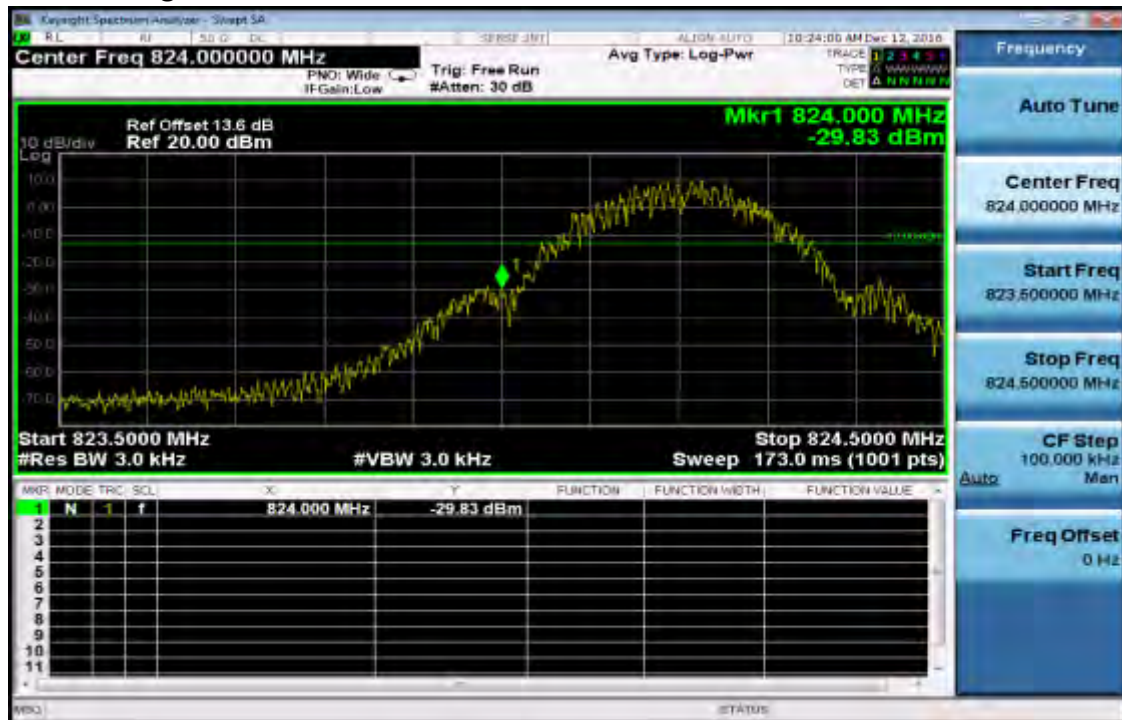
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Band edge emission at antenna terminals – GPRS 850 Channel Lowest



Band edge emission at antenna terminals – GPRS 850 Channel Highest



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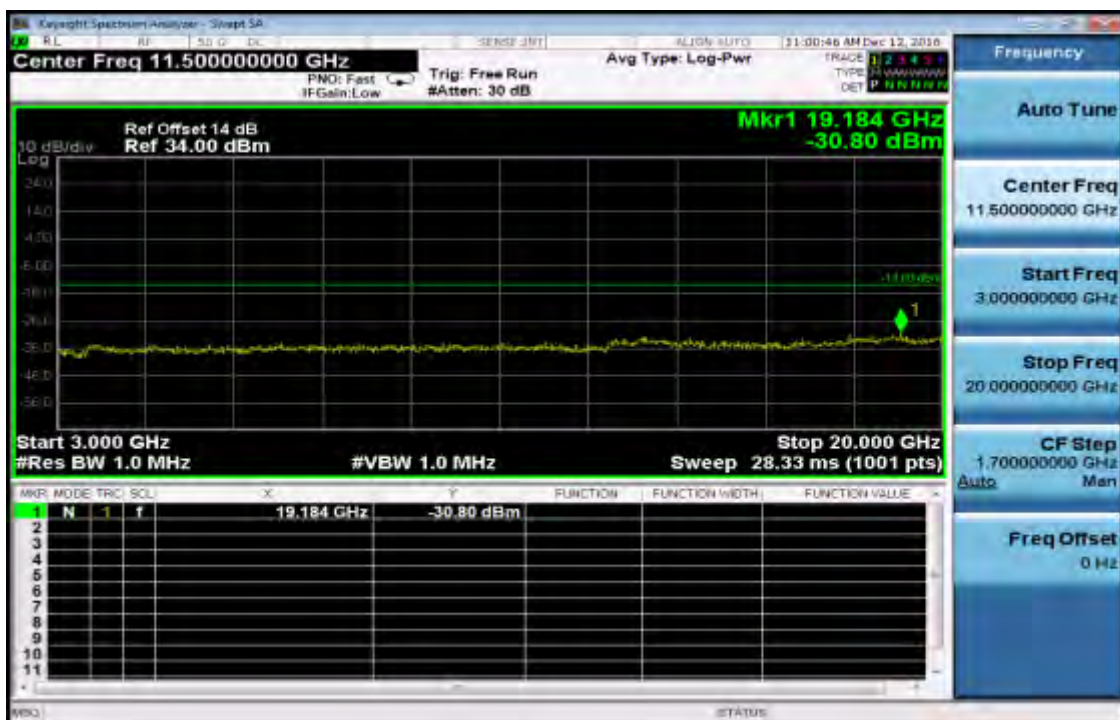
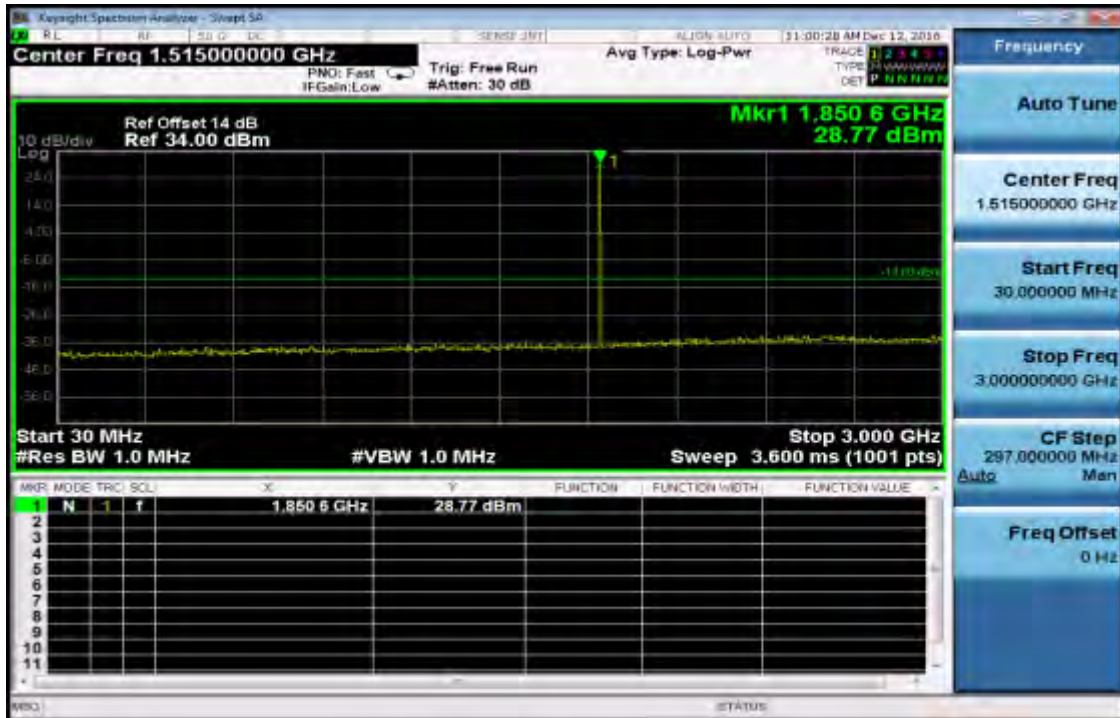
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Out of Band emission at antenna terminals – GPRS 1900 Channel Lowest



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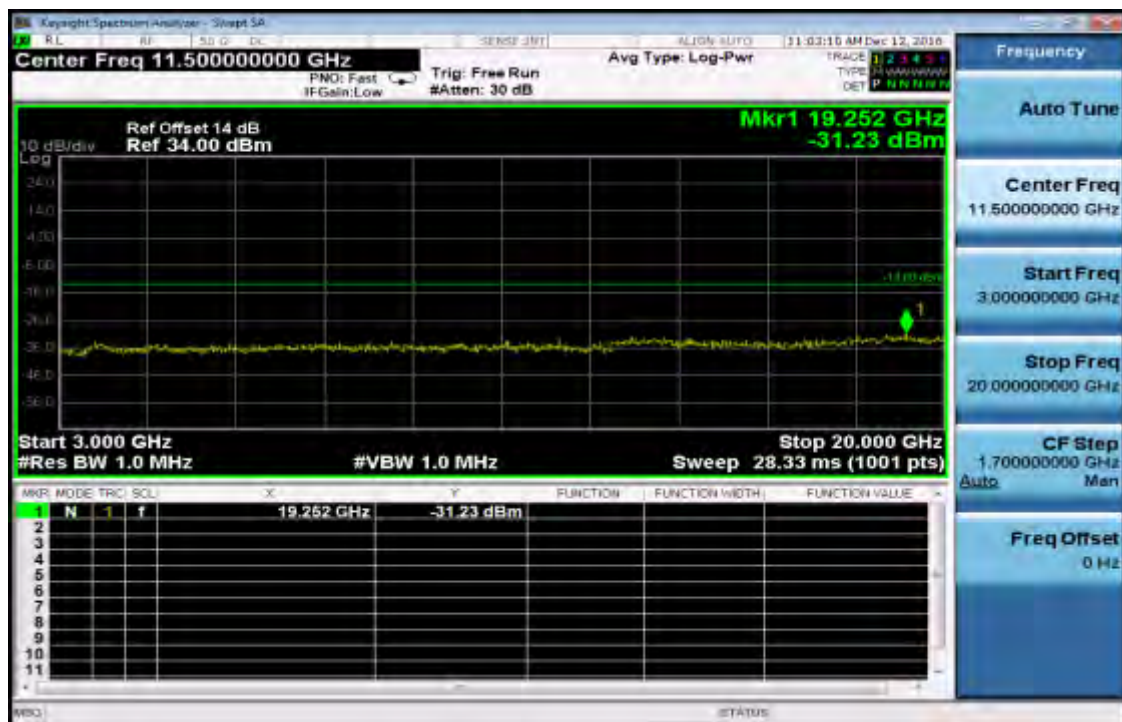
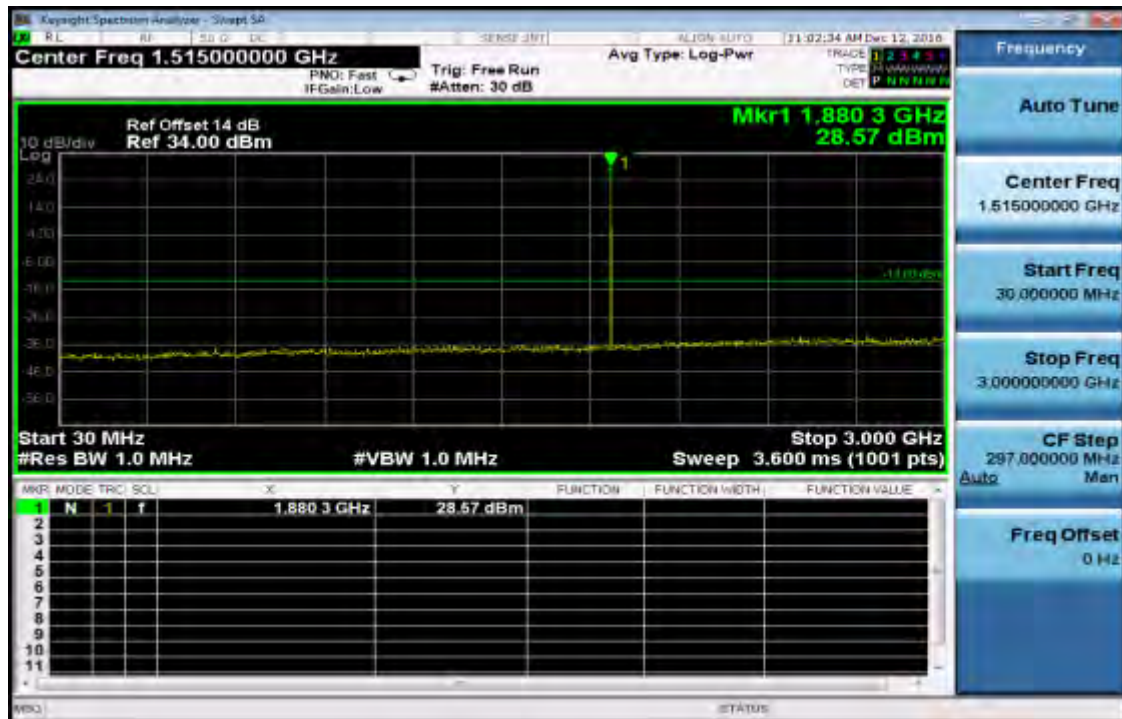
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Out of Band emission at antenna terminals – GPRS 1900 Channel Mid



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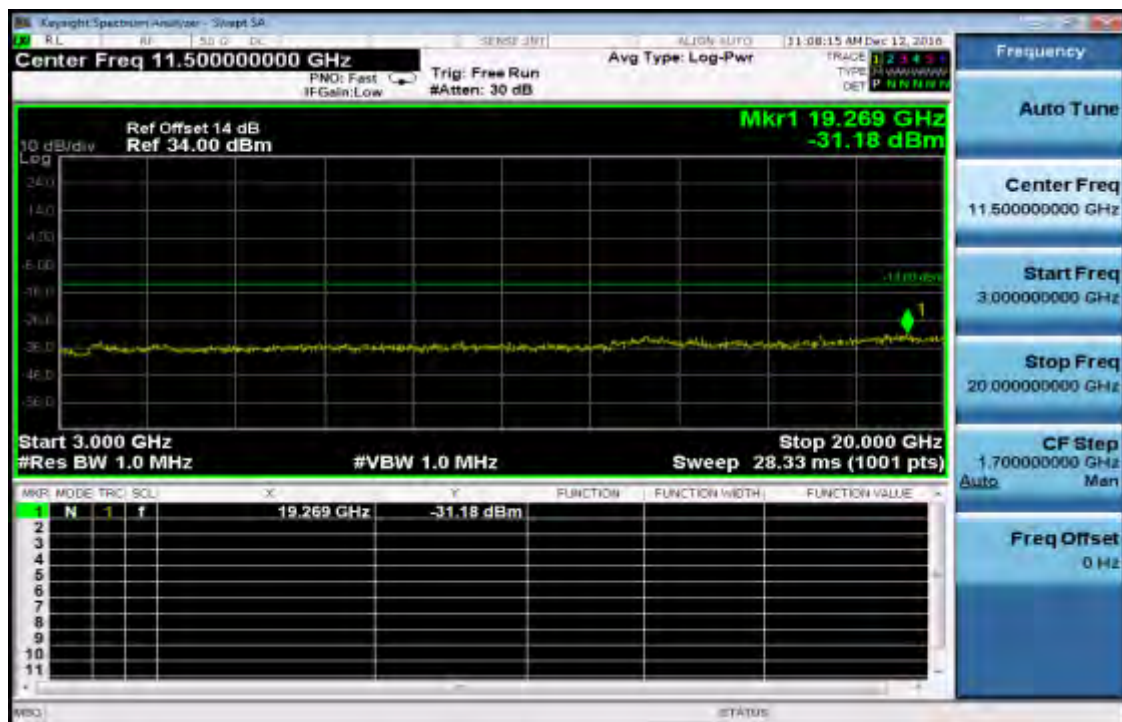
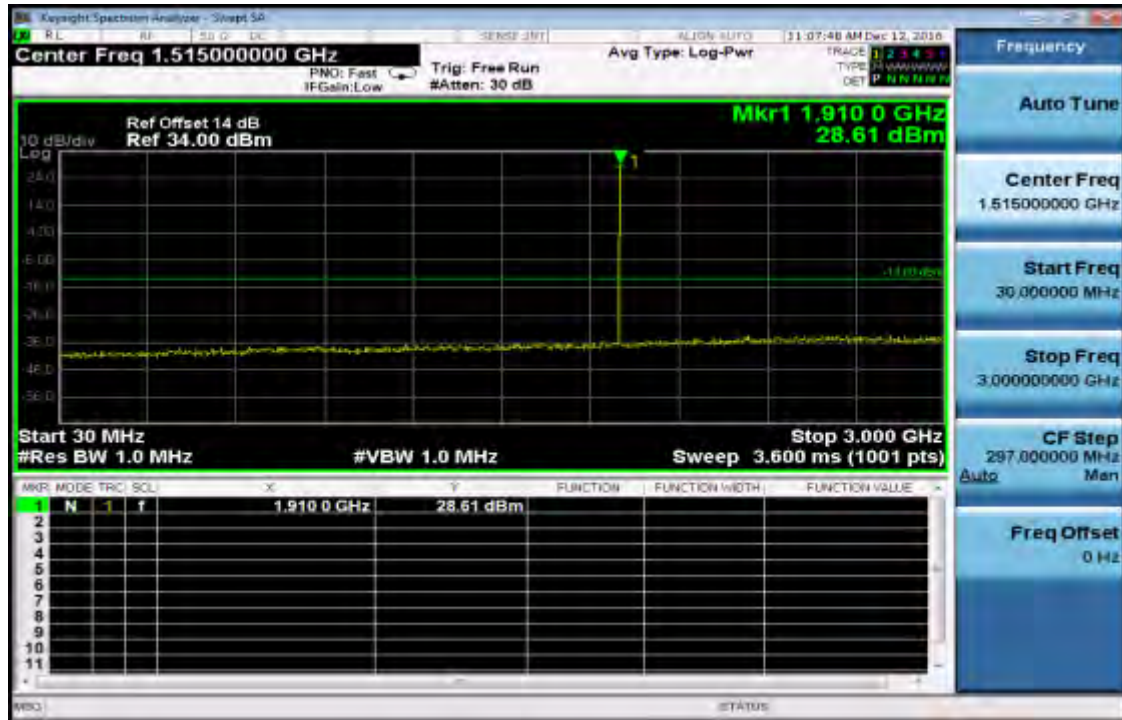
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Out of Band emission at antenna terminals – GPRS 1900 Channel Highest



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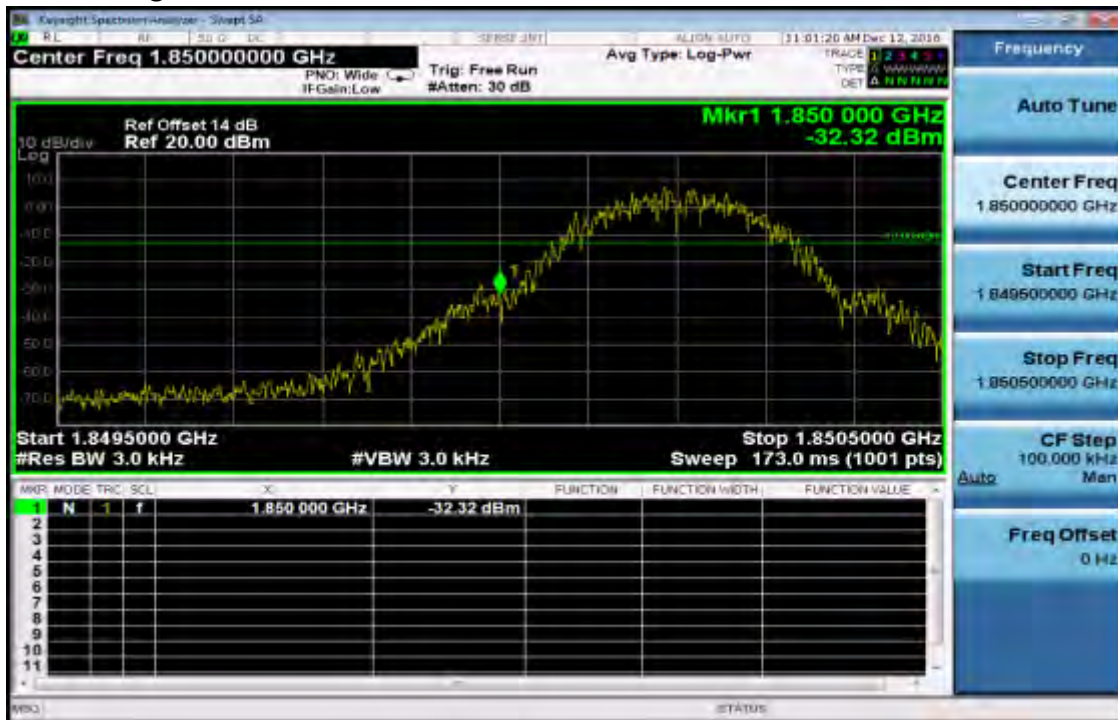
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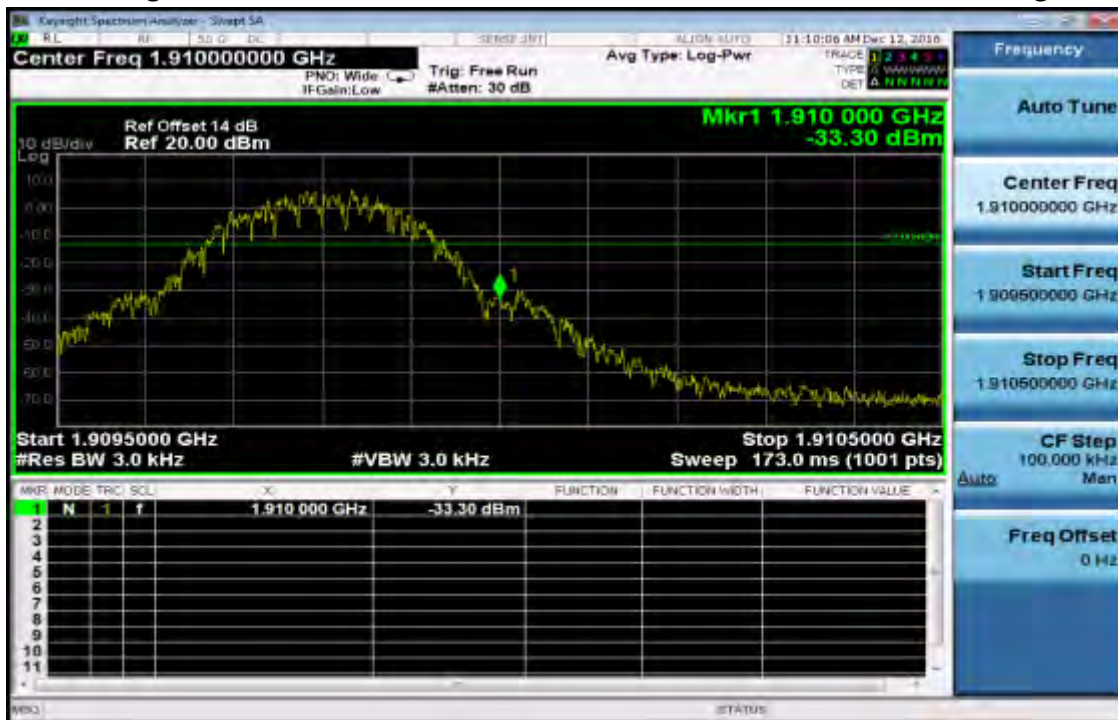
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Band edge emission at antenna terminals – GPRS 1900 Channel Lowest



Band edge emission at antenna terminals – GPRS 1900 Channel Highest



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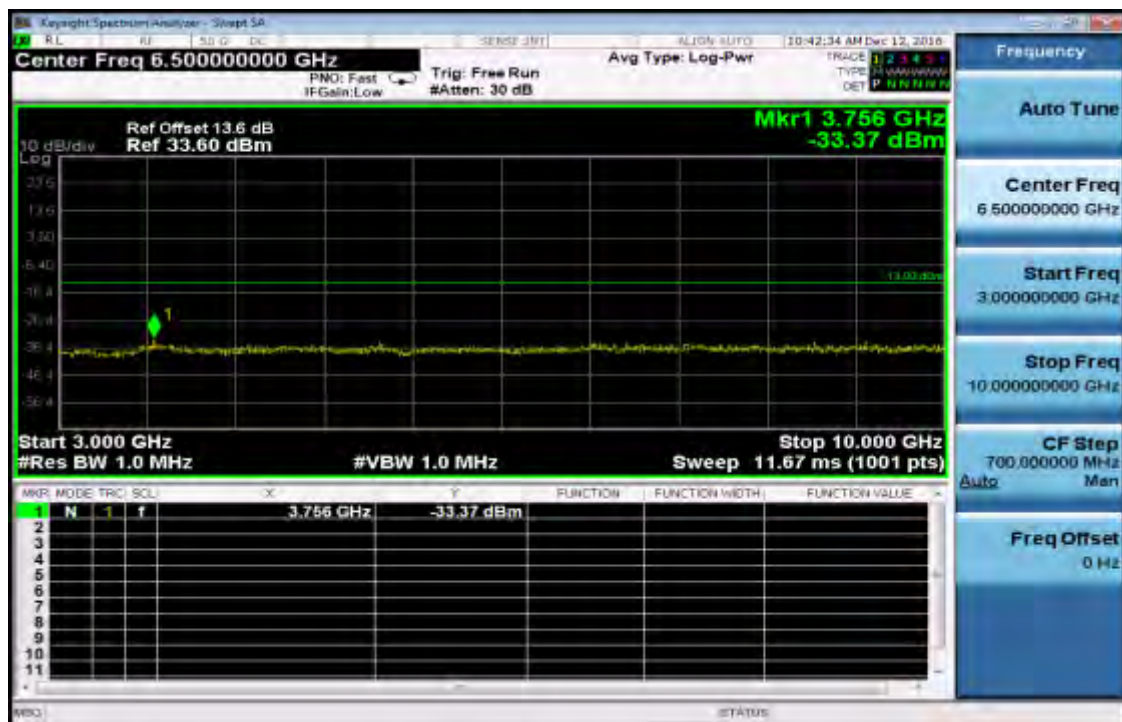
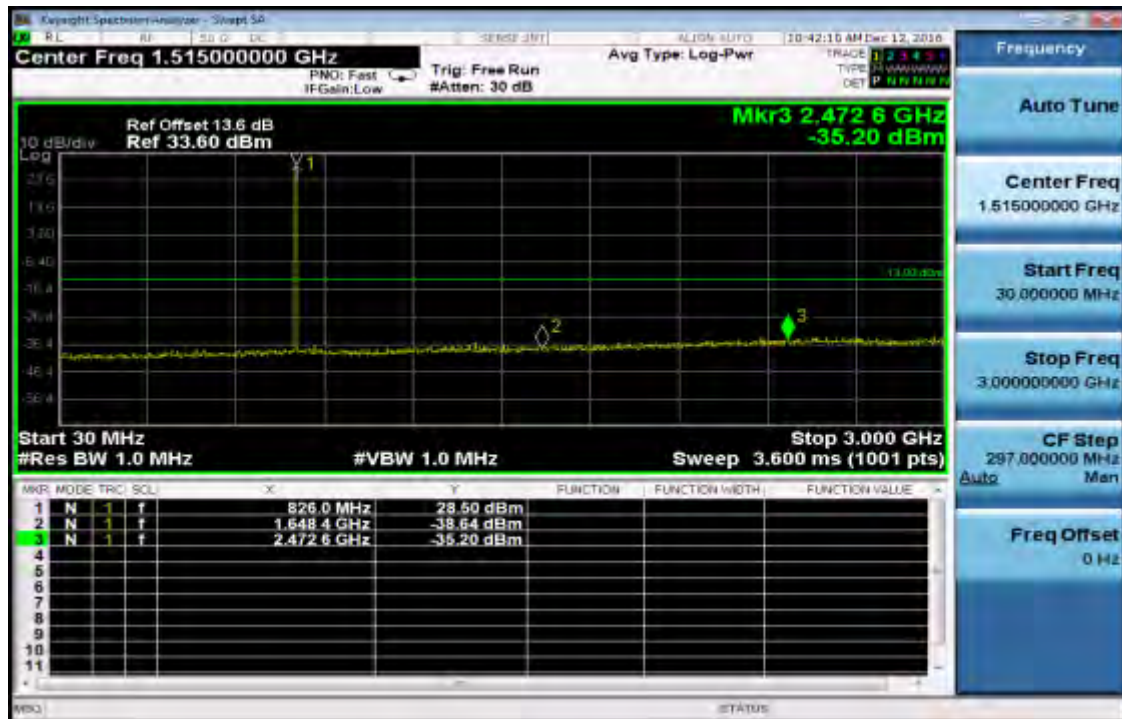
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Out of Band emission at antenna terminals – EDGE 850 Channel Lowest



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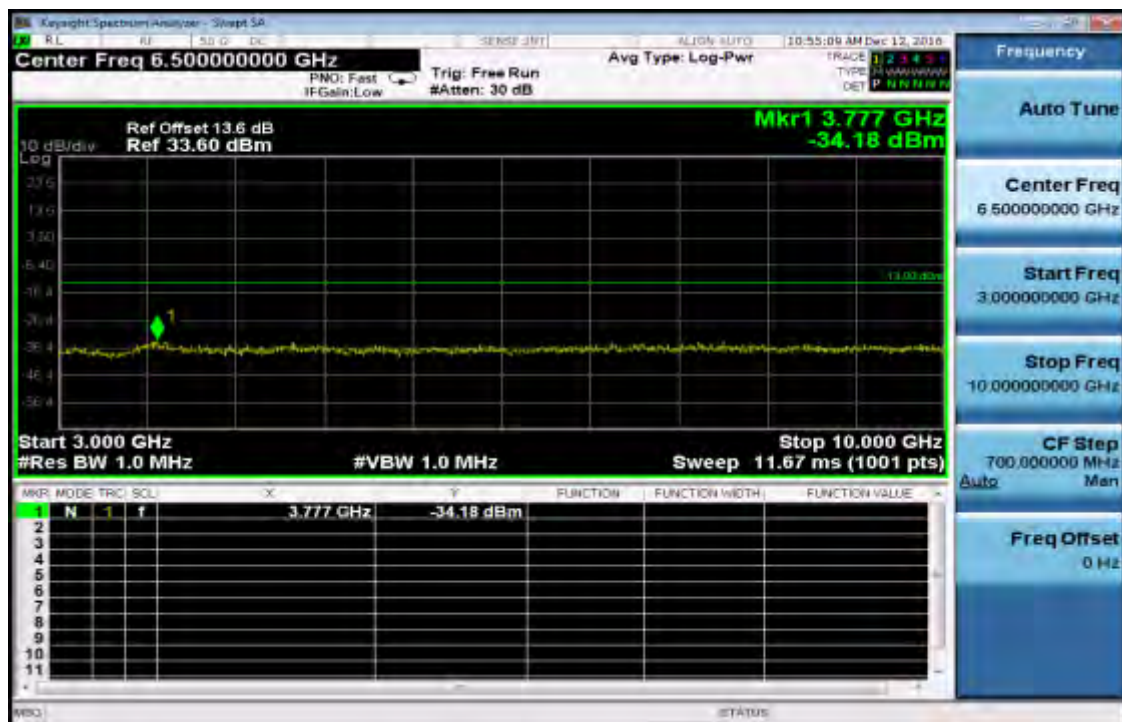
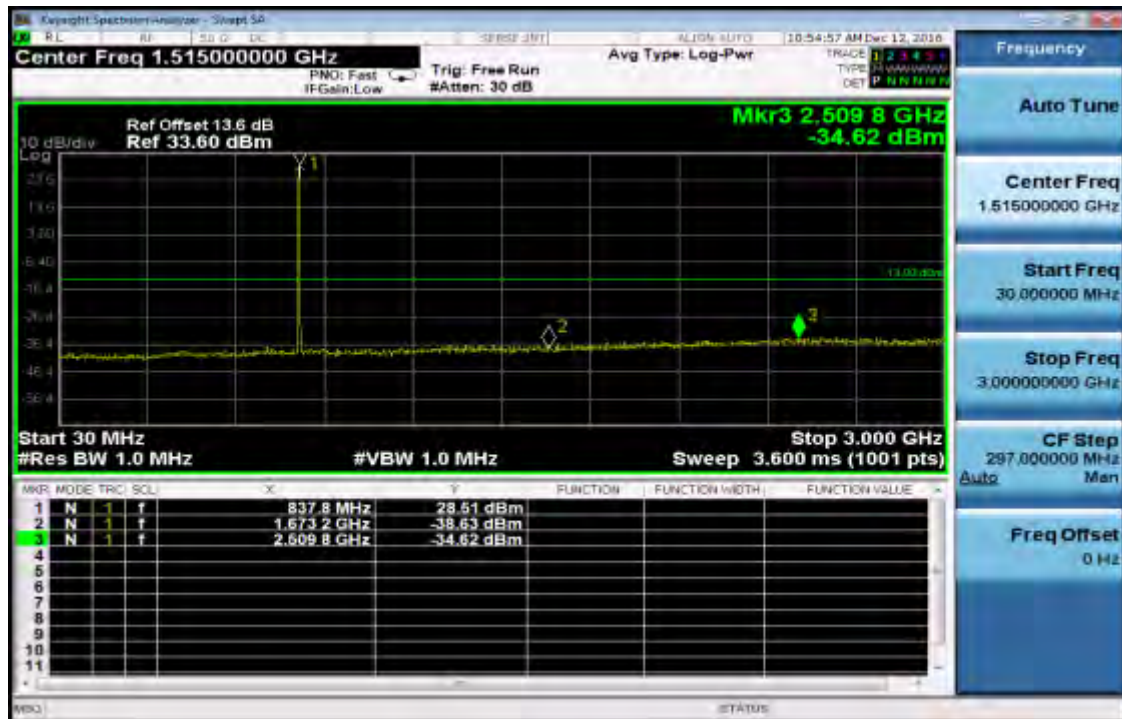
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Out of Band emission at antenna terminals – EDGE 850 Channel Mid



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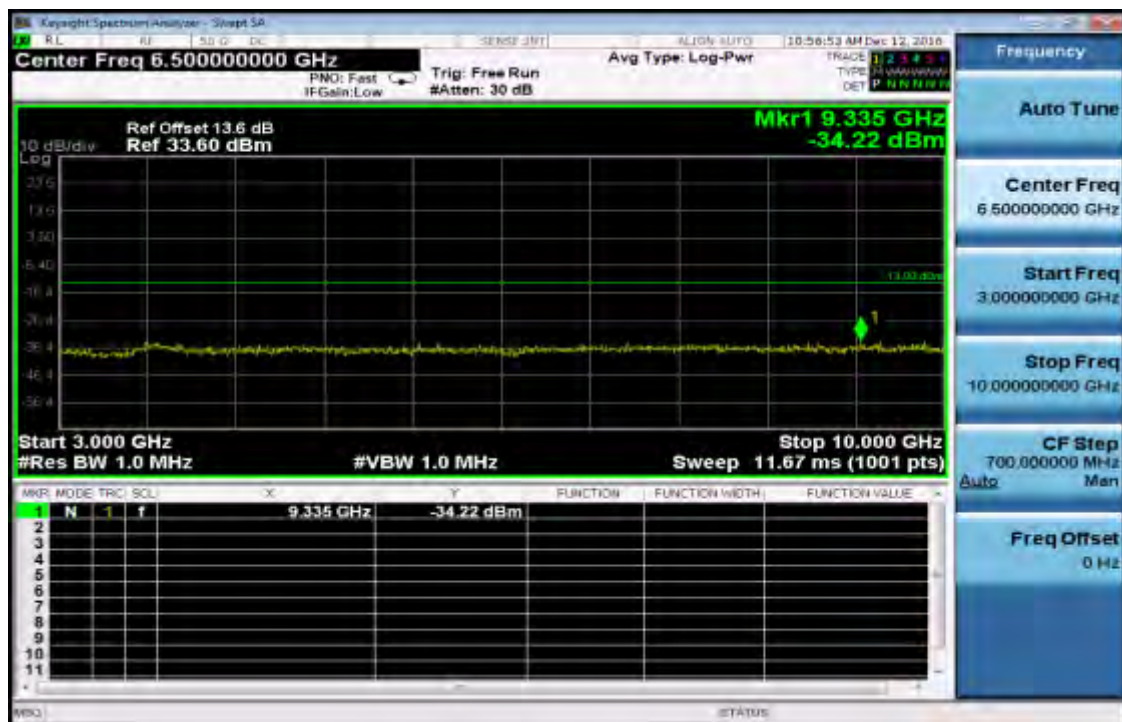
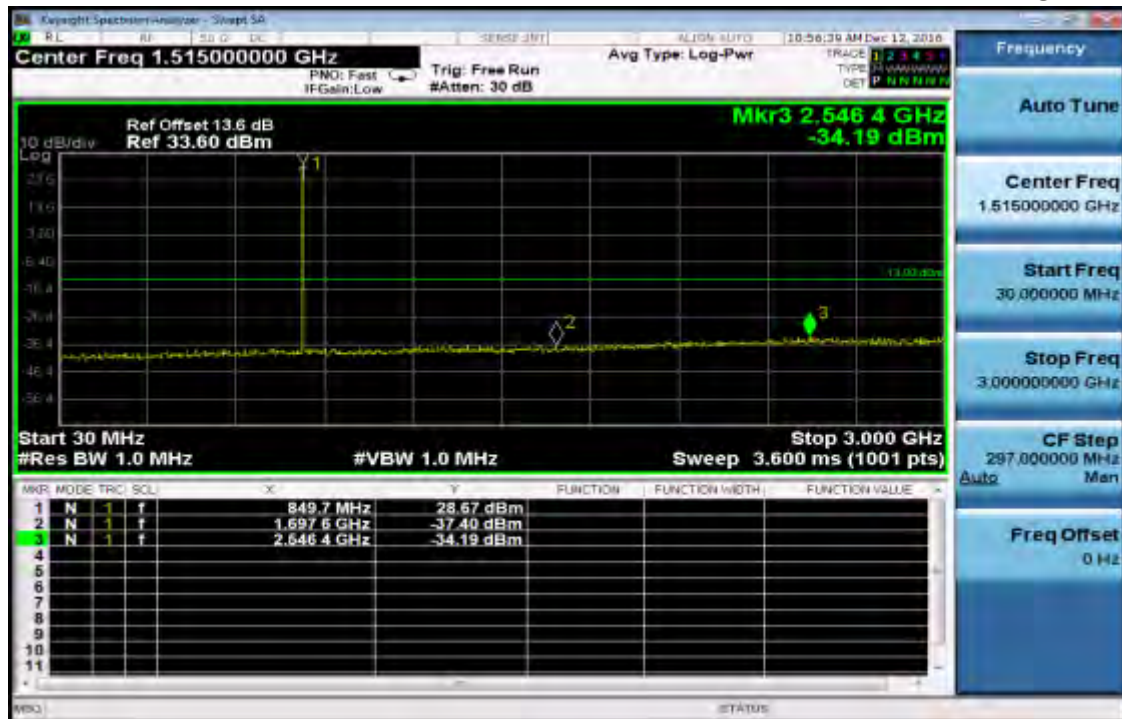
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Out of Band emission at antenna terminals – EDGE 850 Channel Highest



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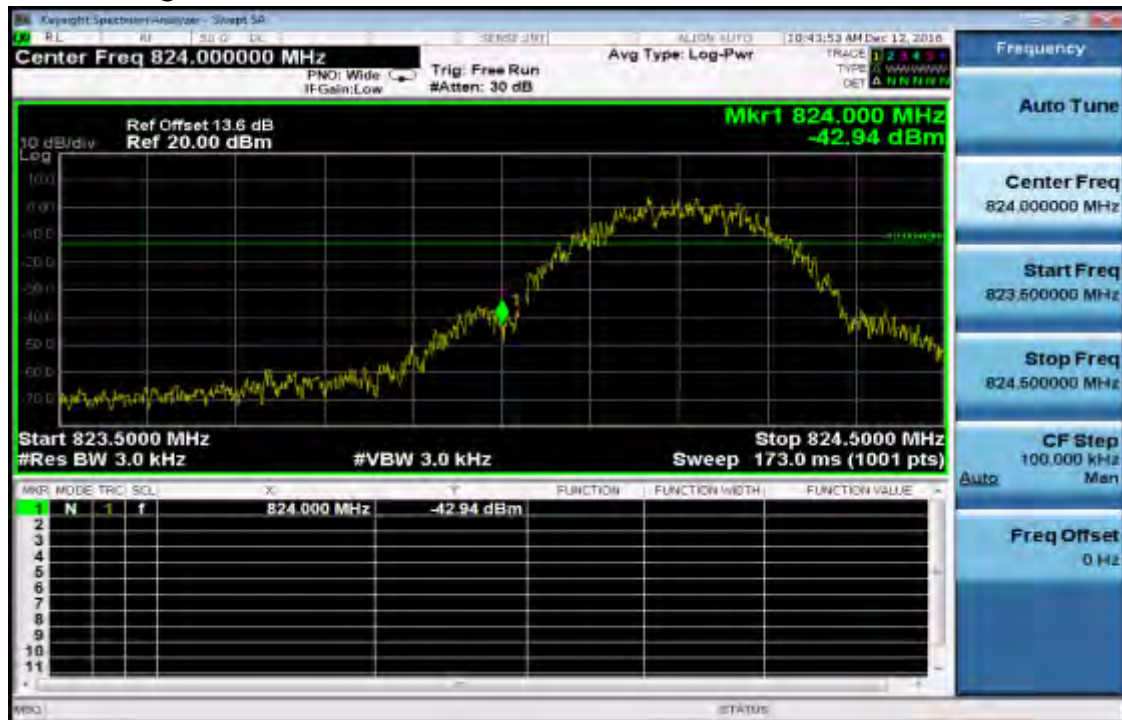
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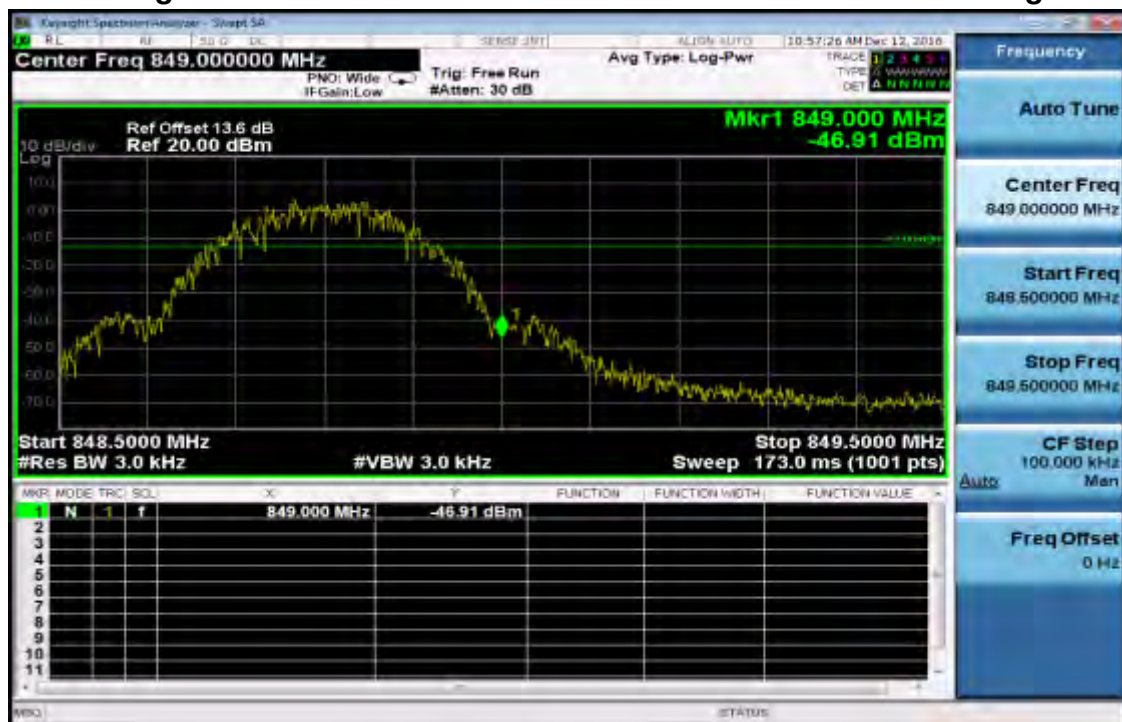
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Band edge emission at antenna terminals – EDGE 850 Channel Lowest



Band edge emission at antenna terminals – EDGE 850 Channel Highest



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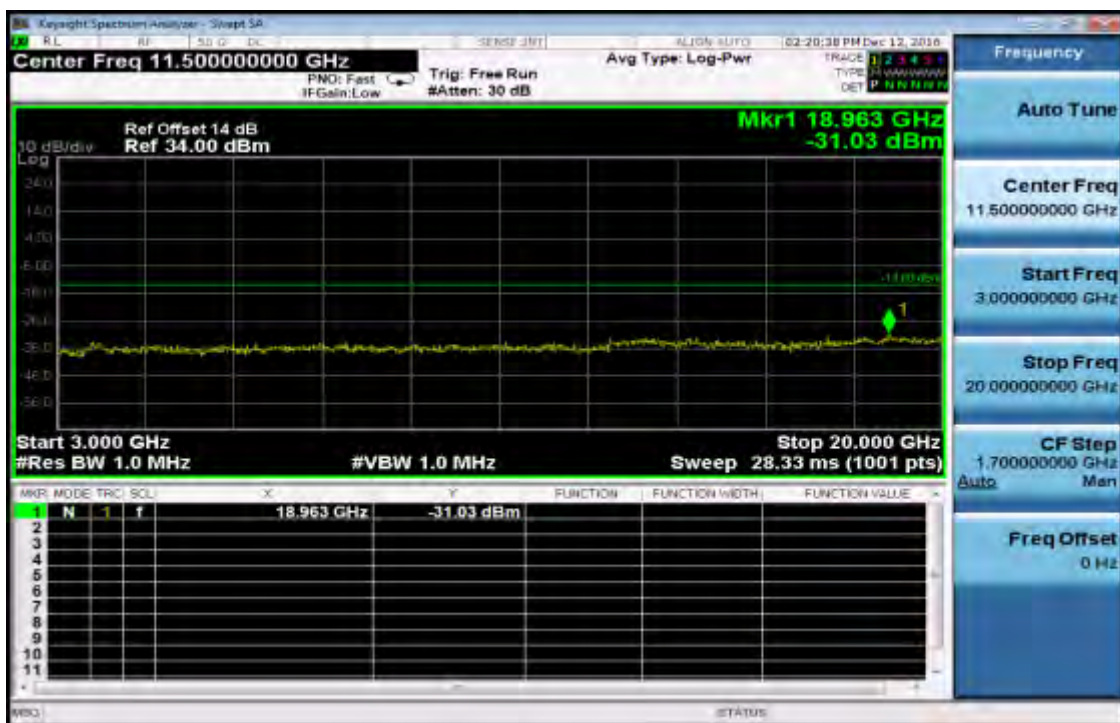
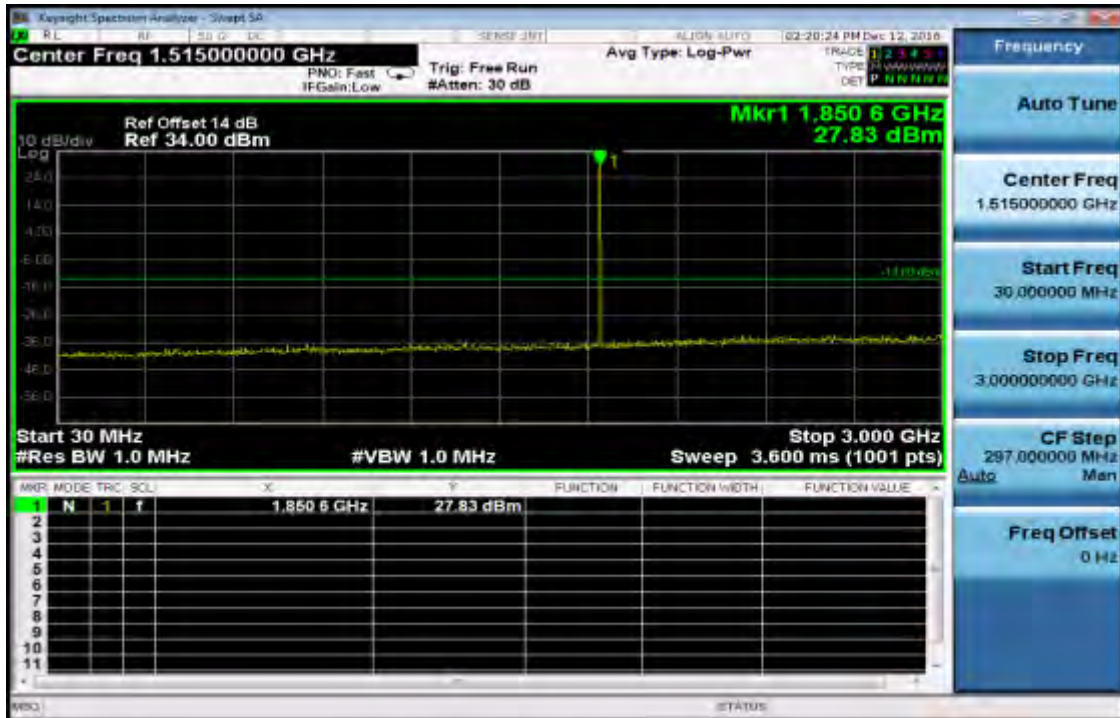
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Out of Band emission at antenna terminals – EDGE 1900 Channel Lowest



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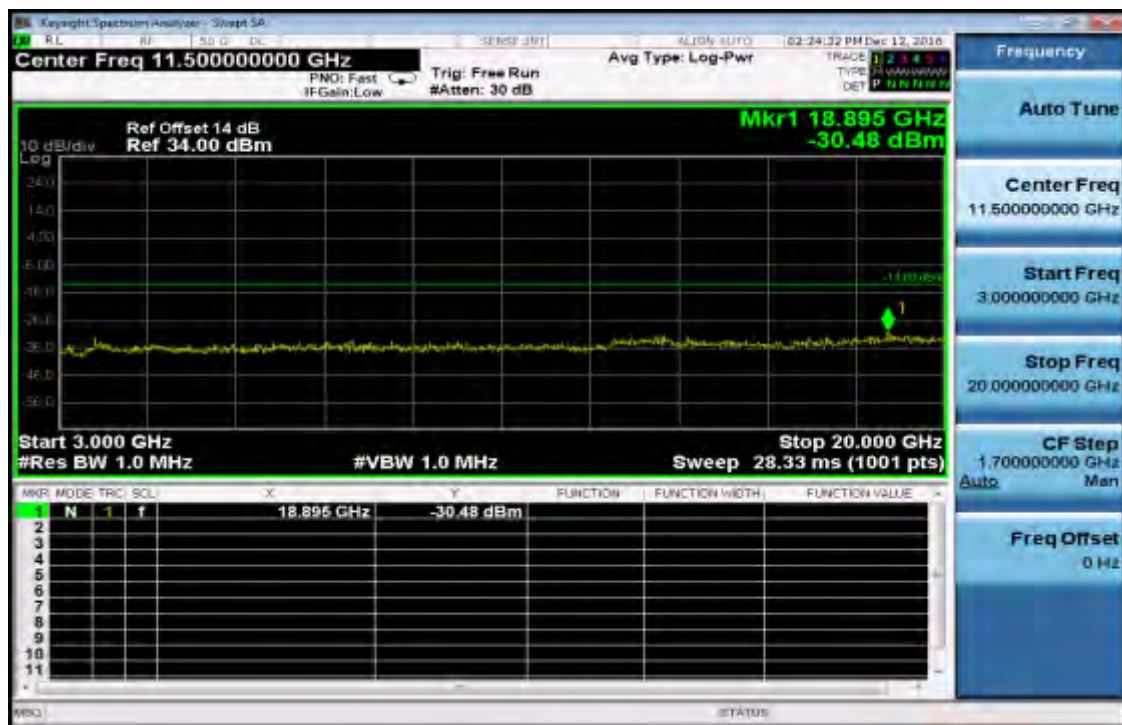
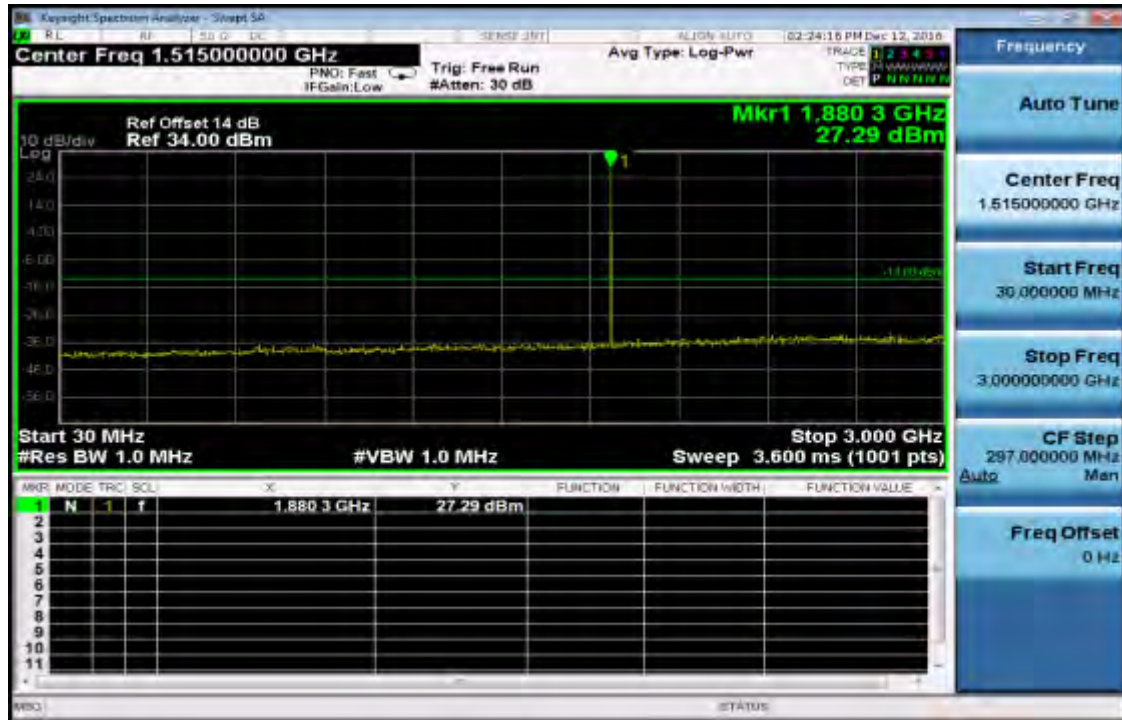
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Out of Band emission at antenna terminals – EDGE 1900 Channel Mid



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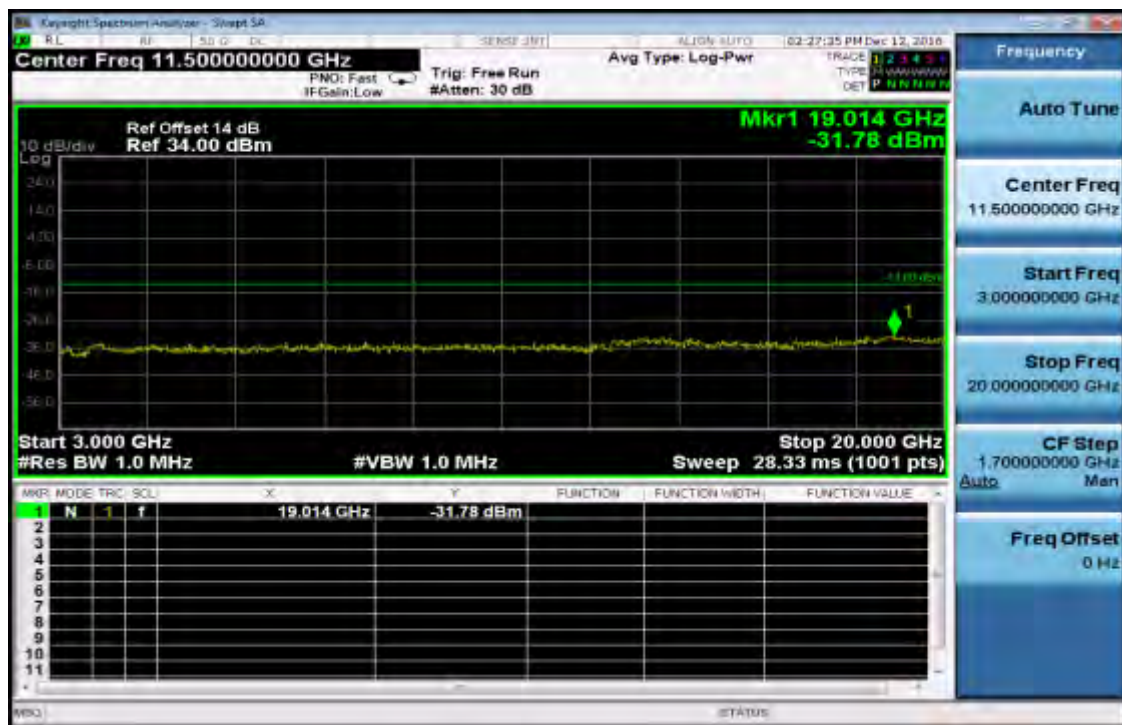
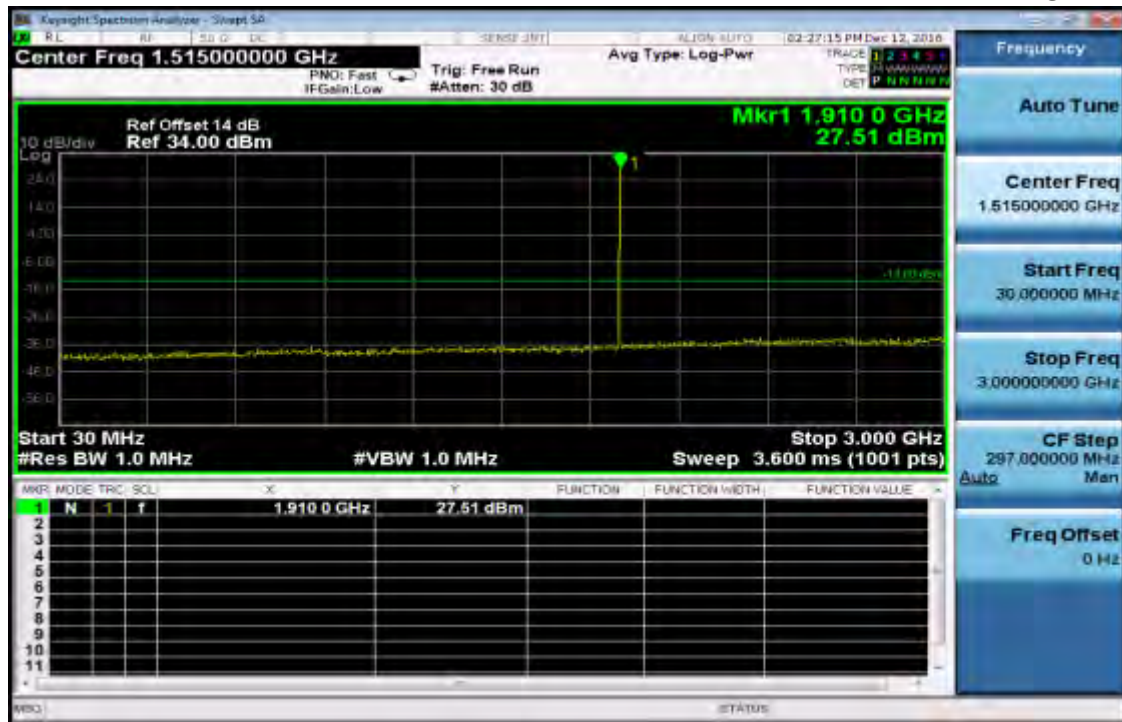
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Out of Band emission at antenna terminals – EDGE 1900 Channel Highest



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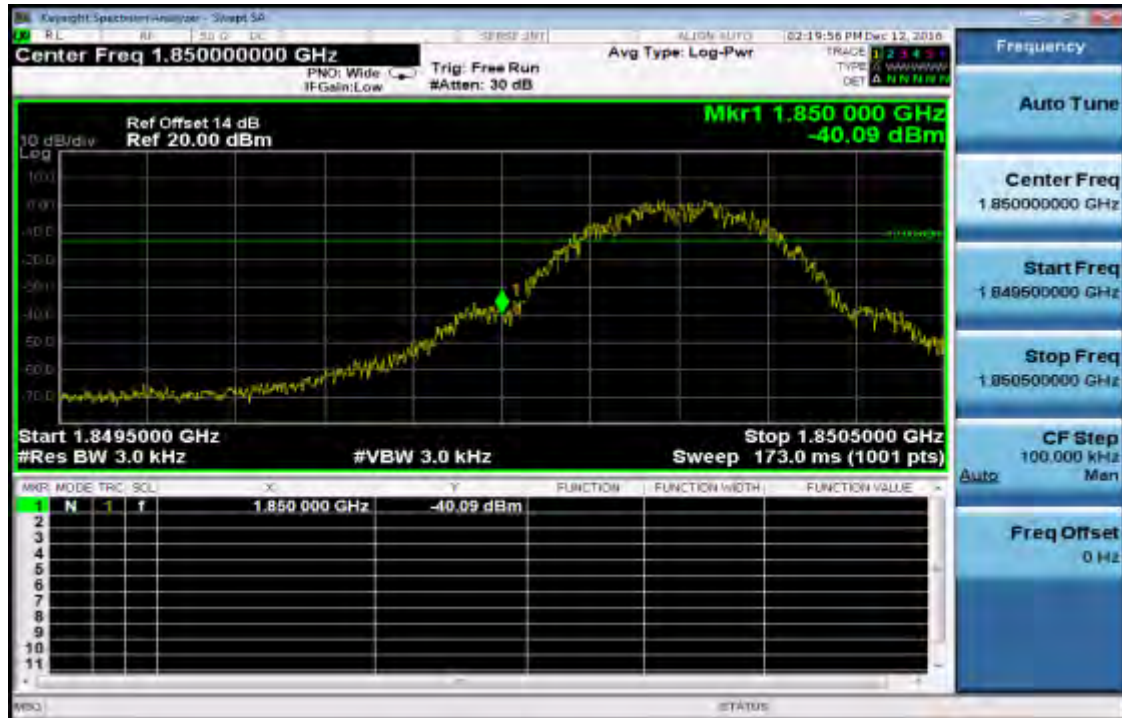
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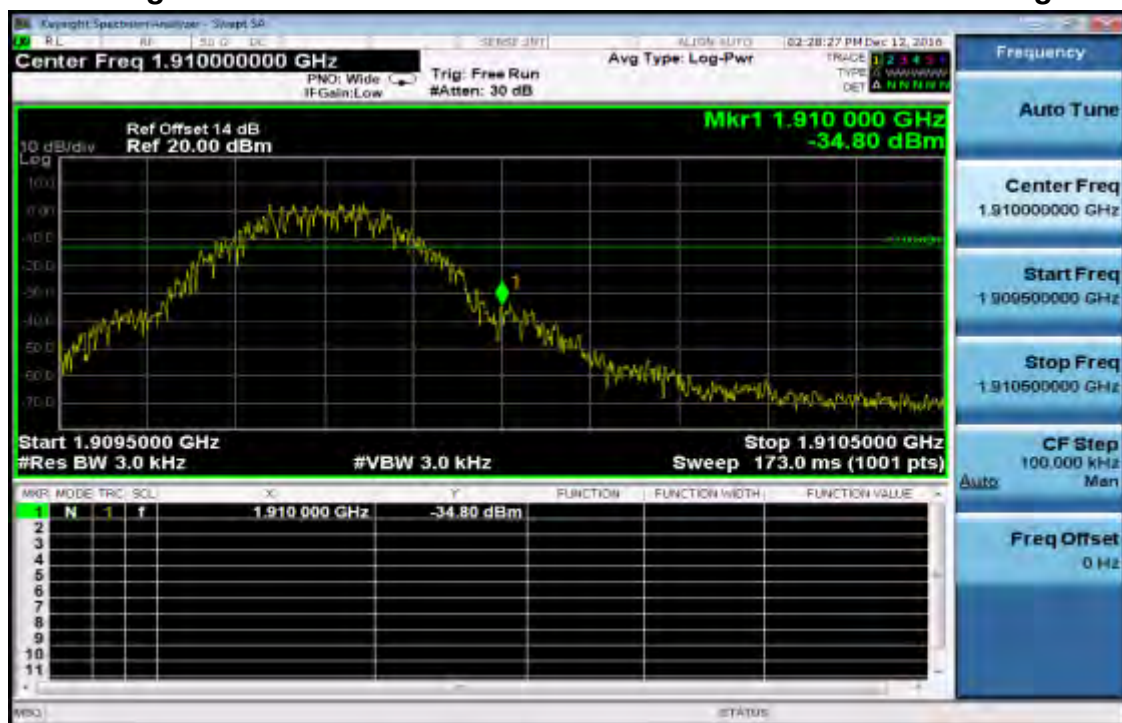
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Band edge emission at antenna terminals – EDGE 1900 Channel Lowest



Band edge emission at antenna terminals – EDGE 1900 Channel Highest



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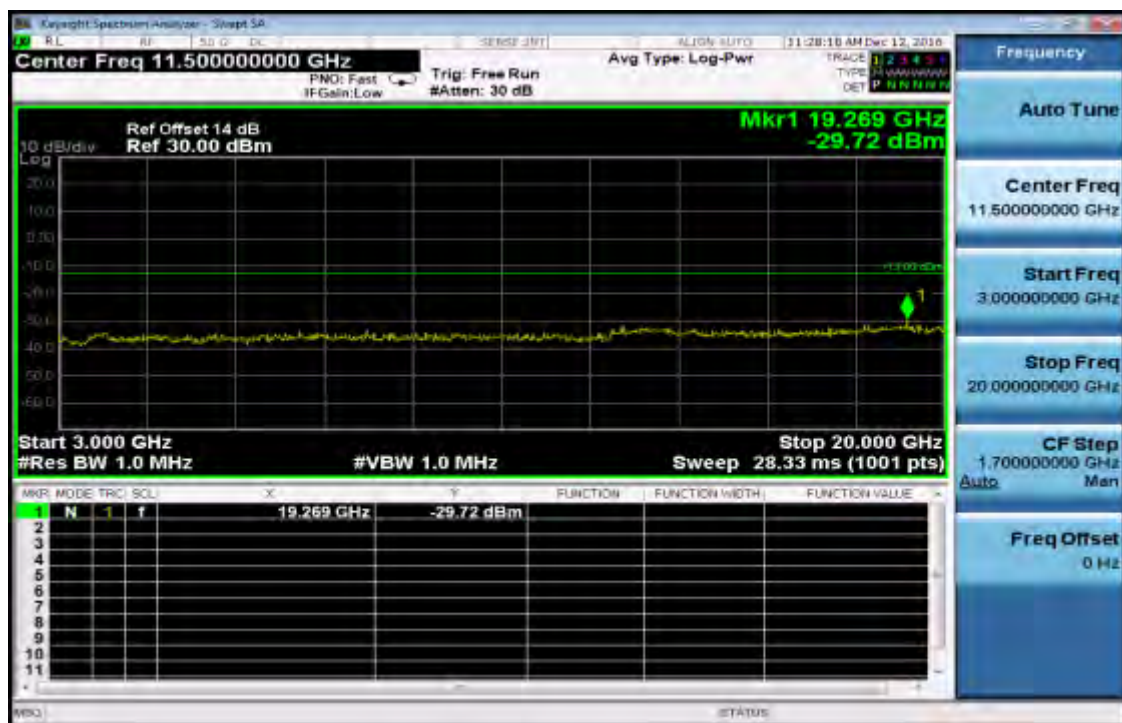
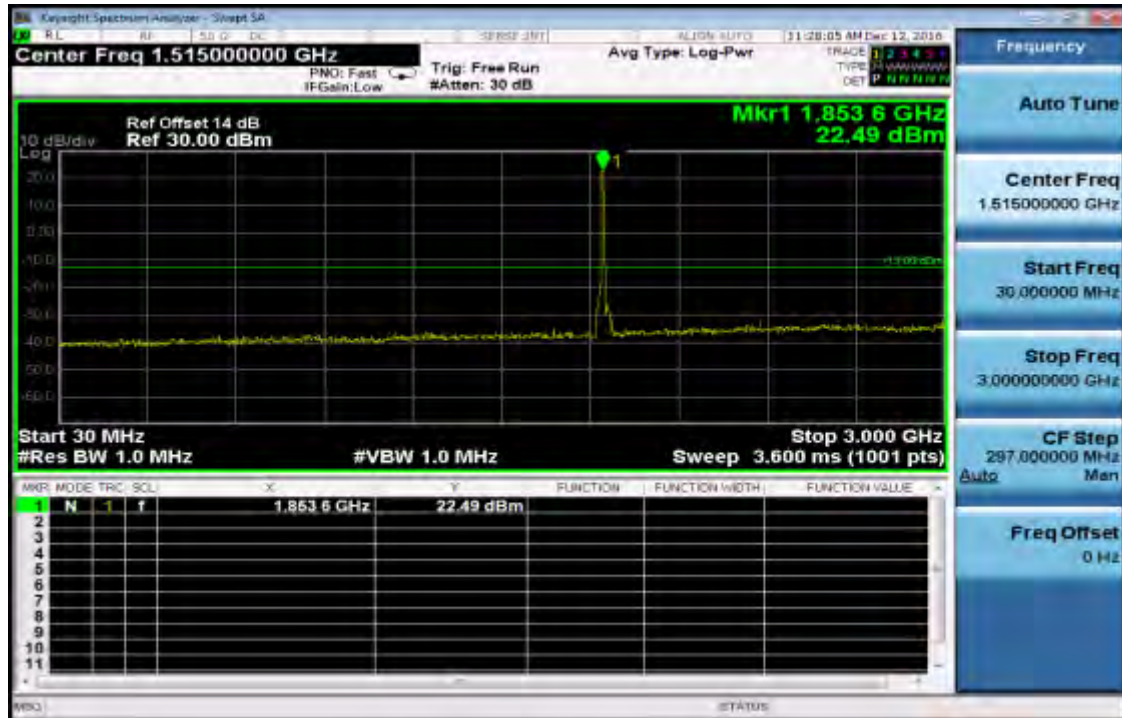
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Out of Band emission at antenna terminals – HSDPA II Channel Lowest



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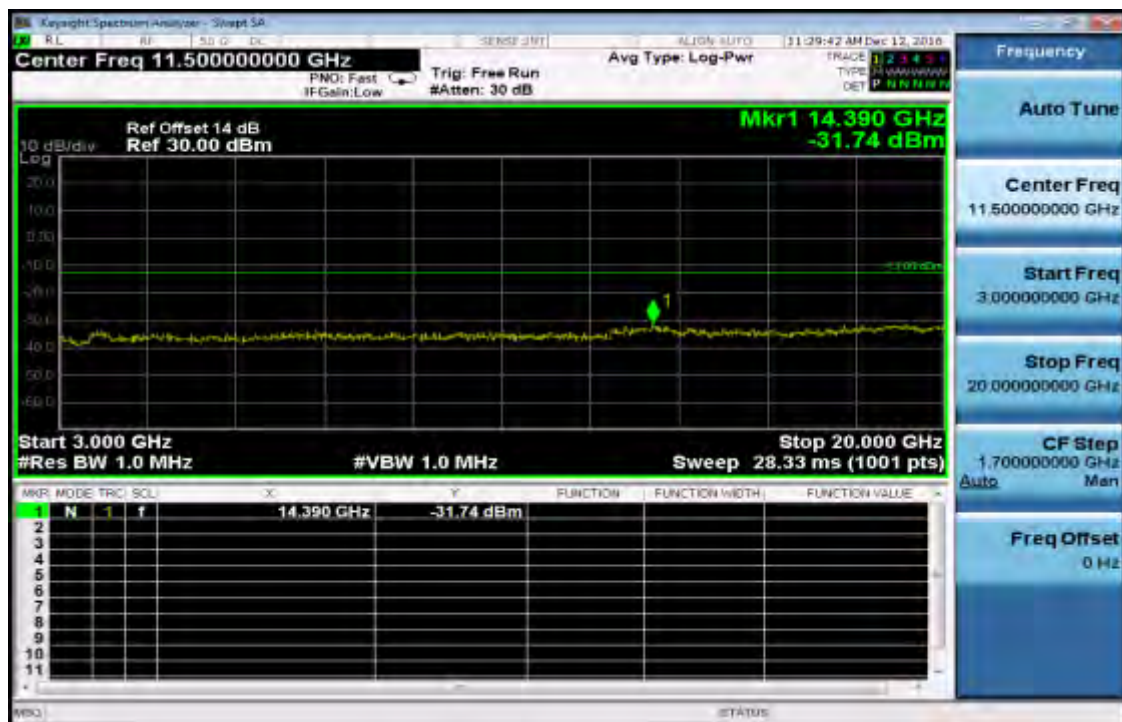
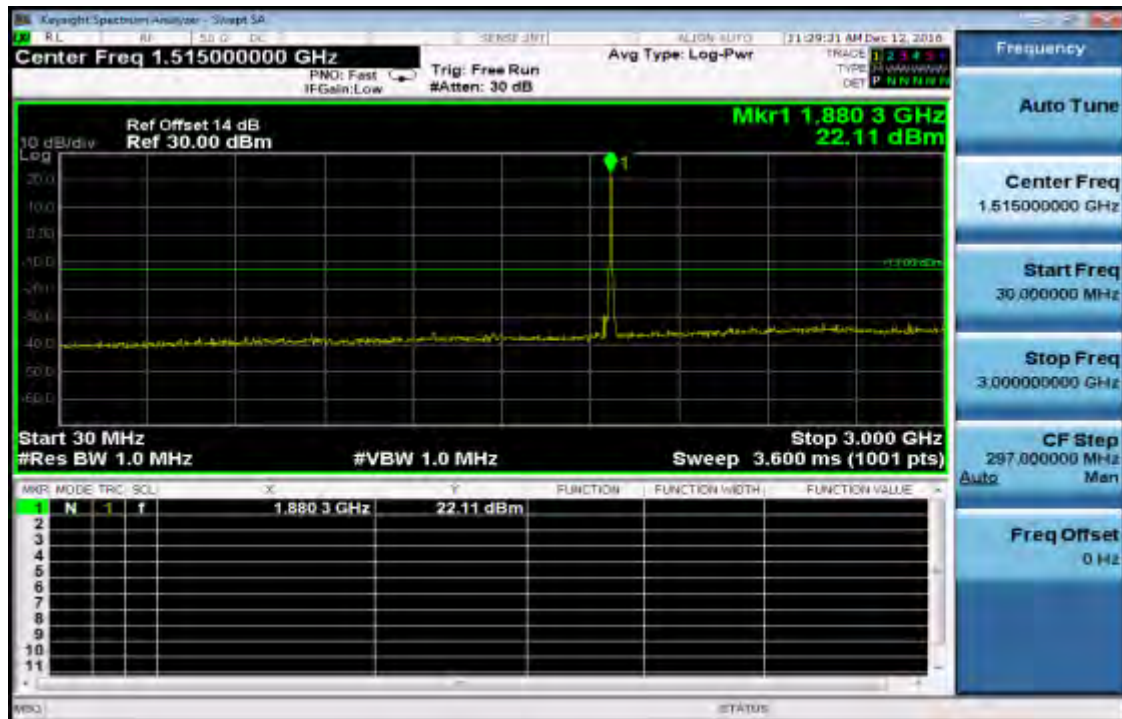
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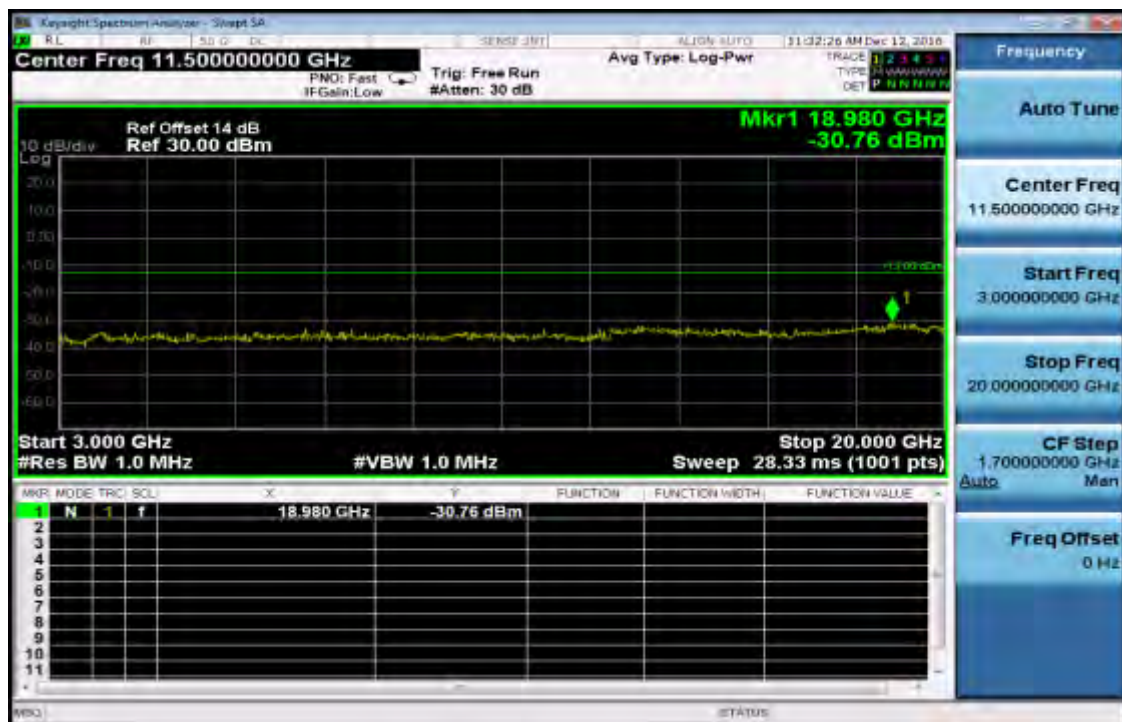
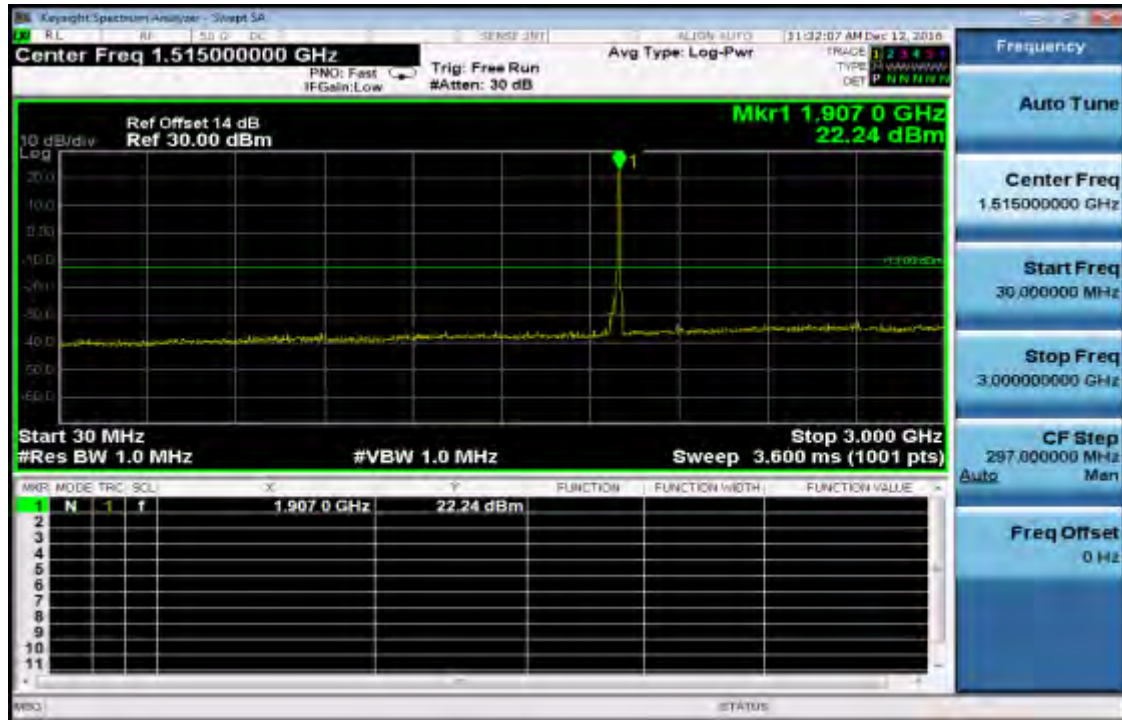
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Out of Band emission at antenna terminals – HSDPA II Channel Highest



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Band edge emission at antenna terminals – HSDPA II Channel Lowest



Band edge emission at antenna terminals – HSDPA II Channel Highest



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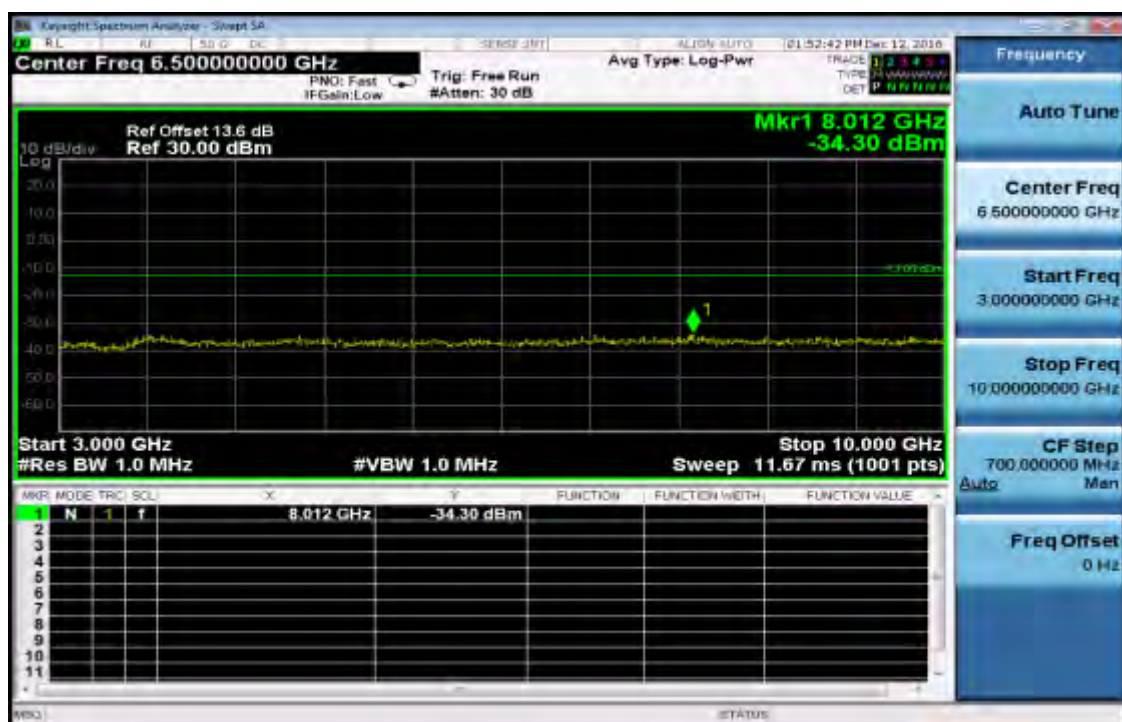
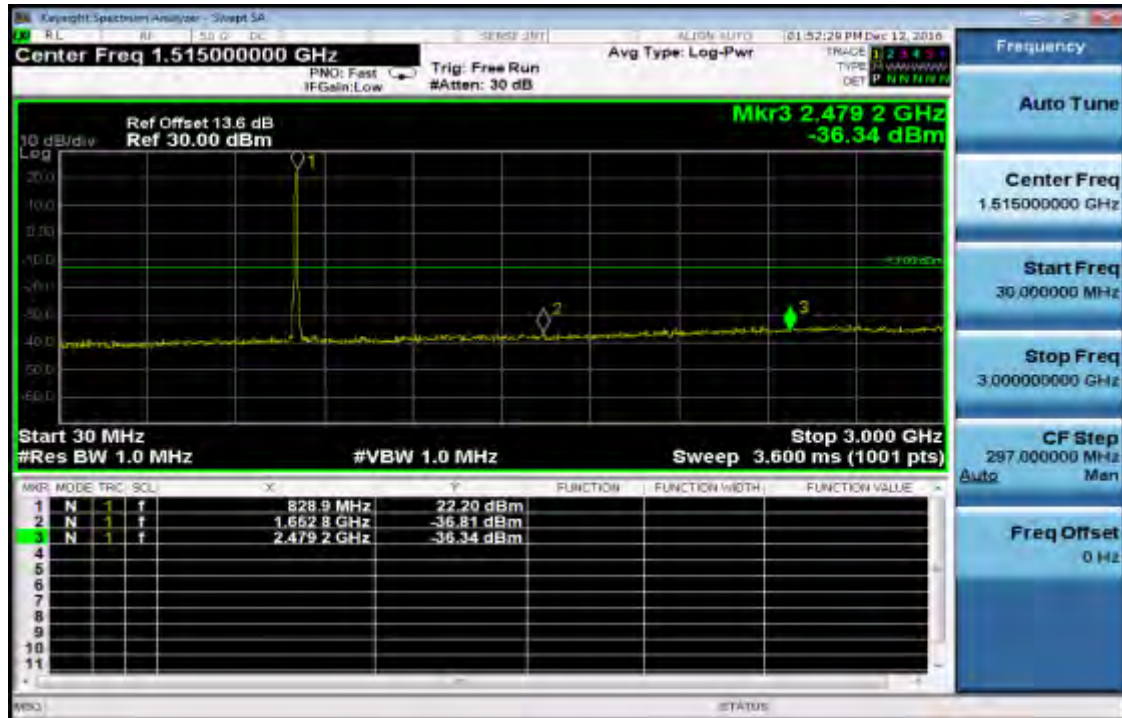
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Out of Band emission at antenna terminals – HSUPA V Channel Lowest



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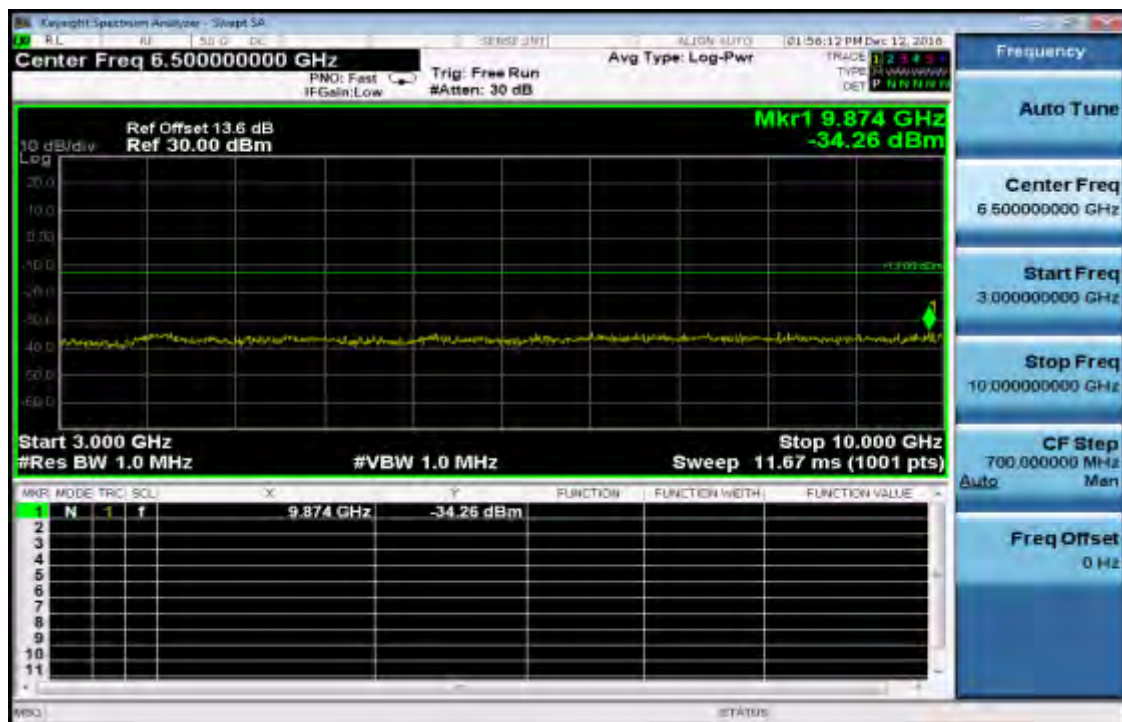
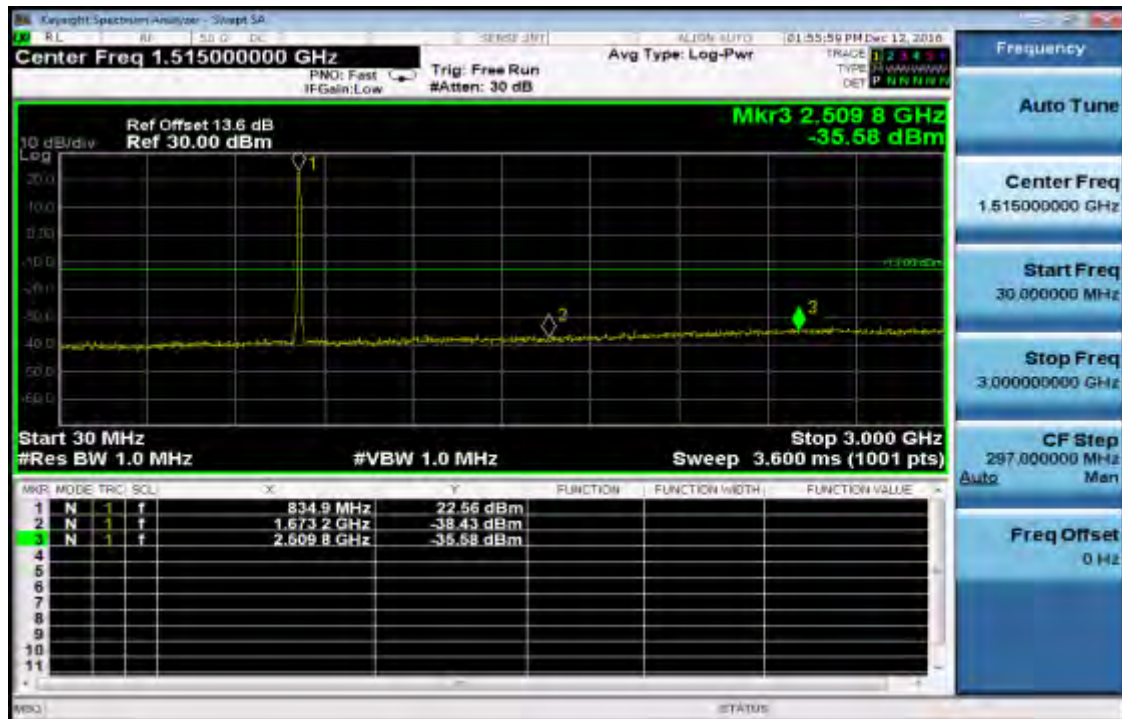
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Out of Band emission at antenna terminals – HSUPA V Channel Mid



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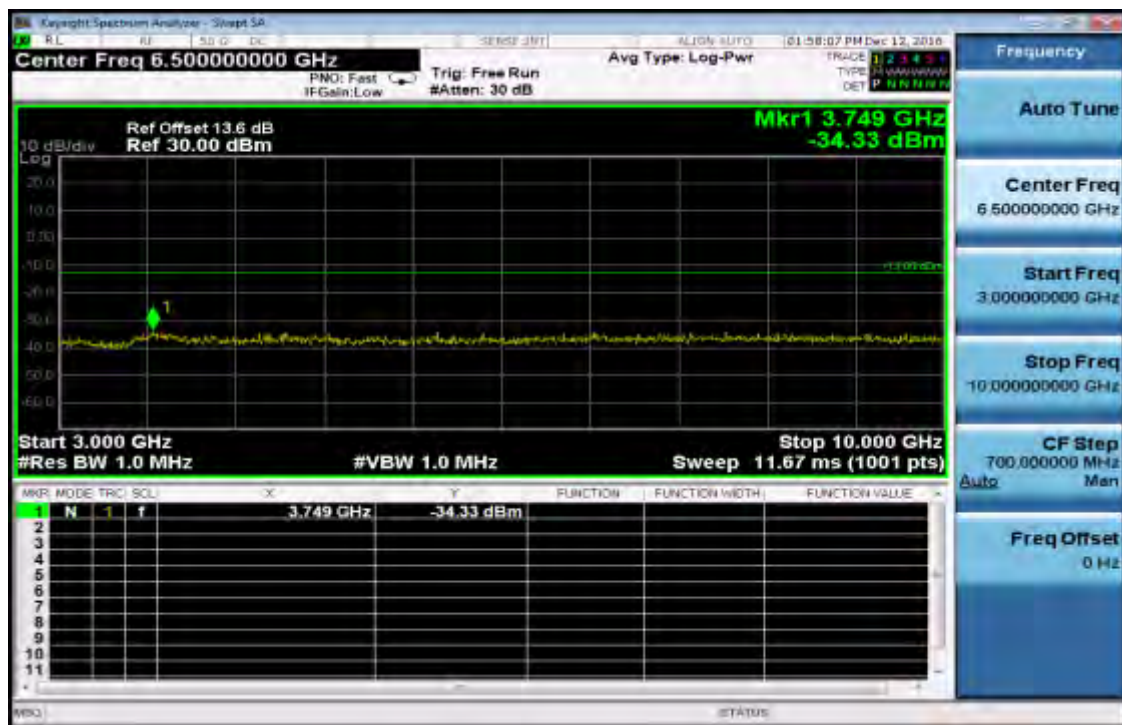
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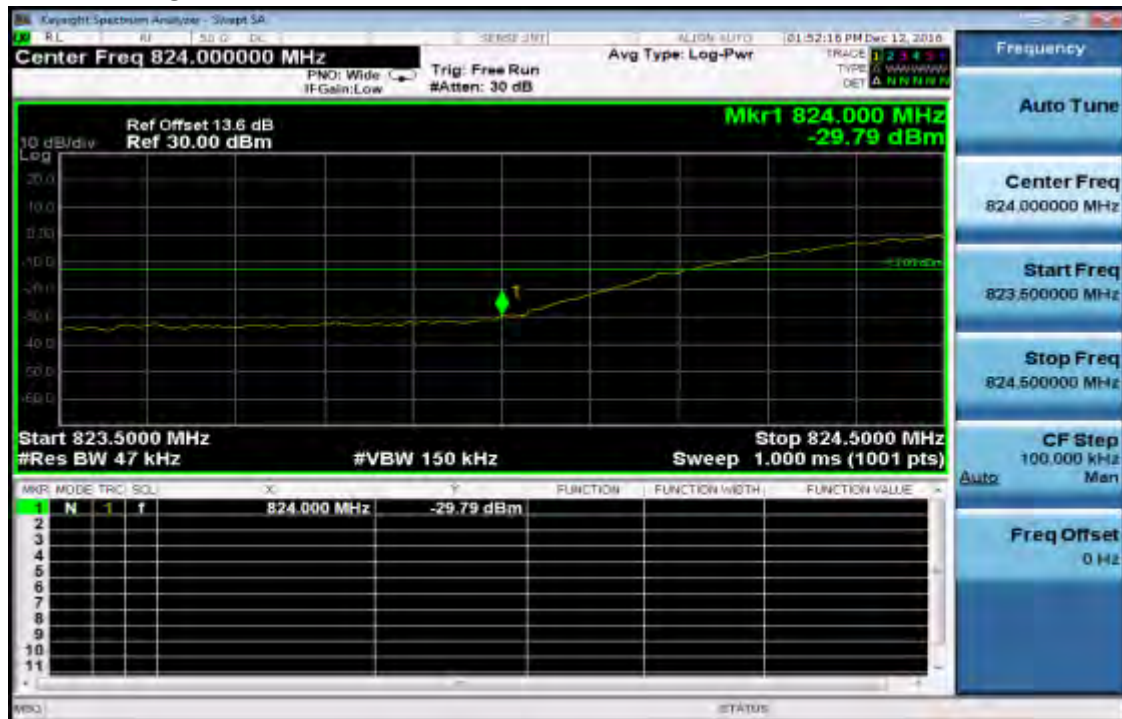
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Band edge emission at antenna terminals – HSUPA V Channel Lowest



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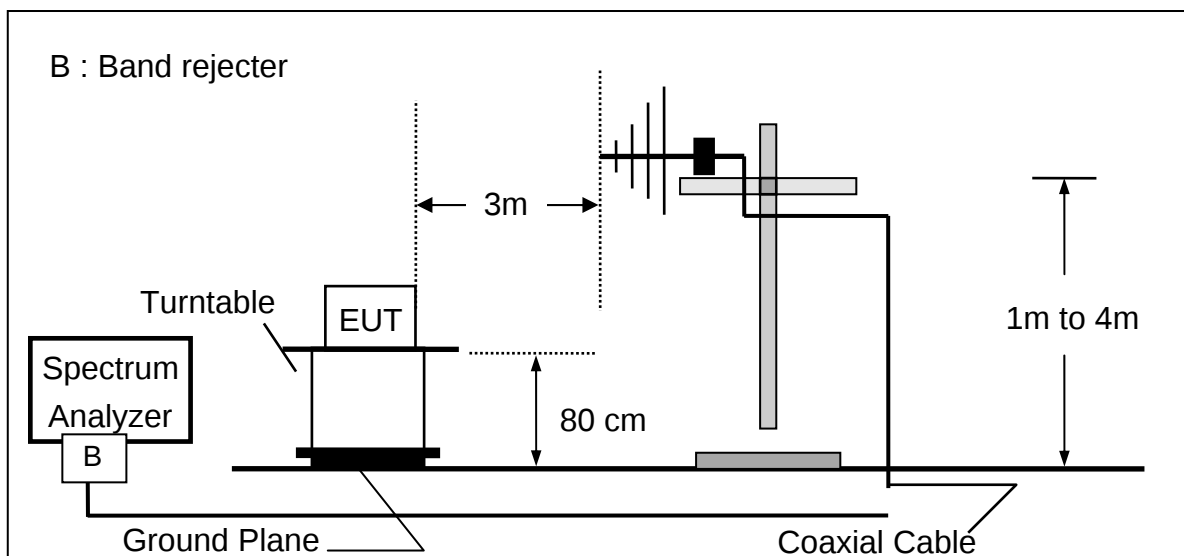
10. FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT

10.1. Standard Applicable

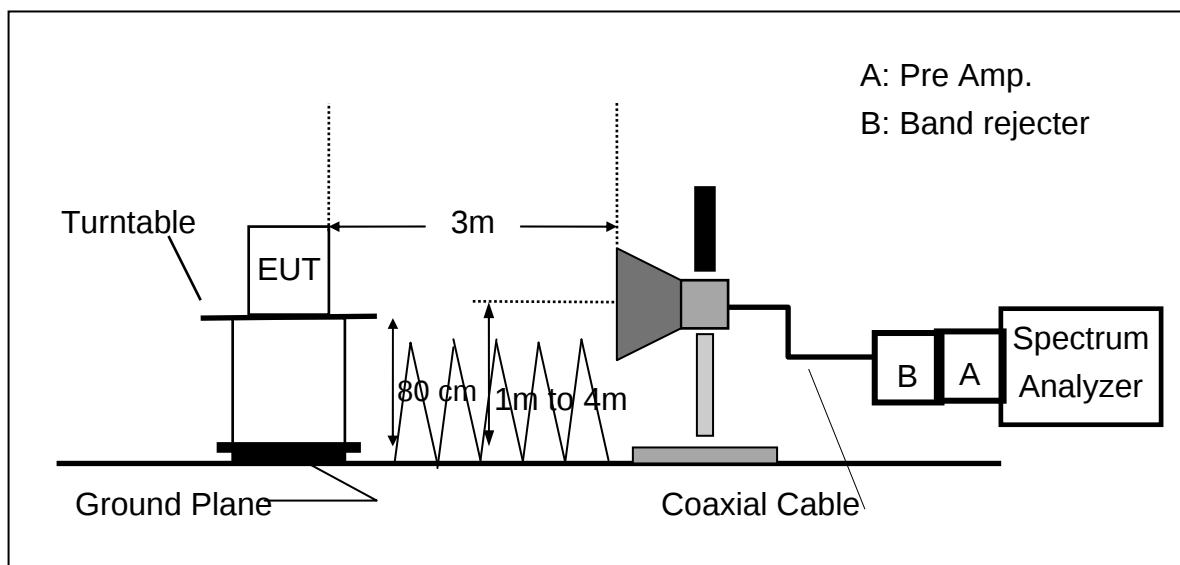
According to FCC §2.1053, FCC §22.917(a), §24.238(a), the magnitude of each spurious and harmonic emission that can be detected when the equipment is operated under the conditions specified in the instruction manual and/ or alignment procedure, shall not be less than $43 + 10 \log$ (mean output power in watts) dBc below the mean power output outside a license's frequency block (-13dBm).

10.2. EUT Setup

Radiated Emission Test Set-Up, Frequency Below 1000MHz



Radiated Emission Test Set-UP Frequency Over 1 GHz



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10.3. Measurement Procedure:

The EUT was placed on a non-conductive; the measurement antenna was placed at a distance of 3 meters from the EUT. 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.

The frequency range up to tenth harmonic was investigated for each of three fundamental frequencies (low, middle and high channels). Once spurious emission was identified, the power of the emission was determined using the substitution method.

The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency.

$$\text{ERP (dBm)} = \text{SG Level(dBm)} + \text{Antenna Gain(dBd)} + \text{Cable Loss(dB)}$$

$$\text{EIRP (dBm)} = \text{SG Level(dBm)} + \text{Antenna Gain(dBi)} + \text{Cable Loss(dB)}$$

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.
“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.
“---” : denotes Noise Floor.

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10.4. Measurement Equipment Used:

SGS FAC-I					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Spectrum Analyzer	R&S	FSV-30	101398	10/05/2016	10/04/2017
Bi-log Antenna	SCHWAZBECK	VULB9160	9160-3158	10/28/2016	10/27/2017
Bi-log Antenna	SCHWAZBECK	VULB9168	300	12/16/2015	12/15/2016
Horn antenna	ETS.LINDGREN	3117	143279	11/14/2016	11/13/2017
Horn antenna	ETS.LINDGREN	3117	123991	12/12/2016	12/11/2017
Horn Antenna	Schwarzbeck	BBHA9170	184	12/12/2016	12/11/2017
Horn Antenna	Schwarzbeck	BBHA9170	185	07/18/2016	07/17/2017
Filter 2400-2483.5 MHz	EWT	EWT-14-0166	M1	01/02/2016	01/01/2017
Pre-Amplifier	HP	8447F	3113A06892	01/02/2016	01/01/2017
Pre-Amplifier	HP	8449B	3008A01973	01/02/2016	01/01/2017
Network Analyze	Anritsu	MS4644A	1216312	05/26/2016	05/25/2017
Signal Generator	Agilent	E4438C	MY45093613	07/07/2016	07/06/2017
Low Loss Cable	Huber Suhner	SUCOFLEX 104EPA	1166TX	01/02/2016	01/01/2017
Low Loss Cable	Huber Suhner	SUCOFLEX 104EPA	1166RX	01/02/2016	01/01/2017
Attenuator	Mini-Circuit	BW-S10W2+	3	01/02/2016	01/01/2017
Turn Table	HD	DT420	N/A	N.C.R	N.C.R
Antenna Tower	HD	MA240-N	240/657	N.C.R	N.C.R
Controller	HD	HD100	N/A	N.C.R	N.C.R
Site Cal	SGS	1166 chamber	N/A	01/02/2016	01/01/2017
Filter 800-1000	Micro-Tronics	EWT	M1	01/02/2016	01/01/2017
Filter 1800-2000	Micro-Tronics	EWT	M1	01/02/2016	01/01/2017
1GHz High Pass Filter	Micro-Tronics	HPM50108	32	01/02/2016	01/01/2017
2GHz High Pass Filter	Micro-Tronics	HPM50110	36	01/02/2016	01/01/2017
Radio Communication Analyzer	Anritsu	MT8820C	6201465317	12/10/2016	12/09/2017

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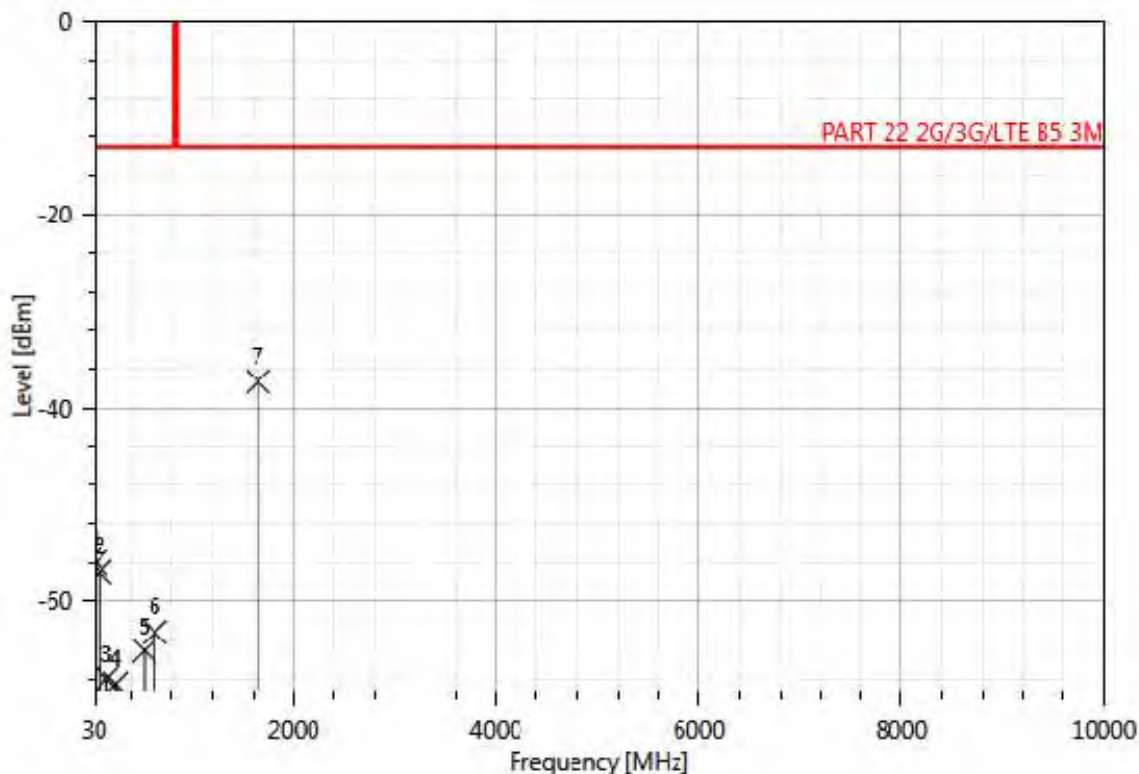
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10.5. Measurement Result:

Radiated Spurious Emission Measurement Result: EDGE 850 Mode

Operation Mode :	EDGE 850	Test Date :	12/14/2016
Fundamental Frequency :	824.2 MHz	Temp. / Humi. :	21 deg_C / 62 RH
Operation Band :	Tx CH LOW	Test Engineer :	Mike
EUT Pol. :	E1 Plane	Measurement Antenna Pol. :	VERTICAL



Freq.	Note	Decetor	ERP	SG Output	Antenna	Cable	Limit	Margin
MHz	F/H/E/S	Mode	Level	Level	Gain	Loss	@3m	
		QP/AV/PK	dBm	dBm	dBd	dB	dBm	dB
41.64	S	Peak	-55.98	-42.14	-12.83	-1.00	-13.00	-42.98
84.32	S	Peak	-56.93	-53.97	-1.78	-1.18	-13.00	-43.93
156.10	S	Peak	-68.00	-64.73	-1.81	-1.46	-13.00	-55.00
246.31	S	Peak	-68.53	-70.16	3.38	-1.75	-13.00	-55.53
522.76	S	Peak	-65.12	-66.44	3.73	-2.42	-13.00	-52.12
628.49	S	Peak	-63.20	-63.91	3.18	-2.47	-13.00	-50.20
1648.00	H	Peak	-37.27	-40.16	7.11	-4.22	-13.00	-24.27

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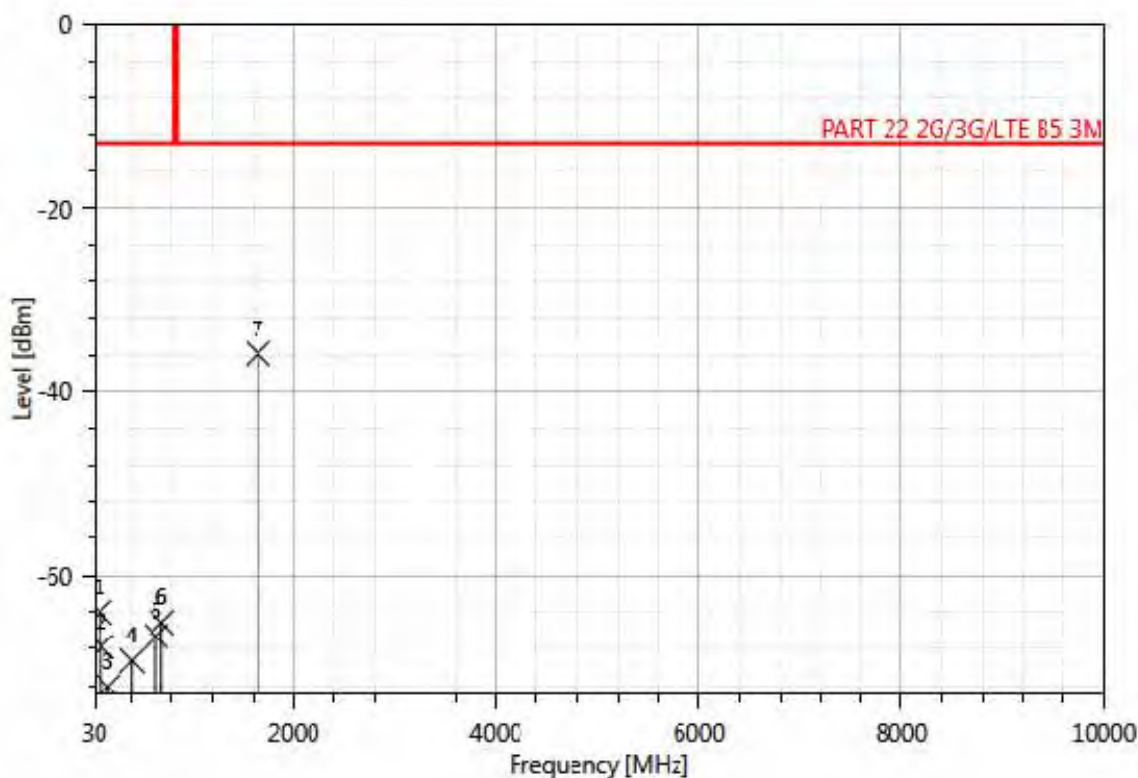
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Operation Mode : EDGE 850 Test Date : 12/14/2016
Fundamental Frequency : 824.2 MHz Temp. / Humi. : 21 deg_C / 62 RH
Operation Band : Tx CH LOW Test Engineer : Mike
EUT Pol. : E1 Plane Measurement Antenna Pol. : HORIZONTAL



Freq. MHz	Note F/H/E/S	Decetor Mode QP/AV/PK	ERP Level dBm	SG Output Level dBm	Antenna Gain dBd	Cable Loss dB	Limit @3m dBm	Margin dB
85.29	S	Peak	-64.05	-61.32	-1.54	-1.19	-13.00	-51.05
102.75	S	Peak	-67.76	-64.63	-1.87	-1.26	-13.00	-54.76
167.74	S	Peak	-72.10	-69.51	-1.07	-1.51	-13.00	-59.10
401.51	S	Peak	-69.28	-70.71	3.82	-2.39	-13.00	-56.28
643.04	S	Peak	-66.61	-67.34	3.15	-2.43	-13.00	-53.61
697.36	S	Peak	-65.14	-65.29	3.08	-2.93	-13.00	-52.14
1648.00	H	Peak	-35.85	-38.73	7.11	-4.22	-13.00	-22.85

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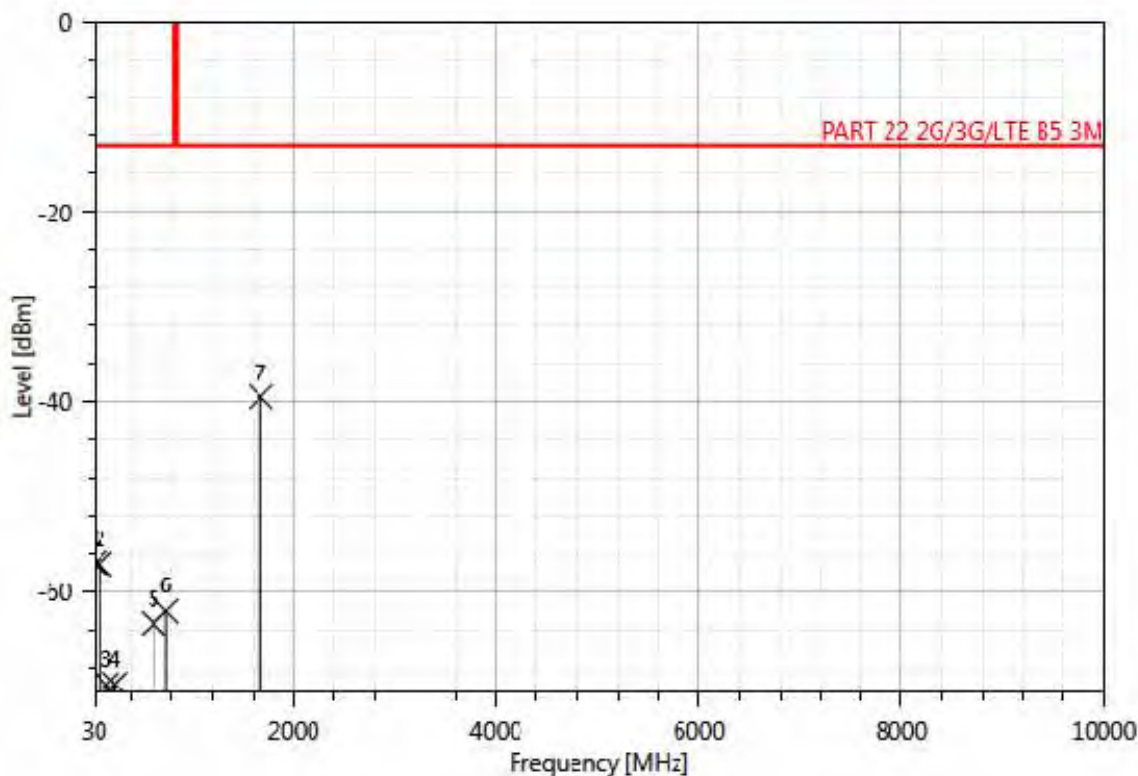
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Operation Mode :	EDGE 850	Test Date :	12/14/2016
Fundamental Frequency :	836.6 MHz	Temp. / Humi. :	21 deg_C / 62 RH
Operation Band :	Tx CH MID	Test Engineer :	Mike
EUT Pol. :	E1 Plane	Measurement Antenna Pol. :	VERTICAL



Freq.	Note	Decetor	ERP	SG Output	Antenna	Cable	Limit	Margin
MHz	F/H/E/S	Mode	Level	Level	Gain	Loss	@3m	
		QP/AV/PK	dBm	dBm	dBd	dB	dBm	dB
39.70	S	Peak	-56.98	-42.88	-13.11	-0.99	-13.00	-43.98
83.35	S	Peak	-57.14	-53.94	-2.01	-1.18	-13.00	-44.14
154.16	S	Peak	-69.82	-66.46	-1.90	-1.45	-13.00	-56.82
236.61	S	Peak	-69.75	-71.24	3.23	-1.73	-13.00	-56.75
616.85	S	Peak	-63.35	-63.98	3.21	-2.58	-13.00	-50.35
742.95	S	Peak	-62.07	-62.12	3.17	-3.12	-13.00	-49.07
1675.00	H	Peak	-39.51	-42.42	7.20	-4.29	-13.00	-26.51

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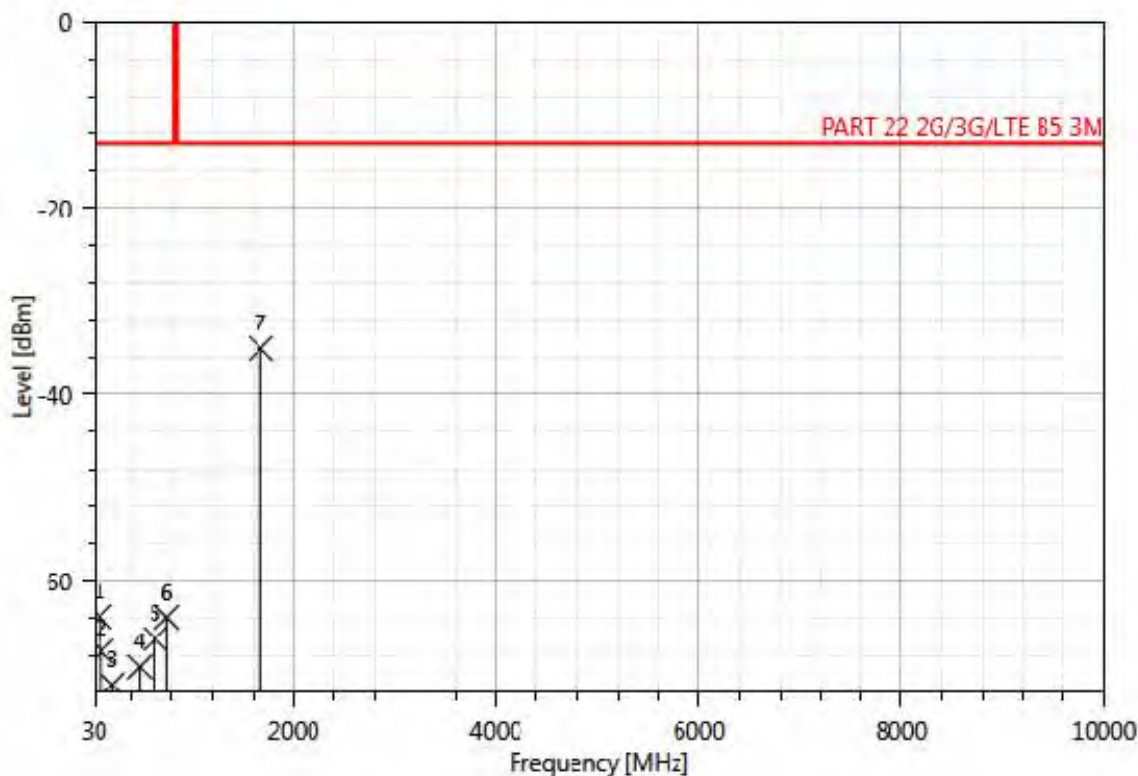
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Operation Mode :	EDGE 850	Test Date :	12/14/2016
Fundamental Frequency :	836.6 MHz	Temp. / Humi. :	21 deg_C / 62 RH
Operation Band :	Tx CH MID	Test Engineer :	Mike
EUT Pol. :	E1 Plane	Measurement Antenna Pol. :	HORIZONTAL



Freq.	Note	Decetor	ERP	SG Output	Antenna	Cable	Limit	Margin
MHz	F/H/E/S	Mode	Level	Level	Gain	Loss	@3m	
		QP/AV/PK	dBm	dBm	dBd	dB	dBm	dB
85.29	S	Peak	-63.89	-61.16	-1.54	-1.19	-13.00	-50.89
102.75	S	Peak	-67.59	-64.46	-1.87	-1.26	-13.00	-54.59
211.39	S	Peak	-71.16	-72.98	3.50	-1.68	-13.00	-58.16
476.20	S	Peak	-69.24	-70.77	3.76	-2.23	-13.00	-56.24
631.40	S	Peak	-66.25	-66.96	3.18	-2.46	-13.00	-53.25
749.74	S	Peak	-63.93	-64.04	3.18	-3.08	-13.00	-50.93
1675.00	H	Peak	-35.06	-37.97	7.20	-4.29	-13.00	-22.06

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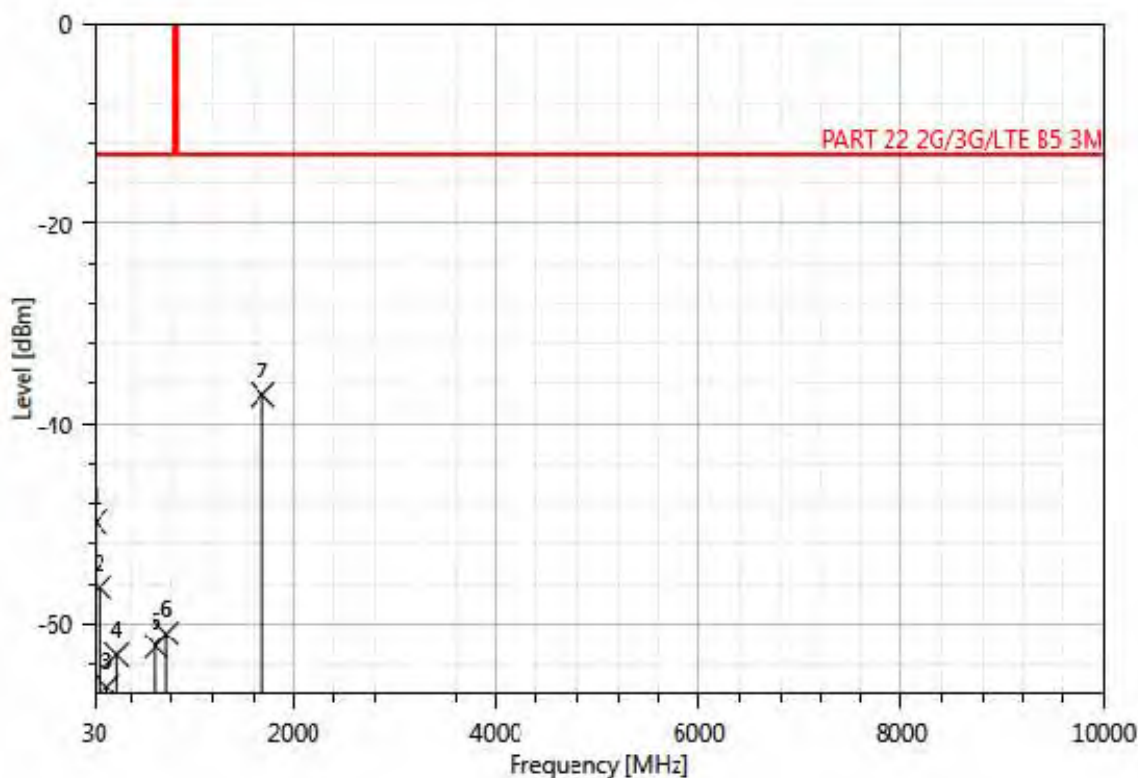
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Operation Mode :	EDGE 850	Test Date :	12/14/2016
Fundamental Frequency :	848.8 MHz	Temp. / Humi. :	21 deg_C / 62 RH
Operation Band :	Tx CH HIGH	Test Engineer :	Mike
EUT Pol. :	E1 Plane	Measurement Antenna Pol. :	VERTICAL



Freq. MHz	Note F/H/E/S	Decetor Mode QP/AV/PK	ERP Level dBm	SG Output Level dBm	Antenna Gain dBd	Cable Loss dB	Limit @3m dBm	Margin dB
41.64	S	Peak	-49.76	-35.92	-12.83	-1.00	-13.00	-36.76
81.41	S	Peak	-56.36	-52.69	-2.50	-1.17	-13.00	-43.36
157.07	S	Peak	-66.27	-63.04	-1.77	-1.46	-13.00	-53.27
255.04	S	Peak	-63.12	-64.92	3.56	-1.76	-13.00	-50.12
641.10	S	Peak	-62.25	-62.98	3.16	-2.43	-13.00	-49.25
744.89	S	Peak	-60.96	-61.03	3.17	-3.11	-13.00	-47.96
1693.00	H	Peak	-37.11	-40.07	7.27	-4.30	-13.00	-24.11

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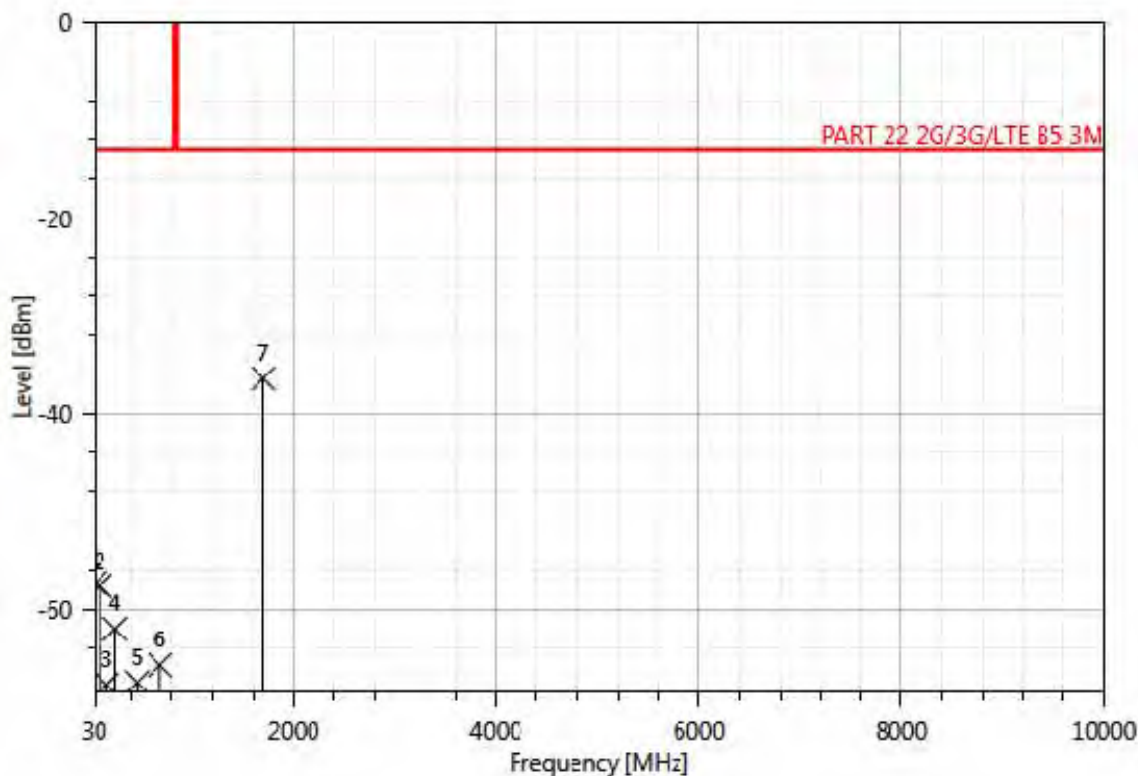
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Operation Mode : EDGE 850 Test Date : 12/14/2016
Fundamental Frequency : 848.8 MHz Temp. / Humi. : 21 deg_C / 62 RH
Operation Band : Tx CH HIGH Test Engineer : Mike
EUT Pol. : E1 Plane Measurement Antenna Pol. : HORIZONTAL



Freq. MHz	Note F/H/E/S	Decetor Mode QP/AV/PK	ERP Level dBm	SG Output Level dBm	Antenna Gain dBd	Cable Loss dB	Limit @3m dBm	Margin dB
39.70	S	Peak	-57.29	-43.19	-13.11	-0.99	-13.00	-44.29
85.29	S	Peak	-57.61	-54.88	-1.54	-1.19	-13.00	-44.61
154.16	S	Peak	-67.69	-64.33	-1.90	-1.45	-13.00	-54.69
236.61	S	Peak	-62.00	-63.49	3.23	-1.73	-13.00	-49.00
451.95	S	Peak	-67.46	-68.92	3.65	-2.19	-13.00	-54.46
679.90	S	Peak	-65.69	-66.18	3.10	-2.62	-13.00	-52.69
1702.00	H	Peak	-36.43	-39.41	7.30	-4.31	-13.00	-23.43

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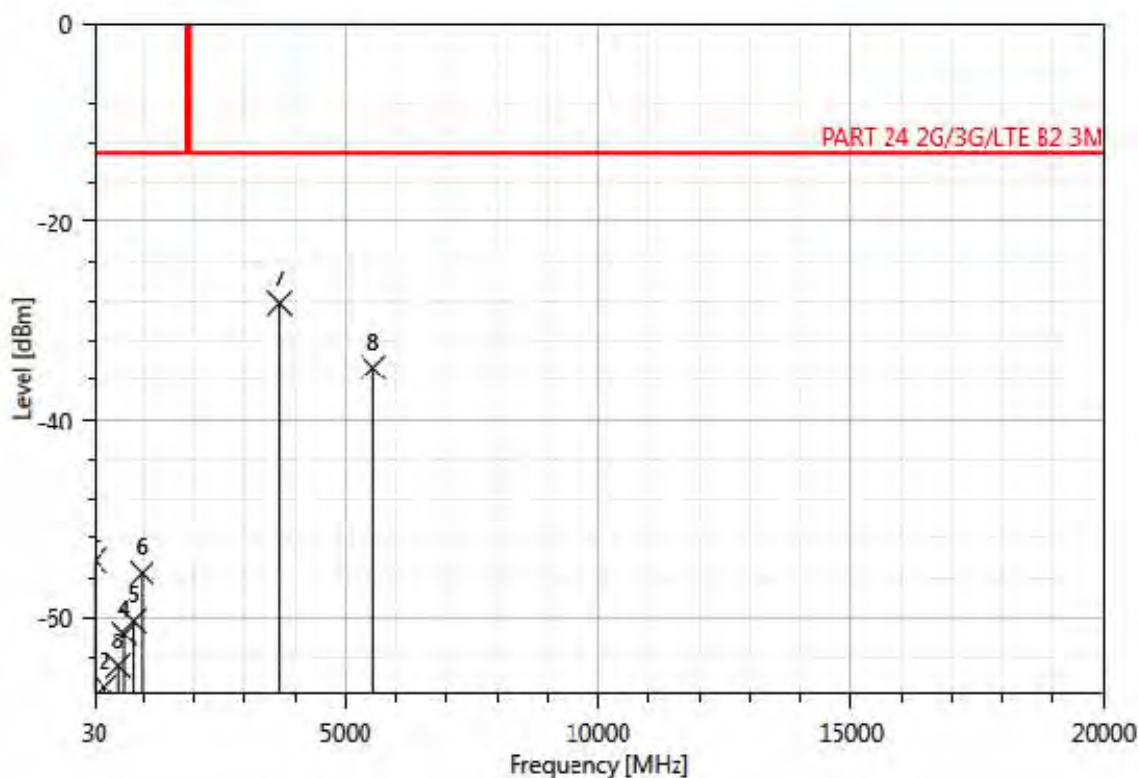
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Radiated Spurious Emission Measurement Result: GPRS 1900 Mode

Operation Mode :	GPRS 1900	Test Date :	12/14/2016
Fundamental Frequency :	1850.2 MHz	Temp. / Humi. :	21 deg_C / 62 RH
Operation Band :	Tx CH LOW	Test Engineer :	Mike
EUT Pol. :	E2 Plane	Measurement Antenna Pol. :	VERTICAL



Freq.	Note	Decetor	EIRP	SG Output	Antenna	Cable	Limit	Margin
MHz	F/H/E/S	Mode	Level	Level	Gain	Loss	@3m	dB
		QP/AV/PK	dBm	dBm	dBi	dB	dBm	
39.70	S	Peak	-54.19	-42.24	-10.96	-0.99	-13.00	-41.19
236.61	S	Peak	-66.93	-70.58	5.38	-1.73	-13.00	-53.93
513.06	S	Peak	-64.81	-68.39	5.94	-2.35	-13.00	-51.81
624.61	S	Peak	-61.61	-64.44	5.34	-2.51	-13.00	-48.61
806.00	S	Peak	-60.27	-62.86	5.48	-2.89	-13.00	-47.27
972.84	S	Peak	-55.44	-57.92	5.65	-3.17	-13.00	-42.44
3700.40	H	Peak	-28.19	-34.05	12.44	-6.58	-13.00	-15.19
5550.60	H	Peak	-34.70	-39.36	12.90	-8.24	-13.00	-21.70

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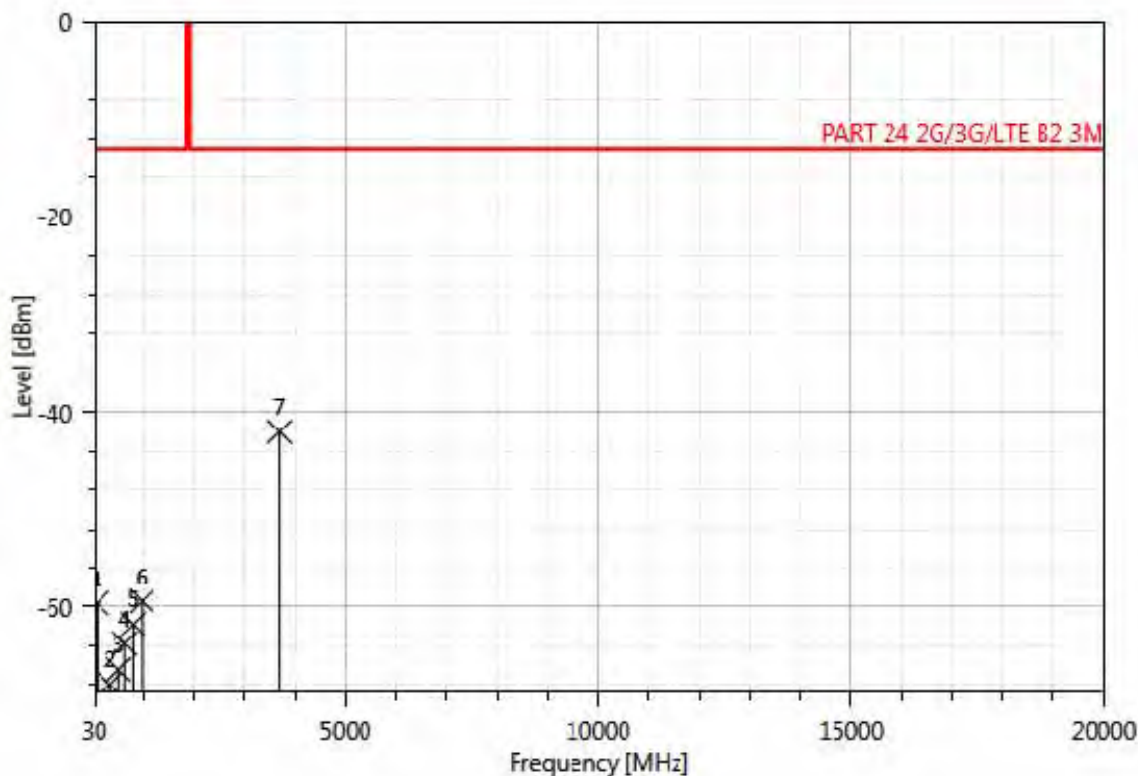
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Operation Mode :	GPRS 1900	Test Date :	12/14/2016
Fundamental Frequency :	1850.2 MHz	Temp. / Humi. :	21 deg_C / 62 RH
Operation Band :	Tx CH LOW	Test Engineer :	Mike
EUT Pol. :	E2 Plane	Measurement Antenna Pol. :	HORIZONTAL



Freq. MHz	Note F/H/E/S	Decetor Mode QP/AV/PK	EIRP Level dBm	SG Output Level dBm	Antenna Gain dBi	Cable Loss dB	Limit @3m dBm	Margin dB
85.29	S	Peak	-59.62	-59.04	0.61	-1.19	-13.00	-46.62
343.31	S	Peak	-67.96	-71.94	5.98	-1.99	-13.00	-54.96
513.06	S	Peak	-66.41	-69.99	5.94	-2.35	-13.00	-53.41
633.34	S	Peak	-63.75	-66.62	5.32	-2.46	-13.00	-50.75
798.24	S	Peak	-61.77	-64.36	5.49	-2.90	-13.00	-48.77
972.84	S	Peak	-59.40	-61.89	5.65	-3.17	-13.00	-46.40
3700.40	H	Peak	-42.02	-47.88	12.44	-6.58	-13.00	-29.02

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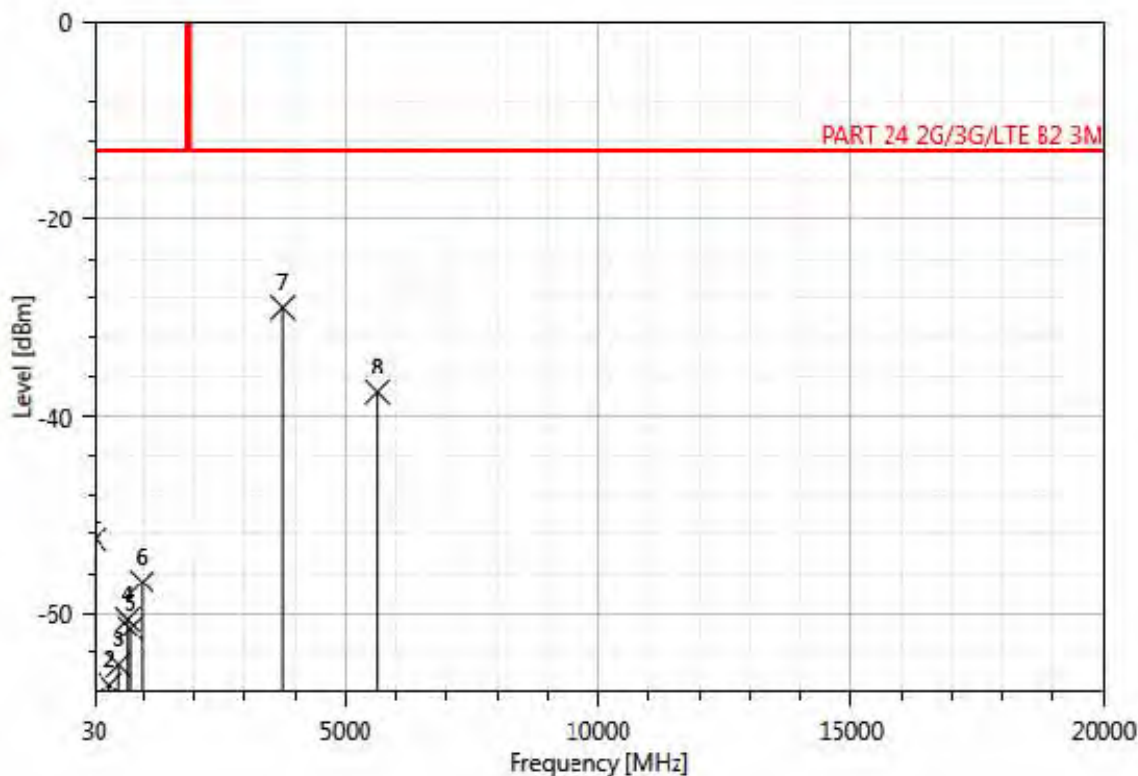
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f (886-2) 2298-0488

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Operation Mode : GPRS 1900 Test Date : 12/14/2016
Fundamental Frequency : 1880 MHz Temp. / Humi. : 21 deg_C / 62 RH
Operation Band : Tx CH MID Test Engineer : Mike
EUT Pol. : E2 Plane Measurement Antenna Pol. : VERTICAL



Freq. MHz	Note F/H/E/S	Decetor Mode QP/AV/PK	EIRP Level dBm	SG Output Level dBm	Antenna Gain dBi	Cable Loss dB	Limit @3m dBm	Margin dB
41.64	S	Peak	-52.49	-40.80	-10.68	-1.00	-13.00	-39.49
335.55	S	Peak	-67.23	-71.24	5.95	-1.93	-13.00	-54.23
515.97	S	Peak	-65.21	-68.76	5.92	-2.36	-13.00	-52.21
691.54	S	Peak	-60.60	-63.02	5.24	-2.83	-13.00	-47.60
740.04	S	Peak	-61.52	-63.70	5.31	-3.14	-13.00	-48.52
972.84	S	Peak	-56.81	-59.29	5.65	-3.17	-13.00	-43.81
3760.00	H	Peak	-28.95	-34.80	12.45	-6.60	-13.00	-15.95
5640.00	H	Peak	-37.58	-42.12	12.90	-8.36	-13.00	-24.58

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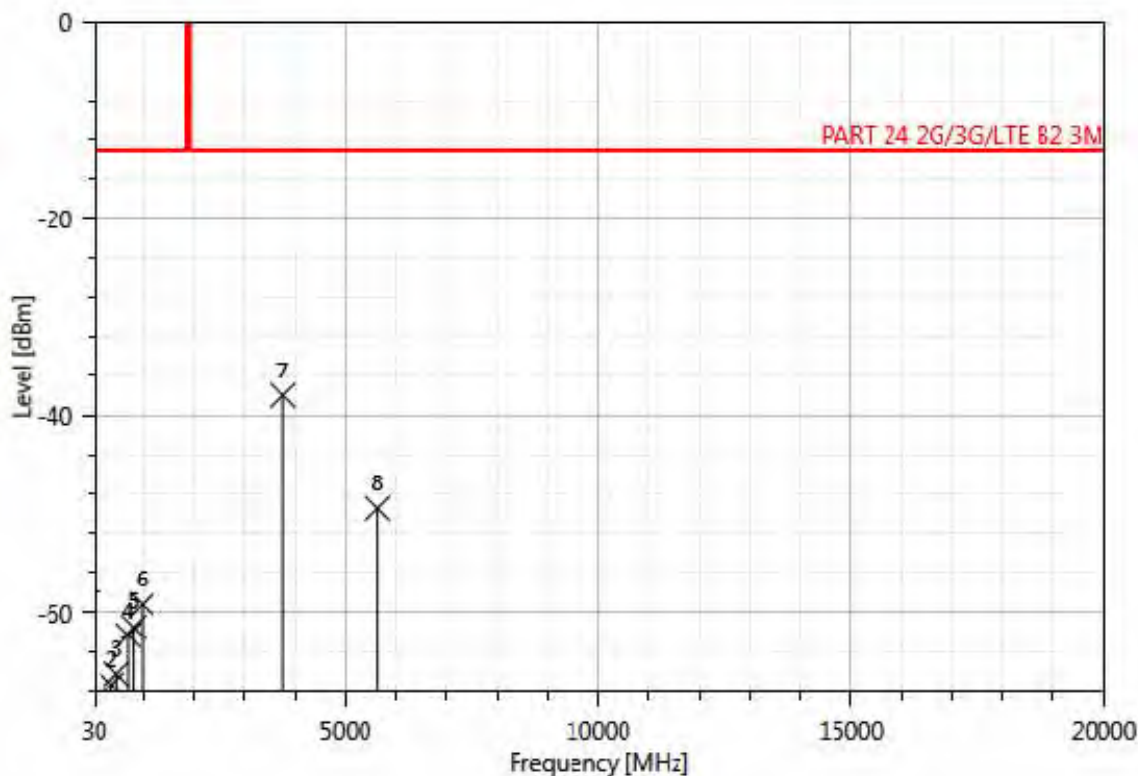
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Operation Mode :	GPRS 1900	Test Date :	12/14/2016
Fundamental Frequency :	1880 MHz	Temp. / Humi. :	21 deg_C / 62 RH
Operation Band :	Tx CH MID	Test Engineer :	Mike
EUT Pol. :	E2 Plane	Measurement Antenna Pol. :	HORIZONTAL



Freq.	Note	Decetor	EIRP	SG Output	Antenna	Cable	Limit	Margin
MHz	F/H/E/S	Mode	Level	Level	Gain	Loss	@3m	dB
		QP/AV/PK	dBm	dBm	dBi	dB	dBm	
30.00	S	Peak	-59.84	-46.26	-12.63	-0.96	-13.00	-46.84
377.26	S	Peak	-67.35	-71.10	5.99	-2.24	-13.00	-54.35
473.29	S	Peak	-66.25	-69.92	5.90	-2.23	-13.00	-53.25
702.21	S	Peak	-62.36	-64.58	5.24	-3.02	-13.00	-49.36
806.00	S	Peak	-61.51	-64.10	5.48	-2.89	-13.00	-48.51
978.66	S	Peak	-59.23	-61.81	5.77	-3.19	-13.00	-46.23
3760.00	H	Peak	-37.96	-43.81	12.45	-6.60	-13.00	-24.96
5640.00	H	Peak	-49.43	-53.97	12.90	-8.36	-13.00	-36.43

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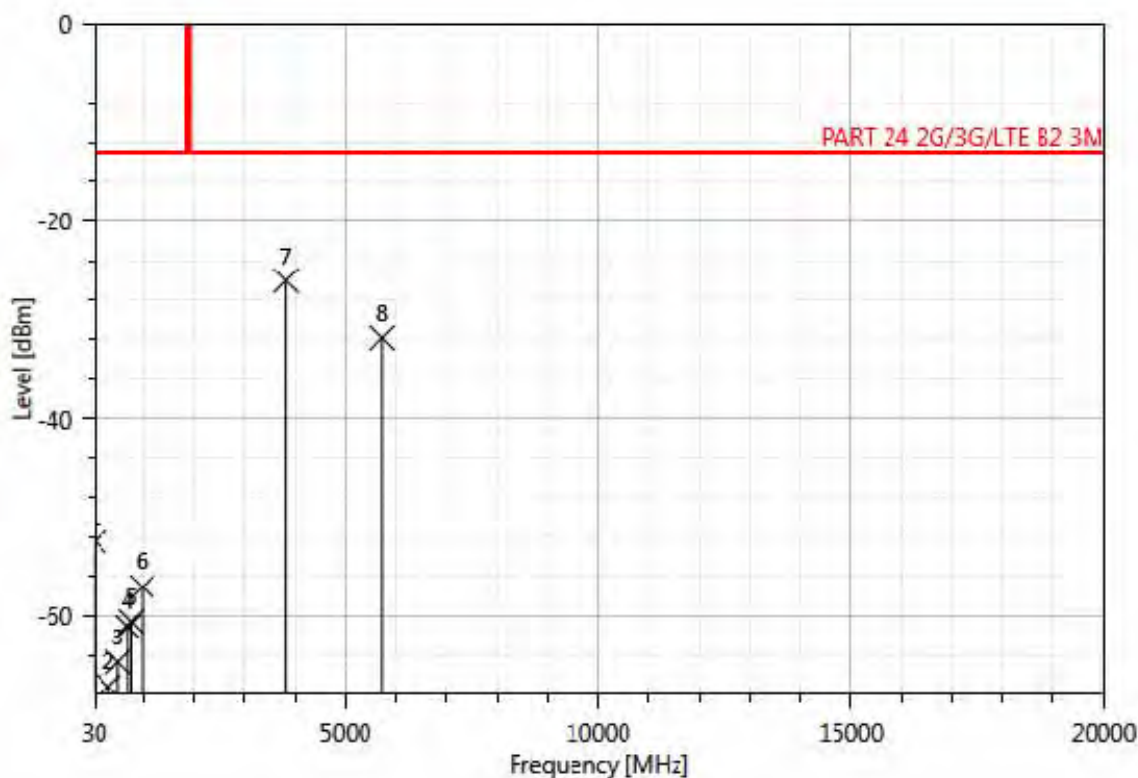
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Operation Mode :	GPRS 1900	Test Date :	12/14/2016
Fundamental Frequency :	1909.8 MHz	Temp. / Humi. :	21 deg_C / 62 RH
Operation Band :	Tx CH HIGH	Test Engineer :	Mike
EUT Pol. :	E2 Plane	Measurement Antenna Pol. :	VERTICAL



Freq.	Note	Decetor	EIRP	SG Output	Antenna	Cable	Limit	Margin
MHz	F/H/E/S	Mode	Level	Level	Gain	Loss	@3m	
		QP/AV/PK	dBm	dBm	dBi	dB	dBm	dB
37.76	S	Peak	-52.45	-40.30	-11.17	-0.98	-13.00	-39.45
313.24	S	Peak	-67.16	-71.07	5.84	-1.93	-13.00	-54.16
498.51	S	Peak	-64.68	-68.38	6.00	-2.30	-13.00	-51.68
696.39	S	Peak	-61.12	-63.45	5.24	-2.91	-13.00	-48.12
759.44	S	Peak	-60.54	-62.88	5.36	-3.02	-13.00	-47.54
977.69	S	Peak	-57.06	-59.63	5.75	-3.19	-13.00	-44.06
3819.60	H	Peak	-26.02	-31.83	12.47	-6.65	-13.00	-13.02
5729.40	H	Peak	-31.88	-36.39	12.90	-8.39	-13.00	-18.88

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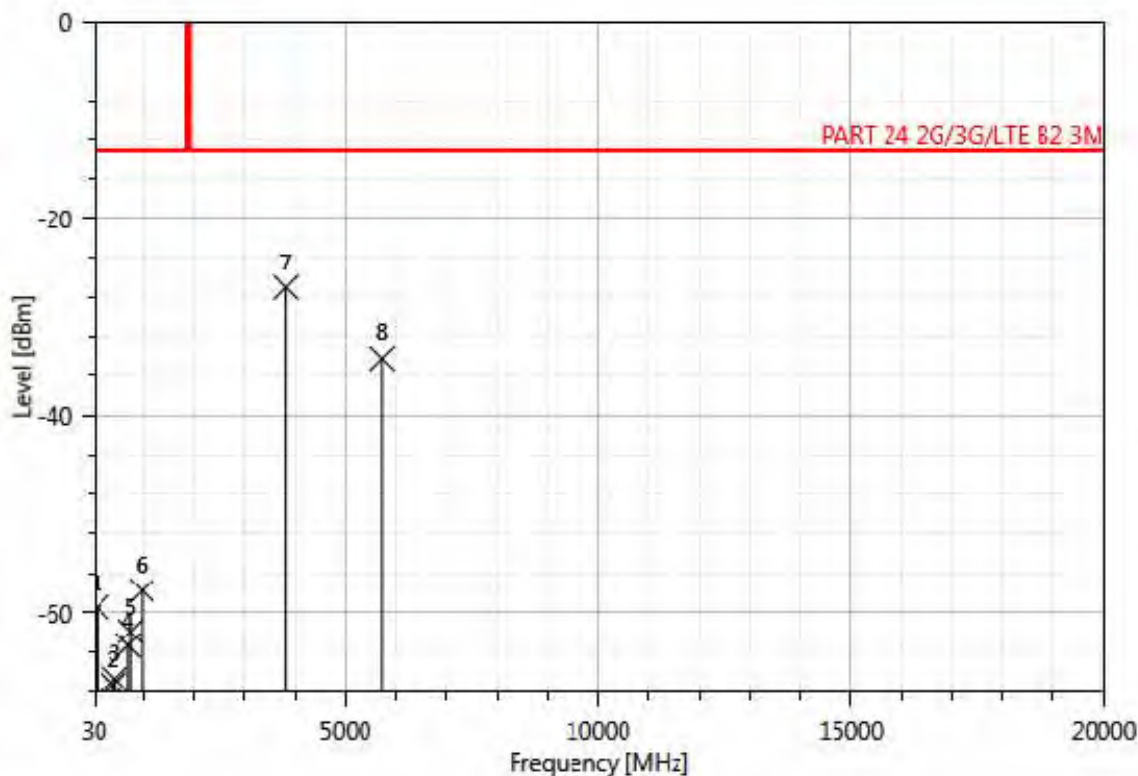
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Operation Mode :	GPRS 1900	Test Date :	12/14/2016
Fundamental Frequency :	1909.8 MHz	Temp. / Humi. :	21 deg_C / 62 RH
Operation Band :	Tx CH HIGH	Test Engineer :	Mike
EUT Pol. :	E2 Plane	Measurement Antenna Pol. :	HORIZONTAL



Freq.	Note	Decetor	EIRP	SG Output	Antenna	Cable	Limit	Margin
MHz	F/H/E/S	Mode	Level	Level	Gain	Loss	@3m	dB
		QP/AV/PK	dBm	dBm	dBi	dB	dBm	
85.29	S	Peak	-59.49	-58.91	0.61	-1.19	-13.00	-46.49
411.21	S	Peak	-67.33	-70.87	5.93	-2.39	-13.00	-54.33
442.25	S	Peak	-66.74	-70.37	5.82	-2.19	-13.00	-53.74
697.36	S	Peak	-63.35	-65.65	5.23	-2.93	-13.00	-50.35
744.89	S	Peak	-61.96	-64.17	5.32	-3.11	-13.00	-48.96
972.84	S	Peak	-57.79	-60.28	5.65	-3.17	-13.00	-44.79
3819.60	H	Peak	-26.98	-32.79	12.47	-6.65	-13.00	-13.98
5729.40	H	Peak	-34.20	-38.71	12.90	-8.39	-13.00	-21.20

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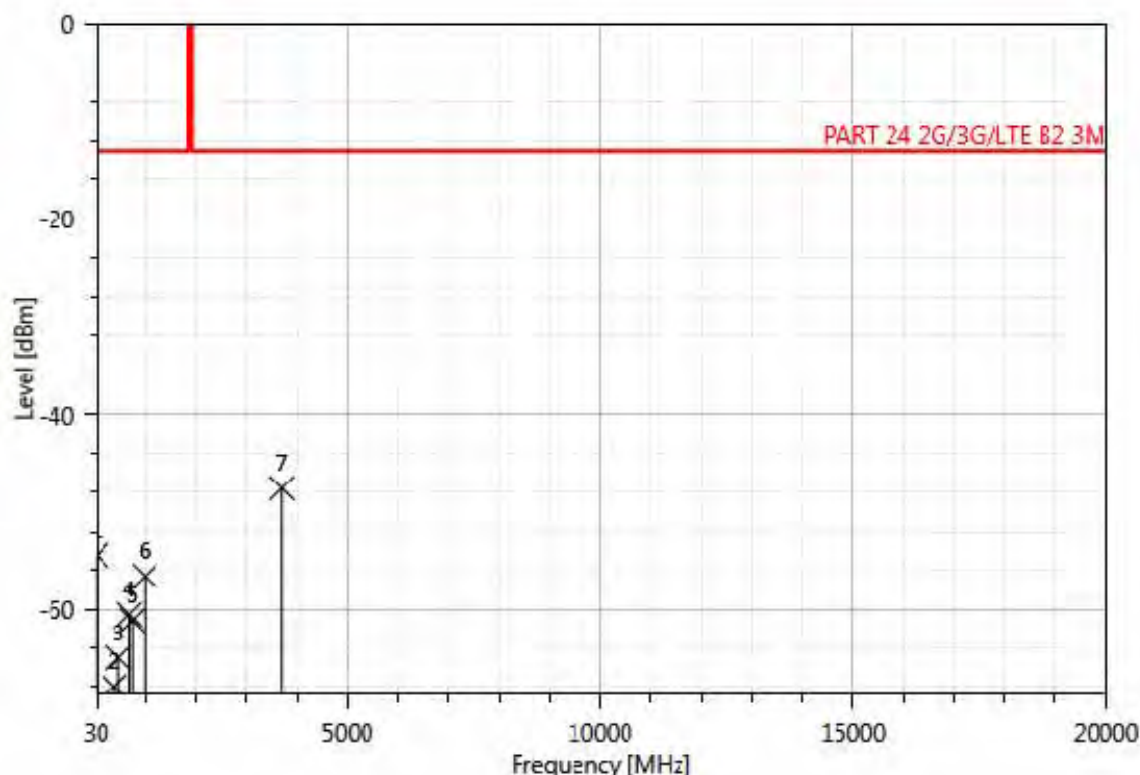
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Radiated Spurious Emission Measurement Result: HSDPA Band II Mode

Operation Mode :	HSDPA B2	Test Date :	12/14/2016
Fundamental Frequency :	1852.4 MHz	Temp. / Humi. :	21 deg_C / 62 RH
Operation Band :	Tx CH LOW	Test Engineer :	Mike
EUT Pol. :	E2 Plane	Measurement Antenna Pol. :	VERTICAL



Freq. MHz	Note F/H/E/S	Decetor Mode QP/AV/PK	EIRP Level dBm	SG Output Level dBm	Antenna Gain dBi	Cable Loss dB	Limit @3m dBm	Margin dB
39.70	S	Peak	-54.52	-42.57	-10.96	-0.99	-13.00	-41.52
386.96	S	Peak	-67.94	-71.62	5.98	-2.30	-13.00	-54.94
471.35	S	Peak	-64.99	-68.66	5.89	-2.22	-13.00	-51.99
682.81	S	Peak	-60.53	-63.11	5.25	-2.67	-13.00	-47.53
744.89	S	Peak	-61.17	-63.38	5.32	-3.11	-13.00	-48.17
990.30	S	Peak	-56.62	-59.39	6.01	-3.24	-13.00	-43.62
3704.80	H	Peak	-47.60	-53.46	12.44	-6.58	-13.00	-34.60

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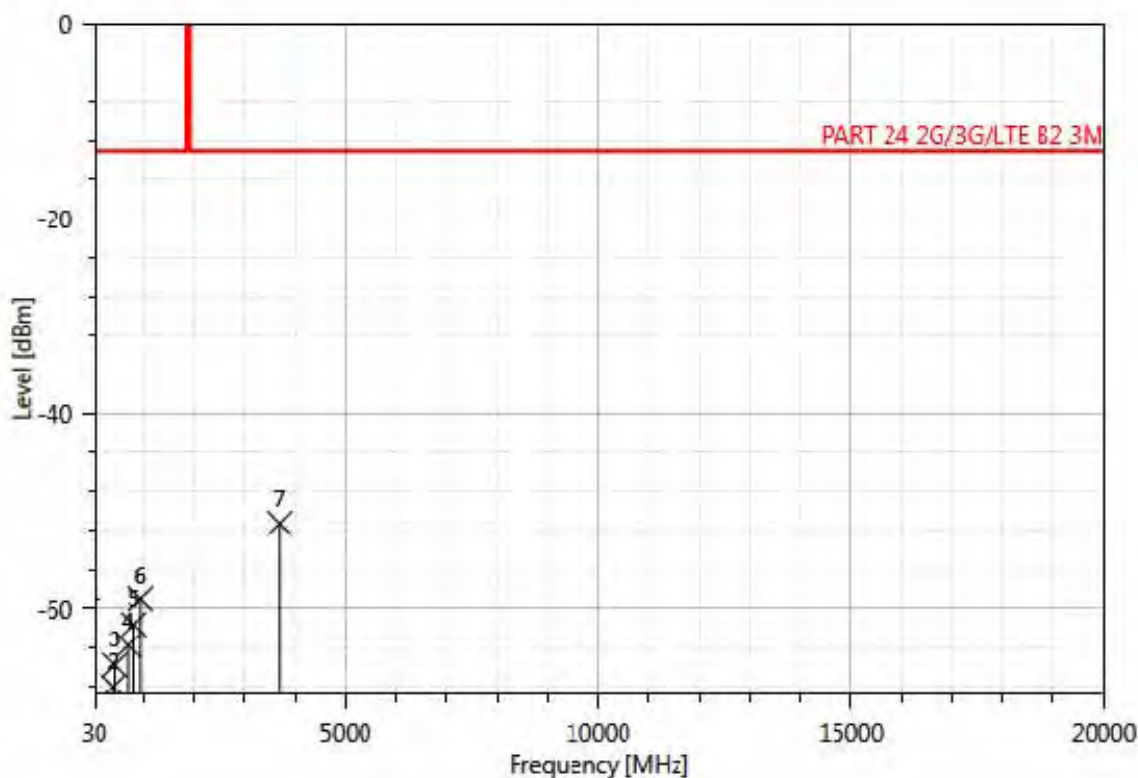
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Operation Mode :	HSDPA B2	Test Date :	12/14/2016
Fundamental Frequency :	1852.4 MHz	Temp. / Humi. :	21 deg_C / 62 RH
Operation Band :	Tx CH LOW	Test Engineer :	Mike
EUT Pol. :	E2 Plane	Measurement Antenna Pol. :	HORIZONTAL



Freq.	Note	Decetor	EIRP	SG Output	Antenna	Cable	Limit	Margin
MHz	F/H/E/S	QP/AV/PK	Level dBm	Level dBm	Gain dBi	Loss dB	@3m dBm	dB
30.00	S	Peak	-60.99	-47.40	-12.63	-0.96	-13.00	-47.99
418.00	S	Peak	-68.02	-71.58	5.91	-2.35	-13.00	-55.02
445.16	S	Peak	-65.81	-69.44	5.81	-2.18	-13.00	-52.81
702.21	S	Peak	-63.81	-66.03	5.24	-3.02	-13.00	-50.81
803.09	S	Peak	-61.66	-64.25	5.49	-2.90	-13.00	-48.66
934.04	S	Peak	-59.08	-61.11	5.26	-3.23	-13.00	-46.08
3704.80	H	Peak	-51.25	-57.12	12.44	-6.58	-13.00	-38.25

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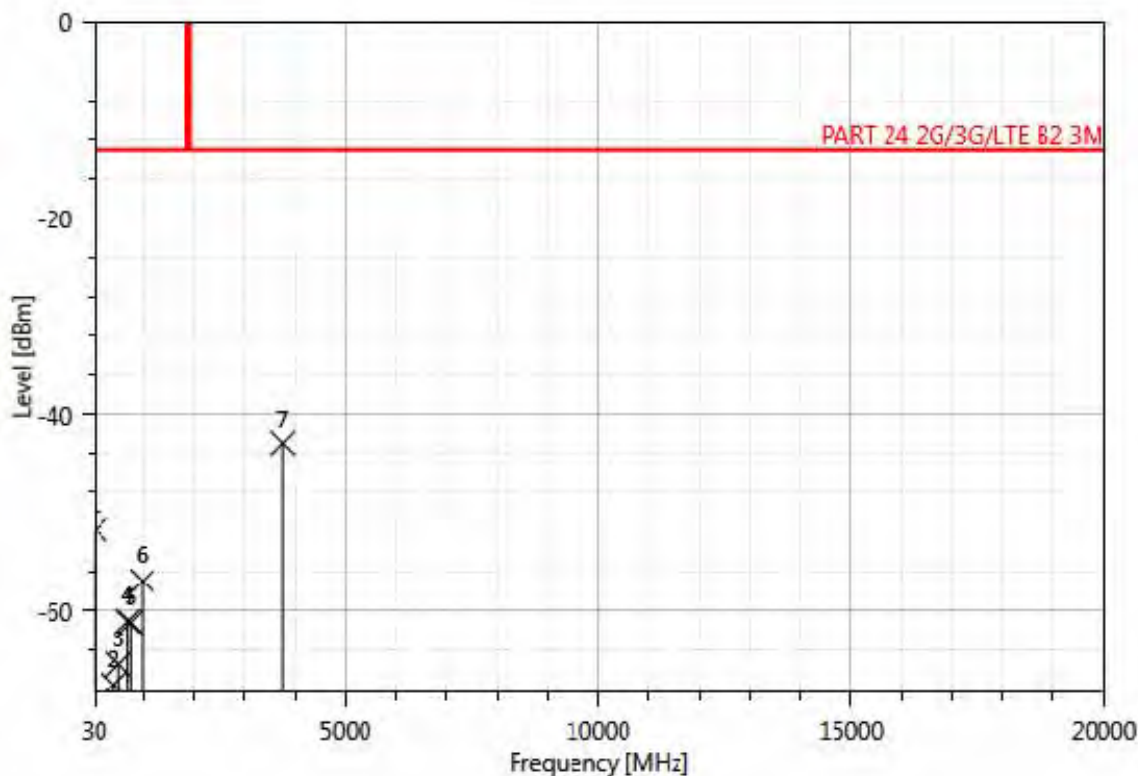
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Operation Mode :	HSDPA B2	Test Date :	12/14/2016
Fundamental Frequency :	1880 MHz	Temp. / Humi. :	21 deg_C / 62 RH
Operation Band :	Tx CH MID	Test Engineer :	Mike
EUT Pol. :	E2 Plane	Measurement Antenna Pol. :	VERTICAL



Freq.	Note	Decetor	EIRP	SG Output	Antenna	Cable	Limit	Margin
MHz	F/H/E/S	QP/AV/PK	Level dBm	Level dBm	Gain dBi	Loss dB	@3m dBm	dB
39.70	S	Peak	-51.78	-39.83	-10.96	-0.99	-13.00	-38.78
416.06	S	Peak	-67.57	-71.13	5.91	-2.36	-13.00	-54.57
515.00	S	Peak	-65.49	-69.06	5.92	-2.36	-13.00	-52.49
689.60	S	Peak	-61.10	-63.55	5.24	-2.79	-13.00	-48.10
752.65	S	Peak	-61.22	-63.50	5.34	-3.06	-13.00	-48.22
980.60	S	Peak	-57.02	-59.63	5.81	-3.20	-13.00	-44.02
3760.00	H	Peak	-43.00	-48.86	12.45	-6.60	-13.00	-30.00

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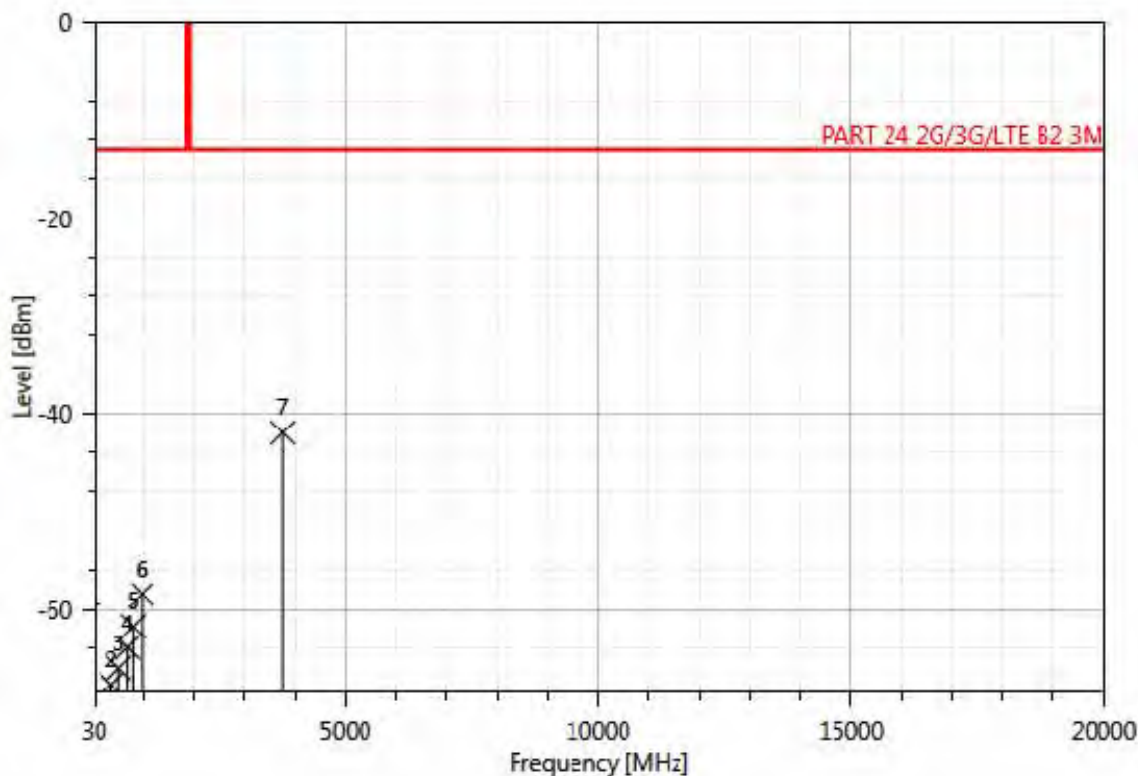
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Operation Mode :	HSDPA B2	Test Date :	12/14/2016
Fundamental Frequency :	1880 MHz	Temp. / Humi. :	21 deg_C / 62 RH
Operation Band :	Tx CH MID	Test Engineer :	Mike
EUT Pol. :	E2 Plane	Measurement Antenna Pol. :	HORIZONTAL



Freq.	Note	Decetor	EIRP	SG Output	Antenna	Cable	Limit	Margin
MHz	F/H/E/S	QP/AV/PK	Level dBm	Level dBm	Gain dBi	Loss dB	@3m dBm	dB
30.00	S	Peak	-61.29	-47.71	-12.63	-0.96	-13.00	-48.29
367.56	S	Peak	-67.69	-71.50	6.00	-2.18	-13.00	-54.69
515.00	S	Peak	-66.01	-69.57	5.92	-2.36	-13.00	-53.01
687.66	S	Peak	-63.89	-66.38	5.25	-2.76	-13.00	-50.89
798.24	S	Peak	-61.74	-64.32	5.49	-2.90	-13.00	-48.74
972.84	S	Peak	-58.51	-60.99	5.65	-3.17	-13.00	-45.51
3760.00	H	Peak	-41.95	-47.81	12.45	-6.60	-13.00	-28.95

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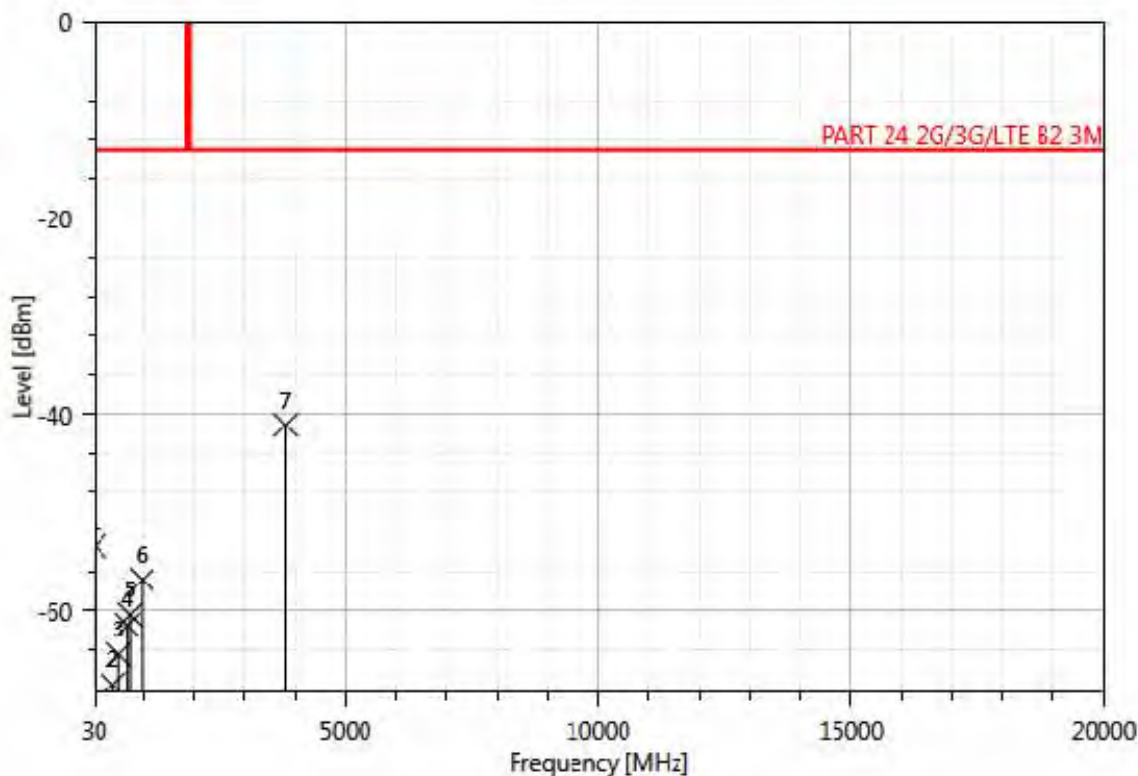
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Operation Mode :	HSDPA B2	Test Date :	12/14/2016
Fundamental Frequency :	1907.6 MHz	Temp. / Humi. :	21 deg_C / 62 RH
Operation Band :	Tx CH HIGH	Test Engineer :	Mike
EUT Pol. :	E2 Plane	Measurement Antenna Pol. :	VERTICAL



Freq. MHz	Note F/H/E/S	Decetor Mode QP/AV/PK	EIRP Level dBm	SG Output Level dBm	Antenna Gain dBi	Cable Loss dB	Limit @3m dBm	Margin dB
41.64	S	Peak	-53.47	-41.79	-10.68	-1.00	-13.00	-40.47
400.54	S	Peak	-67.55	-71.14	5.97	-2.38	-13.00	-54.55
515.97	S	Peak	-64.50	-68.06	5.92	-2.36	-13.00	-51.50
686.69	S	Peak	-61.49	-64.00	5.25	-2.74	-13.00	-48.49
741.01	S	Peak	-60.44	-62.62	5.31	-3.13	-13.00	-47.44
975.75	S	Peak	-56.87	-59.40	5.71	-3.18	-13.00	-43.87
3815.20	H	Peak	-41.09	-46.93	12.46	-6.63	-13.00	-28.09

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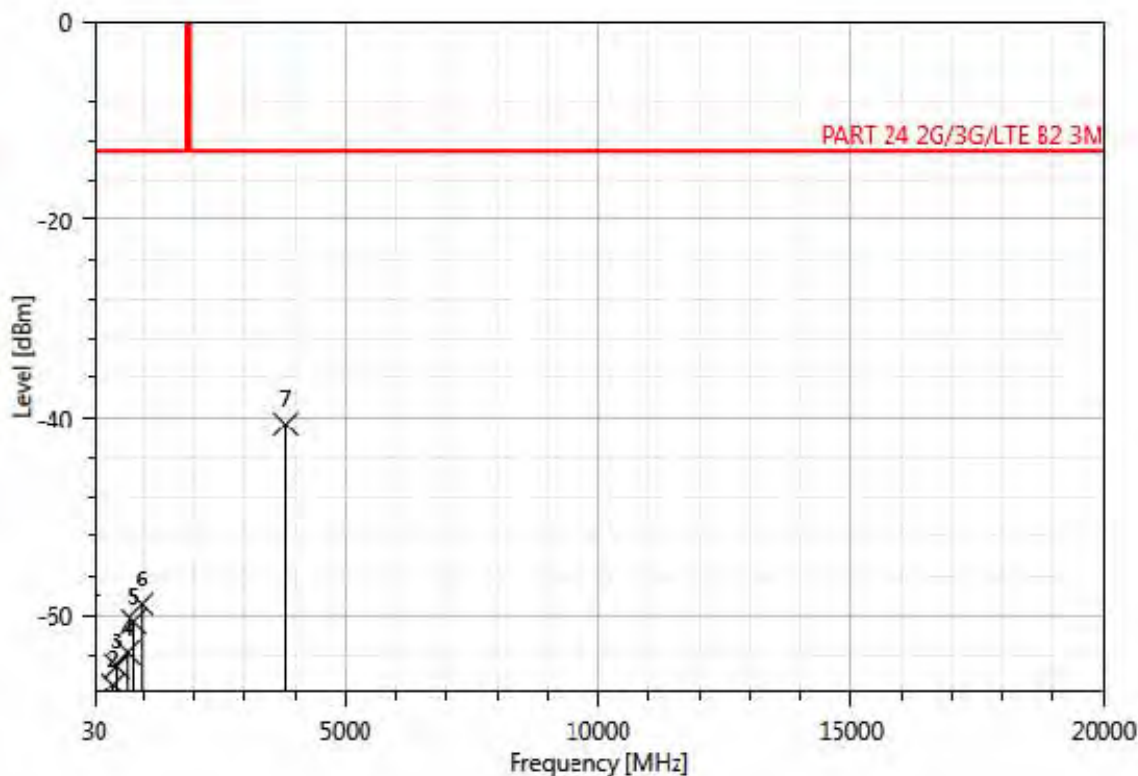
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Operation Mode :	HSDPA B2	Test Date :	12/14/2016
Fundamental Frequency :	1907.6 MHz	Temp. / Humi. :	21 deg_C / 62 RH
Operation Band :	Tx CH HIGH	Test Engineer :	Mike
EUT Pol. :	E2 Plane	Measurement Antenna Pol. :	HORIZONTAL



Freq.	Note	Decetor	EIRP	SG Output	Antenna	Cable	Limit	Margin
MHz	F/H/E/S	Mode	Level	Level	Gain	Loss	@3m	
		QP/AV/PK	dBm	dBm	dBi	dB	dBm	dB
30.00	S	Peak	-59.74	-46.16	-12.63	-0.96	-13.00	-46.74
406.36	S	Peak	-66.96	-70.49	5.95	-2.42	-13.00	-53.96
482.99	S	Peak	-65.10	-68.80	5.94	-2.25	-13.00	-52.10
692.51	S	Peak	-63.75	-66.15	5.24	-2.84	-13.00	-50.75
801.15	S	Peak	-60.56	-63.16	5.49	-2.90	-13.00	-47.56
967.99	S	Peak	-58.84	-61.24	5.56	-3.15	-13.00	-45.84
3815.20	H	Peak	-40.65	-46.48	12.46	-6.63	-13.00	-27.65

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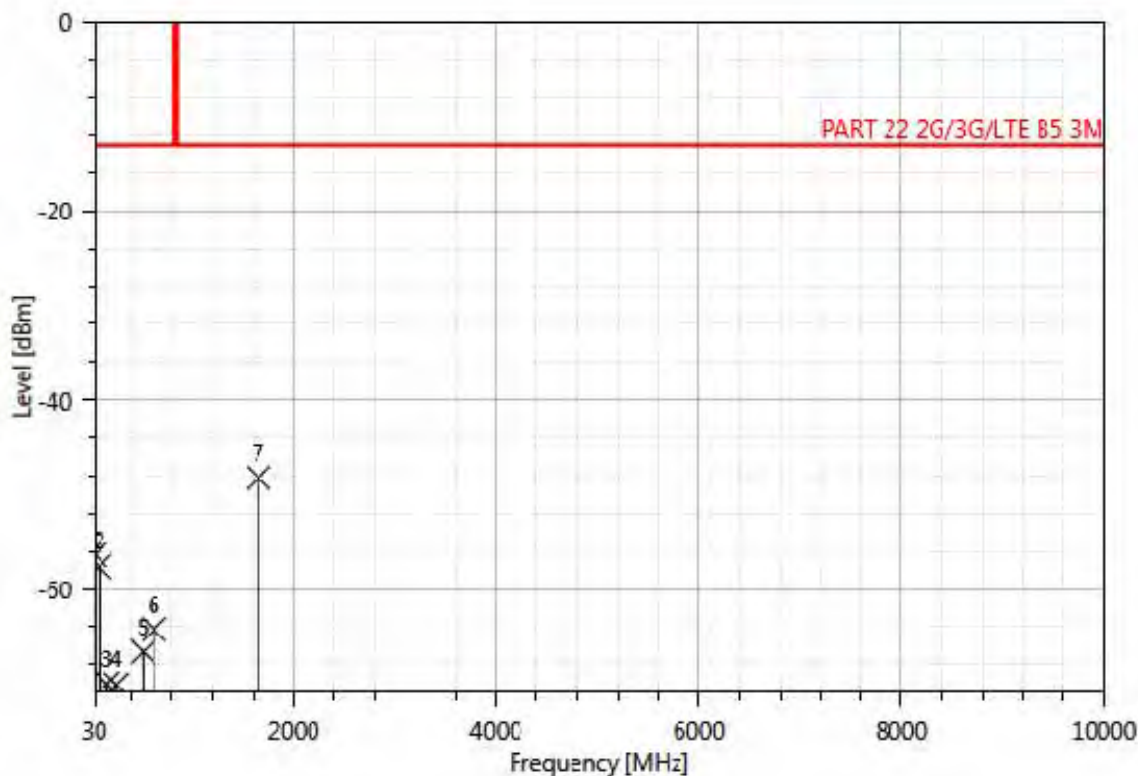
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Radiated Spurious Emission Measurement Result: HSUPA V Mode

Operation Mode :	HSUPA B5	Test Date :	12/14/2016
Fundamental Frequency :	824.2 MHz	Temp. / Humi. :	21 deg_C / 62 RH
Operation Band :	Tx CH LOW	Test Engineer :	Mike
EUT Pol. :	E1 Plane	Measurement Antenna Pol. :	VERTICAL



Freq.	Note	Decetor	ERP	SG Output	Antenna	Cable	Limit	Margin
MHz	F/H/E/S	Mode	Level	Level	Gain	Loss	@3m	dB
		QP/AV/PK	dBm	dBm	dBd	dB	dBm	
36.79	S	Peak	-56.35	-41.94	-13.43	-0.98	-13.00	-43.35
78.50	S	Peak	-57.59	-53.14	-3.29	-1.15	-13.00	-44.59
159.98	S	Peak	-70.01	-66.90	-1.64	-1.48	-13.00	-57.01
250.19	S	Peak	-70.09	-71.78	3.44	-1.76	-13.00	-57.09
512.09	S	Peak	-66.64	-68.08	3.79	-2.35	-13.00	-53.64
619.76	S	Peak	-64.25	-64.90	3.20	-2.55	-13.00	-51.25
1652.80	H	Peak	-48.23	-51.11	7.12	-4.24	-13.00	-35.23

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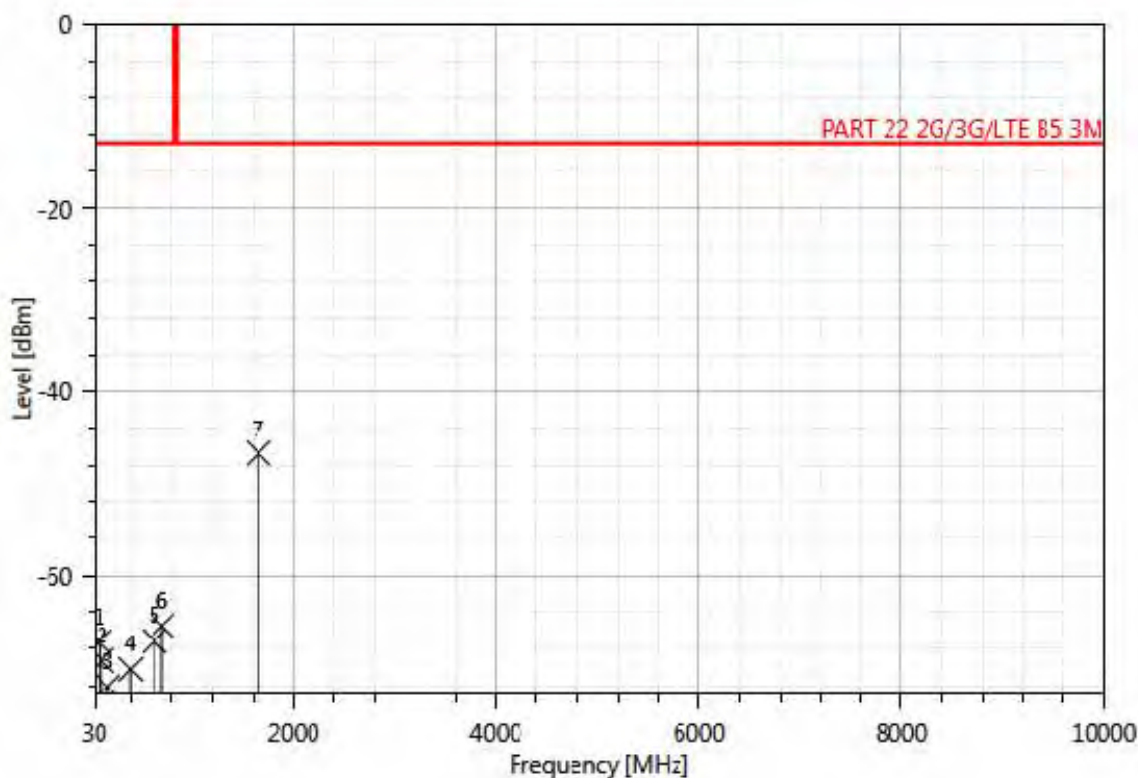
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Operation Mode :	HSUPA B5	Test Date :	12/14/2016
Fundamental Frequency :	824.2 MHz	Temp. / Humi. :	21 deg_C / 62 RH
Operation Band :	Tx CH LOW	Test Engineer :	Mike
EUT Pol. :	E1 Plane	Measurement Antenna Pol. :	HORIZONTAL



Freq.	Note	Decetor	ERP	SG Output	Antenna	Cable	Limit	Margin
MHz	F/H/E/S	Mode	Level	Level	Gain	Loss	@3m	
		QP/AV/PK	dBm	dBm	dBd	dB	dBm	dB
82.38	S	Peak	-67.24	-63.81	-2.26	-1.17	-13.00	-54.24
104.69	S	Peak	-69.26	-65.95	-2.04	-1.27	-13.00	-56.26
165.80	S	Peak	-72.11	-69.40	-1.21	-1.50	-13.00	-59.11
388.90	S	Peak	-70.22	-71.73	3.83	-2.31	-13.00	-57.22
623.64	S	Peak	-67.16	-67.84	3.19	-2.52	-13.00	-54.16
702.21	S	Peak	-65.52	-65.59	3.09	-3.02	-13.00	-52.52
1652.80	H	Peak	-46.69	-49.58	7.12	-4.24	-13.00	-33.69

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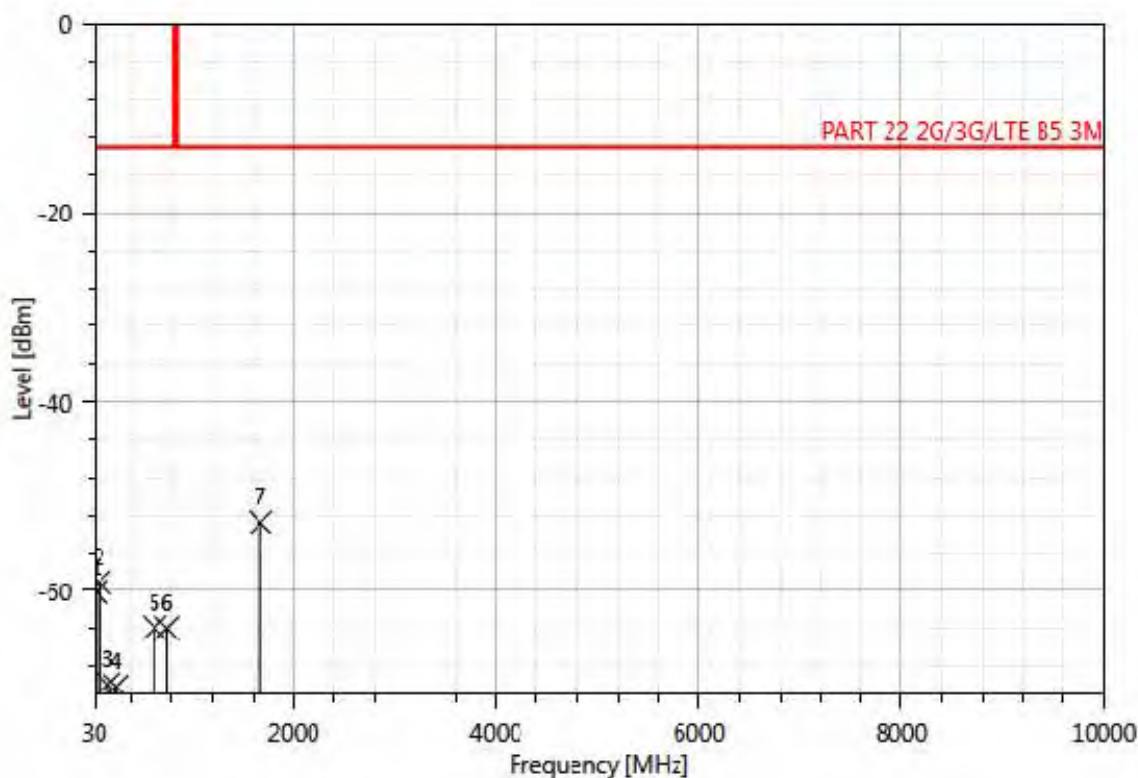
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Operation Mode : HSUPA B5 Test Date : 12/14/2016
Fundamental Frequency : 836.6 MHz Temp. / Humi. : 21 deg_C / 62 RH
Operation Band : Tx CH MID Test Engineer : Mike
EUT Pol. : E1 Plane Measurement Antenna Pol. : VERTICAL



Freq. MHz	Note F/H/E/S	Decetor Mode QP/AV/PK	ERP Level dBm	SG Output Level dBm	Antenna Gain dBd	Cable Loss dB	Limit @3m dBm	Margin dB
47.46	S	Peak	-60.09	-47.22	-11.84	-1.03	-13.00	-47.09
76.56	S	Peak	-59.10	-54.09	-3.87	-1.14	-13.00	-46.10
168.71	S	Peak	-69.90	-67.38	-1.00	-1.51	-13.00	-56.90
250.19	S	Peak	-70.11	-71.80	3.44	-1.76	-13.00	-57.11
626.55	S	Peak	-63.86	-64.56	3.19	-2.49	-13.00	-50.86
750.71	S	Peak	-63.93	-64.04	3.18	-3.07	-13.00	-50.93
1673.20	H	Peak	-52.73	-55.64	7.20	-4.29	-13.00	-39.73

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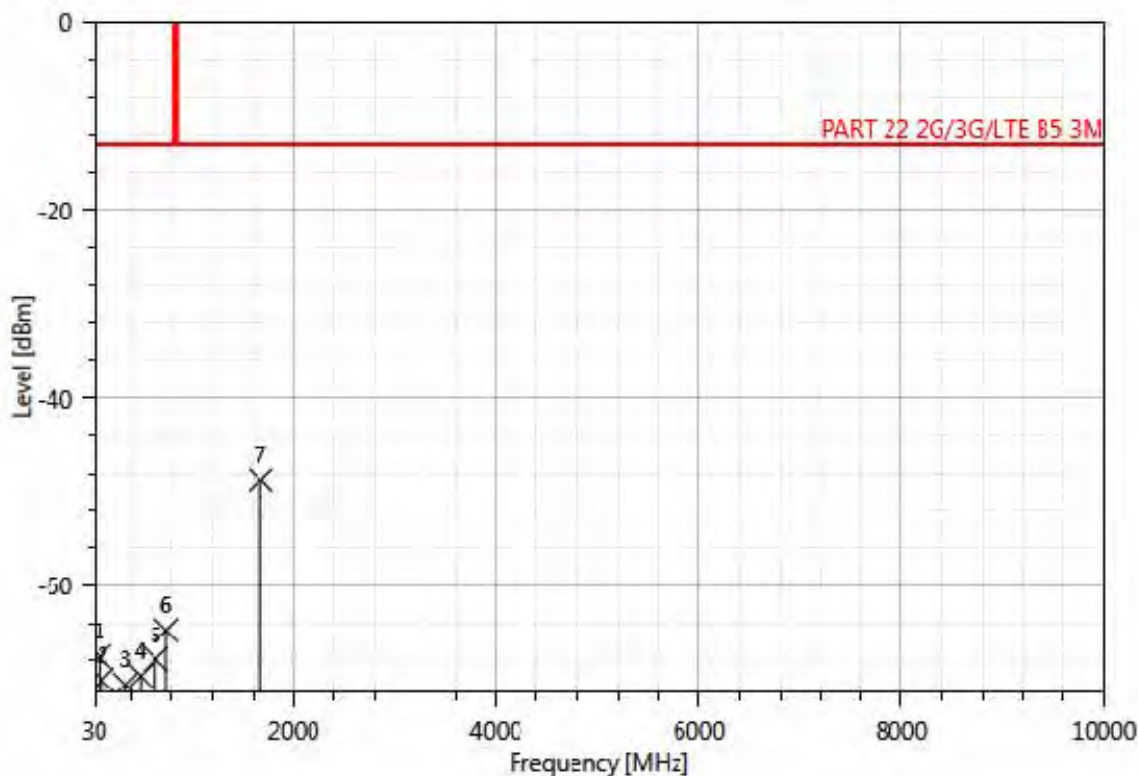
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Operation Mode :	HSUPA B5	Test Date :	12/14/2016
Fundamental Frequency :	836.6 MHz	Temp. / Humi. :	21 deg_C / 62 RH
Operation Band :	Tx CH MID	Test Engineer :	Mike
EUT Pol. :	E1 Plane	Measurement Antenna Pol. :	HORIZONTAL



Freq.	Note	Decetor	ERP	SG Output	Antenna	Cable	Limit	Margin
MHz	F/H/E/S	Mode	Level	Level	Gain	Loss	@3m	
		QP/AV/PK	dBm	dBm	dBd	dB	dBm	dB
81.41	S	Peak	-67.51	-63.85	-2.50	-1.17	-13.00	-54.51
106.63	S	Peak	-70.00	-66.52	-2.21	-1.27	-13.00	-57.00
338.46	S	Peak	-70.50	-72.36	3.81	-1.95	-13.00	-57.50
485.90	S	Peak	-69.59	-71.14	3.80	-2.26	-13.00	-56.59
638.19	S	Peak	-67.82	-68.54	3.16	-2.44	-13.00	-54.82
741.98	S	Peak	-64.72	-64.76	3.17	-3.13	-13.00	-51.72
1673.20	H	Peak	-48.74	-51.65	7.20	-4.29	-13.00	-35.74

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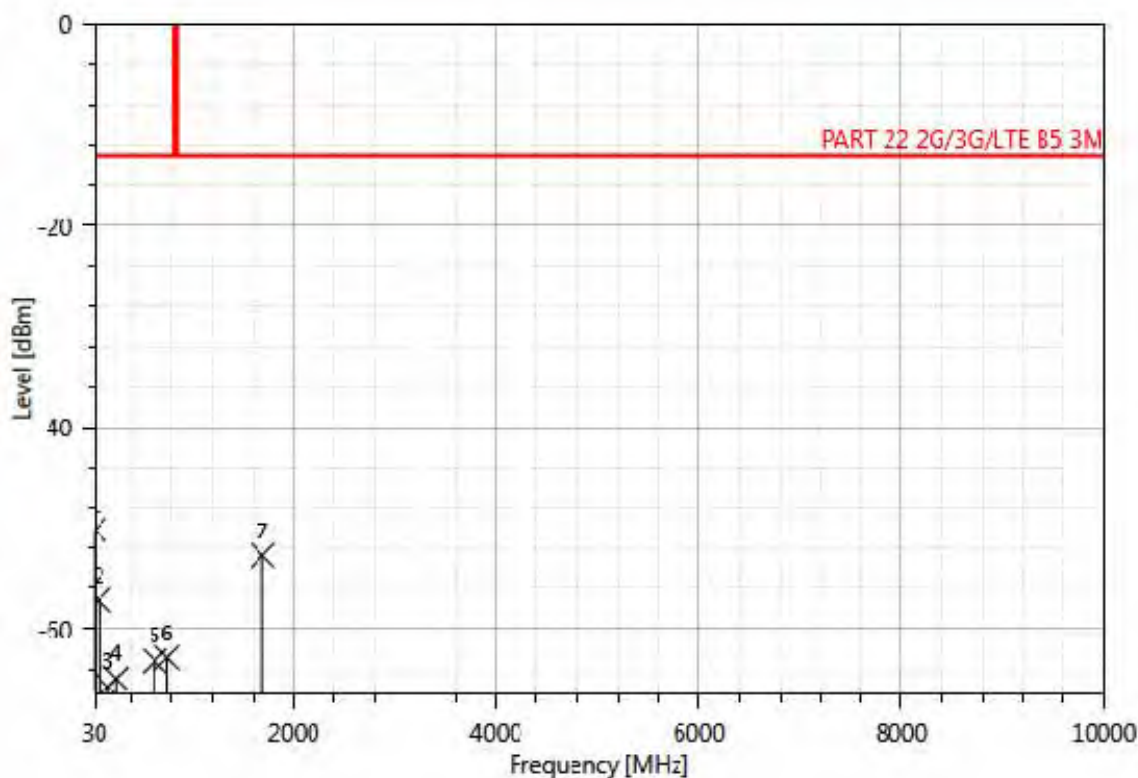
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Operation Mode : HSUPA B5 Test Date : 12/14/2016
Fundamental Frequency : 848.8 MHz Temp. / Humi. : 21 deg_C / 62 RH
Operation Band : Tx CH HIGH Test Engineer : Mike
EUT Pol. : E1 Plane Measurement Antenna Pol. : VERTICAL



Freq. MHz	Note F/H/E/S	Decetor Mode QP/AV/PK	ERP Level dBm	SG Output Level dBm	Antenna Gain dBd	Cable Loss dB	Limit @3m dBm	Margin dB
32.91	S	Peak	-50.18	-35.12	-14.09	-0.97	-13.00	-37.18
76.56	S	Peak	-57.16	-52.15	-3.87	-1.14	-13.00	-44.16
167.74	S	Peak	-65.71	-63.13	-1.07	-1.51	-13.00	-52.71
251.16	S	Peak	-64.93	-66.64	3.47	-1.76	-13.00	-51.93
628.49	S	Peak	-63.19	-63.89	3.18	-2.47	-13.00	-50.19
751.68	S	Peak	-62.86	-62.98	3.19	-3.07	-13.00	-49.86
1693.20	H	Peak	-52.73	-55.69	7.27	-4.30	-13.00	-39.73

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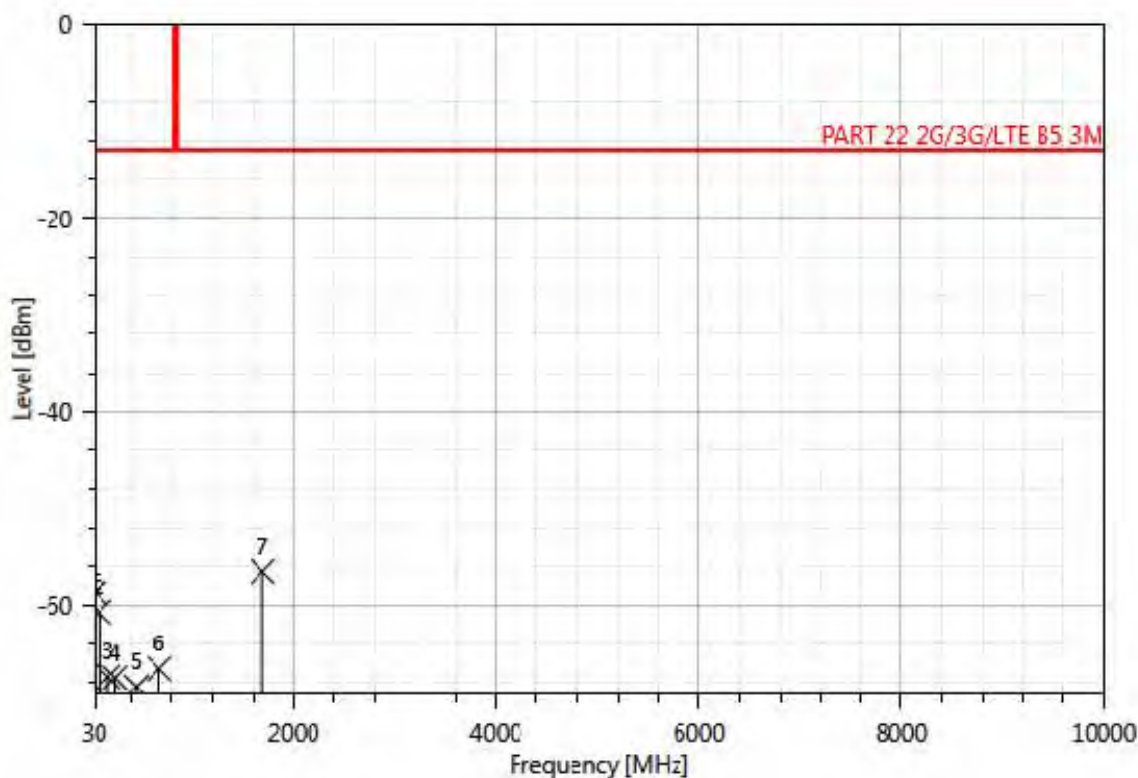
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Operation Mode :	HSUPA B5	Test Date :	12/14/2016
Fundamental Frequency :	848.8 MHz	Temp. / Humi. :	21 deg_C / 62 RH
Operation Band :	Tx CH HIGH	Test Engineer :	Mike
EUT Pol. :	E1 Plane	Measurement Antenna Pol. :	HORIZONTAL



Freq.	Note	Decetor	ERP	SG Output	Antenna	Cable	Limit	Margin
MHz	F/H/E/S	QP/AV/PK	Level dBm	Level dBm	Gain dBd	Loss dB	@3m dBm	dB
36.79	S	Peak	-58.70	-44.29	-13.43	-0.98	-13.00	-45.70
78.50	S	Peak	-60.74	-56.29	-3.29	-1.15	-13.00	-47.74
168.71	S	Peak	-67.36	-64.85	-1.00	-1.51	-13.00	-54.36
237.58	S	Peak	-67.45	-68.96	3.24	-1.74	-13.00	-54.45
444.19	S	Peak	-68.39	-69.87	3.66	-2.18	-13.00	-55.39
672.14	S	Peak	-66.53	-67.17	3.11	-2.47	-13.00	-53.53
1693.20	H	Peak	-56.48	-59.44	7.27	-4.30	-13.00	-43.48

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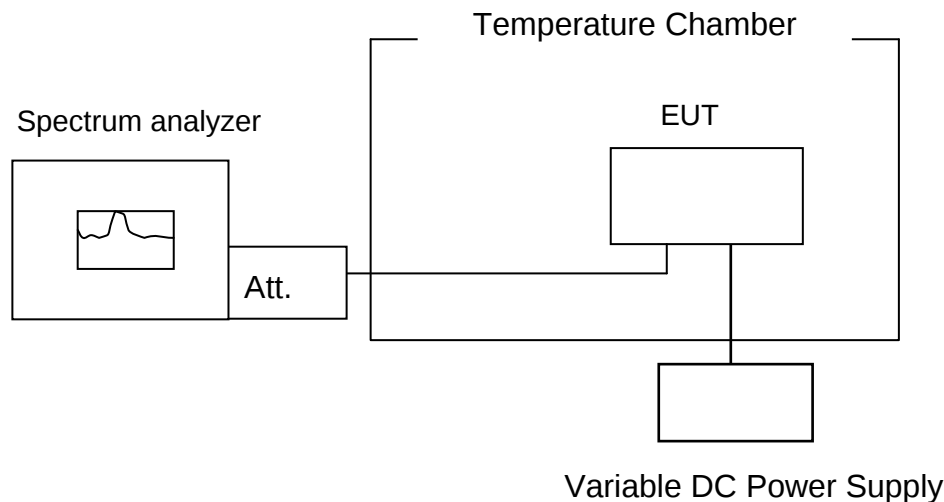
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11. FREQUENCY STABILITY MEASUREMENT

11.1. Standard Applicable:

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

11.2. Test Set-up:



Note: Measurement setup for testing on Antenna connector

11.3. Measurement Procedure:

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to -30°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.

Set chamber temperature to 25 . Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.

Reduce the input voltage to specify extreme voltage variation (+/- 15%) and endpoint as declared by the manufacturer, record the maximum frequency change.

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11.4. Measurement Equipment Used:

SGS Conducted Room					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EXA Spectrum Analyzer	Agilent	N9030A	MY53120760	02/26/2016	02/25/2017
DC Block	Mini-Circuits	BLK-18-S+	1	01/02/2016	01/01/2017
Coaxial Cable	HUBER+SUHNER	SUCOFLEX 102	23670/2	01/02/2016	01/01/2017
Attenuator	Mini-Circuit	BW-S10W2+	2	01/02/2016	01/01/2017
Splitter	Agilent	11636B	N/A	01/02/2016	01/01/2017
DC Power Supply	Agilent	E3640A	MY52410006	11/21/2016	11/20/2017

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11.5. Measurement Result:

FREQUENCY ERROR vs. VOLTAGE

Reference Frequency: GPRS 850 Mid Channel 836.6 MHz				
Limit: +/- 2.5 ppm				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature ()	(MHz)		
8.8	20	836.599994	0	2091
7.7	20	836.599994	0	2091
6.5	20	836.599993	-1	2091
6 (End point)	20	836.599998	4	2091

FREQUENCY ERROR vs. TEMPERATURE

Reference Frequency: GPRS 850 Mid Channel 836.6 MHz				
Limit: +/- 2.5 ppm				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature ()	(MHz)		
7.7	50	836.599993	-1	2091
7.7	40	836.599991	-3	2091
7.7	30	836.599989	-5	2091
7.7	20	836.599994	0	2091
7.7	10	836.599994	0	2091
7.7	0	836.599998	4	2091
7.7	-10	836.599995	1	2091
7.7	-20	836.599992	-2	2091
7.7	-30	836.599992	-2	2091

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FREQUENCY ERROR vs. VOLTAGE

Reference Frequency: GPRS 1900 Mid Channel 1880 MHz				
Limit: +/- 2.5 ppm				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature ()	(MHz)		
8.8	20	1880.000004	-5	4700
7.7	20	1880.000009	0	4700
6.5	20	1879.999994	-15	4700
6 (End point)	20	1879.999992	6	4700

FREQUENCY ERROR vs. TEMPERATURE

Reference Frequency: GPRS 1900 Mid Channel 1880 MHz				
Limit: +/- 2.5 ppm = Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature ()	(MHz)		
7.7	50	1880.000003	-1	4700
7.7	40	1880.000004	1	4700
7.7	30	1880.000006	-3	4700
7.7	20	1880.000009	0	4700
7.7	10	1879.999996	-1	4700
7.7	0	1879.999984	2	4700
7.7	-10	1880.000002	4	4700
7.7	-20	1880.000006	5	4700
7.7	-30	1880.000006	3	4700

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FREQUENCY ERROR vs. VOLTAGE

Reference Frequency: WCDMA II Mid Channel 1880 MHz				
Limit: +/- 2.5 ppm				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature ()	(MHz)		
8.8	20	1880.000001	-1	4700
7.7	20	1880.000002	0	4700
6.5	20	1879.999999	-3	4700
6 (End point)	20	1880.000001	-1	4700

FREQUENCY ERROR vs. TEMPERATURE

Reference Frequency: WCDMA II Mid Channel 1880				
Limit: +/- 2.5 ppm				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature ()	(MHz)		
7.7	50	1880.000003	1	4700
7.7	40	1879.999998	-4	4700
7.7	30	1880.000002	0	4700
7.7	20	1880.000002	0	4700
7.7	10	1879.999998	-4	4700
7.7	0	1879.999997	-5	4700
7.7	-10	1880.000003	1	4700
7.7	-20	1879.999997	-5	4700
7.7	-30	1880.000002	0	4700

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FREQUENCY ERROR vs. VOLTAGE

Reference Frequency: WCDMA V Mid Channel 836.6 MHz				
Limit: +/- 2.5 ppm				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature ()	(MHz)		
8.8	20	836.600001	-1	2091
7.7	20	836.600002	0	2091
6.5	20	836.600001	-1	2091
6 (End point)	20	836.599997	-5	2091

FREQUENCY ERROR vs. TEMPERATURE

Reference Frequency: WCDMA V Mid Channel 836.6 MHz				
Limit: +/- 2.5 ppm				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature ()	(MHz)		
7.7	50	836.599995	-7	2091
7.7	40	836.599994	-8	2091
7.7	30	836.600002	0	2091
7.7	20	836.600002	0	2091
7.7	10	836.599995	-7	2091
7.7	0	836.599998	-4	2091
7.7	-10	836.600001	-1	2091
7.7	-20	836.599998	-4	2091
7.7	-30	836.599994	-8	2091

Note: The battery is rated 7.7Vdc.

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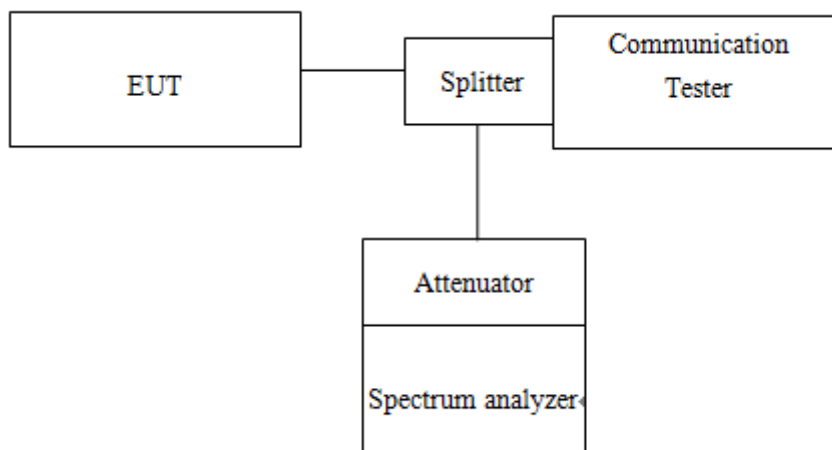
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12. PEAK TO AVERAGE RATIO

12.1. Standard Applicable

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

12.2. Test SET-UP



12.3. Measurement Procedure

1. KDB 971168 D01 is employed as the following procedure is proper adjusted accordingly:
2. Set resolution/measurement bandwidth $\geq$ signal's occupied bandwidth; & internal =1ms
3. Set the number of counts to a value that stabilizes the measured CCDF curve.

12.4. Measurement Equipment Used

SGS Conducted Room					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EXA Spectrum Analyzer	Agilent	N9030A	MY53120760	02/26/2016	02/25/2017
DC Block	Mini-Circuits	BLK-18-S+	1	01/02/2016	01/01/2017
Coaxial Cable	HUBER+SUHNER	SUCOFLEX 102	23670/2	01/02/2016	01/01/2017
Attenuator	Mini-Circuit	BW-S10W2+	2	01/02/2016	01/01/2017
Splitter	Agilent	11636B	N/A	01/02/2016	01/01/2017
DC Power Supply	Agilent	E3640A	MY52410006	11/21/2016	11/20/2017

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12.5. Measurement Result

Tabular Results:

Frequency (MHz)	CH	Peak-to-Average Ratio (dB)	
		GPRS	EDGE
1850.20	9296	8.93	11.42
1880.00	9400	9.98	11.13
1909.80	9538	10.7	11.33

Frequency (MHz)	CH	Peak-to-Average Ratio (dB)		
		WCDMA Band II	HSDPA Band II	HSUPA Band II
1852.4	9262	2.73	4.02	3.41
1880.0	9400	2.67	3.48	3.56
1907.6	9538	2.66	3.75	3.54

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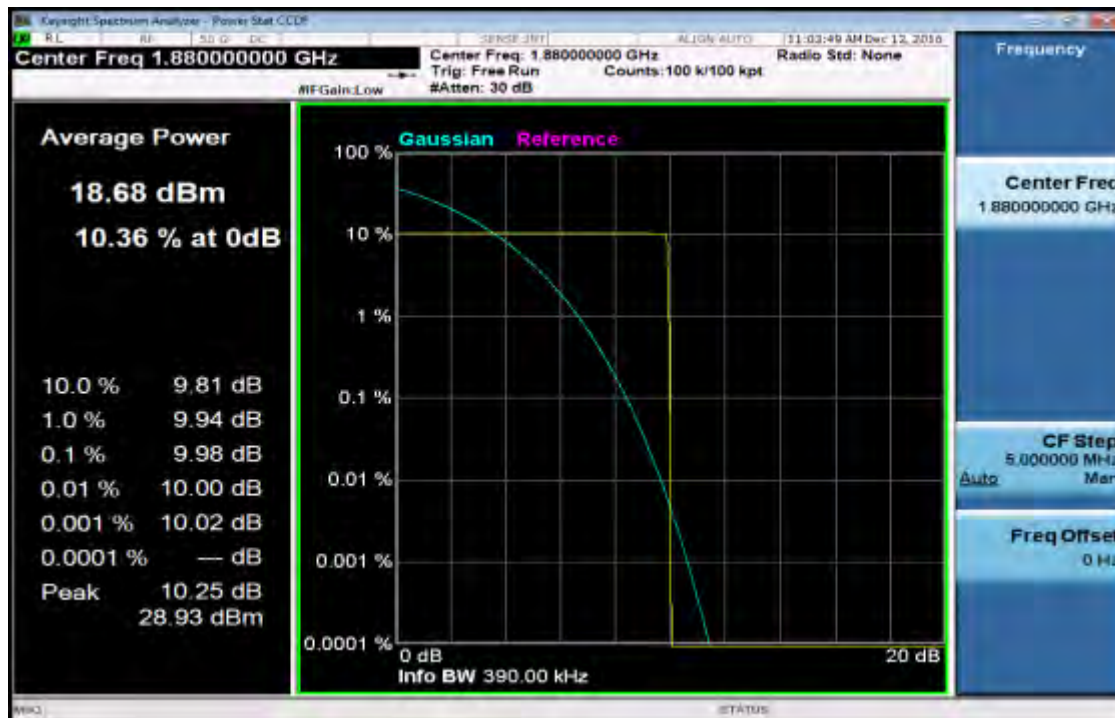
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Measurement Results:

GPRS 1900 Channel Low



GPRS 1900 Channel Mid



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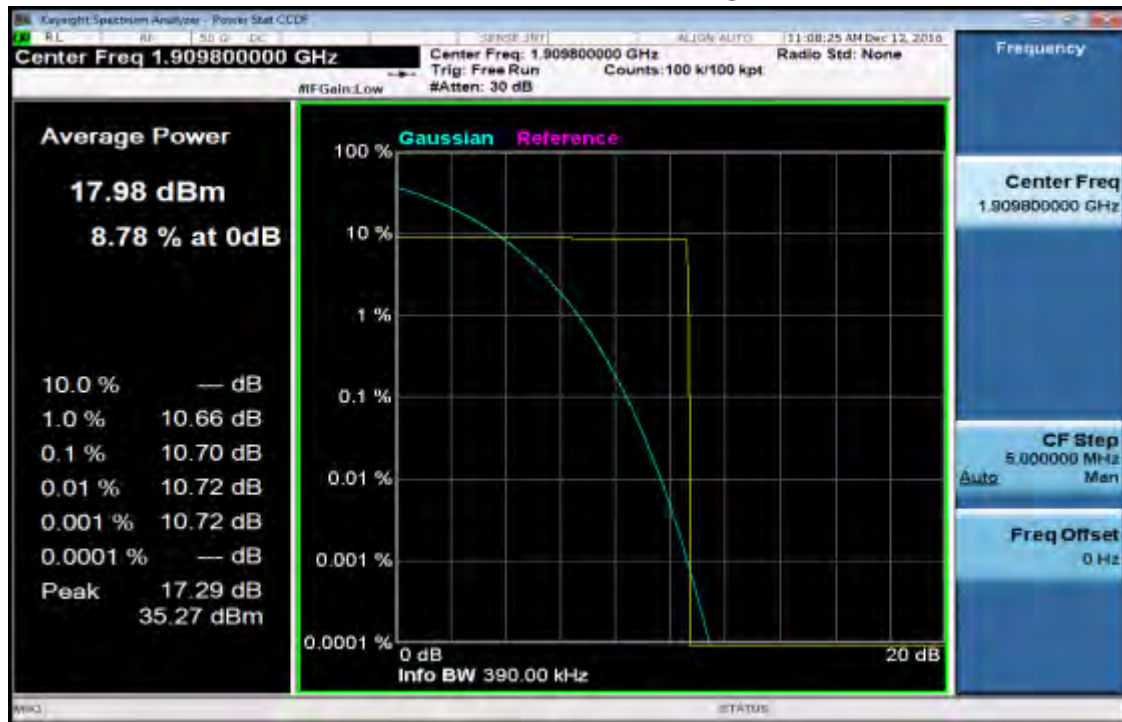
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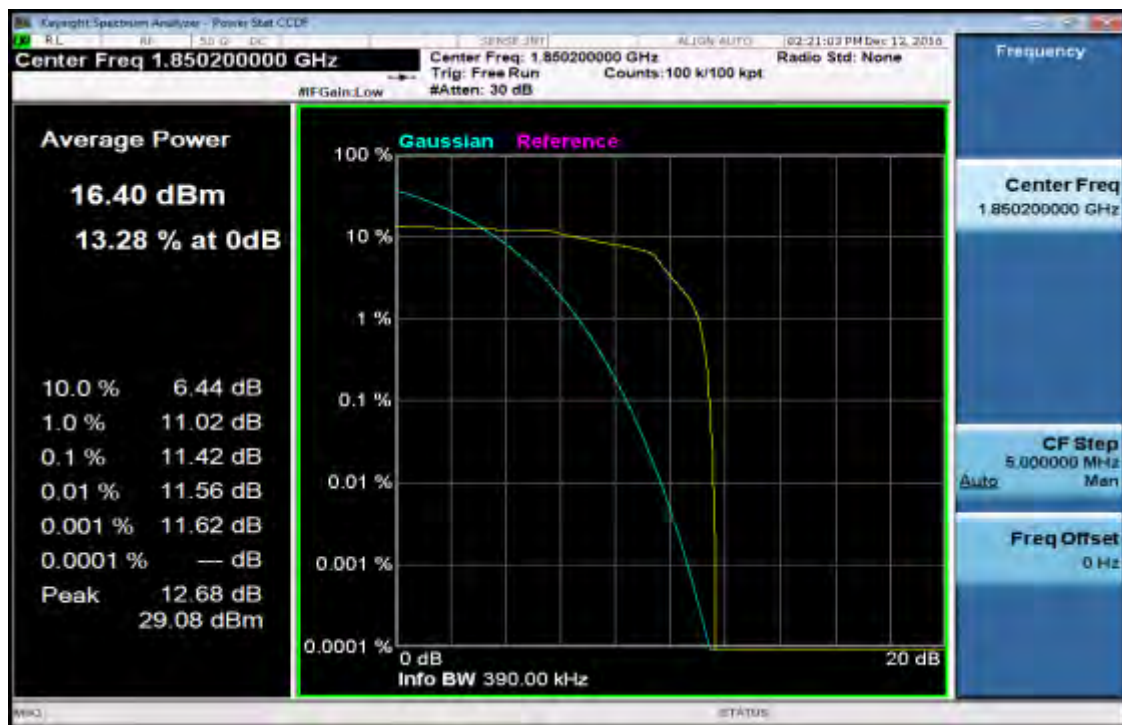
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GPRS 1900 Channel High



EDGE 1900 Channel Low



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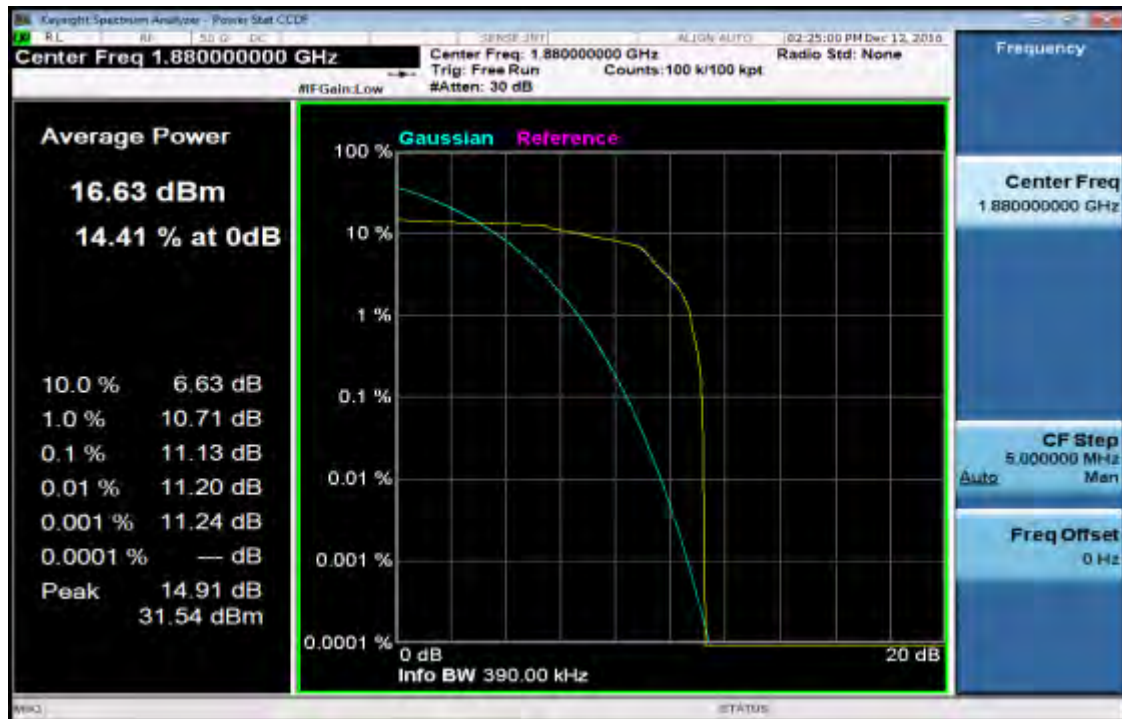
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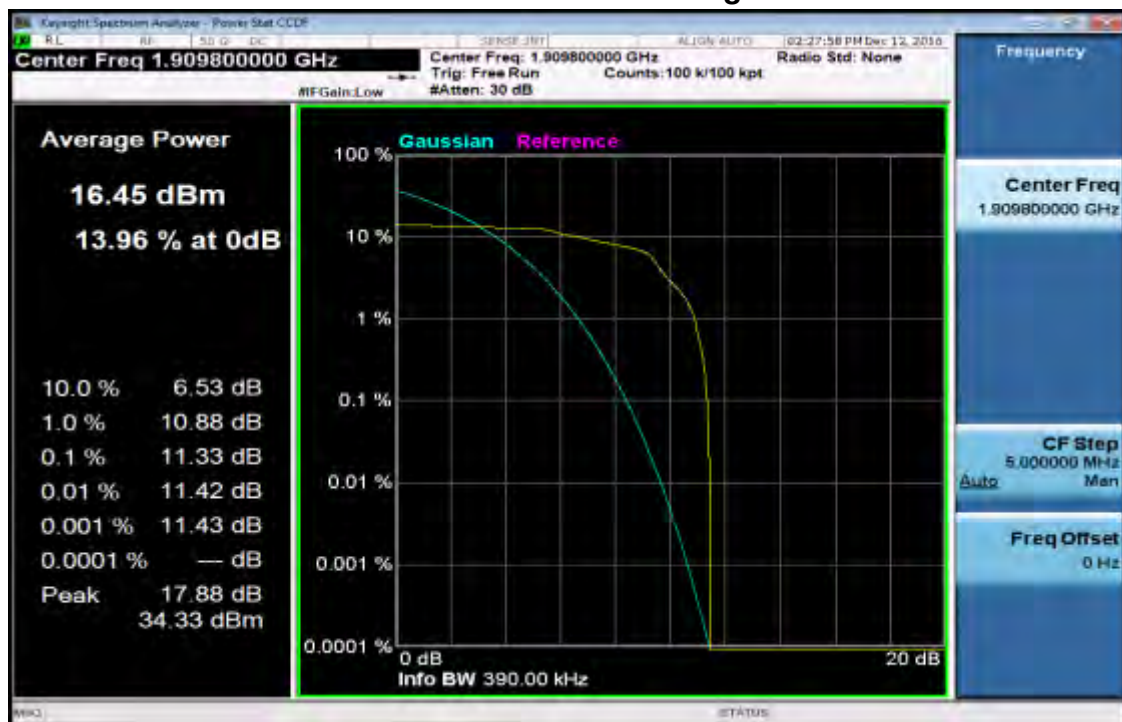
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EDGE 1900 Channel Mid



EDGE 1900 Channel High



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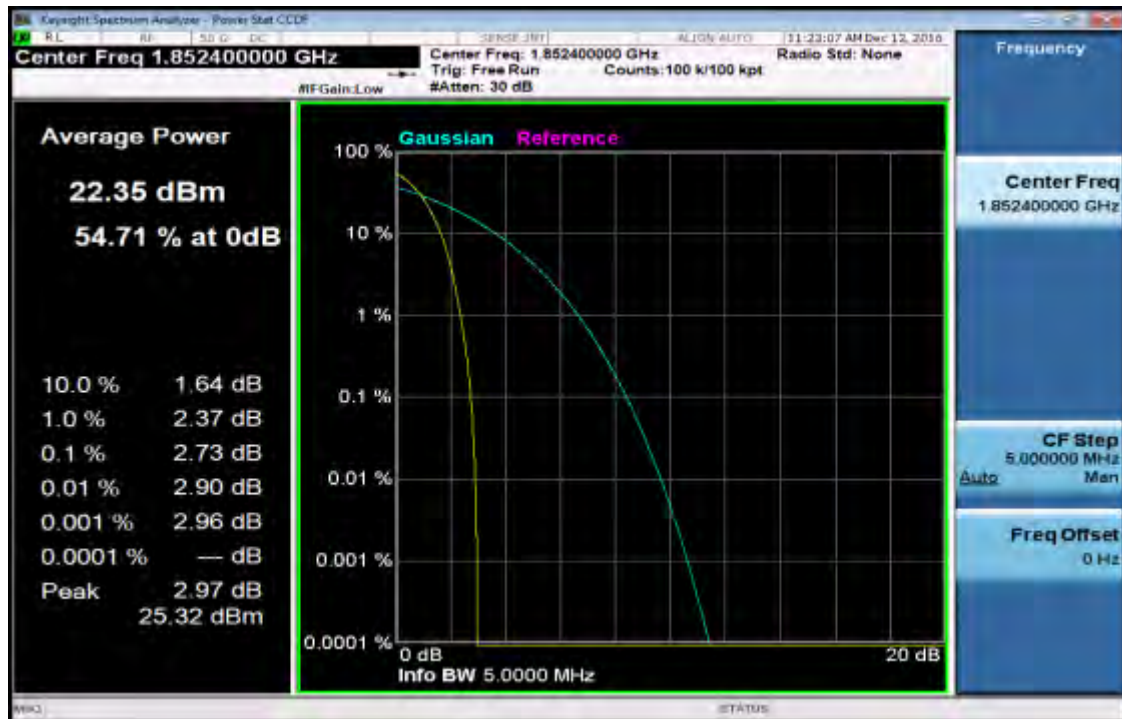
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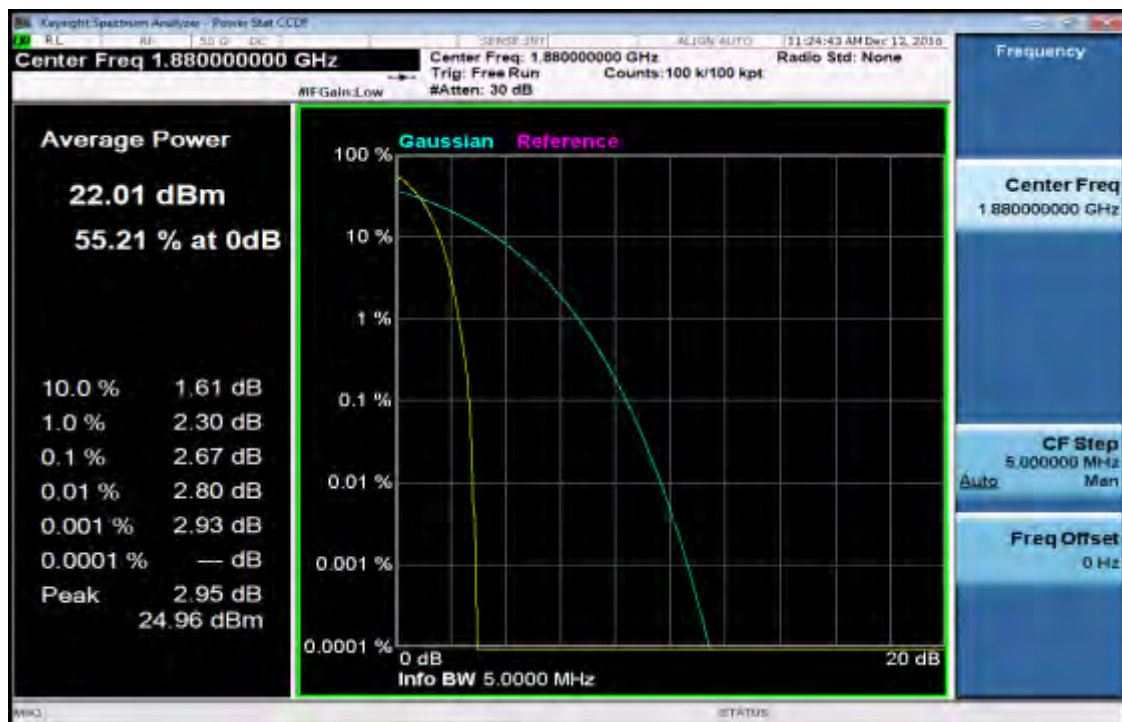
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WCDMA II Channel Low



WCDMA II Channel Mid



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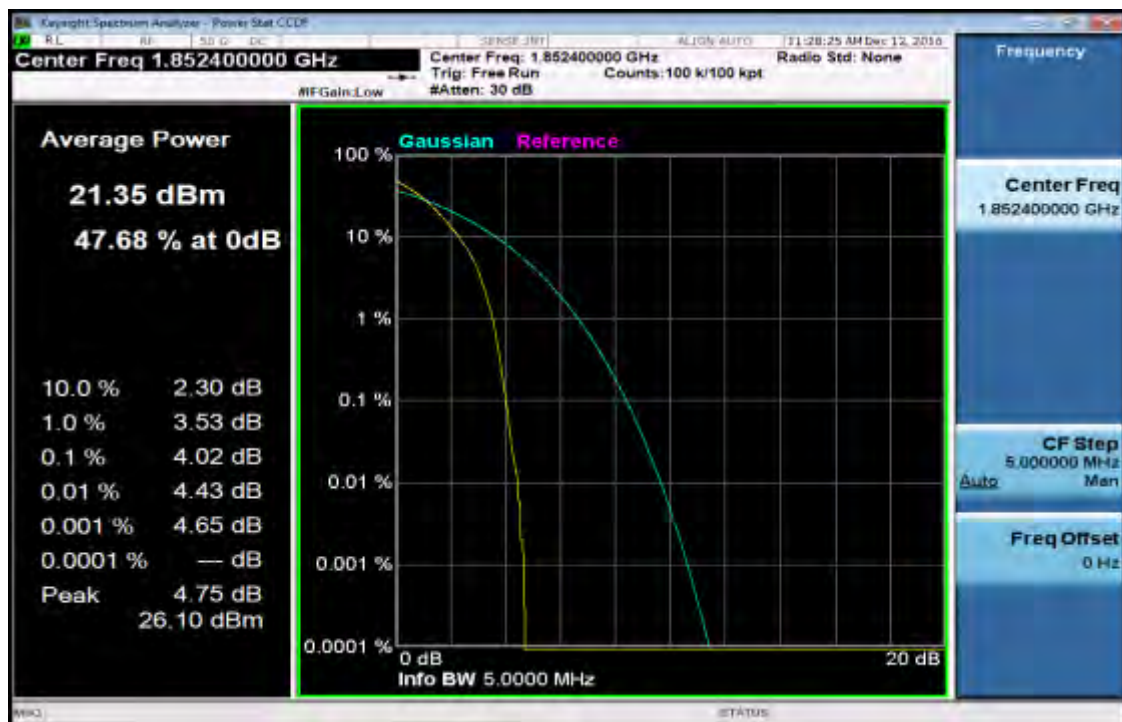
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WCDMA II Channel High



HSDPA II Channel Low



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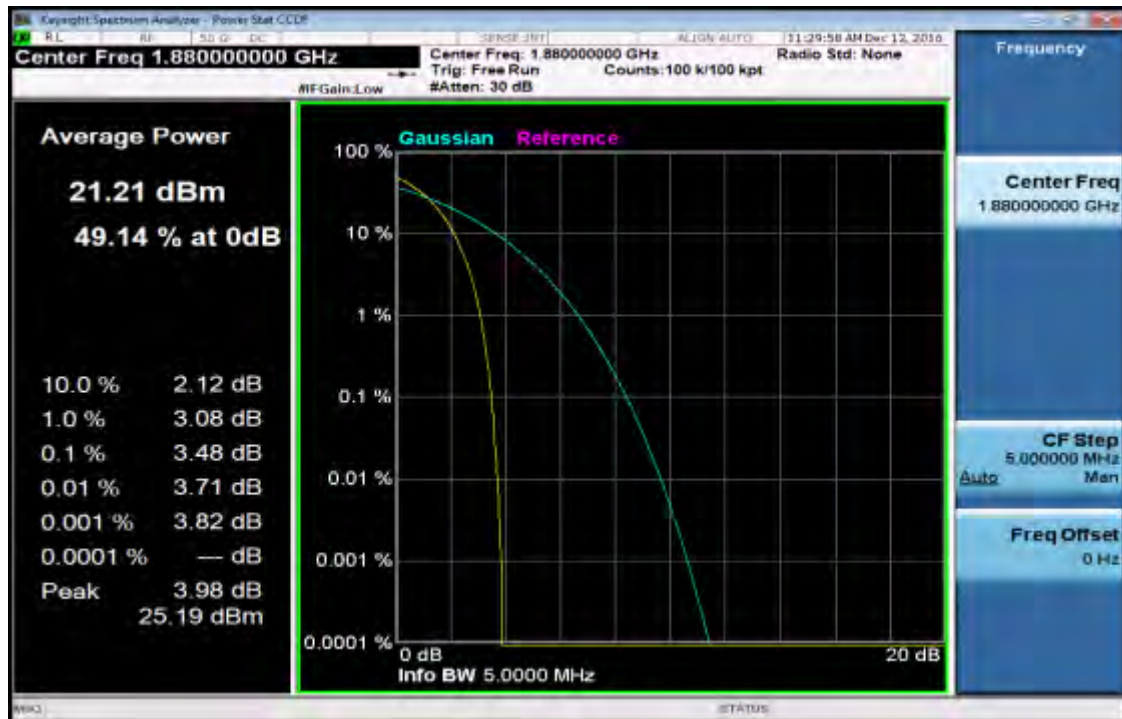
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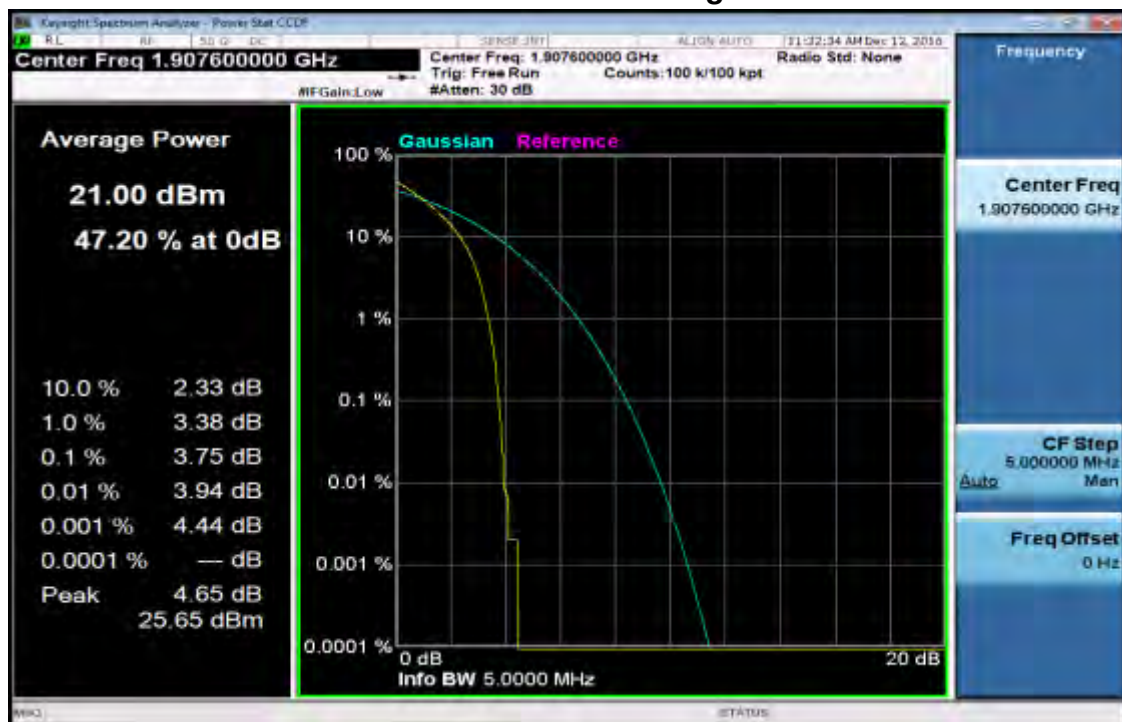
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HSDPA II Channel Mid



HSDPA II Channel High



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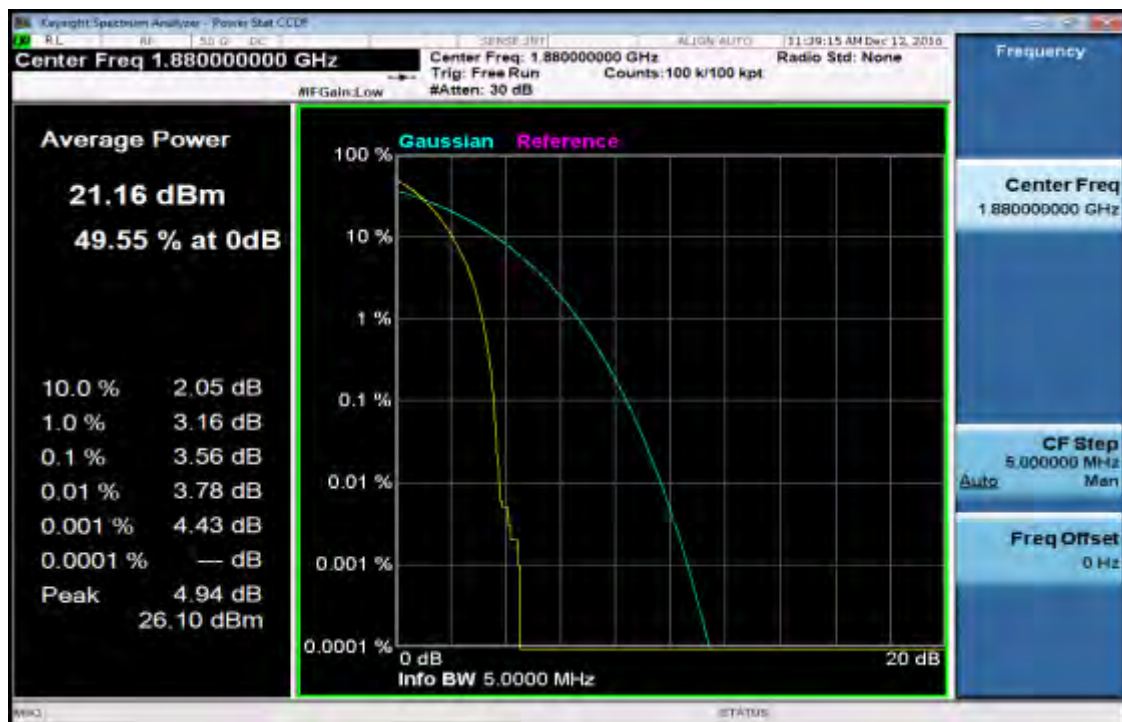
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HSUPA II Channel Low



HSUPA II Channel Mid



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HSUPA II Channel High



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